MASTER PLAN

FOR

KUNNAMKULAM TOWN- 2031

Prepared by

KUNNAMKULAM MUNICIPALITY &

LOCAL SELF GOVERNMENT DEPARTMENT - PLANNING WING

GOVERNMENT OF KERALA

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[redacted]

Kunnamkulam Municipality

Local Self Government Department - Planning wing, Government of Kerala

Master Plan for Kunnamkulam Town - 2031



FOREWORD

Kunnamkulam had a glorious past, being a most sought after destination in the olden times. A glance through the history of Kunnamkulam reveals its fame as a human settlement area even from pre-historic period. Kunnamkulam was also known for its whole sale trade centre. The commercial / trading activities gave rise to a pattern of settlements called 'Angadi Veedukal' here. The earlier urban growth here was controlled partly by Detailed Town Planning schemes for Central Area Part I and Central Area Part II. The Town expanded later in 2000, with the addition of area from the surrounding panchayats and the total area now is 27.45 sq.km. To face the challenges associated with the expansion of the town the necessity of a master plan was felt and thus the council unanimously decided to prepare master plan vide resolution No.3 dated 17.05.2012. The draft Master plan prepared in comply with Kerala Town and Country Planning Act,2016 and its amendments was published in 2021 as per Goverment sanction. The objections/ Suggestions from the public has been recieved and heared them individually. The Master plan Special Committee thoroughly verified the recieved objections/Suggestions and suggested possible modifications,approved the same by Municipal Council and modified the Master plan accordingly. Now the Plan is finalised and I am sure that this plan can definitely help to transform Kunnamkulam into a more livable space for generations to come.

The various proposals in the production sectors are oriented to strengthen the economic base of the town and can succeed in fetching good opportunities for the well being of the people. The suggestions in the service sectors are sure shot solutions towards ensuring peaceful and healthy living atmosphere for the inmates of the town. The calculated efforts, in this plan for protecting our mother nature are worth mentioning. The provision of inner and outer semi ring roads, elevated highways and ramps effectively decongest the core area and facilitate thorough traffic without any hindrance or delay. The provisions of this plan are tailored to ensure planned development of the area.

All the members of the present and previous Council have actively participated in the discussions for finalising the plan. I take this opportunity to appreciate the efforts put in by the former Chairmen T.S. Subramanian & C.K.Unnikrishnan, Standing Committee Chairpersons , members of the Special Commitee members in materialising this plan. The active participation by the Special Committee (SC) members, working group members and the contribution from

expert members of the SC have made this planning exercise fruitful.

A brief description of the events that took place in connection with preparation of this plan is given here under. Soon after the resolution was taken in the council, the meeting for the constitution of SC was convened on 28th June 2012 and a workshop was organised in July 2012 to create awareness about the process and other details of plan preparation. The first meeting ofSC, was convened in August 2012 with the objective of data collection/updating. Data collection/updating was completed with a workshop in September 2012. A workshop for local level analysis was convened on 14th September 2012. A second workshop was convened on 14th September 2012. The initial development seminar was conducted in the auspicious presence of Shri Babu. M. Palissery, the then honourable MLA of Kunnamkulam legislative assembly constituency. A meeting of SC for vetting the data collected was held on 10th December 2012. Finally in August 2013 the findings of various analysis and the development vision was discussedin the SC and working group. Then the development proposals were carved out in the workshop held on 26th, 27th& 29th of August 2013 at the municipal council hall, Kunnamkulam. The untiring efforts by the officials of the Local Self Goverment Department - Planning unit ,Thrissur District is the back bone of this plan.

A Master plan becomes fruitful only when the provision and proposals envisaged in it are implemented. To fulfill the vision of this Plan i.e. to ensure physical and economic growth of the town without hampering nature and peaceful life of the inmates, I request all the development partners, to own the plan and be part of its implementation.

Smt.Seetha Ravindran
Chairperson
kunnamkulam Municipality

PREFACE

Kunnamkulam town known from older times for trading activities, has grown to this size by the nearby rural areas being added to it in the year 2000. An attempt to approach growth in a planned manner took place way back in 1990s with Detailed Town Planning schemes prepared for two areas in this town. Now realising the need for planned growth Municipality has resolved to prepare a Master Plan for the town.

The Master Plan for Kunnamkulam town was prepared after conducting exhaustive discussions with Council members as well as Special Committee members. Many workshops and training sessions were conducted for the SC members and working groups. The participation and co-operation received from the SC and working group members were unparalleled. The Development Seminar conducted to include the aspirations of the people had a good response. The objections/suggestins recieved from the interested persons on pulished Master plan were considered during finalising the Plan. Thus a good level of people's participation was ensured in this Plan.

Extensive surveys and studies were carried out in connection with preparation of this Plan. Land use survey, Traffic and transportation studies and Socio economic survey conducted with a sample size of 10% households, Secondary data collection, Heritage, Environment and Slum surveys etc. of the town were carried out in this respect. Detailed analysis, both inter and intra sector were done and the findings of the analysis revealed the problems and potentials of the town. Based on the projection of requirements for the year 2031 various proposals were carved out. These proposals are sure to stream line the tremendous developments that this town will witness in future. It also can improve the livability of the town.

I take this opportunity to express my gratitude for the initiative, co-operation and enthusiasm shown by the previous Council and SC towards this work. The timely intervention of present Council headed by Chairperson Smt. Seetha Ravindran is appreciable. The hard work, spirit and the sincerity of the planning team in the Thrissur Office headed by District Town Planner in charge Smt. Jeeva Liza Xavior in bringing this Master plan with in the scheduled time is highly appreciated. The contributions of the former District Town Planners Smt. P.V. Mary, Sri. V. K Mohandas, Sri.K.R Rajeev and Smt.S.R.Seema is also to be mentioned at this juncture.

I hope this Master plan will provide the desired frame work for the development of Kunnamkulam town for the years to come.

Thiruvananthapuram

Date :

Asha Ajoygosh

Chief Town Planner(Planning)

Local Self Government Department - Planning wing

Government of Kerala.

ACKNOWLEDGEMENT

The preparation of Master Plan for Kunnamkulam Town was initiated with Council resolution No. 3 dated 17th May 2012. The works for the preparation of Master Plan for Kunnamkulam was thus taken up under second phase of the 'Scheme of preparation of Master Plans and Detailed Town Planning Schemes as per administrative sanction obtained vide G.O (R.T) No. 1376/2012/ LSGD dated17th May 2012. The draft Master Plan for Kunnamkulam town got publication sanction as per G.O. (Ms) No: 273/2022/LSGD dated 17/12/2022, and published in Gazette (Gazette No.252 dated 20th January 2023) inviting objections and suggestions from the public. The preparation of Master Plan incorporating Council suggested modifications is now complted.The Master Plan thus finalised is sure to streamline the growth of the town in a planned and organised manner.

First and foremost I thank, the Present Municipal Council headed by Chairperson Smt.Seetha Ravindran for their immense support and co-operation to this endeavor.The effort and enthusiasm of the SC members and all the members of the working groups are highly appreciated. I take this opportunity to express my gratitude towards previous Chairmen Shri.Unnikrishnan.C.K & Shri.T.S.Subramanian and Conveners of all the working groups for having contributed wonderfully to this plan. The sincere efforts put in by the Secretary and Municipal Engineer needs special mention here.

I express my sincere gratitude and cordial to Smt.Sheeba Rani Y, Chief Town planner (Planning) for her unmathced support and guidence in bringing out this Plan.The valuable guidence of Shri. H. Prasanth, former Chief Town Planner (Planning) are immensely appreciated. I would like to express my gratitude to the timely guidence and co-operation imparted by the team in the Planning wing of the Chief Town Planner for the timely completion of this Plan.

I sincerely appreciate the hard work and unequivocal sincerity of the planning team in the District office comprising of Shri.K.B ManojKumar,Deputy Town Planner, Smt.P.V. Lathika,Assistant Town Planner and Smt. Neethu Krishna, Ist Grade Town Planning Surveyor,in completing all the works in a time bound and organised manner and bringing out this Plan with in stipulated time. The earlier efforts of Smt. Jinumole Varghese and Smt. Sumathy.K.M, former Deputy Town Planners, Smt. Minu Pathrose, former Assistant Town Planner and Shri.Ravindran.P.K, former Ist grade TPS is greatly appreciated. I am also indebted to the Statistical team and all other staff members both in technical and non-technical section of this office for all the co-oper

ration and timely support extended.The service of the former District Town Planners Smt.Seema.S.R,Shri.Rajeev.K.R, Shri.Gopakumar.K.M and Smt.Mary.P.V is remembered with gratitude on this occassion.

Thrissur
07-11-2025

Dr. Pradeep R
District Town Planner
Thrissur

കൗൺസിൽ അംഗങ്ങൾ

കുന്നംകുളം നഗരസഭ 2020-2025

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CHAPTER 1

INTRODUCTION

Kunnamkulam is one of the urban local bodies of Thrissur district. Kunnamkulam municipal area falls in Talappilly Taluk. (Kunnamkulam Municipality was formed in 1948 and was a class IV Municipality till 2000. In 2000, it was elevated to the rank of second grade municipality merging Arthat Panchayat and parts of Chowwannur and Porkulam Panchayats). As per 1991 census, area of Kunnamkulam Town was 6.96 sq. km while in 2001, the town is almost five times its original area.

1.1 Need for Master Plan

1.1.1 Growth of Town

Kunnamkulam Town is one of the fast growing commercial areas of Kerala. It is primarily an agricultural cum service cum industrial town. Its nearness to Guruvayur, a major pilgrim centre in the South, makes it a main halting place for pilgrims coming to Guruvayur temple. The undulating terrain, old and narrow commercial streets and the irregular and uncontrolled commercial developments in the central area is causing hardship to the population in and around the area of town. Because of the strategic location of the town, through which two major corridors connecting South and North are passing and considering its growth over these years, planned and controlled development of the central area of the town becomes a necessity.

1.1.2 Present planning efforts

Based on Integrated District Development Plan (IDDP) of Thrissur, Kunnamkulam town falls under Multifunctional zone II. In this zone, all types of second order urban activities, second order educational and health care facilities and enabling transportation facilities etc. are to be provided. This zone will act as a service centre for the hinter lands and this zone is very much suitable for industries utilising agricultural products of hinter land. So Kunnamkulam town has to be developed to such a level for playing this role effectively.

1.2 Methodology

A comprehensive master plan with sustainable and long term goals is needed for this emerging centre which will ensure sustainable economic and eco-friendly development with better living condition. Multifaceted development perspective which

can support the future development in a controlled manner is called for present development trends in the physical, technological and scientific areas that has to be incorporated in a comprehensive and transparent manner to address people's aspirations.

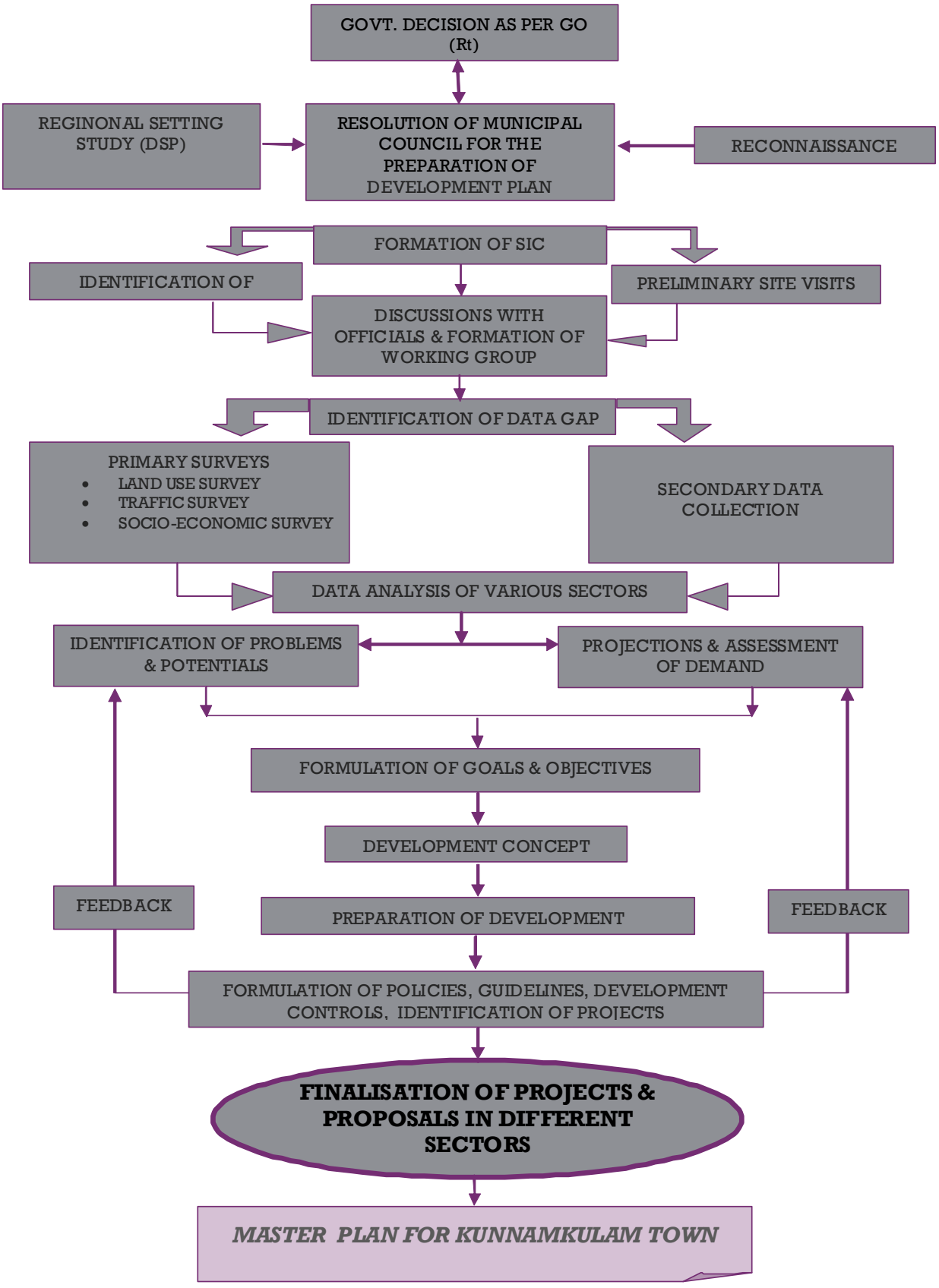


Fig 1.1 Diagrammatic representation of Methodology for preparation of Master Plan

Improved infrastructure facilities and sufficient parking lots have to be provided to support the existing commercial facilities. Prevailing traffic congestion, haphazard development and the solid waste management issues also needs to be addressed for the healthy development of town area. Kunnamkulam is blessed with many historically and archeologically important spots which have the potential to develop as tourist destinations. All these should be considered while preparing the Master Plan.

Preparation of Masterplan for Kunnamkulam Town involves enormous work in collection, compilation, analysis of various primary and secondary data to identify problems and potentials to arrive at formulation of proposals for horizon period. Figure 1.1 represents the broad methodology for preparation of this Master plan.



Vikasana Seminar - Kunnamkulam



Discussion of Development Concept

1.3 Earlier planning efforts and studies

There is no Master Plan or approved Detailed Town-Planning Scheme for Kunnamkulam. Three DTP schemes were prepared; they are DTP scheme for Kunnamkulam central area (part I & II) and DTP scheme for new bus stand area. Out of which DTP scheme for Kunnamkulam central area part I & II were published and the draft report for the DTP scheme of new bus stand area was completed. Though these schemes failed to be implemented within the specified time frame, planned development is a necessity now and should have started earlier.

1.4 Planning Area

Details of surrounding LSGIs influencing Kunnamkulam Town based on IDDP report is given in table 1.1. Comparing with nearby LSGIs, only Kunnamkulam and Guruvayur towns fall under Multifunctional zone II. Also urban profile and functional character of both these towns are urban. All other surrounding LSGIs show rural or semi-rural character. Since there is a published Master Plan for Guruvayur Town, the planning area is confined to Kunnamkulam Municipal area.

Table 1.1 Details of Kunnamkulam and surrounding LSGIs

Name of LSGI	Urban Profile	Functional Character	Development zone as per IDDP
Porkulam	Rural	Rural	Intensive Agricultural zone
Kattakampal	Rural	Semi-rural	Intensive Agricultural zone
Chowannoor	Rural	Rural	Intensive Agricultural zone
Kandanassery	Rural	Rural	Intensive Agricultural zone
Choondal	Rural	Rural	Intensive Agricultural zone
Vadakkekad	Rural	Rural	Intensive Agricultural zone
Guruvayur Town	Urban	Urban	Multifunctional Zone-II
Kunnamkulam Town	Urban	Urban	Multifunctional Zone-II

Source: IDDP Thrissur

1.5 Profile of the Town

1.5.1 Location

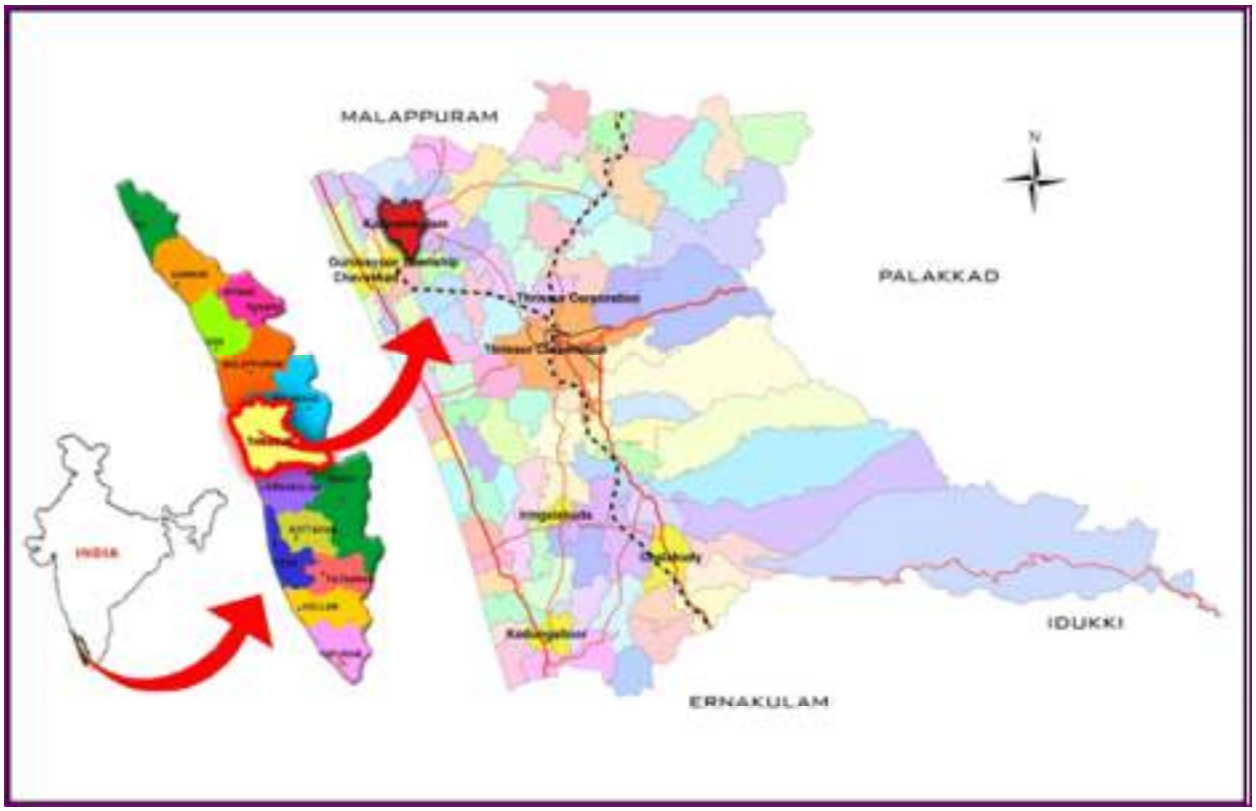


Fig 1.2 Location of Kunnamkulam Town

Kunnamkulam Town lies in latitude 10°39' North and longitude 76°05' East. It has an average elevation of 57 meters. The town is located about 29 km North West of Thrissur and 8 km North East of Guruvayur. It is bounded by Porkulam and Kattakampal Panchayats in the North;Chowwannur and Choondal in the East,Guruvayur Town and Kandanassery in the south,and Vadakkekad Panchayat and Guruvayur Town in the West.Figure 1.2 shows the location of Kunnamkulam Town.

1.5.2 Area and Population

In 2000, Kunnamkulam was elevated to the rank of second grade municipality by merging the adjoining Panchayat Arthat and parts of Chowwannur and Porkulam. The present Kunnamkulam municipality consists of 7 villages. Figure 1.3 shows the location of revenue villages in the Kunnamkulam municipal area. Total area of Kunnamkulam town is 27.45 sq. km. Total population is 54071of whom 25392 are males and 28679 are females with the density of population being 1968 persons/ sq. km, as per 2011 census.



Fig 1.3Villages in Kunnamkulam Municipal Area

Table 1.2 Details of revenue villages in Kunnamkulam

Sl. No	Revenue Villages	Area in Ha
1	Kunnamkulam	705.985
2	Arthat	575.264
3	Anjoor	651.877
4	Porkulam (part)	100.672
5	Chowannoor (part)	301.708
6	Kanipayoor (part)	359.555
7	Mangad(part)	52.607

1.5.3 Climate

Kunnamkulam municipal area falls under tropical and humid climate. Since the region lies in the south western coastal state of Kerala, the climate is tropical, with only minor differences in temperatures between day and night, as well as over the year. Summer

lasts from March to May, and is followed by the southwest monsoon season from June to September. October and November form the post monsoon or retreating monsoon season. Winter from December through February is slightly cooler and windy, due to winds from the Western Ghats.

The town is drained in the monsoon season by heavy showers. The average annual rainfall is 3,092 mm (Thalappilly Taluk). The South-west monsoon generally sets in during the last week of May. After July the rainfall decreases. On an average, there are 122 rainy days in a year. The maximum average temperature of the city in the summer season is 35^0 Celsius while the minimum temperature recorded is 22.5^0 Celsius. The winter season records a maximum average of 32.3^0 Celsius and a minimum average of 20^0 Celsius. The air is highly humid throughout the year, the relative humidity being generally over 70%. Winds are generally light to moderate and they strengthen in the monsoon season.In the south-west monsoon season mainly the wind blows towards western or south western direction. During the rest of the year the wind blows mainly from north eastern to eastern direction in the morning and between south-west and north-west direction in the afternoon.

1.5.4 Physiography

As the name 'Kunnam kulam' indicates the land is with kunnu (mountain) and kulam (ponds). There are several hills in the munici pality namely Aduputty, Kizhoor, Kakkad etc. while the same is interspersed with ponds namely Eeenjakulam, Iyyankulam, Madurakulam etc. From figure 1.4 its seems that the terrain slopes from east to west, forming four distinct geographical zones like hillocks, slopes, plains and low lying lands.

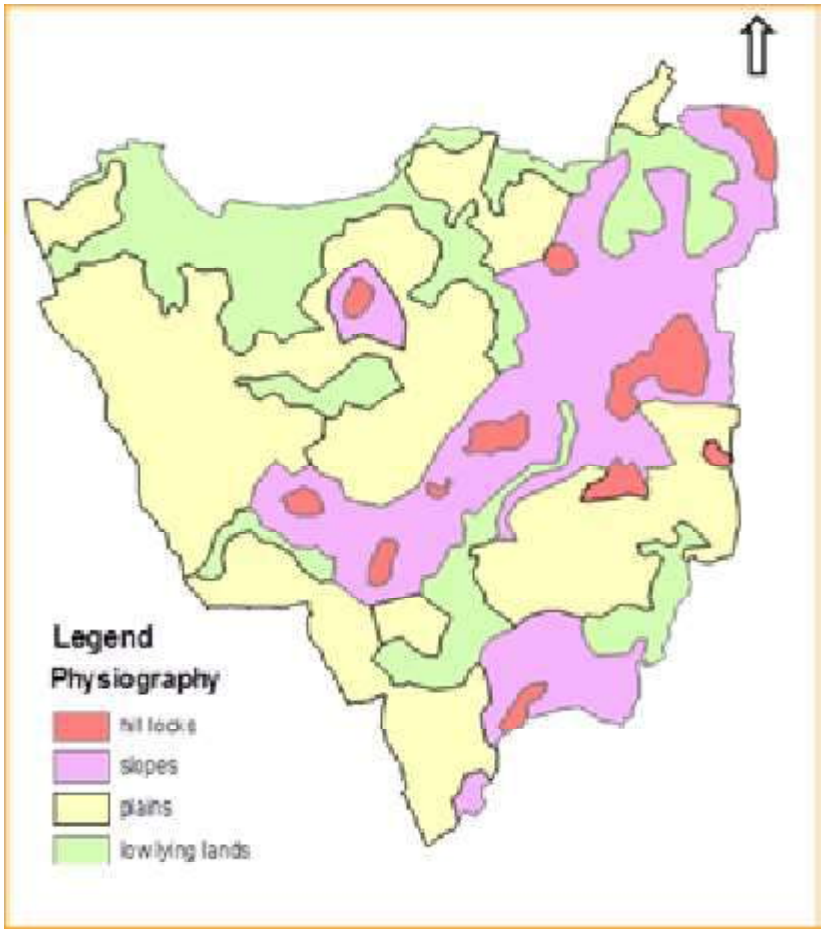


Fig1.4 Physiography -Kunnamkulam

Source:Vikasanarekha 1996

Hill areas are mainly suitable for the cultivation of crops like Banana and Coconut, but the lack of proper irrigation facilities and land sliding is hampering the agricultural activities. Fertile soil in the slopes and plains supports the growth of crops like arecanut, coconut, banana, pepper, nutmeg, ginger and elephant yam. Fertile soil with high clay content in low lying area is suitable for paddy cultivation, but now these areas are under the pressure of conversion.

1.5.5 Geology

Laterite deposit in large scales can be found in the hill area with a top covering of gravelly soil. Granite formation can also be traced about 10 m below the ground. Even though a very small portion of the geographical area falls under low lying land, the soil here is highly fertile and rich in clay content.

1.5.6 History

Kunnamkulam town has its remote antiquity which dates back to the Paleolithic age (Kakkad cave and Chowannur cave supports this fact). The ancient name of Kunnamkulam was Kunnamkulangara;it is believed to be derived from two Malayalam words kunnu (mountain) and kulam (pond). The terrain condition and geomorphology of the area itself lead to the name. Kunnamkulam was a part of of Chera Dynasty and also an important trade centre of erstwhile Cochin State. Suburbs of Kunnamkulam were seats of Nambidis. The immigration and settlement of Christian families in Kunnamkulam after the invasion of Tippu in 1789 marked the development of Kunnamkulam as a trade centre. It is in fact the chief center of the Jacobites in the State.

1.5.6.1 History of governance

It is evident from the history that Kunnamkulam was a part of Chera Dynasty. The town was also a part of erstwhile Cochin State. Manakulam, Cheralayam and Kakkad, the suburbs of Kunnamkulam were the seats of the Nambidis of Manakulam, Ayinikur and Kakkad Karanavappad respectively. They were collectively known as Thalappilli Rajas and belonged to three branches of the same dynasty. Kunnamkulam Municipality was formed in 1948. It was a class IV Municipality till 2000. In 2000, it was elevated to the rank of second grade municipality merging the adjoining Arthat Panchayat and parts of Chowwannur and Porkulam. Kunnamkulam is situated in Thalappilly taluk of Thrissur district.

1.5.6.2 Heritage and Socio cultural history

Kunnamkulam has been a well-developed Christian town. Thomas the Apostleis said to be responsible for the spread of Christianity in this region. Before the invasion of Tippu, Arthat was the chief centre of Jacobite Christians. During the invasion of Tippu Sultan in the south, Christians migrated to Kunnamkulam, they were invited by the Thalappilli Rajas, provided residences and places of worship which strengthened their base in this area. They resided on both sides of the street, started trade and business and began a new era of transaction. These trading activities also lead to the establishment of a particular housing typology known as Angadi houses. The front room of these houses function as shops while the rear rooms were used for residential purpose. There used to be rear yards for every so called 'Angadi' house which was used for processing of their agricultural products.



AmbalaPalli

Kunnamkulam is famous for its religious harmony as Hindus, Christians and Muslims live here. Ruler of erstwhile Cochin State, Raja Rama Varma (Sakthan Thampuran) visited Kunnamkulam on 981 M.E and granted' Anthimahakalankavu temple' to Christians for worship. This church is now called 'AmbalaPalli' where in, the temple character can be seen in the church entrance. Kunnamkulam people express extreme resistance to part with their Hindu based rituals, at the functions like marriages, church festivals etc.

The Manakulam royal family played important roles in the socio cultural development. The Manakulam Palace held Kathakalli performance every evening and the place filled with sound of drums and songs. The Manakulam Kunjunni Raja became the karanavar of the Kakkad family and he spend all his time in composing song for Kathakalli. His son-in-law Mukunda Raja of Manakulam set up the Kalamandalam with the encouragement of his friend poet Vallathol. The scholar Kaikulangara Rama Warrier, the master poets Vallathol and Nalappattu Narayana Menon, the critic Kuttikrishna Marrar had all been permanent visitors of the Manakulam court. It was the Manakulam Royal household which literally obeyed Gandhiji's call for boycott of foreign goods. A great many silk cloths were burned in the central courtyard of the palace. The music of the charka and the rhythm of the loom could be heard in the palace. Thus Manakulam earned a place in the history of Kerala.

The Kanippayyur Mana which is prominent in the practice of traditional architectural science Vastushastra, Astrology and related studies is also located at Kunnamkulam. Researchers and students from India and abroad seek guidance from the mana in Vastuvidya, Jyothisha Thantra and Iconography.

In 1929 Kanippayyur Shankaran Namboothiripadu commissioned a printing press (Panchangam press) the main aim of which was to propagate the knowledge of Vastuvidya and Jyotisha to public. They also own a library holding thousands of books and manuscripts collected from many Brahmin families.

Chowannur and Arthat of Kunnamkulam had a rich cultural background. In Chowannur, there was a Sabha Madom, an endowed college where Sanskrit education was given. Arthat was the chief center of Orthodox Christians. It contains one of the oldest Jacobite Syrian churches in the State. All these contribute the cultural rising up in the area which later on helped the development of the publishing industry.

The ruins of human bodies, decorated pearls, iron tools and earthen pots which are very similar to that found at Thakshasila were obtained from a temple compound at Porkulam in an archeological excavation in 1948, which is aged more than 2400 years. There are plenty of Kudakkalls, Thoppikkall, Kallaras and Caves found in the nearby areas, aged more than 2000 years. There are two burial caves within municipality, at Kakkad and Chowannoor. Archeologists have also unearthed a collection of old Roman coins at Eyyal. These coins date from 123 BC to 117 AD.

1.5.6.3 History of Development

From times immemorial, Kunnamkulam town was famous for its trading activities and mixed land use. It was one of the important trade centers of erstwhile Cochin State. Invasion by Tippu Sultan in the south, lead to Christian immigration and settlement marking the beginning of a new era of transaction in Kunnamkulam. The town built by the settlers from Chattukulangara was in the shape of a cross. The base of the cross is the Eastern Bazar and the other arms of the cross are constituted by the West, North and South Bazars. In each arm of the cross there is a church. St Thomas New church is on the Eastern arm, St Lazarus old church in the west, St Mathias Church in the south and St Lazarus church (Chiralayam Church) in the north. These four arms were the hub of commercial activities. The place was lined with godowns and full of traders. Hundreds of bullock carts lined the roads to load goods. Later better facilities became available in the Parayil

region which has now become the trading center of Kunnamkulam. The development of Parayil Angadi as the heart of Kunnamkulam town increased the importance of this area in the field of trade and commerce.

In the field of education Christian missionaries were active from A.D 915 onwards. Primary schools started functioning those days. Kunnamkulam was among the 3 towns under Cochin State having more than two high schools during that time.In Chowannur, there was a Sabha Madom, an endowed college where Sanskrit education was given.

Kunnamkulam region witness a number of traditional, informal and household manufacturing activities. It comprises mainly the creation of rock-cut products, metallic and clay utensils, screw-rings and screw-hooks and paper-based products. Among these, the manufacturing of paper-based products and book binding are the backbone of these activities for which Kunnamkulam has a unique place in the state. The trade relationship with Sivakasi is one of the important factors behind the growth and development of paper based industry at Kunnamkulam.

Kunnamkulam was famous for its printing and book binding industry; the establishment of schools in and around Kunnamkulam during this period may have encouraged the development of this industry. First printing press Vidyaretnaprabha, was started in 1860 by Paramel Uttoop.'Njanodayam' press started by Bishop Paramel Joseph was later developed into Akshara Retna Prakashini (A.R.P) Press. When C.P. Ramaswamy banned Malayala Manorama in Kottayam, it was published from Kunnamkulam A. R. P. press and was known as 'Kunnamkulam Manorama'.A.R.P press also gave asylum to Swadeshabhimani Ramakrishna Pillai when he was exiled by Diwan Sir C. P.Ramaswamy.

Kunnamkulam also had a prominent place in the health service. Govt. hospital started functioning from 1888.This sector was further strengthened with the establishments of Govt. Ayurvedic Hospital (in 1956) and Govt. Homeopathy Dispensary (in 1980).

The spatial structure of the town has evolved through centuries by the impact of various social, cultural, topographic and political factors. The Ribbon Development pattern along the important transportation corridors and the Line Houses (Angadi Houses) evolved as a result of trading and commercial activities of ancient days. Because of the strategic location of the town, the area is developing as major commercial hub of the district in a fast pace.'Parayil Centre'being a transportation hub acting as a nerve centre for the development activities.

1.5.7 Biodiversity

Kunnamkulam is a land interspersed with hills and ponds. There are wide varieties of plants and trees in Kunnamkulam Town like Manchadi, Podiyeni, Plavu, Elanji, Mavu, Njaval, Asokam, Veppu etc.Coconut and arecanut are the main crops seen in Kunnamkulam. Kole lands and paddy fields also constitute a major portion of Town.

1.6 Inference

From the foregone discussions it can be concluded that Kunnamkulam has a rich cultural and developmental history. The history of Kunnamkulam dates back to the beginning of the human settlement time. In the modern and contemporary history also Kunnamkulam holds a high position. With its rugged terrain and peculiar topology Kunnamkulam has many issues to be attended to. Present need for the plan is well justified from the earlier planning efforts and many other factors discussed above.

CHAPTER 2

REGIONAL SETTING

The regional setting of a town can be arrived at from the hierarchy of the town in the district scenario, the activity that town has to perform and the connectivity with different settlement nodes in the region etc. All these have been worked out in the Integrated District Development Plan of the district. The details are elaborated in this chapter.

2.1 Location

Kunnamkulam Town lies at the north western part of the district, as a part of the urban agglomeration comprising of Guruvayur, Chavakkad and Kunnamkulam Towns and six near by Panchayats. Kunnamkulam town which constitutes about **1.7** % of population (as per 2001 census) of Thrissur district is a part of Thalappally Taluk.As per the development concept of the district, Kunnamkulam falls under Multifunctional zone-II and is categorized as a second order LSGI with urban functional character.

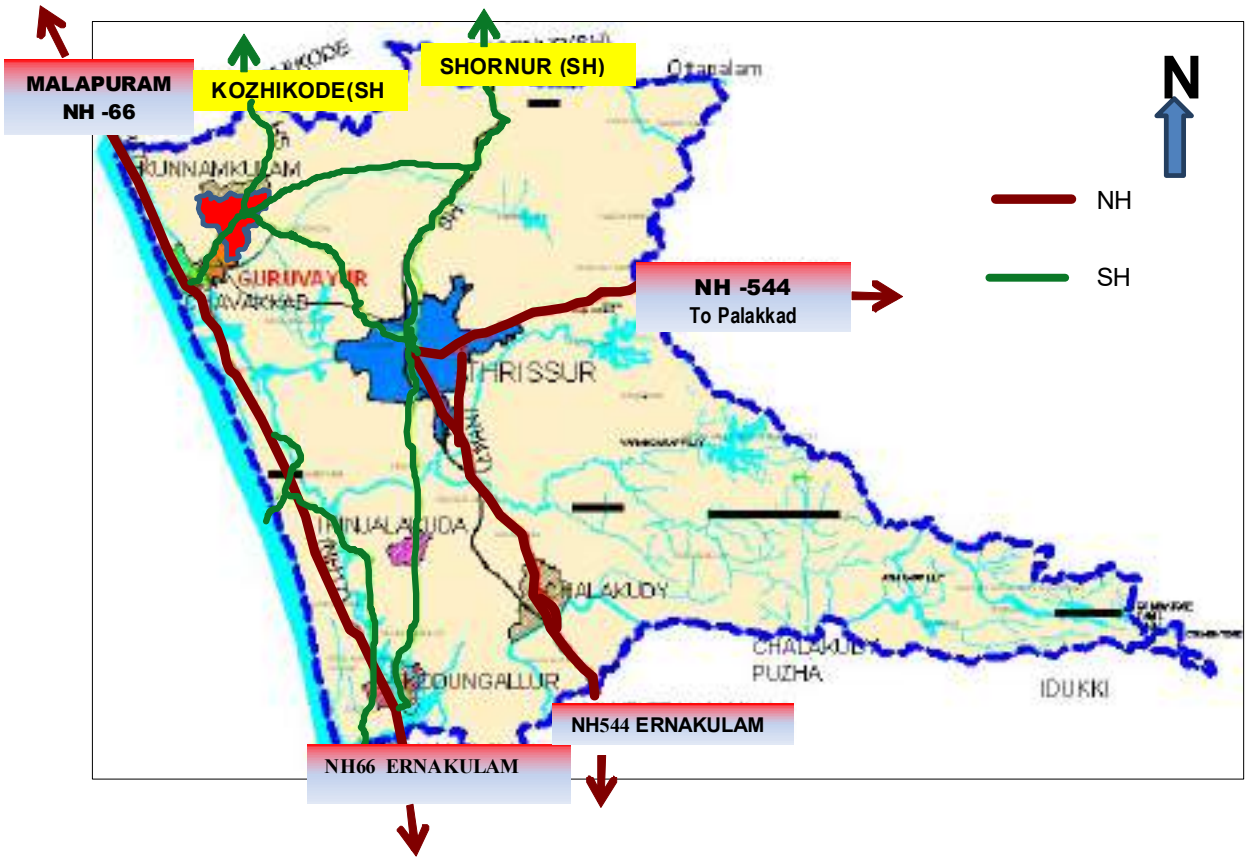


Fig 2.1 Regional linkages of Kunnamkulam

2.2 Linkages

Kunnamkulam Town is well connected to other parts of the District by road. Kunnamkulam acts as a major hub between Thrissur, Malappuram Kozhikode & Palakkad Districts. The town is located about 29 kms northwest of Thrissur and 8 kms south east of Guruvayur. The nearest railway station is Guruvayur which is only 8km from Kunnamkulam. Highly efficient and frequent road transport system, both by the private and public sector exists in Kunnamkulam.The nearest airport is Kochi International Airport,which is 88 kms south of Kunnamkulam.

2.3 Regional Setting of Kunnamkulam Town as per Spatial Structure of Thrissur District

The spatial structure gives a frame work for determining the location of future development activities rationally. Spatial structure of the district derived by integrating hierarchy of settlements and nodes, the transportation network and activity pattern as evolved in the Integrated District Development Plan is shown in figure 2.2. According to this, the eight development zones envisaged for Thrissur district are as follows:

1. Environmental Concern Zone
2. Intensive Agricultural Zone
3. Economic Development Corridor (EDC)
4. Accelerated growth zone – Industrial
5. Accelerated growth zone – Institutional
6. Accelerated growth zone – Marine
7. Multifunctional zone I
8. Multifunctional zone II

From the spatial structure of the district it is clear that Kunnamkulam Town falls under Multifunctional zone II. In this zone, all types of second order urban activities, second order educational and health care facilities and transportation facilities etc. are to be provided. This zone will act as a service centre for the hinter lands and this zone is very much suitable for industries utilizing agricultural produces of hinter land.

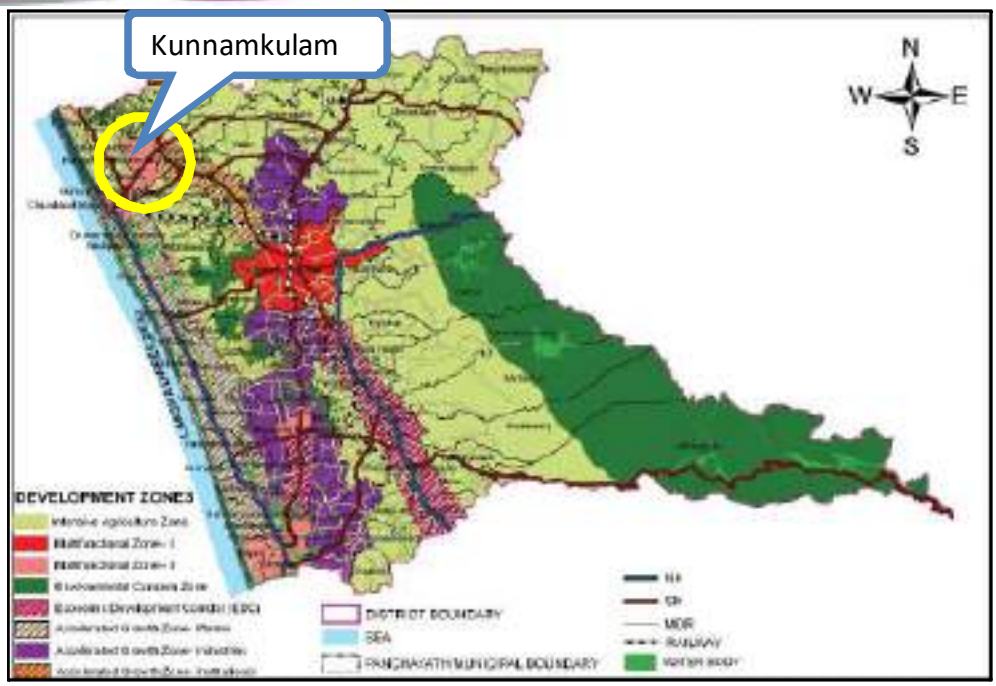


Fig 2.2 Spatial Structure of District

Source: IDDP Thrissur

2.3.1 Activity pattern of the town

Activity pattern is an indicator as to decide on the most suitable activity for the town. Existing activity pattern within the district is derived based on the study of the spatial distribution of the aspects namely, the land use concentration pattern, functional character and urban profile. These are combined to evolve the activity pattern, as shown in fig 2.3. Kunnamkulam town clearly shows Secondary Activity pattern, which indicates that even though land use concentration is agricultural, considerable proportion of the population is engaged in small scale industries, house hold industries and animal husbandry.

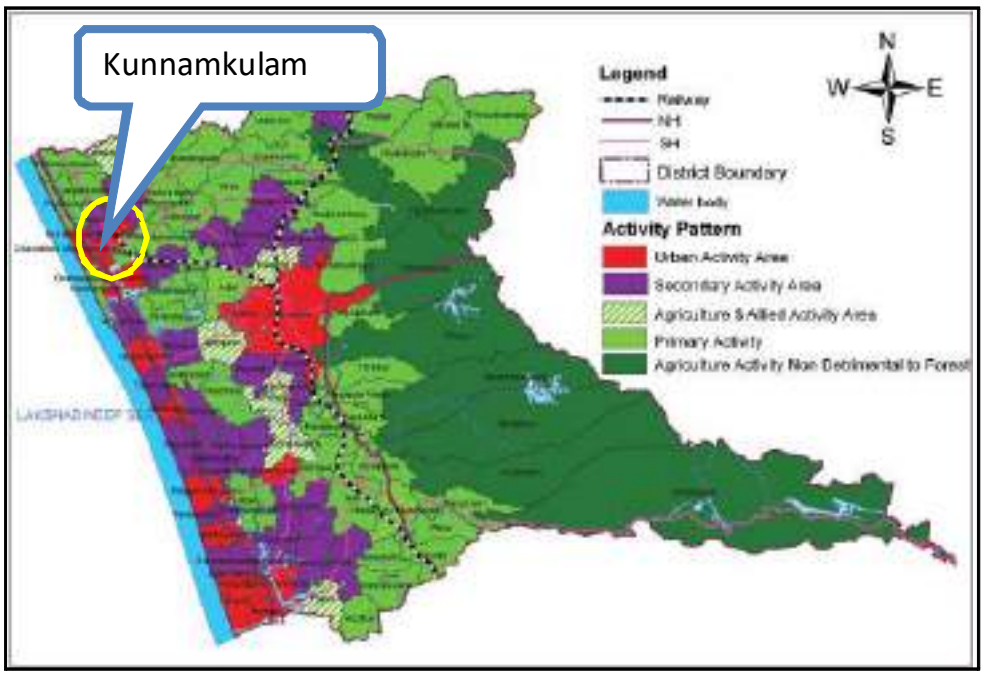


Fig 2.3 Activity Pattern of the District

Source: IDDP Thrissur

2.3.2 Functional Character of the Town

Functional character of an area is determined based on population distribution, plot size and land use of the area. Based on this Kunnamkulam comes under urban classification.

All the Surrounding LSGI's except Chavakkad and Guruvayur are categorized as rural. Guruvayur town already has a Master plan and a Master plan is being prepared for Chavakkad town. As a result the planning area is limited to Kunnamkulam alone. Being a second order settlement in the district, however, the immediate service area of the town, covers 27 LSGIs with a population of 758383 in the year 2021.

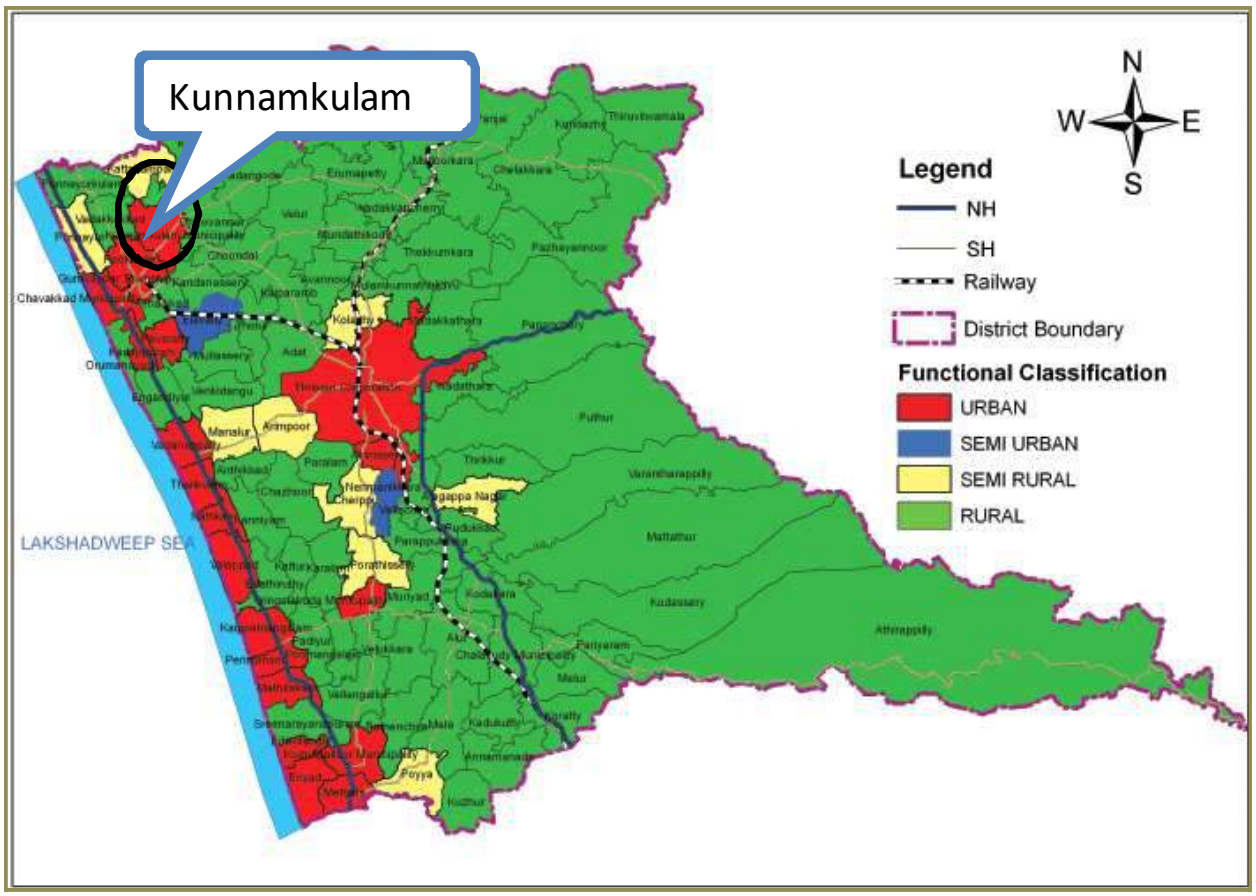


Fig 2.4 Functional Character of Kunnamkulam Townin the District Scenario

Source: IDDP Thrissur

2.3.3 Hierarchy of Settlements in the district and role of Kunnamkulam

Hierarchy value of a settlement is an indicator of the extent of concentration of facilities in a settlement. Cumulative Functional Index (CFI) method is used to find out the hierarchy of settlement. The CFI of a settlement is assessed based on the number and hierarchy of the following types of facilities in the settlement.

1. Educational facilities

2. Health Facilities

3. Markets

4. Physical infrastructure facilities

5. Transportation facilities

In the district scenario Kunnamkulam Town is categorized as a Second order LSGI as shown in *fig 2.5*

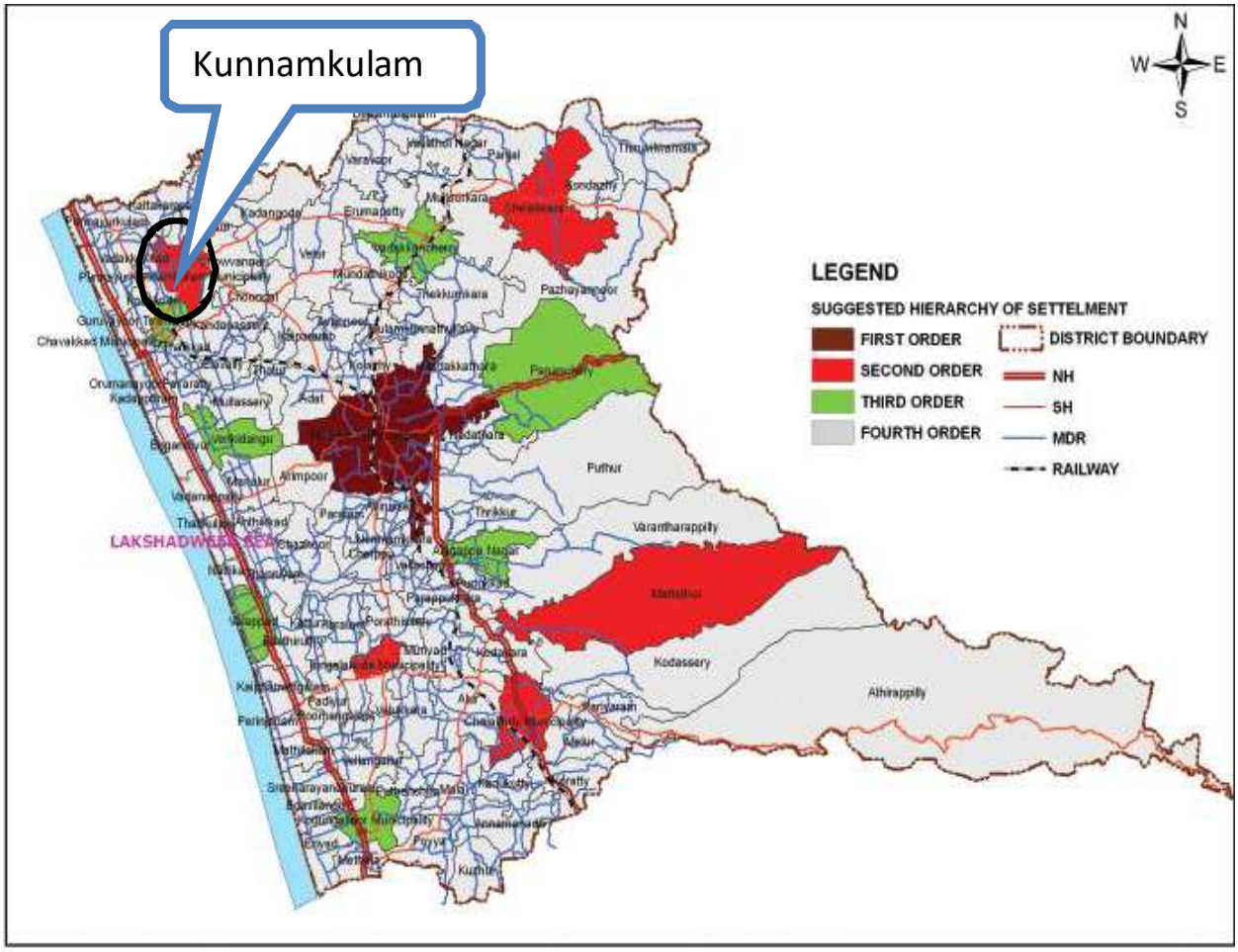


Fig 2.5 Hierarchy of Settlements

Source: IDDP Thrissur

2.3.4 Connectivity

In Kerala, perfect urban - rural continuum exists and the nodes play a crucial role in the transportation network. Parayil Centre, at Kunnamkulam becomes the second order node in the district. Kunnamkulam Town is well connected to various other parts of the district. (Please see Fig.2.6 – Connectivity network of the District)

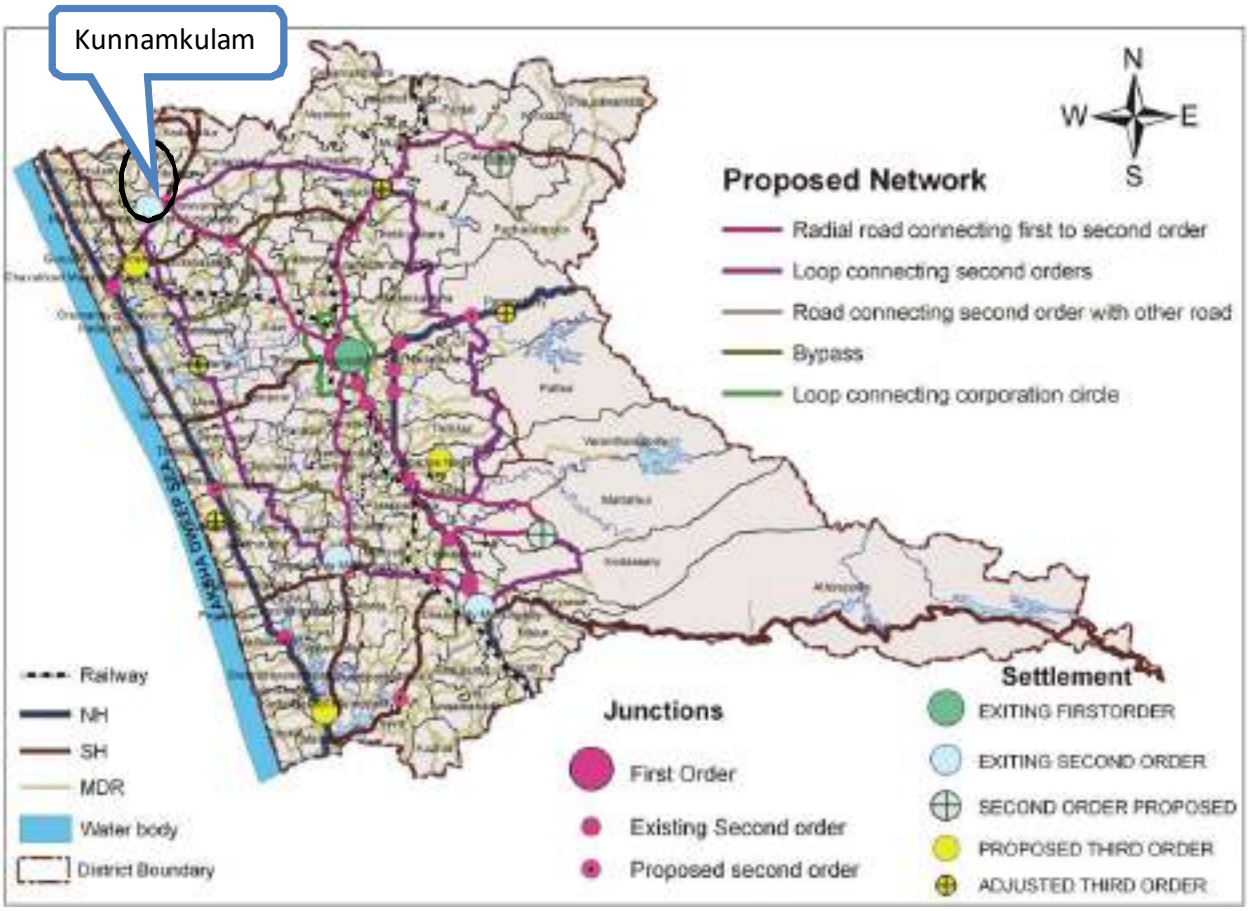


Fig 2.6 Connectivity Network of the district

Source: IDDP Thrissur

2.4 Inference

From the foregoing discussions it is clear that Kunnamkulam Town falls under Multifunctional zone II as per the draft IDDP for the district. So, all types of second order urban activities, second order educational and health care facilities etc. are to be provided. Based on activity pattern, we can understand that even though land use concentration is agricultural, considerable proportion of population is engaged in small scale industries and animal husbandry. This intrinsic nature has to be retained. In case of connectivity, Kunnamkulam is a second order node and acts as a major hub in the road connectivity between Thrissur, Malappuram Kozhikode and Palakkad Districts. The planning area for the Master Plan is delineated to be the jurisdiction of Kunnamkulam Municipal area alone.

CHAPTER 3

DEMOGRAPHY

This chapter explains the demographical characteristics of Kunnamkulam Town as population, population density, growth rate, sex ratio etc. The study is based on the census report 2011.

3.1 Population

Understanding the likely long-term change in the characteristics of the population is vital for the effective planning of infrastructure and services. The study of present and future composition of the population and its spatial distribution helps to identify the best locations to provide services to meet local needs.

The total population of Kunnamkulam Town according to 2011 census is 54071. Out of this 25392 are males and 28679 are females. The total number of household in the city is 11138 and sex ratio is 1117.Figure 3.1 shows the decadal variation of total population in Kunnamkulam Town area.

Figure 3.2 shows a comparison of population of Kunnamkulam Town with major urban local bodies in Thrissur district. The population of Kunnamkulam Town is only 5th highest when compared with other urban LSGI's in Thrissur District. Thrissur Corporation is having the highest population and Chavakad Town is having the lowest. In comparison with the population of nearby LSGI's, as in figure 3.3, Kunnamkulam Town is seen to have second position. Porkulam panchayath has the lowest population i.e.16339 and Guruvayur Town has the highest i.e.70012.

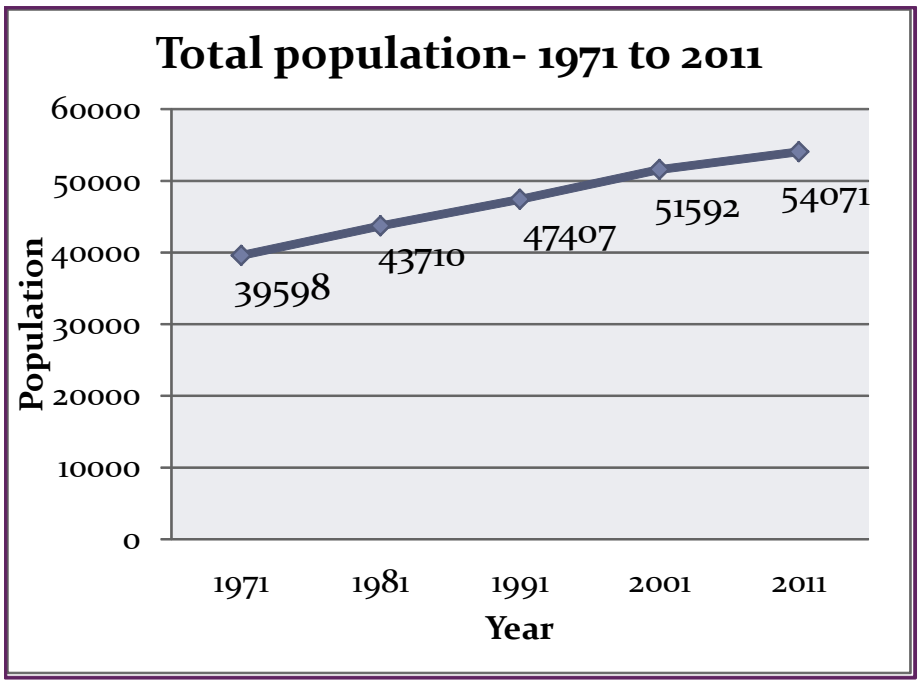


Fig 3.1 Decadal variation in Population

Source: Census of India

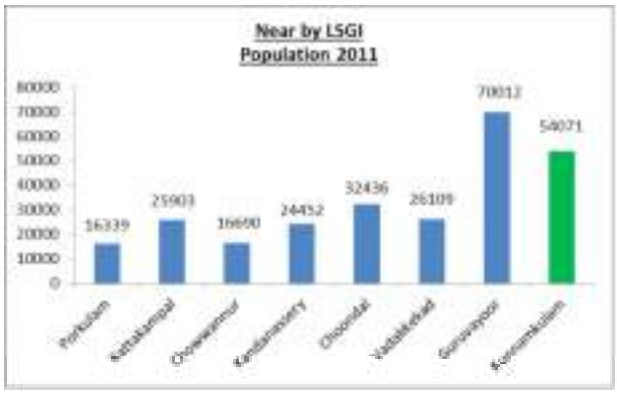


Fig 3.2 Comparison of population with urban LSGI'sof district

Source: Census 2011

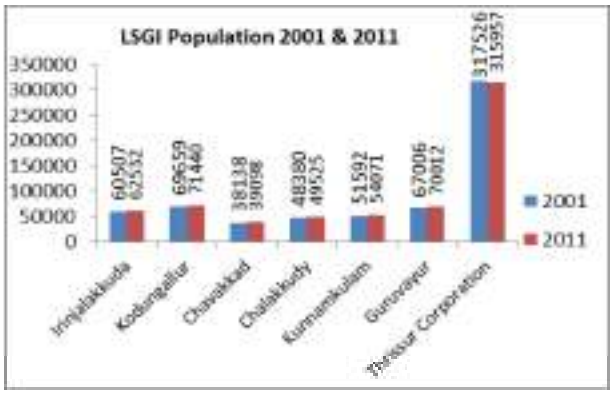


Fig 3.3 Comparison of population with nearby LSGIs

Source: Census 2011

Ward wise distribution of population is given in figure 3.4 and corresponding population figures in table 3.1. This shows that population is more in wards 1, 11, 15, 24, 25 and 27.

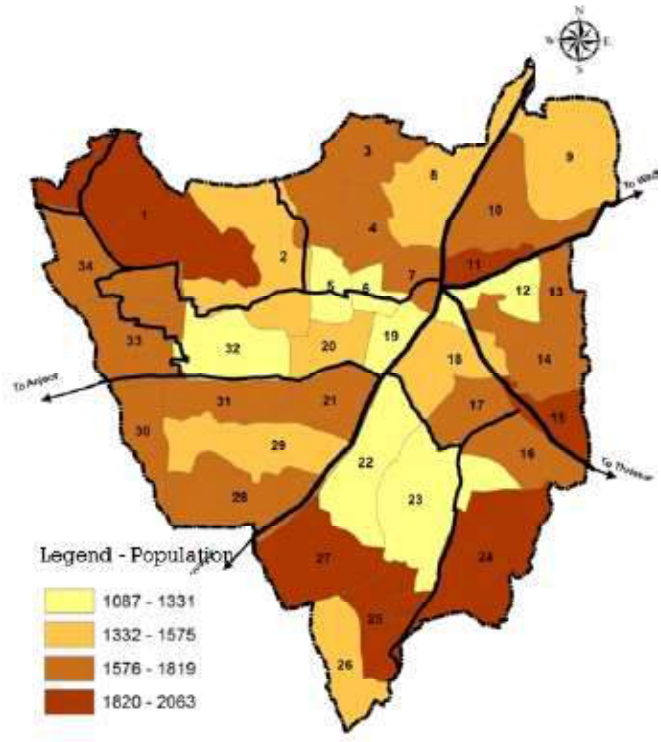


Fig 3.4 Ward wise distribution of population

Source: Census 2011

Table 3.1 Ward wise population 2011

Ward	Population	Ward	Population
1	1893	18	1501
2	1531	19	1223
3	1620	20	1477
4	1608	21	1617
5	1214	22	1253
6	1087	23	1288
7	1620	24	1824
8	1439	25	2063
9	1533	26	1414
10	1772	27	1855
11	1949	28	1815
12	1146	29	1512
13	1816	30	1731
14	1579	31	1655
15	2010	32	1260
16	1751	33	1576
17	1687	34	1752
TOTAL			54071

Source: Census 2011

3.2 Population Growth Rate

Population growth rate of Kunnamkulam Town during the year 2001-2011 is 4.81%, which is less than the growth rate of district (4.94%) as shown in figure 3.6.

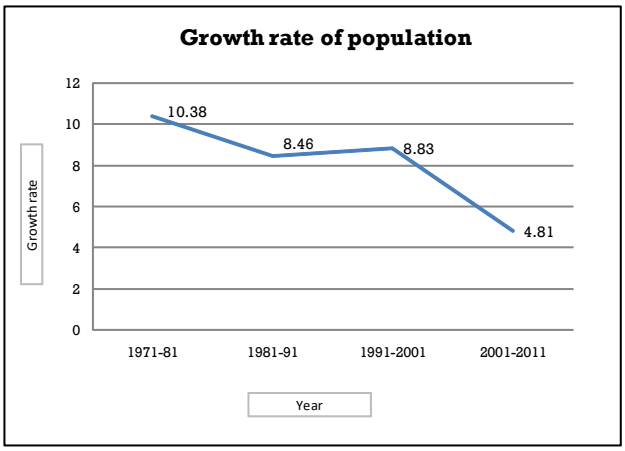


Fig 3.5 Variation in Population growth

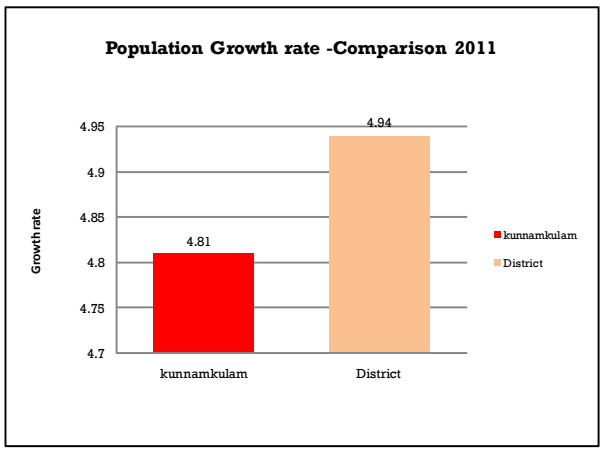


Fig 3.6 Comparison of Population

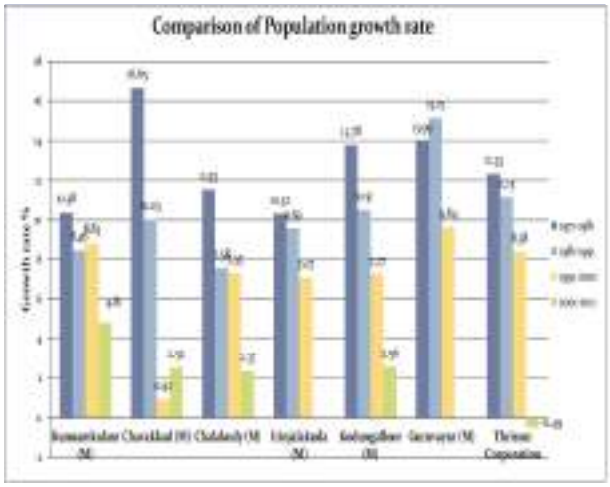


Fig 3.7 Population growth rate Comparison with urban LSGI's

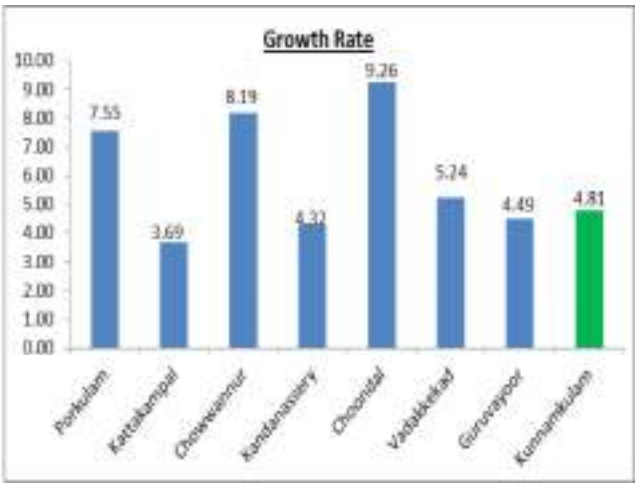


Fig 3.8 Population growth rate comparison with nearby LSGI's

Source: Census 2011

Variation of population growth rate of Kunnamkulam Town (figure 3.5) from 1971 to 2011 shows a decreasing trend. For the calculation of population in 1971, 1981 & 1991, the proportionate population of the merged Panchayats were taken in to consideration. Comparison of population growth rate with other urban LSGI's, Kunnamkulam shows a higher rate and with neighbouring LSGI's it shows a lower rate. The details are shown in figures 3.7 and 3.8.

3.3 Population Density

The population density of Kunnamkulam Town in 2011 is 1968 persons per square kilometer, which is higher when compared with that of Thrissur district, as shown in figure 3.9.

Comparison of population density of Kunnamkulam Town with other urban LSGI's of Thrissur district and nearby LSGI's are shown in figure 3.10 and 3.11. It is clear that population density is lower when compared with urban LSGI's. In comparison with nearby LSGI's,Guruvayur Town is seen to have highest population density and Kunnamkulam Town stands next.

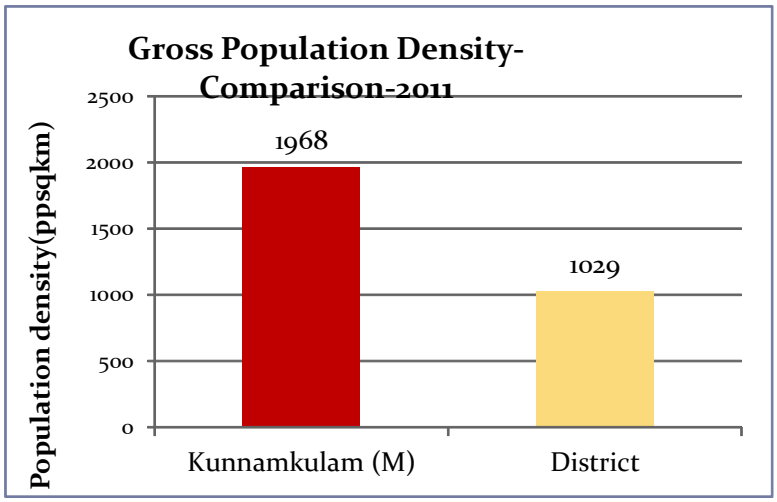


Fig 3.9 Comparison of Population density

Source: Census 2011

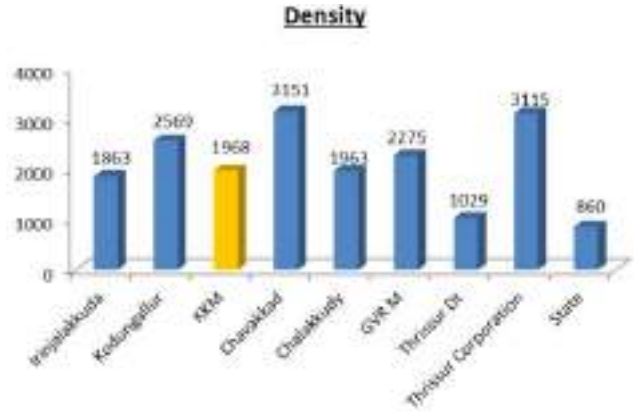


Fig 3.10 Comparison of Population density with urban LSGI's

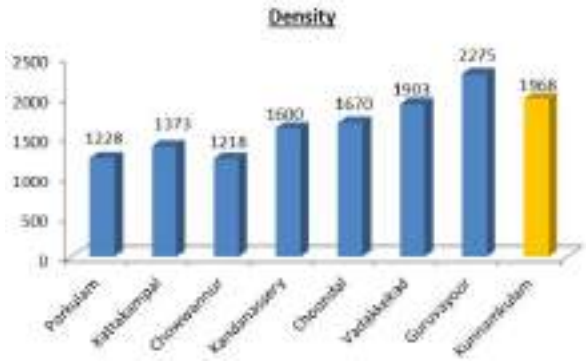


Fig 3.11 Comparison of Population density with nearby LSGI's

Source: Census 2011

Variation of population density through various wards of Kunnamkulam Town is shown in figure 3.12. Population density is higher in wards 6,7,11,13,15 and 17 which lie by the sides of major roads. These wards are having comparatively low area.

Table 3.2 Ward wise population density

Ward No.	Density (pp/Sq.km)	Ward No.	Density (pp/Sq.km)
1	936.74	18	1927.97
2	1030.23	19	3614.64
3	1414.04	20	3090.83
4	3419.94	21	2494.38
5	3485.73	22	1275.55
6	4686.14	23	919.02
7	4380.31	24	1199.58
8	1307.52	25	3356.21
9	1199.12	26	2108.79
10	1661.76	27	1774.10
11	6542.63	28	1693.55
12	2332.83	29	1496.01
13	4158.99	30	3435.28
14	2030.78	31	2814.44
15	4641.82	32	1457.15
16	2623.59	33	1710.20
17	3742.27	34	1820.09

Source: Census 2011

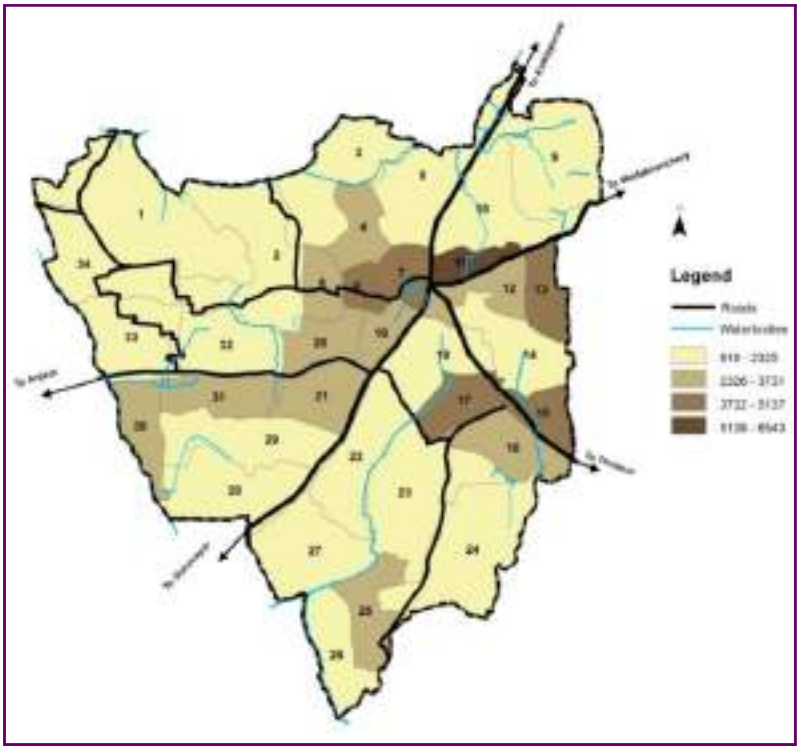


Fig 3.12 Ward wise variation of Gross Population density

Source: Census 2011

3.4 Sex Ratio and Age-Sex Pyramid

Sex ratio of Kunnamkulam Town is 1117 as per 2001 and 1129 in 2011 census while that of Thrissur District is 1092. Figure 3.13 shows the comparison of sex ratio with other urban LSGI's. Highest sex ratio is in Chavakkad and the lowest is in Thrissur Corporation.

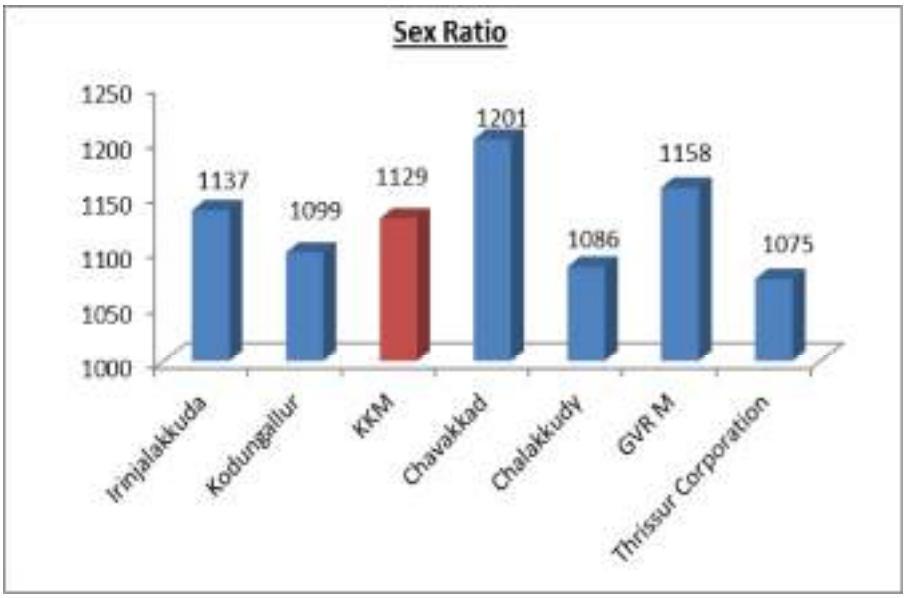


Fig 3.13 Comparison of Sex ratio with other urban LSGIs

Source: Census 2011

Figure 3.14 shows the comparison of child sex ratio among various urban LSGIs in the Thrissur district. Kunnamkulam possess the lowest value when compared to other urban LSGIs.

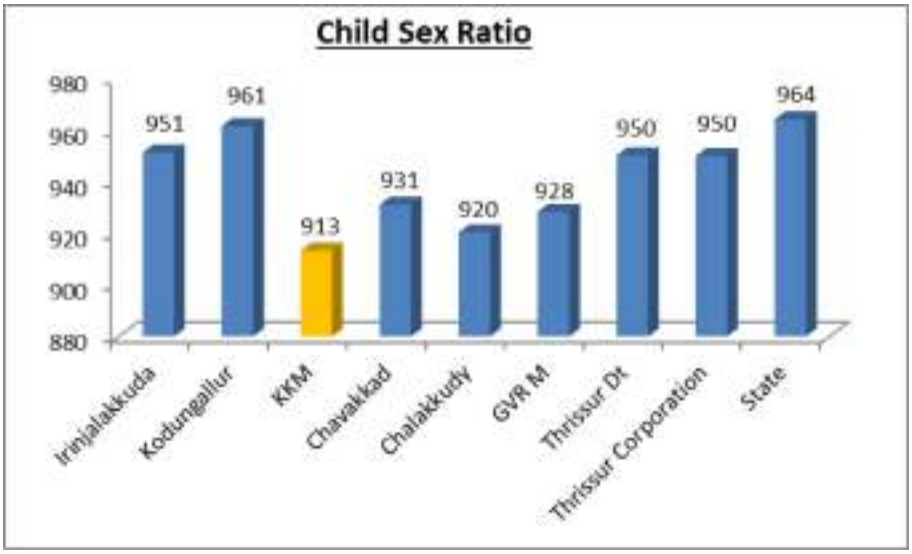


Fig 3.14 Comparison of Child Sex ratio with other urban LSGIs
Source: Census 2011

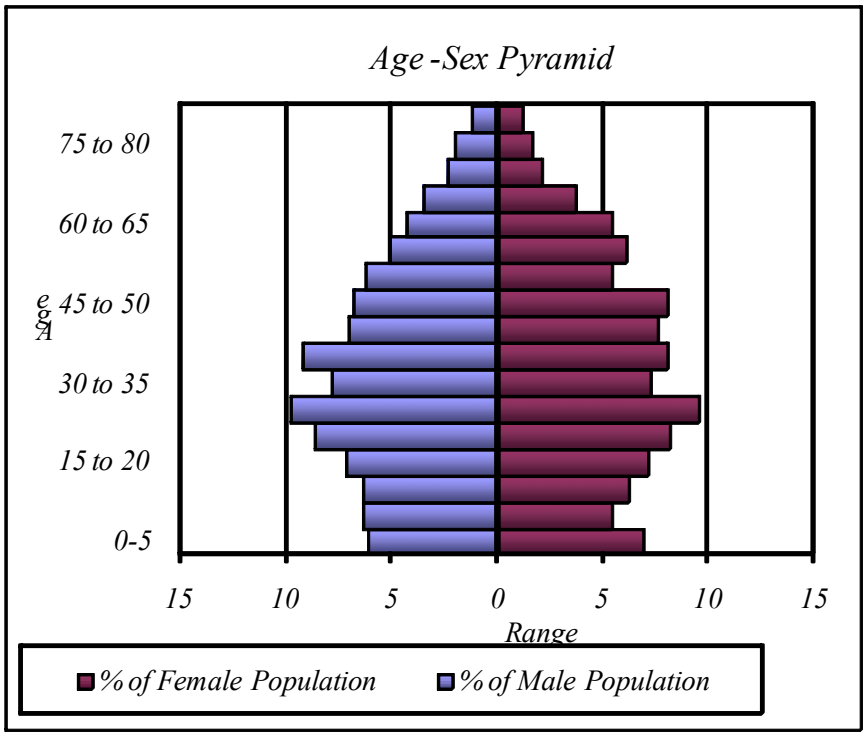


Fig 3.15 Age – Sex pyramid of Kunnamkulam Town
Source : Socio economic survey 2012

Age-sex pyramid of Kunnamkulam Town is arrived at from the socio-economic survey 2012 and is shown in figure 3.15. Age sex pyramid gives the population composition of the Town. For Kunnam kulam the economically productive population (between age group 20-60) is seen to be more in general and in particular males are out numbering females.

3.5 Literacy

Literacy rate of Kunnamkulam shows an increasing trend over the years as shown in figure 3.16. Kunnamkulam shows a higher literacy rate in comparison with that of State, District and Taluk level, as given in Table 3.3. Kunnamkulam Town is having only fourth position when comparing literacy rate with other urban LSGI's of district, as shown in figure 3.17

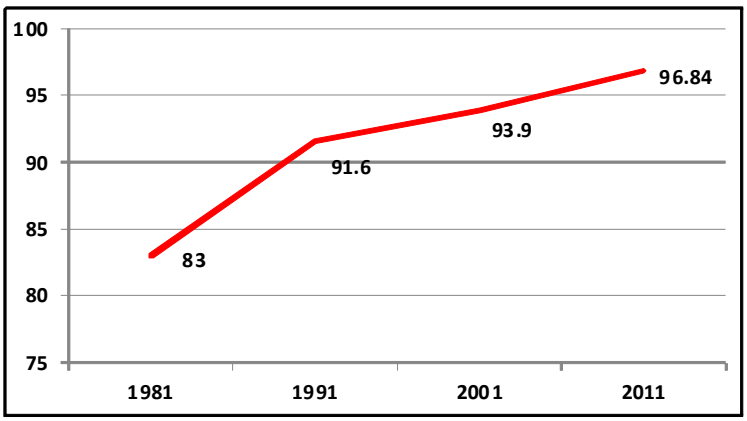


Fig 3.16 Variation of literacy rate

Table 3.3 Comparison of literacy rate

Area	Literacy rate	
	2001	2011
Kerala	90.86	94.00
Thrissur District	92.27	95.08
Thalappilly Taluk	89.60	93.07
Kunnamkulam (M)	93.90	96.84

Source: Census of India

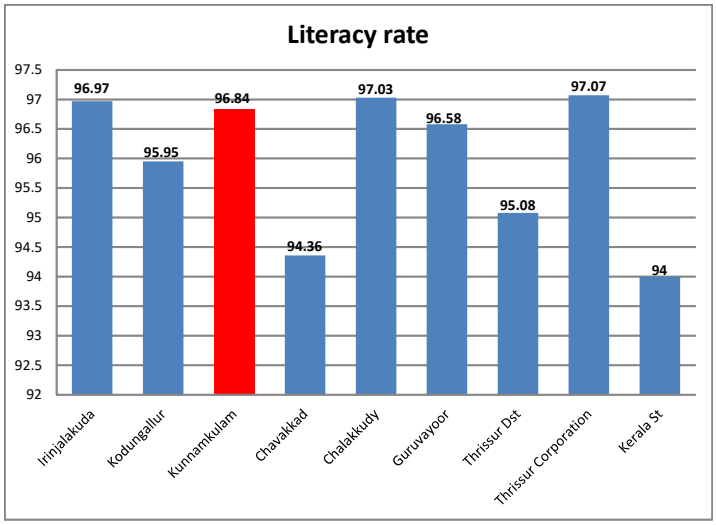


Fig 3.17 Comparison of literacy rate with other towns, District & State

Source: Census 2011

3.5.1 Female literacy rate

Figure 3.18 shows that, female literacy rate of Kunnamkulam is higher compared to that of State, District and Taluk level. But literacy rate is less for females when compared with that of males.

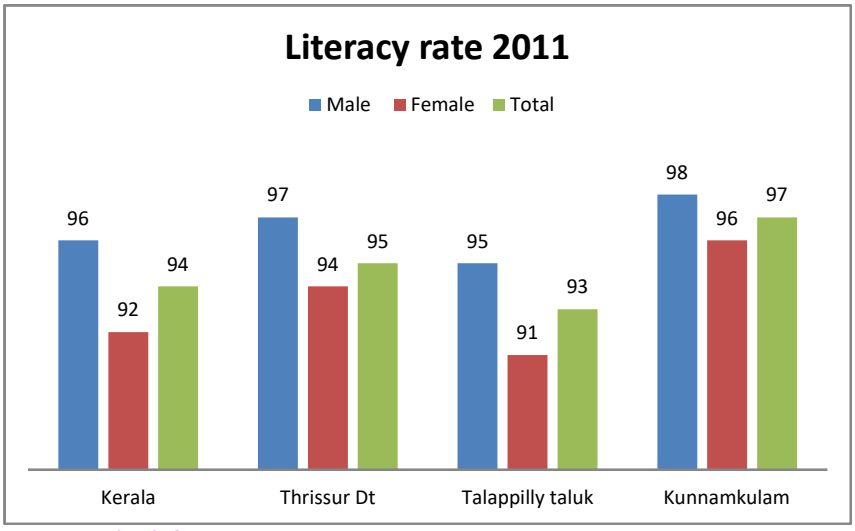


Fig 3.18 Comparison of Male, Female and Total literacy rate

Source: Census 2011

3.6 Household Size

Household size of Kunnamkulam Town as per 2011 census is 4.11, which is less than Household size of State and Taluk. Household size of Kunnamkulam Town as per 2001 census is 4.63.

Table 3.4 Comparison of household size

Area	House Hold Size
	2011
Kerala	4.25
Thrissur District	4.11
Thalappilly Taluk	4.26
Kunnamkulam (M)	4.11

Source: Census of India 2011

3.7 Migration

Socio-economic survey conducted on 2012 reveals that in migration and out migration in Kunnamkulam Town is low. In migration is about 1.9% and out migration is only 0.66%.

3.8 Inference

Population growth rate of Kunnamkulam Town is showing a decreasing trend. Population and population density are less compared to other urban LSGI's. Child sex ratio shows that female population is low compared to other urban LSGI's. Total male and female literacy rate is also high compared to District and Taluk level.

CHAPTER 4

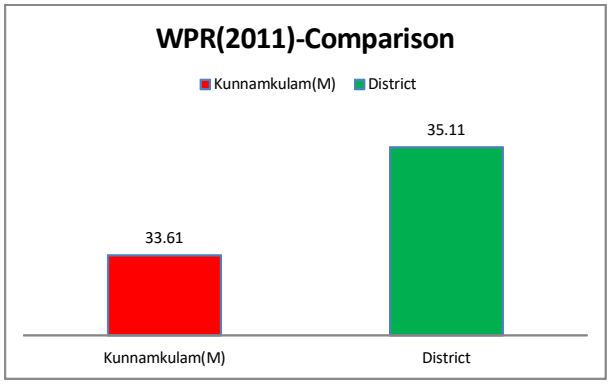
OCCUPATIONAL STRUCTURE

This chapter reveals the existing pattern of occupational structure of Kunnamkulam Town and its temporal variation.

4.1 Work Force Participation Rate

Work force Participation Rate of any place is an indicator of the economic activities taking place in a locality. It is the proportion of total workers to the total population of the locality. WPR of Kunnamkulam Town as per 2011 census is 33 which says that out of total population of 54071, there are 18171 workers. From that 13428 are males and 4743 are females.

A comparison of WPR of Kunnamkulam Town with district value and urban average value is given in figure 4.1, which shows that Kunnamkulam Town is showing a lower value



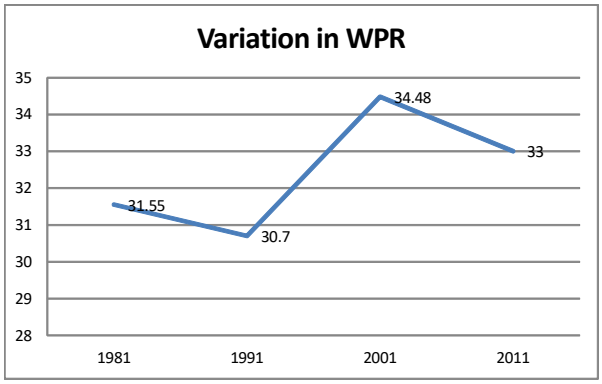


Fig 4.1 Comparison of Work Participation Rate

Fig 4.2 Variation in Work Participation Rate

Source : Census 2011

than district average. Temporal variation of WPR is given in figure 4.2. This shows that work participation rate has decreased from 34.48 to 33, which indicates that more people are engaged in productive activities which contribute to economic development. Work participation rate of females is 16.54%.

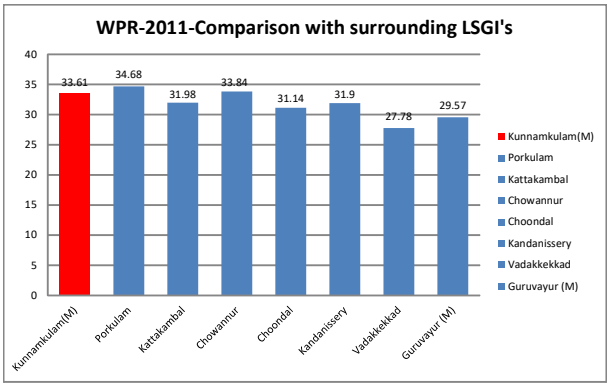


Fig 4.3 Comparison of WPR with surrounding LSGI's

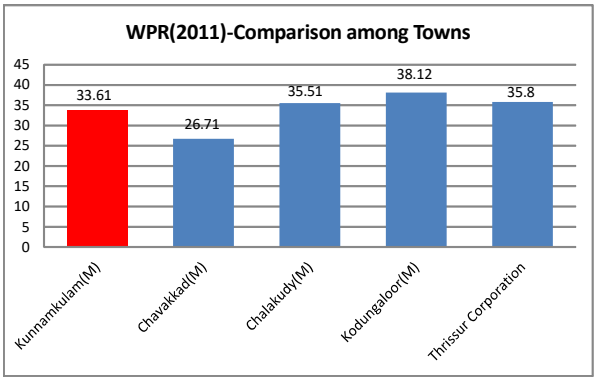


Fig 4.4 Comparison of WPR among towns

Source: Census 2011

Comparison of work participation rate with surrounding LSGI's and other urban LSGI's in Thrissur district is given in figure 4.3 and 4.4 respectively. It is clear that Kunnamkulam Town is having a reasonable WPR in both cases.

4.2 Occupational Structure

Census classifies workers into two groups,main workers and marginal workers. Main workers are engaged in economically productive activity for six months or more in a year, while marginal workers work for less than six months a year.Total workers in Kunnamkulam Town are 18171 and out of this 89% are main workers and 11% are marginal workers (figure 4.5).

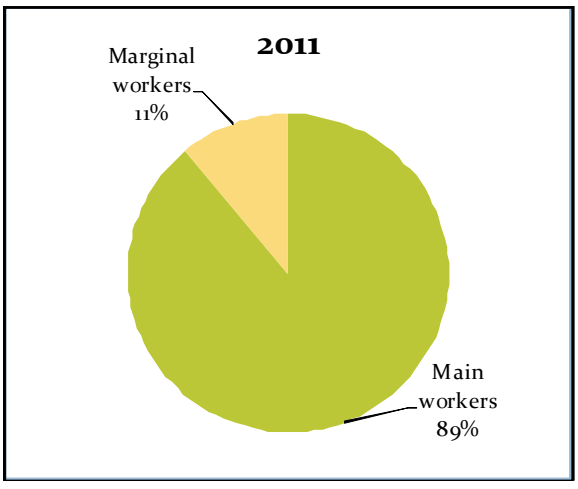


Fig 4.5 Main and Marginal workers

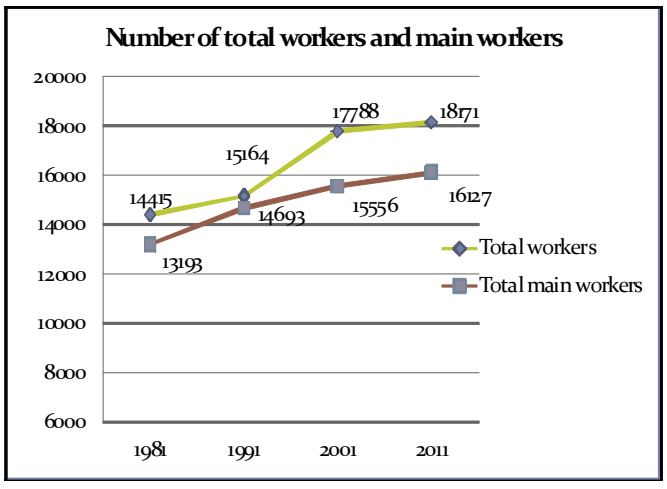


Fig 4.6 Variation of total workers and main workers

Figure 4.6 shows the temporal variation of workers and main workers. It can be seen that the increase in main workers is not the same as that of total workers. This indicates that the majority of job opportunities created are of temporary nature during the period 1991-2001. (This may be due to the increase in number of piece rate workers of note book binding units.)

The composition of work force is called the occupational Structure. Main workers are categorised as cultivators, agricultural labourers, household industrial labourers and other workers to work out the occupational structure.

The temporal variation of occupational structure is given in figure 4.7. It can be inferred from the figure that agricultural activity has drastically come down through the years. On the other hand there is a slight increase in the household industrial scenario and a great leap in other sectors. Percentage of cultivators decreased from 7% in 1981 to 2% in 2011, which indicates reduction in land utilisation for cultivation. Percentage of agricultural labourers shows a steep decrease from 23% in 1981 to 4% in year 2011. Increase in wages of agricultural labourers and reduced value of agricultural products resulted in decrease of agricultural activities.

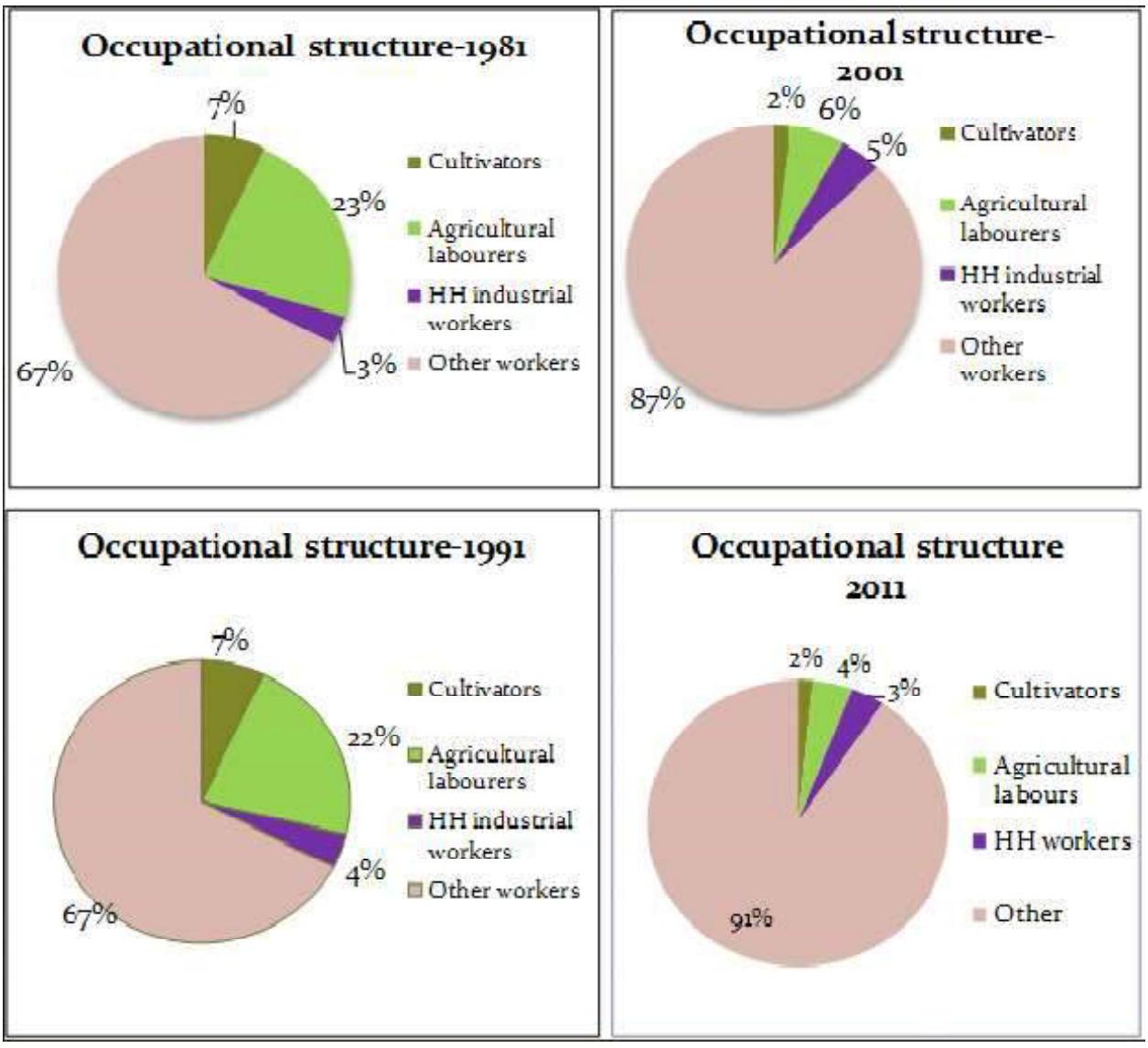


Fig 4.7 Occupational structure – 1981, 1991, 2001 and 2011

Source: Census of India

Percentage of household industrial workers shows a change from 3% to 5% in 2001 and 5% to 3% in 2011 due to the decrease in number of piece rate workers in notebook binding units, while other workers increased from 67% in 1981 to 87% in year 2001, and from 87% to 91% in 2011. The current fourfold and threefold classifications of workers arrived at from socioeconomic survey-2012 are given in figure 4.8.and 4.9 respectively. This shows that tertiary sector forms the economic base of the Town.

Table 4.1 shows the percentage of workers in each category. 38% include other workers mainly from service sector and trade and commerce. Other major categories are construction helpers (11.34%), NRIs (10.37%), Govt. employees (7.5%) and drivers (7.5%).

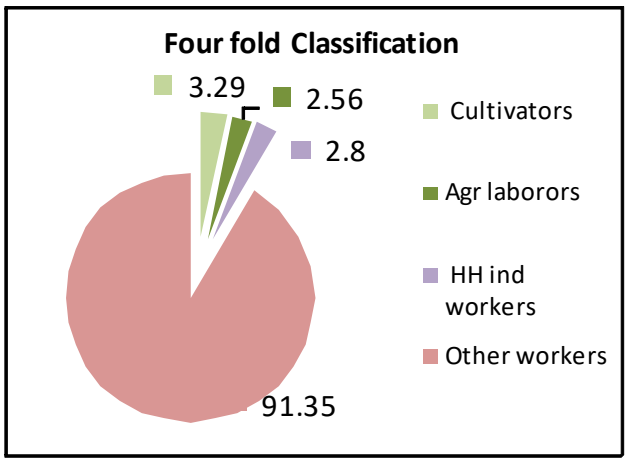


Fig 4.8 Fourfold classification of workers

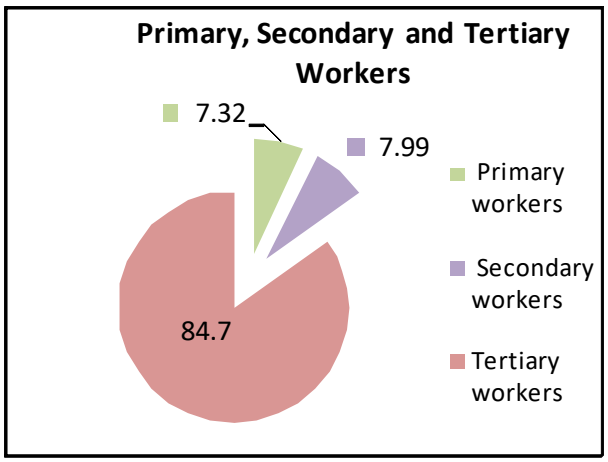


Fig 4.9 Threefold classification of workers

Table 4.1 Percentage of workers in each category

Type	Govt Employee	Agriculture labourer	Agriculture cultivators	Livestock worker	NRI	Headload workers	Beedi workers	Carpenter	Coir worker	House hold industrial worker	Construction (Helper)	Vegetable trader	Retail fish vendor	Whole sale fish vendor	Conventional fish man	Plantation worker	Hotel worker	Driver	Retail seller (Other than edible items)	Beverage worker	Construction worker	Other major industrial worker	Other workers
Average % for the LSGI in each category	7.5	2.56	3.29	1.34	10.37	0.61	0.55	2.44	0.98	2.8	11.34	0.49	0.18	0.06	0	0.12	1.52	7.5	1.04	0.18	2.87	4.21	38.05

Source: Socio-economic Survey 2012

Concentration index of cultivators in the town is given in the spatial distribution map as figure 4.10. Concentration index of cultivators is high in wards 7, 25 and 28. Spatial distribution of agricultural labourers (figure 4.11) shows that they are concentrated in wards adjoining or same as that of cultivators. While comparing with the land use map (fig 4.12) of Kunnamkulam Town, it is seen that cultivators and agricultural labourers are concentrated near to paddy areas. Spatial distribution of concentration index of household industrial labourers in the town is given in figure 4.13. It is seen that household industrial labourers are concentrated along Guruvayur and Anjoor road.

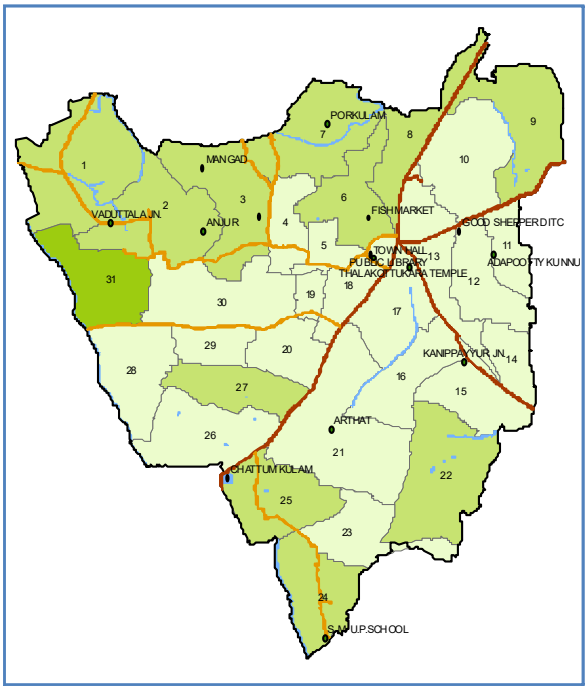


Fig 4.10 Concentration Index of cultivators

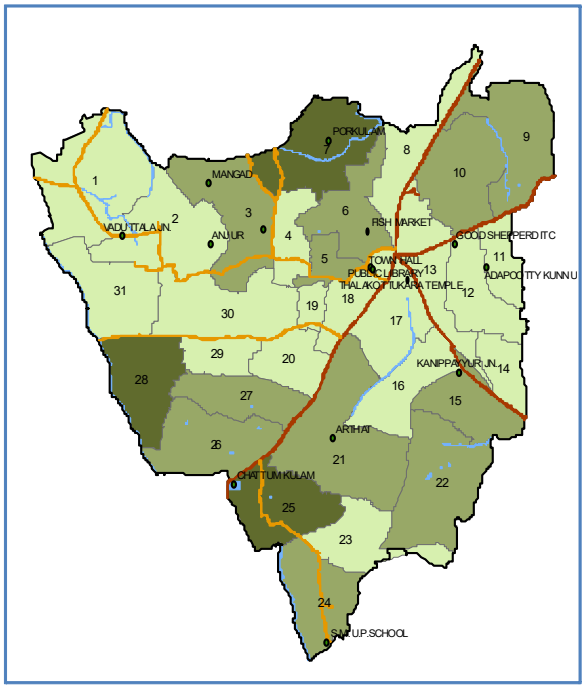


Fig 4.11 Concentration Index of agricultural labourers

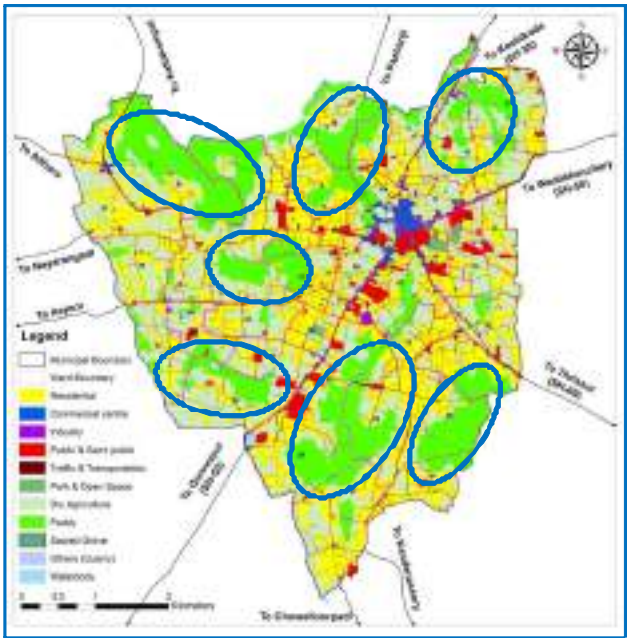


Fig 4.12 Land use map – Paddy areas in the town

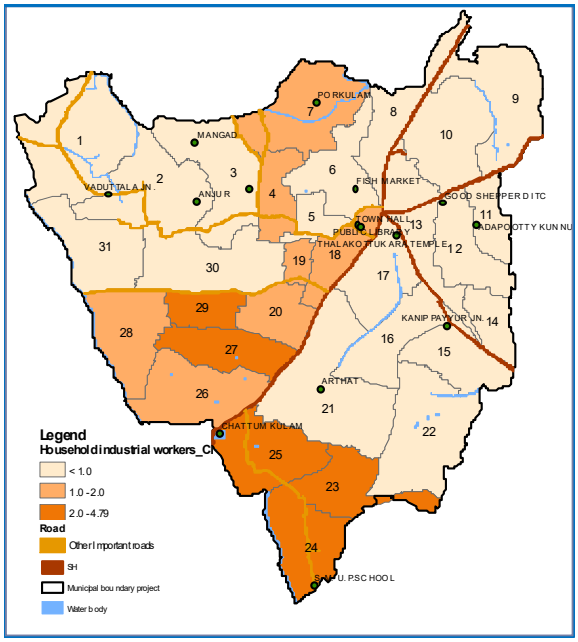


Fig 4.13 Concentration Index of household industrial workers

Source: Socio-economic Survey -2012

4.3 Inference

Work force participation rate of Kunnamkulam Town is higher compared to other urban LSGI's in Thrissur, which indicates the fairly strong economic base of Municipality. Steep decrease in number of agricultural labourers made agriculture an uneconomic sector. Increase in household industrial labourers, especially piece rate workers in notebook binding units and other workers helped in maintaining the economic base. Majority of workers are in tertiary sector which indicates the urban nature of the town.

CHAPTER 5

LAND USE

Existing land use of Kunnamkulam Municipal area and land use analysis is detailed out in this chapter. The study is based on the land use survey conducted by Town and Country Planning Department, in the year 2012

5.1. Existing land use pattern

Existing land use of Kunnamkulam Town based on landuse survey conducted in 2012 is shown in figure 5.1.

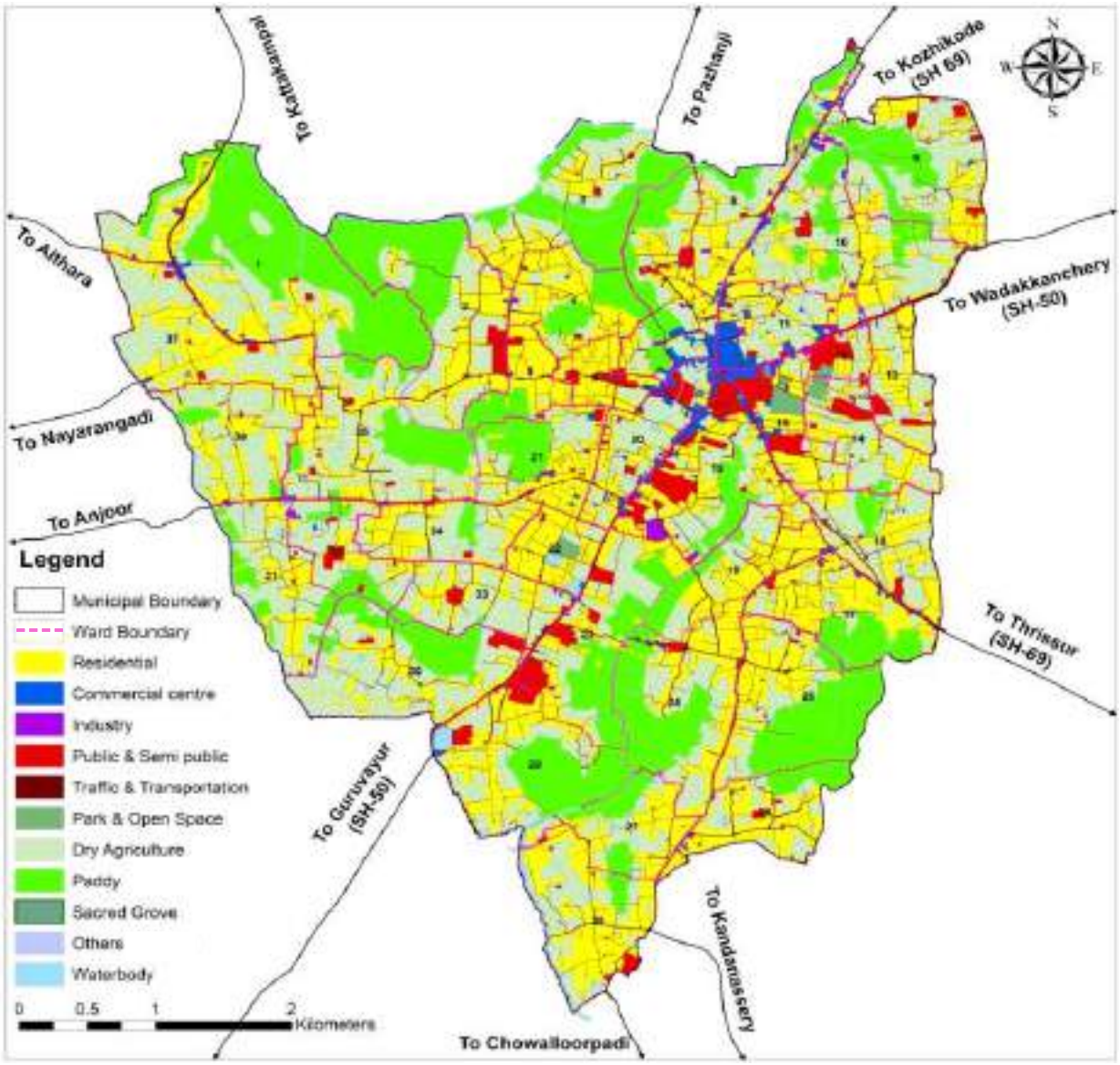


Fig 5.1 Existing land use of Kunnamkulam Town

Kunnamkulam Town as we see now is expanded in 2001 by adding rural LSGIs of Arthat Panchayat in full and parts of Chowwannur and Porkulam and now the area is 27.45 sq.km. This area is utilized for a variety of uses like industrial, commercial, residential, agriculture etc. Unlike many other urban LSGIs the land utilized for agriculture activities is seemingly on the higher side. (The pattern of land use and the outcome of various analyses throw some light into the structure of the land and the development direction of Kunnamkulam). Land use breakup is shown in table 5.1 and percentage of land use is shown in figure 5.2.

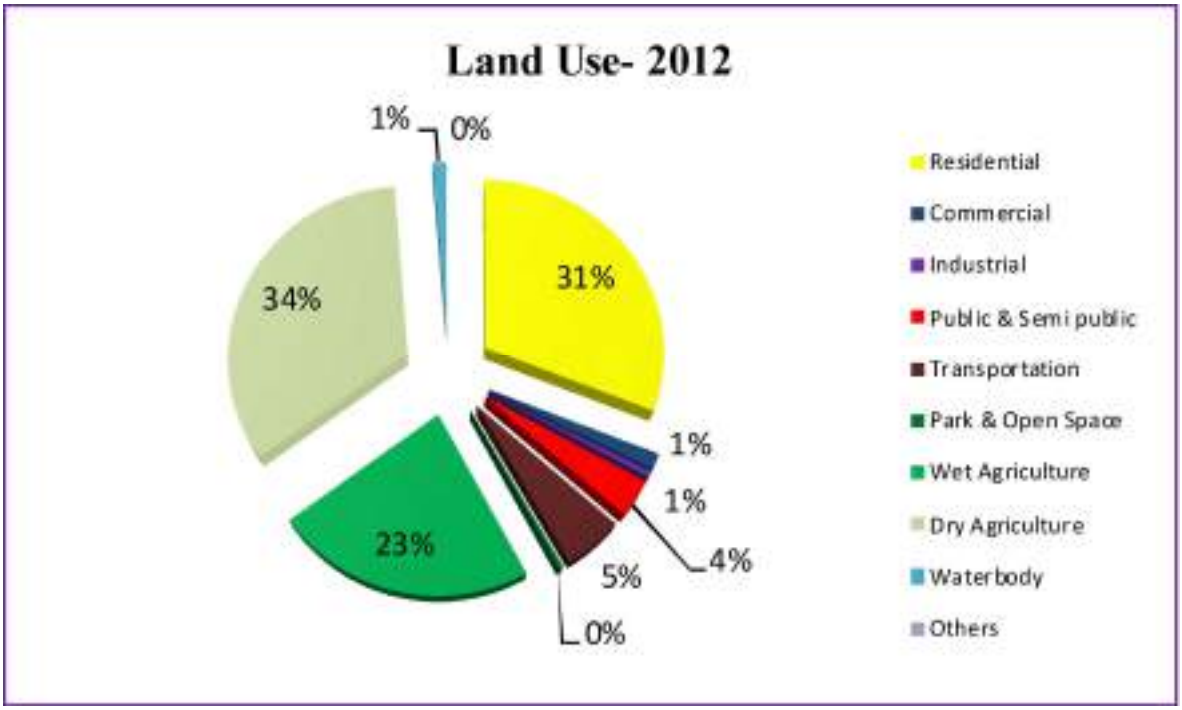


Fig 5.2 Percentage of land use

Source: Land use survey-2012

Table 5.1 Existing land use break up

Land Use	Existing Land Use 2012	
	Area(sq.km)	Percentage
Residential	8.49	30.94
Commercial	0.41	1.49
Industrial	0.15	0.53
Public & Semi public	0.96	3.50
Transportation	1.43	5.23
Park & Open Space	0.11	0.40
Paddy	6.28	22.88
Dry Agriculture	9.27	33.77
Waterbody	0.34	1.23
Others	0.01	0.03
Total	27.45	100.00

Table 5.1 reveals that out of the total area of 27.45 sq.km, an area of 8.49 sq.km is utilized for residential activity (comprising almost 31% of the area). The next major activity is dry agriculture (9.27 sq.km) constituting about 34% of the area. Paddy, especially kole land is a significant land use here with 6.28 sqkm of area under this use (23%). Then comes transportation land use with nearly 5.23%, followed by public and semipublic land use and commercial land use. Water bodies in the form of thodu & ponds also contribute to 1.25% of the total area Table 5.2 gives the ward wise land use break up for 37 wards of Kunnamkulam Municipality. From the table it can be seen that major land use is agriculture in majority of wards which can be attributed to the house hold agricultural activities. Some exceptions are seen in certain wards like 5, 6, 13, 15, 17, 18, 22, 26 and 28. These wards are showing majority of residential land use.

Table 5.2 Ward wise land use break up

Ward No	Ward Name	Ward area(sqkm)	Residential sq.km	Commercial (Sq.Km)	Industrial (Sq.Km)	Public and Semipublic (Sq.Km)	Paddy (Agri) (Sq.Km)	Dry Agriculture (sq.km)	Park and Open Space (Sq.Km)	Transportation (Sq.Km)	Waterbodies (Sq.Km)	Others
1	Muthuvammal	1.987	0.337	0.014	0.001	0.008	1.037	0.495	0.002	0.066	0.027	0.000
2	Kizhoor South	1.190	0.280	0.002	0.002	0.041	0.430	0.367	0.001	0.042	0.024	0.000
3	Kizhoor North	1.026	0.189	0.000	0.000	0.005	0.475	0.304	0.000	0.045	0.008	0.000
4	Kizhoor Centre	0.575	0.278	0.000	0.002	0.004	0.170	0.084	0.000	0.034	0.002	0.000
5	Vyssery	0.324	0.181	0.001	0.000	0.009	0.103	0.004	0.000	0.023	0.003	0.000
6	Nadupanny	0.260	0.177	0.008	0.000	0.027	0.000	0.019	0.000	0.029	0.000	0.000
7	Kakkad	0.780	0.193	0.056	0.009	0.017	0.234	0.223	0.000	0.047	0.001	0.000
8	Munnaca	0.600	0.183	0.016	0.008	0.019	0.117	0.205	0.000	0.023	0.030	0.000
9	Ayyamparambu	1.000	0.243	0.008	0.005	0.032	0.246	0.427	0.000	0.060	0.009	0.000
10	Ayyapath	1.193	0.313	0.019	0.011	0.022	0.208	0.529	0.000	0.082	0.009	0.000
11	Chemkunnu	0.516	0.139	0.081	0.022	0.008	0.000	0.213	0.000	0.049	0.004	0.000
12	Unalikunu	0.153	0.037	0.002	0.001	0.053	0.000	0.044	0.011	0.005	0.000	0.000
13	Chowannoor	0.393	0.168	0.003	0.001	0.033	0.000	0.169	0.000	0.020	0.000	0.000
14	Malamkara	0.500	0.141	0.002	0.002	0.039	0.012	0.254	0.023	0.026	0.001	0.000
15	Town Ward	0.455	0.166	0.035	0.007	0.086	0.000	0.084	0.048	0.029	0.000	0.000
16	Kanippayoor	0.628	0.225	0.007	0.001	0.014	0.051	0.291	0.000	0.036	0.003	0.000
17	Anakkal	0.706	0.324	0.009	0.006	0.008	0.200	0.089	0.000	0.095	0.001	0.000
18	Kanyambal	0.576	0.275	0.002	0.000	0.002	0.098	0.153	0.000	0.039	0.009	0.000
19	Nehru Nagar	0.982	0.301	0.042	0.029	0.157	0.127	0.230	0.001	0.092	0.001	0.000
20	Santhi Nagar	0.534	0.141	0.049	0.006	0.040	0.000	0.249	0.000	0.045	0.003	0.000
21	Thekkepuram	0.623	0.241	0.007	0.006	0.012	0.174	0.145	0.000	0.036	0.002	0.000
22	Kurukkanpara	0.327	0.207	0.002	0.001	0.003	0.000	0.042	0.022	0.028	0.022	0.000
23	Athat East	0.947	0.219	0.000	0.004	0.095	0.305	0.287	0.000	0.037	0.000	0.000
24	Cheeramkulam	1.043	0.321	0.003	0.003	0.012	0.367	0.276	0.000	0.038	0.003	0.000
25	Porkulangad	1.032	0.282	0.002	0.000	0.005	0.497	0.190	0.000	0.050	0.005	0.000
26	Irichikunnu	0.589	0.281	0.003	0.003	0.012	0.104	0.144	0.000	0.036	0.001	0.004
27	Chemmannur North	0.495	0.200	0.001	0.000	0.001	0.134	0.137	0.000	0.018	0.005	0.000
28	Chemmannur South	0.836	0.418	0.002	0.000	0.024	0.037	0.279	0.000	0.035	0.042	0.000
29	Athat South	1.087	0.320	0.003	0.001	0.048	0.345	0.284	0.000	0.045	0.038	0.003
30	ThekkenChittanjoor	1.084	0.183	0.002	0.000	0.031	0.241	0.564	0.000	0.036	0.026	0.000
31	Anjankunnu	0.681	0.179	0.002	0.003	0.004	0.099	0.341	0.000	0.024	0.030	0.000
32	Anjar	0.494	0.096	0.003	0.004	0.027	0.085	0.214	0.000	0.018	0.009	0.000
33	Kavilakkadu	0.570	0.162	0.005	0.002	0.018	0.017	0.328	0.000	0.037	0.001	0.000
34	Chittanjoor	0.545	0.214	0.003	0.000	0.014	0.033	0.239	0.000	0.041	0.001	0.000
35	Alathoor	1.146	0.259	0.004	0.004	0.011	0.272	0.542	0.000	0.052	0.001	0.000
36	Anjoo/Palam	0.745	0.257	0.002	0.000	0.004	0.039	0.390	0.000	0.035	0.018	0.000
37	Vaduthala	0.843	0.363	0.008	0.000	0.014	0.000	0.425	0.003	0.020	0.010	0.000
	TOTAL	27.45	8.493	0.408	0.146	0.959	6.282	9.269	0.111	1.434	0.330	0.006



Kole lands



Perumthodu

Source: Land use survey-2012

5.2 Comparison of land uses

A comparison of the land uses among the urban LSGIs of Thrissur district is shown in table 5.3. From the table it may be inferred that agriculture in both forms dry and wet are on a higher side in Kunnamkulam.

Table 5.3 Comparison of Land use

Land use	Kodungallur	Kunnamkulam	Chalakudy	Irinjalakuda	Chavakkad
Residential	40.32	30.94	37.83	42.04	61.41
Commercial	2.12	1.49	1.85	1.56	1.29
Industry	0.35	0.53	0.77	0.79	0.19
Paddy	7.17	22.88	14.87	25.81	4.17
Park & Open space	0.17	0.4	0.02	0.39	0.34
Dry agriculture	24.52	33.77	32.02	18.47	21.25
Public and Semi Public	3.08	3.5	5.41	3.71	3.98
Traffic &Transportation	4.39	5.23	3.22	4.89	3.89
Water body	14.31	1.23	0.51	1.95	2.61
Vacant space	2.65	-	3.49	0.39	0.53
Mangroves	0.92	-	-	-	0.35

5.3 Concentration index of different land uses

The concentration index (CI) quantifies the extent of concentration of a particular land use in a ward.

$$\text{The concentration index of a particular land use in a ward} = \frac{\text{Percentage of that particular land use in the ward}}{\text{Percentage of that particular land use in the local body area}}$$

Concentration index can be less than one,equal to one or greater than one. CI less than one indicate that there is no concentration of that particular land use in that ward. But CI equal to or greater than one indicates that there is concentration of that particular land use.

5.3.1 Concentration Pattern of Residential Land Use

Figure 5.4 shows the ward wise spatial distribution of concentration index of residential land use and the residential land use is given in figure 5.5. Wards 4, 5, 6, 13, 15 16, 17, 18, 21, 22, 26, 27, 28,34,36 and 37 are having concentration index greater than 1.Residential land use constitutes 31 % of town area. A comparison of the concentration patterns of wet agriculture and residential land uses shows that certain wards are having higher concentration for both the above land uses. Such wards are 4,5,17,21 and 27. This indicate in these wards people are depending upon agricultural activities and further growth in population may effect agricultural activities

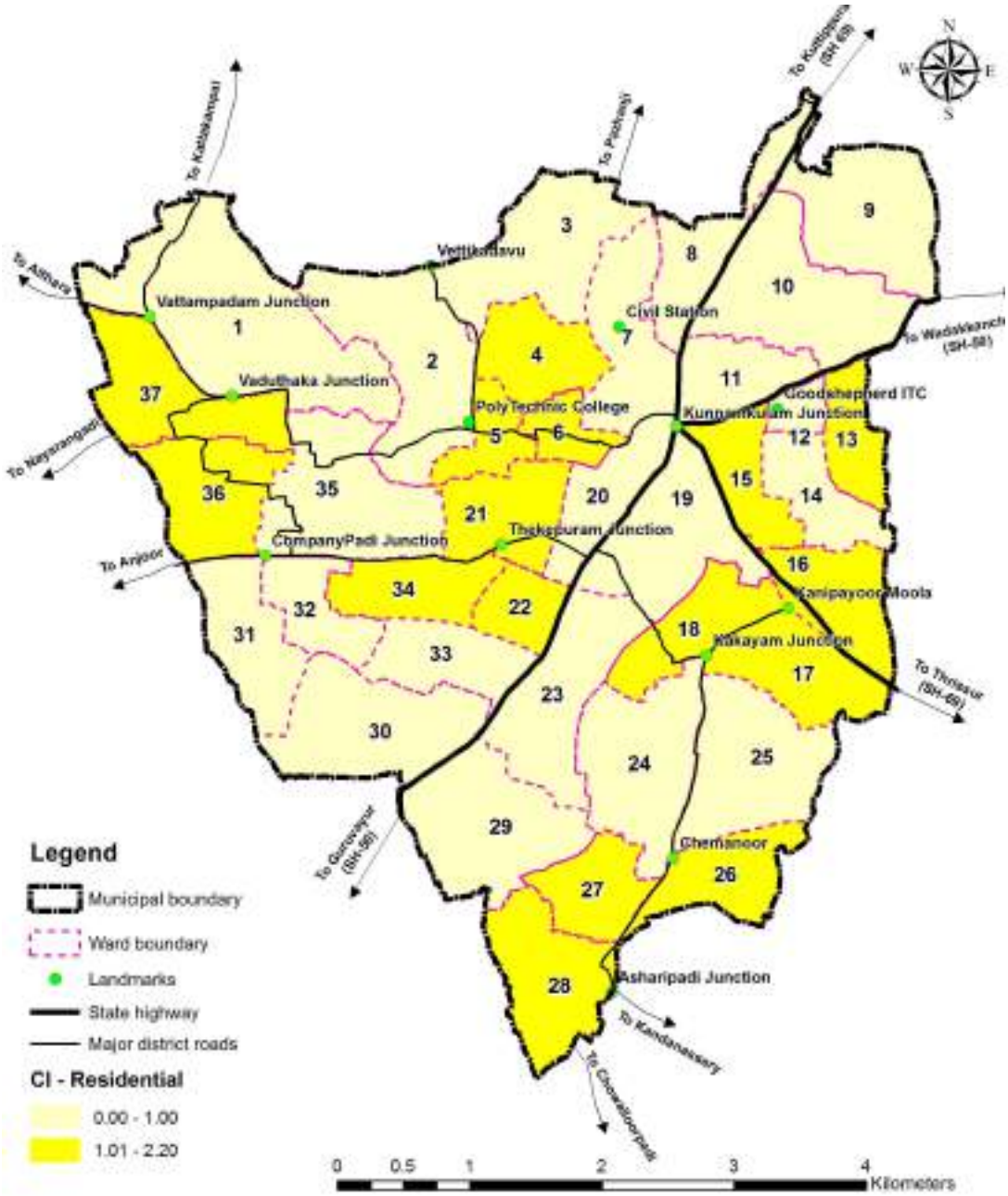


Fig 5.3 Concentration of residential land use

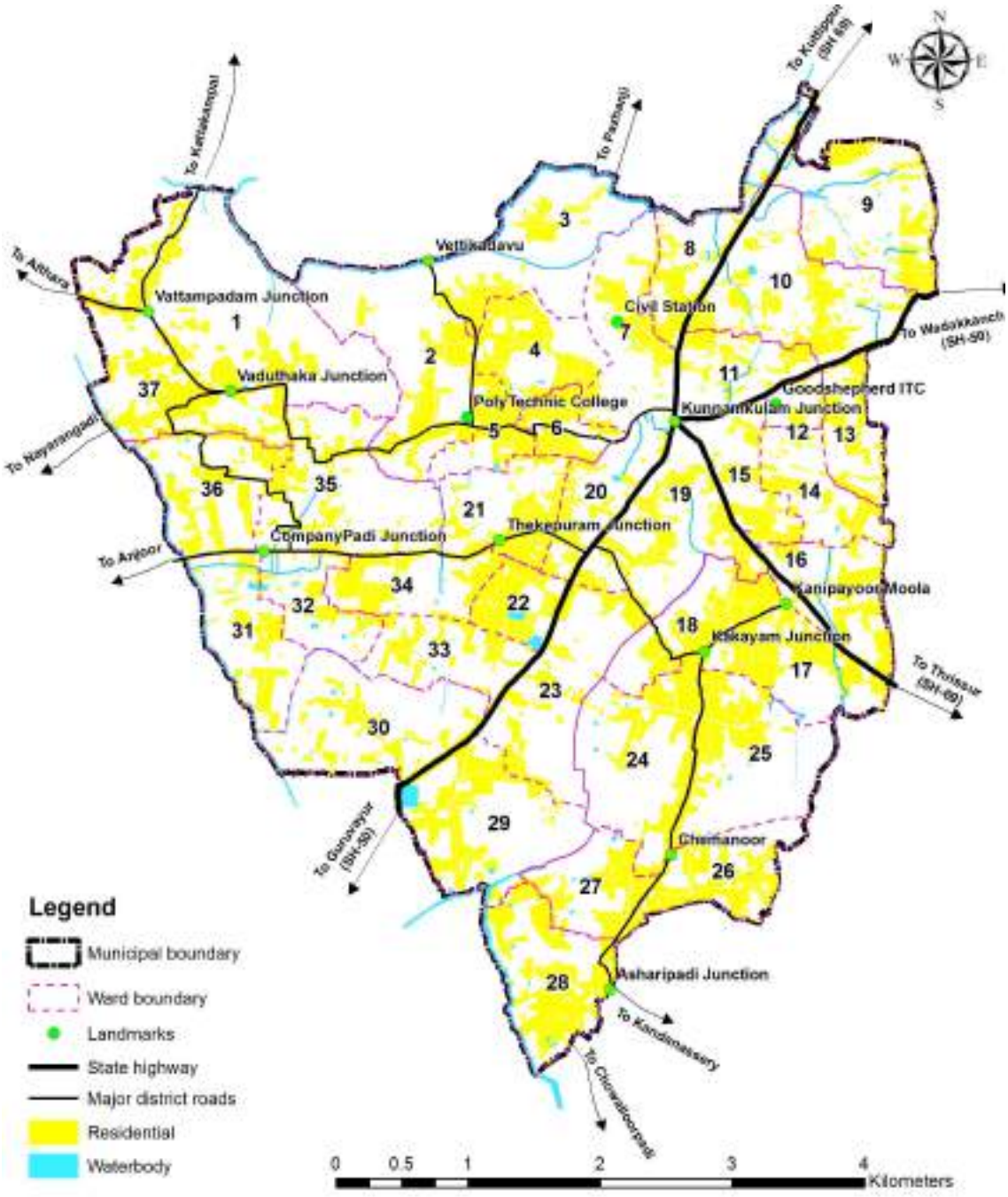


Fig 5.4 Distribution of residential land use

5.3.2 Concentration Pattern of Commercial Land Use

Ward wise distribution of the concentration index of commercial land use of Kunnamkulam Municipality is shown in figure 5.5 and the corresponding land use is given in figure 5.6. From these two figures we can infer that commercial concentration is more towards town centre. Fig 5.6 shows that commercial land use is negligible at outer fringes of municipal area.Wards 11, 20, 15 and 7 are having high concentration out of the 1.49% of municipal area used for commercial purposes.

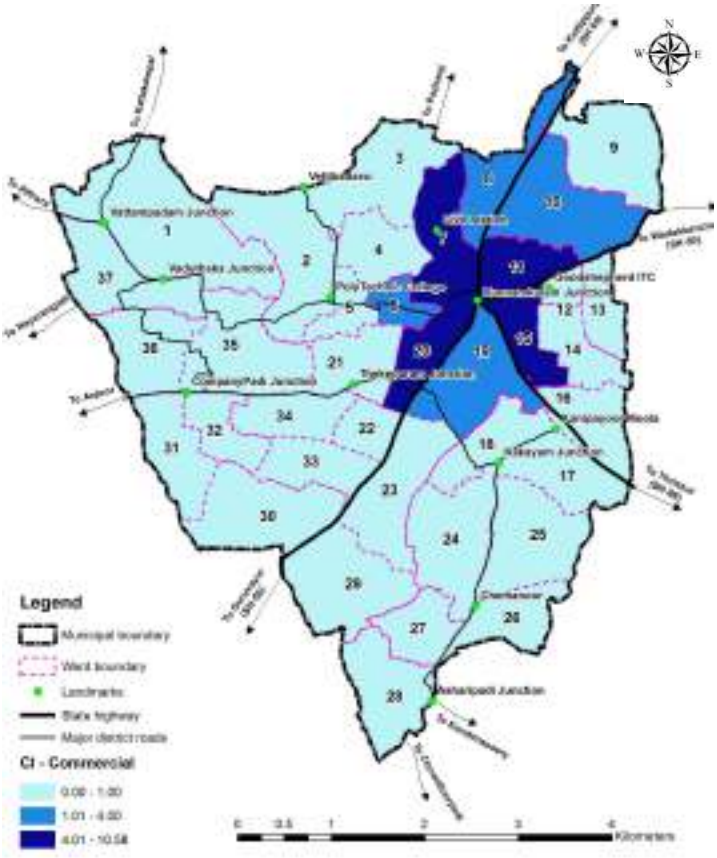


Fig 5.5 Concentration of Commercial land use

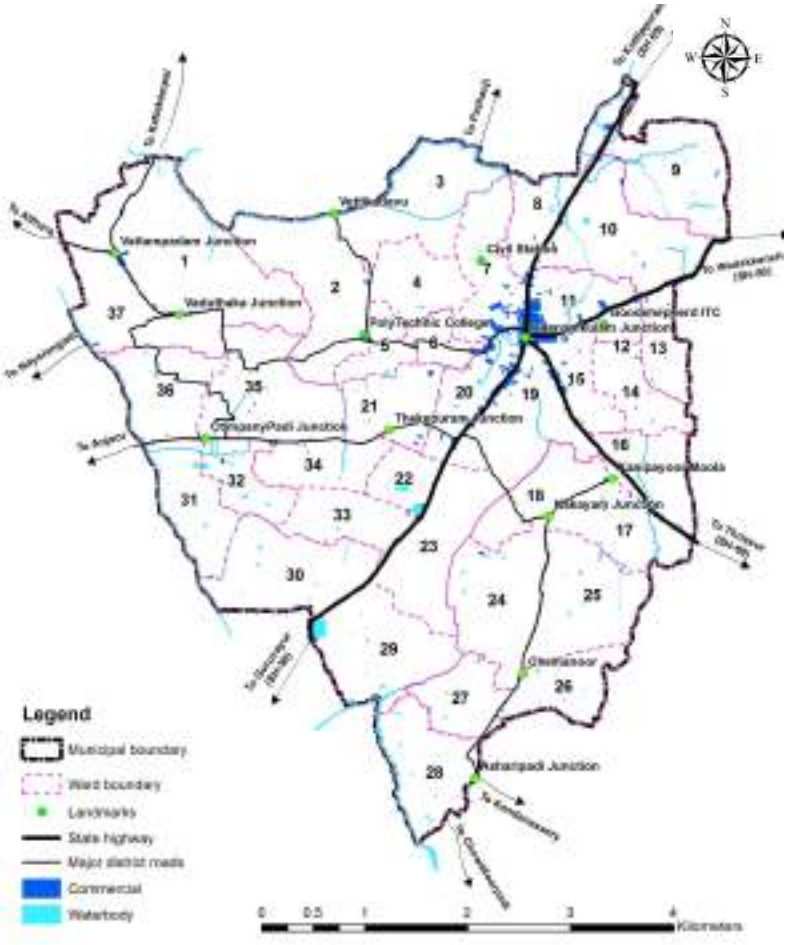


Fig 5.6 Distribution of commercial land use

5.3.3 Concentration Pattern of Industrial Land Use

Only 0.53 % of total municipal area is used for industrial land use. Concentration pattern of industrial land use is shown in figure 5.7. Figure 5.8 shows the industrial land use. From figure 5.7 it is clear that industrial concentration is more towards town center. Wards 11, 19 and 15 are showing higher concentration of industrial land use. Even though the concentration of commercial and industrial land use is seen in the core of the municipality, commercial land use is seen as a ribbon development by the sides of two major roads. Industrial land use is seen to be scattered in various parts of the municipality

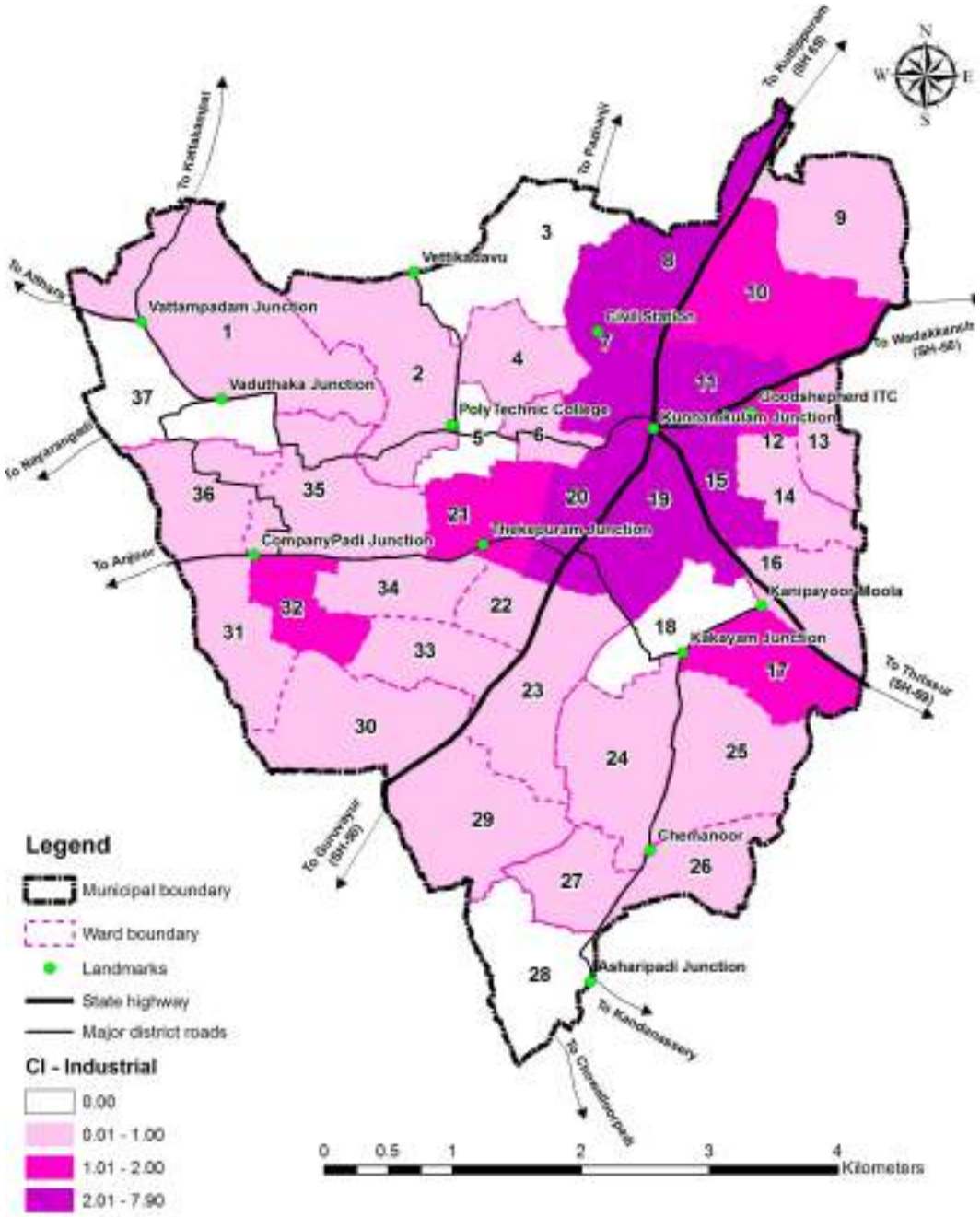


Fig 5.7 Concentration of Industrial land use

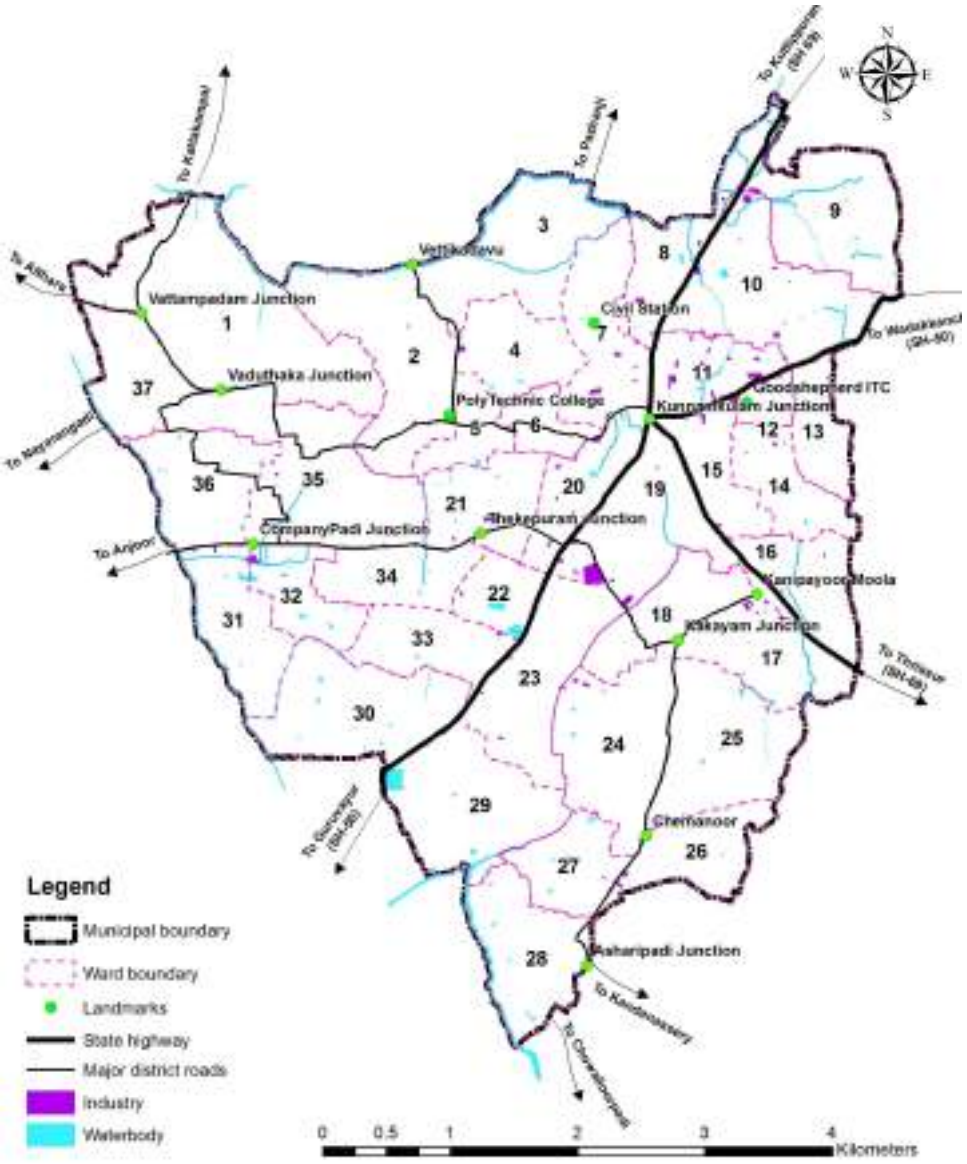


Fig 5.8 Distribution of Industrial land use

5.3.4 Concentration Pattern of Public and Semi Public Land Use

Figure 5.9 shows the ward wise spatial distribution of the concentration index of public and semipublic land use. Concentration is more towards town centre, Guruvayur road and Wadakkanchery road. This is due to the presence of churches, and educational institutions and government offices in this area. Figure 5.10 shows the distribution of public and semipublic land use, which is 3.5 % of municipal area. Public land use is also seen to be scattered apart from having a concentration in the centre.

On comparison it may be inferred that non residential and non-agricultural land uses are concentrated in a strip along the main roads viz- Thrissur – Wadakkanchery road and Guruvayur – Pattambi road. Among these the commercial core is seen to be in the meeting point of these two roads.

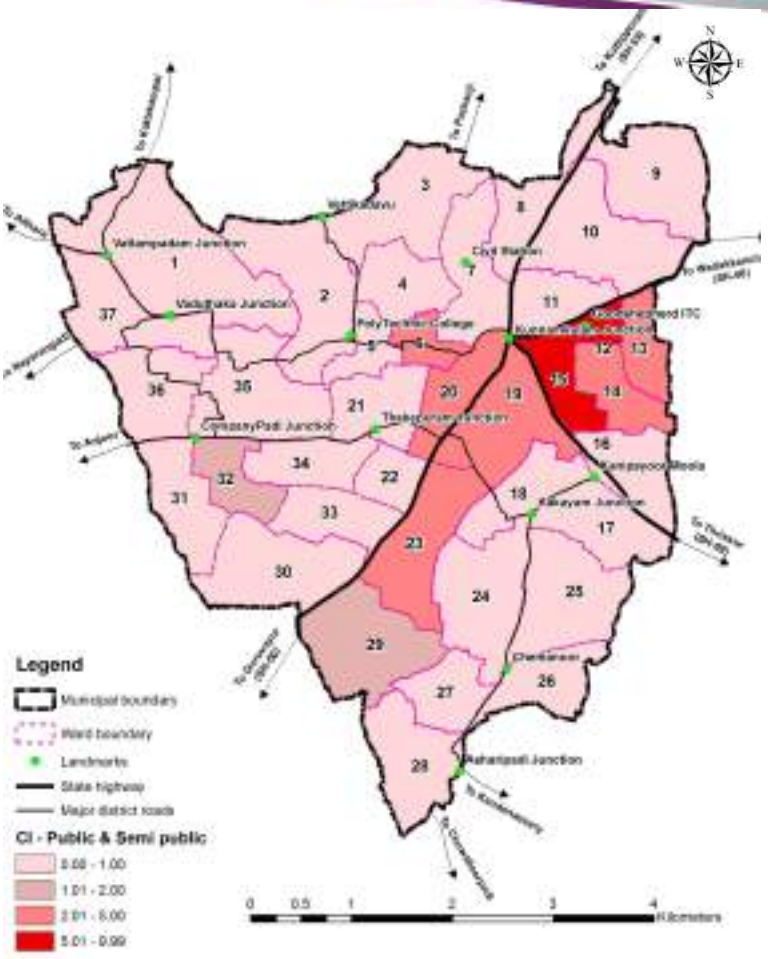


Fig 5.9 Concentration pattern of public land

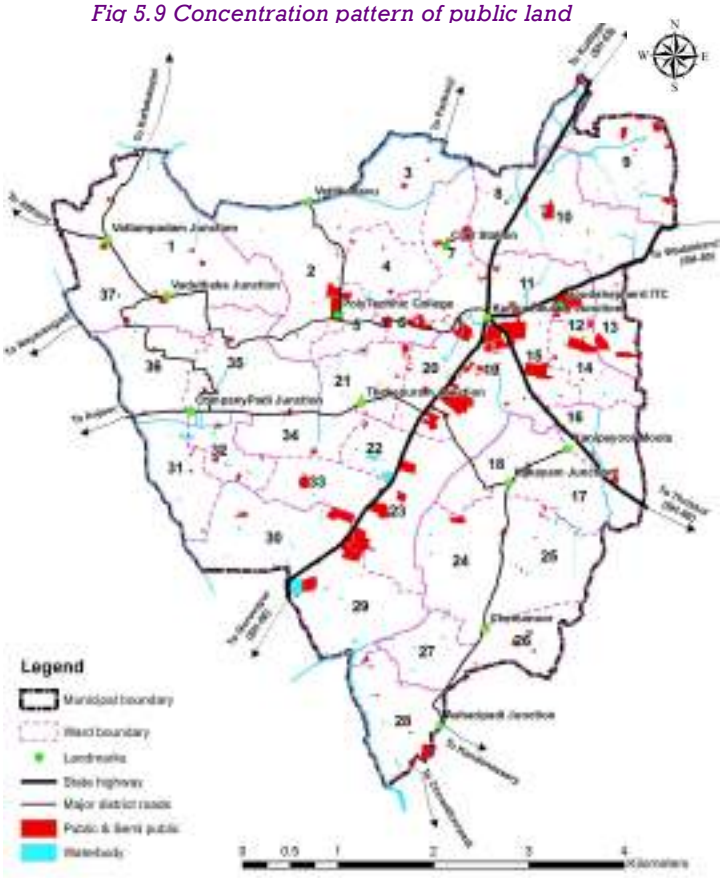


Fig 5.10 Distribution of public & semipublic land use

5.3.5 Concentration Pattern of Agricultural Land Use

Considering both wet and dry agriculture use 56% of total municipal area is under agricultural land use. The ward wise spatial distribution of concentration index of agricultural land use of Kunnamkulam Municipality is as shown in figure 5.11. Agricultural land use is mainly subdivided into wet agriculture and dry agriculture. Details of distribution of wet and dry cultivation are shown in figure 5.12.

From the pattern it can be inferred that wards 1,3,25 are having more concentration of agriculture land use. It is clear that nearly half of wards showing concentration index greater than one in wet agriculture. Agriculture concentration is seen to be generally in the outer periphery of the town. The CBD area is almost free of agriculture activities.

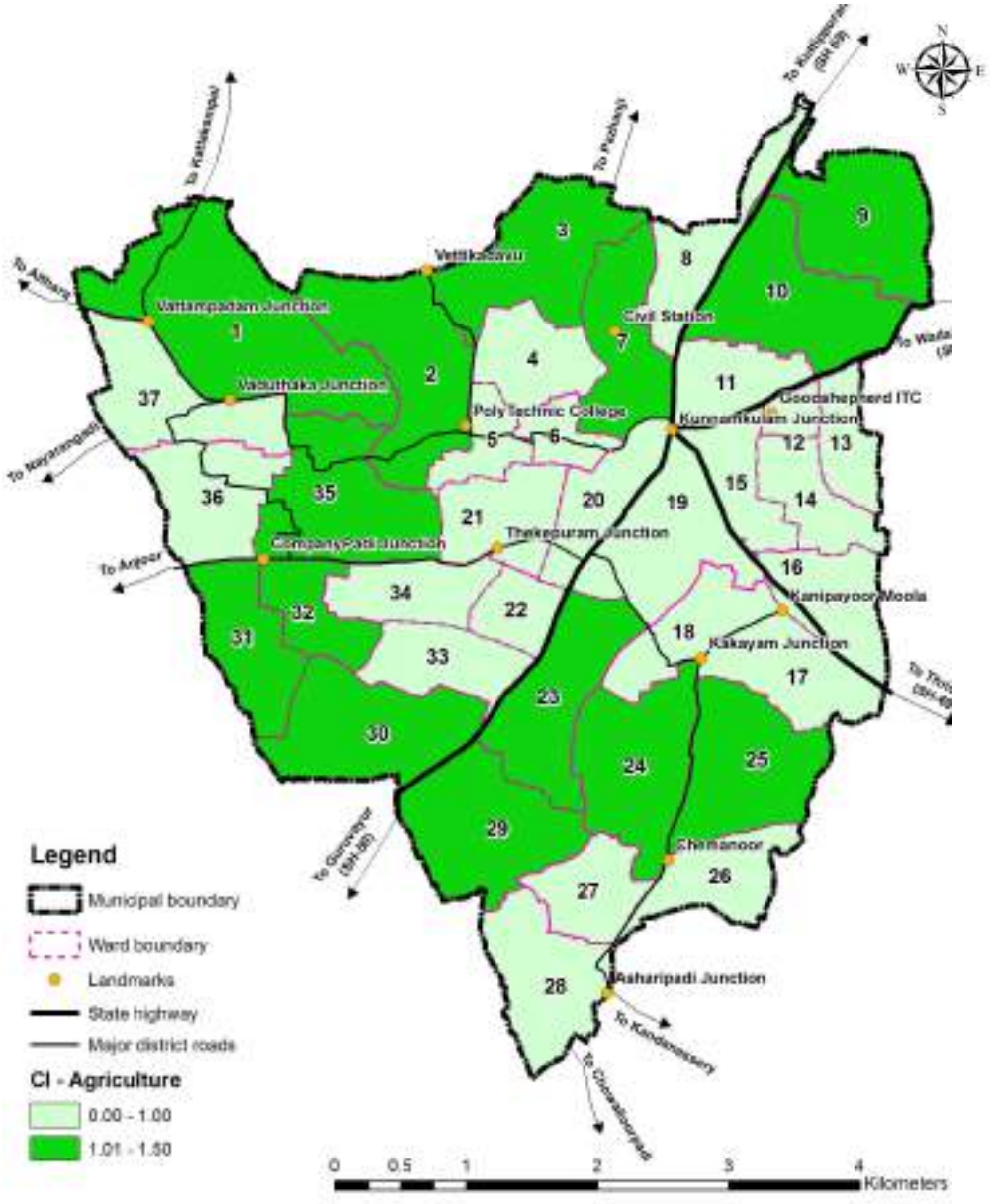


Fig 5.11 Concentration pattern of agricultural land use

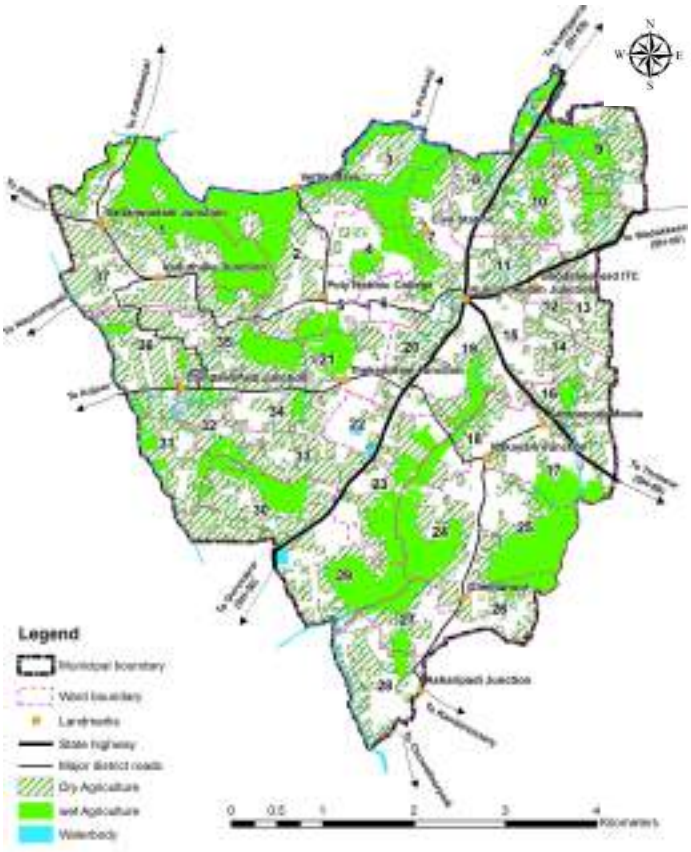


Fig 5.12 Distribution of wet and dry agriculture

5.3 Other major land use concentration

One of the remaining major land uses is transportation which comes to nearly 5.23% of the total area. The two major regional roads passing through Kunnamkulam are Thrissur – Wadakkanchery road and Guruvayur – Pattambi road.Other major roads are Anjoor road (3.2km) Anaikkal to Chemmannoor Asaripadi (3.56km), Vysseri – Vettikadavu(1.46km),Kunnamkulam - Vattampadam- Cheruvakazha (6.2km), Vaduthala- Companipadi (2.75km), and Anaikkal-Govt. Girls high School (1.38km). A higher density of roads is seen in the central area which decreases towards the outer periphery. Another land use worth mentioning here are the Water bodies. This constitutes to around 1.23% of the total area. This may be due to the presence of large number of small ponds and streams in municipal area. But most of them are non-perennial in nature. Concentration of water bodies is seen more towards northern and western side of municipality. The major water courses are perumthodu and chattukulam. This and the many other water streams together water the paddy fields. Parks and open spaces is another land use which is having significance. Only 0.4 % is



Trenching ground at Kurukkanpara

used for park and open space. Spatial concentration is more in wards 15 ,12 , 22 and 14. In ward 15, concentration is more due to the presence of Senior ground and in ward 22, there is a trenching ground of 4.25 acres.

5.5 Functional character of wards

The functional character of a local body is determined by the major activity within the LSGI, The character may be of a rural nature if primary activites are predominant, urban nature if secondary or tertiary activities are predominant or may be a combination of both. The functional character of Thrissur District as per IDDP Perspective plan is shown in figure 5.13.

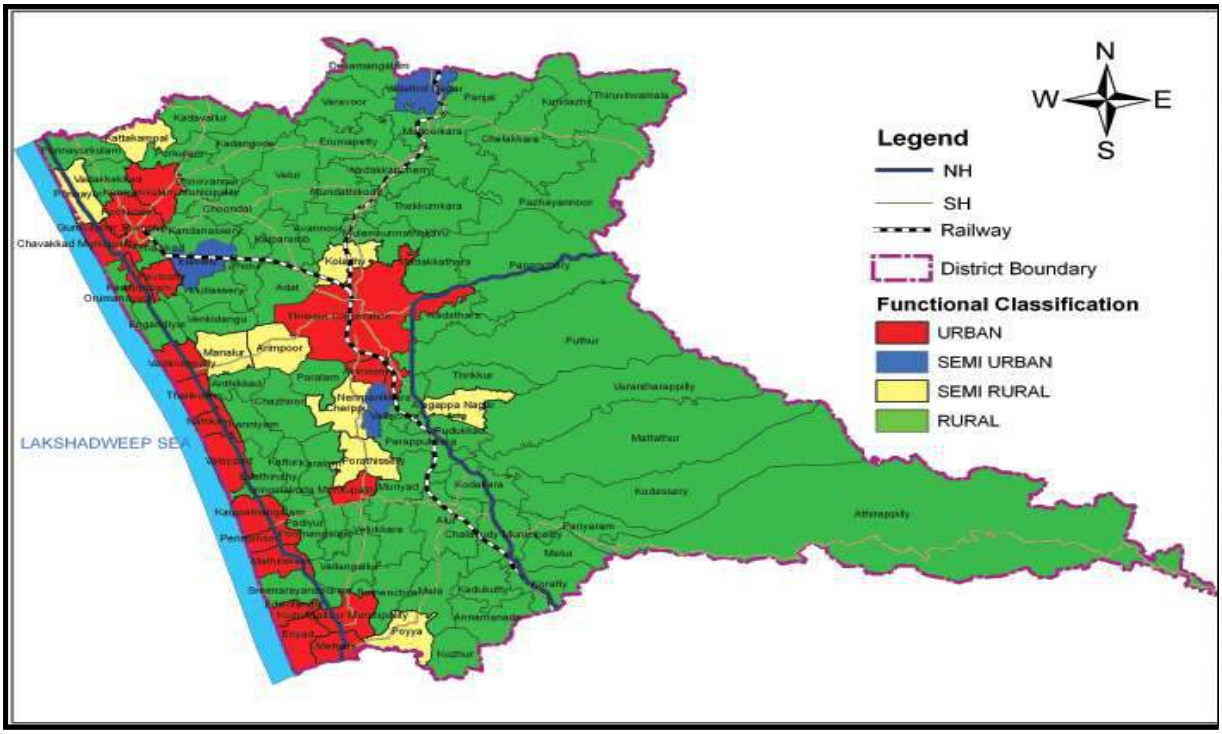


Fig 5.13 Functional Character of Thrissur District

Source: IDDP Thrissur

Analysis based on land use and average plot size (methodology adopted for IDDP, Thrissur report) shows that there exists semi urban and semi-rural character in settlements in addition to the urban and rural character. An area is classified as Semi Urban, if there exists (or it is likely to introduce) both urban and rural activities with predominance to urban activities. If the predominant activity is rural, in the area where both urban and rural activities co-exist; it is classified as a semi-rural area.

The spatial distribution of the settlements based on its character shows a clear demarcation in the pattern of the settlements in four categories. Thrissur Corporation and municipalities except Chalakudy shows urban character. Some of coastal LSGI's also show urban character. Semi urban character is exhibited by LSGI's that have urban

influence like Vallathole Nagar (located near Shornur Municipality in Palakkad District), Elavally and Vallachira. Most of the LSGI's in the midland and high land region of the District exhibit rural character. Semi-rural character is seen in those LSGI's which are in a transition zone between LSGI's of urban and rural character.

According to the analysis of functional character of District, Kunnamkulam Town as a whole shows urban functional character. The same methodology as done for the LSGIs of the district is applied for the wards of the municipality to assess the ward wise wise functional character. The result of this analysis is shown in figure 5.14 which shows that the municipal wards are showing mixed character.

In Kunnamkulam municipality, six wards show urban nature, elevan wards show semi urban character, Seventeen wards belong to semi-rural character and three wards show rural character. It is also clear that only the central town area of Kunnamkulam Town is showing urban character and the primary activities are predominant in other parts of the Town.

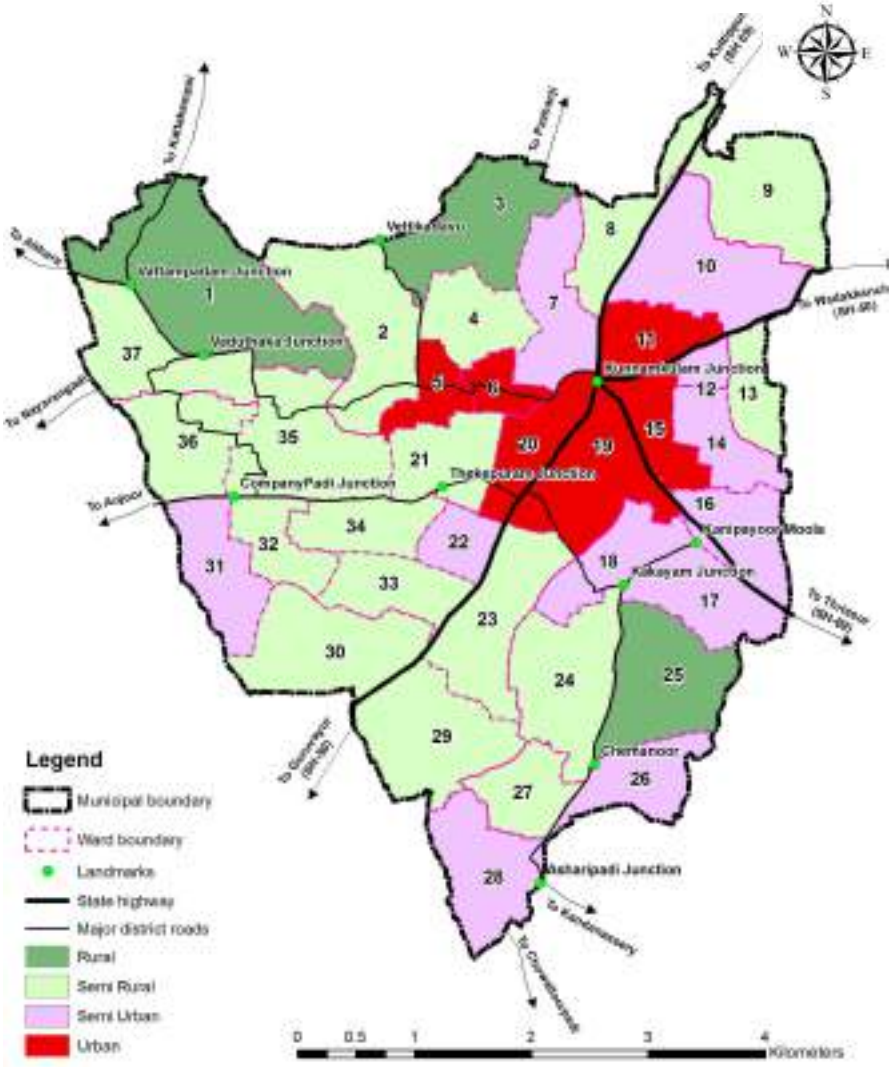


Fig 5.14 Ward wise Functional Character of Kunnamkulam Town

Source – Landuse survey 2012

5.6 Inference

Land use analysis of Kunnamkulam Town shows that residential land use is the single land use predominant in Municipal area. But the total agriculture area considering both dry and wet agriculture comes to a significant figure. The agriculture activities happen mainly in the old Panchayat area. Environmentally sensitive kole lands are a spectacular feature of this place. Urban landuses are seen to have concentration in the town centre, but they also extend along the traffic corridors. Residential landuse is spread throughout the municipal area with varied intensities. As per ward wise study of functional character it is clear that urban nature is seen in town center of the Municipality. Outer fringes are having mixed Charcterictics.

CHAPTER 6

TRADE AND COMMERCE

Trade and Commerce have long been the prominent activity in Kunnamkulam. The past and the Golden time of Kunnamkulam has significant role in the whole sale trade. The earlier studies on occupational structure reveal that this sector has a significant contribution to the development of Kunnamkulam. Study of Trade and Commerce sector in the town is included in this chapter. The town has a unique place in wholesale trading activities mainly notebooks, plastic products and other stationary items.

6.1 Introduction

Kunnamkulam town has unique position in trading. Kunnamkulam is 22 km from Thrissur. Kunnamkulam is the major business center, north of Thrissur in Kerala. The small town in Thrissur district has a business history of more than 300 years. The Arabians, Greeks, and Persians left their footprints on this land years ago.

It is said that Kunnamkulam started to acquire its present form after the encounter with the army of Tipu Sultan. The old church dedicated to St Mary was the center of the Town of Chattukulangara which lies around the church and the Christian population here were said to be members of the Chattukulangara parish. The people of Chattukulangara who were scattered about by the attack of Tipu settled down in the regions of Kottapadi,Kunnamkulam, Pazhanji, Chelakkara, Angamaly, Kuravilangadu etc. The feudal lords of Kunnamkulam welcomed the traders from Chattukulangara. They participated in the development of Kunnamkulam town by all means. The trade links between Tamil Nadu and Kunnamkulam brought the influence of Tamil in this part of land.

The town built by the settlers from Chattukulangara is in the shape of a cross (Nadupanthy). The base of the cross is the Eastern Bazar and the other arms of the cross are constituted by the West, North and South Bazars. These four arms were the hub of commercial activities. The place was lined with godowns and full of traders. Hundreds of bull carts lined the roads to load goods. Today these places are quieter. Better facilities became available in the Parayil region which has now become the trading center of Kunnamkulam.

6.2 Existing scenario

On a detailed study of the land use of Kunnamkulam town, it can be seen that only 1.49 % of the municipal area is used for the commercial purpose.The map showing the distribution of commercial areas in the town is given in figure 6.1. Figure 6.2 shows the spatial concentration of commercial activities. From these figures it is clear that commercial activities are concentrated in town centre and are also distributed along the major traffic corridors at Thrissur – Kuttipuram road and Chavakkad – Wadakkanchery road.

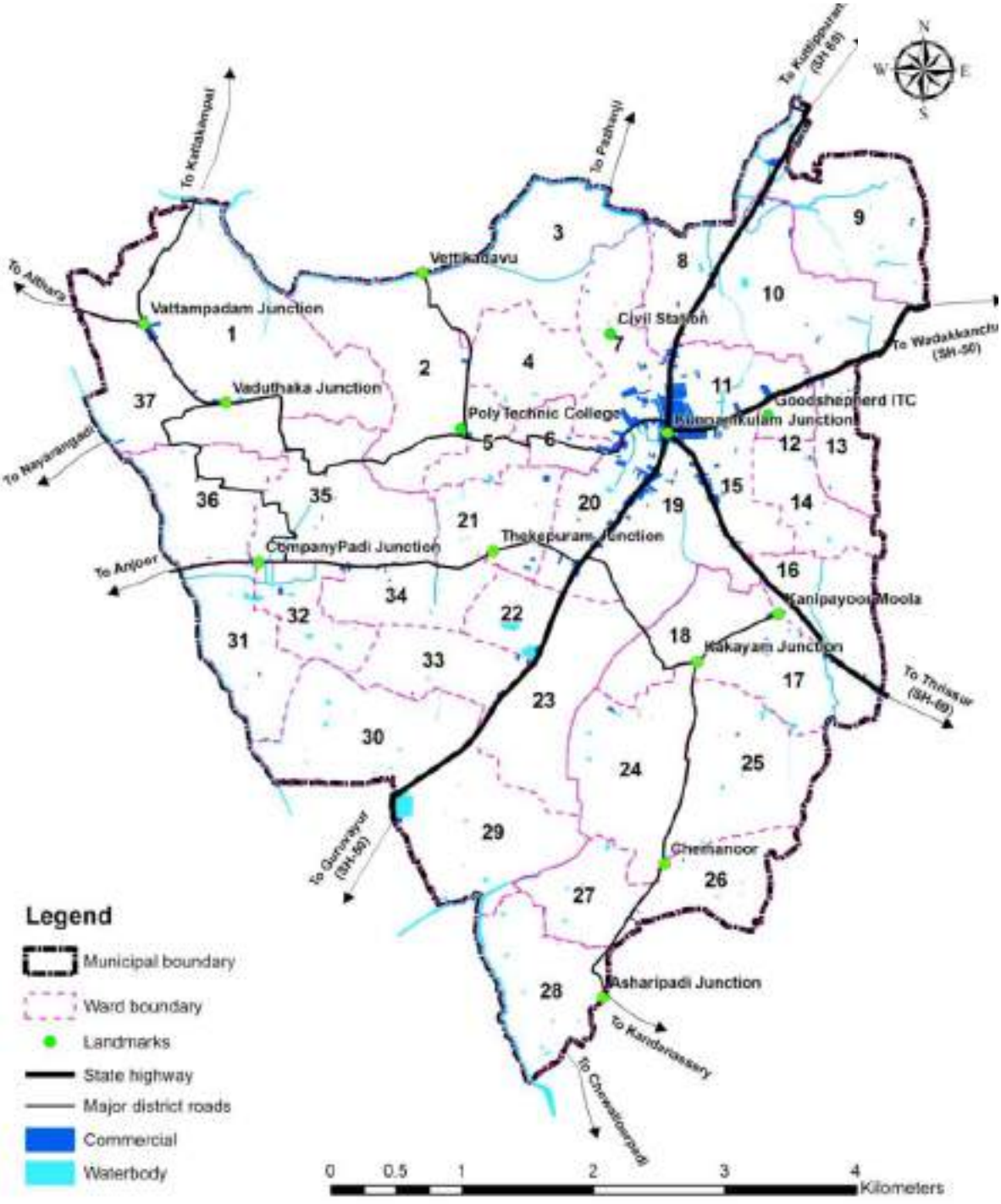


Fig 6.1 Commercial land use in town

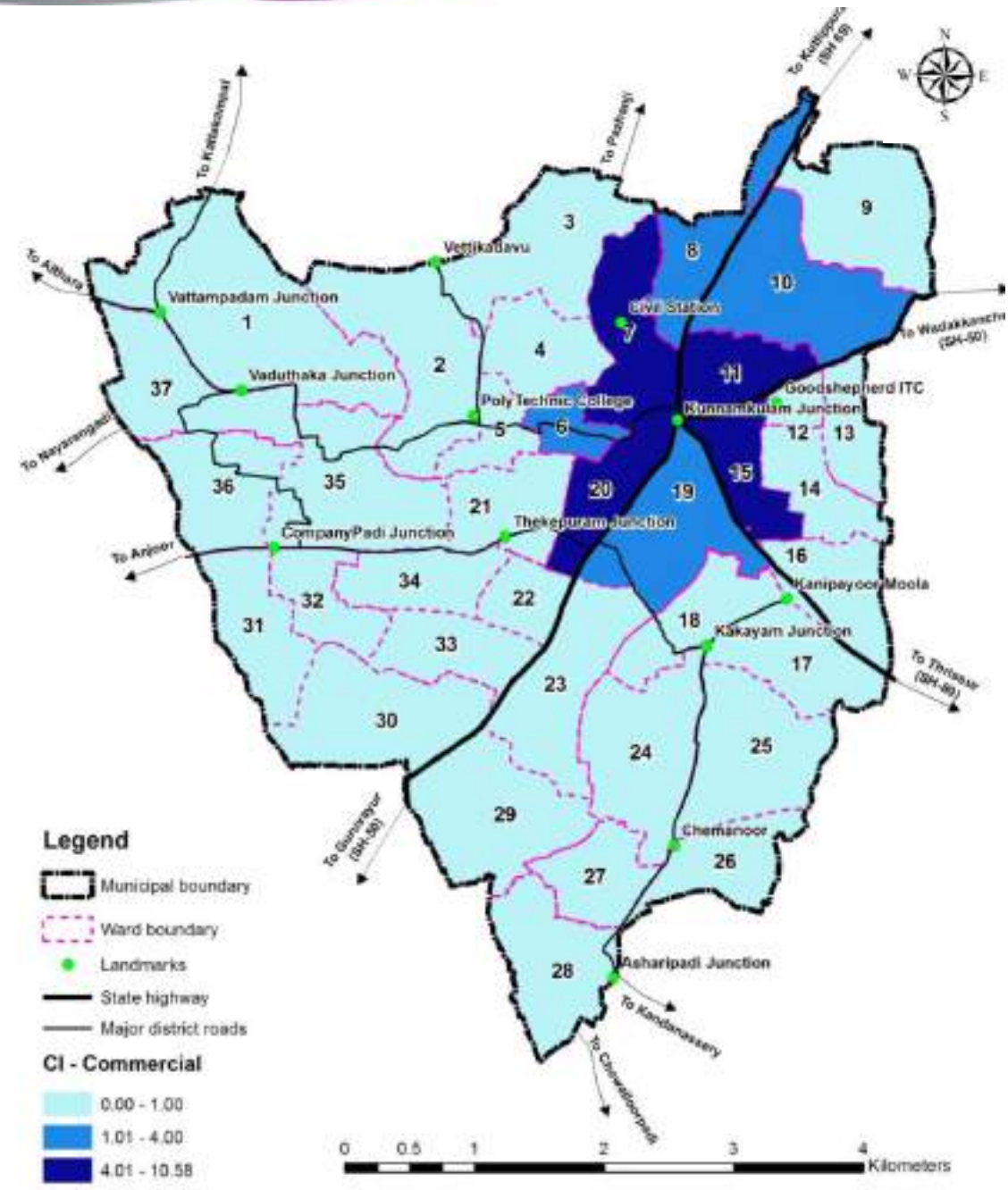


Fig 6.2 Spatial concentration of commercial land use

Source: Land use survey-2012

As per Integrated District Development Plan, Kunnamkulam centre (Parayil Junction) is regarded as an existing third order node and is expected to be a proposed second order node in Thrissur District. Importance of this commercial node is mainly due to

- Meeting of two State Highways, SH 69 and SH 50
- Presence of wholesale and retail commercial centres for agricultural, engineering, plastic and stationery products in northern part of Thrissur

- Better accessibility and transportation facilities available for nearby settlements compared to Guruvayur and Chavakkad Towns.

6.2.1 Major centres and nodes

Major commercial nodes identified are Parayil Junction, Ayyapath Junction, Vattompadam Junction, Chowannoor Junction, Kanipayoor Junction and Arthat Junction as shown in figure 6.3. The various activities in the above junctions are as given in table 6.1. Based on the intensity of commercial activities, these junctions are graded and the result is shown in the figure 6.4. Accordingly one first order node, two second order nodes and three third order nodes are identified.

Table 6.1 Facilities in commercial nodes

Name of Center	Whole Sale	Retail	Business Establishment	Restaurants and Hotels	Others
Town centre	33	455	14	44	19
Ayyapath Jn.	15	159	5	12	4
Kanippayoor Jn.	0	15	2	3	2
Vattampadam	0	13	1	2	0
Chowannoor	0	16	2	2	0
Girls High School	0	11	4	1	0

Source: Socio economic survey-2012

6.2.2 Markets

In Kerala, it is having the saying that 'to purchase something, go to Kunnamkulam, you will find the product at the cheapest rate'. This speaks about the business at Kunnamkulam and the customer service the traders provide. Kunnamkulam is a major business center, north of Thrissur, in Kerala. Every famous brand has a shop at Kunnamkulam. Several agricultural produces such as coconut, arecanut, rice, vegetables, spices and other goods find the markets through the traders of Kunnamkulam. There are lot of textile shops, jewelers, chemists, bakers and others merchants in this area. Because of proximity to Guruvayoor temple, we can find a lot of hoteliers running their business here.

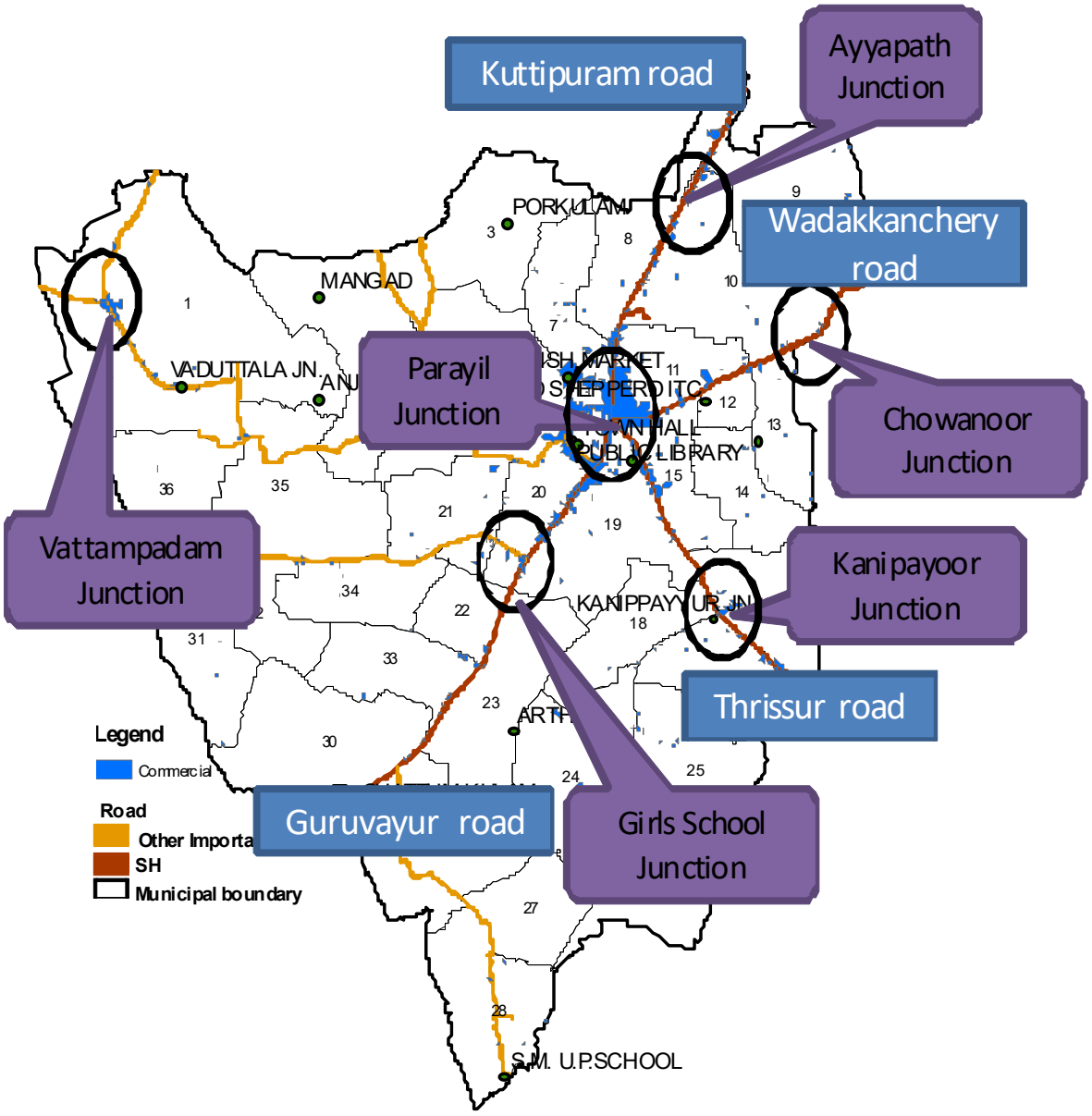


Fig 6.3 Commercial nodes

The commercial activities are mostly concentrated on the town centre, near private bus stand, Thazathepara kaya market, Thurakkulam market, Parayil Angadi and along State highways like Thrissur - Kuttipuram and Chavakkad- Wadakkanchery. Commercial centres are also seen at Arthat, Vattompadam, Chowannoor. Kunnamkulam Parayil centre is a proposed second order node as per District Spatial Plan. Lorry parking facility is provided only at Thazhathepara market and no separate parking area or loading and unloading area are provided for these commercial centres. In Pattambi road loading and unloading done on alternate days for shops on each side. The provision of public toilets is available only at Thazhathepara market and bus stand.



Thazhathepara kaya market



Lorry parking facility at Thazhathepara

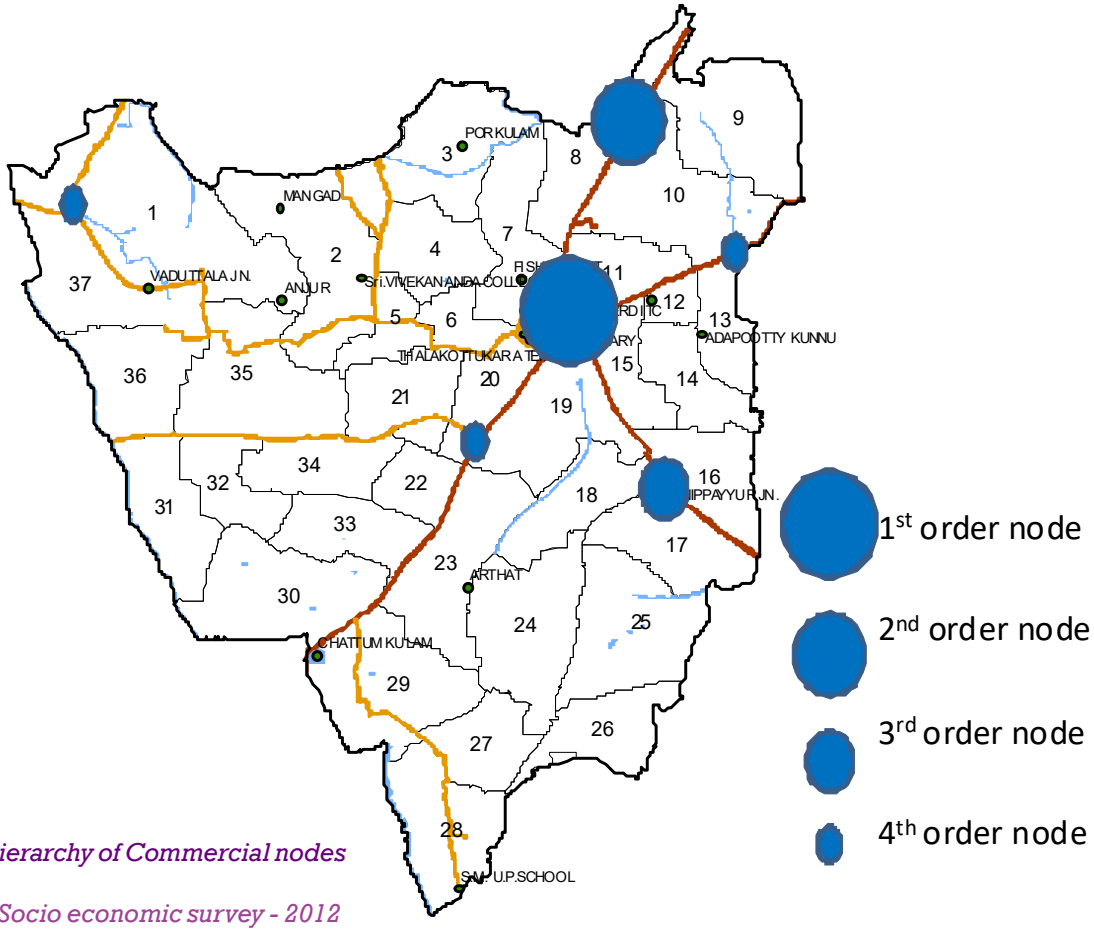


Fig 6.4 Hierarchy of Commercial nodes

Source: Socio economic survey - 2012







Shops at valiyangadi

Earlier Valiayangadi was the major commercial centre of Kunnamkulam town. Almost all commodities were obtained from the shops in Valiyangadi. After the development of State highways, commercial activities were shifted to Parayilcentre. Presently only two vegetable shops, five fish and meat shops are there. The buildings inside Valiyangadi are not properly maintained. Lack of street light facilities, public toilets, accessibility and parking are the major problems. The locations of these markets are shown in figure 6.5.

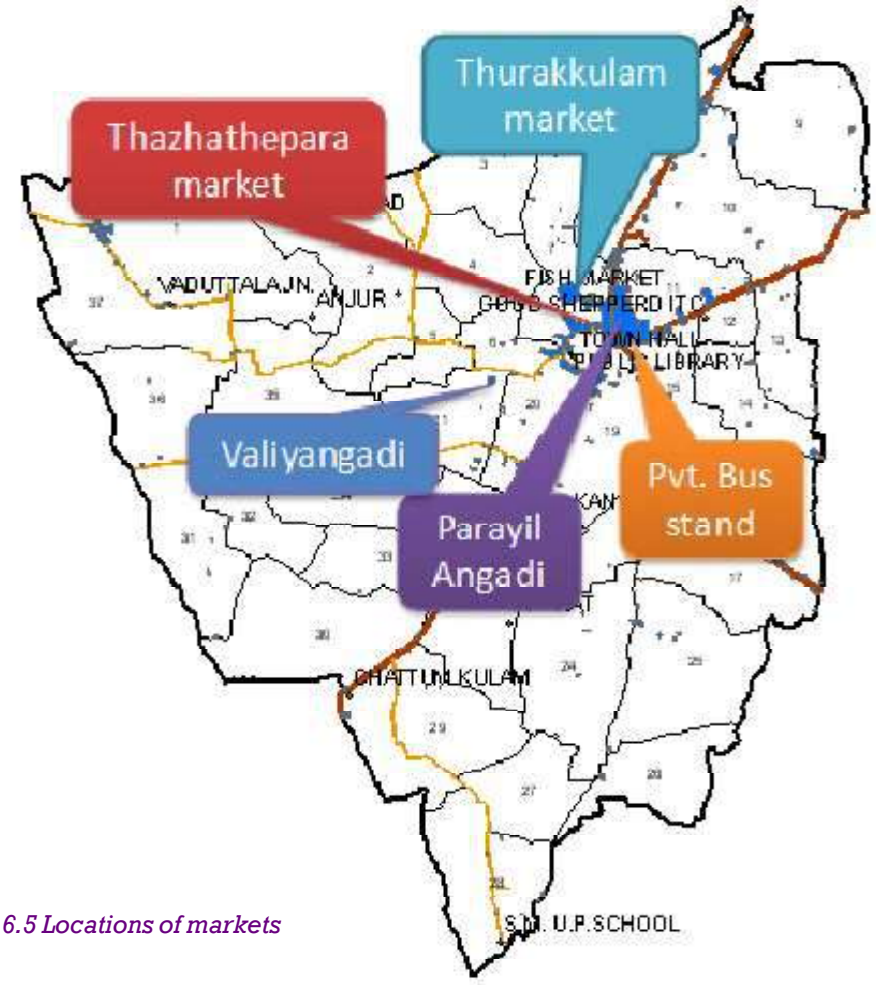


Fig 6.5 Locations of markets

6.2.3 Street vendors

Street vendors are an integral component of urban economies around the world. Distributors of affordable goods and services, they provide consumers with convenient and accessible retail options and form a vital part of the social and economic life of a city. Street vending as an occupation has been existed for hundreds of years and is considered as a corner stone of historical and cultural heritage of cities.





The academic literature on street vending commonly treats street vendors broadly as those who sell goods or services in public space. A variety of employment statuses can be found among street vendors as well. There are about 40 street vendors in Kunnamkulam Town. They are concentrated mostly along the major roads especially

Table 6.2 Street vendors in Kunnamkulam

Type of Activity	No.of Units
Fruits	15
Vegetables	6
Leather/Umbrella	7
Tea and Snacks	9
Flower	2
STD booth	1

Source: Socio economic survey-2012

on Guruvayur road. About 97% are male labourers. Most vendors work as independent self-employed entrepreneurs, either with or without employees. There are also many vendors who work as contributing family members, and some work as employees of informal or even formal enterprises. Although income levels vary, surveys have shown that the overwhelming majority of street vendors lack access to social protection and are subject to a range of employment risks. The details of street vendors are given in Table 6.2. Figure 6.6 gives the spatial distribution of street vendors

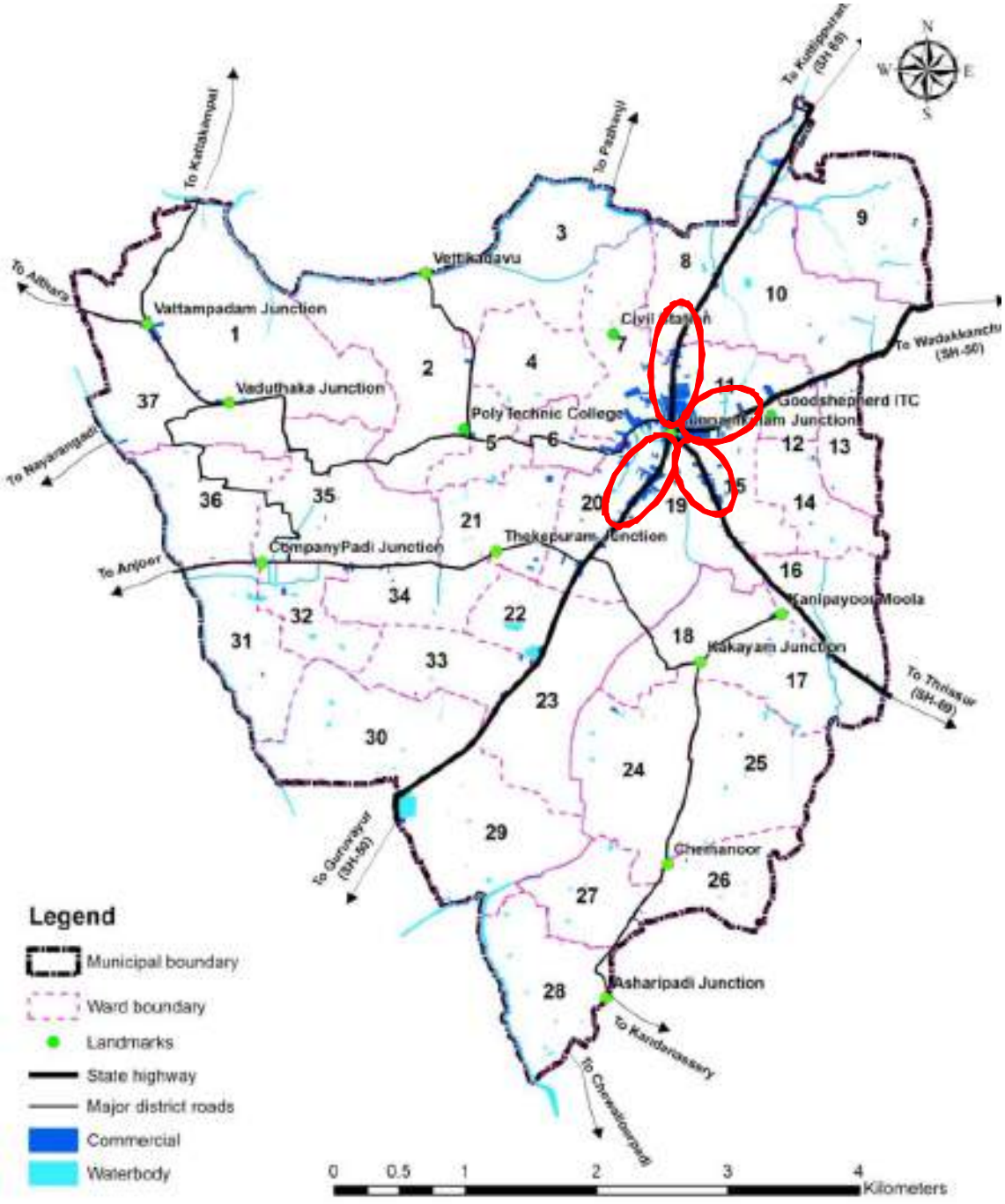


Fig 6.6 Locations of street vendors

Source: Socio economic survey-2012

6.3 Inference

The commercial nodes of Town area are facing a number of development issues.Lack of sufficient parking spaces especially for loading and unloading of goods from trucks is one of the main problems faced by this sector. The parking area allotted for trucks is present only at Thazhatheppara market premises.

The Municipal bus stand located at the Parayil centre creates lot of traffic problems. Majority of commercial activities are restricted in old municipal area. Parayil junction (town centre) is the major commercial node in the municipality. The public toilet facilities are not provided in commercial centres except at Thazhathepara and private bus stand. The markets functioning inside the municipal area have no proper facility for the disposal of the waste generated. Street vendors are seen along major roads with more concentration along Guruvayur road. The replacement of old buildings into fully facilitated new shopping complex with parking facilities can solve the problems to a limit. Kunnamkulam in future can develop as a whole sale trading centre given that all the issues faced in this sector are properly addressed.

CHAPTER 7

INDUSTRY

Study of Industrial sector in Kunnamkulam Town is included in this chapter.Industrial activity was at its height in Kunnamkulam in the past. Printing was the major economic activity then. But these industries are now in a state of decline or facing severe internal or external competition.

7.1 Introduction

Industrial ventures, both small and large scale, have generally come down in all the urban areas as compared to the scenario a few years back. Increase in population and hike of land value etc. can be attributed as the cause for the same. Kunnamkulam is an old commercial town, with a history of more than 300 years, famous for its printing and book binding industry.

Kunnamkulam has no major industrial enterprise as of now. Among the MSME registrations in the state, Thrissur district ranks second. In the district Thrissur corporation has the highest number and Kunnamkulam ranks next. In the book binding industry 73% of the turn over of the state comes from Kunnamkulam Town.

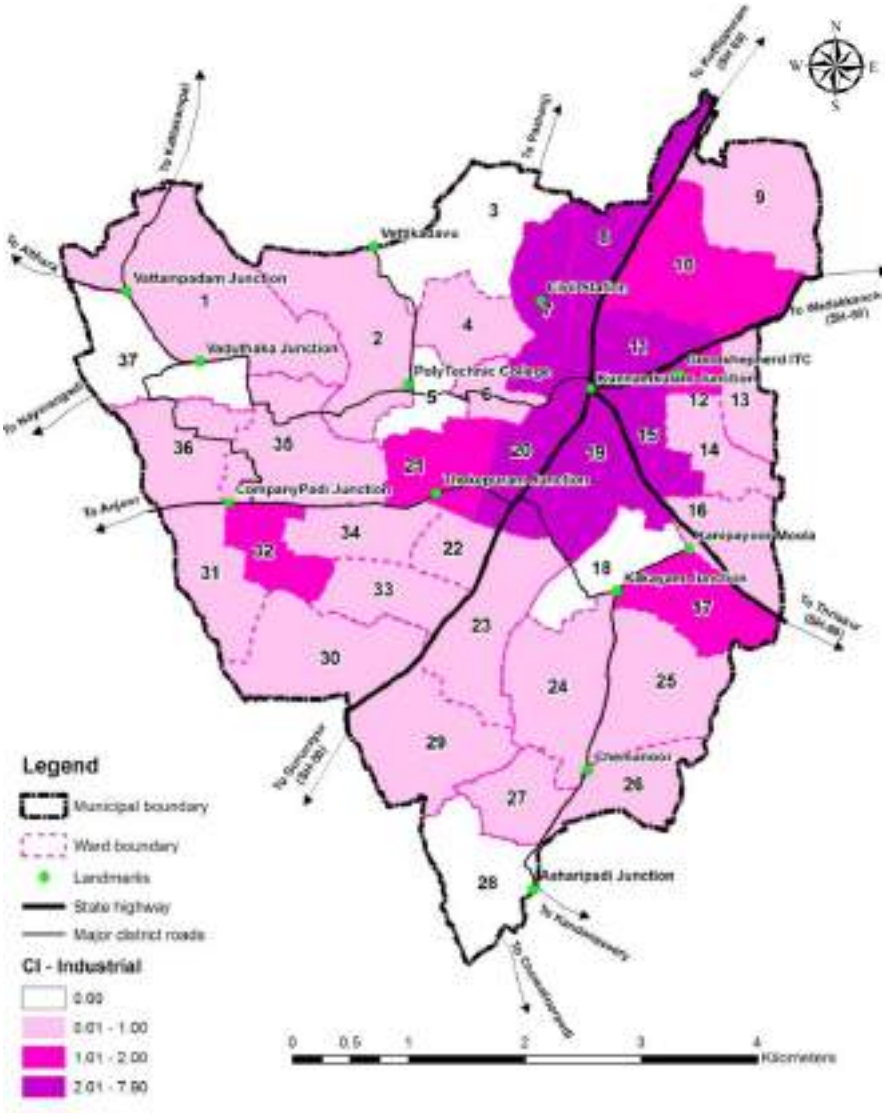


Fig 7.1 Ward wise industrial concentration pattern

Source: Land use survey-2012

7.2 Existing status

Altogether there are 160 industrial units in the town, out of which 5 are small industries and the remaining are

micro industries. An industrial estate owned by DIC(District Industries Centre) also functions at Rajiv Gandhi corner.

Kunnamkulam region witnesses a number of traditional, informal and household manufacturing activities. It comprises mainly the manufacture of rock-cut products, metallic and clay utensils, screw-rings and screw-hooks and paper-based products. Among these, the manu facturing of paper-based products needs special mention for which Kunnamkulam has a unique place in the state.

Land under industrial use in Kunnamkulam Town is only 0.15 sq.km (0.53 % of town area). Analysis of spatial concentration pattern as shown in figure 7.1 reveals that industries are concentrated mainly towards town centre.

7.3 Industrial estate

An Industrial Development Area having an extent of 2.26 Hectares is located in Nehru Nagarward-19. About 24 production units with 100 labourers are working here. The main industries here are plastic based, book binding and nails and screws manufacturing. Facilities like transformer, water supply and internal roads are provided here. Poor maintenance of approach roads and internal roads and frequent power failure largely affect the smooth functioning of these industries. The location of industrial estate is given in figure 7.2



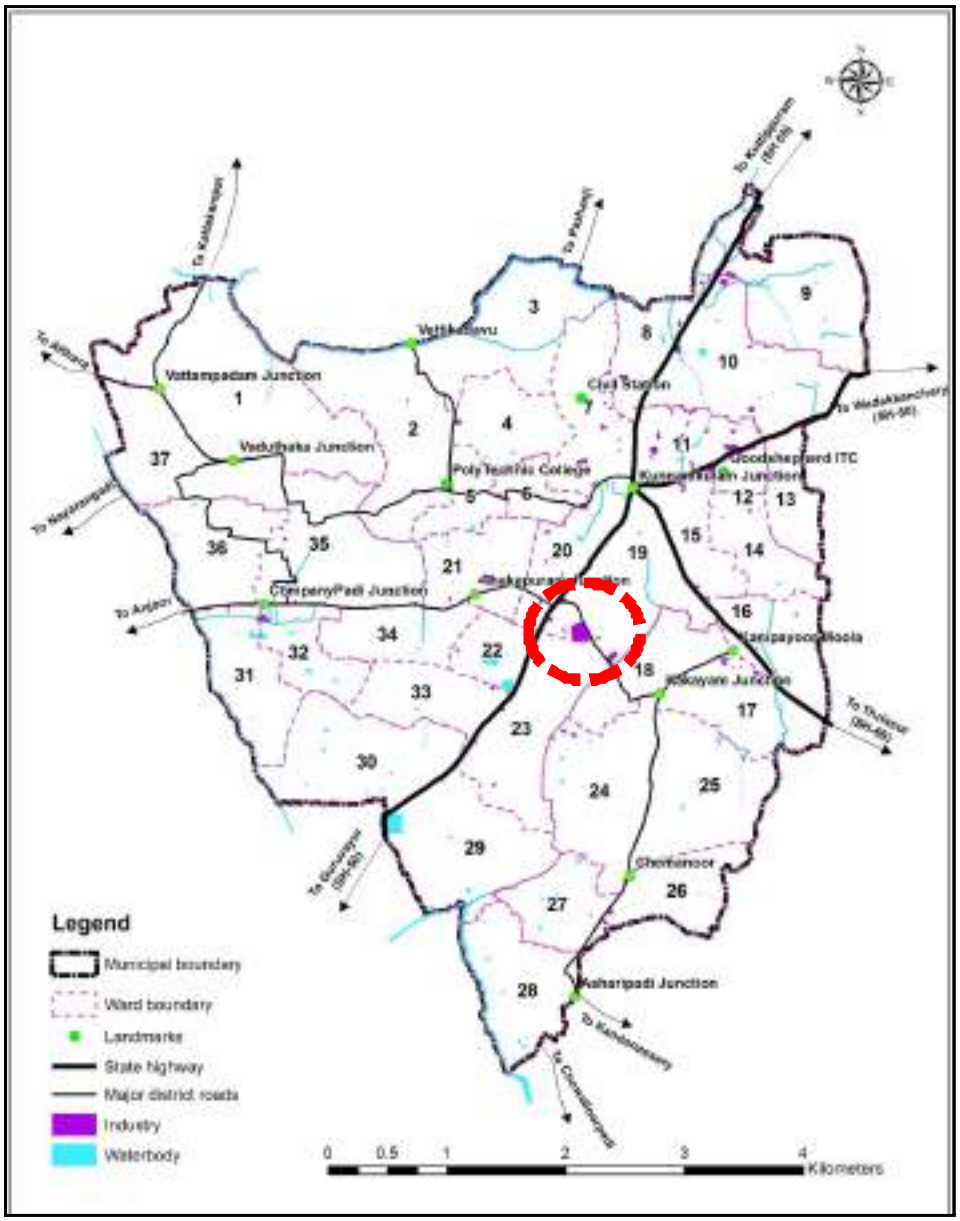


Fig 7.2 Location of Industrial estate

7.4 Micro, Small and Medium enterprises (MSME)

Considering the district wise details of registered MSME units in the State, Thrissur district holds the 2nd position. Within District, Thrissur Corporation has maximum number of MSME's followed by the Kunnamkulam Municipality with 160 Nos. of MSME's.

Table 7.1 Details of industries in Town area

Type of Industry	No of Industries	Labourers
Medium	NIL	NIL
Small	5	68
Micro	155	756

Source: District Industries CentreThrissur-2012

Among them only 5 are small scale and remaining are micro industries. Details are given in table 7.1.There are no medium scale industries. Majority of small scale industries are printing and paper based.

Category wise percentage of micro industries is given in figure 7.3. Out of the 160 number of micro industries 29% are printing and paper based industry. Other industries, include mainly agro-food based, engineering based and plastic based industries. Agro and food based industries mainly include oil and flour mills, papad making, fruit jams, pickles etc. In the category of engineering based industries there are few Aluminium and steel fabrication units.In addition to this there are several unregistered industrial units mainly in rock cut products sector.

7.4.1 Printing Industry and Paper based industry

Iyyu Uttoop, an appreciator of Malayalam literature, a businessman having trade relationship with Cochin, started a press of his own at Kunnamkulam in the name of VidyaRatnaPrabha(VRP)and published a number of religious and other books like,'Astangahrudayam','Amarakosam','Samudrika Sastram','Noothana Sidharoopam' etc. These books and Christian religious books published from here at a cheap rate have got wide publicity in the State. According to Ulloor. S. Parameswara Iyyer, it is the wealth of Uttoop, the intellect of Kaikulangara and the caliber of Malliammavil Kunjhuvareedu, an expert in printing, brought together the human and material resources for publishing books in Malayalam.

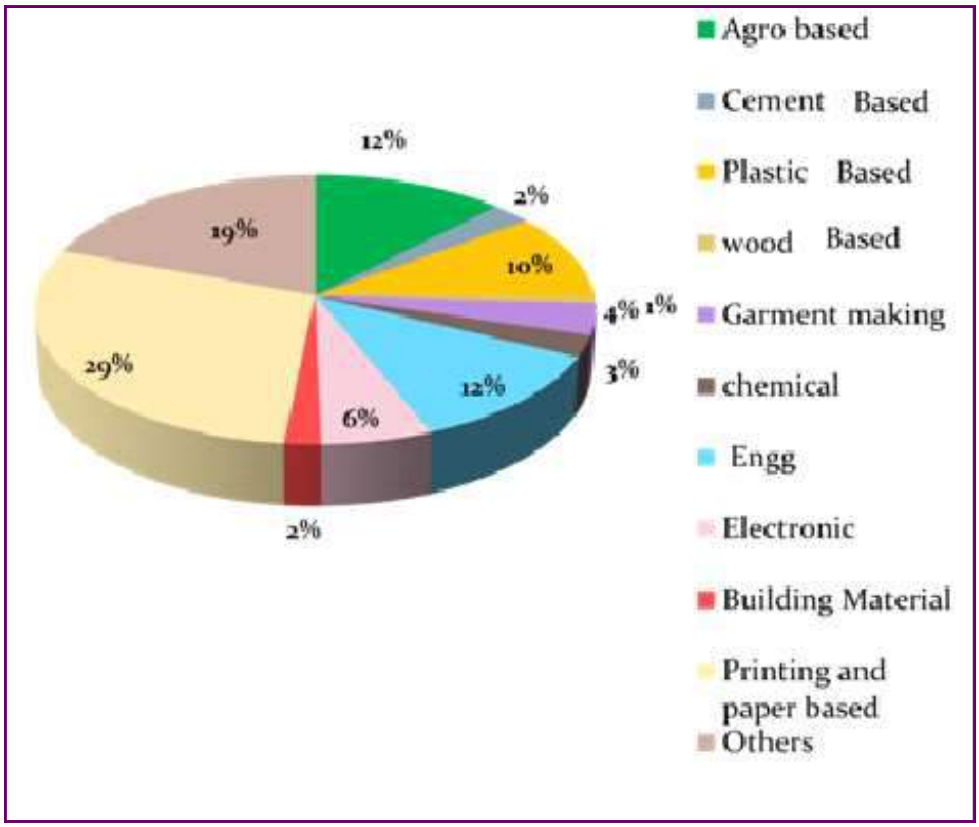


Fig 7.3 Category wise percentage of micro industries

Source: District Industries CentreThrissur-2012

AksharaRetnaPrakashini (A.R.P) press was started by Bishop Paramel Joseph-II. Many famous books like 'Kathamalika' of KuttikrishnanMaarar, Magdalana Mariam of Vallathole and Athmaposhini (magazine) by Vallathole and Swadeshabhimani Ramakrishna Pillai were published by the A. R. P Press. Trade, cultural and educational rising up in Kunnamkulam boosted the growth of printing industries in this area which resulted in beginning of many printing industries.Out of which the one to be mentioned is Victory Press founded by K.T. Pavunni in 1951. Victory Press is one of the few presses approved by the Government as security printers permitted to print cheque, demand draft, share certificate etc.KSRTC bus tickets were also printed here.

But now printing industries are in a state of decline mainly due to high labour charges and lack of modernisation. They find it difficult to cope up with external competition. Now printing is done at cheaper rates in Tamilnadu. Even cover pages required for book binding industries are coming from Sivakasi.

Paper based industry : Kunnamkulam is well known for the production of paper-based goods particularly exercise note books. Note book industry of Kunnamkulam is having a history of about 150 years. Total turnover of book binding Industries is Rs 36.5 Crores which is about 73% of the value for Kerala state. More than 200 production units are working in this area. 75% of workers in this field are women. 24 units under this industry use automatic binding machine, 90 tiny units use semi-automatic ruling, cutting and stitching machine and 50 cottage industries are practicing manual stitching and cutting operation.About two decades ago, handmade paper Christmas stars made in Kunnamkulam ruled Kerala market. But people engaged in star making failed to experiment with designs. Now paper or handmade Christmas stars made from Ernakulam and Kollam districts took that place.The paper-based Industry in Kunnamkulam has a great future because of its peculiarities like products being eco -friendly, household level production pattern, residential prototype, mode of transportation, subcontracting at different stages of production, market potential for diversified biodegradable paper-based products and the advantages of working as clusters.



The locations of printing and paper based industries are shown in figure 7.4

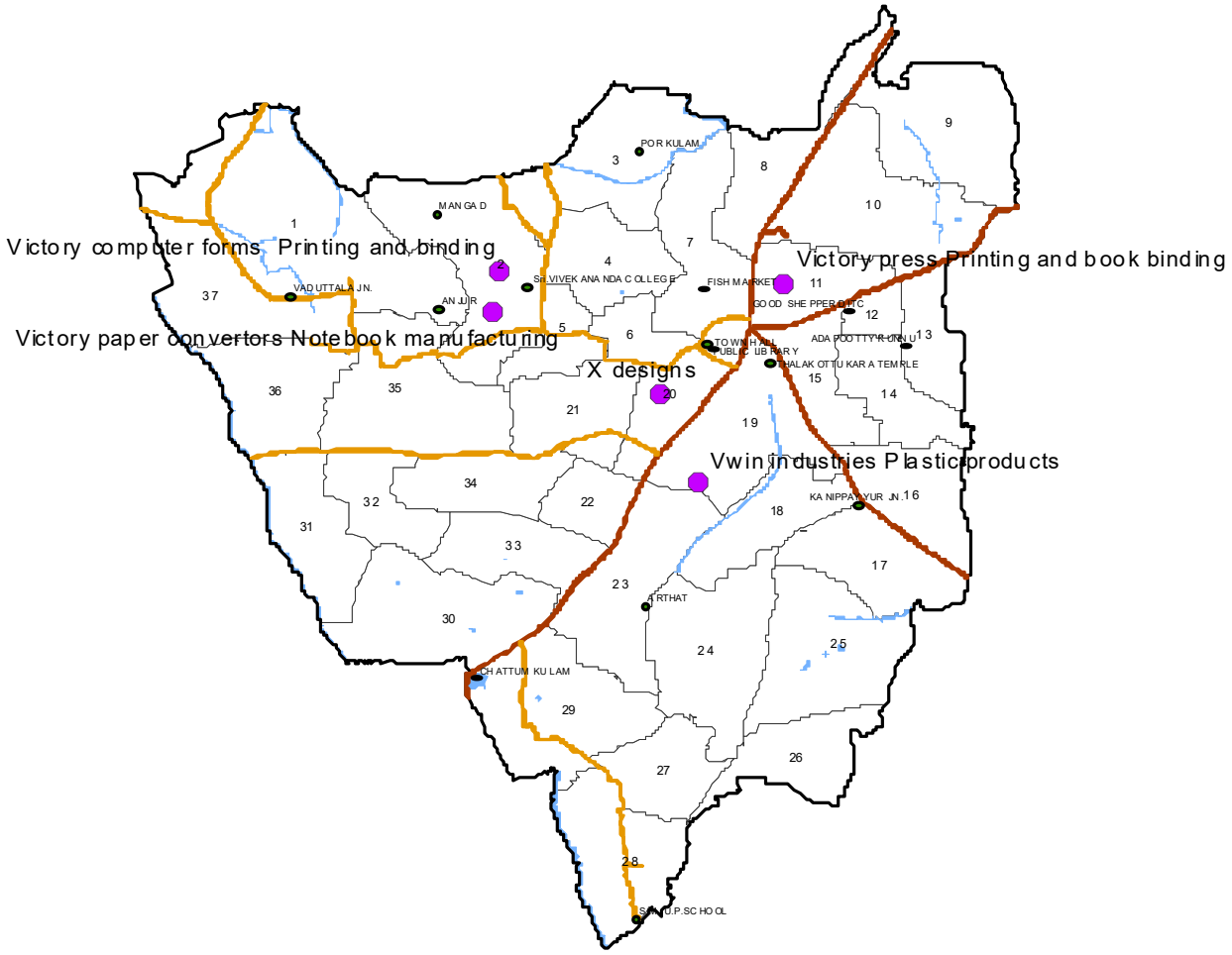


Fig 7.4 Location of Small scale industries

Printing Vs Binding at Kunnamkulam : Stake holder consultations revealed that binding was first initiated in Kunnamkulam. There are evidences of ancient bounded manuscripts of religious books available at the Church library at Thozhiyoor. Stitched manuscripts of Christian religious books using wooden plates on top and bottom instead of wrapper can be seen in the library. Moreover, trade and exporting of agricultural products requires books for the accounting purposes. In the beginning therefore, informal production of account books might have started for the wealthy traders in Kunnamkulam. Briefly, a number of historical reasons point towards the growth and development of this industry at Kunnamkulam such as:

1. Missionary activities in Kunnamkulam: As a contribution of Basel Mission in Malabar area, who trained Christians in book binding at their institute in Mangalore.This lead to spreading of printing and binding activities in the Malabar area.

2. Trade relationship with neighboring states and Sivakasi.

As mentioned in the Cochin State Manual, hundreds of men and women belonging to Taluk of Thalappilli were engaged in the areca-nut industry from September to January. The major portions of the prepared areca-nuts were exported to Tamil Nadu and Andhrapradesh, where there was considerable demand for it. Moreover,crackers which were used extensively during the 'Epic Phony' ceremony were imported from Sivakasi. The trade relationship with Sivakasi is one of the important factors in paper based industry in Kunnamkulam.Almost all raw materials required for book binding industry were imported from outside states like Andra Pradesh, Maharastra and Karnataka. A major portion of cover pages required was obtained from Sivakasi.

3. The beginning of educational institutions in between 1837 and 1898.

When we analyse the beginning of English schools from1837 to 1898, we can see that 7out of 15 schools started in Cochin state were at Thrissur, Kunnamkulam and Irinjalakuda. The establishment of schools in and around Kunnamkulam during this period may have encouraged the development of this industry.

4. Cultural background.

Kadavallur, Chowannur and Arthat the nearby places of Kunnamkulam have a rich cultural background. Kadavallur is well known throughout this coast as being the place where Nambudiris of the Thrissur and Tirunavaya Yogams complete for superiority in Vedic proficiency. In Chowannur, there was a SabhaMadom, an endowed college where Sanskrit education was given. Arthat was the chief center of Orthodox Christians. It contains one of the oldest Jacobite Syrian churches in the State. All these contributed a cultural rising up in the area which later on helped the development of the publishing industry.These published books were sold during Guruvayur Ekadasi,when the temple was open to all Hindus and a good amount of trade tookplace at that time.To sum up, the publishing and binding industry would have grown up as a formal activity in the 1880's.

7.4.2 Rock cut products : Rock cut products manufacturing is an informal activity related to industrial sector found to be very active in Kunnamkulam. More than 300 people are working in this field. These industries are located on road sides near Kurukkanpara quarry in Kunnamkulam - Guruvayur route. (figure7.5).

More than 15000 products are being manufactured in a year. They mainly include Kalvilakku, Kalkkurishu, stone idols, ammikkalu, aatukallu etc. Products manufactured

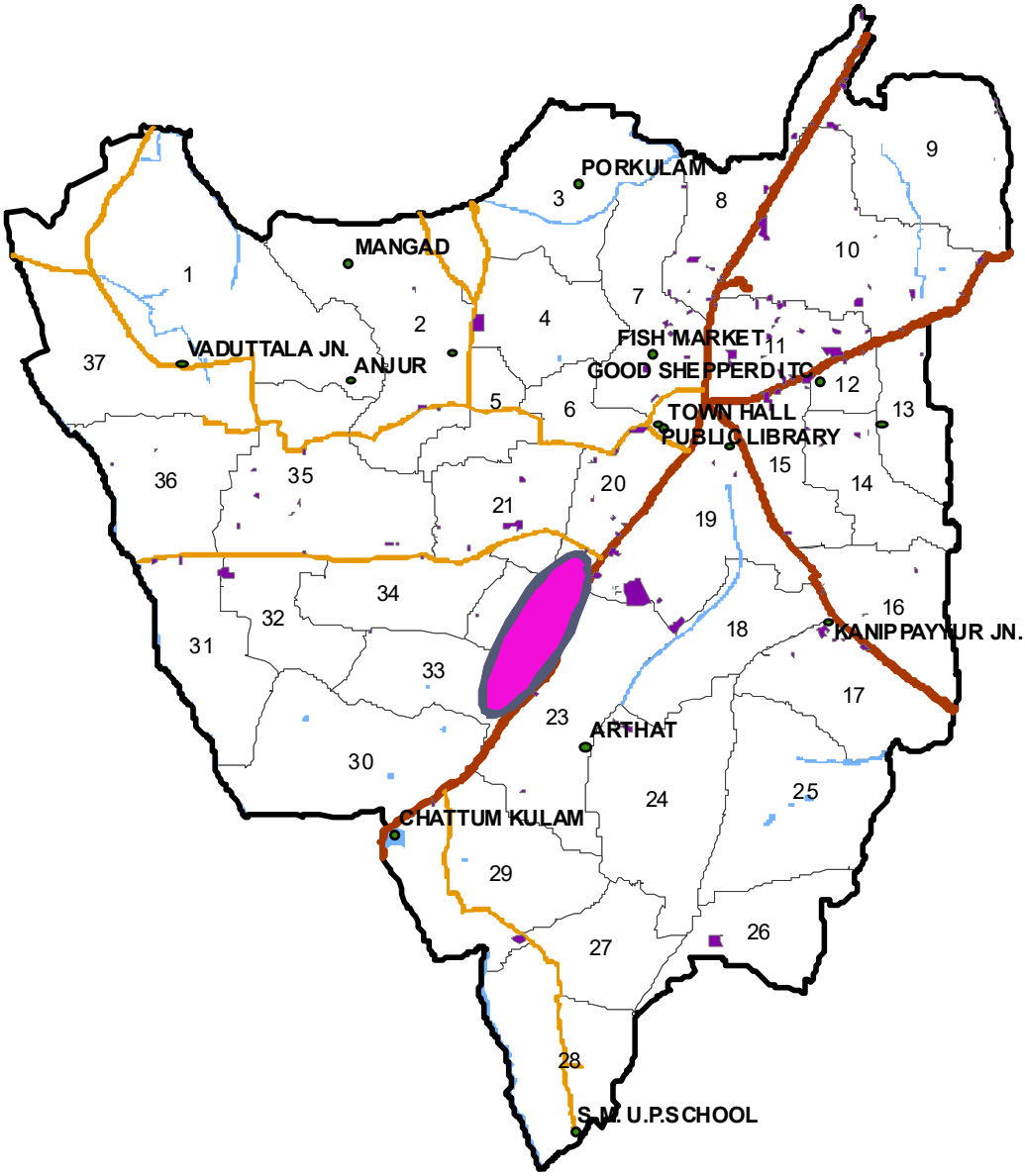


Fig 7.5 Location of rock cut industries

here are exported to far off places even outside India. These are mainly purchased by pilgrims to Guruvayur, various churches and temples, in and around Kunnamkulam. Earlier, granite used as raw material for making these products was obtained from Kurukkanpara quarry. But now quarrying is not done at Kurukkanpara and granite is purchased from Kadangode near Vellarkadu.



The major issues associated with these units are the unavailability of raw materials locally and the widening of Guruvayur – Kunnamkulam road. The road widening already suggested for SH will affect the operations being done by the sides of this road.

7.5 Inference

From the land use analysis it is very clear that only 0.53% of the land is utilized for industrial activities. From the sectoral analysis it has become evident that the activities pertaining to industrial sector taking place at Kunnamkulam are of house hold nature. From local level analysis and enquiry, it is clear that industrial development area at Rajiv Gandhi corner lacks various basic infrastructural facilities. Studies of industrial sector revealed that binding industry which is prominent here is having a bright future, provided that care is given for generating inter-firm linkages, modernisation and diversification of products. High labour charges have affected the growth of printing industries.Possibilities for renovating this industry by technological up gradation and modernisation have to be looked into. Rock cut product sector can increase the economic wealth of the municipality if labourers are properly relocated. Due to the rising prices of land and high demand in the residential sector, land may not be available for intense industrial use in future. But Kunnamkulam town does have a future in the household level industrial activity which has the potential to strengthen the economic base of the area.

CHAPTER 8

TOURISM

Kerala "God's own country" known for its varied physiography and cultural base always had been a favourite destination preferred by tourists. Kunnamkulam also with its peculiar attribute can develop as a preferred location. Existing conditions of tourism sector and potentials for its development are detailed out in this chapter.

8.1 Existing status

At present Kunnamkulam Town is not having a prominent position in the tourism map of Thrissur district. Several historical and archeological sites, ancient temples and churches are there in Kunnamkulam. At present this potential has not been utilised at a desired level. Major tourist attractions in Kunnamkulam Town are given in table 8.1.

Table 8.1 Tourism potential destinations in Kunnamkulam

SI No	Tourist Attractions	Type	Tourist Season
1	SreeMahaGanapathiTemple,Kakkadu	Pilgrimage ,Heritage,Architect,Culture	All the year
2	St.Mary's Church and Holly Cross	Pilgrimage ,Heritage,Architect,Culture	
3	AmbalaPalli	Pilgrimage ,Heritage,Architect,Culture	
4	Kakkadu Palace	Heritage,Architecture	
5	ARP Press,Old town	Heritage (History)	
6	Burial Megalithic Cave,Kakkadu	Heritage,Architecture	
7	Burial Megalithic Cave,Chowannor	Heritage,Architecture	
8	Onathallu	Festival	
9	AduppootyPalliPerunal	Festival	October
10	PaarkadiPooram	Festival	

The tourist activities identified in Kunnamkulam can be grouped into the following categories viz. Pilgrim tourism, Heritage tourism and seasonal tourism.

8.1.1 Pilgrim tourism

There are 3 famous and historic pilgrim tourist destinations in Kunnamkulam which are sought after for religious reasons. They are Sree Maha Ganapathi temple, Kakkadu, St. Mary's Church (ArthaattuPalli) and Holy Cross and AmbalaPalli. The location of these are shown in figure 8.1

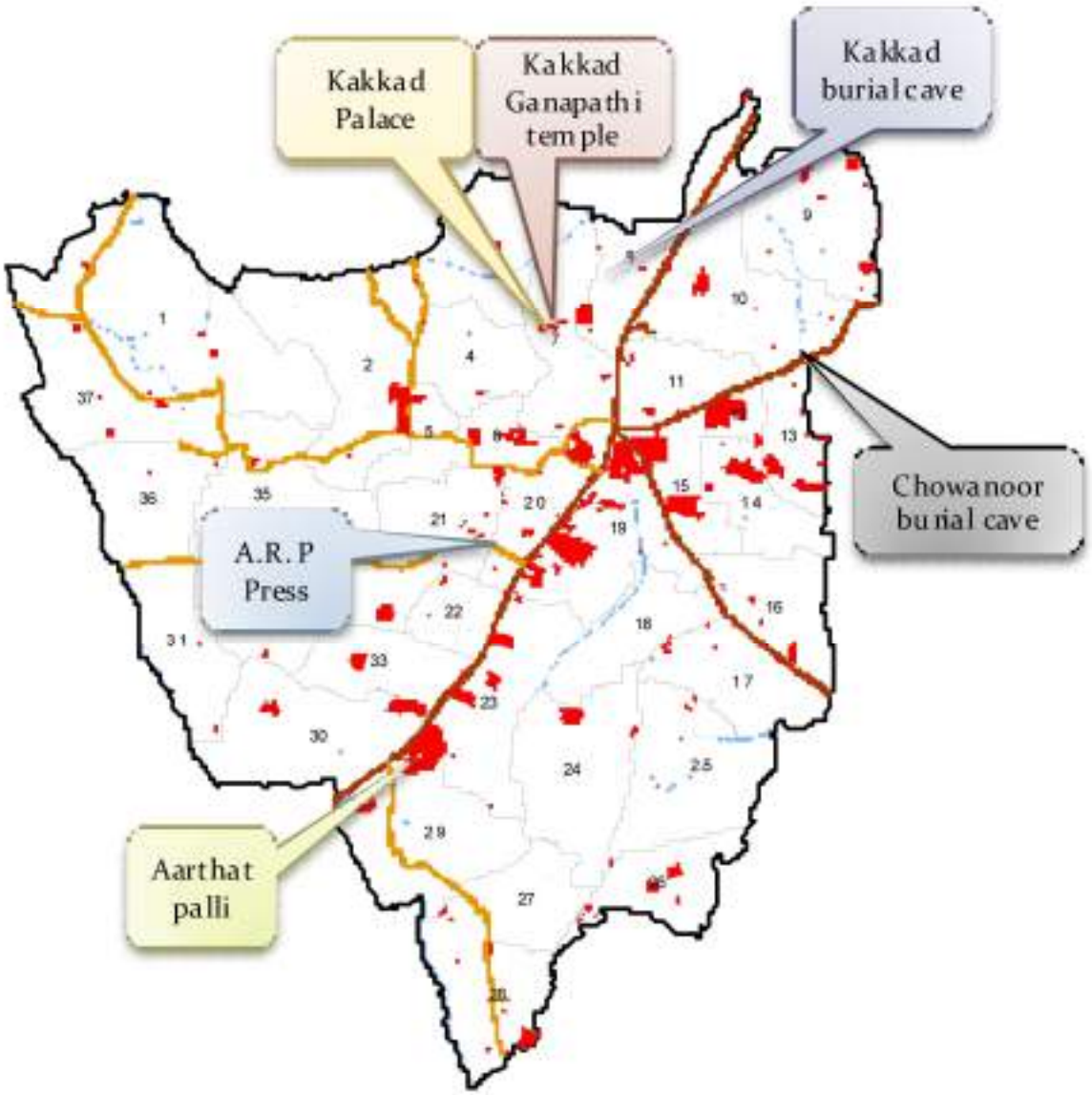


Fig 8.1 Location of tourist destinations

i) SreeMahaGanapathi temple, Kakkadu - This famous Mahaganapathy Temple is believed to be constructed during 225 A.D and is situated just one km away from Kunnamkulam Bus stand. This ancient temple enshrines the idols of Lord-Ganesh and Vettakkorumakan

(Lord - Shiva). The trunk of Ganapathy is turned to the left. This temple is one of the rare Mahaganapathy Temples in Kerala and is only 8km from Guruvayur temple. The temple being the place where Kathakali first performed and owing to the speciality of the deity is attracting people from a far.



Sree Mahaganapathy temple, Kakkad

ii) St. Mary's Church (ArthaattuPalli) and Holy Cross - Arthat Cathedral Church, dedicated to St. Mary, The Mother of God, has a long and glorious tradition and history. It is the permanent monument of the St. Thomas mission in Kerala. The Christian Community associated with the Church is believed to be an ancient Christian community in South India, even a little bit earlier than the Niranam Christian Congregation. The uniqueness of this region is that the Christian Church was established in this part of Malankara at the same time or little bit earlier, when Christian faith was established in Rome, Antioch and Alexandria. The ancient name of Arthat was Chattukulangarai. It is the most prominent church of all the churches in the Kunnamkulam Diocese of the Malankara Orthodox Syrian Church. Moreover it is the only Cathedral of Kunnamkulam Diocese. Beleivers visit this place often to understand and admire the old styles and customs.



St. Mary's Church, Arthat

iii) AmbalaPalli - Ruler of erstwhile Cochin State, Raja Rama Varma (Sakthan Thampuran) visited Kunnamkulam on 981 M.E and granted 'Anthimahakalankavu temple' to Christians for worship. This church is now called 'AmbalaPalli' where in, the temple character can be

seen in the church entrance.This place has become a destination owing to its peculiar feature.



Ambala Palli

8.1.2 Heritage tourism

Major heritage locations are Kakkad Palace, ARP press, and Kakkad burial cave and Chowwannur burial cave. The locations can be seen in figure 8.1.

i) Kakkadu Palace - In 1921, Kakkad Karanawar, Manakulam Kunjunni Raja and his nephew Mukunda Raja of kakkad royal family and Mahakavi Vallathol jointly decided to form Kalamandalam. This decision was taken during their meetings for Kathakali performance which was held every evening at Kakkad Palace. So Kakkad Palace is considered as the place of origin of Kalamandalam. This place is located near Kakkad temple.

ii) ARP Press, old town - 'Njanodayam' press started by Bishop Paramel Joseph was later developed into Akshara Retna Prakashini (A.R.P) Press. When Diwan C.P. Ramaswamy banned Malayala Manorama in Kottayam, it was published from Kunnamkulam A. R. P. press and was known as 'Kunnamkulam Manorama'. A.R.P press also gave asylum to Swadeshabhimani Ramakrishna Pillai when he was exiled by Diwan Sir C. P. Ramaswamy. From there many famous books like 'Kathamalika' of Kuttikrishnan Maarar, 'Magdalana Mariam' of Vallathole and 'Athmaposhini' (Magazine) by Vallathole and Swadeshabhimani Ramakrishna Pillai were published.



A.R.P press, Kunnamkulam

iii) Megalithic Burial Cave at Kakkad - The Megalithic burial cave at Kakkad is situated on the slope of a hill 2km north of the town centre. It has a narrow entrance on the east, accessed by a flight of steps. The cave is dome-shaped and paraboloid on plan with almost straight edge on the entrance side. Running along the northern side, there is a single sectoral bench, to the south of which is a rock circular block.



Kakkad Burial Cave

iv) Megalithic Burial Cave at Chowannur - The megalithic rock cut cave at Chowannur is situated about 3km northeast of the town centre of Kunnamkulam. It is entered through a recessed opening on the east. The other sides of its chamber are circular and its vault hemispherical. On its northern and southern sides are two benches and there are five circular blocks along the western side of the chamber, which appear to be intended as stands for vessels.The site is a centrally protected monument under the control of Archaeological Survey of India since 1951. This place is an ASI site and is a protected monument. This is very near to Kakkad palace.



Chowannoor Burial Cave

8.1.3 Seasonal tourism

Kunnamkulam is famous for certain regional festivities like Onathallu, Aduppootty perunnal, and parkkadi pooram.

i) Onathallu **-** This is a martial art form that is associated with the Onam festival of Kerala. Onathallu is believed to have originated from Kerala's own martial art 'Kalari'. Onathallu is a traditional wrestling that blends machismo, youthfulness and rural simplicity. Onathallu tests the stamina and physical prowess of the combatants. The rule is simple, get the opponent to the ground by any means. Wrestling is a popular pastime in Thrissur and Palakkad districts. It is a skill handed down through generations. Local chieftains once promoted onathallu to retain their territorial supremacy. An onathallu winner used to be respected and feared by everyone in the village.

In Kerala, Kunnamkulam is considered as the famous centre of Onathallu. People like KadamburKunjiraman Nair, VettikkattiriMammi, Varavur Syed Ali and Edathara Velayudhan are some of the names the natives are proud of. The persons who participate in this event are dressed in dhotis or plain white cloth. Onathallu is also known as Kayyamkali . This is because it is a martial art form using hands only. In the courtyards of old tharavad there were places for practicing this Onathallu. Very high self-control is required by the participants who perform this Kayyamkali. The entire game is controlled by a referee (otherwise known as Chayikkaran).



People participating in Onathallu

ii) Adupputtypalli perunal **-** Saint George Orthodox Syrian Church, Adupputty situated at the top most part of a hill called as Adupputty near Kunnamkulam town. The Church is

named after Saint George and popularly called as Adupputty Palli as the church is located in the Adupputty hill. Church is famous for its annual feast called Adupputty perunal celebrated on 27th & 28th day of October in remembrance of Saint called Ossius Thabasi. Many people in and around Kunnamkulam visit the church to seek divine blessings of Saint George.



Aduppoottypalliperunal

iii) Parkkadi pooram- Conducted on third Sunday of January. More than 50 elephants participate in the procession in the festival. The festival is famous for the fire works. It attracts people from in and around the district. It is jointly conducted by 35 groups in the area.



Parkkadipooram

8.2 Tourist Destinations around Kunnamkulam

Guruvayur temple - This is one of the most important and sacred pilgrim centre of Kerala. Situated in the town of Guruvayoor 8kms from Kunnamkulam is one of the five famous Vishnu temples in India. Guruvayoor is known as "BhulokaVaikunta" or the abode of Vishnu on earth. The presiding deity is MahaVishnu, in standing posture with four hands carrying Sankhu (conch), Sudarshanachakram (a serrated disk), lotus and mace. He is worshipped as Balakrishna, the full avatar (Purnaavatara) of Mahavishnu .The idol is made of a rare stone known as Patala Anjana.



Guruvayur Temple

Burial Cave at Kattakampal - The Megalithic burial cave at Kattakambal located 2 km west of Kattakambal lying about ten kilometres North West of Kunnamkulam, district Thrissur. It is a multi-chambered cave, that attracts historians from far and wide. Each chamber provided with a bench cut out of the rock. The floors are rectangular and ceilings horizontal. The site is a centrally protected monument under the control of Archaeological Survey of India since 1951.



Burial Cave at Kattakampal

Burial Cave at Kandanassery - The Megalithic rock cut cave at Kandanassery is situated 1km south of Ariyannur, district Thrissur. This is a rock-cut burial cave of the Iron Age. The chamber, entered through a recessed opening, has a hemispherical dome and paraboloid floor. It has a bench cut out of the rock on all its sides except at the entrance. The site is a centrally protected monument under the control of Archaeological Survey of India since 1951



Burial Cave at Kandanassery

Kalashamala grove and Kallazhikunnu - This scenic hill station in Akathiyoor near Kunnamkulam is the first biodiversity heritage site of Kerala State Biodiversity Board. Experts have identified the grove as home to critically endangered tree species known as Syzygiumtravancoricum (locally known as Kulavetti or Vathamkolli) inside temple premises at Kalashamala. These plant species are included in the IUCN Red list.



Kalashamala grove and Kallazhikunnu

Palayur Church - Palayur Church is believed to be the oldest church built in India, by St. Thomas in AD 52. The main highlight of the church is a "Thaliyakulam",a pond were St. Thomas is believed to have baptized local people, on arriving at Palayoor.



Palayur Church

Pazhanji Church - It is a Malankara Orthodox Syrian Church situated at Pazhanji near Kunnamkulam in Thrissur District. The church is said to have been constructed by believers who fled from Cochin and later settled here. It is how the name Pazhanji (Malayalam meaning Old) came into being for the place.



Pazhanji Church

Mannalamkunnu Beach - It is located in Punnayur Panchayat, which is about 12kms from Kunnamkulam town. There is beach festival taking place annually in this beach named Mannalamkunnu Beach Festival.



Mannalamkunnu Beach

Chavakkad Beach - Lying along the coast of Arabian Sea, this beach attracts domestic tourists and local people. The beach is situated 12kms from Kunnamkulam Town. It is one of the best beaches along the West coast with coconut bordered sea shore with a pleasing view of natural beauty. Chavakkad beach is the place where river confluences with the sea.



Chavakkad Beach

8.3 Tourism Infrastructure

Infrastructural facilities in Kunnamkulam are not sufficient to cater tourists. Seven hotels are available for accommodation, including one 4-star and two 3-star hotels. Accommodation facilities need also be provided for tourists visiting the nearby tourist centres. Pilgrims visiting Guruvayur temple find difficulties for accommodation during peak season. There is a good scope for developing Kunnamkulam as a major halting place for Guruvayur pilgrims during peak season and low cost accommodation facilities can be provided during peak season.

8.4 Inference

Presently Kunnamkulam Town is not having a prominent position in the tourism map of Thrissur district. The tourism potential areas in and around the town can be utilized in developing a tourism circuit to attract more tourists. There is also a potential for developing Kunnamkulam town as a service centre for the adjoining tourists spots including Guruvayur.

CHAPTER 9

AGRICULTURE AND ALLIED SECTORS

This chapter analyses the existing status and development issues of Agriculture and allied sectors in the Kunnamkulam Town area. The land use of the Town shows that agricultural activity is not turned down totally paving way for urban activity. The analysis of agriculture and allied sector shows the existing situation and the problems faced by the sector.

9.1 Existing Scenario

As per the land use analysis 57 % (15.55 sq. km) of the land is used for agricultural purposes, out of which 34% is dry agriculture and 23% is paddy. The spatial distribution of agriculture land use is shown in figure 9.1.

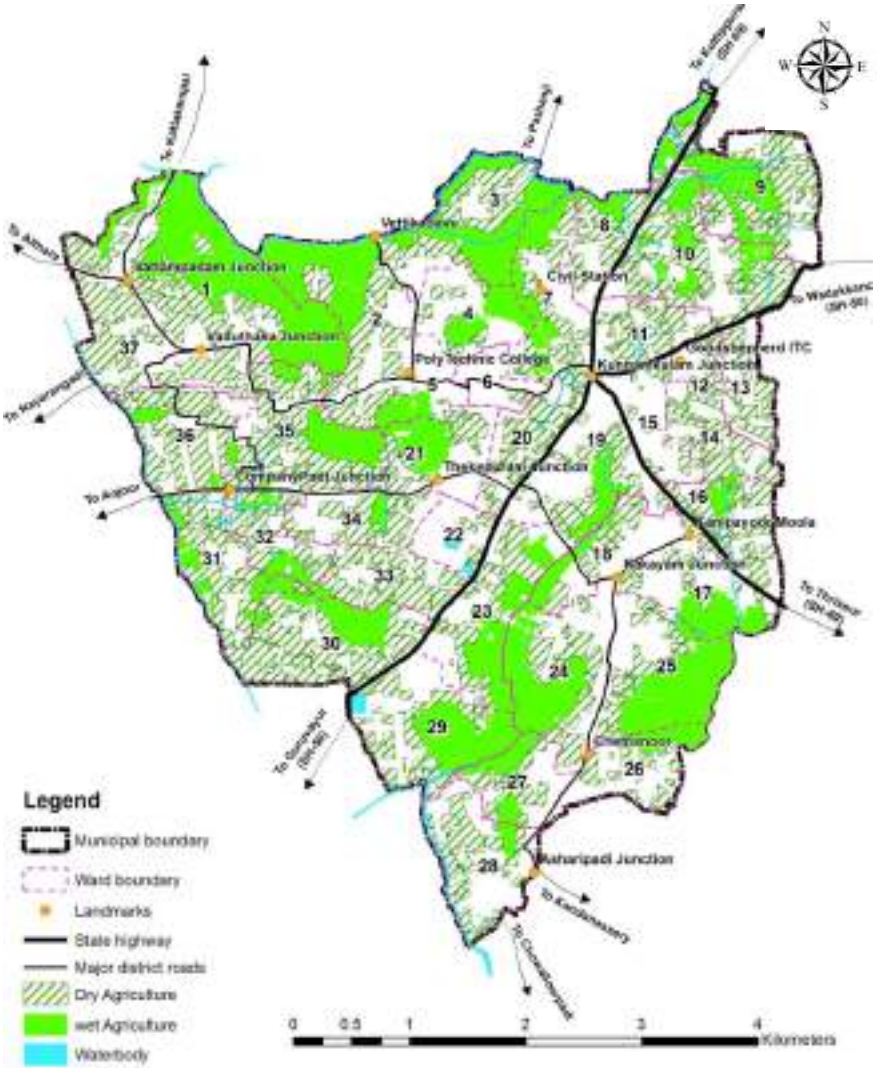


Fig 9.1 Spatial distribution of agriculture land use

Source: Land use survey-2012

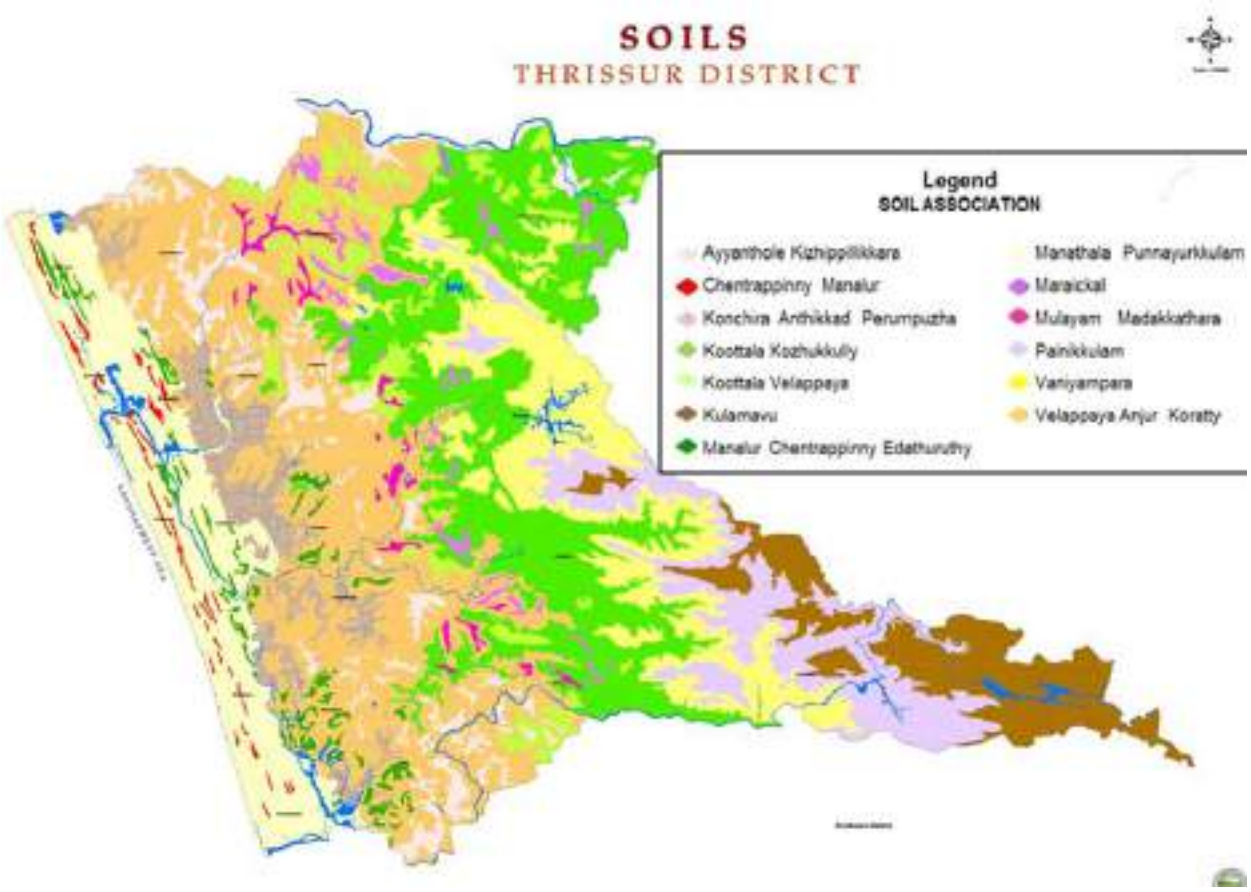


Figure 9.2 Soil Types –Thrissur

Source: Soil conservation dept.

The soil suitability map for the district is shown in the figure 9.2. As per the map, soil type here belongs to Velappaya – Anjur-Koratty series and the Manathala – Punnayurkulam series. The crops suitable for this soil are Coconut, Arecanut, Banana, Cashewnut, and Vegetables.

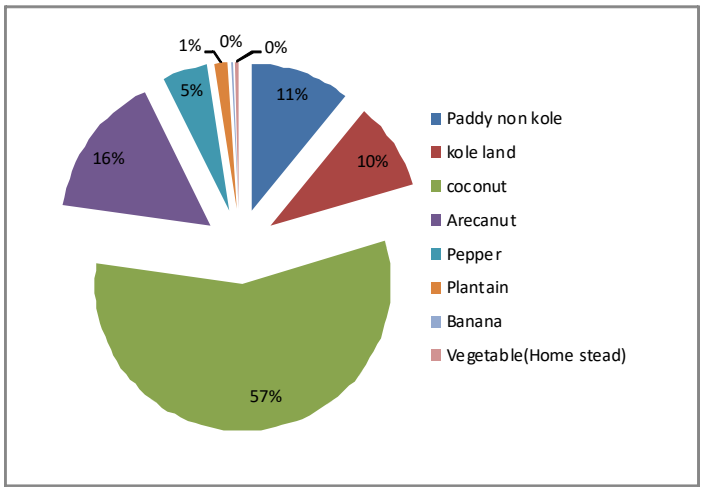


Figure 9.3 Percentage wise distribution of area under cultivation for crops

Table 9.1 Area under cultivation for crops

Types of Crop	Area(Ha)
Paddy non kole	140
Kole land	124
Coconut	730
Arecanut	202
Pepper	63
Plantain	20
Banana	4
Vegetable(Homestead)	7

Source: Krishibhavan 2012

The major crops of cultivation are paddy, coconut, arecanut, pepper and plantain.Apart from this ,nutmeg is also cultivated in some areas. The area of cultivation of different crops in Kunnamkulam area is shown in table 9.1 and their corresponding percentages is given in figure 9.3. One of the major issues faced by agriculture sector is the lack of agriculture labourers. The census report shows a decreasing trend in agricultural labourers as well.

9.1.1 Paddy

Paddy cultivation was part of the proud culture of Kerala State . Rice is the most important cereal and staple food produced and consumed in Kerala. Thrissur has large scale paddy cultivation. In Kunnamkulam Municipality, total area under paddy cultivation is 264 Hectares and its production was 1010 tonnes in the year 2012. Fig 9.4 shows the production and area of paddy in different years. It reveals that the area and production shows a decreasing trend. There is a sharp decline in the area of cultivation from 2008 to 2012. But the production does not show a drastic decline. This indicates that productivity has been low through the years. Paddy cultivation in Kunnamkulam are of two types – Kole and non kole paddy. Kole lands are not only utilised for culitvation but treated as an environmentally sensitive area as well. Altogether 242 hectares of kole land is there and it is evident from table 9.1 that only 124 hectares is cultivated which amounts to 10% of the total area cultivated. Figure 9.5 gives the location of Kole Lands.

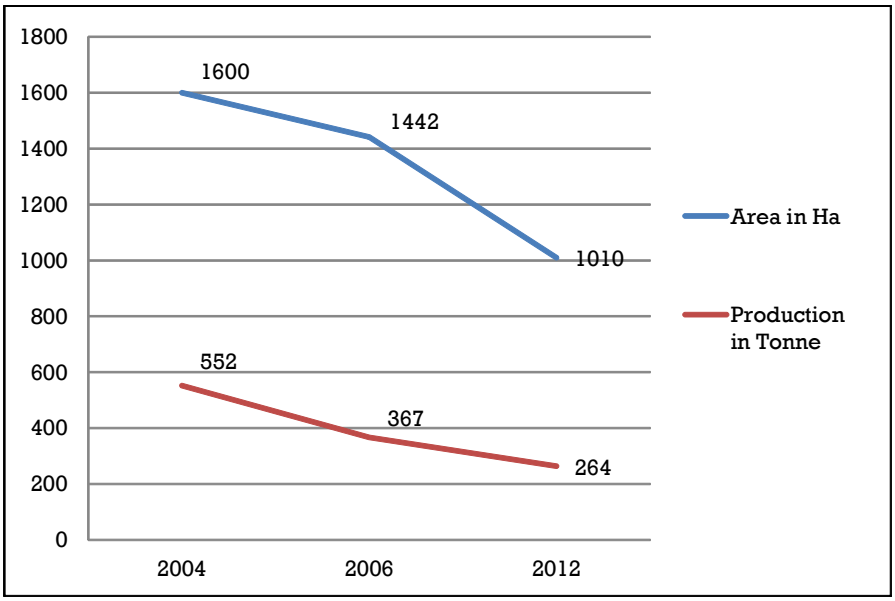


Figure 9.4 Area and production of paddy

Source - Krishibhavan 2012

Due to the redistribution of land holdings, area under paddy has decreased greatly.

Farmers began diverting the waterlogged rice fields to perennial crops such as coconut or arecanut. Land is habitually kept fallow for years since cultivation is not profitable and as a result, priority is given to cash crops such as banana, vegetables, coconut, arecanut, and nutmeg. Figure 9.5 also gives an idea of the Kole land kept idle without

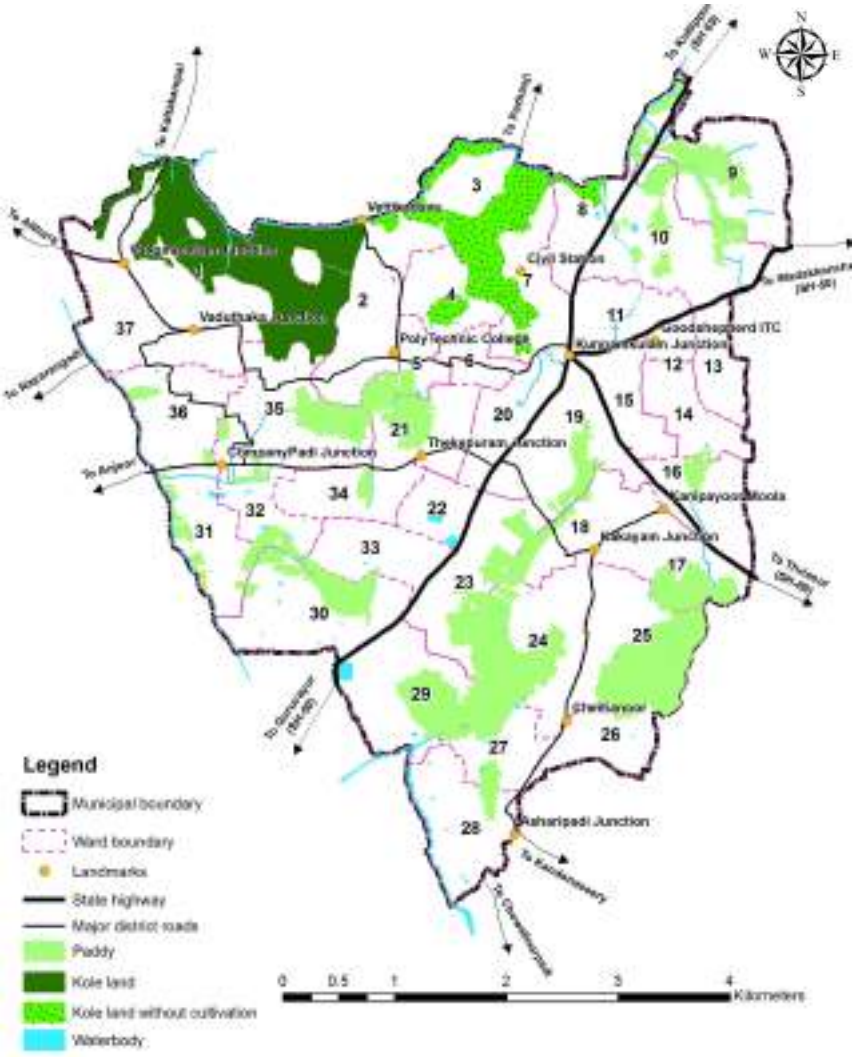


Fig 9.5 Location of Kole Lands

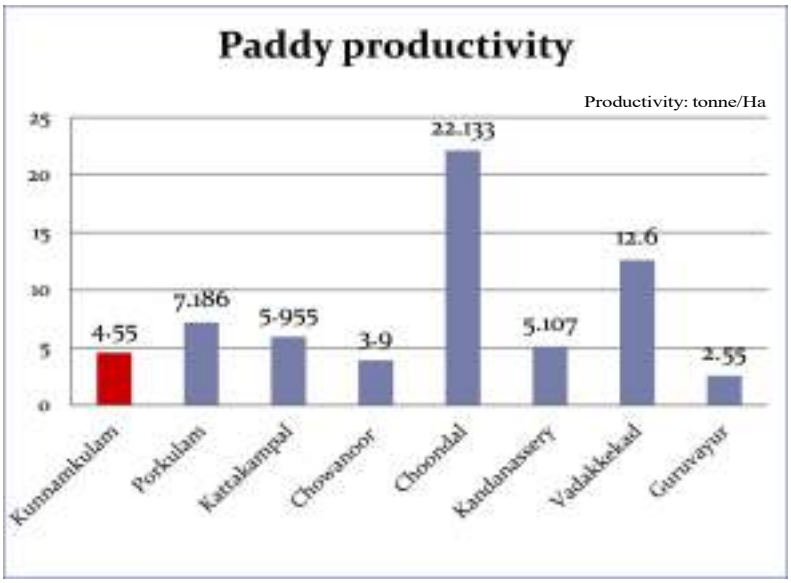


Fig 9.6 Comparison of Paddy Productivity with nearby LSGIs

Source: Krishibhavan 2012

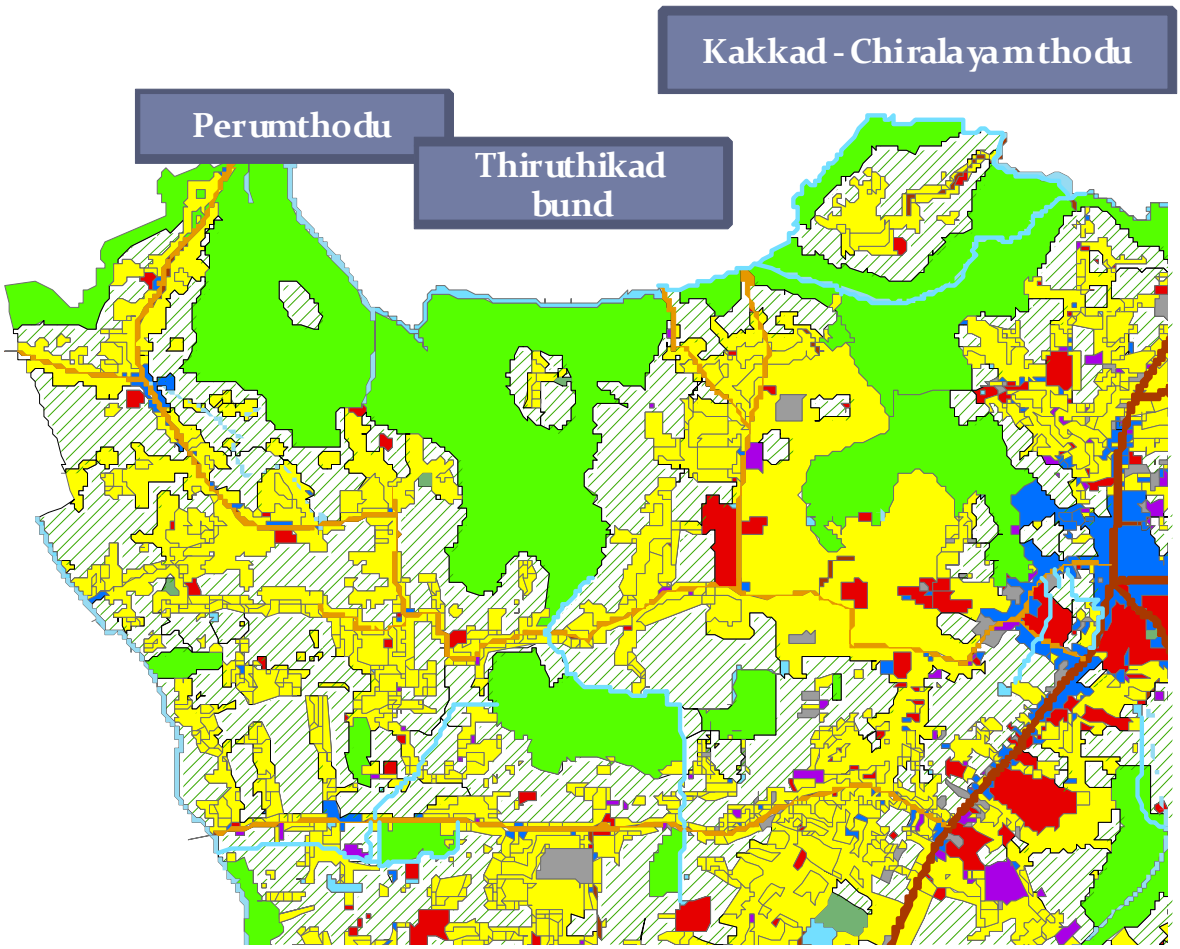


Fig 9.7 Irrigation Facilities

Source: Local Level Analysis-2012

cultivation. The productivity of paddy is higher than the district average but on comparison with the surrounding LSGIs Kunnamkulam has a low productivity (figure 9.6). As per the existing scenario, the agriculture in Town area depends mainly on rain water. Presently one Lift Irrigation Scheme from Perumthodu is functioning here which helps to irrigate 242 ha of kole land in the northern side of this Town. There is a bund constructed at Thiruthikad and Kakkadu – Cheralayam Kole land act as a reservoir from January 15th to March 31st. This reservoir along with Perumthodu helps to irrigate 124ha of kole land at Muthuvammal and Kakkathuruthu. After March 31st water is drained to Perumthodu for paddy cultivation at Kakkad- Chiralayamkole land. The main problem for paddy cultivation here is that, waste water from hotels, markets and other commercial centres of town centre is finally disposed without treatment to Kakkad- Chiralayamkoleland. This polluted water creates clogging in Kakkad –Chiralayamthodu, which inturn affects the free flow of water to Perumthodu.

9.1.2 Coconut

In Kunnamkulam Town area 730 hectares of land are used for coconut cultivation. Generally it is cultivated as a house hold crop. No big plantations are seen here.The yield from this is 36 lakh nuts/year. The productivity is less than district average. When comparing with the surrounding LSGI's the productivity of coconut is seen high in the Porkulam Panchayat and Kunnamkulam Town stands next. It is shown in Fig 9.8. The area of cultivation increases but the production decreases. The main problem faced by the coconut cultivation is the non availability of coconut climbers and the diseases which affect the palms.

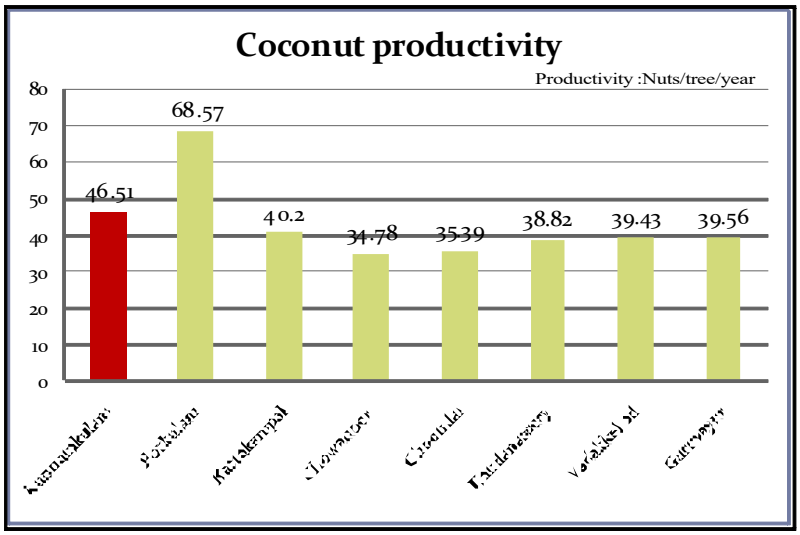


Fig 9.8 Coconut productivity with nearby LSGI's

Source: Krishibhavan 2012

9.1.3 Arecanut

Arecanut is an inter crop in coconut gardens, hence it finds a place in every home stead of Thrissur District especially in Kunnamkulam which shows second highest productivity when compared with the nearby LSGI's (figure 9.9) More productive arecanut plantations are seen in the northern parts of the district and the major yielding areas are places around Kunnamkulam. 202 hectares of area is used for arecanut cultivation. In Kerala the main market for arecanut is Pazhanji which lies in the centre of arecanut cultivating belt.

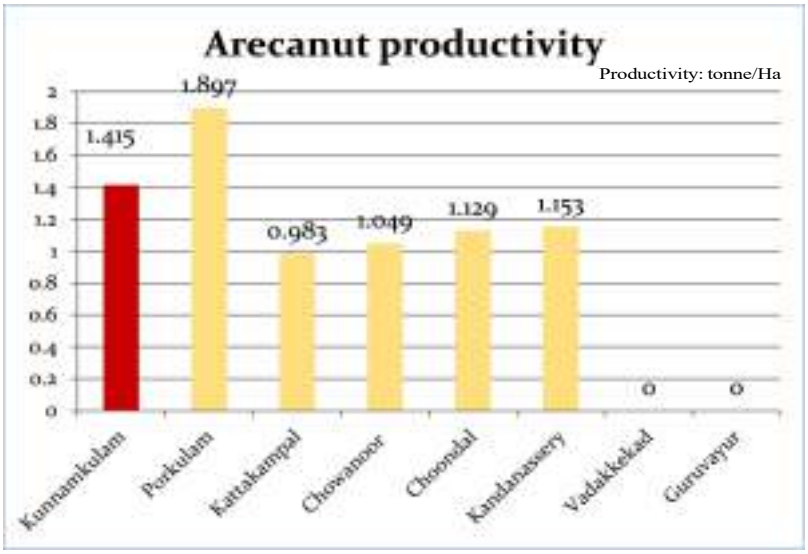


Fig 9.9 Arecanut Productivity with nearby LSGI's

Source – Krishibhavan 2012

9.1.4 Other crops

Nutmeg is the most important tree spice. It is an intercrop plantation. Even though the area of nutmeg plantation is low, productivity is more than district average in Kunnamkulam. The productivity of pepper, plantain and vegetables are shown less when compared with the other LSGI's.

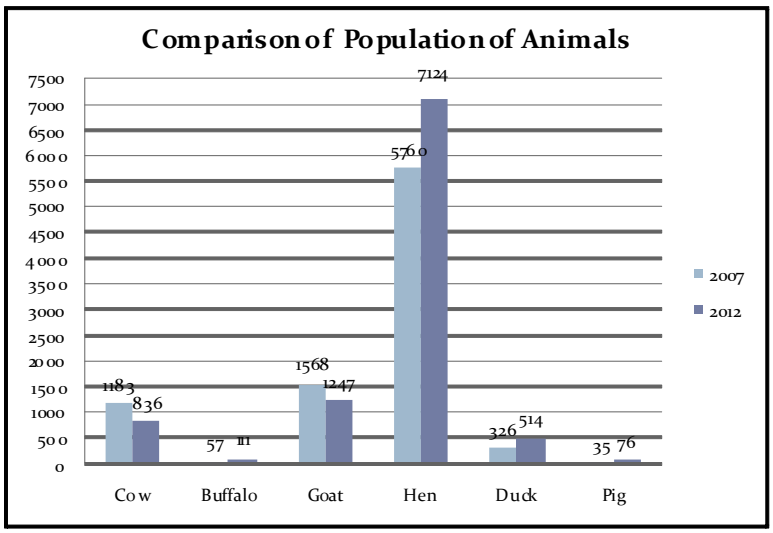


Fig 9.10 Live stock population

Source:Quinquinneal census-2007 & 2012

9.2 Animal husbandry & Dairy development

As per the quinquinneal census 2007 the live stock of Kunnamkulam Town is given in fig. 9.10. The major livestock include hen, duck, goat and cow. The comparison of population of animals for the years 2007 and 2012 is given in fig 9.10. From the graph, buffalo, duck, and hen rearing are found to increase. The land condition also supports these activities. As per the socio-economic survey reports 42.37% of houses have hens at their houses. The details of domestic animals obtained from socio- economic survey is shown in Fig 9.11. This shows that animal husbandry activities are active in the town at household level. One poultry farm is there at Anjoorkunnu where hens are reared and sold to other places and are not used for meat production. One vetenery dispensary at Arthat, Anjoorkunnu and one vetenary polyclinic at Pattambi road are functioning inside the KunnamkulamTown area. One pig and rabbit breeding unit is also working in the veterinary polyclinic with 3 casual workers and 1 Govt.employee. This unit has the capacity to breed nearly 15 pigs and 40 rabbits.

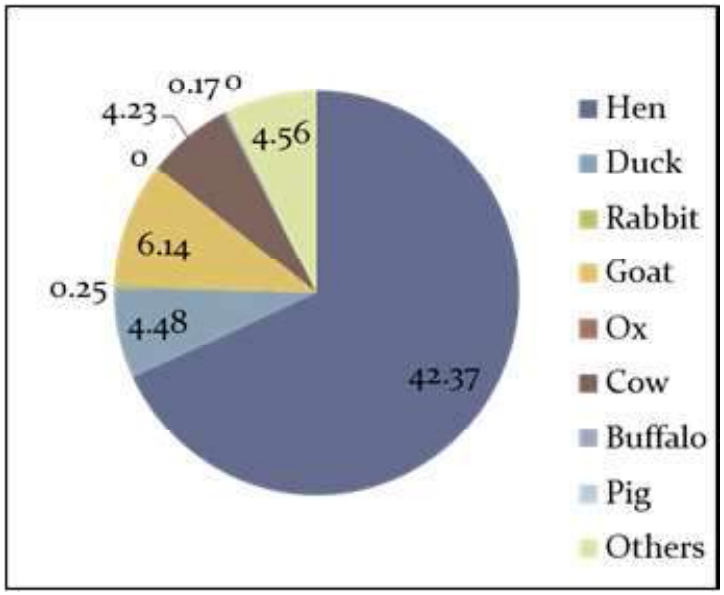


Fig 9.11 Percentage of each category of domestic animals

Source: Local level analysis-2012

Table 9.2 Production and Consumption of milk

Total Milk Production	1650 litres/day
Total Milk requirement	14446 litres/day
Shortage of milk	12796 litres/day

Milk production is also gaining momentum in Kunnamkulam.In Private sector, there are 13 farms with production of 1200 litres of milk per day. The production and consumption of milk in the Kunnamkulam town is given below in Table 9.2. It is obvious from table that the milk production is not sufficient.Two milk collection centres at Kanippayyur and Chittanjur collect 380 litres of milk/day. To compensate the shortage of milk, people depend upon Tamilnadu and nearby areas. The existing production may be enhanced by adopting every possible measure, so as to achieve a self-sufficiency in good milk and milk products.

9.3 Fisheries

Not being a coastal LSGI Fishing sector has no scope at Kunnamkulam town.But inland fishing may be thought of as there are quite a few number of water courses and ponds. The registered number of fisher folk population comes to be 45, out of which 15 are fish merchants. 13 fresh water ponds are identified at Kunnamkulam Town. There is a possibility of inland fish rearing by keeping the ponds clean.

9.4 Marketing Facilities



Fig 9.12 Locations of Markets

Source: Primary survey-2012

The agricultural products, meat, egg and fish produced here and imported from other places are sold out through local markets present in Kunnamkulam Town. Though there are authorised sales counters for milk, meat and egg, large number of unauthorised markets of low quality and disease bearing livestock products are functioning here. The important market where vegetables, fish and meat are available is Parayil Market.The main arecanut market is at Pazhanji which is outside the Town. Thazhatheppara – Kaya market and the Thurakulam whole sale fish market are prominent in marketing special items. Marketing facilities of arecanut are also available at local spice shops in Kunnamkulam. Vegetable shops are also scattered within the town centre along main roads. Five unauthorized slaughter houses are also functioning within Town. Marketing facilities of Kunnamkulam are shown in the figure 9.12

9.5 Inference

Kunnamkulam has a good amount of paddy cultivation and has a presence of ecologically sensitive kole land. But many issues including non-availability of labourers, water logging and waste dumping has led to a decline in the cultivation of paddy. From the detailed study of the sector it is revealed that there is potential for areca-nut and coconut cultivation. Lack of agricultural labourers and irrigational facilities are the main problems faced by this sector. Along with this water logging and waste water disposal at Kakkad – Chiralayam kole land affects paddy cultivation. The analysis throws some light into the fact that even though marine fisheries sector is absent, there is a scope for inland fishery activity. Certain ponds identified here can be made use of for this purpose. In the case of domestic animals rearing and milk production, Kunnamkulam can expect to achieve a self-sufficiency. The absence of an authorized slaughter house and functioning of 5 unauthorized slaughter houses pose a threat to the health of the natives of this place.

CHAPTER 10

TRAFFIC AND TRANSPORTATION

Transportation facilities available in a place determine the extent to which a town can grow in future. As the saying goes transportation network is the backbone for development. This chapter contains base line traffic and transportation data and also schematic transport development plan for Kunnamkulam Town. Scientific data and the development proposals provided in this chapter will go a long way in improving the Traffic and Transportation system of the study region and also help in the formulation of future Master Plan for Kunnamkulam Town. Kunnamkulam depends only on road network for transportation.

10.1 Introduction

Kunnamkulam has a well-connected road network. The State highways passing through Kunnamkulam are SH 50 and SH 69. There are also two major district roads passing through Kunnamkulam. These state highways meet at the heart of Kunnamkulam town (Parayil centre) near the Bus stand. Parayil centre is the busiest location due to the intersection of two state highways coupled with the presence of the bus stand. There is no railway line passing through Kunnamkulam Town. The nearest railway station to Kunnamkulam is Guruvayur railway station, 8 km away from Kunnamkulam Town. There is no major river passing through Kunnamkulam Town.

10.2 Existing Road Network of Kunnamkulam Town

i) State Highways

Two major regional roads that pass through Kunnamkulam Town are State highways SH-69 and SH-50. The SH-69 (Thrissur – Kuttippuram) passes through the CBD area of Kunnamkulam and has a length of 5.14 km within the town, the two ends being Kanipayyoor and Parempadam. Police Station junction, Bus Stand junction, Bhavan junction, Devassy junction, Kurushadi junction etc. are some of the major junctions. The land use along the stretch is predominated with commercial activities .The SH 50 (Chavakad - Wadakanchery State Highway), starts from Chattukulam and leaves the municipality at Chowanur. This section has a length of 6.01 km. The land use along this section is mostly residential taking a commercial nature while approaching the CBD of the Town. Average width of State Highway 69 in the Town area is about 20m and that of SH 50 is 12m.

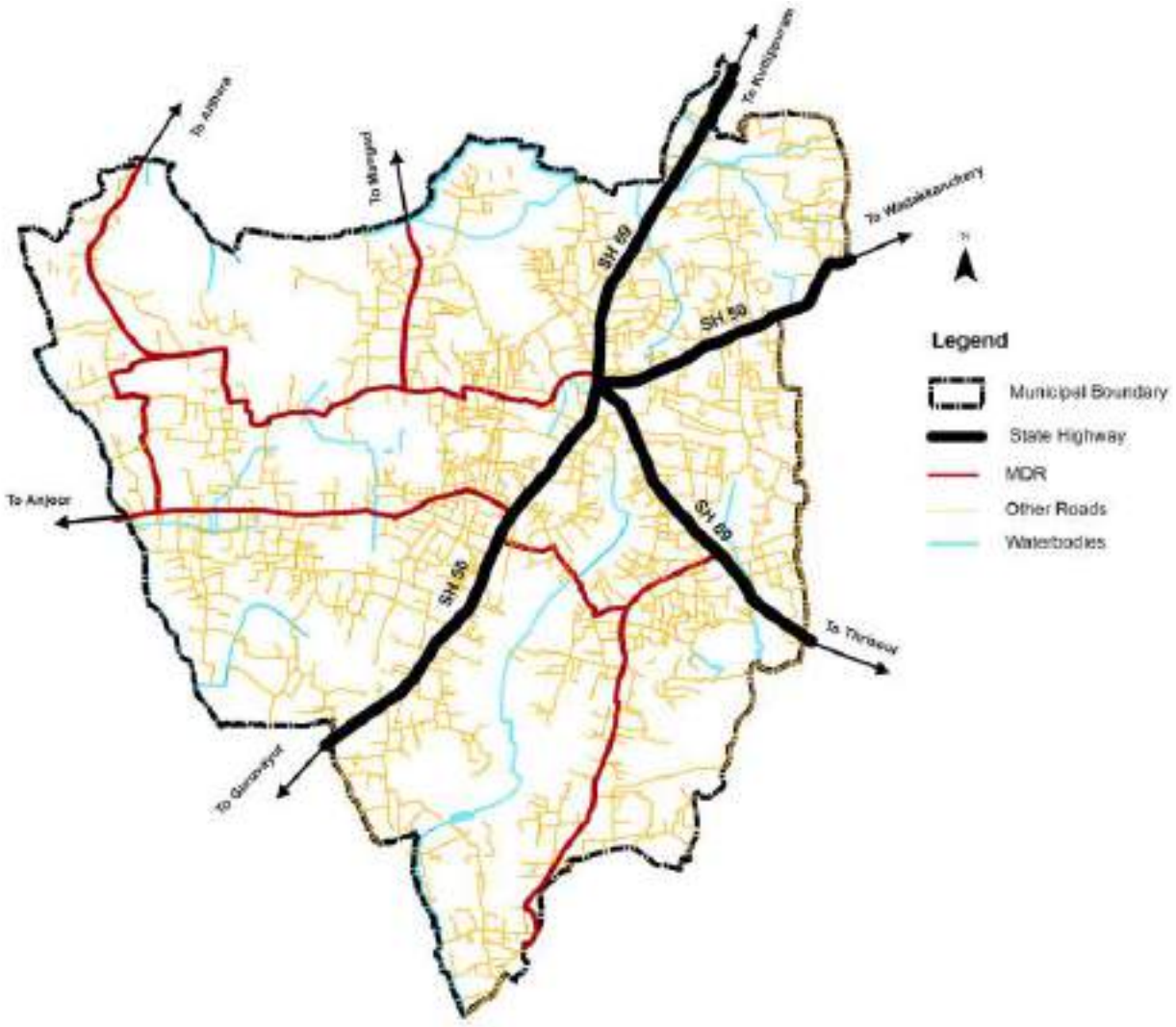


Fig. 10.1 Road network of Kunnamkulam Town

Source: Traffic & Transportation study-2012

ii) Major District Roads

Kunnamkulam Town has many major district roads also which connect Kunnamkulam to other parts of the district. Anjoor road is one of the major roads in the Town, which starts at Kurishupally kavala and leaves the Town at Companypadi bridge. It has a length of 3.17 km. Another major road in the Town is Kanipayoor – Anayikal Road with a length of 3.82 km. It starts from Kanipayoor junction and ends at the Asaripadi junction. Other major roads in the municipality are the Market Road (0.5km), Bhavana Road (1.15km), Kanipayoor old road (0.66km), Malankara Hospital Road (0.45km), Vysseri – Cheruvathani Road (3.99km) etc. The road network of Kunnamkulam Town is shown in the fig 10.1.

10.3 Bus Routes

The major bus routes in the area are two State Highways. There are buses commutating to Kuttipuram, Guruvayoor, Wadakkanchery and Thrissur directions in every 15 minutes. Kunnamkulam – Kattakambal route, Kunnamkulam – Anjoor route and towards Althara buses ply in every 30 minutes. There are bus routes towards Mangad, Pillakkad and Kandanassery, even though the frequency is less. A bus route map of the town is shown in figure 10.2. Apart from the above there are many local roads that connect each and every corner of the town. Majority of the roads are motorable and have conveyance facility in Kunnamkulam Town. This is also given in figure 10.1.

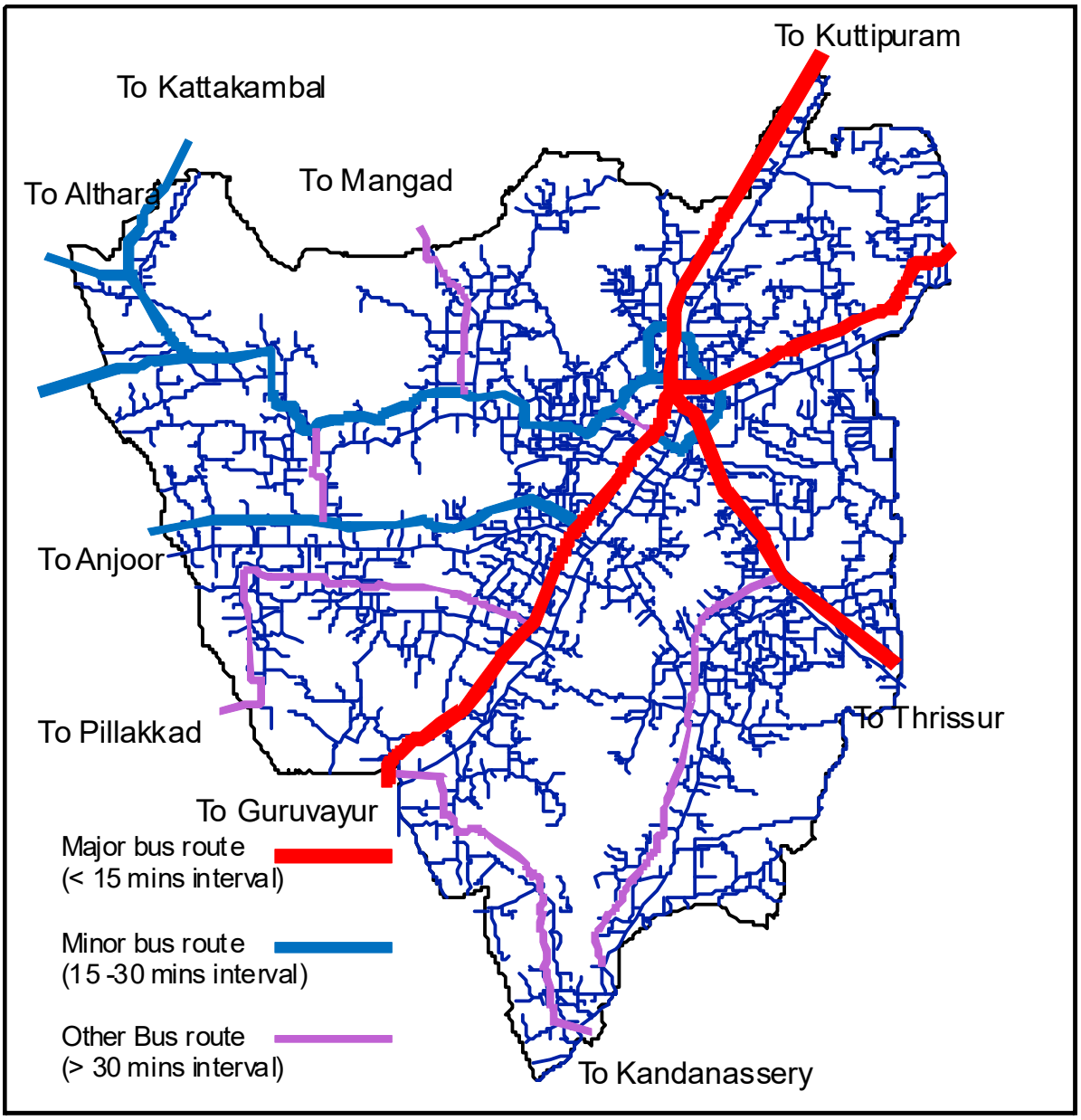


Fig. 10.2 Bus routes

Source: Traffic & Transportation study-2012

10.4 Traffic Surveys

The existing traffic characteristics in Kunnamkulam Town area were studied to identify the main problems and potentials here. To compile necessary inputs for the study, various primary surveys are conducted in the study area. Surveys carried out are as follows

- Speed and Delay Characteristics
- Link Volume Capacity Utilization
- Traffic volume at major intersection
- Parking Characteristics
- Pedestrian Volume

10.4.1 Speed and Delay characterstics

As part of the study, speed and delay survey was carried out on four major road stretches within the Kunnamkulam study area. The study was conducted only on SH stretches.

The Speed and Delay survey was conducted on the SH 69, for a length of 5.15 km, the section being from Kanipayoor Kurishupally to Parempadam. The journey speed for the section was found to be 24.95 kmph against a running speed of 27.14 kmph. The major reasons for the delay is due to heavy traffic congestion and the presence of intersections. On SH 50, the Chavakkad –Wadakkanchery road having a length of 2.32 Km two sections are considered, one is from Bus Stand Junction to Chowannur and the other is from Bus stand junction to Chattukulam. On Chavakkad - Wadakancheri road, the major reasons for delays have been due to heavy traffic congestion. From Bus Stand Junction to Chovannur, the journey speed and running speed were 31.28 kmph and 31.64 kmph respectively, the length of the section being 2.32 km. For the section from Bus stand junction to Chattukulam (3.66 km long), the running speed was 27.97 kmph and the journey speed was 27.11 kmph. The reason for the delay is the presence of intersections, heavy traffic congestion and poor road conditions. The Speed and Delay Characteristics of Major Roads in Kunnamkulam study area are given in Table 10.1. The figure 10.3 shows the delay characteristics of various roads.

Table 10.1 Delay characteristics of various 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:		**SH 69**						
Direction:		**Kanipayoor to Parempadam**						
1	0	Kanipayoor Kurishupally						
2	0.35	Unity Hospital Jn	40	0	40	31.5	31.5	
3	2.3	Oneiro Jn	174	7	181	38.78	40.34	Intersection
4	2.52	Bus Stand Jn	55	5	60	13.2	14.4	Congestion, Intersection
5	2.68	BhavanaJn	49	14	63	9.14	11.76	Congestion, Intersection
6	2.97	Devassyjn	145	0	145	11.17	11.17	Congestion, Intersection
7	5.15	Parempadam	220	34	254	35.01	40.42	Congestion, Intersection
			683	**60**	**743**	**24.95**	**27.14**	
Name of Road:		**Wadakancheri Road**						
Direction :		**Bus Stand Jn to Chowannur**						
1	0	Bus Stand Jn						
2	0.46	Malankara Hospital Road jn	93	3	96	17.25	17.81	Congestion
3	2.32	Chovannur Bus Stop	171	0	171	39.16	39.16	
			264	**3**	**267**	**31.28**	**31.64**	
Direction :			**Bus Stand Jn to Chattukulam**					
1	0	Bus Stand jn						
2	0.26	Municipal Office Road Jn	56	5	61	15.34	16.71	Congestion, Intersection
3	3.66	Chattukulam	415	10	425	28.8	29.49	Intersection, Poor Road Condition
			471	**15**	**486**	**27.11**	**27.97**	

10.4.2. Link Volume and Capacity Utilization

Link Volume - One of the fundamental measures of traffic on a road system is the volume of traffic using the road in a given interval of time. It is also termed as flow and is expressed in vehicles per hour or vehicles per day.

The daily traffic volume has been found to be maximum for the Kurisadi – Parempadam section of Thrissur – Kuttippuram SH amounting to 30,931 PCUs followed closely by Bhavana – Devassy link and police station – Bus stand link. In the Chavakkad – Wadakkanchery road, Town hall –Bus stand junction link possessed the maximum daily traffic in the order of 28,900 PCU followed by Allieds – Town hall junction link with 26700 PCU. For the Anjoor Road the daily traffic was 8700 PCU and for Yesudas road, the daily traffic was about 15000 PCU.

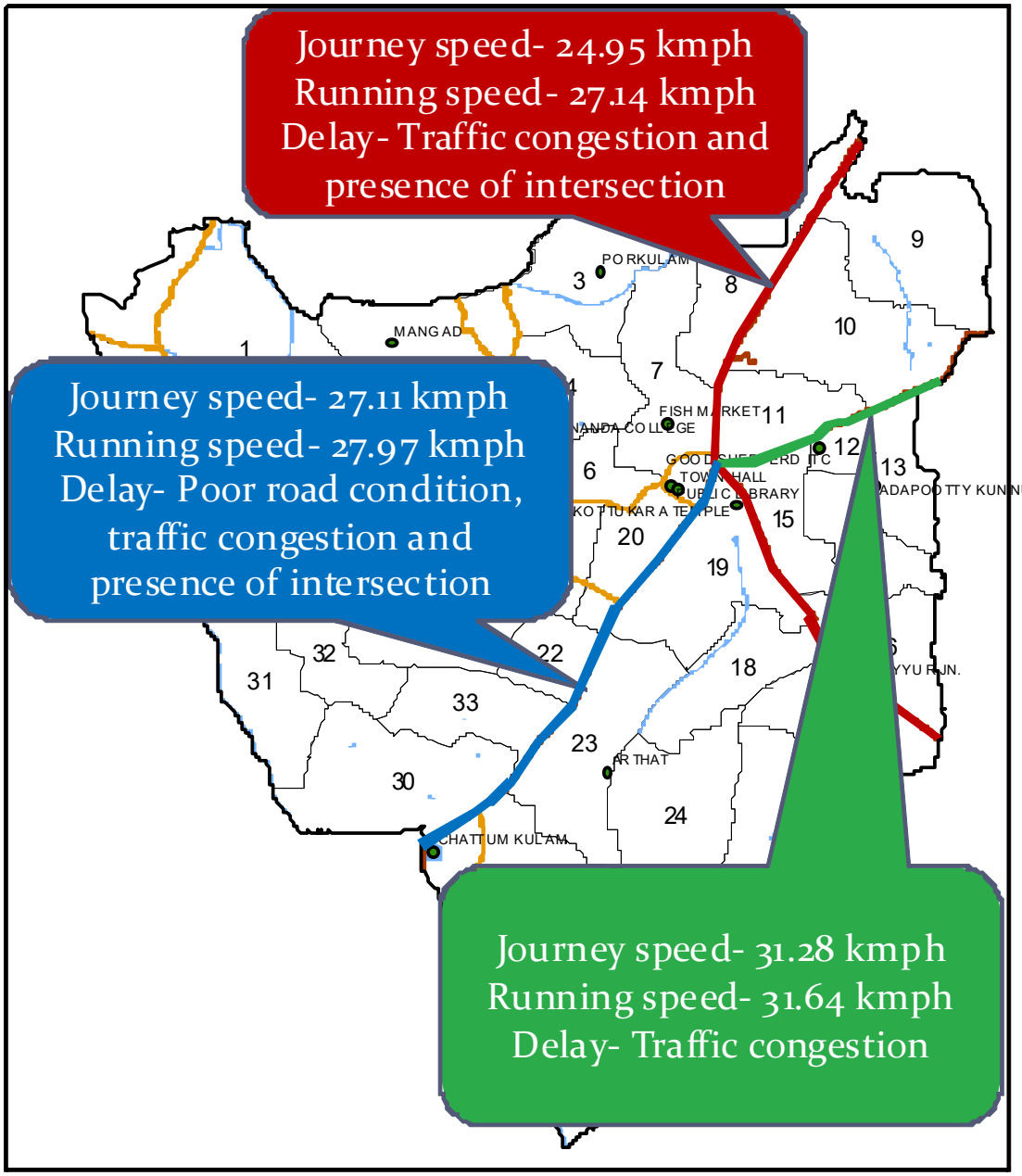


Fig. 10.3 Delay Characteristics of various roads

Source: Traffic & Transportation study-2012

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 Kunnamkulam is given in Table 10.2. Map of Kunnamkulam study area showing the density of traffic on these sections are shown in Figure 10.4.

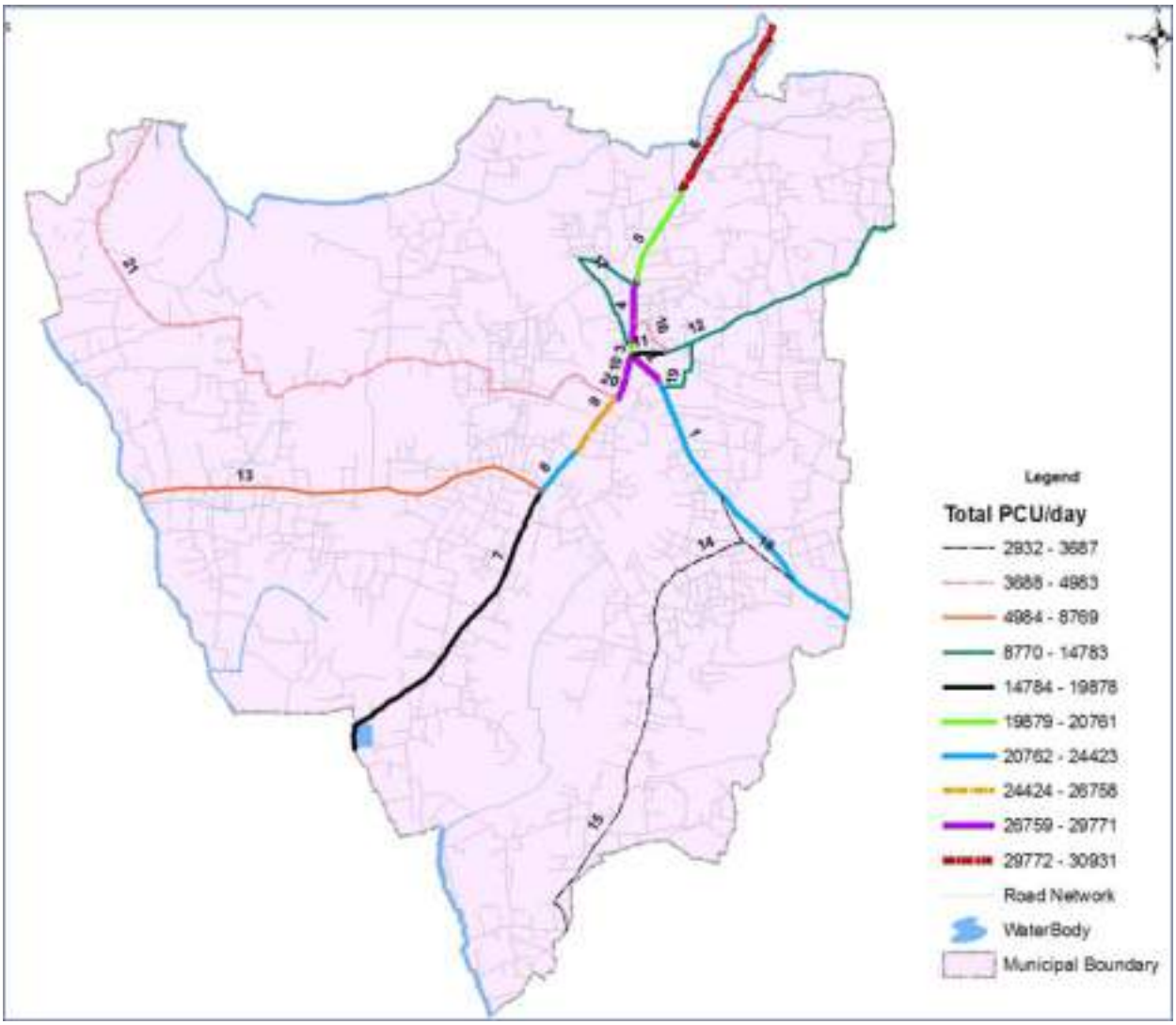


Fig. 10.4 Traffic Volumes in Major Roads

Source: Traffic & Transportation study-2012

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 plying on the road stretch to the capacity of the road stretch. 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 Kunnamkulam Study area is given in Table 10.3. It has been seen that many sections in the study area has been utilized to almost twice its capacity.

Table 10.2 Link Volume

SI No	Road Link	Total	
		Vehicles/day (No)	Total PCU/day
I	Thrissur-Kozhikode Road (SH 69)		
1	Kanipayyor-Police Station Jn	21511	24423
2	Police Staton Jn-Bus Stand Jn	30107	29200
3	Bus Stand Jn-BhavanaJn	20082	20761
4	BhavannaJn-DevassyJn	31611	29771
5	DevassyJn-Kurisadi	23473	20151
6	Kurisadi-Parempadam	27574	30931
II	Guruvayur-Wadakkanchery Road		
6	Chattukulam-Kurisupalli	18476	19256
7	Kurisupalli-Allieds	23899	24323
8	Allieds- Town Hall Jn	27639	26758
9	Town Hall Jn-Bus stand Jn	29166	28922
10	Bus stand- Senior Ground Jn	23335	19878
11	Senior Ground Jn-Chowannur	15369	13625
III	Anjoor Road		
12	Kurisupalli-Anjoor	10444	8769
IV	Kanipayyor-Anaykkal Road		
13	Kanipayyor-Anaykkal	4022	3353
13	Anaykkal-Asaripadi	3691	2932
v	Other Roads		
14	Market Road	3122	4983
15	Yesudas Road	10462	14783
16	Kanipayyoor old Road	4397	3687
17	Malankara Hospital Road	8350	12552
18	Vysseri-Cheruvathani Road	4774	4120

Source: Traffic & Transportation study-2012

Table 10.3 Volume Capacity Ratio

Road/ Link No:	Road Link	Capacity (PCU/day)	Volume (PCU/day)	Volume-Capacity ratio
I	Thrissur-Kozhikode Road (SH 69)			
1	Kanipayoor-Police Station Jn	15000	24423	1.63
2	Police station Jn-Bus stand Jn	15000	29200	1.95
3	Bus stand Jn-Bhavana	15000	20761	1.38
4	BhavanaJn-DevassyJn	15000	29771	1.98
5	DevassyJn-Kurisadi	15000	20151	1.34
6	Kurisadi-Parempadam	15000	30931	2.06
II	Guruvayur-Wadakkanchery Road			
7	Chattukulam-Kurisupalli	15000	19256	1.28
8	Kurisupalli-Allieds	15000	24323	1.62
9	Allieds-Town Hall Jn	15000	26758	1.78
10	Town Hall Jn-Bus stand Jn	15000	28922	1.93
11	Bus stand Jn-Senior Ground Jn	15000	19878	1.33
12	Senior Ground Jn-Chowannur	15000	13625	0.91
III	Anjoor Road			
13	Kurisupalli-Anjoor	9000	8769	0.97
IV	Kanipayoor-Anaykkal Road			
14	Kanipayoor-Anaykkal	9000	3353	0.37
15	Anaykkal-Asaripadi	9000	2932	0.33
V	Other Roads			
16	Market Road	14000	4983	0.36
17	Yesudas Road	9000	14783	1.64
18	Kanipayyoor old road	9000	3687	0.41
19	Malankara Hospital road	9000	12552	1.39
20	Vysseri-Cheruvathani road	9000	4120	0.46

Source: Traffic & Transportation study-2012

10.4.3 Traffic volume at major intersection

Based on the reconnaissance survey, turning movement surveys at 9 major intersections in the study area were conducted to ascertain the peak hour demands. These 9 intersections are either with SH 50 or SH 69. The one and only one intersection which does not include SH 50 or SH 69 is the Kanipayyur intersection that is the Kanipayyur old road and Koonamuchi Road. The Bus stand Junction witnessed the maximum peak hour traffic flow of 4626 PCU followed by Kurisadi inter section. For the other intersections, the peak hour traffic flow varied between 350 to 3700 PCU.

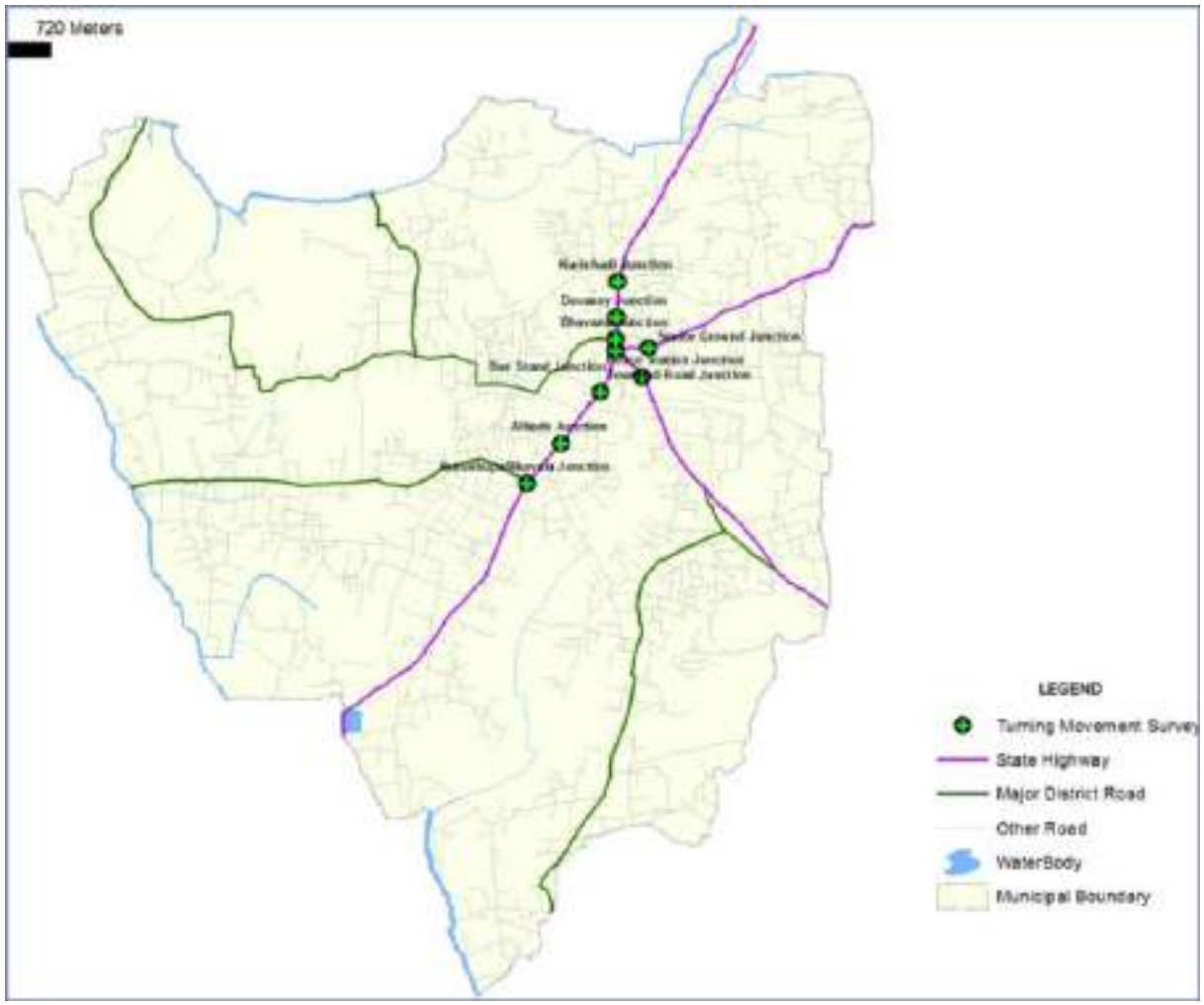


Fig. 10.5 Traffic Volume at Major Intersections
Source: Traffic & Transportation study-2012

10.4.4 Parking Characteristics

Parking surveys were carried out on major road sections of Kunnamkulam 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 10.4

Table 10.4 Locations Identified for Parking Demand Survey in Kunnamkulam

Sl.No.	Road / Location
1	Kunnamkulam To DevassyJewellery (Kozhikode Road)
2	Kunnamkulam Bus Stand Road To Kunnamkulam Municipality (Kozhikode Road)
3	Petrol Pump to Tempo Stand on Guruvayur Road
4	Bhavana Road
5	Wadakkanchery road - National Roads
6	Bus Stand to Police Station Junction (Thrissur Road)
7	Wadakkanchery Road - bus stand Junction to Bus Stand
8	Wadakkanchery Road - SBT to Market Senior Ground Junction

Source: Traffic & Transportation study - 2012

The Wadakkanchery road (from Market to National trading), is a major hub for parking. A total of 356 vehicles, consisting of 215 two wheelers, 77 passenger cars and 33 auto rickshaws were found to be parked in this road. In the Wadakkanchery Road upto Bus Stand junction, 281 vehicles were parked and in the Bus Stand to Kunnamkulam Municipality road section (along Guruvayur Road), a total of 115 vehicles were parked. A total of 102 vehicles, comprising of 22 cars, 20 passenger auto rickshaws, 56 two wheelers and three Goods Autorickshaws were parked in Kunnamkulam to Devassy Jewellery (Kozhikode Road) section. The Map Showing Locations Selected for Parking Survey in Kunnamkulam Town is seen in Figure 10.6.

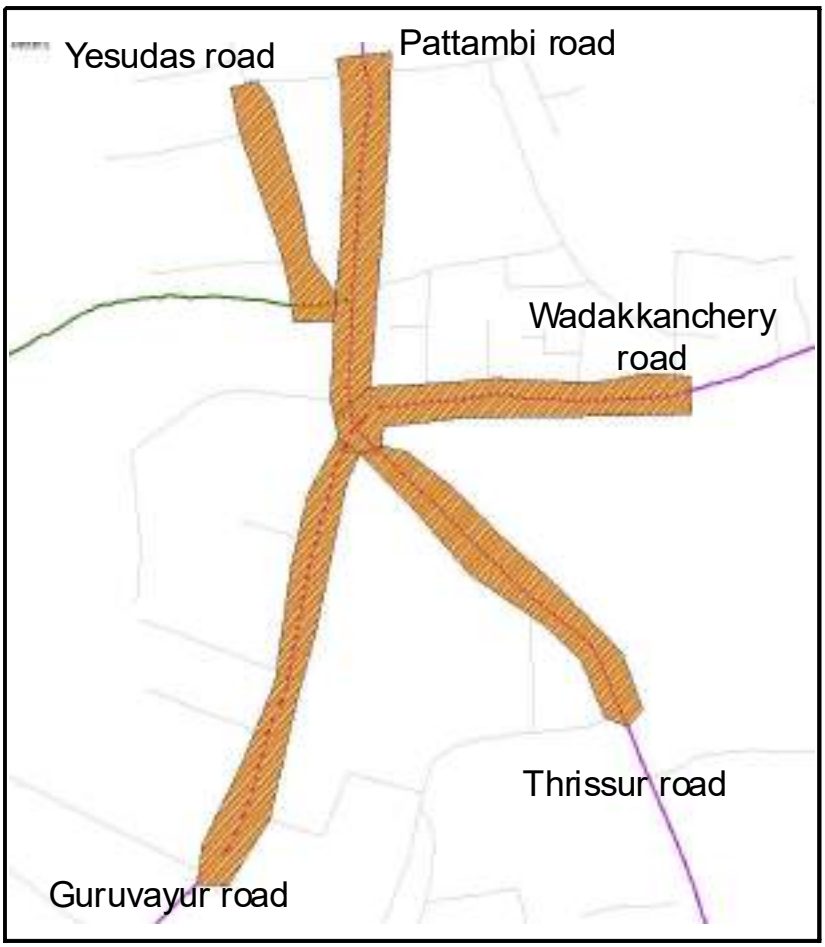


Fig. 10.6 Location selected for parking survey in Kunnamkulam town

Source: Traffic & Transportation study-2012

Majority of the vehicles parked at most of the parking corridors were found to be for short duration of less than 30 minutes. 60 to 70 per cent of the vehicles parked on selected parking corridors were found to be parked for duration less than 30 minutes. 10 to 25 per cent of these vehicles were parked for a period ranging between 30 minutes and one hour. Long duration vehicles constituted only around ten percent of the total vehicles.

10.4.5 Pedestrian Volume

Pedestrian surveys were conducted at major locations where the pedestrian cross movements were found to be high. This survey was conducted at 7 locations in the state Highways and major district roads and most of them were in and around the bus stand area. Analysis of the pedestrian cross movement at major activity/traffic generation areas revealed that a maximum of 1267 pedestrian movements occurred in Wadakkanchery Road to Bus Stand Junction. Also high volume of pedestrian cross movements, occurred at Kozhikode Road - Bus Stand Junction, Wadakkanchery Road to Bus Stand Entry, Thrissur Road to Bus Stand Junction. The locations selected for pedestrian cross survey and the pedestrian cross movements at these locations at peak hours is given in table 10.5 and in figure 10.7.

Table 10.5 Peak hour pedestrian crossing

SI No	Name of Location	Peak Time	No.of Pedestrians		
			Up	Down	Total
1	Kozhikode Road-Bustand Junction	8.30 AM to 9.30 A.M	634	294	928
2	Wadakkanchery Road-Bus stand Junction	8.45 AM to 9.45 AM	805	462	1267
3	Thrissur Road-Opposite Taxi stand	9.00AM to 10 AM	381	280	661
4	Guruvayoor Road-Bus stand Juntion	8.45 AM to 9.45 AM	273	341	614
5	Thrissur road-Bus stand Junction	8.45 AM to 9.45 AM	449	272	721
6	Wadakkanchery Road-Near Bus stand Entry	10 AM to 11 AM	392	479	871
7	Guruvayoor Road-Town hall road junction	8.30 AM to 9.30 A.M	69	164	233

Source: Traffic & Transportation study-2012,

10.5 Characteristic of Inter Town Passenger Trip

The inter-town passenger transport in Kunnamkulam is met through roads mostly by KSRTC buses, private buses, mini-buses, and a host of personalized vehicles like four-wheelers, two-wheelers etc. An analysis of the O-D survey data collected from outer cordon survey locations revealed that an estimated 477,431 inter-town passenger trips were performed in the study region on a reference day consisting of 280,950 bus passenger trips , 53,625 mini-bus trips, 69,711 car trips, 49,716 two-wheeler trips and 23,429 auto trips. It could be inferred that public transport has a significant role in meeting the inter-town passenger demand. Figure 10.8 presents the modal split of inter-town passenger traffic in Kunnamkulam in a pie diagram.

A total of 477,431 passenger trips were performed as inter-town trips in the study region on a reference day. The major traffic generating zones within the study region was the CBD area with 108,882 trips constituting 22.81 per cent of the total trips. About 35000 trips were generated from the remaining area of Kunnamkulam Town and remaining Thrissur district generated 2.28 lakh trips and trips generated from other districts were of inter-town passenger traffic revealed that there were 1.43 lakh internal - external trips (Study region to outside study region), out of 4.77 lakh inter-town passenger trips and constituted 30.12 per cent of total trips. A total of 1.51 lakhs trips were external – internal trips (outside study region to study region) constituting 31.69 per cent of the total trips. External – external trips to the tune of 1.82 lakhs trips were performed through the study region and they were 38.2 per cent of the total trips. As part of decongesting the town area the thorough traffic from southern districts to the northern districts that amounts to a big figure may be diverted. Also there is considerable by

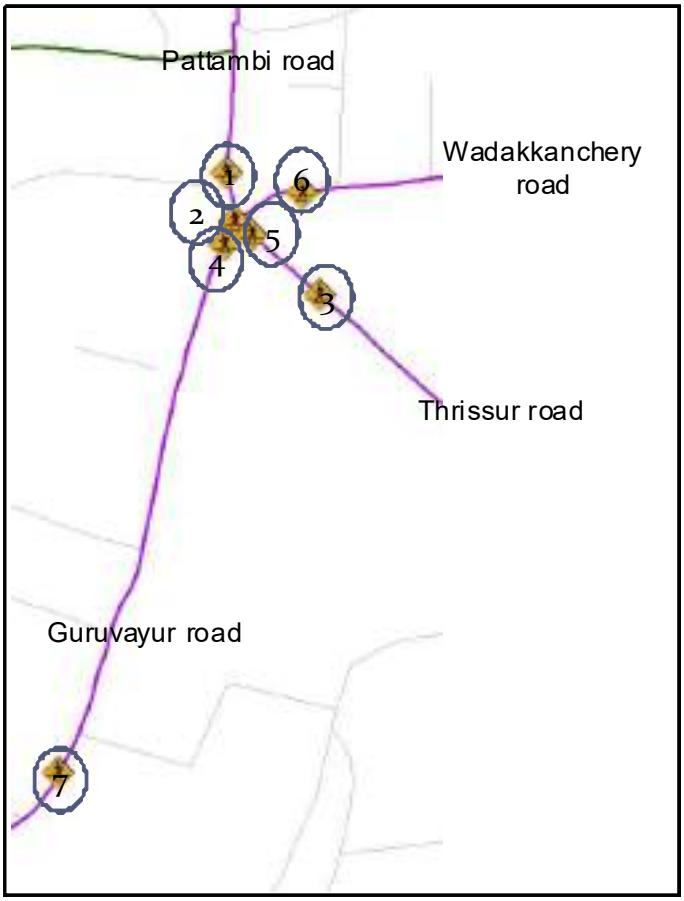


Fig. 10.7 Locations of Pedestrian Survey

passable traffic from eastern side to western destinations which could be by passed. The pattern of inter town passenger trip of Kunnamkulam Town is given in fig 10.9.

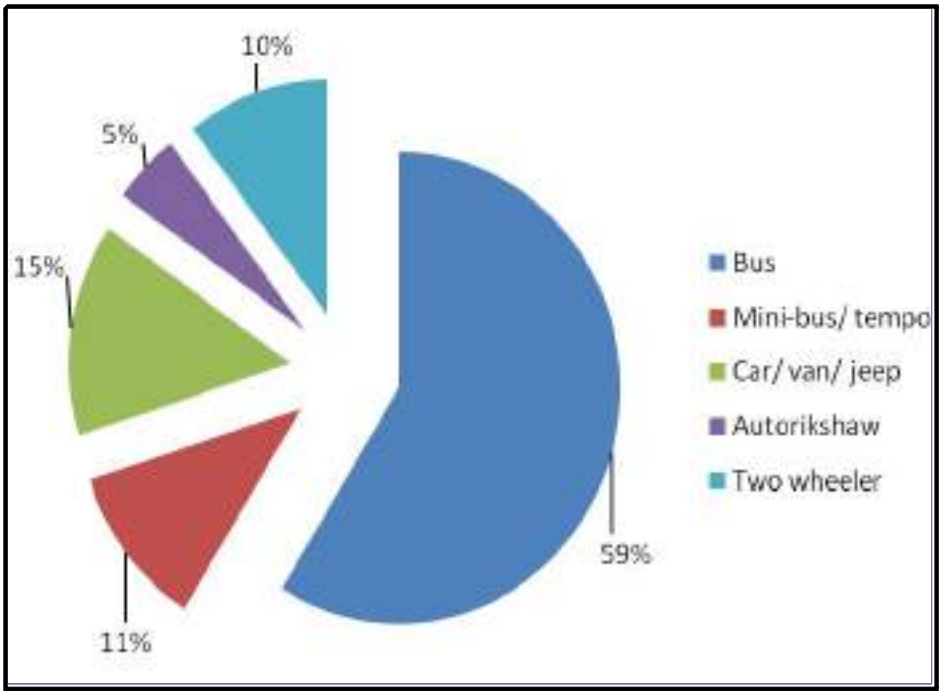


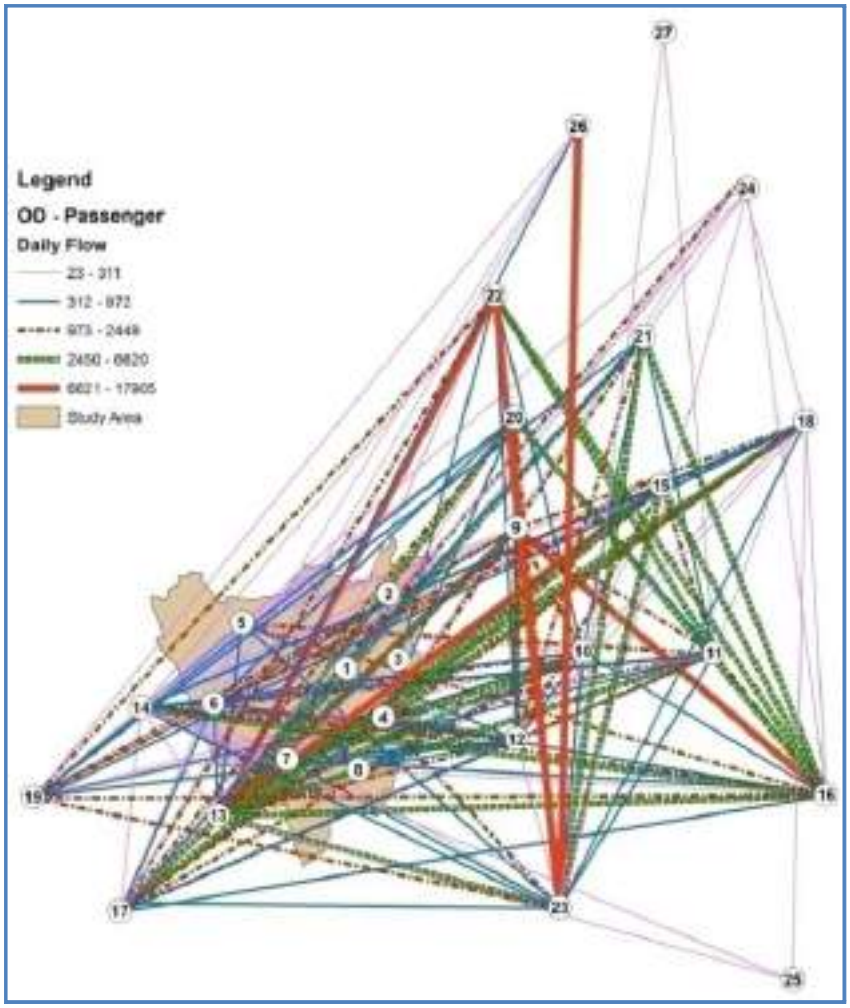
Fig. 10.8 Inter town Passenger Traffic

Source: Traffic & Transportation study-2012

10.6 Characteristics of Inter-town Goods Traffic

Goods traffic comprised of a greater volume of the total traffic which forms an inevitable path in the development scenario. A total of 10,661 goods vehicles passed through the outer cordon points in Kunnamkulam town on the reference day. The total goods volume comprised of 3554 trucks followed by 3751 Mini trucks and 3356 goods autorickshaws. The quantum of goods handled by the goods vehicles was to the tune of 21350 tonnes. Trucks carried the maximum volume of goods traffic (76.03%), followed by mini-trucks (18.47%). The remaining seven per cent of goods traffic was handled by goods autos. The Spilt of inter-town Daily Goods Traffic in Kunnamkulam area is shown fig 10.10.

Inter-town movement of goods to the tune of 21350 tonnes was carried out over the study region. The major traffic generator of goods traffic within the study region was the CBD area with 1308 tonnes (6.13%) most of them bound for other Districts within the State. A total of 4277 tonnes of goods traffic was generated from remaining Thrissur area. Goods generated from other districts formed 45.83% of the total volume, while the goods generated from other states was to the tune of 5781 tonnes.



1	Kunnamkulam CBD
2	Parempadam
3	Chowannur
4	Kanipayyoor
5	Vysseri and Keezhoor
6	Anjoor
7	Arthat
8	Chemmannur
9	Perumpilavu & Pazhanji
10	Pannithadam
11	Vadakkanchery
12	Kechery
13	Guruvayoor
14	Vadakkekad & Anjoor
15	Pattambi
16	Thrissur side
17	Thrissur -Kunnamkulam side
18	Rest of Palakkad
19	Thrissur-Vadanapalli side
20	Edappal,Changaramkulam
21	Rest of Malappuram
22	Other Northern Districts
23	Southern Districts
24	Tamil Nadu North side
25	Tamil Nadu South side
26	Karnataka & Andra Pradesh
27	Other States

Fig. 10.9 Pattern of Inter town Passenger Traffic

Source: Traffic & Transportation study - 2012

In the case of goods traffic attraction, CBD area had the dominant share with 2022 tonnes. Among the external zones, 19.33% of the traffic terminated in Thrissur District, while 61.31% formed the volume to other districts. Goods bound to other states were 1720 tonnes constituting to 8.06% of the total volume. The desire lines of inter-town goods traffic is shown in Figure 10.11.

A further study of the goods traffic pattern observed within the study region vis-a-vis the outside study region revealed that 1486 tonnesie 6.96% of total goods originated from the study region and 11.09% tonnes of goods terminated in the study region. About 17496 tonnes (81.95%) of traffic are of divertable nature, which, are passing through the CBD area of the town

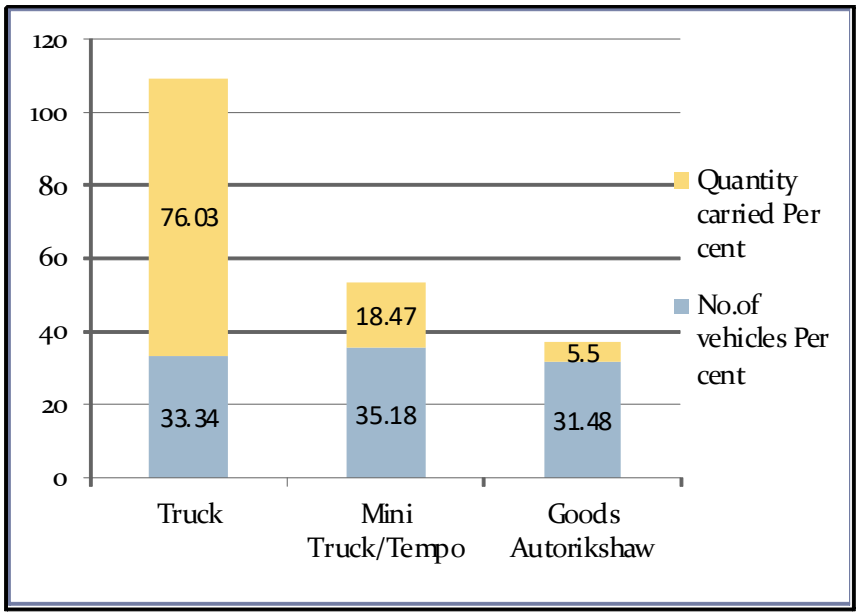
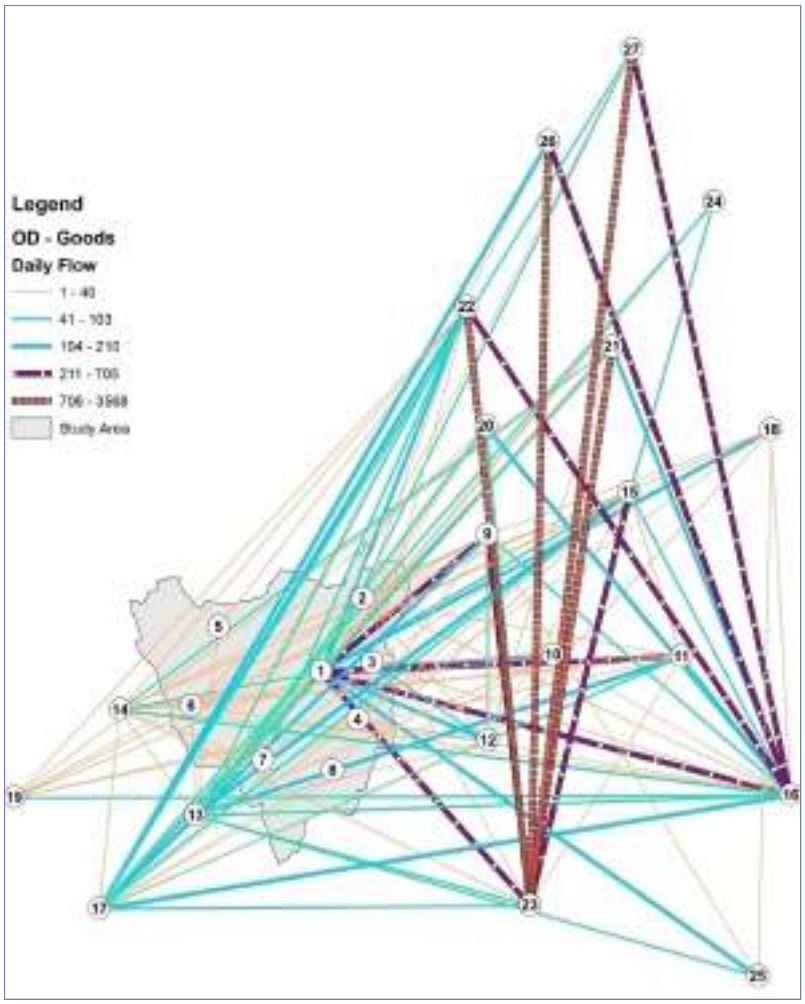


Fig. 10.10 Inter town Goods Traffic

Source: Traffic & Transportation study-2012



1	Kunnamkulam CBD
2	Parempadam
3	Chowannur
4	Kanipayyoor
5	Vysseri and Keezhoor
6	Anjoor
7	Arthat
8	Chemmannur
9	Perumpilavu & Pazhanji
10	Pannithadam
11	Vadakkanchery
12	Kechery
13	Guruvayoor
14	Vadakkekad & Anjoor
15	Pattambi
16	Thrissur side
17	Thrissur -Kunnamkulam side
18	Rest of Palakkad
19	Thrissur-Vadanapalli side
20	Edappal,Changaramkulam
21	Rest of Malappuram
22	Other Northern Districts
23	Southern Districts
24	Tamil Nadu North side
25	Tamil Nadu South side
26	Karnataka & Andra Pradesh
27	Other States

Fig. 10.11 Pattern of Inter town Goods Traffic

Source: Traffic & Transportation study-2012

Out of the 21350 tonnes of inter-town goods traffic observed through outer cordon survey stations, maximum volume of 4800 tonnes movements were observed in the case of industrial goods which amounted to 22.48 percent, followed by construction materials with 22.33 percent and agricultural products with 21.4 percent.

10.7 Inference

As far as Kunnamkulam is concerned, the Parayil centre or the Bus stand junction is the most busiest location and the reason is mainly attributed to the intersection of two state highways coupled with the presence of the bus stand. The main problems related to traffic and transportation, faced by the Kunnamkulam Town is listed below.

i) Highly conflicting traffic movement at the bus stand junction

ii) Heavy movement of vehicular traffic along the SH 69 as well as SH 50;

iii) Inter-mixing of intra-town and inter-town traffic on the major road corridor in the absence of alternate road links;

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

v) Movement of inter-town bus traffic due to the location of inter town-bus station within the central area of the town;

vi) Encroachment of right-of-way by hawkers, parking of vehicles; and

vii) High safety risk to pedestrian movement near the bus stand area

viii) Absence of adequate design for major junctions along the major roads.

Since the most important problem of Kunnamkulam town is high traffic load along the SH 69, especially near the CBD area, emphasis is given to develop alternative links to divert the by - passable traffic passing through the stretch. This would also help to reduce the inter mixing of intra-town and inter-town traffic on roads within the central part of the town.

The major intersections along the roads also need to be improved and suitable designs are to be made to increase the efficiency level of these intersections. Special emphasis should also be given to improve the pedestrian facilities and also developing off-street parking lots.

CHAPTER 11

DRINKING WATER

Availability of safe potable drinking water has become the major concern of all the communities in the whole world. This chapter analyses the existing status and development issues of provision of Drinking water in the Town area. Availability of drinking water, good sanitation and pollution free environment are the three essential factors of a healthy society. Generally health and sanitation are linked to safe drinking water. Pollution of the existing water courses is a major problem in the global context.

11.1 Introduction

From time immemorial the people residing in Kunnamkulam Town area and surrounding Panchayats depended on wells for drinking water.Average annual rainfall of Kunnamkulam Town area is 3092 mm, even then people experienced scarcity of water and they had to depend on water supplied through lorry for drinking purpose. Then a water supply scheme was commissioned in 1974 which could reduce the scarcity to some extent.

11.2 Existing scenario

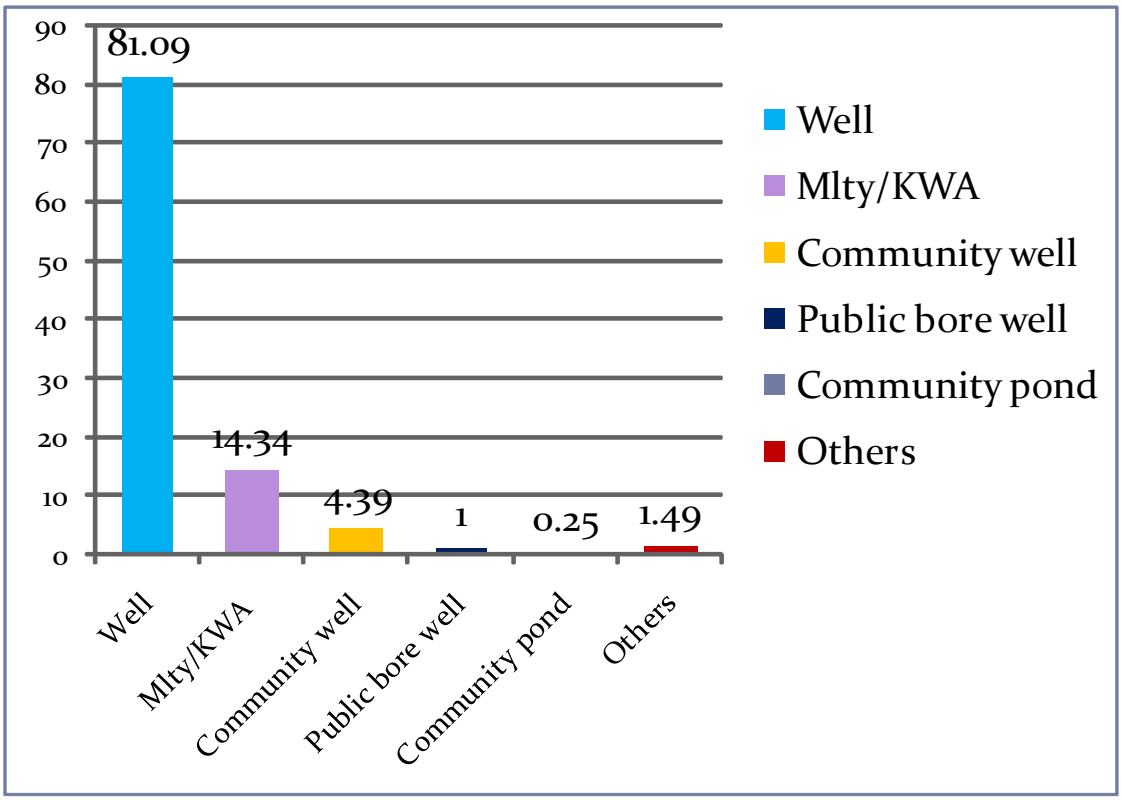


Fig 11.1 Source of drinking water in Town area

Surface sources, ground water sources and rain water collected from roof of buildings meet the water requirement for different purposes i.e.,domestic needs, industrial & commercial needs, institutional needs, fire-fighting, livestock, public purpose, agricultural needs etc. The principal sources of water for domestic use are open wells. In Kunnmakulam 81% of the people depend on well for drinking water and 14.34% of the people depend on water supplied by the water authority (fig 11.1). The principal sources of water for domestic use are open wells and bore wells. There are 55 Bore wells and 110 open wells in the Town. Kerala Water Authority supplies drinking water by way of two schemes. One is Kunnamkulam – Guruvayur water supply scheme (KGWSS) and the other is Chavakkad water supply scheme(CWSS). But these two together do not cover the whole of the town area. At present only the old town area is covered that too the supply is only once a week. The source for these two schemes is the Bharathapuzha River.

11.2.1 Distribution Network

Water from the intake is taken to the treatment plants located at Thrithala and Koottanadu and supplied to Kunnamkulam, Guruvayur, Chavakkad Towns and the ten near by Grama Panchayats. The water from Thrithala water treatment plant (KGWSS) and Koottanadu water treatment plant (CWSS) are stored at a sump. The above stored water is supplied to an Over head (OH) tank of 5 lakh litre capacity near YMCA (KGWSS) and two other OH tanks related to CWSS situated inside the Police quarters and KWA Office compound. The water is treated through rapid sand filtration.The treated water is enough to be supplied to the old municipal area once in a week. The water from Pavaratty water supply scheme (PRWSS) is also used under necessary situations.

Table 11.1:Detail of water supply tanks

Nature of Tank	Capacity	Place
OH Tank	5 Lakh litre	YMCA Road Cherlayam
	5 Lakh litre	Inside Police Quarters
	1 Lakh Litre	KWA office compound

Source: KWA-2012

The total quantity of water supplied by KWA is about 1.1MLD. The details of OH tanks are given in the table 11.1. The distribution network is shown in figure 11.2.

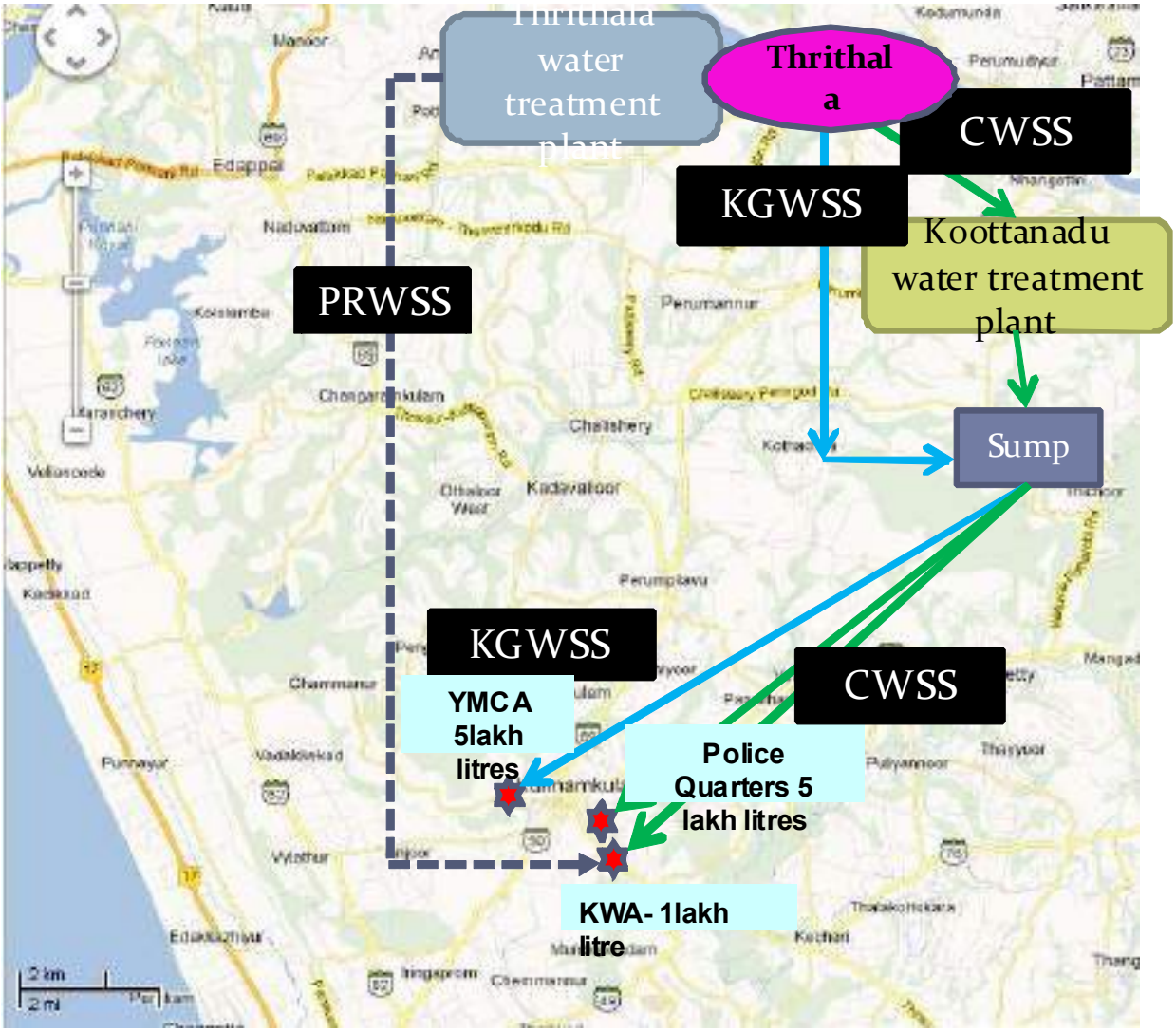


Fig. 11.2 Distribution network

Source: KWA-2012

11.2.2 Water scarcity

Kunnamkulam town is facing the problem of water scarcity during summer season. Water table is receding in the city and the average GWL is 10.65m below ground level. Granite impervious layer of rock can be seen 10m below G.L and hence the possibility of artificial recharging is less. 81.09% of the people depend on well for drinking water and

hence this poses a big threat to this sector here. The requirement of drinking water in this town is around 5 MLD and the actual supply is only 1.1MLD and this also adds to the scarcity issue.

Socio economic survey reveals that out of 14% using municipality / KWA water, 5.47% of the families have duration of water supply less than one hour and nearly 3.93% of people experience scarcity for more than 6 months. A study regarding the proximity of water sources to households conducted in Socio economic survey reveals that in Kunnamkulam Town area almost 100% of population has water sources within 0.5km from their houses. It also reveals that 15.67% of families suffer from water shortage at least for 1-2 months. To put in a nutshell 33% of people experience water scarcity. Details are given in figure.11.3

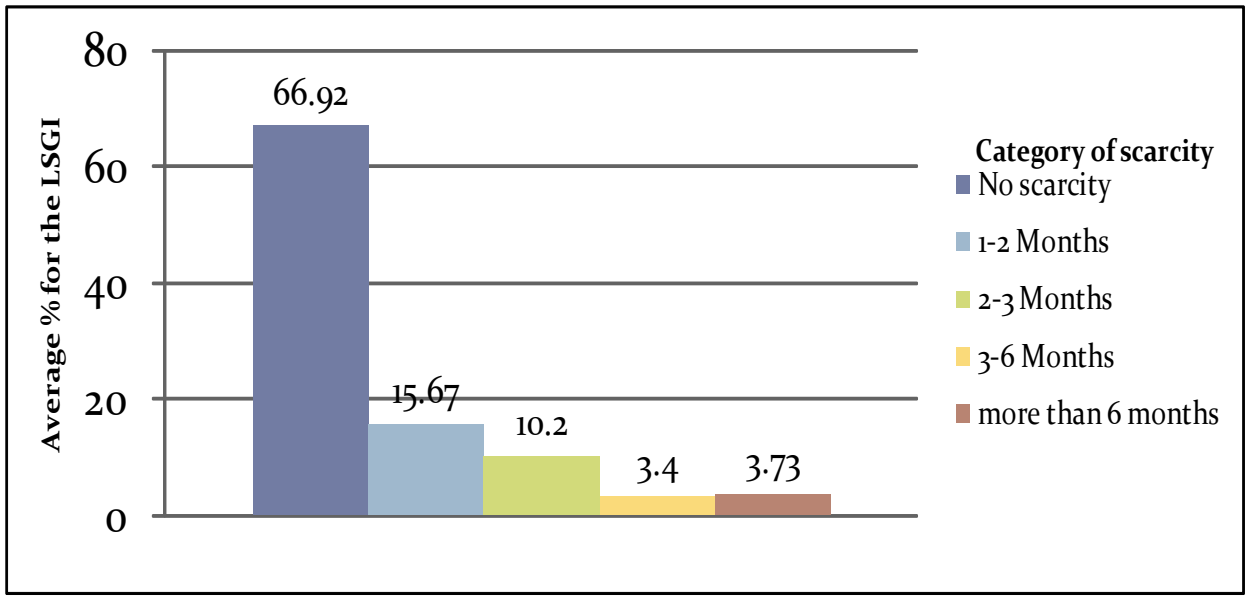


Fig 11.3 Nature of water scarcity

Source: Socio economic survey-2012

The socio economic survey and local level analysis conducted at Kunnamkulam Town area reveals that wards 13 and 27 experiences water scarcity throughout the year and the wards Inchikunnu(26) andPorkalangad (25)areas experiences water scarcity from January to June. The ward wise distribution of water scarcity as seen from socio economic survey is given in figure 11.4.

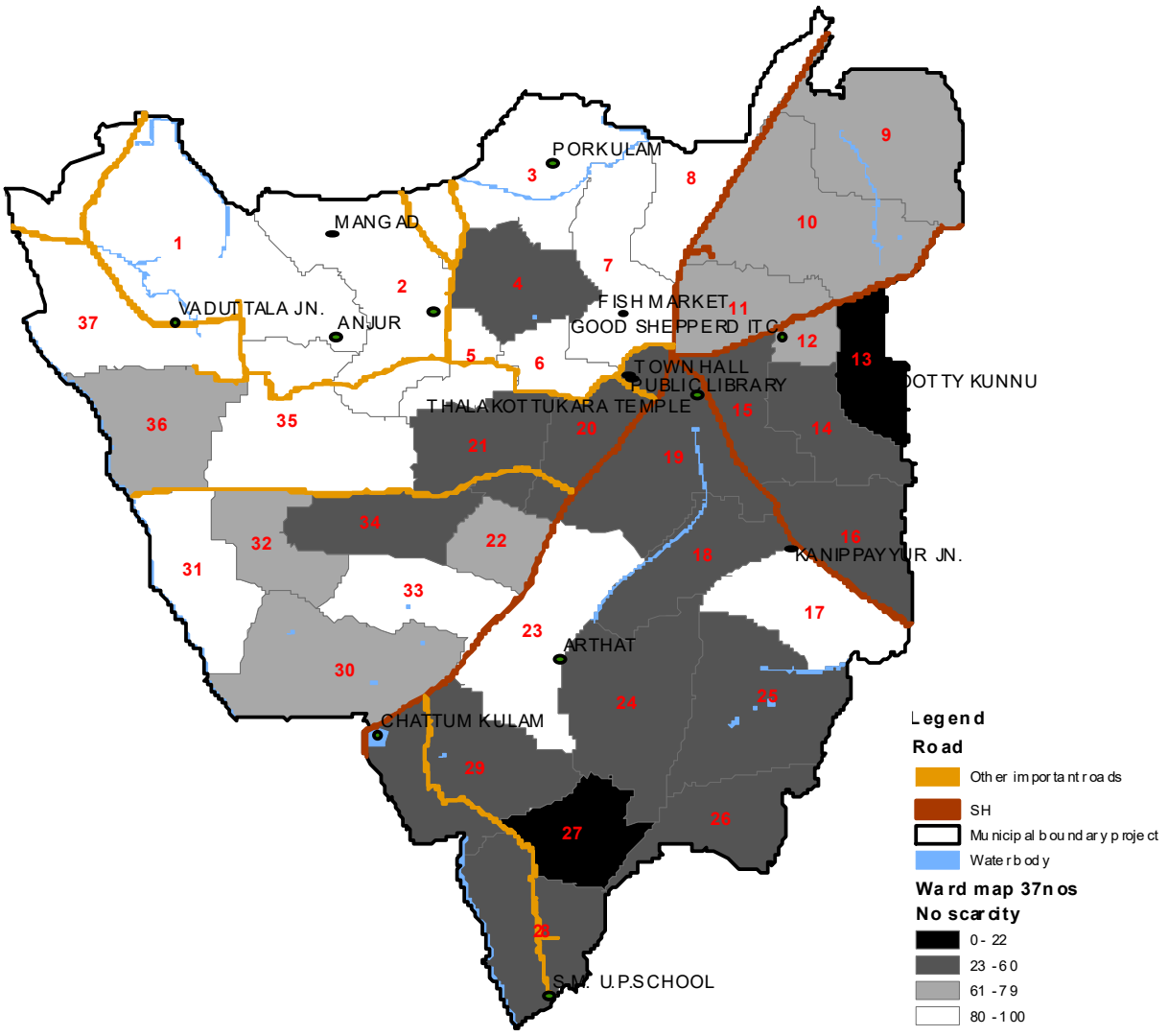


Fig. 11.4 Ward wise distribution of water scarcity

Source: Socio economic survey-2012

11.3 Inference

On a detailed analysis of the above factors it can be divulged that Kunnamkulam Town area is under severe water shortage especially in summer season. The water supply from KWA is found to be insufficient in meeting the needs of people. Water is supplied to old municipal area only. Most people depend on well and bore well for their domestic use. Hence routine maintenance of open and bore wells have to be done.More projects have to be introduced for meeting the water demand of people in the area. Water storage capacity can be increased by introducing overhead water tanks. Alternate water supply schemes utilising the local sources should be explored. Two such sources are Chattukulam and the quarry ponds in Kurukkanpara.

CHAPTER 12

SANITATION

Sanitation is an important segment which when ignored can lead to a sporadic situation. The recent outbreaks of certain viral diseases points to the contamination of the surroundings. Cleanliness both of personal and the environs alone can yield a healthy community. This chapter deals with the various issues related to sanitation in this town.

12.1 Introduction

Waste is the unwanted or useless materials generated from combined residential, industrial and commercial activities in a given area. This can be either solid or liquid. Management of waste reduces or eliminates adverse impacts on the environment and human health and supports economic development and improved quality of life. A number of processes are involved in effectively managing waste for a municipality. These include monitoring, collection, transport, processing, recycling and disposal. Liquid waste treatment becomes very important as it can cause contamination of water sources, soil and air. The existing status and the various measures adopted to tackle it are discussed below.

12.2 Existing status

In 1991 and 1996, the generation and collection of solid waste were less owing to the small area of the town and low residential density. While in 2001, solid waste generation has increased due to the increase of town area. But collection did not extend to the added Panchayats. In 2001, 55% of the solid waste is reported to be bio-degradable and the balance is non bio-degradable (35%) and hospital waste (10%). Kunnamkulam being a commercial centre, it is not free from the plastic menace which is a real threat to the future of Kunnamkulam residents. 100% of the collected solid waste is disposed off by sanitary land filling method and they have an exclusive trenching yard and it is properly maintained.

12.2.1 Solid waste disposal system

The old town area of Kunnamkulam having an area of 6.96 sq.km has centralized solid waste collection system. As of now a door to door collection by Kudumbasree unit is practicing here. About 10 Ton waste is generated in the old town area, out of which 50% is

collected. The collection is done at every street by the 55 workers employed for this purpose with one tractor having a capacity of 1ton. Out of total waste collected 70% are bio-degradable, 20% are non-biodegradable and 10% are inert as the data collected from the municipality depicts (2012).

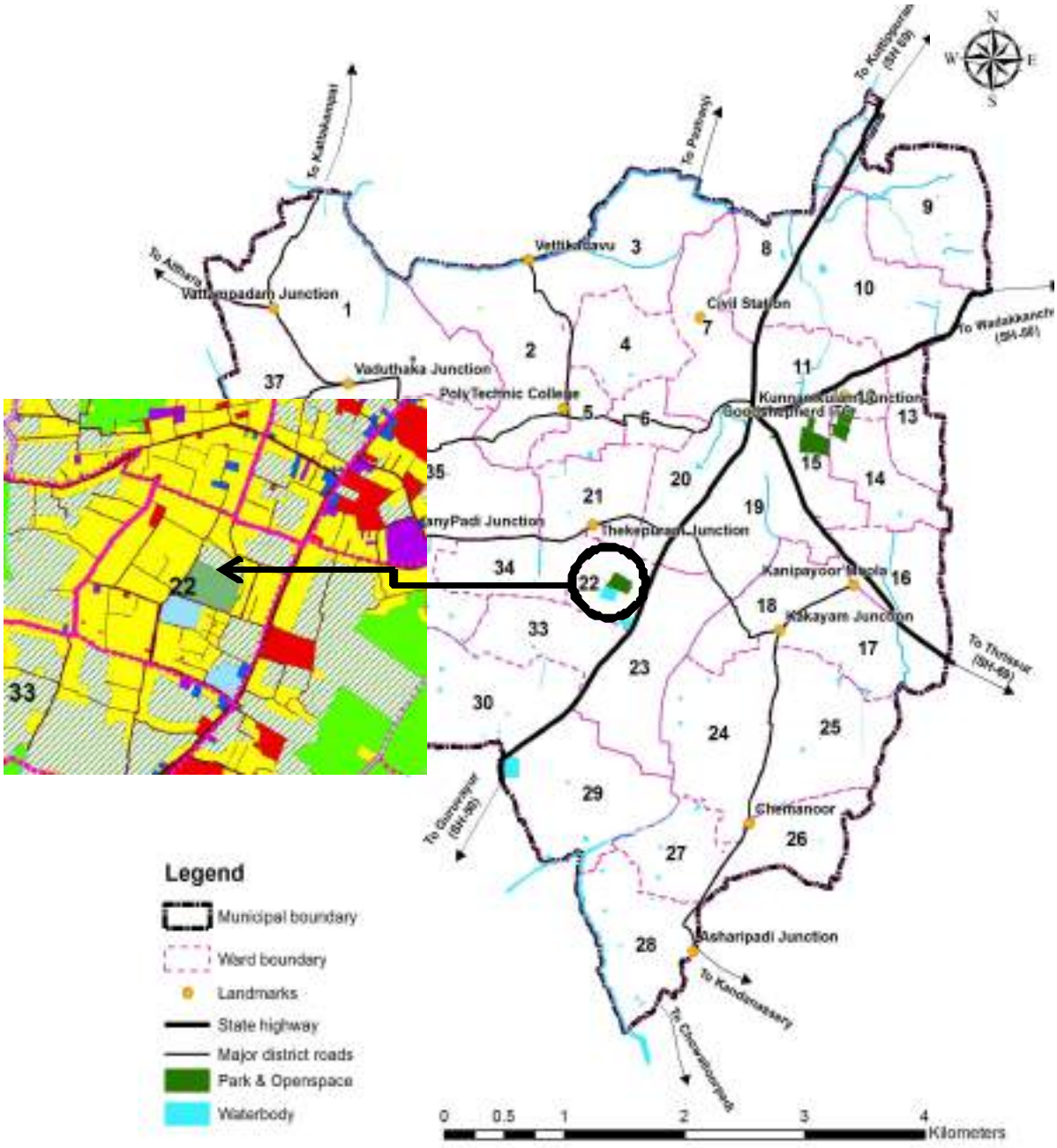


Fig. 12.1 Trenching ground at Kurukkanpara

Source: Landuse survey 2012

Kunnamkulam Town is operating a municipal waste disposal site with an extent of 4.25 acres at Kurukkanpara. Location is shown in figure 12.1. A total of 5T of unsegregated waste is transported to the site which is converted into compost. Kunnamkulam

Municipality has initiated a project of windrow composting system with shredding unit at Kurukkanpara trenching ground. This UIDSSMT project was approved by suchitwa mission in 2009. The design year of the project is 2016. The capacity of the processing unit is 15 Tons of bio-degradable waste per day. Reject comes to 6 Tonnes per day which has to be land filled. An area of 2200 sqm of land within the trenching ground is proposed for land filling for the coming 10 years. The available area is not sufficient for land fill for the coming 20-25 years. The process of windrow composting is given in the flow chart below.





The details of waste disposal of houses as per socio-economic survey 2012 is given below in table 12.1. From this data it can be seen that only about 4.48% of residential waste produced are to be managed by the Municipality. From this it is obvious that source of majority of the waste generated is from shops and establishments. The biomedical treatment plant (BMTP), IMAGE, run by Indian Medical Association located at Palakkad collects all the biomedical waste generated in Hospitals, in the town. All hospitals have their own system for disposalof other organic solid waste.

Table 12.1 Details of waste disposal in Kunnamkulam Town

Category of Place of waste disposal	Own compound	Street	Garbage bin	Open ground	Others
Average % for the LSGI in each category	95.52	0.66	3.15	0.17	0.5

Source: Socio economic survey-2012

12.2.2 Quantity of waste generated per day

As per the census data the population for the years 2001 and 2011are 51592 and 54071 respectively. The projected population for the year 2032 is 65200.Kunnamkulam being a transit point for pilgrims to Guruvayur and a service centre for nearby areas, floating population of 12000 is also considered. Hence the total population for design is 77200. Kunnamkulam being a medium town the quantity of waste generated per day is calculated as 0.375 kg per-capita,then the quantity of waste generated in 2031 will be 29 tons/day. Out of which the biodegradable waste comes around 20 tons/day, but the existing land can be used for processing waste only upto 15 tons/day. There has to be a system to tackle this problem effectively.

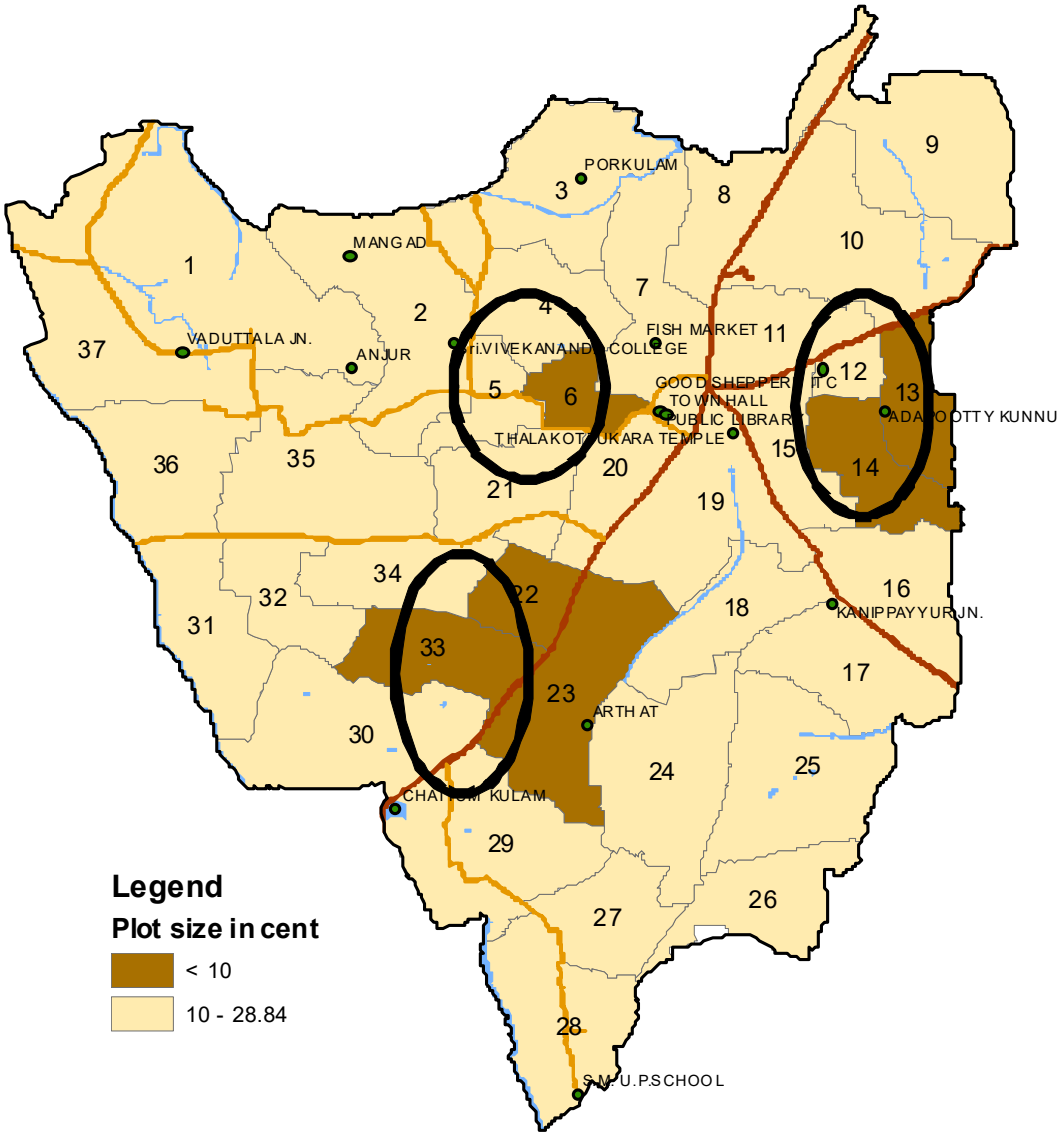


Fig 12.2 :Wards having low residential plot size

Source: Socio economic survey-2012

The areas where plot sizes are lesser than 10 cents of land is given in figure 12.2. Here people have to be provided with a treatment mechanism to dispose of the waste in future.

12.2.3 Sewage disposal

Kunnamkulam is having many natural drains which allow the carriage of runoff as well as the waste water. But the drains at present are getting blocked due to many reasons and are causing water logging.

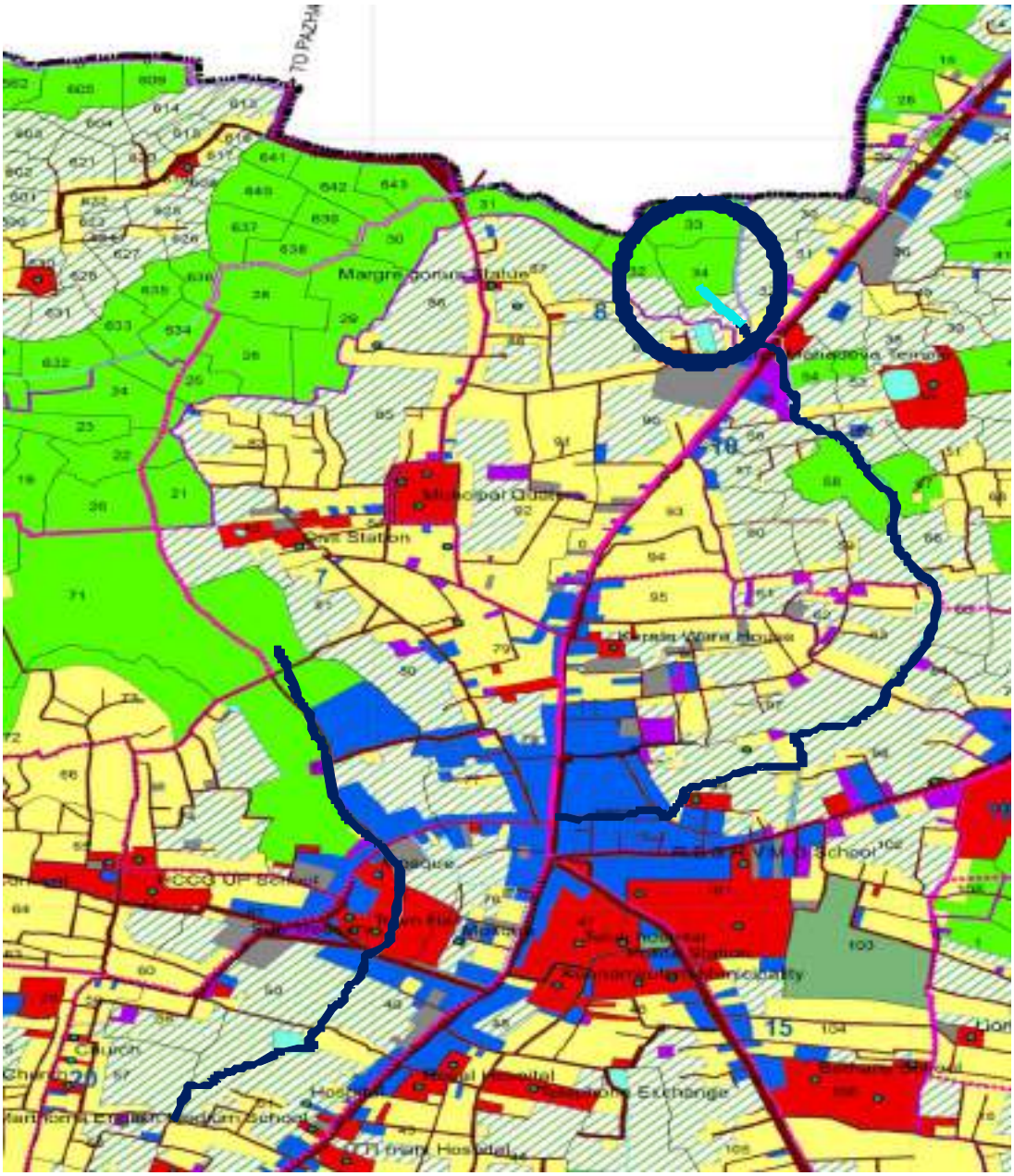


Fig.12.3 Waste water from public sewage drains disposed to bund

Source: Local level analysis-2012

No separate sewage disposal scheme is functioning inside the municipal area.Kunnamkulam Town has made drains for rain water runoff. Waste water from this public sewage drains are drained off to kole lands at Thuruthikkadu bund without any treatment. This is leading to serious environmental problems (figure 12.3).

From the socio-economic survey it can be seen that 90.13% of the families use septic tank and 9.2% use pit latrine. Only 0.67% use other ways for their sanitary waste disposal. Details given in table 12.2.The two public toilets maintained by the municipality, for the entire Town area are at bus stand and Thazhathepara – kaya market.

Table 12.2 Details of sanitary waste disposal in Kunnamkulam Town

Category of sanitary waste disposal	Septic Tank	Pit Latrine	Public Sewerage System	Others
Average Percentage of LSGI in each Category	90.13	9.2	0	0.67

Source: Socio economic survey-2012

12.3 Inference

From the foregone analysis it can be seen that at present Kunnamkulam town faces threat from liquid waste only. Solid waste management schemes are operating in the old town area and the added GramaPanchayat areas do not pose much danger. Waste water contaminating the water sources is an issue to be looked into. Also public comfort stations are not provided at all the required locations. Also liquid waste treatment has to be given more thrust. A three tier system can be adopted for addressing the issue of solid waste management viz, at plot level, at flats and residential association level and then at town level.

CHAPTER 13

EDUCATION

Education is what makes a cultured community. In the 86th amendment to the constitution of India as per the article 21A added on 1st April 2010, Education at the elementary level has been made a fundamental right of a citizen. Education only can take a community forward and equip it to grab the opportunities in this ever changing world.

Education in its general sense is a form of learning in which knowledge, skills, and habits of a group of people are transferred from one generation to the next through teaching, training, research, or simply through auto didacticism. Generally, it occurs through any experience that has a formative effect on the way one thinks, feels, or acts.

This chapter details out the existing educational status, basic infrastructural facilities available in this sector and development issues of Educational sector in Kunnamkulam Municipal area.

13.1 Existing scenario

13.1.1 Literacy rate

Census 2011 gives the literacy rate of Kunnamkulam as 96.84%. This figure is compared with the rate of other urban LSGIs of the district in figure 13.1 Irinjalakkuda and Chalakudy have higher litercy rate than Kunnamkulam.

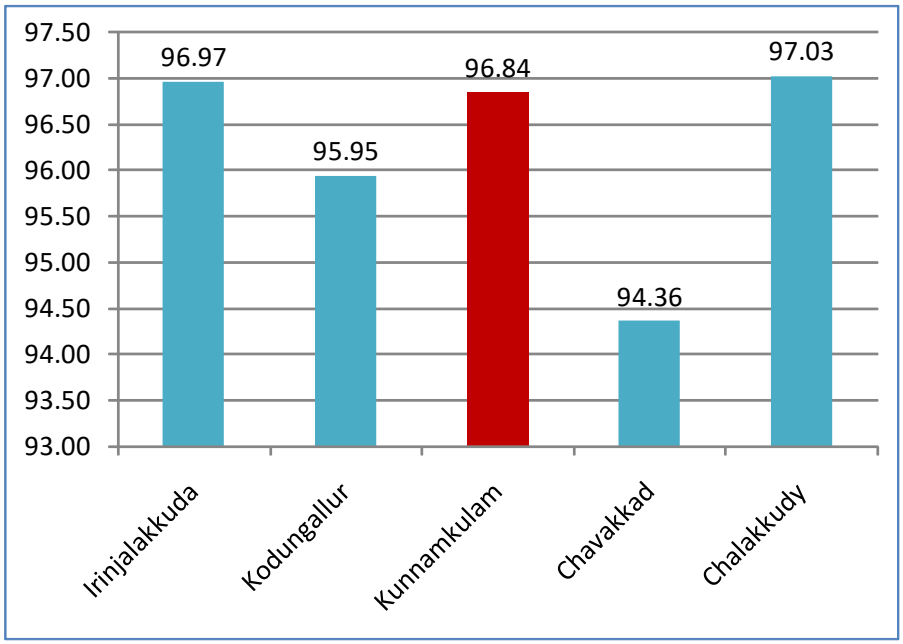


Fig. 13.1 Literacy rate- comparison *Source: Census 2011*

The temporal variation of literacy rate is given in figure 13.2 which shows that literacy rate is steadily increasing through the decades.

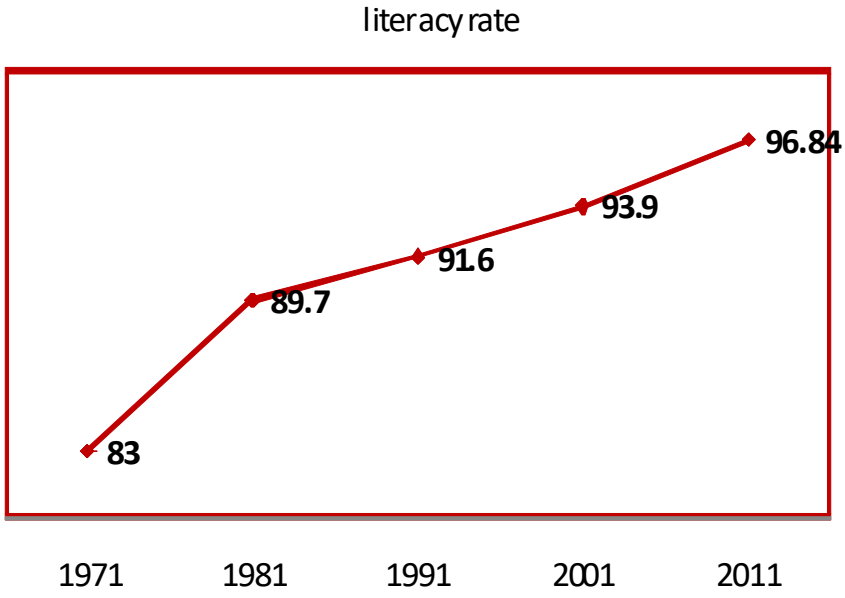


Fig. 13.2 Literacy rate- temporal variation

Source: Census 2011

As per 2011 Census the total literacy rate (96.84%) and female literacy rate(96%) of Kunnamkulam stands higher when compared to State, District and Taluk level. The comparison is shown in Figure. 13.3

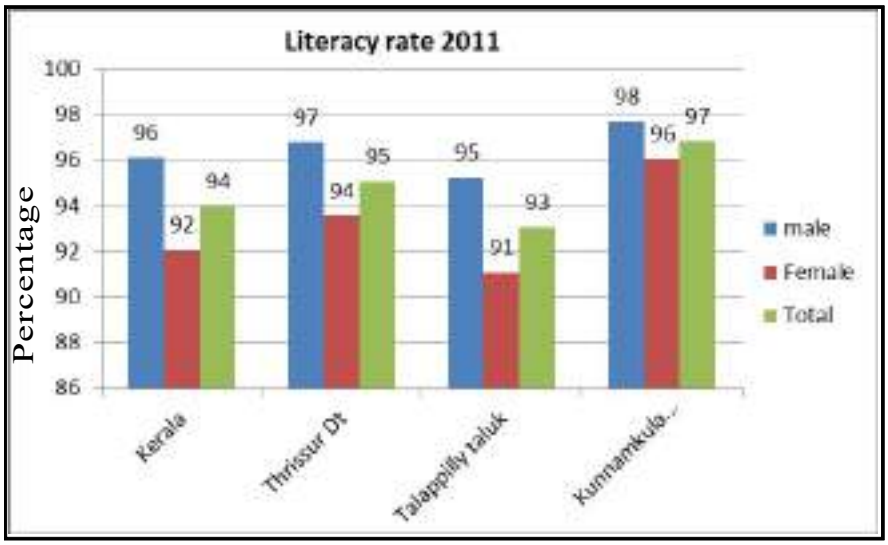


Fig. 13.3 Literacy rate- comparison

Source: Census-2011

Fig. 13.3 shows the literacy rate comparison (2011) of male and female in the context of Kerala, Thrissur district, Thalappilly Taluk and Kunnamkulam town. This discloses the educational stability of Kunnamkulam Town area. The awareness of people, opportunities available for education and the abundance of educational institutions in the surrounding panchayats and towns (with in 25 km) may be the reasons for this increased status.

13.1.2 Educational status

The percentage share of people possessing different educational qualification in Kunnamkulam (2012) is shown in Fig13.4. About 24.77% of people are having primary education, 36.83% have high school education, 13.88% with plus two and 11.83% with degree qualification. 4.22% of residents have post graduate degree and 1.93% of people acquired technical education. Only 2.49% have achieved Professional graduation. It shows that 1.84% of residents are technically qualified. Majority of people have acquired high school education. This is because of availability of educational institutions up to high school level within the commutable distance.

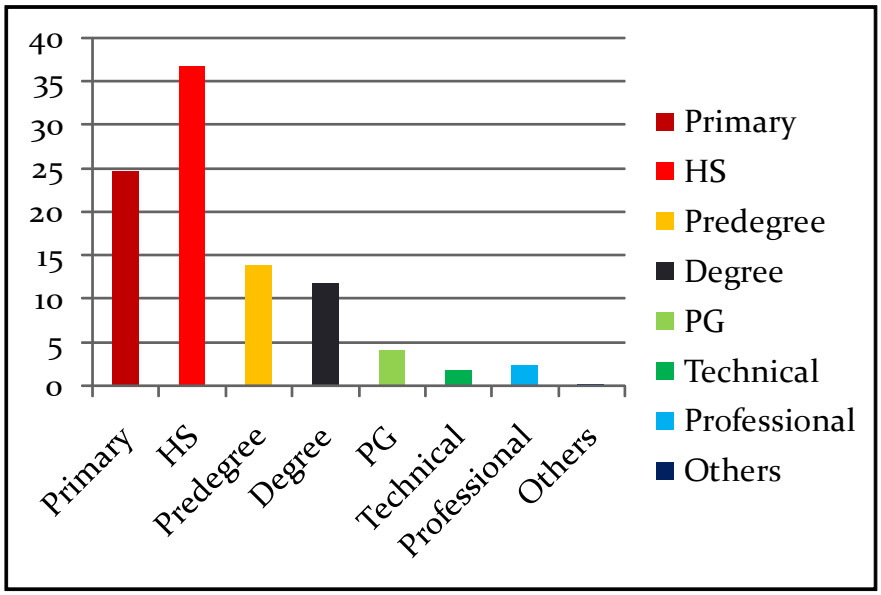


Fig.13.4. Educational status

Source: Socio Economic data 2012

13.1.3 Educational Institutions

The general education system comprises of the school level and higher level educational institutions. The Kunnamkulam Town area has 28 schools, out of which 17 are in the primary section, 5 are high schools, 4 are higher secondary schools and 2 are vocational higher secondary schools (table 13.1).

Table 13.1 Number of Educational Institutions

SL No	Category	Govt.	Aided	Unaided	Total
1	Primary	6	17	4	27
2	H.S	3	5	3	11
3	H.S.S	2	2	2	6
4	V.H.S.S	2	0	0	2

Source: AEO, DEO, Block Resource Centre, Primary enquiry-2012

One aided Arts and Science College and one Govt. Polytechnic are also there. There are 4 special schools working in this area. They are Snehalayam CSI Deaf Kunnamkulam, Tropical health foundation of India, Govt. School for Blind at Kunnamkulam, and GVHSS for Deaf at Kunnamkulam. The locations of these schools are shown in figure13.5 and figure 13.6.

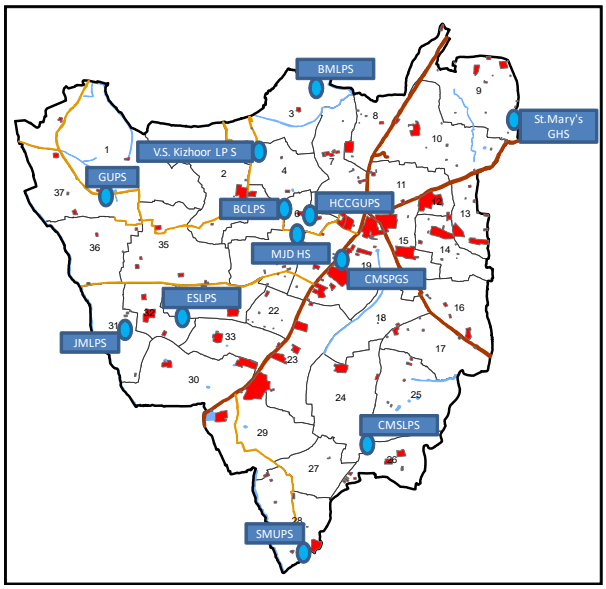


Fig. 13.5 Location of primary and high schools

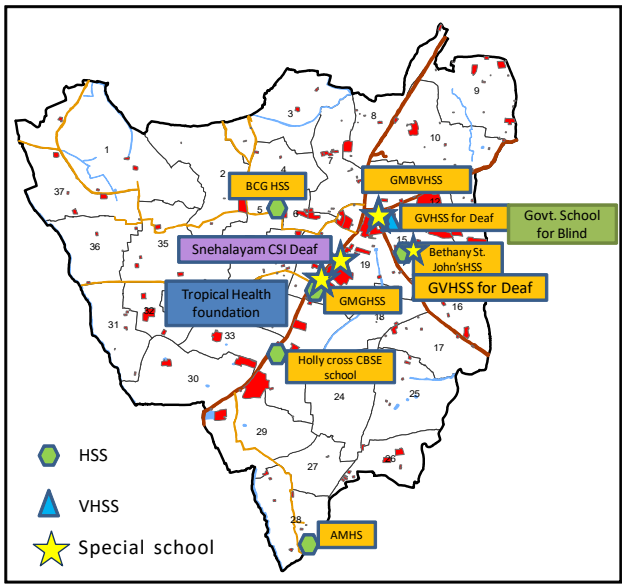


Fig. 13.6 Location of educational institutions

Source: Primary Survey-2012

The location of primary schools shows that the residents of kunnamkulam from every corner can access an educational facility having elementary learning. One of the oldest institutions here is the present Govt. Model Boys high school which was originally in Wadakkanchery but was shifted to Kunnamkulam on 02/04/1878 by the decree of the Maharaja. Associated with this school, an institution for the blind, deaf and dumb was also setup, this was quite rare in those days. The Govt.Model Girls high school is said to

have been established by Parumala Thirumenias Mar Ignatius High School for girls. It was later taken over by the Govt. The result of a survey conducted to assess the infrastructural facilities of these schools is given in table 13.2. The data is obtained from block resource centre.

Table 13.2 Facilities in schools

SI No:	No Separate toilet facility for girls	No Internet Facility	No Play ground
1	CMS LPS,Kaniyampal	HCCGUPS,Cheriayam	MJDHS Nadupanthi
2	ESLPS Alathur	V.S Kizhoor LP School	GMGHSS, Kunnumkulam
3	BMLPS Thiruthikad	MJD LPS ,Kunnumkulam	GVHSS For Deaf
4		GUPS,Vaduthala	Tropical Health Foundation
5		GGLPS,Kunnumkulam	
6		RSSRVMGS,Kunnumkulam	
7		St.Thomas LPS Arthat	
8		SMUPS,Eringappuram	
9		CMSLPS,Kaniyampal	
10		JMLPS,Anjur	
11		ESLPS,Alathur	
12		BMLPS,Thiruthikkad	
13		CMSPGS,Kunnamkulam	

Source: Block Resource Centre - 2012

An analysis of the number of schools in various sectors and the students in various sectors reveals the following: 53% of the students are studying in the aided schools and 33% of the students are in unaided schools whereas only 14% of students are in govt. schools. On the contrary 28% of schools in the govt. sector and only 20% schools are in unaided sector(figure13.7).Facilities and performance or functioning in government institutions have to be increased so that more students will be attracted to the government schools. These schools need to be developed as centers providing quality and cheap education to the students.

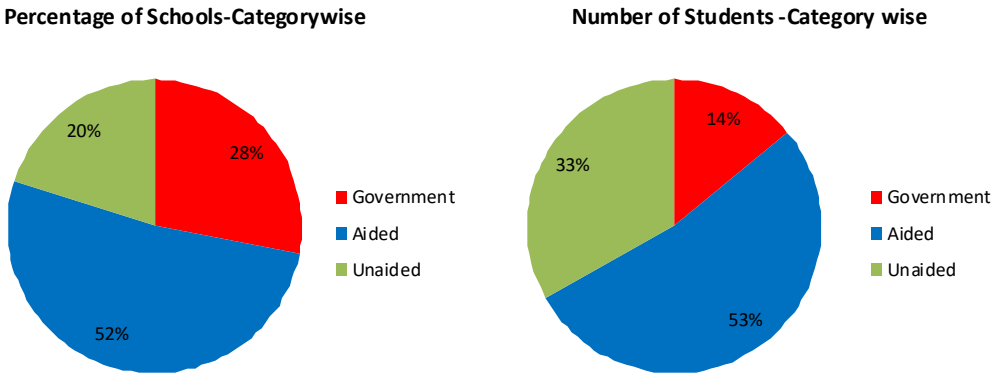


Fig. 13.7 Schools and Students -Percentage wise

Source :Socio Economic Survey

13.2 Higher Educational Institutions

The location of Major Higher educational institutions in the Town area is given in Fig 13.8 below. Sri Vivekananda Arts College the one and only one Arts College in Kunnamkulam has no degree courses in science and has a PG course only in commerce.

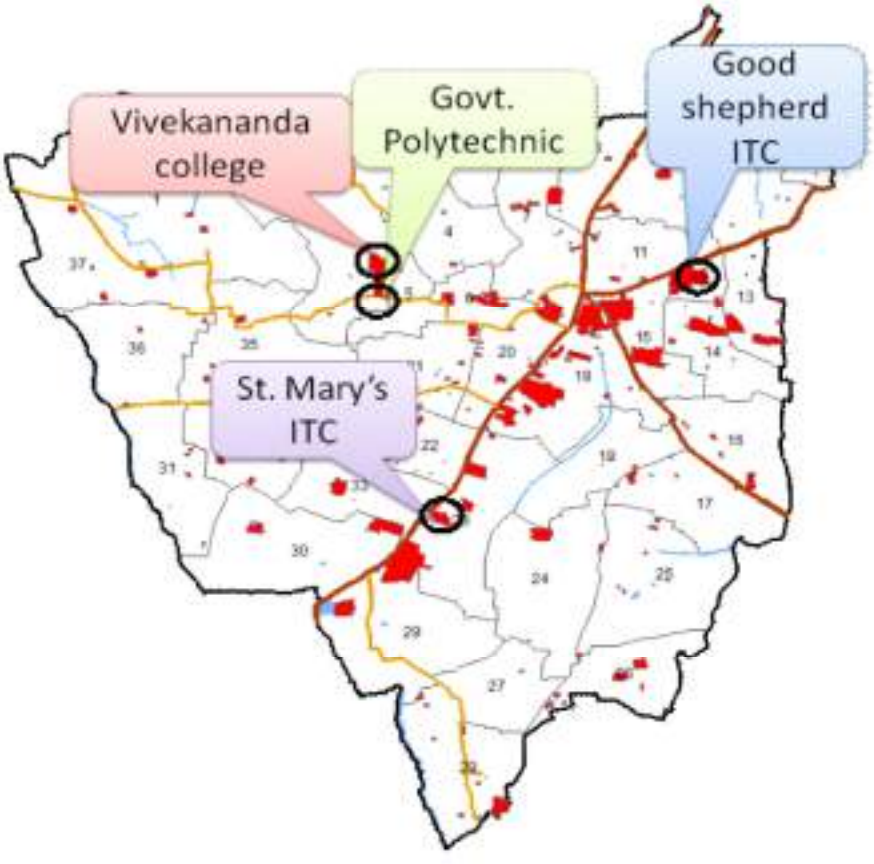


Fig. 13.8 Location of higher educational institutions

Source: Primary Survey-2012

Except the Govt. polytechnic at Kizhoor having 594 seats, no other professional colleges are situated inside the Town area. The two technical educational institutions apart from these, the two ITC's are worth mentioning. In addition to these institutions there are several private colleges and computer institutions. Students have to go out of the town to pursue higher education in the field of engineering, medicine, law and other disciplines of study. There are sufficient number of institutions around Kunnamkulam. The Amala medical college, Govt. medical college, Vidya academy of engineering are some of such institutions. The Figure 13.9 shows the locations of such institutions.

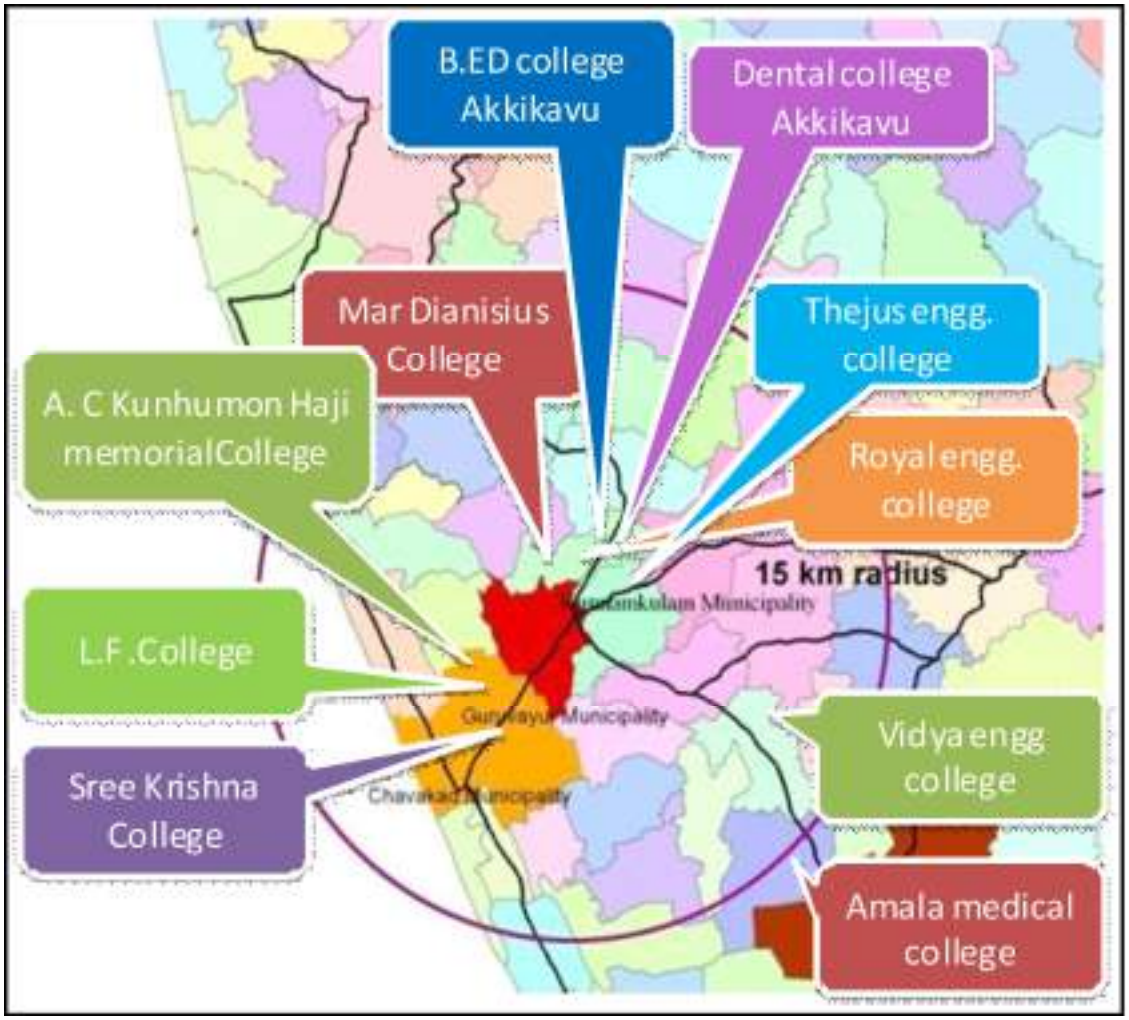


Fig. 13.9 Location of higher educational institutions with in 15 km radius

13.3 Educational facilities as per planning standard

As per planning standard the educational institutions are sufficient in Municipal area (Table 13.3). The number of VHSS institutions in Town area has to be increased so that students are able to get through technical education during the school time itself.

Table 13.3 Planning standards

SI No	Category	No of Students	Index	Required	Existing	Remarks
1	High School	700	1 HS for 13000ppn	4	11	
2	Higher Secondary	400	1HSS With 8 div:for 13000 ppn	4	6	
3	Arts and Science College	500	1 Arts and Science College for 80000 ppn	-	1	
4	Professional College	250	1 Professional College for 250000 ppn	-	-	Available in surrounding areas
5	Polytechnical College	150	1 Polytechnic for 36000 ppn	1	1	
6	ITC/ITI	300	1 ITC/ITI for 35000ppn	1	2	
7	TTC	120	1 TTC for 120000 ppn	-	-	Available in surrounding areas

13.4 Inference

Total literacy rate and female literacy rate of Kunnamkulam Town is higher compared to district and taluk level. Even though there are a good number of institutions in Govt. Sector, students largely depend on the unaided sector. Lack of infrastructural facilities and basic amenities in government schools may be the reasons for this. For higher education, especially in Science field, students have to depend on institutions outside municipality. As per planning standards, educational facilities are sufficient within Town.

CHAPTER 14

HEALTH

Any community requires a healthy population to take its development forward. In the present context this place also faces the threats of many communicable, non-communicable and life style diseases. The new trends in waste disposal systems, environmental pollution and cleanliness are posing severe threats which need to be attended to on a war foot basis. This chapter analyses the existing infrastructural status of the health sector in Kunnamkulam Town. It includes Allopathy, Ayurveda and Homeo sectors both Government and Private sector in the Town area.

14.1 Health – Existing scenario

The analysis of the existing status covers the study on health indicators, existing health infrastructure and problems associated with it.

14.1.1. Health indicators

Integrated disease surveillance program (IDSP) enables the reporting of diseases on a daily basis. This gives an idea about the occurrence of various diseases in different parts of the district. It also enables to understand the pattern of diseases. The demographic indicators available at the district level are given in table 14.1.

Table 14.1 Demographic Indicators

DEMOGRAPGHIC INDICATORS (2009-2010)			
HEALTH INDICATORS	THRISSUR	KERALA	INDIA
Life Expectancy	73	74	63.5
Infant Mortality Rate(1000 Population)	3.8	12	53
Postnatal Mortality Rate(PMR)	3.78	12	37
Maternal Mortality Rate(MMR) (* lakh live births)	53	110	301
Birth Rate (1000 Population)	17	14.6	22.8
Death Rate (1000 Population)	4.1	6.6	7.4
Total fertility rate (Children / Women)	1.7	1.7	2.9
Couple Protection Rate (%)	64	62.3	52
Sex Ratio (M/F)	1000/1109	1000/1084	1000/940
Sex Ratio (M/F) 0-6 years	1000/948	1000/959	1000/914

Source – Health Department

Table 14.2 Blockwise MMR & IMR

No	NAME	MMR - 2009-2010	IMR- 2009-2010
		1000 Live Birth	
1	CHAVAKKAD BLOCK	1.1	12.1
2	CHOWANNUR BLOCK	0.33	1.5
3	WADAKKANCHERY BLOCK	0	10.5
4	PAZHAYANNUR BLOCK	0.58	1.7
5	MULLASSERY BLOCK	1.22	4.9
6	PUZHAKKAL BLOCK	0.3	1.8
7	OLLUKKARA BLOCK	0.19	1.9
8	ANTHIKKAD BLOCK	0	11.5
9	CHERPU BLOCK	0	0.4
10	MATHILAKOM BLOCK	0.76	10.7
11	IRINJALAKUDA BLOCK	0	12.6
12	KODUNGALLUR BLOCK	0	1.6
13	VELLANGALLUR BLOCK	4.61	20.7
14	MALA BLOCK	1.09	9.8
15	KODAKARA BLOCK	1	7.5
16	CHALAKUDY BLOCK	0.43	6.9
17	THALIKULAM BLOCK	0	4

Source – Health Department

This shows that the district itself is in a good position in comparison with the state and the country. The maternity mortality rate and the infant mortality rate available at the block level is consulted and is as given in table 14.2. The blocks Chavakkad and Chowwannur lie adjacent to Kunnamkulam Town.

14.1.2 Health infrastructure

Kunnamkulam Town has one hospital and five dispensaries under Government sector and four hospitals and 17 clinics under private sector out of which 20 are in Alloppathy sector, 2 are in Homoeopathy system and 2 are in Ayurveda. The details are given in table 14.3

Table 14.3 Hospitals in Kunnamkulam Town

Type of Hospital	No of Hospital/ Dispensary	No of doctors	No of Beds
Allopathic	20	151	803
Ayurveda	5	6	0
Homeopathic	2	2	0

Source – Health Department, 2012

Allopathic system of medicine

Taluk Hospital: - The Taluk hospital functioning in the middle of Kunnamkulam Town was established in the year 1888 by the Cochin Government. It is one of the oldest hospitals in Kunnamkulam. About 54071 people, residing in Kunnamkulam Town area and people in the surrounding 15 Panchayats are benefited by this hospital. The facilities like operation theatres and ambulance services are available at the Taluk hospital. The buildings are very old and scattered within the hospital compound. Taluk hospital lacks modern and advanced diagnostic equipments.

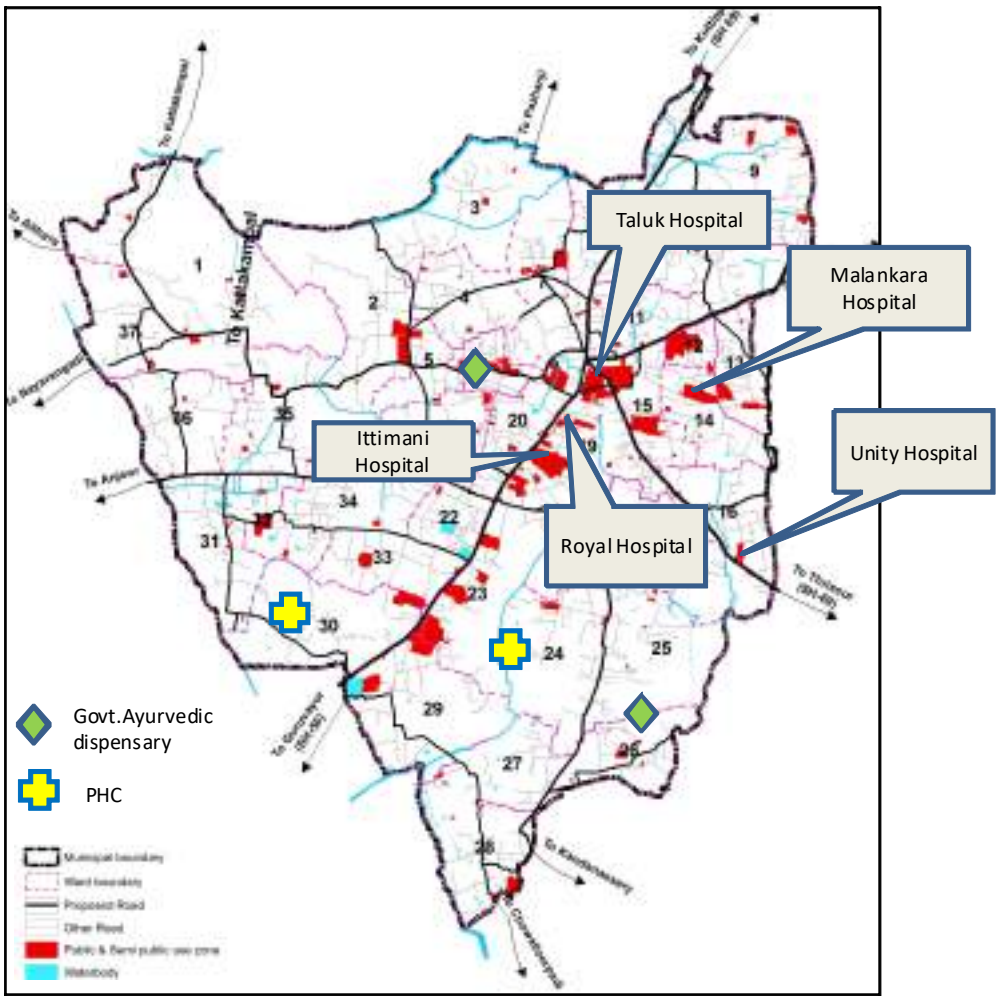


Fig 14.1 Hospitals in Kunnamkulam town including PHC

Primary Health Centres(PHC):- PHC sare the first level of contact of the community with formal health care delivery system. The Two PHCs functioning at Kunnamkulam Town area are in Aarthat and Chowannur. It can be seen that these are accessible from all parts of the Town.

Private sector:-In addition to the Government hospital and primary health centres, there are 4 private hospitals with advanced diagnostic facilities and 13 clinics are also functioning here. Locations of hospitals including PHCs are shown in figure 14.1

Ayurvedic & Homeopathic systems of medicine.

One Government ayurvedic dispensary and four other ayurvedic clinics under private sector are also functioning in the town.Because of the growing popularity and awareness on its safety means middle and upper class turning to ayurvedic treatment. Hence it is inevitable to strengthen the Government Ayurveda institutions.

The two homeopathic dispensaries are functioning at Kunnamkulam and Aarthat in the municipal building.

None of the hospitals in the town have their own waste disposal system. "IMAGE" from Palakkad collects the waste at present. Kunnamkulam residents can access all the higher treatment facilities within a distance of 20km. Amala cancer research centre and medical college and Thrissur medical college are two higher order facilities near to Kunnamkulam within a radius of 10 km.

14.2 Disease pattern

From the district level analysis only "leptospirosis" is reported to have occurred in Kunnamkulam among the recent major communicable diseases. This directly points to the sanitation and cleanliness situation in the area. The diseases are classified as communicable and Non-communicable. The details of houses diagnosed with diseases within last 5 years are given below. The details are compiled from the socio economic survey conducted with a 10% sample in the town. The table 14.4 gives the details.

As per the socio economic survey data 3.07% of families are affected by chicken gunya, 0.17%is affected by TB, 0.17% by Typhoid and 1.49% by Chicken Pox. Typhoid even a single case is an indication of poor sanitation. A lot of limitations and public health issues lead to the emergence of communicable diseases. They are mainly due to lack of drainage and water logged areas, migration of labourers from outside state and no proper liquid waste management system.

Table 14.4 Disease pattern in Kunnamkulam Town

Type	Cholera	Dengue	Chicken Gunya	Hepatitis	TB	Typhoid	Malaria	Chicken Pox
Average % for LSGI in each category	0	0	3.07	0	0.17	0.17	0	1.49

Source: Socio economic survey-2012

14.3 Planning standards

As per the planning standards (table 14.5) health facilities are sufficient in Kunnamkulam Town area. The planning standard as per the UDPFI Guidelines are given below

Table 14.5 Planning standards

Category	No of Beds	Standard as per UDPFI	Required	Existing
General Hospital	500	1 for 2.5 Lakh Population	-	-
Intermediate Hospital(Category A)	200	1 for 1Lakh Population	-	1
Intermediate Hospital(Category B)	80	1 for 1Lakh Population	-	4
Poly-Clinic		1 for 1Lakh Population	-	-
Nursing Home,Child Welfare and Maternity Centre	30	1 for 0.45 lakh Population	1	1
Dispensary		1 for .15 lakh Population	3	5

14.4 Inference

On analysis of the medical facilities available at Kunnamkulam, it is seen that the basic healthcare facilities are sufficient. In the private sector 4 hospitals are functioning. In the development view, the prime need goes to the upgradation of the medical facilities existing in the government sector and also to ensure speciality medical services through the Taluk hospital. The infrastructure facilities are to be upgraded in the hospital for Ayurveda and Homoeopathy systems. At present the biomedical wastes are collected by the "IMAGE" at Palakkad. Hence it is necessary to introduce bio-medical treatment plant in every hospital for treating their waste products in a safe way.

CHAPTER 15

POWER

This chapter analyses the existing status and development issues of power sector in Kunnamkulam Town. "Electricity to each and every common man" is the base slogan for the total electrification project in the State. The availability of electrical power and utilisation of power is directly related to the agricultural and industrial development of a region and the thriving of society.

15.1 Introduction

In Kunnamkulam, majority of people depend on the conventional mode of power only. There is no organized effort to tap the non-conventional power sources. Kunnamkulam is reportedly sufficient in the power requirements. This data is pertaining to the area of jurisdiction of KSEB subdivision which includes Kunnamkulam Town. This is evident from the total number of domestic connections 16637 as against the total no of households of 13156. As the consumption increases the power losses also increases. Kunnamkulam is divided into two electrical sections for supply of power viz. Kunnamkulam section (Major section) and Big Bazaar section.

15.2 Existing status

Transmission system is an essential link between power stations and load centres for bulk transfer of power and it has a vital role in the management of power. KSEB has pioneered the modern concept of developing a large transmission network for transferring power from power stations to the local load centres.

The transmission sector of Kunnamkulam comprises of one 440 KV sub-station at Madakkathara and 4 major inter- state transmission stations of 110 KV at Viyyur and Kunnamkulam and other substations at Konkanoor and Guruvayur.

In the case of domestic fuel LPG is the main player. Nearly 86.57 % of people use LPG as the domestic fuel. 88.81 % of people use both LPG and firewood as the source of domestic fuel. Only 0.25 % of the people use firewood alone or with other non-conventional means of domestic fuels. Almost 1.74 % of people use LPG and electricity for fuel as derived from the Socio economic survey.

15.3 Distribution and supply

KSE Board distributes electricity in the State of Kerala except in the Thrissur Municipal Corporation and Munnar (Kannan Devan Hills). In Kunnamkulam Town the distribution and supply is carried out by the KSEB through the 11 kv feeder at Kunnamkulam Town, Big bazaar, Anjoor, Aruvai, Akathiyurand Vadakkekadu. The distribution network of Kunnamkulam town is shown in the fig.15.1.

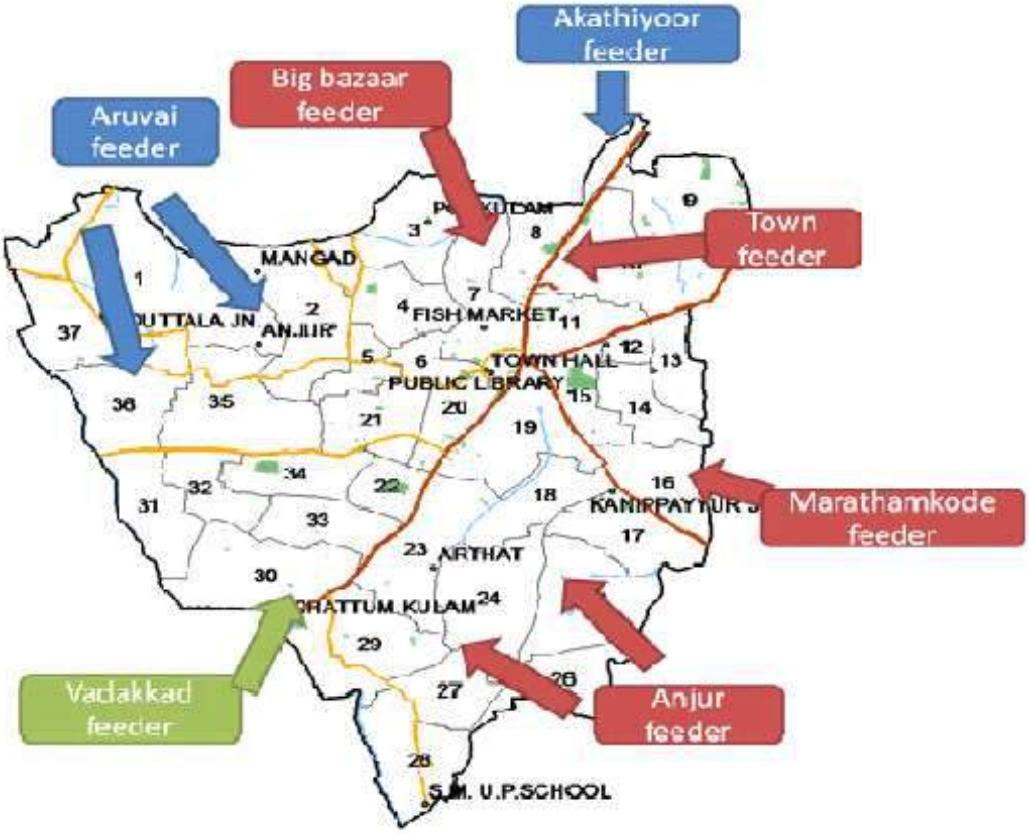


Fig15.1.Distribution network of Kunnamkulam Town

Source: KSEB-2012

The category wise Connection and consumption of energy is as shown in table 15.1 and represented graphically in the figure 15.2 and fig 15.3 below.

Table 15.1.Consumption of electricity

Category wise break up of consumption					
	Domestic	Industrial	Commercial	Agricultural	Others
Consumption(KWH)	2818024	373717	826302	277832	169888
No of Connection	16637	701	4215	2997	219

Source: Electrical Section Kunnamkulam office - 2012

Category wise energy consumption in Kunnamkulam Town shows that the maximum consumption is in domestic sector (63%), followed by commercial (19%) and industrial (8%). Power consumption in agricultural sector is in the range of 6% and in other categories it is in 4%. The figure also shows that the maximum power connections are in the domestic category (67%) followed by commercial (17%) and agriculture (12%).

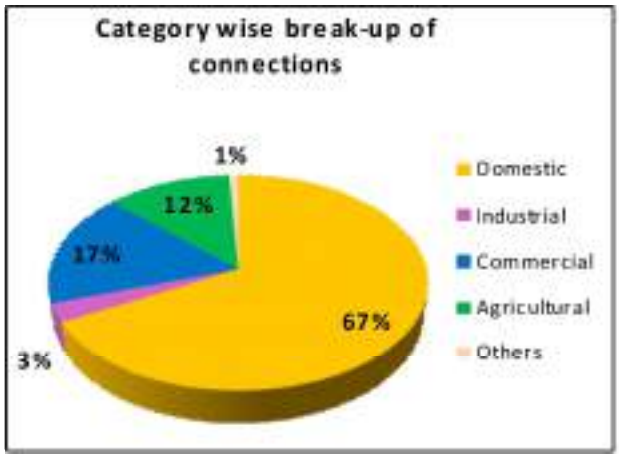


Fig 15.2.Connections – Category wise

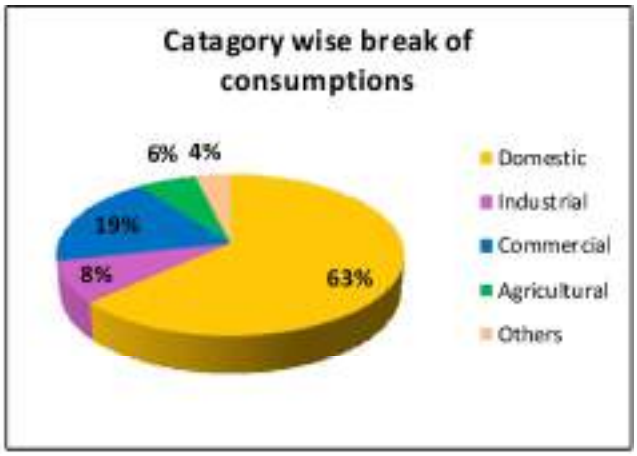


Fig 15.3.Consumption – Category wise

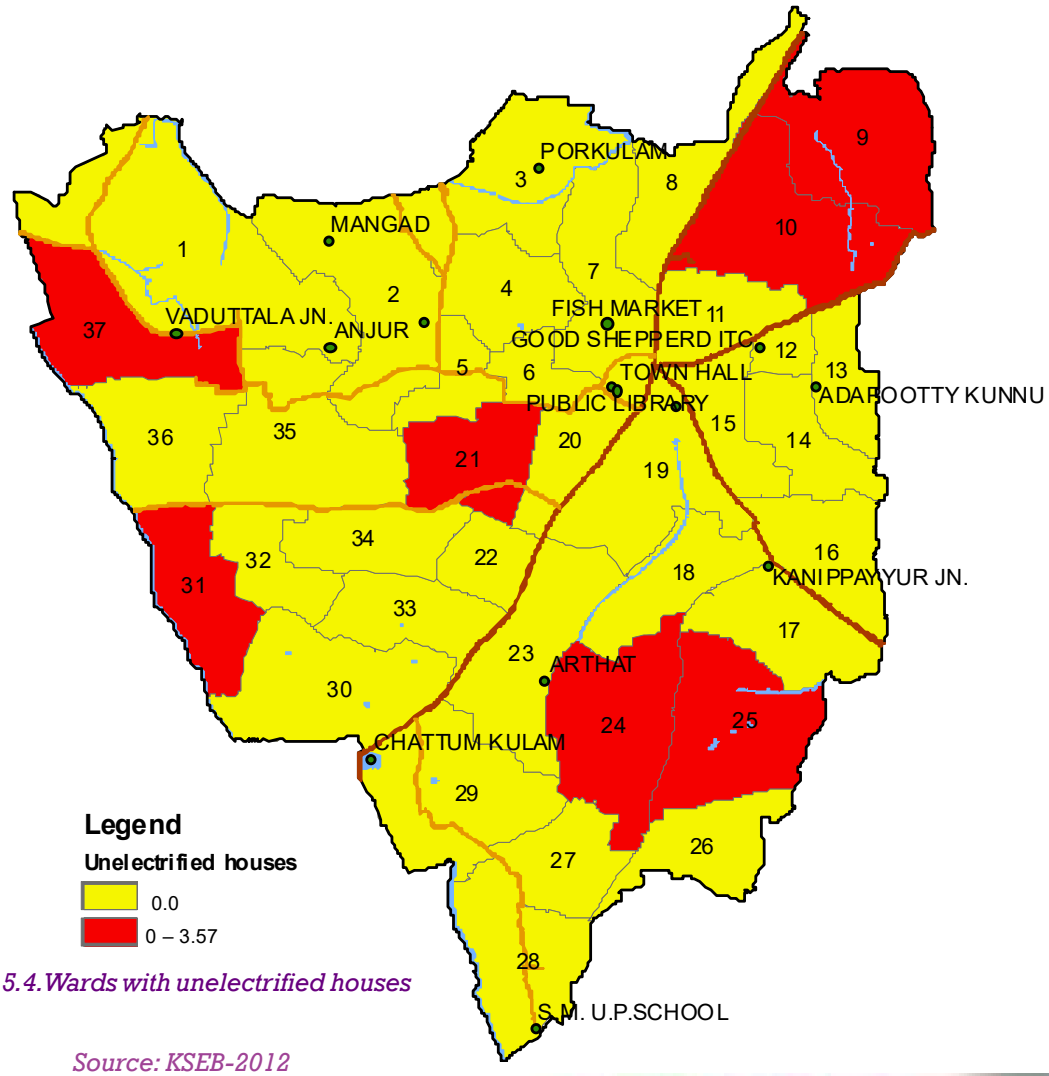


Fig15.4.Wards with unelectrified houses

Source: KSEB-2012

A special drive for the 100 % electrification of LA constituencies of Kerala State was commenced in the year 2009.Under this scheme, the district of Thrissur became declared to be fully electrified.

As per the socio- economic survey conducted in connection with the development plan there are certain unelectrified houses in the municipality. The wards were these problems are there is given in figure 15.4. The unelectrified houses are shown in wards 9, 10, 21,24,25,31 and 37. The solar energy source plays a crucial role among the Non-conventional energy sources. In Kunnamkulam Town area 0.25 % of houses utilize non-conventional energy as a source of Electricity.

15.4 Inference

As far as the power sector in Kunnamkulam Town is concerned, It can be seen that the major power consumers are in domestic sector and only 0.25 % of houses use non-conventional energy for their domestic use. It is revealed from the Local Level analysis that in case of street lights 40 % are not working properly due to the improper maintenance. Also major junctions are not provided with high mast light. Due to the increase of population the power consumption also will increase. To meet the required demand of electricity in future, steps should be taken to utilize non-conventional energy sources to generate electricity.

CHAPTER 16

RECREATION AND OTHER CIVIC AMENITIES

This chapter deals with the infrastructure facilities provided in the town for the safe and comfortable living of the residents. This covers housing sector, recreational facilities and other civic amenities. Recreation is an essential part of human life and finds many different forms which are shaped naturally by individual interests but also by the surrounding social construction.Recreation is an activity of leisure. Humans spend their time in activities of daily living, work, sleep, social duties, and leisure, the latter time being free from prior commitments to physiologic or social needs, a prerequisite of recreation. Recreation if offered in passive as well as active ways. Active recreation facilities include stadium, playground etc whereas passive recreation includes libraries, parks etc.

The facilities provided by the Governments and Municipal Corporations for common people are called civic amenities. All major civic amenities existing in the Town area are discussed here.

The housing stock, housing conditions, the slums and the substandard housing in the Town area are studied in this chapter.

16.1 Recreational infrastructure.

Recreation is difficult to be separated from the general concept of play, which is usually the term for the recreational activity of children. According to the land use, parks and open spaces amount to 0.40% in Kunnamkulam Town area. The one and only play ground/ open space available in the town is the senior ground at Adupputty area having an extent of 4 acres. No park is available here.

The Jawahar stadium situated near the Town in ward 19 is the only one stadium at Kunnamkulam. Commonly the Onathallu,a traditional form of wrestling that blends machismo, youthfulness and rural simplicity, is held at Kunnamkulam Jawahar Stadium during Onam season.

The various cinema halls in the town are listed in table 16.1.

Table 16.1 list of cinema halls

Name	Location	Extent
Baiju	Wadakkanchery road	50 cent
Bhavana	Near Treasury	95 cent
Jawahar	Near Town Hall	50 cent

Source: Primary Survey-2012

Apart from this, the other recreational facilities are The Manthalamkunnu beach, Chavakkad Beach, Burial Megalithic Caves at Kakkad and the Kakkadu Palace which are also the tourist attractions in and around the Town area. Locations of these infrastructure are shown in figure 16.1

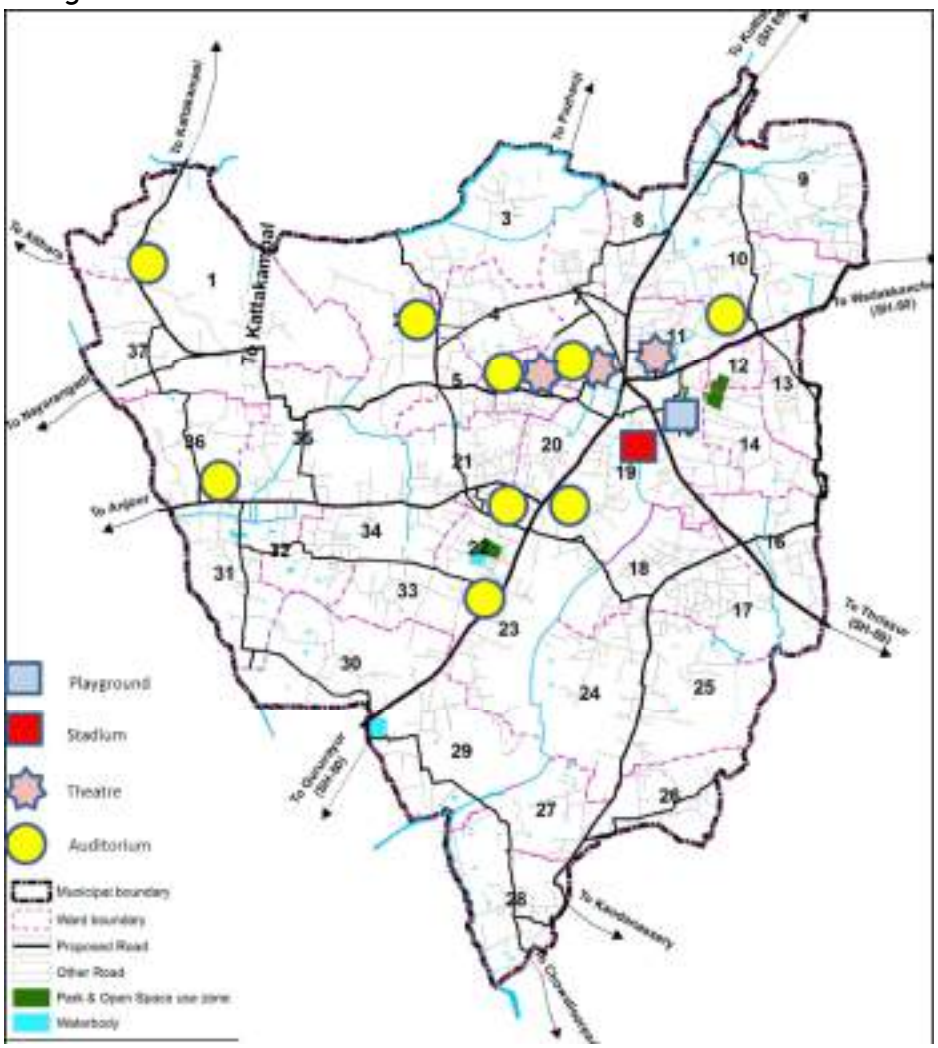


Fig 16.1 Location of infrastructure
Source: Land use survey-2012

16.2 Civic amenities

The various civic amenities provided in the town are detailed below.

The town hall is situated near the new bus stand area. The building is an old one and it is in perishing condition. A town hall with all modern facilities is a must for the town to develop the social and cultural level of the residents.

Municipal Library and Reading Room :- A Municipal library established in the year 1980 is functioning inside the town hall compound of extent 1.5 acres. It has a collection of 9475 books.



Kanippayyur Sankaran Namboodiripad Memorial Research Library (Grandhashala): The collection in the Kanippayyur library, founded in 1990 is a tribute to the great **Sankaran Namboodiripad**. In 2001, in the event of the 110th anniversary of Sankaran Namboodiripad, the Kanippayyur Book stall and library started functioning with more than a thousand books on vedas, epics, mythology, architecture and ayurveda by around thirty renowned publishers. This library also had almost thirty Sanskrit language aids.

Kanippayyur Library with almost a thousand books and scriptures on paper and palm leaves in Sanskrit and Malayalam, which were donated by many Namboodiri families in Kerala and from the personal collections of Sree Sankaran Namboodiripad is a tribute to him. The important objective behind this venture is to publicize Indian cultural heritage. The library, which is set to the research of Indian sciences, contains many valuable records from the above-mentioned categories. Many research students use them for learning and reference.

The details of all public libraries existing in Town area are given in table 16.2 below.

Table 16.2 List of libraries

Name	Location/Ward	No.of books
Muncipal Library	Near Town hall	9475
GrameenaVayanasala	Aarthat	3254
ThozhilaliVayanasala(Not Functioning)	Cherumukku	3562
Mahatma Smaraka Library	Chemmanoor/ward-28	5000
GrameenaVayanasala	Porkalangadu/Ward-26	10500
GrameenaVayanasala	Aanaikkal	5000
GrameenaVayanasala	cheruvathani	Nearly 5000
KanippayyurSankaranNamboodiripad Memorial Research Library	Kanippayyur	
GVS Vayanasala	Kanippayyur	

Source: Municipal office, Kunnamkulam & Local enquiry-2012

Community centers are public locations where members of a community tend together for group activities, social support, public information, and other purposes. They may sometimes be open for the whole community or for a specialized group within the greater community. List of community centers in Kunnamkulam Town area are given in table 16.3 below.

Table 16.3 List of auditorium

Name	Location	Capacity
Town Hall	Ward 18	980
Dining Room(Town Hall)	Ward 18	300
Library Auditorium	Town Hall road	150
Ittimani Auditorium	Guruvayoor Road	200
Lotus Palace	Wadakkanchery road	350
Thalukkutty Memorial Hall	GuruvayoorRoad,Ward 13	250
Tholath	Guruvayoor road	250
J&J Auditorium	Anjoor Road	250
Chattukulam Auditorium	Chattukulam	250
PVIS Auditorium	Pattambi road	200
YMCA	Vysyeri	100
Leo Tower	Near Bhavana theatre	150
Thekkekara Auditorium	Valiyangadi	200

Source: Municipal office, Kunnamkulam & Local enquiry-2012

Crematorium and burial grounds -Adupputty Gas *crematorium and Chemmannoor crematorium* are the cemeteries located in Kunnamkulam Town area. At present the *Chemmannoor* crematorium is closed for renovation work and the one at Adupputty is under construction.

Fire station and police station - One police station is situated at the heart of Kunnamkulam Town very near to the present bus stand, Taluk hospital and Government Boys HSS compound.One fire station is at Chowannur. One fire station or sub fire station within 1 to 3 km to be provided for 2 lakh population.

LPG godown and petrol pump - One LPG Godown of Indian Oil Corporation is in the Thazhatheppara ward to cater to the need of 54071 people. As per UDPFI standards one LPG Godown for 40000 populations is required. Hence the need of an LPG godown is necessary. 5 petrol pumps are located in and around the core area of town. The locations of the civic amenities are shown in figure 16.2

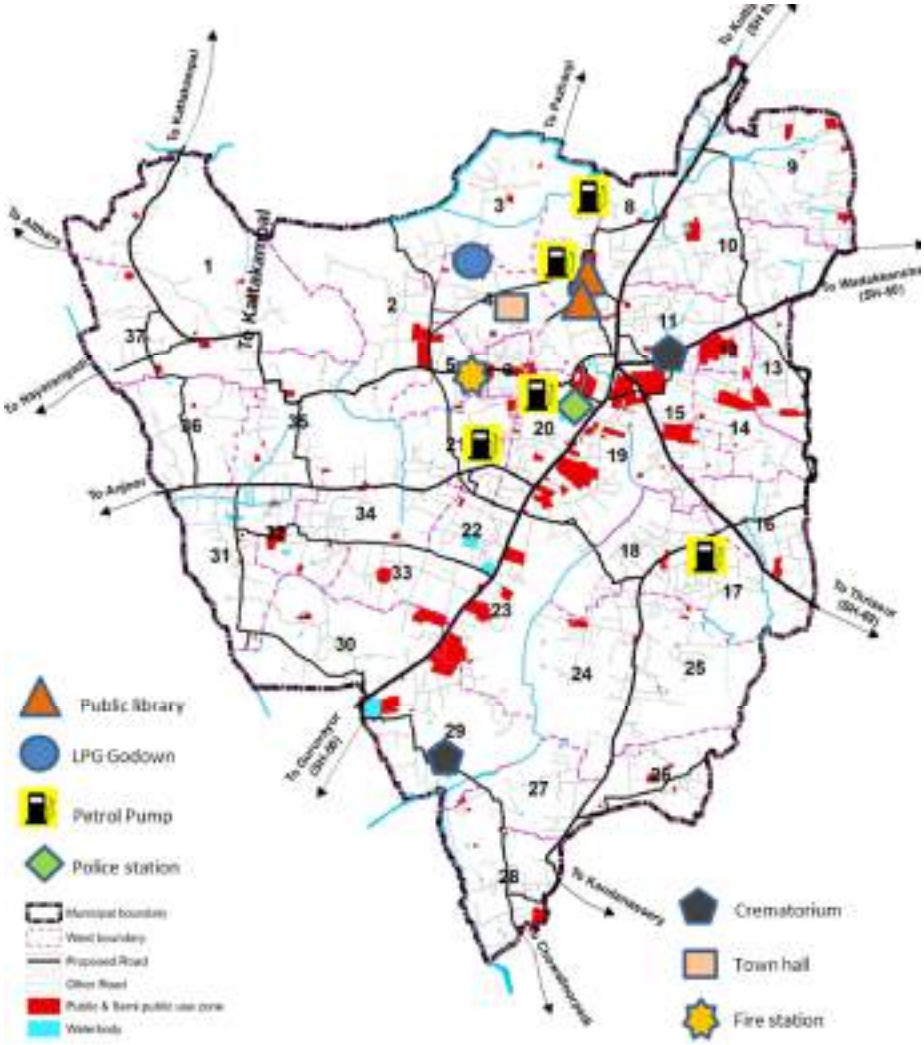


Fig 16.2 Locations of civic amenities

Source: Land use survey-2012

16.3 Housing

Kunnamkulam is a municipal town situated in the Thrissur District, spread over an area of 27.45 km^2 out of which 31% of Town area ie; 8.49 sq.km.is under residential use. The net population density of Kunnamkulam Town is 2488 persons/sq.km. As per 2001 census in Kunnamkulam Town area shows a shortage of 183 (1.64%) houses.

There are 11138 numbers of households against 10955 numbers of occupied residential houses. In 2011 there are 13155 households and 13668 houses, an excess housing stock of 513 nos.

The socio economic survey conducted in the year 2012 discloses that 57.63% of people live in pucca houses and only 4% live in Kutcha and hut houses. It also reveals that 97% have their own houses. About 3% of people present in town area are without houses of their own. Such people are living either in rented houses or in unauthorized substandard houses. Details are shown in Table 16.4 and Fig 16.3. The ward wise distribution of kutcha houses in figure 16.4 shows that wards 7,12, 22, 23 and 34 are having more kutcha houses.

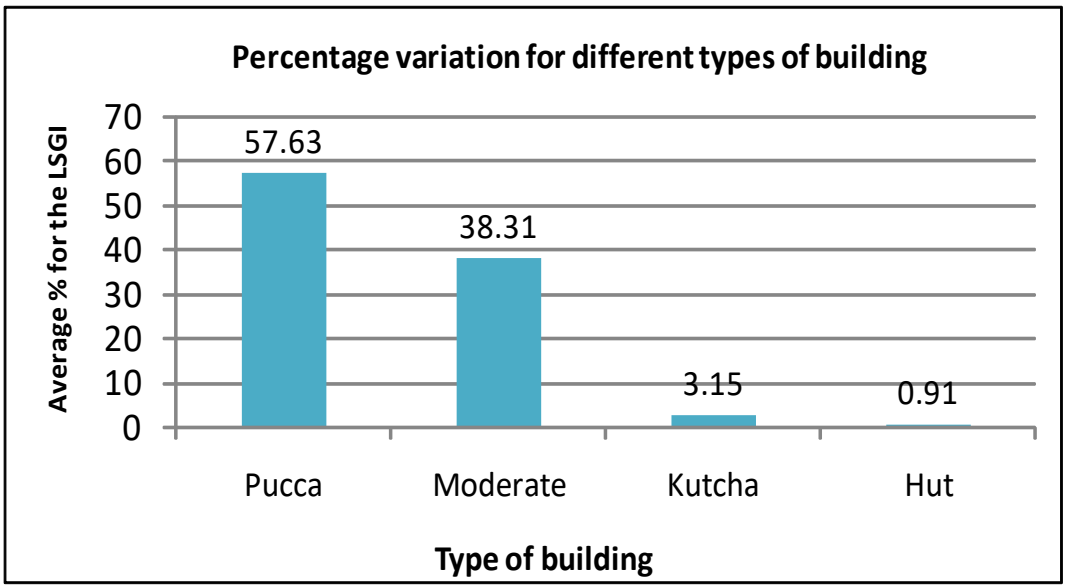
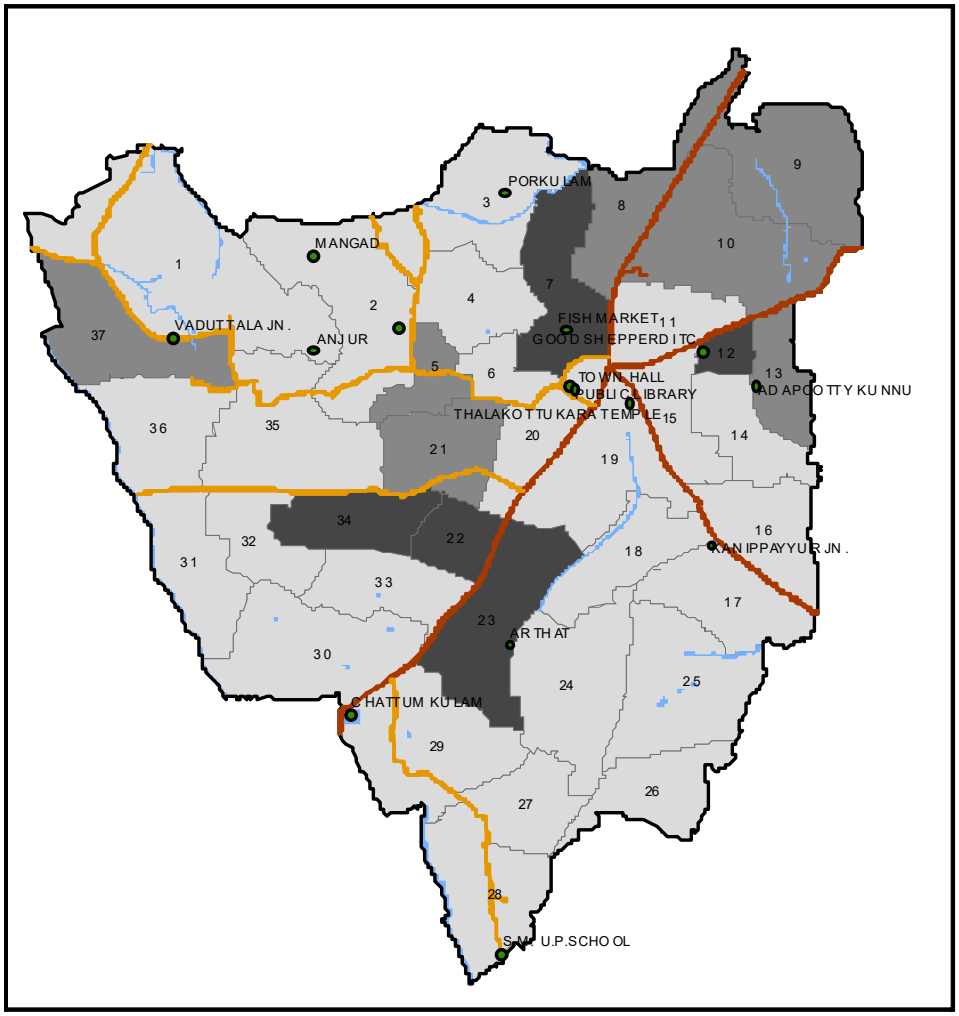


Fig 16.3 Types of houses

Table 16.4 Type of houses

Land Owner ship	Own	Lease	Others
Average % for the LSGI	96.93	0.17	2.82

Fig 16.4 Distribution of Kutcha type houses



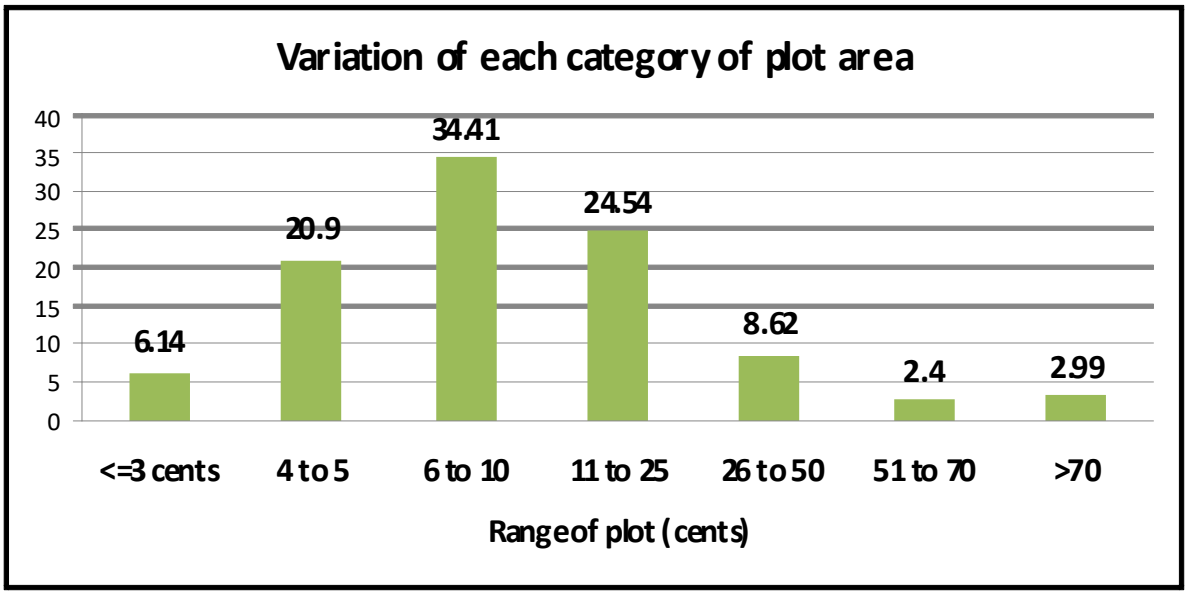


Fig 16.5 Variation of plot area

Source: Socio economic survey-2012

Figure 16.5 gives the details of range of plot area of the house owners. This is obtained from the socio economic survey conducted by the department. 35% of the people fall in the 6-10 category. Majority of the people have plot sizes less than 25 cents. The figure 16.6 details the area of the houses in the town area. Vast majority of the people have houses having area less than 750 sft. These figures project the economic situation of the people.

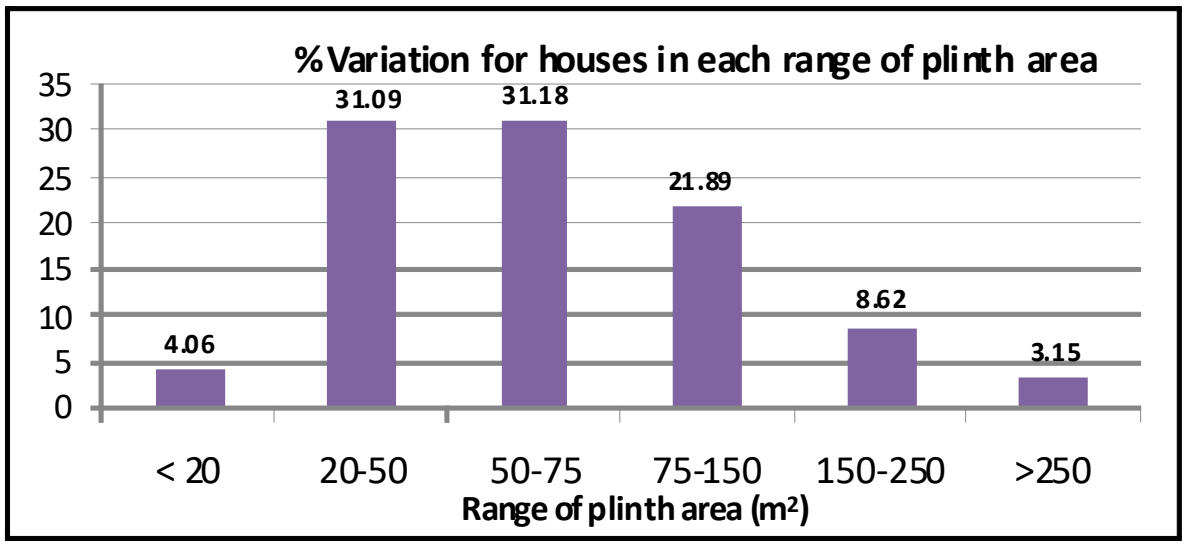


Fig 16.6 Variation of plinth area

Source: Socio economic survey-2012

16.3.1 Substandard housing

Substandard housing is the type of housing that does not meet the standards of living of people. These standards usually deal with how safe and comfortable the dwelling is for the inhabitants. Substandard housing is a serious issue. Unfortunately, the number of people living in the slums or substandard housing is increasing. One of the reasons is the lack of economic opportunities in rural areas that forces people to move to the cities. They move to the cities that are already overwhelming with issues of overcrowding , lack of infrastructure and high cost of living. This forces them to seek shelter in slums.

The details of identified slums in Kunnamkulam Town are given in Table 16.5. The detailed analysis of this data explores that 344 families facing the problems of shortage of drinking water and improper drainage facilities are residing here. They have sufficient access for road, sanitary waste disposal and street lights that mean the infrastructural facilities are not so poor like a slum area. These slums are already included in the IHSDP project. The locations of these colonies are shown in figure 16.6 below.

Table 16.5 Identified slums in Kunnamkulam town

Sl No	Name of the Slum	Ward	Listed/ Non listed	Total Area	No of Houses	Housing Category	No of HHs	Population	Source of drinking water	Method of Sanitary Waste disposal	Street light provided	Acess through a motorable road of 3m width	Drainage
1	Udayagiri Colony	13	Listed	1 Hect	150	NA	150	605	Public tap	Leach pit & septic tank(community	Yes	Yes	Partial
2	Michabhumichery	34	Listed	15 Hect	117	NA	117	463	Public tap	Leach pit & septic tank(community Level)	Yes	Yes	Partial
3	Kariyamthaadmchery	37	Listed	1 Hect	77	NA	77	303	Public tap	Septic Tank(Community Level)	Yes	Yes	No drainage

Source: Municipal office, Kunnamkulam, 2012

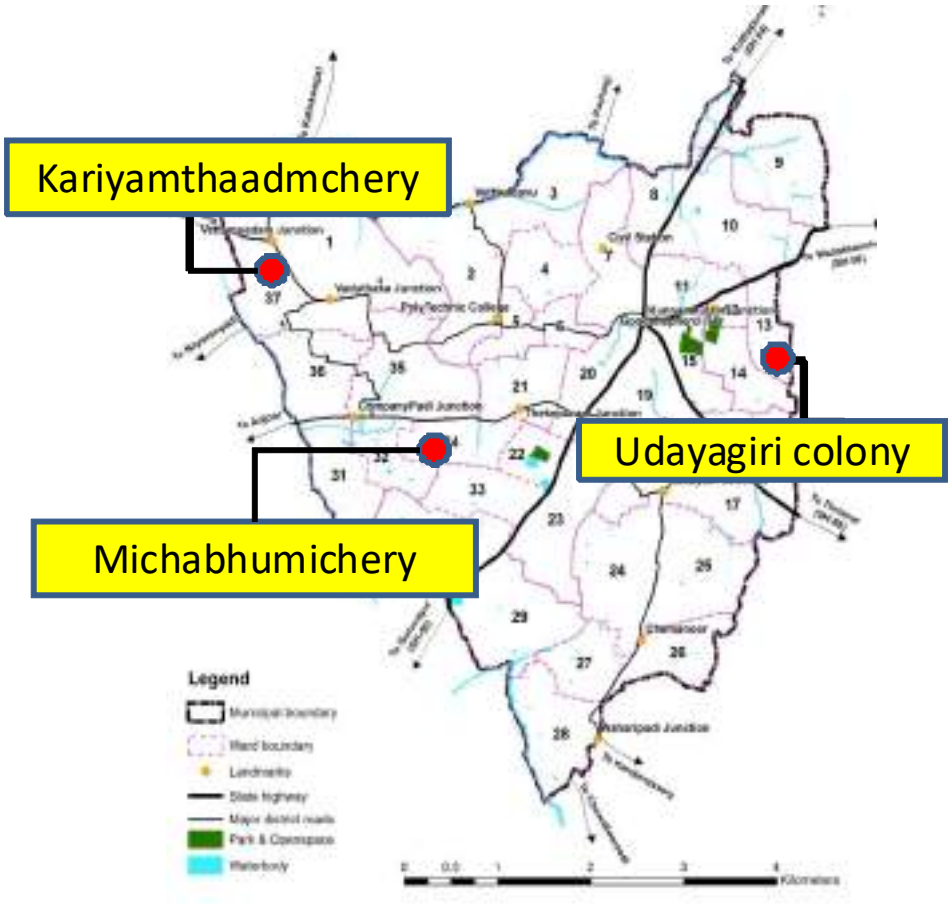


Fig 16.7 Location of slums

Source: Slum survey-2013 by Town and Country planning

A detailed survey to identify the sub standard housing area was conducted covering nearly 43 colonies. They are then graded based on the availability of access, safe drinking water, house condition, sanitation facility available and electric supply availability. The

result as follows,1.In bad condition (grade C), 2.Medium (grade B), and 3.Better than medium (grade A). As per the slum survey conducted by Town and country planning, the substandard housing areas identified in Kunnamkulam Town area are given below in table 16.6.

Table 16.6 Substandard housing areas in Kunnamkulam town

Sl.No.	Name of Colony/Slum	Sectors				Mark	Grade
		Housing condition	Water supply	Access	Sanitation Facility		
1	Cheruvathani, Aakkalakunnu	—	—	+	+	8	C
2	Cheruvathani, Anjoorpadam	0	—	+	+	7	B
3	Nayadi Colony	—	0	+	—	9	C
4	Ullissery	0	—	+	+	7	B
5	Kariyamthadam	0	—	+	+	7	B
6	AlathurLakshamveedu	0	—	+	+	7	B
7	Aluthupadam	+	—	+	+	6	B
8	Aluthupadam,Randalumthara	+	0	+	+	5	A
9	Kalayankulam	—	—	+	+	8	C
10	Vaduthala	+	—	+	+	6	B
11	Kizhur Colony	0	0	+	+	6	B
12	Chandikunnu colony, Karthikasamariya	0	0	+	+	6	B
13	Sowhridah Line 1	0	+	+	+	5	A
14	Sowhridah Line 2	+	+	+	0	5	A
15	Sowhridah Line 4	+	+	+	+	5	A
16	ChittanjoorMichabhoomi (Sowhridah 3)	0	—	+	+	7	B
17	Chittanjoor Colony	0	0	0	+	7	B
18	AnjoorLakshamveedu colony	0	+	+	+	5	A
19	Kavilakad Colony	+	0	—	+	7	B
20	Thekepuram Colony	0	0	+	+	6	B
21	Ambedkar Colony	0	0	0	+	7	B
22	Pulikkaparambu colony	0	0	+	+	6	B
23	Unarvu Nagar	0	—	+	+	7	B
24	Punerjani Cheri	—	—	+	+	8	C
25	Bhagyalakshmi (Koorimana road) Cheri	0	0	+	+	6	B
26	Kurukkanpara Colony	0	+	+	0	6	B
27	Bishop hill cheri	0	—	+	+	7	B
28	Vayaloram colony	+	0	+	+	5	A
29	Senior Ground	+	0	+	+	5	A
30	Savakkotta colony	+	0	+	+	5	A
31	Cherukkunnu	+	0	+	+	5	A
32	Parappurath	—	0	+	+	7	B
33	SMC	+	0	+	+	5	A
34	Cheeramcolony	0	+	+	+	5	A
35	Inchikkunnu colony	+	0	+	+	5	A
36	Udayagiri colony	0	0	+	+	6	B
37	Urulikkunnu colony	+	0	+	+	5	A
38	Kambimashkkunnu	+	0	+	+	5	A
39	Lakshamveedu colony	+	0	+	+	5	A
40	Santhibhavan	+	+	+	+	4	A
41	Chiralayam	0	0	+	+	6	B
42	Kakkad colony	+	0	+	+	5	A
43	Sanmathiyas	+	0	+	+	5	A

Source: Slum survey -2013 by Town and country planning

Based on the slum survey conducted four C type housing areas are identified they are

- Cheruvathani, Aakalakunnu
- Nayadi colony
- Kalayamkulam Colony
- Punerjeni colony

The substandard housing areas are given in figure 16.7. Electricity is provided to each colony. The main problem in this area is shortage of drinking water and poor housing condition.In Nayadi colony proper sanitation facilities are also not available. In Kurukkanppara and souhrada line 2 colonies coming under the B grade catergory also have improper sanitation facilities. The houses which have no sanitation facilities have to provide latrines separately with one common septic tank. A bio gas plant is to be installed with the septic tank and the gas can be used to lighten street lights in this colony. In Kavilakadu colony there are no good roads. Average quality roads are there in Chittanjoor and Ambedkar colonies coming in 'B' grade.

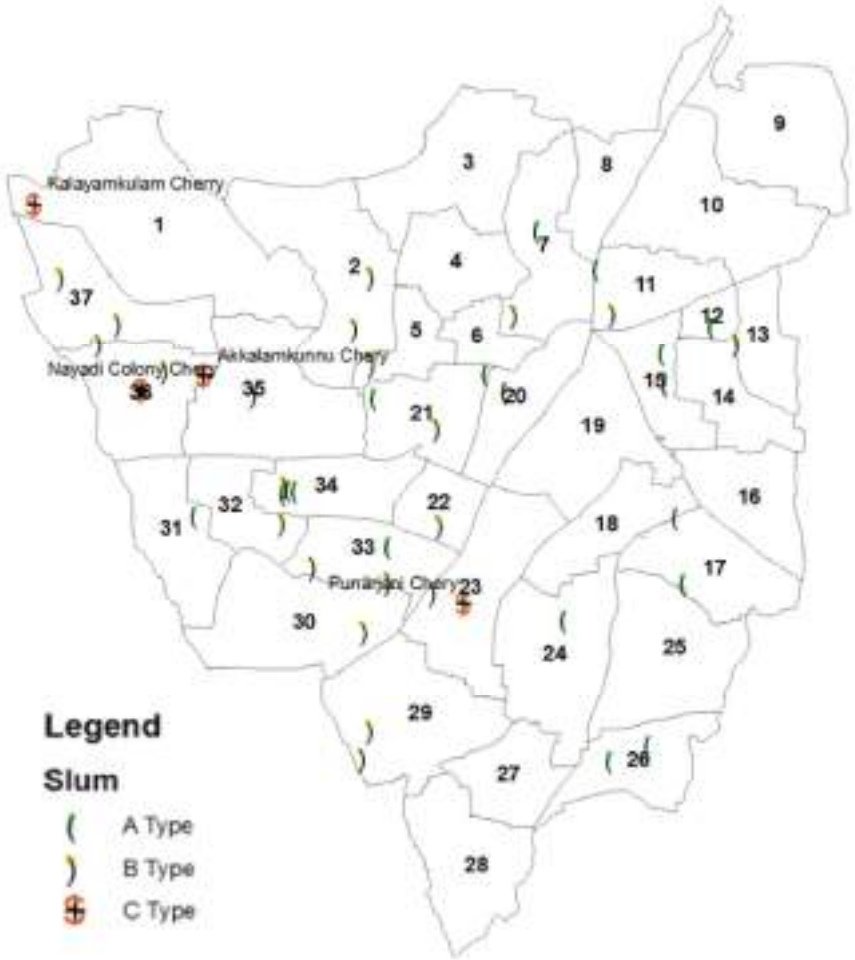


Fig 16.8 Substandard housing areas

Source: Primary survey 2012

16.4 Inference

On a detailed analysis of the recreational facilities it can be seen that no park is existing in the town area. In the same way the insufficiency of open air places and play grounds are shown there. The stadium existing here has to be modified. As per planning standard for a medium town recreational space shall be provided at the rate of 1.4 - 1.6 ha/ 1000 persons, i.e 0.7 sq.km of area is required but only 0.3 sq.km is available.

The existing Civic amenities in the Town area have been analyzed. The Town hall is in a perishable condition. A town hall with modern facilities is a requisite. A Good children's library with a good collection of books is a must. An electric Crematorium inside the Town area is a necessity to meet the increased population. It is evident from the local analysis that most of the families use gas stoves for cooking food, hence one additional LPG godown is essential to cater to the needs of the people. Library facilities are available upto the planning standards. The infrastructure related to the civic amenities need to be improved.

Housing sector in Kunnamkulam is satisfactory. 31% of Town area is under residential use. Notable shortage in housing stock cannot be identified in this area. Only 4% houses has to be enhanced. Out of the 43 urban substandard areas (including slums) only 5 were noted with bad housing condition. Shortage of drinking water and poor housing condition are the main problems of urban substandard area.

CHAPTER 17

SPECIAL CONCERN AREAS

Every human community comprises of people of all caste, status, and social background. Certain groups need to be attended to and brought forward. There are so much support systems already imparted by the constitution of India. Even after all these efforts there are people who require a support to move along. This chapter analyses the status of socially backward and the below poverty line (BPL) families in the town area. This includes women children, elderly, BPL and Scheduled caste people.

17.1 Introduction

Poverty is a social phenomenon in which a section of the society is unable to fulfill even their basic necessities of life. Poverty continues to prevail among the downtrodden and depressed sections of the people. In Kerala, the rate of poverty is continuously diminishing. Respective Governments have undertaken several welfare measures and have given importance to minimum needs programme. Measures like increase in stress on education, reservation of seats in Government jobs, women empowerment and empowering weaker sections of the society are also expected to contribute to the alleviation of poverty.

17.2 Existing status

17.2.1 Economically weaker section (BPL)

The economic status of the BPL people is evaluated based on the occupational structure and average annual income of BPL population. The BPL survey conducted during 2009 reveals that the BPL population are mainly employed as coolie and 5241 families comes under below poverty line. This is about 44% of the total households in Town area. The BPL concentration of families in the town is available from Municipality records in the format of 34 wards.The details are shown in fig 17.1.

From fig 17.1, it can seen that BPL families are more in wards 21,13 and 25 that is at Aduppootty, Kurukkanppara and Chemmannoor areas. The substandard housing areas are also concentrated in and around the above areas. This reveals that BPL families are mostly living in substandard housing areas. The distribution of sub standard housing area as revealed from the sub standard housing area survey is shown in figure 17.2.

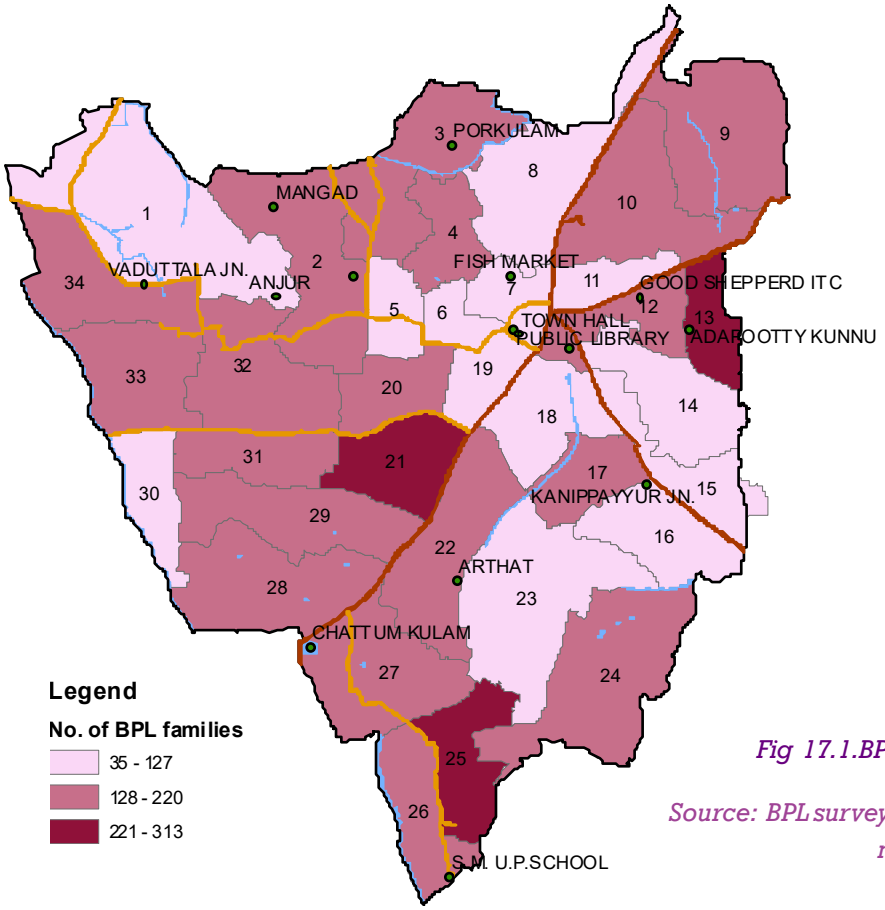


Fig 17.1.BPL Families distribution

Source: BPL survey conducted by Kunnamkulam municipality

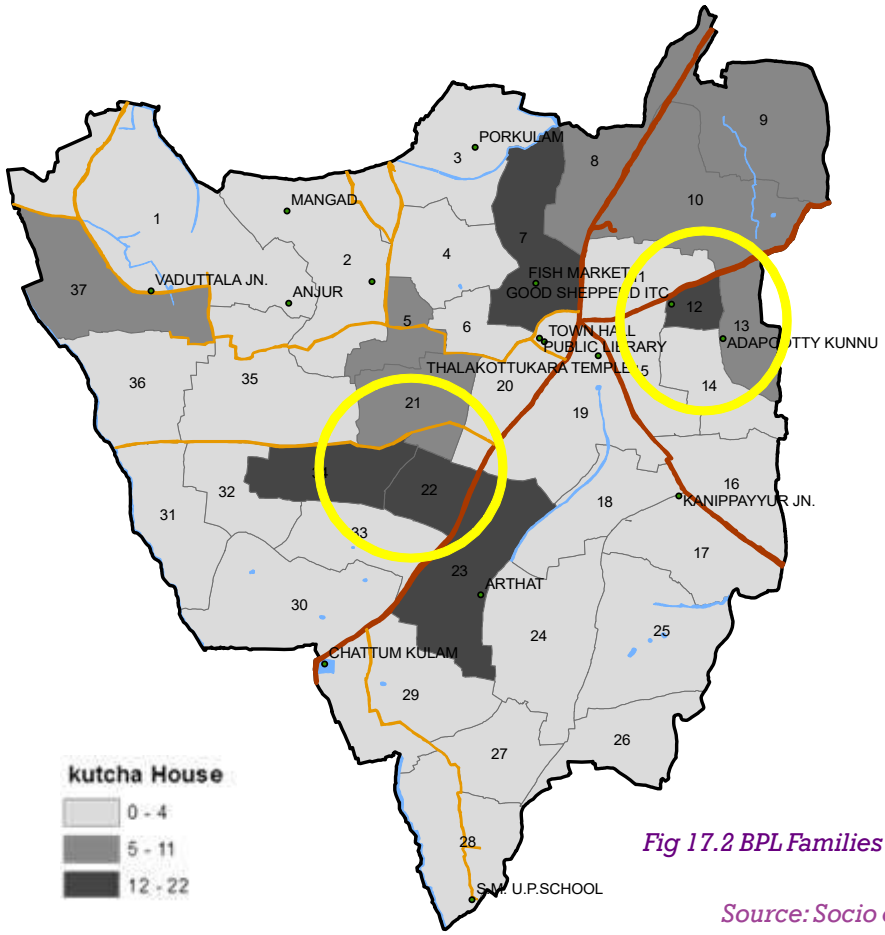


Fig 17.2 BPL Families in substandard housing area

Source: Socio economic survey-2012

17.2.2 Scheduled Caste/Scheduled Tribe

As per 2011 census the SC population of Kunnamkulam town area is 6419.Scheduled castes are concentrated mostly in ward 18 ie in Kaniyampal and in wards 2,4,3,22,33 and 29. A total of 1376 scheduled caste families (11% of HH) are there. SC-ST families in rest of the wards are less than 50. The SC concentrations of families are shown in Fig 17.3.

A comparison of the above three figures reveals that Kurukkanpara and Arthat East area where there are people with a backward nature.

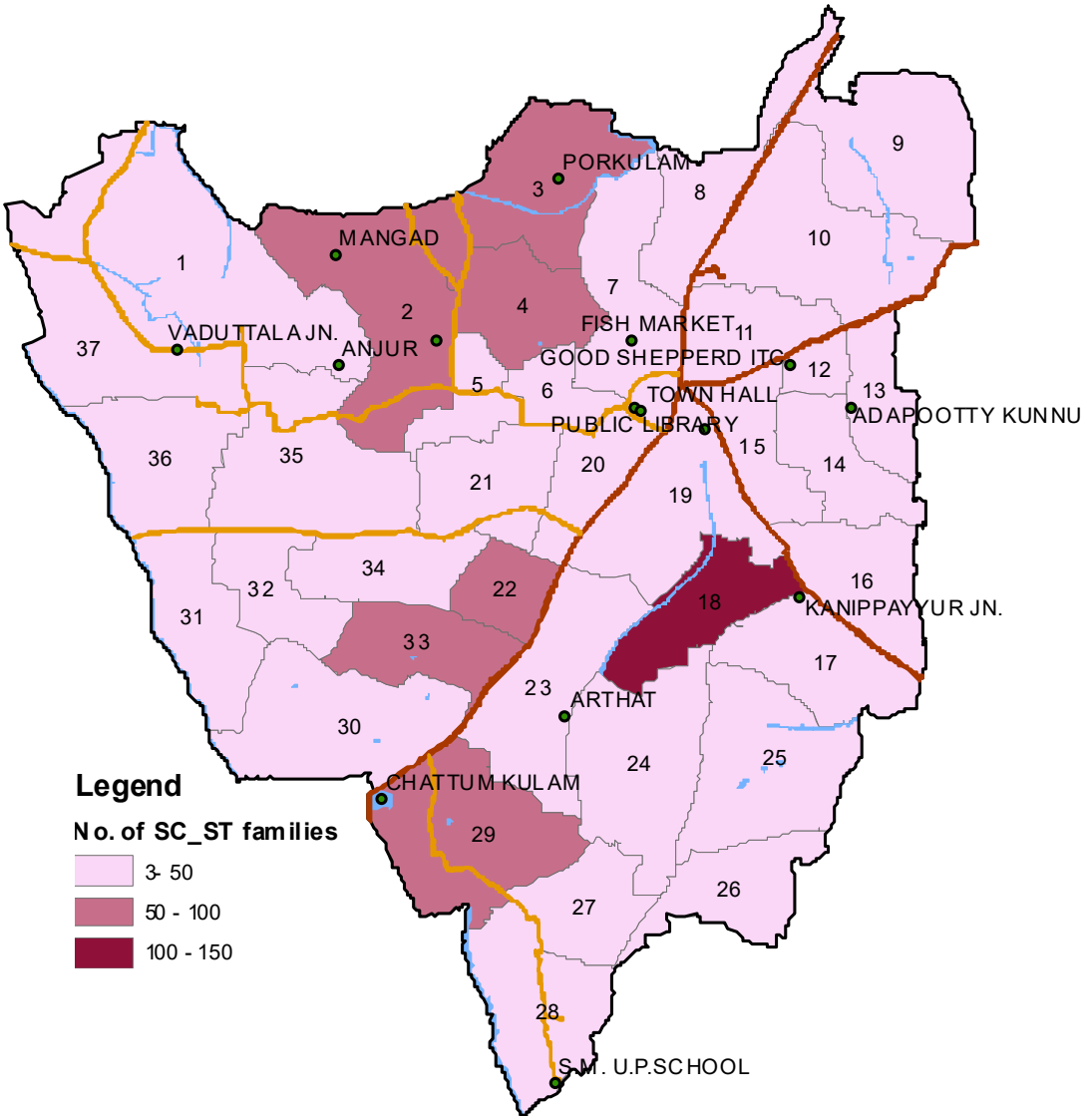


Fig 17.3 SC Families

Source: Municipal office, Kunnamkulam-2012

17.3 Inference

On a detailed analysis it can be seen that 44% of the families in Kunnamkulam Town area are BPL families. They are concentrated along the Adupputty, Kurukkanppara and Chemmannoor area. Scheduled caste families are mostly concentrated along the Kaniyampal area.11% of the households are SC families. There are certain areas of concern in the development of BPL population. Improvement of substandard area should be given top priority. The development programmes should give priority to include the BPL population especially the SC/ST and other socially weaker sections of the society. Data reveals that the areas where there is BPL concentration lack many infrastructural facilities including safe drinking water, electricity, solid waste disposal system etc. Thus in order to have best results in the area of poverty alleviation, there has to be an integrated approach for poverty alleviation through concentrated efforts of Government Departments and others.

CHAPTER 18

ENVIRONMENT

This chapter deals with the ecologically and environmentally sensitive areas and the issues related to them in Kunnamkulam.An ***Environmentally Sensitive Area*** *is a type of designation for an agricultural area which needs special protection because of its landscape, wildlife or historical value. In this era when global warming is the prime concern, it is the duty of every citizen and community to protect nature. Every possible measure need to be taken to let the nature breathe.*

18.1 Existing status

Kunnamkulam as the name indicates is indeed having an uneven terrain with a lot of small hillocks and ponds. Hence there is ample scope for environment protection activities. The ecologically and environmentally sensitive areas in Kunnamkulam Town are Kole lands, Water bodies, Paddy and Sacred groves.

18.1.1 Kole lands

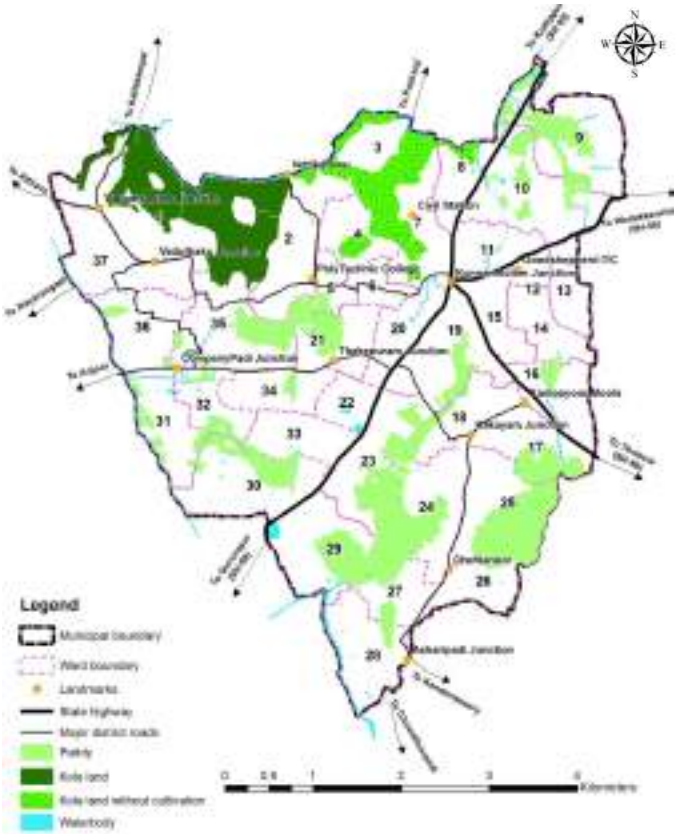


Fig .18.1 Distribution of paddy lands

Source: Landuse survey 2012

Kole lands are rice granaries, located in the central Kerala. It gives 40% of Kerala's rice requirements and acts as a natural drainage for the city. Rice cultivation is the main agricultural activity in Kole area and it dates back to 18th century. Conservation of its geography, hydrology and biodiversity are crucial for the sustenance of our ecological balance. The kole lands in Thrissur – Ponnani area is getting rejuvenated with govt. assistance under the Thrissur Ponnani kole protection project. In Kunnamkulam the kole lands are concentrated at the northern parts of Kunnamkulam Town. Paddy and kole lands form 23 % of the total area and the kole lands alone form 8.77 % of town area.

The fig 18.1 shows the distribution of paddy lands in Kunnamkulam Town area. Presently majority of Kole lands are kept idle due to waste issues and many other problems. Paddy lands without cultivation are under the threat of land conversion. These lands are very environmentally and ecologically sensitive and hence every possible measure should be adopted to conserve it from being converted.

18.1.2 Water Bodies

Water resources are central to the region's aesthetics, economics and health. Clean and safe water is essential to the health and livelihood of the residents. There are several water bodies in the urban area that are a source of drinking water, others are not being used, some others have dried up; there is a need to preserve these natural resources.

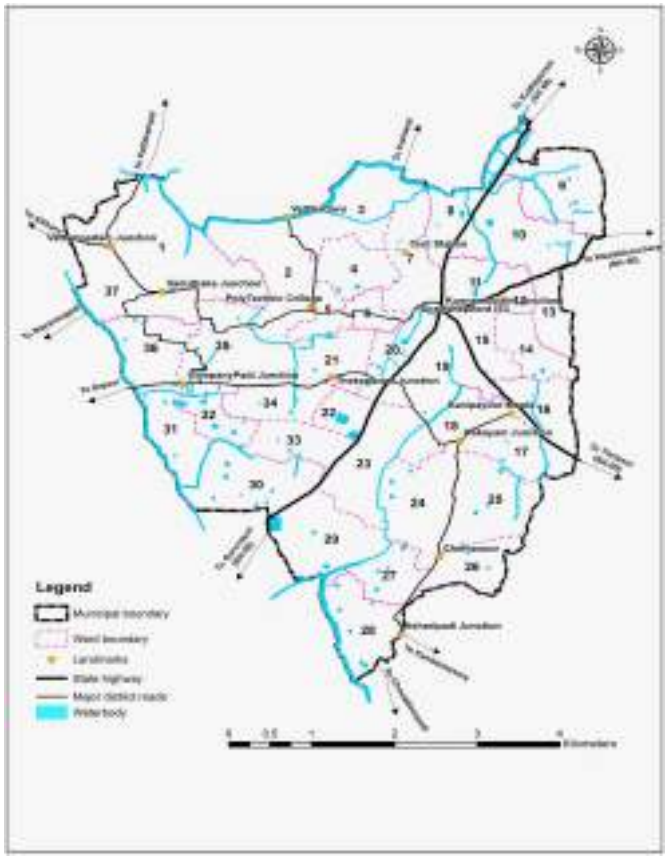


Fig .18.2 Distribution of water bodies

Source: Landuse 2012

The main water bodies in Kunnamkulam Town area are Perumthodu and Kakkad Cheralayam thodu, which passes through the northern side of municipality. According to the land use data, about 1.23% of Kunnamkulam Town area consists of water bodies. The Canoli canal is passing through the north-west side of Kunnamkulam. The location of water courses is shown in the figure 18.2

18.1.3 Sacred grove

Sacred groves even help in soil and water conservation besides preserving its rich biological wealth. These are the last resorts to many of the animals and birds. Sacred groves also enrich the soil through its rich litter composition. The nutrients generated thus are not only recycled within the sacred grove ecosystem but also find their way into the adjoining agro eco systems.

A Kavu of 52 cents land is found in Thurithikkadu in the northern part of Kunnamkulam Town. The common trees found in the sacred Kavu are Manchadi, Aini, jack fruit tree, Podiyeni, Elanji, Mukkutti and Bamboo are very common in the sacred Kavu and is lush green with many climbers and shrubs. Animals like wild roaster, squirrels and various types of birds are also seen here. The kavu needs special protection owing to the Environmental importance. Location of the same is shown in figure 18.3.





Fig .18.3 Sacred grove in Kunnamkulam

18.2 Inference

On a detailed analysis it is revealed that Kunnamkulam Town is environmentally sensitive with the presence of water bodies, sacred grove and Kole lands. It is essential to preserve the environmentally sensitive area for the ecological balance.

CHAPTER 19

DEVELOPMENT ADMINISTRATION AND FINANCE

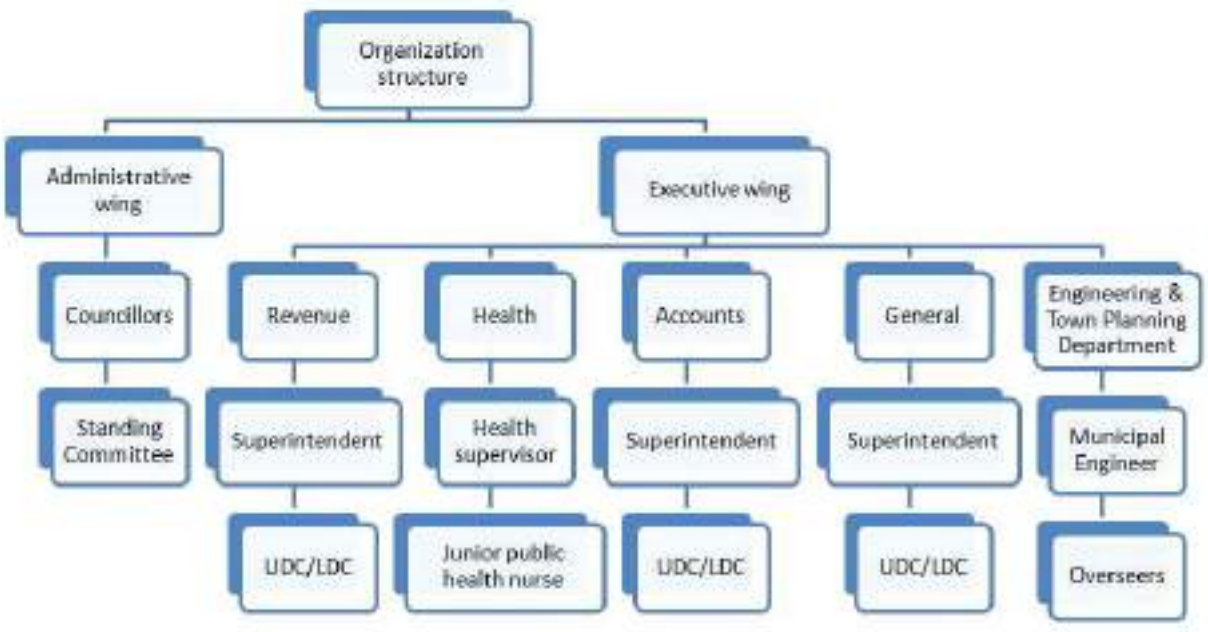
Governance relates to "the processes of interaction and decision-making among the actors involved in a collective problem that lead to the creation, reinforcement, or reproduction of social norms and institutions. This chapter deals with the administrative setup of the local body and finance details.

19.1 Development Administration

Development administration refers to the administration of policies, programs and projects that contribute to the development and have significant socio political and socio economic impact.

19.1.1 Organizational Structure

The structure of the municipality consists of two wings, i.e. the administrative wing and the executive wing. The administrative wing is headed by Chair person and consists of the council members .The executive wing is headed by Secretary and consists of revenue, health, accounts, general, engineering and town planning department. Organizational structure in Kunnamkulam Municipality is shown below.



Administrative Wing

The municipal council, the political arm of the municipality consists of 37 elected councillors, each representing a ward. The chairman (elected from among the councilors) heads the municipal council, which performs its duties as per the provisions of the Kerala Municipalities Act 1999. The political wing provides an overall direction to the municipality and performs its functions through a set of committees constituted for different purposes.

Executive Wing

The executive wing is responsible for day-to-day operations of the municipality, and is headed by the municipal Secretary. The secretary is the administrative head of the municipality and is supported mainly by five departments in the operations. The organizational structure of the municipality comprises of five functional departments. The function of clerical staff dealing under each department/ section of the Municipality is coded for the sake of work allocation and standardization.

19.1.2 Municipality Services

Services that are available for the public from municipality are

- The certificate of Ownership
- Residential certificate
- Building tax deduction
- Property tax payment
- Employment tax payment
- Permission to display advertisement
- Birth/Death Certificate
- Identification Certificate
- Marriage registration
- Building Permission
- Completion report
- To get contractors registration
- Certificate of Identity
- Widows pension
- Disability pension
- Old age pension etc.

19.2 Municipal Finance

Municipal finance is closely connected to issues of income distribution and social equity. Governments can reallocate income through transfer payments or by designing tax systems that treat high-income and low-income households differently.

19.2.1 Sources of municipal income

Municipalities must ensure that there will be adequate money to pay for their planned expenditure if they are to "balance the budget". The various sources of income that can be used by municipalities to finance their expenditure are

19.2.2 External loans

External loans (from a bank or other financial institution) are an expensive form of financing the capital budget because of the high interest rates. External loans should only be used to finance the purchase of major capital items such as roads, buildings, sewerage works and water systems.

19.2.3 Internal loans

Many municipalities have internal "savings funds" such as Capital Development Funds or Consolidated Loan Fund. These funds can make internal loans to the municipality for the purchase or development of capital items, usually at a lower interest rate than for an external loan and the municipality is paying the interest back to its own "savings fund", which can later be used for another capital project.

19.2.4 Contributions from revenue

When purchasing a small capital item, the small total cost can be paid for from the operating income in the year of purchase. This financing source is known as "contributions from revenue". In most municipalities, this source of financing is used to pay for smaller capital items, such as one or two items of furniture and equipment. As no interest is payable, this source of financing is considerably cheaper than external or internal loans.

19.2.5 Government grants

Municipalities may apply to national and State government for grants for infrastructure development.

19.2.6 Donations and public contributions

Local and foreign donors may sometimes donate a capital item or money to be used specifically for the purchase of a capital item in a disadvantaged area. They may want publicity for their donation, which the municipality can arrange to acknowledge their sponsorship.

19.2.7 Public Private Partnerships

Capital costs can be paid for by means of partnerships between the private sector and the municipality. In most cases the private sector partner will have a profit motive in the services and capital being financed, so the terms and conditions must be carefully defined, to protect the community's interests.

19.2.8 Property Rates

All people and businesses who own fixed property (land, houses, factories, and office blocks) in the municipal area are charged "Property Rates" - a yearly tax based on the value of each property. Rates income is used by the municipality to pay for the general services to all people, which cannot easily be charged to a specific service user as a "service charge" for example roads, pavements, parks, streetlights, storm water management, etc.

19.2.9 Service Charges / Tariffs

For specific services that can be directly charged to a house or factory, the principle of "user pays" should be adopted. That is, to charge a price or "tariff" for services such as water, electricity or approval of building plans; where the exact usage of the service can be measured, to the person or business who actually used that service.

19.2.10 Fines

Traffic fines, late library book fines, penalties for overdue payment of service charges: these fines are another source of income or "revenue" , while at the same time motivating users of services to have a culture of obeying democratic laws, rules and deadlines

19.2.11 Equitable share

The equitable share is an amount of money that a municipality gets from national government each year. The constitution says that all revenue collected nationally must

be divided equitably between national, provincial and local spheres of government. The local government equitable share is meant to ensure that municipalities can provide basic service and develop their areas. The amount a municipality gets depends mainly on the number of low-income people in the area – rural municipalities usually get more. Most municipalities only get a small part of their operating budget.

19.3 Finance details

Municipality is having two sources of income, own income source and external source Own Source of income includes Property Tax, Rents, Advertisement Tax, water charges, trade license fees, building license fees, development charges, cases, etc. External Sources includes Development grants, subsidies, loans from various schemes, etc

Table 19.1 Summary of municipal finance

Revenue Account (Rs. in Lakh)				
Item	2012-13	2013-14	2014-15	2015-16
Revenue Income	1053.67	1478.56	1688.41	1887.86
Revenue Expenditure	1100.67	1487.92	1852.32	2148.50
Gross Surplus/Deficit	-47.00	-9.36	-163.91	-260.64
Capital Account (Rs. In Lakh)				
Capital Income	1568.94	1903.58	2068.80	1612.29
Capital Expenditure	1214.54	1892.86	2153.34	1987.88
Gross Surplus/Deficit	354.39	10.72	-84.54	-375.59
Total Income	2622.60	3382.14	3757.21	3500.15
Total Expenditure	2315.21	3380.78	4005.66	4136.38

Table 19.2 Temperoral variation in municipal income and expenditure

Year	Total Income (in Lakh)	Total Expenditure (in Lakh)	Growth in Income	Growth in Expenditure
2012-13	2622.6	2315.21		
2013-14	3382.14	3380.78	28.96	46.02
2014-15	3757.21	4005.66	11.09	18.48
2015-16	3500.15	4136.38	-6.84	3.26

Details of municipal finance (Capital Account) from 2012-13 to 2015-16 is shown below in the table 19.3.

Table 19.3 Municipal Finance (Capital Account)

No	Item	Amount in Lakhs			
		2012-13	2013-14	2014-15	2015-16
	Capital Income				
	Operating Receipts				
1	Tax Revenue	56.23	57.99	69.67	97.14
2	Rental Income from Municipal Properties	0.23	1.05	0.32	0.50
3	Fees & User Charges	46.93	44.28	103.11	51.93
4	Sale & Hire Charges	2.82	3.70	6.43	3.28
5	Revenue Grants, Contributions & Subsidies	279.51	267.85	444.01	181.72
6	Income from Investments	0.26	0.00	0.13	0.26
7	Interest Earned	8.84	9.55	10.13	12.03
8	other operating receipts	0.27	133.15	4.97	8.60
9	Sundry Debtors (Receivables)	239.99	275.75	320.73	319.13
	Non operating receipts				
1	Earmarked Funds	0	18.63	3.82	0.28
2	Grants, Contribution for Specific Purposes	823.85	951.21	1016.80	732.33
3	Deposits Received	22.20	63.71	22.94	90.59
4	Other Liabilities	87.07	75.22	62.95	113.43
5	Fixed Assets	0.001	0	0	-0.18
6	Loans, Advances and Deposits	0.75	1.47	2.77	1.25
	Grand total	**1568.94**	**1903.58**	**2068.80**	**1612.29**
	Capital Expenditure				
	Operating Payement				
1	Establishment Expenses	69.76	80.81	82.49	102.95
2	Administrative Expenses	33.56	32.44	40.36	56.64
3	Operations & Maintenance	65.92	59.79	51.48	52.23
4	Programme Expenses	150.38	426.77	619.10	310.99
5	Decentralised Plan Programme	349.96	409.58	433.57	454.25
6	other operating payements	146.40	184.86	205.12	227.30
	Non operating Payments				
1	Prior Period Item	0	3.54	-0.07	6.27
2	Earmarked Funds	34.25	32.06	73.74	62.52
3	Grants, Contribution for Specific Purposes	0.5	0.48	49.21	69.65
4	Deposits Received	10.57	5.89	24.27	6.30
5	Other Liabilities	310.79	633.87	556.58	618.17
6	Fixed Assets	21.56	1.31	0.09	0.68
7	Loans, Advances and Deposits	20.90	21.47	16.11	19.93
8	others	13.58	0.0	1.30	0.0
	Grand total	**1214.54**	**1892.86**	**2153.34**	**1987.88**
	surplus/Deficit	**354.39**	**10.72**	**-84.54**	**-375.59**

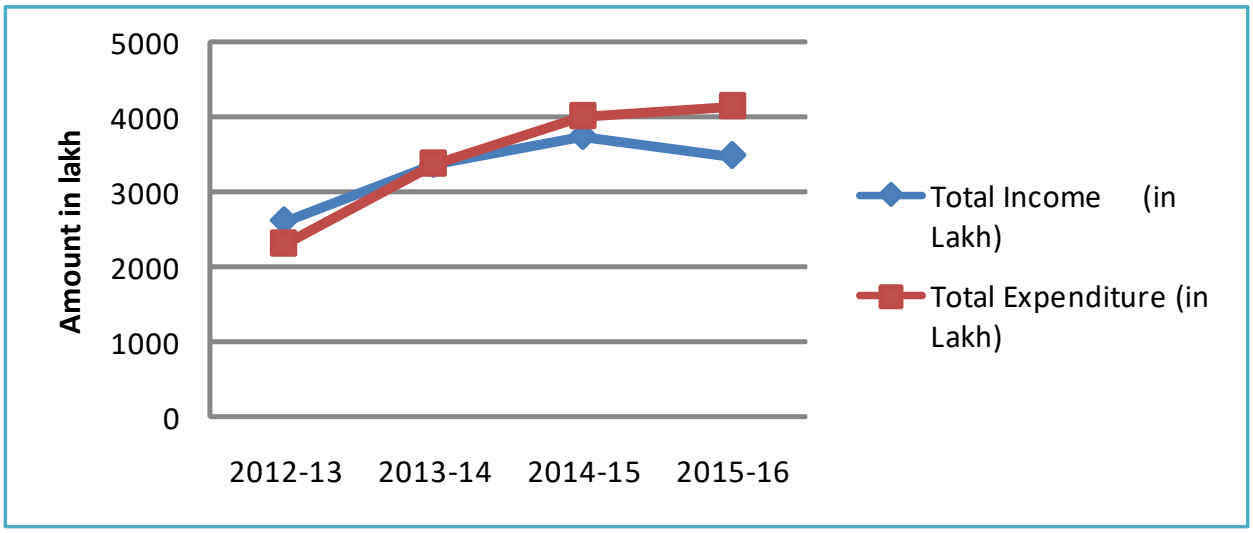


Figure 19.1 Pictorial representation of Total Income and Expenditure

From the analysis of above data it is evident that the surplus in capital income has been gradually changing to deficit. This is mainly due to the growth in the capital income is less than the growth rate in capital expenditure. Also during the year 2015-16 the growth rate in capital income was negative. The variation in Capital income from 2012-13 to 2015-16 is shown in the figure no: 19.2

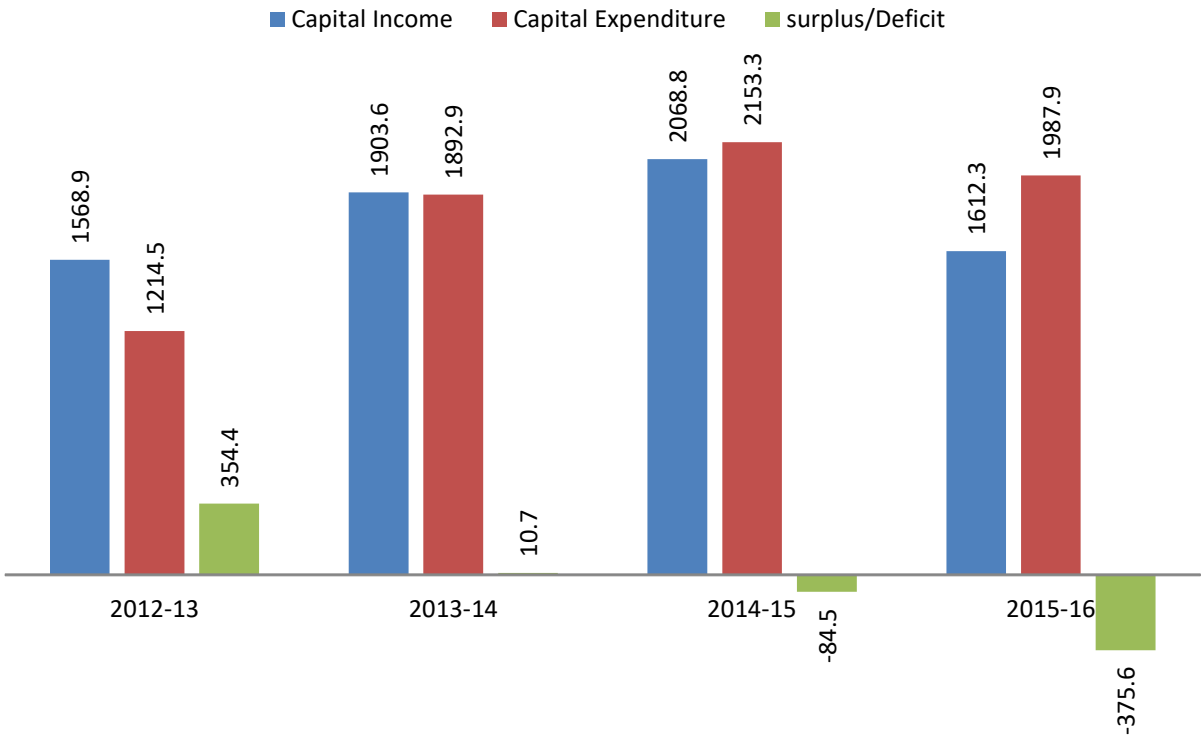


Figure 19.2 Variations in Capital Income and Expenditure

Split up in capital income during the year 2015-16 (fig 19.3) shows that maximum share comes Grants, Contribution for Specific Purposes in non operating receipt, sundry debtors etc .Also the split up in capital expenditure shows maximum share of expenditure is constituted by liabilities, Decentralised plan programs etc.Percentage wise split up in capital income and expenditure is shown below in the figure below (fig 19.3 & 19.4).

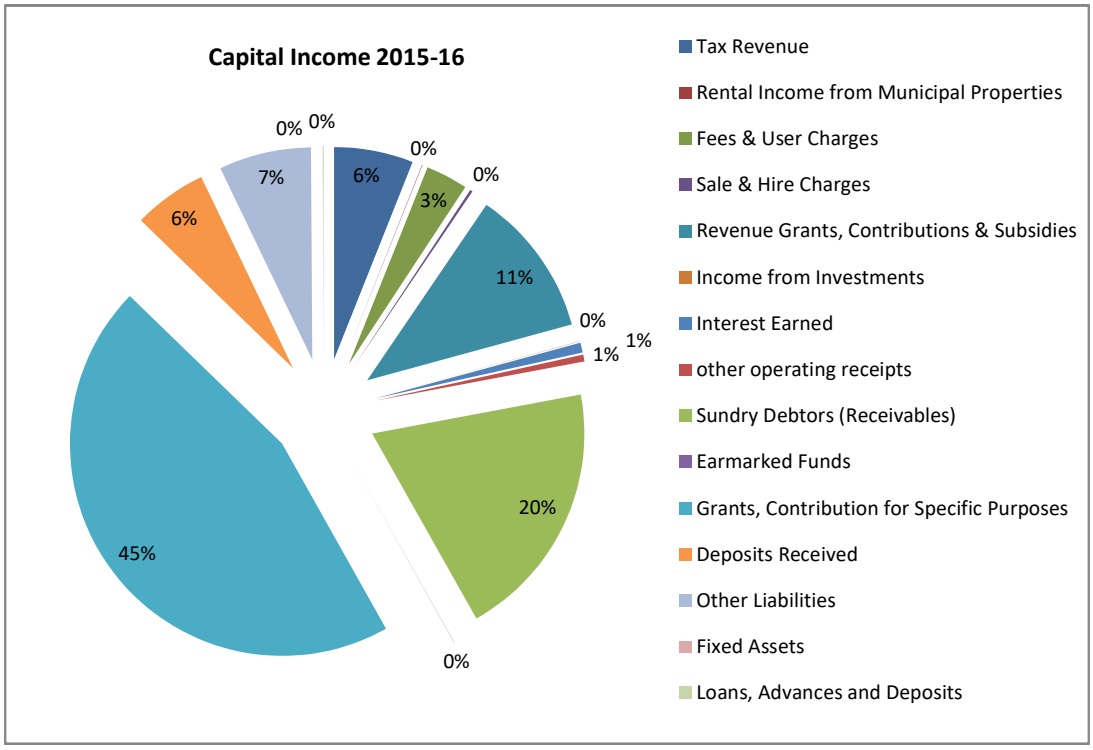


Figure 19.3 Split up in Capital Income 2015-16

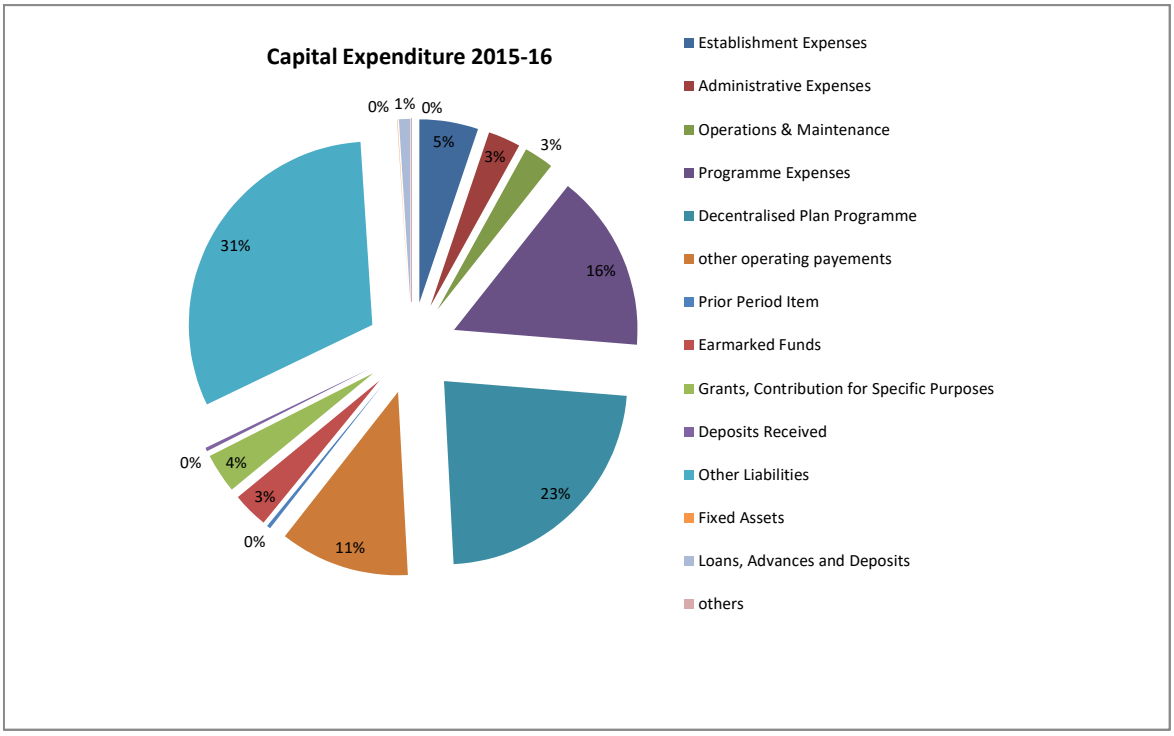


Figure 19.4 Split up in Capital Expenditure 2015-16

Details of municipal finance (Revenue Account) from 2012-13 to 2015-16 is shown below in the table 19.4.

Table 19.4 Municipal Finance (Revenue Account)

No	Item	Amount in lakhs			
	INCOME	**2012-13**	**2013-14**	**2014-15**	**2015-16**
1	Tax revenue	231.80	247.76	250.94	290.48
2	Assigned Revenues & Compensation	0	0	0.00006	0
3	Rental Income from Municipal Properties	97.04	117.76	108.69	115.33
4	Fees & User Charges	50.92	66.96	117.43	70.88
5	Sale & Hire Charges	3.90	3.70	6.43	3.32
6	Revenue Grants, Contributions & Subsidies	660.51	1040.08	1193.05	1394.74
7	Income from Investments	0.26	0.00	0.13	0.26
8	Interest Earned	8.84	2.05	6.42	9.26
9	Other Income	0.41	0.25	5.30	3.60
	Total Income	**1053.67**	**1478.56**	**1688.41**	**1887.86**
	EXPENDITURE				
1	Establishment Expenses	383.78	429.72	516.05	547.83
2	Administrative Expenses	85.18	80.94	77.26	106.67
3	Operations & Maintenance	147.70	69.67	55.50	60.94
4	Interest & Finance Charges	0.17	0.02	0.02	0.01
5	Programme Expenses	147.19	428.93	622.53	788.87
6	Decentralised Plan Programme - Service sector	189.15	76.60	107.07	120.34
7	Decentralised Plan Programme - Infrastructure Sector	126.20	272.07	273.81	268.49
8	Decentralised Plan Programme - Projects not included in sector division	4.76	15.95	21.53	27.20
9	Provosions and write off	13.08	0.00	0.00	0.00
10	Depreciation	3.45	114.01	178.55	228.15
	Total Expenditure	**1100.67**	**1487.92**	**1852.32**	**2148.50**
	Gross Surplus/Deficit	**-47.00**	**-9.36**	**-163.91**	**-260.64**

Analysis of above data, it is clear that the revenue expenditure of the municipality is more than the revenue income in turn available fund are fully utilizing for progressive works by the municipality. Growth rate in the capital expenditure during the year 2014-15 is more than its preceding year and hence more deficit in fund was noticed in that year.

Split up in Revenue income during the year 2015-16 shows that maximum share comes from Revenue Grants, Contributions & Subsidies. Also the split up in capital expenditure shows maximum share of expenditure is constituted by Program expense. Percentage wise split up in capital income and expenditure is shown below in the figure below.

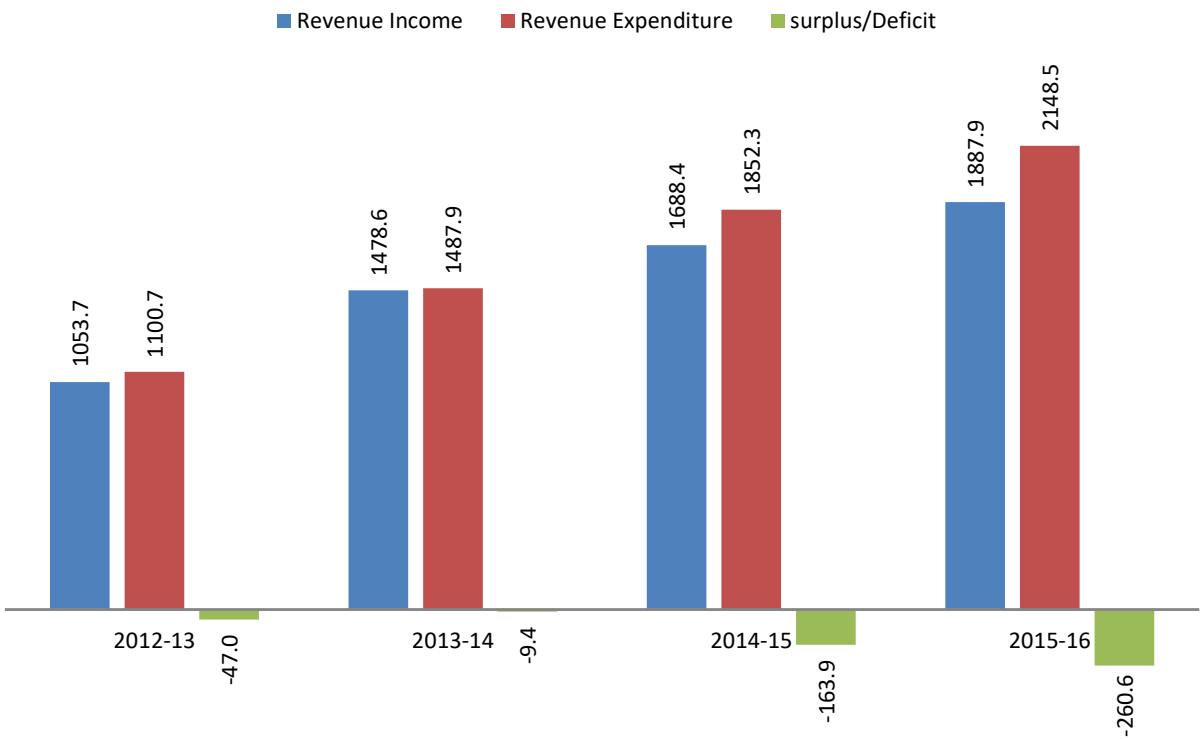


Figure 19.5Variations in Revenue Income and Expenditure

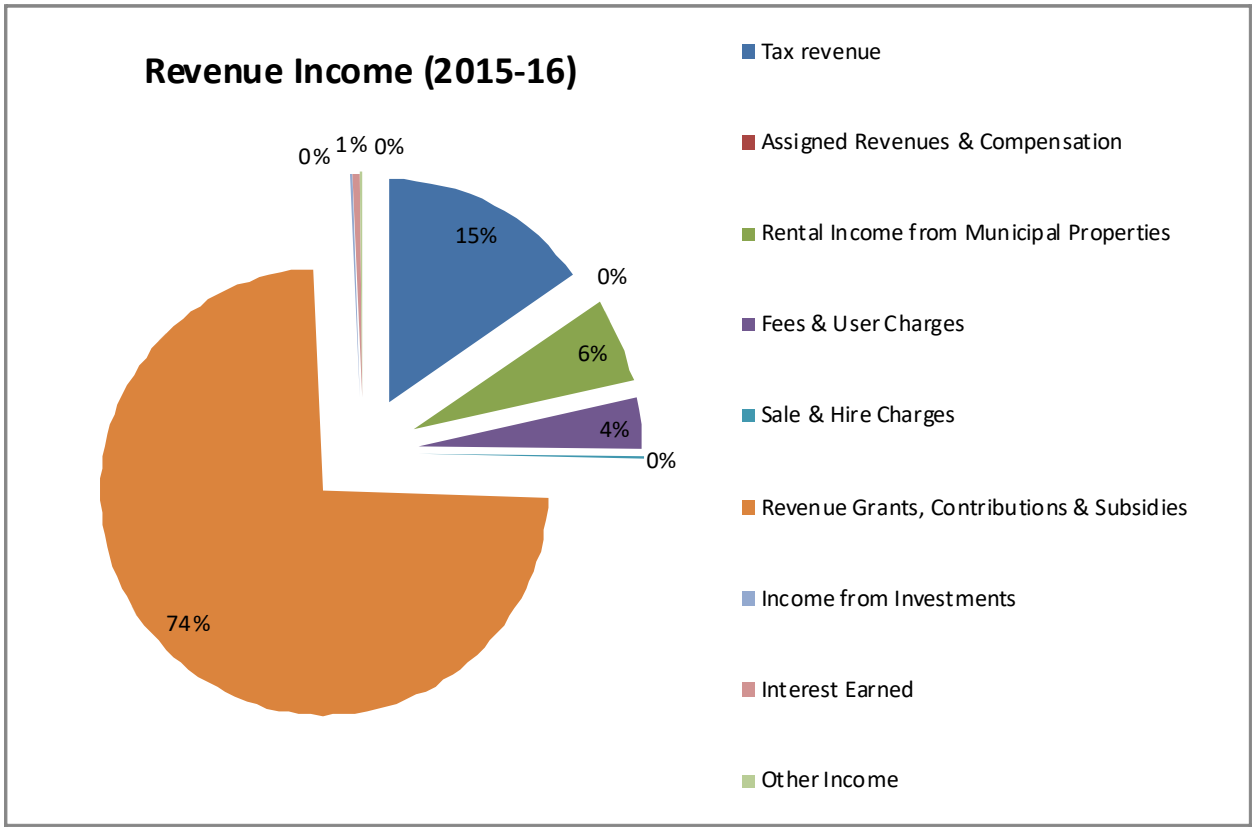


Figure 19.6 Split up in Revenue Income 2015-16

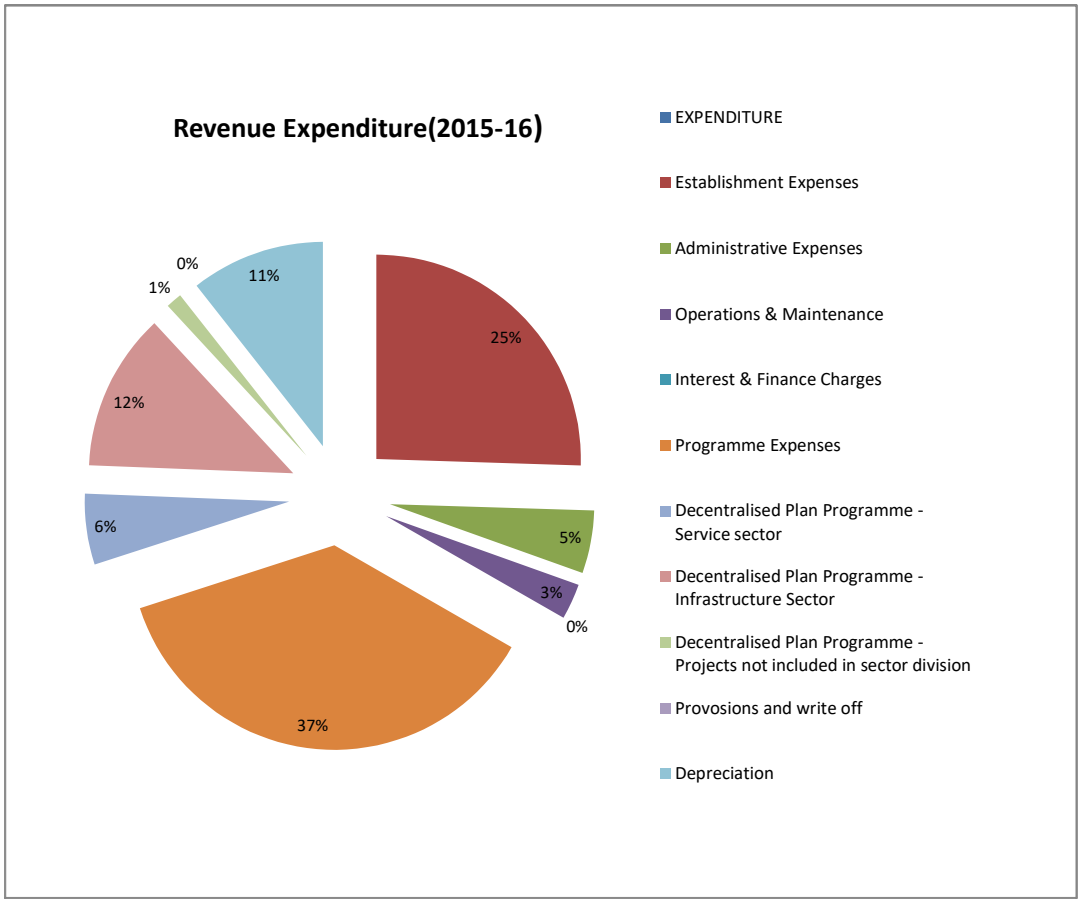


Figure 19.7 Split up in Revenue Expenditure 2015-16

19.3.1 Own sources:

The item head comprises of income sourced primarily from property tax (General purpose tax, Lighting tax, Scavenging tax and Education tax excluding water and drainage tax), professional tax, Advertisement tax and other taxes. Among the own sources property tax is the largest revenue generating item. This has increased from 113 Lakhs in Financial Year 2012 – 13 to166 Lakhs in 2015-16. Own sources of tax income is presented in Table. No 19.5. Property tax and Professional tax together constitutes nearly 64 % of own income.

Table 19 .5 Revenue income -own sources

Item	2012-13	2013-14	2014-15	2015-16
Property Tax (in lakh)	113.16	160.42	156.11	166.86
Profession Tax-Institution (in Lakh)	59.16	22.57491	22.75	24.00
Profession Tax - Employees (in Lakh)	39.51	44.13534	44.79	52.94
Advertisement Tax (in Lakh)	1.52	5.03	0.54	0.52
Entertainment Tax (in Lakh)	18.46	15.55	26.75	46.15
Other Taxes (in Lakh)	0.001	0.005	0.002	0.013

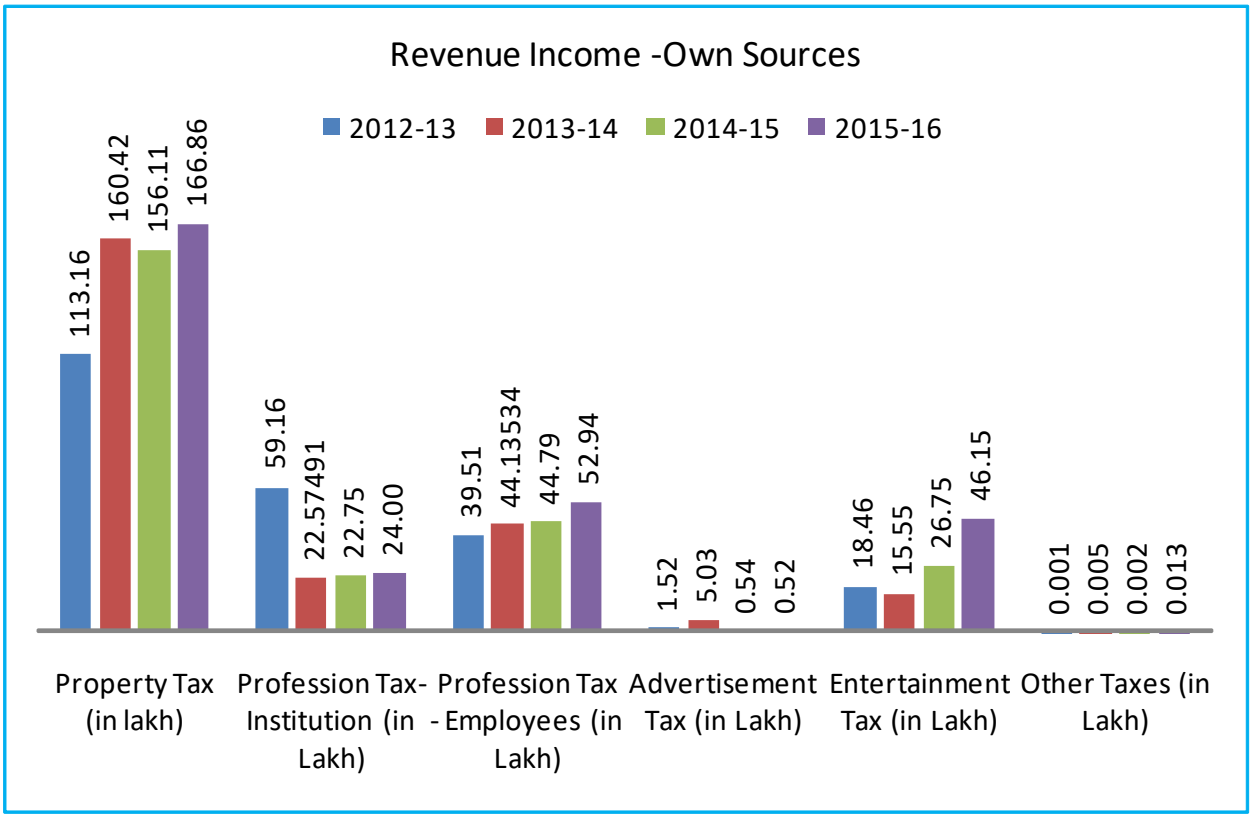


Figure 19.8 Revenue Income own sources 2012-16

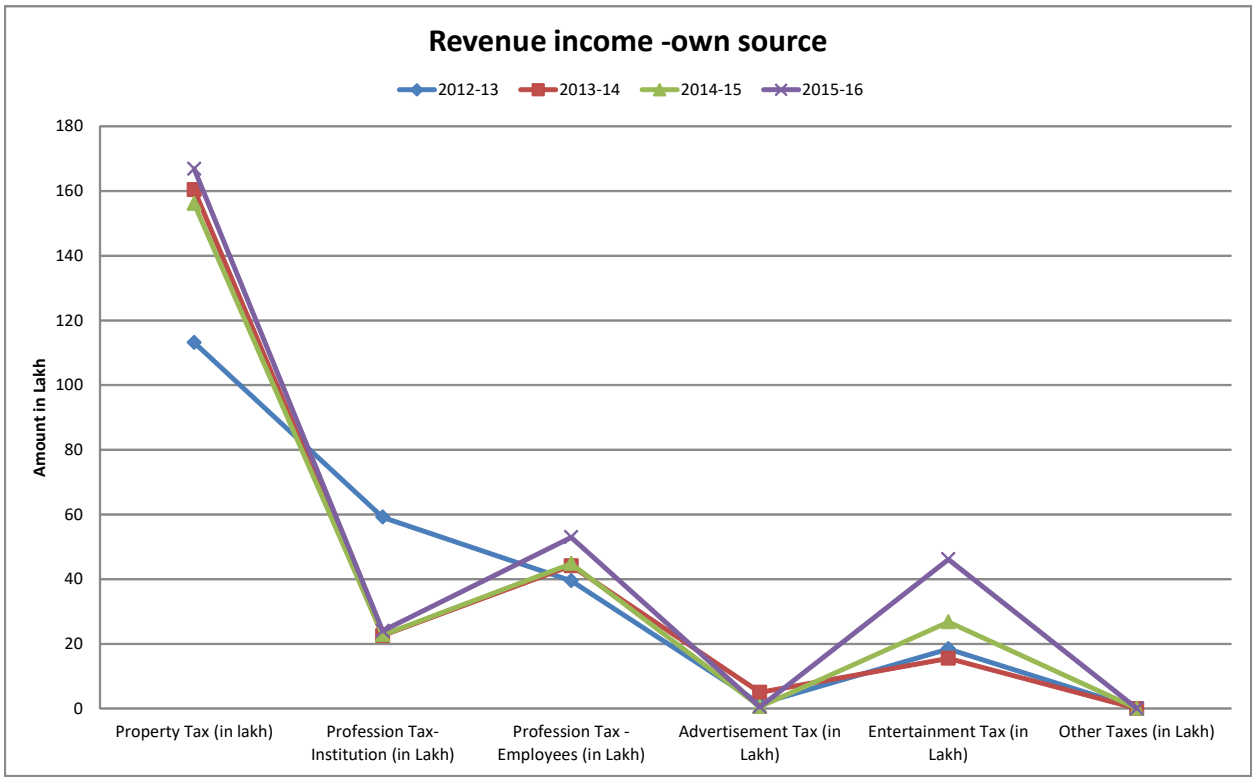


Figure 19.9 Variation in Revenue Income own sources 2012-16

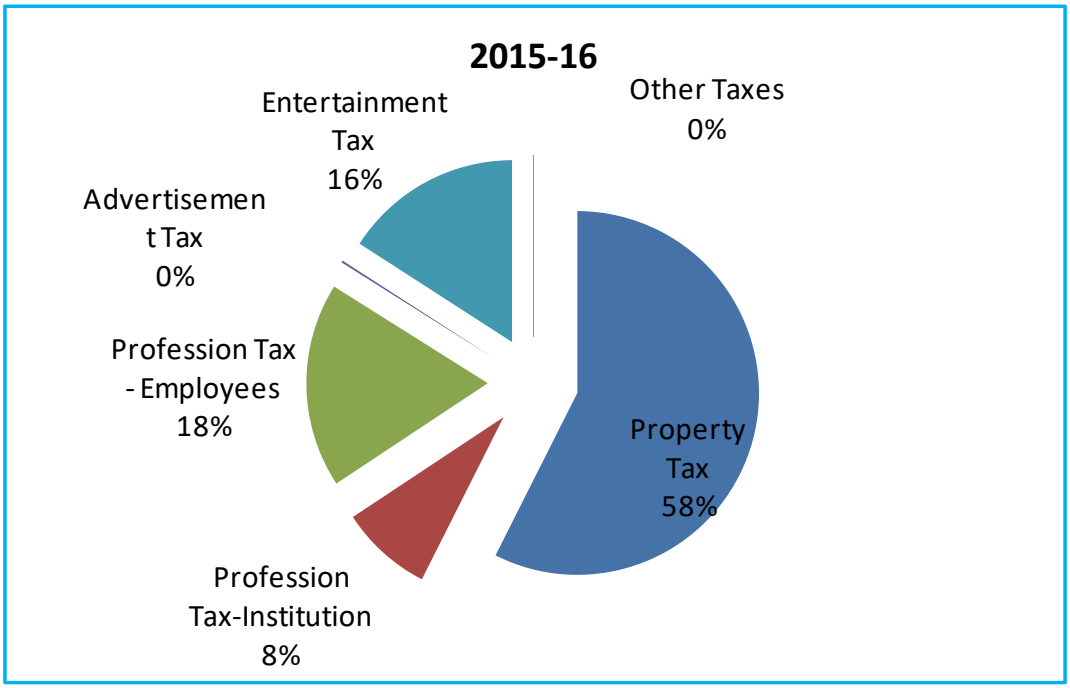


Figure 19.7 Split up in Revenue Income own sources 2015-16

19.4 Assets and Liabilities

An asset is a resource with economic value that an individual, corporation or country owns or controls with the expectation that it will provide future benefit. Assets can be broadly categorized into short-term (or current) assets, fixed assets, financial investments and intangible assets.

A liability is a legally binding obligation payable to another entity. Liabilities are incurred in order to fund the ongoing activities of a business. Examples of liabilities are accounts payable, accrued expenses, wages payable, and taxes. These obligations are eventually settled through the transfer of cash or other assets to the other party. Assets and liability details of Kunnamkulam municipality are mentioned below (Table 19.6).

Table 19 .6 Details of Assets and liabilities

LIABILITIES	2013	2014	2015	2016
Total Reserve& Surplus	837.87	1354.46	1548.14	1643.03
Total Grants, Contributions for specific purposes	792.73	655.74	598.27	186.81
Total Current Liabilities and Provisions	173.77	248.33	274.43	414.99
TOTAL LIABILITIES (in Lakh)	**1804.38**	**2258.54**	**2420.84**	**2244.83**
ASSETS				
Total Fixed Assets	456.65	847.73	1034.99	1177.32
Total Current Assets, Loans and Advances	1347.73	1410.81	1385.85	1067.51
TOTAL ASSETS(in Lakh)	**1804.38**	**2258.54**	**2420.84**	**2244.83**

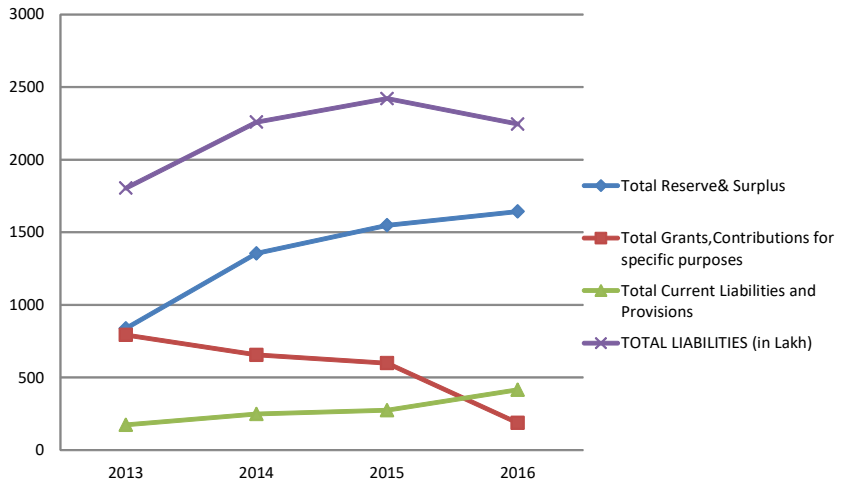


Figure 19.8 Variation in liabilities 2013-16

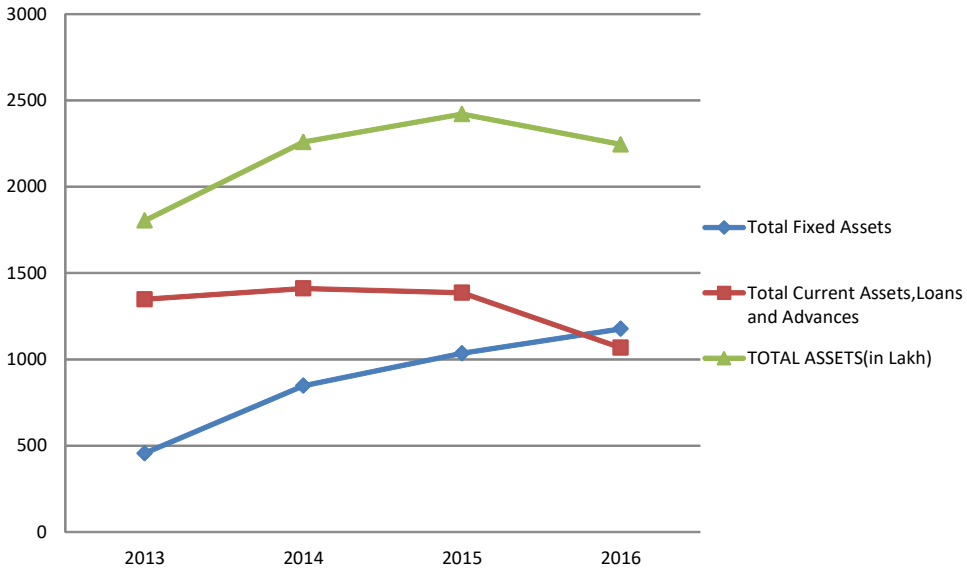


Figure 19.9 Variation in Assets 2013-16

19.5 Key Financial Indicator

The technique of financial analysis is a useful tool to analyse the municipal corporation's financial position. Ratio analyses presented here provide information about efficiency and operational performance, and debt servicing.

19.5.1 Operating Ratio

Operating Ratio (OR) is the ratio of revenue expenditure to revenue income and it

indicates financial status or "profitability" of local body operations. Sound financial management requires that this ratio should beless than unity. The average OR of Kunnumkulam Municipality works out to 1.08. The OR greater 1.0 in kunnumkulam municipality indicates that it has had a deficit revenue account over the past years. Revenue deficit means revenue income is not in a position to support capital investments useful for capital works.

19.5.2 Capital Utilisation Ratio

Capital Utilisation is the ratio of capital expenditure to the capital income. This ratio indicates the performance of the local body in terms of utilisation of capital income. It could also be an indicator of the local body's capacity to utilise capital resources. A capital utilisation ratio of greater than unity indicates that the revenue account surplus has been utilised for capital works, which is a positive feature. A Capital Utilisation ratio below unity indicates that either capital income is being diverted for revenue expenditure (when O.R. is also above1), or that part of the capital income was unspent during the financial year under consideration. The Capital Utilisation Ratio (CUR) of kunnumkulam municipality is 1.01 .The planed expenditure over the past four years is a clear indication of the CUR being just above along with operating ratio being greater than unity. This situation also refers that capital income has been utilized in the financial years to the complete extent, which is a good trend.

Table 19 .7 Key financial indicator data of Kunnamkulam

KEY FINANCIAL INDICATOR	
Resource Mobilisation	
Share of Property Tax in Total Revenue Income	58.42%
Share of Provisional Tax in Total Revenue Income	30.35%
Growth in Revenue Income	17.23%
Growth in Own Sources of Revenue Income	7.98%
Fund Application	
Growth in Total Revenue Expenditure	19.83%
Deficit to Total Revenue Income	7.90%
Performance Indicators	
Operating Ratio (RE/RI)	1.08
Capital Utilization Ratio	1.01

19.6 Problems and Potential

The major problems faced by the municipality is the shortage of funds for development activities. Due to the over dependence of funds from government grants and other subsides had made municipality financial status unstable. To make municipal finance more stable income from own sources and taxes and investments have to be given more concentration. Since the planning area is having more commercial importance investment relating to these areas like building commercial complexes and leasing, promoting PPP model investment in all development sectors by giving tax holidays to private individuals and all will fetch more income to the municipality.

19.7 Inference

The financial position of municipality is currently in a weak stage. Each year the deficit from revenue account is increasing at an alarming rate. Necessary steps have to be taken on an urgent basis to make surplus income to make a balance between the municipal income and expenditure.

CHAPTER 20

LINKAGES AND EXISTING SPATIAL STRUCTURE

Intra sectoral linkages, inter sectoral relations and linkages between settlement characteristics and various sectors need to be addressed for carving out an integrated development vision. Also the existing spatial structure of the planning area which is the physical demonstration of all such linkages is to be analyzed for visualizing the most desirable spatial structure of the area which will minimize the adverse effects on the environment. The details are elaborated in this chapter.

20.1 Population growth on various sectors

The effect of population growth is having direct impact on sectors like water supply, electricity, housing, traffic and transportation, education, health and sanitation while other sectors like industries, trade and commerce and tourism sectors experience secondary impact.

Based on the population projection, additional requirement of water for Kunnamkulam town is 8.4 MLD. This additional requirement will meet by proposed water supply projects like water supply projects from chattukulam pond ,separate water supply scheme from Bharathapuzha and construction of new ponds .These project works has to be started as early as possible because now itself municipality is facing water shortage which is going to get worse in the future due to population growth.

As far as housing sector is considered in 2011 census in Kunnamkulam municipality housing conditions are well enough and having a surplus amount of 3.90 % .In the succeeding years due to population growth these additional houses are going to be occupied and in addition of about 1750 houses are required in 2032.For meeting these housing demand various new housing schemes has to be implemented in the municipality.

Population growth in Kunnamkulam town is not going to effect the educational sector up to 2032 since due to planning norms the number of educational institutions are meeting the required numbers. But to avoid the inflow of students to private institutions better infrastructure, incentives and rewards has to be provided for students in government institutions.

There are sufficient number of health institutions at present to cater the needs of public in 2032 .Even though up gradation of infrastructure has to be done also the

ayurvedic dispensary has to be elevated to ayurvedic hospital with beds since in present scenario there shift of public to ayurvedic treatment.

As far as the industrial sector is considered the growth in population is not going to have a significant impact since more household industries are present. Traditional industries like rock cut product manufacturing and paper industry will have growth if more people are attracted by technological advancement and modernization.

Trade and commerce activities may have a boom due to population growth only if the wants of people is increased .Demands of the public will only be increased if there is surplus income or better employment opportunity .Thus trade and commerce, population growth and employment generations are having an interconnection.

Currently tourism sector is not having much impact as far as population growth is considered as tourism sector is not generating much employment or livelihood opportunities for public in Kunnamkulam.

20.2 Land use changes and Environment

Land–use change is arguably the most pervasive socio economic force driving changes and degradation of ecosystems. Deforestation, urban development, agriculture, and other human activities have substantially altered the Earth's landscape. Such disturbance of the land affects important ecosystem processes and services, which can have wide–ranging and long–term consequences.

It is noted that there has been a considerable reduction in the area of paddy fields over last few years. It is mainly due to the change in the people's perception about agriculture and allied activities. Younger generations are not much engaged in this field. Paddy fields act as green open spaces and as reservoir of water during rains preventing floods and fast run off. The dry cultivation provides green cover and helps in carbon emission .Changes in this land use shall adversely affect the climate and increase in net carbon emission.

20.3 Effect of various sectors on employment

According to the three fold classification, out of total work force participation primary sector contributes 7.32%, secondary sector 7.99% and tertiary sector 84.7%. From the analysis it can be inferred that agricultural activities has drastically come down through

the years. On the other hand there is a slight increase in the industrial sectors .This is mainly due to increase in house hold small scale industries. The major contribution for employment is generated from the tertiary sector which indicates the transformation of the municipality from rural to urban characters. strengthening of small and medium scale industries and technological advancement will create more employment opportunities in the secondary sector .In the primary sector to attract more public, government has to provide proper training and technical assistance for improving the productivity and marketing opportunities in this sector.

20.4 Changes in traffic & transportation needs due to growth in various sectors

Traffic and transportation sector plays an important role in the development of a region . If a region is well connected by other important nodes enhance the development of that region. As far as Kunnamkulam is considered the most important sector is tertiary sector . Due to the growth of trade and commerce sector over the years demand for better connectivity and widened roads .The major commercial nodes like parayil junction, Ayyapath junction,kanipayoor junction are facing traffic congestion due to growth in commercial activities. These Junctions has to be designed to ease traffic flow. Parking areas also have to be earmarked in these locations.

For improving the tourism sector in Kunnamkulam, a well-defined tourist circuit connecting kakkad palace, kakkad cave, Arthat Palli, kurukkanpara and other important tourist locations is suggested .This will enchance the tourism potential of Kunnamkulam region and will trigger the employment opportunity of the region and in turn help in promoting the trade and commerce of this region.

20.5 Spatial distribution of trade & commerce: effect on real property values and equitable housing policies

The spatial distribution of trade and commerce activities has a significant impact on the land value in any town. The property values near the commercial nodes will be more comparing to other places with in the municipalities. Development of a speculative market on land in the State cannot be ignored. The land cumulated by private individuals in the State play a vital role in the speculative market. Investments are being made in this market on land for speculative purposes and only a small fraction of the buyers are real users. Due to such multiple transactions, the end user of the land ends up paying a highly jacked up price which seriously affects the economic viability of the area.

As far as Kunnamkulam is considered there is not much difference in the land values within the core area as comparison with the outskirts of the city. In order to distribute the spatial growth uniformly within the entire area growth nodes are proposed uniformly.

Houses are distributed uniformly over the municipality which is a positive sign as far as the land value is considered there won't be much pressure on a particular area and land values will not shoot up in a particular area which is a positive sign.

20.6 Inclusive growth in various sectors.

Inclusive growth is a concept that advice equitable opportunities for economic participants during_economic growth with benefits incurred by every section of society. This concept expands upon traditional economic growth models to include focus on the equity of health, human capital, environmental quality, social protection, and food security.

To ensure inclusive growth special consideration has taken while planning for Kunnamkulam. Some of the measures that were taken to get benefit to the weaker sections of the society are accommodating the street vendors in newly redesigned parayilangadi market, organic vegetable farming, intensifying the production of cash crop cultivation for increasing the earning by farmers.Other schemes proposed are micro financing for women to improve their entrepreneurship. Landless and houseless rehabilitation schemes etc.

20.7 Existing Spatial Structure

Existing spatial structure is formed by considering the spatial distribution of major activities, environmental sensitive areas, population density, functional character and activity pattern of town.

20.7.1 Functional character

According to the analysis of functional character of district, Kunnamkulam Town shows urban functional character. The same methodology as done for the LSGIs of the district is applied for the wards of the town to assess the ward wise functional character. The result of this analysis is shown in figure 20.1 which shows that the town wards 5, 6, 11, 15,19 and 20 showing urban character. Ward numbers 7,10,12,14,16,17,18,22,26,28 and 31 showing semi urban nature and wards 1,3 and 25 showing rural nature other wards are showing semirural character. It is also clear that central town area of kunnamkulam Town is showing urban nature and towards the periphery semi rural and rural characters are predominent.

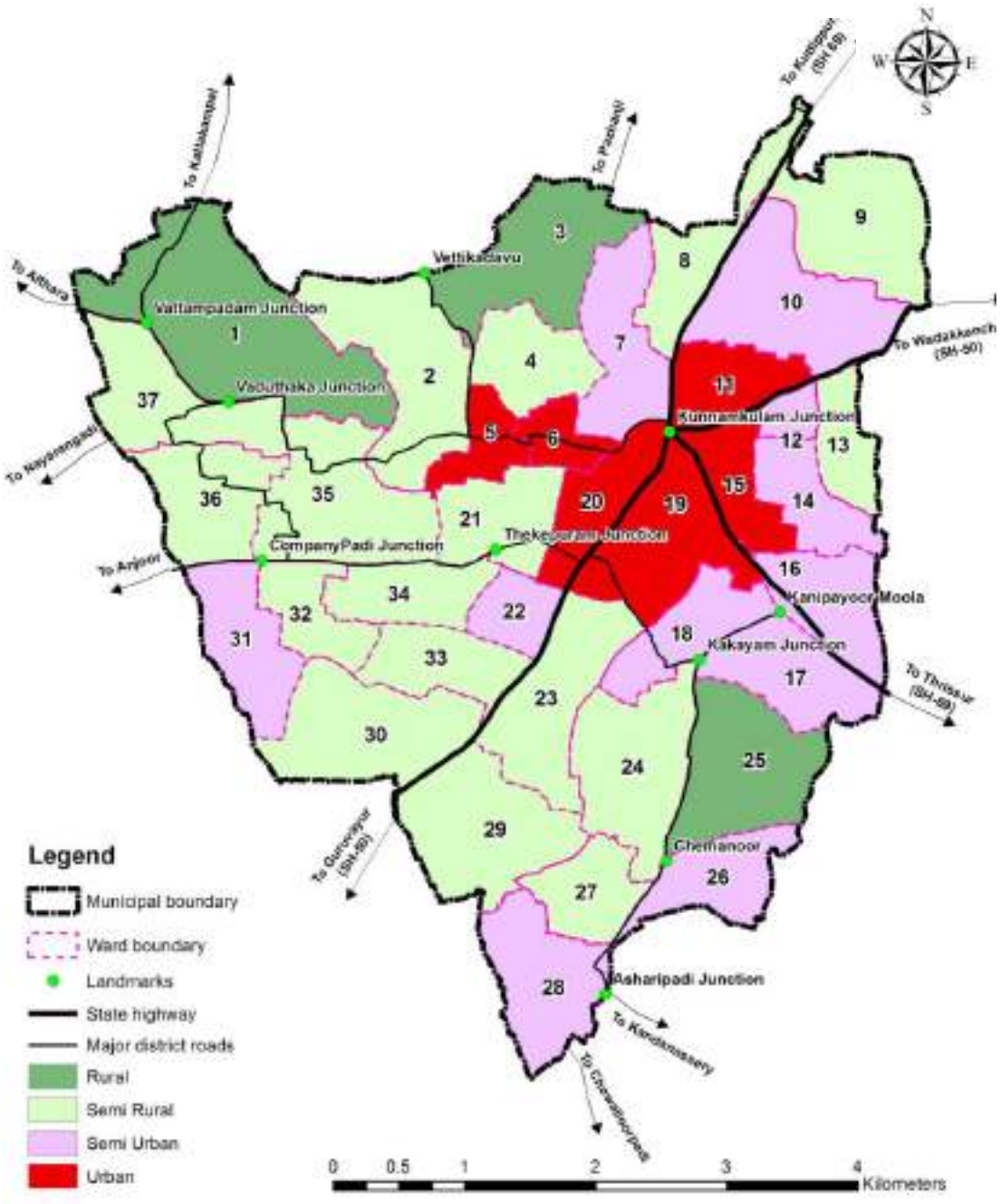


Fig 20.1 Functional Character

20.7.2 Activity pattern

Activity pattern of the town is derived from the analysis of the existing land use and functional character. The concentration indices of the various land uses are compared and studied for this purpose. The activity pattern is shown in the figure 20.2. According to this there is a central core portion consisting of intense commercial activities, a strip on either side of the major roads where mixed activities are concentrated. Along the outskirts of the town, residential and agricultural activities are concentrated.

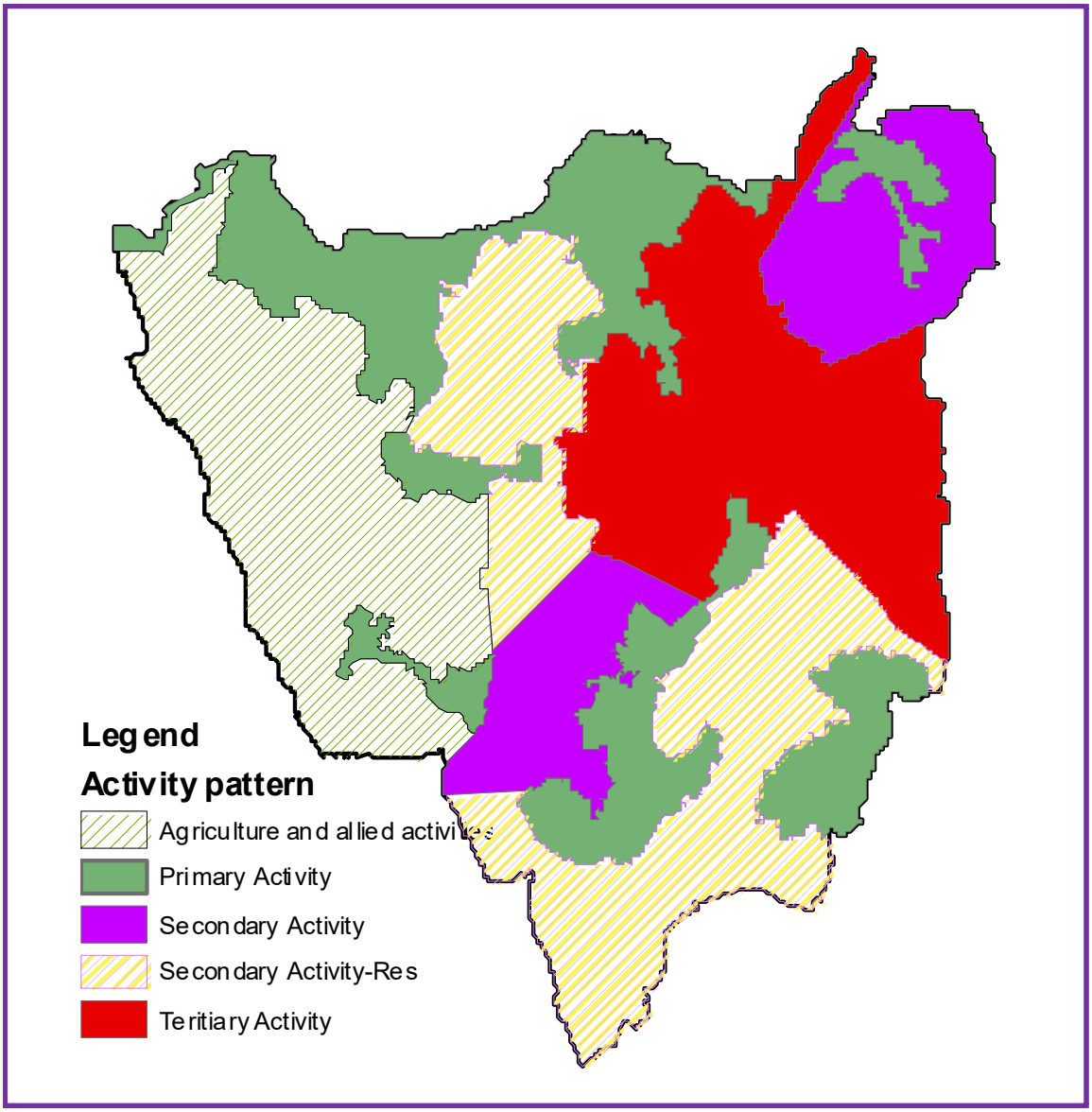


Fig 20.2 Activity pattern

20.7.3 Road network and other sectoral concentration

The existing road network and hierarchy of the nodes are shown in figure 20.4. Spatial distribution of development activities and environmental sensitive areas were laid over spatial distribution of population density as given in figure 20.3. This was integrated with activity pattern of the area to form existing spatial structure. Existing spatial structure of Kunnamkulam Town is shown in figure 20.5.

Spatial structure depicts activity distribution in Municipality. A concentration of commercial activity is seen in central core area. Mixed activities like public and semipublic, industrial and commercial activities are seen around central core area. Remaining areas are mainly residential with prominence of agriculture in western side.

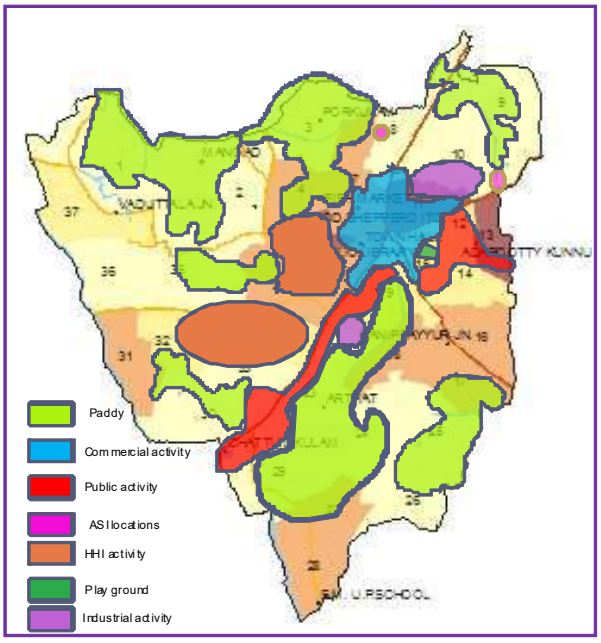


Fig 20.3 Activity distribution

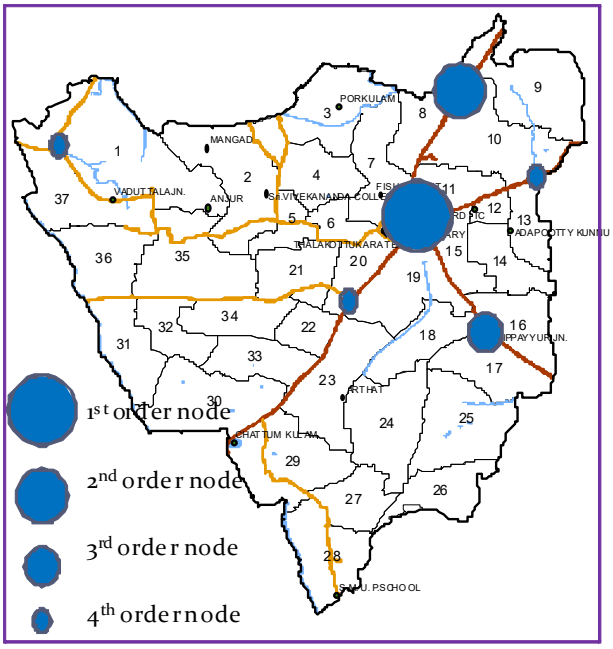


Fig 20.4 Road network and Hierarchy of nodes

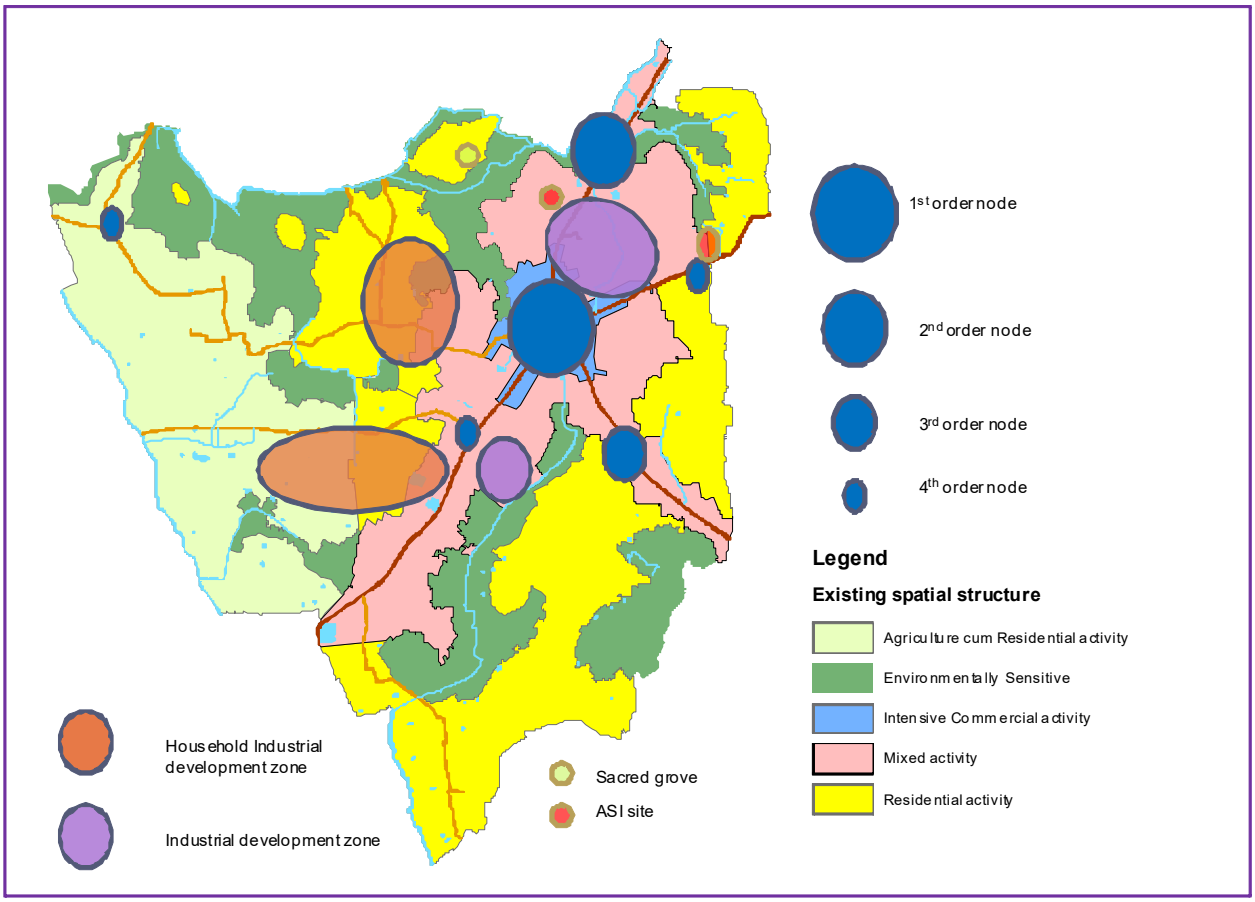


Fig 20.5 Spatial Distributions

20.8 Inference

From the study of various inter sectoral linkages, influence and impact on the growth of one sector on the other was detailed which will be helpful while giving proposal in various sectors and developing an integrated development vision.The town has a natural growth centered around public institutions and the commercial activity in the main junction. To achieve a compact spatial structure in the plan period, it is imperative to control the developments in a scientific manner promoting hierarchial development of land uses from town centre to the periphery.

CHAPTER 21

FINDINGS

The major findings and inferences arrived at from the different analyses are listed here sector wise.

21.1 Regional Setting

- Comparing the nearby LSGIs, only Kunnamkulam and Guruvayur Municipalities fall under Multifunctional zone II. Also Urban profile and functional character of these Municipalities are urban. Since Guruvayur Municipality has published Development Plan, the planning area is confined to Kunnamkulam Municipality
- All other surrounding LSGIs except Guruvayur show rural or semi-rural character
- Kunnamkulam acts as a major hub between Thrissur, Malappuram, Kozhikode and Palakkad District

21.2 Demography

- Total population is showing an increasing trend over the years
- Growth rate of population is showing a decreasing trend in 2011
- As per provisional census 2011, comparing with other urban LSGI's, Kunnamkulam Town is having highest growth rate
- Population and its density are less compared to other urban LSGI's
- Sex ratio shows that female population is comparatively higher than other urban LSGI's except Chavakkad
- Child sex ratio is less compared to other urban LSGI's

21.3 Land use

- Land use analysis shows that Agricultural land use is predominant in Town area
- From ward wise functional character it is clear that urban nature of town is seen only in town center

- Outer fringes are predominantly semi rural in nature
- Activity pattern shows that secondary activity is predominant and there is scope for primary activity too.

21.4 Trade and commerce

- Only 1.49 % of municipal area is used for commercial purpose
- Commercial activities are seen along major roads in and near town centre
- Majority of commercial activities are restricted in old municipal area
- Parayil junction (town centre) is the major commercial node in municipality
- Ayyapath junction forms the 2nd order node
- Kanipayoor junction forms 3rd order node
- Vattampadam, Chowanoor and Girls High School forms 4th order node
- Street vendors are seen along major roads with more concentration along Guruvayur road
- Major activities- fruit shops and tea shops
- No separate parking, loading and unloading facilities provided for commercial centres
- Public toilet facilities are not provided at these commercial centres except at Thazhathepara and Private bus stand

21.5 Industry

- Technological up gradation needed for renovation of printing industry
- Great future for paper based industry
- Care to be given for generating inter-firm linkages, modernisation and the diversification of products
- Land to be identified for relocating people in rock cut product sector
- Lack of facilities in existing Industrial development area

21.6 Tourism

- Presently Kunnamkulam Town is not having a prominent position in tourism map of Thrissur district
- Potential for providing infrastructure for pilgrim tourist to Guruvayur
- Potential for tourism considering the rich heritage and tourist destinations within town. One day tourism circuit can be developed with added infrastructural facilities

21.7 Traffic and Transportation

- Conflicting traffic movement at CBD due to the presence of bus stand
- Heavy movement of vehicular traffic along the SH 69 and SH 50
- Inter-mixing of intra-town and inter-town traffic on the major road
- External-external trips through the town centre could be bypassed
- Unorganised on-street parking in the absence of proper parking lots at CBD area
- Movement of inter-town bus traffic due to the location of bus station within the central area of the town
- Encroachment of right-of-way by hawkers, parking of vehicles
- High safety risk to pedestrian movement near the bus stand area
- Absence of adequate design for Kunnamkulam junction and other major junctions along
- SH 69 –Bhavana junction, Devassy Junction , Senior Ground Junction, KurishupalliKavala
- SH 50-Allieds junction, Town Hall Road, Junction, Kurisadi junction

21.8 Education

- Total Literacy and female literacy of Kunnamkulam Town is higher compared to district and taluk level
- Only 14% of students depend on government institutions

- Reasons may be lack of infrastructural facilities and basic amenities in government and aided schools
- For higher education in Science field, students have to depend on institutions outsidetown
- As per planning standards required educational facilities are available within Town

21.9 Health

- Basic medical facilities are available as per planning standards
- Up gradation of existing facilities is the immediate requirements in the government sector
- Specialty medical facilities are not available in municipal area
- There is no provision of Biomedical waste treatment plant for hospitals

21.10 Drinking water

- 81.07% of people depend on domestic wells and 14% of people are depending on public water supply scheme
- 33% of people are found to experience water scarcity
- Water supply from KWA is found to be insufficient
- Supply only in old municipal area
- Water supplied only once in a week
- From local level analysis

- Routine maintenance of open wells to be done

- Water storage capacity can be increased by introducing overhead water tanks
- Possibilities of rainwater harvesting at household level and various options for ground water recharging are to be explored.
- Alternate sources have to be identified like

- Separate water supply scheme from Bharatapuzha

- Water supply scheme from Chattukulam and two quarry ponds at Kurukkan para

21.11 Agriculture and irrigation

- 57% of the land is used for agricultural purposes
- Potential for coconut and arecanut cultivation
- Scarcity of agricultural labourers
- Need for mechanisation
- Lack of irrigation facilities is a major problem for non kole paddy cultivation
- Water logging and waste water disposal at Kakkad – Chiralayamthodu affecting paddy cultivation at kole lands

21.12 Animal husbandry, Fisheries, Dairy development

- Existing ponds can be ultilised for fish farming,there is a scope for inland fishery activity
- No authorised slaughter houses, 5 unauthorized slaughter houses functioning within the town are a threat to the health of the natives
- Lack of fodder cultivation
- Demand of milk is more compared to availability

21.13 Housing

- 30.49% of municipal area under residential use
- There is a shortage of 183 houses in municipal area
- Housing quality of about 4% of houses are to be enhanced
- Shortage of drinking water and improper drainage facilities are the main problems of substandard housing areas

21.14 Waste management

- Solid waste treatment at source is not adopted
- Sewage water disposal at kole lands leads to environmental issues

- Public toilets are not available at commercial, trading centres and other public places like
  - Thurakkulam market
  - Parayilangadi
  - Valiyangadi
  - At junctions like
    - Ayyapath,
    - Kanipayoor
    - Town hall junction
    - Vattompaadam
- Potential for solid waste treatment at source which can be adopted at three levels
  - Individual houses with plot size less than 10 cents
  - Flats and residence associations
  - Decentralised mechanical treatment plants with zero rejects at Municipal level mainly for markets and public places

21.15. Power

- Major power consumer is the domestic sector
- Use of non-conventional energy sources have to be encouraged
- About 40% of street lights are not functioning properly
- Proper maintenance of street lights are not being done
- Major junctions are not provided with High Mast lights

21.16 Social Infrastructure

- Parks are not available within Town
- Playgrounds are less when compared with planning standards

- Library facilities are not available up to planning standards

21.17 Special concern areas

- BPL families are more in Aduppootty, Kurukkanpara and Chemmannoor areas
- SC families form 11% of municipal households and are more in Kaniyampal area

21.18 Occupational structure

- 89% of the workers are main workers
- Percentage of agricultural labourers shows a steep decrease from 2001 to 2011

CHAPTER 22

GOALS AND OBJECTIVES

The vision statement for Kunnamkulam town can be like this " To transform Kunnamkulam so as to enable it to regain the lost glory, by ensuring physical and economic growth, along with the well being of the people and nature". Goals and objectives to be achieved during plan period are detailed out in this chapter.

22.1 Development goals

The development goals are formulated based on the observations, conclusions and inferences derived from the study and analysis of various sectors of Kunnamkulam town area. From the study it is clear that non agriculture activities are mainly concentrated near the town area. These activities have to be redistributed to sub urban areas with adequate infrastructural facilities for creating a congestion free environment.This is considered as the prime goal. Industrial and commercial activities can gain momentum and become the economic base. More over land use analysis shows that more than half of town area is under agriculture land use which indicates that there is a scope for agriculture in town area specially the added portions. As per IDDP, Kunnamkulam falls under multifunctional zone II, which indicates that it should act as a service provider for surrounding LSGIs, which is also considered as a goal. Along with development activities, environmental sensitive areas and heritage of town has to be protected for sustainable growth of the town.

Major development goals of the town thus are:

1. To transform the town to a more livable space by providing adequate and efficient Infrastructural facilities, improving water supply, waste management, sanitation, road network facilities and by decentralising the CBD area.

2. To attain urban development by strengthening the economic base of Municipality through commercial activities, household industrial activities and agriculture activities.

3. To develop as a service centre in medical and educational fields with necessary facilities, catering to surrounding local bodies

4. To preserve heritage and to protect environmentally sensitive areas like kole lands, paddy and water bodies

22.2 Development Objectives

Kunnamkulam is a mono-centric town with all major activities concentrated in the town centre. Decentralisation of town centre along with provision of adequate infrastructural facilities is required for reducing congestion and improving quality of life. State Highways, SH-69 (Thrissur- Kuttipuram) and SH-50 (Chavakkad- Wadakkanchery), via Guruvayur, meets at town centre of Kunnamkulam, known as Parayil Junction.Kunnamkulam acts as a major hub in the road connectivity between Thrissur, Malappuram, Kozhikode and Palakkad Districts. Moreover major commercial activities are located at town centre. Traffic bottle-necks have to be avoided for providing smooth traffic flow.

Water scarcity during summer season has been the bane of Kunnamkulam for the last 10 years as the water table is receding at an alarming rate. Now the average GWL is 10.65m below ground level. Granite impervious layer of rock can be seen 10m below ground level. Water authority provides water from Bharathapuzha for old town area of Kunnamkulam only. To meet the increasing water demand presently bore wells and unfiltered quarry water are used. Centralised waste collection system exists in town area, which is dumped in trenching ground at Kurukkanpara. Implementation of windrow composting is being done now. This area will be sufficient only for next 10 years. So a three level solid waste management system is to be adopted. Sewage water from town area which is disposed directly at kole lands in Thiruthikad has to be treated. Public toilet facilities have to be provided at major bus stops and commercial nodes. Substandard housing areas identified in municipality have to be rehabilitated with sufficient infrastructural facilities, for improving the living condition of socially and economically backward people.

Kunnamkulam town is well known for its commercial and household Industrial activities. Town acts as a distribution centre to various important nodes like Guruvayur, Chavakkad and Pattambi. Book binding industries form the backbone of Household Industrial activity. Other industrial activities include printing, granite carving, engineering fabrications etc. In order to attract wholesale and retail traders as well as consumers these activities have to be promoted. As per land use analysis 57% of municipal area is having agriculture activity, which indicates that there is a scope of developing agriculture sector as one of the economic base of Town.

As per land use analysis, 6.28 sq.km of paddy and kole land exists in Kunnamkulam Town. These are considered as environmentally sensitive areas. They have to be protected

from being filled and should be conserved for maintaining the ecological balance. For this paddy cultivation has to be revitalized. Also it is highly necessary to conserve ponds and streams in a water scarce area like Kunnamkulam.

Kunnamkulam is looked upon as a centre for trading activities by the nearby LSGIs as Porkulam,Vadakekkad, Chowannur etc.

In view of above facts, development objectives can be summed up as:

1. To develop Kunnamkulam as a multicenter town by decentralising the existing commercial activities to sub urban areas
2. To decongest the traffic network of existing CBD
3. To provide ample drinking water facilities
4. To provide proper waste management and sanitation facilities
5. To provide infrastructural facilities for substandard housing area
6. To promote commercial and small scale industrial activities so as to develop the economy of Kunnamkulam town.
7. To make agriculture a prominent economic base of Municipality
8. To enhance tourism by utilising potential areas in and around the municipality
9. To provide necessary medical and educational facilities catering to the future need of surrounding local bodies
10. To conserve paddy, kole lands and water bodies to prevent environmental degradation

CHAPTER 23

DEVELOPMENT CONCEPT

This chapter explains the Development concept which utilizes a solution to address the opportunities, constraints and needs identified during the analysis phase of Master Plan.

As per Integrated District Development Plan, Thrissur Kunnamkulam Town comes under Multifunctional zone II and is expected to be developed as a second order settlement. From the analysis of various development sectors, it is clear that industrial and commercial activities form the economic base of Town. Moreover, from land use analysis it is clear that abundant space is available for agricultural activities. Optimum ultilisation of these agricultural spaces will add strength to the economic base of town. In addition to this due consideration should be given to environmentally sensitive areas for proper ecological balance. All these factors are considered while formulating development concept of town. Formulation of development concept is based on spatial structure of the Kunnamkulam town.

23.1 Formulation of Development Concept

Based on the findings of the various analyses and the aspirations of the people as revealed in the local level analysis, a vision for the future development of the town is formulated. The vision document spells out every possibility of growth. Vision arrived at here completely justifies the goals for which this document stands for Development Concept is formed based on the existing spatial structure only. The future needs of roads, widening of roads, and future hierarchy of nodes, development chances of industry, trade and commerce, agriculture and tourism sectors are integrated with this. Along with this the preservation of heritage precincts and the conservation of ecologically sensitive areas are considered. Thus a future form of the town is evolved.

23.1.1 Proposed Road Network

Proposed road network is a major factor influencing the future development activities and distribution of population. Development plan objectives include decongestion of traffic network of the CBD area and to decentralize the existing activities. In order to achieve these criteria, the concept is to develop a ring radial road pattern for the town. An inner ring road is proposed for Kunnamkulam to bypass CBD area. Considering future population growthand other development activities in suburban areas, an outer half ring is also proposed. This is to be done by mainly widening existing roads in these suburban areas. Widening of State Highways and radial roads are also proposed along

with this Conceptual road network is as shown in figure 23.1

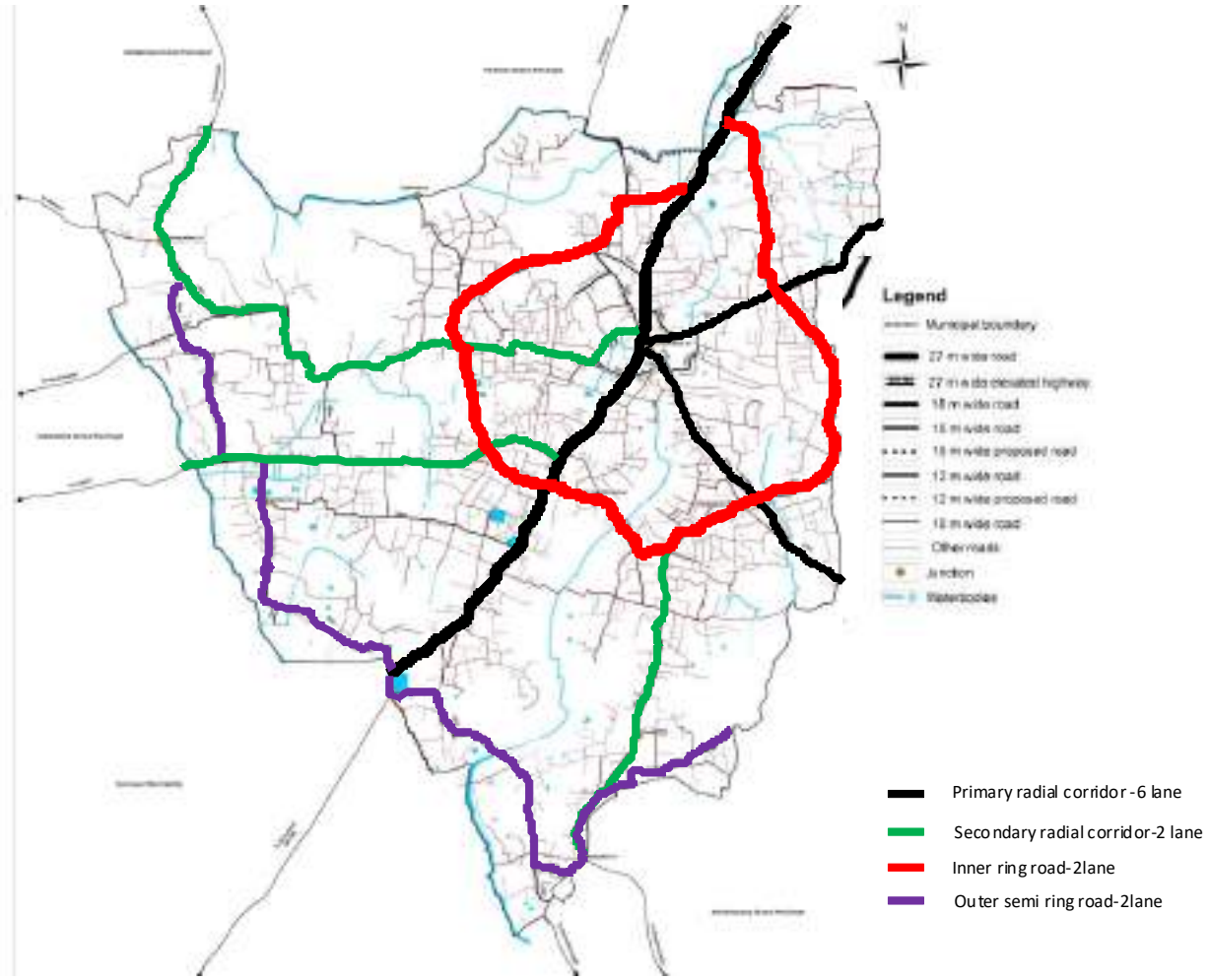


Fig 23.1 Future road network - Conceptual

23.1.2 Future population density distribution

Future population is projected using three methods and the average value is taken. The distribution is carried out using the goals in mind. Projected population of town is around 62,000 in 2031. Future population density distribution was formulated on the concept that population will be shifted from CBD to suburban areas of town. Concept on future population distribution is shown in figure 23.2

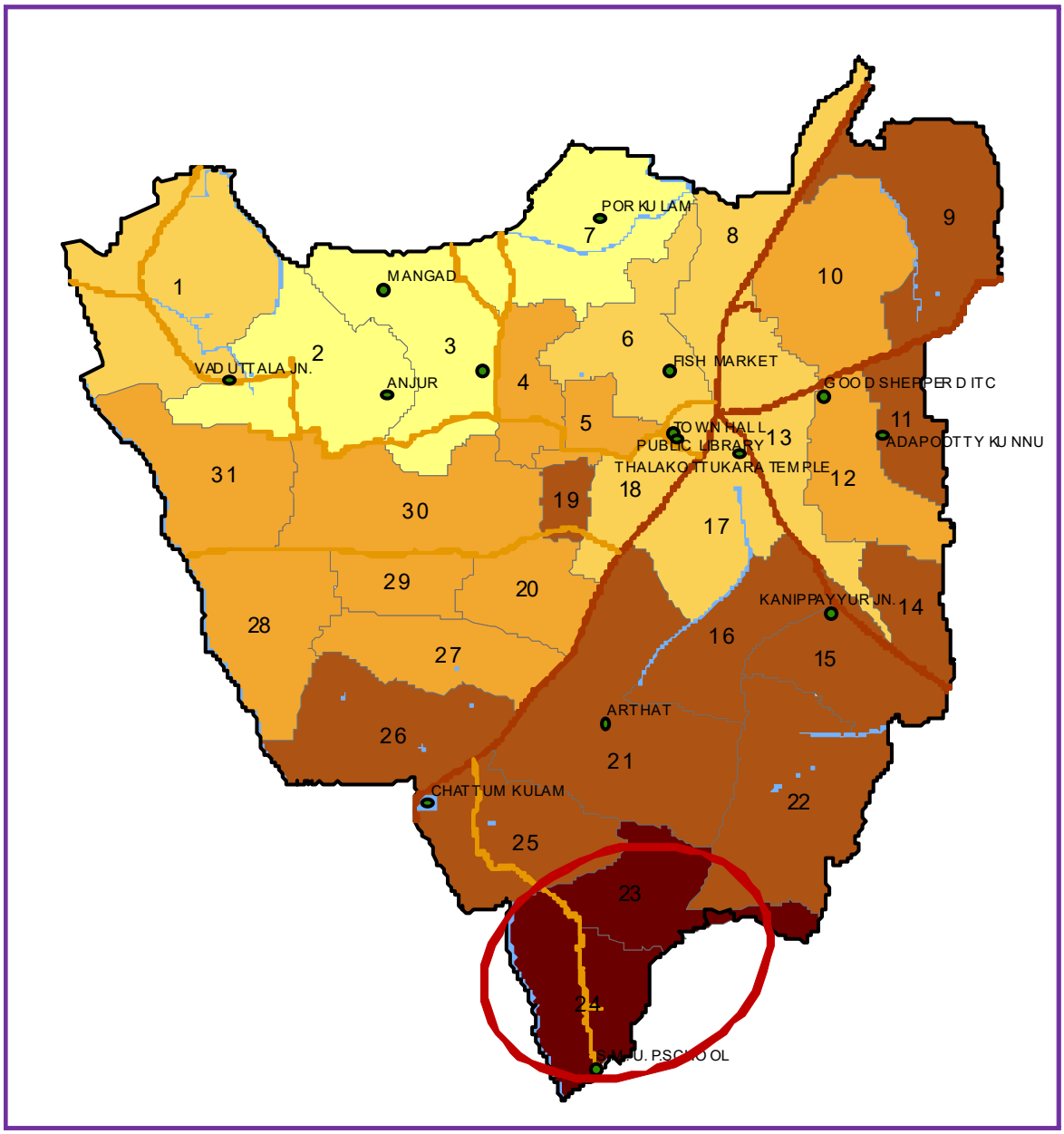


Fig 23.2 Future Population density

23.1.3 Future hierarchy of nodes

Based on the future transportation network, commercial activities can get shifted/ originated in some other location. There are nodes where inner ring roads and partial outer ring road meet. Thus future heirarchy of nodes is derived and is shown in figure 23.8. Major commercial activities are now concentrated at Parayil Junction which forms the first order node and Ayyapath junction forms the second order node. Second order node is also proposed at Kanipayoor junction. Third order nodes are proposed at Chowanoor, Girls High School junction, Kizhoor and Vaduthala junction. Fourth order nodes are proposed at Anaikkal centre, Asaripadi, Chattukulam and Vattompadam.

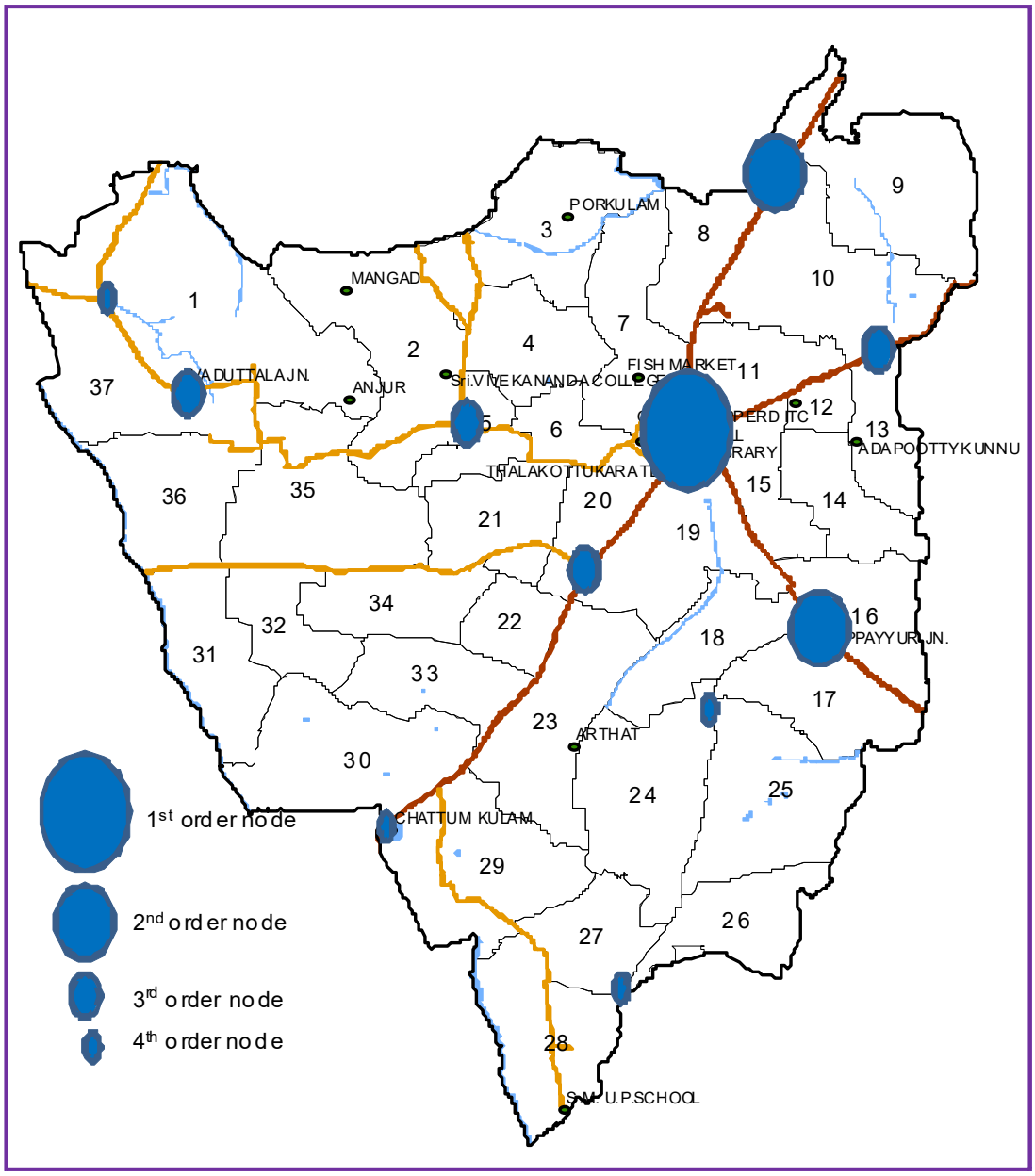


Fig 23.3 Future Hierarchy of nodes

23.1.4 Concept on other development sectors

Industrial sector is having significant influence in the future development of Kunnamkulam town . So a future industrial development concept is also considered for finalising development concept of town. Development of household industries at Chittanjoor and old town area are considered. Along with this development of rock cut product sector at Kurukkanpara, mini industrial estate and industries at town centre are also considered. This is shown in figure 23.4.

In Kunnamkulam Town area, paddy, kole lands and water bodies as shown in figure 23.5 were also considered for formulating development concept.

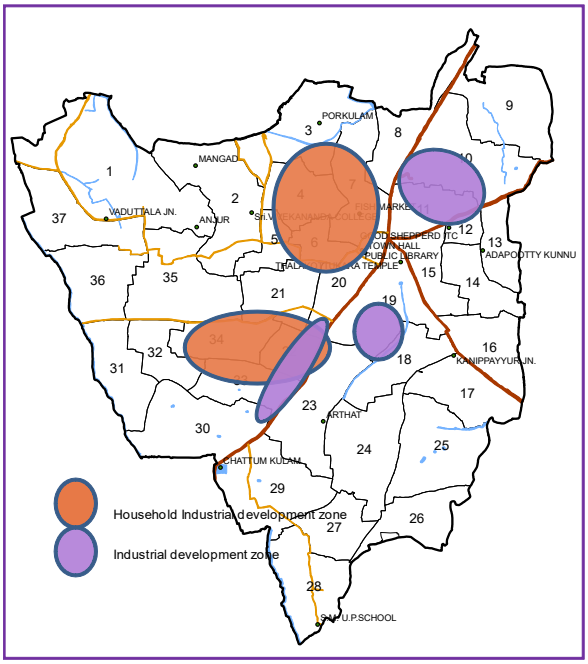


Fig 23.4 Future industrial development

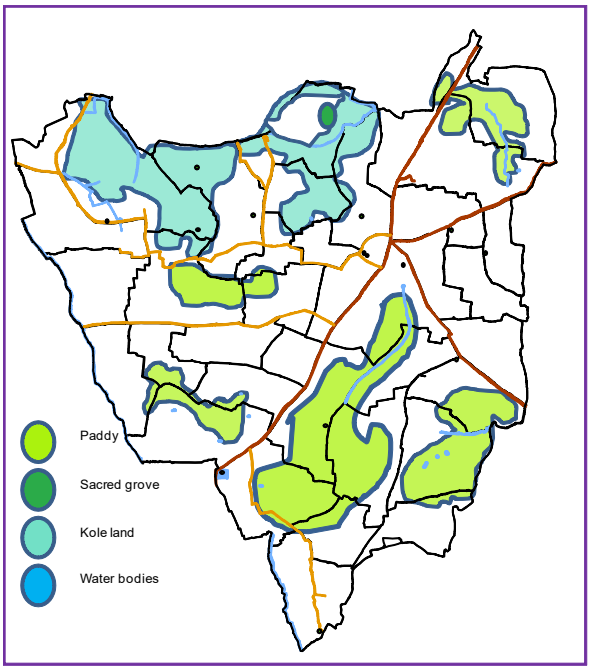


Fig 23.5 Ecologically sensitive areas

23.2 Development Concept

Development concept was evolved by integrating all the above factors, which is pictorially represented in figure 23.6. Development concept formulated after integrating the above discussed factors is shown in figure 23.7, with environmental sensitive zone, commercial core zone at CBD, mixed activity zone around commercial zone, residential zone around mixed activity and low density residential zone in the western side of town.

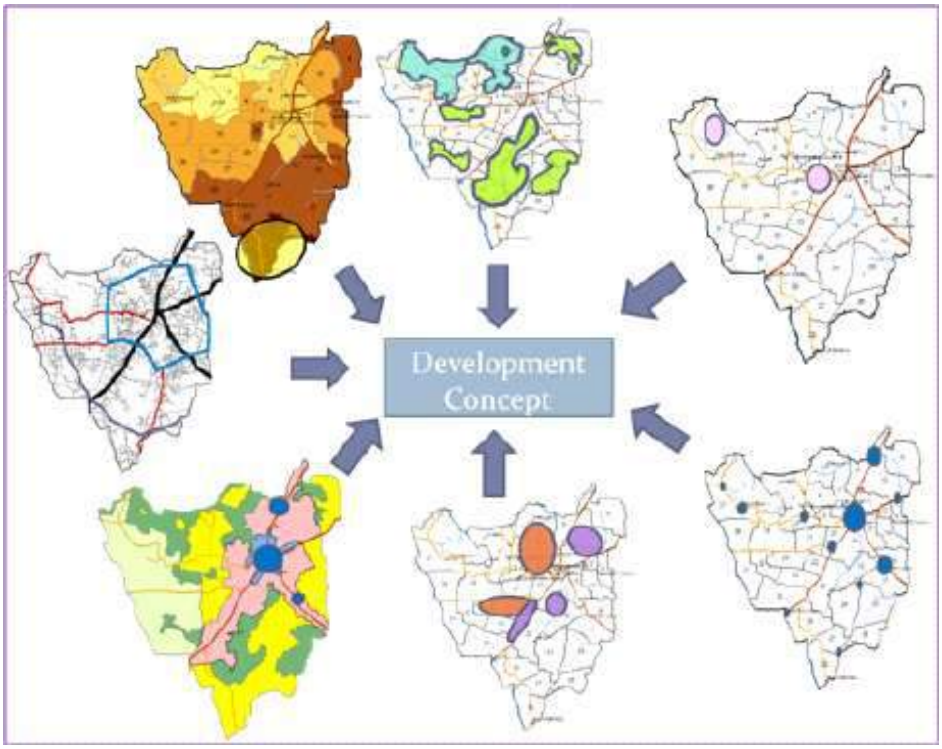


Fig 23.6 Formulation of Development concept

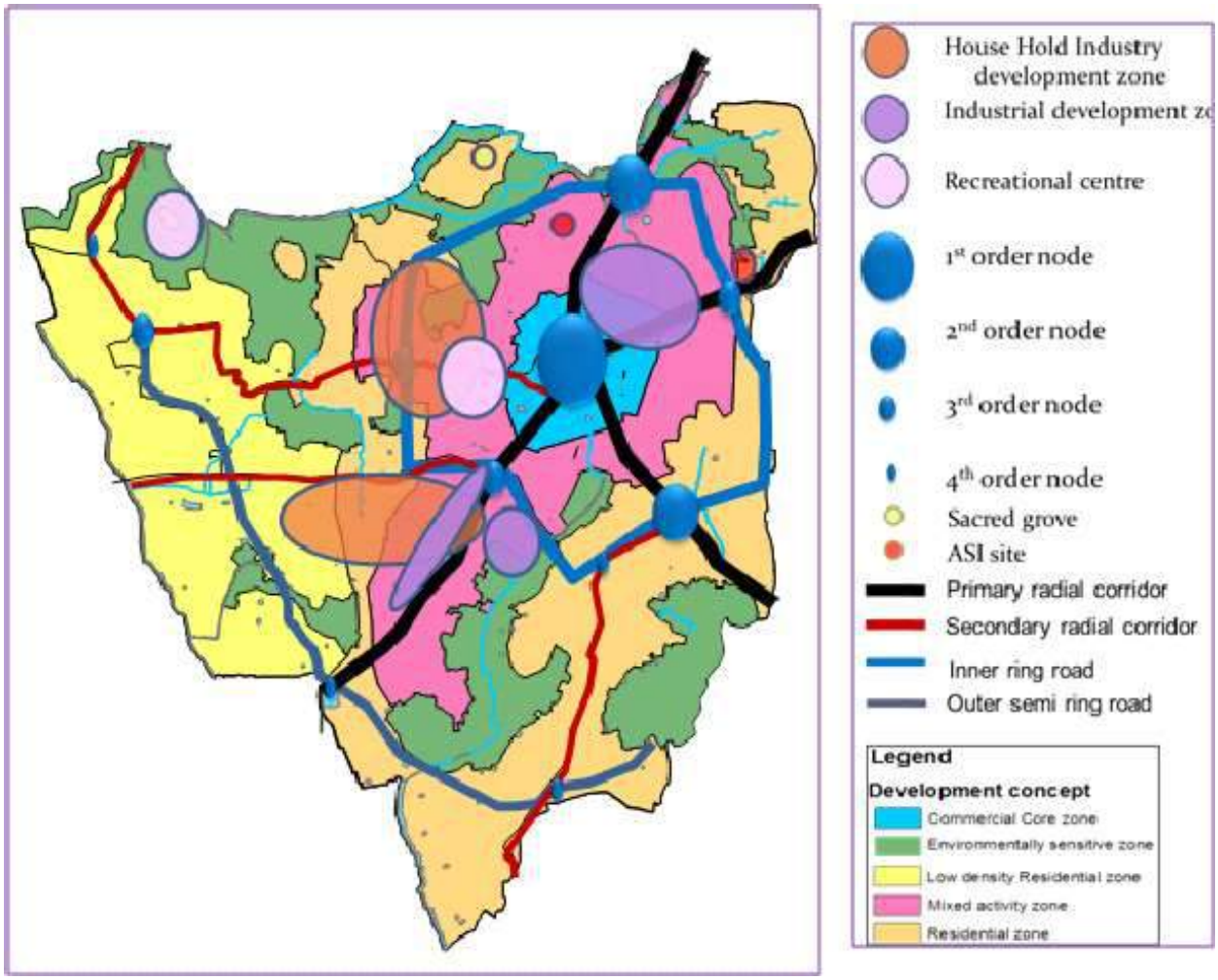


Fig 23.7 Development Concept

23.3 'Smart city' as a principle tool

It is projected that urban India will contribute nearly 75% of the national GDP in the next 15 years. Cities are accordingly referred to as the engines of economic growth. There is accordingly a crying need for the cities to get smarter to handle this large-scale urbanization and finding new ways to manage complexity, increase efficiency, reduce expenses, and improve quality of life.

The core infrastructure elements in a smart city would include:

1 Adequate water supply

2 Assured electric supply

3 Sanitation, including solid waste management

4 Efficient urban mobility and public transport

5 Affordable housing, especially for the poor

6 IT connectivity and digitalization

7 Good governance, especially e-Governance and citizen participation

8 Sustainable environment

9 Safety and security of citizens, particularly women, children and the elderly,

10 Health and education

11 Storm water drainage

12 Reliable utility services

The key feature of a Smart City is in the intersection between competitiveness, Capital and Sustainability. Master Plan adopt 'Smart city' as a general principle tool for the development projects. This physical attribute can be merged with each development.A Smart City will generate options for a common man to pursue his/her livelihood and interests meaningfully. In this context:

- **Competitiveness** refers to a city's ability to create employment opportunities, attract investments and people. The ease of being able to do business and the quality of life it offers determines its competitiveness.
- **Sustainability** includes social sustainability, environmental sustainability and financial sustainability.
- **Quality of Life** includes safety and security, inclusiveness, entertainment, ease of seeking and obtaining public services, cost efficient healthcare, quality education, and opportunities for participation in governance.

Major key aspects of the concepts are:

- Smart economy
- Smart mobility
- Smart environment
- Smart people
- Smart governance
- Smart living

Project proposals for shaping Kunnamkulam as a smart city are as follows;

1) **Smart economy – competitiveness:** The Smart Economy combines the successful elements of the enterprise economy and the innovation or 'ideas', while promoting a high-quality environment, improving energy security and promoting social cohesion. A key feature of this approach is building the innovation or 'ideas' component of the economy through the utilization of human capital - the knowledge, skills and creativity of people - and its ability and effectiveness in translating ideas into valuable processes, products and services. A second important aspect is the greening of the economy and the development of green enterprise.

Major components of sustainable economic development are

- Productivity
- Diversity
- Stability of growth
- Energy
- Waste reduction, treatment and green spaces
- Equity
- Land use-Transport integration

- Agricultural industries and Trade and Commerce have major share in the economic development of Kunnamkulam town. Hence an integrated approach that can improve the economic base of the town through increased productivity can be adopted.
- An agro-eco-park concept may be introduced which provides a base for companies and service organizations that support rural populations in achieving a transition to fully sustainable and organic farming and to develop revenues above the poverty level.
- Some of the urban remunerative projects forging towards the concept of smart economy are: Techno city near Municipal engineer's quarters, Coconut procurement centre at Vappabazaar, Food park at industrial estate, Ornamental poultry farming etc.
- Kunnamkulam, which is being a second order settlement in the district scenario serving wider region, shall be equipped with high quality services.

- Technological up-gradation for reviving and rejuvenating the printing press industries, which were the backbone of economic development of the town, has a great future. Also there can generate inter-firm linkages, modernization and diversification of products to brought back the glory of these industries and develop it as the image of the town.

2) **Smart Mobility** – Transport and Information and Communication technology (ICT) : The town need to make mobility smarter by making it efficient, reliable and green. Some of the projects that makes a smarter mobility system for Kunnamkulam are; Warehouse, loading and unloading area near senior ground, Multi-level parking system near R.C Park, Widening of roads, Bus bay, Bus stop improvement, Changes in existing traffic routes, Pedestrian facility improvement etc.

- Promote a variety of transport options- Transit Oriented Development (TOD), public transport and last mile para-transport connectivity.
- Adopt unique design for bus stops, terminals etc.
- Priority for pedestrian movement and non-motorized vehicular traffic
- Provide pedestrian friendly utilities such as street furnishing, shaded areas, canopies, lighting facilities etc. Junction improvement including grade separation, traffic islands, turning radius etc. shall be considered.
- Intelligent Traffic Systems (ITS), sometimes called Intelligent Transportation Systems, apply communications and information technology to provide solutions to congested highways as well as to other traffic control issues.
- Intelligent traffic management through installation of traffic signal control systems, cameras etc. at major junctions etc.
- Geometric design of roads- Planning is necessary to ensure that the roads designed matches the intentions regarding its function.
- Sharing of Freight and Passenger vehicles, non-motorised vehicles and pedestrian traffic may lead to congestion on roads. Hence restrictions can be brought in town centres to limit the growing pressure of traffic.
- Reduced and managed parking inside 10-minute walk circle around town center

3) **Smart Environment** – Natural resources: The purpose of "smart" environment is to reduce energy consumption and in some cases, creating positive energy - ratio with the principles of ecological design of ICT. In fact, the "smart" buildings, estimated to account for a significant part of reducing greenhouse gas emissions through information and communication technology (ICT).

Following are some of the other strategies to achieve the concept of smart building;

- Promotion of Green buildings by providing incentives
- Environmental Impact Assessment of projects
- Rainwater harvesting for all buildings
- Alternative and sustainable forms of energy to be promoted
- Efficient Waste Management to treat solid waste generated and offer various solutions to recycle shall be introduced. Various methods like landfill, Incineration/Combustion, Recovery and Recycling, Plasma gasification, Composting, Waste to Energy (Recover Energy), Avoidance /Waste Minimization may be adopted for waste disposal.
- Green urban planning
- Ecological awareness
- Sustainable resource management

4) **Smart People** – social and human capital: It creates a sense of belonging, equity and this envisages the public participation opportunity with an Inclusive development approach. Projects like – Nalpamarathoppu, Craft village, Boating facility etc. generates more chances for social interactions and thereby creating a sense of social cohesiveness.

- Capacity Training - to make people smart enough to live in a whole new smarter world by educating them
- E-learning – town must have digital development plans for institutions, connectivity to internet in houses and institutions and promotion of e-learning programs.

5) **Smart Living** – Quality of life: Smart living refers to a better Quality of life. Multi sector integration and consideration is given to create a smart, healthy and vibrant society. Master plan is aimed at - standardized healthcare facilities accessible for all. Various strategies are adopted to ensure safe and healthy living conditions for all, such as;

- Maintenance and betterment of facilities at Govt. hospital, Measures to ensure hotel sanitation and food safety, Three tier system for solid waste management, Adoption of proper septage system, Waste water treatment plant, drinking water facilities, better social infrastructure facilities etc.

6) **Smart Governance** – Participation : e-governance is the application of information and_communication technology (ICT) for delivering government services, exchange of information communication transactions, integration of various stand-alone systems and services between government-to-customer, government-to-business, government-to-government as well as back_office processes and interactions within the entire government framework. Through e-governance, government services will be made available to citizens in a convenient, efficient and transparent manner.

- Friends centers for effective billing purposes
- GIS database for the town and spatial management
- Improvement of services through online

CHAPTER 24

POLICIES AND STRATEGIES

Development Policies and Strategies include a plan of action and guidance for the implementation of development goals and objectives. It helps in efficient ultilisation of potentials and minimizing the problems.

24.1 General development policy

To develop Kunnamkulam as a multicenter town by giving thrust to small scale industrial, commercial and Agricultural activities that helps to achieve strong economic base and self-sufficiency in agricultural sector.

24.2 Policies and strategies

24.2.1 Industrial sector

Promotion of small scale industries is the major development policy of industrial sector and also to diversify the products in paper based industries sector and to encourage industries based on agricultural and animal husbandry.

Development strategies are given below:

- To renovate existing industrial estate
- To encourage clustering of interdependable industries so as to reduce wastage of resources and manpower needed, and increase market of products
- To encourage traditional industries and industries based on products from agriculture and allied sectors

24.2.2 Agriculture and allied activities

Strengthening the economic base of municipality by strengthening the agriculture sector, through optimum utilization of irrigational facilities and to attain self-sufficiency in the case of vegetable and milk production is the development policy of agricultural and allied activity sector.

Development Strategies of the sector are:

- Optimum utilization of irrigation project

- Promoting organic vegetable farming at selected paddy fields
- Establishing dairy farms to increase milk productivity
- Promotion of floriculture
- Establishing marketing cum procurement centre for agriculture produce

24.2.3 Transportation and commercial sector

Development policy is to form a road network to bypass CBD area and to establish proper connection of suburban areas of town and also to develop commercial areas at second order nodes.

Development Strategies of the sector are:

- To decongest traffic network in CBD area
- To ensure proper road connection within the town
- To establish public parking facilities within CBD
- To ensure future development of commercial centres at second order nodes
- To establish loading and unloading facility in CBD area

24.2.4 Tourism sector

Presently Kunnamkulam is not having a well-developed tourism sector. But tourism potential areas can be developed with necessary infrastructural facilities, which help to increase the economy of town, is the development policy of this sector.

Development strategies are:

- Protection of cultural and heritage sites with necessary facilities and infrastructure which will help in enhancing tourism potential
- Provision of low cost accommodation facilities
- To develop one day tourism circuit

24.2.5 Education and Health sectors

People from nearby local bodies depend on the institutes of Kunnamkulam town

for their health and educational needs. So higher order facilities considering the future population is needed.

Development strategies are:

- To upgrade the existing Government institutions by providing better facilities
- To promote extra ciricular activities among students for their overall development
- Shifting Government boys HSS by relocating to more spacious new building on rear side

24.2.6 Other infrastructural facilities

To enhance the quality of living, by providing proper infrastructural facilities and to ensure these facilities to all sections of society is the development policy of this sector.

Development strategies are:

- To improve living conditions and facilities of substandard housing areas
- To develop essential infrastructural facilities in the case of civic amenities.
- To provide necessary facilities for weaker sections of the society

24.2.7 Conservation of Heritage and Environment

Development Policy is to conserve heritage and environmentally sensitive areas for maintaining ecological balance

Development strategies of the sector are:

- To protect active paddy and kole lands from conversion
- To preserve cultural and heritage sites of the town
- To protect water bodies within the town

CHAPTER 25

PROJECTED REQUIREMENTS

This Chapter details out the projected population for the plan year and corresponding requirements

25.1 Population Projection

25.1.1 Arithmetic Method

In this method, the difference between the populations of a place at a given interval is taken and added to a later date to get the future population with the same intervals.

$$P_n = P_0 + rn$$

Where P_n is population in the nth year, P_0 is the population for base year, r is annual increase of population and n is the number of years. Using this method the projected population obtained is given below.

Year	Population	Increase in population	Rate ®
1971	39598		
1981	45691	6093	609
1991	49398	3707	371
2001	51592	2194	219
2011	54071	2479	248
Total		14473	1447
Average		3618	362

Population for 2021, $P_{2021} = 54071 + (362 \times 10) = 57689$

Population for 2031, $P_{2031} = 57689 + (362 \times 10) = 61308$

25.1.2 Geometric Increase Method

In this method the ratio between decadal populations are taken as common and the least available population figure multiplied by the common ratio as the projected population total for the period after an equal interval.

Year	Population	Increase in population	Rate(r)
1971	39598		
1981	45691	6093	1.154
1991	49398	3707	1.081
2001	51592	2194	1.044
2011	54071	2479	1.048
Total			**4.327**
Average			**1.082**

Population for 2021, $P_{2021} = 54071 \times 1.082 = 58505$

Population for 2031, $P_{2031} = 58505 \times 1.082 = 63302$

25.1.3 Incremental Increase Method

In this method, the average increase / decrease during the past decades are taken and the average incremental increase is added for each consecutive decade.

Year	Population	Increase in population	Incremental increase
1971	39598		
1981	45691	6093	
1991	49398	3707	-2386
2001	51592	2194	-1513
2011	54071	2479	285
Total		**14473**	**-3614**
Average		**3618.25**	**-1204.667**

Population at n^{th} decade, $P_n = P_0$+ (Average increase + Incremental increase x No. of decades)

Where P_n= Population at the end of nth decade

P_0= Base year population

Population for 2021, $P_{2021} = 54071 + (3618.25 - 1204.667 \times 1) = 56485$

Population for 2031, $P_{2031} = 56485 + (3618.25 - 1204.667 \times 1) = 58898$

25.2 Perspective Population for the Year 2021, 2031

The perspective population is arrived by taking the average of all the population projecti ons through the various methods discussed above.

Table: 25.1 Projected population for the plan year

Sl No	Method	Population in 2021	Population in 2031	Population in 2032
1	Arithmetic method	57689	61308	61669
2	Geometric method	58505	63302	68493
3	Incremental increase method	56485	58898	59139
	Average	57560	61169	63101
	Rounded to	57600	61200	63200

25.3 Anticipated Changes in Occupational Pattern

The economic activities govern the occupational structure of the area. The expected population by 2031 is 61200.With the introduction of new development projects as per the new development plan, economic base will be increased which will further result in the increase of job opportunities in Town area. From the projected work force participation rate for Kunnamkulam Town area, it can be found that the WPR reaches about 38% by the end of 2031.

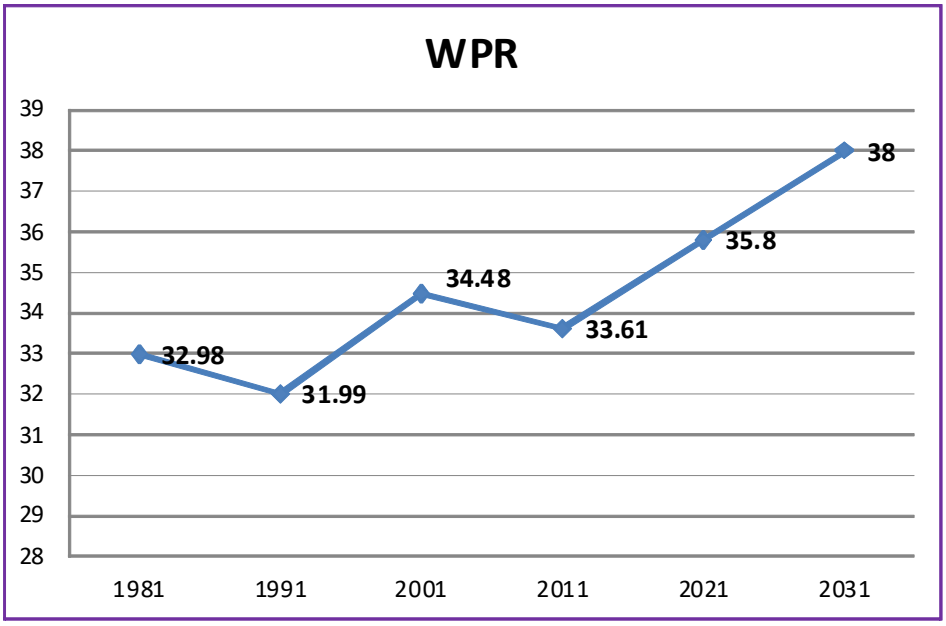


Fig 25.1: Projected WPR

25.4 Projection of Land Use Requirements

25.4.1 Area requirement for various urban uses for the plan year

Table: 25.2 Projected land use for the plan year

Land use	UDPFI guideline (%)	Existing Land use 2012		Projected Land use 2031	
		Area (sq. km)	Percentage	Area (sq. km)	Percentage
Residential	40 to 45	8.49	30.94	12.97	47.26
Commercial	3 to 4	0.41	1.49	0.99	3.6
Industrial	8 to 10	0.15	0.53	0.15	0.54
Residential mix	-	-	-	1.88	6.85
Public & Semi public	10 to 12	0.96	3.5	0.96	3.5
Traffic &Transportation	12 to 14	1.43	5.23	1.83	6.68
Park & Open space	18 to 20	0.11	0.4	0.06	0.23
Paddy	Balance	6.28	22.88	6.24	22.74
Dry Agriculture		9.27	33.77	1.92	6.99
Water Bodies		0.34	1.23	0.34	1.23
Others		0.01	0.03	0.01	0.03
Special use zone	-	-	-	0.1	0.36
Total	**100**	**27.45**	**100**	**27.45**	**100**

25.5 Requirement of Physical Infrastructure

Requirements in Kunnamkulam Municipal area for 2031 according to standard guidelines are given below.

1.Trade and Commerce

Kunnamkulam Town is a Medium town. As per the UDPFI guidelines the trade and commercial area requirement for a medium sized town is estimated as 0.24Ha to 0.32Ha per 1000 persons. In 2012 the trade and commercial area is 0.41sq.km while it increased to 0.99 sq.km by the year 2031. The planning standard for trade and commerce is given in Table 25.3.

Table: 25.3 Planning standards

Sl. No	Hierarchy of commercial centre	Population served	Requirement (by 2031)
1	Cluster centre	1000-4000	16 Nos with 36 shops each
2	Sector centre	5000-20,000	3Nos with 100 shops each
3	Community centre	25000-1 lakh	1 No with 500 shops

2. Water supply

The estimated water demand for a city is broadly classified as domestic and non domestic. The domestic water demand includes per capita consumption and system losses, while non domestic water demand includes industrial and commercial consumption, institutional consumption and fire fighting demand.

As per UDPFI guidelines, the desirable standard of water for domestic use for a medium size town is 135-150 lpcd. As per CPHEEO guidelines, the domestic water requirement is 135 lpcd. For assessing the future water requirement 135 lpcd is taken.

Considering non domestic demand such as industrial, commercial and institutional uses, the quantity is same as 20% of domestic supply. An additional 1 % is given for fire demand. As per Central Public Health and Environmental Engineering Organisation (CPHEEO) manual, a maximum provision of 15% towards un accounted water losses shall be made. An allowance of 33% has to be given for elevated storage capacity. 100% of supplied water is to be properly treated. Table 25.4 shows estimated water demand of town.

Table: 25.4 Estimated water demand

Year		2011	2021	2031
Population	Unit	54071	57689	61308
1.Domestic water demand @135 l/h/d	MLD	7.30	7.79	8.28
2.Non-domestic water demand @20.8% of (1)	MLD	1.52	1.62	1.72
3.Fire demand 1% of (1)+(2)	MLD	0.09	0.09	0.10
4.UFW @ 15% of (1)+(2)+(3)	MLD	1.34	1.43	1.51
5.Total water demand @(1)+(2)+(3)+(4)	MLD	10.24	10.93	11.61
6.Storage capacity required @ 33% of supply	MLD	3.38	3.61	3.83
7.Total storage capacity required @(6)+(5)	MLD	13.62	14.53	15.45

The total quantity of water supplied by KWA is about 1.1 MLD/day. As per the norms future requirements is estimated to be 15.45 MLD in 2031 .So an additional storage tank of 14.35 MLD capacity is to be constructed.

3. Energy

One 11 KV substation for 15,000 population is taken as the general standard for all categories of towns. One 110 KVsubstation is existing there. One LPG godown for 15000 population and 1 petrol pump for 150 Ha of gross residential are and 1 for 40 Ha of industrial area are the requirements.The demand for 2031 is given in Table 25.5.

Table: 25.5 Planning standard of Energy for the plan year

Category	Existing Nos	Standards Recommended	Demand 2032
11KV Substation	One 110KV Substations	1 for 15000 persons	4 Nos
LPG Godowns	1	1 for 40-50000 persons	1
Petrol pumps	5	1 for 150 Ha of gross residential and 1 for 40 Ha of Industrial area	6 Nos

So as per the future demand 4 numbers of 11 KV substation ,one LPG Godown and six numbers of petrol pumps are required for kunnamkulam town itself .

4. Solid waste management

Being a medium town the quantity of waste generated per day as per UDPFI guideline is estimated as 0.375 kg. For projected population of 2031, the quantity of waste generated will be 28 Tons/day. As per the present situation the waste generation is 19 tons/day and collection is 5 tons/day. If the present solid waste management system continues for the coming years, in 2031 an addition of 23 ton to be treated per day. Hence an efficient waste management system has to be adopted for the waste disposal.If three level waste management system is adopted then waste from public places and markets only to be treated.

5. Education and health

The educational and health facilities required as per the planning standard for the year 2031 is given in Table 25.6 and 25.7.

Table 25.6 Educational facilities for the year 2031

SI No	Category	Existing Nos.	Standard Recommended	Demand 2031	Shortage
1	LP School	27	1/2500 population	25	nil
2	UP School	18	1/7500 population	9	nil
3	High School	11	1/13000 population	5	nil
4	HSS	8	1/13000 population	5	nil
5	Arts & Science	One providing arts education	1/80000 population	1	One providing science education
6	Polytechnic	1	1/36000 population	2	1
7	ITC/ITI	2	1/35000 population	2	nil
8	TTI	0	1/120000 population	0	0
9	Professional Colleges	0	1/25000 population	0	0

Table 25.7 Projected requirements for Health Sector

Category	No of Beds	Existing	Standard recommendatios	Demand 2032	Shortage
General Hospital	500	-	1 for 2.5 Lakh population	-	
Intermediate Hospital(Category A)	200	1	1 for 1 Lakh population	-	
Intermediate Hospital(Category B)	80	4	1 for 1 Lakh population	-	
Poly-Clinic		-	1 for 1 Lakh population	-	
Nursing home,Child welfare and Maternity centre	30	1	1 for 0.45Lakh population	1	nil
Dispensary		5	1 for 0.15Lakh population	4	nil

6. Recreational use

Recreational use includes parks, play fields and other open spaces. For a medium town the recreational space should be provided at the rate of 1.4-1.6 ha/1000 persons. The Kunnamkulam Town currently has 0.11 sq.km area for recreational facilities, i.e 0.40 % of the total area. In 2031, the recreational space to be provided is about 1 Ha in 2031 for a population of 61200.

7. Socio cultural facilities

The projected requirements for socio cultural sector in 2031 is represented in Table 25.8. As per requirements additional 2 community rooms and 1 community hall and library is required.

Table 25.8 Projected requirements for Socio-cultural Sector

Category	Standard as per UDPFI	Existing	Demand 2031	Shortage
Community Room	1 for 5000 population	11	13	2
Community Hall & Library	1 for 15000 population	3	4	1
Recreational Club	1 for 1 lakh population	5	-	-
Music,dance & drama centre	1 for 1 lakh population	-	-	-
Meditation & spiritual Centre	1 for 1 lakh population	-	-	-
Socio- cultural centre	1 for 10 lakh population	-	-	-

CHAPTER 26

SECTORAL PROPOSALS

Development proposals which are envisaged for the plan period are detailed out in this chapter

As per Integrated District Development Plan, Kunnamkulam Town comes under Multifunctional zone II. It has to act as centre for industrial utilizing activity agricultural products of hinterland. More over economic base of town should be strong and the quality of life of people should be improved along with this. To achieve goals and objectives of the Master Plan, various sectoral proposals carved out are detailed below.

26.1 Trade and Commerce

26.1.1 Multi-level Parking System

To tackle the problem of insufficient public parking facilities in town centre, a multilevel parking system is to be constructed near 'R.C Park' with an area of about 0.5 acres. Proper drainage facility is to be ensured by constructing drains to 'Appithodu'. The Multi-level parking areas are shown in figure 26.1.

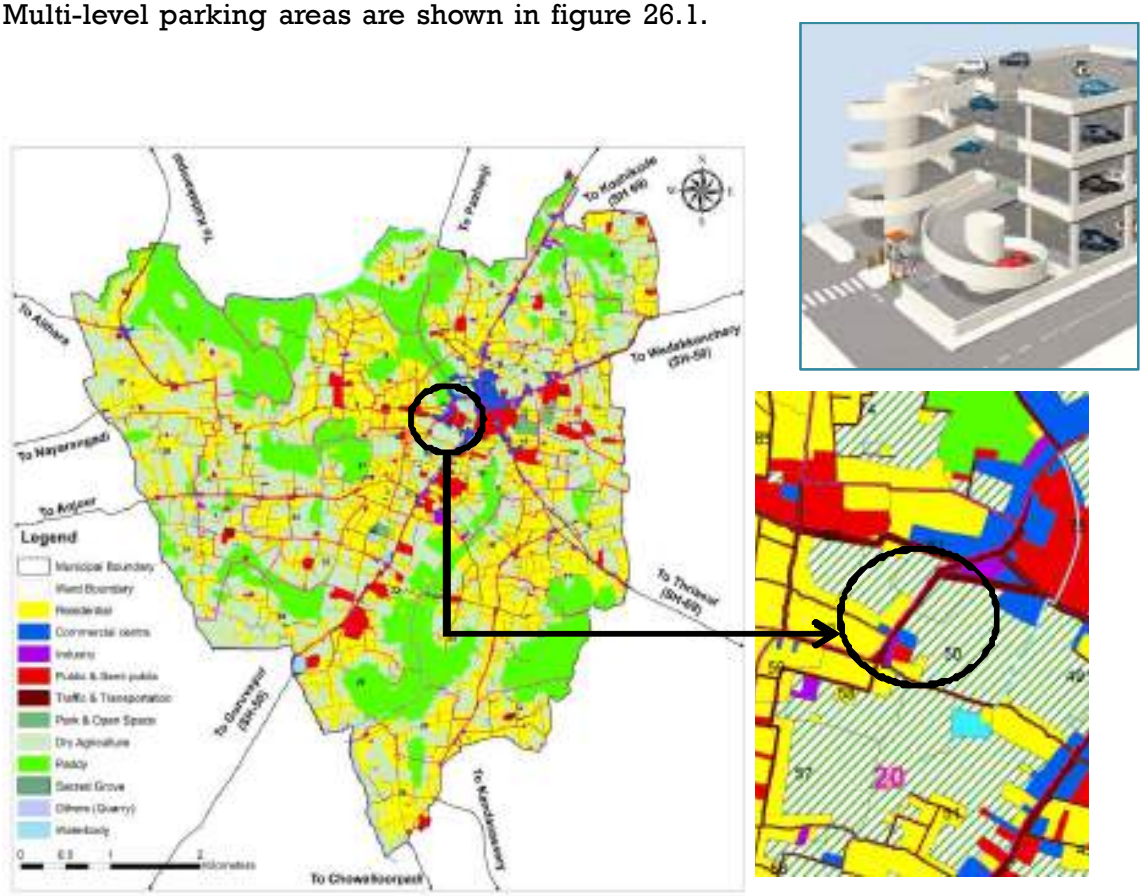


Fig 26.1 Multi level parking System

26.1.2 Redesign of Parayil angadi

The existing Parayil market accommodates vegetable as well as fish and meat shops in 70 cents of land as shown in figure 26.2. Moreover this Angadi area lacks certain necessary infrastructural facilities. So it has to be redesigned with parking facilty in front side, loading and unloading facility at rear, provision for comfort station and biogas plant. Existing fish and meat shops have to be shifted to proposed building at Thurakkulam market. In addition to this existing shops have to be redesigned to accommodate the street vendors at the town centre.

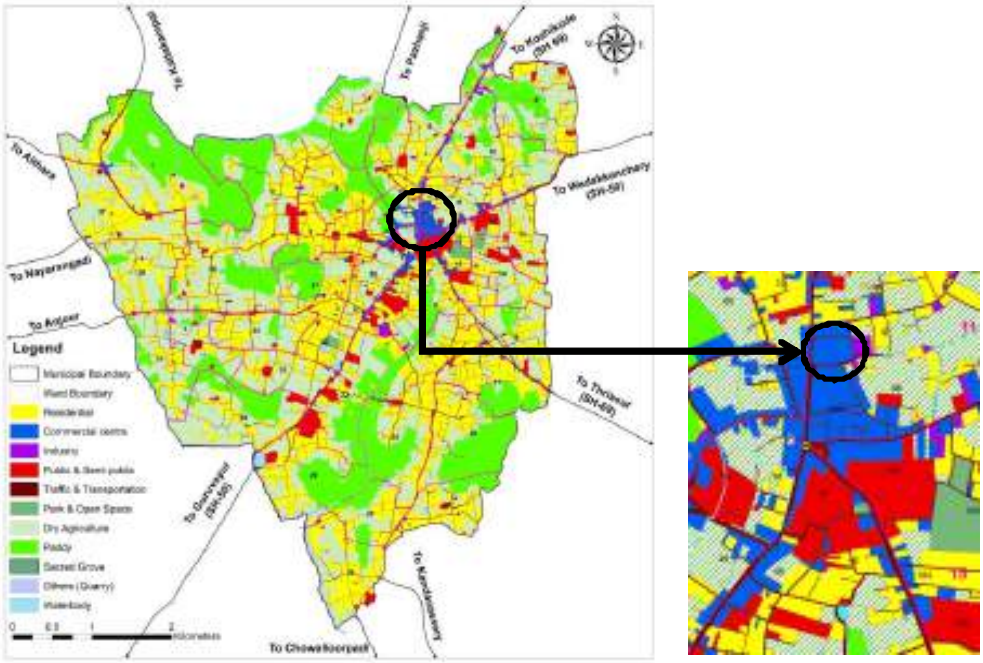


Fig 26.2 Parayil Angadi

26.1.3 Agriculture produce marketing centre cum coconut procurement centre

It is proposed to develop an agriculture produce marketing centre cum coconut procurement centre at Vappabazaar having an extent of 20 cents of land. This is shown in figure 26.3.

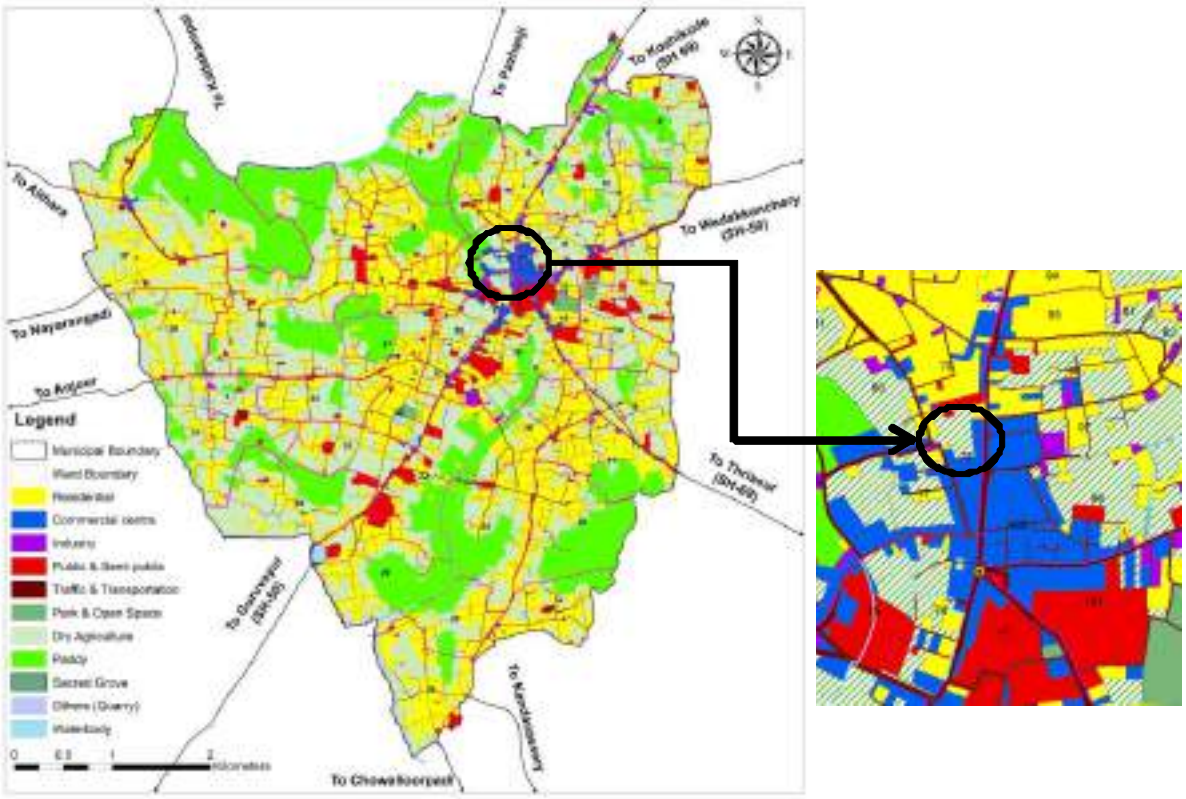
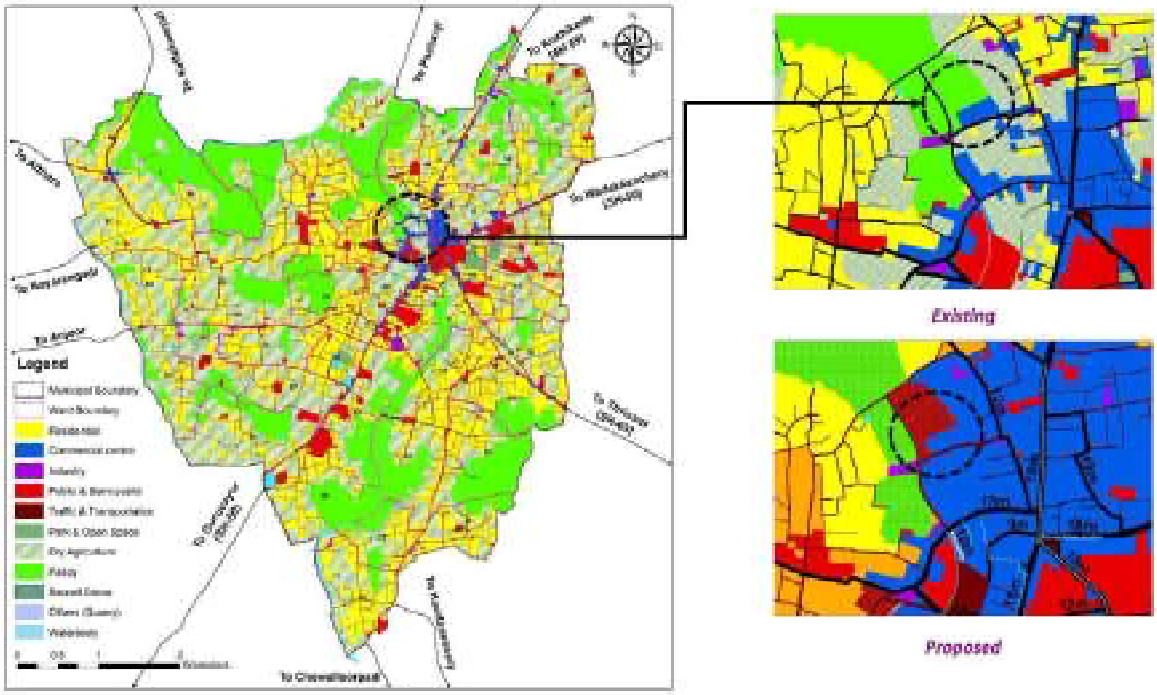


Fig 26.3. Marketing cum procurement centre at Vappa bazaar

26.1.4 Development of Thurakkulam Municipal market

Present infrastructure facilities at Thurakkulam Municipal market is seen to be minimum.Facilities like slaughter house,car parking,loading and unloading spaces are lacking.



Proposed location for development of Thurakkulam market

Inorder to accomodate the modern facilities, it is proposed to acquire the vacant plot on the west side of the market.In the proposed site solid wate disposal plant,Slaughter house and buildings incidental to market purpose is to be provided.Area of land to be aquired is 3.23 acres. Location of the proposed area is shown in figure above.

26.2 Industry

26.2.1 Renovation of existing Industrial Development Area

It is proposed to renovate the existing industrial estate having an area of 5.5 acres at Rajiv Gandhi corner, with necessary infrastructural facilities like, proper compound wall and security cabin, bore well for drinking water, additional transformers and fire protection system and proper maintenance of internal and approach roads. Refer figure 26.4.

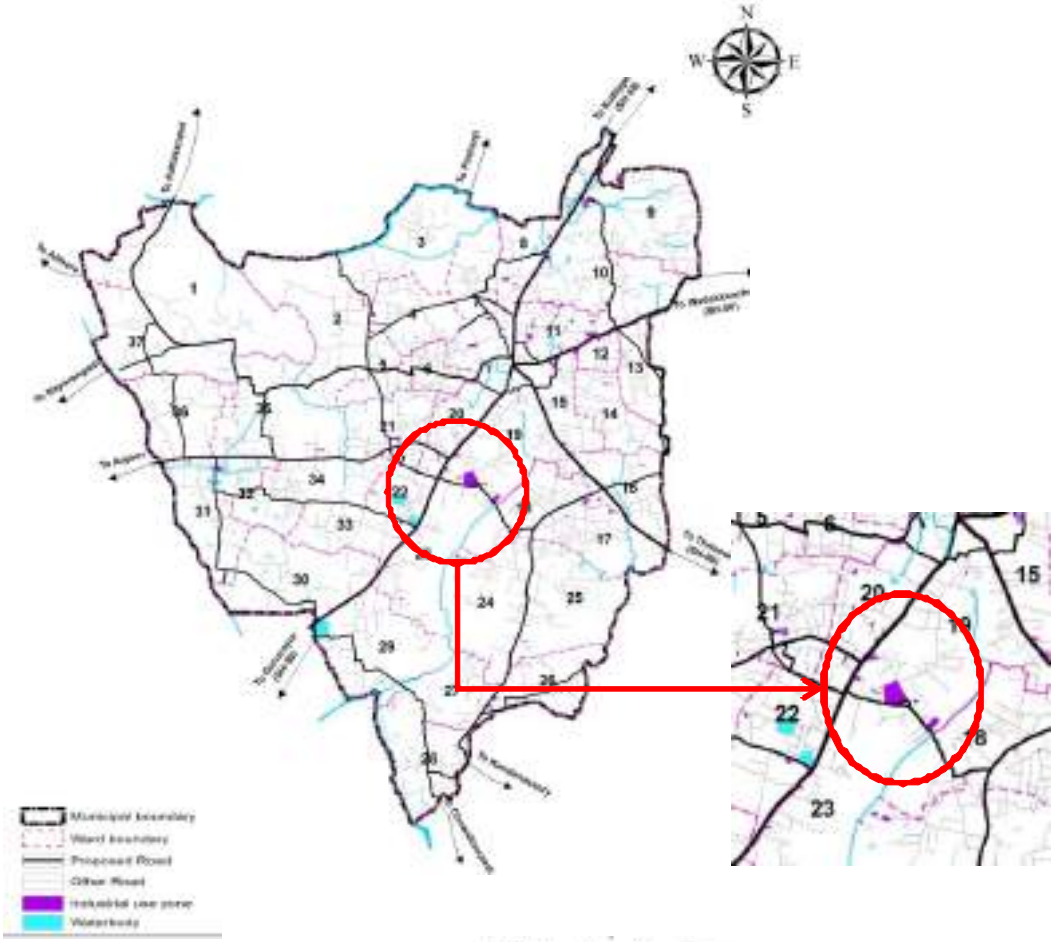




Fig 26.4 Mini Industrial estate at Rajiv Gandhi Corner

26.2.2 Extention of Industrial activities to other parts of the town

To support the industrial sector and to retain the industrial activity an 'Industrial zone' mainly comprising of all the existing industrial land use and the industrial estate is constituted. This constituted industrial zone occupies very small part of the town area and it is not sufficient for the development of industrial sector in full swing. In order to enhance Industrial activities,it is needed to enable limited amount of activities at other parts of the town subjected to relevent regulations .

26.2.3 Food Park

For manufacturing value added products from agriculture and allied sector products, an industrial unit called 'Food Park' is proposed inside existing industrial estate.

26.2.4 Techno City

Presently by-products from book binding units are exported to other states. This can be used effectively to make paper products by converting it into paper pulp. An industrial unit for utilizing these by-products and also a unit for engineering and electronic based products is proposed with 75 cents of land of existing Municipal engineer's quarters (total land 1.5 acres). Refer figure 26.5. Clustering of industries under similar category can also reduce resource consumption and increase market of products.

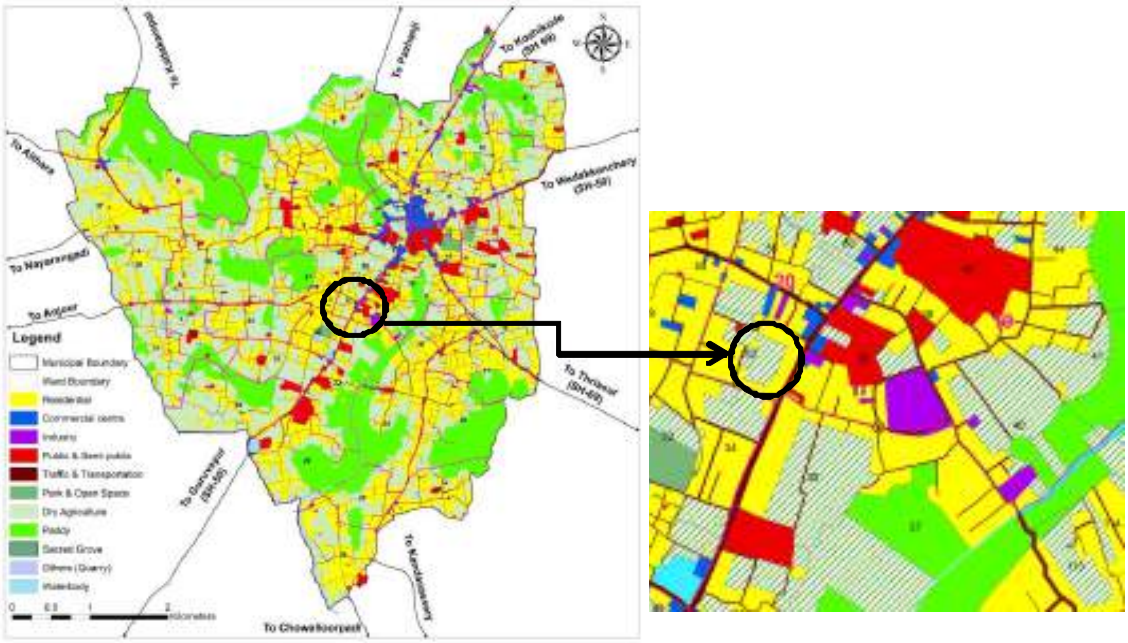


Fig 26.5 Proposed Techno City at Municipal Engineers quarters

26.2.5 Craft Village

Workers in rock cut products sector is under the threat of relocation due to 'Kunnamkulam – Guruvayur' road widening. It is proposed to construct a 'Craft Village'utilizing about 2 acres of land at 'Thanjankunnu' (total 4 acres) and relocate these workers. Exhibition stalls on front side and working space at back side has to be provided.Refer figure 26.6.

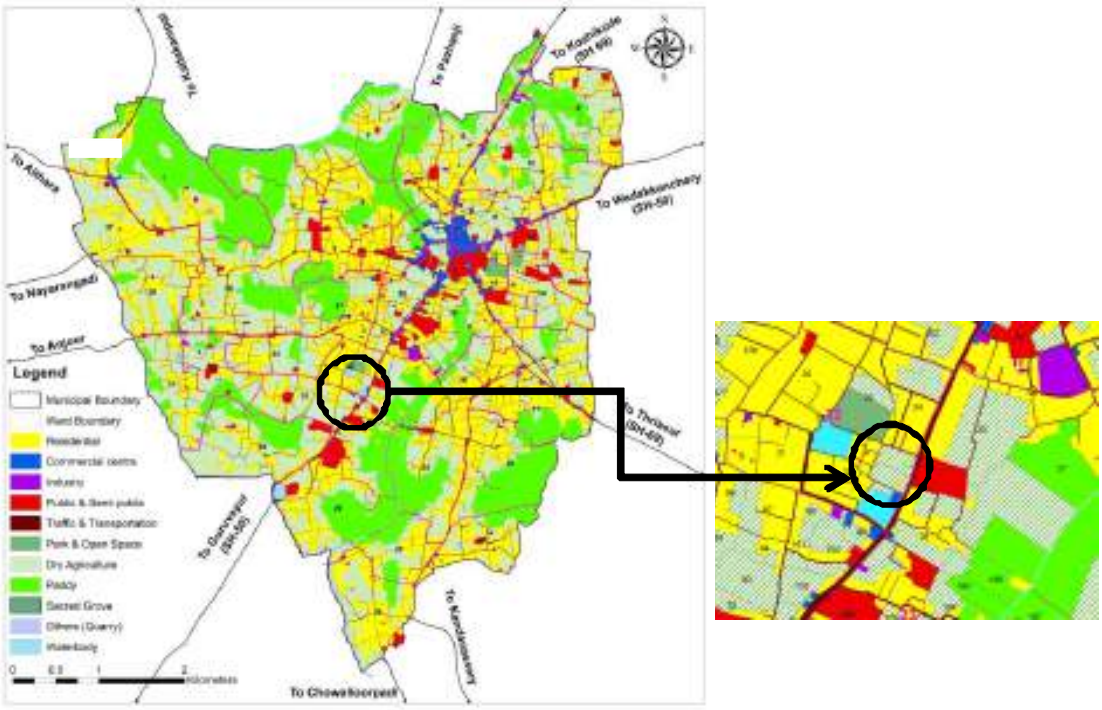


Fig 26.6 Craft Village at Thanjankunnu

26.3 Tourism

26.3.1 Tourism circuit

A tourism circuit connecting potential areas within town, which can be covered in a single day, is to be developed. This circuit can be linked with 'Thrissur Peruma' the proposed tourism week in Thrissur District. A tourism festival can be conducted in connection with this incorporating 'Onathallu' and 'Paarkadi Pooram'.Figure 26.7 shows the proposed tourism circuit for municipality. First location is Kakkad Palace, where it is proposed to build a Cultural Centre which is detailed in 26.3.3. Second location is Kakkad

cave which is an ASI site. Third location is the proposed Boat Jetty at Parempadam which is the starting point of Perumthodu. Then boating and angling facility is to be arranged at Perumthodu till Cheruvallikadavu Bridge. Fifth location is a resort which is proposed at Thuruthu near Cheruvallikadavu Bridge. Sixth location is the heritage street with AngadVeedukal at Nadupanthi, which is detailed in 26.3.5. Seventh location is Arthat palli. Eighth location is Granite Carving Site at Kurukkanpara (Craft Village) and ninth location is Kakkathuruthu, where lot of migratory birds are seen during evening. Finally tourists are to be taken back to Cultural Centre where a performance of 'Onathallu' can be arranged.

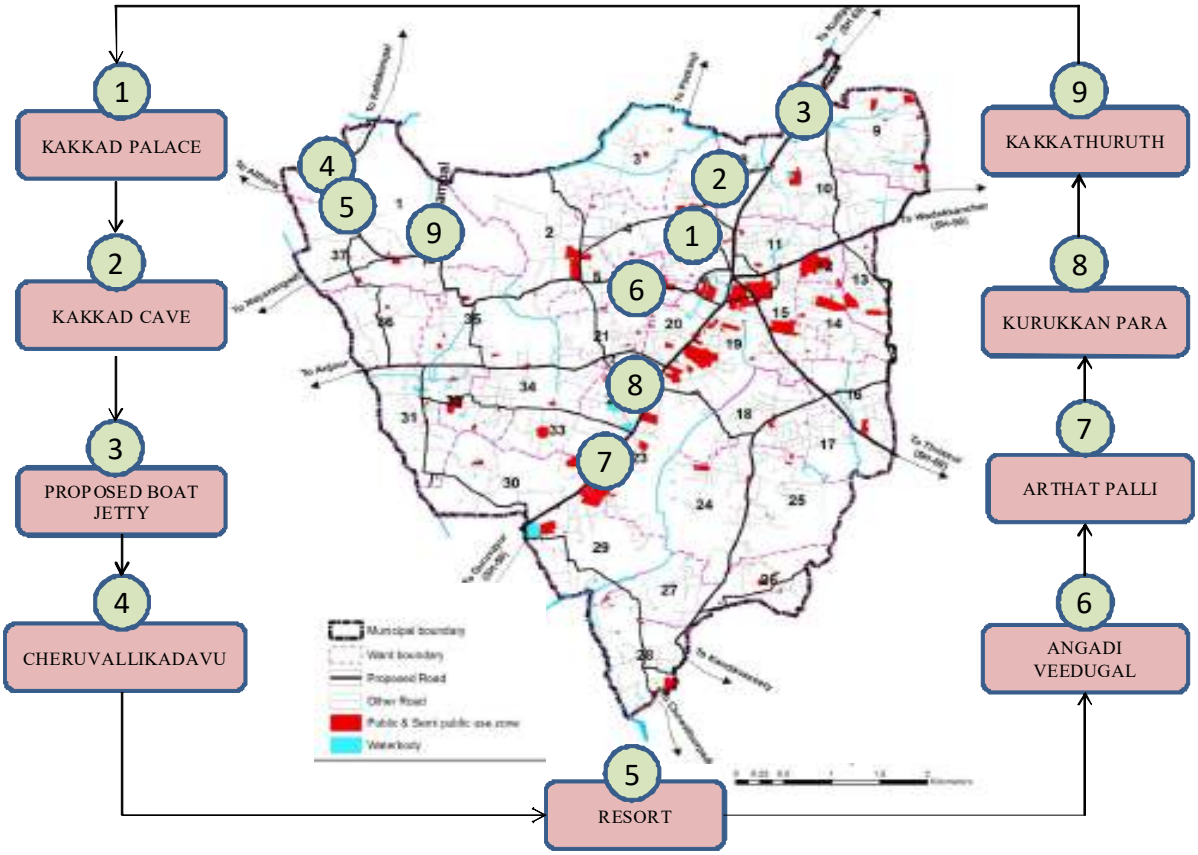


Fig 26.7 Proposed one day tourism circuit

26.3.2 Museum for printing heritage

Considering the rich heritage of Kunnamkulam once had in the printing sector, it is necessary to construct a museum for printing heritage. This is to depict the activities related to printing from the times of ARP press. The existing old building within the Town (Musavary Bungalow), is proposed for this purpose, which is shown in figure 26.8

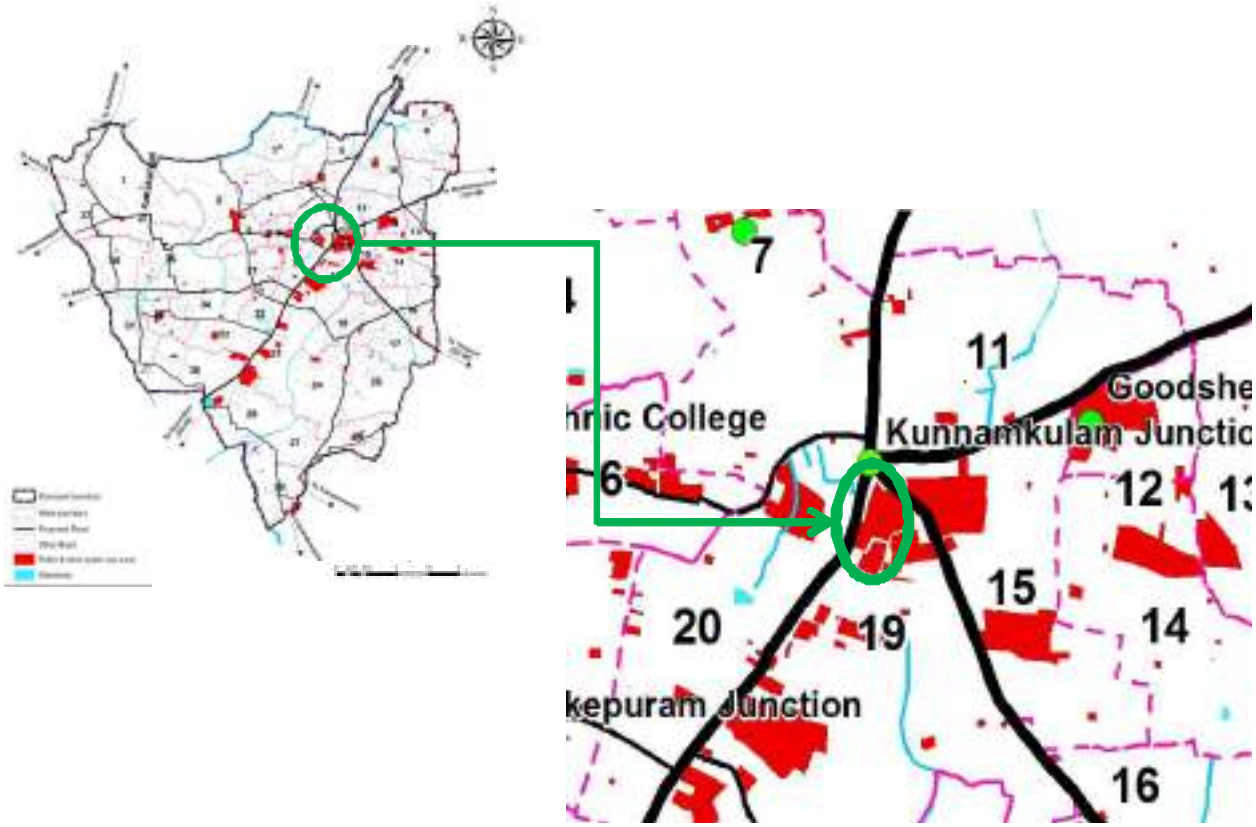


Fig 26.8 Museum for printing heritage

26.3.3 Cultural Centre at Kakkad

A Cultural Centre is proposed near Kakkad Temple.Kakkad is the origin place of Kalamandalam. It has to incorporate the facilities such as Kalamandalam sub centre, Tourism Information centre, performance centre for performing cultural art forms and tourist refreshment facilities like AC cubicles. Refer figure 26.9.

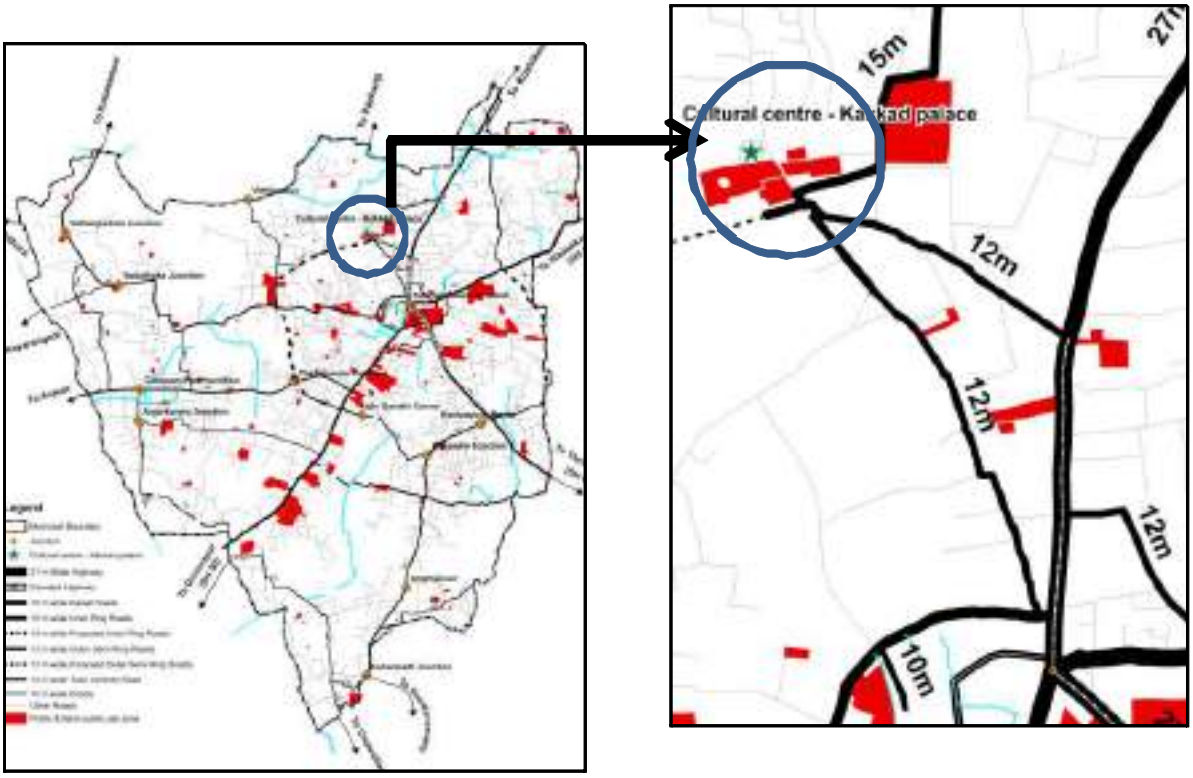


Fig 26.9 Cultural centre at Kakkad palace

26.3.4 Boating and Angling facility

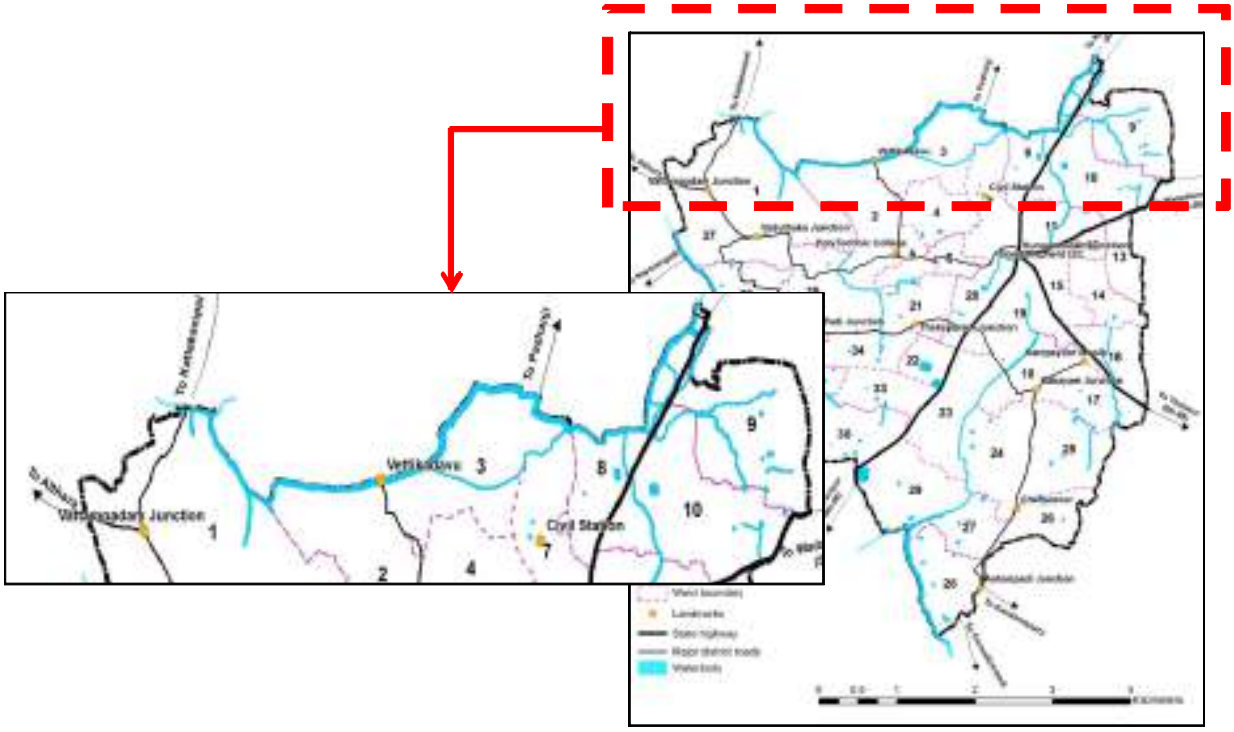


Fig 26.10 Boating and Angling facility at Perumthodu

It is proposed to dredge and deepen the Perumthodu and to provide boating and angling facility to attract tourists, which is shown in figure 26.10

26.3.5 Heritage Street

It is proposed to develop the existing 'AngadiVeedukal' in old town at Nadupanthi as Heritage shopping streets for artefacts which is shown in figure 26.11

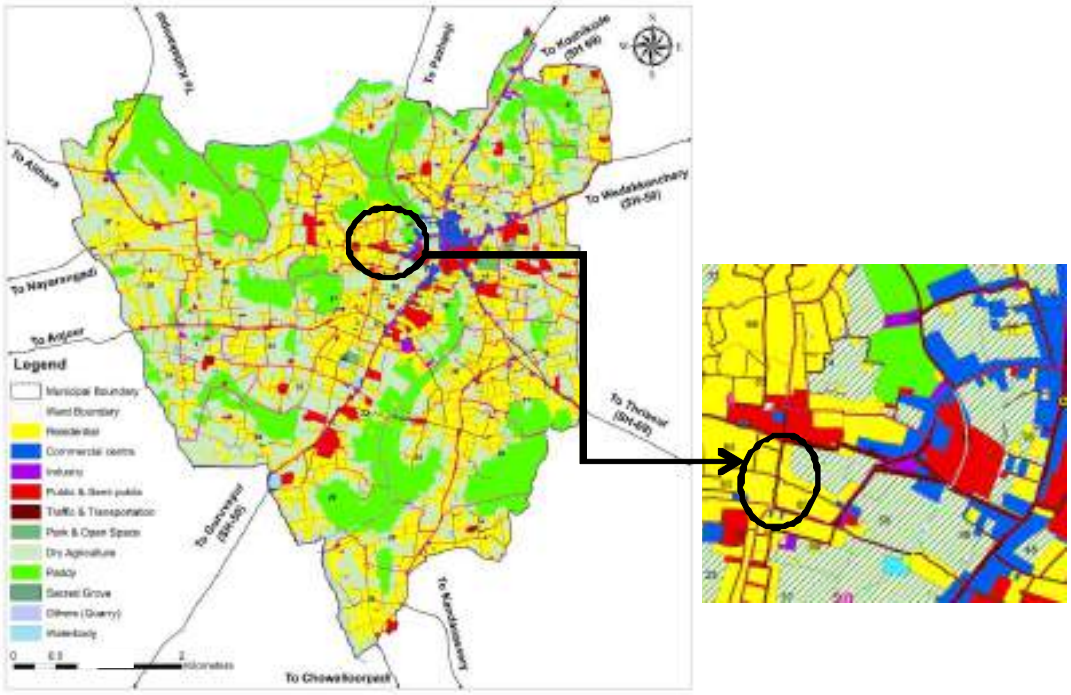


Fig 26.11 Heritage shopping street at Nadupanthi

26.4 Agriculture and Allied sectors

26.4.1 Organic Vegetable Farming

To attain self-sufficiency in case of vegetables, it is proposed to select Chittanjoor, Anaikkal and Arthatpadams for organic vegetable farming as third crop. Refer figure 26.12.

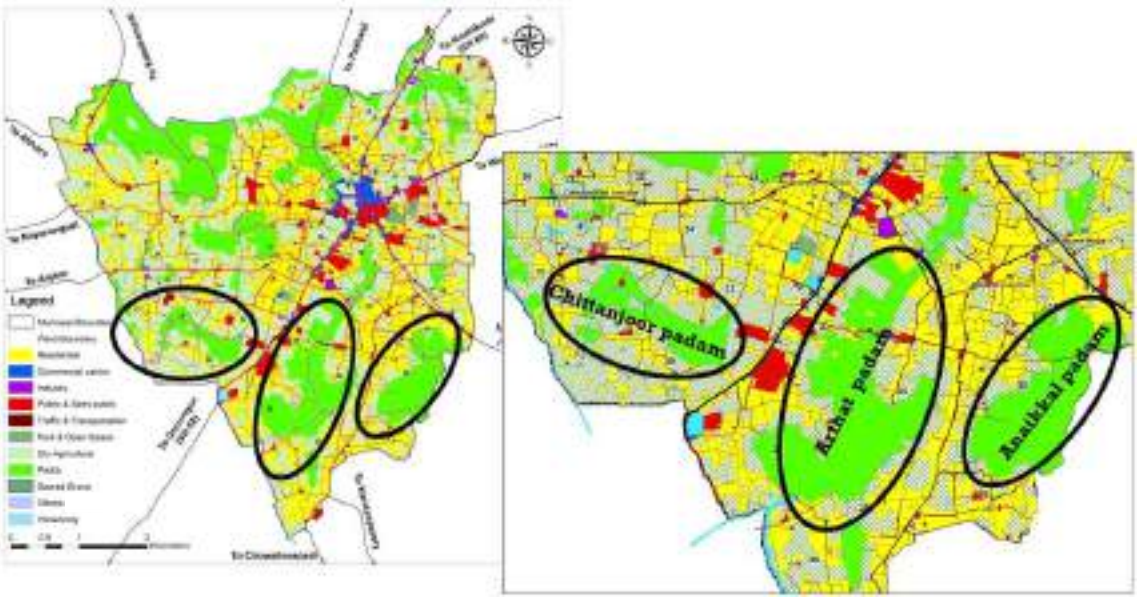


Fig 26.12 Paddy fields selected for organic vegetable farming

26.4.2 Intensified cash crop cultivation and floriculture

In wards of Anjoor, Kavilakkad, Anjoorpalam and Vaduthala, where dry cultivation area is more compared to other portions of municipality, intensified nutmeg, plantain, vegetables and cashew cultivation is proposed considering the crop suitability. In addition to this, considering the proximity to Guruvayur temple, there is potential for floriculture in Municipality which can be cultivated in these wards. Refer figure 26.13.

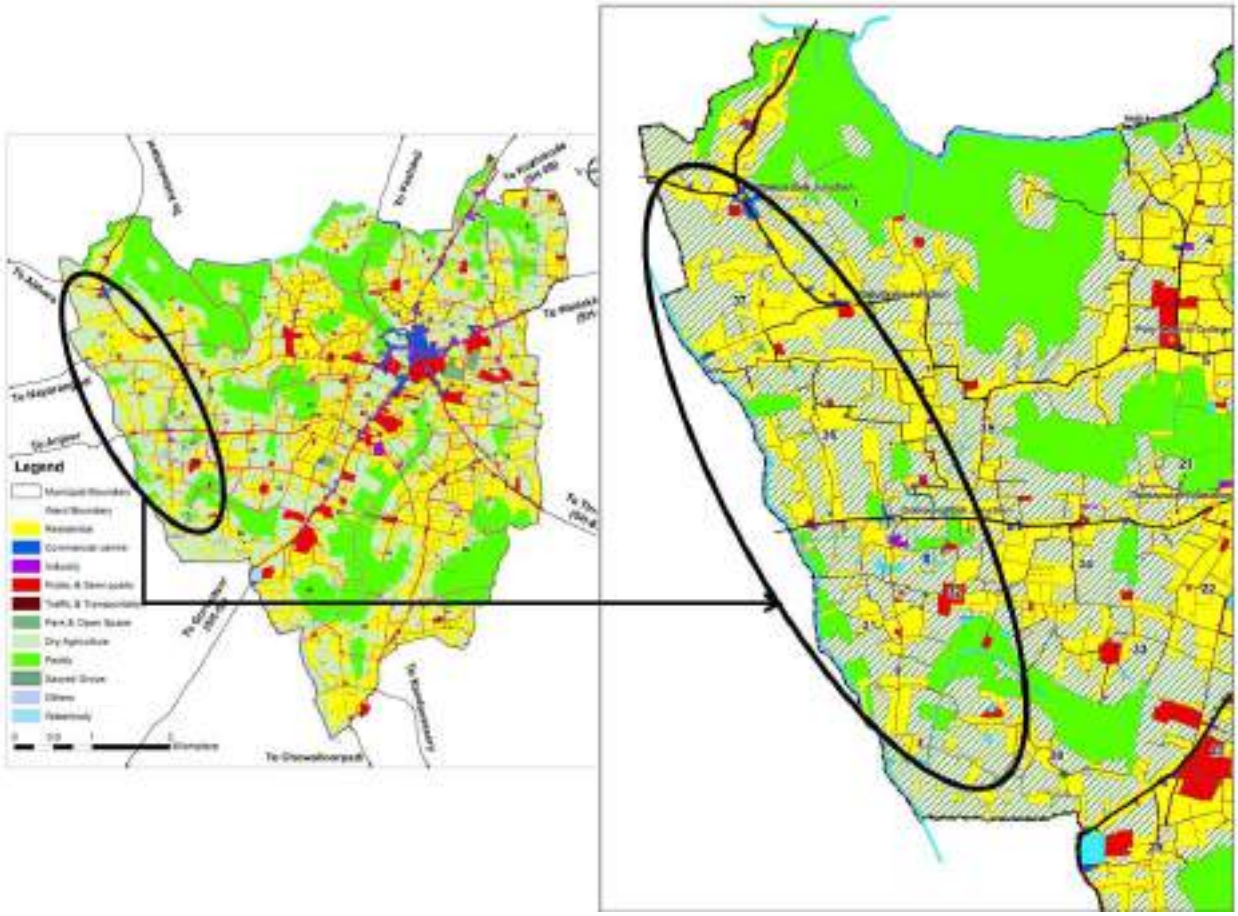


Fig 26.13 Wards selected for intensified cash crop cultivation and floriculture

26.4.3 Promotion of tree growing in private lands

In areas having plot size more than 50 cents, teak saplings can be distributed for promotion of tree growing in private lands, with the help of Social forestry.

26.4.4 Improvement of Mechanisation for paddy cultivation

To increase the productivity of paddy cultivation in active paddy fields, it is proposed to improve mechanization and formulate a committee for proper maintenance of these equipments, in co-operation with Padasekhara Samithi's.

26.4.5 Labour bank for agriculture sector

It is proposed to organize a labour bank at 12 cents of land of existing slaughter house location near Anjoor road. Presently slaughter house is not functioning properly. This location can be utilized for storing the work equipments of the labourers and to make labourers available as when required. Also training can be made available to labourers for using machinery for paddy cultivation and coconut plucking. Refer figure 26.14.

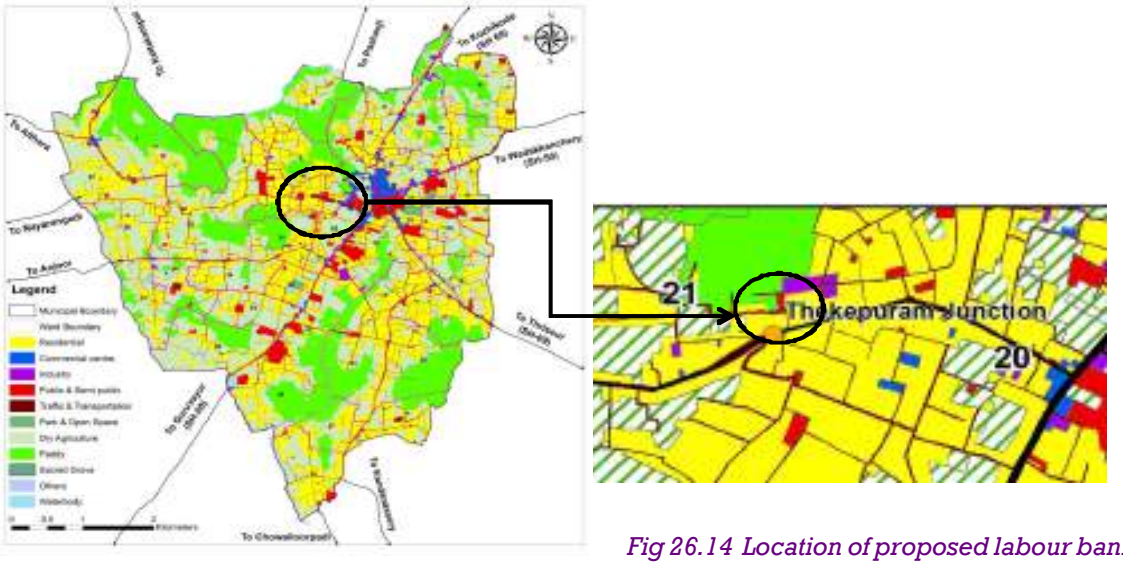


Fig 26.14 Location of proposed labour bank

26.4.6 Ornamental poultry farming

Ornamental poultry farming is proposed in wards of Anjoor, Kavilakkad, Anjoor palam and Vaduthala. Location is shown in fig. 26.15

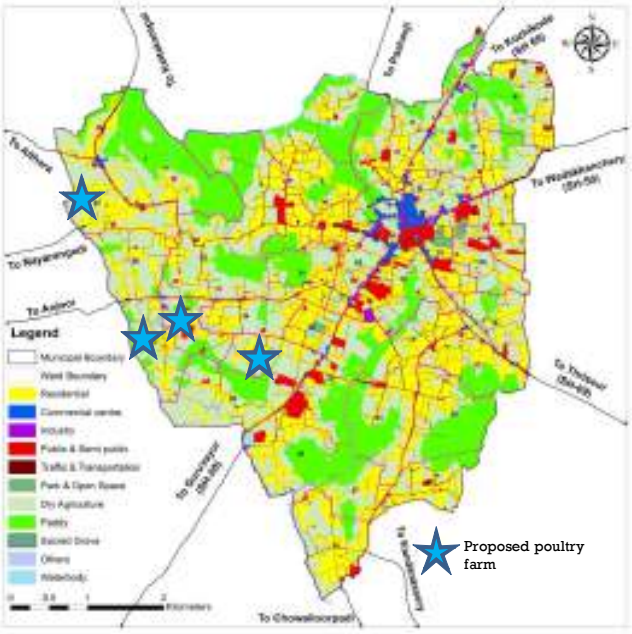


Fig 26.15 Location of ornamental poultry farming

26.4.7 Dairy farm

In town area, the demand for milk is more compared to availability. People depend on other states for additional milk requirement. So it is proposed to develop a dairy farm as PPP project at Parempadam with 50 high breed cattles (About 94 acres of land) along with fodder cultivation and biogas plant for producing Kunnamkulam brand milk. Refer figure 26.16. A committee with Development standing committee Chairman as Chairman and Veterinary Surgeon as member has to be formulated.

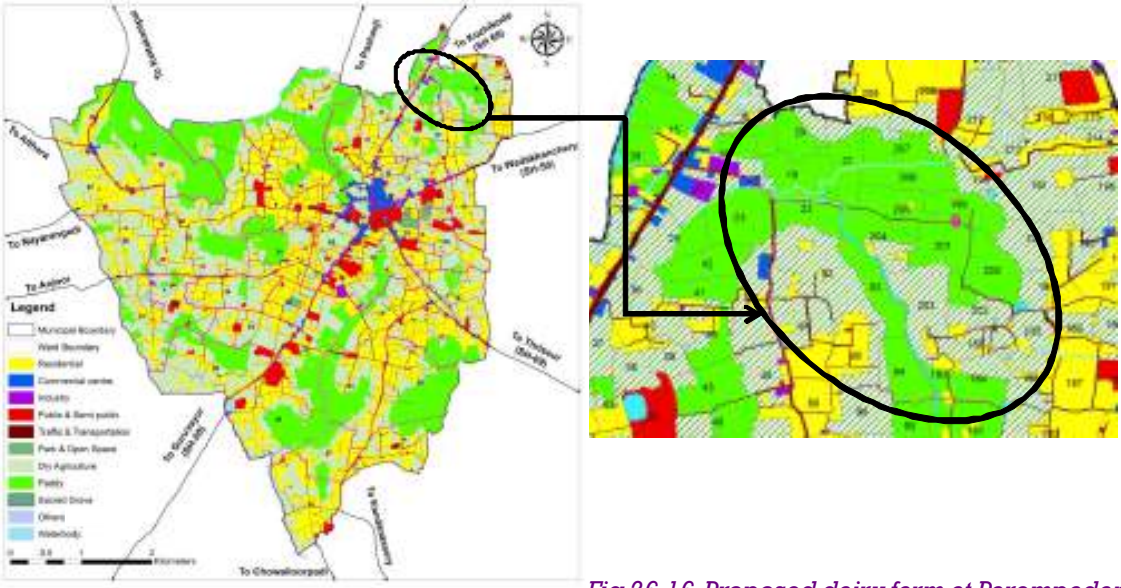


Fig 26.16 Proposed dairy farm at Parempadam

26.4.8 Pisciculture

Pisciculture is proposed at Perumthodu to raise fish stocks and restore fish population which will also support boating and angling facility in tourism sector. Refer figure 26.17.

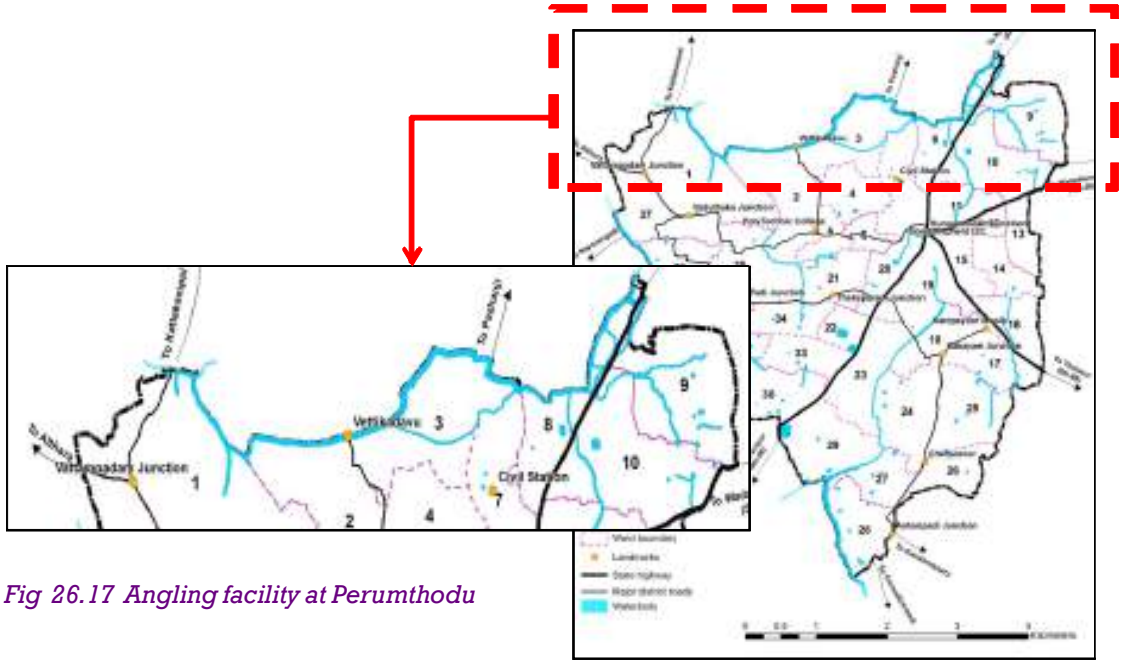


Fig 26.17 Angling facility at Perumthodu

26.4.9 Development of streams

It is proposed to dredge and develop main streams of municipality passing through active paddy fields. They are Perumthodu, Panangayi thodu, Annamkulangara thodu, Karimpana thodu and Kakkathuruthi thodu. Soil obtained after dredging can be utilised for constructing bund roads to paddy fields. Refer figure 26.18

Semi Ring Thode

During the opening time of Thiruthikkad bund, Kakkad-Chiralayam Kole land act as a reservoir. There is losses of water due to evaporation and out flow of water from Kole land. While the other Paddy fields in town suffer water scarcity. It is better to convey water from kole land to surrounding Paddy fields for ensuring sufficient irrigation water and reducing losses. For ensuring adequate water supply to other paddy fields in the town, a semi Ring Thode is proposed by connecting existing possible water bodies in the town.

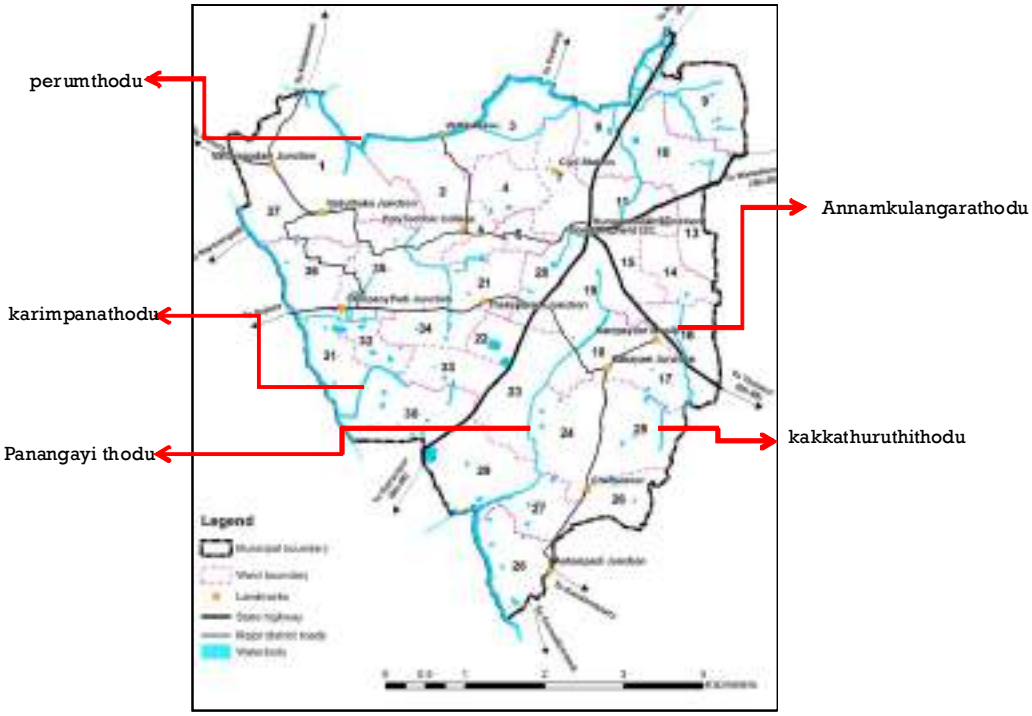


Fig 26.18 Main streams to be developed

26.4.10 Rejunevating Appithodu

Appithodu was major drainage network running through the core area of the town during the past.Due to the development of town and land filling activities and encroachment resulted in vanishing and reducing width in some locations of Appithodu network. In those areas where drain is existing is devoted to waste and sewage dumping . Due to this

activities, water in wells and ponds existing near by to this drain get polluted and public residing in this locality is suffering from viral and bacterial diseases due to unhygenic condition.It can seen that some of the stretches are laking and observed non continuity in drainage network as per land use survey. It is high time to rejunevate Appithodu by reinstating its past status, ensuring prevention of encroachment and dubbing waste. Detailed survey work needed to be conduct for finding the excat alligment and unauthorised aquisition needed to be avoid and protection needed to be ensure.

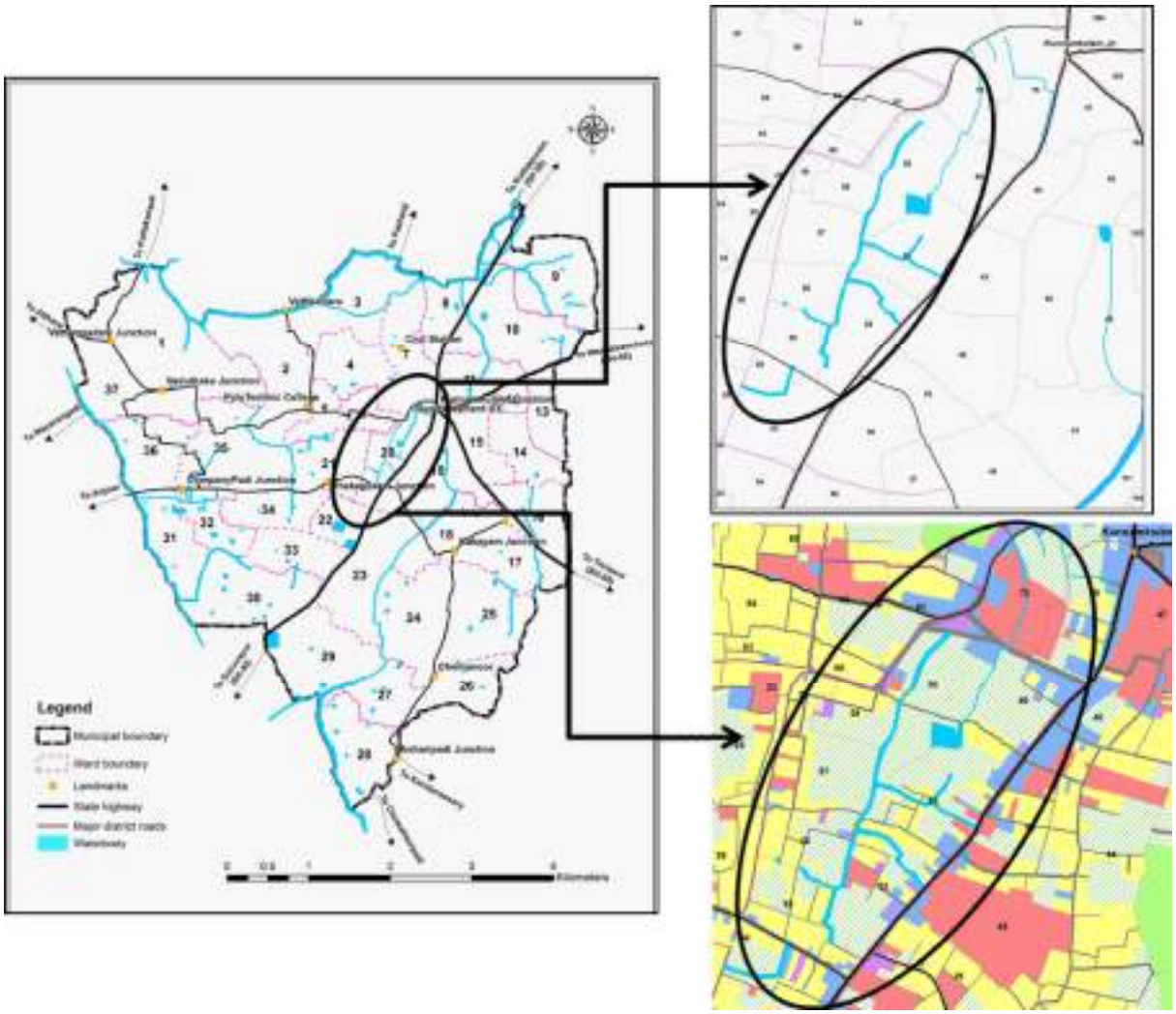


Fig. 26.19 Appithodu-Drainage allignment

26.4.11 Rain water harvesting based on ponds

Considering the water scarcity in municipal area and decreasing ground water level, it is necessary to protect and replenish existing ponds for future. For this rain water harvesting is proposed at Aerukulam which is perennial and at non-perennial ponds namely Kuttankulam and Chemmannoor Kothakulam. These ponds have to be widened and construct wells within the ponds for effective recharging of the ground. Refer figure 26.20.



Fig 26.20 Ponds selected for rain water harvesting

26.4.12 Improvement of right bank canal of Vazhani Irrigation Project

Improvement of right bank canal of Vazhani Irrigation project can solve the problem of water scarcity in town. This will help in replenishing the ground water of town. Refer figure 26.21.



Fig 26.21 Right bank canal of Vazhani dam

26.5 Drinking Water

26.5.1 Water supply projects

Mainly three water supply projects are proposed for Kunnamkulam municipality. They are given below.

a) Water supply project from Chattukulam pond for Arthat – Chemmannoor areas

It is proposed to dig wells in Chattukulam pond and this water can be pumped and stored in two quarry ponds at Kurukkanpara. A filtration and chlorination unit and an overhead tank for storage of treated water has to be provided at ThanjanKunnu in 1 acre out of 4 acres of land. Refer figure 26.22.

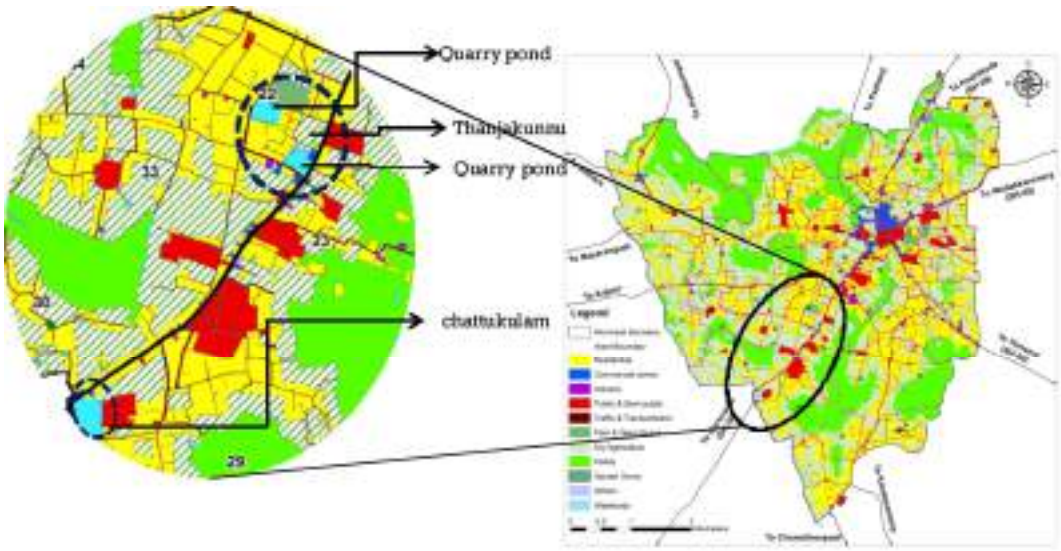


Fig 26.22 Water supply scheme from Chattukulam

a) Ponds proposed for water supply scheme

Following ponds are proposed to be widened and developed for water supply project. Refer figure 26.23.

- Kakkadkulam- to augment KWA water supply in town area
- Madurakulam- for Anaikkal area
- Aerukulam- forVaduthala area, Chattukulam for Arthat-chemmanur area (ward-28).
- Kuttankulam along with rain water harvesting scheme mentioned in 26.4.11, for Aduppootty area

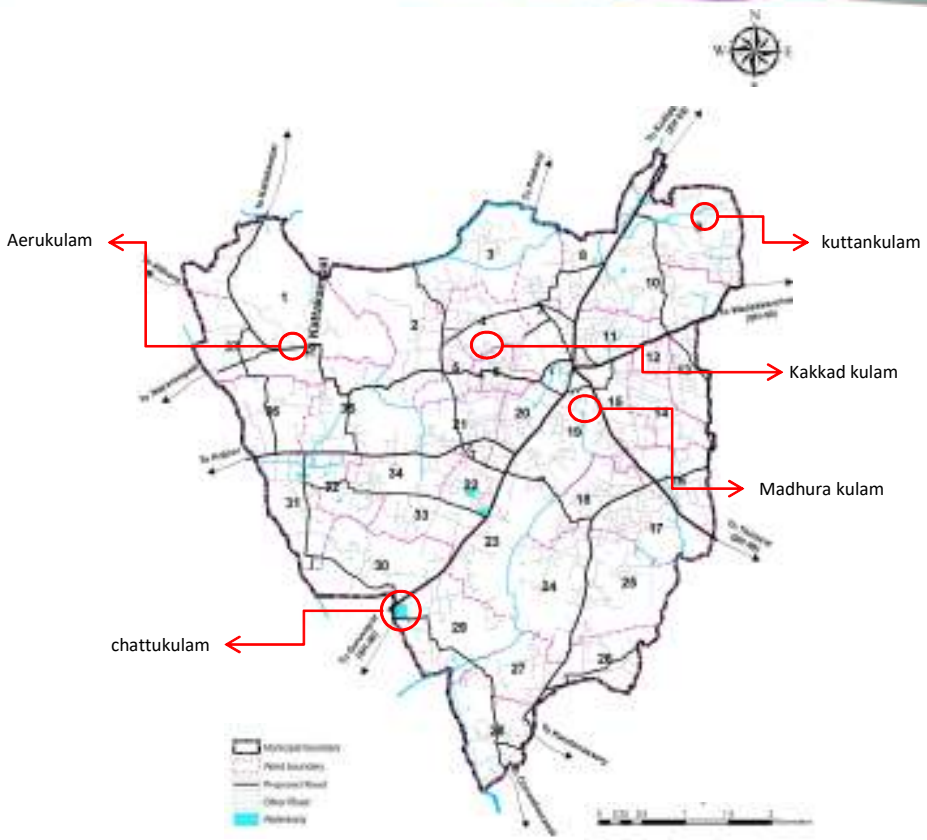


Fig 26.23 Ponds selected for water supply scheme

a) Separate water supply Scheme for Kunnamkulam Municipality from Bharathapuzha

Presently Kunnamkulam and Guruvayur Towns are having a joint water supply scheme. Considering the water scarcity in Kunnamkulam Town a separate water supply scheme is proposed from Bharatapuzha.

26.5.2 Enforcement of Rain water harvesting in public and residential buildings

Along with the above proposals proper enforcement of rain water harvesting in public and residential areas should be ensured to solve the water scarcity problem of Kunnamkulam Town.

26.6 WasteManagement

26.6.1 Waste water treatment Plant

At present the waste water from town area is finally disposed at Kakkad – Chiralayamkole land which is affecting the paddy cultivation. So it is proposed to construct two sewage water recycling units, one near Thurakkulam market and other near Victory Inn. These are shown in figure 26.24.

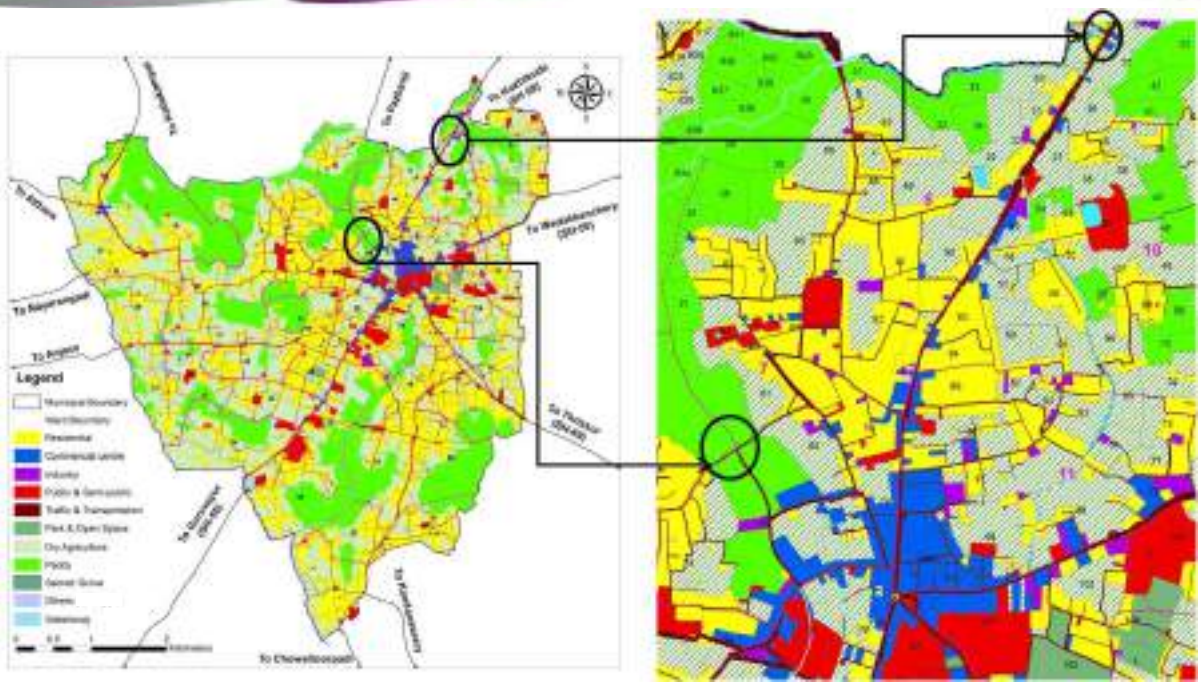


Fig 26.24 Waste water treatment plants near Thurakkulam market and Victory Inn

26.6.2 Scheme for solid waste treatment

A three level solid waste treatment scheme is proposed.

- One at household levels having plot size greater than 10 cents
- Second based on flats and residence association
- Third level from households with plot size less than 10cents, public places and markets utilizing Kurukkanpara Trenching ground for windrow composting

Figure 26.25 shows the location of Kurukkanpara Trenching Ground.

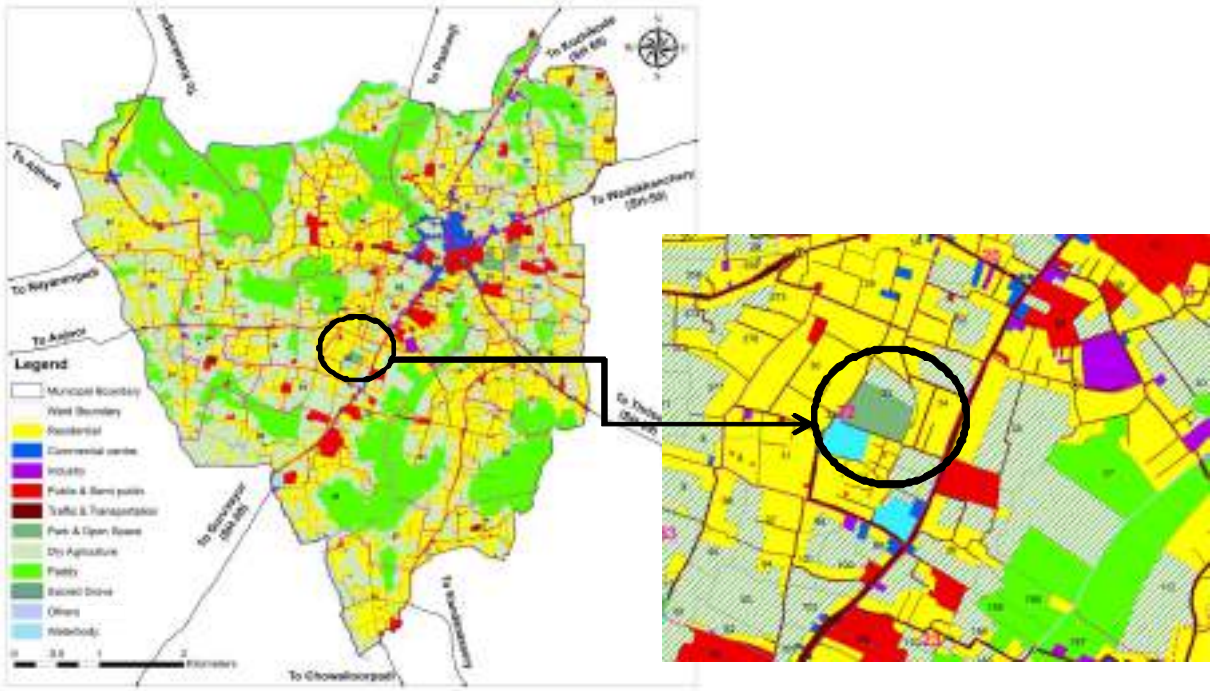


Fig 26.25 Kurukkanpara trenching ground

26.6.3 Provision for comfort station and E-toilet facility

It is proposed to construct comfort stations at following locations. Refer figure 26.26.

- Govt. Hospital
- Kakkad Court
- Thurakkulam market
- Parayil Angadi
- New bus stand

Provision of E-toilet facility is proposed at junctions like

- Ayyapath
- Kanipayoor

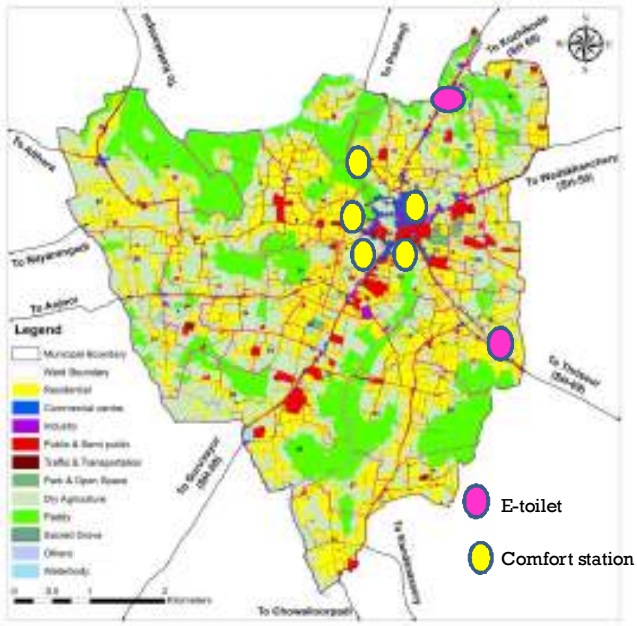


Fig 26.26 Proposed location for comfort stations and E-toilets

26.7 Power

26.7.1 Provision of underground electric cable

It is proposed to provide underground electric cables for town central area for following road stretches

(1) Bethany school to town (Thrissur road)

(2) Good shepard ITC to town (Wadakkanchery road)

(3) Parempadam to town centre (Pattambi road)

(4) Girls school to town centre (Guruvayur)

The alignment of proposed underground electric cable is shown in the figure 26.27.

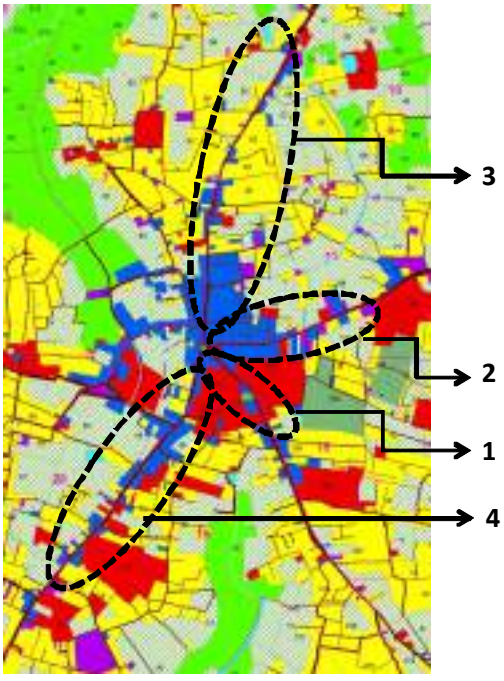


Fig 26.27 Proposed stretch for underground electric cable

26.7.2 Provision of solar panels

It is proposed to provide solar panels in following commercial and public buildings

- M.G Shopping complex
- EMS shopping complex
- Municipal office
- Mini Civil Station

26.7.3 Street light relay system

Street light relay system is proposed for whole municipal area by 2031

26.7.4 Provision of High mast lights

High mast lights should be provided in following major locations which are shown in figure 26.28.

* Parayil Jn.
* Proposed bus stand
* Kanipayoor Jn.
* Girls School Jn.
* Kurusupallikavala
* Onerio Jn.

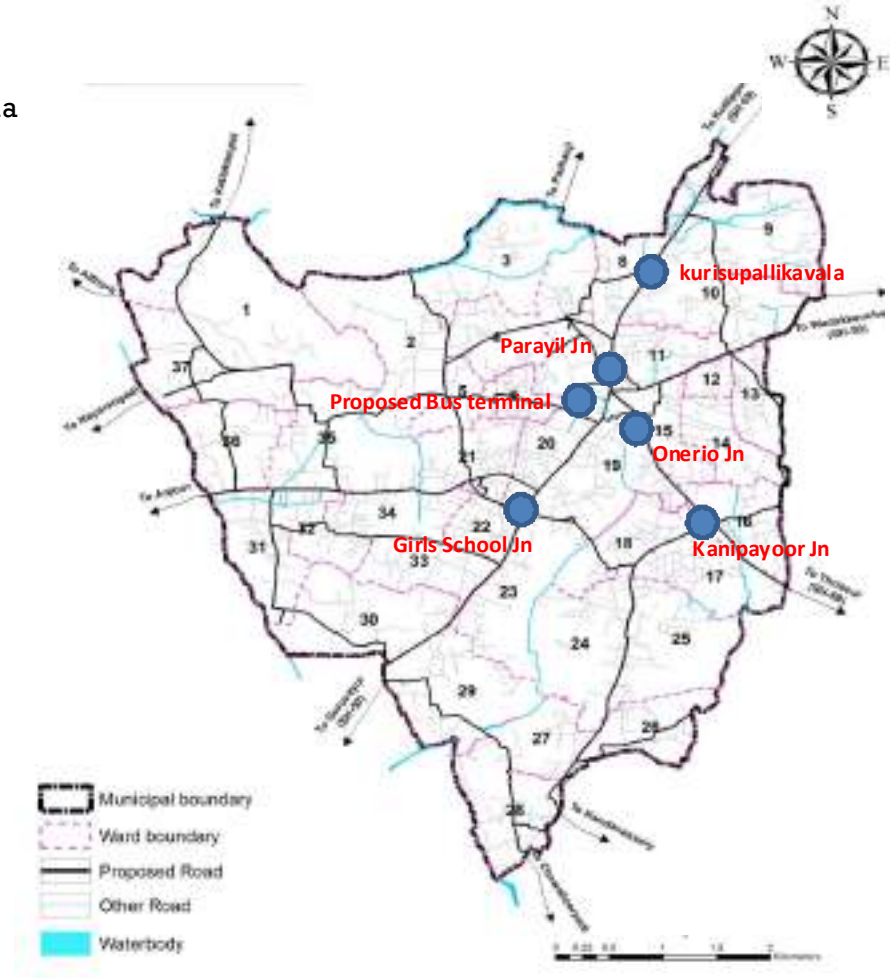


Fig 26.28 Locations for providing high mast lights

26.8 Education

26.8.1 Renovation of Government Schools

It is proposed to renovate laboratory, library and other infrastructural facilities of the existing government schools in Kunnamkulam town area. Figure 26.29 shows the schools lacking basic infrastructural facilities are proposed to be renovated.

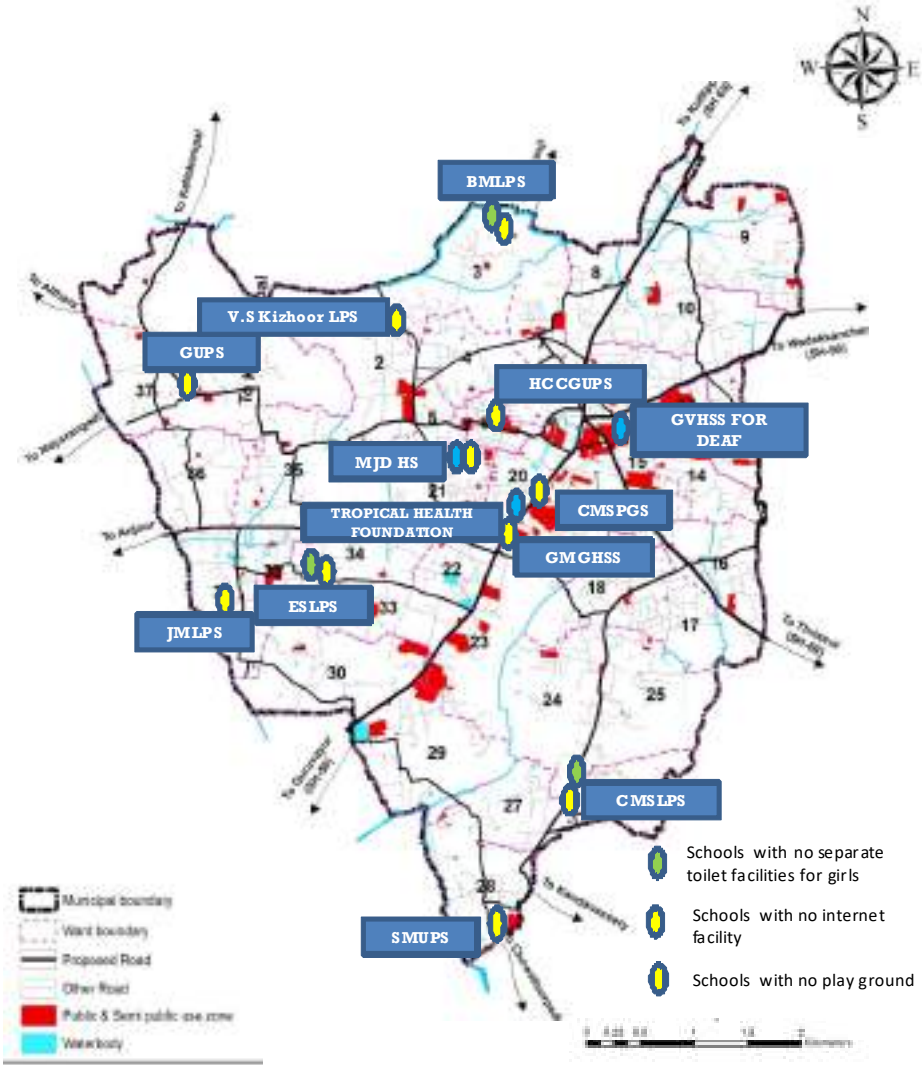


Fig 26.29 Schools lacking basic infrastructural facilities to be renovated

26.8.2 Promotion of extra - curricular activities in Government Schools

Extra - curricular activities like 'Vasthusasthram' and 'Kothupani' utilising the facilities of Kanipayoor Granthashala to be provided in government schools.

26.8.3 Relocation of Govt. Boys HSS

It is proposed to relocate Govt. Boys HSS to new building at the rear side of the same compound. Refer figure 26.30

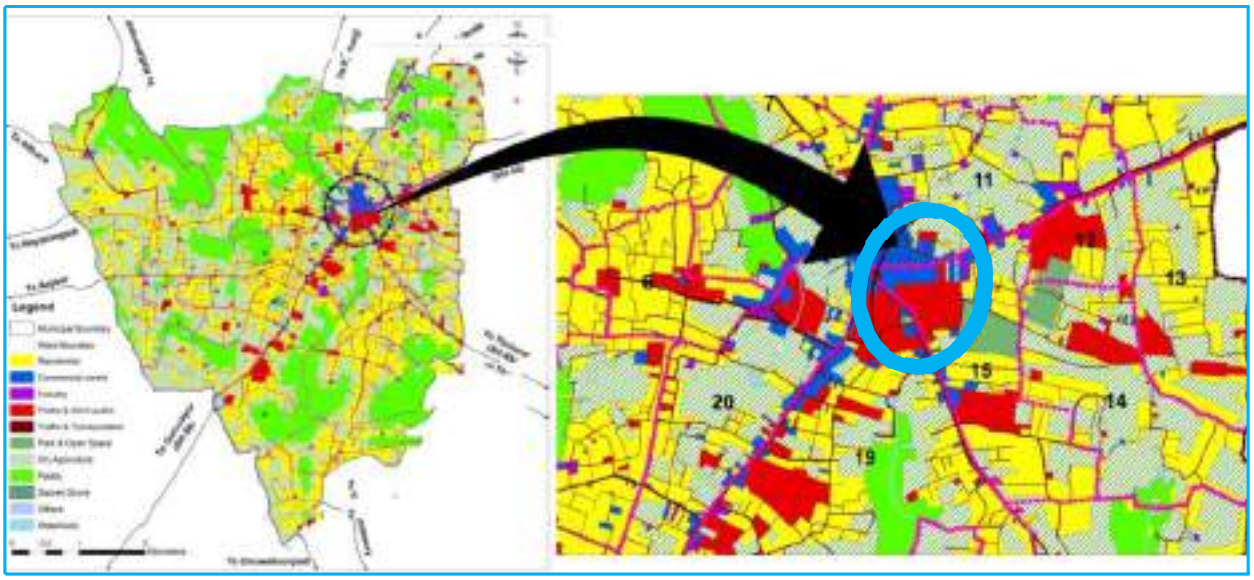




Fig 26.30 Relocation of Government Boys HSS

26.9 Health

26.9.1 Integrated mobile medical unit

As per District Plan, Integrated mobile medical unit has to be provided for Vaduthala-Aakkalakunnu areas from Taluk hospital or Chittanjoor PHC, is shown in figure 26.31.

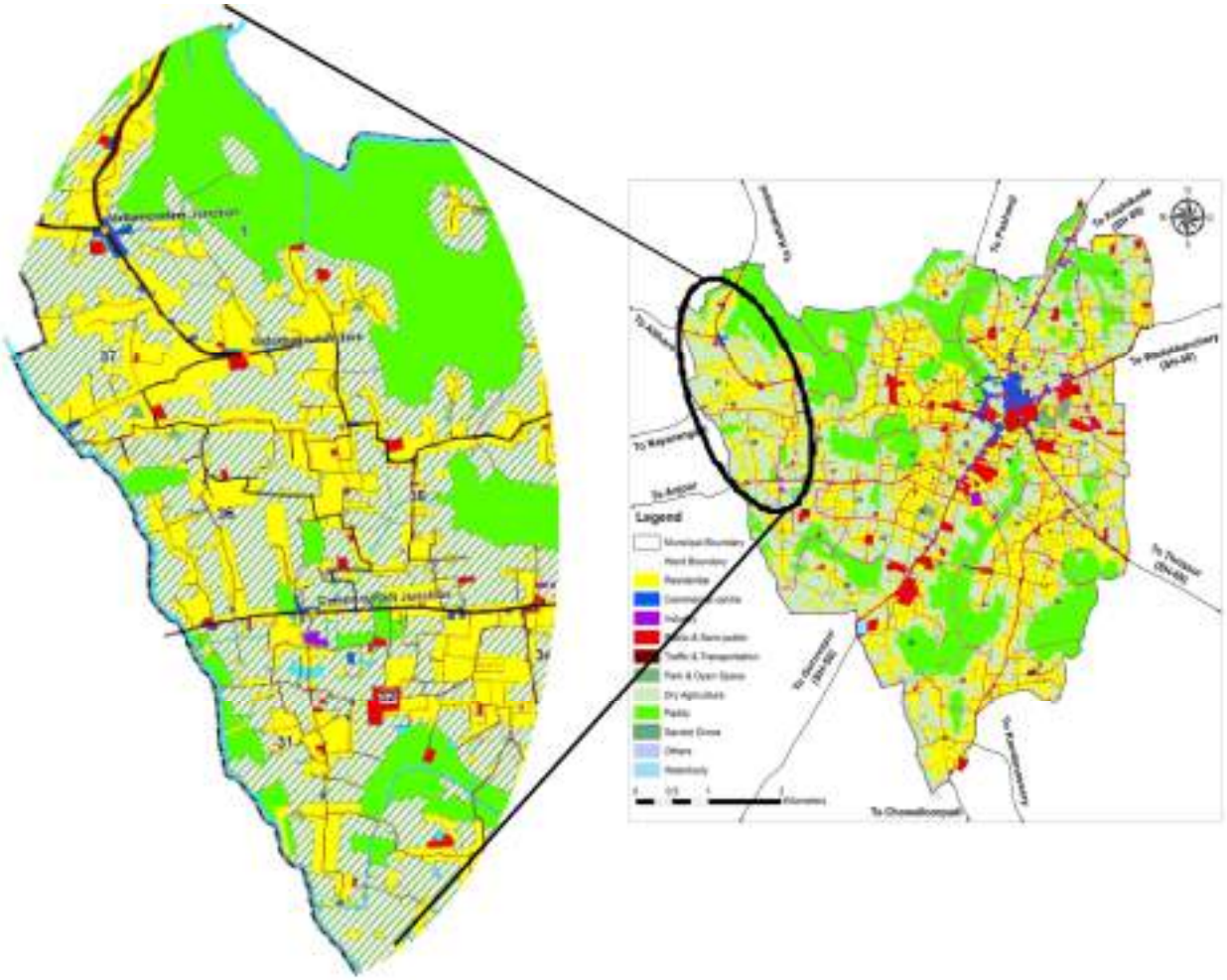


Fig 26.31 Vaduthala – Aakkalakunnu area

26.9.2 Renovation of existing Taluk hospital

The existing Taluk hospital has to be renovated with following facilities and the location is shown in figure 26.32.

- Integrated clinics and lab facilities
- In connection with maternity and child care unit
- Pain and palliative care in ayurvedic sector
- Medical camp and health card for migrant labourers

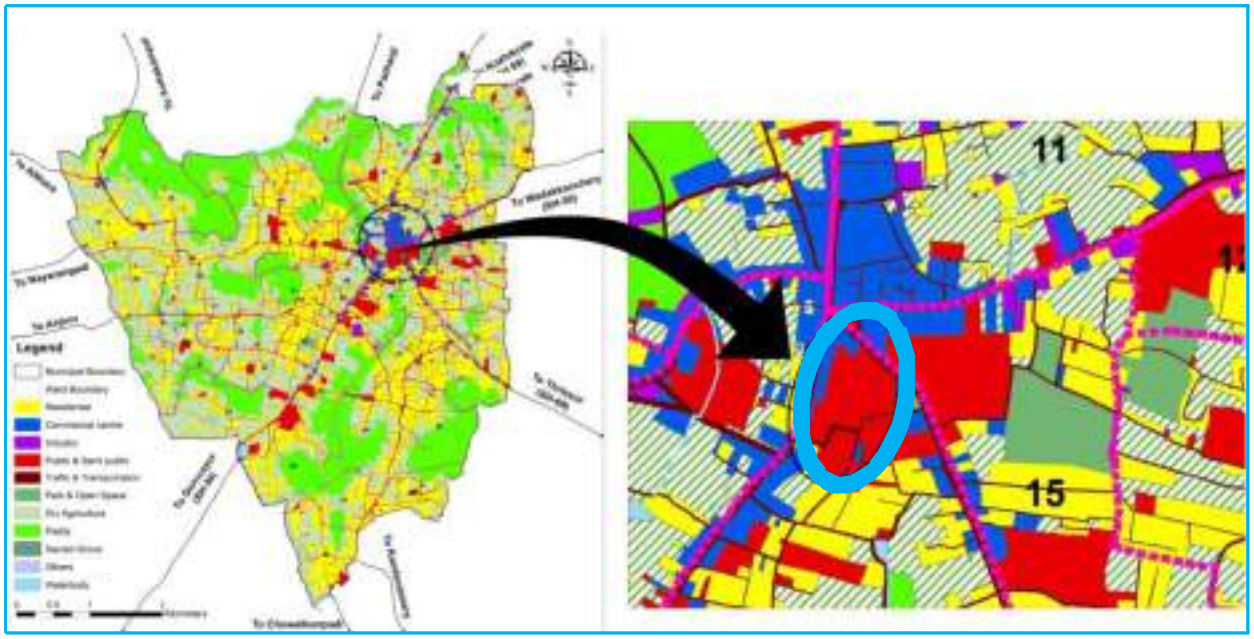
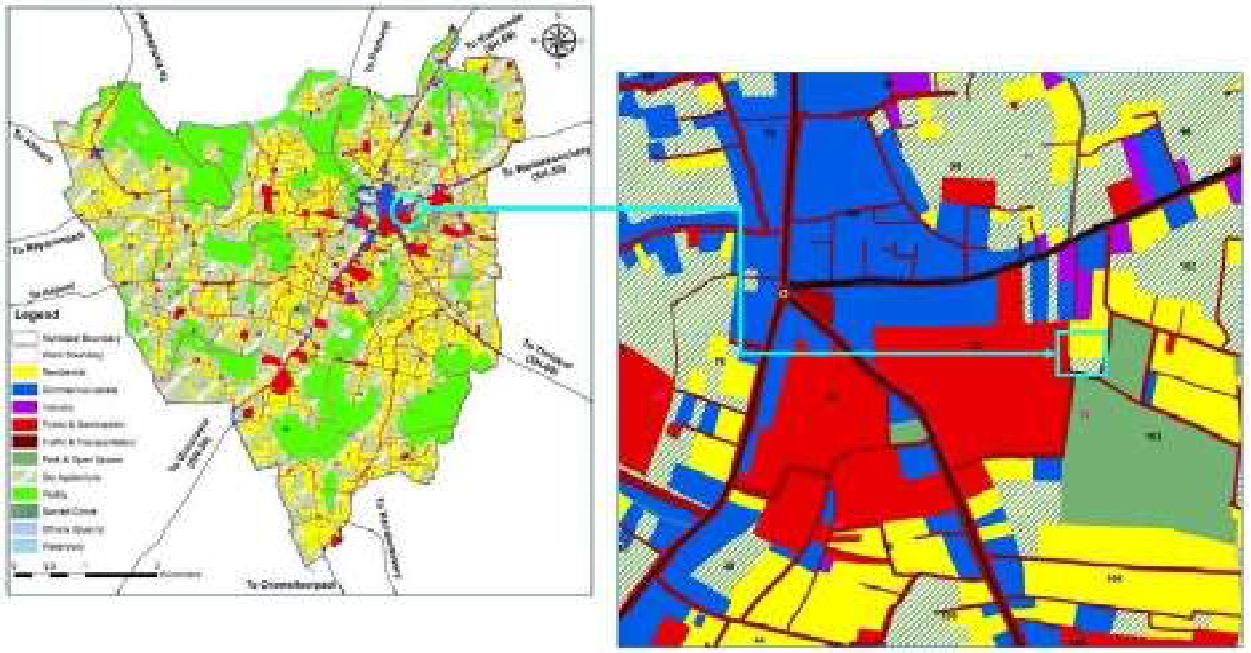


Fig 26.32 Existing Taluk Hospital

26.10 Infrastructural Facilities

26.10.1 Nalpamarathoppu

From the study, it is seen that recreational open spaces available in town area are very less. For ensuring healthy living conditions, more open spaces are to be provided as possible. The residents coming to CBD area of the town for procuring their personal needs are lacking suitable spaces for resting and relaxing. The open space of about 50 cents located at rear side of Govt Boys high school can be utilised as municipal park – 'Nalpamarathoppu'. Trees like Athi, Ithi, Peraal and Arayal, collectively called 'Nalpamaram' has to be planted, placing cement benches around within this open space.



In addition to this a centre for performing arts is to be constructed within this open space for conducting cultural programmes during evening only without affecting the functioning of school and sports programs at near by stadiums. Proposed location is shown in figure 26.33.



Fig 26.33 Proposed location for 'Nalpamarathoppu'

26.10.2 Walk way

A free walk way by the side of the Inner Ring Thodu is proposed. The walk way may be done after dredging the thodu to the required depth and width. The alignment of walk way is shown in figure 26.34.

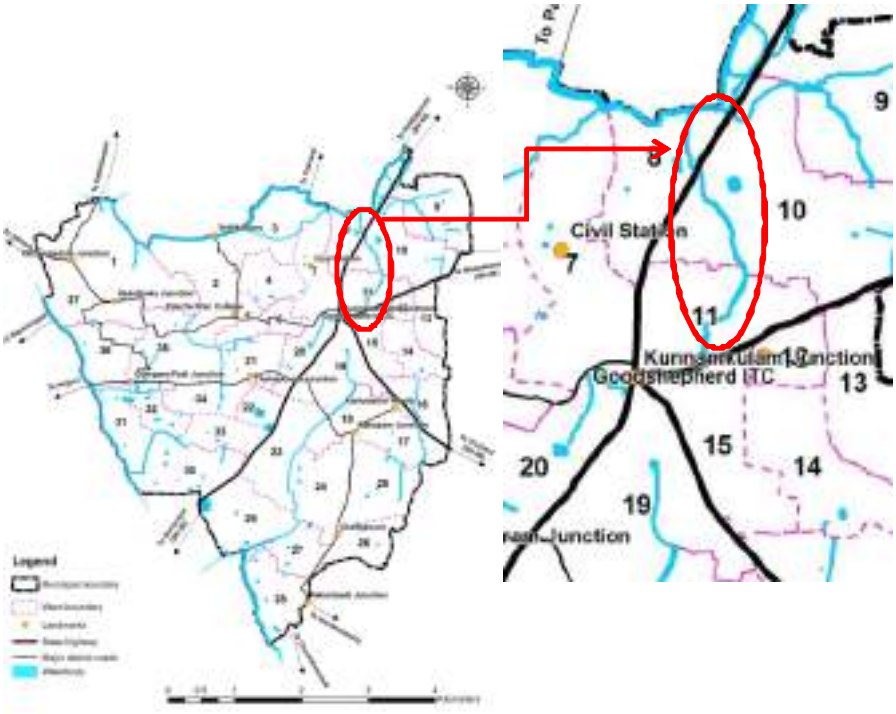


Fig 26.34 Proposed walkway by the side of inner ring thodu

26.10.3 Renovation of Municipal Assets

It is proposed to renovate following municipal assets and the locations are shown in figure 26.35.

- Municipal library to Digital library
- Municipal Park
- Jawahar Stadium to Indoor stadium
- Town Hall

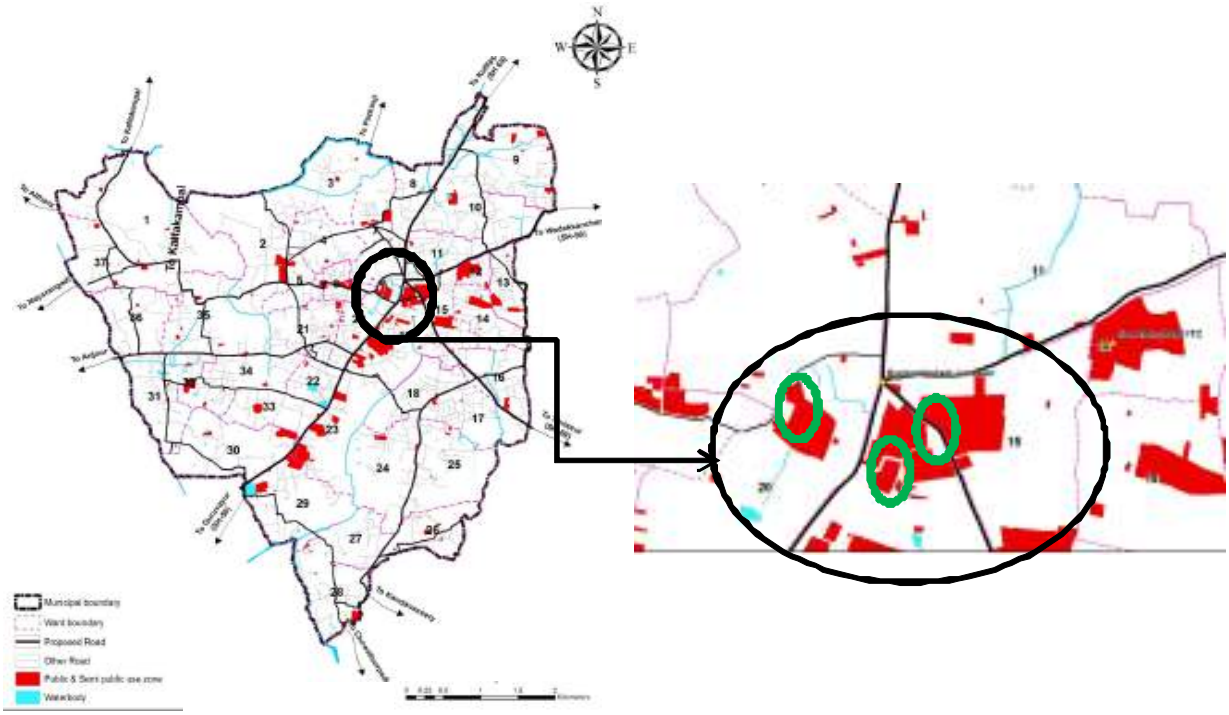


Fig 26.35 Municipal assets to be renovated

26.10.4 Sports complex cum Stadium

Sports complex cum Stadium is proposed at 'Senior Ground' of about 11 acres. Refer figure 26.36.

26.10.5 Children's park

'Hide and Seek'- Children's park is proposed after relocating homeo dispensary within Municipal office compound to Taluk hospital Compound. This park should have facilities for imparting interesting activites to children in origami, clay modelling and other craft works. About 20 cents of land will be available for this. Refer figure 26.37.

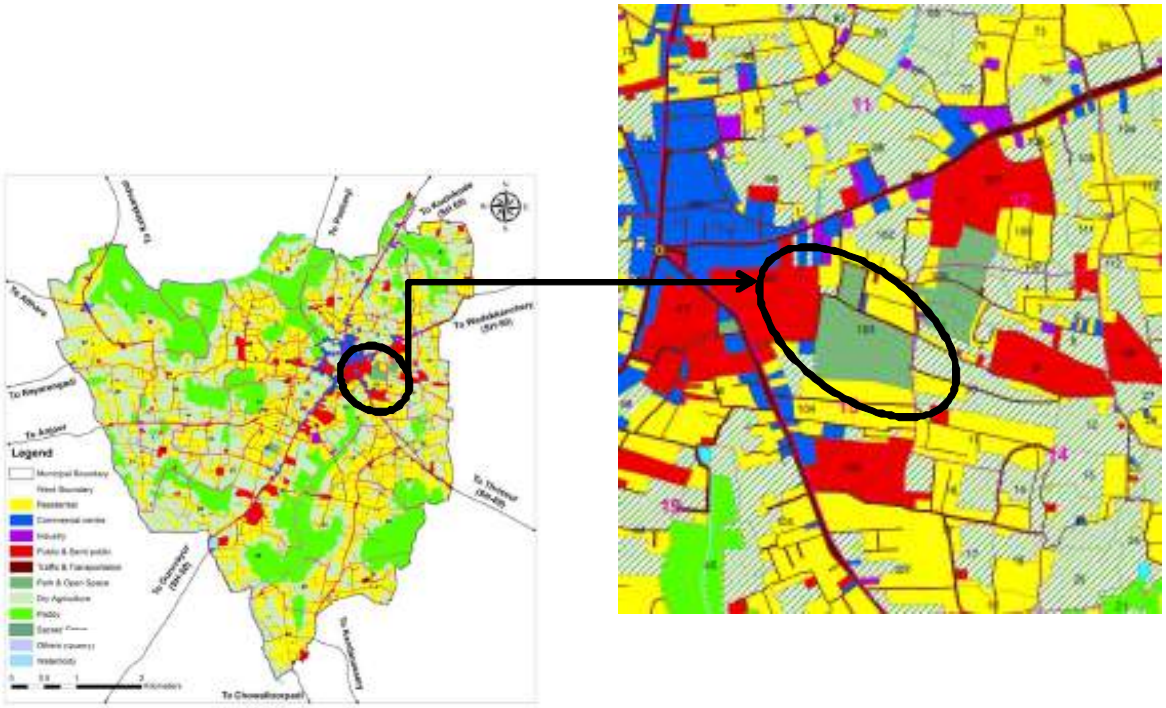


Fig 26.36 Sports complex cum Stadium at Senior Ground

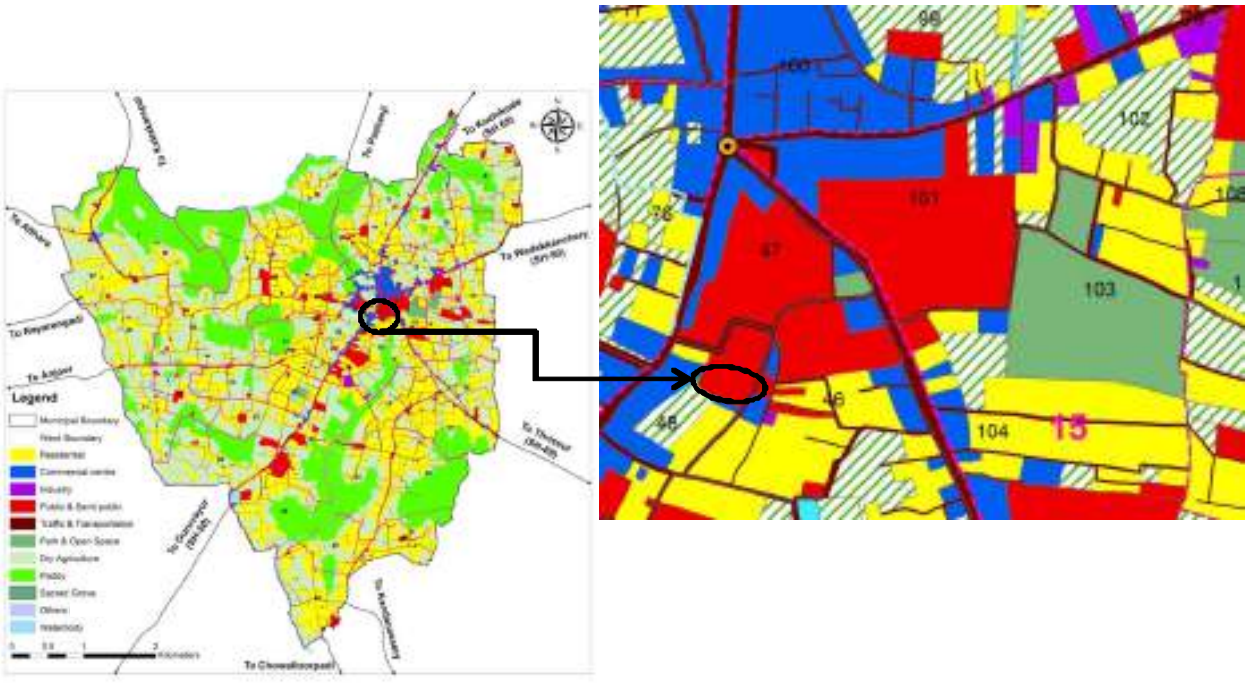


Fig 26.37 Children's park at Municipal office compound

26.10.6 Dormitory facility

Dormitory facilities to provide cheap accommodation for tourists and pilgrims at top floor of following municipal shopping complexes are proposed in the following buildings.Refer figure 26.38.

- MG Shopping Complex
- EMS memorial shopping Complex

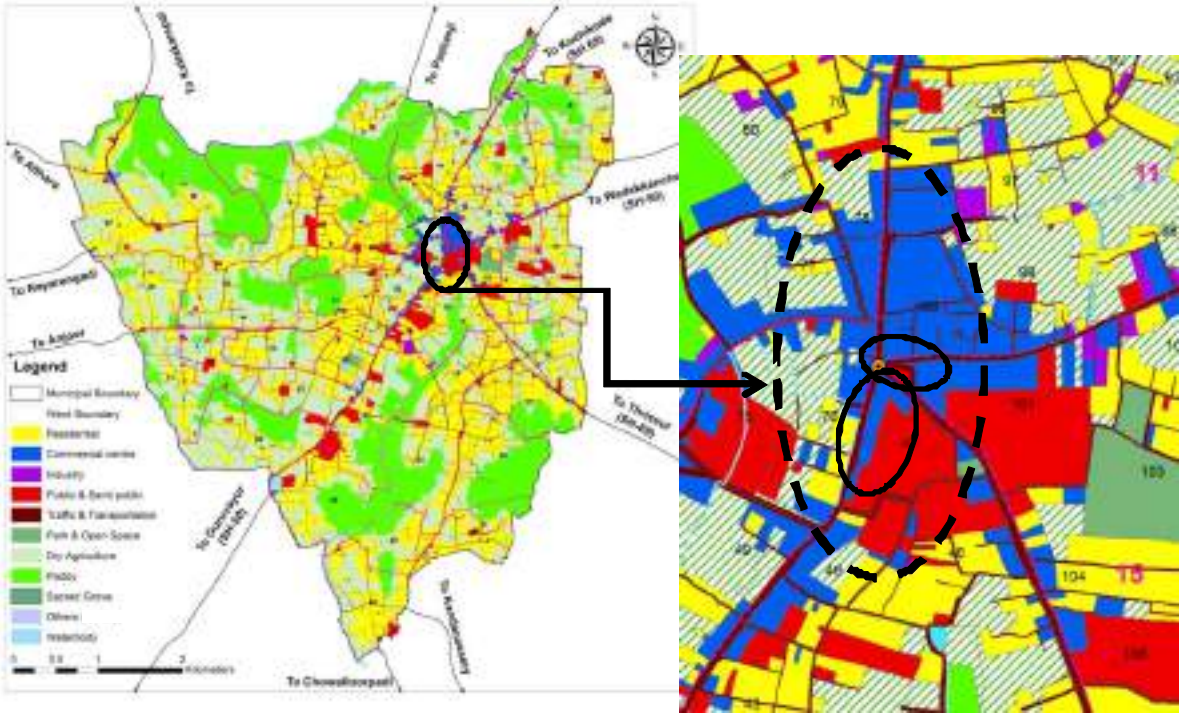


Fig 26.38 Municipal shopping complexes for proposed dormitory facility

26.11 SPECIAL CONCERN AREAS

26.11.1 Social Amenity Centre-'Nirbhaya'

A Social Amenity centre'Nirbhaya' is proposed at existing Municipal Engineer's quarters at Guruvayur road ,utilising 75 cents of land (total of about 73 ares). Following facilities also should be provided along with this.Refer figure 26.39.

- Sakhi centre for women- Waiting hall, helpline and refreshment facilities for women.
- Pakal veedu- for caring old age people during day time.
- Palliative care centre
- BUDS and full time care centre for mentally and physically challenged children

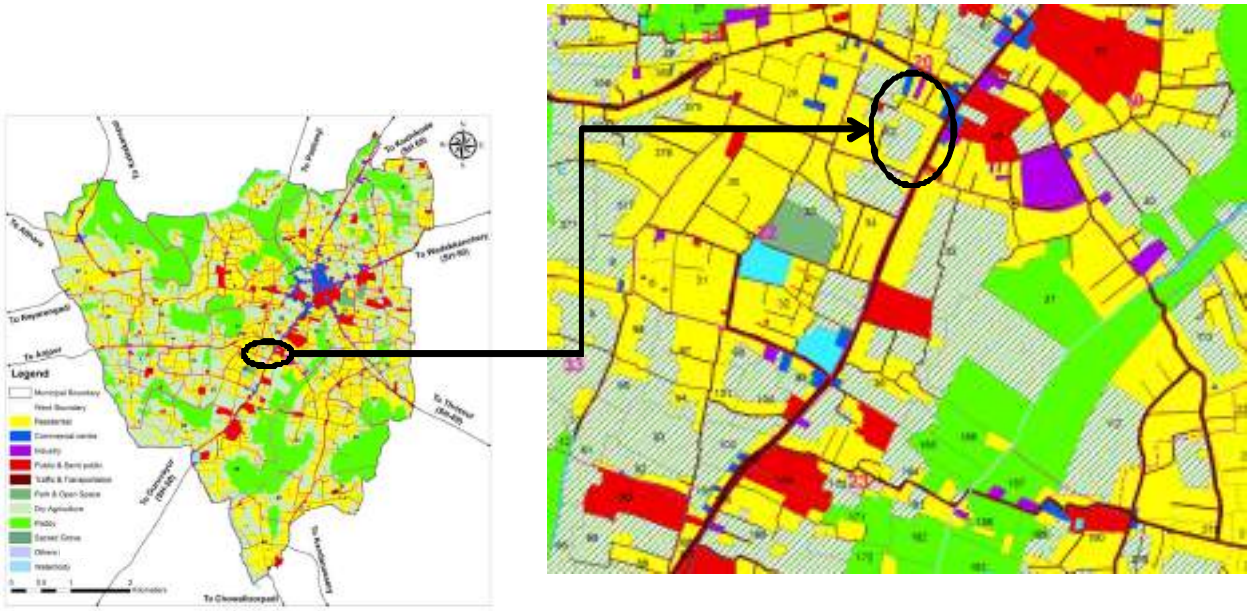


Fig 26.39 Proposed Social Amenity centre

26.11.2 Renovation/improvementof Substandard housing areas

Substandard housing areas identified through slum survey has to be renovated by constructing flats. Refer figure 26.40.In addition to this rainwater harvesting and biogas plant has to be established in these colonies.

26.11.3 Cultural centre cum Vocational training centre

A cultural centre is proposed at Ambedkar Community hall in Kaniyampal area (17cents of land) for promoting traditional art forms of SC/ST people. Refer figure 26.41.

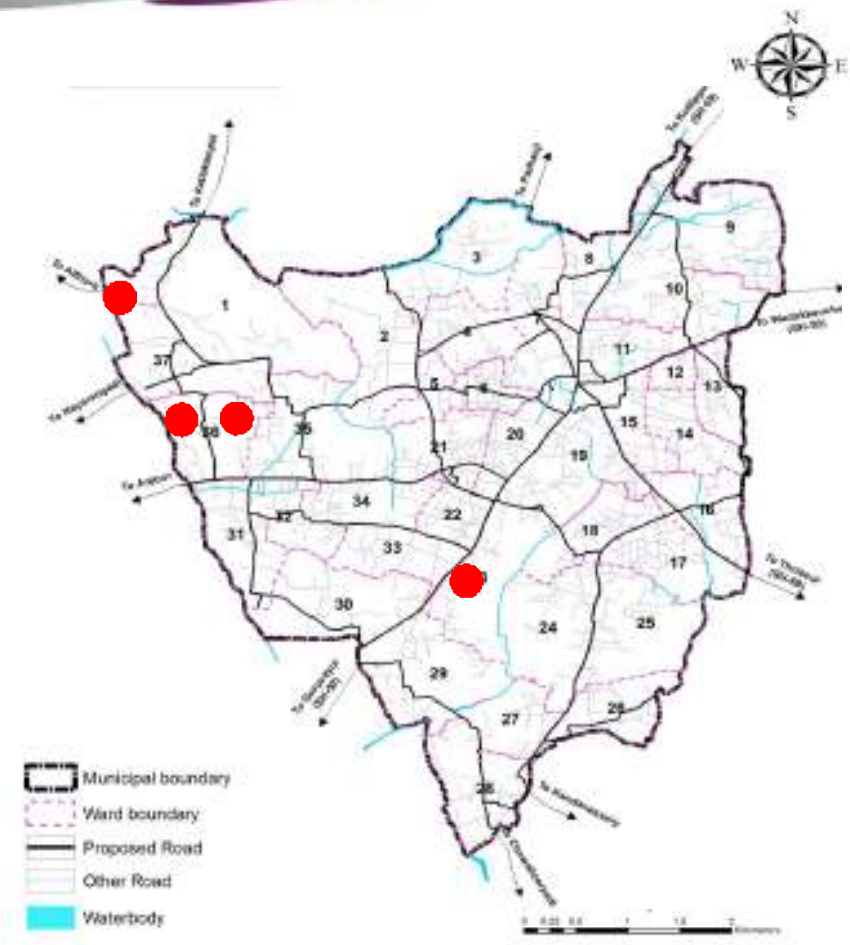


Fig 26.40 Substandard housing areas

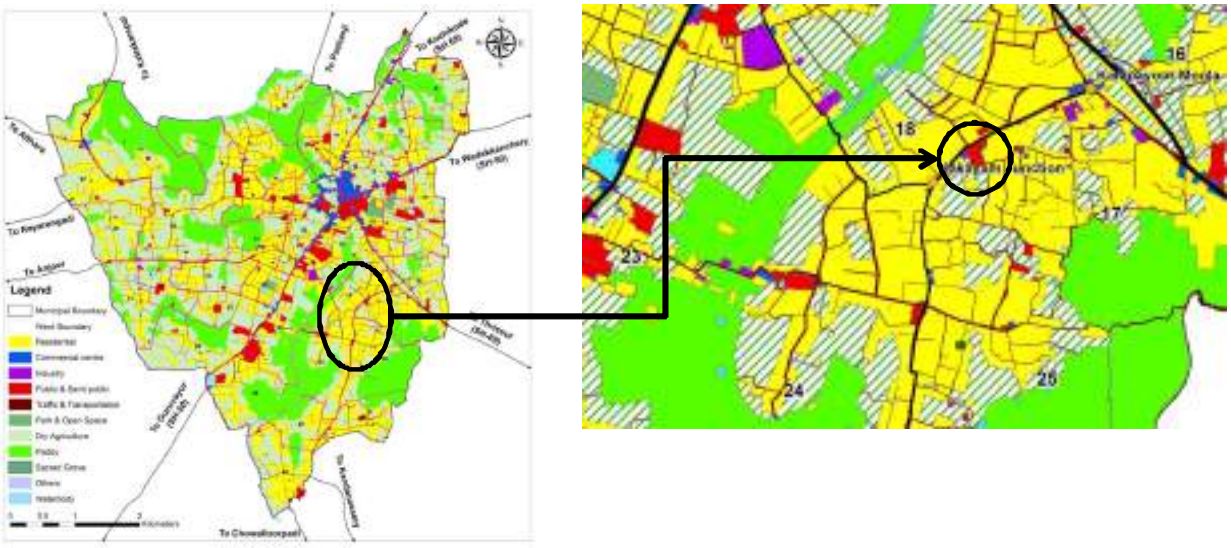


Fig 26.41 Cultural centre at Ambedkar community hall

A Vocational Training centre can also be provided here with programmes on

- Computer aided embroidary and apparel making
- Computer assembling, servicing and repairing
- Heavy vehicle driving
- Other self-employment ventures
- Awareness classes regarding SC/ST grants and entrepreneurship

26.11.4 Proposals given in District Plan

SC/ST families can be included in following proposals given in District Plan

- Micro financing schemes for women
- Landless rehabilitation Schemes
- Houseless rehabilitation proposals
- Proposal for repairing houses

26.12 Environment

26.12.1 Paddy lands to be retained

Following paddy fields are to be retained. These are encircled and shown in figure 26.42.

- Muthuvammal kole
- Kakkathuruthu kole
- Kakkad-Chiralayam kole
- Parempadam
- Arthat padam
- Anaikkal padam
- Chittanjoor padam
- Chemmannoor padam
- Alathoorpadam portion

Along with this all water courses and ponds are suggested to be protected

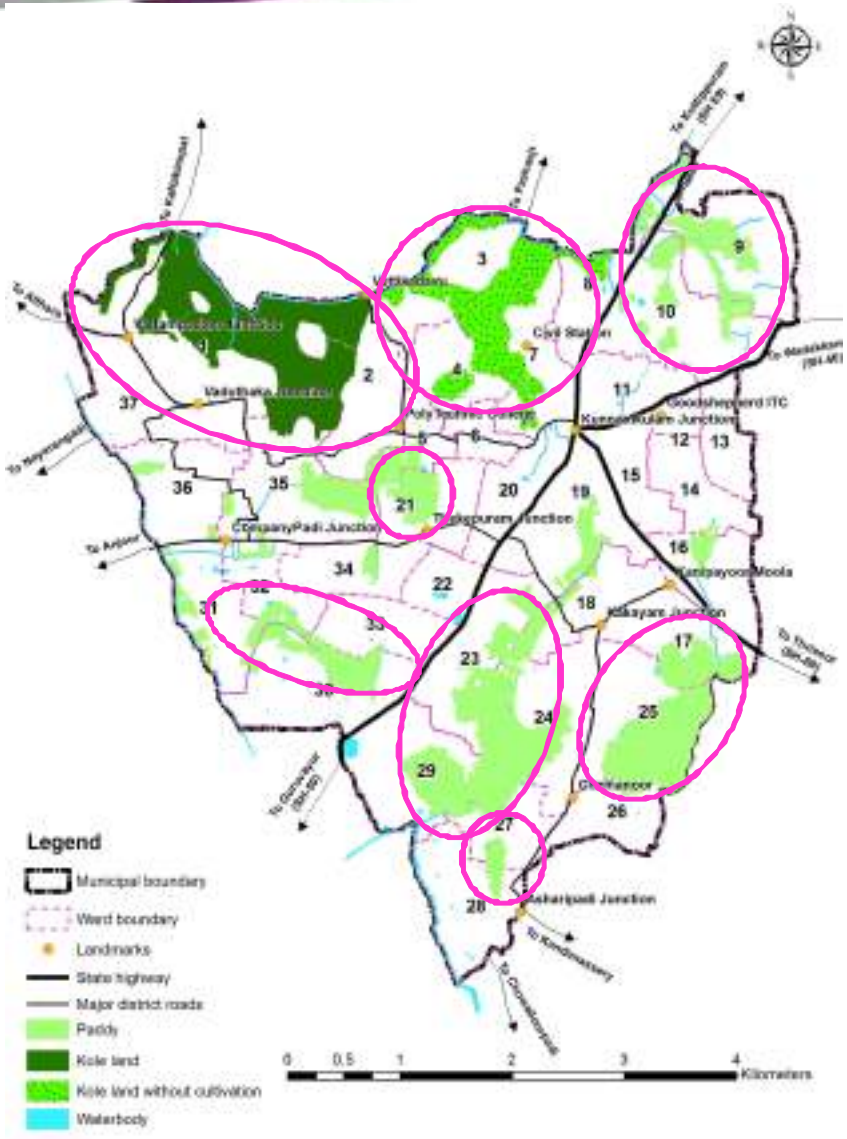


Fig 26.42 Paddy fields to be retained

26.12.2 Tree plantations on road sides

It is proposed to provide tree plantations on either side of following PWD road stretches in cooperation with Social forestry department.

- Anjoor road
- Kunnamkulam old road to Ambedkar Community hall
- Vattompadam to Cheruvallikadavu Bridge

26.12.3 Protection of sacred grove

The sacred grove at Thiruthikad is to be maintained and protected in cooperation with Social forestry. Refer figure 26.43.

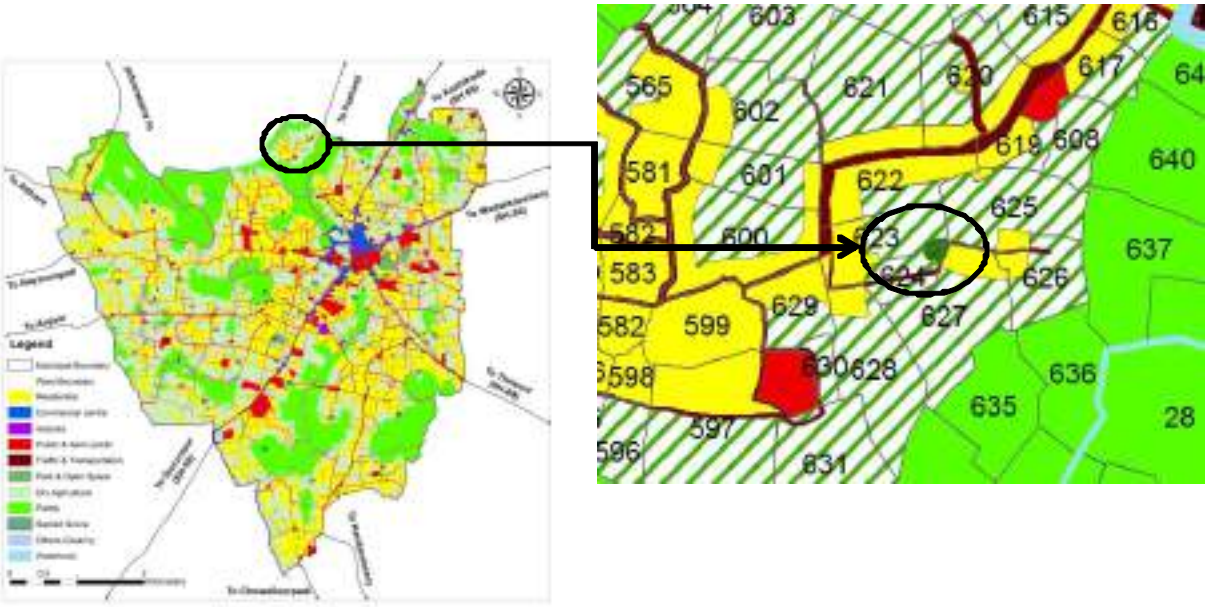


Fig 26.43 Sacred grove at Thiruthikad

26.12.4 Protection of ASI sites

Following ASI sites in municipal area are to be protected as per rules of ASI by introducing necessary regulations.

- Kakkad Cave
- Chowannoor Cave

26.12.5 Tree cladding for public buildings

To reduce air pollution tree cladding should be provided for all public buildings

26.12.6 Horn restriction

To reduce noise pollution, horn restriction is to be provided in

- Mixed activity zone
- High density residential zone
- Other sensitive areas like schools, hospitals etc.

In addition to the above awareness programmes regarding noise and air pollution should be conducted.

26.13 Drainage and Sewage system

The master plan envisages a complete system for the surface drainage of the town. Considering the topography and the water flow direction the entire township is divided into 2 zones. The project aims to interlink the water channels passing through the town and thus carry the excess surface water to safer regions. Different strategies are assumed for each zone.

The main objectives are,

- Division of town as zones for the ease of purpose
- Groundwater recharge

Zone wise classification

Zone A:

A properly designed and implemented drainage and sewer system is required for town core area. The waste water in this area is mostly from markets and other commercial field.

Hence this waste water requires scientific treatment. A sewage treatment plant is proposed here for which the waste water collected can be treated. The collected storm water and waste water transported to the treatment plant and devoted the required treatment. The treated storm water can be reused like releasing to surface water, agriculture and for domestic works. The processed waste water can be used for landscaping, agriculture etc.

Zone B:

The major portion of this zone covers the southeast and southwest part of the town. Residential and paddy areas are present in this zone, therefore care should be given to surface drainage. Here two wastewater treatment plants are proposed, one on the north and another in the south area of the town. The treated water from the north wastewater treatment plant can be reused for fodder cultivation, which is also a proposal and the treated water from the south treatment plant can be discharged to natural drain present there.

A tentative drainage plan is shown in figure 26.44. After analysing the local topography, discharge of waste, climatic condition a detailed drainage plan report with estimation should be prepared for the construction of the drainage plan for the entire township

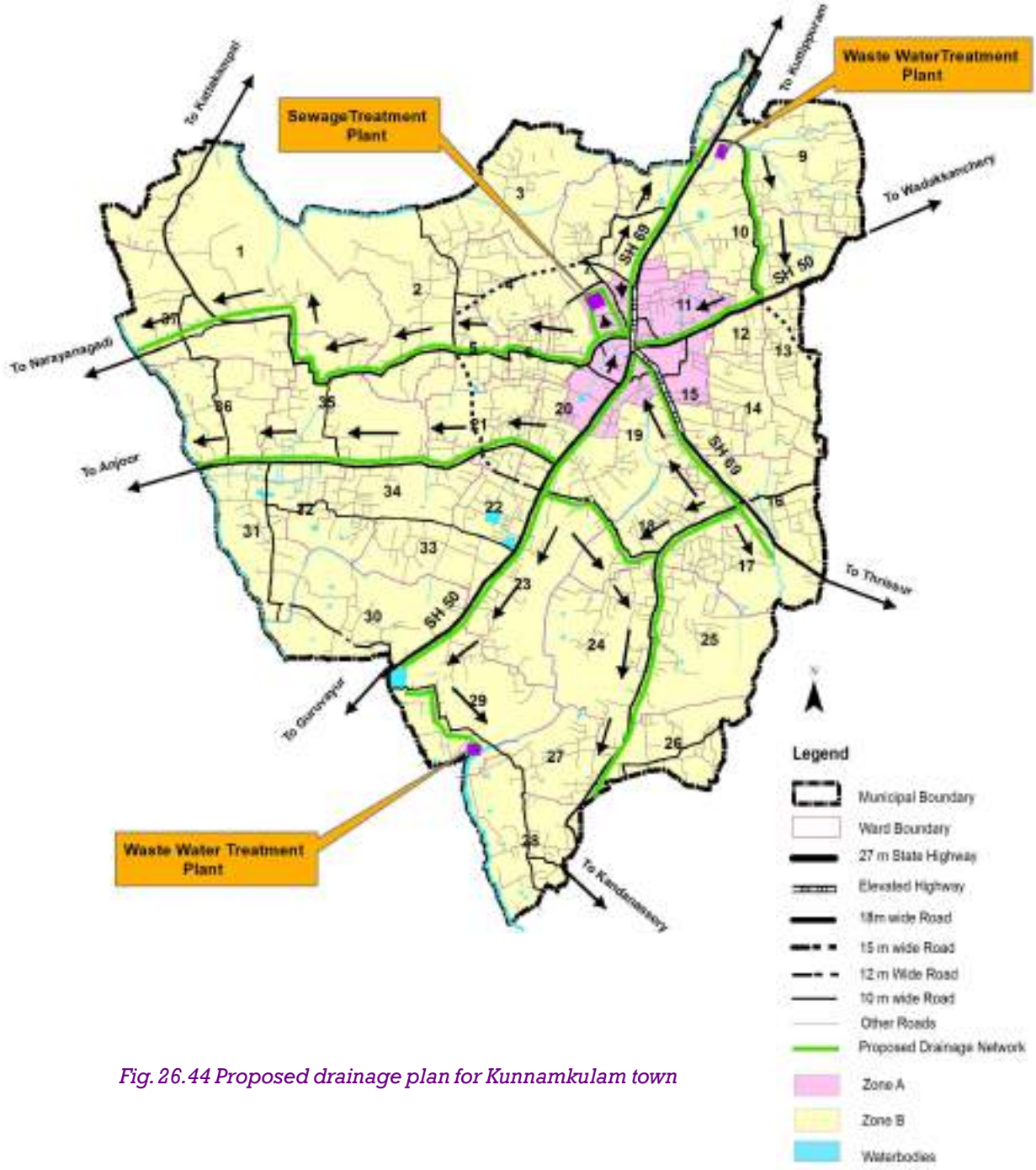


Fig. 26.44 Proposed drainage plan for Kunnamkulam town

CHAPTER 27

PROPOSED LAND USE

The development vision for Kunnamkulam town has envisaged various types and patterns of developments in different parts of Kunnamkulam. The vision is brought to the practical scene in the form of a land use plan. As per the land use plan, Kunnamkulam town area is categorized in to various zones, which are described in this chapter. The various zones are 1.Residential use zone 2. Residential mixed use zone 3. Commercial use zone 4. Industrial use zone 5. Public and Semi public use zone 6.Traffic and Transportation use zone 7. Recreational Open Spaces 8. Dry Agriculture use zone 9.Wet Agriculture use zone 10.Water bodies 11. Special use zone

27.1 Residential use zone

Predominantly resid ential activities are seen around mixed activity zone and also at southern side of Municipality. So as per development concept, these areas are proposed under residential zone. Since resi dential concentration is seen near laterite quarry that area is also converted to residential zone.Total area is around 13.09 sq.km. This use zone is primarily reserved for accommodating the future needs of residential sector. It is reserved mainly to cater to the healthy living of the people. The Residential use zone is shown in figure 27.1

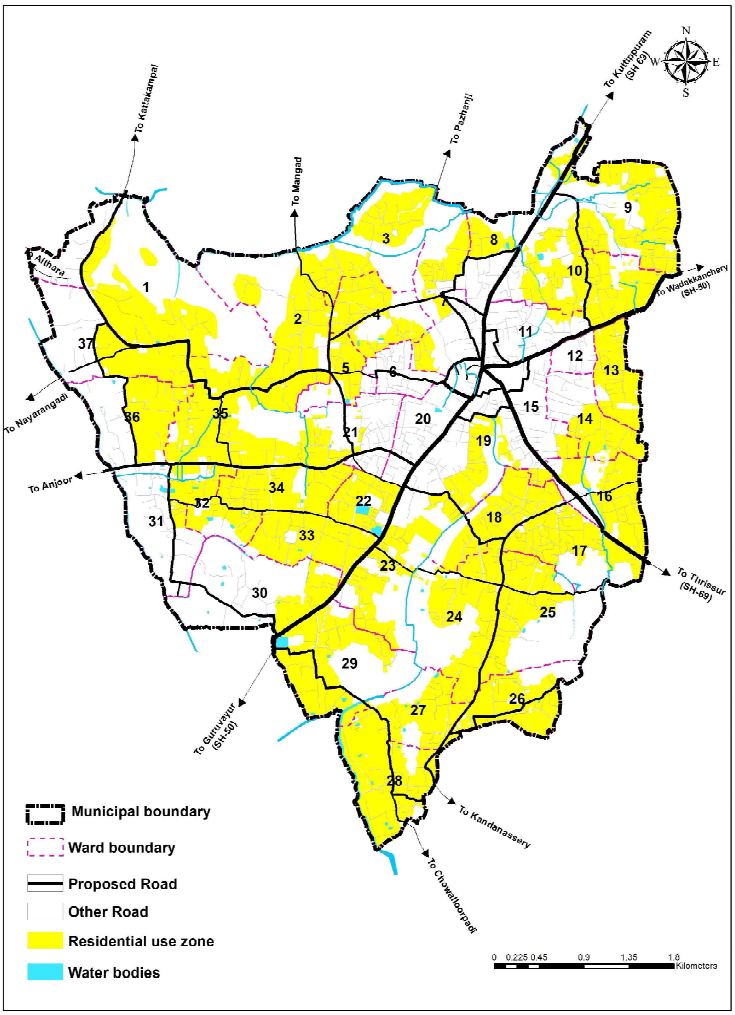


Fig 27.1 Residential use zone

27.2 Residential mixed use zone

As per the vision for Kunnamkulam, a core zone has been set apart for the mixed activities which are predominantly commercial and residential. After analyzing the major activities taking place in town and also the activity pattern of the area, we can see that predominantly mixed urban activities are taking place along with residential activities in areas surrounding town Centre. So as per development concept, area around town centre is proposed as commercial cum residential mixed zone. Total area is around 1.93 sq.km.The Residential mixed use zone is shown in figure 27.2.

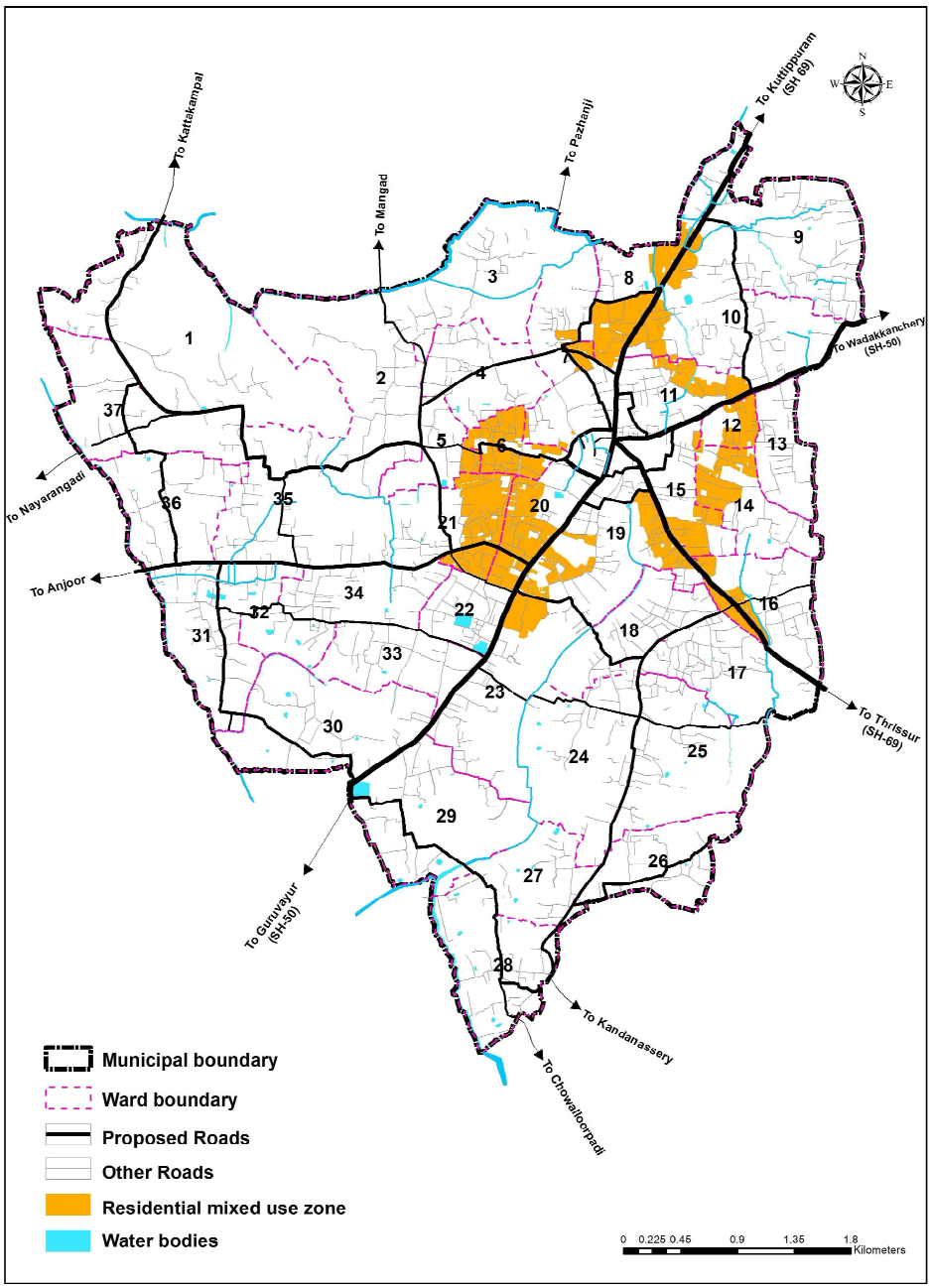


Fig 27.2 Residential mixed use zone

27.3 Commercial use zone

Presently in Kunnamkulam town, intensive commercial activities are seen at town centre and as ribbon development along the major traffic corridor. As per development concept, it is proposed to decentralize these commercial activities to second order nodes, ie Ayyapath junction (Parempadam) and Kanippayoor junction. So these areas along with existing lands under commercial use are proposed as commercial zone in future.Even though this is commercial zone, limited residential activities are enabled in this zone. Total area of Commercial use zone is around 1.01 sq.km of land as shown in figure 27.3

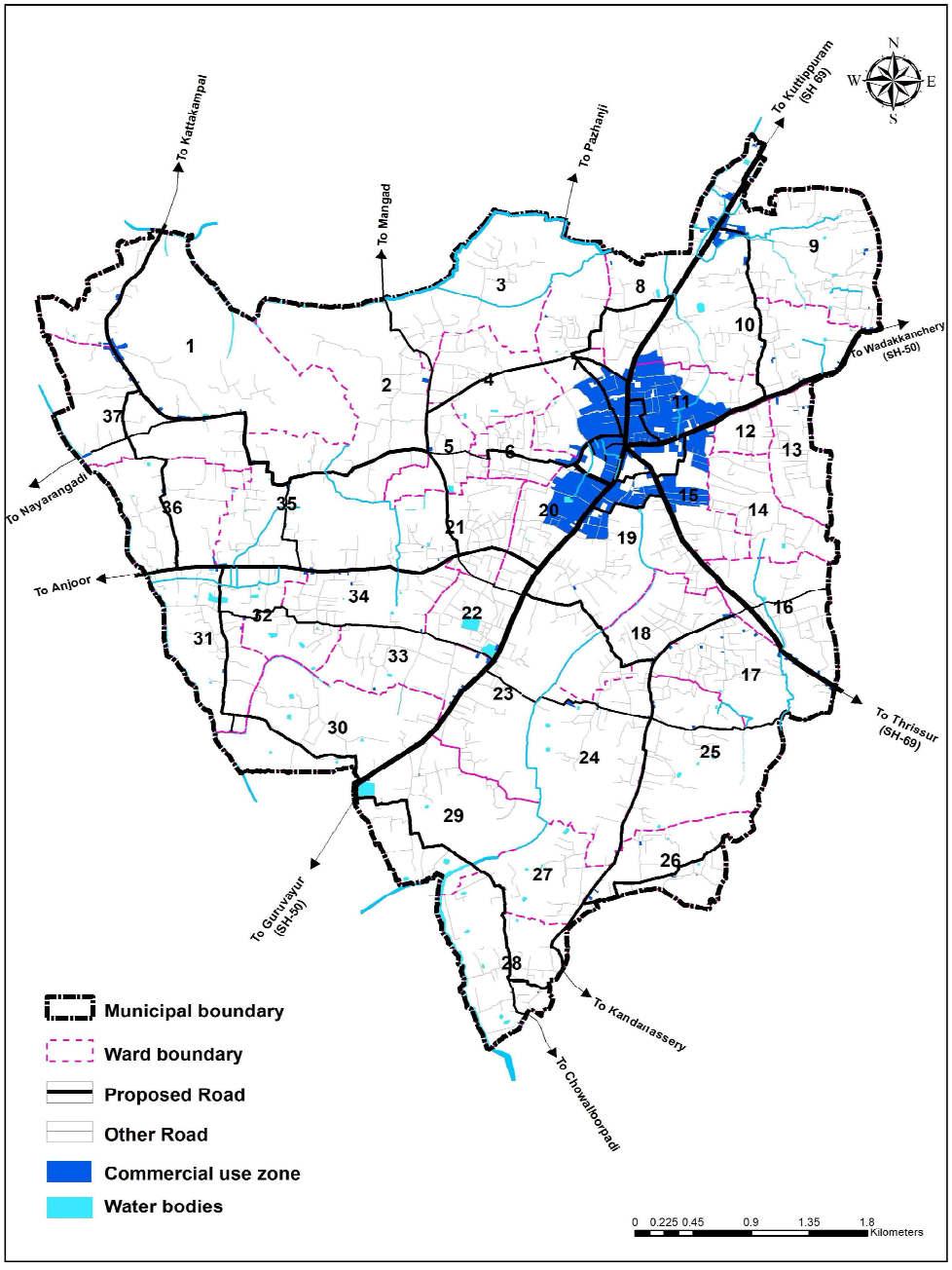


Fig 27.3 Commercial use zone

27.4 Industrial use zone

In the vision for Kunnamkulam town there is no separate zone earmarked for industry alone. But there are quite a number of industrial concerns in the town. To support the sector and to retain the industrial activity an industrial zone mainly comprising of all the existing industrial land use and the industrial estate is constituted. In addition to this, Industrial activities are boosted by enabling other zones also with limited amount of activities subjected to the regulations pertaining to the respective zone. Total area covered in this zone is around 0.13 sq.km. The Industrial use zone is shown in figure 27.4

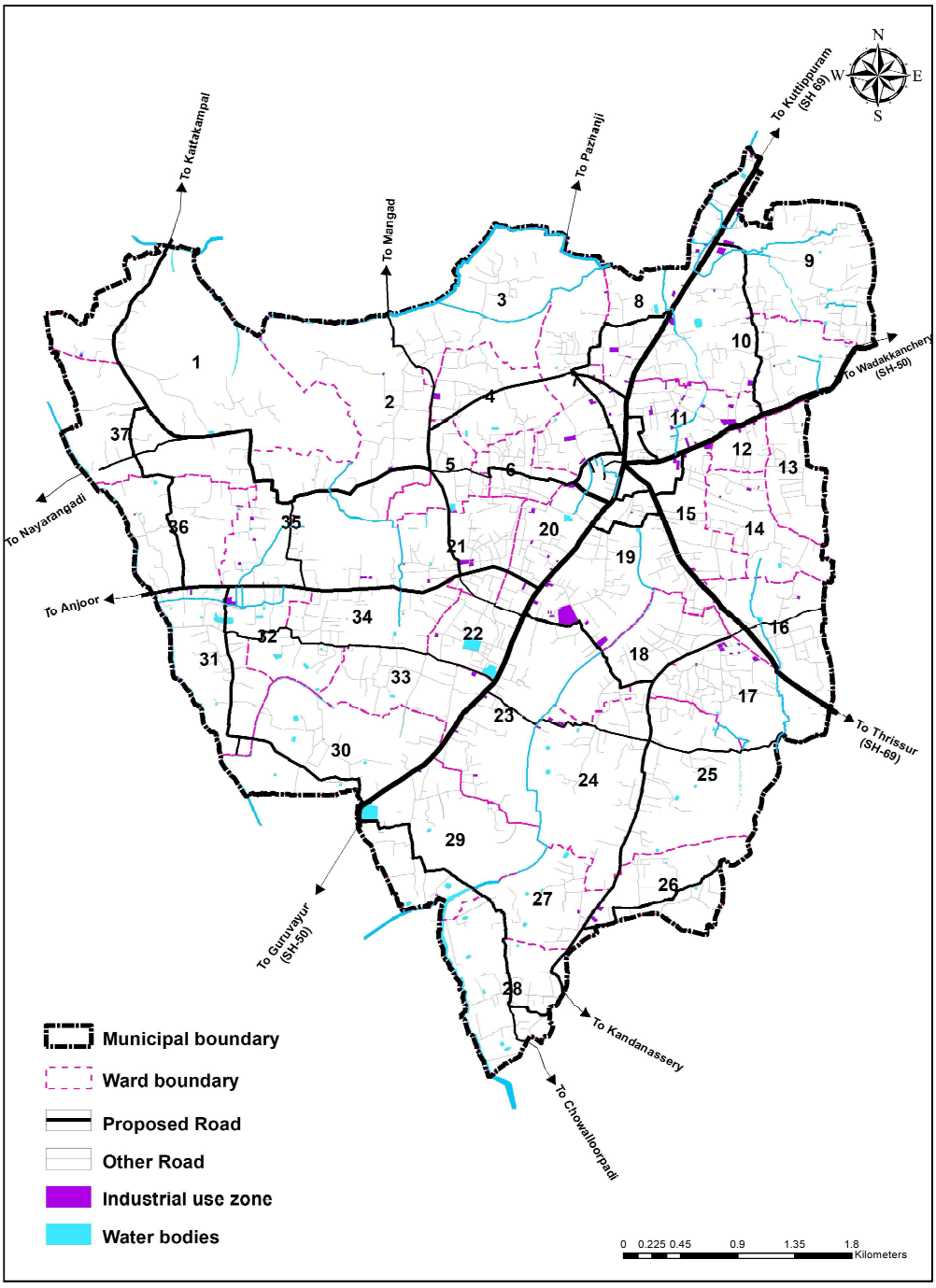


Fig 27.4 Industrial use zone

27.5 Public and Semi public use zone

In the vision for Kunnamkulam town there is no zone set apart as public and semi public zone. But there are quite a number of educational institutions, hospitals and other public utility areas in the town. To retain the amenities provided as such a public and semipublic use zone is demarcated. This zone mainly comprises of all the existing public use land and buildings. Total area covered in this zone is around 0.88 sq.km.Also Master Plan envisages a few proposals to provide social amenities to the people. These proposals are included in the special use zone.The Public and Semi public use zone is shown in figure 27.5.

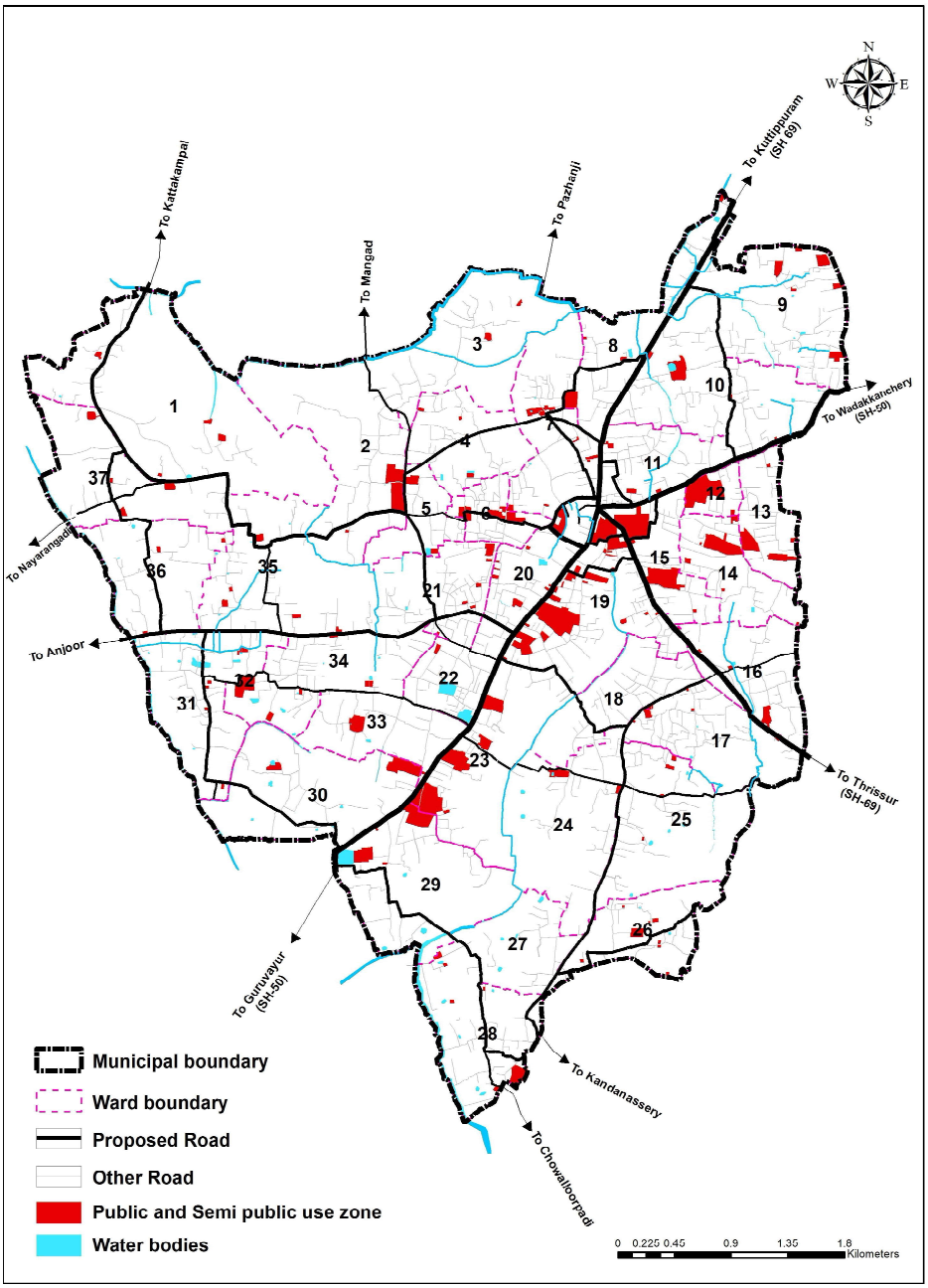


Fig 27.5 Public and Semi public use zone

27.6 Traffic and Transportation use zone

In the vision for Kunnamkulam town there is no zone set apart as transportation use zone. But the total existing transport land use comes to around 6.34% of the total area. Also there are a few proposals in this sector. To retain the amenities provided as such a transportation use zone is demarcated. This zone mainly comprises of all the roads and other transport related activities. Total area covered in this zone is around 1.74 sq.km. The Traffic and Transportation use zone is shown in figure 27.6

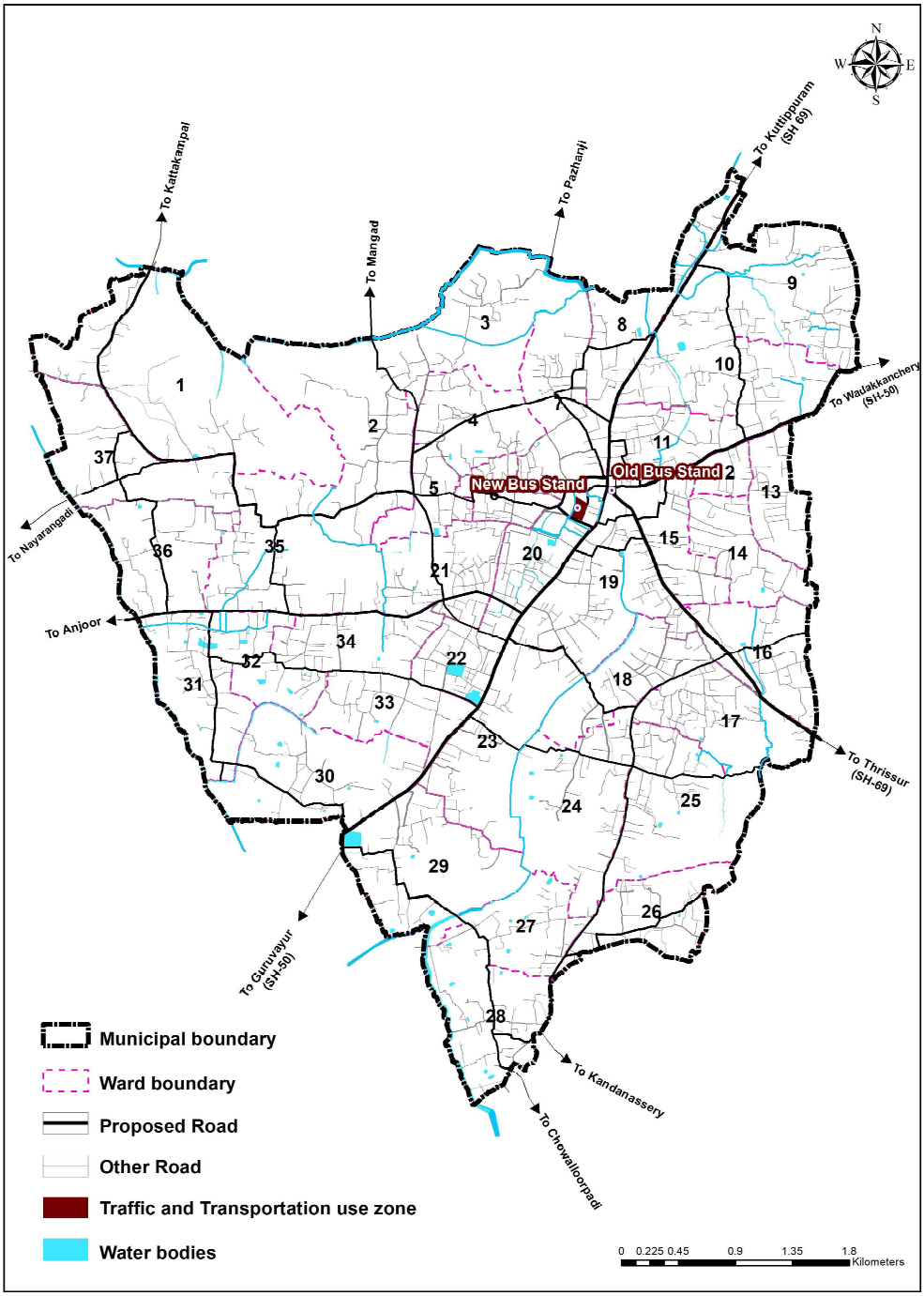


Fig 27.6 Traffic and Transportation use zone

27.7 Recreational Open Spaces

Presently provision for recreational open spaces are less in Kunnamkulam town. Even though specific projects like Nalpamarathoppu, Hide and seek (Children's park) etc. are proposed for recreational and open spaces activities, all of them are classified under Special use zone. The total area under recreational and open spaces is around 0.06 sq.km.

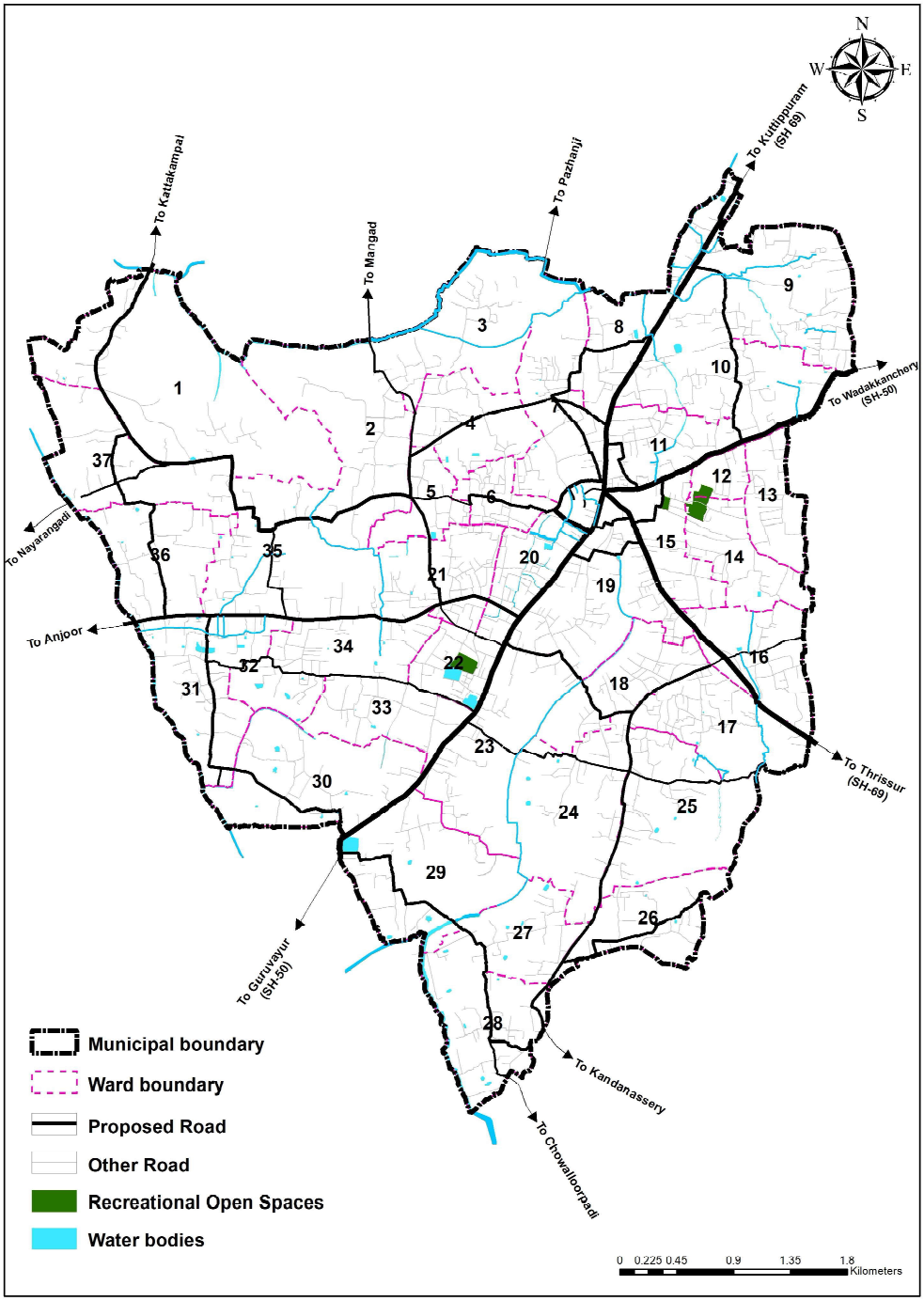


Fig 27.7 Recreational Open Spaces

27.8 Dry Agriculture use zone

Agricultural activities are predominant in wards at western side of town along with low density residential activity. So these sub urban areas are proposed to be retained as dry agriculture zone, so that thrust can be given for agriculture and related activities. Here thrust has been given to the agriculture related activities which can finally make the place self-sufficient in agricultural products to certain extent. The total area set apart for this zone is 1.95 sq.km. This is shown in figure 27.8.

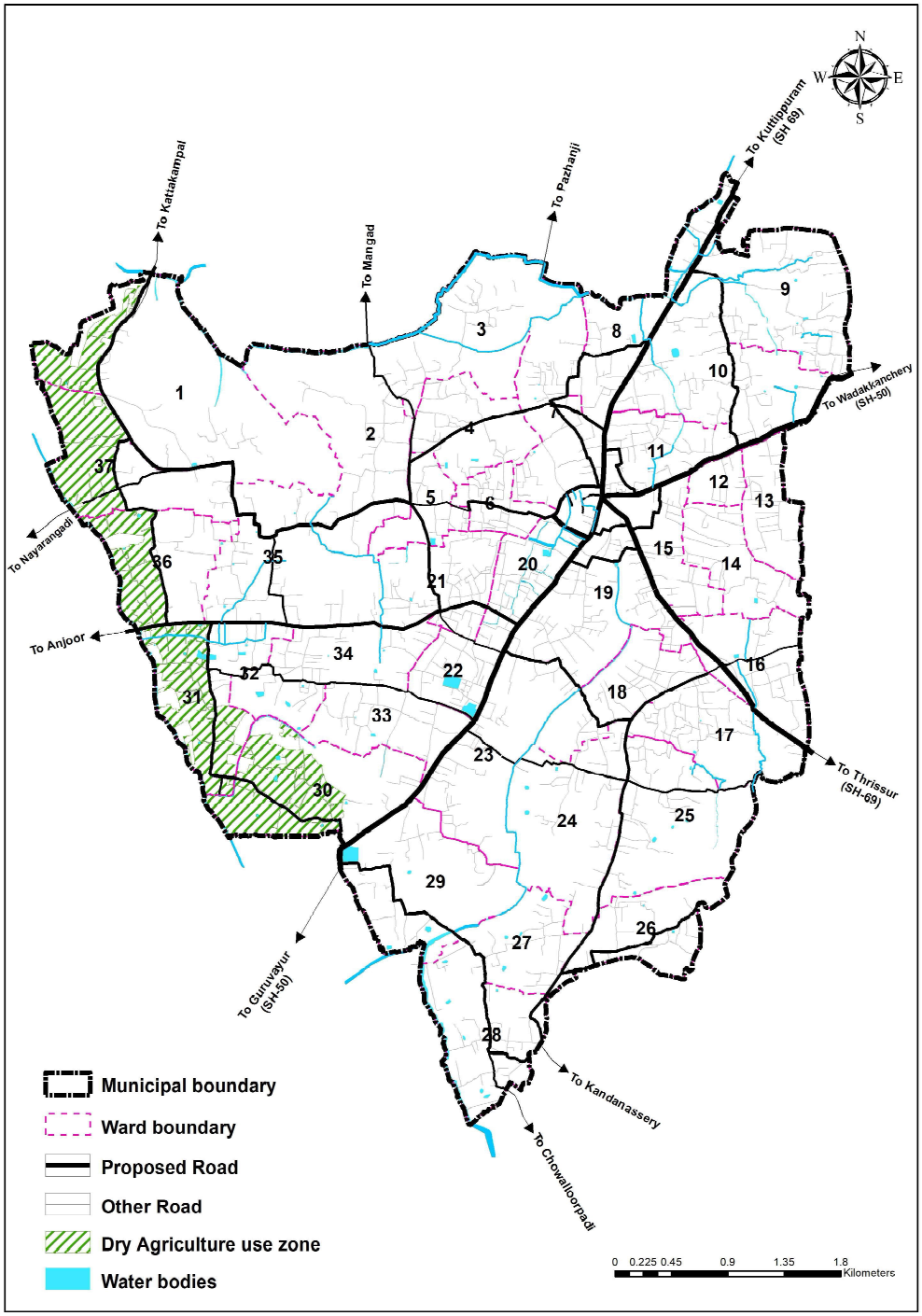


Fig 27.8 Dry Agriculture use zone

27.9 Wet Agriculture use zone

Kunnamkulam Town is having large extent of area under paddy and kole land. To maintain ecological balance of town, paddy fields, kole lands are to be protected and so these are proposed to be retained as Wet Agriculture use zone. Total extent is around 6.22 sq.km. The details are as shown below figure 27.9.

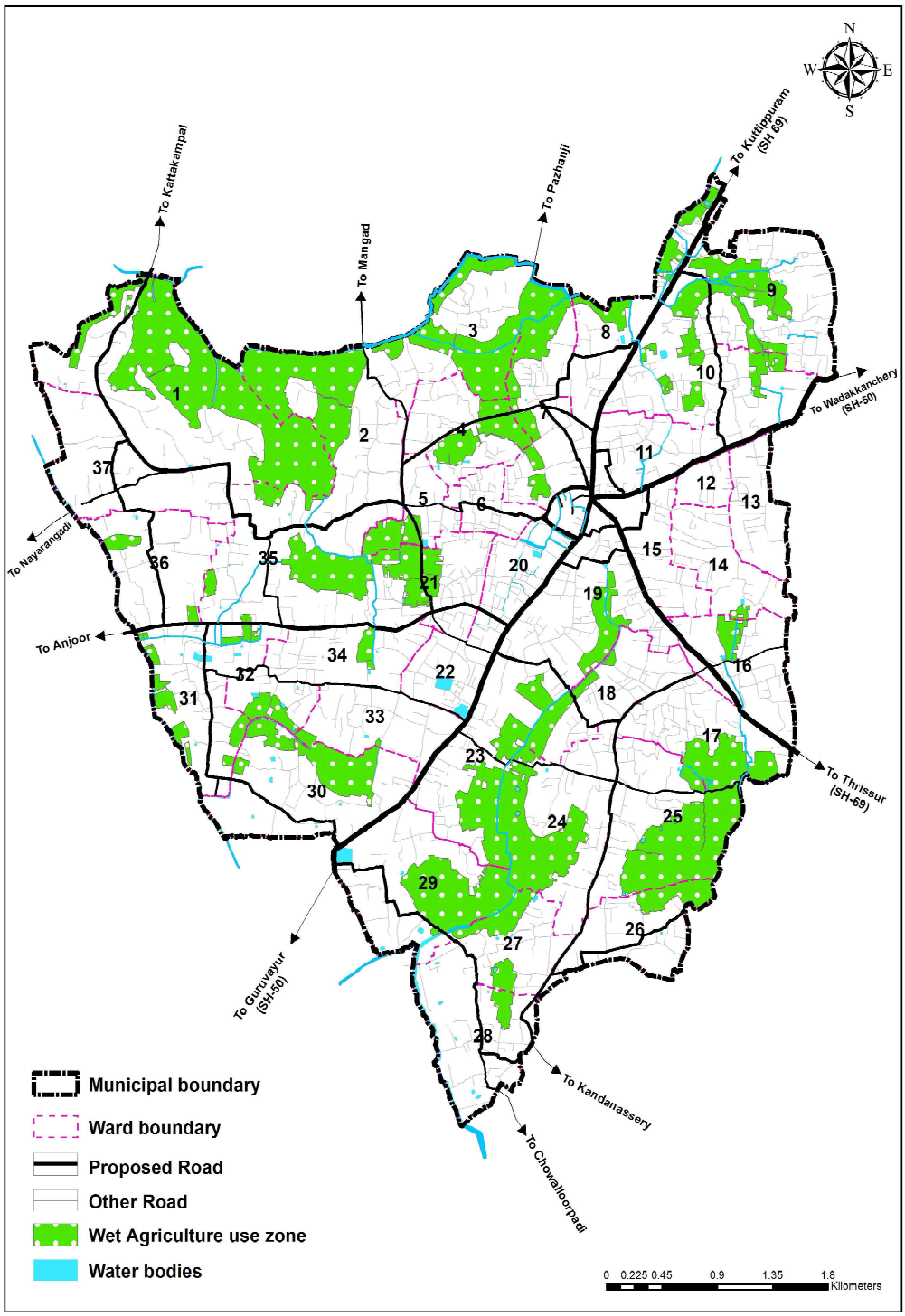


Fig 27.9 Wet Agriculture use zone

27.10 Water bodies

Kunnamkulam town is blessed with quite number of natural waterbodies and canals. It is essential to take measures for the protection of these waterbodies. Master Plan envisages a zone, named waterbodies for the conservation of these areas. Total extent is around 0.34 sq.km. The details are as shown below figure 27.10.

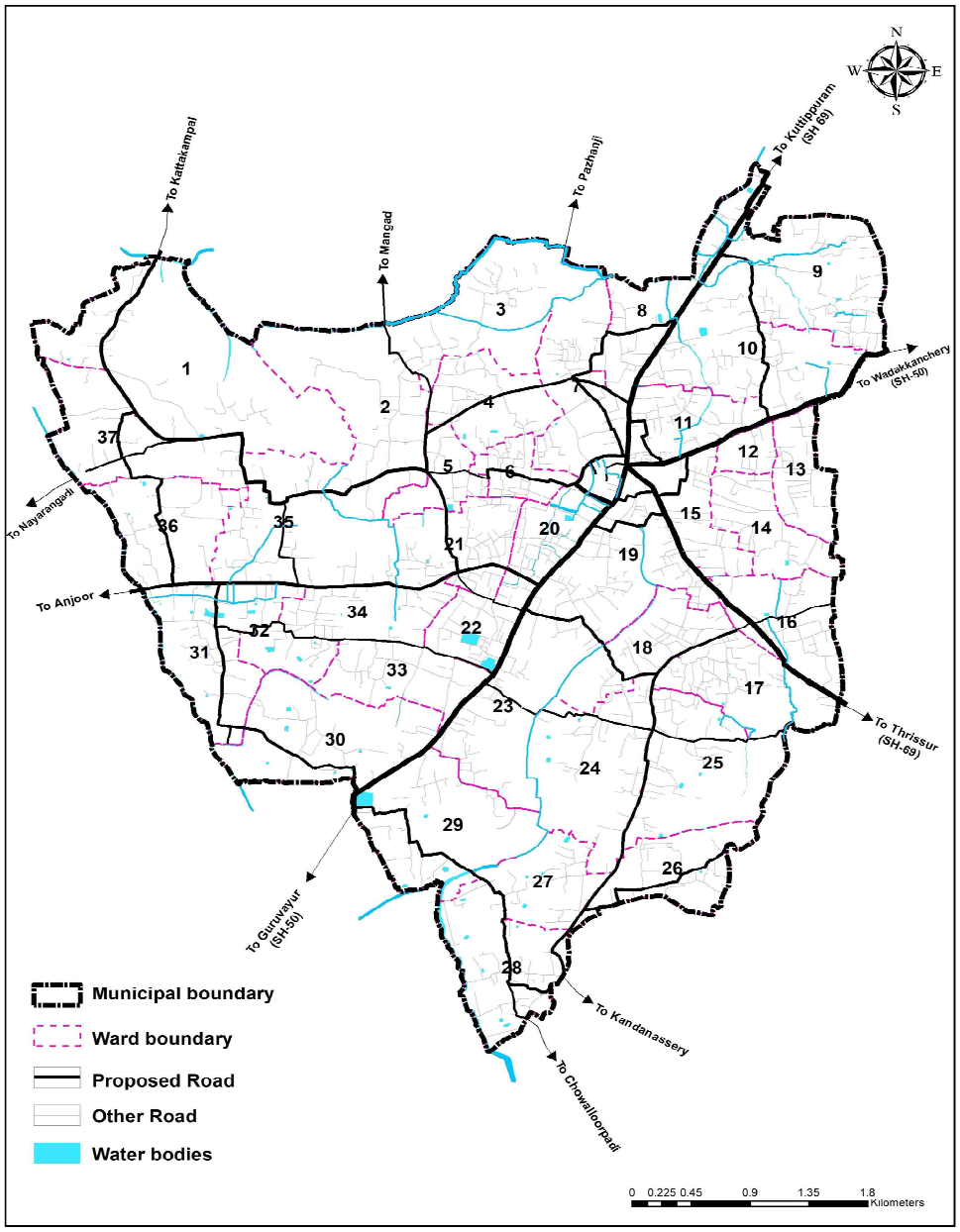


Fig 27.10 Water bodies

27.11 Special use zone

Special use zone include the areas specifically demarcated for certain projects. No other activity unless otherwise specified shall be permitted in such zones. If this project is not materialised within a period of 7 years, from the date of sanctioning of this Master

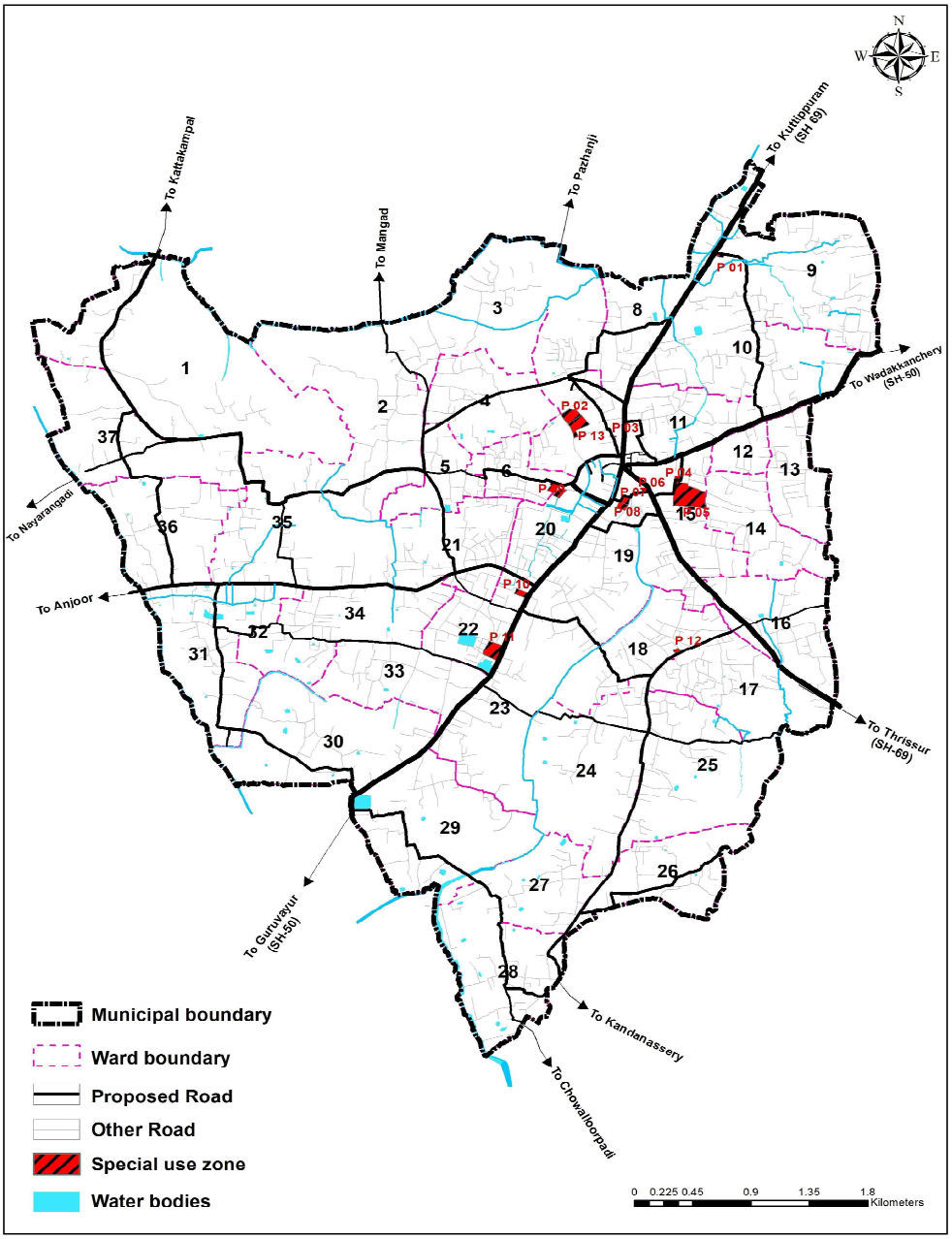


Fig 27.11 Special use zone

Plan the freezed land shall be released and returned back to that zone as per the existing land use Zone.The details are as shown in figure 27.11.Total extent is around 0.10 sq.km. Proposals under this zone are listed below.

P 01. Waste water recycling plant (Near victory Inn)
P 02. Waste water recycling plant (Near Thurakkulam)
P 03. Coconut procurement centre
P 04. Nalpamara thoppu
P 05. Sports complex cum stadium
P 06. Indoor stadium
P 07. Printing Heritage Museum
P 08. Children's park

P 09. Multilevel parking
P 10. Techno city
P 11. Craft village
P 12. Cultural centre- Kaniyampal
P 13. Development of Thurakkulam Municipal market

Heritage sites and Sacred grove: The heritage precincts of Kunnamkulam town are two ASI sites as mentioned in the analysis part namely Kakkad cave and Chowannoor cave. It is suggested to retain the locations and protect as per the rules laid down by ASI. The sacred grove at Thiruthikad needs special protection owing to the environmental importance

27.12 Land Use Map

Proposed land use map of Kunnamkulam Town which is constituted by 11 land use zones is shown in figure 27.12 Area and percentage of land use is shown in table 27.1

Table 27.1 Area and percentage of proposed land use

Sl. No	Land use	Area in Sq.Km	Percentage
1	Residential use zone	13.09	47.69
2	Residential mixed use zone	1.93	7.03
3	Commercial use zone	1.01	3.68
4	Industrial use zone	0.13	0.47
5	Public and Semi public use zone	0.88	3.21
6	Traffic and Transportation use zone	1.74	6.34
7	Recreational Open Spaces	0.06	0.22
8	Dry Agriculture use zone	1.95	7.10
9	Wet Agriculture use zone	6.22	22.66
10	Water bodies	0.34	1.24
11	Special use zone	0.10	0.36
	Total	27.45	100

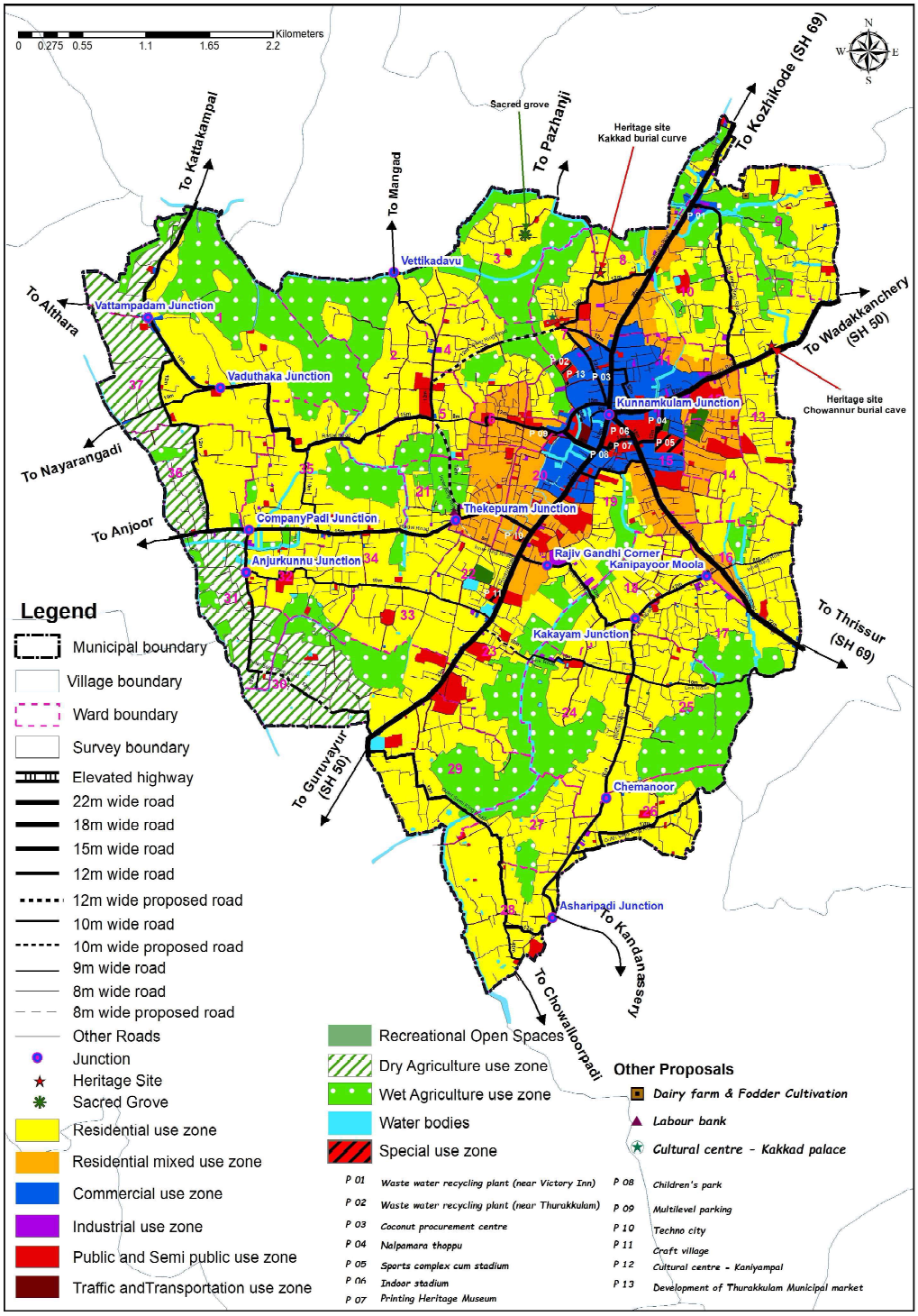


Fig 27.12 Proposed land use map

CHAPTER 28

TRAFFIC AND TRANSPORTATION PLAN

As envisaged in the vision for Kunnamkulam town, it is suggested to decongest the existing town center. Also considering the future demand for good number of roads and efficient system of traffic, an attempt is done to arrive at a functional transportation network. The traffic and transportation proposals to be implemented during the plan period are detailed out in this chapter.

As far as Kunnamkulam town is concerned, the Parayil centre or the Bus stand junction is the busiest location and the reason is mainly attributed to the intersection of two state highways coupled with the presence of the bus stand.

The configuration of the existing road network within Kunnamkulam town is more or less of a radial pattern. The Kunnamkulam market area and the bus stand area together form the CBD region and most of the trips are originated from or concentrated towards this CBD. The two state highways namely SH 69 and SH 50 are intersecting at the CBD, carries huge volume of traffic, both passenger and goods, most of which are by passable. Recently the Thrissur – Kuttipuram State Highway was strengthened under the Kerala State Transport Project (KSTP) and this has improved the overall operational efficiency along the road. Most of the thorough traffic has to pass via the CBD area and the absence of a proper circulation system is aggravating the problem.

Since the most important problem of Kunnamkulam town is the heavy traffic along the SH 69, especially near the CBD area, emphasis is given to develop alternative links to divert the by passable traffic passing through the stretch. This would also help to reduce the inter mixing of intra-town and inter-town traffic on roads within the central part of the town.The major intersections along the roads also need to be improved and suitable designs are to be made to increase the efficiency level of these intersections

28.1 Proposed Road Network

The proposed network of Kunnamkulam is of a radial pattern which is shown in figure 28.1. Six categories of roads are proposed for Kunnamkulam town. These are as follows:

- Primary distributor roads
- Radial roads
- Inner ring road

- Outer semi ring road
- Minor roads
- Town centre roads

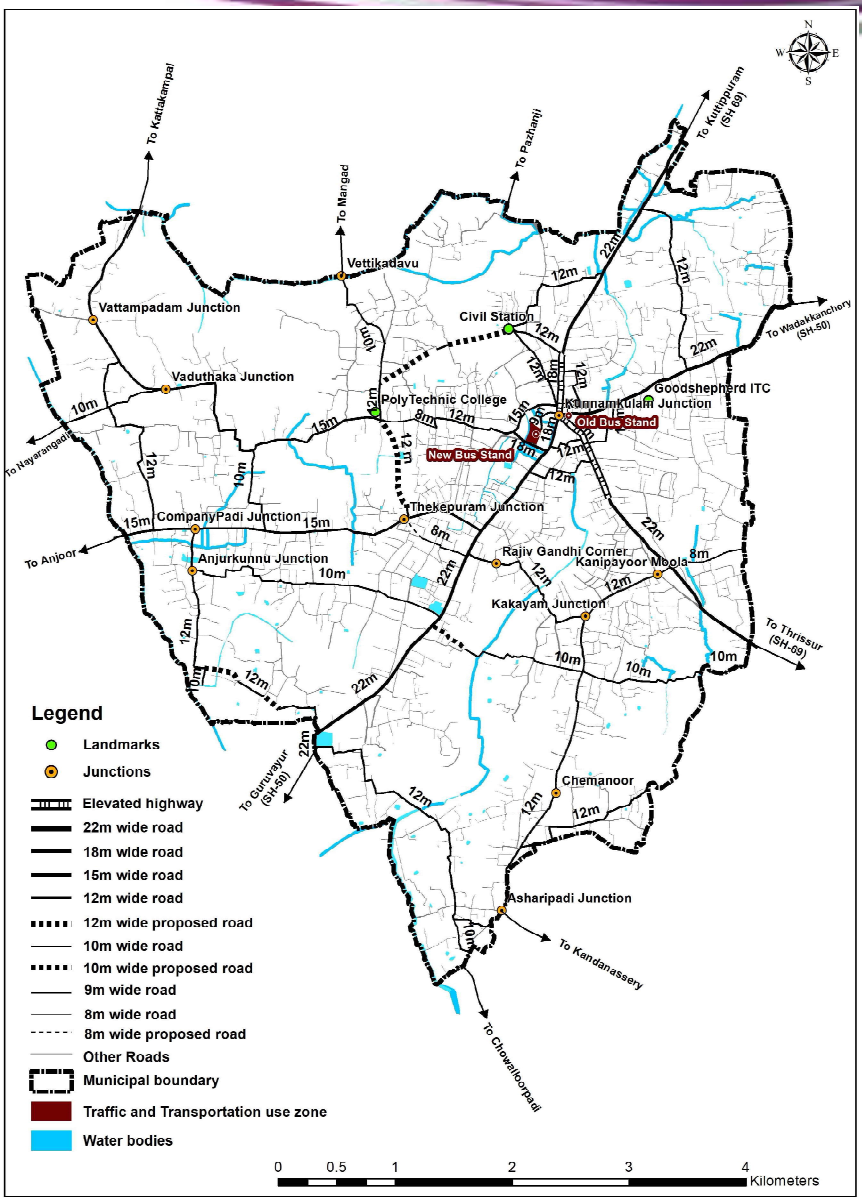


Fig 28.1 Proposed road network

28.1.1 Primary Distributor roads

The two State Highways, Thrissur- Kuttipuram (SH-69) and Chavakkad-Wadakkanchery (SH-50) form the Primary Distributor roads. From traffic and transportation studies conducted, it is revealed that the most important problem of Kunnamkulam town is heavy traffic along the SH 69 ie Thrissur Kuttipuram road, especially near the CBD area. In order to decongest the CBD area, already an Inner ring road is envisioned utilising mostly the existing roads and some portions has to be acquired. Considering the concept of bypassing the town and town's peculiarities, the proposed width of roads passing through this area is limited to 18m.The remaining road stretches outwards to municipal boundary is proposed to be widen as 22m with four lanes. The Primary distributor roads are shown in figure 28.2 and the details are given in table below.

The study has pointed out that a major share of the traffic is goods that too divertible. So an **'elevated highway'** is proposed above existing road SH 69, from Thrissur road near Bethany School to Kozhikode road near Kurishupalli kavala. This would also help to reduce the inter mixing of intra-town and inter-town traffic on roads within the central part of the town. The proposed width of this elevated highway is same as that of corresponding width of Primary roads.

Sl No :	Primary Distributor Roads - Stretches	Proposed Road Width in Meters
1	SH 69 - (Thrissur Road)	
	From Town to Municipal Office Junction	18m
	From Municipal Office Junction to Municipal Boundary	22m
2	SH 69 - (Kozhikode Road)	
	From Town to Palace Road Junction (Kappela Junction)	18m
	From Palace Road Junction to Municipal Boundary	22m
3	SH 50 - (Wadakkanchery Road)	
	From Town to Byju Road Junction	18m
	From Byju Road Junction to Municipal Boundary	22m
4	SH 50 - (Chavakkad Road)	
	From Town to Herbert Road Junction	18m
	From Herbert Road Junction to Municipal Boundary	22m



Typical layout of primary distributor roads

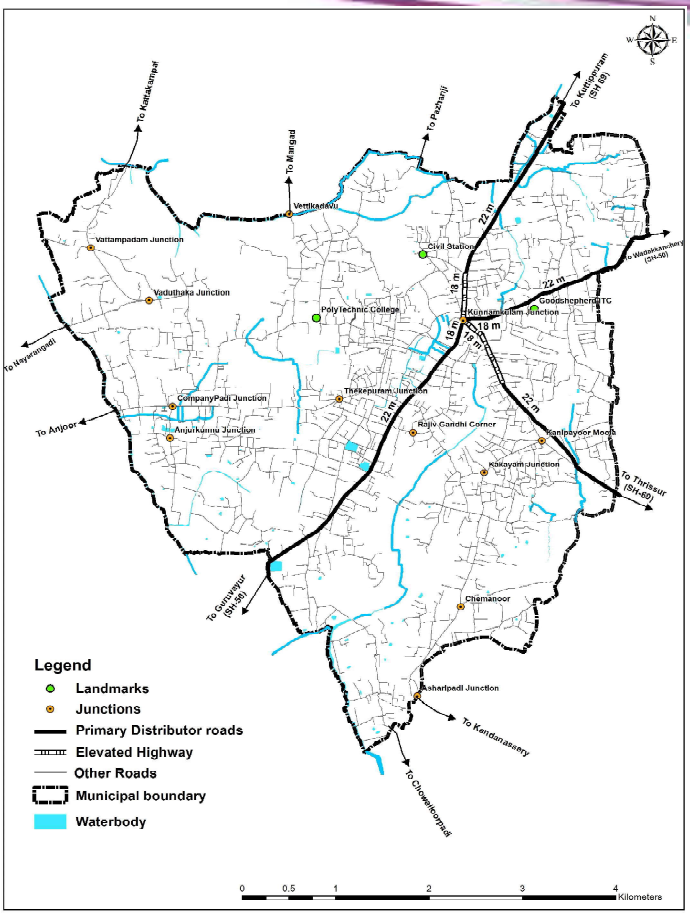


Fig 28.2 Primary distributor roads

8.1.2 Radial roads

Radial roads are the roads that extends traffic outwards from central point of the town. There are three number of radial roads proposed with varying width ranges from 8m to 15m. Their stretches and corresponding width are shown in figure 28.3 and detailed in the table below,

Sl No:	Radial Roads - Stretches	Proposed Road Width in Meters
1	Road from Parayil Jn. on SH 69 to Cheruvallikadavu bridge -	
	• Parayil Junction to Jawahar Junction	15m
	• Jawahar Junction to Vysseri PWD road Jn. (near Bethany School)	12m
	• Vysseri PWD road Jn. to Polytechnic College Jn.	8m
	• Polytechnic College Jn. to Cheruvallikadavu Bridge	15m
2	Anjoor Road	
	• From Girls High School Jn. to Anjoor (Municipal Boundary)	15m
3	Kanipayyur - Annaikkal - Chemmannur road	
	• From Kanipayyur Jn. on old Thrissur Road to Asaripadi Jn.	12m

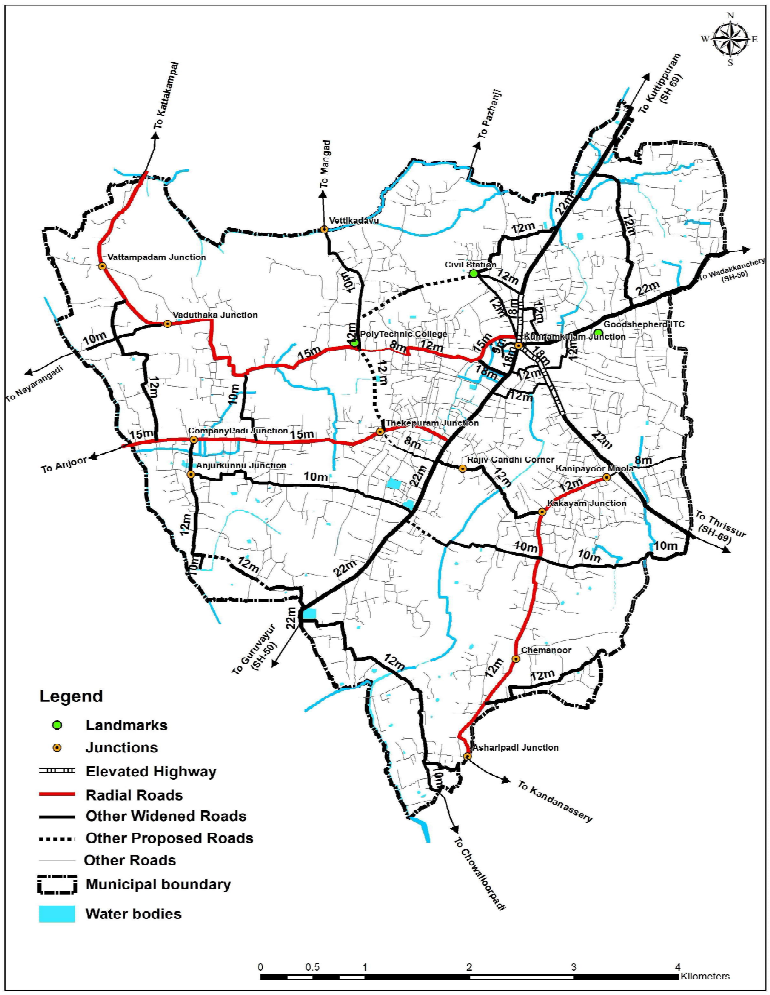


Fig 28.3 Radial roads

28.1.3 Inner ring road

As envisioned to decogest CBD area, an inner ring road is proposed at outside the CBD area of town, utilising mostly the existing roads. Some new alignments are identified and made part of this road for smooth and safety movement. The proposed width of inner ring road is 12m and 8m, and some part of Chowannur Block office road is used without widening.

The road starts off clockwisely from Parempadam Victory Inn junction on SH- 69 and runs via Ayyapath road to intersect SH 50 at Ayyapath road junction. From there uses SH-50 up to Chowannur Cave junction. From this junction uses Chowannur Block office road up to Kanipayyur LP school road junction near to Block office without widening. The alignment continues from this junction to Kanipayoor post office junction on SH-69, via along the side of Annamkulangara temple. This meeting point have some level difference so that a

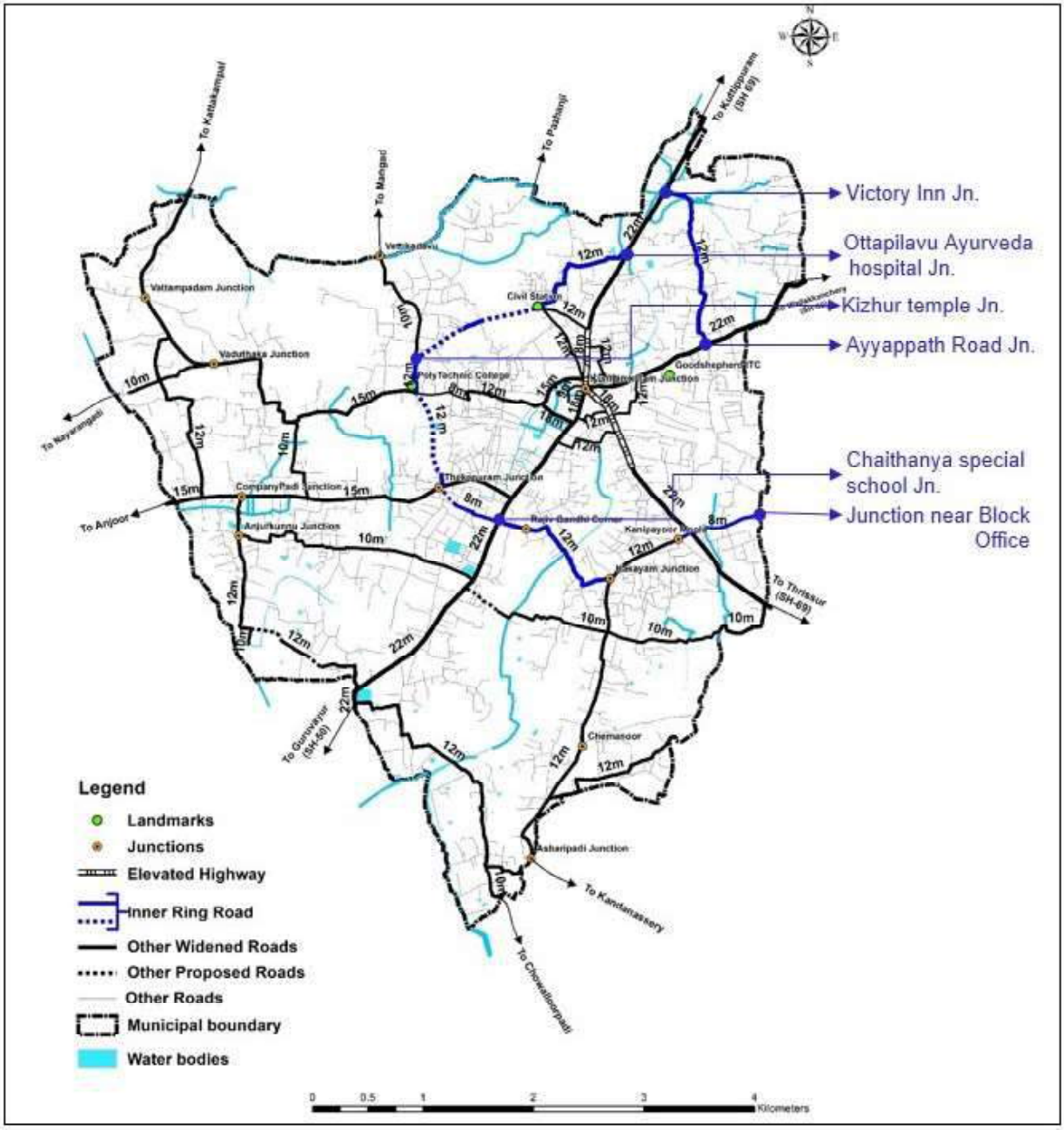


Fig 28.4 Inner ring road

suitable ramp is to be provided. From there, the road continues up to Kanipayoor Moola Junction on old Thissur road.The alignment continues up to Kakkayam junction using Kunnamkulam-Anaikkal- Chemmanur road. From this junction,the alignment continues through MG road and meets with SH 50 at a junction near to" Chythanya Special School" via Industrial estate. The alignment then continues to meet Anjoor road near Thekkepuram junction on which some portion has to be acquired. From there a new alignment is proposed to Polytechnic junction via old slaughter house. From there the road continues up to Kizhoor temple through Mangad road. From temple a diversion is taken towards Kakkad Ganapathy Temple to meet Yesudas road through Kole land as a new alignment.

Then the alignment finally reaches SH 69 near Ottapilavu Ayurveda Hospital through Cheruvathoor Temple road. The ring road can act as a bypass for traffic from Kozhikode, Thrissur, Wadakkanchery and Guruvayur sides. The alignment of inner ring road is shown in figure 28.4 and details are given in table below.

Sl No :	Inner Ring Road - Stretches	Proposed Road Width in Meters
1	Parempadam Victory Inn jn. on SH69 to Ayyappath road jn. on SH 50	12m
2	Ayyappath road jn. on SH 50 to Chowannur cave jn. on SH 50 (Part of primary road)	22m
3	Chowannur cave jn. on SH 50 (Part of primary road) to Kanippayyur LP school jn. (near Block office) on Block road	No Widenning
4	Kanippayyur LP school jn. (near Block office) on Block road to Kanippayur moola jn. (old Thrissur road) via Kanippayur post office.	8m
5	Kanippayur moola jn. (old Thrissur road) to Kakkayam jn. on Chemmannur road (part of radial road)	12m
6	Kakkayam jn. on Chemmannur road to Chaithanya special school jn. on SH 50 via MG road	12m
7	Chythanya special school jn. (old court jn.) to Thekkepuram jn. on Anjur road	8m
8	Thekkepuram jn. on Anjur road to Polytechnic college jn. via old slaughter house	12m
9	Polytechnic college jn. to kizhur temple jn.	12m
10	kizhur temple jn. to kakkad Ganapathy temple on Yesudas road via chiralayam kole land	12m
11	Kakkad temple to ottapilavu Ayurveda hospital jn. on SH 69 via Cheruvathur Siva temple	12m

28.1.4 Outer semi ring road

It is proposed to develop an outer ring road mainly by widening existing suburban roads to 12m in the town. The road proposed starts anticlockwisely from Dubai padi jn. on Vysseri-Vattompadam road to Shappumpadi on Anjoor road. The alignment continues using Anjoor road till Companipadi. From there a road is proposed to Chattukulam via Anjoor kunnu. The alignment then continues to Asaripadi via Chemmannoor and finally reaches

municipal boundary near Anaikkal padam on Koonammoochi road. The outer ring road alignment is shown in figure 28.5.

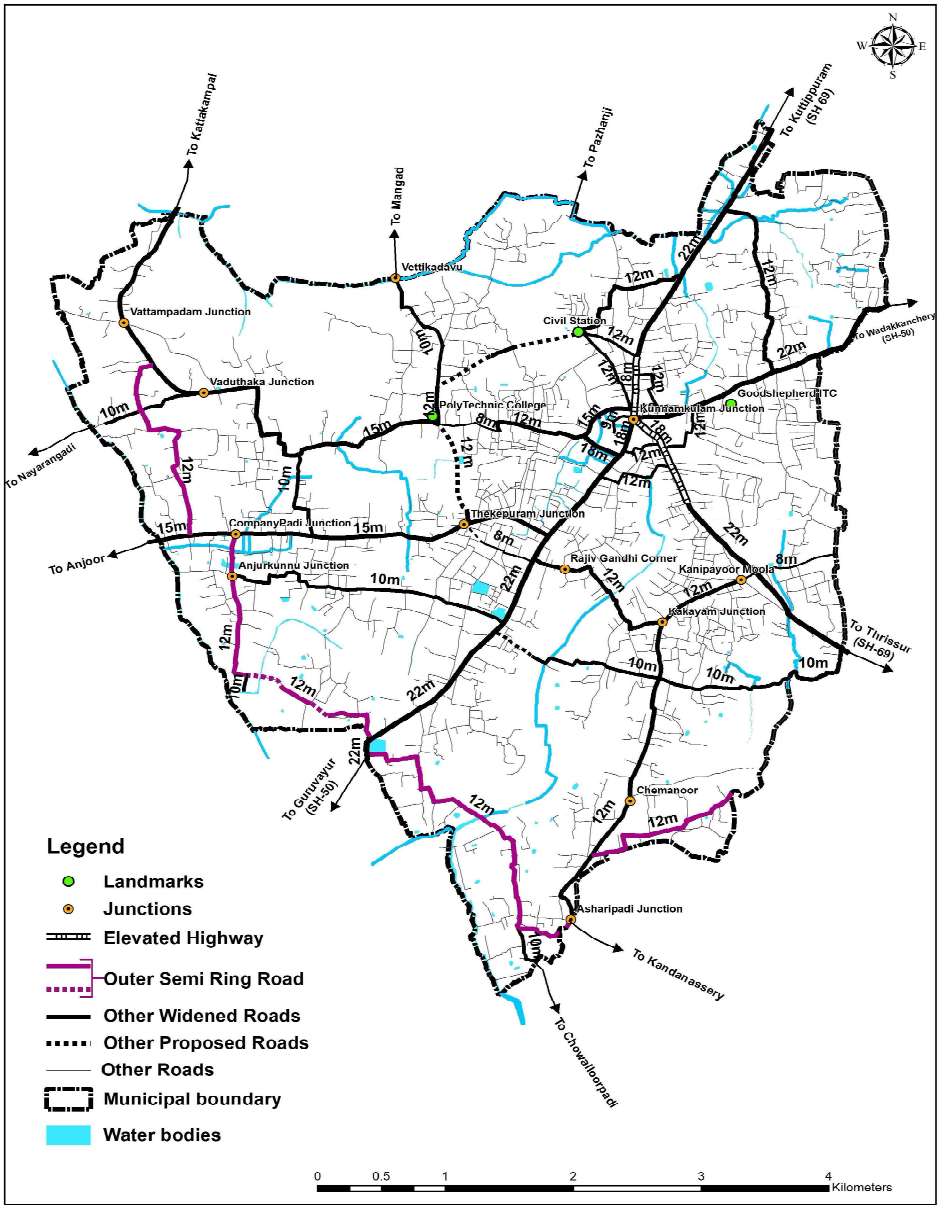


Fig 28.5 Outer semi ring road

28.1.5 Link road connecting SH 69 and SH 50

It is proposed to provide a link road connecting SH69 (Thrissur road) and SH50 (Guruvayoor road) to get a bi-directional traffic which makes by passing CBD area and there by enabling decongenstion of town. The road proposed to starts near Saint George chapel church Kanipayyur on SH69 and ends at near Kurukkanpara on SH 50. Major portion of this road uses existing alignments running through the periphery of Ubhayoor and Cheeramkulam temples and Excel school compound. And a new alignment is proposed in between Cheeramkulam padam & SH 50 stretch for this road. Proposed width of this Link road is 10 m. The figure 28.6 shows the proposed link road connecting SH 69 & SH 50.

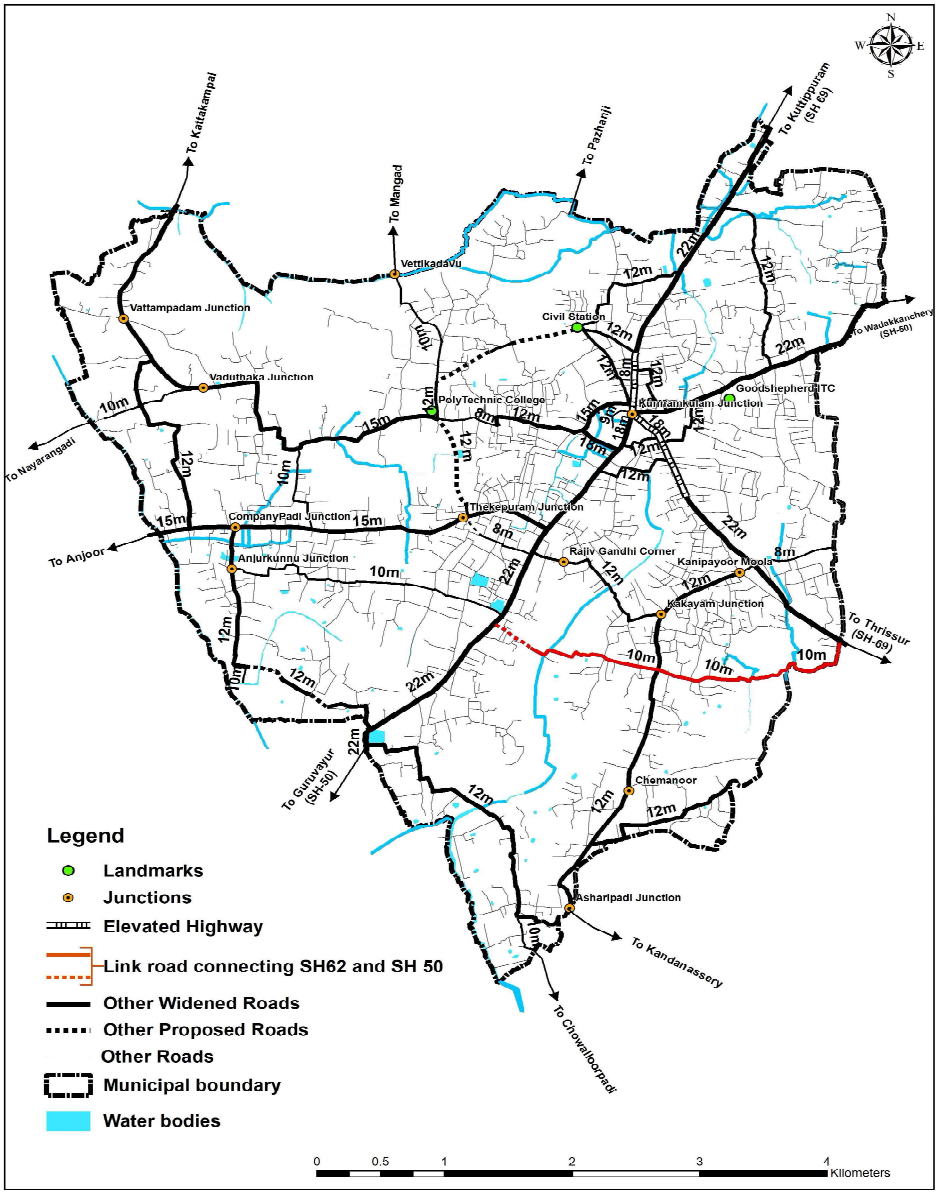


Fig 28.6 Link road connecting SH 69 and SH 50.

28.1.6 Minor roads and Town Centre Roads

The roads being serviced as a link to higher order roads at outskirts of the town area are categorised into Minor roads.

Minor roads: Minor roads are proposed to be widened to 10m width. They include:

- Road from Kizhoor temple to Vettikadavu bridge
- Road connection fromVaduthala road to Anjoor road near Parkkadi temple.
- Kurukkanpara-Pillakkad bus route
- Vaduthala – Chakkithara road
- Road from Chemmannoor kavala to Municipal boundary near A.M.H.S

. Aalingal Temple Junction to Pillakkad thodu Junction

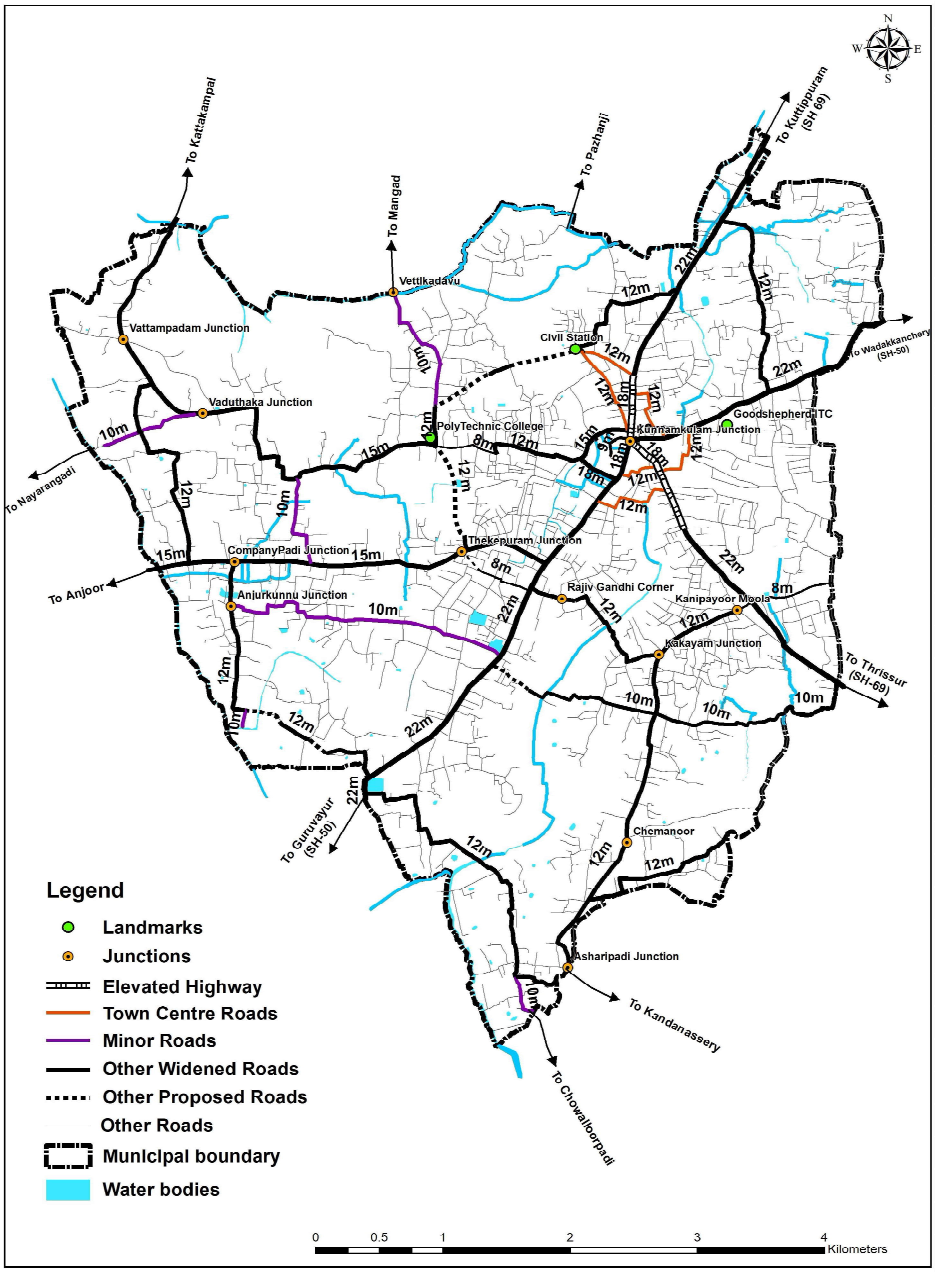


Fig 28.7 Minor roads and Town centre roads

Town Centre Roads

The roads being serviced in the core of the town are categorised into Town centre roads. In order to accommodate future heavy traffic,the Town centre roads are proposed (Fig. 28.7) to be widened to 12m width. They are detailed in the table below.

Sl.no	Town Centre Roads	Proposed Road Width in Meters
1	- Senior ground road- • Starts from Municipal office Junction on (SH 69) Thrissur road and ends at Malankara Hospital road Junction on (SH 50) Wadakkanchery road.	12m
2	-Municipal office road- • Starts from Municipal office Junction on Thrissur road (SH 69) and ends at Thavoos Junction on (SH 50) Guruvayur road.	12m
3	-Yesudas road- • Starts from Kakkad road Junction on Treasury road and passes through Civil station premises and ends at Kurisupally Junction on Kuttipuram road (SH 69).	12m
4	-Market road- • Starts from Kottayil road Junction on Kuttipuram road (SH 69) and passes through old Victory Press and old Byju Theatre and ends at Byju road junction on Wadakkanchery road (SH 50).	12m
5	-Mathurakulam road- • Starts from Mathurakulam road Junction on Thrissur road (SH 69) and passes through Mathurakulam and Royal Hospital (now Daya Hospital) and ends at Royal Hospital Junction on Guruvayur road (SH 50).	12m

28.2 Junction Improvement

A well designed junction can increase the capacity of the same and also adds on to the aesthetics of the area. The following intersecting points in Kunnamkulam town need to be taken up for detailed design considering the existing traffic flow and the need for future road widening. Figure 28.8 shows the locations of junctions to be improved

- Parayil Jn.
- Kanipayoor Jn.
- Ayyapath Jn.

- Girls School Jn.
- Chowannoor Jn.
- Vattompadam Jn.

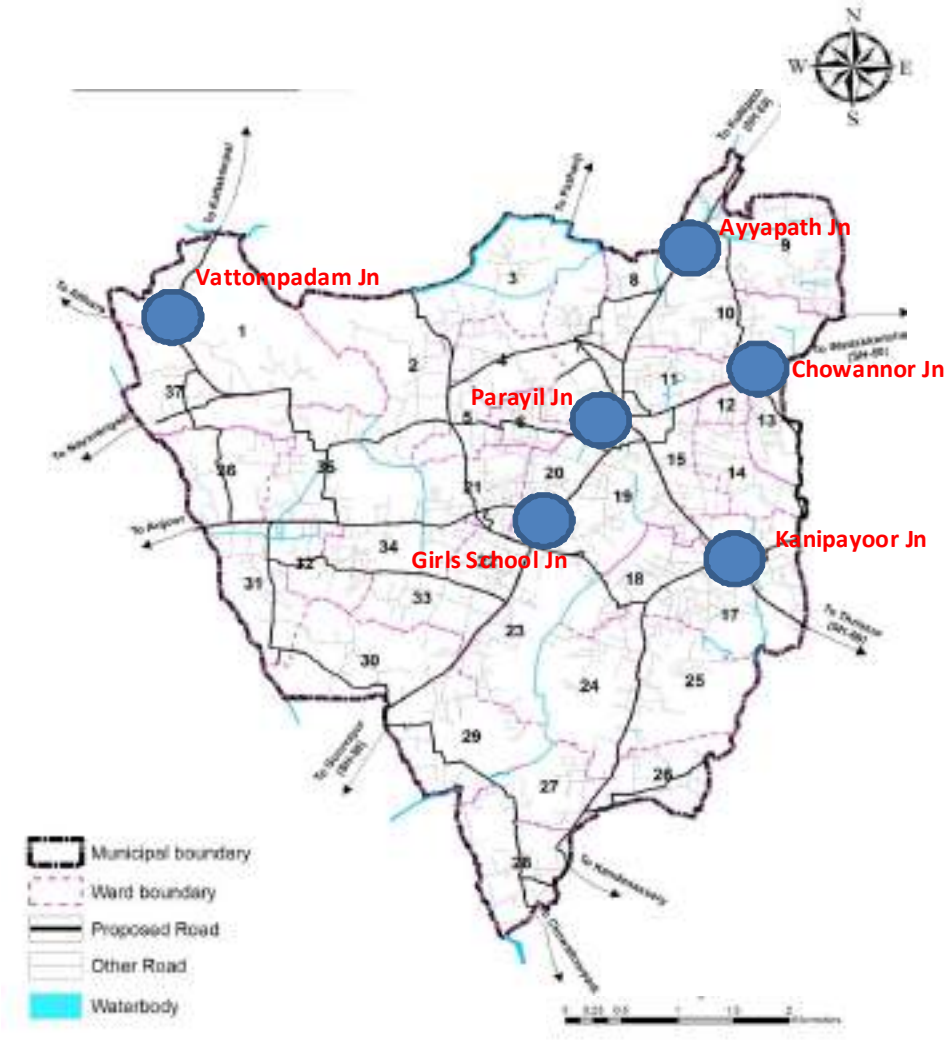


Fig 28.8 Junctions to be improved

28.3 Bus Terminal

The position of the old busstand which was situated very near to the intersection point of SH 69 and SH 50 was the major traffic aggravating problem of Kunnamkulam town. The number of buses operating is too high and the busstand area was surrounded with too many public and commercial activities.

As a remedy a new bus terminal was proposed at a location near to the Town hall and it is established and has been funcioned since 2021. The completed new bus terminal is shown in figure below.



New bus terminal

28.3.1 Exit road from New Bus terminal towards T.K.Krishnan road

New Bus terminal has acess from Herbert road only. If entry and exits are provided from this road will create traffic congestions near bus terminal. As far as location of new bus stand is considered, it is predicted that movement of buses to Calicut sides are going to create traffic blocks to some extent. In this context a new road is proposed for an exit route from the new Bus terminal. Private Buses enter to the Bus terminal through Hebert road and exit through this new proposed road in the northern side. This road will connect the busstand to ring road through T.K krishnan road and Yesudas road.The proposed width of road is 10 m and length is nearly 90m.This proposed road will connect the bus terminal to the calicut road with out disturbing town centre. Alignment of the new road is shown in the figure 28.9

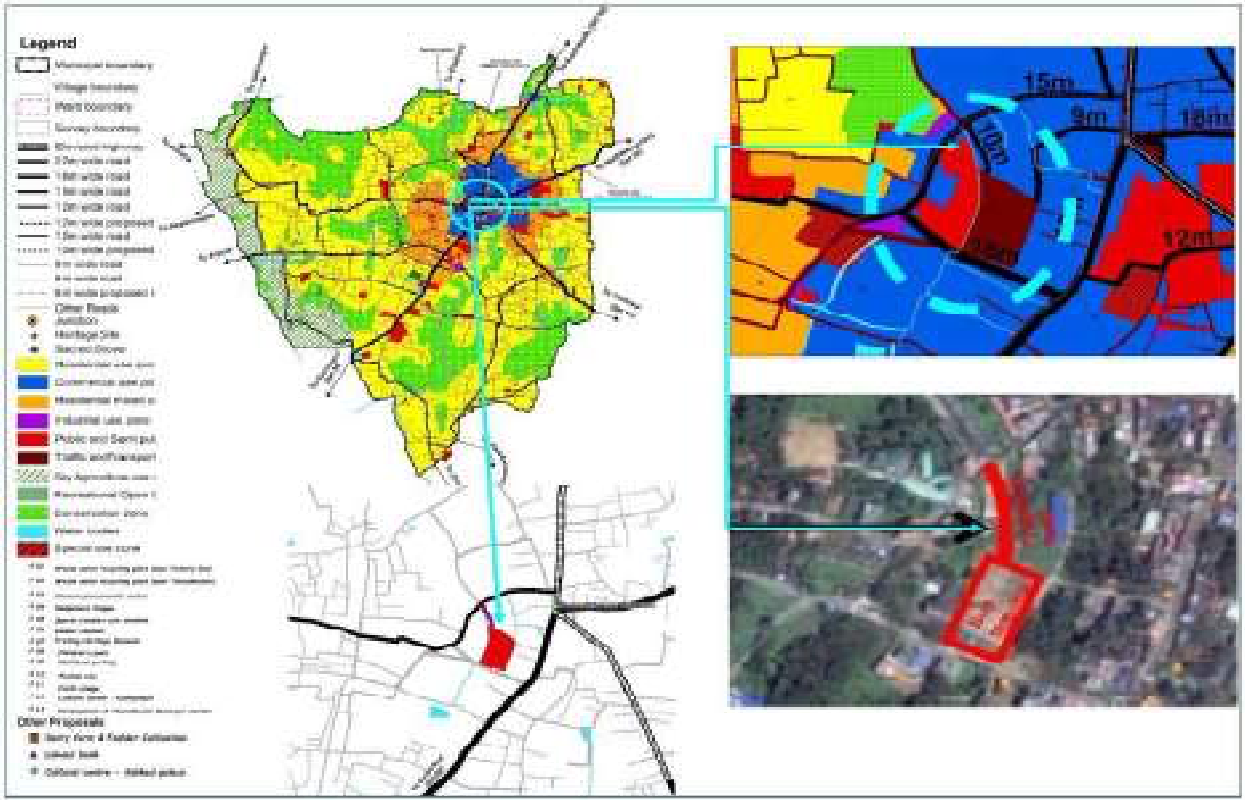


Fig 28.9 proposed new exit road from bus terminal

28.3.2 Link road connecting new bus stand and CBD of town

The shifting of private bus stand from CBD to a new location generates some difficulties to the publics arrived in town for their personal and business activities as unwalkable distance between these two locations. In order to get walkable distance, a link road is proposed from Mahatma Gandhi Shopping Complex to new bus stand as a shortest path. The existing alignment is fully utilised for this road and proposed to a width of 9 m. The movement of buses through this road has to be single directional. The figure 28.10 shows the proposed link road connecting new bus terminal and CBD area.

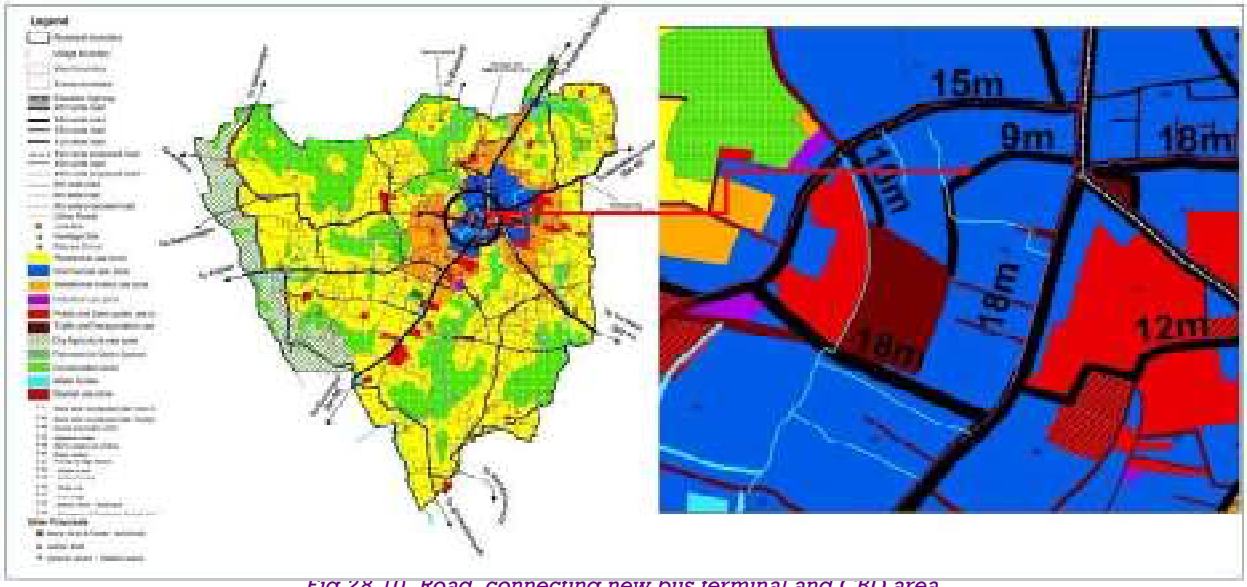


Fig 28.10 Road connecting new bus terminal and CBD area

28.3.3 Approach road to New Bus terminal (Herbert road)

The implemented New Bus terminal is belonging to the side of Town hall road, obviously this road will serve as an approach road to this terminal. In order to make a smooth traffic inwards and outwards to bus stand,the existing town hall road is to be developed. The proposed width of this road is 18m.In figure 28.11 approach road to new bus terminal is showed.

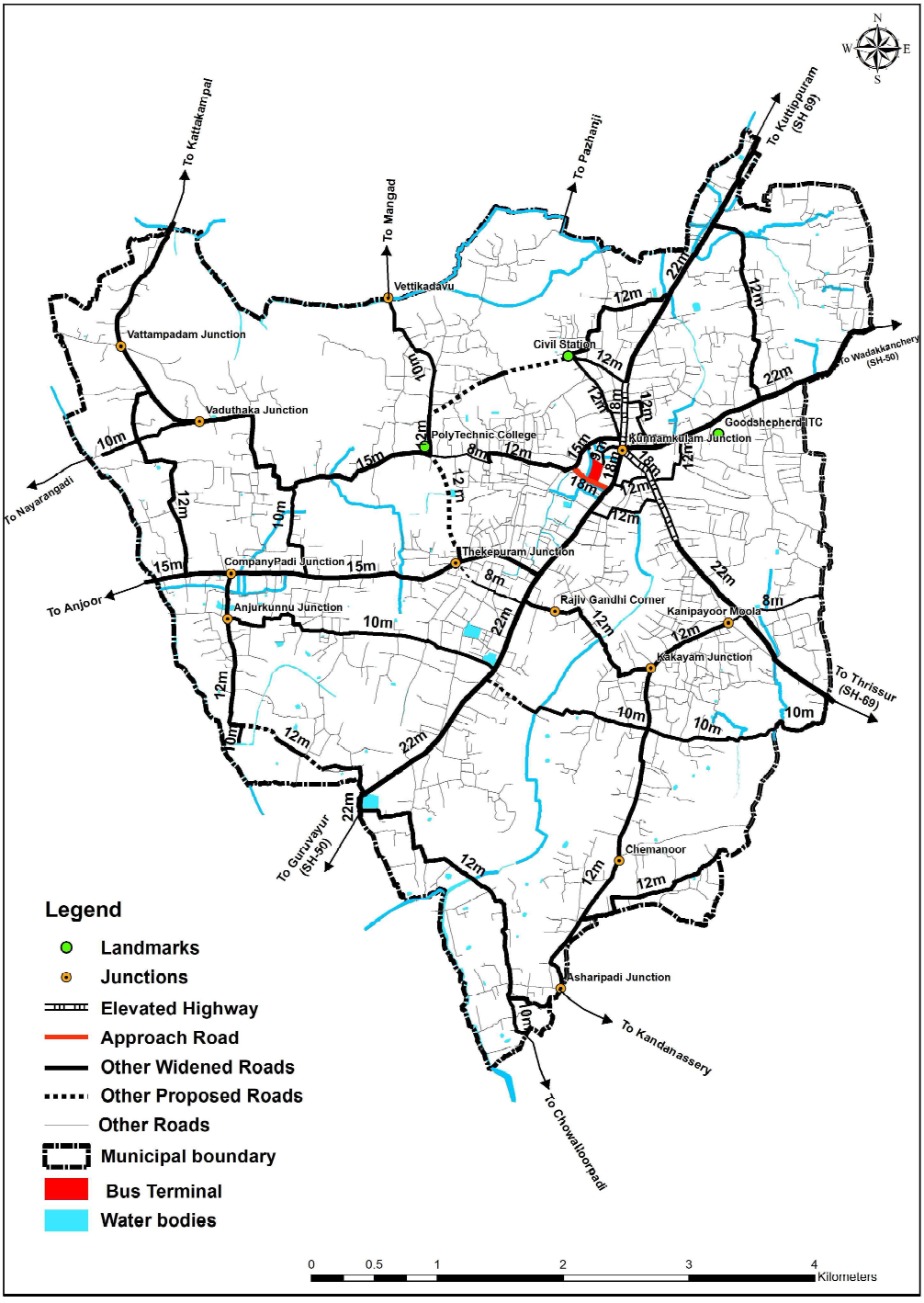


Fig 28.11 Approach road to new bus treminal (Herbert road)

28.4 Pedestrian Facilities

The pedestrian facilities that need to be considered are:

28.4.1 Sidewalks/Footpaths

The sidewalks or footpaths are "pedestrian lanes" that provide people with space to travel within the public right-of-way, that is separated from roadway vehicles. For Kunnamkulam town, considering the existing pedestrian demand, sidewalks with a width of 1.5m to 2.5 m is proposed for all types of roads.

28.4.2 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. For Kunnamkulam town, cross walk markings are desirable at all arms of the major intersections. Apart from these intersections, cross walk markings need to be proposed at major high pedestrian volume locations like educational institutions, hospitals, commercial centres etc.

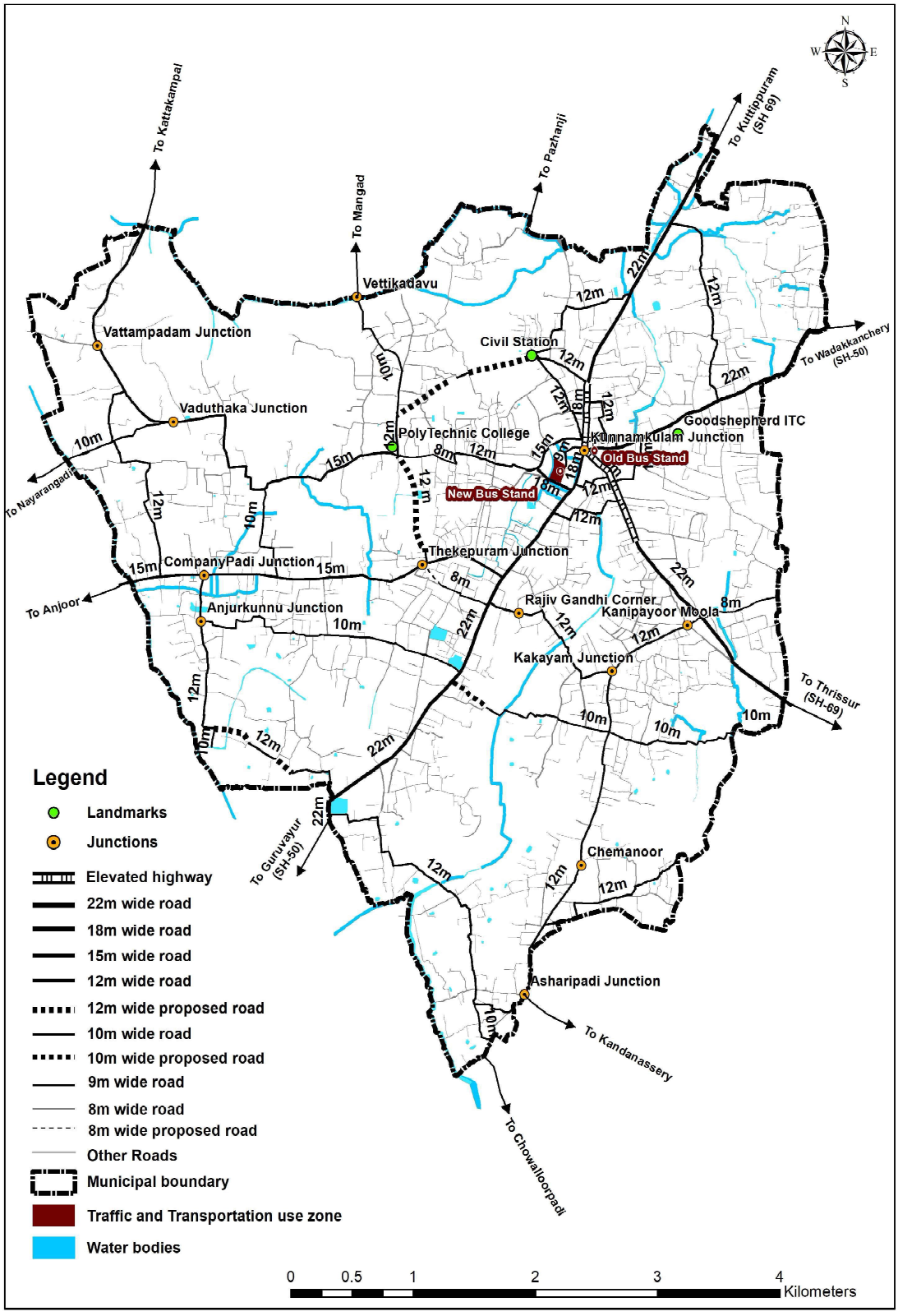


Fig 28.12 Proposed transportation map

CHAPTER 29

ZONING REGULATIONS

1. All future developments shall be in conformity with the provisions of the Master Plan for Kunnamkulam Town - 2031.

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, Commercial use zone, Industrial use zone, Public and Semi public use zone, Traffic and Transportation use zone, Recreational Open Spaces , Dry Agriculture use zone, Wet Agriculture use zone, Water bodies, Special use zone for various purposes etc. Details regarding the nature of uses 'Permitted', uses 'Restricted' and uses 'Prohibited' in each zone are given in table 29.1. 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, *Kunnamkulam Municipality (*here in after 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 locational factors. Such cases which come under this category are classified as "Uses Restricted".

   a. **Uses Restricted -1** Category deals with the restricted uses that may be permitted by the Secretary with the concurrence of the District Officer of the Local Self Government Department (Planning) having jurisdiction over the area (hereinafter referred to as Town Planner).

   b. **Uses Restricted -2** Category deals with the restricted uses that may be permitted by the Secretary with the concurrence of the Chief Town Planner of the Local Self Government Department (Planning) .

4. **"Uses prohibited"** are various objectionable uses in each zone which shall not be permitted under normal circumstances. *All uses which does not come under ' Uses Permitted' or 'Uses Restricted' shall be considered as 'Uses Prohibited'.*

5. 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, may be permitted by the Secretary, *with the concurrence of the Town Planner.*

6. If any portion of a zone is put to a "**Use Prohibited**" as stated in Para 4, before coming into the operation of this Master Plan, such use shall be termed as non-conforming 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, provided that the said use create no adverse environmental influence in the zone. Addition, alteration or reconstruction, if found necessary as part of any disaster mitigation measures may be permitted for such uses by the Secretary with the concurrence of the Town Planner concerned. The total constructed built up area including existing built up area of such non-conforming use shall not *exceed 1.50 times* the existing built up area.

7. Zoning regulations are not intended to prohibit existing uses that have been lawfully established prior to the enforcement of these regulations, unless otherwise specifically mentioned in this Master Plan. Zoning Regulations are essentially intended to help the competent authority in taking decisions regarding granting or refusal of permits for land development and construction of buildings/structures.

8. For the purpose of these regulations, floor area means the total floor area covered by the building at all floor levels as defined in Kerala Municipality Building Rule in force.

9. Subject to zoning regulations of the respective use zones, more than one uses may be combined in a building/plot, provided that the built up area of individual uses shall be limited to that prescribed for each such use in the zoning regulation for the respective zone.

10. Existing areas and structures of archaeological importance, agriculture uses and religious uses may be permitted to continue in all the zones and shall be treated as permitted uses.

11. Regulation of constructions and land developments on the sides of new roads/ roads proposed for widening as per the scheme shall be governed by the distance from the centre line of the road, unless otherwise specified in the Master Plan or Detailed Town Planning scheme in force or in any Detailed Road Alignment approved

by Goverment. If widening on one side of any stretch of the road is constrained due to the physical barriers of Water bodies,Railway land and protected archaeological monuments/sites, the road widening in that stretch shall be accounted from the other side.

12. In the event of change in alignment of road proposal in the Master Plan, after the commencement of land acquisition of the new aligment, the land parcels in stretches excluded from the original alignment may be changed to adjacent suitable land use zone as per **Proposed land use map** with the concurrence of the Town planner. This provision is applicable only to new road development proposals and not to widening proposal.

13. Provisions/regulations under the Kerala Conservation of Paddy Land and Wetland Act 2008, Disaster management Act, Archaeological Sites and Remains Act, Environmental Protection Act 1986 and any other applicable statutes as amended from time to time shall prevail over the respective provisions of this Master Plan.

14. All future developments shall also be in conformity with the provisions of Kerala Municipality Building Rules, unless otherwise specified in these regulations or in any Detailed Town planning Scheme in force.

15. Electric charging stations for vehicles may be permitted in all zones other than Water bodies and Conservation zone.

16. In Wet Agriculture use zone, permitted and restricted uses in adjacent land use zone may be permitted with the concurrence of the Town Planner if that particular land in Wet Agriculture use zone is not classified as paddy land or wetland as per Revenue records at the time of issuance of permit.

17. Transmission/ Telecommunication towers, wireless station, ATMs, water tanks, waste management units and public utility buildings/structures shall be treated as permitted uses in all zones except in Water bodies.

18. Operational Constructions as defined in the Kerala Town & Country Planning Act, 2016 shall be treated as permitted use in the Master Plan Area.

19. Disaster mitigation projects by competent authorities shall be permitted in all zones.

20. Uses permitted in **Residential mixed use zone** may also be permitted by the

Secretary, if not allowable otherwise as per the zoning regulations applicable, on both sides of the following roads (as per this Master Plan) in Residential use zone and Dry Agriculture use zone, in land up to a depth as shown against each road in the table below.

Uses restricted in **Residential mixed use zone** may also be permitted by the Secretary, if not allowable otherwise as per the zoning regulations applicable, but with the concurrence of the Town Planner or the Chief Town Planner as the case may be, on both sides of the following roads (as per this Master Plan) in such applicable zones as mentioned above in land up to a depth shown against each road in the table below.

Sl. No.	Details of Roads	Depth (in metres) on both sides of the road upto which provisions of Residential Mix Zone is applicable
1	All roads having an existing or proposed width of **22 metres or above**	**200m**
2	All roads having an existing or proposed width of **12 metres or above**	**100m**

If more than 50% of the area of a plot is included within the Residential mixed use zone, the entire plot shall be deemed to be included under such Residential mixed use zone.

21. The Goverment shall have the power to issue clarifications in respect of technical interpretations, if any, required on any of the provisions of the Master Plan in consultation with the Chief Town Planner concerned of the Local Self Goverment Department (Planning).

22. Expansion of existing Public and Semipublic Institutions and existing Industrial units including their incidental uses to adjacent plots shall be treated as permited use irrespective of the zone in which such adjacent plot lies, except in Water bodies and Wet Agriculture use zone.

23. Only the existing areas under Public and Semi public uses, Industrial uses and water bodies are intended to be included under Public and Semi public use zone,

Industrial use zone and Water bodies respectively. If any private property put under uses other than those permitted or restricted in the above zones has got included within such zones, the Secretary may, with the concurrence of the Town Planner, after verification of the Revenue ownership documents, accord sanction for development by adopting the regulations of the surrounding land use zone in the **proposed land use map**, subject to the provisions as per applicable Acts, Rules and Goverment Orders in force in the State.

24. If public activity and industrial use ceases or do not exist in a private land, uses permitted/restricted in the surrounding land use zone in the **proposed land use map** shall be allowed in the plot with the concurrence of the Town Planner, if no records are available with Kunnamkulam Municipality regarding any proposal for acquiring that particular land for any public use/Industrial use at the time of application for building construction or land development.

25. Projects of Central/State Goverment, Local Self Goverment Institutions, Public Sector undertakings and other Goverment Institutions may be permitted with concurrence of the Town Planner in all built up zones such as Residential, Commercial, Industrial, Residential mixed, Public and Semi public, Dry agriculture etc, if such uses are not included in the permitted uses or restricted uses as per the zoning regulations applicable.

26. In case of uncertainity in identifying the land's survey number, the alignment and boundary of thodu,canal,river, ponds, existing public road, Railway line in the absence of survey boundaries for the same in the Proposed Land Use map, it shall be referred to the actual position on ground as well as Revenue records, and decision taken by the Secretary in this regard shall be final.

27. The land specially demarcated for certain projects as Special use zone in Proposed Land Use map, may be procured as per the provisions of the Kerala Town and Country Planning Act 2016, by Kunnamkulam Municipality or other agencies concerned. If the proceedings to procure such land have not been initiated within 7 years from the date of sanctioning of this Master Plan, the areas so specifically demarcated may be released and assigned to a use permited/ restricted in the surrounding land use zone in the **Proposed Land Use map** by the Secretary with the concurrence of the Town Planner, based on the application for building permit received.

28. If different land use zones fall within single plot, all uses permitted as per zoning regulations of such land use zones may be permitted by the Secretary in the plot. If application submitted includes any of the restricted uses and not included in such permitted uses, the Secretary shall issue permit with the concurrence of the Town Planner/Chief Town Planner, as the case may be. However, for the part of the plot which comes under Water bodies, Wet Agriculture use zone, Recreational Open Spaces and Special use zone, this provision shall not be applicable.

29. Large Scale development projects in an area 1 hectare or more, exceeding an investment of Rs.100 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 water bodies if not included in the permitted uses or restricted uses as per zoning regulation applicable. In such cases, the recommendation of a committee with constitution as below shall be obtained, subject to satisfying the procedures laid out here under and the Secretary shall comply the same while issuing permit.

Also, adequate provision shall be made for supporting infrastructure such as water supply, sewerage, solid waste management, power supply etc. Seperate systems for management of solid waste and sewage shall be provided and maintained by the developer at his cost. The project shall be completed within a period of 5 years or suggested by the Committee.

29.1 Procedure to be followed

(a) The developer shall submit the project report, detailing the demand, feasibility and Environmental Impact Assessment aspects of the project, together with the approval, if necessary, obtained from the Ministry of Environment and Forests, Goverment of India to the Convener of the committee and the Convener shall make all arrangements for convening meeting of the committee at the earliest and the committee shall consider and dispose of the project report within a period of one month from the date of receipt of the same.

(b) The constitution of the committee shall be as given under:

Additional Chief Secretary/Principal Secretary/

Secretary, Local Self Goverment Department

(as the case may be) - Chairperson

The Director, Local Self Goverment Department

(Urban) - Member

The Chief Town Planner, Local Self Goverment

Department (Planning) - Convener

The District officer of the Local Self Goverment

Department (Planning) having jurisdiction over the

district concerned - Member

Secretary of Kunnamkulam Municipality - Member

(c) The convener shall fix the venue, date and time of the meeting in consultation with Chairperson and shall be responsible for safe custody of records and communications thereof.

(d) The meeting shall be presided over by the Chairperson or in his absence by a member to be authorised by him.

(e) The quorum of the meeting shall be majority of the total number of members of the committee for the project.

(f) The developer shall also produce before the committee, all required clearances from the State and Central Goverment agencies concerned.

Table 29.1 Regulation of uses

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
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, Dharmasala, Asram,Mutt,Madrasa,Hostels and Boarding Houses.	Vehicle Fuel Filling Stations		Any other uses not specified

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Places of Worship			
	Shops, Professional Offices, Commercial Offices, Banks & other Financial Institutions, Restaurants, Canteen, Hotels - floor area **limited to 200 m^2.**	Cremation Ground/ Crematorium, Burial Ground/ Common Vault.		
	Cottage Industries including coir, Service Industries of non-nuisance Nature (See Annexure-I), with number of workers limited to 6 without power or 3 workers with power limited to 5 HP	Public utility areas and Public Utility buildings other than those included in the permitted category.		
	Educational institutions essentially serving the needs of residential community such as Day Care, Crèche, Nursery Schools, Kindergartens and schools offering general education (up to High school level).	Local/State/Central Govt. or Public sector offices		
	Health institutions essentially serving the needs of residential community such as dispensaries, clinics (Out Patient), Diagnostic Centres etc. - floor area **limited to 200m^2.**	Sewage treatment plants		
	Community facilities such as Community Halls, Recreational Clubs, Social Welfare Centres, Gymnasium /Yoga Centres, Swimming Pool, Libraries and reading rooms, Exhibition centres, art galleries etc. having a floor area **limited to 200 m^2.**			

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Utility Installations and Civic Amenities essentially serving the needs of residential community such as post office, police station, police post, telephone exchange, fire station, tot lots, parks, play grounds, water treatment plants below 5 MLD etc. Plant Nurseries, Agriculture and Horticulture, Pastures and Grazing Grounds, Fodder Cultivations,Seed Farms, Storage of Agriculture Produces and seeds, Green Houses, Pump Houses Turf court Wells and Irrigation Ponds incidental to community needs.			
1.2	**Provided that the access road has a width of 5m minimum.**			
	Automobile workshops for two/ three wheelers – floor area **limited to 200 m^2.** Hospitals with 5 bed			
1.3	**Provided that the access road has a width of 8m minimum.**			
	Hospitals with 50 beds, Higher Secondary Schools.	LPG distribution centres (excluding bottling plants and bulk storage) limiting the floor area **limited to 50 m^2.**		

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Convention Centres/ Auditorium/ Wedding Halls/ Community halls/Exhibition Centres and Art Gallery-floor area **limited to 500 m^2.** Shops/Professional Offices, banking and financial institutions – floor area **limited to 500 m^2.** Cottage Industries including coir, Service Industries of non-nuisance Nature (See Annexure-I).			
2	**Residential mixed use zone**			
2.1	All uses that are permitted in Residential use zone and Commercial use zone	All uses that are restricted - 1 in Residential use zone and Commercial use zone	All uses that are restricted - 2 in Residential use zone and Commercial use zone	Any other uses not specified
3	**Commercial use zone**			
3.1	All shops including shopping complexes, shopping malls, multiplex, 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.	Higher educational Institutions provided the access has a width of 8m minimum Dairy & Dairy Farm, Poultry Farm. Other public utility areas & Public utility buildings.	Multiplex complex	All other use premises not mentioned in columns (2), (3) & (4)

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Gymnasium/ Yoga centres	Fuel filling stations		
	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 Annexure-I), saw mills, weigh bridges, printing press, IT hardware / electro nic industries, marble and granite storage / cutting centres.	Saw Mills with Timber Yards		
	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.	Slaughter Houses.		
	Government (Local /State/ Central) or Public Sector Offices, Public utility areas and buildings run by Government.	Container terminals		
	Day care, Creche, Nursery/ Kinder garten, Expansion of existing educational institutions	Sewage treatment plants		
	Transmission & Tele communication Towers, Wireless Stations.			

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Social welfare centres, Library and reading rooms, Exhibition centres, museum, Art gallery museum, convention centres, Auditorium, Wedding halls, Community halls. 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, Wells and Irrigation Ponds			
3.2	**Provided that the access road has a width of 12m minimum**			
	Educational Institutions other than those mentioned in clause 3.1. Hospitals & Health centres, Outdoor games stadium.			
4	**Industrial use zone**			
4.1	All industries other than obnoxious 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.	Other Public Utility Areas and Public Buildings. Obnoxious and nuisance type industries (Annexure - II) Fuel Filling Stations		All other use premises not mentioned in columns (2), (3) & (4)

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Shops, Professional offices/ Banking and financial offices floor area limited to 100sqm, 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, Smoke House. Dry Cleaning Plants, Power Plants, Sub Stations, Trans-mission & Tele communication Towers, Wireless Stations. Government or Public Sector Offices Transport Terminals incidental to industrial use. Residential Uses incidental to the Industrial Use. Any other activity essentially incidental to Industrial use. Tot lots, Parks and Play Grounds attached to incidental residential use.	Cremation Ground / Crematorium, Burial Ground, Common Vault. Storage of Explosives and Fire Works, Gas Godowns, Crusher Units. Sewage Treatment Plants, Dumping Yard. Slaughter House Container Terminals with access width of 18m minimum. Saw mills with timber yard		
5	**Public and Semi public use zone**			
5.1	Local/State/Central Government/ Public Sector Offices and Other Related Public Buildings.	Cremation Ground / Crematorium, Burial Ground, Common Vault.	Bus terminals/ stand, and lorry stand	All other use premises not mentioned in columns (2), (3) & (4)

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Cottage Industries including coir, Service Industries of non-nuisance Nature (See Annexure-I), with number of workers limited to 6 without power or 3 workers with power limited to 5 HP	Fuel filling stations.		
	Educational Institutions, Library and reading rooms, Social welfare centres	Transmission towers and wireless stations.		
	Clinics, Diagnostic centres and hospitals, Civil defence and home guard	Auditorium, Wedding halls/ Community halls incidental to public and semi-public uses, Convention centres, Outdoor games stadium, Parking plazas.		
	Residential Quarters incidental to public and semi public use, Ashram/Mutts.	Sewage treatment plants		
	Tot lots/ parks/ Playgrounds			
	Places of worship			
	Museum, Indoor games stadium, Open air theatre Swimming pools, Exhibition centres and Art gallery, Camping sites.			
	Public Utility Areas and Buildings, Additions and alterations to the existing public and semi public buildings including addition of new blocks without altering the use.			

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
6	**Traffic and Transportation use zone**			
6.1	Transport terminals such as bus terminals/stand, truck/ lorry stand, boat jetty/ port/ harbours autorickshaw stands, taxi/jeep stands, container terminals including constructions that form an integral or essential part of the terminal.	Public Utility Areas and Buildings	Container Terminals provided that the access has a width of 18m minimum.	All other use premises not mentioned in columns (2), (3) & (4)
	Any incidental uses to the transport terminals such as Retail Shops, Restaurants, Canteen, Movie halls, Recreational facilities etc. with floor area limited to 30% of the built-up area of the terminal.	Fuel Filling Stations		
	Staff Quarters, Offices, Night Shelters, Guest Houses etc incidental to the transport terminals			
	Parking Plazas, Transmission Towers and Wireless Stations.			
7	**Recreational Open Spaces**			
7.1	Any construction/ land development essential for the development/ improvement of open air recreational facilities.	Public Utility Areas and Buildings which will not affect the character of the area.		All other use premises not mentioned in columns (2), (3) & (4)
	Fish Landings, Boat Jetties, Guided Boat Rides, Watch Towers, Water Sports Facilities, Eco walkways, Fair grounds and similar uses			
	Tot Lots, Park, Play Grounds, Swimming Pools, Open Air Stadium, Fair Grounds, Open Air Theatre, Zoological and Botanical Garden, Bird Sanctuary, Eco Walk Way etc.			

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
8	**Dry Agriculture use zone**			
8.1	Agriculture, horticulture and fodder cultivation, pastures, grazing ground, and other types of cultivation including social forestry.	Cremation ground / crematorium, burial ground, common vault		All other use premises not mentioned in columns (2), (3) & (4)
		Dumping Yard, Storage of explosive and fireworks, Gas Godowns, Storage of explosive and fireworks, Gas Godowns		
	Dairy Farms, Fish farms, Seed farms, Poultry farms, Plant nursery, pump house, wells and irrigation ponds.	Slaughter Houses		
		Piggery farm		
	Single Family Residential Buildings	Swimming pools, Parking Plazas, Auto rickshaw stands, taxi/ jeep stands		
	Residential quarters/flats with floor area limited to 1500 m2, and height up to 10 m from ground level	Fish/ Meat processing centres		
	Orphanages, old age homes, dharmasala, ashrams, mutts, madrasa.	Places of worship		
		Sewage treatment plants		
	Clinics (Outpatient) and diagnostic centres - floor area limited to **100 m^2.**	Saw mills		

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Shops, professional offices, commercial offices and establishments, banking and financial institutions, Gymnasium, Yoga Centres, restaurants, canteens – floor area limited to **200 m^2.** Police Post/Police Station, Post and Telegraph office, Fire Post/ Fire station, Telephone Exchange, wireless stations and Telecommunication towers, Transmission towers. Day Care and Creche, Nursery/ Kinder Garten / Primary & Upper primary schools. Library and Reading Rooms, Godowns/ warehouses/ Storage – non hazardous – floor area limited to **100 m^2.** Storage of Agricultural produces and seeds, Green houses. Cottage industries, Service industries of non-nuisance Nature (See Annexure -I) Automobile workshops for 2/3 Wheelers Tot Lots/Parks/Play Grounds, Saw mills, Weigh Bridge. Tot lots, parks, Playgrounds, Camping sites Public utility areas and buildings	Fuel Filling Stations	Lorry stand	

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
8.2	**Provided that the access road has a width of 8m minimum**			
	Clinics (Outpatient) and diagnostic centres - floor area limited to **200 m^2.** Shops, professional offices, commercial offices and establishments, banking and financial institutions, Gymnasium, Yoga Centres, restaurants, canteens – floor area limited to **500 m2.** Residential buildings consisting of single or multifamily dwellings, residential flats/apartments upto a height of **16 m** Cottage industries, Service industries of non-nuisance Nature (See Annexure -I) Library and Reading Rooms, Social welfare centres– floor area limited to 200 m2. Godowns/ warehouses/ Storage – non hazardous – floor area limited to **200 m^2.** Auditorium/Wedding Halls/Community halls floor area limited to **500m^2.** Hospitals & Health Centres **with number of beds limited to 5.**	Indoor stadium, Convention centres etc Junk yards, Timber yards		
8.3	**Provided that the access road has a width of 12m minimum**			
	Residential buildings consisting of single or multifamily dwellings, residential flats / apartments, residential quarters.	Stacking yards, Godowns/ Warehouses / Storage – non-hazardous materials.		

Para No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
		Higher Education Institutions. Health Care Facilities		
9	**Wet Agriculture use zone**			
9.1	Paddy cultivation Agriculture/ Horticulture/ Fodder cultivation/ Fish Farms/ Seed Farms/ Pump House/ Wells and Irrigation Ponds without any building construction. 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.	Minor Public Utility areas & Public utility buildings which will not affect the character of the area.		All other use premises not mentioned in columns (2), (3) & (4)
10	**Water bodies**			
10.1	All existing water bodies shall be conserved. Bridges, Side protection walls, Bathing Ghats, Floating jetty etc. may be permitted based on community level requirements. Water landings, Pump Houses.	Fish farms	Minor Public utility areas & buildings which will not affect the character of the area.	All other use premises not mentioned in columns (2), (3) & (4)

11	Special use zone	
	Developments in this Zone may be permitted by Secretary of Kunnamkulam Municipality. For the projects proposed in Paddy land or Wet land, developments shall be subject to the provisions of Kerala Conservation of Paddy Land and Wet land Act in force in the State. The proposals which are marked as P 01, P 02, P 03, P 09, P 11, P 12 are proposed in private owned lands, and the proposals P 04, P 05, P 06, P 07, P 08, P 10, P 13 are proposed in Municipal owned lands. In private land proposals ,the land to be either acquired or procured through Land Pooling or PPP or any other workable methods If these projects are not materialised in corresponding demarcated land within a period of 5 years, from the date of sanctioning of this Master Plan , The freezed land may be released and assigned to a use permitted/restricted in the surrounding land use zone in the Proposed Land Use Map by the Secretary with the concurrence of the Town Planner, based on the application for building permit received.	
P 01	Waste water recycling plant (Near victory Inn)	The proposed land located in Chowanur Village, Re Survey number - 24 Part, Extent of land - 0.15 Ha. Water tanks, recycling plant, Supporting amenities for waste water recycling unit
P 02	Waste water recycling plant (Near Thurakkulam)	The proposed land located in Kunnamkulam Village, Re Survey number - 75 part, Extent of land - 1.08 Ha. Water tanks, recycling plant, Supporting amenities for waste water recycling unit
P 03	Coconut procurement centre	The proposed land located in Kunnamkulam Village, Re Survey number - 78 part, Extent of land - 0.036 Ha. Shops, marketing centre related to agriculture and allied sectors
P 04	Nalpamara thoppu	The proposed land located in Kunnamkulam Village, Re Survey number - 101 part, Extent of land - 0.15 Ha. Open air recreation facilities, public gathering and cultural programme areas etc.
P 05	Sports complex cum stadium	The proposed land located in Kunnamkulam Village, Re Survey number - 103 part, Extent of land - 4.14 Ha. Open Air Stadium, Play Grounds, Parking area, Indoor games areas, General Amenities for sports complex
P 06	Indoor stadium	The proposed land located in Kunnamkulam Village, Re Survey number - 47 part, Extent of land - 0.12 Ha. Any construction/land development incidental to sports complex/indoor stadium
P 07	Printing Heritage Museum	The proposed land located in Kunnamkulam Village, Re Survey number - 48 part, Extent of land - 0.29 Ha. Museum related to Printing Heritage of Kunnamkulam, General amenities for public buildings, Parking area

P 08	Children's park	The proposed land located in Kunnamkulam Village, Re Survey number - 48 part, Extent of land - 0.39 Ha. Any construction/land development essential for the development/ improvement of open air recreational facilities mainly for children
P 09	Multilevel parking	The proposed land located in Kunnamkulam Village, Re Survey number - 50 part & 61 part, Extent of land - 0.85 Ha. Car stacking units (either manually or semi/fully mechanized), Any other amenities incidental to multilevel parking areas
P 10	Techno city	The proposed land located in Kunnamkulam Village, Re Survey number - 53 part, Extent of land - 0.48 Ha. All industries other than obnoxious and nuisance type related to engineering and electronic based products
P 11	Craft village	The proposed land located in Kunnamkulam Village, Re Survey number - 32 part & 34 part, Extent of land - 1.53 Ha. Utility Installations Amenities essentially serving the needs of craft village such as work space, exhibition stalls, storage, machineries for rock cutting (non-nuisance in nature), water treatment unit etc.
P 12	Cultural centre-Kaniyampal	The proposed land located in Kunnamkulam Village, Re Survey number - 116 part, Extent of land - 0.13 Ha. Performance centre, Tourist refreshment centre, tourism information centre, Recreational Clubs, Social Welfare Centres, Libraries and reading rooms
P 13	Development of Thurakkulam Municipal Market	The proposed land located in Kunnamkulam Village, Re Survey number - 75 part, Extent of land – 1.31 Ha. Slaughter house, Solid waste treatment plant, loading and unloading space and buildings incidental to market uses.

ANNEXURE - I

List of non-obnoxious and non-nuisance type of service or light industries

1. Aerated water and fruit beverages
2. Apparel making
3. Assembly of air coolers and conditioners
4. Assembly of bicycles, baby carriage and other small non motorized vehicles.
5. Atta - chakks
6. Ayurvedic medicinal formulations, Ayurvedic health club
7. Bakery products, biscuits, confectionaries
8. Bamboo and cane products (only dry operations)
9. Block making for printing
10. Card board or corrugated box and paper products (paper or pulp manufacturing `excluded)
11. Carpet weaving
12. Cement and concrete products (where crusher is not used)
13. Chilling plants and cold storage
14. Coir (without bleaching / dyeing)
15. Concrete batching plants
16. Cotton and woolen hosiery/ Cotton and silk printing
17. Electro plating
18. Electronics and electrical goods
19. Electronics equipment (Assembly)
20. Engineering workshop and general fabrication works (without any chemical treatment)
21. Embroidery and lace manufacturing
22. Flour mills (job work only)
23. Foam bed, latex thread
24. Foot wear (rubber and PVC)
25. Furniture making
26. Fountain pens
27. Garment stitching, tailoring
28. Gold and silver smithy
29. Gold and silver thread sari work
30. Ice- cream or ice making

31. Insulation and other coated papers (paper or pulp manufacturing excluded)
32. Jobbing and machining
33. Light engineering
34. Laundry, dry cleaning and dyeing
35. Manufacturing of formulated synthetic detergent products
36. Manufacture of soaps involving process without generation of trade effluents (saponification of fats and fatty acids only)
37. Mineralized water
38. Musical instruments manufacturing
39. Oil ginning/expelling
40. Optical frames
41. Paint (by mixing process only)
42. Paper pins and U- clips
43. Power looms / hand looms (without dyeing & bleaching)
44. Photo and picture framing
45. Pressure testing units
46. Printing press
47. Rice mills
48. Rope (cotton and plastic)
49. Rubber gloves other than that for surgical and medicinal purpose
50. Rubberised coir mattresses
51. Scienfific and mathematical instruments
52. Sports goods
53. Steeping and processing of grains
54. Small foundries
55. Tissue culturing
56. Toys
57. Water softening and demineralization plants
58. Watch,pen and spectacles repairing

ANNEXURE - II

List of obnoxious and nuisance industries subject to Objectionable sounds , dust, odours, fumes, effluents or processes constituting hazardous use and which are to be located in hazardous zones (grouped) under Indian Standard Industrial classification

(vide Regulation 7- 1, 7 - 2 and 13-2)

Manufacture of Food Stuff:

(1) Slaughtering, preservation of meat and fish and canning of fish

Manufacture of Beverages:

(2) Production of distilled spirits, wines, liquor etc. from alcoholic fruits and salts in distillery and brewery

(3) Production of country liquor and indigenous liquor such as toddy, liquor from mahua, palm juice

Manufacture of textiles:

(4) Dyeing and bleaching of cotton

Manufacturing of wood & wooden products, sawing and planning of wood:

(5) Wood seasoning

(6) Manufacture of veneer & plywood

(7) Paper, pulp and straw board

Manufacture of leather and leather products:

(8) Currying, tanning and finishing of hides and skins and preparation of fin ished leather

Manufacture of Rubber petroleum & local products:

(9) Manufacture of tyres and tubes and tyre retreading

(10) Manufacture of industrial and synthetic rubber

(11) Reclanation of rubber

(12) Production of petroleum, kerosene and other petrol products in refineries

(13) Production of chemicals and chemical products

Manufacture of chemical and chemical products:

(14) Manufacture of basic industrial chemicals such as acids, alkalies and their salts, not elsewhere specified (specially sulphurious, sulphuric, nitric, hydrochloric etc. acids, ammonia chlorine and bleaching powder manufac ture.)

(15) Manufacture of dyes, paints, colours, ink powder, varnishes, printing ink etc.

(16) Manufacture of fertilizers (specially from organic materials)

(17) Manufacture of disinfectants and insecticides

(18) Manufacture of Ammunition, explosives and fire work

(19) Manufacture of matches

Manufacture of Nonmetallic mineral products other than Petroleum and coal:

(20) Manufacture of cement

(21) Manufacture of lime

(22) Manufacture of plaster of paris

Manufacture of Basic Metals and their Products:

(23) Manufacture of iron and steel including sheeting, refining, rolling and con version into basic forms

(24) Manufacture including smelting, refining etc. of nonferrous metals and alloys in basic forms

(25) Manufacture of ornaments

Manufacture of machinery (other than transport) and electrical equipment:

(26) Manufacture of all kinds of battery, Miscellaneous items not covered above

(27) Incineration, dumping and reduction of offal, dead animals, garbage or refuse

(28) Manufacture of gelatin and glue

(29) Fat, tallows, grease of lard refining of manufacture

(30) Bone meal, bone girst and bone powder

(31) Manufacture of cashewnut shell oil and

(32) Other similar types of nuisance industries.

ANNEXURE -III

KUNNAMKULAM MUNICIPALITY

COUNCIL MEMBERS - 2013

Ward. No.	Councilor	Ward Name
1	Sri. Muhammadunni. K.K	Muthuvammal
2	Smt. Komala Soman	Kizhoor South
3	Smt. Sajini Preman	Kizhoor North
4	Smt. Amrutha Babu	Kizhoor Centre
5	Sri. Unnikrishnan Master C.K	Vaissery
6	Smt. Saramma Mathappan	Nadupanthi
7	Smt. A. Lakshmikutty	Kakkad
8	Smt. Smitha Jinni	Munimada
9	Smt. Suma Anil	Ayyamparambu
10	Smt. Beena Ravi	Ayyappathu
11	Sri. Soman K.A	Cherukunnu
12	Sri. C.V. Baby	Urulikunnu
13	Smt. Sunitha Shivaraman	Chowannur
14	Sri. Shaji A.V	Malankara
15	Sri. Geevar K.V	Town
16	Sri. Somashekharan T	Kanippayyur
17	Adv. Rajeev C.B	Anaikkal
18	Sri. Jayasingh Krishnan	Kaniyambal
19	Smt. Suma Gangadharan	Nehru Nagar
20	Sri. T.S. Subrahmanyan	Shanthi Nagar
21	Smt. Leena Sukumaran	Thekkepuram
22	Sri. K.B. Shibu	Kurukkanpara
23	Adv. Piljo Vargheese	Arthat East
24	Smt. Suhasini Soman	Cheeramkulam
25	Sri. Anil V.G	Porkkalengadu
26	Adv. K.S. Benoy	Injikunnu
27	Sri. C.B. Sreehari	Chemmannur North
28	Smt. Reena Pradeep	Chemmannur South
29	Sri. Anirudhan S.R	Arthat South
30	Smt. Shobhana Haridasan	Thekkan Chittanjoor
31	Smt. Sheeja Pradeep	Anjoorkunnu
32	Smt. Ramani Sukumaran	Anjoor
33	Sri. K.K. Murali	Kavilakkad
34	Smt. Geetha Sasi	Chittanjoor
35	Sri. Ullas M.V	Alathoor
36	Smt. Sathi Ashokan	Anjoor Palam
37	Smt. Safiya Moideen	Vaduthala

KUNNAMKULAM MUNICIPALITY

COUNCIL MEMBERS - 2015 - 2020

Ward. No.	Councilor	Ward Name
1	Smt.Anitha Sukumaran	Muthuvammal
2	Sri. P.M Suresh	Kizhoor South
3	Sri. Assis K.A	Kizhoor North
4	Sri. K.B Saleem	Kizhoor Centre
5	Smt.Sheeba V.M	Vaissery
6	Sri.Biju C Baby	Nadupanthi
7	Sri.P.I Thomas	Kakkad
8	Sri.Bineesh P.K	Munimada
9	Sri.Anandan.K.K	Ayyamparambu
10	Sri.Soman K.A	Ayyappathu
11	Sri. Beena Ravi	Cherukunnu
12	Smt.Sunitha Sivaraman	Urulikunnu
13	Sri.Shaji A.V	Chowannur
14	Smt.Beena Libin	Malankara
15	Smt.Nisha Jayesh	Town
16	Smt.Indira	Kanippayyur
17	Smt.Karthiayini	Anaikkal
18	Smt.Mohini Shajan	Kaniyambal
19	Smt. Suma Gangadharan	Nehru Nagar
20	Smt.Mini Moncy	Shanthi Nagar
21	Sri.Sreejith A.S	Thekkepuram
22	Smt.Vidya Ranjith	Kurukkanpara
23	Smt.Misha Sebastian	Arthat East
24	Sri.Jaisingh Krishnan	Cheeramkulam
25	Smt.Sreeja Praji	Porkkalengadu
26	Smt.Seetha Ravindran	Injikunnu
27	Smt.Pushpa.John	Chemmannur North
28	Sri.O.G Baji	Chemmannur South
29	Smt.Priya Sajeesh	Arthat South
30	Sri.Winson Jose	Thekkan Chittanjoor
31	Sri.Shejeesh.K.C	Anjoorkunnu
32	Sri.K.K Murali	Anjoor
33	Smt.Sandya Prabhu	Kavilakkad
34	Smt. Geetha Sasi	Chittanjoor
35	Smt.Reshma Sunil	Alathoor
36	Sri.T.K Sivadasan	Anjoor Palam
37	Sri.Sujeesh.A.S	Vaduthala

SIC WORKING GROUP MEMBERS - 2013

1. Agriculture, Animal Husbandry, Diary Development and Fisheries Sector

Chairman : Sri. Jayasingh Krishnan. M.K, Chairman, Development Committee

Convenor : Agriculture Officer, Agriculture Office, Kunnamkulam

Members :
1. Sri. Simon Srambickal
2. Sri. Verghese Pulikkottil
3. Sri. Shibu K.B, Councilor
4. Smt. Sobhana Haridas, Councilor
5. Sri. Muhammadunny.K.K
6. Smt. Suma Anil
7. Smt. Neena K Menon

2. Irrigation and Watershed Development Sector

Chairman : Sri. K.V. Geever, Chairman, Health standing Committee

Convenor : Assistant engineer, Minor irrigation

Members :
1. Sri. Surendran C.K.
2. Sri. Mohanan V.A
3. Smt. Suma Gangadharan
4. Smt. Sathi Asokan
5. Smt. Amrutha Babu
6. Smt. Suma Anil
7. Smt. Neena K Menon

3. Industry and Commerce Development Sector

Chairman : Sri. M.V. Ullas, Chairman, Education standing Committee

Convenor : Industrial extension officer, Kunnamkulam.

Members :
1. Sri. K.P.Davis
2. Sri. V.K.Venugopalan
3. Smt. Lakshmykutty teacher
4. Smt. Reena Prathap
4. Smt. Safiya Moidheen
5. Smt. Ramani Sukumaran

7. Social Welfare and Poverty Reduction Development Sector

Chairman : Smt. Saramma Mathappan, Vice chairperson, Kunnamkulam

Convenor : Social Welfare officer, CDPO.

Members : 1. Sri. Cheru master

2. Sri. Anirudhan S.R.

3. Sri. Labeeb Hassan

4. Smt. Smitha Jini, Chairperson, Welfare standing committee.

5. Smt. Sheeba Biju.

6. Smt. M.K.Thankamany.

8. Scheduled Caste and Scheduled Tribe Development

Chairman : Adv. Binoy K.S, Councillor

Convenor : S.C.Development officer, Chowwannur Block

Members : 1.Sri. Sasi

2. Sri. Thavaraj.K.K

3. Smt. Geetha Sasi.

4. Smt. Suhasini Soman

9. Power and Telecommunication Development Sector

Chairman : Sri. Unnikrishnan master

Convenor : Asst. Executive engineer, Kunnamkulam.

Members : 1.Sri. M.A.Lohithakshan

2. Sri. Eapen George

3. Sri. Shaji A.V.

4. Smt. Sunithasivaraman

10. Tourism Development Sector

Chairman : Sri. Anil.V.G, Councillor

Convenor : Tourism Deputy director, Thrissur.

Members : 1. Sri. Raju James panakkal

2. Sri. Bijupal Nharakkatt

3. Smt. Beenaravi

4. Smt. Sheeja Pradeep

5. Sri. A.G. Sathyan
6. Sri. Dileep George
7. Sri. Benny Abraham
8. Sri. ThampanTholath

11. Environment and Waste Disposal Development Sector

Chairman : Adv. Philjo Varghese, Councillor

Convenor : Health Supervisor, Kunnamkulam.

Members : 1. Sri. K.C.Santhosh Kumar
2. Sri. Gopi Master
3. Sri. Somashekaran T
4. Smt. Komala Soman

ANNEXURE -IV

LOCAL SELF GOVERNMENT DEPARTMENT - PLANNING

THRISSUR PLANNING UNIT

Planning Team:

Smt.Jeeva Liza Xavier, Town Planner in charge

Smt. Seema.S.R, Former Town Planner

Shri. K.M.Gopakumar, Town Planner

Shri. V.K.Mohandas, Former Town Planner

Shri. V.A. Gopi, Former Town Planner

Smt. P.V. Mary, Fomer Town Planner

Sri. Manoj Kumar.K.B, Deputy Town Planner

Smt.Deepa V.P, Former Deputy Town Planner

Smt. Jinumole Varghese, Former Deputy Town Planner

Smt. Lathika.P.V, Assistant Town Planner

Smt. Minu Pathrose, Former Assistant Town Planner

Smt. Neethu Krishna, Ist Grade Surveyor/ Draftsman

Shri. P.K. Ravindran, Ist Grade Surveyor/ Draftsman

Technical Assistance:

Shri Bigith.V.B , Planner Associate.

Shri. Ranadiv K Ravindran, Former Planning Assistant GIS

Smt. Reshma K Ravindran, Planning Assistant GIS

Kumari. Zahna Mohammed Sherief, Former Planning Assistant

Smt. Rasmi K Raveendran, Computer Assistant

Smt. P.R. Pankajavally, Former Research Assistant

Smt. Bindu. C, Former Statistical Assistant

Shri.Sajan. V.R, Former Statistical Assistant