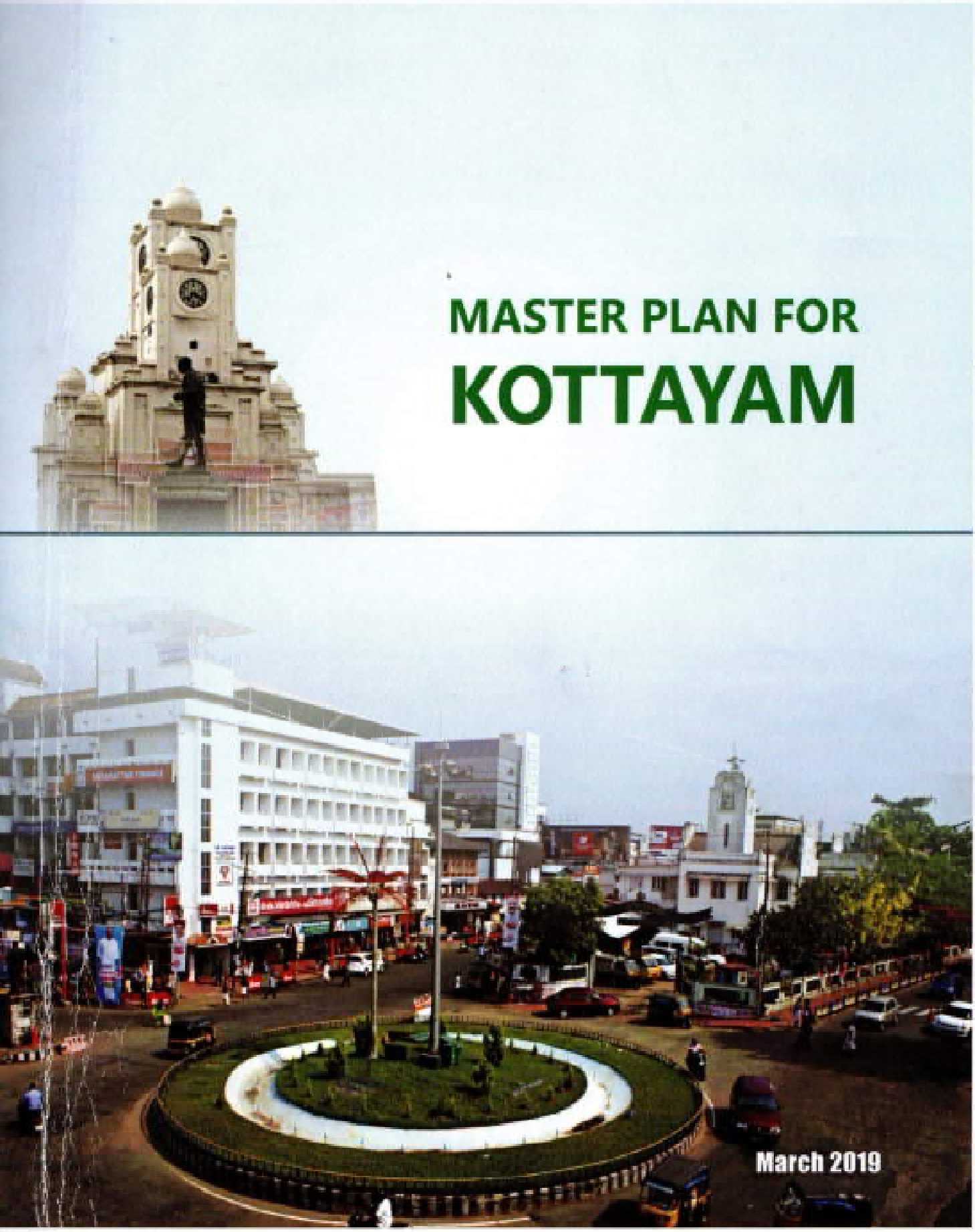


MASTER PLAN FOR
KOTTAYAM

March 2019

DEPARTMENT OF TOWN & COUNTRY PLANNING, KERALA STATE

MASTER PLAN FOR

KOTTAYAM



MARCH 2019

DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE

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FOREWORD

Kottayam "the Land of Letters, Latex and Lakes" is one of the major urban centres of Central Kerala, has prominent role in the socio-economic activities of the region. The present Development plan was sanctioned way back in 1979 and the plan covers the limit of erstwhile Kottayam municipality and part of Kumaranalloor, Vijayapuram and Nattakom Grama panchayats. The municipal limit of Kottayam has been expanded by merging two adjacent Grama Panchayats Kumaranalloor and Nattakom. Considering the changed development scenario, a new planning Area has been delineated and the Planning Area comprises the Kottayam Municipality and the adjacent two Grama Panchayats of Vijayapuram and Panachikkad.

Lack of proper infrastructure facilities made the development of the town in a stagnated situation and thus resulting in the deprivation of Trade and Commerce. The intensive urban development without sufficient supporting facilities may lead to degradation of the city. The new Master Plan envisage to accommodate the contemporary challenges, in the terms of fast urban growth and gaps in infrastructure facilities on one hand and aspirations of various stakeholders, competitive future in terms of attractiveness for investment in view of the last changing urban landscape within and its surroundings at a regional level.

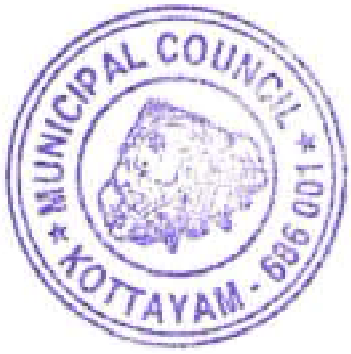
The preparation of Master Plan for Kottayam was a joint effort of Joint Town Planning Committee constituted for the preparation of Kottayam Master Plan and the Office of the Town planner, Kottayam under the guidance and supervision from the office of the Chief Town Planner, Thiruvananthapuram with the assistance of the Special Committee constituted especially for the purpose. The Plan took this shape with the active involvement and contributions of this team.

All the Joint Town Planning Committee members, including Presidents of Vijayapuram and Panachikad Grama Panchayat, actively took part in the preparation of this Development Plan. Chairpersons and Members of all subgroups of Spatial integration committee have done commendable work in data collection, gathering people's support and incorporating people's aspirations as part of this plan. I also acknowledge the contributions of former Chairpersons of Kottayam Municipality and JTPC Sri. Sunny Kalloor and Sri. M.P. Santhoshkumar. The encouragement and enthusiasm of all elected representatives need special mention in the completion of this work is gratefully acknowledged.

The staff of Kottayam District office of Town and Country Planning Department, whole heartedly involved in the successful completion of this project under the leadership of the Smt. Suja Mathai, District Town Planner. Their hard work and commitment for the completion of this project is specially acknowledged.

I hope that this Master plan for Kottayam can act as catalyst to the development of Kottayam in a sustainable manner and will help the future development of the town in a planner manner.

Kottayam,
07-03-2019



Dr. SONA P.R, MA, M.Phil, Ph.D
Chairperson JPC Kottayam and
Chairperson Municipal Council, Kottayam

PREFACE

Planning is a prerequisite for effective development. Development becomes comprehensive when the physical, social and economic variables of an area are planned in an integrated manner. Many functions that the towns perform as seats of industry, trade and business and as providers of various services, including higher education, specialized health care services, communication etc have an impact on the development and welfare of not only the resident population but on people of a wider service area. Hence planned development of our urban areas is a matter of priority.

Kottayam is the major urban centre of the Central Travancore region of the state. The town has grown steadily and commands a key position in the region as a principal Commercial, Educational and Medicare centre. In addition to that, blessed by a rich hinter land of agro based products the town possesses enough potential for further growth. It is necessary to take advantages of available potentials so as to take advantages of the available resources and achieve best results at the local level as well as regional level.

As early as in 1970s planners have recognized the need for a long term Development Plan for Kottayam Town considering the town's growth trends, resources potentials, locational aspects, etc., and prepared a Development Plan for the town and environs, which was sanctioned by the Government way back in 1979 vide GO (Ms.) No.190/79 LA&SWD dated 18.8.1979. Later Government have varied the development controls of the Plan vide GO (P)No.219/2008/LSGD dated 4.8.2008. The Plan has, to a certain extent, been able to guide and control development of the planning area as envisaged. However there befell substantial changes in the physical form and structure of the town over a period of time, which obviously created problems both to the common men and to the executing authorities. Further, the municipal limit was extended in 2010 by merging two adjacent Grama Panchayats of Nattakom and Kumaranallur to Kottayam town. So the need for a new Plan covering the present town limits arose.

The regional aspects of the town revealed Kottayam as the first order settlement in the district with service area transcending even the boundaries of the district. Thus, the town is supposed to cater the requirements of higher order facilities in education, health and in other sectors of the entire population in the service area. Studies revealed that Kottayam Municipality and the neighbouring Grama Panchayats of Vijayapuram and Panachikkad together act as a single planning unit. Hence the delineated planning area for preparation of Development Plan included the areas covered by Kottayam Municipality and the neighbouring Grama Panchayats of

Vijayapuram and Panachikkad. Hence Government have vide G.O.(Ms.)No: 12/2011/LSGD dated 14.01.2011 constituted Joint Town planning Committee (JTPC) for the preparation of Master Plan for Kottayam.

The Joint Town Planning Committee chaired by Smt. Dr. Sona P.R and the Special Committee constituted by the Joint Town Planning Committee extended all supports and played crucial role in the time bound preparation of this Plan. The sustained collective efforts of the JTPC, Special Committee and the Department of Town and Country Planning culminated in the documentation of this Master Plan. As per GO (Ms) No: 3917/2017/LSGD dated 16-02-2017, Government gave permission to publish the new Master plan and it was published in Kerala Gazette No.24 dated 13.06.2017. Based on the Objection/suggestion received from three local bodies and Joint Town Planning Committee resolutions Published Master Plan was modified.

I take this opportunity to appreciate the leadership provided by the mother city of Kottayam and the constituent grama panchayats of Vijayapuram and Panachikkad in the Planning Area. As the planning exercise encompassed various sectors, it required the support and positive interaction with many public and private agencies / departments. It would be unfair if their collective contribution and cooperation are not acknowledged. I appreciate the consistent efforts of the officials at the Chief Town Planner's (Planning) office for giving timely guidance and instructions throughout this process. All the staff of District Town and Country Planning office, Kottayam has to be appreciated for completing this Plan in the stipulated time under the leadership of Sri. P. Anil Kumar and Smt. Suja Mathai, District Town Planners, Kottayam during their tenures.

The Master plan was prepared through a systematic process, comprising of extensive data collection and analysis, identification of development issues, setting up of goals and objectives, formulation of development concept and carving out policies & strategies followed by detailed sectoral proposals. The Plan has proposals for the economic development of the planning area, provision of social and physical infrastructure with due importance for the protection of environment.

I hope that this Master Plan will provide the frame work for planned development of Kottayam.

Thiruvananthapuram,
20.03.2019

Gigi George
Chief Town Planner (Planning)

ACKNOWLEDGEMENTS

The Master Plan for Kottayam visualises a planned spatial development for the improvement of aesthetic, convenient and healthy living condition of the citizens. Experience around the world indicates that adoption of systems approach, scientific techniques and innovative solutions at various stages of development of the town helps the city to grow in a professional manner. Urbanisation has been one of the dominant contemporary challenges as a growing share of global population lives in cities. Therefore planned growths are unavoidable for urban areas.

The present Development plan for Kottayam was sanctioned in 1979 and the plan covers the limit of erstwhile Kottayam Municipality and part of Kumaranallore, Vijayapuram and Nattakom Grama Panchayats. The municipal limit of Kottayam has been expanded by merging two adjacent Grama Panchayats. Considering the development scenario the planning area delineated comprises the Kottayam Municipality and the adjacent two Grama Panchayats of Vijayapuram and Panachikkad. As per GO (Ms) No: 3917/2017/LSGD dated 16-02-2017, Government gave permission to publish the new Master plan and it was published in Kerala Gazette No.24 dated 13.06.2017. Objection/suggestion was called for from the public and hearing was conducted at three local bodies for all applicants. Based on this and Joint Town Planning Committee resolutions Published Master Plan was modified for getting it sanctioned from Government.

The preparation of Maser plan for Kottayam was completed as a joint effort of Joint Town Planning Committee constituted for the preparation of Kottayam Master Plan and the Office of the Town planner, Kottayam with the assistance of the Special committee constituted especially for the purpose, under the guidance and supervision from the office of the Chief Town Planner, Thiruvananthapuram. The plan took this shape with the active involvement and contributions from different sectors. I wish this opportunity to acknowledge them for their valuable contributions.

We sincerely thank Dr. Smt.P.R.Sona, Chairperson of Kottayam Municipality, Smt. Sisi Boby, President Vijayapuram Grama Panchayat and Sri. E.R. Sunil Kumar, President of Panachikkad Grama Panchayat together with JTPC members, SC members, Councilors and members of the local bodies who are wholeheartedly participated in the preparation of Master Plan and contributed their valuable suggestions and proposals addressing the people's aspirations, for bringing this venture in to a success.

The dynamic leadership rendered by Sri.M.P.Santhoshkumar, former Chairman of Kottayam Municipality and the Joint Town Planning Committee need special mention. The contributions of Sri.Baiju Cherukottayil, former President Vijayapuram Grama Panchayat, Smt.Jessy Chacko former President of Panachikkad Grama Panchayat and Sri.Sunny Kalloor former Chairman of Kottayam Municipality also thankfully acknowledged.

I express my sincere thanks to experts in State Planning Cell, for their encouragements and pertinent trainings and reviews for the completion of this project. I am indebted to Sri. Gigi George, Chief Town Planner (Planning), Sri. J Jayakumar, Senior Town Planner, Smt.Sabithamini, Town Planner and Sri. Pradeep, Assistant Town Planner and other staff of Planning Cell, CTP office, Thiruvananthapuram for their support and valuable guidance for the completion of this report.

The contributions made by the former Town Planners, Smt. Shiji.E. Chandran, Sri. M.A.Thomas and Sri P. Anilkumar from beginning to the final stage of this work is thankfully acknowledged. I gratefully acknowledge the commitment, hard work and whole hearted cooperation of the planning team in Town and Country Planning Department, Kottayam. I appreciate the support made by Deputy Town Planners, Smt. Sumol.G and Sri. Jose.K.Syriac, Assistant Town Planners Sri. M.P.Bhuvaneswaran, Sri Sudheer.P.Sukumar and Smt. Gigi Abraham for completion of this work. The works done by Town Planning Surveyors Sri. Rajan M. Joseph, Smt. Smitha K.G and Sri. Saifudeen P.A of this office are thankfully acknowledged for completion of survey works for the preparation of this Master Plan.

Lastly I thank and express my hearty gratitude to all staff of District Town Planning Office, Kottayam for their participation and support throughout the preparation of the Master Plan for Kottayam.

Kottayam
08/03/2019.

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Town Planner

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Part.I



STUDY AND ANALYSIS

1. Introduction

1.1 Introduction

Kottayam, known as “the land of letters, latex and lakes” is blessed with lush green landscape and abundant water bodies to hoist the hymn “God’s own Country”. Kottayam literally means the interior of a fort – *‘Kotta’* (fort) + *‘Akam’* (inside). The town is the headquarters of Kottayam district and an important trade and commercial, educational, printing and publishing centre of Centre Travancore Region of Kerala. The Mahathma Gandhi University and number of other premier educational and medical institutions are located in and around Kottayam town.

Kottayam is one of the oldest Christian centres in India. Establishment of Pazhaya Seminary in 1813 is a major mile stone in the development of the town. In addition to the Seminary the first English School of Kerala was established at Kottayam and later it upgraded as CMS College.



Establishment of CMS Press, Bhashaposhini, Malayala Manorama, Deepika in the earlier stage has enhanced the importance of Kottayam. Now the headquarters of major Malayalam dailies - Malayala Manorama, Deepika and Mangalam etc are located at Kottayam and almost all major Malayalam dailies are printing and publishing from Kottayam. In addition to the dailies a number of other publishers are functioning in Kottayam, publishing periodicals and other literary works.

Also a pioneering centre of modern education in Kerala, the town became India's first municipality to achieve 100% literacy in 1989 and the district became the first tobacco free district in India on September 28, 2008. The city of Kottayam is also known as *Akshara Nagari* (City of Alphabets) in honour of its contributions to print media and literature. The educational institutes of the Town are catering the needs of the town as well as the region.

Earlier Kottayam was an important trading centre of spices and commercial crops, especially rubber. Construction of K.K.Road and establishment of plantations in the high range has accelerated the economic development of Kottayam. Besides rubber, Kottayam is a trading place of other commercial crops like spices cultivated widely in the surrounding areas. Now the trading activity has slightly declined due to various reasons. The institutions like Indian Rubber Board, Plantation Corporation, Oil Palm India Limited etc are located at Kottayam.

The municipal town of Kottayam had an area of 15.55 Sq.Km and a population size of 60,728 (2001 census). The municipal town has been expanded by merging of two adjacent Grama Panchayats, ie. Nattakom and Kumaranallore with erstwhile Kottayam municipal area in 2010 and the area of the town have increased to 55.40 Sq: km and the total population has become 1, 44,911(2001).

A comprehensive study of the town and adjoining part will help to accommodate contemporary challenges in urban development with the interventions of a Development plan. Development Plan is a medium term plan providing to the people the comprehensive proposals for socio- economic and spatial development of the urban centre indicating the manner in which the use of land and the development there in shall be carried out by the local authority and other developmental agencies. It makes known publically the intention of the local authority regarding physical, social and economic developments of the urban centre, the facilities and services that are proposed to be provided in near future.

1.2 Need for a new Plan

Horizon period of the existing sanctioned Development Plan was 1991 and the plan has confined to the old municipal limit and the adjacent areas of the town to a limited extent. The land use and other infrastructural development proposals are intended for the horizon period 1991 and it has to be reviewed in accordance with the contemporary challenges faced by the society. Moreover that the municipal limit of Kottayam has been expanded by adding two adjacent Grama Panchayats Kumaranallore and Nattakom.

The revision of the existing development plan is essential considering the present trends of development and spreading of developments to the surrounding areas and the urban nature of the surrounding Grama Panchayats. Therefore delineation of

new planning area including the contiguous urban area to Kottayam town is essential.

1.3 Methodology

The methodology adopted for preparation of the Master Plan is as per the guidelines issued vide GO (Rt) No.2766/2009/LSGD dated 24.10.1999. As the delineated planning area comprises more than one local body a Joint Town Planning Committee (JTPC) has constituted for the purpose as provided in section 37 of TP Act 1108. The Joint Planning Committee for Kottayam was formed vide GO (Ms) No. 12/2011/LSGD Dated 14.01.2011. The Joint planning Committee constituted a Special Committee to support the preparation of Master Plan. The Chairman, Kottayam Municipality is the Chairman of the JTPC and Town Planner, Kottayam is the Convener of the committee. As per (GO (Ms) No: 3917/2017/LSGD dated 16.02.2017), Master plan for Kottayam has been published and notified in Kerala Gazette No.24 dated 13-06-2017. According to the Town and Country Planning Act 2016, objection/suggestion has been called for and scrutiny of it has been done by the Special Committee. Modification according to the special committee decision has been incorporated in the published Master plan. Complying these modifications, the resolution was taken by the Joint Planning Committee on 31.10.2018.

The plan preparation process consists of data collection, analysis (local analysis and spatial analysis), envisioning process, and detailing. The plan preparation process is detailed in Figure 1.1.

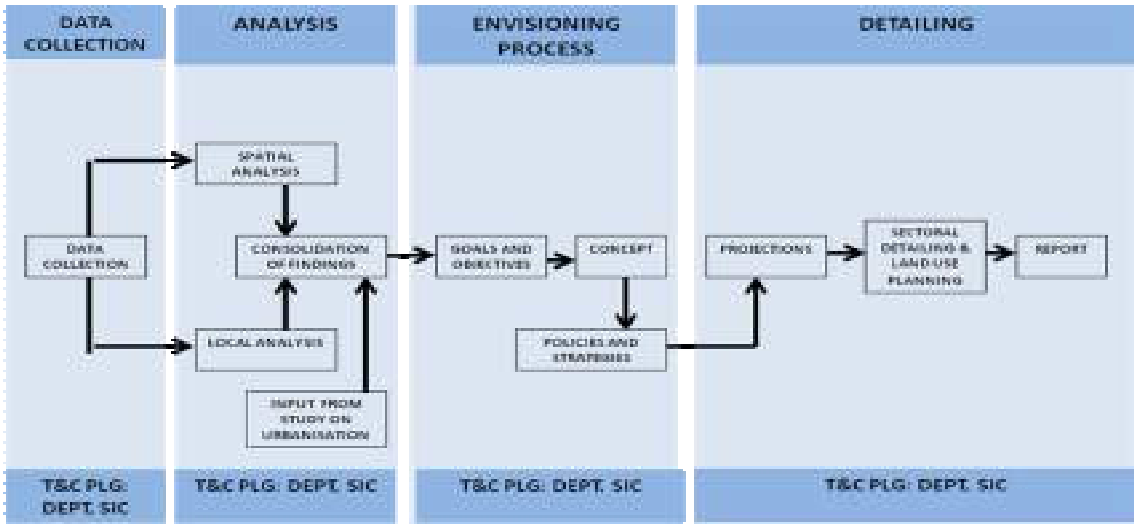


Figure 1.1 Plan preparation process and agencies involves

Detailed regional setting study was carried out in this connection which is documented as the District Urbanization Report (DUR) of Kottayam.

Community involvement

To make the planning process more sustainable and acceptable, the process should respond to the need of the end user and not just make provisions for the future. The activity of community participation is based on the principle that the built and natural environments works better if citizens are active and involved in its creation and management instead of being treated as passive consumers. The community participation is a source of wisdom and information about local conditions, needs and attitudes, and therefore improves the effectiveness of decision making. The peoples aspiration is ensured through the elected representatives in Kottayam Municipal Council and Ward Committees of Vijayapuram and Panachikkadu Grama Panchayats. Special Committee and different working groups constituted for involving in the different stages of preparation of Kottayam Master Plan played a vital role. After publication of the Master plan on 13.06.2017, objection/suggestion was called for from the public and hearing was done on every individual applicants, thus ensuring community participation in every aspects. Modification based on their suggestion has been incorporated in the new Master plan in accordance with the resolution of Joint Town Planning Committee. Peoples participation through detailed discussions and presentations were ensured at the meeting of Joint Town Planning Committee regarding the suggestions required for plan preparation and valuable guidance received from various agencies and NGOs.

1.4 Report

This report consists of 34 chapters and these chapters are grouped into four parts. Part I consists of 24 chapters, containing study and analysis of various sectors giving a detailed information about the existing condition of the town and different planning issues. Part II comprises of five chapters about integrated development vision. Part III comprises of three chapters about land use, transportation and sectoral proposals. The development regulations are included in Part IV and finance resources planning is included in Part V. The Existing land use and Proposed land use Maps are attached separately.

2. Evaluation of present plan

2.1 Introduction

The Development Plan 1971 – 1991 was prepared by the Department of Town and Country Planning under Town Planning Act 1108. The plan was sanctioned vide G.O. (MS) 192/79/LA & SWD dated 18.8.1979. The plan covers an area 21.57 sq.km. The entire old Kottayam Municipal area (15.55 sq.km), part of erstwhile Kumaranelloor and Nattakom Grama Panchayats, part of Vijayapuram Grama Panchayat were coming under the plan. The implementation of land use proposals and projects etc are examining quantitatively and spatially in this chapter.

2.2 Features of Present Development Plan



Figure 2.1 – Existing sanctioned Development Plan for Kottayam

Being the headquarters of Kottayam District and a major commercial centre in the Central Travancore region of Kerala, Kottayam commands an important position in the region. The town has regional influence in the field of education, cultural and

economic activities. The plan proposed that, the town will continue to act at as principal administrative, commercial, educational centre of the region. The strengthening of the industrial base of the town has taken as a policy in the plan. It also assumed that along with the improvement of the industrial base, trade and commerce, transport and communication activities etc would also develop.

Planning Region

The region identified for the plan covers an area of about 2,817 Sq.Km. The planning region comprising of 7 taluks, i.e *Vaikom, Meenachil, Kanjirappally, Changanassery and Kottayam* taluks of Kottayam district and *Kuttanad taluk* of Alappuzha district and *Thiruvalla taluk* of Pathanamthitta district.

High percentage of rural population, high man land ratio in rural areas, lack of adequate alternative and supplementary employment opportunities and industrial establishments, inadequacy of transport facilities compared to the low-land coastal area were the major regional planning problems identified in the plan.

Plan Objectives

The development plan for the region was prepared to achieve the following objectives

- Maximum utilization of natural endowments such as cash crops, paddy resources and human resources
- Revitalizing the economic base and improving the social condition such as housing and other amenities
- Establishment of a hierarchy of settlements starting from village settlements to the regional centre or regional headquarters and attracting the growing population to existing new urban centre by providing suitable employment opportunities and other incentives.
- Forming an efficient network of communication system
- Preservation of agricultural land and protecting the same from urban expansion as much as possible

Regional Pattern

The pattern proposed for the region was compact high-density urban centre and low density peripheral areas, saving as much land for cultivation as possible. It was also estimated that in course of plan period the urban population will be in the order of 7 lakhs, ie 9.20% of estimated population of the region. For achieving the

desired growth of urban population, industrialization has been proposed. Eight urban centres in the region namely – Kottayam, Changanassery, Thiruvalla, Ettumanoor, Vaikom, Pala, Kanjirappally and Mundakkayam have been identified as urban centres for the distribution of future population.

Population Projection

Arithmetic increase method, Geometric increases method, Semi-Logarithmic trend by least square, method of geometrical interpolation and extrapolation etc were adopted for projection of population. The projected population of the town as per the plan for the years 1971, 1981 and 1991 were 0.67 lakhs, 0.83 lakhs and 1.03 lakhs respectively.

Existing Land Use Pattern

The existing land use pattern of the erstwhile Municipal area in the year 1966 is given in Table 2.1.

Table 2.1 Existing Land use pattern

Use	Area (in Sq:km)	% of total area
Residential	10.32	64.88
Industrial	0.14	0.87
Commercial	0.22	1.40
Public & Semi Public	0.53	3.31
Parks & Open spaces	0.14	0.89
Transportation	0.59	3.71
Dry cultivation	0.57	3.56
Paddy fields	3.24	20.31
Water Courses	0.16	1.02

The existing land use pattern during that time reveals that, out total area of 15.91Sq.Km area, 11.94Sq: Km which is 75.06% of the total area was developed areas, and rest being under cultivating or water bodies. Scattered residential development, haphazard development of commercial establishments along important roads and junctions and comparatively large area under agricultural use were the main feature of land use at that time.

Physical extent of future urban area

The overall density of population was 15 persons per acre and developed area was 75% of total area. The high cost of providing urban services to the areas of low densities is often leads to leaving considerable portion of municipal areas without

amenities and services. In view of that, the future population density of the town was fixed as 50 persons per acre and overall density work out as 30 persons per acre in 1991. Based on this and projected population, the additional land required for accommodating the additional population calculated as 2 sq:km. Based on this, land of adjacent Grama Panchayats, i.e. Kumaranelloor (1,050 acres), Vijayapuram (253 acres) and Nattakom (150 acres) were proposed to annex to Kottayam town.

Future population size of the town

Using normal methods, the population for the year 1991 was projected as one lakhs. But the plan was prepared also with the objections of arresting at least to some extent the decreasing trend of growth of population by strengthening the economic base of the town, The impact of the regional development on the town was also taken into account in projecting the future population of the town. Therefore, the 1991 population of the town was assumed as 1.5 lakhs for the purpose of the plan.

Land use pattern proposed

For arriving at suitable standards for allocation of land for various urban uses, existing land use pattern of certain selected Indian towns were made. The space standards adopted in the plan for various urban land uses are given below:

Residential	-	2 acres / 1000 persons
Commercial	-	1 acre / 1000 persons
Industrial	-	2 acre / 60 persons
Public & Semi public	-	1.60 acres / 1000 persons
Education – High school	-	4 acres
Primary School	-	2.25 acres
College	-	12 acres
Medical facilities	-	5 beds per 1000 persons
Public Office	-	1.6 acre per 1000 persons
Park & Open space	-	0.80 acre per 1000 persons
Transportation	-	300 acre per 1000 persons

The proposed land use pattern of the Development Plan 1971 – 1991 is furnished in Table 2.2.

Table 2.2 Proposed land use 1991

Sl. No.	Use	Area in Sq.Km	Percentage
1	Residential	12.14	56.28

2	Public & Semi Public	0.97	4.49
3	Commercial	0.61	2.83
4	Industrial	1.21	5.61
5	Roads & Railways	1.81	8.39
6	Parks and Open spaces	0.49	2.27
7	Paddy field	3.56	16.50
8	Dry cultivation	--	--
9	Water courses	0.77	3.57
	Total	21.57	100.00

Planning Districts

For the distribution of future population and for the even distribution of shopping and other community facilities for the future population of the town, the town was divided into the Central business district, the Eastern residential district with its focal point at Kanjikuzhy, the Western residential district with its focal point at Thiruvathukkal, the Northern industrial – commercial - residential district with its focal point at Chuttuveli.

Occupational structure

As per 1961 census, the work force of the town constituted 28.61percent of the total population. In view of the possibilities for improving the economic opportunities and the probable increase female labour participation, a participation rate of 33.3% has been assumed for the year 1991.

The plan aims at a balanced distribution of the workforce in various sector of the economy. As the primary sector activities not boost the future economy of the urban area, importance has given for the secondary and tertiary sector. Following occupational pattern was suggested for 1991 population.

Projected population (1991)	1.5 lakhs
Working force (1991)	50000
Agricultural labours	1500 (3%)
Household industry	3500 (7%)
Manufacturing other than household industry	10000 (20%)
Construction	3000 (6%)
Trade & Commerce	10000 (20%)
Transport & Communication	4000 (8%)
Other service	18000 (36%)

2.3 Major Proposals

Major projects proposed in the plan, implementation strategy, rough cost estimate of the plan etc are given in the subsequent paragraphs.

Housing - Reconstruction of substandard houses and construction of new houses

Industry – About 270 acres of land proposed for industrial use within the town for manufacturing industries. Household industries proposed to locate on the fringes of residential and commercial area. Nagampadom – Chungom Industrial zone, Industrial zone near railway station, Kodimatha Industrial zone are the major industrial zones proposed.

Commercial – For the even distribution of population, shopping and other community facilities, the town has been divided into four planning districts. Central Business district, Eastern residential district, Western residential district, Northern industrial-cum-residential district are the districts.

The district centers at Kanjikuzhy and Thiruvathukkal has been provided with adequate shopping and community facilities to their respective population. About 5 acres of land was reserved at these centers. About 2.5 acres of land has been proposed for commercial use at sub centres – Churamattom, Kalathilpadi, Upputtil junction and Illickal Bridge. In northern Industrial cum residential area district at Chuttuveli junction, 2.5 acres of land has been proposed for commercial purpose.

Public and Semi Public uses

A new town hall and community center near L.B.S Road and a new College near Thiruvathukkal junction were the proposals in the sector.

Parks, Playgrounds and open space

A major recreational complex consisting of a stadium, park, swimming pool, amusement and entertainment center etc were proposed at Nagampadom. Open spaces and parks were proposed in the district and sub district centers.

Road Network within planning area

A clear hierarchy for roads has been established, depending on function to be performed by each road. A number of regional roads, town roads and feeder roads have been identified and there were proposals for development of these roads. M.C. Road, M.C Road Bypass, K.K. Road, Kottayam –Kumarakom road, Kottayam – Aymanam - Olassa Road, Kottayam – Puthuppally road are identified as regional roads. And the proposal was to develop these roads to 25.00m/18.00m. A net work of town roads of 12m width also proposed for intra-city traffic.

Regional roads

There were proposals to develop the regional roads to improve connectivity with Kochi the commercial capital of the state.The following three alternate alignments proposed in the plan.

Improvement of Kottayam – Vaikom road to highway standards

Improvement of Kottayam–Thalayolaparampu–Kanjiramattom–Ernakulam road

Kottayam – Kumarakom – Vechoor – Ernakulam road

Bus terminal

Proposal for a new bus terminal

Parking facilities

Proposal for improving parking facilities in the commercial area as part of re-development programmes for the market.

Railways

Proposal for Gauge conversion of railway line and railway siding to the industrial areas

Waterways

Development and improvement of Puthenthodu, Kodur river, Boat jetty canal and Market canal, Modernization of water transport system including mechanisation and containerisation, improvement to Meenachil river for navigation for the convenience of the industrial areas located near Nagampadom, landing facilities at Market landing, Kodimatha landing, Boat jetty, Illickal, Nagampadom, Kalathilkadavu, Parampuzha and Chungom were the proposals in the sector.

Water Supply

Proposals were there for improving water supply system for a projected population of 1.5 lakhs by 1991.

Sewage

Underground sewage collection scheme was proposed for congested market area. And there is also a proposal for a sewage treatment plant.

Tourism

Proposal was there for acquisition of 100 acres of land at Kumarakom to develop in as a tourist resort. Provisions of lodging accommodations, recreational complex at Nagampadom were the other proposals.

Power distribution

Proposal was there for setting up one more Substations at Kodimatha, within the town limit.

Rough Cost Estimate

An amount of Rs. 2,130 lakhs has been estimated for the implementation of Development Plan at that time. A detail of rough cost estimate is shown in following table 2.3.

Table 2.3 Rough Cost Estimate

Sl.No	Particulars	Rough cost (in lakhs)
1	Land acquisition & Development	450.00
2	Public Sector housing	290.00
3	Community facilities	190.00
4	Construction of Public Offices	54.00
5	Utilities and Services	290.00
6	Transport and Communication	428.00
7	Public sector industrial scheme	320.00
8	Planning works	7.50
	Total	2130.00

2.4 Plan Evaluation

Development plan for Kottayam reached its horizon year and evaluation of plan is made in the subsequent paragraphs.

2.4.1 Objectives

The level of achievements of the objectives of the plan is discussing here.

- The utilization of the resources of hinterland has not fully achieved. Establishments for processing/value additions of the raw materials have not came up as envisaged in the plan. Due to lack of industrialization, the economic base of the town has not improved much.
- The social sector especially in education, medical and housing sectors, there was tremendous improvement and the town is in far front in these sectors, when compare with the similar town of the state.
- In hierarchy of settlements, the town has been developed as a regional centre of the state and providing services and employment opportunities for the people from other centres.
- Better communication facilities have been established. The region has highest road density in the state.
- Another objective of the plan was preservation of agricultural land and protecting it from urban expansion. But it was not fully achieved.

2.4.2 Planning Policies

An evaluation of major policies and principles of the Development Plan 1971 – 1991 is made in the subsequent paragraphs.

- The projected population of the town by 1991 was 1,50,000. But the town has not reached this population size even in 2001. Moreover, the population size of the town is decreasing over the past two decades. It was increased up to 64,431 in 1981 but later it is reduced to 60,728 in 2001. The major reason for this is that, the economic base of the town has not strengthened as envisaged in the plan. But the surrounding Grama Panchayats recorded comparatively high growth rate.
- About 2 Sq.km. of land of adjacent Grama panchayats, proposed to annex to Kottayam town for provision of various urban facilities and activities and for

accommodating additional population. In 2009, two adjacent Grama Panchayats, Kumaranallore and Nattakom were annexed to Kottayam town and the present area of the town is 55.40 Sq.Km.

- The proposed land use of the Development Plan 1971 – 1991 has not achieved. (Detailed analysis made in the next paragraph).
- The proposal for preparation of detailed Development Plan for priority area has not fully implemented. Sanctioned detailed plan is available for just 2.27 Sq.km of area of the town.
- The proposal for close watch of the trend of development in plan area and modifications to the plan to suit with the changed scenario has not been done.
- The proposal for prioritization of schemes and synchronising it with five year plan has not followed.
- The proposal for a co-ordination committee for the smooth implementation of the projects has not materialized.

2.4.3 Land use

The land use plan is the translation of the planning policies and principles in spatial dimensions. So the analysis of land use would indicate the extent of implementations of Development Plan. A comparison of the land use proposed in the Development Plan 1971-91 with the existing land use 2010 is made in the subsequent paragraphs.

The Table 2.4 shows the comparison of proposed Land use of present plan and the land use of 2010 of old Kottayam municipal area. It shows that area and percentage wise, the proposed land use and existing land use (2010) are same for most category of the land uses. The area under public and semi public is higher than that envisaged in the plan. It is interesting to note that most of the paddy fields (wet lands) proposed in the plan has conserved.

Table 2.4 Comparison - Land uses of Old Kottayam Municipal limit

Land use	Proposed land use		Existing land use 2010	
	Area in sq.km	%	Area in sq.km	%
Residential	9.26	59.55	9.57*	61.54*
Public & Semi public	0.83	5.34	1.53	9.84

Commercial	0.57	3.28	0.62	3.99
Industrial	0.36	2.32	0.20	1.29
Transportation	1.48	4.52	0.66	4.24
Park & Open spaces	0.23	1.48	0.24	1.54
Paddy field	2.19	14.08	2.18	14.02
Water courses	0.69	4.44	0.55	3.54

**including dry agriculture area of 1.28 Sq:km (8.23%)*

Area that included in the Development Plan from Vijayapuram Grama Panchayat, from part of eastern residential district proposed in the plan. Nearly 21.74% of the area proposed to conserve as paddy field. A commercial sub-centre also proposed in the locality. This locality is mainly developed as residential area and nearly 67% of land is coming under residential use. But it is not fully developed as envisaged in the Development Plan and pockets of low-density area are there in different part. Only half area of paddy field proposed for conservation in Development Plan conserved. Remaining paddy fields converted for other purposes. Sub-centers proposed in the plan not developed. Instead of that corridor development has taken place along K.K. Road. Increase in the area of public and semi-public use is mainly due to setting up of educational institutions. The land use details are shown in Table 2.5.

Table 2.5 Comparison of Land uses -Vijayapuram Grama Panchayat area

Land use	Proposed land use 1991		Existing land use	
	Area in sq.km	%	Area in sq.km	%
Residential	0.52	75.36	0.46	66.67
Public & Semi public	0.01	1.45	0.02	2.89
Commercial	0.01	1.45	0.01	1.44
Industrial			0.03	4.35
Paddy field	0.15	21.74	0.08	11.59
Dry cultivation			0.09	13.04
	0.69	100.00	0.69	100.00

The major proposals of the Development Plan 1971-91 for the Nattakom Grama Panchayat area are Industrial area and Park and Open space. The industrial area from part of Kodimatha Industrial zone, and located on either side of Kodoor River. An average 120m width of paddy field on either side of M.C. Road up to Manipuzha

Bridge is reserved for park and open space and in fact it was the major park and open space proposed in the plan. In addition to that a commercial area is also proposed near Kodimatha Bridge.

The major Park and Open space for the recreational purpose of the town has not materialised. These paddy fields, which proposed as Park and Open Space have been converted for other purposes. 44 percentage of the area land, which proposed for other uses from the Grama Panchayat remains as paddy field. The paddy field remains uncultivated. Even though certain industries, mainly automobile industries set up in this area, they are scattered and not according to the plan. Commercial development is taken place at good phase. The land use details are shown in Table 2.6.

Table 2.6 Comparison–Erstwhile Nattakom Grama Panchayat area

Land use	Proposed land use 1991		Existing land use 2004	
	Area in sq.km	%	Area in sq.km	%
Residential			0.03	6.3
Public & Semi Public			0.03	6.00
Commercial	0.01	2.17	0.06	13.93
Industrial	0.21	45.65	0.08	17.53
Transportation	0.03	6.52	0.06	12.03
Park & Open spaces	0.24	45.65		
Paddy field			0.20	44.19

The northern Industrial-cum-Residential district of Development plan 1971-1991 falls in Kumaranelloor Grama Panchayat. Choottuveli is the focal point of the district with a sub-center. An area of 1170 acres has been earmarked for Nagampadom – Chungom Industrial area in the southern part. Remaining area was proposed for residential use and retaining as paddy field.

This area was developed as residential area and recording high growth rate in population. No industrialization has taken place. Instead of that, this area was developed as high-density residential area. Few pockets in the area remain as uncultivated paddy fields. Most of the area proposed to retain as paddy field has been converted for residential use. Commercial centre has not developed at

Choottuveli. Instead of that commercial development has taken all along M.C. Road. The land use details are shown in Table 2.7.

Table 2.7 *Comparison –Erstwhile Kumaranallore Grama Panchayat area*

Land use	Proposed land use 1991		Existing land use 2004	
	Area in sq.km	%	Area in sq.km	%
Residential	1.55	45.06	1.82	52.91
Public & Semi Public	0.04	1.16	0.23	6.69
Commercial	0.04	1.16	0.05	1.45
Industrial	0.66	19.19	0.06	1.74
Transportation	0.17	4.94	0.14	4.07
Park & Open spaces	0.01	0.29		
Paddy field	0.98	28.49	0.80	23.25
Dry cultivation			0.29	8.46
Water courses	0.01	0.29	0.05	1.45

2.4.4 Project Proposals

Commercial

The Development Plan envisaged that, by 1991 about 10000 people would be employed in Trade and Commerce sector. The commercial activities were envisaged in a hierarchical order from Central Business District to sub-centres. The present land use pattern indicates that the CBD area has developed as envisaged in the Development Plan. But the district centers and sub-centers were not developed as proposed.

Industry

The Development Plan projected that about 27% of total workforce would be engaged in industrial sector by 1991. There were proposals for two types of industrial activities i.e. household and manufacturing industries and for setting up of manufacturing industries 270 acres of land has been proposed. No new manufacturing industries came up in the industrial areas proposed in the plan. The industrial area proposed at Nagampadom has not been developed and these areas have been developed as residential area. An industrial estate has been established at Kodimatha, within the municipal limit. But most of the area

proposed for industrial use, are either remaining vacant or assigned for uses other than industry.

Public and semi public use

The Development Plan proposed a college at Thiruvathukkal and a Town Hall in LBS road. Both these proposals were not materialized.

Park and Open space

The Development Plan 1991 emphasized upon provision of recreational area, park and open spaces etc. Amusement cum entertainment centre at Nagampadom and open space at Kodimatha are the major proposals. Stadium, open ground and a park completed at Nagampadom. The area earmarked for open space at Kodimatha has been converted for other uses. Small parks and open spaces proposed at sub-center were not materialized.

Transportation

The Transportation plan for a town is an integral part and complimentary to the Land use planning, so as to provide an efficient system for movement of people, Goods and services. A hierarchical circulation system was proposed in the plan at town level. In addition to that there are certain suggestions for certain regional level roads.

The By-pass road proposed for M.C. Road, through the eastern part of the town has not materialized. But certain new links proposed in the plan i.e. MG. Road, K.U. Road, LBS road extension (part) were completed. Apart from the new development, existing roads were also proposed for widening and improvement depending upon the importance of these roads. Land has been reserved for Development of these roads while preparing Detailed Town planning scheme. But development of any of the roads except Kottayam – Kudamaloor road proposed in the plan has not done. But preliminary actions were taken for development of few roads.

Few regional roads proposed in the scheme i.e. Kottayam - Vaikom road and Kottayam – Ernakulam road (via Kanjiramattom) have been developed. Development of Kottayam – Ernakulam road (via Kumarakom) is in progress.

Parking area proposed as part of re-development programme of the market area has not materialized. As regard to the development of waterways, development of inland waterways and terminal facilities are started under KSTP Project.

Tourism

There was special mention about improvement of tourist facilities at Kumarakom in the Development Plan. Now Kumarakom has been developed as an international tourist destination.

2.5 Other Town planning schemes

A development plan has prepared for Kottayam Medical college area. DTP Scheme for Nagampadom Area, DTP Scheme for Kodimatha Area, DTP scheme for area in between Railway Station Road and Eranjal Bridge, DTP Scheme for M.C. Road in between Manipuzha junction and Nattakom College Junction are the sanctioned detailed Town Planning schemes within the planning area. In addition to that there are draft schemes like DTP Scheme for M.C. Road in between Nagampadom Bridge and Gandhinagar Junction, DTP Scheme for M.C. road in between Kodimatha Bridge and Manipuzha junction, DTP Schemes for Boat Jetty area, DTP Scheme for Manganam East, DTP scheme for Manganam West, DTP Scheme for Gandhi Nagar Road area are the schemes for the priority areas.

2.6 Conclusion

The analysis in the previous paragraphs indicates that in all the three indices, quantitative, qualitative and spatial aspects, there are serious shortfalls. The gap between the development envisaged and actual development are quite large and it due to many factors. One of the reasons for non-implementation the plan proposals were due to non-availability of land with the local bodies. For the implementation of the proposal large scale acquisition of land is required. The plan which was mainly based on the concept of public ownership, but most of the lands was privately owned. A number of departments involved in the development activities. But there was no co-ordination among different agencies. As a result the land assigned for various use remained unattended.

In spite of all the above short falls, certain new road proposals of the plan have been implemented. The development along all major roads has been regulated and it will definitly help future widening of the roads. Certain new road proposal of the plan has been implemented and the widening of certain corridor has taken up. Land use has controlled to an extent especially the environmentally sensitives area has been conserved.

3. Physical Characteristics

3.1 Location

Kottayam town, the headquarters of Kottayam district is situated in the central part of Kerala, in the Central Travancore region. It is situated in between 9° 29' 46" N and 9° 37' 59" North latitude and 76° 29' 22" E and 76° 34' 24" E longitudes. Kottayam town is located in the Main Central road at a distance of 150 km from the state capital, Thiruvananthapuram. The Kottayam-Kumali Road (now NH-183), Kottayam-Kozhanchery Road, Kottayam-Kumarakom – Cherthala road is the roads of regional importance, starting from Kottayam town. The town is connected to main centers of the state as well as nation by railways. Towns like Alapuzha, Vaikom, Kochi and Changanassery are connected by water way also. Kottayam is well connected to the important urban centers of the state – Thiruvananthapurm (150 Km), Kollam (80Km), Pathanamthitta (60Km), Alappuzha (50Km), Changanassery (20Km), Kanjirapally (40Km), Pala (29Km), Vaikom (41Km), Kumali (100Km), Thodupuzha (60Km), Idukki (120Km), Cherthala (40Km), Kochi (80Km), Angamali (96Km) and Thrissur (109Km). The location of the town is shown in Figure 3.1.

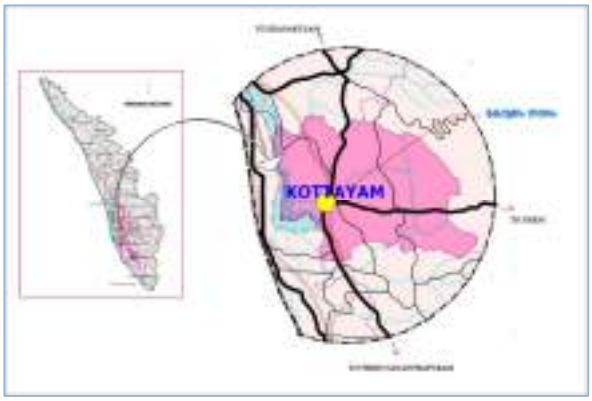


Figure 3.1 Location of Kottayam Town

Kottayam Municipality is surrounded by Ettumanoor and Athirampuzha Grama Panchayats in the north, Vijayapuram and Panachikkad Grama Panchayats in the east, Kurichi and Neelamperoor Grama Panchayats in the south and Thiruvarpu, Aymanam and Arpookara Grama Panchayats in the west.

3.2 History of Governance

Kottayam indeed has a glorious past to its credit having been the scene of many historic landmarks. Certain historians believe that the present Arabian Sea once touched the shores of Kottayam and that the present coastal towns like Alapuzha and Cherthala were non existent. Historians believe that geographical evolutions in the later past have resulted in the upheaval of the present coastal areas from the sea.

In the early time of known history, Kottayam was part of Vembalanadu, a constituent state of the Chera Empire during the region on Kulasekhara Emperores. Vennimala near Puthupally seems to have the capital of Vembalanadu kings. 11th century marked the end on Chera Empire and the state of Vembalanad, split into several smaller units, one of which contained the present Kottayam area called Manjunad. Later the Thekkumkur Rajas with their capital at Vennimala , conquered Manjunad. During the 14th Century AD, the Thekkencore Rajas shifted their capital to Thazhathangadi for the sake of safety. Thekkencore Rajas ruled from Thazhathangady till the mid-18th century. Thekkumkur Rajas constructed Fort encircling their places and the temple. This area was called *"Kottakakam"* meaning *area inside the Fort.* In course of time Kottakakam became Kottayam".

Later, Marthanda Varma, King of Travancore, attacked Thekkumkur and destroyed the palace and the Thaliyil Fort, (the remains of which are still seen) completely and that marked the end of Kottayam as a royal capital. He annexed Thekkumkur and the surrounding areas of Kottayam to the Kingdom of Travancore in 1750. During the British rule of India, Kottayam continued to be ruled under the Princely State of Travancore. At the time of the integration of the State of Travancore and Cochin in 1949, the revenue divisions were renamed as districts, paving the way for the birth of Kottayam District in July 1949. Later it became a part of the state of Kerala, and the headquarters of the district bearing the same name when the state was formed in 1957.

3.3 History of Development

Kottayam is one of the earliest Christian centres in India. The establishment of the Old seminary in 1816 by Christian missionaries is an important land mark in the history of town. In the same year, the first English School in Kerala was established at Kottayam by the missionaries. The school was developed as the

present CMS College in the year 1820. The missionaries established the first Malayalam press in Kottayam. The Malayala Manorama one of the foremost dailies in Kerala was established in Kottayam in the year 1888.

The completion of the 21 kms (13 miles) long Kottayam- Changanassery road in the year 1874 is an important event in the history of development of Kottayam town.

During years 1875 to 1878, the Kottayam - Aluva road was also completed. This road now forms part of the present Main Central Road (MC Road), which connects Trivandrum in the south and Angamaly in the north. The Kottayam - Kumily road (K.K Road) branching off from the Main Central Road at Thirunakkara was opened in 1879-80. These roads have played very important role in the development of Kottayam. Before the construction of these two roads Thirunakkara was just a forest area. With the completion of these two roads, the town began to grow steadily. Today Thirunakkara is the heart of Kottayam town and the hub of all commercial activities.

The Kollam - Ernakulam metre gauge railway line opened in the year 1956 connects Kottayam with Thiruvananthapuram in the south and Cochin in the north. Later this rail linkage has converted to broad gauge and electrified.

Establishment of number of premier institutions like Kottayam Medical College, Indian Rubber Board, and Mahatma Gandhi University, number of Printing and publishing units and number of other Educational and Medical institutions has accelerated growth of Kottayam.

The history of Kottayam in short is a tale of steady growth from temple agglomeration at Thaliyil in the early periods to an urban settlement of more than 1.70 lakhs population. Also Kottayam is one of the major urban agglomeration of the state with 3, 57,533 population as per 2011 census. Today Kottayam is an important town in Kerala with flourishing commercial, educational, medicare activities.

3.4 Socio-Cultural History

Kottayam has played a major role in all the political agitations of modern times like The Malayali Memorial agitation (1891), Nivarthana struggle (1930), The Vaikom Satyagraha (1924) etc.

Kottayam has a place in the cultural map of Kerala. Reflecting the religious mix-up of the population, a large number of Hindu temples and Christian churches are there in the town. Thirunakkara Mahadeva temple, Kumaranallore temple, Valiya Palli, Cheriya Palli, and the Thazhathangadi Juma Masjid are major religious centers.

Thazhathangady Juma Masjid, situated on the banks of river Meenachil, is one of the oldest mosques in India and is more than 1000 years old, famous for its architectural beauty, and richness in wood carvings. Thirunakkara Mahadeva temple, in the heart of the town, is a Shiva temple built in the Kerala style of temple architecture, with interior murals depicting them from the Hindu epics. It was built at the beginning of the 16th century by the then Thekkumkur Raja.

The Public Library in Kottayam is established in 1861 and now it is located at Sastri Road, which is a frequent meeting place for art exhibitions. Kottayam is the birth place of many well-known writers, journalists and artists. Muttathu Varkey, Pala Narayanan Nair, Arundhati Roy etc. are some among them.

3.5 Area and Revenue villages

The area of Kottayam municipality was 15.55 Sq.Km and with the addition of the two adjacent Grama Panchayats Kumaranallore and Nattakom in 2009, the area of the municipality has increased to 55.40 Sq.Km. In addition to Kottayam Municipality, the Planning area includes the Vijayapuram and Panachikkad Grama Panchayats. The total area of the Planning area is 90.75 Sq.Km. Villages included in the planning area are Kottayam, Muttambalam, Veloor, Nattakom, Panachikadu, Perumbaikadu and Vijayapuram. It is shown in Figure 3.2



Figure 3.2 Villages of planning area

3.6 Climate

The climate in this District is moderate and pleasant. The proximity of Kottayam to the equator results in little seasonal temperature variation, with moderate to high levels of humidity. Annual temperatures range between 20 to 35 °C (68 to 95 °F). From June to September, the south-west monsoon brings in heavy rains as Kottayam lies on the windward side of the Western Ghats. From October to December, Kottayam receives light rain from the north-west monsoon. The average annual rainfall is 3600 mm.

3.6.1 Flood 2018

In 2018, following the onset of the south west monsoon, severe flood affected Kottayam town.Due to the incessant rains and overflow of rivers, many parts of Kottayam town especially areas bordering river Meenachil remained submerged. Hindrances to the flow of water through the streams and water channel due to pollution and dumping of waste aggravated the condition. Flood seriously disrupted public and personal transport by cutting off roads and railway lines. The devastating flood caused damages to many roads in Kottayam Municipality.



Nagampadom bus stand and Nehru stadium which were developed as town centre by filling up the paddy fields were severely affected by this flood. This development resulted in the conversion of water streams in to smaller channels and some of them were completely blocked causing the water logging whenever there is a heavy rain. Therefore conversion of paddy field to urban areas shall be minimized or else proper drainage facility has to be ensured.

3.7 Physiography

The town is situated amidst of a picturesque environment of lovely landscape with vast stretches of paddy fields, backwaters fringed by coconut palms and attractive

greenery of the luxurious vegetation covering the plains hills and valleys. The surface formation of the area is characterised by alternating plain and rolling terrain. Change in nature of surface terrain from plain to rolling is noticeable towards the northern and eastern portions. Ground level varies from 0 to 40 meters. Meenachil river is passing through the central part of the town and the Kodur river is the second river passing through the town. A series of canals and streams are there along the low lying areas in the western part of the town and these areas are liable for flooding during monsoon.

3.8 Soil Condition

Laterite hills, wet lands are the general features of the planning area. Gravelly clay loam, clay silty loom, sandy clay loam are the soil texture of the locality.

3.9 Biodiversity

Kottayam has a hilly terrain in the eastern part and low lying areas in the western part. Depending on the location different varieties of food and cash crops are cultivated. Rubber cultivation plays dominant role and in the economic development of the region and rubber trees are extensively cultivated. Paddy cultivation predominates in the lower plains of the planning area along with coconut trees. Vegetables, flowering plants, medicinal plants etc. are also cultivated in the planning area. Commercial production of flowering plants like orchids, Anthurium etc. is also seen in limited extent.

3.10 Conclusion

Kottayam town is situated in the central part of Kerala, in the Central Travancore region and well connected with all major centers of the state. The history of Kottayam in short is a tale of steady growth from temple agglomeration at Thaliyil (Thazhathangadi) in the early periods to an urban settlement with more than 1.70 lakhs population. Today Kottayam is an important town in Kerala with flourishing commercial, educational, medicare activities and major role in the socio-cultural field. The climate in this District is moderate and pleasant. Rubber, paddy, vegetable are the major cultivation of the area.

4. Regional Settings

4.1 Regional Settings

The regional setting of a town spells out the hierarchy of settlement in the regional scenario, the activity which the town has to perform and its connectivity with different settlements. Extensive regional setting study has been carried out in connection with the preparation of Development plan for municipalities in Kottayam district. The study was documented as District Urbanization report of Kottayam. The District Urbanisation report defines the spatial structure of the district which is arrived by integration of hierarchy of settlements, function of settlements and the connectivity between settlements.

The hierarchy of settlements of Kottayam as revealed from regional setting study is shown in Figure 4.1. Kottayam is suggested as first order settlement of the district. Changanassery, Pala, Kanjirappally and Kaduthuruthy are suggested as second order settlements of the district.



Figure 4.1 Hierarchy of settlements of Kottayam District

The Activity pattern of Kottayam district is shown in Figure 4.2. In this study Tertiary activity, Primary activity (Plantation), Primary activity (Agriculture), combination of Agriculture SSI and Animal husbandry, Primary activity (Agriculture and Animal husbandry) are the activities identified for various settlements of the district. In this

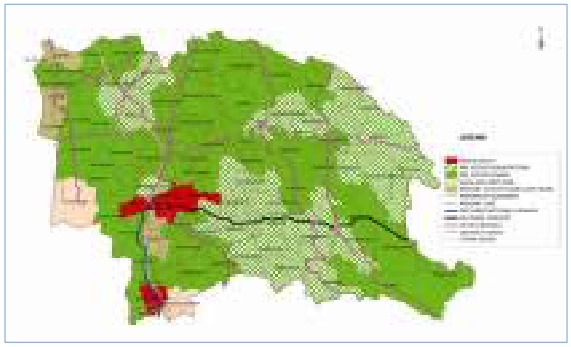


Figure 4.2 Activity Pattern of the district

study tertiary activity has been identified as the activity of Kottayam town.

The connectivity network of Kottayam district is revealed from regional studies of the Study on urbanization of the district. Thiruvananthapuram – Angamali M.C.Road, Kottayam – Kumali road, Kottayam- Kozhanchery Road, Kottayam – Cherthala road are classified as major roads in the study, which are passing through the town.

4.2 Planning Area

The Planning Area of a Master Plan shall be governed by the development scenario. The regional setting study has been resorted for delineation of planning area. Planning Area has been delineated by studying the character of the Grama Panchayats lying adjacent to Kottayam town.

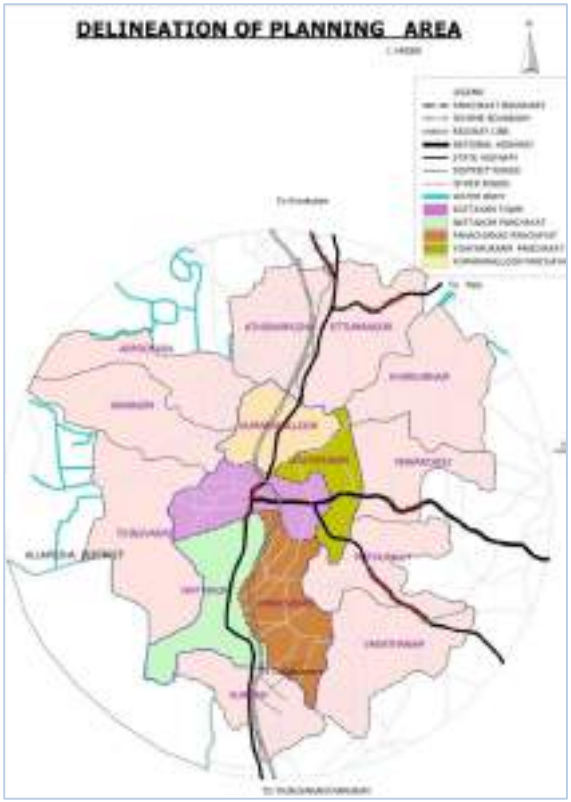


Figure 4.4 LSGIs selected for delineation of Planning area

For delineating planning area, 12 surrounding Grama panchayats, ie Athirampuzha, Ettumanoor, Ayarkunnam, Vijayapuram, Manarcad, Puthupally, Panachikkad, Vakathanam, Kurichi, Thiruvarpu, Aymanam and Arpookara has been included in the study.

The indices considered for the study are the Demographic features (Population density, Growth rate, WPR, Occupational pattern etc), infrastructural facilities available in each local body, connectivity through various modes of transportation such as road, rail and waterway, Centrality value, Administrative and Urban status, percentage of developed land and hierarchy of nodes.

Accordingly the local bodies were ranked in the order of the total scores gained. Kottayam Municipality has the highest rank followed by Vijayapuram, Kumaranalloor, Nattakom, Manarcad, Panachikkad, Ettumanoor, Aymanom, and Thiruvarppu Panchayats, in the descending order of the scores obtained.

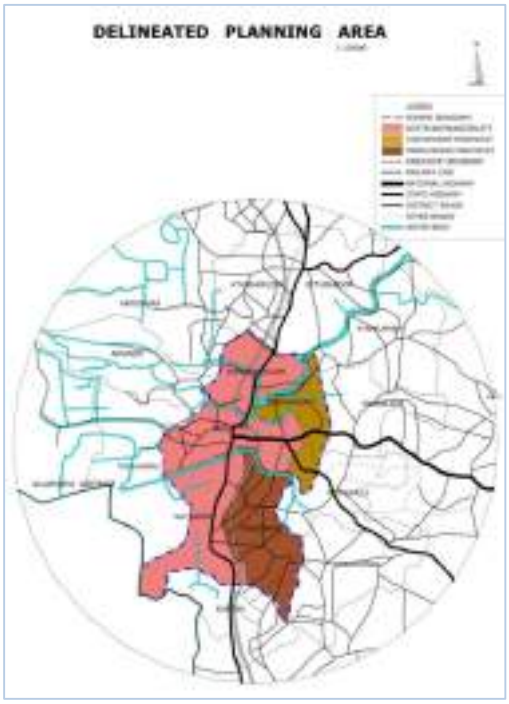


Figure 4.5 Delineated Planning Area

Even though Manarcad is being urbanised at a faster rate, it was excluded, due to its distance from the town centre. Panachikkad Panchayat located next to Kottayam Municipality was included in the planning area considering high population growth rate during1991- 2001 (14%), location within the 1st circle with high centrality value, good infrastructural development (road) and the availability of large extent of land for planned development as the gross population density is only1802 persons with Sq.Km with a net density of 4710 persons per Sq.Km during 2010. The planning area delineated based on the above criteria consists of ***Kottayam Municipality, Vijayapuram & Panachikkad Panchayat***. The details of the delineated Planning area are shown in Table 4.1.

Table 4.1 Delineated Planning Area

LSGI	Area (in Sq:km)	Population
Kottayam (M)	55.40	1,44,911
Vijayapuram (GP)	12.60	30,726
Panachikkad (GP)	22.74	40,979
PLANNING AREA	**90.75**	**2,16,626**

4.3 Influence Area of the town

Kottayam town influences the Kottayam district and adjacent districts in many ways. Kottayam is the headquarters of Kottayam district. A large number of District, Regional, State and Central Government level offices are functioning in

Kottayam. Headquarters of Indian Rubber Board, Mahatma Gandhi University are located at Kottayam. In addition to that Zonal office of State Bank of Travancore, Divisional Office of the LIC etc is located at Kottayam. For the administrative needs people from the entire district and adjacent district depending Kottayam town.

In the study on urbanization of Kottayam district, Kottayam is the only first order settlement of the district. People from entire district depend on Kottayam Town for higher order services and facilities.

Kottayam is the major trading centre of rubber. Large textiles, Jewellery, Automobile show rooms are functioning in the town also attract people from entire district and even from adjacent districts.

Major roads including the National highway, State highways connecting the centres within the state and outside the state are meeting at Kottayam. Kottayam is well connected by KSRTC and the Buses owned by other States and private agencies to all part of the State and neighbouring state. Train services are available from Kottayam to all part of the country. As far as the travel needs is concerned the people from entire district and even from adjacent districts depending Kottayam town.

Number of premier educational institutions, including Mahatma Gandhi University, Kottayam Medical College, Kottayam Dental College, Rajiv Gandhi Institute of Technology, Ramanujam Institute of Science, Indian Institute of Mass Communication is functioning in and around Kottayam town. In addition to that there are a number of Arts and Science colleges, Para medical institutes are also functioning. Students from entire district and from other part of the state depend on Kottayam for their higher education needs.

Medical College Kottayam and number of other Super Speciality hospitals are functioning in and around Kottayam. For higher order medical facilities, people from entire district and even from other district depend on Kottayam town.

Considering the above facts, Kottayam district has been considered as the influence area of Kottayam town. Total extent of the influence area is 2208 Sq.km and total population as per 2011 census is 19.79 lakhs. Figure 4.6 shows the LSGIs and existing road network of Kottayam district.

The origin and destination survey conducted by NATPAC (February 2011) has been taken as the basis for calculation of floating population of the town. As per this study, the total floating population to the town is estimated as 1,97,000, which is more than the resident population.

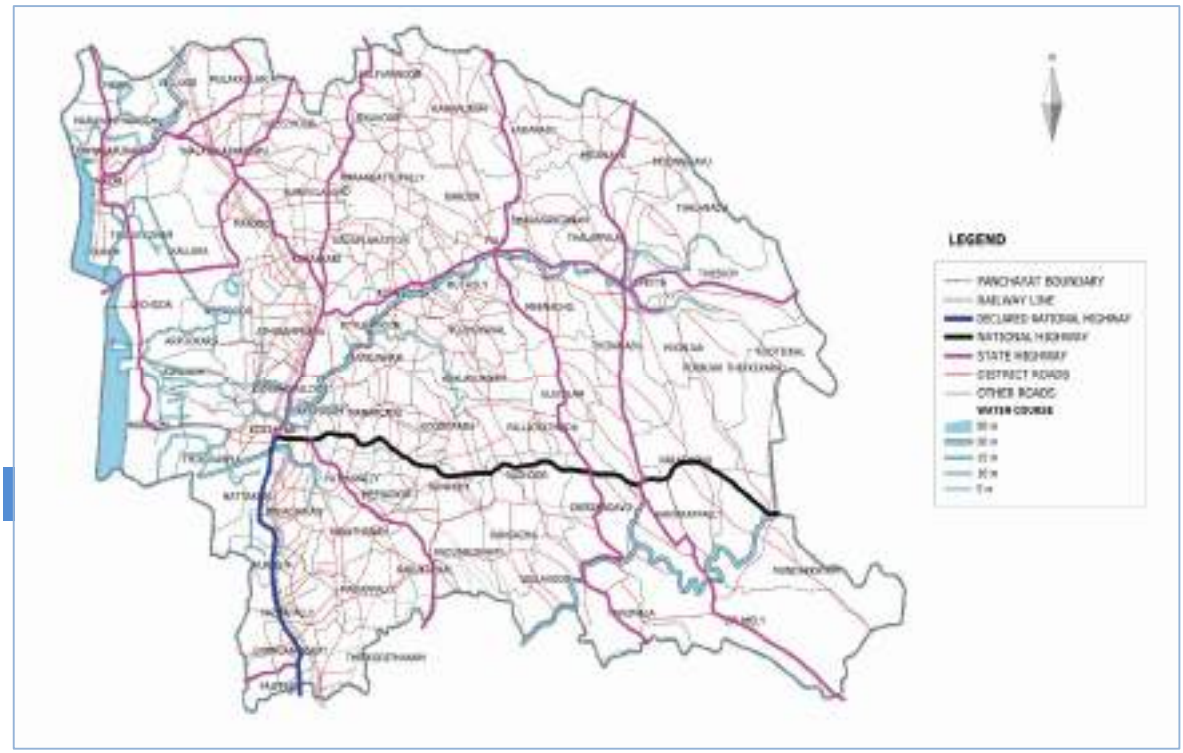


Figure 4.6 Kottayam district

4.4 Characteristics of Influence Region

Kottayam district is considered as the influence region of the town. Total extent of the district is 2208 Sq.km and total population as per 2011 census is 19.79 lakhs. There are 77 LSGIs; including four urban bodies are there in the district. Erattupetta is the smallest LSGI in terms of the geographical area with 7.50 Sq.Km and Poonjar-Thekkekara is the largest LSGI with 60.86 Sq.Km area. The population

(2001) of the LSGIs is varying from 7337 (Thalanad Grama Panchayat) to 1,44,911 (Kottayam municipality).

The growth rate of population of the district during the decade 1971-81, 1981-91, 1991-01, 2001-11 are 10.29%, 7.71%, 6.86% and 1.32% respectively. The district is showing a steady decrease in growth rate of population and approaching zero growth rates. The district has lowest growth rate in the state after the neighbouring districts of Pathanamthitta (-3.12%), Idukki (-1.93%) and Alappuzha (0.61%).
As per 2001 census, out of total population of 19, 53,646 persons 2,99,808 (15.3%) were living in urban areas. The urban share of the district has increased to 28.57% (5,65,611 out of 19,79,384 total population) in 2011 census.

As per 2011 census the density of population of the district is 896 persons per Sq.Km and it is higher than the state density. The density of population is varying from 227.57 persons per Sq.Km (Thalanad Grama Panchayat) to 3849.41 persons per Sq.Km (Changanassery Municipality). Kottayam Municipality is in the second position as far as the density of population is concerned.

4.5 Occupational Structure of the Region

The occupational structure of the influence region is analyzed in this paragraph. As per 2001 census, the main workers are classified into four categories; Cultivators, Agriculture Labourers, Household Industrial Workers and Other Workers.

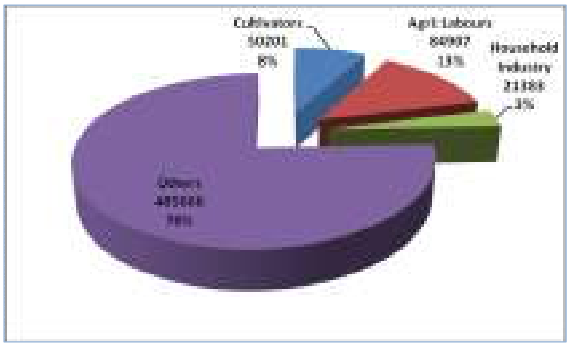


Figure 4.7 Occupational structure of the district

The percentage of two categories of workers in agriculture sector, cultivators and agriculture labours has a nominal share only and it is 7.82% and 13.22% respectively. The percentage of workers in house hold industry sector is only 3.33% and lion's share of main workers (75.63%) belongs to the other workers category. The other workers category will also include some of the primary workers like fisherman, workers engaged in mining and plantation work.

4.6 Land use of the Region

The land use of the region is discussing in this paragraph. The source of the data for analysis of land use is Satellite Data from IRS-P6, LISS-IV, Mx/LISS/ PAN 2003-04 (India Satellite Data). The data form part of the Natural Resources and Environmental Data base (NREDB).

The land use of the region is given in Figure 4.8 and the breakup of land use of the district is shown Table 4.2. In the analysis it is found that 64% of land of the region is under Plantation, 9% land is under residential use and 9% of land is under agriculture use. Water bodies (4%), Forest (1%), Marshy land (1%), built up land (1%), Residential-agriculture mix (0.25%) are the other categories of land use.

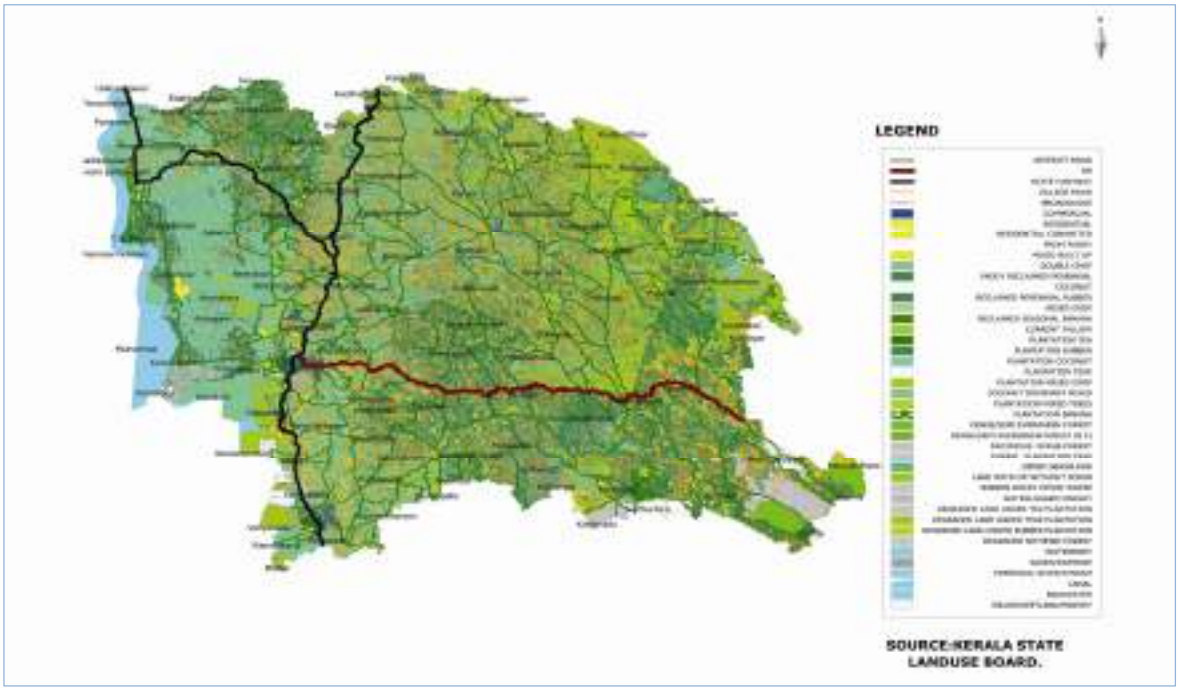


Figure 4.8 Land use of the District

Table 4.2 Land use break up of Kottayam district

Sl:No	Land use classification	Area in Sq:km	Percentage
1	Forest	19.30	1
2	Water Bodies	80.11	4
3	Marshy land	14.74	1
4	Residential	207.92	9

5	Agriculture	198.15	9
6	Plantation	1411.85	64
7	Residential-agriculture Mix	5.62	0.25
8	Other built up land use	13.71	1
9	Others	243.33	11
	TOTAL	2194.74	100

4.7 Functional Character of the Region

The functional character of a settlement is the major activity within the settlement, be it agriculture (rural) or secondary sector and tertiary sector activities (urban activities) or an activity in between rural and urban, i.e. semi rural or semi urban. The classification is based on land use and average plot size within the settlement.

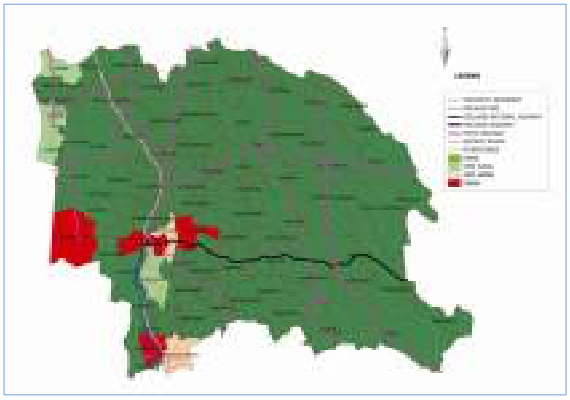


Figure 4.9 Functional Character of the district

Kottayam and Changanassery municipalities, Manarcadu and Kumarakom Grama Panchayats exhibits urban character. Vijayapuram and Trikkodithanam Grama Panchayats show semi-urban character. Vaikom Municipality, Panachikkad, T.V.Puram and Chempu Grama panchayats showing Semi-rural character and the remaining 69 LSGs showing rural character. The settlements in the eastern part and the midland has rural character and the urban and semi urban settlements are located in the western part of the district.

4.8 Industries of the Region

Details of large, medium and small industries of Kottayam district is shown in Table 4.2. In the category of large industry there are 7 units and 11 units in the category of Medium industry are functioning in the region. The Hindustan News Print Ltd, the Madras Rubber Factory (MRF), The Travancore Cements Limited is the major industries of the district. The number of small scale industrial units in district is 19907 and its classification is given in Table 4.3. Agro based units are more in the region followed by textile units, engineering units, forest based and rubber based units.

Table 4.3 Number of Large, Medium and Small Scale Industrial units of the district

Large Industry		Medium Industry		Small Industry	
Public sector	Private sector	Public sector	Private sector	Public sector	Private sector
4	3		11		19907

Table 4.4 Classification of SSI units

Agro based	Rubber based	Plastic based	Forest based	Animal husbandry	Textiles	Chemical	Engineering	Electronics	Mineral	Building Material	Others
3331	1382	375	1237	0	5117	541	1278	68	101	665	5812

4.9 Resources

The resources mainly available in the region are the Agro based products. Latex is the major agro based product of the region. Granite is the major mineral available in the region. Lime shell, available from Vembanad Lake is used as the raw material for the manufacture of white cement and cement paint.

4.10 Facilities of the Region

Facilities are distributed almost evenly in all constituent local bodies with some concentration in Municipal areas. Facilities like Primary Health Centre, Ayurvedic and Homeo medical centres and educational facilities like L.P.School, U.P.School, High School, communication facilities etc are available in all constituent settlements (Local Self Governments) of the district. Markets and banking facilities are also available in all LGs. But higher order facilities are available more in urban areas of the district.

4.11 Transport Linkages

Kottayam town is connected to all the Grama Panchayats/Municipalities of the influence region by State Highways / Major District roads. In addition to that these Grama Panchayats are connected together with a good network of roads. A good public transport system is available connecting Kottayam with these settlements. Thiruvananthapuram – Ernakulam BG line is passing through the western part of the district and there is a proposal for another line through the eastern part of the

district (Sabari Line). The National Water Way is passing through Vembanad lake along the western part of the district and there is network of water way connecting various centres in the western part of Kottayam district.

4.12 Conclusion

In the regional context of the district, Kottayam is proposed as first order settlement of the district. In the district level analysis tertiary activity has been identified as the activity of Kottayam town. Four major roads included in the regional road network passes through Kottayam town. Kottayam district has been delineated as the influence area of the town and total floating population of the town is estimated as 1,97,000. The influence region records a decreasing trend in population growth rate. The economy of the region is agriculture oriented and primary sector activity is the character of the region. The agro based products especially latex is the major resource of the region and the level of industrialization is low. Grama Panchayats in the region are more or less equally developed as far as the lower order facilities are concerned. Kottayam has very good transportation linkage with the settlements in the influence region. The region has other two modes of transportation, i.e. railway and waterway also. For higher order facilities people of the region is depending more on Kottayam town.

5 Land Use

5.1 Introduction

The land use of an area is indicated by the predominant activity of that area, be it agriculture, residential, commercial, public and semi-public, transportation, park and open spaces, industrial etc. Hence the analysis of existing land use is inevitable to understand the predominant economic activity of the area and to assess the availability of suitable land for the future urban development activities of the town. From this it is possible to draw the future requirement of land for various uses in the town. The Department of Town and Country Planning conducted detailed land use survey in the year 2010, as part of preparation of Master Plan for Kottayam.

5.2 Growth of the Town

In the earlier part of history the Thekkumkoor Rajas ruled Kottayam with Thazhathangady as headquarters till the mid-18th century. There are ruins of fort at Thaliyil near Thazhathangadi. Most of the ancient religious buildings like Thirumala Thaliyil temple, Thazhatangadi Juma Masjid Mosque, Cheriyapalli and Valiyapally etc were constructed in this area. Later the area became part of Travancore, and Kottayam has become headquarters of one of the revenue divisions of Travancore. The present civil station building has completed during the year 1949.

In the recent past, Kottayam town has grown around Thirunakkara Temple. Kacherikkadave area (Boat Jetty Area) developed when water way was the major mode of transportation. The educational institutions like CMS College, CMS School, and Baker School were started in Thirunakkara area. Establishment of bus stands, offices like Taluk Kachery and commercial establishment etc in this area has intensified the activities in this area. Establishment of market and KSRTC bus station has accelerated the growth of the town in that direction.

The present trend is ribbon development along major travel corridors especially along K.K.Road and M.C.Road. As the physical development of the town crosses the boundaries, two adjacent Grama Panchayaths Nattakom and Kumaranallore added to Kottayam municipality. Residential areas were developed in the surrounding areas of Commercial and Public land uses. Kanjikuzhy has developed as a commercial node in the east. Samkranthi and Chingavanam are developed as commercial centers in the northern and southern end of the Planning area. The urbanisation is taking place beyond the municipal limit and the poplation of Kottayam urban agglomeration area is 3,57,533.

5.3 Land Use Breakup 2010

The land use survey of the planning area was conducted during the year 2006-07 and later updated during the year 2010. As per the land use survey 2010, residential, agriculture (both dry and wet), commercial, public and semi- public, industrial, open spaces, transportation and water bodies are the major land use classifications of the Planning area.

The land use break up of Planning area, which comprises Kottayam town, Vijayapuram Grama panchayat and Panachikkad Grama panchayat is given in Table 5.1 and it is also represented in Figure. 5.1. The Figure 5.2 is the Existing land use map of planning area 2010. Residential is the predominant land use of the planning area and 41.22 Sq.Km of land is coming under this use, which is 46.52% of total area. It is followed by wet agriculture land (25.26%) and dry agriculture land (13.14%). Public and semi public use (4.91%) and water bodies (4.49%) are the other major land uses of the planning area.

Land use under Transportation, Commercial, Industrial and Park and open spaces are comparatively very low when compare with other land uses. 2.56% of planning area is coming under Transportation use, 1.49% under Commercial use, 1.47% under Industrial use and 0.15% is under the category of park and open spaces.

Table: 5.1 Land use Breakup (in Sq;Km) of Planning Area-2010

Name of LSGI	Residential	Commercial	Industrial	Public & Semi-Public	Green and Open space	Dry Agriculture land	Wet Agriculture land	Transportation	Water body	Total area
Kottayam	24.13	1.17	0.86	2.84	0.13	5.20	15.90	1.76	2.38	55.40
Panachikkadu	11.80	0.06	0.24	0.65	0.00	3.10	4.72	0.36	0.88	22.74
Vijayapuram	6.21	0.11	0.23	0.96	0.13	3.61	2.29	0.19	0.82	12.60
TOTAL	**42.21**	**1.35**	**1.33**	**4.46**	**0.14**	**11.92**	**22.92**	**2.32**	**4.07**	**90.75**

Source: Land use survey 2010

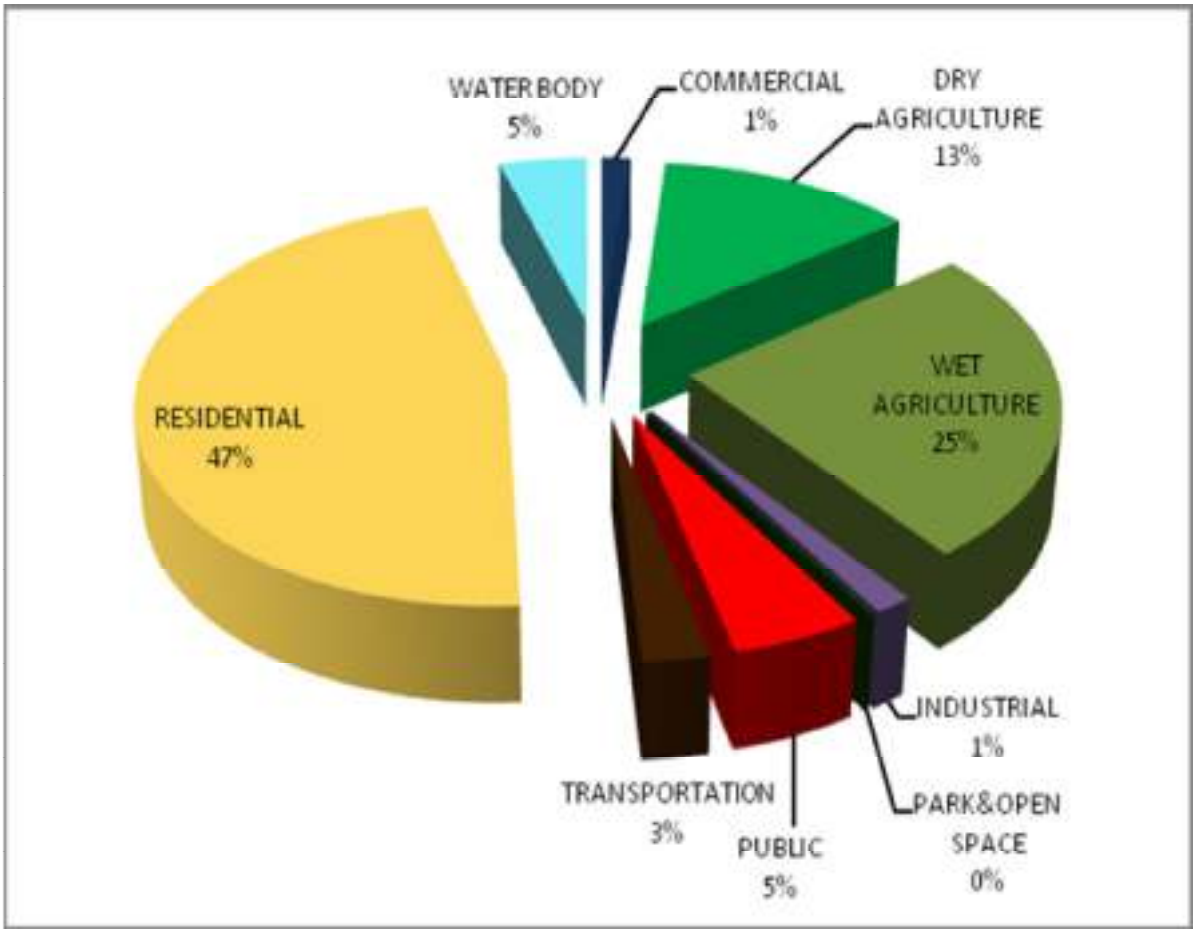


Figure 5.1 Land use break up (2010) of Planning area

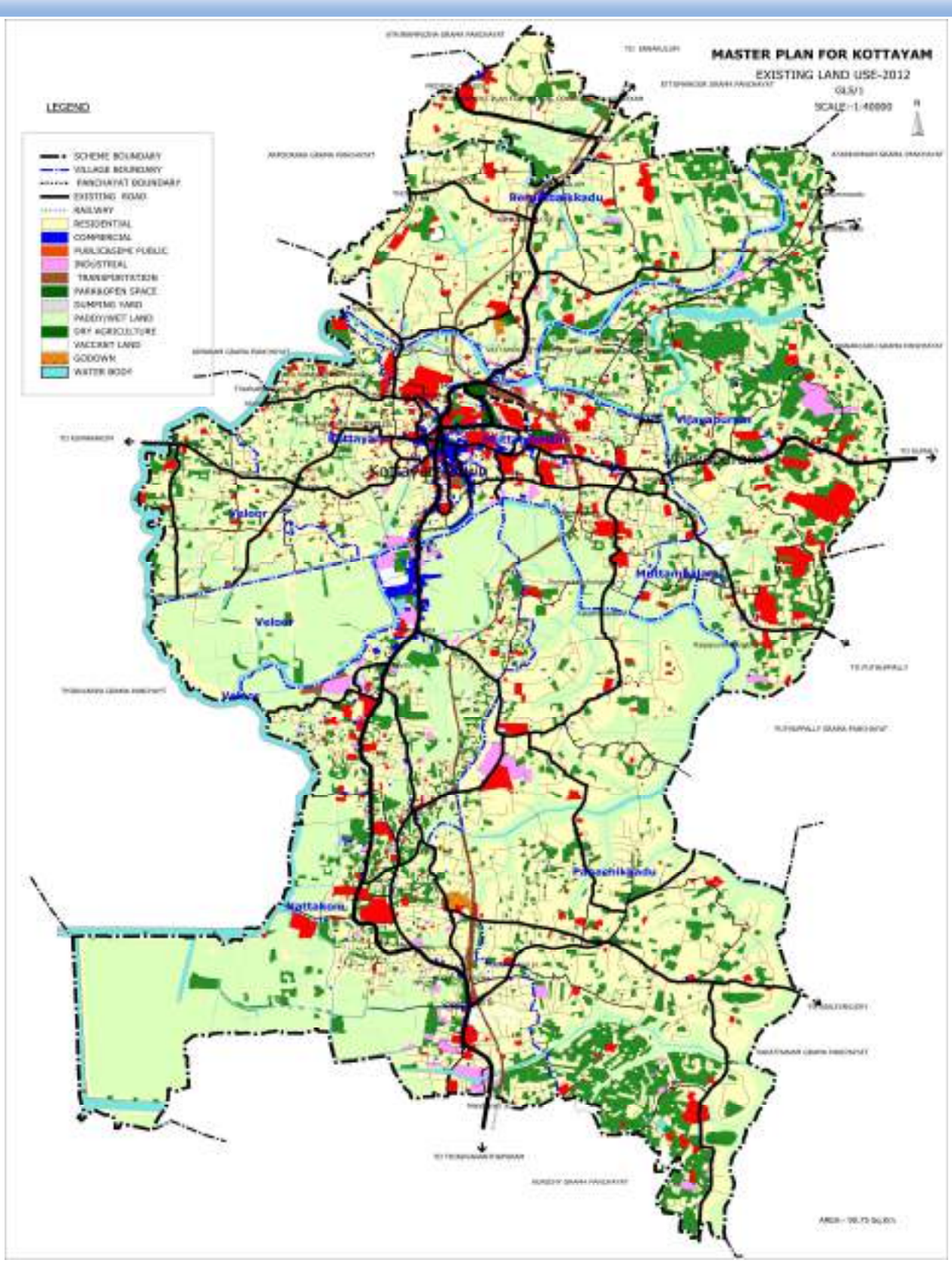


Figure 5.2 Existing Land use map (in A.3)

The distribution of various land use is not uniform throughout the planning area and there is large variation in different parts of the planning area. For this analysis the planning area has been divided into five zones. Old Kottayam municipal area, erstwhile Kumaranallore Grama panchayat area, erstwhile Nattakom Grama panchayat area, Vijayayapuram Grama Panchayat area and Panachikkad Grama Panchayat area are these zones. The land use break up of the zones is shown in Figure 5.3. The non - agriculture land use is more in old Kottayam municipal area and erstwhile Kumaranallore Grama Panchayat area and in other three zones the percentage agriculture land is still high. In fact in erstwhile Nattakom Grama Panchayat area more than half of the area (56%) is coming under Agriculture (both dry and wet) and Vijayapuram Grama Panchayat 41% of land is under agriculture use. In old Kottayam Municipal area limit and erstwhile Kumaranallore Grama Panchayat residential area occupies more than 50% of total planning area. The commercial area is high in old municipal limit and public and Semi public use is high in old Kottayam municipal limit and Vijayapuram Grama Panchayat limit.

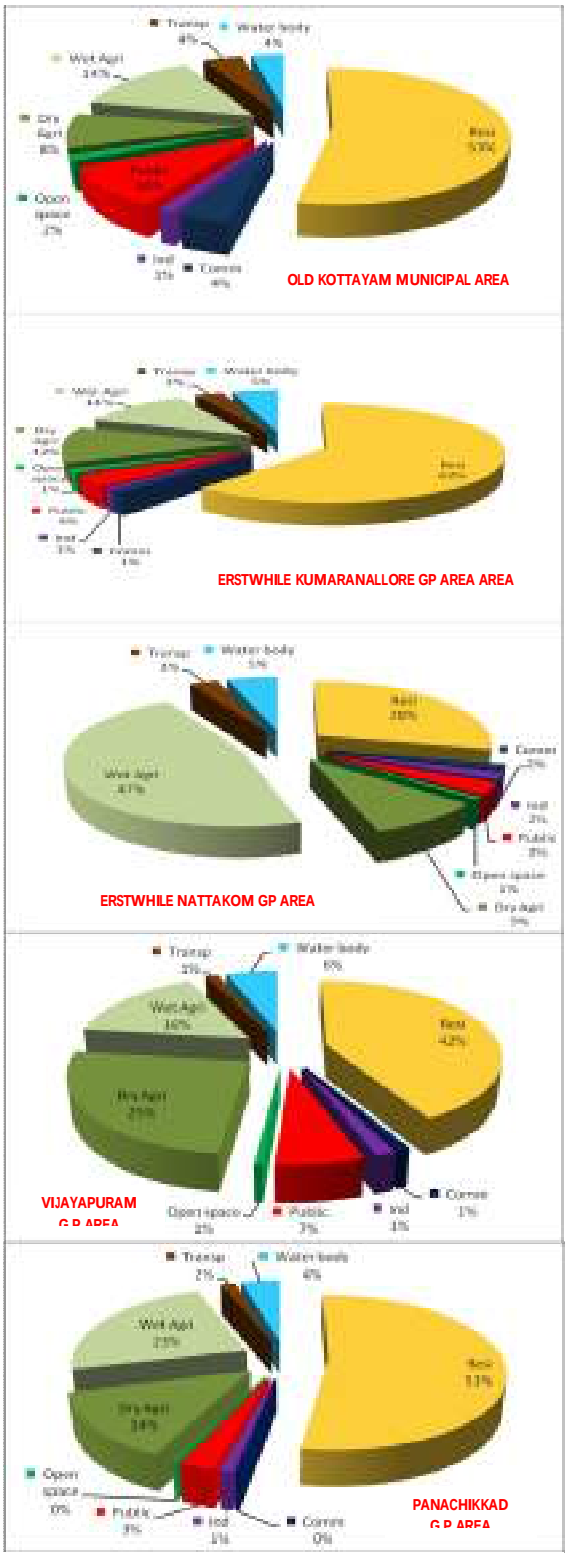


Figure 5.3 Land use breakup of different zones

5.4 Comparison with Planning standards

Comparison of land use breakup of planning area with the proposed land use structure as per UDPFI Guide line has been made and it is shown in Table 5.2. The percentage of residential use is far above (almost double) the suggested standard as per UDPFI guide lines. The percentage of other land uses except Park and Open Spaces are far below the suggested UDPFI standard. But the percentage of Public and Semi public land use is only slightly below the UDPFI standard.

Table 5.2 Comparison of existing and proposed land use structure as per UDPFI Guide line

Sl: No	Land use	Planning Area		Proposed land use structure as per UDPFI Guide line (for medium towns)
		Area of existing land use (in Sq:km)	% of total (existing) developed area	% of Developed area
A	Developed Area			
1	Residential	42.21	81.47	40.00-45.00
2	Commercial	1.35	2.61	03.00-04.00
3	Public and Semi public	4.46	8.61	10.00-12.00
4	Industrial	1.33	2.57	08.00-10.00
5	Transportation	2.32	4.48	12.00-14.00
6	Park and Open space	0.14	0.27	18.00-20.00
	Total Developed Area	**51.81**	100.00	
B	Agriculture Land and Water bodies	**38.94**		Balance land

5.5 Temporal Variation of Land use

A comparison of land use break up of Kottayam municipality (old municipal limit) of the years 1966 and 2010 has been made. The temporal variation of land use of Kottayam municipality is shown in Table 5.3. The area in hectares and percentage of different land uses of the year 1966 and 2010 is shown in the table. There is significant decrease (by about 20%) in the area of land coming under residential land use and there is corresponding increase in the area of other uses like commercial, Industrial, Public and Semi-Public, Park and open Space and transportation. With the effect that the net residential density has been increased from 6786 persons/Sq:km to 7325 persons/Sq:km. The area of land under public

and Semi public has increased considerably while the land under agriculture use remains more or less same. The analysis shows that the residential area is being converted for other urban activities especially commercial use and densification of existing residential area has taken place.

Table 5.3 Land use break up of 1966 and 2010 of Erstwhile Kottayam Municipality

Land use	Area in hectares		Percentage	
	1966	2010	1966	2010
Residential	1032	829	64.88	53
Commercial	22	62	1.4	4
Industrial	14	20	0.87	1
Public & Semi Public	53	153	3.31	10
Agriculture	381	346	23.87	22
Park and Open space	14	24	0.89	2
Transportation	59	66	3.71	4
Water bodies	16	55	1.02	4

5.6 Comparison with similar towns

Comparison of land use of Kottayam municipal Town is made with similar towns in the region like Pathanamthitta, Thiruvalla, Chengannur, Changanassery and Alappuzha. The percentage of different land use of these towns is shown in Table 5.4.

Table 5.4 Comparison of percentage of land use of similar towns

Land Use	Kottayam (2010)	Pathanam-thitta 1985)	Thiruvalla (2005)	Chengannur (1990)	Changanassery (2002)	Alappuzha (2010)
Residential	44.37	52.89	45.45	74.37	56.52	41.60
Commercial	2.17	0.94	0.97	0.29	2.74	1.61
Industrial	1.58	0.26	0.54	0.27	0.43	0.79
Public	5.22	2.13	16.39	4.91	6.56	3.75
Agriculture	38.79	38.81	24.55	9.01	23.63	17.56
Open Spaces	0.25	0.00	2.36	0.00	0.69	0.56
Transportation	3.24	3.15	5.80	5.28	5.99	4.32
Water Bodies	4.37	0.00	3.94	5.91	3.40	28.47
Others	0.00	1.83	0.00	0.00	0.00	1.35

When compare to the towns in the surrounding areas, the percentage of Commercial land use is high in Changanassery and Kottayam is in second position. The percentage of Industrial land use is high in Kottayam. In the case of Public and Semi public land use Kottayam occupies third position after Thiruvalla and

Changanassery. But the area under agriculture use is high in Pathanamthitta and Kottayam after annexing two adjacent Grama Panchayats. The area of land under residential use is less in Kottayam and only Alapuzha town behind Kottayam.

5.7 Concentration Pattern of Land Uses

The concentration pattern of a particular land use gives an idea about where that particular land use is concentrated within the town. The concentration pattern of a land use can be ascertained by the concentration index (CI) of that land use. The concentration index (CI) of a particular land use = ((Area of that land use in a ward) / (Total area of the ward)) / ((Area of that land use in the town) / (Total area of the town)). The concentration index values may be greater than one, equal to one or less than one. The CI greater than one for a particular land use indicates that the land use under consideration is concentrated more in that ward than other wards of the town. Using the above method, concentration pattern of major land use categories - Residential, Agriculture, Commercial, Public and Semi Public and Water Bodies are analysing in the subsequent paragraphs.

Residential Land use

Major land use of the planning area is residential (45.80%) and is mainly concentrated in the 10 wards of Parappadom, Kuzhimattom East, Thekkumgopuram, Veloor, Nattassery West, Kumaranalloor Temple, Kanjikuzhy, Malloossery South, Kumaranalloor West and Eranjal. These wards are located in the western part of Kumaranallore area, western and eastern part of old municipal area and eastern part of Chingavanam. Generally wards on the western part of Nattakom area, eastern part of Vijayapuram has low concentration of residential land use. The concentration of residential use and the

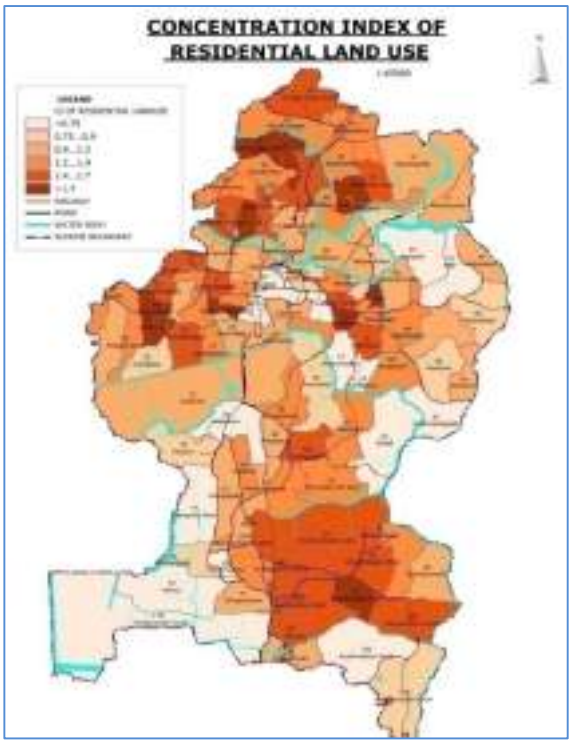


Figure 5.4 Concentration pattern of Residential land use

topography are directly related and elevated and level areas has more concentration residential land use when compare with low and wet land area.

Agricultural Land use

Agricultural Land use is the second major land use in the planning area (38%) and the highest concentration is seen in the Chingavanam South ward(CI-2.03) followed by Kanjiram (CI - 1.89) and Pallom (CI -1.83). The western part of Nattakom area has high concentration of Agriculture land use due to presence of wet lands. The eastern pheripheral area of the planning area also have high value of concenration index due to concentration of dry agricultural activities. The concentration pattern of Agriculture land use is shown in Figure 5.5.

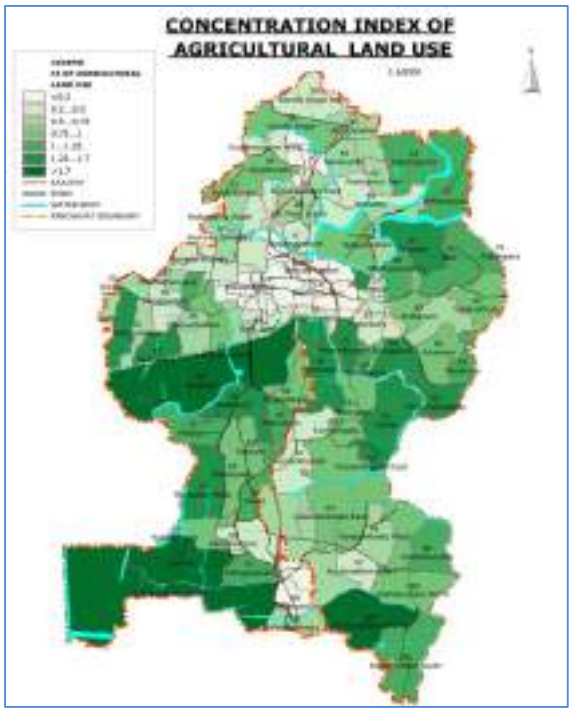


Figure 5.5 Concentration pattern of Agriculture use

Commercial Land use

Concentration of commercial use is seen in the town center and along the major travel corridors. Wards of Vayaskara, Hospital, Cathedral, Kodimatha, Vadavathoor and Thirunakkara have high value of concentration index of commercial land use. Commercial developments are now taking place along three communication axis radiating from the CBD area. It is shown in Figure 5.6.

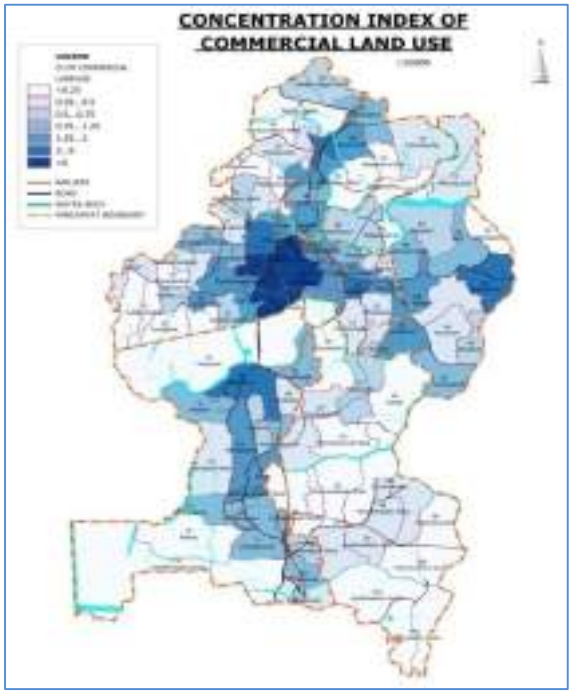


Figure 5.6 Concentration pattern of Commercial land use

Public and Semi public land use

The Public and semi Public land is concentrated more in the old municipal limit. This use has concentration in

Vijayapuram grama panchayat also. The concentration of Public land use is shown in Figure 5.7.

Water Bodies

Meenachil river and its distributaries, Kodoor River and number of other canals are passes through various part of planning area. The water bodies do not have a concentration in a particular area and distributed in all over planning area. The concentration pattern of water bodies is shown in Figure 5.8.

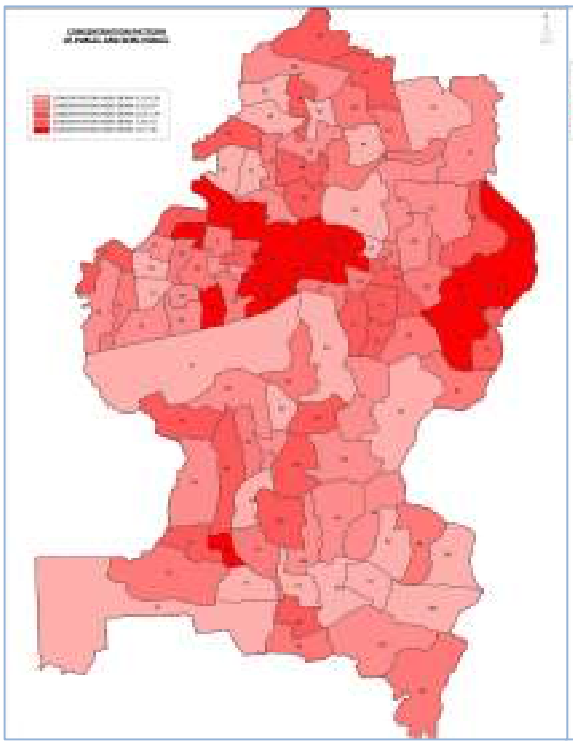


Figure 5.7 Concentration pattern of Public and Semi public land use

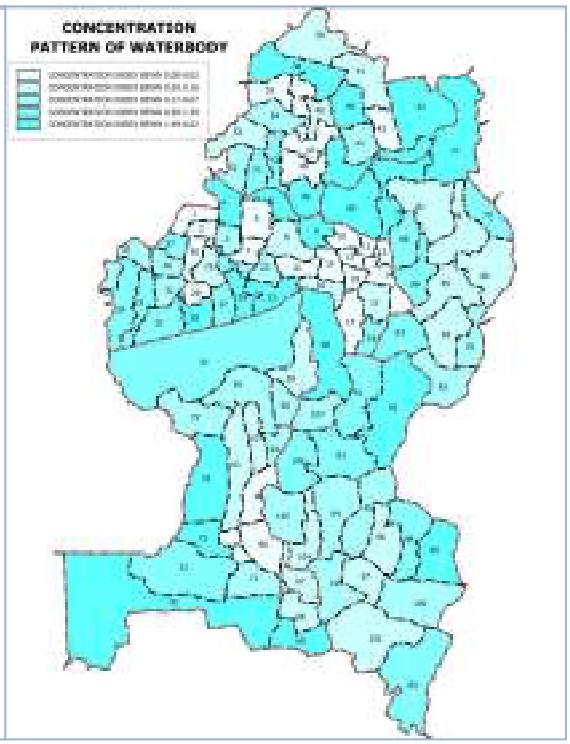


Figure 5.8 Concentration pattern of Water bodies

5.8 Land use Activity Pattern

The activity pattern of Kottayam municipality based on land use is evolved here. Major category of land uses, viz residential, commercial, agriculture, public and semi-public and industrial use are considered in arriving the land use activity pattern. Activity (land use) with higher concentration index has been assigned as the activity of the particular ward. Core, Public, Special Node, High Density Residential, Medium Density Residential, Low Density Residential, Industrial, Agricultural are the activity zones identified based on land use.

The activity pattern of the town based on the land use is shown in Figure.5.9. The activity pattern based on land use is not following any specific pattern. Generally the non agriculture activities have been concentrated in the northern and the south east part of the planning area. The core activities have been surrounded by public and semi public activities. High and medium density residential areas are mainly located in the northern part of the planning area.Industrial activities are scattered. The southern part of the Planning area has more agricultural activity when compare with the northern half of the planning area.

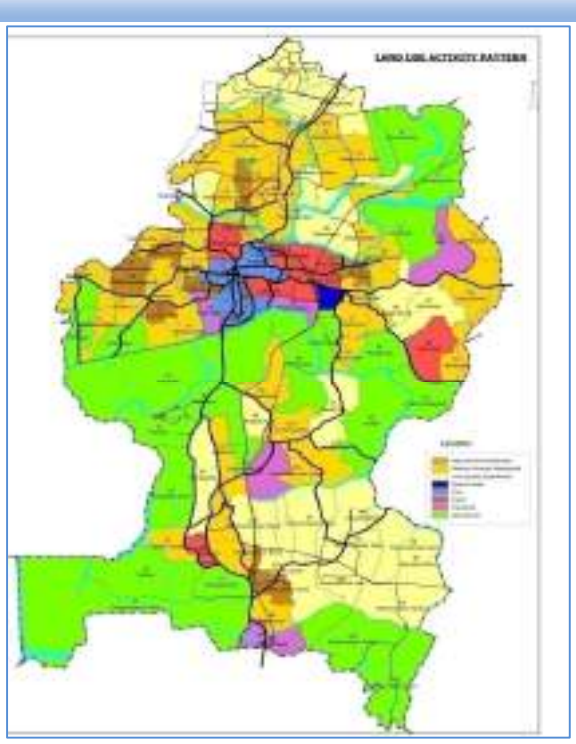


Figure 5.9 Land use Activity Pattern

5.9 Functional Character

The functional character is determined based on population distribution, average plot size and land use. The functional character of different wards of planning area has been determined and it is shown in Figure 5.10. Depending on the nature of the land uses of the wards, they are classified into urban, semi urban, rural and semi rural. In the analysis it is found that, there are 60 urban, 28 semi urban, 11 rural and 8 semi rural wards are there in the planning area. The northern portion of the planning area (comprising old

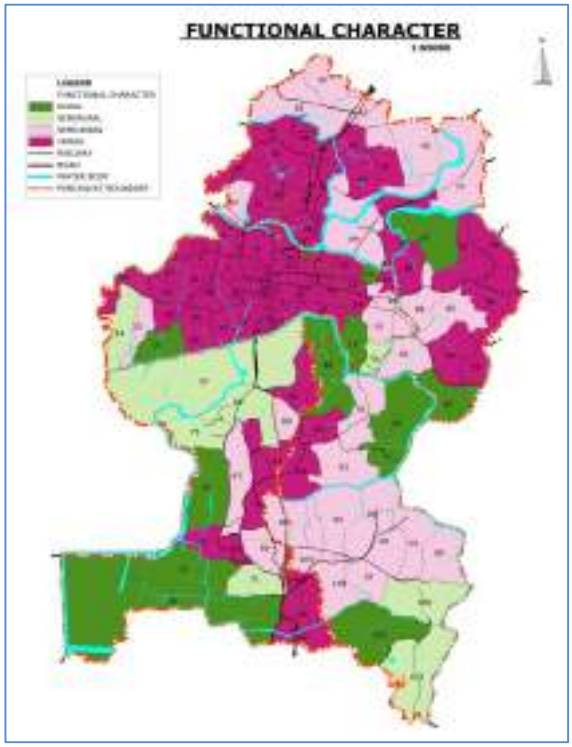


Figure 5.10 Functional Character

municipal limit, erstwhile Kuamaranallur Grama Panchayat area and Vijayapuram Grama Panchayat area) is more urban character in nature. In the southern part of the planning area (comprising erstwhile Nattakom Grama Panchayat and Panachikkad Grama Panchayat area) a rural urban mixed nature is observed. The south western part is predominantely rural in nature, especially the low lying areas. There is a corelation between the transportation network and the character of the wards. Wards along the major roads are more urbanised than the others areas.

5.10 Conclusion

In the earlier part of history, the town is developed with Thazhatangadi as the focal point and in the later part it is developed with Thirunakkara as focal point. Residential land use is the major land use of the area, followed by agriculture land use. The percentage of other land uses is very less. The distribution of land use is not uniform in various part of the Planning area. There is much deviation in percentage of land use when compare with the planning standards. The temporal analysis shows that the residential area is being converted for other urban activities and densification of existing residential area has taken place. The activity pattern based on land use is not following any specific pattern. The functional character shows that majority of wards in Planning area have urban or semi urban character.

6 Demography

6.1 Introduction

The population parameters serve as the basis of all planning process. The estimation of future population is needed for the assessment of various needs and distribution of activities in available land. This chapter explains about the population and demographical characteristics of Kottayam Planning Area in comparison with Kerala state, neighbouring districts, and other local self-Government institutions etc. The study is based on the census reports.

Population of Kerala as per 2001 census is 3,18,41,374 and that of Kottayam district is 19,53,646. Kottayam district with 5.68% of total geographical area of state accommodate 6.14% of total population of the state. Population density of Kerala is 819person/ sq.km and that of Kottayam district is 885person/sq.km. Kottayam is in the eighth position among the districts of the state as far as the density of population is concerned. Kottayam town (old municipality) with 60728 persons is the most populous statutory town of the district as per 2001 census.

6.2 Population Size

The planning area comprises Kottayam municipality, Vijayapuram Grama Panchayat and Panachikkad Grama Panchayat. Since Vijayapuram Grama Panchayat has bifurcated in to Vijayapuram and Manarcad Grama Panchayats after 2001 census it is difficult to compare the census figures of present Vijayapuram GP alone with previous years. The extent of Kottayam municipality has increased by merging two adjacent Grama Panchayats Nattakom and Panachikkad in 2009. So the analysis of population size and growth is done by splitting it into constituent LSGIs (present and previous) and individually analysing the same. The population size of the Planning area since 1971 is shown in Table 6.1. It is also represented in Figure 6.1

Table 6.1 Population Size of Planning Area

Constituent Area	1971	1981	1991	2001
Kottayam Municipality - Old Municipal area **(KTM)**	59714	64431	63155	60728
Kottayam Municipality - erstwhile Nattakom GP **(NTM)**	32024	36238	39124	41702
Kottayam Municipality - erstwhile Kumaranallore GP **(KMLR)**	29545	35491	39041	42481
Vijayapuram GP (Including the population of **Manarcad GP**) **(VPM)**	39608	42924	50417	55949
Panachikkad GP **(PNCD)**	27468	31512	35916	40979
TOTAL *(Include the area of Manarcad GP)*	**188359**	**210596**	**227653**	**241839**

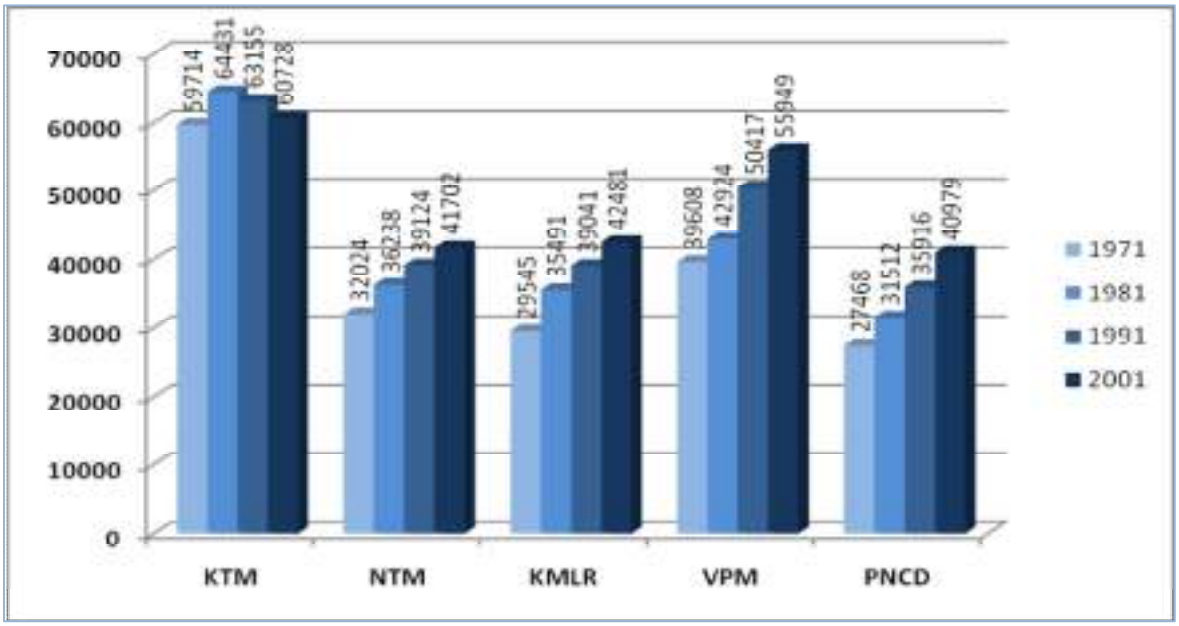


Figure 6.1 Population Size of planning area

The above analysis shows that the population size of the mother town (old Municipal limit) showing an increase trend in the initial stage and then it starts declining. But all other constituent areas of the Planning area are showing a steady increasing trend. The derived population of Kottayam Planning area (2001) is 216616.

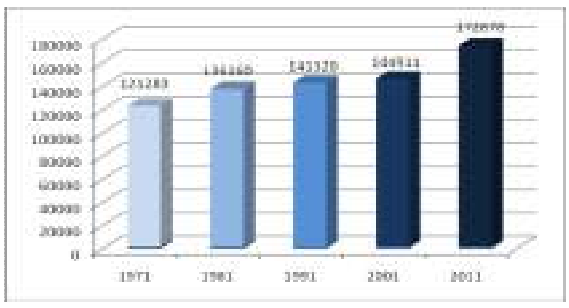


Figure 6.2 Population size of Kottayam Municipality

The estimated population of present Kottayam Municipal town area from 1971 is shown in Figure 6.2. As per the provisional census figure 2011, the population of the present municipal town has reached 1,72,878. As per 2001 census the Planning area has total population of 2,16,616, of which 110137 (51%) are females and 106479 (49%) are males. This is 11.09% of the district population.

Comparing with the other municipalities of the district it is seen that the population size of Kottayam municipal area is much higher than that of other municipalities of the district. It is shows the importance of Kottayam town in the district.

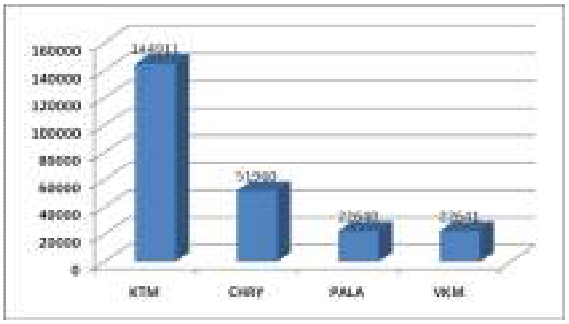


Figure 6.3 Population sizes of towns of the district

6.3 Population Growth Rate

Since 1981 growth rate of population of Kottayam district is steadily decreasing and the growth rate of 1991-01 and 2001-11 are 7.06% and 1.32% respectively. The corresponding figures of Kerala state are 9.42% and 4.86% respectively. The population Growth rate of planning area during 1991-2001 is only 2.54%.

The analysis of population growth rate of constituent areas of planning area is shown in Table 6.2 and Figure 6.3. It indicates that the core area of the planning area is showing negative growth rate and the surrounding areas recorded comparatively higher growth rate

Table 6.2 Population Growth rate of Planning Area

Constituent Area	1971 -1981	1981-1991	1991-2001
Kottayam Municipality - Old Municipal area	7.9	-1.98	-3.84
Kottayam Municipality - erstwhile Nattakom GP	13.16	7.96	14.8
Kottayam Municipality - erstwhile Kumaranallore GP	20.13	10	10.1
Vijayapuram GP	8.37	17.46	25.27
Panachikkad GP	14.72	13.98	15.32
PLANNING AREA	12.27	3.79	2.54

A comparison is also made with other towns of the district. The growth rate of two major towns of the district, Kottayam (old Municipal limit) and Changanassery was negative during 1991-2001 and that of the small towns Pala and Vaikom recorded positive growth rate and it is shown in Figure 6.4. Conversion of residential land use for various other urban land uses, saturation of facilities in the core area, availability of urban facilities in the surrounding areas etc are leading to out migration of people to the peripheral area.

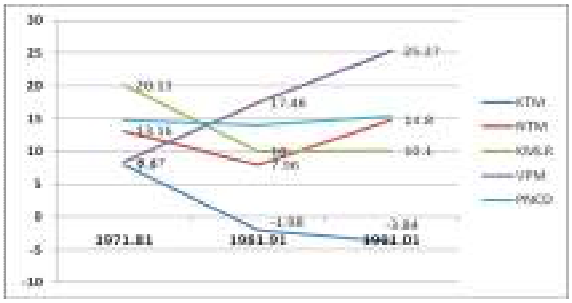


Figure 6.4 Population Growth rate of Planning area

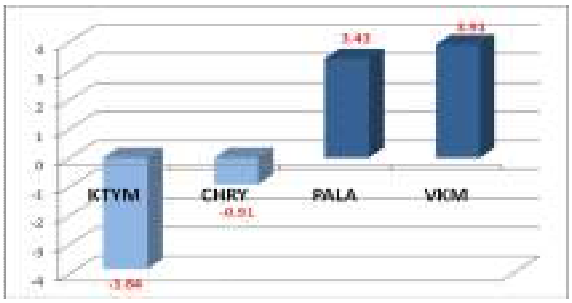


Figure 6.5 Population Growth (1991-2001) Comparison with other towns of the district

6.4 Urbanization of the Region

The percentage of urban population of Kottayam district (13.52%) and Kerala state (13.48%) was more or less same during the census 1951. But there after the phase of urbanization of the district was not at the rate of the state and the percentage of urban population of the district during the 2011 census was 28.55 % compare with 47.72% of the state. The urbanization trend of Kerala State and Kottayam district is given in the table 6.3

Table 6.3 Urban Population of Kerala State and Kottayam District

Year	Kerala state			Kottayam District		
	Total population	Urban population	% of urban population	Total population	Urban population	% of urban population
1951	185.49	18.26	13.48	11.32	1.53	13.52
1961	169.4	25.54	15.11	13.14	1.65	12.56
1971	213.47	34.66	16.20	15.39	2.08	13.52
1981	254.54	47.71	18.74	16.97	1.59	9.37
1991	280.98	76.80	27.33	18.28	3.20	17.51
2001	318.39	82.67	25.97	19.53	2.99	15.31
2011	333.88	159.32	47.72	19.79	5.65	28.55

The rural urban break up of five taluks of the district is given in the table 5.6. It shows that Kottayam is the most urbanized taluk of the district. But this is very low when, compared with the percentage of the state urban population.

Table 6.4 Rural urban break up of Kottayam district (2001)

Taluk	Population			Percentage of urban population
	Total	Rural	Urban	
Vaikom	309387	286750	22637	7.32
Meenachil	403531	351216	52315	12.96
Kottayam	627903	455036	172967	27.53
Kanjirappally	260805	260805	-	-
Changanassery	351275	299315	51960	14.79

The urban population of the state showed consistent increase over the decade. The percentage of urban population has increased two fold within a span of 5 decades. Lack of industrialization of the district and widely dispersed type of habitation are reasons for the slow phase of urbanization. But during the last decade the percentage of urban population of the district has almost doubled and it is mainly due to annexation of two Grama Panchayats to the Municipality. Two urban agglomerations (Kottayam and Changanassery) are there in the district as per 2011 census.

6.5 Gross Population Density

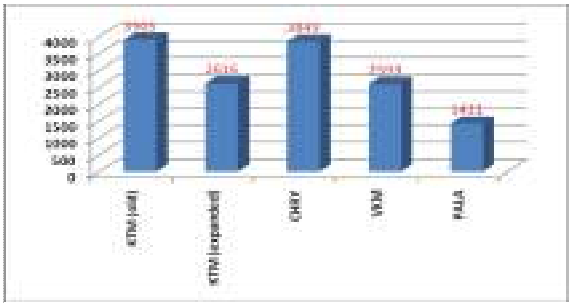


Figure 6.6 Population density of Municipalities

As per 2001 census the overall population density of Kottayam district is 885 persons per Sq.Km and population density of Planning area is 2387 person per Sq.Km. The erstwhile Kottayam municipality has a density of 3905 persons per Sq.Km and with the addition of two adjacent Grama Panchayats in 2009; the density of the town has reduced to 2616 persons per Sq.Km. The density of population of the other three municipalities of the district namely Changanassery, Vaikom and Pala (2001) are 3849, 2593 and 1421 persons per Sq.Km respectively. It is represented in Figure 6.5.

The density of population of constituent local bodies of the Planning area is shown in Table 6.3. There is large variation in density of population in different part of the planning area and it is varying from 1802 persons per Sq.Km in Panachikkad Grama Panchayat to 3905 persons per Sq.Km in old municipal town limit.

Table 6.5 Density of population of Planning Area (2001) in Persons /Sq;km

Constituent Area	LSGI wise		Planning Area
Kottayam Municipality - Old Municipal area	3905	2616	2387
Kottayam Municipality - erstwhile Nattakom GP	1616		
Kottayam Municipality - erstwhile Kumaranallore GP	3021		
Vijayapuram GP	2436	2436	
Panachikkad GP	1802	1802	

The ward wise population density of the planning area is shown in Figure 6.6. The ward wise gross population density is varying from 308 persons per Sq.Km in Chingavanam ward of erstwhile Nattakom Grama Panchayat to 10259 persons per Sq.Km in A.R Camp of old Kottayam Municipality. Eranjal (8169 persons per Sq.Km), Mount Carmal (7318 persons per Sq.Km) and Kanjikuzhy (7248 persons per Sq.Km) are the wards with high population density. The population density is high in Eranjal, Mount Carmel and Pannimattam wards of Kottayam municipality. Generally the northern half of the Planning area has high population density when compare with the southern half. Also the wards along the major travel corridors also have high population density and the wards in the peripheral areas of the town have lower population density. The wards in Panachikkad Grama Panchayat have low density in the Planning Area.

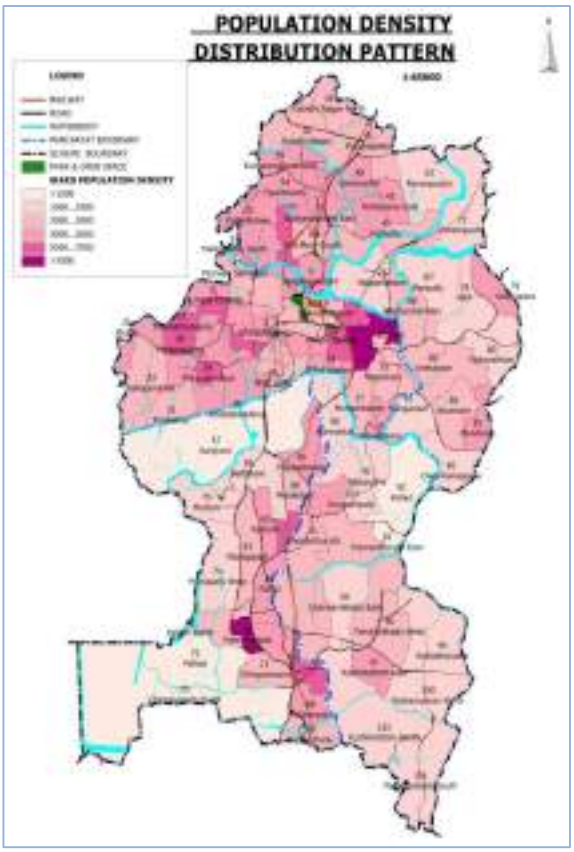


Figure 6.7 Ward wise distributions of population

6.6 Net Population Density

The net population density of the planning area is shown in Figure 6.7. The net population density is high in Pannimattom ward of erstwhile Nattakom Panchayat with a net density of 25726 persons per Sq.Km, followed by A.R.Camp (25,157 persons per Sq.Km), Civil Station (19,051 persons per Sq.Km) and Vayaskara

(12024 persons per Sq.Km) and all these wards belongs to erstwhile Kottayam Municipality. The lowest net population density recorded in Pannimattom North ward of Panachikkad Grama Panchayat with 2313 persons per Sq.Km and Nattassery ward of Vijayapuram Grama panchayat with 2746 persons per Sq.Km. Generally wards in Panachikkad Grama panchayat is with low net population density.

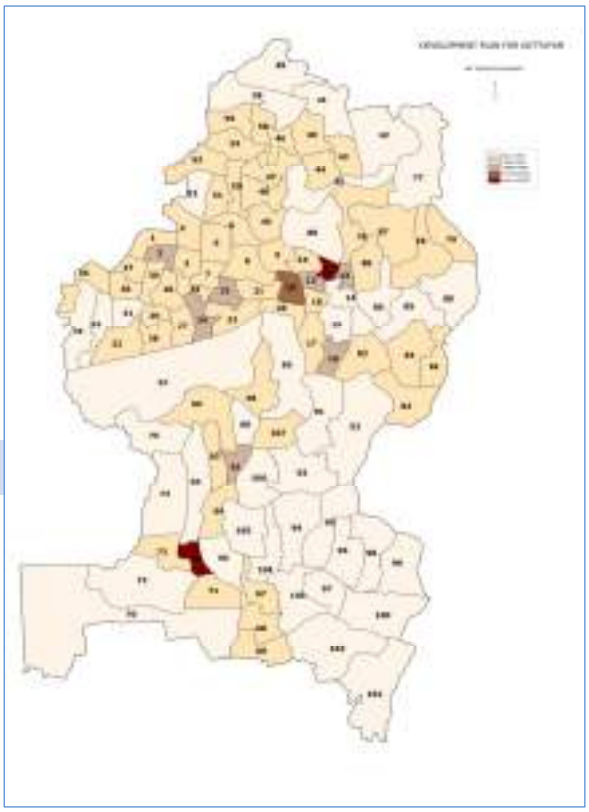


Figure 6.8 Net population density of wards

6.7 Population Concentration pattern

The population concentration pattern is derived by calculating the cumulative population after arranging the wards in the descending order of density. The concentration pattern of the planning area is shown in Figure 6.8. Population is concentrated in the town centre and along the main urban corridors. Along the peripheral area low concentration of population is seen due to the presence of cultivable land. The presence of high rise apartments in the Town centre may be one of the reasons for the Population concentration

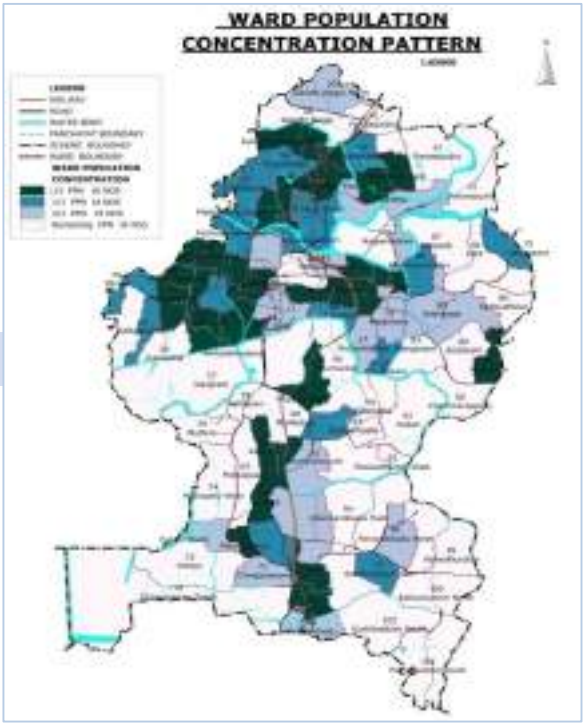


Figure 6.9 –Population Concentration Pattern

6.8 Sex Ratio

Sex composition of human population is one of the basic demographic characteristics. Changes in sex composition largely reflect the underlying socio-economic and cultural pattern of a society. Sex-ratio is an important social-indicator for measuring the extent of equity prevailing between males and

females at a given point of time. Sex ratio in the municipality (1030) is slightly higher than the district average (1025), but less than the urban average (1056). But it is low when compare with other towns in the district- Changanassery (1066), Pala (1061) and Vaikom (1068). In the planning area, Vijayapuram Grama Panchayat (1042) has high sex ratio, followed by erstwhile Kumaranalloor Grama Panchayat (1040), erstwhile Nattakom Grama Panchayat (1035), old Kottayam municipality (1030) and Panachikad Grama Panchayat (1029). It is shown in Figure 6.9.



Figure 6.10 – Sex Ratio – Census 2001

6.9 Literacy Rate

Literacy rate is one of key of socio-economic parameter of progress of modern society. Kottayam town has attained a unique status to become first 100% literacy town in India in the year 1989 itself. Literacy rate of the planning area is 96.63 % and the details are furnished in Table 6.4.

Table 6.6 – Literacy Rate of the Planning Area

Name of LSGI	Literacy rate	Name of LSGI	Literacy rate
Kottayam Municipality	96.57	Panachikadu	96.75
Vijayapuram	96.75	**Planning Area**	96.63

6.10 Conclusion

The population size of Kottayam town is much higher when compared with the other urban centres of the district. The growth rate of population in old municipal limit is showing a decreasing trend while all other parts showing an increasing trend. The area where the Planning area belongs is the most urbanized part of the district. The increase in the urban population of the district is mainly due to annexation of new areas to the existing town and not due to natural growth or in migration. The gross density of population of the municipal area has reduced after annexation of two adjacent Grama Panchayats. In planning area the population is concentrated more in the upper half when compared to the lower half.

7 Occupational Structure

7.1 Introduction

Economic growth is related to a quantitative sustained increase in the country's per capita output or income accompanied by expansion in its labour force, consumption and volume of trade. Economic development is related to qualitative changes in economic wants, goods, incentives and institutions. In this chapter the existing economic base of the town based on the occupational structure is studied. Work participation rate and its temporal variation, the occupational structure and the change that has happened over a period of time, spatial distribution of workers in the town etc are analyzed in this chapter.

7.2 Main and Marginal Workers

As per 2001 census, main workers constitute 85.34%, and marginal workers 14.66 %, of the total workers in Kottayam Municipality. The details of workers in the delineated planning area is given in Table 7.1. The Planning area has a total 66,808 workers and out of that 57,016 are main workers and 9,792 are marginal workers. When the total population is considered, the main workers constitute only 22 % and marginal workers by 2 % of total population.

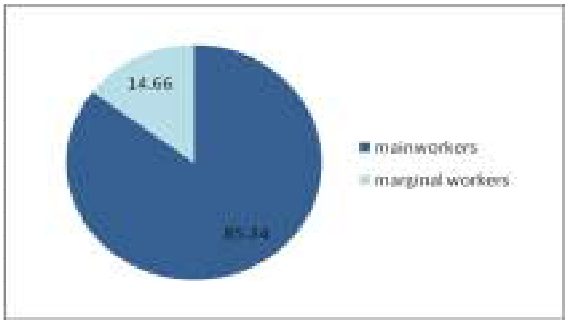


Figure 7.1 Percentage of Main and Marginal workers (2001)

Table 7.1 - Main & Marginal Workers Distribution in Planning area

LSGI	Total Workers	Main Workers	Marginal Workers	WPR
Kottayam Municipality	45156	39073	6083	31.16
Vijayapuram Panchayat	9352	8179	1173	30.44

Panachikad Panchayat	12300	9764	2536	30.02
TOTAL	**66808**	**57016**	**9792**	**30.84**

Source – Census 2001

7.3 Distribution of Workers

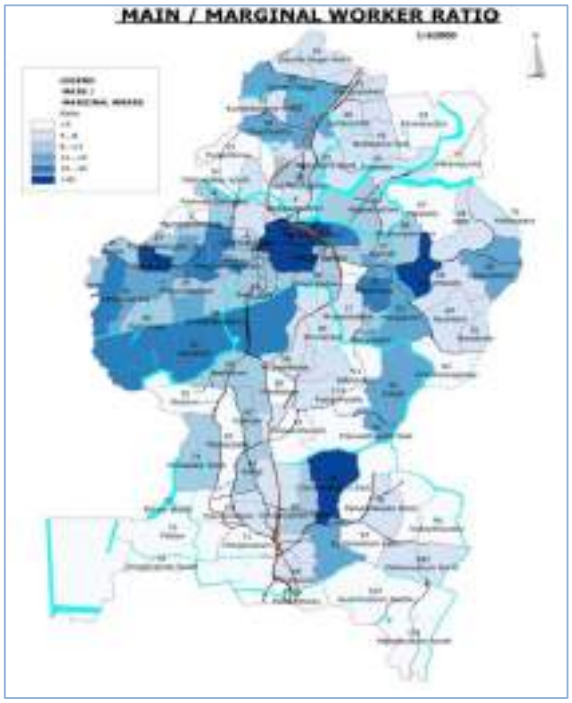


Figure 7.2 – Main - marginal workers ratio

While studying the workers concentration pattern, Main Workers are high (99.21%) in the wards of Railway Station, Parappadom & Channanikkadu East and it is low in the wards of Pathammuuttam South (51.53%). Main- Marginal Workers ratio is high in the wards of Railway Station, Hospital and Channanikkadu East. Generally it is high in the town centre area. This shows that in the central wards the presence of marginal workers is much less than that of the other wards implying the availability of employment opportunities in that area due to the presence of commercial and public institutions. The main-marginal workers ratio is also high in the wards of Nattakom, adjacent to areas where Government College, Polytechnic College and industries like Travancore Cement Ltd are located. Channanikkad East ward of Panachikadu Grama Panchayat also show high Ratio of main and marginal workers and concentration of more Main workers.

The correlation between growth rate of population and workers of the planning area also analysed. The rate of growth of population in planning area is showing a decreasing trend but rate of growth of workers is above the growth rate of population during 1991-01 and generally showing an increasing trend. It shows the economic development of the planning area.

Table 7.2 Comparison of population and workers growth rate

	1971-81	1981-91	1991-01
Growth rate of population	12.27%	3.79%	2.54%
Growth rate of workers		2.37%	8.34%

7.4 Work Participation Rate

Work participation rate is the ratio of the working force to the total population of the Planning area. The work participation rate of planning area is shown in Table 7.1 and the temporal variation of work participation rate of Main workers of planning area is shown in Table 7.3. The work participation rate increased considerably from 26.35% in 1981 to 30.84% in 2001.

Table 7.3 Temporal variation of WPR in planning area

Year	Main workers	Marginal workers	Total workers	WPR
1981	55501	4734	60235	26.35
1991	66315	3111	61662	27.09
2001	57016	9792	66808	30.84

Comparing the WPR of Planning area with the state (32.32) and District (32.4) figures, the WPR of Planning area stands very low (30.84). District WPR is higher than the state rate. Among other towns of the district, Kottayam town ranks third (31.2), next to Vaikom (32.9) and Pala town (32.3) as far as work participation rate is concerned. Kottayam Planning area shows a less WPR, when compared to other urban local bodies in the district. The above comparison of WPR is shown in Figure 7.3.

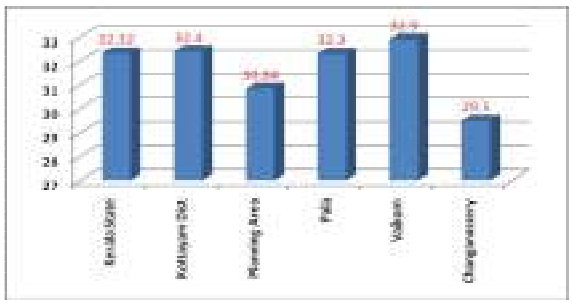


Figure 7.3 Comparison of WPR with state, district and other towns of the district

When compared with the neighbouring Panchayats it is seen that the WPR of the Planning area is less than that of the majority of the neighbouring local bodies. It is represented in Figure 7.4.

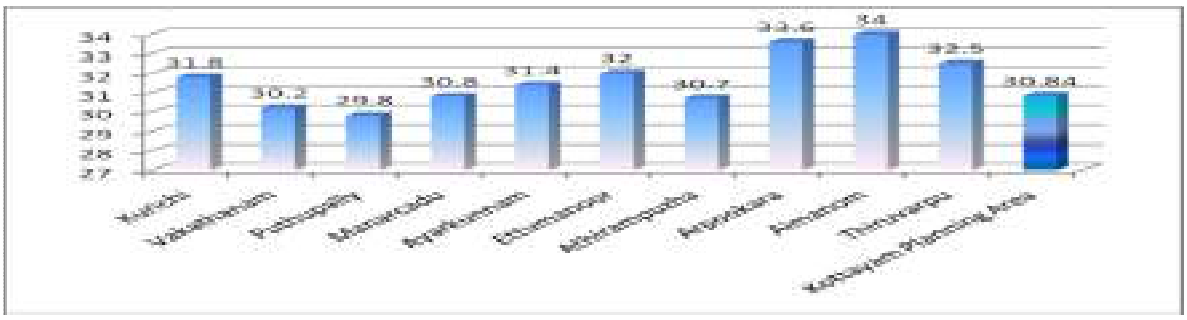


Figure 7.4 Comparison of WPR with surrounding Grama Panchayats

7.5 Occupational Pattern

The occupational pattern of planning area is shown in Figure 7.5 and it shows that the other workers category is dominating in all the LSGs constituting the planning area and the share of cultivators, agriculture labours and household industrial workers are nominal. The Economic base of an area is directly linked to the occupational structure of the workers of that area. The classification of workers from 1981 to 2001 in the planning area is shown in Figure 7.6. The temporal variation of the distribution of workers in the planning area shows that, the tertiary sector dominates over primary and secondary sectors. In 2001 the percentage of tertiary sector workers was 93 %, while it was 90% & 83 % in 1981 and 1991 respectively. It shows the decline of the production sector and the domination of the service sector.

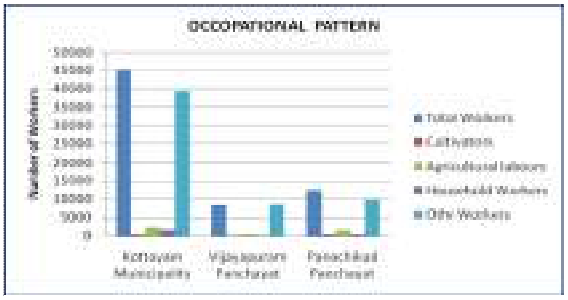


Figure 7.5 Occupational pattern of Planning area

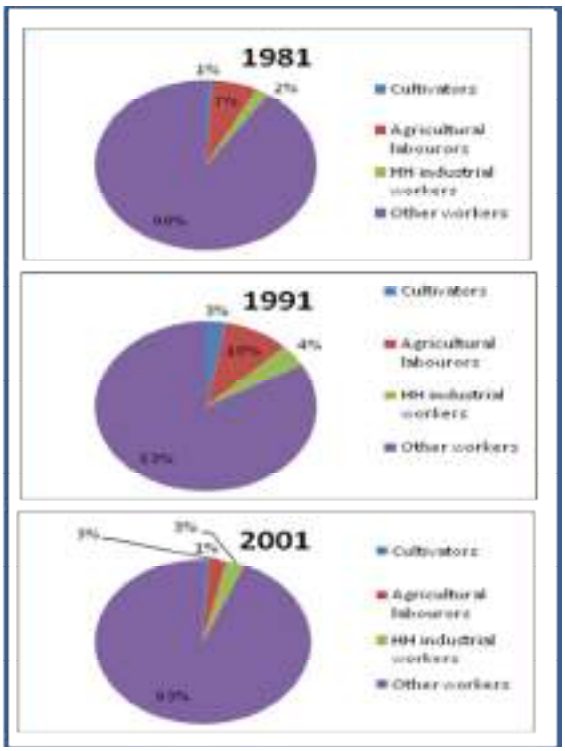


Figure 7.6 Temporal variation of occupational structure

7.6 Concentration Pattern of Workers

The concentration pattern of the four catagory of workers, ie Cultivators, Agriculture labours, Household industrial workers and Other workers is analysing in this paragraph. This gives an idea of the spatial distribution of the workers and their concentration areas.

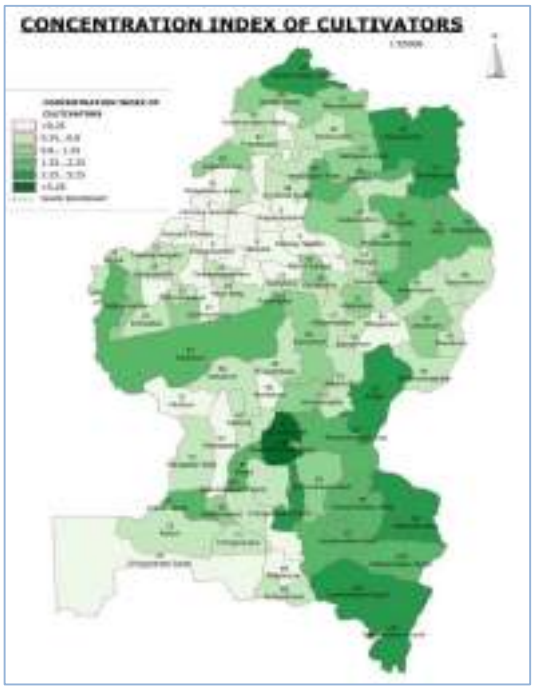


Figure 7.7 – CI of Cultivators

Cultivators

The concentration pattern of cultivators is shown in Figure 7.7. High lands of the eastern part of the planning area have a high concentration of cultivators. The major cultivation in this area is dry agriculture. The concentration of cultivators is high in the wards of Poovanthuruth and Poovanthuruth West (> 5.25). In the town centre most of the wards have a CI less than 0.25 which shows the urban development in the core area and rural nature in the peripheral area of the planning area

Agricultural Labourers

The lower half of the Planning area is of rural or semi rural nature. Agricultural labourers are mainly concentrated in the wards of Kanjiram, Kuzhimattom East and Velloothuruthy (CI is > 4.25). Compared to the other parts, the upper half of the planning area is more urban nature. In the town centre there is concentration of non-agriculture workers concentration. The concentration pattern of Agriculture labours is shown in Figure 7.8.

House Hold Workers

House Hold Industrial workers spread throughout the planning area with concentrations in erstwhile Kumaranallore Grama Panchayat, Panachikkad Grama Panchayat. Poovanthuruth, Kumaranalloor West and East wards have high concentration of the HH Workers (>3.31). The concentration pattern of House hold industrial workers is shown in Figure 7.9.

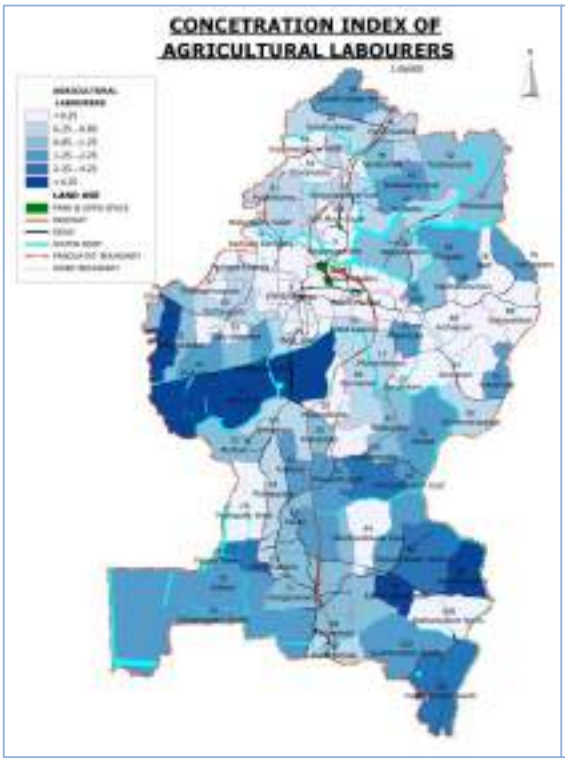


Figure 7.8 – Concentration Index of Agriculture labours

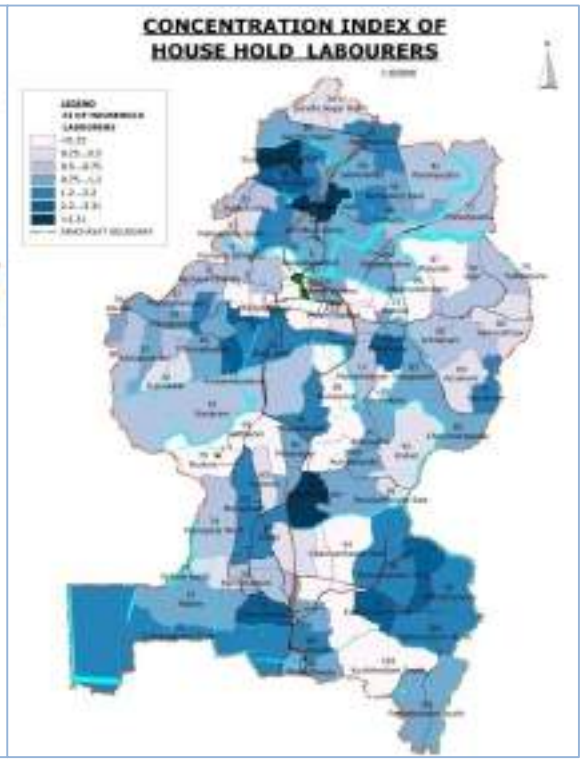


Figure 7.9 – Concentration Index of House Hold Workers

7.7 Conclusion

Growth rate of population of Kottayam Planning area is at a lower phase. The growth rate of workers is more than that of population growth rate. But the WPR rate of the planning area is less than the State and district figures. So the economic base of the town has to be further strengthened by creating job opportunities in various sectors. The occupational pattern shows that the Other category workers occupies major share (more than 90%) of workers and the percentage of workers in production sector is very nominal when compared with the service sector.

Generally the Cultivators and Agriculture labours are found to be concentrated towards the outskirts of the Planning area, where the availability of agricultural land is more. House hold industrial workers are found to be scattered throughout the Planning area. But there is no specific pattern in distribution of different category of workers. The availability of cultivable area is more in planning area and cultivation has to be encouraged in available agricultural lands. It will strengthen the economic base of the town.

8 Trade and Commerce

8.1 Introduction

In the earlier part of history, when the water way was predominant means of transportation the trade activities of the town was concentrated at Thazhathangadi, Chungam, Nagampadam and Kodimatha and commodities from Kottayam and Idukki districts were transacted through Kottayam. With the decline in the water transport system and development of road transportation system the activities in these places declined and the trading activities has shifted to other places. The town is an important trading center of spices and commercial crops, especially rubber. It is also a major trading centre of textiles and Jewellery in the region.

8.2 Land under Commercial use

The total land under commercial use of Kottayam Municipality is 1.11 Sq.Km, which is 2.12% of the total town area. The commercial area of the town was developed with M.L.Road as a nucleus. Later the commercial area has extended to other part of the town like K.K.Road, T.B.Road, LBS Road etc and these places together formed as the CBD of the town. Now the commercial development is also taking place along the major travel corridors – M.C.Road and K.K.Road to the peripheral area. The commercial land



Figure 8.1 Commercial Land uses of planning area

use of the planning area is shown in Figure 8.1.

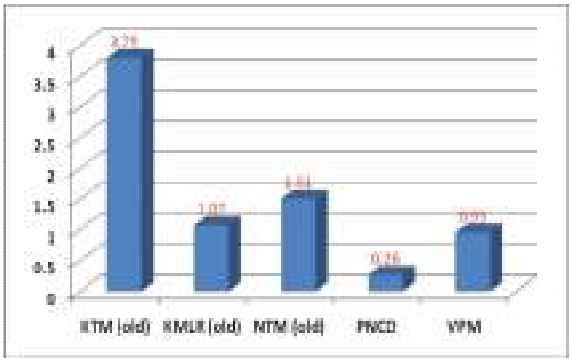


Figure 8.2 Comparison of commercial land use under planning area

While analysing the the percentage of commercial land within the planning area, obviously the core town (old municipal area) have more percentage of commercial land (3.79%) and it is followed by erstwhile Nattakom Grama Panchayat area (1.51%). The percentage of commercial land in Panachikkad Grama Panchayat is only 0.26%. The percentage of commercial land use in different areas of the Planning area is shown in Figure 8.2.

A comparative study with similar adjacent town in the region has been made and the percentage share of commercial area to the total area of the towns Pathanamthitta, Thiruvalla, Chengannur, Alappuzha, Changanassery and Thodupuzha are 0.94%, 0.97%, 0.29%, 1.61%, 2.74% and 1.80% respectively and it is shown in Figure 8.3. It is shows that Kottayam is in second place after Changanassery as far as the percentage of commercial land use is concerned and it shows the commercial importance of the Town.

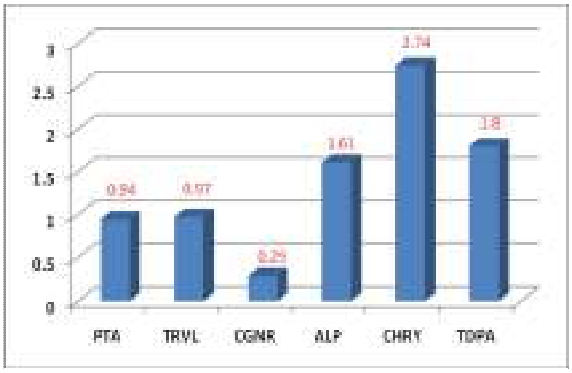


Figure 8.3 Percentage of commercial areas in sourrounding towns

An analysis regarding the temporal variation of commercial land use has been made. The percentage of commercial land was 1.40% of total area in 1966 and has increased to 2.12% in 2010. The area under commercial land use has increased by 1.50 times in 20 years. Commercial development also taken place in other parts of the planning area. Trade and Commerce is one of the economic bases of the town.

8.3 Commercial Nodes

A detailed survey regarding the commercial nodes in the town has been conducted by the department. Based on the preliminary survey, 14 commercial nodes in the planning area have been identified for the detailed study. The facilities at various nodes has been generally grouped into Retail shops, Whole sale shops, Commercial Offices, Small Scale Industries, Other facilities and Higher order facilities. The number of shops / units of different categories coming under these general groups were counted. The CBD area has been excluded from this analysis. For comparison total scores for each node were calculated after assigning weightage to each facility. The total score obtained for each node is given in Table 8.1.

Table 8.1 Total Score obtained for nodes

Name of Node	Total Score	Rank
Chingavanam	179.89	1
Kodimatha	176.00	2
Kanjikuzhy	156.73	3
Sankranthi	106.75	4
Kumaranalloor	90.01	5
Chungam	82.83	6
Kaduvakkulam	81.60	7
Kalathipady	76.47	8
Thiruvathukkal	68.65	9
Paruthumpara	52.14	10
Vadavathoor	50.38	11
Pakkil	47.84	12
Pallom	36.59	13
Nattakom	28.82	14

A graph is drawn with the score obtained for each node and based on the variations in the graph, the existing hierarchy of nodes has been found out. It is shown in Figure 8.4.

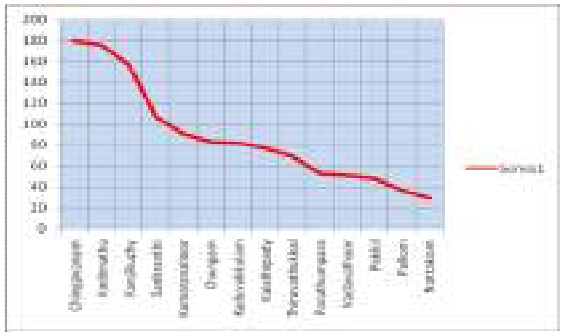


Figure 8.4 Identification of hierarchy of nodes

Based on the above analysis the existing hierarchy of nodes has been arrived at as given below. It is represented in Figure 8.5.

First order – *Chingavanam, Kodimatha Kanjikuzhy and Samkranthi*

Second order - *Kumaranallore, Chungam, Kaduvakkulam, Kalathilpady and Thiruvathukkal*

Third order – *Paruthumpara, Vadavathoor, Pakkil, Pallom and Nattakom*

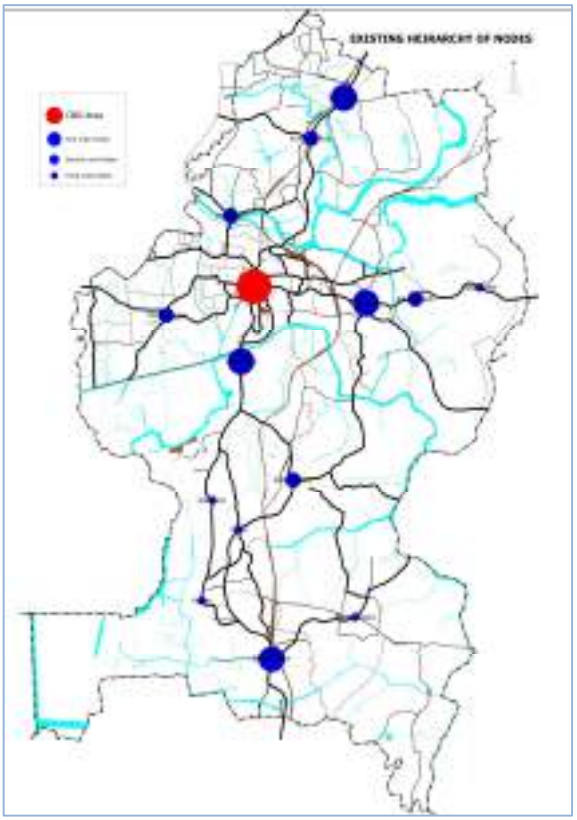


Figure 8.5 Commercial Nodes of the town

8.4 Markets


Kodimatha Vegetable Market

Once Kottayam was a famous market of the region and due to development of other markets in the surrounding areas and due to various other reasons the importance of the market has slightly declined. The main market is located in the road popularly known as M.L.Road (Market Landing Road) at the CBD of the town itself and it mainly consists of Provision market, Vegetable market, Fish market (fresh), fish market (Dry) and Meat market. The vegetable market and Fish market (Fresh) has recently shifted to Kodimatha area and it is located on the side of M.G.Road and about 0.50Km away from the present market. In addition to above, markets are functioning at Kanjikuzhy and Chingavanam. The commodity transaction through Kottayam market is given in Table 8.2.

Table 8.2 Details of Commodity transaction – Kottayam Market

Sl. No	Commodities	Average Quantity	Price (in Lakhs)	Arrived From	Distributed to
1	Vegetable	75 tonnes/week	22.50	Tamil nadu, Karnataka	Kottayam Dist
2	Banana	9 tonnes/week	2.52	Tamil nadu, Karnataka	Kottayam Dist
3	Rice	15.18 tonnes/week	425.40	Tamil nadu, Karnataka, Andrha Pradesh	Kottayam and Idukki Dist
4	Sugar	200 tonnes/week	58.00	Tamil Nadu, Karnataka, Maharshtra	Kottayam Dist
5	Pulses	75 tonnes/week	52.50	Tamil Nadu, Karnataka, Maharshtra , madhya pradesh	Kottayam Dist
6	Betel	1500 bundles /week	1.50	Adoor, Pandalam	Kottayam Dist
9	Arecanet	4 tonnes/week	6.00	Malappuram	Kottayam Dist
10	Cattle feed	40 tonnes/week	1.10	Irinjalakkuda	Kottayam Dist
11	Fish	120 tonnes/week	5.00	Ettumanoor, Paippad	Kottayam Dist
12	Salt	15 tonnes/week	1.20	Tamil Nadu	Kottayam Dist
13	Jaggery	50 tonnes/week	2.25	Tamil nadu, Karnataka	Kottayam Dist
14	Maida	150 tonnes/week	33.00	Kottayam District	Kottayam Dist
15	Coir	3 load/week	1.50	Alapuzha, Tamil nadu	Kottayam Dist
16	Oil	10 tonnes/week	6.60	Tamil nadu	Kottayam Dist
17	Black gram	12 tonnes/week	7.80	Maharastra	Kottayam Dist
18	Rubber	500 tonnes/week	925.00	Kottayam, Pathanamthitta	Kottayam and Ernakulam Districts, Punjab, UP and Delhi

Sourse: Primary Survery 2012

From the above analysis it can be observed that natural rubber, which is the major product from the hinterland, is the major commodity in terms of quantity and amount transacted through Kottayam Market.

8.5 Godowns

Godown of State Warehousing Corporation at S.H.Mount, FCI Gowdon at Chingavanam and Godowns near Railway Stations owned by different agencies, Godowns at Kodimatha are the major godowns of the Planning area. In addition to that a number of other small and medium sizes Godowns are there at different part of the planning area.

8.6 Fair and Exhibition Grounds

The Nagampadam Maidan is the only area available in the town for conducting Fairs and Exhibition. But its condition is to be improved and water logging shall be avoided. The Thirunakkara Maidan was another place used for conducting trade and fairs earlier but now it is not for such purposes after its renovation. Being a regional center a ground for conducting trade, fairs and exhibition is needed for the town.

8.7 Infrastructural facilities

The infrastructure facilities at Kottayam market area is inadequate - very narrow and congested streets, absence of parking areas, inadequate drainage system are the major problems faced by the market area. The buildings are very old and renewal of market area with adequate infrastructure facilities is highly essential. But a new Vegetable market has constructed at Kodimatha with modern facilities and started functioning.

No slaughter house is functioning at Kottayam and unauthorised slaughtering is done at different places of the planning area. The system for disposal of market waste is also inadequate. No terminal facilities for the trucks coming to Kottayam. Now the trucks are parking at scattered locations like Kodimatha, Nagampadam, Manipuzha, S.H.Mount etc.

Hardly any facilities are available at the markets functioning at Chingavanam and Kanjikuzhy. Basic facilities like platforms, shelters, toilets, drainage, parking areas are absent. These markets also needed immediate attention.

Kottayam Port, India's first multi-modal ICD is minor port using inland water way is situated at Nattakom on the banks of Kodoor river. It is expected that, export of commodities, especially spices, would become hassle-free and cheaper compared to the present mode of freight movement through roads to Kochi port. The mini port will definitely improve the trade and commerce prospects of Kottayam.

8.8 Other Shopping Facilities

In addition to markets, there are shopping complexes in various part of the town. Textiles, electronics goods, stationary, building materials, super markets etc are functioning in these shopping complexes. K.K.Road, T.B.Road, LBS Road are the major shopping avenues of the town. Samkranthi, Kanjikuzhy and Chingavanam are the other major commercial nodes in the planning area. Jewelleries and textile show rooms of higher order scale is functioning at Kottayam and these showrooms attracting number of peoples from surrounding districts. Automobile showrooms of almost all major companies are functioning at Kottayam especially in M.C.Road at Nattakom and Kumaranallore area. Exclusive outlets of many national and international products are functioning in the town.

8.9 Informal Sector

Hawkers and vendors have long been a common feature of sidewalks and markets of urban centers. Hawkers contribute substantially in meeting the needs of the community. They indirectly support the local artisans and poorer sections of the community, by making available commodities at a comparatively cheaper rate. Even though their activities can be justified socially, it is conflicting with the management of traffic and pedestrian movement on street and in many cases affects the environmental quality.

Even though in a small scale, the informal sector activity is there in Kottayam Municipality also. A study has been conducted by the Town and Country Planning Department to assess various aspects of hawking. There is no organized space for hawkers in the town and they are mainly utilizing road margins. M.L.Road, T.B Road, Nagampadam and Thirunakkara Bus Stations are the areas of major informal sector activities. Details of informal sector area of the Planning area is shown in Table 8.3

Table 8.3 Informal Sector of Planning Area

Sl: No	Area	Activity / Commodity	No.of units	No.of labours
1	Nagampadam Stand	Fruit, Pan shop, Vegetable, Lottery, Toys, Cool drinks, Food	24	29

2	Nagampadam-Railway Station road	Lottery, Helmet, Hens, Snacks, Vegetables, Cool bars, Food, Chappal repairing	20	27
3	Around Kanjikuzhy Jn	Vegetable, Pan shop, Fruits, Lottery, Tea & Snacks, Umbrella repairing, Shoes & Chappals, Food	21	30
4	M.L.Road	Vegetable, Fruits, Snacks, Fish,	65	69
5	T.B.Road and K.K. Road (Market Jn to KSRTC)	Garments, Cosmetic, Medicines, Umbrella and Chappal repairing, Electronic goods, Audio and Vedio CDs, Fruits, Toys, Tools, Lottery, Food, Home appliances	85	100
6	P.O.Road	Vegetable, Pan shop, Fruits, Lottery, Tea & Snacks, Umbrella repairing, Food, Flowers	23	25
7	LBS Road	Vegetable, Pan shop, Fruits, Ground Nuts, Lottery, Audio and Vedio CDs,	14	14
8	Temple Road	Vegetable, Pan shop, Snacks, Ground Nuts, Lottery, Tools, Food, Coir, Repairing of Chappals,	16	19
9	YMCA Road	Vegetable, Snacks, Garments, Fish, Repairing of Chappals	11	15
10	Thiruvathukkal Jn	Ground Nuts, Fish, Food	4	6
11	Chingavanam Jn	Vegetable, Pan shop, Snacks, Ground Nuts, Lottery, Food, Fish	18	19
12	Kodimatha - Manipuzha	Food stalls, Fruit	11	22
13	Pakkil Jn	Fish, Lottery, Stationary, Lottery	5	7
14	Samkranthi	Lottery, Food, Fish	4	7
15	Chungam	Lottery, Pan shop, Fish	4	6
16	Paruthumpara Jn	Fish, Ground nut, Vegetables	6	7
17	Vadavathoor	Food stalls, Lottery, Pan shop, Fruit Stall	4	6

8.10 Commercial Facilities

The distance to various commercial facilities like weekly market, daily market, super market and convenient shops were studied in the Socio-economic survey conducted as part of preparation of Master Plan. As per this survey weekly market, daily market, supper market and convenient shops are available at an average distance of 3.44km, 2.51 km, 4.19km and 0.31km respectively in the Planning

area. The above distance for constituent areas of the Planning area is shown in Table 8.3

Table 8.4 Nearness to the Market facilities

Sl:No	Name of the Area	Weekly market	Daily Market	Supper Market	Convenient Shops
1	Old Kottayam Municipal limit	1.38	1.00	1.40	0.27
2	Erstwhile Kumaranallore G.P	4.16	3.29	3.58	0.38
3	Erstwhile Nattakom G.P	4.38	3.70	6.14	0.19
4	Vijayapuram GP	5.57	3.00	3.25	0.25
5	Panachikkad GP	1.73	1.58	6.59	0.44
TOTAL		3.44	2.51	4.19	0.31

8.11 Banking

Branches of almost all banks are functioning at Kottayam. Details of different category of banks functioning in the Planning area are shown in table 8.9. 118 branches of various category banks are functioning in the town. Sufficient numbers of branches are available for the need of the people.

Table 8.5 Banks in Planning Area

Sl:No	LSGIs	SBI and Associates	Nationalized Commercial banks	Scheduled Commercial banks	Co-operative Banks and Societies
1	Kottayam	16	19	18	39
2	Vijayapuram	2	4	2	15
3	Panachikkad			1	2
TOTAL		18	23	21	56

8.12 Conclusion

Once water way was the predominant mode of transportation, Kottayam was a major trade center and trading activities are mainly concentrated at Thazhathangadi, Chungam and Kodimatha. In the later part of history, the trade and commercial activities were shifted to present CBD area. Rubber is the major commodity in terms of quantity and amount transacted through Kottayam market. Large showrooms of textiles, jewellery and automobiles are functioning at Kottayam. Activity of informal sector is concentrated more in CBD area. Sufficient numbers of banks are functioning in planning area.

9 Industry

9.1 Introduction

Kottayam is the land of letters, latex and lake. Growth of industrial sector in the planning area during the past few years is considerable. The contribution of Kottayam district in India's natural rubber production is high. Significant growth has been achieved in the agro-based industrial sector especially rubber based industries, food products and other industries in the planning area and hinter land. The printing industry is another notable activity in the planning area.

9.2 Raw materials

Agro based products especially natural rubber is the major raw material of the planning area. There is abundant scope for rubber-based units in the area. The increasing output in rubber production and the advent of modern processing techniques have resulted in the establishment of rubber-based industrial units like M.C.sheets, foot wear, rubber band units etc. Other agriculture products like pineapple, rise, tapioca etc can also utilized as raw material and processing units based on these agriculture products can be established. Lime shell is another raw material available from the backwaters in the western part of the district.

9.3 Existing scenario

As per the land use survey the area of land coming under industrial land is 1.24 Sq.Km, which is just 1.37% of total planning area. The industrial units are distributed in all part of planning area and more concentration of industry is there where the major industries are located. Poovanthuruthu Industrial Plot area, Chingavanam, Kodimatha are the other areas having more concentration of Industrial land use. The distribution of Industrial land use in the Planning area is shown in Table 9.1 and Figure 9.1.

Table 9.1 Distribution of Industrial land use

Sl	Area	Area (In Sq:km)
1	Old Kottayam Municipality	0.20
2	Erstwhile Kumaranallore GP	0.11
3	Erstwhile Nattakom GP	0.50
4	Vijayapuram GP	0.20
5	Panachikkad GP	0.23
	TOTAL	1.24

The industrial units in the planning area are limited to few medium and small scale industries. The Travancore Cements Limited at Nattakom is the major public sector undertaking in the planning area which manufactures white cement, mainly using lime shell as the raw material. Kottayam is a major production and trading centre of natural rubber. Madras Rubber Factory (MRF) located at Vadavathoor is the major industrial unit in the planning area, utilizing rubber as raw material. The Travancore Electro Chemical Industries at Chingavanam is the other industrial unit located in the planning area and it is remaining closed for the last many years. There are 3025 small scale industries in the planning area and providing employment to 10976 persons.



Figure 9.1 Distribution of Industrial Land use

Almost all major Malayalam dailies have printing and publishing units in Kottayam. The Malayala Manorama, Deepika, Mangalam, Mathrubhoomi, Desabhimani, Veekshanam and Kerala Kaumudi dailies are published from Kottayam and their printing units are located within the planning area. In addition to that there are a number of other periodical and book publishing units in the planning area. This sector provides employment for a large number of people in and around the Planning Area.

Another sector is to be considered is modern industrial units like IT hardware units and electronic component units. Even though the level of education is high in planning area, the units of this kind is not much in the planning area.

9.4 Major industrial units

Travancore Cements Limited located at Nattakom, established in the year 1949 is the major public sector undertaking in the planning area. It manufactures white cement using lime shell as the major raw material and it is only one of these kinds in India.



Travancore Cements

Madras Rubber Factory (MRF) is the major Rubber based industry in the planning area established in the year 1969. Tyres and tube for automobiles are the major products of this unit.

The Travancore Electro Chemicals was another major industrial unit in the planning area. Oxygen, acetylene and carbon rods for welding were the major products of this unit. The lime shell from Vembanad Lake was used as raw material. But this unit is remaining closed now due to various reasons. This unit located at Chingavanam adjacent to M.C.Road as well as railway line. Revitalization of this unit is needed as large extent of land and machineries are remaining idle now.

9.5 Industrial Development Plots

Industrial Development plot at Poovanthuruth is the only Development Plot functioning in the Planning area. Total extent of land of the Development Plot is 41.25 acres and 205 plots are there and 212 industries are functioning in the Development Plot. The units in the industrial Plot mainly producing rubber based products, building materials, steel fabrication etc. In addition to that there are three Mini Industrial Estates at Kodimatha, Nattakom and Kumaranallore. The infrastructural facility, i.e. roads, water supply, waste disposal of these estates has to be improved.

9.6 Small scale units

The small scale industrial units can be categorised into Agro based, Rubber based, Plastic based, Forest based, Animal Husbandry, Textiles, Chemical, Engineering, Electronics, Minerals, Building Materials etc. The LSG wise number of SSI units in various categories is shown in Table 9.2 and also in Figure 9.1.

Table 9.2 – Classification of Small Scale Industries Units

Name of Panchayat	Agro based	Rubber based	Plastic based	Forest based	Chemical	Engineering	Electronics	Minerals	Building Materials	Others	Total
Panachikadu	64	94	15	50	17	20	-	1	5	63	329
Vijayapuram	67	23	1	10	1	21	1	2	7	99	232
Kottayam (M)	287	194	47	115	35	203	4	6	51	862	1804
Total	**418**	**311**	**63**	**175**	**53**	**244**	**5**	**9**	**63**	**1024**	**2365**

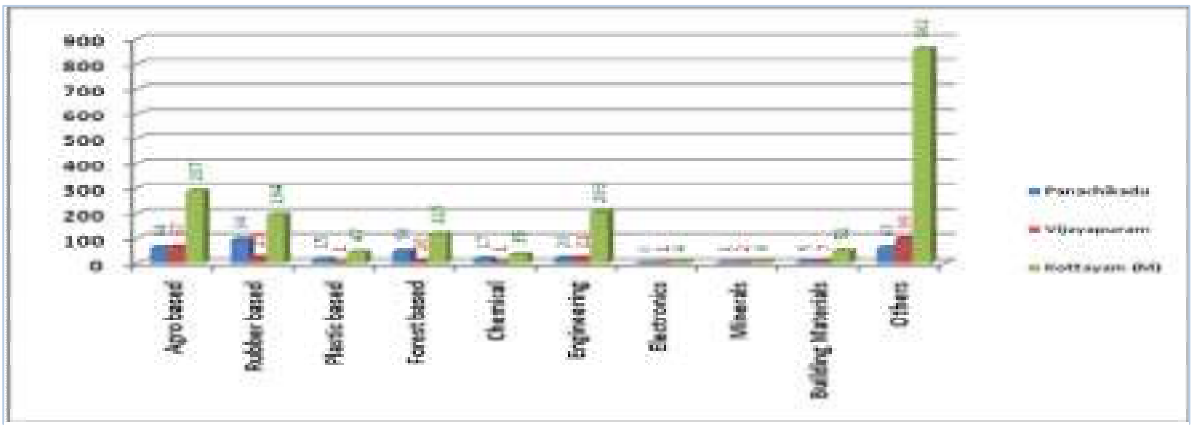


Figure 9.2 LSG wise SSI Units

In the planning area small scale industries in the categories of agro based, rubber based, engineering based and forest based units are high in number. In Kottayam Municipal area Agro based industries are more in number, followed by Engineering and Forest based units. Rubber based, Agro based and forest based units are more in Panachikad Grama Panchayat. Agro based, rubber based and Engineering units are more in Vijayapuram grama Panchayat. The table shows different category of industrial units in the planning area. In general agro based industrial units are predominant in the region followed by rubber and engineering based units.

Printing and Publishing industry is the agglomerated industry in the Planning area. The first printing press in Kerala (C.M.S Press) was established at Kottayam in 1821 by Rev. Benjamin Baily, a British missionary. The first Malayalam-English and English-Malayalam dictionaries were published from Kottayam in 1846 and 1847 respectively. The Co-operative society of writers "Sahithya Pravarthaka Sahakarana Sangam" (SPCS), for publishing their books was established at Kottayam in 1945. Kottayam is the headquarters of a number of book publishing agencies and is the main centre of publishing business of the state.


C.M.S Press, Kottayam


Malayala Manorama

Almost all major dailies Malayala Manorama, Mathrubhumi, Kerala Kaumudi, Deshabhimani, Deepika, Madhyamam, Mangalam etc are publishing from Kottayam. Famous publishers like DC Books, V Publishers, Vidhyardhimitram, Current Books, NBS and number of other publishers are functioning at Kottayam. In addition to that around thirty periodicals are publishing from Kottayam. Almost 70 percent of books publishing in Kerala is from Kottayam.

9.7 Traditional Industrial units

Many of the traditional industrial units in the planning area have been extinct and the remaining is functioning in limited scale only. Manufacturing of bamboo bags and mats, production of furniture, manufacturing of tools, manufacturing of pickles and pappads are the traditional industrial products of the planning region. With the emergence of tourism activities in the region there is further scope for traditional industries in the planning area.

9.8 Related Establishments

Indian Rubber Board


Indian Rubber Board Office, Kottayam

The headquarters of Indian Rubber Board, constituted under the Rubber Production and Marketing Act 1947, has its headquarters at Kottayam. Indian rubber institutes is also located at Kottayam. The Board has been implementing various schemes in the field of manufacturing of production and processing of natural rubber since 1957 which is the major agro product of the region.

Kottayam Port, Nattakom


Kottayam Port, Nattakom

The Kottayam Port, located at Nattakom is an inland port with customs clearance facilities and established under public and private participation. The Port and Container terminal, comprised in 10 acres of land is expected to handle 6,000 containers a year. The containers from this port have to move to Kochi Port through barges. It is helpful in transporting commodities to and from central Kerala, comprising Pathanamthitta, Kottayam and Idukki districts at very cheaper cost when compare to other modes of transportation. This port will definitely promote further industrialisation of the region.

9.9 Conclusion

Only 1.5 % of total land use of the planning area is coming under industrial use. Small scale units provide more employment opportunities. Agro based materials are available in plenty in the influence area and major share of these products are sending to other places without value addition or processing. Agro based and rubber based units are prominent in the planning area and more units have to be established for local economic development. Low density areas of planning area can be considered for establishing micro industrial units. The Kottayam mini port is an advantage for industrialization of the planning area and region. Better connectivity with other parts of the state and neighbouring states is another advantage.

10 Heritage and Tourism

10.1 Heritage

Changes accompanying urban growth causes the destruction of distinctive and meaningful built and natural elements, eradicating the physical expression of former indigenous ways of life that are very much part of the settlement culture. Since the architecture is a long-term and large scale physical witness to the past, future generations will continue to refer to it as a reflection of the spirit of the historic culture.



Kumaranallore Devi Temple



Kottayam Cheriyapally

During the recent decades, the rehabilitation and regeneration of historic centers has been increasingly recognized as an efficient tool for urban development synthesizing cultural values with economic opportunities. Maintaining and enhancing historic buildings and historic areas can be economically rewarding and in long term increase the value of private and public property.



Thazathangadi Juma Masjid

Thazhathangadi Juma Masjid is one of the oldest mosques of Kerala is situated in the Planning area. In addition to that there are a number of buildings/areas of heritage value in the town. Cheriyapally, Valiyapally, Thirunakkara Mahadeva Temple, Kumaranallore temple are the few among them.



Thazathagadi Heritage Area

Raw of houses along the bank of Meenachil River at Thazhatangadi which were constructed during 1860s has unique architectural characteristics. Some of these buildings were constructed with Gothic style of architecture and these types of buildings are available between Edakkattupally and Alummood. Number of old churches and temples are there in the area and the remains of old fort is there at Thaliyil close to this area.

10.2 Tourism

Kottayam has enough potential and components to become a hot spot of tourism. It has diversity as it has backwaters in the western part and hills in the eastern part and very rich in history, culture, heritage and spirituality. Still Kottayam town has not branded as a tourist destination. The neighbouring Kumarakom has placed in the world tourism map. But the impact of tourism development in Kumarakom has not reached at Kottayam and the local economy has not developed much. The tourists who are reaching Kumarakom are mostly confined their trips at Kumarakom by boating and not visiting other part of the district and at present there is no package for the same.

All category of tourist destination are available in the surrounding area of Kottayam – Vagamon, Elaveezhapoonchira (Hill and adventure tourism), Sabarimala, Erumeli, Bharananganam (Pilgrim tourism), Kumarakom (Backwater tourism), Thazhathangadi (Heritage site). The religious festivals, boat races, book and other fairs are the other potentials of the town. The tourist potential of the town is mentioned below.

Gate way of Tourist and Pilgrim Centers


Sabarimala Sri Ayappa Temple

Kottayam is the ideal take-off point for visits to Vagamon, Peerumadu, Munnar, Idukki, Thekkady and Kumarakom. Kottayam town is also a gateway to the pilgrim centres like Sabarimala, Erumeli, Mannanam, Vaikom, Ettumanoor, Thirunakkara, Bharananganam and famous Manarcad church. Kottayam town is linked by rail to other prominent cities in Kerala and also linked to the waterways for scenic travel. The nearest airport is Cochin International Airport which is about 88 kilometers away.

Kumarakom


Backwaters at Kumarakom

The international tourist destination Kumarakom which lies on the bank of Vembanad Lake is just 8 km away from Kottayam town. The bird sanctuary at Kumarakom, region's fragile and bio diverse ecosystem, network of rivers and canals are the attractions of the place. Premium category resorts and hotels, house boats etc are available at Kumarakom.

Pilgrim Centers and heritage places


Thirunakkara Mahadeva Temple

The pilgrim centres and heritage places of Planning area and immediate surroundings that attracts tourists and pilgrims are Thirunakkara Mahadeva temple, Valiya palli, Cheriya palli, Thazhathangadi Juma Masjid, Thazhathangadi Heritage area along Meenachil river, Thiruvarppu temple, Kumaranalloor Devi Temple, Panachikkadu Saraswathy Temple (*Dakshina Mookambika*).

Backwaters and Paddy fields

The Verbena backwaters are located adjacent to planning area. Meenachil, Kodoor, Neelimagalam rivers, Puthanthodu and number of canals connecting the Planning area with the backwaters. Long stretches of paddy fields along the south west side of the planning area is another attraction. There are enough potential to develop farm tourism in this area.


Vembanad Lake

Festivals

The Panachikadu Saraswathi Temple is famous for the Navarathri festival, attracts devotees from all parts of the state. On Vijayadasami day, thousands of devotees visit the Saraswathy Temple, with their children for 'Vidyarambham' (ceremonial commencement of formal education). Cultural events, Classical dance and music performances are held in the temple premises during the festival days.


Saraswathi Temple, Panachikkad

There are several famous pilgrim centres around the Planning area like - Kudamaloor Palli in Aimanam Panchayat, 'St. Alphonsa Birth Place in Aroppokkara Panchayat, Mahadeva temple in Ettumanoor Panchayat, Athirampuzha Palli in Athirampuzha Panchayat etc. attracts Tourists / Pilgrims especially during the festival seasons.

Boat Race

The famous Thazhathangadi boat race in the Meenachil River, in connection with Onam celebration, attracts a lot of tourists. It is the oldest boat race in Kerala and different categories of race boats participating in the competition.


Meenachil river at Thazhathangadi

Health Tourism

The planning area has enough potential for developing health tourism as there are number of health care institutions in all three systems are available in the Planning area.

10.3 Tourist Inflow

As per the statistics of District Tourism promotion council, Kottayam, the total number of tourists visited the Planning area per year is 1,39,500 and it includes 2461 foreign tourists. Details of tourist visited the planning area is shown in Table 10.1. In addition to that lakhs of pilgrims who are visiting Sabarimala temple are passing through the Planning area during Mandalam and Makaravilakku seasons.

Table 10.1 Tourist visited the planning area (2009-2010)

Sl:no	Name of LSGI	Number of Tourists visited per year	
		Foreign	Domestic
1	Kottayam municipality	2360	1,37,039
2	Vijayapuram GP	101	-
3	Panachikkad GP	-	-
TOTAL		**2461**	**137039**

10.4 Tourism Infrastructure

Hotels in the category of three stars are available at Kottayam. In addition to that there are premium hotels and resorts are there at Kumarakom, just 8.00Km away from the town. The tourist accommodation facilities available in the planning area shown in Table 6.3.

Table 10.2 Accommodation Facilities

Name of the LSGI	No. of Hotels		
	3 Star / 2 Star	Economy hotels	No. of Home stays
Kottayam Municipality	4	23	4
Panachikad Panchayat	-	-	-
Vijayapuram Panchayat	-	-	4
Total	4	23	8

In addition to the above, a Guest House owned by Tourism Department (Nattakom Guest House) is functioning in the Planning area. The location of the Gust house on the tip of a hill and provide a panoramic view of Kottayam town. Tourism Information centre under the District Tourism Promotion Council is functioning. The boat jetty at Kodimatha is used for the operation of Tourist boats to the backwaters.



Taj Hotels, Kumarakom



Nattakom Guest House

10.5 Conclusion

Even though Kottayam has enough potential and diversity, tourism has not developed as a major component of local economy. Its locational advantage and connectivity with adjacent tourist centers by different modes of transportation provide enough potential for the development of tourism. The town has also potential for developing health tourism also.

11 Agriculture

11.1 Introduction

The area of municipal town Kottayam has been expanded recently by adding two adjacent Grama panchayats, Nattakom and Kumaranallore. Two Grama Panchayats Vijayapuram and Panachikkad are there in the planning area in addition to the Kottayam Municipality. The Functional character of the town shows that 11 wards are rural and 8 wards are semi - rural. 39% of land of planning area is under agriculture land use and agriculture is one of the major activities of the planning area. Agriculture and allied activities has major role in the economy of the planning area. In this circumstance study on Agriculture sector is more relevant as far as the planning area is concerned.

11.2 Existing Scenario

Total extent of the land under cultivation within the Planning area is 3484 hectares. Both food crops as well as cash crops are cultivated in the planning area. Paddy and tapioca are the major food crops in the planning area. Rubber, coconut, Pepper, Arecanut etc are the main cash crops. Annual crops like plantain and pineapple, seasonal crops like ginger, tubers, vegetables and a wide range of perennial crops like jack, mango etc are also grown in the planning area.

Rubber is the major cash crop in the district. Paddy field has a share of 29.23% of the total land use of the

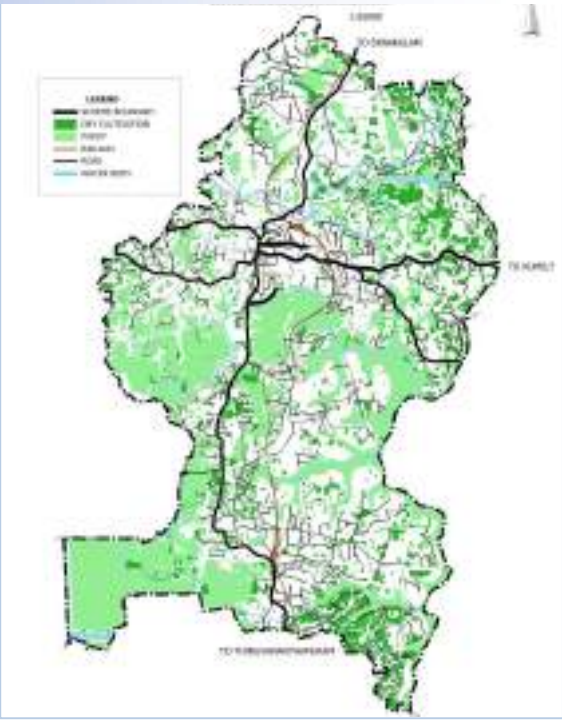


Figure 11.1 Land under agriculture use

Planning area. Coconut and plantains are seen all along the Planning area. Arecanut, banana, tapioca, rubber, pineapple and tube crops are the other major cultivations in the planning area.

Total area under different cultivation in the planning area is 5150 hectares with a total production of (all crops) 16423 tonnes. This accounts an average production of 3.2 tonnes/hectares or 12.6 kg/cent. Among the crops Banana & Tapioca have production with 4900.75 tons in 305 Ha & 4568 tons in 270 hectares respectively. Paddy cultivation (Puncha) is seasonal with an area of 1230 hectares and a yield of 1500 tonnes. Rubber, the major cash crop is cultivated in an area of 1263 Ha with a yield of 2652 tons. Area under cocoa cultivation is 25 Ha with production of 348 tons. It is to be noted that, the area of cultivation and yield are inversely proportional in the case of coconut and Arecanut. This may be due to the fact that, the coconut trees were widely affected by the fungal disease in the recent years. Production of clove and area under cultivation is very low in the Planning area.

Floriculture and medicinal plants are not cultivated in the planning area, except the one located in the Kottayam Municipality, where anthoorium is cultivated for commercial purpose. Plant nurseries are absent in the planning area.

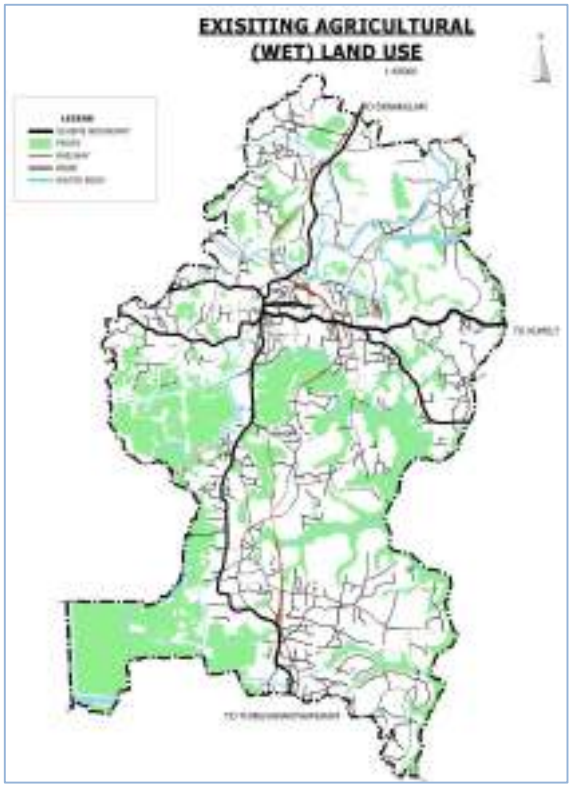


Figure 11.2 Existing paddy fields and wet lands

Paddy

A quick land use survey shows that, out of total 22.92 Sq:km of wet land in planning area, 13.08 Sq:km is cultivable but not cultivating now, 0.52 Sq:km is now remaining as Marshy land, 0.67 Sq:km is recently filled and in only 6.69 Sq:km of paddy, there is paddy cultivation.

The district share of paddy is 6.58% of the state total paddy area. As far as planning area is concerned, annual production of 1500 tones. These are the ecological sensitive area which reserves the water

stock for the town (ground water recharge areas) and the treasure of bio-diversity and has to be retained in all respect.

Vegetables

The planning area is not self sufficient in vegetable production and depends mainly on other areas for meeting the additional requirements. The total area under vegetable cultivation is 40.4 hectares for 580 tones with maximum production at Nattakom (300 tones) followed by Vijayapuram (180 tones) and Kumaranalloor Panchayats (100 tones). The requirement of Vegetables for the community is around 60 times than the production, assuming an average consumption of 0.5 kg. Vegetable / day / person.

Cocoa

Cocoa is produced in 25 ha of land and the annual production is 347.76 tonnes. Production of cocoa is maximum in Kumaranalloor (180 tones) followed by Nattakom (160) Grama Panchayats.

Coconut

As far as planning area is considered coconut is cultivated in 100.10 hectares of land and the production is 124 lakh per year. The maximum area under cultivation of coconut is in Nattakom (50.3 Ha) followed by Kumaranalloor (26.3 Ha), and Vijayapuram (23.5 Ha).

Rubber Cultivation

Rubber is one of the major cash crops in the district as well as the Planning area. Annual production of rubber in the Planning area is 2652 tones. The cultivation is more in Panachikad Panchayat followed by Vijayapuram Grama Panchayat.

Tapioca and Banana

Area under cultivation of banana is maximum at Panachikad (100 hectares) followed by Nattakom (75 hectares) and Kumaranalloor (62 hectares). Banana production is maximum in Nattakom (1800 tones) followed by Kumaranalloor (1480 tones) and Vijayapuram (1375 tones). Area under cultivation of tapioca is maximum at Panachikad (102 hectares) and Vijayapuram (70 hectares), Kumaranalloor (70 hectares) respectively. Production of Tapioca is maximum in Vijayapuram (1750 tones) followed by Panachikad (1334 tones) and Kumaranalloor (1018 tones).

11.3 Work Force

Cultivators and agriculture labours form just 1% and 3% of total work force of the Planning area. It indicates that the agriculture sector is not a predominant sector as far as the occupational pattern of the planning area is concerned.

11.4 Irrigation

There are no major irrigation projects in the Planning area and the agriculture is mainly depending on monsoon. Meenachil River and its tributaries, Kodur River, canals and lakes are the sources of irrigation in different parts of the district. Thannirmukkam bund across the Vembanad Lake has major role in controlling the salinity of rivers and canals of planning area. Many projects are implementing for strengthening the sides of river and canals and preventing soil erosion.

11.5 Marketing Facilities

Good marketing facility is essential for trading of agricultural produces. Kottayam town is the major commercial centre in the Planning area. There are 3 daily vegetable markets in the erstwhile Kottayam town and one in Nattakom area. Trading of commercial crops is done through various agencies functioning in the Planning area.

11.6 Conclusion

348400 ha of land which is 39% of land of planning area, is under agriculture land use and agriculture is one of the major activities of the planning area as far as land use is concerned. Coconut, rubber and paddy are the predominant crops as far as the area of land concerned. The workers engaged in the agriculture sector is very nominal. There is reduction in the area of land under cultivation. Adequate area has to be retained considering the roll of agriculture land in environmental protection. The production of agriculture crops other than cash crop is inadequate for the use of Planning area and need to be brought from outside.

12 Animal Husbandry and Fisheries

12.1 Introduction

Animal Husbandry, Dairy development and fisheries sectors has vital importance in generating additional employment opportunities and supplementing income of families. Mostly peasants and agricultural labourers are engaged in cattle rearing and allied activities. Hence any development in this sector will strengthen the economy of the town. Generally the Animal Husbandry and Dairy development is a rural oriented activity and the peripheral area of the planning area is suitable for these activities.

The availability of large number of water bodies and wet lands will provide opportunities for developing fisheries sector. This chapter discusses the existing scenario of Animal Husbandry and Fisheries sector in the Planning Area.

12.2 Animal Husbandry –Existing Situation

Animal husbandry has vital importance in generating additional employment opportunities and supplementing income of small and marginal farmers. Once agriculture and animal husbandry was a profitable occupation and later the agricultural sector become a non profitable occupation and the area of agricultural fields reduced due to various reasons and importance has given to cash crops. The set back of the agricultural sector affects the animal husbandry sector. Increasing price of cattle feeds and lack of availability of grass etc are also affects this sector.

Cow, Buffaloes, Hen, Goat, Duck, Pig etc. are the main livestock's in the Planning area. There is a Pig farm in erstwhile Nattakom Grama Panchayat near Kodimatha. The livestock population of the planning area is shown in Table 12.1. It shows that in planning area the live stock population is high in Kottayam Municipal area.

Table 12.1 Live Stock population of the Planning Area

Sl. No.	Name of LSGI	Live stock population				
		Cow/ Buffalo	Goat	Hen	Duck	Pig
1	Kottayam Municipality	2577/153	2358	17828	502	197
2	Vijayapuram Grama Panchayat	902 / 11	616	3939	572	Nil
3	Panachikadu Grama Panchayat	1306 / 15	1670	9129	98	Nil

There is no poultry farm functioning in the planning area. Among the 25 slaughter houses functioning in the planning area 13 are functioning unauthorisedly without license. LSGI wise slaughter house details are shown in Table 12.2.

Table 12.2 Details of Poultry farms and Meat Production

Sl. No.	Name of LSGI	Poultry Farm		Slaughter House	
		Farm with in the LIGIs	Production per month	No. of Slaughter Houses	Production per month
1	Kottayam Municipality	Nil	Nil	18	174450 Kg
2	Vijayapuram Grama Panchayat	Nil	Nil	2	4,500 Kg.
3	Panachikad GramaPanchayat	Nil	Nil	5	10,000 Kg.

There are nearly 30 diary farms and about 570 litres of milk produced and sold through 5 milk societies. Milma Dairy is functioning at Vadavathoor in Vijayapuram Grama Panchayat. Details of dairy farms functioning in the Planning Area are shown in Table 12.3. Details of dairy outlets and collection centers are shown in Table 12.4. Hatcheries are not functioning in the Planning area.

Table 12.3 Details of Dairy Farms

Sl. No.	Name of LSGI	No. of Dairy Farm	No. of Cattle	Quantity of Milk produced per day
1	Kottayam Municipality	17	74	460 litres
2	Vijayapuram Grama Panchayat	11		
3	Panachikadu Grama Panchayat	2	40	110 litres

Table 12.4 Details of Dairy outlets and collection centres

Sl. No.	Name of LSGI	Type of outlets and collection centres	
		Milk Co-operative societies	Others
1	Kottayam Municipality	1 (APCOS)	Nil
2	Vijayapuram Grama Panchayat	1	Nil
3	Panachikadu Grama Panchayat	3	Nil

12.3 Fisheries

In the western part of the Planning Area there is ample opportunity for the fisheries sector as there are a number of small and large water bodies. An agency called Fish Farmers Development Agency (FFDA) is working for the enhancement of fisheries sector. It provides technical help and economic support to those who are engaged in this sector.

A fish production centre in private sector is functioning at Karappuzha, Kottayam town. Recently fish farming is popular in Kottayam town and surrounding areas. A shrimp seed producing centre, in private sector is also functioning in the town and about 2 lakhs of shrimp seed is produced from this hatchery.

Environmental issues especially water pollution affects the fishing sector badly. The fishing in Vembanadu Lake faces a lot of problems due many reasons. 'Karimeen', 'Prawn', 'Shrimp', 'Kari', 'Vala', 'Paral', 'Pallathi' etc are seen in the backwaters of Kottayam area.

Table 12.5 – Details of fish production

Sl. No.	Name of LSGI	No. of labourers working	No. of families related	Major type of fish	No. of fish catch / month (specify unit)
1	Kottayam Municipality	64	64	Carp	37250
2	Vijayapuram Grama Panchayat	NIL	NIL	Carp	10696
3	Panachikadu Grama Panchayat	15	15	Carp	2500

12.4 Conclusion

Animal husbandry & fisheries can be developed as an additional income generating sector. Considering more percentage of land under agriculture use and availability of water bodies, there is ample scope for developing Animal Husbandry and fisheries sector in the town. Decline in the cultivation of paddy, increase in production cost, non-availability of good cattle breed etc are the major hindrances in growth of the sector. However high demand for milk, egg and meat in the town and surrounding areas and comparatively good price for the products are the potentials in the field. Hence this sector can be developed as an income generating economic activity of the town.

13 Housing

13.1 Introduction

Housing is one of the basic needs of human being and it is important next to food and clothing. Normally the quality of housing reflects the quality of living. Demographic trends include smaller families increasing demand for smaller housing unit closer to social services and amenities. But attention has to be given for the renovation and modernization of existing stock also.

13.2 Residential Areas

Existing residential area constitutes 45.8% of the total land use of the planning area. The LSGI wise break up shown in Figure 13.1. It is distributed throughout the planning area except the water logged areas with different intensity. The concentration of residential land use is already discussed in the paragraph 5.7. Residential areas are concentrated more in the North West and South East part of the Planning area. This is due to the fairly level terrain with good accessibility. Perennial water source and availability of better facilities are the other reasons for high concentration. The concentration pattern of residential area is shown in Figure 13.2. The gross and net density of population is already discussed in the paragraph 6.5 and 6.6. The population density is more in the northern half of the planning area when compare to the southern part of the planning area. The topography of land is the reason for this.

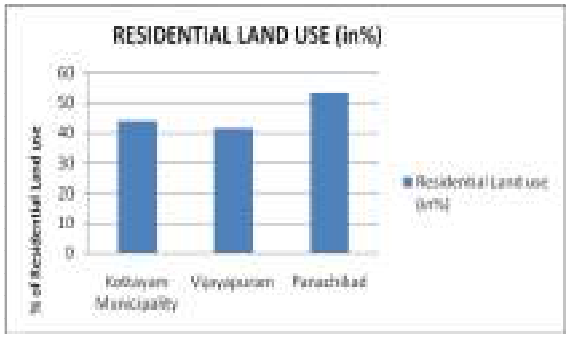


Figure 13.1 LSGI wise % of residential land use

While analysing the residential areas, it can be categorised as - Purely residential, Mixed (non-agriculture) residential and Agricultural mixed residential. Erstwhile Kumaranalloor Grama Panchayat, part of old Kottayam municipality, part erstwhile Nattakom grama Panchayat, part of Vijayapuram Grama Panchayat and few part of Panachikkad Grama panchayat is classified under the first category –purely residential area. Part of old Kottayam Municipal area is coming under the second category - Mixed residential. The third category consists of part of Vijayapuram and Nattakom Panchayat and the major portion of the Panachikad Grama Panchayat.

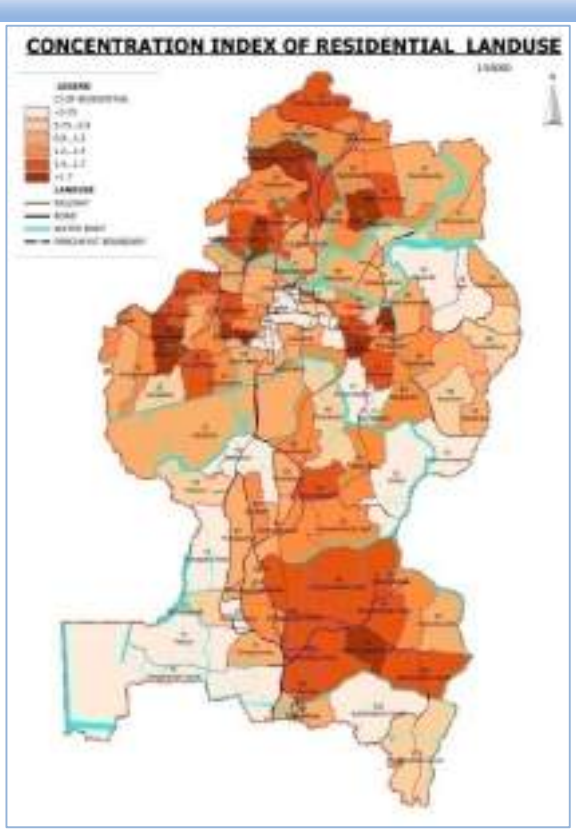


Figure 13.2 Concentration of Residential areas

13.3 Housing condition

Details regarding the housing sector have been obtained from the concerned local bodies, Panchayat level statistics and the primary survey (Socio Economic Survey) conducted by the department. The factors like the plot extent, plinth area, and nature of ownership, type and structural conditions of the buildings etc related to the housing sector are analysing in the subsequent paragraphs.

House Hold Details

As per 2001 census, there are 49,131 households in the Planning area with a population of 2,16,616. The population, number of households, average household size of the planning area is 4.41. LSG wise number of houses is shown in Table 13.1.

Table 13.1 LSGI wise Population and House hold size

Sl. no	LSGIs	Population	No. Of Households	Household size
1	Kottayam Municipality	1,44,911	32900	4.40
2	Vijayapuram GP	30,726	6834	4.50
3	Panachikkad GP	40,979	9397	4.36
	PLANNING AREA	2,16,616	49131	4.41

Plot Extent

The average plot extent of the planning area is 20.96 cent. The average plot extent is high in Panachikkad Grama Panchayat (30.29 cents) and it is low in old Kottayam Municipal town limit (10.60 cents) and the variation in average plot size is high. The average plot size of different areas of the planning area is shown in Table 13.2. The plot size indicates that further densification of residential area is possible.

Table 13.2 Average Plot extent and Plinth area of buildings

Sl. No	Areas	Plot extent (in cents)	Plinth Area (in Sq:m)
1	Old Kottayam Municipality limit	10.60	84.52
2	Erstwhile Kumaranallore GP	21.42	85.70
3	Erstwhile Nattakom GP	19.93	80.22
4	Vijayapuram GP	22.56	73.50
5	Panachikkad GP	30.29	69.94
PLANNING AREA		**20.96**	**78.78**

Plinth Area and number of Floors

The average plinth area of residential buildings in the planning area is 78.78 Sq:m and it varies from 69.94 Sq;m to 85.70 Sq:m and the variation in the plinth area is less among different areas and it is shown in table 13.2. The average plinth area is high in erstwhile Kumaranallore Grama Panchayat area and old Kottayam Municipal area.

92.52% of the residential buildings in the planning area are single storied, 7.38% are two storied and only 0.02% of buildings are three storied building. The floor wise percentage of building in the Planning area is shown in Table 13.3.

Most of the buildings are of homestead type and it is the character of the Planning area. But generally the new buildings are double storied or more, due to the non availability and high land values. More multi-storeyed buildings are seen in the town area and Kumaranalloor Panchayat.

Table 13.3 Number of floors of buildings

Sl. No	Areas	Single storied (%)	Double storied (%)	Three Storied (%)
1	Old Kottayam Municipality limit	87.80	12.00	0.80
2	Erstwhile Kumaranallore GP	92.92	7.10	0.00
3	Erstwhile Nattakom GP	93.53	5.80	0.00

4	Vijayapuram GP	89.97	10.00	0.00
5	Panachikkad GP	98.37	2.00	0.00
PLANNING AREA		**92.52**	**07.38**	**0.02**

Nature of Ownership of Building

The nature of ownership of the building is shown in Table 13.4 and Figure 13.3. 91.4% of the Households in the planning area have their own dwellings. Rented houses (7%) are seen maximum in the old Kottayam Municipality area (11.36%), reflecting its urban character and immigration. 1.75% of unauthorised buildings are also present in the area (maximum in Kottayam Municipality – 4%).

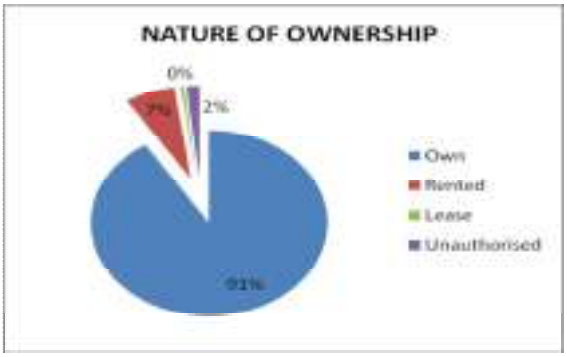


Figure 13.3 Nature of Ownership

Table 13.4 Nature of ownership of buildings

Sl.No	Areas	Nature of ownership			
		Own	Lease	Rental	Unauthorised
1	Old Kottayam Municipality limit	84.59	0.08	11.36	04.03
2	Erstwhile Kumaranallore GP	89.70	01.30	07.00	04.50
3	Erstwhile Nattakom GP	91.85	00.72	07.31	00.12
4	Vijayapuram GP	94.14	00.46	05.39	00.00
5	Panachikkad GP	96.71	00.00	03.18	00.12
PLANNING AREA		**91.40**	**00.51**	**06.85**	**01.75**

Structural Condition

Number of houses, structural condition of houses (pucca, moderate and kutcha) in LSGI wise is shown in Table 13.5 and the figure 13.4.

Table 13.5 Structural Condition of houses and number of flats

Sl.No	Areas	Structural condition (%)			
		Pucca	Moderate	Kutcha	Hut
1	Old Kottayam Municipality limit	43.57	50.57	04.20	00.25
2	Erstwhile Kumaranallore GP	43.90	48.10	05.00	01.00
3	Erstwhile Nattakom GP	52.57	41.48	03.98	04.43
4	Vijayapuram GP	45.09	33.59	21.01	00.31
5	Panachikkad GP	28.79	65.38	05.24	00.58
PLANNING AREA		**42.84**	**47.82**	**07.89**	**00.51**

42.84% of the buildings in the planning area are pucca buildings, 47.82% of buildings are moderate building, 7.89% of buildings are kutcha buildings and the remaining 00.51% of buildings is huts.

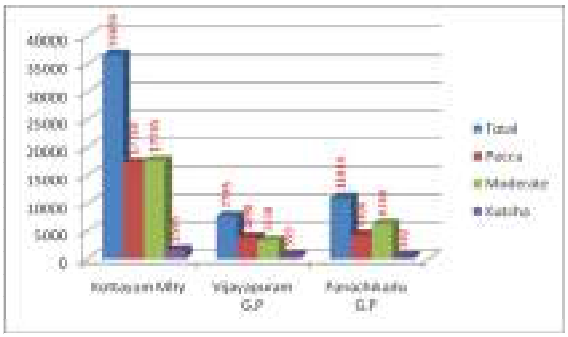


Figure 13.4 Structural conditions of buildings

Pucca buildings are more in erstwhile Nattakom and Vijayapuram Grama Panchayats. Moderate buildings are predominating in Panachikad, old Kottayam Municipal limit and Kumaranalloor Grama Panchayat. Vijayapuram Grama Panchayat has 21.01% Kutcha buildings, which requires renewal programs. A small percentage (0.51) of huts is also seen in planning area.

Multi storeyed apartments are there Planning area. 23 apartments are there in Kottayam Municipal area and 5 apartment buildings are there in Vijayapuram Grama Panchayat.

13.4 Slums

As bye products of industrialisation and urbanisation, slums are formed in most of the urban areas. Listed and non listed slums are there in the delineated planning area.

Details of slums in the old Kottayam Municipal limit and erstwhile Nattakom Grama Panchayat area has obtained from the IHSDP report prepared recently and details are furnished in Table 13.6. In old kottayam Municipal limit 596 households and in erstwhile nattakom Grama Panchayat 235 households are living in slum areas

Table 13.6 Details of slums

Sl. No	Area	No of slums	Wards	No of houses	No of house-holds	Structural condition (%)		
						Pucca	Moderate	Kutcha
1	Old Kottayam Municipality limit	18	1, 11, 31, 32, 33, 34, 35	553	596	65	512	35
2	Erstwhile Kumaranallore GP	Nil						

3	Erstwhile Nattakom GP	7	2, 6, 9, 11, 12, 13, 16, 17	210	235		210	
4	Vijayapuram GP	Nil						
5	Panachikkad GP	Nil						

13.5 Conclusion

Existing residential area constitutes of 45.8% of the total land use of the planning area and it is distributed throughout the planning area except the water logged areas with different intensity. There is enough land in the peripheral area to accommodate additional population. The average household size of the planning area is 4.41 and the average plot extent is 20.98 cents. The plinth area of residential buildings is 78.78 Sq;m, 92.52% of buildings in the Planning area are single storeyed buildings and 91.40% of households are living in their own houses. The structural condition of houses is generally good and a small percentage of houses are Kucha building and need attention. Vertical development is started in the town and more number of residential apartments is coming in the planning area. The homestead type development is the character of the area. The identified slums are the other area in housing sector which needs attention.

14 Drinking Water

14.1 Introduction

For the survival of human life one of the important components is pure water. Kottayam district is crisscrossed with a number of rivers, streams and lagoons. About 4.27% of planning area is under water. Meenachil River is the main source of drinking water to the planning area. Sources of water, water supply schemes etc are discussing in this chapter.

14.2 Sources of Water

Surface sources are the major source of water meeting various requirements ie, domestic, industrial, commercial, institutional, fire-fighting, livestock, public, and agricultural needs of the Planning Area. Identification of sources of water, their conservation and optimal utilization are of utmost importance.

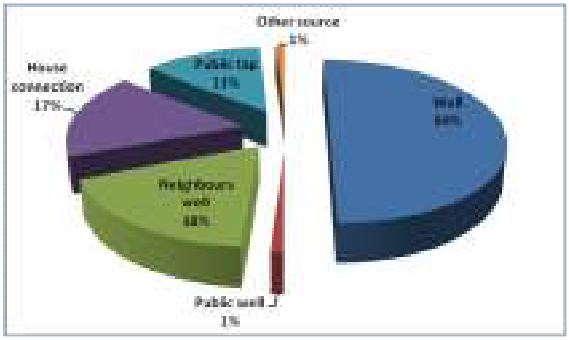


Figure 14.1 Source of water

As per socio economic survey, wells are the major source of drinking water in the Planning area. About 50% of households depends their own well for drinking water, while 18% using neighbour's well as source of water. 17% has individual house connections. Public tap, pond and tube wells are the sources of water for the remaining households and it is shown in Figure 14.1. But there is variation among different areas regarding the source of drinking water and area wise percentage of different sources of water is shown in Table 14.1. More than half (56.10%) of the households in the old Municipal Area are provided with individual house connection of Kerala Water Authority and 15.86 % using water of Public taps as source of drinking water. But the distribution of water by Kerala Water authority is very limitted in other areas especially in the pheripheral areas and still well is the major source of water for major portion of households in the Planning area.

Table 14.1 Source of Water

Sl: No	Source of Water	Old Kottayam Municipal area	Erstwhile Kumaranallore GP	Erstwhile Nattakom GP	Vijayapuram GP	Panachikkad GP
1	Well	37.29	71.06	65.47	30.81	73.43
2	Public Well	00.17	01.28	01.92	00.51	02.45
3	Public Tube Well	00.00	00.09	00.00	00.26	00.47
4	Pond	00.17	00.09	00.24	00.51	00.12
5	Public Taps	15.86	02.19	06.83	37.88	09.21
6	House Connection	56.10	12.87	19.18	00.67	08.62
7	Neighbours well	05.73	11.78	34.53	29.63	20.05
8	Other Sources	00.08	00.64	01.08	00.00	03.61

Distance to the water sources and scarcity of drinking water is also studied in the Socio economic survey. For 90% of the households some source of water is available within 0.25 km distance. The distance to source of water is shown in Figure 14.2. In the survey it is also revealed that 83% of households are free from water scarcity. 3% households have water shortage for more than 6months.

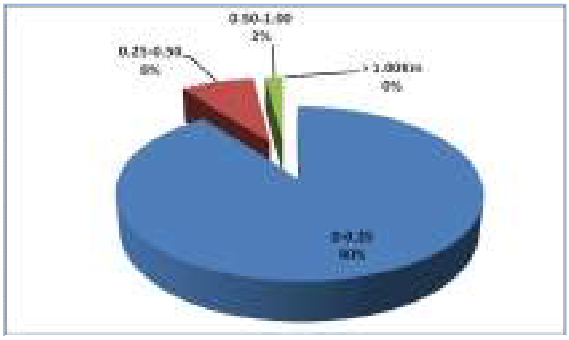


Figure 14.2 Distance to source of water

14.3 Water Supply Schemes

Meenachil River is the main source of drinking water to the planning area and two intakes and treatment plants are there to collect and purify the water. The treatment Plant located at Thiruvanchcoor serves the need of old Kottayam municipal area and the second one located at Vellooparambu serves the need of the remaining planning area.

The scheme known as “Urban Water supply scheme for Kottayam” was commissioned in 1961. The intake and treatment facilities are provided at Thiruvanchoor. The total capacity of the scheme 12.50MLD and later two

augmentation schemes were implemented in 1984 and 1995 and at present 18 MLD of water is distributing from this scheme.

The second scheme known as “Kottayam Sub Project” and the intake and treatment facilities are provided at Velloparambu on the down stream side of Thiruvanchoor in Vijayapuram Grama Panchayat. The total capacity of the scheme is 15.64MLD. As the source is perennial, it dries during the summer season and the service area faces water scarcity. There is no scheme for recycling of waste water in the planning area. The details of Water treatment Plants is shown in Table 14.2. The treatment Plants are very old and proper maintenance and renewal of it is required.

Table 14.2 - Details of Water Treatment Plant

Name of LSGI	Location	Source of water	Capacity of the Plant (MLD)	Types of treatment
Kottayam Municipality	Thiruvanchcoor	Meenachil River	20	Tubes and filter with disinfection
Kumaranalloor Panchayat	Vellooparamu (Vijayapuram Panchayat)	Meenachil River	15.64 (serves 5 local bodies – Nattakom, Kumaranellore,Vijayapuram, Manarcad & Panachikkad)	Sedimentation Filtering and Chlorination
Nattakom Panchayat				
Vijayapuram Panchayat				
Panachikkadu Panchayat				

There are 5 Over head tanks located at various places of the planning area with a total capacity 108.20 lakhs litres. The area wise capacity of water supply distribution tanks is shown in Figure 14.3.

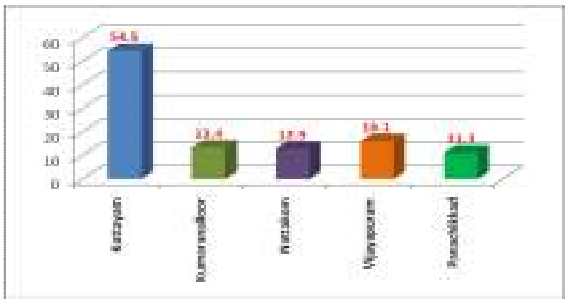


Figure 14.3 Area wise capacities of tanks

Treated water is supplied through a network of distribution system of diameter of size varying from 90mm to 600mm. The distribution system, which is almost 50 years old, is one of the reasons for insufficient distribution of treated water. Undulating topography of the area is another problem in the distribution of purified water.

Table 14.3 – Water Supply Details

Name of LSGI	Net Work	Sources	Area of coverage	No. and capacity (ML) of OH tank	Total Quantity supplied / day
Kottayam Municipality		Meenachil River	All wards	54.5 Tank	20 MLD
Kumaranalloor Panchayat	300mm AC to 90mm PVC pipe line			2 Nos (7.1 + 6.3 = 13.40 Lakhs liters)	3.79 MLD
Nattakom Panchayat	500 mm AC to 90 mm PVC pipe line			12.9Lakh Liters	3.87 MLD
Vijayapuram Panchayat	600 mm AC to 90 mm PVC pipe line(Manarcad panchayat included)			15.3+0.8 =16.10	4.59 MLD

Source. KWA Kottayam

14.4 Water Scarcity Areas

The topography of the area is undulating in nature, coverage and the frequency of supply of the protected water supply is limited. Some areas face water scarcity, especially during the summer season. Majority of these areas are in the elevated regions, where the slope is greater than 15^0. Some of these areas are Thiruvathukkal, Kallupurakkal, Divan Kavala, Nattakom Guest House, Poovanthuruthu, Kaduvakkulam, Kuzhimattom, Pathammuuttam, Panachikkad Temple, Chozhiyakkad, Thidamboor Temple, Pullarikkunnu, MRF, Vadavathoor seminary etc.

14.5 Conclusion

The water supply by Kerala Water Authority is found to be insufficient in meeting the needs of people. More schemes/augmentation of present schemes has to be implemented for meeting the water demand of people in the Planning area especially in the peripheral areas where well is major source of drinking water. The renewal of existing schemes is also needed. Proper conservation and protection of the surface water sources, rain water harvesting projects, ground water recharging, waste water recycling etc are also considered.

15 Transportation

15.1 Introduction

For the balanced development of an urban centre planned growth of spatial activities, coupled with provision of adequate infrastructural facilities like a well defined hierarchy of road network, drainage, water supply, power supply etc are required. But in most of the cities and towns the available road system is not able to cater to the present traffic. The fast development of socio-economic and commercial activities coupled with inadequate supporting facilities and ever increasing demand due to centralization of employment centres in C.B.D area caused a perpetual vicious circle of traffic problems.

Among the various urban infrastructure facilities transportation is the one, which shapes the structure and growth of the city. A workable circulation plan ensuring efficient operation of the transportation system facilitates economic growth of the town. With progressive urbanization travel demand in towns has increased tremendously. This is evident from the long delays and traffic congestion observed on urban roads in most of the towns. In order to make the transport system efficient, there is a continuous need to maintain a balance between demand and supply of facilities within the towns and its environs.

As part of preparation of Master Plan for Kottayam, the study on Traffic and Transportation was entrusted with the National Transportation Planning and Research Centre (NATPAC) and the study was conducted in the year 2011. The source of data included in this chapter is from the report “Traffic and Transportation Studies for 23 towns in Kerala State – Kottayam Municipality”, submitted by NATPAC. Study about vehicle population, road network, speed and delay, traffic volume, parking, pedestrian, Origin and destination of traffic etc were carried out.

15.2 Transportation System

The road network plays most vital role in the all round development of any area. The existing road network in the district consists of NH (PWD), SH and MDR, under Kerala Public Work Department and other roads maintained by the Municipality and grama panchayats. Kottayam District has fairly good network of roads. As far as the Planning area is concerned, the transportation system consists of roadways, railways and waterways. Among the three modes of transportation, road transportation is the most important mode of communication and roadways has key role in handling a major share of traffic. Railway caters to the need of long distance passengers. Even though water transportation have major role earlier in handling goods as well as passenger traffic of the planning area, now it is confined to the western parts of the district.

Road Transport

Road transport is the major mode of transportation of the planning area. Public transport in the town is largely dependent on buses, run by both private operators and the state owned State Road Transport Corporation (KSRTC).



KSRTC Bus Station, Kottayam

There are four bus stations functioning in the Planning area. Three of them are used for the operation of private buses and the fourth one is exclusively for the operation of KSRTC buses. The Municipal bus station located at Nagampadam is the major bus terminal and close to the railway station and the other two bus stations are located at Kodimatha and Thirunakkara and mainly acting as bus bays.

Rail Transport

Kottayam railway station is situated in the heart of the town and the Thiruvananthapuram – Ernakulam Broad gauge line passes through Kottayam. Train services to all major



Railway Station, Kottayam

canters of the country are available from Kottayam. The Station is also catering the needs of Kottayam and adjacent districts and also the pilgrims who are visiting Sabarimala. In addition to that there are two more railway stations – Chingavanam and Kumaranallor in the Planning area. The FCI Godown is located at Chingavanam Railway station. Kumaranallore has the status of a halt station only.

Water Transport

The National Waterway No.2 passes through Vembanad Lake, adjacent to the Planning area. Kottayam mini port is located at Nattakom on the bank of Kodoor River. This port is intended for container movement through waterways using barges up to Kochi port and further movement through ship to various destinations and vice versa.


Boat Jetty at Kodimatha

The boat jetty of Kottayam town is located at Kodimatha which is 1.00 Km away from city centre. The State Water Transport Department (SWTD) is operating regular boat services from Kottayam to Alappuzha.

Airways

Nearest airport is Cochin International Airport located at a distance of 90 Km from Kottayam. Another International Airport Thiruvananthapuram is 164 Km away from the town. The helipad at Police Parade Ground Kottayam is used for landing of helicopters.

15.3 Road Network

The road network in Kottayam town is of radial type with limited inter-linkages. The major road passing through the town is the Main Central (MC) road connecting Angamaly in the north and Thiruvananthapuram in the south. This road passes through the CBD area of Kottayam and has got a length of 16.59 km within the Municipality. The road is predominantly of two lane standards and has been


M C Road

provided with bituminous surfacing, which is in a fair condition. The traffic volume is very high in the CBD area.

NH 220 (popularly known as K.K Road) connecting Kottayam and Kumali is the other major road passing through the Planning area. This road has been provided with good surfacing and is predominantly of two lane standard width. Kottayam – Kozhanchery Road and Kottayam-Kumarakom-Cherthala road are the major roads having regional importance.


K.K Road

The other important roads of the planning area are: Lal Bahadur Sasthri road, Kottayam – Kumarakom road, Kottayam- Medical College road via Chungam and Varisseri, Samkranthi – Medical College Road, Samkranthi- Peroor Road, Chavittuvary-Vellooparambu Road, Kumaranallore-Kudamallor road, Kottayam-Thiruvathukkal-Illickal Road, S.H.Mount –Chungam Road, Market Landing Road (ML Road), M.G.Road, Central Jn - Thiruvarhukal Jn Road, Chingavanam-Paruthumpara-Njaliyakuzhy Road, Chinavanam-Pakkil-Mulamkuzha Road (Old M.C.Road), Mariyapally- Power House-Mavilangu Road, Pannimattom-Paruthumpara-Panachikkad Road, Kanjikuzhy-Kollad-Nalkavala-Parackkal Kadavu- Puthupally road and Manipuzha – Divan Kavala-Nalkavala Road

15.4 Vehicle Population

Details regarding the number of registered motor vehicles in Planning area is difficult to delineate as there is very high level of integration with regard to vehicle flow and traffic from adjoining areas. But the data regarding the number of motor vehicles at the district level is available and it is considered for the analysis. The trend of growth of vehicle population has been phenomenal all over the State and Kottayam is no exception. The growth of motor vehicles in Kottayam district during the years from 2000 to 2012 is given in Table 15.1.

Table 15.1: Growth of Motor Vehicles in Kottayam District

Year	No. of vehicles	Growth index
2000-01	300988	100.00

2001-02	323530	107.49
2002-03	348154	115.67
2003-04	375873	124.88
2004-05	403641	134.11
2005-06	439442	146.00
2006-07	475083	157.84
2007-08	341454	113.44
2008-09	371203	123.33
2010-11	445940	227.00
2011-12	497638	253.00

Note: Base year (2000-01) index = 100.00

Table 15.2 presents the number of motor vehicles having valid registration in the district as on 31.03.2012. It is of interesting to note that the major component of vehicle population in the district continues to be two-wheelers (51.81%) followed by cars constituting 20.52 per cent. Most of the vehicular growth in the district is in the urban areas of the district. As such, Kottayam Urban Area containing the district headquarters and major commercial, economic, medical and educational activities ensure the increased vehicle population resulting in over-crowded and congested road network. This has resulted in poor serviceability of road, traffic delay, increased vehicle operating cost and high accident risk.

Table 15.2**: **Number of Vehicles having Registration as on 31.03.2012 in Kottayam Dist.

Sl. No.	Type of Vehicle	Number
1	**Goods Vehicles**	
	i. Four wheelers and above	23822
	ii. Three wheelers and Tempos	7416
2	**Buses**	
	i. Stage carriages	1444
	ii. Contract carriages/Omni-buses	12176
3	**Four wheelers**	
	i. Cars	114839
	ii. Taxis	16858
	iii. Jeeps	11130
4	**Three wheelers**	
	i. Auto rickshaws	46607
	ii. Motorised cycle rickshaws	0

5	**Two wheelers**	
	i. Scooters and Motor cycles	257778
6	**Tractors**	
	i. Tractors	712
	ii. Tillers	124
	iii. Trailers	63
	iv. Others	4531
	Total	**497500**

15.5 Speed and delay

The Speed and Delay survey was conducted on the MC Road, for a length of 3.30km, the section being from Kodimatha Bridge to Mathrubhoomi office, Chavittuvari. The journey speed for the section was found to be 18.59 kmph against a running speed of 20.86 kmph. The major reasons for the delay have been due to heavy traffic congestion.

On Kottayam-Kumily road (NH 220), the major reasons for delays have been the presence of bus stops and intersections. For this section (From Kanjikuzhy Bridge to Central Junction), the journey speed and running speed were 20.62 kmph and 24.05 kmph respectively, the length of the section being 2.98 km.

On the railway station road, for the section from Nagampadom junction to Logos Junction (1.17 km long), the running speed was 14.79 kmph and the journey speed was 11.50 kmph. The reason for the delay has been the presence of entry and exit points at the private bus stand and at the railway station.

The Temple road also had traffic delay problems and the reason has been the narrow roads and pedestrian movements. The journey speed and running speed for 1.17 km section of this road (from RR junction to Kurisupalli) was 23.72 kmph and 25.59 kmph respectively.

The Kottayam – Kumarakom road (for the section from Baker junction to Arthootty – 1.3 km), the running and journey speeds were 17.09 and 18.18 kmph respectively.

The delays due to intersection and signals reduced the journey speed and running speed in Sasthri road to 24.73 kmph and 19.43 kmph respectively. The test stretch in this road was from Seematti round to Collectorate junction (1.28 km).

15.6 Link Volume and Capacity Utilization

Link volume

It has been seen that the traffic on the MC Road, especially within the CBD area is very high. A maximum daily traffic of 58,000 PCU was observed in the Seematti Round – Baker Junction link. On the outermost links on either sides of the CBD area, the daily traffic was in the range of 24,000 to 27,000 PCU.

In NH 220, a maximum daily traffic volume of 43,000 PCU was observed in the Collectorate – Kanjikuzhy section. For the YMCA Road, the daily traffic volume was 14,407 PCU only, whereas for the Post Office Road, the traffic was 17,230 PCU, both being one way sections. The Sasthri Road catered to a daily traffic of 23000 to 32000 PCU.

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

The 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 Kottayam Study area is given in Annex 15.1. It has been seen that many sections in the MC road has been utilized to almost two to three times its capacity.

The turning movement surveys at 22 major intersections in the study area were conducted to ascertain the peak hour demands. The summarized traffic flow in PCU at these intersections is given in Table 15.3. It could be seen that the Nagampadom Junction witnessed the maximum peak hour traffic flow of by 8,403 PCU. For the other intersections, the peak hour traffic flow varied between 1,000 to 5,500 PCU.

Table 15.3: Peak Hour Traffic Flow at Major Intersections

Sl. No.	Name of Intersection	No. of Arms	Peak Hour	Peak Hour Volume (PCU)
1	Pulimoodu junction	3	10:00 AM - 11:00 AM	5522

2	SBT junction	3	10:00 AM - 11:00 AM	5105
3	R R junction (Thirunakkara Maidan)	4	10:00 AM - 11:00 AM	2906
4	Central junction (Thirunakkara Maidan)	4	5:15 PM - 6:15 PM	2663
5	Jewel Junction (Thirunakkara Maidan)	3	4:45 PM - 4:45 PM	1790
6	Temple Junction (1)	4	9:30 AM - 10:30 AM	2233
7	Temple Junction (2)	3	9:15 AM - 10:15 AM	1140
8	Hotel Imperial junction	4	5:00 PM - 6:00 PM	1603
9	T B junction	4	5:00 PM - 6:00 PM	1603
10	Aida Hotel Jn.	3	3:00 PM - 4:00 PM	2475
11	Seematti Round	5	3:00 PM - 4:00 PM	5072
12	Logos-1 Junction	4	9:30 AM - 10:30 AM	5190
13	Logos-2 junction	3	3:00 PM - 4:00 PM	3129
14	Kurien Uthuppu road junction	3	10:00 AM - 11:00 AM	3628
15	Thiruvathukal junction	4	10:00 AM - 11:00 AM	895
16	Manorama Junction	3	9:45 AM - 10:45 AM	1858
17	Baker Junction	3	3:00 PM - 4:00 PM	5299
18	Green Park Hotel Junction	3	9:30 AM - 10:30 AM	3604
19	Nagampadom Jn.	3	9:45 AM - 10:30 AM	8403
20	Collectorate junction	3	3:45 PM - 4:30 PM	3039
21	Kanjikuzhy Junction	4	3:45 PM - 4:30 PM	4475
22	Chalukunnu Junction	4	9:45 AM - 10:30 AM	1906

15.7 Parking Characteristics

Parking surveys were carried out on major road sections of Kottayam 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 15.4.

The Thirunakkara Maidan, in the heart of the city is a major hub for parking. Even then, on street parking activities are found in roads around the maidan. A total of 26 vehicles, consisting of 20 two wheelers, three passenger auto rickshaws and three cars were found to be parked in the Imperial junction – Pulimoodu junction link. In the TB road, 39 vehicles were parked and in the KK Road, upto East Police Station, a total of 37 vehicles were parked. A total of 84

vehicles, comprising of three buses, 24 cars, 27 passenger auto rickshaws, 34 two wheelers, two trucks, five mini trucks and seven Goods Auto rickshaws were parked in the market road.

Majority of the vehicles parked at most of parking corridors were found to be for short duration of less than 30 minutes. 60 to 95 per cent of the vehicles parked on selected parking corridors were found to be parked for duration less than 30 minutes. Five to 22 per cent of these vehicles were parked for a period ranging between 30 minutes and one hour. Long duration vehicles constituted only around five per cent of the total vehicles.

Table 15.4: Locations major Parking areas

Sl. No.	Road /Location
I	**Around Thirunakkara Maidan**
1	Central Junction - Gandhi Square
2	Jewel Junction - SBT Junction
3	SBT - Gandhi Square
4	Seematti Junction - Central Jn
5	Imperial Junction - Pulimoodu Junction
II	**TB Road**
1	KSRTC - TB Junction
III	**Temple Road**
1	Municipal Bus Stand - Temple Junction
2	Temple Junction - Boat Jetty Road
IV	**KK Road**
1	KK Road - Market Road
2	Basaleous College - Collectrate
3	Collectrate - East police Station
V	**Market Road**
1	Anupama - Market
2	Imperial Junction - Market Road
3	Chanthakadavu
VI	**Post Office Road**
1	Seematti Round - Temple Junction
VII	**Others**
1	Mamman Mappila Hall - District Hospital
2	Aida Junction - Pulimoodu
3	Baker Junction - Link road

15.8 Pedestrian Volume

Pedestrian volume surveys were conducted at major locations where the pedestrian cross movements were found to be high. Analysis of the pedestrian cross movement at major activity/traffic generation areas revealed that a maximum of 2058 pedestrian movements occurred in the Gandhi Square – Seematti Link. Also high volume of pedestrian cross movements, in the order of 1500, occurred at various points in the CBD area *viz,* near Hotel Anand in KK Road, at Gandhi Square and near YMCA Building. Peak hour pedestrian cross movements observed at major locations in Kottayam are given in Table 15.5.

Table 15.5: Peak Hour Pedestrian Cross Movements at Major Junctions.

Sl.No.	Name of location	Peak time		No. of Pedestrians		
				Up	Down	Total
1	Hotel Anand in K.K.Road	12.30	1.30	631	818	1449
2	YMCA Road - Best Hotel	12.00	1.00	818	533	1351
3	At Old Bus Station	12.00	1.00	839	595	1434
4	MC Road (Gandhi Square – Seematti Round)	11.45	12.45	1068	990	2058
5	Collectorate	9.00	10.00	116	429	545
6	KK Road - BCM College	8.00	9.00	654	23	677
7	CSI Complex	12.00	1.00	236	244	480
8	Logos Building	8.15	9.15	154	546	700
9	YMCA	9.15	10.15	642	994	1636
10	YMCA - Bus Bay	12.15	1.15	537	757	1294
11	RR Junction	11.30	12.30	518	661	1179

15.9 Base Year Inter-town Travel Characteristics

The objective of this study is to determine the origin and destination of external-external, external-internal and internal-external passenger and goods movements across the outer cordons of the study area. An analysis of these traffic movements gives the proportion of by-passable traffic along with the major external interaction areas. Base year inter-town travel characteristics of passenger and goods movements were obtained by conducting origin-destination survey of a sample number of motor vehicles passing through major outer

cordon locations on roads in Kottayam. Table 15.6 gives the location of outer cordon survey points selected for origin – destination survey.

Table 15.6: Origin-Destination Survey Locations in Kottayam

Sl. No.	Name of Location	Name of Road
1.	**Outer Cordon Points on Roads**	
1	Thellakom	MC Road
2	Chingavanam	MC Road
3	Vadavathur	NH 220
4	Chungam	Chalukunnu-Medical College Road
5	Illickal	Kottayam-Kumarakom Road
6	Mandiram	Kottayam-Kozhenchery Road
2.	**Railway stations**	
1	Kottayam	Kottayam-Thiruvananthapuram section
2	Chingavanam	Kottayam-Thiruvananthapuram section

Traffic volume at outer cordon points

Volume survey of all the vehicles entering/exiting the study region was conducted at six outer cordon points of the study region. Classified volumes of vehicles were recorded according to their direction of travel.

The maximum daily traffic volume of 31,500 was observed at Vadavathur in NH 220, comprising mostly with 12,500 cars and 10,500 two wheelers. 28,000 PCU was observed on Thellakom in MC Road followed by 25,000 PCU at Chingavanam. Cars constituted the maximum in both locations, followed by two wheelers and passenger auto rickshaws. In other locations traffic volume ranged from 5,000 to 22,000 PCU per day.

Since the exact volume of passengers alighting or boarding a train in a day could not be established from manual counts due to multiple entry/exist points, number of passengers boarding/alighting a railway station was worked out by taking the average number of passengers who booked their tickets in advance as well as on the day of travel in addition to the number of season ticket holders in a month. The same number of passengers was also taken as the alighting passengers. From the data compiled from railway stations on the number of tickets booked, it was found that an average of 20,042 passengers had boarded Kottayam railway station on a day in November 2010 and 202 passengers had boarded Chingavanam railway station on a day in November 2010.

Zoning Pattern Adopted for the Study

For a meaningful analysis of O-D survey data, the study region was divided into 11traffic zones, the boundaries of the zone forming the combined boundary of

one or more wards or Panchayaths. In a similar way, outside study region was divided into 13 traffic zones, which include the immediate surrounding areas, adjoining Districts and neighbouring States. The traffic-zoning pattern adopted for the study is given in Table 15.7.

Table 15.7: Zoning Pattern Adopted for Study Area

Sl. No.	Name of Zone	Description
	Within the Study Region	
1	CBD	Tirunakkara Maidan, Old Bus stand and Baker Junction area
2	Nagampadom	Municipal Bus stand, Railway Station area
3	Civil Station	Collectorate, District Hospital and Logos junction area
4	Kanjikuzhy	Kanjikuzhy junction, Plantation and Devalokam area
5	Market Area	KSRTC Station, Anupama Theatre and Market Landing road area
6	Kodimatha	Boat Jettyand Kodimatha area
7	Chalukunnu	Chalukunnu, Arthootty, Uppootti and Desabhimani area
8	Thiruvathukkal	Thiruvathukkal and Kurussupalli area
9	Kumaranalloor	Kumaranalloor Panchayat
10	Nattakam	Nattakam and Panatchikadu Panchayat
11	Vijayapuram	Vijayapuram Panchayat
	Outside the Study Region	
12	Medical College	Athirampuzha & Arppookara Panchayaths
13	Thiruvarppu	Aimanom, Thiruvarppu Panchayaths and other western parts of Kottayam district
14	Changanassery	Changanassery Taluk and other southern parts of Kottayam district
15	Kanjirappally	Kanjirappally Taluk and other north-eastern parts of Kottayam district
16	Puthupally	Puthupally and other south-eastern parts of Kottayam district
17	Ettumanoor	Ettumanoor and north-western parts of Kottayam district
18	Pala	Pala and other northern parts of Kottayam district
19	Idukki	Idukki district
20	Ernakulam	Ernakulam district
21	Other southern districts	Alappuzha, Kollam, Pathanamthitta, Thiruvananthapuram
22	Other northern districts	Thrissur, Palakkad, Malappuram, Kozhikode, Wayanad, Kannur and Kasargode districts
23	Tamil Nadu	Tamil Nadu
24	Other States	Other States excluding Kerala and Tamil Nadu

Modal-split of Passenger Traffic

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

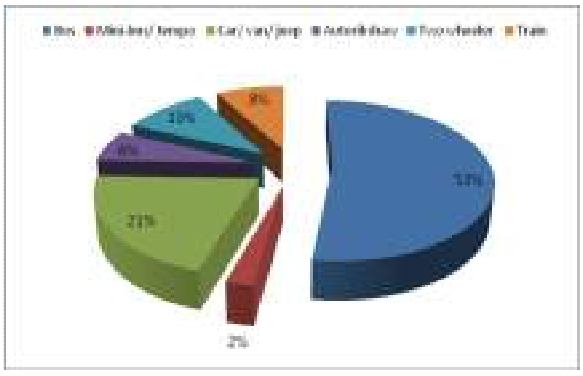


Figure 15.1 Modal Split of inter town Passenger traffic

significant role in transport of inter-city passengers. Water transport carries only a negligible percentage of inter-city passenger traffic. An analysis of the O-D survey data collected from outer cordon survey locations revealed that an estimated 4,94,759 inter-town passenger trips were performed in the study region on a reference day consisting of 2,58,878 bus passenger trips (52.3%), 1,03,373 car trips (20.89%), 49,626 two-wheeler trips (10.03%), 40,490 train trips (8.18%), 30,902 auto trips (6.25%) and 11,490 mini-bus trips (2.32%). It could be inferred that public transport had a significant role in meeting the inter-town passenger demand. Table 15.8 gives the modal split of inter-town passenger traffic in Kottayam. Figure 15.1 presents the same in a pie diagram.

Table 15.8: Modal Split of Inter-town Daily Passenger Trips in Kottayam

Sl.No.	Mode of Travel	No. of Passengers	% of Passengers
1	**Bus**	258,878	52.33
2	Mini-bus/ tempo	11,490	02.32
3	Car/ van/ jeep	103,373	20.89
4	Autorikshaw	30,902	06.25
5	Two wheeler	49,626	10.03
6	Train	40,490	08.18
Total		**494,759**	**100.00**

Purpose of Trip

In Kottayam, an estimated 1.16 lakh inter-town passenger trips were performed for work or related purpose, which constituted almost 24% of the total inter-town passenger movements. This was followed by 94000 back home trips and 57000 shopping trips. Educational trips were five per cent of the total passenger trips.

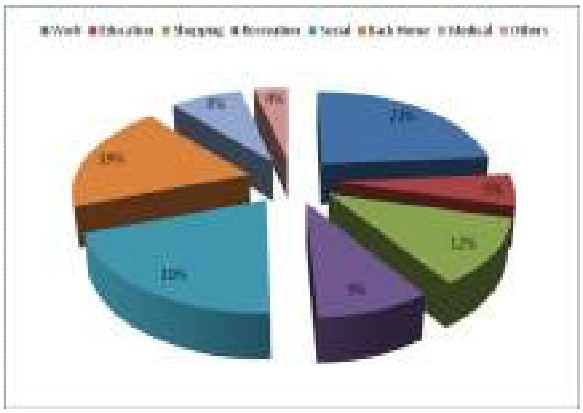


Figure 15.2 Purpose of trips

Table 15.9 presents distribution of inter-town passenger trip for different purposes according to mode of travel. Figure 15.2 illustrates the same with pie diagram.

Table 15.9: Mode of Travel and Purpose of Trip

	Purpose of trip	Mode of Travel							
		Bus	Mini-bus	Car	Auto	Two-wheeler	Train	Total	Per cent
1	Work	65876	2366	21773	6559	19023	848	116,445	23.54
2	Education	10334	399	2849	1608	2944	9073	27,207	5.50
3	Shopping	18369	319	9607	1866	2072	25044	57,277	11.58
4	Recreation	24658	2294	11400	2313	2604	108	43,377	8.77
5	Social	56130	3295	23398	7337	8335	1205	99,700	20.15
6	Back Home	52834	1565	22027	5864	10421	771	93,482	18.89
7	Medical	20332	367	8076	4232	2671	3278	38,956	7.87
8	Others	10345	885	4243	1123	1556	163	18,315	3.70
Total		**258,878**	**11,490**	**103,373**	**30,902**	**49,626**	**40,490**	**494,759**	100.00

Occupation of passengers

The occupational characteristics of passengers were ascertained from the O-D survey. It could be seen that persons working in the service sector constituted the major segment (39 percent) of the inter-town travelers, of whom 22 per cent worked in the private sector and 17 per cent in government sector. Self employed people including those engaged in own business, professionals, cultivators, causal laborers and people working in the Gulf were 38 per cent, most of them doing their own business. Dependant population like unemployed, housewife, student and retired hands together constituted 23 per cent of the total inter-town passengers**.** Table 15.10 presents the occupational distribution of inter-town passenger trip. It is also represented in Figure 15.3.

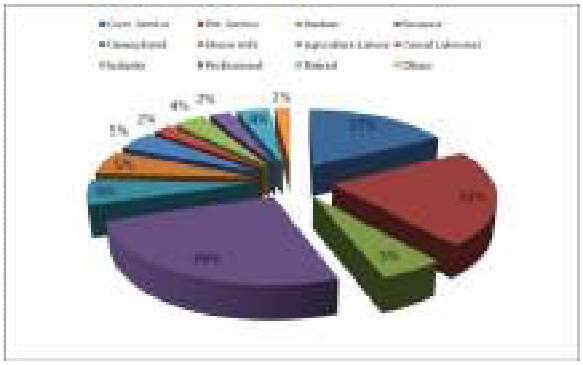


Figure 15.3 Occupation of Passengers

Table 15.10: Mode of Travel and Occupation of Trip Maker

Sl. No.	Occupation of Trip Maker	Mode of Travel							
		Bus	Mini-bus	Car	Auto	Two wheeler	Train	Total	Per cent
1	Govt. Service	44475	1871	17254	5225	9218	6946	84,989	17.18
2	Pvt. Service	59928	2428	21137	7892	13774	2522	107,681	21.76
3	Student	15082	681	4408	1978	4316	544	27,009	5.46

4	Business	68561	3392	34235	3657	10463	6636	126,944	25.66
5	Unemployed	9957	550	3675	1601	1689	11392	28,864	5.83
6	House wife	13774	328	4643	3995	1430	2251	26,421	5.34
7	Agri: Labour	10716	558	4762	1228	1540	3714	22,518	4.55
8	Casual Labourers	6168	169	1865	1229	1392	283	11,106	2.24
9	Industry	10733	399	3682	1734	2286	0	18,834	3.81
10	Professional	6872	585	2656	529	1417	45	12,104	2.45
11	Retired	8783	346	3181	1718	1384	3863	19,275	3.90
12	Others	3829	183	1875	116	717	2294	9,014	1.82
Total		**258878**	**11,490**	**103,373**	**30,902**	**49,626**	**40,490**	**494,759**	100.00

15.10 Origin – destination of Passenger Trips

A total of 4,94,759 passenger trips were performed as inter-town trips in the study region on the reference day. The major traffic generating zones within the study region was the CBD area with 17,855 trips constituting 3.6 per cent of the total trips. Among the external zones, a maximum of 59,994 trips (12.1%) trips originated from Aimanom & Thiruvarppu Area. 1737 trips generated from the state of Tamil

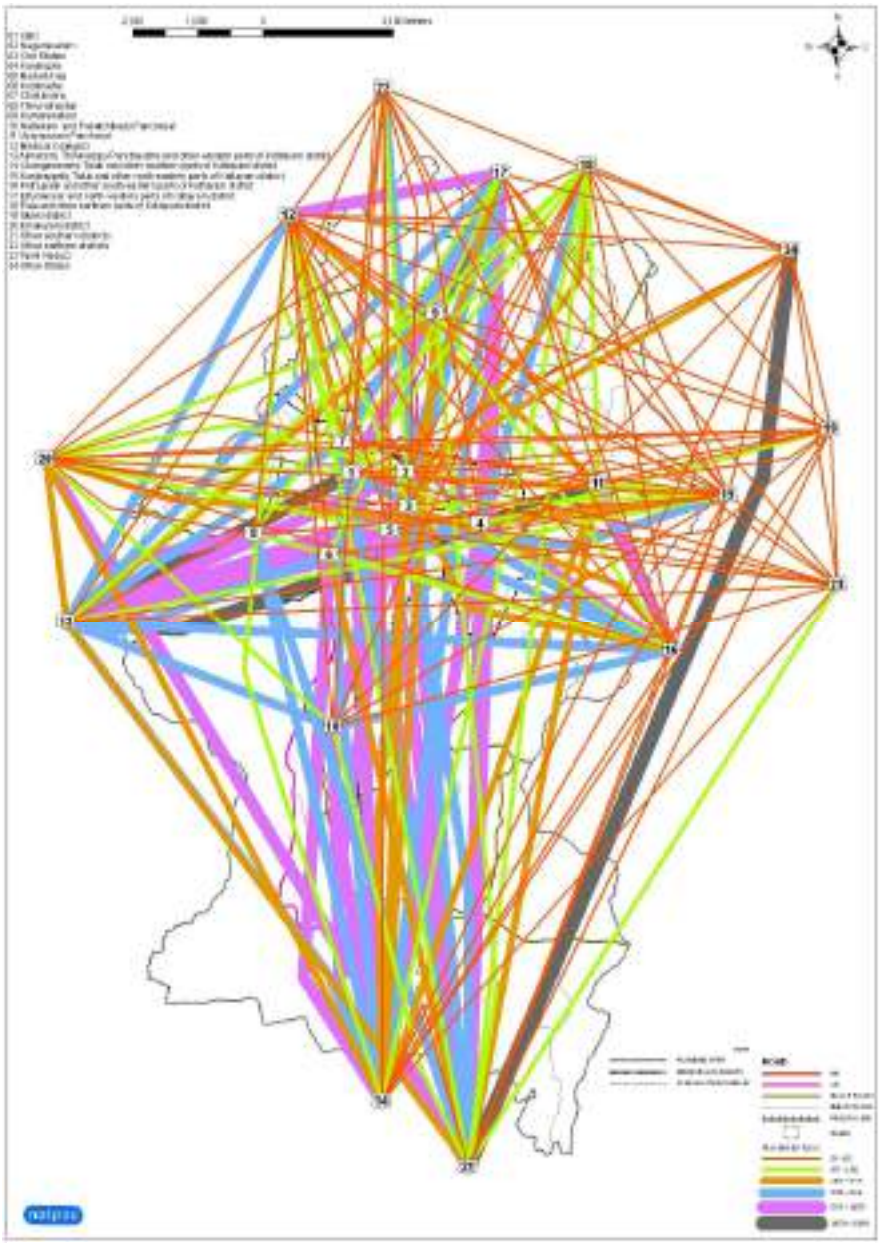


Figure 15.4 Desire line of Passenger Traffic

Nadu and 10759 trips were generated from other states. An analysis of inter-town trip attractions revealed that the CBD area attracted 43875 inter-town passenger trips from various zones. Aimanom & Thiruvarppu Area attracted 70935 trips. A total of 1888 trips found their destinations in the state of Tamil Nadu while 9727 trips were bound to other states. The desire line of passenger traffic is shown in Table 15.4.

Pattern of inter-town passenger trips

The O-D pattern of inter-town passenger traffic revealed that there were 2,02,208 internal - external trips (Study region to outside study region), out of 4,94,759 inter-town passenger trips and constituted 40.9 per cent of total trips. A total of 1,91,585 trips were external – internal trips (outside study region to study region) constituting 38.7 per cent of the total trips. External – external trips to the tune of 1,00,966 were performed through the study region and they were 22.2 per cent of the total trips. Pattern of inter-town passenger trips according to vehicle type are given in Table 15.11.

Table 15.11: Pattern of Inter-town Daily Passenger Trips in Kottayam

Sl. No	Originating Region	Terminating Zones				Total	Percent
		Kottayam Study Area	Kottayam District	Other Districts	Other States		
1. Bus							
1	Kottayam study area	-	92,576	17,082	214	**109,872**	**42.44**
2	Kottayam district	84,544	25,886	5,691	443	**116,564**	**45.03**
3	Other districts	17,937	7,496	5,642	283	**31,358**	**12.11**
4	Other States	393	200	423	68	**1,084**	**0.42**
Total		**102,874**	**126,158**	**28,838**	**1,008**	**258,878**	**100.00**
Percent		**39.74**	**48.73**	**11.14**	**0.39**	**100.00**	
2. Mini-bus							
1	Kottayam study area	-	4,626	1,698	-	**6,324**	**55.04**
2	Kottayam district	1,386	1,061	582	82	**3,111**	**27.08**
3	Other districts	1,119	342	468	60	**1,989**	**17.31**
4	Other States	-	-	66	-	**66**	**0.57**
Total		**2,505**	**6,029**	**2,814**	**142**	**11,490**	**100.00**
Percent		**21.80**	**52.47**	**24.49**	**1.24**	**100.00**	
3. Car/Van/Jeep							
1	Kottayam study area	-	35,470	8,156	113	**43,739**	**42.31**
2	Kottayam district	31,078	9,476	3,341	241	**44,136**	**42.70**
3	Other districts	8,244	3,698	2,894	67	**14,903**	**14.42**
4	Other States	139	146	250	60	**595**	**0.57**
Total		**39,461**	**48,790**	**14,641**	**481**	**103,373**	**100.00**

Percent		**38.17**	**47.20**	**14.16**	**0.47**	**100.00**	
Sl. No	**Originating Region**	**Terminating Zones**				**Total**	**Percent**
		Kottayam Study Area	**Kottayam District**	**Other Districts**	**Other States**		
4. Auto-rickshaw							
1	Kottayam study area	-	11,117	992	-	**12,109**	**39.19**
2	Kottayam district	10,808	3,220	302	-	**14,330**	**46.37**
3	Other districts	3,363	422	451	112	**4,348**	**14.07**
4	Other States	115	-	-	-	**115**	**0.37**
Total		**14,286**	**14,759**	**1,745**	**112**	**30,902**	**100.00**
Percent		**46.23**	**47.76**	**5.65**	**0.36**	**100.00**	
5. Two wheeler							
1	Kottayam study area	-	18,473	2,827	-	**21,300**	**42.92**
2	Kottayam district	19,964	4,756	292	46	**25,058**	**50.49**
3	Other districts	2,041	861	366	-	**3,268**	**6.59**
4	Other States	-	-	-	-	**-**	**-**
Total		**22,005**	**24,090**	**3,485**	**46**	**49,626**	**100.00**
Percent		**44.34**	**48.54**	**7.02**	**0.10**	**100.00**	
6. Train							
1	Kottayam study area	-	902	6,432	1,530	**8,864**	**21.89**
2	Kottayam district	781	2	1,310	338	**2,431**	**6.00**
3	Other districts	7,573	1,006	2,022	7,958	**18,559**	**45.84**
4	Other States	2,100	269	8,267	-	**10,636**	**26.27**
Total		**10,454**	**2,179**	**18,031**	**9,826**	**40,490**	**100.00**
Percent		**25.82**	**5.38**	**44.53**	**24.27**	**100.00**	
7. All Vehicles							
1	Kottayam study area	-	163,164	37,187	1,857	**202,208**	**40.87**
2	Kottayam district	148,561	44,401	11,518	1,150	**205,630**	**41.56**
3	Other districts	40,277	13,825	11,843	8,480	**74,425**	**15.04**
4	Other States	2,747	615	9,006	128	**12,496**	**2.53**
Total		**191,585**	**222,005**	**69,554**	**11,615**	**494,759**	**100.00**
Percent		**38.72**	**44.87**	**14.06**	**2.35**	**100.00**	

15.11 Inter-Town Goods Traffic

Volume of Goods Vehicles at Outer Cordon Points

A total of 10,136 goods vehicles passed through the outer cordon points in Kottayam Municipality on the reference day. The total goods volume comprised of 4853 trucks followed by 3660 Mini trucks and 3253 goods autorickshaws.

Modal Split of Goods Traffic

The quantum of goods handled by the goods vehicles was to the tune of 31,048 tonnes. Trucks carried the maximum volume of goods traffic (65.25%), followed by mini-trucks (10.48%). The remaining 3.9 per cent of goods traffic was handled by goods autos. Modal split of Inter town Goods traffic is shown in Table 15.12.

Table 15.12: Modal Spilt of inter-town Daily Goods Traffic

Sl. No.	Mode of Travel	No. of Vehicles		Quantity carried(in tonnes)	
		No.	Per cent	Tons	Per cent
1	Truck	4853	41.25	20,259	65.25
2	Mini-truck/ tempo	3660	31.11	8,725	28.10
3	Goods Autorikshaw	3253	27.65	2,065	6.65
	Total	**11,766**	**100.00**	**31,048**	**100.00**

O-D of Goods Transportation

Inter-town movement of goods to the tune of 31,048 tonnes was carried out over the study region. The major traffic generator of goods traffic within the study region was the Nagampadom zone with 2563 tonnes (8.3%). A total of 1262 tonnes of goods were generated from the CBD area and 1434 tonnes were from the market area. The Nattakom zone generated 4252 tonne while Aimanom and Thiruvarppu area generated 1245 tonnes. The Tamil Nadu state generated 698 tonnes and goods from other states were 641 tonnes

In the case of goods traffic attraction, CBD area had the dominant share with 1966 tonnes. A total of 501 tonnes were bound to outside states of which 364 tonnes were bound for Tamil Nadu. The desire line of goods traffic is shown in Table 15.5.

Pattern of Goods Traffic

A further study of the goods traffic pattern observed within the study region vis-a-vis the outside study region revealed that 13,121 tonnes of traffic originated from the study region and 9,631 tonnes of traffic terminated in the study region. Nearly 8,296 tonnes of traffic are of divertible nature, which, are passing through the CBD area of the town.

Composition of Goods Traffic

Out of the 31,048 tonnes of inter-town goods traffic observed through outer cordon survey stations, maximum volume of 5,898 tonnes movements were observed in the case of fruits and vegetables which amounted to 19 per cent., followed by Coconut and Copra to the tune of 4,795 tonnes (15%).

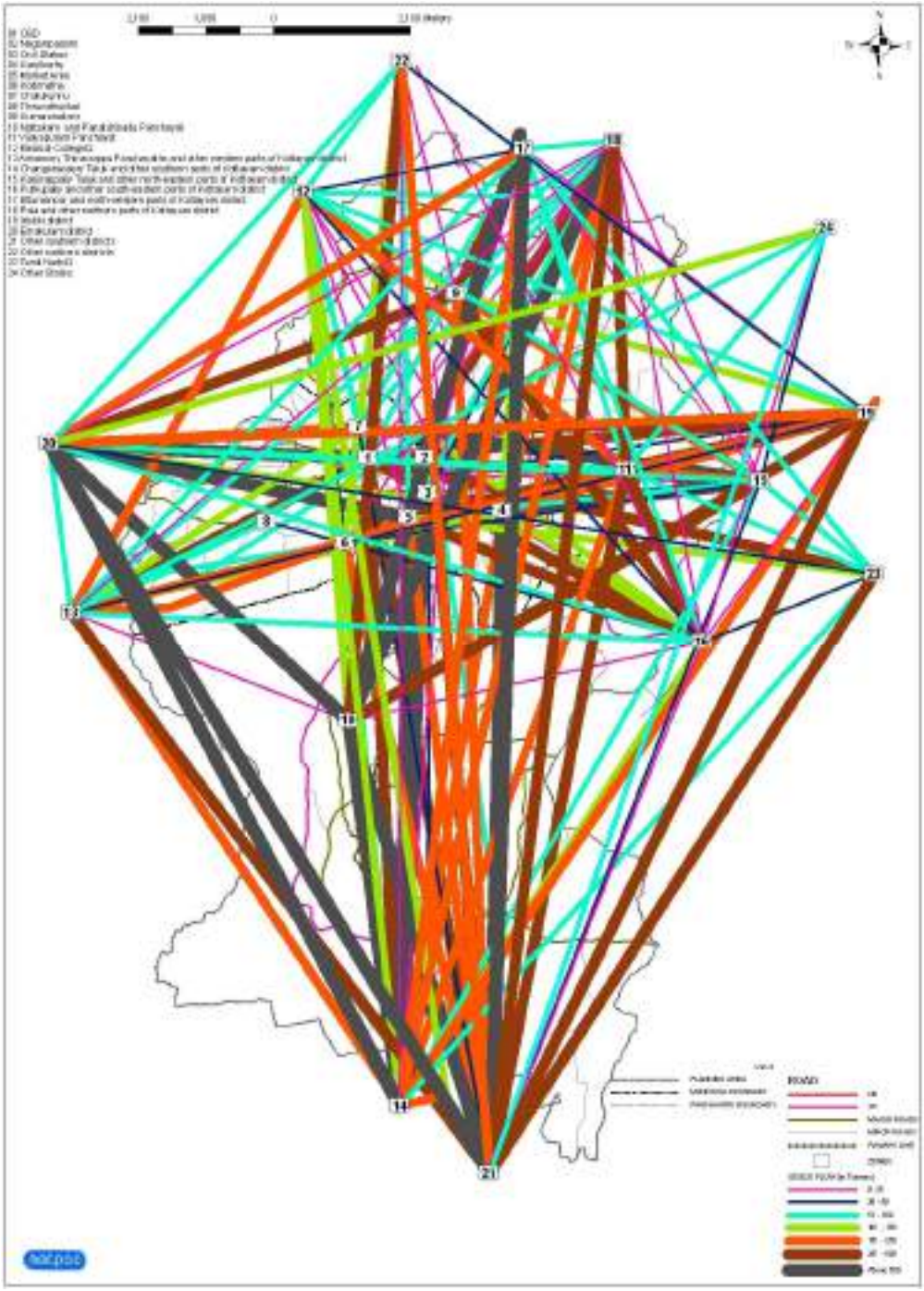


Figure 15.5 Desire line of Goods traffic

15.12 Conclusion

The configuration of the existing road network within Kottayam Town does not reflect any regular form, although it resembles more or less like ring and radial type having radial roads connected with partial ring roads. The major reasons of this traffic volume are concentration of activities like commercial, public and semi-public activities, location of bus stand etc. The major traffic and transportation problems facing Kottayam town are absence of bypasses and link roads, the inter-mixing of intra-city and inter-city traffic in the absence of adequate bypasses, Narrow width of roads in the central part of the city,Heavy movement of vehicular and pedestrian traffic, Lack of pedestrian facilities, footpaths sub-ways and pedestrian streets, Encroachment of right-of-way etc

The most important aspect of traffic and transportation problem of Kottayam town is the congested central core with limited scope for road widening. Hence, emphasis has been given to develop alternative linkages so as to divert the traffic passing through the CBD area. This would also help to reduce the unwanted inter-mix of intra-city and inter-city traffic on urban roads within the central part of the town.

16 Energy

16.1 Introduction

This chapter analyse the existing status of Power sector in the planning area. In planning area, conventional source of energy is mainly used and the use of non-conventional sources of energy is very limited. Electric connections, catagry wise consumption, level of electrification, different types of fuels used in the planning area etc are discussed in this chapter.

16.2 Power Distribution

Electric power to the planning area is distributed through substations located at Poovanthuruth (Pallom 220KV and New Pallom 220KV substations) in Panachikkad Panchayat which is one of the major substations in Kerala. It also serves the nearby districts apart from planning area. In addition to that power is supplied from the 110 KV Substation located at Chengalam and 66 KV Substation Kanjikuzhy and 66KV substation at Pallom. Construction of a new 110KV substation is in progress at Kodimatha.



220KV Poovanthuruth substation

The distribution of power in the town is under the control of 8 Electrical Sections, located at Pallom, Kottayam East,

Kottayam Central, Nattakom, Kumarakom, Aymanom, Manarcad and Gandhi Nagar. The power is also supplied to the areas out side the Planning area from the above sections. As per the Socio-economic survey voltage problem is experiencing only in 12% of households and power interruption is the problem experiencing in the town.

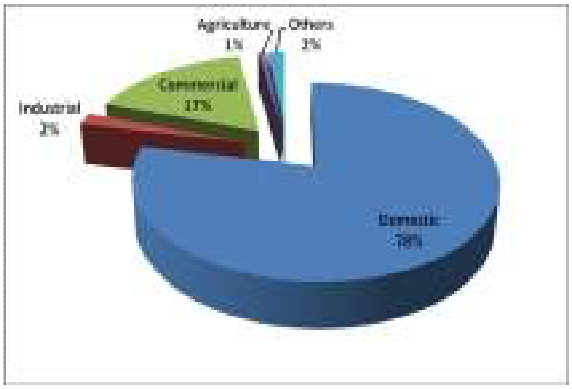


Figure 16.1 Category wise connections

Electrical sections, number of connections, catogary wise connections of the Planning area etc is shown in Table 16.1. Category wise connections are also shown in Figure 16.1.

Table 16.1 Category wise electricity connection details

Sl. No	Total No of connections		Category wise breakup – No of connections				
	Major section	Total Numbers	Domestic	Industr-ial	Commer-cial	Agricult-ure	Others
1	Pallom section	11549	9831	331	1346	37	4
2	Kottayam east	18601	14708	298	2739	122	734
3	Kottayam central	15452	10036	258	4499	38	621
4	Nattakom	10137	8540	367	1204	18	8
5	Kumarakom	14412	1242	148	1665	164	15
6	Aymanom	10651	9432	138	914	156	11
7	Manarcad	10358	9120	172	979	72	15
8	Gandhinagar	14069	11572	202	2192	78	25

Source: KSEB Divisional office Pallom

The category wise electricity consumption (in MKWH) in different section in the Planning area is shown in Table 16.2.

Table 16.2 Category wise electricity Consumption (in MKWH) details

Sl.No	Total consumption		Category wise breakup				
	Major section	Total consumption	Domestic	Industrial	Commercial	Agriculture	Others
1	Pallom section	3142803	1937124	756281	397830	8311	43257
2	Kottayam east	4475092	3140697	432313	564287	5278	332517
3	Kottayam central	2391196	2940761	279362	1308272	1076	508410
4	Nattakom	3297758	1408679	1184566	642018	1041	61454
5	Kumarakom	2363648	2005012	45821	273960	31173	7682
6	Aymanom	2204125	1812890	161312	154520	8148	67255
7	Manarcad	2698371	1877921	383051	410036	7680	19683
8	Gandhinagar	3505271	2115941	205639	1096798	4810	82083

From the above table it can be observed that more percentage of electric power (in terms of connection and consumption) is used for domestic purpose (78% connections) and followed by Commercial connections (17% connections). Consumption for Industrial and Agriculture purpose is very less. It indicates low level of industrialization of the Town.

16.3 Level of Electrification

As per the Socio-economic survey 96.61% of the houses are electrified in the planning area and the percentage of electrified houses are almost uniform in the planning area. 94.95% of houses has only single phase connection and only 12.69% of the house holds reported that there is voltage problem.

16.4 Fuels

As per the Socio-economic survey LPG and firewood are the major fuels used in the Planning area. In 84% of houses LPG and in 61% of houses fire wood is using as fuel. In notable share of houses both LPG and fire wood are using as fuel. The use of other fuels is very less in the Planning area.

16.5 Conclusion

Low voltage is not a problem in the planning area but frequent power supply interruption is a problem. Most of the houses are electrified and importance shall be given for improving the quality of supply. Consumption electricity for Industrial purpose is very less. It indicates low level of industrialization of the Town. Similarly steps should be taken to utilize the non-conventional sources of energy sources to generate electricity and also as fuel.

17 Waste Disposal

17.1 Introduction

Handling of solid wastes is one of the major problems faced by the urban local bodies. Increase in the volume of urban waste is principally due to increasingly affluent life style, rather than urban growth. The municipal solid waste productions continue to grow over the time. The present quantum of solid waste generated in the Planning area is about 30 tonnes per day.

17.2 Collection System

The primary sources of solid waste are the houses, commercial establishments, industries, markets, hotels and restaurants and hospitals etc. The LSGIs are now engaged in the collection, transportation and disposal of all solid waste generated in the planning area.

The Health wing of the municipality is in charge of collection and disposal of wastes. The collection of wastes by the municipality is mainly confined to the developed area of old municipal limit and few centers of newly added portion. In two Grama Panchayat areas only part of the solid waste generated is being collected and disposed. No agency other than Municipality is engaged in collection of solid waste. 5 trucks, 4 mini trucks, 9 Drivers and 151 workers were engaged in the collection of waste in municipal limit and another 12 workers are employed at the disposal yard which is functioning on BOT basis.



The waste collection points are Mullankuzhi, Chellathampally, Sub jail, D.C.Books, Pentecostal pally, Kollkadavu, Children's Library, Puthanangady, Pullaparampu, Kozhichantha, Erayilkadavu, Vayaskara, Kodimatha old MC road, Fish market, Thiruvathukkal maidan, Malikapeedika, Thaliyilkotta, Alummoodu. In the interior area of the town only mass cleaning is being done on demand basis. There is no secondary storage space for solid waste. A hotel waste management system is adopted and about 12 tonnes of waste from hotel collected daily evening.

17.3 Solid Waste Disposal System

The waste disposal yard is located at Vadavathoor in Vijayapuram Grama Panchayat and 704.97 cents of land is available there. Separation of wastes into bio-degradable and others are done at the disposal yard. A Vermi-composting Plant is established here for disposal of bio-degradable wastes and non-degradable wastes are disposed by land filling in the yard itself. The composting plant is not properly functioning at present. This has lead to several health and environmental issues. There is public protest against the functioning of dumping yard, due to improper waste management. System for separation of solid waste, at the source itself, has been commenced recently.

The Socio Economic survey revealed that 92.13% of the households disposing there wastes in own premises, 2.66% disposing their wastes in dust bins, 1.90% in streets and remaining 3.32% in open spaces.It is represented in Figure 17.1.

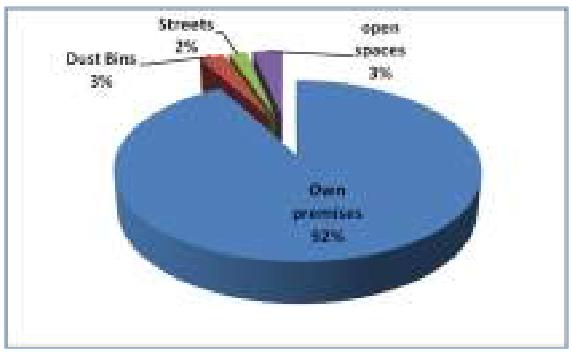


Figure 17.1 Method of Waste disposal

17.4 Disposal of Bio-medical wastes

No system managed by the Municipality is functioning in the town for collection and disposal of bio-medical wastes from the Hospitals. They are depending on a private agency (IMAGE, Palakkad) for collection and disposal of bio-medical waste.

17.5 Sanitary Wastes

There is no sewage system for the town. As per the Socio-economic survey conducted by the Town and Country Planning Department (2010), 98.07 % of houses in the Planning area have some sort of sanitation system and only 1.92% of houses in the town do not have any sanitation system. In the survey it is also inferred that 29.63% of houses have septic tank, 68.44% of houses have pit latrine and 1.54% of houses using public place for the disposal of sanitary wastes and 0.38% of houses using public latrine. It is represented in figure17.2 and the analysis shows that better Sanitation system is available for the houses in the town.

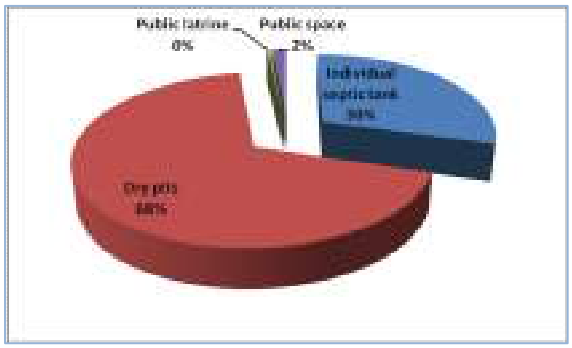


Figure 17.2 Method of sanitary waste disposal

17.6 Drains

Kottayam town is with undulating terrain enables natural drainage of storm water. Natural drain existing in the area is mainly discharging storm water in to Meenachil River, Puthenthode, Kodur River etc. Paddy lands and fallow lands acts as the collection and intermediate storage basin for rain water. Certain canals like Boat Jetty Canal, Market landing canal, Chanthathodu Chingavanam etc are experiencing high rate of water pollution due to the direct discharge of the effluents into canals and drains and it badly affects the aqua life.



For the disposal of surface run off, drains are available along the major roads. These drains are ultimately leading to natural drains for the disposal of water. Major portion of surface run off is disposed into Kodur river Meenachil river. At

present there is no treatment facility and the waste water is disposing into the natural drain directly.

17.7 Public Comfort Stations

The availability of Public toilet / comfort station is very less in the town and at present only three Public comfort stations – at Nagampadom Private Bus Stand, Thirunakkara and Star Junction is functioning in the town. More public Comfort Stations are to be provided at different parts of the town.

17.8 Conclusion

A major portion of the old municipal area is covered by Solid waste collection system. The space at the dumping yard is inadequate and the plants are not working properly and it creates some environmental problems and leading to agitation of local people. The problems in this area are to be addressed. The collection and disposal of waste from the newly added portion of the municipality and the two Grama panchayats are nominal. Sewage system shall be provided for the developed areas of the town and the pollution of the natural water bodies to be avoided.

18 Education

18.1 Introduction


CMS College, Kottayam

Kottayam is always in the fore front in the field of literacy and education. The first English school in Kerala was started by the Missionaries of the Church Mission Society (C.M.S) at Kottayam, in the beginning of the 19th century and it is the present CMS High School, Kottayam. The first college in Kerala the C.M.S College is also located at Kottayam. The city of Kottayam is also known as "Akshara Nagari (City of Alphabets) in honour of its contributions to print media and literature which implies the rich culture of Kottayam in advanced education field. This chapter discusses the existing educational facilities, level of education and important problems affecting educational sector in Kottayam planning area.

18.2 Level of Education

The general Education status is assessed based on literacy rate, number of educational institutions per 1 lakhs population and educational status. Kottayam municipality is the 1st municipality in India, to be declared as 100% literate in the year 1989. The literacy rate of the planning area is 96.63%. The literacy rate of Kottayam district and Kerala state are 95.82% and 90.92%. The literacy rate of the Planning area is higher than the district and state literacy rate. Presence of continuing education centres helps to alleviate socio, cultural and educational problems of the common man.

18.3 Higher Education

The Mahathma Gandhi University is situated at Kottayam. The main campus of the University is located at Priyadarsani Hills in the adjacent Athirampuzha Grama Panchayat and the Centers of the University are functioning in the Planning area. The University provide facilities for higher education in different discipline and researches in different field.

The Indian Institute of Mass Communication is recently established at Kottayam and its campus is located at Vadavathoor within the Planning area. The Rajive Gandhi Institute of Technology, Kottayam, one of important Engineering colleges of the state is located in the near by Pampady Grama panchyat.

CMS College, BCM College, Baselious College, Government College, School of Legal Thoughts, School of Social Science, Mount carmel B.Ed College, Government Polytechnic College, St.Gits College of Engineering College are the major institutions in higher education sector within the Planning Area. In addition to that there are a number of higher education institutions and professional institutions are functioning in the surrounding area.

18.4 General Education

Schools

There are 83 schools functioning in the delineated Planning area with 25,042 students and 1030 teachers. Out of 83 schools, 18 are Government schools, 54 are aided schools and 11 are unaided schools. The ownership details of schools is shown in Figure 18.1.

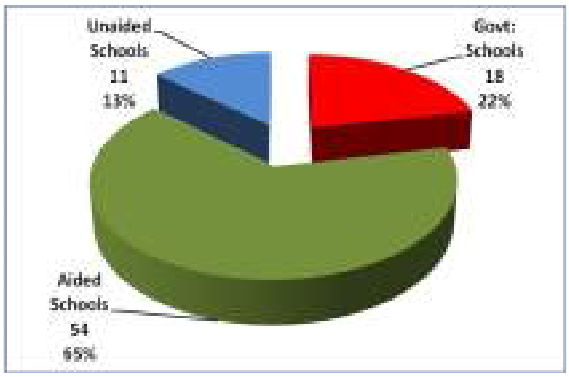


Figure 18.1 Ownership of Schools

There are 2 Vocational Higher Secondary Schools, 16 Higher Secondary Schools, 6 High Schools, 59 Primary (UPS & LPS) schools within the Planning area.

Table 18.1 Details of Schools in Planning area

Name of LSGI	Schools			Total
	Govt.	Aided	Unaided	
Kottayam Municipality	15	35	10	60
Vijayapuram Grama Panchayat	3	5	1	9
Panachikadu Grama Panchayat	0	14	0	14
Total	**18**	**54**	**11**	**83**

The Table 18.1 explains that the number of aided schools is much higher than that of Government schools. Students are interested to study in aided schools than Government schools because of the availability of much better infrastructure facilities.

Infrastructure Facilities



Most of the schools are provided with good access roads and schools buses. Other facilities like play ground, computer labs etc. are available to a limited number of schools. But it is seen that separate toilet facilities for girls are provided by all the schools in planning area.

Distance to Educational Facilities

Analysis of the Socio economic survey data shows that the average distance to Pre-Primary School, L.P.School, UP School and High School are 0.68, 0.85, 1.28 and 1.45 Km respectively. The area wise average distance to various category of schools is shown in Table 18.2 and figure 18.2. Lower level education facilities are available within a distance of 0.70 km, except for Panachikad Panchayat; while higher order facilities are available within an average of 1.45km.

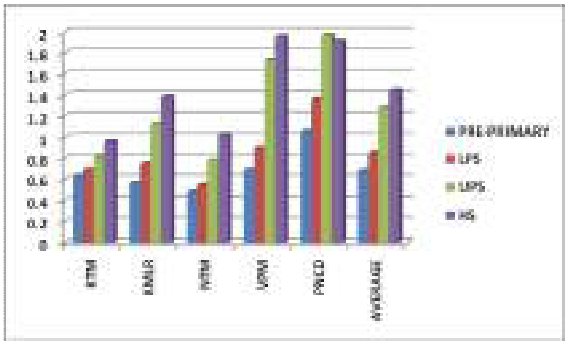


Figure 18.2 Area wise average distance to various category of schools

Table 18.2 – Distance to Educational Facilities (in Kms)

Sl.No.	Area	Pre-Primary school	L.P. School	U.P. School	High School
1	Old Kottayam Municipal limit	0.63	0.69	0.81	0.96
2	Erstwhile Kumaranalloor GP	0.56	0.74	1.12	1.38
3	Erstwhile Nattakom GP	0.48	0.54	0.78	1.03
4	Vijayapuram GP	0.69	0.9	1.73	1.96
5	Panachikad GP	1.06	1.36	1.97	1.91
	AVERAGE	**0.68**	**0.85**	**1.28**	**1.45**

The distance to various categories of schools is compared with certain standards. The adopted standards based on studies related to preparation of IDDP and LDPs in Kollam district, are the pre primary school, primary schools upper primary schools and high schools shall be available within a distance of 0.50, 0.50, 1.00 and 3.00Km respectively. A comparison between the average distance to various category of schools and adopted standard is shown in Figure 18.3. The figure shows that in the case of Pre-primary schools, primary schools, upper primary schools, the travel distance is more than that of adopted standard and in the case of High School it is less than the adopted standard. Even though there are sufficient number of schools in the town there is concentration in certain part of the town, especially in the old municipal limit. The selection of school is based on the standard and the syllabus followed in the schools. This may the reason for increase in travelling distance.

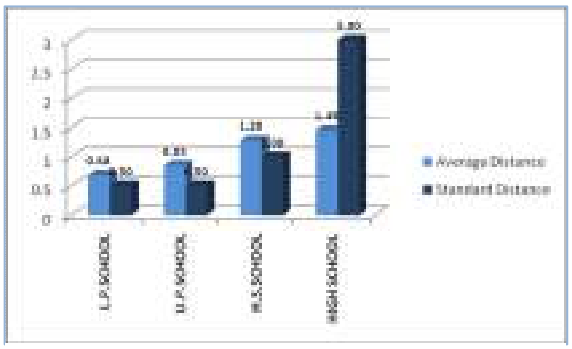


Figure 18.3 Comparison between average distance and adopted standard

18.5 Conclusion

Sufficient numbers institutions for general and higher order education is available in the Planning area. Kottayam is an educational hub, meeting the demands of students from other part of the state also. There is every chance to enhance the present status as there is already proposal for certain national Institutions around the Planning area. But new Research and Technical institutions has to be established in the Planning area utilizing the potential of M.G.University.

19 Health

19.1 Introduction

The existing scenario of medical facilities available in the planning area is discussed in this chapter. Kottayam is one of the leading Health Care Centres in Kerala. Institutions in three systems of medicine i.e. Allopathy, Ayurveda and Homeo are functioning in the Planning area. In this chapter the existing status of medical facilities in three systems are discussed.

19.2 Allopathic system

Medical College, Kottayam one of the premier medical Institutions of Kerala is located at the North West corner of the planning area and part of the Medical college campus is fall within the planning area. Government Dental College is also located in this campus. Institute of Child Health is located in adjacent Athirampuzha Grama Panchayat, very close to Planning area.


Kottayam Medical College

District hospital, Kottayam is located within the municipal limits. In addition to that S.H.Medical Centre, Bharath Hospital, Mundakappadam Mandiram Hospital etc are the major hospitals in private sector with super speciality facilities within the planning area. Velankannimatha Hospital, Carithas


District Hospital, Kottayam

Hospital are the other higher order super speciality medical Institutions functioning adjacent to Planning area. The School of Nursing is functioning in Medical College campus and the School of Medical Education offering Para courses in also functioning adjacent to Planning area. Details of Medical facilities in Allopathic system of medicine are shown in Table 19.1.

Table 19.1 – Facilities available in Allopathic system of Medicine.

Sl. No.	Area	Beds	Doctors	No. of institutions in Govt. / Private sectors
1	Old Kottayam Municipal limit	817	175	4 /60
2	Erstwhile Kumaranalloor GP	80	23	
3	Erstwhile Nattakom GP	13	13	
4	Vijayapuram GP	269	48	1 / 6
5	Panachikad GP	-	3	1 / 1

19.3 Ayurvedic system of medicine

District Ayurvedic hospital functioning at Vayaskarakunnu is the major institution in Indian System of medicine of the planning area. There are 65 institutions (including clinics, dispensaries and hospitals), 56 in Kottayam Municipal limit, 5 in Vijayapuram Grama Panchayat, 4 in Panachikkad Grama Panchayat is functioning in the Planning area. Most of the institutions mentioned above are clinics. Facilities available in Ayurvedic system of medicine is shown in Table 19.2



District Ayurveda Hospital, Kottayam

Table 19.2 Facilities available in Ayurvedic system of medicine

Sl. No.	Name of LSGI	Number of beds	Number of Doctors	No. of institutions in Govt. / Private
1	Kottayam Municipality	60	61	2 / 54

2	Vijayapuram Panchayat	Nil	5	0 / 5
3	Panachikad Panchayat	Nil	5	1 / 4

19.4 Homeopathic system of medicine

District Homeo hospital is functioning at Nagampadam in Municipal Bus Stand compound and many of infrastructure facilities are absent in the hospital. 62 Homeopathic Institutes (clinics, dispensaries and hospitals) are functioning in the planning area. Details of institutions in Homeopathic system are shown in Table 19.3.



District Homeo Hospital, Kottayam

Table 19.3 – Facilities available in Homeopathic system of medicine

Sl. No.	Name of LSGI	Number of beds	Number of Doctors	No. of institutions in Govt. / Private
1	Kottayam Municipality	51	48	1 / 44
2	Vijayapuram GP	Nil	9	0 / 9
3	Panachikad GP	Nil	8	1 / 7

Athurasramam NSS Homeo Medical College is functioning in the adjacent Kurichi Grama Panchayat close to the boundary of planning area. There is also a Central Research Institute at Kurichy in Homeopathy under the CCRH is functioning close to the Athurasramam NSS Homeo Medical College. The Central Research Institute at Kurichy was started in 1974, was declared as Homoeopathic Research Centre exclusively for behavioural disorders and epilepsy in 1988. There is no other research centre for psychiatric disorders anywhere in the country under Homoeopathy.

19.5 Bio Medical Waste disposal

Some of the hospitals in the planning area have their own method, for the waste disposal. But most of the medical institutions are depending on the services of the

private agency IMAGES (I M A goes eco friendly) for the disposal of bio-medical waste. The segregated biomedical waste is collected by the agency from the hospitals and is disposed of by their mechanism.

19.6 Conclusion

Kottayam is one of the leading Health Care Centres in Kerala. Institutions in three systems of medicine i.e. Allopathy, Ayurveda and Homeo are functioning in the Planning area and adjacent areas. The institution includes research centres and medical education centres. There is enough scope for developing health tourism in the Planning area. In Allopathic system adequate infrastructure facilities are available. But in the case of Ayurvedic and Homeopathic the infrastructure facilities are to be improved.

20 Recreational & Civic Amenities

20.1 Introduction

This chapter details out the existing Recreational and Civic Amenities in the Planning area. Recreation is an essential part of human life and it is found in many different forms i.e. either it is natural or it is manmade. Backwaters, lagoons, hill stations, buildings and sites of heritage values available in and around the Planning area provide enough opportunity for recreation. This chapter is discussing about the recreational and civic amenities available in the Planning area.

20.2 Recreational Facilities



As Kottayam district is a land locked district, beaches are not there in the planning area and there are only limited recreational facilities available in the planning area and the available facilities are concentrated in the town centre. The recreational facilities of the town is limited to few small parks, stadium and cinema theatre

Parks

At present there are four parks in the Planning Area. The jubilee Park at LBS Road is the major park of the town and it is situated in a land of extent of 90 Are 60Sq:m area. A children's playing area, aquarium etc are also functioning as part of this park. It is the major recreational area in the Planning area.

The Children's park near Civil Station, Park at children's library is the other parks functioning in the town. These parks are not in properly maintained condition. Parks are not available in the other two constituent Grama Panchayats.

Stadium and Grounds

The *Nehru stadium* at Nagampadom is the only stadium available in the planning area for conducting sports. But the condition of the gallery of the stadium is not in good condition and water logging of the ground during the rainy season is the major drawback of this stadium and the stadium needs urgent reconstruction.



The Open maidan near Jubilee Park in Kurian Uthup Road is the space available in the town for conducting fairs, public meetings etc. The yard is not properly filled and problem of water logging is experiencing in the ground. The size of this ground is inadequate to accommodate the people as well as vehicles arriving.

The *Thirunakkara Maidan* located at the heart of the city has witnessed many historical events. This maidan has recently renovated and the maidan is used for conducting public meetings and as parking area.

The *Police Parade Ground* near Civil Station is another open space available in the Planning area. The National day functions are deliberating in this ground. This maidan is also used for major fairs and stage shows.

In addition to the above there are number of grounds associated with Colleges and schools and occasionally used for various functions. But there is no swimming Pool (for public use) within the Planning area.

Water front recreation

The Planning area is blessed with number of rivers, canals and water bodies. The Vembanad Lake and Kumarakom tourist villages are adjacent to Kottayam. Landing facility is available at Kodimatha and tourist boats are operating from Kodimatha for boating in Vembanad Lake and connected water bodies.



Town Hall and Auditoriums



Mammen Mappillai Hall is the major hall of the Planning area. In addition to that there are number of other hall / auditorium (both independent and associated with religious and educational institutions) distributed throughout the planning area with little concentration in the old municipal limit.

Cinema Theatre

There are seven air conditioned theatre in the town meeting the demand of the planning area as well as the influence area of the town.



Libraries

Kottayam Public library and Jawahar Balabhavan and Children's library are the major libraries in the Planning area. In addition to that there are a number of small libraries in different part of Planning area.

20.3 Average distance to Recreational Facilities

The average distance for the recreational facilities, as obtained from the socio economic survey is furnished in Table 20.1. It shows that recreational facilities are available at a reasonable distance for the people of planning area except for those from Panachikkad Grama Panchayat.

Table 20.1 - Recreational Facilities (Distance in Kms)

Sl.no.	Name of Panchayat	Recreational facilities	Cinema Theatre	Park	Play Grounds
1	Kottayam	0.94	2.08	1.92	1.27
2	Kumaranalloor	1.21	5	4.93	1.62
3	Nattakom	0.83	6.24	6.97	2.55
4	Vijayapuram	1.32	4.97	5.48	1.88

5	Panachikad	1.64	3.76	10.42	3.03
	AVERAGE	**1.19**	**4.41**	**5.94**	**2.07**

20.4 Other Civic Amenities

Other civic amenities like Crematorium/ Burial Ground are also available in planning area. Gas based Crematorium owned by the municipality is functioning at Muttambalam. A Burial ground is also there at Panachikkad Grama Panchayat. In addition to that Burial Grounds / volts are there associated with various Religious institutions.

20.5 Security

Being the district headquarters all district level Police officers are functioning at Kottayam. Four Police Stations, Kottayam East, Kottayam West, Chingavanam and Gandhi Nagar are also functioning in Planning Area.

20.6 Fire and Safety

The main objective of the fire and rescue service is to protect the people and their properties from fire and other calamities, which include both natural and incidental. Office of the fire and rescue service is functioning at Vayaskarakunnu.

20.7 Conclusion

The location of the existing stadium and grounds at the centre of the town creating traffic bottlenecks for entire town when major meetings / fairs are being conducted. This necessitates a new modern stadium and a large fairground away from the central area. Absence of an Indoor stadium and Swimming pool is experiencing in the Planning Area. Measures are to be taken to improve the environmental status and aesthetic beauty of town by town beautification measures. The potential of the water bodies has to be fully exploited and convert it as a major water front recreation centre of the region.

21 Environment

21.1 Introduction

Urbanization leads too many environmental problems of varying extent and it varies from town to town. Large scale industrialization, commercial activities, population explosion, vehicular growth, conversion of green and open areas, inadequate waste disposal etc. are leading to many environmental problems. Increased interaction between residing population and natural resources, due to economic developments leads to environmental issues. The urban environmental problems are threats to human well-being, resulting from human-induced damage to the physical environment, originating in or born in urban areas. It includes, localized environmental problems such as inadequate house hold water and sanitation facilities and indoor air pollution, town level environmental problems such as air pollution, inadequate waste management and pollution of water bodies, degradation of natural areas, Infrastructure deficit etc.

21.2 Municipal Solid Waste



Collection conveyance and disposal of solid waste of the town is carried out in core area of the town only. Collection of solid waste is confined to selected area in the newly added Nattakom and Kumaranallore zones of the Municipality and Vijayapuram and Panachikkad Grama Panchayats. In low density areas households disposes the solid wastes in their own compound. The condition of the waste dumping yard at Vadavathoor is leading to serious environmental problem.

21.3 Industrial Pollution

The pollution from the industrial unit is not much there in the planning area as the industrial sector is mainly limited to few small scale industrial units and only few large / medium scale industrial units are functioning in the planning area3. More attention is needed for the industrial plot at Poovanthuruth as number units concentrated in this area.

21.4 Noise Pollution

There is no major industry in the town producing noise pollution. The important source of noise pollution is motor vehicles. Heavy traffic blocks in the CBD during the peak hours leading to noise and air pollution. Such pollution is high in two major travel corridors-M.C.Road and K.K.Road.



21.5 Water Pollution



The Planning area is an environmentally sensitive area. Two major rivers, Meenachil and its distributaries and Kodur Rivers are passes through Kottayam town. In addition to that number of canals which were once used as waterways is also there in the Planning area. The network of the river and canals are also acts as drainage net work of the Planning area. These water bodies are being polluted by disposal of waste water, solid wastes including wastes from fish and meat markets. Except few canals all canals having the problem of weed growth and the Boat Jetty canal is an example of it. The Mundar and Meenathala rivers of the Planning area need rejuvenation.

21.6 Paddy Fields



The paddy fields, in addition to its agriculture importance, are also acting as a collection basin of rain water and in turn, recharging the ground water resources. Many of the paddy fields are remaining uncultivated and became pools of waste water. Nutrient enrichment due to use of fertilizers and disposal of wastes have led to proliferation of weeds and bacterial contamination. Due to the above reasons, most of the uncultivated paddy fields become the basin of polluted water. Nuisance of mosquito, rats and snakes are also there in most of the areas. It is affecting the quality of water in the adjacent wells.

Few cases of epidemics are also reported due to polluted water. The paddy fields are being converted for various urban activities like construction of buildings, roads etc. So the conversion of paddy fields and the condition of uncultivated paddy fields is another environmental problem. The existing paddy and wet lands of the Planning area is shown in figure 21.1.

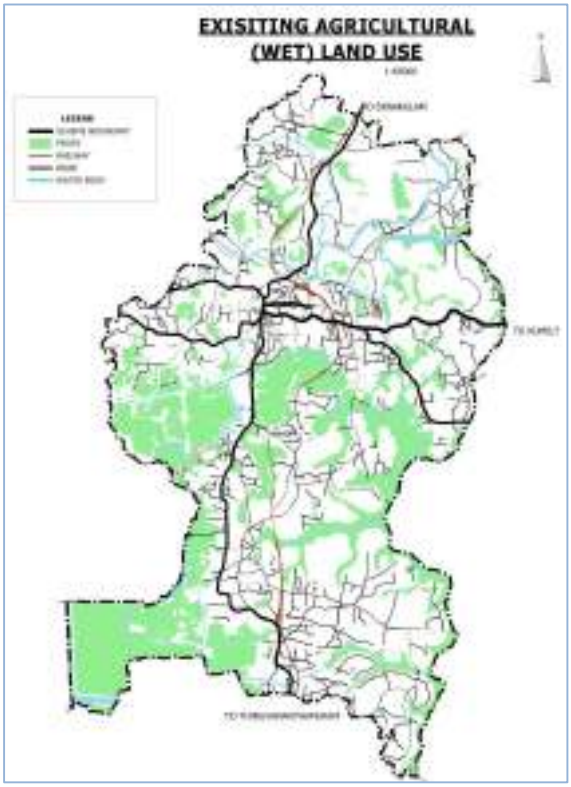


Figure 21.1 Existing paddy fields and wet lands

21.7 Flooding

Even though, for a limited period, flooding is experiencing in certain part of the Planning area due to lack of availability of drains and blocking of natural drains. Measures are required for protection of remaining paddy fields, natural drains and periodic maintenance of road side drains for minimising flooding.

The inundated areas of flood 2018 are depicted in the map (fig 21.2) of the master plan area. Depth of inundation and spatial extent of the flood of the Kottayam municipal area, Panachikad and Vijayapuram panchayat is clearly evident from the map. Flood water level up to 45cm, 110cm and 300cm are given in the map. Places with inundation exceeding 300 cm was not there in the master plan area. Integrating this flood data with the spatial planning will help in avoiding inappropriate development in areas at risk of flooding.

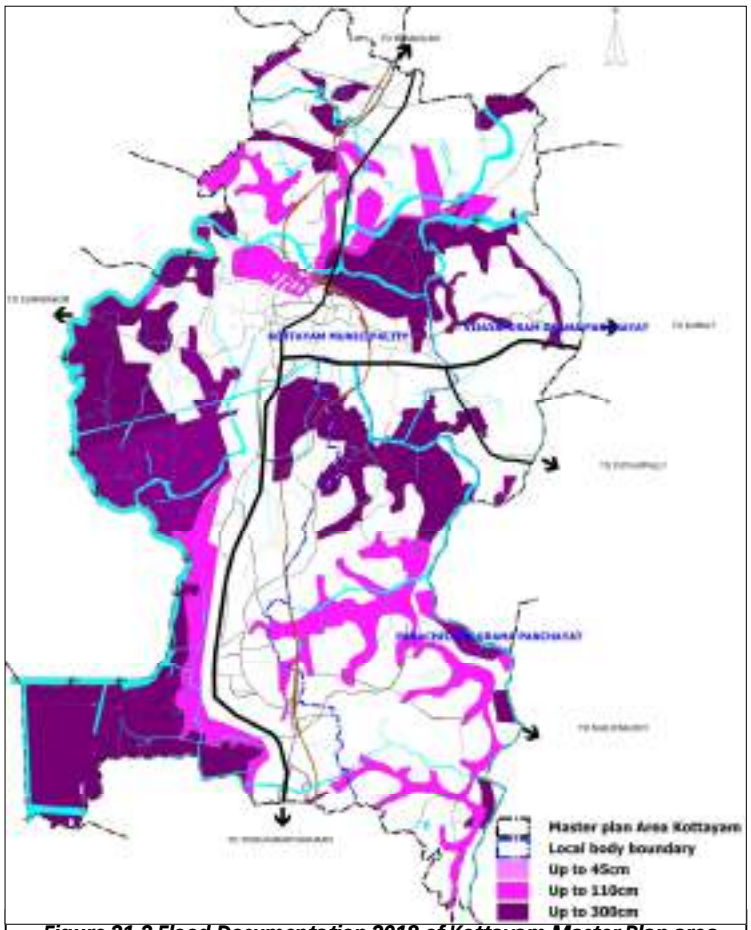


Figure 21.2 Flood Documentation 2018 of Kottayam Master Plan area (Map based inundation level)

21.8 Infrastructure

According to the Socio-Economic Survey only 30% of the people of the town are getting protected water. Remaining people are depending well water for drinking purpose. Inadequate Park and Open space for recreation is also experienced in the town.

21.9 Conclusion

The town is experiencing various environmental issues, but in different magnitude. In the planning area priority has to be given for protection of environmentally sensitive areas, proper waste disposal and protection of water bodies. The infrastructure facilities are to be improved. For the prevention of disasters in the future, enforce zoning policies that direct development away from floodplain areas of the planning area.

22 Resources

22.1 Introduction

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

22.2 Fiscal Resources

The main source of income of Kottayam Municipality is municipal taxes, fees for various services, income from properties, government grant (plan fund), deposits and cess. The total income of Kottayam Municipality (After the addition of Kumaranallore and Nattakom Grama Panchayats) for the financial year 2011-12 was Rs.52,32,79,964 and the total expenditure for the same year was 35,59,60,103 and the closing balance was 16,73,19,861. But only a small share of the total income is available for capital improvement programme and it is inadequate to provide infrastructural facilities and services in par with demand.

The total income of Vijayapuram Grama Panchayat for the financial year 2010-11 was Rs.4,18,74,251 and the total expenditure for the same year was 3,77,70,871 and the closing balance was 41,03,380.

The total income of Panachikkad Grama Panchayat for the financial year 2010-11 was Rs.5,89,89,911 and the total expenditure for the same year was 4,68,47,367 and the closing balance was 1,21,42,544.

In addition to the above, various programmes including infrastructure development projects are being implemented through various State government Departments and also under various centrally sponsored schemes.

Procuring funds for implementation of urban development plans and services delivery system from alternate sources shall be thought of.

22.3 Human Resources

The details of human resources have already been discussed in the chapter.6. The level of education of the planning area is very high and number of technical professional institutions, Medical and Para medical institutions are functioning in the planning area. Steps are to be taken for the effective utilization of the human resources for the development of local economy and in the provision of infrastructure and services.

22.4 Land

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

Details of land use in the planning area are discussed in Chapter 5. Generally the core area of the planning area is thickly built up but certain pocket of low density is available in the peripheral area. The land value is comparatively high in the central area. Certain localities of the town needed renewals and innovative approaches are to be taken while adopting urban renewal programmes and optimum use of the potential land is to be ensured.

22.5 Mineral Resources

Hardly any mineral resources are available in the Planning area. But in the influence area of the town granite and lime shells are available. Lime shell from the Vembanad lake is using as raw material for Travancore Cements Limited and it was the raw material of Travancore Electro Chemicals limited which is remaining closed now. Number of units in Poovanthuruthu Industrial Plot is functioning with granite as raw material.

22.6 Agriculture Resources

As far as the region is concerned, Agro-based products are the major resources. Rubber is the major crop in the eastern part of the region. The major industrial unit of the planning area, the Madras Rubber Factory (MRF) is functioning with latex from the influence area of the town. A number of units using natural rubber (latex) and rubber wood as raw material are functioning in the planning area. A part of upper Kuttanad region is coming under the planning area and rice is a product from this area. Products like tapioca, vegetables, ginger etc are available in the town and its influence area. But only a portion of the agro –based products of the region are utilizing and converted it as value added products.

22.7 Fishing



The planning area is has criss crossed by number rivers and canals. The Vembanad backwater is lying adjacent to the planning area. In addition to that there are vast paddy fields in the Planning area. Eventhough in small scale fishing is an activity in the western part of the planning area and in the Grama Panchayats on the Western part of the Planning area.

22.8 Conclusion

Still conventional method of resource mobilization is adopted in the constituent local bodies of the planning area. Human resources which are available in plenty have to be utilized properly. The land resources can also be used more effectively. The major resources of the influence region of the planning area are agro based. Innovative approaches have to be adopted for resource mobilization for the economic development of the planning area and to provide better services to the people.

23 Development Administration, Municipal Finance and Ongoing and Committed Projects

23.1 Introduction

The role of different departments involved in the development activities of the Planning Area is discussed in this chapter. The Local Self Governments (Municipality and Grama Panchayats) has major role in the development activity of the Planning Area. In addition to the Municipality, Public Works Department, Kerala water Authority, Kerala State Electricity Board, Agriculture Department etc are the major departments involved in the development activities. The functions and the financial status of the Municipality are discussed in detail. The details of the public offices functioning in the town are also included in this chapter.

23.2 Kottayam Municipality



The historical adoption of 74th Constitutional Amendment Act by the Central Government in 1992 has paved the ways and means for independent functioning of local bodies. This act makes election to the urban local government's mandatory, in addition to greater devolution of administrative and financial powers. In this chapter, the existing system of Governance in the Kottayam Municipality is discussed.

23.2.1 The elected council

The elected council consists of 52 members, which includes 26 women members. The Chairperson who is the head of the council has been elected from the elected

members of the council. The Vice-chairperson, to assist the chairperson and also to discharge the duties of chairperson in absence is also elected by the members of the municipal council. There are six standing committees, ie for Finance, Works, Development, Health, Education, Welfare and Education Arts Sports & Culture to assist the municipal council in respective fields. Each Standing committee consists of five members. The vice-chairperson is the chairman of the Finance standing committee and the members of the council will elect the chairpersons of standing committees.

23.2.2 Administrative Structure of the Municipality

The municipal secretary is the executive head of the Municipality and he is supported by six sections of staff ie, General Administration section, Revenue section, Engineering section, Town Planning section, Public health section and Peoples planning section.

General Administration section

The General Administration section is headed by the Junior Superintend and consists of three sub-divisions i.e. Establishment, accounts and other general matters.

Revenue Section

Revenue section is headed by the Revenue Inspector. The section deals with the revenue of the Municipality.

Town Planning section

This section looks after the implementation of the Development plans and other Town Planning schemes, approval of building plan and lay out plans, detection of unauthorized construction, eviction of encroachments etc.

Engineering section

The Engineering section is headed by Municipal Engineer in the cadre of Executive Engineer and assisted by Assistant Executive Engineer, Assistant Engineers and Public works overseers. This section is responsible for the project planning,

execution and maintenance of basic services and other infrastructure within the town.

Public Health section

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

People's Planning section

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

23.2.3 Functions of the Municipal Council

Kottayam Municipality is one of the major agencies implementing development works in Kottayam municipal area. The development works under the responsibility of Kottayam Municipal Council and it includes, the construction of Municipal roads and their maintenance, Public health - Primary health centres, Community health centres, Solid waste disposal, Construction of public market and their maintenance, Public cremation ground and its construction procedures, Open spaces, Parks and their construction works, Providing infrastructure in slums, Protection of common ponds, Maintenance of the institutions transferred to the Municipal Council like Schools, Hospitals and other institutions

23.2.4 Municipal Finance

The 74th Constitution Amendment Act 1992 paved the way for devolution of financial and administrative powers to urban local bodies in a large way. By this amendment the financial position of the urban local bodies improved and a sizeable share of the total plan fund of the state Government has devolved to the local bodies for their plan implementation. The financial position of the municipality is discussed in the subsequent paragraphs.

Receipts of municipality

The receipts of the municipality has been grouped into, three categories i.e. Revenue, Capital and Debt. The receipts under revenue includes income from

taxes, income from other laws, income from the municipal properties, municipal fees, Grand in aid from Government for the maintenance of assets transferred from Government etc. The receipts under capital includes Government grants, government loans, income from municipal institutions, income from deposits, endowment grant for implementing the programmes of the departments transferred to the municipality, Government grant for decentralized planning etc. The receipts under debt includes deposits, provident fund, pension fund, return from advances, sinking funds, library cess, surcharges, sale tax, income tax, labour welfare fund etc. The Table 23.1 shows the Receipt of Kottayam Municipality from 2009-10, 2010-11 and 2011-12 (After adding Kumaranallore and Nattakom Grama Panchayats).

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

The expenditure under capital account includes expenditure for management, public works, education, water supply and drainage, public health, street lighting, endowments, deposits, poverty eradication programmes, expenditure for the programmes implemented through the departments transferred to the municipality, programmes under decentralized planning etc.

The expenditure under debt account include the expenditure for the repayment of deposits, repayment of cash deposits, pensions, re-payment of advances, library cess, sale tax, income tax, payment of welfare funds etc. An abstract of the total expenditure of the Municipality under the above three heads is presented in Table 23.1.

Table 23.1 Abstract of Municipal Receipts and Income

Sl:No	Particulars	2009-10	2010-11	2011-12
A	**RECEIPTS**			
	Opening Balance	5,67,90,180	68139901	138966896

	Revenue A/c Receipts & Others	105019457	131989453	198079054
	Capital A/c Receipts	55131430	55084856	126595000
	Debit head	23263339	27496737	59639014
	Total Receipts	**240204406**	**282710947**	**523279964**
B	**EXPENDITURE**			
	Development Fund Expenditure	21505356	33225722	103938728
	Maintenance Fund Expenditure	16730470	12104252	37686092
	Revenue Accounts and other Expenditure	98277803	102930585	171063910
	Debit Head Expenditure	35550876	46280642	43271373
	Total Expenditure	**172064505**	**194541201**	**355960103**
	Closing Balance	68139901	88169742	167319861

Source: Municipal Office, Kottayam

23.3 Vijayapuram and Panachikkad Grama Panchayats

The 73rd Constitutional Amendment Act by the Central Government in 1992 has paved the ways and means for independent functioning of rural local bodies. This act makes election to the rural local government's mandatory, in addition to greater devolution of administrative and financial powers. In this chapter, the existing system of Governance in two constituent rural local bodies of the Planning area is discussed.

23.3.1 The elected committees

The elected committees consist of 19 and 23 members respectively in Vijayapuram and Panachikkad Grama Panchayats and 50% of the members are women members. The President who is the head of the council has been elected from the elected members of the committee. The Vice-President, to assist the President and also to discharge the duties of President in the absence is also elected by the members of the Committee.

23.3.2 Available Services

The services available from the Grama Panchayat includes issue of Birth & Death certificates, Registration, Hindu Marriage registration, General Marriage registration, issue of Marriage Certificate, Building permit/Land development permit, Permit transaction, Renewal of permit, Belongingness Certificate, Residential Certificate, Identity Certificate, P.F.A License, Agricultural labour pension, Handicapped Pension, etc.

23.3.3 Income and Expenditure

The abstract of annual income and expenditure of Panachikkad and Vijayapuram Grama Panchayats for the year 2010-11 is shown in Table 23.2.

Table 23.2 – Abstract of Annual Budget- 2010-11

	Panachikadu	Vijayapuram
Total Income	5,89,89,911	4,18,74,251
Total Expenditure	4,68,47,367	3,77,70,871
Balance	1,21,42,544	41,03,380

23.4 Other Departments

Kerala Water Authority is dealing the distribution of drinking water in the Planning area. The Electricity distribution system is maintained by the Kerala State Electricity Board. The Kerala State Public Works Department (Roads) is in charge of construction and maintenance of roads other than those roads owned by the Municipal Council. The Kerala State Public Works Department (Buildings) is constructing major buildings.

23.5 Ongoing and Committed Projects

The major ongoing projects in the Planning area are discussing in the subsequent paragraphs. These projects will definitely influences the future development trends of the Planning area and influence the travel and land use patterns. The new roads and development of existing roads will strengthen the present road network and also open up new land and areas for future urban development. Most of these projects has already started and is in progress. These proposals have to be considered in framing the planning policies and strategies and the proposed land use pattern of the planning area.

Erayilkadavu Bridge and Kottayam Development Corridor

A new bridge at Erayilkadavu across Kodoor River and a new road as its continuation (Kottayam development Corridor) has been sanctioned and its work is in progress. The bridge and the continuous road to Manipuzha Jn and further up to Mulamkuzha Jn will provide an alternate link between the Town Centre (Malayala Manorama Jn in K.K.Road) and Mulamkuzha Jn. Administrative sanction and

Special sanction for an amount of Rs.590 lakhs has been accorded vide GO (Rt) No. 1134 / 2011 / PWD Dated 31.8.2011 for the construction of Erayilkadavu Bridge across Kodoor River. Government accorded Administrative sanction and Special sanction for an amount of Rs.20.75 crores for the work "formation of Kottayam Development Corridor" vide G.O. (Rt) No.193 / 12 /PWD Dated 8.2.2012 and the work of this road also started.



Construction of Erayilkadavu Bridge


Construction of Kottayam Development Corridor

Kottayam-Kodimatha Mobility Hub

The concept of this project is a place of connectivity where different modes of transport come together and easily accessible to all and which is also an attractive concentration of shopping and enjoyment. This proposal has included as item 40 of the Budget of Kerala for 2011-2012. Vide GO (Ms) No. 1907 / 2011 /LSGD dated 9.8.2011, Government has ordered to constitute a Special purpose vehicle (SPV) and entrusted the District Collector, Kottayam to register a society under Charitable Societies Act. "The Kodimatha Mobility Hub Society" has been formed for the purpose. The Chief Minister of Kerala is the Chairman of the Society, Minister of Finance and Law and Minister of Revenue and Member of Parliament of Kottayam are the Co-Chairmans of the Society. Chairman, Kottayam Municipal Council, District Panchayat President are the Members of the Society and The District Collector Kottayam is the Managing Director of the Society.

The wet land between M.C.Road (west) and Railway line (east), and between Manipuzha – Guest House Road (south) and Kodoor River (North) has been

identified for this purpose. As per the preliminary reports, the project components includes, Bus Terminals, Rail Terminal, Central Administrative Block, Call centre, Service Utility Management Centre (For KSEB, Water Authority, BSNL, PWD Wings Etc), Commercial Complexes, Accommodation Facilities, Tourist Taxi Terminal, Auto Terminal, Sub Office of Kottayam Port and Police Station. Preparation of Detailed Project Report and environmental Impact Assessment study is in progress.

Road connecting Cement Jn (in M.C.Road) and Parochal near Thiruvathukkal (Western By-pass)

Vide GO (Rt) No. 09/2010/PWD Dated 15.1.2013, government has accorded Administrative Sanction for a total project cost of Rs.5742 lakhs with NABARD financial assistance for the road connecting Cement Jn (in M.C.Road) and Parochal near Thiruvathukkal and this road will acts as a Western By-pass and provide direct connectivity between Nattakom and Thiruvathukkal and Illickal. A portion of this road is aligned through the paddy fields and connects few isolated habitable area in the western part of the planning area and provide an alternate route connecting south and western part of the planning area and also provide an access to Kumarakom from the Southern part of the Planning area.



Kodimatha - Manipuzha Four lane road

Kodimatha-Nattakom Four lane road

Work for developing the stretch of M.C.Road between Kodimatha and Nattakom into a four line road has been started and is in progress. This will relive the traffic congestion of this stretch of M.C.Road.

Mooledom Railway Over bridge

Construction of the Railway Over bridge at Mooledom in Manipuzha-Nattakom Guest Road has been started and it is in progress. This road will relive the traffic



Mooledom ROB under construction

in the central area of the town by diverting the east-south and south –east traffic from the town centre. It also serves as a link road connecting M.C.Road and the Kottayam-Changanassery combined By-pass.

Kumaranallore Railway Over bridge

The construction of the Railway over bridge in Kumaranallore – Kudamaloor road at Kumaranallore has been started. It will improve the accessibility to the high density residential areas of Kumaranallore and also provide an alternate access to Medical College – University area.



Kumaranallore ROB under construction

Vattamoodukadavu Bridge

Government accorded Administrative sanction and special Sanction for the revised estimate for an amount of Rs. 900 lakhs for the construction of Vattamoodu bridge across Meenachil river connecting M.C.Road and Eranjal-Thiruvanchoor Road vide GO (Rt) No. 1357/2011/PWD Dated 07.10.2011.



Vattamoodu Bridge- under construction

The construction of the bridge has been started and it is in progress. It will provide a new link connecting the North and Eastern part of the Planning area.

Kerala State Transport Project (KSTP)

Up gradation of M.C.Road in the Planning area has been included in Phase.II of KSTP project and land acquisition has almost completed.

23.6 Conclusion

The Local Self governments has major role in providing various services, infrastructure facilities and civic amenities to the people. But the present institutional capacity is inadequate to provide better services to the people. The financial management of the LSGs to be improved. The major ongoing projects has significant influence is future traffic and land use pattern and it is to be considered while framing the future planning policies and land use pattern

24 Existing Spatial Structure

24.1 Introduction

The existing spatial structure of the planning area has been arrived by analyzing the *activity based on Land use, Low-Lying lands, Functional character, Spatial distribution of population, Road Network, Commercial Nodes* etc. Detailed description of each of the above factors are discussing in the subsequent paragraphs.

24.2 Land use activity pattern

The sanctioned Development Plan for Kottayam covers an area of 21.68 Sq.Km, comprising the erstwhile Kottayam Municipality and parts of Kumaranelloor, Nattakom and Vijayapuram Grama Panchayaths. The plan envisaged with a CBD Area and Sub centres at Chootuveli (North), Thiruvathukal (West) and Kanjikuzhy (East). The evaluation of the plan revealed that the sub centres envisaged in the plan has not been developed but instead of that, corridor development has been taken place.

The core area of Kottayam Town is a multifunctional zone. The Kottayam Market, the main centre of the whole sale and retail commercial activities is located within the core area. It also houses major educational institutions like CMS College, Baselios College, BCM College and a number of other educational institutions. Other important traffic attracting centres in the core area are the Collectorate and the District Hospital. Transport Terminals such as Railway Station and Bus Stands (both KSRTC and Private) are also located here. The level of congestion is very high and therefore requires regulated developments in future for this area. Some of the recent developments in the peripheral areas of the town, such as the establishment of Medical College, have relieved pressure on infrastructure in the core area to some extent.

In addition to the commercial activities in the Town Centre, commercial activities have also taken place along the sides of two major roads, ie. M.C.Road and K.K.Road. Lal Bahadoor Sastri Road is also developing as a major shopping street. The Core area is still continuing as a strong magnet for commercial activities. Certain nodes with high concentration of commercial areas have already come up at certain locations such as Kanjikuzhy, Kumaranalloor, Kodimatha, Samkranthi, Chingavanam etc.

The existing land use reveals that the Railway line is passes through the centre of the Planning area and present the railway line could be crossed at Kumaranalloore, Mooledam, Parekavala. In addition to that rivers and streams are criss crossing the Planning area influence the spread of physical development in the Planning area. Topography has also played an important role in the land utilisation. The western part of the planning area is low lying with the gradual formation of high lands towards the eastern part of the Planning area.

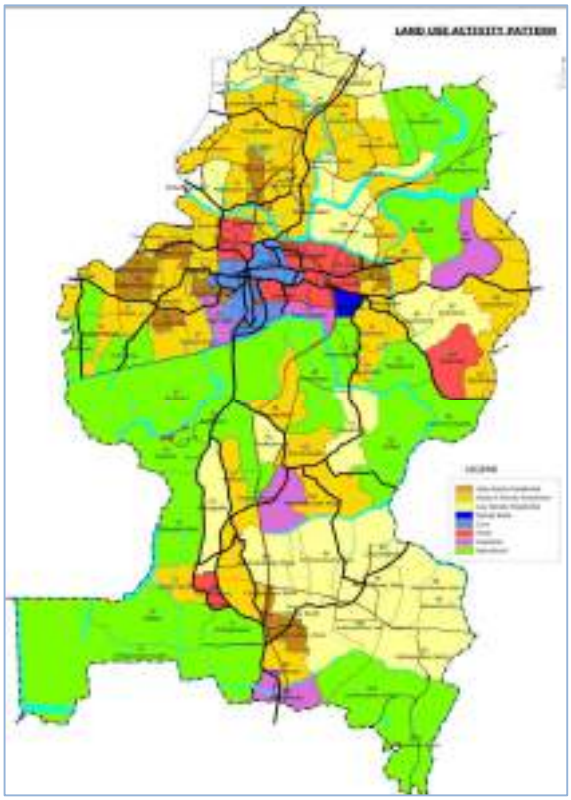


Figure 24:1 Activity pattern based on land use

The planning area houses a large number of small scale rubber based industries. Kottayam is the cradle of news papers and publishing houses. The major industries are located at Nattakom, Chingavanam and Vadavathoor and these canters are little away from the Town Centre.

Dry cultivation areas are seen mainly on the eastern side (high lands) of the Planning area and these areas with low residential density. Vast areas of cultivating paddy fields and wet lands (uncultivated paddy fields) exist in the South West part of the planning area. One of the main concerns is to check the conversion of the cultivable agriculture land to the maximum extent possible.

The activity pattern based on land use is shown in figure 24.1. The existing land use of the planning area is categorised into *Core area, Public area, Special Nodes, High Density Residential, Medium Density Residential, Low Density residential, Industrial and Agricultural (including uncultivated wet land areas)* activity areas.

As per the activity based on land use, it is seen that the Town centre and major commercial activities are located in the northern half of the planning area whereas southern part is mainly consist of Agriculture, low density residential and Industrial activities.

24.3 Functional character

The functional character of the planning area is shown in figure 24.2. Based on functional character, the planning area has been divided into urban, semi urban, semi rural and rural areas. Wards are taken as the unit for the analysis and most of the wards in the old municipal limit, erstwhile Kumaranallore Grama Panchayat and Vijayapuram Grama Panchayat has either urban or semi urban character. Majority of wards in Panachikkad Grama Panchayat has semi urban character and majority of wards in erstwhile Nattakom Grama Panchayat has rural or semi rural character. But most of wards along M.C.Road in this area has urban or semi urban character.

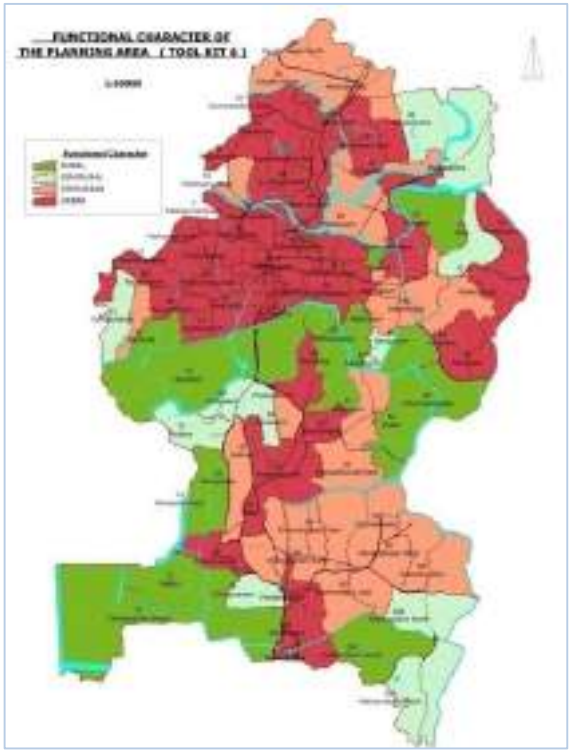


Figure. 24.2 Functional Character

24.4 Low-lying lands

The low-lying lands of the planning area are mainly consists of rivers, canals and paddy fields and wet lands (uncultivated paddy fields). The low-lying lands of the planning area are shown in Figure 24.3. A quick survey shows that 57% of the wet agriculture land is remaining uncultivated now. The low-lying lands of planning

area are mainly concentrated in erstwhile Nattakom Grama Panchayath and Panachikkad Grama Panchayat.

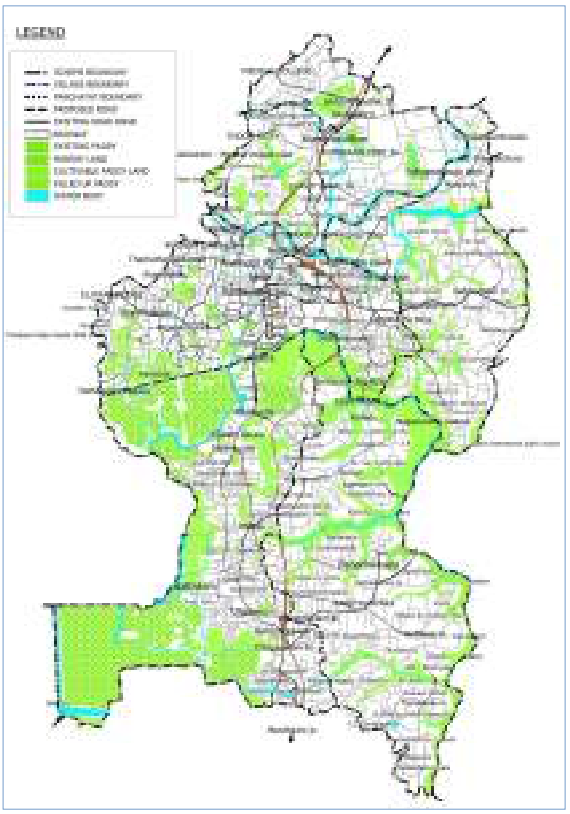


Figure 24.3 Low lying lands

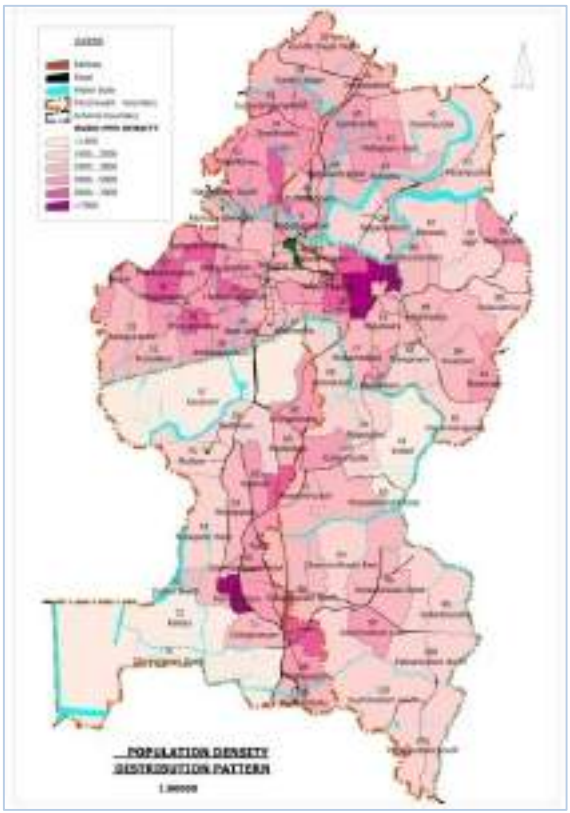


Figure 24.4 Population distribution

24.5 Population distribution

Population distribution of the planning area has studied in ward wise and it is shown in Figure 24.4. Based on density of population, the planning area has been divided into high density, medium, low and very low density area.

Ward wise population density has considered for this analysis. Wards within the old municipal limit, erstwhile Kumaranallore Grama Panchayat and Vijayapuram Grama Panchayat have generally high population density. But in the southern part of the planning area which consists of erstwhile Nattakom Grama Panchayat and Panachikkad Grama Panchayat, the population density is comparatively low except in wards along M.C.Road.

24.6 Road Network and Waterways

Existing road network of the planning area have no specific pattern but resembles like radial pattern with no (major) ring links. The planning area have topographical constrains like undulating terrain and water bodies. But the major developments are taking place along the corridor sides.

The Main Central road running in the North South direction of the Planning area and the major roads viz K.K.Road, Kozhanchery Road and the Kumarakom Road form the radial roads originating from the CBD area. These radial roads are only partially connected by link roads. Meenachil River, Kodoor River and Puthenthodu forms part of waterway network of the Planning area.



Figure 24.5 Existing Road Network

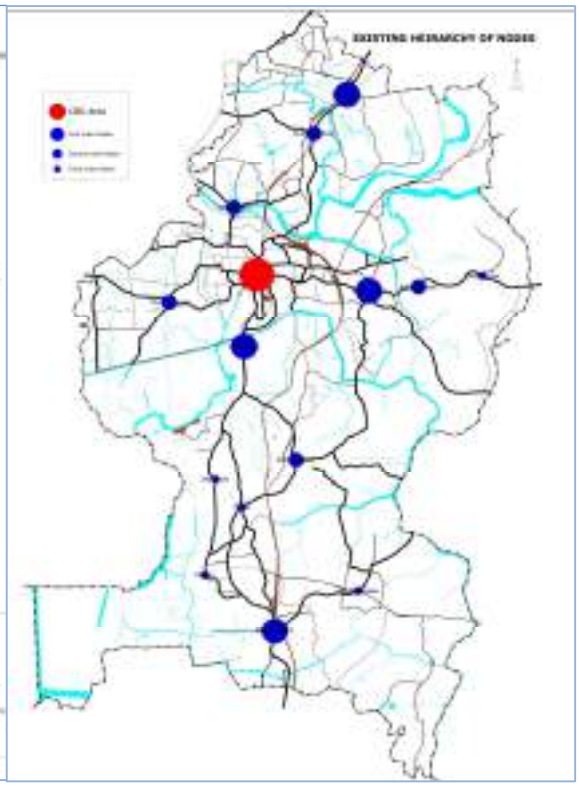


Figure 24.6 Existing Commercial Nodes

24.7 Commercial nodes

The major commercial nodes are identified based on primary survey conducted in the Planning area. A hierarchy of nodes has been arrived based on the score obtained for each node. The total score for each node has been arrived based on the commercial and other establishments present in each node after assigning suitable weightage. The CBD has been excluded from the analysis. The nodes are categorised into first, second and third order nodes based on the score obtained. Kanjikuzhy, Kodimatha, Samkranthy and Chingavanam are the first order nodes and Kumaranallore, Chungam, Thiruvathukkal, Kalathilpadi and Kaduvakkulam are the second order nodes. The third order nodes are Vadavathoor, Nattakom, Pakkil, Pallom and Paruthumpara. The Existing Commercial nodes of the Planning area are shown in Figure 24.6.

24.8 Existing Spatial Structure

The existing spatial structure is evolved by overlaying the above aspects spatially and it is shown in Figure 24.7. By considering different combination of above aspects, the components of existing spatial structure has been arrived. The existing spatial structure is shown in figure 24.8.

Core activities, public activities, special nodes, high density residential area, medium density residential area, low density residential area, industrial area, agriculture activity, low-lying lands and commercial nodes are major components of existing spatial structure.

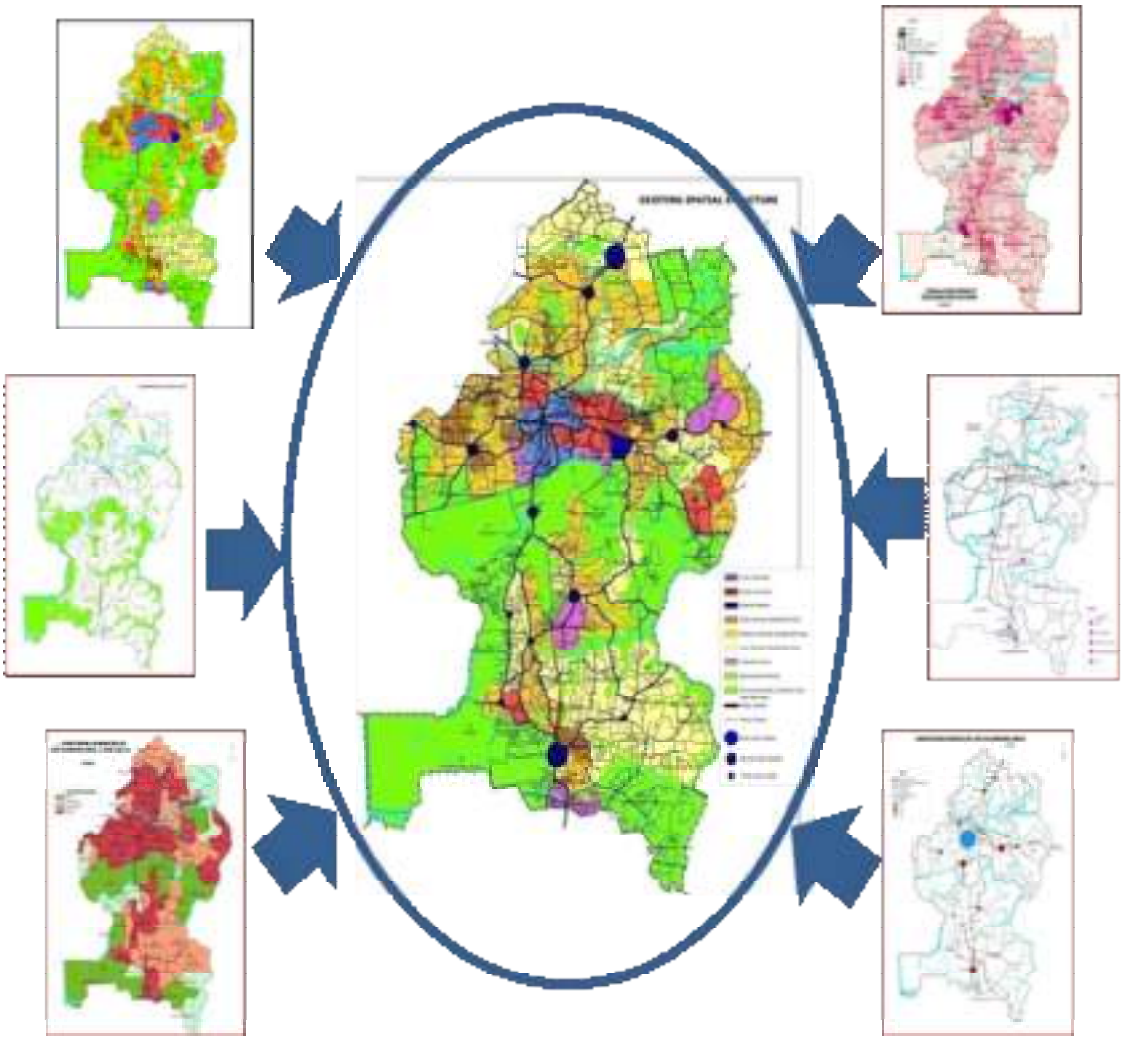


Figure 24.7 Existing Spatial structure - Methodology

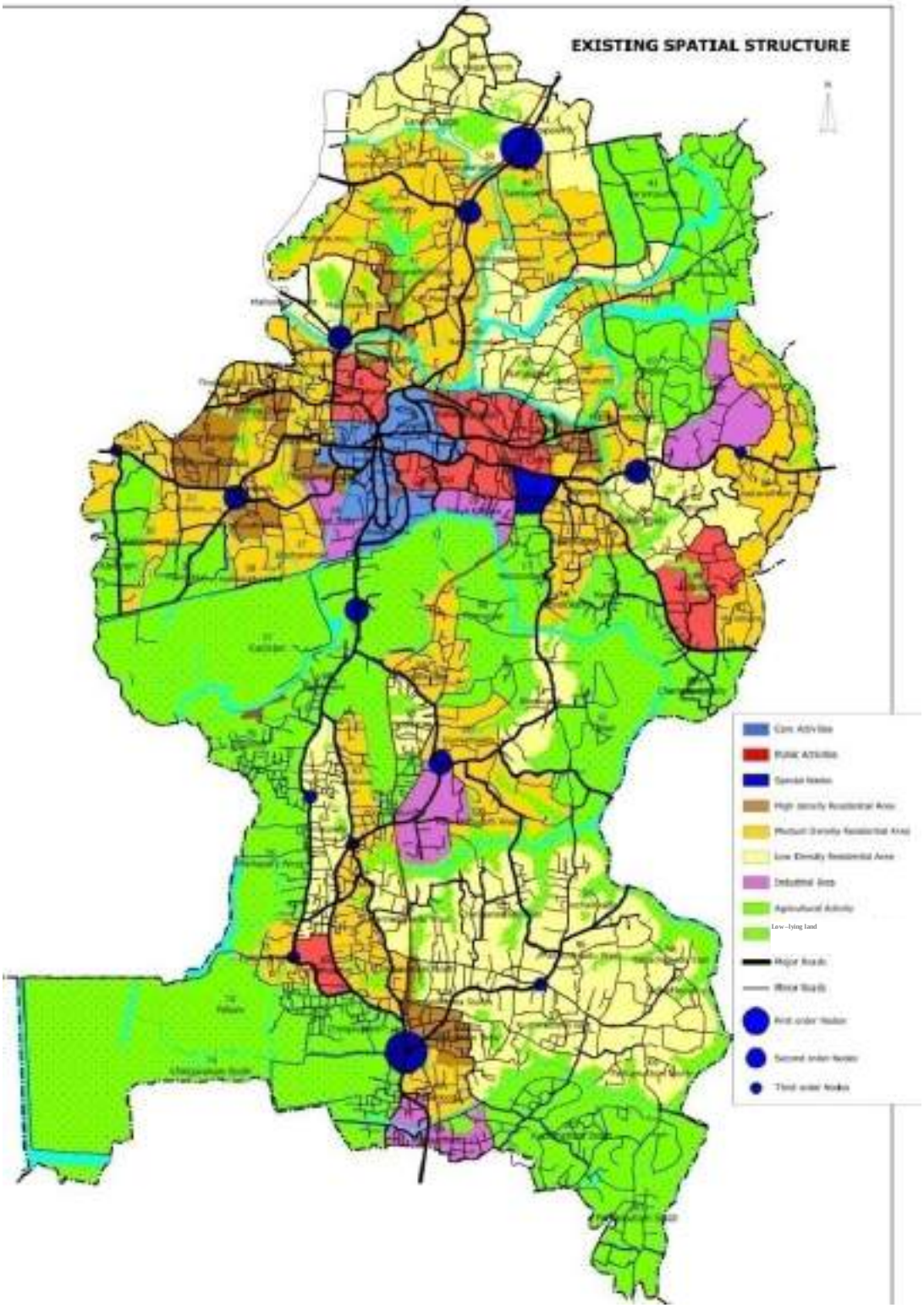


Figure 24.8 Existing Spatial structure

Part.II



INTEGRATED DEVELOPMENT VISION

25 Findings

25.1 Introduction

Kottayam, known as “the land of letters, latex and lakes”. Kottayam literally means the interior of a fort - *Kotta* (fort) + *Akam* (inside). The town is the headquarters of Kottayam district and an important trade and commerce, educational, printing and publishing centre of Centre Travancore Region of Kerala. It is the administrative head quarters and the major service town of the district, since the ancient period itself.

The revision of the existing development plan is essential as the present trends of development are spreading all over the town and surrounding areas. New development plan for Municipal area alone is not sufficient due to the emergence of urban nature to the surrounding Panchayats. Therefore delineation of new planning area including the contiguous urban area to Kottayam town is essential and it is done based on various selected indicators as described in the earlier chapters. The planning area delineated comprises of three local bodies namely Kottayam Municipal town (includes newly added Nattakom and Kumaranalloor Grama Panchayats), Vijayapuram Grama Panchayat and Panachikad Grama Panchayat.

25.2 Evaluation of present Plan

The evaluation of the present Development Plan indicates that, the gap between the development envisaged and actual development are quite large and it due to many factors. One of the reasons for non-implementation the plan proposals was due to non-availability of land with the local bodies. For the implementation of the proposal large scale acquisition of land is required. The plan which was mainly based on the concept of public ownership, but most of the lands was privately owned. A number of departments involved in the development activities. But there

was no co-ordination among different agencies. As a result the land assigned for various uses were remained unattended.

In spite of all the above short falls, certain new road proposals of the plan have been implemented. The development along all major roads has been regulated and it will definitely help future widening of these roads. Certain new road proposals of the plan have been implemented and the widening of certain corridor has taken up. Land use has controlled to an extent especially the environmentally sensitives area has been conserved.

25.3 Physical Characteristics

Kottayam town is situated in the central part of Kerala, in the Central Travancore region and well connected with all major centers of the state. The history of Kottayam in short is a tale of steady growth from temple agglomeration at Thaliyil in the early periods to an urban settlement with more than 1.70 lakhs population. Today Kottayam is an important town in Kerala with flourishing commercial, educational, medicare activities and major role in the socio-cultural field. The climate in this District is moderate and pleasant. Rubber, paddy, vegetable are the major cultivation of the area.

25.4 Land Use

In the earlier part of history, the town was developed with Thazhatangadi as the focal point and in the later part it is developed with Thirunakkara as centre. Land use analysis of the planning area depicts the predominant share in residential sector followed by agriculture sector. An equal share of public use and water bodies succeeds the major land uses. Residential concentrations are mainly seen in the North West and south east part of the planning area and along the sides of the major travel corridors. Agriculture use is concentrated in south west part is mainly the low lying wet agriculture areas and that in the North eastern part is mainly dry agriculture areas. Commercial and Public uses are concentrated more in the Town centre and also seen scattered in the planning in the form of Corridor development. The distribution of land use is not uniform in various part of the Planning area.

There is much deviation in percentage of land use when compare with the planning standards. The temporal analysis shows that the residential area is being converted for other urban activities and densification of existing residential area has taken place. The activity pattern based on land use is not following any specific pattern. The functional character shows that majority of wards in Planning area have urban or semi urban character.

25.5 Demography

The population size of Kottayam town is much higher when compared with the other urban centers of the region. The growth rate of population in old municipal limit is showing a decreasing trend while all other parts showing an increasing trend. Population growth rate in old Kottayam Municipal limit during 1991-2001 has recorded negative growth rate (-3.84) and the newly added portion - erstwhile Nattakom and Kumaranalloor Grama Panchayats shows 7 to 9% growth rate respectively during the same period. The negative Growth rate in the town centre implies the increase in the land value, congested infrastructure development, and the commercial use developments in the town centre. The constituent Grama Panchayats Vijayapuram and Panachikad records 10.97% and 14.1% growth rates respectively. This shows that the new residential developments are taking place outside the core area of the town.

The area where the Planning area included is the most urbanized part of the district. The increase in the urban population of the district is mainly due to annexation of new areas to the existing town and not due to natural growth or immigration. The gross density of population of the municipal area has reduced after annexation of two adjacent Grama Panchayats. In the Planning area the population is concentrated more in the upper half when compared to the lower half.

25.6 Occupational Structure

Growth rate of population of Kottayam Planning area is at a lower phase. The growth rate of workers is more than that of population growth rate. But the WPR rate of the planning area is less than the State and district figures. So the economic base of the town has to be further strengthened by creating job opportunities in various sectors. The occupational pattern shows that the Other category workers

occupies major share (more than 90%) of workers and the percentage of workers in production sector is very nominal when compared with the service sector.

Generally the Cultivators and Agriculture labours are found to be concentrated towards the outskirts of the Planning area, where the availability of agricultural land is more. House hold industrial workers are found to be scattered throughout the Planning area. But there is no specific pattern in distribution of different category of workers. The availability of cultivable area is more in Planning area and cultivation has to be encouraged in available agricultural lands. It will strengthen the economic base of the town.

25.7 Trade and Commerce

Once water way was the predominant mode of transportation, Kottayam was a major trade center and trading activities are mainly concentrated at Thazhathangadi, Chungam and Kodimatha. In the later part of history, the trade and commercial activities were shifted to present CBD area. Rubber is the major commodity in terms of quantity and amount transacted through Kottayam market. Large showrooms of textiles, jewellery, home appliances and automobiles are functioning at Kottayam. Activity of informal sector is concentrated more in CBD area. Sufficient numbers of banks are functioning in planning area.

25.8 Industrial Sector

Only 1.5 % of total land use of the planning area is coming under industrial use. Three large scale industries (one in government sector and the others in private sector) and 3025 small scale industries are functioning in the planning area with a direct work force of 12814 persons. Small scale units are providing more employment opportunities. Agro a based material is available in plenty in the influence area and major share of these products are sending to other places without value addition or processing. Agro based and rubber based units are prominent in the planning area and more units have to be established for local economic development. Low density areas of planning area can be considered for establishing micro industrial units. There is enough scope for Engineering, Printing

and Publishing industries and especially Nattakom, Panachikad and Vijayapuram areas. The Kottayam mini port is an advantage for industrialization of the Planning area and region. Better connectivity with other parts of the state and neighbouring states is also an advantage for industrialisation of the Planning area.

25.9 Tourism Sector

Even though Kottayam has enough potential and diversity, tourism was not developed as a major component of local economy. Certain famous heritage and religious centres are present in the planning area. Kottayam is the transit point of the pilgrims visiting Sabarimala. The internationally famous tourist destination Kumarakom is adjacent to Planning area. The town lacks necessary facilities for boarding and staying of tourists. It's locational advantage and connectivity with adjacent tourist centers by different modes of transportation provide enough potential for the development of tourism. The town has also potential for developing health tourism, education, farm tourism etc. The festivals of the planning area are another potential.

25.10 Agriculture Sector

50150 ha of land which is 38% of land of planning area, is under agriculture land use and agriculture is one of the major activities of the planning area as far as land use is concerned. Nattakom area has the highest agricultural land use (56.09%) (Dry and wet) followed by Vijayapuram and Panachikad Panchayats. In this, erstwhile Nattakom Grama Panchayat covers maximum area of paddy (46.7%) cultivation and Vijayapuram Grama Panchayat predominates in dry cultivation (25.2%). In Panachikad Grama Panchayat has 23.5% as paddy land. Coconut, rubber and paddy are the predominant crops as far as the area of cultivating land is concerned. The workers engaged in the agriculture sector is very nominal. There is reduction in the area of land under cultivation. Adequate area to be retained considering the roll of agriculture land in environmental protection. The production of agriculture crops other than cash crop is inadequate for the use of Planning area and need to be brought from outside.

25.11 Animal husbandry & Fisheries

Animal husbandry & fisheries can be developed as an additional income generating sector. Milk production in the organized dairies in the planning area is only 570 litres per day and about 8,000 litres from the individual milk cultivators. Assuming an average consumption of 0.2 litres of milk per person, in the Planning area, the requirement is estimated as 43,000 litres, which shows a shortage of 34,500 litres. Considering comparatively more percentage of land under agriculture use and availability of water bodies, there is ample scope for developing Animal Husbandry and fisheries sector in the town. Decline in the cultivation of paddy, increase in production cost and non-availability of good cattle breed etc are the major hindrances in growth of the sector. However high demand for milk, egg and meat in town and surrounding area and comparatively good price for product are the potentials. Hence this sector can be developed as an income generating economic activity of the town.

25.12 Housing sector

Existing residential area constitutes of 45.8% of the total land use of the Planning area and it is distributed throughout the planning area except the water logged areas with different intensity. There is enough land in the peripheral area to accommodate additional population. The average household size of the planning area is 4.41 and the average plot extent is 20.98 cents. The plinth area of residential buildings is 78.78 Sqm, 92.52% of buildings in the Planning area are single storied buildings and 91.40% of households are living in own houses.

The structural condition of the houses is generally good and a small percentage of houses are Kucha building and need attention. Vertical development is started in the town and more number of residential apartments is coming in the Planning area. The homestead type development is the character of the area. The identified slums are the other area which needs attention.

25.13 Drinking Water

The water supply by Kerala Water Authority is found to be insufficient in meeting the needs of people. More schemes/augmentation of present schemes has to be implemented for meeting the water demand of people in the Planning area especially in the peripheral areas where well is major source of drinking water. The renewal of existing schemes also needed. Proper conservation and protection of the surface sources, rain water harvesting projects, ground water recharging, waste water recycling etc are also considered.

25.14 Transportation

The configuration of the existing road network within Kottayam Town does not reflect any regular form, although it resembles more or less like ring and radial type having radial roads connected with partial ring roads. The major reasons of this traffic volume are the concentration of activities like commercial, public and semi-public activities, location of bus stand in the central area of the town. The major traffic and transportation problems facing Kottayam town are absence of bypasses and link roads, the inter-mixing of intra-city and inter-city traffic in the absence of adequate by-passes, narrow width of roads in the central part of the city, heavy movement of vehicular and pedestrian traffic, lack of pedestrian facilities like foot paths sub-ways and pedestrian streets, Encroachment of right-of-way etc.

The most important aspect of traffic and transportation problem of Kottayam town is the congested central core with limited scope for road widening. Hence, emphasis has been given to develop alternative linkages so as to divert the traffic passing through the CBD area. This would also help to reduce the unwanted inter-mix of intra-city and inter-city traffic on urban roads within the central part of the town.

25.15 Energy

Low voltage is not a problem in the planning area but frequent power supply interruption is a problem. Most of the houses are electrified and importance shall be given for improving the quality of supply. Consumption electricity for Industrial

purpose is very less. It indicates low level of industrialization of the town. Similarly steps should be taken to utilize the non-conventional sources of energy sources to generate electricity and also as fuel.

25.16 Waste Disposal

A major portion of the old municipal area is covered by solid waste collection system of the municipality. The space at the dumping yard is inadequate and the plants are not working properly and it creates some environmental problems and leading to agitation of local people. The problems in this area are to be addressed. The collection and disposal of waste from the newly added portion of the municipality and the two Grama Panchayats are nominal. Sewage system shall be provided for the developed areas of the town and the pollution of the natural water bodies to be avoided.

25.17 Education Sector

Sufficient numbers institutions for general and higher order education are available in the Planning area. Kottayam is an educational hub, meeting the demands of students from other part of the state also. There is every chance to excelling the existing status and there are already proposal for certain national Institutions around the Planning area. New Research and Technical institutions has to be established in the Planning area utilising the potential of M.G.university.

25.18 Health Sector

Kottayam is one of the leading Health Care Centres in Kerala. Institutions in three systems of medicine ie, Allopathy, Ayurveda and Homeo are functioning in the Planning area and adjacent areas. The institution includes research centers and medical education centers. There is enough scope for developing health tourism in the Planning area. In Allopathic system adequate infrastructure facilities are available. But in the case of Ayurvedic and Homeopathic the infrastructure facilities are to be improved.

25.19 Recreational Facilities

The location of the existing stadium and grounds at the town centre creating traffic bottlenecks for entire town when major meetings / fairs being conducted. This necessitates a new modern stadium and a large fairground away from the central area. Absence of an Indoor stadium and Swimming pool is experiencing in the Planning Area. Measures are to be taken to improve the environmental status and asthetic beauty of town by town beautification measures. The potential of the water bodies has to be fully exploited and convert it as a major water front recreation centre of the region.

25.20 Environment

The town is experiencing various environmental issues, but in different magnitude. A lot of environmentally important places such as lakes, canals, ponds, fields etc are seen in the Planning area. It is essential to conserve these important places. In the planning area priority has to be given for protection of environmentally sensitive areas, proper waste disposal and protection of water bodies. The infrastructure facilities are to be improved.

25.21 Resources

Still conventional methods for resource mobilization are adopted in the municipality. Human resources which are available in plenty have to be utilized properly. The land resources can also be used more effectively. The major resources of the area are agro based. Innovative approaches have to be adopted for resource mobilization and to provide better services to the people.

25.22 Development: Administration, municipal finance, Ongoing Projects

The Local Self governments has major role in providing various services, infrastructure facilities and civic amenities to the people. But the present institutional capacity is inadequate to provide better services to the people. The financial management of the LSGs to be improved. The major committed and ongoing projects which have significant influence is future traffic and land use pattern are to be considered while framing the future planning policies and land use pattern.

26 Goals and Objectives

26.1 Goals

The findings of the analysis of various sectors are used for shaping the development goals. The analysis shows that, Kottayam was developed as an administrative headquarters from the earlier days. It is also a service town of vast areas spread over Kottayam and part of the surrounding districts and the people from these area is depending Kottayam for various services. It is identified as first order settlement of the district in the study of Urbanization of Kottayam district. Also Kottayam has been identified as a future third order settlement of the state. But in the recent time there is a decline in the status as a regional centre due to various reasons. So develop Kottayam as market centre and an easily accessible regional level service centre in the Central Travancore with adequate infrastructure is the first goal.

Kottayam is a major education centre of the state from early days and a University and a number of Premier educational institutions are functioning in and around the town. A number of major medical institutions are also functioning here. The town is the leading centre in the publication of News papers, periodicals and books. So excelling the existing status of the town as a centre of excellence, health, and publishing and develop it as a hub of institutions is the second goal.

Trade and commerce has been identified as the notable economic activities of the town. The hinterland of the town has agriculture resources especially cash crops. There is scope for developing agro based industries in the planning area. Tourism can be developed as a major economic activity of the planning area due to the potential of the town and its location, adjacent to the major tourist destination of the nation. The establishment of the inland port at Kottayam is another advantage in developing the economy of the town. Optimum utilization of resources for diversification and strengthening the economy of the town another goal.

The town is lacking many infrastructure facilities. In fact it the major problem faced by the town and is one of the reasons for the decline in other sector of the town. The integrated development of the infrastructure is the other goal.

Environmental protection is another urgent need of the town. The town is located in the region, where the mid land adjourns with the low land and it is an environmentally sensitive area. The paddy fields, natural drains, hills etc are the environmentally sensitive areas of the planning area. There are a number of buildings and areas of heritage importance in the town. These are to be protected / conserved. It has importance in the development of tourism is concerned. Conserve the environmentally important areas and heritage areas are another goal. Ensure the social welfare and security of the society is another goal. The development goals set are summarized as follows.

- **To develop Kottayam as an easily accessible regional level service centre in the Central Travancore with adequate infrastructure**
- **Excelling the existing status of the town as a centre of excellence, health, and publishing and develop it as a hub of institutions.**
- **To optimum utilization of resources for diversification and strengthening the economy of the town.**
- **Integrated development of infrastructure**
- **To conserve the environmentally important areas and heritage buildings/percents.**
- **To ensure the social welfare and security of the society**

26.2 Objectives

The Optimum utilization of potentials and resources creates new economic base for Kottayam. This will ultimately improve the quality of life of the people. Development based on available potentials and resources is the action towards archiving the development goal. The development objectives for Kottayam town are summarized below.

In connection with the first goal to ***develop Kottayam as an easily accessible regional level service centre and trade center in the Central Travancore*** with adequate infrastructure, the objectives set are

- To develop new hub of activities utilizing the potential of new roads adjacent to the present central area of the town
- To develop various higher order facilities to cater the service demands of the region
- To develop trade and commercial activities of the town
- To develop the regional road net work of the town so as to ensure better connectivity.
- To improve the traffic and transportation facilities of central area of the town aiming at the decongestion of central area and to ensure the free flow of traffic.

In connection with the second goal, ***excelling the existing status of the town as a centre of excellence, health, printing and publishing and develop it as a hub of institutions***, the objectives set are.

- To diversify the courses in the existing educational institutions and establishing intuitions of international standards.
- To establish a knowledge City
- To develop Kottayam as a hub of health tourism

For the third goal ***optimum utilization of resources for diversification and strengthening the economy*** of the town the objectives set are.

- To promote value addition products under agriculture especially cash crops.
- To promote small scale industries based on the resources of the region
- To promote port related activities
- To develop tourism activities utilising existing potentials

Fourth goal is the ***integrated development of infrastructure*** and the objectives set are

- To improve the traffic and transportation facilities in of central area of the town aiming at the decongestion of central area and to ensure the free flow of traffic.

- To decentralise the urban activities from inner core to the peripheries of planning area utilizing the newly added planning area.

- To develop an inter model transportation system, by linking various modes of transportation.
- To improve other infrastructure facilities like drinking water, waste disposal, housing etc

Conserve the ***environmentally important areas and heritage areas*** is the fourth goal and the objectives set in this regard are

- To rejuvenate and protect all sensitive natural drains, ponds and other water bodies etc
- To conserve the cultivable paddy land of the town.
- To conserve heritage buildings/precincts

Finally the objectives set for the fifth goal regarding the ***welfare of weaker sections of the society*** are

- To ensure welfare of the economically weaker section of the society like aged people, women and socially backward people

- Up-lift the weaker section of the society by rendering job opportunities, better services and living conditions.
- To ensure the security of the citizen.

27 Development Concept

27.1 Introduction

The development concept of a particular area is derived based on the development objectives formulated. The problems and potentials existing in the area, the conclusions and recommendations of sectoral studies are also considered for the formulation of development concept. The development concept is derived by integration of the spatial particulars of the area and above factors. The proposed spatial structure for the area has to be evolved first for formulation of the concept plan.

27.2 Proposed Spatial Structure

After evaluating the existing spatial structure of the Kottayam Planning area, the proposed spatial structure is evolved out by considering the factors like spatial distribution of existing developments, proposed population distribution, proposed road network, proposed commercial nodes, and the environmentally sensitive areas. It is represented in Figure 27.1.



Figure 27.1 Proposed Spatial Structure- Methodology

The ***Spatial distribution of existing development*** is influenced by the topographical features like plain lands and undulating terrain, physical barriers such as water bodies, railway line etc. Existing Core area, corridor development along major travel corridors, concentration of public activities, wet land put to agriculture use / disuse and dry

agriculture, commercial nodes, major industries at Nattakom, Vadavathoor etc. The Spatial distribution of existing development of the planning area is shown in Figure 27.2.

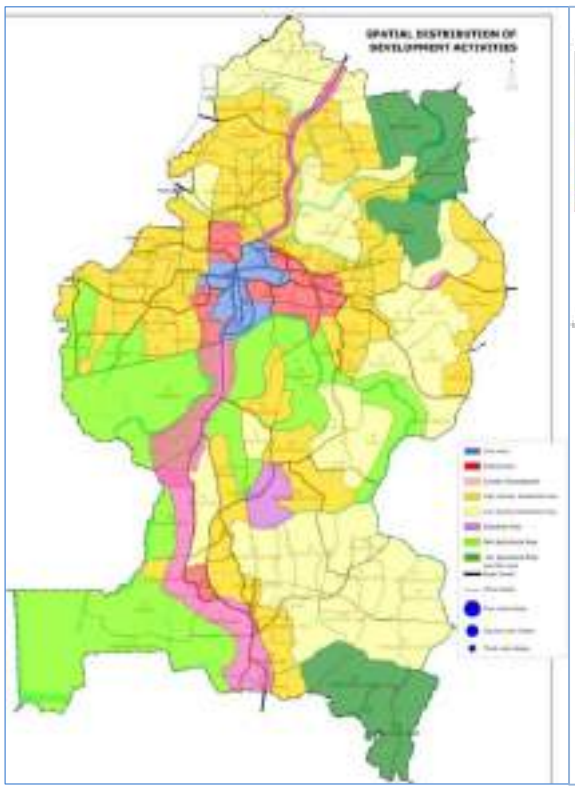


Figure 27.2 Spatial distribution of existing development

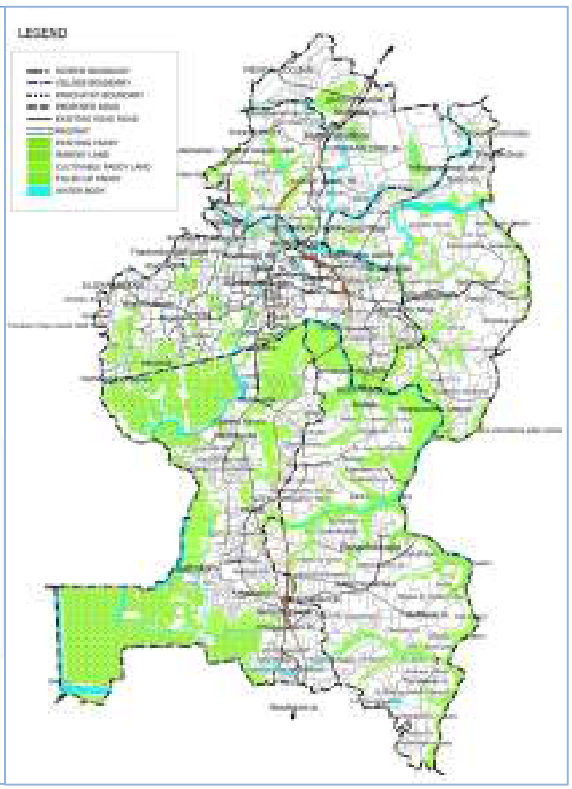


Figure 27.3 Existing paddy fields and wet lands

The ***Paddy fields, wet lands and water bodies*** are taken into account considering its environment sensitiveness. All efforts are to be made for retaining cultivable paddy fields. Quick survey about paddy fields shows that only in 37.78% of the paddy field there is cultivation and 57.05 of the paddy fields, which is cultivable are remaining uncultivated. The existing paddy and wet lands, water bodies are shown in Figure 27.3.

Spatial distribution of population is proposed in such a way that the further densification in the congested central area is discouraged considering the limitations in providing infrastructure and accommodating more population in the immediate surroundings of central core. High density development is considered in the locations considering the land suitability of the area. The future urban profile recommended for the region in the State Urbanization report also considered in this

connection. Only low density development is proposed in the area suitable for agriculture. New road net works are proposed considering the spatial distribution of population also. The figure 6.4 shows the future distribution of population.

Proposed Transportation Network is planned based on the traffic and transportation survey and the capacity required for future requirements. Existing network is radial pattern without or partial ring roads and therefore proposal is also based on Ring and radial pattern. There is limited scope for major widening of roads in the CBD area. Therefore diverting majority of through traffic from central

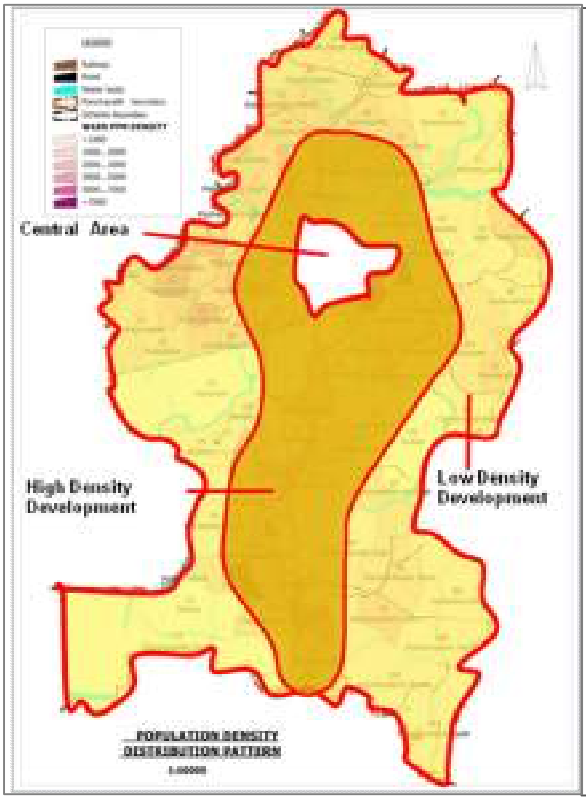


Figure 27.4 Distribution of population

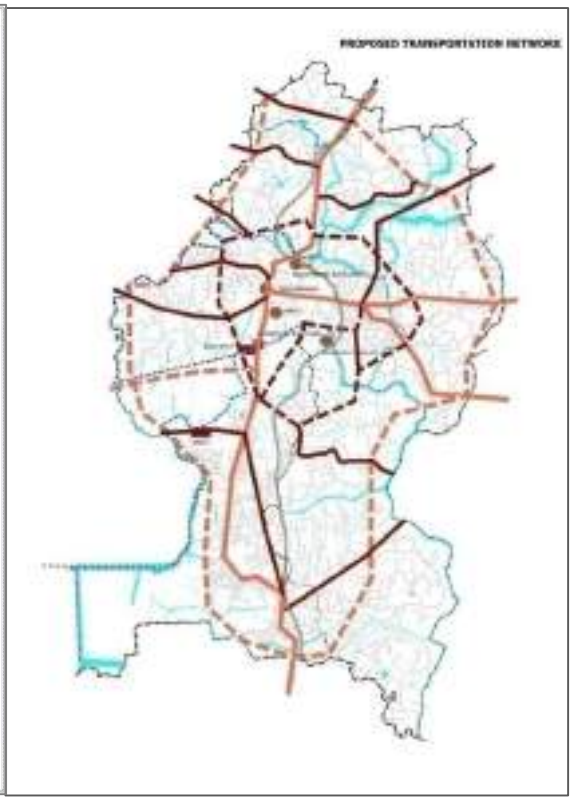


Figure 27.5 Transportation Network

area to the peripheral area by proposing inner ring road and outer ring road can be a solution for the congestion free traffic. Shifting of transport related activities will help in decongesting the central area. Major activity areas are connected with new links. Utilization of water ways for transportation and Inter modal transport facilities are suggested for the improvement of Traffic and Transportation facilities. The figure 27.5 shows the proposed transportation network.

In addition to the extension of CBD to the surrounding areas **Commercial nodes** are proposed in different part of the Planning Area. Special nodes are identified at Samkranthi and Chingavanam. First and Second order nodes are categorized and proposed considering the spatial distribution of activities. It is shown in figure 27.6.

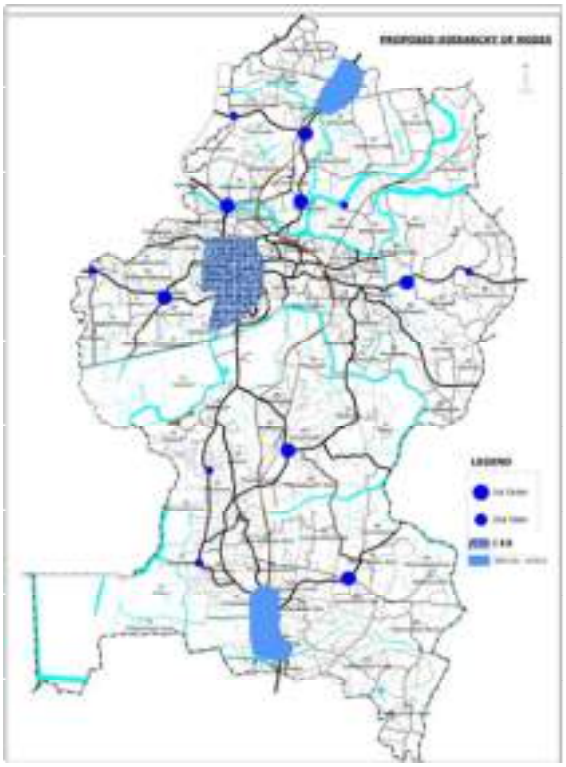


Figure 27.6 Commercial Nodes

Details of major **Ongoing and Committed Projects** are already explained in Chapter 23. As these projects are already initiated based on government decisions, it is also considered in arriving the proposed spatial structure.

Considering all the above factors and super laying all these indicators proposed spatial structure is evolved and based on this Development concept is derived. The methodology adopted is shown in Figure 27.7.



Figure 27.7 Proposed Spatial Structures - Methodology

Core area, Central area, Corridor development, High density residential area, Low density residential area, Industrial area, Low lying land put to agriculture use / disuse, Dry Agriculture area, Nodes are the major elements of the Proposed Spatial Structure. It is represented in Figure 27.8. Various activities like Tourism, Port related activities, economic development

activities, and institutional areas, industrial areas are the other features of proposed spatial structure.

27.3 Development Concept

The various studies and analysis points out that Kottayam has the potential of becoming a major centre for rubber trading and rubber based industries and a centre of printing and publishing media in the state apart from being the higher order education and medicare institutions and an important tourist destination. The potential for the development of the above sectors has to be utilized maximum for the economic growth of the region.

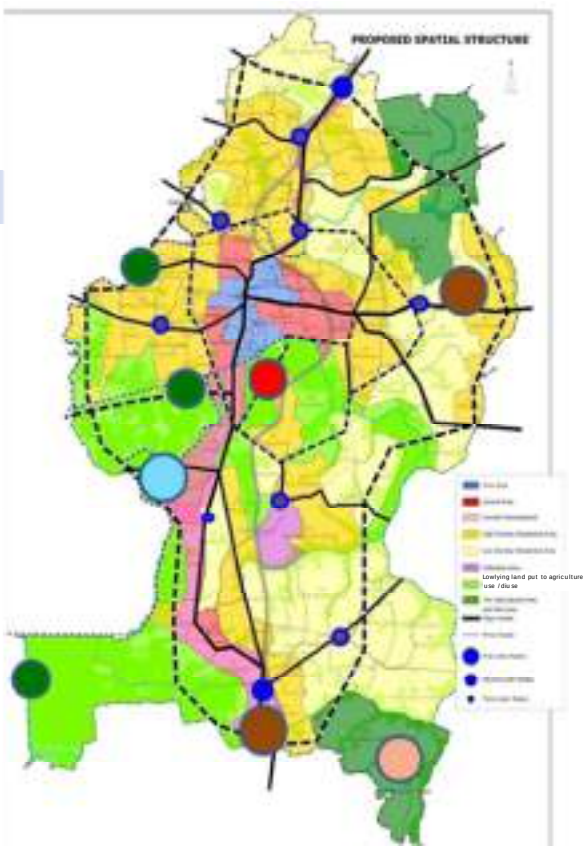


Figure 27.8 Proposed Spatial Structures

Along with the spatial structure of the town, those factors influencing the development of the town have to be considered for the formulation of development concept. As far as Kottayam is concerned though in different magnitude e*xisting development Plan, trade and commerce, administrative center and first order settlement, agriculture and animal husbandry, SSI and IT, tourism, ancillary development due to above economic activities, committed projects* have influence, in the formulation of development concept. Among that trade and commerce, administrative center and first order settlement and committed projects have significant influence. The factors influencing in the formation of development concept is shown in Figure 29.9 and the development concept arrived is shown in Figure 29.10.

The development concept evolved based on the above principles; divide the planning area into eight major policy development zones

as shown in the figure 27.10. They are Town Centre, Promotive Urban Development Zone 1 and 2, High and low density Residential zone, Institutional promotional zones, Industrial promotion zone, Low lying land put agriculture use/diuse and Dry agriculture areas etc. Other activity areas like Tourism Related activity, Port Related activity, economic development zone (special zone) and proposed commercial nodes are also identified in the concept plan.

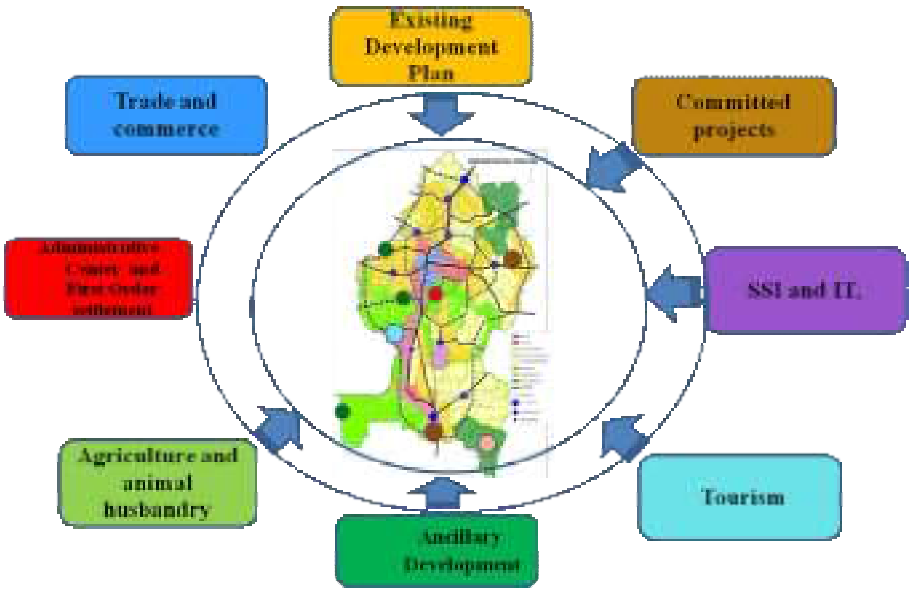


Figure 27.9 Formulation of Development Concept

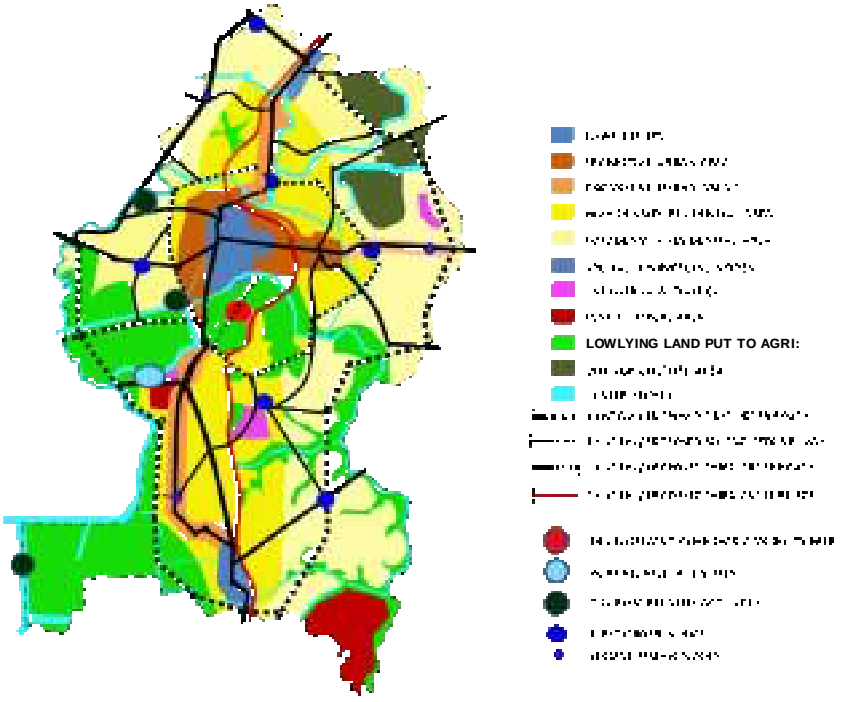


Figure 27.10 Development Concept

Development concept varied after the publication of the Master plan for Kottayam (as per GO (Ms) No : 3917/2017/LSGD dated 16-02-2017) due to the objection/suggestion from the public and the final decision of Joint town planning committee.

28 Development Policies & Strategies

28.1 Introduction

The development concept has been evolved based on the studies and analysis on various physical features and economic factors affecting the planning area. This chapter contain the development policies and strategies evolved for the implementation of the development concept formulated for a period of 20 years. The general development policy and sectoral development policy are included in this chapter.

28.2 General Development Policy

The general development policies adopted for implementation of development concept is furnished below.

Excelling the existing status of the town as a centre of excellence, health, and publishing and develop it as a hub of institutions.

Trade, commerce and shopping have been identified as another activity of the town. Develop Kottayam as a major Market and shopping centre of the region. Also develop Kottayam as a market centre of cash crops of the planning region.

Develop the economy of the planning area utilizing the resources available in the influence region. It includes utilizing the raw materials especially, the locally available cash crops, tourism potentials, human resources, inland port etc.

Develop Kottayam as the centre of Central Travancore region and a first order center of the district with required facilities especially infrastructure facilities.

Providing better service facilities to the people by provision of better health services, quality education, quality power, water and various infrastructure facilities and ensure the welfare of economically weaker sections of the society.

Future development of the town with due consideration to the environment, with protection of environmentally sensitive areas.

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

28.3 Trade and Commerce

Policy:

Strengthen the economy of the town by developing and diversifying the Trade and Commerce activities and developing the town as a regional commercial centre.

Strategies:

- Opening up of new land for commercial activities with easy access
- Establishment of commercial complexes of International standards
- Renewal of existing commercial areas which are in dilapidated condition.
- Extension of Commercial area and providing connected facilities like parking place, drainage, waste disposal system etc.
- Provision of facilities for informal sector.
- Establishment of new commercial complexes by Municipality and other agencies.
- Provision of Parking areas in Market Places and Commercial areas
- Provide market facilities for locally produced value added products and agriculture products.

28.4 Industrial Sector

Policy :

The development Policy is to revitalize the traditional industries of the town, establish new industrial units for value addition of products available in the hinterland and

diversification of industrial activities by promoting IT establishments, apparel units etc.

Strategies:

- Modernisation and expansion of printing industries
- Revitalise the Travancore Cements Ltd and establishment of subsidiary units
- Starting of export oriented units utilizing the potential of port
- Expansion of industrial estates and starting of new units
- Promotion of small I.T. establishments.
- Provision of infrastructure facilities like road, telecommunication facilities.
- Marketing facilities for the value added products.
- Industrial units for socially and economically weaker sections and industrial units under social organizations like Kudumbasree.

28.5 Heritage and Tourism

Policy:

Total exploitation of tourism potentials – Vembanad lake, rivers, hill locks, rich culture, literacy, heritage, festivals, health facilities, famous pilgrim centers, locational advantage etc and develop tourism as one of the major economic activities of the town.

Strategies:

- Promotion of backwater, river and farm tourism
- Develop as a tourist transit centre considering the location of the town between world class tourist centers like Kochi, Alappuzha, Thekkadi, Munnar and Kumarakom and Provide support facilities for tourists
- Increasing connectivity of the town with neighbouring centers with different modes of transport like highways and water ways.
- Develop Kottayam as the gateway to the pilgrim tourism of Kerala considering its nearness to Sabarimala, Erumeli, Bharananganam, Manarcaud Church, Parumala Church, and Manjanikkara Church etc.
- Utilizing the tourism potentials of boat races, religious festivals, cultural festivals, fares.

- Conservation of buildings/ precincts which have heritage value.
- Promotion of health tourism utilizing large number of health institutions.

28.6 Agriculture, Animal Husbandry and Fishing Sector

Policy:

Strengthening the economic base of the town to an extent through strengthening the agricultural, animal husbandry and inland fishing sector. Proper integration of agriculture, animal husbandry and fisheries sector and increase productivity in this sector. Improving the environmental condition of the area by rejuvenating water bodies and uncultivated paddy fields. Exploitation of tourism potential of this sector.

Strategies:

- Promotion of homestead cultivation in low density residential area and intense cultivation in the area identified for agriculture. Priority for cultivation of vegetables
- Promoting organic farming and usage of bio fertilizer in agriculture activity, the solid waste may be converted in to bio fertilizer and reduce the quantity of solid waste at disposal point.
- Retain the paddy fields through promotion of paddy cultivation by adopting suitable practices to maximize productivity.
- Promotion of units for the value addition of agriculture products.
- Establish more dairy, goat and poultry farms and increase productivity through scientific methods.
- Promotion of fish farming utilizing the large number of water bodies.
- Rejuvenation of canals and water bodies and to improve the environmental condition by promoting agriculture and fishing

28.7 Transportation.

Policy:

Provide an efficient road network, considering the traffic need of the town, connecting the various activities and nodes of the town. Development of a regional road net work considering the regional importance of the town. Development of an integrated multimodal transport system.

Strategies:

- Developing a hierarchical system of road network within the planning area.
- Providing new road links for diverting traffic in the central area and decongesting the town center.
- Development of waterway as an alternate mode for intercity movement of goods as well as passenger transport.
- Provision of inter model transit facility.
- Exploring possibility for introducing air transport system.
- Improvement of transport infrastructures like terminal facilities, parking facilities, pedestrian facilities.

28.8 Housing

Policy:

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

Strategies:

- Provide adequate residential areas in land use plan.
- Promotion of planned development of residential activities
- Slum rehabilitation and improvement under different programmes.
- Improvement / provision of basic infrastructure like quality roads, street light, recreational facilities, drainage etc in residential areas.

28.9 Drinking water

Policy:

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

Strategies:

- Conservation and protection of water sources within the planning area. Protection of conventional water sources

- Augmentation and extension of protected water supply system to more areas.
- New schemes for uncovered area
- Provision of separate water distribution system for elevated area.
- Replacement of damaged pipe lines and fittings.
- Conservation of paddy fields and ponds for recharging the ground water sources.
- Promote water Harvesting.

28.10 Power

Policy:

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

Strategies:

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

28.11 Waste disposal and Drainage

Policy:

Improve the system of collection, conveyance and disposal of generated waste with participation of people and provide a hygienic environment. Promotion of a system of disposal of wastes at source itself. Maintain the habitable area free from flooding.

Strategies:

- Strengthening the present collection system with additional labours, vehicles etc.
- Effective mechanism for waste disposal at the existing dumping yard
- Promoting the system of waste disposal at source itself. Extension of waste collection system to more public area with people's participation and adoption of decentralised disposal system.
- Popularising Bio fertilizer manufacturing units.
- New public comfort stations.

- Effective land use planning and protecting habitable area from flooding
- Maintenance of existing road side drains and natural drains to avoid flooding.

28.12 Education

Policy:

Establishing institution with new generation courses, diversification of courses in the existing institutions and improve the general education status of the town so as to excelling the existing status as centres of excellence.

Strategies:

- Optimum utilisation of the facilities of M.G.University
- Establishing a Knowledge city and a Media village
- Provision of adequate infrastructural facilities for General education institutions in Government and Aided sector.
- Modernization of educational institutions with facilities like smart classes, language labs etc.
- Utilize the unutilized potentials, including land for starting new institutions/courses.
- Supporting facilities like hostels, libraries, sports complexes and career development centers.

28.13 Health

Policy:

Improve the general health condition of the people by preventive measures and maintaining a healthy and hygienic conditions. Provide modern health facilities to cater the needs of people of Kottayam and its influence region. Provide quality treatment through three systems of medicines and promotion of health tourism.

Strategies:

- Further advancement of Supper Specialty facilities at hospitals
- Providing infrastructure facilities for Indian System of Medicine and Homeopathic Medicine System.
- Promotion of health tourism linking with other tourist activities
- Creation of a healthy and hygienic environment.

- Centre for care of Aged people, disabled persons, children etc

28.14 Civic amenities and recreation facilities

Policy:

Provide higher order civic amenities and recreational facilities as per standard considering the resident as well as population of the region.

Strategies:

- Provide new Parks, fair ground and Open spaces.
- Provision of water front recreational areas
- Improvement of existing recreational facilities.
- Improvement to the existing libraries and provision of modern facilities.

28.15 Environment

Policy:

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

Strategies:

- Conservation of wet lands and water bodies.
- Conservation of identified heritage precincts and sacred grooves.
- Effective solid waste management.
- Improving aesthetics of the town through various efforts like planned street scape, town squares, organized open space etc.

29 Projected Requierments

29.1 Introduction

This chapter gives the projected population for the plan year of Master Plan and the projected requirements as per the standards. The developments envisaged for the Planning Area through the Development concept will increase the Job opportunities and population of Planning area. Education and Medi care, Printing and publishing activities, Trade and Commerce, Agriculture and allied activities, small scale industries and tourism are the activities envisaged in the development concept. In addition to that Kottayam is proposed as an administrative centre and first order settlement in the district and the facilities in this regard has to be provided and this will create job opportunities especially in service sector.

29.2 Population Projection

Population projection is usually done by understanding the pattern of population growth in the past and assuming the same pattern will continue in the future, the present population is projected to the desired future period by using various projection methods. Population growth of an area depends on numbers of births, death, in migrants and out migrants over a time period taken for the population projection.

Mathematical population projection methods are used for finding out the projected population. Arithmetic increase method, Incremental increase method and Linear growth method are used for calculation purpose and the average of it is considered as the projected population for the horizon period and it is shown in Table 29.1 and Figure 29.1.

Table 29.1 Projection of Population

Sl. No.	Area	Arithmetic Increase method				Incremental Increase Method			Linear Growth Method			Average
		2001	2011	2021	2031	2011	2021	2031	2011	2021	2031	2031
1	Kottayam Municipality	144911	145375	148965	152555	157934	170957	183980	153221	161531	169841	168792

2	Vijayapuram Panchayat	30726	55920	64318	72716	30698	30670	30642	34136	37546	40956	48105
3	Panachikad Panchayat	40979	46822	53377	60850	45993	51007	56021	45479	49979	54479	57117
4	Planning Area	**216616**	**248117**	**266660**	**286121**	**234625**	**252634**	**270643**	**232836**	**249056**	**265276**	**274014**

29.3 Perspective Population for the year 2021 and 2031

The perspective population is arrived by taking the average of all the population projections through the various methods discussed above. In addition to that factors like migration also considered.

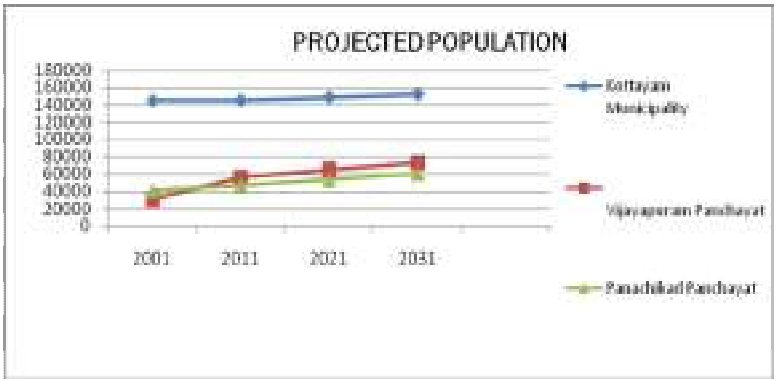


Figure 29.1 Projected population- Mathematical Methods

Table 29.2 Perspective Population for the year 2021 and 2031

Sl:no:	Methods	Projected population in 2021	Projected population in 2031
1	Arithmetic Increase method	266660	286121
2	Incremental Increase Method	252634	270643
3	Linear Growth Method	249056	265276
	Average	256117	274014
	Taking an average of 1% in migration in 2021 and 2% in 2031 due to the policies adopted in development plan	2561	5480
	Total	258678	279494
	Rounded to	258700	279500

PROJECTED POPULATION OF KOTTAYAM PLANNING AREA

The expected populations of Kottayam Planning Area are shown graphically in above figure. Population is expected to reach 279500 by 2031 due to the provision of developmental policies.

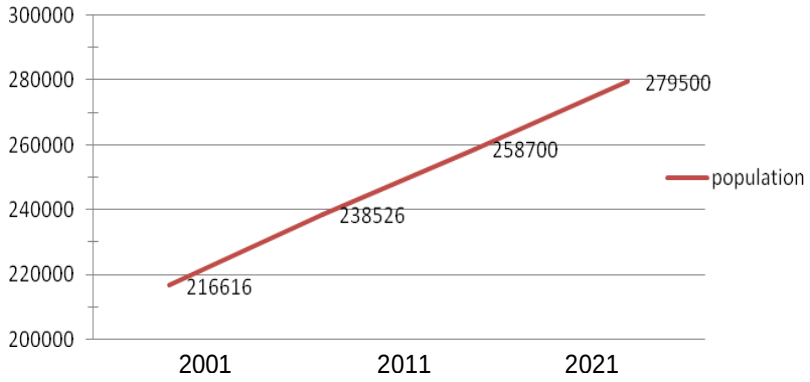


Figure 29.2 Projected Population

29.4 Growth rate of Population

The growth rate of population of the Planning area is shown in Figure 29.3. It can be seen that the growth rate of population of Kottayam Planning area is showing a decreasing trend. It may be correlated with the general tendency of very low growth rate of population of the district as well as state.

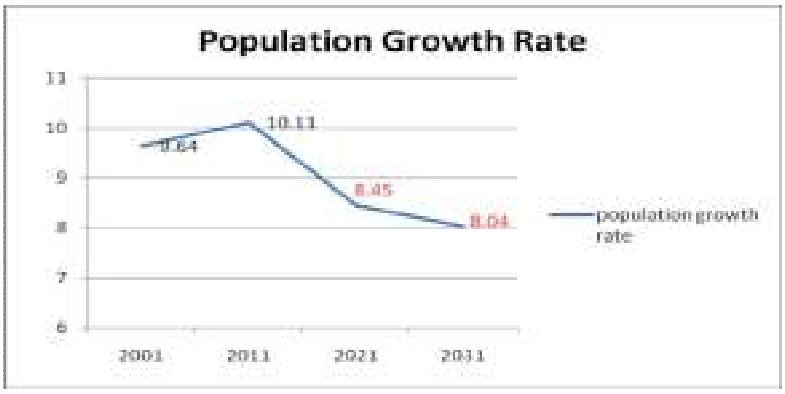


Figure 29.3 Future growth rate of population

29.5 Changes in occupational Structure

The economic activities govern the occupational structure of the area. The expected population by 2031 is 279500. From the work force participation rate for Kottayam Planning area it can be found that the WPR is 31% by the end of 2001. As per UDPFI Guide lines, for a Municipal Area, the minimum work participation rate shall be 33%. 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 Planning area. Based on this the work participation rate of the planning area for the year 2031 is adopted as 34%. The Working force during 2031 is 95030 (34% of 279500)

29.6 Area requirement for various urban uses

Kottayam Planning area can be considered as a medium town as per UDPFI guidelines (population 50,000 to 5,00,000). The requirements for the medium town as per UDPFI guidelines are worked out in table below.

Residential Areas

At present an area of 41.57 Sq.km (45.80%) is being occupied for residential purpose. As per UDPFI guidelines an area of 40-45% is to be provided. But Kottayam Planning area has already have residential areas as per standards and therefore a part of this area can be used for other developments.

Commercial Uses

According to existing land use survey, only 1.33 Sq:km (1.5% of total area) of land is under commercial use in Kottayam Planning area. UDPFI guidelines propose an area of 3-4% for commercial uses. As trade and commerce is considered as one of the major activity in the Planning area, a projected area of 3% of total land use have to be allotted for this section which comes to be around 3 sq.km in area.

Industrial Area

As per UDPFI guidelines, for small and medium towns, industrial workers are taken to be about 20% of total working population. Thus it is estimated that there will be around 19000 industrial workers in Kottayam Planning area by 2031. As per UDPFI guidelines, density of industrial workers must be in the range of 100 pph to 125 pph. Assuming employment density as 125 pph, the extent of industrial area will be 19000/125 =152 ha. Thus about 1.5 sq.km of Kottayam planning area can be estimated to be occupied by industries by 2031. A projected area of 2% can be reserved for industrial activities in Kottayam Planning area.

Public & Semi-public Use

According to land use survey, there is 4.33 sq.km (4.77%) of land area under Public and semi public use in Kottayam Planning area. As per UDPFI guidelines, area of 10-12% of total area must be provided for public and semi-public uses for a medium town. Since there will be introduction of new facilities like educational

institutions, health institutions, auditoriums public centres etc. in future, allotment of an area of 11% of total can be taken for this purpose.

Transport & Communication

According to UDPFI guidelines, an area of 12-14% should be allotted for transport and communication purposes in the case of medium town. It can be found that only 2.6% of total area is used for this purpose in Kottayam Planning area. In order to accommodate the fast growing traffic in the town and to reduce the traffic problems existing here, more road networks have to be introduced. From the traffic survey conducted by NATPAC, it was found that the width of many roads have to be increased so as to accommodate the traffic volume.

Recreational Uses

Land uses coming under this category are playing fields, stadium, parks and open maidans, gardens, etc. Current area available for recreational uses is 0.83% of total area of Planning area of Kottayam which is found to be very less. According to UDPFI guidelines, 18-20% of total land area must be used for recreational purposes for the case of a medium town. But while considering the current unavailability of land, this guideline cannot be followed. It is given that for a medium town, recreational open spaces shall be provided at the rate of 1.4-1.6 ha/ 1000 persons. By taking this provision, the area to be provided comes around 3 sq.km for this purpose.

Agricultural land & Water Bodies

At present 34.88 Sq.km of area is demarked as agricultural land which includes both wet and dry land. In order to meet the demand in the coming years, uncultivated dry land and a part of the paddy land will have to be converted to other land uses. It is proposed to retain land predominantly under agricultural use and low lying land which are environmentally sensitive lands are to be conserved for future. Paddy land kept uncultivated for years can be used for other essential purposes for catering the urban demand. Thus most sensitive and cultivable lands of agriculture area are taken into consideration and retained as such by imposing required zoning regulations.

In case of dry agricultural land, some active areas like rubber plantations, mixed crop areas etc are included under agricultural use zone. This area also has to be protected by enforcing proper rules so as to prevent from conversion to other uses. Rest area can be utilized for other land uses as per the demand.

At present 4.27 sq.km of land area is used by water bodies. This area has to be protected as such from encroachment and waste dumping by providing buffer zones for water bodies and also to reduce the water scarcity in future.

29. 7 Requirement of Physical Infrastructure

INFRASTRUCTURE

a) Water Supply

A minimum of 70-100 lpcd and a maximum of 135-150 lpcd are recommended by UDPFI for domestic uses. From this the future demand is estimated at 279500 x 150 = 4,19,25,000 litres per day for domestic uses.

b) Electricity

One electric substation of 11 kv for 15,000 population is taken as the general standard for all categories of towns.

c) Solid Waste Disposal

Only one solid waste treatment plant is functioning in Kottayam Planning area at Vadavathoor. For projected population of 2031, considering solid waste of 0.5 kg/capita/day waste generation comes around 108 tons/day. Treatment plants with modern techniques have to be implemented for the effective treatment of this waste. Decentralized treatment plants can remedy the current stagnant situation of dumping yards.

d) Sewerage

Treatment of sewerage is essential for hygienic environment. Small and medium towns may be encouraged for adopting low-cost sanitation techniques with the technical assistance by local bodies and involvement of NGO's in implementation of such programmes. For Kottayam Planning area, need for public sewerage system will occur in the near future when the accumulation of apartments in the town area increases. Individual Septic tanks and ESP type latrines are sufficient for meeting the present demands.

Part.III



LAND USE AND SECTORAL PROPOSALS

30 Land use plan

30.1 Introduction

Land use plays a major role in the process of evolving better environment for the town. Better management and distribution of activities in the town will reduce many problems relating to traffic and provision of service. The land use plan for the horizon year is proposed in tune with the policies and strategies mentioned in previous chapters, considering the present trend of land development, ongoing and committed projects and projected requirements and based on the development concept evolved.

In the proposed land use plan, the town has been divided into various zones. ***Low density Residential zone, High density Residential zone, Commercial zone, Town centre, Mixed zone I, Mixed zone II, Public and Semi public zone, Institutional promotion zone, Industrial zone, Transportation zone, Park and open space, Thazhathangadi Heritage zone, Storage/Godowns zone, Solid waste management zone, Paddy/Wetland zone, Special zone within paddy/wetland zone, Land reserved for Government purpose, Dry agriculture zone, Water body, Medical college scheme area, Kodimatha house plots and Green strip*** are the zones proposed.

The area coming under the Area Development Plan for Kottayam Medical College Area has been marked as a separate area and the zoning regulation of the Area Development Plan is applicable to this area. The proposed land use is shown in Figure 30.1.

Figure 30.1- Proposed Land use Plan

30.2 Town Centre

The Town centre mainly covers the present CBD of the town. All major commercial activities of the Planning area are concentrated in and around the town centre. In addition to commercial activities, Public uses like temples and churches, hospitals, recreational areas, educational institutions, etc. are there in the town centre. The entire area in this zone has organic development with high intensity of activities with high and moderately built up areas. For decongesting this central area, certain regulations regarding Floor Area Ratio has to be included in the zoning regulations. Town Centre serves as the main business centre for the district and therefore it is proposed to develop it as commercial hub without further densification. 1.43 sq.km of land is coming under this zone

30.3 Mixed Zone I

Since there is restriction for the development in the town centre, for promotion of urban development an area has been proposed around the town centre. 3.83 sq.km of land is coming under this zone. This Mixed zone I can attract more development to the area and it will also relieve the congestion in the central area to an extent.

30. 4 Mixed Zone II

The stretch of major roads such as M.C. Road and K.K Road emanating from the town centre are acting as development corridors, the existing land use shows the mixed use development along these corridors. In addition to that mixed zones are proposed at Paruthumpara, Boat jetty kadavu and Thiruvathukkal. In order to regulate the development along the corridor side Mixed zone II has been proposed. Commercial, residential, public and semi public, small industries are promoted in this area. 5.29 sq.km of land is coming under this zone.

30. 5 Residential Zones

In the proposed land use plan residential areas are categorized into **High density Residential zone and Low density Residential zone** with different regulations. The High density Residential zone has proposed in the immediate vicinity of Mixed zone I and II and 20.22 sq.km of land is coming under this zone. The Low density Residential zone mainly proposed in the peripheral areas and 19.40 sq.km of land is coming under this zone.

30. 6 Commercial Zone

Commercial sector is one of the major economic activities of the planning area. Exclusive commercial zones and commercial mixed zones are proposed in the plan. Commercial zones are proposed at the present CBD and Chingavanam. Provisions are there in Town centre, Mixed zone I and II and along the major roads for commercial activities. The area coming under the Commercial zone is 0.45 sq.km.

30. 7 Public and Semi public Zone

The existing public and semi-Public uses are proposed to retain as such. The public and Semi-Public zones are scattered all over the Planning area. In addition to that there are provisions for Public and Semi-Public uses in other zones also. The total land coming under Public and semi-Public use is 4.16 sq.km.

30. 8 Industrial Zone

All major industrial land uses are proposed as exclusive Industrial Use Zone in the proposed land use map. In addition to that there is provision for setting up industrial units in other zones also with certain restrictions. In addition to existing 0.88 sq.km of land an additional 0.26 sq.km land also proposed under this zone.

30. 9 Transportation Zone

The proposed road network of the Planning area consists of roads of width 45.00m, 30.00m, 25.00m, 22.00m, 20.00m, 18.00m, 15.00m, 12.00m, 10.00m and 8.00m. The existing Bus terminals, Railway Stations, Port area has been included in the Transportation zone and 2.38 sq.km of land is coming under this zone. Provision is there in the Special zone within Padyy/Wetland zone for transport related activities. Adequate provisions are included in the zoning regulation for transport related uses in other zones also. Details of the proposals in the Transportation sector is discussed in the Chapter 31.

30. 10 Park and Open Space

At present a total extent of 0.16 sq.km of land is coming under this zone. A new stadium at Pulinakkal area and a Park at Kalathilkadavu area has been proposed under this category and an additional land of 0.15 sq.km has proposed for this purpose. The total area including existing and proposed land coming under Park and open space is 0.31sq.km.

30. 11 Thazhathangadi Heritage Zone

A heritage zone has been proposed at Thazhatangadi area. It is intended to protect the buildings of heritage value and 0.09 sq.km of land is coming in this zone.

30. 12 Storage / Godowns Zone

The existing Gowdowns and storage area has been proposed to retain as such and 0.08 sq.km of land proposed as Storage/Godowns zone in the proposed land use plan.

30. 13 Solid waste management Zone

The existing dumping yard at Vadavathoor is proposed to retain for the same use. 0.01 sq.km of land is coming under this zone.

30. 14 Institutional Promotion Zone

An institutional promotion zone has been proposed at the South – East corner of the planning area (in Panachikkad Grama Panchayat). This zone has been suggested to attract more institutions to this zone by giving appropriate incentives and 2.40 sq.km of land is proposed under this zone.

30. 15 Paddy/Wetland zone

Major portion of the existing paddy fields and wet lands has been proposed as low lying Paddy/Wetland zone. Major portion of this zone is coming in Nattakom area where there are vast stretches of continuous paddy fields and cultivation is there in most of these paddy fields. The remaining area under this zone is scattered in almost all part of the planning Area. The total land coming under this zone is 20.53 sq.km.

Considering the ongoing and committed projects, a portion of this zone of 1.56 sq:m of area at Kodimatha has been designated as Special zone within paddy/wetland zone with certain conditions. The project should be implemented based on the environment Impact study and an area development plan shall be prepared for the area after conducting detailed studies including ecology and drainage. The provisions of Kerala conservation of Paddy and Wet Land Act 2008 should be satisfied. Piecemeal developments cannot be permitted in this zone considering the environmental aspects. The whole area shall be developed by a single Agency (Special Purpose vehicle) constituted by the Government of Kerala for ensuring planned development of the area giving thrust to drainage.

30. 16 Kodimatha house plots

An extent of 0.02 sq.km of land is coming under Kodimatha house plot area near Kodimatha, which is considered as an area substantially or exclusively developed as residential area.

30. 17 Land reserved for Government Purpose

An extent of 0.05 sq.km of land is also reserved for Government purpose near Kalathilkadavu Bridge in Panachikkad Grama Panchayat subject to satisfaction of certain conditions.

30. 18 Dry Agriculture zone

2.38 sq.km of land in the North –East part of the planning area has been proposed as Dry Agriculture land. This area is mainly consists of rubber plantations, mixed cultivation land and also low density residential areas.

30. 19 Water Body

Meenachil river, Kodoor river, Neelimangalam river, Puthenthodu and other small water bodies constituting water bodies in the Planning area and 4.05 sq.km of land is coming under this catagory.

30. 20 Medical College scheme area

The North-West corner of the Planning area is coming under the sanctioned Area Development Plan for Kottayam Medical College. This area has not been included in any of the zones mentioned in the previous paragraphs and the zoning regulations of the Area Development Plan for Kottayam Medical College are applicable to this area.

30. 21 Proposed Land use break up

The proposed land use break up in sq.km and percentage of different land uses of the planning area is shown in Table 30.1. High density Residential zone and Low density Residential zone with 22.28% and 21.38% of the Planning area occupies major land use followed by Paddy/Wetland area with 20.90% of the total area.

Table 30.1 Proposed Land use break up

Sl.No	Land Use	Area (In sq.km)	Percentage
1)	Low density Residential zone	19.40	21.38
2)	High density Residential zone	20.22	22.28
3)	Commercial zone	0.45	0.49
4)	Town Centre	1.43	1.58
5)	Mixed zone.I	3.83	4.23
6)	Mixed zone.II	5.29	5.82
7)	Public and Semi-Public zone	4.16	4.58
8)	Institutional Promotion zone	2.40	2.64
9)	Industrial Zone	1.14	1.26
10)	Transportation zone	2.38	2.62
11)	Park and Open Space	0.31	0.34
12)	Thazhathangadi Heritage zone	0.09	0.1
13)	Storage/ Godowns zone	0.08	0.09
14)	Solid waste management zone	0.01	0.01
15)	Paddy/Wet land zone	18.97	20.9
16)	Special zone within paddy/wetland zone	1.56	1.72
17)	Land reserved for Government Purpose	0.05	0.05
18)	Dry agriculture zone	2.38	2.63
19)	Water body	4.05	4.46
20)	Medical College scheme area	2.54	2.8
21)	Kodimatha House plots	0.02	0.02
	Total in sq. Km.	**90.75**	**100**

31 Transportation Plan

31.1 Introduction

Transportation is one of the major sectors as far as an urban area is concerned and this chapter details the development proposals to be implemented in the transport sector within the plan period of 20 years in the Planning area. Due importance has been given for providing an efficient transportation system considering the future traffic also. Proposals for an efficient road network, terminal facilities, parking facilities and pedestrian facilities are included in this chapter.

In fact the traffic and transportation is one of the major problems faced by Kottayam town. One of the objectives is to improve the traffic and transportation facilities in of central area of the town aiming at the decongestion of central area and to ensure the free flow of traffic. Another objective is to decentralize the urban activities from inner core to the peripheries of planning area utilizing the newly added planning area and the proposed road network is arrived considering this also. Three modes of transportation system are prevailing in the planning area such as road, rail and water transport. To develop an inter model transportation system by linking various modes of transportation is another objective of the plan.

31.2 Road Network

A ring and radial pattern road network has been proposed for the planning area. M.C. Road, K.K. Road (NH), Kottayam – Kozhanchery road and Kumarakom road are the arterial roads in the proposed road network. An inner ring road connecting the M.C. Road, K. K. Road, Kozhanchery road and Kumarakom road is included in the proposed road network. In addition to that widening of certain major roads is proposed considering the proposed land use. In addition to that there are proposals in the category of collectors and distributaries connecting the roads mentioned. The proposed road net work is shown in figure 31.1.

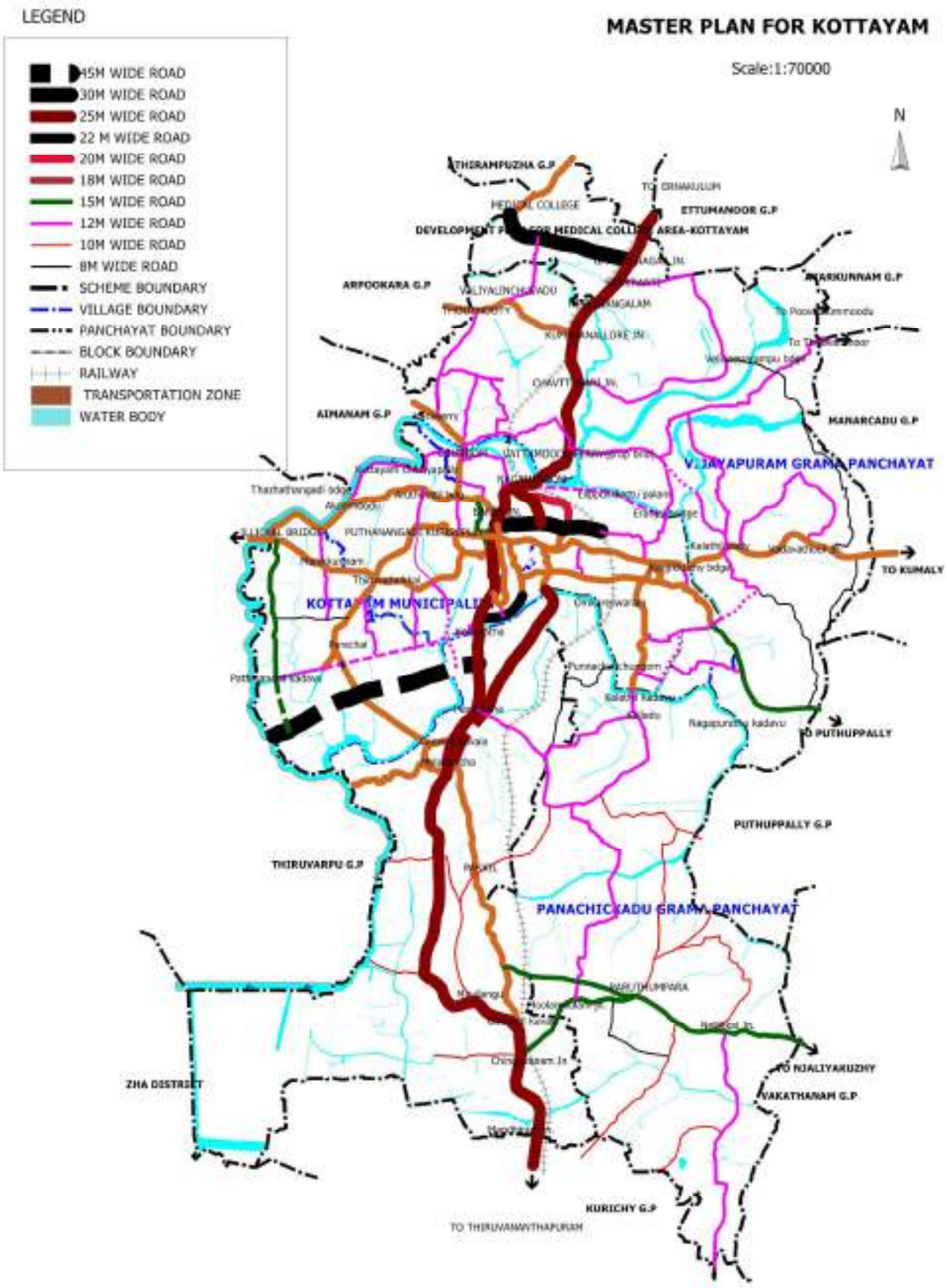


Figure 31.1 –Proposed Road Network

For the area coming under area of Development Plan for Medical College Area Kottayam, the road widening / new road proposals as per said Development Plan shall be followed.

Table 31.1 Proposed Roads

Sl. No.	From	To	Proposed width (M)	Remarks
1	Pathadippalam	Chingavanam (Tesil)	25	M. C. Road
2	Central Jn.	Airattunada	18	K. K. Road
3	P. T. Chacko Statue	Logos Jn.	30	Sastri Road
4	Logos Jn.	Rubber Board Jn.	30	Mother Theresa Road
5	Rubber Board Jn.	Kanjikuzhy (Mother Theresa Road to Mount Carmal School Boundary)	12	
6	Seematti Round	Aida Jn.	18	T.B. Road
7	Central Jn.	Thirunakkara (Gandhi Square)	18	Link road
8	Anaswara Theatre	Palambadam Jn.	15	
9	Gandhinagar	Medical College	30	Medical College Scheme
10	Chanthakkavala	Market Landing	18	M.L. Road
11	Kodimatha (M.C. Road)	Market Landing	22	M. G. Road
12	Kasthurba Jn.	Near Chanthakkadavu	18	Via. Muttambalam
13	Kanjikuzhy	Thruthel palam	18	
14	Thruthel palam	Puthuppally	15	
15	Kanjikuzhy	Kalathilkadavu	18	Via. Devalokam
16	K. K. Road (Near Kanjikkuzhy bridge)	Manganam kurishu	12	Link Road (Chiraya Thondu)
17	Manorama	Erayilkadavu	18	
18	Manippuzha	Erayilkadavu	25	Byepass
19	Manippuzha	Mulankuzha	25	Part of Earayil Kadavu Byepass **(Proposed Road)**
20	K. K. Road (Opposite Collectorate)	Muttambalam - Chanthakkadavu Road	12	Lourde Road

Sl. No.	From	To	Proposed width (M)	Remarks
21	K. K. Road (Opposite Baselious College)	Logos Jn.	18	Good Shepperd Road
22	Logos Jn.	Nagampadam (Via. Railway)	20	Railway Station Road
23	Ceaser Jn.	Municipal Park Jn. (Kurian Uthup Road)	25	Kurian Uthup Road
24	Nagampadom Bridge	Iranjal Bridge	12	Via. Elippulikkattu kadavu **(Proposed Road)**
25	Thirunakkara Temple	Kumarakom Road (Opposite CMS College)	15	Shreenivasa Aiyar Road(Link road)
26	Thirunakkara Temple	Post office	15	Post Office Road
27	Thirunakkara	Puthanangady	18	Temple Road
28	Thekkumgopuram	Childrens' Liabrary	18	
29	Chalukunnu	Childrens' Liabrary	12	
30	CMS College	Kumarakom Road	12	Semithery Road
31	**Part of Inner Ring road**			
31.1	Choottuveli	Manippuzha	12	Via. Vattamoodu - Aimanathupuzha - Kalathippadi - Aanathanam - Thuruthel palam - Mar Baselious - Kalathil kadavu - Kollad - Diwan kavala
31.2	Manippuzha	Kodimatha (M. C. Road)	25	
31.3	Kodimatha	Puthenthodu (Part of Cherthala Byepass)	45	**(Proposed road)**
31.4	Puthenthodu	Karappuzha	12	
31.5	Karappuzha	Puthanangady	8	
31.6	Puthanangady	Aruthootty	12	
31.7	Aruthootty	Alummoodu (Part of Kumarakom Road)	18	
31.8	Alummoodu	Choottuveli	12	Via. Cheriya palli - Kochana - Chungam - Thekkumpalam - S.H. Mount
31.9	Pazhaya seminary Jn.	Chungam	18	Part of Chalukunnu-Varissery Road

Sl. No.	From	To	Proposed width (M)	Remarks
32	Kumaranalloor	Thoothootty	18	
33	Valyalinchuvadu	Kumaranalloor Temple Road North Gate	12	
34	Varissery	Thoothootty	12	Pullarikunnu Road
35	Pullarikkunnu	Kariampadam	12	Padinjarekara Road
36	Chungam	Pullarikkunnu	12	Mallussery Central Road
37	Chungam	Thidamboor Temple	12	Thidamboor Temple Road
38	Chalukunnu	Varissery	18	Via. Chungam
39	Baker Jn.	Illickal (Kumarakom Road Via Alummoodu)	18	
40	Pulimood Jn.	Illickal (Kumarakom Road Via Thiruvathukkal)	18	Via. Thekkumgopuram - Karappuzha
41	Puthanangady	Pulinackal Jetty	18	Via. Thiruvathukkal
42	Illickal	Cherthala Byepass	15	Via. Pathinanchil Kadavu (Including Proposed road)
43	Kodimatha	Thiruvarpu Grama Panchayath Boundary	45	Cherthala Byepass
44	Cement Factory	Parechal Road	18	
45	Aravupuzha	Kalluprackal	12	Via. Manikkunnam
46	Pulinackal	Panampadi	8	Via. Kalluprackal
47	Parechal	Pathinanchil Kadavu	12	Near to Puthenthodu
48	Kodimatha	Parechal	12	Near to Puthenthodu **(Proposed Road)**
49	Karapuzha	Mutharamman kovil	12	
50	Chingavanam	Paruthumpara	15	
51	Parakkulam	Malikakkadavu (Changanassery)	12	
52	Thannimoodu	Homeo College Road	10	
53	Nellickal	Panchayath Boundary (Kuzhimattom Road)	10	
54	Sadanam Jn.	Thuruthippally	8	Via. N.S.S. High School Road
55	Parakkulam	Panachikkadu Temple Road	10	Via. Velloothuruthy
56	Ottakkanjiram	Ambattukadavu	10	

Sl. No.	From	To	Proposed width (M)	Remarks
57	Paruthumpara	Near Parackal kadavu	10	
58	Nalkavala	Parackal kadavu	10	
59	Kaduvakulam (Choolakavala)	Paruthumpara (Sayippu kavala)	12	Via. S.N. Public School
60	Mulankuzha	Gomathi Jn.	18	Via. Pakkil - Pannimattom
61	Kaduvakulam	Mavilangu Jn. Road	10	Via. Pakkil - Power House
62	Chingavanam	Market Road	10	
63	Pallom Post Office jn	Karimpinkala kadavu	10	
64	Nattakom Zonal Office	Kannadikkadavu	10	
65	Nattakom Zonal Office	Power House Jn.	12	
66	Polytechnic	Nattakom Port	18	
67	Cement Jn.	Polytechnic Road	18	
68	Diwan kavala	Punnackal chungam	8	
69	Kalathilpady	Ponpally Jn.	12	Ponpally Road
70	Vijayapuram Panchayath Office	Girideepam School	12	Via. Pallam Block Office Jn.
71	Kanjikuzhy	Thiruvanchoor Road	12	Via. Iranjal Bridge
72	Kanjirapallypady, Vellooparambu	Seventh Day School	8	Via. Mosco - Thembraval Kadavu
73	Samkranthi	Plackilpady Jn	12	(Blessy pady)
74	Pathinarilchira	Karimbinpady	12	
75	Plackilpady	Kanjirappallyppady	12	
76	Chavittuvari	Kanjirapallypady, Vellooparambu	12	
77	M. C. Road (Near Ceaser Jn.)	Chungam Road	12	Annankunnu Road
78	Manganam LPS	Devaprabha Kalungu	12	
79	Paruthumpara	Pathieye pally kadavu	15	Via. Paruthumpara
80	Pannimattom	Paruthumpara		
81	Vayaskarakunnu	Palampadam	12	Via. Fire Station
82	Shappupady	Diwan Kavala	12	Via. Boat Jetty - Nalkavala - Kaduvakulam
83	T.B. Road	M. G. Road	12	Link Road

Sl. No.	From	To	Proposed width (M)	Remarks
84	Devalokam Aramana	Inner Ring Road Connection	12	
85	Medical college scheme-ICH road		18	
86	Madhavanpady	Rubber Board Jn (Up to Boundary)	8	
87	Mundakapadam Jn	Saw mill(up to inner ring road-Anathanam Rd)	8	

31.3 Other Proposals

31.3.1 Mobility Hub

Mobility hub at Kodimatha integrating three modes of traffic ie, Roadway, Railway and Waterway.

31.3.2 Mini-Port

Expansion of Mini port at Nattakom to handle more goods through the port.

31.3.3 Parking Facilities

Providing off street parking facilities at the following places

- K.K.Road
- T.B.Road
- Old Vegetable Market Area
- Nagampadam area
- Kodimatha
- Chingavanam
- Samkranthi

31.3.4 Terminal Facilities

Following are the proposals in this category

- Remodeling of Nagampadam Municipal Bus Stand
- New Bus stand for KSRTC Buses
- New Bus Terminal at Kodimata
- New Bus stands at Chingavanam, Thiruvathukkal and Medical College
- Truck Terminal at Kodimatha

31.3.5 Junction Improvement

Junction improvement at Chingavanam, Manipuzha, Kodimatha (M.G.Road Jn), Aida Jn, Pulimoodu Jn, Central Jn, Seematti Round, Nagampadam, S.H.Mount, Chavittuvari, Kumaranallore, Gandhi Nagar, Logos, Collectorate, Manorama Jn, Kanjikuzhy, Kalathilpady, Vadavathoor, Thiruvathukkal, Illickal, Chalukunnu, Chungam, Paruthumpara.

31.3.6 Flyovers/ Subways

Flyover at Kanjikuzhy, Nagampadam, Chingavanam, Samkranthi and subway at Seematti Round

31.3.7 Pedestrian Facilities

Providing Pedestrian subways at the CBD area and improvement of foot paths. Beautification of Sasthri Road and Kurian Uthup Road with pedestrian facilities.

31.4 Water Ways

Development of water ways connecting Kottayam with Alappuzha, Changanassery, Vaikom and National Water Way for intercity passenger and goods movement. It will reduce pressure on the road network to an extent and indirectly promote tourism to an extent. It is achieved through following projects.

- Developing and protecting Puthenthodu, Kodoor River and Meenachil River.
- Evicting encroachments and protection of Pallikkonam Thodu, Aruthootty Thodu, Kanjikuzhy Thodu, Meenanthalayar, Chingavanam Puthenthodu.
- Terminal facilities are to be provided at Kodimatha, Nattakom, Thazhatangadi

31.5 Railways

Thiruvananthapuram – Ernakulam BG railway line is passing through Kottayam. Following are the major proposals in this sector

- Early completion of doubling of track between Kayamkulam and Ernakulam
- Including Kottayam in the suburban rail network of Kochi
- Expansion of Kottayam Railway station with more platforms and passenger amenities.
- Improvements to Chingavanam and Kumaranallore railway stations.
- Shifting of the Goods shed from the town centre.

32 Sectoral Proposals

32.1 Introduction

The sector wise proposal of Kottayam Master Plan is included in this chapter. The sector wise proposals are derived based on development concept and development issues pertaining to the sector. The economic feasibility and the environmental feasibility etc are considered for finalizing the proposals. But detailed environmental impact assessment has to be conducted for the major projects. The sector wise proposals are furnished below. The spatial locations of the major projects are shown in the proposed land use map. For setting up of the remaining projects of different scale adequate provisions are there in the zoning regulation of different zones subject to the conditions stipulated in the regulation. Provision is also there for Mega Projects as per paragraph 33.2.46 in the zoning regulation of the Plan. (see the Chapter.33)

32.2 Trade and Commerce Sector

Earlier Kottayam was one of the major trade and commerce centre especially cash crops from its vast hinterland. One of the goals of the plan is to develop Kottayam as an easily accessible regional level service and trade centre in the Central Travancore region. It is proposed to make free of the existing problems of the present Town Centre and expand it further. It is also proposed to develop Sankranthi and Chingavanam as special Commercial nodes.

32.2.1 International Shopping Complex

Shopping complex of international standards with facilities like storage area, loading and unloading area, connectivity with neighbouring centres, modern drainage and waste disposal facilities are proposed. Major Shopping Complexes can be established in commercial zone, mixed zone.I&II, Special area within environmentally sensitive zone etc subject to the conditions stipulated in the zoning regulation.

32.2.2 Parking Plaza at Market Area

A new multi level parking plaza at old Vegetable market

32.2.3 New Markets

New markets at special nodes at Chingavanam and Sankranthi.

32.2.4 Shopping Complexes

New shopping complexes by Municipality and other agencies.

32.2.5 Trade and Fair Area

An area for conducting Trades and Fares.

Fair grounds can be established in the Town Centre, Commercial zone etc subject to the conditions stipulated in the zoning regulation.

32.2.6 Commercial Area Development

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

32.2.7 Hawking Area

A hawking area for the rehabilitation of Hawkers and vendors at suitable locations in the town in commercial zone as per the timely decision of town street vending committee.

32.2.8 Truck Terminal

A modern truck terminal for the town in Kodimatha area

32.3 Industry

Travancore Cements limited and the Madras Rubber factory (MRF) are the medium type industry functioning in the town. Industrial Development Plot at Poovanthuuth, Mini Industrial Estates at Kumaranallore and Nattakom are the other industrial centres within the planning area. In addition to that there are a number of micro and small industrial units functioning in different part of the planning area. Printing and publishing is another major activity in the Planning area. Agricultural produces especially cash crops are the raw materials available in the region. Presents of Mini Port at Nattakom are a major potential for industrialisation of the town.

32.3.1 I.T Based units / Apparel Park

IT based hardware and software units/Apparel Park.

For setting up Mega projects in the Planning Area provisions are there as per paragraph 33.2.43 (of chapter.33) and units of smaller scale can be established in certain other zones also subject to satisfaction of conditions stipulated in the zoning regulation.

32.3.2 Small Industrial units

Small industrial units for value addition of agricultural and other products of the region proposed.

Provisions are there in all major zones for establishing Small scale Industrial units subject to satisfaction of conditions stipulated in the zoning regulation.

32.3.3 Exhibition cum Sale Centre

Permanent Exhibition cum sale Centre for selling locally manufactured industrial products.

Exhibition centres can be established in Town centre, Commercial zone etc subject to satisfaction of the conditions stipulated in the zoning regulation.

32.3.4 Printing Units

Establishing more modern printing units.

32.4 Agriculture

In addition to increase the production in agricultural sector, the rejuvenation of agriculture sector of planning area is necessary as measure to ecological conservation as vast area of land of the planning area especially in the western part is wet agriculture land. The vast paddy fields and water bodies in the western part of the town is a major tourism attraction also. Most of the paddy fields are remaining uncultivated. Conservation of cultivable paddy lands is essential for considering the environmental equilibrium of the town. In the proposed land use, these factors are to be considered and the agricultural areas zoned into environmentally sensitive area and dry agriculture land. Similarly in the low density residential areas there is ample scope for home stead cultivation. A combined action in agriculture, animal husbandry and solid waste management will reduce the problem of waste Management in the town.

Dry cultivation (especially rubber) is predominant in Vijayapuram Panchayat and Panachikad Panchayat where as paddy lands are available in Nattakom areas and in the north eastern parts of Panachikkad Panchayat. Rejuvenation of paddy cultivation has been proposed in these areas.

The other cultivations in the planning area are tapioca, coconut, areca nut, plantain, banana, pineapple, pepper, nutmeg, clove etc and these cultivations are to be further promoted by giving technical support and joint farming programmes where ever possible.

32.4.1 Agriculture labour bank

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

32.4.2 Cultivators Group / Group Farming and Implements bank

For facing the current problems in agriculture sector effectively measures like cultivator's group / group farming may be formed. An agricultural implements bank is also to be setup. Cultivation in the uncultivated land by leasing out the land to interested cultivators groups may be promoted. This programme can be implemented jointly by Krishibhavans, Kottayam Municipality and Grama Panchayats.

32.4.3 Bio-fertilizer Plants

Promoting organic farming and usage of bio fertilizer is one of the agriculture promotion strategies for the town. This is to be achieved through the following measures. Installation of Mini Bio fertilizer plant in all houses of the town for the disposal of the degradable wastes and for the production of bio gas and manure with the subsidy of Government/LSGIs. Centralized plant by the Municipality for processing the wastes from the public places is also proposed at convenient locations.

32.4.4 Farm Tourism

Considering the large extent of land under agriculture use in the proposed land use, promotion of farm tourism is proposing as an additional income for farmers.

32.4.5 Floriculture

Floriculture at suitable areas considering the local demands for flowers.

32.4.6 Vegetable Cultivation

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

32.4.7 Value addition of Agro based products

Small scale units for value added products from the agricultural products of the town and its hinter land is proposed in this sector. Provisions are there in all major zones for establishing Small scale Industrial units subject to satisfaction of conditions stipulated in the zoning regulation.

32.4.8 New dairy farms

Considering the vast agriculture land available in the periphery of planning area establishing small scale dairy farms with 10 to 25 cows in a unit are proposed.

Dairy farms can be established in Dry Agriculture zone, Mixed zone etc subject to satisfaction of conditions stipulated in the zoning regulation.

32.4.9 Poultry farm / Broiler farm

As in the case of dairy farms small poultry farms with 75 to 100 hens per unit can be started in those areas identified as suitable for agriculture is proposed , for meeting the demand of eggs and meat of the town to an extent. Poultry farms can be established in Dry Agriculture zone, Mixed zone etc subject to satisfaction of conditions stipulated in the zoning regulation.

32.4.10 Slaughter House

Construction of a modern slaughter house in the Planning area.

Poultry farms can be established in Dry Agriculture zone subject to satisfaction of conditions stipulated in the zoning regulation.

32.4.11 Fishing

Promotion of fish farms, especially in the western part of planning area.

32.4.12 Protection of ponds and Canals

Rejuvenation and protection of Puthenthodu, Aruthoottithodu, Kanjikkuzhi Thodu, Boat jetty Canal, Mundar, Pallikkonam Thodu, Illickal-Amballor Thodu, puthenthodu-Chingavanam are proposed in this category.

32.5 Tourism and Heritage

There is ample scope for development of tourism within the planning area as there are enough resources for tourism within the region. Network of canals and water bodies and location of the town adjacent to Vembanad lake, the position of the town in between the international tourist destinations like Kochi, Kumarakom, Alappuzha, Thekkadi, Munnar etc, presence of ancient temples churches and mosques are the advantages in the promotion of tourism in the town. All forms of tourism –heritage, pilgrim, backwaters, paddy fields, Plantation, monsoon etc are there in the region.

32.5.1 Waterways

Revival of water ways and canal beatification for public transportation as well as tourism purpose. Establishing terminal facilities for tourist boats with modern facilities

32.5.2 Health Tourism

Promotion of health care and health tourism utilizing the facilities of supper speciality hospitals available in the town.

32.5.3 Pilgrim Tourism

Development of Pilgrim tourism by utilizing the presence of famous pilgrim centres of the state like Sabarimala, Erumeli, Bharanaganam, and Manarcaud in the adjacent areas. Provision of adequate facilities at religious centres, railway station and other transport terminals.

32.5.4 Heritage

Development of Thazhathangadi heritage zone and conservation and preservation of temples, churches, mosques and other buildings of heritage value are the proposals in this in this sector.

32.5.5 Aesthetic Beauty of the town

Improvement of aesthetic beauty of the CBD area of the town by town beautification programme. Development of LBS Road, Kurian Utup Road, Kodimatha – Manipuzha Road as modal streets and improvement of major junctions are the proposals in this regard.

32.5.6 Tourism Infrastructure

Establishing new hotels, shopping malls etc.

32.5.7 Permanent Exhibition Centre

For establishing permanent exhibition centres, provisions are incorporated in the zoning regulation for Mixed Zone.I, Institutional promotion area subject to the conditions stipulated in the zoning regulation.

32.5.8 Convention Centre

A modern convention centre for the town.

Convention centre can be established in Commercial zone, Institutional promotion zone and Town Centre etc subject to satisfaction of conditions stipulated in the zoning regulation.

32.5.9 Nattakom Guest House

Utilizing the available land, expansion and introduction of more facilities including a convention centre.

32.5.10 Water Front Recreation Facilities

Providing water front recreation facilities at Chingavanam Chanthakadavu, Kodimatha – Boat Jetty Area and Thazhthangadi Area.

32.6 Transportation Sector

The proposals of this sector has included in Chapter 31.

32.7 Housing

In the proposed land use map sufficient area has been proposed for residential development. The residential areas have been categorised into high density residential area and low density residential area and comparatively high FAR is permissible in the high density residential areas. But in the inner core of town further residential densification is discouraged.

The structural condition of houses is found to be better in Planning area. But there are slums in certain parts of the town and a number of households were living in the slum area and attention is needed in this area. In housing sector the proposals are mainly related with the improvement of slum area.

- Rehabilitation of slum dwellers
- Improvement of infrastructure facilities of slum area
- Improvement structural condition of kutcha houses and huts

32.8 Drinking Water

The projected population of the Planning Area for the year 2031 is 2,79,500 and it is estimated that a quantity of 41.92 MLD of water is required for the Planning Area in the horizon year (Present supply is only 32.25 MLD).

32.8.1 Augmentation scheme

Augmentation scheme of present water supply scheme to ensure supply of 41.92 MLD water for Planning Area by the year 2031 is proposed. This project may be implemented by Kerala Water Authority.

32.8.2 Isolated distribution of elevated area (Mini schemes)

In order to ensure adequate water, provide separate distribution tanks at elevated areas and schemes utilizing the available resources.

32.8.3 Replacement of damaged pipe lines

Replacement of damaged pipe lines of the existing distribution network.

32.8.4 Public Wells

Maintenance of public wells

32.8.5 Small Schemes

Expansion of water supply schemes mainly small water supply schemes functioning in the planning area.

32.8.6 Extension of Pipe lines

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

32.8.7 Protection of natural water sources

Protection of wells, ponds and natural drains of the planning area. The protection of Meenachil river is highly essential as it is the major source of drinking water to the Planning area.

32.8.8 Water Harvesting

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

32.9 Energy

The proposal in the power sector is furnished below.

32.9.1 Improvement of Power distribution

- Installation of new Transformers, 11 KV lines etc.

32.9.2 Street Lighting

- Provision of High mast lights and Sodium vapour lights in CBD Area and at major road intersections.
- Provision of separate street mains for street lights.
- Proper lighting of residential areas.

32.9.3 Electrification of houses

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

32.9.4 Non-Conventional Energy

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

32.10 Waste disposal

It is estimated that the total generation of solid waste of the town by the year 2031 is 108 tonnes / day, whereas the present collection is only about 29 tonnes per day. The analysis shows that 30% of houses have septic tank and 68 % of houses have dry pits. Drains are available for few stretches of roads only. The proposals in this sector are given below.

32.10.1 Solid Waste Collection

The proposals include limiting the waste collection by the Local self Governments to public places and more densely populated wards. Strengthening and modernization of present waste collection, conveyance and disposal system – by adding more vehicles, equipments and labours. Improvement of infrastructure facilities of the dumping yard.

32.10.2 Decentralized waste disposal plants

Biogas plants to houses, by providing biogas plants at different subsidized rate to households based on their income.

32.10.3 Septic tanks

Only 30% of houses have septic tank. Continue this system of waste disposal. Provide septic tanks for remaining houses. Provide subsidy to economically weaker sections are the proposals in this regard.

32.10.4 Sewage System

Provision of sewage collection and treatment system for the town centre and densely populated part of the town.

32.10.5 Road side drain

Provision of road side drains for all major roads in the CBD Area.

32.10.6 Natural drains

Cleaning and removal of blocks and weed growth of Kodoor River, Meenachil river and other natural drains and canals. Protection work to prevent furthers disposal of wastes.

32.10.7 Public Comfort Stations / E-Toilets

New public comfort stations / E-toilets are to be provided at public places.

32.10.8 Awareness Programme

Conduct awareness programme on health, hygiene and environment.

32.11 Education

Educational Institutions in the category of High school, Higher Secondary Schools, Arts and Science College, Professional College, Polytechnic College, ITI/ITC etc as per planning standards is available. Presence of M.G.University is the main advantage in this sector. Now efforts are to be made to convert Kottayam as an educational Hub. The projects which are to be implemented in educational sector are detailed below.

32.11.1 Research and Technical institutions

Establish advance Research Centres in various disciplines in M.G.University.

32.11.2 Medical Research and Educational City (Medi City)

Establish Medi city (Medical Research and Educational City) linking Kottaym Medical College, Kottayam Dental College, Homeo College Kurichi, Homeo Research Centre Kurichi, Vector Control and Research unit, School of Medical Education etc. For setting up Mega projects in this sector provisions are there as per paragraph 33.2.43 (of chapter.33) and centers of different scale can be established in certain other zones subject to satisfaction of conditions stipulated in the zoning regulation.

32.11.3 Media Corridor

Establish a Media Corridor for media studies and studies and researches related to printing. The presents of number of institutions in the Planning region like K.R.Narayanan National Institute of Visual Science and Arts (at Pallikkathodu), Indian Institute of Mass Communication, Manorama School of Communication, the Media study Centre of M.G.University, St.Joseph Media City of Changanassery are to be utilised.

32.11.4 Language Lab

Establish a language lab with the School of Letters of Mahatma Gandhi University as nodal agency.

32.11.5 Finishing School

Establish a Finishing School at Kottayam mainly to train those who are trying jobs in abroad.

32.11.6 Tourism Institute

Establish an Institute of Tradition, tourism and management at Kottayam.

32.11.7 Improvement of Infrastructural facilities and modernization of Government and aided schools

Improvement of infrastructure facilities of Government and Aided schools like new buildings, play grounds, toilets, computer lab, language lab, internet facilities, drinking water, vehicles etc. for 18 government and aided schools.

32.11.8 Utilization of surplus land and buildings

Utilize the unutilized facilities of existing educational institutions including land, buildings etc for new institutions with new generation courses.

32.11.9 Sports Complex

A sports complex for students.

Provisions are there in the Commercial zone, low density residential zone zoning for this purpose subject to the conditions stipulated in the zoning regulation.

32.11.10 Students Centre

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

32.12 Health

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

32.12.1 National Institute of Medical Science

Elevate Kottayam Medical College as a National Institute of Medical Science with the status of a deemed university.

32.12.2 Para medical Institute

Elevate the School of Medical Education to the status of a National Level Para Medical Institute.

32.12.3 Up gradation of District Hospital

Upgrading the District Hospital to the status of a General Hospital by providing all necessary departments, equipments and infrastructural facilities.

32.12.4 Emergency Medical services

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

32.12.5 Ayurveda Hospital

Providing necessary infrastructural facilities in existing Ayurveda Hospital at Vayaskarakunnu.

32.12.6 Homeopathic Hospital

A building for District Homeo Hospital.

32.12.7 Centre for Aged and disabled people

Canters for the care of Aged people, disabled children, mentally retarded person etc

32.12.8 Health Tourism

Promoting health tourism utilizing the available institutions.

32.13 Civic Facilities, Culture

Recreational and other civic facilities are inadequate in the town. As regional centre, higher order facilities are to be provided in the town.

32.13.1 Parks

New park at Kalathilkadavu area on the bank of Kodoor River and renovation of existing Parks

32.13.2 Stadium

A new stadium at Pulinakkal area, Renovation of Nehru Stadium.

32.13.3 Indoor Stadium

An Indoor Stadium for the town.

32.14 Environment

Paddy fields, water bodies are included in the category of environmentally sensitive areas of the town. Regulation has been included in the zoning regulation for the protection of the environmentally sensitive areas. Following are the proposals in this regard

- Conservation of paddy fields
- Conservation of natural drains
- Effective waste management

32.14.1 Disaster zone map

Kottayam district is prone to natural hazards such as flood, drought, lightning, landslide earthquake etc. In the planning area, flood is the most commonly occurring natural hazard. Other hazards such as drought, lightning occurs rarely in the master plan area.

After analyzing the spatial distribution of annual flood plain, flood 2018 inundation levels at different places of the master plan area, loss of connectivity and damages to the infrastructure, spatial distribution of affected residential and public buildings, the damage and loss of physical infrastructure like roads, the blockage of railway lines due to inundation, the planning area is broadly classified as High risk zone, Moderately safe zone, and safe zone for settlement. The disaster zone map based on the flood 2018 is given in the map. fig 32.1. This classification is done for the regulation of further growth of settlement.

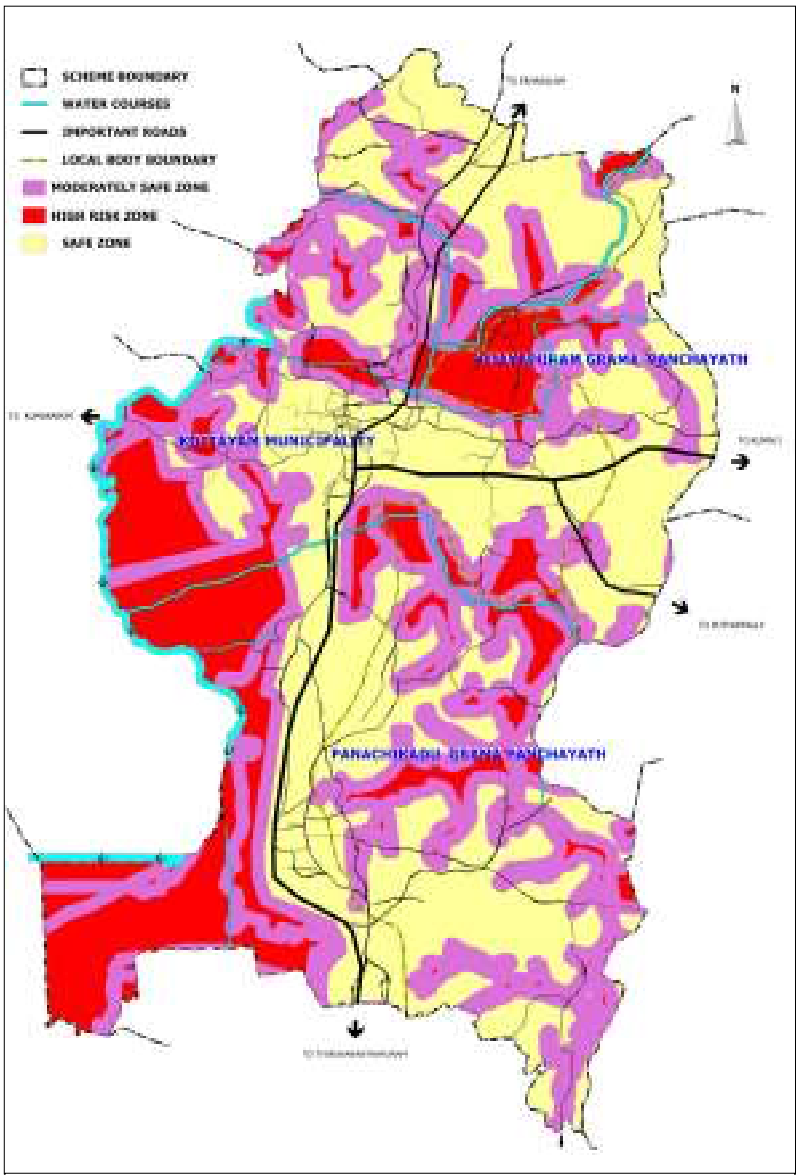


Figure 32.1 Disaster zone map –based on flood 2018

Encroachment of non developable land for developmental purpose is the main reason for many of the man made hazards to turn into disaster events. Hence major development shall not be permitted in the areas which are prone to disasters.Therefore

development of the town area shall be in tune with environment, protecting watershed features such as flood plains, paddy fields and wetlands together with the planned development to cater the urban needs.

32.15 Governance

For providing better services to the people and to improve the efficiency of functioning, the infrastructure of government offices and the municipal office has to be improved. Number of Government offices is functioning in rented building and suitable space has to be provided for these offices.

32.15.1 Municipal Office Complex

The proposal includes a new office complex for Municipality, improvement of facilities at the zonal offices at Kumaranallore and Nattakom. Improvement of facilities of two Grama Panchayat offices.

32.15.2 Office Complex

New office complex for government offices which are now functioning at rented buildings.

Part.IV



DEVELOPMENT REGULATION

33 Zoning Regulations

33.1 Introduction

Zoning is a device of land use planning used in a Master Plan. The word is derived from the practice of designating permitted uses of land based on mapped zones which separate one set of land uses from another. Zoning Regulations are the means to achieve development of a use zone as envisaged in the Development Plan. In other words Zoning Regulations are laws that define and restrict how to use a particular property coming under a Development Plan. Thus it is the public regulation of land and building use to control the character of a place.

The development suggestions of a Master plan will be spatially located in the proposed land use plan. Areas will be zoned under various categories such as ***Low density Residential zone, High density Residential zone, Commercial zone, Town centre, Mixed zone I, Mixed zone II, Public and Semi public zone, Institutional promotion zone, Industrial zone, Transportation zone, Park and open space, Thazhathangadi Heritage zone, Storage/Godowns zone, Solid waste management zone, Paddy/Wetland zone, Special zone within paddy/wetland zone, Land reserved for Government purpose, Dry agriculture zone, Water body, Medical college scheme area, Kodimatha house plots and Green strip*** for securing the most efficient and effective use of land in public interest. Therefore, a set of zoning regulations for the implementation and enforcement of the proposals envisaged in the Master Plan will also be part of the Master Plan. Zoning regulations will specify the details regarding the nature of uses *'permitted'*, uses *'restricted'* and uses *'prohibited'* in each zone.

The area coming under Kottayam Medical College Area Development Plan is marked as a separate zone in the proposed land use Map and the regulations of the said Plan is applicable to the particular area.

33.2 Zoning Regulation

33.2.1 All future developments shall be in conformity with the provisions of the Master plan and future construction shall conform to the Kerala Municipality Building Rules in force unless otherwise specified in this regulations.

33.2.2 For the implementation and enforcement of the proposals envisaged in the Master plan for Kottayam, areas have been zoned under various uses such as ***Low density Residential zone, High density Residential zone, Commercial zone, Town centre, Mixed zone I, Mixed zone II, Public and Semi public zone, Institutional promotion zone, Industrial zone, Transportation zone, Park and open space, Thazhathangadi Heritage zone, Storage/Godowns zone, Solid waste management zone, Paddy/Wetland zone, Special zone within paddy/wetland zone, Land reserved for Government purpose, Dry agriculture zone, Water body, Medical college scheme area, Kodimatha house plots and Green strip.*** Details regarding the nature of uses "permitted", uses "restricted" and uses "prohibited" in each zone are given in subsequent paragraphs

Uses permitted- Uses permitted in a zone cover the uses that can be normally accommodated in the relevant zone.

Restricted uses- In some cases, it may be possible to permit some uses, 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 spatial location factors. Such cases, which come under this category, are classified as "Uses restricted". Restricted uses are classified again in two categories depending upon the intensity of use as below.

i. Category deals with the uses that shall be restricted by the executive authority with concurrence of the Town Planner of the Department of Town and Country Planning having jurisdiction over the area.

ii. Category deals with the uses that shall be restricted by the executive authority with the concurrence of Chief Town Planner of the Department of Town and Country Planning.

Uses prohibited - enlists the various objectionable uses in each zone, which shall not be permitted under normal circumstances.

All other uses other than permitted uses and restricted uses are Prohibited uses.

The zoning regulation for different zones of Master Plan for Kottayam is given in the subsequent paragraphs.

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
33.2.3	**LOW DENSITY RESIDENTIAL ZONE**			
	All single family residences and its incidental uses, night shelters, Orphanages/Old Age Homes/ Dharmasalas/ Convents.	Automobile workshops for 2 wheelers/light motor vehicles with power limited up to 10 HP, Non – obnoxious and non-nuisance service and manufacturing type industries engaging not more than 9 workers with power limited 10 HP or 19 workers without power (see annexure 32.1)- all the above uses subject to the condition that floor area shall be limited to 200 sq.m	Fuel Filling Stations	Any other uses not specified in columns 2, 3 & 4.
	Residential Apartments / flats subject to the condition that the maximum permissible coverage and FAR shall be 60% of corresponding values prescribed in the building rules		Zoological and Botanical Gardens, Bird Sanctuary	
	Residential Layouts, Home stays and Resorts.			
	Shops, Commercial offices and Restaurants /Canteen /Hotels, Confectionaries, Banking and Financial institutions, Professional Offices, Movie hall, Godowns, Ware houses, Storage of non-hazardous materials, IT software units *– all the above uses subject to the condition that floor area shall be limited to 500sq.m*	IT Software and hardware industrial units, Electronic Industrial units - all the above uses subject to the condition that floor area shall be limited to 500 sq. m	Radio and TV stations, museum, dairy farms	
	Beauty Parlor, ATMs, Gymnasium/Yoga Centers.			
	Educational Institutions up to Upper Primary School, Library and Reading Rooms, Day Care and Crèche, Nursery/ Swimming Pool	All educational institutions		
	Hospitals with 10 beds, Nursing Home/ Clinics (Outpatient) – floor area up to 500 sq. m.			

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Auditorium / Wedding Halls / Community halls / Exhibition Centers Art Gallery, Cultural and information Centre, Museum, Other Public Utility Areas & Buildings, Places of Worship, Social welfare centres – all the above uses subject to the condition that floor area shall be limited to 500 sq. m	Outdoor game stadium, open air theatre, amusement park		Any other uses not specified in columns 2, 3 & 4.
	All Government and Public sector offices and institutions, Open air Theatre.			
	Transmission towers, Telecommunication towers and Wireless Stations.			
	Non –obnoxious and non-nuisance type of Industries as per Annex 32.1, subject to the condition that floor area shall be limited to 150 sq.m, Water Treatment Plants below 5 MLD	LPG Godowns up to 150 sq.m		
	Tot Lots/park/play ground			
	Storage of Agricultural Produces and Seeds, Green Houses.			
	Plant Nursery, Pump House, Wells and ponds for irrigation and agriculture, green houses, smoke house attached to Residential buildings for agriculture related purposes			

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
33.2.4	**HIGH DENSITY RESIDENTIAL ZONE**			
	All residences, Residential Flats/Apartments, and its incidental uses, night shelters, Orphanages/Old Age Homes/Dharmasalas, Convents, Residential Quarters, Farm Houses - all the above uses	Lodging houses with Floor area upto 5000 sq.m	Fuel Filling Stations	Any other uses not specified in columns 2, 3 & 4.
	Shops, Commercial offices and Restaurants/ Canteen/ Hotels, Bakery, Confectionaries, Banking and Financial institutions, and Professional Offices, Movie hall, Godowns, Ware houses, Storage non-hazardous, IT software – all the above uses subject to the condition that floor area shall be limited to 1000 Sq.m.	IT hardware/ Electronic Industries - all the above uses subject to the condition that floor area shall be limited to 200 sq. m, Parking Plaza	Zoological and Botanical Gardens, Bird Sanctuary	
	Auditorium / Wedding Halls / Community halls / Exhibition Centers Art Gallery, Cultural and information Centre, Museum, Other Public Utility Areas & Buildings, Places of Worship, Social welfare centres - all the above uses subject to the condition that total floor area shall be limited to 1000 sq. m	Outdoor game stadium, open air theatre, amusement park		
	Beauty Parlor, ATMs, Gymnasium/Yoga Centers.	Hospitals with 10 beds, Nursing Home / Clinics (Outpatient) – floor area shall be limited to 1000 sq. m		
	All educational institutions up to Upper Primary School, Day Care and Crèche, Nursery/ Kindergarten, Library and Reading Rooms, Swimming Pool	All educational Institutions		

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Smokehouse attached to Residential Buildings			Any other uses not specified in columns 2, 3 & 4.
	Clinics (Outpatient) – floor area shall be limited to 300 sq. m.			
	All Government and public sector offices and institutions, Open air Theatre.			
	Non – obnoxious and non-nuisance Service and manufacturing type of Industries as per Annex 32.1, subject to the condition that floor area shall be limited to 150 Sq:m, Water Treatment Plants below 5 MLD	Automobile workshops for 2 wheelers/ Light motor vehicles with power limited to 10 HP, Non – obnoxious and non-nuisance Service and Manufacturing type industries engaging not more than 9 workers with power limited 10 HP or 19 workers without power subject to the condition that floor area shall be limited to 200 sq. m		
	Tot Lots/park/play ground			
	Storage of Agricultural Produces and Seeds, Green Houses			
	Plant Nursery, Seed Farms, Pump House, Wells and Irrigation Ponds			
	Transmission towers, Telecommunication towers and Wireless Stations, P&T office.			
33.2.5	**COMMERCIAL ZONE**			
	All Shops including Shopping Complexes, Shopping malls, Multiplex, Hypermarkets, Automobile show rooms, Restaurants, Hotels, Motels, Markets – all the above uses	Single Family Residences, Ashram / Mutt, Residential apartments	Fuel Filling Stations	Any other uses not specified in columns 2, 3 & 4.

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Professional offices, Commercial Offices & Establishments, Banking and Financial institutions, Gymnasium / Yoga Centers, Beauty Parlors, Weigh bridges, IT software units.	Places of worship, Smoke House.		Any other uses not specified in columns 2, 3 & 4.
	Educational institutions up to Higher Secondary level, Day Care and Crèche-*all the above uses subject to the condition that floor area shall be limited to* 1000 sq. m	Educational institutions above Higher Secondary level	Radio and TV station	
	Public Utility Areas & Building, Social welfare centre, - *all the above uses subject to the condition that floor area shall be limited to* 1000 sq. m	Bus terminal/stand, Lorry stand, Public Utility Areas & Building, Social welfare centre.		
	Transmission towers, Telecommunication towers and Wireless Station	Indoor/Outdoor game stadium, museum, exhibition centre and art galleries		
	All Government or Public Sector offices	IT Hardware/ Electronic Industries, Marble and Granite Storage/Cutting centers		
	Auditorium, wedding hall, convention centres – all the above uses subject to the condition that floor area shall be limited to 1500 sq.m	Auditorium, wedding hall, convention centres, Movie Hall above 1500 sq.m		
	Clinics, Diagnostic Centres and hospitals up to 50 beds, Library and Reading Rooms	Tot Lots/Parks/Play Grounds, open air theatre, fairground, Amusement parks, camping site		
	Cold storage, Printing press, water treatment plan below 5 MLD.			
	Parking Plaza, Taxi/Jeep Stand, Auto rickshaw Stand			
	Smokehouse attached to Residential Buildings			

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Non – obnoxious and non-nuisance Service and manufacturing type of Industries as per Annex 32.1, Service and Manufacturing industries of non-nuisance Nature engaging not more than 19 workers without power or 9 workers with power limited to 30 HP, Automobile workshops, Automobile Service Stations – all the above uses subject to the condition that floor area shall be limited to 300sq.m.			Any other uses not specified in columns 2, 3 & 4.
33.2.6	**TOWN CENTRE**			
	All Shops including Shopping Complexes, Shopping malls, Multiplex, Hypermarkets, Automobile show rooms, Restaurants, Hotels, Motels, Markets – all the above uses are permitted	Indoor / Outdoor game stadium, places of worship, Smoke House, museum, exhibition centre and art galleries, Movie Hall	Fuel Filling Stations	Any other uses not specified in columns 2, 3 & 4.
	Residences, Ashram/Mutt, Residential apartments with lower floors for commercial uses, Hostels, Boarding houses, Guest Houses, Lodges, Night Shelters, Orphanages/Old Age Homes/Dharmasala, Residential Quarters, Farm Houses, Convents	IT Hardware / Electronic Industries, Marble and Granite Storage/Cutting centers	Radio and TV station	
	Educational institutions up to Higher Secondary level, expansion of all existing educational institutions, Day Care and Crèche, Nursery/Kindergarten - *all the above uses subject to the condition that floor area shall be limited to* 1000sq.m	Educational institutions up to Higher Secondary level, expansion of existing educational institutions all the above uses above *1000sq.m*		

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Godowns, ware houses, Storage of non-hazardous materials, Stacking yard			Any other uses not specified in columns 2, 3 & 4
	Auditorium, wedding hall, convention centres – all the above uses subject to the condition that floor area shall be limited to 1500 sq.m	Auditorium, Wedding Hall, Convention Centres – all the above uses above 1500 sq.m		
	Public Utility Areas & Building, Social welfare centre, - all the above uses subject to the condition that floor area shall be limited to 1000 sq. m	Public Utility Areas & Building, Social welfare centre – all the above uses above 1000 sq. m		
	Professional offices, Commercial Offices & Establishments, Banking and financial institutions, Gymnasium / Yoga Centres, Beauty Parlours, Weigh bridges, IT software units - all the above uses	Clinics, Diagnostic Centres and Hospitals above 300 beds	Cremation ground/ crematorium, Burial Ground/Common Vault	
	All Government or Public Sector offices, Swimming pool	Parking Plaza, Bus terminal/stand, Lorry stand		
	Non – obnoxious and non-nuisance Service and manufacturing type of Industries as per Annex 32.1, Automobile workshops, Automobile workshops for 2 wheelers/ Light motor vehicles, Automobile Service Stations, Cold storage, Service and manufacturing Industries of non-nuisance Nature (Annex 32.1) engaging not more than 19 workers without power or 9 workers with power limited to 30 HP, Saw Mills, ice factory, printing press, water treatment plan below 5 MLD.	IT Hardware/ Electronic Industries, Automobile workshops for 2 wheelers/ Light motor vehicles.		

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Clinics, Diagnostic Centres and hospitals up to 50 beds, Library and Reading rooms	R & D institutes, Radio and TV station, civil defense and home guard		Any other uses not specified in columns 2, 3 & 4.
	Transmission towers, Telecommunication towers and Wireless Station	Indoor and Outdoor game stadium, Amusement parks, Convention centre		
	Parking Plaza, Taxi/Jeep Stand, Auto rickshaw Stand	Tot Lots/Parks/Play Grounds, open air theatre, fairground, camping site		
	Smokehouse attached to Residential Buildings			
	ATMs, Cyber café, Restaurant/ Canteen - all the above uses			
	Beauty parlours, Gymnasium/ Yoga centre			
	Plant Nursery , Storage of Agricultural Produces and Seeds			
33.2.7	**MIXED ZONE – 1**			
	All residences including apartments, Night shelters, Residential Quarters, Hostels and boarding houses, lodges and guest houses, Ashram/Mutts, Convents, Orphanages, Old age homes, Dharmasalas - all the above uses subject to the condition that floor area shall be limited to 4000 sq.m	All residences including apartments, Night shelters, Residential Quarters, Hostels and boarding houses, lodges and guest houses, Ashram/Mutts, Convents, Orphanages, Old age homes, Dharmasalas - *all the above uses above* 4000 sq.m	Fuel Filling Stations	Any other uses not specified in columns 2, 3 & 4.
	Automobile show rooms, Godown, warehouses, storage, IT/ software units, stacking yard, Movie hall all the above uses up to 1000 sq. m	Automobile show rooms, Godown, warehouses, storage, IT/ software units, stacking yard, Movie hall all the above uses above 1000 sq. m	Radio and TV station, Indoor game stadium,	
	Godown, warehouses, storage, Automobile show rooms all the above uses subject to the condition that floor area shall be limited to 1500 sq. m	Godown, warehouses, storage, Automobile show rooms -all the above uses above 1500sq.m		

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Day Care and Crèche, Nursery/ Kindergarten, Library and Reading Rooms.	Parking Plaza, Taxi/Jeep Stand		Any other uses not specified in columns 2, 3 & 4
	All Shops including Shopping Complexes, Shopping malls, Multiplex, ATM's, Bear pubs/Parlor, Liquor Bars, Restaurants, Hotels, Motels, Godowns, Markets, Professional offices Commercial Offices & Establishments, Weighbridge, Banking and financial institutions, Warehouses, Storage, IT/ software units – *all the above uses subject to the condition that floor area shall be limited to 4000 sq.m.*	All Shops including Shopping Complexes, Shopping malls, Multiplex, Restaurants, Hotels, Motels, Markets, Professional offices, Commercial Offices & Establishments, Banking and financial institutions, - *all the above uses above 4000* sq.m		
	Gymnasium/ Yoga Centres, Beauty Parlours, Health club	Automobile service station for heavy vehicles, Saw mill with timber yard, Automobile workshops with power limited up to 15 HP, manufacturing and service industries engaging not more than 9 workers with power limited 15 HP or 19 workers without power (see annexure I),IT hardware / Electronic Industries	Cremation ground/ crematorium, Burial Ground/ Common Vault, Sewage treatment plant above 2MLD	
	All Government, public sector offices and institutions, Forensic science lab, – all the above uses subject to the condition that floor area shall be limited to 1000 sq.m.	All Government and Public Sector offices, Public Utility Areas & Building, Social welfare centre, Museum - all the above uses above 1000 sq.m		

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	All educational institutions subject to the condition that floor area shall be limited to 1000 sq. m	All educational institutions above 1000 sq. m		Any other uses not specified in columns 2, 3 & 4
	IT hardware/ Electronic Industries	Outdoor game stadium, Amusement parks, Dairy farm /Poultry farm, Sewage treatment plant below 2MLD		
	Public utility buildings, Places of worship - all the above uses subject to the condition that floor area shall be limited to 300 sq.m.	Public utility buildings, Places of worship - all the above uses above 300 sq.m up to 1000 sq.m.		
	Clinics, diagnostic centres and hospitals up to 300 beds	Hospitals above 300 beds		
	Social welfare centres, Museum, Auditorium, Wedding hall, Swimming pool, Exhibition Centre and art galleries, community halls, Convention centres , Places of worship, Public Utility Areas & Building cultural and information centres - all the above uses subject to the condition that floor area shall be limited to 1500 sq. m	Social welfare centres, Exhibition Centre and art galleries, Museum, Auditorium, Wedding hall, movie halls, Convention centres, Exhibition Centre and art galleries, Places of worship, Indoor game stadium above 1500 sq.m		
	Cottage industry, Automobile workshops for 2/3 Wheelers, Automobile service station for light vehicles, Manufacturing and Service Industries of non-nuisance nature (Annex 32.1) engaging not more than 19 workers without power or 9 workers with power limited to 10 HP, Printing press, Water treatment plants below 5 MLD			
	Tot Lots/Parks/Play Grounds, open air theatre , camping site			

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Smoke house attached to Residential Buildings, Smoke house			Any other uses not specified in columns 2, 3 & 4
	Marble and granite storage/cutting centres.	Bus terminals/stand, lorry stand		
	Ice factory, Cold storage, Water treatment plants up to 5 MLD			
	Amusement park, Transmission towers and wireless stations			
33.2.8	**MIXED ZONE –II**			
	All permitted uses in High density Residential (33.2.4), Commercial zone (33.2.5) and Public and semi Public zone (33.2.9)	All restricted-I uses in High density Residential (33.2.4), Commercial zone (33.2.5) and Public and semi Public zone (33.2.9)	All restricted. II uses in High density Residential (33.2.4), Commercial zone (33.2.5) and Public and semi Public zone (33.2.9)	Any other uses not specified in columns 2, 3 & 4.
33.2.9	**PUBLIC AND SEMI PUBLIC ZONE**			
	All Government and Public sector offices and institutions and its incidental uses.	Transmission Towers and wireless stations, R & D institutes, Radio and TV station, Civil defence and home guard, Indoor game stadium, Convention centre	Fuel filling stations	Any other uses not specified in columns 2, 3 & 4.
	Day care and crèche, All educational institutions of area up to 1000 Sq:m	All educational institutions, IT Hardware / Electronic Industries, Automobile workshops for 2 wheelers/ Light motor vehicles	Cremation ground/ crematorium, Burial Ground/ Common Vault	
	All medical institutions of area up to 1000 Sq;m	All medical institutions		
	Water treatment plant below 5 MLD	Indoor and Outdoor game stadium, Amusement parks, Water treatment plant above 5 MLD		

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Library and reading rooms, Social welfare centres, Museum, Auditorium, Wedding hall, Swimming pool, Exhibition Centre and art galleries, community halls, cultural and information centres, public utility buildings, Places of worship.			Any other uses not specified in columns 2, 3 & 4
	All Residences – floor area up to 300 sq. m, Residential uses incidental to the public and semi pubic uses.			
	Night Shelters, Orphanages/Old Age Homes/Dharmasala, Residential Quarters, Farm Houses, Ashram/ Mutt, Convents			
	ATMs, Cyber café, Restaurant/ Canteen - all the above uses subject to the condition that floor area shall be limited to 300 sq.m, Beauty parlors, Gymnasium/ Yoga centre			
	Shops, Commercial offices, and Restaurants/Canteen, Professional Offices, Banking and Financial institutions – all the above uses subject to the condition that floor area shall be limited to 500 sq. m			
	Tot Lots/Parks/Play Grounds, open air theatre , Camping site			
	Plant Nursery , Storage of Agricultural Produces and Seeds			
	Parking Plaza			

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
33.2.10	**INSTITUTIONAL PROMOTION ZONE**			
	All uses permitted in Low Density Residential zone as per paragraph 33.2.3.			Any other uses not specified in columns 2, 3 & 4.
	All educational institutions, All Govt. or Public Sector offices and institutions, expansion of existing educational institutions, Forensic science lab, Museum, Auditorium, wedding hall, Convention centres Social Welfare centers, Swimming pool, Exhibition centre and art gallery, Places of worship , Hospitals, Hostels, all uses incidental to institutions			
33.2.11	**INDUSTRIAL ZONE**			
	All type of Industries, Medium Industries, Automobile Workshops, Show rooms, Automobile Service Stations – light/heavy vehicles, Spray painting Workshops and the incidental uses related to above uses	Restaurants / Canteen with floor area up to 200 sq.m	Industrial Estates and Industrial Parks	Any other uses not specified in columns 2, 3 & 4.
	Cold Storage, Ice Factory, Water Treatment Plants	Saw mills with Timber Yards		
	Marble and Granite Storage / Cutting Centres, Minor Storage of Explosives and Fireworks, Gas Godowns	Residential Quarters, Professional offices with floor area up to 200 sq. m		
	Dairy Farm, Smoke houses, Fish and Meat Processing Centre, Sewage Treatment Plants, Junk Yards	Commercial office / Establishments, Banking and Financial institutions with floor area up to 200 sq.m		
	Residences with floor area up to 500 sq. m, Residential uses incidental to industrial use			
	ATMs, Godowns / Warehouse/ Storage of non-hazardous, Weighbridge, IT Software unit, stacking yard			

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
33.2.12	**TRANSPORTATION ZONE**			
	All buildings and uses connected with transport and communication such as Bus Terminal / Lorry / Car/Jeep stand, Railway Station, Container Terminals, Auto Rickshaw stand, essential repair and service shops related to the transport and communication use, Residential uses incidental to main use	Police Post/Station, Post and Telegraph Office, Transmission Towers and Wireless Stations, Telephone Exchange, Electric Sub-Station, Commercial offices/ Establishments/ shops, Banking and Financial institutions approved by Government.		Any other uses not specified in columns 2, 3 & 4.
	ATMs, Restaurants / canteen floor area up to 300 sq.m, Weigh bridges	Lodging houses		
	Public Utility areas and buildings and parks which form an integral part of the transportation use	Extension and maintenances of existing authorised building up to 300 sq.m		
	Tot lots, Parks and play grounds			
	Parking plaza, Bus terminal / Stand, Lorry stand, Auto rickshaw stands, Taxi / Jeep Stands, Container terminal			
33.2.13	**PARK AND OPEN SPACE**			
	Any construction for the development / improvement of park and open space, Tot Lots/Parks/Play Grounds, Public Utility buildings	Fair Grounds, Open Air Theatre, Camping Site, ATMs,	Parking Plazas, Incidental Retail shops, Restaurant, Canteen.	Any other uses not specified in columns 2, 3 & 4.
33.2.14	**THAZHATHANGADI HERITAGE ZONE**			
	No development, redevelopment, construction including additions, alteration, repairs, renovations, replacement of special and architecture features, demolition of any part or whole thereof in respect of any objects or building in the zone, shall be allowed except with the prior written permission of the Kottayam Municipality as stipulated in Paragraph 33.2.32 (General Guide lines)			
33.2.15	**STORAGE /GODOWNS ZONE**			
	Godowns / warehouses/storage of non hazardous materials and its incidental uses.			Any other uses not specified in columns 2, 3 & 4.

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
33.2.16	**SOLIDWASTE MANAGEMENT ZONE**			
	Dumping yard, treatment plants and all connected uses related to solid waste management			Any other uses not specified in columns 2, 3 & 4.
33.2.17	**PADDY/WETLAND ZONE**			
	Agriculture/Horticulture/Fodder cultivation/Fish Farms/Seed Farms/Wells and Irrigation Ponds without any building construction. Pump House	Maintenance, extension and reconstruction of existing authorized building up to 300 sq.m.	Minor Public Utility areas & buildings which will not affect the character of the area.	Any other uses not specified in columns 2, 3 & 4.
33.2.18	**SPECIAL ZONE WITHIN PADDY/WETLAND ZONE**			
	Zoning regulation is same as that of the Mixed Zone-I (Paragraph 33.2.7). For the developments in this area, the conditions stipulated in paragraph 33.2.23 are also applicable.			Any other uses not specified in columns 2, 3 & 4
33.2.19	**LAND RESERVED FOR GOVERNMENT PURPOSE**			
	All buildings of State and Central Governments and Local Self Governments subject to the condition that proper environment Impact study shall be conducted. Studies including ecology and drainage shall also be conducted before implementation of the projects. The provisions of Kerala conservation of Paddy and Wet Land Act 2008 should be satisfied.			Any other uses not specified in columns 2, 3 & 4
33.2.20	**DRY AGRICULTURAL ZONE**			
	All Residences, Orphanages, Old Age Homes, Dharmasala, Ashram/Mutt, Convent – *all the above uses subject to the condition that floor area shall be limited to* 300 sq. m	All Residences above 300 sq.m	Fuel Filling Stations	Any other uses not specified in columns 2, 3 & 4.

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	ATMs, Shops, Professional Offices, Commercial Offices/ Establishments, Banking and Financial institutions, Restaurants/ Canteens – *all the above uses subject to the condition that floor area shall be limited to* 300 sq. m.	Service industries of non-nuisance type (Annexure I) 20 workers without power or 10 workers + 20HP, Saw Mills, Automobile workshops for 2 Wheelers/Light motor vehicles	Dumping yards, Sewage Treatment plants	Any other uses not specified in columns 2, 3 and 4
	Day Care and Crèche, Nursery/Kindergarten/Primary & Upper primary schools, Library and Reading Rooms, Public Utility Areas & Buildings, Swimming pools	Fish / Meat processing centres, Dairy farm, Poultry farm, Piggery farm,	Junk yards, Cremation Ground/ Crematorium/ Burial Ground/ Common Vault	
	Godowns/Warehouses/ Storage – non-hazardous – *all the above uses subject to the condition that floor area shall be limited to* 100 sq.m	Stacking Yards, Godowns/ Warehouses /Storage – non-hazardous, - *all the above uses subject to the condition that floor area shall be limited to* 500 sq. m		
	Clinics (Outpatient) and Diagnostic centres -floor area up to 200 sq. m.			
	Gymnasium/Yoga Centres			
	Transmission towers, Telecommunication towers and Wireless Station, Telephone Exchange.			
	Small and medium service and manufacturing type industries.	LPG godowns, Sawmills with Timber yard		
	Tot Lots/Parks/Play Grounds, Open air theatre, Camping site.			
	Smokehouses attached to residential buildings, Smokehouses.			
	Plant Nursery, Agriculture, Horticulture, Fodder cultivation, Pastures, Grazing grounds, Fish Farms, Seed Farms, Pump House, Wells and Irrigation Ponds.			

Paragraph No.	Uses Permitted	Uses Restricted -1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Storage of Agricultural Produces and Seeds, Green houses.			Any other uses not specified in columns 2, 3 and 4
	Markets - *subject to the condition that floor area shall be limited to* 500 sq.m			
	Places of Worship, Hospitals and health centres – *all the above uses subject to the condition that floor area shall be limited to* 500 sq. m			
	Auditorium/Wedding Halls/Community halls, Convention centre Social Welfare centers–*all the above uses subject to the condition that floor area shall be limited to* 1000 sq m.		Slaughter houses, Storage of explosive and fireworks.	
33.2.21	**WATER BODY**			
	Water landings, Pump houses, Boat jetties, Terminals, Bridges, side protection walls, Fish landing centres	Fish farms	Minor Public Utility areas & buildings which will not affect the character of the area	Any other uses not specified in columns 2, 3 & 4.
33.3.22	**MEDICAL COLLEGE SCHEME AREA**			
	The North-West corner of the Planning area is coming under the sanctioned Area Development Plan for Kottayam Medical College. This area has not been included in any of the zones mentioned in the previous paragraphs and the zoning regulations of the Area Development Plan for Kottayam Medical College are applicable.			
33.3.23	**KODIMATHA HOUSE PLOT AREA**			
	This area will not have the benefit of the proposed or existing road widening since it is considered as an area substantially or exclusively developed as residential area.			
33.2.24	**GREEN STRIP**			
	Area to be used only for planting trees in order to retain as green areas, parks, pump houses, wells and irrigation ponds, storage of agricultural products and seeds, green house.			

33.2.23 The following exclusive regulation for the "Special Zone within the Paddy/Wetland zone" at Kodimatha has been included. The project should be implemented based on the environment Impact study and an area development plan shall be prepared for the area after conducting detailed studies including ecology and drainage. Piecemeal developments shall be avoided in this zone considering the environmental aspects. The whole area shall be developed by a single Agency (Special Purpose Vehicle) constituted by the Government of Kerala for ensuring planned development of the area as per Government orders and Municipal decisions giving thrust to drainage and the agency shall deal with the matters pertaining to

i. The land development and procurement process.
ii. Make proposals for a water collection pond of adequate size and drainage system to take care of flooding issues.
iii. Assigning of developed land.
iv. Compensating land owners who have surrendered land free of cost for developing Kottayam Development Corridor.
iv. Obtaining all necessary statutory clearance at appropriate time pertaining to land development.
v. Preparation of Detailed Plan for the area for the above purpose including action plans.
vi. Monitoring of the whole process.

Necessary clearance from the concerned agencies shall be obtained for conversion of wet land and an environmental impact assessment study has to be conducted prior to development. Details regarding the nature of regulations in these zones are given in subsequent paragraphs.

33.2.24. Those who surrenders land free of cost for the formation of Western Bypass (Travancore Cements Ltd, Nattakom to Parochal), for a depth of 30.00m from the central line of the road, mixed uses as per paragraph 33.2.8 (Mixed Zone.II) is allowed subject to the condition that maximum coverage shall be 40% and FAR shall be 1.50 or as per the Building Rules in force whichever is least and should satisfy all provisions of Kerala conservation of Paddy and Wet Land Act 2008.

33.2.25. Land to a depth of 50 m from central line of road on either sides of the **roads having existing or proposed width of 8m and above** in Residential (both High density and Low density), Public and Semi public, Commercial and Dry Agricultural zones are deemed as Mixed zone II

33.2.26. Land to a depth of 100m in Residential (both High density and Low density), Commercial, Public and Semi Public and Dry agricultural zone along the

sides of **roads with existing or proposed width 12 meter and above,** uses permitted in Residential (both High density and Low density), Commercial, Public and Semi Public zones may also be permitted by the Secretary of Local Self Government Institutions if the uses are not permissible otherwise.

33.2.27. The alignment of **Cherthala byepass** earmarked by **RBDCK** (Roads and Bridges Development Corporation of Kerala LTD) shall be followed for road proposal.

33.2.28. No construction shall be permitted in zones where building construction is prohibited except for repair or reconstruction of existing authorised dwelling units not exceeding existing FAR/existing plinth area.

33.2.29. For the development and construction on either side of Post Office Road condition number (iii) insisted in the GO (Rt) No.262/05/LSGD dated 20.1.2005 shall be followed.

33.2.30. The area reserved for a new stadium at Pulinakkal area, Park and open Spaces at Kalathilkadavu, additional land for Industrial use at Poovanthuruthu, land proposed for Government purpose near Kalathilkadavu bridge in Panachikkad Grama panchayat and additional land for Transportaton use at Nattakom Port area shall be reserved for the purpose for a period of 5 years only. If the responsible authority could not develop or start to develop within a period of 5 years from the date of sanctioning of the scheme, the zoning regulation may be treated as reserved for the uses indicated in the Existing land use map.

33.2.31 Existing areas and structures of archaeological importance, agriculture uses and religious uses may be permitted to continue in all zones and shall not constitute non-conforming uses.

33.2.32 Thazhathangadi Heritage Zone

In the Heritage zone of Thazhathangadi area, not withstanding anything contained in the zoning regulations of the scheme and subject to modifications as prescribed hereunder, no development, redevelopment, construction including additions, alterations, repairs, renovations, replacement of special and architectural features, demolition of any part or whole thereof in respect of any objects or buildings in the area within the Heritage Area, shall be allowed by the Municipality subject to the following conditions. Provided that, no buildings or objects, which in the opinion of the Municipality have architectural, aesthetic, archaeological, cultural or historic value, will be allowed to change from the existing condition without prier permission of the Municipality. Provided also that new constructions and additions or

alterations to existing buildings may be permitted in this area with the following additional regulations namely;

i. The total number of storeys including the existing if any shall not exceed two from the street level.

ii. The overall height of the construction including the existing upto the topmost point of the proposed construction shall not exceed 9 metres and

iii. The architectural character of the facades of the construction shall be as per the advice of the Municipality.

Provided also that the use or reuse of any site or building shall be as per the recommendations of the Municipality.

33.2.33. Only the existing public and semi-public areas (as on the date of publishing the plan) has been included in the public and semi-public use zone of the proposed land use Map and no new plots has been included in this zone. The public and semi public zones are limited to the boundary of the plot with existing public and semi-public uses. In case any adjacent plots which are marked as public and semi-public zone in the map but not under the public and semi public use will be considered to be included in the adjacent zone as per proposed land use map. In these cases, each case has to be studied individually and concurrence of the Town Planner shall be obtained.

33.2.34. The provisions of Noise Pollution (Regulation and Control) Rules 2000, at places notified as 'silent zones' by respective government orders shall be followed.

33.2.35. Irrespective of zones and uses permitted/restricted in the zones, the provisions of Kerala Conservation of Paddy and Wet Land Act 2008 shall be followed where ever the Act is applicable.

33.2.36. In the case of concurrence issued for constructions involving filling of wetland, low lying land and paddy fields, various mitigation measures including proper drainage measures has to be specified and local bodies has to ensure that same are provided / enforced. Necessary permission from the concerned department shall be obtained for filling and development of wet land, low lying land and paddy fields.

33.2.37. A green strip of 10.00m width shall be provided along the sides of Meenachil River, Neelimangalam river, Kodur river and Puthenthodu (Boat jetty canal Junction to Scheme boundary) excluding those areas where river bank roads are proposed.

33.2.38. Zoning regulations are not intended to prohibit existing uses that have been lawfully established prior to the enforcement of these regulations. They are essentially intended to help the competent authority in decisions regarding granting or refusal of planning permissions for land use conversions and construction of buildings/ structures or any other matter specifically mentioned in these regulations.

33.2.39. For the zone marked as Medical College Scheme area in the proposed land Use Map GLS/2 Map), the zoning Regulation, road widening / new road proposals as per the sanctioned Area Development Plan for Medical College is applicable.

33.2.40. If a plot under a particular survey number/numbers included in a single document registered before date of sanction of this plan, falls under two different zones, zoning of major portion (more than 50%) is applicable to the whole plot

33.2.41. The powers entrusted to the authorities for approval of usage of plot and layout shall be in compliance with the building rule applicable for the area is to be followed as such unless otherwise specified in this regulations.

33.2.42. Subject to zoning regulations of the respective use zones, more than one uses may be combined in a building, provided that the total floor area of such a building shall not exceed the maximum floor area permitted for any of such use premises in that use zone.

33.2.43. For the purpose of these regulations, floor area means the total floor area of the building in all floors.

33.2.44. Regulation of Constructions on the sides of new roads or 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 General Town Planning Schemes or any detailed road alignments approved by the Chief Town Planner.

33.2.45. The provisions of the Detailed Town Planning schemes or Area Development Plans will prevail over the regulations mentioned above.

33.2.46. Large scale development proposals in an area not less than 2 Ha., which provide direct employment (after commissioning of the project) to the tune of not less than 50 and Higher education and Research Centres may be permitted in all zones except following zones namely park and open spaces zones, Environmentally sensitive areas, water body and if not already included under ‘uses permitted’ or ‘uses

restricted' category as per these regulations, subject to the satisfaction of relevant Acts and rules in force and also subject to the recommendation of a committee to be constituted by the Government for this purpose, under the chairmanship of the Secretary, Local Self Government Department, consisting of the Chief Town Planner of Kerala State Town and Country Planning Department, the Town Planner, District office of the Kerala State Town and Country Planning Department, Kottayam, the Secretary, Kottayam Municipality, the Secretary Vijayapuram Grama Panchayat and the Secretary Panachikad Grama Panchayat and satisfying the following conditions. The Chief Town Planner is the Convenor of the Committee.

i. The developer shall produce project-cum-feasibility report and Environmental Impact Assessment Report, if required, of the project to the convener of the committee, at least15 days in advance of the committee meeting.

ii. The developer shall produce before the committee all required clearances from the State and Central Government agencies concerned.

iii. Adequate provision shall be made for supporting infrastructure such as water supply, sewerage, solid waste management etc. Separate sewage treatment plant and solid waste management measures shall be provided and maintained by the developer at his cost.

iv. Adequate MoU between the developer and the Secretary, Kottayam Municipality/ Secretary, Vijayapuram Grama Panchayat / Secretary, Panachikkad Grama Panchayat shall be undertaken to bring this into effect.

v. The maximum FAR shall be 2 and minimum access width shall be 12m.

vi. The project shall be completed within a period of 3 years if not specified otherwise.

33.2.47. (i) Expansion of existing Public and Semi-public institutions to adjacent plots shall be permissible without regard to the land use in which such adjacent plot is zoned and the development regulations imposed by such zoning, subject to the provisions of Paddy Land and Wetland Act in force or other applicable statutes.

(ii) The Secretary of Local Self Government Institutions, with the concurrence of the District Officer of the Department of Town and Country Planning having jurisdiction over the area, shall permit in land uses such as Paddy Land or Water body, such uses that are permissible in adjacent land use zone, if that particular land in the Paddy Land Zone or Water body Zone is not classified as Paddy Land or Water body as per revenue records.

Part.V



FINANCE RESOURCE PLANNING AND PHASING

34 Finance Resource Planning and Phasing

34.1 Introduction

The financial resource planning and phasing of major projects included in the master Plan for Kottayam, which are to be implemented within the plan period of 20 years, are included in this chapter. The project Cost (Rough cost estimate), implementing agency, phasing of the project, further studies and actions etc are included in this chapter.

34.2 Project cost

The rough cost estimate for the capital investment of different sectors is given in Table 34.1. The total estimated cost of the projects at the 2013 price level is 551050 lakhs (rough cost estimate only). Detailed project report, financial analysis and cost estimation of each project are to be done during the implementation stage.

Table 34.1 Rough Cost Estimate of Projects

Sl:No.	Sector	Rough Cost Estimate (In Lakhs)	Implementing Agency
1	Road Network	320400	PWD, Local Bodies
2	Other projects in Transportation Sector	175400	PWD, Local Bodies
3	Trade and Commerce	8700	Government, Private Sector
4	Industry	3500	Government, Private Sector
5	Tourism and Heritage	6000	Government, Private Sector
6	Agriculture	800	Government, Private Sector
7	Animal Husbandry	600	Government, Private Sector
8	Fisheries	350	Government, Private Sector
9	Housing	350	Government, Municipalities, Private Sector
10	Drinking Water	3150	Government, Private Sector
11	Energy	1300	KSEB

12	Waste Disposal	4200	Government, Municipality, Private Sector
13	Education	11300	Government, Private Sector
14	Health	9200	Government, Private Sector
15	Civic Facilities, Culture	2300	Government, Private Sector
16	Environment	2500	Government, Private Sector
17	Governance	1000	Government, Municipality

34.3 Phasing of the Projects

The proposals given in the Master plan are envisaged for a perspective period of 20 years. The phases of implementation of proposals of the Master plan is given has to be phased accordingly.

34.4 Additional Studies

For the major projects, detailed investigations and studies like Environment Impact Assessment has to be conducted on a case by case basis as and when the projects are taken up for implementation.

34.5 Detailed Road alignment Plans/Other implementation mechanisms

Procedures for preparing Road alignment Plan for all new roads are to be taken immediately after publishing the Master Plan. In order to utilize the land effectively and to ensure planned development by applying appropriate town planning techniques detailed plan and project has to be prepared for different proposals by a competent agency.



ANNEXES

ANNEX 33.1

TYPE OF NON-OBNOXIOUS AND NON-NUISANCE TYPE OF SERVICE OR LIGHT INDUSTRIES

1. Apparel making.
2. Aerated water and fruit beverages
3. Assembly of bicycles, baby carriage and other small non-motorised vehicles.
4. Atta-chakkies.
5. Bakery products, biscuit confectionery.
6. Bamboo and cane products (only dry operations)
7. Block making for printing.
8. Cardboard or corrugated box and paper products (Paper or pulp manufacturing excluded)
9. Carpet weaving.
10. Cement blocks, paving tile units
11. Chilling plants and cold storage.
12. Cotton and woollen hosiery.
13. Electronic equipment, electrical goods.
14. Fountain pen making.
15. Flour mills.
16. Furniture and packing case making without machinery.
17. Garments stitching, tailoring.
18. Gold and Silver smithy.
19. Gold and Silver thread sari works.
20. Ground nut decorticating (Dry).
21. Ice-cream or Ice making.
22. Insulation and other coated papers (Paper or pulp manufacturing excluded).
23. Jobbing and machining.
24. Leather footwear and leather products excluding tanning and hide processing.
25. Manufacture of formulated synthetic detergent products.
26. Manufacture of soaps involving process without generation of trade effluent (saponification of fats and fatty acids only)

27. Medical and surgical instruments.
28. Manufacture of mineralised water.
29. Musical instruments manufacturing.
30. Oil ginning/expelling (no hydrogenation/refining)
31. Manufacture of Optical-frames.
32. Paint (by mixing process only)
33. Manufacture of Paper pins and U-clips.
34. Power looms/handlooms (without dyeing and bleaching).
35. Printing press.
36. Radio assembling.
37. Rice mullers.
38. Manufacture of Rope (cotton and plastic)
39. Scientific and mathematical instruments.
40. Shoelace manufacturing.
41. Sports goods manufacturing.
42. Steeping and processing of grains.
43. Thermometer making.
44. Toys making.
45. Spice grinding operation.
46. Furniture without machinery.
47. Electro plating.
48. Gold and Silver smithing.
49. Rubber goods industry (Micro and Tiny units only)

