MASTER PLAN

FOR

THODUPUZHA TOWN

THODUPUZHA MUNICIPALITY

LOCAL SELF GOVERNMENT (PLANNING) DEPARTMENT KERALA

JULY - 2022

FOREWORD

Democratic decentralisation will not succeed unless and until the fruit of development reaches the grass roots. For this, deliberate actions need to be taken up in terms of decentralised planning and administration. The people's plan process initiated in Kerala as a part of this noble objective has been recognized as a bold step towards decentralisation. But much more has to be done in this direction to make these efforts more effective. Preparation of master plan for each and every local planning area in the district is one such step. This master plan is a humble effort towards this direction.

Thodupuzha became a municipality on 1st September 1978. Since then this town has seen number of institutions both in government and private sector being setup and investments in various commercial ventures and in improving infrastructure. The geographical location of the town is along the boundary of the district. The town has immense potential to be a regional centre with its Taluk head quarter status and a sought after and well-connected urban centre within the district. The economic growth potential of a town may depend on a number of factors like geographic location, tourism potential, availability of economic/social/physical infrastructure, regional linkages, propensities for accepting further investments and ability for creating spread effects. At present, the developmental efforts of various departments in this regard are mostly compartmentalised and lack people's participation to a greater extent in identifying and solving the problems faced by the town. The town needs an integrated approach, whether it is in infrastructure development, environmental conservation or service delivery in various social sectors. Earnest efforts are undertaken to reflect the varied necessities for planned sustainable development of the town. The master plan emphasises on such needs, meanwhile giving thrust to people's aspirations, economic realities etc. I hope this master plan shall be a road map for the development of Thodupuzha for years to come

I take this opportunity to thank the officials of Town and Country Planning Department for preparing this plan, through a process in which people participation was carefully included, understanding the aspirations and expectations of the citizens of the Town, all the members of municipal council, members of the Spatial Integration Committee, officials of the Thodupuzha municipality and various government departments, in making the endeavour a success. The modification of published draft report was a joint effort of special committee, constituted especially for this purpose and all the ward councillors. The published plan is now finalised with the active involvement and contribution of this team. The encouragement and enthusiasm of all elected representatives in the completion of this work is gratefully acknowledged. I submit this

comprehensive master plan before the people of Thodupuzha with the hope that they will make use of this vision document for furthering the development objectives of the plan.

Thodupuzha
18/07/2022

Sanish George
Municipal Chairman, Thodupuzha

PREFACE

The settlement pattern of Kerala is unique in terms of urban rural continuum. Urban areas are engines of economic development and have to perform complex multiple functions. In order to equip urban areas to perform such complex multiple functions and to ensure orderly, planned, sustainable development of the area with forward and backward linkages with rural hinterland, planning interventions are inevitable. Therefore an integrated and coordinated spatial planning strategy, based on a comprehensive Master Plan, addressing the potentials and constraints for spatial development of the town is required. The 74th constitutional amendment and subsequent state legislation have put forward a paradigm shift in the development planning process. The focus has shifted from centralised, descriptive, allocation based planning to participatory, long term, spatial planning for the planned sustainable development.

A Master plan has multiple objectives to ensure efficiency of built form of the town so as to augment economic development to facilitate inclusive and faster development by the impetus given to various sectors of economy and to put in place a regulatory mechanism for limiting the anthropogenic threats to the environmental resources, keeping the demands of development well within the carrying capacity of our precious environment. It is in this backdrop that the Government of Kerala have decided to facilitate preparation of master plans for all statutory towns in the state. Preparation of master plan for Thodupuzha town was taken up, in the first phase of the State Plan Scheme 'Scheme of preparation of Master Plans and Detailed Town Planning Schemes' introduced for this purpose, as a joint effort of the Thodupuzha Municipality and the Local Self Government (Planning) Department.

Thodupuzha Municipality in the foothills of the fragile Western Ghats is peculiar in terms of topography, environment, culture, wide range of flora and fauna, hill produces etc. The District Urbanisation Report of Idukki prepared by the then Town and Country Planning department emphasises the need of developing Thodupuzha town as a first order urban centre in the district to cater to the higher order demands. This master plan is prepared through a systematic process covering extensive collection of data through both primary surveys and secondary sources, local level and spatial analysis, identification of problems and potential, identification of development issues, setting up of goals and objectives, evolving spatial structure, formulation of development concept and carving out policies and strategies followed by detailed sector wise proposals. The plan envisages Thodupuzha to function as the regional centre of trade and commerce in the district as well as a centre of higher order health care besides being an administrative town. Planning interventions required for achieving these are formulated in this plan.

I appreciate the guidance and involvement of Smt. Cicily Jose, Prof. Jessy Antony, Smt. Mini Madhu, Smt. Safiya Jabbar, and Sri. A.M. Harid former Chairmen of Thodupuzha Municipality, and all the members of the Municipal Council in the plan preparation process**.** The collective contributions of various departments, private agencies, people's representatives and above all the people of Thodupuzha have acted as a crucial tool for carving out this plan. A planning team was constituted in the District office of the Town and Country Planning department, presently the Local Self Government (planning) Department, in connection with the preparation of this Master Plan under the leadership of the District Town Planner. I take this opportunity to appreciate all officials of Idukki District Office, especially the former District Town Planners viz. Smt. K.S. Girija, Sri. J. Ashok Kumar, Sri. Pavithran R, Sri. Jimmichen Mathew, Sri. T.N. Rajesh and the present District Town Planner, Smt. Jinumole Varghese, for their consistent efforts in materialising the preparation of this Master Plan. The anchor role played by the officials of the then State Project Cell of the department of Town and Country planning , in coordinating and stream lining all planning activities, needs special mention.

As per GO (MS) 137/2021/LSGD dated 13/07/2021, Government had issued permission to publish the draft Master Plan for Thodupuzha Town and it was published in Kerala gazette number 2673 dated 13/09/2021. With due consideration to the objections and suggestions received from the public, published Master Plan was modified by the Council. I take this opportunity to appreciate the efforts of the special committee chaired by the present Municipal Chairman Sri Sanish George and all the council members who played a crucial role in the modification works in a time bound manner. The collective efforts of the Special committee, Municipal Council and Local Self Government (Planning) Department culminated in the finalisation of this Master Plan.

I hope, this Master Plan will provide the desired frame work for planned development of Thodupuzha town.

Thiruvananthapuram **H. Prasanth**
18/07/2022 **Chief Town Planner (Planning)**

ACKNOWLEDGEMENT

Master plan for Thodupuzha, like every master plan prepared for any area, envisages a planned and sustainable development of the town. Idukki possesses a unique status among the districts of Kerala due to its rugged terrain, the serene environment, availability of natural resources, presence of numerous tourist spots, wide range of hill produces and spices. Thodupuzha town, being situated in lower plain than most part of the district displays a character slightly different from the general character of the district. The topography is fairly level, forest, plantation like cardamom and tea are absent and the main occupation is also different from the rest of the district. Thodupuzha can aptly play the role of a trade and commerce hub of the district while providing higher order healthcare and administrative facilities. While preparing the master plan a comprehensive approach was adopted, to utilise all strengths of the town, analysing the functioning of all sectors, affecting human life and environment. The district office of the Town and Country Planning department extended technical support to Thodupuzha municipality in this endeavour. It is hoped that this plan will pave way for a planned development of the town.

Help and support came in plenty from various organisations and people for the preparation of the plan. I acknowledge with gratitude the support given by former municipal councils chaired by Smt. Cicily Jose, Prof. Jessy Antony, Smt. Mini Madhu, Smt. Safiya Jabbar and Sri. A. M. Harid. The efforts put by all the members of the Spatial Integration Committee in this task are heartily acknowledged.

I am extremely grateful to former Chief Town Planners Smt. K.S. Girija, and Sri. Giji George, for the support and motivation extended towards the plan preparation. The plan was finalised after a series of discussions, revisions and modifications. I thank all those who have participated in these processes that led to the moulding of the plan in the present form. I express my sincere thanks to the officers of the then State Project Cell in the Chief Town Planner's Office for co-ordinating and streamlining all activities in this Master Plan preparation process.

I would like to express my sincere gratitude to the Chief Town Planner Sri. Pramodkumar C.P and Sri. H. Prasanth Chief Town Planner (Planning), for all the guidance and support extended during the finalisation of the published Master Plan

I take this opportunity to appreciate the sincere efforts of all the officials of Town Planning office, Idukki who have contributed from the beginning to the final stage of this work. The former Town Planners Sri. J. Ashok Kumar, Sri. T.N. Rajesh, Sri. Pavithran R. and Sri Jimmichen Mathew

are gratefully remembered for their contributions. Planning team of this office headed by Sri. K. Viswanadhan Deputy Town Planner who have contributed remarkably in this exercise especially in data compilation, analysing, and preparation of thematic maps, graphs, and report drafting etc. is also remembered. The sincere and remarkable efforts put in by the team headed by Smt. Sreelatha P.R Assistant Town Planner of this office in finalising the plan as per the decision of the council are highly appreciated.

As per Go (MS) 137/2021/LSGD dated 13/07/2021, Government gave permission to publish the Master Plan and it was published in Kerala gazette number 2673 dated 13/09/2021. Objections and suggestions were called for from the public and hearing was conducted. Based on this, published Master Plan was modified and Municipal Council resolution was taken for getting it sanctioned from Government. Modification of the draft was completed as a joint effort of special committee and councillors. I sincerely thank the Special committee chaired by Municipal Chairman Sri Sanish George and members of Municipal council for their commitment and hard work. I also appreciate the members of Municipal council for the whole hearted participation in the modification works and for bringing in their valuable suggestions to make this venture a success.

I also express my gratitude towards all other staff of Town Planning office Idukki, for their participation in various stages of plan preparation and its modifications. I once again thank everyone who has contributed towards this master plan.

Jinumole Varghese

Town Planner

Office of the Town Planner, Idukki

Idukki

18/07/2022

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CHAPTER - 1
INTRODUCTION

Thodupuzha is the older of the two municipalities of Idukki district. It is an ancient town with a history dating back to many centuries. Until AD 1600 Karikode near Thodupuzha was the head quarter of Keezhmalainadu which was one of the provinces Kerala was divided into then. The municipality was formed in 1st of September 1978 by conglomerating Thodupuzha grama panchayath and parts of Manakkad, Kumaramangalam and Karikode grama panchayaths.

Thodupuzha located at an average altitude of 70 m in a district with altitude ranging between 40 m and 1200 m for about half of the area has developed over the years as the largest trading centre also due to the added advantage of road connectivity to major centres of neighbouring districts. It had been the administrative centre of the region until the district was formed with head quarter at Painavu in Vazhathope grama panchayath 1972. The municipality still has too many district level offices while it is a taluk head quarter too. Even with these functions the municipality effectively plays the main occupation hither to has been agriculture. This scenario is now witnessing a change with a shift from agriculture based economy to one that based on trade and commerce. Geographically Thodupuzha region falls in midland. It is the biggest commercial centre of the district. It is the gateway from west to Idukki where located Idukki arch dam, the second largest of this kind in Asia and the district head quarter at Painavu.



Thodupuzha town

Thodupuzha- Puliyanmala road SH - 33 is the main travel corridor of the district that connects Thodupuzha to Painavu the district headquarter and to the tourist destinations like Idukki arch dam and Thekkady as well. The main educational institutions and medical facilities of the district are located in the municipal area and surroundings. Many district level and taluk level offices function here mainly due to the presence of infrastructural facilities. Municipality which accommodates many hotels of descent service level could serve as a transit point for the tourists from the western districts to destination like Idukki, Thekkady, and Munnar etc. The natural scenic beauty of Thodupuzha especially the surrounding area like Muttom has made it a hot spot for malayalam movie makers. Abundance in agricultural products in the municipality and districts gives scope for establishing agro

based industries which is a sector unexplored so far. As said before, tourism related activities will also have to be boosted.

1.1 NEED FOR PLAN

As mentioned earlier Thodupuzha is the older of the two municipalities of Idukki district and is having taluk head quarter status. Major portion of the town is still under agricultural use. Due consideration has to be given for agriculture and allied activities while ensuring balance growth of urban and nonurban activities. The town has grown as a trade service centre and still trade and commerce is the major activity of the town. Being a taluk head quarter a large number of state and central government offices are functioning in the town. In addition a number of educational and medical institutions are also functioning here. But many infrastructural facilities are inadequate. These attract a lot of people from high range and the needs of floating population have to be considered.

At present the town experience a development in the core area and the hinterlands are developed not in a planned manner, which leads to exploitation of natural resources. To avoid this and to ensure planned development of the town, a development plan is needed. Planning is prerequisite for the effective development. So a necessity in felt for the preparation of a master plans for Thodupuzha town.

1.2 METHODOLOGY

The methodology adopted for preparation of the master plan is as per the guidelines issued vide GO (Rt) No.2766/2009/LSGD dated 24.10.2009. A Spatial Integration committee (SIC) has been formed exclusively for the preparation of master Plan. It is headed by the municipal chairman and the municipal secretary is the convener of the committee. The municipal engineer is the joint convener of the committee. One representative from each working groups, the district Town Planner

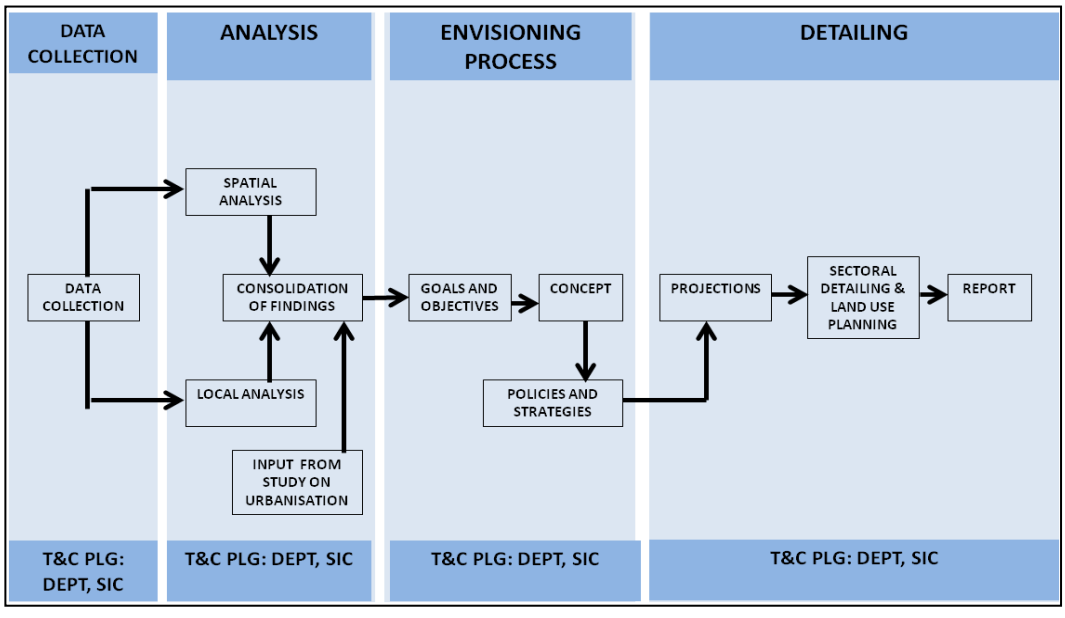


Fig. No 1.1: Plan preparation process and agencies involves

and resource persons are the members of the Spatial Integration Committee. In order to gather the views of citizens, stake holders, experts in various fields, people's representative's four workshops were conducted. The plan preparation process consists of data collection, analysis (local analysis and spatial analysis), envisioning process, and detailing. The plan preparation process is detailed in Figure No 1.1.

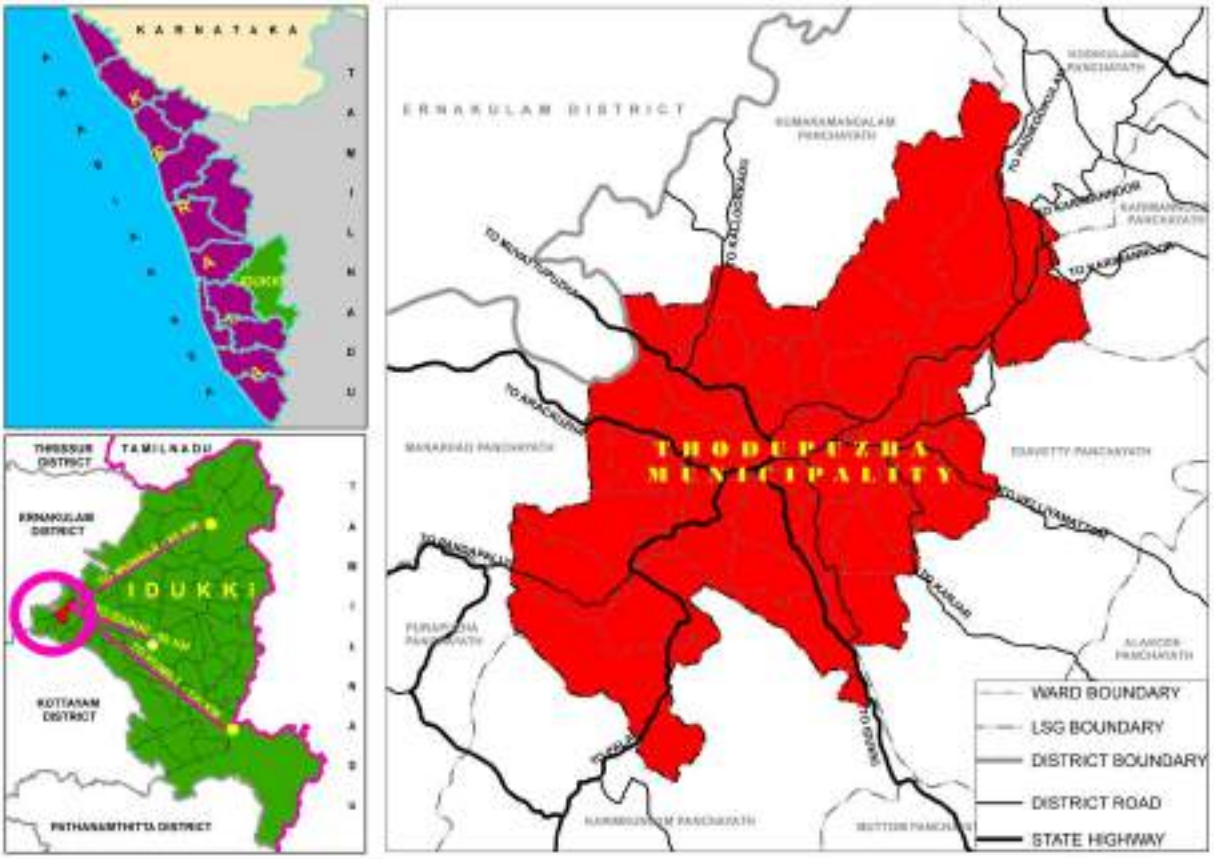
1.3 INFERENCE

Thodupuzha municipal area is witnessing shift from agricultural based economy to one that based on trade. For streamlining the development activities associated with urbanization that follows this change of economic scenario, planning intervention has become inevitable.

CHAPTER - 2
PHYSICAL CHARACTERISTICS

2.1 LOCATION

Thodupuzha is situated in the foothills of western ghats mountain ranges at the north western part of Idukki district. The town lies between 9° 52' 29.73" and 9° 56' 2.30" north latitudes and 76° 41' 15.25" and 76° 44' 20.50" east longitudes. Map No 2.1 shows the location of the town.



Map No.2.1: Location of Thodupuzha

SH - 8 (Punalur - Muvattupuzha), an important state highway of Kerala passes through the town. Also there are 4 other state highways viz. SH - 33 (Thodupuzha - Puliyanmala), SH - 40 (Alapuzha - Madurai), SH - 41 (Ernakulam - Thekkady) and SH - 44 (Sabarimala - Kodaikanal) that meet within the town area. The town is located at 202 km, 62 km, 92 km, 60 km respectively from the major centres of Kerala viz. Thiruvananthapuram, Ernakulam, Thrissur and Kottayam. Kochi international airport at 54 km is the nearest airport. Aluva at 53 Km is the nearest railway station. Major tourist destinations of Kerala such as Munnar, Thekkady, Wagamon are at 80 km, 93 km and 55 km respectively from Thodupuzha. The town is bounded by Kumaramangalam and Kodikulam

grama panchayat of Idukki and Manjalloor grama panchayat of Ernakulam district in the north: Manakkad, Purappuzha and Karimkunnam grama panchayat in the west: Karimkunnam grama panchayat in the south: and Edavetty grama panchayat in the east.

2.2 HISTORY

The name 'Thodupuzha' might have come from two words, 'thodu' (which means a small stream) and 'puzha' (which means a river). It is believed that the stream developed into a river, and the town on the banks of the river came to be known as Thodupuzha. There is another version which defines the word ‘thodu’ (malayalam word) as ‘touch’ and ‘puzha’ as ‘river’. Thus the town touching the river became Thodupuzha.

Thodupuzha is an ancient town with a history dating back to many centuries. In AD 100, Kerala comprised of several provinces such as Venadu, Otanadu, Navishainadu, Munjunadu, Vempolinadu, and Keezhmalainadu. Thodupuzha and Muvattupuzha were in Keezhmalainadu, which had its headquarters at Karicodu. Keezhmalainadu existed till AD 1600. In that year, it lost a battle with Vadakkumkoor and became a part of it. The Kings of Vadakkumkoor used to live at Karicodu for several years. At the time of king MarthandaVarma, Vadakkumkoor became part of the state of Travancore. The relics of the fort are still there at Karicodu. The Annamalai temple at Karicodu carries the traits of tamil architecture. In this temple, one can see many statues and lamps made out of stone and metal, believed to have been made in the 14th century. The church at Muthalakodam, a place situated 2 kilometers from Thodupuzha, is believed to have been constructed before 13th century. The Nainar mosque near Karikodu is said to have been constructed by the Vadakumkoor Raja for his muslim soldiers. At the formation of Kerala state in 1956, Thodupuzha was part of the Ernakulam district.

2.3 AREA

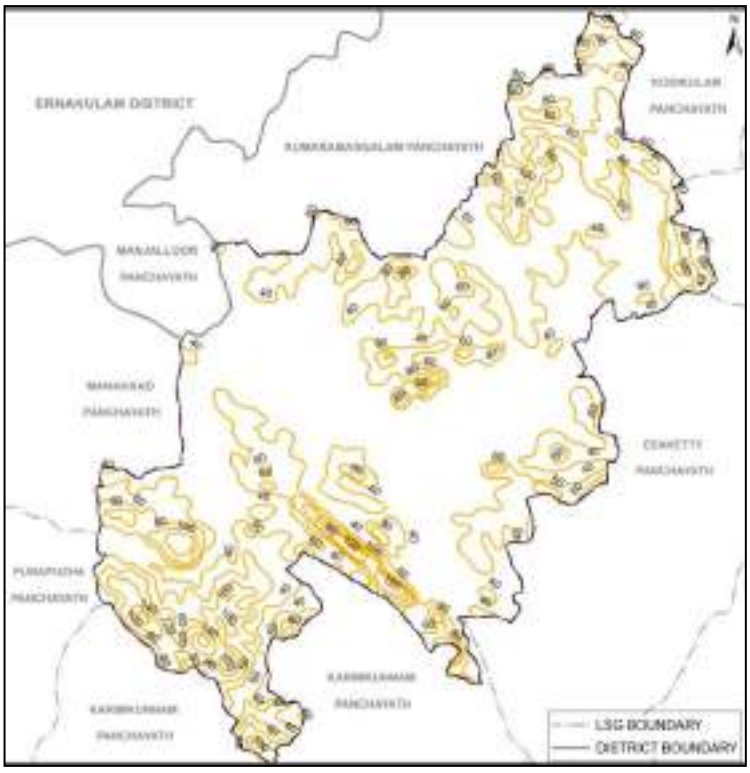
The total geographical area of the town is 35.43 Sq. km (3543 ha.) which accounts for 0.78 % of the total area of Idukki district. The town comprise of 28 wards at the time of conducting the surveys and now the total number of wards is 35. The town falls in 6 villages with majority of the area in Thodupuzha village alone.

2.4 DEMOGRAPHY

As per 2011 India census, the total population of Thodupuzha was 52045. Males constitute 49.1% of the population and females 50.9%. Thodupuzha has an average literacy rate of 95.59%, higher than the national average of 74.04%. Male literacy is 96.95% and female literacy is 94.29%. In Thodupuzha, 10 % of the population is under 6 years of age. Thodupuzha has a large share of “Vellala Pillai” clan who had migrated to here from “Tenkasi” in Tamil Nadu.

2.5 GEOGRAPHICAL FEATURES

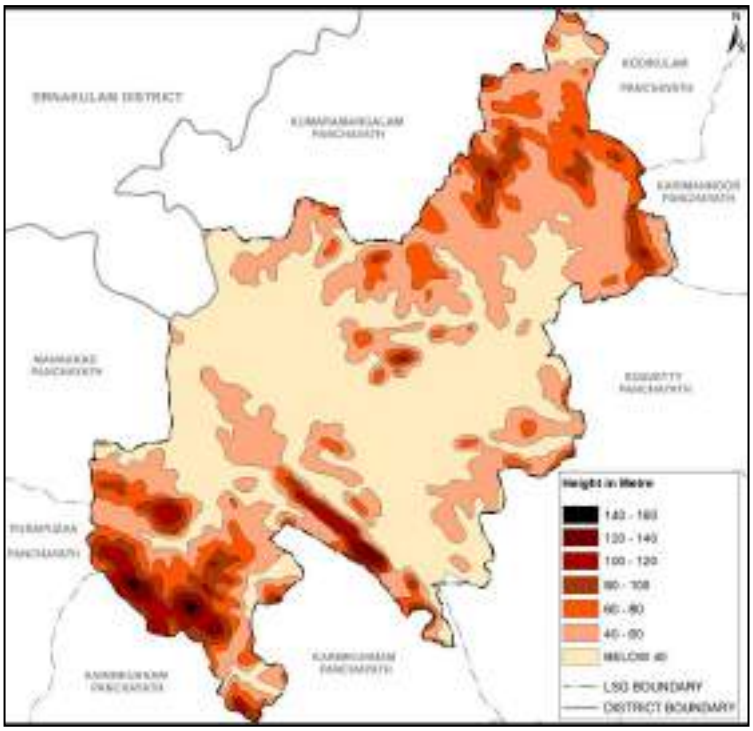
Thodupuzha is a foothill town of western ghats. The highest point in the municipal area is 140 m above MSL in Parakadavu, located in the south west part of the town. The town generally falls in midland region (below 100 m above MSL). About 55% of the land is having altitude less than 40 m above MSL. The north western part of the town is at relatively high altitude with average value of 70 m above MSL. Map No 2.2 and 2.3 shows the contour and physiographical maps of Thodupuzha town respectively.



Map No.2.2: Contour map of Thodupuzha

2.6 CLIMATE

The climate of Thodupuzha is having the general character of the state with a fairly uniform temperature throughout the year, higher than that of other parts of the district and a rainfall slightly less. Like other parts of the state, Thodupuzha also has four seasons viz. dry weather from December to February, hot weather from March to May, south-west monsoon from June to September and north-east monsoon from October to November. The mean temperature during the hot season is 32^0C and the rainfall varies from 1400 mm to 2000 mm during southwest

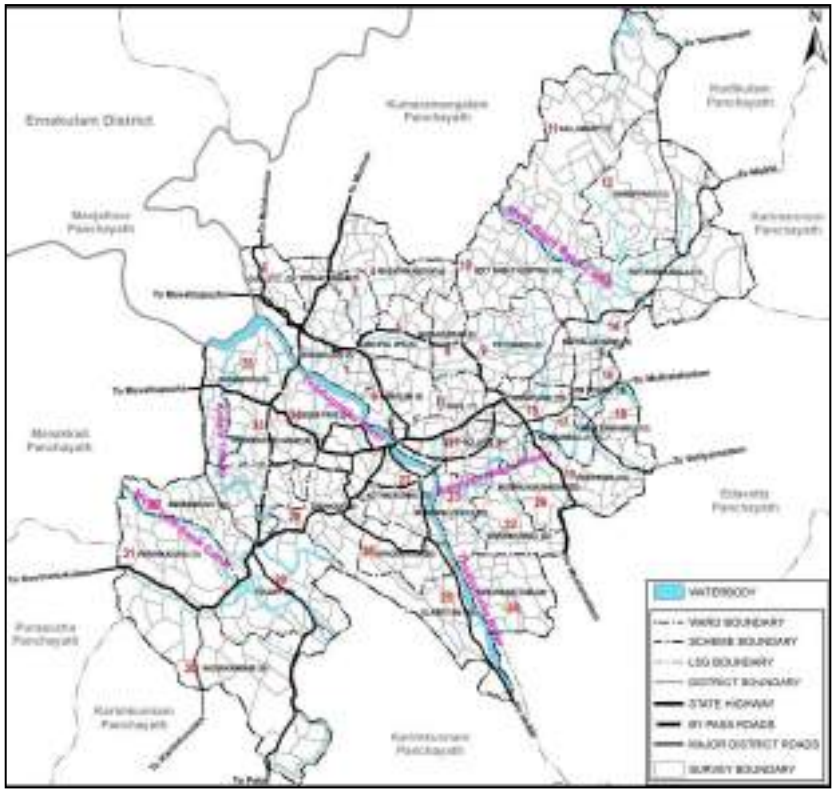


Map No.2.3: Physiography of Thodupuzha

monsoon and 400 mm to 700 mm during northeast monsoon. The average humidity in Thodupuzha is 75%.

2.7 WATERBODIES

Thodupuzha is blessed by the presence of Thodupuzha river that flows through the middle of the town and is the major tributary of the river Muvattupuzha. It originates as the outflow or the tail raise from Moolamattom power house which use water from Idukki reservoir for power generation. It is a perennial river and runs full almost the entire 12 months. After flowing through Arakkulam, Kudayathoor and Muttam Grama Panchayats it enters the town at its south eastern corner and exits in the north western end. The river receives a number of tributaries in the municipal area. The reservoir and dam of Moovattupuzha Valley Irrigation Project (M.V.I.P.) is located in Muttom grama panchayat near the municipal boundary. The project has two distributory canals and both are flowing through the town. The right bank canal passes northern region through Muthalakodam and the left bank canal is in the southern region flowing through Parakadavu and Nadukandam. However these two canals are not intended to benefit the municiplaity. Thodupuzha river is the only source of the water supply schemes of entire town and also the schemes established in Thodupuzha taluk area. Major water supply schemes of Ernakulam district, northern parts of Kottayam and Alappuzha districts depend on Moovattupuzha river whose main source, in fact, is Thodupuzha river. Map No 2.4 shows the distribution of water bodies within the municipal area.



Map No.2.4: Distribution of waterbodies

2.8 SOIL

The municipal area mostly has laterite soil, the soil type that is most extensively found all along the midland area of the state while sedimentary soil and clay also are seen to a certain extent. Laterite soil is generally less fertile with low contents of nitrogen, phosphorous, potash and organic

components. They are generally acidic with pH value ranging from 5 to 6.2 (CESS, 2006). The major crops grown are coconut, tapioca, rubber, arecanut, pepper, cashew and spices.

2.9 ECONOMY

The town has a large number of people engaged in plantation and allied activities even though significant developments have taken place in industrial and tertiary sectors also. Dense population, land reforms & change in family systems, etc. have resulted in the fragmentation of land. Hence, a shift in the economic activity from agriculture to other sectors is also taking place.

2.10 BIO-DIVERSITY

Rubber is the main crop of the town. Coconut trees are also seen sparsely. Other crops like plantain, mango trees, cocoa, banana, pepper, tapioca, pine apple, ginger, and turmeric etc. are also being cultivated. The town has got fame for Ayurvedic medicines and treatment for long time and a variety of medicinal plants herbs, spices etc. are grown here. Kaithoni, Nandhyarvattom, Manjal, and Adalodakam are some of the herbs abundantly seen here.

2.11 INFERENCE

Thodupuzha is the commercial headquarter of Idukki district. Even though its geographical location, near the west boundary, is a slight disadvantage its connectivity to the main urban centres of this region has benefited the town to grow as a major trade centre. Physiographically the town is at vantage compared to most places of the district as the variation in altitude is much low which gives scope for infrastructural development including road and other civic amenities. It has been a trade centre for hill produces from the high ranges for quite a long time. While its economy is presently equally dependant on both agriculture and trade, trend indicates a shift towards the latter. Establishment of Painavu as the headquarter of Idukki when the district was formed causes the shifting of many district level administrative institutions existed here to Painavu even though some are still functioning here. Thodupuzha and its neighbouring places are blessed with natural beauty. Thodupuzha itself is not a major tourist destination, but is the gateway to top tourist destinations like Munnar, Thekkady, Idukki dam, Peermade etc. The reservoir formed with the construction of Malankara Dam across the Thodupuzha river six kilometres away from Thodupuzha will benefit the town also in tourism.

CHAPTER - 3
REGIONAL SETTING

3.1 INTRODUCTION

The regional setting portrays the function, location and connectivity of town posses in relation to the settlements of the region surrounding it. The regional linkage of a town is depicted by its connectivity to the surrounding settlements which includes the transportation facilities as well as the influence other settlements have on the town. In this chapter regional linkage of the town with surrounding district and the regional setting of the town within the district are probed into. The regional linkage of the town with surrounding district is described in terms of connectivity and spatial location, whereas the regional setting of the town within the district is described based on the "District Urbanisation Report" and "Integrated District Development Plan Volume-1 Perspective Plan prepared by Town and Country Planning Department.

3.2 REGIONAL LINKAGE OF THE TOWN WITH SURROUNDING DISTRICT

Physiographically, Idukki district is situated in the south west edge of peninsular shield of India, and is distinctly marked by the western ghats where ground elevation above mean sea level range between 700-2100m, whereby it is totally contained within the highland region and midland region of the state. There exists only a strip of middle land in western part of the district while low land area is totally absent. The western part of the district in which Thodupuzha town situates is included in the midland area. Thodupuzha municipality is the first statutory urban area within the Idukki district which shares the boundary of two districts which are Idukki and Ernakulam. Since the town is situated in the western corner of Idukki



Map No.3.1: Regional connectivity

district, the interaction of the town with other similar urban centres Muvattupuzha and Kothamangalam in Ernakulam district as well as Palai in Kottayam district plays a crucial role than the interaction with other towns within the district. The district is only connected by single mode of transport i.e road. The regional connectivity of the town is shown in Map No 3.1. Thodupuzha is well connected (Map No 3.1) with a good road network with adjoining places. The region lacks rail transport and water transport services. The nearest airport is Nedumbassery International Airport at a distance of 54 km from Thodupuzha. The important regional road network (State Highways) passes through Thodupuzha town is shown in Table No 3.1. The area is served by public transport system consisting of both state owned Kerala State Road Transport Corporation (KSRTC) and private buses. Both KSRTC and private bus operators provide inter-city services.

Sl No	SH No.	Name of SH	Route	Connecting Urban Centers
1	8	Main eastern highway (Punalur Muvattupuzha road)	Punalur (starts from km 44/900 of NH -208) - Pulimukku junction (joins SH -05) - Koodal junction - Konni junction - Ranni market - Makkapuzha - Ponthanpuzha - Manimala bridge - Cheruvally - Ponkunnam junction (Kottayam - Kumily road (SH -13) crosses and overlaps for 0.4 km) - Elamgulam - Pala town - Thodupuzha - Vazhakulam - Nirmala college junction - Muvattupuzha (joins MC road -SH -01)	Pala & Muvattupuzha
2	33	Thodupuzha Puliyanmala road	Thodupuzha junction (SH -8) - Muttom - Kuruthikulam - Meenmutty - Painavu junction - road to Idukki dam takes off - Kattappana junction - Puliyanmala - joins Munnar - Kumily road	Painavu, Cheruthoni, Kattapana, Kumily
3	40	Alappuzha – Madurai road	Alappuzha – Muhamma – Thanneermukkam – Vechur bund road – Thalayolaparambu – Peruva – Mutholapuram –Marika - Vazhithala – Kolani – Thodupuzha – Vannappuram – Nedumkandam - Thookkupalam - Cumbummettu	Alappuzha, Nedukandam
4	44	Sabarimala – Kodaikkanal road	Pamba – Chalakayam – Thulappilly – Mukkootuthara – Erumeli – Koovappally – Kanjirappally – Kappadu – Kalaketty – Thidanadu – Erattupetta – Melukavu – Muttam – Thodupuzha (Mariyil Kalungu, Chungam, Kothaikunnu, Market road, LF road, Bapputy hall)-Vengalloor- Kaloor – Neriyamangalam – Panamkutty – Kallarkutty – Anachal – Munnar – Top Station – Vattavada - Kodaikanal	Erattupetta, Munnar
5	41	Ernakulam – Thekkady road	Palarivattom – Kakkanad – Pallikkara – Kizhakkambalam – Pattimattom - Valamboor – Muvattupuzha – Pandappally – Parakkadavu – Thodupuzha - Chottupara – Upputhara – Kumily - Thekkady	Ernakulam, Muvattupuzha, Kumily

Table No 3.1: Important regional road network (State Highways) passes through Thodupuzha town

3.3 REGIONAL SETTING OF THE TOWN WITHIN THE DISTRICT BASED ON THE IDDP VOLUME – 1, PERSPECTIVE PLAN

The regional setting of the town within the district has been established by analysing the

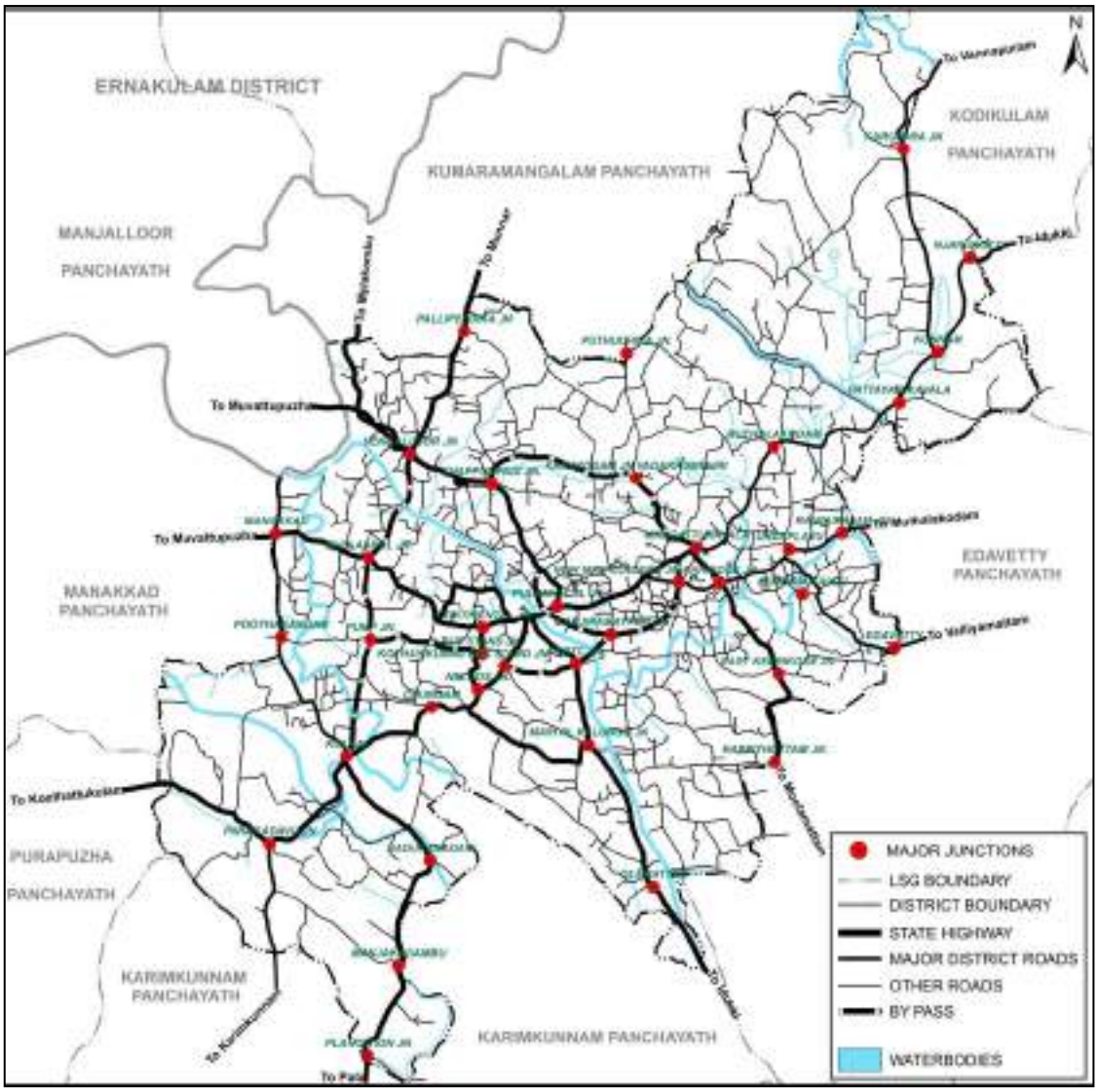
1. Inter District Connectivity Pattern
2. Hierarchy of settlements derived out in the "IDDP Volume-1 Perspective plan"
3. Functional character of settlements derived out in the "IDDP Volume-1 Perspective plan"
4. Future urban profile of settlements derived out in the "IDDP Volume-1 Perspective plan"
5. Activity pattern of settlements derived out in the "IDDP Volume-1 Perspective plan"
6. Spatial structure of the district derived out in the "IDDP Volume-1 Perspective plan"

3.3.1 Inter district connectivity pattern

Thodupuzha is well connected with various growth centres and tourist spot within the district by fairly distributed road network. Obviously the state highway (Muvattupuzha - Punaloor (SH-08) passes through Thodupuzha and connects it to two of its neighbouring towns, Muvattupuzha and Pala. Thodupuzha-Puliyanmala road (SH-33) connects Thodupuzha to Idukki district centre at Painavu as well as tourist destinations like Idukki dam and Thekkady. Alappuzha -Madurai road (SH-40), Sabarimala – Kodaikkanal road (SH-44) and Ernakulam – Thekkady road (SH-41) are also passes through Thodupuzha town. Map No 3.2 shows the existing road network in the district and Map No 3.3 shows the existing road network of the town.



Map No 3.2: Existing road network – Idukki district



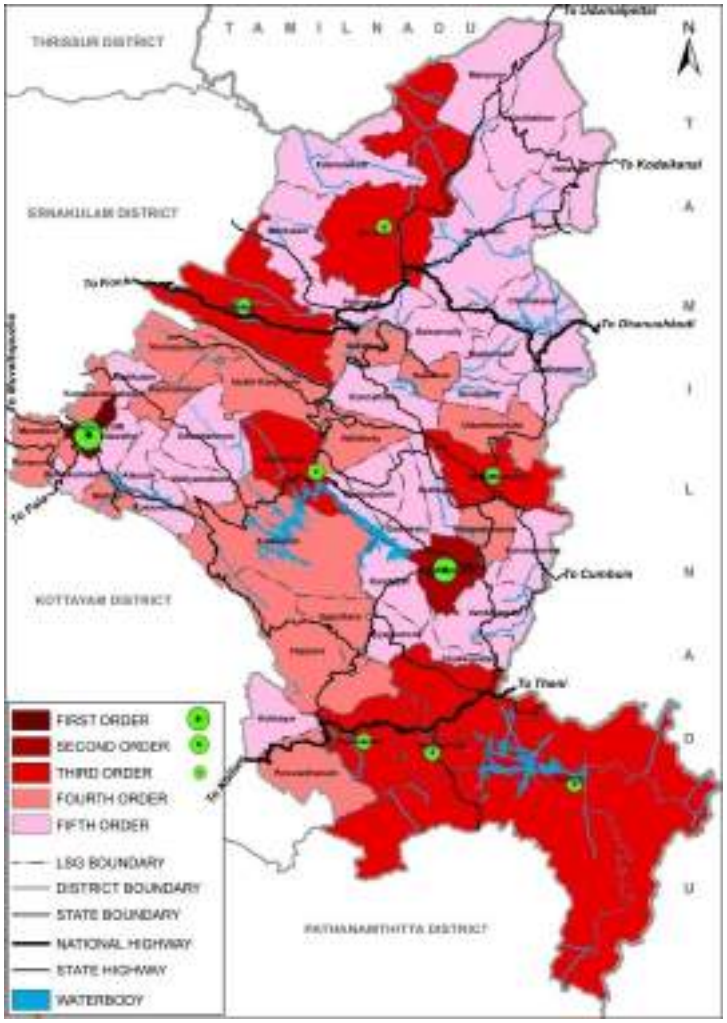
Map No 3.3: Existing road network – Thodupuzha

The analysis of the road network of the district and town reveals the following facts:-

- Thodupuzha town is well connected with prominent urban centres within the district as well as nearby districts Ernakulam, Kottayam, Alappuzha and Pathanamthitta by road.
- The town is well linked with prominent locations like Theni, Madhurai, Cumbam, Kodaikanal, Palani etc. in Tamilnadu state.
- The town is well connected with the district head quarter and other major commercial centres within the district.
- Thodupuzha is well connected with prominent tourist places within the district as well as important tourist destinations like Kochi, Alapuzha etc. within the state and Madhura, Kodaikanal etc. outside the state by fairly distributed road network.

3.3.2 Hierarchy of settlements derived out in the "IDDP Volume-1 Perspective Plan"

The existing hierarchy of settlements within the district is determined based on the number and order of facilities. Cumulative Functional Index (CFI) method is used for this purpose. The CFI of a settlement is assessed based on the number and presence of education, health, market, agricultural and allied sectors, transportation and community facilities in the settlement. CFI is plotted against the number of settlements to find out the hierarchy of settlements. From the analysis, it is seen that Thodupuzha town comes as I[st] order settlement with a high CFI compared to other settlements in the district. Kattapana municipality also comes in the I[st] order category. 7 LSGs comes under IIIrd order settlements and the remaining local bodies are grouped under IVth and V[th] order settlements. The I[st] order settlement is the urban centre and one of the prominent commercial hub of the district. Map No 3.4 shows the spatial distribution of the hierarchy of settlements in the district. The identified IInd & IIIrd order settlements are the major growth centres in the district.

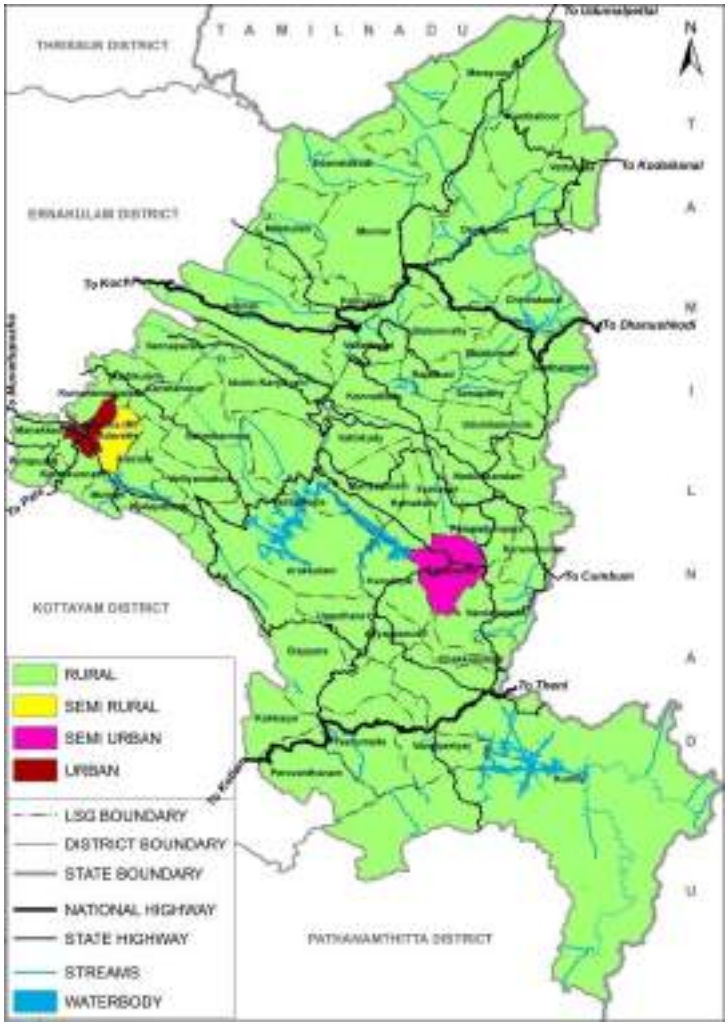


Map No 3.4: Hierarchy of settlements – Idukki district

The above facts clearly point out the primacy of the Thodupuzha in terms of facilities and its functional importance as the 1st order statutory urban centre within the district. Hence the town has to function not only as taluk head quarter to serve the entire taluk but also to fulfil the entire district as only one 1st order statutory urban centres within the district.

3.3.3 Functional character of settlements derived out in the "IDDP Volume-1 Perspective Plan"

The function of a settlement is the major activity within the settlement, be it agricultural and allied activity (Pucca rural) or secondary sector and tertiary sector activities (Pucca urban activities) or a combination of the two (Semi urban or Semi rural). The "IDDP Volume-1 Perspective plan" derived out the major functions of the settlements within the district after analysing and scientifically synthesising the land use and average plot-size within the settlements. The resulting functional character of the settlement within the district is shown in Map No 3.5. The analysis of the above functional character of settlements within the district clearly shows that Thodupuzha town is showing urban function. Kattappana municipality also shows urban character. Edavetty grama panchayth, one of the boundary local body of Thodupuzha town shows semi rural function and all other local bodies within the district shows rural character.

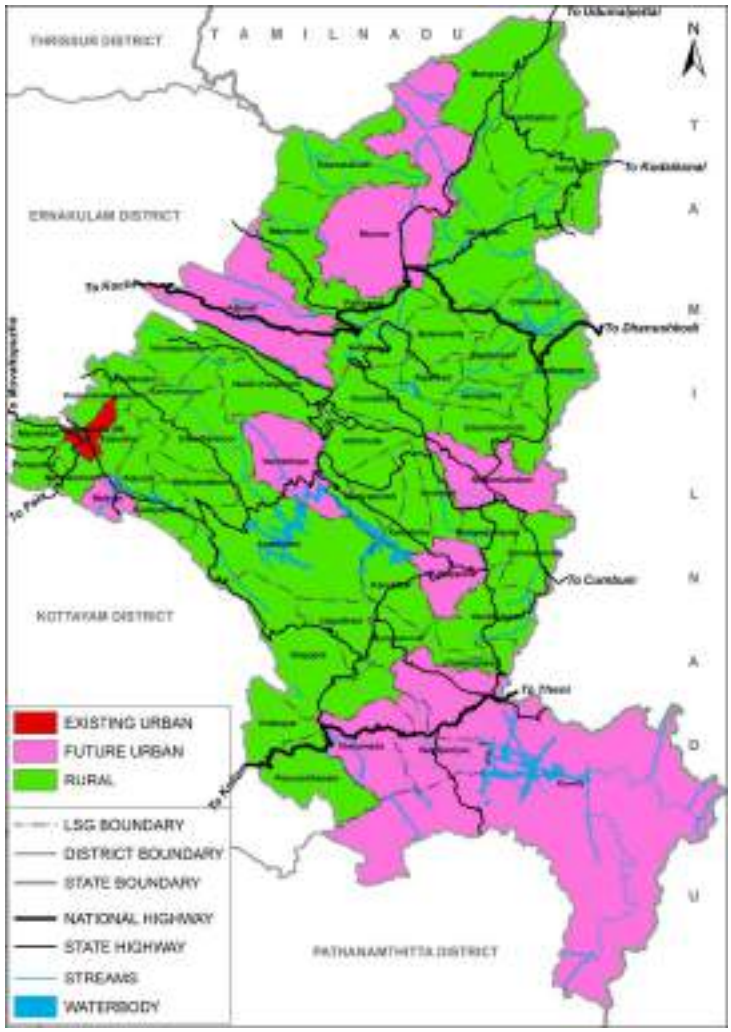


Map No 3.5: Functional character of settlements – Idukki district

Hence the main activity taking place in this district is rural (Agriculture and plantation). There are two statutory urban areas in the district ie. the Thodupuzha town and Kattappana town. This reveals the fact that the Thodupuzha has to function not only the taluk head quarter but also to serve as a facilitator to the regional part of the district especially for the surrounding local bodies. The town has to perform the function of an urban centre with due consideration to service sector activity. Where as in terms of land use, presence of rubber plantation, average plot size, unique topography the town has also to sustain certain level of agro allied activity so as to ensure the optimum resource utilisation and above all to ensure the ecological and environmental aspects.

3.3.4 Future urban profile of settlements derived out in the "IDDP Volume-1 Perspective Plan"

Thodupuzha municipality is the first urban local self government in the district. The future urban profile of the district is determined based on criteria like existing statutory urban area, census urban area, grade of LSGs, hierarchy of settlements and perspectives in urban developments. It is revealed that there will be 9 more urban LSGs in the district by the end of next two decade. The growth rate of population density and present condition of the local body can be taken as deciding criteria by how fast it attain urban nature. The Map No 3.6 shows the urban profile of the district.



Map No 3.6: Urban profile – Idukki district

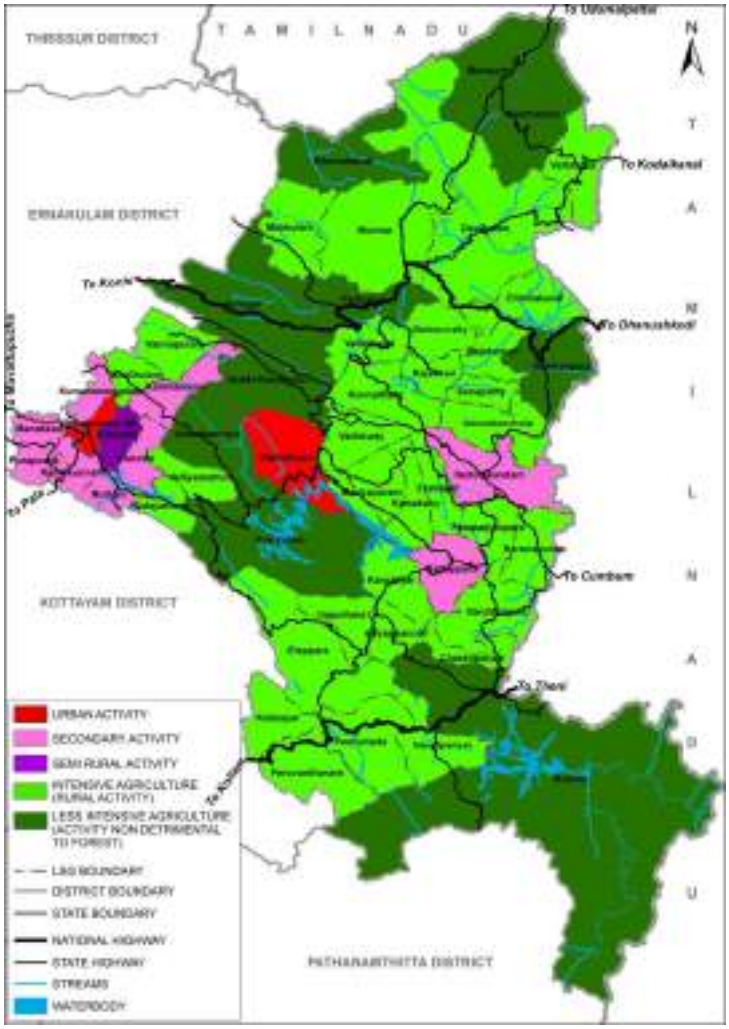
3.3.5 Activity pattern derived out in the "IDDP Volume-1 Perspective Plan"

The activity pattern of the settlements of the district is determined based on the functional character, land use concentration and urban profile. It is seen from the analysis, in the 31 LSGs the predominant activity is primary (agriculture) in which agriculture and animal husbandry activity are predominant and in another 12 LSGs agriculture along with plantation and forest activity are predominant. In 9 LSGs secondary and tertiary activities are predominant and two Local Self Government, Thodupuzha municipality and Vazhathope grama panchayath shows urban activities. Map No 3.7 shows the activity pattern of the district.

3.3.6 Spatial structure of the district derived out in the "IDDP Volume-1 Perspective Plan"

The spatial structure of a region is defined as the geographical distribution of people and other uses of land across the region and the pattern of trips necessitated by their land uses; spatial structure

of a region defines the function within the sub region, hierarchy and connectivity. The spatial structure of the district can be obtained by overlaying the map of activity pattern, hierarchy of settlements and connectivity. This gives the spatial structure of the district.



Map No 3.7: Activity pattern – Idukki district

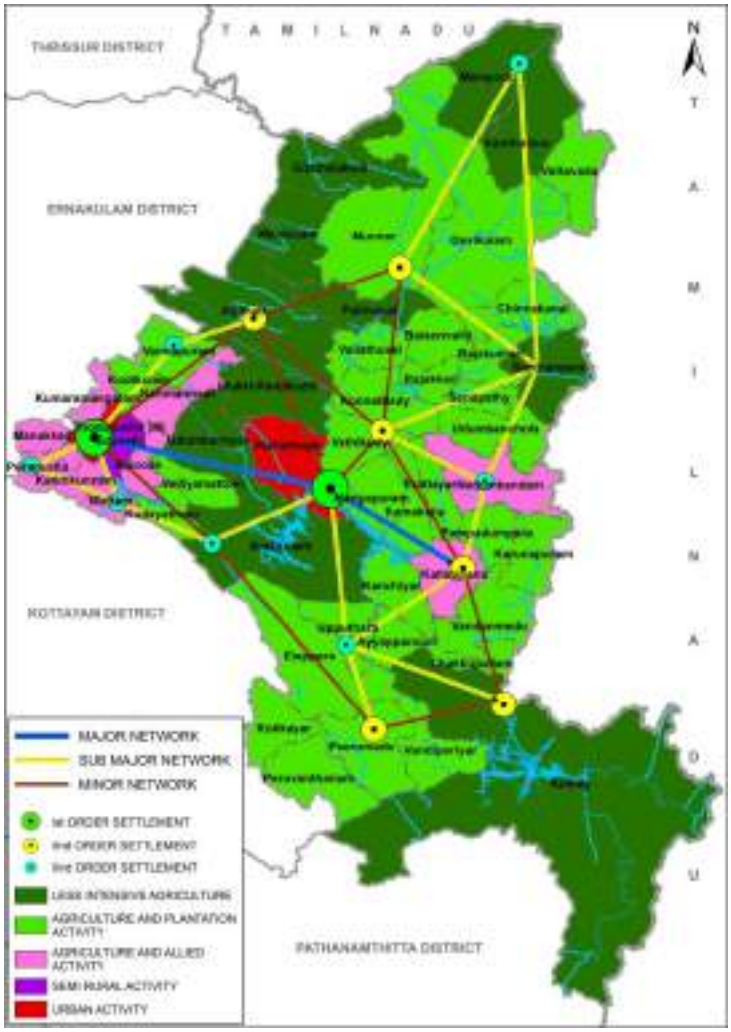
The major activity in Idukki district is agriculture including plantation. Concentration of forest land around the peripheral region limits urban as well as agricultural activities in these areas. The district is well connected with roads with a well developed road network composed of NH, SH, district roads and village roads. The major problems are poor surface conditions of the most of the roads and insufficient carriage width. In other words, the settlements are well connected with poor roads. As per the proposed hierarchy of settlements in the district IDDP Volume-1 Perspective Plan, there is two first order settlement, 6 second order settlements and 7 third order settlements in the district. Ist order settlements show the urban activity whereas most of the second and third order settlements shows semi rural/rural character.

Higher concentration of forest land, agriculture together with unique environmental and topographic parameter makes the district a paradise for tourism activity. The analysis of spatial structure clearly reveals the entire spatial structure is based on the existing urban centre, Thodupuzha as first order settlement. Map No 3.8 shows the suggested spatial structure of the district.

3.4 PLANNING AREA

For delineating the planning area of this Master Plan the present status of the town in respect of urban nature, development trend have been analysed in comparison with the surrounding

settlements which are all grama panchayaths. Thus the characteristics like urban profile, functional character and land use concentration of the surrounding grama panchayats viz Kumaramangalam, Kodikulam, Manakkad, Purapuzha, Karimkunnam, Karimannoor and Edavetty grama panchayats have been analysed and are as shown in Table No 3.2 and Map No 3.9. From the above table, it is clear that all of the adjacent settlements are predominantly rural.



Map No 3.8: Suggested spatial structure – Idukki district

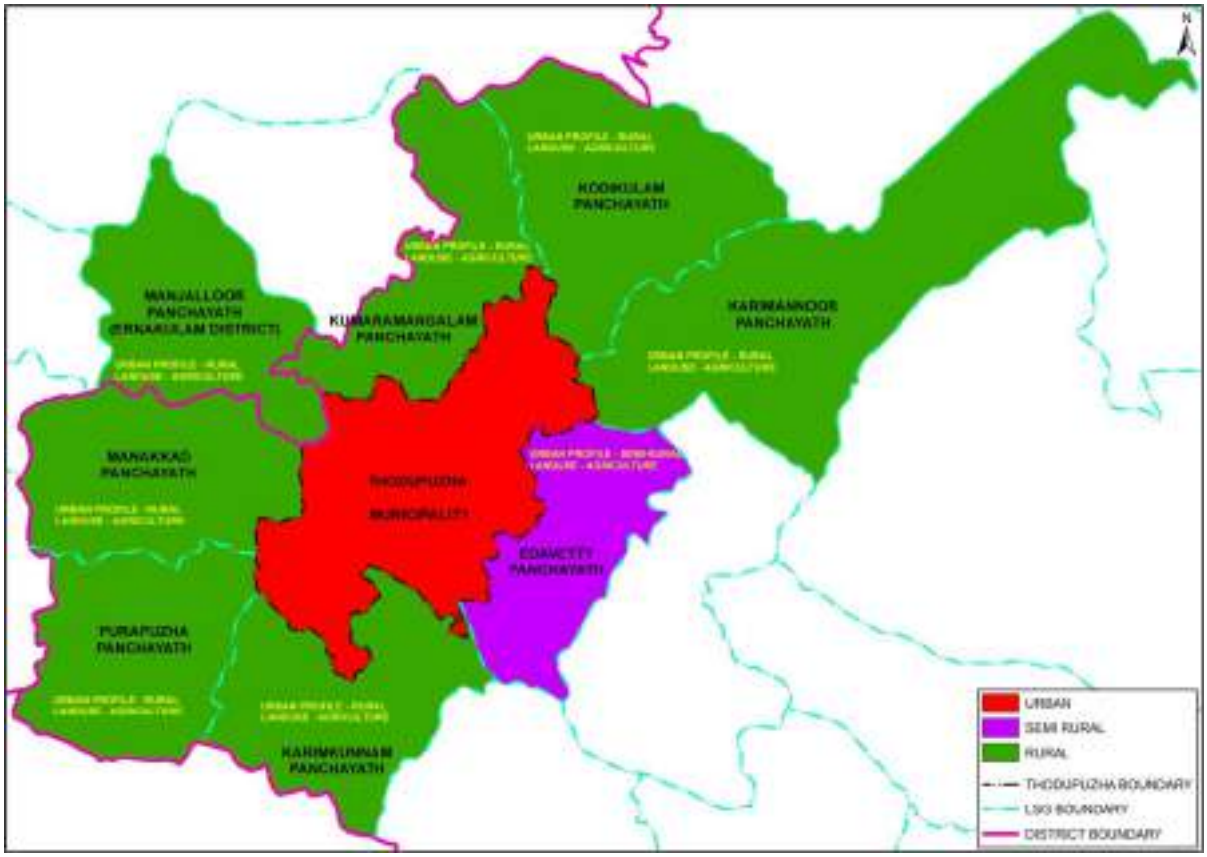
3.5 INFERENCE

Thodupuzha town is strategically located at the far west low land area of Idukki district as the gateway to important tourist destinations along the eastern regions of the district. Thodupuzha in terms of facilities and its functional importance as the first statutory urban centre within the district shows the primacy. Hence the town has to function not only as taluk head quarter to serve the entire taluk but also to fulfil the entire district.

Thodupuzha town is well connected with prominent urban centres within the district as well as nearby districts Ernakulam, Kottayam, Alappuzha and Pathanamthitta by road. The town is also well linked with prominent locations like Theni, Madhurai, Cumbam, Kodaikanal etc. in Tamilnadu state.

Settlements	Urban Profile	Functional Character	Land use
Kumaramnagalam	Rural	Rural	Agriculture
Kodikulam	Rural	Rural	Agriculture
Manakkad	Rural	Rural	Agriculture
Purapuzha	Rural	Rural	Agriculture
Karimkunnam	Rural	Rural	Agriculture
Edavetty	Rural	Semi-Rural	Agriculture
Manjalloor (Ernakulam)	Rural	Rural	Agriculture

Table No.3.2: Character of adjacent settlements



Map No 3.9: Functional character of planning region

CHAPTER - 4
DEMOGRAPHY

Population characteristics of a place have significant bearing on every planning activity that affects the place. Demographical studies point out the conditions and requirements, so that future development and growth may be planned accordingly. In this chapter the demographic particulars like population size, density, growth rate, literacy, sex ratio, spatial distribution of population etc. of Thodupuzha municipal area are analyzed and the target population is estimated.

4.1 POPULATION SIZE

According to 2011 census the total population of Thodupuzha municipal area is 52045 which has been showing a steady increase from 35743 in 1981 since the formation of town in 1978. In 2011, males numbered 25563 and females 26482 with a sex ratio of 1036. The population of the town and the district in 1981, 1991, 2001 and 2011 are given in Table No 4.1 and Figure No 4.1.

Year	Area (Sqkm)	1981	1991	2001	2011
Thodupuzha	35.43	35743	40656	46246	52045
Idukki district	4358	943172	1056326	1129221	1108974

Table No.4.1: Population of Thodupuzha and Idukki from 1981 to 2001

In 2011, Thodupuzha town contained 4.69% of the total population of Idukki district. The corresponding figures in 1981, 1991 and 2001 were 3.79 %, 3.85% and 4.09%. The population of Thodupuzha along with other town of the region has been given in Table No 4.2 and Figure No 4.2. Among these four municipalities, Thodupuzha is having the highest population while in area it is the second largest.

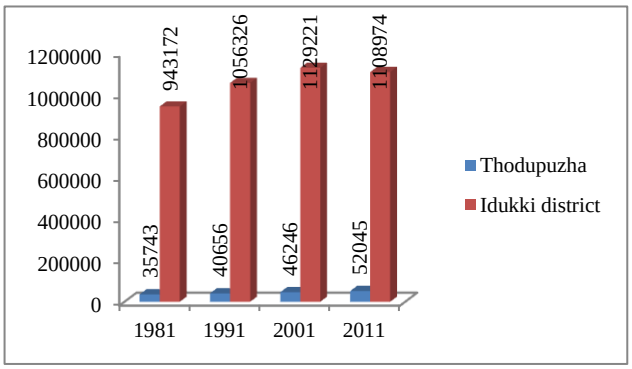


Fig. No.4.1: Population of Thodupuzha and Idukki from 1981 to 2001

Name	Area	1981	1991	2001	2011
Thodupuzha	35.43	35743	40656	46246	52045
Kothamangalam	37.45	33122	35535	37173	38837
Muvattupuzha	13.18	25313	27595	29246	30397
Palai	16.06	21624	21880	22640	22056

Table No.4.2: Population of Thodupuzha and other municipalities of the region

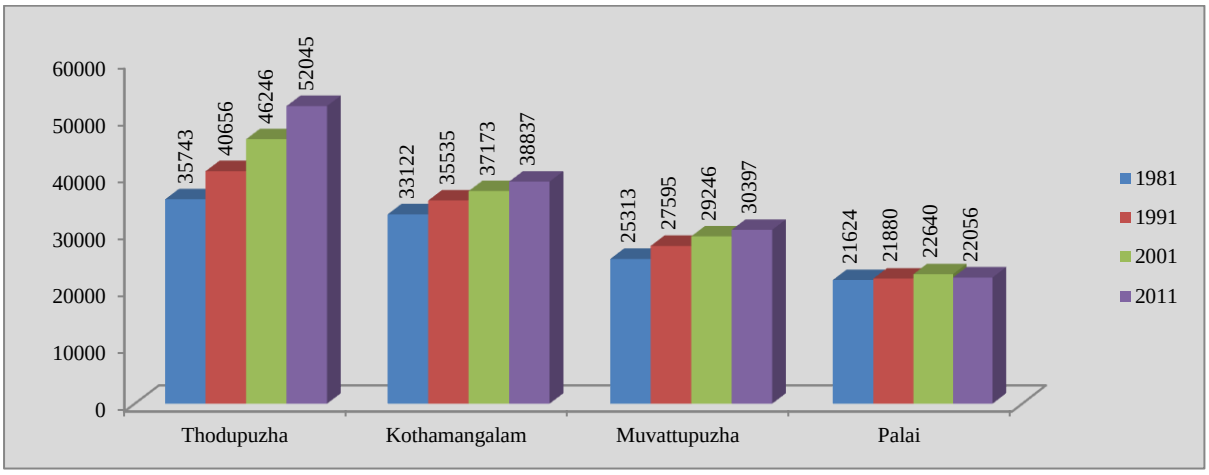


Fig. No.4.2: Population of Thodupuzha and other municipalities of the region

4.2 POPULATION GROWTH RATE

Population growth rate is the rate at which the number of individuals in a population increases in a given time period as a fraction of the initial population. The decennial population growth rate of the town during the decades 1981-1991 and 1991-2001 remained almost the same at 13.74 % and 13.75 % respectively. While during 2001-2011 there is a slight decrease to 12.54%.

Name	Decadal growth rate		
Town under study	1981-1991	1991-2001	2001-2011
Thodupuzha town	13.74	13.75	12.54
Idukki district	10.45	7.03	-1.79
Kerala state	14.32	9.42	4.9
Kerala state urban	60.92	7.64	92.8

Table No.4.3: Comparison of population growth rate with state and district

At the district level the decennial growth rate during 2001-2011 is negative. The state of Kerala has a decennial growth rate of 4.9 percent during 2001-2011. Comparison of population growth rate with state and district are shown in Table No 4.3 and Figure No 4.3 respectively.

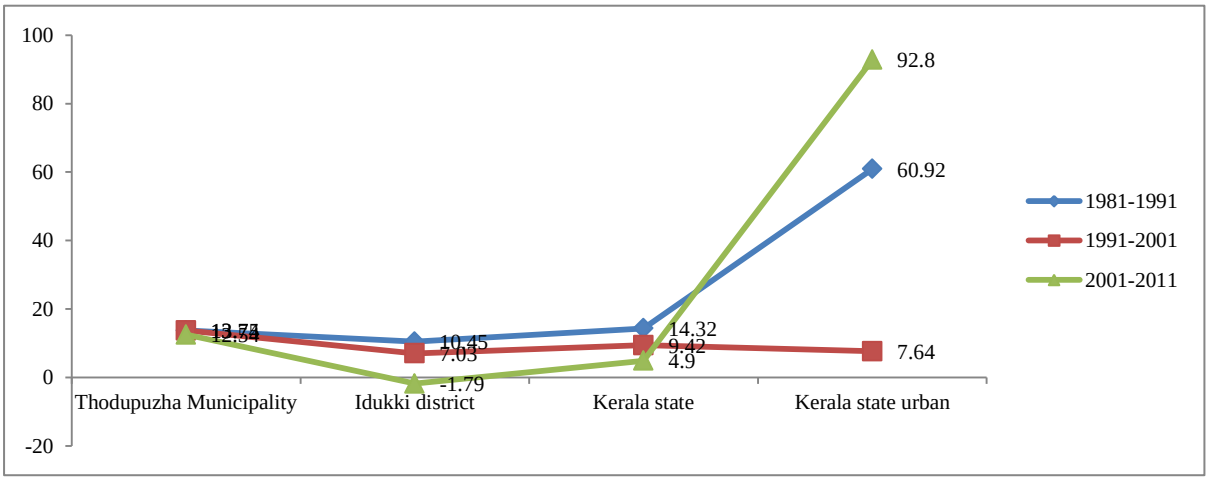


Fig. No.4.3: Comparison of population growth rate with state and district

This is almost half of the decennial growth rate witnessed during 1991-2001 (9.42 %). The urban growth rate of the state exceeds even 90 percent during this decade. During the period 1991-2001 decadal growth rate in the urban areas of the state was only 7.64 percent. In relation to this, the present increase in the urban growth rate is about twelve times.

Name	Growth Rate in %		
	1981-1991	1991-2001	2001-2011
Thodupuzha	13.74	13.75	12.54
Muvattupuzha	9.00	5.98	3.93
Kothamangalam	7.28	4.6	4.48
Palai	1.18	3.47	-2.58

Table No.4.4: Comparison of population growth rate of Thodupuzha with similar towns

The growth rate of Thodupuzha along with similar towns of the region has been given in Table No 4.4. It is observed that Thodupuzha town recorded highest growth rate of population.

The growth rate of the panchayats neighbouring the town is depicted in Table No 4.5 and Figure No 4.4, while Edavetty grama panchayat has maintained top position; Thodupuzha town is the immediate follower. Reason for the hike of growth rate of the Edavetty grama panchayat can be attributed largely to opportunities for employment, education, housing, health care and transportation which permits the advantage of proximity and diversity as the opportunities are centralised and possess almost all the urban features of the town.

LSG	1981-91	1991-2001	2001-2011
Thodupuzha	13.74	13.75	12.54
Muttom	5	3.73	2.82
Kumaramangalam	12.46	9.41	6.01
Manakkad	13.16	8.82	3.11
Edavetty	-	11.48	19.23
Purapuzha	6.32	4.73	-4.34
Karimkunnam	6.01	4.67	-1.62

Table No.4.5: Comparison of population growth rate with neighbouring panchayats

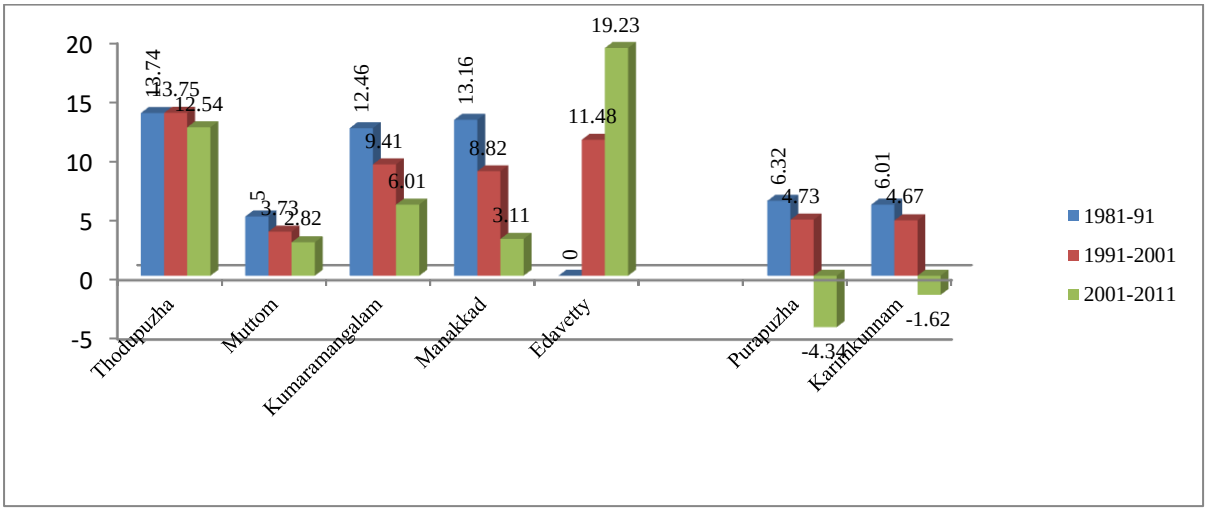


Fig. No.4.4: Comparison of population growth rate with neighbouring panchayats

4.3 DENSITY OF POPULATION

Population density indicates the number of people in a defined jurisdiction in relation to the size of the area that they occupy. Idukki district has a population density of 254 inhabitants per square kilometre and is the least densely populated district. The Gross Population Density of Thodupuzha as per 2011 census is 1468 persons/sq.km. while the district with nearly half of its area under reserved forest has got much low population density. The values of population density of the town and the district in 1981, 1991, 2001 and 2011 are given in Table No 4.6 and Figure No. 4.5.

	1981	1991	2001	2011
Thodupuzha town	1008	1147	1305	1468
Idukki District	193	215	259	254

Table No.4.6: Population density of Thodupuzha and Idukki

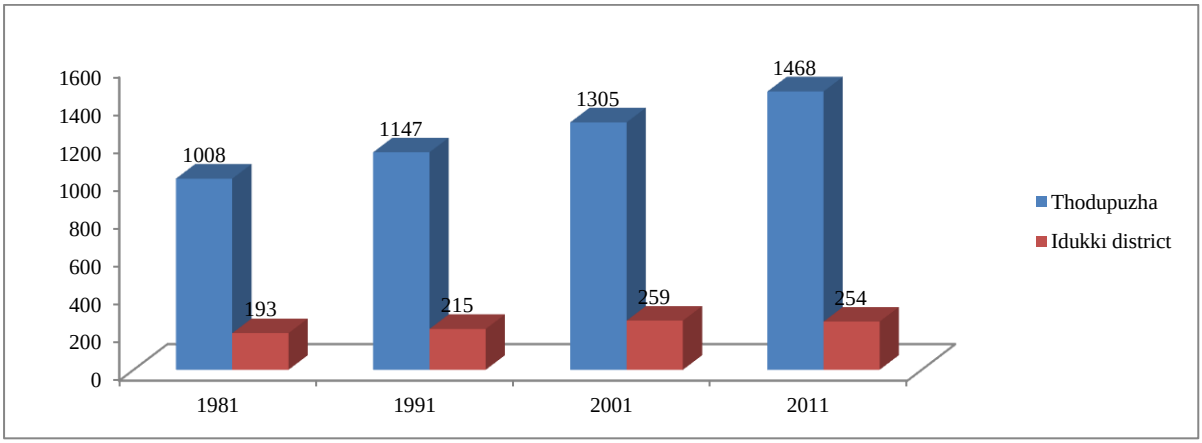


Fig. No.4.5: Population density of Thodupuzha and Idukki

The Net Population Density calculated leaving out the uninhabitable areas like forest, water bodies, rocky areas etc. works out to be 1363 persons per sq.km. The population density of other major settlements of the district has been given in Table No 4.7 along with that of Thodupuzha. Most of these settlements have population density less than one fourth of that of Thodupuzha except Kattappana.

Town under study	Name of Local Bodies	Total Population	Area in Sqkm	Density (2011)
	Thodupuzha	52045	35.43	1468
Other major Local bodies within the District	Munnar	32029	269.29	119
	Adimaly	40484	181.66	223
	Kattappana	42546	57.47	740
	Kumaly	35915	799.57	45
	Idukki District	1108974	4358	255

Table No.4.7: Population density of major local bodies of the district - Comparative analysis

Town under study	Local bodies	Area in sq.km	Density (2001 Census)	Density (2011 Census)
Nearby LSGs	Thodupuzha	35.43	1305	1468
	Muttom	24.41	435	447
	Kumaramangalam	23.54	596	631
	Manakkadu	22.21	660	680
	Edavetty	25.97	461	549
	Purapuzha	27.82	445	425
	Karimkunnam	22.84	554	545

Table No.4.8: Population density of surrounding panchayats of the municipality- Comparative analysis

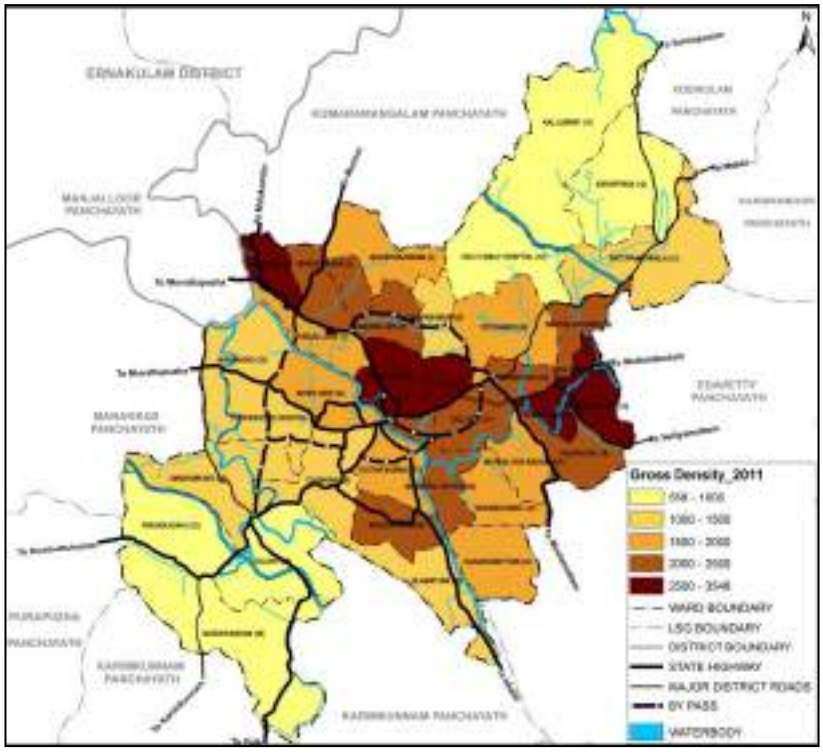
The surrounding panchayats have a population density less than half of that of Thodupuzha which indicates the need for planned and sustainable development in the town. Details are given in Table No 4.8. Comparison of population density of the Thodupuzha with other growth centres shows preference of people to concentrate to the town. The population density of municipalities of the region has been given in Table No 4.9 in comparison with that of Thodupuzha.

Name	1981	1991	2001	2011
Thodupuzha	1001	1147	1305	1468
Kothamangalam	827	887	928	970
Muvattupuzha	1921	2094	2219	2306
Palai	1346	1362	1410	1373

Table No.4.9: Population density of nearest municipalities - Comparative analysis

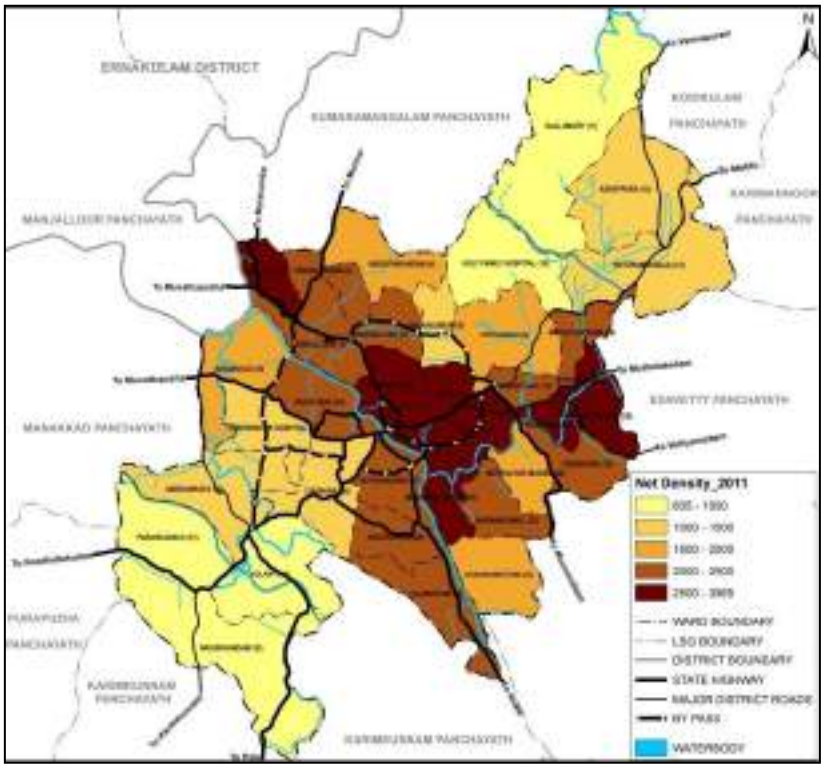
4.4 WARD WISE POPULATION DENSITY

The municipal area is divided into 32 wards, and the population density of the town shows variation among different wards. Ward wise population density of the 32 wards of the municipality tabulated in Annexure 4.1 and its spatial distribution is depicted in Map No 4.1. Further, the net population densities among the wards are



Map No.4.1: Gross population density

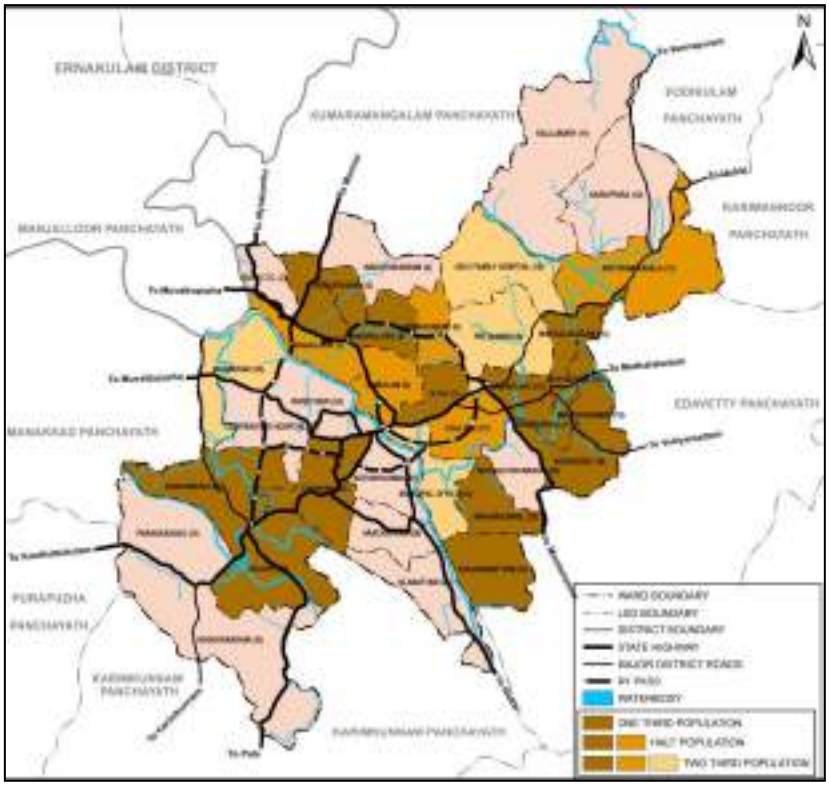
portrayed in Map No 4.2. While the town has population density of 1468 these values vary from 830 to 3476 among different wards. The ward 6 (B.H.S.) exhibits highest population density due to availability and proximity to infrastructure facilities at the central portion of the town and the lowest value is in ward 19 (Maramkunnel) which is at the peripheral area of the town.



Map No.4.2: Net population density

4.5 POPULATION CONCENTRATION PATTERN

Population concentration pattern is obtained by calculating the cumulative population after arranging the wards in descending order of population density (Total population in the ward/total area of the ward). Population of town is concentrated in the central portion of the town. One third population is concentrated in 14 wards with an area of 10.64 Sq.km, which comprises of 30% of total town area. Half population of the town is scattered in 19 wards and two third populations is in 23 wards.



Map No.4.3: Population concentration pattern

Map No 4.3 shows the population concentration pattern.

4.6 AGE - SEX PYRAMID

Age-sex pyramid graphically display the percentage or actual amount of a population broken down by gender and age. It vividly reflects the trends in birth and death rate. Table No 4.10 shows the percentage of male and female population under different age groups with an incremental value of 5 years. This is further displayed in Figure No 4.6 which is called Age-Sex Pyramid which consists of horizontal histograms that helps to comprehend the aforesaid age and sex ratio structure. It can be seen that the males in the age group 35 to 40 outnumber other groups while females the age group 15 to 20 outnumber those other groups. And the low value towards the bottom indicates a shrinking population which is a common phenomenon in developed countries where the population in adult age groups outnumbers the child age groups. In the upper age groups both male and female dependable population are less which is an indication of the availability manpower resource. The high value of histograms at the middle of the pyramid indicates a high population growth rate, during 1950 to 1985 obviously before family planning programs were implemented effectively.

Age Group	% of Female Population	% of Male Population
0-5	5.35	7.22
5 to 10	7.39	5.47
10 to 15	7.39	7.82
15 to 20	9	8.63
20 to 25	7.72	9.23
25 to 30	8.02	8.59
30 to 35	7.22	6.19
35 to 40	8.36	9.44
40 to 45	7.56	6.92
45 to 50	8.19	8.71
50 to 55	7.13	5.89
55 to 60	6.32	5.08
60 to 65	4.03	3.72
65 to 70	2.93	2.73
70 to 75	1.91	2.14
75 to 80	1.02	0.94
80 <	0.93	1.28

Table No.4.10: Age – Sex pyramid- % of male and female population in different ranges

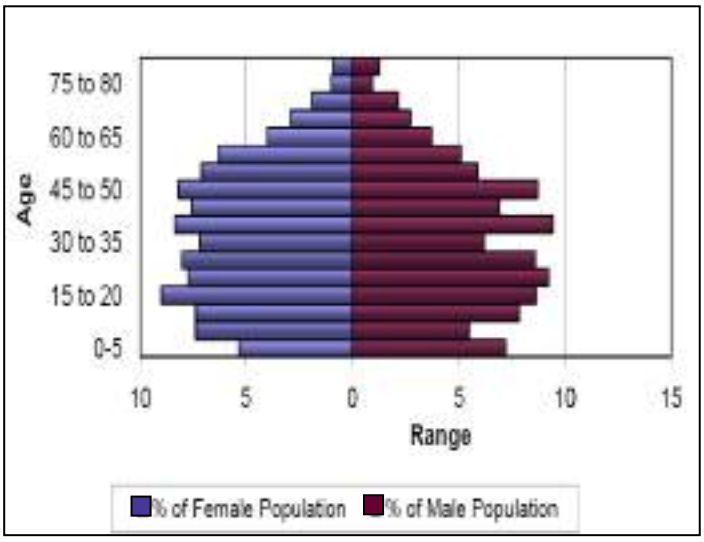


Fig. No.4.6: Age – Sex Pyramid

4.7 SEX RATIO

As described earlier, according to 2011 census, the male population of Thodupuzha is 25563 and that of female is 26482 resulting in a sex ratio of 1036. With regard to sex ratio in Idukki, it stood at 1006 per 1000 males compared to 2001 census figure of 993. The variation in sex ratio from the census 1981 onwards is given in Table No 4.11 along with that of the district and the state. It could be

seen that sex ratio of Thodupuzha has been steadily increasing. The overall sex ratio of Kerala is 1084 which is the highest and best as per census 2011 of India as it is the great source to find the equality of male and female in a society at a given period of time. Among the LSGs of the district Thodupuzha has the highest sex ratio. The sex ratios of important LSGs of the district are tabulated in Table No 4.12. It could be seen that Thodupuzha has the highest sex ratio of 1036. Another finding is that the sex ratio of children below the age of six in the town is 970.

	1981	1991	2001	2011
Thodupuzha	992	1003	1024	1036
Idukki	963	975	993	1006
Kerala	1032	1036	1058	1084

Table No.4.11: Sex ratio- Comparison with state and district

Name of LSGs	Sex ratio - 2001	Sex ratio - 2011
Thodupuzha	1024	1036
Munnar	979	994
Adimaly	981	1002
Kattappana	995	1015
Kumaly	988	999

Table No.4.12: Sex ratio- Major towns of the district

4.8 CHILD SEX RATIO

Child sex ratio is the number of girl children per 1000 boy's children. Like the sex composition of the total population, the sex comparison by age groups is vital for studying the demographic trends of young population, its future patterns and particularly the status of the girl child. The child sex ratio is primarily influenced by sex ratio at birth and mortality in the early childhood. Comparative child sex ratio of nearby LSGs of Thodupuzha town is presented in the Table No 4.13 and Figure No 4.7 for two decades which indicates that except Thodupuzha and Muttom in all other settlements child sex ratio has improved. In Thodupuzha town the ratio declined by 17 points during the period 2001-2011.

LSGs	2001	2011
Thodupuzha	991	974
Muttom	984	937
Kumaramangalam	971	982
Manakkad	992	1021
Edavetty	911	963
Purapuzha	958	1065
Karimkunnam	927	933

Table No.4.13: Child sex ratio of nearby panchayaths

The child sex ratio of Thodupuzha town along with similar towns has been given in Table No

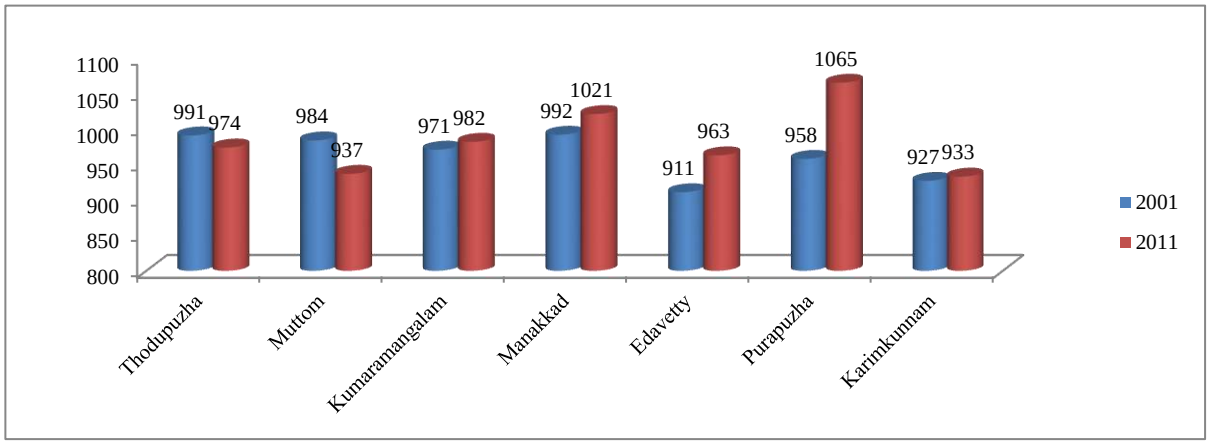


Fig. No.4.7: Child sex ratio of nearby panchayats

4.14 and Figure No 4.8. Thodupuzha and Palai towns indicates the declining trend in child sex ratio while in Kothamangalam and Muvattupuzha towns, the ratio improved by 40 points during the period 2001-2011. It is observed that the sex ratio of the total population exceeded child sex ratio during these periods in Thodupuzha town.

	2001	2011
Thodupuzha	991	974
Kothamangalam	892	932
Muvattupuzha	932	972
Palai	995	930

Table No.4.14: Child sex ratio of surrounding municipalities

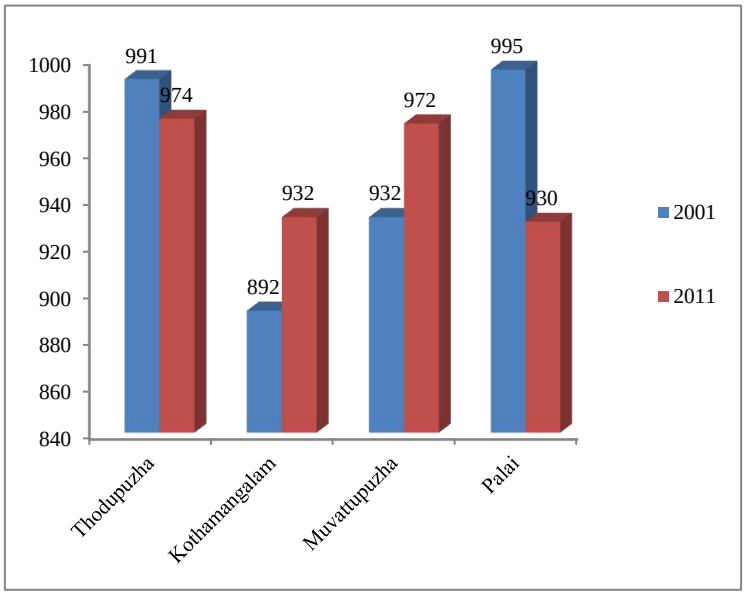


Fig. No.4.8: Child sex ratio of surrounding municipalities

4.9 LITERACY

Kerala is the most literate state in India. During the last decade literacy rate in the district has increased from 88.69 to 92.20. Thodupuzha town, according to 2011 census, has a literacy rate of 95.59%, higher than the national average of 74.04% which is an indication of the level of economic and social development in the municipal area. Table No 4.15 shows the literacy rate of the town and the district in the previous decades. The literacy of the town stood higher than that of the district in the previous decades and continues to do so in the present decade also.

	1981	1991	2001	2011
Thodupuzha	-	88.43	92.96	95.59
Idukki	67.44	86.94	88.69	92.2

Table No.4.15: Literacy rate-Thodupuzha and Idukki

4.9.1 Educational status based on socio economic survey

Based on the socio economic survey conducted in 2010 the literacy rate of Thodupuzha town is 96.15. Percentage of persons in each educational status is shown in Table No 4.16.

Type	Illiterate	Primary	HS	Pre-Degree	Degree	PG	Technical	Professional Graduates	Others
Average %	3.85	16.45	28.46	27.01	17.52	6	0.13	0.04	0.54

Table No.4.16: Percentage of educational status

4.10 HOUSE HOLD SIZE

House hold size refers to the number of people that inhabit a given dwelling unit. Temporal variation in house hold size of important towns in Idukki district in comparison with Thodupuzha town is given in Table No 4.17. House hold size of all important towns shows a decreasing trend over the decade and Thodupuzha town is having the highest household size.

	2001	2011
Thodupuzha	4.49	4.13
Munnar	4.2	4.02
Adimaly	3.87	3.92
Kattappana	4.4	4.09
Kumily	4.29	4.07

Table No.4.17: Household size- Major towns of the district

House hold size of nearby LSGs of Thodupuzha town is given in Table No 4.18. Though house hold size of all panchayats shows a decreasing trend. kumaramangalam panchayath is having the top position and Thodupuzha town in the second position. As household size is shrinking it is an indication of more houses and less density.

The household sizes, as obtained from census 2011 vary between 3.78 in ward 32 and 4.43 in ward 2 and 10 respectively. The average household sizes of the various wards of the town are given in Annexure 4.2 along with the number of households therein.

	2001	2011
Thodupuzha	4.49	4.13
Muttom	4.35	4.1
Kumaramangalam	4.69	4.24
Manakkad	4.39	4.01
Edavetty	4.48	4.05
Purapuzha	4.41	4
Karimkunnam	4.41	3.93

Table No.4.18: Household size-nearby LSGs

4.11 INFERENCE

Thodupuzha town has the highest population density among the LSGs of the district. As per the 2011 census the town contains 5% of the population of the district and this share has been increasing during the previous decades. The town witnessed a constant population growth rate of 13.75% during the decades of 1981-1991 and 1991-2001. There is a slight decrease of growth rate 12.54% for the town in 2001-2011 and district shows a remarkable change of negative growth rate of -1.8%. Also the population growth rate of the town has been higher than that of similar towns of the region and the neighbouring LSGs of the district as well. The population density varies between 830 and 3476in the 35 wards of Thodupuzha town. Population is concentrated more in central parts of the town and along major transportation corridors and nearby the built-up areas. Age sex pyramid indicates a possibility of decrease in population in the future. The town experienced a growth in sex ratio in the previous decades which is higher than that of the district. As per 2011 census Thodupuzha has a fairly good literacy rate of 95.59% which is well above the figure of the district.

CHAPTER - 5
EMPLOYMENT

In this chapter, the economic base of the town is analyzed based on its occupational structure as obtained from census records. Work Participation Rate, its temporal variation, change in the occupational structure during the past, the spatial distribution of workers in the town etc. are analyzed.

5.1 WORK FORCE OF THE TOWN

The work force of a place is usually indicated by Work Participation Rate which is the ratio of total workers (Main and marginal) to the total population and is generally expressed as percentage. As per 2011 census, total workers in Thodupuzha town are 17739 and total population is 52045 which indicate that the Work Force Participation Rate is 34.07%. Thus the percentage of non-workers is 65.93%. Among the total workers 75.8% are males and 24.2% are females. The total workers are divided into main and marginal workers, where the respective figures for the town are 15934 and 1803. Main workers constitute 27.1% and the marginal workers 4.2% and non workers are 65.9% of the total population. The percentage of non workers in the town is higher than Idukki district. The breakup of workers of the town and Idukki district are shown in Table No 5.1 and Figure No 5.1.

	Persons	Total Population	Main workers		Marginal workers		Total No. of workers Main+ Marginal		Non workers	
			No.	%	No.	%	No.	%	No.	%
Thodupuzha (M)	Persons	52045	15934	30.61	1803	3.46	17739	34.07	34306	65.9
	Males	25563	12369	48.38	1078	4.21	13447	75.8	12116	47.4
	Females	26482	3567	13.46	725	2.73	4292	24.2	22190	83.8
Idukki	Persons	1108974	415947	37.50	100416	9.05	516363	46.56	592611	53.43
	Males	552808	287566	52.02	44144	7.98	331710	59.6	221098	40.4
	Females	556166	128381	23.08	56272	10.11	184653	33.2	371513	66.8

Table No.5.1: Comparative analysis of workers - Thodupuzha and Idukki

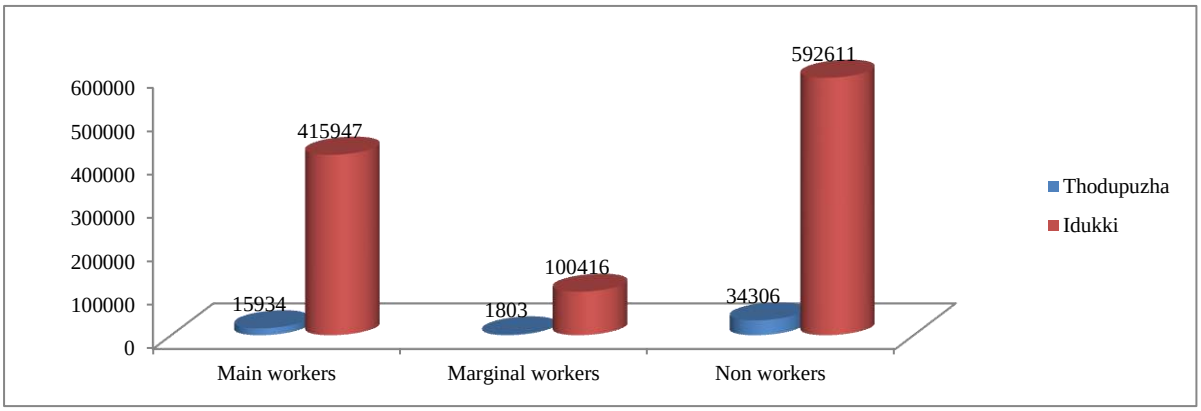


Fig. No. 5.1: Comparative analysis of workers - Thodupuzha and Idukki

It can be seen that the WPR of the Thodupuzha town is 34.07 which is lower than that of Idukki district, which is 46.56.

5.2 TEMPORAL VARIATION OF WORK PARTICIPATION RATE

The growth rate of population and growth rate of WPR since 1981 are shown in Table No 5.2 and Figure No 5.2. The growth rate of WPR during the last three decades shows a steady increasing nature, though there shows a decreasing trend in the growth rate of population both in the case of district and town.

	1981-1991	1991-2001	2001-2011
Growth rate of population	13.74%	13.75%	12.54%
Growth rate of WPR	6%	3%	6.31%

Table No .5.2 : Decadal growth rate of population and workers

5.3 COMPARISON WITH OTHER TOWNS OF THE REGION

Figure No 5.3 shows the WPR during the last three decades of the Thodupuzha and the nearby municipalities of the region viz. Muvattupuzha, Kothamangalam and Palai. All these municipalities had almost same values of WPR.

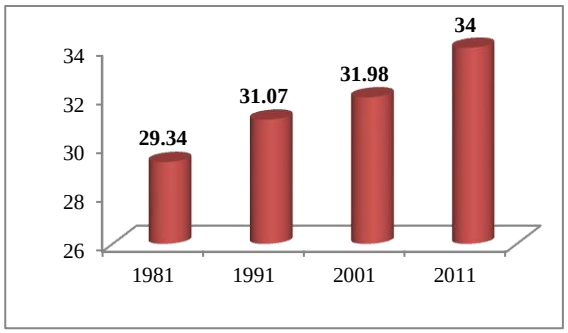


Fig. No.5.2: Decadal growth rate of WPR

5.4 OCCUPATIONAL STRUCTURE

In the 2011 census, the main workers are classified into four categories viz. Cultivators, Agricultural labourers, Household industrial workers and Other workers. The other workers category includes the primary sector workers like fishermen and workers engaged in mining and plantation work. In Thodupuzha town the workers in the aforesaid categories are negligible. Occupational structure of Thodupuzha (2011) is shown in Figure No 5.4. In the town, 88.78% of workers belong to other workers category, 6.15% of workers are agricultural labourers, 3.5% of workers are cultivators and the remaining 1.56% is household industrial workers. The temporal variation of occupational structure of Thodupuzha is shown in Table No 5.3. The same is also represented in the Figure No 5.5. It can be seen that number of labourers engaged in primary sector (cultivators and agriculture labourers) has

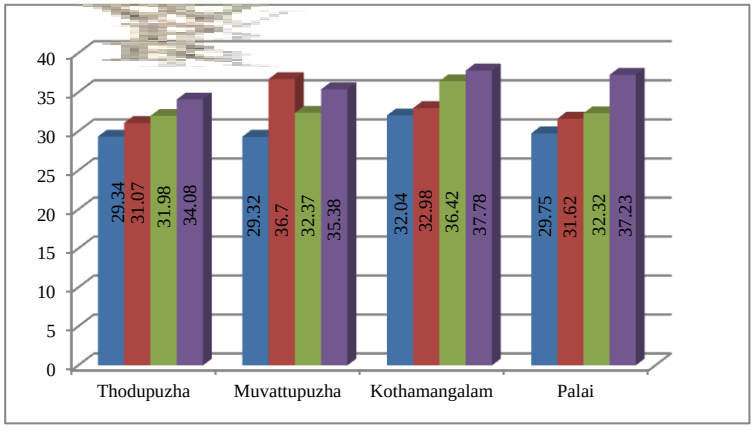


Fig. No.5.3: WPR of Thodupuzha and nearby municipalities

been decreasing during the past three decades but there is corresponding increase in the other workers category. The number of household industrial workers maintained fairly steady growth.

The output of Socio - Economic survey 2010 with regards to the composition of workers in the town is given in Table No 5.4. The survey reveals that, 17.84 % of workers are government employees and 2.86 % of workers are working outside the country. Workers engaged in agriculture and allied sector constitute 15.41 % (Agriculture labourers 6.34 %, cultivators 7.64 % and live stock workers 1.43 %).

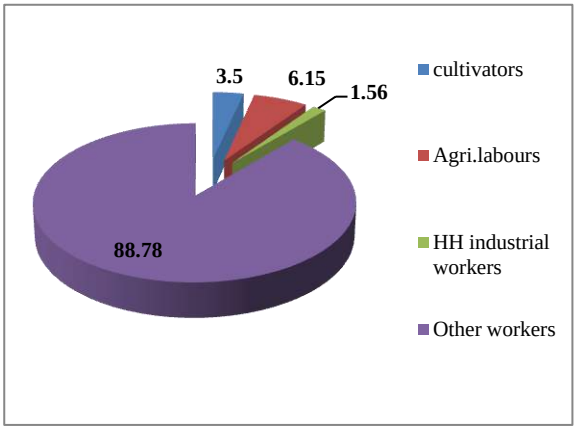


Fig. No.5.4: Occupational structure

Year	Cultivators	Agricultural labours	HH Industrial workers	Other workers
1981	1110	1567	163	7243
1991	1380	2088	180	8639
2001	511	432	162	11458
2011	559	981	249	14147
Growth rate	**9.39%**	**127%**	**53.70%**	**23.40%**

Table No.5.3: Temporal variation of occupational structure

A ward wise analysis of the occupational structure of the town indicates that the concentration of workers in the primary sector (cultivators and agricultural labourers) and other classes in this sector are high in wards like Holy family, Kallumary and Pattayam kavala.

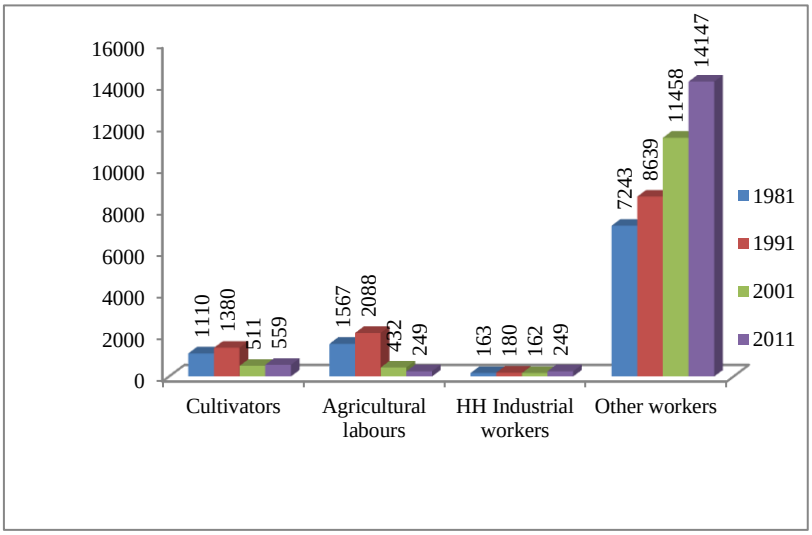


Fig. No.5.5: Temporal variation of occupational structure

It shows predominance of agriculture and allied activities in this area. The percentage of workers in the secondary sector is very low. Hence, it is clear that majority of the workers belong to the tertiary sector ie, service sector.

Type	Govt employee	Agriculture labourer	Agriculture cultivators	Live stock worker	Outside country	Headload workers	Beedi workers
Percantage	17.84	6.34	7.64	1.43	2.86	0.99	0.19

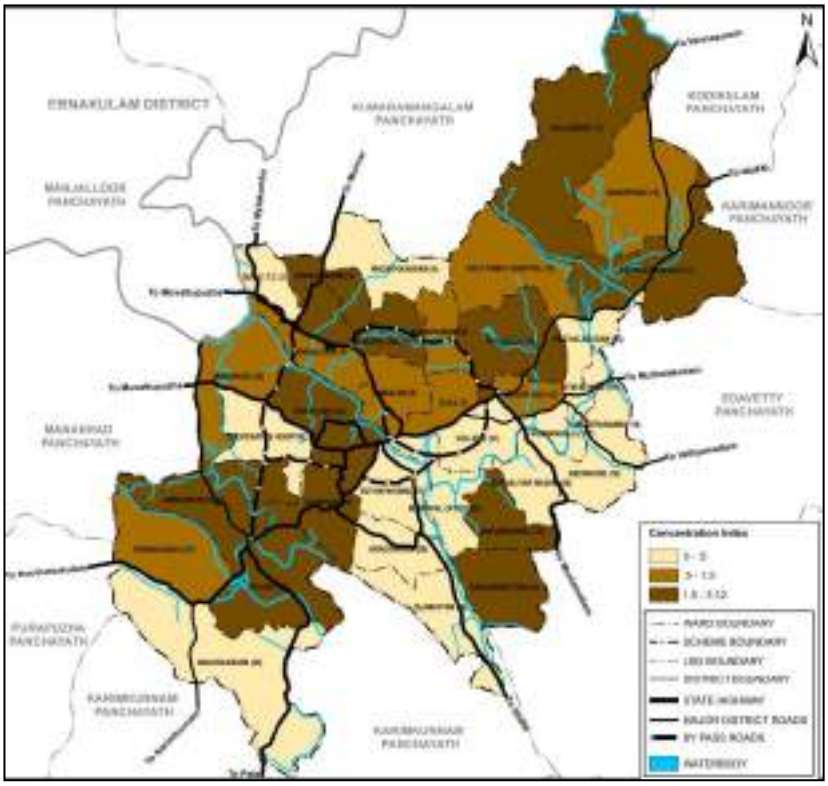
Type	Plantation worker	Hotel worker	Driver	Retail seller (Other than edible items)	Beverage worker	Construction worker	Other major industrial worker	Other workers
Percentage	0	1.8	6.34	7.4	0.12	2.8	0.56	35.92

Type	Carpenter	Coir worker	House hold industrial worker	Construction (Helper)	Vegetable trader	Retail fish vendor	Whole sale fish vendor	Conventional fish man
Percentage	0.62	0.25	0.19	3.48	1.12	1.93	0.19	0

Table No.5.4: Breakup of workers as per socio-economic survey

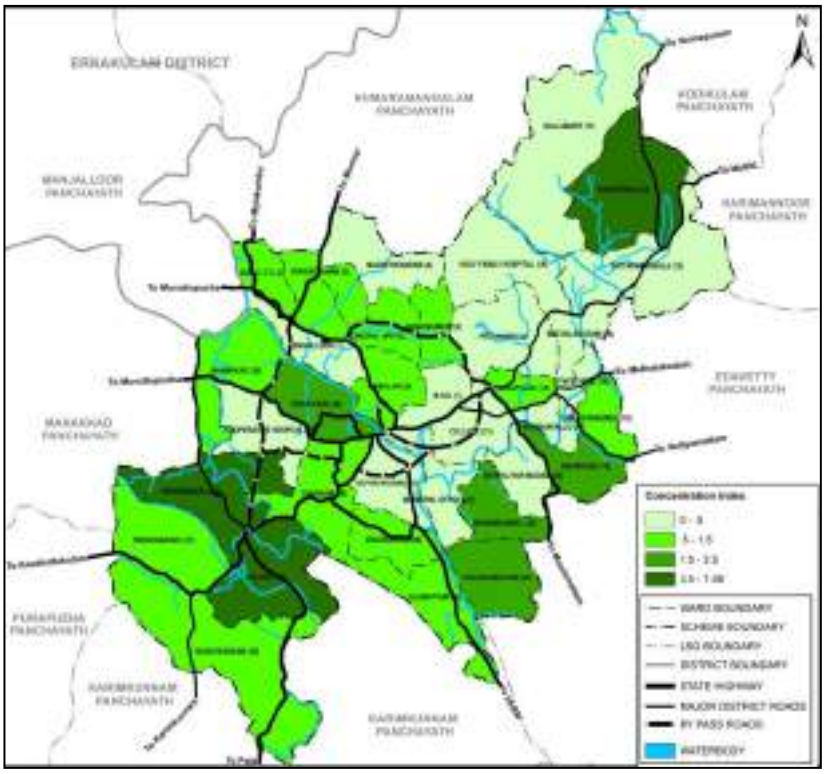
5.5 SPATIAL DISTRIBUTION OF WORKERS

Concentration Index (CI) values with regards to different category of workers in various wards of town has been calculated to analyze the variation of concentration of workers in the town area. CI of a particular category of workers in a ward is the ratio of the percentage of that category of workers in the ward and the percentage of the category of workers in the town. The CI gives a picture about the share of a particular category of workers in a ward is higher or lower than the share of that category of workers in the town. The variation of CI values of the four categories of workers in the municipal area has been shown in Map No 5.1 to 5.4. Map No 5.1



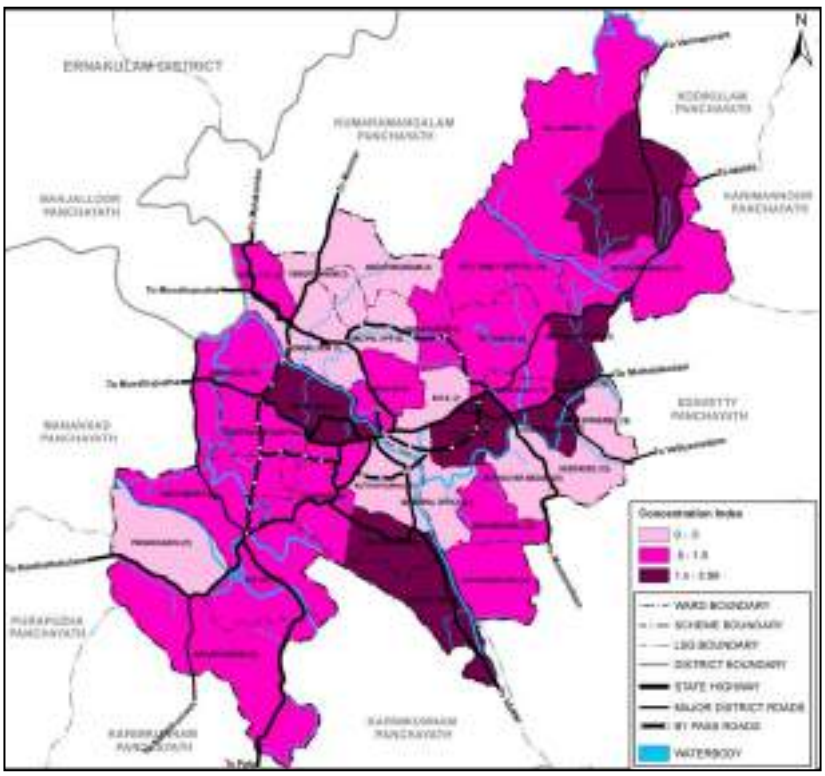
Map No.5.1: Concentration index of cultivators

and 5.2 show the variation of concentration index of cultivators and agricultural labourers respectively.



Map No.5.2: Concentration index of agricultural labourers

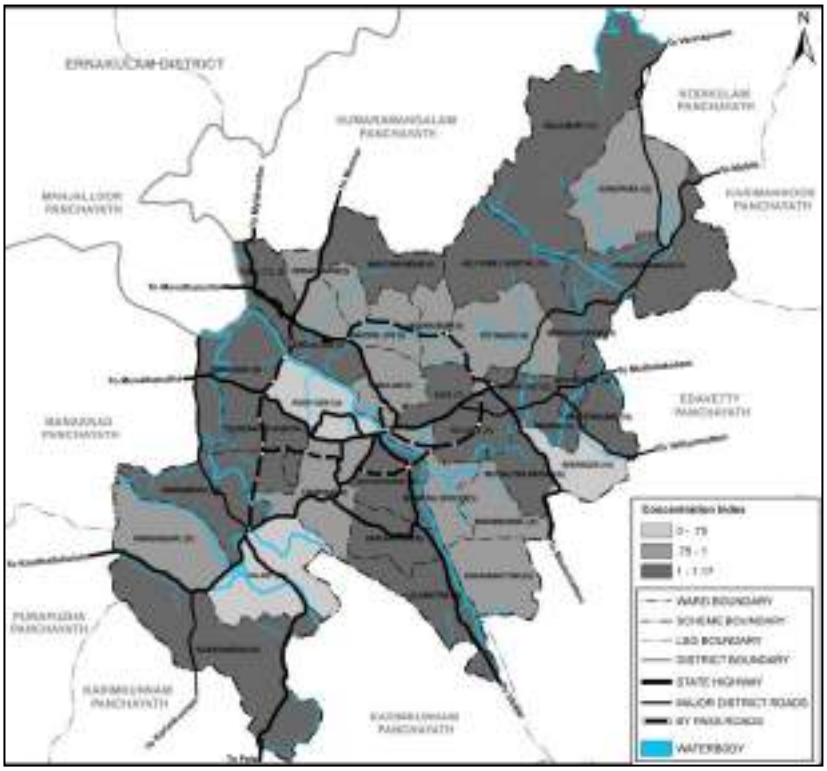
A ward wise analysis of the occupational structure of the town indicates that the concentration of workers in the primary sector (cultivators and agricultural labourers) and other classes (in this sector are negligible) are high in wards like Holy family, Kallumary and Pattayam kavala. It shows predominance of agriculture and allied activities in this area. The percentage of workers in the secondary sector is very low. Hence, it is clear that majority of the workers belong to the tertiary sector. This shows an inclination of people towards the service sector.



Map No.5.3: Concentration index of household industrial workers

From these figures it is clear that these two activities are concentrated in central portions of the town. Even though one would expect more agricultural activities in the peripheral areas of any town, here the peripheral area has more plantation activities which are classified under other workers category. This involves the

supplying services to consumers and businesses. The concentration pattern of household industrial workers is shown in the Map No 5.3. Household industrial workers are mainly concentrated in the central part of the town and are also found scattered in some other wards too. Variation of concentration index of other workers (that includes plantation workers) is shown in Map No 5.4. Other workers category is concentrated in the north and south peripheral areas and in some wards of the central portion too.



Map No.5.4: Concentration index of other workers

5.6 INFERENCE

The work participation rate of Thodupuzha town is lower than that of the district. It has shown a slight increase during the past three decades, but the growth rate of work participation rate is less than the growth rate of population. The decennial variation of occupational structure (2001-2011) shows that there is noticeable growth in the number of primary sector and tertiary sector workers. The decennial growth rate of primary, secondary and tertiary sector workers are 63.3%, 53.7% and 23.4% respectively. Even though the decennial growth rate of workers in agriculture and industrial category are very high compared to service sector, the percentage of these categories to main workers are very low. Hence it may be concluded that the main economic activity of the town is based on service sector. Agriculture and industrial sector also exists with remarkable growth rate during the last decade.

CHAPTER - 6
LAND USE

6.1 INTRODUCTION

Land use of an area analysed in order to ascertain the predominant land use of each parcel of land be it Agriculture, Residential, Commercial, Public and Semi Public, Parking and Transportation, Industrial etc. and to arrive at the unique land use a parcel of land should be put to use when the plan is implemented. The survey of land use was conducted in 2010 to facilitate the analysis as detailed below.

6.2 EXISTING LANDUSE

Total area of Thodupuzha municipality is 35.43 sq.km and it comprises of 35 wards as formed in the ward delimitation of 2010. The various land use that exist in the municipal area as obtained by land use survey 2010 are given in Table No 6.1 and are also shown in Figure No 6.1 and Map No 6.1.

LAND USE	AREA Sq.km	%
Residential use	10.563	29.81
Commercial use	0.562	1.59
Public and semi public use	0.644	1.82
Industrial use	0.228	0.64
Parks, play ground and open space use	0.048	0.14
Paddy fields	0.679	1.92
Dry agriculture	8.639	24.38
Dry agriculture predominantly rubber cultivation	11.649	32.88
Parking and transportation use	1.105	3.12
Rocky area	0.574	1.62
Water bodies	0.735	2.08
TOTAL	**35.43**	**100**

Table No.6.1: Land use breakup

Dry agriculture predominantly rubber cultivation covering about 11.649 sq.km and constituting 32.88% of total land use is the major land use of the town followed by **Residential use** covering about 10.563 sq.km and constituting 29.81% of the total area. Rubber cultivation has major presence in the north and south portions while residential areas are seen spread across the municipal area with comparatively higher residential concentration in the central part. **Dry agriculture** area with predominantly mixed type of crops, covering about 8.639 sq.km constituting 24.93%.of total area.

Parking and transportation facilities constitute 1.105 sq.km area which is 3.12% of the total municipal area. The town can boast of good network of roads many of which have come up recently. The present **Commercial land use** of about 0.562 sq.km ie. 1.59% of the total area can be expected to have a sharp rise in the near future in the normal course as the town is witnessing fast development in trade and commerce. Other significant land uses include **Water bodies** of about 0.735 sq.km which is 2.08% of the total area, **Paddy fields** is about 0.679 sq.km (1.92%), **Public & semi public use** of

about 0.644 sq.km (1.82%), **Rocky area** of 0.574 sq.km (1.62%) etc. No major industry function in the town while there is about 0.228 sq.km, ie., 0.64% of the total area under **Industrial** use.

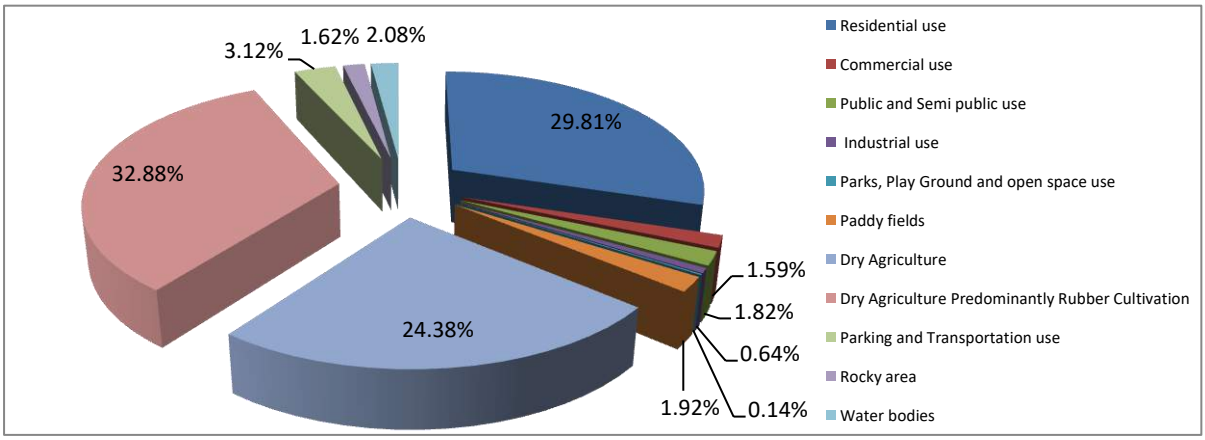
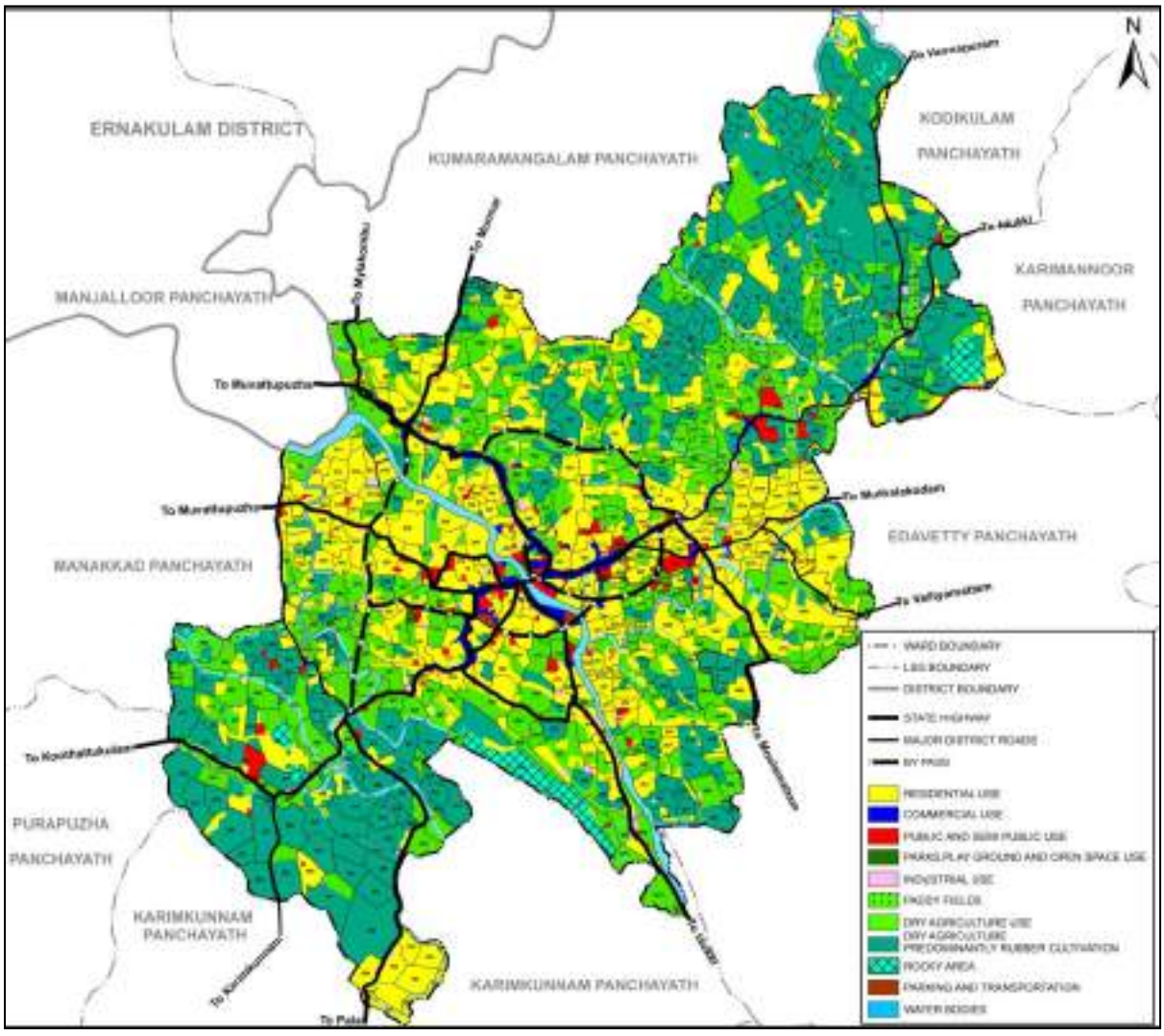


Fig. No.6.1: Landuse breakup



Map No.6.1: Existing landuse

6.3 COMPARISON WITH PLANNING STANDARDS

Comparison of land use breakup of Thodupuzha with the land use structure suggested in UDPFI guide lines is shown in Table No 6.2. The percentage of residential use is far above the suggested standard as per UDPFI guide lines. The percentage of commercial area is also higher than the UDPFI standard. The percentage of public and semi public land use, industrial land use and recreational use are far below the suggested UDPFI standard. The land use under transportation is slightly below the value suggested under UDPFI guidelines.

Sl: No	Land use	Thodupuzha town		Proposed land use structure as per UDPFI guide line (for small towns)
		Area of existing land use (in Ha)	% of total (existing) developed area	% of developed area
A	**Developed area**			
1	Residential	1056.3	80.33	45.00-50.00
2	Commercial	56.2	4.27	02.00-03.00
3	Public and semi public	64.4	4.90	06.00-08.00
4	Industrial	22.8	1.73	08.00-10.00
5	Transportation	110.5	8.40	10.00-12.00
6	Recreational	4.8	0.37	12.00-14.00
	Total developed area	**1315**	**100.00**	
B	**Dry agriculture lands, Paddy, Rubber cultivation, Rocky area and Water bodies**	**2227.6**		**Balance land**

Table No.6.2: Comparison of existing land use and proposed land use structure as per UDPFI guide line

6.4 COMPARISON WITH SIMILAR TOWNS

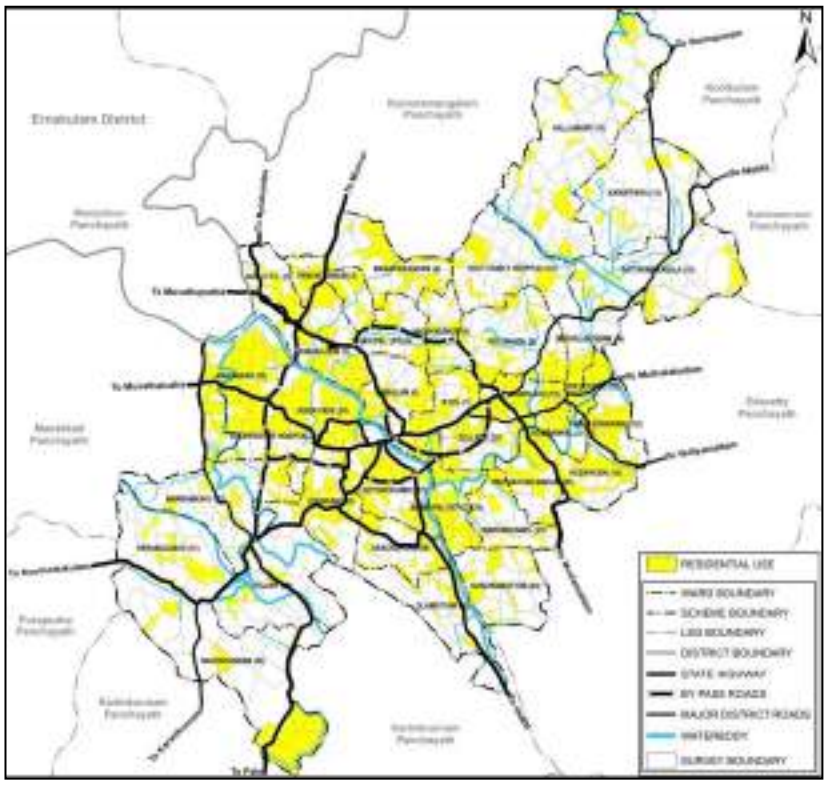
The comparison of various land use of Thodupuzha with that of similar towns in the region like Pala, Muvattupuzha and Kothamangalam are given in Table No 6.3.

Land use (Area in Ha)	Town							
	Thodupuzha		Muvattupuzha		Kothamangalam		Pala	
	Area	%	Area	%	Area	%	Area	%
Residential	1056.3	29.81	796.45	60.42	1022	25.52	638.81	39.77
Commercial	56.2	1.59	29.18	2.21	35	0.87	46.02	2.87
Industrial	22.8	0.64	4.91	0.37	9	0.22	7.98	0.50
Public and semi public	64.4	1.81	67.14	5.09	85	2.13	101.84	6.34
Agriculture	2096.7	59.18	246.89	18.74	2489	62.16	712.7	44.37
Open spaces	4.8	0.14	11.95	0.91	53	1.33	1.99	0.12
Transportation	110.5	3.12	66.54	5.05	195	4.87	41.02	2.56
Water bodies	73.5	2.08	94.94	7.2	116	2.9	55.73	3.47
Others	56.41							

Table No.6.3: Comparison of land use with nearest municipalities

6.5 CONCENTRATION PATTERN OF LAND USES

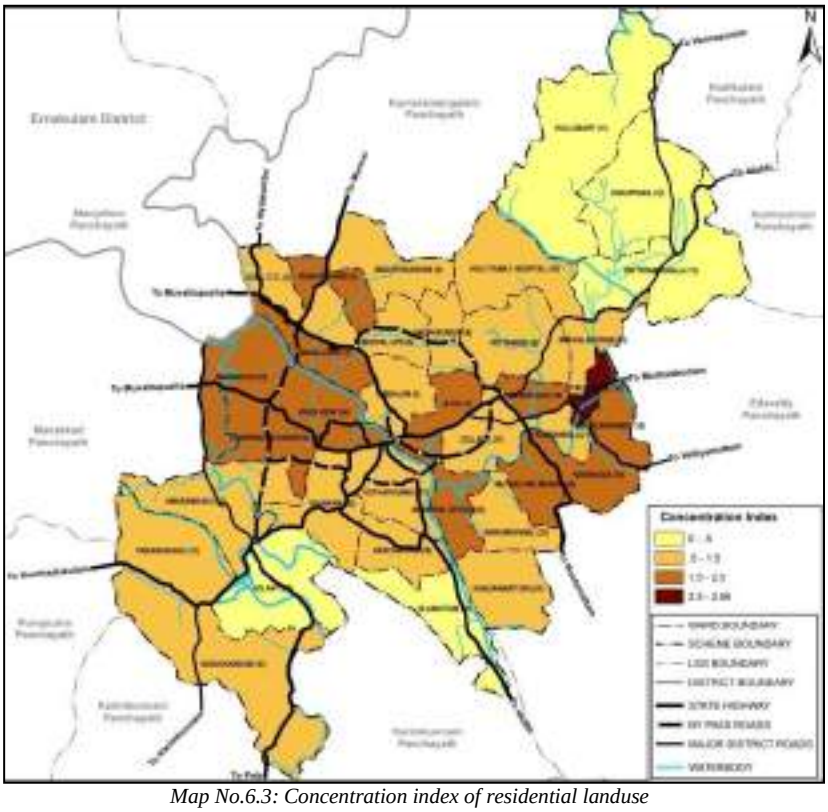
The Concentration Index of a land use in a ward quantifies the extent of concentration of a particular land use in the ward in comparison with the occurrence of that land use in the entire municipal area. The value of concentration index can be less than one, equal to or greater than one. CI value, less than one indicates a concentration of less than the municipal average in respect of that particular land use in that ward. If the CI value is greater than one, it indicates a concentration of greater than that of the municipal average in that particular land use in that ward.



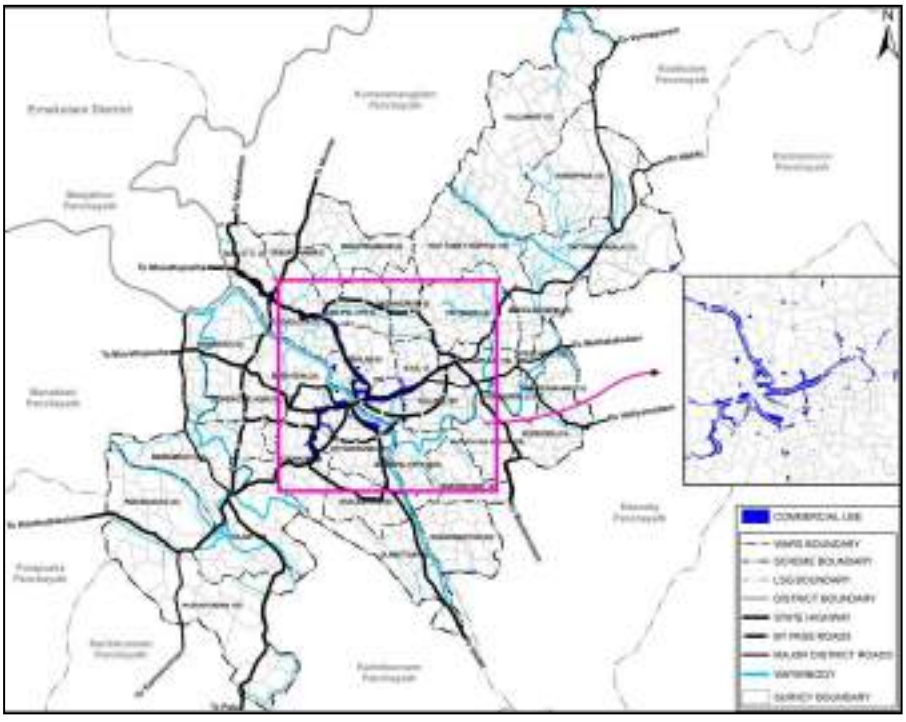
Map No.6.2: Spatial distribution of residential land use

6.5.1 Residential land use

The area under residential use is 10.563 km^2, which is 29.81% of the area of the town. The distribution of residential land use is shown in Map No 6.2. Residential land use is second to the area under rubber cultivation in extent in the town. Residential area is mostly found in the central and in a comparatively small area in southern part of the municipal area. Also the municipal area generally has scattered dwellings. The concentration pattern of residential land use is shown in Map No 6.3 displaying the various ranges of concentration indexes (CI) in the wards. The wards 1, 3, 7, 15, 16, 18, 19, 20, 23, 33, 34 and 35 show high concentration with CI values ranging from 1.5 to 2.86. Obviously these wards fall in the central part of the municipal area where accessibility is high and also where the terrain is comparatively level. The presence of river might have attracted residential settlements to this area.



Map No.6.3: Concentration index of residential landuse

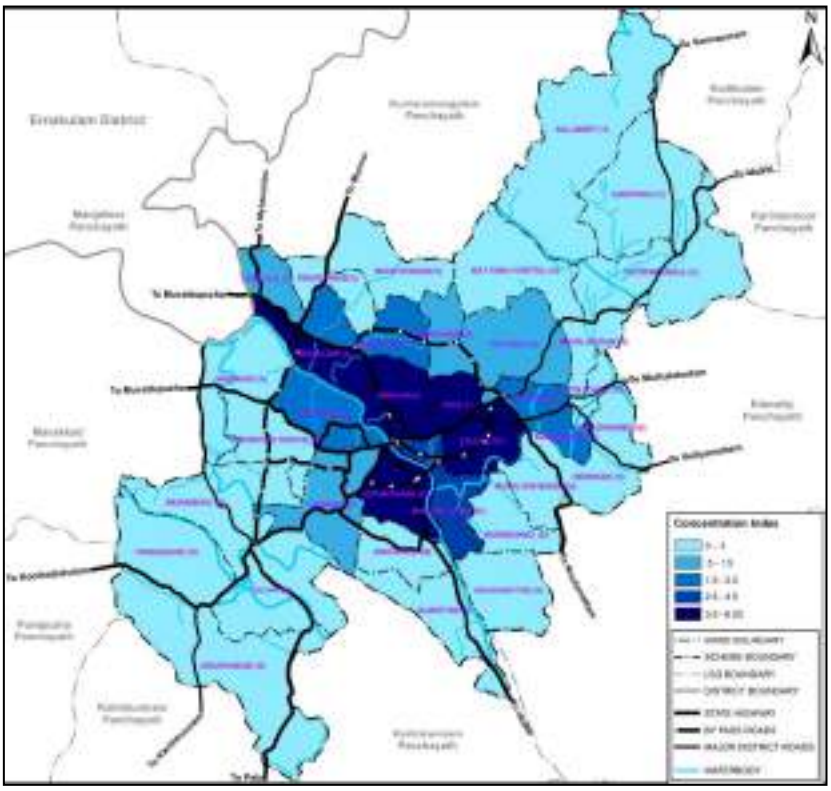


Map No.6.4: Spatial distribution of commercial landuse

In addition to this high residential concentration this central area is home to the taluk head quarter, main educational institutions, major commercial centres and religious centres too. Karikode, which is the headquarter of Keezh malainadu, a province of Kerala that existed till AD 1600. Clearly the town developed in the early stages with this central area as the nucleus.

6.5.2 Commercial land use

Commercial areas are also distributed in the central portion of the municipal area, usually along the major road sides. The distribution of commercial land use is shown in Map No 6.4. The major commercial activity centres are around Central junction, mini civil station area, municipal bus stand area, PWD rest house area, K.S.R.T.C bus stand area, Vengalloor, Muthalakodom etc. Recently Mangattukavala area has started developing as a commercial centre too.



Map No.6.5: Concentration index of commercial landuse

Concentration pattern of commercial land use is shown in Map No 6.5. CI of commercial land use ranges from 5 to 6.52 in, Ambalam and B.H.S wards. The wards named College, Municipal office, Kothayikunnu and Vengalloor have CI values ranging from 3 to 5. It could be seen that the CI sharply declines from the wards in the central portion to most of the peripheral wards. Reason for that is due to high accessibility and the presence of other infrastructural facilities.

6.5.3 Industrial land use

Industrial land use does not have a very significant presence in the municipal area. The few industries present in the town are found scattered mostly in the central portion of the town. Since there is no concentration of industries worth the name in any of the wards analysing the CI has not been attempted. Wards 1, 25, 33 and 35 have the bigger ones of these comparatively small industries. The distribution of industrial land use is shown in Map No 6.6. No major industries are functioning in

the town. There is ample scope of agro based and IT based industries due to good transportation net work.

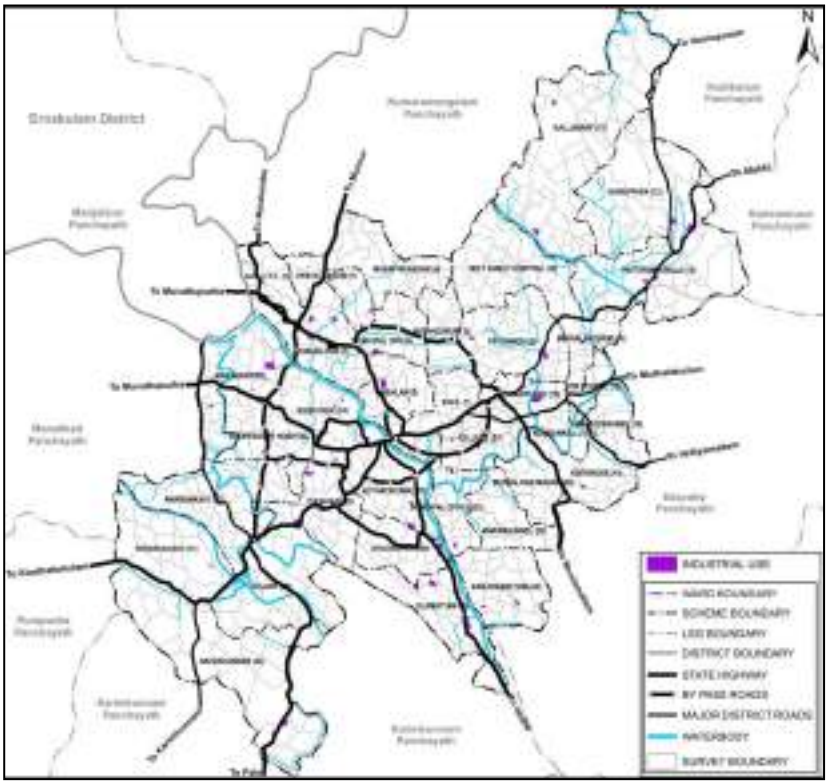
6.5.4 Public and semi-public land use

The distribution of land under public and semi public use is shown in Map No 6.7. This mainly consists of land occupied by government establishments, educational facilities, health facilities, social institutions and religious institutions etc. It could be seen that the land parcels under this use are distributed mostly along the major roads in the central portion of the town.

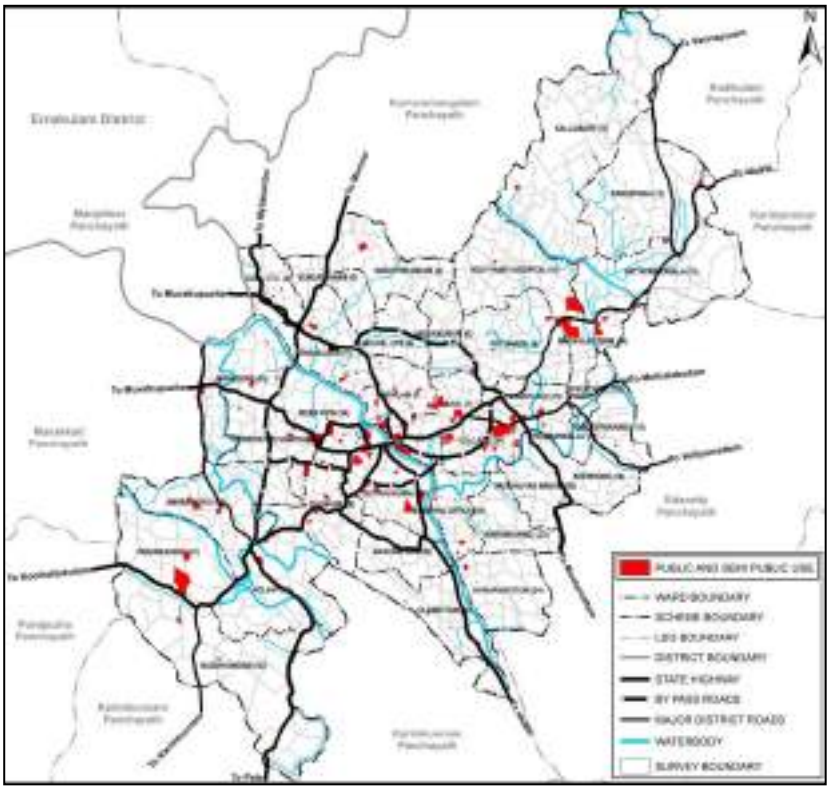
Higher CI values (3 to 7.5) of this land use are seen in wards 6,7,14,17 and 21. The concentration pattern of public and semi public land use is shown in Map No 6.8.

6.5.5 Agricultural land use (Dry agriculture)

The distribution of agriculture land use constitutes 26.29% of the area



Map No.6.6: Spatial distribution of industrial landuse



Map No.6.7: Spatial distribution of public and semi-public landuse

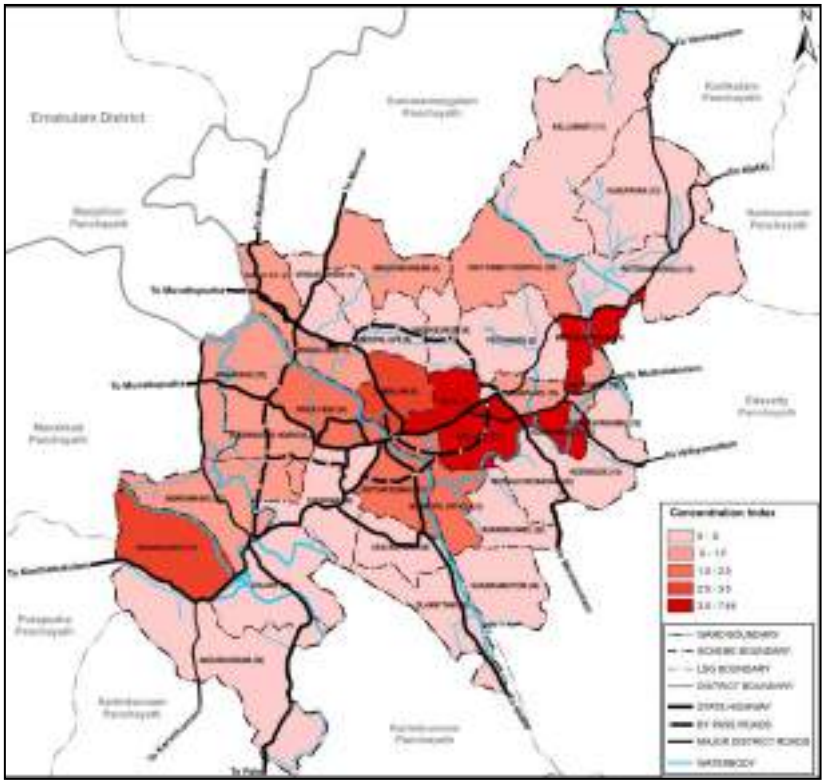
of the town which is the third largest among the different land uses. This land use has considerable occurrence in almost the entire town.

The area under paddy cultivation is only 0.679 km^2 which is only 1.92% of the municipal area. The distribution of agricultural land and its concentration are shown in Map No 6.9 and 6.10 respectively.

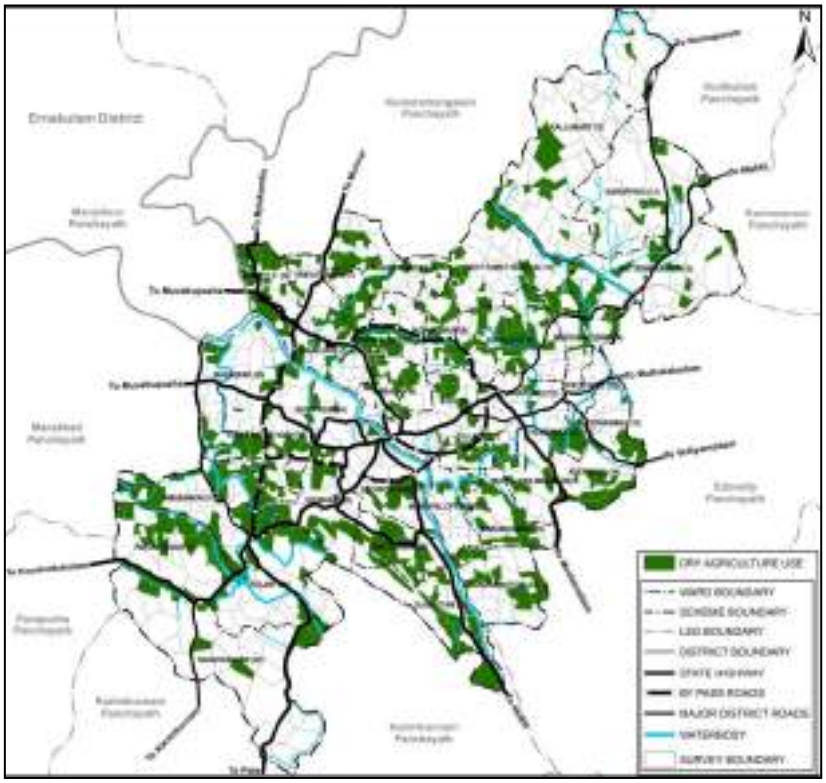
6.5.6 Rubber cultivation land use

Rubber is the only plantation crop cultivated in the town. Major cultivation areas are located in the north and south portions of the town. The distribution of rubber cultivation land use is shown in Map No 6.11. Very large land holdings under this category are not found in the town. Most of the land holdings are below 3 hectors.

Scattered dwellings are a common occurrence in almost all rubber cultivation areas. Pineapple cultivation is common in rubber cultivation during the first 3 years of rubber planting. Concentration pattern of

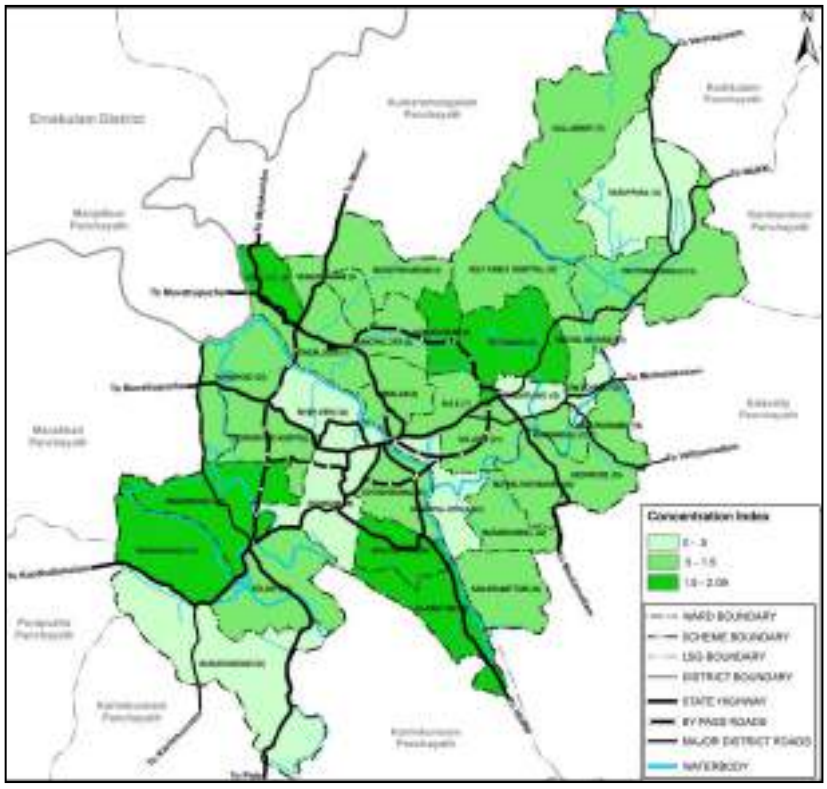


Map No.6.8: Concentration index of public and semi-public landuse



Map No.6.9: Spatial distribution of dry agriculture landuse

rubber cultivation is shown in Map No 6.12. Higher CI values that range from 1 to 2.12 are seen in the wards 10,11,12,13,24,29,30 and 31. Absence of a very high CI value indicates presence of rubber cultivation throughout the town.



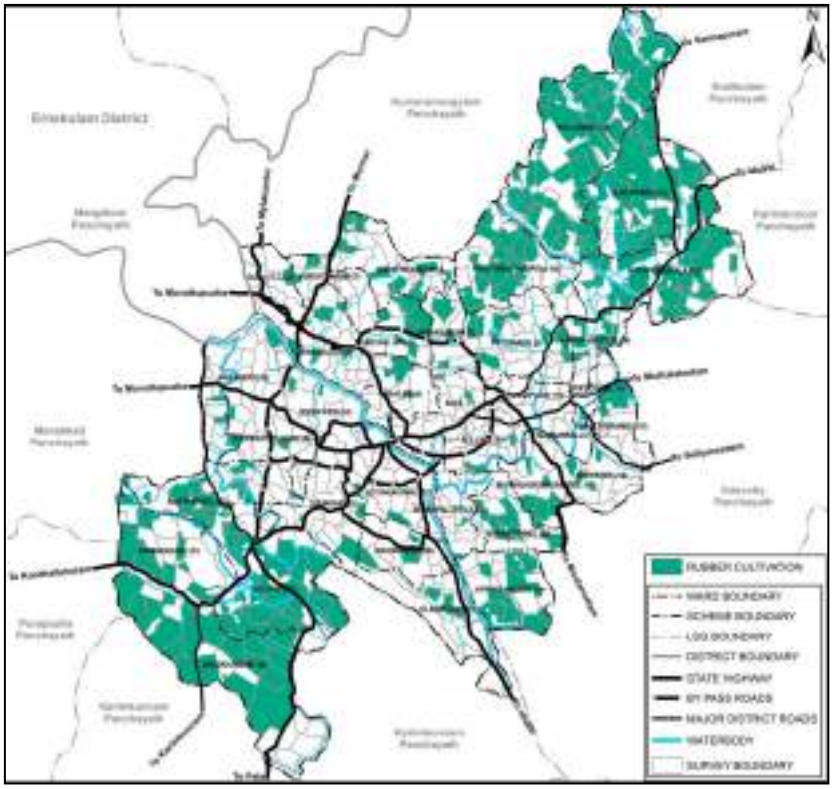
Map No.6.10: Concentration index of dry agriculture landuse

6.5.7 Other Land Use

In addition to the major land uses mentioned above the land uses under park and open spaces, transportation, water bodies and, rocky area are discussed here.

The land under park and open space possesses a very low share of the total area of the town. The distribution of land under this use is shown in Map No 6.13. There is only one park worth calling the name which is located near the mini civil station on the banks of Thodupuzha river.

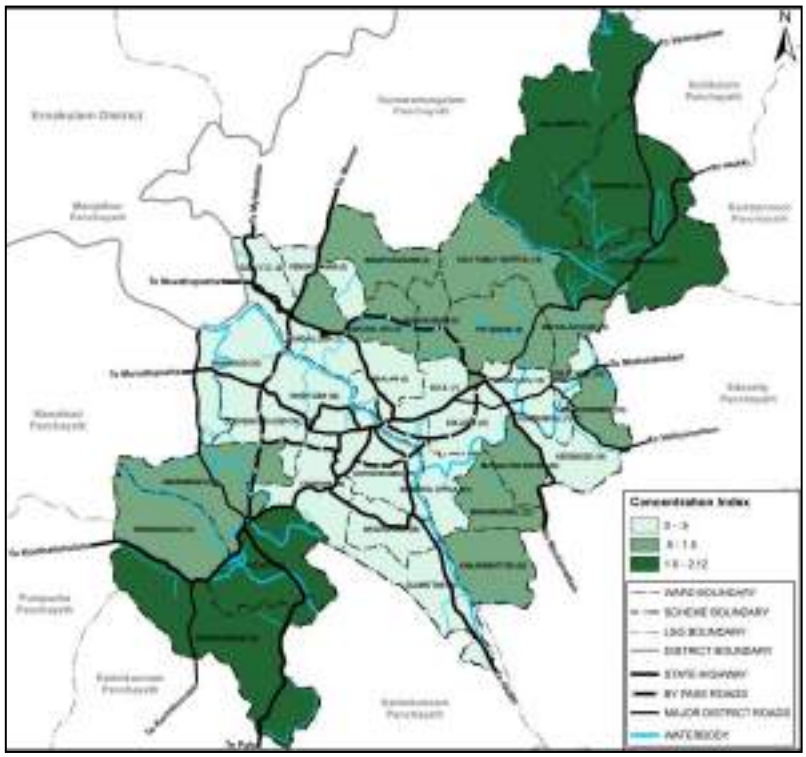
The land uses coming under transportation mainly constitute that for roads, bus terminals, lorry and other parking areas and railway



Map No.6.11: Spatial distribution of rubber cultivation

land to be taken over by Indian railways for its project. Map No 6.14 shows the major parking facilities and bus terminals.

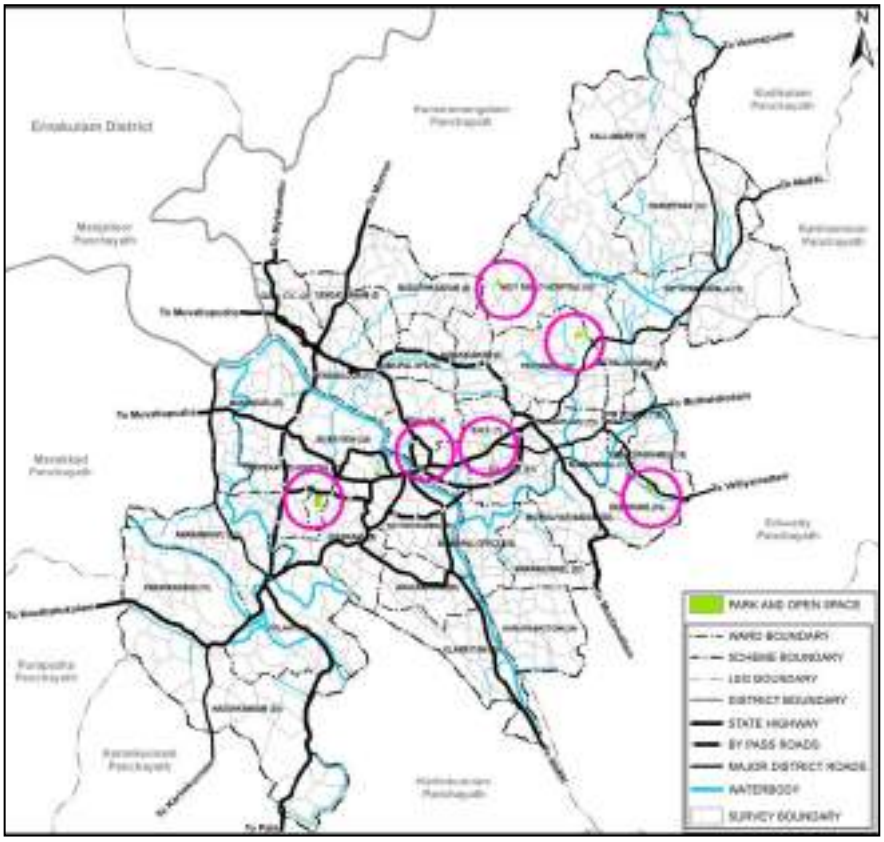
The major water bodies are Thodupuzha river which runs full almost throughout the year, left bank and right bank canals, Kolani stream, Kanjiramattam stream, Cheruthottinkara stream, Vengalloor stream and Dhanwandhari stream. Most of the small natural streams originate within the municipal area and discharge in to Thodupuzha river within the town.



Map No.6.12: Concentration index of rubber cultivation

There are only very few ponds present but most residences have open wells. Map No 6.15 shows the rivers and streams of the town.

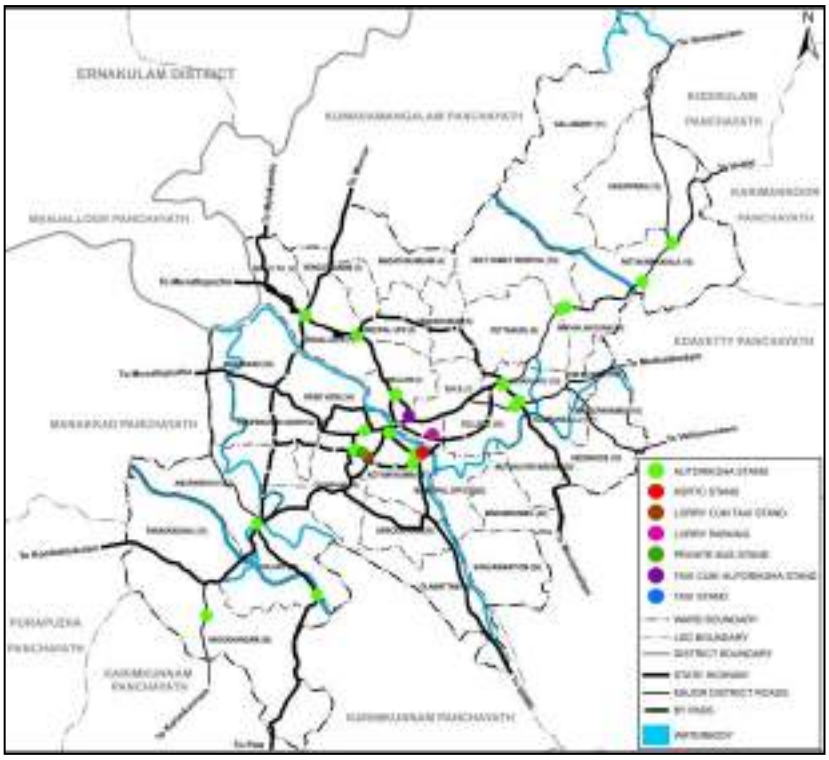
There is a large parcel of rocky land called Uravappara in ward 25 (Olamattam), another in ward 13 (Pattayamkavala) and also some comparatively small parcels in ward 31 (Parakkadavu).



Map No.6.13: Spatial distribution of Park, Play ground and Open space

6.6 FUNCTIONAL CHARACTER

The functional character of an area is determined by the major land use that can be attributed to an area as obtained by analyzing the average size of land holdings in the area. Based on the per capita availability of land holdings the functional character of any settlement can be classified into four;



Map No.6.14: Spatial distribution of parking facilities

1. Urban character, 2. Rural character, 3. Semi urban character, 4. Semi-rural character.

Functional character based on average size of land holdings are shown Table No 6.4.

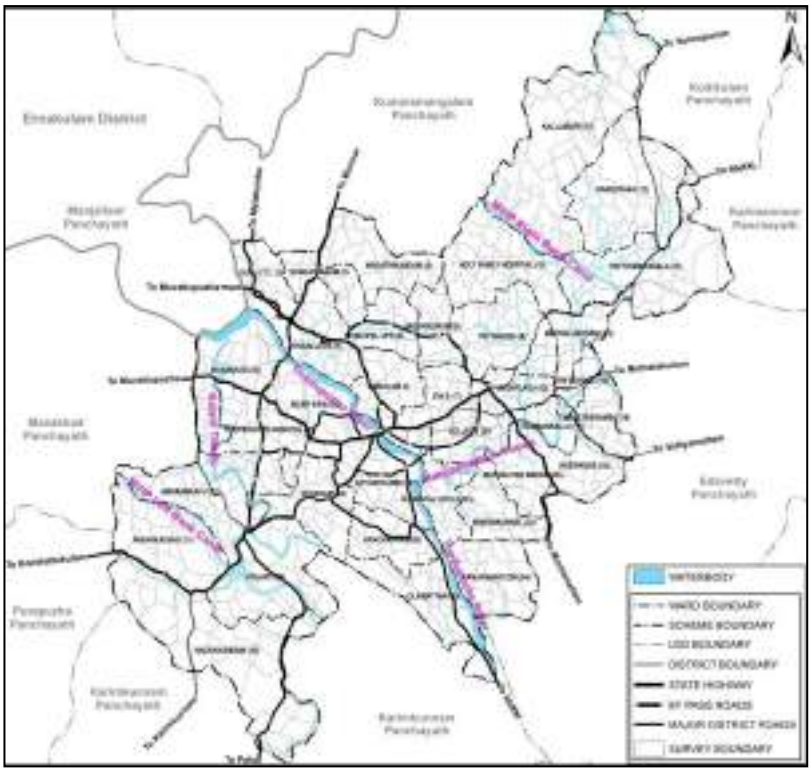
Thodupuzha municipal area as a whole has been found to have urban functional character while analysed in the district perspective as shown in Map No 6.16. In case of the district the predominant activity has been identified as rural when the functional character was analysed.

Average size of landholdings in residential area	Categorization of residential area	Functional character
Below 25 cents	Fully residential area	Urban
25-50 Cents	Agriculture cum residential area	Semi rural
50-70 Cents	Agricultural activity is predominant with residential area	Semi rural
Above 70 cents	Fully agricultural land with residential area	Fully rural

Table No.6.4:Functional character based on average size of land holdings

In case of the Thodupuzha town the analysis of the functional character showed that wards no 6 (Ambalam), ward no 7 (BHS), ward no 18 (Malleparambu) and ward no 21 (College) are having urban character. There are 7 wards viz. ward 15 (Undaplavu), ward 16 (BTM School), ward 17

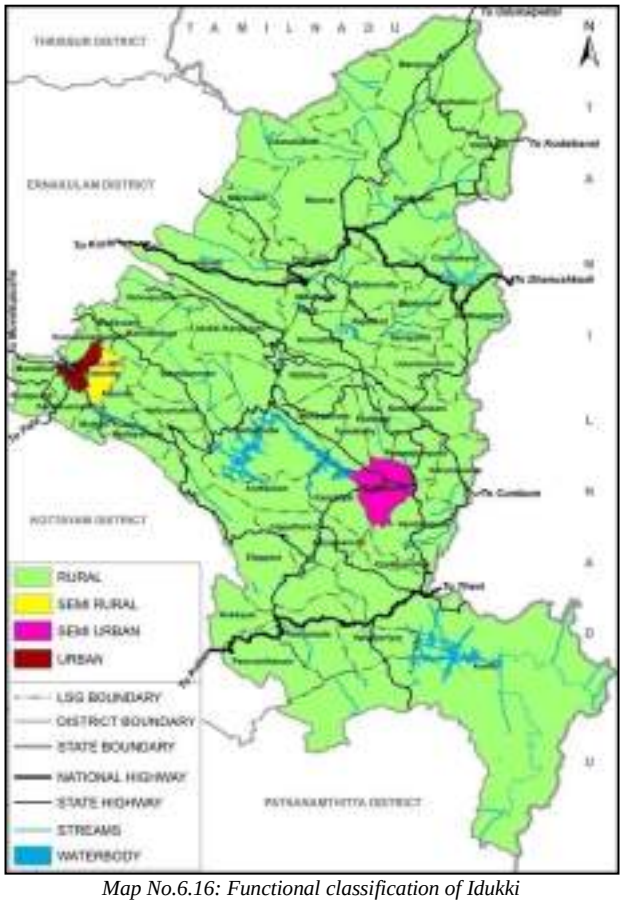
(Kumbankallu), ward 23 (Municipal office), ward 27 (Kothayikunnu), ward 28 (Chunkam) and ward 34 (River view) having semi urban character. The reason for urban and semi urban character in these wards is due to the availability of infrastructural facilities. The rest of the wards are having semi rural character. The functional character of Thodupuzha town is shown in Map No 6.17.



Map No.6.15: Spatial distribution of waterbodies

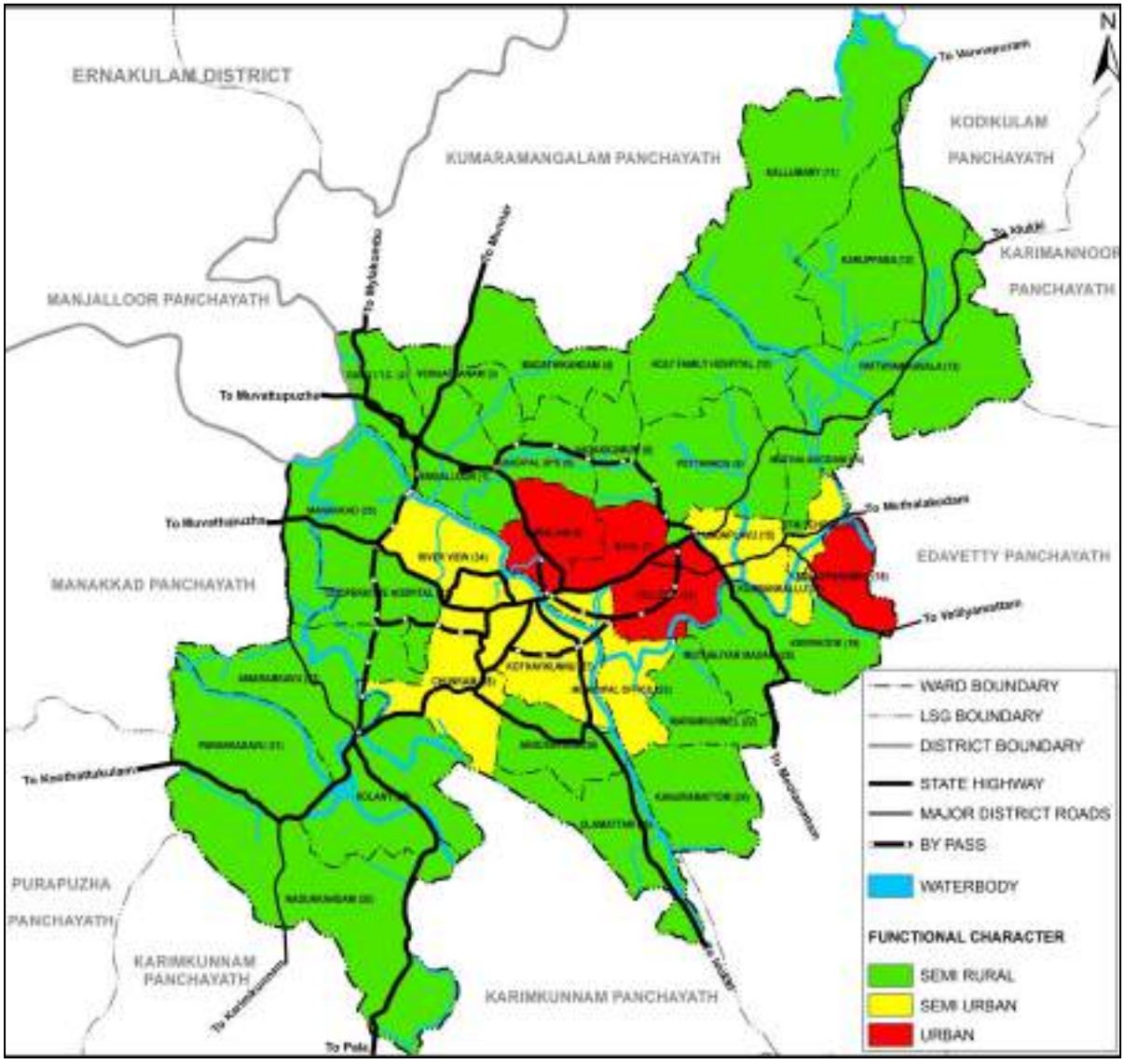
6.7 INFERENCE

It is found from the land use analysis of Thodupuzha town that rubber cultivation, residential use and dry agricultural use are the 3 major components of land use of the town. Among these rubber cultivation and dry agriculture together constitute 57.26 % of the total municipal area. Especially rubber cultivation activities are more concentrated in the peripheral areas while residential uses are found interspersed with dry agricultural uses around central portion of the town. Naturally urban activities like commercial activities and public and semi public uses are having major presence in the central area along the sides of roads of higher order. Industrial uses are, though of small scale type and present only up to a limited extent, found scattered over a large area, that too along the major roads. And looking at the presence of water bodies it is to



Map No.6.16: Functional classification of Idukki

be mentioned that the presence of Thodupuzha river which flows full throughout the year is a big boon to the town. Regional setting study has identified the town to display urban activity. As regards infrastructural, social, administrative, health facilities are concerned the town stands at the first order in the hierarchy of settlements of the district. The town displays urban functional character in four wards, semi urban character in seven wards and semi rural character in the rest of the wards. It is expected that the town will maintain its first order status in the future among the settlements of the district as well as the urban functional character too.



Map No.6.17: Functional character of Thodupuzha

CHAPTER - 7
TRADE AND COMMERCE

7.1 INTRODUCTION

Formerly Thodupuzha had an economy based on plantation especially rubber which still continues so. Also it did act as a trade centre though possibly not a well established one for hill produces of high ranges east to it. In addition the town had acted as the administrative centre of this area until Idukki district was formed in 1976 with headquarter at Painavu. Of late the town has been gaining prominence as a commercial centre mostly on the retail side due to its status as the only urban settlement of the district and its strategic location at low altitude with fairly good road connectivity to the settlements of the neighbouring districts. Five state highways passes through the town giving it ample scope for further development as a commercial centre. As said earlier the main settlement of trade is retail business including textiles, jewellery, household appliances etc. to cater the population of the eastern area of the district.

7.2 LAND UNDER COMMERCIAL USE

The total land under commercial use of the town is only 0.562 sq.km which is 1.59% of the total area of the town. Table No 7.1 and Figure No 7.1 gives a comparison of the share of commercial land use of Thodupuzha with that of four other most developing LSGs of the district. It could be seen that the area under commercial land use in Thodupuzha is significantly on the higher side. This may be due to the presence of excellent connectivity between Thodupuzha and neighbouring LSGs and the presence of other infrastructural facilities. Table No 7.2 and Figure No 7.2 shows a comparison of these values between Thodupuzha and other similar urban centres of the region. Palai and Muvattupuzha stand 1st and 2nd place in this list. Thodupuzha comes in the third place. Thodupuzha is the only municipality

Under study	% of Commercial area
Thodupuzha	1.59
Kattappana	0.51
Kumily	.41
Munnar	0.53
Adimaly	0.525

Table No.7.1: Share of commercial land use - Thodupuzha and important LSGs of the district

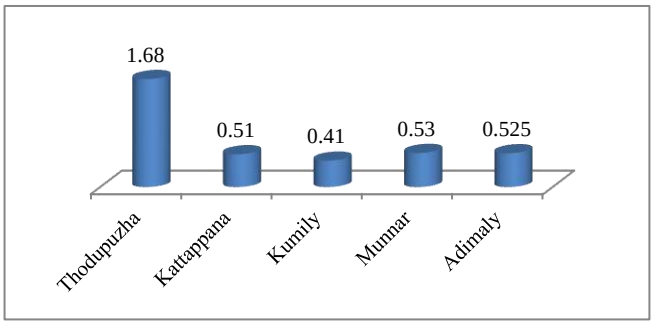


Fig. No.7.1: Share of commercial land use - Thodupuzha and important LSGs of the district

in Idukki district and have agriculture as the main occupation.

Gandhi square area was the prominent commercial centre in earlier times nearby which exists the market, head quarter of the town etc.

Under Study	% of Commercial area
Thodupuzha	1.59
Kothamangalam	0.87
Muvattupuzha	2.21
Palai	2.87

Table No.7.2: Share of commercial land use - Thodupuzha and nearby municipalities

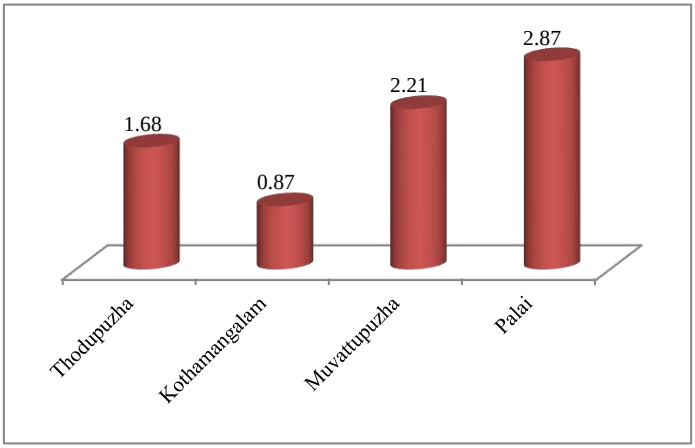
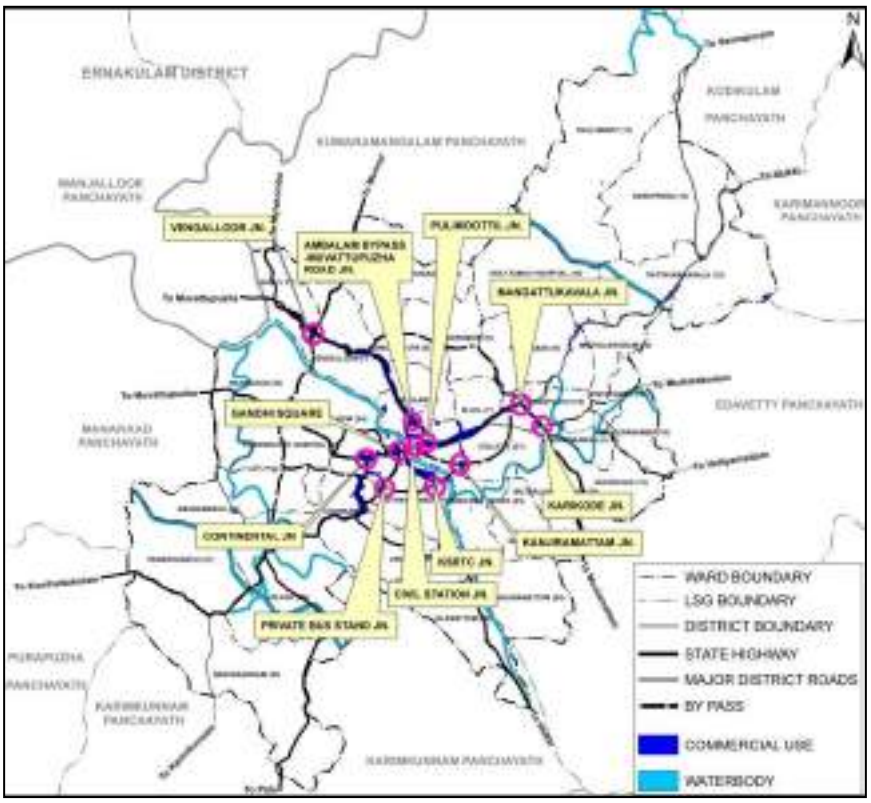


Fig. No.7.2: Share of commercial land use - Thodupuzha and nearby municipalities

The former private bus stand also was near to this junction. With the establishment of new private bus stand the expansion of commercial activity has taken place towards this area and all along the major roads. The establishment of new bridge and the formation of bypasses towards this near KSRTC bus stand has given impetus to development of KSRTC bus stand area as a commercial centre. Pulimoodu junction area, Civil station area, Mangattukavala bus stand area, Vengalloor etc. are some of the other commercial centres. By pass roads and ring roads connecting main centres and presence of other infrastructural facilities promotes commercial activities of the junctions.

7.3 COMMERCIAL NODES

A detailed survey regarding the commercial nodes in the town has



Map No.7.1: Commercial nodes

been conducted by the department. Based on the preliminary survey, 11 commercial nodes in the town have been identified for the detailed study. The facilities at various nodes has been generally grouped into retail shops, whole sale shops, commercial offices, small scale Industries, other facilities and higher order facilities.

The number of shops / units of different categories coming under these general groups were counted. For comparison total scores for each node were calculated after assigning weightage to each facility. The details about commercial establishments under various categories available at each node, the weightage assigned to each category of establishments and total score of each node are shown in Annexure 7.1. The total score obtained for each node is given in Table No 7.3 and Figure No 7.3. Based on the variations in the graph, the existing hierarchy of nodes has been found out. The locations of these nodes are shown in Map No 7.1.

Sl No.	Nodes	Score
1	Private bus stand jn.	231.75
2	Vengalloor jn.	171.95
3	Mangattukavala jn.	160.67
4	Civil station jn.	126.42
5	Ambalam bypass-Muvattupuzha road jn.	126.25
6	Gandhi square jn.	120.4
7	Continental jn.	102.71
8	Pulimoodu jn.	93.61
9	Kanjiramattam jn.	73.38
10	Karikode jn.	63.08
11	KSRTC stand jn.	60.27

Table No.7.3: Commercial nodes and scores

Based on the above analysis the existing hierarchy of nodes has been arrived at as given below.

- ***FIRST ORDER*** - Private bus stand junction
- ***SECOND ORDER*** - Vengalloor junction and Mangattukavala junction.
- ***THIRD ORDER*** - Civil station, Ambalam bypass-Muvattupuzha junction, Gandhi square junction and Continental junction.

With the establishment of new private bus stand about 20 years back, the area nearby has gained momentum and is now having the status of first order. A commercial corridor development has been identified

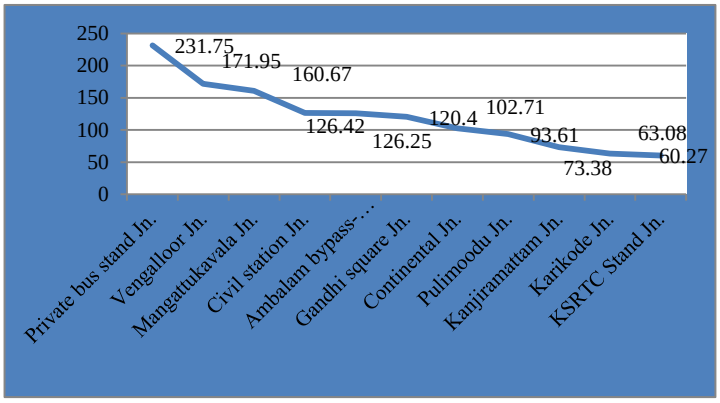


Fig. No.7.3: Commercial nodes and scores

between this area and Gandhi square junction area. Mangattukavala junction is having a new private bus stand established about 10 years back and has gained momentum since. Vengalloor junction in Punaloor - Muvattupuzha state highway is also fast developing with the formation of bypasses passing through it.

7.4 MARKETS

The municipal market having an extent of 1 acre functioning near Gandhi square area is the only fully functional market in the town. This is a daily market and was established way back in 1915 but has not the development with regards to infrastructure or the extent it deserves. The market facilitates retail trading of agriculture produce, fish and meat etc. The vegetables and fruits arrive from Tamilnadu, Karnataka, Andhrapradesh and from local areas. Produces like pepper, ginger etc. traded are locally available. There is another market near Pulimoodu junction called Chanthakunnu market which was established long ago and is now having trading on banana only. Table No 7.4 detailed the commodity transaction of the municipal market. Location of municipal, Chanthakunnu markets and private firm market for fish are shown in Map No 7.2.

Sl. No	Commodities	Average quantity	Price	Arrived from	Distributed to
1	Vegetable	200 Tonnes/week		Tamilnadu, Maharashtra	Locality
2	Banana	75 Tonnes/week		Tamilnadu, Maharashtra	Locality
3	Rice	140 Tonnes/week	31/kg	Andhrapradesh, Karnataka	Locality
4	Sugar	70 Tonnes/week	31.50/kg	Karnataka, Maharashtra	Locality
6	Betel	500 Kg/week	120/kg	Tamilnadu, Palakkad	Locality
7	Pepper	2000 Kg/week	400/kg	Locality	Locality
9	Arecanut	1 Tonnes/week	20/kg	Locality	Locality
10	Yam	1000 Kg/week	24/kg	Locality	Locality
12	Goat	300 Kg/week	400/kg	Locality	Locality
13	Fish	14 Tonnes/week		Tamilnadu, Locality	Locality

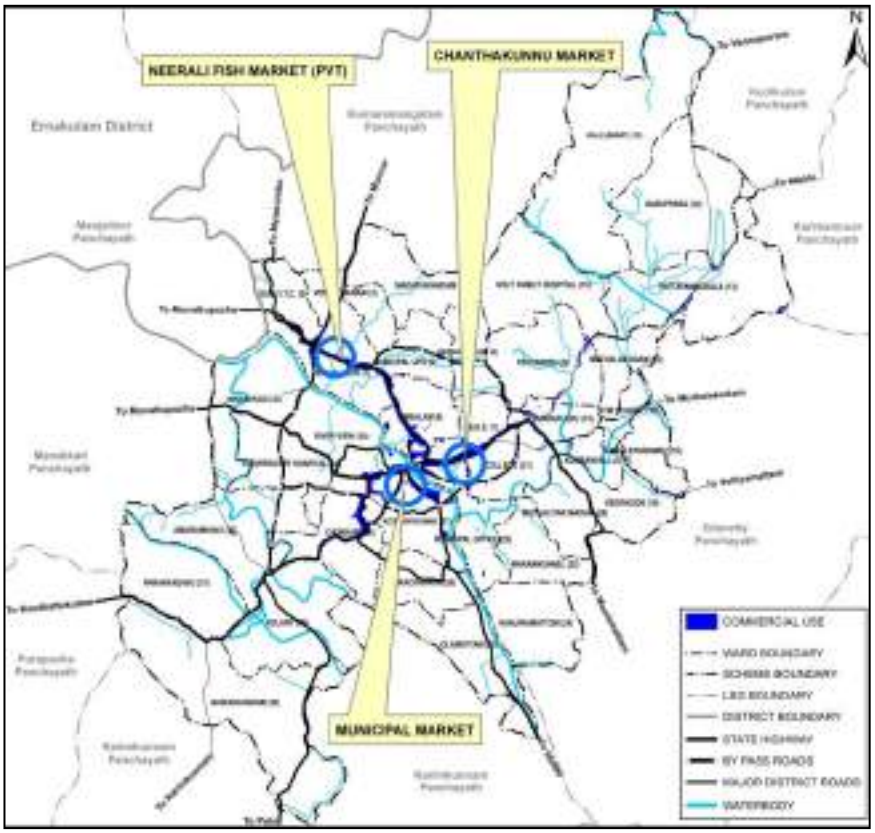
Table No 7.4: Details of commodity transaction – Municipal market

7.5 INFRASTRUCTURE FACILITIES

The municipal market near Gandhi square does not have good quality stalls, enough parking spaces or approach roads. The drainage and sanitation facilities are not good either. It lacks a good compound wall too. The hygiene of the market is not satisfactory. The market requires renovation of many stalls and construction of facilities including sanitation, existing slaughter house, drainage, good approach road, parking spaces etc. Recently for fish stalls new building has been constructed and the vendors are being shifted to these stalls. Renovation of Chanthakunnu market to regain its old glory may also be explored.

7.6 OTHER SHOPPING FACILITIES

In addition to markets, there are shopping complexes in various part of the town. They usually house super markets, showrooms/shops dealing textiles, electronics goods, stationary, building materials etc. new such developments are being witnessed at municipal bus stand area, KSRTC bus stand area, Mangattukavala area, Vengalloor area etc.



Map No.7.2: Location of markets

Agricultural products, hill products, spices etc, are traded in the market. Agricultural products are imported from neighbouring states Tamilnadu, Karnataka, Andhrapradesh and also from surrounding locality and distributed to local areas only. Other commodities like electronic goods, stationary, building materials are not exported from here and are distributed to local areas only.

7.7 INFORMAL SECTOR

Like any town of Kerala, Thodupuzha is also having its share of street vendors. Most of them do trading in tea snacks, fruits and vegetables, garments, minor electronic goods, seed sale etc. A few of them run pan shops flower stalls, lottery stall, soda-lemon stall etc. Still a fewer are engaged in foot wear and umbrella repairing. The street vendors are mostly seen near civil station, town hall area, Ambalam junction area and Continental area. Altogether about 15 to 20 such units are seen in the town. They usually occupy sidewalks, parking spaces and even portions of roads themselves. However they contribute substantially in meeting the needs of the community especially the poorer one by making available commodities and services at a comparatively cheaper rates. Even though their activities can be justified socially, they are usually conflicting with the management of traffic and pedestrian movement on street and affect the environmental quality also.

7.8 INFERENCES

The town is witnessing an orientation towards commercial activities especially retail trade to cater to the needs of the population of the influence area. It's a clear shift in the main economic base of the town which was agricultural based earlier. The establishment of a good network of roads including many bypasses through less inhabited area adds to this development. A study on the status of the present commercial nodes of the town has identified the municipal bus stand area as the first order node in the hierarchy with respect to the commercial facilities available. Good road network, presence of offices and educational institutions, hotels, good water supply and drainage system etc. are available in new private bus stand area. Vengalloor junction area stands second. The municipal market near Gandhi square is the only established market of the town. The informal sector also has its presence felt in the town even though not at a big scale.

CHAPTER - 8
INDUSTRIES

8.1 INTRODUCTION

In this chapter the present scenario of industrial sector of the town is analysed. The town does not have any major or medium type of industrial units but only have units in the category of MSME. The mini industrial estate of industrial department is the major industrial establishment of the town. Most of these units as scattered in different parts of the town. As per the land use analysis 22.8 hectares of land which is just 0.64% of total town area is coming under industrial land use. As per the census 1981, 1991 and 2001 the number of workers in house hold industrial sector are 163, 180 and 162 respectively. An absence of improvement in these temporal values points to a stagnancy of this sector.

8.2 M.S.M.E. UNITS

The number of registered industrial units in the category of MSME (Micro, Small and Medium Enterprises) as in year 2009 is 869. Garment and readymade dress manufacturing industry is the single most predominant industry in this category followed by food and general engineering industries.

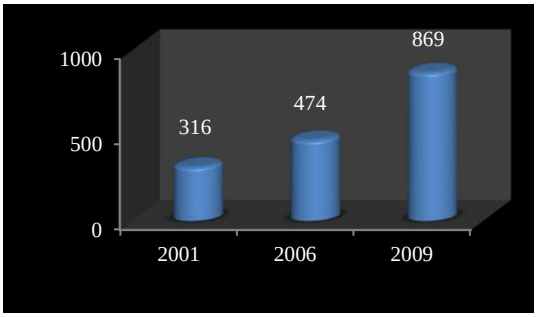


Figure No.8.1: Number of registered industrial units

Even though there is ample scope for agro based industries like rubber based products, preparation of jam, fruit, and syrup etc. The investment in this category has so far been minimal. Among the registered units it is estimated that about 22 % of the enterprises are either closed down or not working. Figure No 8.1 shows the number of registered units in the years 2001, 2006 and 2009. As in the figure the number of units has been increasing during this period from 316 in 2001 to 869 in 2009. The rate of growth between year 2006 and 2009 is seen as 83 %. There is a sudden growth between 2006 to 2009 (3 years) than that in between 2001 to 2006 (5 years) because all other facilities have a remarkable growth during this period.

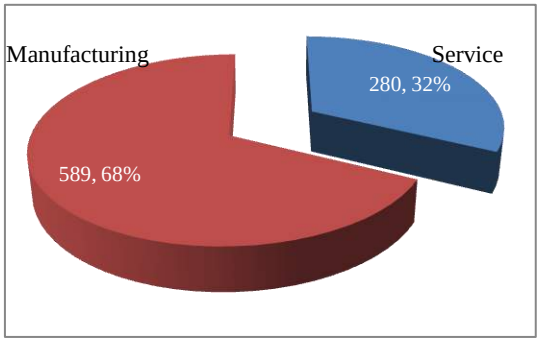
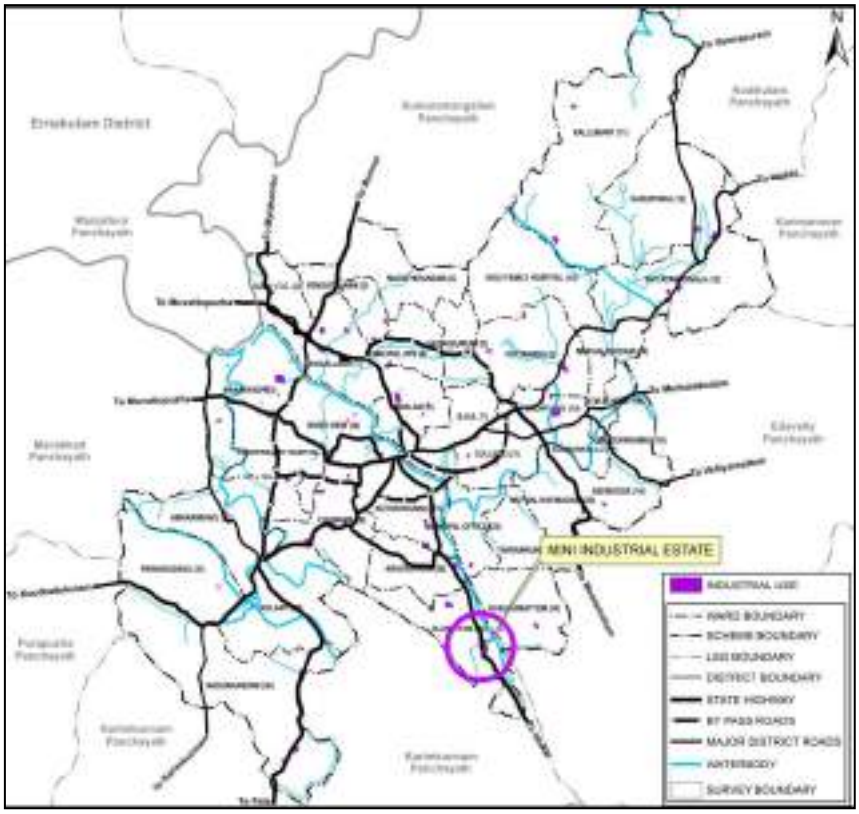


Figure No.8.2: Breakup- Manufacturing and service sector industries

Figure No 8.2 portrays the breakup between manufacturing and service sector industries. Out of 869 industrial units, 589 units which is 68% of total units are in service sector and the remaining 280 units (32%) are in manufacturing sector. General engineering, wood industries, garment units, DTP and printing, cement blocks, software development, rubber products, rexin products and paper products are the units functioning in the manufacturing sector.



Map No 8.1: Location of mini industrial estate

8.3 MINI INDUSTRIAL ESTATE

The Mini Industrial Estate promoted by SIDCO at Olamattam which contains 12 sheds is the only organized industrial area within the town limit. It is located at the southern part of the municipality by the side of Thodupuzha – Puliyanmala state highway. Among the nearby panchayaths there are two Mini Industrial Estate each in the panchayaths of Manakkad and Udumbannoor formed by industrial department and one in Kodikulam panchayath promoted by SIDCO. These units will also benefit the municipality too. Map No 8.1 shows the location of Mini Induatrial Estate at Olamattam in municipality.

8.4 RAW MATERIALS

Agro based raw materials are available in the region, which can be utilized as industrial raw material. Latex which is a major industrial raw material is available in plenty in the town and its hinter land. Granite and clay are the other raw minerals available in the influence region. Need is felt for a planned development of such agro based industries as the raw materials are available in plenty in the town itself.

8.5 INFERENCE

Only SSI units are functioning in the town and there are no major industries. The presence of Thodupuzha river should be exploited in a sustainable way to promote industries that may require a considerable amount of water. Also the presence of an excellent road network including long bypass roads passing through fairly uninhabited areas must also be seen as a boon in this regard. There is high potential for agro based industries using raw materials like latex, rubber, wood etc. Reviving the one famous light industrial activities like bus body building need to be explored.

CHAPTER - 9
TOURISM AND HERITAGE

9.1 INTRODUCTION

Tourism can play an important role in the economy of Thodupuzha is the potential in this regard is wisely exploited. Even though Thodupuzha itself is not a major tourist destination, it is the gate way to top tourist destinations like Munnar, Thekkady, Vagamon, Idukki dam, Malankara dam, Peermade etc. Also there are numerous tourism destinations within short travel distance from Thodupuzha. Thodupuzha river running full all twelve months a year is another attraction. The town hosts considerable number of cultural, educational institutions, temples, mosques etc.

9.2 IMPORTANT TOURISM DESTINATIONS IN TOWN AND NEARBY PANCHAYATHS

- **Uravappara**

Has scope for developing as a tourism and pilgrimage spot due to the presence of Uravappara temple standing over a small hill of rock stretching over 2 km. Located at about two km from town centre, this rock gives a good view of Thodupuzha town.


Uravappara

- **Malankara dam and reservoir**

Dam constructed in Muttom gramapanchayath across Thodupuzha river at 6 km from Thodupuzha. Recently has become hot spot for film makers.


Malankara dam

- **Ilaveezha Poonchira**

Has potential to attract trekking enthusiasts. At about 18 km away from Thodupuzha town.


Thommankuthu

- **Thommankuthu waterfall**

At 20 km from Thodupuzha this is a place visited by numerous tourists.

- **Other tourist spots**

There are other less important tourism spots like Nadukani Pavilion, Thumbichy mount, Paaramada echo point, Elapully waterfalls etc. not much far away from Thodupuzha.



Meenuliyan para

9.3 TOURISM INFRASTRUCTURE

No major star hotels operate in Thodupuzha but there are some middle class or economy accommodations available. The list of the important ones are given in Table No 9.1. A few home stay facilities are also available.

Hotels/tourist homes	
S.l.No	
1	Silcila hotel
2	Tee Cee hotel
3	Gemini tourist home
4	Madaparambil resorts
5	Hotel Mourya Monarch
6	Pappootty hall
7	Uthram residency
8	Edassery hotel
9	Aishwarya tourist home
10	Hotel Ambady
11	Arathy tourist home
12	Rest house Thodupuzha

Table No. 9.1: Home stay facilities

9.4 HERITAGE

Thodupuzha has decent long history to boast of Karikode, near Thodupuzha, was the headquarters of the Vadakkumkur Rajas where the remains of a fort and a Devi temple constructed by the Vadakkumkur Rajas can be seen. The famous Annamalai temple dedicated to Lord Siva constructed in the Chola style of architectures is also located here at Karikode. There are other important temples dedicated to Sree Krishna, Siva, Devi and Sastha. Besides there are several churches and mosques. The Nainar mosque, near Karikode, is believed to have seen constructed by the Vadakkumkur Raja for his soldiers. There are six mosques in the town. Thodupuzha town's different tourist attractions, details of tourists, which include foreign and domestic, details of tourist infrastructure, and home stays details are given below. Map No 9.1 portrayed major heritage spots within the town. Table No 9.2 shows the major tourist attraction centres.

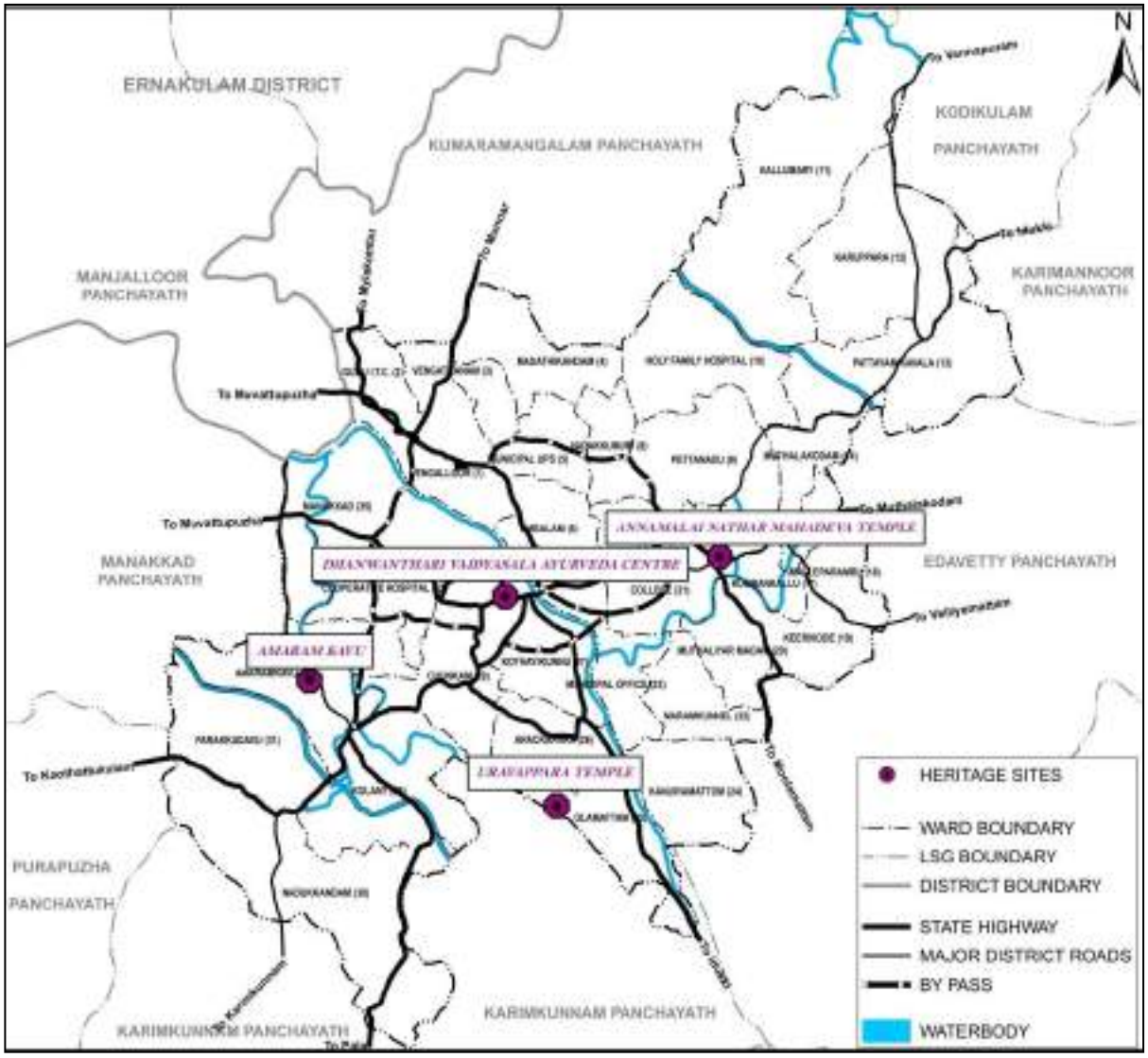
9.5 INFERENCE

Thodupuzha is the gateway to some important tourist destinations of Idukki district such as Munnar,

Tourist attractions	Type	Tourist season
Amaram kavu at Kolani	Religious	All season
Uravappara temple, Olamattom	Religious	Festival season
Annamalai Nathan Mahadeva temple	Heritage	All season
Dhanwanthari vaidyashala Ayurveda centre	Heritage	All season
Charakas Ayurvedic resorts	Health	Tourist season

Table No. 9.2: Tourist attraction centres

Marayur, Thekkady, Idukki arch dam and Vagamon. The town can perform the role of a transit point to these places for the tourists coming from the districts of Kottayam, Ernakulam etc. Thodupuzha river running full all twelve months a year is another attraction. There is ample scope for creating manmade facilities to attract the tourists bound for these destinations. The town hosts considerable number of temples, mosques, churches, cultural and educational institutions etc. Steps may be taken for maintaining these sites and heritages.



Map No. 9.1: Heritage sites

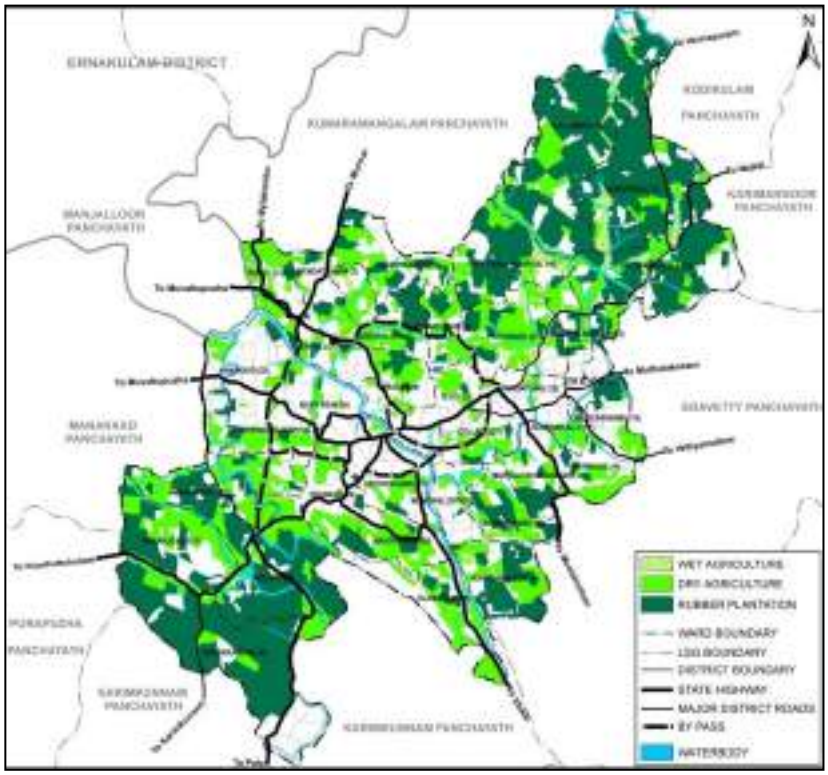
CHAPTER - 10
AGRICULTURE

Agriculture including plantation is the most important sector of the town's economy and it is the biggest source of employment. The major chunk of employment under the 'Other workers' category (in the four fold classification of workers) belongs to plantation especially rubber. Rubber is the principal crop. Paddy fields have relatively less presence in the town and the area is decreasing too. Activities allied to agriculture such as dairy, poultry etc. are also seen up to a certain extent. The conversion of paddy fields for cultivation for cash crops like rubber and for non agricultural purposes which is common in Kerala is widespread in the town too.

10.1 AGRICULTURAL LAND USE

Crops are grown in 20.97 km^2 area which is about 59.18 % of the total extent of 35.43 km^2 of the municipality. The area under different crop cultivations are given in Table No 10.1 and also in Figure No 10.1. Rubber grown in 32.88 % of agricultural area has become the major crop cultivated.

Dry agriculture area



Map No.10.1: Spatial distribution of different crops

Crops		Area in Ha.	% of town area	% of Agriculture area
Rubber		1164.9	32.88	55.55
Dry agriculture	Coconut	500	14.11	23.85
	Other Crops	363.9	10.27	17.36
Wet agriculture		67.9	1.92	3.24

Table No.10.1: Area under different crops

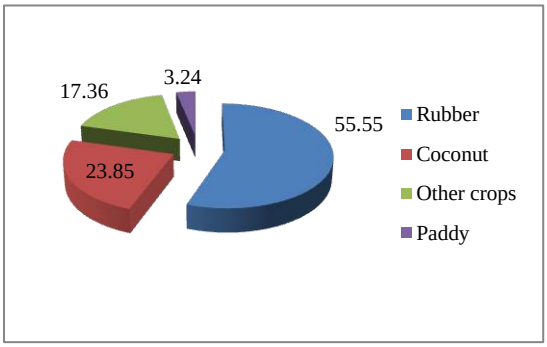
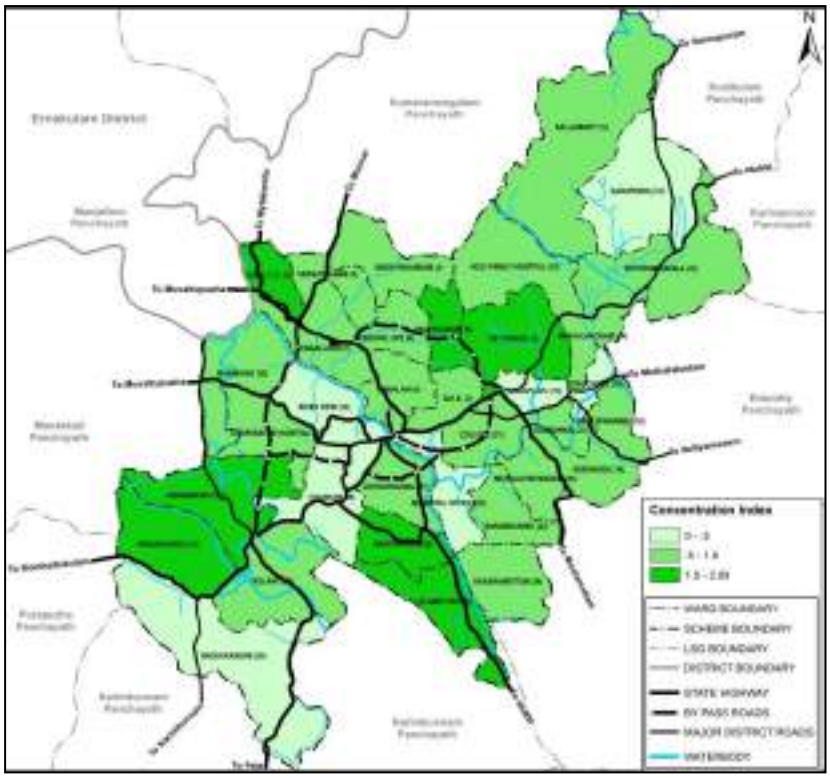


Fig. No.10.1: Area breakup – different crops

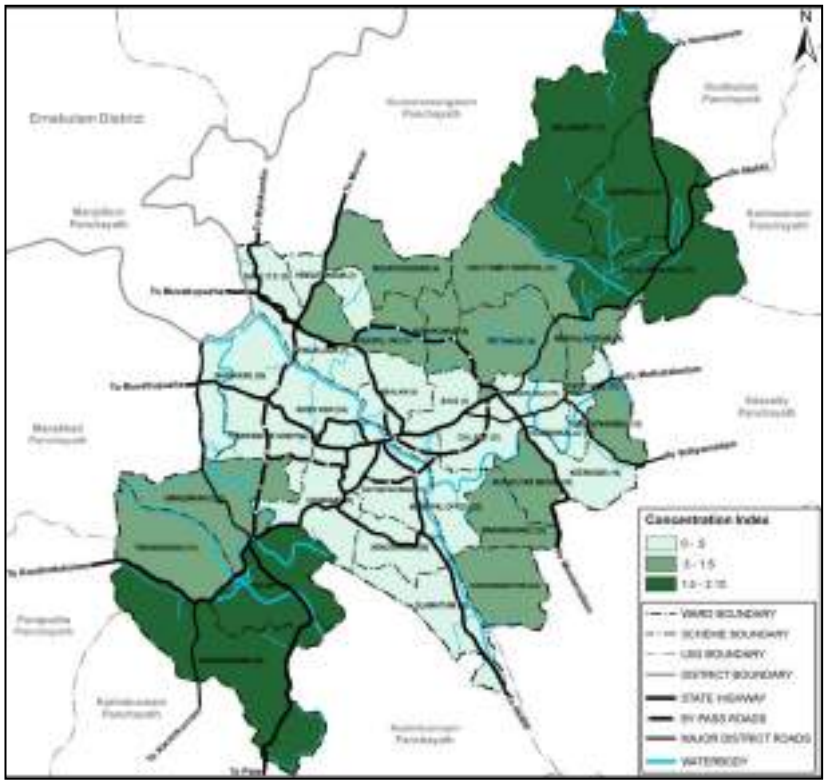
other than coconut constitutes 24.38 % of the agriculture area. The extent of paddy is 68 Hectares which is only 1.92 % of the agricultural area. Map No 10.1 shows distribution of the different crop areas.

10.2 CONCENTRATION INDEX OF AGRICULTURE LAND USES

Concentration pattern of dry agriculture land and rubber plantation area are shown in Map No 10.2 and 10.3 respectively. It could be seen that dry agricultural area is fairly distributed throughout the town with high concentration in central region. Usually this use is found mixed with residential uses. Rubber plantation is more concentrated in the peripheral areas.



Map No.10.2: Concentration index of dry agriculture



Map No.10.3: Concentration index of rubber cultivation

10.3 MAJOR CROPS

Major crops of Thodupuzha municipal area is shown in Table No 10.2 along with area of cultivation and productivity. The share of different crops area is portrayed in Figure No 10.2. Rubber is the crop with the largest area followed

by coconut and pineapple. Tuber crops, banana, pepper, arecanut and vegetables are also cultivated to a lesser extent. Paddy is not a major presence in the town. Rubber is being cultivated widely due to the facts that this plant is comparatively easy to grow, does not need much irrigation, less prone to diseases and that the price of natural rubber has been steadily going up for the past many years. The altitude of the town is suitable for growing rubber trees. Low price of coconut and vulnerability of coconut tree to disease coupled with high cost of cultivation have driven away people from coconut tree cultivation. It is observed that area under paddy cultivation has been steadily decreasing over the years. Most paddy fields are left uncultivated and are vulnerable to conversion for cash crops and non agricultural purposes.

10.4 LABOUR STRENGTH

As per 2011 census out of total workers of 17739, 559 (3.15%) workers are cultivators, 981 (5.53%) workers are agriculture labourers and 249 (1.40%) workers are in the category of house hold industry and 14147 (79.75%) are in other category.

	Major crops	Area in Ha.	Productivity	% of agricultural area
Plantation	Rubber	1164.9	3 MT/Ha	55.55
Wet agriculture	Paddy	67.7	3 MT/Ha	3.24
Dry agriculture	Coconut	500	4100 Nut/Ha	23.85
	Pineapple	102	16 MT/Ha	4.86
	Tuber Crops	75	40 MT/Ha	3.58
	Banana	80	15 MT/Ha	3.82
	Pepper	45	250 Kg/Ha	2.15
	Arecanut	33	800 Kg/Ha	1.57
	Vegetable	29	5 MT	1.38

Table No.10.2: Details of major crops

Thus the cultivators and agricultural labourers together constitute 8.68%. But in the census the plantation labourers, which is a predominant group in the town are included in the other category of workers and it is difficult to assess exact percentage of this category. As per the socio – economic survey 2010 the percentage of agriculture labourers is 6.34, percentage of cultivators is 7.64 % and the percentage of live stock workers is 0.19 %. The total percentage of workers engaged in agriculture and allied sector is 14.17 %. As per this survey labourers engaged in agriculture and allied sector are having a considerable share of the total workers of the town. In 2001 the percentage of

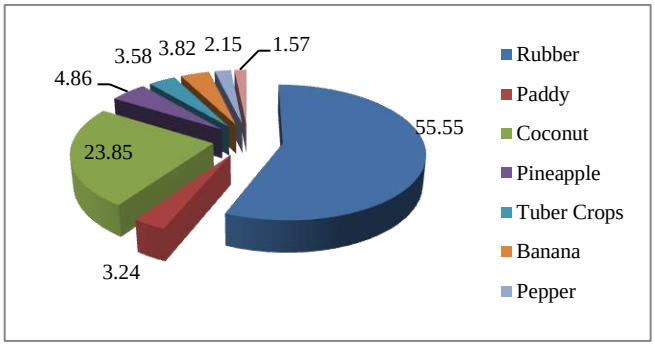


Fig. No.10.2: Share of different crops

cultivators, agricultural labourers were 4.07% and 3.44% respectively. Even though there is reduction in number of workers engaged in agriculture and allied sector still it is the major sector of the town.

10.5 IRRIGATION FACILITIES

The town does not benefit from any irrigation project. Even though two canals viz. left bank canal and right bank canal of Muvattupuzha Valley Irrigation Project pass through the municipal area they are not supposed to provide irrigation to some parts of the municiapl area. Construction of dam at Malankara across Thodupuzha river as envisaged in the project that started in 1974 has been completed. Also two canals have also been constructed.

As said earlier the major crop is rubber which does not require irrigation. Water table of most of the municipal area in the plains is fairly high and farmers depend on wells and ponds for irrigating the crops like vegetables, coconut, banana etc. But the elevated portion do have shortage during summer. Thodupuzha river and other natural streams like Kolani stream, Kanjiramattam stream, Cheruthottinkara stream, Vengalloor stream and Dhanwandhari stream keep the water table high near their banks.

10.6 MARKETING FACILITIES

The municipal market near Gandhi square trades agriculture produces of the area of the town like banana, yam, ginger etc. Pineapple which has got serious attention of farmers for about 20 years has a steady trading route to places like Bombay etc. Rubber is also having dependable dealers.

10.7 INFERENCE

Thodupuzha municipal area having 60 % land under agriculture use. Rubber is the back bone of the agricultural economy of the town which at present takes up 56 % of total agricultural area of the town. Further its area is ever increasing even converting land of food crops and paddy fields. The town does not benefit from any irrigation scheme and farmers depend on Thodupuzha river, other smaller streams, ponds, wells etc. for watering their crops. Most of the paddy fields remain uncultivated and are under the threat of convertion for cash crops and non agricultural pursuits. The number of cultivators and agricultural labours are seen decreasing and majority of workers are entering into other jobs making agricultual production uneconomical. Some problems faced in this sector are increased production cost, non availability of agricultural labours, absence of efficient mechanisation for paddy cultivation, lack of marketing facilities etc. The income genetated is not commensurate with the production. The production diversification system and value addition process of the produce may be resorted to tackle this problem. Home stead agricultural activities can be promoted in that area. Department related to agriculture like Krishibhavan Thodupuzha may be

considered as the potential available in this sector and there is ample scope for promotiing urban agricultural acivities such as production of vegetables for own use, export oriented forticulture etc. and also scope for agro based industries based on rubber, coconut, jackfriut, pineapple, rubber wood etc.

CHAPTER - 11
ANIMAL HUSBANDRY AND FISHERIES

11.1 INTRODUCTION

Animal husbandry and dairy development sector is of vital importance in generating additional employment opportunities and supplementing income of small and marginal farmers. Mostly peasants and agricultural labourers are engaged in cattle rearing and allied activities. It is estimated that about 10% of gross domestic product is contributed by this sector. Milk, egg and meat are the principle primary product in animal husbandry of Kerala. Generally the animal husbandry and dairy development is a rural oriented activity. In the case of Thodupuzha, 60% of total land is coming under agriculture use. 24 out of 35 wards of the municipality have semi rural character and 7 wards have semi urban character. The socio-economic survey (2010) reveals that in 27.4% of houses, at least there is one domestic animal (except dog) and 1.43% of workers of the town are live stock workers. Hence this is one sector which should be given the attention it deserves.

11.2 LIVE STOCK PATTERN

The main species of live stocks found in Thodupuzha are Bovines (Cattle and buffaloes) and Ovine (sheep). The Table No 11.1 and Figure No11.1 shows the live stock pattern of Thodupuzha (2010). The Bovines (Cattle and buffaloes) constitute 36% of total live stocks population of 1137, in which number of buffaloes are only 87. The cattle population is distributed in all wards of the town, but buffaloes are available in ward 18 only. The total number of Ovines (Goats) in the town is 1973, which constitute 34% of total live stocks. As in the case of cattle, the Goats population is distributed in all wards of the town.

Live Stocks	Numbers
Cattles	2011
Buffalos	87
Rabbits	493
Goats	1973
Pigs	194
Dogs	1110

Table No.11.1: Live stock pattern

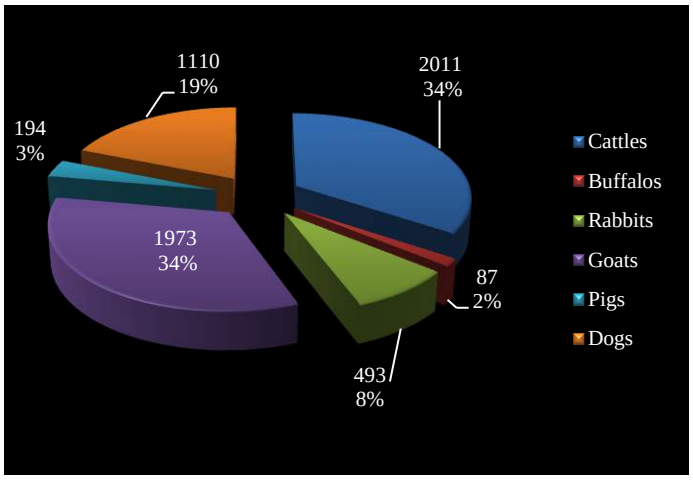


Fig. No.11.1: Live stock pattern

11.3 POULTRY

The total poultry population of the town is 6284. The category wise number of poultry population is depicted in the Table No 11.2 and its percentage is also shown in Figure No 11.2.

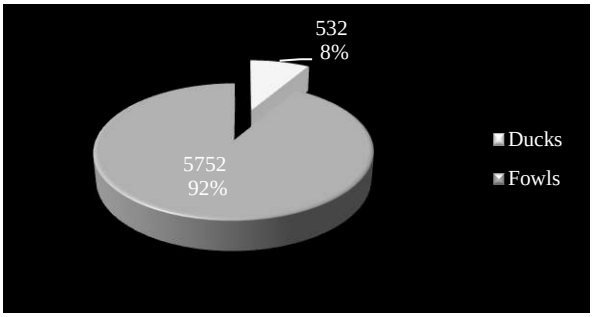


Fig. No.11.2: Poultry population and its percentage

Live Stocks	Numbers
Ducks	532
Fowls	5752

Table No.11.2: Poultry population

11.3.1 Production

The total production is shown in Table No 11.3.

Item	Production
Milk	2230150 litres/month
Meat	31800 Kg/month
Egg	1350000 Nos./month

Table No.11.3: Production details

11.3.2 Institutions

District Veterinary Centre, Deputy Director Office of Dairy Development Department, Milk Quality Control Unit and Regional Artificial Insemination Centre are functioning in the town.

11.4 FISHERIES SECTOR

Fisheries sector in Idukki district consist of inland only. Thodupuzha municipal area is low land of the Idukki district. Hence, this analysis evaluating water resources, fishery resources and human resources related with fresh water operations. In mid land sector includes Thodupuzha region. Town has paddy fields availability of fishing and aqua cultural activities yet to be fully utilized. The important in the town is Thodupuzha river. In this sector only below, 10 people are engaged fishing activities.

11.5 INFERENCE

Having a considerable extent of land under agriculture use, the municipal area has really high potential in animal husbandry. Strengthening of the existing livestock in quantity and quality is the need of the municipal area. The supporting infrastructure facilities including health care and marketing network have to be strengthened. Ensuring steady supply of quality inputs at reasonable rates and development of pricing system based on actual expense is highly essential for the subsistence of the sector. Advance surveillance programmes, better insurance coverage schemes,

modern plants for manufacturing and marketing and milk and meat products etc. can be provided to ensure more output.

In general fishing sector is one of the key sources of good income for the society in coastal area. Being the only one urban settlement of the hill district the town has only limited potential in the fisheries sector. However the limited inland water resources in the form of river, pond, dam etc... with in the town and region can effectively utilised by providing proper training to active fisherman in this area is very much essential. The inland fisheries sector in our district have enormous potential in dam stocking and its landings with due consideration to this resource and fisherman folk welfare.

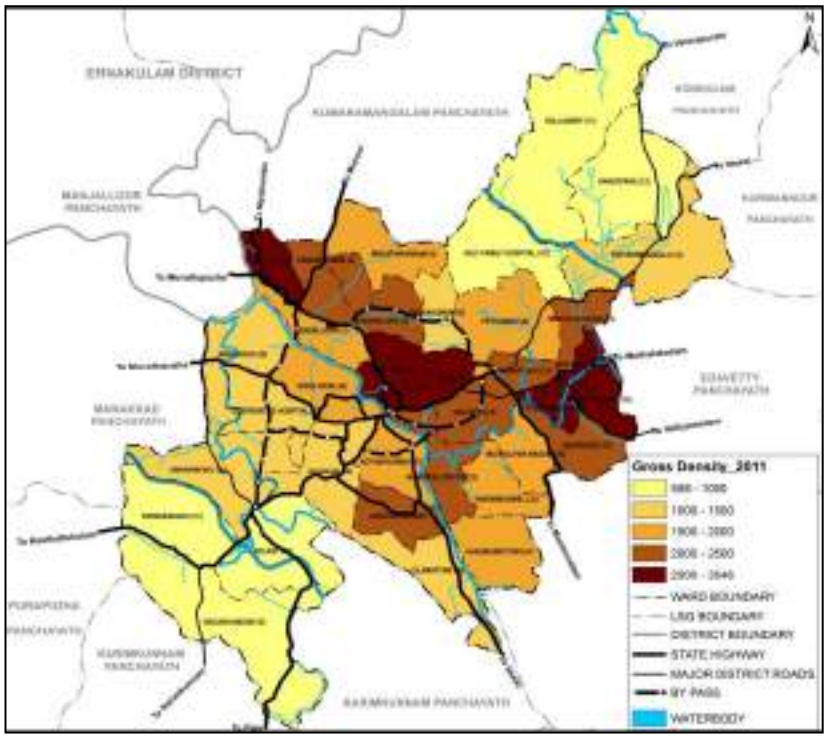
CHAPTER - 12
SHELTER

12.1 INTRODUCTION

Housing is next to food and clothing in importance as a basic need of every human being. Normally the quality of housing reflects the quality of living. Going by the trend of population growth Thodupuzha has experienced during the last two decades the population is expected to grow considerably in the coming decade also. With this in back ground one can reasonably expect the housing need also to grow largely.

12.2 RESIDENTIAL AREAS

As seen in most part of Kerala, Thodupuzha also is having scatter ed residential pattern. The population density and concentration of residential areas have been discussed earlier. It can be seen that residential areas are more concentrated in the central part of the town around the commercial areas and its density thins out towards the peripheral area. Gross population density shown in Map No 12.1.



Map No.12.1: Gross population density (ward wise)

12.3 HOUSING STOCK

The number of households and houses of the town since 1981 are given in Table No 12.1. The housing shortage is very obvious in the analysis warranting measures for making up deficiency.

Sl No	Year	Population	No. of houses	No. of households	No. of houses per 1000 HH
1	1981	35743	6073	6268	969
2	1991	40656	7953	8097	982
3	2001	46246	13376	13648	755

Table No.12.1: Number of households and houses

12.4 RESIDENTIAL PLOTS

Details regarding the size of plots and ownership of plots have been collected in the socio economic survey 2010. The average size of residential plots of the town is 15.9 cents. It varies from 4.19 to 32.5 cents. The ward wise average plot size of Thodupuzha town is shown in Annexure 12.1. The share of plots under different range of plot area in the town has been shown in Table No 12.2. It is observed that majority of plots fall within 4 to 25 cents range.

Range of plot area	< = 3 cents	4 – 5	6 - 10	11 - 25	26 - 50	51 - 70	>70
Average % for LSGI	11.85	33.54	19.58	16.24	7.64	2.63	6.41

Table No.12.2: Share of different ranges of plot area

In the socio-economic survey it is revealed that majority of households in the town, ie. 97% have their own land, 2% of household have lease land and the remaining 1% have other type of land ownership. It is shown in Figure No 12.1.

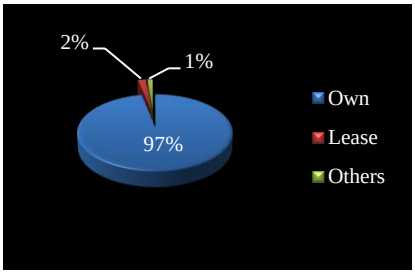


Fig. No.12.1: Percentage of land ownership

12.5 SIZE AND STRUCTURAL CONDITION OF HOUSES

As per the socio-economic survey conducted by Town and Country Planning Department in 2010, the average plinth area of the building is 71.77 sq.m. and average floor area is 70.81 sq.m. The percentage of houses in different range of plinth area is shown in Figure No 12.2. More houses (33.89%) have plinth area in the range of 20-50 sq.m followed by houses (21.6 %) in the range of 50-75 sq.m plinth area. It indicates that the houses in Thodupuzha are medium size.

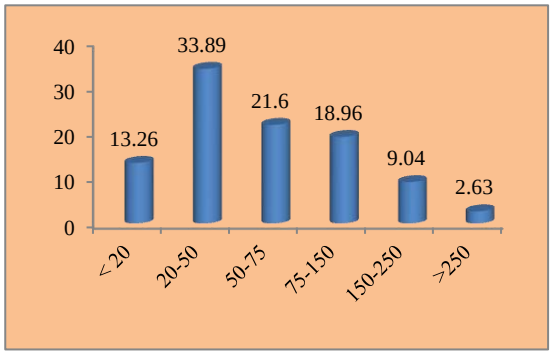


Fig. No.12.2: % of houses in different range of plinth area

The structural condition of houses shows that 68% f houses are pucca building, 31% of buildings are moderate buildings, 1% of buildings are kutcha buildings and 0.61% of houses are huts. It is represented in Figure No 12.3. Distribution of houses with different types of floor material, different types of walls and different types of roof are as shown Figures No 12.4, 12.5 and 12.6 respectively. It indicates the better structural condition of houses in

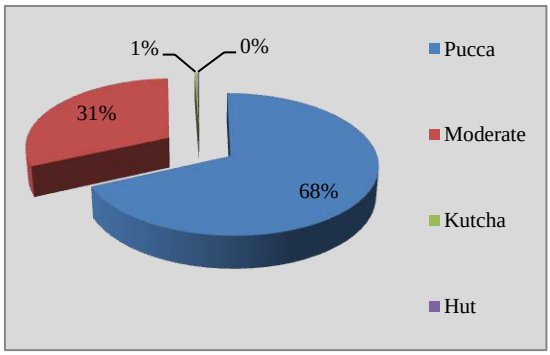


Fig. No.12.3: Structural condition of houses

the town.

From the Figure No 12.4 it can be found that 52% of houses are with ordinary tiles and 35% of houses are with mosaic and marble tiles and only 13% of houses are with other flooring materials.

From the Figure No 12.5, it can be observed 81 % of houses are with good quality wall materials ie. like brick plastered and 17% of houses with brick wall and only remaining percentage is with other inferior type wall materials like plastic, grass, coconut leaves, earth blocks etc.

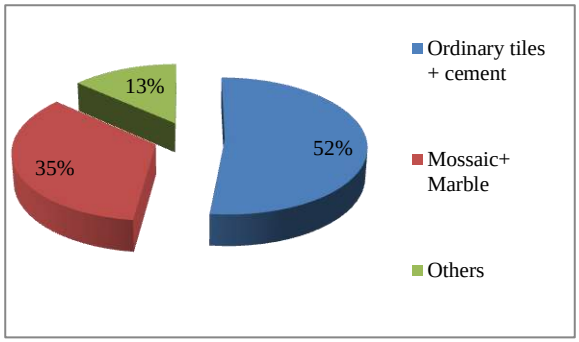


Fig. No.12.4: Materials used for floor

From the Figure No 12.6, it can be observed that 61.02 % of houses are with concrete roof, 37.75% of houses are with moderate quality roofing materials like tin sheet, asbestos sheet and tiled roof. Only 0.18% of houses are with plastic and perishable materials like grass, coconut leaves etc.

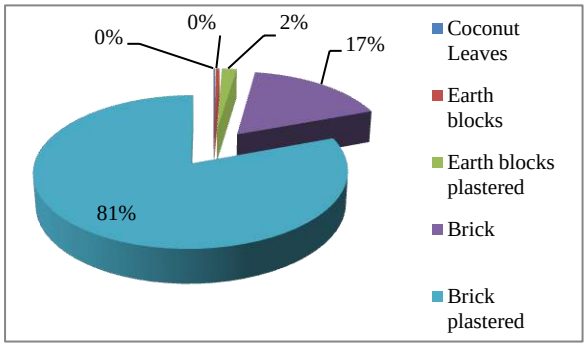


Fig. No.12.5: Materials used for wall

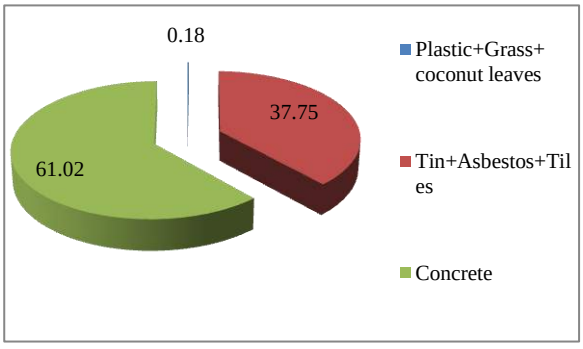


Fig. No.12.6: Materials used for roof

12.6 SANITARY AND SOLID WASTE DISPOSAL SYSTEM

As per the socio-economic survey 2010, 98 % of houses in Thodupuzha municipal area has some sort of sanitary system. No public sewerage system is there in the town. Septic tank is the major form of sanitary waste disposal system and it is followed by pit latrine. Percentage wise usage of different sanitary waste disposal systems of the town is shown in Figure No 12.7. The survey also reveals that 96% of wastes from the houses are disposed in their own compound. Streets, garbage bin etc. are the other places of disposal. The percentage of disposal at different places is shown in Figure No 12.8.

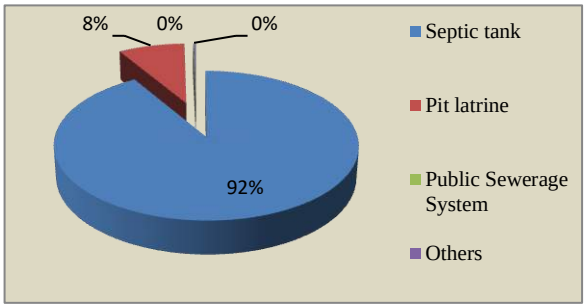


Fig. No.12.7: Method of sanitary waste disposal

Better sanitation system is available for the houses in the town and nearly 92% of houses have septic tanks. But the system for collection of wastes from the houses is very poor. A system for collection of wastes from the houses has to be evolved especially in high density wards.

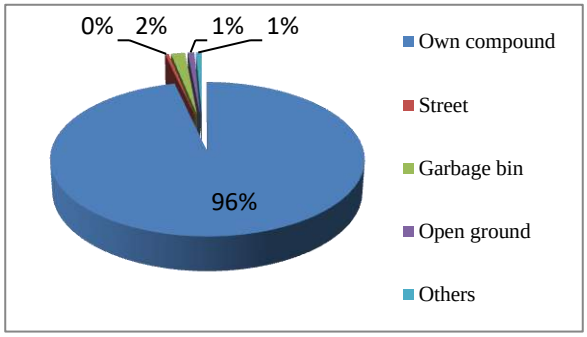


Fig. No.12.8: Method of solid waste disposal

12.7 ELECTRIFICATION OF HOUSES

As per the socio-economic survey (2010) conducted by Town and Country Planning Department, 99.91 % of houses of the town are electrified and only 0.09% of un-electrified houses in the town.

12.8 AVAILABILITY OF SERVICES

The socio-economic survey data is also analyzed by comparing the distance to various facilities with certain standard. The average distance to various services and comparison with adopted standards is shown in Annexure 12.2. The percentage of households having opinion their distance to the facilities are exceeding the adopted standard is given in the Table No 12.3.

Sl No	*Facilities and standard*	*% of people with the opinion that distance to facilities are higher than standard*
1	Distance to motorable road greater than 0.5 km	18.8
2	Distance to bus stop greater than 0.5 km	52.15
3	Distance to primary school greater than 0.5 km	60.84
4	Distance to LP school greater than 0.5 km	64
5	Distance to UP school greater than 1 km	24.58
6	Distance to HS school greater than 3 km	4.74
7	Distance to PO greater than 3 km	1.4
8	Distance to health greater than 5 km	0.26
9	Distance to hospital greater than 5 km	0.35
10	Distance to ration shop greater than 5 km	0.18
11	Distance to play ground greater than 5 km	0.79

Table No.12.3: Average distance to various services

The analysis shows that when compared with the adopted standards, the facilities like motorable roads, high school, post office, helth facilities, ration shops, play ground are available at a close distance to the residential areas. But more distance has to be covered for the facilities like bus stops and schools other than primary schools.

12.9 MIGRATION DETAILS

As per socio economic survey, it is found that in the last five years 15 families have migrated due to the reason of job, education and some other reasons.

12.10 COLONIES

In Thodupuzha municipal area, there are 11 colonies the details of which are shown in Table No 12.4. The total number of population is 3028 in 2011 as per the detailed project report of town. The types of the houses are moderate. Altogether the colonies have 26.71 hectares of land .The source of water mostly is public tap. Method of sanitary disposal is generally through septic tank and leach pit; no other disposal methods are there. Basic infrastructure facilities like streetlights and motorable roads are available. No ongoing and committed projects to colony people.

Name of the colonies	Wards	Area (acre)	No of houses	Number of SC/S THHs
Kolani	26	4.17	79	10
Anjaprapara	29	10	200	32
Uravappara	23	15.2	76	15
Karuppara	11	4.5	45	15
Randupalam	13	3	26	Nill
Kavabakunnu	7	1.5	18	Nill
Vengalloor	19	4.2	33	8
Puthussery	11	2.2	19	Nill
Benglamkunnu	6	1.75	25	Nill
Edukettipara	12	10.02	69	5
Parakadavu	28	9.45	83	51

Table No.12.4: Colony details

12.11 INFERENCE

The residential area of the town is more concentrated in the central area around the commercial centres and the residential density gradually thins out towards the outer periphery. 97% of households have their own plots. There has been shortage of houses in the recent past and measures have to be taken to fill the gap. Houses in Thodupuzha are medium sized and septic tank is the major form of sanitary waste disposal. Solid waste are not normally collected from residential areas, the need for which is not apparent since the dwellers resort to disposing the waste in their own land without causing serious environmental implication. Most of civic services are available at reasonable distances from residential areas. Some 11 colonies are existing in the municipal area which has comparatively descent living conditions. However, making improvement of some of the facilities of the colonies is also seen required.

CHAPTER - 13
WATER SUPPLY

13.1 INTRODUCTION

It is a fast developing city due to the presence of major offices and many educational institutions and is the gateway to many tourist destinations. The municipality has a population of 52045 as per 2011 census. In addition to this there may be presence of foreign tourists and migrant labourers. In present scenario, the source of water for the entire town is the Thodupuzha river. The highly civilised life style and living standards of people have increased the demand of water. Due to the non availability of alternate source s like wells, ponds etc. and the majority of people of the town invariably depends on the municipal water supply scheme. The existing water supply scheme to Thodupuzha has designed for 2013. The scheme was commissioned on 1992 with 12 MLD capacity. The intake well is situated at Mooppilkadavu and treatment plant at a Pattanikunnu, 1.30 km from intake point.

The diameter of existing well is 12 m and existing pump set are very old and are not satisfying to meet the present demand. Also existing treatment plant is of conventional type and water is distributed directly from the sump at plant site by gravity. In the farthest ends of distribution network, the water will not reach with sufficient pressure and hence arrangements had made to provide water in alternate days.

Due to the undulating topography of the area it is not possible to feed water in some areas. Acute scarcity of water experience in these areas like Konnakamala, Manjumavu, Uravapara, Keerikode, Kanjirampara. In addition to this the carrying capacity of the main pipe which is passing through the heart of the town is now reduced due to incrustation. Also the old pipes in the low lying areas break frequently and cause much difficulty to the public. It is very difficult to rectify and correct the actual problem. The AC and GI pipes in the network are beyond the scope of repair and are to be replaced. All these factors necessitate the augmentation of the water supply system to meet the present demand of the town.

It is proposed to enhance the drinking water supply rate to 200 lpcd to the inhabitants. To meet industrial, commercial, domestic and fire fighting demand the new water supply project for the year 2045 comes to nearly 25 mld.

It is proposed to provide ground level service reservoirs at Keerikodu, Erattiani, Edavetty, Kanjirampara, Manjumavu, Uravapara and service reservoirs cum sump with pump house at

Konnakamala, Maragolipara near Jaihind library Muthalakodam. Also three boosting stations at Muthalakodam, Konnakamala and Marangolipara are proposed.

To convey water it is proposed to provide a new gravity mains of 300 mm diameter from the existing sum at treatment plant to the proposed sum near Muthalakodam and Keerikodu. The gravity mains are designed for a velocity of 0.6 m/sec and pumping mains are designed for 1m/sec. The entire area is divided into 10 zones out of which, four zones are proposed to feed from proposed plant. Also the existing distribution pipes are proposed to be replaced.

Considering the tourist potential of Idukki, it is high necessity to have a well planned water supply scheme. Town and surrounding areas are fast developing due to many institutions and establishments. Also migration of inhabitants is unpredictable. Hence design as per ultimate demand is desirable.

13.2 DRINKING WATER – EXISTING SCENARIO

The source of the entire water supply system of the Thodupuzha municipal area depends on Thodupuzha river. The present water supply system at Thodupuzha municipal area is developed by municipality and KWA under various schemes in many stages. The frequency of water supply from municipality to these 4, 8, 9, 10, 11, 22, 23, 29, 30 and 32 wards are once in two days. Hence all other wards are having water supply daily. There is only one tank with capacity of 20 lakhs litres and it is supplied 8 MLD of water per day through pumping station to 3 tanks with capacity of 1 lakh, 50000 litres and 10000 litres. The various sources of water in the municipal area with percentage is shown in the table below. There is three number of treatment plant with the capacity of 1 lakh litres, 50000 litres and 10000 litres and the working condition of the plants are satisfactory. From the socio economic survey the distribution of water for the domestic purpose are 12794 numbers in all 32 wards, non domestic purpose 1011 numbers and industrial 3 nos. For this purpose the water is treated properly and supplying. Most of the houses are having their source of water within compound and distance of less than 0.5 km. Average distance to water sources is shown in the Table No 13.1

Distance to water sources	>0.5 km	> 1 km	Duration of water supply less than 1 hrs	Duration of water supply once in two days
Average % for the LSGI	3.51	0.18	24.5	11.6

Table No.13.1: Average distance to water sources

The 41.80 % of houses are getting there water through street taps (536), public bore well and house connections. There is no supply of water from the municipality/KWA in the wards of 16 and

19. 58.20 % of houses are found to be having their own bore well in their site itself. The conception of water under domestic purpose is around 76% and for industrial, institutional and fire fighting is 24%. The percentage of water supply in the town is shown in the Table No 13.2 below.

Source of water	Percentage (%)
Well	55.6
Municipality/KWA	39.8
Community well	2.53
Public bore well	1.27
River	0.04
Owned pond	0.06
Community pond	0.15
Others	0.55

Table No.13.2: Percentage of water supply

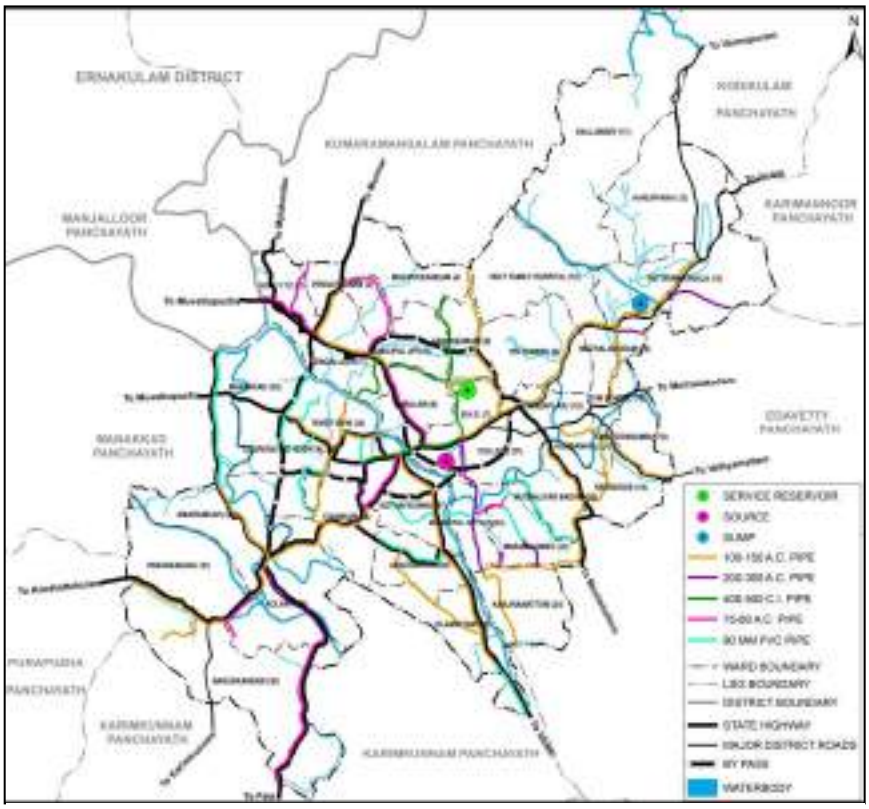
13.3 WATER SCARCITY

The socio economy survey shows that there is no scarcity of water for 76 % of houses and 14 % of house having scarcity of water in 2-3 months period and 4 % of houses having more than 6 months of water scarcity. The percentage of water scarcity of houses in each category is shown in the Table No 13.3 below. Water network system in town shown in Map No 13.1

No scarcity	1-2 Months	2-3 Months	3-6 Months	More than 6 months
76	2.3	14	3.7	4

Table No.13.3: Percentage of water supply of houses

The total length of the distribution network in the town is 100678 meters. The diameter of the water supply pipes are ranging from 500 mm to 25 mm. The charges per household connection is rupees 560/-. Present water supply scheme in town is Urban Water Supply Scheme (UWSS). Water distribution is shown in Map No 13.2.

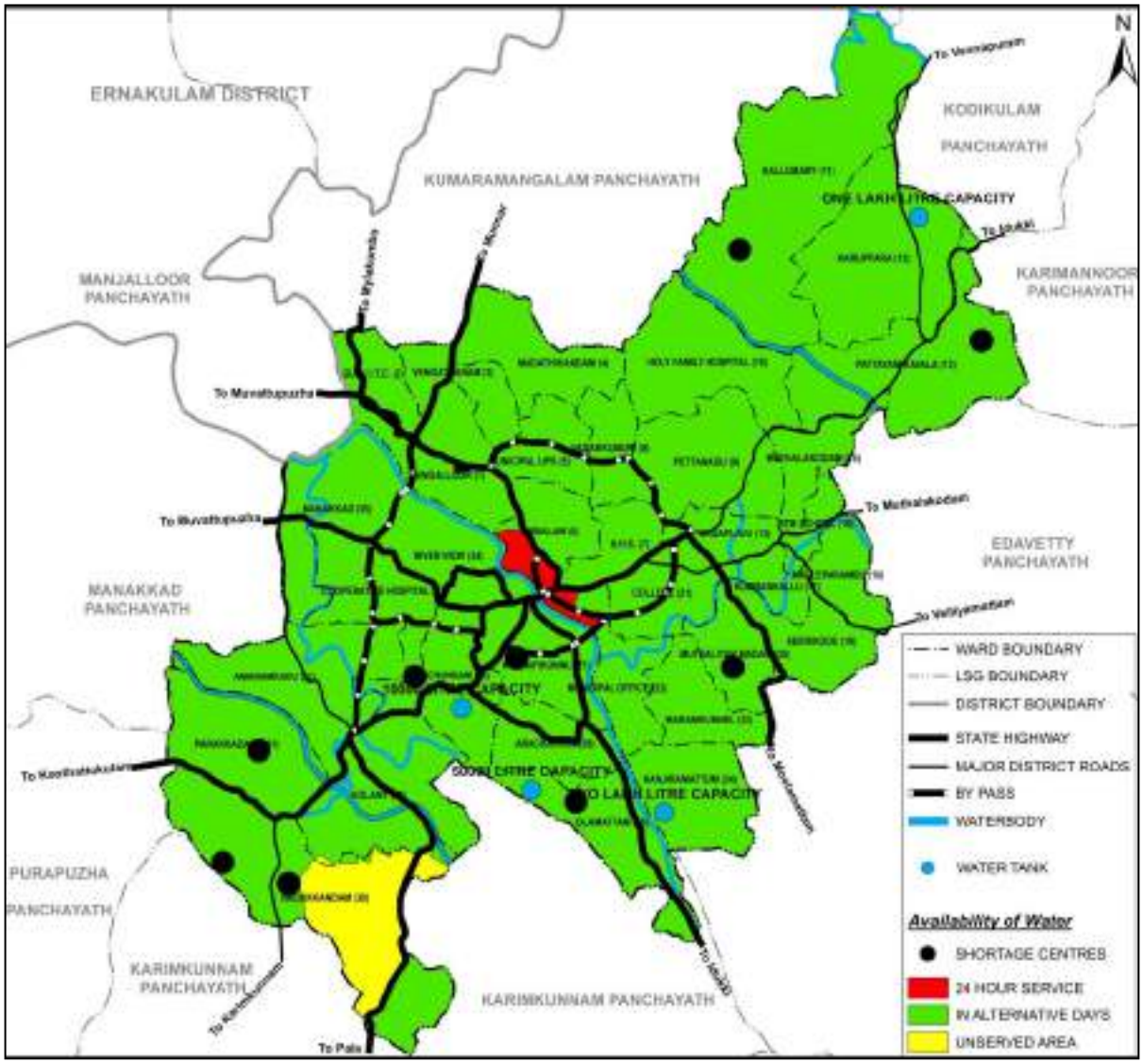


Map No.13.1: Water supply - Network system

13.4 INFERENCE

From the above, the water supply sector in the Thodupuzha town is in unsatisfactory level. We need to improve the water

supply system in effective manner and the water should reach every ward in the town. There is a need to locate a place for construction of over head tanks to supply the water. The treatment plants with latest technologies are also needed.



Map No.13.2: Water supply - Distribution system

CHAPTER - 14
TRAFFIC AND TRANSPORTATION

14.1 INTRODUCTION

Availability of infrastructure facilities that include road network, drainage, water supply, power supply etc. is the most decisive factor in the growth of any town or a country for that matter along with economics. Development in any sector cannot be envisaged without a corresponding improvement in the infrastructure facilities. On the contrary, without the support of a complimentary development of infrastructure, all other sectors would face deterioration. For a town, availability of good transportation is clearly the top priority in this regard. It is always seen that following the installation of a good road network other development activities in all spheres of lives of the people would naturally come to the area. In this chapter, the existing transportation infrastructure and facilities of Thodupuzha town are analysed.

This study on traffic and transportation was entrusted with the National Transportation Planning and Research Centre (NTPRC) and the study was conducted in the year 2010. The source of all data included in this chapter is from the report "Traffic and Transportation Plan for 23 towns in Kerala State – Thodupuzha town", submitted by NTPRC. It is seen that NTPRC has conducted study about vehicle population, road network, speed and delay, traffic volume, parking, pedestrian facilities, origin and destination of traffic etc. as part of preparing this report.

14.2 TRANSPORTATION SYSTEM

14.2.1 General

Thodupuzha is well connected with a good road network with adjoining places. The region lacks rail transport and water transport services. The nearest airport is Cochin International Airport at a distance of 54 kilometres from Thodupuzha. The study area is served by public transport system consisting of both state owned Kerala State Road Transport Corporation (KSRTC) and private buses. The mofussil services and inter-city services are provided by both KSRTC and private bus operators. The KSRTC bus stand is located near the Gandhi square jn. and the private bus stand is located near the Continental junction in the Thodupuzha – Pala road.

14.2.2 Railways

There is no railway line passing through Thodupuzha municipal area. The nearest railway station is Aluva which is 56 Km from Thodupuzha. Ernakulum junction railway station is at 60 km

from Thodupuzha and Kottayam railway station is at a distance of 57Km. The suggested Sabari rail route to Sabarimala passes through Thodupuzha.

14.2.3 Road network

Thodupuzha has an excellent network of roads that connects it to the nearby towns and cities. The road network available in the study is more of ring and radial pattern. The main eastern highway (Muvattupuzha - Punaloor SH-08) passes through Thodupuzha and connects it to three of its neighbouring towns, Muvattupuzha, Pala and Koothattukulam.

Category of roads	State highway	Major district road	Bypass
Length (in Km)	27.91	15.75	9.85

Table No.14.1: Break up of PWD roads

Thodupuzha-Puliyanmala road (SH-33) connects Thodupuzha to Idukki district centre at Painavu as well as tourist destinations like Idukki dam and Thekkady. Alappuzha-Madurai road (SH-40) also passes through Thodupuzha town. Also there are a number of major district roads and municipal roads. There is a half ring road in the town and this has greatly reducing the traffic intensity in the Central Business District (CBD) area. The road network map of Thodupuzha municipal area is given in Map No. 14.1. The beak up of PWD roads and summary of major roads are shown in Table No 14.1 and 14.2 respectively.

Description	8 m & above	Between 6-8 m	Between 3-6 m	Less than 3 m
No. of roads	3	27	27	3
Length of roads (km)	2.25	24.15	27.43	3.03

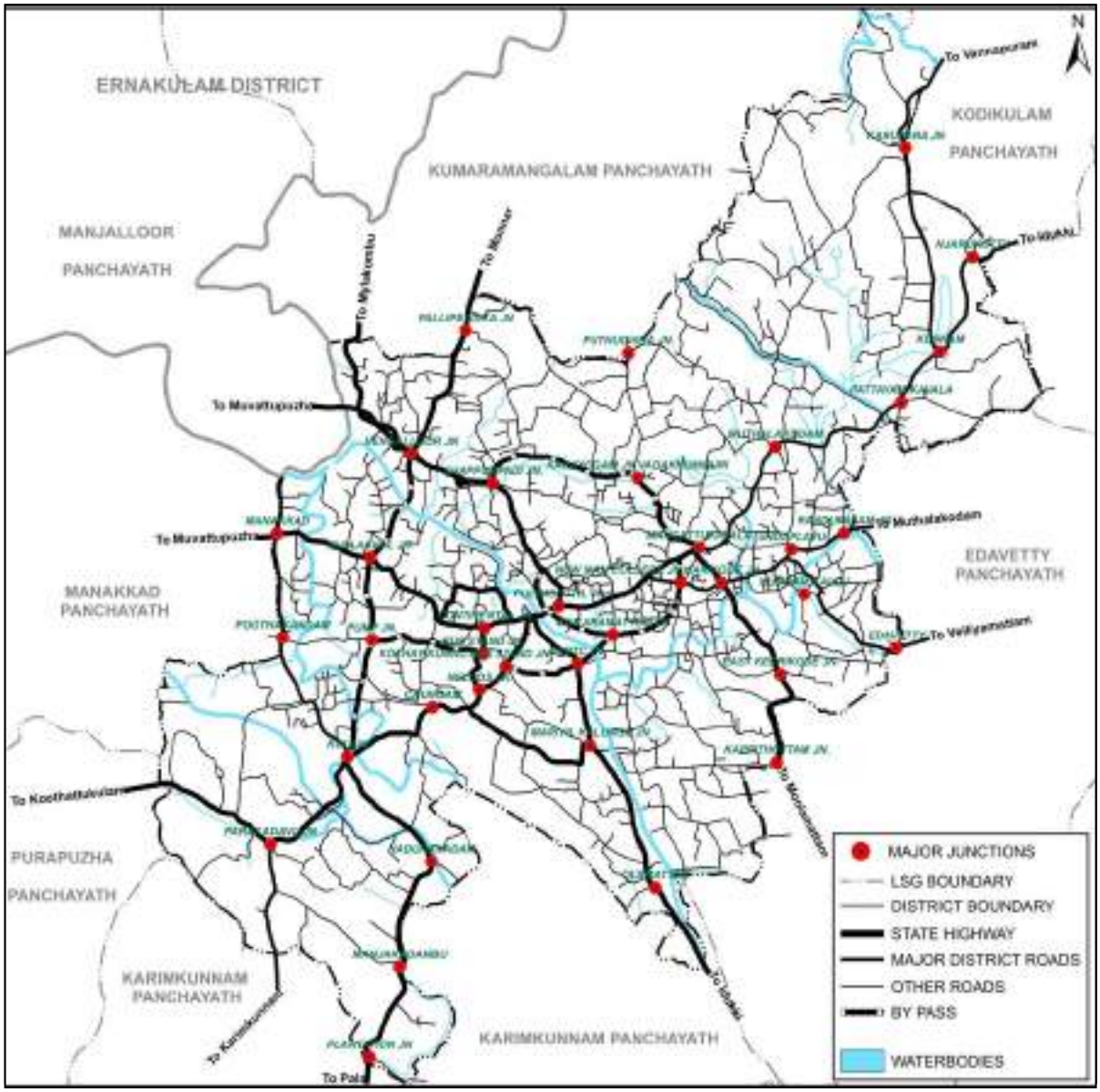
Table No.14.2: Summary of major roads

14.2.4 Vehicle population

The trend in vehicular growth has been phenomenal all over the country and the state and Thodupuzha town is no exception to this. The growth of number of motor vehicles in Idukki district during the period from 2000 to 2009 is given in Table No 14.3. It can be seen that the vehicle population in Idukki district has grown by more than 2.3 times during the last nine years.

Year	Number of vehicles		Index	
	Idukki	Kerala	Idukki	Kerala
2000-01	34226	2449961	100.0	100
2001-02	36469	2825912	106.6	115.3
2002-03	39069	3111099	114.2	127
2003-04	44546	3338267	130.2	136.3
2004-05	48159	3675930	140.7	150
2005-06	52953	4080392	154.7	166.5
2006-07	63285	4504220	184.9	183.8
2007-08	69780	4442387	203.9	181.3
2008-09	78899	4880059	230.5	199.2

Table No.14.3: Growth of vehicles comparison – Idukki and Kerala.



Map No 14.1: Existing road network

14.3 TRAFFIC CHARACTERISTICS

All primary and secondary data collected were analyzed systematically and the results of base year traffic characteristics are reported in this section. For the purpose of studying the traffic characteristics of the study area, major travel corridors are divided into 66 homogeneous sections. The details of homogeneous sections on major roads in Thodupuzha study area are given in Annexure 14.1.

14.3.1 Road network characteristics

The summary of inventory details of major roads in the study area is given in Annexure 14.2.

The salient observations of road inventory survey are discussed below:

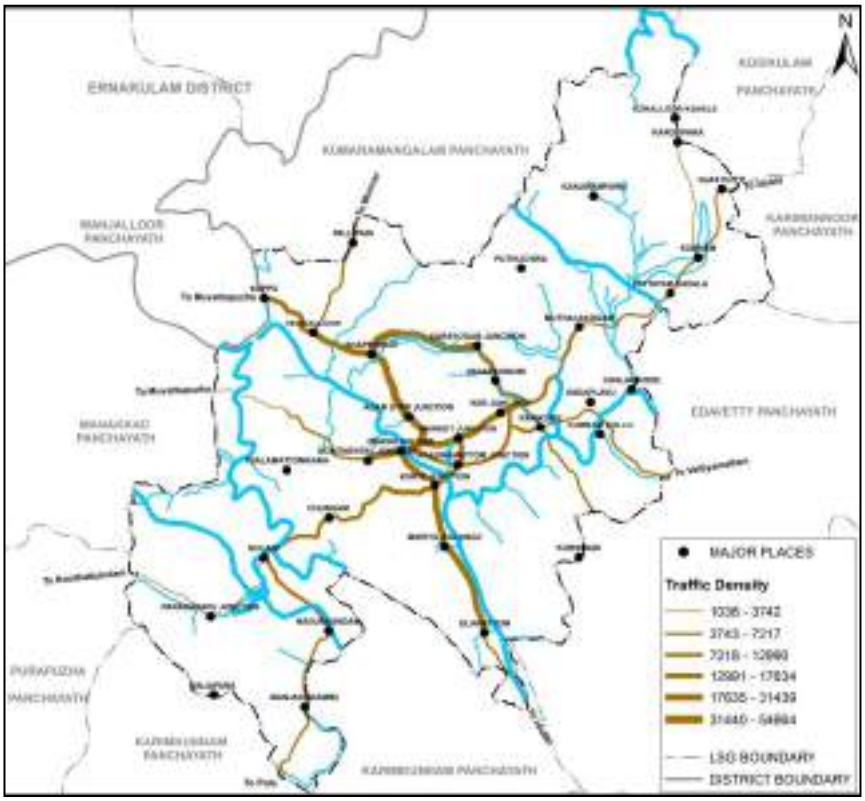
The main eastern highway (Muvattupuzha - Punaloor SH-08) passes through the CBD area of Thodupuzha and has a length of 8.6 km within the municipal area. The road is predominantly of two lane standards and the section from Thodupuzha to municipal area has been improved under the Kerala State Transport Project (KSTP). The section is subject to heavy traffic in the CBD area. Another major road in the town is Thodupuzha – Puliyanmala Road (SH-33) which connects Thodupuzha with Idukki and Kattappana. This road is with two-lane width and is provided with good bituminous surfacing.

Other important roads in the town are the Alappuzha – Madurai state highway, Ernakulum – Thekkady state highway, Thodupuzha – Kaliyar road and Oonnukallu road.

Major PWD roads in the town are the ring road comprising of Shappumpadi – Mangattukavala – Kanjiramattom – KSRTC junction – Chunkam – Kolani – Thalamattomkarayil _ Vengalloor sections (part of the road is under construction), Thodupuzha – Velliyamattom road, Kunnam – West Kodikulam road and Njarukutty - Karimannoor road.

14.3.2 Speed and delay characteristics

As part of the study, speed and delay survey was carried out on the three major road stretches within the Thodupuzha study area. The speed and delay characteristics of major roads in Thodupuzha study area is given in Annexure 14.3.



Map No.14.2: Traffic volumes in major roads

The speed and delay survey was conducted on SH 8, for a length of 5 km, the section being from Kappu to Kolani. The journey speed for the section was found to be 26.31 km/h against a running speed of 28.68 km/h. The major reason

for the delay has been the presence of bus stops and congestion due to heavy traffic. The Gandhi square – Civil station section possessed the journey speed of 10.31 km/h only.

On Thodupuzha-Moolamattom road, the delays were caused by signal at KSRTC junction and also by congestion effects. For this section (From Gandhi square to Mariyil kalungu), the journey speed and running speed were 17.19 km/h and 24.46 km/h respectively, the length of the section being 1.3 km.

The Thodupuzha – Kaliyar road did not have any specific delays in its full length and the section between market junction and Muthalakodam (2.24 km) had running and journey speed of 36.52 km/h.

14.4 LINK VOLUME AND CAPACITY UTILIZATION

14.4.1 Link volume

Data pertaining to traffic volume and its composition was collected for all major roads through link volume survey. Composition of traffic on various homogeneous sections of the roads in Thodupuzha is given in Annexure 14.4. Density of traffic on these sections are shown in Map No 14.2. On SH 8, the daily traffic volume varied from a minimum of 6500 PCU in Plantation - Kolani section to a maximum of 54000 PCU in the Civil station – Adam star section. In SH 33, the daily traffic volumes observed were 11500 PCU for the Muttom – KSRTC section and 24000 PCU for the KSRTC – Gandhi square section. For the Alapuzha – Madurai SH, the daily traffic volume was 3600 PCU only, whereas for the Oonnukallu road, the traffic was 7200 PCU.

The four lane bypass section between Mangattukavala and Shappumpadi catered to a daily traffic in the range of 14000 to 28000 PCU, whereas for the bypass section between Chungam and KSRTC junction, the traffic was in the range of 10000 to 24000 PCU. The bypass section between Chungam and Kanjiramattom catered to a traffic of 15000 to 22000 PCU. For the Thodupuzha – Kaliyar road, traffic was low in the order of 5400 and 10000 PCU. For other roads, the daily traffic ranged between 1100 to 10000 PCU.

Sl. No.	Name of Intersection	Type of Intersection
1	KSRTC Junction	Four-arm
2	Civil Station	Four-arm
3	Karikode	Four-arm
4	Mangattukavala I	Three-arm
5	Mangattukavala II	Three-arm
6	Gandhi Square	Three-arm
7	Adam Star Junction	Three-arm
8	Vengalloor	Three-arm
9	Shappumpadi	Three-arm
10	Continental Junction	Three-arm
11	Market Junction	Three-arm
12	Kolani	Three-arm

Table No.14.4: Major intersections selected for volume count survey

14.4.2 Capacity utilization

Capacity utilization of the road stretches was measured by volume-to-capacity ratio (V/C Ratio). It is

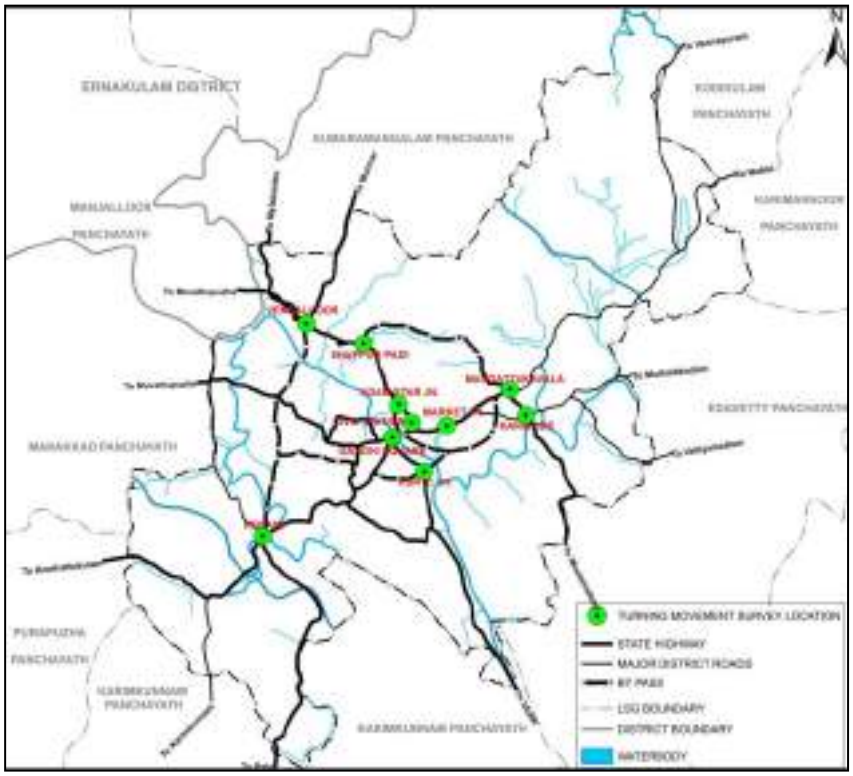
the ratio of volume of traffic playing on the road stretch to the capacity of the road stretch.

For working out the capacity of different road sections, the information compiled during the road inventory survey was compared with the specifications of IRC-106-1990 (Guidelines for capacity on urban roads). While working out the capacities due consideration was given to carriage-way width, junctions, parking, lateral clearance, shoulder, surface condition etc. The broad classification adopted for calculating the capacities is given in Annexure 14.5.

The traffic volume observed at different road stretches were compared with the capacity of road sections, to calculate the volume-capacity ratio (V/C ratio) of different road sections within the study area. The volume capacity ratio of major roads within the Thodupuzha study area is given in Annexure 14.6. It has been seen that the sections between Continental junction to Shappumpadi in SH 8 has been utilized to almost two to three times its capacity. For other roads the volume was within the capacity limits for most of their lengths.

14.4.3 Traffic volume at major intersections

Based on the reconnaissance survey, turning movement surveys at 12 major intersections in the study area were conducted to ascertain the peak hour demands. Major intersections selected for volume count survey are given in Table No 14.4 and shown in Map No. 14.3. The summarized traffic flow in PCU at these intersections is given in Table No 14.5. It could be seen that the Civil station junction witnessed the maximum peak hour traffic flow of 6,457 PCU, followed by 4,159 PCU at Gandhi square. For the other intersections, the peak hour traffic flow varied between 1,100 to 4,000 PCU. The maximum peak hour traffic flow in Civil station junction may be due to the presence of majority of govt offices. markets, town hall, some offices are in Gandhi square junction and therefore there is peak flow during the peak time.



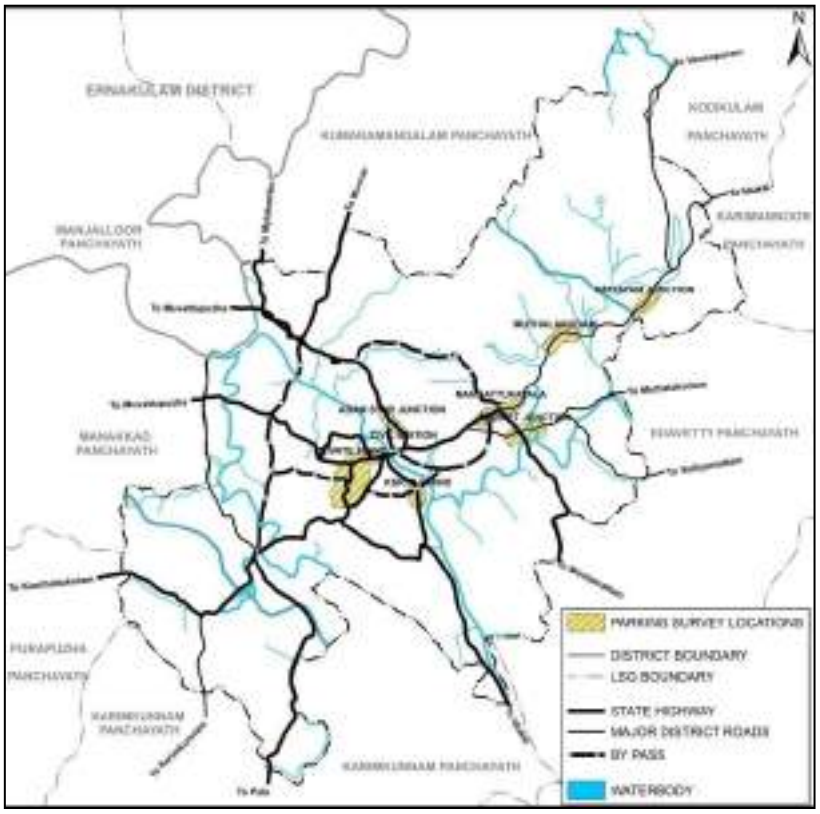
Map No.14.3: Major intersections selected for turning movement survey

Sl.No.	Name of road/ intersection	No. of arms	Peak hour	Peak hour volume (PCU)
I	Punaloor - Moovattupuzha road SH 8 (From Plantation to Kappu)			
1	Kolani	3	9:00 to 10:00	1,245
2	Continental	3	15:00 to 16:00	3,160
	Gandhi square	3	9:00 to 10:00	4,159
3	Civil station	4	16:00 to 17:00	6,457
4	Market	3	10:00 to 11:00	4,024
5	Adam star	3	9:45 to 10:45	3,111
6	Shappumpadi	3	15:45 to 16:45	3,864
7	Vengalloor	3	15:00 to 16:00	3,156
II	Thodupuzha - Moolamattom road SH 33 (From Gandhi square to Ripples)			
8	KSRTC	4	10:00 to 11:00	2,827
III	Thodupuzha - Velliyamattom road			
9	Karikode	4	10:00 to 11:00	1,575
IV	Thodupuzha - Kaliyar road			
11	Mangattukavala I	3	10:30 to 11:30	1,683
12	Mangattukavala II	3	10:30 to 11:30	1,163

Table No.14.5:Peak hour traffic flow at major intersections

14.5 PARKING CHARACTERISTICS

Parking surveys were carried out on major road sections of Thodupuzha study area to obtain the peak parking demand and parking duration of various categories of vehicles on these road sections. Major road stretches/locations selected for parking survey is given in Table No 14.6. Map No. 14.4 shows the locations selected for parking survey.



Map No.14.4: Parking survey locations

14.5.1 Parking accumulation

Table No.14.7 gives the summary of peak parking accumulation observed on major parking corridors in Thodupuzha. Of the 9 locations where parking accumulation survey was conducted, it was found that the private bus stand area had the highest parking accumulation of 157 vehicles parked at 12 noon on a normal working day. 108 of these vehicles were found to be two wheelers, followed by 31 cars and 13

passenger auto rickshaws. Other important parking areas within the study area had parking accumulation in the range of 30 to 90 vehicles.

Sl. No.	Name of locations
1	Private bus stand
2	Mangattukavala
3	Muthalakodam
4	Gandhi square to Continental jn.
5	Civil station to Temple
6	Temple to Adam star
7	Market road
8	Woodland to Gandhi square
9	Woodland to KSRTC

Table No.14.6: Parking survey locations

Sl. No	Road section	Peak Parking time	Type of Vehicles						Total	
			Mini Bus	Car	Pass Auto	Two wheeler	Truck	Mini Truck	No	ECS
1	Private Bus stand	12	1	31	13	108	0	4	157	74
2	Mangattu kavala	16	0	15	5	9	0	0	29	22
3	Muthalakodam	12.3	0	8	11	12	0	2	33	25
4	Gandhi Square To Continental Jn.	11.3	0	26	10	28	0	1	65	43
5	Civil Station To Temple	11	0	35	16	7	0	0	58	52
6	Temple To AdamStar	12.3	0	26	8	15	0	0	49	37
7	Market Road	13.3	0	38	10	31	1	7	87	68
8	Woodland To Gandhi Square	11.3	0	19	15	30	0	1	65	42
9	Woodland To KSRTC	13	0	31	13	24	0	0	68	**49**

Table No.14.7: Parking accumulation at different road sections

14.5.2 Duration of parking

Majority of the vehicles parked at most of parking corridors were found to be for short duration of less than 30 minutes. 55 to 95 per cent of the vehicles parked on selected parking corridors were found to be parked for duration less than 30 minutes. Five to 20 per cent of these vehicles were parked for a period ranging between 30 minutes and one hour. Long duration vehicles constituted only around five per cent of the total vehicles. Duration of various types of vehicles parked on selected parking corridors of Thodupuzha are given in Annexure 14.7.

14.5.3 Pedestrian volume

Pedestrian surveys were conducted at major locations where the pedestrian cross movements were found to be high. Locations selected for pedestrian survey are given in Table No 14.8 and shown in Map 14.5.

Analysis of the pedestrian cross movement at major activity/traffic generation areas revealed that a high volume of pedestrian cross movements, in the order of 1350, occurred in the private bus stand area during the one-hour time period between 3:30 PM and 4:30 PM. Civil station area witnessed a peak hour total of 940 cross movements. Peak hour pedestrian cross movements observed at major locations in Thodupuzha are given in Table No 14.9.

Sl No	Locations
1	Muthalakodam
2	Karikode
3	Kolani
4	KSRTC Bus stand
5	Private bus stand
6	Civil Station
8	Adam star
9	Gandhi Square

Table No.14.8: Locations selected for parking survey

14.6 BASE YEAR INTER TOWN TRAVEL CHARACTERISTICS

Base year inter-town travel characteristics of passenger and goods movements were obtained by conducting origin-destination survey of a sample number of motor vehicles passing through major outer cordon locations on roads in Thodupuzha. Table No 14.10 and Map No 14.6 shows the location of outer cordon survey points selected for origin – destination survey. During the OD survey, buses were not stopped due to practical difficulty and hence, OD pattern of buses were estimated from OD pattern of other vehicle types. As the origin –destination survey was conducted on a sample basis only, to get the total number of vehicles passing through the outer cordon locations; traffic volume survey was also conducted.

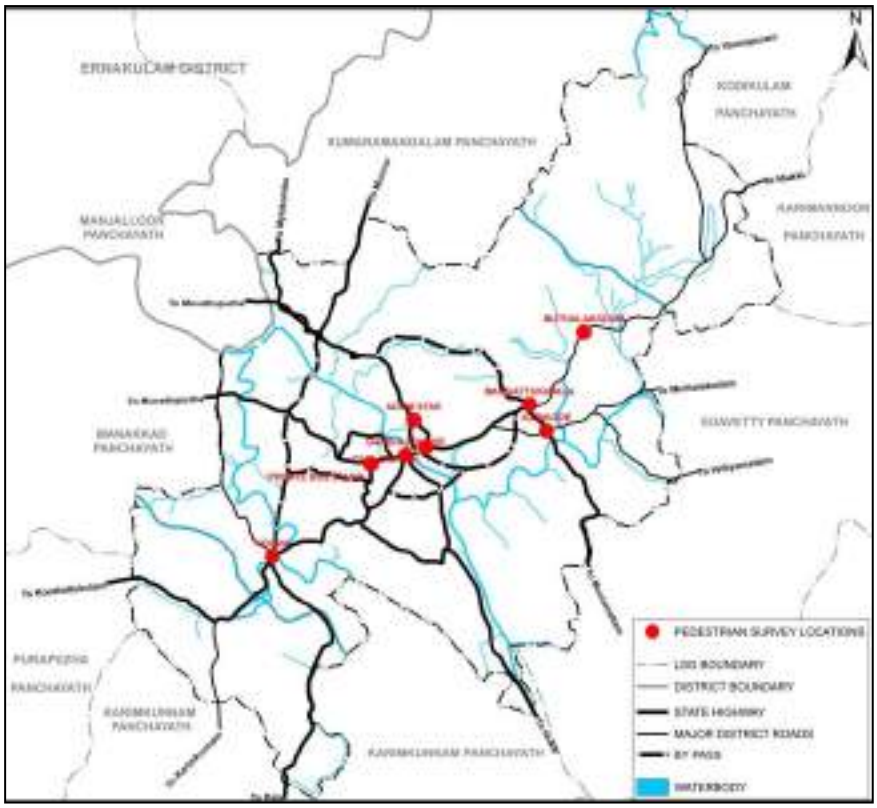
Name of location	Peak time		No. of Pedestrians		
			Up	Down	Total
Muthalakodam	10.00	11.00	232	176	408
Karikode	8.30	9.30	108	60	168
Kolani	9.00	10.00	96	88	184
KSRTC Bus stand	10.00	11.00	124	124	248
Private bus stand	15.30	16.30	1045	297	1342
Civil station jn	16.30	17.30	576	364	940
Mangattukavala	16.15	17.15	124	192	316
Adam star Jn - Temple Road	9.15	10.15	100	72	172
Adam star Jn - MVPA road	10.00	11.00	120	88	208
Gandhi Square	8.30	9.30	400	120	520

Table No.14.9: Peak hour pedestrian cross movements

14.6.1 Traffic / Passenger volume

14.6.1.1 Traffic volume at outer cordon points

Volume survey of all the vehicles entering/exiting the study region was conducted at eight outer cordon points of the study region. Classified volumes of vehicles were recorded according to their direction of travel. Distribution of vehicles passing through the outer cordon points in Thodupuzha are given in Annexure 14.8.



Map No.14.5: Pedestrian survey locations

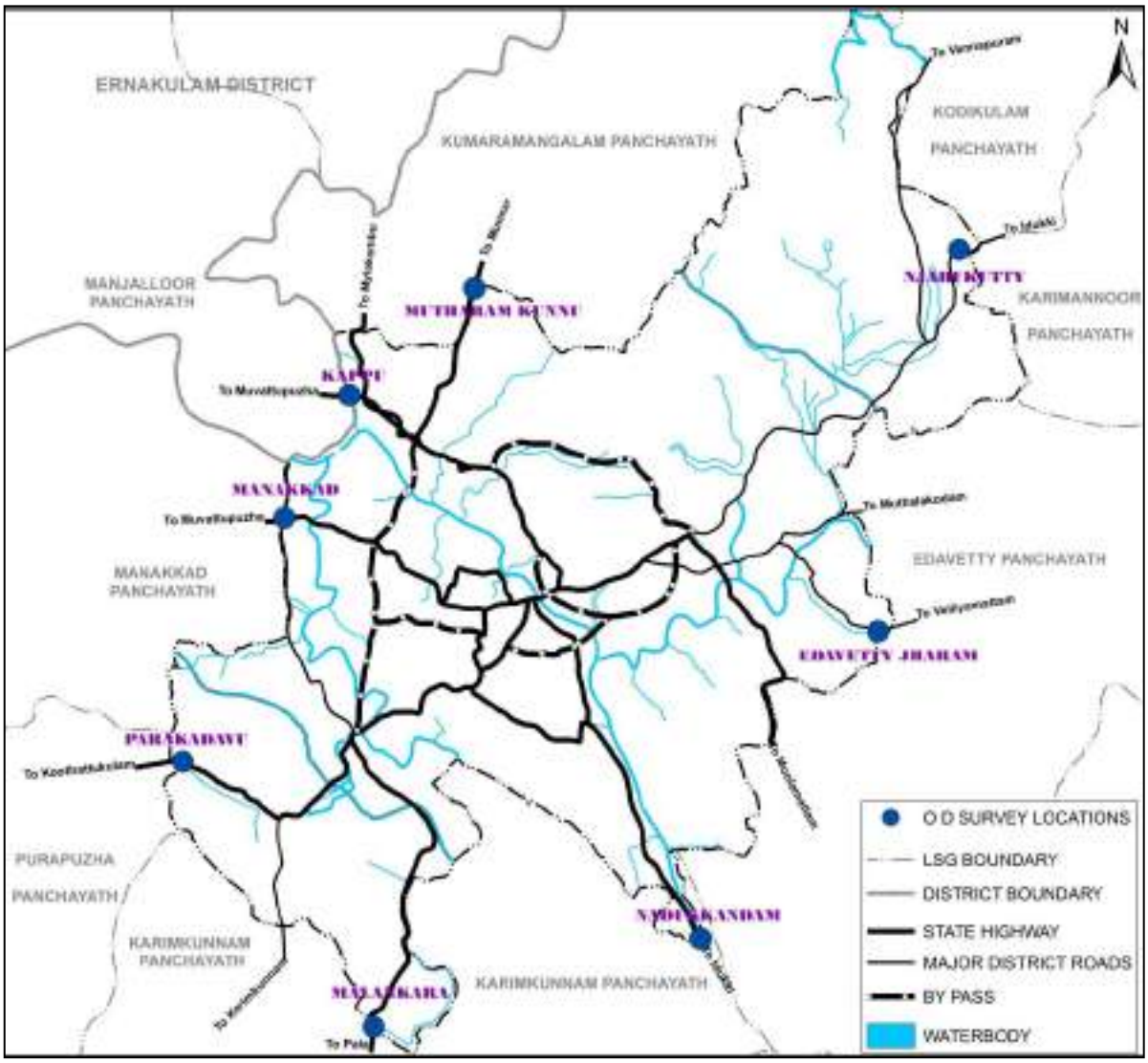
The maximum daily traffic volume of 16,500 PCU was observed in Kappu on SH-8, wherein both inbound and outbound traffic were almost the same. Two wheelers constituted the maximum followed by cars. As many as 11,500 PCU of vehicles were observed at Malankara survey location on SH 8. In other locations traffic volume ranged from 3,500 to 8,500 PCU per day.

Sl.No.	Name of location	Name of road
1	Malankara	On SH 8
2	Kappu	On SH 8
3	Nadukandam	On SH 33
4	Njarukutty	On Kaliyar road
5	Parakadavu	On SH 40
6	Edavetty	On Velliyamattom road
7	Manakkad	On SH 41
8	Mutharamkunnu	On SH 44

Table No.14.10: Origin-Destination survey locations

14.6.1.2 Sample size of vehicles/ passengers interviewed at outer cordon locations

As stated earlier, the Origin – Destination survey was done on a sample basis. The sample size varied from a minimum of 1.12% (for goods auto rickshaws at Manakkad) to a maximum of 26.23% for trucks at Njarukutty.



Map No.14.6: Origin-Destination survey locations

14.7 CHARACTERISTICS OF INTER -TOWN PASSENGER TRAFFIC

14.7.1 Modal-Split

The inter-town passenger transport in Thodupuzha is met purely by road based KSRTC buses, private buses, mini-buses, and a host of personalized vehicles like 4-wheelers, two-wheelers etc.

Sl.No.	Mode of Travel	No. of Passengers	% of Passengers
1	Bus	61,572	40.74
2	Mini-bus/ tempo	4,557	3.02
3	Car/ van/ jeep	37,117	24.56
4	Autorikshaw	14,919	9.87
5	Two wheeler	32,960	21.81
	Total	151,125	100.00

Table No.14.11: Modal spilt of inter-town daily passenger trips

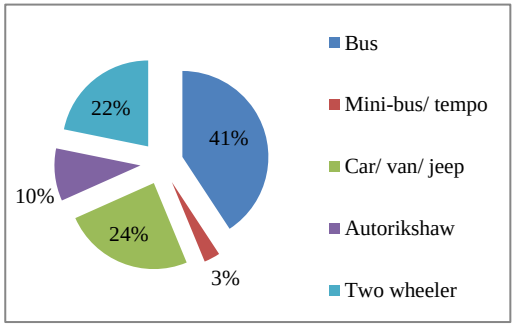


Fig. No.14.1: Modal spilt of inter-town daily passenger trips

An analysis of the O-D survey data collected from outer cordon survey locations revealed that an estimated 151,125 inter-town passenger trips were performed in the study region on a reference day consisting of 61,572 bus passenger trips (40.74%), 37,117 car trips (24.56%), 32,960 two-wheeler trips (21.81%), 14,919 auto trips (9.87%) and 4,557 mini-bus trips (3.02%). It could be inferred that public transport had a significant role in meeting the inter-town passenger demand. Table No 14.11 gives the modal split of inter-town passenger traffic in Thodupuzha. Figure No.14.1 presents the same in a pie diagram.

14.7.2 Purpose of trip

In Thodupuzha, an estimated 1.01 lakh inter-town passenger trips were performed for work or related purpose, which constituted almost 67% of the total inter-town passenger movements. This was followed by 14,051 shopping trips and 9,901 recreation trips. Table No 14.12 presents distribution of inter-town passenger trip for different purposes according to mode of travel. Figure No 14.2 illustrates the same with pie diagram.

Sl. No.	Purpose of Trip	Type of Vehicle						
		Bus	Mini-bus	Car	Auto	Two wheeler	Total	Percent
1	Work	14,492	354	7,130	1,973	11,625	35,574	23.54
2	Part of work	15,039	1,666	5,805	5,132	9,275	36,917	24.43
3	Personal business	11,732	220	10,467	2,619	3,762	28,800	19.06
4	Shopping	5,724	-	3,900	1,593	2,834	14,051	9.30
5	Recreation	3,786	291	3,254	519	1,444	9,294	6.15
6	Social	3,799	175	3,737	629	986	9,326	6.17
7	Education	4,033	849	2,244	618	2,157	9,901	6.55
8	Back home	195	-	25	92	144	456	0.30
9	Serve passenger	983	-	-	1,431	-	2,414	1.60
10	Medical	1,565	1,002	447	138	690	3,842	2.54
11	Others	224	-	108	175	43	550	0.36
Total		51,706	61,572	4,557	37,117	14,919	32,960	151,125

Table No.14.12: Distribution of inter-town daily passenger trips according to mode of travel and purpose of trip

14.8 PARKING FACILITIES

Considering the parking demand observed at many of the road stretches, parking system is proposed for Thodupuzha city. The tentative locations for provision of parking facilities are given below;

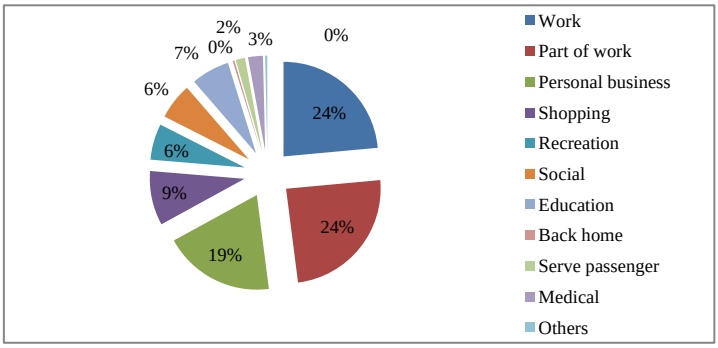


Fig. No.14.2: Distribution of inter-town daily passenger trips according to mode of travel and purpose of trip

- Pulimoottil junction

- Civil station area

- Kanjiramattam junction

- Mangattukavala junction

14.9 INFERENCE

Road is the only mode of transportation currently available in Thodupuzha. The proposed Sabari rail is understood to have its alignment passing through the town. It has a fairly satisfactory network of roads that has a pattern of ring and radial type. The newly developed bypass roads relieves the central area of the town from traffic congestion that was experienced previously. It's observed that many of the roads especially the municipal roads are having inadequate right of way and carriage width. The parking facilities available are seen insufficient. Also the pedestrian facilities are to be improved too.

CHAPTER - 15
POWER

15.1 POWER DISTRIBUTION

The distribution of electric current to the town is being done through the 66 KV substation at Mundekkallu. The distribution is further carried out through three sections viz. Thodupuzha No 1 section, Thodupuzha No 2 section and Purapuzha section. Altogether there are 170 transformers 130 km high tension lines and 630 km of lower tension lines. No area is un-electrified and power failures occur usually due to natural calamities.

15.2 CATEGORY WISE CONNECTIONS

The total numbers of connections are 21117 out of which domestic connections take up the majority part at 71% followed by commercial connections at 24%. Industrial agricultural connections are far less. As regards the consumption, 46 % of the total use goes to domestic purposes, 29 % for commercial purposes and 24 % for industrial purpose. Details of the different types of connections in the town are given in Table No 15.1 and shown in Figure No 15.1 and 15.2. As per the data obtained from KSEB 3229 street lights have been installed in the town which include LED, CFL and Sodium Vapour lamp etc.

Description	Domestic	Industrial	Commercial	Agricultural	Others	Total
Connections (Numbers)	15050	678	5089	271	29	21117
Consumptions (MKWH)	958520	500000	601697	8843	505	2069565

Table No.15.1: Category wise power connections

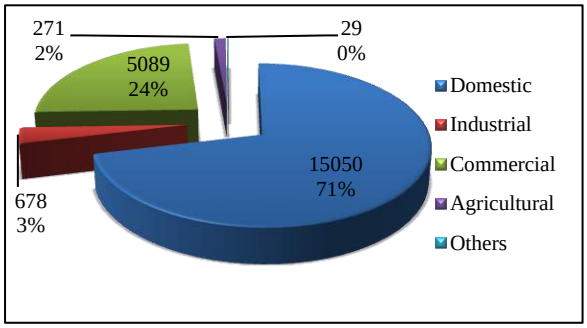


Fig. No.15.1: Category wise power connections

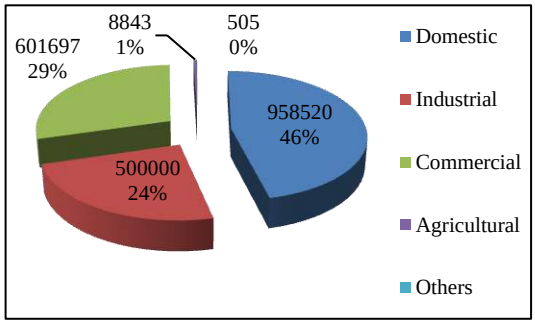


Fig. No.15.2: Category wise consumption details

As per the socio–economic survey conducted in 2010 the number of un-electrified houses are very insignificant. It's also observed in this survey that only about 0.8% of the population use non-conventional sources of energy along with conventional electric power supply.

15.3 DOMESTIC FUELS

It's observed that from the socio-economic survey about 90 % of population use LPG as fuel and 87.5 % use fire wood along with LPG. About 1 % use electricity along with LPG. No house has been identified using non-conventional energy alone.

15.4 INFERENCE

In the town most of the houses are electrified. Domestic fuel consumption stands high along the various types of power uses both in number of connections and consumption. Commercial use follows domestic use. Industrial or agricultural uses are not significant in the town. The use of non-conventional energy has not yet gained momentum and its use is seen along with conventional electrical energy only. LPG is the widely used domestic fuel. Fire wood also is used along with LPG in most of the houses.

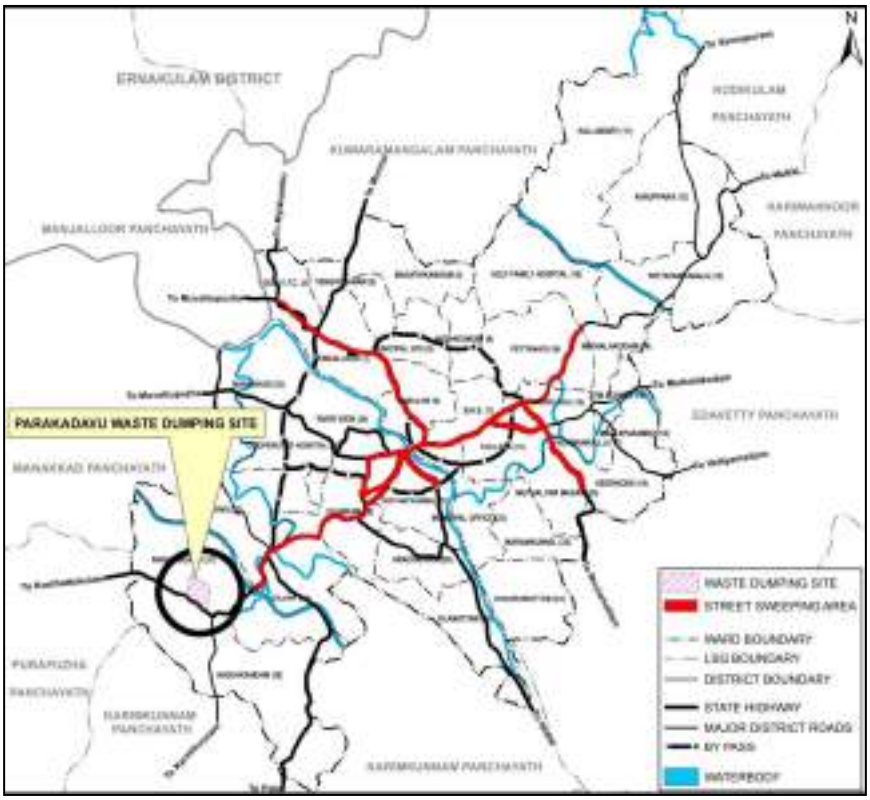
CHAPTER - 16
SOLID WASTE MANAGEMENT AND SANITATION

16.1 INTRODUCTION

Handling of solid wastes is one of the major problems faced by the urban local bodies. Increase in the volume of urban waste is principally due to increasingly affluent life style, rather than urban growth.

16.2 SOLID WASTE COLLECTION SYSTEM

The health wing of the municipality is in charge of collection and disposal of wastes, primarily the solid waste. The municipality collect waste that accumulate at public places and the waste are not fully removed every day. Only municipality do the collection and disposal. Four mini trucks are used and 34 workers are employed in hygiene related jobs of the municipality including waste collection and disposal. About 4-5 tonnes of solid waste are estimated to be generated every day in the town out of which about 75% are removed. There are 60 collection points and are located near residential areas, shops and markets.



Map No.16.1: Regular sweeping area and disposal site

Most of the major roads are regular sweeping areas including market area, private bus stand area, KSRTC bus stand area and Gandhi square area etc. In the residential areas and mild commercial activity areas cleaning is done on demand basis. The Map No 16.1 shows the regular cleaning areas.

16.3 WASTE DISPOSAL SYSTEM

The dumping yard of municipality is at Parakkadavu which was formerly a granite quarry. This site has an extent of 1.5 Acre. The waste is partly treated by turning the organic matter into manure with the help of organic solutions. This treatment process has been running for the last one year only. Construction of structures for implementing Window Composite manure making process is under way. The plastic waste cannot be treated with these processes and the plastic waste accumulated is to the tune of 500 tonnes. The municipality is trying to dispose of this accumulation safely by engaging some companies practicing in this field. Its surrounding plots have scattered residences and agriculture. The municipal council expressed the opinion that this present waste disposal plant is capable of processing the municipal waste provided, the plant is modernised incorporating latest technology in waste treatment processes.

In the socio-economic survey 2010 conducted by Town and Country Planning Department, 94.43 % of the households reported disposing the solid waste at their own compound, 0.44 % in the street, 1.67 % in garbage bins and 0.79 % in open ground. These different modes of solid waste disposal are shown in Figure No 16.1.

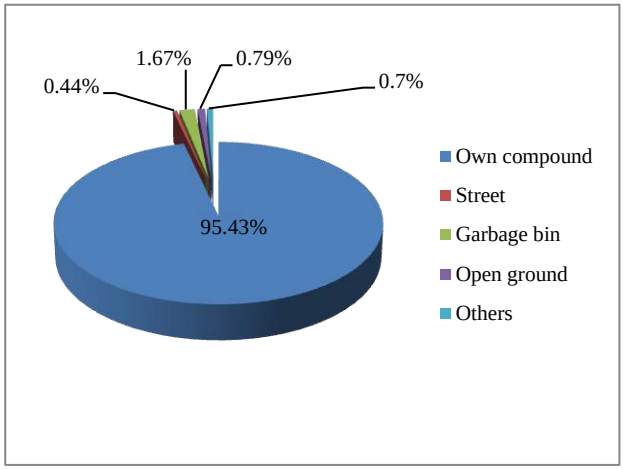


Figure No.16.1: Modes of solid waste disposal

It is seen that about 81% of the households are having less than 10 cents of land which indicate that in future the present system of disposing waste by majority of the population in their own land may shift to that in public places.

16.4 BIO-MEDICAL WASTES

The bio-medical wastes that are usually generated by hospitals are disposed off by the hospitals themselves.

16.5 SANITARY WASTES

There is no sewerage line installed by the municipality. As per the socio-economic survey 2010, 99.77 % of households have their own sanitary waste disposal system, which includes septic tank (90.61 %) and pit latrine (8.17%). In future also this scenario is not expected to have any change.

16.6 DRAINS

Drains are available along the major roads for facilitating surface runoff. They are both covered and uncovered at places. Most of the surface runoff is disposed into Thodupuzha river and

other natural drains. One serious environmental implication that these runoff would carry waste and obnoxious matters into these water bodies and prevention of this occurrence has to be explored. Thodupuzha river that flows through the middle of the town to which "Kanjiramattom Thodu" and "Kolani Thodu" join together with the network of other streams / thodu provides an excellent natural drainage network for the town. Due to this naturally blessed drainage network together with topographical slope the town was free from flooding even in monsoon. But now a days the unplanned development on the sides of these water bodies resulted decrease in the effective width of these water bodies and interruption for free flow of water. As a result of this flooding of certain areas within the town became common after heavy rain. The above facts points out the need for renovation / protection of natural drainage basins of the town together with need for drainage plan and drainage network starting from plot level to the town level.

16.7 INFERENCE

The town at present has a waste treatment plant. In this waste dumping yard only organic waste is treated to turn to manure while the plastic waste gets accumulated. Safe disposal system for non-biodegradable wastes need to be installed. In most cases its observed that most of the residents are depositing the domestic waste in their own land as plots are comparatively large. But in future this picture may change with further division of land which will follow urbanisation and people may resort to dumping waste in public places. It is expected that this present plant will be capable of processing the municipal waste provided the plant is modernized incorporating the latest technology in waste treatment process. The sanitary waste of the houses which at present does not create any pressure on the town may not cause any headache in near future also. An area of concern is the surface drainage carrying the waste of the street, commercial establishments, markets etc. discharging into the river and drains.

CHAPTER - 17
EDUCATION

17.1 INTRODUCTION

Thodupuzha can boast of fairly rich history of education which started with the establishment of Newman college in 1964. Idukki district being one with majority of its area in high ranges with difficult terrain and hostile weather for many months in every year has not contributed much in the field of education. Here Thodupuzha being located at fairly low altitude with good connectivity to the western districts serves as the educational hub of the district. The town is home to educational institutions other than mentioned above like Depaul english medium school and Applied Science college etc. Institutions like University College of Engineering, Govt Poly Technic Muttom and B'ed, M'ed education institution in Kumaramangalam panchayath have come up within short distance from the town. Also Al-Azhar medical college being constructed now is quite near to Thodupuzha. All these assert the role of the town as the educational centre of the region and the district as well.

17.2 GENERAL EDUCATION STATUS

The general education status is assessed based on literacy rate, number of educational institutions per 1 lakhs population and the level of education people have achieved. The literacy rate of Thodupuzha town as per 2001 census is 92.96 %. The literacy rate of Idukki district and Kerala state are 88.69 % and 90.92 %. The literacy rate of the town is higher than that of the district and the state also. There is enough number of educational institutions in the town. The educational status of the town is assessed by studying the percentage of people attained different levels of education. It is shown in Table No 17.1 and Figure No 17.1.

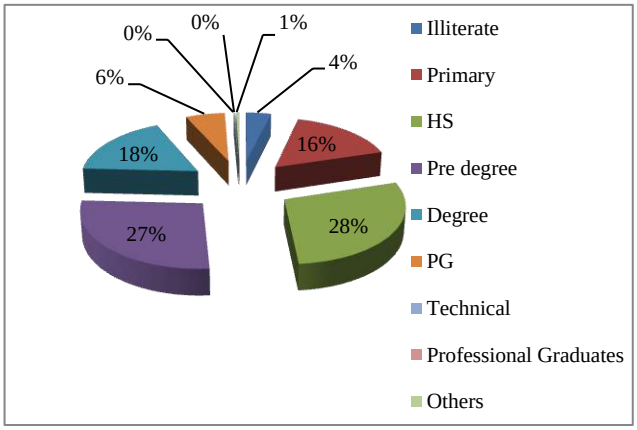


Fig. No.17.1: Educational status of the town

Type	Illiterate	Primary	HS	Plustwo	Degree	PG	Technical	Professional graduate	Others
Average of % for the LSGI	3.85	16.45	28.46	27.01	17.52	6	0.13	0.04	0.54

Table No.17.1: Educational status of Thodupuzha

It is observed that 16.45 % of the people of the town have only primary education, 28.46 % high school education and 27.01 % pre-degree qualification. The remaining 24.23 % possess degree or higher qualification which is a reasonably high share. Thus Thodupuzha has comparatively high literacy rate and the educational qualifications of the people are also high. It indicates the high educational status of the town.

17.3 SCHOOL EDUCATION

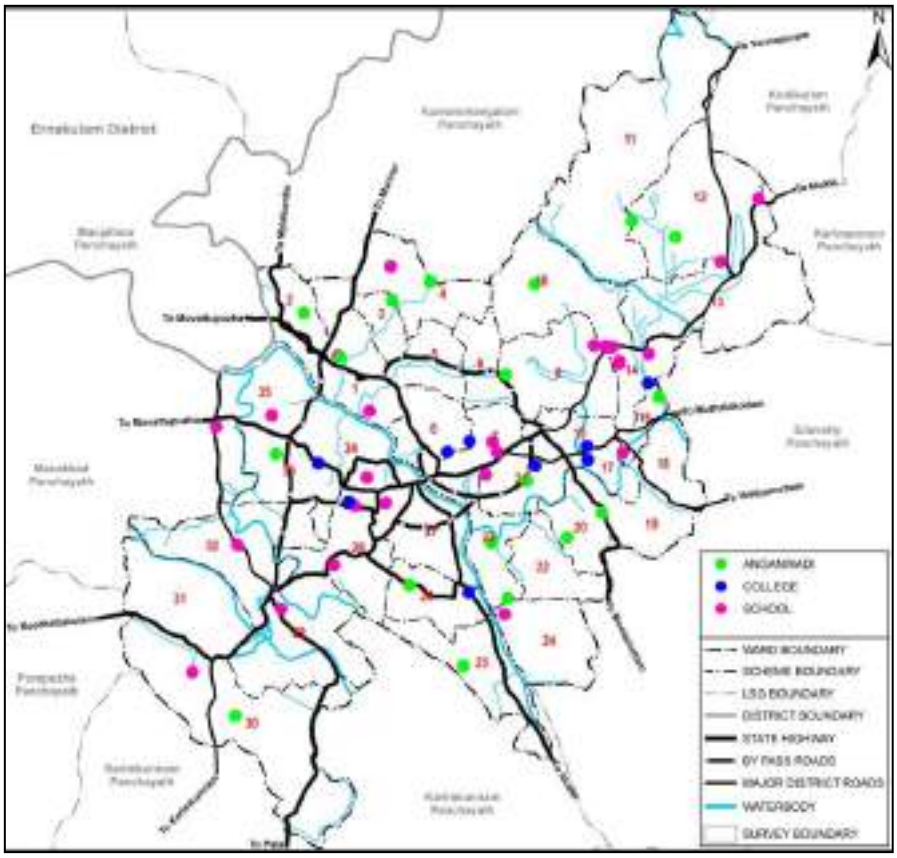
The details of schools in the town, i.e. number of students, number of teachers, syllabus (up to HSS), category like government, aided, unaided, unrecognized etc, facilities available, medium of instruction etc. are given in Annexure 17.1. There are 23 schools functioning in Thodupuzha municipal area. The details of schools in various categories are shown in Table No 17.2.

Sl. No	Name of school	Govt/Aided/Unaided/ Unrecognized	Syllabus (up to HS)	Cate-gory	Number of students			Number of teachers	Student teacher ratio
					Primary	High school	HSS		
1	GHS Kanjiramattom	Govt	state	HS		117		15	7.8
2	GHSS Thodupuzha	Govt	state	HSS		151	573	41	17.66
3	GVHSS Thodupuzha	Govt	state	HSS			300	36	8.33
4	Thodupuzha D.E.M.H.S.S	Unaided	CBSE	HSS		370	74	33	13.45
5	Thodupuzha J.R.E.M.H.S.S	Unaided	CBSE	HSS		821	100	38	24.24
6	SH GHS Muthalakodom	Aided	state	GHS		735		30	24.5
7	SG GHS Muthalakodom	Aided	state	GHS		395	868	51	24.76
8	SS HSS Thodupuzha	Aided	state	HSS		477		20	23.85
9	Thodupuzha SVBLPS	Unaided	CBSE	HS		375		27	13.89
10	Thodupuzha DIET Lab UPS	Govt	state	UP	29			7	4.14
11	Chunkom SJUPS	Aided	state	UP	150			8	18.75
12	Muthalakodam SGUPS	Aided	state	UP	680			20	34
13	Thodupuzha SSUPS	Aided	state	UP	797			23	34.65
15	Kolani LPS	Govt		LP	62			5	12.4
16	Kumbakallu BTMLPS	Aided	state	LP	87			5	17.4

Table No.17.2: Details of schools

17.4 HIGHER EDUCATION

In the higher education sector there are seven institutions functioning in Thodupuzha municipal area. Among them two are arts and science colleges offering courses up to PG level, one in aided sector and the other in co-operative sector. In addition three nursing colleges two of which are in private unaided sector and one in co-operative sector are also functioning here. There is an Applied Science college offering courses in graduate and PG level in Electronics and Computer Science streams. A B.Ed centre under the direct management by MG university also functions in the town. Altogether these institutes have strength of about 3500 students. The details of these institutes are shown from Table No 17. 3 To 17. 5.



Map No.17.1: Spatial distribution of educational institutions

Name of college	Location	Whether having PG course (Y/N)	Number of students course wise (UG)				Number of students course wise (PG)				Govt./Aided/ Unaided
			BA	B. Sc	B.com	Tot	MA	M.Sc	M.Com	Total	
New man college	Thodupuzha east	Yes	516	459	169	1144	36	79	37	152	Aided
Co-operative college	St. Sebastian's ward 8	Yes	120	-	900	1020	30	-	100	130	Unaided and co-operative management

Table No.17.3: Details of arts and science colleges

Sl. No.	Name of college	Details of ownership	Specify the professional courses offered	Number of students course wise					
				Malayalam	Social science	Maths	Natural science	Physical science	Total
1	MGU B.ed centre	University	B.ed	20	50	20	28	32	150

Table No.17.4: Details of B.Ed colleges

Sl. No	Name of college	Details of ownership	Location	Specify the courses	Number of students course wise
1	Co-operative nursing School	Co-operative management	Co-operative nagar, Thodupuzha	General nursing midwifery	General nursing midwifery
					52
2	Holy family hospital Muthalakodam	Private	Muthalakodam	B.Sc Nursing, General nursing	350
3	School of nursing Pvt LTD, Chazhikadu hospital	Private	Thodupuzha	General nursing 1St yr and 2nd yr	34
4	Applied science college	MG university	Thodupuzha	B.sc. Computer Science	133
				B.sc Electronics	115
				B.com with computer application	44
				M.sc Computer science	21
				M.sc Electronics	21

Table No.17.5: Details of professional colleges

17.5 INFERENCE

The town has a literacy rate higher than that of the district and the state as well. In the field of education generally private sector together with the aided once has dominance over other sectors like govt. or co-operative. At the school level the scenario is of a mixed kind with either the state or central syllabus followed in different schools and having run by aided, un-aided and govt sectors with the aided sector having a majority. Most schools follow state syllabus.

CHAPTER - 18
HEALTH

18.1 INTRODUCTION

Hospitals under the three systems of medicine viz. Allopathy, Ayurveda and Homeopathy have considerable presence in Thodupuzha town. The existing medical facilities and major diseases reported etc. are discussed here.

18.2 ALLOPATHIC SYSTEM OF MEDICINE

Under the Allopathic system of medicine, 9 hospitals function in the town out of which 8 are private hospitals and taluk hospital is the only one in government sector. In addition a medical mobile unit with the service of one doctor also operate in the town. Among the private hospitals Holy Family hospital is of super specialty category. Which has departments of medical treatment like general medicine, cardiology, paediatrics, orthopaedic, gynaecology, ophthalmology, otorhino - laryngology (ENT), urology, neurosurgery and radiology etc. Altogether there are 1187 beds and 55 doctors in these hospitals. The taluk hospital has 136 beds and 17 doctors. The name of the hospitals and their details are shown in Table No 18.1. A new super speciality hospital is now under construction near Vengalloor junction Thodupuzha-Muvattupuzha road. A medical college named 'Al-Azhar' medical college and super speciality hospital is also coming up in Kumaramangalam grama panchayath at 3 km from the municipal boundary.

Name of hospital	Number of beds	Number of doctors	Govt/Private/ Co-operative
Taluk hospital	136	17	Govt.
Medical mobile unit	1	1	Govt.
Karuna hospital	210	3	Private
Archana hospital	75	2	Private
Dist. Co-operative hospital	170	6	Co-operative
St. Mary's hospital	150	6	Private
Excelsior hospital	95	7	Private
Mount Sinai hospital	40	2	Private
St. George hospital	10	1	Private
Holy family hospital Muthalakodam	300	10	Private

Table No.18.1: Name of Allopathic hospitals and details

18.3 INDIAN SYSTEM OF MEDICINE

Thodupuzha has a reasonably long history in Ayurvedic stream of treatment since the establishment of Dhanwandhary Arya Vaidhyashala in 1933 which now also functions with 52 beds. In the town in addition to this four more Ayurveda hospitals are present including the one in govt sector named 'District Ayurveda Hospital' which accommodates 100 beds. The details of Ayurvedic hospitals in the town are given in Table No 18.2. Altogether there are 18 doctors and 181 beds in these hospitals. The Ayurvedic medicine manufacturing unit named 'Nagarjuna', which is a major producer of Ayurvedic medicine in Kerala whose supply covers almost entire Kerala and outside.

Sl. No	Name of hospital	No. of beds	No. of doctors	Govt/Private/ Co-operative
1	District Ayurveda hospital	100	8	Govt.
2	Soukya Ayurveda hospital and school of nursing	4	2	Private
3	Sree Ramakrishna ayurveda yogashramam	5	1	Private
4	Charakas ayurveda hospital	20	3	Private
5	Dhanwanthari Ayurveda hospital	52	3	Private

Table No.18.2: Details of Ayurvedic hospitals

18.4 HOMEOPATHIC SYSTEM OF MEDICINE

Under the Homeopathic system one dispensary is functioning at Kolani under the public sector. There was a govt: hospital with 8 beds in the town which is now shifted to Muttom grama panchayath. About 12-15 private clinics and govt Homeo dispensary are functioning in the town which facilitates only outpatient consultation.

18.5 SPATIAL DISTRIBUTION OF MEDICAL FACILITIES

Distances to a medical facility and hospital have been assessed in the socio-economic survey conducted in 2010. In the survey, it is found that the average distance to a medical facility is 0.95 km and a hospital is 1.55 km. The distance to the hospital is further analyzed by assessing the percentage of households with travel distance more than 5.00 km and less than 5.00 m.

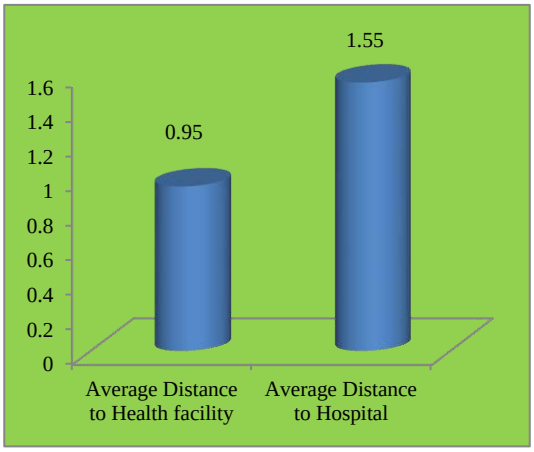
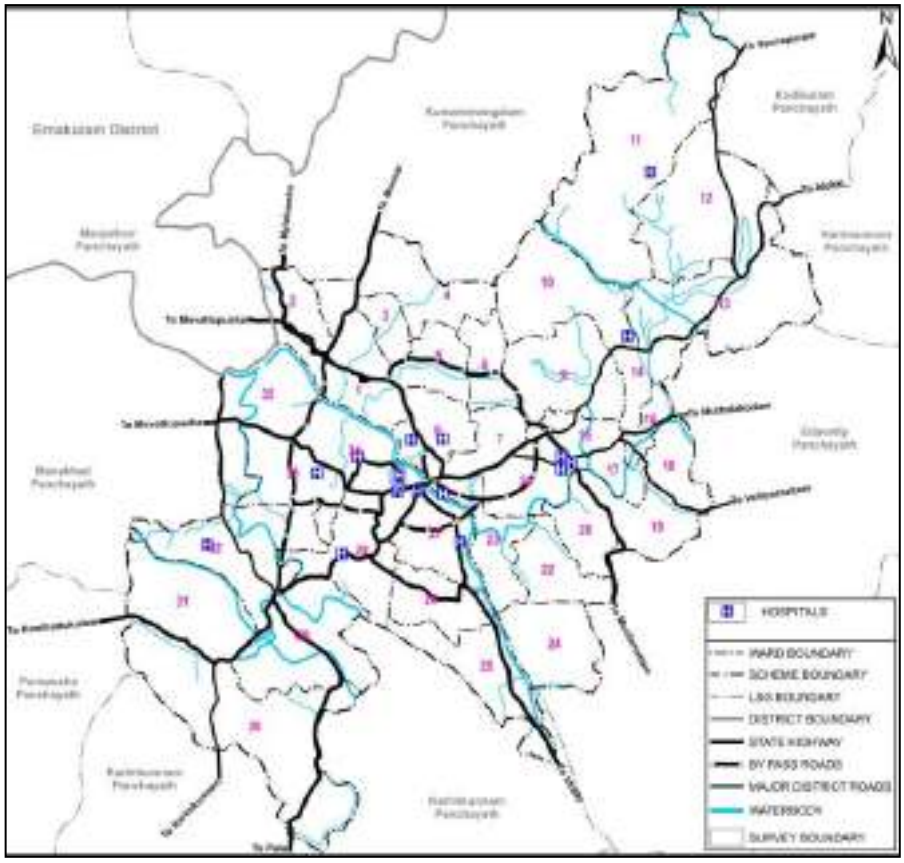


Fig. No.18.1: Average distance to health facilities

It is found that every household surveyed has reported availability of health facility within 5 km. Figure No 18.1 shows the average distance to health facilities. Spatial distribution of hospitals are shown in Map No 18.1.

18.6 DISEASES

In the socio-economic survey conducted in 2010 as part of preparation of development plan details regarding major diseases occurred in the town during in the past 5 years were collected. It is seen that chicken guinea which affected 8.43 % of the people is the only major diseases to be mentioned. Dengue fever has been reported to have affected 0.26 %. Major diseases occurred and percentage of houses diagnosed with diseases is shown in Figure No 18.2.



Map No.18.1: Spatial distribution of hospitals

18.7 INFERENCE

Thodupuzha is blessed with presence of good hospitals in both private and public sector. Private sector plays major role in both Allopathic and Ayurvedic streams of medicine. An established Ayurvedic medicine manufacturing unit is also functioning in the town which has history of good quality Ayurvedic treatment for about 3/4 century. In Homeopathic side private clinics are the common ones. New hospitals of Allopathy with super speciality standard are coming in and near the town which include a medical college. Going by the present strength in the infrastructure like road network and connectivity to settlements of the nearby districts and that most places of the district are in high ranges, the town which is at lower planes is expected to serve as a medical city in the coming future.

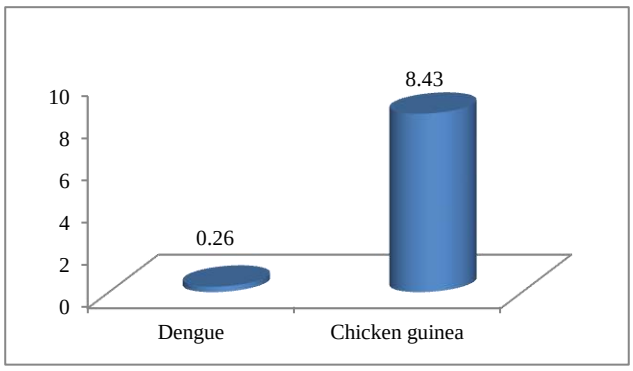


Fig. No.18.2: % of houses diagnosed with diseases within last 5 years

CHAPTER - 19
RECREATIONAL FACILITIES AND CIVIC AMENITIES

19.1 INTRODUCTION

The availability and present condition of facilities for recreation, sports, religious and cultural functions etc. of the town are discussed.

19.2 RECREATION

The town does not possess much facilities of recreation. The area under park and open space is 4.8 Ha. which is 0.14% of the area of the town. The major recreational facilities available include municipal children's park near Civil station, 5 cinema theatres, one swimming pool managed by a private hospital, a town hall owned by town and an open ground near Gandhi square etc. Further the library called Janaranjini Vayanasala situated at Kolani, is one of the biggest libraries in Kerala and has around 30000 books. It is accommodated in its own two-storied building with separate TV room, reading room, book room, and computer centre with high speed internet facility and mini conference room. There is a municipal library situated near to Civil station.

YMCA runs a cultural centre of low scale extent near Thodupuzha-Puliyanmala state highway. Organisations like Lions Club, JAYCEES, Rotary club and other cultural organisations are active in the town. The details of existing recreational facilities are given in Table No 19.1.

Sl No	Facilities	Name	Location/ward	Extent/capacity
1	Park	Municipal children's park	Ward 28	63.1 cent
3	Open air theatre	Municipal stage and ground	Ward 7	14 cent
4	Community hall/town hall	Mini town hall	Ward 7	500 seat
5	Swimming pool	Charakas hospital, (Private)	Vengalloor ward 4	8 cent
6	Public libraries	Municipal library	Near to Civil station, 28 ward	3.50 cent
7	Cinema hall	5	23, 10 wards	1260 seat

Table No 19.1: Existing recreational facilities

19.3 RELIGION, CULTURE

There are about 30 temples of major and minor nature, 16 churches and 21 mosques present in the town. Annamalai temple at Karikode is the oldest of the temples and Bhagavathy temple Karikode has got fame for its association with Vadakkumkoor Rajas. Sreekrishna Swami temple near Civil station is also an important one while Amaramkavu near Kolani possesses a very old 'kavu' with trees of about 500 years age. Among the important churches are Muthalakodam church, Chunkam church, town church etc. among the mosques the Nainar mosque near Karikode is the most famous and oldest and is said to have been constructed by the Vadakumkoor Raja for his muslim soldiers.

19.4 INFERENCE

Only lower order recreational facilities are available in the town. Taking into account the fact that it is the only town in the low range area of Idukki district and its status as a transit point to eastern regions of multiple tourism importance of the district and the scope for development in sectors of health, education, trade and commerce etc., the town needs more avenues of recreation and cultural activities. Need is felt for stadium for sports, a large open ground etc. in addition to other recreational facilities of social life.

CHAPTER - 20
SOCIAL WELFARE AND SECURITY

20.1 INTRODUCTION

This chapter contain the analysis of the present status of weaker section of the society particularly the women, children, old aged people and scheduled caste people. The safety aspects of the town are also discussed in the chapter.

20.2 WOMEN

As per 2011 census, out of total population of 52045, the number of female in the town is 26482, which is 50.9 % of total population. There are a few institutions working for the welfare for women in the town. Also there are a few working women's hostels.

In the local level analysis the major proposals suggested in this sector includes, programme for self employment of women like SSI units under Kudumbasree, ensure the safety of women, starting of old age homes etc.

20.3 CHILD DEVELOPMENT

Population in the age group of 0 to 15 is considered child group. As per the socio-economic survey 2010, 20.64 % male population and 20.51 % of female population are in the child group. Anganwadies are the grass root level delivery point of social welfare activities. 42 anganwadies are functioning in the town and out of these, 18 are functioning in own buildings, 24 are functioning in rented building. New buildings are to be constructed for those Anganawadies functioning in rental buildings.

Three orphanages also function in the town under private management especially for children with different ability.

20.4 OLD AGED PEOPLE

The people above 60 years are considered as the old age people. As per the socio-economic survey 2010, 10.82 % of male population and 10.81 % of female population are coming under this group. At present 3 old age homes are functioning in the town, one run by Social Welfare department under the control of municipality, and the other two under private management. In the local level

analysis major suggestion in this sector are improving the conditions of old age homes and providing necessary medical facilities for old age people.

20.5 SC, ST DEVELOPMENT

The scheduled caste population of Thodupuzha town as per 2011 census is 2146 (male-1045, female-1101) and it is 4.58 % of total population. The total number of scheduled tribe population in the town is only 572 (260 male and 312 female). In the local analysis, the major suggestion related to this sector was for improvement of housing condition, improvement of infrastructural facilities of SC colonies and programmes for improving the educational standards and job opportunities for them.

20.6 SECURITY

Office of the Deputy Superintendent of Police, office of Circle Inspector of police (SHO) are functioning in Thodupuzha. In the local level analysis there was demand for a police out post at Parakkadavu.

20.7 FIRE AND SAFETY

The main objective of the fire and rescue service is to protect the people and their properties from fire and other calamities, which include both natural and incidental. Office of the fire and rescue service is functioning in Thodupuzha near Muvattupuzha road.

20.8 INFERENCE

For the welfare of weaker section of the town more facilities are to be provided. In the changed social structure more attention is needed for the welfare of old age people. Projects have to be evolved for the economic development of women, scheduled caste and scheduled tribe people.

CHAPTER - 21
ENVIRONMENT

21.1 INTRODUCTION

Urbanization which usually includes large scale industrialization, commercial activities, population explosion, vehicular growth, conversion of green and open areas, inadequate waste disposal etc. leads to many environmental problems primarily due to the increased interference of residing population in the natural resources. The impacts usually are:-

- Localized health problems caused by polluted air, impure water, unhygienic premises and sanitation etc.
- Degradation of healthy nature.
- Infrastructure deficit.

21.2 MUNICPAL SOLID WASTE SYSTEM

Collection conveyance and disposal of solid waste of the town is carried out in a limited way. Collection of solid waste is confined to selected area of the town and only limited system, is available for collection of wastes. 95.43 % of households dispose the solid wastes in their own compound. The system for the transportation and disposal of waste is inadequate and only a partial treatment of wastes done at the dumping ground. A large quantity of wastes especially the non-organic ones are dumped at the yard without treatment, leading to environmental problems.

21.3 INDUSTRIAL POLLUTION

The industrial development of Thodupuzha is limited to a few small scale industrial units. No large scale or medium scale industrial units are functioning in the town. Industries are categorized as red, orange and green according to the nature of pollution. Red category being the highest pollution potential. There are 869 MSME units in the town and out of that there are only 21 units coming under green category. There is not much pollution from industrial units.

21.4 NOISE POLLUTION

There is no major industry in the town creating noise pollution. The important source of noise pollution is motor vehicles. Such pollution is experienced during day and night in the busy roads like Punaloor-Muvattupuzha state highway and in the roads at the central area of the town.

21.5 AIR POLLUTION

During the day such pollution is experienced due to motor vehicles along the sides of the roads. The town does not have any major or medium type industrial units. There are only units in the category of MSME and are scattered in different parts of the town. Due to this there is no remarkable air pollution in the town.

21.6 WATER POLLUTION

Thodupuzha river that runs full 12 months of year, is the biggest blessing to the town. This is the major source of water to the town be it for drinking or for other commercial or industrial purpose. There are other smaller natural drains too passing through the municipality. The waste from commercial establishments, industrial premises, hospital premises, road sides etc. naturally discharges into these water bodies especially Thodupuzha river. The very few ponds that the town possesses also get polluted. Ways to stop these pollutions especially that of Thodupuzha river need to be found.

Thodupuzha river that flows through the middle of the town to which “Kanjiramattom thodu” and “Kolani thodu” join together with the network of other streams/thodu provides an excellent natural drainage network for the town. Due to this naturally blessed drainage network together with topographical slope the town was free from flooding even in monsoon. But now a days the unplanned development on the sides of these water bodies resulted decrease in the effective width of these water bodies and interruption for free flow of water. As a result of this flooding of certain areas within the town became common after heavy rain. The above facts points out the need for renovation/protection of natural drainage basins of the town together with need for drainage plan and drainage network starting from plot level to the town level.

21.7 PADDY FIELDS

The paddy fields, in addition to its agriculture importance, are also acting as a collection basin of rain water and in turn and also recharge the ground water resources. Over the past few years the area of paddy fields has considerably reduced. The total extent of paddy fields exist now is about 65 Ha. Actual records of the variation of the paddy fields into different purposes are not available. The paddy fields are being converted for various urban activities like construction of buildings, roads etc. These conversions can cause environmental impacts like depletion of water table and floods during rain etc.

21.8 INFRASTRUCTURE

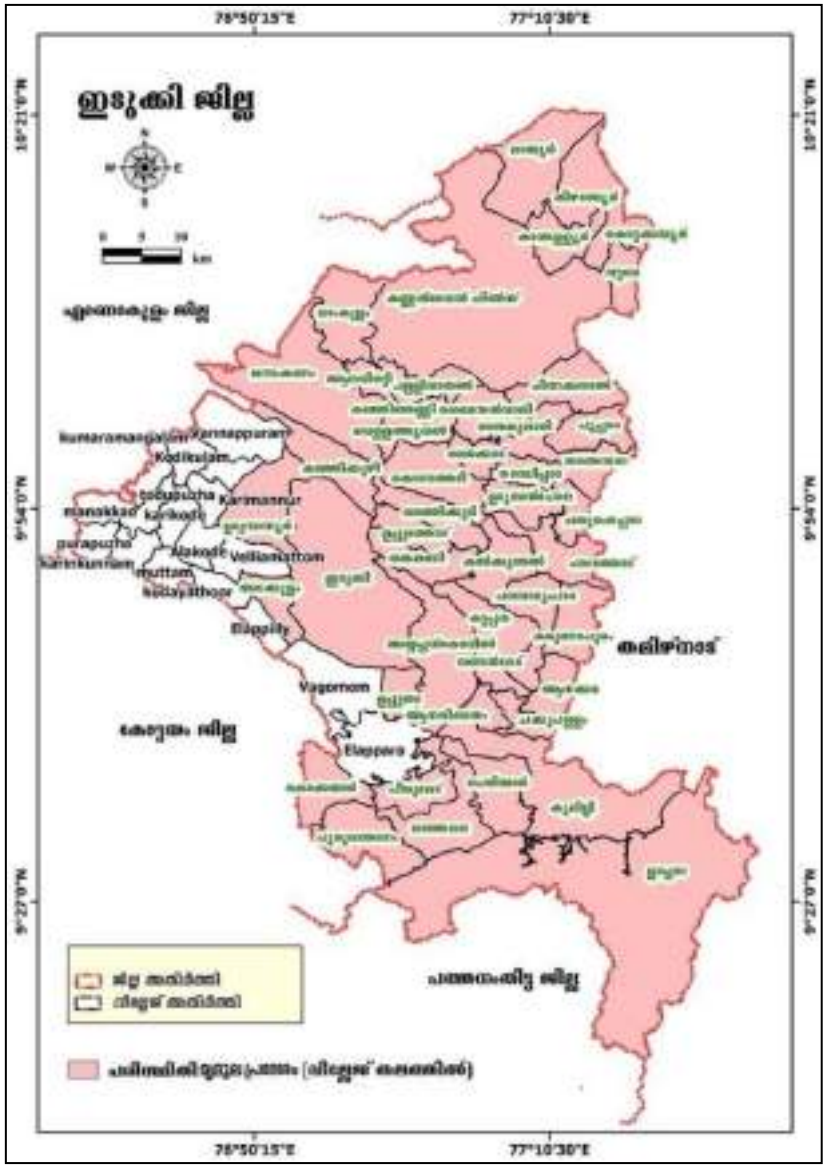
According to the socio-economic survey (2010) 45.3 % of the people of the town are getting protected water. Remaining is depending on well water for drinking purpose. In majority of cases the quality of well water is good too.

21.9 SQUATTER SETTLEMENTS

There are 11 squatter settlements (colonies) in the town. The condition of many of these colonies has to be improved.

21.10 REPORT OF THE HIGH LEVEL WORKING GROUP ON WESTERN GHATS (DR K. KASTURI RANGAN REPORT) IN THE CONTEXT OF IDUKKI DISTRICT

Western ghats is a magnificent mountain range next only to himalayas and is a biological treasure trove with a high degree of endemism (11% to 78%) and scenic beauty. This unique eco-system has been threatened by continuously increasing habitat pressures and declared as one of the world's hottest hotspots of biodiversity. Realizing the need to protect and rejuvenate the ecology of and for sustainable development in western ghats, the ministry of Environment and Forests (MOEF) constituted a western ghats Ecology Expert Panel (WGEEP). The mandate of WGEEP was to demarcate ecologically sensitive zones and suggest measures to conserve protect and rejuvenate the ecology of western ghats region. Taking into account the comments and suggestions made by different stakeholders including state governments and central ministries on WGEEP report, the MOEF constituted a High Level Working Group (HLWG) to suggest an all-round and holistic approach for sustainable and equitable development while keeping in focus the preservation and conservation of ecological systems in western ghats.



Map No.21.1: Ecological sensitive units (Kasthuri Rangan report)

The High Level Working Group (HLWG) headed by Dr K. Kasturi Rangan brings out a detailed report comprising of two volumes. As per the report HLWG has identified approximately 37 % of the western ghats as ecologically sensitive. The identified ecologically sensitive area covers about 60,000 sq.km of natural landscape of western ghats and represents a continuous band of natural vegetation extending over a horizontal distance of 1,500 km. The ecologically sensitive area is spread across six states of western ghats region viz. Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu. The ESA also includes protected areas and world heritage sites of western ghats and the government of India. The ecological sensitive area identified by the committee has been delineated in to ecological sensitive units with revenue village as boundary unit. There is 4156 number of such ecological sensitive units (revenue villages) in the whole western ghats.

Out of the 4156 number of ecological sensitive units (revenue villages) in the whole western ghats 123 number ecological sensitive units (revenue villages) are in Kerala and out of which 47 numbers are in Idukki district. The list of ecological sensitive units (revenue villages) in Idukki district is shown in Table No 21.1

Sl. No	District	Taluk	No. of villages in ESA	Name of villages	
1	Idukki	Devikulam	12	1. Marayoor 2. Keezhanthoor 3. Kannandevan Hills 4. Kottakamboor 5. Kanthalloor 6. Vattavada	7. Mankulam 8. Mannamkandam 9. Pallivasal 10. Anaviratti 11. Kunjithanni 12. Vellathooval
2	Idukki	Peermadu.	8	1. Upputhara 2. Kumily 3. Manjumala 4. Periyar	5. Kokkayar 6. Peerumed 7. Mlapra 8. Peruvanthanam
3	Idukki	Thodupuzha	4	1.Kanjikuzhi 2.Udumbannoor	3.Idukki 4.Arakulam
4	Idukki	Udumbanchola	23	1. Chinnakanal 2. Bisonvalley 3. Rajakumary 4. Poopara 5. Rajakadu 6. Konnathady 7. Santhanpara 8. Kandhippara 9. Chathurangapara 10. Vathikudy 11. Udumbanchola 12. Upputhodu	13. Parathodu 14. Kalkoonthal 15. Thkamany 16. ASyyappankovil 17. Pambadumpara 18. Kattappana 19. Karunapuram 20. Vandanmedu 21. Anakkara 22. Anavilasm 23. Chakkuppallam

Table No.21.1: Ecological sensitive units (Kasthuri Rangan report)

Out of the 47 number of ecological sensitive units (revenue villages) in the western ghat area of Idukki district there is no ecologically sensitive units under Thodupuzha municipality. The spatial distribution of ecological sensitive units (revenue villages) in the western ghat area of Idukki district is shown in Map No 21.1.

The analysis of the spatial distribution of ecological sensitive units (revenue villages) shows that most of the reserve forest area of high range of Idukki district comes under ecological sensitive units. The High Level Working Group (HLWG) imposed certain major control/restriction over the area comes under ecological sensitive units for sustainable and equitable development while keeping in focus the preservation and conservation of ecological systems in western ghats. The low range areas of Idukki district which comes around 12 % of the geographical area of the district are not included in the ecological sensitive units.

From the map and table it is seen that entire area of Thodupuzha municipality and surrounding area are not included in the ecologically sensitive areas. Hence the imposed control / restriction over the area comes under ecological sensitive units for sustainable and equitable development while keeping in focus the preservation and conservation of ecological systems in western ghats will impose added pressure on land in the ecologically less sensitive areas. This will impose profound implications over the planned development of the Thodupuzha town.

21.11 INFERENCE

The town is experiencing various environmental issues, but in different magnitude. Since Thodupuzha comprising of considerably large extent of plantation and farm lands is on the threshold of fast development particularly due to the recent creation of a good network of roads, opening of new commercial establishments etc. care has to be given to see that the growth is environmentally sustainable. Priority has to be given for protection of environmentally sensitive areas, implementing harmless waste disposal systems, and protection of wet land and water bodies etc. The town also demand the need for renovation/protection of natural drainage basins of the town together with need for drainage plan and drainage network starting from plot level to the town level.

CHAPTER - 22
RESOURCES

22.1 INTRODUCTION

Money, man power and land are the main resources for planning and development of urban centers. Among these resources, land is limited and its availability differs from place to place. As a basic principle, allocation of these resources among various competing land use must be such that it helps in achieving a high level of economic efficiency.

22.2 FISCAL RESOURCES

The main sources of income of Thodupuzha municipality are municipal taxes, fees for various services, income from properties, government grant (plan fund), deposits and cess. The total receipts for the financial year 2010-2011 was Rs.59836270 and the total revenue including the opening balance was Rs. 140910147. But only a small share of the total income is available for capital improvement programme and it is inadequate to provide infrastructural facilities and services in par with demand.

In addition to the above, various programmes including infrastructure development projects are being implemented through various state government departments and also under various centrally sponsored schemes. Procuring funds for implementation of urban development plans and services delivery system from alternate sources shall be thought of.

22.3 HUMAN RESOURCES

The details of human resources have already been discussed in the chapter 5. Steps are to be taken for the effective utilization of the human resources for the development of local economy and in the provision of infrastructure and services.

22.4 LAND RESOURCES

Urban land is emerging as a new area for local resources generation. There already exist innovative examples of generation of substantial funds using urban land as a resource in many parts of the country. No steps in this direction have been adopted in Thodupuzha so far and there is enough potential for utilizing land as a major resource.

22.5 MINERAL RESOURCES

Hardly any mineral resources are available in Thodupuzha town limit except granite. However due to the environmental implications quarrying granite has not been attempted recently.

22.6 AGRICULTURAL RESOURCES

As far as the region is concerned, only agro-based products are available. Rubber is the major crop of the town. Products like pineapple, tapioca, vegetables, betel, ginger etc are available in the town and its influence area.

22.7 INFERENCE

The main sources of income of Thodupuzha municipality are municipal taxes, fees for various services, income from properties, government grant (plan fund), deposits and cess. It's seen that three major resources i.e. money, manpower and land are available in plenty. Agriculture is a dependable resource here, rubber being the major crop. Granite is the only mineral resource available, but due to the environmental implications quarrying has not been seriously attempted to.

CHAPTER - 23
DEVELOPMENT ADMINISTRATION AND MUNICIPAL FINANCE

23.1 INTRODUCTION

The role of different departments involved in the development activities of Thodupuzha town is discussed in this chapter. The municipality has major role in the development activity of the town. In addition to the municipality, Public Works Department, Kerala Water Authority, Kerala State Electricity Board, Agriculture department etc. are the major departments involved in the development activities. The functions and the financial status of the municipality is discussed in detail. The details of the public offices functioning in the town are also included in this chapter.

23.2 THODUPUZHA MUNICIPALITY

23.2.1 Introduction

The historical adoption of 74th constitutional amendment act by the central government in 1992 has paved the ways and means for independent functioning of local bodies. This act makes election to the urban local governments mandatory, in addition to greater devolution of administrative and financial powers. In this chapter, the existing system of governance in the Thodupuzha municipality is discussed.

23.2.2 The elected council

The elected council consists of 35 members, which includes 18 women members. The chairman who is the head of the council has been elected from the elected members of the council. The vice-chairman, to assist the chairman and also to discharge the duties of chairman in absence is also elected by the members of the municipal council. There are six standing committees, ie for finance, works, development, health, education, welfare and education arts sports & culture to assist the municipal council in respective fields. Each standing committee consists of five members. The vice-chairman is the chairman of the finance standing committee and the members of the council will elect the chairpersons of other standing committees.

23.2.3 Administrative structure of the municipality

The municipal secretary is the executive head of the municipality and he is supported by the following six sections of staff.

- General administration section
- Revenue section
- Engineering section
- Town planning section
- Public health section and
- Peoples planning section.

General administration section

The General administration section is headed by the junior superintendent and consists of three sub-divisions i.e. establishment and other general matters.

Revenue section

Revenue section is headed by the revenue inspector. The section deals with the revenue of the town.

Town planning section

The town planning section is headed by the municipal engineer and assisted by public work overseers. This section looks after the implementation of the development plans and other town planning schemes, approval of building plan and lay out plans, detection of unauthorized construction, eviction of encroachments etc.

Engineering section

The engineering section is headed by municipal engineer in the cadre of Assistant Executive Engineer and is assisted by public works overseers. This section is responsible for the project planning, execution and maintenance of basic services and other infrastructure within the town.

Public health section

This section is headed by the public health officer grade. I. This section attends works like collection and disposal of solid wastes, cleaning of drains and work related to public health.

People's planning section

This section co-ordinates the plan formation under decentralized planning process. Annual plans and five year plans for the town are being prepared under decentralized planning process.

23.2.4 Functions of the municipal council

Thodupuzha municipality is the major agency implementing development works in Thodupuzha. The development works under the responsibility of Thodupuzha municipal council includes, the construction of municipal roads and their maintenance, public health - primary health centre, community health centre, solid waste disposal, construction of public market and their maintenance, public cremation ground and its construction procedures, open spaces, parks and their construction works, providing infrastructure in colonies, protection of common ponds, the maintenance of the institutions transferred to the municipal council are schools, hospitals and other institutions

23.3 MUNICIPAL FINANCE

23.3.1 Introduction

The 74th constitution amendment act 1992, paved the way for devolution of financial and administrative powers to urban local bodies in a large way. By this amendment the financial position of the urban local bodies improved and a sizeable share of the total plan fund of the state government has devolved to the local bodies for plan implementation. The financial position of the town is discussed in the subsequent paragraphs.

23.3.2 Receipts of municipality

The receipts of the town has been grouped into, three categories i.e. revenue, capital and debt. The receipts under revenue includes income from taxes, municipal properties, municipal fees, grant in aid from government, grand in aid from government for the maintenance of assets transferred from government etc. The receipts under capital includes government grants, government loans, income from municipal institutions, income from deposits, endowment

Sl. No	Head of account	2007-08	2008-09	2009-10	2010-11
1	Revenue amount	52470869	49916863	53692761	59836270
2	Capital amount	55079588	26241624	28840748	37165798
3	Debt amount	6960223	5782101	4550301	8034238
	Total income	114510680	81940588	87083810	105036306
Total income including opening balance		125618579	122112176	133868837	148944385

Table No.23.1: Abstract of total receipts

grant for implementing the programmes of the departments transferred to the town, government grant for decentralized planning etc. The receipts under debt includes deposits, provident fund, pension fund, return from advances, sinking funds, library cess, surcharges, sale tax, income tax, labour welfare fund etc. The Table No 23.1 and Figure No 23.1 presents an abstract of total receipts in the above three heads from the financial year 2007-08 onwards. It shows mixed variation in the receipts over the period under study for three heads, i.e. revenue, capital and debt.

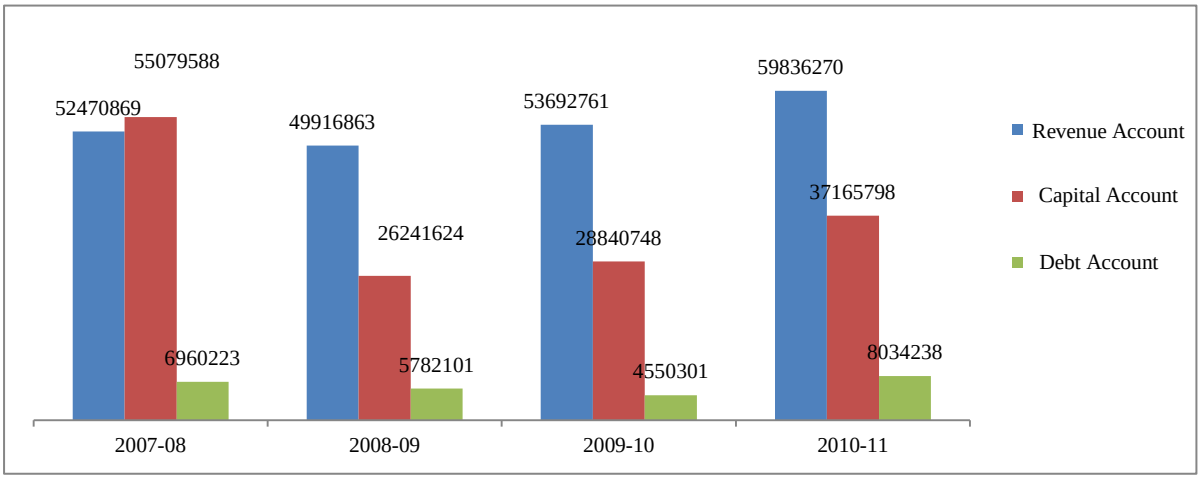


Fig. No.23.1: Abstract of total receipts

23.3.3 Expenditure of the municipality

Like the receipts, the expenditure of the town is also classified into three accounts revenue account, capital account and debts account. The expenditure under revenue account includes the expenditure for administration and tax collection, public works, town planning, education, water supply and drainage, public health, street light, maintenance of municipal properties, grant for maintenance of transferred assets etc.

Sl. No	Head of account	2007-08	2008-09	2009-10	2010-11
1	**Revenue account**	38832456	36862706	49673070	45310229
2	**Capital account**	37411170	32158386	34613062	43241605
3	**Debt account**	8903365	6306057	5674626	8543302
Total expenditure		85146991	75327149	89960758	97095136
Grand total including closing balance		125618579	122112176	133868837	148944385

Table No.23.2: Abstract of total expenditure

The expenditure under capital account includes expenditure for management, public works, education, water supply and drainage, public health, street lighting, endowments, deposits, poverty eradication programmes, expenditure for the programmes implemented through the departments transferred to the town, programmes under decentralized planning etc. An abstract of the total expenditure of the municipality under the above three heads is presented in the Table No 23.2 and Figure No 23.2.

The expenditure under debt account include the expenditure for the repayment of deposits, repayment of cash deposits, pensions, re-payment of advances, library cess, sale tax, income tax, payment of welfare funds etc.

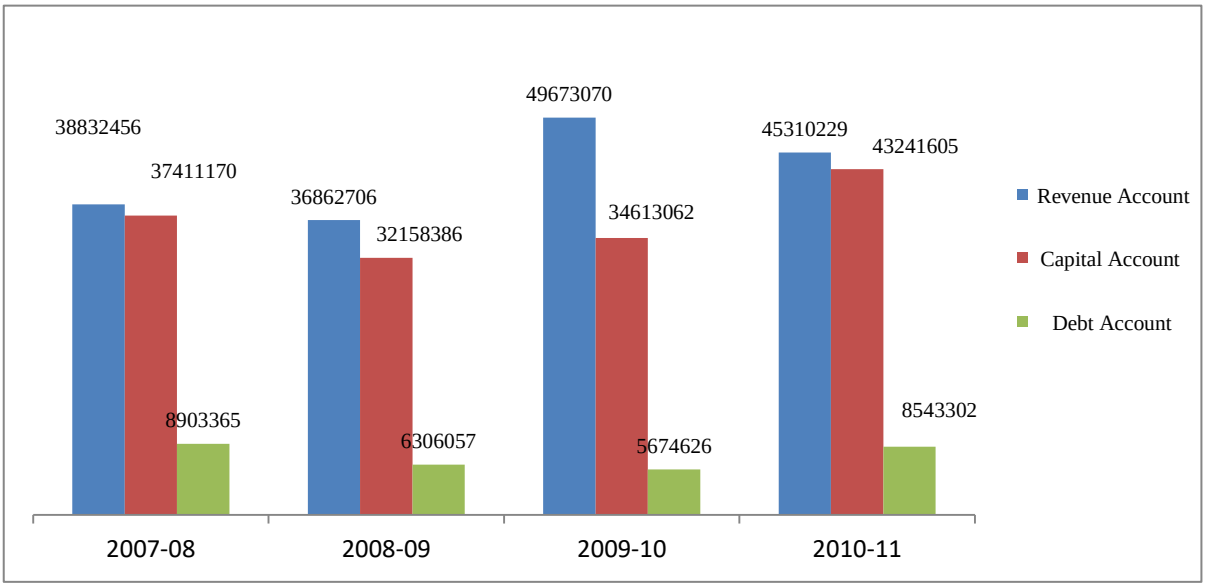


Fig. No.23.2: Abstract of total expenditure

23.4 GOOD GOVERNANCE

The present office building of the municipality does not have sufficient space for efficient functioning. It was constructed immediately after the formation of municipality. Space constraint is affecting the day to day functioning of the office. Adequate space and facilities for people who are visiting the office for different purposes are not available.

A good governance is that the office has to be computerised with network facilities for collection of taxes and other revenues, issue of certificates, accounting etc.

23.5 OTHER DEPARTMENTS

Kerala water authority is dealing with the distribution of drinking water in municipal area. Office of the Assistant Eexecutive Engineer is functioning at Thodupuzha. The electricity distribution

system is maintained by the Kerala State Electricity Board. The electrical sections I and II are in charge of distribution of electricity. The Kerala State Public Works Department (Roads) is in charge of construction and maintenance of roads other than those roads owned by the municipality. The Kerala State Public Works Department (Buildings) is constructing major buildings.

23.6 PUBLIC OFFICES FUNCTIONING IN THE TOWN

Thodupuzha is the headquarters of Thodupuzha taluk. There are about 100 state government offices and about 20 central government offices functioning in the town. Most of the state govt offices are in civil station and a few are in rented buildings. There are many offices having their own complexes.

23.7 INFERENCE

Thodupuzha municipality has major role in providing various infrastructure facilities and civic amenities to the people. It is a second grade town and the present staff pattern is inadequate considering the responsibilities, powers and assets transferred to the municipality. The total receipt of the municipality has been showing varying trend. The present municipal office building is not at all adequate for its smooth functioning and also for providing better service to the people. Many district level offices and taluk level offices are functioning at Thodupuzha in the civil station and other buildings. A few of the offices are still in rented buildings.

CHAPTER - 24
FINDINGS AND CONCLUSIONS

24.1 INTRODUCTION

Settlement studies as well as regional setting study and detailed sector wise analysis of various aspects of the town has been made in the previous chapters of this report. The findings of the analysis are summarized in this chapter.

24.2 THODUPUZHA IN THE DISTRICT CONTEXT

Thodupuzha is one of the two municipalities in Idukki district. It is the headquarters of Thodupuzha taluk and is located in the far western corner of the district. In the regional setting study, Thodupuzha has been identified as a first order settlement in the existing hierarchy of settlements. In the District Urbanization Report Thodupuzha is proposed as a first order settlement of Idukki district. In the district scenario, the functional character of the town is urban. The activity pattern proposed is primarily urban activities.

24.3 LOCATION

The location of the town is in the Central Travancore Region at the far western end of Idukki district and is almost equidistant from the west and the east boundaries of the state. The town is situated in the foothills of western ghats mountain ranges at north latitude between 9° 52’ 29.73” and 9° 56’ 2.30” and east longitude between 76° 41’ 15.25” and 76° 44’ 20.50”.

24.4 HISTORY OF DEVELOPMENT

Thodupuzha is an ancient town with a history dating back to many centuries. Karikode near Thodupuzha was the head quarter of Keezhmalainadu, a province of Kerala from AD 100 to AD 1600 and later head quarter of kings of Vadakkumkoor until it became the part of state of Travancore.

24.5 TOPOGRAPHY

Thodupuzha is a foothill town of western ghats. The altitude ranges between less than 40m to 160m above MSL. About 55% of the land is having altitude less than 40 m above MSL. The north western part of the municipality is at relatively high altitude with average value of 70 m above MSL.

24.6 REGIONAL SETTING

In the suggested hierarchy of settlements as per the Urbanisation Report of Idukki, Thodupuzha is proposed to continue as first order settlement. The activity pattern identified is urban. Thodupuzha - Puliyanmala road, Punaloor – Muvattupuzha road and Alapuzha – Madurai road are suggested as first order roads.

24.7 PLANNING AREA

Municipal area itself is taken as the planning area.

24.8 ADMINISTRATIVE STATUS

Thodupuzha is the headquarter of Thodupuzha taluk of Idukki district. Until the formation of Idukki district many regional level offices functioned here and at present some district level offices continue to function here.

24.9 LAND USE

In the town with total area of 35.43 Sq.km, rubber plantation has the largest land use of the town, 32.88% followed by residential use (29.81%). Dry agriculture is also major component (24.38%).

The major urban activities of the town like commercial establishments, public buildings etc are concentrated in the central part of the town along and the high density residential area is located in an area around this. There is specific pattern in land use activity and non agriculture activities are concentrated around the central part of the town and the agriculture activities and the plantation are in the periphery of the town.

24.10 FUNCTIONAL CHARACTER OF WARDS OF THE TOWN

The town displays urban functional character in four wards, semi urban character in seven wards and semi rural character in the rest of the wards. It is expected that the town will maintain its first order status in the future among the settlements of the district as well as the urban functional character too.

24.11 DEMOGRAPHY

Thodupuzha town has the highest population density among the LSGs of the district. The town witnessed a constant population growth rate of 13.75% during the decades of 1981-1991 and 1991-2001. But during 2001-2011 there is a slight decrease to 12.54%. At the district level the

decennial growth rate during 2001-2011 is negative trend (-1.79). Population is concentrated more in central parts of the town and along major transportation corridors and nearby the built-up areas. Age sex pyramid indicates a possibility of decrease in population in the future. Sex ratio of the town (1036) is higher than that of the district (1006). As per 2011 census Thodupuzha has a fairly good literacy rate of 95.59% which is well above the national average of 74.04%.

24.12 WORKERS

The work participation rate of Thodupuzha town is lower than that of the district. The work participation rate has shown a slight increase during the past two decades, but the growth rate of work participation rate is less than population growth rate. The occupational structure shows that more percentage of workers belong to the other workers category. There is gradual reduction in the number of workers engaged in agriculture and related activity and there is corresponding increase in other workers category.

24.13 COMMERCIAL ACTIVITY

1.61% of the municipal area is under commercial land use. The town is witnessing in orientation towards commercial activities especially retail trade to cater needs of the population of the influence area. It's a clear shift in the main economic base of the town which was agricultural based earlier. The establishment of a good network of roads including many bypasses through less inhabited area adds to this development.

24.14 INDUSTRY

Only SSI units are functioning in the municipality and there are no major industries. The presence of Thodupuzha river should be exploited in a sustainable way to promote industries that may require a consider amount of water. Also the presence of an excellent road network including long bypass roads passing through fairly uninhabited areas must also be seen as a boon in this regard. There is high potential for agro based industries using raw materials like latex, rubber, wood etc. Reviving the once famous light industries activities like bus body building near to be explored.

24.15 TOURISM AND HERITAGE

Thodupuzha is the gateway to some important tourist destinations of Idukki district such as Munnar, Marayur, Thekkady, Idukki arch dam and Vagamon. The town can perform the role of a transit point to these places for the tourists coming from the districts of Kottayam, Ernakulam etc. Also there are numerous tourism destinations within short travel distance from Thodupuzha.

Thodupuzha river running full all twelve months a year is another attraction. There is ample scope for creating manmade facilities to attract to the town the tourists bound for these destinations. The town hosts considerable number of temples, mosques, churches, cultural and educational institutions etc. Means may be sought for preserving these sites and their heritage.

24.16 AGRICULTURE

Thodupuzha municipal area having 60% land under agriculture use. Rubber is the back bone of the agricultural economy of the town which at present takes up 55% of total agricultural area of the municipality. Further its area is ever increasing even converting land of food crops and paddy fields. The town does not benefit from any irrigation scheme and farmers depend on Thodupuzha river, other smaller streams, ponds, wells etc. for watering their crops. Most of the paddy fields remain uncultivated and are under the threat of convertion for cash crops and non agricultural pursuits.

24.17 ANIMAL HUSBANDRY

Having got a considerable extend of land under agriculture use, the municipality has a really high potential in animal husbandry. Strengthening of the existing livestock in quality is the need of the hour. The supporting infrastructure facilities including health care and marketing network have to be strengthened. Ensuring steady supply of quality inputs at reasonable rates and development of pricing system based on actual expense is highly essential for the subsistence of the sector. Advance surveillance programmes, better insurance coverage schemes and modern plants manufacturing products of milk and meat etc. also needed.

24.18 HOUSING

The residential area of the town is more concentrated in the central area around the commercial centres and the residential density gradually thins out towards the outer periphery. 97% of households have their own plots. There has been shortage of houses in the recent past and measures have to be taken to fill the gap. Eleven colonies are there in the municipality with comparatively descent living conditions. However, some improvements of the facilities are required.

24.19 DRINKING WATER

According to the socio-economic survey (2010) 45.3% of the people of the town are getting protected water. Remaining are depending on well water for drinking purpose. In majority of cases the quality of well water is good too. Certain areas of the town need special attention as there is more scarcity of water.

24.20 TRANSPORTATION

Road is the only mode of transportation currently available in Thodupuzha. The proposed Sabari rail is understood to have its alignment passing through the town. It has a fairly satisfactory network of roads that has a pattern of ring and radial type. The newly developed bypass roads relieves the central area of the town from traffic congestion that was experienced previously. It's observed that many of the roads especially the municipal roads are having inadequate right of way and carriage width. The parking facilities available are seen insufficient. Also the pedestrian facilities are to be improved too.

24.21 POWER

In the municipality most of the houses are electrified. Domestic fuel consumption stands high along the various types of power uses both in number of connections and consumption. Commercial use follows domestic use. Industrial or agricultural uses are not significant in the town. The use of non-conventional energy has not yet gained momentum and its use is seen along with conventional electrical energy only. LPG is the widely used domestic fuel. Fire wood also is used along with LPG in most of the houses. .

24.22 SOLID WASTE DISPOSAL

The municipality at present has a waste treatment plant. In this waste dumping yard only organic waste is treated to turn to manure while the plastic waste gets accumulated. Safe disposal system for non-biodegradable wastes need to be installed. In most cases its observed that most of the residents are depositing the domestic waste in their own land as plots are comparatively large. But in future this picture may change with further division of land which will follow urbanisation and people may resort to dumping waste in public places. It is expected that this present plant will be capable of processing the municipal waste provided the plant is modernized incorporating the latest technology in waste treatment process. The sanitary waste of the houses which at present does not create any pressure on the town may not cause any headache in near future also. An area of concern is the surface drainage carrying the waste of the street, commercial establishments, markets etc. discharging into the river and drains. An effective intervention for avoiding this, need to be tried.

24.23 EDUCATION

The town has a literacy rate higher than that of the district and the state as well. In the field of education generally private sector together with the aided once has dominance over other sectors like

govt or co-operative. At the school level the scenario is of a mixed kind with either the state or central syllabus followed in different schools and having run by aided, un-aided and govt sectors with the aided sector having a majority. Most schools follow state syllabus.

24.24 HEALTH

Thodupuzha is blessed with presence of good hospitals in both private and public sector. Private sector plays major role in both allopathic and ayurvedic streams of medicine. An established ayurvedic medicine manufacturing unit is also functioning in the municipality which has history of good quality ayurvedic treatment for about 3/4 century. In homeopathic side private clinics are the common ones. New hospitals of allopathy with super speciality standard are coming in and near the municipality which include a medical college. Going by the present strength in the infrastructure like road network and connectivity to settlements of the nearby districts and that most places of the district are in high ranges, the town which is at lower planes is expected to serve as a medical city in the coming future.

24.25 RECREATION

Only lower order recreational facilities are available in the town. Taking into account the fact that it is the only municipality and its status as a transit point to eastern regions of multiple tourism importance of the district and the scope for development in sectors of health, education, trade and commerce etc., the town needs more avenues of recreation and cultural activities. Need is felt for a stadium for sports, a large open ground etc. in addition to other recreational facilities of social life.

24.26 SOCIAL WELFARE & SECURITY

For the welfare of weaker section of the town more facilities are to be provided. In the changed social structure more attention is needed for the welfare of old age people. Projects have to be evolved for the economic development of women, scheduled caste and scheduled tribe people.

24.27 ENVIRONMENT

The town is experiencing various environmental issues, but in different magnitude. Since Thodupuzha comprising of considerably large extent of plantation and farm lands is on the threshold of fast development particularly due to the recent creation of a good network of roads, opening of new commercial establishments etc. care has to be given to see that the growth is environmentally sustainable. Priority has to be given for protection of environmentally sensitive areas, implementing harmless waste disposal systems, and protection of wet land and water bodies etc.

24.28 RESOURCES

The main sources of income of Thodupuzha municipality are municipal taxes, fees for various services, income from properties, government grant (plan fund), deposits and cess. It is seen that three major resources i.e. money, manpower and land are available in plenty. Agriculture is a dependable resource here, rubber being the major crop. Granite is the only mineral resource available, but due to the environmental implications quarrying has not been seriously attempted to.

24.29 URBAN GOVERNANCE

Thodupuzha municipality has major role in providing various infrastructure facilities and civic amenities to the people. It is a second grade municipality and the present staff pattern is inadequate considering the responsibilities, powers and assets transferred to the municipality. The total receipt of the municipality has been showing varying trend. The present municipal office building is not at all adequate for its smooth functioning and also for providing better service to the people.

24.30 INFERENCE

The spatial structure of the municipality displays a pattern with urban activities at the central core along the major travel corridors surrounded by residential activity. The agriculture activities including plantation are concentrated in the peripheral wards of the town. The few environmentally sensitive areas present in the town are scattered in all parts.

CHAPTER - 25
DEVELOPMENT VISION, GOALS AND OBJECTIVES

In this chapter, the development vision of the town and the development goals and objectives set to realise this vision are detailed.

The economic base of Thodupuzha municipality is multifaceted. Agriculture with trade and commerce act as the major sources of income while service sector also plays a very vital role. At present Thodupuzha is accommodates about 40% of district administrative offices. It is the biggest trade/commercial centre of Idukki and also ties with border region of Ernakulam district for consumer goods, textiles, construction materials and automobiles. The presence of educational facilities as well healthcare facilities in service sector is worth mentioning. It is a transit point towards eastern highland from border region of Ernakulam and Kottayam. The town is blessed with a well defined road network within the town and to outside with a presence of 5 state highways. Thodupuzha river originating as the tail race of Moolamattom power house that uses water from Idukki reservoir is a big boon to Thodupuzha. Also two main canals of MVIP viz., right bank and left bank pass through the south-western area. These water bodies can support industrial activities, promote agriculture, supply drinking water etc. Thodupuzha has high concentration of infrastructure facilities which coupled with availability of large tracts of land and abundant water indicates the scope for industrial development, tourism and education. The presence of tourist destinations like Thommankuthu waterfall, Malankara reservoir, Annamalai temple, Karikode Nainar masjid, Ilaveezha Poonchira in and around the town gives ample scope of tourism development too.

25.1 DEVELOPMENT VISION

With the foresaid blessings, resources and strengths the town possesses, the development vision of it has been arrived at as one consisting of

- Well defined road network having sufficient capacity to carry the traffic.
- Environment with ample greenery, unpolluted waterbodies, clean air, effecient and clean waste disposal system etc.
- Excellent service sector especially having good medical and educational facilities
- Effective programs to promote agriculture and tourism along with trade and commerce and to sustain the present role of town in the administrative sector.

25.2 DEVELOPMENT GOALS

Though Thodupuzha has resources (natural and man-made) for development they are either unutilized or under-utilized. So to utilize the natural resources in an appropriate way is one of the goals. Conservation of the natural features is an important need. This necessitates the conservation of the environmentally important area as one of the goals of the plan. In order to keep the impact of development activities on human settlements and environmentally sensitive areas, the least possible it is necessary to promote complementary activities and discourage the non-conforming activities through proper land use planning.

The study conducted in connection with the preparation of 'Urbanization Report Idukki' and the preparation of 'District Development Plan' has identified Thodupuzha as a first order settlement of the district. Hence developing Thodupuzha as one providing first order facilities that cater the surrounding panchayats is also required. Thus the development goals set are summarised as follows.

- To develop Thodupuzha as a regional centre of trade and commerce in the district
- To develop Thodupuzha as a centre of higher order health facilities of the district.
- To develop necessary facilities in all sectors so that the town carries out its role as first settlements of the district effectively.
- To protect/conserve the environmentally important areas.

25.3 DEVELOPMENT OBJECTIVES

In order to achieve the first goal, the following are the objectives:

- Renovation and expansion of the existing market.
- Develop trading facilities for rubber products and hill produces.
- Promote the marketing and export of value added products of fruits especially Pineapple.

To promote higher order health care facilities the following objectives are proposed:

- Improve facilities in taluk hospital and introduce more super specialty facilities.
- Promote private ayurvedic centres as part of health tourism; develop yoga centres, health clinics, counselling centres with facilities for exercise/upkeep of mind and body.

To achieve the third goal i.e. developing facilities in all sectors the following objectives are proposed:

- Develop various higher order facilities to cater the service demands of the region.
- Improve the road net work of the town so as to ensure better regional connectivity.
- Improve the traffic and transportation facilities in central area of the town aiming at the decongestion of central area and to ensure the free flow of traffic.
- Improve other infrastructure facilities like drinking water, waste disposal, housing etc

To achieve the fourth goal i.e. to protect and conserve the environmentally important areas the following objectives are aimed at:

- Protect all natural drains, ponds, sacred groves etc.
- Conserve the paddy lands.

CHAPTER - 26
DEVELOPMENT CONCEPT

The development concept is evolved based on the development objectives, which is derived from the problems and potentials of the planning area as obtained from the conclusions and recommendations of the sectoral studies. The development concept of Thodupuzha is briefed here.

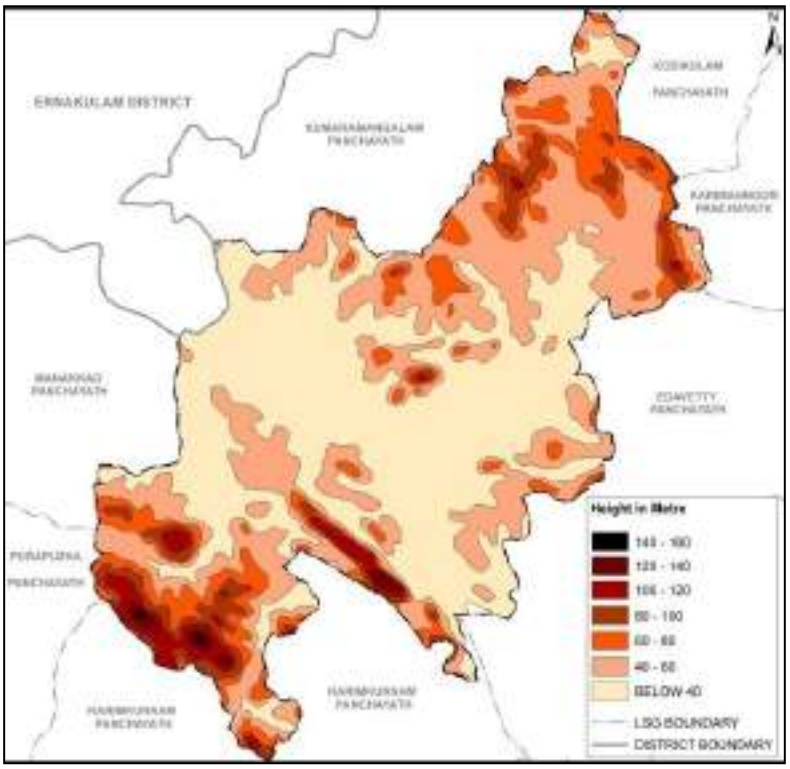
As already discussed in previous chapters the economic base of Thodupuzha town is trade and commerce along with agriculture and allied activities. Thodupuzha is the main commercial centre of the district. It is attempted to discuss the development concept of Thodupuzha based on the spatial structure of the town.

26.1 SPATIAL STRUCTURE

The spatial structure of area is determined by the topography, existing spatial distribution of activities, transportation network as well as the environmentally sensitive areas of that area.

26.1.1 Topography

Map No 26.1 describes the elevation of different areas of Thodupuzha municipal area. It can be observed that most of the areas have altitude below 40 especially at the central area of the town. It points to availability of land for urban developments in that area.

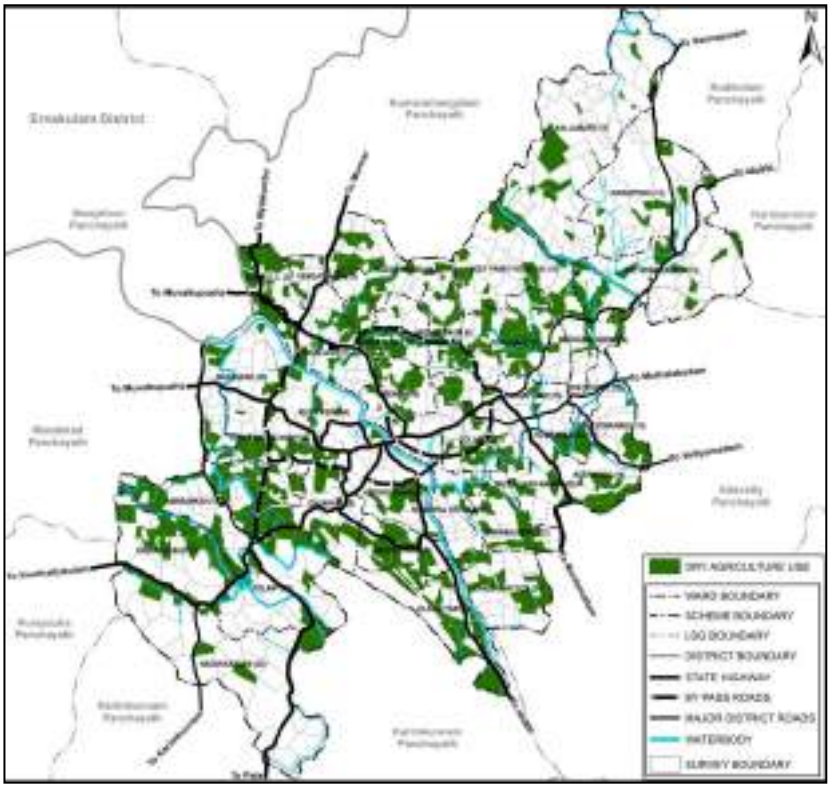


Map No.26.1: Physiography

26.1.2 Spatial distribution of activities

The study of agricultural land use and residential land use and their distribution shows that the agricultural areas and developed areas consisting of residential areas and commercial areas are situated in a mutually exclusive manner as seen in Map No 26.2, 26.3 and 26.4. The commercial areas are particularly seen along the major roads in the town.

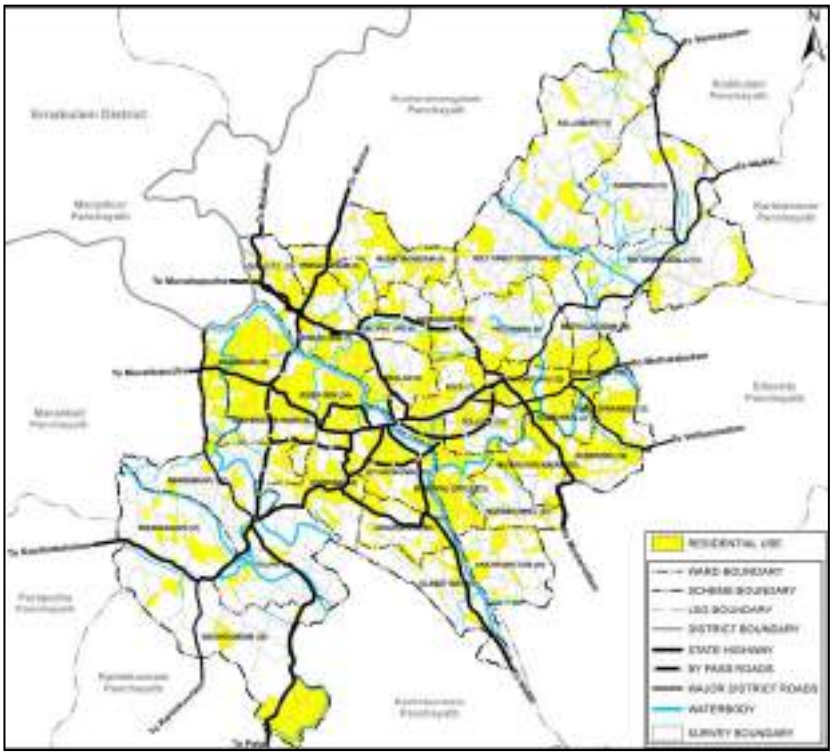
Integrating the above, the spatial distribution of major development activities of the town is arrived which is shown in Map No 26.5.



Map No.26.2: Spatial distribution of agricultural landuse

26.1.3 Environmentally sensitive areas and heritage sites

In Thodupuzha, the environmentally sensitive areas inc lude the scattered paddy fields, water bodies and sacred groves (Amaramkavu). There are a few age-old temples, mosques and churches of heritage value present in the town. The distribution of paddy fields is shown in Map No 26.6. Location of the heritage sites and sacred groves which are ecologically important are shown in Map No 26.7.

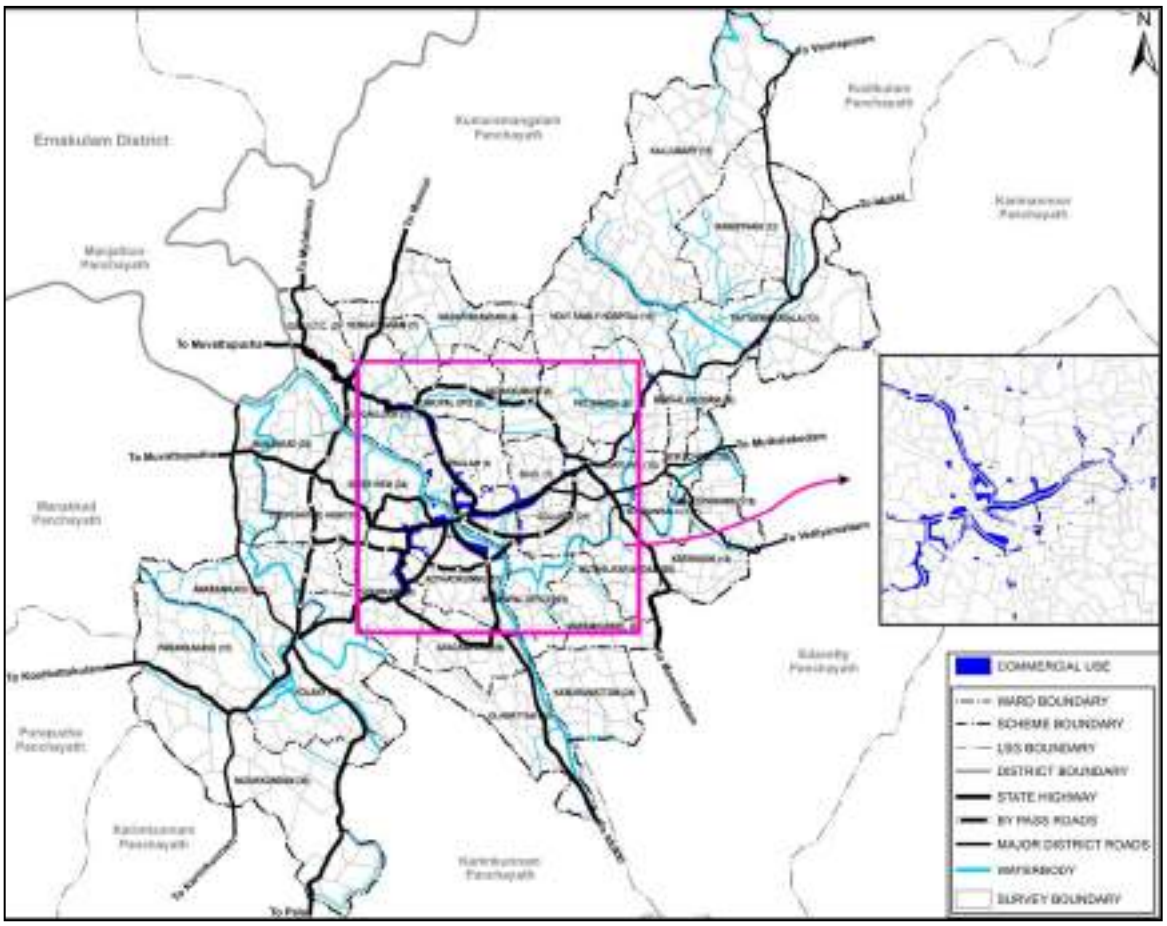


Map No.26.3: Spatial distribution of residential landuse

26.1.4 Distribution of population

There is a concentration of population in the wards situated along the important roads in Thodupuzha town viz. Punaloor-Muvattupuzha road, Thodupuzha- Puliyanmala road, Thodupuzha-Velliyamattom road,

Thodupuzha-Nedumbassery road etc. The following wards viz. Guru ITC ward, B.H.S ward, College ward, Arackapara ward and Ambalam ward hold the majority of the population. The distribution of density of population is shown in Map No 26.8.



Map No.26.4: Spatial distribution of commercial landuse

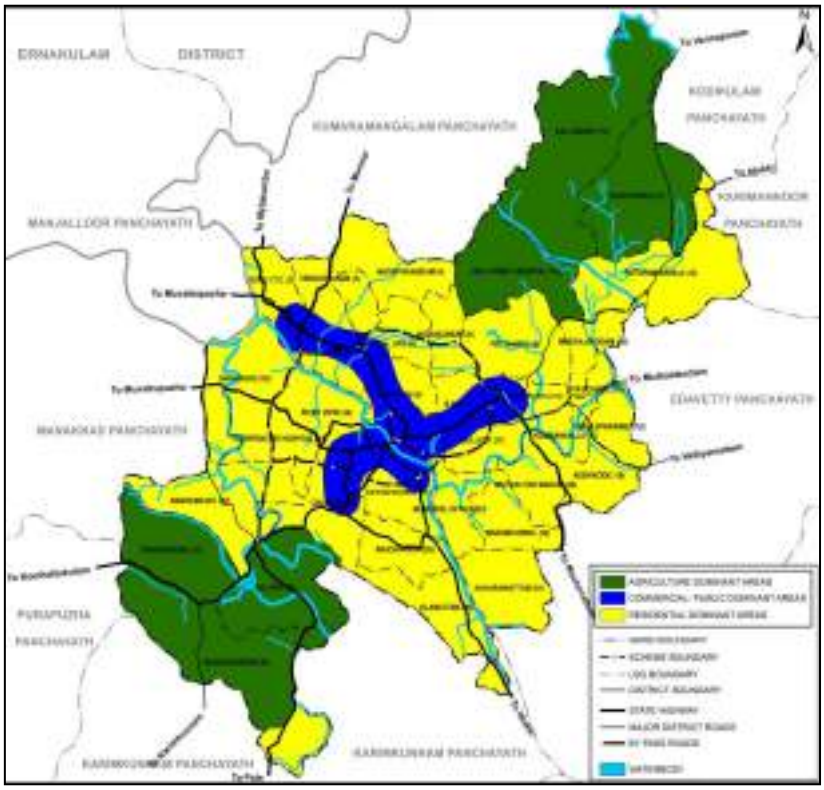
26.1.5 Hierarchy of nodes

Private bus stand area, Vengalloor junction area, Mangattukavala area, Civil station area and Ambalam bypass Muvattupuzha road junctions are having higher order in the existing hierarchy of nodes. In the proposed hierarchy private bus stand area, Kolani, Vengalloor and Mangattukavala are proposed as first order nodes. These nodes fall in the ring road of the town that has already been formed. Kolani though not qualify for a higher order node in the existing hierarchy is having great potential being placed in the bypass of Punaloor-Muvattupuzha road and also at the meeting point of Koothattukulam road. Karikode area, Gandhi square area, Pulimoodu junction area, KSRTC junction area, Kanjiramattam area and Continental junction area are proposed as second order nodes. The proposed nodes of the town are shown in the Map No 26.9.

26.1.6 Proposed road network

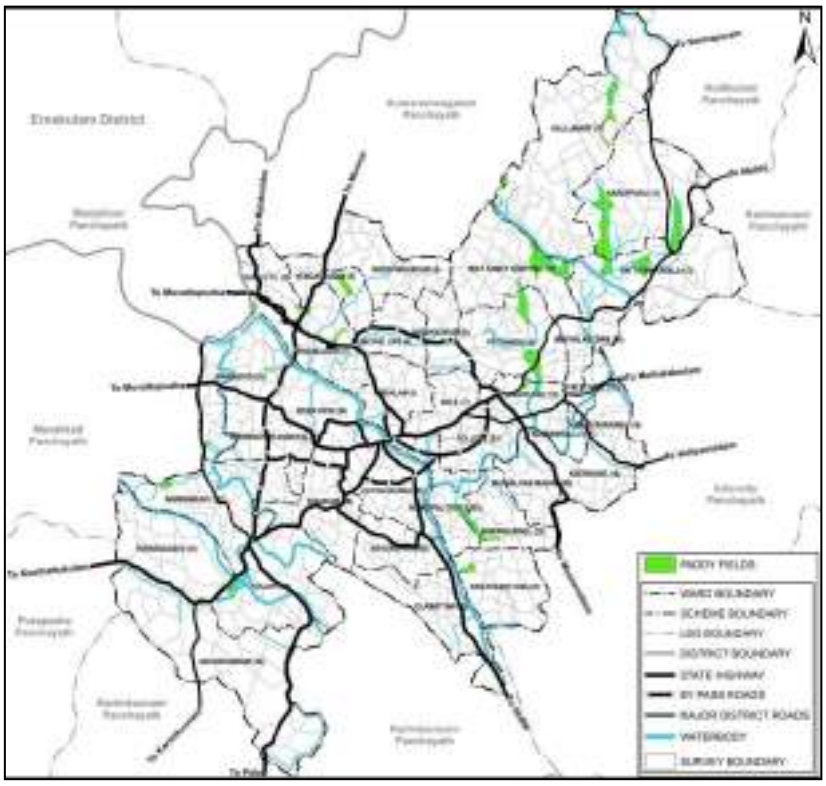
The layout of proposed roads depends upon the proposed developments and distribution of

population. Also the projected traffic volume based on the study of traffic and transportation determines the standards to be set for the proposed roads. The regional connectivity also has bearing on the proposed network. The concept of road network of the town is shown in Map No 26.10.



Map No.26.5: Spatial distribution of development activities

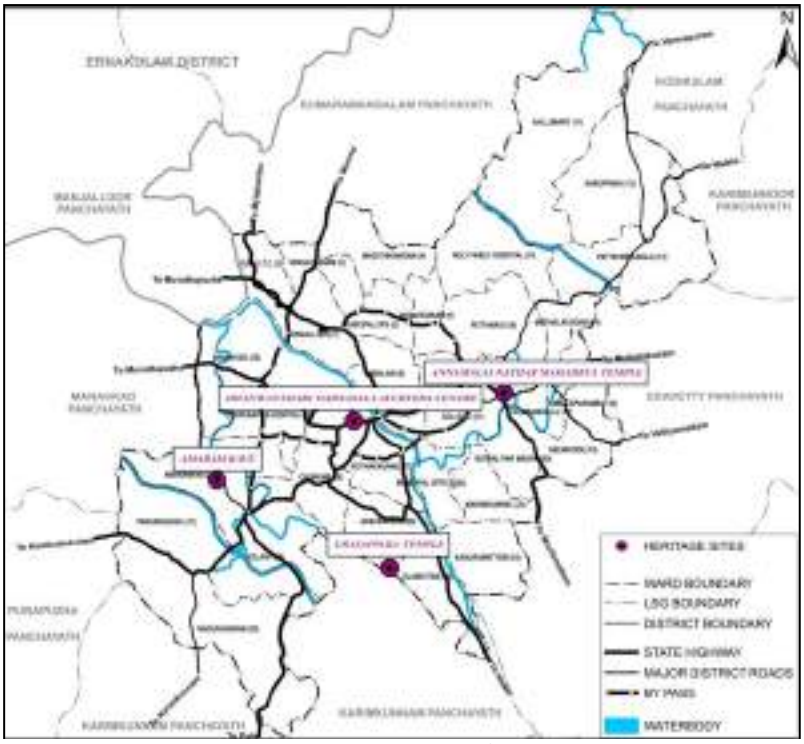
By the integration of all the components described above the spatial structure of Thodupuzha municipal area can be determined. The evolution is shown in Map No 26.11. The spatial structure outlines the activity pattern of different locations in the town, besides suggesting the proposed road network.



Map No.26.6: Spatial distribution of paddy fields

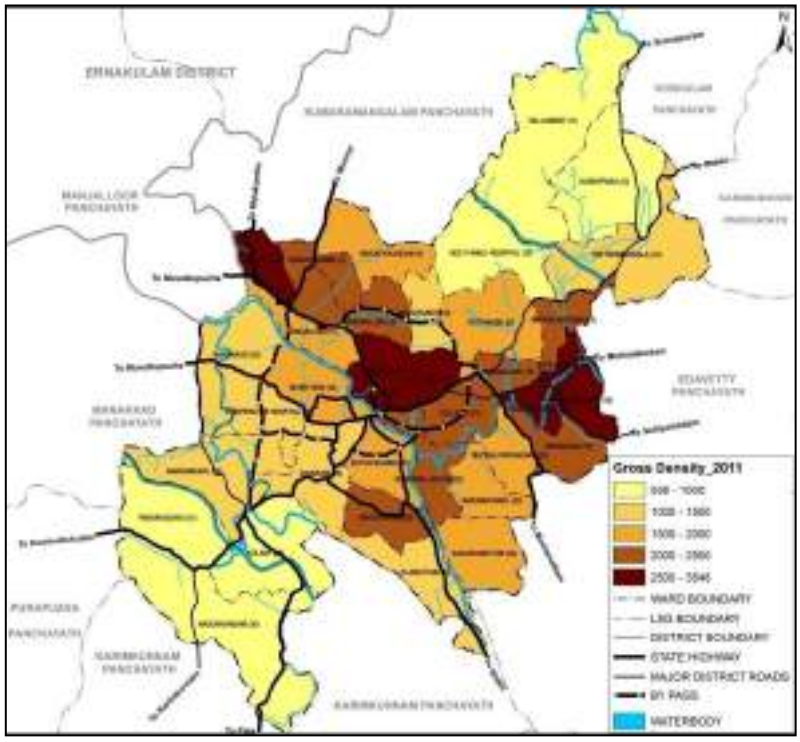
A concentration of residential use is observed in the wards of Maramkunnel, Riverview, Manakkad, B.H.S, C-operative hospital and Kothayikunnu. The wards having concentration of agricultural use are Kallumary, Karuppara, Pattayam kavala, Kanjiramattom, Colony and Parakadavu. The environmentally sensitive

areas which mainly consist of paddy fields as scattered. The commercial and public activities are concentrated in the wards of Vengalloor, Ambalam, River view, Chunkam, Kothayikunnu, BHS, College and Undaplavu which are situated along the major travel corridors. Higher order commercial nodes are situated in these areas.



Map No.26.7: Spatial distribution of heritage sites

The future commercial development also will be around at these places. As regards the proposed road network Punaloor - Muvattupuzha road, Thodupuzha - Puliyanmala road and some link roads are to be elevated to higher order status and other roads with second order status. There is having high concentration of population to be retained as residential areas. The spatial structure thus arrived at is shown in Map No 26.12.

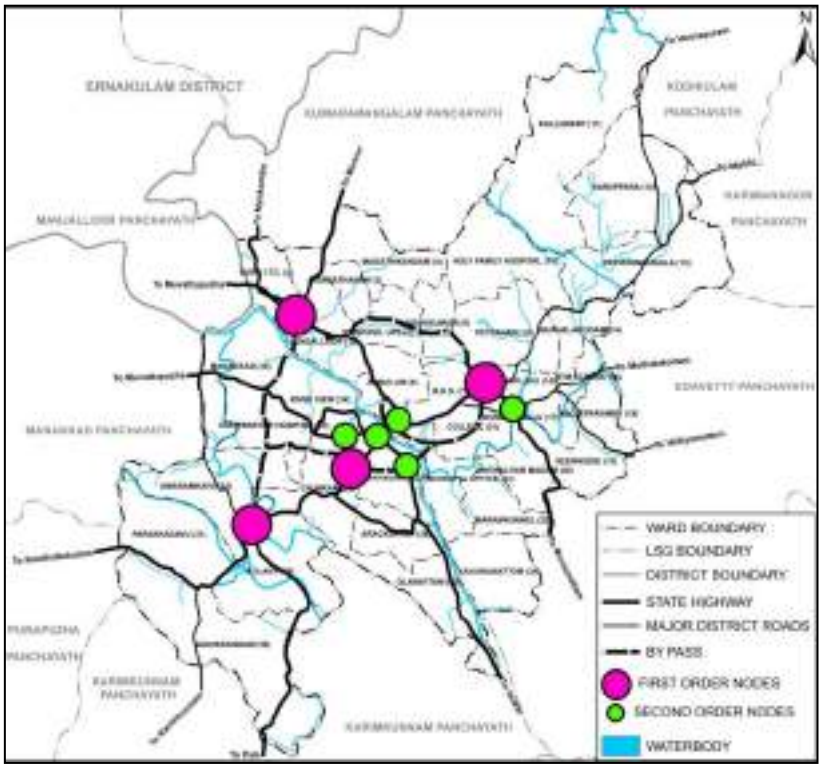


Map No.26.8: Gross population density

26.2 DEVELOPMENT CONCEPT

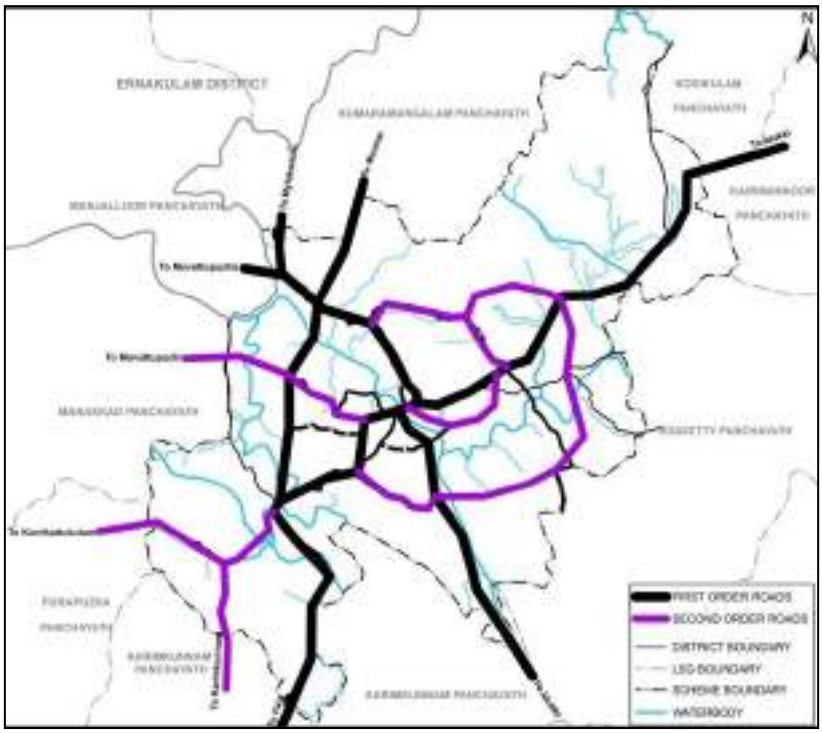
The development concept of the municipal area has now to be finalized taking in to account the spatial structure evolved along with the influence of the sectors which play dominant roles in the economy and life of the people of the town together with following factors.

1. *Strategic importance of the town in terms of taluk head quarter and statutory urban centre as well as 1st order settlement of the hill paradise 'Idukki district', internationally emerging tourist destination.*
2. *The strategic location of the town in terms of regional connectivity and the gate way to Idukki district and renowned tourist destinations.*



Map No.26.9: Hierarchy of nodes

3. *Not only the unique topography, salubrious climate and environment of the town but also the wider region (i.e. the district).*
4. *The unique and critical character of the town that the high density settlement area (within the region) having uni-mode transportation connectivity surrounded with vast agriculture land (dry and wet).*
5. *Importance of the Thodupuzha in terms of market town to cater the marketing demand of wider resourceful influence region.*



Map No.26.10: Conceptual road network

6. *The blessed primary sector (agriculture & animal husbandry) resource base of the town and its influence region.*

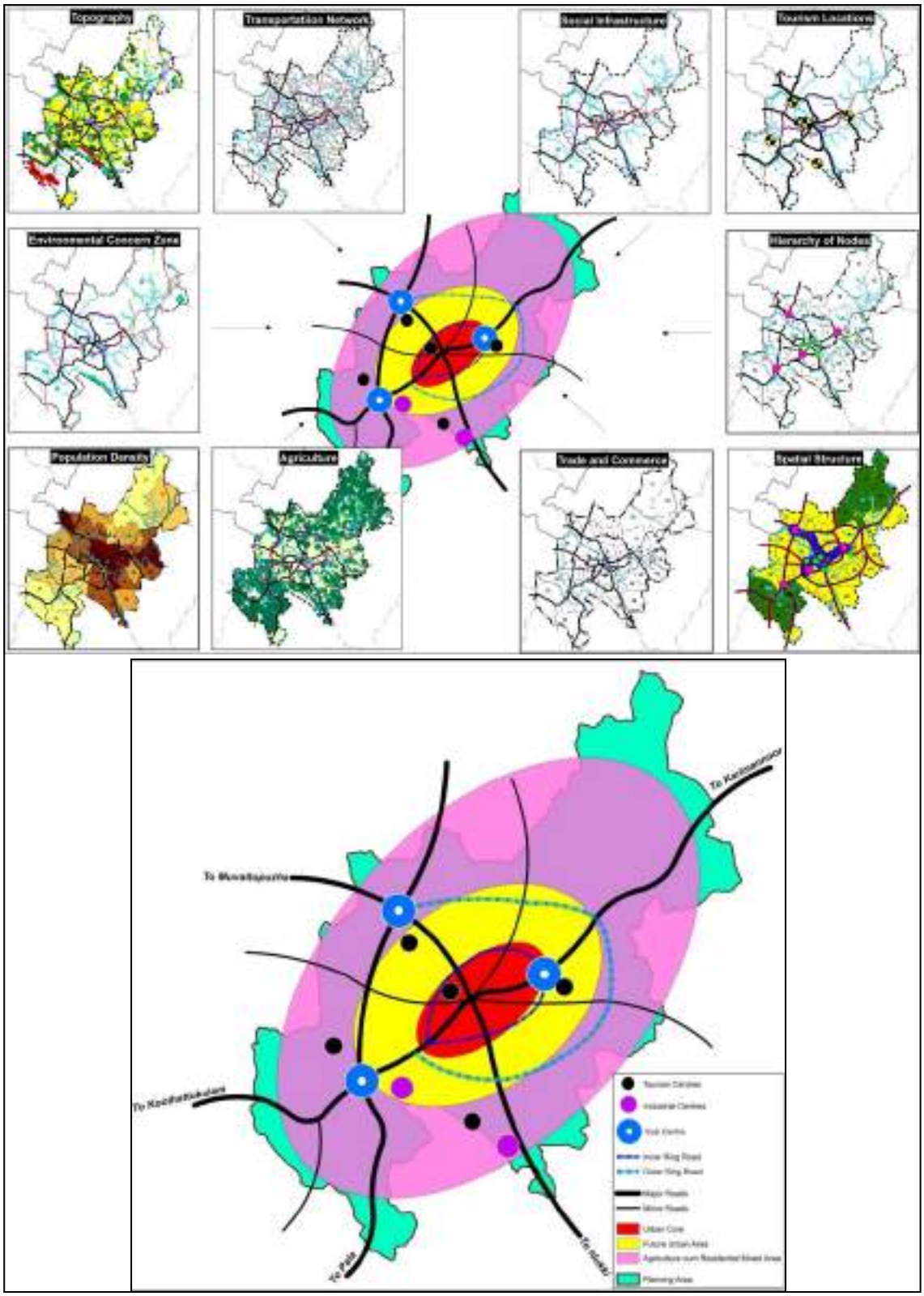
7. *To arrest the present undesirable transportation corridor based ribbon development of the town and to contain the urban core and laterally shift the direction of development to the extend possible so as to preserve the primary sector activity of the town with ultimate aim to protect the environment, agro based, local economy and topography.*
8. *Facilitate the bypass through passenger and goods traffic and to avoid congested traffic stretches in the core area.*
9. *Provision of taluk level higher order facilities (social & physical infrastructure) to cater the demand of its influence region.*
10. *Presence of renowned higher order educational institutions (New man college, DIET,….) and possibility of utilizing the unique resource base for specialized national level education centers and to serve as the education hub of the district.*
11. *Potential to serve as a tourism facilitation base town to enhance the potential trade mark of Idukki as international tourist destination.*
12. *Potential of resource based agro allied industrial activity to ensure the value addition of resource base.*
13. *Potential of MSME sector with focus on art & craft, rubber based, food processing, value addition of forest products, tourism activities, hill products etc. together with potential on IT.*
14. *Potential in trade & commerce not only in terms of taluk head quarter but also in terms of agro & allied resource base, traditional market town & tourism facilitation centre.*
15. *Primacy of the Thodupuzha town for provision of services to its surrounding local bodies.*
16. *Presence of floating population in the town.*

The importance of Thodupuzha as the trade and commerce centre of the district, its dominance in the field of education and health facilities, the economy of agro-allied sectors including animal husbandry, importance as a transit point towards major tourism destination of the region and the district are the major factors influencing the future development. Small-scale industries will also have a say in the future development. That this town still homes many administrative establishments of regional and district level need also to be considered. The development concept of Thodupuzha is shown in Map No 26.13 and 26.14.

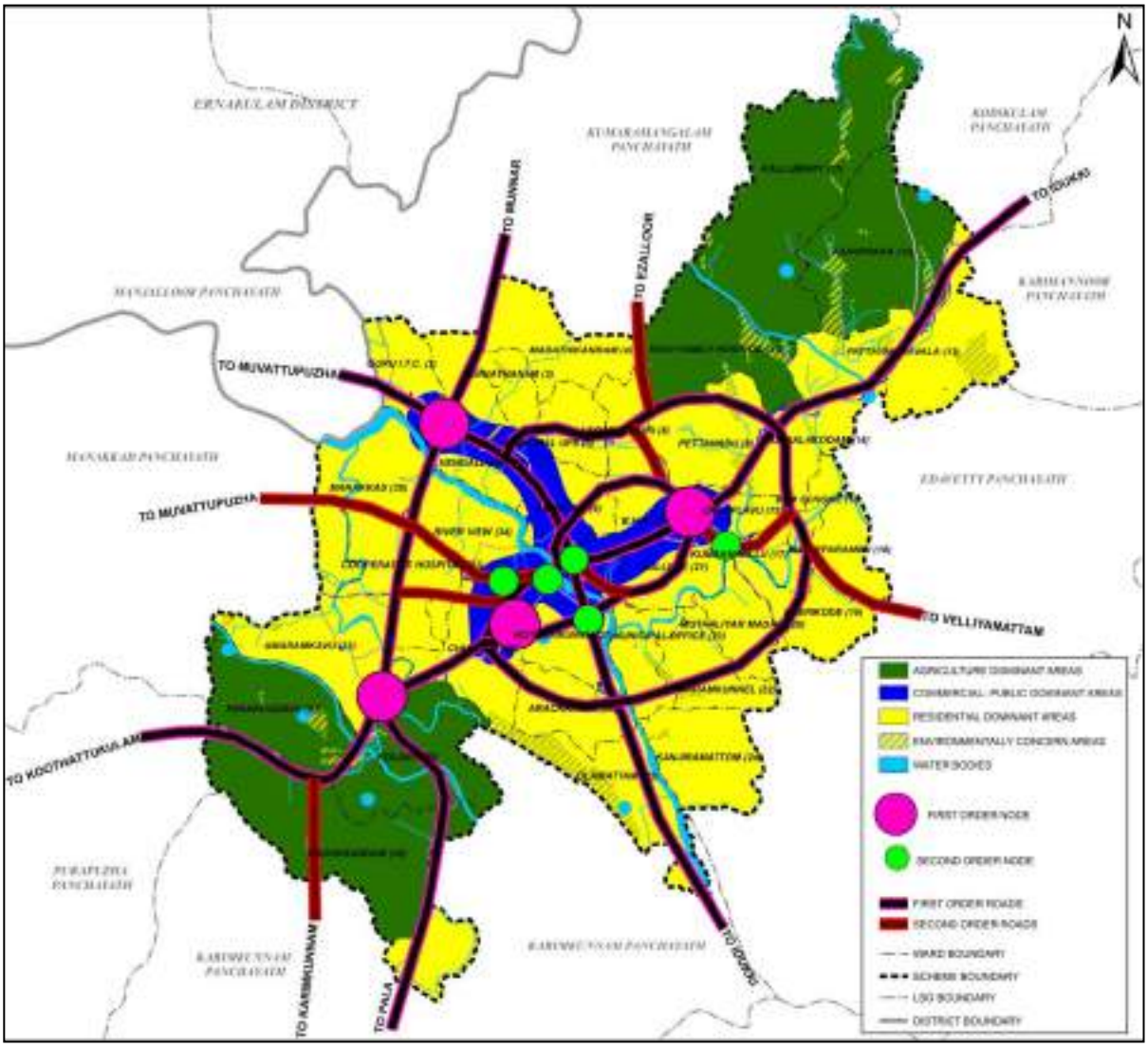
Based on the above factors the development concept of Thodupuzha has been evolved with the main features as follows:

- Give the inputs required for the sustainable growth of the town as the trade and commerce centre of the region.
- Supplement the sectors of education and health with the infrastructure required them.
- The identified intensive agriculture areas at the periphery to be retained as such.
- Provide infrastructure needed to take advantage of the town's role as a transit point to the tourism destinations.

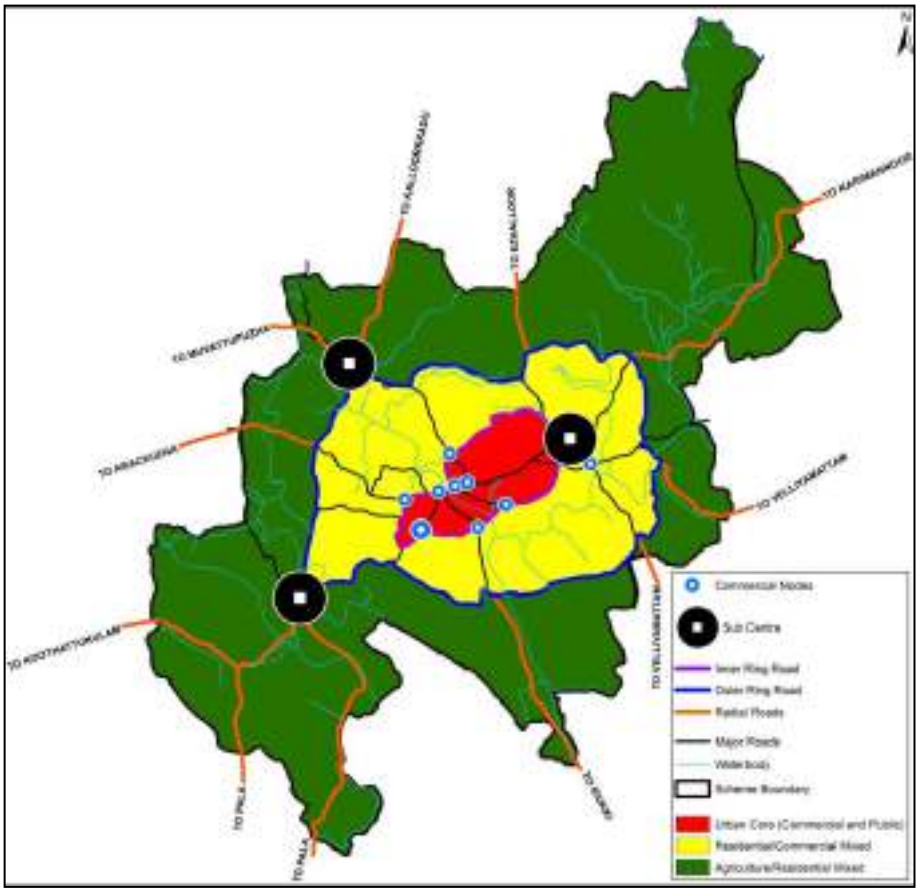
- Since land with relatively low residential density is available explore scope of promoting small scale industrial units in such areas.
- Provide infrastructural requirements to support the administrative establishments.
- Take measures to protect environmentally sensitive areas/heritage precincts.



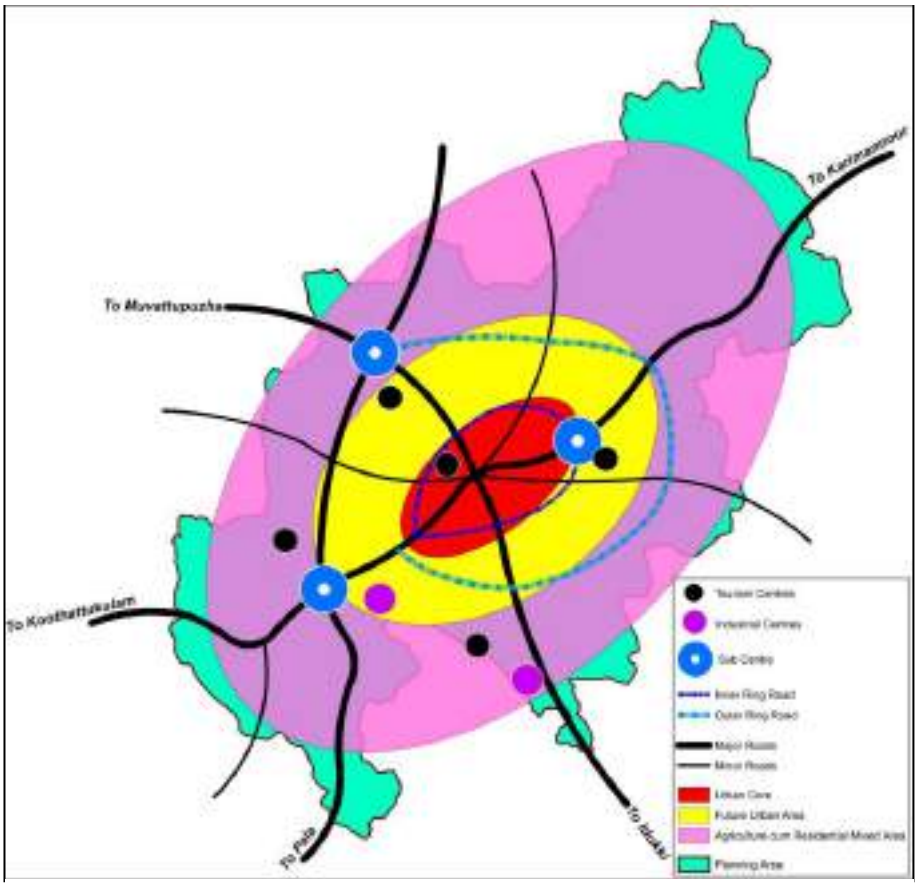
Map No.26.11: Evolution of spatial structure



Map No.26.12: Proposed spatial structure



Map No 26.13: Evolution of development concept



Map No 26.14: The development concept

CHAPTER - 27
DEVELOPMENT POLICIES AND STRATEGIES

27.1 INTRODUCTION

Following the evolution of development concept based on the analysis of various sectors and aspects of development of the town development policies and strategies have to be formulated so that the development concept is materialised. Here the development policy, both general and sector wise, for a plan period of 20 years is being discussed in this chapter.

27.2 GENERAL DEVELOPMENT POLICY

The general development policy may be detailed as below.

- Trade and commerce has been identified as one of the major activities of the town. Develop Thodupuzha as a major market centre of the region. Also develop Thodupuzha as a market centre of the local agriculture produces.
- Agriculture and animal husbandry has been identified as another major economic activity of the town. Projects for promoting both these sectors need to be identified so that maximum production of food crops and cash crops is achieved along with self sufficiency in the production of vegetables, milk, egg, meat etc. to the extent possible.
- Develop I.T. establishments, apparel units and S.S.I units utilizing the raw materials especially, the locally available agro based products. Develop Thodupuzha as a tourist transit point considering its location importance.
- Develop Thodupuzha as an administrative centre and as a first order settlement in the district, by providing required facilities.
- Provide better service facilities to the people by provision of better health services, quality education, power, water and various infrastructure facilities.
- Ensure protection of environment along with the general development of the town.

27.3 SECTORAL DEVELOPMENT POLICIES AND STRATEGIES

The sector wise policies and strategies for the major sectors identified for Thodupuzha town is furnished below.

27.3.1 Trade and commerce

Policy:

Improve the trade and commerce sector especially for making available marketing facilities

for local products.

Strategies:

- ✓ Improve the condition of the municipal markets.
- ✓ Revive the old Chanthakunnu market.
- ✓ Extension of commercial area and providing connected facilities like parking place, drainage, waste disposal system etc.
- ✓ Provision of facilities for informal sector.
- ✓ Establishment of new commercial complexes by town and other agencies.
- ✓ Provision of parking areas in market places and commercial areas.
- ✓ Provide market facilities for locally produced value added products and agriculture products.

27.3.2 Industrial sector

Policy :

Development policy is to establish industrial units for value addition of locally available resources and diversification of industrial activities by promoting IT establishments, apparel units etc.

Strategies:

- ➢ Promote agro based industrial units (rubber, jack fruits etc.).
- ➢ Promote building material units, utilizing the raw materials like granite available in the hinder land.
- ➢ Promotion of small I.T. establishments.
- ➢ Provision of infrastructure facilities like road, telecommunication facilities.
- ➢ Marketing facilities for the value added products.
- ➢ Industrial units for socially and economically weaker sections and industrial units under social organizations like Kudumbasree.

27.3.3 Heritage and tourism

Policy:

Considering the location importance of the town, develop Thodupuzha as a tourist transit centre and conservation of heritage buildings and places of the town.

Strategies:

- ➢ Provide support facilities for tourists.

- Form a tourist circuit with Thodupuzha as transit centre and connecting with adjacent tourist places.
- Maximum utilization of existing potentials.
- Provide facilities for Sabarimala pilgrims.
- Conservation of buildings/ precincts which have heritage value.

27.3.4 Agriculture sector

Policy:

Strengthening the economic base of the town through strengthening the agricultural sector.

Strategies:

- Promotion of homestead cultivation.
- Promoting organic farming and usage of bio-fertilizer agriculture activity, the solid waste may be converted in to bio-fertilizer.
- Priority for cultivation of vegetables.
- Retain the paddy fields through promotion of paddy cultivation by adopting suitable practices to maximize productivity.
- Utilize the potential of available markets for selling of agriculture products.
- Promotion of units for the value addition of agriculture products.

27.3.5 Animal husbandry sector

Policy:

Make animal husbandry as profitable and achieve self sufficiency in the production of milk, meat and egg to the extent possible by proper integration of agriculture and animal husbandry sector.

Strategies:

- Establish more dairy, goat and poultry farms and increase productivity through scientific methods.
- Provision of basic infrastructure facilities like offices for veterinary clinics, slaughter house etc.
- Providing animal welfare.

27.3.6 Housing

Policy:

Provision of houses for the newly added population, improvement of structural condition of houses of economically weaker sections and improvement of housing quality of colonies.

Strategies:

- Provide adequate residential areas in land use plan.
- Colony rehabilitation and improvement under different programmes.
- Provision of basic infrastructure like quality roads, street lights, recreational facilities, drainage etc. in residential areas.

27.3.7 Drinking water

Policy:

Ensure drinking water of required standard throughout the day for all households of the town. Increase the coverage of protected water supply system. Also provide sufficient water to the commercial and industrial establishments.

Strategies:

- Extension of water supply pipe lines to more areas.
- Provision of separate water distribution system for elevated area.
- Replacement of damaged pipe lines and fittings.
- Conservation of paddy fields and ponds for recharging the ground water sources.
- Promote water harvesting.

27.3.8 Transportation

Policy:

Provide an efficient road network, considering the traffic need of the town, connecting the various activities of the town and also considering the proposals of district road network.

Strategies:

- Developing a hierarchical system of road network.
- Providing new road links for diverting traffic in the central area.
- Provision of parking facilities.
- Provision of pedestrian facilities.

27.3.9 Power

Policy:

Provide quality power to the existing consumers and ensure quality power for the new establishments. Provide a good street light system for the town.

Strategies:

- Provide uninterrupted power supply.
- Provide a good street light system for the town.
- Electrification of the houses of socially and economically weaker section.
- Adoption of non-conventional source of energy to the extent possible.

27.3.10 Waste disposal and drainage

Policy:

Improve the system of collection, conveyance and disposal of generated waste and provide a hygienic environment. Maintain the habitable area free from flooding.

Strategies:

- Strengthening the present collection system with additional labours, vehicles etc.
- Expansion of present waste disposal area with more effective mechanism for waste disposal.
- Extension of waste collection system to more area with people's participation.
- Bio-fertilizer manufacturing units.
- New public comfort stations.
- Maintenance of existing road side drains and natural drains to avoid flooding.

27.3.11 Education

Policy:

Improve the general education status of the town and diversification of courses in higher education sector so as to develop Thodupuzha as an education centre catering the need of surrounding areas.

Strategies:

- Provide adequate infrastructural facilities for general education institutions in government and aided sector.
- Modernization of educational institutions with facilities like smart classes, language labs etc.
- Utilize the unutilized potentials, including land for starting new institutions/courses.

- Provide supporting facilities like hostels, libraries, sports complexes and career development programmes.

27.3.12 Health

Policy:

Improve the general health condition of the people by preventive measures. Provide modern health facilities to cater the needs of people of Thodupuzha as well as surrounding grama panchayats. Provide quality treatment through three systems of medicines.

Strategies:

- Provide all necessary departments with equipments and super specialty facilities at Thodupuzha taluk hospital.
- Provide infrastructural facilities for Indian System of Medicine and Homeopathic Medicine System.
- Conduct health awareness programmes.
- Provide centre for care of aged people, disabled children etc.

27.3.13 Civic amenities and recreation facilities

Policy:

Provide civic amenities and recreational facilities as per standard considering the resident as well as floating population.

Strategies:

- Provide new parks and open spaces at town level and local level.
- Improvement of existing recreational facilities.
- Improvement of the existing libraries and provision of modern facilities.
- Construction of a crematorium.

27.3.14 Environment

Policy:

To make Thodupuzha an eco-friendly, hygienic and aesthetically pleasing town by reducing pollution, improving and protecting environmentally sensitive areas.

Strategies:

- Conservation of wet lands and water bodies.
- Conservation of identified heritage precincts and sacred grooves.

- Provide effective solid waste management.
- Improve aesthetics of the town through various efforts like planned street scape, organized open space etc.

CHAPTER - 28
PROJECTED REQUIREMENTS

28.1 INTRODUCTION

The developments envisaged in the town through the development concept will increase the job opportunities and population of Thodupuzha town. Trade and commerce, agriculture and animal husbandry, small scale industries and tourism are the activities envisaged in the development concept. In addition to that Thodupuzha is proposed as a first order settlement in the district and the facilities in this regard has to be provided and this will create job opportunities especially in service sector.

28.2 CHANGES IN OCCUPATIONAL STRUCTURE

Change in occupational structure will mostly depend in the change in economic activities of the area. Thodupuzha being developed as a market town, the predominant activity of the town is tertiary activity and 88.78% of workers are engaged in tertiary sector. In the development concept trade and commerce has taken as a major activity for the future and more job opportunity is expected from this sector. Another feature of the town is that nearly 60% of the land of the town is under agriculture land use and 9.66% of workers are engaged in primary sector activities. Hence there is scope for developing agriculture activity, particularly homestead cultivation and allied activities. Only of 1.56% workers are engaged in secondary sector activities. In the development concept, being an urban area more emphasis has been given for industrial development, particularly through small scale industrial units.

Also Thodupuzha is an administrative centre and additional facilities have to be provided in this regard. Proposals in this regard will create additional job opportunities especially in tertiary sector. The details of calculation of estimated additional job opportunities created by the year 2031 are furnished below. Details are also furnished in Annexure 28.1.

(a) Agriculture and allied sector

(i) Cultivators

Approximate number of homesteads available for homestead cultivation (derived from existing land use)	--	1361
Number of cultivators (2011)	--	559

Approximate number of persons attracted for homestead

type of cultivation -- 250

Total cultivators 2031 -- 809

(ii) Agriculture Labourers

As per the economic review 2003, a home stead cultivation in an area of 0.25 Ha will create one man day.

Area available for homestead cultivation (approximately) -- 150 Ha

Number of jobs created in agriculture and animal husbandry -- 600

Number of agriculture labourers (2011) -- 981

Total agriculture labourers by 2031 -- 1581

(b) At present the number of persons engaged in **secondary sector** is very low. It is expected to increase the number of industrial workers double by 2031.

People who are working in industrial sector (2011) -- 249

The proposed workers in household hold industry by 2031 -- 249x2 =498

(c) Development in industry, tourism and elevation of Thodupuzha as a second order settlement will increase the job opportunities in **other sector**. It is expected to increase the opportunities by 40% in this sector.

People who are engaged in other sector at present (2011) -- 14147

Total number of workers in other sector by 2031 -- 19806

The expected changes in occupational structure by 2031 is given in Table 28.1

The change in occupational structure of Thodupuzha town is shown in Figure No 28.1

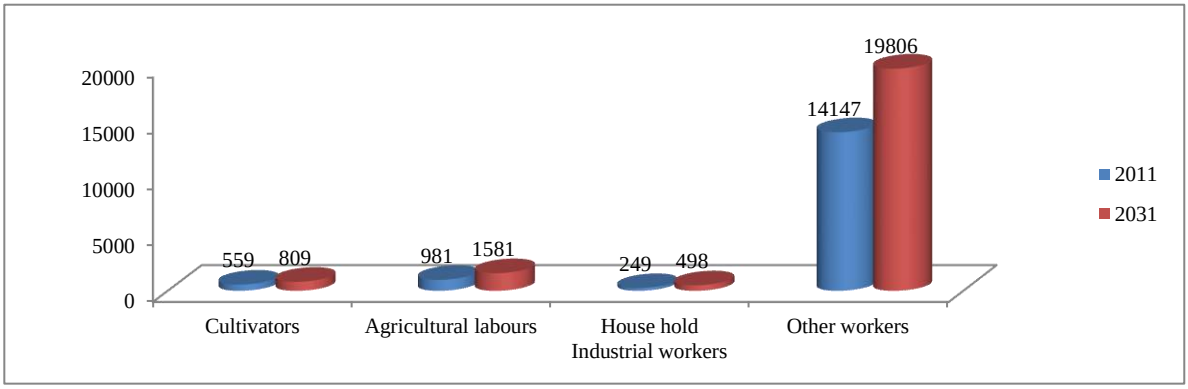


Fig. No.28.1: Expected changes in occupational structure

Sl.No.	Category	2011	2031
1	Cultivators	559	809
2	Agriculture labourers	981	1581
3	House Hold Industrial workers	249	498
4	Other workers	14147	19806

Table No.28.1: Expected changes in occupational structure

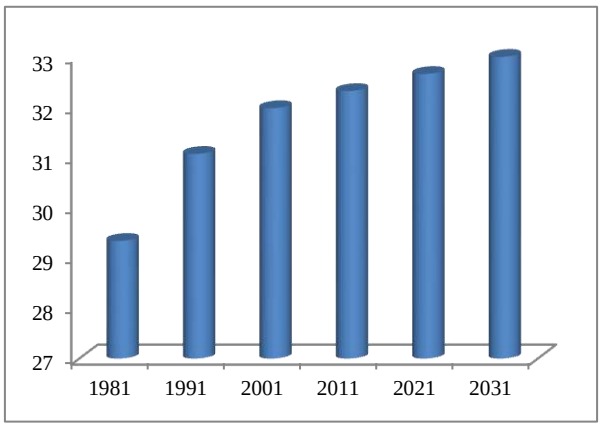


Fig. No.28.2: Expected work participation rate

The Work Participation Rate of Thodupuzha as per 2001 census is 34.07%. As per UDPFI guide lines, for a municipal area, the minimum work participation rate shall be 33%. Based on this the work participation rate of Thodupuzha for the year 2031 is adopted as 33%. The increase in work participation rate is shown in Figure No 28.2.

28.3 EXPECTED FUTURE POPULATION

The population projection for 2021 and 2031 of the municipal area are made by assuming that same trend in the population growth continues. The population is projected by four methods and the average of the four is taken to arrive at the population figures in , 2021 and 2031.

The following methods were used.

a. Arithmetical method

b. Geometrical increase method

c. Decreasing rate method

d. Apportionment method

28.3.1 Arithmetic method

This method is based on the assumption that the increase in population is constant. In this method, the average increase of population for the last three or four decades is worked out and then for each successive future decade, this average is added. This method gives low results, as such is applied for old and large cities. The population at the end of 'n' years or decades is calculated by the equation.

Year	Projected population
2021	57479
2031	62913

$P_n = P + ni$

Where, P_n = Population at the end of 'n' years or decades

P = Present population

I = Average increased per year or decade

28.3.2 Geometrical increase method

In this method the percentage increase in population from decade to decade remains constant. From the available census records, this percentage is fixed and then population of each future successive decade is worked out. This method gives high values and is applied to young and rapidly growing cities. Thus, the population at the end of 'n' years or decades is given as,

Year	Expected population
2021	58988
2031	65931

$P_n = p\ (1+r/100)\ n$

Where r = Average increase per decade

28.3.3 Decreasing rate method

In this method it is assumed that rate of percentage increase decreases and the average decrease in the rate of growth is calculated. Then the percentage increase is modified by deducting the decrease in rate of growth. This method is applicable only in such cases where the rate of growth of population shows a downward trend. By this method, the population growth rate of 2011, 2021 and 2031 are calculated by assuming that the same percentage decrease in population growth prevails as that of 2001 for the succeeding decades.

Decrease rate method			
Year	**PPN**	**PPN G.R**	**% Decrease in G.R**
1981	35743		
1991	40666	13.77	
2001	46246	13.72	-0.36
2011	52045	12.54	-8.60
2021	58009	11.46	-8.60
2031	64083	10.47	-8.60

28.3.4 Apportionment method

In this method, the ratio of the municipal population to the district population is found out and the same is projected to the next decades by assuming the change in ratio during 2001-2011, 2011-2021 and 2021- 2031 is same the value as that during 2001-2011.

Year	Total population		Ratio of municipal population to district population	Change in the ratio
	Idukki	Thodupuzha		
	x	y	y/x	
1981	971636	35743	0.0368	
1991	1078066	40666	0.0377	0.0009
2001	1129221	46246	0.0410	0.0032
2011	1108974	52045	0.0469	0.0059
2021	1031196	54486	0.0528	0.0059
2031	976596	57363	0.0587	0.0059

The projected total population by the above-mentioned methods differs slightly. The average of these four projected values is taken as the population figures of the Thodupuzha municipal area.

SL.NO	Method adopted	Total population	
		2021	2031
1	Arithmetic method	57479	62913
2	Geometric method	58988	65931
3	Decreasing rate method	58009	64083
4	Apportionment method	54486	57363
	Average projected population	**57241**	**62573**

28.4 HOUSING AND SHELTER

While dealing with housing, it is first necessary to distinguish between housing need and housing demand. Whereas the need refers to inadequacy of existing provisions when compared with socially acceptable norms, demand is an economic concept, wherein standard and amount of housing demand is related to household's income and ability to pay. Both housing need and demand are affected by factors such as housing shortage and rate of obsolescence, whereas demand would be additionally affected by affordability and future housing needs. Future need of housing is assessed based on the following criteria.

- Structural condition of buildings.
- Squatter settlements.
- Housing for the additional households.

As per census 2011 the total number of households in the town is 12604 while the total number of houses is 12332. So there is a shortage of 272 houses. Also it is seen that out of 12332 residential buildings in the town 71 (0.53%) residential buildings are kutcha buildings and huts and require immediate upgradation. The projected population of Thodupuzha town by 2031 is 62573. So an additional population of 10528 has to be accommodated in the town. Approximately additional number of 3115 new houses is to be constructed in the next twenty years. Considering the above three factors approximately 3387 additional houses are needed by 2031.

28.5 DRINKING WATER

The steps adopted for the estimation of requirement of drinking water for the year 2031 is furnished below.

Projected population (2031) -- 62573

Per capita domestic water demand as per standards -- 135 lpcd

As per socio-economic survey, well is the main source of water for 64% of houses. On the assumption that part of requirement of drinking water is met from the domestic well also, it is assuming that 100 lpcd is to be supplied through pipe line for domestic purpose. It is also assumed that 50 lpcd is required for non-domestic purposes.

Total lpcd required -- 150

Water to be distributed through pipe line is 62573 x 150 = 93.85950 lakh litres or = 9.4 MLD

28.6 SOLI D WASTE

The estimation of quantity of solid wastes to be handled by the year 2031 is furnished below.

At present in 95.43 % of houses, waste is disposed in own compound. Since a major portion of the town is proposed as agriculture area and considering low density, it is assumed that only half of the waste needs to be collected. The waste to be collected from the remaining portion of the town is estimated as follows.

Projected population		- 62573
Half of projected population		- 31286
Waste to be collected	31286x 0.25 Kg/day	= 7.82 tonnes/day.
Present collection		- 4 tonnes/day.

So a system has to be evolved for collection and disposals of an additional quantity of 3.82 tonnes/day by 2031.

CHAPTER - 29
LAND USE PLAN

29.1 LAND USE REQUIREMENT

Land use management plays a major role in the process of evolving better environment for the town. Good management and distribution of activities in the town will minimise the problems related to traffic and providing services. Thodupuzha is a trade centre and service town. The land use plan for 2031 is proposed in tune with the policies and strategies mentioned in the previous chapters; especially the development concept evolved considering the present trend of development and projected requirements.

In the proposed land use plan, land has been set apart for *Residential use, Residential mixed use Agriculture cum Residential use, Commercial use, Commercial use - I (sub centre), Industrial use, Public and Semi-Public use, Transportation use, Parks, play-ground and Open spaces use, Paddy field use, Rocky area use, Water bodies and Special zones use.*

29.2 RESIDENTIAL USE ZONE

The basic concept of this zone is to contain the undesirable organic urban spread of residential activities to the extent possible and to contain the urban core ensuring the effective planned utilisation of lands. This zone is envisaged to full fill the planned residential development of the town satisfying the residential demand together with supporting activities.

The total land under residential use in Thodupuzha town is 992 Ha, which is 28% of the total area of the town. The overall density of population is only 13.5 persons/Ha and the residential density is 52 persons/Ha. For a small town like Thodupuzha, UDPFI guide lines propose, an average density of 75-125 persons per hectare. Assuming a population density of 75 persons/ Ha, 826 Ha of land is required for residential use by 2031. According to the development concept, the area suitable for residential purpose has been identified around central core of the town. In the proposed land use 2031, 9838.58 Ha of land has proposed for high density residential land use. It is comparatively large area and the residential density is far below the recommended standards. Since homestead type of development is the character of the area homestead type cultivation can also be done in this zone.

29.3 RESIDENTIAL MIXED USE ZONE

The basic concept of this zone is to promote the residential use in combination with other urban activities predominantly commercial in a planned manner to satisfy the present and future demand of economic market force and pressure on urban land. This zone is in continuum with urban

core and spatially located at centre of the town around the commercial zone.

Considering the development trend of the town and in order to accommodate different compatible developments a residential mixed zone has been proposed. It is generally a mixed zone and many non-residential uses like commercial, small-industrial, public use etc. are also permissible in this zone in addition to residential use subject to certain conditions. An area of 391.46 Ha of land has been proposed under this zone. The area around the commercial zone at the central part is proposed under this zone.

29.4 COMMERCIAL USE ZONE

Area required for commercial and trade activities have been worked out on the assumption that on an average 0.50 Ha per 1000 persons (UDPFI guide line) is required. Thus the commercial area requirement is worked out as 30.98 Ha. The area proposed under commercial use is 166 Ha, which is 4.8% of total town area. According to the development concept, the central area with heavy commercial built up (Gandhi square to Private bus stand area, KSRTC jn, Civil station etc.) and the area around first order nodes have been identified as commercial zones. The future commercial zone has been grouped into two categories; Commercial zone and Commercial zone I for which 56 Ha and 110 Ha of area have respectively been earmarked. The total proposed commercial area is 4.8% of the town area. In first zone pure commercial activities alone are permitted and in second zone certain other uses also are permitted in addition to commercial activities.

The basic concept of commercial zone is to contain the undesirable organic urban spread to the extent possible and to contain the urban core ensuring the effective planned utilisation of lands. This zone is envisaged to full fill the planned commercial development of the town satisfying the present & future demand together with supporting activities.

The basic concept of commercial zone I is to decongest the urban core to the extent possible and to develop sub centres to facilitate the essential urban services. This zone is spatially distributed in such a way that it is equally accessible from all part of the town without entering the core area.

29.5 INDUSTRIAL USE ZONE

At present hardly 20 hectares of land, which is only 0.56 % of the total town area is coming under the industrial use. The number of industrial workers in the year 2031 is worked out as 324. So an additional 162 new employment opportunities have to be provided in the secondary sector. No major industries are proposed for the town and targeted employment generation under industrial sector is proposed to be met through promoting small scale industrial units. There is no proposal for

an exclusive industrial zone except retaining the present mini industrial estate at Olamattam and other presently functioning industries. Cottage industries and service industries of non-nuisance nature only are proposed within town limit, in various zones as permitted in respective zoning regulation. All existing industries are included in this use zone.

29.6 PUBLIC AND SEMI PUBLIC USE ZONE

At present 54.74 Ha of land, which is 1.58% of total town area is coming under public and semi-public land use. The standard recommended is 1.20 hectares per 1000 population. The existing public and semi-public use land is proposed to be retained as such.

29.7 PARKS, PLAY GROUND AND OPEN SPACES, RECREATIONAL AREA AND TOURISM USE ZONE

At present only 1.79 hectares of land, which is 0.05% of total town area is coming under this category. The major proposal in this sector includes,

- Play ground near private bus stand in Kothayikunnu ward.

29. 8 TRANSPORTATION USE ZONE

The proposed road network of Thodupuzha consists of roads of width 18m, 16m, 14m, 10m, 8m and 6m, it also includes all other existing roads, property to be taken over by the Indian railways for its project, existing bus stands, lorry stand and designated parking areas etc. The total extent of land coming under transportation use is 15.2 Ha.

29.9 AGRICULTURE USE ZONE

As per the land use survey, 1668 hectares of land is coming under agriculture land use and is under cultivations like paddy, coconut, mixed crops and rubber. In the proposed land use the agriculture area has been grouped into two categories; wet agriculture which includes paddy fields, and dry agriculture predominantly rubber cultivation. Wet agriculture is distributed in all parts of the town. The land reserved under agriculture cum residential area is 1606 hectares.

29.10 ROCK STRETCH AT URAVAPPARA

Uravappara area contains a relatively vast expanse of rocky area about one kilometre long and 80m wide and about 60m high. This has environmental concern area and has to be preserved.

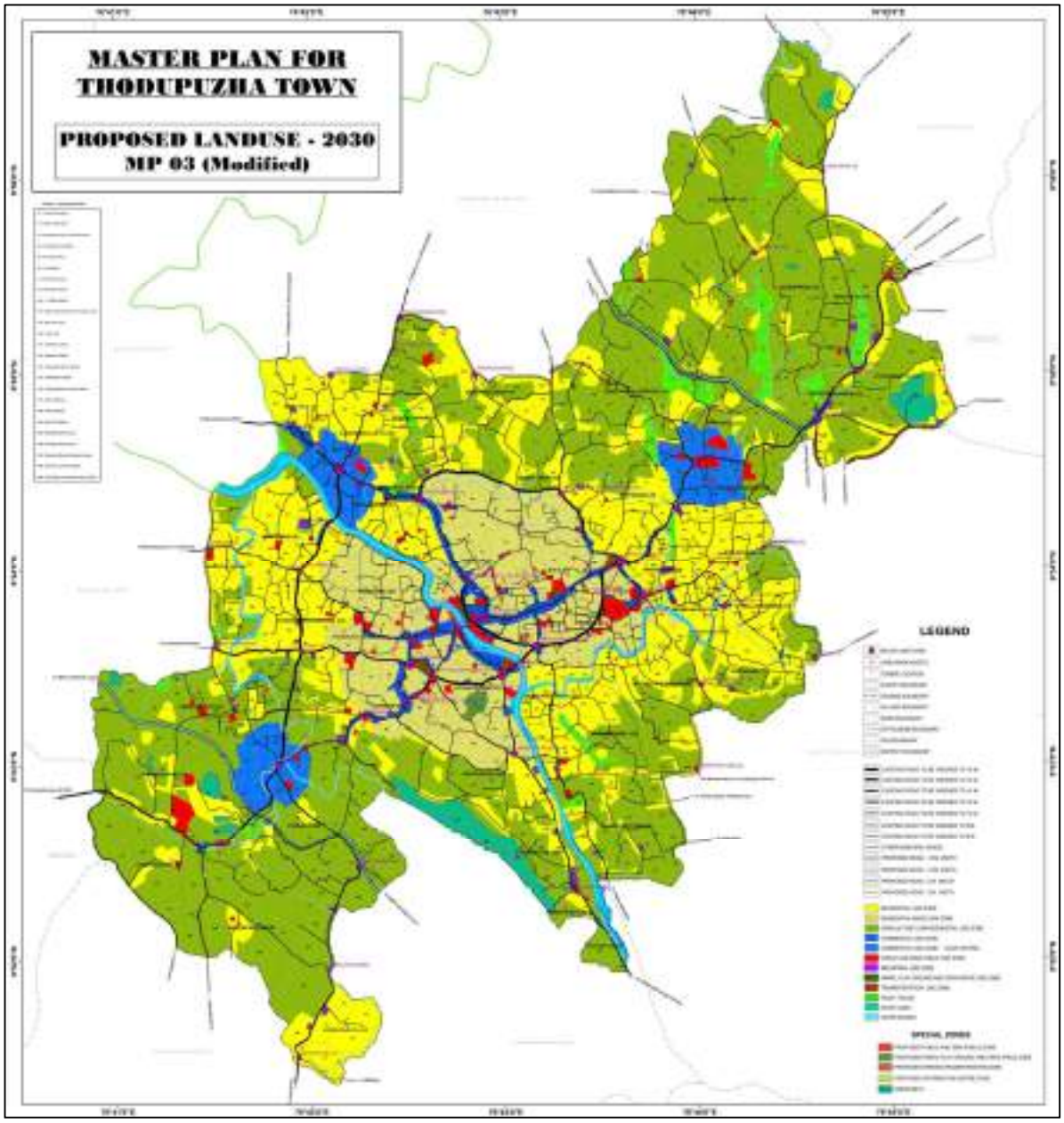
29.11 PROPOSED LAND USE ZONE

As mentioned earlier the proposed land use plan has been evolved based on the development concept and the projected requirement for the horizon year. Thus Thodupuzha municipal area has been divided into the following 13 land use zones as per the proposed land use.

1. Residential use zone
2. Residential mixed use zone
3. Agriculture cum Residential use zone
4. Commercial use zone
5. Commercial use zone I (Sub centre)
6. Public and Semi-public use zone
7. Industrial use zone
8. Park, Playground and Open spaces use zone
9. Transportation use zone
10. Paddy fields
11. Rocky area
12. Water bodies
13. Special zone

    a) *Proposed Public and Semi Public zone.*
    b) *Proposed Park, Playground and Open space e zone.*
    c) *Proposed Parking and Transportation zone..*
    d) *Proposed Information centre zone.*
    e) *Proposed green belt.*

Map No 29.1 shows the proposed land use 2030. The abstract of the proposed land use 2030 is presented in the Table No 29.1. It is also shown in Figure No 29.1. The activities which are permissible in different use zones are explained in the Zoning Regulations (Chapter 33).



Map No.29.1: Proposed land use breakup - 2030

Proposed Land use breakup - 2030			
Sl. No.	**Land use**	**Area (M^2)**	**%**
1	AGRO RESIDENTIAL USE ZONE - 46.7 %	16061355	46.65
2	COMMERCIAL USE ZONE - 1.6 %	560001	1.63
3	COMMERCIAL USE ZONE - 1 (SUB CENTRE) - 3.2 %	1100352	3.20
4	ENVIRONMENTAL CONCERN ZONE (ROCKY AREA) 1.6 %	553402	1.61
5	INDUSTRIAL USE ZONE - 0.58 %	199701	0.58
6	NEW PROPOSED ROAD - .09 %	31107	0.09
7	PADDY FIELDS - 1.9 %	653899	1.90
8	PARK, PLAY GROUND AND OPEN SPACE ZONE - 0.05 %	17907	0.05
9	PROPOSED INFORMATION CENTRE - 0.01 %	1844	0.01
10	PROPOSED PARK, PLAY GROUND AND OPEN SPACE USE ZONE - 0.15 %	53082	0.15
11	PROPOSED PARKING/TRANSPORTATION USE ZONE - 0.02 %	6020	0.02
12	PROPOSED PUBLIC AND SEMI PUBLIC USE ZONE - .01 %	5126	0.01
13	PUBLIC AND SEMI PUBLIC USE ZONE - 1.6 %	547450	1.59
14	RESIDENTIAL MIXED USE ZONE - 11.37 %	3914578	11.37
15	RESIDENTIAL USE ZONE - 28.57 %	9838576	28.57
16	TRANSPORTATION ZONE - .44 %	152896	0.44
17	WATER BODIES - 2.14 %	735393	2.14
	Total	**34432689**	

Table No.29.1: Proposed land use breakup - 2030

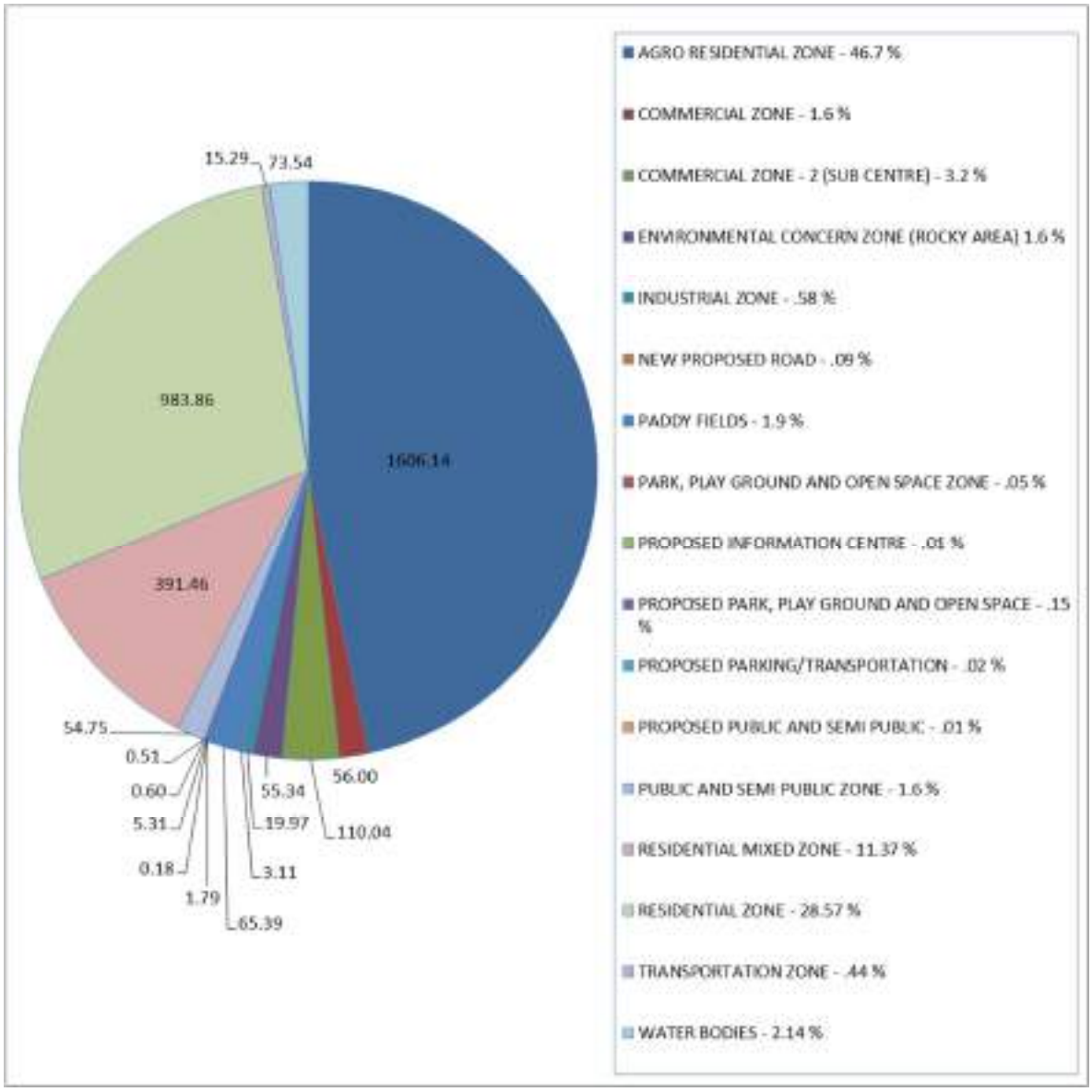


Fig. No.29.1: Proposed land use breakup - 2030

CHAPTER - 30
TRAFFIC AND TRANSPORTATION PLAN

30.1 TRANSPORTATION PLAN

Transport development plan for Thodupuzha city is prepared taking into account the existing traffic scenario and based on an evaluation of the future traffic on the base year network. Transport development schemes cover all the available modes of travel and are formulated so as to reduce the severe strain put on the existing road network. All committed development schemes were taken into account while formulating the transport development plan. The study on traffic and transportation was entrusted with NATPAC and the detailed study report is included in the Chapter – 14.

30.2 ROAD NETWORK

30.2.1 Development strategy for the horizon year

The configuration of the existing road network within Thodupuzha town does not reflect any regular form, although it resembles more or less like ring and radial type having radial roads connected with partial ring roads. The main eastern highway towards Thiruvananthapuram and Ernakulam sides and other major roads main eastern highway viz. SH 33, SH 40, SH 41 and SH 44 form the radial roads centered from the busy central commercial area. These radial roads are partially connected by link roads, which form an inner ring road.

The Punaloor – Muvattupuzha road passing through Kolani, Gandhi square and Vengalloor is the spinal cord of the city road network. This road is forced to carry both intra-city and inter-city traffic. Consequently, this road carries traffic far exceeding its capacity at present and is likely to bear in the horizon year as well unless corrective measures are formulated and implemented. Gandhi square area and Civil station area faces acute traffic congestion because of a number of roads with narrow width radiating from this part. The other reasons are concentration of activities like commercial, public and semi-public activities, location of bus stand, unorganized parking, etc. All the existing problems as well as the future traffic and transportation problems likely to arise have to be taken into account while formulating the long term road development plan for the horizon year.

The major traffic and transportation problems facing Thodupuzha town are:

i) The inter-mixing of intra-city and inter-city traffic in the absence of adequate bypasses;

ii) Narrow width of roads in the central part of the city;

iii) Heavy movement of vehicular and pedestrian traffic;

iv) Unorganized on-street parking in the absence of proper parking lots;

v) Encroachment of right-of-way; and

vi) Idle parking and uncontrolled loading/unloading operation of trucks near godowns and wholesale markets.

The various transport-related problems facing the town along with the development proposals made by various agencies have been taken into account while formulating the long term development strategy for the city. Since the most important problem of Thodupuzha is chronic congestion in central area with limited scope for road widening, emphasis was given to develop alternative link to divert the traffic passing through the central area. This would also help to reduce the unwanted mix of intra-city and inter-city traffic on roads within the central part of the city. The development strategy for the city should give special emphasis in relocating the traffic generating facilities and services like bus terminals, truck terminals, wholesale markets, ware houses and godowns to the peripherals of the city so as to avoid the heavy vehicles through the urban roads within the central area of the city. In order to reduce the number of private vehicle trips and intermediate public transport trips, the development strategy should give importance to provide an efficient public transport system for the city linking all major traffic generators, work centers, commercial activity centers. As the level of service of urban roads are dictated to a great extent by the capacity of intersections, the development proposals should give importance to increase the capacity of major intersections by proper planning and design of these junctions. Special emphasis should also be given to improve the pedestrian facilities and in developing off-street parking lots.

30.2.2 Proposed road development plan

On the basis of the projected volume of traffic and alternative network development schemes considered, a road development plan has been formulated for the town. It has been found that there is no more room for increasing the number of roads in the area, instead of which augmentation of capacity and provision of ring roads are to be resorted to. Thus in the proposed network four categories of roads viz. first order roads, second order, third order and fourth order roads with widths 14m, 12m and 10 m , 8m and 6m respectively are proposed as under.

1. Inner ring road (18m,14m,12 m, and 10m width)

Arackapara jn. – Continental jn. – Civil station jn. – Vaniyapilli jn. – Rathapilli jn. – Mangattukavala jn. – Kanjiramattam jn. – KSRTC Jn. – Parking yard (PVT bus stand jn.) .

2. Outer ring road (14m,12m,10m width)

Kolani jn. – Mullakkal jn. – Vengalloor jn. – Shappumpadi jn. – Karayogam jn. – Muthalakodam jn. – Undaplavu jn. – Kumbankallu jn. – Keerikode jn. – Mariyil kalungu jn. – Nelcos jn.

3. Radial roads and other major roads

(i) SH 8 – Punaloor to Muvattupuzha

(ii) SH 33 - Thodupuzha to Puliyanmala

(iii) SH 41 - Thodupuzha to Alapuzha

(iv) Parakadavu to Koothattukulam

(v) MDR - Thodupuzha to Kaliyar

(vi) Vengalloor to Kaloor (Sabarimala- Kodaikanal SH 44)

First order roads (18m,16m and 14m width)

These roads mainly carry inter-city traffic and intra city traffic together. They act as radial roads centered from the busy central commercial area. These radial roads are partially connected by link roads which form an inner ring road. Following roads are the major roads included in this category.

1. Koothattukulam – Kolani (Part of SH 40) 18m
2. Punaloor – Muvattupuzha SH8 14m
3. Thodupuzha – Puliyanmala SH 33 – 14m
4. Thodupuzha – Udumpannoor (MDR)
5. Thodupuzha – Mangattukavala 14m
6. Mangattukavala – Municipal boundary 16m
7. Mangattu kavala –Karikodu (16 m)

Second order roads (12m and 10m width)

Second order roads also take major share of the traffic along with first order roads. The following roads are proposed in this category with 12m and 10 m width.

a) Thodupuzha- Manakkadu road 12m
b) Vengallur-Kaloor road (Oonnukal road) 12m
c) Kanjiramattom –Thekkumbhagam road 12m
d) Marikalungu-Chungam road 12m
e) Mariyilkalungu-Kothaikunnu (Near Geo gas agency) road 12m
f) Market road to Dhanwanthari junction road 12m
g) River view road 12m
h) Kothayikunnu- Municipal market up to Idukki road (10 m)
i) Karikkodu – Velliyamattom road (from Karikkodu Junction – Kumbankallu bridge)

j) Mariyilkalungu approach road

Third order roads (8 m width)

These are of lower level mobility than those mentioned above. The following roads are proposed in this category with 8m width.

1. Kalur Church road
2. Madathikandam - Muthalakkodam
3. Kaithakkodu-Shappum padi road
4. Muthalakodam – Karuppara
5. Karuppara- Ezhallur
6. Muthalakodam- Ezhallur road (Pathaipara via)
7. Parakkadavu- Manjakadambu road
8. Chunkam –Kolani (canal jn via)
9. Kunnam- Padinjare kodikulam
10. Karikodu- Kanjar
11. Muthalakkodam – Pettenadu (from Muthalakkodam up to Canal road)

Fourth order roads (6m width)

Fourth order roads usually serve the residential neighborhood and within the business areas. Following roads are proposed in this category with 6m width.

a) Guru ITC- Milacombu road
b) Vimalalayam – Muthaliyar Madam – Kappiththottam Society padi road
c) Kolani –Manakkad road

Other roads (which were included in DTP schemes and not envisaged, incorporated in Master Plan)

a) From TB Junction – old Kanjiramattom Junction (widening proposal) 6m
b) Link road connecting Jinadevan road and Thodupuzha Udumpannoor road (new proposal) 12m
c) Link road from Josco Junction in Idukki road up to market (new proposal) 10m

30.2.3 Junction improvements

Adequate improvements are immediately warranted for the intersections *viz.*, Gandhi square, Civil station, Muthalakodam, Mariyilkalungu, Continental junction, Muvattupuzha road-Ambalam bypass junction in Muvattupuzha road, Karikode junction, Mullakkal junction and KSRTC junction.

30.3 RAIL NETWORK

Thodupuzha as of now has no rail connectivity. The proposed Sabari rail line is supposed to be passing through parts of Thodupuzha town. It is expected that, once this rail link is established, there will be a great boost in the economy of the population and the traffic loads in the roads, especially to long distance areas, will be reduced considerably.

30.4 TRANSPORT TERMINALS

30.4.1 Bus terminals

Thodupuzha town has three bus terminals, one near the Kothaikunnu area from where the private buses are operated, one at Mangattukavala, one near Muppil kadavu bridge junction and used by KSRTC buses.

30.4.2 Goods terminals

There is a lorry parking proposed near Kanjiramattam junction.

30.5 PEDESTRIAN FACILITIES

The pedestrian facilities that need to be considered are:

Sidewalks or walkways: Sidewalks and walkways are “pedestrian lanes” that provide people with space to travel within the public right-of-way, that is separated from roadway vehicles. Sidewalks are associated with significant reductions in pedestrian collisions with motor vehicles. For Thodupuzha, considering the scarcity of land availability, sidewalks with a width of 1.5m to 2.5 m is proposed for all types of roads including arterial, sub-arterial, collector and local roads.

Marked crosswalks and enhancements: Marked crosswalks indicate optimal or preferred locations for pedestrians to cross and help designate right-of-way for motorists to yield to pedestrians. Crosswalks are often installed at signalized intersections and other selected locations. Marked crosswalks are desirable at some high pedestrian volume locations (often in conjunction with other measures) to guide pedestrians along a preferred walking path. For Thodupuzha, cross walk markings are desirable at all arms of the major intersections. Apart from these intersections, cross walk markings are proposed at major high pedestrian volume locations like educational institutions, hospitals and commercial centers.

Pedestrian overpasses/underpasses: Pedestrian overpasses and underpasses allow for the uninterrupted flow of pedestrian movement, separated from the vehicle traffic. However, they should be a measure of last resort, and it is usually more appropriate to use traffic-calming measures or install

a pedestrian-activated signal that is accessible to all pedestrians. This is also an extremely high-cost and visually intrusive measure. Such a facility must accommodate all persons. These measures include ramps or escalators. Extensive ramping will accommodate wheelchairs, but results in long crossing distances and steep slopes that discourage use. Studies have shown that many pedestrians will not use an overpass or underpass if they can cross at street level in about the same amount of time. Overpasses work best when the topography allows for a structure without ramps. Underpasses work best when designed to feel open and accessible. Grade separation is most feasible and appropriate in extreme cases where pedestrians must cross roadways of high speed, high-volume arterials.

Pedestrian underpass/overpasses are proposed at selected locations in Thodupuzha which have high concentration of commercial establishments and pedestrian volume. The locations are;

i) Pedestrian subway at Civil station area

ii) Pedestrian subway near Private stand area

Detailed engineering surveys need to be carried out before finalizing the exact location and design of the pedestrian facilities at the proposed sites.

30.6 PARKING FACILITIES

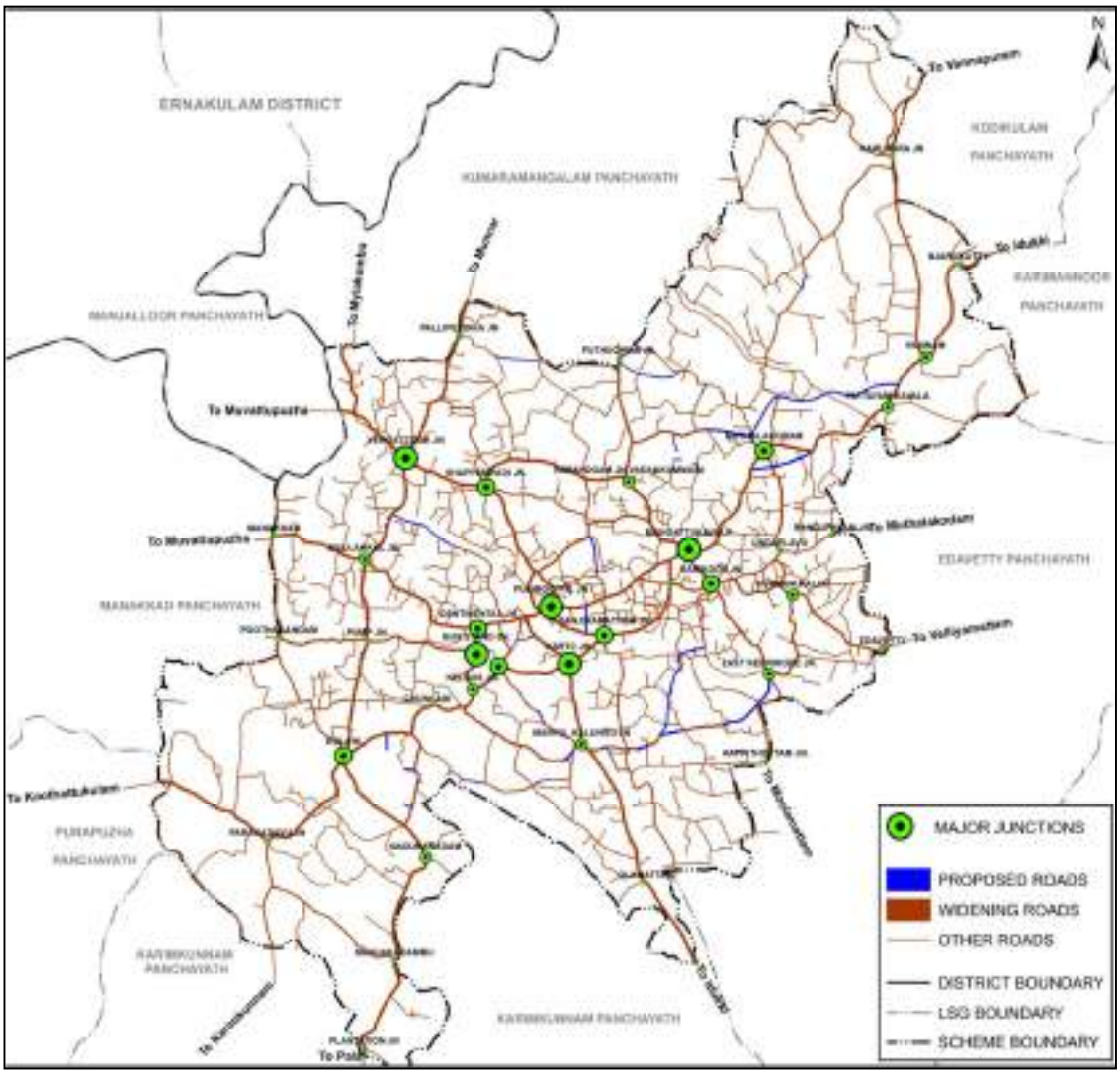
Considering the parking demand observed at many of the road stretches, a combination of commercial cum automated parking system is proposed for Thodupuzha. The tentative locations for provision of these facilities are given below;

(i) Private bus stand area (Kothayikkunnu and Mangattukavala)

(ii) Civil station area

(iii) Near new Kanjiramattam Jn.

The proposed road network of Thodupuzha town is given in Map No 30.1.



Map No.30.1: Proposed road network - 2030

CHAPTER - 31
SECTORAL PROPOSALS

31.1 INTRODUCTION

For implementation of any development plan, execution proposals have to be formulated in each sector based on development concept and development issues pertaining to the sector. The economic feasibility and the environmental feasibility etc are considered for finalizing the proposals. The proposals envisaged in the master plan can be grouped into sectoral proposals and major proposals incorporated in the zoning.

31.2 SECTORAL PROPOSALS

The sector wise proposals envisaged in the master plan are grouped and described in the following heading.

31.2.1 Trade and commerce

During the last one decade or so trade and commerce has been gaining dominance as the economic activity of Thodupuzha. One of the goals of the plan is to develop Thodupuzha as a market town of regional importance. It is proposed to make free the busy central commercial area of the traffic and other kind of congestions etc and develop it further. Also other nodes identified have to be given impetus for development.

31.2.1.1 Thodupuzha municipal market renovation

Reconstruction of Thodupuzha municipal market with new building with ample parking space, drainage facility, waste disposal system, approach road, separate stalls etc.

31.2.1.2 Shopping complexes

New shopping complexes by municipality and other agencies in commercial areas.

31.2.1.3 Trade and fair area

An area for conducting trades and fair on the side of bypass roads.

31.2.1.4 Commercial area development

Development of major commercial area of the town by provision of approach road, parking area, drainage facilities, and waste collection facilities.

31.2.1.5 Hawking area

A hawking area for the rehabilitation of hawkers and venders at suitable locations in the town.

31.2.2 Industry

No major industrial units are functioning in Thodupuzha and the industrial scenario of the town is limited to few small industrial units. Agricultural produces and raw materials for building materials are available in the region. Presence of industrial estate at Olamattam is another advantage. Considering all the above, the major proposals evolved for the sector are:-

31.2.2.1 I.T based units /apparel park

IT based hardware and software units/apparel park can be established in the multi functional zone proposed near any of the by-passes.

31.2.2.2 Apparel park

An apparel park by the side of any of the many by-passes. Nearness to metro city Cochin provides large scope to this sector. Also there is easy and good road network to Cochin.

31.2.2.3 Small industrial units

Small industrial units for value addition of agricultural producers of the region proposed. Jack fruit and coconut are available in plenty in the region. Ample scope for agro based industries based on rubber, coconut, jackfruit. pineapple, rubber wood and other various small scale industries like manufacture of jams, jelly, syrups etc. Because they are available plenty with less cost. The infrastructural facilities like water, road, sanitation, labour, shops etc promotes development in this sector.

31.2.2.4 Automobile sector

Revival of the bus body building units and ancillary activities.

31.2.3 Tourism and heritage

There is limited potential for tourism within the municipality. But the town has locational advantage and proposals mainly in the nature of supporting facilities are included in the plan.

31.2.3.1 Wayside amenity centres /motels

To take advantage of the status as a transit to the tourism destinations like Sabarimala pilgrim tourism, supporting infrastructure like a motel and smaller scale amenity centres are proposed.

31.2.3.2 Tourism circuit

Utilizing the location advantage of the town, a tourism circuit connecting Thodupuzha with adjacent tourist spots like Malankara, Elaveezha Poonchira, Thommankuth, Moolamattam, Idukki etc. can be established and trips can be operated.

31.2.3.3 Aesthetic beauty of the town

Improvement of aesthetic beauty of the busy area of the town by town beautification programs has been attempted. Also the new bypasses are classic cases for beautification too.

31.2.4 Agriculture

Around 60% of land of the town is coming under different category of agriculture land use. Irrigation facilities are inadequate in the town. As per the 'District Urbanization Report' of Idukki, agriculture, animal husbandry and small scale industries are the activities proposed for the town.

Most of the paddy fields are remaining vacant or under cultivation of crops like vegetable, plantain, tapioca, betel etc. Conservation of these paddy lands is essential, for the environmental equilibrium of the town. In the proposed land use, these factors are considered and the agricultural areas zoned into environmentally sensitive area/paddy fields, wet agriculture area and dry agriculture area.

31.2.4.1 Irrigation projects

Water is available in plenty in the town from Thodupuzha river. Though two canals from Malankara reservoir formed in the upstream of this river (RBC and LBC) under M.V.I.P. pass through the town promotes irrigation partially. Lift irrigation is needed for making water available for irrigation. 10 such medium scale projects are proposed.

31.2.4.2 Agriculture labour bank

The agriculture sector of the town is facing lack of supply of agriculture labourers. An agriculture labour bank is proposed to meet this problem. The details of the agriculture labours may be kept in a register in the municipality. The agriculture labourers may be supplied from the labour bank to the cultivators based on demand. This programme can be implemented jointly by krishibhavan and the municipality.

31.2.4.3 Cultivators group /group farming and implements bank

For facing the problems in agriculture sector effective measures like cultivators group/group

farming may be formed. Cultivation in the uncultivated land by leasing out the land to interested cultivators groups may be promoted.

31.2. 4.4 Bio-fertilizer plant

Promoting organic farming and usage of bio-fertilizer is one of the agriculture promotion strategy for the town. This is to be achieved through the following measures. Installation of mini bio-fertilizer plant in all houses of the municipality for the disposal of the degradable wastes and for the production of bio gas and manure with the subsidy of government. Centralized plant by the municipality for processing the wastes from the public places is also proposed at present dumping yard.

31.2.4.5 Floriculture

Floriculture considering the local demands utilizing the irrigation facilities available.

31.2.4.6 Vegetable cultivation

Scheme for attaining self-sufficiency to an extent in the production of commonly used vegetables by extension of vegetable cultivation to more areas. Possibility of exporting vegetables also to be explored.

31.2.4.7 Value addition of agro based products

Units for value added products from the agricultural products of the town and its hinter land.

31.2.4.8 Cultivation in canal puramboke land

Hectares of MVIP canal land are remaining unutilized and encroachments in different form are taking place on these lands. A project for cultivation in these canal bank lands can be under Kerala State Irrigation Infrastructure Development Corporation with the help of Kudumbasree or other similar groups is proposed.

31.2.4.9 Soil conservation measures

Considering the undulating topography of the town proper soil conservation measures under watershed development programs is proposed.

31.2.5 Animal husbandry

The activities in the animal husbandry sector shall be coordinated with other sectors especially agriculture sector. Coordinated efforts in a centralized manner is required in the production

of egg, meat etc in a profitable manner. The area which identified as suitable for agriculture activity is suitable for the animal husbandry also.

31.2.5.1 New dairy farms

Considering the vast agriculture land available and rural nature of part of the town establishing small scale dairy farms with 10 to 25 cows in a unit are proposed.

31.2.5.2 Poultry farm /broiler farm

As in the case of dairy farms small poultry farms with 75 to 100 hens per unit can be started in those areas identified as suitable for agriculture, for meeting the demand of eggs and meat of the town to an extent.

31.2.5.3 Slaughter house

Many slaughter houses function in the town some of which are unauthorized. Steps need to be taken for modernising them according to the prescribed statutory norms.

31.2.5.4 Marketing of products

Facilities for selling of the products like broiler chicken, egg etc are to be developed and attached to the markets of the Thodupuzha town.

31.2.6 Drinking water

The projected population of Thodupuzha town for the year 2031 is 61974 and it is estimated that a quantity of 9.3 MLD of water is required for the town in the horizon year. This estimation has been done considering the availability of water from local resources, ie. well.

31.2.6.1 Augmentation scheme

Augmentation scheme of present water supply scheme to ensure supply of 9.3 MLD water for Thodupuzha town by the year 2031 is proposed. This project may be implemented by Kerala Water Authority.

31.2.6.2 Replacement of damaged pipe lines

Replacement of damaged and old pipe lines of the existing distribution network.

31.2.6.3 Public wells

Maintenance of public wells.

31.2.6.4 Small schemes

Expansion of water supply schemes like Parakkadav, Karooppara and made it more efficient. This project may be implemented by Kerala Water Authority.

31.2.6.5 Extension of pipe lines

Strengthening the distribution network by extension of pipe lines to uncovered area. This project may be implemented by Kerala Water Authority.

31.2.6.6 Protection of natural water sources

Protection of wells, ponds and natural drains. This project may be taken by the municipality.

31.2.6.7 Water harvesting

Adoption of water harvesting methods. This project may be taken up by the municipality.

31.2.7 Energy

The proposal in the power sector is furnished below.

31.2.7.1 Improvement of power distribution

Installation of new transformers, 11 KV lines etc.

31.2.7.2 Street lighting

Provision of high mast lights and sodium vapour lights in the central area and at road intersections. Provision of solar lighting system for street lights.

31.2.7.3 Electrification of houses

Electrification of all houses especially the houses of economically weaker section.

31.2.7.4 Non-conventional energy

Incorporating energy conservation and efficiency by adoption of non-conventional sources of energy like bio gas, solar energy and green buildings etc.

31.2.8 Waste disposal

It is estimated that the total generation of solid waste of the town by the year 2031 is 7.75 tonnes / day, whereas the present collection is only 4 tonnes per day. The analysis shows that 90.61% houses have septic tanks and it is assumed that this system will continue in future also. Drains are available for a few stretches of roads only. The proposals in this sector are given below.

31.2.8.1 Solid waste collection

Limit the waste collection of the town to public places and more densely populated wards only. Strengthening and modernization of present waste collection, conveyance and disposal system by adding more vehicles, equipments and labours.

31.2.8.2 Decentralized waste disposal plants

Promote decentralized waste disposal culture by providing biogas plants at subsidized rate to households.

31.2.8.3 Road side drain

Provision of road side drains for all major roads in the central commercial area.

31.2.8.4 Natural drains

Cleaning and removal of blocks of Kanjiramattom thodu, and all natural drains. Construction of river training works is needed to protect river banks from erosion.

31.2.8.5 Public comfort stations / e-toilets

New public comfort stations / e-toilets at feasible locations are proposed.

31.2.9 Education

Educational institutions in the category of high schools, higher secondary schools, arts and science colleges, professional colleges, polytechnic colleges, ITI/ITC etc as per planning standard is available within and very near to town. DIET also is functioning here. The projects which are to be implemented in educational sector are detailed below.

31.2.9.1 Improvement of infrastructural facilities and modernization of government and aided schools

Improvement of infrastructure facilities of government and aided schools like providing new buildings, play grounds, toilets, computer lab, language lab, internet facilities, drinking water, vehicles etc. for 23 government and aided schools.

31.2.9.2 Sports complex

A sports complex for students.

31.2.9.3 Students centre

A student's centre with hostel, library, career development centre for students of colleges in the town and surrounding area.

31.2.10 Health

Health facilities as per standard for the population of the town as well as Thodupuzha Taluk is available in the town. The projects which are to be implemented in health sector are detailed below.

31.2.10.1 Up gradation of taluk hospital

Upgrading the Taluk hospital to the status of a super specialty hospital by providing all necessary departments, equipments and infrastructural facilities including trauma care units.

31.2.10.2 Emergency medical services

An emergency medical service with all necessary equipments with priority for aged people.

31.2.10.3 Ayurveda hospital

New block to district Ayurveda hospital is proposed.

31.2.10.4 Homeopathic hospital

A new hospital near Muthalakkodam in Homeopathic System of Medicine is proposed.

31.2.10.5 Centre for aged and disabled people

Centres for the care of aged people, disabled children, mentally retarded person and promotion of palliative care units etc.

31.2.10.6 Health tourism

Promoting health tourism considering the favourable climatic condition of the town. Availability of natural herbal plants from nearby areas of town can be effectively utilized for the growth of health tourism and traditional treatment.

31.2.11 Civic facilities, Culture

Recreational and other civic facilities are inadequate in the town. For this only town and a first order settlement in the district, the following proposals are included in the plan.

31.2.11.1 Stadium and Sports complex

Stadium and sports complex near Kothaikkunnu bypass road .

31.2.11.2 Town hall

Construct a new town hall at the old bus stand site.

31.2.12 Social welfare, Security

For the welfare of children, women and weaker section of the town and for the security of the people the following proposals are included in the plan.

31.2.12.1 Community halls

About 15 small community halls (cultural centres) are there in the town. Additional 6 more such community halls are proposed.

31.2.12.2 Own building for anganwadies

New buildings for 16 anganvadies which are now functioning in rented building.

31.2.12.3 Equipments to all anganwadies

Provision of modern playing equipments for all 42 anganvadies.

31.2.12.4 Women development

Small industrial units like tailoring units, food processing, candle manufacture, manufacture of umbrellas etc in all wards of the town with the help of Kudumbasree or similar social groups. Necessary training programme for starting the units and centralized market facilities for selling the products.

31.2.12.5 Child care centre

Starting of a child care centre.

31.2.12.6 SC / ST development

Training programme for personality development for attending test and interviews of competitive examinations. Training for servicing of mobile phones, computer, umbrella etc and food processing. Subsidy for starting industrial units.

31.2.13 Environment

Paddy fields, water bodies, sacred grooves are included in the category of environmentally sensitive areas of the town. Strict regulation has been included in the zoning regulation for the protection of the environmentally sensitive areas.

31.2.13.1 Conservation of paddy fields

Details of the projects are furnished previously.

31.2.13.2 Conservation of natural drains

Details of the projects are furnished previously.

31.2.13.3 Protection of sacred grooves

Protection of sacred grooves by regulation. Any construction that is harm to the sacred grooves are banned by regulation.

31.2.13.4 Effective waste management

Details of the projects are furnished previously.

31.2.14 Governance

The present municipal office was constructed in the year 1960 and it is inadequate for the present day functions. For providing better services to the people and to improve the efficiency of functioning, the infrastructure of the municipal office has to be improved. Also nearly half of the Taluk level offices are functioning in rented building.

31.2.14.1 Municipal office complex

A new office complex for town at old bus stand along with town hall.

31.3 SPECIAL ZONES

Special zones are the land areas specifically demarcated for certain use/proposals/ projects. The land area demarcated as special zones are in principle to be used for the community well fair especially for public & semi-public use, recreation use, urban infrastructure (physical & social), conservation use etc.. Other activities unless otherwise specified should not be permitted in the special zone. However uses/activities which are not likely to affect the quality and environment of special zone (known as confirming activities), mainly commercial/residential activities, can be permitted in

20% area of each parcel of land for making the reserved use/proposals/project financially viable. The use/proposals/projects for which each parcel of land is reserved under special zone can be implemented by any public authority (municipality, government etc..), or by any semi – public authority or by Special Purpose Vehicle (SPV) or by any mode of public private participation (PPP) or by private authorities. Immediately after the sanction of the plan municipality should prepare detailed projects for which special zones are demarcated and publish the same. The municipality can release the land demarcated for special zones to any other use by following the procedure for variation of sanctioned plan laid down in Kerala Town and Country Planning Act but not within a period of five years from the date of sanction of the plan. The areas demarcated for special zones, parking, playground and open space in survey numbers 64 p, 96 p,75 p, 58 p of Thodupuzha village can be treated as agriculture cum residential zones, public and semi-public zones in survey number 266 p can be treated as residential mixed zones, park and play ground in survey number 310 of Thodupuzha village can be treated as mixed zone, if the municipality does not initiate any procedure within a period of seven years from the date of sanction of the plan for implementing the use/ proposals/projects for which the special zone is demarcated. The special zone is further sub divided into following sub zones based on the use/proposal /projects for which it demarcated.

Considering the present and future needs of Thodupuzha town, based on the analysis and discussions made with municipal council following major proposals are also included in the development plan and land is demarcated for these projects under various special zones. Beside this sectoral proposals are already dealt in section 31.2 of this chapter. The environmental and economical feasibility should be considered for finalising the proposals envisaged under various development zones and are described below.

31.3.1 Public & Semi public use zone

Though Thodupuzha town is well known for an excellent road network, most of the public and semi-public institutions functioning here are with lack of infrastructural facilities. To tackle this existing problem and to cater future demands, lands demarcated for this purposes is given below. The basic concept of this special zone is to reserve land for public and semi-public purpose so as to facilitate concept based planned development of the town.

Ward/Location	Major projects
Northern side of Punaloor Muvattupuzha road adjacent to Thodupuzha river (Left bank).	Land reserved for municipal town hall, commercial complexes and parking plaza.

31.3.2 Park & Open space use zone

The basic concept of this special zone is to reserve land for recreational purpose (Park, play grounds and open spaces) so as to facilitate concept based planned development of the town. Only limited facilities for recreational purposes are available in the town. Being a grade 1 town these facilities in the town has to be improved considering the life style of the people of the town and its influence area. A stadium for sports, open ground, a cultural centre, a town hall for conducting different activities and fairs are also needed in the town. The locations demarcated for these are listed below.

Sl. No.	Ward/Location	Projects
1	Southern side of right bank MVIP canal and western side of Muthalakodam Pazhukkakulam road.	1. Park and garden. 2. Pedal boating. 3. Children's park /play ground. 4. Swimming pool and fountains. 5. Refreshment stall/comfort station. 6. Internet kiosk with Wi Fi.
2.	Southern side of Kothayikkunnu bypass. 200 m away from KSRTC junction.	1. Play ground. 2. Exhibition/mela ground. 3. Public meeting/ assembling ground. 4. Indoor stadium.

31.3.3 Parking and Transportation

The basic concept of this special zone is to reserve land for parking and transportation purpose so as to facilitate concept based planned development of the town.

Since land availability in the public domain is very little, it is suggested to have multi-level mechanised parking system in four locations owned by municipality in the municipal area as given in the table below.

Sl. No.	Ward/Location
1.	Land owned by Municipality near private bus stand
2.	Land owned by Municipality near lorry stand at Kanjiramattom junction
3.	Land owned by Municipality near Mini Civil station
4.	Land owned by Municipality near Mangattukavala Pvt. Bus Stand

The above four projects together on fulfillment are expected to solve the vehicle parking issues in the town

31.3.4 Information centre

At Vengalloor which is the district and municipal boundary, around 0.3 acre land is demarcated for an information centre cum comfort station. It is in Guru ITC ward. This is intended to give information about the road network, details of the heritage sites, tourist destinations etc. to the tourists coming from neighbouring districts.

In addition to above major proposals at various junctions land is earmarked for wayside parking and comfort stations. Almost all the natural drains remain blocked with garbage or similar waste due to encroachments. All natural drains need to be conserved and in addition it is proposed to provide a buffer zone along the side of the drains and to provide drainage in missing links.

31.4 INFERENCE

Only lower order recreational facilities are available in the town. Being the gate way to major tourist destinations of the district, Thodupuha needs more civic amenities and recreational centres. Similarly considering the lack of infrastructural facilities in public and semi-public institutions and the demand for more market and commercial areas land is earmarked for these major proposals. Also present parking demand of vehicles in the town is mainly met by on street parking and a need is felt for comfort stations at important junctions for the convenience of the passengers. Hence land is located at various junctions for way side parking and comfort stations.

Another concern is lack of off-street parking area and most of the present parking is on street. The town like any other town of the state needs comfort stations at major commercial areas, road junctions etc.. Land has been earmarked for such proposals too.

CHAPTER - 32
RESOURCE PHASING

32.1 INTRODUCTION

The phasing of major projects included in the master plan for Thodupuzha, which are to be implemented within the plan period of 10 years, is discussed in this chapter. The project cost (rough cost estimate), implementing agency, phasing of the project, further studies and actions etc are included in this chapter.

32.2 PHASING OF THE PROJECTS

The proposals given in the master plan is envisaged for a perspective period of 20 years. The phases of implementation of proposals of the master plan are given in Table No 32.1.

Sl No	Projects	First 5 years	5-10 years
A	**ROADS**		
1	Mangattukavala - Karikkodu.	Preliminary activities and taking possession of land.	Completion of the project.
2	SH 8 - Thodupuzha to Palai.	Completion of the project.	
3	SH 8 - Thodupuzha to Muvattupuzha.	Completion of the project.	
4	SH 33 - Thodupuzha to Idukki.	Preliminary activities and taking possession of land.	Completion of the project.
5	Parakadavu to Koothattukulam.	Preliminary activities and taking possession of land.	Completion of the project.
6	MDR - Thodupuzha to Kaliyar.	Preliminary activities and taking possession of land.	Completion of the project.
7	Vengalloor to Kaloor (Sabarimala- Kodaikanal SH44).	Preliminary activities and taking possession of land.	Completion of the project.
8	Mangattukavala - Velliyamattam road.	Preliminary activities and taking possession of land.	Completion of the project.
9	Karikode - Kanjar road.	Preliminary activities and taking possession of land.	Completion of the project.
10	Kunnam - Padinjarekodikulam road.	Preliminary activities and taking possession of land.	Completion of the project.
11	Vadakkumury - Ezhalloor road.	Preliminary activities and taking possession of land.	Completion of the project.
12	Chunkam - Mariyilkalungu road.	Preliminary activities and taking possession of land.	Completion of the project.
13	Muthalakodam- Karuppara road.	Preliminary activities and taking possession of land.	Completion of the project.

14	Pazhukkakulam-Ezhalloor road.	Preliminary activities and taking possession of land.	Completion of the project.
15	Karuppara-Ezhalloor road.	Preliminary activities and taking possession of land.	Completion of the project.
16	Manjakadambu-Parakadavu road.	Preliminary activities and taking possession of land.	Completion of the project.
17	Kolani-Poothakandam-Manakkad road.	Preliminary activities and taking possession of land.	Completion of the project.
18	Kothayikunnu-Muncipal market up to Idukki road.	Preliminary activities and taking possession of land.	Completion of the project.
19	Kanjiramattam-Anakkayam road (Kanjiramattam Ambalam via.	Preliminary activities and taking possession of land.	Completion of the project.
20	Shappumpadi-Pallipedika road.	Preliminary activities and taking possession of land.	Completion of the project.
21	Mariyilkalungu-Karikode (via. Kanjiramattam).	Preliminary activities and taking possession of land.	Completion of the project.
22	Chunkam-Palai road near Nadukkandam canal junction.	Preliminary activities and taking possession of land.	Completion of the project.
23	Muthalakodam-Ezhalloor road.	Preliminary activities and taking possession of land.	Completion of the project.
24	Vadakkummury-Madathikandam junction.	Preliminary activities and taking possession of land.	Completion of the project.
25	Guru ITC junction-Mailakombu road.	Preliminary activities and taking possession of land.	Completion of the project.
26	Kappithottam-Muthaliyarmadam-Vimalalayam road.	Preliminary activities and taking possession of land.	Completion of the project.
B	**JUNCTION IMPROVEMENT**		
1	Gandhi Square.	Preliminary activities and taking possession of land.	Completion of the project.
2	Civil Station.	Preliminary activities and taking possession of land.	Completion of the project.
3	Muthalakodam.	Preliminary activities and taking possession of land.	Completion of the project.
4	Mariyil kalungu.	Preliminary activities and taking possession of land.	Completion of the project.
5	Continental junction.	Preliminary activities and taking possession of land.	Completion of the project.
6	Muvattupuzha road-Ambalam bypass junction.	Preliminary activities and taking possession of land.	Completion of the project.
7	Karikode junction.	Preliminary activities and taking possession of land.	Completion of the project.
8	Mullakkal junction.	Preliminary activities and taking possession of land.	Completion of the project.
9	KSRTC junction.	Preliminary activities and taking possession of land.	Completion of the project.
C	**PARKING SPACES**		

1	Private bus stand area.	Completion of the project.	
2	Civil Station area.	Completion of the project.	
3	Market junction.	Completion of the project.	
D	**PEDESTRIAN FACILITIES**		
1	**Pedestrian Sub Ways**		
2	Civil Station area.		Taking possession of land and completion of the project.
3	Near private stand area.	Taking possession of land and completion of the project.	
4	Providing standard foot path		
5	Foot path in first, second and third order roads.		Completion of the project.
E	**TRADE AND COMMERCE**		
1	Municipal market.	Completion of the project.	
2	Shopping complexes.	Preliminary activities and taking possession of land.	Completion of the project.
3	Trade and fair area.	Preliminary activities and taking possession of land.	Completion of the project.
4	Commercial area development.	Preliminary activities and taking possession of land.	Completion of the project.
5	Hawking area.	Preliminary activities and taking possession of land.	Completion of the project.
F	**INDUSTRY**		
1	Small industrial units.	Preliminary activities and taking possession of land.	Completion of the project.
G	**TOURISM AND HERITAGE**		
1	Motel and way side amenities centre.	Preliminary activities and taking possession of land.	Completion of the project.
2	Tourism circuit.	Completion of the project.	
3	Beautification of the town.		Completion of the project.
H	**AGRICULTURE**		
1	Irrigation projects.	Completion of the project.	
2	Agriculture labour bank.	Completion of the project.	
3	Cultivators group / group farming and implements bank.	Completion of the project.	
4	Bio-fertilizer plant.	Completion of the project.	
5	Floriculture	Completion of the project	
6	Vegetable cultivation.	Completion of the project.	
7	Value addition of agro based projects.	Completion of the project.	
8	Cultivation in canal puramboke land.	Completion of the project.	
9	Soil conservation measures.		Completion of the project.

I	**ANIMAL HUSBANDRY**		
1	New dairy farms.	Completion of the project.	
2	Poultry farm.	Completion of the project.	
3	Broiler farm.	Completion of the project.	
4	Slaughter house.	Completion of the project.	
5	Marketing of products.	Completion of the project.	
K	**DRINKING WATER**		
1	Augmentation scheme.	Preliminary activities.	Completion of the project.
2	Replacement of damaged pipe lines.	Completion of the project.	
3	Public wells.	Completion of the project.	
4	Small schemes.	Completion of the project.	
5	Extension of pipe lines.	Completion of the project.	
6	Protection of natural water sources.	Completion of the project.	
7	Water harvesting.	Completion of the project.	
L	**ENERGY**		
1	Improvement of power distribution.	Preliminary activities.	Completion of the project.
2	Street lighting.	Preliminary activities.	Completion of the project.
3	Electrification of houses.	Preliminary activities.	Completion of the project.
4	Non-conventional energy.	Preliminary activities.	Completion of the project.
M	**WASTE DISPOSAL**		
1	Sewage waste collection and treatment.	Preliminary activities.	Completion of the project.
2	Septic tanks.	Completion of the project.	
3	Road side drain.		Completion of the project.
4	Natural drains.		Completion of the project.
5	Public comfort stations / e-toilets.	Completion of the project.	
6	Awareness programme.	Completion of the project.	
N	**EDUCATION**		
1	Improvement of infrastructural facilities and modernization of 23 government and aided schools.	Completion of the project.	
2	Sports complex for students.		Completion of the project.
3	Students centre.	Preliminary activities and taking possession of land.	Completion of the project.
Q	**HEALTH**		
1	Up gradation of taluk hospital.	Completion of the project.	
2	Emergency medical services.	Completion of the project.	
3	Ayurveda hospital new block.	Preliminary activities and taking possession of land.	Completion of the project.
4	New homeopathic hospital at Muthalakodam.	Preliminary activities and taking possession of land.	Completion of the project.

5	Centre for aged and disabled people.	Preliminary activities and taking possession of land.	Completion of the project.
R	**CIVIC FACILITIES, CULTURE**		
1	Stadium and sports complex.	Preliminary activities and taking possession of land	. Completion of the project
2	Town hall.	Preliminary activities and taking possession of land.	Completion of the project.
S	**SOCIAL WELFARE, SECURITY**		
1	Community halls	Completion of the project.	
2	Own building for anganvadies	Completion of the project.	
3	Equipments to all anganvadies	Completion of the project.	
4	Women development-small industrial units.	Completion of the project.	
5	Child care centre.	Completion of the project.	
6	SC / ST development - training programmes.	Completion of the project.	
T	**ENVIRONMENT**		
1	Protection of sacred grooves.	Completion of the project.	
U	**GOVERNANCE**		
1	Municipal office complex.	Completion of the project.	
2	Office complex- taluk level.	Completion of the project.	

Table No.32.1: Phases of implementation

For the major projects, detailed investigations and studies like environment impact assessment has to be conducted on a case by case basis as and when the projects are taking up for implementation.

CHAPTER - 33
ZONING REGULATIONS

1. All future developments shall be in conformity with the provisions of the master plan for Thodupuzha town.
2. For the implementation and enforcement of the proposals envisaged in this master plan, areas have been zoned under various categories such as 'Residential use zone', 'Residential mixed use zone', 'Agriculture cum Residential use zone', 'Commercial use zone', 'Commercial use zone I (Sub centre)', 'Public and Semi-Public use zone', 'Industrial use zone', 'Parks, Play grounds and Open spaces use zone', 'Transportation use zone', 'Paddy fields', 'Rocky area', 'Water bodies' and 'Special zones'. Details regarding the nature of uses 'Permitted', uses 'Restricted' and uses 'Prohibited' in each zone are given in the accompanying sheets. These regulations shall be enforced in conjunction with other specific provisions if any elsewhere in the master plan.
3. Uses 'Permitted' in a zone cover the uses that can be normally accommodated in the relevant zone. Such uses may be permitted by the Secretary, Thodupuzha municipality, hereinafter referred to as Secretary. In some cases, it may be possible to permit some other uses also, which are not likely to affect the quality and environment in a zone specified for a particular use. Such cases have to be individually studied based on their performance characteristics and special location factors. Such cases which come under this category are classified as "Uses Restricted".
4. Uses Restricted -1 category deals with the uses that shall be restricted by the Secretary with the concurrence of the Town Planner of the district office of the Department of Town and Country Planning.
5. Uses Restricted -2 category deals with the uses that shall be restricted by the Secretary with the concurrence of the Chief Town Planner concerned of the Department of Town and Country Planning.
6. "Uses prohibited" enlists the various objectionable uses in each zone which shall not be permitted under normal circumstances.

If any point of a zone is put to a "Uses Prohibited" as stated in para 2, before the sanctioning of the scheme, such use shall be termed as nonconforming use. A non-conforming use may be allowed to continue in its existing location and essential repairs and maintenance for the structure may be permitted by the Secretary with the concurrence of the Chief Town Planner, provided that the said use create no adverse environmental influence in the zone.

7. Existing areas and structures of archaeological importance, agricultural uses and religious uses may be permitted to continue in all the zones and shall not constitute non-conforming uses.
8. Regulation of constructions and/or land developments on the sides of new roads/roads proposed for widening as per the plan shall be governed by the distance from the centerline of the road, unless otherwise specified in the plan or in any detailed road alignment approved by the Chief Town Planner concerned.
9. The Secretary shall ensure that all constructions and/or land developments, if any, in paddy lands or in wet lands, shall be in conformity with the Kerala Conservation of Paddy land and Wet Land Act and other relevant rules in force in the state, irrespective of the proposed land use zone in which such lands are included.
10. The government shall have the power to issue clarifications in respect of technical interpretations, if any, required in consultation with the Chief Town Planner concerned.
11. Any use not specified either in the 'uses permitted' or 'uses restricted' category of a particular use zone, but which is of a similar nature to any use permitted or restricted in that particular use zone, can be considered by the Secretary, with the concurrence of the Chief Town Planner concerned.

Sl No	Uses Permitted	Uses Restricted - 1	Uses Restricted - 2	Uses Prohibited
1	**Residential use Zone**			
1.1	Residential buildings consisting of single or multifamily dwellings, residential flats / apartments, residential quarters, night shelters, orphanages, old age homes. Guesthouse, hostels and boarding houses.	Ashram, mutt, madrasa. Places of worship. Public utility areas and public utility buildings other than those included in the permitted category.		Any other uses not specified.

	Shops, professional offices, commercial offices, banks & other financial institutions, restaurants, canteen, hotels – built up area limited to 500 m^2.	Vehicle fuel filling Stations.		
	Cottage industries, service industries of non-nuisance nature (See Annexure: 33-5), with number of workers limited to 10 without power or 5 workers with power limited to 10 HP.	Cremation ground /crematorium, Burial ground/common vault.		
	Educational institutions essentially serving the needs of residential community such as day care and crèche, nursery schools, kindergartens and schools offering general education (up to High school level).			
	Health institutions essentially serving the needs of residential community such as dispensaries, clinics (Outpatient), diagnostic centres etc. having a built up area limited to 500m^2.			
	Community facilities such as community halls, recreational clubs, social welfare centres, gymnasium /yoga centres, swimming pool, libraries etc. having a built up area limited to 500m^2.			
	Utility installations and civic amenities essentially serving the needs of residential community such as post office, police station, telephone exchange, fire station, open grounds, water treatment plants below 5 MLD. Public utility areas, tot lots, parks, play grounds.			
	Transmission towers, tele-communication towers and wireless stations.			
	Plant nursery, pump house, wells and irrigation ponds incidental to community needs, Smoke houses or similar uses for agriculture value addition attached			

	to a residential building. Poultry farms, dairy and kennel with built up area limited to 200 m^2.			
	Provided that the access road has a width of 5m minimum.			
1.2	Automobile workshops for two/ three / four wheelers – built up area up to 200 sq.m.			
	Provided that the access road has a width of 8 m minimum			
1.3	Hospitals with 10 beds, higher secondary schools. Convention centres/ auditorium/ wedding halls/ community halls/exhibition centres and art gallery-built up area limited to 1200 m^2.Shops/professional offices, banking and financial institutions – built up area limited to 1200 m^2.	LPG distribution centres (excluding bottling plants and bulk storage) built up area limited to 100 m^2.		
	Provided that the access road has a width of 10 m minimum			
1.4	Hospitals and health centres with number of beds limited to 20.	.		
2	**Residential Mixed use Zone**			
2.1	All uses that are permitted in Residential use zone. Automobile workshops for 2/3 wheelers, service industries of non - nuisance nature (See Annexure II) engaging not more than 19 workers without power or 9 workers with power limited to 15 HP, civil defence and home guard. Parking plaza, taxi/jeep stand.	Museum, exhibition centres and art gallery, places of worship. Fuel filling stations.		
	Provided that the access road has a width of 5 m minimum			
2.2	Diagnostic centres, clinics (Outpatient), – built up area limited to 500 m^2.			
	Provided that the access road has a width of 8 m minimum			
2.3	Shops, professional offices, commercial offices/ establishments, banking and financial institutions, restaurants/canteen, hotels, IT/ software units – built up area limited to 1200 m^2. Social welfare centres / movie halls/ auditorium/ wedding halls/ community halls – built up area limited to 1200 m^2. Secondary/higher secondary schools, technical high schools. Hospitals and health centres with number of beds limited to 10. Markets of plot area limited to 500			

	m^2. Weigh bridge, godowns/ warehouses/ storage non-hazardous Marble and granite storage centres, industrial estates & industrial parks, automobile workshops / automobile service stations for light motor vehicles. Service industries of non-nuisance nature			
Provided that the access road has a width of 12 m minimum				
2.4	Educational institutions of higher order. Shops, offices, markets. Hospitals & health centres with number of beds limited to 100. Automobile workshops/ automobile service stations for heavy vehicles/ movie halls/ auditorium/ wedding halls/ community halls – built up area limited to 1500 m^2.	Bus terminals, lorry stands.		
Provided that the access road has a width of 18 m minimum				
2.5	Hospitals & health centres up to 300 beds. Movie halls/ auditorium/ /wedding halls/ community halls - built up area above 1500 Sq.m with parking at 1.2 times that of KMBR. Tourism amenities, restaurants, canteen, hotels, resorts, passenger amenity and refreshment centres.		Container terminal.	
2.6	Professional offices, commercial offices/ establishments, banking and financial institutions, IT/ software units. Social welfare Service industries of non-nuisance nature		Multiplex	
3	**Agriculture cum Residential use Zone**			
3.1	Agriculture, horticulture and fodder cultivation, pastures, grazing ground, and other types of cultivation including social forestry. Dairy farms, fish farms, seed farms, poultry farms, plant nursery, pump house, wells and irrigation ponds. Smoke houses. Single family residential buildings. Residential flats/ apartments up to 3 stories, and 12 dwelling units Orphanages, old age homes, places of worships, dharmasalas, ashrams, mutts, madrasas, dormitory, hostels. Clinics (Outpatient) and diagnostic	Public utility areas and buildings. Cremation ground / crematorium, burial ground, common vault. Slaughter houses. Bio gas plants, composting plants, higher education institutions other than those included in permitted uses/health care centre up to 50 beds. Storage of explosive		

	centres - built up area limited to 1000 m^2. Shops, professional offices, commercial offices and establishments, banking and financial institutions, gymnasium, yoga centres, restaurants, canteens – built up area limited to 500 m^2. Police post/police station, post and telegraph office, fire post / fire station, telephone exchange, wireless stations and telecommunication towers. Day care and creche, nursery / kinder garten / primary & upper primary schools. Library and reading rooms. Godowns/ warehouses/ storage – non-hazardous, Cottage industries, service industries of non-nuisance nature. Automobile workshops Tot lots/parks/play grounds, saw mills, weigh bridge	and fireworks, gas godowns. Dumping yards, fuel filling stations.		
Provided that the access road has a width of 8m minimum				
3.2	Clinics (Outpatient) and diagnostic centres - built up area limited to 1200 m^2. Shops, professional offices, commercial offices and establishments, banking and Financial institutions, gymnasium, yoga centres, restaurants, canteens – built up area limited to 1200 m^2. Auditorium/wedding halls/community halls built up area limited to 500m^2. Hospitals & health centres with number of beds limited to 5. Utility installations and civic amenities essentially serving the needs of residential community such as post office, police station, telephone exchange, electric substation, fire station, tot lots, parks, play grounds, saw mills, water treatment plant below 5 MLD.	Fish and meat processing centres, sewage treatment plants, solid waste treatment plants, saw mills with timber yard.		
4	**Commercial use Zone**			
4.1	All shops including shopping complexes, shopping malls,	Places of worship.	Multiplex	Any other use not

	hypermarkets, restaurants, hotels, markets. Professional offices, commercial offices & establishments, banking and financial institutions, IT software units, movie halls, auditorium, wedding halls, community halls. Godowns / warehouse / storage of non-hazardous materials, stacking yards. Gymnasium/ yoga centres. Cottage industries, automobile workshops, automobile service stations, cold storage, service industries of non-nuisance nature with number of workers limited to 19 without power or 9 workers with power limited to 30HP(See Annexe:33-5), saw mills, weigh bridges, printing press, IT hardware / electronic industries, marble and granite storage / cutting centres. Expansion of existing residential buildings, single family residences, residential flats/ apartments with lower floor(s) for commercial use only, night shelters, orphanages, old age homes, dharmasala, hostels and boarding houses, lodges and guest houses, ashram, mutts, madrasa. Government (Local /state/central) or public sector offices. Daycare, creche, nursery/ kindergarten, expansion of existing educational institutions. Transmission & tele- communication towers, wireless stations. Social welfare centres, library and reading rooms, exhibition centres, art gallery museum, convention centres. Clinics, diagnostic centres and hospitals with number of beds limited to 50. Tot lots, parks & playgrounds, fair grounds, open air theatres. Parking plaza, transport terminals. Plant nursery, storage of agricultural produces and seeds, Pump house,	Dairy & dairy farm, poultry farm. Other public utility areas & public utility buildings. Fuel filling stations. Saw mills with timber yards. Slaughter houses.		specified.

	wells and irrigation ponds.			
Provided that the access road has a width of 12m minimum				
4.2	Educational institutions, hospitals & health centres, outdoor games stadium.			
5	**Commercial use Zone. I (Sub Centre)**			
	Uses permitted, restricted shall be as in Residential Mixed use Zone			
5.1	Markets.	Stadium, other recreation facilities.		Any other use not specified.
6	**Public and Semi Public use Zone**			
6.1	Local/state central government/ public sector offices and other related public buildings. Additions and alterations to the existing public and semipublic buildings including addition of new blocks without altering the use. Buildings for incidental uses with built up area limited to 100 m^2. Residential quarters incidental to public and semi-public use. Single family residential buildings, public utility areas and buildings. Educational institutions (including professional education/collegiate education /higher education institutions),library and reading rooms, social welfare centres, museum, swimming pools, exhibition centres and art gallery, convention centers, indoor/ outdoor games stadium. Clinics, diagnostic centers and hospitals. Parking plazas, auto rickshaw/ taxi/jeep stands. Auditorium / wedding halls / community halls incidental to public and semipublic uses. Tot lots/parks/play grounds, open air theatre, camping sites. Transmission towers, Tele communication towers and wireless stations.	Cremation ground / crematorium, burial ground, common vault. Bus terminals/stand, lorry stand. Fuel filling stations. Sewerage treatment plants.		Any other use not specified
7	**Industrial use Zone**			
7.1	All industries other than obnoxious	Other public utility		Any other

	and nuisance type industries, automobile workshops & automobile service stations, spray painting workshops, saw mills, timber yard, ice factory, cold storage, fish and meat processing units, printing press, water treatment plants, marble and granite storage and cutting centres, industrial estates &industrial parks, IT software units. Godowns/warehouses/storage of non-hazardous material, stacking yards, weigh bridge. Dairy and dairy Farms, dairy related industries, poultry farms, piggery farm, and smoke house. Dry cleaning plants, power plants, sub stations, smoke houses. Government or public sector offices, transport terminals incidental to industrial use. Transmission and telecommunication towers, wireless stations. Single family residential building, Residential buildings uses incidental to the industrial use. Any other activity incidental to industrial use. Tot lots, parks and play grounds attached to incidental residential use.	areas and public buildings. Cremation ground / crematorium, burial ground, common vault. Storage of explosives and fireworks, gas godowns, sewage treatment plants, slaughter house, crusher units. Container terminals with minimum access width of 18m. Dumping yards/junk yards. Fuel filling stations.		use not specified.
8	**Parks, Play Grounds and Open Spaces use zone**			
8.1	Any construction/land development essential for the development/ improvement of open air recreational facilities. Boat jetties, guided boat rides, watch towers, eco walk ways, water sports facilities. Parks, playground, fair grounds, open air theatre, recreation amenities, stadium, tot lots, zoological and botanical gardens/bird sanctuary, camping site, swimming pools, exhibition centres and art gallery, parking facilities, viewer's galleries. Telecommunication towers.	Public utility areas and buildings which will not affect the character of the area.		Any other use not specified.
9	**Transportation use Zone**			
9.1	All uses connected with traffic & transportation such as road, bridges, fly over, under pass, transport terminals such as bus terminals/stand, truck/lorry stand, auto rickshaw stands, taxi/jeep stands.	Public utility areas and buildings. Fuel filling stations.	Container terminals provided that the access has a width of 18m minimum.	Any other use not specified.

	Public utility areas & buildings and parks which form an integral part of the transportation use proposed. Any incidental uses to the transport terminals such as retail shops, restaurants, canteen, staff quarters, offices, night shelters, and guest houses. Parking plazas, transmission towers, telecommunication towers and wireless stations.			
10	**Paddy Fields**			
10.1	Paddy cultivation. Agriculture /horticulture/fodder cultivation, fish farms/ seed farms/ pump house/ wells and irrigation ponds.	Minor public utility areas & public utility buildings which will not affect the character of the area.		Any other use not specified.
10.2	Constructions/ land developments in conformity with the conservation of paddy land and wet land act in force in lands designated as paddy land or wet land under the said act. Constructions/ land developments in conformity as per orders obtained for conversion of land under the Kerala Conservation of Paddy land and Wet land act.			
11	**Rocky Area**			
11.1	Additions and alterations to the existing buildings and addition of new blocks without altering the use. Single family residential building not exceeding 300m^2built up area. Minor public utility areas & buildings with built up area up to 100 m^2, which will not affect the character of the area. Water treatment plants, water storage/ distribution tanks, tele-communication and transmission towers.			Any other use not specified.
12	**Water bodies**			
12.1	All existing water bodies shall be conserved. Bridges, side protection walls, bathing ghats, floating jetty.			Any other use not specified.
13	**Special Zones**			
	Special zones include the land areas specifically demarcated for certain use / proposals / projects. Other activity unless otherwise specified shall not be permitted in such zones. However uses / activities which are incidental to the proposed special use and are not likely to affect the quality			

	and environment of the zone, can be permitted in 20 % area of each parcel of land for making the proposal / project financially viable. The proposals / projects can be implemented by any public authorities (Municipality, Government etc.), or by any semi – public authorities or by Special Purpose Vehicle (SPV) or by any mode of Public Private Participation (PPP) or by private authorities. Immediately after the sanction of the plan municipality should prepare detailed projects for which special zones are demarcated and publish the same. The municipality can release the land demarcated for special zones to any other use by following the procedure for variation of sanctioned plan laid down in Kerala Town and Country Planning Act 2016but not within a period of five years from the date of sanction of the plan. The areas demarcated for parking, playground and open space in survey numbers 64 p, 96 p,75 p, and 58 p of Thodupuzha village can be treated as agriculture cum residential use zones, public and semi-public zones in survey number 266 p can be treated as residential mixed use zone, park and play ground in survey number 310 of Thodupuzha village can be treated as residential mixed use zone, if the municipality does not initiate any procedure within a period of seven years from the date of sanction of the plan for implementing the use / proposals / projects for which the special zone is demarcated. The land demarcated as special zones for fulfilling the general public requirements for the planned development of the town has to be developed by the municipality by acquiring / purchasing the land or by public private partnership project or by any other methods found suitable by the municipality. Due to any reason, if the spatial location of uses/proposals/projects envisaged in any of the Special Zone has to be changed to any other spatial location in the same zone the municipal council shall decide such location change within the zone after getting the report of the District Town Planner concerned in this regard. The special zone is further sub divided into following sub zones based on the use / proposals / projects for which it demarcated.
13.1	**Proposed Public and Semi Public Zone**
	Land reserved for various public and semi-public purpose as per Annexure: 33-1.
13.2	**Proposed Parks, Play Grounds and Open Spaces Zone**
	Land reserved for various recreational purposes (Parks, Play Grounds and Open Spaces) as per Annexure: 33-2.
13.3	**Proposed Parking and Transportation Zone**
	Land reserved for various parking and transportation purpose as per Annexure: 33-3.
13.4	**Proposed Information Centre Zone**
	The land having extent of 0.3 acre at survey No.1224 part on the northern side of Punaloor-Muvattupuzha SH and western side of Vengalloor-Mylakkombu road (SH40) is earmarked as special zone for Information centre. Incidental constructions/land developments such as comfort station, facility for refreshment, limited budget accommodation, supporting activities like hotel, cafeteria, handicrafts outlet, hill produces outlet, spices outlet, agro products outlet, parking area, shops etc...are also permitted in this zone.
13.5	**Green Belt**
	Land to a depth of 2m on both sides of the Thodupuzha river is demarcated under this zone. It is suggested to clear all the encroachments on both sides of Kanjiramattom thodu and Kolani thodu

	in a time bound manner and the cleared land shall be treated as a buffer zone by planting trees or by providing a planned green space
	Agriculture/ horticulture/fodder cultivation/ pastures/ grazing grounds/ fish farms/ seed farms/ pump house/ wells and irrigation ponds without any building construction, roads/ food paths/walk ways, works related to maintenance and conservation of water bodies, bathing ghats, pump houses, water landings, service liniest only are permitted in this special zone. *River beautification and tourism related projects may be implemented with the concurrence of the Chief Town Planner.*

14 GUIDELINES FOR LARGE SCALE PROJECTS

Large scale development proposals in an area not less than 2 hectares, exceeding an investment of Rs.50 crores, which provide direct employment (after commissioning of the project) to the tune of not less than 500 may be permitted in all zones other than heritage and park & open space, subject to the recommendation of a committee to be constituted by the government for this purpose, under the chairmanship of the Secretary, Local Self Government Department, consisting of Chief Town Planner concerned of Kerala State Town and Country Planning Department and the Secretary, Thodupuzha municipality as members and the District Town Planner, Idukki as convener and satisfying following conditions:-

a) The developer shall produce project cum feasibility report and environmental impact assessment report, if required, of the project to the convener of the committee, 15 days in advance of the committee meeting.

b) The developer shall produce before the committee, all required clearances from the state and central government agencies concerned.

c) Adequate provision shall be made for supporting infrastructure such as water supply, sewerage, solid waste management etc. Separate sewage treatment plant and solid waste management measures shall be provided and maintained by the developer at his /her cost.

d) Adequate memorandum of understanding between the developer and Secretary of local body concerned shall be undertaken to bring this into effect.

e) The minimum access width shall be 12 meter.

f) The project shall be completed within a period of 3 years if not specified otherwise.

15 GENERAL GUIDELINES

1. The general guidelines shall apply to all zones irrespective of the zoning regulations for individual zones.

2. Zoning regulations will prevail over the provisions in Kerala Municipality Building Rules in force.

3. For the purpose of these regulations, built up area means the total area covered by the building at all floor levels. It shall also include area of mezzanine floor, galleries, bar sati and pent house at terrace level;

4. Subject to zoning regulations of the respective use zones, more than one uses may be combined in a building, provided that the total built up area on all floors of such a building shall not exceed the maximum built up area permitted for major use in that zone.

5. Urban renewal: In pockets where old and dilapidated structures do exist in clusters and which cannot be re developed in normal course, urban renewal proposals can be considered as per land pooling /plot re-organisations techniques, as permitted by the town planning legislations in force. The proposals shall be made by all the land owners in the area under consideration jointly.

6. No building shall be constructed (other than that is essential for the bonafide use of the water body under consideration) within 3 m from the boundary of any water body. Jogging tracks may be provided along streams, within this area.

7. Incentives for green building and utilization of solar power and other renewable energy may be permitted as per government policies from time to time.

8. Expansion of existing Public and Semi Public institutions including Educational and Health Institutions to adjacent plots shall be permissible without regard to the land use in which such adjacent plot is zoned and the development regulations imposed by such zoning, subject to the provisions of Paddy land and Wet land Act in force, CRZ regulations, if applicable or other applicable statutes.

9. The Secretary of the Municipality, with the concurrence of the District Officer of the Department of Town and Country Planning having jurisdiction over the area, shall permit in land uses such as Paddy land or Waterbody, such uses that are permissible in adjacent land use zone, if that particular land in the Paddy land zone or Waterbody zone is not classified as Paddy land or Waterbody as per revenue records.

10. Silent zone is to regulate and control the noise pollution to the extent possible as suggested in the Government Order G.O.(P) No.64/02 dated 20th April 2002. Land around hundred meters hospitals, education institutions, courts and religious places fall under this zone. The permissible noise level in this zone is as per Noise Pollution (Regulation & Control) Rules 2000.

11. Among the lands coming under the proposed Commercial use Zone, Residential use Zone and Agriculture cum Residential use Zone, the lands with nearness to roads as given below shall be coming under proposed Residential Mixed use Zone.

a. Land up to a depth of 150 m on both sides of roads with existing or proposed width greater than 10 m and up to 12 m

b. Land up to a depth of 200 m on both sides of roads with existing or proposed width greater than 12 m and up to 18 m

c. Land up to a depth of 250 m on both sides of roads with existing or proposed width greater than 18 m.

12. The sanctioned DTP Scheme for Central Area East shall stand revoked as provided under 2nd provision of the section 50 (1) of Kerala Town and Country Planning Act 2016, once the Master Plan is sanctioned under Section 36 of Kerala Town and Country Planning Act 2016.

CHAPTER - 34

DTP SCHEMES AND THEIR REVOCATION

Introduction

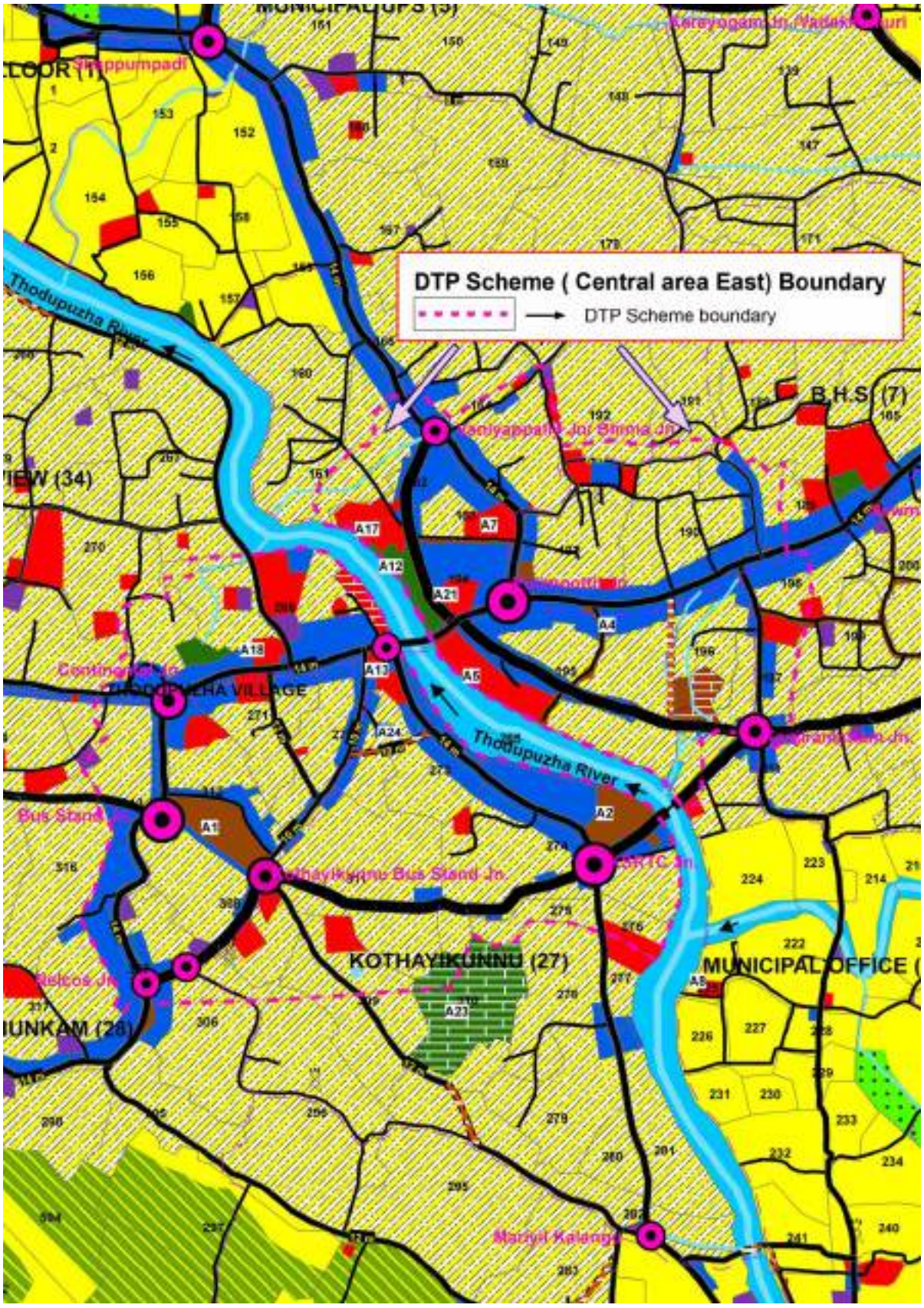
The perennial Thodupuzha river that flows through the middle of the town and the Muvattupuzha Punalur state highway, one of the major transportation corridors crossing the river are the two major factors that contributed to the evolution of the Thodupuzha town. To orient the development in a planned manner, detailed Town Planning schemes were prepared and implemented in Thodupuzha. D.T.P. Scheme for Central area East (sanctioned as per GO (MS)No.200/87 LAD dtd. 20/08/1987) and D.T.P. Scheme for Central Area West (published on 05/07/1984) are in force in the Thodupuzha municipal area. These two schemes together included the areas on the west and east banks of Thodupuzha river. The area comprised of these two Schemes has developed as business and administrative centre of the Town. One can say that Thodupuzha Town has in fact evolved as a business and administrative centre with this area as the nucleus were prepared to control and streamline the possible sudden growth of this area. These Schemes prepared in the early 1980s and mainly consisted of proposals for construction of new bypass roads, widening of the existing roads, creation of infrastructural facilities and civic amenities and expansion of administrative facilities etc. and also include control measures for maintaining healthy and peaceful environment in the scheme areas.

34.1 D.T. P. Scheme for Central Area East (Sanctioned)

The DTP Scheme for Central Area East, Thodupuzha was sanctioned by government vide GO (MS) No. 200/87/LAD of 20/08/1987 under the provisions of Travancore Town Planning Act 1108. The Scheme covers an area of 47.20 hectors in the core of the town on the east side of Thodupuzha River

34.1.1 Review of the Schemes

The detailed town planning scheme for Thodupuzha central area East (sanctioned) and West (published) together constitute an area of 1.162 sq. kilometers and is only 3.27% of the present Thodupuzha municipal area which has an area of 35.43 sq km. The fact that these two schemes are in force in their respective area for the last four decades, necessitate review of these two plans especially in the context of preparation of this master plan considering the social, cultural, economic and physical changes witnessed by Thodupuzha during this period.



Map No.34.1: DTP Scheme for central area- East

Major objectives of the schemes included (i) Development of road network of the area for relieving the traffic congestion that will be induced by envisaged commercial and related developments. (ii) Bringing in or attracting commercial developments to the central area while keeping the residential developments detached from the commotion and pollution of the business activities of the town (iii) Improving civic amenities and expansion of government office facilities, parking, recreation and transportation facilities etc. One of the Major proposals of DTP Scheme for Central Area East was the construction of a new bypass road connecting Thodupuzha – Muvattupuzha road and Thodupuzha – Udumbannur road. The important locations of this new road are Vaniyappalli Junction, Civil Station Junction and Kanjiramatton Junction which is materialized. Another important proposal in the DTP scheme for Central Area East was widening of link roads between Thodupuzha-Udumbannur road and Kanjiramattom bypass road is not yet implemented. In the case of The DTP scheme for Central Area West the proposals like widening of link roads between Thodupuzha –Idukki road and market road are not yet implemented. Such proposals of these schemes that were not yet taken up and which are still found to be essential are incorporated in this Master plan.

The analysis of the scheme reveals the fact that the above mentioned scheme area has already been developed as central core area of the town with predominant commercial, public and semipublic as well as transportation land use. The above objectives of the schemes perceived four decades ago that have come in to reality can be observed as scheme achievement.

The DTP Scheme for Central Area East shall stand revoked as provided under 2nd provision of the section 50 (1) of Kerala Town and Country Planning Act 2016, once the Master Plan is sanctioned under Section 36 of Kerala Town and Country Planning Act 2016.

34.2 DTP Scheme for Central Area West (Published)

The DTP Scheme for Central Area West, Thodupuzha was published on 5/07/1984 under the Travancore Town Planning Act 1108. The Scheme has not yet been sanctioned by Govt. The Scheme covers an area of 69 hectors in the core of the town on the west side of Thodupuzha River.

ANNEXURES

ANNEXURE – 4.1

Ward wise population density as per 2011 census

Ward No	Ward name	Area sq.km.	Total population	Population density
1	Vengalloor	0.887	1401	1579
2	Guru I.T.C	0.951	1346	1415
3	Municipal U.P.S	0.983	2173	2210
4	Madathikkandom	1.1046	1135	1031
5	Ambalam	1.0149	1779	1616
6	B.H.S	0.4396	1528	3475
7	Mangattukavala	1.0278	1634	1589
8	Pettenadu	1.1174	1616	1446
9	Holy Family Hospital	1.0982	1627	1481
10	Kallumary	1.2902	1561	1210
11	Karuppara	1.5014	1721	1147
12	PattayamKavala	1.0799	1807	1688
13	Muthalakodam	1.0662	2055	1938
14	Undaplavu	0.8621	1653	1922
15	Kummamkallu	1.0214	1848	1811
16	Malepparambu	0.9829	1819	1850
17	Keerikodu	1.4182	2140	1517
18	Muthaliyarmadom	1.07899	2080	1927
19	Maramkunnel	1.2453	1034	830
20	Kanjiramattom	1.0726	1907	1778
21	Municipal office	1.0149	1468	1446
22	College	1.2902	1690	1550
23	Olamattom	1.4565	1560	1071
24	Kothaikunnu	1.2838	1206	939
25	Arakkappara	1.2454	1558	1251
26	Chumkam	0.8614	1479	1716
27	Kolani	1.2838	1427	1711
28	Manjakkadambu	1.41819	1620	1142
29	Konnakkamala	1.3158	1229	934
30	Thenamkunnu	1.0982	1506	1369
31	Riverview	1.3286	1593	1198
32	Manakkadu	1.271	1845	1451

ANNEXURE 4.2

Ward wise average house hold size as per 2011 census

Ward No.	Ward name	No. of house holds	House hold size
1	Vengalloor	350	4
2	Guru I.T.C	304	4.43
3	Municipal U.P.S	520	4.18
4	Madathikkandom	297	3.82
5	Ambalam	442	4.02
6	B.H.S	370	4.13
7	Mangattukavala	403	4.05
8	Pettenadu	422	3.83
9	Holy Family Hospital	373	4.36
10	Kallumary	352	4.43
11	Karuppara	406	4.24
12	PattayamKavala	410	4.41
13	Muthalakodam	473	4.34
14	Undaplavu	400	4.13
15	Kummamkallu	421	4.39
16	Malepparambu	418	4.35
17	Keerikodu	497	4.31
18	Muthaliyarmadom	501	4.15
19	Maramkunnel	264	3.92
20	Kanjiramattom	489	3.9
21	Municipal office	372	3.95
22	College	412	4.1
23	Olamattom	372	4.19
24	Kothaikunnu	282	4.28
25	Arakkappara	384	4.06
26	Chumkam	354	4.18
27	Kolani	355	4.02
28	Manjakkadambu	417	3.88
29	Konnakkamala	290	4.24
30	Thenamkunnu	378	3.98
31	Riverview	388	4.11
32	Manakkadu	488	3.78

ANNEXURE 7.1

Commercial nodes and scores

Sl: No	Node	Commercial offices				Small scale industries						
		Barber shops, beauty clinics	Clinics	Tailor shops	Banks	Auto workshops	Flour mills	Hollow bricks	Service stations	Saw mills	Weigh bridges	Welding workshops
	Weightage >	1.00	1.10	1.22	1.00	1.83	3.67	3.67	2.20	2.75	11.00	2.75
1	Private bus stand jn.	10	7	9	10	4			8			
2	Mangattukavala jn.	2		2	6	17		1	1	5		4
3	Vengalloor jn.	2	4	2	5	3	2	3	3	2	1	4
4	Karikode jn.	3	1	3	1	3	1	1				1
5	Gandhi square jn.	2	2	1	2	1	1					
6	Civil station jn.	5	4	3	5							
7	Pulimoodu jn.	2	1		5							
8	KSRTC Stand jn.	6	10		2				1	1		
9	Kanjiramattam jn.	2	4	6	1	2			1			
10	Ambalam bypass-Muvattupuzha road jn.	8	1	9	5							
11	Continental jn.	4	1	4	4					1		1

Sl No	Node	Others										
		Luxury hotels (bar attached)	Cinema halls	Auditorium	Petrol pump	Marble, granite shops	Aluminium fabrication	Lodges	Furniture shop	Automobile showroom	Hospital	Hotels - 4 star and above
	Weightage >	2.75	11.00	1.83	2.75	2.75	1.83	1.83	1.57	3.67	2.75	11.00
1	Private bus stand jn.			3	1	2	1	1	3	1		
2	Mangattukavala jn.			1	1		2		4	2		
3	Vengalloor jn.	1		1	1	3	1		4	7		
4	Karikode jn.						1		1		2	
5	Gandhi square jn.	1		1				2			1	
6	Civil station jn.		2					1	2			
7	Pulimoodu jn.	1		1							1	
8	KSRTC Stand jn.	1		1		1		1	2		1	
9	Kanjiramattam jn.					3	2	2				
10	Ambalam bypass-Muvattupuzha road jn.				2				2			
11	Continental jn.						1	3				

Sl: No	Node	Retail shops														
		Chicken centre	Rubber dealer	CD music shops	Car work shop	Acri	Studio	Tours and travells	STD & photostat	Book stall	Digital & offset printing	Metal house	Lottery	Computer sales	Medical shop	Gift house
	Weightage >	1.83	5.50	1.38	11.00	3.67	1.00	1.22	1.00	3.67	2.20	2.75	1.37	1.83	1.00	1.22
1	Private bus stand jn.	2	2	3		1	5	3	6	3			8	4	7	7
2	Mangattukavala jn.	2				1	3	1	2	1			3		5	2
3	Vengalloor jn.	2	1	1		1	1	1	2		1		1		2	2
4	Karikode jn.	2		1			2		2				2	1	7	
5	Gandhi square jn.	1		3			5	2	2	2	3	1	3	1	9	2
6	Civil station jn.			2			4	5	9		4	1		1	6	1
7	Pulimoodu jn.			2			4	2	5		3		1		4	4
8	KSRTC Stand jn.						1	2	1			1		1	4	1
9	Kanjiramattam Jn.				1		3	1	2			1			1	
10	Ambalam bypass-Muvattupuzha road jn.	1		2			3	5	2		1		1	3	4	4
11	Continental jn.			2			4		6				10		3	5

Sl: No	Node	Whole sale shops														
		Share market	Gold loan	Sports goods	Dry cleaning	Paint shop	Fish mar -ket	Textile shops	Spare parts shops	Jewellery shop	Hardware shops	Super market	Hardware & sanitary ware shops	Glass shop	Eletrical	Total score
	Weightage >	2.75	2.20	5.50	2.20	3.67	1.83	1.00	1.83	2.20	1.83	2.20	5.50	2.20	1.57	
1	Private bus stand jn.	1		1	2	1	2	13	3	3	1	2		2	3	232
2	Mangattukavala jn.				1			9	11		1				3	161
3	Vengalloor jn.						1	4	2		4	1		1	2	172
4	Karikode jn.				2		1	3								63.1
5	Gandhi square jn.	1	3		1	2	1	13	3	1	1	1			1	120
6	Civil station jn.	1	3		1			9		2			1	1	4	126
7	Pulimoodu jn.	1	5					4		7			1	1	4	93.6
8	KSRTC Stand jn.						1	3				1				60.3
9	Kanjiramattam jn.		3					6			2					73.4
10	Ambalam bypass-Muvattupuzha road jn.		16	1				6	1	2		2			1	126
11	Continental jn.					3	1	20	1		1			3		103

ANNEXURE – 12.1

Ward wise average plot size

Ward No	Ward name	Average plot size
1	Vengalloor	19.24
2	Guru ITC	4.19
3	Municipal UPS	6.11
4	Madathikandam	18.35
5	Ambalam	31.19
6	BHS	4.21
7	Mangattukavala	5.9
8	Pettanadu	22.94
9	Holy Family Hospital	32.5
10	Kallumary	17.58
11	Karuppara	28.86
12	Pattayam Kavala	32.14
13	Muthalakodam	15.93
14	Undaplavu	13.02
15	Kummanakallu	14.82
16	Maleparambu	4.67
17	Keerikodu	4.22
18	Muthaliyarmadam	18.49
19	Maramkunnel	18
20	Kanjiramattam	13.73
21	Municipal Office	7.78
22	College	19.5
23	Olamattam	17.45
24	Kothayikunnu	6.16
25	Arakkappara	5.47
26	Chumkam	11.64
27	Kolani	31.74
28	Manjakadambu	21.43
29	Konnakkamala	25.17
30	Thenamkunnu	11.15
31	Riverview	25.22
32	Manakkadu	17.68

ANNEXURE 12.2

Average distance to services and comparison with adopted standards

Average distance to motorable road	% saying distance to motorable road greater than 0.5 km	Average distance to bus stop	% saying distance to bus stop greater than 0.5 km	Average distance to primary school	% saying distance to primary school greater than 0.5 km	Average distance to LP school	% saying distance to LP school greater than 0.5 km	Average distance to UP school	% saying distance to UP school greater than 1 km	Average distance to high school	% saying distance to high school greater than 3 km	Average distance to PO	% saying distance to PO greater than 3 km	Average distance to health	% saying distance to health greater than 5 km	Average distance to hospital	% saying distance to hospital greater than 5 km	Average distance to ration shop	% saying distance to ration shop greater than 5 km	Average distance to play ground	% saying distance to play ground greater than 5 km
0.5	0	0.7	80	0.8	97	0.8	97	1	40	1.3	0	0.9	0	1	0	1.55	0	0.8	0	0.8	0
0.94	100	1.1	100	1.2	100	1.2	100	1.3	67	1.3	0	1	0	1.9	0	1.91	0	1.1	0	0	0
0.92	69	0.9	69	1.4	81	1.4	81	1.4	69	1.5	0	1.1	0	2.8	8.3	2.78	8.3	1.4	0	0.5	0
0.52	8.7	1	74	1.8	96	1.8	96	1.8	57	2.1	17	1.3	4.4	2.8	0	3.17	4.4	1.8	0	4.1	39
0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	1.7	0	0.51	0	0.5	0	0	0
0.65	60	0.7	86	0.8	93	0.8	93	0.8	9.3	0.8	0	0.7	0	1.1	0	1.05	0	0.7	0	2.5	0
0.68	67	0.7	90	0.7	90	0.8	90	0.8	4.2	0.7	0	0.8	0	0.7	0	0.74	0	0.7	0	0.9	0
0.51	4	0.7	60	0.8	96	0.8	96	0.8	12	0.9	0	0.8	0	0.7	0	0.59	0	0.7	0	0.8	0
0.5	0	0.5	0	0.8	100	0.8	100	0.8	0	0.8	0	0.8	0	1.5	0	0.75	0	0.8	0	1.1	0
0.56	24	0.7	73	0.8	76	0.8	76	0.8	16	0.8	0	0.8	0	0.8	0	0.83	0	0.8	0	0.8	0
0.52	8.9	0.8	76	0.8	78	2.3	98	2.3	100	2.3	24	2	22	1.6	0	2.28	0	0.9	0	1.9	4
0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.6	0	2.1	0	0.53	0	0.5	0	0.5	0
0.5	1.8	0.5	7.3	0.5	15	0.6	20	0.6	0	0.6	0	0.7	0	1.4	0	0.9	0	0.8	1.8	2.5	0
0.5	0	0.7	86	0.7	89	0.7	89	0.7	0	0.7	0	0.8	0	2.2	0	0.89	0	0.8	0	2.5	0
0.52	9.4	0.6	21	0.6	28	0.6	33	0.6	3	0.7	0	0.8	0	1	0	0.96	0	0.8	0	1.2	0
0.65	58	0.7	67	0.8	91	0.7	67	0.8	8.3	0.7	0	0.8	0	0.8	0	0.85	0	0.8	0	0.8	0
0.61	43	1	84	1.1	94	1.1	94	1.1	43	1.1	0	1	0	1.1	0	1.07	0	0.9	0	1.5	0
0.5	0	0.5	0	0.6	15	0.6	23	0.6	2.1	0.6	0	0.7	0	2.1	0	0.93	0	0.7	0	0	0
0.5	0	0.8	100	0.8	100	0.8	100	0.8	0	0.8	0	0.8	0	2.5	0	1.5	0	0.8	0	0	0
0.5	0	0.8	100	0.7	95	0.7	95	0.7	0	1.3	0	1	0	1.4	0	1.48	0	0.9	0	1.6	0

0.58	23	0.7	69	0.9	92	1	95	1.1	44	1.1	0	0.8	0	1.6	0	1.57	0	0.8	0	1.5	0
0.5	0	0.7	44	0.7	65	0.7	65	0.8	21	0.8	0	0.7	0	1	0	0.99	0	1	0	1.8	0
0.51	4.3	0.6	26	0.7	60	1.3	100	1.3	77	1.3	0	0.9	0	0.8	0	1.39	0	0.7	0	1.4	0
0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0
0.55	20	0.7	75	0.7	75	0.7	75	0.7	0	0.7	0	0.7	0	0.7	0	0.69	0	0.7	0	0.8	0
0.5	0	0.5	0	0.5	0	0.5	4.3	0.5	0	0.7	0	0.7	0	1.7	0	1.22	0	0.7	0	0	0
0.51	3.2	0.5	3.3	0.6	45	0.6	48	0.7	3.2	1	0	0.8	0	1.4	0	2.15	0	1	0	1.8	0
0.56	25	1	98	1.5	100	1.5	100	1.5	85	3.9	95	1.8	13	3.7	0	3.96	0	1.8	0	4	0
0.54	7.7	0.7	49	0.7	55	0.7	49	0.7	8.1	1	2.6	1.1	0	1.4	0	1.22	0	1.1	2.6	0.8	0
0.56	24	0.7	76	1	89	1	89	1.1	47	1.1	0	0.8	0	1.4	0	1.34	0	0.8	0	0	0
0.5	0	0.6	26	0.6	16	0.6	16	0.6	2.3	0.6	0	0.7	0	0.6	0	1.05	0	0.6	0	0.7	0

ANNEXURE 14.1

List of homogeneous sections on major roads

Road/link No.	Name of road	
1	**Punalur - Muvattupuzha road - 8.6 km**	
L-01	Border	Manjakadambu
L-02	Manjakadambu	Nadukkandam
L-03	Nadukkandam	Kolani
L-04	Kolani	Bypass jn.
L-05	Bypass jn.	Continental jn.
L-06	Continental jn.	Gandhi Square
L-07	Gandhi Square	Adam Star jn.
L-08	Adam Star jn.	Shappumpadi
L-09	Shappumpadi	Vengalloor
L-10	Vengalloor	Kappu
2	**Thodupuzha-Moolamattom road - 2.3 km**	
L-11	Border	Olamattom
L-12	Olamattom	KSRTC jn.
L-13	KSRTC jn.	Gandhi Square
3	**Pallipeedika - Shappum Padi road - 1.9 km**	
L-14	Pallipadi	Shappumpadi
4	**Thodupuzha-Koothattukulam road - 2.3 km**	
L-15	Kolani	Parakadavu
L-16	Parakadavu	Border
5	**Thodupuzha-Oonnukal road (SH-44) - 1.6 km**	
L-17	Vengalloor	Pallipadi
L-18	Pallipadi	Border
6	**Parakkadavu-Anjapra road - 1 km**	
L-19	Parakadavu	Border
7	**Mariyil Kalungu - Chungom road - 1 km**	
L-20	Mariyil Kalungu	Chungom
8	**Bypass road - 1.4 km**	
L-21	Chungom	Church jn.
L-22	Church jn.	KSRTC jn.
L-23	KSRTC jn.	Kanjiramattom jn.
9	**Kanjiramattom – Thekkumbhagom road - 2.4 km**	
L-24	Kanjiramattom	Border

10	**Karikode-College jn. road - 0.8 km**	
L-25	Karikkode	College jn.
11	**Velliyamattom road - 2 km**	
`L-26	Edavetty Jharam	Kumbamkallu
L-27	Kumbamkallu	Karikkode jn.

Road/link No.	Name of road	
L-28	Karikkode jn.	Mangattukavala
12	**Karikode-Kappithottam Kurisadi road - 2 km**	
L-29	Karikkode jn.	Border
13	**Kanjiramattom – Convent jn. – Vimala public school road - 1.1 km**	
L-30	Karikkode jn.	Convent jn.
L-31	Convent jn.	Vimala Public School
14	**Thodupuzha - Kaliyar road - 5.9 km**	
L-32	Mangattukavala	Muthalakodam
L-33	Muthalakodam	Pattyam Kavala
L-34	Pattyam Kavala	Kunnam
L-35	Kunnam	Njarukutty
L-36	Njarukutty	Border
15	**Njarkutty - Karimannoor road - 0.5 km**	
L-37	Njarkutty	Border
16	**Civil station- Temple jn. - Adamstar - 0.360 km**	
L-38	Civil Station	Adam Star
17	**KKR jn. - Four lane link road - 0.2 km**	
L-39	KKR jn.	Link Road
18	**Four lane bypass road - 2.3 km**	
L-40	Mangattukavala	Vadakkumuri
L-41	Vadakkumuri	Karayogam jn.
L-42	Karayogam jn.	Shappumpadi
19	**Karayogam jn.-Puthuchira-Muthalakkodam road - 2.9 km**	
L-43	Karayogam jn.	Muthalakkodam jn.
20	**Muthalakkodam-Undaplavu road - 1 km**	
L-44	Muthalakkodam	Undaplavu
21	**Chalamkode-Undaplavu-Karikode road - 1.1 km**	
L-45	Karikode	Undaplavu
L-46	Undaplavu	Chalamkode
22	**Undaplavu-Kumbom Kallu road**	
L-47	Undaplavu	Kumbom Kallu
23	**Muthalakkodam-Kanjirampara - Ezhalloor road - 1.9 km**	
L-48	Muthalakkodam	Kanjirampara
L-49	Kanjirampara	Ezhalloor jn.

24	Ezhalloor jn.- Karoopara road - 1 km	
L-50	Ezhalloor Jn.	Karoopara
L-51	Karoopara	Njarkutty
25	Kunnam-West Kodikulam road - 1.4 km	
L-52	Kunnam	Karoopara

Road/link No.	Name of road	
26	Thodupuzha-Manakkad road - 2.2 km	
L-53	Continental jn.	KSEB jn.
L-54	KSEB jn.	Co-operative Hospital jn.
L-55	Co-operative Hospital jn.	Manakkadu
27	Kolani-Thalammatomkarayil-Vengalloor bypass - 2.5 km	
L-56	Kolani	Thalammatomkarayil
L-57	Thalammatomkarayil	Co-operative Hospital jn.
L-58	Co-operative Hospital jn.	Vengalloor jn.
28	KSEB jn.-River-Carmel jn. road - 1.7 km	
L-59	KSEB jn.	Carmel jn.
29	KSEB jn (Church)-Chungom road - 0.8 km	
L-60	KSEB jn.	Chungom jn.
30	Market jn. - Civil station - 0.92 km	
L-61	Market jn.	Kanjiramattom jn.
L-62	Kanjiramattom jn.	Civil Station
31	Kothayikunnu road - 0.510 km	
L-63	Pvt Stand	Gandhi Square
32	Vadakkummuri-Adam Star road - 1.250 km	
L-64	Vadakkummuri	Adam Star
33	Kanjiramattom – Vimala jn. - Mangattukavala - 1.07 km	
L-65	Kanjiramattom	Vimala jn.
L-66	Vimala jn.	Mangattukavala
34	Civil station- Temple jn. - Adamstar - 0.360 km	
L-67	Civil Station	Adam Star

ANNEXURE 14.2

Inventory details of major roads

Sl.No	Road name / Chainage	Length (km)	Width (m)		Footpath (m)		Shoulder (m)		Adjoining landuse	
			CW	ROW	L	R	L	R	L	R
I	**Punalur-Moovattupuzha road**	**8.60**								
1	Plantation - Manjakadambu	1.00	7.0	12.0			1.0	1.0	Agricultural	Agricultural
2	Manjakadambu - Nadukkandam	0.80	7.0	10.0			1.0	1.0	Agricultural	Agricultural
3	Nadukkandam - Kolani	1.30	7.0	15.0			1.5	1.5	Residential/Agricultural	Residential/Agricultural
4	Kolani - Bypass jn.	1.40	7.0	12.0			1.0	1.0	Residential/Commercial	Residential/Commercial
5	Bypass jn. - Gandhi square	1.03	7.0	9.0	1.0	1.0	1.0	1.0	Commercial	Commercial
6	Gandhi jn. - Adams star jn.	0.73	7.0	10.0	1.0	1.0	1.0	1.0	Commercial	Commercial
7	Adams star jn. - Shappumpadi	0.79	7.0	10.0	1.0	1.0	1.0	1.0	Commercial	Commercial
8	Shappumpadi - Vengalloor jn.	0.64	7.0	12.0	1.0	1.0	1.0	1.0	Commercial	Commercial
9	Vengalloor jn. - Kappu jn.	0.91	7.0	12.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
II	**Thodupuzha - Kattappana road**	**3.65**								
1	Pulimchodu jn. - Olamatom jn.	1.10	7.0	12.0			1.0	1.0	Agricultural	Agricultural
2	Olamatom jn. - Mariyil kalungu	1.28	7.0	10.0			1.0	1.0	Agricultural	Agricultural

3	Mariyil kalungu - KSRTC jn.	0.72	7.0	10.0			1.0	1.0	Agricultural	Agricultural
4	KSRTC jn.- Gandhi jn.	0.55	7.0	9.0	1.0	1.0	1.0	1.0	Commercial	Commercial
III	**Pallipeedika - Shappum padi**	**1.80**								
1	Onnukallu - Pallipedika	1.80	2.5	7.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
IV	**Alappuzha - Madurai road**	**2.18**								
1	Kolani jn.- Parakadavu jn.	1.17	5.5	9.0			1.0	1.0	Agricultural	Agricultural
2	Parakadavu jn. - Purappuzha Panchayath border	0.73	7.0	10.0			1.0	1.0	Agricultural	Agricultural
V	**Thodupuzha - Onnukallu road**	**1.86**								
1	Vengalloor - Pallipedika	1.25	5.0	8.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
2	Pallipedika - Muttaramkunnu	0.61	5.0	8.0			1.0	1.0	Agricultural	Agricultural
VI	**Parakkadavu-Anjapra road**	**0.80**								
1	Manjumavu jn. - Parakkadavu	0.80	3.0	7.0			1.0	1.0	Agricultural	Agricultural
VII	**Mariyil Kalungu - Chungom road**	**1.31**								
1	Mariyil Kalungu - Chungom	1.31	3.0	6.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
VIII	**Bypass road**	1.43								
1	Kanjiramattom jn.- KSRTC jn.	0.43	7.0	12.0			1.0	1.0	Commercial/Agricultural	Commercial/Agricultural
2	KSRTC jn. - Pvt bus stand jn.	0.72	7.0	12.0			1.0	1.0	Commercial/Agricultural	Commercial/Agricultural
3	Pvt bus stand jn. - Chungam	0.28	7.0	12.0			1.0	1.0	Commercial/Agricultural	Commercial/Agricultural

IX	**Kanjiramattom – Thekkumbhagom road**	**2.25**								
1	Kanjiramattom - Temple jn.	1.00	3.0	8.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
2	Kanjiramattom - Temple jn.	1.25	3.0	7.0			1.0	1.0	Agricultural	Agricultural
X	**Karikode-College jn. road**	**0.35**								
1	Karikode-College jn. road	0.35	3.5	7.0			1.0	1.0	Public Institutes	Public Institutes
XI	**Velliyamattom road**	**2.22**								
1	Kumbamkallu jn. - Edavetty	1.20	3.5	9.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
2	Edavetty - Karikode	1.02	3.5	9.0			1.0	1.0	Commercial	Commercial
XII	**Karikode-Kappithottam Kurisadi road**	**1.91**								
1	Karikode- Kurisadi jn.	1.91	3.0	7.0			1.0	1.0	Agricultural	Agricultural
XIII	**Kanjiramattom– Convent jn. – Vimala school**	**1.07**								
1	Kanjiramattom – Convent jn. – Vimala school	1.51	3.5	7.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
XIV	**Kaliyar road**	**5.74**								
1	Njarukutty - Kunnam jn.	1.16	7.5	15.0			1.5	1.5	Agricultural	Agricultural
2	Kunnam jn.- Pattayam jn.	0.49	7.0	15.0			1.5	1.5	Agricultural	Agricultural
3	Patayam jn. - Muthakodam	1.29							Agricultural	Agricultural
4	Muthakodam - Mangattu kavala jn.	1.31	7.0	10.0			1.0	1.0	Agricultural	Agricultural
5	Mangattu kavala jn. -Market jn.	1.49	7.0	10.0			1.0	1.0	Commercial/Residential	Commercial/Residential
XV	**Njarkutty - Karimannoor road**	**0.20**								
1	Njarkutty - Karimannoor road	0.20	7.0	10.0			1.0	1.0	Agricultural	Agricultural

XVI	**Civil station - Temple jn. - Adamstar**	**0.92**								
1	Civil station - Temple jn.	0.92	5.5	10.0			1.0	1.0	Commercial	Commercial
XVII	**KKR jn. - Four lane link road**	**0.18**								
1	Adam star - Vadakkummuri	0.18	3.0	5.0			1.0	1.0	Residential	Residential
XVIII	**Four lane bypass road**	**2.25**								
1	Bye pass - Karayogom jn.	1.37	12.0	20.0			1.0	1.0	Agricultural	Agricultural
2	Karayogom jn.- Vadakkummuri jn.	0.45	12.0	20.0			1.0	1.0	Agricultural	Agricultural
3	Vadakkummuri Jn - Mangattukavala	0.43	12.0	20.0			1.0	1.0	Agricultural	Agricultural
XIX	**Karayogam jn. - Muthalakkodam road**	**1.57**								
1	Karayogam jn. - Puthuchira	1.00	3.0	7.0			1.0	1.0	Agricultural	Agricultural
2	Puthuchira - Muthalakkodam jn.	0.57	3.5	7.0			1.0	1.0	Agricultural	Agricultural
XX	**Muthalakkodam - Undaplavu road**	**1.00**								
1	Muthalakkodam - Undaplavu road	1.00	2.5	5.0			1.0	1.0	Residential	Residential
XXI	**Chalamkode - Undaplavu - Karikode road**	**1.07**								
1	Chalamkode - Undaplavu	0.54	3.0	5.0			1.0	1.0	Residential	Residential
2	Undaplavu - Karikode Road	0.53	3.0	5.0			1.0	1.0	Residential	Residential
XXII	**Undaplavu-Kumbomkallu road**	**0.23**								
1	Undaplavu - Kumbomkallu road	0.23	2.5	4.0			1.0	1.0	Residential	Residential
XXIII	**Muthalakkodam - Kanjirampara road**	**1.02**								
1	Muthalakkodam - Pazhaseri	1.02	3.0	7.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
XXIV	**Kaarupara - Ezhalloor jn.**	**0.79**								
1	Muthalakkodam - Pazhaseri	0.79	3.0	6.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
XXV	**Kunnam - West Kodikulam road**	**2.50**								
1	Cheruthottinkkara - Pallippadi	1.54	3.5	9.0			1.0	1.0	Agricultural	Agricultural

2	Pallippadi - Kunnam	2.50	3.5	9.0			1.0	1.0	Agricultural	Agricultural
XXVI	**Thodupuzha-Manakkad road**	**2.11**								
1	Continental jn. - KSEB jn.	0.40	7.0	10.0			1.0	1.0	Commercial	Commercial
2	KSEB jn. - Hospital	0.41	7.0	10.0			1.0	1.0	Agricultural	Agricultural
3	Hospital - Manakad jn.	1.30	6.0	10.0			1.0	1.0	Agricultural	Agricultural
XXVII	**Kolani - Thalammatomkarayil - Vengalloor bypass**	Under construction								
XXVIII	**KSEB jn. - River - Carmel jn. road**	**1.65**								
1	KSEB jn. - River - Carmel jn. road	1.65	3.0	9.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
XXIX	**KSEB jn. (Church)- Chungom road**	**0.75**								
1	KSEB jn. (Church) - Chungom road	0.75	3.5	9.0			1.0	1.0	Residential/Agricultural	Residential/Agricultural
XXX	**Market jn. - Kanjiramattom - Civil station**	**0.92**								
1	Market jn.- Kanjiramattom	0.30	3.5	5.5			1.0	1.0	Commercial	Commercial
2	Kanjiramattom - Civil station	0.62	7.0	15.0			1.0	1.0	Commercial	Commercial
XXXI	**Thodupuzha - Kothayikunnu road**	**0.51**								
1	Priavte stand - Gandhi square	0.51	3.0	7.0			1.0	1.0	Commercial	Commercial
XXXII	**Vadakkummuri - Adam star**	**1.25**								
1	Adam star - Vadakkummuri	1.25	3.5	6.0			1.0	1.0	Residential	Residential
XXXIII	**Kanjiramattom – Mangattukavala**	**1.07**								
1	Kanjiramattom – Mangattukavala	1.07	7.0	15.0	-	-	1.5	1.5	Commercial/Agricultural	Commercial/Agricultural

ANNEXURE 14.3

Speed and delay characteristics of major roads

Sl. No	Chainage	Location	Running time (seconds)	Delay time (seconds)	Journey time (seconds)	Journey speed (kmph)	Running speed (kmph)	Cause of delay
Name of road: 1. Punalur-Muvattupuzha road (SH 8) – From L 04 to L 10								
1	0.0000	Vengalloor						
2	1.4700		158.4	10.7	169.1	31.30	33.41	Bus Stop
3	1.7000	Adam Star jn.	32.7	3.6	36.3	22.81	25.32	Intersection
4	2.0700		49.7	4.5	54.2	24.58	26.80	Congestion, Signal
5	2.1800	Civil station	18.9	19.5	38.4	10.31	20.95	Signal
6	2.9500	Continental jn.	117.2	7.5	124.7	22.23	23.65	Intersection, Signal
7	4.1500	Chungom	142.5	6.7	149.2	28.95	30.32	Bus Stop
8	5.0000	Kolani jn.	108.2	4.1	112.3	27.25	28.28	Bus Stop
			627.6	**56.6**	**684.2**	**26.31**	**28.68**	

Name of road: 2. Thodupuzha-Moolamattom road – From L 12 to L 13								
1	0.000	Gandhi square						
2	0.030		5.2	3.9	9.1	11.87	20.77	Signal
3	0.450		57.9	9.5	67.4	22.43	26.11	Bus stop , Congestion , Signal
4	0.590	KSRTC jn.	32.1	44.4	76.5	6.59	15.70	Signal
5	0.610		4.9	23.2	28.1	2.56	14.69	Bus stop, Congestion
6	1.300	Mariyil kalungu	91.2		91.2	27.24	27.24	
			191.3	**81.0**	**272.3**	**17.19**	**24.46**	
Name of road: 14. Thodupuzha-Kaliyar road – From L 32 to L 33								
1	0.000	Muthalakodam						
2	2.240	Market jn.	220.8		220.8			
			220.8		**220.8**	**36.52**	**36.52**	

ANNEXURE 14.4

Volume of daily vehicular traffic on major road links

Sl. No	Road link	Type of vehicle												Total vehicles/ day (No)	Total PCU/ day
		Bus	Mini-bus	Car	Passenger auto	Two wheeler	MAT	Truck	Mini-truck	Goods auto	Bi- cycle	Hand cart	Others		
I	**Punalur - Muvattupuzha road**														
L 01, L 02	Border - Nadukkandom	258	49	1,968	619	2,290	17	308	461	157	32	5	3	**6,167**	**6,483**
L 03	Nadukkandom - Kolani	310	135	2,312	1,534	3,541	21	220	375	350	177	0	0	**8,975**	**8,505**
L 04	Kolani - Bypass jn.	463	177	3,407	2,799	5,528	21	360	532	325	112	0	2	**13,726**	**12,990**
L 05	Bypass jn.- Continental jn.	1,286	111	6,951	4,909	10,284	14	213	127	237	14	0	0	**24,146**	**22,163**
L 06	Continental jn.- Gandhi Square	1,311	81	9,008	5,930	12,398	27	239	134	286	43	0	0	**29,457**	**26,539**
L 07 (A)	Gandhi Square - Civil Station	1,442	184	12,931	17,547	17,536	16	534	919	1,430	106	9	5	**52,659**	**48,450**
L 07 (B)	Civil Station - Adam Star	1,227	437	17,634	18,351	21,329	21	349	785	1,184	149	25	0	**61,491**	**54,664**
L 08	Adam Star - Shappumpadi	899	356	11,871	12,671	18,273	33	1,023	1,114	1,218	151	0	7	**47,616**	**43,134**
L 09	Shappumpadi - Vengalloor	833	327	10,023	6,541	14,532	26	688	1,066	689	29	25	6	**34,785**	**31,439**
L 10	Vengalloor - Kappu	617	37	5,684	1,585	6,204	65	778	1,022	547	45	0	0	**16,584**	**17,007**
II	**Thodupuzha - Moolamattom road**														
L 11	Border - KSRTC jn.	518	55	3,699	1,237	3,242	13	703	560	260	54	0	0	**10,341**	**11,488**

L 12 & L 13	KSRTC Jn - Gandhi Square	1,168	835	5,774	6,794	6,938	8	514	656	614	58	0	0	**23,359**	**23,999**
III	**Thodupuzha - Koothattukulam road**														
L 15 & L 16	Kolani - Border	215	10	965	415	1,752	7	95	182	84	21	8	0	**3,754**	**3,632**
IV	**Thodupuzha - Oonnukal road**														
L 17 & L 18	Vengalloor - Border	167	52	2,182	1,322	4,152	0	50	397	284	56	0	0	**8,662**	**7,217**
V	Bypass road														
L 21	Chungam - Church jn.	107	108	3,100	1,738	6,400	13	97	800	179	25	0	0	**12,567**	**10,262**
L 22	Church jn. - KSRTC jn.	1,239	768	3,596	2,917	5,568	8	847	317	334	6	0	13	**15,613**	**17,634**
L 23	KSRTC jn. - Kanjiramattom	1,168	835	5,774	6,794	6,938	8	514	656	614	58	0	0	**23,359**	**23,999**
VI	Kanjiramattom - Thekkumbhagom road														
L 24	Kanjiramattom - Thekkumbhagom	10	87	1,254	2,132	3,128	0	38	86	108	75	13	0	**6,931**	**5,551**
VII	Karikode - College jn. road														
L 25	Karikode - College jn.	12	259	2,981	3,845	3,845	0	64	291	380	158	0	0	**11,835**	**10,261**
VIII	Velliyamattom road														
L 26, L 27 & L 28	Mangattukavala - Edavetty	171	34	1,148	851	2,582	0	306	509	289	67	0	0	**5,957**	**5,858**
IX	Karikode - Kappithottam road														
L 29	Karikode - Kappithottam Kurisadi	12	87	2,054	1,858	1,993	0	96	162	316	181	0	0	**6,759**	**6,013**

X	Thodupuzha - Kaliyar road														
L 32	Mangattukavala - Muthalakodam	167	78	3,287	2,517	4,770	14	256	389	304	60	0	8	**11,850**	**10,604**
L 33, L 34, L35 & L 36	Muthalakodam - Njarkutty	112	61	1,458	768	3,522	13	139	219	149	10	0	0	**6,451**	**5,373**
X	Njarkutty - Karimannoor road														
L 37	Njarkutty - Karimannoor	185	20	30	88	187	13	41	20	30	0	0	0	**614**	**1,038**
XI	Four lane bypass road														
L 40 & L 41	Mangattukavala - Karayogam	94	201	4,705	3,370	7,362	21	378	735	599	54	0	8	**17,527**	**15,345**
L 42	Karayogam - Shappumpadi	66	377	7,041	4,973	10,147	26	509	1,040	1,180	21	0	18	**25,398**	**22,354**
XII	Kunnam - West Kodikulam road														
L 52	Kunnam - Karoopara	44	40	533	460	1,884	13	143	121	103	108	0	0	**3,449**	**2,953**
XIII	Thodupuzha - Manakkad road														
L 53 & L 54	Continental - Co-operative hospital	63	66	2,695	2,957	5,775	13	88	104	180	43	0	0	**11,984**	**9,508**
L 55	Co-operative hospital - Manakkadu	67	51	577	948	1,378	52	150	251	172	36	0	0	**3,682**	**3,742**
XIV	Market jn. - Civil station														
L 61	Market - Kanjiramattom	315	43	2,204	2,490	4,084	14	97	605	125	126	0	0	**10,103**	**9,195**
L 62	Kanjiramattom - Civil station	125	109	3,100	1,738	5,790	13	97	800	179	25	0	0	**11,976**	**10,013**
XV	Kanjiramattom - Mangattukavala														

L 65 & L 66	Kanjiramattom - Mangattukavala	30	173	3,762	2,472	5,668	13	78	194	36	100	0	0	**12,526**	**10,087**
XVI	Civil station - Adam star														
L 67	Civil station - Adam star	484	162	5,174	5,601	7,320	39	724	379	409	8	0	3	**20,303**	**19,477**

ANNEXURE 14.5

Recommended design service volume (PCUs per hour)

Sl.no	Type of carriage way	Total design service volumes for different categories of urban roads		
		Arterial*	Sub-arterial**	Collector***
1	2-Lane (One-Way)	2,400	1,900	1,400
2	2-Lane (Two-Way)	1,500	1,200	900
3	3-Lane (One-Way)	3,600	2,900	2,200
4	4-Lane Undivided (Two-Way)	3,000	2,400	1,800
5	4-Lane Divided (Two-Way)	3,600	2,900	
6	6-Lane Undivided (Two-Way)	4,800	3,800	
7	6-Lane Divided (Two-Way)	5,400	4,300	
8	8-Lane Divided (Two-Way)	7,200		

* Roads with no frontage access, no standing vehicles, very little cross traffic

** Roads with frontage access but no standing vehicles and high capacity intersections

*** Roads with free frontage access, parked vehicles and heavy cross traffic

Source: Guidelines for capacity of urban roads in plain areas, Indian Roads Congress, IRC 106-1990

ANNEXURE 14.6

Volume-capacity ratio on major road links

Road/ Link No.	Road link	Capacity (PCU/ day)	Volume (PCU/ day)	Volume-capacity ratio
I	**Pala - Thodupuzha road**			
L 01, L 02	Border - Nadukkandom	15,000	6,483	0.43
L 03	Nadukkandom - Kolani	15,000	8,505	0.57
L 04	Kolani - Bypass jn.	15,000	12,990	0.87
L 05	Bypass jn. - Continental jn.	15,000	22,163	1.48
L 06	Continental jn. - Gandhi square	15,000	26,539	1.77
L 07 (A)	Gandhi Square - Civil station	15,000	48,450	3.23
L 07 (B)	Civil station - Adam star	15,000	54,664	3.64
L 08	Adam star - Shappumpadi	15,000	43,134	2.88
L 09	Shappumpadi - Vengalloor	15,000	31,439	2.10
L 10	Vengalloor - Kappu	15,000	17,007	1.13
II	**Thodupuzha - Moolamattom road**			
L 11	Border - KSRTC jn.	15,000	11,488	0.77
L 12 & L 13	KSRTC jn. - Gandhi square	15,000	23,999	1.60
III	**Thodupuzha - Koothattukulam road**			
L 15 & L 16	Kolani - Border	12,000	3,632	0.30
IV	**Thodupuzha - Oonnukal road**			
L 17 & L 18	Vengalloor - Border	12,000	7,217	0.60
V	**Bypass road**			
L 21	Chungam - Church jn.	15,000	10,262	0.68
L 22	Church jn. - KSRTC jn.	15,000	17,634	1.18
L 23	KSRTC jn. - Kanjiramattom	15,000	23,999	1.60
VI	**Kanjiramattom - Thekkumbhagom road**			
L 24	Kanjiramattom - Thekkumbhagom	9,000	5,551	0.62

VII	**Karikode - College jn. road**			
L 25	Karikode - College jn.	12,000	10,261	0.86
VIII	**Velliyamattom road**			
L 26, L 27 & L 28	Mangattukavala - Edavetty	9,000	5,858	0.65
IX	**Karikode - Kappithottam road**			
L 29	Karikode - Kappithottam Kurisadi	12,000	6,013	0.50
X	**Thodupuzha - Kaliyar road**			
L 32	Mangattukavala - Muthalakodam	15,000	10,604	0.71
L 33, L 34, L35 & L 36	Muthalakodam - Njarkutty	15,000	5,373	0.36
X	**Njarkutty-Karimannoor road**			
L 37	Njarkutty-Karimannoor	9,000	1,038	0.12

XI	**Four lane bypass road**			
L 40 & L 41	Mangattukavala - Karayogam	36,000	15,345	0.43
L 42	Karayogam - Shappumpadi	36,000	22,354	0.62
XII	**Kunnam-West Kodikulam road**			
L 52	Kunnam - Karoopara	15,000	9,508	0.63
XIII	**Thodupuzha - Manakkad road**	15,000	3,742	0.25
L 53 & L 54	Continental - Co-operative hospital			
L 55	Co-operative hospital - Manakkad	15,000	9,195	0.61
XIV	**Market jn. - Civil station**	15,000	10,013	0.67
L 61	Market - Kanjiramattom			
L 62	Kanjiramattom - Civil station	15,000	10,087	0.67
XV	**Kanjiramattom - Mangattukavala**			
L 65 & L 66	Kanjiramattom - Mangattukavala	15,000	19,477	1.30
XVI	**Civil station - Adam star**			
L 67	Civil station - Adam star	9,000	2,953	0.33

ANNEXURE 14.7

Parking duration of vehicles on major parking corridors

Sl. No.	Vehicle type	Duration (minutes)							Total
		<30	30-60	60-90	90-120	120-150	150-180	>180	
Location: Private bus stand									
1	Bus	1	0	0	0	0	0	0	1
2	Mini-bus/ tempo	68	26	8	5	0	0	0	107
3	Car	84	8	2	1	1	0	0	96
4	Pass auto	37	8	1	0	0	0	0	46
5	Two wheelers	154	56	24	6	4	0	0	244
6	Truck	2	0	0	0	0	0	0	2
7	MT	6	1	0	0	1	0	0	8
8	Goods auto	0	0	0	0	0	0	0	0
	Total	**352**	**99**	**35**	**12**	**6**	**0**	**0**	**504**
	Percent	**69.84**	**19.64**	**6.94**	**2.38**	**1.19**	**-**	**-**	**100.00**
Location: Mangattukavala									
1	Bus	1	0	0	0	0	0	0	1
2	Mini-bus/ tempo	1	0	0	0	0	0	0	1
3	Car	34	2	1	0	0	0	0	37
4	Pass auto	22	0	0	0	0	0	0	22
5	Two wheelers	18	3	0	0	0	0	0	21
6	Truck	3	0	0	0	0	0	0	3
7	MT	3	0	0	0	0	0	0	3
8	Goods auto	0	0	0	0	0	0	0	0
	Total	**82**	**5**	**1**	**0**	**0**	**0**	**0**	**88**
	Percent	**93.18**	**5.68**	**1.14**	**-**	**-**	**-**	**-**	**100.00**

Location: Muthalakodam									
1	Bus	1	0	0	0	0	0	0	1
2	Mini-bus/ tempo	0	0	0	0	0	0	0	0
3	Car	18	6	5	1	0	0	0	30
4	Pass auto	8	8	0	1	0	0	0	17
5	Two wheelers	8	9	2	0	0	0	0	19
6	Truck	1	0	0	0	0	0	0	1
7	MT	2	2	0	0	0	0	0	4
8	Goods auto	1	0	0	0	0	0	0	1
	Total	**39**	**25**	**7**	**2**	**0**	**0**	**0**	**73**
	Percent	**53.42**	**34.25**	**9.59**	**2.74**	**-**	**-**	**-**	**100.00**

Location: Gandhi square to Manakkad jn.									
1	Bus	1	0	0	0	0	0	0	1
2	Mini-bus/ tempo	0	0	0	0	0	0	0	0
3	Car	58	1	0	0	0	0	0	59
4	Pass auto	32	1	0	0	0	0	0	33
5	Two wheelers	75	12	1	0	0	0	0	88
6	Truck	0	0	0	0	0	0	0	0
7	MT	7	0	0	0	0	0	0	7
8	Goods auto	0	0	0	0	0	0	0	0
	Total	**173**	**14**	**1**	**0**	**0**	**0**	**0**	**188**
	Percent	**92.02**	**7.45**	**0.53**	**-**	**-**	**-**	**-**	**100.00**
Location: Civil station to Temple									
1	Bus	0	0	0	0	0	0	0	0
2	Mini-bus/ tempo	0	0	0	0	0	0	0	0
3	Car	87	10	0	0	0	0	0	97

4	Pass auto	33	2	0	0	0	0	0	35
5	Two wheelers	33	4	1	0	0	0	0	38
6	Truck	2	0	0	0	0	0	0	2
7	MT	0	0	0	0	0	0	0	0
8	Goods auto	0	0	0	0	0	0	0	0
	Total	**155**	**16**	**1**	**0**	**0**	**0**	**0**	**172**
	Percent	**90.12**	**9.30**	**0.58**	**-**	**-**	**-**	**-**	**100.00**
Location: Temple to Adamstar									
1	Bus	0	0	0	0	0	0	0	0
2	Mini-bus/ tempo	0	0	0	0	0	0	0	0
3	Car	50	7	0	0	0	0	0	57
4	Pass auto	23	3	0	0	0	0	0	26
5	Two wheelers	31	3	0	0	0	0	0	34
6	Truck	0	0	0	0	0	0	0	0
7	MT	2	0	0	0	0	0	0	2
8	Goods auto	0	0	0	0	0	0	0	0
	Total	**106**	**13**	**0**	**0**	**0**	**0**	**0**	**119**
	Percent	**89.08**	**10.92**	**-**	**-**	**-**	**-**	**-**	**100.00**

Location: Market road									
1	Bus	0	0	0	0	0	0	0	0
2	Mini-bus/ tempo	0	0	0	0	0	0	0	0
3	Car	75	4	3	0	0	0	0	82
4	Pass auto	66	5	0	1	0	0	0	72
5	Two wheelers	137	27	9	0	0	0	0	173
6	Truck	1	0	0	0	0	0	0	1
7	MT	22	1	0	0	0	0	0	23

8	Goods auto	0	0	0	0	0	0	0	0
	Total	**301**	**37**	**12**	**1**	**0**	**0**	**0**	**351**
	Percent	**85.75**	**10.54**	**3.42**	**0.28**	**-**	**-**	**-**	**100.00**
Location: Woodland to Gandhi square									
1	Bus	0	0	0	0	0	0	0	0
2	Mini-bus/ tempo	0	0	0	0	0	0	0	0
3	Car	19	3	4	1	0	0	0	27
4	Pass auto	19	12	0	1	0	0	0	32
5	Two wheelers	38	11	3	0	0	0	0	52
6	Truck	0	0	0	0	0	0	0	0
7	MT	1	0	0	0	0	0	0	1
8	Goods auto	0	0	0	0	0	0	0	0
	Total	**77**	**26**	**7**	**2**	**0**	**0**	**0**	**112**
	Percent	**68.75**	**23.21**	**6.25**	**1.79**	**-**	**-**	**-**	**100.00**
Location: Woodland to KSRTC									
1	Bus	0	0	0	0	0	0	0	0
2	Mini-bus/ tempo	0	0	0	0	0	0	0	0
3	Car	54	19	10	1	0	0	0	84
4	Pass auto	30	5	0	1	0	0	0	36
5	Two wheelers	74	18	5	1	0	0	0	98
6	Truck	0	0	0	0	0	0	0	0
7	MT	3	1	0	0	0	0	0	4
8	Goods auto	0	0	0	0	0	0	0	0
	Total	**161**	**43**	**15**	**3**	**0**	**0**	**0**	**222**
	Percent	**72.52**	**19.37**	**6.76**	**1.35**	**-**	**-**	**-**	**100.00**

ANNEXURE 14.8

Distribution of inbound and outbound traffic at outer cordon survey points

Sl. No	Type of vehicle	Malankara			Parakadavu		
		In	Out	Total	In	Out	Total
1	KSRTC bus	77	48	125	48	48	96
2	Private bus	145	206	351	39	58	97
4	Other buses	10	32	42	13	9	22
6	Minibus/Tempo	32	23	55	5	5	10
7	Car/Van/Jeep	1,875	1,824	3,699	470	495	965
8	Passenger auto	600	637	1,237	197	218	415
9	Two wheeler	1,710	1,532	3,242	808	944	1,752
10	MAT	13	-	13	7	-	7
11	Truck	348	355	703	27	68	95
12	Mini-truck/tempo	392	168	560	103	79	182
13	Goods auto	126	134	260	17	67	84
14	Bicycle	25	29	54	7	14	21
15	Hand cart	-	-	-	-	-	-
16	Others (Specify)	6	-	6	-	-	-
Total (No)		5,359	4,988	10,347	1,741	2,005	3,746
Total (PCU)		5,939	5,585	11,524	1,666	1,934	3,600

Sl. No	Type of vehicle	Kappu			Nadukandam		
		In	Out	Total	In	Out	Total
1	KSRTC bus	97	91	188	66	57	123
2	Private bus	176	179	355	60	57	117
4	Other buses	41	33	74	12	11	23
6	Minibus/Tempo	6	31	37	33	16	49
7	Car/Van/Jeep	2,811	2,873	5,684	1,100	868	1,968
8	Passenger auto	782	803	1,585	303	316	619
9	Two wheeler	3,005	3,199	6,204	1,312	978	2,290
10	MAT	4	61	65	14	4	18
11	Truck	473	305	778	157	151	308
12	Mini-truck/tempo	339	683	1,022	239	222	461
13	Goods auto	280	267	547	62	95	157
14	Bicycle	20	25	45	18	14	32
15	Hand cart	-	-	-	-	-	-
16	Others (Specify)	2	2	4	-	-	-
Total (No)		8,036	8,552	16,588	3,376	2,789	6,165
Total (PCU)		8,294	8,737	17,031	3,486	2,978	6,464

Sl. No	Type of vehicle	Edavetty			Manakkad		
		In	Out	Total	In	Out	Total
1	KSRTC bus	7	7	14	73	15	88
2	Private bus	85	72	157	15	44	59
4	Other buses	-	-	-	-	-	-
6	Minibus/Tempo	13	23	36	28	83	111
7	Car/Van/Jeep	519	629	1,148	500	697	1,197
8	Passenger auto	383	468	851	911	1,054	1,965
9	Two wheeler	1,242	1,340	2,582	1,401	1,568	2,969
10	MAT	-	-	-	26	-	26
11	Truck	139	167	306	86	58	144
12	Mini-truck/tempo	260	249	509	249	304	553
13	Goods auto	136	153	289	89	268	357
14	Bicycle	-	-	-	-	97	97
15	Hand cart	-	-	-	-	-	-
16	Others (Specify)	-	-	-	-	-	-
Total (No)		2,784	3,108	5,892	3,378	4,188	7,566
Total (PCU)		2,762	3,066	5,828	3,255	3,783	7,038

Sl. No	Type of vehicle	Njarukutty			Mutharamkunnu		
		In	Out	Total	In	Out	Total
1	KSRTC bus	7	5	12	8	7	15
2	Private bus	8	6	14	61	66	127
4	Other buses	4	5	9	15	10	25
6	Minibus/Tempo	11	10	21	31	21	52
7	Car/Van/Jeep	744	684	1,428	1,038	1,144	2,182
8	Passenger auto	358	322	680	527	795	1,322
9	Two wheeler	1,769	1,566	3,335	2,015	2,137	4,152
10	MAT	-	-	-	-	-	-
11	Truck	42	56	98	20	30	50
12	Mini-truck/tempo	91	108	199	209	188	397
13	Goods auto	58	61	119	146	138	284
14	Bicycle	5	5	10	24	32	56
15	Hand cart	-	-	-	-	-	-
16	Others (Specify)	-	3	3	-	7	7
Total (No)		3,097	2,831	5,928	4,094	4,575	8,669
Total (PCU)		2,383	2,264	4,647	3,403	3,856	7,259

ANNEXURE 17.1

Details of schools of Thodupuzha

Sl. No.	Name of school	Govt/Aided/Unaided/ Unrecognized	Syllabus (up to HS)	Cate-gory	Number of students					Number of teachers
					Pre-Primary	Primary	High school	HSS	VHSS	
1	GHS Kanjiramattom	Govt	state	HS			117			15
2	GHSS Thodupuzha	Govt	state	HSS			151	573		41
3	GVHSS Thodupuzha	Govt	state	HSS				300		36
4	Thodupuzha D.E.M.H.S.S	Unaided	CBSE	HSS			370	74		33
5	Thodupuzha J.R.E.M.H.S.S	Unaided	CBSE	HSS			821	100		38
6	SH GHS Muthalakodom	Aided	state	GHS			735			30
7	SG GHS Muthalakodom	Aided	state	GHS			395	868		51
8	SS HSS Thodupuzha	Aided	state	HSS			477			20
9	Thodupuzha SVBLPS	Unaided	CBSE	HS			375			27
10	Thodupuzha DIET Lab UPS	Govt	state	UP		29				7
11	Chunkom SJUPS	Aided	state	UP		150				8
12	Muthalakodam SGUPS	Aided	state	UP		680				20
13	Thodupuzha SSUPS	Aided	state	UP		797				23
15	Kolani LPS	Govt		LP		62				5
16	Kumbakallu BTMLPS	Aided	state	LP		87				5

ANNEXURE 28.1

Homestead cultivation area

Out of 35 wards, 9 wards have been found to have average plot size more than 0.10 hectare (24.7 cents). Hence these 9 wards have been selected for homestead cultivation. In these wards, it is assumed that 50% of plots have plot area more than 0.10Ha. From the total number of households in each ward 50% plots selected for home stead cultivation and a total of 1361 homestead is available for homestead cultivation in Thodupuzha, In this manner a total of 160 Ha of land will be available for homestead cultivation. As per economic review 2003, homestead cultivation in an area of 0.25 Ha will create one man day of job opportunity. Based on this it can be calculated that at least persons will be employed in the agriculture and animal husbandry sector. The details of calculation of homesteads are shown in the following table.

Ward No	Ward name	Area Sq.km	Total No of households	Plot area in cents	Homesteads in residential areas
1	Vengalloor	0.6272	298	19.24	
2	Guru I.T.C.	0.4978	274	4.19	
3	Vengathanam	0.5439	286	6.11	
4	Madathikandam	0.9939	305	18.35	
5	Municipal Ups	0.963	293	31.19	146
6	Ambalam	0.7168	310	4.21	
7	B.H.R.	0.4831	279	5.9	
8	Vadakkumuri	0.512	288	22.94	
9	Pettanadu	1.3045	303	32.5	152
10	Holy family hospital	1.4011	304	17.58	
11	Kallumary	3.1437	310	28.86	155
12	Karuppara	1.915	310	32.14	155
13	Pattayam kavala	1.9402	317	15.93	
14	Muthalakodam	0.5067	293	13.02	
15	Undaplavu	0.369	269	14.82	
16	Btm School	0.2561	267	4.67	
17	Kumbankallu	0.3363	291	4.22	
18	Malleparambu	0.5094	282	18.49	
19	Keerikode	0.7303	290	18	
20	Muthaliyar madam	0.5542	276	13.73	
21	College	0.7759	284	7.78	
22	Maramkunnel	0.7077	289	19.5	
23	Municipal office	0.7421	296	17.45	
24	Kanjiramattom	0.9796	303	19.24	
25	Olamattam	1.0824	308	6.16	

26	Arackapara	0.7081	282	5.47	
27	Kothayikunnu	0.8005	317	11.64	
28	Chunkam	1.2026	291	25.68	146
29	Kolany	1.5466	300	31.74	150
30	Nadukkandam	2.7742	318	21.43	
31	Parakkadavu	1.278	281	8.94	
32	Amaramkavu	1.5216	300	25.17	150
33	Co-operative hospital	0.8466	280	11.15	
34	River view	0.9484	304	26.35	152
35	Manakkad	1.2116	310	25.22	155
	Total	**35.4301**	**10308**		**1361**

ANNEXURE 33 - 1

Uses/proposals/projects envisaged in the Special Zone A - Proposed Public and Semi Public Zone					
1	2	3	4	5	6
Zone	Location	Survey No	Area in Acre	Uses/Projects/Proposals	Remarks
Special Zone A - Proposed Public and Semi Public Zone	Northern side of Punaloor Muvattupuzha road adjacent to Thodupuzha river (Left bank)	266 part	0.9	Land reserved for municipal town hall, commercial complexes and parking plaza.	In any land parcel demarcated under this special zone, if land is available in excess to the uses /proposals/projects specified in column 6 that excess land area shall be used for any uses specified in public and semi public zone in this chart.

ANNEXURE 33 – 2

Uses/Proposals/projects envisaged in the Special Zone B - Proposed Park, Play ground and Open space Zone						
1	2	3	4	5	6	7
Zone	Sl. No.	Location	Survey No.	Area in Acre	Uses/Projects/Proposals	Remarks
Special Zone B - Proposed Park, Play Ground and Open Space Zone	1	Southern side of right bank MVIP canal and western side of Muthalakodam pazhukkakulam road.	64 part,96 part, 75 part, 58 part	2.4	1. Park and garden. 2. Pedal boating. 3. Children's park /play ground. 4. Swimming pool and fountains. 5. Refreshment stall/comfort station. 6. Internet kiosk with Wi Fi.	In any land parcel demarcated under this special zone, if land is available in excess to the uses /proposals/projects specified in column 6 that excess land area shall be used for any uses specified in public and semi public zone in this chart.
	2	Southern side of Kothayikkunnu bypass. 200m away from KSRTC junction.	310 part	14	1. Play ground. 2. Exhibition/Mela ground. 3. Public meeting/ assembling ground. 4. Indoor stadium.	

ANNEXURE 33 – 3

Uses/Proposals/projects envisaged in the Special Zone C - Proposed Parking and Transportation Zone

Since land availability in the public domain is very little, it is suggested to have multi-level mechanized parking system in four locations owned by municipality in the municipal area as given in the table below.

Sl. No.	Ward/Location
1.	Land owned by Municipality near private bus stand
2.	Land owned by Municipality near lorry stand at Kanjiramattom junction
3.	Land owned by Municipality near Mini Civil station
4.	Land owned by Municipality near Mangattukavala Pvt. Bus Stand

ANNEXURE 33 – 4

Type of non-obnoxious and non-nuisance type of service or light industries permissible in various zones.	
Sl No	**Type of services**
1	Production of copra.
2	Processing of arecanut.
3	Rice and flour mills.
4	Production of rice, flour etc., by hand pounding.

5	Processing of cardamom, ginger, pepper etc.
6	Production of Khandsri for sugar-cane.
7	Carrying and preservation of fruits and production of jam, jelly etc.
8	Processing of and preservation of cashew nuts.
9	Bakeries.
10	Production of dairy products.
11	Oil mills (vegetables).
12	Extraction of oil by ghani.
13	Manufacture of hydrogenated oil.
14	Manufacture of “aval” (Beaten rice) appalam.
15	Production of vinegar.
16	Manufacture of soda, water, lemonade etc.
17	Manufacture of ice.
18	Manufacture of ice cream.
19	Processing, packing and distribution of tea.
20	Processing, grinding, packing and distribution of coffee.
21	Manufacture of syrup.
22	Manufacture of beedi.
23	Manufacture of cigar.
24	Manufacture of tobacco snuff.
25	Manufacture of chewing tobacco.
26	Cotton ginning, clearing, pressing etc.
27	Cotton spinning other than in mills.

28	Cotton spinning and weaving in mills.
29	Cotton weaving in handloom.
30	Cotton weaving in power looms.
31	Handloom weaving.
32	Khadi weaving in handloom.
33	Printing of cotton textiles.
34	Manufacture of cotton thread, rope twine etc.
35	Jute spinning.
36	Manufacture of jute products including repairing of gunny bags.
37	Weaving of silk by handloom.
38	Manufacture of hosiery goods.
39	Making of embroidery products.
40	Tailoring.
41	Manufacture of quilts and mattresses.
42	Manufacture of coir and coir products.
43	Manufacture and assembling of umbrellas and production of spare parts of umbrellas.
44	Repairing of umbrellas.
45	Manufacture of wooden furniture and fixtures.
46	Manufacture of structural wooden goods such as doors, beams etc.
47	Manufacture of wooden industrial goods such as parts of handloom ambarcharka, bobbirs etc.
48	Manufacture of wooden utensils, choto frames, toys, etc., and photo framing.
49	Cane industry including baskets, weaving etc.
50	Manufacture of miscellaneous wooden articles such as sticks, sandals, rules etc.

51	Manufacture of paperboard and paper hand.
52	Making of paper boxes, bags, envelopes etc.
53	Printing and publishing of newspapers and periodicals.
54	Printing and publishing of books.
55	Miscellaneous printing works including type cutting, book binding.
56	Manufacture and repairing of leather shoes and chap pals.
57	Manufacture of leather products such as suitcase, bag etc.
58	Vulcanizing and repairing of tyres and tubes.
59	Manufacture of rubber gloves.
60	Manufacture of rubber products such as rubber sheets, nipples and rubber shoes including smoke-rubber.
61	Manufacture of pharmaceuticals, chemicals, ayruvedic medicine etc.
62	Manufacture of agarbathi and other cosmetics.
63	Manufacture of plastic products such as nameplates etc.
64	Manufacture of lemongrass oil, candles etc.
65	Manufacture of cement products such as well-keros, tube, closets etc.
66	Manufacture of structural stone goods, stone crushing, stone carving, stone dressing, marble carving etc.
67	Manufacture of stone wares.
68	Manufacture of stone images.
69	Manufacture of chinaware's and crockery.
70	Manufacture of large containers and chinaware.
71	Manufacture of glass and glass products.
72	Manufacture of clay models.

73	Manufacture of iron and steel furniture.
74	Manufacture and repairing of brass and bell metal products.
75	Manufacture of aluminum utensils and other products.
76	Manufacture of tin cars and copper vessels.
77	Electroplating, tinplating, welding etc.
78	Manufacture of agricultural implements, screws etc. (blacksmith and foundry).
79	Manufacturing assembling and repairing of machinery such as water pumps, oil mill chuck etc.
80	Manufacture of small machine tools and machine parts.
81	Manufacture of sewing machine parts and assembling and repairing of sewing machine.
82	Manufacture of electrical machinery and repairing of electric motors armature winding etc.
83	Manufacture and repairing of electric fans.
84	Charging and repairing of batteries.
85	Repairing of radios, microphones etc.
86	Manufacture of electric meters, production of electric and allied products, repairing and servicing of electrical appliances.
87	Bodybuilding of motor vehicles.
88	Manufacture and repairing of motor engine parts and accessories.
89	Serving and repairing of motor vehicle.
90	Manufacture of cycles, parts and accessories.
91	Manufacture and repair of boats and barges.
92	Manufacture and repairing of animal drawn and hand drawn vehicles.
93	Repairing of photographic equipments, spectacles etc.
94	Manufacturing of medical instruments.

95	Repairing of watches and clocks.
96	Manufacture of Jewellery.
97	Manufacture, repair and tuning of musical instruments.
98	Manufacture of sports goods, balloons etc.
99	Ivory, carving and ivory works.
100	Miscellaneous industries.

ANNEXURE 33 – 5

List of obnoxious or nuisance industries subject to objectionable odours, fumes effluents or processors to be located in various zones	
(Grouped under Indian Standard Industrial Classification)	
Sl No	**Type of industries**
I	**Manufacture of food stuff :**
1	Slaughtering, preservation of meat and fish and canning of fish.
II	**Manufacture of beverages:**
2	Production of distilled spirits, wines, liquor etc., from alcoholic malt, fruits and malts in distillery and brewery.
3	Production of country liquor and indigenous liquor such as toddy, liquor form mahua, palm juice.
III	**Manufacture of textiles :**
4	Dyeing and bleaching of cotton.
IV	**Manufacture of wood and wooden products :**
5	Sawing and planning of wood.

6	Wood seasoning and creosoting.
7	Manufacture of veneer and plywood.
8	Paper, pulp and straw board.
V	**Manufacture of leather and leather products :**
9	Currying, tanning and finishing of hides and skims and preparation of finished leather.
VI	**Manufacture of rubber, petroleum and coal products:**
10	Manufacture of tyres and tubes.
11	Manufacture of Industrial and synthetic rubber.
12	Reclamation of rubber.
13	Production of petroleum, kerosene and other petroleum products in refineries.
14	Production of chemicals and chemical products.
VII	**Manufacture of chemicals and chemical products :**
15	Manufacture of basic industrial chemicals such as acids, alkali and their salts not elsewhere specified (especially sulphurous, sulphuric, nitiric, hydrochloric acids, ammonia, chorine and etc).
16	Manufacture of dyes, paint, colours and varnishers, printing ink.
17	Manufacture of fertilizers (Specially from organic materials).
18	Manufacture of disinfectants and insecticides.
19	Manufacture of ammunition, explosive and fireworks.
20	Manufacture of matches.
VIII	**Manufacture of non-metallic mineral products other than petroleum and coal :**
21	Manufacture of cement and cement products.
22	Manufacture of lime.
23	Manufacture of plaster of paris.

IX	**Manufacture of basic metals and their products :**
24	Manufacture of iron and steel including smelting, refining, rolling and conversion into basic forms.
25	Manufacture including smelting, refining etc., or nonferrous metals and alloys in basic forms.
26	Manufacture of armaments.
X	**Manufacture of machinery (other than transport) and electrical equipments:**
27	Manufacture of all kinds of battery.
XI	**Miscellaneous items not covered above.**
28	Incineration, reduction or dumping of offal, dead animals' garbage or refuse.
29	Manufacture of gelatin and glue.
30	Fat, tallow, grease or lard refining of manufacture.
31	Bone meal, bone grist and bone powder.
32	Manufacture of cashew nut shell oil.
33	Other similar types of nuisance industries.