MASTER PLAN

FOR

CHAVAKKAD TOWN

2031



Prepared by

CHAVAKKAD MUNICIPALITY, LOCAL SELF GOVERNMENT DEPARTMENT
PLANNING ,
GOVERNMENT OF KERALA
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Chavakkad Municipality

Local Self Government Department Planning , Government of Kerala

Master Plan for Chavakkad Town -2031

FOREWORD

Chavakkad was a major trade and commerce centre from ancient days itself. Canoli Canal has played a major role in the development and establishment of Chavakkad as a trade center. Due to huge migration to Gulf countries during 70s and 80s, it is also known as Mini Gulf of Kerala.The growth of the town into a major commercial and pilgrim centre has been in a haphazard manner. So in order to tackle the issues associated with the expansion of the town, need for a Master Plan was felt and thus the council unanimously decided to prepare master plan vide Council resolution No. 3 dated 24th August 2012. Now the draft plan is prepared and I am sure that this plan can definitely help Chavakkad to be a more habitable space in the near future. Various proposals in tourism i.e. revitalization of Canoli canal, recreational space in Vanchikadavu, recreational corridor and beautification of Blangad beach etc. are focussed to connect the fisheries to the tourism and transforming Chavakkad in to one of the major tourist attractions of Thrissur district. The suggestions in the service sectors are certain solutions towards ensuring peaceful and healthy living atmosphere for the inmates of the town.Proposed Grid Iron pattern road network through the provision of East-West and North- South corridors along with intersection improvements, pedestrian facilities and shifting of market activities along with the provision of multilevel car parking would effectively decongest the core area and facilitate thorough traffic without any interruption or delay. The provisions of this plan are tailored to ensure planned development of the area.

All the members of the present and previous council have actively participated in the discussions for finalising the plan. I take this opportunity to appreciate the efforts put in by the former Municipal Chairman Shri. N.K. Akber, Chairperson Smt. Satheerathnam Surendran and former Municipal Vice Chairman Shri. Malikkulam Abbas, for their active involvement in the work. Former standing Committee Chairpersons Shri. Radhakrishnan M.R etc. and the present Councillors are also appreciated for their immense association with the work.The active participation by the various Special Committee (SC)members, working group members and the contribution from expert members of the SC have made this planning exercise prolific.

Here is a brief description of the events that took place while this document was being prepared. A training on General Planning process and Local level analysis for SC members and planning team was convened on 6th February 2013 to create awareness about the process and other details of plan preparation. Prior to the first SC meeting, a development seminar was conducted on 16/5/13. The initial development seminar was conducted in the auspicious presence of Shri K.V. Abdulkhader, the honourable MLA of Guruvayoor legislative assembly constituency.

The first meeting of SC was convened in June 2013 with the objective of data collection/updating. It was conducted during the days 12/6/13, 13/6/13 and 14/6/13. Socio economic data collection/ updating were completed with a workshop in September 2012 which was sincerely done by Kudumbasree members of Chavakkad Town.

Finally in January 2015 the findings of various analysis and the development proposals were discussed with the SC and working group. From the comprehensive negotiations arrived at from the meeting held on 17 th of January 2015 at the Municipal Council hall, Chavakkad sectoral proposals gained a momentum. In continuation to this meeting, a site visit was arranged on 19 th of January 2015 with the then Vice Chairman Shri. Malikkulam Abbas and Standing Committee Chairman Shri.Radhakrishnan M.R, so that suitable locations for development proposals could be identified. The draft Master plan thus prepared and approved by the Chief Town planner (Planning) was approved by the Municipal council vide council resolution No. 1 dated 28th November 2017,and submitted to Goverment for publication sanction. The Goverment accorded the publication sanction vide G.O. (Ms) No. 89/2018/LSGD dated 03/07/2018. There by, the Municipal Council published the draft Master Plan on Official Gazette, Municipal website & notice board and in news papers, inviting objections and suggestions from the people concerned to be submitted with in the presribed time. A Special Committee was formed as per norms and processed the recieved objection and suggestions and submitted report in the prescribed format to the Municipal Council. The Municipal Council considered the report of the SC on received objections and suggestions and determined to modify the draft Master Plan according to SC recommendations and entrusted to District Town Planner for accomplishing such modifications. The modified Master Plan thus prepared is hereby submitted to Goverment for sanctioned .

The tireless effort by the staff members of the Thrissur District Office of the LSGD Planning Department is the back bone of this plan.

A Master Plan becomes prolific only when the provision and proposals envisioned in it are implemented. In this respect I request all the development partners, to own the plan and be part of its implementation.

Smt. Sheeja Prasanth

Chairperson,
Chavakkad Municipality

PREFACE

With the promulgation of 73rd and 74th Constitutional Amendment Acts and subsequent State Acts, decentralized planning process came into operation in the State, entrusting functional and fiscal powers to the Local Self-Governments. Acheiving local development is one of the main objectives of decentralized planning approach. The Kerala Town and Country Planning Act 2016, which subsequently came into force enables preparation of a Master Plan by Local Self Goverments, be it a Municipal Corporation, Municipality or Grama Panchayath. The Goverment of Kerala have facilitated preparation of Master Plans for all statutory towns in the State through the Plan scheme ' Preparation of Master Plans and Detailed Town Plans', with the technical support of Local Self Goverment (Planning) Department.

Chavakkad town, from older times was a major commercial centre with fish, beedi, coir and oil as the major industries. A Detailed Town Planning scheme was prepared for the Central area of Chavakkad town long way back in 1990s. As Chavakkad town is one of the fast growing commercial centres, Master Plan becomes a necessity to bring about growth in planned and controlled manner.

The draft Master Plan for Chavakkad Town was prepared after conducting comprehensive discussions with the Councillors as well as Special Committee members. Many workshops and training sessions were conducted for the SC members and working groups. The contribution and co-operation received from the SC and working group members were unparalleled. The Development Seminar conducted to include the aspirations of the people had a good response. Thus a good level of people's participation was ensured in this plan.

For the preparation of this plan, extensive surveys and studies were carried out, including land use survey, traffic and transportation studies, socio economic survey (conducted on households) secondary data collection etc. Detailed analysis was done for both inter and intra sector which revealed the problems and potentials of the town that need attention and various proposals were carved out.

I take this opportunity to express my sincere appreciation to the Hon'ble Chairpersion, the Municipal Council and the members of the special committee for successfully finalising a comprehensive Master plan for the planned development of Chavakkad town with a long vision. The hard work, spirit and the sincerity of the planning team in the Thrissur Office headed by the

District Town Planner Sri. K.R. Rajeev , in the preparation of the Master Plan is highly appreciated.

The contributions of the former District Town Planner's, namely, Shri. K.M. Gopakumar, Sri.V.K.Mohandas, Sri. V.A Gopi, needs special mention at this juncture.

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

H. Prasanth

Chief Town Planner (Planning)

Thiruvanathapuram

Local Self Goverment (Planning)Department

Government of Kerala.

ACKNOWLEDGEMENT

The preparation of Master Plan for Chavakkad Town was initiated with Council resolution No. 3 dated 24th August 2012. The works for the preparation of Master Plan for Chavakkad Town was thus taken up under second phase of the scheme of preparation of master plans as per administrative sanction obtained vide G.O (R.T) No. 1376/2012/LSGD dated 17th May 2012. The preparation of modified Master Plan for Chavakkad Town in accordance with received objection and suggestions is now completed. The modified Plan prepared is sure to stream line the growth of the town in a planned and organised manner.

First and foremost I highly obliged, to the Municipal Chairperson Smt. Sheeja Prasanth, former Chairman Shri. N. K. Akbar, former Chairperson Smt. Satheerathnam, Vice Chairman Shri. Mubarak.K.K, Smt. Manjusha and Shri. Malikkulam Abbas former Vice Chairmans, and all the other Council members of previous and present Councils for their immense support and co-operation to this endeavour, at all the phases of the work. The effort and enthusiasm of the SC members and all the members of the working groups are highly appreciated. I take this opportunity to express my gratitude to the Convenors of all the working groups, for having contributed wonderfully to this plan. The sincere efforts put in by the Secretary and Municipal Engineer needs special mention here.

I also express my warm gratitude and cordial to shri. H. Prasanth, Chief Town planner (Planning), Smt. Girija and Sri. Shaji Joseph, former Chief Town Planners (Planning), Shri. Ajay Kumar.S, Senior Town planner (Planning) , Smt. Mitzie Thomas , Town Planner and Shri.J. Jayakumar, Smt. Usha Kumari. P.R, former Senior Town Planners(Planning), office of the Chief Town Planner (Planning) for their support and guidance in bringing out this draft plan, in the scheduled time. I also thank for the timely guidance and support rendered by the officials of the Planning wing of the Department for the scheme.

I sincerely appreciate the hard work and unequivocal sincerity of the planning team in the District Town Planning office comprising of shri. K.B.Manojkumar, Deputy Town planner, Smt .Deepa. V .P and Smt. Jinumole Varghese, former Deputy Town Planners, Smt. Vimaja. C.R, Assistant Town Planner , Smt. Lathika. P.V, I st Grade Surveyor/ Draughtsman ,Smt.Meenakshy C and Shri.Ravindran.P.K, former I stGrade Surveyor/ Draughtsmans in completing all the works in a time bound and organised manner and bringing out the Master Plan within the stipulated time.

I am also indebted to the statistical team and all other staff members of this office including project staff for all the co-operation and timely support extended. The services of Shri. K.M.Gopakumar,V.K. Mohandas, and V.A. Gopi former District Town Planners Thrissur is acknowledged with gratitude on this occasion.

Thrissur,
21.07.2022

K.R.Rajeev
Town Planner

CHAVAKKAD MUNICIPALITY

COUNCIL MEMBERS - 2022

WARD NO	NAME OF WARD	COUNCILOR
1	Puthen Kadappuram North	Smt. Ummu Rahmath
2	Gramakulam	Smt. Sreeji Subhash
3	Thiruvathra North	Smt. Priya Manoharan
4	Kunchery	Sri. Muhammed Anvar.A.V
5	Punna North	Smt. Shahida Muhammed
6	Punna South	Sri. R.M.Ummer
7	Alumpadi	Smt. Manju Sushil
8	Mammiyoor	Smt. Baby Francis
9	Muthuvattoor	Sri. K.V.Sathar
10	Ovungal	Sri. P.S.Abdul Rasheed
11	Palayoor North	Sri. Akbar Konoth
12	Palayoor East	Smt. Joysi Teacher
13	Palayoor South	Smt. Shahina Salim
14	Palayoor	Smt. Supriya Ramachandran
15	Palayoor West	Sri. K.V.Shanavas
16	Chavakkad Town	Smt. Bushara Latheef
17	Kozhikkulangara	Smt. M.B.Prameela
18	Manathala North	Smt. Smrithy.S.S
19	Civil Station	Sri. Faisal
20	Manathala	Smt. Ummu
21	Blangad	Sri. Renjith Kumar
22	Madekkadavu	Sri. K.C.Manikandan
23	Blangad Beach	Sri. Kabeer
24	Dwaraka Beach	Smt. Girija Prasad
25	Pulichirakkettu West	Smt. Remya Binesh
26	Pulichirakkettu East	Smt. Sheeja Prasanth
27	Parappil Thazham	Smt. Prasanna Ranadive
28	Puthan Kadappuram South	Sri. Asmathali
29	Kottappuram	Sri. P.K.Radhakrishnan
30	Puthiyara	Sri. K.K.Mubarak
31	Thiruvathra	Sri. M.R.Radhakrishnan
32	Puthan Kadappuram	Smt.Shahidha

CHAVAKKAD MUNICIPALITY

COUNCIL MEMBERS - 2010-2015

WARD NO	WARD NAME	COUNCILOR
1	Puthen Kadappuram North	T.A.Haris
2	Gramakulam	Tharayil Janardhanan
3	Thiruvathra North	K.H.Salam
4	Kunchery	Subura
5	Punna North	Shahida Muhammed
6	Punna South	Hima Manoj
7	Alumpadi	K.S.Baburaj
8	Mammiyoor	Saison Marokki
9	Muthuvattoor	Santha Subramanian
10	Ovungal	M.B.Rajalakshmi
11	Palayoor North	Haseena Salim
12	Palayoor East	Joycy.V.J
13	Palayoor South	Shahina Salim
14	Palayoor	P.V.Peter
15	Palayoor West	Bushara Latheef
16	Chavakkad Town	A.H.Akbar
17	Kozhikkulangara	N.K.Akbar
18	Manathala North	Viswambharan
19	Civil Station	Nazeem Abhu
20	Manathala	Saleem Panantharayil
21	Blangad	Manjusha Suresh
22	Madekkadavu	Manjula Jayan
23	Blangad Beach	Karthiayani Teacher
24	Dwaraka Beach	A.C.Anandan
25	Pulichirakkettu West	Suresh Babu
26	Pulichirakkettu East	A.A.Mahendran
27	Parappil Thazham	P.P.Narayanan
28	Puthan Kadappuram South	Seenath
29	Kottappuram	Manju Krishnan
30	Puthiyara	Adv.Haseena
31	Thiruvathra	Lisha Mathramkottu
32	Puthan Kadappuram	P.M.Nazar

CHAVAKKAD MUNICIPALITY

COUNCIL MEMBERS - 2013

Ward No	Name of Ward	Councilor
1	Puthen Kadappuram North	Smt. NoorjahanChinganath
2	Gramakkulam	Smt. Indira Ramu
3	Thiruvathra North	Smt. ResmiBiju
4	Kuncheri	Shri. Shanavas K.V
5	Punna North	Shri. Sulaimu P M
6	Punna South	Shri. Yatheendra Das P
7	Alumpady	Smt. HimaManoj
8	Mummiyoor	Shri. Baby Francis
9	Muthuvattoor	Shri. Sathar K.V
10	Ovungal	Shri. Abdul Rasheed P.S
11	Palayoor North	Shri. Malikkulam Abbas
12	Palayoor East	Shri. Sajan E.M
13	Palayoor South	Smt. SahinaSalim
14	Palayoor	Smt. KomalamMundathara
15	Palayoor West	Shri. Abdul Letheef
16	Chavakkad Town	Smt. Bushara T.S
17	Kozhikkulangara	Smt. Rajalekshmi M B
18	Manathala North	Smt. SandhyaAnilkumar
19	Civil Station	Shri. Abdul Kalam
20	Manathala	Smt. LailaSubair
21	Blangad	Shri. Sureshkumar P.V
22	Madekkadavu	Shri. Sudheeran K.K
23	Blangad Beach	Smt. K.K.Karthiayani Teacher
24	Dwaraka Beach	Smt. Padmaja Teacher
25	Pulichirakkettu West	Smt. RamaniBaburaj
26	Pulichirakkettu East	Smt. SatheerathnamSurendran
27	Parappil Thazham	Smt. JyothiKrishnadas
28	Puthen Kadappuram South	Shri. Nasar P.M
29	Kottappuram	Shri. Mohanan P.K
30	Puthiyara	Shri. K.M Ali
31	Thiruvathra	Shri. Radhakrishnan M.R
32	Puthen Kadappuram	Smt. FathimaHaneefa

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LIST OF SYMBOLS AND ABBREVIATIONS

ARWSS	Accelerated Rural Water Supply Scheme
ATM	Automatic Teller Machine
AUWSP	Accelerated Urban Water Supply Program
BOD	Biological Oxygen Demand
BOT	Build, Operate and Transfer
BPL	Below Poverty Line
BRGF	Backward Regions Grant Fund
BSNL	Bharath Sanchar Nigam Limited
BSY	Balika Samrithi Yojana
BW	Bore well
CBSE	Central Board of Secondary Education
CC	Cement Concrete
CESS	Centre for Earth Science Studies
CFL	Compact Fluorescent Lamp
CFI	Cumulative Functional Index
CHC	Community Health Centre
CI	Concentration Index
CNC	Computer Numerical Control
CPHEEO	Central Public Health Environmental Engineering Organization
CT	Computerized Tomography
D& O Trade	Dangerous and Offensive Trade
DIC	District Industrial Centre
DMS	Data Management System
DPC	District Planning Commitee
DPR	Detailed Project Report
DRW	Drought Relief Work
DTP	Detailed Town Planning
DTPC	District Tourism Promotion Council
DUR	District Urbanisation Report
DSP	District Spatial Plan
DWCUA	Development of Women and Children in Urban Areas
DYSP	Deputy Superintendent of Police
ECG	Electro Cardio Gram
EEG	Electro Encephalon Gram
ENT	Ear, Nose and Throat

ESA	Environmental Sensitive Areas
ESI	Employees State Insurance
EWS	Economically Weaker Section
FFDA	Fish Farmers Development Agency
FOP	Financial Operating Plan
FY	Financial Year
Gm	Grams
GO	Government Order
GOI	Govt.of India
GOI-UNDP	Govt.of India- United Nations Development Programme
GOK	Government of Kerala
GP	Grama Panchayat
gpcd	Grams per Capita per Day
GPF	General Provident Fund
GPS	Global Positioning System
GPS	Global Position System
GWT	Ground Water Table
H_2S	Hydrogen Sulphide
Ha	Hectares
hect	Hectares
HH	Households
HHI	Household industries
HP	Horse Power
HS	High School
HS	Health Supervisor
HSS	Higher Secondary school
HT	High Tension
HUDCO	Housing and Urban Development Corporation
ICDS	Integrated Child Development Scheme
ICSE	Indian Council of Secondary Education
ICU	Intensive Care Unit
IDDP	Integrated District Development Plan
IHSDP	Integrated Housing and slum Development Project
IMAGE	Indian Medical association Goes Eco friendly
IP	In Patient
IRCTC	Indian Railway Catering and Tourism Corporation
ISP	Integrated Sanitation Program

IT	Information Technology
ITC	Industrial Training Centre
ITES	Information Technology Enabled services
ITI	Industrial Training Institute
KILA	Kerala Institute of Local Administration
KINFRA	Kerala Infrastructure Development Corporation
KMs	Kilometre
KPCB	Kerala State Pollution Control Board
KSEB	Kerala State Electricity Board
KSRTC	Kerala State Road Transport Corporation
KSTP	Kerala State Transport Project
KSWDC	Kerala State Women's Development Corporation
KSY	Kishori Sakthi Yojana
KUDFC	Kerala Urban Development Finance Corporation
KVA	Kilo Volt Ampere
KW	Kilo Watt
KWA	Kerala Water Authority
KWH	Kilo Watt Hour
LCS	Low Cost Sanitation
LDP	Local Development Plan
LED	Light-Emitting Diode
LIC	Life Insurance Corporation
LIG	Low Income Group
LIS	Lift Irrigation scheme
Lit	Liters
LL	Lakh Liters
LP	Lower Primary
lpcd	Liters Per Capita Per Day
LPG	Liquefied Petroleum Gas
LSGD	Local Self Government Department
LSGI	Local Self Government Institution
LSGs	Local self Governments
LT	Low Tension
m	Meters
MDR	Major District Road
ML	Million Liters
MLA	Member of Legislative Assembly

MLD	Million Liters per Day
MoEF	Ministry of Environment and Forest
MoUD	Ministry of Urban Development
MP	Member of Parliament
MSL	Mean Sea Level
MSW	Municipal Solid Waste
MT	Metric Tonne
NABARD	National Bank for Agricultural and Rural Development
NATPAC	National Transportation Planning and Research Centre
NCD	Non Communicable Disease
NGO	Non-Governmental Organizations
NH	National Highway
NHAI	National Highway Authority of India
NHED	Nutrition and Health Education
NHG	Neighborhood Group
NICU	New Born Intensive Care Unit
NMAM	Model National Municipal Accounting Manual
NNM	National Nutrition Mission
Nos	Numbers
NORKA	Non Resident Keralites Affairs
NPAG	Nutrition Programme for Adolescent Girls
NRI	Non Residential Indian
NRW	Non-Revenue water
NSDP	National Slum Development Program
NUIA	National Institute of Urban Affairs
O-D	Origin & Destination
OG	Out Growth
OH	Over Head
OHSR	Overhead Service Reservoir
OHT	Over head Tank
OP	Out Patient
PCU	Passenger Car Unit
pH	Potential of Hydrogen
PHC	Primary Health Centre
PMRY	Prime Minister's Rozgar Yojana
PPP	Private Public Participation
PSP	Public Stand Post

PSU	Public Sector Undertaking
PTA	Parent Teacher Association
PVC	Poly Vinyl Chloride
PWD	Public Works Department
R&D	Research and Development
R-APDRP	Restructured Accelerated Power Development and Reforms Programme
RCC	Reinforced Cement Concrete
ROB	Road Over Bridge
RWSS	Rain Water Supply System
SC	Scheduled Caste
SFC	State Finance Commission
SH	State Highway
SHG	Self Help Group
SIC	Spatial Integration Committee
SJSRY	Swarna Jayanthi Shahari Rozgar Yojana
SNP	Supplementary Nutrition Program
SPEM	State Poverty Eradication Mission
SPM	Suspended Particulate Matter
Sq. km	Square Kilometers
SSA	Sarva Siksha Abhiyan
SSI	Small Scale Industries.
ST	Scheduled Tribe
STP	Sewage Treatment Plant
SVL	Sodium Vapour Lamp
SWM	Solid Waste Management
T &CS	Thrift and Credit Societies
TPD	Tonnes per day
TTC	Teachers Training Centre
TWSS	Town Water Supply Scheme
UA	Urban Agglomeration
UDPFI	Urban Development Plan Formulation and Implementation
UGD	Underground Drainage
UIDSSMT	Urban Infrastructural Development Scheme for Small & Medium Towns
ULB	Urban Local Body
UNESCO	United Nations Educational, Scientific and Cultural
UP	Upper Primary
USEP	Urban Self Employment Program

UST	Urban Skill Training
V/C	Volume to Capacity
VAMBAY	Valmiki Ambedkar Awas Yojana
WBM	Water Bound Macadam
WFPR	Work Force Participation Rate
WPR	Work Participation Rate
WSS	Water Supply Scheme
WTP	Water Treatment Plant

CHAPTER 1

INTRODUCTION

Chavakkad Town is one of the urban local bodies and the only coastal Town of Thrissur district. Chavakkad Town is the Head quarter of Chavakkad Taluk. Among the urban LSGIs of Thrissur district Chavakkad has the smallest geographical area and population. Chavakkad Panchayat was formed in 1927 and was upgraded to Chavakkad Municipality on October 1st1978. Chavakkad Municipality is a Third grade municipality. As per 2011 census, geographical area of Chavakkad is 12.41 sq. km and population is 39098. During the last three decades, Chavakkad has developed in to a marine fisheries centre and a beach tourism centre. This development has been in a haphazard manner. The need now is to take into account the existing scenario and to try and introduce new approaches which will ensure that further development is in consonance with the requisites of modern living and within the acceptable environmental parameters.

1.1 Need for Master Plan

1.1.1 Growth of Town

Chavakkad Town is one of the fast growing commercial areas of Kerala along NH 66. Chavakkad has great potential in Marine fishing and Beach tourism. Its nearness to Guruvayur temple, a major pilgrim centre in the South India can makes it a main halting point for pilgrims who visits Guruvayur temple. Many Guruvayur pilgrims are visiting Chavakkad beach. Fringed shadow of coconut lagoons and mesmerizing atmosphere make Chavakkad beach a tourist spot throughout the year. Presence of 'Azhimukham' confluence of river and sea is a uniqueness of this place. NH 66 which cuts across Chavakkad connects two major corridors, Kanyakumari at South and Panjim of Goa at North are passing through Chavakkad Town. Hence planned and controlled development of the central area of the town becomes a necessity.

The presence of famous religious centres like Palayoor St. Thomas Church, Manathala Juma Masjid, Manathala Siva temple etc in and around Chavakkad has created an atmosphere of religious reverence in the city attracting devotees from all around the world. Added to this its glorious history and heritage which also fascinates tourists and researchers. The development of the city into a pilgrim centre, and a major residential settlement, has been in a haphazard manner. It is necessary to guide these developments in an orderly manner based on an integrated development Plan.

Growing at an unprecedented pace, the city needs to imbibe and integrate its elegant past as well as the modern developments into an organic whole, which may involve a purposeful transformation of the socio-economic, natural and built environment. An integrated planning for up-gradation of physical infrastructure, provision of basic amenities, various housing options and preservation of natural environment, will help Chavakkad to portray a "world class" image in the coming years. For achieving the coveted goal, coordinated and integrated approach amongst several agencies involved with urban services and development along with a participatory planning process is needed.

1.1.2 Present planning efforts

Based on District Spatial Plan (DSP) of Thrissur, Chavakkad Town falls under Multifunctional Zone- II and Environmental Concern Zone. In this zone urban activities including higher order educational, health facilities and transportation net work coping up with the requirements are available. It also lies in environmental concern zone due to the coastal belt.

From the activity analysis, it is found that the development nature of most of the LSGIs come under the category of urban activities which promotes service sector activities and industrial sector activities which in turn enhance the fisheries and allied activities.This zone is also influenced by activities of Kochi, the commercial and industrial hub of the state. The zone has immense potential with small scale and village industrial activities in connection with allied activities and also having tourism potential.

The development of Chavakkad Town has to be planned in accordance with the above concept so that the development of the town also contributes to the development of the district as a whole.

1.2 Methodology

Planning process for the preparation of Master Plan is as per the guidelines issued by the Government for the 'Scheme of preparation of master plans for Municipalities'. A Development Seminar was conducted to assess stake holder's perspectives on the Master Plan. The following figure 1.1 describes the methodology adopted for the master plan preparation.

1.2.1 Planning Area

Delineation of planning area for a master plan depends on the depth of growth and expansion toward the surrounding areas. The character and functions of the nearby areas are studied for this purpose. The table 1.1 below gives the details of the surrounding LSGIs arrived at in the settlement study of IDDP Thrissur.

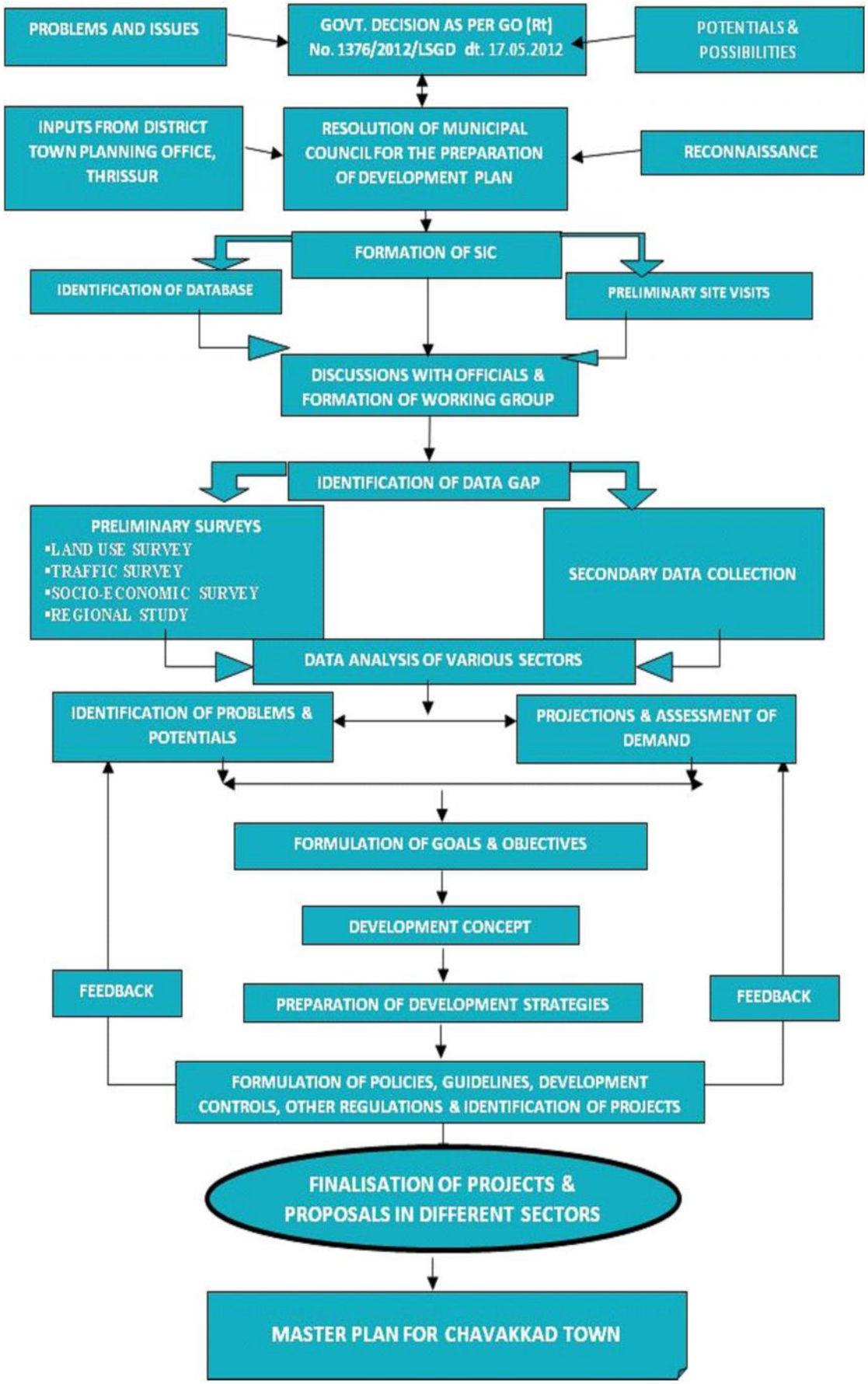


Fig. 1.1 Diagrammatic representation of Methodology for preparation of Master Plan

Table 1.1 Details of Chavakkad Town and surrounding LSGIs

LSGI	Profile	Character	Development Zones
Orumanayur Panchayat	Rural	Rural	Intensive Agricultural Zone
Kadappuram Panchayat	Rural	Urban	Accelerated Growth Zone -Marine
Punnayur Panchayat	Rural	Semi-Rural	Accelerated Growth Zone -Marine
Chavakkad Municipality	Urban	Urban	Multifunctional Zone II, Environmental concern zone
Guruvayur Municipality	Urban	Urban	Multifunctional Zone II

Source: IDDP, Thrissur

Comparing with nearby LSGI's (Regional map), only Guruvayur Town falls under Multifunctional zone II. Chavakkad, Kadappuram and Punnayur fall under 'Accelerated growth marine zone'. Profile and functional character of the Guruvayur Town, Chavakkad Town and Kadappuram Panchayat show as urban. All other surrounding LSGIs show rural or semi-rural character. Since Guruvayur Town is having a published Development Plan, the planning area is confined to Chavakkad Town. Preparation of regional plan including all the above LSGI's in future is recommended.

1.3 Profile of the Town

1.3.1 Location

Chavakkad is located about 32 km northwest of Thrissur, the headquarters of Thrissur District. Chavakkad Town lies between 10°31' North latitude and 76°15' East longitude. The town is located in the coastal area of Thrissur District having almost level ground with an average elevation of +7.60 meters from MSL. Figure 1.2 shows the location of Chavakkad Town.

It is bounded by Punnayur Panchayat in the North, Orumanyur and Kadppuram in the south and Guruvayur Town in the East. Arabian Sea bounds the Town on the western side. Chavakkad can be accessed through NH 66 which connects Kochi to Panavel and also from SH50 staring from Chavakkad to Wadakkanchery.

1.3.2 Area and Population

Total geographical area of Chavakkad Town is 12.41 sq. km and total population is 39,098 as per census 2011 with the density of population being 3151 persons/ sq. km. The male population is 17762 and female population is 21336. Chavakkad Town consists of two revenue villages, Manathala village in full and part of Guruvayur village. Table1.2 shows area details of two villages and Figure 1.3 shows revenue villages in the Chavakkad Town.

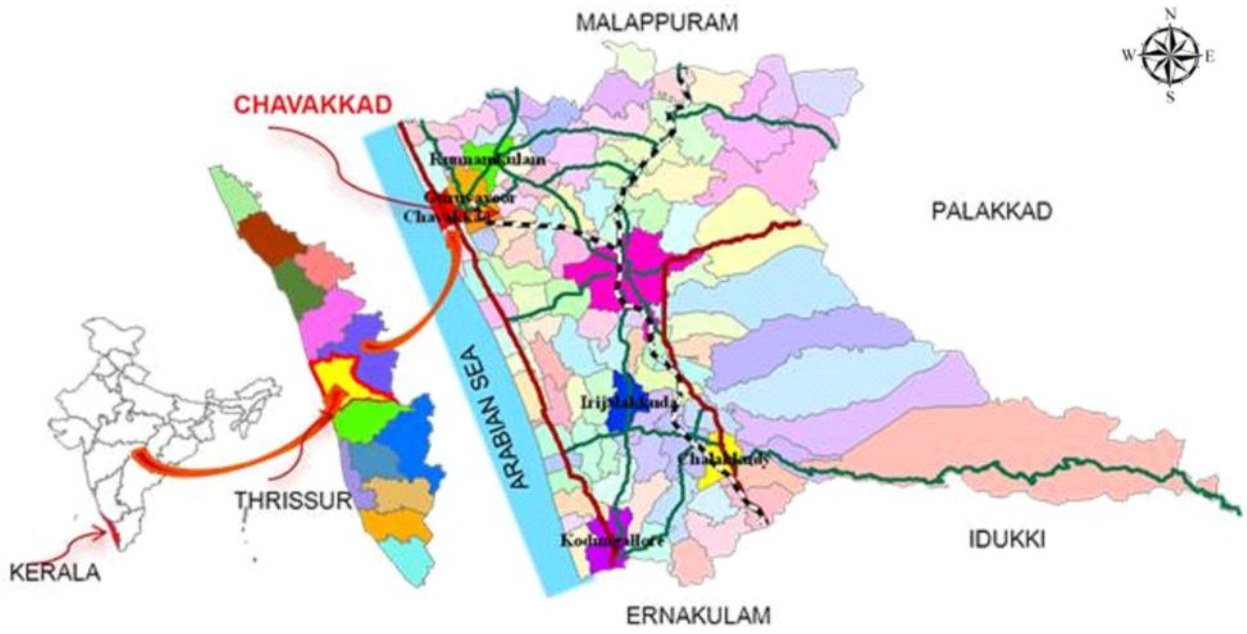


Fig 1.2 Location of Chavakkad Town

Table 1.2 Area of Villages in Chavakkad town

Sl. No	Revenue Villages	Area in sqkm
1	Manathala	8.90
2	Guruvayur(Part)	3.51

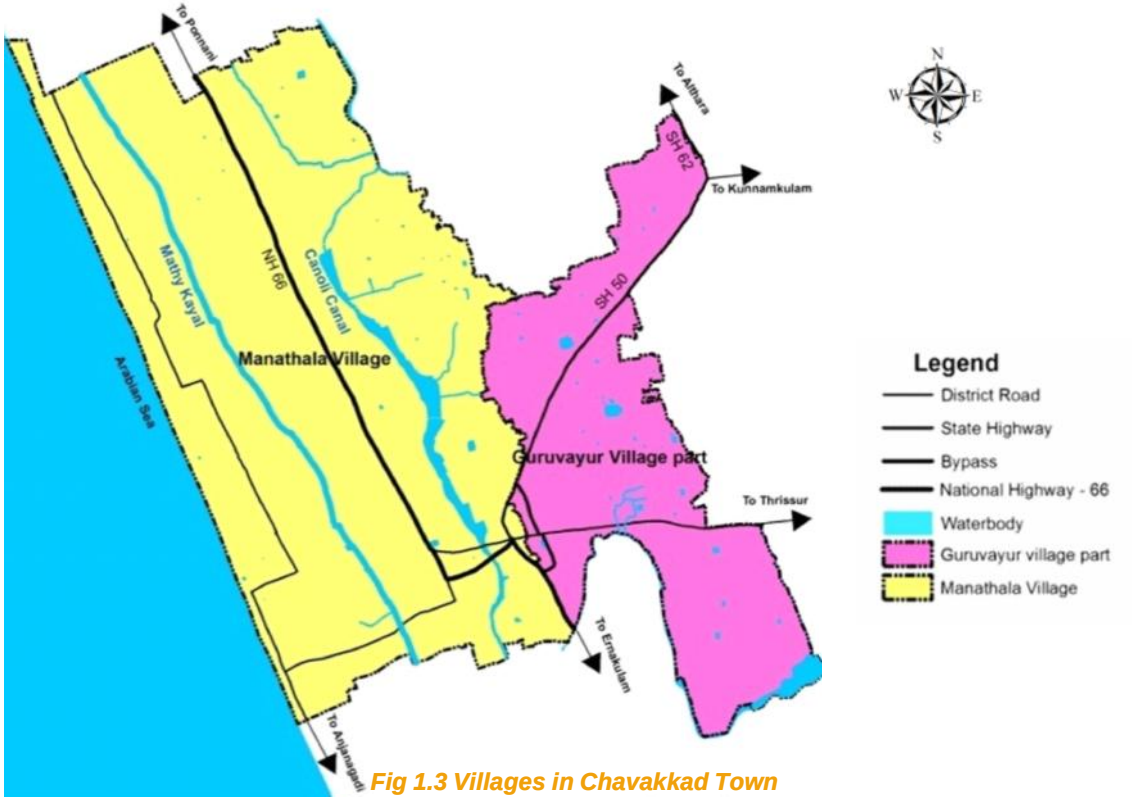


Fig 1.3 Villages in Chavakkad Town

The total No. of electoral wards as per the ward division in 2011 is 32. As per the 2011 census, there were 29 wards. For the study and analysis, ward division of 32 is considered. The spatial location of 32 wards of Chavakkad town is shown in Fig 1.4.Ward number and area is shown in table 1.3.

Table 1.3 Wardwise area of Chavakkad Town

Ward no	Ward name	Ward area	Ward no	Ward name	Ward area
1	Puthenkadappuram North	0.462	17	Kozhikkulanagara	0.350
2	Gramakkulam	0.373	18	Manathala North	0.402
3	Thiruvathra North	0.605	19	Civil Station	0.366
4	Kunjeri	0.524	20	Manathala	0.250
5	Punna North	0.665	21	Blanagad	0.329
6	Punna South	0.487	22	Medekkadavu	0.288
7	Alumpadi	0.321	23	Blanagad Beach	0.228
8	Mammiyur	0.407	24	Dwaraka Beach	0.346
9	Muthuvattoor	0.295	25	Pulichirakkett West	0.541
10	Ovungal	0.384	26	Pulichirakkett East	0.393
11	Palayoor North	0.284	27	Parappil thazham	0.311
12	Palayoor East	0.177	28	Puthenkadappuram South	0.500
13	Palayoor South	0.579	29	Kottappuram	0.179
14	Palayoor	0.514	30	Puthiyara	0.387
15	Palayoor West	0.358	31	Thiruvathra	0.335
16	Chavakkad town	0.487	32	Puthenkadappuram	0.468

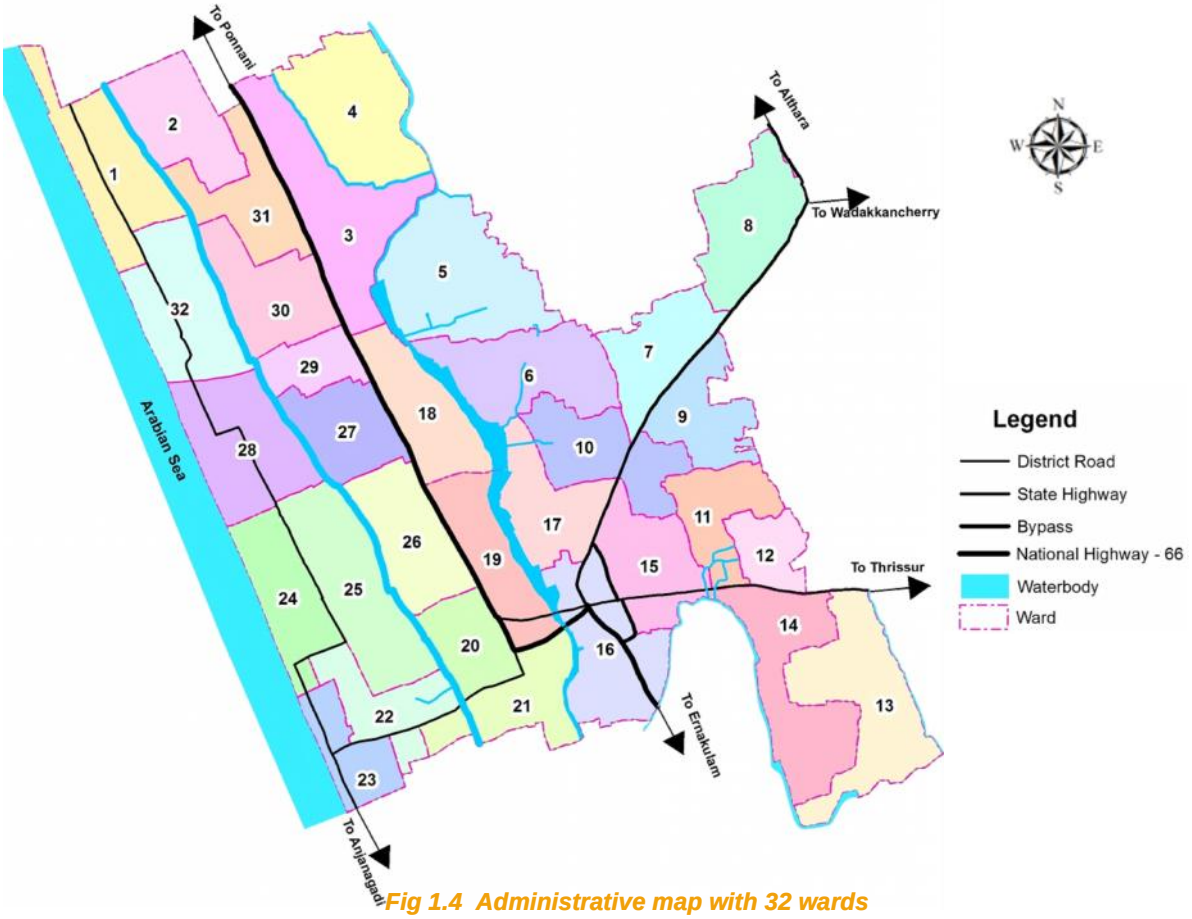


Fig 1.4 Administrative map with 32 wards

1.3.3 Climate

Chavakkad Town area has tropical humid climate. Since the region lies in the western coast of Kerala, the climate is tropical, with minor differences in temperatures during day and night, as over the year. The average temperature of the area is 27.2^{0}C. Summer lasts from March to May, followed by the southwest monsoon season from June to September, then the post monsoon or retreating monsoon season from October to November and winter from December through February is slightly cooler and windy, due to winds from the Western Ghats. The town gets heavy showers in monsoon season. The average annual rainfall is 3130 mm.

1.3.4 Physiography

Chavakkad Town lies in the coastal area. The topography is almost plain and level land. Chavakkad is situated at a height of + 7.6 m from MSL . This entire coastal area is suitable for coconut cultivation. Canoli canal is passing through the town which divides the town in to two parts. The west side of the Canoli canal is coastal area and east side is town area. Mathy kayal which flows in the west side of NH 66 in North South direction is surrounded by paddy fields which is the only remaining paddy area in the town.

1.3.5 Geology

Geographically, Chavakkad town is on plain terrain with Arabian Sea forming the western border of the town. Soil is sandy clay and clayey in nature. The main crops cultivated are is coconut and paddy. Paddy area is located on both sides of Mathy kayal. Majority of these paddy fields are left vacant at present.

1.3.6 History

The history of Chavakkad dates back to ancient times. The name 'Chavakkad' was derived from the word 'Sapakkad', which meant that the place was supposed to be cursed, as lot of people left the place enraged following the arrival of Saint Thomas and consequent happenings. Some believe that the name came from Cheval trees (Ayiniplavu), which is plenty there and also it has a name called 'Kuttungara'.

1.3.7 History of Governance

The Chavakkad Province, which was under the control of the Punnathur Swarupam, was captured by the Dutch in 1717, later by the Mysore force in 1776 under the leader ship of

Tipu Sultan. During his invasion he constructed a pathway which developed as main road presently known as NH 66. This road connects Ernakulam and Malappuram district.From 1789 onwards British started ruling. During this period Chavakkad included in Malabar District of Madras region ruled by British. The District was ruled by **District Board** and Local body by a system known as **Unions**. The history of the local self-government of Chavakkad commences with the formation of the Chavakkad union in 1918 under the Malabar District Board. In 1927, new administrative machinery namely the Panchayat Board was formed, prior to the Panchayat elections of 1963, the first ever such election after formation of the Kerala State in 1956, the Chavakkad Panchayat had re-partitioned and Guruvayur Province was separated from the Chavakkad Panchayat and certain other provinces like the southern Palayur, Punna, Thiruvathra, Blangad and Manathala were also included. On 1st October 1978, Chavakkad Panchayat was upgraded to the status of a Municipality. Fish industry, Beedi industry, Coir industry and oil industry were the major Industries. In ancient days itself, Chavakkad was a major commercial centre. The main commercial center was situated at the bank of Canoli canal. This place is known as Vanchikadavu. The goods were transported from Muziris port situated at Kodungallur through Canoli canal. Chavakkad was connected to Cochin, Kodungallur, Chettuva and Ponnani through Canoli canal.

Chavakkad is famous for numerous religious places. The Palayur Church, one of the seven churches in Kerala founded by St. Thomas, the Manathala mosque, where kaber of Hydroskutty Mooper, one of the freedom fighter present and Manathala Viswanatha temple founded by Sree Narayana Guru are the major pilgrim centers. Palayur was one of the major settlements of Jews during the first century AD. Jude kunnu of that time is now known as Judan bazaar.

The Bazal Missionaries who reached Kerala in the 19th century have contributed much to the progress in the field of education. They established schools in different parts of Kerala state, including M.R.R.M High School and Kannakkott School at Chavakkad.

Guruvayur, one of the famous pilgrim centers in India is located about 2 kms from Chavakkad town. Mammiyoor temple and Punnathoor Kotta Elephant Sanctuary are the other tourist centers located in the immediate vicinity of Chavakkad town. Punnathoor Kotta is a home to 60 temple elephants and the camp is one of its kinds in the world.

Chavakkad is an important trade center for copra, coir and fish. The major source of revenue in Chavakkad is repatriated income mainly from the Non-Resident Indians working in the Middle East. The place is called as Mini Gulf. The Rajah Group, owners of famous Kajah Beedi, Rajah Tiles, and Rajah Motors has headquarters in Chavakkad. The Kajah Beedi Company was started in the year 1948 by Hajee Abdul Khader. Rajah Motors, which produced the first multi-purpose

vehicle (MPV) in India, known by the name 'Tiger' and 'Kangaroo', has its factory and offices located in Chavakkad.



Mathi kayal

1.3.8 Biodiversity

The presence of Arabian Sea, Mathy kayal, Canoli canal, Mangroves and various streams and ponds makes Chavakkad Town the habitat for many flora and fauna. The reaches of Arabian sea has made easy availability of various types of marine fishes like sardine, mackerel, prawn, king fish, pomfert etc.



Canoli canal

1.4 Inference

The presence of Arabian Sea along the western boundary makes Chavakkad Town different from the other urban areas in the District. Canoli Canal ,Mathy kayal, various ponds and the mangroves in the waterlogged areas are the other important geographical features. Proximity of sea makes the availability of various types of fishes and so the potential of fishing activities and tourism.

CHAPTER 2

REGIONAL SETTING

This chapter spells out the hierarchy of the town in the regional scenario, the activity which the town performs and town's connectivity to the different settlement in the region. It also deals with details regarding state Urbanisation report and the integrated district development plan for the Thrissur district including the development scenario of the town.

2.1 Location

Chavakkad Town lies in the north western part of the district. It is bounded by Punnayur Panchayat in the north, Orumanayur and Kadappuram Panchayat in the south, Guruvayur Town in the east and Arabian Sea in the west. It is located at 10°31′ N latitude and 76°15′E longitude. Chavakkad is the only coastal Town in Thrissur district. NH 66 connecting Kanyakumari and Panavel is passing through this Town. Chavakkad Town is the head quarter of Chavakkad Taluk. Fig.2.1 shows the boundaries of Chavakkad Town. Chavakkad Town comprises of two revenue villages, Manathala village in full and a part of Guruvayur village.

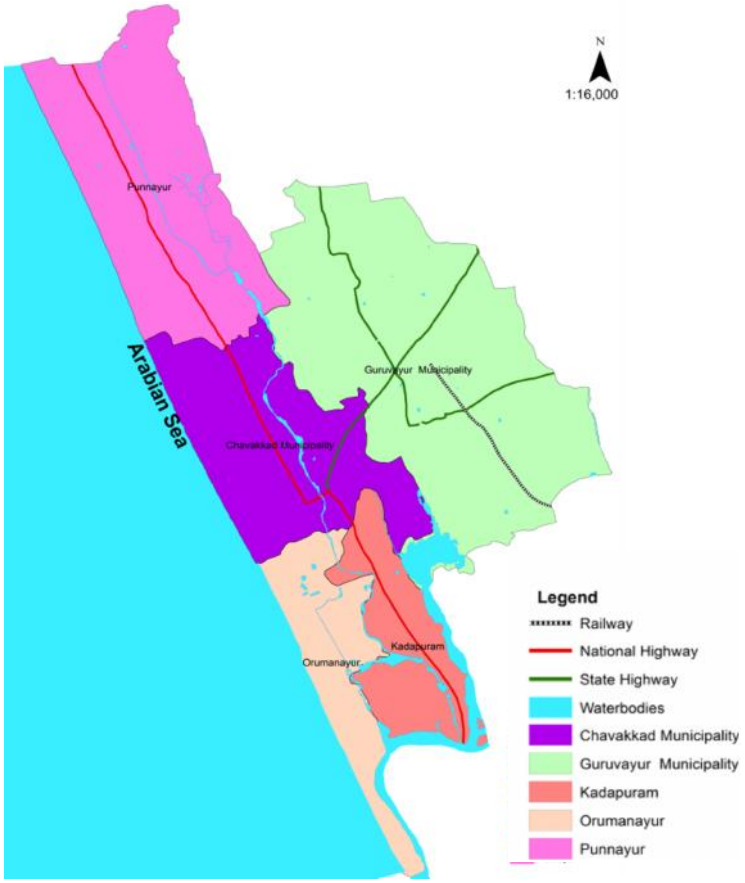


Fig. 2.1 Boundaries of Chavakkad Town

2.2 Linkages

Chavakkad town is well connected to other parts of the District by road. Chavakkad acts as a major commercial center between Ernakulam and Malappuram Districts along the National Highway 66. The town is located about 32kms northwest of Thrissur,administrative head quarter of Thrissur District and 4 kms from Guruvayur temple pilgrim centre of national imporatance. Other towns in the district such as Kunnamkulam, Wadakkancherry, Kodungallur, Irinjalakuda, Chalakudy are at 12 km, 32 km, 42 km and 57 km respectively from the town. Existing Linkage of Chavakkad Town is shown in Figure 2.2. The nearest railway station and KSRTC terminal is at Guruvayur which is only 5 kms from Chavakkad. An efficient and frequent road transport system, both by the private and public sector exits in Chavakkad. National highway No.66 passes through Chavakkad and connect town to Ponnani,Mangalore and Goa and Mumabi .The nearest airport is Nedumbassery which is 70 km south of Chavakkad. The nearest seaports are Kochi - 75 km and Kozhikode -80km from the town. In early days, Chavakkad was connected by water way through Canoli Canal from Kodungallur to Ponnani.

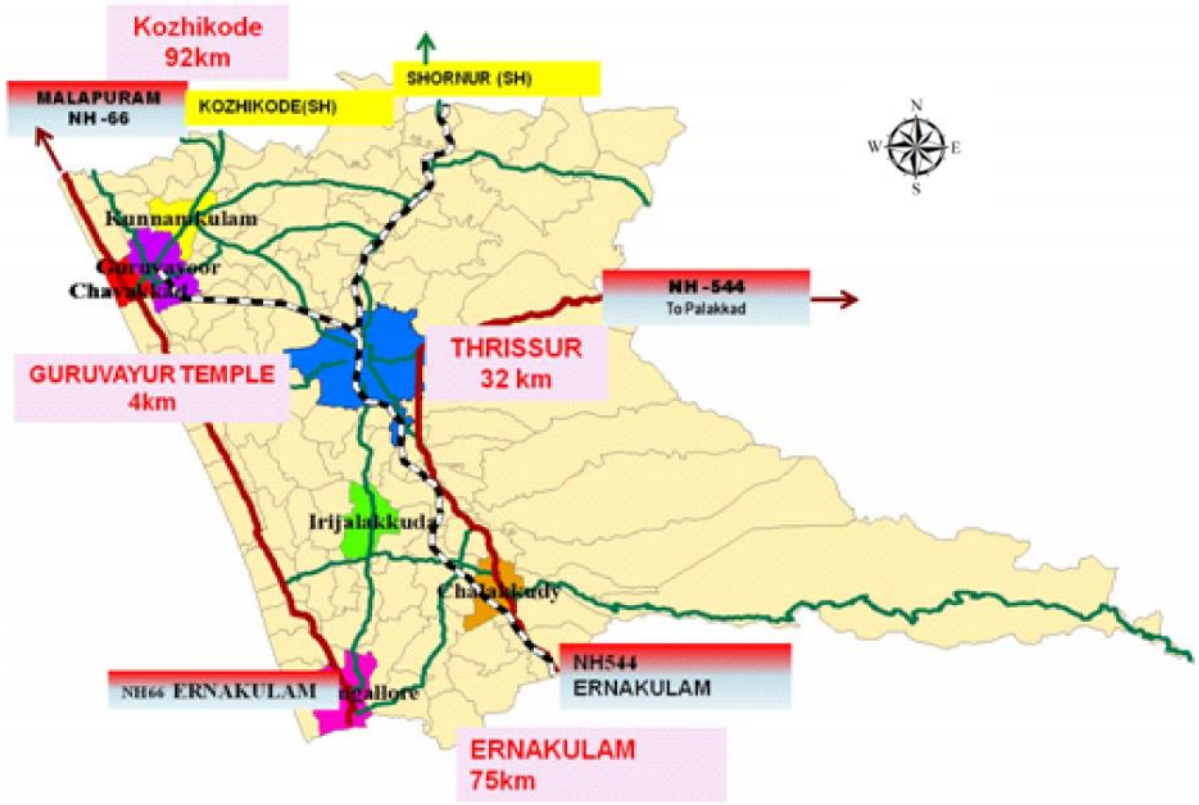


Fig. 2.2Regional linkage of Chavakkad town

Source: JDDP, Thrissur

2.3 Influence region of the town

Chavakkad town, which lies in Chavakkad Taluk, serves the adjoining Panchayath and municipalities. Chavakkad is home to numbers of religious places Palayur church, Manathala Mosque and Viswanatha temple and other prominent religious centres of the town. The heritage

and tourism potential of the town can attract large number of domestic as well as international tourists. The NH 66 passing through the heart of the town adds to its regional significance. The SH50, SH 62 offers transportation facilities that promotes trade and commerce. Chavakkad Town is influenced by the neighbouring municipalities and corporation. In a regional scale (90 km) radius, Chavakkad Town influenced by major facilities like airport, medical college and higher educational institutions of Kozhikode, Malappuram and Ernakulam district. Sub region in a scale (45 km radius) influenced by other towns of Palakkad, Thrissur.(15 km radius) is nearby local area and Chavakkad is mostly influenced by nearby local bodies. The figure 2.3 shows the existing regional influence of the town.

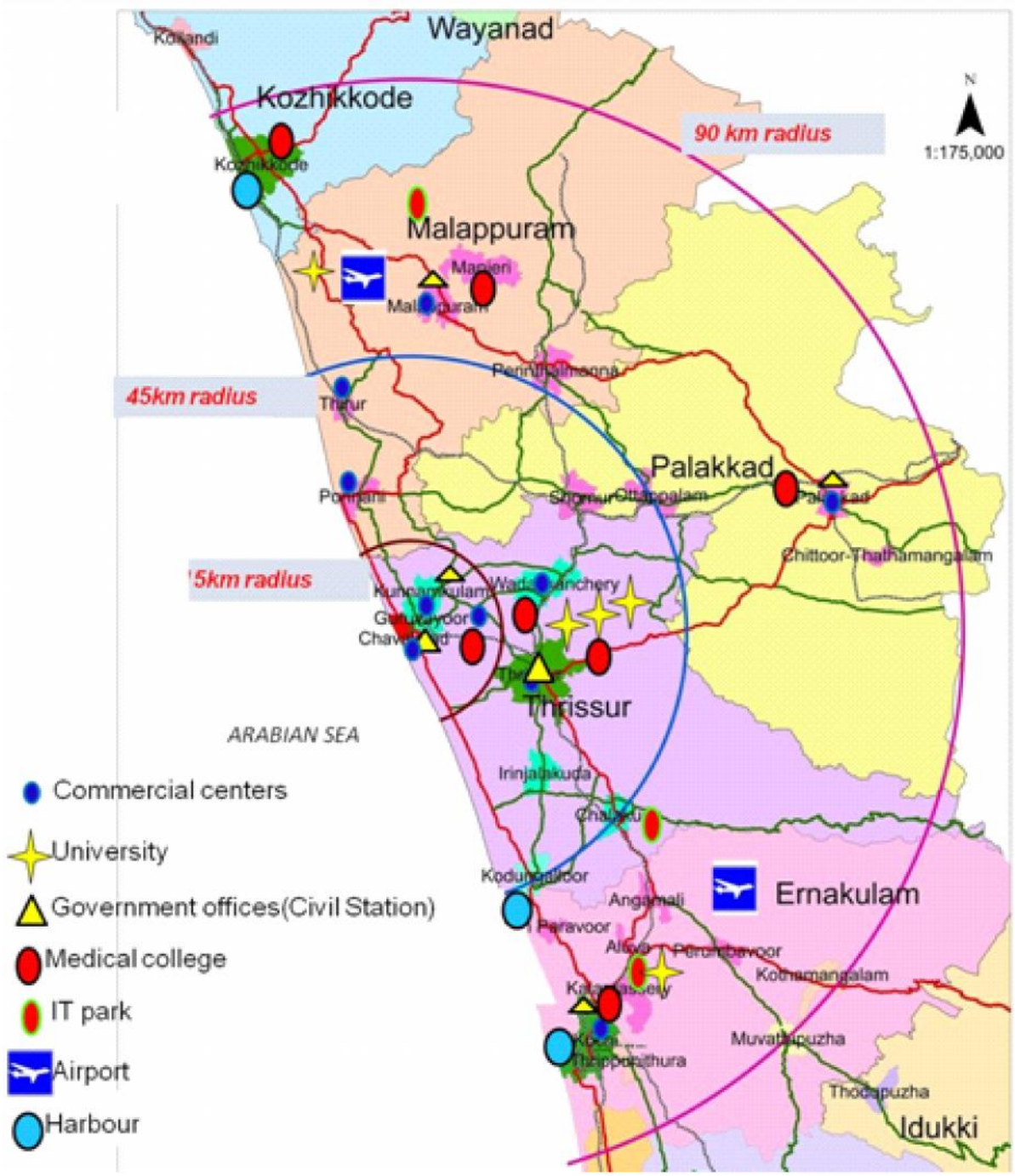


Fig. 2.3 Regional influence of ChavakkadTown

2.4 State Urbanisation report

State Urbanisation report envisages a sixth order hierarchy for Chavakkad Town in the future .The urban profile is as shown in figure 2.4. In 2021, Chavakkad Urban agglomerate is expected to be a part of Guruvayur cluster. Also Chavakkad will form a constituent LSGI in the Alappuzha – Ernakulam – Thrissur – Palakkad corridor in 2013. Guruvayur, Chavakkad, Punnayur and Kadappuram are the nearby LSGI'S which comes under this corridor and is as shown in figure 2.5. Table 2.1 shows the urban profile of Chavakkad Town and the surrounding LSGIs as per IDDP,Thrissur.

Table 2.1 Urban Profile of Chavakkad Town and Surrounding LSGI's

Name of LSGI	Urban Profile
Chavakkad Town	Urban
Orumanayur Panchayat	Rural
Kadappuram Panchayat	Rural
Punnayur Panchayat	Rural

Source: IDDP, Thrissur

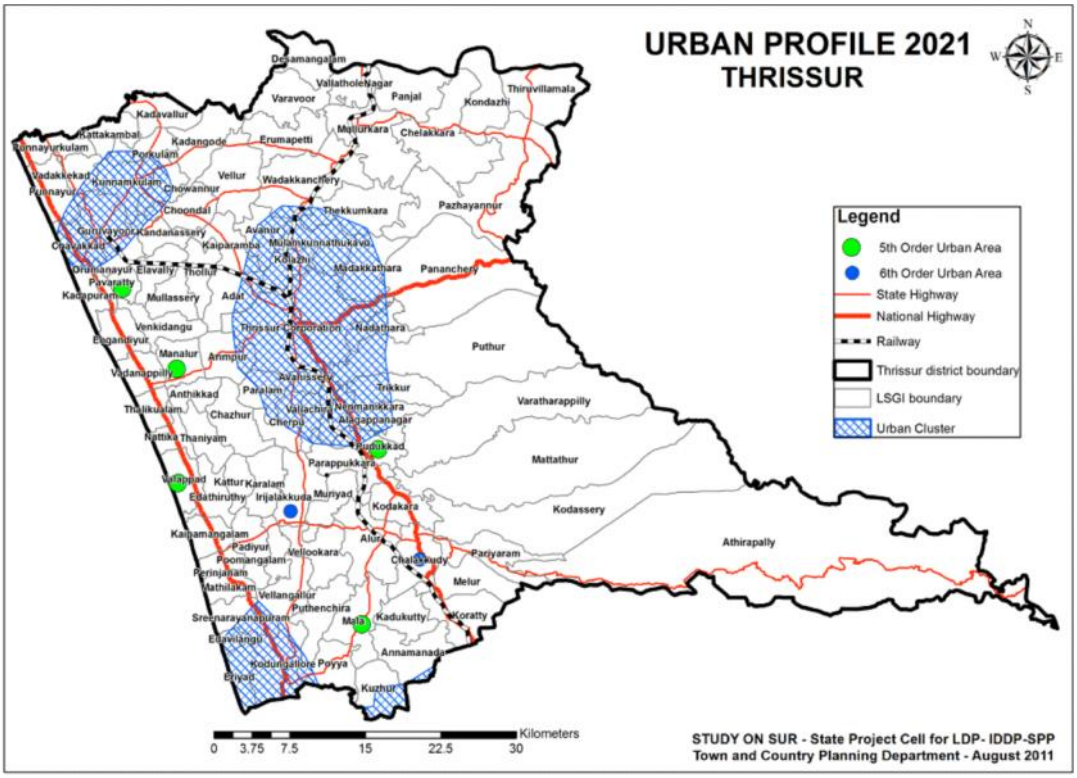


Fig 2.4 Urban profile - 2021 thrissur *Source: State Urbanization Report*

2.5 Development concept of Thrissur district

Spatial structure of Thrissur district

The spatial structure gives a frame work for determining the location of future development activities rationally. Spatial structure of the district is derived by integrating hierarchy of settlements and nodes, transportation network and activity pattern as evolved from the Integrated District Development Plan. The spatial structure of Thrissur district is shown in figure 2.6.From the spatial structure of the district, it is clear that Chavakkad Town is having an urban activity and Chavakkad Town Junction is an existing 2nd order junctions.

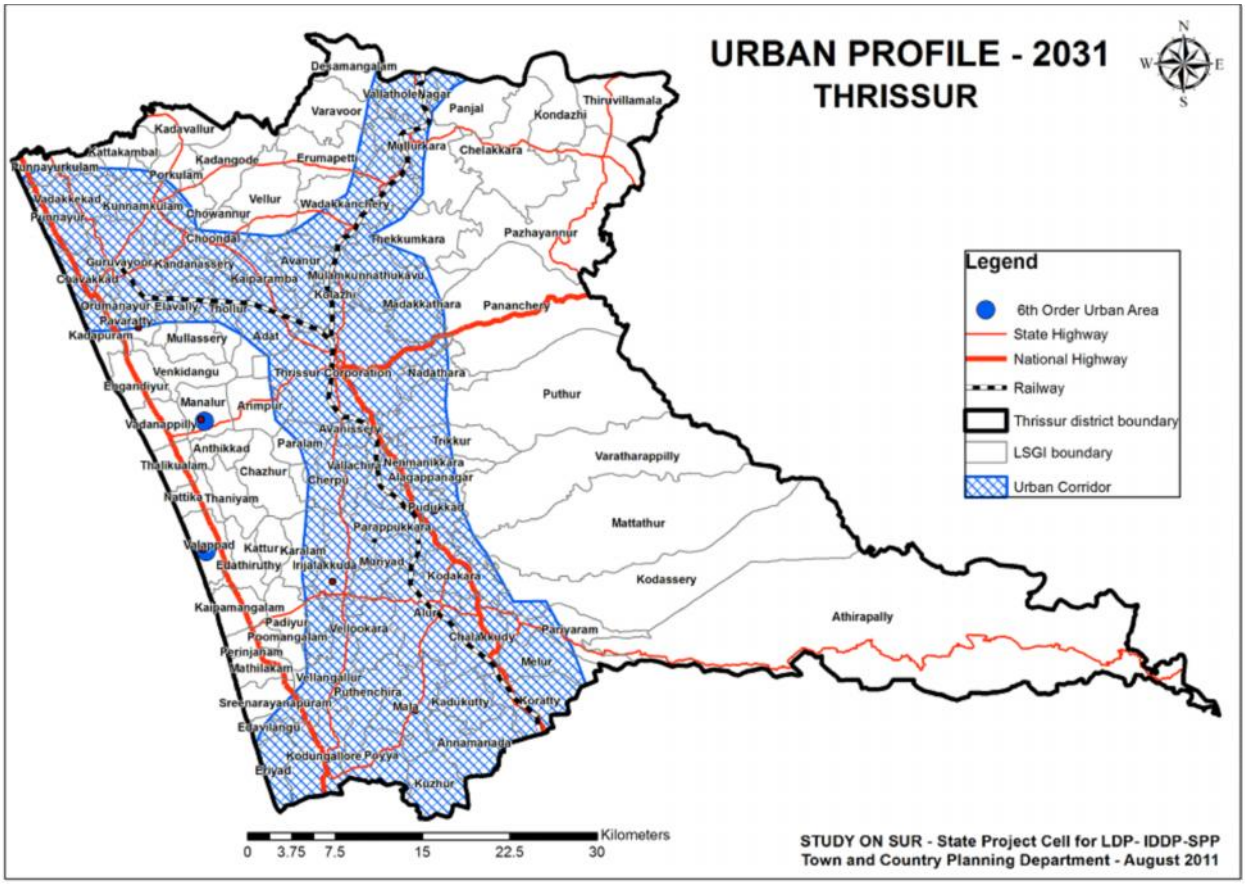


Fig 2.5 Urban profile - 2031 thrissur

Source: State Urbanization Report

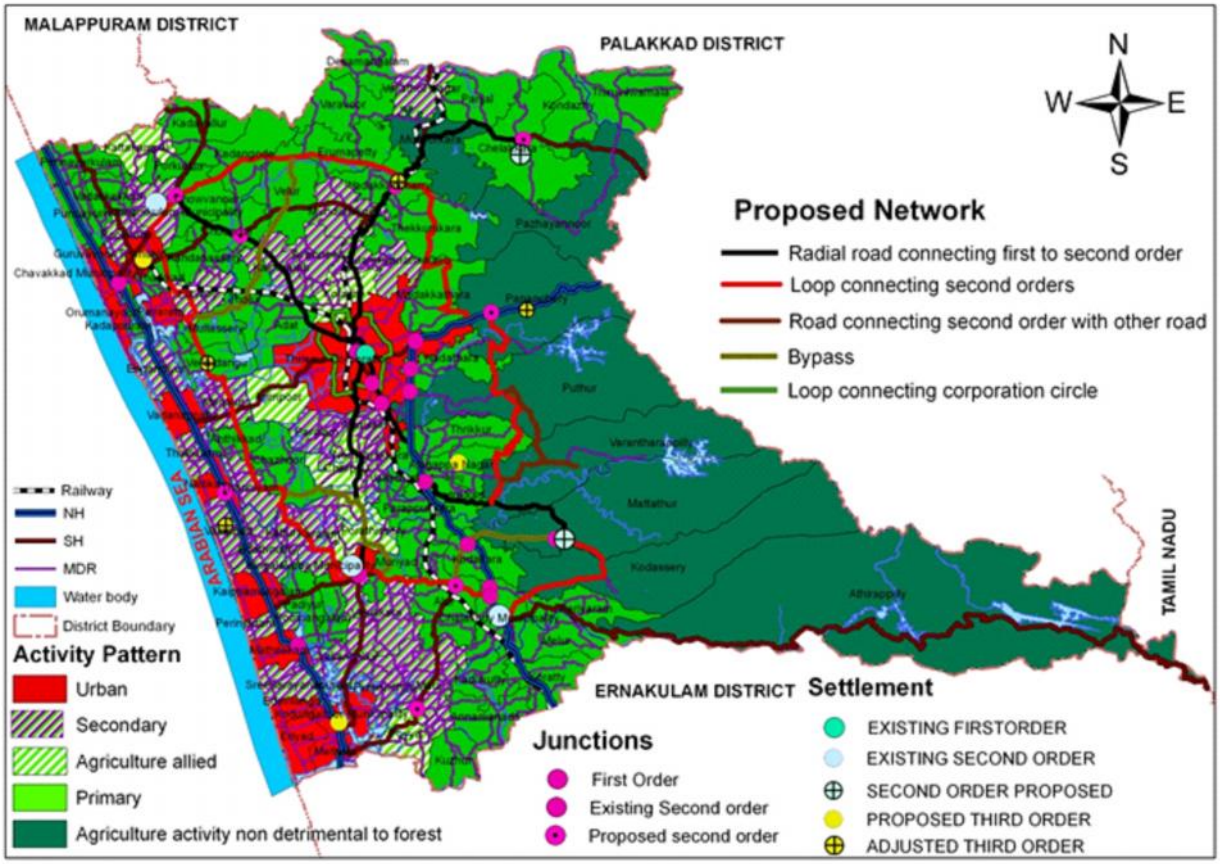


Fig 2.6 Spatial Structure of District

Source: IDDP, Thrissur

Activity Pattern of the Town

Activity pattern is an indicator that decides the most suitable activity for the town. Existing activity pattern within the district is derived based on the study of the spatial distribution of the aspects namely, the land use concentration pattern, functional character and urban profile. These are combined to evolve the activity pattern, as shown in figure 2.7. Chavakkad town shows an urban Activity pattern, which indicates that in such areas, the work force is predominantly non agricultural and considerable proportion of work force is engaged in service sector activities.

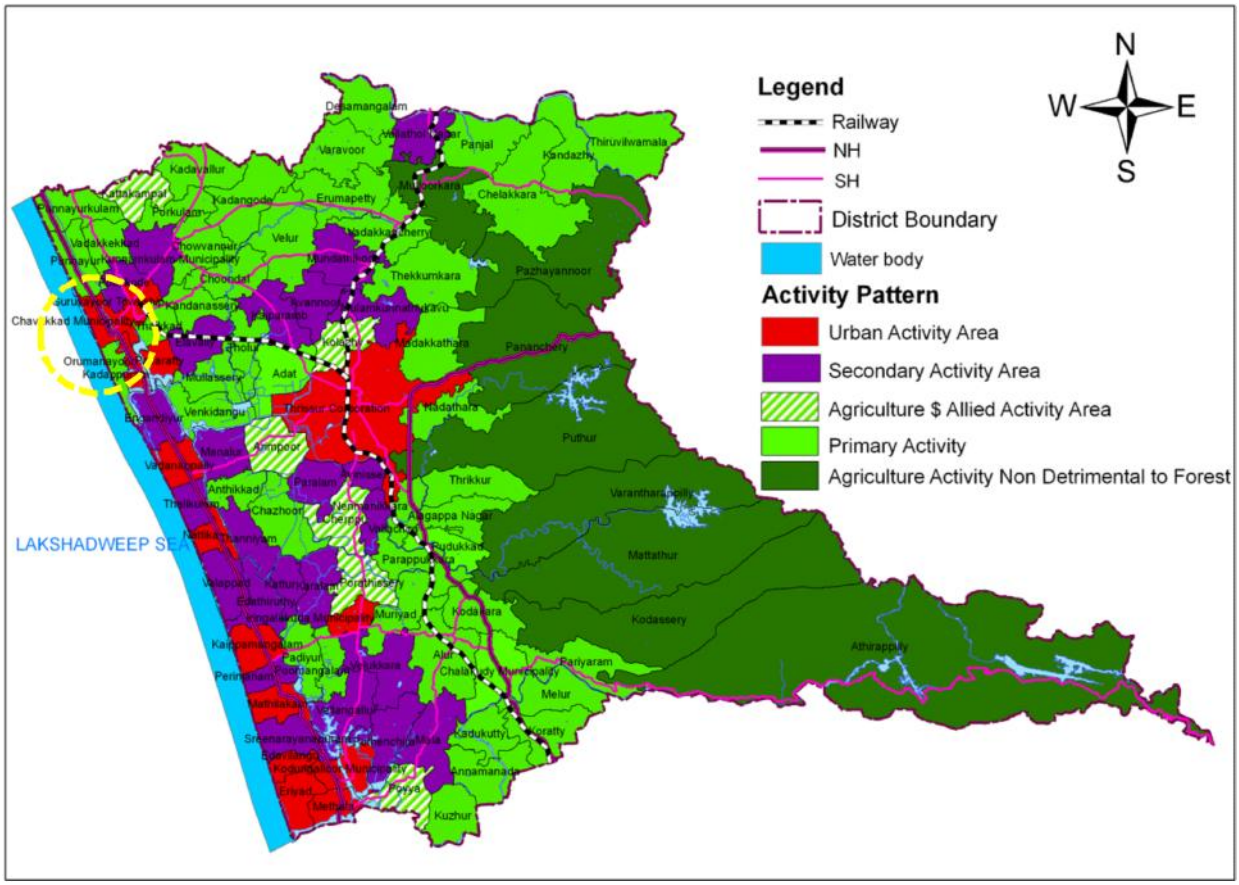


Fig 2.7 Activity Pattern of the District

Source: IDDP, Thrissur

Functional Character of the Town

Functional character of an area is determined based on population distribution, plot size and land use of the area and the average plot size within the settlement. Based on this Chavakkad Town comes under urban classification as shown in figure2.8. All the surrounding LSGI's except Chavakkad and Guruvayur are categorized either rural or semi- rural.

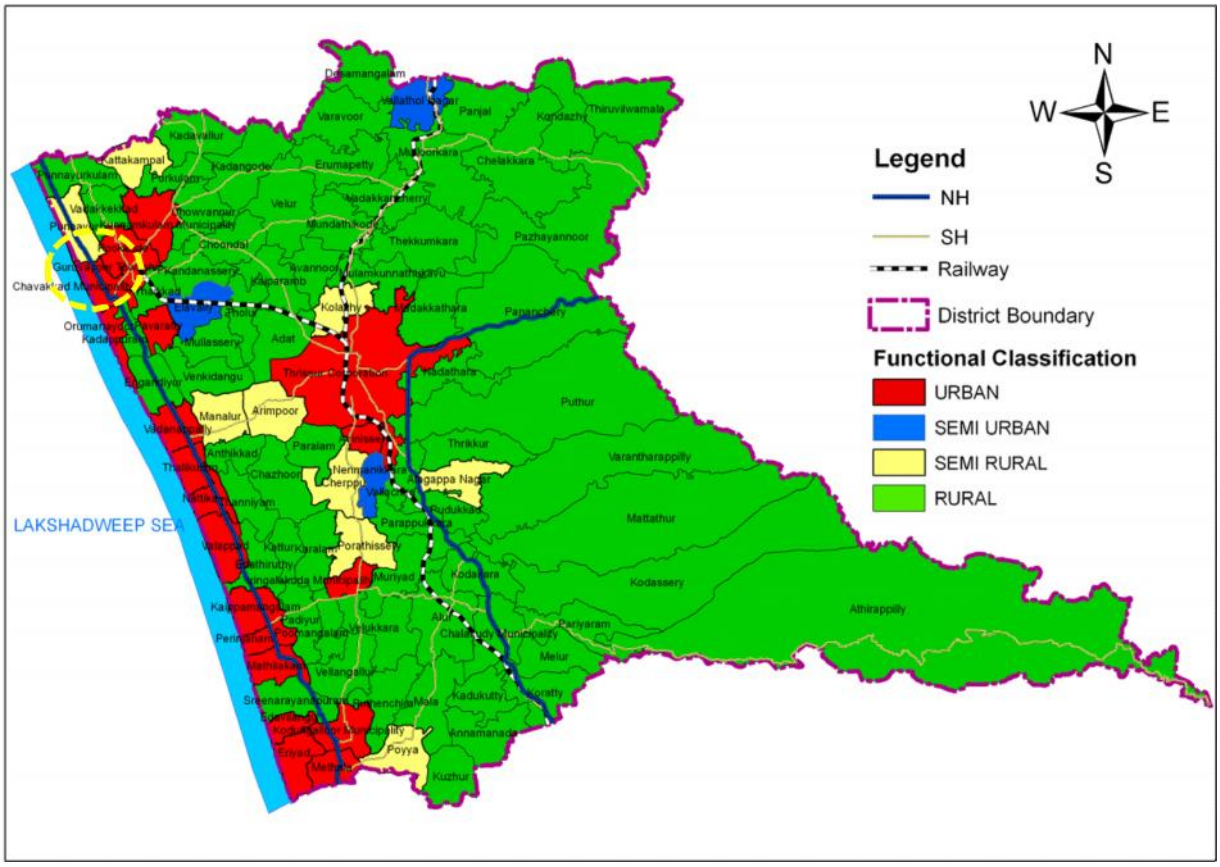


Fig 2.8 Functional Character of Chavakkad town in the District Scenario

Source: IDDP, Thrissur

Suggested Hierarchy of Settlements

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

1. Educational facilities
2. Health Facilities
3. Markets
4. Physical infrastructure facilities
5. Transportation facilities

Table 2.2 shows the hierarchy of settlement of Chavakkad Town and surrounding LSGI's. In the district scenario, Chavakkad Town is categorized as a Fourth order LSGI as shown in fig 2.9

Table2.2Hierarchy of Settlement of Chavakkad Town and Surrounding LSGI'sScenario

LSGI	Hierarchy
Orumanayur	4IH ORDER
Kadappuram	4IH ORDER
Punnayur	4IH ORDER
Chavakkad	4IH ORDER
Guruvayur Town	3ra ORDER
Kunnamkulam Town	2na ORDER

Source: IDDP, Thrissur

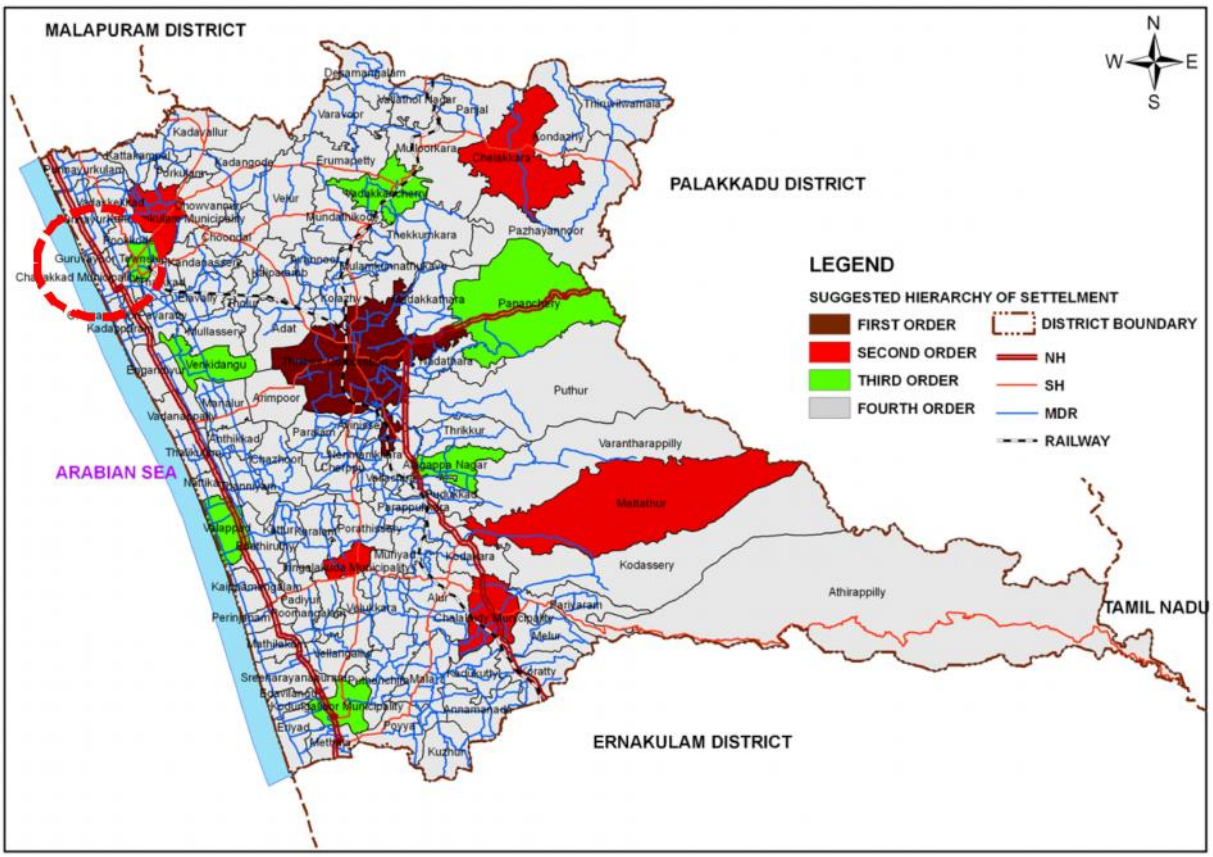


Fig 2.9 Hierarchy of Settlements

Source: IDDP, Thrissur

Connectivity

Being a 4th order settlement in the district in Kerala, a perfect urban - rural continuum exist and hence nodes play a crucial role in the transportation network. Hence it is highly essential to modify the existing road network based on the proposed hierarchy of nodes. Based on the study, Chavakkad center comes under existing 2nd order, as proposed conceptual road network as per District Spatial Plan is shown in fig 2.10. It is clear from the proposed road network that Chavakkad Town is well connected to various other parts of the district. Transportation corridor development based on regional spatial structure is Chavakkad - Guruvayur - Kodungallur – Methala – Paravur - Ernakulam having major transportation network of NH-66 and its major activities as per spatial structure is tertiary supported by fisheries.

Development concept of Thrissur district

As per the development concept of integrated district development plan, the district is divided in to eight development zones. Also future hierarchy of each settlement and nodes

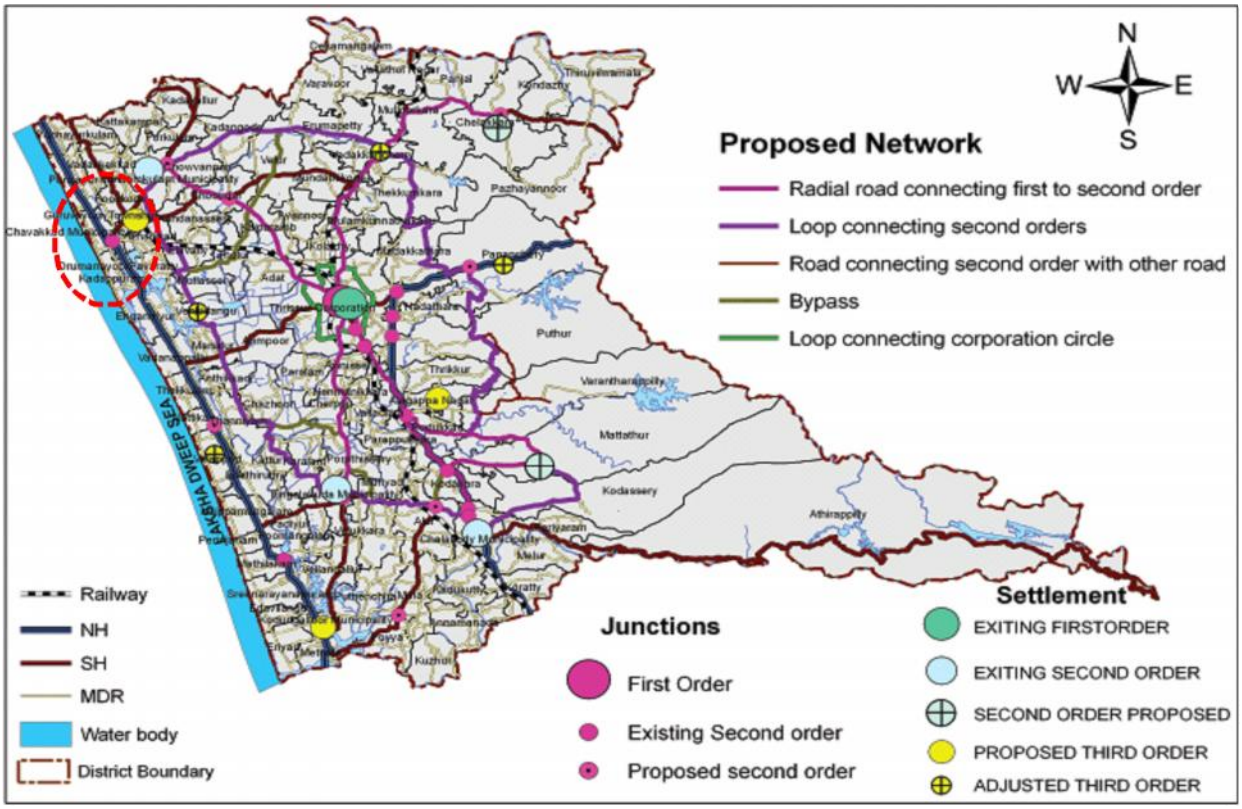


Fig 2.10 Proposed Conceptual Road Network

Source: IDDP, Thrissur

are set and a future transportation network connecting those higher order settlements and nodes are planned. A development zone is delineated by grouping the settlements possessing similar major economic activity pattern from the Spatial Analysis. In other words, the thrust development sector of each Grama Panchayat or Municipal Council is specified. The Development Concept of the district based on Integrated District Development Plan is given in fig. 2.11.From the development concept of the district based on IDDP, it is clear that Chavakkad town falls under both Multifunctional Zone II and environment concern zone. In multifunctional zone II, 2nd order activities which also serves various sectors effectively. In this zone all types of 2nd order urban activities, 2nd order educational and health care facilities and enabling transportation facilities etc are to be provided. This zone will act as a service centre for the hinter land and this zone is very must suitable for industries utilizing agricultural producers of hinter land. Chavakkad town also falls under environmental concern zone in order to preserve the environmentally sensitive areas of the district so as to ensure sustainable development, areas where environmentally sensitive land uses are concentrated are delineated as environmental concern zone.

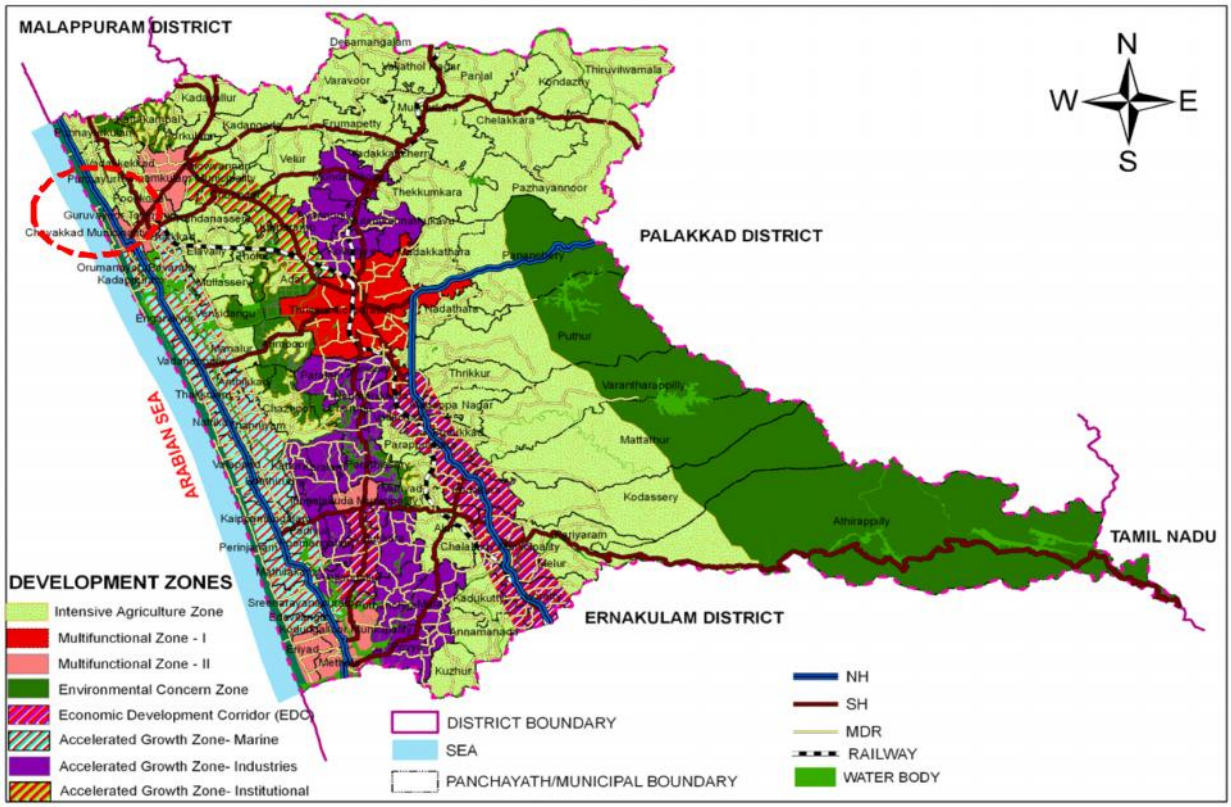


Fig 2.11 Development Concept based on integrated district development plan

Source: IDDP, Thrissur

2.6 Inference

From the discussions, it can be seen that Chavakkad Town is showing a strong urban character. The workforce is predominantly non-agricultural and considerable proportion of population is engaged in service sector activities. From the development concept of integrated district development plan Chavakkad falls in both Multifunction zone II and Environmental concern zone results from several studies conducted concerning this region, also project a future urban character for the town. Hence it may be concluded that in future urbanization of Chavakkad act as a service centre for hinter lands and also has to ensure sustainable development

CHAPTER 3

DEMOGRAPHY

This chapter explains about the population and demographical characteristics of Chavakkad Town in comparison with Thrissur District, neighbouring local Govt. institutions and urban LSGI's of Thrissur District.

3.1 Population

The knowledge of basic demographic trends is essential to sort out the problems and exact needs of the area. It provides idea regarding the habitation of people and their basic requirements which the authorities should consider while planning the town.

Chavakkad is the smallest town in Thrissur District in geographical area and population among the urban LSGI's.

According to 2011 census, Chavakkad Town has a total population of 39098. Chavakkad Town shares 1.25% of population of Thrissur District and the district population shares 9.34% of Kerala state. Chavakkad has a male and female population of 17762 and 21336 respectively with a sex ratio of 1201 which is higher than state and district average. The total number of household in the city is 8269. Figure 3.1 shows the decadal population of Chavakkad Town.

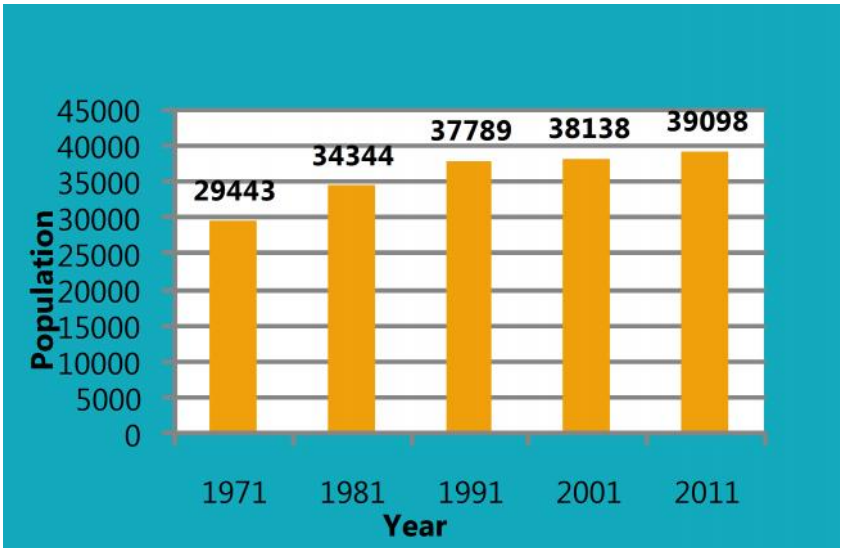


Fig 3.1 Decadal Population

Source: Census data

Even though the population density is high, population of Chavakkad Town is low when compared with other urban LSGI's in Thrissur District. Thrissur Corporation is having the highest population and Chavakkad Town is having the lowest.

Chavakkad is the smallest town in Thrissur District in population as shown in fig 3.2. In comparison with the population of nearby LSGI's, as in figure 3.3, Chavakkad Town is seen to have second position. Orumanayur Panchayat has the lowest population of 11688 and Guruvayur Town has the highest of 70012.

Ward wise distribution of population is given in figure 3.4 and its details are given in table 3.1. This shows that population density is more in wards along the sides of beach road (ward Nos 1,20,24,28,30,32) west of NH and(wards 4,5,16) on the eastern side of NH. In Chavakkad Town ward 16 has higest population density.

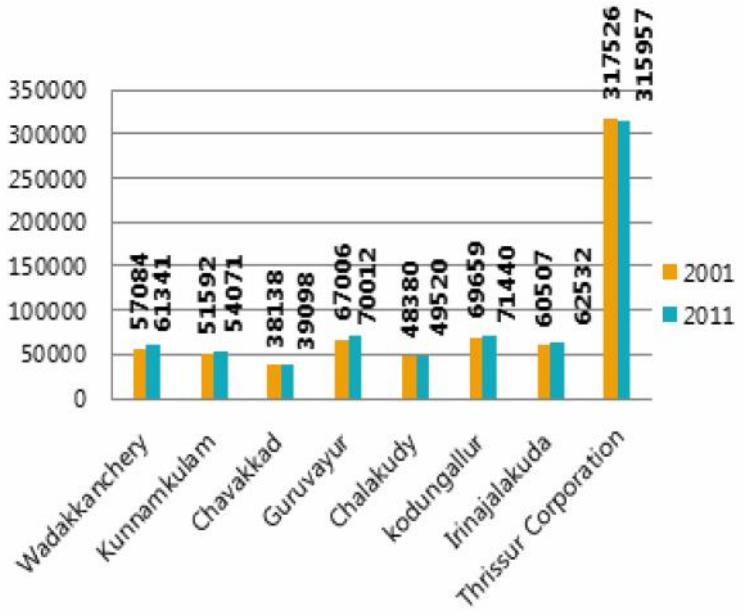


Fig3.2 Comparison of population with urban LSGI.s – 2001 & 2011

Source: Census data

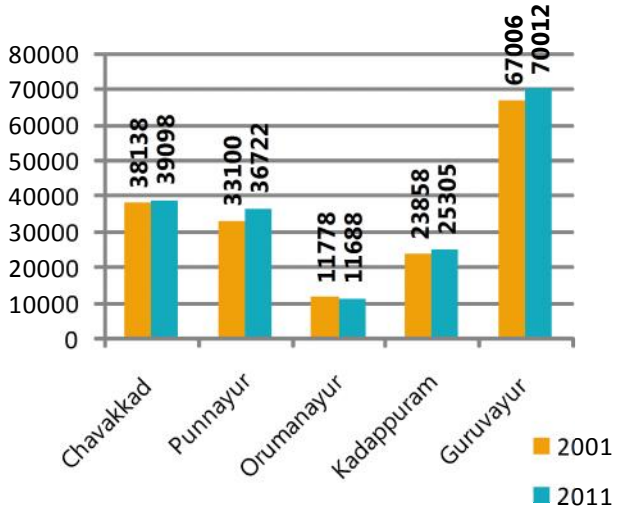


Fig 3.3 Comparison of Population with nearby LSGI's

Source: Census data

Table 3.1 Ward wise population

Ward No	Population	Ward No	Population
1	1762	17	879
2	1282	18	652
3	1010	19	514
4	1644	20	1527
5	1669	21	1300
6	1121	22	1314
7	1332	23	1191
8	1397	24	1457
9	803	25	1317
10	1319	26	1263
11	1250	27	887
12	488	28	1718
13	1044	29	510
14	1133	30	1724
15	1026	31	1343
16	1501	32	1721

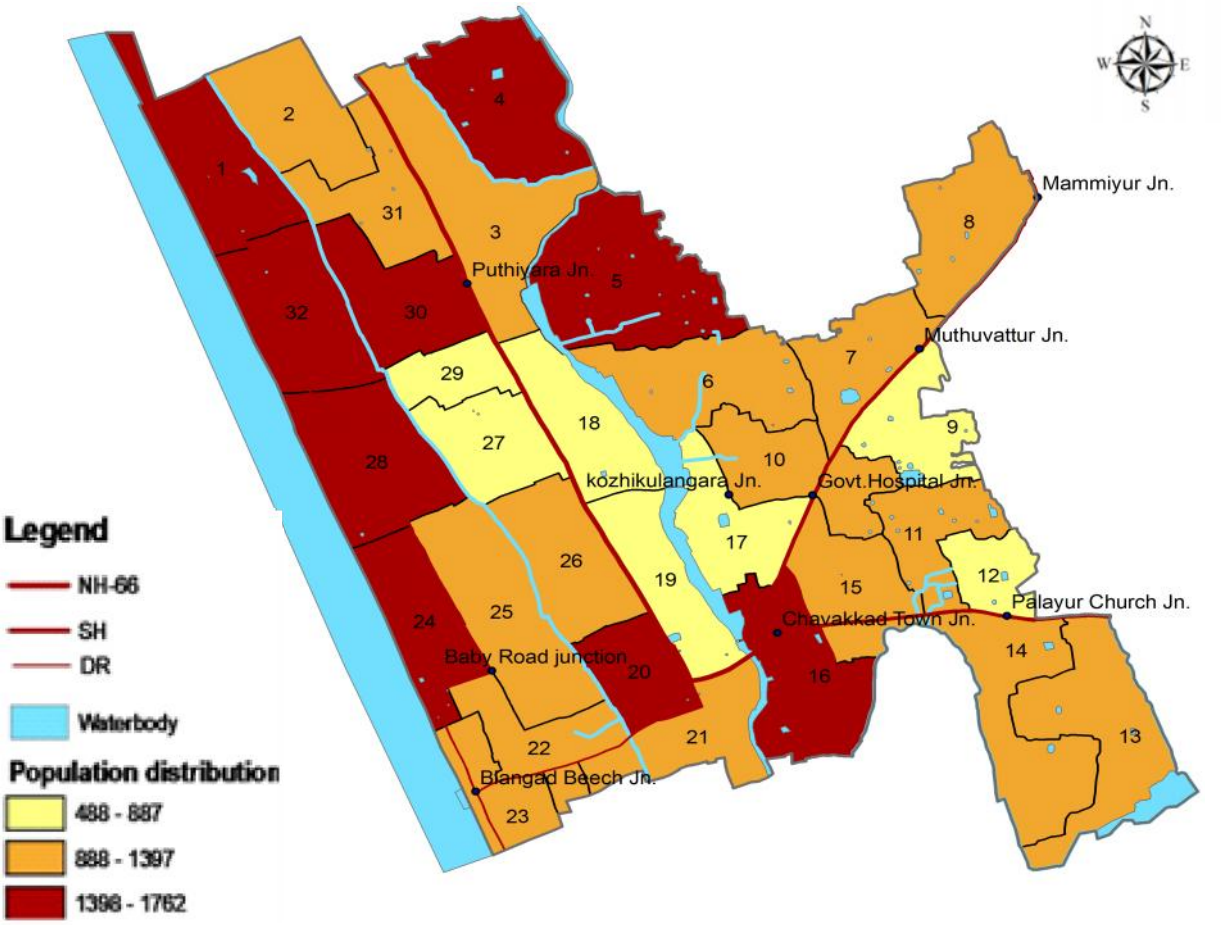


Fig3.4 Ward wise distribution of population

3.2 Population Growth Rate

In order to study how the population changes over time it is useful to focus on the rate of change (rather than just levels). Population growth rate of Chavakkad Town during the decade 2001-2011 is 2.52%, which is less than the growth rate of district (4.94%) (fig 3.6).

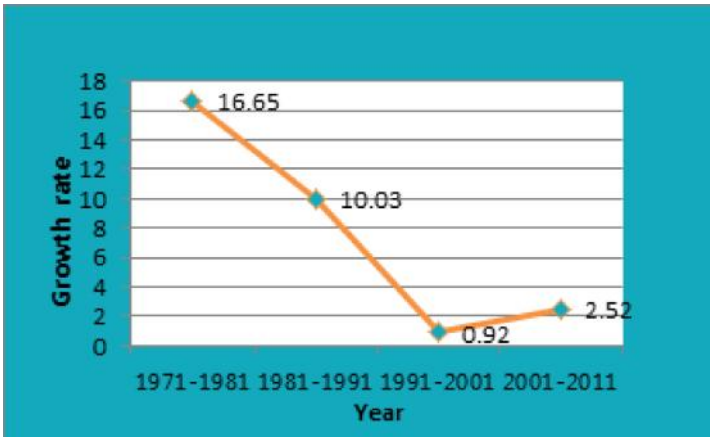


Fig 3.5 Decennial growth rate of population

Source: Census data

Variation of population growth rate of Chavakkad Town (fig 3.5) shows a decreasing trend from 1971 to 2001 and an increasing trend from 2001 to 2011. Comparison of population growth rate with other urban LSGI's is shown in figure 3.7. On comparing it was found that Chavakkad Town is having a lower growth rate of population and is on fifth position among other LSGI's of district during 2001-2011. Comparison of population growth rate with nearby LSGI's is shown in fig 3.8.

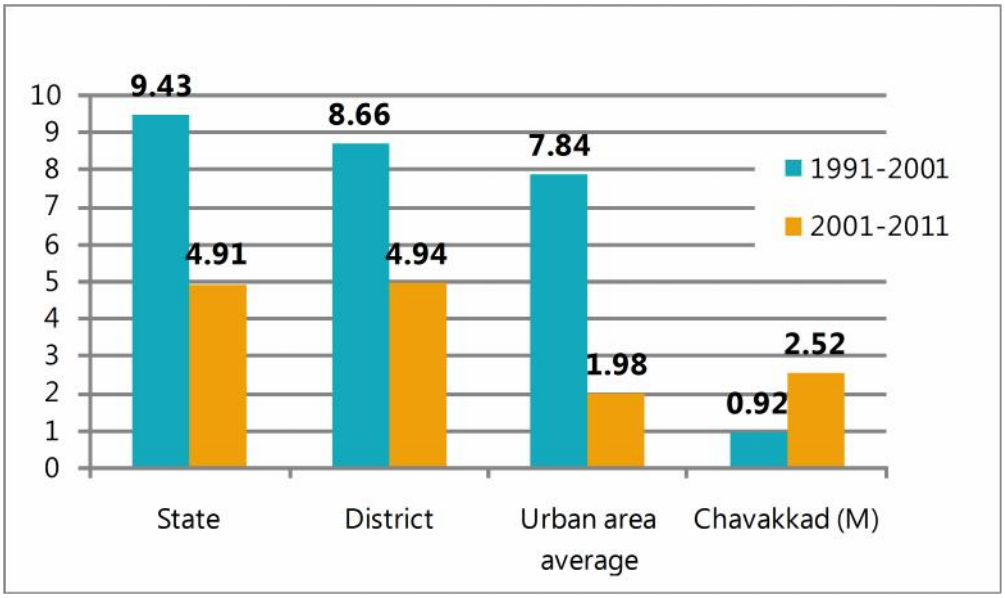
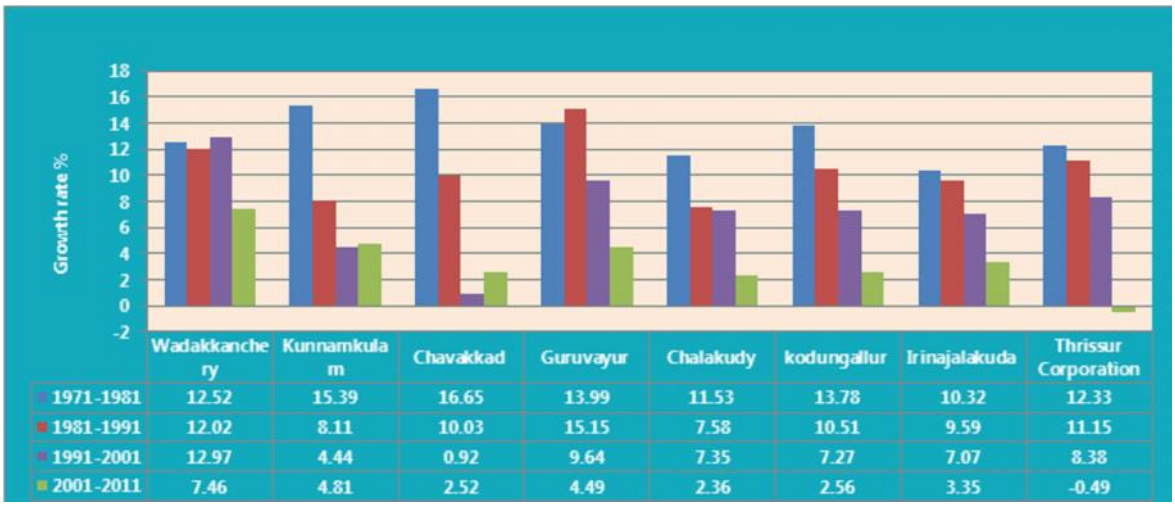


Fig 3.6 Comparison of Population growth rate

Source: Census data



	Wadakkanchery	Kunnamkulam	Chavakkad	Guruvayur	Chalakudy	kodungallur	Irinajalakuda	Thrissur Corporation
1971-1981	12.52	15.39	16.65	13.99	11.53	13.78	10.32	12.33
1981-1991	12.02	8.11	10.03	15.15	7.58	10.51	9.59	11.15
1991-2001	12.97	4.44	0.92	9.64	7.35	7.27	7.07	8.38
2001-2011	7.46	4.81	2.52	4.49	2.36	2.56	3.35	-0.49

Fig 3.7 Population growth rate Comparison with urban LSGI's

Source: Census data

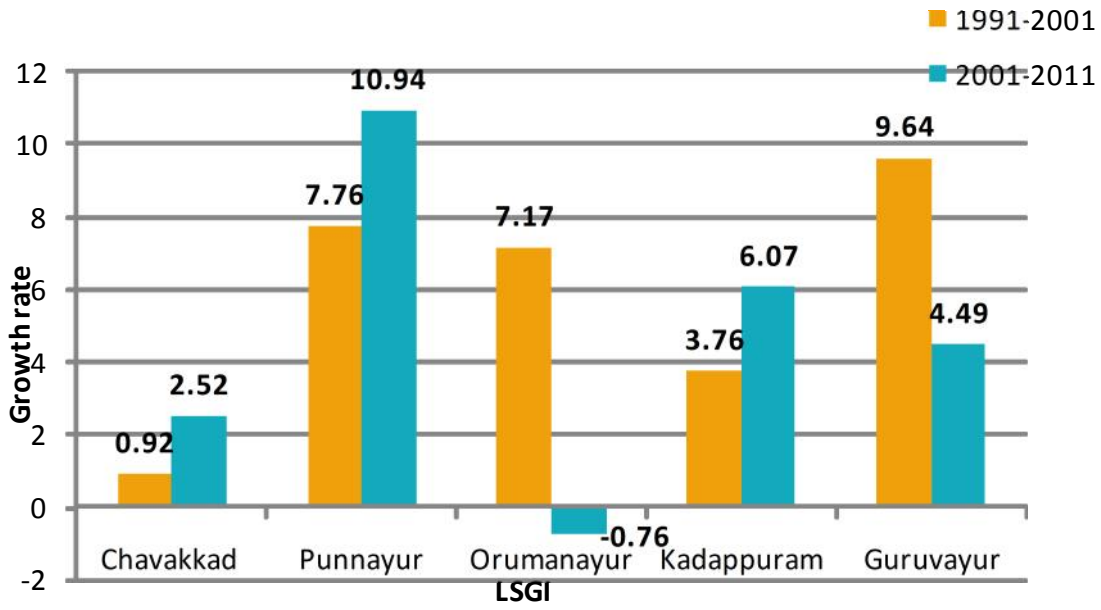


Fig 3.8 Population growth rate compared with nearby LSGI's

Source: Census data

3.3 Population Density

The population density of Chavakkad Town in 2011 is 3151 persons per square kilometer, which is higher than that of district and is as shown in figure 3.9. Comparison of population density of Chavakkad Town with nearby LSGI's and that with other urban LSGI's of Thrissur district are shown in figure 3.10 and 3.11. It is clear that population density of Chavakkad Town is higher than all surrounding LSGI's. Ward wise population density of Chavakkad Town is shown in figure 3.12. Population density is found to be higher in wards 20, 22& 23 along the sides of beach road and west of NH. Figure 3.13 shows ward wise plot size of Chavakkad town ,it implies that Chavakkad town is having higher plot size Fig 3.14 shows the ward wise net population density of the town, ward no 1, 11, 20, 22, 23 and 30 has showing more net population density.

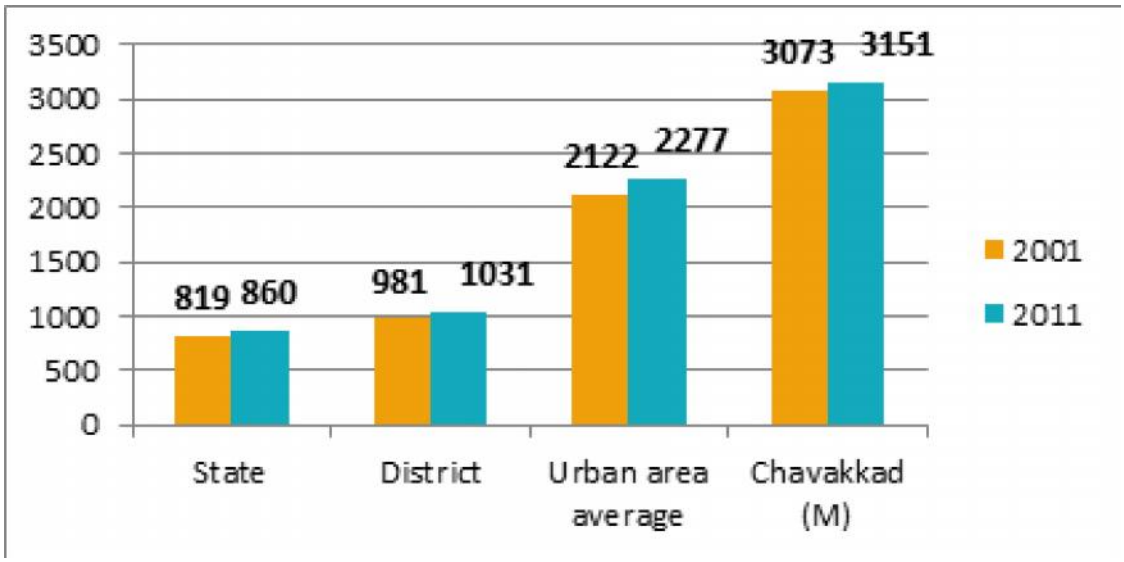


Fig 3.9 Comparison of Population density

Source: Census data

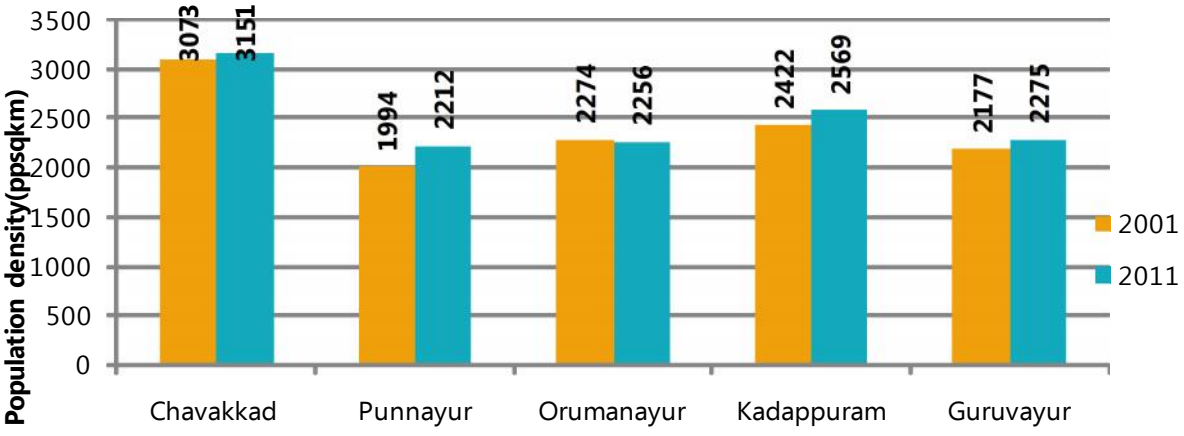


Fig 3.10 Comparison of Population density **with nearby LSGI's**

Source: Census data

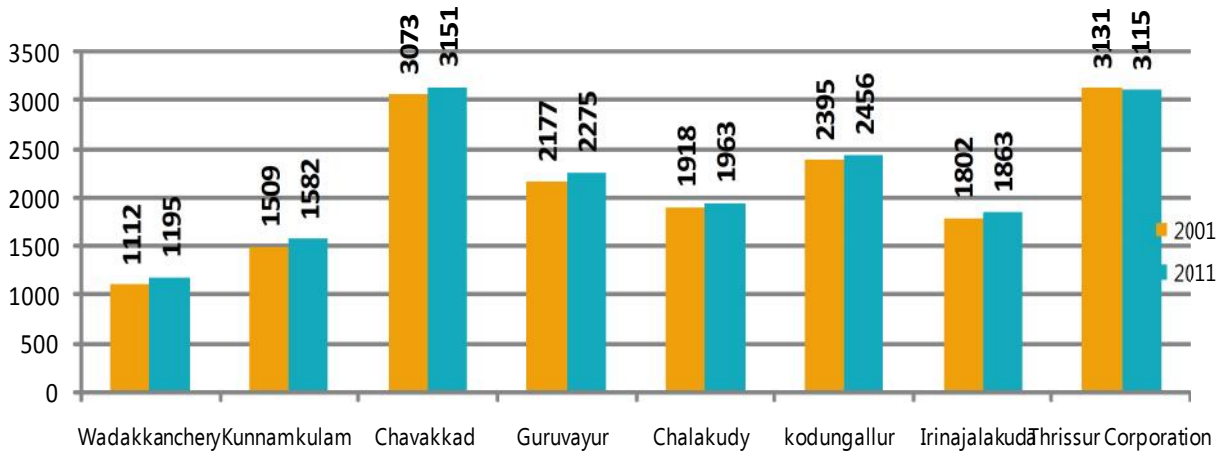


Fig 3.11 Comparison of Population density with urban LSGI's Source: Census data

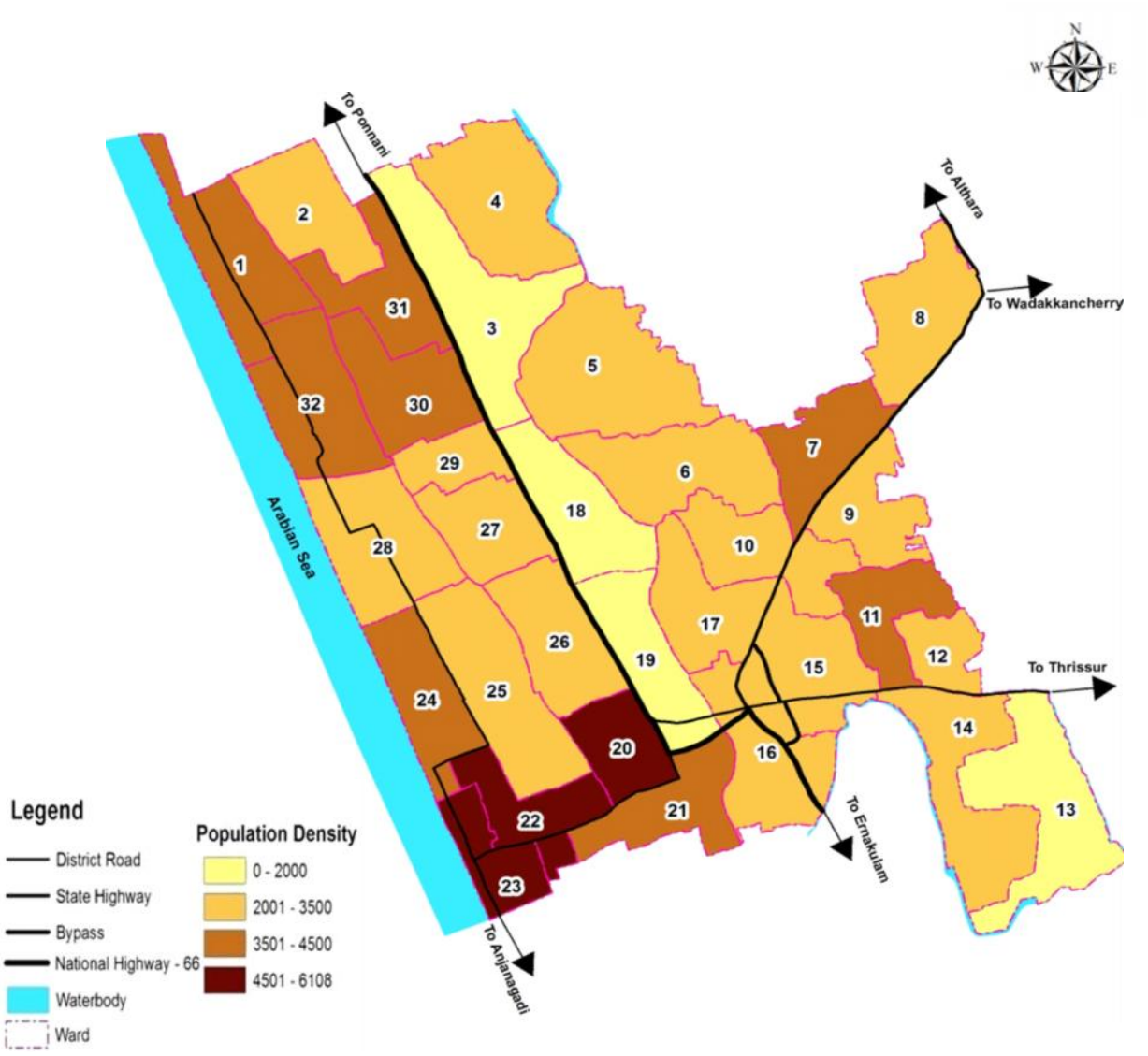


Fig 3.12 Wardwise variation of Population density

Source: Census data

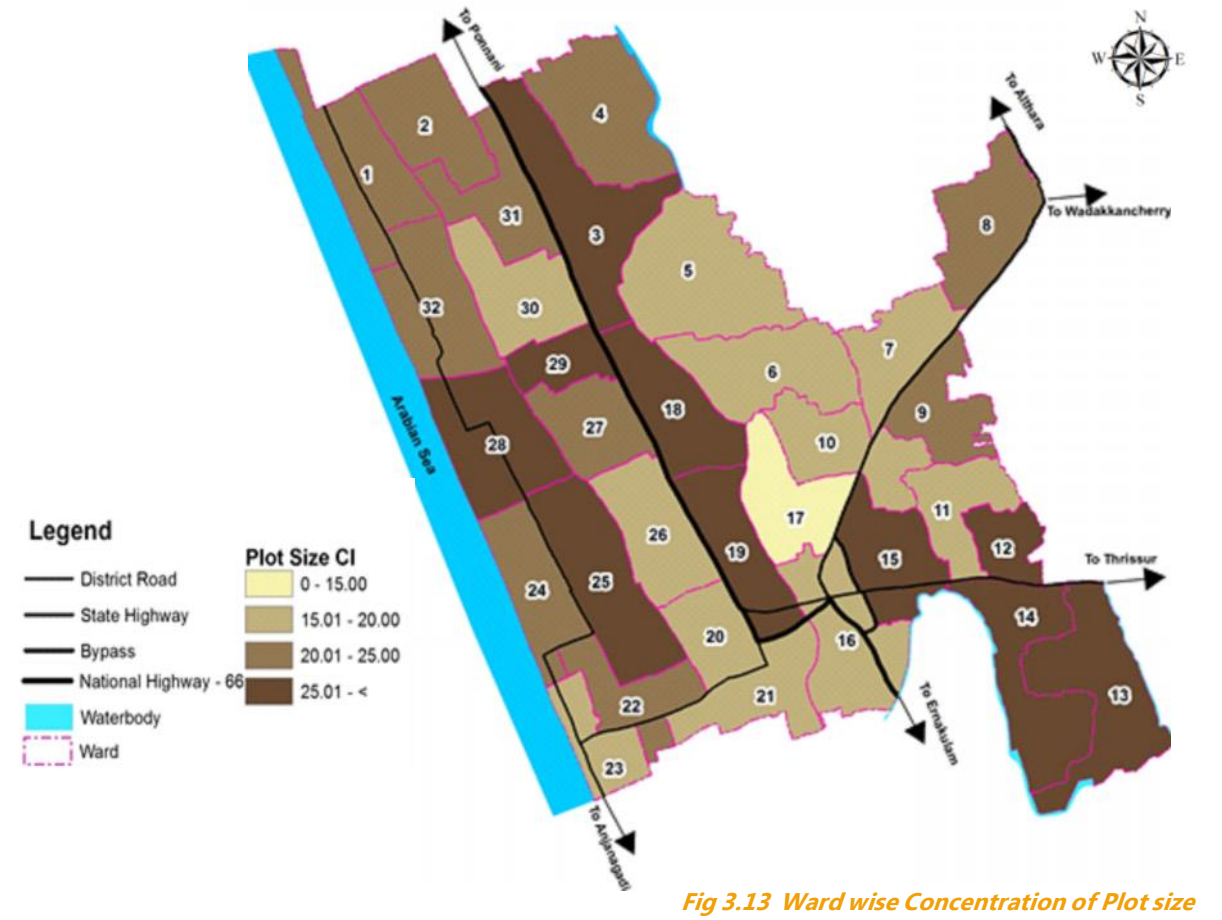


Fig 3.13 Ward wise Concentration of Plot size
Source: Census data

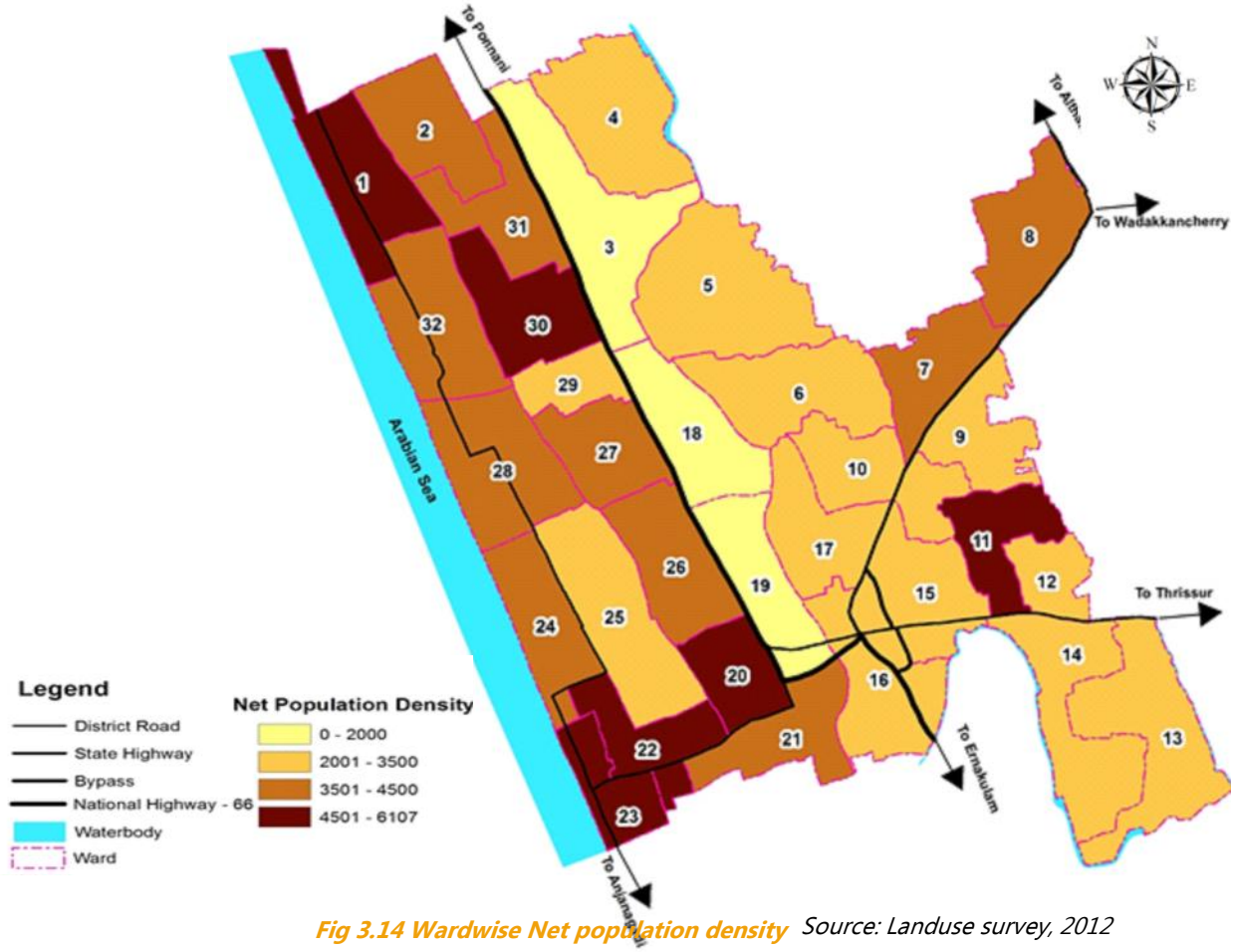
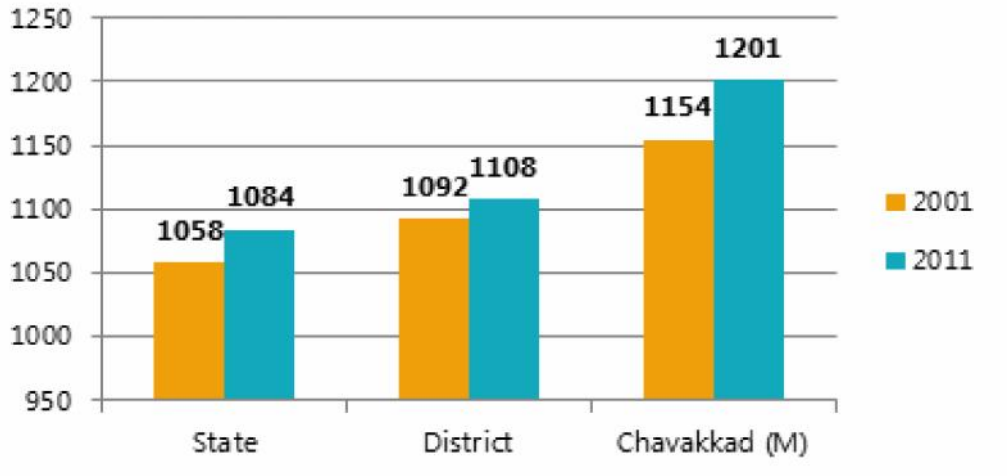


Fig 3.14 Wardwise Net population density *Source: Landuse survey, 2012*

3.4 Sex Ratio

Sex ratio is defined as the number of females per 1000 males. As per 2011 census, the sex ratio of Kerala is 1084 against a national average of 940. Kerala is the only state in India where the sex ratio is greater than 1000. Sex ratio of Thrissur district and Chavakkad town are 1108 and 1201 respectively. The temporal variation of sex ratio of the state, district and Chavakkad Town during 2001 and 2011is shown in fig 3.15.



Source: Census data

Fig 3.15 Comparison of Sex ratio

Chavakkad Town area shows the sharpest increase of 47 points in the sex ratio during the last decade when compared to the district and state. Sex ratio of Chavakkad Town area is higher than the district and state average. Comparison of sex ratio of Chavakkad town with other urban LSGI's in district is shown in fig 3.16. Chavakkad Town ranks Ist position in largest sex ratio when compared with other towns in the district. Comparison of sex ratio of Chavakkad town with adjoining LSGI's is shown in fig 3.17. Chavakkad town ranks 2nd position when compared with other nearby LSGI's.

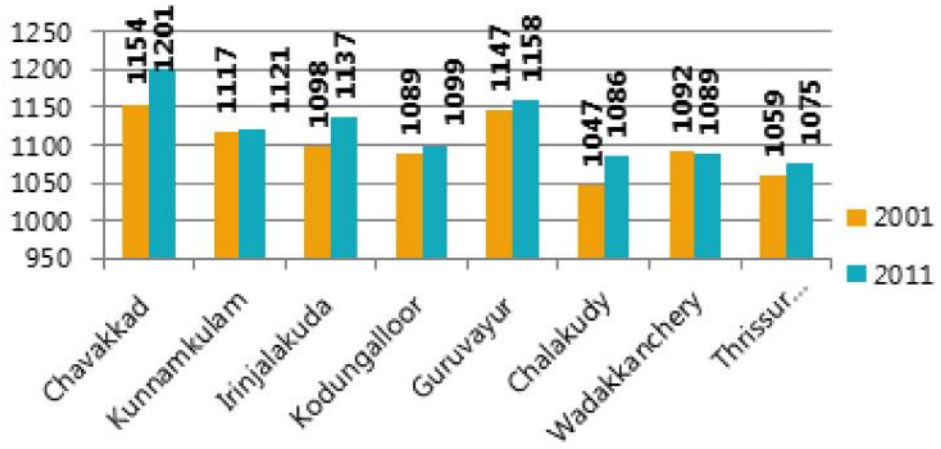


Fig 3.16 Comparison of Sex ratio of Chavakkad town with urban LSGI's

Source: Census data

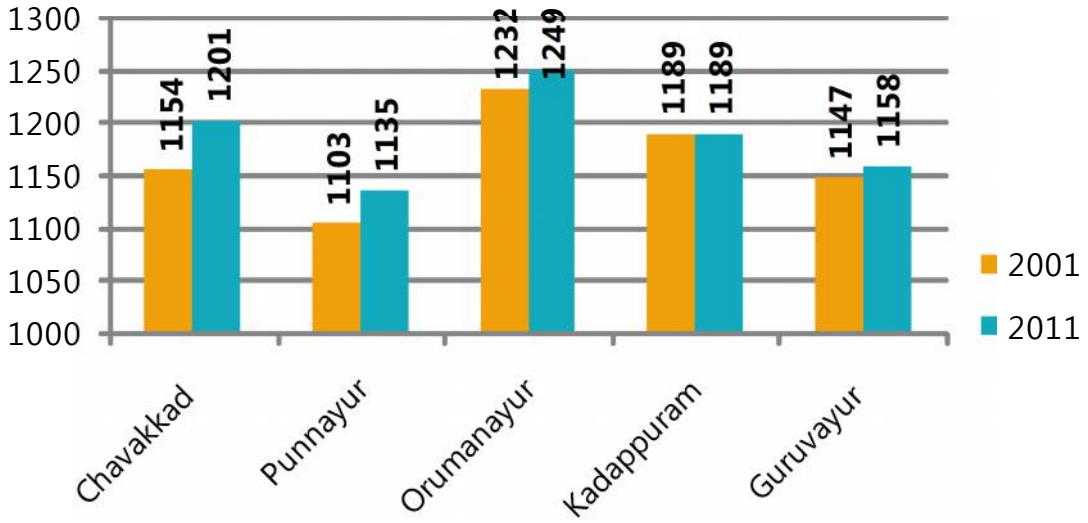


Fig3.17 Comparison of Sex ratio of Chavakkad Town with nearby LSGI's

Child sex ratio

Source: Census data

Chavakkad has a child sex ratio of 931. Even though Chavakkad town shows higher sexratio, child sex ratio shows a decling trend.The decadal variation of child sex ratio of Kerala, Thrissur and Chavakkad Town shown in fig 3.18.On comparing child sex ratio with other urban LSGI's of Thrissur district, Chavakkad shows a fourth position and are as shown in figure 3.19.

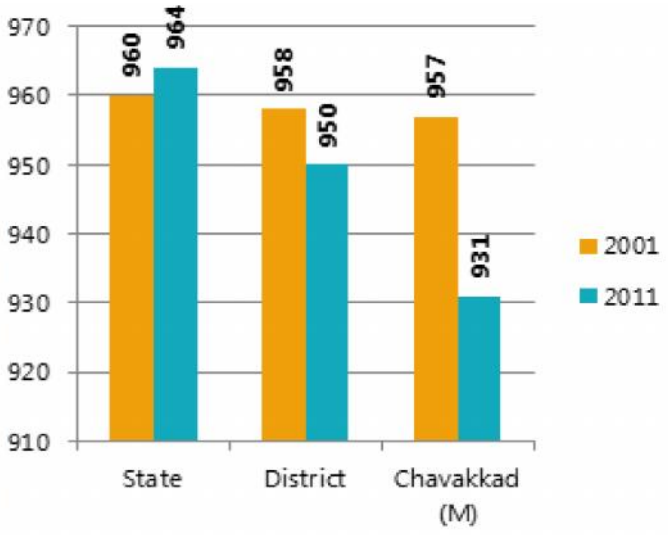


Fig3.18 Child sex ratio-The decadal variation

Source: Census data

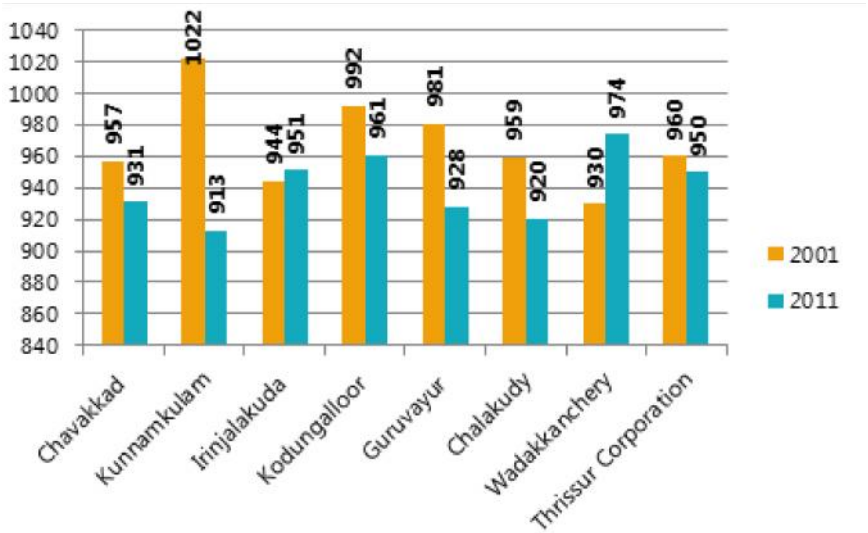


Fig 3.19 Comparison of Child Sex ratio of Chavakkad Town with urban LSGI's

Source: Census data

3.5 Age structure

One of the most important demographic characteristics of population compostion is Age structure. Age-sex pyramid of Chavakkad Town is arrived at from the socio-economic survey and is shown in figure 3.20. Age-sex pyramid gives the population composition of the Town. For Chavakkad, the economically productive population i.e. between age group 25-40 is seen to be more in general and in particular males are out numbering females.

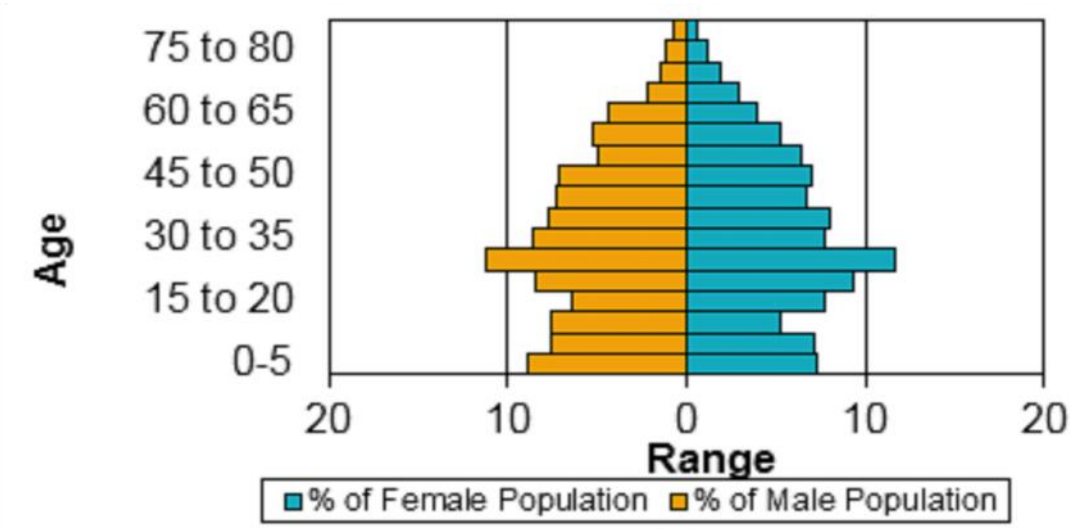


Fig 3.20 Age – Sex pyramid of Chavakkad Town

Source: Socio economic survey, 2012

3.6 Literacy Rate

The Literacy rate of Chavakkad Town is showing an increasing trend during 2001-2011 and can be inferred from figure 3.21. The Literacy rate of Chavakkad town is 94.36 %, which is nearly equal to State but less than the District literacy rate of Chavakkad Town comparison with other towns as shown is figure 3.22

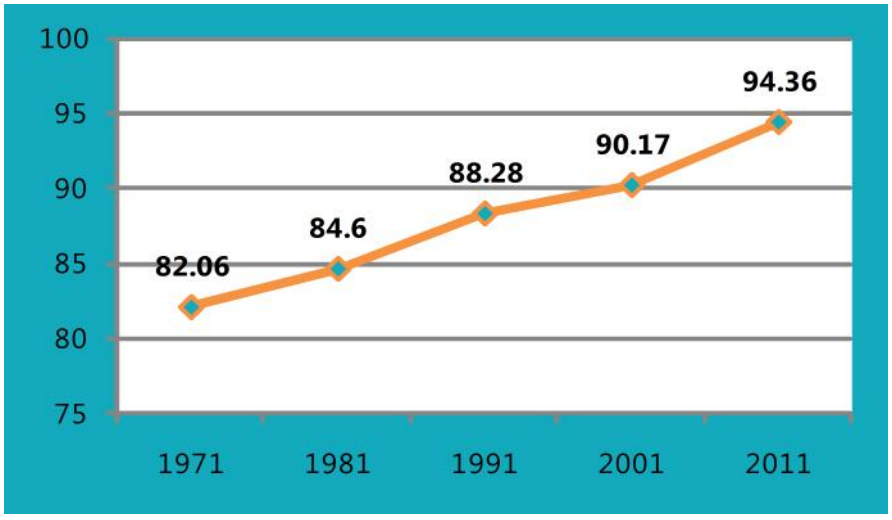


Fig 3.21 Decadal Variation of Literacy rate

Source: Census data

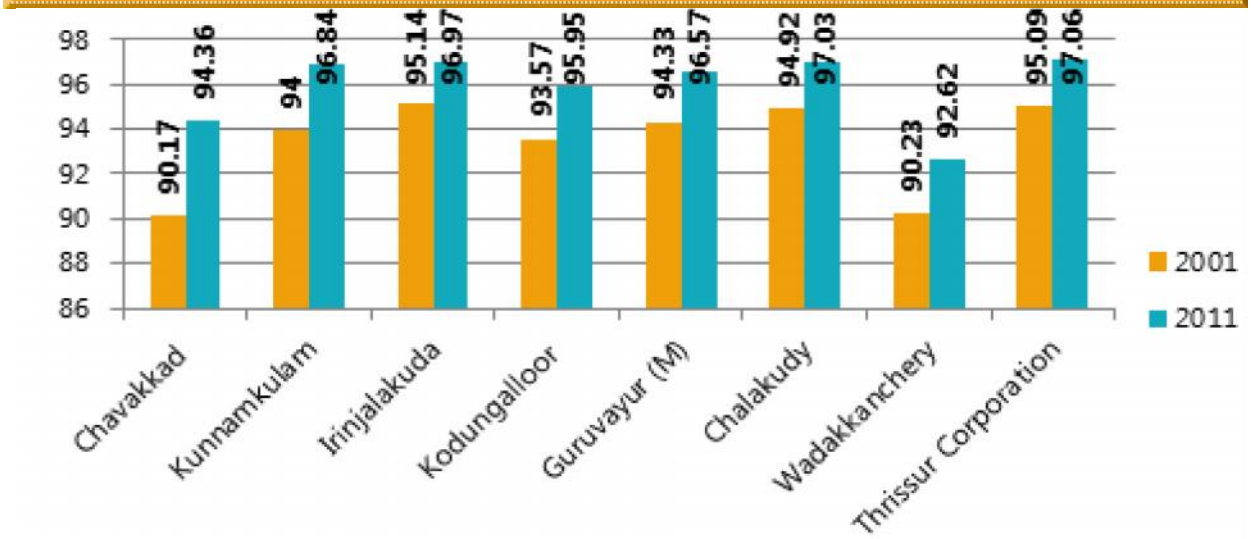


Fig 3..22 Comparison of Literacy rate with urban LSGI's

Source: Census data

3.7 Household Size

House hold is another important component of demography. A house hold is usually a group of persons who normally live together and take their meals from a common kitchen unless the exigencies of work prevent them from doing so. As per 2011 census, as against a total population of 39098 persons Chavakkad has a household size of 4.73 persons. In 2001 census, the average size of house hold size in Chavakkad was 5.62. The average house hold size has decreased during 2001-2011.This decrease in house hold size indicates the decrease in the family members in a household which indicates a changing trend to nuclear families. It is seen that Household size of Chavakkad Town is higher than State, District and other urban LSGI's. Figure 3.23 shows the comparison of household size in nearby LSGI's.

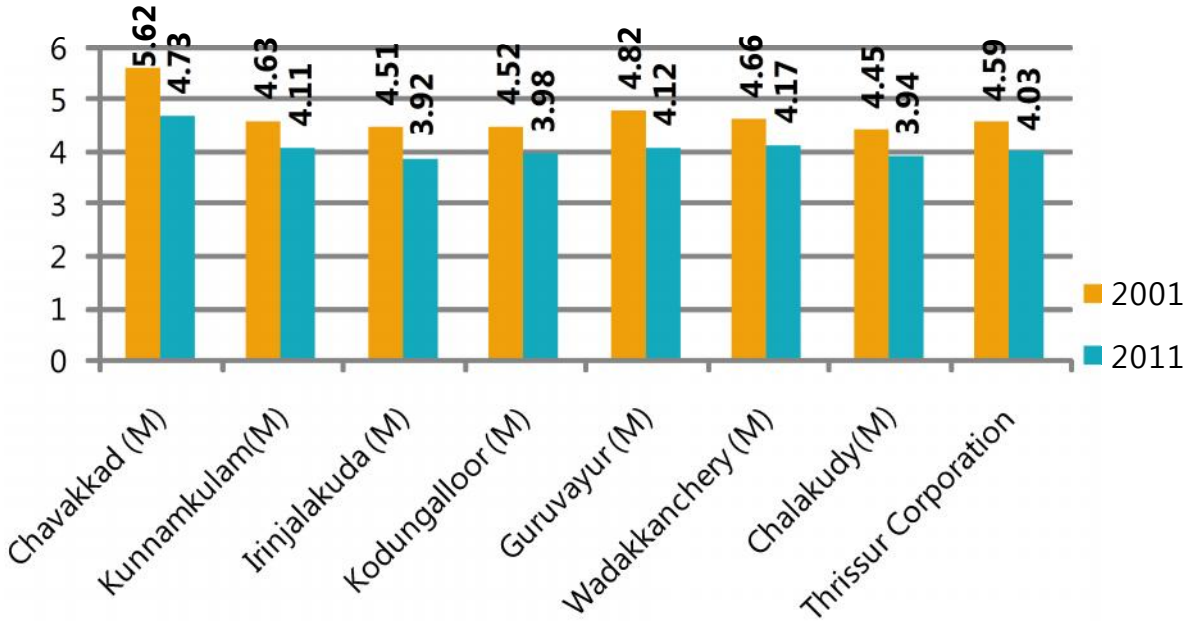


Fig 3.23 Comparison of Household size with nearby LSGI's

3.8 Migration

As per Panchayath level NORKA Report of Thrissur district, out of total Population of 39098, 4212 number of persons are NRI'S i.e. 10.773% of total population; in which it is from 2811 number of Households. Figure 3.24 shows the Comparison of NRI's with other urban area, Figure 3.25 shows Percentage of Chavakkad out migrants in different countries, from figure it implies that more persons are migrated to gulf countries, may be due to this Chavakkad is also known Mini Gulf of Kerala in early years.

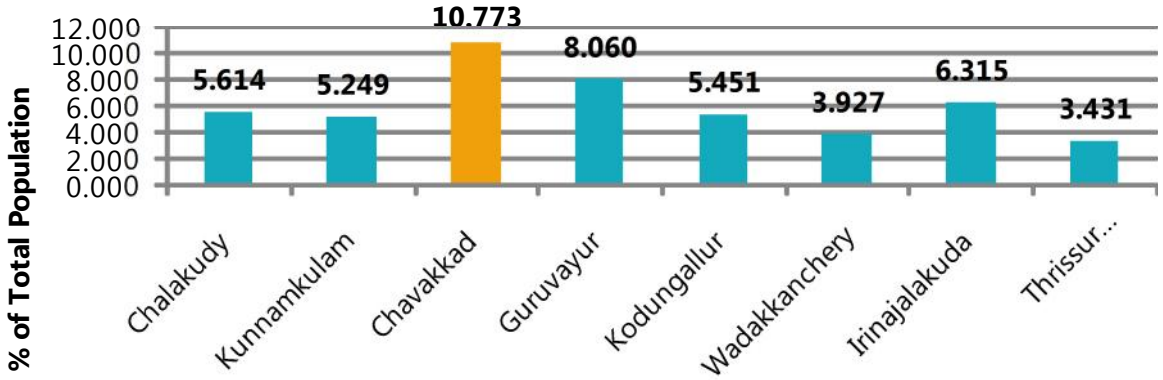


Fig 3.24 Comparison of NRI's with other urban local bodies

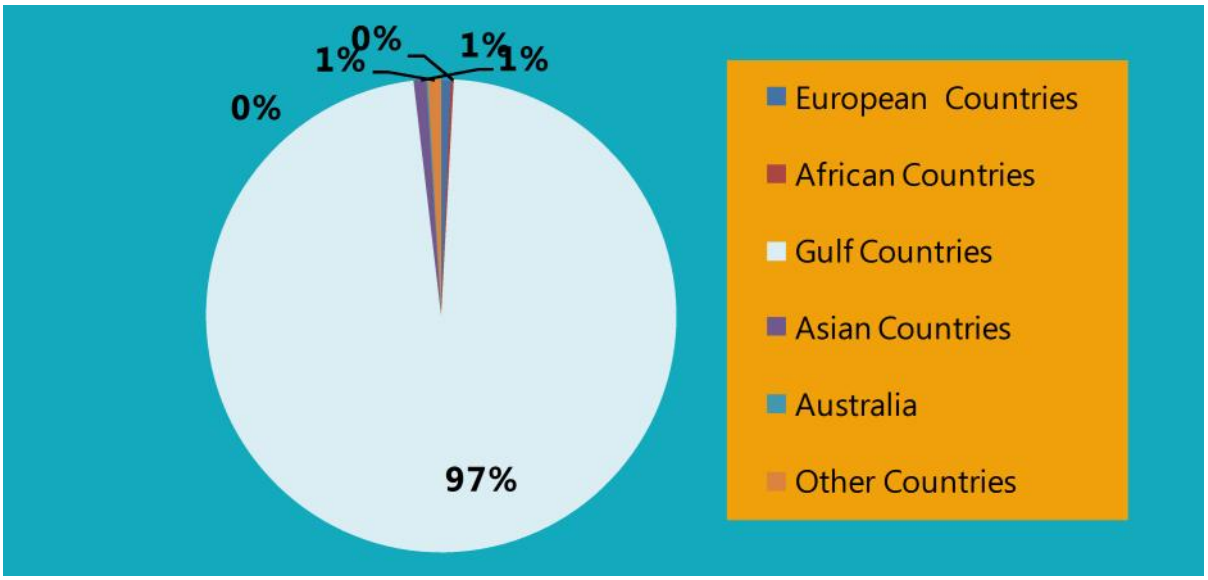


Fig3.25 Percentage of migrnats from Chavakkad town in different Countries

Source: Panchayath Level NORKA Report, 2013

3.9 Social Composition

Chavakkad town is rich with many types of religious communities. In Census 2011, Religious census is also been calculated, from the data it implies that In Chavakkad Town about more than half population i.e. 53.38% of the total population are from Muslim Community and 41.87 % are from Hindu Community, only 4.25 % are from Christianity (Figure 3.26 and Table 3.2)

Table 3.2Details of Different Religious Communities of Chavakkad Town

Name of Religions	Total Number
Hindu	16369
Muslim	20949
Christian	1661
Sikh	1
Buddhist	0
Jain	1
Other religion and Persuasions	4
Religion not stated	113

Source: Census data

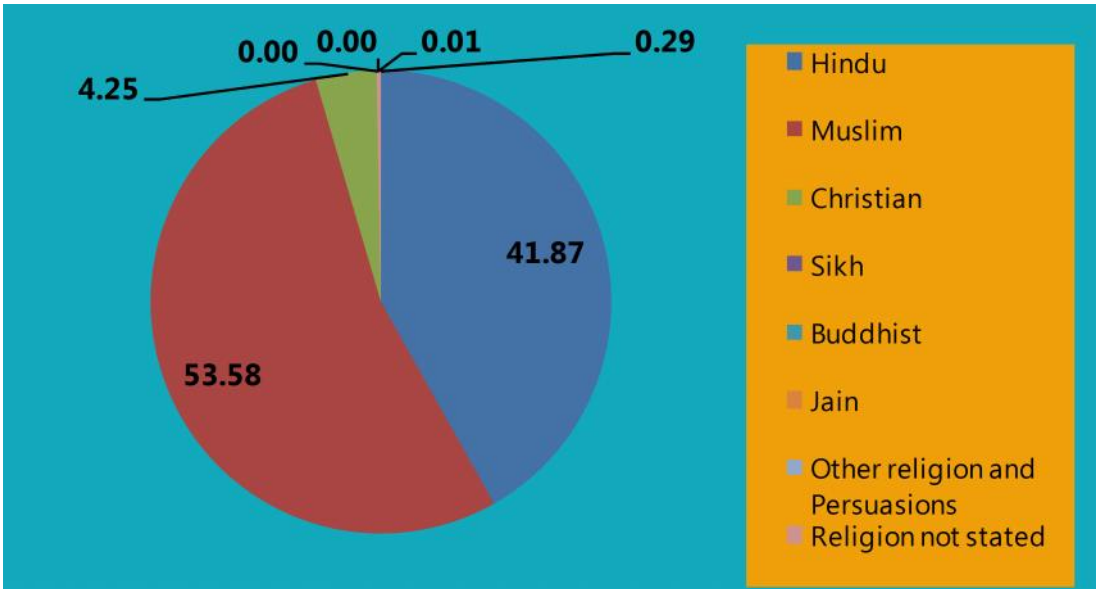


Fig 3.26 Percentage of Chavakkad population in different Religious Communities

Source: Census data

3.9 Inference

Chavakkad Town is the smallest Town in Thrissur District in geographical area and population among the Urban LSGI's. Population growth rate of Chavakkad Town shows a decreasing trend up to 2001 and a slightly increasing trend during 2001- 2011. Population density is high compared to other urban LSGI's. Even though Chavakkad has high sex ratio, child sex ratio seems to be decreasing. Household size of Chavakkad is higher than the State, District and other urban LSGI's, which means Chavakkad shows a joint family living trend even though there is a changing trend to nuclear families. About 87.96% of the total population is above age of 6. Chavakkad Town has a more number of NRIs among other urban areas from the district and more than half of the Population of the town is from Muslim Community.

CHAPTER 4

EMPLOYMENT

This chapter reveals the existing pattern of occupational structure of Chavakkad Town and the percentage of workers with in the local body. 2011 census data are taken for the analytical purpose of occupational pattern. This chapter points out the percentage of workers in different categories of work and the work force participation of Chavakkad and its comparison with remaining urban LSGIs.

4.1 Work Force Participation Rate

The details of population, workers and WFPR of Chavakkad during 1981-2011 are shown in table 4.1. Work force Participation Rate of any place is an indicator of the economic activities taking place in that locality. It is the proportion of total workers in the total population of the locality. WFPR of Chavakkad Town as per 2011 census is 26.715 which say that out of total population of 39098 there are 10445 workers. Of the total workers, 8226 are males and 2219 are females.

A comparison of WFPR of Chavakkad Town with district value and state is given in figure 4.1 which shows that Chavakkad Town is showing a lower value than district and state average.

Table.4.1 Details of population, workers and WFPR

Year	Total Population	Total Workers	WFPR
1981	34344	7759	22.59
1991	37789	9048	23.94
2001	38138	9792	25.68
2011	39098	10445	26.71

Source: Census Data

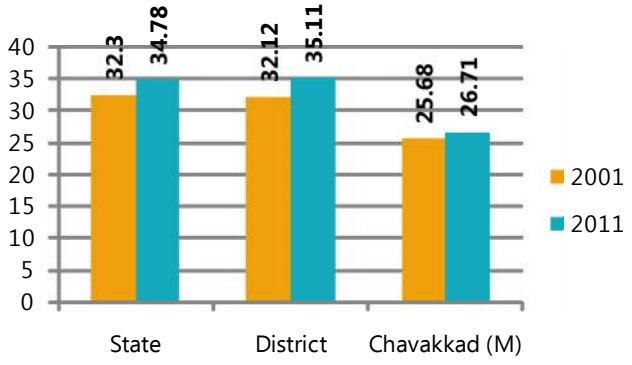


Fig 4.1 Comparison of Work Force Participation Rate

Source: Census Data

Temporal variation of WFPR of Chavakkad Town is given in figure 4.2. This shows that work participation rate has a sudden decrease upto 1981 and a gradual increase from 22.08 to 26.71 during 1981-2011, which indicates that more people are engaged in productive activities which contribute to economic development. Work force participation rate of females is 10.4% in 2011.

Comparison of work participation rate with surrounding LSGI's and other urban LSGI's in Thrissur district is given in figure 4.3 and 4.4 respectively. Chavakkad shows second highest WFPR when compared with nearby LSGI's and show the lowest WFPR when compared with other urban LSGI's.

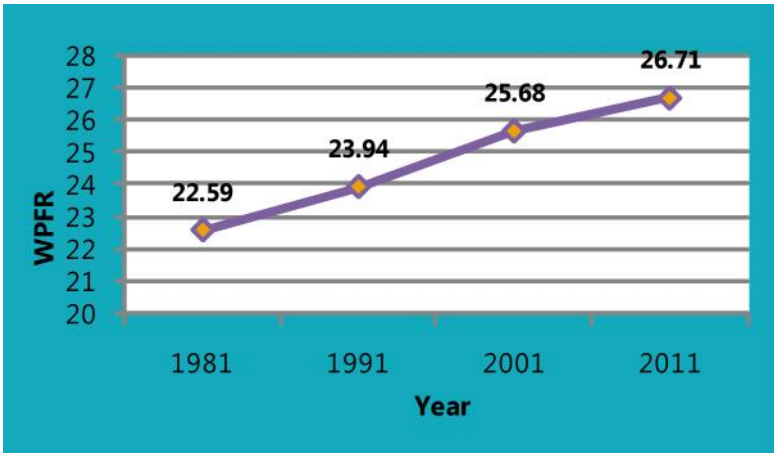


Fig 4.2 Variation in Work Force Participation Rate

Source: Census Data

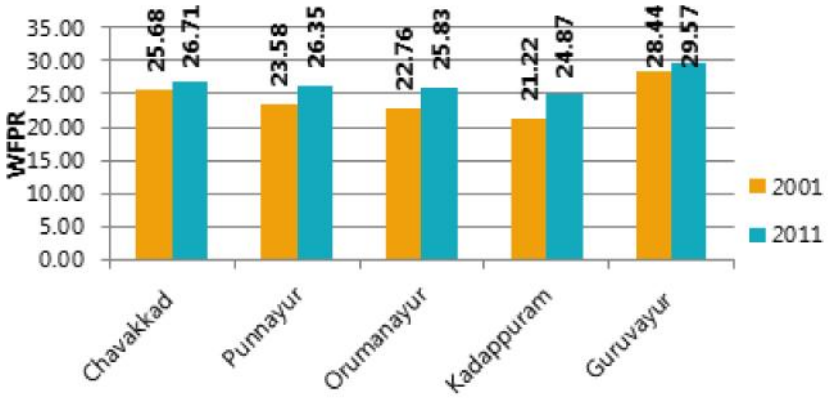


Fig 4.3 Comparison of WFPR with nearby LSGI's

Source: Census Data

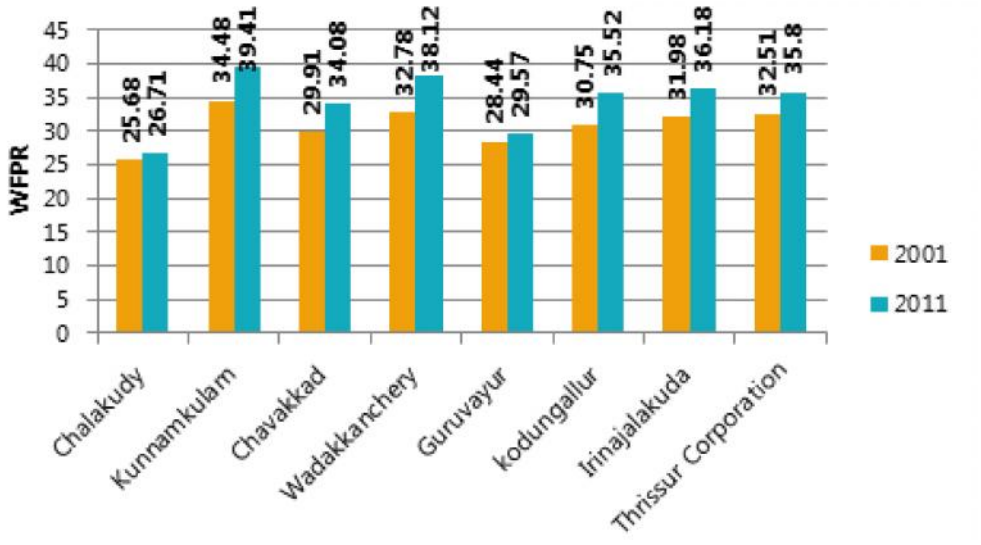


Fig 4.4 Comparison of WFPR with urban area

Source: Census Data

Figure 4.5 shows ward wise WPR of the Chavakkad town. It implies that ward no 1, 8, 28, 30 shows high WPR. It ranges from 11 to 36.

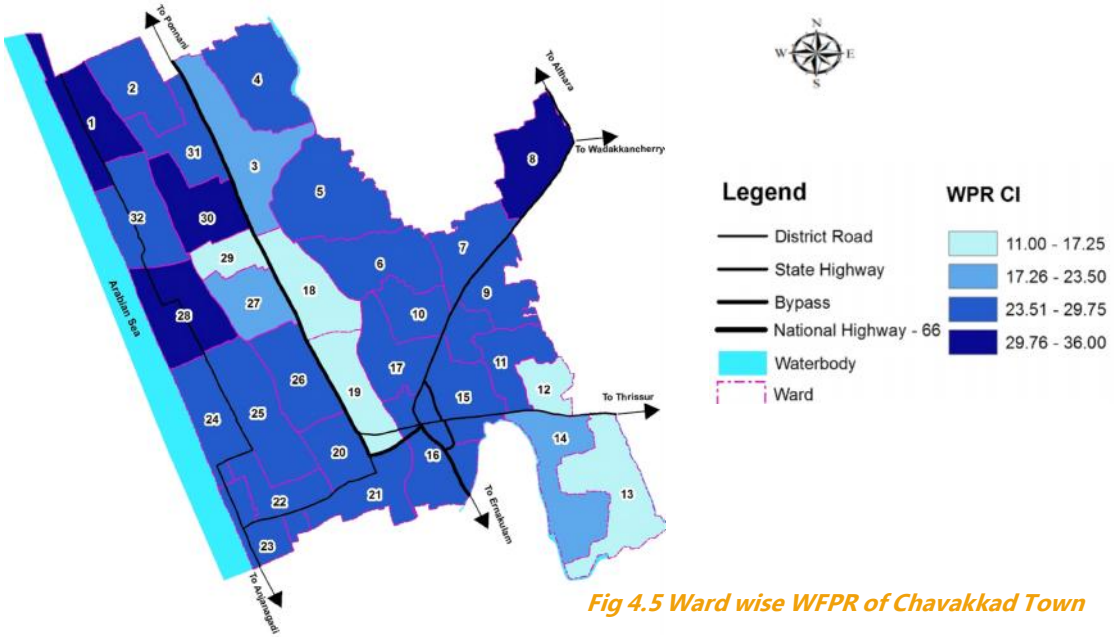


Fig 4.5 Ward wise WFPR of Chavakkad Town

Female work force participation rate

In recent years, women are playing an important role in economic development. Their contribution in gross domestic production and all other sectors are having a prime importance. The women work participation is high in urban area and low in rural area. Percentage of female and male workers is shown in fig 4.6.

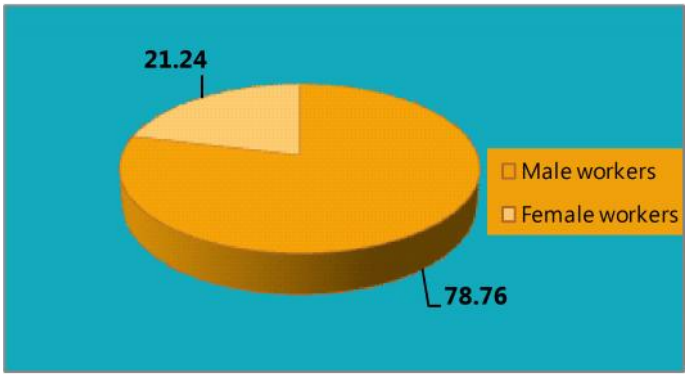


Fig 4.6 Percentage of female and male workers

Source: Census Data

Only 21.24% of total workers are female. The figure 4.7 shows the comparison of percentage of male and female workers of Chavakkad town area with district and state average. When compared with the district and state, Chavakkad town area has the least female work force participation rate (5.68%).

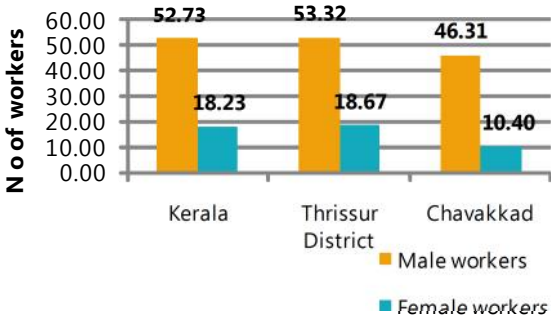


Fig 4.7 Working Population by gender

Source: Census Data

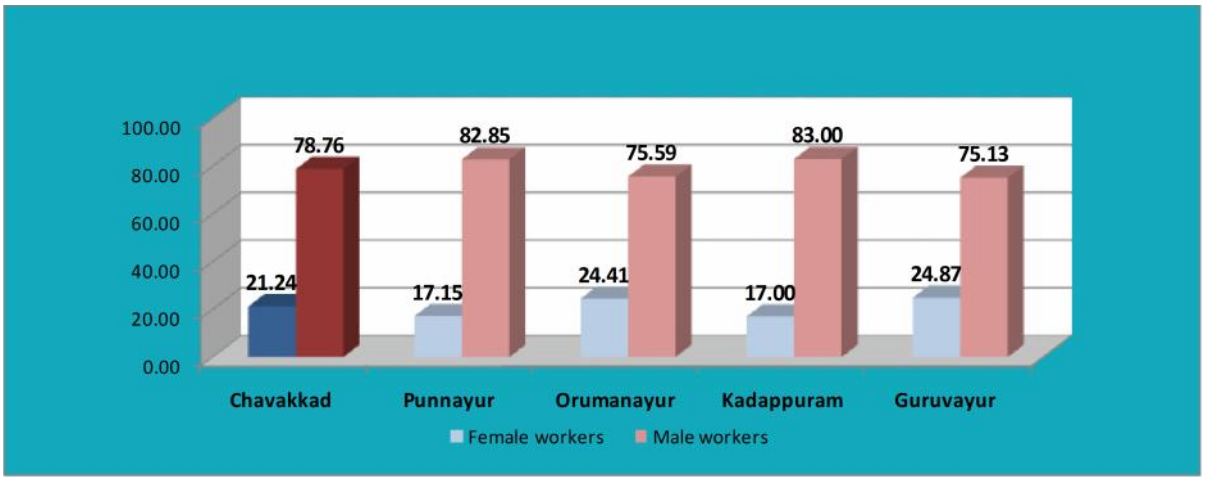


Fig 4.8 Comparison with nearby LSGIs of percentage of male and female workers w.r.t total workers

Source: Census Data

Figure 4.8 shows the comparison with nearby LSGIs of percentage of male and female workers with respect to total workers.It reveals the Chavakkad town ranks 3rd position when compared with the nearby LSGI's. It reveals that Chavakkad town shows a moderate rate on the comparison with nearby LSGI's. All these comparison, implies that Chavakkad shows low work force participation rate, one of the reason being low female work participation rate.

Classification of workers

Accordingly as per census of India, all persons engaged in 'work' defined as participation in any economically productive activity with or without compensation, wages or profit are workers. The figure 4.9 shows the percentage of main marginal and non-workers of Chavakkad town. Census classifies workers into two groups, main workers and marginal workers. Main workers are engaged in economically productive activities for six months or more in a year, while marginal workers work for less than six months in a year. Total workers in Chavakkad Town are 10445 and out of this 89% are main workers and 11% are marginal workers . Figure 4.10 shows the comparison of total workers , main and marginal workers comparison with state and district, it reveals that the percentage of total workers in Chavakkad Town is 26.71 which is lower than the district and state average . The percentage of main workers in Chavakkad town is also lower than the district and state average Marginal workers of the town are also low when compared with state and district.

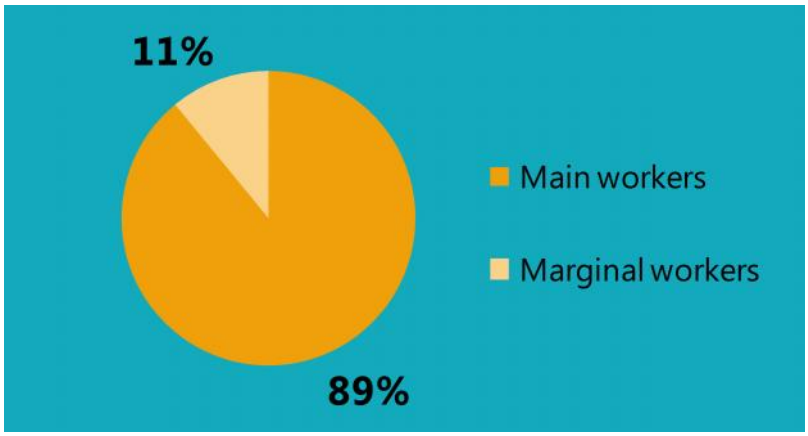


Fig 4.9 Percentage of main and marginal workers

Source: Census Data

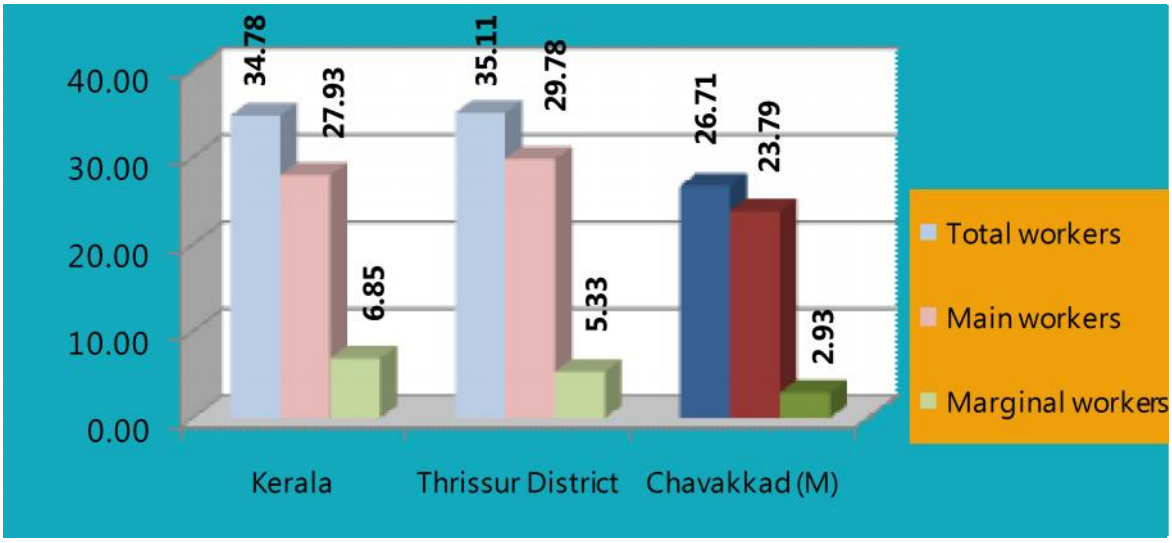


Fig 4.10 Comparison of % of main,marginal and total workers of Chavakkad Town with state and district

Source: Census Data

Figure 4.11 shows the temporal variation of total workers and main workers and it can be seen that the increase in main workers is not the same as that of total workers. This indicates that the majority of job opportunities created are of temporary nature and mainly during the period 1991-2011.i.e. Chavakkad shows a gradual increase in the number of total workers and also in the main workers .

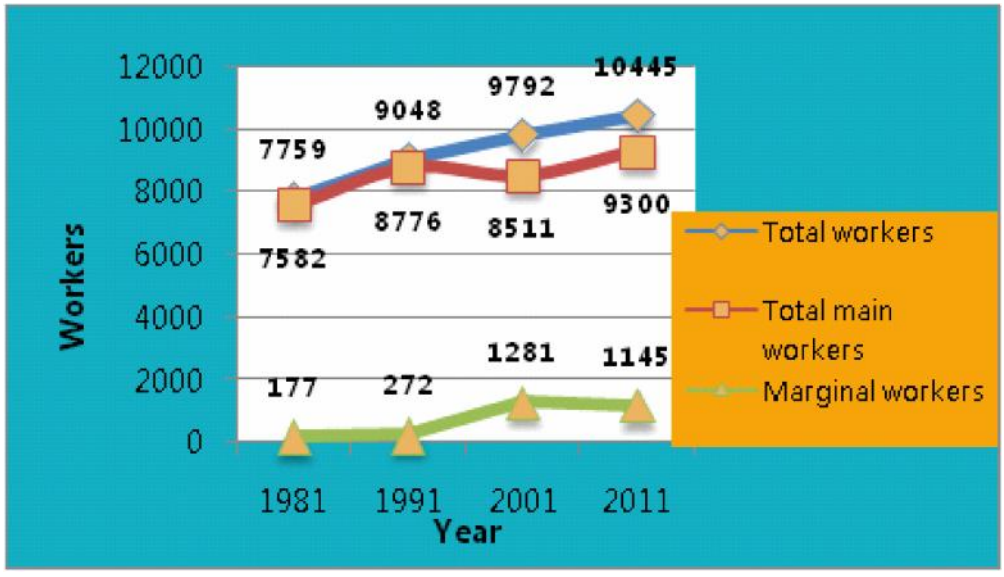


Fig 4.11 Variation of total workers and main workers

Source: Census Data

4.2 Occupational Structure

The composition of work force is called the Occupational Structure. Main workers are categorized as cultivators, agricultural labourers, household industrial labourers and other workers so as to work out the occupational structure. Majority of the workers are other workers Cultivators, Agriculture sector observed a declined trend indicating the dominance of industrial, commercial and service sectors during the last three decades. The temporal variation of occupational structure is given in figure 4.12. It can be inferred from the figure that agricultural activity and house hold industrial activity have drastically come down through the years. Percentage of cultivators shows an increasing trend from 1981 to1991 then decreased to marginal in 2011, which indicates reduction in land utilisation for cultivation. Percentage of agricultural labourers shows a steep decrease from 9% in 1981 to 1% in year 2011. Percentage of cultivation shows are increasing trend from 1981 to 1991, then decreased to a negligible. Increase in the wages of agricultural labourers and reduced value of agricultural products have resulted in the decrease of agricultural activities. Percentage of household industrial workers shows a varying trend from 2% in 1981 to 3% in 2011, while other workers increased from 87% in 1981 to 96% in 2011.

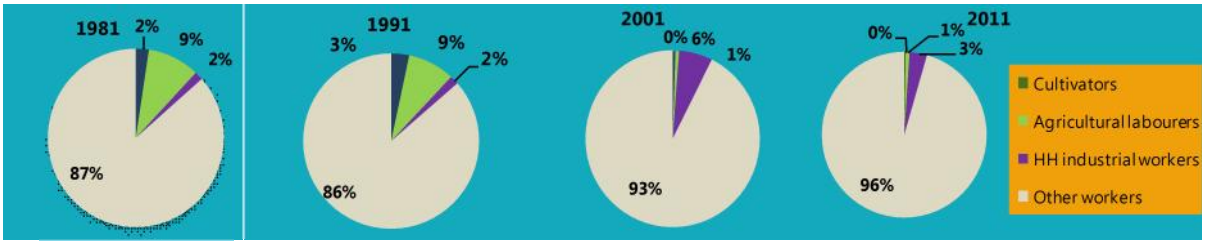


Fig 4.12 Occupational structure-1981, 1991, 2001 and 2011

Source: Census Data

Table 4.2 shows that HH industrial workers and agricultural workers are decreasing. Other workers are increasing and are mainly from service sector trade. The current threefold and fourfold classifications of workers arrived at from socio-economic survey conducted in 2012. This shows that tertiary sector forms as the economic base of the town.

Table 4.2. Fourfold classification of workers1981,1991,2001,2011

Type of workers	1981	1991	2001	2011
Cultivators	179	292	42	25
Agricultural labours	722	761	58	70
Household industrial workers	117	141	524	318
Other workers	6564	7582	7887	8887

Source: Census Data

From the figure 4.13 it implies that other major categories are construction helpers (8.83 %), beedi workers (5.08 %), retail fish vendors (5.25%) and drivers (8.5%). It can be seen that 18.17 % NRI workers are present in Chavakkad. From the local level analysis, it reveals that at least one person from a family works in Gulf countries. 32 %include other workers and are mainly from service sector, trade and commerce.

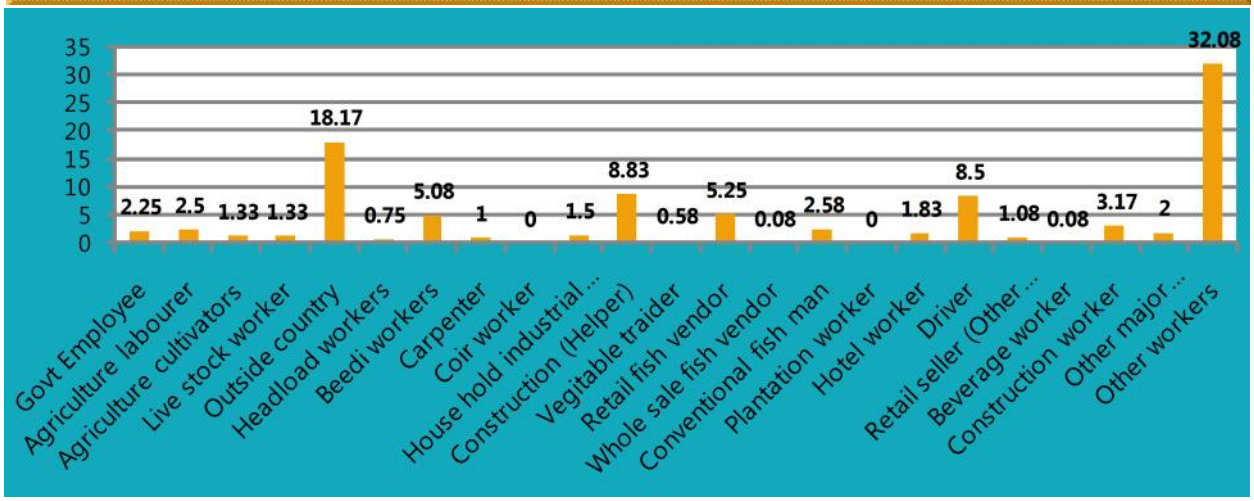


Fig 4.13 Percentage of workers in each category

Source: Socio economic survey 2012

Female Headed Houses

There are about 27 million female headed households in the country. They constitute 10.9% of the total households in the country. Larger proportion of Female Headed Households lives in 'No exclusive room' and in 'One room' dwelling units compared to Male Headed Households. The household sizes in case of Female Headed Households tend to be smaller than the Male Headed Households. The proportions of households possessing different assets are lower in case of Female Headed HHs in comparison to Male Headed HH. Reasons for emergence of Female Headed Households are the broad range of domestic situations typically characterized by the absence of a resident male head, widowhood, divorce, separation and desertion. Migration of male members for long periods, Loss of economic function by resident males due to severe unemployment, disability, illness reluctance to accept jobs and Households with no mature sons and sons residing in independent nuclear units.

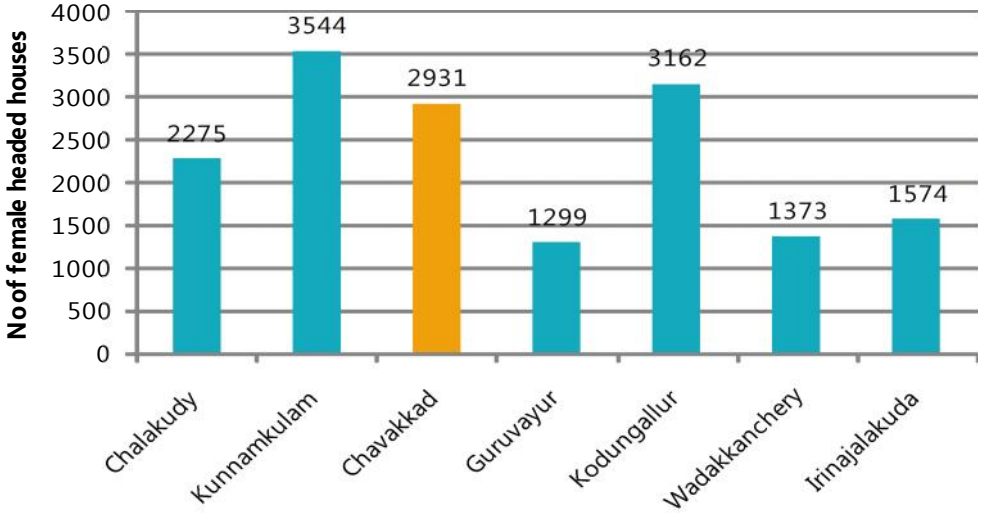


Fig 4.14 Comparison of % female headed houses with other urban area

Source: Census Data

Chavakkad town has 8269 of total number Households in which 2931 number are of female headed houses i.e. 35.4% of female headed household which could be due the increase in NRI's based families. The figure 4.14 shows the comparison of Female headed households with other urban areas.

Spatial Distribution of Workers

Concentration index of cultivators in Chavakkad Town is given in the figure 4.15. Concentration index of cultivators is high in wards 5 and 11. Figure 4.16 shows Spatial distribution CI of agricultural labourers and their concentration is more in wards 2,8,17. Spatial distribution of concentration index of household industrial labourers in Chavakkad Town is given in figure 4.17. It is seen that household industrial labourers are concentrated Along the NH.



Fig 4.15 Concentration Index of cultivators

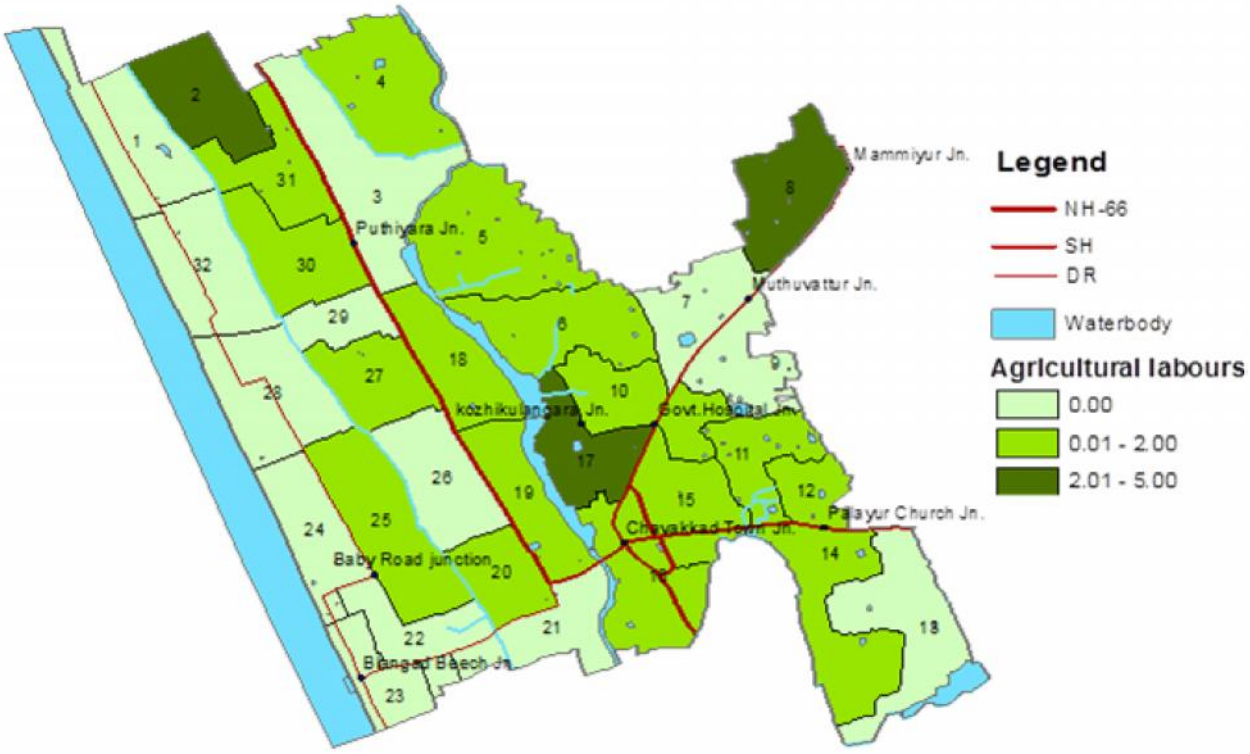


Fig 4.16 Concentration Index of agricultural labourers

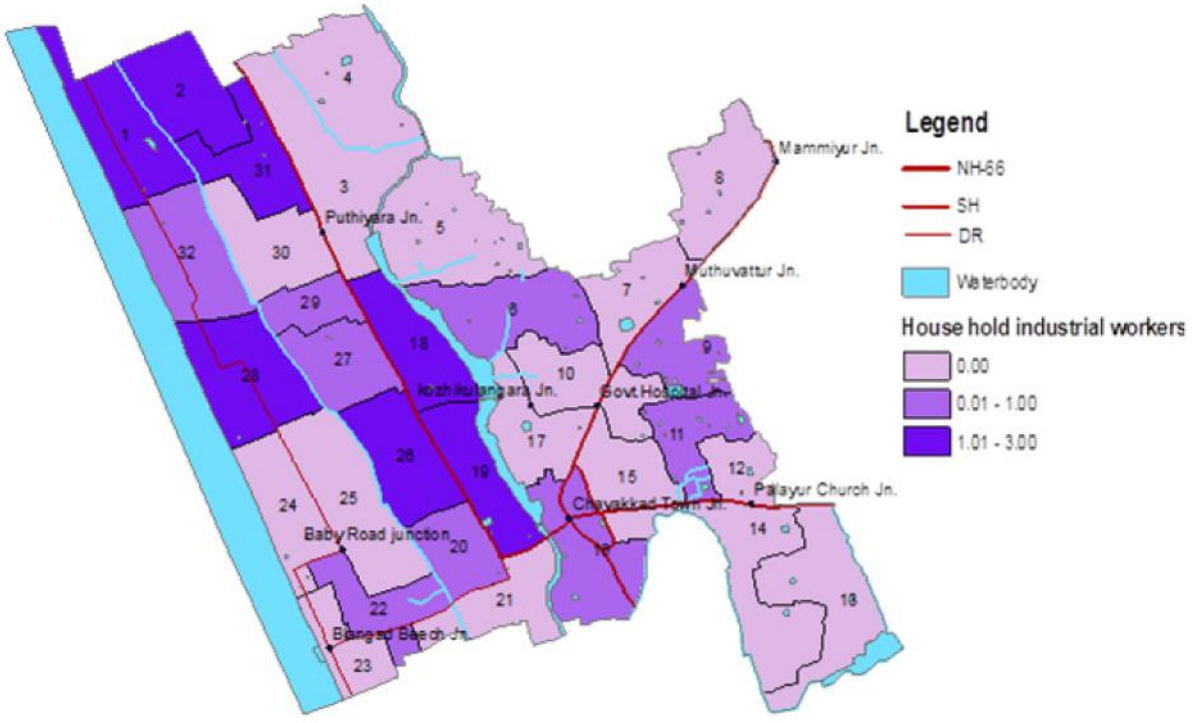


Fig 4.17 Concentration Index of household industrial workers

4.3 Inference

From the analysis, WFPR of Chavakkad Town shows as increasing trend during 1981-2011. WFPR of Chavakkad is moderate. Chavakkad shows a gradual increase in the number of Total workers and also in the Main workers. Out of the total workers 89% are main workers and only 11% are marginal workers. Chavakkad has 10.77 % of NRI workers which is more than other Towns in the district. This shows that economy of Chavakkad town to an extend depends on foreign money. When compared with other Towns, Chavakkad shows the lowest percentage cultivators, Agricultural workers, HH workers and other workers. Majority of workers are in tertiary sector which indicates the urban nature of Town.

CHAPTER 5

LAND USE

This chapter deals with the study and analysis of existing land use -2013 of Chavakkad town area. The study is based on the land use survey conducted by Town and Country Planning Department, Thrissur. The analysis provides an insight into the structure of land, which can be used as a platform while planning for the future land use demands.

5.1 Existing land use pattern

Chavakkad town has a geographical area of 12.59 sq.km and is utilised for various uses like residential, commercial, industrial, agricultural etc. The land use break up in terms of area as well as percentage with respect to the total area is given in Table 5.1 & Figure 5.1. Residential land use is predominant than other land uses, which covers about 60.32 % of land. It can be seen that major land use is residential in majority of wards. Ward 5 and 6 shows an exception with majority of dry agricultural land use. The land use breakup in 32 wards of Chavakkad town is shown in table 5.2.

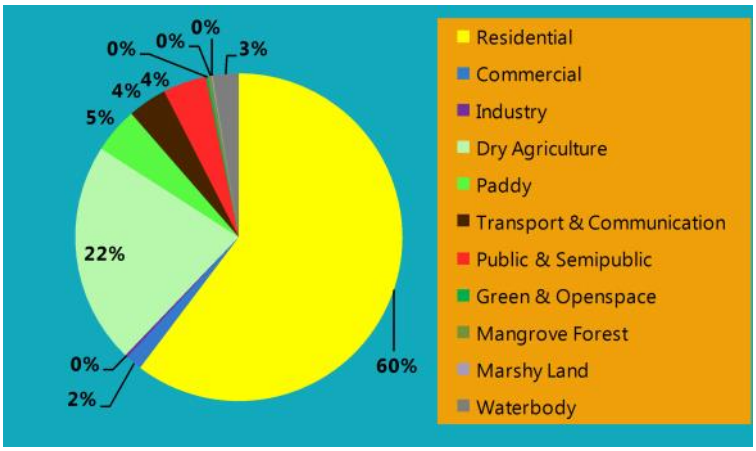
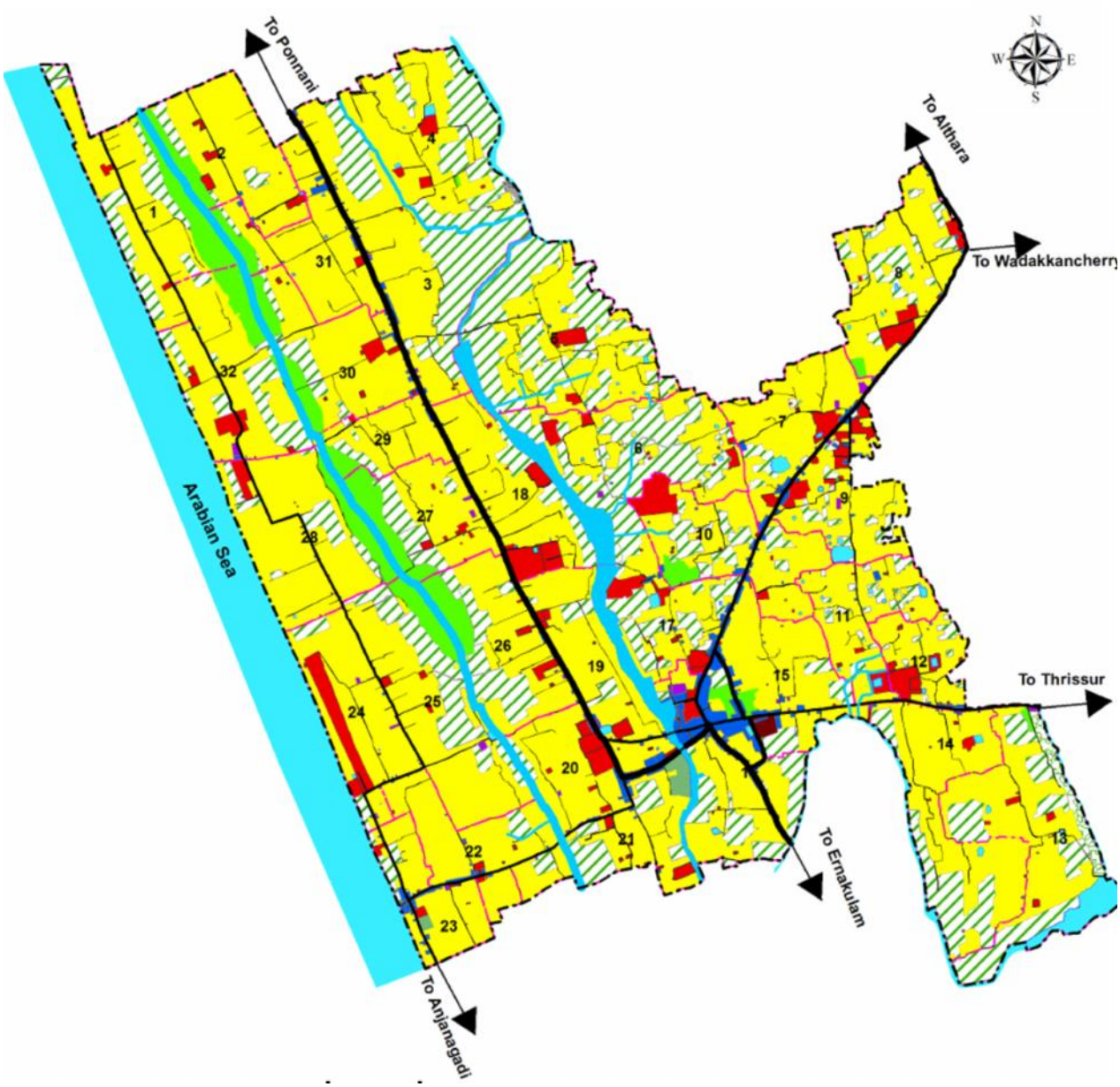


Fig 5.1 Percentage of land use breakup –ward wise

Table 5.1 Existing landuse breakup

Land use Type	%	Land use area
Residential	60.32	7.60
Commercial	1.63	0.20
Industry	0.25	0.03
Dry Agriculture	21.88	2.76
Paddy	4.52	0.57
Transport & Communication	3.86	0.49
Public & Semipublic	4.30	0.54
Green & Openspace	0.20	0.03
Mangrove Forest	0.35	0.04
Marshy Land	0.12	0.01
Waterbody	2.58	0.32
Total	100	12.59

Source: Land use Survey, 2013



Legend

- District Road
- State Highway
- Bypass
- National Highway - 66
- Waterbody
- Ward
- Transportation
- Paddy
- Residential
- Commercial
- Industry
- Public & Semipublic
- Park & Openspace
- Dry Agriculture
- Mangrove Forest
- Marshy Land

Fig 5.2 Existing land use 2013

Ward No	Ward Name	Residential	Commercial	Industrial	Dry Agriculture	Paddy	Transportation	Public	Park & Open Space	Mangrove Forest	Marshy Land	Water bodies
1	Puthen Kadappuram North	0.273	0.001		0.079	0.088	0.01	0.004				0.003
2	Gramakkulam	0.277			0.034	0.047	0.01	0.013				0
3	Thiruvathra North	0.307	0		0.261		0.03	0.015				
4	Kuncheri	0.296			0.19	0.001	0.01				0.006	0.004
5	Punna North	0.27	0.002	0	0.319		0.02	0.017				0.042
6	Punna South	0.192	0.001	0.001	0.239		0.01	0.019				0.024
7	Alumpady	0.242	0.01	0.004	0.021		0.02	0.019				0.007
8	Mummiyoor	0.275	0.003	0	0.072		0.02	0.032			0.009	0.002
9	Muthuvattoor	0.188	0.008	0.002	0.033		0.02	0.037				0.011
10	Ovungal	0.235	0.007	0	0.066	0.02	0.01	0.039				0
11	Palayur North	0.209	0.002		0.039		0.01	0.011				0.006
12	Palayur East	0.122	0.002		0.014		0.01	0.023				0.002
13	Palayur South	0.27	0	0.001	0.183		0.01	0.007		0.044		0.057
14	Palayur	0.358	0.002	0.001	0.13		0.02	0.006				0.003
15	Palayur West	0.254	0.019	0.001	0.042	0.01	0.03	0.002				
16	Chavakkad Town	0.214	0.069	0.004	0.116	0.01	0.03	0.01				0.029
17	Kozhikulangara	0.13	0.008	0	0.134		0.01	0.034				0.033
18	Manathala North	0.234	0.001	0.001	0.048		0.02	0.05				0.051
19	Civil Station	0.253	0.007	0.001	0.026		0.02	0.015				0.04
20	Manathala	0.184	0.007	0.002	0.013		0.01	0.017				
21	Blangad	0.187	0.006	0	0.081		0.01	0.01	0.021			0.01
22	Madekkadavu	0.252	0.006	0	0.014		0.01	0.005				
23	Blangad Beach	0.171	0.011	0.001	0.018		0.02	0.004	0.007			
24	Dwaraka Beach	0.253	0.001	0.002	0.021		0.01	0.055				0.001
25	Pulichirakketu West	0.321	0	0.002	0.147	0.049	0.02	0.005				
26	Pulichirakketu East	0.205	0.003	0.001	0.108	0.052	0.02	0.011				
27	ParapilliThazham	0.153	0.001	0.002	0.064	0.073	0.01	0.007				0
28	Puthen Kadappuram South	0.359	0.001		0.056	0.055	0.02	0.013				0
29	Kottappuram	0.128	0.001	0	0.017	0.02	0.01	0.001				
30	Puthiyara	0.246	0.005		0.046	0.063	0.01	0.015				
31	Thiruvathra	0.263	0.007	0	0.005	0.025	0.02	0.004				0.001
32	Puthen Kadappuram	0.285	0.002	0.002	0.097	0.046	0.01	0.02				0
	Total	7.6	0.193	0.028	2.756	0.567	0.49	0.542	0.028	0.044	0.015	0.326

5.2 Concentration index of different land uses

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

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

Concentration index can be less than one, equal to one or greater than one. CI less than one indicate that there is no concentration of that particular land use in that ward. But CI equal to or greater than one indicates that there is concentration of that particular land use. The concentration index of residential, agricultural, commercial, industrial and public landuses are detailed here.

5.2.1 Concentration pattern of residential land use

As per the existing land use 2013, the major land use is residential. 60.32 % of land in the town is under residential use. This includes an area of 7.60 sqkm. As per UDPFI standards 45 - 50% of area can be developed for residential land use.

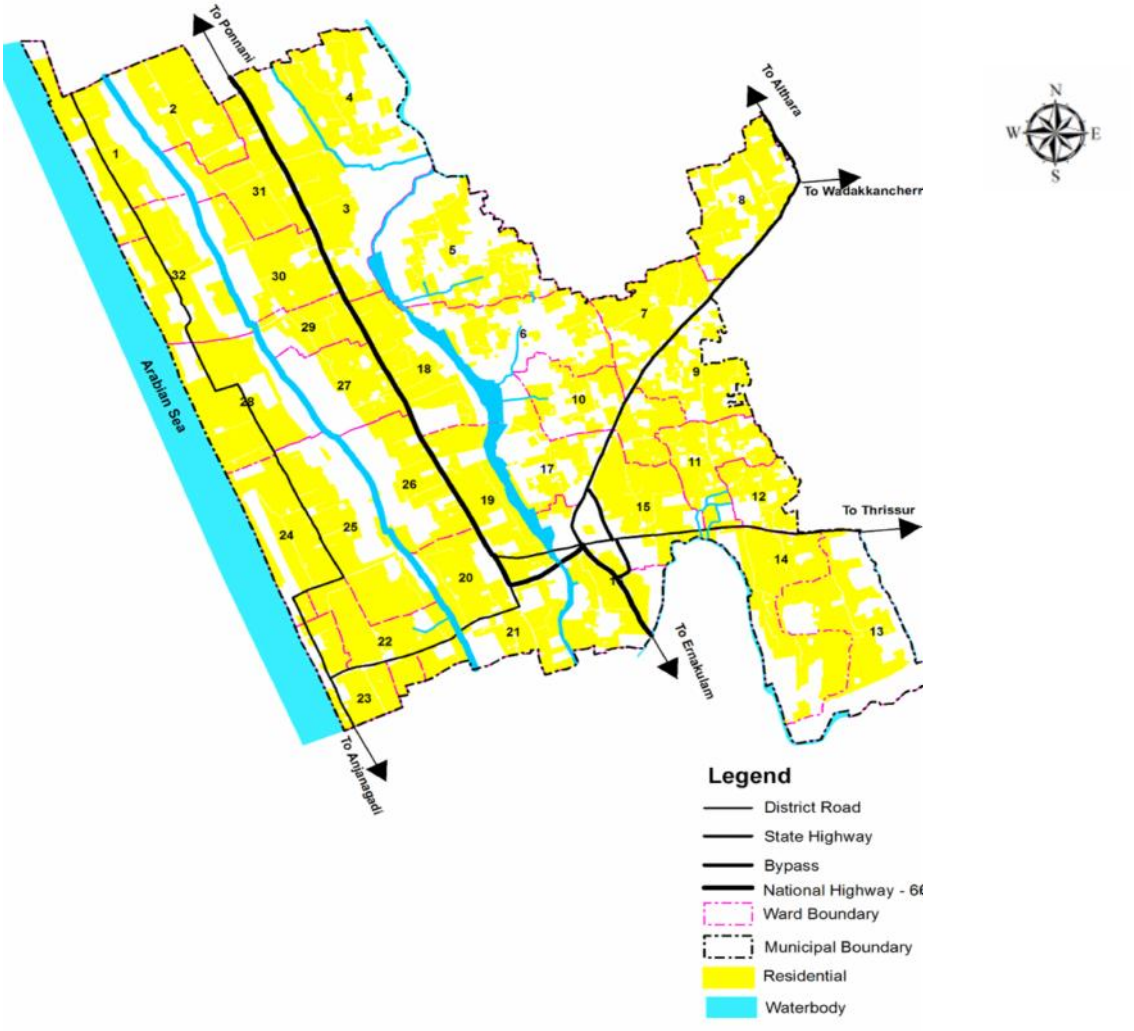


Fig 5.3Spatial distribution of Residential landuse

Figure 5.3 shows the ward wise spatial distribution of residential area and concentration index of residential land use is shown figure 5.4.Wards 7,22,23,31 are having high concentration index. Residential land use constitutes 60.32 % of town area. Generally residential concentration is seen along the main roads.

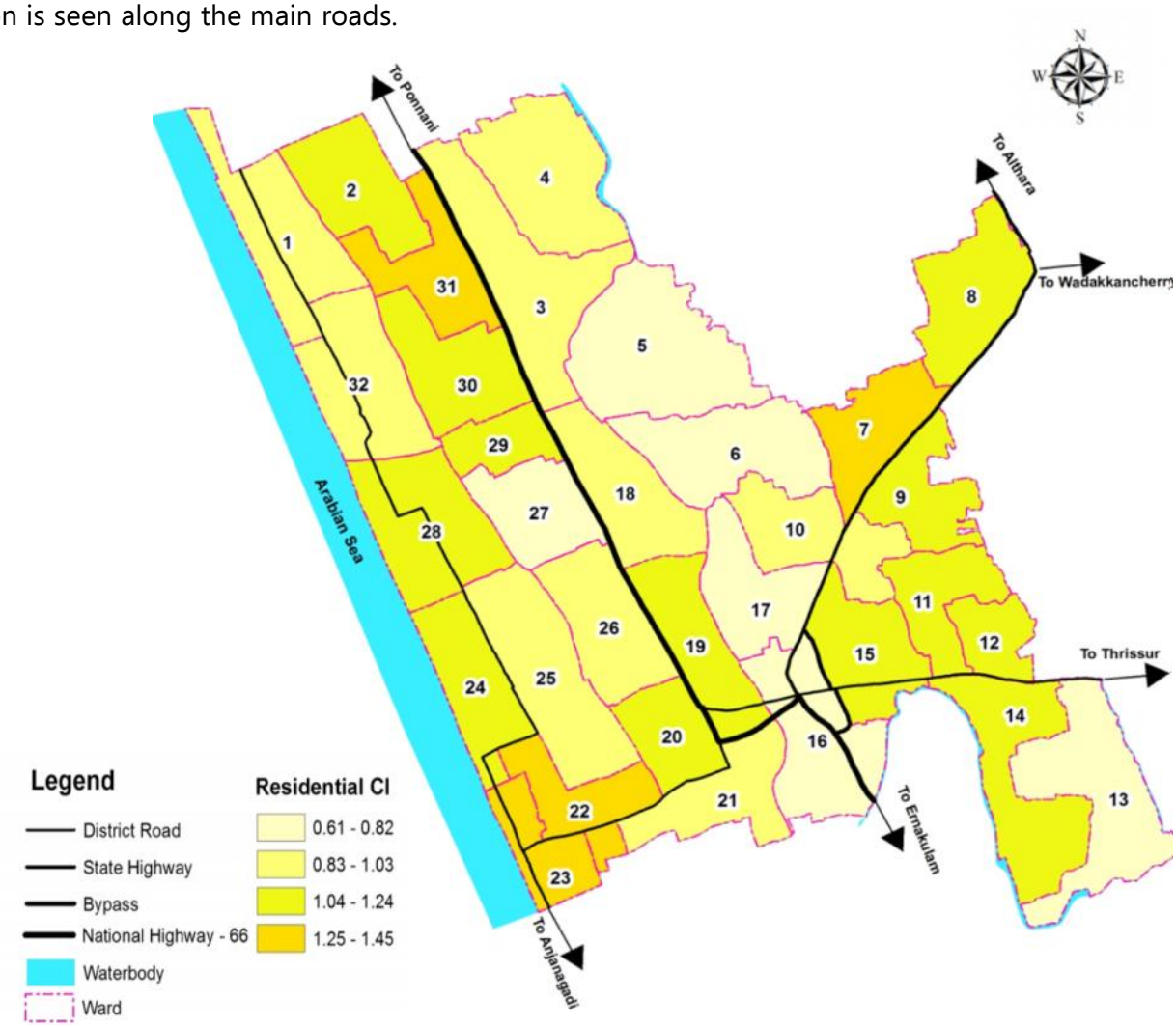


Fig 5.4 Concentration index of Residential landuse

5.2.2 Concentration pattern of commercial land use

The commercial activities are mainly concentrated in the centre of the town. 1.63% of land in the town is under commercial use. As per UDPFI standards 2 -3 % of area can be developed for commercial land use. So land available under this use is below the prescribed norms. The corresponding land use is given in figure 5.5, Commercial land use is concentrated mainly in Chavakkad town (16) followed by Palayoor west (15), and Blangad beach (23) as shown in figure 5.6. From these two figures we can conclude that Commercial concentration is more towards town center and along the sides of Wadakkanchery road and Kanjani road. Fig 5.5 shows that commercial land use is marginal at outer fringes of town center.

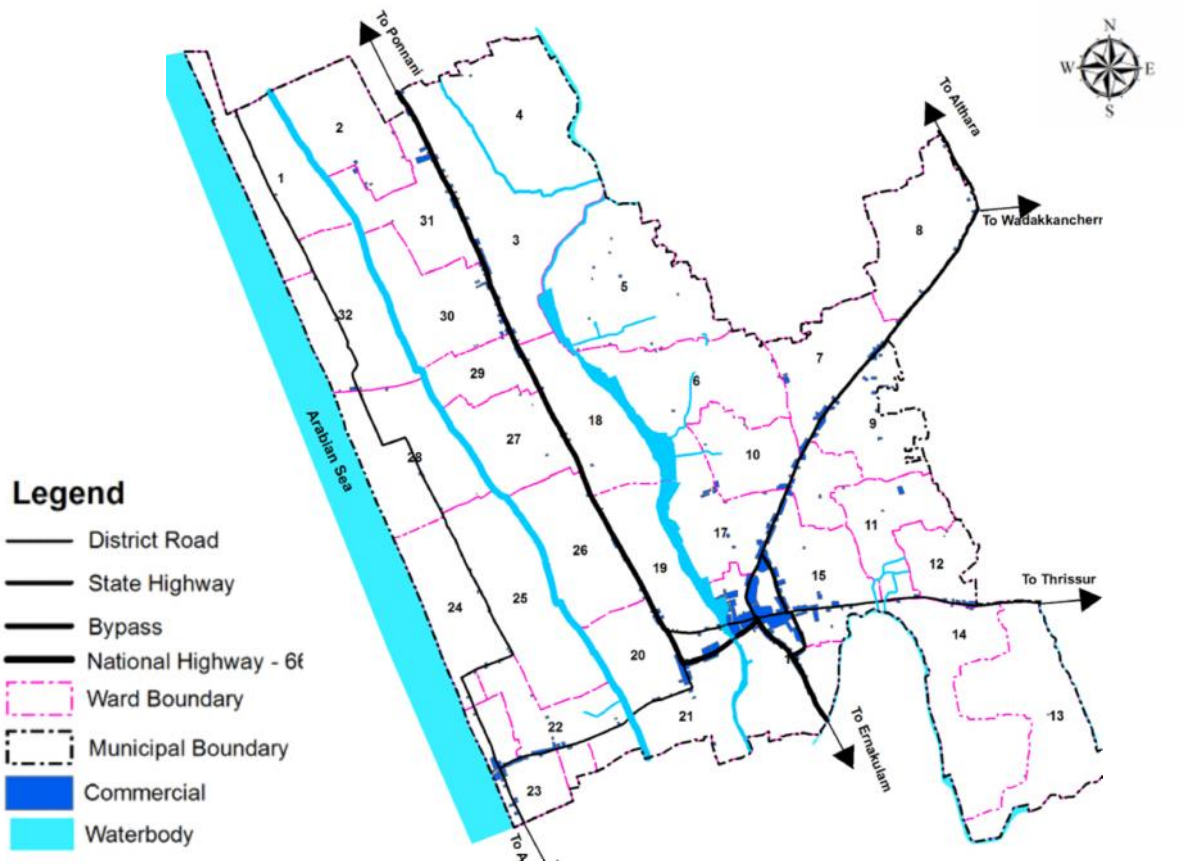


Fig 5.5 Spatial distribution of Commercial landuse

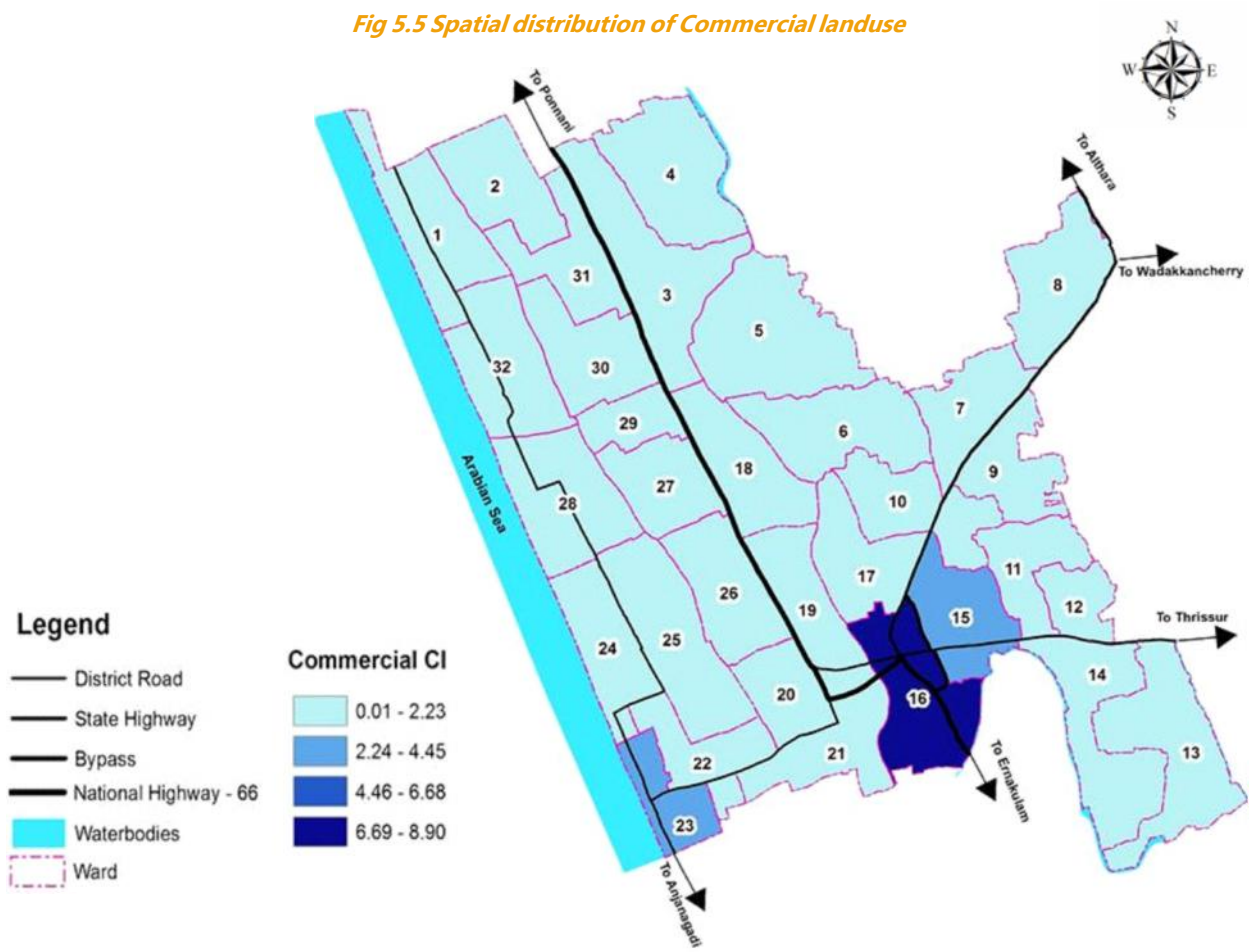


Fig 5.6 Concentration index of Commercial landuse

5.2.3 Concentration pattern of industrial land use

At present the area under industrial use is only 0.03 Sq km, which is about 0.25% of the total area of town. As per UDPFI standards 8 - 10% of area can be developed for industrial land use. Industrial use is very less compared to the norms of the UDPFI guidelines. There are no large and small scale industries in Chavakkad town and the existing industries are of small scale type. As per the spatial distribution the major industrial land use is shown in figure 5.7, Concentration pattern of industrial land use is shown in figure 5.8. It is clear that industrial concentration is very poor in Chavakkad.

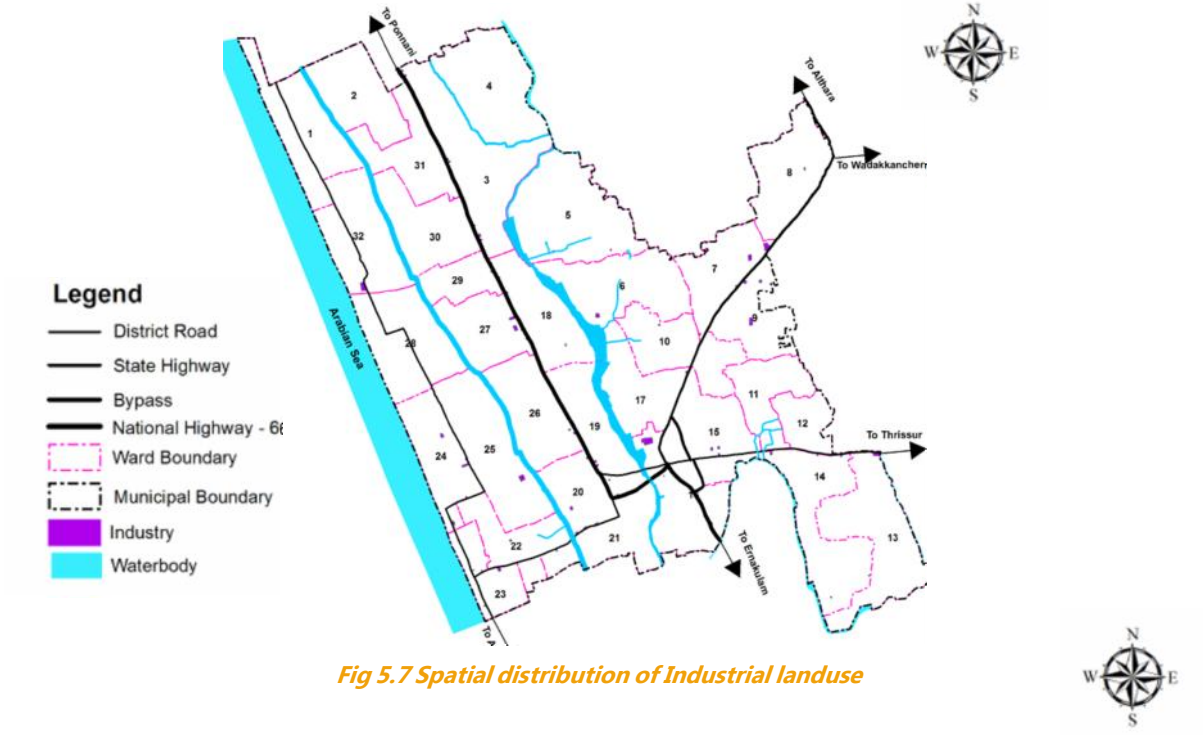


Fig 5.7 Spatial distribution of Industrial landuse

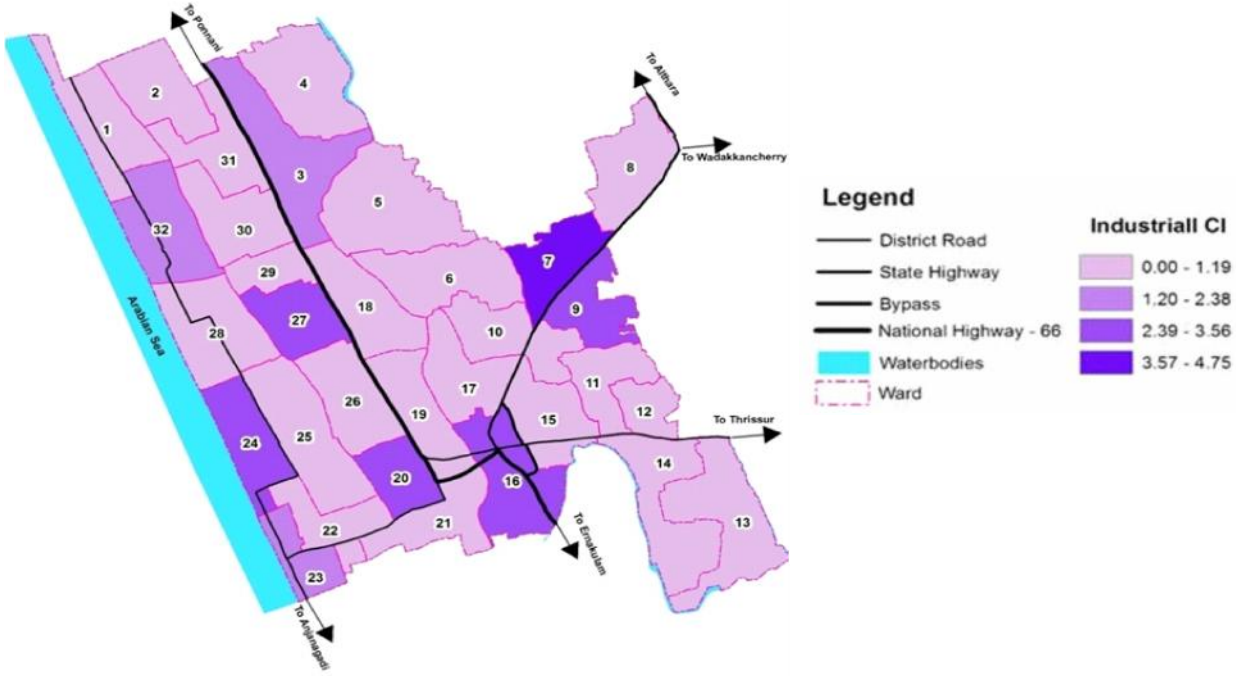


Fig 5.8 Concentration index of Industrial land use

5.2.4 Concentration pattern of public and semipublic landuse

Govt. /Semi Govt. offices, educational and research institutions, medical and health institutions, social, cultural and religious institutions, cremation and burial grounds, Govt. lands etc. are grouped under this category. An area 0.54 sq km which is 4.30% of the total town area is under public and semi public use. As per UDPFI standards 6 - 8% of area has to be developed for public use. It is clear that the area under this land use is less than prescribed norms. Figure 5.9 shows the ward wise spatial distribution of public and semipublic land use; Figure 5.10 shows the of the concentration index of public and semipublic land use. Concentration is more along Wadakkanchery road and towards the town Centre. Public use is concentrated in wards no 9, 12,18,20,24. On comparing residential, public and commercial land use concentrations, it can be seen that Wadakkanchery road shows all these type of land use concentrations. Public land use seems to be scattered throughout the town. Concentration index of Built up area of the Chavakkad town is shown in figure 5.11. From figure it is clear that built-up area is concentrated in ward no 9, 12,16,20,24.

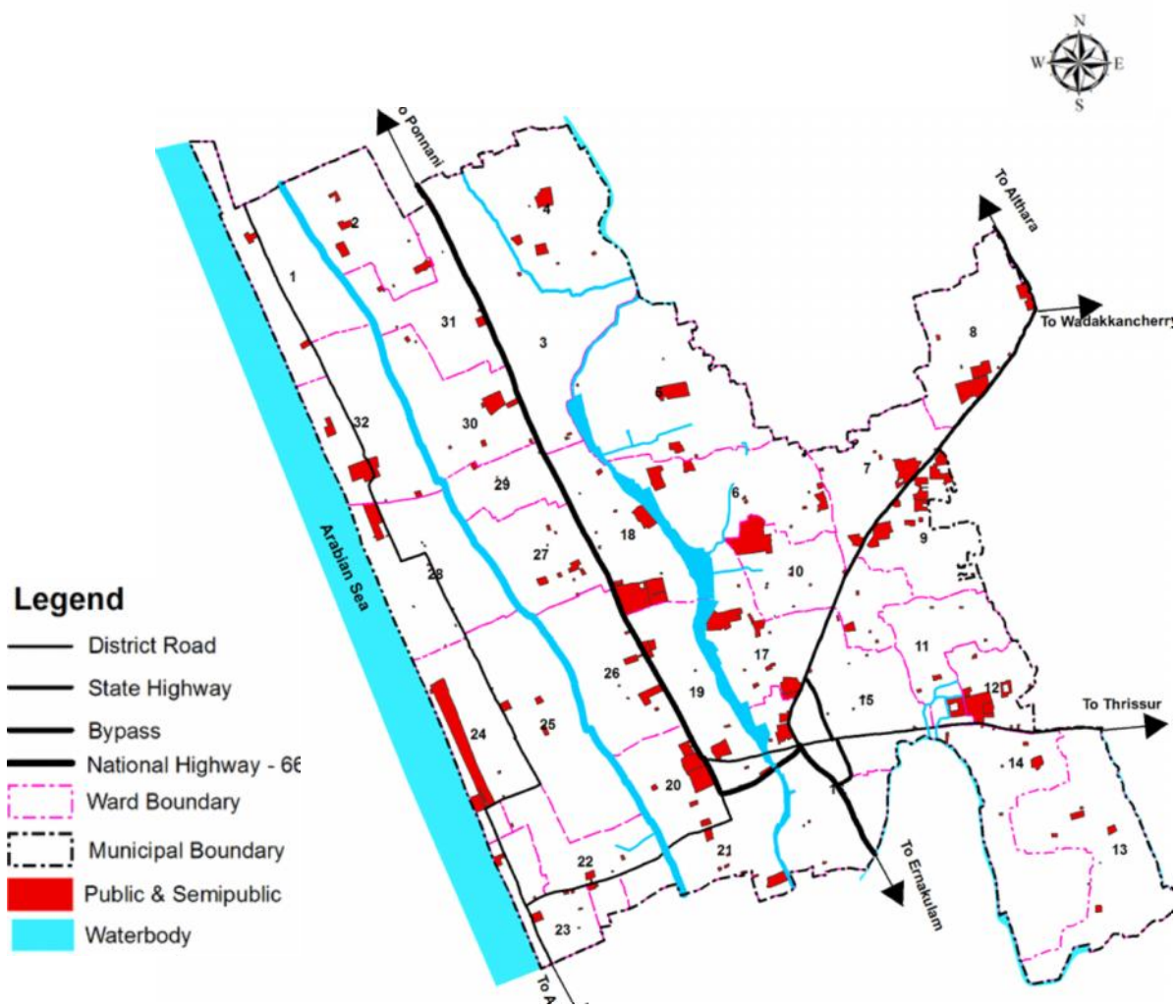


Fig 5.9 Spatial distribution of public and semipublic land use

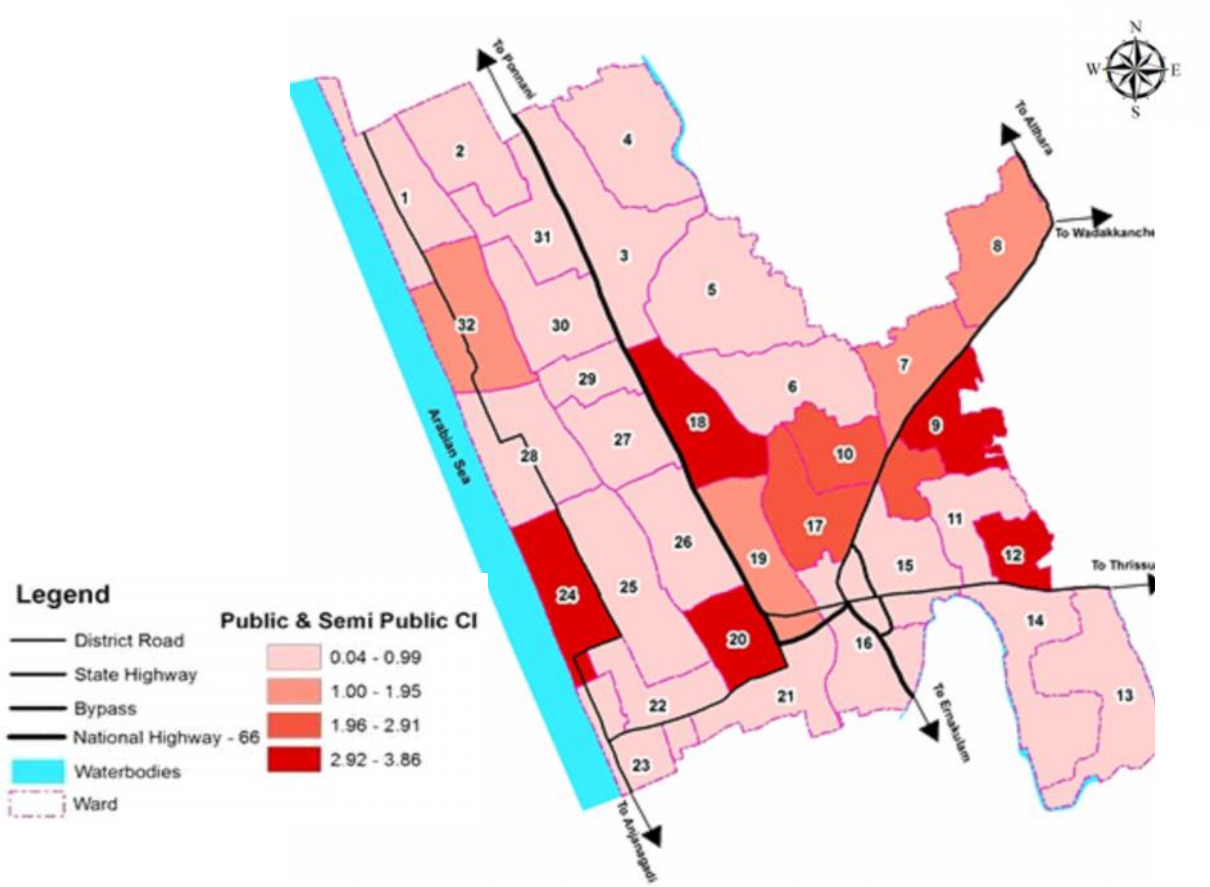


Fig 5.10 Concentration index of public and semipublic land use

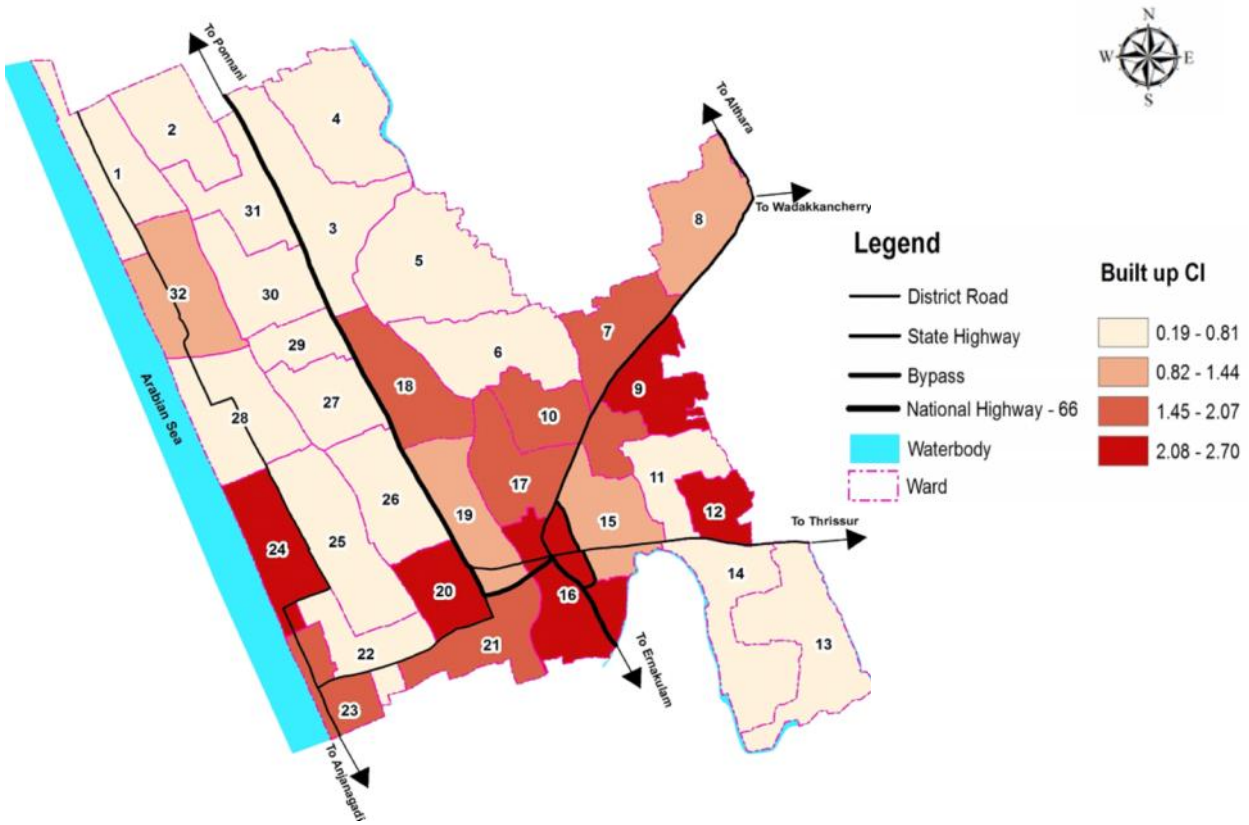


Fig 5.11 Concentration index of built-up

5.2.5 Concentration pattern of agricultural land use

Considering both wet agriculture (paddy) and dry agriculture use, 26.40 % of total town area is under agricultural land use. Spatial distribution of wet and dry cultivation is shown in figure 5.12.The ward wise spatial distribution of concentration index of agricultural land use of Chavakkad town is as shown in figure 5.13. Agricultural land use is mainly subdivided into wet agriculture and dry agriculture.

From the pattern it can be inferred that wards 3 and 5 are having more concentration of agriculture land use. On analysis it is clear that agricultural concentration index shows more than one in these wards mainly due to the presence of dry agriculture. The paddy is located on both sides of Mathy kayal. Dry agriculture is located along the sides of Canoli canal.

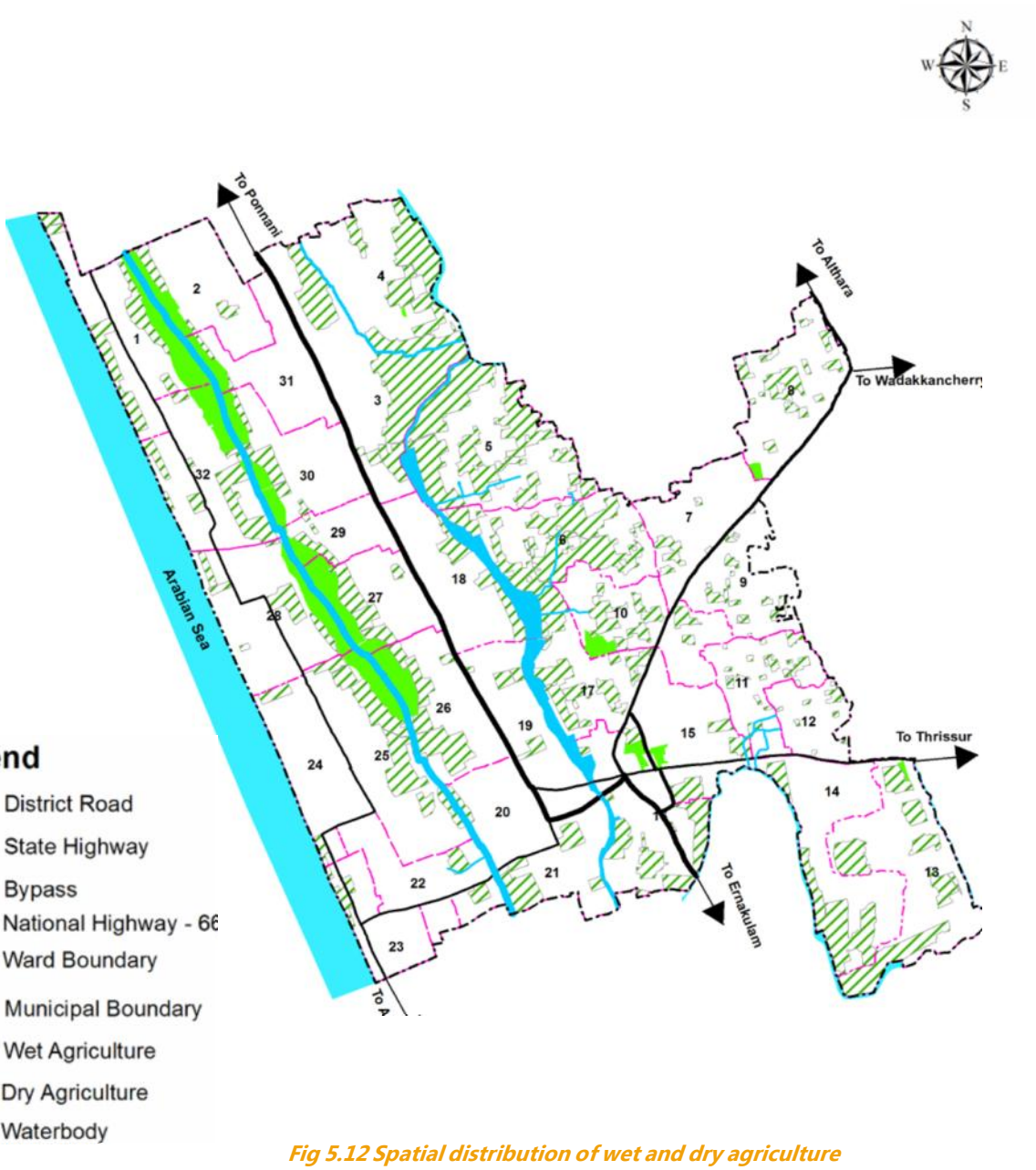


Fig 5.12 Spatial distribution of wet and dry agriculture

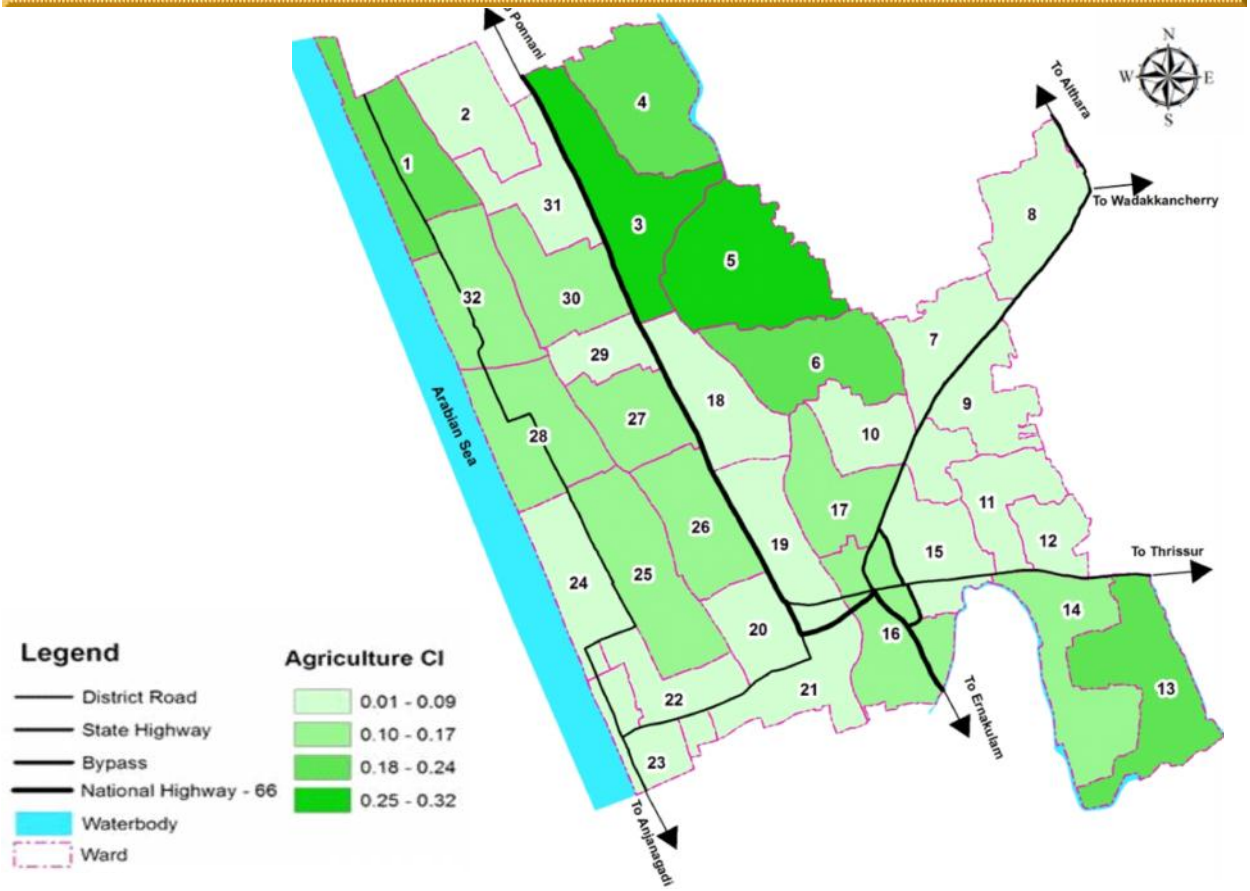


Fig 5.13 Concentration index of agricultural land use

5.2.6 Other major land use concentration

One of the remaining major land uses is transportation which comes to nearly 3.86 % of the total area. The major regional roads passing through Chavakkad are NH-66 (Edapally- Panavel road), SH-50 (Chavakkad- Kunnamkulam road-2.9 km), and Chavakkad-Thrissur road and SH-62 (Mammiyur juntion-Altara-0.52 km). Other major roads are by pass road connecting NH-66 and Kunnamkulam road (0.7km), the road to Guruvayur from Muthuvattoor, Chavakkad Beach road (1.5km) and Chavakkad- Chettuva road. A higher density of roads is seen in the central area which decreases towards the outer periphery. Another land use worth mentioning here is Water bodies. This constitutes to around 2.57% of the total area. This is due to the presence of natural canals, backwaters and number of ponds. Canoli canal and Mathy kayal which is a natural stream are the water bodies here.

Green and open spaces are another land use which is having some significance. Only 0.20% is used for park and open space. About 0.12% of land is occupied by vacant marshy land. These are located in the northern areas of town. Mangroves (0.35%) are also found in the south eastern areas of the town. In addition to this entire coastal area of Chavakkad town is developed with an additional accretion land with an average of 200 m cross width as shown in figure 5.14.

Wardwise percentage of land use is shown in figure 5.15. Figure 5.3 shows that about 60.32% of the land is occupied for residential purposes. The next highest single land use is dry agriculture which comes to about 21.88% of the area. The Public and semipublic land uses and paddy constitutes 4.30% and 4.52% respectively. Marshy land, Mangrove, Commercial, Industrial land uses are also there in the town. Land used for Transport and communication purpose occupies about 3.86%. Water bodies in the form of Canal also contribute to 2.58 % and commercial land use nearly about 1.63%.

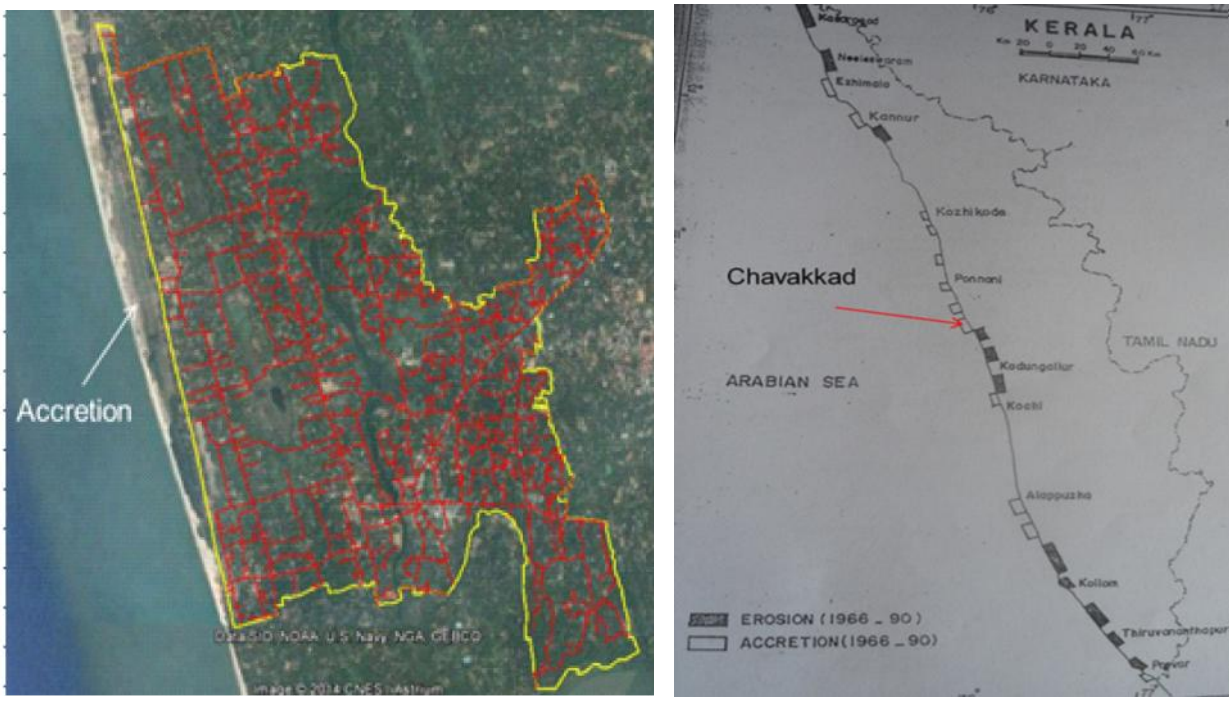


Fig 5.14 Map showing accretion of Chavakkad town

5.3 Comparison of land uses with other towns

A comparison of the land uses among the urban LSGI's of Thrissur district is shown in table 5.3. It may be seen that residential use holds a major share in Chavakkad town. Table also reveals that residential land use percentage seems to be the highest in Chavakkad when compared to other towns. Industrial land use is comparatively less and this town has certain special land uses such as mangroves and marshy lands.



Canoli canal



Mangroves

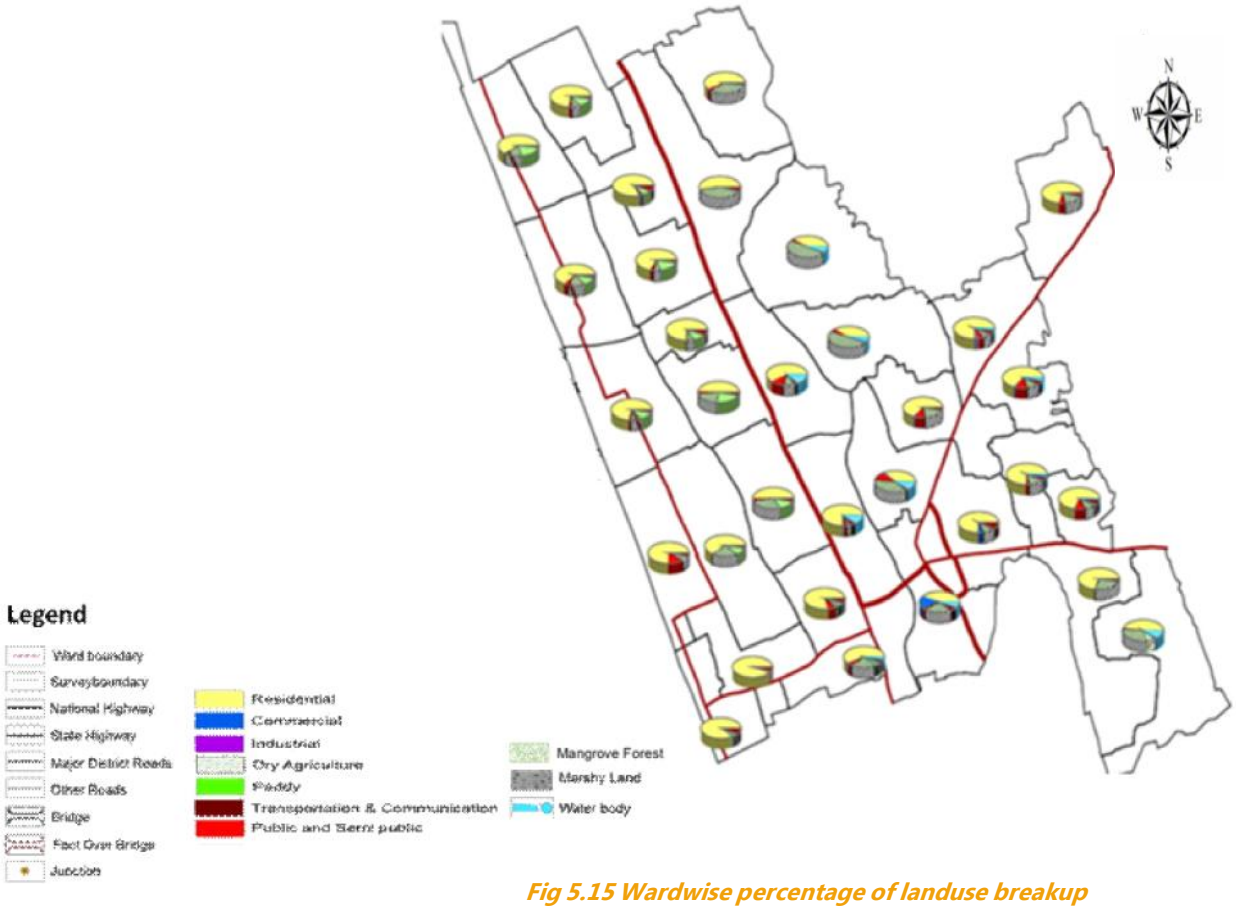


Fig 5.15 Wardwise percentage of landuse breakup

Table 5.3 Comparison of Land use with other Urban LSGI s of the district

Land use	Kodungallur	Kunnamkulam	Chalakkudy	Irinjalakuda	Chavakkad
Residential	41.36	30.94	36.76	42.02	60.35
Commercial	2.1	1.49	1.88	1.56	1.63
Industrial	0.36	0.53	0.92	0.79	0.25
Dry Agriculture	23.44	33.77	32.27	18.47	21.89
Paddy	9.75	22.88	15.01	25.82	4.40
Transport & Communication	4.32	5.23	6.75	4.89	3.81
Public &Semipublic	3	3.5	5.59	3.70	4.30
Park& Open space	3.25	0.40	0.06	0.39	0.20
Mangrove forest	0.82	-		-	0.35
Marshy land	0.11	-		-	0.12
Water Body	14.31	1.25	0.76	1.95	2.58
Vacant land	0.14	-	3.49	0.39	-

5.4 Functional character of wards

The functional character of a local body is determined by the major activity within the LSGI. The character may be of a rural nature if primary activities are predominant and urban nature if secondary or tertiary activities are predominant or may be a combination of both. The functional character of Thrissur district as per Integrated District Development Plan, Thrissur is shown in figure 5.16.

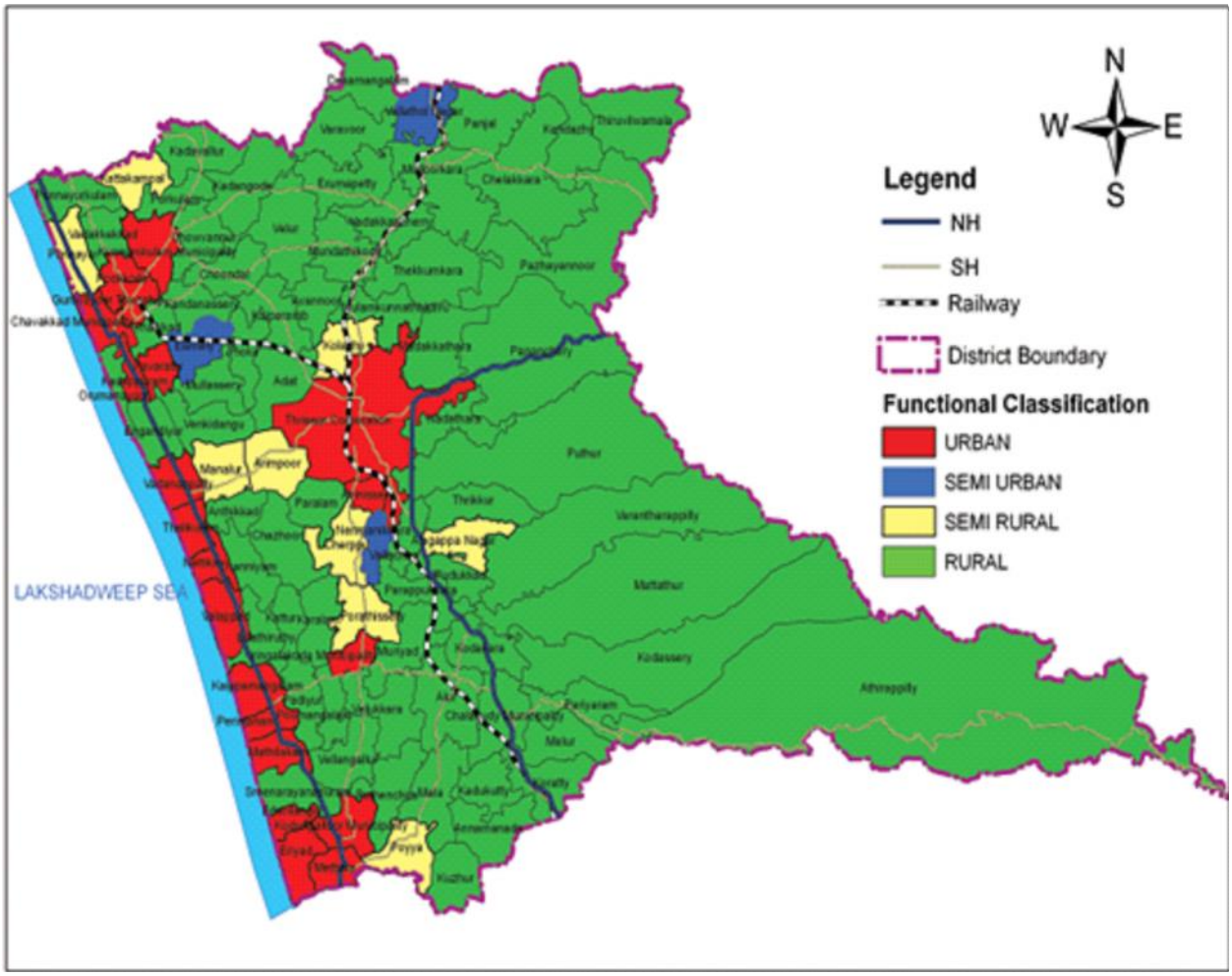


Fig 5.16 Functional Character of Thrissur District-LSGI wise

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

The spatial distribution of functional character of the settlements shows a clear classification in the pattern of the settlements into four categories. Thrissur Corporation and all other towns except Chalakkudy show urban character. Some of coastal LSGI's also shows urban character. Semi urban character is exhibited by LSGI's that have urban influence like Vallathole Nagar (located near Shornur Town in Palakkad District), Elavally and Vallachira. Most of the LSGI's in the midland and high land region of the District exhibit rural character. Semi-rural character is seen in those LSGI's which are in a transition zone between LSGI's of urban and rural character.

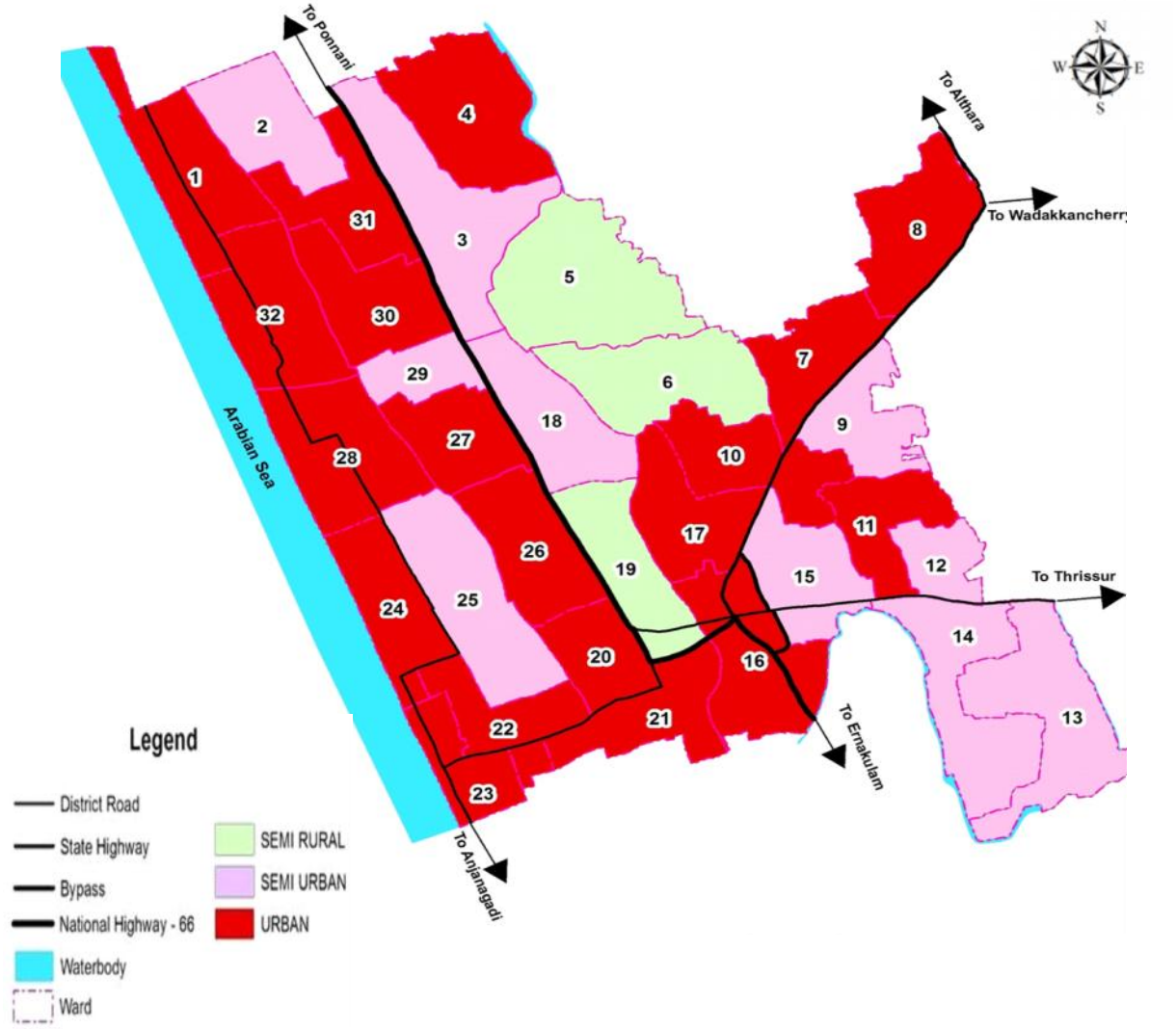


Fig 5.17 Ward wise Functional Character of Chavakkad town

According to the analysis of functional character of District, Chavakkad town as a whole shows urban functional character. The same methodology as done for the LSGI's of the district is applied for the wards of the town to assess the ward wise functional character. The result of this analysis is shown in figure 5.17 .In Chavakkad town area, almost all wards are urban in nature. Nine wards shows semi urban character and only two wards belong to semi-rural character due to the presence of dry agriculture. In town area,no ward has rural nature. It is also clear that in the town centre and on the sides of NH and SH, wards show urban nature due to the presence of commercial and public land uses. Along the sea shore, all wards except one show urban nature.

5.5 Inference

Land use analysis of Chavakkad town shows that residential land use is the single land use predominant in town area. Residential land use percentage is high in Chavakkad when compared to other towns. But both dry and wet agriculture area, also come to significant figures.

In agricultural activities, dry agriculture is more predominant. Wet land constitutes the environmentally sensitive areas in the town area. On comparing residential, public and commercial land uses, it is evident that Wadakkanchery road side shows all these type of land use concentrations. According to the analysis of functional character, Chavakkad town as a whole shows urban functional character, but several wards show semi urban and semi-rural nature.In Chavakkad there is a presence of certain special land uses such as mangroves and marshy lands.

CHAPTER 6

TRADE AND COMMERCE

Trade and Commerce have long been the prominent activity in Chavakkad. The olden and golden times of Chavakkad were significant in the whole sale trade through Canoli canal. The earlier studies on occupational structure revealed that this sector had a significant role in Chavakkad. Even in the present scenario,Chavakkad town has a unique place in wholesale trading activities especially fish based industries, plastic products etc. This chapter deals with analysis of Trade and Commerce sector in Chavakkad.

6.1 Introduction

Chavakkad had established itself as a main center of trade and commerce during the first century A D. Kodungallur was a major port in ancient Kerala. Chavakkad became a main center of trade and commerce since it could establish navigational channels with Kodungallur through Chettuva and Enamavu. The Canoli canal-built by the then Malabar collector Mr. Canoli connecting the main trade centers like Kozhikode, Ponnani, Chavakkad, Kodungallur and Kochi heightened the importance of Chavakkad as a trade center. Vanchikadavu (bay of Canolicanal) at Chavakkad had many godowns in the olden days, the ruminants of which could be seen even now.The weekly markets and cattle markets of Chavakkad were very famous, Vanchikadavu was the main commercial center of Chavakkad by the side of the Canoli canal, for transporting goods by waterways. It was through this Canoli Canal that the postal service from Kochi to Kozhikode was done, for which there were postal boat services. Canoli Canal has played a major role in the development and establishment of Chavakkad as a trade center. That's how Canoli Canal and Nadappalam became the official emblems of the town of Chavakkad. Presently there are no trading activities through canoli canal, now it is swapped by the road network.



Vanchikadavu Nadappalam



Vanchikadavu old port



Office emblem

6.2 Existing scenario

On a detailed study of the land use map of Chavakkad Town, it can be seen that only 1.63% (0.20 sqkm) of the municipal area is used for commercial purposes. As per the UDPFI guidelines the trade and commercial area requirement for a small sized town is estimated as 0.24 Ha to 0.32 Ha per 1000 persons. Commercial activities are concentrated in the town centre and are also distributed along the major traffic corridors such as Chavakkad – Wadakkanchery road and Chavakkad- Kanjani road

As per Integrated District Development Plan forTrissurdistrict, Chavakkadcentre is regarded as an existing third order node in the district and is expected to be a second order node in the District by 2021. Importance of this commercial node is mainly due to:

- Meeting ofNH 66, SH 50 and a Major District Road(Kanjani Road).
- Presence of wholesale and retail commercial centres
- Better accessibility and transportation facilities available for nearby panchayats to this junction.

6.2.1 Major commercial centres and nodes

Major commercial nodes identified are Town (Kootungara) Junction, Thiruvathra, PuthiyaraJunction, Blangad beach Junction as shown in figure 6.1.Based on the intensity of commercial activities, these junctions are graded and the result is shown in the figure 6.2. Accordingly one first order node and eight third order nodes are identified.



Chavakkad town center

Notable thing is the absence of second order node, Chavakkad bus stand junction which shows the second order characteristics seems to be merged with town junction. The hierarchy of the first and third order nodes are shown in table 6.1 and 6.2.

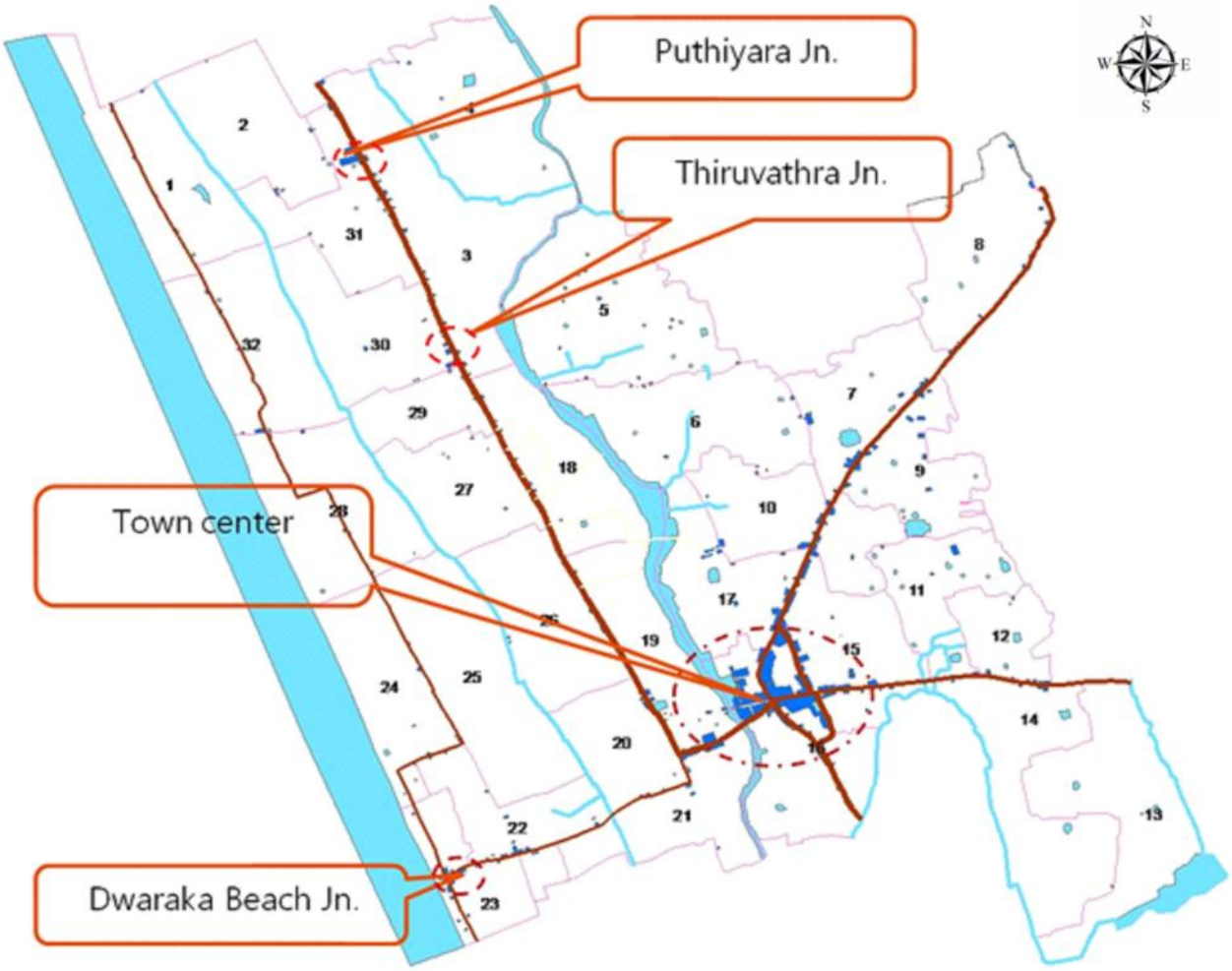


Fig. 6.1 Commercial nodes

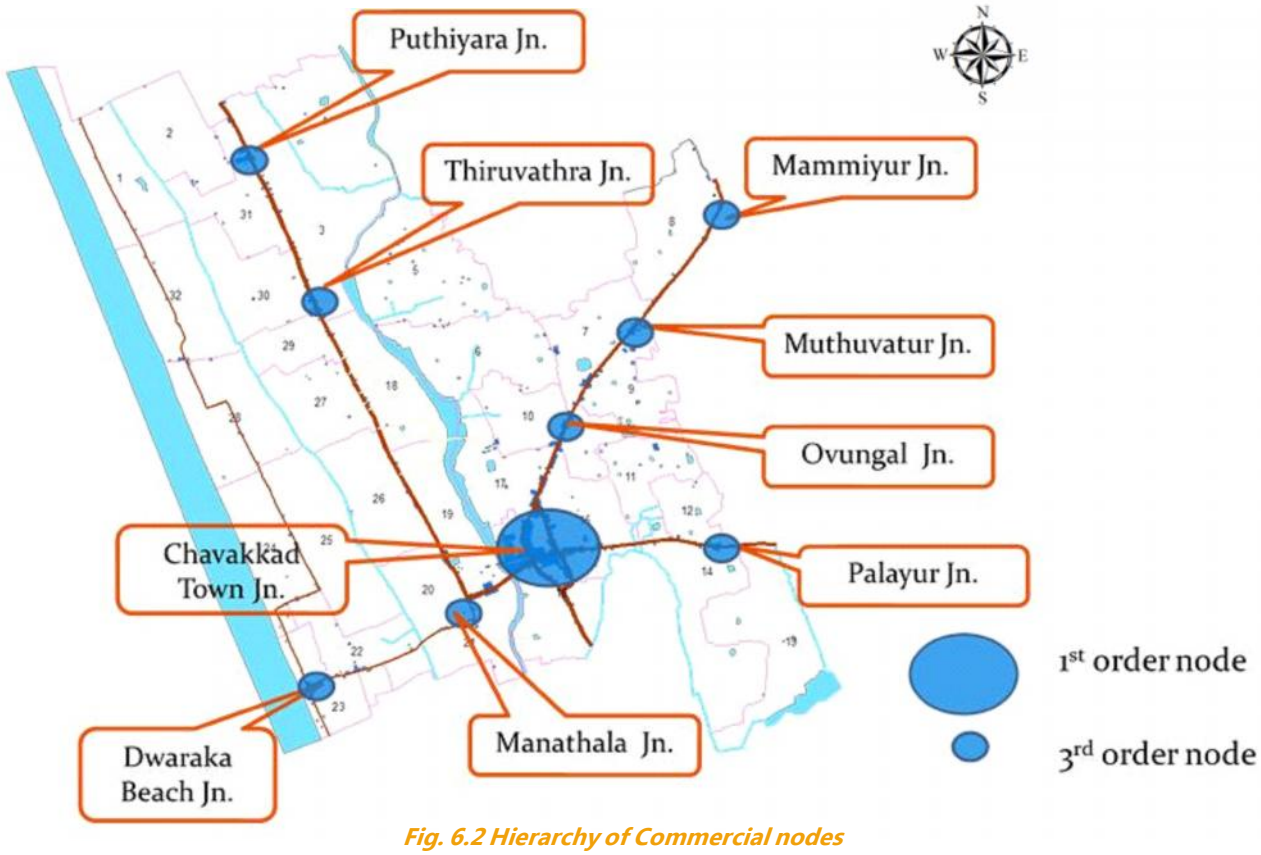


Fig. 6.2 Hierarchy of Commercial nodes

Table 6.1 Hierarchy of First and Third ordernodes

Commercial centre								
Area of concentration of commercial activities	Location	Category of commercial node	Separate parking area	Authorised auto stand (Y/N)	Authorised taxi stand(Y/N)	Authorised lorry stand(Y/N)	Public comfort station	Proper Drainage
Dwarakabeach road junction	ward-22	3rd	No	Yes	No	No	No	No
Thiruvatra junction	ward-3	3rd	No	Yes	No	No	No	No
Mammiyoor junction	ward-8	3rd	No	Yes	Yes	No	No	No
Muthuvettoor junction	ward-9	3rd	No	No	No	Yes	No	No
Bus stand junction	ward-22	2nd	No	Yes	Yes	No	Yes	No
Manathala junction	ward-17	3rd	No	Yes	No	No	No	No
chavakkad junction	ward-15	1 st	No	Yes	Yes	No	No	No
Ovungal junction	ward-10	3rd	No	Yes	No	No	No	No

While comparing the commercial land use area (2013) with other urban LSGI's in the district as shown in figure 6.3, Chavakkad has the lowest commercial area(0.203 sq km).

Table 6.2 Details of Trade and Commerce in Chavakkad Town

Sl.No	Name of the centre	Wholesale	Retail	Business establihment	Restaurants and hotels	Others
		No of shops	No of shops	No of units	No of units	No of units
1	MuthuvattoorJn	1	43	3	5	36
2	OvungalJn	1	27	3	2	29
3	Hospital Jn	0	47	2	3	34
4	ChavakkadJn	15	356	34	36	86
5	PalayurJn	0	22	3	1	13
6	Chavakkad Beach Jn	0	4	0	4	8
7	Puthankadapuram	0	5	0	3	7
8	ThiruvatharaJn	0	12	0	0	10
9	MammiyurJn	0	24	1	6	16

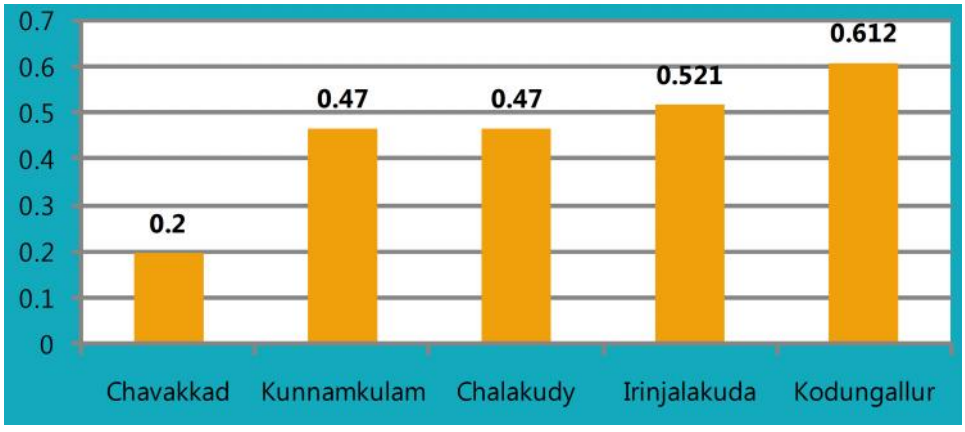


Fig. 6.3 Commercial area comparison with other LSGI's of the district, Source- land use 2013

6.2.2 Markets

Chavakkad town is a coastal town. Its west boundary is Arabian sea for a length of 5 Km. Fishing and fish based activities hold a predominant position in commercial activities of the Town. It is also observed that fish vending is being carried out as an unorganised activity along the roadsides. Earlier Vanchikadavu was the major commercial center of Chavakkad town when water transportation was prevalent. Almost all commodities were obtained from the shops in Vanchikadavu. After the development of NH-66 and SH-50, commercial activities were shifted to Chavakkad town junction. But the trading activities continued in the existing shops at Vanchikadavu and presently this area is one of the main commercial centres in the town. Only one public market is functioning in town which is situated at the northern side of Municipal office complex. The facilities in the market are insufficient for satisfying the present requirements. Location of the market is shown in figure 6.4.

Chavakkad is a major business center of Thrissur district. Almost all leading consumer brands have outlets in Chavakkad. Several agricultural products such as coconut, arecanut, rice, vegetables, spices and other goods are marketed through the traders of Chavakkad. Apart from that, lot of textile shops, jewelleries, pharmacies, bakeries and others shops can be seen in this area. Because of its proximity to Guruvayur temple, we can find a lot of hoteliers running their business here.



Fig. 6.4 Location of Market

The commercial activities are mostly concentrated in the town centre, near private bus stand, Beach area,Puthiyara junction and alongthe sides of National highway, State highway(Chavakkad-Wadakkanchery)and Major district road (Chavakkad – Kanjani). Commercial centres are also seen at Thiruvathra, Muthuvatoor and Palayur, this collectively makes the Chavakkad town center a proposed third order node as per district spatial plan.



Public market

Commercial areas lack facilities such as separate parking area, loading and unloading area, public toilets, comfort stations and proper drainage systems etc

6.2.3 Street vendors

Street vendors are integral component of urban economies around the world. The distribution of goods at affordable and convenient rate makes the retail option vibrant, which is a vital part of the social and economic life of a city. Street vending as an occupation has been existed for hundreds of years and is considered as a cornerstone of many cities.

Street vendors are broadly classified as those who sell goods or services in public space. A variety of employment status can be found among street vendors as well. There are about 25 street vendors in ChavakkadTown.They are concentrated mostly along the major roads especially along Wadakkanchery road. About 97% of them are male labourers. Most of the vendors work as independent self-employed entrepreneurs, either with or without employees.

Table 6.3 Details of street vendors

Type of activity	No. of vendor	Concentrated Area
Fruits,nuts	6	Town Jn.
Vegetables	7	Town
Leather/umbrella	2	Town
Tea and snacks	4	Mini civil station, Bus stand
Fish	2	Beach Jn.
Ayurveda medicine	3	Town

There are also many types among them such as vendors who work as contributing family members and some work as employees of informal or even formal enterprises. Surveys have shown that the majority of street vendors lack access to social protection and are subjected to a range of

employment risks along with varying income levels. The details of street vendors are given below in Table 6.3. Figure 6.5 gives the spatial distribution of street vendors.



Fig. 6.5 Locations of street vendors

6.3 Financial Insititution

There are 17 financial institutions available in the town,and details are shown in table 6.4. The financial institution in various sectors, there are 10 Nationalised banks 2 Scheduled and commercial bank. Guruvayur co-operative urban bank is also in this town.

Table 6.4 Financial institutions in various sector

Financial Institution	Nos
Nationalised banks	10
Scheduled and commercial bank	2
Urban co-operative bank	1
Kerala state co-operative-agricultural &rural development bank	1
Co-operative society and service banks	3

6.4 Problems and potentials

Chavakkad town is the main commercial node and highly influenced to other LSGI in the district. But considering commercial node the town is mostly characterized by congestion due to vehicular and pedestrian traffic. Lack of enough space and road width is the major reason for conjestion. It prevents smooth moving of vehicular causing frequent traffic blocks. The infrastructure facilities in the public market are insufficient for satisfying the present requirements. Street vendors are also a factor of congestion of road and measures to be taken to ensure smooth flow of traffic, smooth movement of pedestrians and maintenance of cleanliness and public hygiene while facilitating vendors to sell goods and services at convenient location.

6.5 Inference

Only 1.61% of the Town area is used for commercial purpose. The commercial nodes of Municipal area are facing a number of development issues. Lack of sufficient parking spaces and area for loading and unloading of goods from trucks are the main problems faced by this sector. Majority of commercial activities are restricted in old town center area. Town center is the major commercial node in the Town. Facilities such as public toilet, drainages and solid waste disposal management etc. are to be established for effective functioning of commercial area. A new market should be planned to satisfying the future needs. Street vendors are seen along major roads with more concentration along Wadakkanchery road. Development should address an inclusive method by giving consideration to all. The replacement of old aged building into fully facilitated new shopping complexes with parking facility can solve the problems to a limit.Chavakkad in future can develop as a wholesale trading center if its potentials are of utilised to its fullest.

CHAPTER 7

INDUSTRY

This chapter deals with the study of industrial sector activities in Chavakkad Town. Beedi making was a main activity of Chavakkad in the past. At present Beedi making is shifted to other states owing to the social situation prevalent here .Chavakkad town is not known for hardcore industrial activity but household industries had always been the backbone of the economy of Chavakkad.

7.1 Introduction

Industrial growth is a key factor in the development of an urban area. Large, medium, small and micro industries contribute to the physical, social and economic upliftment of the area. An industry can be called as a large scale one if it has an investment of more than 10 crores for setting up the plant and machinery. Industry with 5 to 10 crore investment is said to be a medium one and that having an investment between 25 lakhs and 5 crores is called a small scale industry. Micro industries are small enterprises having an overall investment of about 25 lakhs.

Chavakkad did not have a buzzing industrial activity even in the olden days. Industries incidental to fishing and coir had its presence a few years back. From the census data it is evident that house hold industrial workers have a strong platform in Chavakkad. Socio economic survey also records that the people are engaged in industrial activities such as carpentry, coir, household activities and construction works

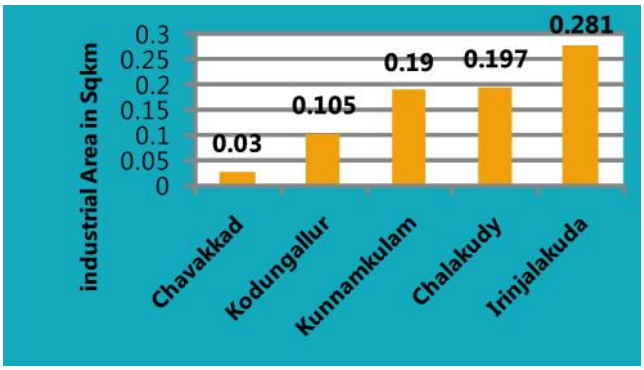


Fig. 7.1 Industrial area comparison with urban LSGI's of the District

7.2 Existing scenario

There are no large and small scale industries in town. A comparison of industrial land use with the urban LSGI's of the district is shown in Figure 7.1. Influence of industry in the town is less when compared to that of other urban local bodies. There are about 143 industrial units in Chavakkad town which occupies only 0.032sq.km (0.25%) of town area. Town has two mini industrial estates situated at Baby road Manathala and Puthen Kadappuram near Fisheries School. Out of which Manathala industrial estate is in public sector and other is in private sector.

Industries are concentrated mainly in Muthuvattur junction and at two industrial estates one at Baby road junction and other at Puthenkadappuram.

7.3 Industrial Estates

Mini Industrial Estate, Manathala is located at Baby road junction (ward 25) with an extent of 70 cents. It has seven rooms in total out of which five are working. Small Scale industries like soap production, welding, Agarbathi making etc are functioning here.

Mini industrial estate at Puthen Kadappuram has Ice plant, bakery, Yamaha boat engine workshop, mill and pickle making unit. Both the mini industrial estates are situated near to residential area with issues related to land availability.Security problems and frequent power failures largely affects the smooth functioning of these industries. Water supply connection is present. for both estates .The location of industrial estates in Chavakkad is shown in figure 7.2.



Fig. 7.2 Location of Industrial estate

7.4 Micro, Small and Medium enterprises (MSME)

Considering the registered MSME units in the State, Thrissur district holds the 2nd position. Within the District, Thrissur Corporation has the maximum concentration. Chavakkad town does not have any large, medium or small scale industry. There are 143 micro industries are functioning within Chavakkad and details are given in table 7.1

Table 7.1 Details of industries in Chavakkad Town

Sl.No	Nature of Activity	Category	Total No. of Industrial Units	Total Workers
1	Wooden Based	Micro	5	23
2	Food Processing	Micro	31	183
3	Readymade Dresses	Micro	19	118
4	Soda	Micro	4	9
5	Bakery manufacturing	Micro	12	57
6	Computer based	Micro	19	62
7	Workshops	Micro	8	26
8	Engineering based	Micro	13	41
9	Others	Micro	32	141

Source: District Industries Centre Thrissur

Category wise percentage of micro industries is given in figure 7.3. Out of the 143 number of micro industries, 21.678 % are food Processing industries mainly include oil and flour mills, pappad making, fruit jams, pickles etc. Other industries like Aluminium and steel fabrication, engineering based workshops and textile based garments making units etc. are present in the town.

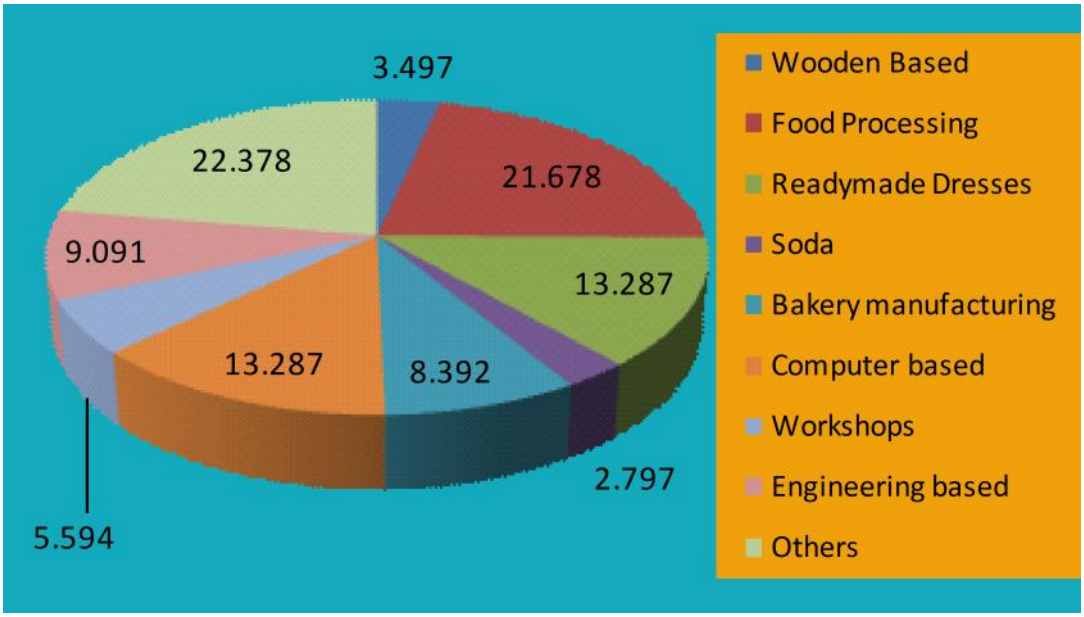


Fig 7.3 Category wise percentage of micro industries

7.4.1. Fish based industries:

Chavakkad town has high potential for fish based industry. Fish industry is mainly concentrated in the coastal area. Among the 18 fishing villages in Thrissur district, two of them namely Manathala and Blangad villages are situated in Chavakkad Town. Fisheries activities are concentrated at Blangad and Puthenkadappuram. Factory for extracting oil from fish was working during the time of British rule, but it is shut down now.



7.4.2 Traditional Industries





Traditional Industries that were functioning prosperously here, were beedi making and coir making. Beedi making - Kajah Beedi, one of the known major brands in the field is located at Thiruvathra and Muthuvattur. In the present scenario the activities are dull owing to the social parameters. Coir making - In the ancient days it was a major industry, owing to the vast coastal stretch, backwaters and canals. Presently coir making is decreasing.

The figure 7.4 shows the temporal variation of HH industrial workers in the town through decades. A drastic decline from 5.35% to 3.04% in 2011 indicates the decline of the sector. The shifting of work opportunities may be one of the reasons for this.

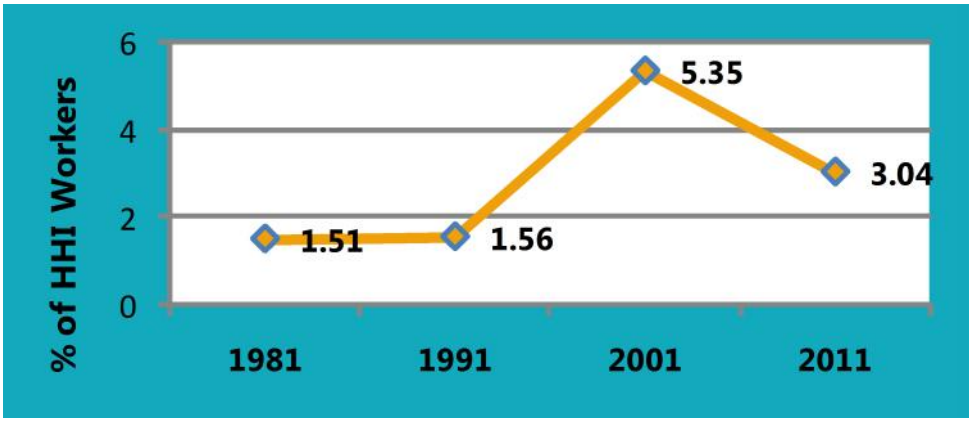


Fig 7.4 Rate of House Hold Industrial workers

7.5 Problems and Potentials

Even in older days Chavakkad town did not have a buzzing industrial activity due to lack of large parcel of land. There are no large, medium and small scale industries in the town. Traditional industries like beedi making and coir making are dull owing to social parameters. Chavakkad town has high potential for fish based industry but lack of facilities like new technology , skilled laboures are the major problems facing in this sector and all are located near residential area

7.6 Inference

Land use analysis shows that only 0.25% of the land is utilized for industrial activities, which is considerably less than the planning standards. From the sectoral level analysis, it has become evident that the activities pertaining to industrial sector in Chavakkad are of house hold nature. From local level analysis and enquiry, it is clear that areas of industrial development lack various basic infrastructural facilities. It seems that due to the increase in price value of land and high demand in the residential sector, large land parcels may not be available for industrial use in future. But it is seen that Chavakkad does have a future in household level industrial activity which can become an economic base of the area.

CHAPTER 8

TOURISM

Tourism is regarded as second largest and fastest growing industry in the world. It has potential to generate income and employment without any harm to nature if utilised effectively. Chavakkad is famous for its Beaches and is in the tourism map of Thrissur District. The presence of Palayur church, one of the 7 churches established by St. Thomas in AD 52, has given rise to pilgrim tourism in Chavakkad town. A number of pilgrims's to Guruvayur temple are also visiting tourist areas in Chavakkad town and surrounding LSGIs. Existing conditions of tourism sector and potentials for its development are detailed out in this chapter.

8.1 Existing status

At present Chavakkad Town is having a prominent position in the tourism map of Thrissur district. Chavakkad beach and Palayur church are included in the map as shown in Figure 8.1 . Chavakkad town shares its west boundary with Arabian Sea. Chavakkad beach is one of the main spots of tourist attraction in town. According to statistics 2010, total domestic tourist flow of 56,632, this accounts for 3% of total domestic flow to Thrissur. Chavakkad is blessed with pilgrim centers like Palayur church, Manathala mosque, Manathala Siva temple and Vallabhatta Kalari which practices both martial art and health tourism. Major tourist attractions in Chavakkad town and their categories are given in table 8.2 and figure 8.2

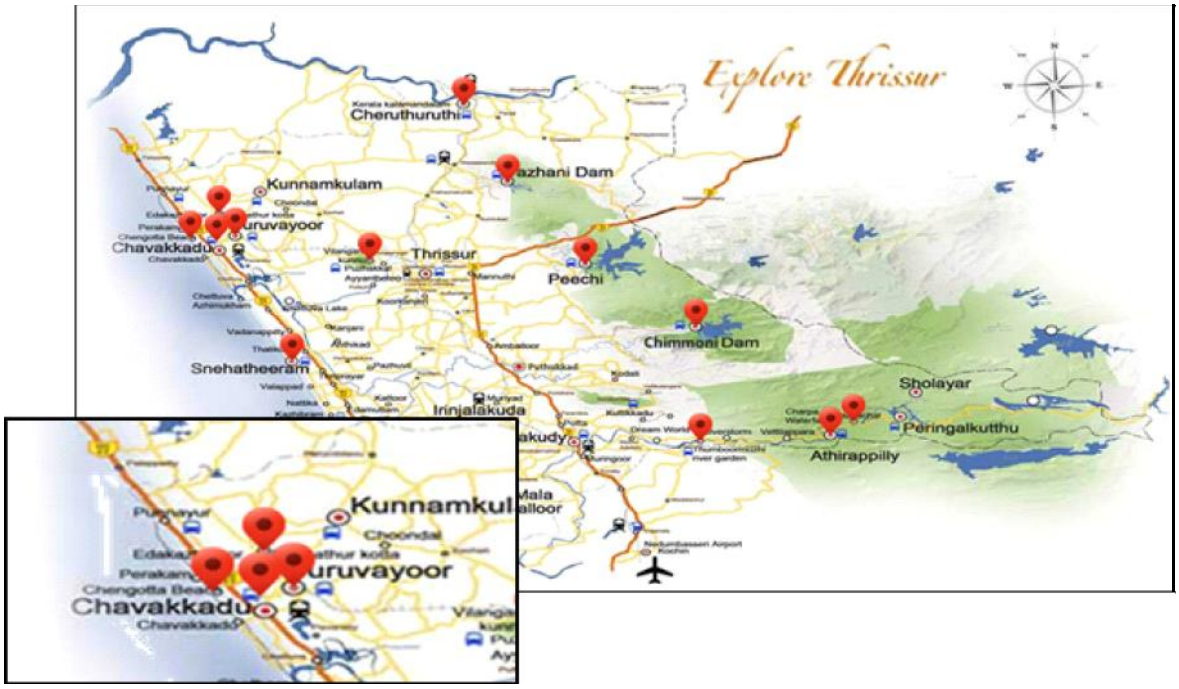


Fig 8.1 Tourist map of Thrissur district

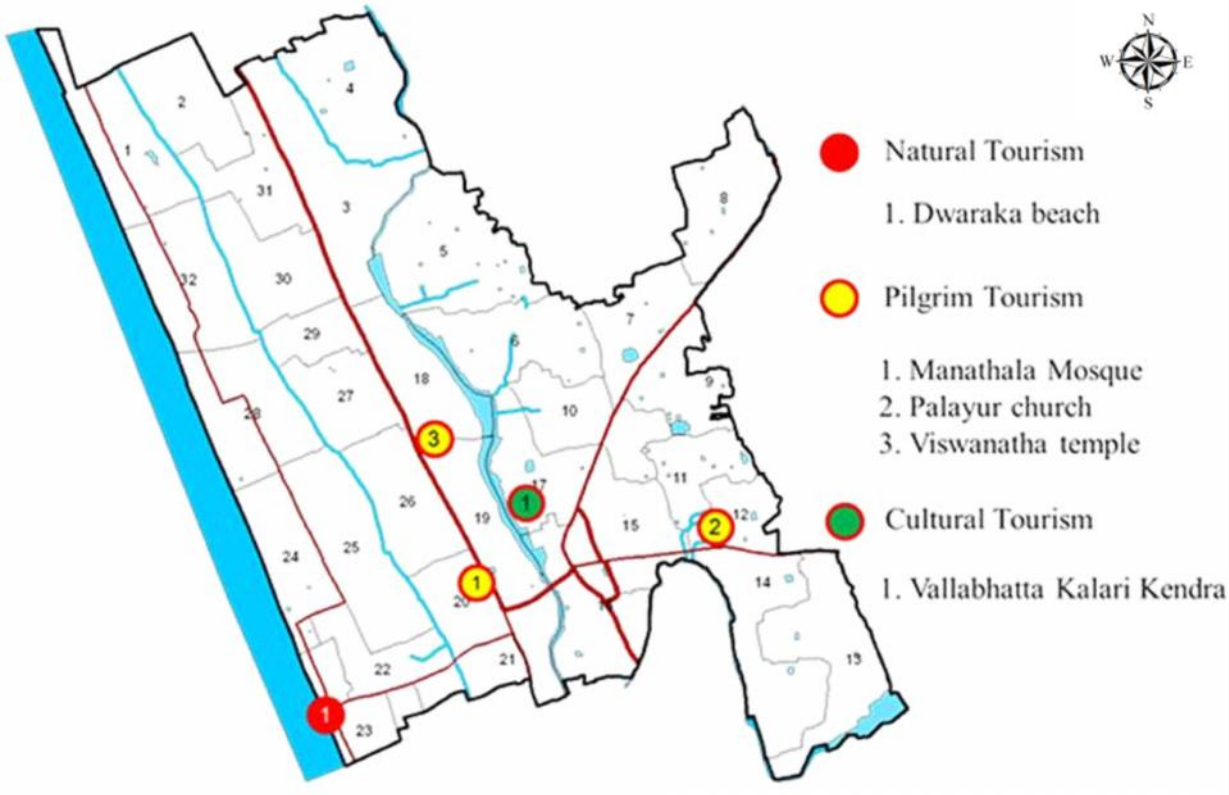


Fig 8.2 Locations of tourist destinations

Table 8.1Major tourist locations destinations

Sl. No	Tourist attractions	Type	Tourist Season
1	Dwaraka Beach	Natural	All the year
2	Palayur Church ,Historical Museum Palayur	Pilgrimage, Heritage, Cultural	All the year
3	Manthala Mosque	Pilgrimage, Heritage	All the year
4	ManathalaVishwanatha temple	Pilgrimage, Heritage	All the year

8.1.1 Natural tourism

Chavakkad Dwaraka beach is situated on the west side of Town at a distance of 2 km from the town center. Costal stretch of the beach is approximately 2 km. The silent nature makes the beach a tourist favourite spot, Coconut-bordered seashore provides a panoramic view of rare natural scenic beauty and entices thousands of tourists. Fringed shadow of coconut lagoons and the mesmerizing atmosphere make Chavakkad Beach a tourist spot round the year. Apart from tourist visits, local population also relishes this beauty. Chavakkad beach is 32 km from Thrissur and 5 km from Guruvayur, which increases its tourist potential. The journey will take only an hour from Thrissur. Tourists who choose to spend some private and memorable moments prefer the

Thrissur - Chavakkad Beach trip. The trip from Thrissur to Chavakkad Beach is a perfect weekend tour. About 3500 people are visiting the beach each Sunday/holidays and around 1000 tourists in normal days as part of Guruvayur temple pilgrimage. The details of tourists visited in Chavakkad are shown in table 8.2



Dwaraka beach

Chavakkad Beach is an example of a beach with a pristine nature. The place where the sea confluence with a river is known as Azhimugham and here it is situated at just 4 km from Dwaraka beach in Kadappuram Panchayat. From the table, it can be seen that about 75% visitors are part of Guruvayur pilgrimage. Most of the tourists are from Tamilnadu and others are from adjacent districts.

Table 8.2 Details of tourist visited

No. of visitors	Time (Sunday)	Other State/ Other District	Part of Guruvayur Pilgrimage
180	7.00am-10.00am	150	150 (83%)
640	10.00am-12.00am	540	520 (81%)
557	12.00am-2.00pm	510	500 (91%)
548	2.00pm-4.00pm	495	490 (89%)
1281	5.00pm-7.00pm	980	825 (64%)

Source: Tourist Survey on 09-03-2014 (Sunday)

8.1.2 Pilgrim tourism

i) Manathala Mosque

Manathala mosque is one of the famous mosques in Thrissur District. Hydroskutty Mooper – one of the freedom fighter is buried here. Manathala Nercha is the famous festival of this mosque.



Manathala Mosque

ii) Palayur Church

In AD 52, St. Thomas established Palayur Church.Palayur Church is believed to be the oldest church built in India, by St. Thomas. The main highlight of the church is "Thaliyakulam"; it is believed that St. Thomas baptized local people in this pond.



St Thomas Church

iii) Viswanatha temple,Manathala

Vishwanatha temple is one of the famous Siva temples in the district. Sree Narayana Guru flaid the foundation stone in 1908 and Prathishta did in 1910AD by Brahmasree Sivalingadasa Swamikal. It is situated 5 km northwest of Guruvayur along the side of NH 66 .The temple owns 3.91 acres of land of which 30 cents constitutes Temple complex. Sivarathri is observed as ten day festival .Tiru vela,Theyyam and Kettukazhcha are main attractions.



Viswanatha temple

8.1.3 Cultural tourism

i) Indian Christian Historical Museum Palayur

"Indian Christian historical museum Palayur" is situated within the Palayur church compound .In this museum, the materials regarding the history of Christianity is exhibited which includes dress of St Thomas, coins, books etc. It is open to public between 8 am to 5 pm in all days.



Museum

ii) Boatukulam

Boat Jetty (Boatukulam) is the place where St Thomas landed at Palayur. This pond is on the western end of the church. It was the part of a waterway, which brought the saint to Palayur from Kodungallur, 30 miles south of the church. There erected is a huge statue of the saint, somewhat 45 feet, which the church claims as the largest statue of the saint in the world across a pond.



Boatukulam

iii) Thaliyakulam

Thaliyakulam is the pond where St. Thomas baptized the Brahmins. The history behind this Thaliyakulam pond says that St.Thomas noticed the men taking water in their cupped hands and tossing it into the air, symbolically offering it to Surya, the god of the sun. He then asked them to make the water stay in the air, as a sign Surya had accepted the offering. The Brahmins decided this as impossible. St. Thomas then scooped up water from the pond and threw it upward. Water drops remained suspended in the air until they mysteriously disappeared. Those who witnessed the event were stunned, and many requested baptism. St. Thomas later baptized them in the same pond.



Thaliyakulam

iv) Vallabatta Kalari Kendra

Vallabatta Kalari Kendra is a significant traditional center situated near police quarters in Chavakkad town. Vallabhatta Kalari, Chavakkad is conducting Kalaripayatt workshops, demonstration and Kalari exhibitions. They also work with dancers for choreography in Kerala, Coimbatore, Bangalore and foreign countries like France, Belgium, America, and China etc. They train people, police and those who require defending for self-protection. In Vallabhatta Kalari Sangam institution Kalari Marma Chikiltsa and Uzhichil Treatment are carried on hereditarily since decades back.



VallabhattaKalari Kendra

8.1.4 Water way Tourism

Chavakkad has two canals; Canoli canal passing in the north south direction constructed by 'Canoli Saip' and the other one is Mathy Kayal. Canoli canal was a waterway for transporting goods from Muziris port Kodungallur to Ponnani in older days. Presently it is not used as a waterway. It is polluted due to the solid wastes deposited and major portions are encroached by public. There is a potential for waterway tourism through Canoli canal by providing boating, pathway along the bay of canal etc. This waterway can be connected to the surrounding Chettuva Lake, Enamavu Lake and Azhimukam.



Canoli canal



Mathy Kayal

8.1.5 Tourism infrastructure

Infrastructural facilities in Chavakkad are not sufficient to cater to tourists. Seven hotels are there for accommodation, including one 2-star hotel and a PWD Rest room of general category with only five rooms. It is seen that most of the tourists used to stay at Guruvayur where plenty of lodges are available. Pilgrims visiting Guruvayur temple find difficulties for accommodation during peak season. There is a good scope for developing Chavakkad as a major halting place for Guruvayur pilgrims during peak season and low cost accommodation facilities shall be provided during peak season.

Well-connected roadways support the tourism network of the town. The national highway NH 66 connecting Kanyakumari to Panvel (Goa), SH 50 and SH 62 which collectively form a well-routed primary and secondary inter connections. The inner roads and streets leading to tourist centers are not sufficient to cater to the needs. The destinations lack in comfort stations, toilets etc. Table 8.3, 8.4 shows the details of Hotel facilities and lodging respectively.

Table 8.3 Details of Hotel facilities

Sl .no	Name of hotel	Category
1	Golden Beach	General
2	Salkara	General
3	Grand	General
4	Parahamsa	General
5	Amaravathi	Beer parlour
6	Singapore Regency	General
7	T M Mahal	General
8	Samudra	** hotel
9	Rahmaniya	General
10	Hera	General
11	Alsakhai	General
12	Café sree	General

Table 8.4 Details of Lodging Facilities

Lodging facilities	No of rooms
Samudra	13
Pwd rest house-	5



Samudra hotel

8.2 Tourism potential areas around Chavakkad town

Chavakkad is well being connected to the surrounding LSGIs. This connectivity can boost the tourist potential of the place when linked with the destinations around Chavakkad. There are a handful of such locations as Guruvayur temple,Mammiyoor temple,Anakotta etc. One-day tourism is possible connecting these places, which is situated in nearby LSGI's within five kms from Chavakkad. Tourist destinations surrounding Chavakkad are shown in figure in 8.3



Fig. 8.3 Tourist destinations surrounding Chavakkad

(i) Guruvayur temple

Guruvayur Sri Krishna temple is a Hindu temple dedicated to the God Krishna (an avatar of the God Vishnu); located in the town of Guruvayur just 4 km away from Chavakkad .This temple is visited by thousands of pilgrim's daily. Krishnanattam Kalari and Mural painting institute can offer a different experience to the pilgrims.



Guruvayur Temple

(ii) Mammiyoor temple

Mammiyoor temple or famously known as Mammiyoor Mahadeva Kshetram is a Shiva temple situated in Guruvayur. As the rituals goes every devotees who goes to Guruvayur temple is supposed to go Mammiyoor also.



Mammiyoor Temple

(iii) Punnathur Anakotta

Anakotta (anathavalam) is a unique place- a world of elephants of different sizes and natures. Elephant sanctuary is only a couple of kilometers from the temple town of Guruvayur and 5 kms from Chavakkad. It was the palace of Samoothiri Raja during his region.Now it is owned by Guruvayur Devaswam and is used as a wellness treatment center for elephants. Medical treatment facilities are also provided here for elephants. Pilgrims of Guruvayur temple visit this place also.



Punnathur Anakotta

(iv) Chettuva Azhimukam

The place where the sea confluence with a river isknown as Azhimukam, here it is situated at 4 km distance only from Dwaraka beach in Kadappuram Panchayat. A number of tourists are visiting this place, out of which most of them are pilgrims of Guruvayur.



Chettuva Azhimukam

v) Light house

Lighthouseis situated between Dwaraka beach and Azhimukam. It offers an opportunity to capture the beauty of land and sea in a single glimpse. Earlier the light house provided guidance to the seafarers, but now has transformed itself to a piece of enjoyment.



Light house

The festivals in the above pilgrim tourism spots are detailed as under:

(i) Manathala Nercha

It is conducted under the direction of Manathalamasjid committee. It is celebratedduring the month of January of every year. 'Kazhchas,' which is the procession of different colourful cultural programs like Band melam, Chendamelam, (group of elements) etc. from the different locations of the town get finished at Manathala mosque. Hundreds of people participate in this festival. A large number of native NRI Muslim employees gather during this period to attend this festival.



Manathala Nercha

ii) Palayur Church festivals

St.Thomas day Celebration

St. Thomas Day celebration also known as "Dukrana"Thirunal is celebrated on July 3every year in the memory of martyrdom of Marthomas leeha. So many pilgrims from different parts ofThrissur, Palakkad and Malappuram districts visitthe church during this day. "Ottu" is being arranged for pilgrims those who visit the church during this day.About ten thousand pilgrims visit the church during thirunal day.



Palayur church festival

Tharppana Thirunal

St. Thomas, the Apostle of Christ landed in 52 AD at Kodungallur, and went on to establish seven churches for the faithful he evangelize in Kerala.One of them is Palayur Church. Tharppana Thirunalis another festival of Palayur church and it is celebrated on July 13, 14 every year. Local residents are the major participants in this festival.



Tharppana Thirunal

Palayur Maha Theerthadanam

The Thrissur Archdiocesan authorities are today whole heartedly committed to develop Palayur into a national as well as international pilgrim tourism center in South India. The Palayur church was elevated as the first Archdiocesan pilgrim centre on 16th April 2000. The relic of St. Thomas conveyed from Ortona, Italy was ceremonially placed in the main altar of the church. The 30 km long annual Lenten Maha Theerthadanam or great pilgrimage on foot from the Thrissur to Palayurisconducted every year.



Palayur Maha Theerthadanam

(iii) Manathala Viswanatha temple festival

This festival is celebrated in the month of February every year. This resembles with typical pooram festival having melams and elephants. Hundreds of people participate in this festival. A large number of native NRI Hindu employees gather during this period to attend this festival.



Manathala Viswanatha Temple festival

8.3 Problems and potentials

Tourism is not so prominent even though it has tourist destination like natural tourism, Pilgrim tourism and cultural tourism. These types of tourism are more seasonal. Chavakkad Beach, lying

on the coast of Arabian Sea and situated 5 km from Guruvayur, is one of the best beaches along the West coast of district. Fringed shadow of coconut lagoons and the mesmerizing atmosphere make Chavakkad Beach a tourist spot throughout the year. Azhimukam shows also a potential way for water tourism. The Vallabhatta Kalari can be another source of health and martial art tourism for economic development of town.

8.4 Inference

Presently Chavakkad town is not having a prominent position in the tourism map of Thrissur district. However, by utilising tourism potentials inside and outside the town; a one-day tourism circuit can be developed. Waterway tourism can be developed by boating through Canoli canal connecting with Chettuva Lake, Ennamavu Lake and Azhimikham. Infrastructure facilities for Guruvayur pilgrim tourists shall be developed to direct the pilgrims to Chavakkad town. Chavakkad Beach, Azhimukam, Vallabhatta Kalari and similarly fisheries itself can boost tourism, which can provide an economic boost to the society and Chavakkad town.

CHAPTER 9

AGRICULTURE AND ALLIED SECTORS

Chavakkad being an urban area does not seem to have much relevance for agriculture .Even then; there are traces of agriculture which have not given in while giving way for Urbanisation. Land use of Chavakkad shows patches of agricultural areas. This chapter analyses the existing status and development issues of Agriculture and allied sectors in the planning area.

9.1 Introduction

Chavakkad town is situated along the coastal area sharing its west boundary with Arabian Sea. The soil type is sandy in nature which is suitable for cultivation of coconut, arecanut, cashew and floriculture. Paddy fields are located in the periphery of Mathykayal. Majority of these fields are at present lying vacant. Some Ramacham plantations are there in northern parts of Town. There is coconut cultivation in all the possible plots in the town. Irrigation to these crops is not being in an organized manner. Water stored in ponds and streams during rainfall is used for irrigation.

9.2 Agriculture -Existing Scenario

As per the land use analysis of Town 26.4% (3.33 sq. km) of the land is used for agricultural purposes, out of which 21.88% is dry agriculture and 4.52% is wet agriculture (Paddy). The spatial distribution of agriculture land use of Town is shown in figure 9.1. It is seen that paddy area is distributed along both sides of Mathykayal. In dry agriculture areas, mainly the cultivation of coconut, bananas, arecanut etc. are being done. Figure 9.2 shows the ward wise distribution of concentration of agricultural land use. Wards 3, 5, followed by ward no 4,6,13 show more concentration of agricultural land use. The soil suitability map for the district is shown in the figure 9.3. As per the map soil type here belongs to the Manathala – Punnayurkulam series. The crops suitable for this soil are Coconut, Arecanut, Banana, Cashewnut, and Vegetables.

The major crops of cultivation are coconut and paddy. Arecanut, pepper and banana are cultivated on a marginal scale. Apart from this, Ramacham is also cultivated in northern part. The area of cultivation of different crops in Chavakkad area is shown in table 9.1 and their corresponding percentage is given in fig 9.4. One of the major issues faced by the agricultural sector is lack of agricultural labourers. The census report shows a decreasing trend in agricultural labourers as well.



Fig 9.1 Distribution of wet and dry agriculture

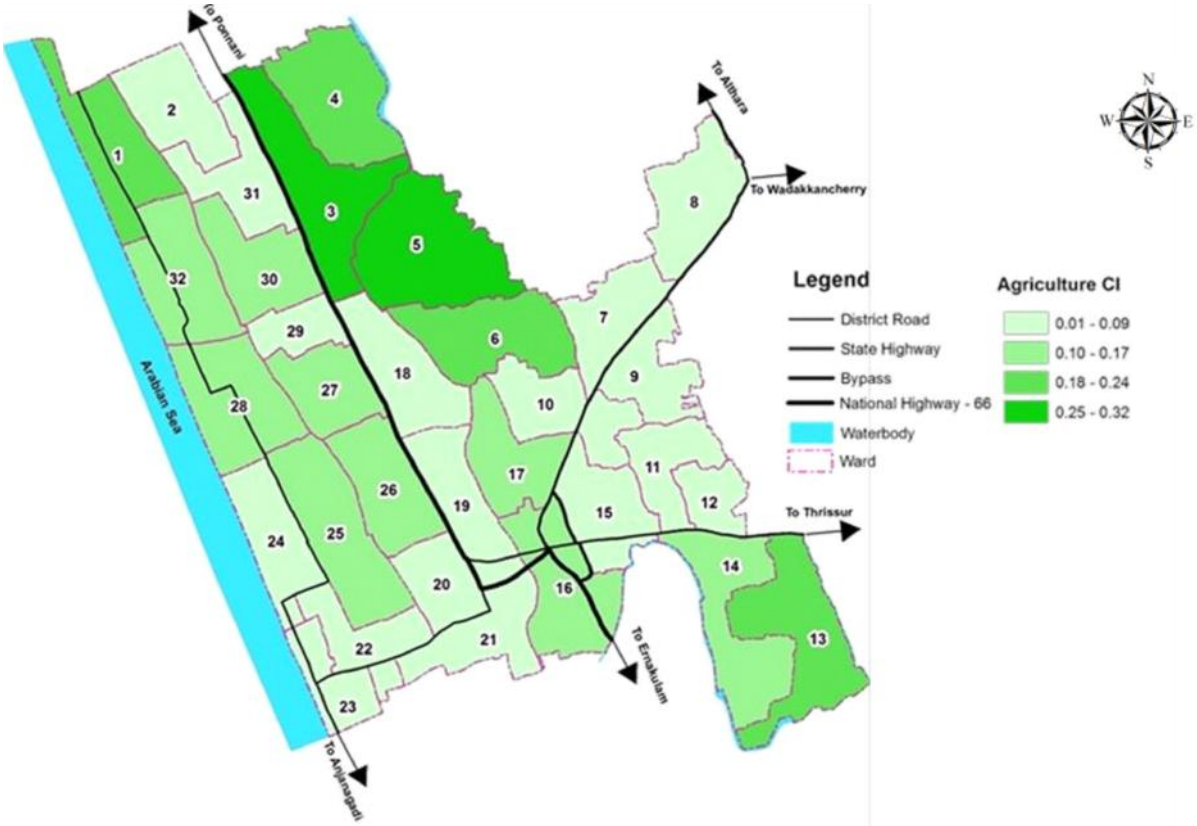


Fig 9.2 Concentration pattern of agricultural land use

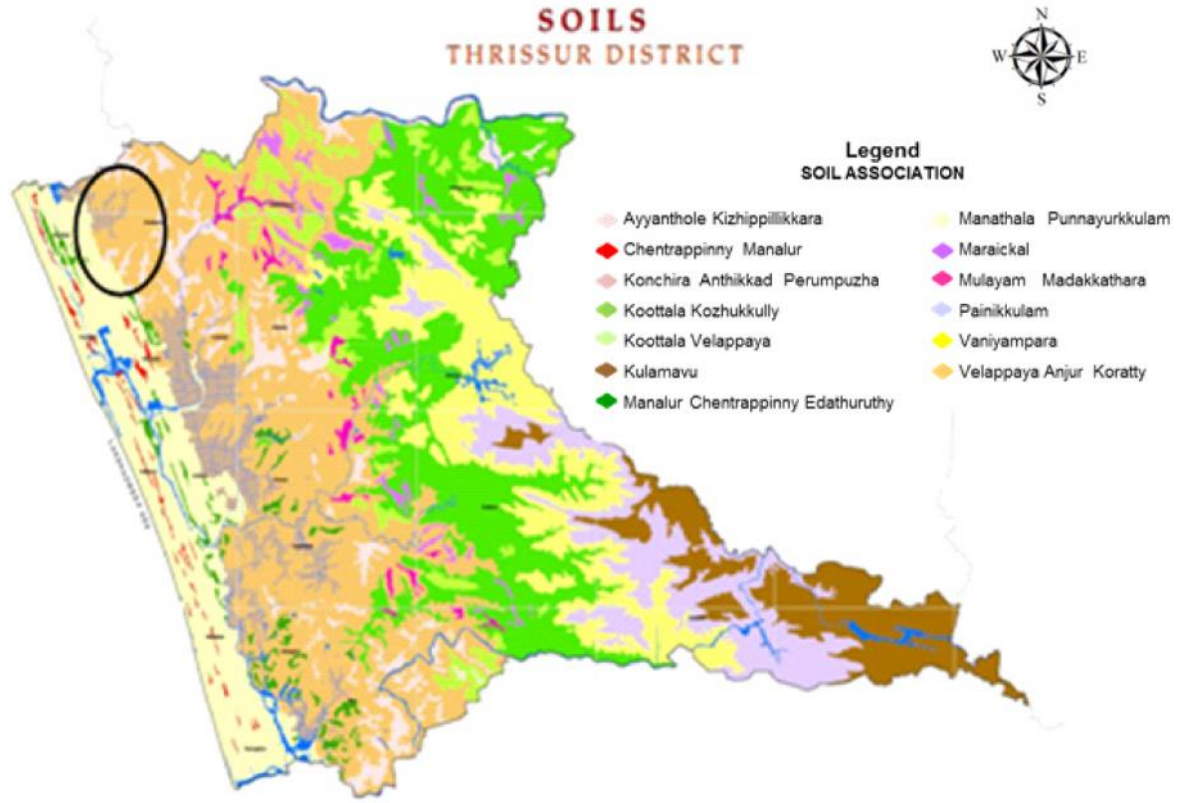


Fig 9.3 Crop suitability of various soil sources – Thrissur district

Table 9.1 Important crops Productions and Productivity

Type of Crop	Production	Productivity
Paddy Non Kole	260	4 T/Ha
Coconut	8662500	45nos/palm
Arecanut	2.64	.004 T/Ha
Banana	350	14 T/Ha
Veg (Homested)	80	8 T/Ha
Tuber	20	5 T/Ha
Vetiver	2.5	2.5 T/Ha

Source- Krishibavan Chavakkad

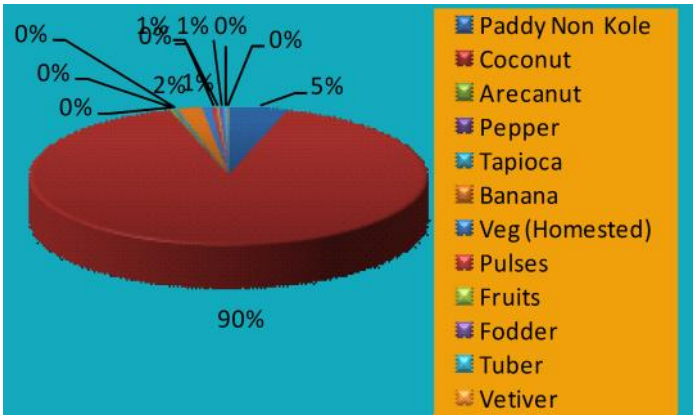


Figure 9.4 Area under cultivation for crops

9.2.1 Paddy

Paddy cultivation was part of the proud culture of Kerala State, rice being the most important cereal and staple food produced and consumed in Kerala. Paddy cultivation is very less in Chavakkad town. As per the land use analysis of town, 4.52 % of the land is used for paddy cultivation. It is seen that paddy area is distributed along both sides of Mathykayal. Access to the paddy land is obstructed in many places which need to be developed further. During rainy season Mathykayal overflows and water logging occurs in paddy area. Here puncha crops are cultivated because paddy area is under water logged conditions for other seasons. The cultivation cycle followed is Jan- May. In order to prepare area for paddy cultivation, the water which is logged in this area is completely drained out with the help of 'Pettiyum parayum'.

Pettiyum parayum is located at the south end point of paddy area. The drained out water flows through Mathy kayal towards Chettuva Lake and finally enters Arabian Sea. Temporal variation of area and production of paddy is shown in figure 9.5. The area remains constant for these years and production occurs a slight increase. Comparison of Paddy area with nearby urban LSGI is shown in figure 9.6 and can be seen that area of cultivation is very small.

Total area under paddy cultivation is 60 hectares with productivity of 4.3T/Ha i.e. 4300 kg/Ha. On comparing with the surrounding LSGIs, Chavakkad shows a second highest productivity among the nearby LSGI's as shown in figure 9.7. Agricultural activity mainly depends upon the rainfall in Chavakkad town, in the absence of proper irrigation facilities. Now a day, it is seen that there is no individual cultivation of paddy. The non-availability of labourers, and the occasionally occurring natural disasters may be rendering the whole process a non-profitable one.

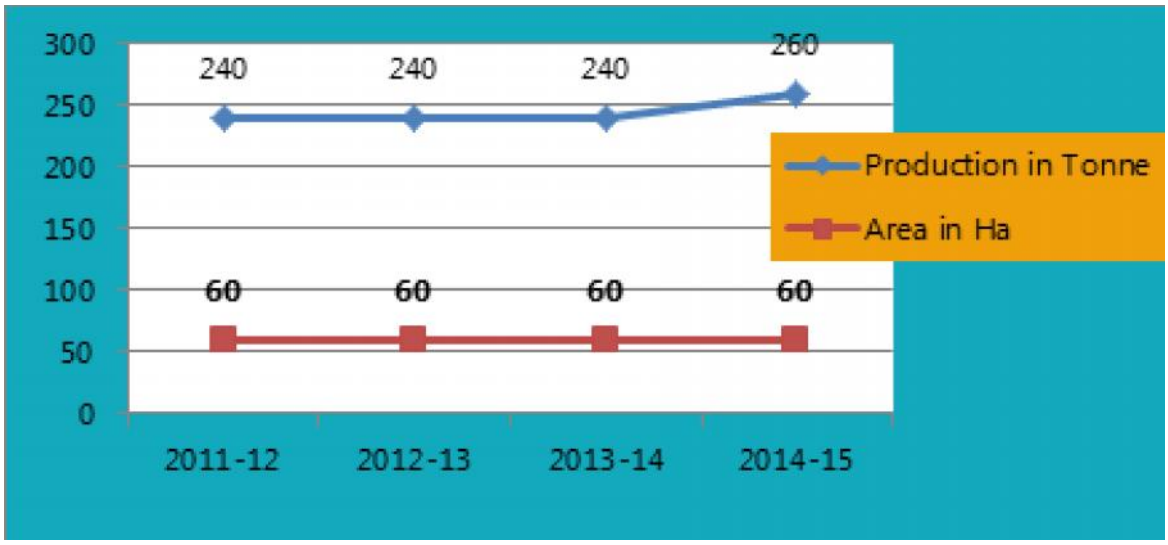


Fig 9.5 Temporal variations of area and production of paddy

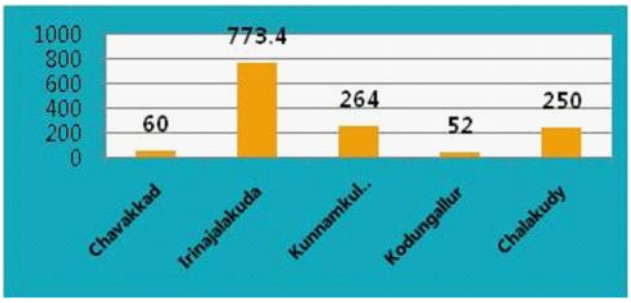


Fig 9.6 Comparison of paddy Area (Ha) with urban LSGIs

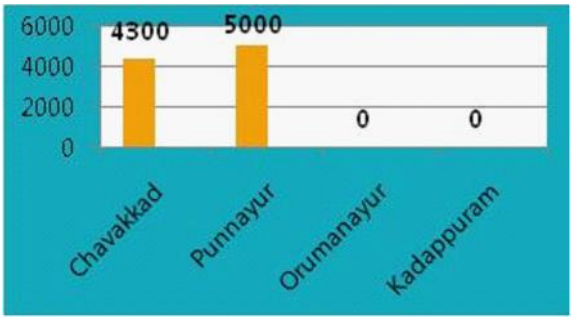


Fig 9.7 Comparison of productivity in kg/Ha with nearby LSGI's

9.2.2 Coconut

In Chavakkad Municipal area, 1100 hectares of land are used for coconut cultivation which is spreaded evenly throughout the built-upable areas of town. No independent big plantations are seen here. The coconut production of Chavakkad is 45nuts/tree/year which is more than the State production of 40nuts/tree/year. The productivity is more than even the state average.

When comparing with the surrounding LSGI's the productivity of coconut is seen to be high in the Punnayur GramaPanchayath and Chavakkad town stands next. The temporal variation of area and production of coconut from 2011-15 is shown in figure 9.8 and 9.9 respectively. The main problem affecting the coconut cultivation is the non-availability of coconut climbers and the diseases affecting the palms. The conversion of land to residential use in order to take care of the high population density will be a reason for the reduced coconut cultivate area.



Fig 9.8 Temporal variation of area in Ha of coconut



Fig 9.9 Temporal variation of production of coconut (no of nuts)

9.2.3 Arecanut

Arecanut is cultivated as an inter crop in coconut fields, hence it finds a place in every home stead of Thrissur District. Chavakkad shows a marginal presence of Arecanut cultivation. According to agricultural data, Arecanut are cultivated in 3 hectares' of land.

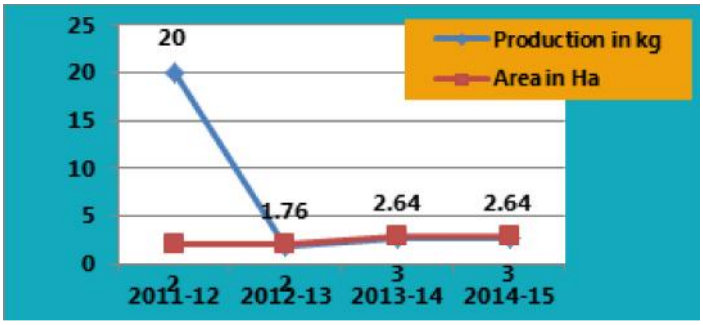


Fig 9.10 Temporal variation of area and production of arecanut

The figure 9.10 shows the temporal variation of area and production of arecanut of Chavakkad town; from figure it implies that Arecanut production after a sudden decrease in 2012 is having a constant production.

9.2.4 Other crops

Ramacham is a medicinal plant. The cultivation of Ramacham is more in Punnayur Grama Panchayat of Thrissur district. It is cultivated in the north western sides of the town which lies at

the border of Punnayur GramaPanchayat. The figure 9.11 shows the location of Ramacham cultivation. Area of cultivation of Ramacham is 10 Ha and the productivity is 12.5Ton/ Ha/ year. Table 9.2 shows the area, production and productivity of different crops in Chavakkad town

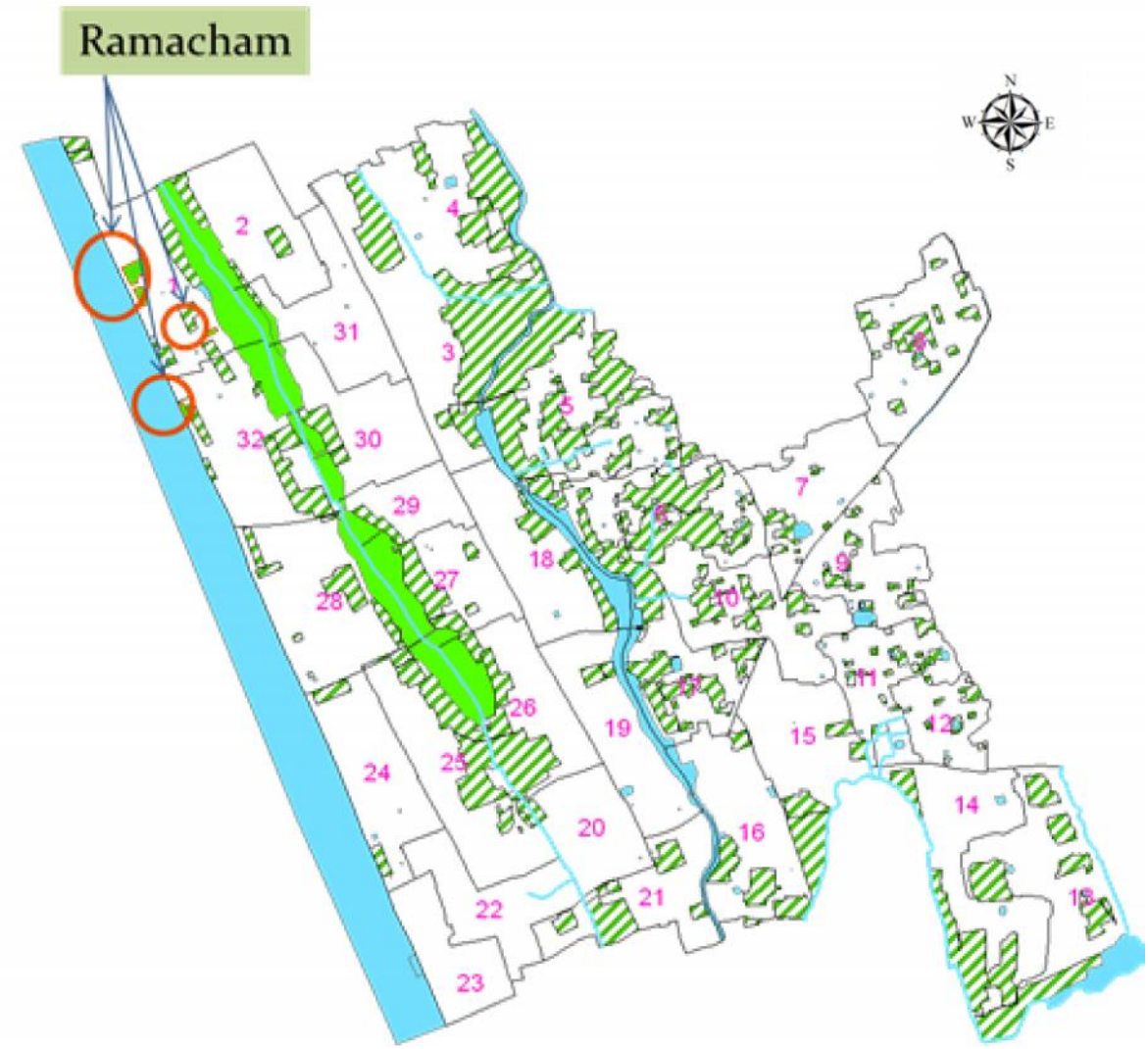


Fig 9.11 Ramacham cultivation area

Table 9.2 Important crops, Area, Productions and Productivity

	Area (in Ha)				Production				Productivity			
Type of Crop	2011-12	2012-13	2013-14	2014-15	2011-12	2012-13	2013-14	2014-15	2011-12	2012-13	2013-14	2014-15
Paddy Non Kole	60	60	60	60	240	240	240	260	4T/Ha	4T/Ha	4T/Ha	4 T/Ha
Coconut	950	1050	1050	1100	7481250	8268750	8268750	8662500	45 nos/palm	45 nos/palm	45 nos/palm	45nos/palm
Arecanut	2	2	3	3	20	1.76	2.64	2.64	.004 T/Ha	.004 T/Ha	.004 T/Ha	.004 T/Ha
Banana	20	25	25	25	280	350	350	350	14T/Ha	14T/Ha	14T/Ha	14 T/Ha
Veg (Homested)	5	7	7.5	10	40	56	60	80	8T/Ha	8T/Ha	8T/Ha	8 T/Ha
Tuber	2	2	2.5	4	10	10	12.5	20	5T/Ha	5T/Ha	5T/Ha	5 T/Ha
Vetiver	0.5	0.5	1	1	1.25	1.25	2.5	2.5	2.5T/Ha	2.5T/Ha	2.5T/Ha	2.5 T/Ha

9.3 Agricultural Infrastructure

Even though, Chavakkad town has no prime importance in the field of Agriculture, as per krishibhavan, there are 64 pump set which can be used for the present agriculture purpose and thereis no other machineries in Chavakkad town.

Padasekhara samithi form the driving force of group farming activities. Chavakkad town has only one Padasekharam located in the east of ward 28, 32, south of ward no 26,29,30,31 and full on the ward 25. There was cultivation in 2008 to 2013. But in 2014-15 there was no cultivation, the present area of the Padasekharam is 600 cent.

9.4 Irrigation facilities

Irrigation is done using facilities like water from Mathykayal, motor and other amenitieswhich are already established for effective pumping of water. PettiyumParayum" is used for draining out the excess water from the agricultural area for preparing the area for paddy cultivation. An ambitious project called, "Jalasree scheme" is already announced for the upgradation of the Pookulam pond (Estimated project cost is 77 lakh).

9.5 Watersheds

A watershed is an extent or an area of land where surface water from rain or ice converges to a single point in lower elevation. These water bodies supply drinking water, water for agriculture and manufacturing, offer opportunities for recreation and provide habitate to numerous plants and animals. Unfortunately various forms of pollution, including runoff and erosion, can interfere with the health of watersheds and hence its protection is important. The details of watersheds are given in Table 9.3.

Table 9.3 Details of Watersheds

SlNo	Name of Water shed	Area (Ha)	Priority
1	Areekkara-Peramangalam W/s	200	Low
2	Mathikayal-Muttipadam W/s	660	Low
3	Canoli canal W/s	310	Low
4	Punchapadam-NDU Thodu	456	Low
5	Valiyathodu-Cheriyathodu W/s	65	Low

Source- Soil Conservation Department, Thrissur

9.6 Animal husbandry & Dairy development

As per the quinquennial census 2012, the live stock of Chavakkad town is given below. The major livestock include hen, goat, cow and dog. The status of population of animals for the year 2012 is given in table 9.4. The table indicates that hen and goat are more in Chavakkad. As per the socio-economic survey reports 61.90% of houses have hens in their houses. The details of domestic animals as obtained from socio economic survey is shown in Fig 9.12. This shows that animal husbandry activities have become an inevitable part of the house holds of Chavakkad. There exists one Slaughter house at Chettuva road near to the south by pass junction and exists one vetenary dispensary at Manathala. There are 10 meat stalls and 9 fish stalls functioning in the town. The spatial distribution of marketing facilities is shown in figure 9.13.

At present there are no dairy farms in Chavakkad town. One milk society is functioning in the Baby road which has just started in the year 2013. The quantity of milk collected here is 105 litres

Table.9.4. Live stock Population (Quinquinneal -2012)

Cow	383
Buffalo	23
Goat	1953
Hen	5513
Rabbit	157
Pig	5
Dog	872

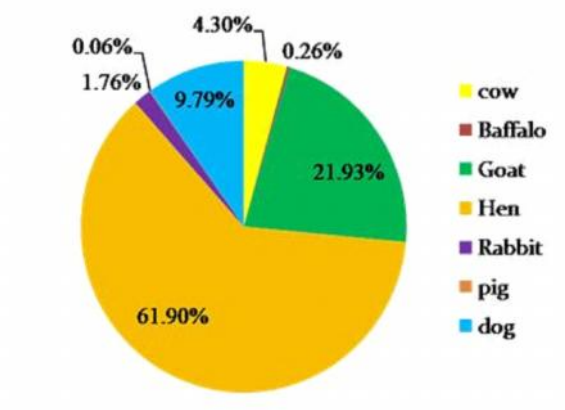


Fig 9.12 % of Livestock population

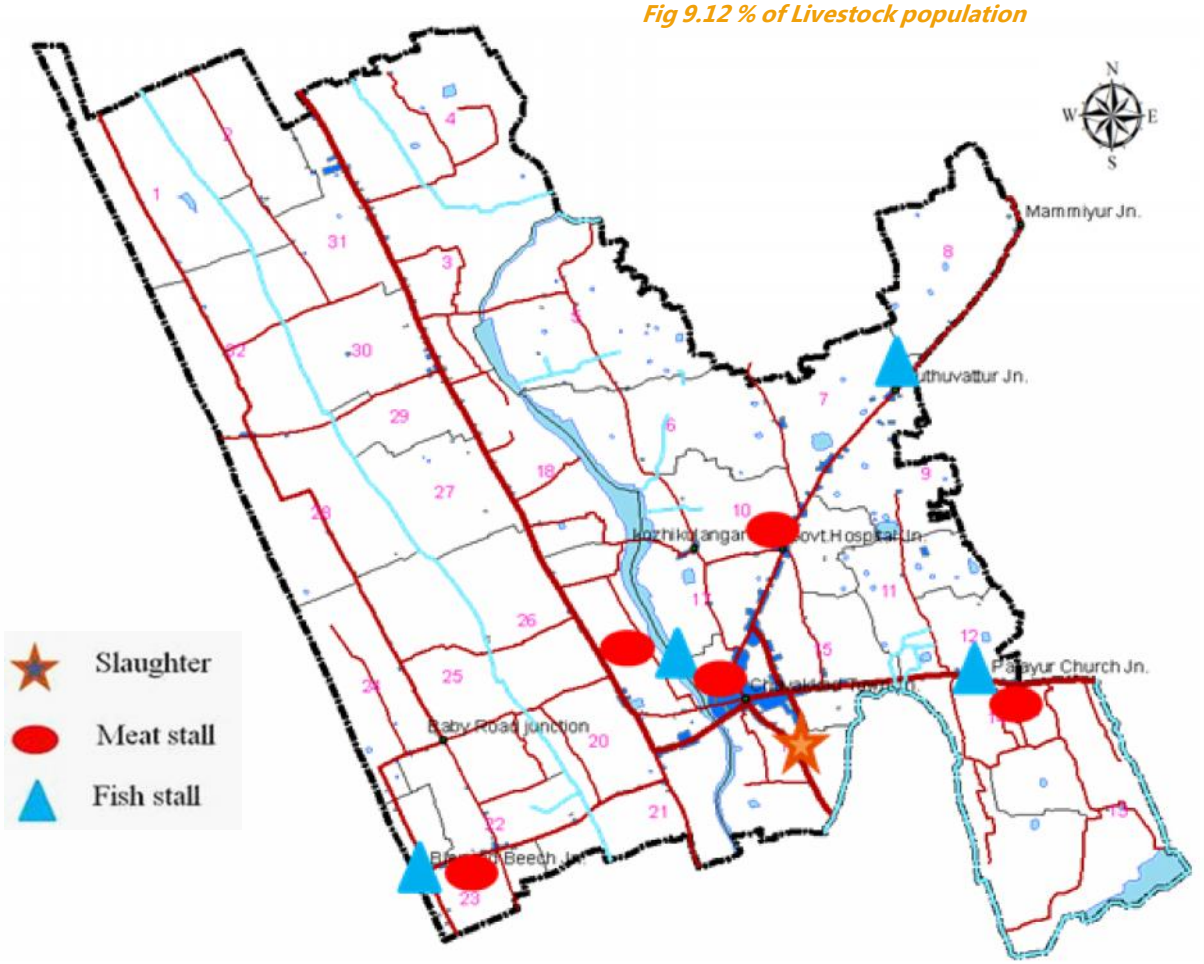


Fig. 9.13 Location of slaughter house, meat stall and fish stall

per day. The milk production is not sufficient to meet the need of Town. To compensate the shortage of milk, people depend on Tamil nadu and nearby states. The existing production may be enhanced by adopting every possible measure, so as to achieve self-sufficiency in good milk and milk products. Figure 9.14 shows the location of milk society in Chavakkad Town.

9.7 Problems and Potentials

Chavakkad town does not have a prime importance for agriculture due to lack of agriculture labour, non profitability, lack of individual interest and also due to the type of land use. There

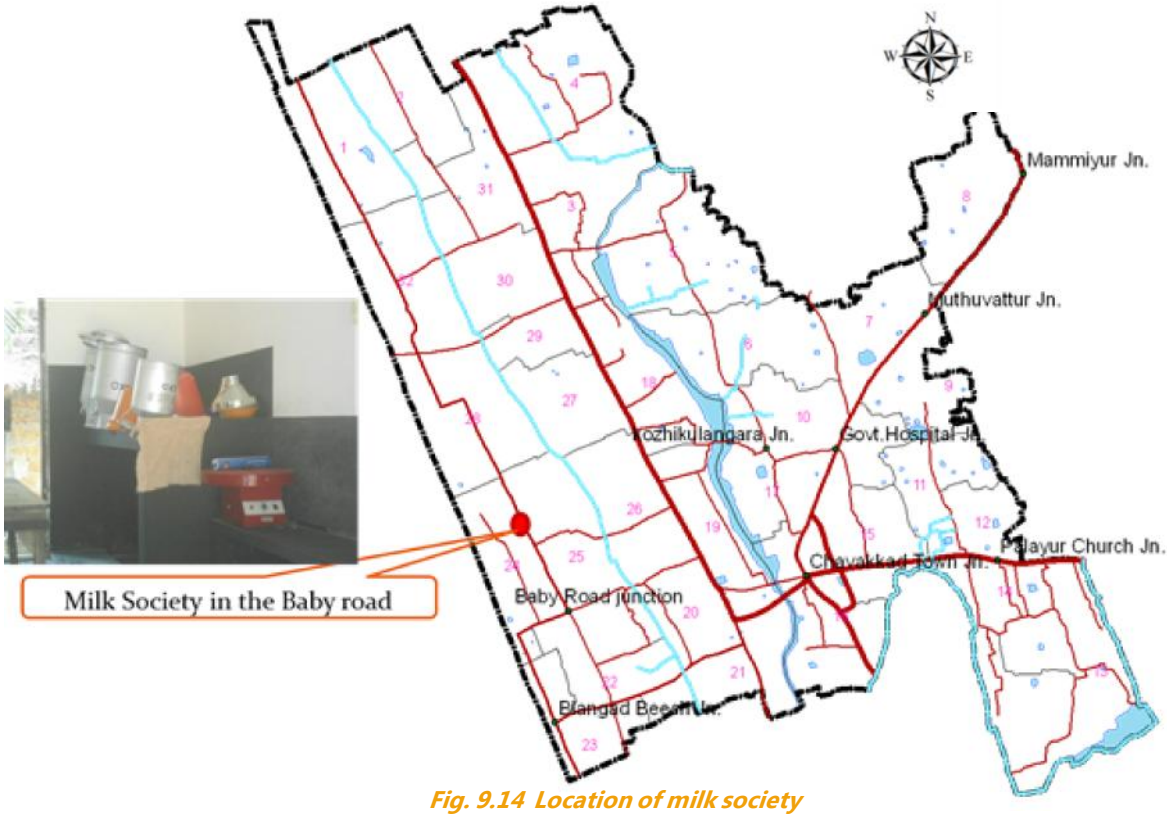


Fig. 9.14 Location of milk society

is only 26.40 % of the land for both dry and wet agriculture. Major crop is coconut. Agriculture mainly depends on rain water."Pettiyum parayum" is used to drain out water from the agriculture area during cultivation. Less production of milk, meat and egg due to lack of new methods.

9.8 Inference

Presence of sandy soil makes the land suitable for crops such as Coconut and Arecanut. 26.40% (3.33 Sqkm) of the land is used for agricultural purpose with 4.52 % wet cultivation and 21.88 % dry cultivation. Paddy is cultivated along the periphery of Mathikayal. Also there is a presence of Ramacham cultivation to a marginal level. Major crop is coconut and Chavakkad shows higher coconut productivity than state. Agriculture mainly depends on rain water. "Pettiyum parayum" is used to drain out water from the agricultural area during cultivation. "Jalasree Scheme "is already proposed for the up gradation of existing ponds. Issues like lack of agricultural labourers and irrigational facilities, lack of acess to paddy land, non-profitable process etc. pulls back this sector. Since ¼th of total area belongs to this use, a new policy level intervention required to overcome this dilemma. Animal husbandry sectors also required an integrated approach and schemes to increase the production of milk, meat and egg. These two sectors may be promoted at least with an eye on achieving self-sufficiently.

CHAPTER 10

FISHERIES

Chavakkad town is located along on the coast of Arabian Sea. Chavakkad town is bounded by sea on the western side. Hence fishing has been a major activity of the people from olden times. This chapter analyses the existing status and development issues of fisheries sector in the Chavakkad town area.

10.1 Introduction

Thrissur having a coastal stretch of 54 km is rich in fisheries wealth and has an excellent aquatic biodiversity. Thrissur district has a number of brackish water and fresh water sources apart from the coastal stretch. Fishing is one of the traditional industries in the coastal area of Thrissur district. The inland water bodies are also rich in various species of fish. A large number of people earn their livelihood by fishing and fishing related industries. Fishing is one of the major occupations of Chavakkad. The food habit of the people of the region has boosted the fishing industry even more. The traditional fishermen of Thrissur comprises of Marakkan, Arayan, Valan and Mukkuvan.

Thrissur has a coastal line extends from Azhikode to Kappirkkad (Manthlamkunnu). There are 7 major fishing centers in the district viz. Azhikode, Nattika, Vadanappalli, Blangad, Puthenkadappuram and Chettuva.The Thrissur city and its outskirts are hot beds of fishing activities with 8 inland spots and 18 fishing villages, along the coast.



Different species of Fish

Among the 18 fishing villages two of them viz., Manathala and Blangad are situated in Chavakkad town. Fishery activities are concentrated at Blangad and Puthenkadapuram. As per 2011 Panchayat level statistics, 17 % of marine fishermen in Thrissur are from Chavakkad as shown in Table 10.1. A scheme called Saving Cum Relief Scheme (SCRS) is undergoing in

these fishing villages. This is a centrally sponsored scheme implemented in the state to provide relief to the fishermen during the lean fishing season. Contribution of Rs.1800/- will be made by Centre and State Government on 50:50 basis.

Table 10.1 Details of active fishermen

Name of the place	Marine Active Fishermen (Nos)
Thrissur	8645
Chavakkad	1463

As per IDDP report marine fishermen population of Chavakkad town is 11872 in 2009. As per data from Fisheries Deputy Directorate Office, there are 450 registered fishermen in Chavakkad town and 800 numbers of labourers working in fisheries sector. Yield of fish wealthreach at its peak in monsoon season. As per the data from Fisheries Deputy Directorate Office nearly 180 ton is harvested per year. At the same time yield of fish wealth recorded nearly 1380 ton/annum. In earlier days Chavakkad town used to export fish, but now it is completely vanished.



Different species of Fish

Prawn, Sardine (Mathy), Macerel (Ayila), Queen fish (Neymeen), King fish (Aikora), Squid(konthal), Pomfret (Avoli), Shark, Crab, Milkfish(poomeen), Tuna(kudatha), Chemballi are the main species of fish available in this area. Majority of workers are from outside the town especially from south of Kerala and Kanyakumari district. The accommodation of these workers poses a problem to the town. Trolling ban period is for 45 days, starting from June 14th to July 31st midnight and their life during that period is worse. The report from this field point out that yield of fish wealth is gradually decreasing which will adversely influence the income of fishermen.

10.2. Fisheries Technical School



Fisheries Technical School at Puthenkadappuram

Chavakkad Fisheries Technical School situated at Puthenkadappuram is one of the ten Fisheries Technical Schools in Kerala. School offer education, food and accommodation at free of cost for all fishermen children of in VIII, IX and X classes. Fisheries Science is a special subject in addition to state syllabus, hence it is known as Fisheries Technical School.

The total student strength of the school is only 32 at a time. Presently students are not willing to opt this education is a problem faced by this school.

10.3 Government Agencies involved in Fisheries Sector

The government agencies functioning in Chavakkad for the benefit of fisheries sector are given in table 10.2.

Table 10.2 Main institutions related to Fisheries

Name	Place	Function
Matsya bhavan	Manathala	Coastal area officer
Fisheries Development Office	Blangad	Supervision of Fisherman
Matsya information centre	Puthenkadappuram	Information about the availability of fish, changes in the climate and natural calamities
Matsya Thozhilali Vikasana samaithi	Puthenkadappuram	Protection and development of fisherman
Fisheries Technical School	Puthenkadappuram	Educational development of Fisherman boys providing free education on 8,9,10 classes including food and accommodation
Fisheries UP School Putnenkadappuram	Puthenkadappuram	School especially for fisherman children
GFUP School Blangad	Blangad	School especially for fisherman children

Government agencies involved in fisheries sector in Chavakkad are:-

- Fisheries Department: - This department deals with the technical matters related to fisheries.
- Matsya Bhavan:- This office involve in the procurement of fish and their marketing
- Matsya Fed: - This agency works for the welfare of fishermen and their family. Around 1800 workers are registered under Matsya Fed and its jurisdiction area is from Chettuva to Andathodu.

Benefits are given to the worker's family for marriage, delivery and also in the event of death. Ration is also given to fishermen family during trolling period.

10.4 Infrastructure

Two fish landing centers are there in the town. One at Blangad beach and the other at Puthenkadappuram. Both are situated in puramboke land between LTL and HTL. The fish landing centers are shown in figure 10.1. One boat repairing unit, one fish net making unit and two ice plants are functioning in the town. Fishing related industries are functioning in the mini industrial estate located at Puthenkadappuram. The main fish market is located at Vanchikadavu. In addition

to this fish stalls are functioning at various centers in the town. Town council has proposed a project for new fish market. The location of the same is shown in figure 10.2. The location has a



Fig.10.1 Location of fish landing centers Chavakkad

At Puthenkadappuram,the fish drying area is provided. Open air drying by means of sun and wind has been practiced since ancient times to preserve food. Water is usually removed by evaporation in air drying, sun drying, wind drying and the dried fish has a storage life of several years. The method is cheap and effective in suitable climates; the work can be done by the fisherman and family, and the resulting product is easily transported to market. So many open fish drying yards are functioning for the preservation and storage of the fresh fish at Puthenkadappuram. Existing infrastructure facilities affect the seashore system. Density of pollution is high in fishing area, pollution from fish landing center and spreading of oil from boats are the problems faced here.



Fish drying yard

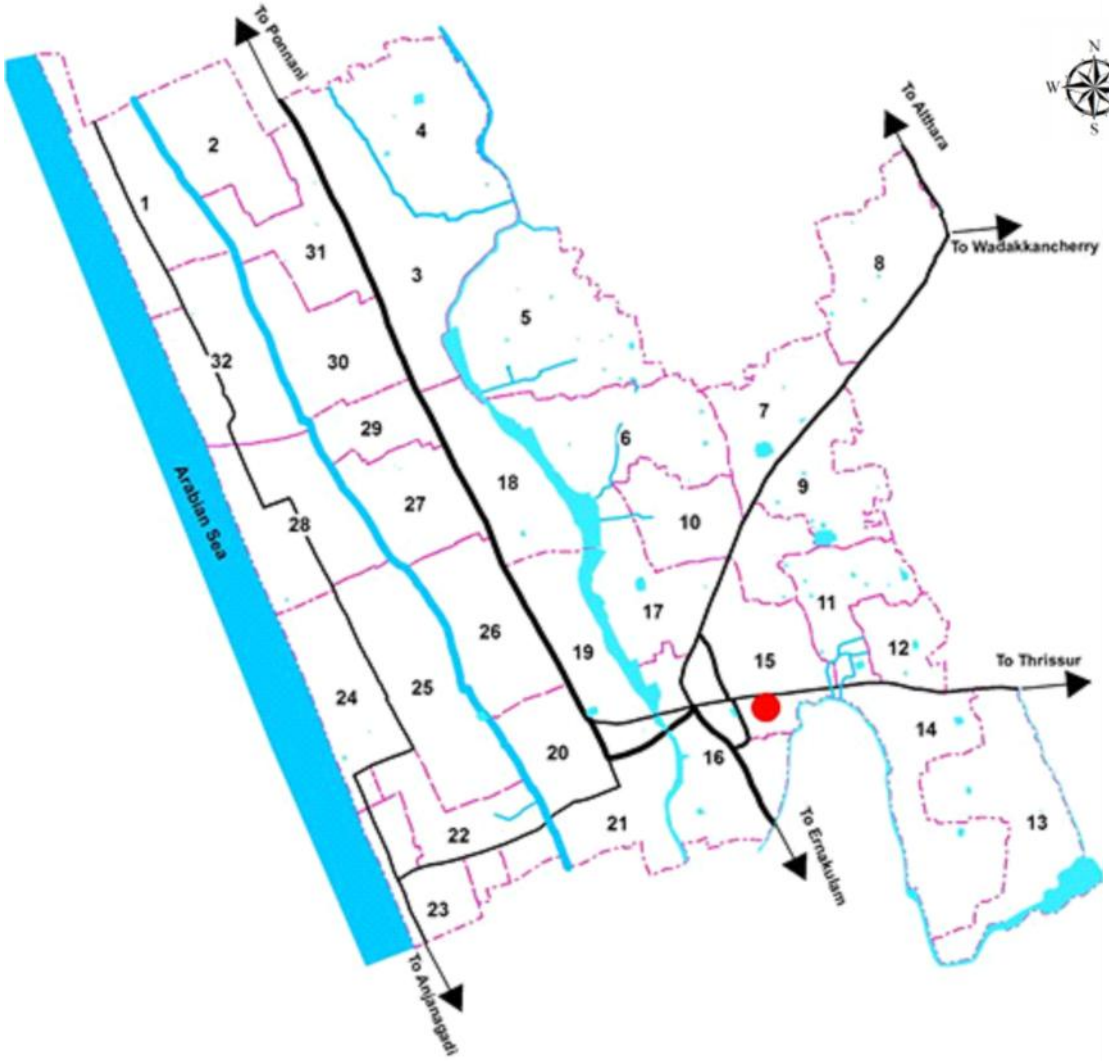


Fig.10.2 Location of proposed fish market

10.5 Fishing based Industries

In Chavakkad town there exists a high potential for fish based industry. The fishing industry can be culturing, processing, preserving, storing, transporting, marketing or selling fish or fish products. Factories for extracting oil from fish were working at the time of British rule. At present there is no effort is taking place for the upliftment of fish based industries.

10.6 Sources for inland fish culture

Chavakkad has so many ponds, both in public and private lands which are presently not in use. So there is Possibility of inland fishing through the development of existing ponds. Figure 10.3 shows the distribution of ponds in Chavakkad.

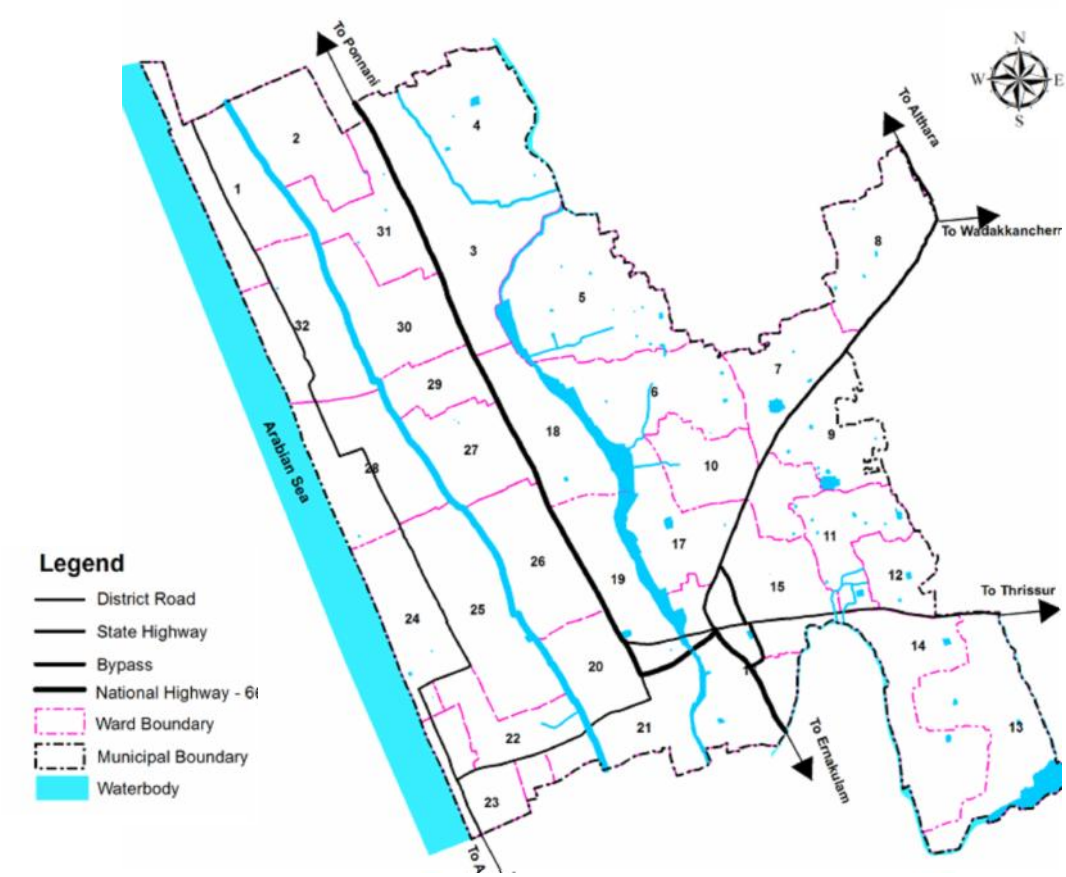


Fig.10.3 Ponds in Chavakkad

10.7 Problems and Potentials

Chavakkad town is having prime importance in Fisheries sectors due to presence of Natural sea, Canoli canal, Mathy kayal etc but it is not been exploited. Infrastructure facilities for fisheries are not properly used. Population density is high in Fishermen settlements and their per capita is less which has poor living Standards of people. One of the major problems is pollution of sea water from Fish landing centre and spreading of oil from boat .Large number of workers are from outside the town ad so their accommodation is a problem. There are high potentials for marine fisheries and fishing related industries.

10.8 Inference

From the analysis, it is found that the ample potential in fisheries is not exploited. The existing opportunities may be exploited to develop tourism fisheries with a participatory approach. By utilizing the available fisheries infrastructure and diversification of products and practices, this sector could be developed. Integrated fish farming and inland fishing through the development of existing ponds could be promoted. Great care is needed to prevent the pollution of water bodies and spread of fish diseases in order to support the common fisher folk depending on fishing. Preventive measures to be taken to check the pollution of sea water from landing center and spreading of oil from boat.

CHAPTER 11

TRAFFIC AND TRANSPORTATION

Transportation facilities available in a place determine the extent to which a town can grow in future. As the saying goes transportation network is the backbone for development. This chapter contains base line traffic and transportation data and analyses of Chavakkad town. Scientific data and the findings provided in this chapter will go a long way in improving the Traffic and Transportation system of the study region and also help in the formulation of future Development Plan for Chavakkad Town.

11.1 Introduction

Chavakkad has a well-connected road network. The National Highways, State Highways and Major district road all passes through Chavakkad. The National Highway passing through Chavakkad is NH 66.The State highways passing through Chavakkad are SH62 and SH 50.There are two major district roads passing through Chavakkad. Chavakkad Town center is the busiest location due to the intersection of NH, SH and Kanjani road (MDR) coupled with the presence of the bus stand. There is no railway line passing through Chavakkad Town. The nearest railway station to Chavakkad is Guruvayur railway station, 5 km away from Chavakkad Town.

11.2 Existing Road Network of Chavakkad Town

The road network of Chavakkad Town is shown in the fig 11.1.

i) National Highways

National Highway No.66 which connects Kanyakumari of Thamilnadu to Panvel of Goa passes through Chavakkad town. The south end is Orumanayur and north end is at Thiruvathra. This busy National Highway runs roughly north-south along the Western Coast of India, parallel to Western Ghats and connects Mumbai to Kochi, passing through the States of Maharashtra, Goa, Karnataka,Thamilnadu and Kerala. The NH 66 passes through central area of the town and has got a length of 6.2km within the Town. Bypass road of 0.70 km is connecting NH66 and SH50.South Bypass junction, Chavakkad junction, Mullathara junction, Manathala junction etc. are some of the major junctions enroute this corridor. The land use along this section is mostly residential taking a commercial nature while approaching the CBD of the town. The proposed bypass alignment by National Highway Authority of India can separate the intermixing of local traffic from through traffic. This new venture can also bypass the town center.

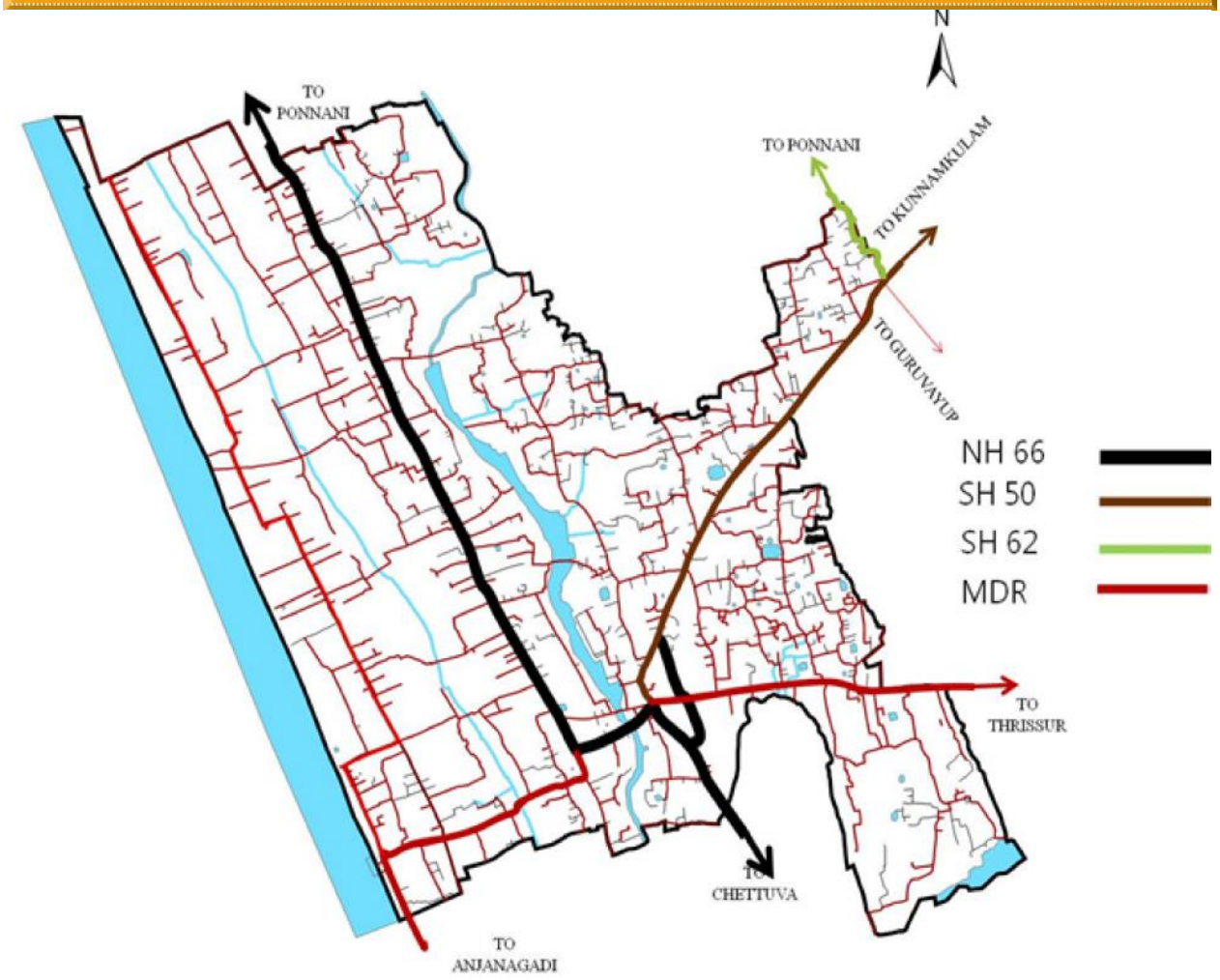


Fig.11.1 Road network of Chavakkad town

ii) State Highways

Two major regional roads that pass through Chavakkad Town are State highways SH 62 and SH 50. The SH50 (Chavakkad – Wadakkanchery) passes through the CBD area of Chavakkad. It has a length of 2.90 km and has carriageway width between 5.5 and 7m. It is a radial road which starts from the central area of the Chavakkad Town and serve as sub arterial road. Guruvayur-Ponnani (State Highway No. 62) road is touching the north-eastern boundary of the town for a length of 0.8km.

iii) Major District Roads

Chavakkad town has two major district roads which connect Chavakkad to other parts of the district. Chavakkad - Kanjani road is one of the major roads in the town, which starts at Town center and leaves the town at Angadithazham junction. It has a length of 2.4 km. Other major road in the town is Chavakkad – Munakkakadavu Road with a length of 2 km. It starts from Chavakkad and ends in Blangad Beach junction. Apart from these major roads there are a

number of municipal roads which connect the various parts to the main roads.Baby road which is running parallel to sea and which starts from Blangad Beach junction and ends at Thiruvathra is an important road of town.

11.3 Bus Routes of Chavakkad Town

Chavakkad town is well connected to Thrissur, the district headquarters, as well as to Kodungallur, Kunnamkulam and Guruvayur, the important urban settlements in the district. Transportation in the town is through private buses as well as KSRTC buses. The major bus routes in the area are National Highway, two State Highways and Major District roads. There are buses plying between Thrissur, Kodungallur, Kunnamkulam, Guruvayur, Ponnani directions in every 15 minutes.

Buses ply in every 30 minutes through Chavakkad– Munakkakadavu route via beach and Chavakkad – Edakkazhiyur route via beach. There are bus routes towards punna, even though the frequency is less. A bus route map of the town is shown in figure 11.2. Apart from the above there are many local roads that connect each and every corner of the town. Majority of the roads are motorable and have conveyance facility. According to the analysis of node hierarchy Chavakkad has two kinds of nodes namely 1st and 3rdorder. Concentration of 3 rd order nodes in mid & eastern regions of the municipality. 2 nd order node (Bus stand Jn.) seems to be merged with I st order node. Connectivity increases the potential for future development.

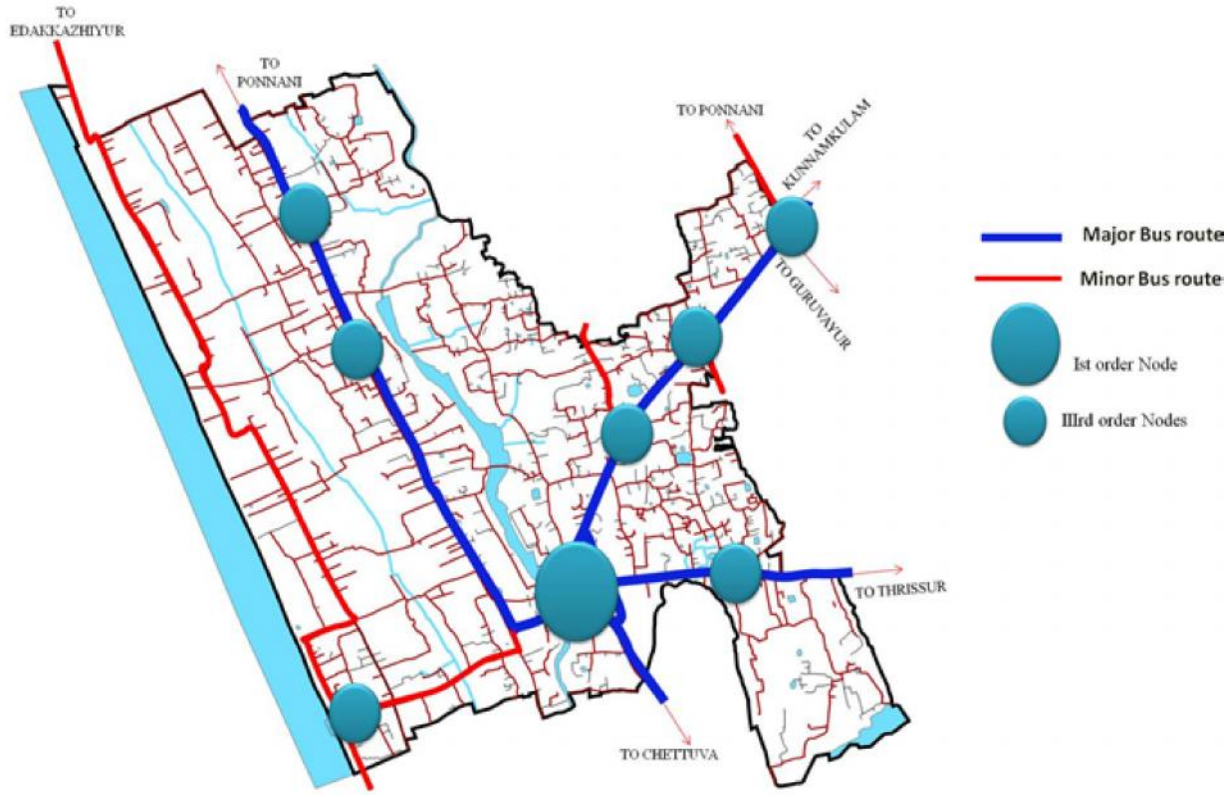


Fig.11.2 Bus routes and nodes in Chavakkad Town

11.4 Traffic Surveys

The existing traffic characteristics in Chavakkad town area were studied to identify the main problems and potentials here. To compile necessary inputs for the study, various primary surveys are conducted in the study area. Surveys carried out are as follows. Fig 11.3 shows survey locations.

- Road inventory survey
- Speed and Delay Survey
- Link Volume survey
- Turning movements at intersections.
- Parking Survey
- Pedestrian Survey
- Origin-Destination Survey

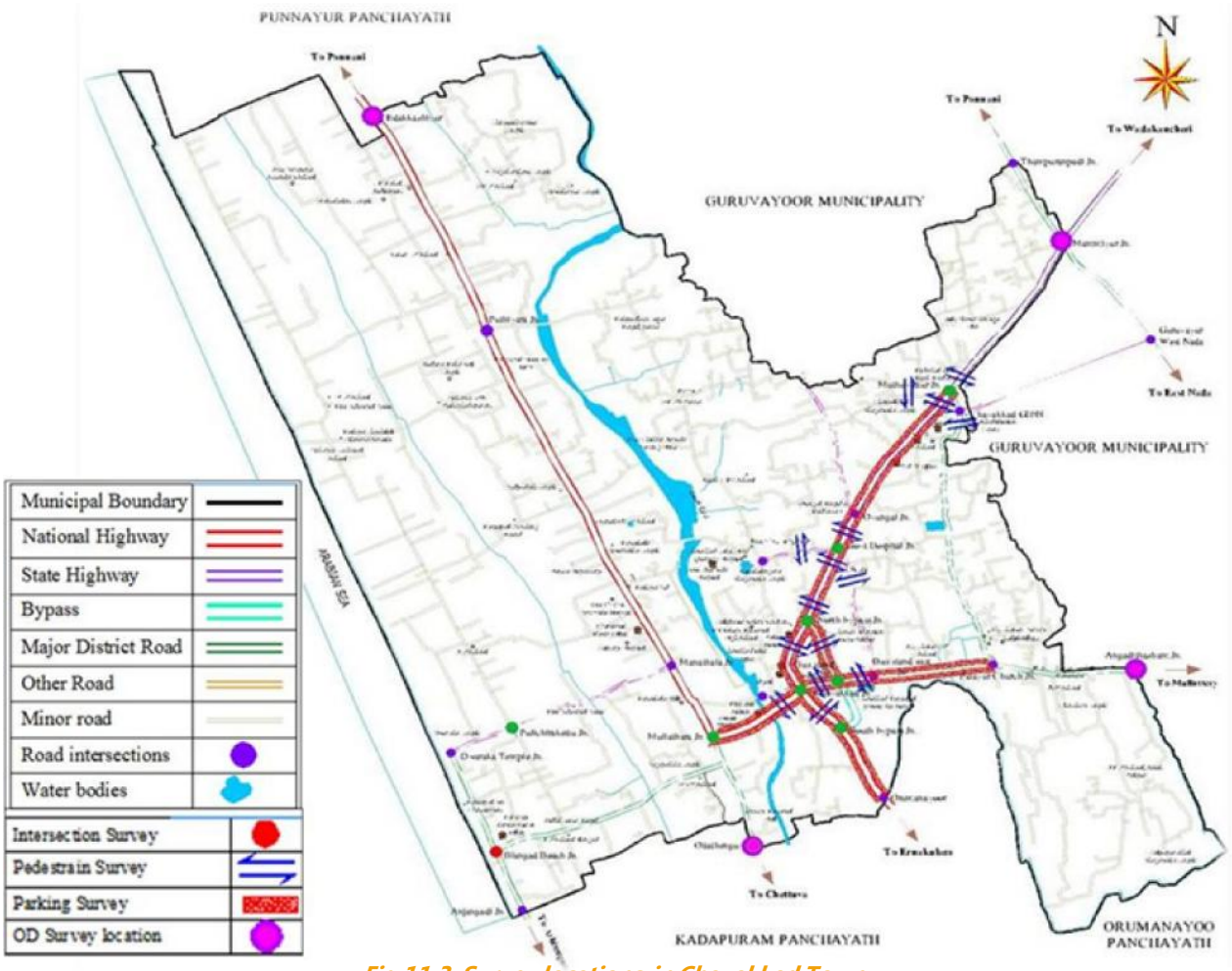


Fig.11.3. Survey locations in Chavakkad Town

11.5 Base year traffic characteristics

The secondary and primary data collected from various sources were analyzed systematically and the base year traffic characteristics are reported in this section.

11.5.1. Road inventory

NH 66 passing through the central area divides the town into two parts, and functions as arterial road to the town. Two radial roads namely Chavakkad-Kunnamkulam road(SH50) and Chavakkad-Thrissur road branch off from the central area of Chavakkad town and serve as sub-arterial roads. Other important roads in the town are; the road to Guruvayur from Muthuvattoor, bypass connecting NH 66 and Kunnamkulam road, Chavakkad Beach road and Chavakkad-Chettuva road.

National Highway No. 66 traverses in north-south direction having a length of 6.2 Kms within the town. Carriageway width of NH varies from 6.0 to 9.0 meters. Chavakkad-Kunnamkulam road (2.9 km) has carriageway width between 5.5 and 7m.The road to Thrissur via Chavakkad bus stand and Palayur church has a width of 6m and 2.4 km of this road lies within in the town. Guruvayur-Ponnani (State Highway No. 62) road which is almost 0.8 km within the town.

The other roads in the town are:

(i) Bypass road – 0.7km

(ii) Beach road – 1.5km

(iii) Baby road & Munnakkakadavu road – 2.0km

These roads all together have a length of 4.2km with the carriageway width varying from 3.0 to 7.0 metre.

11.5.2 Speed and delay characteristics

As part of the study, speed and delay survey was carried out on 10.7 Kms of road stretches within the Chavakkad town. The road sections identified include: parts of National Highways, State Highways, and Thrissur road. The speed and delay characteristics of major roads are given in Table 11.1.

11.5.2.1 Average journey speed

On NH66 towards Ponnani, the average journey speed varied from 15 kmph between Chavakkad Centre and Manathala Jn and to about 43 kmph in the rest of the road stretches. On the NH towards Ernakulam side, the average speed was about 26kmph. On Kunnamkulam road, the average speed was 31kmph with the maximum speed of 40 kmph recorded between Ovungal and Court complex. On Thrissur road, 28kmph was the average journey speed and the lowest of 16kmph was observed between Chavakkad centre and Bus stand. The details are shown in figure 11.4. The road stretch having maximum delay is identified to be Muthuvattoor to Mammiyoor and Chavakkad centre to bus stand.

Table 11.1 Speed and delay characteristics of major road sections in Chavakkad town

Sl. No.	Name of Road and homogeneous section	Length (Km.)	Travel time (Sec)	Delay (sec)	Delay cause	Speed (km/hr)	
						With delay	without delay
	I. Edappally-Panavel road (NH 66)						
1	Baby Beach road to Edakkazhiyur	0.60	49.22			43.89	43.89
2	Edakkazhiyur to Vishwanatha temple	2.70	223.88			43.42	43.42
3	Vishwanatha Temple to Manathala	1.30	108.77			43.03	43.03
4	Manathala to Chavakkad Centre	0.50	118.83	3.42	Narrow bridge	15.15	15.60
5	Chavakkad Centre to North Bypass Jn	0.30	40.75			26.50	26.50
6	North Bypass Jn to south border	0.50	65.23			27.60	27.60
	II. Chavakkad - Kunnamkulam road (SH 50)						
7	Chavakkad to North Bypass Jn	0.50	69.22	3.37	Inadequate road width	26.00	27.33
8	North Bypass Jn to Hospital Jn	0.40	48.47			29.71	29.71
9	Hospital Jn to OvungalJn	0.20	24.79			29.04	29.04
10	OvungalJn to Court Complex	0.30	28.57	2.00	Pedestrians	37.80	40.65
11	Court complex to Muthuvattoor	0.50	59.97	3.00	Parking & pedestrian	30.02	31.60
11	Muthuvattoor to Mammiyoor	1.10	150.95	11.69	Pedestrians	26.23	28.64
	III. Thrissur/ Kanjani road						
13	Chavakkad centre to Bus Stand	0.20	50.69	7.99	Parking & pedestrian	14.20	16.86
14	Bus stand to Palayur church	0.90	100.85			32.13	32.13
15	Palayur church to Border	0.70	79.67	4.71	Inadequate road width	31.63	33.62

11.5.2.2 Causes of delay

By analysis of the causes of delay it is revealed that Kunnamkulam road witnessed the maximum delay of six percent of journey time, followed by five per cent delay on Thrissur road. Major causes of the delay are the inadequate capacity of roads caused by the commercial activities at Kunnamkulam road and Thrissur road and narrow bridge on Ponnani road.

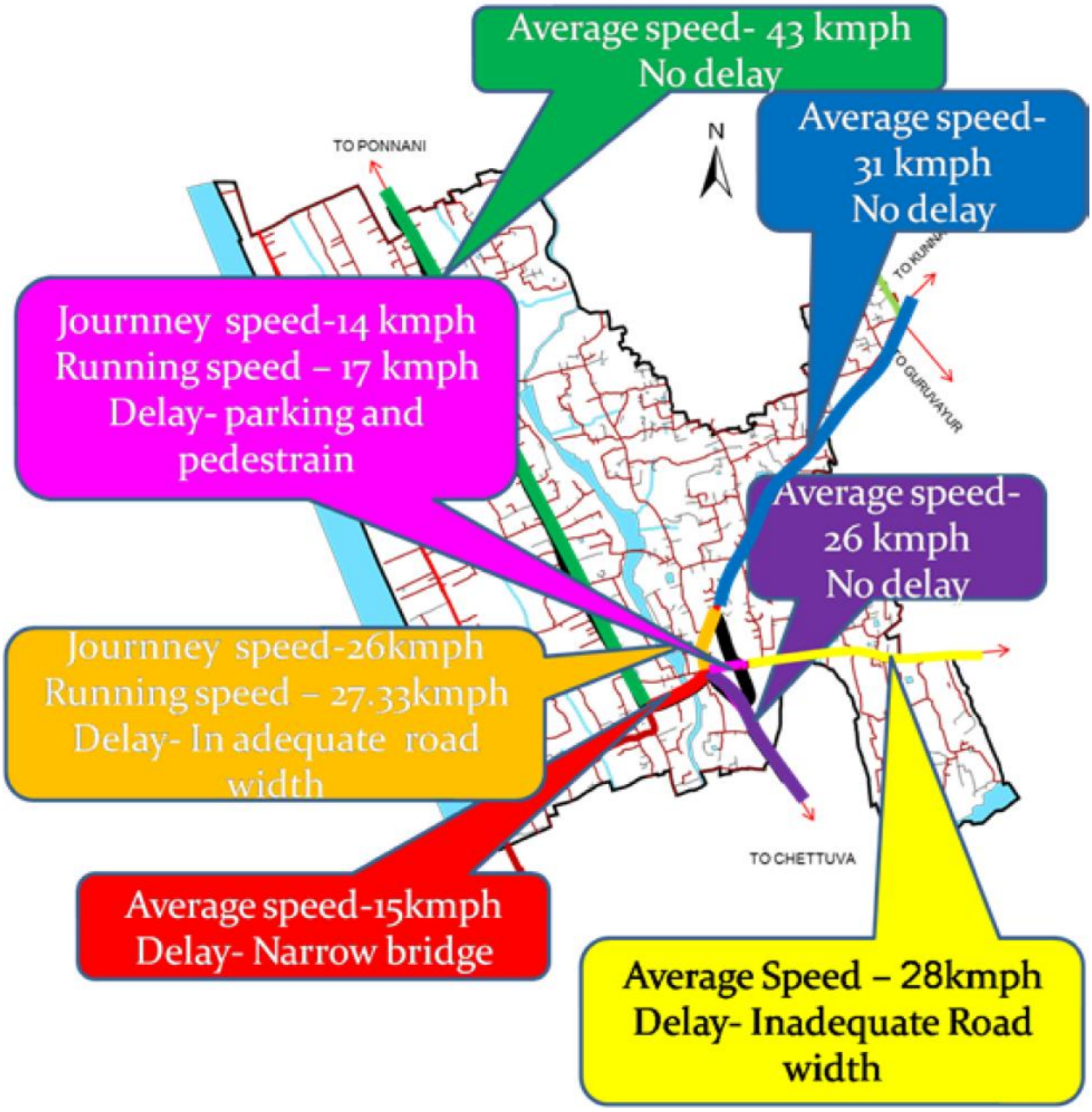


Fig. 11.4 Speed and delay characteristics of various roads

11.5.3 Traffic volume at major intersections

Turning movement of vehicles was conducted at 10 major intersections in Chavakkad town to ascertain the peak hour demands. A consolidated table showing traffic at the 10 major intersections are given in Table 11.2.It has been observed that Mammiyoor Junction witnessed the maximum peak hour traffic flow of 3,551 PCU, followed by 2,718 PCU at Bus stand Junction, 2,484 PCU at Chavakkad main junctions and 2,293 PCU at Manathala Junction and 2,072 PCU at North bypass Junction. Hospital Junction and Mullathara Junction on Kunnamkulam road recorded peak hour traffic of 1,500 to 1,900 PCU. Other junctions namely South Bypass, Baby beach center and Blangad beach had traffic volume below 1,000 PCU. Thus the maximum peak hour volume is along the Mammiyoor and Bus stand Jn. stretches of roads.

Table 11.2 Peak hour traffic flow observed at major intersections in Chavakkad town

Sl. No.	Name of intersection	No. of arms	Peak hour traffic (PCU)	Peak hour
1	South Bypass Jn	3	955	05.15 pm to 06.15 pm
2	Chavakkad Centre	4	2,484	10.00 am to 11.00 am
3	Mullathara	3	2,293	03.15 pm to 04.15 pm
4	North Bypass Jn	3	2,072	05.00 pm to 06.00 pm
5	Hospital Jn.	4	1,846	10.14 pm to 11.45 pm
6	Muthuvattoor	3	1,592	08.30 am to 09.30 am
7	Mammiyoor	4	3,551	08.15 am to 09.15 am
8	Bus Stand Jn.	4	2,728	04.15 pm to 05.15 pm
9	Baby Beach Centre	4	220	10.30 am to 11.30 am
10	Blangad Beach Jn.	3	675	05.45 pm to 06.45 pm

Source: Traffic survey, Dec 2013

11.5.4 Traffic volume and capacity utilization

11.5.4.1 Link volume

Data pertaining to traffic volume and its composition was collected for all major road links in Chavakkad town through traffic volume survey. Traffic data collected from the field was converted into a 'Passenger Car Units (PCU)' using conversion factors recommended by Indian Road Congress; New Delhi.Figure 11.5 shows traffic density on major roads in Chavakkad town. Table 11.3 shows the PCU of various roads in Chavakkad town.

Table 11.3 Details of PCU in various roads in the town

Sl no	Road	Volume (PCU/day)
1	NH 66	7067-20998
2	SH 50	17666-25011
3	Thrissur road	15665-26676
4	Bypass road	11233-14064
5	SH 62	4462
6	Chettuva Road	8756

Source: Traffic survey, Dec 2013

1. On the National Highway NH 66 within Chavakkad town, the daily traffic volume varied from 7,067 PCU at Chavakkad centre-South Bypass section, to a maximum of 20,998 PCU at Chavakkad Centre-Mullathara section
2. On the Kunnamkulam road, the traffic volume varied between17,666and 25,011 PCU among its various homogenous sections.
3. On the Thrissur road, the highest traffic volume of 26,676 PCU was observed between East and West sides of Bus stand, followed by 15,665 PCU between Chavakkad centre and Bus stand West Jn.

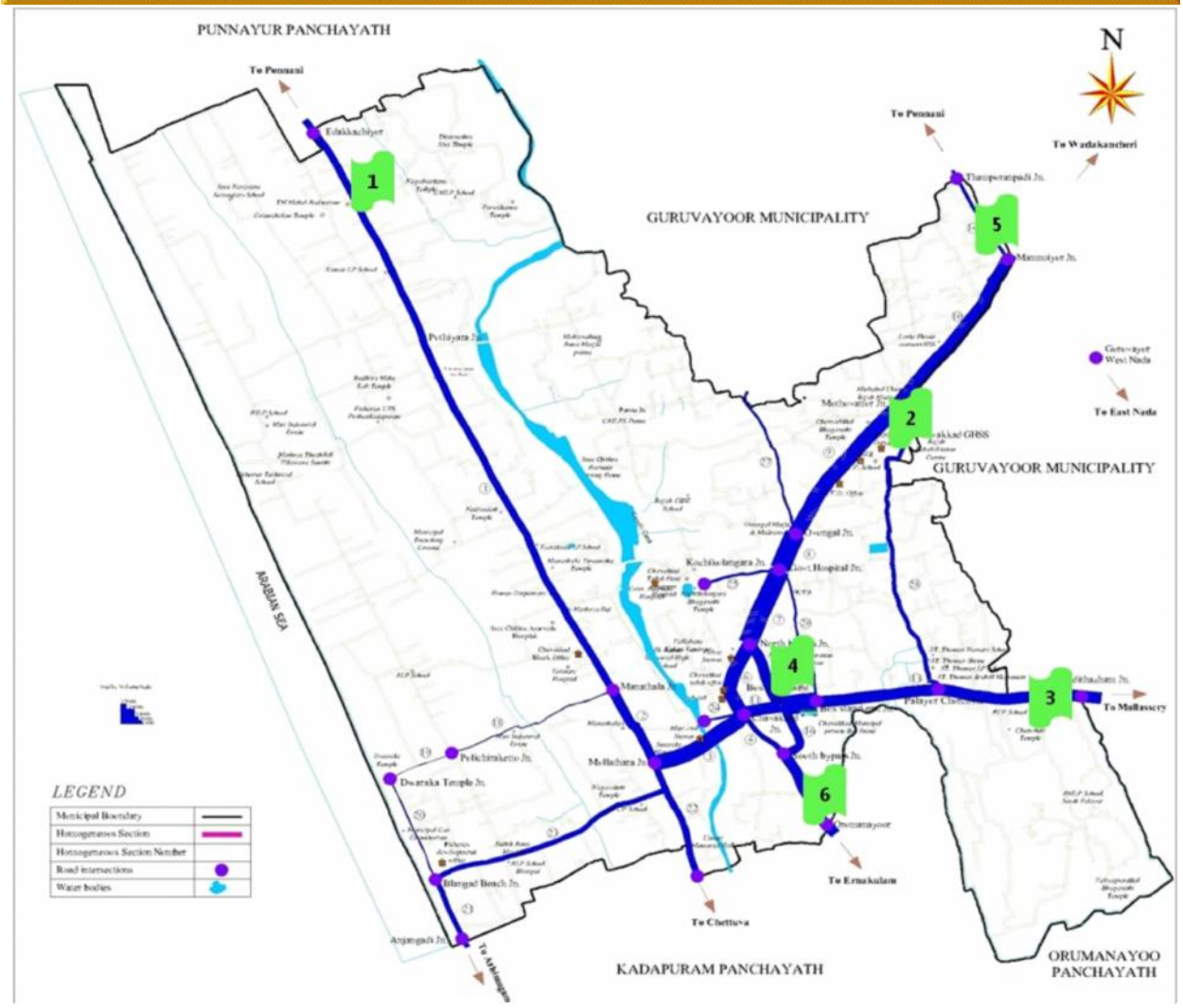


Fig. 11.5 Traffic density on major roads in Chavakkad

4. On the bypass road connecting Kunnamkulam road, Thrissur road and Ernakulam road, the traffic volume ranged between 11,233 to 14,064 PCU.
5. The road section between Mammiyoor to Althara (border 0 of SH 62, had a traffic volume of 4462 PCU.
6. Chettuva road, between town and border had a traffic volume of 8,756 PCU .

The rest of other minor roads in the town had traffic below 7,000 PCU. The volume of traffic is formed to be the highest along Thrissur road between East and West sides of Bus stand.

11.5.4.2 Capacity utilization

Capacity utilization of the road stretches is measured by volume-by-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 road inventory details 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, proximity of junctions, parking, lateral clearance, shoulder, surface condition etc.

The volume capacity ratio of major roads is given in Table 11.4 . It is observed that the homogeneous sections on Kunnamkulam road as well as on Thrissur road carry traffic volume exceeding their carrying capacity. The NH stretch between Chavakkad and Mullathara centre carried traffic 1.4 times the capacity, while the traffic volume on the southern portion of NH is nearing the capacity. On the bypass road, carrying capacity of the south portion is saturated at present while the north portion is nearing the saturation level. Apart from the above, the traffic volume is nearing the capacity in the Chettuva road with V/C ratio of 0.97.In the rest of the road stretches, the existing traffic volume was found to be below their carrying capacity. The road stretches with critical V/C ratio (>1) are bus stand west Jn. to bus stand east Jn., Hospital Jn.– Ovungal, North Bypass Jn. - Hospital Jn., Mullathara - Chavakkad Centre, Chavakkad Centre - North Bypass Jn., Ovungal – Muthuvattoor, Muthuvattoor - Mammiyoor Jn (Border), Chavakkad Centre - Bus Stand West Jn., Bus stand East Jn. - Angadithazham (Border), Bus Stand Jn. (W) to North bypass.

Table 11.4 Capacity of major road sections in Chavakkad Town

SL No.	Name of Road and homogeneous section	Capacity (PCU)	Volume (PCU)	Volume capacity ratio
	I. Edappally-Panavel road (NH 66)			
1	Edakkazhiyur (Border) - Manathala	15,000	9,483	0.63
2	Manathala - Mullathara	15,000	11,548	0.84
3	Mullathara - Chavakkad Centre	15,000	20,998	1.4
4	Chavakkad Centre - South Bye pass Jn	15,000	7,067	0.47
5	South Bye Pass Jn- Orumanayur (Border)	15,000	14,233	0.95
	II. Chavakkad - Kunnamkulam road (SH 50)			
6	Chavakkad Centre - North Bypass Jn	15,000	18,228	1.22
7	North Bypass Jn - Hospital Jn	15,000	24,884	1.66
8	Hospital Jn - Ovungal	15,000	25,011	1.67
9	Ovungal - Muthuvattoor	15,000	19,909	1.33
10	Muthuvattoor - Mammiyoor Jn (Border)	15,000	17,666	1.18
	III. Thrissur/ Kanjani road			
11	Chavakkad Centre - Bus Stand West Jn	11,000	16,290	1.36
11	Bus stand West Jn - Bus stand East Jn	11,000	26,676	2.22
13	Bus stand East Jn - Angadithazham (Border)	11,000	15,665	1.31

	Ⅳ. Guruvayur-Ponnani road (SH 62)			
14	Mammiyoor Jn - Thampuranpadi (Border)	11,000	4,462	0.37
	Ⅳ. Guruvayur Road			
15	Muthuvattoor - Chavakkad GHSS	11,000	10,009	0.83
	V. Bypass road			
16	South Bye Pass Jn- Bus Stand Jn (W)	11,000	11,233	0.94
17	Bus Stand Jn (W) to North bypass	11,000	14,064	1.17
	VI. Baby road and Munnakkakadavu road			
18	Manathala (NH) - Pulichirakettu	9,000	1,559	0.17
19	Pulichirakettu - Dwaraka Temple	9,000	1,244	0.14
20	Dwaraka Temple - Blangad Beach	9,000	2,054	0.23
21	Blangad Beach - Anjangadi (border)	9,000	7,032	0.78
	VII. Manathala - Chettuva road			
22	Manathala - Chettuva Road (Border)	9,000	8,756	0.97
	VIII. Beach road			
23	Blangad Beach - Manathala	9,000	7,004	0.78
	IX. Other major roads			
24	Rice Bazaar road	9,000	3,366	0.37
25	Hospital Jn - Taluk Hospital	9,000	3,655	0.41
26	Hospital Jn - Bus Stand Jn(E)	9,000	3,030	0.34
27	Perakom Road from Ovungal - Mallad (border)	9,000	3,368	0.37
28	Chavakkad GHSS - Palayur	9,000	5,771	0.64

11.6 Parking characteristics

Parking surveys were carried out on major road sections of Chavakkad town to obtain the peak parking accumulations and parking duration of vehicles

11.6.1 Parking accumulation

The parking activities in Chavakkad are concentrated on Ponnani road with a parking accumulation of 252 vehicles at a time, 158 ofthem being two wheelers. Other than the bus stand area, Kunnamkulam road between Main Jn and Muthuvattoor 113 vehicles are parked, half of them being two wheelers; the bypass between Kunnamkulam road and Thrissur road also had parking

activities with 82 vehicles during the morning peak time. Thrissur road also had high parking activity with 75 vehicles. Ernakulam road had relatively less parking activity. Table 11.5 and Figure 11.6 shows summary of parking accumulation observed on major roads in Chavakkad town.

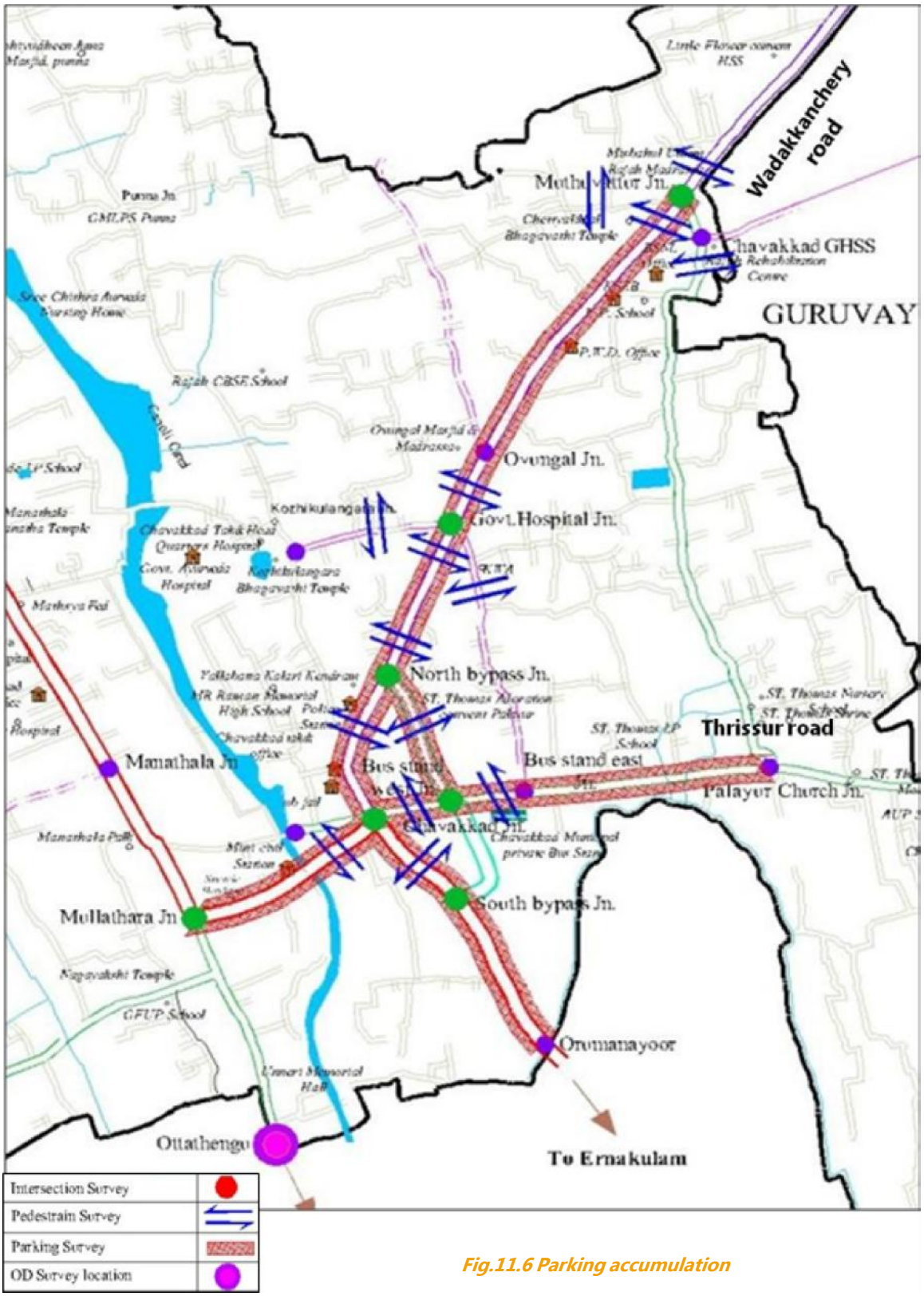


Fig.11.6 Parking accumulation

Table 11.5 Parking accumulation at different road sections in Chavakkad town

Sl. No.	Road section	Peak parking time	Type of vehicles								Total (No of vehicles)
			Bus	Mini Bus	Car	Pass auto	Two-Wheeler	Truck	Mini Truck	Goods auto	
1	**Thrissur road:** Chavakkad to Bus stand	10.00 AM	0	0	5	5	35	0	0	1	**46**
2	**Thrissur road:** Bus stand to Palayur	11.00 AM	0	0	1	3	21	0	2	2	**29**
3	**Ernakulam road:** Chavakkad to South Bypass Jn	10.30 AM	0	0	9	4	15	0	0	1	**29**
4	**Ernakulam road:** South Bypass to Orumanayur	09.30 AM	0	0	4	1	17	0	0	3	**25**
5	**Ponnani road:** Chavakkad to Ponnani Road	10.00 AM	0	0	52	35	158	0	4	3	**252**
6	**Kunnamkulam road:** Chavakkad to North Bypass	11.30 AM	0	0	11	10	31	3	0	3	**59**
7	**Kunnamkulam road:** North Bypass to Ovungal	09.30 AM	0	0	9	6	15	0	0	0	**30**
8	**Kunnamkulam road:** Ovungal to Muthuvattoor	09.00 AM	0	0	10	3	19	0	1	1	**34**
9	**Bypass:** Bus Stand to North bypass	09.30 AM	0	0	35	3	41	3	0	0	**82**

Source: Traffic survey, Dec 2013

11.6.2 Duration of parking

Majority of the vehicles parked on NH were found to be for short duration (less than 30 minutes), about 49-84% of the vehicles along selected road corridors were found to be parked for duration less than 30 minutes. About 16% of these vehicles were parked for a period ranging between 30 minutes and one hour. 11% of vehicles in all were parked for duration of more than an hour. Duration of parking of vehicles on selected parking road corridors of Chavakkad town is shown in Table 11.6

Table 11.6 Percentage of vehicles parked on various road stretches according to parking duration in Chavakkad Town

Sl. No.	Vehicle type	Duration (Minutes)							Total
		<30	30-60	60-90	90-110	110-150	150-180	>180	
1	**Thrissur road:** Chavakkad to Bus stand	75	14	2	1	1	2	5	100
2	**Thrissur road:** Bus stand to Palayur	78	14	3	3	1	1	-	100
3	**Ernakulam road:** Chavakkad to South Bypass Jn	75	20	4	1	-	-	-	100
4	**Ernakulam road:** South Bypass to Orumanayur	67	21	3	8	1	-	-	100
5	**Ponnani road:** Chavakkad to Ponnani Road	80	7	9	4	-	-	-	100
6	**Kunnamkulam road:** Chavakkad to North Bypass	64	20	3	4	4	5	-	100
7	**Kunnamkulam road:** North Bypass to Ovungal	81	11	4	3	-	-	-	100
8	**Kunnamkulam road:**Ovungal to Muthuvattoor	69	18	13	-	-	-	-	100
9	**Bypass:** Bus Stand to North bypass	49	34	5	5	3	4	-	100
	Total	**72**	**16**	**6**	**3**	**1**	**1**	**1**	**100**

Source: Traffic survey, Dec 2013

11.7 Pedestrian volume

Pedestrian movements were observed on all the arms of Chavakkad centre, Municipal office, North bypass, Hospital, Muthuvattur, Little flower and Bus stand junctions. Accordingly, pedestrian survey was carried out at these locations. An analysis of the pedestrian cross movements at these locations revealed that a high volume of pedestrian cross walk of 1,405 persons were recorded around Bus stand Jn during peak hour. It was followed by 1,113 cross walk movements at Muthuvattoor Jn and 988 Pedestrians at Chavakkad central area. Peak hour pedestrian cross walks observed at major locations in Chavakkad town is presented in Table 11.7

11.8 Accident statistics

Accident data compiled from Chavakkad police station reveals that about 100 accidents were reported in a year on various roads within the station limits. Of these, two thirds were of grievous nature. Number of accidents reported during the last three years is shown in Table 11.8.

Table 11.7 Pedestrian Volume

Sl. No	Name of location	Peak time	No. of pedestrians		
			Up	Down	Total
1	Chavakkad Centre	10.15 to 11.30	453	535	988
2	Kunnamkulam road: In front of Municipal Office	12.00 to 13.00	130	80	210
3	North Bypass Jn	9.15 to 10.00	594	110	704
4	Hospital Junction-Kunnamkulam road	9.30 to 10.30	117	88	205
5	MuthuvattoorJn	16.15 to 17.00	555	568	1123
6	Kunnamkulam road: In front of Little Flower School	15.45 to 16.45	80	273	353
7	Bus Stand Junction	16.45 to 17.45	853	552	1406

Source: Traffic survey, Dec 2013

Table 11.8 Accident reported in Chavakkad police station limits

Table Year	Number of accidents reported			
	Simple	Grievous	Fatal	Total
2010	23	83	10	116
2011	23	82	10	115
2011	17	66	8	91

Source: Chavakkad Police station

The accident prone locations in Chavakkad town are identified and are given below;

(i) Edakkazhiyur

(ii) Mullathara Junction

(iii) Orumanayur Junction

11.9 Characteristics of Inter-city passengers

11.9.1 Travel characteristics

The inter-city passenger transport in Chavakkad is predominantly met by KSRTC buses, private buses, mini-buses, and a host of personalized vehicles like four-wheelers, two-wheelers etc. An analysis of the O-D survey data collected from outer cordon survey location revealed that an estimated 1.68 lakh inter-city passenger trips were performed in the study region on a reference day consisting of 83,678 bus passengers (50%), 36,021 car users (2 %), 31,277 two-wheeler trips (19%), and 17,460 auto trips (10%). It has been found that public transport buses had a significant role in meeting the inter-city passenger demand. Table 11.9 and Figure 11.7 give the modal split of inter-city passenger traffic in Chavakkad town.

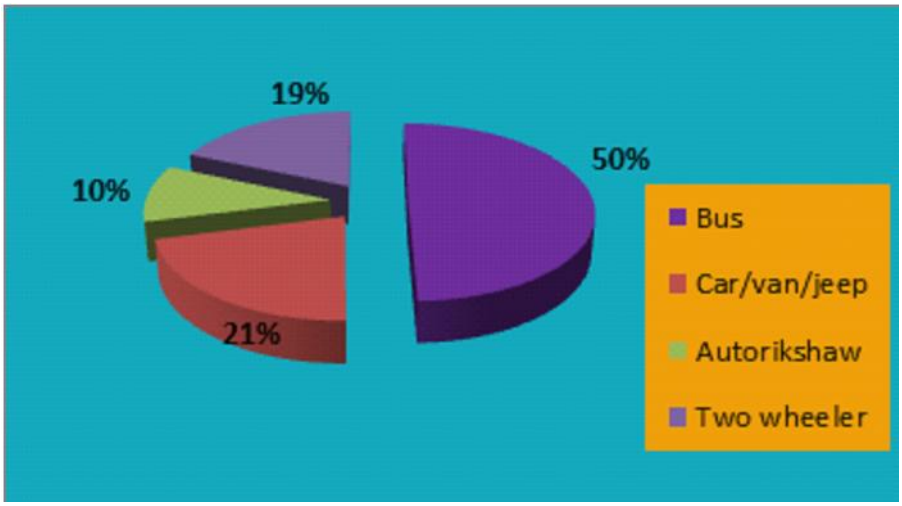


Fig. 11.7 Modal split of inter-city passenger traffic

Table 11.9 Modal split of inter-city passenger trips in Chavakkad town

Sl. No.	Mode of travel	No. of passengers/day	% of passengers
1	Bus	83,680	49.68
2	Car/ van/ jeep	36,021	21.38
3	Autorikshaw	17,460	10.37
4	Two wheeler	31,281	18.57
	Total	1,68,442	100.00

Characteristics of passenger trips according to purpose of trips were analyzed and it was found that more than a quarter of total trips were carried out for social purposes, followed by 24 per cent business trips and 20 per cent work trips. This implies that the town is predominantly trade and business centre in the region. Purpose wise distribution of inter-city passenger is given in Table 11.10.

Table 11.10 Distribution of inter-city passengers according to purpose of trip

Sl.No.	Purpose of trip	No. of passengers/ day	Percent of passengers
1	Work	31,079	18.45
2	Part of work	3,350	1.99
3	Personal business	41,561	24.67
4	Shopping	7,962	4.73
5	Recreation	783	0.46
6	Social	45,235	26.85
7	Education	6,686	3.97
8	Medical	11,854	7.63
9	Others	18,933	11.24
	Total	**1,68,442**	**100.00**

11.9.2 Origin-destination of passenger trips

A total of 168,442 passenger trips were performed as inter-city trips in the study region on a reference day. The major traffic generating zone within the study region is the Town area with 51,215 trips while other zones had very little generation of trips. Desire lines of inter-city passenger movements in Chavakkad town are given in Figure 11.8.In the case of outside study region but within Thrissur district, Thrissur district towards Kunnamkulam had generated about 28,000 trips, followed by Thrissur side with 25,000 trips, Ponnani side with 19,000 trips each and Kodungallur side had generated the least trips of 13,000. About 15,000 inter-city trips were originated from other districts to the State.

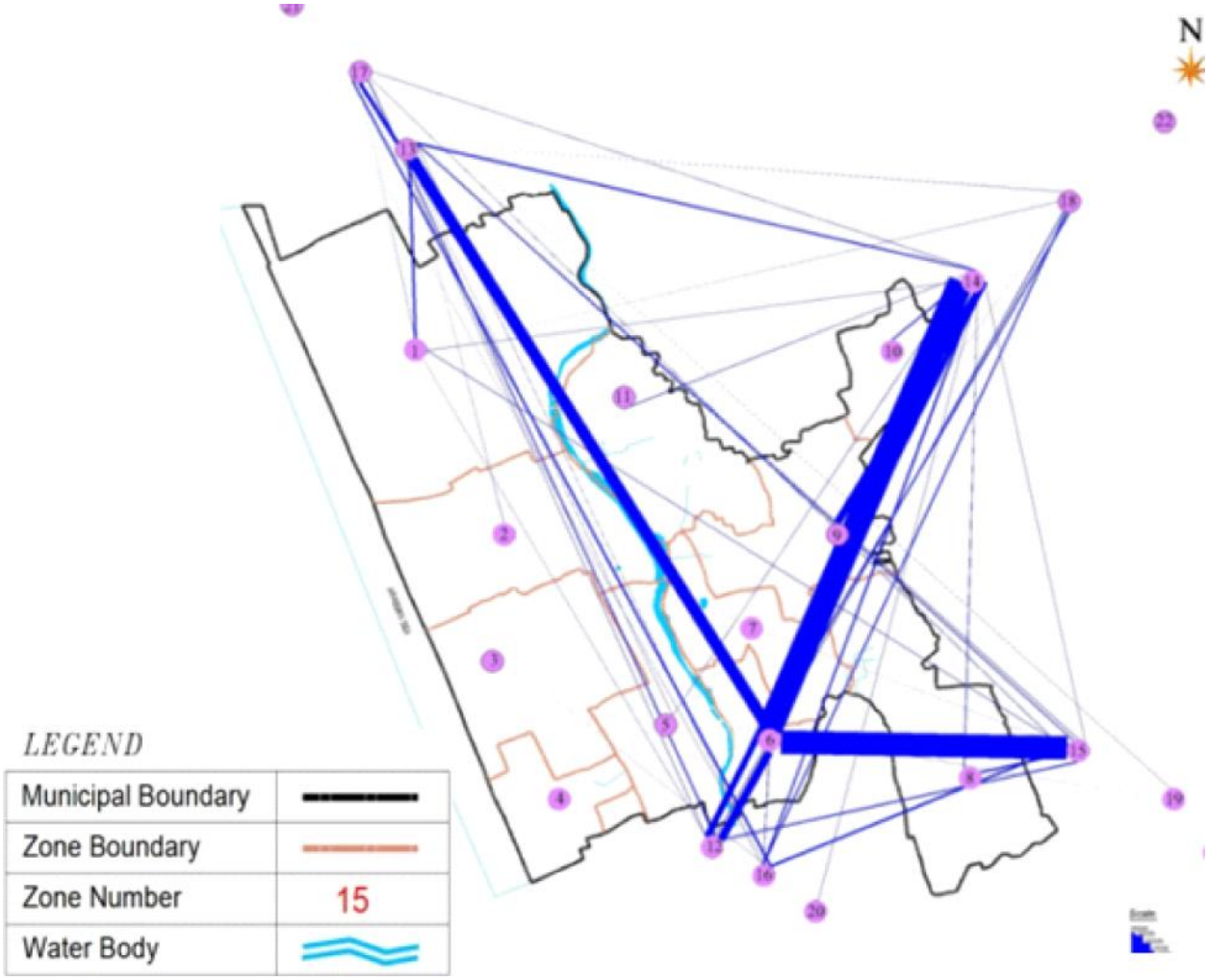


Fig.11.8 Desire lines of inter-city passenger movements

11.10 Inter-city goods transportation

Intercity goods transportation characteristic was arrived at by conducting classified volume counts and road side interview of goods vehicles at outer cordon points. Analysis of data, shows the following findings

11.10.1 Volume of inter-city goods vehicles

Maximum number of 1,716 goods vehicles passes through Mammiyoor on Kunnamkulam road which comprised 803 trucks, 419 mini-trucks and 493 goods auto. This was closely followed by 1,667 goods carriers passing through Ottathengu point on Ernakulam road which comprised 916 trucks, 596 mini-trucks and 155 goods autos. At Angadithazham point on Thrissur road, a total of 1,228 goods vehicles were observed on the reference day, comprising of280 trucks, 521 mini-trucks and 426 goods autos. As low as 909 goods vehicles passed through Edakkazhiyur point on Ponnani road. Figure 11.9 shows the characteristics of inter town goods traffic.

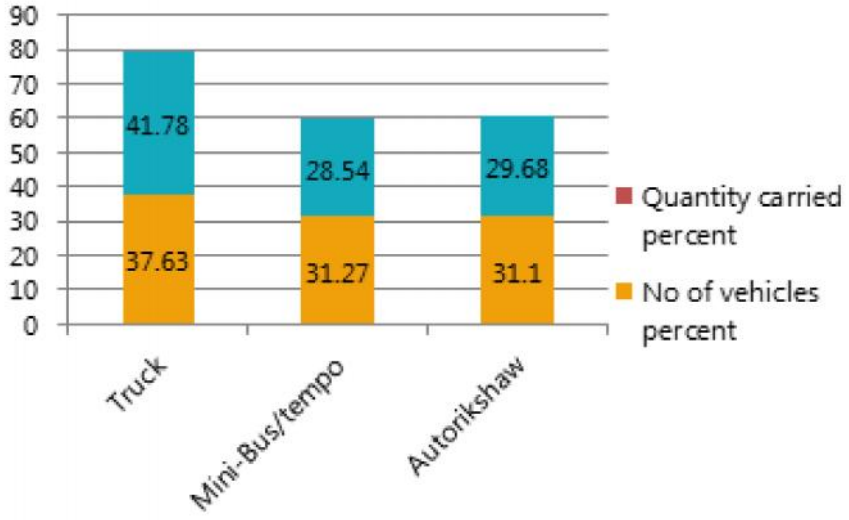


Fig.11.9 Characteristics of inter town goods traffic

11.10.2 Type of goods carriers and quantum of commodities

A total of 5,403 goods carriers transported goods traffic to and from the study region, consisting of 2,033 trucks, 1,690 mini-trucks and 1,681 goods autos. The quantum of goods carried by these vehicles was to the tune of 6,476 tonnes per day. Trucks carried the maximum goods traffic (42%), followed by goods auto (30%) and mini-trucks (29%). Table 11.11 shows the distribution of goods vehicles and the quantity of goods transported in Chavakkad

Table.11.11 Distribution of inter-city goods vehicles and the quantum of goods transported in Chavakkad town

Sl. No.	Mode of travel	No. of vehicles		Quantity carried	
		No.	Per cent	Tons	Per cent
1	Truck	2,033	37.63	2,706	41.78
2	Mini-bus/ tempo	1,690	31.27	1,848	28.54
3	Autorikshaw	1,681	31.10	1,922	29.68
	Total	**5,403**	100.00	**6,476**	100.00

11.10.3 Composition of goods traffic

Out of the 6,476 MT of inter-city goods traffic entering/exiting the study region, nearly 33% were construction materials followed by 25% consisting of agricultural products, 19% of industrial goods, 8 percent of petroleumproducts, 6 percent of food grains, and the other commodities accounting for 10%. In the case of individual commodities, the maximum volume of 713 MT was bricks and tiles (11 per cent), followed by 472 MT of sand clay (7%) and LPG with 334 MT (5 %).

11.10.4 O-D of inter-city goods

Out of 6,476 MT transported through the study region, the major traffic generator of goods traffic was town area itself, with 575 tonnes. Among the zones outside the study region but within Thrissur district, goods traffic bound for Kodungalloor recorded 1,034 tonnes, Kunnamkulam side 636 tonnes, and Ponnani side 484 tonnes. Other districts within the State together had accounted for 2,830 tonnes of goods traffic. A small proportion of 533 tonnes of goods traffic was transported to other States. Similarly in the case of goods traffic attraction, Chavakkad town had the dominant share with 510 tonnes. Among the external zones but within Thrissur district, Kodungalloor side has attracted 1,615 tonnes, followed by Kunnamkulam side with 340 tonnes and Ponnani side with 225 tonnes. All other districts together attracted 1,810 tonnes. Only 47 tonnes of goods traffic was terminated in other States. Desire line diagram of inter-city goods movements in Chavakkad town is given in Figure11.10.

11.11 Traffic Projection

The fundamental principle of urban transportation planning is to formulate a long-term transportation plan to cater to the needs of the community in the future. Thus it becomes necessary to forecast the future travel demand for the horizon year. Traffic projection helps in evaluating the shortfall in the road network and accordingly augments the facilities and plans the road network such as developing new roads, missing links, bypass road etc. This section discusses the different methods of traffic projections for this study.

11.11.1 Methods of traffic projection

Various methods of traffic projection employed in the transport planning include;

i) Growth factor method

ii) Regression analysis method based on economic indicators like population, per-capita vehicle ownership, income growth, growth rate in industrial sector and land use pattern

iii) Interpolation method based on past trend in traffic growth rates

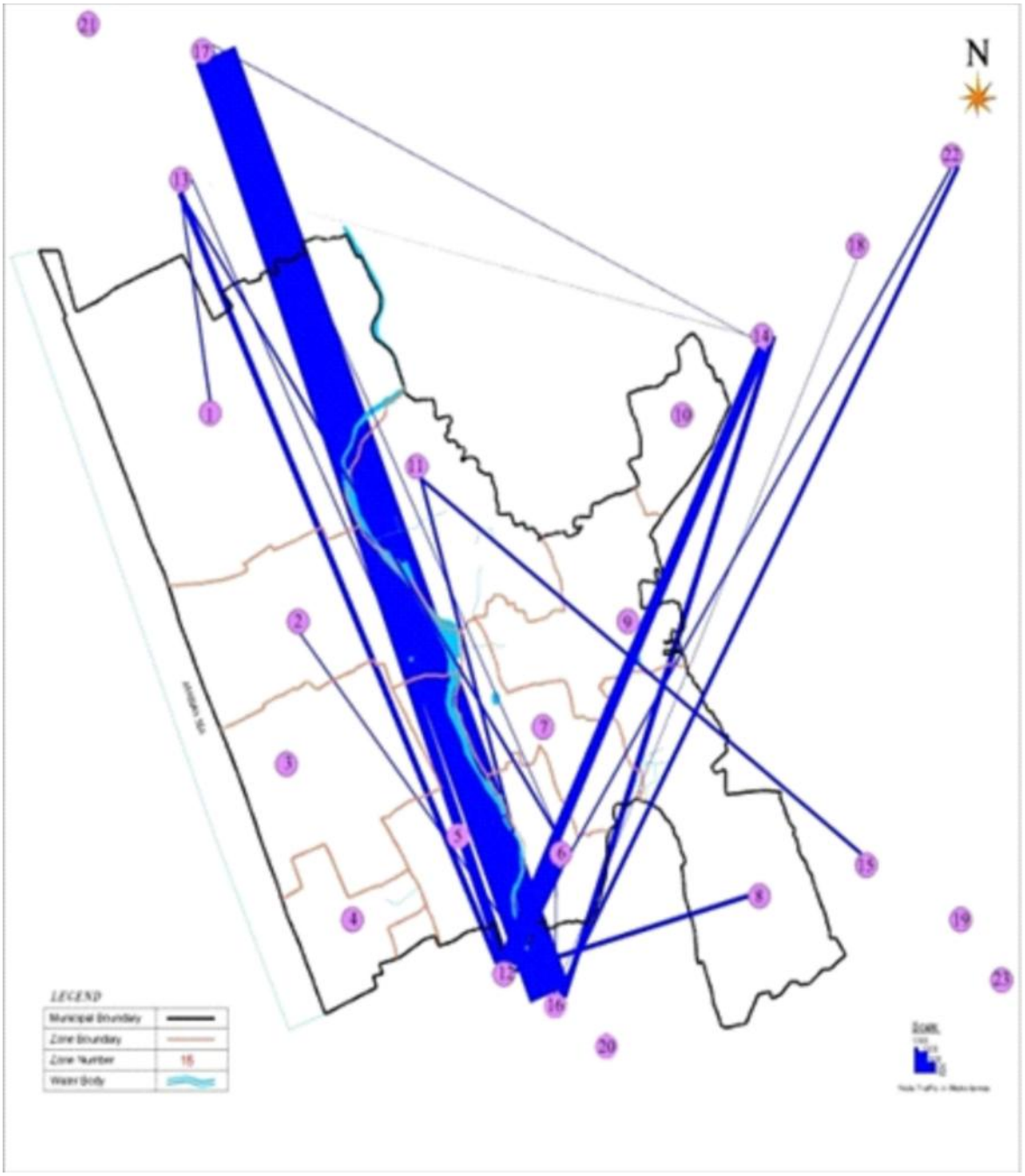


Fig 11.10.Desireline diagram of inter-city goods movements in Chavakkad town

The relationship established between the various economic indicators for passenger and goods traffic movement can be used to estimate the future demand in an area. Also the growth rate of vehicular population in the area over the years will give a good estimate of the future trips. The traffic volume on links from the past years can be used to establish a growth rate for prediction of the future volume on links.

11.11.2 Techniques adopted for projection

In the case of Chavakkad town, traffic projections were carried out according to the growth rates worked out on the following basis:

- Growth rate based on realistic estimates using influencing parameters
- Rates arrived based on studies conducted by NATPAC in different towns of similar size in Kerala in the past,
- Growth rate of vehicle population in Thrissur district over the years and
- Variation of AADT on major roads from biannual counts made by PWD periodically.

The growth rates estimated as per the above basis are shown in table 11.12

Table.11.12 Growth rates estimated as per the above basis

Methods	Annual growth rate (%)
Studies conducted by NATPAC in similar towns in Kerala in the past (traffic growth)	3 to 6
Growth rate of motor vehicles registration in Thrissur district during 2005-2011	11.00
Biannual traffic count on major roads by PWD during 2007-08 (growth in AADT)	13.50

The impact of annual traffic growth on peak hour traffic was estimated based on the peak hour factors on daily traffic. On the basis of a critical evaluation of the above growth rates and also factors such as moderation in traffic growth over the years due to development of Information Technology in transportation sector, the following growth rates were adopted for Chavakkad town for different categories of roads. Growth rates adopted for Chavakkad town are shown in table 11.13

Table.11.13 Growth rates adopted for Chavakkad town

Hierarchy of road	Annual traffic growth rate (%)	
	Up to 2020	Beyond 2020
Primary road	5	4
Secondary road	4	3
Tertiary road	3	2

Projected link volume on existing network

The estimated daily traffic for different horizon years on various road stretches in Chavakkad town is shown in table 11.13. Volume-capacity ratio for the horizon years is also presented in this table. It can be seen that all the major road corridors of Chavakkad town namely Kunnamkulam road, Thrissur road, Ernakulam road, Ponnani road, and bypass would be severely congested in the horizon year with the anticipated traffic exceeding the capacity of the roads under "do-nothing option". Other roads in the town will also experience saturation flow in five-year time.

The projected traffic on the existing road network within the CBD area implies that the existing road network would not be able to handle the traffic in the horizon year without up- gradation of the transport infrastructure facilities. Augmentation of the capacity of the existing road network by strengthening/ widening and the construction of alternate link roads is a must considering the dramatic increase in the traffic volume. The figure 11.11 and table 11.14 shows the anticipated capacity utilization of major roads.

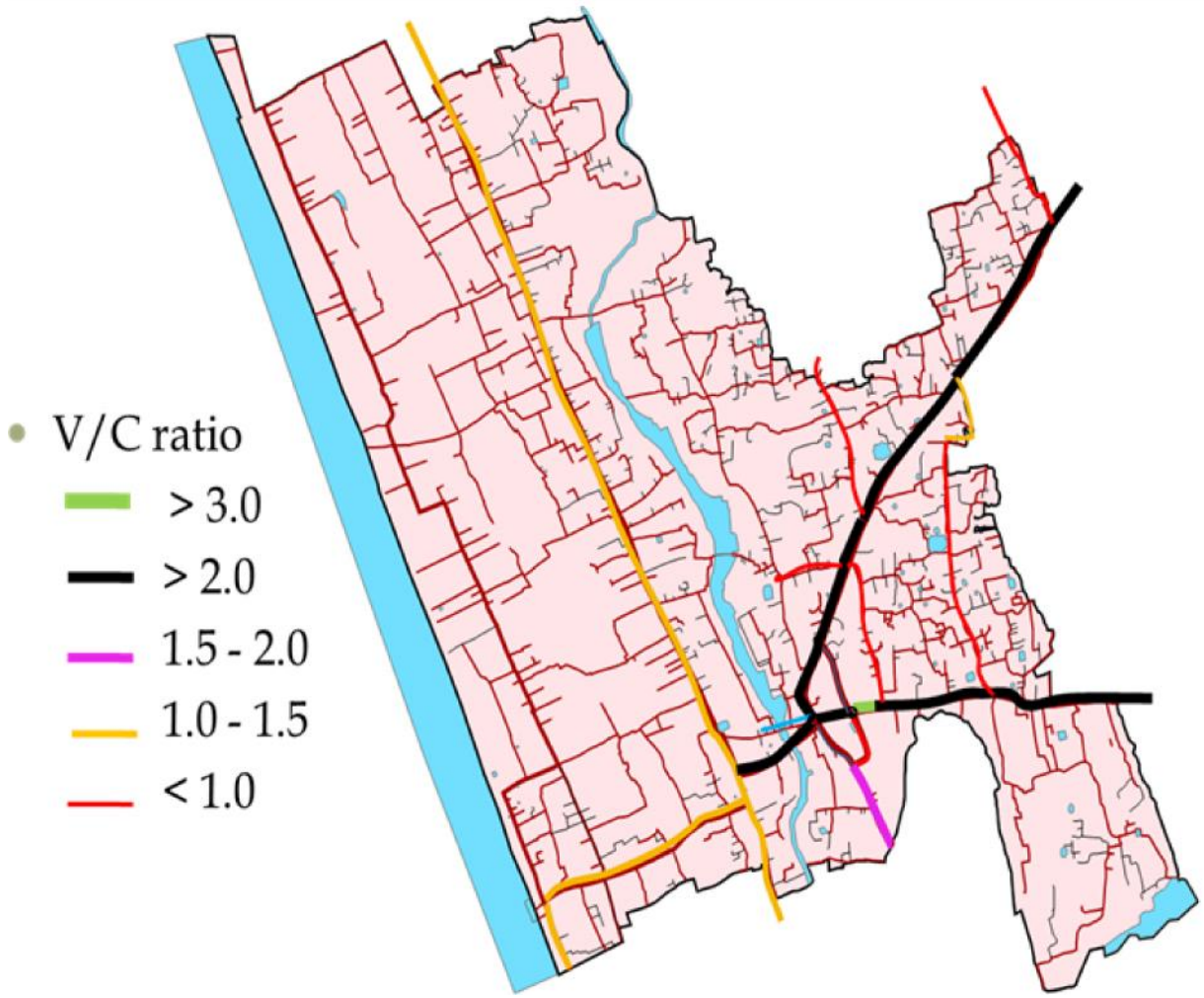


Fig.11.11. Anticipated capacity utilization of roads

Table.11.14 The anticipated capacity utilization of major roads

Sl. No	Road Link	Road capacity (PCU/ day)	2013		2015		2020		2030	
			Volume (PCU/ day)	Volume capacity ratio	Volume (PCU/ day)	Volume capacity ratio	Volume (PCU/ day)	Volume capacity ratio	Volume (PCU/ day)	Volume capacity ratio
	I. Edappally-Panavel road (NH 66)									
1	Edakkazhiyur (Border) - Manathala	15,000	9,483	0.63	10,455	0.70	13,344	0.89	16,235	1.08
2	Manathala - Mullathara	15,000	12,548	0.84	13,834	0.92	17,656	1.18	21,481	1.43
3	Mullathara - Chavakkad Centre	15,000	20,998	1.40	23,150	1.54	29,546	1.97	35,947	2.40
4	Chavakkad Centre - South Bye pass Jn	15,000	7,067	0.47	7,792	0.52	9,944	0.66	12,099	0.81
5	South Bye Pass Jn- Orumanayoor (Border)	15,000	14,233	0.95	15,692	1.05	20,027	1.34	24,366	1.62
	II. Chavakkad - Kunnamkulam road (SH 50)									
6	Chavakkad Centre - North Bypass Jn	15,000	18,228	1.22	20,097	1.34	25,649	1.71	31,206	2.08
7	North Bypass Jn - Hospital Jn	15,000	24,884	1.66	27,435	1.83	35,015	2.33	42,601	2.84
8	Hospital Jn - Ovungal	15,000	25,011	1.67	27,575	1.84	35,193	2.35	42,818	2.85
9	Ovungal - Muthuvattoor	15,000	19,909	1.33	21,949	1.46	28,014	1.87	34,083	2.27
10	Muthuvattoor - Mammiyoor Jn (Border)	15,000	17,666	1.18	19,477	1.30	24,858	1.66	30,244	2.02
	III. Thrissur/ Kanjani road									
11	Chavakkad Centre - Bus Stand West Jn	12,000	16,290	1.36	17,619	1.47	21,436	1.79	24,850	2.07
12	Bus stand West Jn - Bus stand East Jn	12,000	26,676	2.22	28,852	2.40	35,103	2.93	40,694	3.39
13	Bus stand East Jn - Angadithazham (Border)	12,000	15,665	1.31	16,943	1.41	20,614	1.72	23,897	1.99
	IV. Guruvayur-Ponnani road (SH 62)									
14	Mammiyoor Jn - Thampuranpadi (Border)	12,000	4,462	0.37	4,826	0.40	5,871	0.49	6,806	0.57
	IV. Guruvayur Road									
15	Muthuvattoor - Chavakkad GHSS	12,000	10,009	0.83	10,826	0.90	13,171	1.10	15,269	1.27
	V. Bypass road									
16	South Bye Pass Jn- Bus Stand Jn (W)	12,000	11,233	0.94	12,150	1.01	14,782	1.23	17,137	1.43
17	Bus Stand Jn (W) to North bypass	12,000	14,064	1.17	15,212	1.27	18,507	1.54	21,455	1.79

Sl. No	Road Link	Road capacity (PCU/ day)	2013		2015		2020		2030	
			Volume (PCU/ day)	Volume-capacity ratio	Volume (PCU/ day)	Volume-capacity ratio	Volume (PCU/ day)	Volume-capacity ratio	Volume (PCU/ day)	Volume-capacity ratio
	VIII. Beach road									
23	Blangad Beach - Manathala	9,000	7,004	0.78	7,431	0.83	8,614	0.96	9,511	1.06
	IX. Other major roads									
24	Rice Bazaar road	9,000	3,366	0.37	3,571	0.4	4,140	0.46	4,570	0.51
25	Hospital Jn - Taluk Hospital	9,000	3,655	0.41	3,877	0.43	4,495	0.5	4,963	0.55
26	Hospital Jn - Bus Stand Jn(E)	9,000	3,030	0.34	3,214	0.36	3,726	0.41	4,114	0.46
27	Perakom Road from Ovungal - Mallad (border)	9,000	3,368	0.37	3,574	0.4	4,143	0.46	4,574	0.51
28	Chavakkad GHSS - Palayoor	9,000	5,771	0.64	6,123	0.68	7,098	0.79	7,837	0.87

11.12 Transport Development for Chavakkad Town

Transport development plan for Chavakkad town is prepared taking into account the existing traffic scenario and based on an evaluation of the future traffic on the base year network. Transport development schemes are formulated so as to reduce the severe strain put on the existing road network. All committed development schemes were taken into account while formulating the transport development plan.

11.12.1 Major traffic problems in Chavakkad town

Chavakkad town lies on the National Highway No. 66 and two major roads fork out from the centre of Chavakkad town – one leading to Kunnamkulam (SH 50) and the other leading to Thrissur/ Kanjani via Chavakkad bus station and Palayur church. The main junction in Chavakkad from where roads are leading to Kunnamkulam, Ponnani, Ernakulam and Thrissur experiences severe traffic problems during peak periods due to poor road geometric and lack of proper design of junction.

Since NH 66 carries heavy volume of passenger and goods traffic, the available road width is grossly inadequate to meet the traffic demand in the CBD area of the town. This results in traffic bottlenecks on the roads during peak hours. The location of a narrow bridge across Canoli canal and the inadequate turning radius at Manathala junction add to the traffic problems on Ponnani road. Transport buses from Ernakulam to Chavakkad town deviate at bypass junction to proceed to the bus stand located on the bypass. The junction needs to be properly designed to regulate the traffic movements at the junction.

Most of the vehicular traffic plying on the NH is through traffic but pass through the central area of the town in the absence of an urban bypass. The Canoli Canal which passes through Chavakkad town and run parallel to the NH 66 has become a major constraint as the

existing bridges across the Canal are quite narrow and hence movements of heavy vehicles are not possible.

On the Kunnamkulam road, there are a number of public offices like government offices, court, police station and educational institutions. The road width is grossly inadequate to cater to the traffic generated from these offices. In the absence of footpath, pedestrians especially school children walk on the carriageway of the roads putting themselves into greater risk. During the opening and closing hours of schools, there are frequent traffic jams witnessed. The situation becomes aggravated due to parking of vehicles on both sides of the road and pedestrian cross and lateral movements.

There is no well-developed link road connectivity between Ponnani road and Kunnamkulam road. In the absence of this, vehicles have to pass through the central area of the town. Similarly, vehicles coming from Ernakulam side to Kunnamkulam/ Guruvayur have to pass through the central area of Chavakkad town putting further strain on the narrow Kunnamkulam road.

Construction of bypass connecting Ernakulam and Kunnamkulam roads, to some extent, mitigate the traffic problems witnessed on the NH 66 as the heavy vehicles between Kunnamkulam and Ernakulam sides take deviation to the bypass without touching the central area of the town. However, the intersections formed at the Ernakulam road, Kunnamkulam road and Thrissur road at the bus stand need to be properly designed to streamline the flow of traffic and also address the safety concerns of the intersection.

11.13 Problems

Major traffic and transportation problems facing Chavakkad town are:

i) Heavy volume of vehicular traffic along the National highway, Thrissur and Kunnamkulam roads and inadequate carriageway width and right-of-way;

ii) Inter-mixing of local traffic with through traffic in the absence of alternate road links/ regional bypass;

iii) Unorganized parking activities in the absence of proper parking lots;

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

v) Safety risk to pedestrians (lateral and cross movements) along and across Kunnamkulam road

vi) Poor road geometry and unplanned intersections

vii) Absence of proper bus bays

11.14. Inference

As far as Chavakkad is concerned, Chavakkad town center is the busiest location due to the intersection of NH, SH and Kanjani road coupled with the presence of the bus stand. There is no rail and water transportation through this town. Transportation in the town is through private buses as well as KSRTC buses. The major bus routes in the area are National Highway, two State Highways and Major District roads. Heavy volume of vehicular traffic, intermixing of local traffic with through traffic, inadequate carriage way width and right of way unorganized parking, safety risk to pedestrians, poor road geometry and unplanned intersections are the main problems faced by the Town. It has been observed that Mammiyoor Junction witnessed the maximum peak hour traffic flow. Bus stand and Muthuvattur junctions are the locations having high pedestrian movements. The major traffic generating zone within the study region is the town area itself. The major intersections along the roads also need to be improved and suitable designs are to be made to increase the efficiency level of these intersections. Special emphasis should also be given to improve the pedestrian facilities and also developing off-street parking lots.

CHAPTER 12

WATER SUPPLY

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

12.1 Introduction

Water has always been an important and life sustaining necessity to humans and is essential for the survival of all living organisms. But only less than 1% of the whole water on earth is accessible to man and other living beings in the form of fresh water in lakes, rivers, and underground aquifers. The average annual rain fall of the state is estimated as 3000mm. However, its spatial and temporal distribution pattern is mainly responsible for frequent floods and droughts in Kerala. About 60 % of the annual rainfall in the state is received during the South-West Monsoon (June – August), 25% during North – East Monsoon (September – November) and the remaining during the summer months.

Chavakkad has a tropical humid climate. The average temperature of the city in the summer season is 39^0 C while the minimum temperature is 22^0 C. The winter season is pleasant with temperature between 22^0 C to 32^0 C and heavy rains occur in the Monsoon season. The average annual rainfall of Chavakkad town area is 3130 mm.

12.2 Existing scenario

12.2.1 Sources of water:-

Surface water, ground water and rainwater collected from roof of buildings are the sources which meet the water requirement for different purposes i.e., domestic needs, industrial &commercial needs, institutional needs, fire-fighting, livestock, public purpose, agricultural needs etc.

As per Socio-Economic survey 2012 data, 58.05 % of the households in Chavakkad depend on well for drinking water and 15.54 % of households depend on water supplied by the water authority as shown in fig 12.1 and table 12.1 shows the details of sources of water The principal sources of water for domestic use are open wells, bore welland charm pipe.

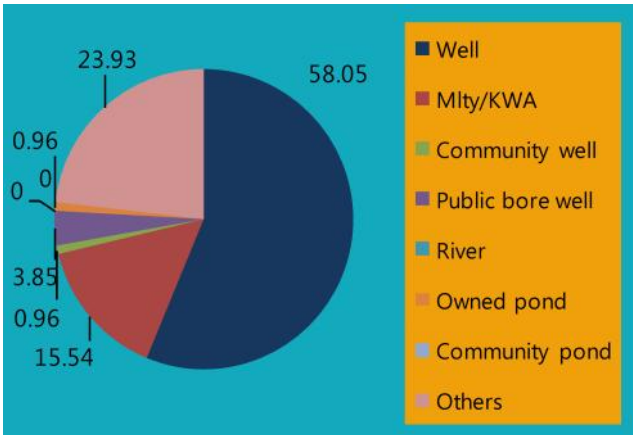


Fig 12.1 Sources of water

Source:Socio economic survey,2012

In Chavakkad due to the peculiarity of soil, underground water can be pumped out from earth directly. The main challenges to these sources are coliforms and mud.Kerala Water Authority supplies drinking water under Comprehensive Water Supply Scheme (CWSS) for Kunnamkulam, Guruvayur and Chavakkad towns. For this scheme water from Bharathapuzha river is used.

Table 12.1 Details of sources of water

Source of water	Well	Mlty/KWA	Community well	Public bore well	River	Owned pond	Community pond	Others
Average % for the LSGI	58.05	15.54	0.96	3.85	0	0.96	0	23.93

Source:Socio economic survey,2012

12.2.2 Drinking water supply scheme

The main source of drinking water schemes in Chavakkad Municipal area is Bharathapuzha. Treatment units are located at Thrithala (40 Km away from Chavakkad)and Koottanadu. The Water supply scheme for Chavakkad Town is known as ComprehensiveWater Supply Scheme (CWSS).The supply network of the scheme is shown in figure 12.2.

The water from intake is taken to the treatment plants located at Thrithala and Koottanadu and supplied to Chavakkad, Guruvayur, Kunnamkulam Towns and to nearby Grama Panchayats. The water from Thrithala water treatment plant (KGWSS) and Koottanadu water treatment plant (CWSS) are stored at a sump. The above stored water is supplied to various OH tanks of Chavakkad town. There are four OH tanks within town, the locations of which are shown in figure 12.3. The water is filtered by rapid sand filtration. The total quantity of water supplied by KWA is about 15 lakhs litres per supply day. Water is supplied in Chavakkad town once in three days. The location and capacity details of OH tanks are given in table 12.2.

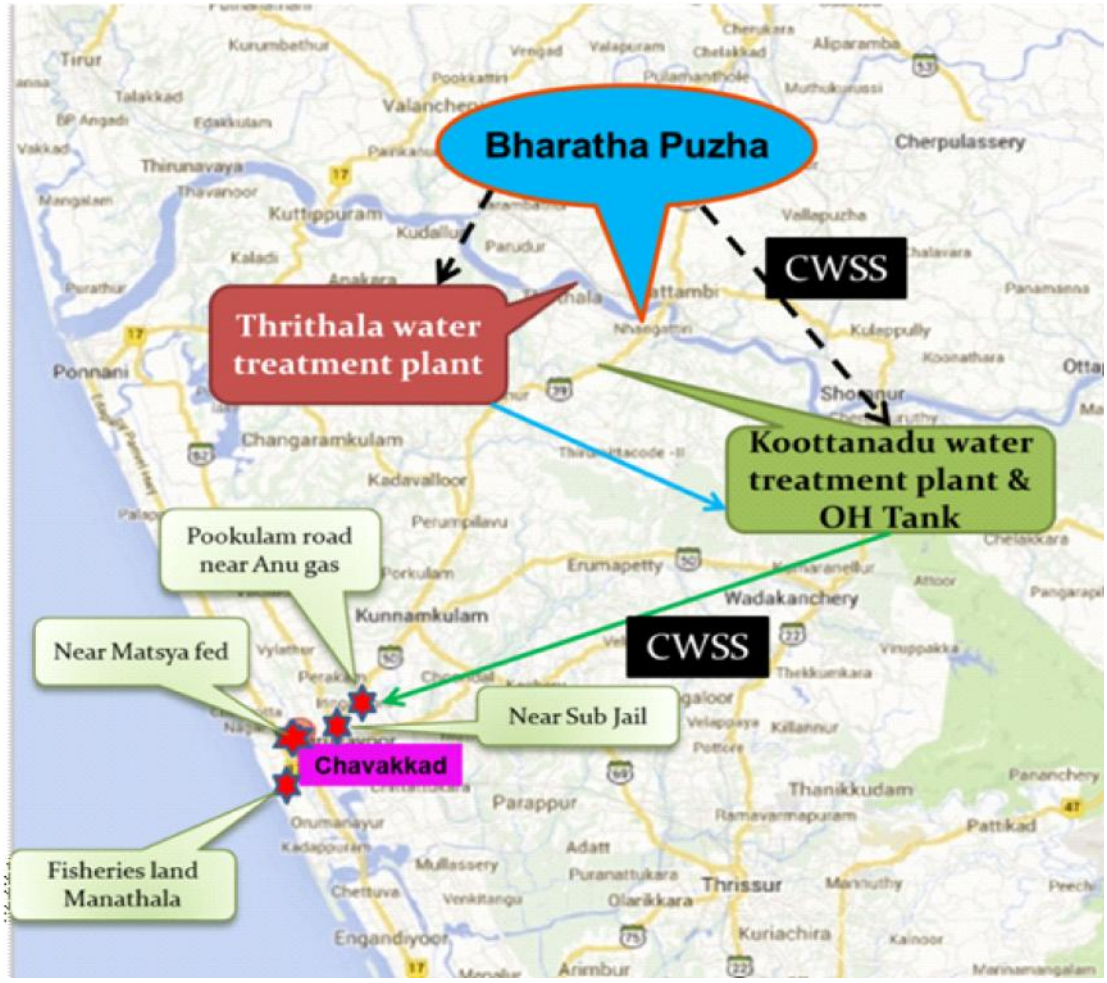


Fig.12.2 Distribution network

Source :Kerala Water Authority

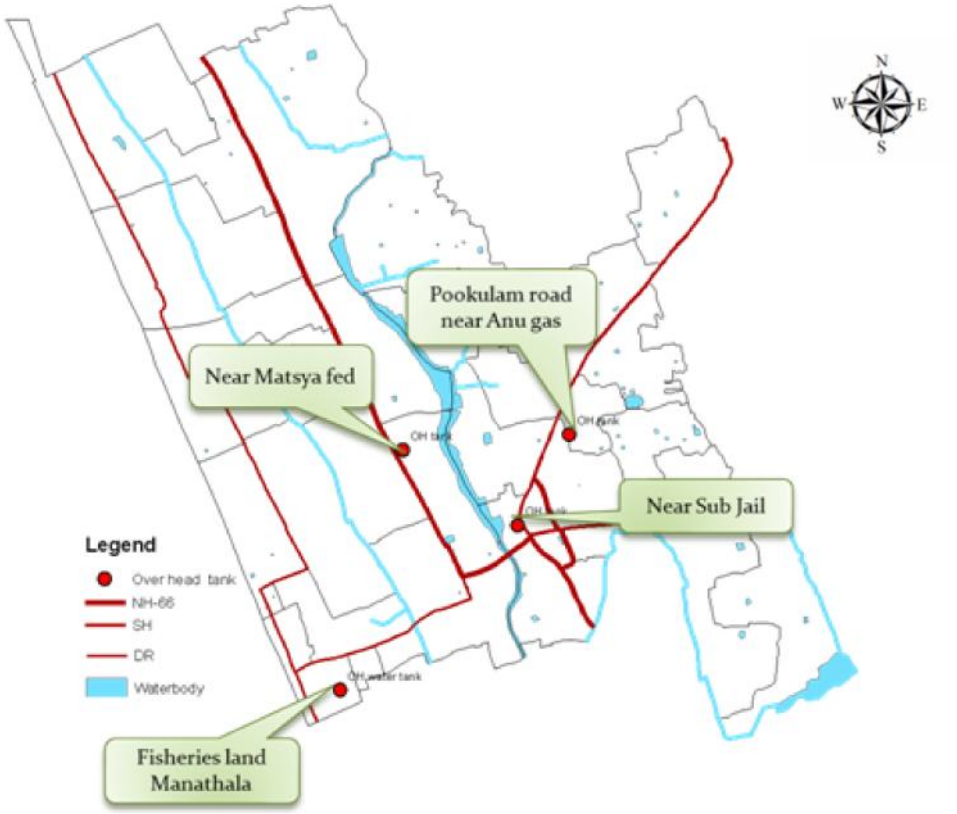


Fig 12.3 Location of OH tank

Table 12.2 Details of OH tank

Location	Capacity	Ward
Pookulam road near Anu gas	10 Lakhs Litre	10
Fisheries land Manathala	5 Lakhs Litre	23
Near Sub jail	10 Lakhs Litre	16
Near Matsya fed	10 Lakhs Litre	19

Source: Kerala Water Authority

12.3 Water scarcity

Chavakkad town is facing of water scarcity during summer season. The average ground water level of Chavakkad is 1.71m below ground level. 58.05% of the people depend on well for drinking water and hence receding of water table poses a big threat. Figure 12.4 shows the nature of scarcity. At present only 18.02% of people experience water scarcity. Chavakkad town requires around 25 lakh litres per day as per present population. The actual supply is only 15 lakh litres per supply day, and this shortage also adds to the scarcity issue. The requirement of water as per UDPFI guidelines for domestic uses is 135-150 lpcd. A study regarding the proximity of water sources to households conducted in Socio economic survey reveals that in Chavakkad town almost 100% of population has water sources within 0.5km from their houses. It reveals that 7.15% of people experience scarcity of drinking water for more than 6 months. The figure 12.5 shows the distribution of water scarcity in Chavakkad town. As per the figure, it can be seen that wards 4, 8, 14, 21 and 25 are experience more scarcity.

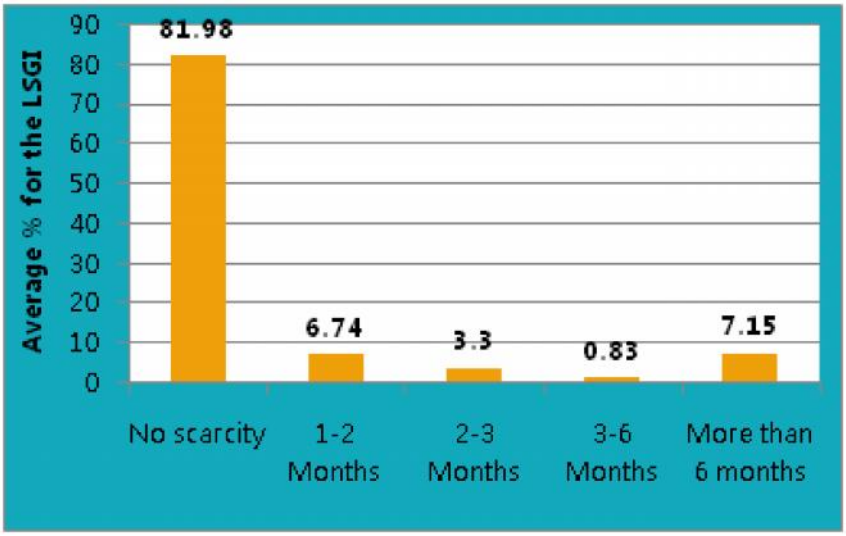


Fig.12.4 Nature of water scarcity

Source: Socio Economic data, 2013

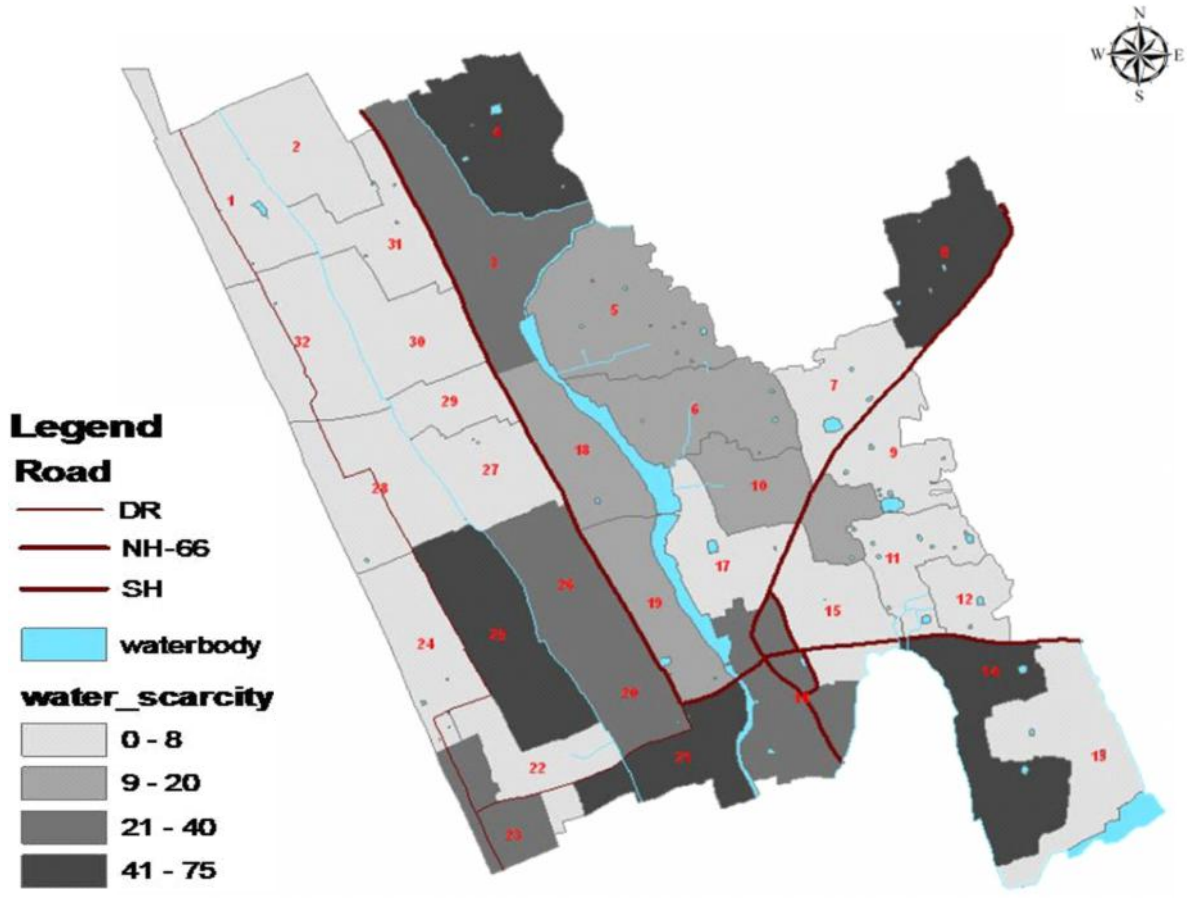


Fig 12.5 Distribution of water scarcity

As per the analysis of data from Kerala Water Authority, presently water is being supplied to the whole area of the town, once in three days. Total numbers of water connections are 541 out of which total domestic connections are 488. Socio economic survey reveals that 15.54 % households depend on KWA water. According to the source of Ground Water Department, the water table level of urban LSGI's shown in table 12.3. The water table level of Chavakkad shows minimum of 0.57mbgl and average of 1.71mbgl.

Table 12.3 Water table level of urban LSGI's

Town	Minimum (mbgl)	Maximum (mbgl)	Average (mbgl)
Irinjalakuda	6.21	12.23	9.99
Kunnamkulam	7.91	13.24	10.65
Chavakkad	0.57	3.56	1.71
Kodungallur	1.24	4.32	2.86
Chalakudy	0.1	3.98	2.3

Source: Ground water department

Figure 12.6 shows the priority of development as suggested by the people during socio economic survey. It can be seen that 4.68 % of people suggested drinking water to be their priority of requirements.

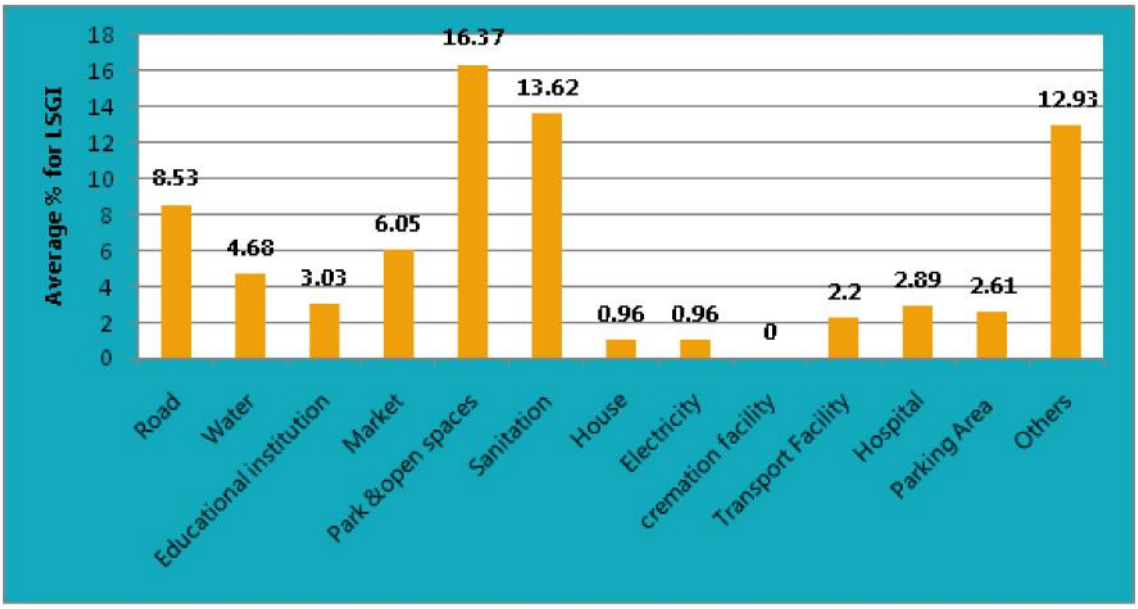


Fig12.6 Priority of development

12.3.1 Alternate sources

To tackle the shortage of drinking water, suggestions were made in the local analysis that to use some of the existing ponds as drinking water sources. Pookkulam is already included in the "Jalasree Scheme" of Kerala Government for the up gradation of ponds in LSGIs.

12.4 Ongoing Water supply Project

A new water supply scheme is going on for Chavakkad Town under UIDSSMT scheme. The source is Karuvannur Puzha and the tapping point is at Nandi. The commissioning of this scheme can improve the drinking water supply of Chavakkad Town in future. The scheme aims for the supply of 13 MLD of water for Guruvayur and Chavakkad Towns. The figure 12.7 shows the location of tapping point in Karuvannur puzha. The scarcity problem will be solved after the completion of this project. The scheme is envisaged as a cooperative movement of central, state and local self-governments. 80% of the total project cost is shared by the central government 10% by the state government and rest by concerned local self-governments. Here the beneficiaries are Guruvayur and Chavakkad Towns.



Fig 12.7 Tapping point at Karuvannur puzha

12.5 Problems and potentials

18.02 % of people are found to experience water scarcity. Water supply from KWA is found to be insufficient. KWA Water supply done once in 3 days only. The water scarcity problem is expected to be solved after the completion of UIDSSMT project.

12.6 Inference

As per Socio-Economic survey 2012 data, 58.05% of the households in Chavakkad depend on well for drinking water and 15.54 % of the households depend on water supplied by the water authority. Socio economic survey reveals that 18.02% of people experience water scarcity. The water supply from KWA is found to be insufficient in meeting the needs of the people. KWA supplies water only once in three days. The water scarcity problem is expected to be solved with the completion of ongoing UIDSSMT scheme. According to Ground water department data water table of Chavakkad is 1.71 m below ground level. Urbanisation and related increase in ground water draft may lead to decline of ground water level. Measures and actions are to be taken to check the sudden flow of water which enhances the recharge of ground water.

CHAPTER 13

SANITATION

Sanitation is an important segment where ignorance can lead to a sporadic situation. The recent outbreaks of certain viral diseases point to the contamination of the surroundings. Cleanliness both at personal and the environmental level alone can yield a healthy community. This chapter deals with the various issues related to sanitation in this town.

13.1 Introduction

Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and feces. The word 'sanitation' also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal. The collection, transport, treatment and disposal or reuse of human excreta, domestic wastewater and solid waste, and associated hygiene promotion. Sanitation includes all four of these engineering infrastructure items, Drainage systems for rainwater, also called storm water drainage, Sewerage system, Solid waste management systems and all medical waste in Chavakkad Town. Liquid waste treatment becomes very important as it can cause contamination of water sources, soil and air. The existing status and the various measures adopted to tackle are discussed below.

13.2 Existing Drainage Network

13.2.1 Physiography

Chavakkad Town is a coastal town sharing its west boundary to Arabian Sea for a length of 5 km approximately. Chavakkad town and its surrounding local body area has a lot of natural drains and back waters which finally connect to the sea. Though Chavakkad Town area is almost a level land it has sufficient elevation at the bank of natural drains for gravitational flow of drainage from artificial drains and also from the land itself. This shows that Chavakkad Town has a good natural drainage system

13.2.2 Existing Natural drainage network

Figure 13.1 shows the existing natural drainage network of Chavakkad Town and its surrounding areas. From the figure it's seen that majority of surface runoff through small drains including Mathy kayal drain and Kannikuthi thode flowing into Canoli canal. In addition to this some drains are flowing directly into Chettuva Lake and all these surface runoff finally disposed to Arabian Sea at Munakkakadavu estuary. For the drainage net work of the town Canoli canal act as Primary drain and Mathy kayal drain and Kannikuthi thode is to be considered as the secondary.

Kannikuthi thode joins to Canoli canal which is shown as confluence point 1 in figure 13.1 and the joining point of Mathy Kayal to Canoli canal as confluence point 2.Finally Canoli canal merge to Karuvannur river which is shown as confluence point 3 and enentually discharge to ocean at Munakkakadvu estuary. The total lengths of natural drains ditributed in the town area are 16.07 km, out of which Canoli canal constitutes a length of 4.96 km, Mathy kayal drain constitutes a length of 4.63 km, Kannikuthi thode 1.61 km and other small drains constitutes 5.04 km length. In addition to the water drains Chavakkad town has so many water bodies like ponds, backwaters etc. which all are the recipients of surface runoff. Unplanned urban development encroaches and solid waste filling etc. over loads the existing natural drains and result in flooding and water logging in certain areas of the town particularly during monsoon.

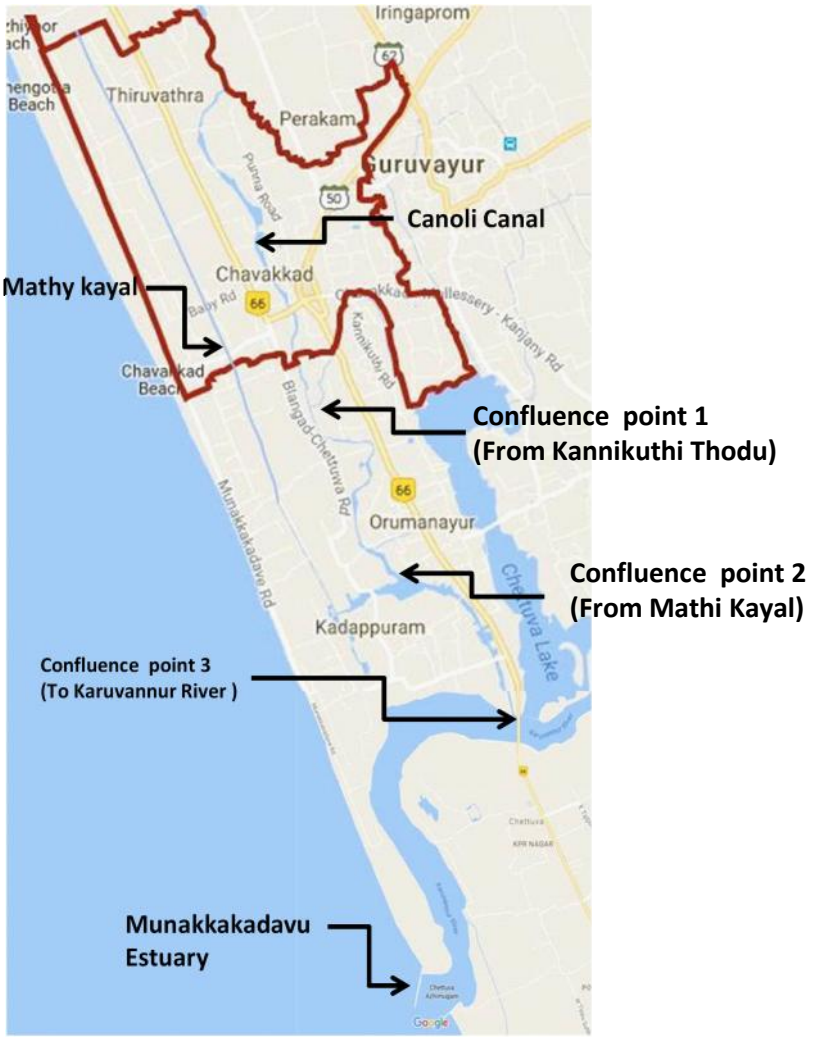


Fig 13.1 Existing Natural drainage network of Chavakkad town

13.2.3 Existing Artificial drainage network

A physical survey has been conducted to identify the drainage network and thematically represented in figure 13.2. From the figure it is seen that the road side drains are existing only at core centre of the town. The outer periphery areas seemed to be lacking proper drainage. A physical survey has been conducted to identify the drainage network and thematically represented

below in map From Manathala Mosque junction to Athirthi junction in NH 66 is also lacking road side drain which create flooding of roads during monsoon season.

Table 13.1 Details of Drainage survey

Description	Measurements
Total Length of Existing roads including all roads	126.50 km
Total length of road side drains	24.53 km
Total length of covered drains	8.83 km
Total length of uncovered drains	15.70 km
Maximum breadth of existing drains	2 m
Minimum width of existing drains	0.30 m
Maximum width of existing drains	1.50 m
Minimum width of existing drains	0.20 m

Source: Drainage survey, 2016

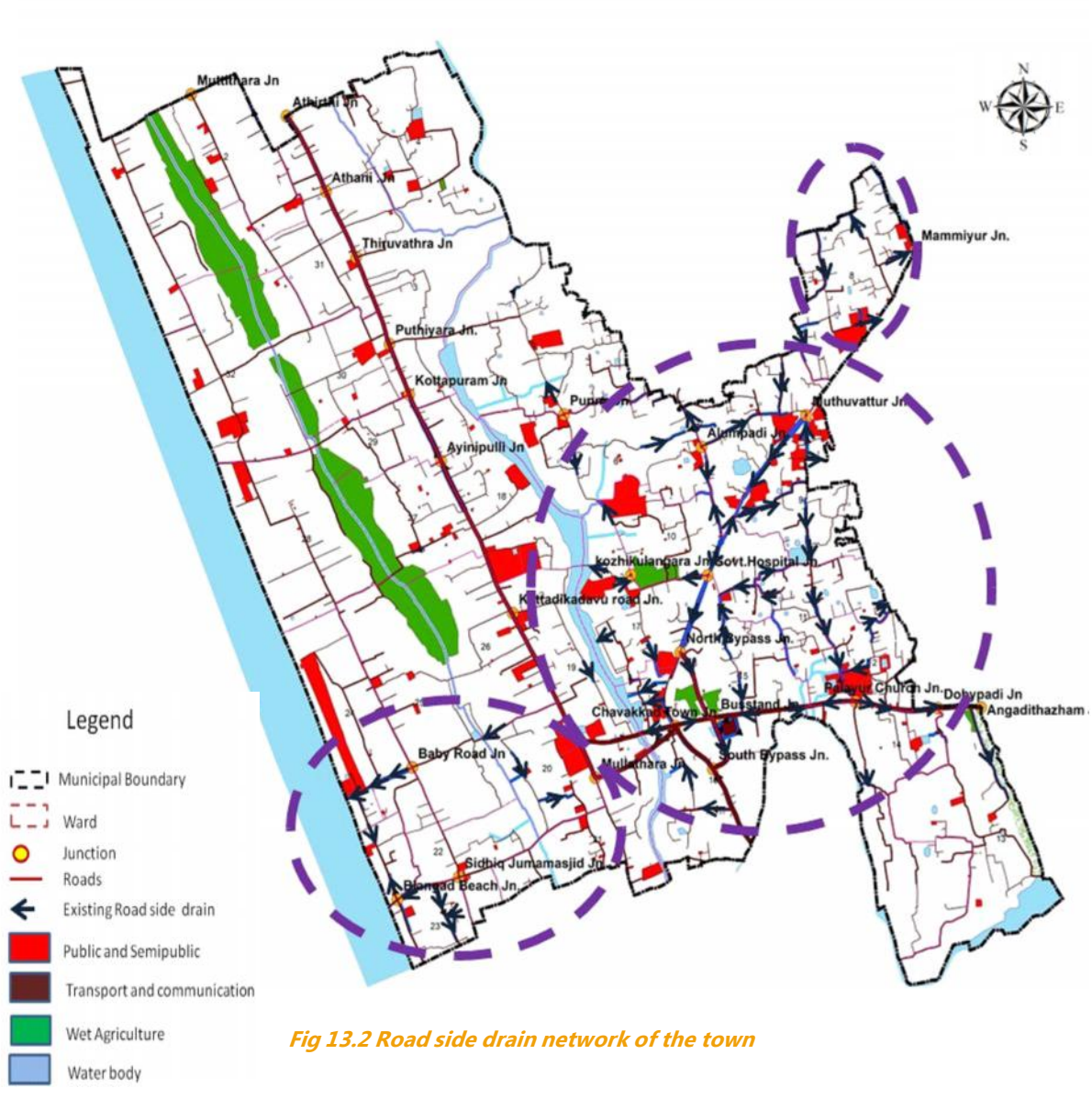


Fig 13.2 Road side drain network of the town

From the figure it is seen that road side drains are flowing into the adjacent natural drains ,which enter either to primary drains (Canoli canal) through secondary drains or Chettuva Lake backwater and finally discharged into Arabian sea. It is also seen that majority of road side drains have gaps in the network at so many locations, which may lead to flooding during rainy season in those areas

Some of the locations observed flooding during rainy seasons are Bus stand area, Thekkanchery colony, Thekke Palayur and Punna. The main reason identified for flooding in the town are deposition of silt and wastes, encroachment and growth of vegetation in the primary drainage canals/drains which reduced the water carrying capacity of the canals /drains, over loading to the drain network due to unplanned development and haphazard filling up of low land /water bodies without giving due consideration to drainage, In adequate flow capacity, poor condition of certain culverts that obstruct normal flow in the canal/drains and sometimes results overflow and flooding in the adjoining areas.

Mathy kayal is major recipient of storm water runoff as per the geography of the town. The changes in land use associated with urban development affect water logging and flooding in many ways. As per the land use survey Chavakkad town covers 60 % built up area. At present scenario it is seen that all the open spaces provided for built up are paved with paving tiles which prevents infiltration of rain water to sub surface which increases the surface run off of the town. As the Chavakkad town has more built up area, some control may be taken on pavement of open spaces to reduce the formation of surface run off.

13.2.4. Identification of gaps in the net work

Land use survey and physical road side drain survey has been followed to identify the existing drainage network. During survey work so many gaps were observed in drainage network.

Natural drains:

Due to side encroachment, land filling for developments, solid waste dumping etc. the water carrying capacity of the drains were reducing, small drains are getting blocked and create gaps in the drainage network.

Road side drains :

Road drainage is the process of removing and controlling excess surface and sub soil water with in the right of way. Road drains will remove and diverse surface water from the roadways and adjoining land.

The following points were observed during drain survey

1. The road cross sections are not as per standards. Lacking carriage way slopes, enough width and slope of shoulder.
2. In the road stretch where foot path is provided, lack of Kerb and catch pit were observed.
3. Lack of cross drainage structures like culverts and small bridges were observed at some crossing points.
4. Non continuity of road side drains were observed at so many locations.
5. Lack of road side drains were observed at outside the CBD area of town.

13.3 Sewerage System

An organised sewerage system is an important aspect to create healthy living conditions. Currently there is no sewerage system in the Town. From the socio- economic survey it can be seen that 83.49% of the families use septic tank and 12.79% use pit latrine. Only 3.71% use other ways for their sanitary waste disposal. Three public toilets are provided by the municipality to serve the entire municipal area which is located at bus stand, Blangad beach and near municipal office. The town being a low lying one and the general soil nature being sandy, a sewerage system may be looked upto for future needs. With the help of various schemes from central and state government, all houses in Chavakkad town can be provided with toilet facilities.

13.4 Solid waste disposal system

The quantity of solid waste depends upon the living standards of its residents. The degree of commercialization, urbanization, and industrialization, in fact, has resulted in a vast increase in the amount of waste generated per person. Chavakkad being a small town, the quantity of waste generated per day is taken as 0.250 kg per capita. The solid waste disposal is done for town area only; there exists a trenching ground at Parappil Thazham. The total quantity of waste generated in the town area is 6 ton/day and the total quantity of solid waste collected is 4 ton/ day. As per Socio economic data percentage of houses without any sanitation system is 1.38%. There is no sewage disposal scheme for the town. Waste water from public sewage drains flows into the Canoli canal and Mathy kayal and then finally goes to Arabian Sea.The solid waste disposal is being carried out for town area only. Municipal Solid Waste (MSW) collection points are located in every streets, hotels and houses. Number of workers employed for waste collection is 34. Kudumbasree unit is also involved in the waste collection procedure, they cover about 300 houses. Generated waste is collected on a daily basis with the help of two tractors and one Ape (auto).



Composting process

Chavakkad town has a municipal waste disposal trenching site at Parappil Thazham with an extent of 59 cent. Location of trenching ground is shown in figure 13.3. A total of 4 ton of unsegregated waste is transported to the site, out of which 1.5 ton is converted into compost by using vermicomposting method and rest is used for land filling. Composting is a scientifically managed method used for disposal of municipal solid waste. Composting of refuse (MSW) is a biological method of decomposing solid wastes. This decomposition can be conducted either in aerobic conditions, or anaerobic conditions, or both. The end product is manure, called the compost or humus, which is in great demand as fertilizer for farms. The detail of waste disposal from houses as per survey 2013 is given in table 13.2. It is seen that here people are using their own house compound for solid waste disposal.

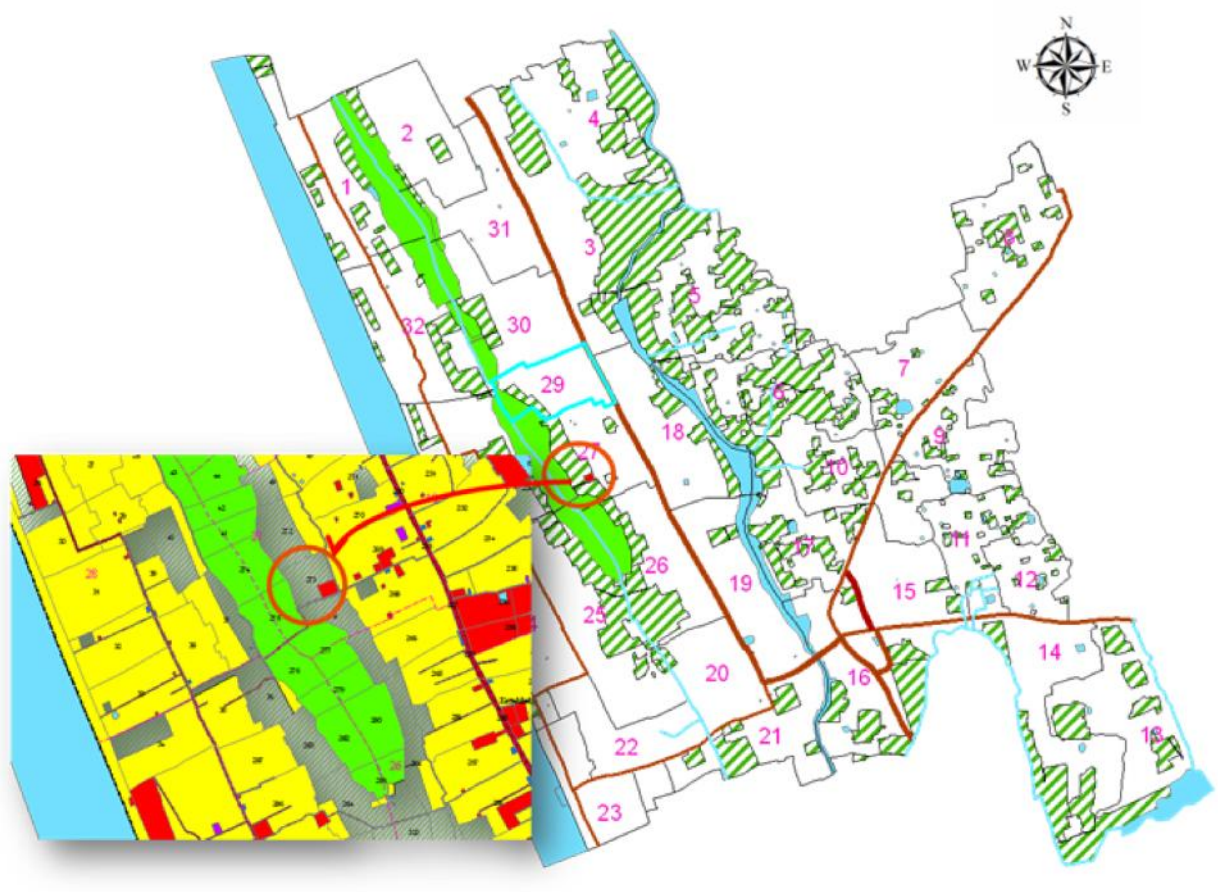


Fig. 13.3 Trenching ground at Parappil Thazham

Table.13.2 Details of waste disposal in Chavakkad

Category of place of waste disposal	Own compound	Street	Garbage bin	Open ground	Others
Average % for the LSGI in each category	97.11	0.83	0	1.1	0.96

Source- Socio Economic Survey 2012

Trenching ground is situated comparatively higher level than the surrounding agricultural area. Leachates from the bottom of land of dumped waste flows to lower area, and contaminate the area, causing serious health problems to the people living near to the trenching ground. Land fill gases generated from dumped waste also become a serious environmental problem. As per the census data the population for the year 2011 is 39098. The projected population for the year 2031 is 44000. Chavakkad being a transit point for pilgrims to Guruvayur and a service centre for nearby areas; floating population of 5000 is also considered. Hence the total population for design is 49000.Chavakkad being a small town the quantity of waste generated per day is calculated as 0.250 kg per-capita then the quantity of waste generated in 2031 will be 13 ton/ day. The existing trenching ground is not sufficient enough for processing this much waste. Hence a system has to be established to tackle this problem effectively.

13.5 Biomedical Waste

All Hospitals have their own system for disposal of solid waste. All Biomedical wastes are collected by IMAGE at Palakkad.

13.6 Problems and Potentials

The road side drains are covered only at core centre of the town and outer periphery areas are seemed to be lack of road side drains. The majority of road side drains have gaps in the network which may leads to flooding; Bus stand area, Thekkanchery colony and Thekkae Palayur is observed flooding area during rainy season. Discontinuous drainage network are due to encroachment and pollution. Waste water from public sewage drains is disposed finally in Canoli canal and area surrounding Mathy kayal. No Separate sewage disposal scheme is functioning inside the town area. The town has municipal waste disposal trenching site, Land fill gases and leachates generated from dumped waste also become a serious environmental problem. All Biomedical wastes are collected by IMAGE at Palakkad.

13.7 Inference

From the foregone analysis it can be seen that at present Chavakkad faces threat from both solid waste and liquid waste. High level of contamination occurs at water sources due to the absence of proper sewage systems. Discontinuity in drainage channels cause for pollution and encroachment of natural drainages cause occasional flooding during rainy seasons. Occasional flooding during rains has lent a hazardous character to certain areas of the town. Also public comfort stations are not provided at all the required locations. A three tier system can be adopted for addressing the issue of solid waste; one at the individual level where plot sizes are less than 20 cents, one at the flats and residential association level and then at all markets and commercial centers. As per projected population quantity of waste generated in 2031 will be 13 ton/day and hence more scientific approach of sewage disposal has to be taken. All Hospitals have their own system for disposal of solid waste.

CHAPTER 14

ENERGY

This chapter analyses the existing status and development issues of power sector in Chavakkad Town. "Electricity to each and every common man" is the base slogan for the total electrification project in the State. The availability of electrical power and utilisation of power is directly related to the agricultural and industrial development of a region and the upliftment of society. This analysis also looks into the possibility of having renewable sources of energy, which can make the system sustainable.

14.1 Introduction

In Chavakkad, people depend on the conventional mode of power only. There is no organized effort to tap the non-conventional power sources. Chavakkad is reportedly sufficient in the power requirements. This data is pertaining to the area of jurisdiction of that KSEB office which includes Chavakkad Town. As the consumption increases the power losses also increase. Chavakkad is divided into two electrical sections for supply of power viz. Chavakkad section and Manathala (Beach) section.

14.2 Existing Status

Transmission system is an essential link between power stations and load centres for bulk transfer of power and it has a vital role in the management of power. KSEB has pioneered the modern concept of developing a large transmission network for transferring power from power stations to the local load centres. One 11 KV substation for 15,000 population is taken as the general standard for all categories of towns.The Kerala power system grid is connected to the Southern Region Transmission system through two 400KV double circuit lines. They are (1) Udumalpet - Madakkathara line and (2) Thiruneveli - Pallippuram (Trivandrum) line. There are 6 major inter-state transmission lines; 220KV level and 110KV level. The transmission sector of Chavakkad comprises of one 440KV sub-station at Madakkathara and 4 major inter- state transmission stations of 110KV at Athani and Guruvayur, and other substations at Punna. Punna substation is a 33 KV substation which is situated at Chavakkad town itself. The transmission system is given in figure 14.1.

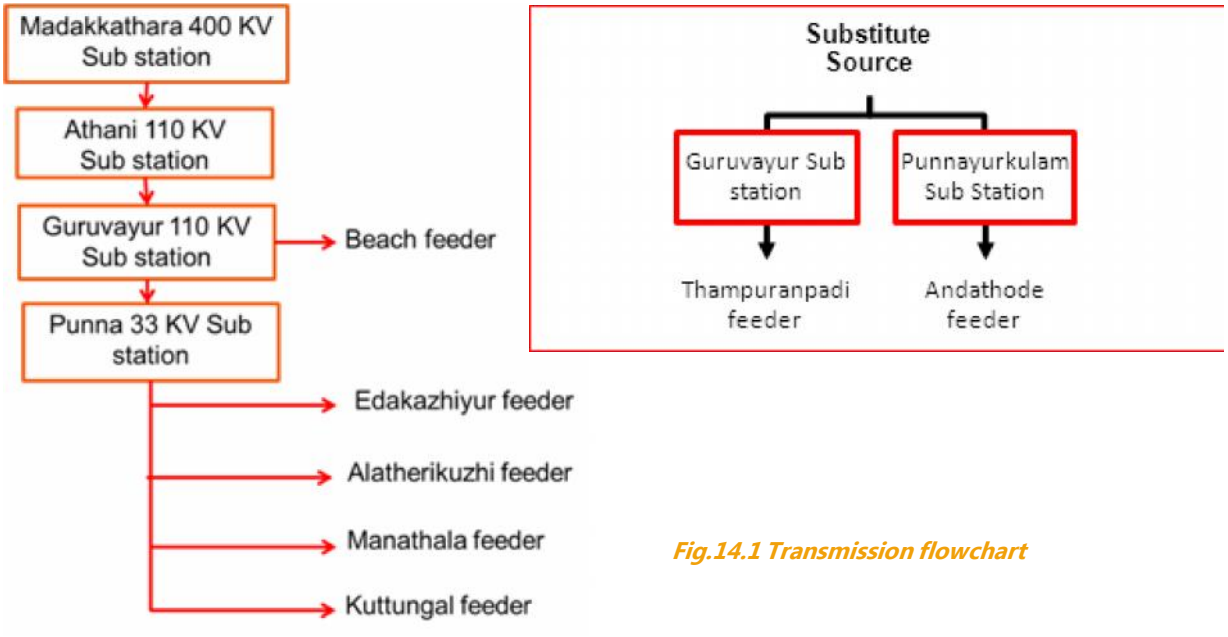


Fig.14.1 Transmission flowchart

14.3 Distribution and Supply

In Chavakkad town the distribution and supply is carried out by the KSEB through the Edakkazhiyur feeder, Kuttungal feeder, Beach feeder, Manathala feeder and Alatherikuzhi feeder. The Edakkazhiyur, Kootungal, Beach and Manathala feeders are getting supply from Punna substation, while Alatherikuzhi feeder get supply from Guruvayur Substation.The above data shows that, the power supply of Punna substation covers majority areas of town. Chavakkad has two substitute feeders, Thampuranpadi feeder and Mammiyoor feeder, which can supply power to Chavakkad area during emergency. The distribution network of Chavakkad town is shown in the fig.14.2.

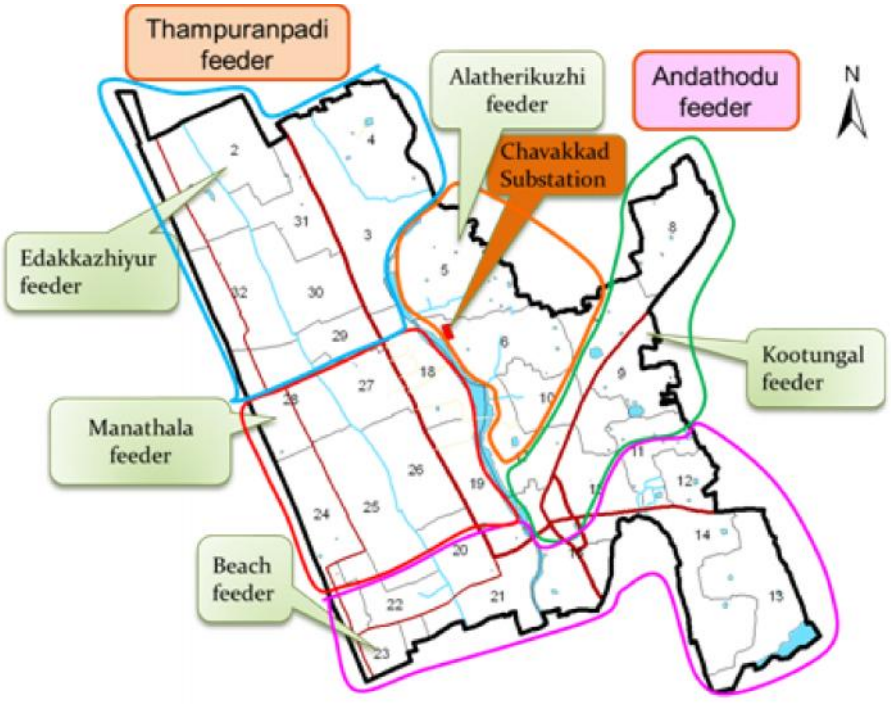


Fig. 14.2 Distribution network

The category wise consumption of energy is shown in table 14.1 and represented graphically in figure 14.3. Category wise energy consumption in Chavakkad town shows that the maximum consumption is in domestic sector (71.18%), followed by commercial (23.43%) and agricultural (2.61%). Power consumption in industrial sector is in the range of 2.14% and in other categories it is 0.65%.The figure 14.4 shows that the maximum power connections are in the domestic category (64.87%) followed by commercial (23.74%) followed by agriculture (10.12%) and industrial (1.24%). Only .04 % power connections are in other category.

Table 14.1. Consumption of electricity

Total Consumption(KWH)	Category wise break-up consumption				
	Domestic	Industrial	Commercial	Agricultural	Others
2803314	1995282	59906	656731	18093	73302

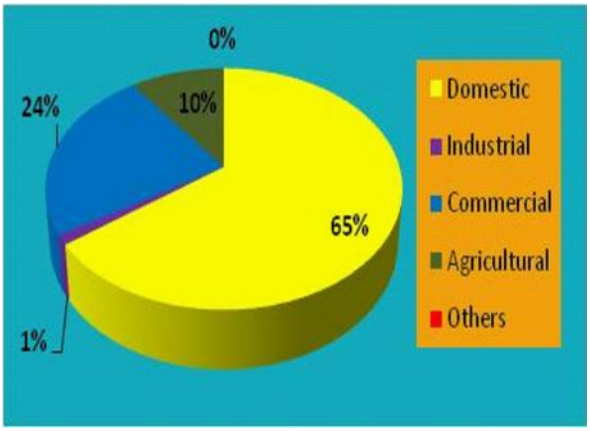


Fig. 14.3 Energy Consumption

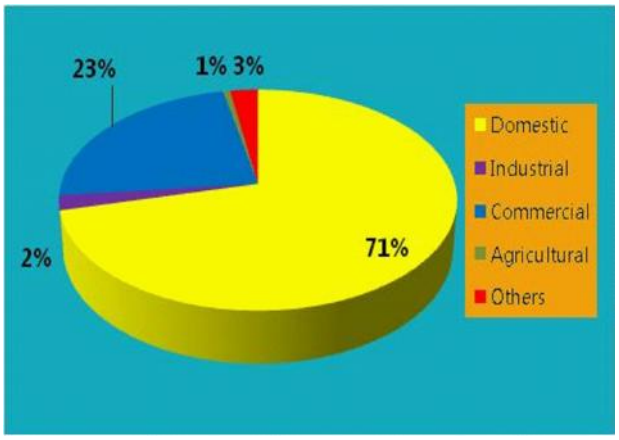


Fig. 14.4 Energy Connection

Energy connection and consumption are compared with other urban LSGI's and is as shown in figure 14.5. On analysis (figure 14.5) it is evident that Chavakkad town possesses lowest number of energy connections and consumption pattern. Less initiatives in industry and lower population than other Urban LSGIs in Thrissur district may be the reason for this. Special drive for the 100 % electrification of LA constituencies of Kerala state was commenced in the year 2009. Under this scheme, the district of Thrissur was declared to be fully electrified. As per the socio-economic survey conducted in connection with the development plan, there are certain unelectrified houses in the town. The wards which has un electrified houses are 1,3,4,6,7,22,24,27,28,29 and 32.

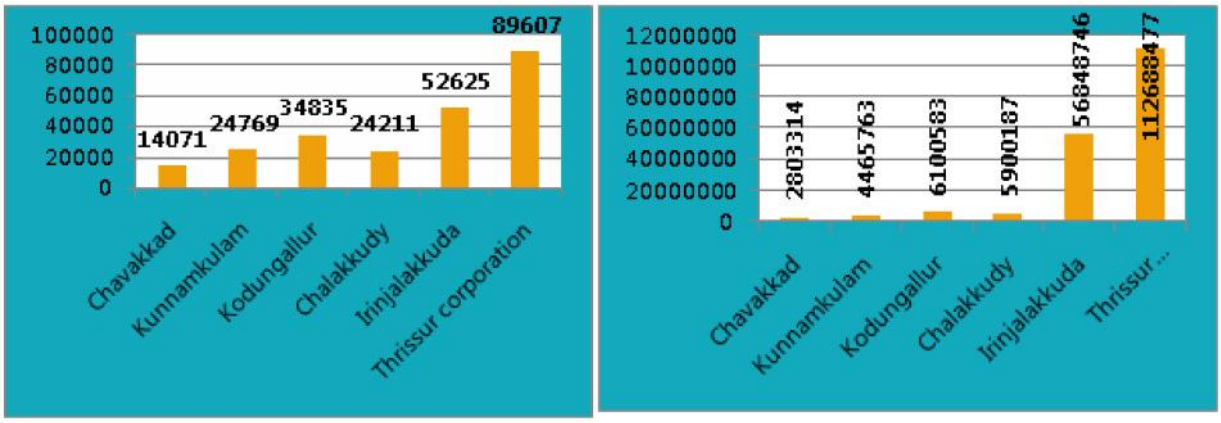


Fig.14.5. Comparison of energy connection and consumption pattern

14.4 Nonconventional Sources of Energy

The State of Kerala has immense potential for utilising solar energy and wind energy. Specific studies can be conducted to examine their potential in these segments in this area. As per the socio-economic survey conducted in connection with the development plan only 0.28% of houses in town utilize nonconventional energy sources. An initiative with a vision to switch over to solar energy in the near future has to be taken.

14.5 Problems and Potentials

Use of non- conventional energy sources is not found to be very common in this area. Due to the increase of population the power consumption is also increasing. Street light facilities are not maintained properly. Needed an uninterrupted power supply. There is a need of 33KV Substation for Chavakkad itself, Inter linking of Guruvayur, Chavakkad and Punnayurkulam Substations to be done, Needed more transformers and their are possibilities of wind and tide power

14.6 Inference

As far as the power sector in Chavakkad town is concerned, it can be seen that the major power consumers are in the domestic sector. Power consumed for industrial and agricultural purposes is very low. Also use of non- conventional energy sources is not found to be very common in this area. Due to the increase of population the power consumption is also increasing. To meet required demand of electricity in future, steps should be taken to utilise non-conventional energy sources to generate electricity. In the case of streetlights, proper maintenance is not being done. In town, the junctions are not provided with high mast lights wherever required.

CHAPTER 15

EDUCATION

This chapter details out the existing educational status, basic infrastructural facilities available in this sector and developmental issues of Educational sector in Chavakkad Town area. Education is a social process which helps a man to handle the duties and responsibilities in the society. Thrissur district is well known for its immense advancement in the field of mass education. Thrissur district has many educational institutions, known across Kerala for the quality of education they impart. Most of them are situated in the headquarters of district that is in Thrissur Corporation.

15.1 Existing scenario

15.1.1 Literacy rate

As per census 2011, the literacy rate of Chavakkad is 94.36% which is nearly equal to State and less than District. The figure 15.1 shows the comparison of literacy rate with state and district. As per 2011 Census the Male literacy rate (95.95%) and female literacy rate (93.08%) of Chavakkad stands higher when compared to State level. The temporal variation of literacy rate is given in figure 15.2 which shows that literacy rate is steadily increasing through the decades. The figure 15.3 shows the comparison of literacy rate with other urban areas within the district it shows that the literacy rate When compared to other urban LSGIs in the district Chavakkad town is lower than other urban area except Wadakkanchery Town.

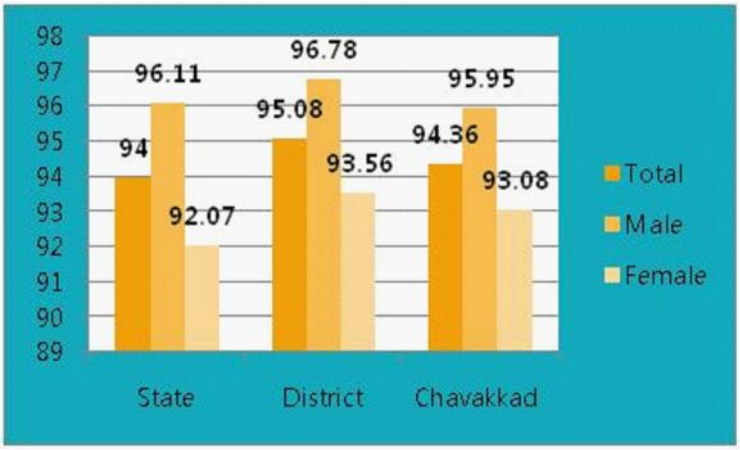


Fig. 15.1 Literacy rate- comparison

Source: Census data

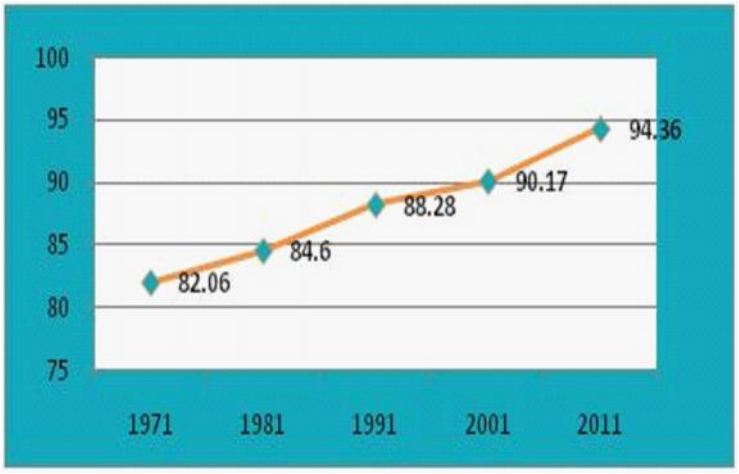


Fig. 15.2 Literacy rate- temporal variation

Source: Census data

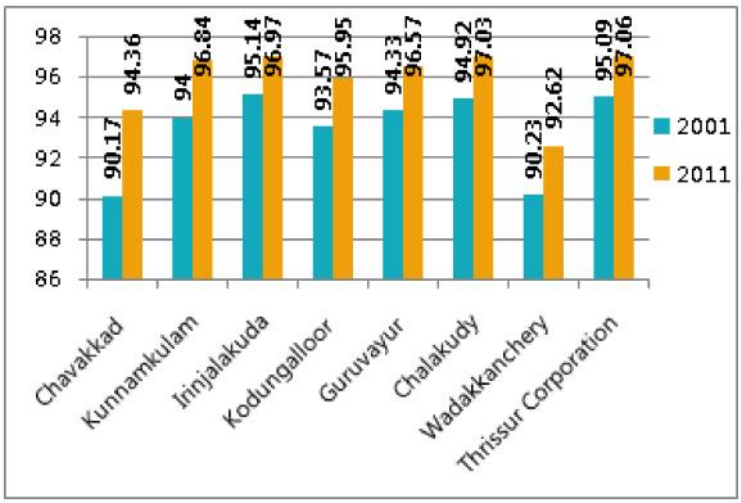


Fig. 15.3 Literacy rate- comparison with urban areas

Source: Census data

15.1.2 Educational status

The percentage share of people possessing different educational qualification in Chavakkad is shown in Figure 15.4.About 30.13% of people are having primary education, 37.5% have high school education, 10.48% with plus two and 10.39% with degree qualification. 1.22% of residents have post graduate degree and 0.09% of people acquired technical education. Only 0.77% has achieved Professional graduation. The data reveals that 9.37% of total population has no primary education.

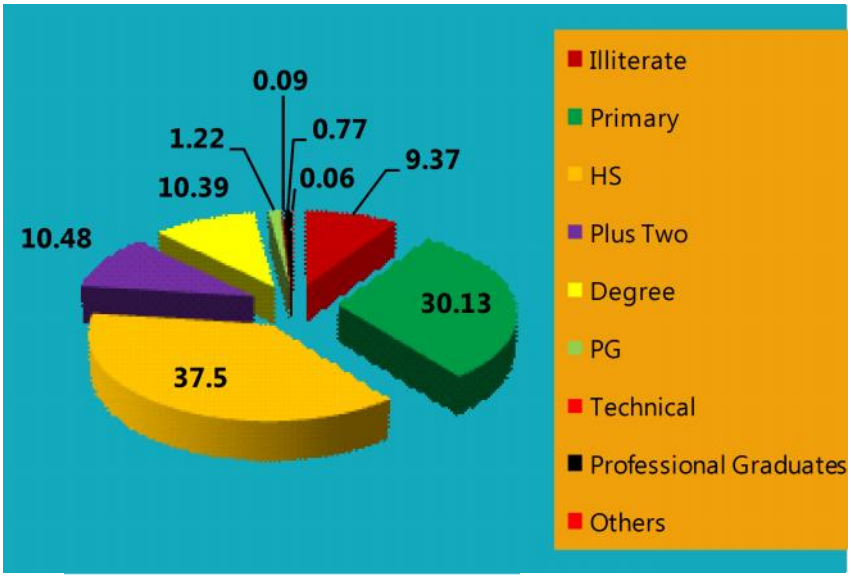


Fig.15.4. Educational status

Source: Socio ecomonic survey,2012

15.1.3 Educational Institutions

The general education system comprises of the school level and higher level educational institutions. The Chavakkad town area has 20 schools, out of which 14 are in the primary section, 3 are high schools, and 3 are higher secondary schools but there is no Vocational Higher Secondary schools. The table 15.1 gives numbers of educational institutions in Chavakkad. The figure 15.5 shows the locations of schools in the Town.

Table 15.1 Number of Educational Institutions

Sl No	Category	Govt	Aided	Unaided	Total
1	Primary	4	10	0	14
2	HS	1	2	0	3
3	HSS	1	1	1	3
4	VHSS	0	0	0	0

Source: AEO, Chavakkad

Table 15.2 Facilities in schools

Sl. No	No separate toilet facility for girls	No Internet facility
1	KALPS Manathala	KALPS Manathala
2	AMLPS Palayoor	AMLPS Palayoor
3	SALPS Manathala	SALPS Manathala

The location of educational institutions shows that the institutions are evenly distributed such that the residents from any part of the Chavakkad town can have an access for elementary learning. One of the oldest institutions here is the Manathala Govt. HSS. One among the ten Fisheries Technical Schools in Keralais situated at Puthenkadappuram in this Town.The infrastructure facilities for the schools are found comparatively well in Chavakkad according to the secondary data 2012. The table 15.2 gives the list of infrastructure facilities.



Fig. 15.5 Location of educational institutions

An analysis of the number of schools and the students in them throws light into the fact that 70.68% of the students are studying in the aided schools and 16.93% of the students are in unaided schools whereas only 12.39% of students are in govt.sector schools.

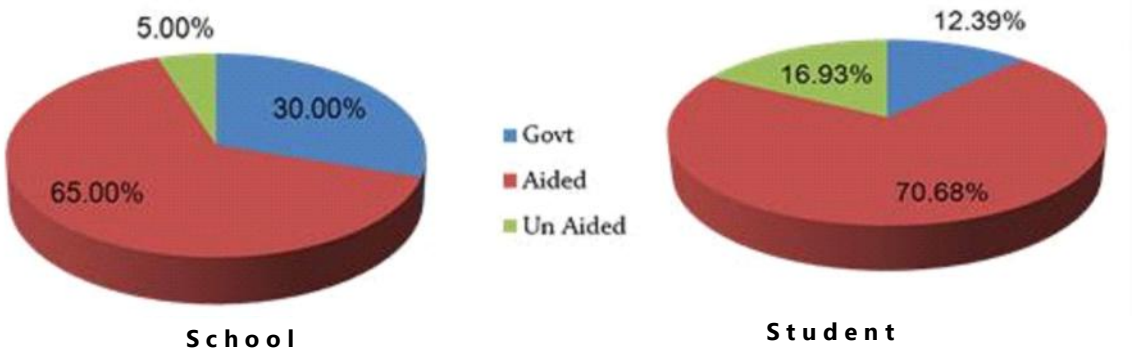


Fig. 15.6 Schools and Students -Percentage wise

Source:AEO, Chavakkad

A contradictory fact is that 30% of schools are in the govt. sector but only 12.39% among total students are schooling here (Figure15.6).Facilities, performance and functioning of government institutions have to be increased so that more students will be attracted to government schools than schools in the private sectors. These schools are to be developed as centers that can provide quality education to the students at free of cost. Table 15.3 shows the passing % of the HS in chavakkad town during the period from 2011-2016

Table 15.3 Shows the passing % of H S in Chavakkad Town (2011-2016)

Name of School	Place	% SSLC Passed 2011	% SSLC Passed 2012	% SSLC Passed 2013	% SSLC Passed 2014	% SSLC Passed 2015	% SSLC Passed 2016
L F C G H S	Mammiyur	73	100	100	100	100	100
G R F T H S	Chavakkad	100	100	100	100	100	100
G H S S	Manatha	82	78	88	92	100	86

Source:Direct Enquiry

Service area of LP, UP AND HS is shown in Figure 15.7, 15.8, 15.9 respectively, Comparinhg the figures it is seen that education institutions are reachable within a walking distance.



Fig. 15.7 Service area existing LP School

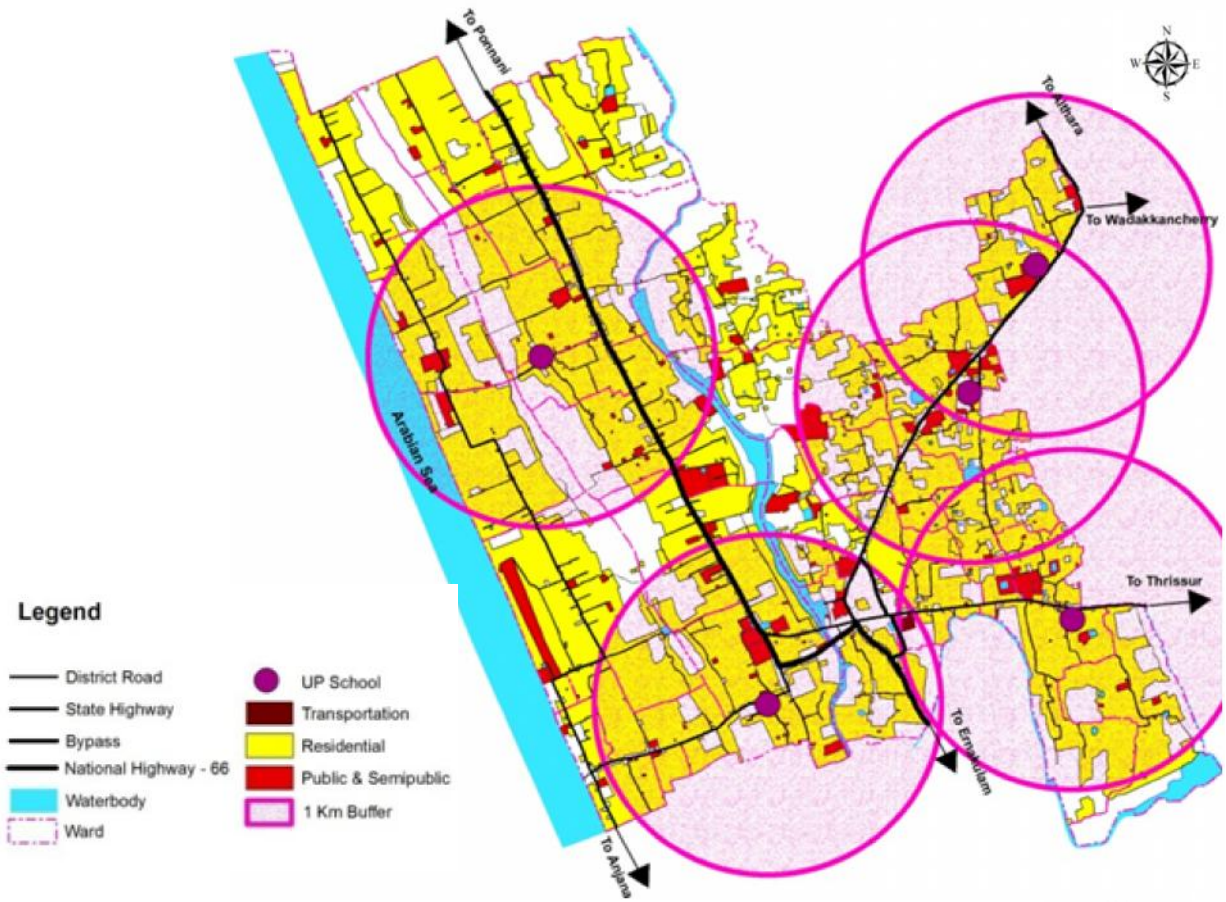


Fig. 15.8 Service area existing UP School

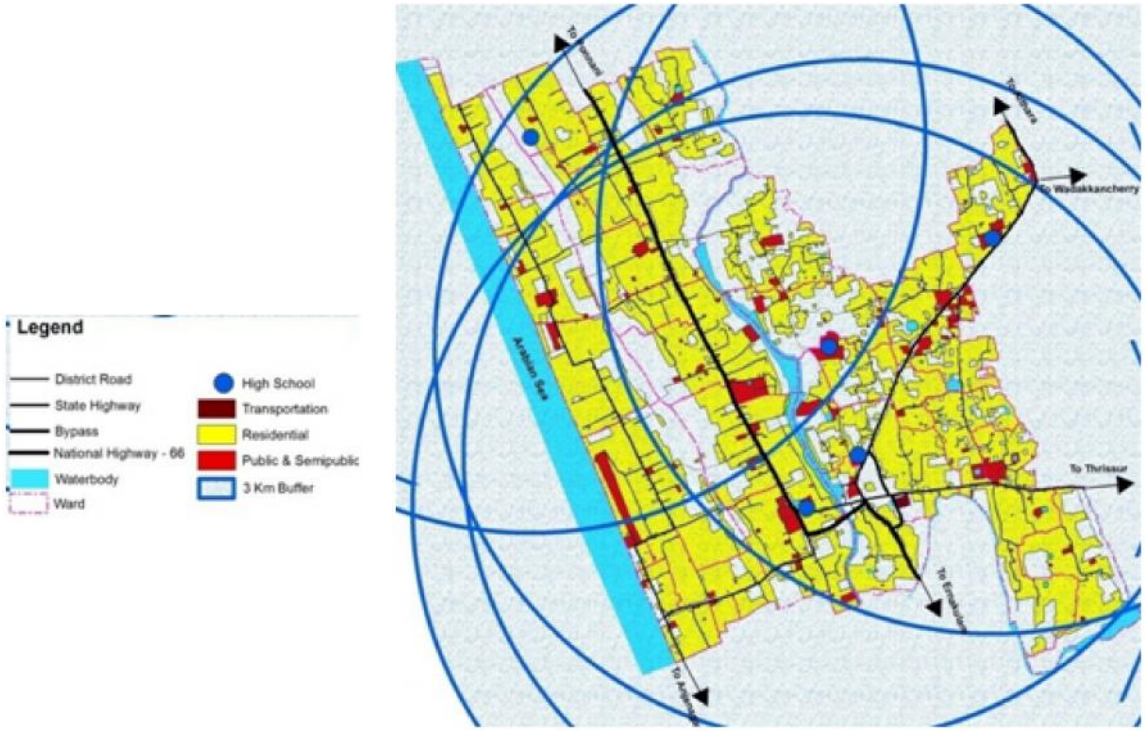


Fig. 15.9 Service area existing HS School

15.2 Higher Educational institution

In Chavakkad town there are no major higher educational institutions, in both professional as well as other fields of education. Students have to go out of the town to pursue higher education in the field of engineering, medicine, law or in any other discipline of study. There are sufficient numbers of institutions around Chavakkad. Amala medical colleges, Govt. medical college, Govt Engineering College, Vidya academy of engineering are to name a few. The figure 15.10 shows the location of higher educational institutions. Chavakkad has an easy access to Malappuram district so that the students can avail higher education from that area. There are several private colleges and computer institutions in Chavakkad town, in which a number of short term courses are being conducted and nearly 650 students are availing education from these centers. In addition to this nearly fifteen arts and science colleges are there under govt. and aided sector within a radius of 25 km from Chavakkad.

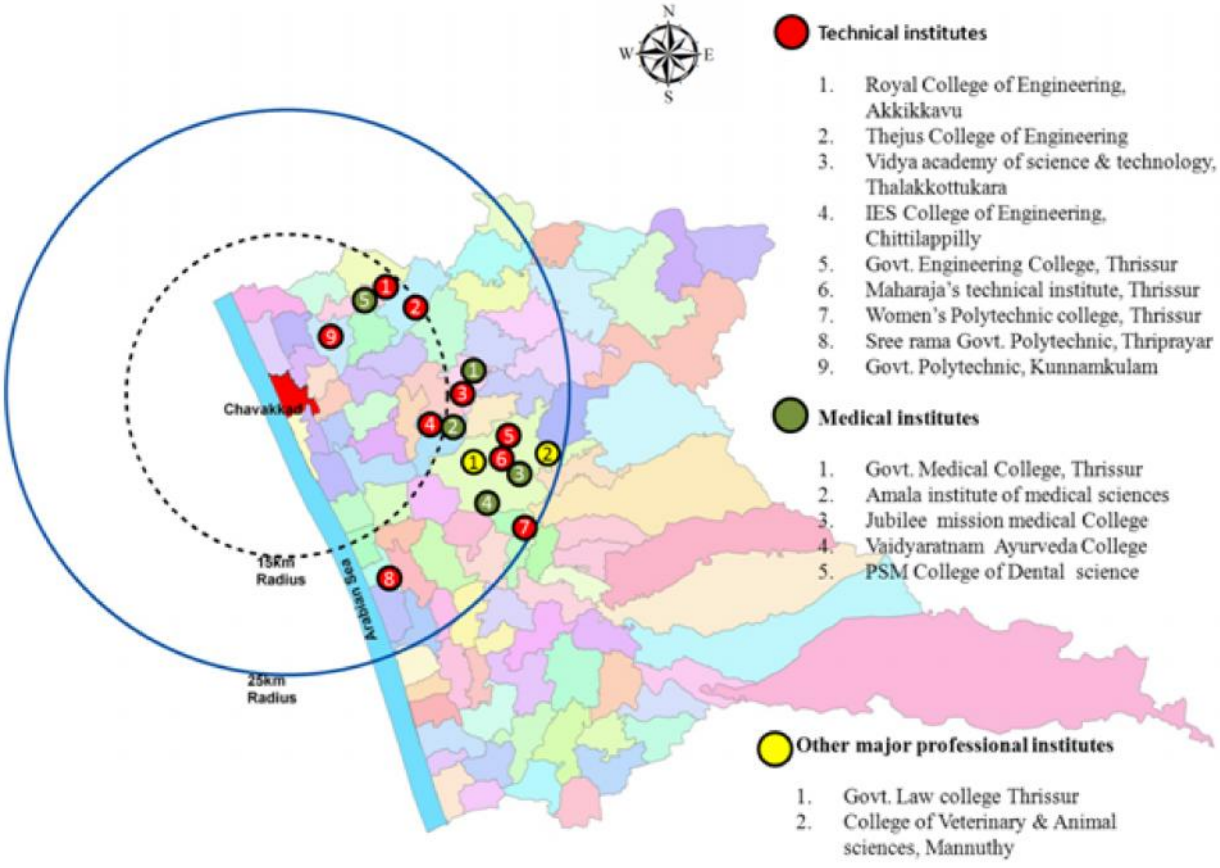


Fig.15.10 Location of higher educational institutions

15.3. Parallel Education Systems

At present three equivalent courses are conducted for people who lost their opportunity for formal schooling viz., IVth(Athulya), VIIth , Xth ("Saksharathathulyath Padamsahayi"). About 220 students are using this opportunity. This parallel education system helps to increase the literacy level of people.

15.4. Educational facilities as per planning standard

The educational facilities required as per planning standards are given in table 15.4

Table1 5.4 Planning standards

Sl. No	Category	No of students	Index	Required	Existing	Remarks
1	High school	700 students	1 HS for 13000 ppn	3	3	
2	Higher secondary	400 students	1 HSS with 8 div: for 13000 ppn	3	3	
3	Arts and Science college	500 students	1 Arts and Science college for 80,000 ppn	-	-	Available in surrounding areas
4	Professional college	250 students	1 Professional college for 2,50,000 ppn	-	-	Available in surrounding areas
5	Polytechnic College	150 students	1 Polytechnic for 36000 ppn	1	-	Available in surrounding areas
6	ITC/ITI	300 students	1 ITC/ITI for 35000 ppn	1	-	Available in surrounding areas
7	TTC	120 students	1 TTC for 120000 ppn	-	-	Available in surrounding areas

It is observed from the table that basic educational facilities available in the Town area are sufficient in quantitative terms. But in qualitative terms the facilities are seen below standard. Professional colleges are available in nearby areas of the Town. A polytechnic and ITI institution are essentially required in the town area as per planning standard. The number of VHSS institutions in town area has to be increased so that students are able to get technical education during the school time itself.

15.5 Problems and Potentials

Total literacy and female literacy of Chavakkad town is low when compared with the district and other urban LSGI's. 30 % of institutions are in government sectorwhich depends only 12.39 % of students due to lack of infrastructural facilities and basic amenities. As per planning standards, a polytechnic and ITI are required for town. There is no professional college in the town. But there are professional colleges in adjacent local bodies.

15.6 Inference

Total Literacy rate and female literacy rate of Chavakkad town is lower compared to district and among urban LSGIs. To equalize male and female literacy level, greater care has to be given for girl child education. The spatial distribution of educational institutions shows that up to primary level all people have access to education. Another revelation is that even though there exists sufficient number of institutions in Government sector, students largely depend on unaided sector. It can be improved by adding infrastructural facilities and basic amenities in government schools. For higher education especially in Science field, students have to depend on institutions outside town. Eventhough polytechnic and ITI are not in the town as per planning standards, it is available in the nearby areas.

CHAPTER 16

HEALTH

Any community requires a healthy population to take its development forward. In the present context this place faces threats of many communicable, non-communicable and life style diseases. The new trends in waste disposal systems, environmental pollution and cleanliness are posing severe threats which need to be attended to on a war foot basis. This chapter analyses the existing infrastructural status of the health sector in Chavakkad town.

16.1 Health – Existing scenario

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

16.1.1 Health indicators

Integrated Disease Surveillance Program (IDSP) enables the reporting of diseases on a daily basis. This gives an idea about the occurrence of various diseases in different parts of the district. It also enables to understand the pattern of diseases. The demographic indicators available at the district level are given in table 16.1.

Table 16.1 Demographic Indicators 2009-10

Health Indicators	Thrissur	Kerala
Life Expectancy	73	74
Infant mortality rate(1000 Population)	3.8	12
Postnatal Mortality Rate(PMR)	3.78	12
Maternal mortality rate(lakh live births)	53	110
Birth rate (1000 population)	17	14.6
Death rate(1000 population)	4.1	6.6
Total fertility rate(Children/Women)	1.7	1.7
Couple protection rate(%)	64	62.3
Sex Ratio (M/F)	1000/1109	1000/1084
Sex Ratio(M/F)0-6 years	1000/948	1000/959

Table 16.2 Block wise MMR & IMR

Sl No	Name	MMR 2009-2010(1000 live birth)	IMR 2009-2010
1	Chavakkad	1.1	12.1
2	Chowannur	0.33	1.5
3	Wadakkanchery	0	10.5
4	Pazhayannur	0.58	1.7
5	Mullassery	1.22	4.9
6	Puzhakkal	0.3	1.8
7	Ollukkara	0.19	1.9
8	Anthikkad	0	11.5
9	Cherpu	0	0.4
10	Mathilakam	0.76	10.7
11	Irinjalakkuda	0	12.6
12	Kodungallur	0	1.6
13	Vellangallur	4.61	20.7
14	Mala	1.09	9.8
15	Kodakara	1	7.5
16	Chalakkudy	0.43	6.9
17	Thalikulam	0	4

Source-Health department

This shows that the district itself is in a good position in comparison with the state and the country. The Maternal Mortality Rate (MMR) and the Infant Mortality Rate (IMR) available at the block level are consulted and is seen that both the figures are pretty good for Chavakkad block which lies adjacent to Chavakkad town. Block wise MMR and IMR are shown in Table16.2.

16.2 Health infrastructure-Existing Scenario

Chavakkad town has one Allopathic hospital and one Homeodispensary and one Ayurvedic dispensary in Government sector. Three hospitals and 18 clinics are there in private sector out of which 10 are in Allopathic system, 8 are in Ayurvedic system and 2 are in Homoeopathy system of medicine. The details are given in table 16.3. No medical facilities are available along coastal stretch and outer peripheral area. The locations of the hospitals in government sector are shown in the figure 16.1. It can be seen that all the facilities are concentrated towards the town centre.

Table 16.3 Hospitals in Chavakkad Town

Type of Hospital	No.of Hospital/dispensary	No.of Doctors	No.of Beds
Allopathic	10	43	258
Ayurveda	7	15	26
Homeopathic	4	4	0

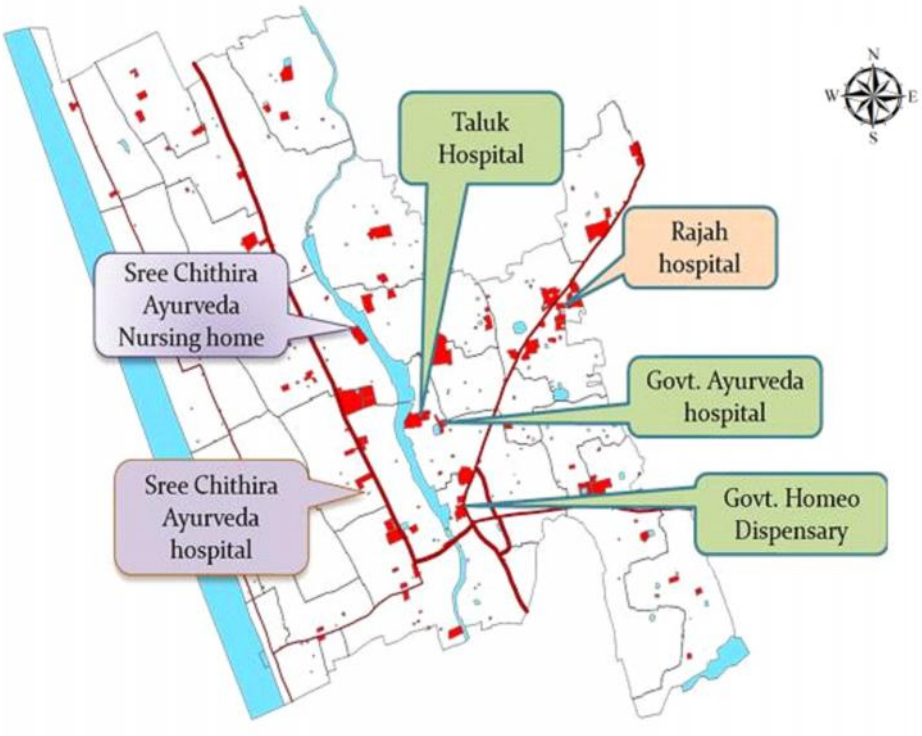


Fig16.1 Hospitals in Chavakkad Town

16.2.1Allopathic system of medicine

Taluk Hospital: -



The Taluk hospital functioning at Kozhikulangara, approximately 1 km from Chavakkad town was started as a local fund dispensary in this town in the year 1924, under Malabar District Board. It is one of the oldest hospitals in Chavakkad. About 39098 people, residing in Chavakkad town area and people in the surrounding Guruvayur town and 3 Panchayats namely Punnayur, Orumanayur and Kadappuram are benefitted with this hospital.

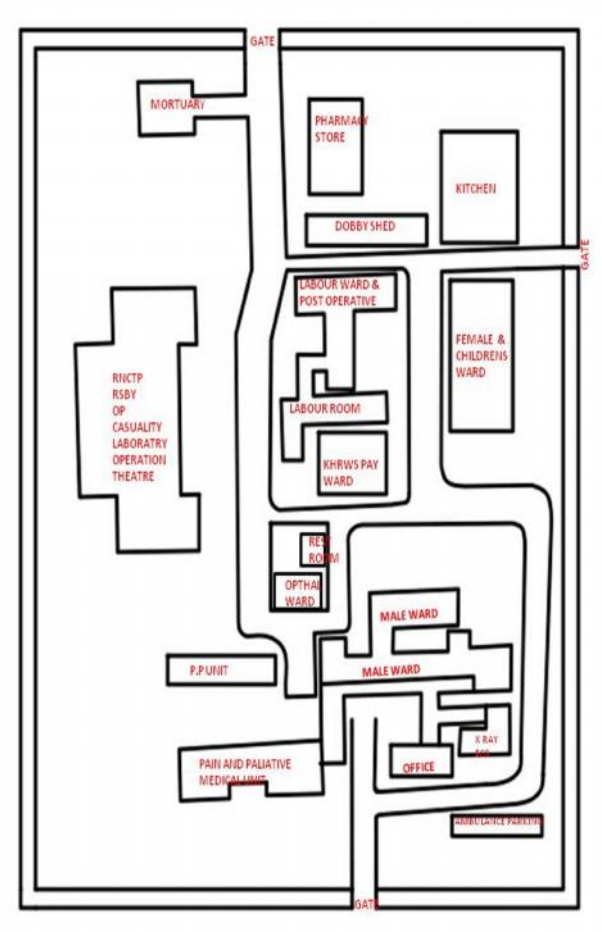


Fig 16.2 Layout of Taluk Hospital

Facilities such as operation theatres and ambulance services are available in the Taluk hospital. The buildings are very old and scattered around the hospital area. The access road to taluk hospital from NH 66 is very narrow.The taluk hospital junction is very congested with shop buildings and auto, taxi parking.Taluk hospital lack modern diagnostic equipments and infrastructural facilities. The layout plan of taluk hospital is as shown in figure 16.2. Ongoing projects are sewage treatment plant ,water purification plant and labour complex inside the taluk hospital.

Table 16.4 IP, OP details of Taluk Hospital

Year	Out patients	In patients
2011	203620	3422
2012	211640	3912
2013	230640	4525
2014	284360	4813
2015	326440	6832

Source-Direct Enquiry

Primary Health Centres:-

PHC is the first level of contact of the community with formal health care delivery system. The two PHCs are functioning in Chavakkad town area one at Manathala and other at Baby road. It can be seen that these are accessible from all parts of the town.

Private sector:-

In addition to the Taluk hospital, there is one private hospital- Rajah Hospital - with advanced diagnostic facilities. Also 8 clinics are functioning here. IP, OP details of this hospital is shown in table 16.5.



Rajah charitable hospital

Table 16.5 IP, OP details of Rajah Charitable Medical Trust

Year	Out patients	In patients
2011	128306	8197
2012	136971	84585
2013	152547	8583
2014	161716	8300
2015	160704	7401

Source- Direct Enquiry

16.2.2 Ayurveda systems of medicine.

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

16.2.3 Homeopathic systems of medicine

In addition to one Govt. Homeopathic dispensary which is working in the town building, three private homeopathic clinics are functioning in Chavakkad Town.

The comparison of medical institutions available in urban LSGIs of Thrissur district is shown in figure 16.3. From these details it is evident that Chavakkad town has basic facilities in health sector. Also it may be noted that in comparison ,Ayurvedic system of Medicine is having better facilities in Chavakkad town. Chavakkad residents can access all the higher treatment facilities within a distance of 25 km. Amala cancer research center and Medical college and Thrissur Medical college are to name a few.

As far as the waste disposal from hospitals is concerned, it is seen that the IMAGE agency at Palakkad collects the waste from hospitals for processing.

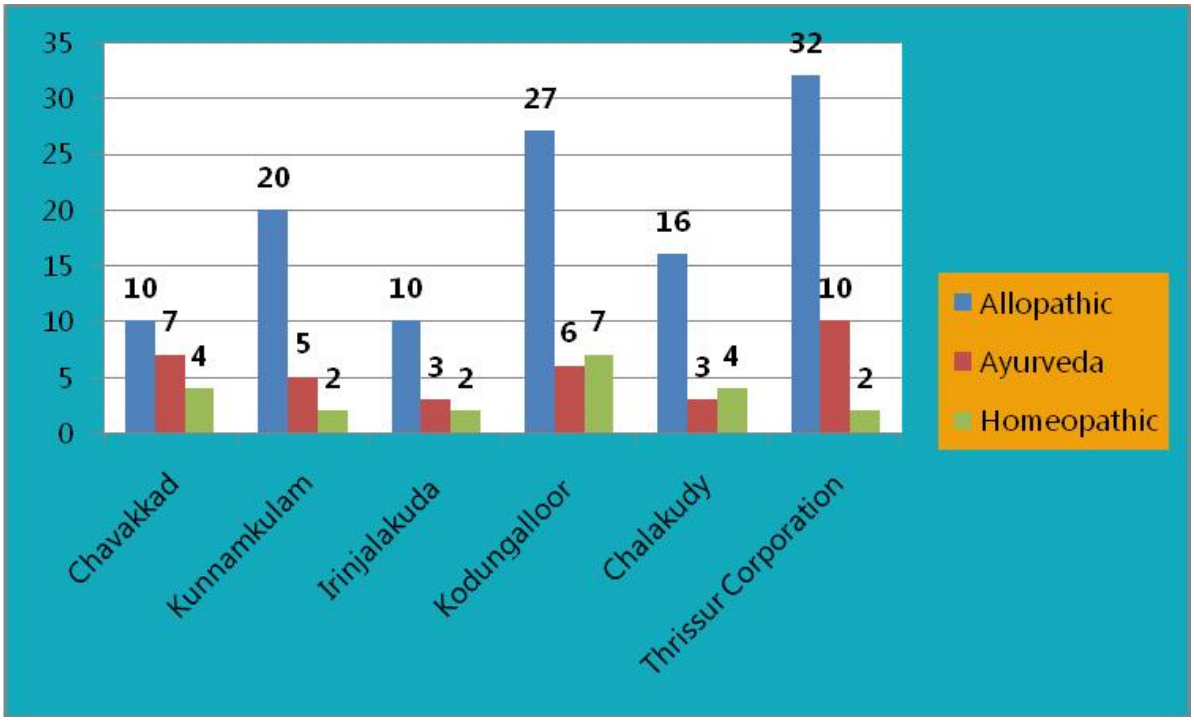


Fig 16.3 Comparison of medical Institutions

16.3 Traditional Medical treatment in Vallabhatta Kalari Kendra

In Vallabhatta Kalari Kendra several type of traditional treatments are available. Marmachikitsa is the treatment for the vulnerable parts of the human body. Uzhichil (complete body massage) is done by applying medicated oil to attain a healthy constitution, body flexibility and proper blood circulation."Chavutti Uzhichil" includes foot massages lasting 7 to 14 days during the Monsoon period which improves flexibility of the muscles and joints,

stimulate circulation and rejuvenates muscular and nervous system of the body and above all tunes up the practitioner's body to a right balance of muscular strength and flexibility. By Kizhi chikitsa a technique, swelling, blood clotting or rheumatic diseases are treated.





16.4 Vayomitram project

Vayomithram medical camp is organized with free medical treatment for citizen above 65 years old. The project also offers palliative care for patients and free ambulance services. The project has three exclusive help desks in Thrissur; one of them is functioning in Chavakkad town. Awareness should be created among the public regarding this programme.

16.5 Disease pattern

The table 16.6 shows disease pattern in Chavakkad Town, the data collected through socio economic survey conducted using a 10% sampling method regarding diseases. As per the socio economic survey data 3.16% of families are affected by Cholera, 0.28% of families are affected by Dengue, 8.25% of families are affected by chickun guinea, and 0.41% is affected by TB, 0.41% by Typhoid and 5.5% by Chicken Pox. Even a single case of Typhoid is an indication of poor sanitation. A lot of limitations and public health issues lead to the emergence of communicable diseases. They are mainly due to lack of drainage system and proper waste management system. The water logging in various areas also aggravate the situation.

Table 16.6 Disease pattern in Chavakkad Town

Type	Cholera	Dengue	Chickun Guinea	Hepatitis	TB	Typhoid	Malaria	Chicken Pox
Average % for the LSGI in each category	3.16	0.28	8.25	0.41	0.41	0.41	0	5.5

Source-Municipal office, Chavakkad

16.6 Planning standards

The planning standard as per the UDPFI Guidelines are given in table 16.7. As per the planning standards, health facilities are sufficient in Chavakkad Town area. On primary verification it can be seen that the infrastructural facilities available in the government institutions are not up to the mark and hence need to be improved

Table 16.7 Planning standards

Category	No. of Beds	Standard as per UDPFI	Required	Existing
General Hospital	500	1 for 2.5 lakh population	-	-
Intermediate Hospital (Category A)	200	1 for 1 lakh population	-	-
Intermediate Hospital (Category B)	80	1 for 1 lakh population	-	-
Poly-Clinic		1 for 1 lakh population	-	-
Nursing home, Child welfare and Maternity Centre	30	1 for 0.45 lakh population	1	1
Dispensary		1 for 0.15 lakh population	3	5

16.7 Silent zones

It is recognised through a recent directive stated in letter number E2-2634/2012(2) recognising silent zones in various Master Plans. The location of these hospitals and health centres are presently not recognised as silent zones and need to be modified accordingly.

16.8 Problems and Potentials

0.41% Typhoid is reported, which is indication of poor sanitation. As per UDPFI, planning standards basic medical facilities are available. The government hospitals and dispensaries do not have good infrastructural facilities, modern treatment of facilities and modern equipments. There are 3 Ayurvedic and 1 Homeo dispensary in the town.

16.9 Inference

From the analysis of the medical facilities available at Chavakkad, it can be seen that the basic healthcare facilities are sufficient. In the private sector only one hospital is functioning. As per the UDPFI requirements, town has sufficient health care facilities. But no medical facilities are available in coastal and outer peripheral area. It has to be ensured that government hospitals and dispensaries have good infrastructural facilities. At present, the biomedical wastes are collected by the IMAGE at Palakkad.

CHAPTER 17

RECREATIONAL FACILITIES

This chapter deals with the infrastructure facilities provided in the town for the safe and comfortable living of the residents. This covers housing sector, recreational facilities and other civic amenities. Recreation is an essential part of human life and finds many different forms which are shaped naturally by individual interests and also by the surrounding social construction. Recreation is an activity of leisure. Human spend their time in activities of daily living, work, sleep, social duties, and leisure, the latter time being free from prior commitments to physiologic or social needs, a prerequisite of recreation. Recreation is offered in passive as well as active ways. Active recreation facilities include stadium, playground etc. whereas passive recreation includes libraries, parks etc. Places of recreation, specialized institutions and clubs will provide new avenues for the residents to spend their leisure home for productive purposes chancing their capabilities as well as for special occasion like marriage, engagement etc.

17.1 Recreational infrastructure.

Recreation is difficult to be separated from the general concept of play, which is usually the term for children's recreational activity. According to land use-2013, Park and open space accounts for 0.15% in Chavakkad town area. Only one playground / open space is available in the town, i.e. the municipal ground in front of the civil station. As per municipal office records the land has an extent of 1 acre. No park facility is available here.

Blangad Beach

Blangad Beach is one of the main recreational facilities in the town which is situated in the western border. The length of beach is 2km. Chavakkad beach is counted as one of the Kerala's popular beaches. Stadium and Cinema hall facilities are not available in the town



Blangad beach

17.2 Civic amenities.

Community centers are public locations where members of a community tend to gather for group activities, social support, public information, and other purposes. Most of them are meant for the upper class of the society.There are three community halls within town namely Singapore Regency, T.M Hall and Municipality Hall. A new municipality community hall is constructed at Thiruvathra under IHSDP Scheme.



TM Hall

Libraries

Chavakkad has much to say in the field of art, sports and cultural activities. The Jai Hind Library and Reading room in Manathala which has a Government grand is the oldest of the sort in Chavakkad. A Municipal library is functioning inside the Municipal building. It has a collection of 9475 books. Beach library is near the Blangad beach. A new municipal Gramakulam library is constructed at Thiruvathra under IHSDP Scheme. Chavakkad Town is having 25 numbers of clubs.



Beach library

Theater/Auditorium

Presently there is no Theater/Cinema Hall in Chavakkad Town. Chavakkad Town has 4 Auditorium in which 3 is privately owned.

Table 17.1 shows the Recreational facilities of the town. Location of various recreational facilities is shown in figure 17.1.

Table 17.1 Recreational facilities in town

Sl no.	Facilities	Name/ Nos	Location/ward	Extent/capacity
1	Park	NIL		
2	Beach	Blangad	Ward XXIII	
3	Open(Play) ground	Municipal ground	Opposite civil station, Ward XXI	1 acre
4	Stadium	NIL		
5	Open air theater	NIL		
6	Community Hall/Town Hall	Singapoor Regency	Chettuva road,Chavakkad	300 persons
		T.M Hall	Thiruvathra	300persons
		Raja Hall	Muthuvettoor	1000persons
		Municipality hall	Chavakkad	100persons
7	Art Gallery	NIL		
8	Swimming pool	NIL		
9	public libraries	Beach library	Blangad	11317 books
		Municipal library	Muthuvettoor	12346 books
10	Cinema Hall	NIL		
11	Recreational Clubs	25 nos		

17.3 Ongoing schemes for Park & Open spaces

Parks, open spaces and recreational facilities are not sufficient as per planning standards. Now at Chavakkad beach, development projects are undertaken by District Tourism Promotion Council. By the completion of this project the facilities at beach will be developed to an extent. Table 17.2 shows the planning standards as well as facilities in the other civic amenities sector in the town.



Ongoing project for recreational Facility at Beach

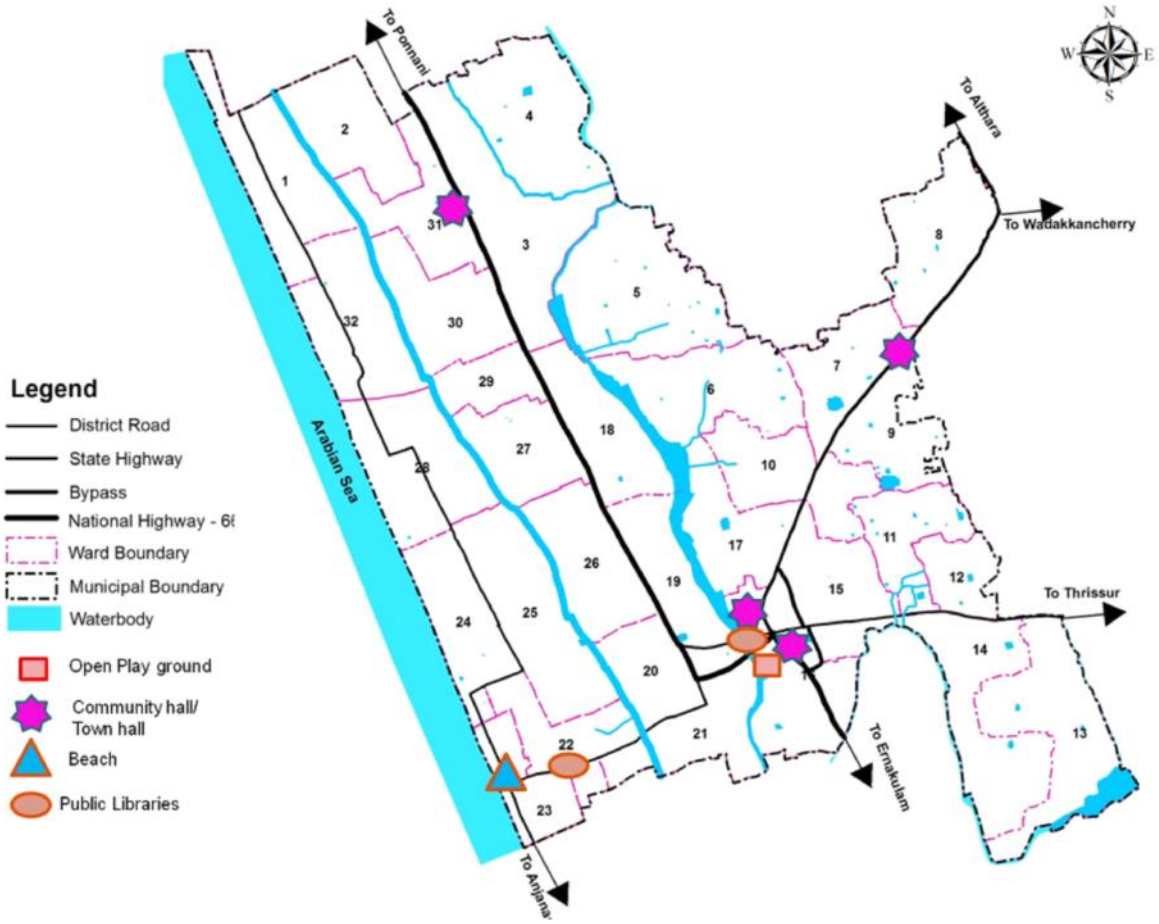


Fig. 17.1 Spatial Distribution of Recreational Facilities

Table 17.2 Details of Planning standards and facilities available in Chavakkad town

Category	Standard as per UDPFI	Required	Available
Community Room	1 for 5000 population	8	4
Community Hall & Library	1 for 15000 population	3	3
Recreational Club	1 for 1 lakh population	-	25
Music, dance, & drama centre	1 for 1 lakh population	-	-
Meditation & spiritual centre	1 for 1 lakh population	-	-
Socio-cultural centre	1 for 10 lakh population	-	-
Recreational space (Park &Open space)	1.4 - 1.6ha for 1000persons	0.54 sq.km	0.04sq.km

17.4 Problems and Potentials

Blangad Beach is one of the main recreational facilities in this Town and is counted as one of the popular beaches in Kerala. There is no park in Municipal area. Open grounds and play grounds are found insufficient.

17.5 Inference

On a detailed analysis of the recreational facilities it is evident that there is no park in the municipal area. In the same way open grounds and play grounds are insufficient. As per UDPFI planning guide lines, for a small town recreational space shall be provided at the rate of 1.4-1.6 ha/1000 persons, i.e. 0.54 sq.km of area is required here, But only 0.04 sq.km is available.

An analysis of civic amenities in the town reveals that the town hall is in a perishable condition, and a good children's library with a well collection of books related to child literature is absent. Facilities like community rooms/recreation clubs etc may be provided for creating a sense of social bonding among people. Swimming pool facilities can be made available by developing one of the ponds

CHAPTER 18

OTHER CIVIC AMENITIES

The other amenities of the town include police station, fire station, cremation ground etc. Each area must have these amenities to serve its growing population.

18.1. Police station



Chavakkad Police Station



Office of Police Circle Inspector, Chavakkad

As per UDPFI guidelines one police station is required for every 90000 population. Chavakkad town has a police station in which both Circle Inspector and sub inspectors offices are functioning in the same compound. Accordingly, the town is sufficient with one police station to maintain peace and order. Chavakkad police station situated at the centre of Chavakkad town very near to the Municipality building complex.

18.2. Fire station

As per UDPFI guidelines one fire station is required for two lakh population i.e. one fire station or sub fire station within 1to 3 km. Chavakkad town does not have a fire station. But the fire station located at Guruvayur town serves Chavakkad town and adjacent panchayats and hence planning standards has been satisfied.

18.3. Fuel stations

There are 4 petrol pumps in the core area of the town and one LPG godown in Chavakkad town. LPG Godown of Indian Oil Corporation is located near the hospital junction to cater to the

needs of 39098 people. As per UDPFI standards, one LPG Godown for 40000 populations is required, hence it meets the standard, but it will not satisfy the future population. There is one kerosene pump to face the needs of fishermen but currently it is not functioning. The details of the fuel station in the Chavakkad town are shown in the Table 18.1

Table.18.1 Details of Fuel stations

Name	Ward No	Location	Capacity
Indian oil	18	Manathala Bridge	60000 litres
HP	10	Hospital Junction	15 cent
HP	15	Near Bus stand	75000 litres/38 cents
BPCL	7	Muthuvattoor	10 cents
LPG Godown	10	Hospital junction	1 (Indane)

Source: Direct enquiry

18.4. Crematorium and Burial Ground

One Crematorium is functioning with in the Chavakkad town , owned by Municipality. It is situated along Dwaraka beach road having an area of 0.267 Ha. The figure 18.1 shows the spatial distribution of other Civic amenities.

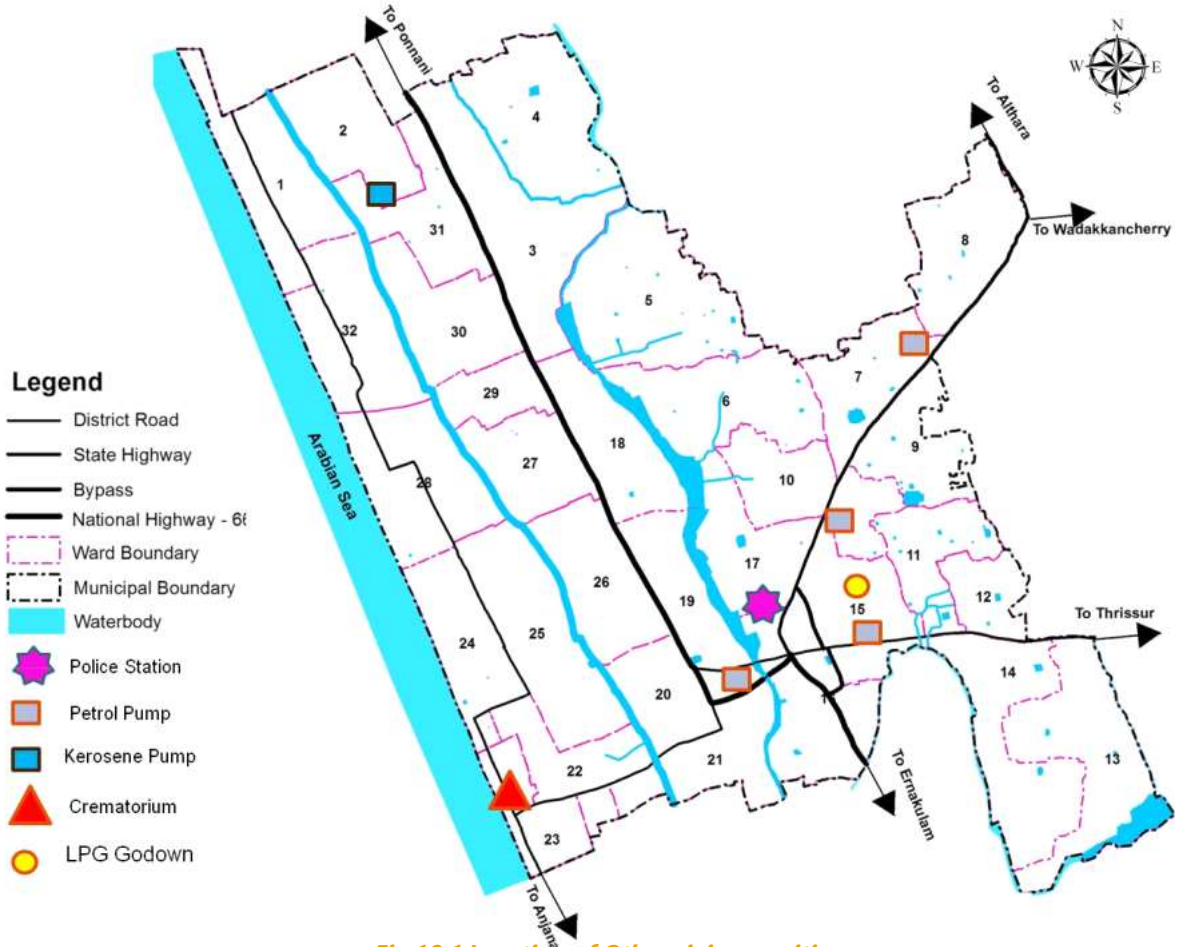


Fig 18.1 Location of Other civic amenities

18.5. Communication facilities

Communication facilities mainly include Post offices, telephone service, internet facilities and fax services. As per UDPFI guidelines one post office is required for 10000-15000 population. There are 2 post offices located in Chavakkad town which are Blangad and Palayoor, the servicing of two other post offices (Kuranjiyoor and Perakam) situated in Guruvayur town, which also serve some areas of Chavakkad town. BSNL is major service provider. There are 2 telephone exchanges in Chavakkad town. One is located at Muthuvatoor which owned by BSNL itself and other rented in Chavakkad bypass road.

18.6. Comfort Station

There are 3 comfort stations at Chavakkad town . One at Chavakkad Municipal bus stand with separate blocks for men and women and other two are at Municipal office and Blangad beach respectively. As per the norms, in markets, toilet and restrooms should be provided separately for female and male members maintaining cleanliness. Details of this are shown in table 18.2.Table 18.3 shows the planning standards as well as facilities in the other civic amenities sector in the town.

Table 18.2 Details of Comfort stations in Chavakkad town

	Maintenance/Managed by			
	Private	Public	Public-Private	Per/user
Public toilets in Nos	Nil	3 (1- Near Municipal office,1-bustand,1-blangad beach)	Nil	Rs .1
Users per toilet daily		500 person		
Average yearly expenditure		Rs 200000		

Table 18.3 Details of Planning standards and facilities available in Chavakkad town

Category	Standard as per UDPFI	Required	Available
Police Station	1 for 90,000 population	-	1
Fire Station	1 for 2 lakh population	-	-
LPG Godown	1 for 40000 population	1	1
Electric crematorium	1 for Large size town	1	-
Cremation Ground	1 for 5 lakh population	-	-
Burial ground	1 for 5 lakh population	-	-
Post office	1 for 15000 population	3	4

As per the planning standards, Chavakkad Town need an electric crematorium. Rest of the facilities are sufficient in the town at present situation, but should have more LPG Godowns to fulfill the needs of the future population.

18.7 Problems and potentials

Chavakkad town is sufficient with the police station, fire station etc. as per planning standards. Lack of Comfort station is one of the problems in the town. There are 3 comfort stations in town and it is not sufficient to meet the requirements. There is no electric crematorium with in the town.

18.8 Inference

An analysis of other civic amenities in the town reveals that the town is sufficient with facilities like police station, fire station and fuel station. Providing an electric crematorium, LPG Godowns and more comfort stations can improve the other civic amenities of the town.

CHAPTER 19

HOUSING

Housing generally refers to the social problem ensuring that members of society have a home in which to live, whether this is a house or some other dwellings, lodging or shelter. This chapter deals with the housing stock, shortage, conditions, the slums and the urban substandard areas in the town area

19.1 Introduction

Housing is not merely confined to the four walls which make a house but also all supporting infrastructure which are required to sustain the human beings in terms of physical and social infrastructure. The rapid increase of population and the evolution of family system have increased the need for housing in cities and towns.

19.2 Existing housing stock

In Chavakkad town there are 32 wards and town spreaded over an area of 12.59 sqkm in which 60.32 % town area i.e. 7.575 Sqkm is under residential area. The net population density of Chavakkad town is 3103. As per census 2011, Chavakkad town area has 8269 number of house-holds with an average size of household in 2011 is 4.73 and majority of houses are having decreasing trend in HH size reveals increasing trend towards nuclear family. About 59.83 % houses are pucca and only 16 % live in kutcha and huts. Almost 24.35% of houses are moderate houses. Spatial distribution of different types of buildings are given in Fig 19.1

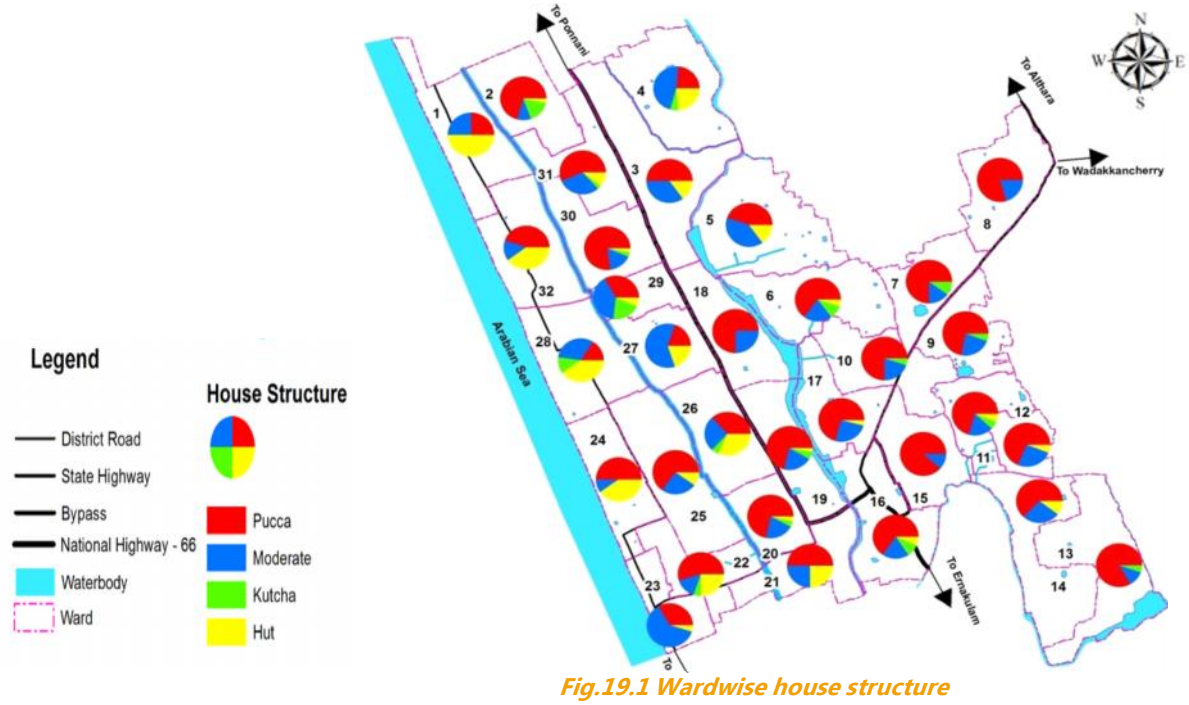


Fig.19.1 Wardwise house structure

Land Tenure

Land tenure reflects the relationship between people and land directly. Details of operational holdings of town are shown in Table 19.1

Table.19.1 Details of operational Holdings of Chavakkad Town

SC		ST		OTHERS		INSTITUTIONAL		TOTAL	
No.of Holdings	Area of Holdings	No.of Holdings	Area of Holdings	No. of Holdings	Area of Holdings	No.of Holdings	Area of Holdings	Holdings	Area of Holdings
61	407	---	---	1330	30589	4	283	1395	31279

Source: Census 2011

As per census 2011, 90.7% have their own land for housing. Table 19.2 shows the ownership status of Chavakkad town

Table.19.2 Ownership status of Chavakkad town

Own	Rented	Any other
90.7	8.1	1.2

Source: Census 2011

As per census 2011, number of households with conditions of census house is shown table 19.3. A 'Census House' is a building or part of a building used or recognized as a separate unit because of having a separate main entrance from the road or common courtyard or staircase. It may be occupied or vacant. It may be used for a residential or nonresidential purpose or both.

Table.19.3 Number of households with condition of Census House

Residence			Residence cum other use			Total		
Good	Livable	Dilapidate	Good	Livable	Dilapidate	Good	Livable	Dilapidate
59.9	33.2	6.5	0.1	0.2	0	60	33.4	6.6

Source: Census 2011

19.3 Housing shortage

There are 8269 households in Chavakkad town and at present total number of houses in the town are 10102 and all are owned or otherwise given for rent. The data shows that number of houses in the town is more than the households, hence it is assumed that there may be a chance of more than one house owned by some of the high/middle income group population. As per socio economic survey, it reveals that 95.32% have their own houses and about 4.68% of the total population lives without own house. Such people lives either in rented houses or in unauthorized substandard houses. Figure 19.2 shows the details of range of plot area of the house owners. This is also obtained from socio-economic survey.28% of the people fall in the category of 6-10 cents. Majority of the people (89.68%) have plot sizes less than 25 cents. The plinth area details of houses are given in Figure 19.3.

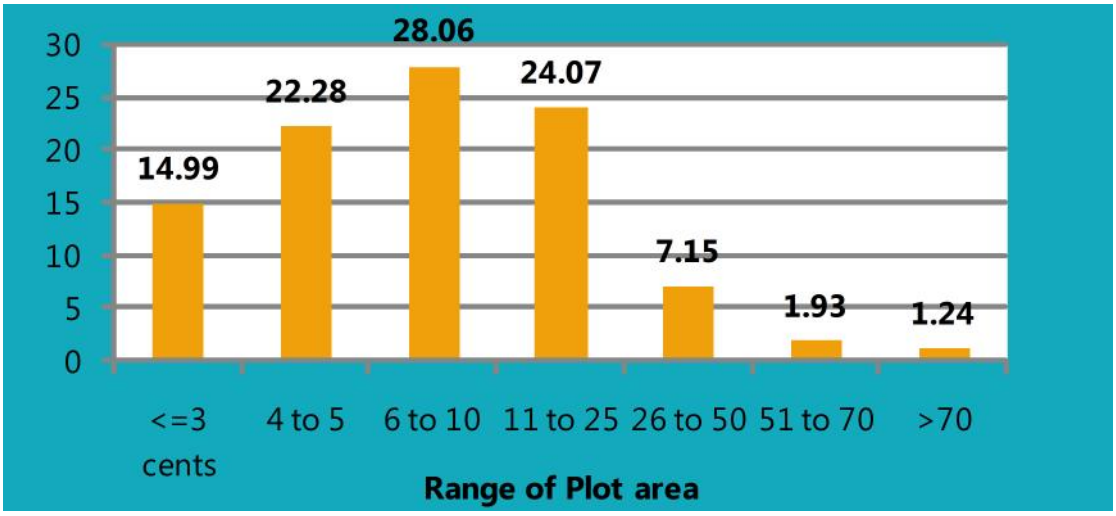


Fig. 19.2 Variation of plot area

Source: Socio economic survey, 2012

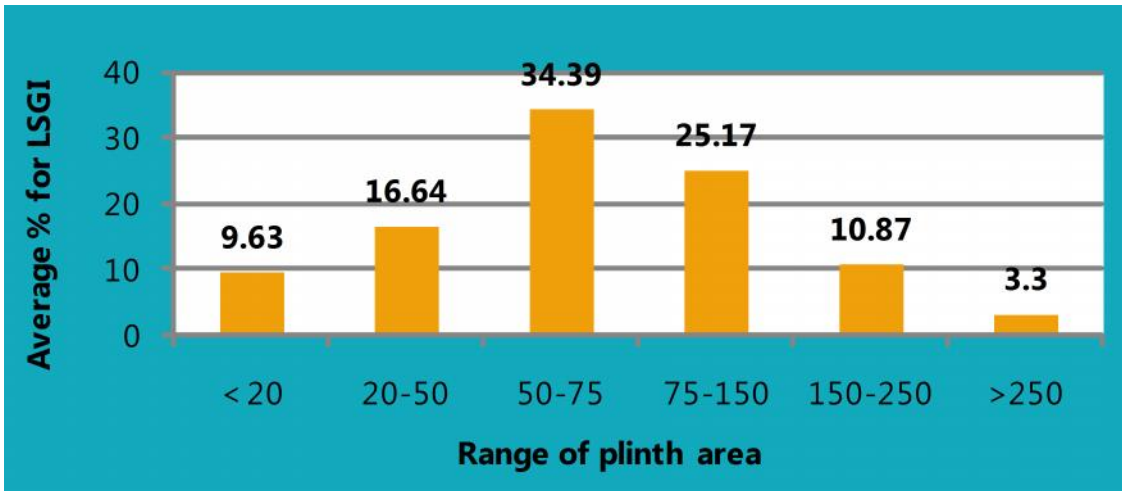


Fig 19.3 Variation of plinth area

Source: Socio economic survey, 2012

As per census 2011, type of housing structure is classified as permanent, semi-permanent, total temporary, serviceable, non-serviceable and unclassifiable based on the type of material use in construction of wall and roof. Type of structure are shown in Table 19.4, 19.5 & 19.6 variation of different types of roof and wall respectively.

Table.19.4 Variation of different types of Structure

Permanent	Semi permanent	Total Temporary
77.7	8.1	13.9

Source: Census 2011

Table.19.5Variation of different types of roof

Type of Roof	Grass/ Thatch	Hand made Tiles	Machine made tiles	Burnt Brick	Stone/ Stale	G.I. Metal/ Asbestos	Concrete	Any other Material
Percentage	17.3	4.2	19.8	0.3	0.3	0.4	57.5	0.1

Source: Census 2011

Table.19.6 Variation of different types of wall

Type of Wall	Grass/ Thatch	Mud/ Unburnt	Wood	Stone not packed	Stone Packed	G.I Metal	Burnt bricks	Concrete	Any Other Material
Percentage	13.2	5	0.3	10.6	54.2	0.1	14.1	2	0.3

Source: Census 2011

Figure 19.4 shows Households by types of structures of Chavakkad town on the basis of materials of roof and wall.

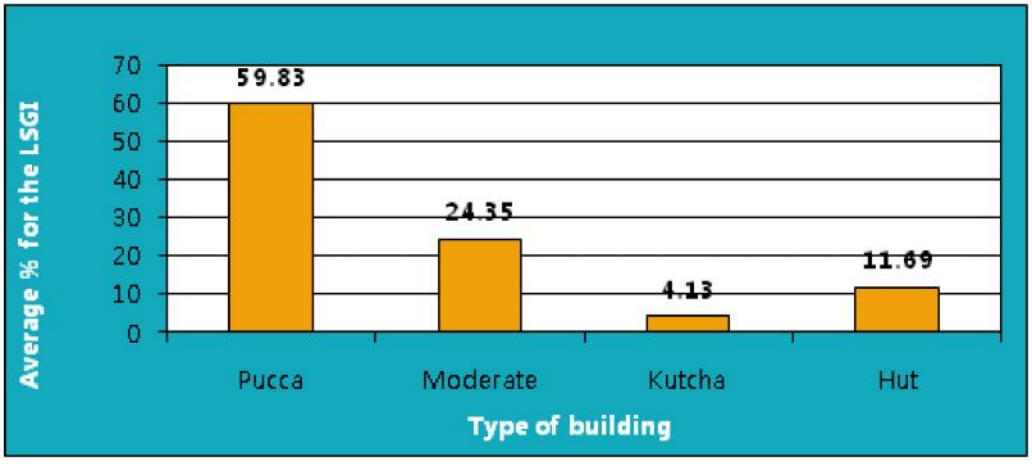


Fig 19.4 Types of structure

Source: Socio economic survey, 2012

As per Census 2011, the total number of temporary houses is 13.9% of the total number of houses i.e.

10102*13.9%=1404 Nos

Hence the No. of Houses to be replaced=1404 Nos

In addition to this, it is assumed that around 50% of the semi permanent has to be replaced by horizon period 2031 i.e. (10102*8.1%) 50%= 409 Nos

19.4 Slums and other sub-standard housing

The integrated Housing and Slum Development Project (IHSDP) is a scheme undertaken by the town tackle the problems in a holistic way adopting a multi-pronged approach of improving the living condition and enabling construction of affordable housing for slums. The objective of the scheme is to provide basic services viz solid waste management, water supply, improvements of slums, construction and improvements of drains/ storm water drains, sewerage, drainage, street lighting etc to the urban poor in the cities covered under this mission. The details of slums covered under IHSDP in Chavakkad Town are given in Table 19.7.

Table 19.7 Slums developed under IHSDP

Name of Colony	Ward	Area (acre)	Population	Households				Sanitation Facility	Water Connection
				Dilapidated	Renovation Required	Habitable Condition	Total		
1.Thiruvathra	2	1.54	106	10	3	4	17	13%	Tw+Mc
2.Gramakulam	2	0.93	82	10	5	2	17	60%	Tw+Mw
3.Edappully	11	1.40	98	8	9	7	24	100%	Ow+Cw
4.Four cent	12	0.63	79	4	3	8	15	60%	Ow+Mc
5.Vanchikadavu	16	0.82	84	15	1	0	16	100%	Tw+Ow+Mc
6.Pazhayanadapalam	18	1.10	119	9	11	0	20	10%	Ow+Mc
7.Pallithazham	20	2.90	174	41	6	0	47	93%	Tw+Ow

TW - Tube well, MC- Municipal connection, OW - Open well, CW- Common well

Source: Chavakkad municipality

Seven colonies are being developed under this scheme. After the partial fulfillment of the IHSDP project, infrastructural facilities like access roads, sanitary waste disposal facilities, street lights etc. of these areas are improved. IHSDP project had completed in the year 2016. The location of these colonies is shown in figure 19.5.

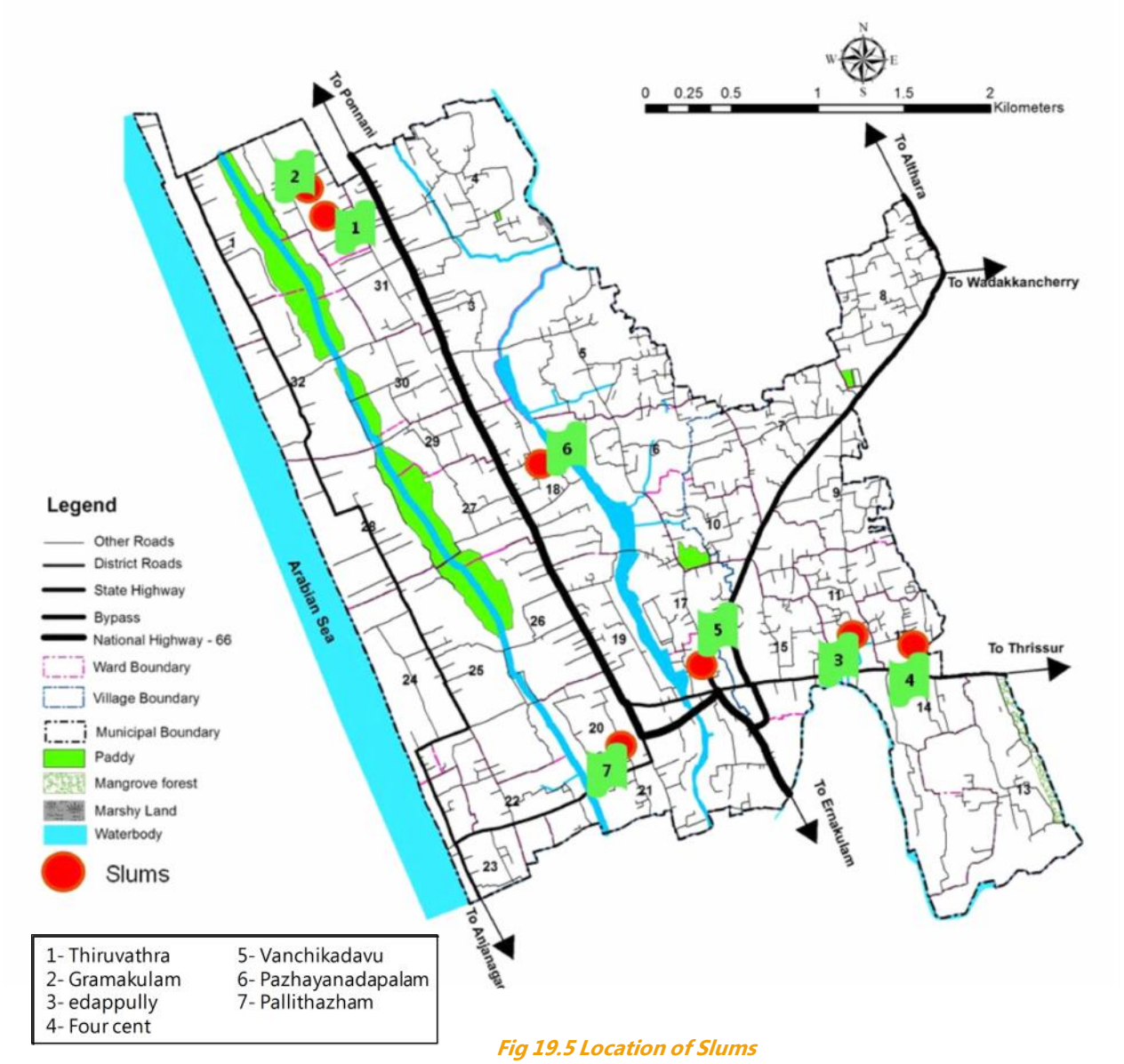


Fig 19.5 Location of Slums

Substandard housing is the type of housing that does not meet the standards of living of people. These standards usually deal with how safe the dwelling is for people to live. Substandard housing is a serious issue. Unfortunately, the number of people living in the slums or substandard housing is increasing. The Figure 19.6 shows the Concentration of Substandard houses, the coastal area shows more concentration.

One of the reasons is the lack of economic opportunities in rural areas that forces people to move into the cities. They move to the cities that are already dealing with issues of overcrowding, shortage of infrastructure and high cost of living. This forces them to seek shelter in slums. Improving substandard housing should be given priority for keeping world healthy and safe . According to Socio Economic Survey 2013, 16% of the houses are found as substandard houses.

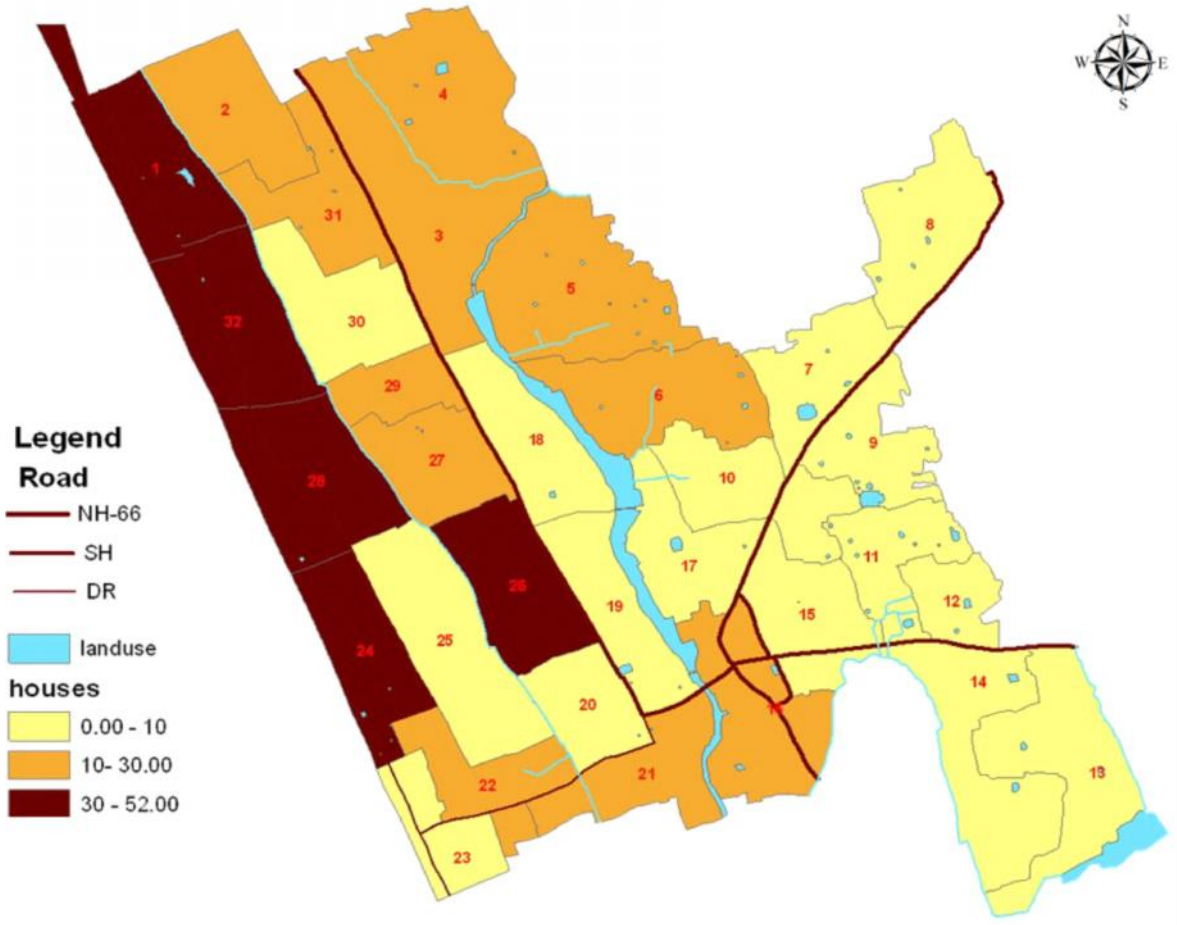


Fig.19.6 Concentration of substandard houses

19.5 Problems and Potentials

Almost 60.32 % of the total land in the town is residential use. The demand for housing is increasing with time, which is clearly reflected in the change in habitation pattern. There exists shortage of housing in the town, the land available adjacent to the core area can be made use for that. The issues related with slums and other colonies are discussed the next chapter. The coastal area shows more concentration of substandard houses.

19.6 Inference

Planning intervention is required to arrest the uncontrolled development activities in the core area as well as in the hinterlands, so as to ensure agro-oriented, sustainable planned development and to evaluate the issues related to the poor housing condition in the town.

CHAPTER 20

SPECIAL CONCERN AREAS

Every human community comprises of people of all caste, status, and social background. Certain groups need consideration to bring them forward. There is so much support system already imparted by the constitution of India. Even after all these efforts, there are people who require a support to move along.

This chapter analyses the status of socially backward and the below poverty line (BPL) families in the town area. Each planning area is unique in it and has got areas of special concern that demands attention; physically, economically and socially. In this chapter the special areas of concern for the planned socio economic development of the town is discussed.

20.1 Introduction

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

20.2. Existing scenario

20.2.1 Social Backwardness & Poverty

Poverty is often concentrated in certain segments of the society, generally defined by region age or social group. Socio economic equalities between place and people have sharpened over the years. In fact, poverty amid plenty is the world's greatest challenge. Social backwardness of Chavakkad Town is analyzed on the basis of following parameters

- BPL Household
- Scheduled caste and Scheduled tribe population concentration and literacy rate
- Spatial distribution of scheduled caste and scheduled tribe colonies

20.2.1.1 BPL Household

The Below Poverty Line (BPL) is an economic benchmark and poverty threshold used by Government of India to indicate the economic backwardness and to identify individuals and households in need of government assistance. Kerala is one of the states that had formulated its own criteria. In Kerala, there are nine parameters taken, and a family that lacks to four or more parameters is classified as BPL (Table 20.1). Ward wise BPL households are shown in Table 20.2.

Table 20.1 List of parameters for classification of BPL

SL No	Parameters
1	No land or less than 5 cents of land
2	No house or dilapidated house
3	No sanitary latrine
4	Family without colour television
5	No regular employed person in the family
6	No access to safe drinking water
7	Women headed household or presence of widows or divorcee
8	SC and ST
9	Mentally retarded or disabled member in the family

The economic status of the BPL population is evaluated based on the occupational structure and average annual income of BPL population. The BPL survey conducted during 2009 reveals that the BPL population is mainly employed as coolie and 3569 families comes under

below poverty line. This is about 43.16% of the total households in town area. The BPL concentration of families in the town is given in figure 20.1.

From fig 20.1 it can be seen that BPL families are more in wards 1, 2, 22, 25 and 29 which are located along the coastal areas. The substandard housing areas are also concentrated along the coastal area. This may indicate that the BPL families are mostly living in substandard housing areas. The distribution of substandard housing area as revealed from the substandard housing area survey is shown in figure 20.2.

Table 20.2 Ward wise number of BPL Households

Ward No	Ward Name	No. of BPL House holds	Ward	Ward Name	No. of BPL House holds
1	Puthenkadappuram North	231	17	Kozhikkulangara	76
2	Gramakkulam	195	18	Manathala North	121
3	Thiruvathra North	100	19	Civil Station	50
4	Kunjeri	71	20	Manathala	51
5	Punna North	171	21	Blangad	101
6	Punna South	91	22	Medekkadavu	210
7	Alumpadi	94	23	Blangad Beach	60
8	Mammiyur	83	24	Dwaraka Beach	110
9	Muthuvattoor	55	25	Pulichirakkett West	134
10	Ovungal	109	26	Pulichirakkett East	132
11	Palayoor North	87	27	Parappilthazham	104
12	Palayoor East	73	28	Puthenkadappuram South	175
13	Palayoor South	67	29	Kottappuram	88
14	Palayoor	68	30	Puthiyara	87
15	Palayoor West	160	31	Thiruvathra	131
16	Chavakkad Town	75	32	Puthenkadappuram	102

Source: Municipal office, Chavakkad

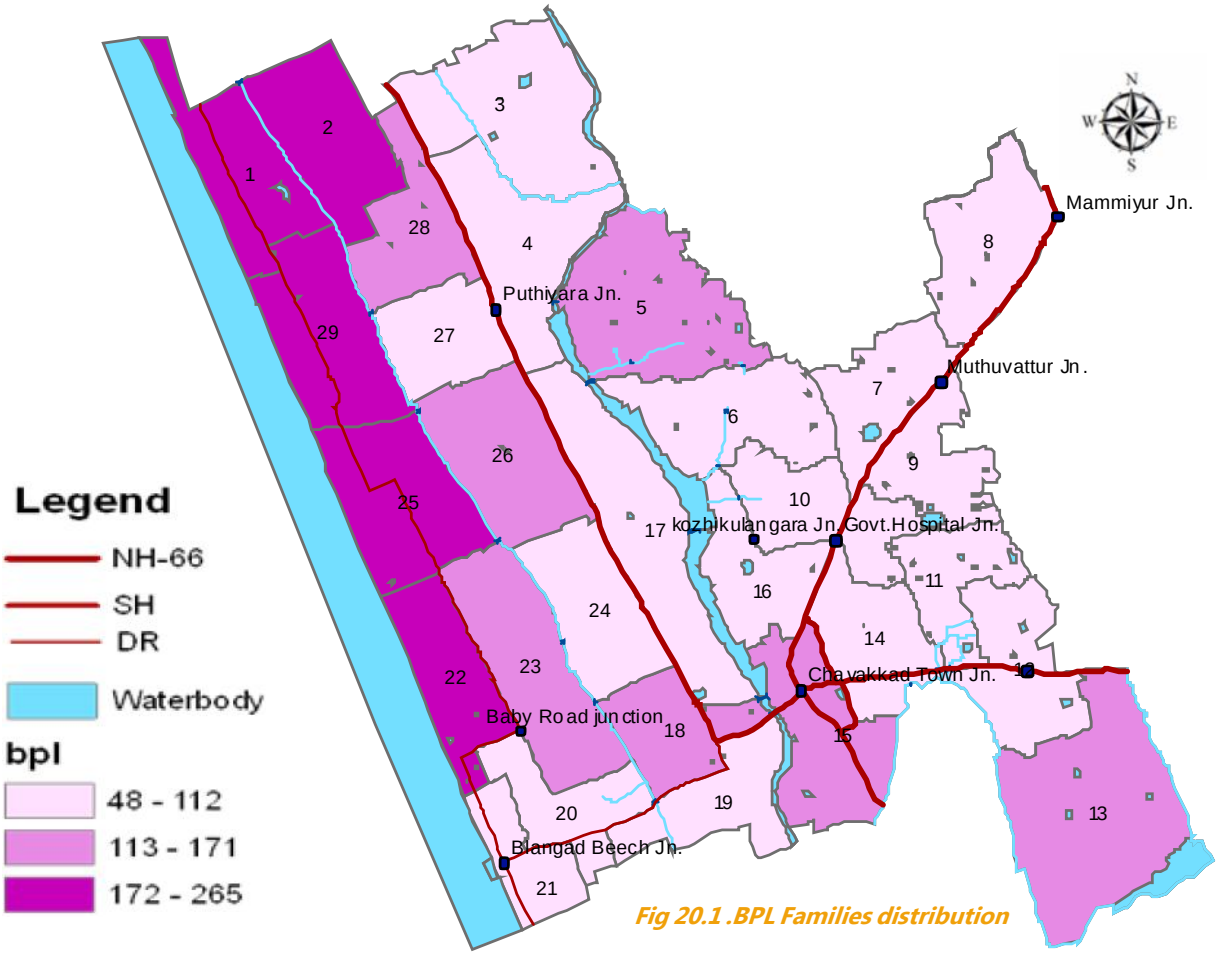


Fig 20.1 .BPL Families distribution

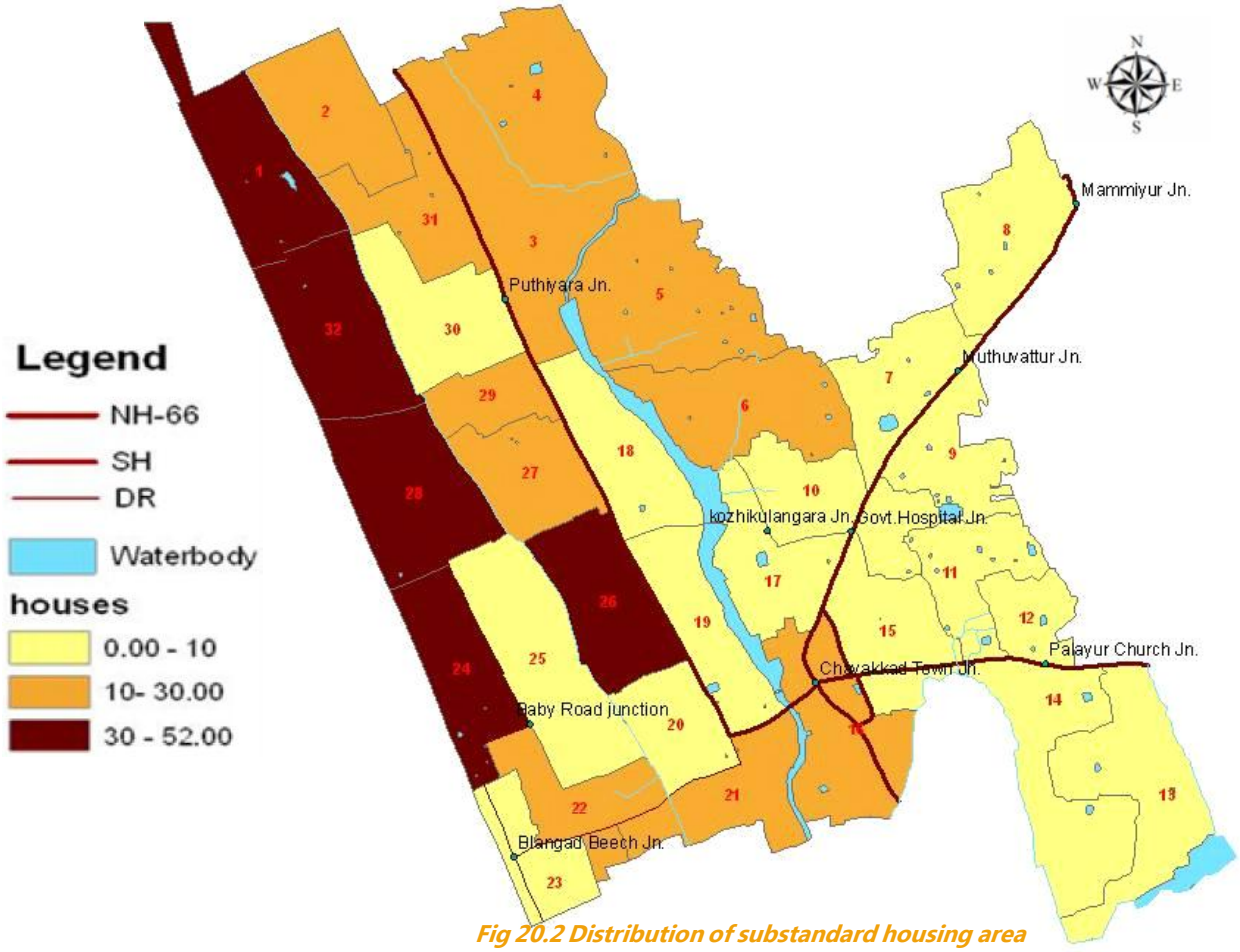


Fig 20.2 Distribution of substandard housing area

20.2.1.2 Scheduled Caste/ Scheduled Tribe

As per 2011 census, SC and ST population of Chavakkad town area is 883 and 58 .As per the list from municipality; there are 318 SC/ST families which constitute 3.85% of total households. Scheduled castes are concentrated mostly in wards 5,7,8,9,10,11,13,15,19 and 23. Lower concentrations are in wards 21, 22, 27 and 28. (Figure 20.3,Table 20.3)

A comparison of the figures 20.1, 20.2, 20.3 reveals that SC/ST families are not showing a backward areas . As per socio economic survey, percentage of SC/ST families is 10.87% where SC families is 10.04% and ST families is 0.83%. (Figure 20.4 shows the wardwise population of the ST Population) Table 20.4 shows the Details of Infrastructural facilities of the Slum.

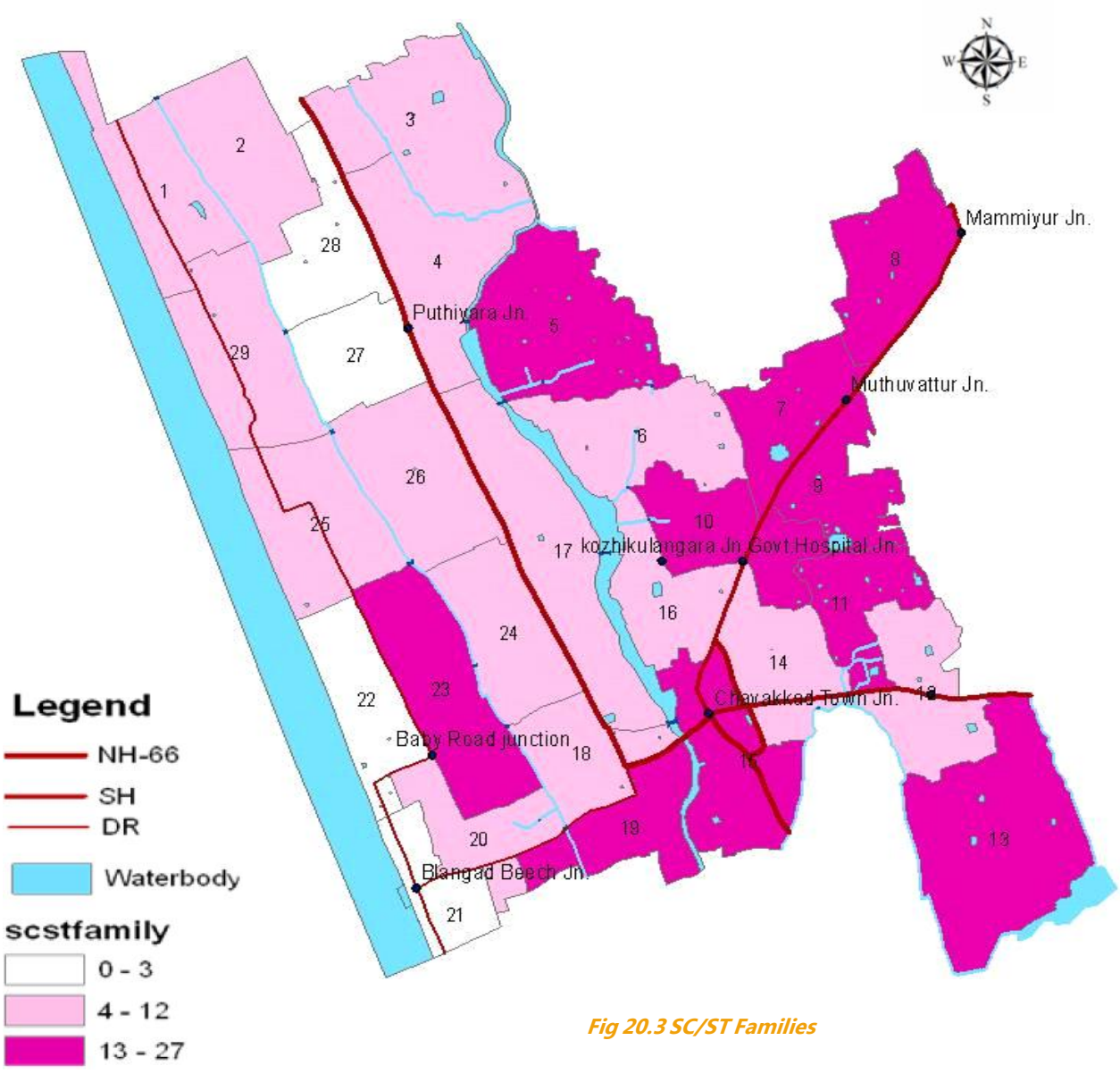


Fig 20.3 SC/ST Families

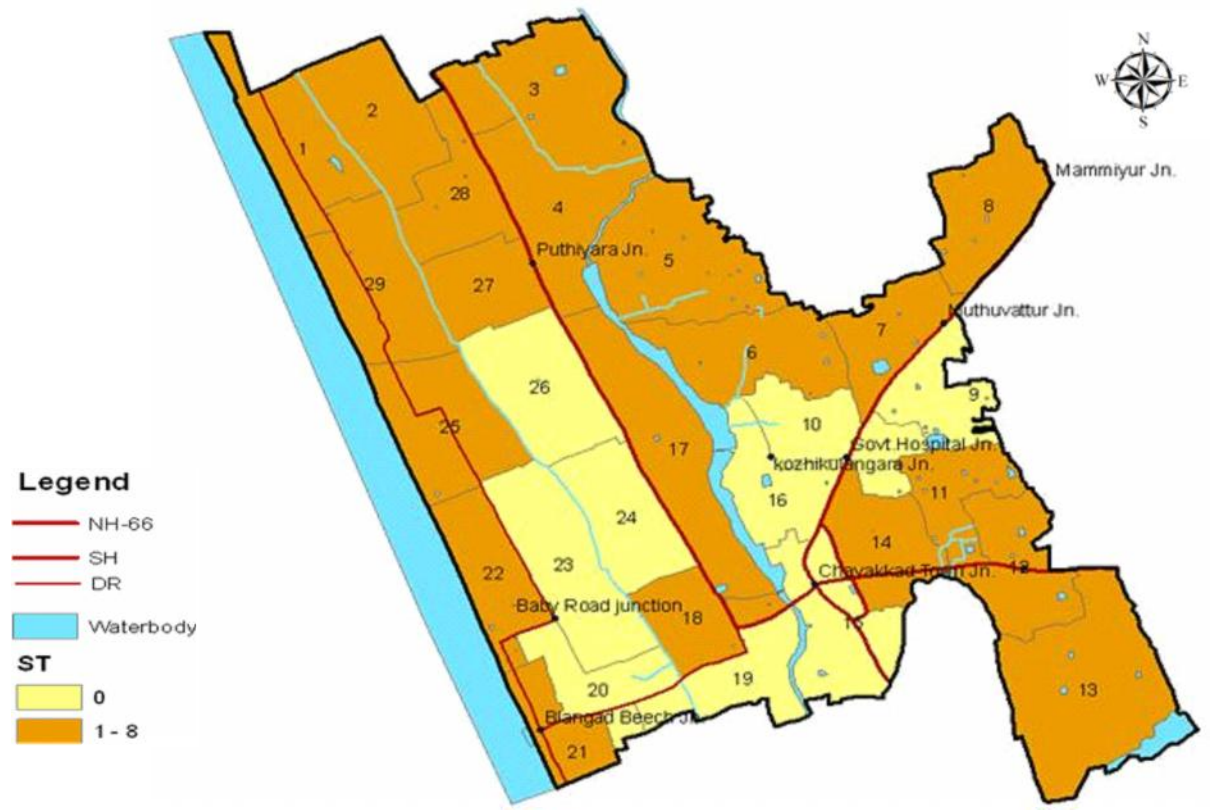


Fig 20.4 Wardwise population of ST

Table 20.3 Details of SC colonies

Sl.No	Item	Nos
1	Total No. of Sangetham	30
2	Total No. of families	213
3	Total male ppln	1279
4	Total female ppln	1335
5	Total ppln	2614
6	Toilet facilities not available	30
7	Piped water connection	106
	Fully	14
	More than 6 months	19
	Less than 6 months	73
	Scarcity	23
8	Not electrified	31
9	No Street light facilities	11
10	No.of landless and houseless families	10

Source: Municipal office, Chavakkad

Table 20.4 Details of infrastructural facilities of SC colonies

SL.No	Name of SC Colony/Sangetham	Housing Condition			
		Pucca	Semi Pucca	Kutcha	No of Households without Toilet
1	Thiruvathra-chiramam kunnu	0	0	5	1
2	Thiruvathra-puncheri	6	6	1	3
3	Punna- mookkola	5	5	2	3
4	Alumpadi	5	6	4	1
5	Thupratt	5	4	1	0
6	Kozhikkulangara vailithrara	8	7	2	0
7	Madappully parambil-1	6	6	1	0
8	Madappully parambil-2	2	1	4	0
9	Edappully	7	7	1	2
10	Palayoor (4 cent)	2	5	0	2
11	Thekkan Palayoor	4	5	1	0
12	Peringadan	2	2	4	4
13	Thekkanchery Harbour	4	5	0	0
14	Chavakkad Thekkanchery	2	8	1	1
15	Cheguvera	7	9	0	1
16	Kozhikkulangara Manappatt Parambu	5	6	1	3
17	Kadavu	5	5	0	0
18	Chapparambu Thazhan	5	5	0	0
19	Madekkadavu-1	6	5	3	0
20	Madekkadavu-2	2	2	2	0
21	Poliyedath	6	4	3	1
22	Bhagavathy Parmbu	9	6	4	0
23	Thamarath	4	5	0	0
24	Kuttoth	1	4	1	0
25	4 cent	2	7	0	0
26	KP Valsalan Road	6	8	4	2
27	Mathikayal Theeram	2	4	3	6
28	Parappil	4	5	2	0
29	Valiparambu	4	4	5	0
30	Gramakulam	5	3	4	0

Source: Municipal office, Chavakkad

20.3 Poverty Alleviation Programmes

Urban Poverty alleviation involves:

(i) upgrading the physical environment in poor settlements by providing basic services such as water, sanitation, waste collection, storm drainage, access roads and street lighting;

(ii) regularizing security of land tenure and housing; and

(iii) Instituting a social support program focused on promoting sustainable livelihoods through the accumulation of natural, physical, human, social, financial as well as institutional and knowledge/information assets.

20.3.1 Major Poverty Alleviation Interventions

Centrally Sponsored Schemes (CSS) are schemes that are implemented by state governments of India but are largely funded by the Central Government with a defined State Government share. The details of centrally sponsored scheme in Chavakkad Town is shown in table 20.5 Presently, Chavakkad town has no schemes in progress.

Table 20.5 Details of Centrally Sponsored Schemes in Chavakkad Town

Name of Scheme	Year(started)	Year(Completed)	Allotment	Status
NSDP	1999	2002	8713365	No schemes are in progress
VAMBAY	2001	2008	15080000	
SJSRY	1997	2004	11878243	
IHSDP	2006	2016	16998870	Completed

Source: Municipal office, Chavakkad

20.3.2 Urban Poor programs in Chavakkad

Kudumbsree/UPA cell functions in Chavakkad Town also. There are 261 'Ayalkootam' including 4618 families. Details of Urban women self helping Programme (UWSP) is shown in table 20.6

20.4 Social Security & welfare women and child development

Social security is primarily a social insurance program providing social protection or protection against socially recognized conditions, including poverty, old age, disability, unemployment

and others. Women, children, disabled and the aged are the most vulnerable sections of our society for historic and social reasons. Accidents and Crime data of Chavakkad Town for the year from 2011 are shown in table 20.7

Table 20.6. Details of Urban Women Self Helping

Type of Unit	No. of Units	Type of Unit	No. of Units
Dairy Farming	7	Tailoring Unit	6
Beef Farming	18	Crasy Unit	2
Goat Farming	112	Kopra Unit	1
Café Sree	1	Computer Unit	2
Canteen	5	Kerala Drum Production(Chenda)	1
Total			155

Source: Municipal office, Chavakkad

Table 20.7 Details of Accidents and Crimes in Chavakkad Town

Sl.No	Name	2011	2012	2013	2014	2015
1	Theft	8	8	5	8	13
2	Cheating	32	25	27	20	23
3	Violence against women	3	4	6	6	6
4	Murder	4	4	3	4	7
5	Accidents	226	398	641	344	528
6	Criminal cases	142	224	1075	507	229
7	Other cases	52	22	40	40	38

Source: Police Station, Chavakkad

20.4.1 Social Welfare programmes and infrastructures

Social welfare schemes are introduced with the objective of benefiting various marginalized sections of the society. There are many schemes in place with central and state assistance. These schemes give ample support for aged, handicapped or orphan people, by way of pension provisions, insurance coverage and other benefits. For securing the lives of the poorest of the poor families, the Government of Kerala has introduced the social Security Pension Schemes. Currently 7 types of Social Security Pensions are being distributed through local bodies.

The types of pensions are Agriculture Labour Pension, Destitute Pension, Widow, pension, Old age pension, disability pension etc. The details of pension schemes and number of beneficiaries and amounts in Chavakkad Towns are shown in Table 20.8.

Table 20.8 Details of Social welfare Programmes in Chavakkad Town

Name of Schemes	No.of Beneficiaries	Amount
Pension	2593	2860500
Pension	1534	1534000
Disabled pension	284	284000
years	125	125000
Un employments wages	53	6360
Agriculture labour pension	59	59000

Source: Municipal office, Chavakkad

20.5 Social Welfare

The existing status and particular issues regarding women, children, senior citizen and differently abled persons are considered with the help of authorities such as social welfare development, Kudumbasree, Angnawadis, and Old age homes etc.

20.5.1 Women

Women constitute 54.57% of the total population in the town. As per census 2011, sex ratio of Chavakkad Town is 1201 and child sex ratio is 931. (This fact indicates that there is a considerable decrease in female population.) The female literacy rate has been increasing through the years as shown in figure 20.5. As shown in figure 20.6 female workforce participation rate has decreased over decades. It clearly states that women are not actively participating in the development scenario of the area.

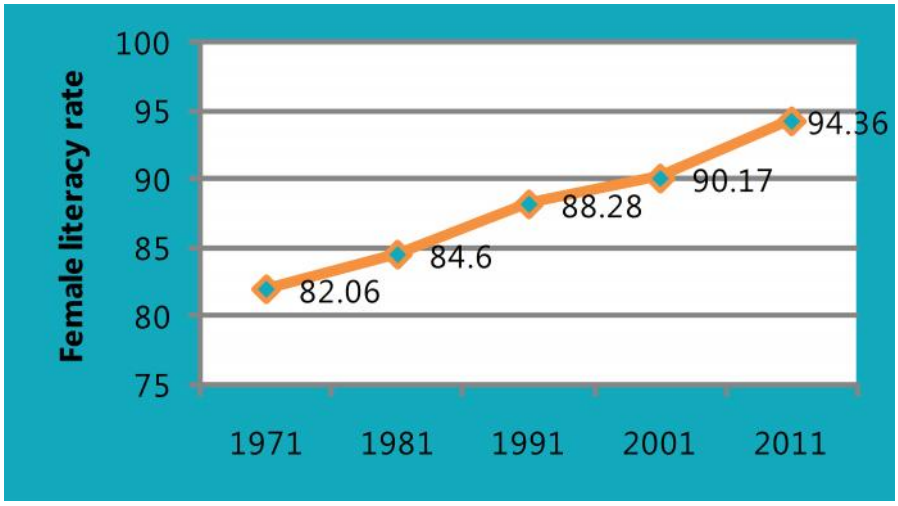


Fig 20.5 Decadal variation of Female literacy rate

Source: Census Data

State Poverty Eradication Mission otherwise known as Kudumbasree addresses poverty focusing on the empowerment of women. In Chavakkad town, Kudumbasree units have played a major role in women empowerment. Considering the existing scenario, more efforts are needed to ensure the further upliftment of women. For this, schemes providing self-employment that ensure a secure living atmosphere is to be implemented.

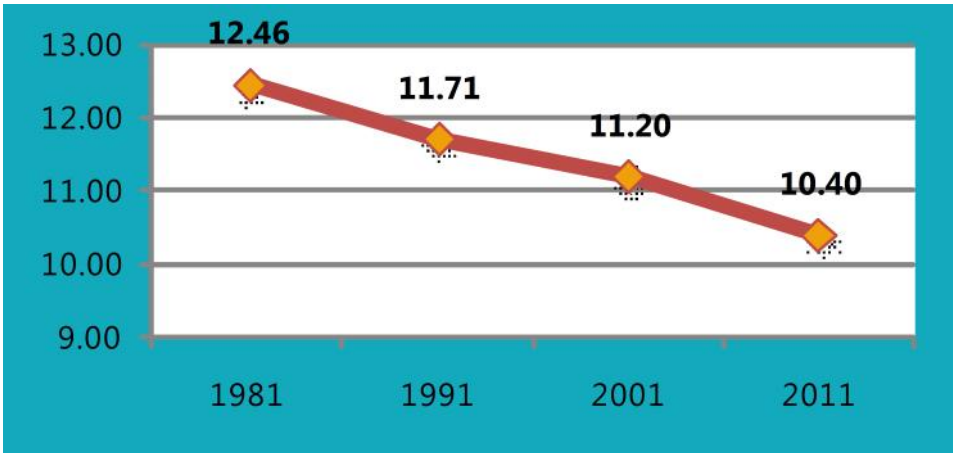


Fig 20.6 Decadal variation of Female WFPR

Source: Census Data

20.5.2 Children

As per Census 2011, 0-6 age population is 4360 which is about 12.03% of the total population. Out of this, 2436 are males and 2268 are females. Out of 38 Anganwadis, eleven of them are functioning in rented building. Better infrastructural facilities have to be provided in Anganwadis. It is necessary that the expansion and improvement in the quality of early childhood care, with primary attention given to the girls, be ensured through ICDS in remote and socio-economically backward areas. There exists a school called Prathyasa for the differently abled children. Care should be given to provide necessary facilities to these institutions.

20.5.3 Senior citizen

As per Socio-economic survey 2012, about 9% of the total population consists of persons of age more than 60. Municipal Old Age Home - Ashrayabhavan is situated at Thiruvathra (Athirthi) - ward 2. Vayomithram Project provides free medical treatment for Citizens above 65 years which need more publicity. Proper attention should be given by providing support system and rehabilitation to the senior citizens.

20.5.4 Status of Anganwadi

Angnawadis are the grass root level service delivery point of social welfare activities. Anganwadi Center is the focal point for delivery of services which is managed by an Anganwadi worker, assisted by a helper. Both are honorary workers selected from local community. As per criteria, there should be one Anganwadis for 1000 population. There are a total of 38 Anganwadis of which 23 are working in own buildings, four in school building ,one in fisheries building and the rest in rented buildings in Chavakkad Town. In these Anganwadis 13 Nos have no drinking water facilities and 6 Anganwadis have no toilet facilities. Although remaining Anganwadis are having toilets, all toilets are not baby friendly. Details of Angnwadis are shown in table 20.9.

Table 20.9 Details of Anganwadi in Chavakkad Town

Sl.No	Ward No	Anganwadi No	Name &Location	Area	No.of Children		No.of workers	Building Status	Well	Drinking Water	Electricity	Toilet	Kitchen
					6 Months-3yrs	3-6 yrs							
1	XXI	89	GFUPS Chaparambu		10	10	2	School	No	Yes	Yes	No	Yes
2	XXI	90	Manathala Pallithazham	2.2	18	16	2	Own	No	No	Yes	Yes	Yes
3	XXII	91	Madayakadavu	3.5	16	12	2	Own	No	Yes	Yes	Yes	Yes
4	XXIII	92	Blangad Beach		12	12	2	Fisheries	No	No	Yes	Yes	No
5	XXIV	93	Dwaraka beach		15	18	2	Rent	No	Yes	Yes	No	No
6	XXV	94	Pulichirakettu		10	12	2	Rent	No	Yes	Yes	Yes	Yes
7	XXV	95	Pulichirakettu West	3.5	10	18	2	Own	No	Yes	Yes	Yes	Yes
8	XXVIII	96	Puthankadappuram Subcentre	7	10	19	2	Own	Yes	Yes	Yes	Yes	Yes
9	XXVIII	97	Puthankadappuram Fisheries Colony	4	10	11	2	Own	No	Yes	Yes	Yes	Yes
10	XXXII	98	Puthankadappuram Masjid	2	10	19	2	Own	No	Yes	Yes	Yes	Yes
11	XXXII	99	Puthankadappuram AC padi	5	10	18	2	Own	No	Yes	Yes	Yes	Yes
12	I	100	Ayodya Nagar		15	25	2	Rent	No	Yes	Yes	No	Yes
13	XII	101	Gramakulam Therly Vasu Smaraka	5	10	20	2	Own	No	Yes	Yes	Yes	Yes
14	II	102	Muttil Colony	4	15	22	2	Own	No	Yes	Yes	Yes	Yes
15	XXX	103	Puthiyara Masjid	3	14	27	2	Own	No	Yes	No	Yes	Yes
16	II	104	Gramakulam Yuvadara Club		15	13	2	Library	No	Yes	Yes	Yes	Yes
17	XXVII	105	Ainippulli Ahammed memmorial	3	8	12	2	Own	No	Yes	Yes	Yes	Yes
18	XXVII	106	Parpil thazhe nalu cent colony	3	13	12	2	Own	No	Yes	Yes	Yes	Yes
19	XXVI	107	Manathala	5	13	14	2	Own	No	Yes	Yes	Yes	Yes
20	XIX	108	GHSS Manathala		8	17	2	GHSS	No	Yes	Yes	Yes	Yes
21	XVIII	109	Manathala Kainamkat School	2	10	10	2	Own	No	Yes	Yes	Yes	Yes
22	III	110	Kottapuram Hanumankara temple	3	13	20	2	Own	No	Yes	Yes	Yes	Yes
23	IV	111	Kuncheri Desabhimani vayanasala	2	12	15	2	Own	No	Yes	Yes	Yes	Yes
24	V	112	Punna North		10	14	2	Rent	No	Yes	Yes	Yes	Yes
25	VI	113	Punna south centre-GUPS		12	21	2	GUPS	No	Yes	Yes	Yes	Yes
26	X	114	Kozhikkulanagara		8	12	2	Rent	No	No	No	No	Yes
27	XVII	115	Vanchikkadavu	2	12	17	2	Own	No	No	Yes	Yes	Yes
28	XVI	116	Thekkancheri	2.13	15	17	2	Own	No	No	Yes	Yes	Yes
29	VI	117	Alumpadi	2.5	7	11	2	Own	No	No	Yes	Yes	Yes
30	VII	118	Muthuvattoor		6	10	2	Rent	No	Yes	Yes	Yes	Yes
31	VIII	119	Mammiyur	3	10	6	2	Own	No	No	No	Yes	Yes
32	IX	120	Gandhi Nagar Edappully	2	8	14	2	Own	No	No	Yes	Yes	Yes
33	X	121	Chavakkad Anu Gas	2	8	12	2	Own	No	No	Yes	Yes	Yes
34	XV	122	Chavakkad Bus Stand		10	14	2	Rent	No	Yes	Yes	Yes	Yes
35	XI	123	Pulayoor Edappalli Colony	2	10	10	2	Own	No	No	Yes	Yes	Yes
36	XIV	124	AUPS Palayoor		10	12	2	AUPS	No	No	No	No	Yes
37	XII	125	Palayoor South	1.5	10	14	2	Own	No	No	Yes	Yes	Yes
38	XIV	126	Palayoor Alappat		7	11	2	Rent	No	No	Yes	No	Yes

Source: ICDS, Chavakkad

20.6 Inference

On a detailed analysis it can be seen that 43.16% of the families in Chavakkad Town area are BPL families. They are concentrated along the coastal area. There are certain areas of concern in the development of BPL population. Improvement of substandard housing should be given top priority. In development programmes priority should be given to the BPL population especially socially weaker sections of the society. Also, infrastructure facilities including safe drinking water, street light etc. should be provided in the BPL concentration areas. Thus in order to have best results in the area of poverty alleviation. An integrated approach has to be formed among various government, non-government authorities and others. As per socio econmoic surevy 2012, 9 % population is consisting of persons with age more than 60.

CHAPTER 21

ENVIRONMENT

Environment includes water, air, land and the inter relationship that exist between these. It also deals with the complex relationship regarding living and nonliving beings. This chapter discusses about the ecologically and environmentally sensitive areas and the issues related to them in Chavakkad town. An Environmentally Sensitive Area is a type of designation which needs special protection because of its landscape, wild life or historical value. In this era when global warming is the prime concern, it is the duty of every citizen and community to protect nature. Every possible measure is needed to be taken to let the nature breathe.

21.1 Existing status.

Chavakkad Town has a plain terrain with Arabian Sea as the western border. Soil type is sandy in nature. Water bodies, Coastal areas, Mangroves, backwaters and Paddy are the major ecologically and environmentally sensitive areas in Chavakkad town.

21.1.1. Coastal Boundary

Chavakkad Town is located along the coast with Arabian Sea sharing its west boundary for a length of 5 km. According to Coastal Regulation Zone Notification 2011 by Central Ministry of Environment and Forest, this area is classified as CRZ - II Zone. CRZ-II Zone includes the areas that have been developed up to or close to the shore line. For the purposes of the expression "developed area"is referred to as that area within the existing municipal limits or in other existing legally designated urban areas which are substantially built-up and has been provided with drainage and approach roads and other infrastructural facilities, such as water supply and sewerage mains. Figure 21.1 shows the distribution of ecologically sensitive areas. Density of pollution is high in fishing area, pollution from fish landing center and spreading of oil from boats are the problems faced here. The development and construction activities with in this area shall be in regulated by the concerned CZMA (Coastal Zone Management Authority) in accordance with the CRZ rules. CRZ area of Chavakkad town is detailed out in figure 21.2.

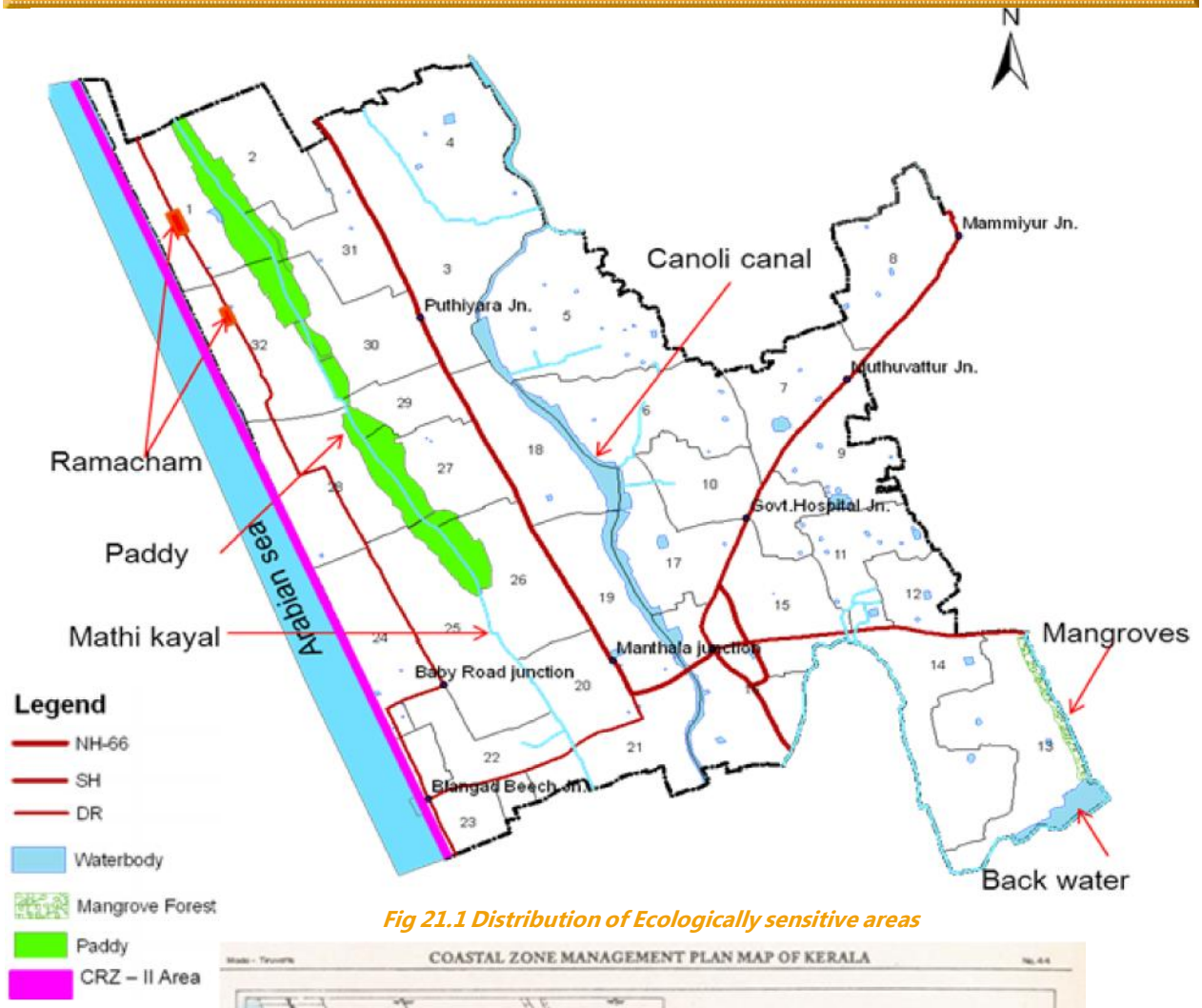


Fig 21.1 Distribution of Ecologically sensitive areas

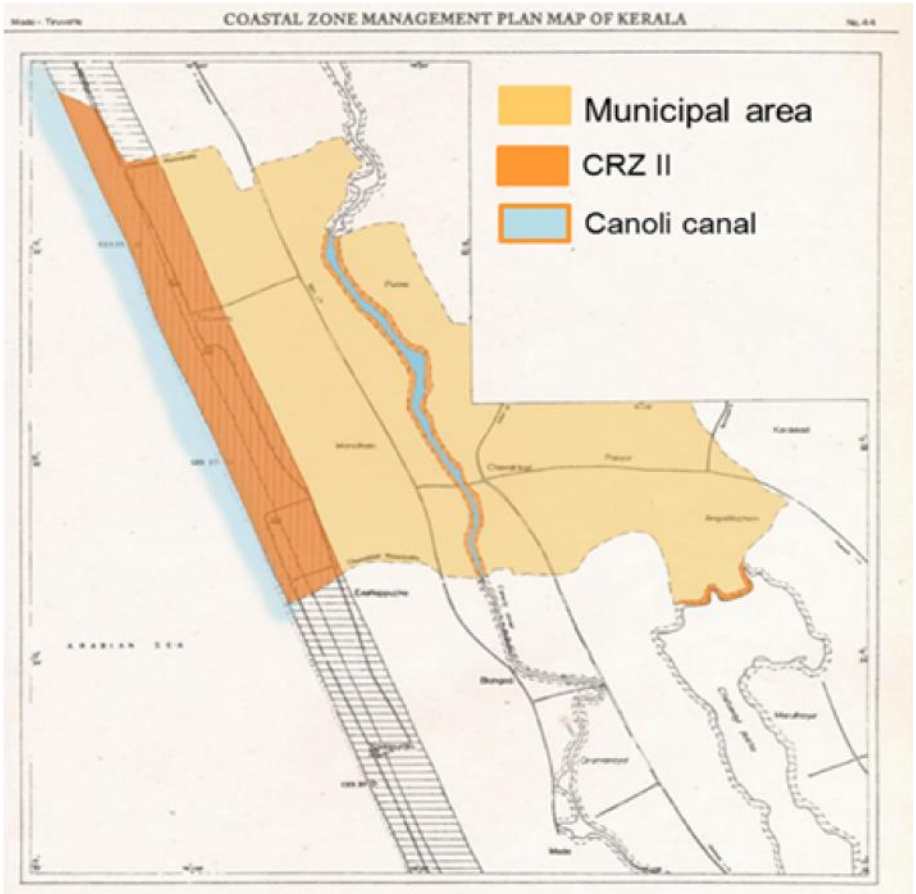


Fig 21.2 CRZ area of Chavakkad town, Generated from Coastal Zone management map of Kerala Center for Earth Science Studies, Thiruvananthapuram

21.1.2 Paddy

Non Kole type paddy cultivation is being practiced here. The Non kole paddy lands are concentrated along the sides of Mathy kayal at the western parts of Chavakkad Municipality. This land form constitudes about 4.52% (0.57 km2) of municipal area.Fig 21.3 shows the distribution of paddy lands in Chavakkad Municipal area. Paddy lands without cultivation are under the threat of land conversion. These lands are important in the view of environmentally and ecologically sensitiveness and hence every possible measure should be adopted to conserve it from conversion.

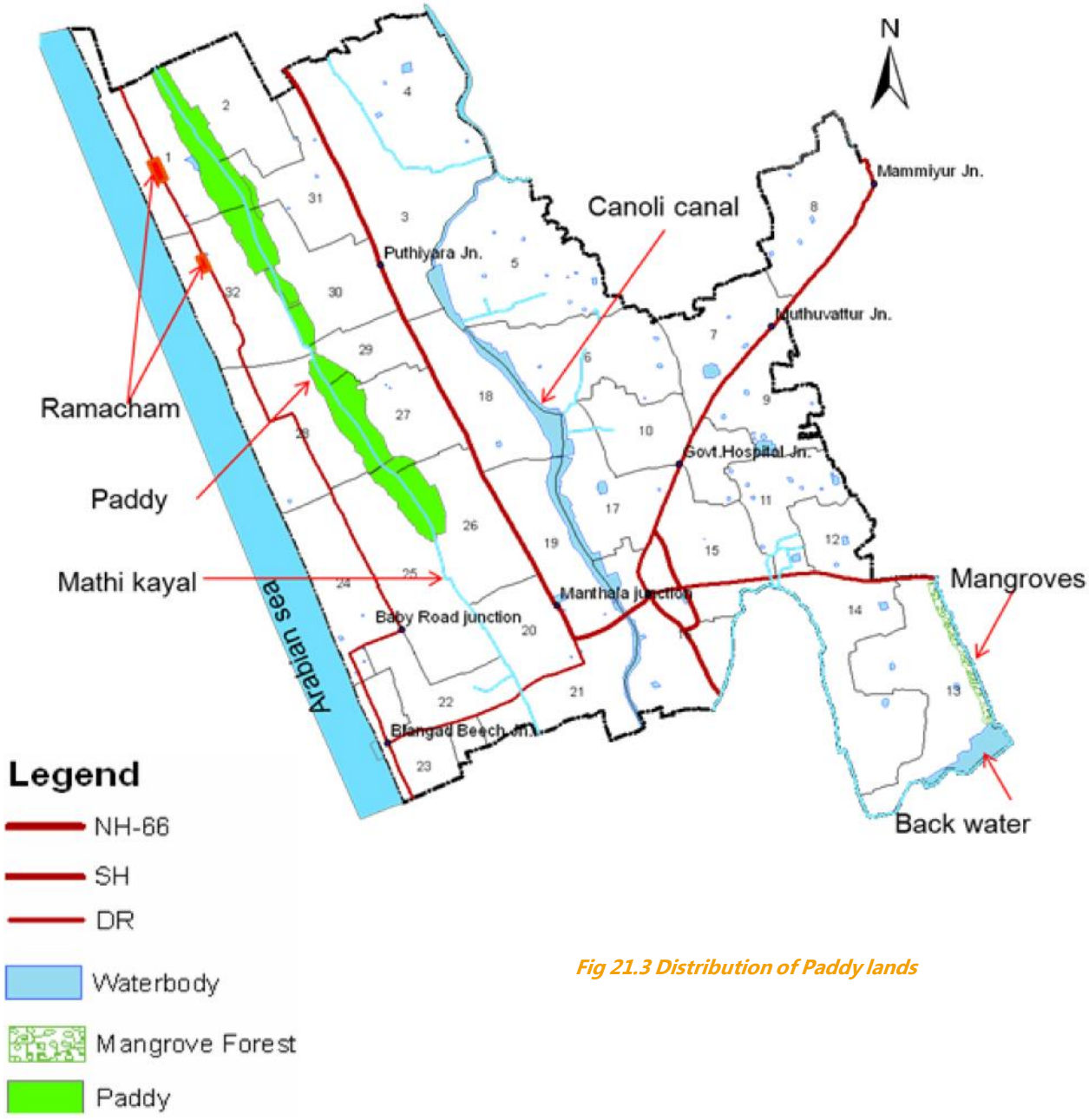


Fig 21.3 Distribution of Paddy lands

21.1.3. Water Bodies

Water sources are essential for the region's aesthetics, economics and health. Clean and safe water is a must to the health and livelihood of the residents. There are several water bodies in the urban area, among which some of them are being used as a source of drinking water, some others have dried up, some are not in use etc. so there is a need to preserve these natural sources. The main water bodies in Chavakkad Municipal area are Canoli canal which passes through eastern side and Mathy Kayal, which passes through the Western side of Town. According to the land use data 2013, about 2.58% (0.32km2) of Chavakkad Municipal area is constituted by water bodies which include eight ponds under religious use and seven ponds under public use. Public ponds are getting polluted with sewage from the houses. There are schemes for the up gradation of ponds like "Jalasree Scheme". Pookulam upgradation is proposed under this scheme (77lakhs). Pulichirakettu used to get dried during summer season and hence needed to be preserved. The location of water courses is shown in the figure 21.4.

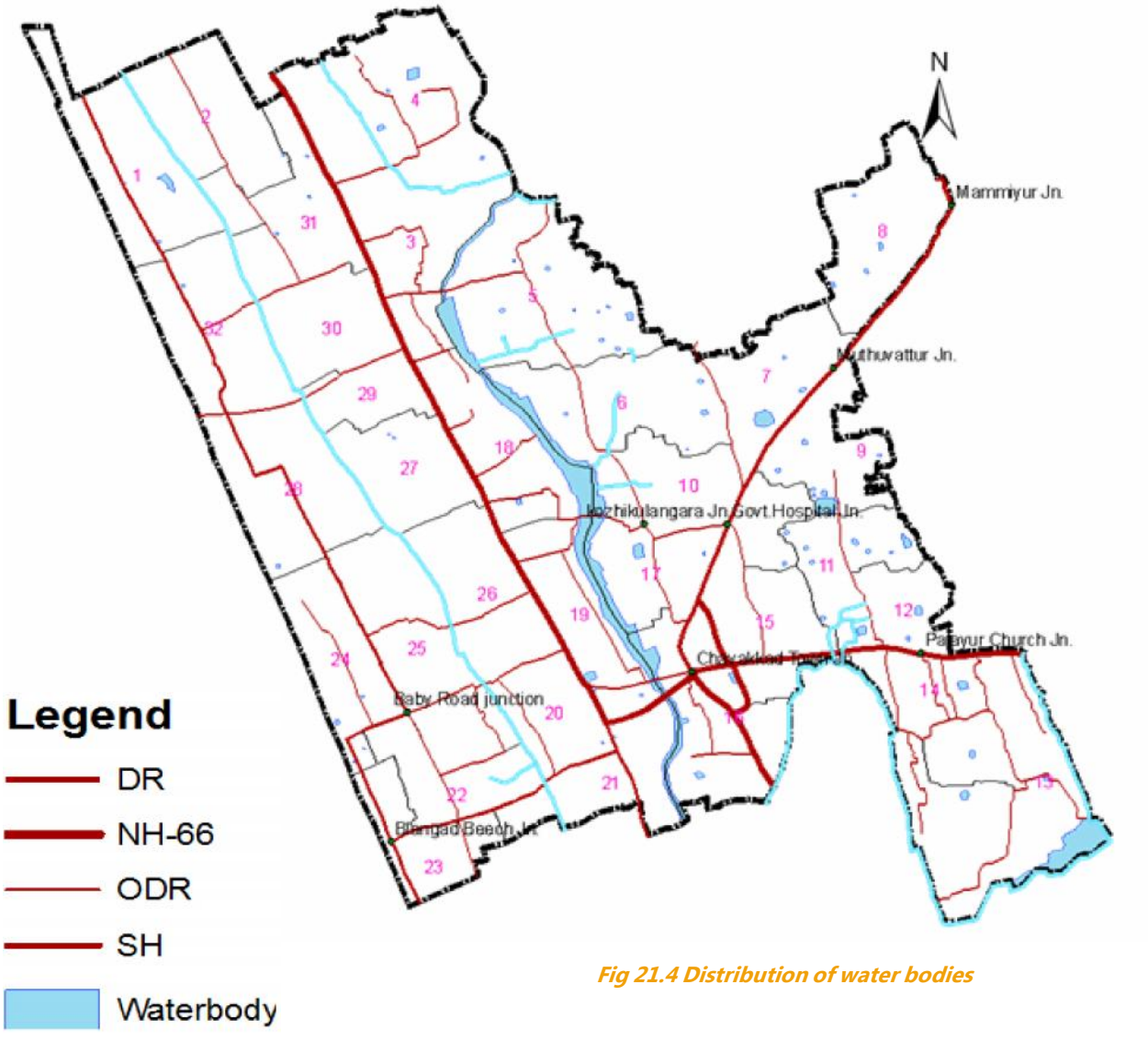


Fig 21.4 Distribution of water bodies

Details of water bodies is shown in Table 21.1

Table 21.1Details of water bodies

Name of water body	Type	Ward/ Location	Water Availability	Present use	Quality of water		Remarks
					Polluted/ Unpolluted	Reason for pollution	
Canoli Canal	Back water	Running North-South along the centre of municipality	Perennial		polluted	Sewage from houses	Suitable for water way
Mathy kayal	Kayal	Western side of municipality	Perennial	Agriculture use	polluted	Sewage from houses	
Ambath kulam	Pond	Ward 15	Perennial	Public use	polluted	Sewage from town	
Chittadathkulam	Pond	Ward 14	Perennial	Public use	polluted	Sewage houses	
Chenjerikulam	Pond	Ward 14	Perennial	Temple pond	Unpolluted		
Njavalkulam	Pond	Ward 13	Perennial	Public use	Unpolluted		
Pond	Pond	Ward 13	Perennial	Public use	Unpolluted		
Nagaharikavu kulam	Pond	Ward 4	Perennial	Temple pond	Unpolluted		
Thiruvathrakulam	Pond	Ward 4	Perennial	Temple pond	Unpolluted		
Pookulam	Pond	Ward 9	Perennial	Public use	Unpolluted		
Manathala kulam	Pond	Ward 19	Perennial	Public use	Unpolluted		
Viswanatha temple pond	Pond	Ward 18	Perennial	Temple pond	Unpolluted		
Church pond	Pond	Ward 11	Perennial	Church pond	Unpolluted		
Madam pond	Pond	Ward 7	Perennial	Palayur madam pond	Unpolluted		



Canoli canal



Paddy along Mathykayal



Pookulam Existing condition

21.1.4. Mangroves and Back water

Mangroves and back waters are located in the south eastern boundary of the municipal area. It is distributed over 4 Ha. Mangroves are wet land ecosystems formed by the assemblage of specialized plants and animals adapted to semi saline swamps along coasts. The major threats to the mangrove forests are land reclamation for urbanization, intensive aquaculture, felling of mangrove trees for fuel and fodder, unsustainable land use, ambiguity in ownership etc.



Mangroves and Back water

21.1.5. Ramacham

Ramacham is a medicinal plant. The cultivation of ramacham is more in Punnayur Panchayat of Thrissur district. It is cultivated in the north western sides of the Chavakkad town which lies along the border of Punnayur Panchayat. Area of cultivation of Ramacham is 10Ha and the productivity is 12.5 Ton/ Ha/ year.



21.1.6. Noise pollution

Noise pollution is another factor that actively contributes to the degradation of environment or in making a place less livable. Noise pollution is increasing at an alarming rate and become a threat in urban areas. Noise produced from different source are creating catastrophe to the human. Hence necessary steps may be suggested to curb the level of noise so that environment qualities are maintained. Several measures like use of improved technique, creation of the vegetation cover; protective devices etc. may be introduced to control noise pollution. In Chavakkad the Hospital area, School area and Residential area are to be taken care from this point of view.

21.2 Problems and Potentials

There is no Forest area within town. Existing ponds are getting polluted and encroached. Waste disposal into Canoli canal and Mathy kayal is one of the major problems. Noise pollution is increasing at an alarming rate and become a threat in urban areas. Chavakkad town is coming under CRZ-II zone.

21.3 Inference

From the discussion foregone it can be very well concluded that Chavakkad has a great number of fragile areas which needs to be taken care of while formulating the future plan for Chavakkad. The high density of population is exposed to the vulnerability of sea erosion in monsoon season. Preventive measures are to be taken against natural calamities. The development and construction activities within this area shall be in regulation by the concerned CZMA in accordance with the CRZ rules.

CHAPTER 22

DEVELOPMENT ADMINISTRATION AND FINANCE

Governance plays an important role in the implementation and execution of development activities. Municipal governance act as an indicator for development of the local body. This chapter it deals with the development administration and finance of Chavakkad Town.

22.1 Development administration

The states must ensure that the autonomy of the local bodies and their capacity to take up routine activities. In order to make urban decentralization a success, municipal reforms should focus on Capacity building of urban local bodies, especially in the smaller and medium towns, Standardization and computerization of municipal accounts, Delinking local initiatives from political motives through involvement of community, Unbundling of services especially for small towns should be taken up.

The local administration of the town is carried by the Municipal Council

Major development activities undertaken by the Municipality are

1) Construction and Maintenance of municipal roads
2) Public Health
3) Water supply
4) Sewage disposal
5) Providing economic help for the Construction and maintenance of houses to economically backward communities.
6) Street light
7) Administration of Institutions owned by the municipality like Schools, Hospitals etc

Besides municipal level activities functions in the various development departments are being controlled by the municipality and state plan schemes of these departments are channeled through the municipality.

22.2 Municipal Finance

The financial position of urban local self governments throughout the nation is very precarious except for a few very large urban centres. Most of the urban local self governments, especially the smaller ones like Chavakkad are not financially self sustaining.These municipalities often depend on grants from Central and State governments for funding their day to day affairs and fulfilling their constitutional obligations. The major source of income for urban local self governments is the property tax levied on the buildings in the municipality. This source has immense potential, but is not being tapped to the full extent at present. The problems faced in revenue generation through property tax are:-

- Irrational rates

- Reductions given due to various (non-financial) reasons

- Tax avoidance and evasion

- Leakages in collection system

- Improper records keeping and monitoring

Almost all these handicaps can be overcome by digitalizing the data base and managing this spatial information in a GIS platform with stakeholder interface. The timely detection of unauthorized construction, thus bringing the evaders to the tax net and ensuring compliance of regulations, also can be effectively carried out using remote sensing applications once the GIS data base is in position and regularly updated. Another source of own revenue for the municipality is entertainment tax. Scope of this source of revenue in Chavakkad is meagre as there is no Cinema theaters.

The Chavakkad Municipality maintains a municipal fund for managing the finances of the town. The accounts of the municipal fund were maintained on a cash based single entry system. The financial status of the Municipality has been reviewed for the past four years, commencing from the financial year 2012-13.This section contains a description of the municipal finances, the sources and uses of funds, and an assessment of municipal finances based on important financial indicators. The transactions are carried out mainly under revenue and capital receipts and expenditure. The municipal finance can be broadly classified into revenue account and capital account. These accounts can be further divided into income and expenditure. The various subgroups under each head are shown in Figure 22.1

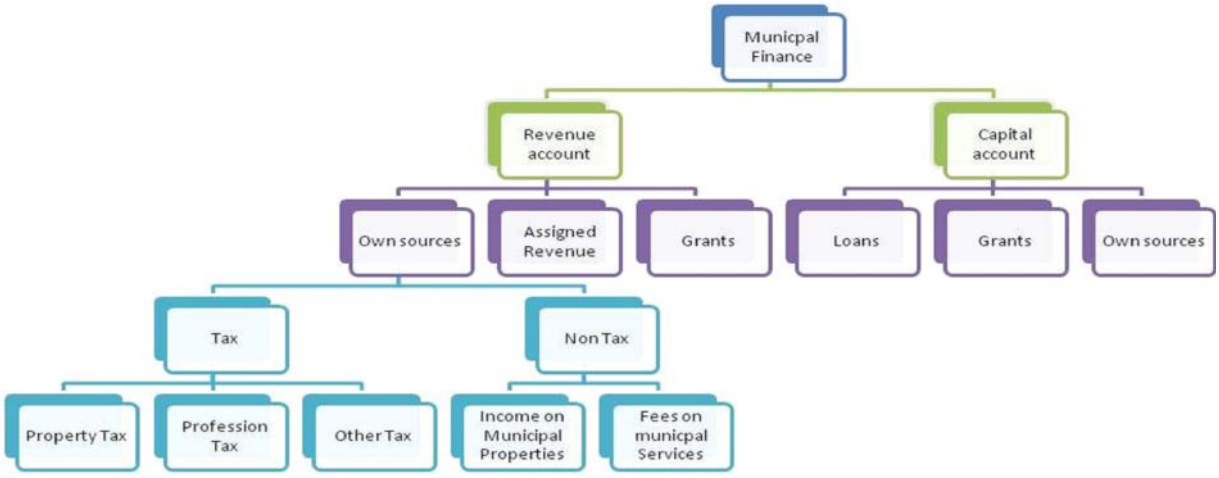


Fig 22.1 Hierarchy of Municipal Finance

Revenue Account : All recurring items of income and expenditure are included under this head. These include taxes, charges, salaries, maintenance expenditure, debt servicing etc. The revenue account comprises of two components, revenue income and revenue expenditure. Revenue income comprises of internal resources in the form of tax and non tax items and external resources in the form of shared taxes/ transfers and revenue grants from the State Government. Revenue expenditure comprises of expenditure incurred on establishments, operation & maintenance and debt servicing. The revenue sources of municipality can be broadly categorized as own sources (taxes, income from municipal properties and markets, building permit fee, trade licenses, income from fees and fines etc) assigned revenues (comprises of Kerala state transfers of municipal income collected by the state government) and grants (revenue grants and compensations under various heads).Revenue expenditure consists of the expenditure incurred for the general management and collection of taxes, public works, town planning, education, water supply & drainage, public health & sanitation, street lights, other municipal properties, running expenses of transferred institutions and miscellaneous expenses.

Capital Account: Income and expenditure items under this account are primarily nonrecurring in nature. The account is subdivided into capital income and capital expenditure. Capital income items include loans, contributions by GoK, other agencies and capital grants under various State and Central Government programs, revenue account transfer for capital works and

income from sale of assets. Capital expenditure includes the expenditure incurred for public works like water supply, drainage and roads.

Deposits and Advances: Under the municipal accounting system, certain items are compiled under advances and deposits. These items are temporary in nature and are essentially adjustments for the purpose of recoveries and payments. Items under this head include library cess, income tax deductions, pension payments, provident fund, payment and recoveries of advances to employees and contractors, etc. Summary of financial status of Chavakkad Town is shown in table 22.1.

Table 22.1 Summary of Municipal Finance

Item	2012--13	2013-14	2014-15	2015-16
Opening Balance	989.51	801.26	1598.57	1062.96
Revenue Account				
Revenue Income	497.11	429.53	779.83	435.94
Revenue Expenditure	573.46	1437.22	1615.89	868.64
Surplus/Deficit	-76.34	-1,007.69	-836.06	-432.69
Capital Account				
Capital Income	495.40	1,557.98	939.82	666.25
Capital Expenditure	468.37	262.89	184.26	122.67
Surplus /Deficit	27.0362	1295.09571	755.55705	543.5797
Debt Head Account				
Income	70.27	167.41	136.04	166.14
Expenditure	304.2087	390.58541	591.14596	417.83482
Surplus /Deficit	-233.9368205	-223.17768	-455.1044	-251.69768
Closing Balance	801.26	865.37	1062.96	922.15
Total income	2052.29	2956.18	3454.25	2331.29
Total Expenditure	1346.03	2090.70	2391.29	1409.15

Source: Chavakkad Municipal office

Temporal variation of total receipts and expenditure is shown in Table 22.2 and pictorial representation is shown in Fig 22.2. Average percentage of annual growth is 7.34% and expenditure is 9.54% a fiscal deficit occurs when a government's total expenditures exceed the revenue that it generates, excluding money from borrowings. Deficit differs from debt, which is an accumulation of yearly deficits. A fiscal deficit is regarded by some as a positive economic event. On the other hand, fiscal conservatives feel that governments should avoid deficits in favor of a balanced budget policy.

Table 22.2 Temporal variation of total receipts and expenditure

Year	Total Reciepts	Total Expenditure	Growth in income	Growth in expenditure
2012-13	2052.29	1346.03		
2013-14	2956.18	2090.81	44.04	55.33
2014-15	3454.25	2391.29	16.85	14.37
2015-16	2331.29	1409.14	-32.51	-41.07
			9.46	9.54

Source: Chavakkad Municipal office

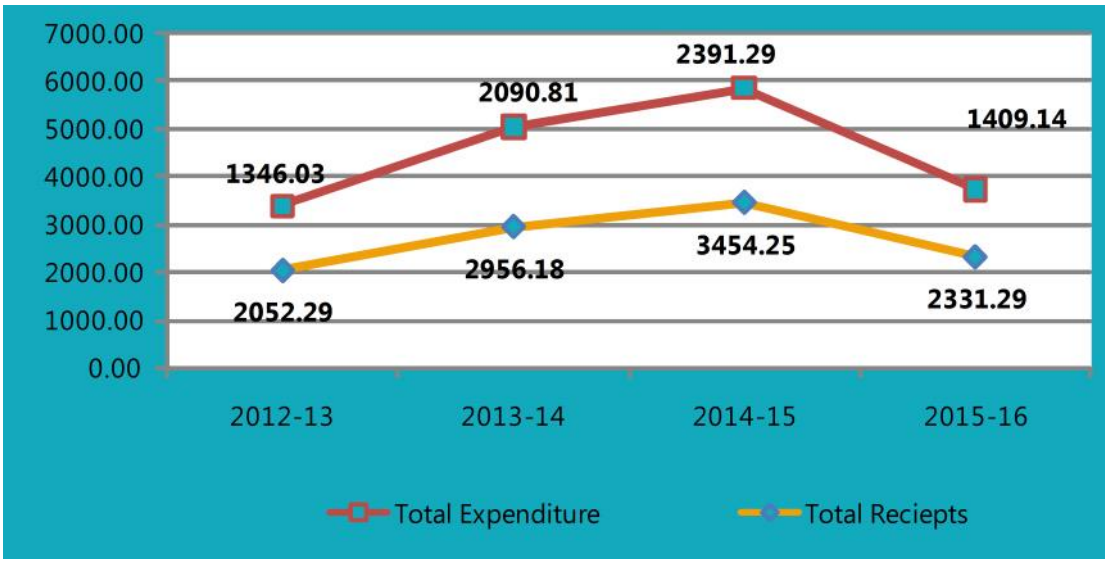


Fig 22.2 Temporal variation of Municipal Finance

22.3 Governance

The municipal governance has not improved much in the last few years. The available technologies are not much utilized to the maximum extent for ensuring efficient and effective governance. The tax administration is still based on manual registers and assessment which causes heavy leakage and non-compliance. Reluctance in use of IT enabled solutions hampers seamless integration of various governance functions and efficient service delivery.

22.4 Existing source of funds

Major sources of revenue income for the town are municipal taxes, income from municipal properties and grants (revenue account) from the state government/ Central Government. The municipal taxes contribute 34% of the revenue income and 53% of the capital income; it is shown in figure 22.3. The Table 22.3 and Figure 22.4 shows the present details of revenue income, shows the details of revenue income in last four years from the table it implies that, the income from tax comes to 15.94 % and grant from state government is 31.33 % of the total revenue income. This indicates the need to concentrate on efficient collection of taxes and enhancing income from properties for the financial health of the municipality. In the capital account, more than almost 100 % of the funds are provided by the state plan schemes.

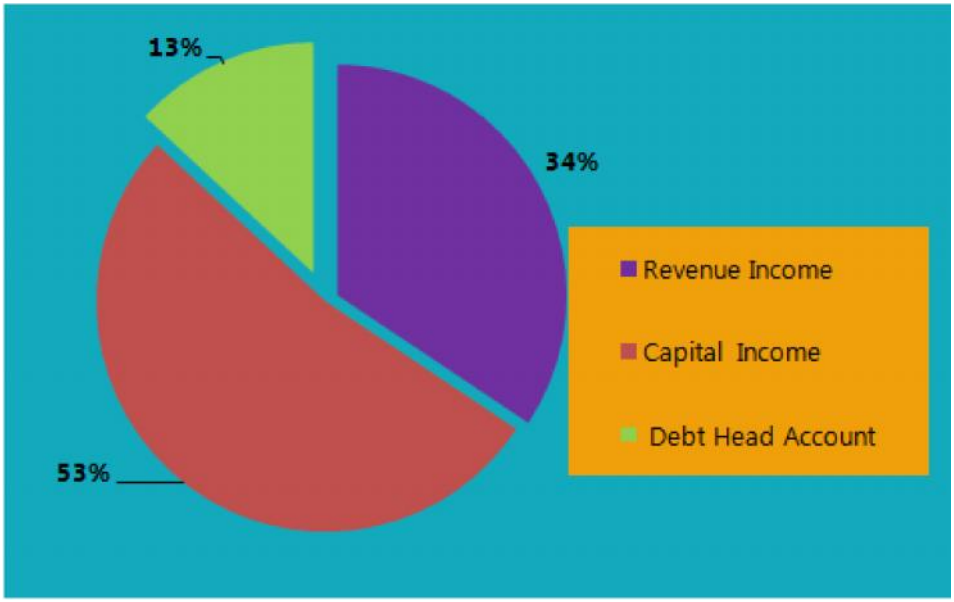


Fig 22.3 Split up of Source of income

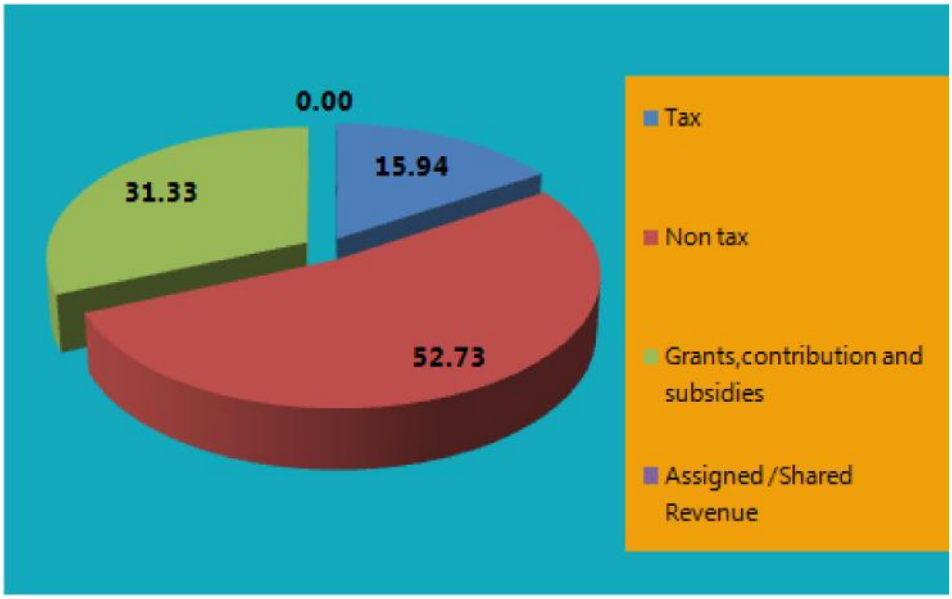


Fig 22.4 Split up of Revenue income (%)

Table 22.3 Temporal Variation of revenue income

Item	2012-13	2013-14	2014-15	2015-16
Tax	52.39	69.89	81.57	69.50
Non tax	143.96	164.15	233.83	229.87
Grants,contribution and subsidies	300.75	195.48	464.44	136.58
Assigned /Shared Revenue	0.03	0.00	0.00	0.00
Total Revenue in come	497.13	429.52	779.84	435.95

Table 22.4 and 22.5 shows the temporal variation of Capital and Debit head account

Table 22.4 Temporal Variation of Capital income

Capital Income	2012-13	2013-14	2014-15	2015-16
Grants Contributions for Specific purposes	494.36	1,557.02	938.81	665.02
Loans, Advances and Deposits	1.05	0.96	1.01	1.23
Others(Secured loans ,Fixed assets)	-	-	-	-
Total	495.40	1,557.98	939.82	666.25

Table 22.5 Temporal Variation of Debt Head income

Debt head income	2012-13	2013-14	2014-15	2015-16
Earmarked Fund	16.78	87.72	20.80	6.04
Deposits Received	21.17	34.49	70.32	120.55
Other Liabilities	32.33	45.20	44.92	39.55

22.5 Key Financial indicators

Key Financial indicators are facts about project implementation results, not actions. The standard practice by banks and borrowers is to consider performance targets as indicative. The technique of financial analysis is a useful tool to analyse the municipal corporation's financial position.

Ratio analyses presented here provide information about efficiency and operational performance, and debt servicing.

Table 22.6 Key Financial Indicators

Key Financial Indicators			
A	Resource Mobilization		Unit
	Per Capita Income	1114.993	Rs p.a
	Growth in Revenue Income	-44.09	%
	Share of Tax Sources in Revenue Income (%)	15.9422	%
	Growth in Tax Sources of Revenue Income (%)	-14.79	%
	Share of Non-Tax to Revenue Income (%)	52.72852	%
B	B. EXPENDITURE MANAGEMENT		
	Per Capita Expenditure	2221.699	Rs p.a
	Growth in Total Revenue Expenditure	-46.244	%
C	PERFORMANCE ASSESSMENT		
	Operating Ratio (RE/RI)	1.99	
	Capital Utilization Ratio	0.18	

As such they provide insight into areas that merit further investigation but do not, in themselves, provide definite answers on the financial condition of a given service. And hence, they have been calculated as an average over a period of five years, to provide. a realistic picture. Table 22.6 shows the Key Financial indicator of the town.

22.6 Problems and potentials

The major problems faced by the municipality in the finance sector are deficit amount raised and this can affect the proper running of the municipality and paucity of funds for developmental activities. The Town has to prepare a number of financially viable projects and to be implemented in the town which can be developed (through PPP mode or otherwise) for enhancing the income of the municipality.

22.7 Inference

The fiscal deficit of the municipality is not an indication of financial health, but of poor financial management and a lack of fund utilized for major projects since there is no major development exists. But the municipality has tremendous potential for development of financially remunerative projects for sourcing funds for urban development.

CHAPTER 23

LINKAGES AND EXISTING SPATIAL STRUCTURE

While analysing the different sectors in the Planning area, intra sectoral linkages, inter sectoral relations and linkages between settlement characteristics and various sectors need to be addressed for carving out an integrated development vision. Also the existing spatial structure of the planning area which is the physical manifestation of all such linkages is to be analyzed for visualizing the most desirable spatial structure of the area which will minimize the adverse effects on the environment while ensure utilization of the existing potentials in a sustainable manner.

In this chapter, inter sectoral linkages between the core sectors and linkages between settlement character and sectoral developments are analyzed and a desirable spatial pattern is derived

23.1 Inter Sectoral Linkages

From the analysis of different sectors in the planning area, the following Core sectors were identified.

1. Topography, Environment and Strategic importance
2. Social and Physical infrastructure
3. Tourism
4. Trade and Commerce
5. Special Concern areas
6. Agriculture.

The inter sectoral linkage between these core sectors are described below.

23.1.1 Linkage between Topography, Environment and Strategic importance with other core sectors

The town is located within the plain land region topography with Arabian Sea in the west coast, have good environment potential. Investment and design of physical infrastructure have direct linkage with the topography of the area. Being the Head Quarters of Chavakkad Taluk

and the only 4th order settlement, the town attracts a number of taluk level offices of the Government and some of the private sector concerns and hence the social infrastructures have to be strengthened. The major land use change effecting environment, identified in Chavakkad Town is the depletion of paddy field and conversion of dry cultivation area into construction purpose.The relation between demand for traffic & transportation infrastructure and different sectors of economy is a very dynamic one. The growth in any sector of economy calls for instantaneous changes in the demand pattern for transportation infrastructure. Even though the back bone of the economy of the town is Household industries, the value addition of to it are find lacking. Household industries with value addition and are to be promoted allocation of land shall be made such a way to minimize the environmental impact and to wastage of public money and generate more job opportunities.

23.1.2 Linkage between Tourism, Trade and Commerce

Tourism plays a major role in the economic aspects of Chavakkad district. Chavakkad town is rich with natural tourism, pilgrim tourism and cultural tourism. Town act as a service provider for neighbouring panchayath Development of commercial sector will definitely encourage the tourism sector since large number of tourists with more purchasing power will be attracted to the area. Tourism villages, well organized markets and marketing of fish based products and handicrafts are the emerging needs in this sector.

23.1.3 Linkage between Tourism and Transportation

Transportation has been an integral part of the tourism industry; transportation links tourists to various tourist attractions. Tourism sector is one of the main sector of the economy for Chavakkad Town. Chavakkad town is having different type of tourism like Natural, Pilgrims, and Cultural. Transportation as the means to reach the destination and also the means of movements at the destination plays a vital role in tourism sector. For increasing economy of the town all these type of tourism should be interconnected to each other; these can be done giving proper accessibility. Providing more access to different modes in the town can attract more tourists to the town. Accessibilty of areas depends on the improvement in transportation modes plus low fare, nature of site, state of infrastructure and efficency of Public transport system.

23.1.4 Linkage between Tourism and Environment

Tourism and environment have a dual relationship. Certain level of environmental quality is

meant for healthy development of tourism sector. Therefore, tourism should be planned and managed within the environmental limits and with due reggard to the long term appropriate use of natural and human resources. The main tourist attraction of the town is its environment and natural beauty of the sea; hence ecofriendly and sustainable tourism activities are preferred. This necessities to make awareness among tourist and local people with the value of natural resources and cultural heritage deeply.

23.1.5 Linkage between Fisheries with Tourism

Chavakkad town is having beaches as tourist site in the form of Arabian sea in the west coast of the town plays a major role The revenue and jobs that tourism can bring to an area can help diversify the local economy and job market, as well as providing additional income for fishing families, sometimes ensuring that their production activity remains viable. Indeed, tourism is one of the few industries that have kept growing, even during the economic crisis. As well as providing additional sources of income for fishing families and other local inhabitants, tourism can also help to improve sales of local fish through a range of activities, such as direct sales to tourists, promotion in local restaurants, and festivals that raise awareness of the area's fishing activity and products. Building on traditional activities such as fishing can help attract visitors looking for a more authentic experience, favoring more sustainable tourism that values and contributes to the local community The demand of fish and fish producrs is growng strngthening the linkage between fisheries and tourism can catalyse and add value to socio economic benefits each sector contributes to sustainable development.

23.1.6 Linkage between Trade and Commerce with Industries

Industries and Commerce are mutually complementing sectors and hence industrial development will automatically boost the commercial activities. Strong network of commercial centres with proper infrastructural facilities is necessary for the development of industrial sector. At present commercial sector mainly depend in imported materials and industrial sector struggles for want of good marketing network. Expansion of trade and commerce depends on industrial growth.

23.1.7 Linkage between Settlement Characteristics & Sectoral developments

In early settlements, the development pattern was based on agricultural activities alone while in modern era; settlement characteristics were derived out of complex activity pattern of an area. Hence linkages are analyzed for understanding the existing spatial structure and also to visualize the most suitable spatial structure.

23.2. Land use changes and environment

The changes in land use effect the environment to a great extent. The major land use change thus effecting environment, identified in Chavakkad town is that non agricultural activities are mainly concentrated near the town area. These activities have to be redistributed to sub urban areas with adequate infrastructural facilities for creating a congestion free environment. The agricultural production is not a very significant factor to be considered while formulating land use policy in an urban context. But, the paddy land essentially acts as green open space and also functions as reservoir of water during rains preventing floods and fast run off. Likewise the dry cultivation area also provides the necessary green cover in the town. Changes in this land use shall reduce the green cover and hence shall adversely affect the environmental quality. The land use policy decides the compactness of built form in the town. A less compact built form (with more than necessary intrusion of residential, commercial and such other land uses requiring built space to agricultural / open land uses) shall mean wider building foot prints. This calls for putting more land under manmade structures detrimental to environmental quality. Reducing the building foot print is the answer to this problem. Reducing the building foot print also shall mean compact development for which it is easier and less costly to provide basic amenities like water, sewerage system, energy, roads etc. Providing waste treatment facilities are also a lot easier for a compact development. All these have positive impact on the quality of environment. The distribution of various land uses in the town decides the traffic pattern of the town and hence has environmental ramifications. So, the changes in land use shall be managed in such a way that traffic and transportation needs are optimised causing less pollution from vehicular traffic and less consumption of precious fossil fuels. Chavakkad town consist of Waterbodies, Costal areas, Mangroves etc when changes occurs these has to be conservated.

23.3 Industrial sector- effect on environment, land use and employment

Micro small and medium enterprises (MSME) sector is an important generator of employment. In Chavakkad town the activities pertaining to industrial sector are of household nature. But Fish based industries can also be promoted due to high resources. Areas of industrial development lack various basic infrastructural facilities. Considering the tremendous potential for employment creation, the MSMEs have to be promoted. Besides the land use policy of allowing non-polluting and non nuisance industries of small scale in residential and commercial areas, the development of necessary infrastructure required for industrial developments such as good road connectivity, availability of water and electricity etc also should be attempted to promote industrial development in the town.

23.4 Effect of various sectors on environment

The small industrial sector is considered to be the prime provider of employment in small and medium towns. But in the case of many towns in Kerala, including Chavakkad, the employment in industrial sector is not the prominent one. The tertiary sector, mostly various service employees are more than industrial workers .Trade and commerce is an important employment sector, both direct and indirect. However the employees in these sectors are mostly unorganized and hence are not much reflected in the statistics. The fluctuation in the employment level is also high in this sector. In tourism sector, the town acts as a service provider for the whole district. So tourism has much potential for creating more jobs. Even though studies based on physical features suggest Fisheries, tourism and MSME are the thrust areas of employment in the town. The number of cultivators and agricultural labourers are on the decline in Chavakkad. Thus trend is not likely to be reversed. So for increase in productivity the advanced technology inputs are imminent in this sector. The town being the administrative Head Quarters of the Taluk, attracts number village level offices of the Government and some of the private sector concerns. Even though the employment in this sector is at saturation level, the town has much potential of tourism and MSME units. Education and Health care are the major providers of organised employment in the State. Fisheries sectors also have good potential for employment.

23.5 Changes in traffic & Transportation needs due to growth in various Sectors.

The relation between demand for traffic & transportation infrastructure and different sectors of economy is a very dynamic one. The growth in any sector of economy calls for instantaneous changes in the demand pattern for transportation infrastructure. However, the transportation infrastructure cannot be provided in an incremental manner. Phase wise expansion is the only solution. Hence careful consideration is required in any development plan while dealing with development in major sectors of economy and social infrastructure.

The growth in tourism sector calls for increased freight traffic both in bound and out bound. So these locations shall be identified in such a manner that connectivity from the existing network is adequate. So that efforts in expansion of network to meet the additional demand are optimum. Additional tourism facilities and industrial zone also result in changes in demand pattern. The trips generated by these developments shall be intra city in nature. Hence the location of new such facilities should be decided keeping the need to segregate through traffic and intra city traffic.

The increase in trade and commerce increases the intra city traffic also. So development of trade & commerce meant for local consumption should be decentralized to the maximum extent possible. Development of education and health care sectors means establishment of institutions of higher order also. This shall increase the passenger traffic. The locational decisions of such institutions shall be taken so that the existing network is suitably used by the additional demand and development of the network is possible in a phased manner.

23.6 Changes in traffic & transportation needs due to change in land use

The land use pattern and the traffic pattern are interring woven inexplicably. The traffic pattern is the dependant variable in the relation between various land uses. The changes in traffic pattern due to changes in land use can be studied using models to a reasonable level of accuracy. The land use pattern can change mainly in two ways. One is due to the growth in population and subsequent increase in economic activities. The other is due to changes or increase in the pace of economic activities due to other impetus rather than population growth. The population growth is mainly reflected upon the residential land use, its geographic spread and densification. The trips generated increases in proportion to the growth in population and the origin of these trips are decided by the spatial distribution and density of residential land use. The change is generally increase in volume and not in pattern since the various destinations are normally in place and in the case of Chavakkad Town the residential land use is predominant in town; its share is high when compared with other urban LSGI's. The land use changes attributable to changes in the pattern of economic activity recast the existing traffic pattern and needs special consideration. The distribution of commercial land use has a great impact on both the intra city and intercity traffic demand. This indicates need to locate commercial land use easily accessible from arterial and sub arterial roads. But the experience in the state in this regard is the occurrence of ribbon development which is detrimental to the proper development of roads and result in inefficient use of land. So care shall be taken to prevent ribbon development while considering development of commercial land use along the arterial and sub arterial roads. The attempt to bypass intra traffic away from NH also shall prompt to a good road network.

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

The draft housing policy 2011 of the Government of Kerala states that "the International Covenant of United Nations on economic, social and cultural rights, to which India is a signatory, upholds the right to adequate housing as a human right. Article 21 of the Constitution of India which

defines the protection of life and personal property encompasses the right to shelter and right to livelihood also which are integral to the dignified living of the individual." The trend in urban development in the state had been such that more and more people are forced to out migrate from the towns. The draft Housing policy upholds the need for adequate and affordable housing for all. The spatial distribution of trade and commerce activities has a significant impact on the land value in any town. Development of a speculative market on land in the state cannot be ignored. The land banks amassed by private individuals in the state play a vital part in this speculative market. Investments are being made in this market on land for speculative purposes and only a small fraction of the buyers are real users. Due to such multiple transactions, the end user of the land ends up paying a highly jacked up price seriously which affects the economic viability of the venture. The increase in land value in commercial zones/ Central business zone has a ripple effect on the price of residential plots also. This issue can be addressed in a development plan by ensuring adequate spread of commercial land use such as central business zone and making adequate area available for trade & commerce and small scale industries development so that pressure on commercially developable area is released. This will affect the land value in residential area also since there will not be any un satiated demand for commercial use and the resultant attempts by the trade and commerce activities to intrude in to the residential areas. The extent zoned for residential use also should be adequate so that the demand for more houses could be met. Another provision that shall reduce the pressure on land for housing is allowing low density EWS and LIG houses in a restricted manner in areas zoned for agriculture etc. These policy interventions through zoning (in extent and zoning regulations) are expected

23.8 Tourism and environment

Tourism contributes both positively and negatively to the environment. Tourism imparts different stresses on different geographic locations. Tourists who travel to cities with high populations do not cause much of a noticeable effect on the environment, as the relative impact created by the tourists is low. Additionally, the tourists draw resources away from the location, especially the local water and food. Tourists also consume significant amounts of fuel in their travels, in the form of taxis, boats and planes. Tourism plays a major role in the economic aspects of district. Thrissur is called the cultural capital of Kerala. Tourism and environment has a dual relationship. Certain level of environmental quality is meant for healthy development of tourism sector. Tourists increase the amount of pollution in any given habitat Well developed Tourism destinations lose their charm due to destination in environmental quality. Even though the Chavakkad town has much tourism destinations, it has to acts as service provider for nearby

area. The major tourist destinations in the town are Chavakkad beach and some pilgrim centres. The places of tourist attraction are mostly in the environmentally fragile areas in the town. So maintaining like environmental quality should be given top priority while formulating new tourism projects. A provision of basic amenities for the anticipated No. of visitors is a must. New concepts like e-toilets etc can be provided while formulating the projects. Waste management produces (for both solid as liquid waste generated by the tourism activity) should be state of art and should not interfere with the biotic systems in any case. Maintaining environmental quality and already developed destination need special consideration. Since the Chavakkad Town is coastal area having enough scenic beauty, it is essential to provide an efficient solid waste management system. Negligence in this regard shall gradually kill the environment.

23.9 Inclusive growth in various sectors

The eleventh five year plan of the country focused on inclusiveness. This specific focus in the eleventh plan has helped creating awareness and institution building for inclusive growth. The draft approach paper to the twelfth five year plan, released by the Planning Commission of India, aims at faster, sustainable and more inclusive growth. Inclusiveness, being a multidimensional concept, is difficult to assess. The concept can be explained in terms of liveability, poverty alleviation, access to health, education, basic amenities etc in general. Housing is the most prominent component of inclusive growth in the context of a development plan. Adequate and affordable housing should be ensured to all by direct intervention and / or policy measures to promote affordable and decent housing for the poor. The road connectivity, availability of water supply, electricity, educational facilities, healthcare facilities, recreational options and other amenities are addressed by the development plan. An equitable distribution of such amenities is targeted by this development plan which shall improve the inclusiveness in urban development. In the trade and commerce sector, recognizing the street vendors as legitimate entrepreneurs addressing the shopping needs of the common man is a big step towards inclusive growth. By this initiative the street vendor is no more a person to be taken off the road for illicit occupation, but someone whose trade is to be facilitated by the public authority in the interests of the common man.The attempt is to share a part of the demand for trade and commerce and the profit there from with the poor who takes out a livelihood by peddling goods for day to day use. Besides, the common man receives his supplies at reduced prices since the overhead expenses are minimal for the street vendor. In the industrial sector, allowing micro enterprises in residential and commercial zones is a policy measure for ensuring inclusive growth in the sector. The zoning regulations in general have to be lenient towards the housing needs of the poor, being inclusive.

The water scarcity in some wards of the municipality will solve problem by introducing water supply scheme under UIDSSMT. The spatial distribution of educational and healthcare facilities is also important from the inclusiveness point of view. Access to school and primary healthcare facilities at walkable distance is essential for bringing in inclusiveness in the growth of these sectors. Ensuring proper sanitation (by giving sanitary toilets, efficient collection of wastes, abatement of waste water logging etc) should be given top priority in alleviating slum like conditions within the town. In the traffic & transportation front, widening of interior collector roads so that mass transport systems like buses can reach the habitations, measures for the safe passage of pedestrian traffic etc can be considered as attempts at inclusive growth.

23.10 Energy efficiency and land use

Energy efficiency is a very important consideration in the design of any system that uses energy. The urban system as a whole is a guzzler of energy. The energy requirement of an urban area is much more compared to a rural area of the same size. Conservation of energy is a need of the day due to various reasons such as depletion of fossil fuels, carbon emission and related climate change, depletion of ozone layer etc. The energy saved is considered to be energy produced. The benefits of energy saved by land use planning measures are of long term and hence need careful consideration. The compact nature of development reduces intra city traffic and thus saves fossil fuel. Efficient layout of various land uses based on their compatibility and trip generation characteristics shall result in reduction in use of energy for transportation needs. The compactness and proper layout shall prompt pedestrian traffic also contributing to energy conservation. This also shall be help conserve energy in sectors like water supply, electricity etc. The formation of urban heat islands within the municipality can be avoided by appropriate land use measures. This shall cause savings in energy by reduced demand for air conditioning and artificial ventilation.

23.11 Existing Spatial Structure

The Spatial Structure of the Planning area defines the development status and spatial distribution of population as well as facilities. The spatial structure can be derived out by taking care of the following factors.

1. Environmentally sensitive areas
2. Functional character
3. Hierarchy of nodes

4. Existing and future urban area

5. Activity pattern

6. Transportation concept and proposed road network

23.11.1 Environmentally Sensitive area.

Chavakkad Town has a plain terrain with Arabian Sea as the western border. Soil type is sandy in nature. Water bodies, Coastal areas, Mangroves, Marshy land, backwaters and Paddy are the major ecologically and environmentally sensitive areas in Chavakkad town. Figure 23.1 shows the environmental sensitive areas of Chavakkad town

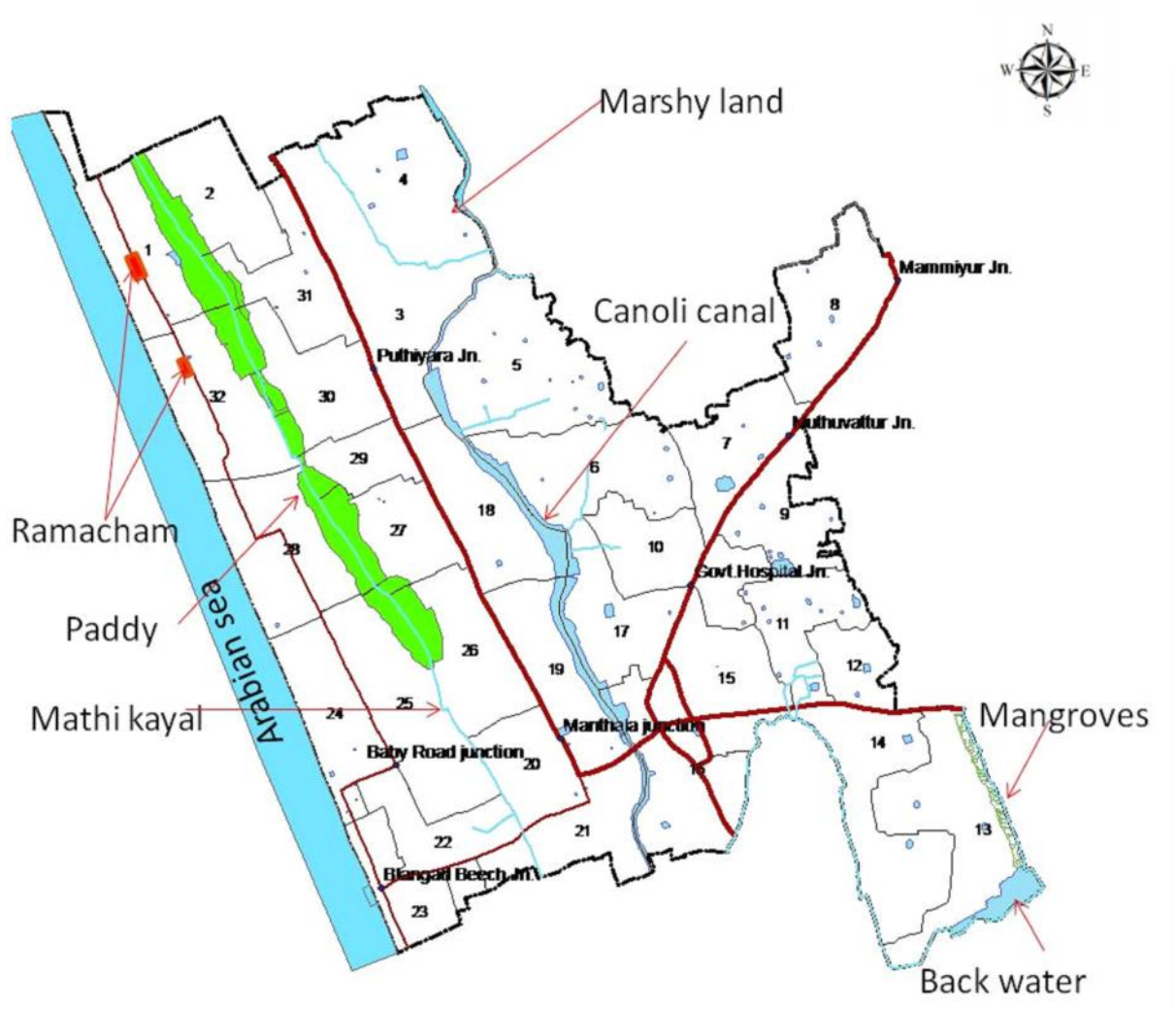


Fig 23.1 Environmental sensitive area

23.11.2 Functional Character

According to the analysis of functional character of the District, Chavakkad town as a whole shows urban functional character. The same methodology as done for the LSGIs of the district is applied for the wards of the town to assess the ward wise functional character. The result of this analysis is shown in figure 23.2 which shows that the majority of municipal wards are showing urban character. The Wards 5 and 6 having agricultural activity shows semi-rural character. Most of the wards lying nearer to highway show urban character. It can be seen that no wards are showing rural character which shows the decline in primary sector and the development of the town as a residential settlement depending mostly on tertiary sector.

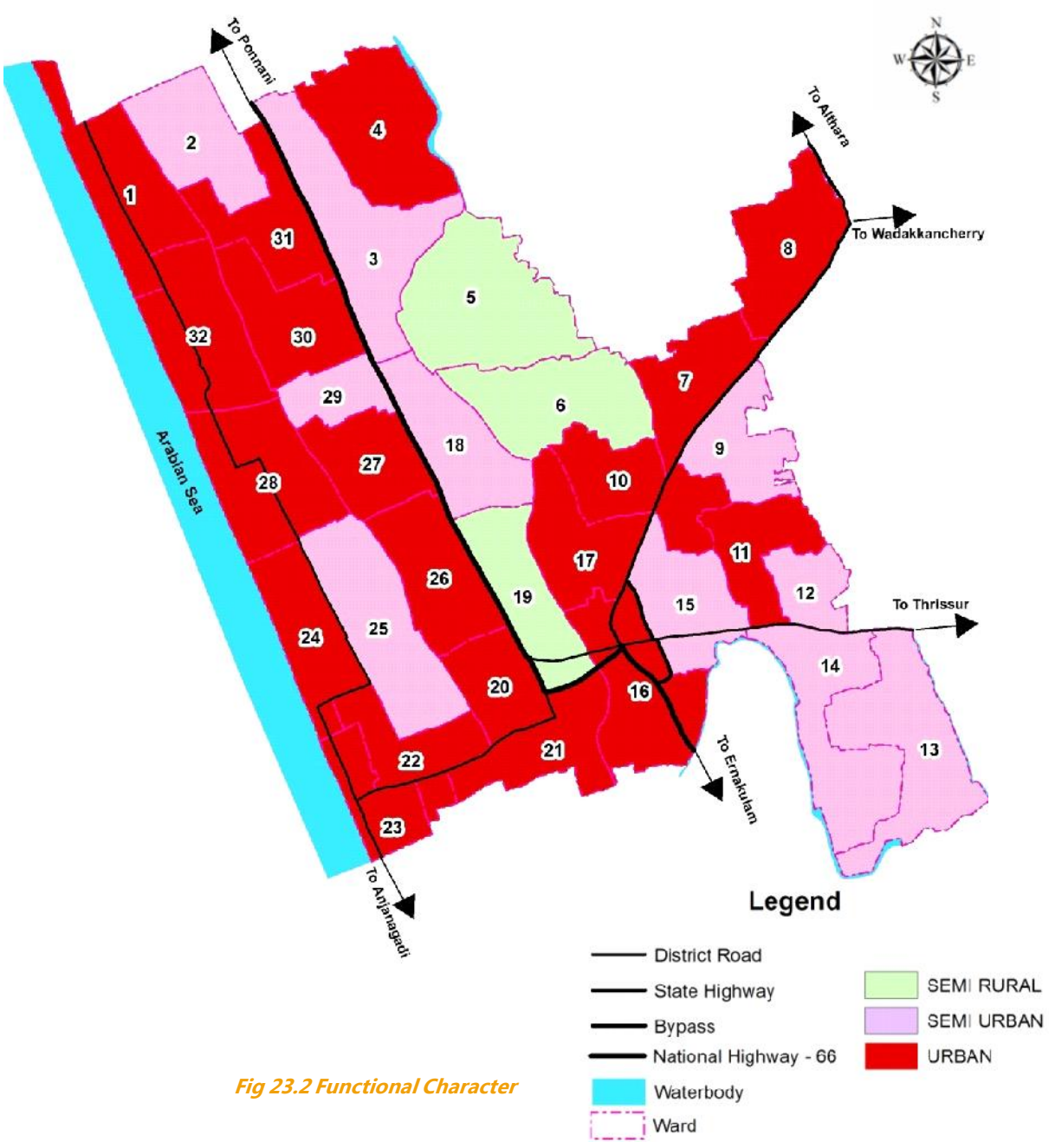


Fig 23.2 Functional Character

23.11.3 Activity Pattern

Activity pattern of the town is derived from the analysis of the existing land use. The concentration indices of the various land uses are compared and studied for this purpose. The activity pattern is shown in the figure 23.3. According to this, tertiary activities are found in the core area of the town central portion and along the sides of major roads. Residential activity covers the major portions of the town. Agricultural and primary activities are found in the periphery of Mathy Kayal. The activity pattern thus derived is given in figure 23.3

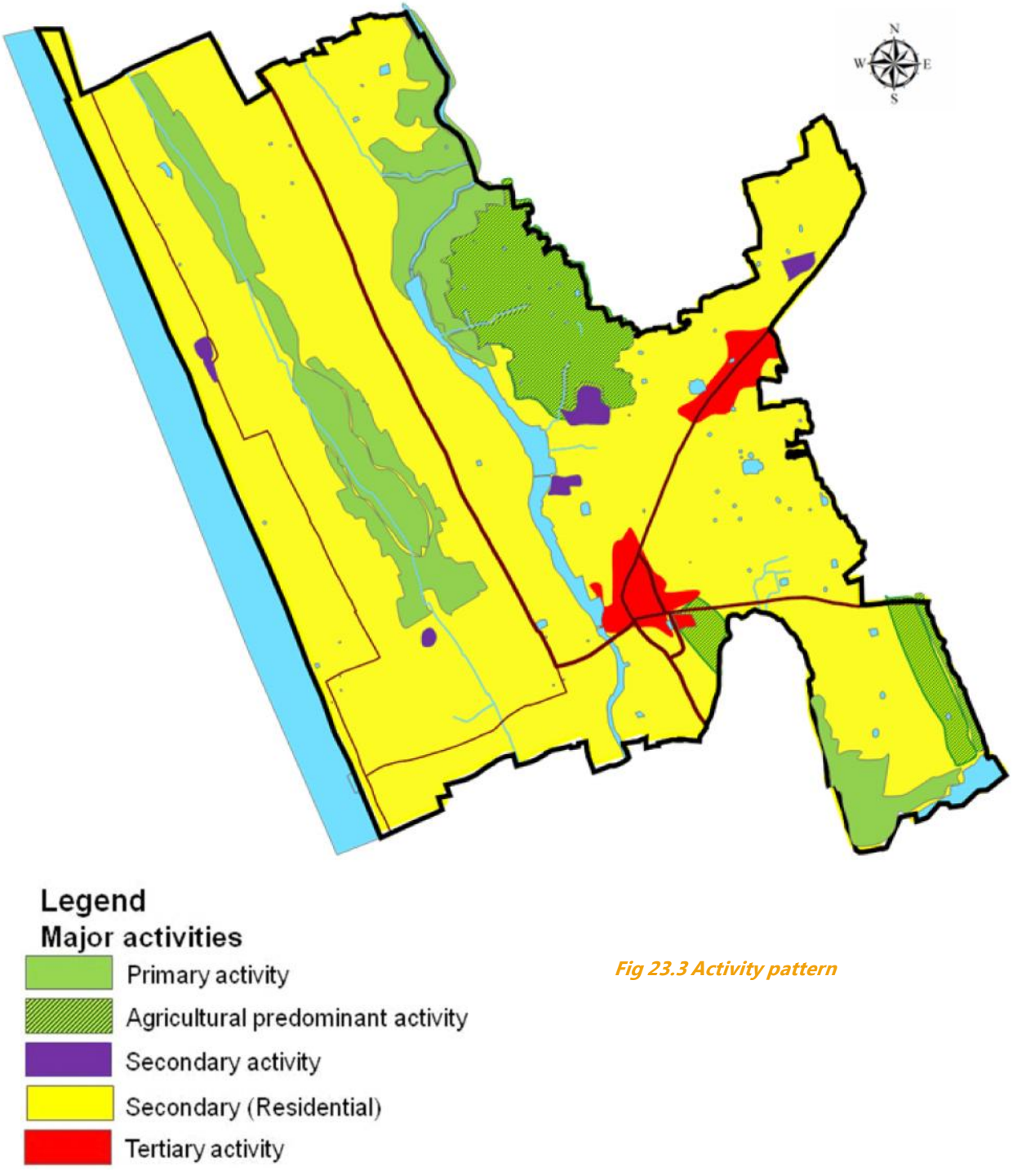


Fig 23.3 Activity pattern

23.11.4 Road network and other sectoral concentrations

The existing road network and hierarchy of the nodes are shown in figure 23.4 Existing spatial structure of Chavakkad town is shown in figure 23.5 Spatial structure depicts the present activity distribution in the town. It can be seen that majority of the area are occupied by residential activity. Intensive commercial activity is found in town centre. Commercial activities also exist in the sides on major roads and at Vanchikadavu market. Agricultural activity is found mainly in the periphery of the Mathy Kayal. Marshy lands, mangroves and wetlands constitute the environmentally sensitive areas in the town.

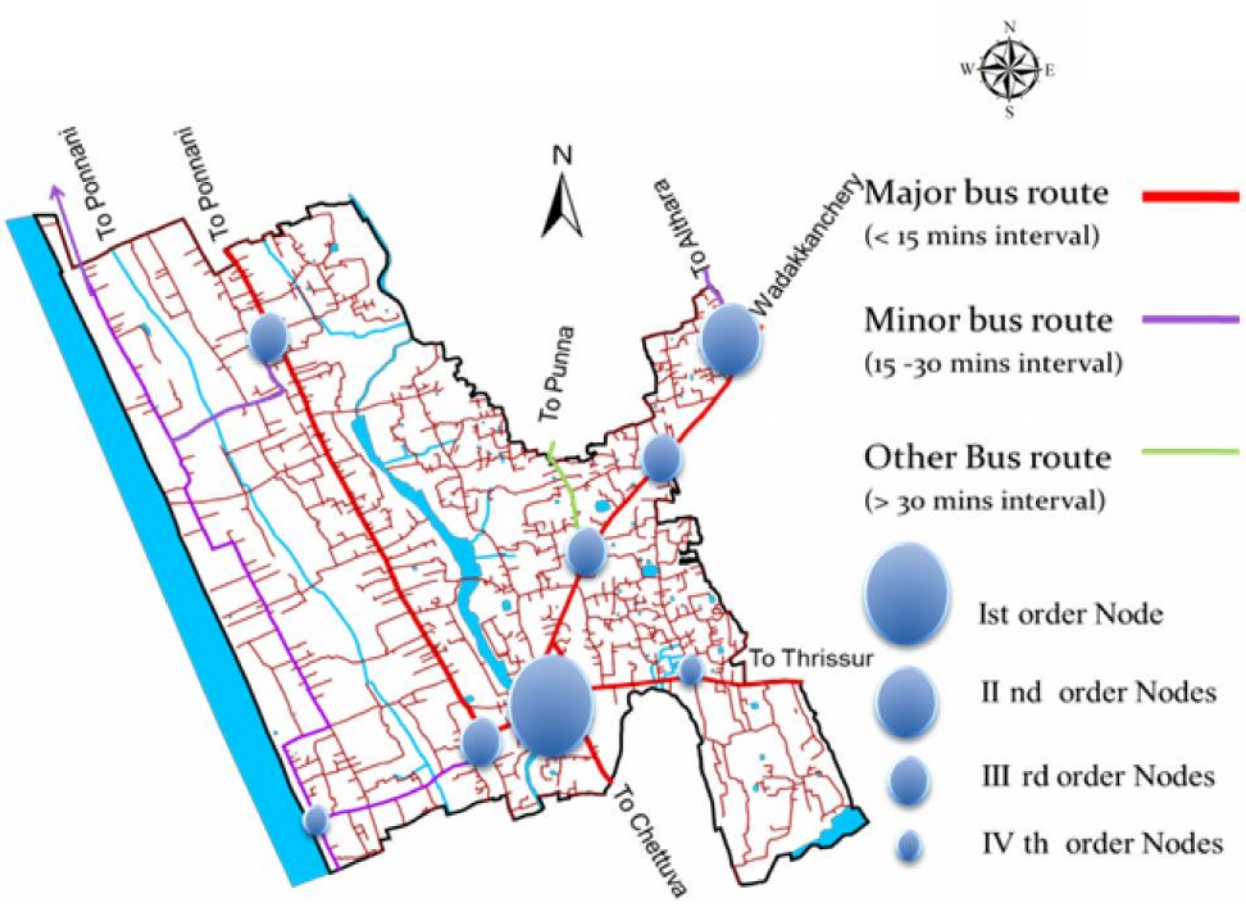


Fig 23.4 Road network and hierarchy of nodes

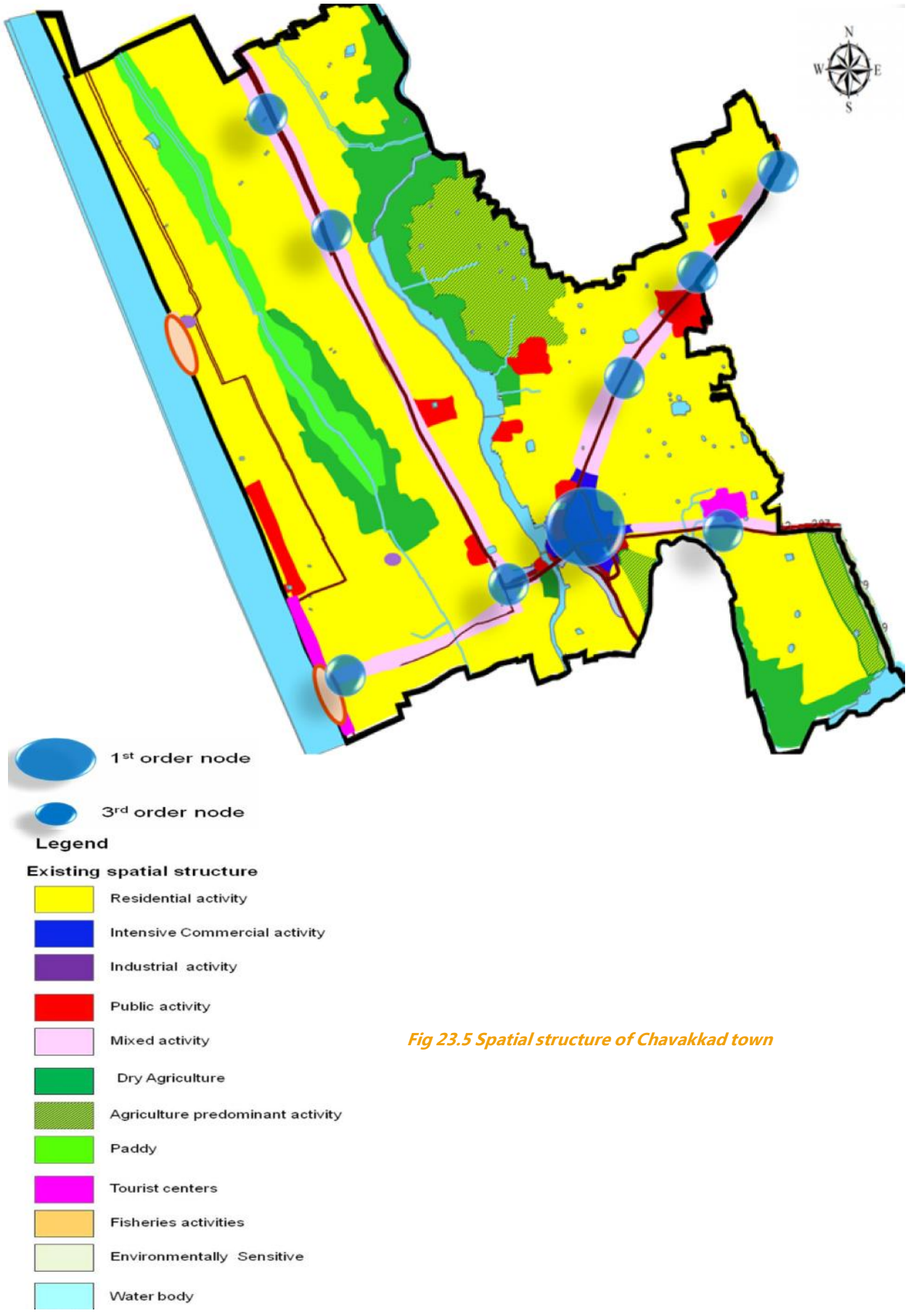


Fig 23.5 Spatial structure of Chavakkad town

CHAPTER 24

FINDINGS

The major findings and inferences arrived at from the different sectoral analysis are listed below

24.1 Regional Setting

- As envisioned in State Urbanization report, Chavakkad town is a 6th order urban center in the state
- As envisioned in Thrissur IDDP Chavakkad town is in the Multifunctional Zone II and Environmental concern zone.
- Chavakkad is a coastal town that shares west boundary with Arabian Sea
- NH-66 connects this town to various other points of the state
- The state highways that connect this town to other parts of the district are SH 50 and SH 62
- Chavakkad town is connected with road network only
- Canoli Canal is passing through this town
- Chavakkad Taluk head quarters is in Chavakkad Town
- Chavakkad Municipality is a third grade Municipality

24.2 Demography

- Chavakkad is the smallest town in Thrissur district in geographical area (12.41sq km) and population(39098) among the Urban LSGIs
- Population density is 3151 and is higher than State, District and other towns of the district
- Growth rate of population shows decreasing trend up to 2001 and shows an increasing trend in the last decade with a value 2.52 in 2011 census
- Age group 25-40 has maximum population
- Sex ratio is 1201 and is the highest in Chavakkad Town when compared with other towns even though child sex ratio is low

- House hold size is 4.73 and is high when compared to other towns.
- As per Panchayath level NORKA Report of Thrissur district 10.773% of total population are NRI's.
- 53.38 % of the total population is from Muslim community.

24.3 Employment

- WFPR of Chavakkad Town is 26.71 which are lower than the other Towns of the district.
- Chavakkad shows a gradual increase in the number of total workers and also the Main workers.
- Out of the total workers 89% are main workers and only 11% are marginal workers
- Other workers constitute 94.67% of total workers, which is increasing over decades that indicates more people are engaged in trade and business
- A major decrease in HH workers from 524 in 2001 to 318 in 2011
- Cultivators are marginal and are only 1.33 % of the total workers.

Potentials

- Chavakkad town has more NRI workers.
- From local level analysis it is evident that at least one person of a family is working in Gulf countries.
- Chavakkad town has 8269 of total number Households in which 2931 number are of female headed houses i.e. 35.4% are female headed household

24.4 Land use

- Land use analysis shows that residential land use is predominant in town; its share is high when compared to other urban LSGIs in the district (60.32 %)
- Both sides of SH 50 have mixed land use concentrations
- Commercial concentration is more towards town center and along the sides of Wadakkanchery road
- Industrial concentration is not very prominent and the existing units are scattered.

- Paddy is marginal only.
- Presence of Mangroves in ward number 13 is a notable factor.
- Functional character of Chavakkad town is urban in nature.
- Wardwise functional character reveals that 18 wards showing urban character, no wards are having rural character as well. 9 wards showing semi urban character and 2 wards are semi-rural character

24.5 Trade and commerce

- Only 1.63% of municipal area is used for commercial purpose.
- Commercial activities are seen along Guruvayur road (near town junction, Town), Kanjani road, Chettuva road and beach area.
- Only 1st& 3rd urban nodes are there in the town, 2nd order node is absent.
- Municipal Office building shopping complex and Bus stand shopping complex are major commercial centers.
- Chavakkad has one market, located at northern side of Municipal office complex.
- Street vendors are seen along major roads with more concentration in Chavakkad town Junction and beach area.
- Parking facilities are provided in the Bus stand parking ground and Municipal Office building parking.
- Public comfort station facilities are provided at Bus stand and Beach area.
- No separate loading and unloading facilities are provided for commercial centers.
- Market has less area and insufficient infrastructure facilities.
- Traffic problem due to the presence of street vendors along major roads.
- Public comfort stations are not provided at major commercial centers.

24.6 Industry

- There are no large, medium or small scale industries.
- Industrial activities are comparatively very less in town

- Two Mini industrial estates are functioning within the town out of which one is in the Municipal land and the other run in the private sector
- The industrial estate at Puthenkadappuram has industries related to fishing and concerned equipments
- Most of the Micro industries are Agro and Engineering based
- High potential for fishing related industry.
- Chavakkad does have a future in household level industrial activity which can become an economic base of the area.

Problems

- Industrial estate's area is not sufficient for large scale operations and is located in residential area.

24.7 Tourism

- Chavakkad town is included in the District Tourism Map.
- There is no tourism information center in the town
- There is a high potential for beach tourism. Around 1000 tourists during normal day and more than 3000 in holidays and festival season visit this beach. About 75% visitors are part of Guruvayur pilgrimage
- Most of the tourists coming here are lodging at Guruvayur
- Palayur Church is an important pilgrim destination
- Potential for water way tourism through Canoli canal and boating to Chettuva Azhimugham and adjacent lakes
- Tourist circuits can be identified connecting the adjacent tourist centers of nearby LSGIs
- Infrastructure facilities are not sufficient to accommodate tourists from Guruvayur and other adjacent tourist places
- Vallabatta Kalari Kendra can be utilized to its fill potentials as a source of health and martial art tourism for the economic development at the town.

24.8 Agriculture

- Soil type is sandy in nature.
- Suitable crops - Coconut, Areca nut and Floriculture
- 26.4 % (3.33 Km^2) of the land is used for Agricultural purpose comprising of 4.21% wet agriculture (paddy) and 20.88 % dry agriculture.
- Paddy is seen along the periphery of Mathikayal
- Ramacham is seen to be cultivated in a small scale in the town.
- Major crop is Coconut, and the production of coconut is above the state average.
- Agriculture mainly depends on rain water
- "Pettiyum Parayum" is used to drain out water from the agricultural area near Mathy kayal during cultivation
- "Jalasree Scheme"- Schemes for the up gradation of ponds – is introduced in the town.

24.9 Animal Husbandry

- Major live stock include hen, duck, goat and cow
- No Poultry farm exists in the town.
- One Slaughter house at Chettuva road near town centre.
- No dairy farms in Chavakkad Town.
- One Milk Society is functioning at Baby road.
- Fodder cultivation is not being taken up anywhere.
- Demand of milk is more compared to availability.

24.10 Fisheries

- High potential for marine fisheries
- Existing marine fishing activities can be exploited to maximum
- Two fish landing centres are situated at Chavakkad

- Possibilities of Inland fishing through development of existing ponds
- A Fisheries Technical School is functioning near Puthenkadappuram
- Large number of workers is from outside the town and their accommodation is a problem.
- Pollution of Sea water due to oil spillage from boats and landing center has to be prevented.
- Poor/Low living standard of fishermen

24.11 Traffic and Transportation

- Heavy volume of vehicular traffic along the National highway, Thrissur and Kunnamkulam roads
- Ernakulam road had relatively less parking activity, while Ponnani road posses high concentration of parking
- Inadequate carriageway width and right-of-way
- Inter-mixing of local traffic with through traffic in the absence of alternate road links/ regional bypass.
- High volume of pedestrians cross walk is recorded at bus stand junction during peak hour.
- Unorganized parking in the absence of proper parking lots
- Encroachment of right-of-way by hawkers, parking of vehicles and traders
- Safety risk to pedestrians (lateral and cross movements) along and across Kunnamkulam road
- Poor geometrical treatment of roads, unplanned intersections and lack of bus bays.
- Off-street parking need special emphasis.
- Majority of roads are found flooded for some day during rainy season.

24.12. Water Supply

- 58.05% of people depend on domestic wells and 15.54% of people depend on public water supply scheme
- 18.02% of people are found to experience water scarcity
- Water supply from KWA is found to be insufficient
- Water supply is done once in 3 days.
- The water scarcity problem is expected to be solved after the completion of UIDSSMT project.

24.13. Sanitation

- Discontinuous drainage network due to encroachment and pollution of natural drains.
- Lack of road side drains along major roads
- No sewerage disposal scheme in town area
- Waste water from public sewage drains are disposed finally in the Canoli canal and area surrounding Mathykayal and these finally goes to Arabian Sea.
- 83.49% of houses have septic tank
- Total quantity of waste expected to be generated in 2031 is 13 tons/day
- 97.11% of people are using their own compound for waste disposal
- All houses in Chavakkad town has toilet facilities.
- The town has a Municipal waste disposal trenching site and there are about 34 employees to collect MSW.
- All Biological wastes from hospitals are collected by IMAGE, Palakkad

24.14. Energy

- Power connection and consumption are more in domestic sector.
- Coastal area has more un electrified houses
- Only 0.28 % of houses are using non-conventional sources

- Need uninterrupted power supply
- Need 11 KV Substation at Chavakkad itself
- Inter linking of Guruvayur, Chavakkad and Punnayurkulam Substations for uninterrupted power supply
- For more steady voltage and reducing uninteruption in power supply, more transformers are needed
- Wind and tidal power are to be explored as possible.

24.15. Education

- Total Literacy and female literacy of Chavakkad Town is low when compared with the district and other urban LSGIs
- 30 % institutions are in Govt. sector but only 12.39 % of students depend on Government institutions, reasons may be lack of infrastructural facilities and basic amenities in government schools.
- For higher education students depend on institutions outside town within a radius of 15 km.
- As per planning standards required educational facilities are not available in technical educational stream in the town

24.16. Health

- 0.41 % of Typhoid is reported, which is an indication of poor sanitation.
- Basic medical facilities are available as per URDPFI Planning standards
- Upgradation of existing facilities is the immediate requirements in government sector
- Taluk hospital junction is very congested with shops and taxi parking and also the access road to taluk hospital from NH-66 is very narrow.

24.17. Recreational Facilities

- Parks, open spaces and recreational facilities are not sufficient as per planning standards
- Town does not have a stadium of its own.

- Swimming pool facilities can be made available by developing one of the ponds

24.18. Other civic amenities

- Chavakkad town is sufficient with the police station; fire station
- There are 3 comfort stations in town and it is not sufficient and not properly maintained
- There is no electrical crematorium with in the town

24.19 Housing

- 60.32 % of town area is under residential use
- As per census 2011, 90.7% have their own land for housing.
- As per Census 2011, the total number of Temporary house is 13.9% of the total number of houses
- Seven colonies are being developed under IHSDP scheme

24.20 Special Concern Areas

- 43.16 % households in Chavakkad town area are BPL families
- BPL families are cocentrated in coastal area.
- Ward 5, 7,8,9,10,11,13,15,19 &23 shows high SC-ST concentration.
- There are 261 Ayalkootam including 4618 families.
- Out of 38 Anganwadis, eleven of them are functioning in rented building.

24.21 Environment

- Existing ponds that are kept idle has to be protected from pollution and encroachment.
- Canoli canal and Mathy kayal are already polluted further pollution should be prevented.
- Protection measures for environmental sensitive areas are required.
- Paddy lands without cultivation are under the threat of land conversion.
- Noise pollution near Hospitals, schools and Residential areas are to be taken care of.

24.22 Development administration and finance

- The finance sector is weak, this affect the proper running of the Municipality and paucity of funds for developmental activities.
- The Municipality has tremendous potential for development of financially remunerative projects for sourcing funds for urban development

CHAPTER 25

GOALS & OBJECTIVES

25.1 Vision for town

Chavakkad is envisioned to be an inclusive region which is economically vibrant, environmentally sustainable and which provides healthy and good quality life to its inhabitants. It will also be a leading tourist destination which will meet the aspirations of the local residents as well as tourists alike.

25.2 Formulation of Development goals

The development goals are formulated based on the observations, conclusions and inferences derived from the study and analysis of various sectors of Chavakkad town area. From the study it is clear that non agricultural activities are mainly concentrated near the town area. These activities have to be redistributed to sub urban areas with adequate infrastructural facilities for creating a congestion free environment. This is considered as the prime goal. Industrial and commercial activities can gain momentum and become the economic base. More over land use analysis shows that 60.32% of municipal area is occupied with residential landuse having high population density which indicates that better living spaces are to be provided to people. From the study, it is understood that Chavakkad has a potential for beach tourism. As per IDDP Thrissur, Chavakkad falls under Accelerated growth zone-marine, which indicates that there is a scope for fisheries activities. Here fisheries play an important role in the socio economic development of town in view of its contribution to the food basket, nutrition security, large foreign exchange earnings, generation of employment and income.

25.3 Development Goals

1. To decongest the traffic network of existing CBD
2. To develop Chavakkad town as a marine city through the sustainable development by utilizing potentials available in marine sector.
3. To enhance tourism sector making use of available tourism potentials of the town.
4. To develop Chavakkad town as a service center for the Chavakkad Taluk area
5. To ensure healthy living conditions with the provision of excellent infrastructure facilities

6. To preserve ecologically and environmentally sensitive areas

25.4 Development Objectives

The development plan objectives represent policy and planning guide lines for identifying and evaluating the development alternatives by more clearly defining the future needs of various sectors and maintaining focus throughout the planning effort.

Chavakkad town is the meeting place of NH66, SH 50 and Kanjani road. Hence Chavakkad has connectivity to Ernakulam and Malappuram districts. Most of the commercial activities are found along the sides of these major roads. So creating a congestion free transportation network is necessary.

Chavakkad town is the headquarters of the Chavakkad Taluk. People from different parts of Taluk are visiting Chavakkad for a variety of needs. So it becomes necessary to develop Chavakkad as a service center for Chavakkad Taluk area.

As Chavakkad is a densely populated urban area and the issues related to their healthy living conditions, it is necessary to provide sufficient living spaces and excellent infrastructural facilities. Being an urban center, the dependency of people in and around the town for their educational, health and recreational needs has to be considered.

Being a nearby city of Guruvayur temple, where a lot of pilgrims are visiting from various part of India, it is necessary to develop Chavakkad as a intermediate hault place for people heading to Guruvayur temple.

Chavakkad is a marine town sharing its west boundary with Arabian Sea, their existing fishing activities since ancient days. Presently instead of developing in an organized manner, it is undergoing an organic growth. Planned intervention is required in this sector.

Chavakkad is blessed with beautiful beach. So many tourists are visiting here since ancient days. The survey conducted shows that the majority of tourists visited here are Guruvayur pilgrims. Yet now it is in an undeveloped condition. So it is necessary to develop the beach in a planned manner.

Canoli canal is passing through Chavakkad and it has branches to various lakes and Chettuva Azhimukam. Presently the canal is in an unused condition due to pollution and encroachment. So the prevention of encroachment of Canoli canal and its beautifications is necessary. Also provisions for boating through canal can attract tourists.

Chavakkad has a little presence of wet land, mangroves, marshy lands, ponds and water bodies. These environmentally sensitive areas have to be protected from all kinds of encroachment and pollution.

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

1. **To decongest the traffic network of existing CBD**

- Improve road network of the area
- Develop the existing transportation network for easy movement of people from surrounding local bodies
- Decentralize the existing commercial activities to other potential

2. **To develop Chavakkad town as a marine city through the sustainable development by utilizing potentials available in marine sector**

- Improve industrial sector and tourism sector by utilizing potentials available in marine sector
- Provide infrastructure facilities for fishing
- Provide infrastructure facilities for fish storing and processing
- Provide marketing facilities very close to fish landing center
- Improve the social status of fishermen

3. **To enhance tourism sector making use of available tourism potentials of the town.**

- Provide better infrastructure facilities for existing beach tourism
- Beautify Canoli canal along with preventing pollution and encroachment
- Create water way tourism through Canoli canal connecting surrounding lakes
- Increase the economic growth by enhancing job opportunities and better socio-economic environment

4. **To develop Chavakkad town as a service center for the Chavakkad Taluk area**

- Create pollution free environment to the tourism areas
- Provide accommodation facility and car parking facility for the tourists

- Provide better recreation facility for the tourist

5. To ensure healthy living conditions with the provision of excellent infrastructure facilities

- Provide sufficient livable spaces to meet the future need
- Provide proper waste management and sanitation facilities
- Enhance medical and educational sectors within the town to equip these institutions to meet the needs of the future

6. To preserve ecologically and environmentally sensitive areas

- Conserve paddy and water bodies to prevent environmental degradation
- Preserve the existing dry Agricultural activities to the minimum extent
- Preserve the existing marshy lands and mangrooves for ecological balancing

CHAPTER 26

DEVELOPMENT CONCEPT

A development vision/concept throws light into the form into which the city may develop. It also suggests an ideal future pattern of development. This chapter explains the Development Concept carved after taking into consideration the opportunities, the constraints and the needs identified during the analysis phase of development plan.

A people - oriented approach is the right key to the development of the town. Adequate and efficient infrastructure to cater to the different needs of the people can be developed. Tourism which will not adversely affect the well-being of the citizens can be developed. Municipal economy can be strengthened through efficient tax collection and optimum use of the available resources and assets. An integrated approach for the development of potentials available in the sectors of agriculture, animal husbandry, commerce and industry is to be adopted.

The geographical location of Chavakkad town in the coastal region of Kerala, sharing west boundary with Arabian Sea, makes Chavakkad a blessed town with potential for beach tourism and fisheries. The potentials available in these sectors can be effectively utilized.

In addition to this, due consideration should be given to environmental sensitive areas for proper ecological balance. All these factors are considered while formulating development concept of town. Formulation of development concept is based on spatial structure of the Chavakkad town.

26.1 Formulation of Development Concept

Based on the findings of the various analysis and the aspirations of the people revealed in the local level analysis, a vision for the future development of the town is formulated. The vision for future spells out every possibility of growth. Vision arrived at here, completely justifies the goals for which this document stands for. Development Concept is formed based on the existing spatial structure, State Urbanisation report 2012 and Integrated District Development Plan – 2031, Thrissur. As per the State Urbanization Report Chavakkad town is included in the Guruvayur urban agglomeration and as per IDDP, Chavakkad included in Multifunctional Zone II and Environmental concern Zone

The broader frame work of the Master plan structured with the elements from these reports. The future needed livable space, the future needs of roads, widening of roads and future hierarchy

of nodes, development chances of tourism and fisheries sectors are integrated with this. Along with this the preservation of heritage precincts and the conservation of ecologically sensitive areas are considered. Thus a future form of the town is evolved.

26.1.1 Proposed Road network



Fig 26.1 Conceptual road networks

Proposed road network for Chavakkad town is prepared taking into account the existing regional traffic scenario and based on an evaluation of the future traffic on the base year network. Transport development schemes are formulated so as to reduce the severe strain put on the existing road network. The configuration of the existing road network within Chavakkad town

resembles more or less a **grid-iron pattern**. The town is developed around the Chavakkad CBD and the traffic is served basically by the National Highway 66, which almost bisects the total Municipal area, the two State Highways viz. the Chavakkad – Wadakkanchery SH &Guruvayur-Ponnani SH, Kanjani road and with a number of north-south and east-west corridors. Since the most important problem of Chavakkad town is high traffic load along NH 66, especially near the CBD area, emphasis is given to develop alternative links to divert the by-passable traffic passing through the NH stretch. This would also help to reduce the inter mixing of intra-town and inter-town traffic on roads within the central part of the town. Conceptual road network is as shown in figure 26.1.

26.1.2 Suggested population density distribution

Population is projected using three methods and the average value is taken. The distribution is carried out using the goals in mind. Projected population of the town is around 44,000 in 2031.

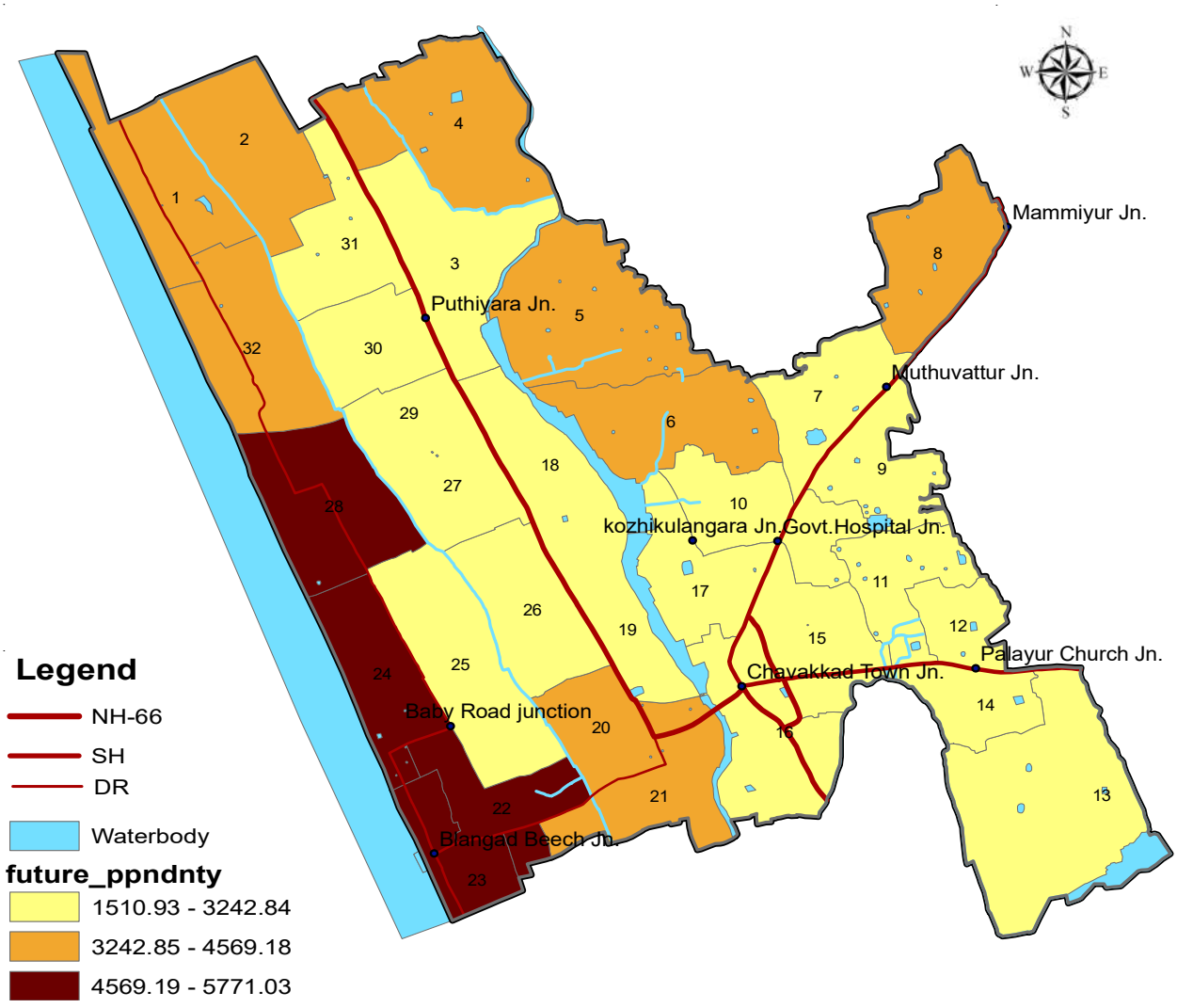


Fig 26.2 Suggested population density distributions

Future population density distribution was formulated on the concept that population will be shifted from CBD to suburban areas of the town. Concept on suggested population density distribution is shown in figure 26.2. As per the suggested population density central area of the town is meant for the mixed residential use where commercial and public use will play a vital role. Subsequently the increasing population is redirected to the outer and sub urban area of the town up to a certain limit, where dry agricultre acivity along with dwelling residences is concentrated.

26.1.3 Suggested hierarchy of nodes

Based on the future transportation network, commercial activities can get shifted/originated in some other locations. Chavakkad being a town with major commercial activity will accept all improvements in the commercial sector whole heartedly. Region around town junction are highly congested due to the increased commercial activity in those areas. Hence it is suggested to develop a town centre and Junctions are categorised based on the nodal hierarchy of commercial usage. The existing nodes along the national highway can merge into a commercial corridor. Nodes can originate where the North-South corridors and East-West corridors cross each other. Thus suggested hierarchy of nodes is derived and is shown in figure 26.3. Apart from the central commercial corridor, second order nodes are proposed in Thiruvathra Athirthi and Dwaraka Beach. The proposed third order nodes are at Mammiyur, Muthuvattur, Hospital junction, Puthen kadappuram and some junctions along NH 66.

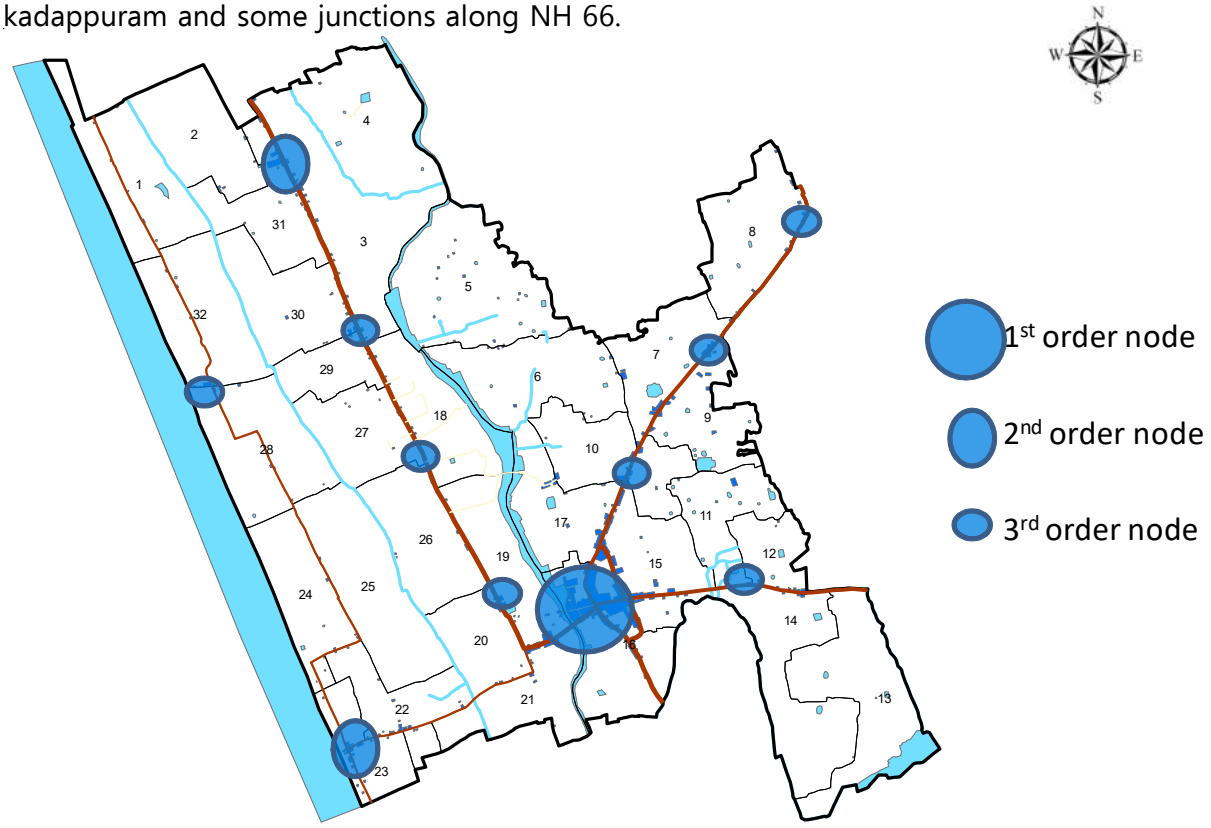


Fig 26.3 Hierarchy of nodes - Suggested

26.1.4 Concept on other development sectors

As per the studies conducted, the development sectors of tourism and fisheries were found to have potentials to become the economic base of the town. Hence a future tourism concept for utilising the opportunities available in this field and ensuring growth that upholds our heritage and culture is considered. Here specific focus is given for responsible tourism. Major tourist destination and areas of fisheries development are shown in figure 26.4 and figure 26.5 respectively

A lot of Guruvayur pilgrims and tourists from inside and outside Chavakkad visit beach. The beautification of existing beach and providing better infrastructural facilities in an eco friendly and sustainable manner is to be taken up for enhancing the activity. The canoli canal which may be regarded as a historic precinct can be developed and beautified in a sustainable, eco friendly manner.

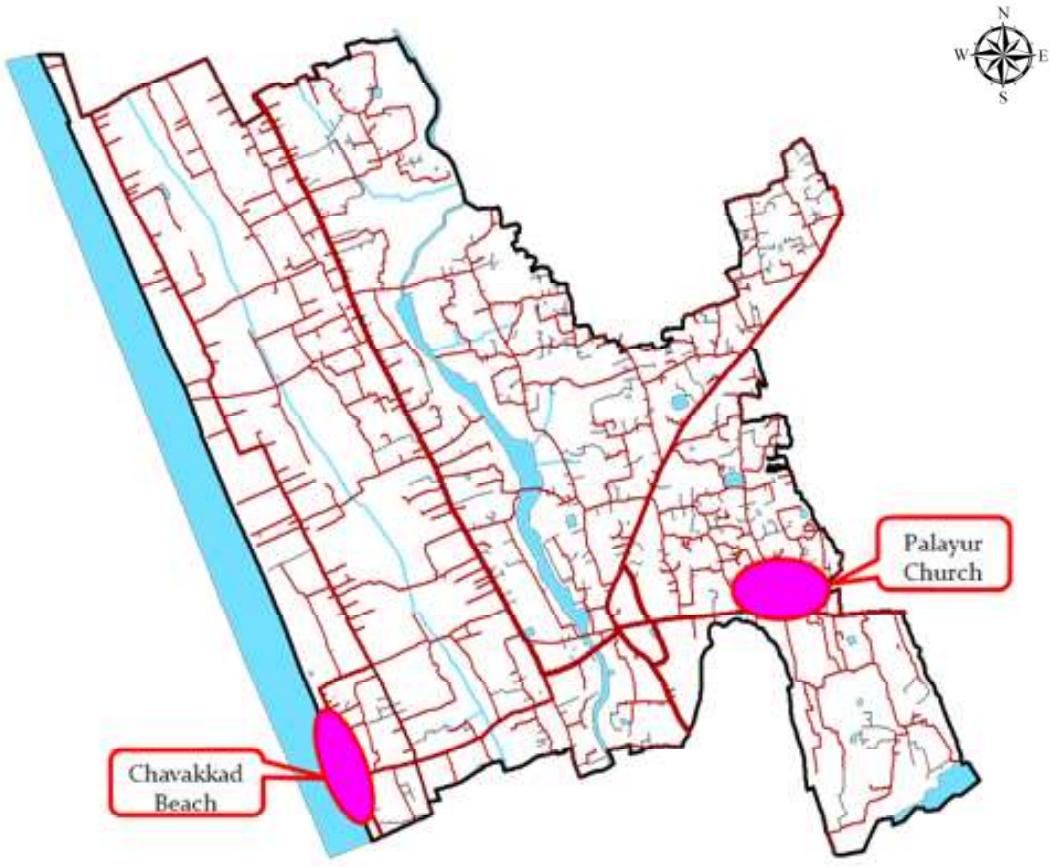


Fig 26.4 Major tourist destination

Chavakkad is sharing its west boundary with Arabian Sea, hence fishing is a major employment and economic generation sector of town. The development of fishing and fish based industries in a sustainable manner will be ideal. An integrated approach for the utilization of potentials available in the sectors of agriculture, animal husbandry, fisheries and industry is to be adopted. The protection of the environmentally sensitive areas in Chavakkad area is also considered in the formulation of development concept. The analysis of Chavakkad land use map shows that 1.61% of land area is under commercial usage. 60% of Commercial activities are concentrated in core area, rest are scattered around town. Hence providing more space for commercial activities away from core area can improve the economic status.

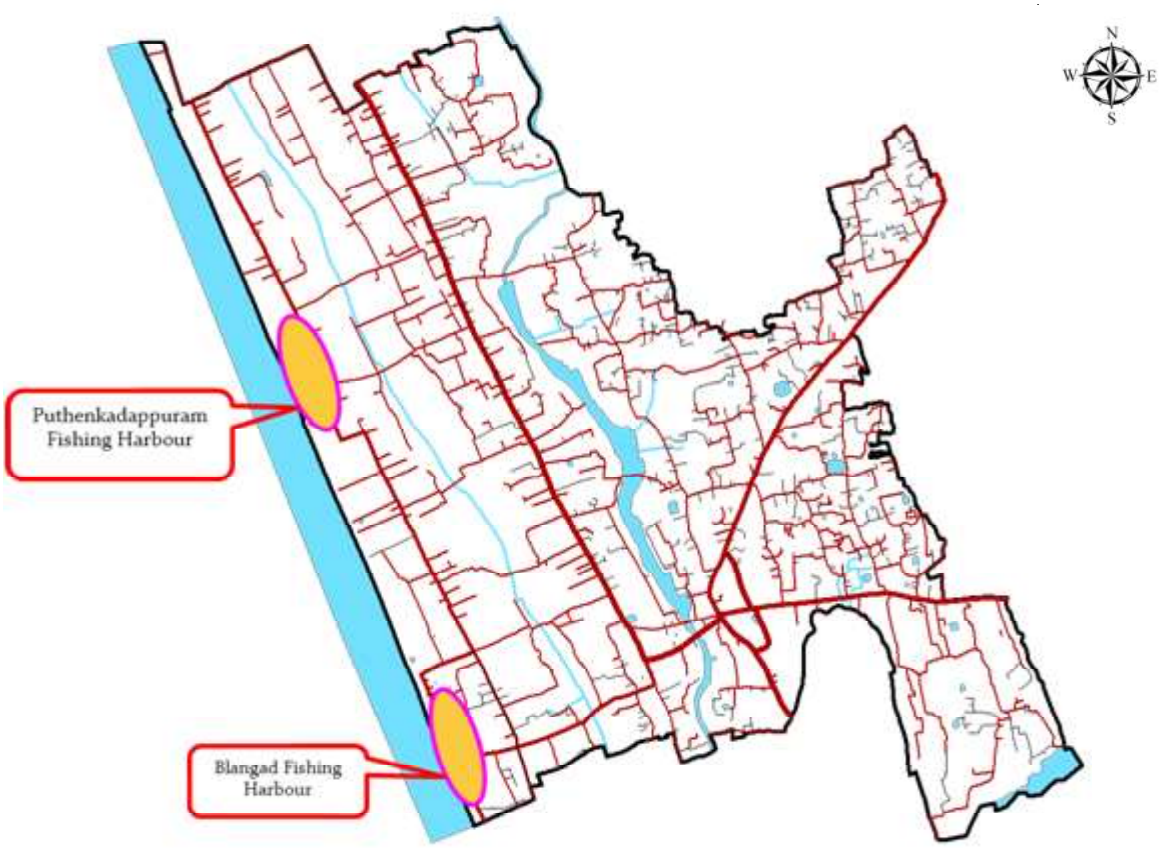


Fig 26.5 Suggested areas for fisheries development

26.1.5 Concept on Ecological Conservation

It includes water bodies, Mangroves, Marshy land,back water, coastal area and paddy where attempt has to be made for the protection of the same. The Master Plan aims to conserve these areas as its existing condition with developments based on the eco friendly manner. Figure 26.6 shows the concept on ecological conservation.

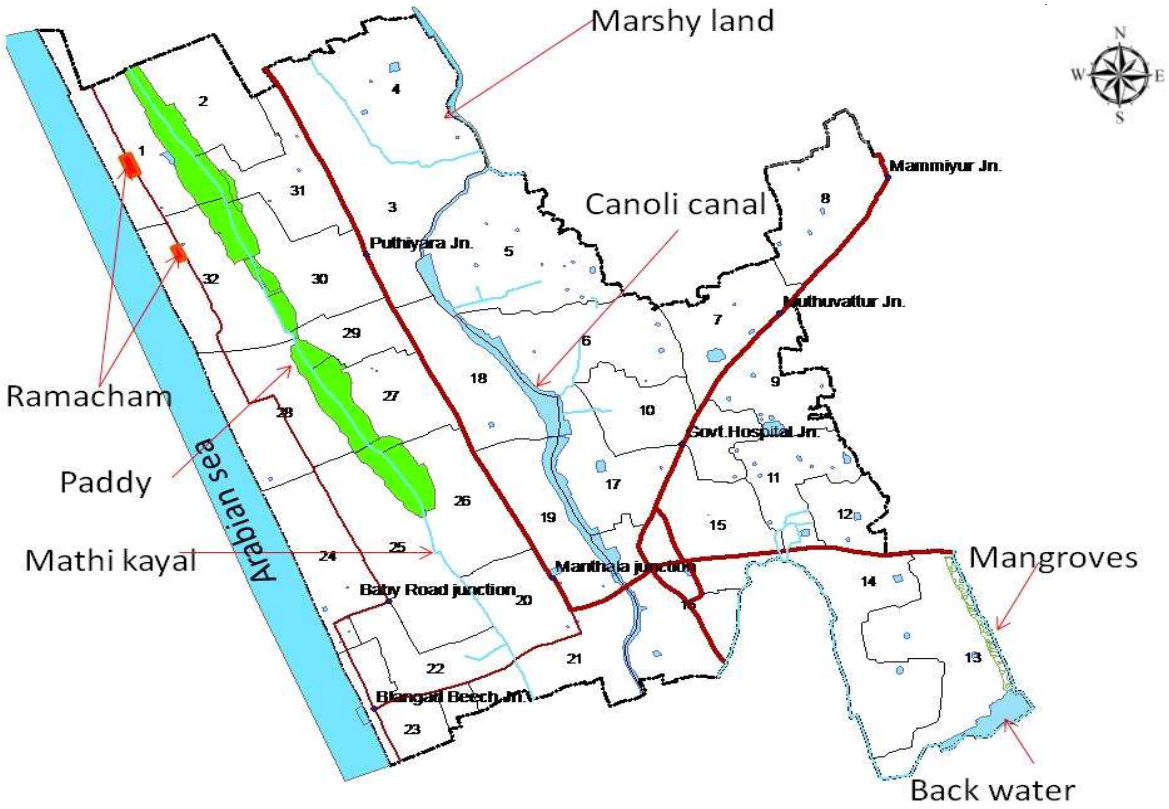


Fig 26.6 Concept on Ecological Conservation

Development Concept

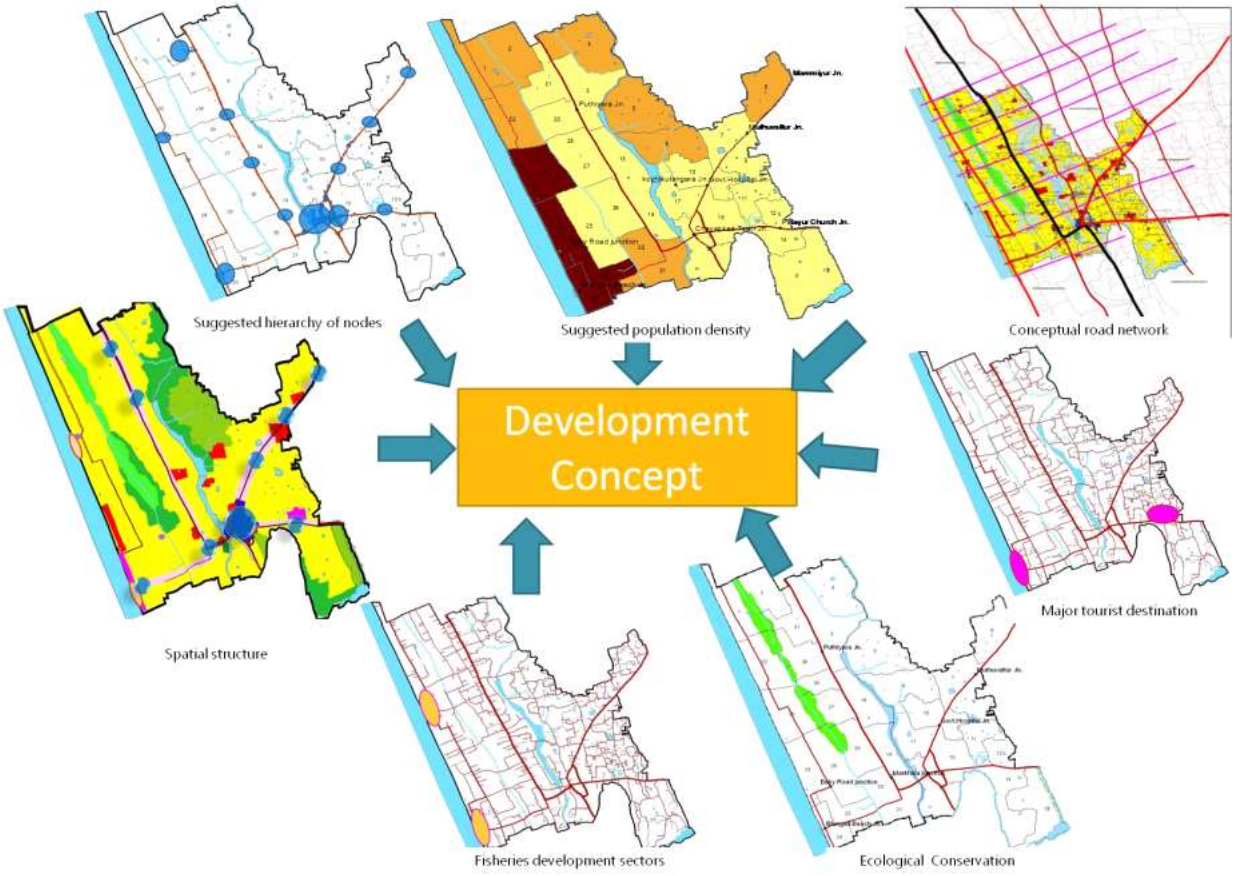


Fig 26.7 Formulation of Development Concept

Development concept was evolved by integrating all the above factors, and the process is schematically represented in figure 26.7. Development concept formulated after integrating above discussed factors is as shown in figure 26.8 As per the development concept thus derived, the town is divided in to the following zones: Habitable zone, Residential Mixed zone, Commercial zone, Public zone, Paddy zone and Environmentally sensitive zone . For the distribution of future needed living space, the Habitable zone is subdivided into High density Habitable zone and Low density Habitable zone. Pucca residential areas with essential concentration of commercial and public activities are delineated as High density Habitable zone. Out skirts of the town, where dry Agriculture activities along with dwelling residences, is proposed to develop as Low density Habitable zone allowing more residential uses up to certain extent.

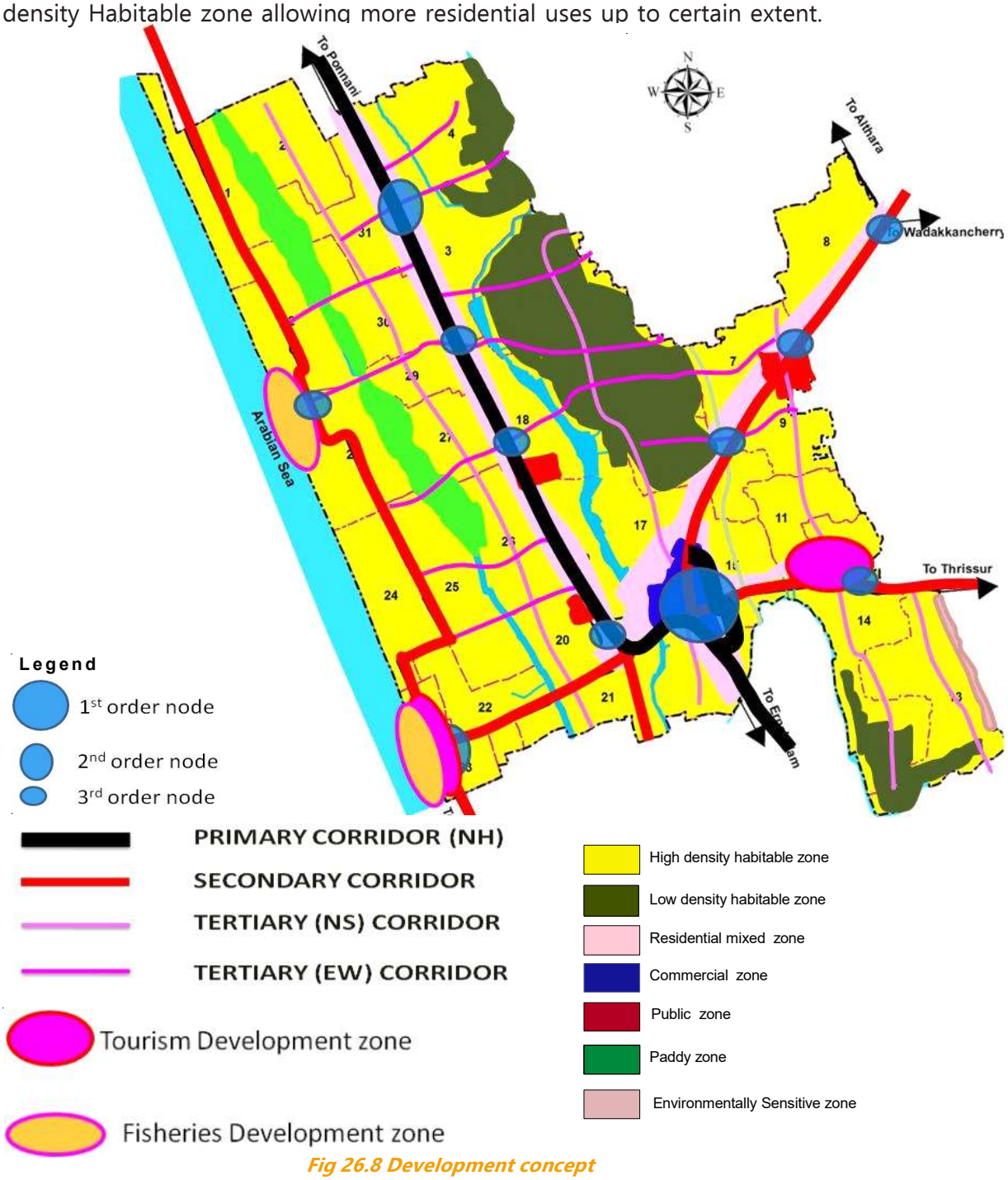


Fig 26.8 Development concept

CHAPTER 27

POLICIES & STRATEGIES

This chapter discusses the policies and strategies to be adopted for the implementation of the development vision suggested for Chavakkad Town.

Policies are concepts that guide the thought process and behaviour of decision makers and strategy refers to the long- term objectives and the adoption of course of action to achieve these objectives

27.1 General development policy

To develop Chavakkad as a Marine city through the sustainable development of potentials available in marine and tourism sectors. The spatial development envisaged is one which optimizes the utilization of resources, reduces regional, spatial and economic imbalance, protects the environment and maintains an ecological balance.

27.2 Sectoral development policies & strategies

27.2.1 Fisheries sector

Chavakkad Town is a town which shares its west boundary with Arabian Sea. Fishing activity is a major means of employment and lively hood of the people in this area. It is seen that an organized system is not followed in fisheries for a sustainable economy generation. Measures must be taken to evolve diversified practices and allied activities to utilize the potentials available in this sector, so as to enhance economic growth. Most of the workers are from outside Chavakkad; hence their accommodation is a problem, so accommodation facilities for workers should be improved.

Strategies adopted for policy are,

- To form fishing villages consisting of basic living facility to fishermen
- To improve infrastructure facilities for fishing, storing and processing
- To provide marketing facilities very close to landing center
- To improve road network to the areas of proposals
- To establish a new fish museum
- To improve the social status of fishermen

- To provide new fish markets near fishing areas
- To establish training centre and seed banks

27.2.2 Tourism Sector

Chavakkad Town is blessed with a beautiful beach which is attracting visitors from far and wide places. Majority of tourists visited here are Guruvayur pilgrims. The presence of Palayur church established by St. Thomas, which is one of the pilgrim destinations for Christians, is an addition to pilgrim tourism. The presence of Canoli canal and Mathy kayal also offer avenues for exploring water way recreational activities. The strategies adopted are

- To beautify existing beach
- To give separate entry for tourists and fisheries
- To provide a new entry to beach from Dwaraka temple point
- To provide accommodation facilities to tourists
- To introduce community inclusive tourism activities
- To link of fisheries with beach tourism
- To provide for pollution free environment
- To develop web site for tourism promotion
- To provide ample car parking facilities
- To utilise the available Martial academies like Vallabhatta Kalari, to introduce Cultural and arts based tourism
- To provide side walkways, lighting, chairing, and fencing etc for canal front development.

27.2.3 Industries sector

Presently industrial activity is not prominent in Chavakkad municipal area. In ancient days household industries were existing to a large extent. Chavakkad has coconut production to a large extent than Kerala state average production. Fishing is also a major activity of Chavakkad. The development of processing units for the local products and support for the presently declining traditional industries is to be adopted as the policy for industrial sector. The strategies are,

- To promote agro based industries and household industries
- To establish coconut based industries
- To promote units for value addition of fish
- To develop existing industrial estates
- To ensure proper storage and marketing facilities for the industrial products.
- To provide for industries to support fishing activities like repairing and maintenance of fish boat, fish net etc.
- To encourage non-nuisance, non-polluting industries

27.2.4 Agriculture & allied sectors

The wet agricultural activity of Chavakkad Town is marginal. Chavakkad has a better productivity in coconut cultivation. The policy is to support the agricultural activities existing in the municipal area and conserve existing wet agriculture. The strategies adopted are,

- To promote organic agriculture, which presently gain a new scope for development Guruvayur temple related activities may boost this venture
- To impart concentrated efforts from the sides of the Town and Government department concerned to support the existing agricultural activities
- To integrate home stead cultivation and animal husbandry sector
- To retain the existing paddy cultivation area
- To promote coconut cultivation by introducing coconut based industries
- To provide incentives/benefits to cultivation/paddy land owners.

27.2.5 Transportation sector

Chavakkad town is a junction where NH, SH and an MDR Kanjani road meet. As per the regional setting of Chavakkad, **Grid Iron Pattern** network is better to be adopted for the development of road network.Alternative links are required to divert the by-passable traffic passing through the NH stretch. This would also help to reduce the intermixing of intra- town and inter-town traffic on roads with in the central part of town. It is seen that majority of roads are flooded for some days during rainy season, hence proper drainage system is to be undertaken.

- To adopt important measures like Junction improvement, splay etc for the existing road network for CBD area of the town.
- To provide linkages to NH from major roads
- To develop the hierarchical road network with increased road widths

- To provide proper drainage facilities to all major roads
- To prevent on street parking by providing suitable off street parking facilities for CBD area of the town.
- To ensure the safety of pedestrian movement at various points of CBD area of the town.

27.2.6 Commercial sector

The existing commercial sector is currently focussed towards central area (Town junction extending along Wadakkanchery and Kanjaniroad) and is presently expanding in a haphazard manner. The existing market building is small and infrastructure facilities seem to be unsatisfactory and lack of comfort stations and car parking. The diversion of roads in order to decongest CBD generates new junctions which will generate new commercial centres. The development policy is to shape its growth in a structured manner.

- To develop CBD area with centralised waste management systems, slaughter house, underground wiring, public parking sites etc.
- To provide a new market, separately for fish and vegetables
- To provide pedestrian linkages between significant locations within CBD
- To provide road network connecting all commercial centers
- To provide loading and unloading spaces
- To arrange new locations for street vendors protecting their rights

27.2.7 Health and sanitation

Chavakkad is the head quarter of Chavakkad Taluk. The residents of surrounding LSGIs depend on Taluk hospital. Eventhough health facilities of Chavakkad town are satisfactory as per planning standards, certain measures have to be taken.

- To ensure proper infrastructural facilities for hospitals
- To conduct health awareness programs by government departments
- To provide palliative care units, centers to rehabilitate mentally retarded patients as well
- To empower Vayomithram project
- To modify existing trenching ground
- To encourage biogas plants for waste disposal at household level

- To implement strict regulations regarding waste disposal at public places
- To provide comfort stations at major nodes.

27.2.8 Education sector

The educational facilities are satisfactory up to secondary level in Chavakkad. Presently technical educational facilities are not available in town. As per planning standards some technical institutions are necessary for Chavakkad. The strategies are,

- To ensure the primary education of all children
- To provide technical institutions
- To improve basic infrastructure facilities of institutions
- To introduce physical training to students with the assistance of available martial academies like Vallabhatta Kalari Sangham

27.2.9 Other infrastructural facilities

Chavakkad being a major residential settlement, the main policy is to enhance the quality of living of the people, by providing adequate infrastructural facilities and to ensure these facilities to all sections of the society. The strategies adopted are,

- To assess the future needs related to drinking water, sanitation, solid waste management and other social and recreational amenities, and to plan accordingly these by improving living conditions.
- To improve the living conditions of people living in the sub- standard areas
- To promote the usage of non conventional energy sources by introducing various schemes

27.2.10 Conservation of heritage & environment

About 25% of the land area of Chavakkad town is environmentally sensitive. Also areas of heritage importance lie scattered in various parts of the municipal area. The conservation and protection of these areas is a matter of urgent interest.

- To conserve and protect the wetland from encroachment
- To preserve cultural and heritage sites of town
- To protect water bodies within town

27.2.11 Recreation

As recreation refers refreshment of health or spirits by relation and enjoyment it must be provided as per planning standards for the healthy living of human beings. Chavakkad town shows lack of recreation facilities as far as planning standards are concerned. In order to provide recreation the following strategies to be adopted.

- To provide recreation facilities as per planning standards.
- To improve the infrastructure facilities for existing recreation centres.
- To make the recreation centres as plastic free zone.
- To maintain the recreation centres as eco friendly spaces.
- To make the recreation centres as accessible and inclusive centres
- To utilize the natural tourism potentials (beach & canoli canal) in a ecofriendly manner

CHAPTER 28

PROJECTED REQUIREMENTS

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

28.1Population Projection

28.1.1Arithmetic Method

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

$$P_n = P_0 + rn$$

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

YEAR	Population	Increase in population	Rate (r)
1971	29443		
1981	34344	4901	490.1
1991	37789	3445	344.5
2001	38138	349	34.9
2011	39098	960	96
Total		9655	966
Average		**2413.75**	**241**

Population for 2021, P_2021 = 39098+(241×10)=41508

Population for 2031, P_2031 = 41508+(241×10)=43918

28.1.2 Geometric Increase Method

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

YEAR	Population	Increase in population	Rate(r)
1971	29443		
1981	34344	4901	16.65
1991	37789	3445	10.03
2001	38138	349	0.92
2011	39098	960	2.52
Total			**30.12**

Geometric Mean = (16.65 x 10.03 x 0.92 x 2.52) ¼= 4.44 (r)

Pn=Po (1+r/100) n, where Po = existing population, r = Geometric Mean, n = no. of decades

Population for 2021, $P_{2021} = 39098x\left(1+\frac{4.44}{100}\right) = 40834$

Population for 2031, $P_{2031} = 39098x\left(1+\frac{4.44}{100}\right)x\left(1+\frac{4.44}{100}\right) = 42647$

28.1.3 Incremental Increase Method

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

YEAR	Population	Increase in population	Incremental increase
1971	29443		
1981	34344	4901	
1991	37789	3445	-1456
2001	38138	349	-3096
2011	39098	960	611
Total		**9655**	**-3941**
Average		**2413.75**	**-1313.67**

Population after nth decade is P_n = P+ n.X + {n (n+1)/2}.Y

Where, P_n = Population after nth decade

X = Average increase

Y = Incremental increase

Where P_n= Population at the end of n^{th}decade,P_0= Base year population

Population for 2021, $P_{2021} = 39098x\left(1+\frac{4.44}{100}\right) = 40834$

Population for 2031, $P_{2031} = 39098x\left(1+\frac{4.44}{100}\right)x\left(1+\frac{4.44}{100}\right) = 42647$

28.2 Perspective Population for the Year 2021 &2031

The table 28.1 shows the projected population of Chavakkad town for the plan period by different methods.

Table: 28.1 Projected populations for the plan period

SINo	Method	Population in 2021	Population in 2031
1	**Arithmetic method**	**41508**	**43918**
2	**Geometric method**	**40834**	**42647**
3	**Incremental increase method**	**40198**	**39985**
	Average	**40847**	**42183**
	Taking an average of 1% Migration in 2021, 2% in 2031 Population due to the policy adopted in development plan	408	844
	Outside workers (mainly from States of West Bengal, Bihar, Orissa, and Assam) as per data from Chavakkad Police station	210 (Assuming 2% increase)	250 (Assuming 2% increase)
	Total	**41465**	**43227**
	Rounded to	**42000**	**44000**

The perspective population is arrived by taking the average of all the population projections through the various methods discussed above and the in migration for job and various other reasons. The expected population of Chavakkad Town is shown graphically in Figure 28.1. Population is expected to reach 44000 by 2031.

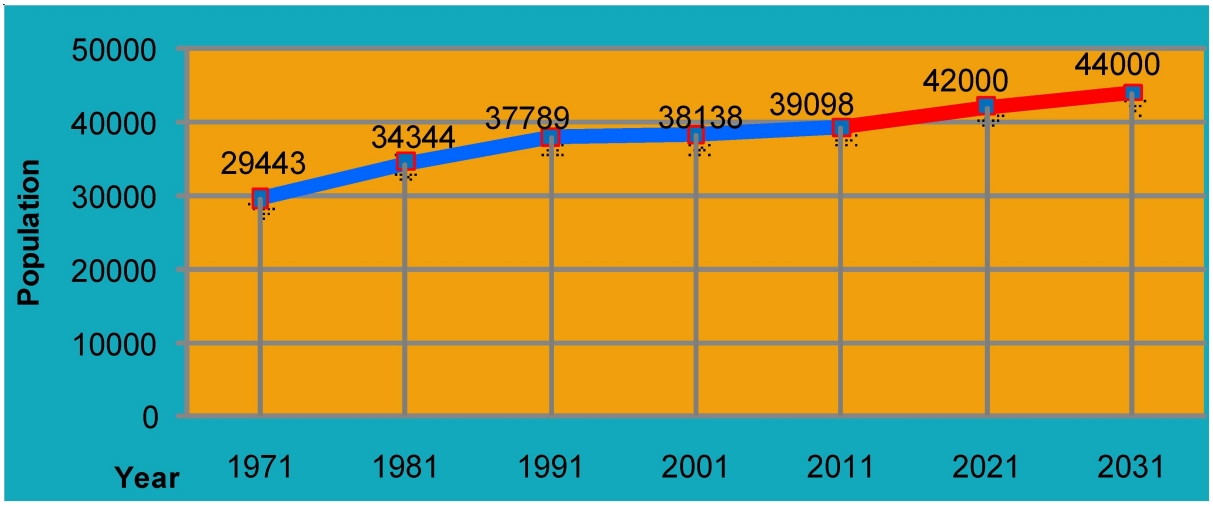


Fig 28.1 Projected populations

28.3 Anticipated changes in Population Growth Rate

The growth rate of population in Chavakkad town is showing a decreasing trend. Considering this trend, the population growth rate values were extrapolated for the decades 2011-2021 and 2021-2031. It was found that the growth rate increase in 2011-2021 then decrease in 2021-2031 decades. The fig 28.2 shows the expected variations in population growth rate. Since population growth rate of Chavakkad town area is higher than that of state value (4.91%), expecting a population growth in coming decades. This shows the importance for introducing a planned growth for the town area which helps the people for their better living.

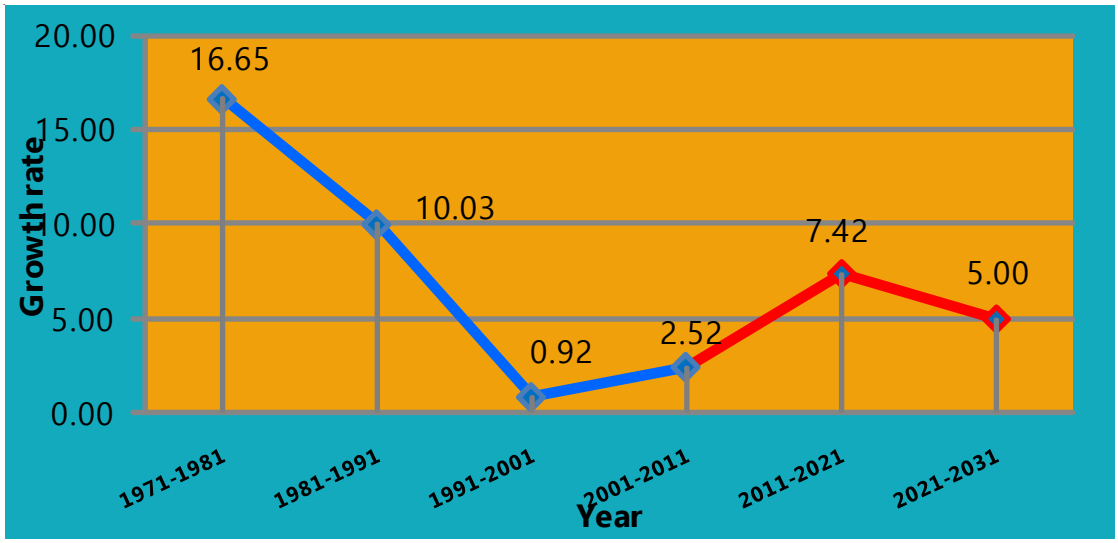


Fig 28.2 Projected Growth rate

28.4 Anticipated Changes in Occupational Pattern

The economic activities govern the occupational structure of the area. The expected population by 2031 is 44000. With the introduction of new development projects as per the new development plan, economic base will be strengthened which will further result in the increase

of job opportunities in town area. From the projected work force participation rate for Chavakkad Town area, it can be found that the WPR reaches about 27.33% by the end of 2031.The fig 28.3 shows the expected variations in population WPR.

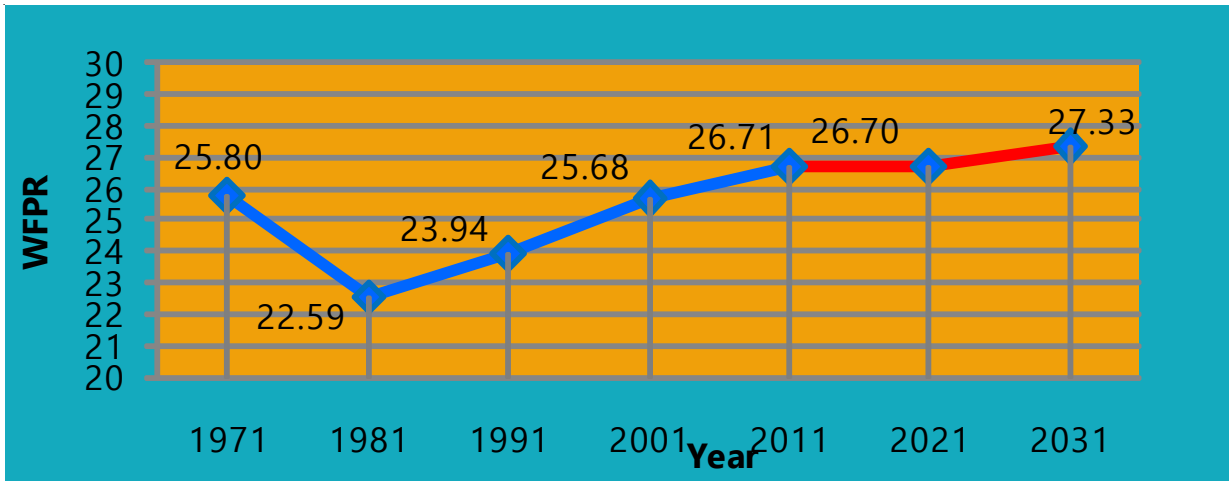


Fig 28.3 Projected WPR

Table: 28.2 Projected land use structure for Chavakkad town

Land use category	Percentage of developed area as per URDPFI guideline (%)	Existing Land use 2012		Proposed Land use 2031	
		Area (sq. km)	Percentage	Area (sq. km)	Percentage
Residential use	45-50	7.575	60.17	4.973	39.50
Residential agriculture use	-	-	-	2.982	23.69
Residential mixed use	-	-	-	1.869	14.85
Commercial	2-3	0.203	1.61	0.207	1.64
Industrial	8-10	0.032	0.25	0.024	0.19
Public & Semi public	6-8	0.540	4.29	0.514	4.08
Traffic & Transportation	10-12	0.486	3.86	0.887	7.05
Recreational	12-14	0.00	0.00	0.113	0.90
Agriculture, water bodies, Green and open space, Mangroves, Vacant land	Balance	3.754	29.82	0.912	7.25
Special use zone-Fisheries	-	-	-	0.107	0.85
Total developed area	100	12.59	100	12.59	100

28.5 Projection of Requirements

28.5.1 Area requirement for various urban uses for the plan year

Chavakkad town can be considered as a small town II as per URDPFI . The table 28.2 shows proposed land use for the plan year. From table 28.2 it is seen that there are new types of land uses in proposed land use plan-2031, namely High density residential use ,

low density residential use, residential mixed use and special use zone-fisheries, which are emerged based on the new development vision. While comparing the existing land use with URDPFI guidelines it seems that Chavakkad town satisfies the residential demands in terms of gross residential area. Public and semi public and Commercial land use demands seem to be almost satisfied and show no significant thrust. It reveals that a concrete development policy is to be carried out in industrial sector in order to provide an exposure to this sector, since it shows a large variation from its URDPFI standard value. Master plan envisages industrial development through growth pole techniques. Even though traffic and transportation sector shows a significant difference from standards, its effective distribution according to requirements fulfills the function. Consideration should be given for green and open space development which functionally constitutes recreational activities and promote passive and active recreation.

28.6 Requirement of Physical Infrastructure

Requirements in Chavakkad Town area for 2031 according to standard guidelines are given below:

1. Trade and Commerce

Chavakkad town is a small town. As per the URDPFI guidelines the trade and commercial area requirement for a small sized town is estimated as 0.20 Ha to 0.25 Ha per 1000 persons. At present Commercial activities consititue 0.52 Ha per 1000 persons which is more than URDPFI standards. The requirement is only to redistribute the commercial activities to all growth poles and also provide better infrastructural facilities for existing commercial activities.

2. Water supply

The total quantity of water supplied by KWA is about 1.5 MLD/Supply day. The requirement of water as per URDPFI guidelines for domestic uses is 135-150 lpcd. A minimum of 150 lpcd per person is considered as the future demand. From this the future demand for domestic purpose is estimated to be 4.05 MLD (50% of population using own well). The additional requirement is 3.55 MLD.

3. Energy

One 11 KV substation for 15,000 population is taken as the general standard for all categories of towns. One 33 KV substation is existing there. One LPG godown for 40000-50000 populations and petrol filling station is permitted in residential and industrial use zone in urban areas , along national and state highways and 30mx17m is the area requirement for filling station only . In the current scenario,there are 4 petrol pumps in chavakkad town . The demand for 2031 is given in Table 28.3.

Table: 28.3 Projected requirements of Energy for the plan year

Category	Existing Nos	Standards recommended	Demand 2031
11KV substation	One 33KV substation	1 for 15000 persons	3
LPG godown	1	1 for 40-50000persons	1

Table: 28.4 Projected requirements of Educational institution

Sl. No	Category	No of students	Index	Existing	Required as per existing ppn	Required as per projected	Remarks
1	High school	700 students	1 HS for 13000 ppn	3	3	3	-
2	Higher secondary	400 students	1 HSS with 8 div: for 13000 ppn	3	3	3	-
3	Arts and Science college	500 students		-	0	0	Available in surrounding areas
4	Professional college	250 students	1 Arts and Science college for 80,000 ppn	-	0	0	Available in surrounding areas
5	Polytechnic College	150 students	1 polytechnic for 36000 ppn	-	1	1	Available in surrounding areas
6	ITC/ITI	300 students	1 ITC/ITI for 35000 ppn	-	1	1	Available in surrounding areas
7	TTC	120 students	1 TTC for 120000 ppn	-	0	0	Available in surrounding areas

4. Sanitation

Being a small town the quantity of waste generated per day as per UDPFI guideline is estimated as 0.250 kg/Person. For projected population of 2031, the quantity of waste generated will be 13 tons/day. As per the present situation the waste generation is 6 tons/day and collection is 4 tons/day. If the present solid waste management system continues in the coming years, in 2031 an addition of 9 ton will have to be treated per day. Hence an efficient waste management

system has to be adopted for the waste disposal. If three level waste management system is adopted then waste from public places and markets need to be treated.

5. Education and health

The educational facilities required as per the planning standard for the year 2031 is given in Table 28.4 and 28.5.

Table 28.5 Projected requirements of Healthcare institutions

Category	No. of Beds	Standard as per URDPFI	Existing	Required as per existing ppn	Required as per projected
General Hospital	500	1 for 2.5 lakh population	-	-	-
Intermediate Hospital (Category A)	200	1 for 1 lakh population	-	-	-
Intermediate Hospital (Category B)	80	1 for 1 lakh population	-	-	-
Poly-Clinic		1 for 1 lakh population	-	-	0
Nursing home, Child welfare and Maternity centre	30	1 for 0.45 lakh population	1	1	1
Dispensary		1 for 0.15 lakh population	5	3	3

6. Recreational use

Recreational use includes parks, play fields and other open spaces. For a small town the recreational space should be provided at the rate of 1.0-1.2 Ha/1000 persons. The Chavakkad Town currently has 5Ha area for recreational facilities, i.e. 0.36 % of the total area. In 2031, the recreational space to be provided is about 48 Ha in 2031 for a population of 44100.

7. Recreational facilities

The planning standards for recreational facilities is shown in table 28.6

Table: 28.6 Projected requirements of socio-cultural facilities

Category	Standard as per URDPFI	Required as per existing ppn	Required as per projected ppn	Available
Community Room	1 for 5000 population	8	9	4
Community Hall & Library	1 for 15000 population	3	3	2
Recreational Club	1 for 1 lakh population	-	-	25
Music, dance, & drama centre	1 for 1 lakh population	-	-	-
Meditation & spiritual centre	1 for 1 lakh population	-	-	-
Socio-cultural centre	1 for 10 lakh population	-	-	-

CHAPTER 29

PROPOSED LAND USE PLAN

The development vision for Chavakkad town has proposed developments expected and suitable for different areas of the town. The vision is brought to the practical scene in the form of a land use plan. As per the land use plan, Chavakkad Municipal area is categorised in to various zones, which are described in this chapter. The various zones are: 1.High density Residential use zone 2. Low density residential use zone 3. Residential Mixed use zone 4. Commercial use zone 5.Public and semipublic use zone 6.mall Industrial use zone 7. Transportation use zone 8. Parks and open spaces 9. Paddy 10. Mangrove Forest 11. Marshy Land 12. Water bodies 13. Special use zone - Fisheries 14. Special use zone

29.1 High density Residential use Zone.

Residential land use is seen predominant than other land uses in the town. The development concept of Chavakkad town is envisaged to accomodate more habitable spaces for the growing population. Also, to achieve a better population distribution , it is proposed to densify the western and eastern parts of the town. Hence , a high density zone is proposed for these parts. The Proposed High density Residential use Zone is shown in Fig 29.1. The spatial area included in this zone is 4.9318 sq.km (493.2 Ha).

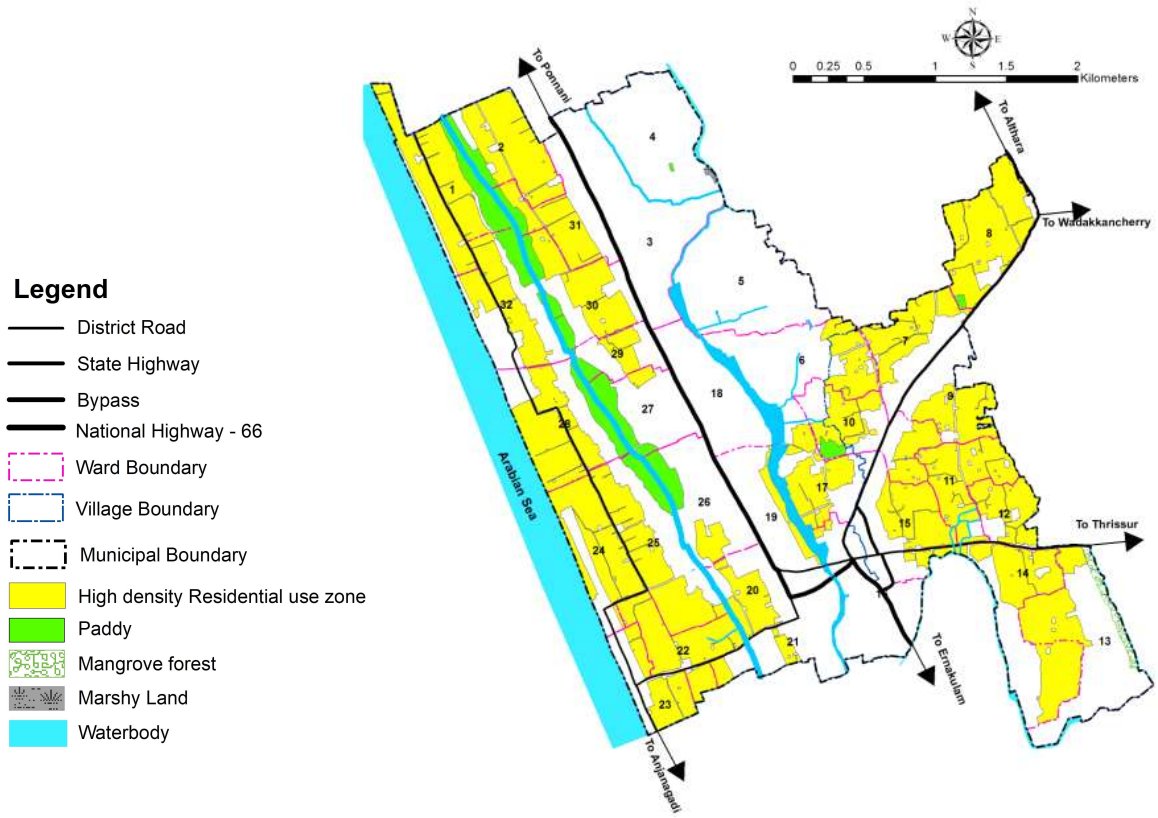


Fig 29.1 High density Residential use Zone

29.2 Low density Residential use Zone

In accordance with the development concept, to make sufficient habitable spaces available for future, limited residential and other use activities are accomodated in the existing dry Agriculture areas of the town. Theses activities can co-exist with the agricultural activities and hence, this area is proposed as " Low density Residential use Zone". This zone will also help for distributing the dense population towards peripherals of the town. The proposed Low density Residential use Zone is shown in figure 29.2. . The total area included in the zone is 2.92sq.km (292.73 Ha).

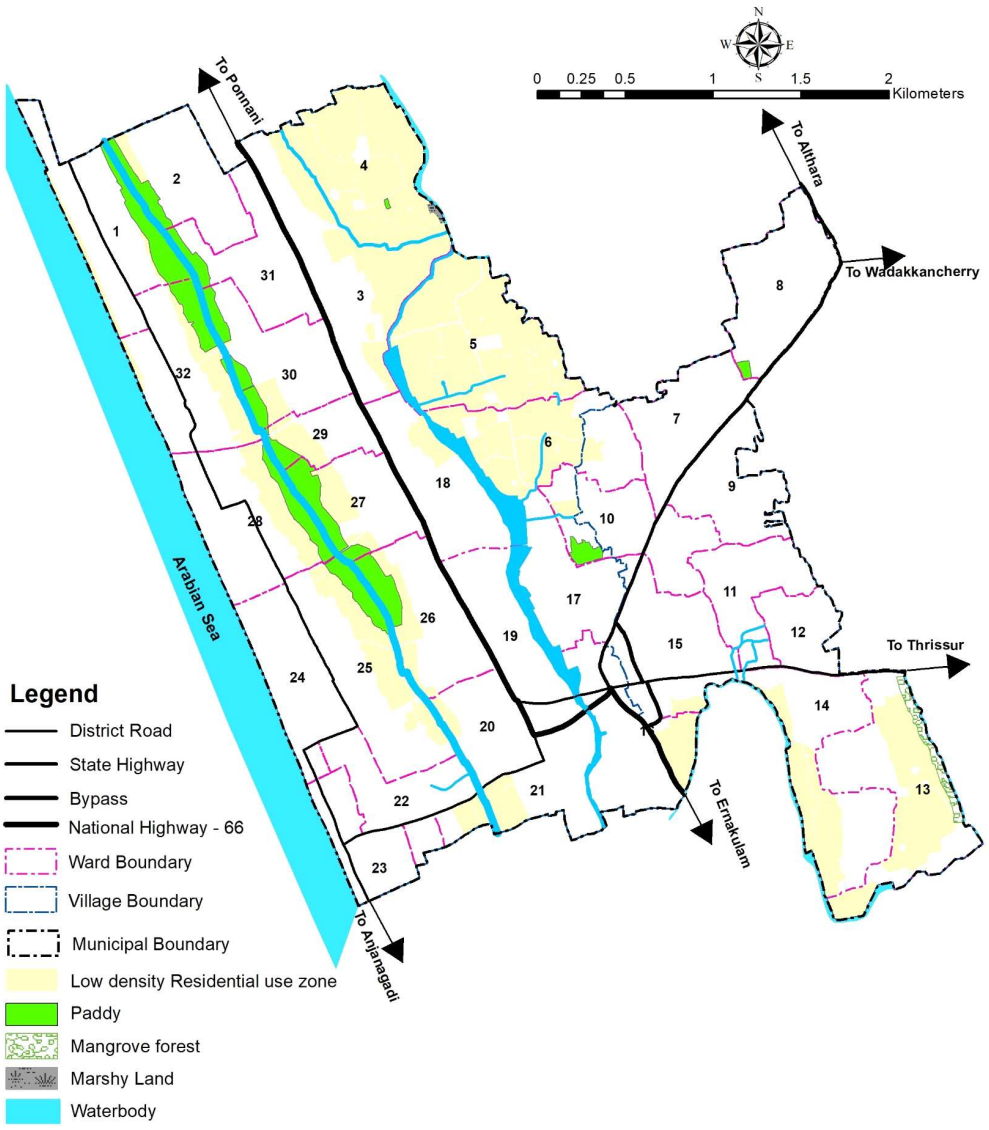


Fig 29.2 Low density Residential use Zone

29.3 Residential Mix use Zone

In this zone it is proposed to provide for the trend of mixed land use prevailing in our urban areas and along transportation corridor, in which residential, commercial, public and semipublic uses are permitted. Provision of this zone will expand the town centre to the outer area and thus the core area can be saved from congestion. Since residential activities are permitted in this zone, while permitting higher orders uses adequate conditionalities to ensure minimum distance to the residents will be insisted.This zone is surrounding to commercial zone and acts as a transition zone from commercial to residential use. It is a multiuse zone that provides for the establishment and growth of large institutional campuses higher density residential development.

Mixed land use is seen along major corridors of the town. So in addition to the proposed Residential Mix use Zone , it is also proposed to reserve 50 -150m on both sides of the road as mixed use zone along the major corridors.

The residential mixed zone is shown in figure 29.3. The total area of this zone is 1.9082 Sqkm (190.82 Ha).

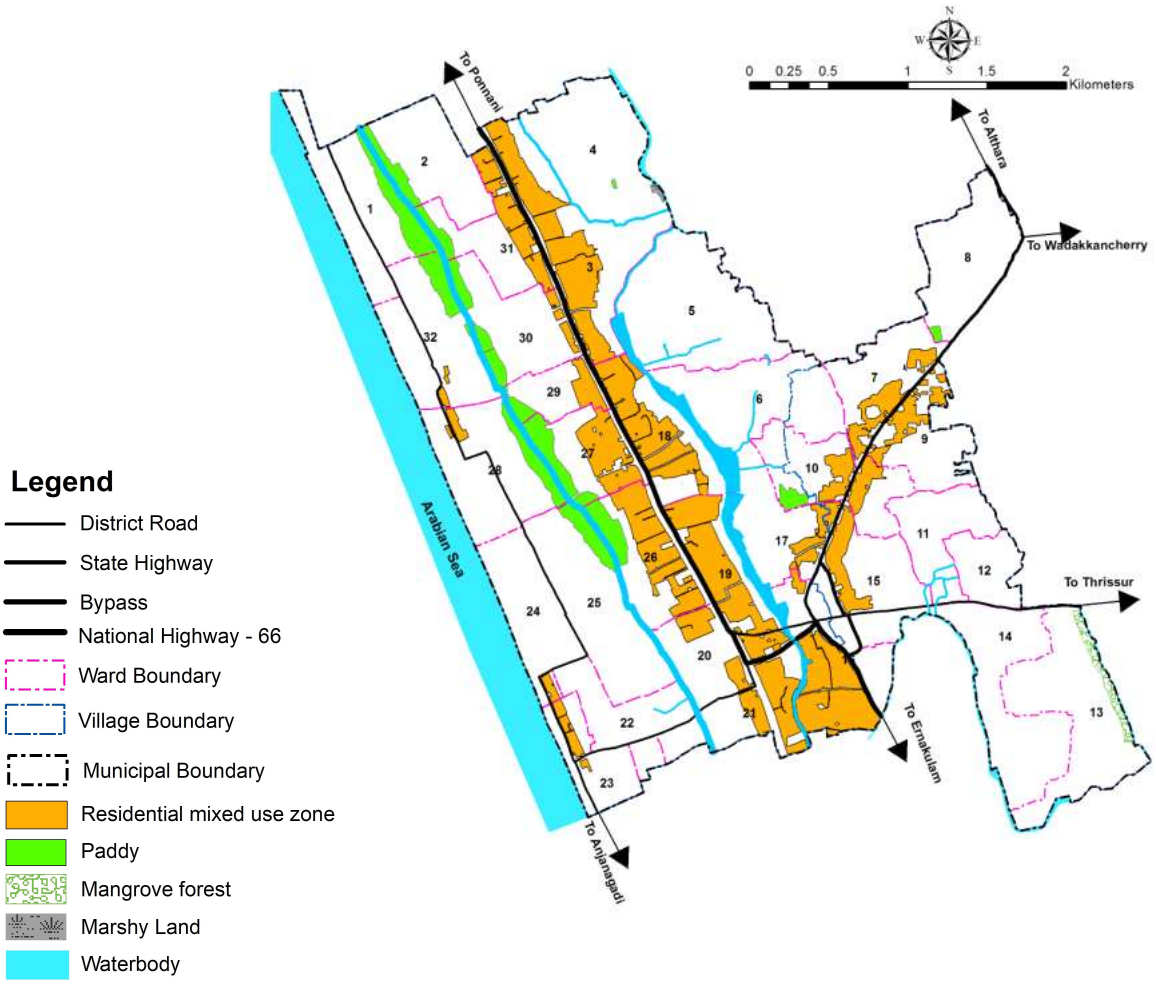


Fig 29.3 Residential Mix use Zone

29.4 Commercial use Zone

Commercial sector is said to be the back bone of economy of a town. Presently, intensive commercial activities are seen at town centre and as ribbon development along the major traffic corridor.

As per development concept, it is proposed to concentrate commercial activities at major nodes. So these areas along with existing land under commercial use and the proposals for infrastructural developments supporting the trade and commerce sector are proposed as commercial zone in future. The area between the North South by pass road & the stretch from North by pass junction on SH 50 to South by pass junction on NH 66 are proposed as commercial zone due to the peculiarity of town area and also due to this area is well connected with major corridors, this will decongest the existing commercial area. Other proposals are given in the residential mixed zone in the major nodes and also along the major corridors. The total area included in this zone is 0.2043 Sq.km (20.43 Ha). The commercial use zone is shown in figure 29.4

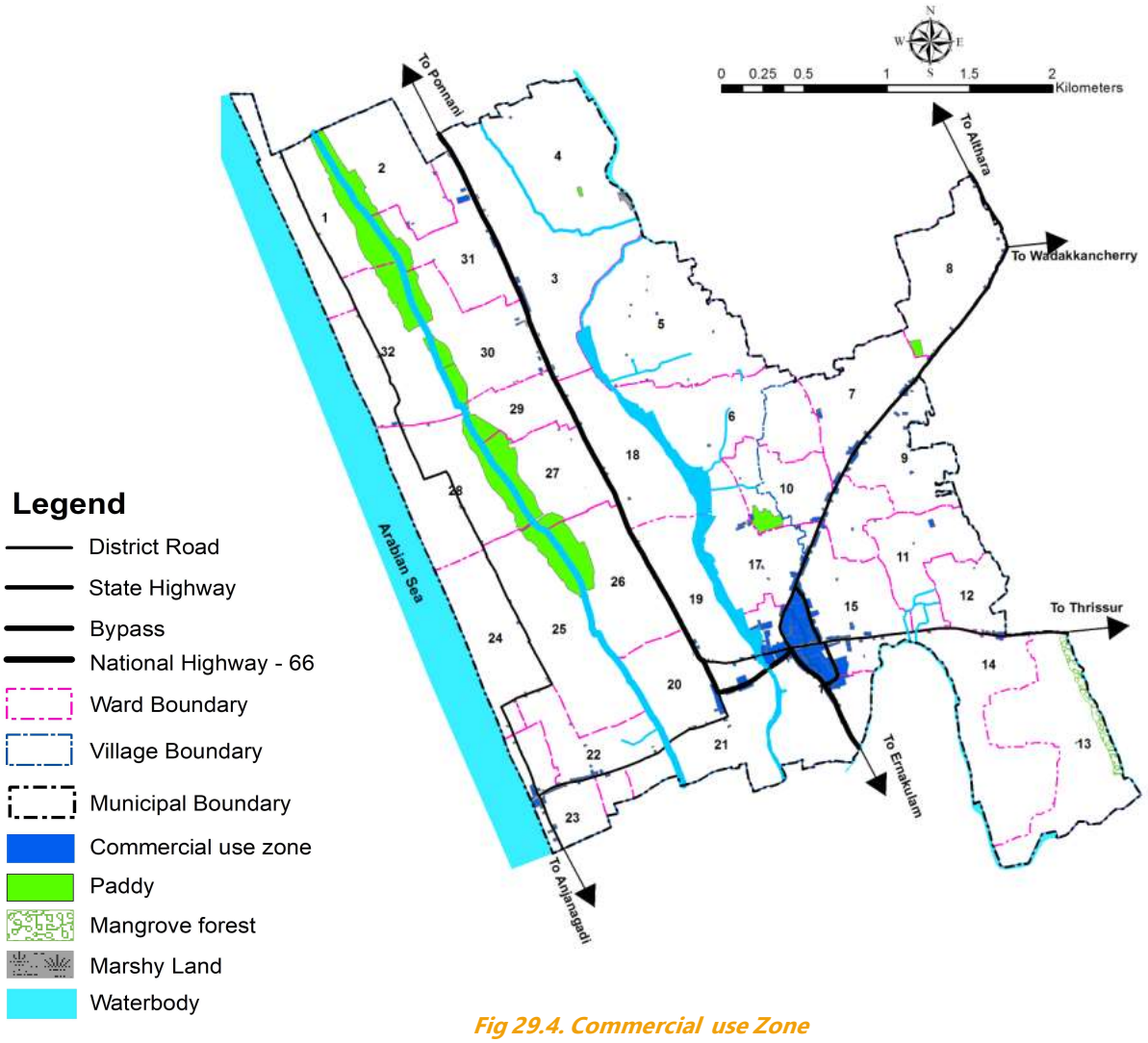


Fig 29.4. Commercial use Zone

29.5 Public & Semi Public use Zone

Being a Taluk head quarter, Chavakkad has many Government offices. In addition to this there are quite number of religious institutions, sub jail, hospitals and other public utility areas. To retain the amenities provided as such a public and semipublic use zone is demarcated. Also there are a few proposals to provide social amenities to the people in this plan. These proposals are included in this zone. This zone mainly comprises of all the existing public use land and buildings.

The existing solid waste disposal centre at Parappilthazham can be maintained as such with the provision of proper treatment facilities. Total area covered in this zone is around 0.5293 Sq.km. (52.93Ha). The public and semipublic use zone is shown in figure 29.5.

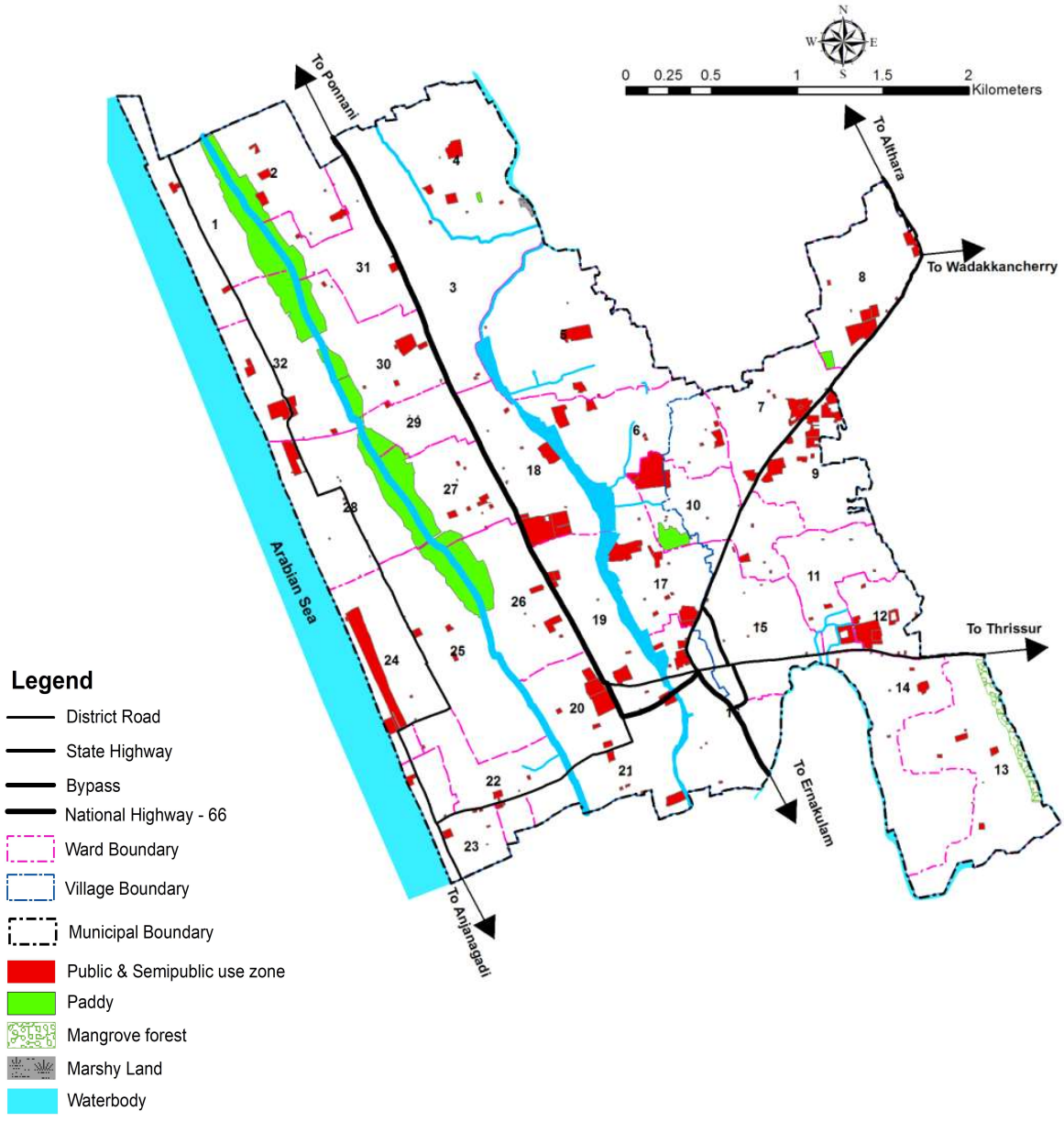


Fig29.5 Public & Semi Public use Zone

29.6 Small Industrial use Zone

Presently the industrial concentration is seen marginal in town. Industrial area is spread out in some pocket of municipal area. This area has to be retained as such. For improving the employment opportunities and thus the economic back ground of municipal area, introduction of new areas is a must. The expansion of existing industrial estate areas is proposed for industrial use.

The industrial area at Puthenkadappuram is proposed for the devolopment of fishing activities. A new industry is proposed at Puthiyara for developing the coconut based industries. To benefit the zone a good road proposal is also suggested to cater to the needs of this zone. Total area included in this zone is 0.0254 Sq.km (2.54 Ha). The small industrial use zone is shown in figure 29.6.

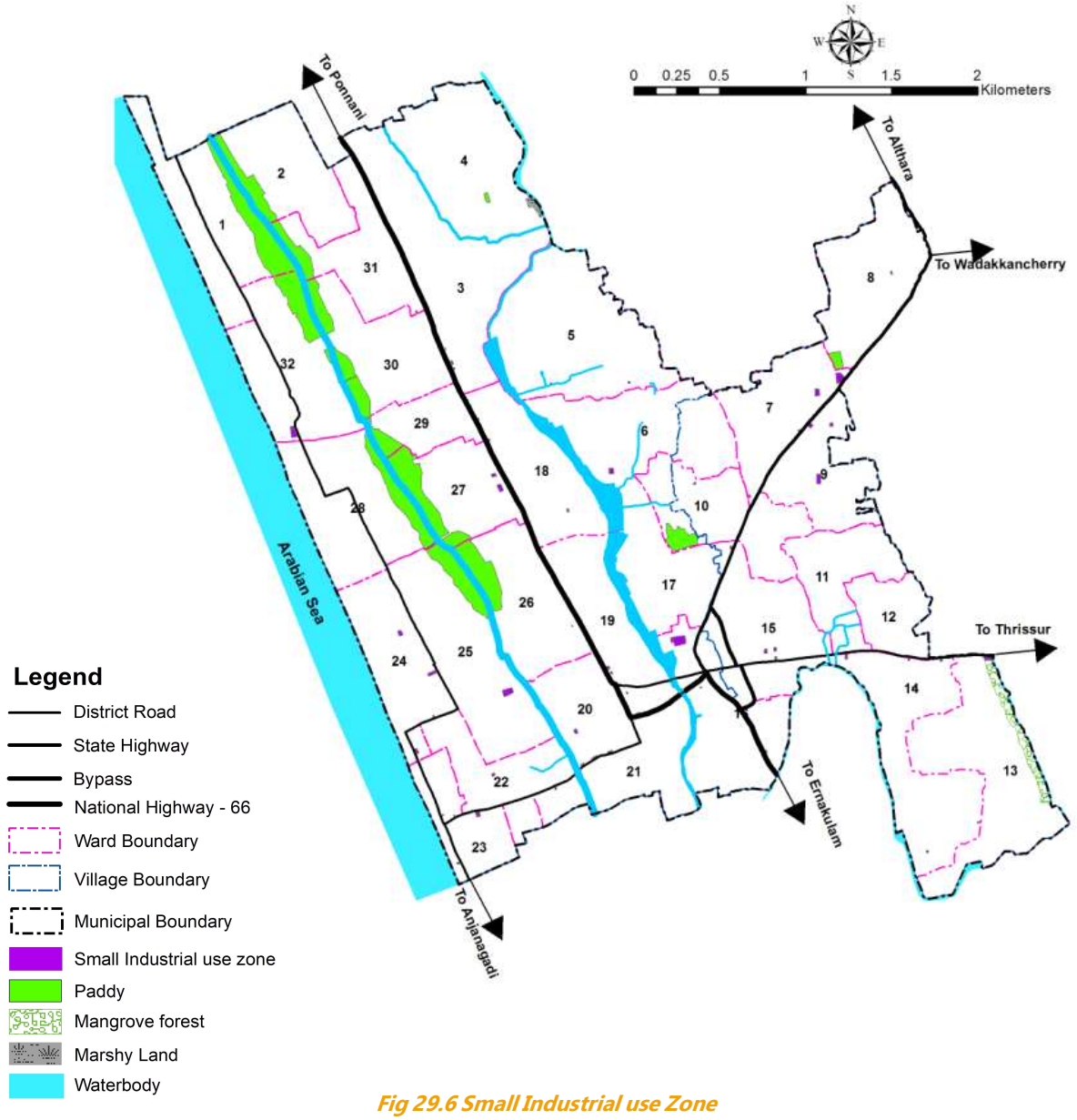


Fig 29.6 Small Industrial use Zone

29.7 Transportation use Zone

For the comprehensive development of a town, the road network plays an important role. The detailed explanation of traffic and transportation plan 2031 is given in chapter 30. Existing traffic and transportation facilities has to be maintained with proper cleanliness and with required facilities. The total existing transport land use comes to around 6.82 % of the total area. Also there are a few proposals in this sector .This zone mainly comprises of all the roads and other transport related activities. The total area covered in this zone is around 0.8591 Sq. km (85.9 Ha). The Transportation use Zone is shown in figure 29.7.



Fig 29.7 Transportation use Zone

29.8 Parks & Open Spaces

The Open space is an important part of providing for the social, economic and cultural well being of a community. It is important that the town has land to accommodate parks, sports fields, recreational facilities, amenity areas, buffers and areas with natural value. The locations of these areas are given in figure 29.8. The total area included in this zone is 0.024 sq.km (2.4 Ha)

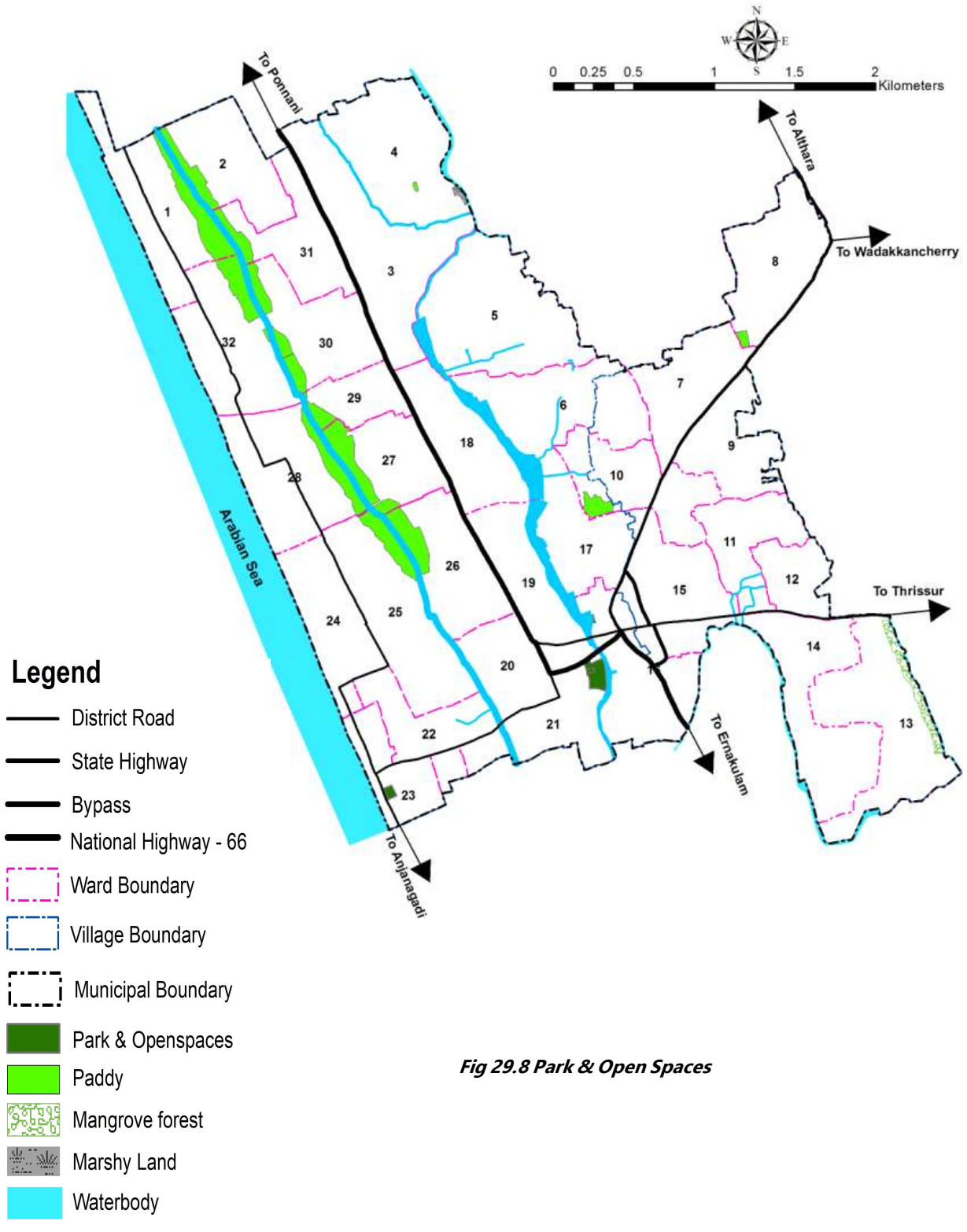


Fig 29.8 Park & Open Spaces

29.9 Paddy Land

As paddy lands are ecologically sensitive area, it is to be protected for ecological balance of the town. As far as Chavakkad town is considered majority of paddy lands are located at both sides of the Mathy kayal thodu, some pockets of paddy lands are also seen at Town center which is uncultivable due to its surrounding developments. The areas where cultivation is not possible are taken in to consideration for developmental purpose. All cultivated paddy land is to be conserved for future so that paddy cultivation is to be extended up to its maximum potential. The other uses around these lands are so carefully arranged so as to prevent its deterioration. The total area included in this zone is 0.5410 Sq.km (54.10 Ha).

29.10 Mangroves

The southern boundary of Chavakkad has observed the presence of marginal saline and brackish waters and in a presence of mangrove trees. Mangrove forest itself have a unique eco system and should be protected, mangrove swamps protect coastal areas from erosion. The other areas around these lands are so carefully arranged so as to prevent its deterioration. The total area included in this zone is 0.0434 Sqkm. (4.338 Ha).

29.11 Marshy Land

A marshy land is a low lying wet land with grassy vegetation, usually is a transition zone between land and water. It has a unique eco system and it should be protected in addition to this it also serves an area for water recharging. A pocket of marshy land is observed at north boundary of Chavakkad town on the bank of canoli canal. The total area included in this zone is 0.0049 Sqkm. (0.490 Ha).

29.12 Water bodies

Existing land use map 2012 shows 0.320 km^2 area as water body in the Chavakkad town. To meet the water demand in the coming years, it is suggested to retain this area without encroachments for other uses. A green strip of 5m wide is proposed around the Canoli canal. So that protection of the canal is ensured. The proper maintenance of existing natural drainage without encroachments can remedy the major water logging problem and also scarcity of water during the summer season.

The location of paddy, Mangrove Forest, Marshy Land and Water body as Environmnetal sensitive areas is shown in figure 29.9.

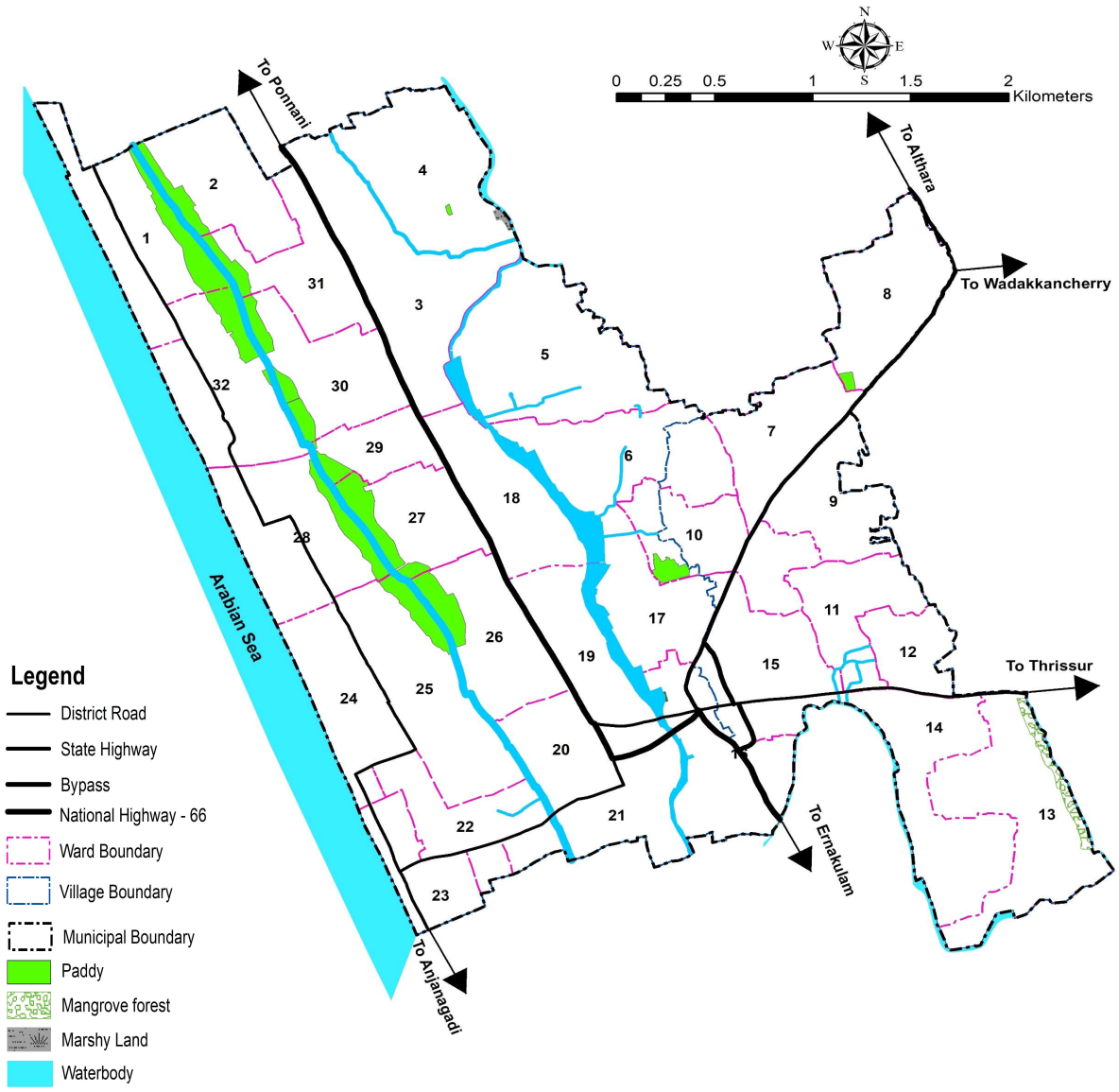


Fig 29.9 Environmental sensitive areas

29.13 Special use zone- Fisheries

Considering the importance of fishing sector in Chavakkad town master plan envisages a special use zone for fisheries in Puthenkadappuram. It consist of with 0.0832 sqkm (8.31 Ha) area in a well-designed manner. The details of this proposed fishing village at Puthenkadappuram is enclosed with chapter 26 (new sector proposals). This use zone aims overall development of fishermen community. It's a form of area with great flexibility in which there is no forced implementation of project occurs. All the existing buildings will continue under the same title. This zone will develop under the guidelines of CRZ and provisions in masterplan-2031. The location of the proposed Special use zone –Fisheries is shown in fig. 29.10.

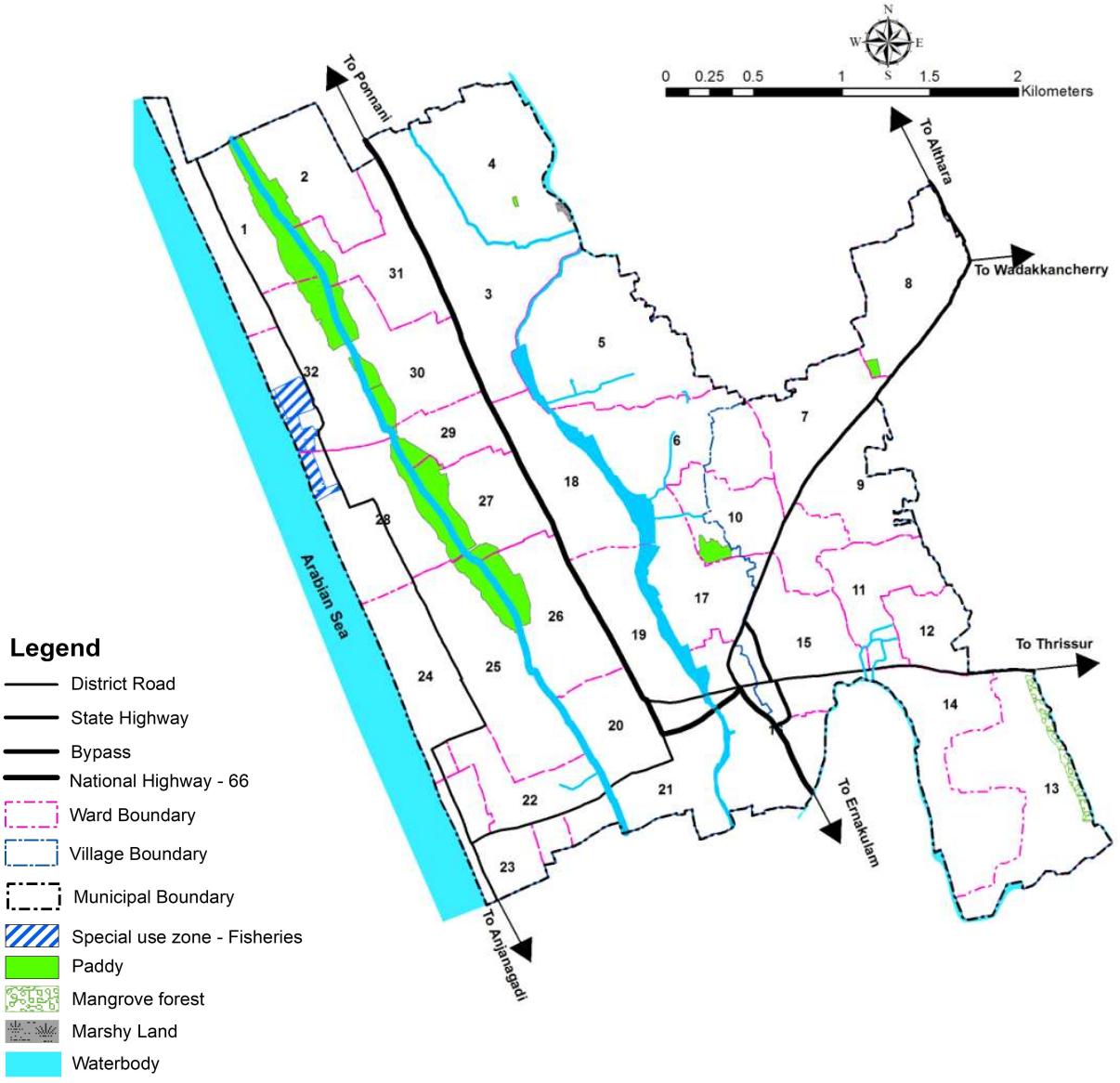


Fig 29.10 Special use zone - Fisheries

29.14 Special zones

This zones include the areas specifically demarcated for certain projects which are formulated for the future development of the town. No other activity unless otherwise specified shall be permitted in such areas. If this projects are not materialized in corresponding demarcated land within a period of 5 years, from the date of sanctioning of this master plan, The freezed land may be released and returned back to that zone as per the existing land use. The proposed projects under this zone is listed below:

1. Blangad beach beaitification
2. Boating centre at Punna
3. Coconut processing industry

4. Community hall
5. Floriculture & Organic farming
6. Geriatric unit for Taluk hospital
7. Integrated duck & prawn farming
8. Meat & vegetable market
9. Multi level parking
10. Plastic recycling unit and Renovation of Solid Waste Treatment Plant
11. Solar panel installation

This zone collectively has an extent of 0.19 sq.km (19.02 Ha). It is about 1.51% of the total area. The zone is shown in figure 26.11.

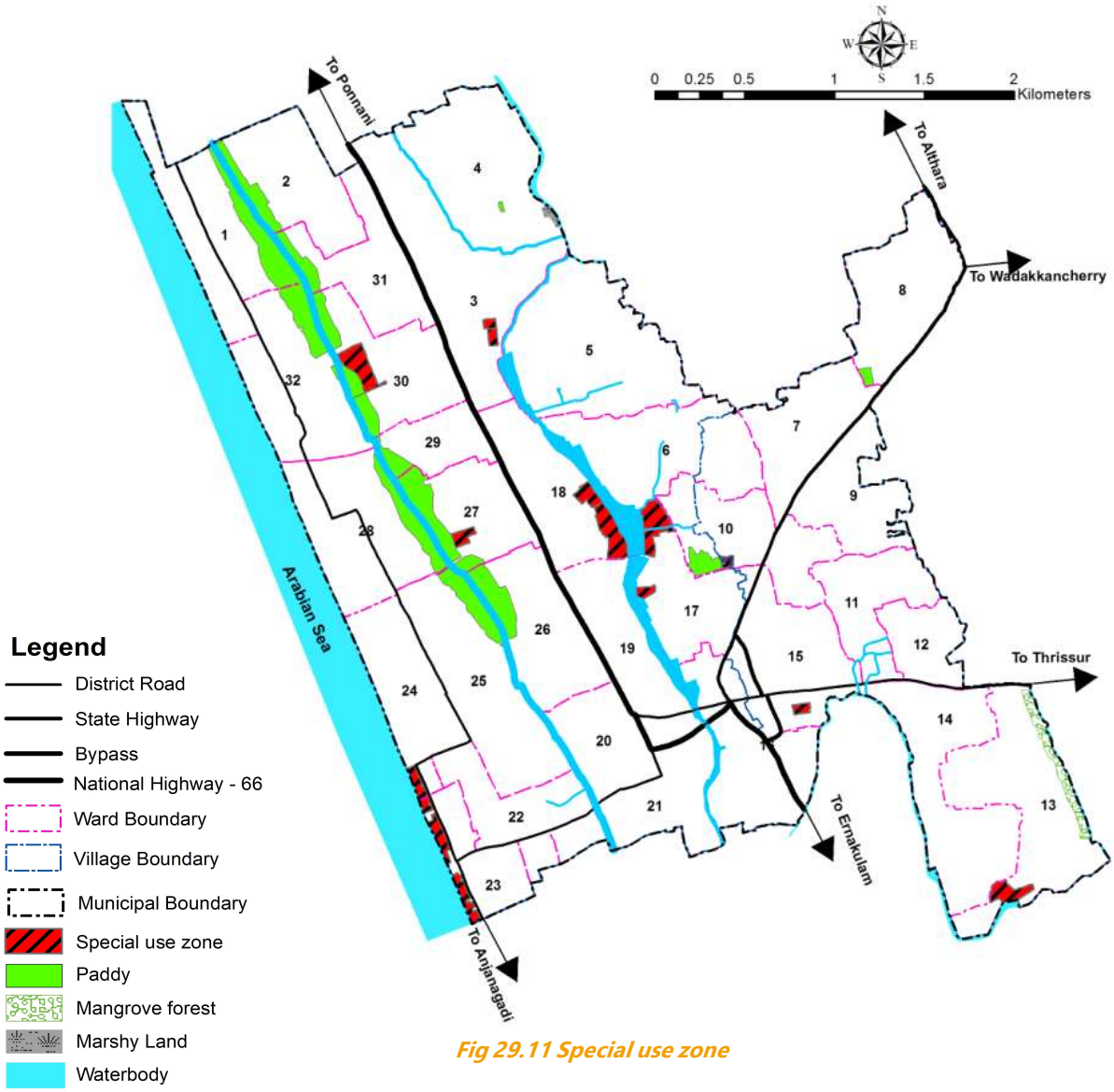


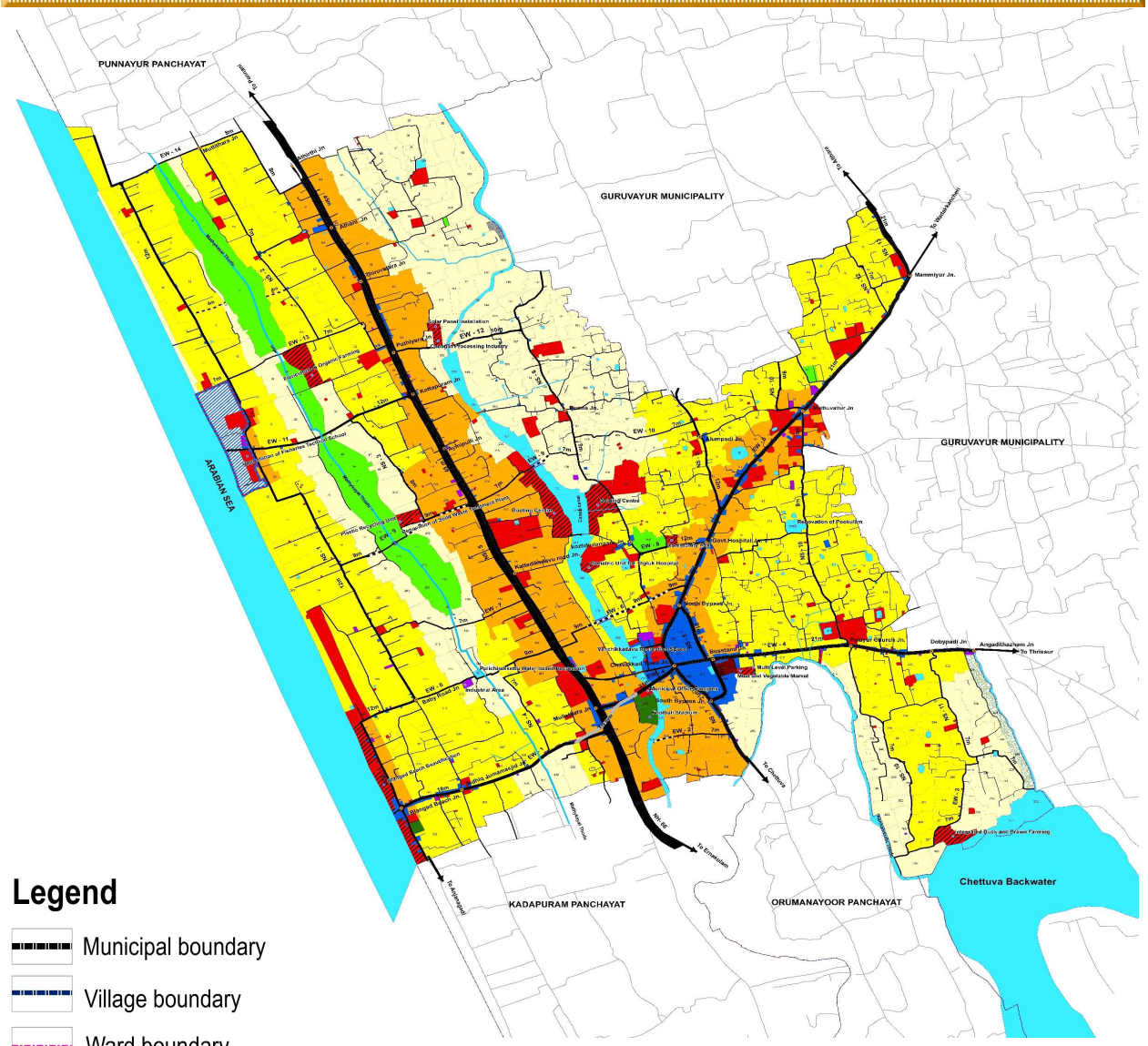
Fig 29.11 Special use zone

29.15 Proposed land use map

Proposed land use map of Chavakkad Town which is constituted by 14 major land use zones is shown in figure 29.12. Area and percentage of land use is shown in table 29.1. All the existing uses in all the zones such as residential, commercial, public/semi public, industrial and recreational etc. remains in the same title in proposed land use plan-2031

Table 29.1 Area and Percentage of Proposed Landuse plan

Sl No	Landuse	Area in sqkm	Percentage
1	High density Residential use zone	4.9318	39.164
2	Low density Residential use zone	2.9273	23.246
3	Residential mix use Zone	1.9082	15.153
4	Commercial use Zone	0.2043	1.622
5	Public & semipublic use Zone	0.5293	4.203
6	Small Industrial use Zone	0.0254	0.202
7	Transportation use Zone	0.8591	6.822
8	Parks & Open Spaces	0.0240	0.191
9	Paddy Land	0.5410	4.296
10	Mangroves	0.0434	0.345
11	Marshy Land	0.0049	0.039
12	Water bodies	0.3207	2.547
13	Special use Zone- Fisheries	0.0832	0.661
14	Special Zones	0.1902	1.510
	TOTAL	12.5928	100.00



Legend

- Municipal boundary
- Village boundary
- Ward boundary
- Surveyboundary
- Special use zone boundary
- National Highway 45m
- 21 m wide road
- 18 m wide road
- 12 m wide road
- 10 m wide road
- 9 m wide road
- 8 m wide road
- 7 m wide road
- Other roads
- Proposed 9 m wide road
- Proposed 7 m wide road
- Proposed 4 m wide road
- Fly over
- Bridge
- Foot Over Bridge
- Proposed Bridge
- Junction
- Sectoral Proposals
- High density Residential use Zone
- Low density Residential use Zone
- Residential Mix use Zone
- Commercial use Zone
- Public & Semi Public use Zone
- Small Industrial use Zone
- Transportation use Zone
- Park & Open Spaces
- Paddy Land
- Mangroves
- Marshy Land
- Water bodies
- Special use zone - Fisheries
- Special zones

Fig 29.12 Proposed Land use plan

CHAPTER 30

TRAFFIC AND TRANSPORTATION PLAN

Traffic and Transportation development plan for Chavakkad town is prepared taking into account the existing traffic scenario and based on an evaluation of the future traffic on the base year network. Transport development schemes are formulated so as to reduce the severe strain put on the existing road network. All committed development schemes were taken into account while formulating the transport development plan.

30.1. Major traffic problems in Chavakkad town

Chavakkad town lies on the National Highway No. 66 and two major roads fork out from the centre of Chavakkad town – one leading to Kunnamkulam (SH 50) and the other leading to Thrissur/ Kanjani via Chavakkad bus station and Palayur church. The main junction in Chavakkad from where roads are leading to Kunnamkulam, Ponnani, Ernakulam and Thrissur experiences severe traffic problems during peak periods due to poor road geometrics and lack of proper design of junction.

Since NH 66 carries heavy volume of passenger and goods traffic, the available road width is grossly inadequate to meet the traffic demand in the CBD area of the town. This results in traffic bottlenecks on the roads during peak hours. The location of a narrow bridge across Canoli canal and the inadequate turning radius at Manathala junction add to the traffic problems on Ponnani road. Transport buses from Ernakulam to Chavakkad town deviate at bypass junction to precede to the bus stand located on the bypass. The junction needs to be properly designed to regulate the traffic movements at the junction.

Most of the vehicular traffic plying on the NH is through traffic which passes through the central area of the town in the absence of urban bypass. The Canoli Canal which passes through Chavakkad town and run parallel to the NH 66 has become a major constraint as the existing bridges across the Canal are quite narrow and hence movements of heavy vehicles are not possible.

On the Kunnamkulam road, there are a number of public offices like government offices Court, Police station and Educational Institutions. The road width is grossly inadequate to cater

to the traffic generated from these offices. In the absence of footpath, pedestrians especially, school children walk on the carriageway of the roads putting themselves into greater risk. During the opening and closing hours of schools, there are frequent traffic jams witnessed. The situation becomes aggravated due to parking of vehicles on both sides of the road and pedestrian cross and lateral movements.

There is no well-developed link road connectivity between Ponnani road and Kunnamkulam road. In the absence of this, vehicles have to pass through the central area of the town. Similarly, vehicles coming from Ernakulam side to Kunnamkulam/ Guruvayur have to pass through the central area of Chavakkad town putting further strain on the narrow Kunnamkulam road.

Construction of bypass connecting between Ernakulam and Kunnamkulam roads, to some extent, mitigate the traffic problems witnessed on the NH 66 as the heavy vehicles between Kunnamkulam and Ernakulam sides take deviation to the bypass without touching the central area of the town. However, the intersections formed at the Ernakulam road, Kunnamkulam road and Thrissur road at the bus stand premise need to be properly designed to streamline the flow of traffic and also address the safety concerns of the intersection.

In short, major traffic and transportation problems facing Chavakkad town are:

i) Heavy volume of vehicular traffic along the National highway, Thrissur and Kunnamkulam roads and inadequate carriageway width and right-of-way;

ii) Inter-mixing of local traffic with through traffic in the absence of alternate road links/ regional bypass;

iii) Unorganized parking activities in the absence of proper parking lots;

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

v) Safety risk to pedestrians (lateral and cross movements) along and across Kunnamkulam road

vi) Poor road geometric and unplanned intersections and lack of bus bays.

30.2. Development strategy for the horizon year

While formulating the long term transport development plan for the horizon year, all the existing problems as well as the future traffic and transportation problems likely to

arise needs to be considered. In addition, all the development proposals especially the four-lining of NH 66 made by NHAI has been taken into account.

The most important problem of Chavakkad town is inter-mixing of local traffic with regional, especially on National and State Highways. Emphasis is given to develop alternative roads to divert by-passable traffic passing through the town. This would also help to reduce the stress on existing roads in the central part of the town.

As the level of service of urban roads are dictated to a great extent by the capacity of intersections, the development strategy should be to increase the capacity of major intersections by proper planning and design and control of these junctions. Special emphasis need to be given to improve the pedestrian facilities and also to develop off-street parking lots.

30.3 Proposed road development plan for Chavakkad town

On the basis of the projected volume of traffic and alternative network development schemes considered, a road development plan has been formulated for the town. As per the future road development plan for the town, the proposed network conforms to a Grid-iron Pattern. This would involve developing the existing roads with the following hierarchical pattern:

v) Primary Distributor Road – Providing connectivity in between various States with a 'right of way' width ranging between 30 and 45 m.

vi) Secondary Distributor Road – Providing connectivity to nearby towns and the hinterland - the 'right of way' width ranges from 12 to 23 m.

vi) Tertiary Road – providing connectivity to town centre with rest of activity centers – the 'right of way' width ranges from 7 to 12 m.

While the National highway being the major travel corridor of the town, it is proposed to be of four lane standard and the section within the town would serve as Primary Distributor road. Apart from this, the State Highways, Major District Roads and various North-South & East-West corridors are proposed with the status of Secondary Distributor or Tertiary road category. The conceptual road development plan for Chavakkad town is shown in figure 30.1

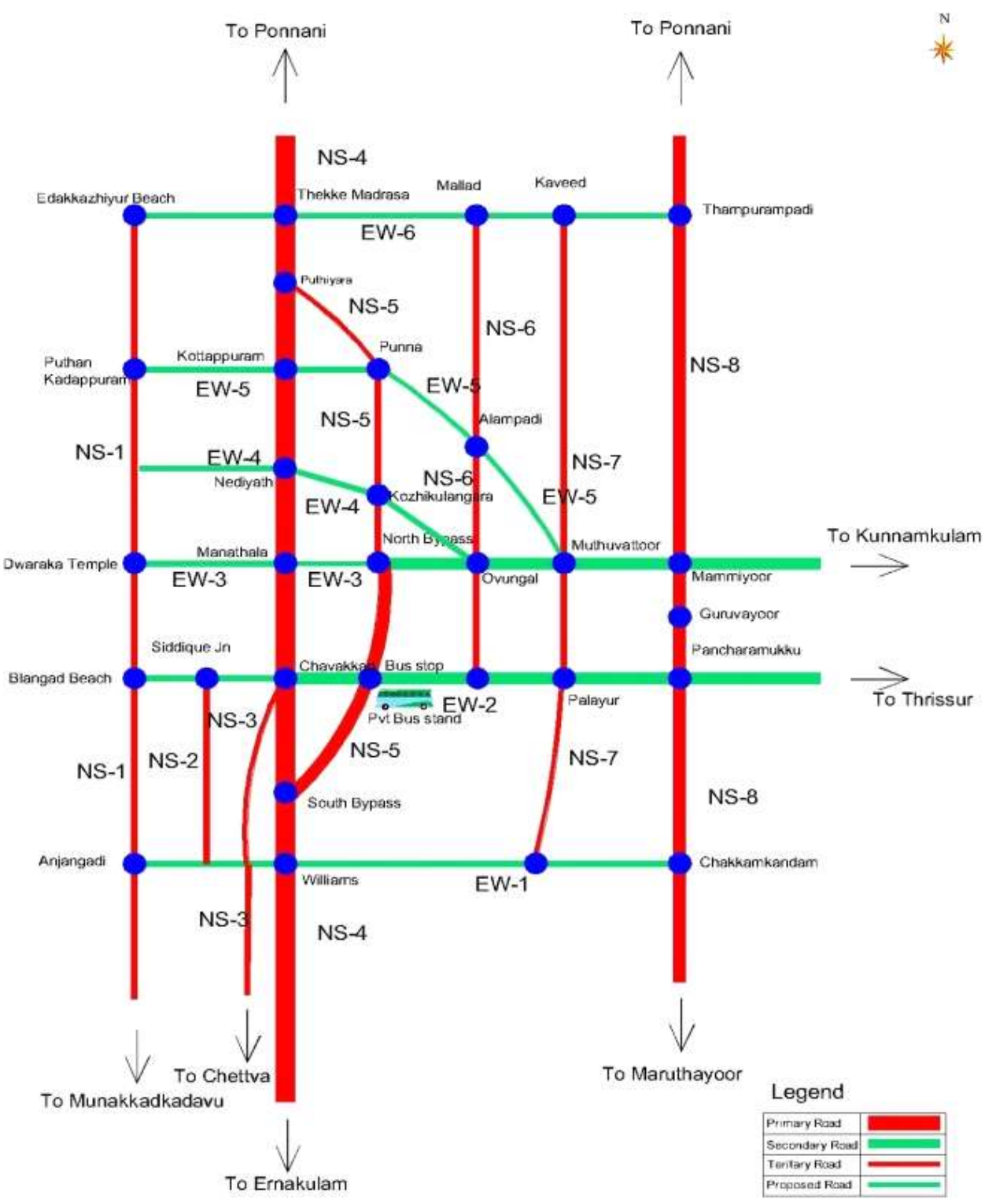


Fig. 30.1 Conceptual road development plan

30.3.1 Primary Corridors

The NH 66 coming from Edapally entering Chavakkad at Orumanayur Panchayat border of Chavakkad Municipality passes through Chavakkad Town square and leaves at Thiruvathra Athirthi, dividing town in to two parts as east & west. The NH 66 will be the Primary corridor of the proposed road network of Chavakkad. It also will be the major North- South corridor of proposed Grid-Iron pattern. Chavakkad Town square is the meeting place of NH 66, SH 50, and MDR and Vanchikadavu road. Traffic Studies have observed that the town square is a congested area. To reduce the congestion in the core area by pass for NH is proposed.

Under the policy of Central Government, NHAI is determined to increase the width of NH 66 to 45m. Accordingly National Highway Department prepared a new alignment for NH 66. The incorporation of new NH alignment in Chavakkad Master Plan could satisfy the need of Chavakkad Town. It is seen that the new alignment do not enter the core area of Chavakkad. So the new alignment is incorporated in the master plan as Primary corridor. The new proposed road is meeting NH at a distance of 500 m south of old NH alignment. The stretch between Mullathara Junction to Kadappuram border are newly proposed one and the remaining portion is just the widening of old NH road. Table 30.1 & figure 30.2 show the details of proposed alignment of NH 66.

Table 30.1 Proposed alignment of NH 66

Sl.No	Stretch		Nature of Development	Existing width m	Proposed width m	Length Km
	Start	End				
1	Athirthi Border	Mullathara Jn.	Widening of Existing road	17.00 -19.50	45	3.86
2	Mullathara Jn.	Kadappuram border	New	6.00-8.00	45	0.62

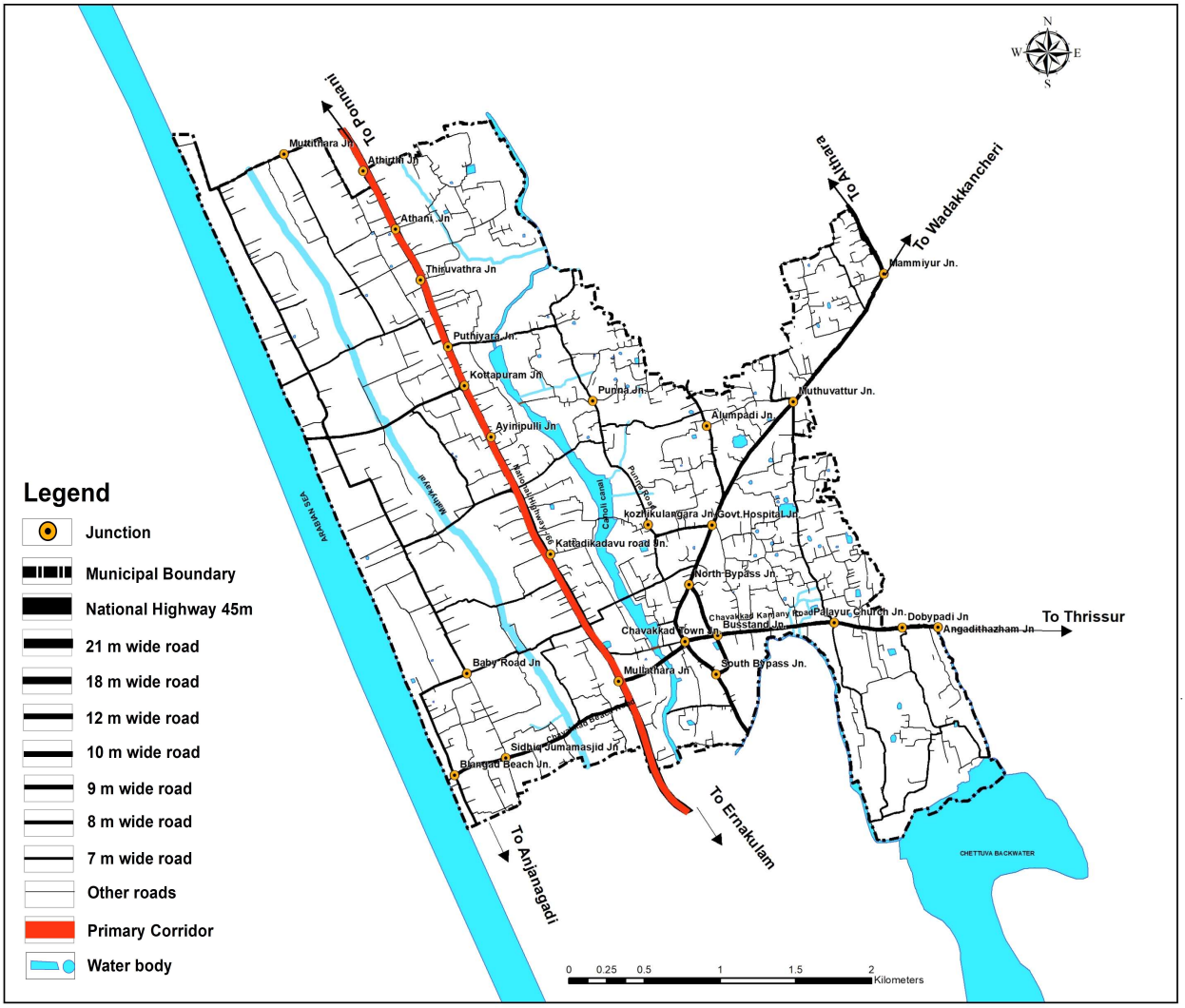


Fig. 30.2 Primary Corridor

30.3.2 Secondary Corridors - State highways SH 50 & SH 62, and Kanjani road (MDR) will be the Secondary Corridors of the proposed road network of Chavakkad.

30.3.2.1. State Highway -SH 50

SH 50 stretches in Chavakkad is starting from Chavakkad town and ending at Wadakkanchery town. Within this stretch it connects various major towns like Guruvayur town & Kunnamkulam town, Erumapetty center. This shows the importance of this road.

Traffic survey studies reveal that V/C ratio of some stretches of this road is greater than 1. Traffic projection shows that in the horizon year the utilization capacity of this road will be doubled. So it is necessary to increase the width of this road. Providing a 21m width to this road is satisfactory in order to fulfill the requirement. Table 30.2 shows the details of proposed SH 50.

Table 30.2 Proposed alignment of SH 50

Sl.No	Stretch		Nature of Development	Existing width m	Proposed width m	Length Km
	Start	End				
1	Mammiyur Jn.	Chavakkad Town Jn.	Widening of Existing road	8.00-11.00	21	2.9

30.3.2.2 Kanjani road - MDR

Chavakkad Kanjani road is starting from Chavakkad town and ending at Angadithazham Junction. Within this stretch it connects various major towns like Guruvayur Municipality, Pavaratty and Venkidangu center.

Traffic survey study reveals that V/C ratio of some stretch of this road is greater than 1. Traffic projection shows that in the horizon year the utilization capacity of this road will be doubled. So it is necessary to increase the width of this road. Providing a 21m width to this road is satisfactory in order to fulfill the requirement. Table 30.3 shows the details of proposed Chavakkad Kanjani Road.

Table 30.3 Proposed alignment of MDR

Sl.No	Stretch		Nature of Development	Existing width m	Proposed width m	Length Km
	Start	End				
1	Chavakkad Town Junction	Angadithazham Junction	Widening of Existing road	8.50-9.50	21	1.68

30.3.2.3. State highway -SH 62

SH 62 is starting from Guruvayur and ending at Ponnani. A small stretch of this road is passing through the town and it is from Mammiyur junction to Unni Master Road of Chavakkad town. This is a connection road to Malappuram District. Because of the importance, the width of this road is proposed to be 21m. Table 30.4 shows the details of proposed SH 62.

Table 30.4 Proposed alignment of SH 62

Sl.No	Stretch		Nature of Development	Existing width m	Proposed width m	Length Km
	Start	End				
1	Mammiyur junction	Unni Master road	Widening of Existing road	8.50-9.50	21	0.52

30.3.2.4. By pass road

The Bypass road connecting SH 50 at North, Kanjani road and NH66 at south will be taken as secondary distributer. The width of this road is proposed to be 21 m.

30.3.2.5. Old NH road

The road from the Chavakkad Town junction to Orumanayur boundary which is a part of NH 66 is taken as secondary distributor. The width of road is proposed to be 21 m.

30.3.2.6. New link road

A new link between North bypass Jn and Manathala Jn is proposed to make a connection from SH 50 to NH 66 in order to decongest the town square. The proposed road width is to be 9m. The secondary corridors are shown in figure 30.3. A new bridge is to be provided across the Canoli canal. The bridge should be proposed adequate height from the high flood level of canal for boat service.

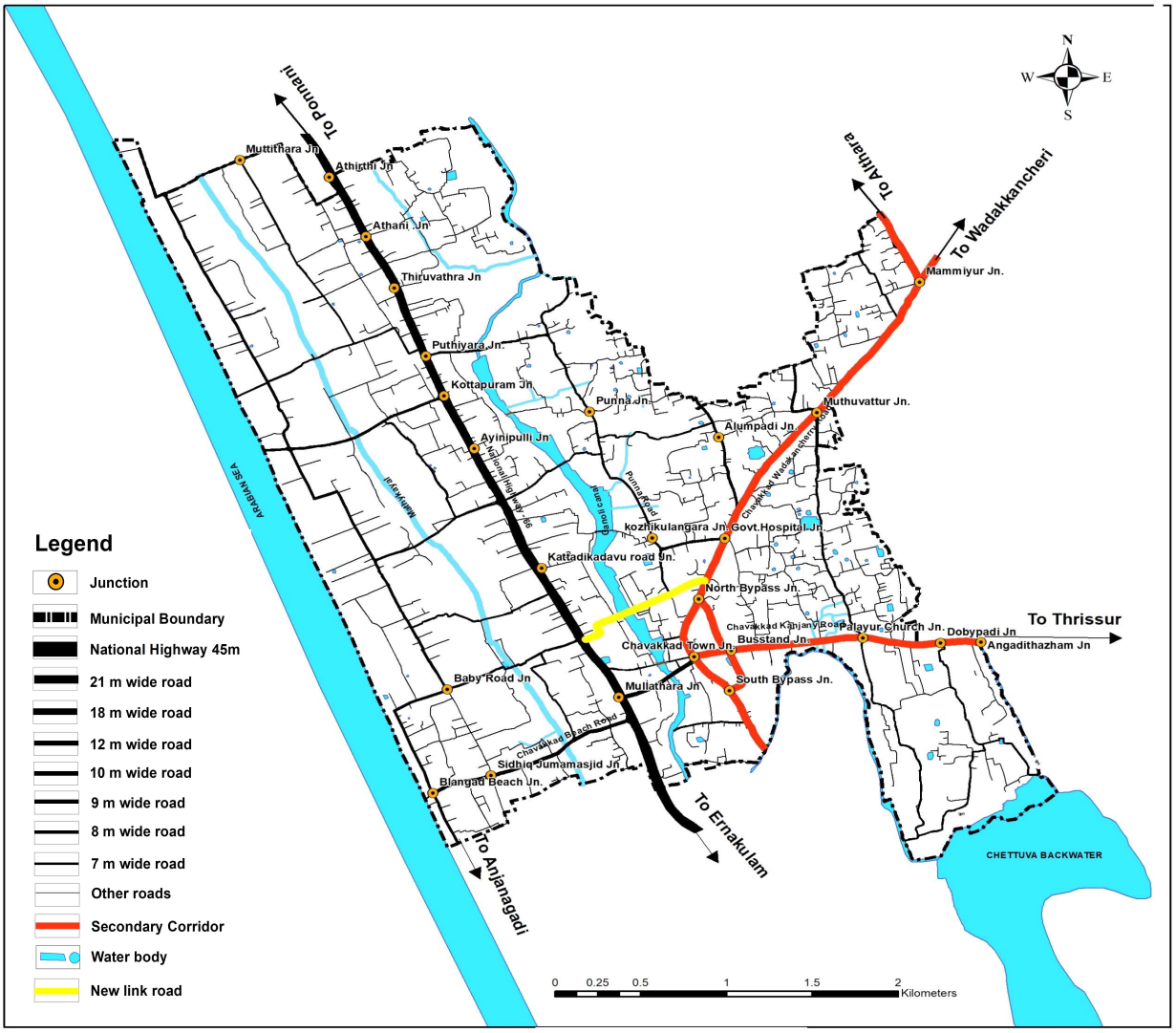


Fig. 30.3 Secondary Corridor

30.3.3 Tertiary distributers

30.3.3.1. North- South corridors

Thirteen north-south corridors are proposed as part of grid-iron pattern road network for Chavakkad town. The NH 66 will be the major North-South corridor passing through the central area of the town with the status of primary distributor road. With a length of 6.2 km, this road will carry the bulk of through traffic of Chavakkad town. The SH 62 will be another North -South Corridor with the status of secondary distributor road. Other North-South corridors are;

(i) NS-1:- Road from Munnakkakadavu to Edakkazhiyur beach which pass through the coastal area of Chavakkad town is one of the major north-south corridors proposed for Chavakkad town. This road will run parallel to the NH 66 and would siphon off the excess traffic from the NH 66 in the long run. With a length of 5.40 km, it is proposed as a tertiary road. The proposed road width is 12m

(ii) NS-2 :- Road from Muttathara junction in north Municipal boundary to EW-14 of length 1.35 km, it is proposed as a tertiary road. The proposed road width is 7m

(iii) NS-3:- Road from Fisheries UP School junction to Municipal Trenching ground junction of length 0.76 km, it is proposed as a tertiary road. The proposed road width is 8m

(iv) NS-4:- The road from Pulichirakkettu in Baby road to Mathy kayal culvert junction in Beach road (Prayan Road) of length 0.68 km, it is proposed as a tertiary road. The proposed road width is 7m

(v) NS -5 :- NH 66 will continue to serve as the primary distributor of the town in north-south axis. The proposed road width is 45 m with NHAI's alignment.

(vi) NS-6 :- Road from Punna (Municipal boundary) to New Link road (near Police quarters) of length 2.33 km, it is proposed as a tertiary road. The proposed road width is 9 m

(vii) NS- 7 :- Road from Chavakkad Town to Orumanayur boarder towards Ernakulam of length 0.522 km, will be North South corridor with status of secondary distributor road. The proposed road width is 21 m

(viii) NS-8 :- The Chavakkad bypass connecting North Bypass Junction and South Bypass Junction together of length 0.66 km is proposed as the next road in the north-south direction with the status of secondary distributor. The proposed road width is 21m.

(ix) NS-9 :- Road from Ovungal Junction to Mukkuttakal junction (Mallad road) of length 0.68km, it is proposed as a tertiary road. The proposed road width is 12 m

(x) NS-10 :- The road from Williams juction of Orumanayoor Panchayath to Alumpadi junction on Ovugal palli - Kaveed road, via Palayur Church and Muthuvattoor junction would form another north-south corridor, and is proposed as tertiary road. It has a total length of 3.50 Km, having two stretches with varying proposed widths as given below

The road from Alumpadi junction to Palayur Church junction via Muthuvattoor junction is proposed to 9m, having a length of 1.97 Km.

The road from Palayur Church junction to Williams junction (Thekkan Palayur) is proposed to 7m, having a length of 1.50 Km.

(xi) NS-11 :- Road from Dobipadi Junction of Kanjani road to EW-3 of length 0.746 km, it is proposed as a tertiary road. The proposed road width is 7 m

(xii) NS -12 :- The road from Mammiyur Mosque junction to Navya nagar of Unni master road of length 0.48 km, is proposed as a tertiary road. The proposed road width is 7 m

xiii) NS-13 :- The corridor from Guruvayur temple to Thampuranpadi via Mammiyur junction of length 0.52 Km. The road from Guruvayur to Thampuranpadi forms part of SH 62 and is the north-south corridor on the eastern side. This road is proposed as a secondary distributor. The entire road will lie outside the Chavakkad municipal town limit except the small stretch between Mammiyur Jn and Thampuranpadi which forms the eastern boundary of Chavakkad town. The proposed road width is 21 m.

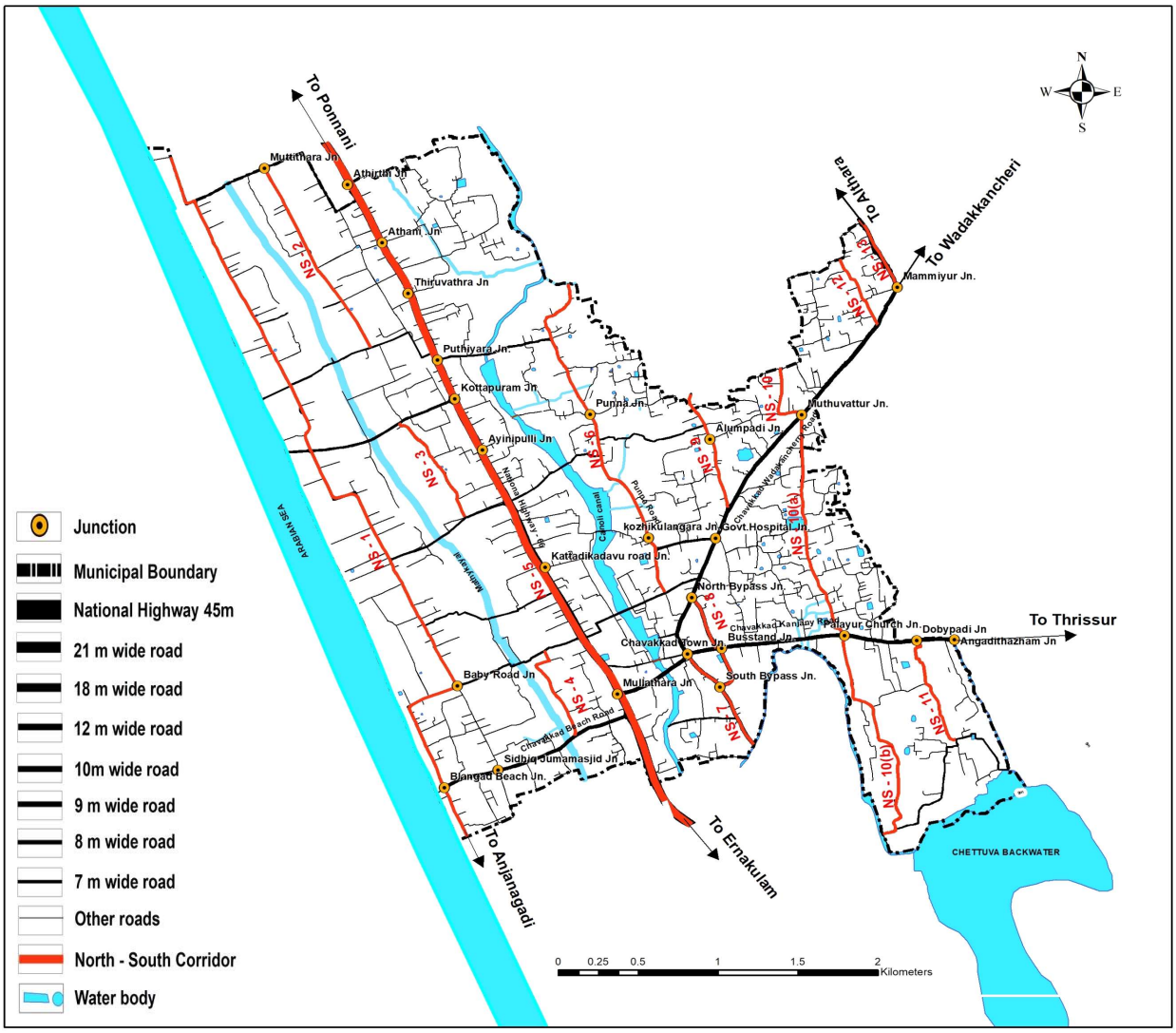


Fig 30.4. North - South Corridors

30.3.3.2 East - West corridors

Fourteen east-west corridors are proposed for Chavakkad town as part of Grid-iron pattern of road network. They provide the inter-connectivity to the north-south corridors, Kunnamkulam road and Thrissur roads. The major east-west corridors proposed for the town and details of the roads are discussed below;

(i) EW-1 :- The road from Chavakkad Beach to Mullathara junction of NH -66 of length 1.25km, it is proposed as a tertiary road. Proposed road width is 18 m.

(ii) EW-2 :- The road from Ottathengu junction of old NH 66 to bank of Canoli canal of length 0.42 km, it is proposed as a tertiary road. Proposed road width is 7 m.

(iii) EW-3 :- The road from Kazhuthakkalkettu to Chakkamkandam of length 1.45 km, it is proposed as a tertiary road. Proposed road width is 7m.

(iv) EW-4 :- The road from Mullathara junction of NH 66 to Angadithazam junction of Thrissur road through Chavakkad town will be the major East-West corridor with status of secondary corridor of length 2.17 km. Proposed road width is 21 m.

(v) EW-5 :- SH 50 will continue to serve as the secondary distributor of the town in East-West axis. The proposed road width is 21 m

(vi) EW-6 :- The road from Baby road junction to North bypass junction of SH 50 of length 1.703 km, it is proposed as a tertiary road. Proposed road width is 9 m. A new bridge is to be provided across the Canoli canal. The bridge should be proposed adequate height from the high flood level of canal for boat service.

(vii) EW-7 :- The road from ALP School junction of Baby road to to Gandakarna temple road junction of NH 66 of length 0.84 km, it is proposed as a tertiary road. Proposed road width is 7m.

(viii) EW-8 :- The road from Govt.Hostpital road junction on SH 50 to Kozhikulangara temple junction of length 0.37 km, it is proposed as a tertiary road. Proposed road width is 12 m.

(ix) EW-9 :- Nediyedath Temple road connecting baby road and Punna (NS1 and NS 6) of length 1.44 km, it is proposed as a tertiary road. It is proposed as two stretches with varying widths as given below,

1) Western side of NH 66- Proposed road width is 9m, having a length of 0.85 Km

2) Eastern side of NH 66- Proposed road width is 7m, having a length of 0.67 Km

(x) EW-10 :- Road from Punna junction in NS-6 to Alumpadi junction in Mallad road of length 0.678 km, it is proposed as a tertiary road. Proposed road width is 7m.

(xi) EW-11 :-The road from Puthenkadppuram to Kottapuram junction in NH-66 of length 1.10 km, it is proposed as a tertiary road. Proposed road width is 12 m.

(xii) EW-12 :- The road from Puthiyara junction in NH-66 to Punna road (NS-6)of length 0.69 km, it is proposed as a tertiary road. Proposed road width is 10m. Rebuilding of the existing bridge to be made across the Canoli canal. The bridge should be proposed adequate height from the high flood level of canal for boat service.

(xiii) EW-13 :- The road from Puthiyara junction in NH-66 to Kadappuram near Ghalar mosque of length 1.27 km, it is proposed as a tertiary road. Proposed road width is 7m.

(xiv) EW-14 :- North boundary road connecting Athirthi junction, and Muttathara junction of length 1.27 km, it is proposed as a tertiary road. Proposed road width is 8 m.

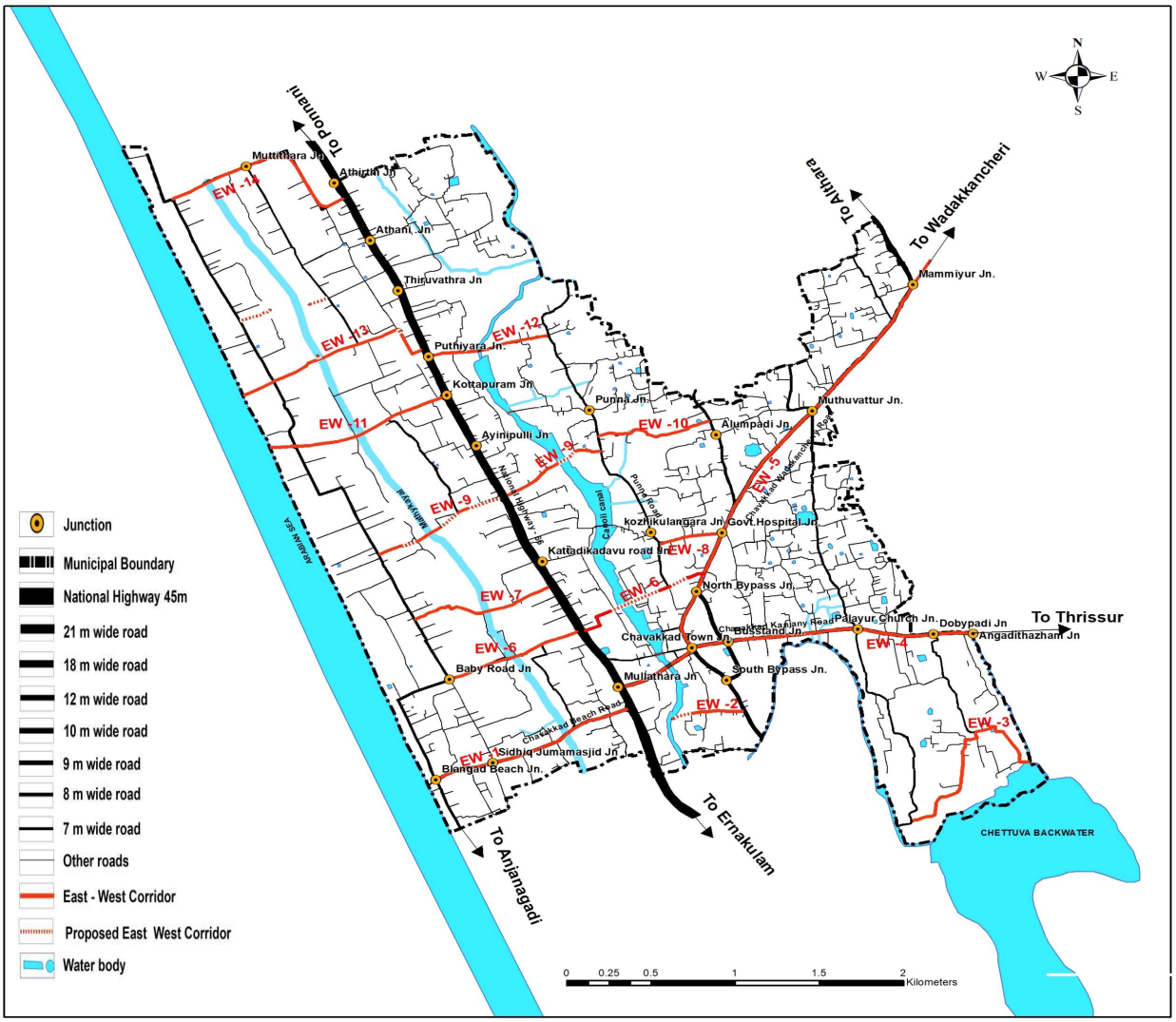


Fig 30. 5 East -West Corridors

30.3.3.3 Local roads

All other roads, except cul-de-sac roads in Chavakkad town having an existing width of 4m and above, are proposed to the status of local roads with a minimum right of way as 6 m.

30.3.3.4. Other Roads (Access to Paddy)

In some areas there is no proper access to paddy fields. Improper access to fields affects the cultivation. So it is proposed to provide a 4 m. wide access to paddy fields in three required locations as shown in the map, figure 30.6.

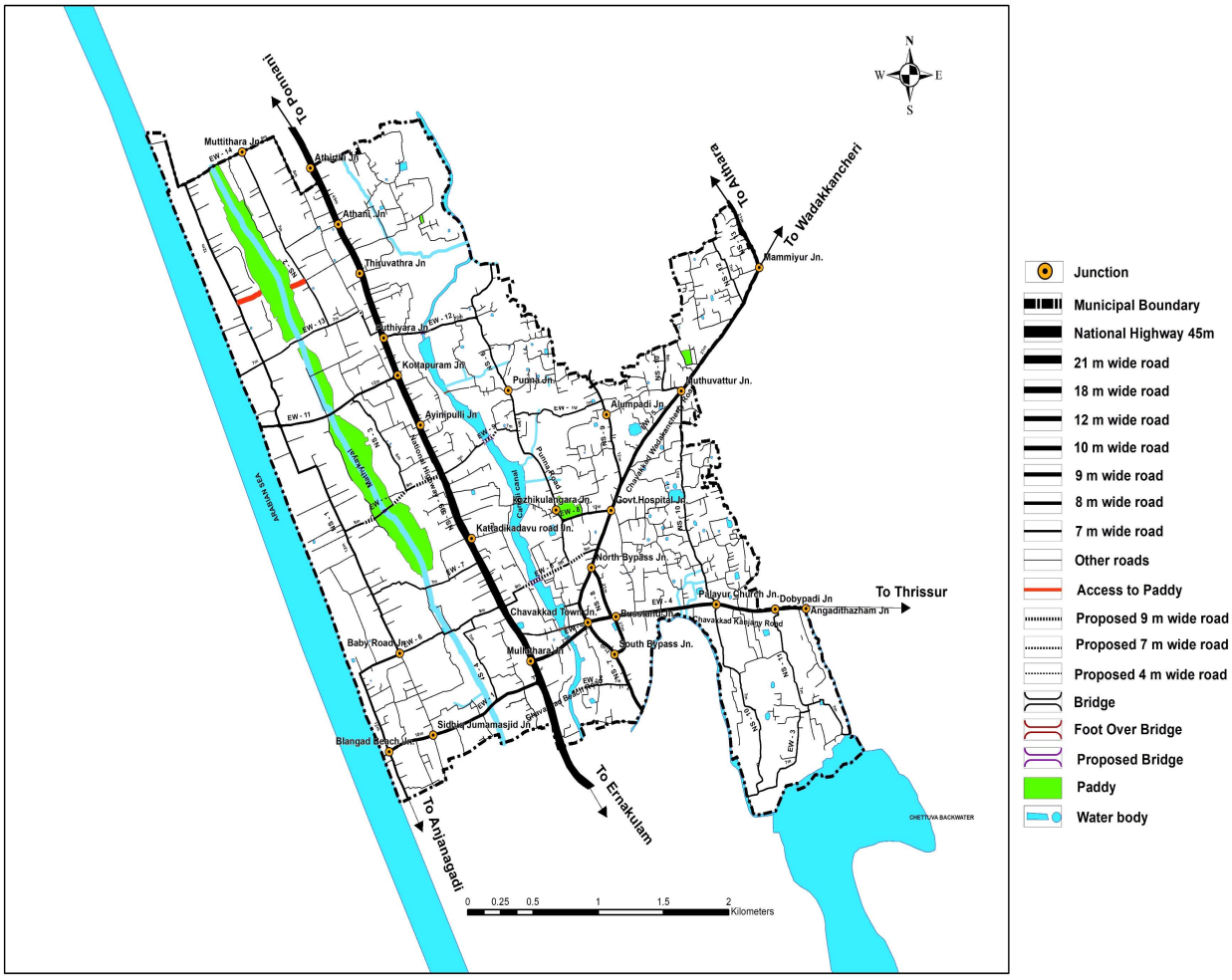


Fig.30.6. Location of Access Roads to paddy fields

30.3.4 Fly over at Mullathara junction

A Fly over is proposed at Mullathara - Beach road junction to enable smooth traffic towards Chavakkad beach . This will enable the Guruvayur pilgrimage to visit beach without much traffic problems. By providing this flyover, a non-congested corridor from Guruvayur temple to beach will form.

30.3.5 Bridges

The bridges that are required for the transportation network for the town are:

- EW-6 Corridors (New link road) as a new bridge
- EW-9 Corridors as a new bridge
- EW-12 Corridors as rebuilding

The figure 30.7 shows the location of flyover and proposed bridges

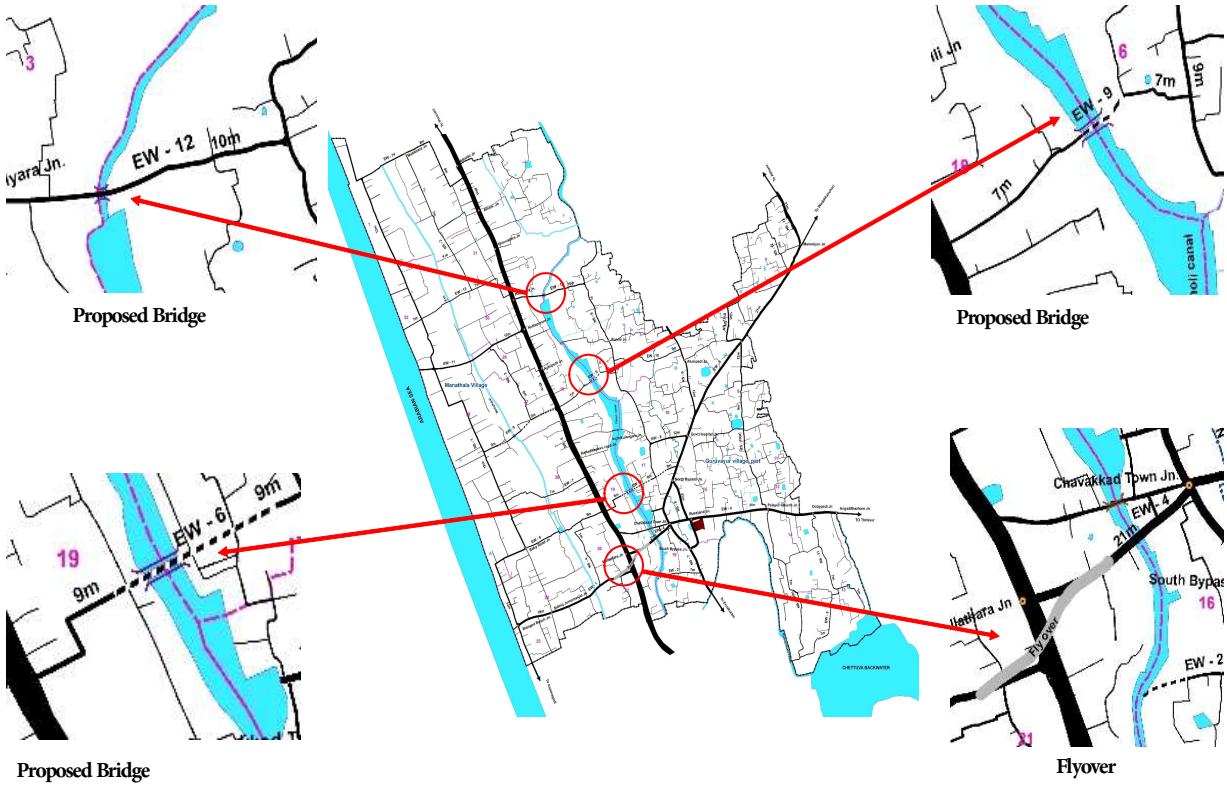


Fig.30.7 Location of flyover and proposed bridges

30.3.6 Intersection improvements

Intersections are the vehicle conflict points and are prone to accident risk. Therefore there is a need to properly design the intersections for stream lining traffic flow and ensure orderly movement of traffic. The following intersections in Chavakkad town need to be taken up for detailed design considering the existing traffic flow and the need for future road widening.

(i)	Williams Jn	(ii)	South Bypass Jn	(iii)	Chavakkad Main
(iv)	MullatharaJn	(v)	Manathala Jn	(vi)	Nediyath Temple
(vii)	Kottapuram	(viii)	Puthiyara	(ix)	North Bypass
(x)	Hospital	(xi)	Evangel	(xii)	Muthuvattoor
(xiii)	Bus stand	(xiv)	Palayur	(xv)	Alumpadi
(xvi)	Kozhikkulangara	(xvii)	Punna	(xviii)	Baby road Jn
(xix)	Mammiyur	(xx)	Siddique		

However, the following junctions need to be improved on priority basis.

(i)	Chavakkad Main Jn	(ii)	South Bypass Jn	(iii)	Bus stand Jn
(iv)	North Bypass Jn	(v)	Mullathara Jn		

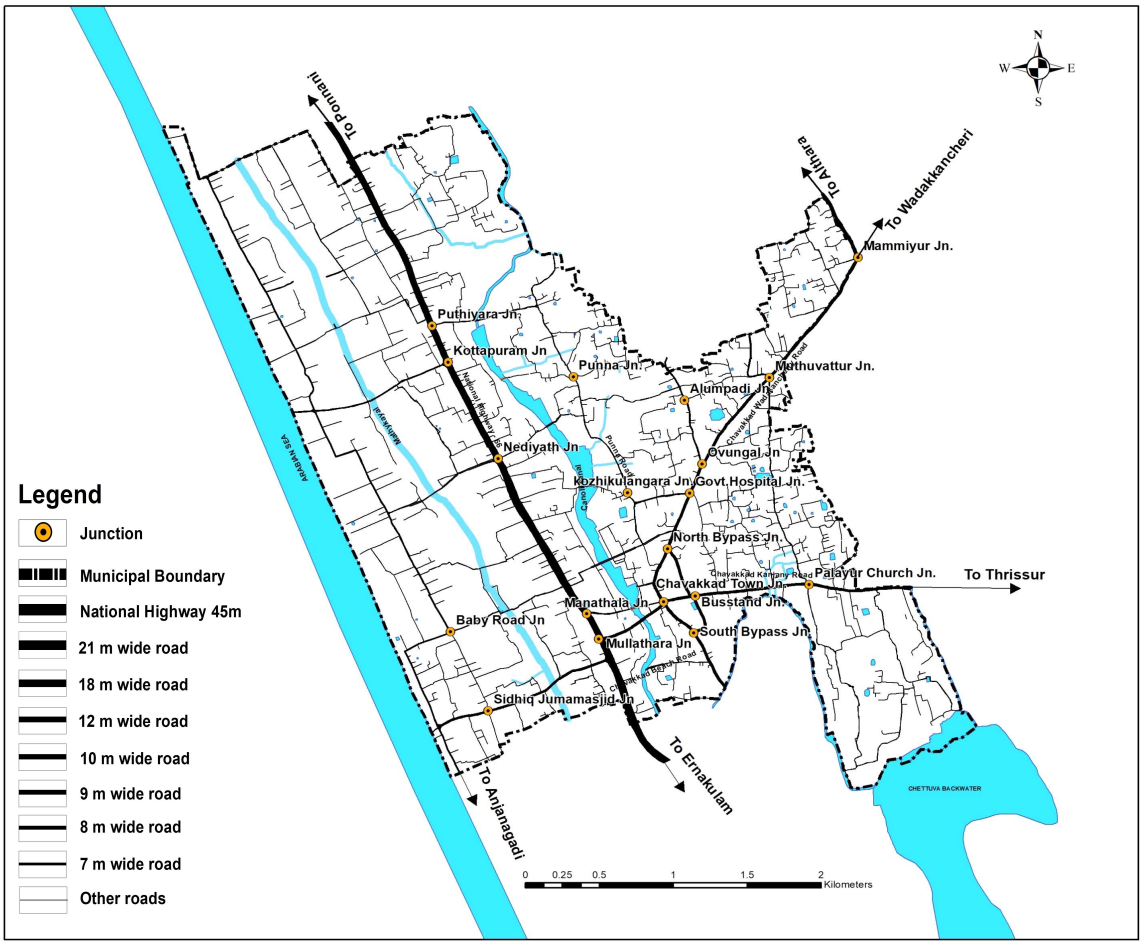


Fig.30.8 Major Junctions to be improved

30.3.7 Rail network

There is no railway station located within the municipal limit of Chavakkad town. However, Guruvayur railway station, located about 4 km from Chavakkad town, and Thrissur railway station located about 27 km provides the much needed connectivity for Chavakkad Town.

30.3.8 Pedestrian facilities

The pedestrian facilities that are required for a town are:

(i) Walkways or sidewalks;

(i) At-grade cross walk facilities

(ii) Underground/ elevated walkway

(iii) Pedestrian amenities etc.

A brief description of the above facilities which is required for Chavakkad town is given below

30.3.8.1 Sidewalks or walkways

Sidewalks are "pedestrian lanes" that provide people with space to travel within the public right-of-way, that is separated from roadway vehicles. Sidewalks are associated with significant reductions in pedestrian collisions with motor vehicles. For Chavakkad town, considering the existing pedestrian demand, sidewalks with a width of 1.5 m to 2.5 m is proposed for different types of roads. Pedestrian ways should be always associated with pedestrian amenities such as shading devices, Anti-slippery materials for pavement, proper curb area from vehicular zone Etc. If possible in areas where land is available, street furniture can also be furnished to increase the pedestrian facilities and also image ability of the space.

30.3.8.2 At-grade crosswalks

Crosswalks indicate preferred locations for pedestrians to cross the road and it is the designated right-of-way for motorists to yield to pedestrians. Crosswalks are often installed at signalized intersections and mid sections of roads where pedestrian intensities are heavy. Marked crosswalks (zebra crossing) are desirable at some high pedestrian crossing locations to guide pedestrians along a preferred walking path. For Chavakkad town, cross walk markings are desirable at all arms of the major intersections. Apart from these intersections, cross walk markings need to be proposed at intense pedestrian activity locations like bus stops, educational institutions, hospitals, major commercial complex/ mall etc. Proposed locations for cross walk facilities are shown in table 30.5

Table.30.5 Proposed location for cross walker facilities

SI NO	ROAD	LOCATION
I	Chavakkad - Ernakulam road	South Bypass Jn, Chavakkad Main Jn
II	Chavakkad - Thrissur road	Chavakkad Main Jn, Bus Stand Jn, Palayur Jn
III	Chavakkad – Kunnamkulam road	Chavakkad Main Jn,Police station Jn,Hospital Jn, Ovungal Jn,Muthuvattoor Jn,Mammiyur Jn
IV	Chavakkad – Ponnani road	Chavakkad Main Jn,Mullathara Jn,Manathala Jn
V	Chavakkad – Chettuva road	Mullathara Jn

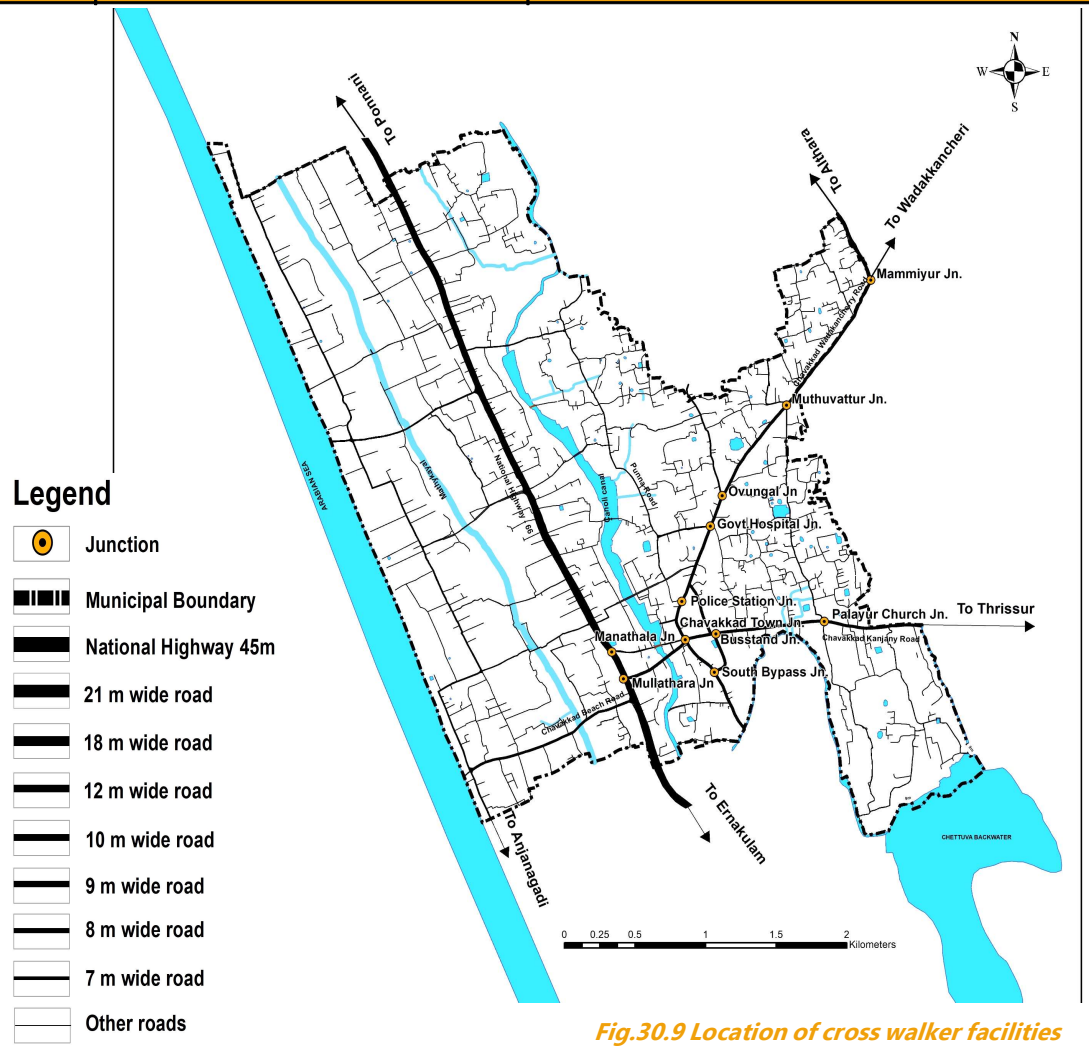


Fig.30.9 Location of cross walker facilities

30.3.8.3 Pedestrian overpasses/ underpasses

Pedestrian overpasses and underpasses allow for the uninterrupted flow of pedestrian movement, separated from the vehicle traffic. However, they should be a measure of last resort, and it is usually more appropriate to use traffic-calming measures or install a pedestrian-activated signal that is accessible to all pedestrians. This is also an extremely high-cost and visually intrusive measure. Such a facility must accommodate all persons. These measures include ramps or escalators.

Extensive ramping will accommodate wheelchairs, but results in long crossing distances and steep slopes that discourage use. Studies have shown that many pedestrians will not use an overpass or underpass if they can cross at street level in about the same amount of time. Overpasses work best when the topography allows for a structure without ramps. Underpasses work best when designed to feel open and accessible. Grade separation is most feasible and appropriate in extreme cases where pedestrians must cross roadways of high speed, high-volume arterials. Pedestrian underpass/overpasses are not proposed for any location in Chavakkad town at present.

30.4 Parking facilities

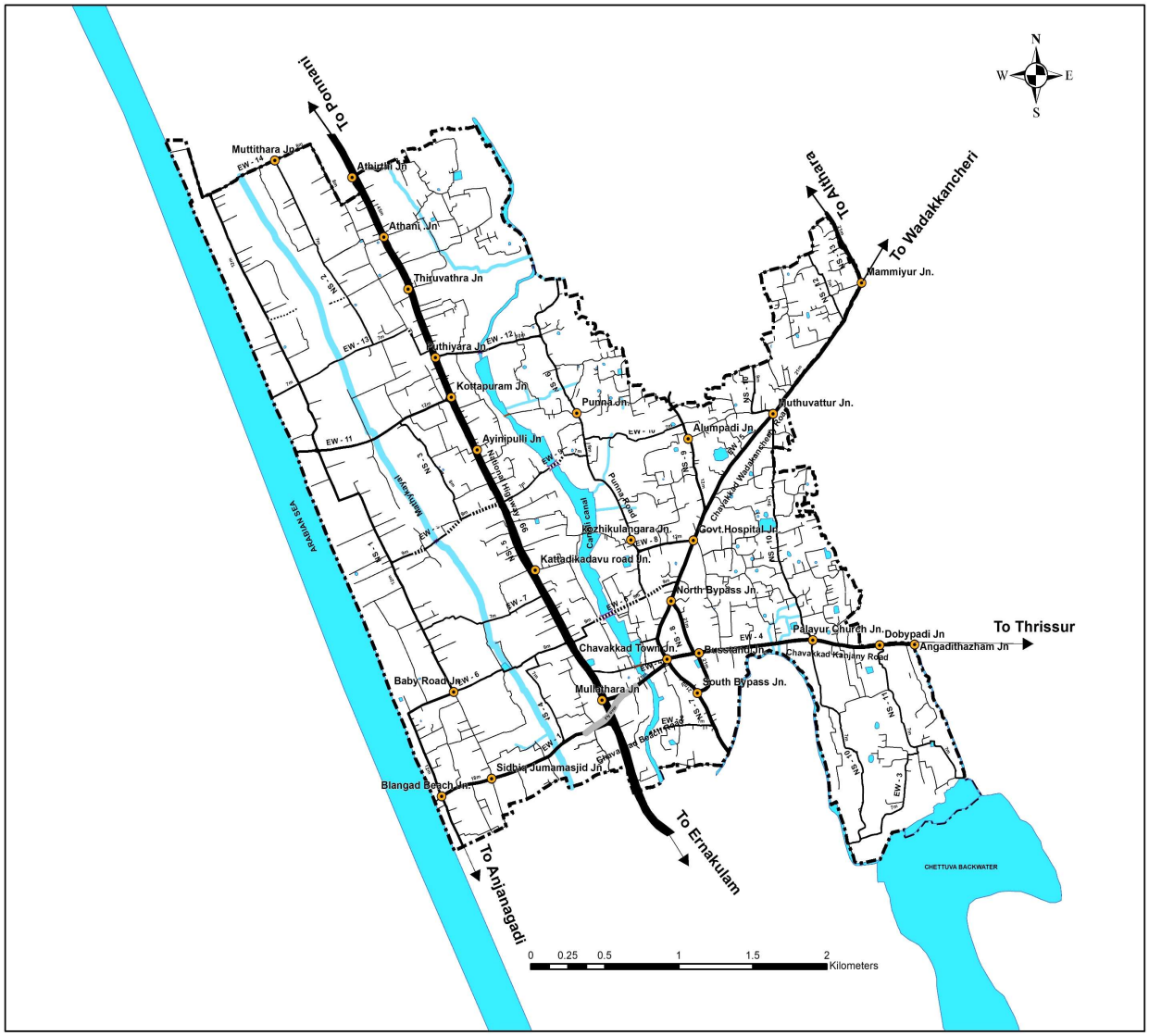
As most of the commercial activities are centered along the Chavakkad-Kunnamkulam road, and Chavakkad – Kanjani road as a short term measure, a parking management plan need to be prepared with earmarking of parking spaces for various categories of vehicles utilizing the available road spaces. A progressive parking fee need to be considered to restrict long haul parking with low fee for short duration parking and relatively high fee for long duration parking. In the long run, a combination of commercial cum automated parking system is proposed for bus stand area in Chavakkad town.

30.5. Bus bays

Off line bus stop/ bus bays is a special zone on the side of the main road way for primarily bus to stop for a designated area in order to pick up and drop passengers. Absence of bus bays cause for a traffic congestion in Chavakkad town area. So provision should be allocated for bus bays when designing new proposed roads. Figure 30.10 shows the proposed Trasnporation plan

30.6 Inference

Based on detailed studies, base line data pertaining to traffic and transportation system for Chavakkad town has been compiled. The base line data contains transport network in the study area, volume and capacity utilization on major roads, parking demand and pedestrian volume, and inter-city passenger and goods traffic characteristics. In addition, projection of traffic on major roads has been carried out for various horizon periods considering the growth potentials of the study area. Based on traffic projection, a long term Transportation Development Plan has been formulated for the town. The proposals included in the long term plan would enable a balanced development of the Urban Centre in the coming years. It is expected that the base line data given in this report will serve as basic inputs for the preparation of Master Plan for Chavakkad town. It is hoped that the long term Transportation Development Plan will go a long way in achieving transport driven land use development for the town in the coming years.



Junction
Municipal Boundary
National Highway 45m
21 m wide road
18 m wide road
12 m wide road
10 m wide road
9 m wide road
8 m wide road
7 m wide road
Other roads
Proposed 9 m wide road
Proposed 7 m wide road
Proposed 4 m wide road
Fly over
Bridge
Foot Over Bridge
Proposed Bridge
Water body

Fig. 30.10 Proposed Transportation plan

CHAPTER 31

SECTORAL PROPOSALS

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

As per Integrated District Development Plan, Chavakkad Town comes under Multifunctional Zone II & Environmental concern zone which indicates that there is a scope for fisheries and tourism activities. Considering the development vision, projected economic base and strategies adopted various development proposals are carved, which are described in the forth coming paragraphs.

31.1 Tourism

31.1.1 One day Tourism Circuit

A tourism circuit connecting potential areas within and around the town which can be covered in a single day is to be developed. This circuit can be linked with 'Thrissur Peruma' the proposed tourism week in Thrissur District. Figure 31.1 shows the proposed tourism circuit for Town. First location is the Guruvayur Temple, which is a major pilgrim centre in India. Second location is Mammiyoor Temple which is a part of the 108 famous Shiva temples in Kerala and one of the five Shiva temples in Kerala. It is said that pilgrims who visited Guruvayur temple must visit Mammiyur temple. Third location is the Punnathoorkotta which is a fort and former palace located in Thampuranpadi, about 2 km from the Guruvayur, and has been renamed as Anakotta (meaning "Elephant Fort"). Next location is the Palayoor church in the Chavakkad Town which is the first Catholic Church in India which is believed to be established in AD 52 by St. Thomas the apostle of Christ . In true Kerala tradition, the Palayur pilgrim complex together with the Guruvayur temple and Manathala masjid forms a sacred triangle of religious harmony & communal amity. Fifth location is the Chettuva Azhimukam (estuary) which is a beautiful location where the Chettuva River meets the Arabian Sea. Sixth location is the Light house in Kadapuram Panchayat. The seventh location is the Blangad beach in Chavakkad where the tourists could enjoy the sun set and various activities in the beach like fishing, beach games, flying kites etc. Here the tourists can enjoy the local sea food available in the restaurants and see he various fish varieties exhibited in the fish market. One day tourism circuit in Chavakkad town is shown in figure 31.1.



Fig 31.1 One Day tourism Circuit

➢ **Guruvayoor Sri Krishna Temple**

Guruvayoor Sri Krishna Temple is a major Pilgrim centre in India. It is a Hindu temple dedicated to the God Krishna (An avatar of the God Vishnu). Daily poojas & offerings are available in temple. The temple opens at 3 o' clock in the morning and closed at 9.30 pm, making the end of a day. Gajarajan, Guruvayoor Kesavan's (Elephant) statue, Mara Prabhu statue, Melpathur Auditorium where stage programmes are performing and Theerthakulam are some of the scenes available at Temple premises. Plenty of lodging and Hotel facilities are available at Guruvayoor.

The temple is located at 29 km from Thrissur. The nearest railway station is at Guruvayoor railway station and the nearest major railway station with better connecting is at Thrissur. The nearest airport is Cochin international Airport which is located at 75 km from Guruvayoor. Guruvayoor is well connected from all major towns of Kerala and Tamilnadu. Various private and state governments – owned bus companies operate regular services to this town.

➢ **Mammiyoor Temple**

Mammiyoor Temple (Mammiyoor Mahadeva Kshethram) is a shiva temple situated in Guruvayoor, just five minutes walking from Sri Krishna Temple. Every devotee who goes to Guruvayoor Temple is supposed to go to Mammiyoor Temple also, as the ritual goes. Only Hindus are allowed inside the premises.

➢ **PunnathurKotta**

PunnathurKotta was once the palace of a local ruler, but the palace grounds are now used to house the elephants belonging to the Guruvayoor Temple, and has been renamed Anakkotta (Meaning "Elephant fort"). There are about 60 elephants housed. The elephants are ritual offering made by the devotees of Lord Guruvayoorappa. The camp also acts as a training school and treatment place for the elephants. The visiting hours are 8:00 AM to 6:00 PM. Punnathur Kotta is located in Thampuranpadi at a distance of 3 km from the Guruvayoor Temple, along the side of SH62. Car parking facilities, Teastalls and small fancy shops are available here.

➢ **Palayur St. Thomas Church**

Palayur Church is believed to be the oldest Church built in India, by St. Thomas in AD 52. It is a famous pilgrim center of Christiansin Thrissur district. All peoples are visiting here to see the architecture and monuments of the church premises. Some of the monuments are:

- **Boat Jetty** (Boat Kulam) - where St.Thomas landed at Palayur.
- **ThaliyaKulam-** The Pond where St.Thomas babtized the local people.
- **Historical Museum -**where the materials regarding the history of Christians is exhibited.

Palayur Church is located at 2km from Guruvayoor Temple along the side of Chavakkad – Kanjani road. An information centre is available at church compound. Car parking spaces are available in Church compound itself.

➢ **Chettuva Azhimugham**

Azhimugham is the place where the sea confluence with a river, seeing of its natural beauty is a best experience as far as tourist concerned. Chettuva Back water, Munakkakavu fish landing center can also seen here. It is situated at about 8km from Guruvayoor Temple in Kadappuram Panchayat area. The transportation facilities are moderately good. One can spend about two hours minimum by watching of the natural beauty available here and surroundings.

➢ **Light House**

Light house is used for navigation purposes. It helps fisherman to identify the bank of sea. Chavakkad Light house is situated in Kadappuram Panchayat along the side of Anchangadi –Munakadavu PWD road. It is a central Government property. Here they allowed peoples to enter and watch the view from the top of the Tower – during day time.

➢ **Blangad Beach**

Blangad beach is also known as Dwaraka beach is situated about 5 km from Guruvayoor Temple, lying on the coast of Arabian Sea. About 2 km length coconut bordered seashore is available here. This area has major fishing activities with a fish landing centre. The tourist coming here can watch these fishing activities which will be a best experience to them. It has an entry from NH 66. The transportation facilities are moderately good. Car parking and sanitary facilities are not satisfactory at present. It is most appropriate to visit the beach in the evening.

➢ **Mannalamkunnu Beach**

Mannalamkunnu beach is situated in Punnayur Panchayat area, north of Dwaraka beach at a distance of 10 km from Dwaraka beach. It has an entry from NH 66. This beach is in developing stage. It has a unique beauty.

31.1.2 Water way Tourism



Fig 31.2 Water way tourism Circuit

Boating is proposed along Canoli canal, Chettuva Lake and Enamavu Lake. Parks & green open spaces are proposed along the sides of Canoli canal. Visitors can stop at destinations and take a break at the canal side parks. Cruising the canal reveals scenic views around every bend and the natural world of serene beauty. Water way tourism circuit is shown in figure 31.2

31.1.2.1 Boat Jetty at Punna

For boating, a landing place is required to enter and exit from boats. This place could have a capability of receiving the visitors and their vehicles to a large extent. The access to this place should have sufficient width and well connection to nearest Highways.

A boat jetty is proposed at Punna laying on both sides of the Canoli canal, one is near to Rajah School which is situated at east of canal in ward no. 18 (sy nos. 192,191,177)with an area of 20 hectre and other is near to Manathala shiva temple which is situated at west of canal in ward no.18 (sy nos. 223, 224, 239) with an area of 20 hectre. The west side boat jetty has a good connection to NH66 and the eastside has well connected to SH50. A suspension bridge is proposed to connect the two places. For getting a recreation feeling it is to be arranged with sitting place, cafe, toilets, car parking etc .The figure 31.3 shows the location of boat jetty. Conceptual plan and view the boat jetty is shown in figure 31.4 and 31.5 respectively

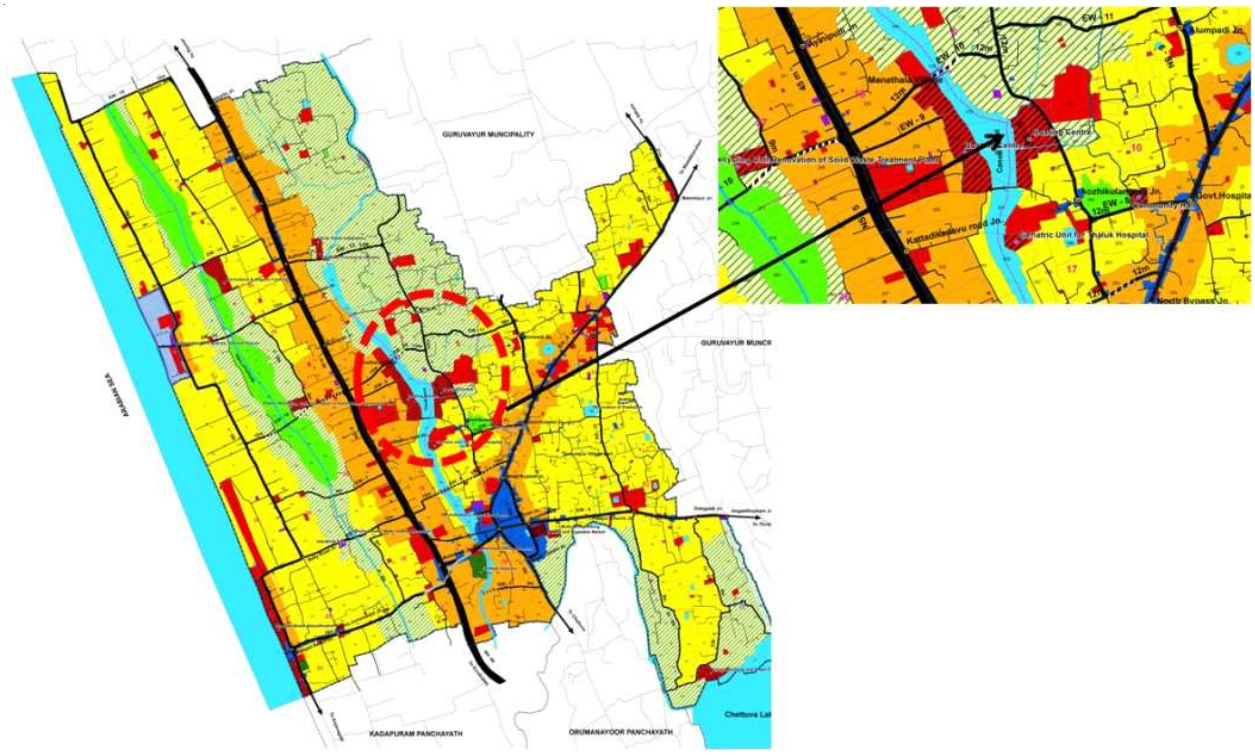


Fig 31.3 Location of boat jetty



Fig 31.4 Conceptual plan of boat jetty



Fig 31.5 Conceptual view of boat jetty

31.1.3 Chavakkad Blangad Beach Beautification

The aim of this project is to develop Chavakkad beach as one of the prime tourist destinations in the district of Thrissur.The area will be developed as a centre with excellent facilities and a lively community hub, and as a seaside holiday town looking out towards the ocean. Facilities and shops should be easily accessible either by walking or cycling. Requirement opportunities for high quality holiday accommodation will be maximized in a way that is sensitive to the environment, and brings benefits to the permanent residential community.

Project components are:-

1. Improving pedestrian circulation and safety by establishing connections to the beach, providing covered pathways, shaded spaces, footpaths on the sides of the existing roads etc.

2. Providing transportation facilities to the beach by extending the bus route to the beach area and providing new autorikshaw stand, taxi etc.

3. Providing accommodation facilities such as new lodges, resorts, restaurants etc.

4. Active community participation in the tourism activities by creating inclusive tourism activities like Pesca tourism, Local sea food restaurants, Exhibition of fish varieties. It requires fisherman

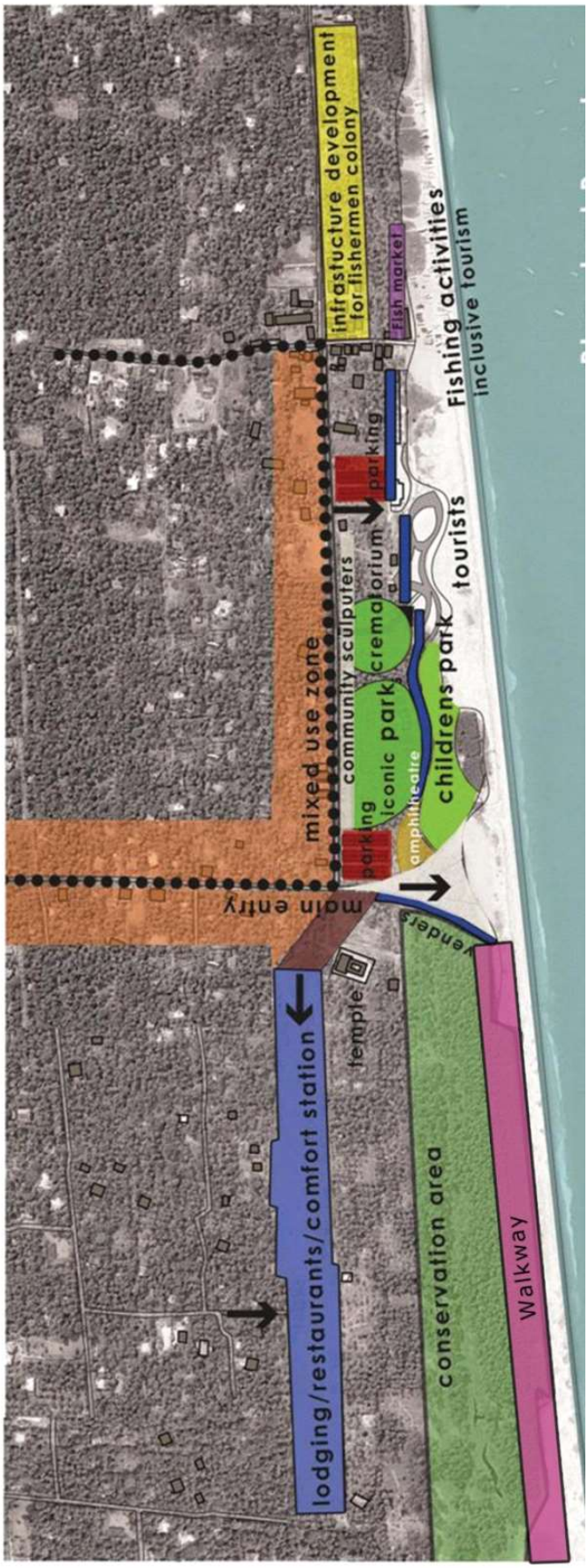


Fig 31.6 Blangad beach Beautification Plan

training, safely equipments for boating, interaction between envisaging and implementing agencies such as police department local self-government, tourism department, members from fisherman community. All these strategies can be implemented to beautify Blangad beach and the plan is shown in figure 31.6.

31.1.3.1 Linking Fisheries to Tourism Economy

The main measures which can be adopted to link the fisheries sector to tourism economy are

- **Activities linked to the fishing activity such as Pesca-tourism** (Linking up with tourism by taking tourists on board fishing vessels) or guided visits to aquaculture sites.
- **Improving infrastructure** to make Chavakkad fishing area more attractive to tourists.
- **Support for local fish restaurants** by offering opportunities to eat freshly caught local fish in restaurants run directly by fishermen associations.
- **Accommodation provided for fishermen and their families,** projects that foster cooperation between the fisheries and tourist sectors to develop and market as a successful tourist spot for products and services.

Training programmes for fishermen at the Chavakkad region to provide motivation and skills necessary to ensure adequate quality of tourist services

31.1.3.2 Macro and micro level designs.

The design put up as part of this should follow some common design principles such as

- **Conservation of the environment**

  Coastal environments are the important ecosystems that must be conserved for the future.

- **Promotion of activities for sustainable community development**

  Community development is vital for any settlement, and these small and regional communities require particular support with regard to the provision of services and facilities as well as economic stimulation.

- **Improvement of accessibility with much care for pedestrian facilities**

  Appropriate accessibility facilities should be considered along with development. Units with size of walk-able distance will allow safe and enjoyable pedestrian movements.

It can add a feel of place-making with sense of arrival having effective circulation and way finding features.

- **Provisions for visual permeability**

Visual permeability should be provided from the nodes towards the beach. Creating vistas and views are also essential.

31.1.3.3 Inclusive Tourism at Chavakkad Beach

Urban Design is the key role in crafting unique supplies for tourism industry and branding the town to offer matchless experience. The following diagram shows the various components that influence beach tourism as far as in harmony with the local community is concerned. Flow diagram of inclusive tourism in Chavakkad town is shown in figure 31.7. Various proposed activities and facilities for Chavakkad Beach is shown in figure 31.8.



Fig 31.7 Inclusive tourism Circuit flow chart



Fig 31.8 Proposed activities and facilities in Beach

31.1.3.4. Website Development for tourism promotion

The tourist importance of the town needs to be made known through modern ways to people seeking information. The hosting of a website detailing the tourism prospects of the town and the available facilities is hence proposed.

31.1.3.5. Walkway in Blangad beach

Master plan envisages the overall development of each sector in Chavakkad town. As a part of it Chavakkad beach beautification (Blangad beach) programmes can play an essential role in different sectors like tourism, fisheries, recreation, economy etc.

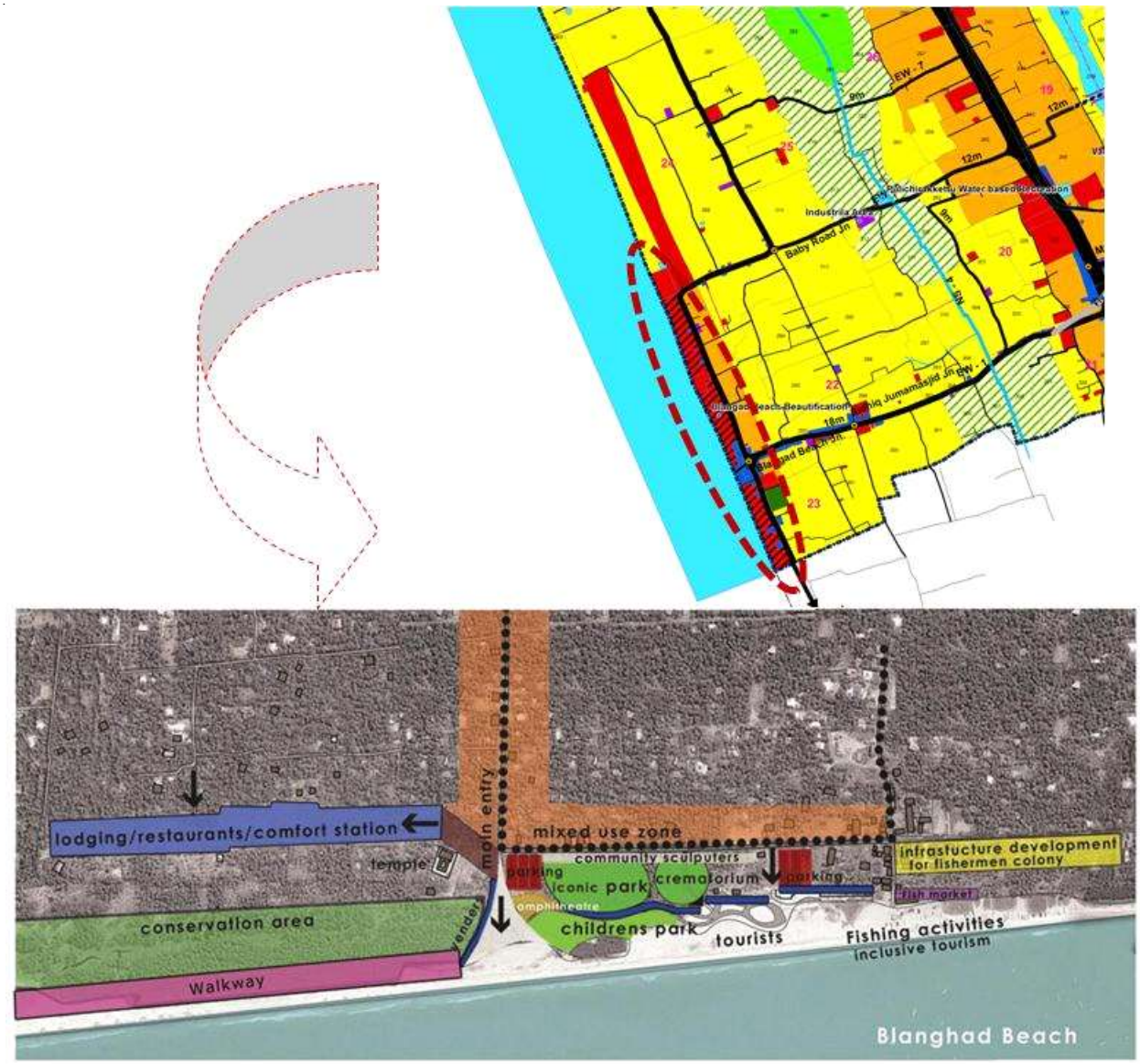


Fig 31.9 Proposed walkway in Blangad Beach

Master plan proposes a walk way along the side of sea shore starting from the main entry of Blangad beach as shown in figure. 31.9 Walk way will perform as a focal point for recreation activities. It should promote pedestrian friendly atmosphere with a bicycle track too. Walk way have a length of 500 m and can be used for a multiple of recreational functions. Provisions for advertisement should be incorporated within design, which can earn revenue. The location of proposed walkway and its conceptual rendering is as shown in figure 31.10, 31.11 and 31.12

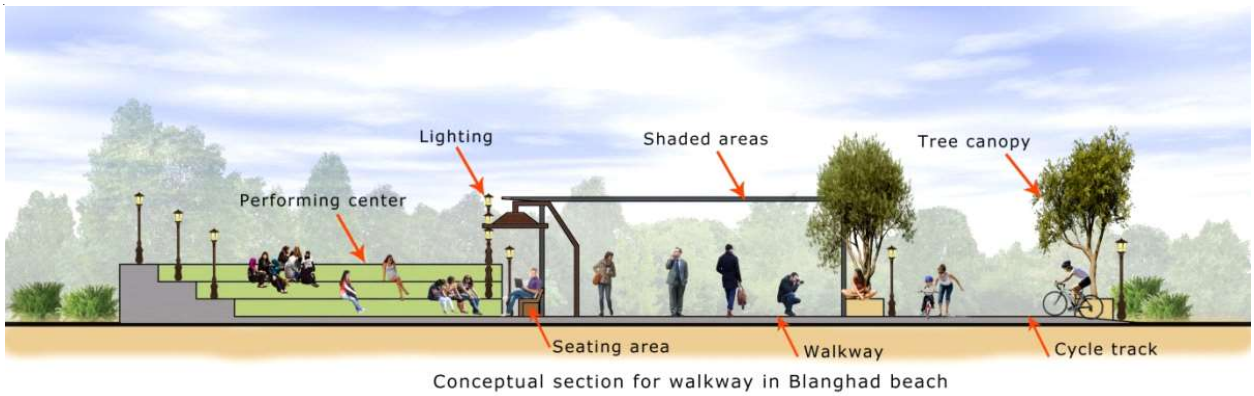


Fig 31.10 Street Section of proposed walkway in Blangad Beach



Fig 31.11 Conceptual rendering of paved walkway with seating and shading areas

➢ Walk way design elements are:-

- Paved walkway
- Paved bicycle track
- Seating areas
- Shaded areas
- Lighting facilities
- Performing areas/ Podiums
- Community sculptures
- Advertisement areas



Fig 31.12 Conceptual rendering of performing areas and bicycle track

31.1.4 Revitalization of Canoli Canal

The Canoli canal was built by the British East India Company under the supervision of the Malabar collector Mr. Canoli. This canal connected the main trade centers like Kozhikode, Ponnani, Chavakkad, Kodungallur and Kochi. It raised the importance of Chavakkad as a trade center. Vanchikadavu at Chavakkad was the point where goods were transacted from large house boats to smaller ones and distributed in land. The area had many pandikasala (godowns) built by the businessman who had settled here. The weekly Wednesday markets and cattle markets of

Chavakkad were very famous. It was through Canoli Canal that the postal boat service from Kochi to Kozhikode was operated. Canoli Canal has played an important role in the development and establishment of business centres in Chavakkad. That's why Canoli Canal and Nadappalam (foot over Bridge to cross the canal) became the official emblems of the municipality of Chavakkad. Chavakkad became a main center of business and commerce since it is the main hault place between Kozhikode and Kochi with navigational channels through Chettuva and Enamavu. The place is now known as Mini Gulf as Chavakkad has the highest number of NRI's in Thrissur district.

Canoli canal is envisioned as a close-knit group of Canal and community that welcomes residents and visitors alike. The history, unique natural setting, recreational opportunities, cultural events, and community connections and services are celebrated here. The proposed projects should envisage the effective use of Canoli Canal as the CBD area's prime location in terms of visual, open space, and recreational amenities.

The best opportunity for Chavakkad to recapture its identity is to enhance public access to its central waterfront with following parameters,

1. Capture a distinct identity

To transform Chavakkad by promoting a theme that picks up on its waterfront character and heritage.

2. Provide a sense of comfort and convenience

Introducing Canal side improvements and pedestrian amenities, along the Canoli canal to bring in a new life to the town, public spaces are needed to encourage people to linger so that residents and visitors would shop, enjoy, and spend money.

3. Personalise the Canal edge with public art

Public art not only show cases creative energy but also can serve as an expression of community character and help in the process of place-making and community revitalization.

Opportunities for public art range from hand crafted banner poles to sculptures; whatever an artist can imagine should be considered an opportunity to translate heritage of Chavakkad to the broader public. Public art that graces public spaces will add a sense of comfort and security. Public art can also bring vitality to the town that makes the experience inviting as well as educational and interesting.

4.Enhance views of Canoli canal from CBD

The Canoli Canal is undoubtedly the most important natural resource of Chavakkad and one of its primary identifying characteristics. Maintaining and improving visual connections to the Canal from town will help visitors remind of why Chavakkad, as a waterfront community, is different from other areas. Chavakkad should build on its special connection with Canoli Canal. Visual connections to the river will provide a sense of place and remind residents and visitors ,the unique character of Chavakkad.

5.Create a waterfront walk system

The concept of a waterfront walkway would link together the various portions of the waterfront and create an additional recreational amenity. Specific recommendations for this walkway include the following:

- Locate the walk way by the side of canal in the town area
- Extend Linkages to the waterfront from the main roads.
- Utilize design elements, such as signage, paving to unify and enhance this waterfront walk system

6.Provide adequate street and sidewalk lighting

Any new street lighting should provide enough light for the sidewalk and should have limited impact on the neighbourhood.

7.Allow and promote additional water-oriented activities, such as a canoe 'trail', water taxi stops, tours, boat launches, etc.

The waterfront is a recreational asset that should be accentuated by providing additional opportunities for the use of water. The canoe trail that has been informally organized to date should be formally identified and enhanced with signage.

8.Provide parks, open spaces & boat centre on the sides of the canal

The town should provide additional landscaping wherever necessary and ensure that it continues to be well maintained. A visitor's center near or in this park is also appropriate and would serve as a first point of contact with the community, providing travelers with access to public rest rooms, water fountains, brochures, maps, and restaurants menus. On-site staff, if available, can answer questions and offer recommendations customised to the individual visitor's needs. A podium as a perform center may be provided in the park, where visitors could park, view an orientation map, and depart for other attractions.

31.1.5 Recreational area near Vanchikkadavu

Urban open/recreational space is a natural and cultural resource that are consciously acquired or publicly regulated to serve conservation and urban shaping in addition to providing recreational opportunities. It can provide community revitalisation, green infrastructure, help children learn, promote arts etc. In Chavakkad Town, Vanchikkadavu area has similar potential to develop as a recreational spot. The land under the control of Irrigation department with an extend of 0.0040 Ha may be used for this purpose. Pedestrianisation techniques should be followed while deriving urban design/architectural solutions for this area.

Proposals include:

a) Small play area for children

b) Walkway along the banks of Canoli canal

c) Seating facilities

d) Community sculptures

Proposed location map and conceptual rendering of Vanchikkadavu and Canoli canal is shown in figure 31.13, 31.14 and 31.15 respectively.



Fig 31.13 Conceptual rendering of Vanchikadavu

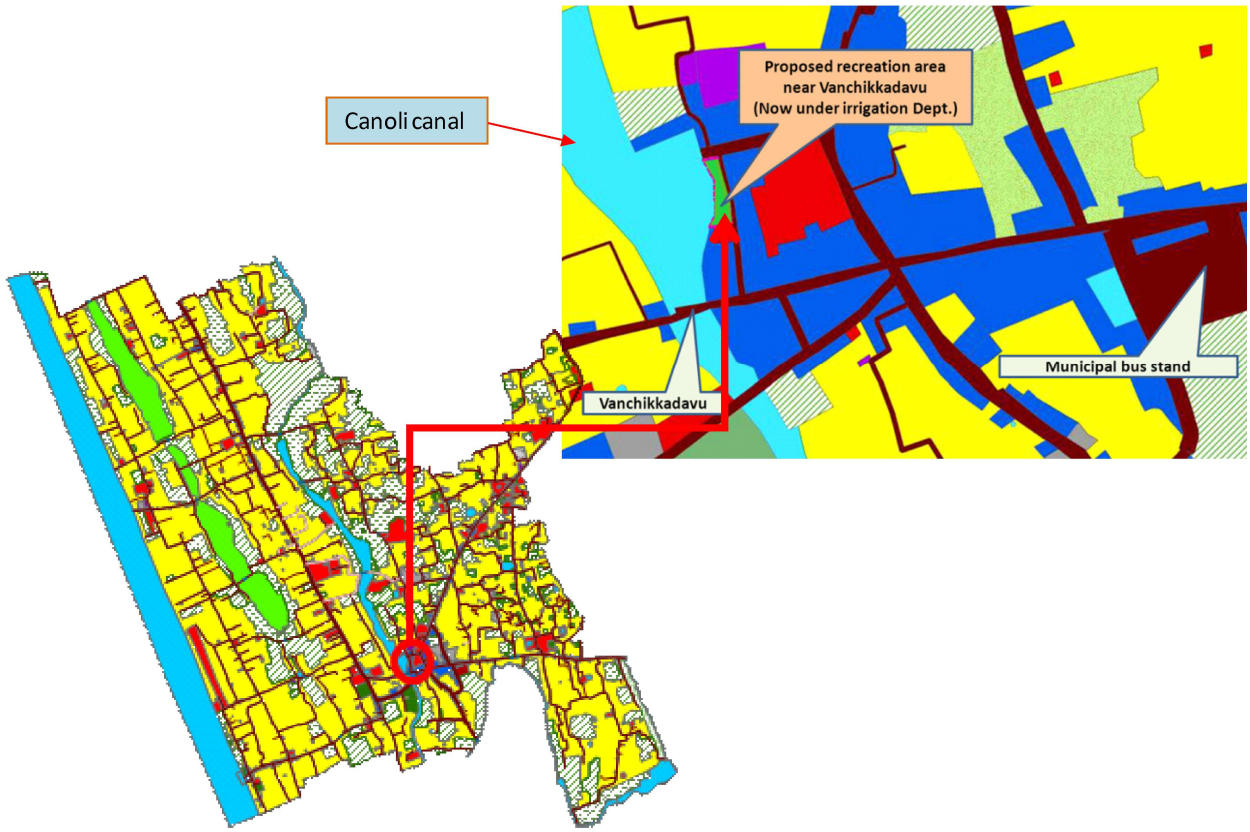


Fig 31.14 Map showing location of recreational spot

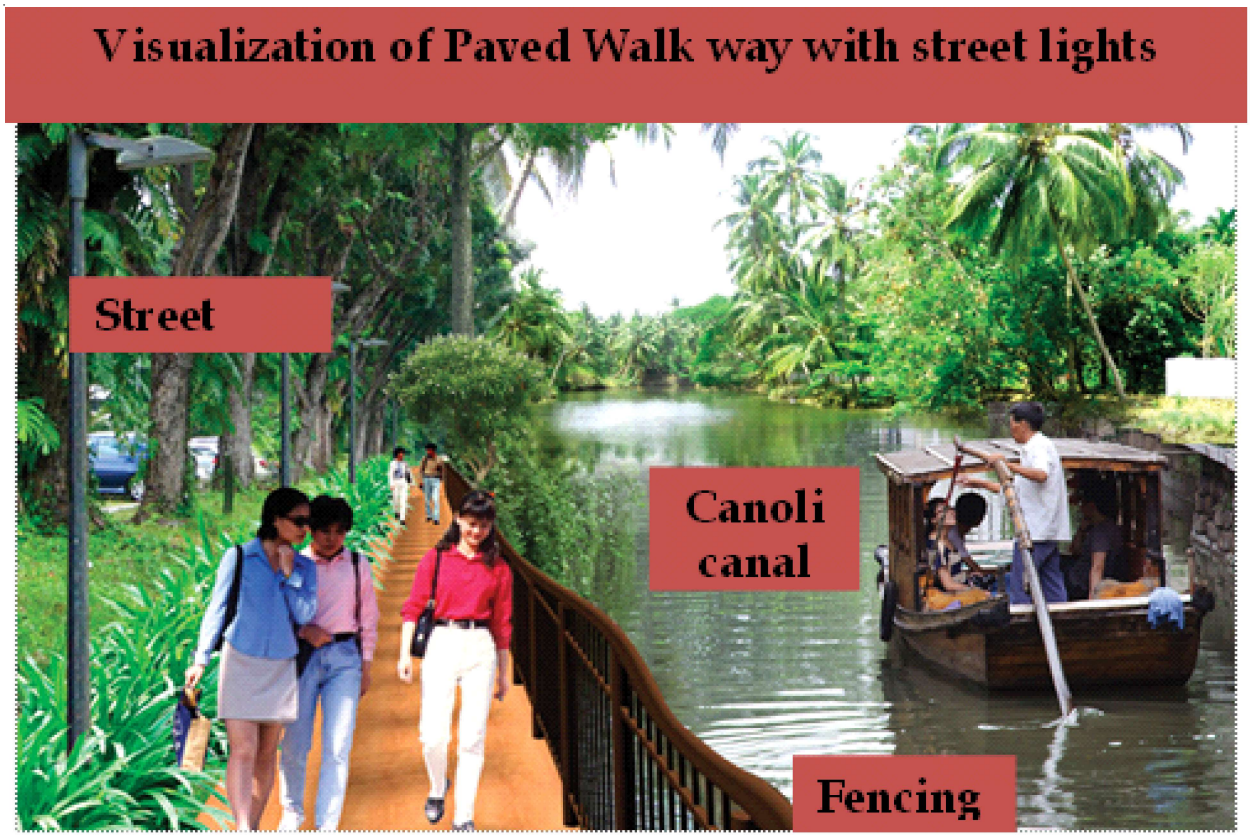


Fig 31.15 Conceptual rendering of Canoli canal

31.2 Recreation

31.2.1 Pulichirakkettu as a Recreational Space

Pulichirakkettu is a natural pond situated in the south west portion of Chavakkad Town with an extent of 0.16 Ha. At present this natural water body is not used for any purpose. Pond is filled with water hyacinth and other plants. Presence of water plants and unprotected sides reduce the water capacity of the pond. During summer evaporation is at its peak. Figure 31.16 shows the location of Pullichirakkettu.

In an aesthetical and ecological view it deserves a much better treatment. Since it is located within the premises of town and on the way to Dwaraka beach, it has a potential which can be developed as a public recreation space. Also dredging activities are required to increase the water storing capacity.

Design elements may be:

- Open space
- Walking pathway
- Swimming area
- Adequate swimming facilities
- Appropriate fencing
- Seating
- Stone & Art work
- Fountain



Pulichirakkettu present situation



Conceptual rendering of Pulichirakkettu



Fig 31.16 Map showing location of Pulichirakkettu

31.3 Fisheries

Diversification of aquaculture practices and their allied activities is required for the integrated development of fisheries sector in and around the municipal area.

31.3.1 Puthenkadappuram Fishing Village

Fishing villages are an integral part of fisheries tourism in many places. This project aims to develop Puthenkadappuram as the major fishing centre in the district of Thrissur with excellent infrastructure facilities, fish processing industry and a lively community hub. This will enhance the economic growth of the fishing community and the region as a whole. The development will also trigger the growth of tourism sector by integrating tourist activities to fishing & the industrial visits.

The project components are:

➢ **Improving basic infrastructure facilities in the fishermen colony**

- Land pooling measures have to be undertaken with the support from the local residents. Cost for infrastructure development can be met from the municipal fund
- Provide sanitary facilities, roads and even new houses.
- A compact transit served village will serve as a bench mark for ecological development instead of dilapidated housing and dispersed settlement patterns that is poorly served in basic infrastructure.

➢ **Developing the fisheries industrial zone**

A new fish processing unit has to be started with the expansion of existing units.

➢ **Providing facilities for enhancing the fishing activities**

- Providing facilities for fish drying yard, storage space, Net mending etc.
- Providing new fish market in the beach side.

➢ **Enhancing tourism activities**

- Inclusive tourism strategies with the involvement of communities.
- Pesca tourism.
- Visit to the fish processing industries.
- New fish market which displays varieties of locally caught fish.
- Providing new marine museum attached to the fisheries technical school.

Providing spaces for new restaurants

➢ **Enhancing the linkages to the area**

- Proposal for widening the connecting roads to 12 m width with footpath, cycle track etc. and demarcating the zones on both sides as mixed use.
- The mixed use zone would be a mix of commercial and residential spaces, consisting of residences, shops, lodging facilities, restaurants etc.

➢ **Fish drying unit**

Often increase in the catch or yield results in a bulk which may be difficult to be sold in a day itself. Hence a mechanized fish drying unit is proposed at the Puthenkadappuram. This facility enables the fisherman to handle the bulk catch without falling prey to heavy loss.

➢ **Fish processing centre**

The centre will exclusively work for processing the fish to preserve it for longer time as fresh as original. The project has a potential for effective storage system and ensuring constant supply to the market during off-season. The proposed centre will work to empower the trout fish farmers in two ways viz; preserve the fishes for months which will trail the way for fish

export from the state and will fetch profits for the farmers throughout the year. Hence it is proposed to setup a modern fish processing centre near existing industrial area in Puthenkadappuram. Proposed location for fishing activities and suggested proposals in Puthenkadappuram is shown in figure 31.17 and 31.18 respectively, the identified land for fisheries village comes to 10.74 Ha.



Fig 31.17 Location of fishing Village

➢ **Training centre cum seed bank**

Awareness and training about new techniques in cultivation and marketing of variety of fish species is required for the integrated development of the sector in the Town. Facilities for ensuring availability of good quality seeds are also essential. Hence it is proposed to setup a training centre cum seed bank at the fisheries technical school campus at Puthenkadappuram.

Fishing village at Puthenkadappuram consist of the following facilities

1. Boat landing
2. Fish drying area
3. Haritha theeram project
4. New residential unit/ infrastructure facilities
5. Fish market
6. Restaurant
7. Parking area
8. Industrial zone/ Proposed fish processing industry
9. Shops
10. Upgradation of existing school
11. Fish museum
12. Fish laboratory
13. Training centre cum seed bank



Fig 31.18 Proposed Fishing Village at Puthenkadappuram

Some of the major facilities in the Puthenkadappuram:

- **Fish museum**

A museum tracing the unique story of the fishing community in Chavakkad captured in a wealth of film, photography, paintings & memorabilia of Chavakkad seafront life is proposed.The artifacts including full size boats,types of fish varieties preserved in glass cubes etc. can be displayed at the museum.The museum shop can sell a wide range of items of interest to the visitors, including books about fishing industry and reproduction of fishes, photographs of the fishing activities etc.This is also proposed in the fisheries technical school campus.





- **Fish Laboratory**





Fish laboratory will act as an extended service for the fishermen. Laboratory can ensure the quality of fish for exporting as well as local sales. It can check the use of preservatives such as ammonia. Seasonal and spreading diseases are the major issues in artificial fish cultivation centers; here laboratory services can be used as preventive measures. As per Integrated District Development Plan (IDDP) Of Thrissur, fish laboratory is proposed for Chavakkad Town. Providing space for fish laboratory within fisheries will enhance the scope of the project.

➢**Harithatheeram Padhathi**

The HarithaTheeram Programme aims at the protection of the State's coastline from natural calamities like the tsunami, sea erosion, cyclonic winds etc. Establishing a bio-shield of sand binding trees like Casuarina equisetifiolia and shrubs wherever possible along the coast are the components. It also envisages the improving of the tree cover in the coastal households, meeting their demands for fuel, fodder and small timber. The project is already included in the IDDP report, which can be adapted in fishing village also.





31.4 Industry

31.4.1 Coconut processing industry

Chavakkad shows a coconut production that is more than state average.Coconut trees are densely distributed evenly in the residential areas. Considering the huge demand and the good potential for coconut processing industry at Chavakkad, various proposals were carved. Copra and coconut oil are the two major products of the coconut processing industry. Nearly 26% of the total production of nuts is utilized for food purposes and the rest goes for oil extraction.

In spite of the fact that our country has the necessary raw material to launch new product lines, minimal progress has taken place in the application of modern technology for full utilisation of various coconut products such as desiccated coconut and its powder, packed coconut milk, coconut cream, coconut milk powder, tender coconut water, vinegar, Nata-de-coco, etc.

Coconut Development Board, Kochi, have developed the required technologies for production of value-added food products from coconut, which have good commercial potential, both in domestic as well as export market. The Coconut-based food processing plant would be an integrated type delivering multiple products having great export potential.

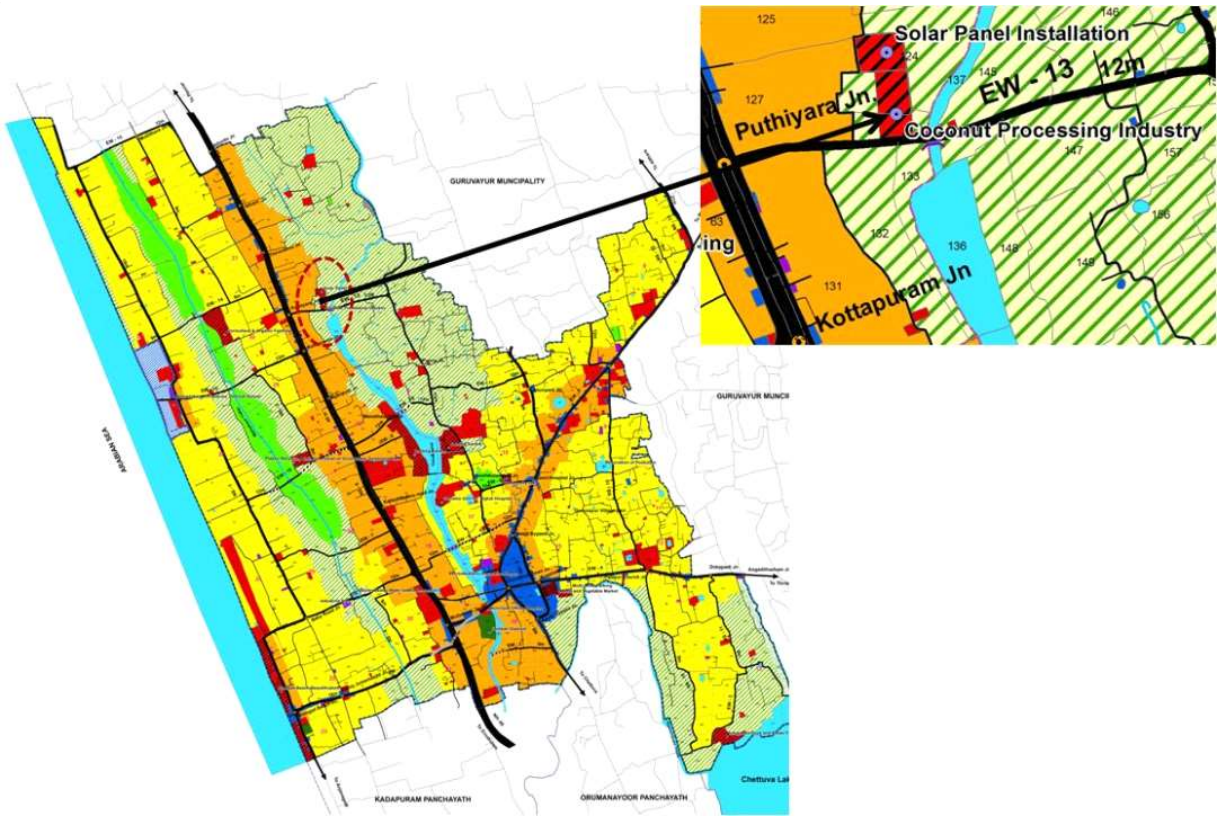


Fig 31.19 Location of proposed Coconut Processing industry

To handle the surplus produce, it is necessary to have sufficient facilities to make value added products based on this. For manufacturing products of coconut, an industrial unit is proposed at Puthiyara (ward no 3; Sy no 124 & 132) with an extent of area 0.468 Ha. Proposed location for coconut processing industry is shown in figure 31.19.

31.4.2 Industrial area near Pulichirakkettu

Chavakkad Town consists of two industrial estates, in which one is under Government sector and other is under private sector. It is essential that industrial sector should play a vital role to attain growth and economic sustainability. So it is decided to mark 0.204 Ha of land as industrial area near Pulichirakkettu. Proximity to the town, accessibility towards the proposed land and availability of land is the major factors for the selection of this land. The land can be used for industrial projects except hazardous industries. The land is located in the map as shown in figure 31.20.

31.4.3 Industrial area at Puthenkadappuram

In the case of fisheries sector various development proposals are suggested. Also value added products will have to be included to hold the surplus. Hence processing plants are to be erected. Also the waste generated out of this processes may be converted to manure/other value added products. For processing of fish and production of manure from fish waste, and it is proposed on the existing industrial estate at Puthenkadappuram.



Proposed Industrial land near Pulichirakkettu

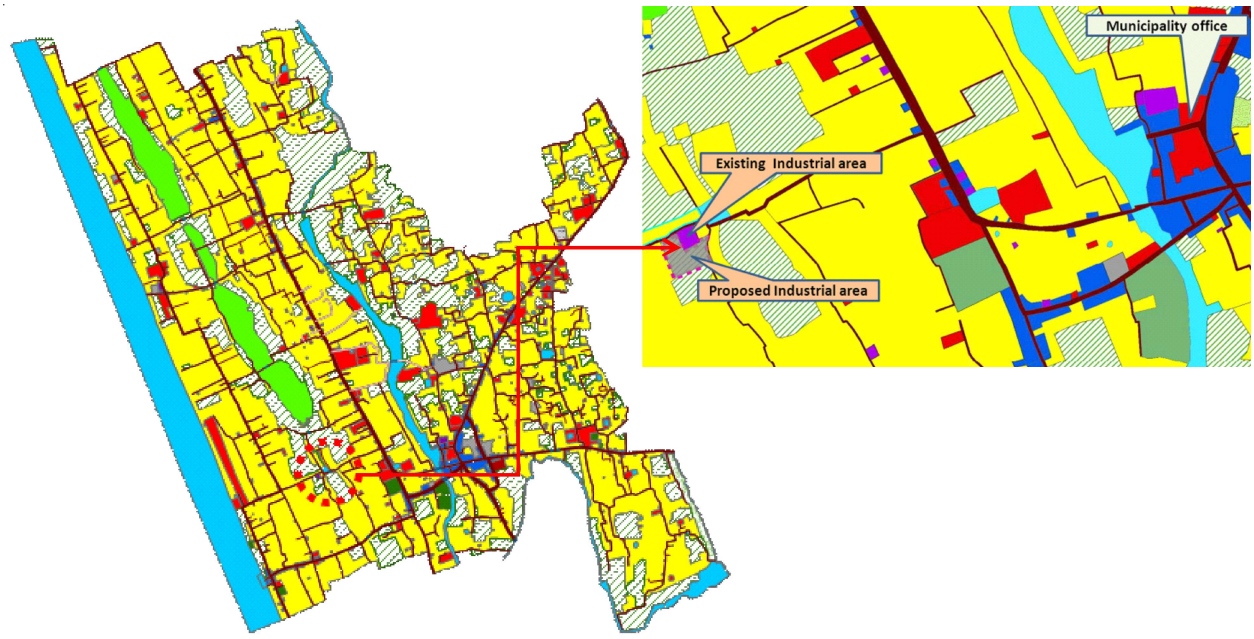


Fig 31.20 Map showing Proposed Industrial land near Pulichirakkettu

31.5. Trade & Commerce

Fish, Meat and Vegetable Market near Municipality bus stand

Absence of proper parking facilities, loading and unloading area are the major issues of existing Vegetable market near municipality building. Over crowding near vegetable market ends up in on street parking and traffic congestion. Fish and meat market near Vanchikkadavu also lacks facilities like parking, proper access etc. So a well-designed and modern equipped market complex for vegetables, meat and fish, is proposed near Municipality bus stand where

some portion of land is proposed for Multi level parking system. The area of total land available is 0.505 Ha, under private ownership. A separate entry to Market complex should be provided with adequate parking facilities. At present a 3.75 meter wide road is the access to this site, which is to be widened. Also an efficient solid waste/waste water management system is to be introduced in order to avoid hazardous situations.



Examples for Modern Market complex

31.6. Education

31.6.1. Upgradation of Fisheries Technical School

Even though existing educational facilities are capable to meet the needs for future, it lacks in technical education sector. There exists only one technical institution (Fisheries Technical School, Chavakkad) inTown. So this school is to be upgraded. Figure 31.21 shows the location of technical school.

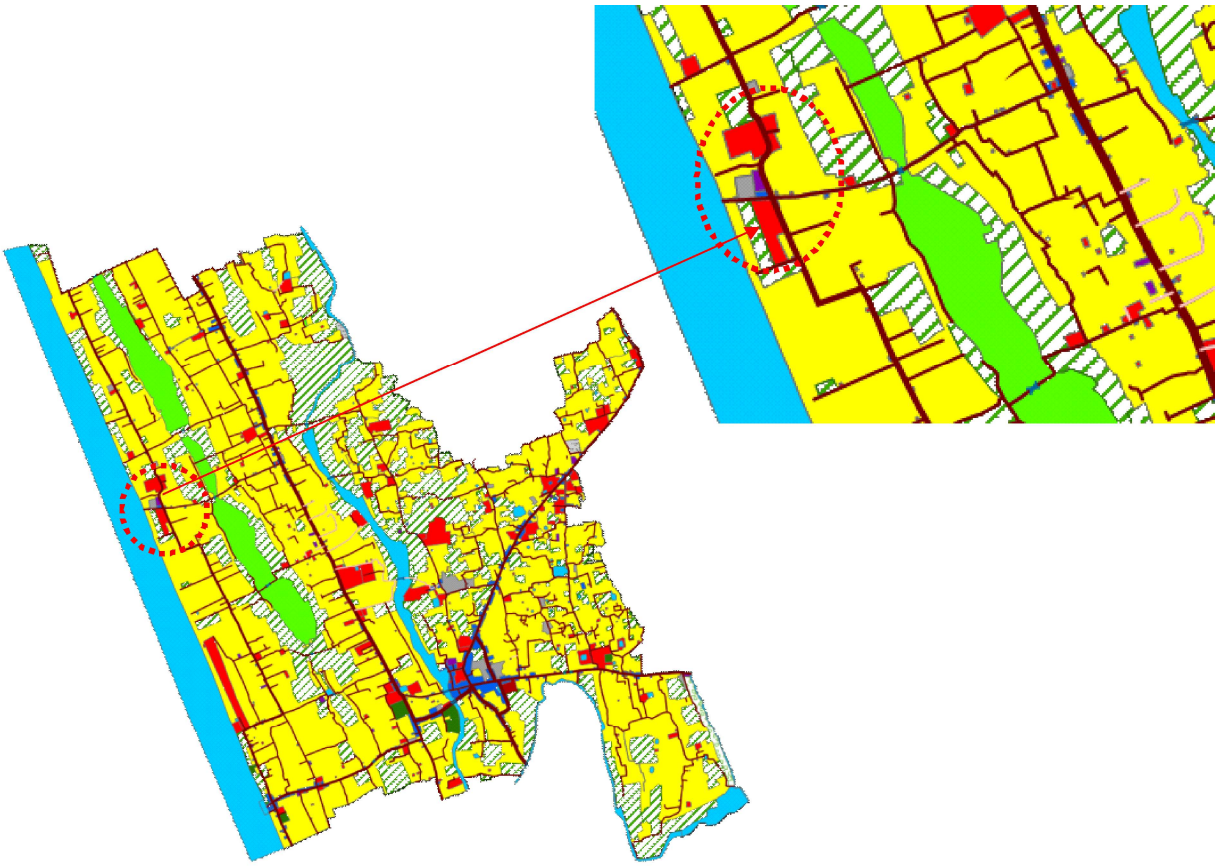


Fig 31.21 Map showing location for technical school

31.6.2. Renovation of Government Schools

It is proposed to incorporate laboratory, library, Playground, Smart class rooms, Internet labs Toilets and other infrastructural facilities in the existing government schools in Chavakkad municipal area. This can improve the quality of the educational institutions and can attract more students to these institutions.

31.7 Environment

31.7.1 Paddy lands to be retained

Paddy lands are being degraded to a large extent due to the land filling, conversion of the land for the cultivation of coconut, banana etc & commercialization of the plots. The paddy fields on the sides of Mathy kayal need to be conserved. The paddy land needs to be conserved for two reasons, one is that they form a part of economy and the other is that they form a vital part of environmental and ecological system of Chavakkad. They provide natural drainage paths for flood waters, conserve ground water, and are crucial for the preservation of a rich variety of

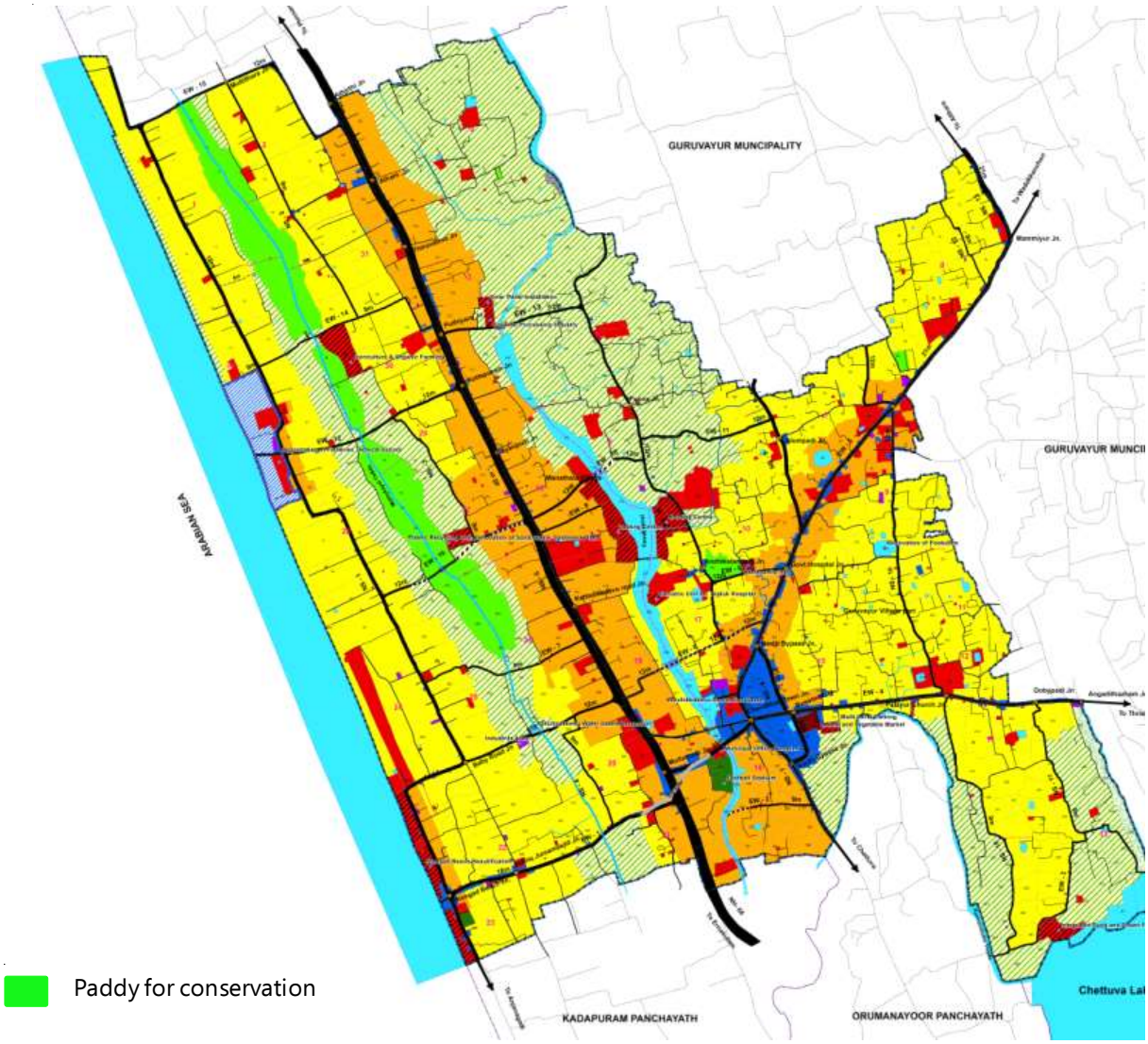


Fig 31.22 Suggested location for Conservation of Paddy

flora and fauna. A green belt has to be proposed around the Mathy kayal to avoid land filling and encroachments. It is observed that it is difficult to find workers at the time of transplanting and harvesting, operations for which timely availability of labour is crucial. Also the low level of profitability is another reason for the deviation from paddy cultivation. Group farming programmes such as the Padasekhara samitis – or the collectives of paddy farmers & Krishibhavans can help them to revive rice growing in Chavakkad. Krishibhavans distribute seeds and fertilizers to farmers at subsidised rates through Padasekhara samitis. Also mechanisation of paddy cultivation can help farmers to certain extend. Along with this all water courses and ponds are to be protected. Suggested locations to be brought under paddy conservation are as shown in figure 31.22.

31.7.2 Mangrove protection

Portion of the western edge of the town has to be delineated into eco- sensitive zone. Mangroves contribute to the overall health of the zone. This ecosystem traps and cycles various organic materials, chemicals and important nutrients .The roots act not only as physical traps but provide attachment surfaces for various organisms. Fresh water fish varieties in Chavakkad would become extinct without healthy mangrove forests. Suggested locations of areas for mangrove protection are as given in figure 31.23.

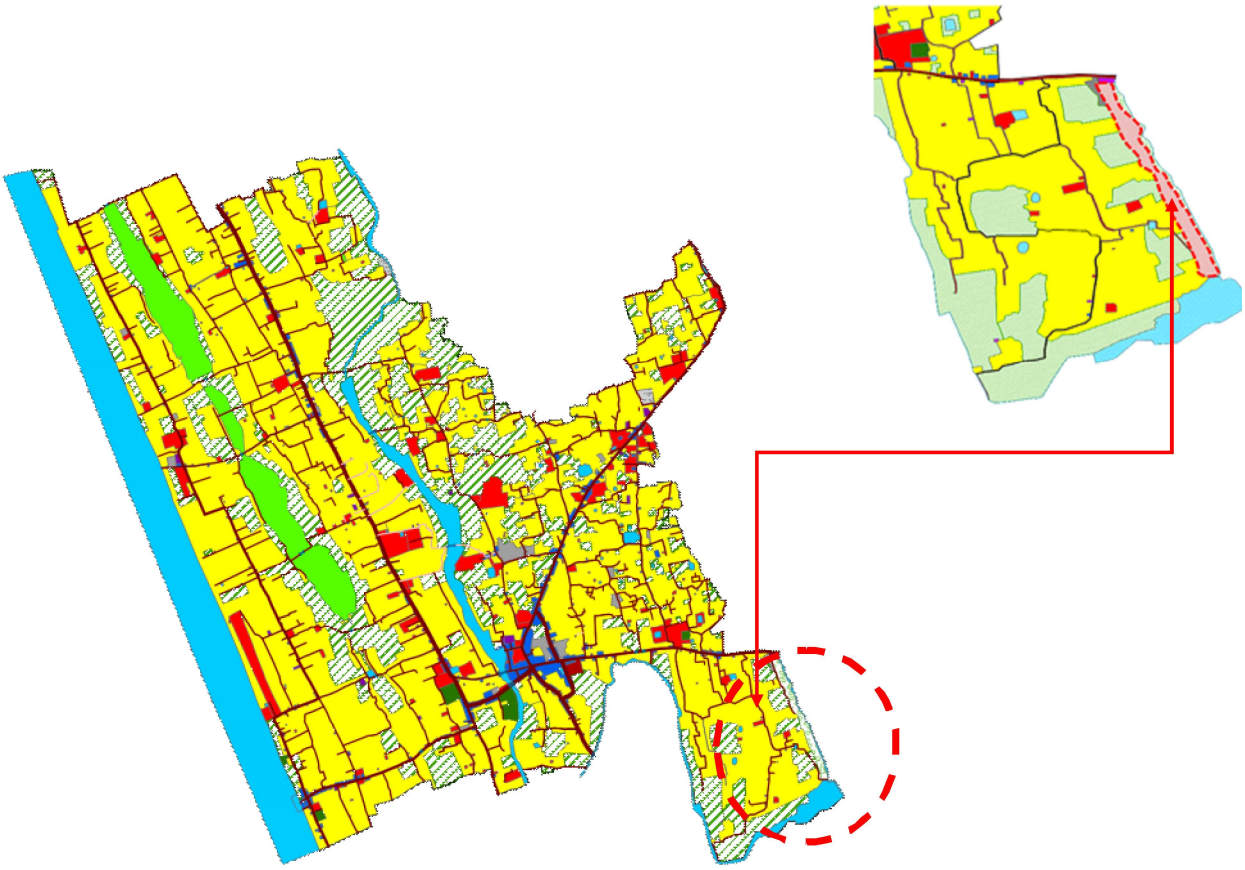


Fig 31.23 Locations of areas for mangrove protection

31.8. Energy

31.8.1 Provision of substations, Petrol pumps and LPG godown

Projected requirement shows that three, 11 KV substations and five petrol pumps are required to cater to the needs of population at the end of master plan period. Provisions should be made from concerned authorities.

31.8.2 Provision of underground electric cable

It is proposed to provide underground electric cables for town central area for following road stretches as shown in figure 31.24. From the Blangad beach road to the Dwaraka temple. This is to avoid the visual obstruction caused by the electric cables to the beachside.

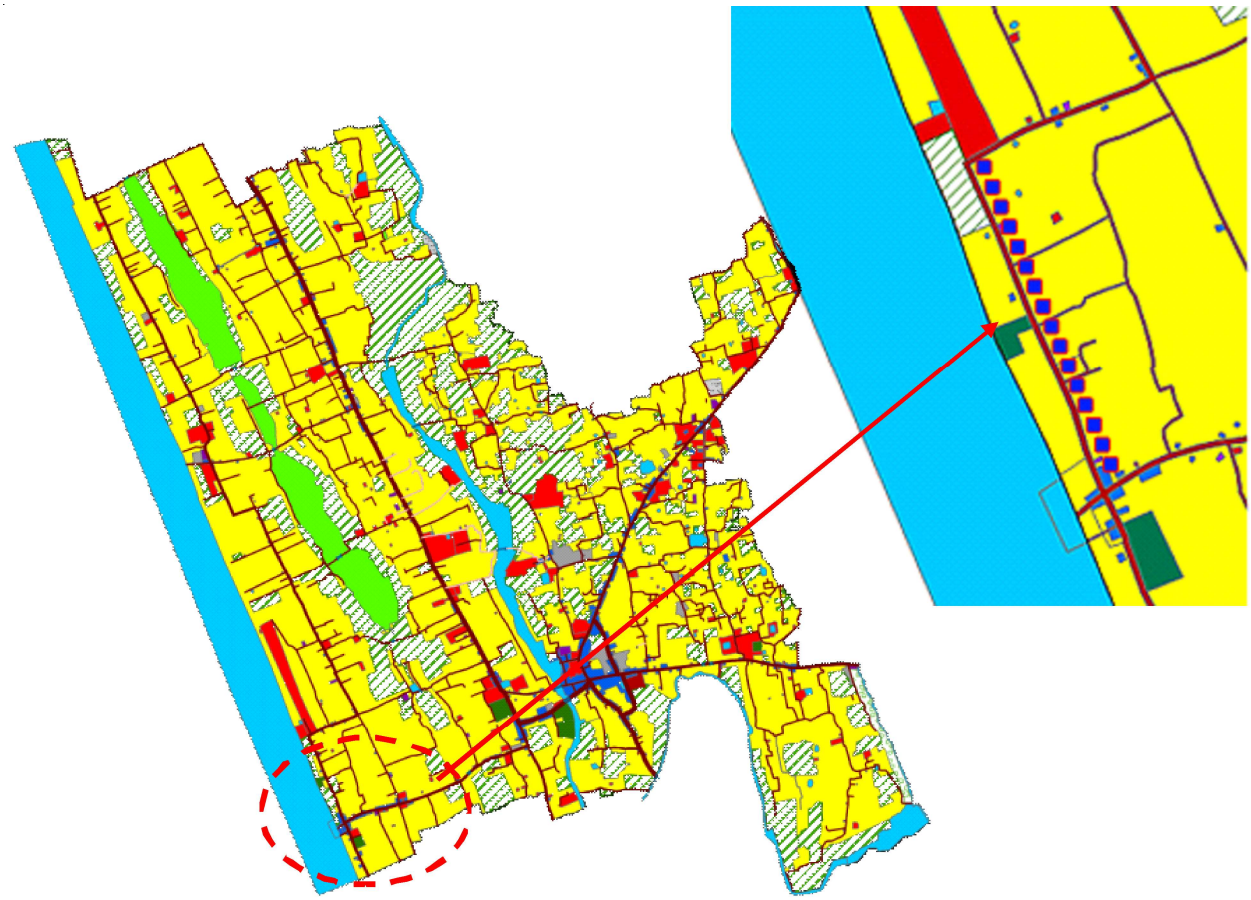


Fig 31.24 Suggested location for underground electric cable

31.8.3 Provision of solar panels

Use of solar panels can reduce the excessive dependency on conventional power systems. Here also a policy decision is required from Municipality authorities to promote the use of solar panels in new buildings in both public and private sector.

It can be done two ways -

1 At building level – As a pioneer programme it has to be implemented for all public building

2 Solar panels in open area – A solar pool consist with a number of solar panels can be arranged in open areas for the generation of power. The master plan envisages generating power for the proposal coconut industry from this source

A site near puthiyara Junction has been proposed for the production of electicity for proposed coconut industry.The proposed site has an area about 0.3723 Ha. From this nearly 3200KW of power can be generated per day.The power generated can be utilised for coconut industry and if excess of electricity is produced can be supplied to KSEB board.



Solar panel on roof top



Solar panel on open area

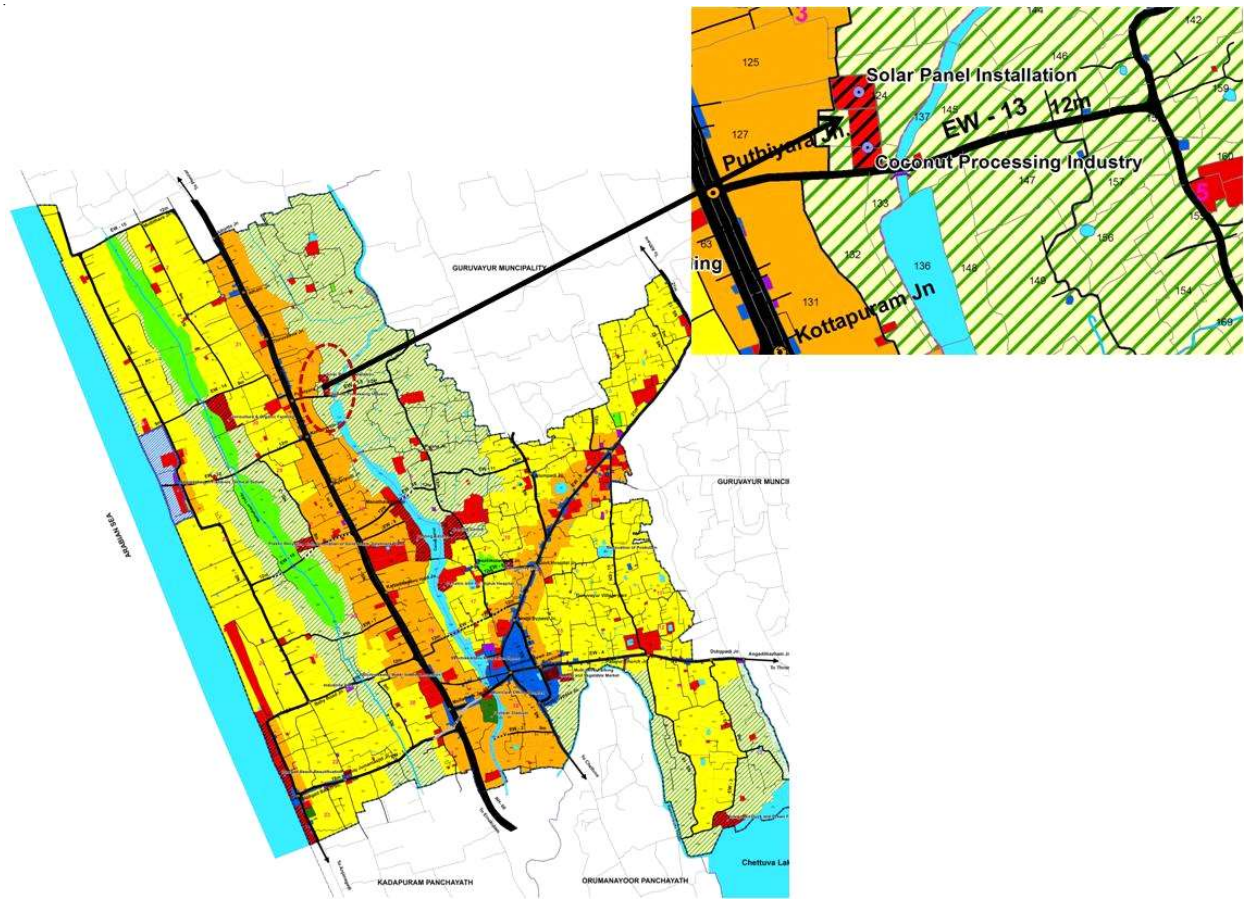


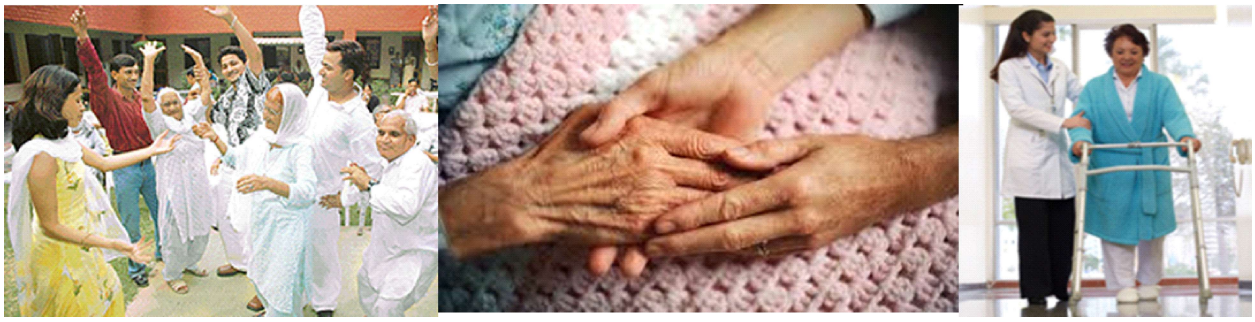
Fig 31.25 Suggested location for provision of solar panels

31.9. Health

Geriatric Unit for Taluk Hospital

It was found in the analysis that the health care facilities are not properly distributed. Hence it is proposed to set up a Geriatric section in Taluk hospital at Chavakkad and suggested location is as in figure 31.26.

Geriatrics is a speciality that focuses on health care of elderly people. It aims to promote health by Preventive and treating diseases and disabilities in older adults . Geriatric care center addresses the complex needs of older people, focusing on health promotion and the prevention, treatment of diseases and disabilities in the elderly people.



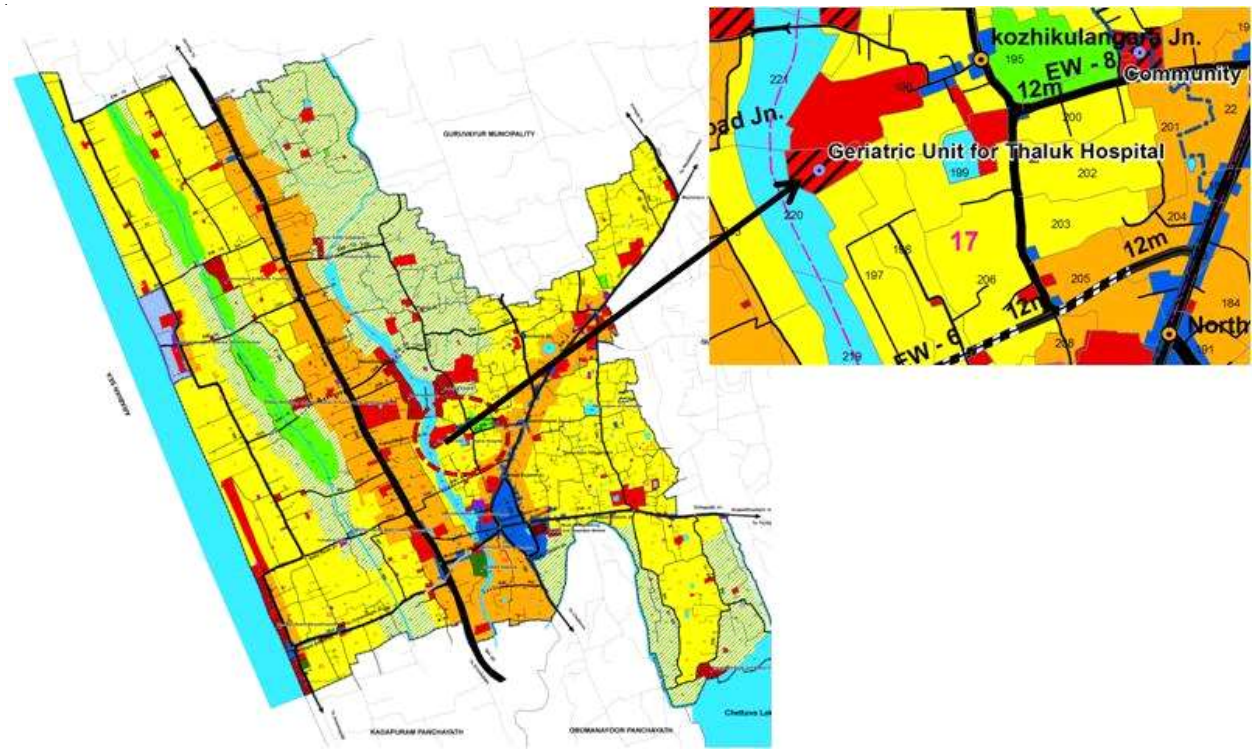


Fig 31.26 Suggested location of geriatric section in Taluk hospital

31.10. Sanitation

31.10.1 Drainage net work proposals

Every city should be '' ZERO RUN OFF '' Drainage for the healthy living conditions. From the above studies and available amenities of the town, a drainage net work has been proposed for the town which are envisaged as below.

31.10.1.1 Improving the existing drainage network

The primary drain of the network are Canoli canal which passing north south of the town, and flowing from north to south and finally enter to Chettuva lake and discharge water to Chettuva lake which is located outside the town boundary. Ultimately, the lake discharges water to Arabian sea through river mouth at Munakkakadavu.

The secondary drains are Mathy kayal drain and Kannam kuthy thodu. Mathy kayal is a paddy land there by it is low a level area. Both drains receives the run off from different small drains and road side drains, and discharge in to Canoli canal at the confluence point located outside the town boundary.

The surface water from the road way is to be collected and then disposed off. The water is first collected in longitudinal drains, generally in road side drains and the water is disposed off to the nearest stream , valley or water course. Cross drainage structures like culverts and small bridge may be necessary for the movement of water from the road side drains.

Primary drains

The primary drainage network of Chavakkad town is Canoli canal which eventually discharge the town's storm water into Arabian Sea. Thus the entire storm water discharge from the Chavakkad town goes to Arabian Sea. Lengths of primary drains constituted in town are 4.96 km.

Secondary drains

The secondary drains are Mathy kayal thodu and Kannamkuthy thodu. These essentially drain water from different areas of the town into primary drains, water bodies and low-lying fields in the outskirts of the town. The secondary drains are lined with masonry, exhibiting poor condition due to inadequate maintenance and repairs.

The general gradient of the secondary drains is adequate, facilitating drainage of storm water in to the primary drains and water bodies. Lengths of primary drains constituted in town are 6.25 km.

Tertiary drains (Distributory drains)

All other natural drains which carry storm water to primary and secondary are considered as tertiary drains or distributory drains. Lengths of tertiary drains constituted in town are 4.87 km. These drains are also receives surface water from the road side drains and discharge in to primary or secondary drains.

31.10.1..2 Road side drains

Road side drains collects surface water from the road surface and it is diverted towards the closest drains.

In addition to storm water discharge these drains are also being used to discharge sullage and septic tank overflows. Most of the drains are open and are choked with silt and garbage.The figure 31.27 shows the conceptual drainage network.

31.10.1.3 Suggestions

- The primary drains Retaining wall and concrete bed will be provided. Desilting will be carried out.
- The secondary drains will be constructed / upgraded to maintain discharge in the primary drains.
- Tertiary drains will be constructed / upgraded to maintain discharge in the primary or secondary drains.
- Road side drains will be provided to all roads as far as possible.
- New storm water drain will be constructed in the flood-affected area of the town
- Master plan for storm water drain network will be prepared.
- Cross drainage works will be constructed at necessary road crossing locations.
- Continuity of road side drain will be assured.
- Mandatory rain water harvesting at micro level to be done.
- Tile paving of open spaces to be restricted.
- Provide road side greens as it should become storm water filters.

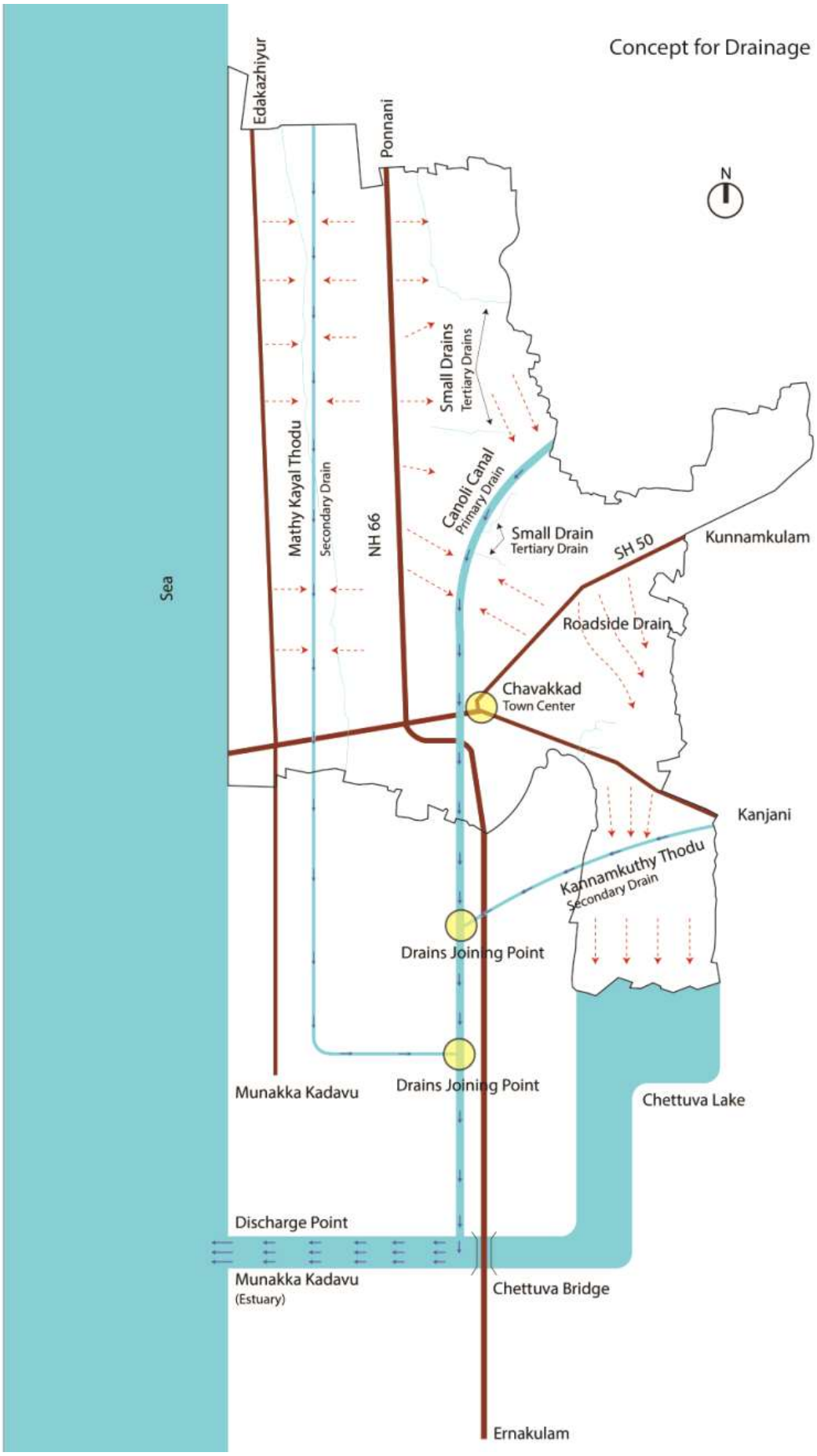


Fig 31.27 Conceptual drainage network

31.10.2 Waste treatment Plant

Now a manually operating solid waste unit is used to treat the solid waste. Chavakkad town lacks a modern and scientific solid waste treatment unit. The existing system will become insufficient in near future itself since the solid waste production is increasing at an alarming rate. So a modern solid waste treatment unit is proposed near trenching ground.

In household level techniques such as Pipe composting /bio gas plants may be used.



Solid waste treatment unit



Plastic Recycling unit

A well-planned collection system is required for effective treatment of solid waste. A collection centre for each ward which works for a definite period of time in each day is also proposed. From this decentralized centres waste is collected by municipal agency. Along with this regular collection from households by Kudumbasree agencies which is now undergoing can be continued. Also a strict invigilation is required from concerned authorities to stop the dumping of waste in streets.

31.10.3 Plastic recycling unit.

Treatment of plastic waste is a special concern which requires a scientific approach. In modern science, solutions are available for effective treatment of plastic waste. Most of the methods are based on plastic recycling programmes.

Used plastic can be converted to other forms which itself is a valuable product. So such a plastic recycling system is proposed near to trenching ground. The land adjacent to trenching ground may be attached for these projects and is about 0.85 Ha.

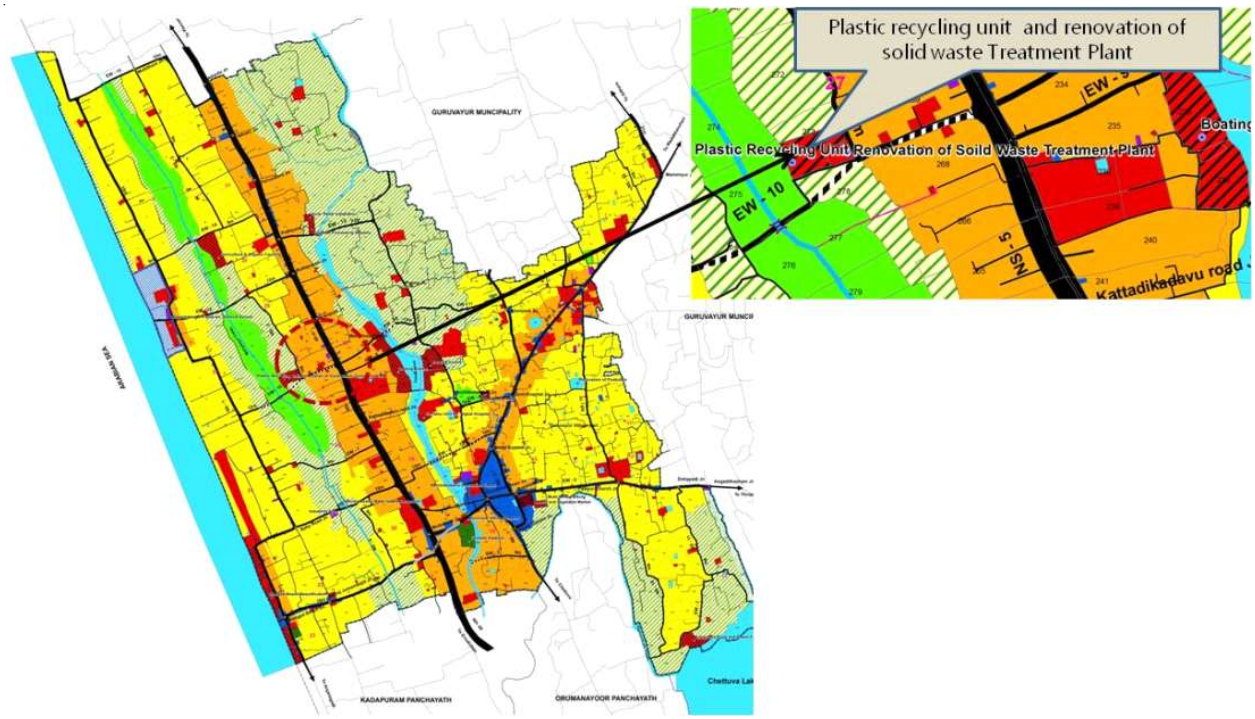


Fig 31.28 Map showing location of proposed Solid waste treatment unit& Plastic recycling unit

A buffer zone consisting of with special type of vegetation which absorb odour can be provided around the treatment unit. These buffers ensure residential and other sensitive land uses located close to treatment unit or where people may be exposed to unpleasant odours a pollution free atmosphere. This also acts as an aesthetical cover to the plant. Figure 31.28 Map showing location of proposed Solid waste treatment unit & Plastic recycling unit.

31.10.4 Comfort station/E-toilet facilities

Comfort stations/ E-toilet facilities are proposed at major locations like civil station, Private bus stand, Govt.Hospital. This can also be provided near parks, beach area etc.

31.11 Water Supply

31.11.1. Water Supply Scheme

Presently there exists shortage of about 2 MLD of water after the completion of currently undergoing UIDSSMT (13 MLD) scheme the present water scarcity can be completely solved.

31.11.2. Rainwater harvesting and recharging Techniques

Rainwater harvesting techniques are to be implemented in existing buildings. Also measures are to be taken to ensure that mandatory rules regarding rain water harvesting is implemented in the prescribed manner.

Besides this ground water recharging techniques such as rain water pits, checking of water flow etc are to be promoted.

31.12. Agriculture

Existing land use 2013 shows that nearly 26.40 % of the total land belongs to dry and wet agricultural area. But now due to several reasons agricultural activities shows a decline in production rate. So a policy level decision has to be made to restore this sector which can provide job opportunities and to attain a minimum level of self sufficiency. Figure 31.29 shows agricultural area.

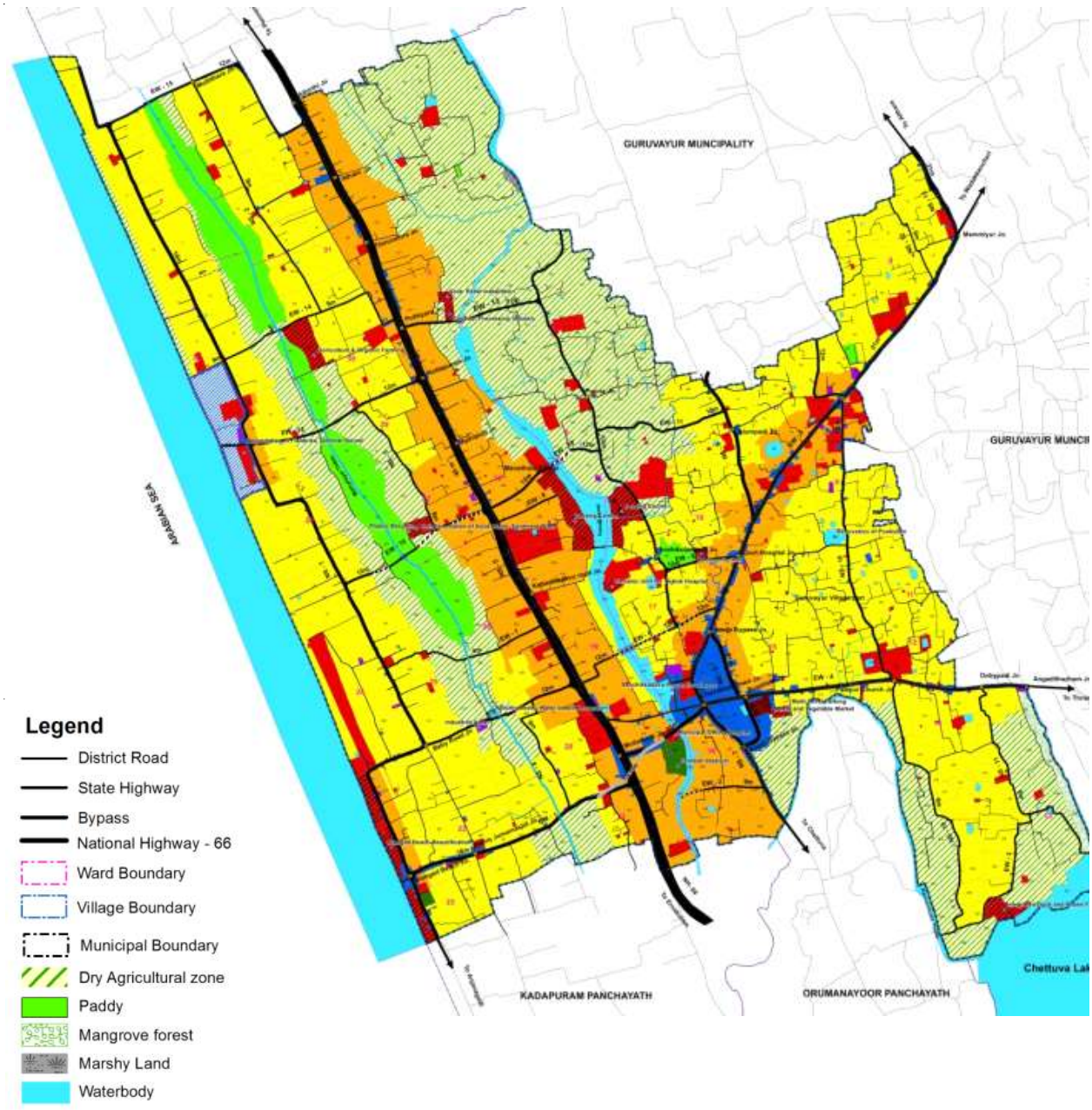


Fig 31.29 Map showing Agricultural area

31.12.1. Organic Farming and Floriculture

Organic Farming

Integrated District Development Plan mentioned that 'The ultimate aim is to make the district the first organic district of the country'. To achieve this, care should be given to ensure availability of the product, need for the product in the market, maximum price for farmer etc. Chavakkad Town has a specific role in the growth of agriculture sector in the district. Availability of adequate infrastructure facilities & land with favourable soil conditions are the two basic components which makes Chavakkad best suitable for this sector.

Organic farming has much scope in the present scenario, where people have become more conscious about the importance of the same. Consideration should be given to ensure market for the produces. Here we can utilise the potential of Guruvayur as a Pilgrim centre. There are more than 130 lodges / tourist homes and nearly 100 wedding halls / dining halls and nearly 200 restaurants functioning within 500 mts distance from temple. At present the demand is fulfilled by the vegetables from Tamilnadu which is excessively contaminated with pesticides. This situation can be avoided if adequate amount of organic vegetables are made available in the market. Food and safety department, Health department and Hotel & Restaurant owners associations should integrate together to form a common platform to make non contaminated organic vegetables available.

- Various techniques which may be adopted:-

  - Branding of the product (Kanjikkuzhi model, Kanjikkuzhi Grama panchayat, Alappuzha)
  - I.D. card for farmers
  - Online marketing (To avoid third party & to ensure maximum price for farmers)
  - Organic farms in school according to availability of land, type of soil etc.
  - Special menu for organic foods in each restaurant
  - Roof top farming in urban areas

- Integartion with LSGI's Kerala agricultural university & other research insititue, I.T department, Eductaion Department,Health Deoartment, Hotel & restaurant owners association etc

Floriculture

Floriculture is the cultivation of flowers or flowering plants, especially of decorative flowering plants, usually on a commercial scale.Floriculture create employment for the locally people to some extent.The development, via plant breeding, of new varieties is a major occupation of

floriculturists. Proximity to Guruvayoor temple should be increases the scope of this cultivation.The flowers suitable for the coastal area are Jasmine, Sunflower and Marigold.

Both the organic farming and floriculture is proposed near Puthenkadappuram .The existing land use of the proposed site is dry agriculture area .Figure 31.30 shows the location of Floriculture and organic farming, It has a area about 2.89 Ha .



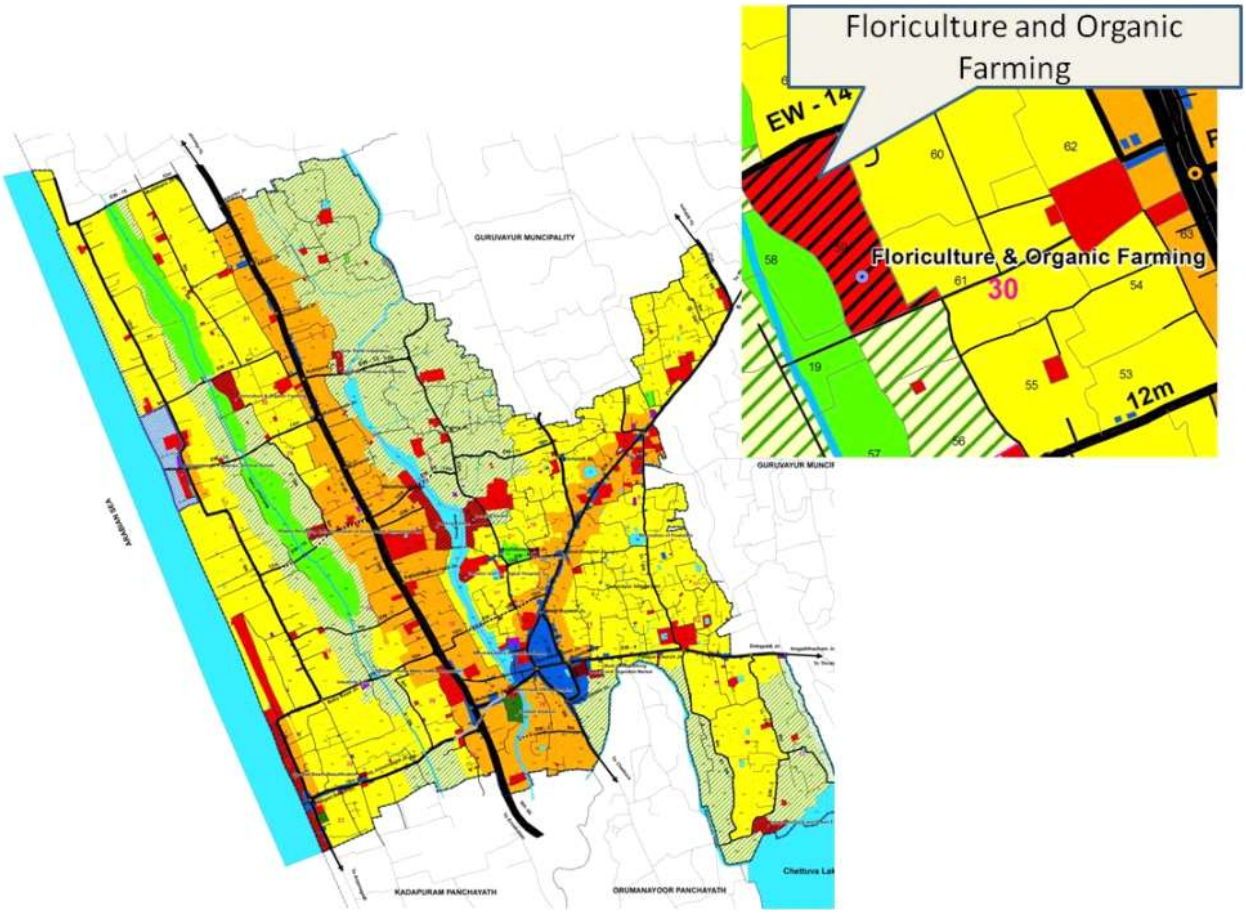


Fig 31.30 Suggested locations for floriculture and Organic Framing

31.12.3 Improvement of Mechanisation for paddy cultivation

To increase the productivity of paddy cultivation in active paddy fields, it is proposed to improve mechanisation and formulate a committee for proper maintenance of these equipments, in co-operation with Padasekhara Samithi's. This Committee can arrange for training to farmers as well.

31.13. Irrigation

Upgradation of ponds

About 40-50 ponds exist in the municipal area under different ownerships. It is proposed to take measures to beautify the Pookulam public pond by the Government under the scheme "JALASREE". Components of the proposal include retaining wall, paved walkway, handrails etc. Location of Pookulam pond is shown in fig 31.31.

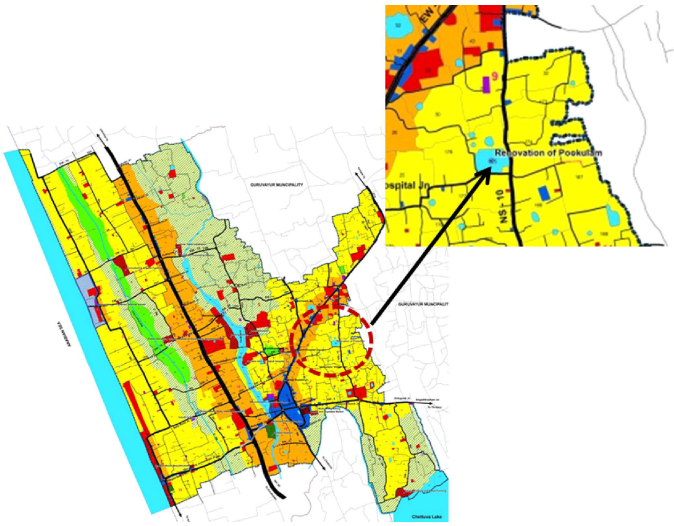


Fig 31.31 Location of Pookulam pond



Pookulam - existing condition

31.14. Animal Husbandry

Chavakkad should increase the production of meat, egg and milk to meet the needs of the projected population. Study shows that milk production should be increased twice the quantity available at present and this can be achieved by two methods.

1. Individual activities.

2. Self Help Group activities.

31.14.1 Integrated Duck and Prawn Farming Proposal

Ducks improves the fertility of the pond by their droppings. Ducks keep water plants in check. They loosen the pond bottom with their dabbling and help in the release of nutrients from the soil, which increase pond productivity. Also aerate the water while swimming; thus, they have been called biological aerators. It is proposed at Chakkankandam about an area of 1.76 Ha. Location for integrated duck and prawn farming is as shown in figure 31.32.

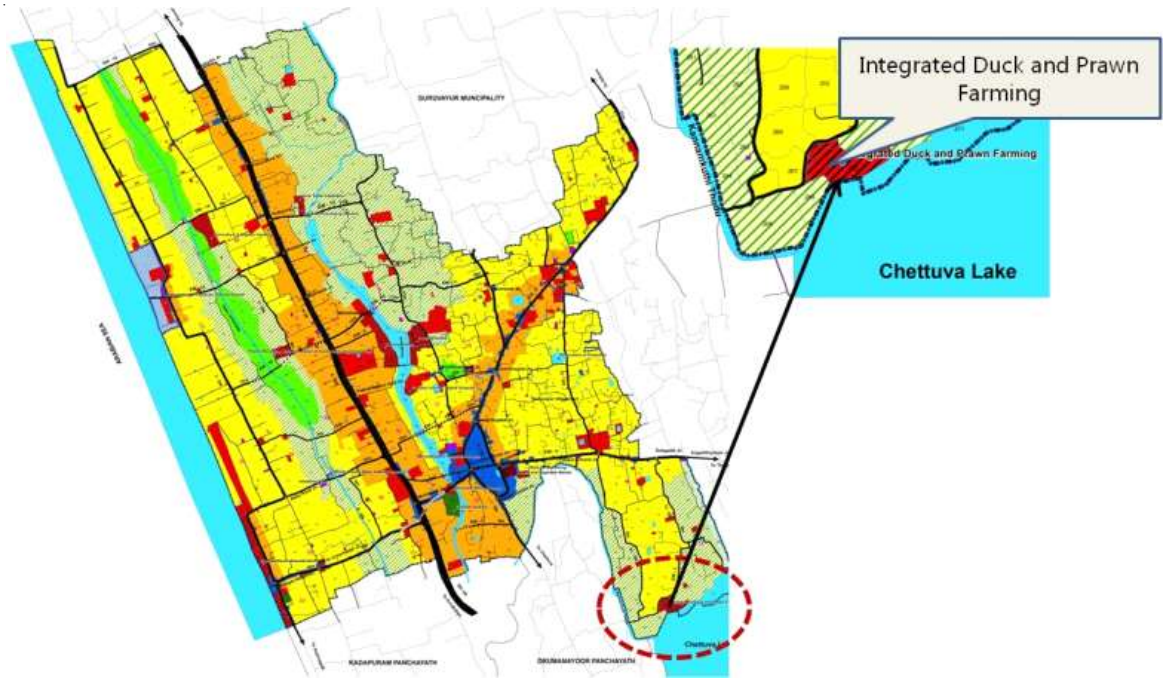


Fig 31.32 Proposed sites for Integrated Duck and Prawn farming

31.15. Other Infrastructure Facilities

31.15.1. Multi-Level Parking System

From studies it is clear that the efficient usage of available roads is very much reduced which is mainly due to on street parking of vehicles along road sides. This problem is severe in areas like Municipal building area and Municipal bus stand area. Introduction of parking facilities and systems can reduce the problem of on street car parking and thus increase the efficient usage of available road width. So a multi-level car parking with a Fish, meat & vegetable market complex is proposed in a plot near Chavakkad Municipal bus stand of area 0.505 Ha.

The proposed market complex near to bus stand area can also share the facilities and location of multi levelparking is as shown in figure 31.33.

A multi-storey car park (also called a parking garage, parking structure) is a building/ structure designed for car parking and where there are a number of floors or levels on which parking takes place. It is essentially a stacked car park.

Multi-level parking system is of two types, one is conventional vertical parking (using ramp) system and other is fully automatic operating system.

The advantages of multilevel parking system are: -

- Maximum utilization of ground space
- Quick entry and exit due to the independent operation of lifts

- Designed for driver convenience & governed by computers
- Safety guaranteed for cars
- Require less building volume



Conventional type Multi-level parking unit parking



Multi-level parking unit with automatic parking system

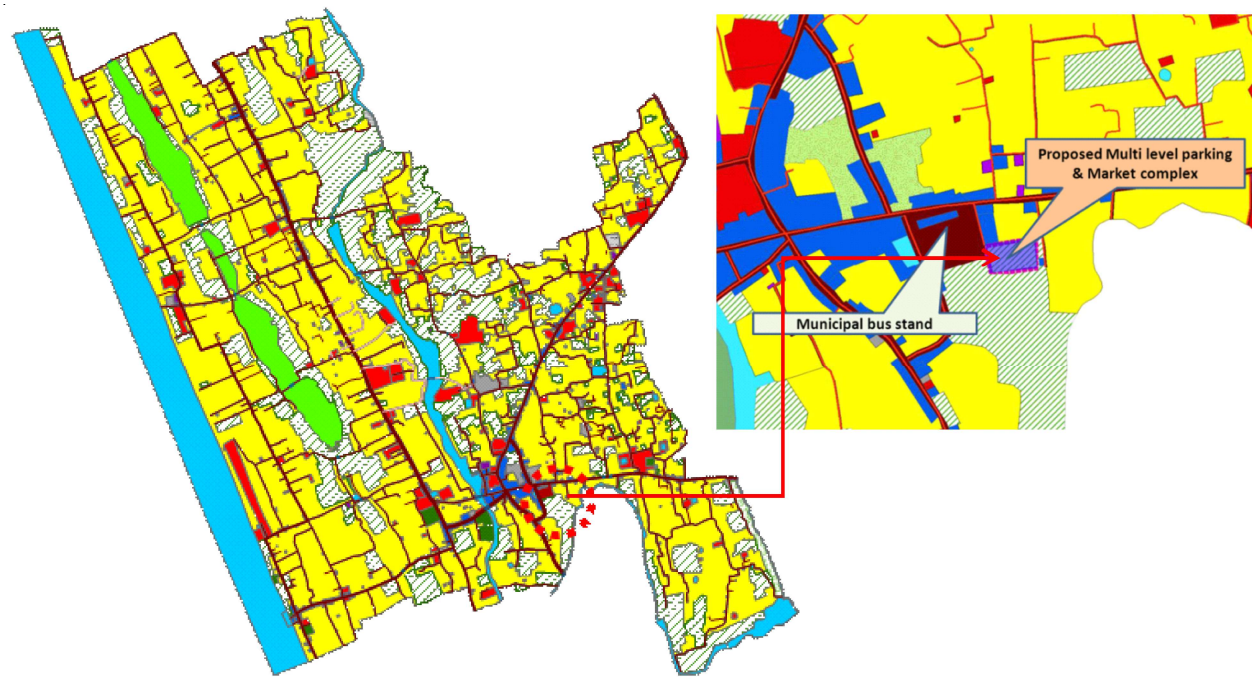


Fig 31.33 Map showing land for proposed multi-level parking unit and market complex

31.15.2. Community Hall near Kozhikkulangara Temple

Chavakkad Town has four community halls, in which three of them belong to private sector. There exit only one community hall in the ownership of Chavakkad Municipality (Municipality hall) which is small in size. So it is proposed to construct community hall with all amenities and parking facilities in land available (with an extent of .375Ha) near Kozhikkulangara

temple and is as shown in figure 31.34. 12 m. wide proposed road near to this land will also increase the potential of this area. The land is a private property and is to be acquired.

Community hall should be designed with multi-purpose functionality, which can be used for gathering functions such as meetings, marriage and also for exhibition purpose. This can play a vital role in income of town.

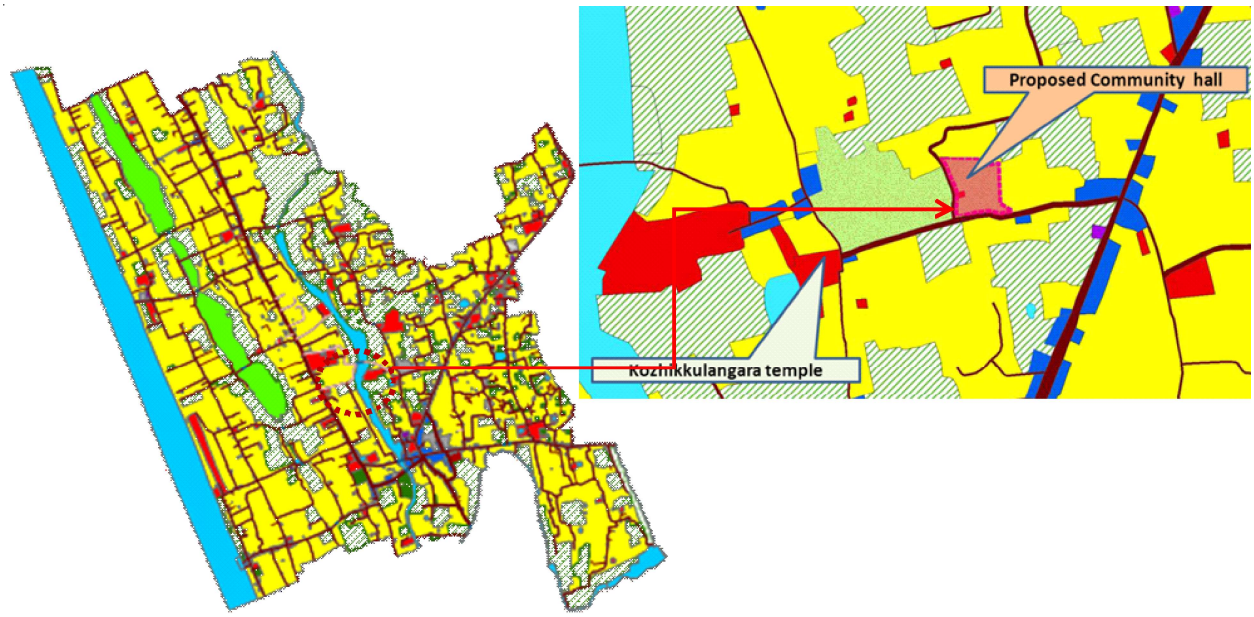


Fig 31.34 Map showing location of proposed community hall

31.15.3. Municipal building near Mini civil station

Existing Municipality building lacks adequate facilities. To accommodate more requirements either existing building has to be extended or a new one to be envisaged. Since existing building has no scope for extension due to shortage of land, a new municipal building is proposed in the municipal land opposite to mini civil station with an extend of 0.242 Ha. All amenities such as parking, council halls, chambers etc. should be incorporated in the new building. Private land adjacent to the proposed municipal building may be acquired in future.

31.15.4. Renovation of stadium

Chavakkad is famous for its love for football. Several football tournaments in different formats are held in Chavakkad and its premises throughout the year. So a Football stadium with gallery facilities is an ambitious project in the sports sector. At present all the matches are held in Chavakkad Municipal ground opposite to Mini civil station. Land has been identified within the same compound of proposed municipal building.An extent of 1.94 Ha can be converted to a football stadium with sufficient parking area.Proximity towards Canoli canal is an attractive

element of this area. Proposed boating service starting from Punna can have an access point from Stadium ground. Pedestrian walkways, seating areas, lamp posts, snack counters etc. may be added to impart a lively character to the spot. Location and conceptual rendering of football stadium is shown in fig 31.35 and 31.36 respectively. A Commercial complex may also be envisaged along with the Stadium.

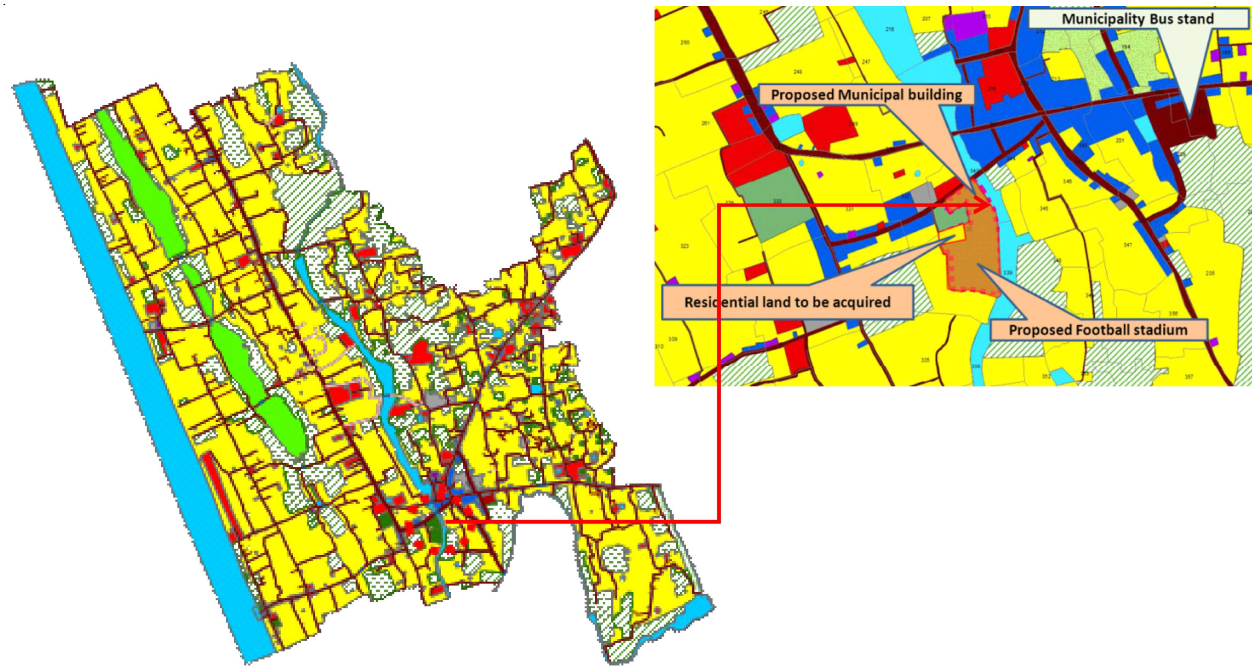


Fig 31.35 Location of proposed municipal building and football Stadium



Fig 31.36 Conceptual rendering of football Stadium

CHAPTER 32

ZONING REGULATIONS

1. The implementation and enforcement of the Master Plan shall be in conformity with development control regulations prescribed hereunder. These regulations shall guide decisions on the granting or rejecting of applications for land development and buildings.

2. All future constructions and developments with in the plan area shall also conform to the Kerala Municipality Building Rules in force, if not otherwise specified in these regulations, Kerala conservation of Paddy land and Wet land Act,2008 and any other legislation applicable to the planning area.

For the implementation and enforcement of the proposals envisaged in this Master Plan, areas have been zoned under various categories such as High density Residential Zone, Low density residential Zone, Residential Mix use Zone, Commercial use Zone, Small Industrial Zone, Public and Semi-Public use Zone,Transportation use Zone, Parks and Open Spaces, Paddy Land, Water Bodies, Mangroves, Marshy Land, Special use Zone – Fisheries, Special Zones etc. Details regarding the nature of uses 'Permitted', uses 'Restricted' and uses 'Prohibited' in each zone are given in the accompanying sheets. These regulations shall be enforced in conjunction with other specific provisions if any mentioned elsewhere in the Plan.

Uses **'Permitted'** in a zone cover the uses that can be normally accommodated in the relevant zone. Such uses may be permitted by the Secretary, *Chavakkad Municipality* hereinafter referred to as Secretary.

Restricted Uses : In some cases it may be possible to permit some other uses also, which are not likely to affect the quality and environment in a zone specified for a particular use. Such cases have to be individually studied based on their performance characteristics and special location factors. Such cases which come under this category are classified as "Uses Restricted".

Uses **Restricted -1** Category deals with the uses that shall be restricted by the Secretary with the concurrence of the Town Planner of the District office of the Department of LSGD Planning having jurisdiction over the area.

Uses **Restricted -2** Category deals with the uses that shall be restricted by the Secretary with the concurrence of the Chief Town Planner concerned of the Department of LSGD Planning.

Used prohibited" enlists the various objectionable uses in each zone which shall not be permitted under normal circumstances. All other uses other than permitted and restricted are Prohibited uses.

3. If any space in a zone is put to a "**Use Prohibited**" as stated in Para 2, before the sanctioning of the scheme, such use shall be termed as non-conforming use. A non-conforming use may be allowed to continue in its existing location and essential repairs and maintenance for the structure may be permitted by the Secretary, provided that the said use create no adverse environmental influence in the zone. Addition, alteration or reconstruction, if found necessary as part of any mitigation measures may be permitted for such uses by the Secretary with the concurrence of the Chief Town Planner concerned.

4. Zoning regulations are not to prohibit existing uses that have been lawfully established prior to the enforcement of these regulations, unless otherwise specifically mentioned in this Plan. All such existing uses in every zone shall be permitted to continue.

5. Existing areas and structures of archaeological importance, agriculture uses and religious uses may be permitted to continue in all the zones and shall not constitute non-conforming uses

6. Regulation of constructions and/or land developments on the sides of new roads/roads proposed for widening as per the Plan shall be governed by the distance from the centreline of the road, unless otherwise specified in the Plan or in any detailed road alignment approved by the Chief Town Planner concerned.

7. The proposals in this plan for the formation of NH-66 will henceforth be applicable to the present aligment of the NH-66 formed. For those stretches where NH had been formed in deviation to the aligment proposed in the Plan, reservation of land for the formation of NH-66 with 45m width is here by dispensed with and henceforth use regulations as per Residential Mix use Zone regulations.

8. Constructions and/or land developments, if any, in paddy lands and in wet lands, shall be in conformity with the Paddy land and Wet Land Act in force in the state.

9. In Coastal Regulation Zones all developments are to be made in accordance with CRZ laws prevailing.

10. Silent Zone' as precribed by the Noise Pollution (Regulation and Control) Rules, 2000 under the Environment Protection Act,1986 and its subsequent amendments, shall be applicable to the area under this Plan.

11. The Government shall have the power to issue clarifications, if any doubt or any unforseen situations that may arise in the technical interpretation / implementation of the provisions of the Proposed Land Use and Zoning Regulations, required in any of the provisions in this Plan in consultation with the Chief Town Planner concerned.

12. Any use not specified either in the 'uses permitted' or 'uses restricted' category of a particular use zone, but which is of a similar nature to any use permitted or restricted in that particular use zone, can be considered by the Secretary, with the concurrence of the Chief Town Planner concerned.

Table 32.1 ZONING REGULATIONS

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
13	**High density Residential use Zone**			
13.1	Residential buildings consisting of single or multifamily dwellings, residential flats / apartments, residential quarters, night shelters, orphanages, old age homes.	Ashram, Mutt, Madrasa.	Vehicle Fuel Filling Stations	Any other uses not specified
	Shops, Professional Offices, Commercial Offices, Banks & other Financial Institutions, Restaurants, Canteen, Hotels - floor area **limited to 300 m^2.**	Places of Worship.		

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
	Cottage Industries including coir, Service Industries of non-nuisance Nature (See Annexe-I), with number of workers limited to 6 without power or 3 workers with power limited to 5 HP	Public utility areas and Public Utility buildings other than those included in the permitted category.	Cremation Ground/Crematorium, Burial Ground/ Common Vault.	
	Educational institutions essentially serving the needs of residential community such as Day Care, Crèche, Nursery Schools, Kindergartens and schools offering general education (up to High school level).			
	Health institutions essentially serving the needs of residential community such as dispensaries, clinics (Out Patient), Diagnostic Centres etc having a floor area **limited to 200m^2**.			
	Community facilities such as Community Halls, Recreational Clubs, Social Welfare Centres, Gymnasium /Yoga Centers, Swimming Pool, Libraries etc. having a floor area **limited to 200m^2.**			

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
	Utility Installations and Civic Amenities essentially serving the needs of residential community such as post office, police station, telephone exchange, fire station, tot lots, parks, play grounds, water treatment plants below 5 MLD.			
	Transmission Towers, Telecommunication Towers and Wireless Stations			
	Plant Nurseries, Pump House			
	Wells and Irrigation Ponds incidental to community needs.			
13.2	**Provided that the access road has a width of 5m minimum.**			
	Automobile workshops for two/ three wheelers – floor area **limited to 200 m^2.**			
13.3	**Provided that the access road has a width of 8m minimum.**			
	Hospitals with 10 beds,	LPG distribution centres (excluding bottling plants and bulk storage) limiting the floor area limited to 50 m2.		
	Higher Secondary Schools.			
	Convention Centres/ Auditorium/ Wedding Halls/ Community halls/Exhibition Centers and Art Gallery-floor area limited to 500 m2.			
	Shops/Professional Offices, banking and financial institutions – floor area limited to 500 m2.			
13.4	**Provided that the access road has a width of 12m minimum.**			
	Hospitals with 50 beds,			

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
14	**Low density Residential use Zone**			
14	Residential buildings consisting of single or multifamily dwellings, residential flats / apartments, residential quarters, night shelters, orphanages, old age homes,all below a height of 16m.	Cremation ground / crematorium, burial ground, common vault	Storage of explosive and fireworks, Gas Godowns, Dumping Yard	Any other uses not specified
	Agriculture, horticulture and fodder cultivation, pastures, grazing ground, and other types of cultivation including social forestry.	.		
	Dairy Farms, Fish farms, Seed farms, Poultry farms, Plant nursery, pump house, wells and irrigation ponds.			
	Dharmasala, ashrams, mutts, madrasa.			
	Clinics(Outpatient) and diagnostic centres - floor area limited to **100 m^2.**	Slaughter Houses.		
	Shops, professional offices, commercial offices and establishments, banking and financial institutions, Gymnasium, Yoga Centres, restaurants, canteens – floor area limited to 200 m2.			

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
	Police Post/Police Station, Post and Telegraph office, Fire Post / Fire station, Telephone Exchange, wireless stations and Telecommunication towers.			
	Day Care and Creche, Nursery / Kinder Garten / Primary & Upper primary schools.Library and Reading Rooms, Godowns/ warehouses/ Storage – non hazardous – floor area limited to 200 m2.			
	Cottage industries, Service industries of non-nuisance Nature (See Annexe -I)engaging not more than 6 workers without power or 3 workers with power limited to 5HP,			
	Automobile workshops for 2/3 Wheelers			
	Tot Lots/Parks/Play Grounds, Saw Mills, Weigh Bridge.			
14.2	**Provided that the access road has a width of 8m minimum**			
	Clinics(Outpatient) and diagnostic centres - floor area limited to **200 m^2.**			

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
	Library and Reading Rooms, Godowns/ warehouses/ Storage – non hazardous – floor area limited to **200 m^2.** Auditorium/Wedding Halls/Community halls floor area limited to **500m^2.** Hospitals & Health Centres **with number of beds limited to 5.**			
14.3	**Provided that the access road has a width of 12m minimum**			
	Residential buildings consisting of single or multifamily dwellings, residential flats / apartments, residential quarters.	Stacking yards, Godowns/ Warehouses/ Storage - non hazardous materials. Higher Education Institutions. Health Care Facilities including Diagnostic Centres, Clinics, Hospitals with number of **beds limited to 50.**	Fuel Filling Stations.	

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
15	**Residential Mix use Zone**			
15.1	All uses that are permitted in High density Residential use Zone	Museum, Exhibition centres and art gallery, Places of worship	Fuel filling stations	Any other uses not specified
	Automobile workshops for 2/3 wheelers, Service Industries of non-nuisance nature (See Annexe II) engaging not more than 19 workers without power or 9 workers with power limited to 15 HP, Civil defence and home guard.	Dharmasala, hostels, Boarding houses, lodges, guest houses, Ashram mutt, Madrassa		
	Transmission / Telecommunication Towers and Wireless stations			
	Parking Plaza, Taxi/Jeep Stand			
15.2	**Provided that the access road has a width of 5m minimum**			
	Diagnostic Centres, Clinics(Out Patient), – floor area limited to **500 m^2**.	Government (Local/State/Central) or public section offices		

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
15.3	**Provided that the access road has a width of 8m minimum**			
	Shops, Professional Offices, Commercial Offices/ Establishments, Banking and financial institutions, Restaurants/Canteen, Hotels, IT/ Software units – floor area limited to 1000 m2.			
	Social Welfare Centres / Movie Halls/ Auditorium/ Wedding Halls/ Community Halls – floor area limited to 1000 m2.			
	Secondary/Higher Secondary Schools, Technical High Schools.			
	Hospitals and health centres with number of beds limited to 10.			
	Markets of Plot area **limited to 500 m^2**.			
	Weigh Bridge			
	Godowns/ Warehouses/ Storage non-hazardous – floor area limited to **200 m^2**.			
	Marble and Granite Storage Centres, Industrial Estates & Industrial Parks Automobile Workshops / Automobile Service Stations for Light Motor Vehicles.			
	Service Industries of Non Nuisance Nature (see annexure II) engaging not more than 9 workers with power limited to 30 HP in areas other than industrial estates/parks.			

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
15.4	**Provided that the access road has a width of 12m minimum**			
	Educational Institutions of Higher Order	Bus Terminals, Lorry Stands		
	Shops, Offices, Markets.			
	Hospitals & Health centres with number of beds limited to 100.			
	Godowns / Ware houses/ Storage (non-hazardous) - floor area limited to **500 m^2**.			
	Automobile workshops/ Automobile Service stations for Heavy vehicles/ Movie Halls/ Auditorium/ Wedding Halls/ Community Halls – **floor area limited to 1000 m^2**.			
15.5	**Provided that the access road has a width of 18m minimum**			
	Hospitals & Health centres **upto 300 beds**		Container Terminal	
	Movie Halls/Auditorium/Wedding Halls/ Community Halls - **floor area above 1000 Sqm** with **parking at 1.2 times that of KMBR.**			

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
16	**Commercial use Zone**			
16.1	All shops including shopping complexes, shopping malls, Multiplex, hypermarkets, restaurants, hotels, markets.	Places of worship	Higher educational Institutions provided the access has a width of 8m minimum.	Any other uses not specified
	Professional offices, commercial offices & establishments, banking and financial institutions, IT software units, Movie halls, Auditorium, Wedding Halls, Community Halls	Dairy & Dairy Farm, Poultry Farm.		
	Godowns / warehouse / storage of Non-hazardous materials, stacking yards.	Other public utility areas & Public utility buildings.		
	Gymnasium/ Yoga centres	Fuel filling stations		
	Cottage industries, automobile workshops, automobile service stations, cold storage, service industries of non-nuisance nature with number of workers limited to 19 without power or 9 workers with power limited to 30HP(See Annexe-II), saw mills, weigh bridges, printing press, IT hardware / electronic industries, marble and granite storage / cutting centres.	Saw Mills with Timber Yards		

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
	Expansion of existing residential buildings, Single Family Residences, Residential flats/apartments with lower floor(s) for commercial use only, night shelters, orphanages, old age homes, dharmasala, hostels and boarding houses, lodges and guest houses, Ashram, Mutts, Madrasa.	Slaughter Houses.		
	Government (Local /State/Central) or Public Sector Offices			
	Day care, Creche, Nursery/ Kindergarten, Expansion of existing educational institutions			
	Transmission & Telecommunication Towers, Wireless Stations.			
	Social welfare centres, library and reading rooms, exhibition centres, art gallery museum, convention centres			
	Clinics, diagnostic centres and hospitals with number of **beds limited to 50.**			
	Tot lots, Parks & playgrounds, fair grounds, open air theatres			
	Parking plaza, Transport terminals			
	Plant nursery, Storage of agricultural produces and seeds, Pump House, Wells and Irrigation Ponds			
16.2	**Provided that the access road has a width of 12m minimum**			
	Educational Institutions other than those mentioned in clause 13.1,			
	Hospitals & Health centres, Outdoor games stadium.			

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
17	**Public & Semi Public use Zone**			
17.1	Local/State/Central Government/Public Sector Offices and Other Related Public Buildings Residential Quarters incidental to public and semi public use. Public Utility Areas and Buildings. Additions and alterations to the existing public and semi public buildings including addition of new blocks without altering the use. Buildings for incidental uses with floor area limited to **100 m^2**.	Cremation Ground / Crematorium, Burial Ground, Common Vault.		Any other uses not specified
18	**Small Industrial use Zone**			
18.1	All industries other than obnoxious and nuisance type industries, Automobile Workshops & Automobile Service Stations, Spray Painting Workshops, Saw Mills, Timber Yard, Ice Factory, Cold Storage, Fish and Meat Processing Units, Printing Press, Water Treatment Plants, Marble and Granite Storage and Cutting Centres, Industrial Estates & Industrial Parks.	Other Public Utility Areas and Public Buildings.	Fuel Filling Stations	Any other uses not specified

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
	Godowns/Warehouses/Storage of non hazardous material, stacking yards, weigh bridge.	Cremation Ground / Crematorium , Burial Ground, Common Vault.		
	Dairy and Dairy Farms, Dairy related Industries, Poultry Farms, Piggery Farm, Smoke House.			
	Dry Cleaning Plants, Power Plants, Sub Stations	Storage of Explosives and Fire Works, Gas Godowns, Crusher Units.		
	Government or Public Sector Offices			
	Transport Terminals incidental to industrial use.	Sewage Treatment Plants, Dumping Yard.		
	Transmission & Telecommunication Towers, Wireless Stations.			
	Residential Uses incidental to the Industrial Use. Any other activity essentially incidental to Industrial use.	Slaughter House		
	Tot lots, Parks and Play Grounds attached to incidental residential use.	Container Terminals with access width of 18m minimum.		

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
19	**Transportation use Zone**			
19.1	Transport terminals including constructions that form an integral or essential part of the terminal.	Public Utility Areas and Buildings	Container Terminals provided that the access has a width of 18m minimum.	Any other uses not specified
	Any incidental uses to the transport terminals such as Retail Shops, Restaurants, Canteen etc. which are integral or essential part of the terminal with maximum percentage of coverage permissible for the project as a whole shall be limited to 30% and F A R shall be limited to 1.	Fuel Filling Stations		
	Staff Quarters, Offices, Night Shelters, Guest Houses etc incidental to the transport terminals			
	Parking Plazas, Transmission Towers and Wireless Stations.			
20	**Park & Open Spaces**			
20.1	Any construction/land development essential for the development/ improvement of open air recreational facilities.	Public Utility Areas and Buildings which will not affect the character of the area.		Any other uses not specified
	Fish Landings, Boat Jetties, Guided Boat Rides, Watch Towers, Eco Walk Ways, Water Sports Facilities, Fair Grounds etc.			
	Tot Lots, Park, Play Grounds, Swimming Pools, Open Air Stadium, Open Air Theatre, Zoological and Botanical Garden, Bird Sanctuary, Eco Walk Way etc.			

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
21	**Paddy Land**			
21.1	Paddy cultivation Agriculture/ Horticulture/Fodder cultivation, Fish Farms/ Seed Farms/ Pump House/ Wells and Irrigation Ponds without any building construction. OR Constructions/ land developments in conformity with the Conservation of Paddy Land and Wet Land Act in force in lands designated as paddy land or wet land under the said Act.	Minor Public Utility areas & Public utility buildings which will not affect the character of the area.		Any other uses not specified
22	**Mangroves**			
22.1	All existing Mangroves shall be conserved. Mangrove cultivation			Any other uses not specified
23	**Marshy Land**			
23.1	All existing Marshy Land shall be conserved.	Water recharging arrangements		Any other uses not specified
24	**Water bodies**			
24.1	All existing water bodies shall be conserved. Bridges, Side protection walls, Bathing Ghats, Floating jetty etc may be permitted based on community level requirements. 5 m wide Green Strip may be provided on both sides of natural water bodies having width of 5m and above			Any other uses not specified

<table>
<tr><th>Para No</th><th>Uses Permitted</th><th>Uses Restricted-1</th><th>Uses Restricted-2</th><th>Uses Prohibited</th></tr>
<tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>25</td><td colspan="4">Special use zone - Fisheries</td></tr>
<tr><td>25.1</td><td>Fish related activity buildings up to 150 sq.m</td><td rowspan="4">Retail shops / banks, Restaurants / canteen incidental, Bakeries and confectioneries, weigh bridge upto 150 sq.m</td><td>Fish related activity buildings above 150 sq.m</td><td rowspan="4">Any other uses not specified</td></tr>
<tr><td>Fishermen housing unit area upto 150 sq.m</td><td rowspan="3">Public and semi public buildings, lodging upto 300 sq.m</td></tr>
<tr><td>ATMs, Tele communication center upto 25 sq.m</td></tr>
<tr><td>Retail shops upto 100 sq.m</td></tr>
<tr><td>26</td><td colspan="4">Special zones</td></tr>
<tr><td></td><td colspan="4">Special zones include the areas specifically demarcated for certain projects. No other activity unless otherwise specified shall be permitted in such zones. If this projects are not materialised in corresponding demarcated land within a period of 5 years, from the date of sanctioning of this master plan , The freezed land may be released and returned back to that zone as per the existing land use</td></tr>
<tr><td>SZ 1</td><td>Boat Jetty at Punna</td><td colspan="3">Landing place, sitting place, cafe, comfort stations, parking lot</td></tr>
</table>

Para No	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
	1	2	3	4
SZ 2	**Blangad Beach Beautification**	Path way, parking lot, lodges, resorts, restaurants, local sea food restaurants, Exhibition stalls, web site development amenities,lighting, sitting place, performing area and stage, community sculptures		
SZ 3	**Coconut processing industry**	Godowns, parking lot, loading and unloading area,storage building, stacking yard, comfort station, show stall		
SZ 4	**Provision of solar panels**	Solar panel installation, accessory building, transformer area, any other amenities incidental to solar panel installation		
SZ 5	**Geriatric Unit for Taluk Hospital**	Hospital building, inside and out side recreation area, comfort station, parking lot		
SZ 6	**Waste treatment Plant**	Treatment plant, trenching yard, storage building, generator room, any other amenities incidental to waste treatment plant		
SZ 7	**Plastic recycling unit.**	Plant buiding, storage building, trench yard, parking lot, loading and unloading place		
SZ 8	**Organic Farming and Floriculture**	Huts, temporary buildings incidental to farming, laboratory, seed storage building, open well, tube well, motor shed, loading and unloading place		
SZ 9	**Integrated Duck and Prawn Farming**	Huts, temporary buildings incidental to farming, laboratory, open well, tube well, motor shed, loading and unloading place		
SZ 10	**Multi-Level Parking System**	Car stacking unit (either manually or semi/fully mechanized), any other amenities incidental to multilevel parking areas		
	Fish, Meat & Vegetable Market	Shop buildings, Parking Lot, Loading and Unloading spaces, any other amenities incidental to market area		
SZ 11	**Community Hall near Kozhikkulangara Temple**	Community hall building, parking lot, any other amenities incidental to community hall		

GENERAL NOTES:

1. For the purpose of these regulations, floor area means the total floor area of the building on all floors.
2. 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 on all floors of such a building shall not exceed the maximum floor area permitted for any of such use in that zone.
3. Land to a depth of 50 m on either sides of roads having an existing/proposed width of 12m and above in High density residential use zone and Low density residential use zone will be deemed as Residential Mix use Zone.
4. Land to a depth of 150 m on either sides of roads having an existing/ proposed width of 27m and above in High density residential use zone and Low density residential use zone will be deemed as Residential Mix use Zone.

GUIDELINES FOR LARGE SCALE PROJECTS

Large Scale development proposals in an area not less than 2 hectares, exceeding an investment of Rs.50 crores, which provide direct employment (after commissioning of the project) to the tune of not less than 500 may be permitted in all zones other than Heritage and Park & Open space, subject to the recommendation of a committee to be constituted by the Government for this purpose, under the Chairmanship of the Secretary, Local Self Government Department, consisting of Chief Town Planner concerned of Kerala State Local Self Government Department Planning as Convenor, and the Secretary, Chavakkad Municipality as members and the District Town Planner, Local Self Government Department Planning, and satisfying the following conditions:-

a) The developer shall produce project cum feasibility report and environmental impact assessment report, if required, of the project to the convenor of the committee, 15 days in advance of the committee meeting, including clearences from Kerala conservation of Paddy Land and Wet Land Act, 2008 as per norms.

b) The developer shall produce before the committee, all required clearances from the State and Central Government agencies concerned.

c) Adequate provision shall be made for supporting infrastructure such as water supply, Sewerage, Solid Waste Management etc. Separate sewage treatment plant and solid waste management measures shall be provided and maintained by the developer at his /her cost.

d) Adequate Memorandum of Understanding between the developer and Secretary of Local body concerned shall be undertaken to bring this into effect.

e) Maximum floor area ratio shall be 2 and Minimum access width shall be 12 meter.

f) The project shall be completed within a period of 3 years if not specified otherwise.

ANNEXURE: I

List of non-obnoxious and non-nuisance type of service or light industries

1. Aerated water and fruit beverages
2. Apparel making
3. Assembly of air coolers and conditioners
4. Assembly of bicycles, baby carriage and other small non motorized vehicles.
5. Atta - chakks
6. Ayurvedic medicinal formulations, Ayurvedic health club
7. Bakery products, biscuits, confectionaries
8. Bamboo and cane products (only dry operations)
9. Block making for printing
10. Card board or corrugated box and paper products (paper or pulp manufacturing excluded)
11. Carpet weaving
12. Cement and concrete products (where crusher is not used)
13. Chilling plants and cold storage
14. Coir (without bleaching / dyeing)
15. Concrete batching plants
16. Cotton and woolen hosiery/ Cotton and silk printing
17. Electro plating
18. Electronics and electrical goods
19. Electronics equipment (Assembly)
20. Engineering workshop and general fabrication works (without any chemical treatment)
21. Embroidery and lace manufacturing
22. Flour mills (job work only)
23. Foam bed, latex thread
24. Foot wear (rubber and PVC)
25. Furniture making
26. Fountain pens
27. Garment stitching, tailoring
28. Gold and silver smithy
29. Gold and silver thread sari work
30. Ice- cream or ice making
31. Insulation and other coated papers (paper or pulp manufacturing excluded)
32. Jobbing and machining

33. Light engineering
34. Laundry, dry cleaning and dyeing
35. Manufacturing of formulated synthetic detergent products
36. Manufacture of soaps involving process without generation of trade effluents (saponification of fats and fatty acids only)
37. Mineralized water
38. Musical instruments manufacturing
39. Oil ginning/expelling
40. Optical frames
41. Paint (by mixing process only)
42. Paper pins and U- clips
43. Power looms / hand looms (without dyeing & bleaching)
44. Photo and picture framing
45. Pressure testing units
46. Printing press
47. Rice mills
48. Rope (cotton and plastic)
49. Rubber gloves other than that for surgical and medical purpose
50. Rubberized coir mattresses
51. Scientific and mathematical instruments
52. Sports goods
53. Steeping and processing of grains
54. Small foundries
55. Tissue culturing
56. Toys
57. Water softening and demineralization plants
58. Watch, pen and spectacles repairing.

ANNEXURE II

List of obnoxious and nuisance industries subject to Objectionable sounds, dust, odours, fumes, effluent or processes constituting hazardous use and which are to be located in hazardous zones (grouped) Under Indian Standard Industrial classification (videRegulation7-1,7-2 and 13-2)

Manufacture of Food Stuff:

(1) Slaughtering , preservation of meat and fish and canning of fish

Manufacture of Beverages:

(2) Production of distilled spirits, wines, liquor etc. from alcoholic fruits and salts in distillery and brewery

(3) Production of country liquor and indigenous liquor such as toddy, liquor from mahua, palmjuice

Manufacture of textiles:

(4) Dyeing and bleaching of cotton

Manufacturing of wood & wooden products, sawing and planning of wood:

(5) Woodseasoning

(6) Manufactureofveneer&plywood

(7) Paper, pulp and strawboard

Manufacture of leather and leather products:

(8) Currying, tanning and finishing of hides and skins and preparation of finishedleather

Manufacture of Rubber petroleum & local products:

(9) Manufacture of tyres and tubes and tyre retreading

(10) Manufactureofindustrialandsyntheticrubber

(11) Reclanation of rubber

(12) Production of petroleum, kerosene and other petrol products in refineries

(13) Production ofchemicalsandchemicalproducts

Manufacture of chemical and chemical products:

(14) Manufacture of basic industrial chemicals such as acids, alkalies and their salts ,not elsewhere specified (specially sulphurious, sulphuric, nitric, hydrochloric etc. acids, ammonia chlorine and bleaching powder manufacture.)

(15) Manufacture of dyes, paints, colours, ink powder, varnishes, printing ink etc.

(16) Manufacture of fertilizers (specially from organic materials)

(17) Manufacture of disinfectants and insecticides

(18) Manufacture of Ammunition, explosives and fireworks

(19) Manufacture of matches

Manufacture of Nonmetallic mineral products other than Petroleum and coal:

(20) Manufacture of cement

(21) Manufacture of lime

(22) Manufacture of plaster of paris

Manufacture of Basic Metals and their Products:

(23) Manufacture of iron and steel including sheeting, refining, rolling and conversion into basic forms

(24) Manufacture including smelting, refining etc of non ferrous metals and alloys in basic forms

(25) Manufacture of ornaments

Manufacture of machinery (other than transport) and electrical equipment:

(26) Manufacture of all kinds of battery, Miscellaneous items not covered above

(27) Incineration, dumping and reduction of offal, dead animals, garbage or refuse

(28) Manufacture of gelatin and glue

(29) Fat, tallows,grease of lard refining of manufacture

(30) Bone meal, bonegirst and bone powder

(31) Manufacture of cashew nut shell oil and

(32) Other similarty pes of nuisance industries.

ANNEXURE : III

SIC WORKING GROUP MEMBERS - 2013

1. Agriculture, Animal Husbandry, Diary Development and Fisheries Sector

Chairman	:	Sri. M.R.Radhakrishnan, Councilor
Convenor	:	Agriculture Officer, Agriculture Office, Kunnamkulam
Members	:	1. Sri. Simon Srambickal
		2. Sri. VergheseePulikkottil
		3. Sri. Shibu K.B, Councilor
		4. Smt. SobhanaHaridas, Councilor
		5. Sri. Muhammadunny.K.K
		6. Smt. Suma Anil
		7. Smt. Neena K Menon

2. Irrigation and Watershed Development Sector

Chairman	:	Sri. P.M. Naszar, Councilor
Convenor	:	Assistant engineer, Minor irrigation
Members	:	1. Sri. Surendran C.K.
		2. Sri. Mohanan V.A
		3. Smt. Suma Gangadharan
		4. Smt. SathiAsokan
		5. Smt. AmruthaBabu
		6. Smt. Suma Anil
		7. Smt. Neena K Menon

3. Industry and Commerce Development Sector

Chairman	:	Sri. Shanavas.K.V,
Convenor	:	Industrial extension officer, Kunnamkulam.
Members	:	1. Sri. K.P.Davis
		2. Sri. V.K.Venugopalan
		3. Smt. Lakshmykutty teacher
		4. Smt. ReenaPrathap
		5. Smt. AmruthaBabu
		6. Sri. P.I.Jose
		7. Sri. P.I.Nixon

4. Health and Drinking Water Sector

Chairman	:	Mrs. BusharaLatheef, Councillor
Convenor	:	Superintendent, Taluk hospital, Kunnamkulam.
Members	:	1. Sri. K.M.Varghese
		2. Sri. C.I.Job
		3. Sri. Soman K.A
		4. Smt. LeenaSukumaran
		5. Smt. Binju Jacob

5. Infrastructure Development Sector

Chairman	:	Sri. K.K.Sudheeran, Councillor
Convenor	:	AE, PWD roads, Kunnamkulam.
Members	:	1. ME, Kunnamkulam Municipality
		2. Sri. C.B.Sreehari
		3. Smt. SajiniPreman
		4. Sri. K.P.Saxon
		5. Sri. K.T.Abdu
		6. Sri. M.K.Poulson
		7. Sri. C.T.Joy

6. Education Development Sector

Chairman	:	Sri. Abdul Kalam, Councilor
Convenor	:	A.E.O, Kunnamkulam.
Members	:	1. Sri. Raghavan Master
		2. Sri. Mathew Chemmannur
		3. Smt. Lakshmykutty teacher
		4. Smt. SafiyaMoidheen
		5. Smt. RamaniSukumaran

7. Social Welfare and Poverty Reduction Development Sector

Chairman	:	Smt. Karthyayini Teacher, Councilor
Convenor	:	Social Welfare officer, CDPO.
Members	:	1. Sri. Cheru master

2. Sri. Anirudhan S.R.
3. Sri. Labeeb Hassan
4. Smt. SmithaJini, Chairperson, Welfare standing committee.
5. Smt. SheebaBiju.
6. Smt. M.K.Thankamany.

8. Scheduled Caste and Scheduled Tribe Development

Chairman : P.K. Mohanan
Convenor : S.C.Development officer, Chowwannur Block
Members : 1. Sri. Sasi
2. Sri. Thavaraj.K.K
3. Smt. GeethaSasi.
4. Smt. SuhasiniSoman

9. Power and Telecommunication Development Sector

Chairman : Sri. K.M. Ali
Convenor : Asst. Executive engineer, Kunnamkulam.
Members : 1.Sri. M.A.Lohithakshan
2. Sri. Eapen George
3. Sri. Shaji A.V.
4. Smt. Sunithasivaraman

10. Tourism Development Sector

Chairman : Sri. Rajalakshmi, Councilor
Convenor : Tourism Deputy director, Thrissur.
Members : 1. Sri. Raju James panakkal
2. Sri. BijupalNharakkatt
3. Smt. Beenaravi
4. Smt. SheejaPradeep
5. Sri. A.G.Sathyan
6. Sri. Dileep George
7. Sri. Benny Abraham
8. Sri. ThampanTholath

11. Environment and Waste Disposal Development Sector

Chairman	:	Mr.P.V.Suresh, Councilor
Convenor	:	Health Supervisor, Kunnamkulam.
Members	:	1. Sri. K.C.Santhosh Kumar
		2. Sri. Gopi Master
		3. Sri. Somashekaran T
		4. Smt. KomalaSoman

Nominated Members:

1. Mr. Malikkulam Abbas, Vice Chairman
2. Mr. Yatheendra Das, Councillor

ANNEXURE : IV

LOCAL SELF GOVERNMENT DEPARTMENT PLANNING

THRISSUR PLANNING UNIT

Planning Team for Master Plan for Chavakkad Town

Shri. K.R.Rajeev, Town Planner

Shri .K.M.Gopakumar, Former Town Planner

Shri. K. Mohandas, Former Town Planner

Shri. Manoj Kumar. K.B,Deputy Town Planner

Smt. Deepa V.P, Former Deputy Town Planner

Smt. Jinumole Varghese, Former Deputy Town Planner

Smt. Vimaja C R, Assistant Town Planner

Smt . Lathika P.V, Ist Grade Surveyor/ Draftsman

Smt. Meenakshy.C, Former Ist Grade Surveyor/ Draftsman

Technical Assistance:

Smt. Manohari. C P , Research Assistant

Smt. Sumitha .K S, Statistical Assistant

Shri .Biju. K A, Statistical Assistant

Shri. Sanu.K. Thekkath, Former Planner Associate

Kum. Zahna. Mohammed. Sherief, Former Planning Assistant

Shri. Bigith. V.B, Former Planner Associate

Shri. Ravindran.P.K. ,Former Ist Grade Surveyor/ Draftsman

Shri. Sreekumar. A. K, Student (urban design), College of Engineering,Tvm

Smt. P.R. Pankajavally, Former Research Assistant

Shri. V. Manoj, Former Research Assistant

Smt. Bindu. C, Former Statistical Assistant

Shri. Sajan. V.R, Former Statistical Assistant

Smt. Reshma K Ravindran, Former GIS Assistant

Shri. Ranadiv. K. Ravindran, Former Planning Assistant (GIS)
Smt. Nimi Thomas. K, Former Computer Assistant
Smt. Rasmi.K.Raveendran,Former Computer Assistant