MASTER PLAN

for

CHITTUR - THATHAMANAGALAM TOWN 2042

Prepared by
Chittur - Thathamangalam Town
Local Self Government Department, Planning
Government of Kerala
February 2024

CHITTUR - THATHAMANGALAM MUNICIPALITY

February 2024
CHITTUR - THATHAMANGALAM TOWN
LOCAL SELF GOVERNMENT DEPARTMENT, PLANNING
GOVERNMENT OF KERALA

MASTER PLAN FOR CHITTUR - THATHAMANGALAM TOWN 2042

FOREWORD

The twin settlements of Chittur and Thathamangalam represent the quintessential qualities of peaceful small-town life in Kerala with all the amenities and conveniences being available within easy reach while the angsts of an urban existence are kept away. This unique aspect, which is often not seen in many similar towns in Kerala, was repeatedly quoted as most valued aspect of the town by the residents of Chittur-Thathamangalam Municipality, throughout the numerous public interactions the Municipality had during the preparation of this Master Plan.

The process to prepare the first ever Master Plan for our Municipality started in 2012 and a Draft Plan was prepared with the help of the Town and Country Planning Department and released for public consultation in 2021. This 'Chittur-Thathamangalam Municipality Master Plan 2042' being presented here is the outcome of several public consultations, interactions with experts, focus group discussions, and workshops, held over the last eighteen months. Significant effort has gone into balancing aspirations and expectations of citizens while also being cognizant of the challenges posed by environmental issues.

We believe that planning is a participatory process, and it is with great pride and satisfaction that we present this Peoples' Plan, which was developed using a progressive methodology that has seldom been used in Kerala or even in the country. We believe that this Master Plan will be a 'trend-setter' and many other local self-governments will embrace this methodology for the preparation or modification of their own Plans. Citizens and many experts – planners and other sectoral experts – have contributed their time and energy freely and willingly and this participative and collaborative process has been the cornerstone of our approach.

We would like to place on record, our sincere appreciation for the support provided by the people of Chittur-Thathamangalam Municipality through their whole-hearted participation in various consultations and workshops and for being forthcoming in their suggestions and objections alike. To aid the Municipality for the preparation of the Master Plan, we appointed a Master Plan Expert Committee consisting of urban planners, Dr. Jayaraj Sundaresan, based at London School of Economics and Political Science, and Dr. Malini Krishnankutty, based at IIT-Bombay. These urban planners of international repute have anchored the process of preparing this Plan, and without the overwhelming support they provided, it would have been impossible for the Municipality to prepare this Plan. The Chittur-Thathamangalam Municipality is indebted to them for their significant contributions to this Plan and words are insufficient to express our appreciation for their effort. Various other sectoral experts were also brought in to help in the process, and we are thankful for the tremendous support they provided. It would be amiss if we do not mention that all the experts who were involved in this process – including the Master Plan Expert Committee members – provided all their services completely free of cost, in a rare and true spirit of support towards our effort to make Chittur-Thathamangalam a better place for its people.

The support provided by the members of the Master Plan Sub-Committee, and the local planning coordinators, Ms. Anupama Sivaram and Ms. Shilpa Sojan, has been vital in making this Plan a reality. We would also like to thank the Town and Country Planning Department who extended their support throughout the process and were always available for discussions and consultations. The Municipal Council members and staff provided all necessary support and direction as needed, from time to time.

We are very happy to submit this Peoples' Plan to the people of Chittur and Thathamangalam.

K. L. Kavitha

Chittur-Thathamangalam
16 January 2023

K.L. Kavitha
Chairperson
Chittur-Thathamangalam Municipality

PREFACE

Urban areas have been the driving force in economic and social development of the Nation. In order to have planned development of urban areas in the State, Government of Kerala introduced the 'Scheme for preparation of Master Plans and Detailed Town Plans' in the year 2008, with the prime objective of preparation of Master Plans of urban areas to give impetus to the development and economic potential of towns. Under this scheme, preparation of Master Plans were taken up in a phased manner, covering 32 Master Plans for 38 statutory urban areas in the first phase; and the remaining then existed statutory urban areas in the second phase. The Department of Local Self Government (Planning) (former Department of Town and Country Planning) gives technical assistance to the Local Self Governments concerned in the preparation of Master Plans. Master Plans are prepared through participatory process and the aspirations of the Local Self Governments, and the residents are duly considered while framing policies and strategies for the development of towns.

Master Plan for Chittur-Thathamanagalam town was taken up in the second phase of the Scheme in 2012 as per G.O.(Rt.) No.1376/2012/LSGD dated 17/05/2012. Extensive studies were carried out in connection with the preparation of Master Plan for Chittur-Thathamangalam Town comprehensively covering the areas crucial to planning and sustainable development of the region. The methodology involved data collection and analysis, identification of development issues, setting up of goals and objectives, formulation of development concept and carving out policies & strategies followed by detailed sectoral proposals. The development framework provided by Integrated District Development Plan for Palakkad District, became a determinant in formulating the development concept of the Plan. The draft Master Plan prepared through joint effort of the Chittur-Thathamangalam Municipality and the Department, with a focus on accelerated development of the town, was published following the statutory permission obtained from Government.

Considering the objections and suggestions received on the published draft Master Plan, the new Municipal Council of Chittur-Thathamangalam Municipality decided to revisit proposals. The Municipal Council constituted Master Plan Committee for addressing objections and suggestions and also an Expert Committee for extensive consultations and for redefining the development strategies and priorities of the Published draft Master Plan. With a focus on adopting conservation strategy for the town, in lieu of the original concept of accelerated growth of the town, the Master Plan was restructured.

I would like to acknowledge the efforts of Chittur-Thathamangalam Municipal Council, supported by the officials of the district office of the Local Self Government Department (Planning), Palakkad, the Master Plan Committee, the Expert Committee and all other stakeholders in finalising the modification of draft Master Plan. I hope this Master Plan will provide the desired framework for future of Chittur- Thathamangalam Town, envisioned by the Municipality.

20/4/24

Prasanth H
Chief Town Planner (Planning)
Local Self Government Department (Planning)

ACKNOWLEDGEMENTS

The Master Plan delivers a coordinated strategy to guide future development, transport and public space investments over the next 20 years to ensure our town to be safe, attractive and a continued source of pride. The preparation of the Master Plan for Chittur-Thathamangalam town was started in July 2012 as per G.O. (Rt.) No 1376/2012/LSGD dated 17.5.2012 under Phase II of the Scheme of preparation of Master Plans and Detailed Town Planning Schemes.

I am sincerely acknowledging the valuable guidance and involvement of Municipal Chairperson Smt. K L Kavitha and former chairpersons Sri. K Madhu and Smt. K.A Sheeba during the preparation of Chittur-Thathamangalam Master Plan. I gratefully acknowledge the contributions of all councillors of the Municipality for their support.

Special thanks also go to officials of various line departments who shared data and gave their valuable support in this plan preparation exercise without which the compilation of this vital document would have been difficult to realize. The plan has been prepared in a participatory way having several consultations with stake holders at all stages. I offer special thanks to members of Spatial Integration Committee, members of various Working Groups and other stake holders for offering their views, comments and recommendations in developing the Plan. I would like to extend special thanks to the residents of Chittur-Thathamangalam Town who provided substantial input that helped to shape the Master Plan.

Many sectoral experts from all across the country not only supported from far but also visited Chittur, participated in the workshops and deliberations and their inputs have been central to this process. To aid the Municipality for the preparation of the Master Plan, they appointed a Master Plan Expert Committee consisting of urban planners, Dr. Jayaraj Sundaresan, based at London School of Economics and Political Science, and Dr. Malini Krishnankutty, based at IIT-Bombay. These urban planners of international repute have helped in the process of updating this Plan. Planners Ms. Anupama Sivaram and Smt. Shilpa Sojan had also supported this Expert Committee for post publishing works of this plan. We value and treasure their inputs and generosity.

I would like to offer special thanks to Sri. Prasanth H, Chief Town Planner (Planning) and Sri. S. Ajay Kumar, Senior Town Planner (Planning) for their outstanding support and overall guidance. The support and guidance rendered by officials of the State Project Cell for the Scheme which led to the time bound preparation of this plan are also acknowledged. I sincerely thank Sri.Giji George, Sri. Shaji Joseph former Chief Town Planners (Planning) for their encouragement, involvement, constant guidance and valuable suggestions at the time of preparing the first Published draft of the Master Plan. My most heartfelt thanks and gratitude to the dedicated effort put by Sri. V.A. Gopi, Sri. K.M Gopakumar and Sri. V.K Mohandas during their respective tenures in the capacity of District Town Planner for their involvement at different periods.

Preparation of Master Plan for Chittur-Thathamangalam Town is the culmination of several months of dedicated work by the members of the Planning Team constituted for the purpose in this office. My thanks, love and appreciation go to Sri. Govind Ramdas, who left us unexpectedly. He deserves special recognition for his job well done and fond remembrance

of his excellent skills and contributions, hard work and dedication. I extend my sincere gratitude to all members of Planning Team with special mention to Sri. Sarath Sankar M and Smt. Jagadambika Devi K V, Assistant Town Planners, Smt. Vimaja C R, Planner Associate, Smt. Chaithanya M, Sri. Harishankar M and Sri. Ashar Salih.N, Planning Assistants, Smt. Syamini C, GIS Assistant and Smt. Sheeja.V and Smt. Ambili.V Computer Assistants who were involved in the plan preparation. Special thanks also to all other staff of District office for their tireless efforts without which this plan would not have been completed.

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Deepa V P
District Town Planner
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Master Plan 2042

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District Town Planner
Palakkad

A Peoples' Plan

A few interrelated questions in the practice of Urban Planning needs urgent and innovative solutions for it to be relevant and effective in the 21st century to shape a sustainable urban future. These include 1) who makes the Plan for whom, 2) how is it made, 3) what kind of Plan is it; what does it contain and what does it aim to do? and 4) how to make the ideas and commitments in the Plan a reality? This Master Plan 2042 finds answers to these questions in its own way, foregrounding democracy, local governance, respect, participation, social, economic and environmental equity, and liveability. This was developed through extended participatory processes that lasted for almost a year, including ward cluster meetings, focus group discussions and Master Plan workshops. In total, more than a thousand people participated in these meetings. These meetings were an opportunity for the people and the municipality to come together to deliberate on the actual priorities that should inform a Peoples' Master Plan for Chittur-Thathamangalam Town based on locally relevant issues, needs and aspirations that also has regional, national and global significance. This was in addition to the more than thousand letters people wrote to the Municipality giving their suggestions and objections.

This process elicited locally relevant priorities for the Master Plan to focus on, such as assets and livelihoods that need protection from predatory processes, and conditions that need urgent and sustained change for progress. Additionally, building on the path laid by Kerala Town Planning Act 2016, it also cemented a foundational principle that Chittur-Thathamangalam Municipality and its people will not settle with anything less than a democratic participatory Planning process for its Master Plan. In fact, the first of the 20 Focus Group Discussions to deliberate on the Peoples' Master Plan started with 75 children from the 14 schools in Chittur-Thathamangalam Municipality outlining their needs and aspirations. In the context of Planning's checkered history in India as an agent of massive dispossessions and environmental disasters, this commitment to a democratic Planning process led by Chittur-Thathamangalam Municipality and its people is nothing less than exemplary.

This process clearly delivered a Plan that focuses on peoples' priorities, needs and aspirations on wide ranging issues of simultaneous local and global relevance like the impact of climate change on agriculture, increasing jobs for young people, addressing mental health and addiction, public health, making the town walkable for everyone, especially children, old people and the disabled, increasing road safety, adequate housing for all, caste equity, making public spaces safe for women, protecting peaceful ambience, sustaining the productive organic mixed homestead landscape and biodiversity, public spaces, ecological security, flood control and disaster mitigation, surface water percolation, food production etc., to name a few. Moving away from a far removed, abstract, technical and legal template, Chittur-Thathamangalam Municipality and its people elevated the Master Plan to a collective political commitment.

Policies in the Plan outline these priorities and commitments, followed by strategies for its implementation like regulation, campaigns, projects, capacity building initiatives and promoting innovative institutional and contractual arrangements. In addition to providing administrative focus and direction for investment for the next 20 years, this first Plan also establishes a foundation upon which further policy evolutions will and can take place, building on the basic strength of Chittur and Thathamangalam. Such an evolvable Planning process and Plan document we believe is stronger by being able to attend to changing local, regional and global realities rather than become ossified and irrelevant in time.

The Plan is finally about enabling the people of the town to achieve their aspirations while ensuring that the quintessential character of the town and its peaceful ambience is maintained and strengthened.

Dr. Jayaraj Sundaresan & Dr. Malini Krishnankutty
Master Plan Expert Committee, Chittur-Thathamangalam Town Master Plan 2042

A Note of Thanks

Firstly, we want to thank the Chittur-Thathamangalam Municipality for inviting us to support this historic Peoples' Master Plan process. This Master Plan would not have materialised without the active participation and support of many individuals and institutions over the past one year. Most importantly, thousands of people from Chittur and Thathamangalam participated in different avenues of participatory planning process to provide inputs, valuable suggestions, opinions and idea. The Chairperson Ms. Kavitha K.L., Vice Chairman, Mr. Sivakumar M. and all Councillors, in particular Mr. M. Mukesh, Mr. Achuthanand Menon R. and Mr. Robin Babu of Chittur-Thathamangalam Municipality extended immense logistical support towards the plan preparation effort. Support from KILA, especially from Mr. Joy Elamon, enabled the appointment of planners Ms. Anupama Sivaram and Ms. Shilpa Sojan as local planning coordinators who provided local technical support. We would also like to place on record the help provided by various planners within the Kerala T& C P Dept. including CTP Prasanth H., Sr. Town Planner Ajay Kumar, Ms. Deepa V.P., District Town Planner and Mr. Sharath Sankar M., Asst. Town Planner from Palakkad Town Planning Department, who have engaged with this plan and helped Chittur-Thathamangalam Municipality at various stages in plan preparation.

Many sectoral experts from all across the country not only supported from far but also visited Chittur, participated in the workshops and deliberations and their inputs have been central to this process - Dr. Anjana Bhagyanathan from National Institute of Technology Calicut, Mr. Arun Narayanan, convenor, Indian National Trust for Cultural Heritage- Palakkad Chapter, Dr. Gopakumar Cholayil from the Agricultural University and Kerala Sastra Sahitya Parishad, Dr. May Jacob from Agronature, Aluva, Dr. Pradip Kalbar and Dr. Himanshu Burte from Indian Institute of Technology Bombay, Dr. Ramesh Krishnamurthy from Wildlife Institute of India, Dehradun Dr. Avinash Madhale from Centre for Environment Education, Pune, Ms. Laskhmi Menon from Pure Living, Kochi, Mr. Rajiv Raman, sanitation specialist, Mr. Nirmal Panikker from Agnisudhi, Mr. Sreekumar Kumaraswamy from World Resources Institute, Mumbai, Mr. Sunil CP, architect from Thrissur, Mr. Ravikant Joshi, urban finance and governance consultant, Delhi, and Mr. Tony Mathews from Transport Research Lab, Delhi, Dr. Richard Scaria and Mr Pankaj Chirayil, from Government College Chittur Department of Geography – and their support has been nothing short of phenomenal. All of them gave time and professional inputs generously and free of cost, despite severe work pressures, only on the basis of friendships and commitment to improving Chittur-Thathamangalam Municipality. We value and treasure their inputs and generosity.

Kerala Land Use Board went out of their way to correct and share their 2020 GIS data base of the town which enabled the preparation of most current Land Activities Map 2022 and a viable and feasible Proposed Land Use Plan in time for this Master Plan report. The entire mapping support was provided by professors of Government College, Chittur, Dr. Richard Scaria, Mr. Pankaj Chirayil, Dr. Roobina, Mr. Suresh P. and field work was provided by their geography students. Special mention is in order for the GIS support towards preparation of both the ward level Land Activities maps and also for mapping the drainage ecology by Mr. Muhsin M.C. under the guidance of these professors. All municipal ward councillors supported the mapping effort by checking and verifying the ward land activity maps as did the students of Nehru College of Architecture, Palakkad who did a final round of verification of the maps prepared. Thus, the Land Activities map for the town is the collective effort of many persons that formed an important updated base for the entire planning effort.

The ecological basis of the plan was made possible due to the guidance of Prof. Anjana Bhagyanathan and the preparation of drainage models by her student Ms. Tinu Susan Scaria with local ground verification and support from Dr. Richard Scaria, Mr. Pankaj Chirayil and Mr. Muhsin M.C. Detailed ground truthing and mapping of the entire natural drainage system, irrigation network and storm water drains, along with studying liquid waste disposal was conducted by Ms. Shweta Lokhande,

PhD student, IIT Bombay and Nikhil Nidhiri, JRF, IIT Bombay, with guidance from Prof. Pradip Kalbar. They were assisted by a number of M.Sc. students from Government College, Chittur- Aswathy P., Archana V. N., Manuprasad S., Muhammad Navas M., Arathi Nair, Anagha Subramanian, Sandrima M, Hasna A. and Shahanas K. B. - who helped to achieve this mapping of the entire complex town drainage network in just ten days! They were given a comprehensive tour of the paddy fields and irrigation canals in Chittur and Thathamangalam by the Secretary of Alachankode Padasekhara Samithi, Mr. M. Mani and councillor, Mr. Rafi M. respectively, that enabled a finer understanding of the issues on the ground. They were also provided valuable ground support by various councillors along with a ward guide in each ward.

Data updation was a critical part of the exercise. The help provided by Dr. Anoop V.G., District Medical Superintendent at Chittur Taluk Hospital with ward level health data for the town was exceptional. Various Government officials in different departments provided current data and helped update the sectoral data in the Draft Master Plan. Statistical Assistant Gr-1, Mr. Haris K. who provided demography and vital statistics data on the town, Mr. Pratheeshkumar C., Accounts Dept Senior Clerk, who helped with data on municipal finance and Ms. Sunitha, Municipal Assets Clerk who helped with municipal assets, deserve special mention. The consistent attention and support to the process rendered by Mr. Agith Kumar N., PA to the Chairperson, and necessary and timely inputs provided by the Municipal Engineer, Mr. Prasanna Kumar, Mr. K.B. Muraleedharan, Asst. Executive Engineer, Ground Water Dept. and by Mr. Sasi Kumar, ex- DFO on afforestation and soil conservation is highly appreciated.

Others who provided important support along the way include planner Ms. Geethanjali Jayaprakash, who helped with a transport proposals impact study of some key stretches of the town's main roads; Masters students of College of Engineering and Technology Thiruvananthapuram who spent time studying the town as part of a combined integrated graduate studio; and two graduate theses by planners Gayathri M.R. and Anupama Sivaram, helped us document and understand heritage conservation issues in the town better.

Graphics and communication support, often at extremely short notice, by Mr. Arun Narayanan and Ms. Sanusha U.S. was invaluable and brought a spark to the public outreach and made the participatory process more successful. We also acknowledge the creative design support from Mr. Anand Krishnan M., who breathed life into the 'parrot' mascot in the early days of the plan. And last but not the least, we also thank Mr. Y. Kalyanakrishnan, for his continuous support and guidance, Mr. Niranjan T.G, for being the catalyst that brought this team together, for his ecological insights and for working quietly behind the scenes, and Mr. Sudeesh Yezhuvath, for his formidable organisational and operational leadership, that ensured this plan kept to a schedule. To conclude, it was the hard work put in by planners Ms. Anupama Sivaram and Ms. Shilpa Sojan, who provided able and invaluable ground support throughout the plan preparation, that was central to this report and made it possible.

Dr. Jayaraj Sundaresan & Dr. Malini Krishnankutty
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LIST OF ABBREVIATIONS

ADS	- Area Development Society
ACMA	- Automotive Component Manufactures Association
AD	- Anno Domini
BOD	- Biological Oxygen Demand
BOT	- Build, Operate and Transfer
BPL	- Below Poverty Line
BRGF	- Backward Regions Grant Fund
BSY	- Balika Samridhi Yojana
CAA	- Constitution Amendment Act
CAGR	- Compounded Annual Growth Rate
CBD	- Central Business District
CBO	- Community Based Organization
CC	- Cement Concrete
CDP	- City Development Plan
CDS	- Community Development Supervisor
CEC	- Cation Exchange Capacity
CESS	- Centre for Earth Science Studies
CFL	- Compact Fluorescent Lamp
CHC	- Community Health Centre
CI	- Concentration Index
CNC	- Computer Numerical Control
COPP	- Committee on Plan Projects for Industrial Townships
CPHEEO	- Central Public Health Environmental Engineering Organization
CT	- Computerized Tomography
D& O Trade	- Dangerous and Offensive Trade
DIC	- District Integration Committee Organization
DPR	- Detailed Project Report
DRW	- Drought Relief Work
DTP	- Detailed Town Planning
DTPC	- District Tourism Promotion Council
DWCUA	- Development of Women and Children in Urban Areas
DYSP	- Deputy Superintendent of Police
E - Coli	- Escherichia coli
ECG	- Electro Cardio Gram
EEG	- Electro Encephalon Gram
EPZ	- Ecological Protection Zone
EIUS	- Environmental Improvement in Urban Slums
ESA	- Environmental Sensitive Areas
ESI	- Employees State Insurance
EWS	- Economically Weaker Section
FFDA	- Fish Farmers Development Agency
FGD	- Focus Group Discussion
FOP	- Financial Operating Plan
FRBW	- Flood and Riverine Buffer Zone
FY	- Financial Year
GLSR	- Ground Level Storage Reservoir
Gm	- Grams
GO	- Government Order

GOI	- Government of India
GOI-UNDP	- Govt.of India- United Nations Development Programme
GOK	- Government of Kerala
gpcd	- Grams per Capita per Day
GPF	- General Provident Fund
GPS	- Global Positioning System
H2S	- Hydrogen Sulphide
Ha	- Hectares
HH	- Households
HP	- Horse Power
HS	- High School
HS	- Health Supervisor
HSC	- House Service Connection
HSS	- Higher Secondary school
HUDCO	- Housing and Urban Development Corporation
ICDS	- Integrated Child Development Scheme
ICTC	- Integrated Counselling and Testing Centre
ICU	- Intensive Care Unit
IDDP	- Integrated District Development Plan
IDSMT	- Integrated Development for Small and Medium town
IGMSY	- Indira Gandhi Mathruthva Sahayog Yogana
IHSDP	- Integrated Housing and Slum Development Project
ILFS	- Infrastructure Leasing & Financing Society
IMAGE	- Indian Medical association Goes Eco friendly
IP	- In Patient
IPSASB	- International Public Sector Accounting Standards Board
IPT	- Intermediate Public Transport
IRCTC	- Indian Railway Catering and Tourism Corporation
IRTC	- Integrated Rural Technology Centre
ISP	- Integrated Sanitation Program
ITC	- Industrial Training Centre
JNNURM	- Jawaharlal Nehru National Urban Renewal Mission
JSSK	- Janani-Shishu Suraksha Karyakram
JSY	- Janani Suraksha Yojana
kg	- Kilograms
KILA	- Kerala Institute of Local Administration
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
KWA	- Kerala Water Authority
KWH	- Kilo Watt Hour
LAV	- Local Assets of Value
LAP	- Local Area Plan
LCS	- Low Cost Sanitation
LDP	- Local Development Plan
LED	- Light-Emitting Diode

LIC	- Life Insurance Corporation
LIG	- Low Income Group
Lit	- Litres
LL	- Lakh Litres
LP	- Lower Primary
LPV	- Local Precincts of Value
lpcd	- Litres Per Capita Per Day
LPG	- Liquefied Petroleum Gas
LSG	- Local Self Government
LSGD	- Local Self Government Department
LSGI	- Local Self Government Institution
(M)	- Municipality
m	- Metres
m^2	- Square Metres
MCW	- Maternity and Child Welfare
MDR	- Major District Road
METIND	- Metal Industries Limited
ML	- Million Litres
MLA	- Member of Legislative Assembly
MLD	- Million Litres per Day
MoUD	- Ministry of Urban Development
MP	- Member of Parliament
MSL	- Mean Sea Level
MSME	- Micro, Small & Medium Enterprises
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
NDMA	- National Disaster Management Act
NGO	- Non-Governmental Organizations
NH	- National Highway
NHAI	- National Highway Authority of India
NHED	- Nutrition and Health Education
NHG	- Neighbourhood Group
NMAM	- Model National Municipal Accounting Manual
NNM	- National Nutrition Mission
Nos	- Numbers
NPA	- Nutrition Programme for Adolescent Girls
NRW	- Non-Revenue water
NSDP	- National Slum Development Program
NUIA	- National Institute of Urban Affairs
O&M	- Operation & Maintenance
O-D	- Origin & Destination
OG	- Out Growth
OH	- Over Head
OHSR	- Overhead Service Reservoir
OHT	- Overhead 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
PWD	- Public Works Department
R&D	- Research and Development
R-APDRP	- Restructured Accelerated Power Development & Reforms Program
RCC	- Reinforced Cement Concrete
RGGVY	- Rajiv Gandhi Grameen Vidyutikaran Yojana
RIMP	- Risk Informed Master Plan
RNCTP	- Revised National Tuberculosis Control Program
ROB	- Road Over Bridge
SC	- Scheduled Caste
SFC	- State Finance Commission
SH	- State Highway
SHG	- Self Help Group
SIC	- Spatial Integration Committee
SIDCO	- Small Industries Development Corporation
SIFL	- Steel Industrial Forgings Ltd
SILK	- Steel Industrials Limited Kerala
SIMCO	- South India Metal Company
SIPC	- Small Industries Promotion Centre
SISI	- Small Industries Service Institute
SJSRY	- Swarna Jayanti Shahari Rozgar Yojana
SPAC	- State Plan of Action for the Child
SPM	- Suspended Particulate Matter
SPEM	- State Poverty Eradication Mission
Sq. km	- Square Kilometers
SSA	- Sarva Siksha Abhiyan
ST	- Scheduled Tribe
STP	- Sewage Treatment Plant
SVL	- Sodium Vapour Lamp
SWM	- Solid Waste Management
TB	- Tuberculosis
T&CS	- Thrift & Credit Societies
THRS	- Take Home Ration Scheme
TPD	- Tonnes per day
TTI	- Teachers Training Institute
TWSS	- Town Water Supply Scheme
UA	- Urban Agglomeration
URDPFI	- Urban Development Plan Formulation and Implementation
UGD	- Underground Drainage
UIDSSMT	- Urban Infrastructural Development Scheme for Small & Medium Towns
UK	- United Kingdom
ULB	- Urban Local Body
UNESCO	- United Nations Educational, Scientific and Cultural

UP	- Upper Primary
USEP	- Urban Self Employment Program
USS	- Ultra Sound Scan
UST	- Urban Skill Training
UWEP	- Urban Wage Employment Program
V/C	- Volume to Capacity
VAMBAY	- Valmiki Ambedkar Awas Yojana
W	- Watts
WBM	- Water Bound Macadam
WPR	- Work Participation Rate
WSS	- Water Supply Scheme
W/S	- Watershed
WTP	- Water Treatment Plant

Chapter 1: INTRODUCTION

1.1 General

Urban Planning is a discipline, which synthesizes inputs from various disciplines into an integrated plan of action for shaping the natural and built environment in order to achieve a desirable quality of life in urban areas by keeping resource constraints in view. It is a technical and political process concerned with the use of land and design of urban environment, including transportation networks, to guide and ensure the orderly development of settlements and communities. It concerns itself with research and analysis, strategic thinking, architecture, urban design, public consultation, policy recommendations, implementation and management. Master plan helps in controlling, directing and promoting sound and rational development or redevelopment of an urban area with a view to achieve maximum economic, social and aesthetic benefits. It visualizes the population growth, economic development potential and ecological improvements of the town, during the plan period giving a perspective of 20-25 years.

Palakkad or Palghat is the land of Palmyras and Paddy fields. Along with Kuttanadu, Palakkad is a major Paddy growing area of the state. It is often called as the "Gateway of Kerala". Palakkad district is situated in the central part of Kerala state. The district is bounded on the North by Malappuram District, in the East by Coimbatore district of Tamil Nadu, in the South by Thrissur district and in the West by Thrissur and Malappuram districts. There are five Taluks, 163 villages, 88 Panchayats and 7 municipalities namely Palakkad, Shoranur, Ottappalam, Chittur-Thathamangalam, Pattambi, Cherpulasseri and Mannarkkad. A twenty-mile-across gap in the Western Ghats is the most striking feature of Palakkad district. The geographical area of the district is 4480 km^2 which is 11.5% of the state's area. The district is one of the main granaries of Kerala and its economy is primarily agricultural. The proximity and easy approach to Tamil Nadu have caused the blend of Malayalam and Tamil cultures here. Chittur-Thathamangalam, the twin towns located southeast of Palakkad district is in the centre of this gap.

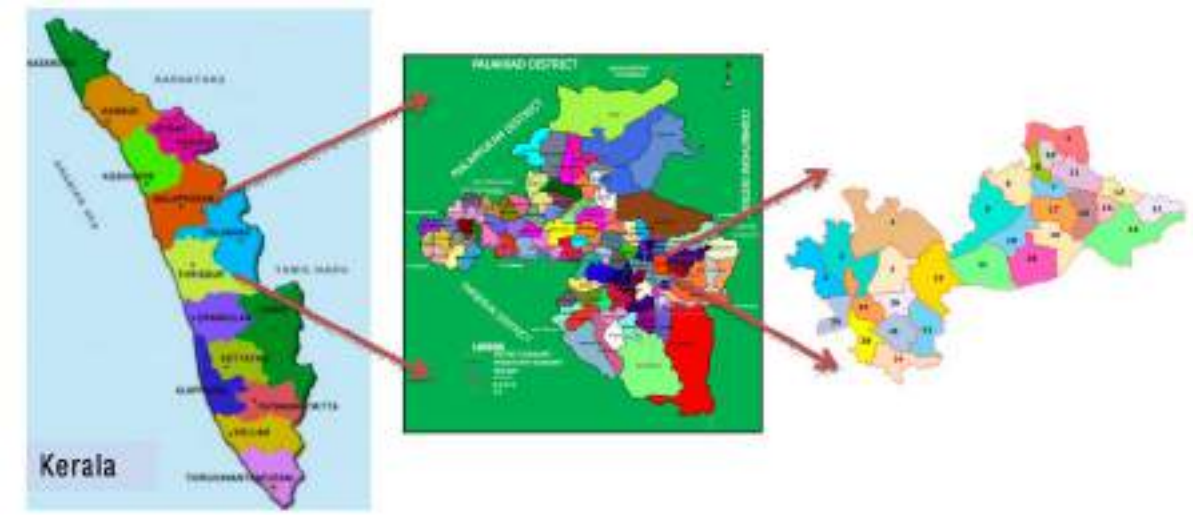

Fig 1.1 Location of Chittur-Thathamangalam Municipality

Chittur-Thathamangalam Municipality is situated in Chittur Taluk, the south-eastern taluk of Palakkad District and is the head quarter of Chittur Taluk. Chittur taluk is included in Palakkad Revenue Division. Chittur-Thathamangalam Municipality comprises of two villages, Chittur and Thathamangalam. Chittur village surrounded by paddy fields and palm groves encircled in the south and west by the river "Sokanasini" a tributary to Bharathapuzha and Thathamangalam

village on the west bank of river. An important feature of the town is the presence of different languages like Malayalam, Vellalas and Pandarams speaking Telugu, Devangas speaking Kannada, Brahmins and Chetty speaking Tamil. Location of Chittur-Thathamangalam Municipality is shown in Fig 1.1.

1.2 Earlier Planning Efforts and Studies

The earlier planning effort in this area can be addressed in two levels i.e., district level and town level.

1.2.1 District Level

The decentralized planning system was implemented in India through the 73rd and 74th Constitutional Act of India on December 1992. Accordingly, the Kerala State legislative assembly enacted the Kerala Panchayath Raj Act 1994 and the Kerala Municipality Act 1994 repealing the previous Acts. The 74th Amendment Act of the Constitution of India mandated District Planning Committee to prepare a development plan for the district. As per the Article 243 ZD of the Constitution; the District Planning Committee shall consolidate Panchayath/Municipality Plans in the district and prepare a Development Plan for the district as a whole. By realizing the above fact, Government have accorded sanction to prepare an Integrated District Development Plan (IDDP) and Local Development Plan (LDP) for Palakkad District vide Order No.354/07/LSGD dated 01.02.2007. The District Planning Committee of Palakkad decided vide decision dated 26.05.2007 to prepare an Integrated District Development Plan (IDDP) Palakkad along with local development plan (LDP) for each and every local Government in the district in an integrated manner. The District Planning Committee in its meeting held on 31.12.12 approved IDDP Palakkad. Kerala Town and Country Planning Act 2016 gives a statutory backing to the preparation of Perspective Plan for District as per section 14.

1.2.2 Town Level

Interim Development Plan for Chittur-Thathamangalam Municipality was prepared in 1997. The Development Plan aims at preparing a broad framework for future development of the town in a planned manner. The plan also aims to decongest the central area of the town by widening of existing narrow roads and providing bye-pass roads. Plan points out the location and space for different infrastructure facilities in the town. This also identifies projects which the local body can include in their annual plans for implementation. There are three Detailed Town Planning schemes covering CBD areas. Those are DTP Scheme for Central area East, DTP Scheme for Central area West and DTP scheme for Central area. Three DTP schemes were completed, and a Master Plan was drafted in 1991 with the horizon year as 2011. However, they were not sanctioned or implemented. Considering the present-day developmental activities occurring in the municipality it becomes imperative that a Master Plan should be prepared and brought into force.

1.2.3 Review of Town Planning Scheme, Review of Interim Development Plan Demography

Municipal town comprised of 24 wards and the population was 32048 (1991 Census) with a density of 2179 persons/ sq. km. The interim development plan was prepared taking base

population of Census 1991 and the population was projected for 2001, 2011. The projected total population for the year 2001, 2011 were 33779, 35614 respectively. The actual population of the town in 2001, 2011 were 31886, 32298 respectively which were lower than anticipated.

Occupational Structure

Projected WPR for 2001, 2011 were 32.76%, 33.0% respectively, but actual WPR was 36.90 % in 2001 and 40% in 2011. More thrust was given to primary and secondary sector. But workers in tertiary sector was increased to 72.89% in 2001 and then to 79.22% in 2011 as against the anticipated rate of 47.07% in 2001 and 49.10% in 2011.

Land Use

Industrial: The total industrial workers expected in 2011 were 8.41% of the total workers. Assuming a standard of 50 person/ha the area required was 19.5ha (1.36% of the total area). The total number of household workers expected in 2011 was 1200 persons. No additional area was required for functioning household industry as these industries are functioning within the residential premises.

Commercial: In the commercial sector the total number of workers expected in 2011 was 2050. 5.5 ha was earmarked for this purpose.

Table 1.1 Proposed land use in 2011 of the Draft Interim Development Plan (1997)

Sl. No.	Land use	Proposed Area in Ha (2011)	Percentage
1	Industrial	20	1.36
2	Commercial	13	0.88
3	Mixed use	55	3.74
4	Transport & Communication	54	3.68
5	Water bodies	111	7.55
6	Agricultural area	658	44.73
7	Public & Semi Public	52	3.54
8	Residential	502	34.12
9	Mixed use	6	0.4
	Total	**1471**	**100**

Traffic & Transportation: The total area of the existing roads in 1991 was 40.33 ha. It was proposed to widen some of the existing roads and to provide some new roads. A total area of 52 ha was earmarked for the road development of the town.

Water bodies: It was proposed to retain all the water bodies without developing this for any other uses. The total area under this category was 111 ha. The existing area of water bodies in the municipality is 98.7 ha.

Agricultural: The total number of agricultural workers expected was 4176 in 2011. An extent of 658 ha (44.73% of the total area) was earmarked for this purpose.

Public and Semi-Public: Area required for other services which includes activities such as schools, hospitals, public and Semi-Public offices, library, community halls, burial grounds, religious institutions and civic infrastructure were expected to be 52 ha.

Residential: An area of 502 ha was earmarked for residential purposes.

Projects

The following projects were identified to be implemented during the plan period in the municipality on priority basis.

1. A mini-industrial area of 2.50 ha was proposed near to PENCOS industrial area. Project was not implemented.
2. A mini slaughterhouse was planned in Chittur college compound. Project was not implemented. But municipality has now proposed a new slaughterhouse at Parakkalam.
3. A garbage dumping yard with an area of 1 ha was planned at Aryampallam. This dumping yard of the municipality is having an extent of 38.74 cents. But the municipality has set up a new dumping yard in Parakkalam (Chembakasseri Ward). Very recently the municipality has installed a solid waste treatment plant at a cost of 78.63 lakhs designed by IRTC.
4. Housing scheme of 1 ha for LIG were planned in Chembakasseri ward but was not implemented so far.
5. The weekly market at Thathamangalam was proposed to be developed by acquiring 0.4 ha of land. A market was developed near Thathamangalam bus stand in 0.18 ha of land.
6. An area of 0.5 ha was proposed for a bus terminal in Thathamangalam. Bus stand was developed in another location in Thathamangalam in 0.62 ha of land. A bus stand was proposed in Chittur in 1 ha of land along the side of Chittur bypass. But it was not implemented.
7. Since there was no permanent lorry stand in Chittur to park vehicles coming from neighbouring states and districts, a lorry stand at Anikode was proposed. It was proposed to acquire 1 acre of land along the side of Chittur bypass for this scheme. But it was not implemented.
8. An area of 0.50 ha was earmarked for a market in Chittur along the side of Chittur bypass. But it was not implemented.
9. An area of 0.40 ha was earmarked for a town hall near Nehru theatre. The existing Nehru theatre is now converted to Nehru auditorium.
10. A working women's hostel was proposed in 0.3 ha of land in Chittur, but it was constructed in 0.13 ha of land in Thathamangalam.
11. A park of 1.50 ha and a stadium of 5 ha was planned at Chittur but neither of them was implemented.

The following bypass roads were proposed in the earlier draft:

1. Kozhikkada - Mettupalayam bypass: This proposed road of 21 m width for bypassing heavy vehicle traffic from Thathamangalam town area. It is proposed to reduce the traffic congestion due to the narrow width of the existing main road, but it was not implemented.

2. High School - Hospital Junction bypass: This proposed road of 21 m width connecting High School Junction and Hospital Junction serve the purpose of bypassing heavy vehicle traffic from Chittur town area. The lorries from Coimbatore to Chittur town can be diverted, without hindrance to the town roads.

3. Beena Theatre - Kacherimedu bypass: The road connecting Beena Theatre to Kacherimedu is having a width of 21 m for easy movement of vehicles from Palakkad to Coimbatore without entering the busy town.

Junction improvements were planned at major intersections as the pedestrian traffic is very difficult in these narrow Junctions especially during the morning and evening hours. Widening of the hospital Junction was proposed, but still the Junction remains narrow and congested.

Review of DTP Schemes in Chittur-Thathamangalam Municipality

There are three published DTP schemes in Chittur-Thathamangalam Municipality and the location of them are shown in Fig 1.2. Those are DTP Scheme for Central area, DTP Scheme for Central area (West) and DTP Scheme for Central area (East).

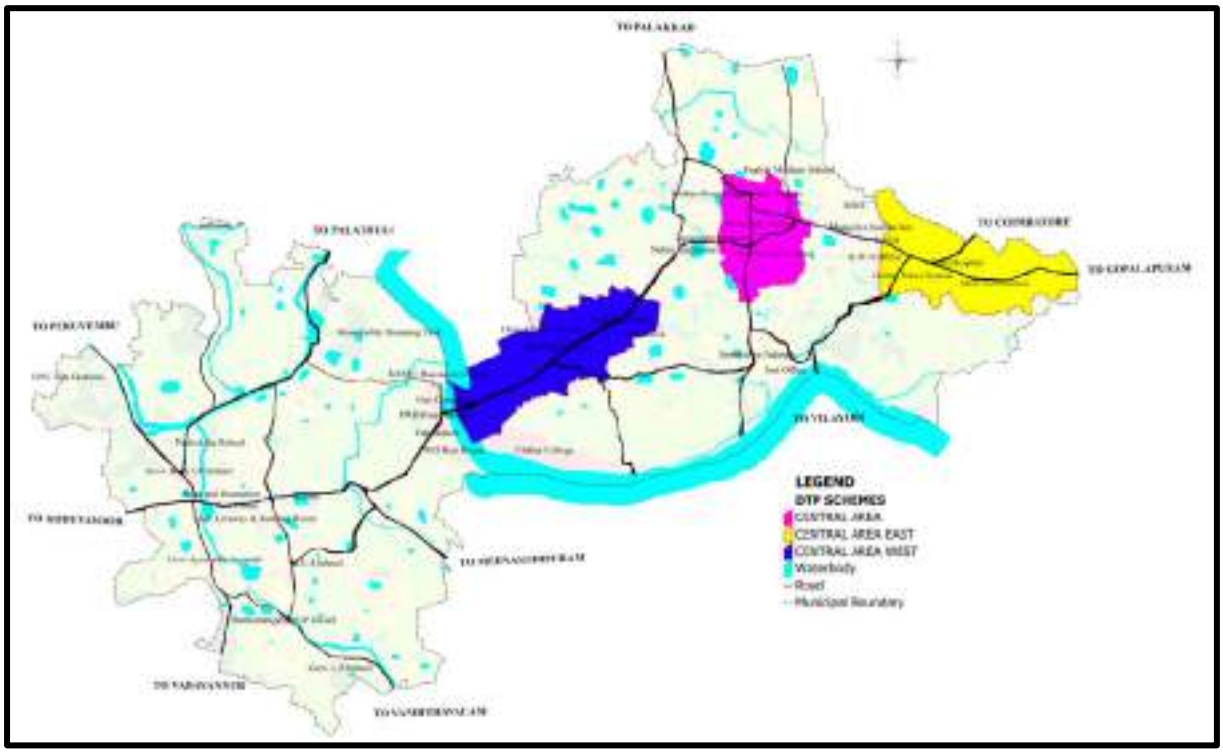

Fig 1.2 Location of DTP schemes in Chittur-Thathamangalam Municipality

DTP Scheme for Central Area

DTP scheme for Central area was prepared in 1997. The area of scheme is 40 ha and includes CBD area of town. The major objective of this scheme is the planned development of central area of town. The scheme envisaged a city centre with all commercial and shopping activities to cater the entire town. Major road proposals are widening of Chittur Nattukal road to 18 metre upto Anikode Junction and 12 m for the remaining stretch and proposal for development of a lorry stand on the side of proposed 12 m link road. None of the road proposals of the DTP scheme are developed till now.

DTP Scheme for Central Area East

DTP scheme for Central area East was also prepared in the year 1997. The area of scheme is 68.32 ha and includes CBD area of town including petrol pump Junction and Hospital Junction. The major objective of this scheme is the planned development of central area of town. Major road proposal is a bypass road 21m wide for Chittur Nattukal road in order to avoid the traffic congestion in the area but it was not implemented.

DTP Scheme for Central Area West

DTP scheme for Central area West was also prepared in the year 1997. The area of scheme is 76.08 ha and includes municipal office, major government offices and educational institutions. The major objective of this scheme is the planned development of these areas. Major road proposal is the widening of Chittur Nattukal road to 21m but it was not implemented.

1.3 Need for Master Plan

Chittur-Thathamangalam Municipality is one among the seven municipalities of Palakkad district and functioning as Chittur Taluk headquarter. Chittur-Thathamangalam town is also a regional centre for people in the surrounding rural areas and thus provides facilities to support them. The town centre is presently seen lacking appropriate and effective planning and urban design strategies to support and attract further growth and investment.

This town is connected by Thathamangalam – Chittur – Nattukal Road (SH 25), Palakkad – Koduvayur – Thathamangalam – Meenakshipuram Road (SH 27), Chittur – Vannamada Road (MDR 312) and Palakkad – Chittur road.

Chittur-Thathamangalam Municipality does not have a sanctioned Master Plan. Municipality has an Interim Development Plan prepared by Department of Town Planning, Kerala in 1997 with a horizon period up to 2011. There are three Detailed Town planning schemes prepared but not published. Hence there is a dire need for a comprehensive Master Plan that provides an overall vision to guide future development of town by wiping out the deficits in urban infrastructure, mining the problems and exploring the potential of town.

1.4 Legal Framework for Master Plan

As per The Kerala Town and Country Planning Act 2016 in force in the state, notwithstanding anything contained in the Kerala Municipality Act, 1994 or the Kerala Panchayath Raj Act 1994, the Municipal Corporation, Municipal Council, Town Panchayath or Village Panchayath shall have the following additional function “Prepare or get prepared a Master Plan for the Local Planning area”. It contributes sufficient statutory backing to the preparation of Master Plan for town. As per G.O. (Rt.) No.1376/2012/LSGD dated: 17.05.12 Administrative Sanction and Financial Sanction was accorded for the implementation of the second phase of the Scheme of preparation of Development Plans and Detailed Town Planning Schemes which includes Chittur-Thathamangalam Municipality. The Municipal Council has taken resolution to prepare Master Plan for the town as per resolution No.24 dt 20.12.2012.

1.5 Methodology

The standard process that is adopted while preparing all Master Plans in Kerala which was followed by the Town Planning Dept in the formulation of the Draft Master Plan 2031 for Chittur-Thathamangalam town is outlined below. It must be noted that the indirect participation method was used in the plan formulation process for this Draft Master Plan 2031. The Municipality felt that that direct public participation was necessary and accordingly, there was an extensive public consultation process that was conducted after the Draft Master Plan 2031 was published, which is detailed out below in Section 1.7.

With the help of guidelines issued by the government of Kerala in the title "Scheme of preparation of Development Plans" the Master Plan preparation process can be divided into many steps listed as follows:

As the first step, existing town planning schemes are to be evaluated to justify the need for a new Master Plan. A seminar on development can help to analyse stakeholder's context on the plan.

1.5.1 Preliminary Efforts

- Constitution of SIC
- Delineation of planning area
- Collection of cadastral maps
- Global Position System (GPS) Survey
- Preparation of Digitized maps

1.5.2 Data Collection and Compilation

Two types of data collection are involved.

- **Primary data:** Primary data collection involves land use survey, socio economic survey and traffic survey.
- **Secondary data**: Secondary data collection involves sectoral data collection by SIC through working groups.
- **Data Compilation**: Collected data is compiled in specified format so as to make the analysis easy.

  The responsibility of secondary data collection and compilation vest with the SIC. The process of data collection and compilation may be enriched and monitored by conducting a series of workshops. The District Town Planner shall ensure that the data collection and compilation are completed within the stipulated time frame even if the SIC fails to accomplish the task within the said time frame.

1.5.3 Analysis

Two types of analysis are done:

Local analysis: The objective of Local Analysis is to analyze the development trend of each sector, its potential and development problems associated with each sector. It also includes a

study on peoples' development aspirations from the earlier development reports. SIC has the responsibility of local level analysis. The process of local analysis may be enriched and monitored by conducting series of workshops.

- **Spatial analysis**: The spatial analysis focuses upon regional setting of the settlement as well as the distribution pattern of activities & population, land use and infrastructure network within the local body.

The findings of both the analysis and findings from the urbanization study of the district are then integrated to facilitate the envisioning process.

1.5.4 Envisioning Process

The outcome of the envisioning process comprising of setting up of goals and objectives, formulation of development concept and formulation of policies and strategies is the integrated development vision of the planning area.

Setting up of goals and objectives:

The major development problems and potential of planning area will be clear from the consolidated findings of the analysis. Accordingly, the development goals and objectives will be formulated.

Formulation of Development concept

A Master Plan has to look into the development perspective of the area for a future period. This is accomplished through the formulation of development concept of the area.

Formulation of policies and strategies

General Development Policy based on the development concept is formulated. Then sectoral policies and strategies are framed inconformity with the general policy. The development concept and sectoral policies are presented in the council which is then finalized by taking the feasible suggestions of the council into account.

1.5.5 Detailing

Projected Requirements

The future requirements in each sector are assessed in this step. Inter-sectoral integration is also ensured while assessing the future requirements in each development sector.

Sectoral Detailing, Land Use Planning

Sectoral development suggestions are formulated to achieve the projected requirements. Detailing is a joint activity of both Town and Country Planning Department and SIC. A proposed land use plan is also prepared with zoning regulations.

Draft Plan and its Legal Processing

The following statutory steps have been enjoined in the Kerala Town and Country Planning Act 2016 with regards to the preparation, publication and regulation aspect of a Master Plan.

Section 36 (1) of the Kerala Town and Country Planning Act 2016 envisages that the Municipal Council may, by a resolution decide to prepare a Master Plan in respect of the area under its jurisdiction or part thereof.

As per section 36(2), the Municipal council should prepare or get prepared a draft Master Plan. Draft Master Plan has to be forwarded along with Council resolution to government. As per section 36 (3) Government on receipt of Master Plan in consultation with Chief Town Planner accord approval for publication within a period of 60 days from the date of receipt of draft Master Plan.

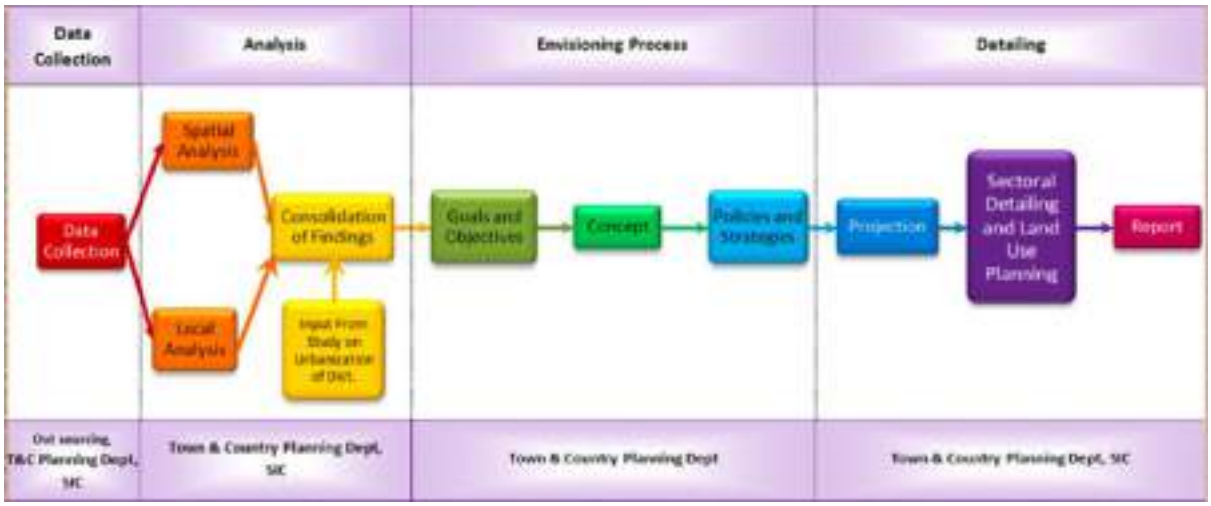

Fig 1.3 Stages and responsibilities of Master Plan preparation.

As per section 36(4), Municipal Council within a period of 60 days from the date of receipt of approval for publication, publish the same in the website and a notice of publication in the official Gazette and in at least two newspapers having wide circulation within Municipality (one must be Malayalam newspaper) inviting objections and suggestions to be submitted within 60 days from the date of publication of notice specifying the place or places where a copy shall be available for inspection by the public.

Immediately after publication of the Master Plan, a copy of Master Plan should be forwarded to District Planning Committee for their remarks as per section 36(5). As per section 36(6), Municipal Council shall appoint a special committee formed under section 32. Special committee shall process the objections and suggestions and hear all such persons who have made request in writing or being so heard and submit report in prescribed format to Municipal Council.

As per section 36(7), Municipal Council within a period of 60 days from the date of receipt of report of Special Committee approve the Master Plan with or without modifications as may be considered necessary and shall forward Master Plan together with objections and suggestions, report of special Committee and the recommendations to Government for Sanction.

As per section 36(8) within a period of 60 days from the date of receipt of Master Plan, government may accord sanction to the plan after ensuring compliance with the provisions of perspective plans or any other plans prepared under the Act and publish a notice in the official Gazette intimating the fact of sanction of Master Plan. Government may obtain technical remarks from Chief Town Planner to ensure compliance with plans under the Act. If the Master Plan is returned for incorporating modifications suggested by Government, the same shall be resubmitted within 90 days to Government for sanction as if plan is submitted afresh.

As soon as Master Plan has been sanctioned by the Government, Municipal Council shall forward a copy to District Planning Committee and shall publish a notice regarding sanction of Master Plan by Government and in at least one newspaper specifying the place or places where a copy shall be available for reference or sale. Sanctioned Master Plan or its extract shall be published in the website of Municipality.

1.6 Community Involvement

There can be no meaningful development in any society, if the people themselves are kept out of the planning process. Peoples' participation, therefore, is essential and must be introduced at relevant stages in the planning process. To "listen to the people" both to understand their needs and to assess how their lives are actually being affected by development projects and policies are important. The direct participation can be through individuals, citizen groups, neighbourhood groups, business groups, consumer groups, and such other groups. NGOs and CBOs can also play a vital role as an intermediate link between the people and the government. The suggested indirect participation of the people is ensured through elected representatives in the Municipal Council / Corporation and Ward Committees (74th CAA). This kind of participation has appropriately been provided in the plan formulation process.

It should be mandatory to present the salient features of a Master Plan in a public meeting, organized by the local authority just after the public notice inviting their comments and suggestion before its approval.



Fig 1.4 Photo of Development Seminar

The indirect method adopted for the preparation of Master Plan ensured limited community involvement at various stages of preparation of the Draft Master plan. In the meeting conducted on 20/ 12/2012, the Spatial Integration Committee was formed with Municipal Chairman as the Chairman of the Committee. Municipal Secretary and Municipal Engineer were appointed as Convenor and Joint Convenor respectively. Other members of the Committee were working

group Chairman and District Town Planner. Sri. Narayanankutty was chosen as the resource person of the Spatial Integration Committee.

Separate planning team was created in the District Town and Country Planning Office under the leadership of Deputy Town Planner. As per the discussions conducted with the Spatial Integration Committee, various surveys and data collection were carried out. Development seminar was conducted on 5/2/2013. Land use and socio-economic surveys were completed, and traffic and transportation survey and study work were undertaken with the technical support of NSS College of Engineering, Palakkad. The Municipal Council made various suggestions to incorporate in the Master Plan of Chittur-Thathamangalam town. The draft Master Plan was discussed with Municipal Chairman and Councillors prior to the submission to Chief Town Planner for vetting.

1.7 Publication of Draft Master Plan 2031

Based on Government Order no. 1376/2012/LSGD dt. 17.05.2012, the Chittur-Thathamangalam Municipal Council passed a resolution (no. 24) on 20.12.2012 to prepare a Master Plan for the town. Subsequently a draft report and suggestions were presented to the Council on 30.07.2014 by the Town Planning Dept. Thereafter, the Council formed a sub-committee which submitted its suggestions on 20.08.2014. This was discussed by the Council in its meeting held on 27.09.2014 and suggestions were decided (resolution no. 7) to be passed on to the Town Planner. Subsequently a modified draft report that included these suggestions was once again submitted to the Chittur-Thathamangalam Municipal Council on 03.06.2016. After technical examination and site visit by the CTP, draft report and maps were submitted to the Chittur-Thathamangalam Municipal Council on 20.07.2018 for approval and for submission to the Government seeking permission for publication. The Council approved the Draft Master Plan in its meeting held on 29.08.2018 and decided to submit the draft plan to the Government seeking permission to publish the plan (resolution no. 5).

There was a delay of more than two years between the resolution taken by the Council to prepare a Master Plan (on 20.12.2012) and the submission of the draft plan to the government seeking permission to publish (29.08.2018). Hence, the Council was asked to pass a fresh resolution to prepare a Master Plan and this resolution was adopted in the meeting of the Council held on 30.12.2019 (resolution no. 6). Subsequently, permission to publish the draft Master Plan was provided vide GO no. 79/2021/LSGD dt. 26.02.2021 and the Draft Master Plan 2031 and maps were made available.

The next section details out the extensive public consultation process that the Chittur-Thathamangalam Municipality conducted after the Draft Master Plan 2031 was published inviting suggestions/objections from the public

1.8 Draft Master Plan 2031 – Public Consultation and Revision

When the new Council took over in 2021, the request seeking permission to publish the Draft Master Plan 2031 had already been submitted to the government by the previous council. This permission was granted and the responsibility to publish the Draft Master Plan 2031 in the Gazette inviting suggestions and objections from the public fell on the new council; so it was published on 18 October 2021.

As stipulated by the Kerala Town Planning Act 2016 (Section 36-6), the Municipality constituted a Special Committee (resolution no. 26) on 28.10.2021 (from here on called the Master Plan Sub-Committee) to support the public consultation process, conduct in-person hearings and to prepare and submit the Objections-Suggestions Review report. The Municipality also constituted a Master Plan Expert Committee (resolution no. 33) on 29.11.2022 to advise on the content as well as on the wider aspects of the planning process in Chittur-Thathamangalam Municipality.[1] With the financial support from Kerala Institute for Local Administration (KILA) one local planning coordinator and one urban planner were appointed to support the various stages of this process in Chittur-Thathamangalam Municipality.[2]

This process started in the middle of the Covid lockdown and social distancing regulations during the end of 2021 and beginning of 2022. The Town Planning Department submitted one copy of the Draft Master Plan Report and maps to the Municipality. The Municipality, decided to reach out to people in Chittur-Thathamangalam Municipality and devised and implemented an extensive public consultation and participatory process that eventually lasted over 10 months divided into roughly three stages.

1.8.1 Stage 1 – Public Consultation

In the first stage, the plan document was uploaded onto social media (Facebook page) inviting objections, suggestions and comments from people and also with a request to distribute widely among the people of Chittur-Thathamangalam Municipality.

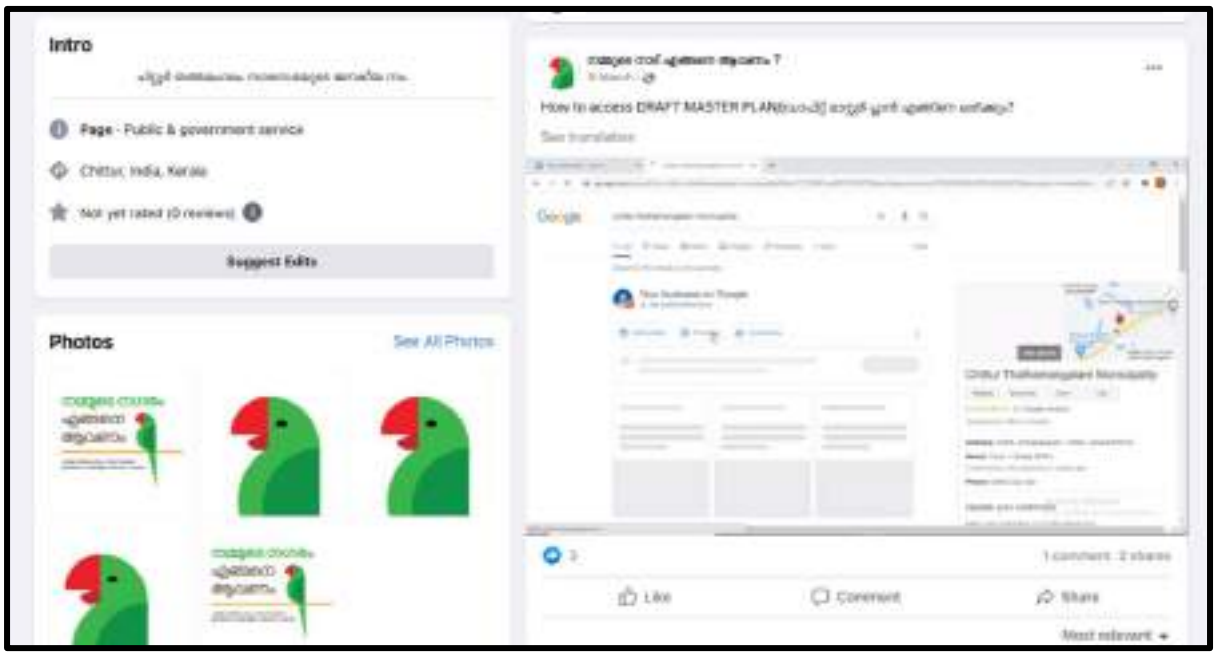

Fig 1.5 Facebook page: https://www.facebook.com/profile.php?id=100081125246624

This was followed by Ward Sabha meetings, which were held online, between February 12 and February 17, 2022, due to Covid lockdown restrictions informing people of the publication of

[1] The two-member committee members – Dr. Malini Krishnankutty, IIT-Bombay and Dr. Jayaraj Sundaresan, based at London School of Economics and Political Science

[2] Anupama Sivaram (M. Plan), joined in February 2022, and Shilpa Sojan (M. Plan), joined in September 2022.

the Draft Master Plan and inviting objections/suggestions. Once Covid restrictions were relaxed, the first physical public meeting to discuss the Draft Master Plan was called on 17 February 2022, where the salient points of the published plan were presented by the Town Planning Department. After the lockdown restrictions were lifted, nine, in-person, Ward Cluster (grouping the 29 municipal wards into 9 clusters) meetings were held on the 17th, 18th and 19th March 2022. In these meetings, the Local Planning coordinator, advisors and officials explained to the people gathered the following: the meaning of, reason for and the importance of planning, salient features of the Kerala Town Planning Act 2016, content and process of the Draft Master Plan 2031 and how to read the maps and the report. The details of the Plan proposals were explained to people in detail using a copy of the document, enlarged maps and figures, including the proposed road network, existing and proposed land use plans and the list of proposed projects, among others. Importantly, all discussions were conducted in Malayalam. Approximately, 316 people attended these Phase 1 meetings in-person. Comments from these meetings were recorded/minuted. People's questions about the content and process of the plan were answered using the information from the document. People were also encouraged to write and submit their objections, suggestions and comments to the Municipal Secretary either in free format or using the prescribed objections-suggestions form, which were distributed widely during these meetings. Given below are the photos from these meetings.



























Fig 1.6 Photos from the nine in-person Cluster Meetings held in March 2022

Through this process, the Municipality received an overwhelming 1123 responses in the form of objections, suggestions and comments through in person, post, emails, and social media. These comments were recorded and collated methodically based on the relevant and recurring themes and common objections and suggestion themes.

Objections and suggestions were filed by 1) individuals within Chittur-Thathamangalam Municipality who are affected by various aspects of the Draft Plan, 2) institutions and associations that represent thousands of individuals like the Vyapari Vyavasi Ekopana Samithi, outlining how their members are affected by the Draft Plan and what they propose as a collective, 3) institutions whose properties and assets are affected by the Draft plan, like the Thathamangalam Mosque Committee or various temple committees, and, 4) experts and planning specialists from Chittur, Palakkad and other parts of India, like Mr. Arun Narayanan, (Convenor, INTACH Palakkad), Dr. Malini Krishnankutty (IIT Bombay and TISS Mumbai), Dr. Jayaraj Sundaresan (London School of Economics and Political Science) and Mr. Sreekumar K., (Program Head - Transport, World Resource Institute India) among others.

After the closing date for receiving objections and suggestions, the Municipality invited people who filed objections and suggestions for an in-person hearing. These were held on the 12th, 25th, 26th and 27th of July 2022 and were attended by 455 people of all ages and gender and from diverse socio-economic groups.













Fig 1.7 Photos from the Public Hearings held in July 2022

From this first phase of public consultation process, it became clear that people felt that the published Master Plan for Chittur-Thathamangalam Town 2031 (Draft) (hereinafter referred to as Draft Master Plan 2031) was based on spatial and socio-economic data that was outdated, it had many significant errors and that its template proposals failed to address specific issues and opportunities of the town. More importantly, it attracted vehement opposition from people due to the direct impact and extensive damage that the transport proposals - that they viewed as inappropriate - would cause to their lives, livelihoods, property, environment, and the future of Chittur-Thathamangalam Municipality.

In order to account for the delays caused by Covid lockdown towards the end of 2021 and in the beginning of 2022, as recommended by the people, the Municipality (via Special committee resolution 26; dated 28.10.2021) requested the government for a six-month extension. This was to enable them to have enough time to examine in detail the high volume of vehement public objections (1123 in total) on various aspects of the Draft Master Plan 2031, then conduct in-person public hearings, as well as assess the nature of public objections and suggestions.

1.8.2 Stage 2 – Focus Group Discussions

This extension also helped Chittur-Thathamangalam Municipality to implement the second stage of public consultation and participatory planning process as mandated by the Kerala Town Planning Act 2016 (Section 34) that the Draft Master Plan 2031 had conducted cursorily, through the indirect mode. Through a series of Focus Group Discussions, Chittur-Thathamangalam Municipality reached out to its people across ages, groups and gender, working in various sectors and sought to understand the issues and problems they face, their aspirations, ideas and imagination for the first Master Plan for Chittur-Thathamangalam Town.

The Municipality conducted twenty Focus Group Discussions (FGDs) between 23.6.2022 and 28.10.2022, on various themes including children's needs, education, gender, ecology, sanitation, employment, mobility and so on, attended by more than 550 people. These meetings were recorded, minuted and salient points transcribed to be analysed and incorporated into the Master Plan Sub-Committee report of the objections/suggestions received. Many ideas

emerged from these meetings that are unique to the issues that people in Chittur-Thathamangalam town face and that need non-template solutions.










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Fig 1.8 Photographs from Focus Group Discussions

1.8.3 Stage 3 – Participatory Planning

Following the public consultations mentioned above, a third and final stage of public participation, was organised at the end of the Focus Group Discussions as a three-day workshop, in order to deliberate on the issues that emerged and to develop salient features of a place-specific Master Plan as the Suggestions Report. This workshop, called the Master Plan Shilpashala, was held on 14th, 15th and 16th October 2022, and was inaugurated by the Hon. Minister for Local Self Government, Shri. M.B. Rajesh. It also convened 15 planning experts from across the country with 186 people from Chittur-Thathamangalam Municipality, to deliberate on the main aspects of a 20-year Master Plan for the town. Through this workshop, priority sectoral projects and policies were consolidated by integrating 1) expert sectoral understanding and experience, 2) peoples' aspiration and ideas (represeted through diverse viewpoints of the participants, objections and suggestion letters, FGDs, in-person hearings) and 3) already ongoing projects in the town, state government missions, national government missions,[3] various other law and judicial rulings,[4] and international campaigns and guidelines.[5]



Fig 1.9 Hon. Minister for Local Self Government, Shri. M.B. Rajesh inaugurating the Chittur-Thathamangalam Master Plan Shilpashala

[3] Amrut 1 & 2, Hriday, Swacch Bharat

[4] National Green Tribunal Ruling on Buffer Zones

[5] UNSDGs, Wetlands conservation/guidelines, water, ecology etc.



Fig 1.10 Participants of the workshop on site visits








RISING HEAT
WATER BODIES
WATER BUDGET
WATER BODIES
ENVIRONMENT
WASTE MANAGEMENT
BIO-DIVERSITY
POLICY DECISION
HEALTH
IMPLEMENTATION



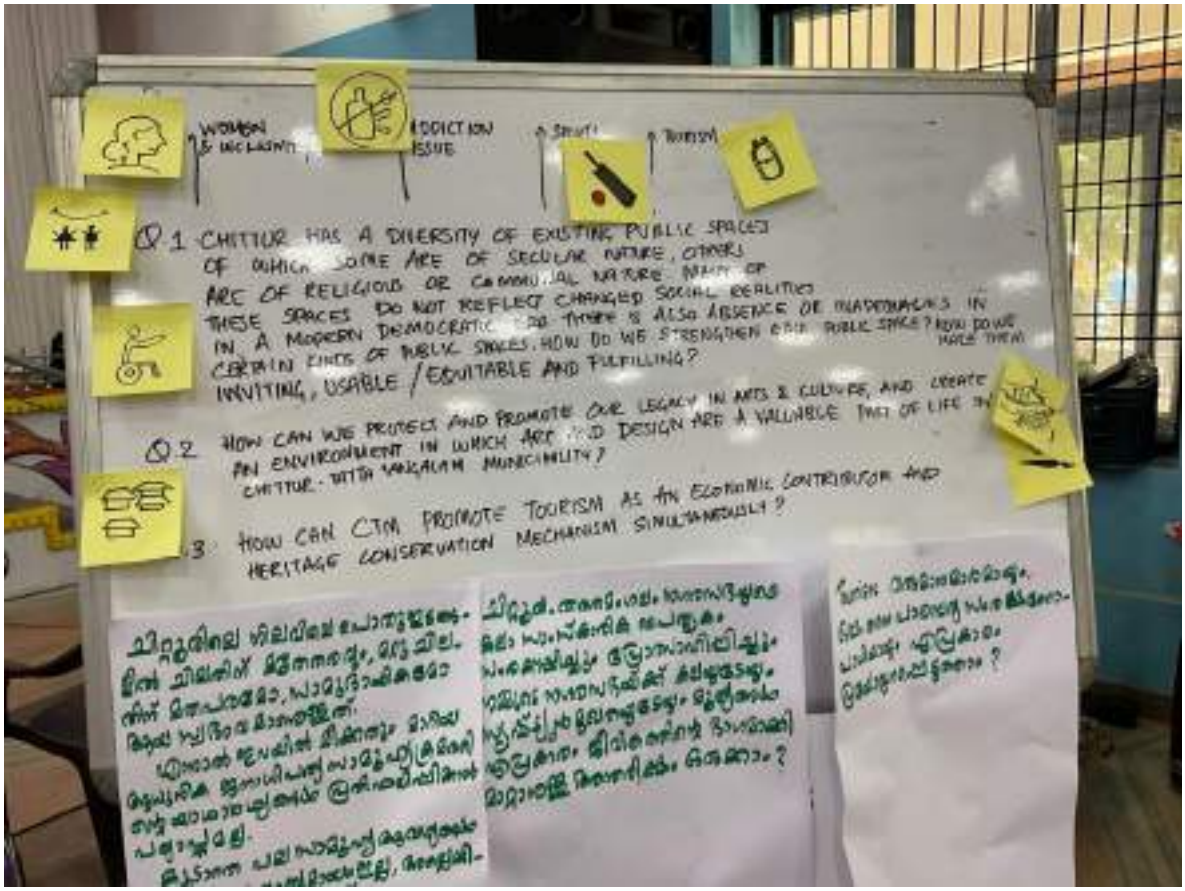

WOMEN
ADDICTION ISSUE
TOURISM
Q1 CHITTUR HAS A DIVERSITY OF EXISTING PUBLIC SPACES
OF WHICH SOME ARE OF SECULAR NATURE, OTHERS
ARE OF RELIGIOUS OR COMMUNAL NATURE MANY OF
THESE SPACES DO NOT REFLECT CHANGED SOCIAL REALITIES
IN A MODERN DEMOCRATIC SO THERE IS ALSO ABSENCE OF MARGINALS IN
CERTAIN KINDS OF PUBLIC SPACES. HOW DO WE STRENGTHEN OUR PUBLIC SPACE? HOW DO WE
INVITING, USABLE / EQUITABLE AND FULFILLING?
Q2 HOW CAN WE PROTECT AND PROMOTE OUR LEGACY IN ARTS & CULTURE, AND CREATE
AN ENVIRONMENT IN WHICH ART AND DESIGN ARE A VALUABLE PART OF LIFE IN
CHITTUR - WITH VARIALAM MUNICIPALITY?
Q3 HOW CAN CTM PROMOTE TOURISM AS AN ECONOMIC CONTRIBUTOR AND
HERITAGE CONSERVATION MECHANISM SIMULTANEOUSLY?





Fig 1.11 Photographs from the 3 days Chittur-Thathamangalam Master Plan Shilpashala

Through this three-stage process it is estimated that Chittur-Thathamangalam Municipality has reached out to and involved more than 1500 people from within Chittur-Thathamangalam Municipality to comment on the Draft Master Plan 2031and propose suggestions.

Master Plan Sub-Committee members collated and analysed the extensive information (supported by local planning coordinators and Master Plan Expert Committee members) by,

1) going through each one of the objections/suggestions received, 2) grouping them together using common themes, 3) identifying the extent and nature of objections/suggestions, 4) examining objectors' claims through analysis of details of plan document (internal validity), site conditions using experts and robust documentation methods (external validity), including documenting the existing land use, independently analysing the impact of road widening and road proposals along with the objections. From the analysis, it became clear that people of Chittur and Thathamangalam have vehemently objected to most of the proposals in the Draft Master Plan 2031 advancing clear rationale.

The Master Plan Sub-Committee held a meeting on 19 November 2022 and unanimously approved the Report of the Master Plan Sub-Committee to be submitted to Chittur-Thathamangalam Municipality. Subsequently, the report was submitted on 21 November 2022. The Council endorsed the Master Plan Sub-Committee recommendations that the Draft Master Plan 2031 be modified significantly while retaining any appropriate data and enabling salient policy proposals from that document. Accordingly, the Master Plan Expert Committee was tasked with appropriately modifying the Draft Master Plan 2031 for Chittur-Thathamangalam Town.

The Municipal Council approved the Master Plan 2042 vide Resolution No. 1 dated 10.01.2023 and forwarded it to Government seeking permission to publish. After due scrutiny, the government conveyed its recommendation to 'republish' the Plan with minor modifications vide letter reference no. RD 2/114/2023/LSGD dated 30.07.2023. Accordingly, the Municipal Council decided to request the help of the Master Plan Expert Committee in its meeting dated 30.09.2023, to modify the plan as appropriate and submit to the Council, to start the process of republication. The modified Plan document was submitted to the Chairperson of the Municipal Council on 01.03.2024.

Chapter 2: PROFILE OF TOWN

2.1 Location

Chittur-Thathamangalam Municipality is situated in Chittur Thaluk, the South-Eastern thaluk of Palakkad district. Located at 10° 42' N latitude and 76° 44' E longitude and at an altitude of 115 m above MSL. The municipality is located at the centre of 32 km wide Palakkad gap. The municipality consists of two small towns Chittur and Thathamangalam, situated on the east and west banks of Sokanasini Puzha (Chittur Puzha), a tributary of Bharathapuzha. Palakkad which is the district headquarters lies 17 km west of Chittur-Thathamangalam Town. Other towns in the District Shoranur, Ottappalam, Pattambi and Cherpulassery are located 62 km, 48 km, 72 km, 60 km west of Chittur-Thathamangalam Town respectively and Mannarkkad located 55 km northwest of Chittur-Thathamangalam Town.

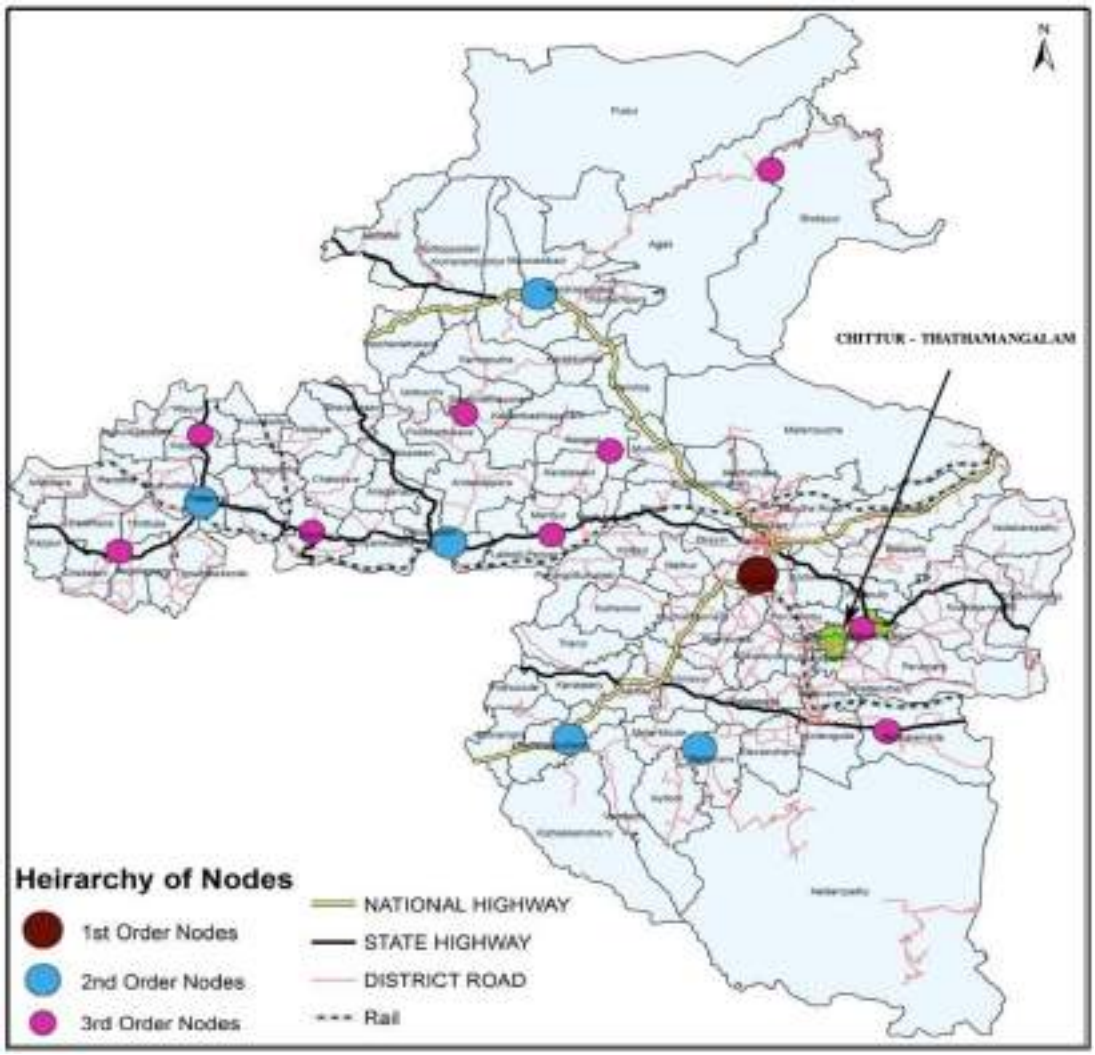


Fig 2.1 Connectivity of Chittur-Thathamangalam Town with other towns in District
Source: IDDP, Palakkad

The district is bounded on north-west by Malappuram district, on south-west by Thrissur district and on the east by Coimbatore, which is one of the largest towns of Tamil Nadu. The municipality is bounded by Peruvemba Panchayat and Polpully Panchayat in the North, Nalleppilly Panchayat in the East, Pattenchery Panchayat and Perumatti Panchayat in the South and Peruvemba and Pudunagaram panchayat in the West. Boundaries of Chittur-Thathamangalam Municipality is shown in Fig 2.2.

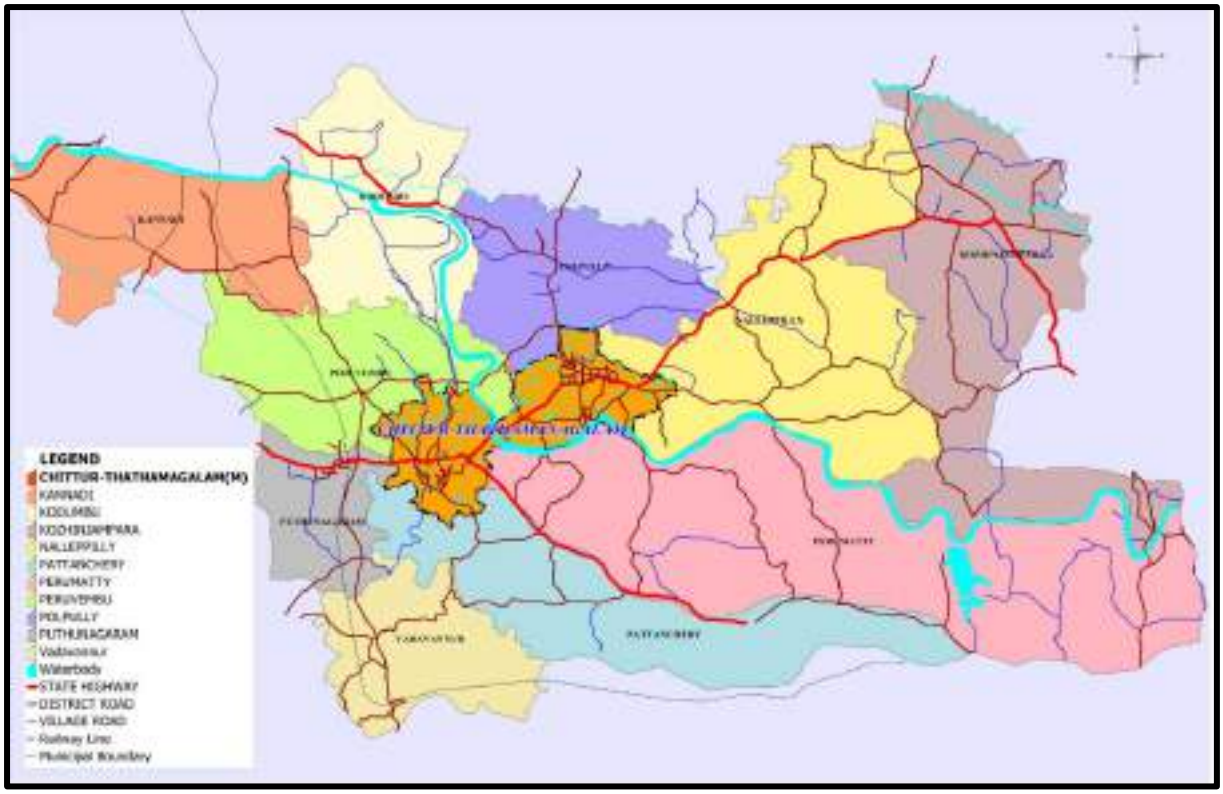


Fig 2.2 Boundaries of Chittur-Thathamangalam Municipality

2.2 Area, Administrative Divisions

The municipality is having an area of 14.71 sq. km. and a population of 32298 as per Census 2011. This is an area comprising of two revenue villages, Chittur and Thathamangalam. Chittur-Thathamangalam is a residential town blessed with its natural beauty of paddy fields, palmyra and coconut trees. Chittur-Thathamangalam municipal area is a part of Chittur constituency of Kerala Legislative Assembly and a part of Alathur constituency of Lok Sabha. As per the 2011 Census, there were 26 wards. For the study and analysis, 29 wards as of now are considered. The spatial location of 29 wards of Chittur-Thathamangalam Municipality is shown in Fig 2.3. Ward number and names of wards are shown in Table 2.1.

Table 2.1 Number and names of wards in Chittur-Thathamangalam Municipality

Ward No:	Ward Name	Ward No:	Ward Name	Ward No:	Ward Name
1	Cherumkode	11	Kannanthara	21	College
2	Pattani Street	12	Kosathara	22	Banglaparambu
3	Arangam	13	Kacherimedu	23	Paruthikkavu
4	Chembakassery	14	Aryampallam	24	Kammanthara
5	Ambattupalayam	15	Devangapuram	25	Mannathukavu
6	Muthukadu	16	Valmutty	26	Srikurumbakavu
7	Kadambidi	17	Anikodu	27	Kadavalavu
8	Vadakathara	18	Thekegramam	28	Gramam
9	Naramkuzhi	19	Tharakalam	29	Mettuvalavu
10	Kizhakethara	20	Kunnathupalayam		

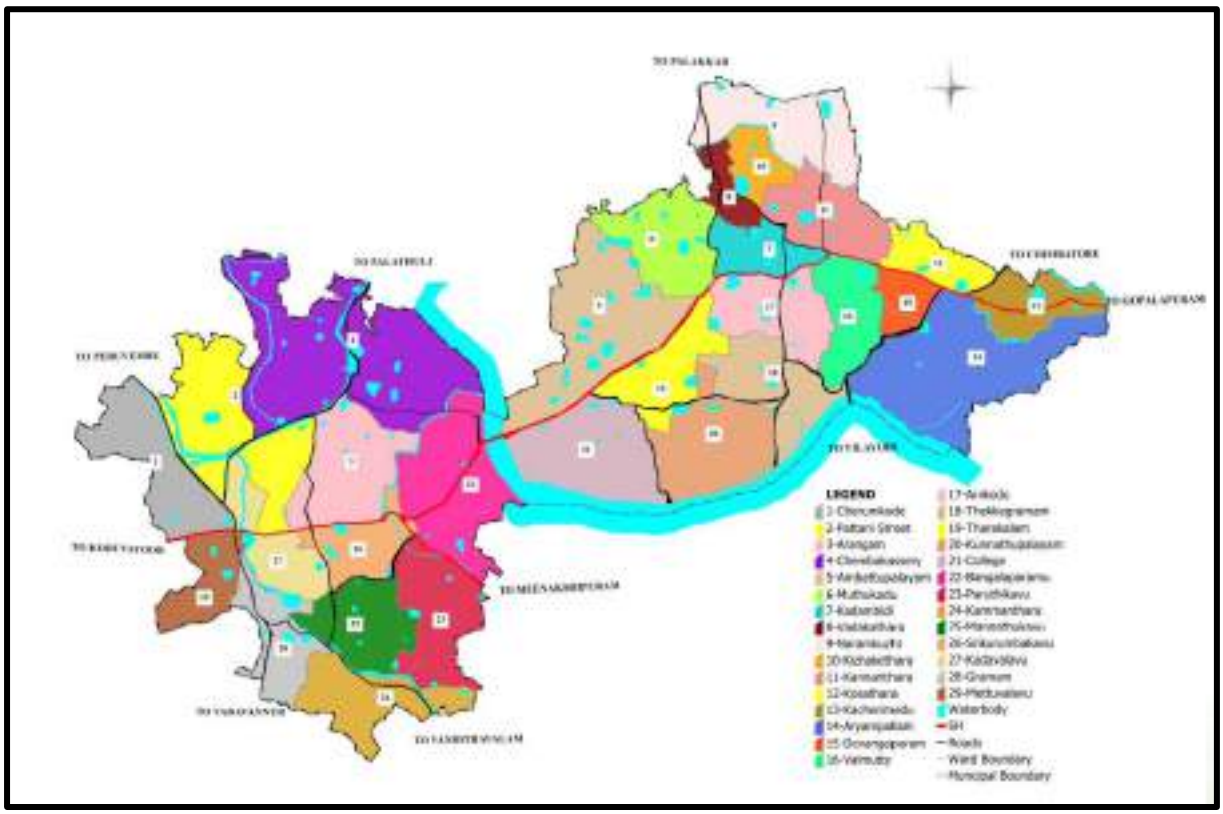


Fig 2.3 Administrative map with 29 Wards

2.3 Climate

Palakkad gap of about 32-40 km wide in the Western Ghats is perhaps the most influential factor in the climate of this area. During dry weather hot winds blow widely from the burning plains of Tamil Nadu through this gap and dries up the greenery. Summer starts from February onwards and the temperature rises generally over 40°C till the end of May. But there will be plentiful seasonal rainfall also till September and heavy rainfall and winds during October and November. Highest rainfall will be during June and July. The average rainfall is 1350 mm. Northeast monsoon available from mid-September to November is relatively weak and the average rainfall is 600 mm.

Generally, there are 4 seasons viz the dry weather from December to February, hot weather from March to May, South-west monsoon from June to September and the retreating or north east monsoon from October to November. The relative humidity is greater than 70%. However, these fixed rhythms no longer hold true as Chittur-Thathamangalam too, just like the rest of the world, has recently been witnessing the vagaries of climate change.

2.4 Physiography and Relief

Based on the physical features, the district is divided into two natural divisions – midland and high land. The midland consists of valleys and plains. The municipality comes within the midland region. It has a relief of about 100 m and comes under moderately sloping to steeply

sloping area. Fig 2.4 shows physiography of the district showing Chittur-Thathamangalam town.

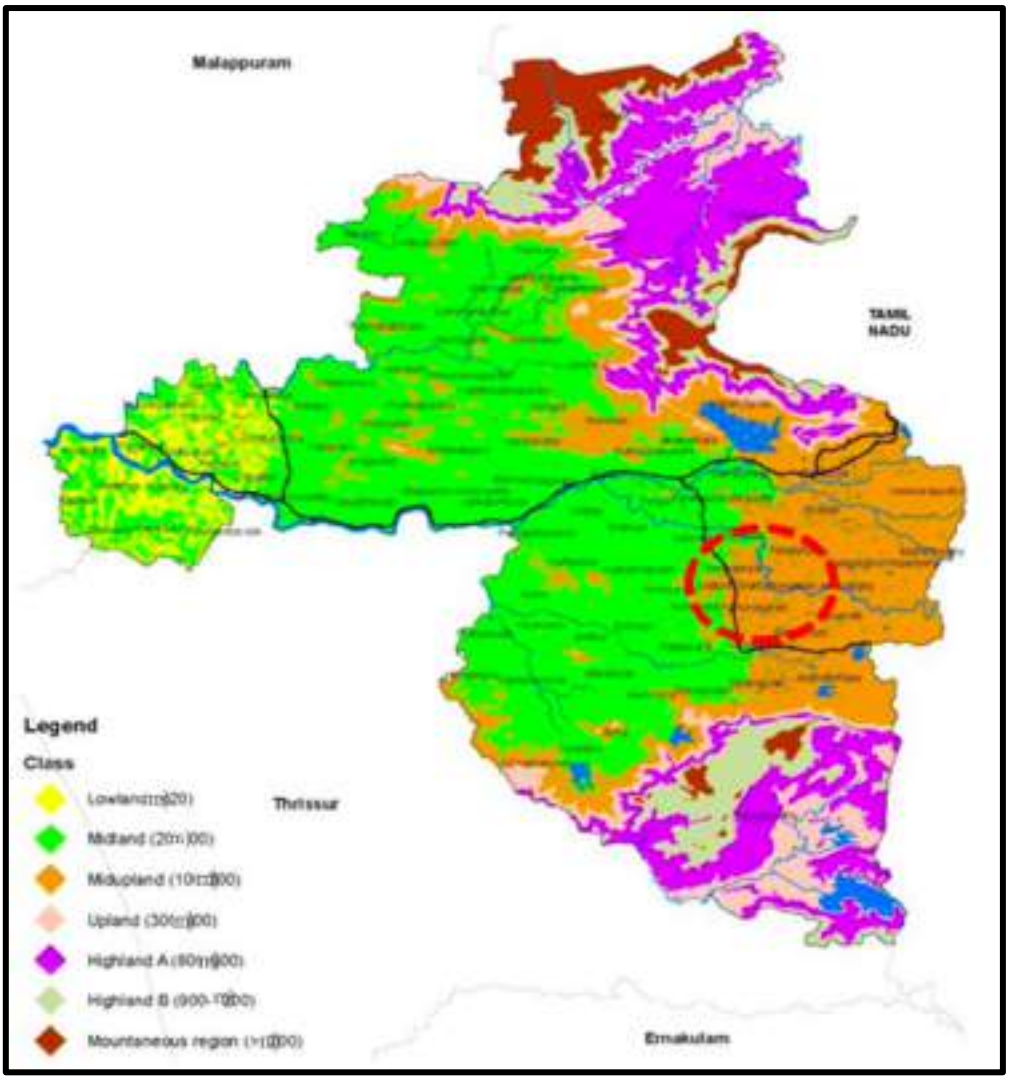


Fig 2.4 Physiography of Palakkad district showing Chittur-Thathamangalam Town
Source: IDDP, Palakkad

Chittur-Thathamangalam is having less extensive valleys and slopes are having mild gradients. The peripheral areas of the town are agricultural lands and paddy. Tributary of Bharathapuzha river passes through the centre of town. Chittur-Thathamangalam Municipality has a relief within 50 and 100 m (Fig 2.5). Contour map and Digital Elevation Mode (DEM) of Chittur-Thathamangalam. Town are shown in Fig 2.6 and Fig 2.7 respectively. Chittur-Thathamangalam Municipality is having percentage of slope of 1 to 5% and comes under gently sloping (Fig 2.8).

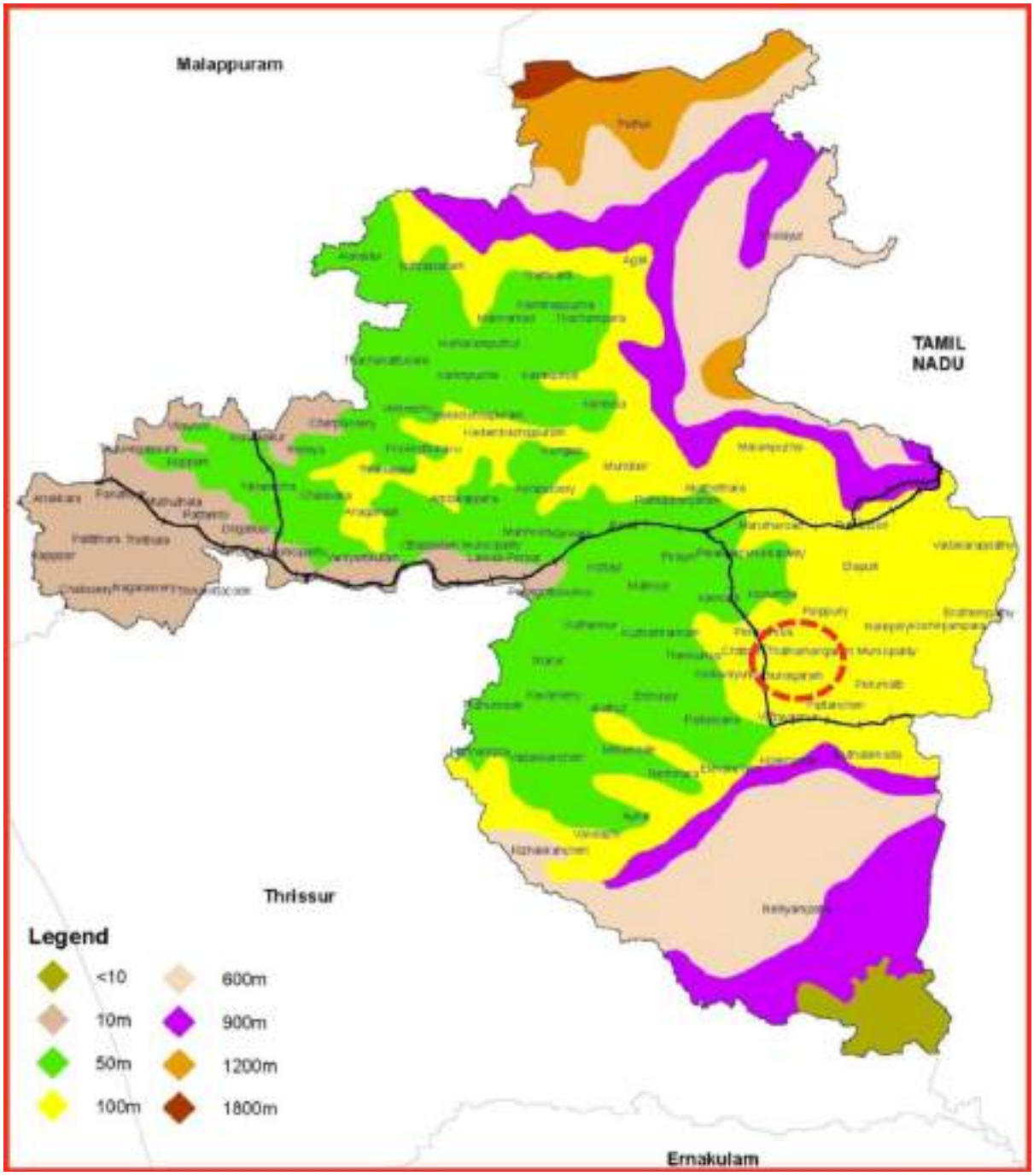


Fig 2.5 Relief of District showing Chittur-Thathamangalam Town
Source: IDDP, Palakkad

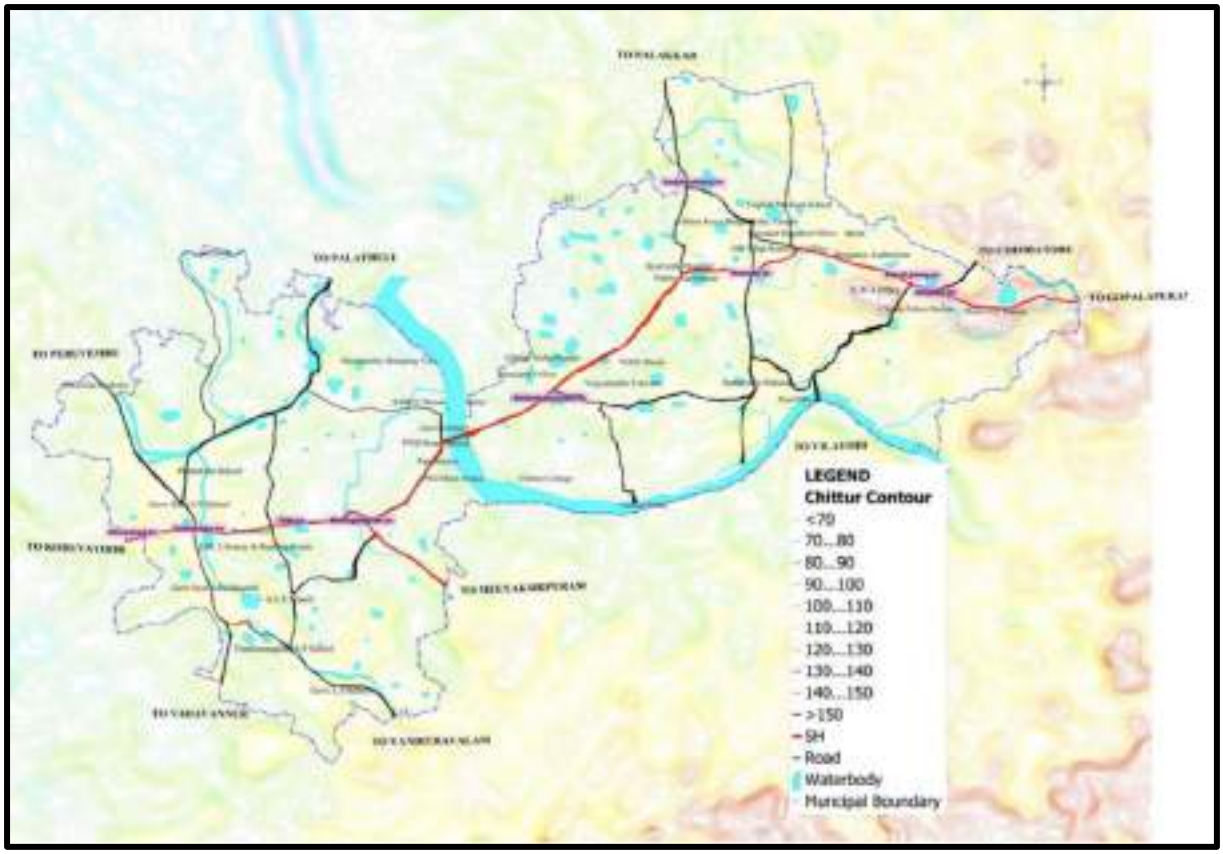


Fig 2.6 Contour Map of Town

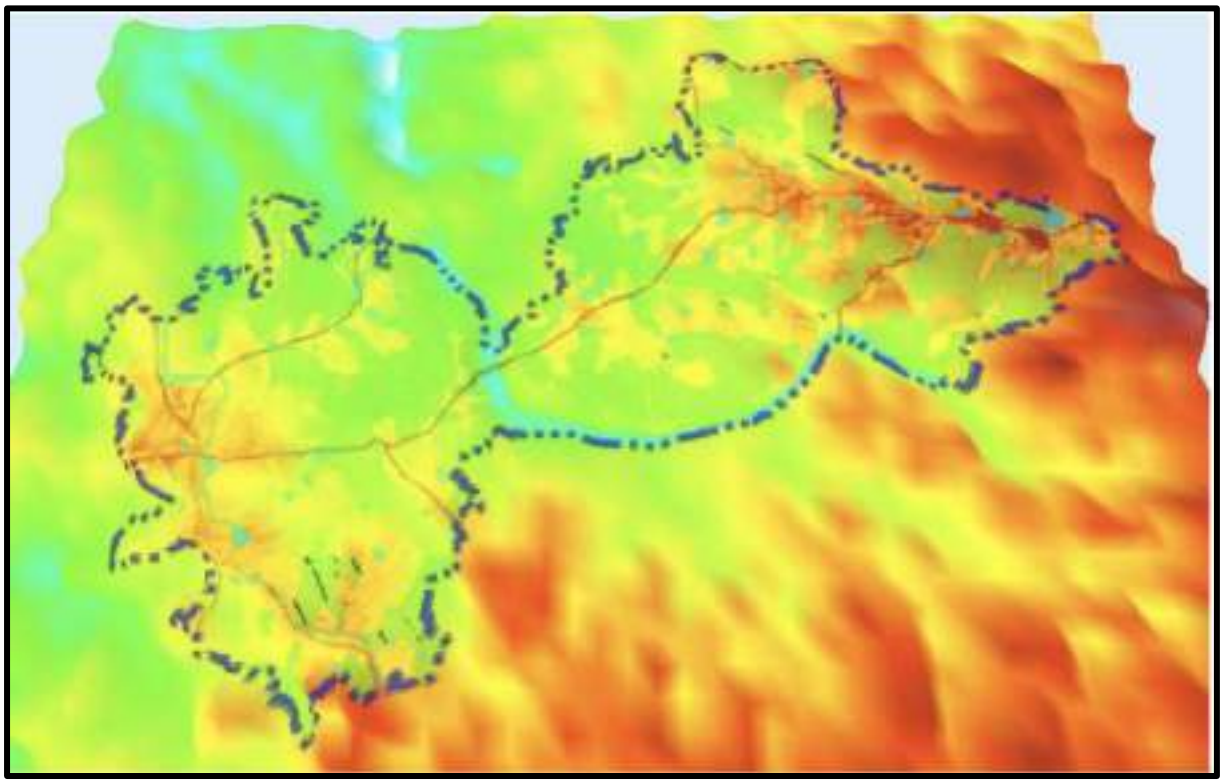


Fig 2.7 DEM of Town

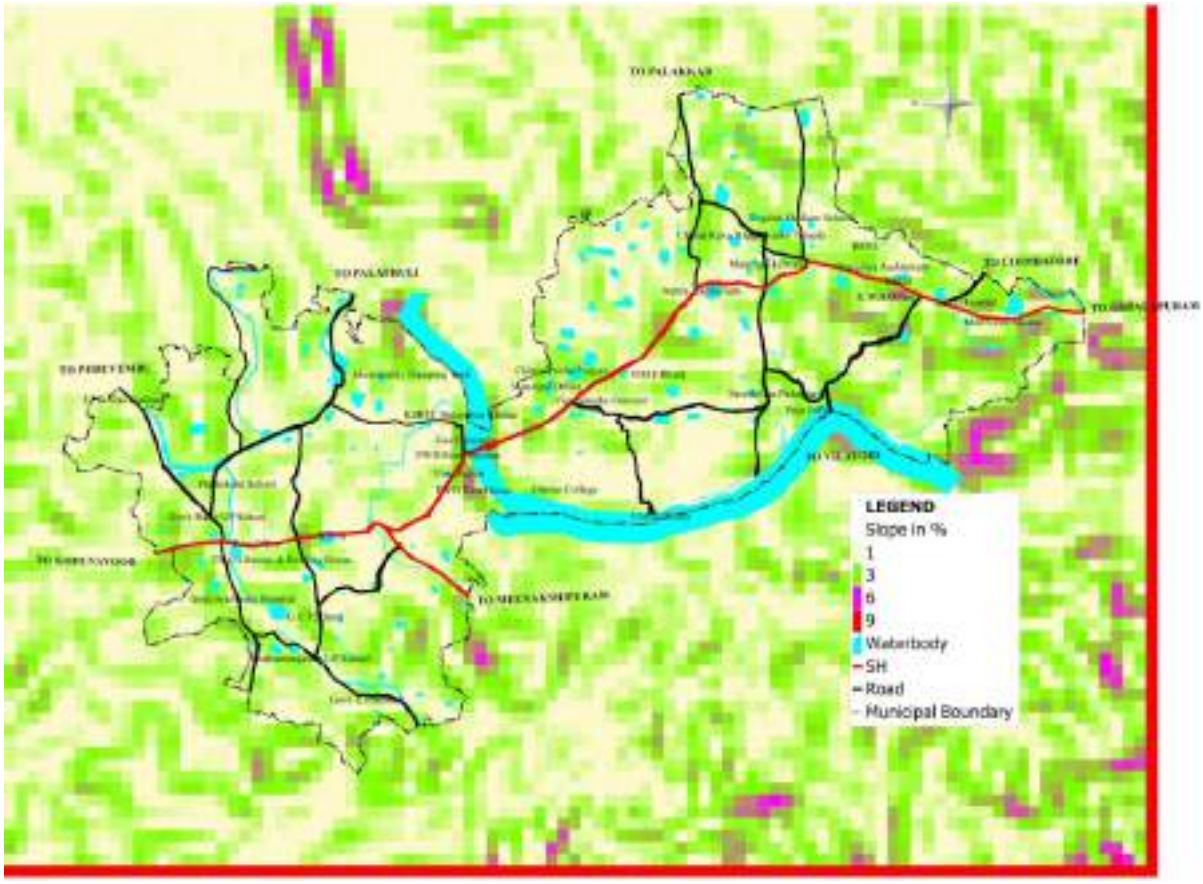


Fig 2.8 Slope of Town

Soil

There are four different types of soil found in Palakkad district (Fig 2.9). They are peaty, laterite, forest and black soil. These soils are dark, low in organic matter, calcareous, neutral to moderately alkaline (PH 7.0 to 8.5) and high in clay content and Cation Exchange Capacity (CEC). Hence, they exhibit the characteristic cracking during dry periods. They are usually located in gently sloping to nearly level lands. The levels of potassium and calcium are moderate and those of nitrogen and phosphorus, low. In a relatively small area of 1000 ha. in Chittur block, a highly dispersed soil termed as “Poonthalpadam” soil, is seen. This soil occurs as a slushy layer to a depth of about 0.5m to 1.5m. A bed of limestone is seen beneath the slushy layer. Limestone deposits are also found in this area. Different types of soil present in municipality are shown in Fig 2.10.

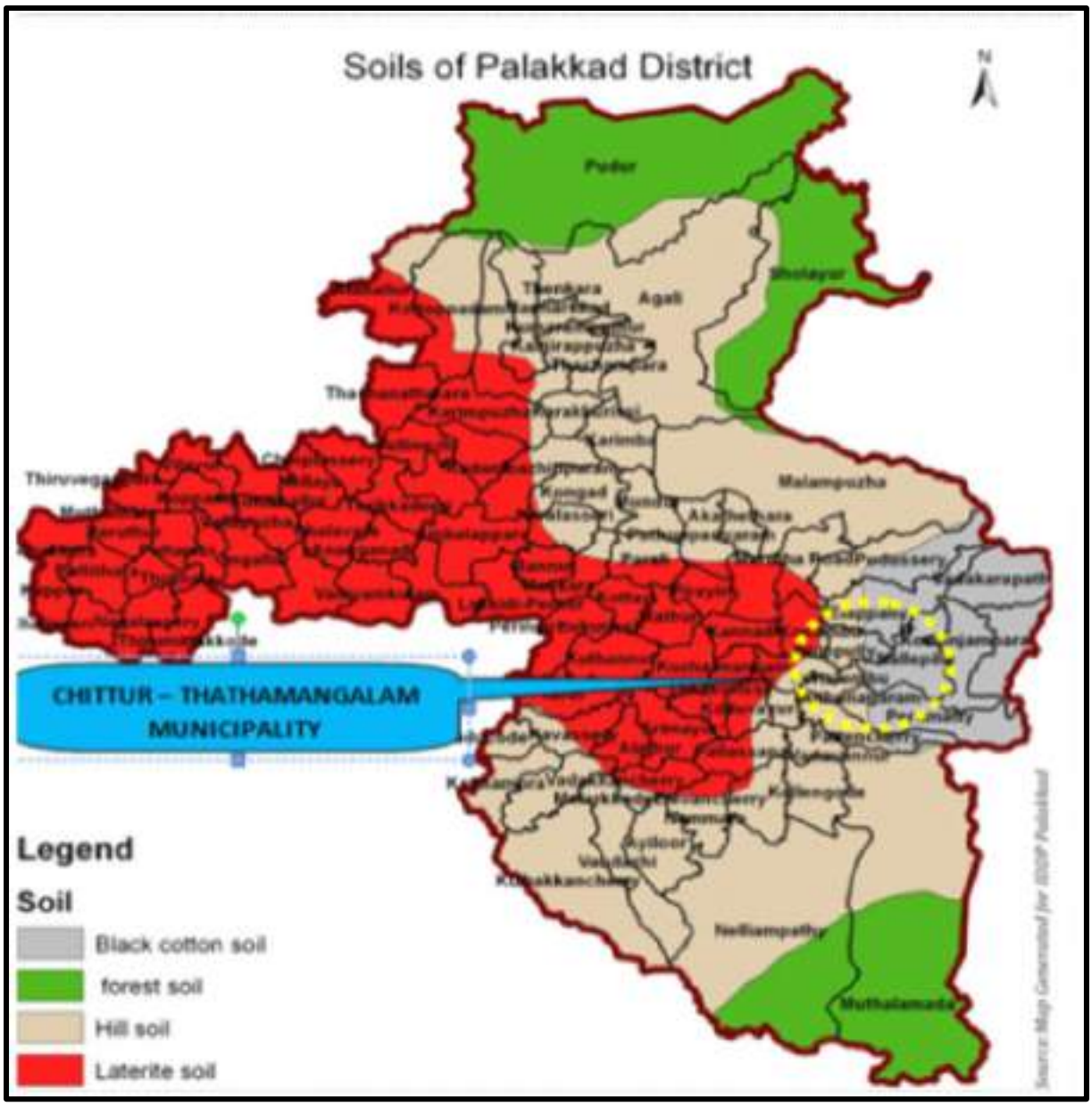


Fig 2.9. Soil types of the district showing Chittur-Thathamangalam Town
Source: IDDP, Palakkad

According to Soil Survey Department study, eleven soil series were identified in Chittur-Thathamangalam municipality. Out of these five-soil series viz Ozhalapathy, Attayampathy, Chamanampathy, Kozhinjampara and Perumkunnam are upland series and six soil series viz Nadukulam, Kavassery, Peruvemba, Vadavannur, Vannamada, and Polpully are low land series. The upland soil series are mainly cultivated with coconut, banana and fruit trees.

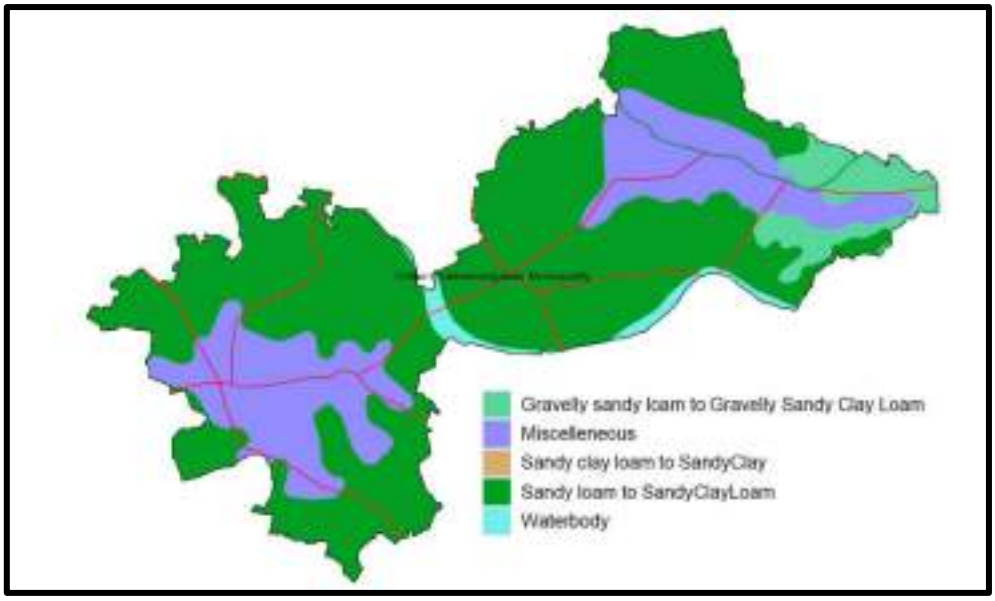


Fig 2.10 Soil types of Chittur-Thathamangalam Town
Source: Kerala State Land Use Board

Geomorphology

Geomorphology means a "discourse of earth landforms" and it is generally defined as a Science of Landforms which are the products of various exogenetic and endogenetic forces. It is a systematic study of landforms in relation to the climatological, geological and structural aspects. Landforms play a vital role in land resource mapping, terrain evaluation and soil classification in addition to groundwater studies. Geomorphologically, the area is classified as Pediplane, Flood Plane, Plateau and water bodies (Fig 2.11). Plateau is the most prominent geomorphic unit occurring in the study area. The weathered thickness is less than 10 m, and the topsoil thickness is also less.

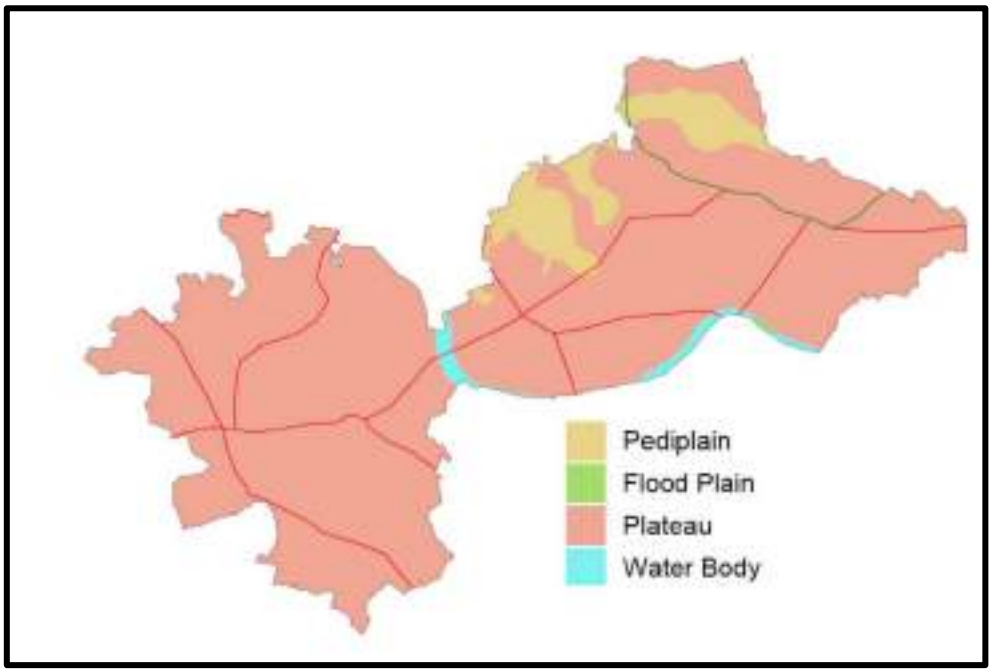


Fig 2.11 Geomorphology of Chittur-Thathamangalam Town
Source: Kerala State Land Use Board

2.5 Biodiversity

The flora of Chittur-Thathamangalam is characteristically tropical, owing to the seasonal rainfall and moderate temperature. Some of the dominant trees in the region are Coconut Tree (Cocos Nucifera), Plaintain (Musa Paradisiaca), Mango Tree (Mangifera Indica), Jackfruit Tree (Artocarpus Heterophyllus) and Palm tree. Plain lands are utilised for Paddy cultivation. No animal can be mentioned peculiar to this area. Birds like Crows, Pigeons, Sparrows, Woodpeckers, Myna, Kingfishers, Parrots, etc. are seen in all areas. An exotic species of snail – Achatina fulica (African Snail) - has become a very serious pest here and measures to control it has not succeeded yet.



2.6 History/Evolution and Growth

On 1st January 1957, Malabar District trifurcated into three districts viz. Kannur, Kozhikode and Palakkad. Palakkad District thus formed consisted of old Valluvanad Taluk, Palakkad taluk, portion of Ponnani taluk of Malabar District and Chittur taluk of erstwhile Travancore Cochin state. This section tries to explore the history and evolution of Chittur-Thathamangalam.

2.6.1 History of Governance

Chittur town originated after 768 AD. Chittur was in the hands of Pandyas and Thathamangalam was a Brahmin settlement, which was under Cholas. After 10th Century, Chittur seems to be under the rule of Palakkad kings whose origins are at Tharur in Alathur Taluk.

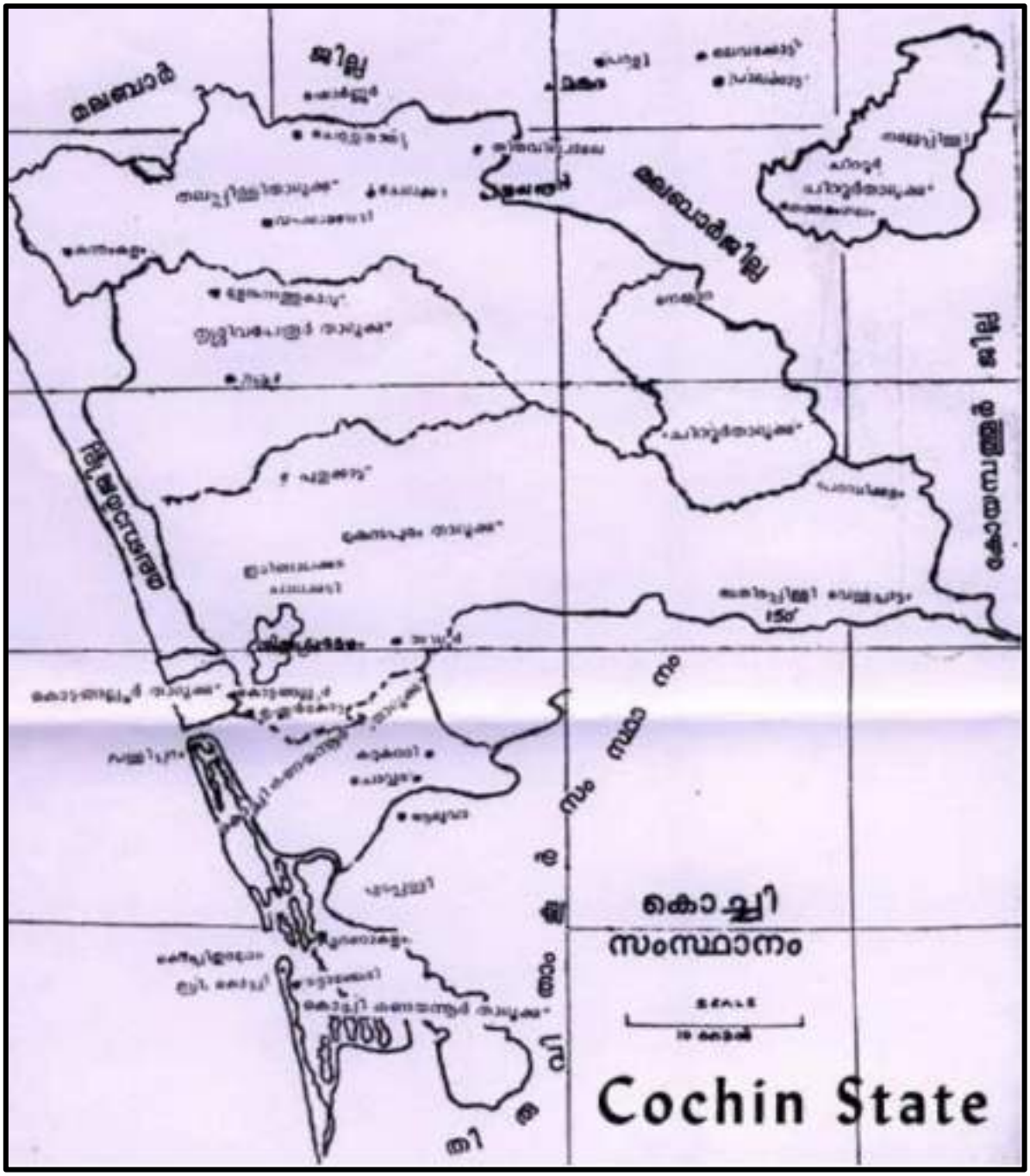


Fig 2.12 Cochin state

Kerala, once a land of small kingdoms, had witnessed several pitched battles. Legends say that in 917 A.D, Singa mannan (Kongan), the ruler of Rama Pattanam, situated in the west of Pollachi declared war against Chittur, accusing the people of Chittur for confiscating trade products like silver and muslin which they were carrying back to their home town. A large Kongu army, consisting chiefly of cavalry invaded the territory of the Palghat Raja. Palakkad Rajas with the help of Ernad, Valluvanad and Perumpadappu forces, fought against the forces of Kongu Rulers, who were instigated by Rashtrakutas. However, the Army of Nedumpurayur won the onslaught of the Kongapada. The people of Chittur who were not familiar with the war, feared and prayed before the female deity. In the history of Chittur, Chittur Bhagavathi is the famous deity and is the focal point of the development of the civilization. Chittur Bhagavathi blessed and helped them to defeat Kongu army and their leader after a fierce battle

by the Maharaja of Cochin, assisted by the Zamorin and the Rajas of Palghat and Walluvanad. For this service, timely help and to enable better protection, the Palghat Raja ceded to Cochin, the territories known as Naludesam and Kodakaranad, which constitute the present Taluk of Chittur. Naludesam comprised of the four adjoining "Desams", Chittur, Nalleppilly, Thathamangalam, and Pattancheri. Since then, Chittur was enjoying the patronage of Kochi kings. This paved the way for prosperous and happy life of the people of the land. Few communities in the state commemorate the war victories of their forefathers. People of Chittur had assimilated a story of triumph into their cultural veins and on the first Monday after the dark lunar night in 'Kumbham', Malayalam calendar (English calendar February - March) they celebrate the war they had fought and won - Konganpada, the only war festival (Ranothsavam) in the state. The Cochin kingdom (the Princely State) included much of modern-day Thrissur district, Alathur & Chittoor Taluks of the Palakkad district and Kochi Taluk, most of Kanayannur Taluk (excluding Edappally), parts of Aluva Taluk (Chovvara, Kanjoor, Srimoolanagaram) and parts of Paravur Taluk (Chendamangalam) of the Ernakulam district.

Chittur–Thathamangalam town came into prominence long back in 1908 as a "Sanitary Board" in Cochin state and in 1910, the government of Cochin passed the Municipal and Sanitary improvement Regulation. Thus, the sanitary boards existing at that time were reconstituted into town councils for the conservancy and sanitary improvement of the urban areas. An Administration Committee was formed with elected and nominated members in 1918. Subsequently Cochin Municipal Act was enacted in 1938, Administration transferred to elected members only. Municipal Act was amended in 1952, then elections were based on adult suffrage. The Cochin Municipal Regulation was enacted in 1921, as a result Council came into existence comprising three nominated members and elected members.

The municipality was governed by the enactments and regulations of the erstwhile Government of Cochin. Chittur-Thathamangalam Municipality was bifurcated in June 1938 and formed into two separate Municipal Towns viz Chittur and Thathamangalam. It was again reunited after a span of 9 years on October 1, 1947.

Present Kerala state was constituted from the princely states of Travancore and Cochin and of the Madras State. Palakkad District was formed on 1/1/1957 comprising the newly formed Perinthalmanna, Ponnani, Ottappalam, Palakkad, Alathur and Chittur Taluk of erstwhile Travancore - Cochin state.

This municipality was divided into 18 wards in 1983 and increased to 24 wards in 1995. Subsequent to the enactment of 74th CAA, Kerala Municipalities Act 1960 was repealed by Kerala Municipalities Act 1994. In 2005 there are 26 wards and it increased to 29 wards in 2010. This municipality celebrated its Platinum Jubilee in 1983 and Centenary in 2008.

The name Chittur might have been derived from the fact that the portion of Anamalai river which flows through this part is known by the name Chittar. Chittar might have changed due to constant use by common villagers as "Chittur" (Ooru means dwelling place in Tamil). Another legend has it that the word Chittur came from the Tamil word "Siru Ooru" meaning "a small village". Thathamangalam is the village that was given by Palghat Raja to Brahmins for prosperity of the land (Dattam means given and Mangalam means goodness in Sanskrit). It was set up by a Brahmin Bhatt named 'Datta'.

2.6.2 History of Development

GSMHS (Government Sundaran Memorial High School), Thathamangalam which started in 1890 was the first school in Chittur-Thathamangalam. In 1896 GUPS (Government Upper Primary School) Chittur started its function. The Government College, Chittur was established on 11 August 1947. It started functioning in the present forty-acre campus on the bank of serene Sokanasini (also known as Chittur Puzha) since 1954. First Ayurvedic hospital was started by Cochin Government in 1867 and later it was changed into Taluk Ayurvedic Hospital. Chittur Taluk hospital started its function in 1883. In 1961 leprosy treatment department, in 1972 ENT department, 1975 laboratory facilities, in 1982 X ray facilities and in 1983 Family welfare facilities were added. A fire station was established in the year 1983. The first Water supply scheme was commissioned by Kerala Water Authority in 1978 which covered the entire town area. KSRTC bus operating centre started in Chittur in 1991 and upgraded as sub depot in 2000. Meenakshy Tile works and Pencos Unit were the industrial units that functioned in the early periods.

2.6.3 Socio-Cultural History

Chittur-Thathamangalam is having a rich history of its cultural heritage. The majority of the inhabitants of this town speak Malayalam, though others use Tamil as their main language. The town is said to be the land with the confluence of Tamil – Malayalam culture. The area was a part of princely state of Cochin before India received independence from the British. Many settlements of Tamil Brahmins namely Durgagoshta gramam, Lankeshwara gramam, Thekkegramam (Chittur), Padinjare gramam and Thekkegramam (Thathamangalam) are there in the town. Another important feature of the town is that dominant group of people of different mother tongues have settled in the town. Nair (Malayalam), Velalas and Pandarams (Telegu), Devangas (Kannada), Brahmins and Chetty (Tamil) have settled in the town from olden days. These cultures of four languages have influenced the town very much.

Devangapuram in Chittur taluk of Palakkad district is famous for its fantastic handloom fabrics since time immemorial. The weavers of this area are experts in weaving finer variety of dress materials like Dothi, Sarees, Settu mundu etc. Even though all communities are engaged in weaving now, the real weaver community is Devangas who emigrated from Mysore during the period of Chera and Chola dynasty. Unlike the weaver community of the other parts of Kerala ie. ‘Chalia’, the ‘Devanga’ community worship goddess Chamundeswary. Devanga means the people who make angavastram (cloth) for Devas (God). The weaving style of those people showcases most attractive designs.

Chittur is distinguished as the seat of Thunchath Ezhuthachan - the father of Malayalam literature. The Thunchath Acharya Madom here is said to have been founded by the great literary luminary during the last days of his life. It is on Vijayadasami day that the memorial gets the maximum number of visitors with hundreds of children brought here for a ritualistic initiation into learning (Ezhuthiniruthu). Thekkegramam is mostly occupied by Tamil Brahmins. The gramam still has an old look and on both sides of the building are temples of Sree Rama and Siva. The street with long arrays of Agraharams has all the charm of antiquity, worth preserving.

Socio-cultural festivals Kongan Pada

Kongan Pada is the only war festival of Kerala commemorating the victory of the people of Chittur, against the Kongu Chieftain. This is a ritual drama associated with Chittur Kavu Bhagavathi Temple which falls in the month of February/ March. The history of this festival is entangled in folklore. The battle is believed to have taken place in late 9th century A.D against Chola King Rajadhi Raja of Kongu country. The festival gives great importance to the mother Goddess of Chittur. According to legend, when the Kongu King attacked the village, the Goddess herself came in person and led the army to victory by killing the invading King. For many years, large crowds have assembled outside a small shrine in Chittur to commemorate this victory. The original battle lasted only twenty-four hours. However, Konganpada re-enacts the various events in detail in several colourful processions, culminating in a huge fireworks display, spread over a two-week period. The main event falls on the first Monday after new moon in the lunar month of Kumbham (February-March). It is probably the only temple festival in Kerala that recreates the full story of a legendary battle.

The festival starts with *Chilambu,* an event recalling Kongu King's declaration of war, and frightened people praying and pleading to the Goddess for help. People of the village gather at the Kalari (gymnasium for practicing the martial art form Kalari Payattu) of Sreekandathu family, the traditional martial art teachers to the Nayar soldiers of Chittur.

After praying to the Goddess, they start practicing for *Malama,* an ancient folk dance performed by men. They sing songs in praise of the Goddess and her powers, as they move in a circle to the rhythm of drums. The following Wednesday is known as *Kannyaar,* when an astrologer makes predictions about the impending festivities.

On Friday, a festival of colour and joy, *Kummatti* is celebrated. On following Monday, Konganpada begins with 101 rounds of *Vedi* (pop-guns) on the temple grounds. The important event of the day is another carnival like procession in the evening that starts from a shrine on the east side of the village. *Ezovela,* a group of dancers decked with brass breastplates, daggers stuck in waistbands and holding long bamboo poles to mimic lances, leads the procession.

Following them is *Thattummel Koothu,* four men dressed in colorful costumes, standing on bamboo platforms carried on shoulders by several bearers. Behind *Thattunmel Koothu* come several groups of dancers performing *Kurathiyaattam* and *Sinki Naadakam* (folk dances) as they move ahead. Then come the drummers and pipers of *Panchavadyam* (orchestra of percussion instruments).

After that comes the most beautiful spectacle of the event, the *Kolam* children, young boys dressed as girls and girls dressed as boys, sitting on shoulders of men. Late at night, representatives of the four major Nayar families of the village assemble at the house of Chittedathu family and dresses a member of this family as Kongan.

Accompanied by tribal band and surrounded by shouting men holding blazing torches, he arrives at the temple on horseback for *Olavayana,* reading of the declaration of war. He holds a palm leaf scroll in his hands and narrates the contents written in archaic Tamil language. Following this, rival groups run horses on the street to recreate a battlefield. A few of them act dead and they are taken back to their relatives. It is followed by *Pothottam* in which a few men rush forward to the village with a wooden head of a buffalo pretending it to be the head of the dead buffaloes of the enemy.

The following Wednesday villagers gather on temple grounds to see the performances of *Malama* and *Parisa Muttu*. It is believed that years ago a Muslim from a village in North Malabar came to see the festivities and later wrote a song about it. *Parisa Muttu* is a folk-dance rendition of this song. The festivities conclude with an event called *Pallu* on the following Tuesday. Representatives of the four major Nayar families of the village read aloud the accounts of the festivities in front of the oracle.



Kanyarkali



Olavayana



Kutti Kolam



Thattunmel Koothu

Thathamangalam Angadi Vela or Kuthira Vela

Another important festival is Thathamangalam Angadi Vela or Kuthira Vela of Vettakaruppa Swamy Temple at Thathamangalam. During this festival a grand horse race is conducted by the local people. Most of the horse riders are from the neighbouring state of Tamil Nadu. This is a 15-day festival celebrated once in 2 years in Thathamangalam. One can see so many volunteers painted in black with charcoal, these men are guards who control the people standing on the roadside to see the race.



Angadi Vela

Vishu vela is celebrated on a grand scale in different parts of Chittur by different communities before and after Vishu. Kenampulli mala, a small hill with a Subramanya temple, situated at a distance of 1.50 km from Chittur Kacheri Medu is a place of scenic beauty.

2.7 Regional Setting

The regional setting of a Town can be arrived from the Regional Plan which spells out hierarchy of the town in the District Scenario, the activity the town has to perform and its connectivity with different settlements. Regional linkage of the Chittur-Thathamangalam Town with surrounding district/ state and its regional setting within the district are shown in Fig 2.13.

2.7.1 Regional Connectivity

Chittur-Thathamangalam municipality is having a good connectivity to neighbouring LSGIs, other parts of the state. The town is connected by Palakkad – Thathamangalam – Pollachi interstate highway (SH 27), Thathamangalam – Chittur - Nattukal highway (SH 25), Chittur – Vannamada road (MDR 312), Palakkad – Chittur Road (MDR 302) and Chittur – Vandithavalam (ODR) passes through the municipality. The town is at a distance of 35 km from Pollachi, the major agricultural market of South India. Coimbatore the industrial metropolitan city is located at a distance of 40 km and Thrissur, the cultural capital of Kerala

is located at about 67 km from the town. Kochi - the queen of the Arabian sea is at a distance of 145 km and Kozhikode is at a distance of 147 km from the town. Nearest railway station is at Putunagaram which is at a distance of 5 km. But it is not functional due to the Palakkad – Pollachi – Palani – Dindigal railway metre gauge to broad gauge conversion works. Presently the Palakkad Junction railway Station which is situated at distance of 21 km serves the people of the area. The nearest airport is at Coimbatore situated at a distance of 60 km from the town.

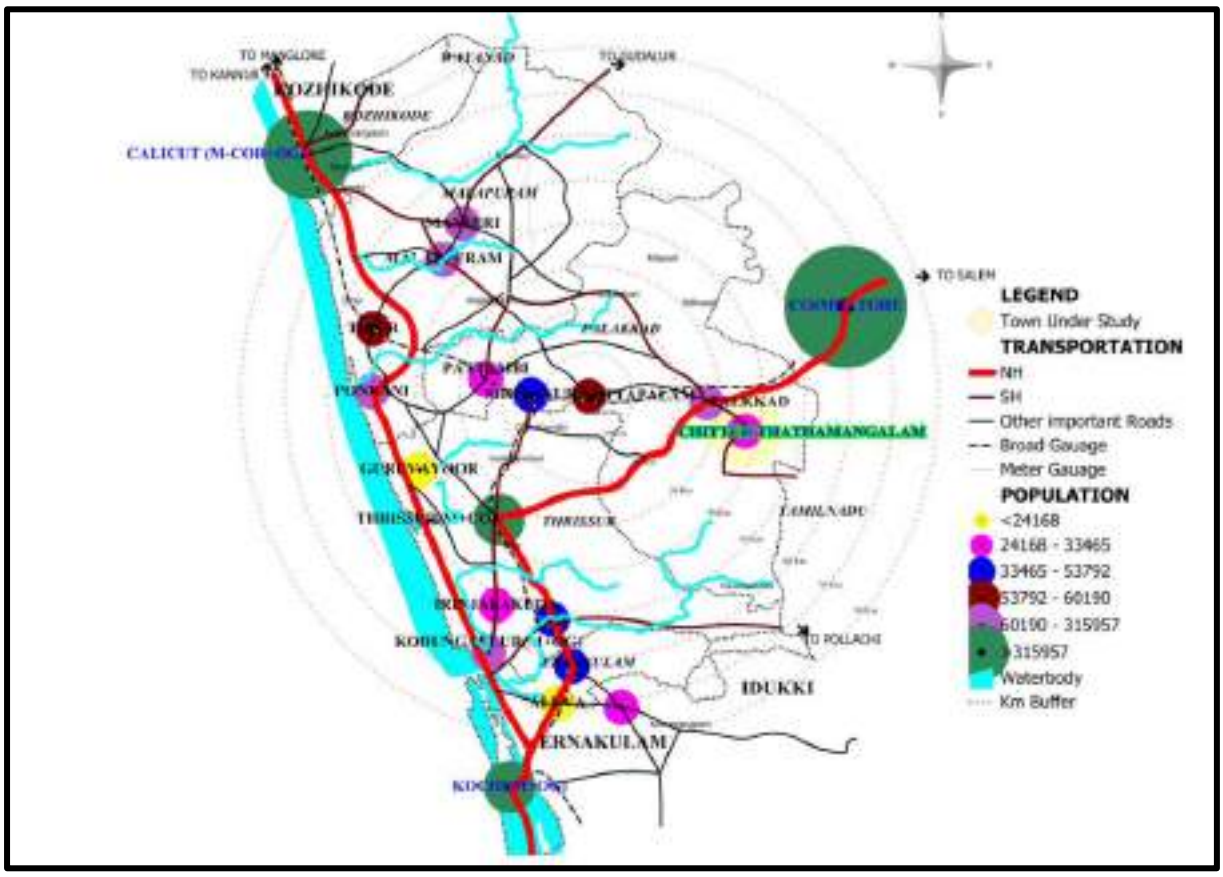


Fig 2.13 Regional Linkages

2.7.2 Hierarchy of Settlements based on Integrated District Development Plan (IDDP)

As per the settlement analysis of IDDP, the settlements of the district are grouped in to four hierarchies. The Palakkad Municipality is the first order settlement. Alathur, Shoranur (M), Mannarkkad, Chittur-Thathamangalam (M) are proposed as second order settlements. Chittur-Thathamangalam Municipality was suggested as a second order Settlement (sub regional centre) and supposed to provide second order facilities like Taluk Hospitals, Marketing facilities to the LSGIs in the respective service areas (Elappully, Vadakarapathy, Polpully, Eruthempathy, Kozhinjampara, Perumatty, Nalleppilly, Peruvemba, Koduvayur, Pudunagaram, Vadavannur, Pattancherry, Muthalamada, Kollengode, Elavancherry, Pallassana). Fig 2.14 shows the hierarchy of settlements.

It must be noted that Chittur-Thathamangalam features in this list of second order settlements because of its urban settlement status. If it were not for this historical accident of it gaining the status of a municipality during colonial times, nothing in its current situation, with 50% of its land still under agricultural use and its population little over 32000, would have justified it

being tagged as ‘urban.’ Therefore, despite the IDDP settlement analysis and the projection to transform it to a second order settlement, it continues to function as a third order node. Consequently, there is no need to expect it to provide second order facilities like marketing facilities to LSGIs in its service area. This is all the more irrelevant considering the fact that there are very well-established, old agricultural produce markets nearby, in Koduvayur and Kozhinjampara, that are well connected with the surrounding LSGs and are performing this role well. Hence there is no need for Chittur-Thathamangalam to upgrade and provide agricultural produce marketing facilities for surrounding LSGs.

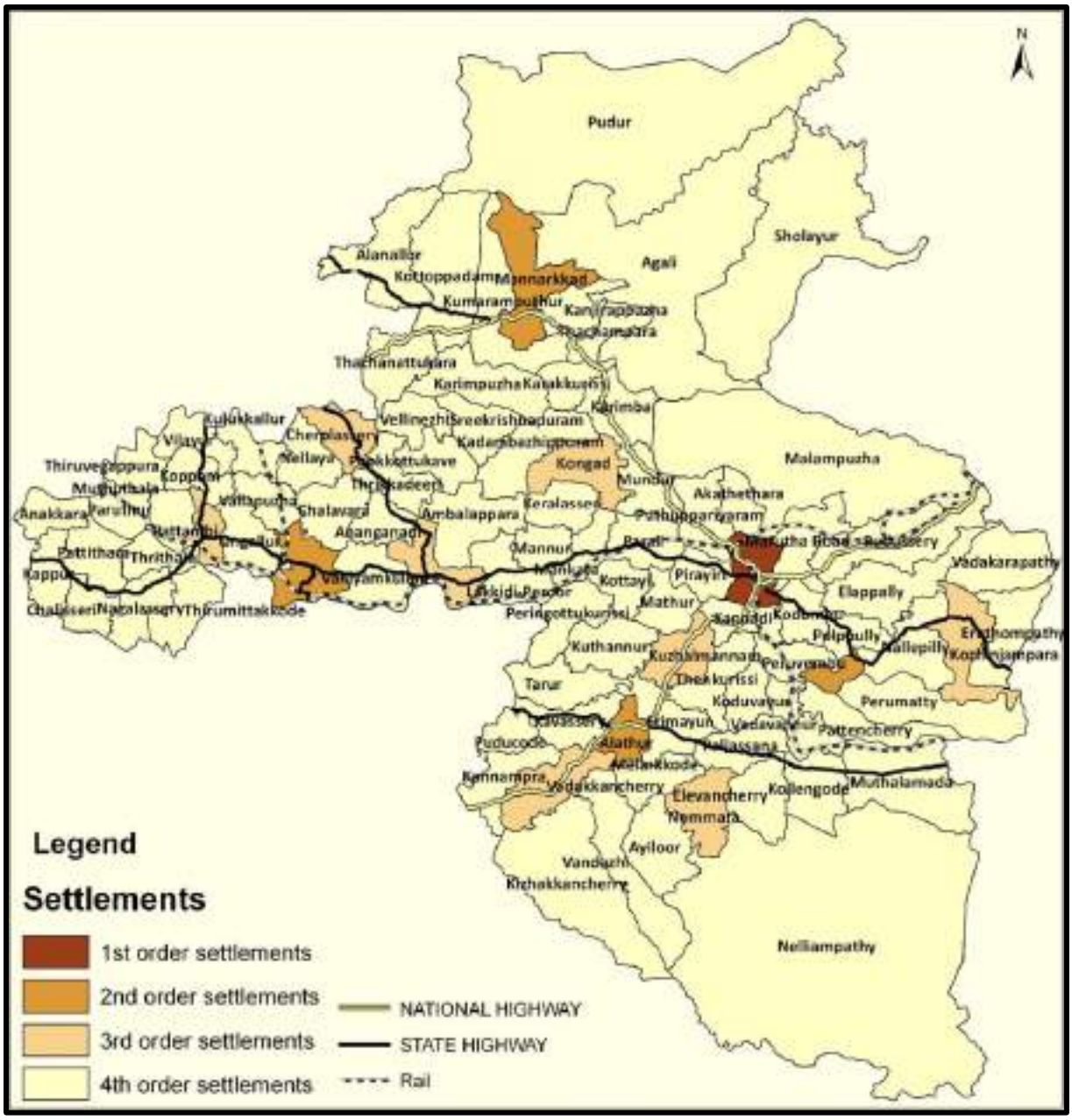


Fig 2.14 Hierarchy of Settlements
Source: IDDP, Palakkad

2.7.3 Hierarchy of Nodes

Chittur town Junction in Chittur-Thathamangalam Municipality is coming as third order node and service population is taken as approximately 80,000. Hierarchy of nodes are shown in Fig 2.15.

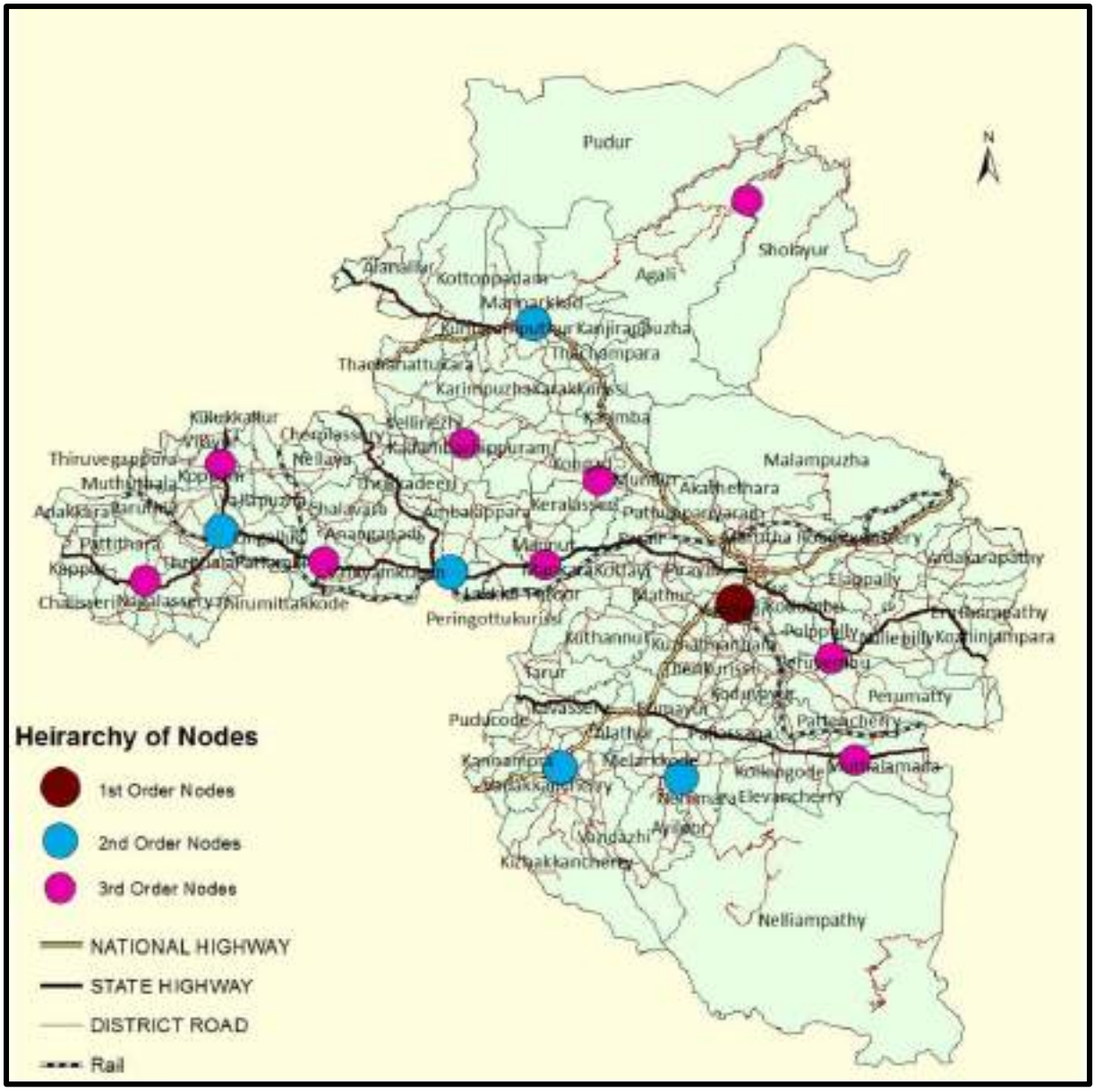


Fig 2.15 Hierarchy of nodes
Source: IDDP, Palakkad

2.7.4 Functional Character

The spatial distribution of the settlements based on its administrative structure and character is demarcated as Urban, Semi Urban, Semi Rural and Rural. Chittur-Thathamangalam municipality is shown as urban due to its status as a municipality (Fig 2.16).

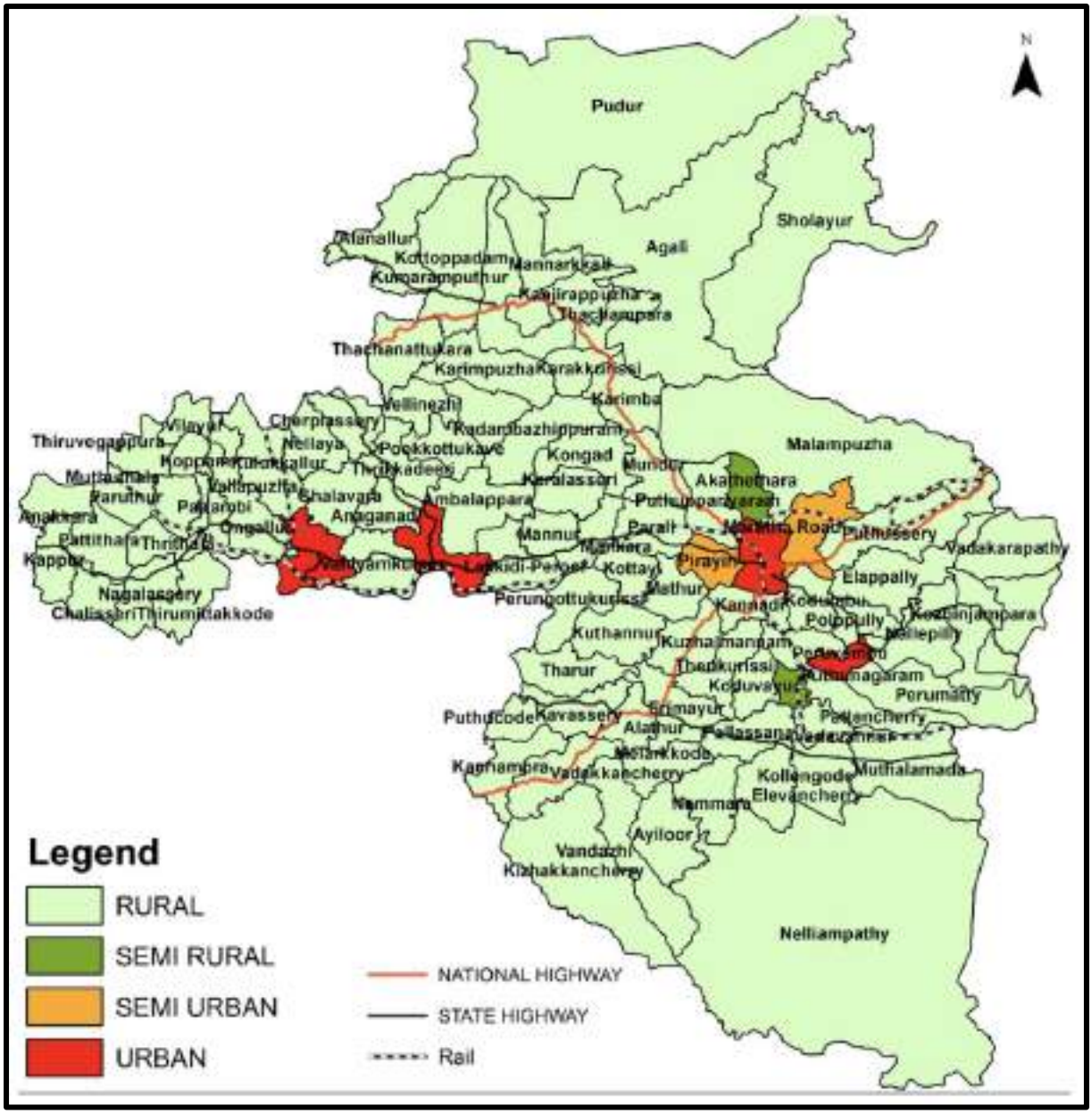


Fig 2.16 Functional character
Source: IDDP, Palakkad

2.7.5 Future Urban Profile

In IDDP (Integrated District Development Plan) Palakkad-2013 report, the future urban profile of the district is derived through sequential analysis through four criteria viz. Census urban, existing physical and economic development, perspectives in urban development and finally proposed hierarchy of settlements. The study accorded Chittur-Thathamangalam Municipality an urban profile (due to its municipal status) and it was suggested as a second order settlement within the district along with all other municipalities in the district. However, this second order status suggested for Chittur-Thathamangalam needs to be reconsidered, given the fact that it continues to be semi-rural in character with around 50% of its lands still under agricultural use. Further, considering the hierarchy of nodes, Chittur-Thathamangalam municipality was suggested as a third order node within the district. Hence though the IDDP suggested that the municipality be upgraded and developed as second order settlement and third order node for

serving the local region, a relook at the second order settlement status for the Chittur-Thathamangalam Municipality is necessary. In the decade that has elapsed since the IDDP 2013 was drawn up, Chittur-Thathamangalam municipality has not developed as a second order settlement and continues to be a third order node serving the local region. It still is hardly urban in character, and its municipal status is primarily due to it having been granted municipal status in 1908 during colonial times. This indicates that in the upcoming IDDP review, the second order settlement status needs to be changed given the fact that the town has never been urban in character even a century after municipal status was thrust upon it.

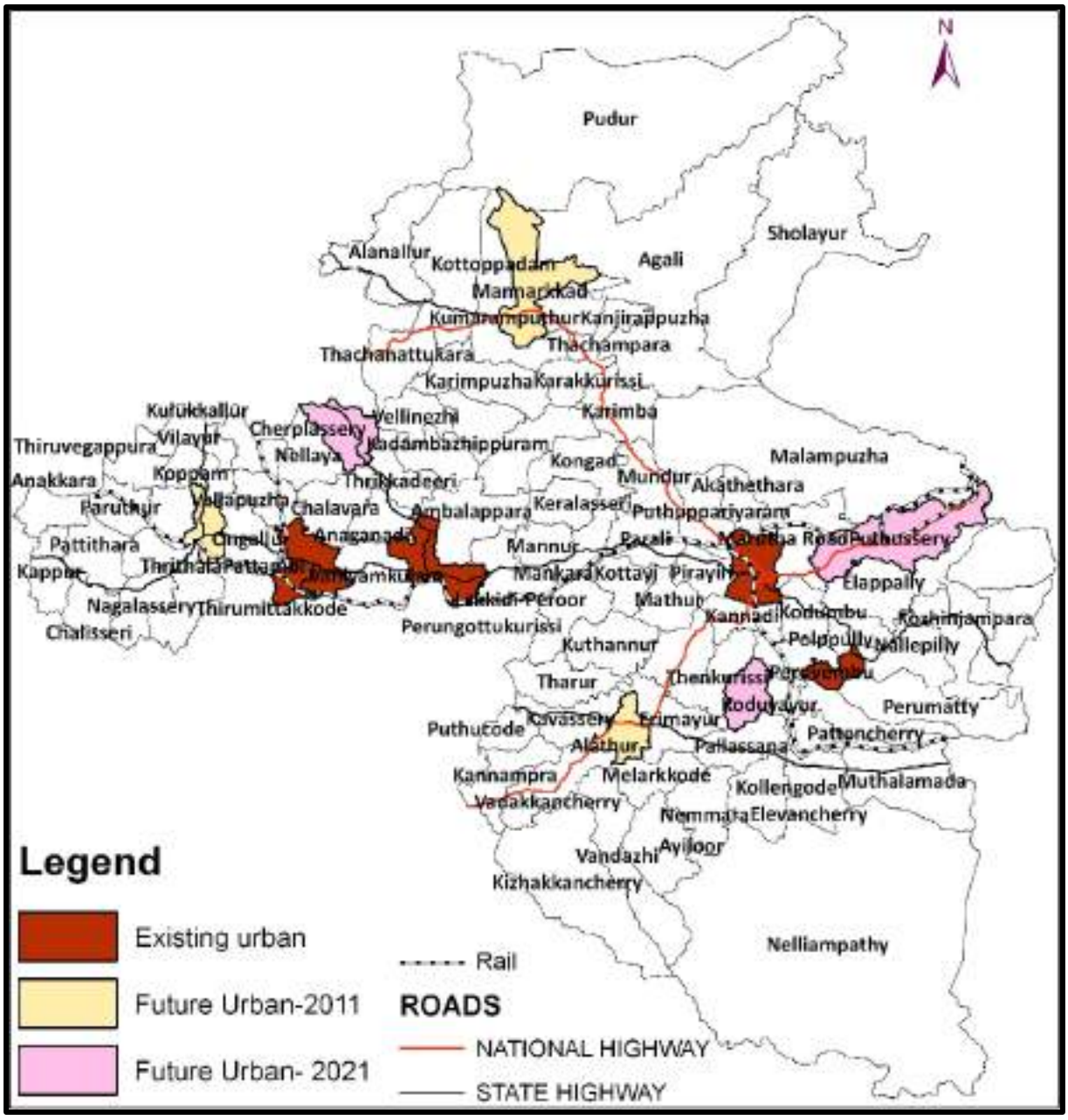


Fig 2.17 Future Urban Profile
Source: IDDP, Palakkad

2.7.6 Activity Pattern

The Activity Pattern of the district is analysed based on the land use concentration pattern, functional character and future urban profile. Accordingly, the major activities of the settlements of the district are identified to be urban activity, primary activity, secondary activity, agriculture and allied activity or activity non detrimental to forest. The final activity pattern of the district emerging out by superimposing the activities is shown in figure 2.18. Chittur-Thathamangalam Municipality shows the activity pattern as Tertiary.

2.7.7 Development Concept

The spatial structure of the district is evolved by integrating the activity pattern, regional connectivity and hierarchy of settlements. The development goals and objectives of the district.

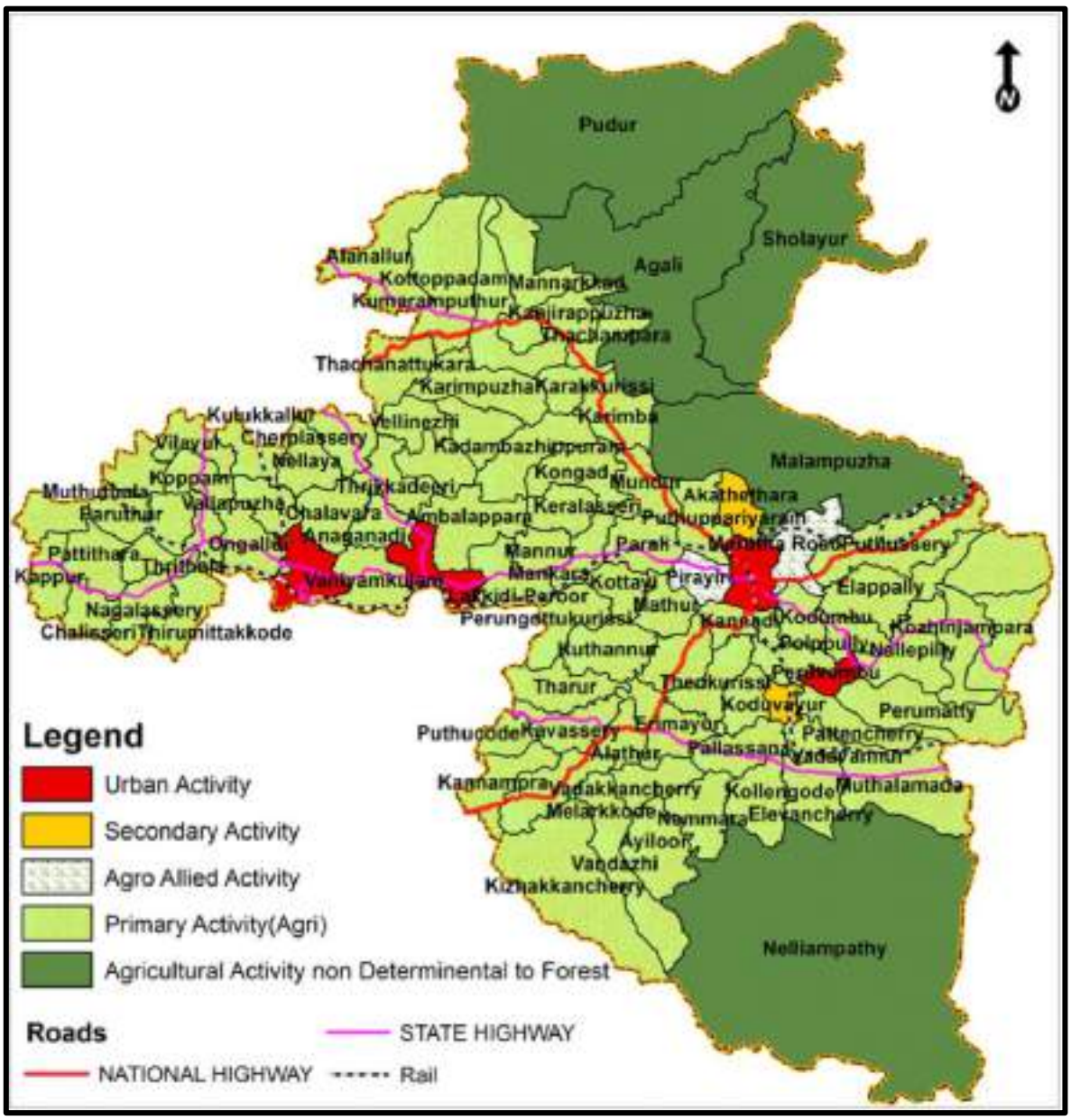


Fig 2.18 Activity Pattern
Source: IDDP, Palakkad

As per development concept of IDDP (Fig 2.19), Chittur-Thathamangalam Municipality comes under Multi-functional Zone (2nd Order) and it was suggested that it should act as a service centre for the hinterland and this zone is considered very much suitable for industries utilizing agricultural produce of the hinterland. Second order urban facilities were suggested to be provided in this zone. However, in the last decade, it has failed to display any characteristics of the second order settlement and of the 'multi-functional' zone and continues to be semi-rural in character.

A decade has passed since the IDDP Palakkad 2013 report. Therefore, it needs to be reviewed and updated. The development concept of the district needs appropriate reformulation, synthesising findings of studies and appropriate formulation of goals and objectives for settlements within the district. The updated development concept can then provide the required framework for integrated development of the district for the coming decade.

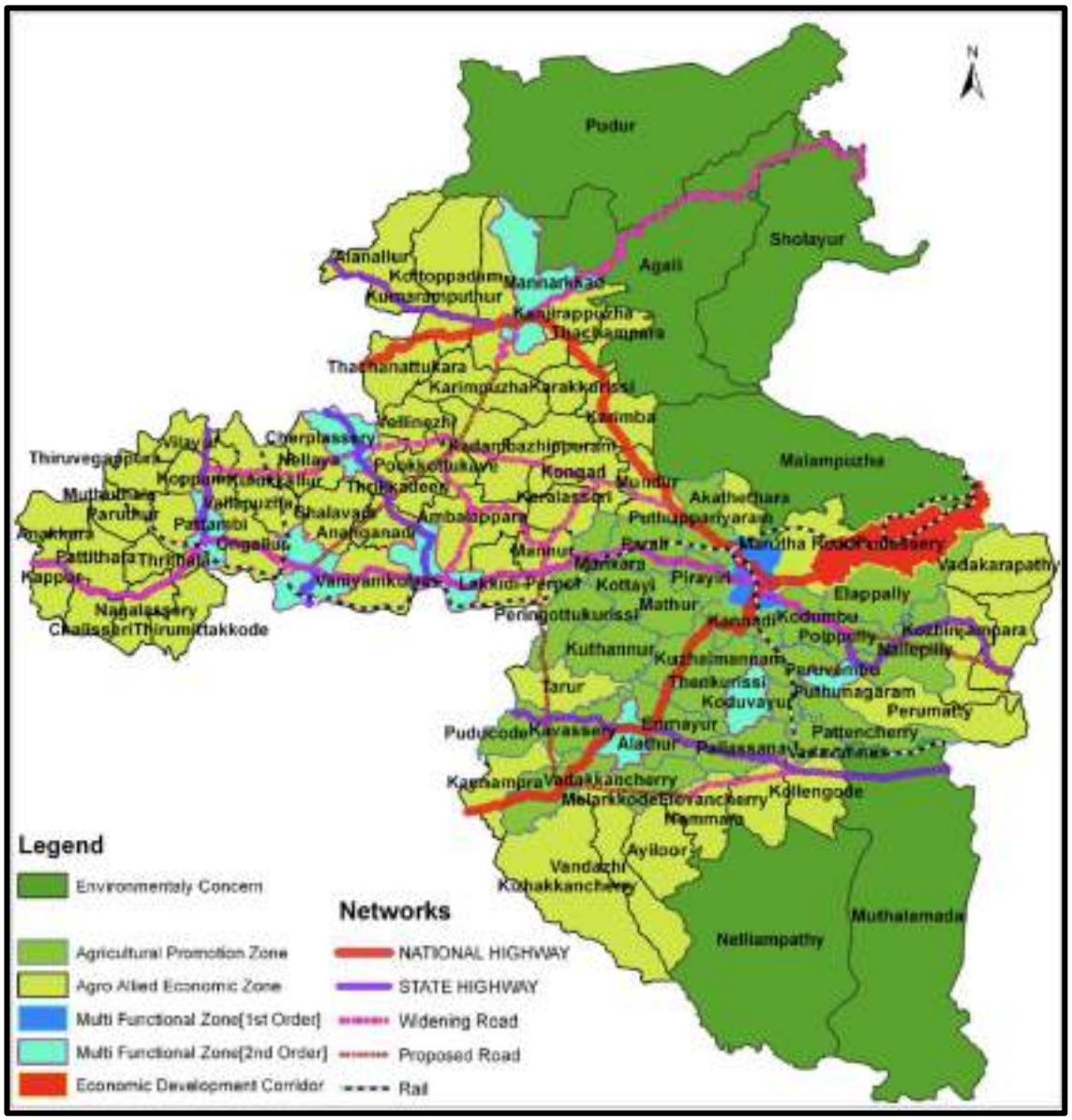


Fig 2.19 Development Concept
Source: IDDP, Palakkad

2.8 Service Area of Chittur-Thathamangalam Town

Based on the Hierarchy of Settlements derived out in the "Integrated District Development Plan" Chittur-Thathamangalam Municipality is listed as the one of the four second order settlements in the district. Service area of Chittur-Thathamangalam Municipality includes the following LSG's and its area and population is shown in Table 2.2 and in Fig 2.20. The service population of the Chittur-Thathamangalam town, visualised as a future second order settlement in the district is 390192.



Fig 2.20 Service area of Second order settlements as per IDDP Palakkad

Table 2.2 Area and population of LSGs included in Service area of Chittur-Thathamangalam Town

Sl. No.	Name	Area in km^2	Population	Sl. No.	Name	Area km^2	Population
1	Polpully	19.96	16500	9	Kozhinjampara	43.84	28751
2	Elappully	49.07	39032	10	Vadakarapathy	49.51	26459
3	Koduvayur	20.61	29197	11	Eruthempathy	36.93	18158
4	Vadavannur	17.38	17126	12	Perumatty	60.79	30445
5	Kollengode	49.33	29587	13	Elavanchery	32.18	17940
6	Muthalamada	66.76	37060	14	Pallassana	29.33	23729
7	Puthunagaram	9.24	17892	15	Chittur-Thathamangalam	14.71	32298
8	Pattanchery	30.3	26018				

2.9 Chittur-Thathamangalam Town and its Immediate Influence Zone

There are six panchayats which surround Chittur-Thathamangalam town. The surrounding panchayats are Peruvemba, Polpully, Pattancherry, Perumatty, Pudunagaram and Nalleppilly. Table 2.3. gives the demographic details of the immediate influence zone.

Table 2.3 Demographic Details of Immediate Influence Zone

Name of LSGI	Area in Sq Km	Population				Population Density				Growth rate		
		1981	1991	2001	2011	1981	1991	2001	2011	1981-1991	1991-2001	2001-2011
Chittur Thathamangala	14.47	30407	32048	31886	32285	2101	2215	2204	2231	5.40	-0.51	1.25
Nalleppilly	39.87	26775	30032	32044	32713	672	753	804	820	12.16	6.70	2.09
Perumatty	60.79	23842	27693	29500	30445	392	456	740	764	16.15	6.53	3.20
Pattanchery	30.30	20673	23505	24735	26018	682	776	620	653	13.70	5.23	5.19
Puthunagaram	9.24	13984	15691	16373	17892	1513	1698	411	449	12.21	4.35	9.28
Peruvemba	20.49	15426	17384	18433	19312	753	830	462	484	12.69	6.03	4.77
Polpully	19.96	13670	15121	15645	16500	685	758	392	414	10.61	3.47	5.47

Source: Census 1981, 1991, 2001, 2011

The population of Chittur-Thathamangalam and its immediate influence region grew from 1,44,771 persons from 1981 to 175165 persons in 2011 constituting a growth rate of 4.42% during the decade of 1991-2001 and 3.8 8% during 2001-2011.

Regional setting studies conducted in connection with preparation of Master Plans for towns in the district, documented as District Spatial Plan as well as draft IDDP for the district, reveals that all the adjoining panchayats exhibit rural nature. Chittur-Thathamangalam Town has good road connectivity to adjacent local bodies and to District headquarters. Due to this connectivity with all the adjoining areas, all neighbouring LSGI's depend on Chittur-Thathamangalam town for their daily needs, as is expected from a third order node. The economy of Chittur-Thathamangalam Town, though listed as 'urban,' in reality it is characterized by a mix of

tertiary activity, secondary and primary activities while its immediate influence zone is characterized by primary activities like agriculture. Activity pattern of Chittur-Thathamangalam town and surrounding LSGI's is shown in Table 2.4.

Table 2.4 Activity pattern of Chittur-Thathamangalam Town and surrounding LSGI's

Name of LSGI	Urban Profile	Functional Character	LCI	Activity Pattern
Peruvemba	NON-URBAN	RURAL	URBAN	PRI ACTIVITY(AGR)
Polpully	NON-URBAN	RURAL	URBAN	PRI ACTIVITY(AGR)
Nalleppilly	NON-URBAN	RURAL	URBAN	PRI ACTIVITY(AGR)
Pattanchery	NON-URBAN	RURAL	URBAN	PRI ACTIVITY(AGR)
Perumatty	NON-URBAN	RURAL	AGR	PRI ACTIVITY(AGR)
Puthunagaram	NON-URBAN	SEMI RURAL	URBAN	AGR+ANM HUSB+SSI
Chittur-Thathamangalam	URBAN	URBAN	URBAN	TERTIARY

Fig 2.21 shows a pictorial representation of Activity Pattern of Chittur-Thathamangalam Town and surrounding local bodies. From this data, though it appears that the town is urban in character, in reality, though there is a predominance of tertiary activities in Chittur-Thathamangalam Town, primary activities and secondary activities (household industrial activities) also continue in the town. All the neighbouring LSGI's except Pudunagaram Grama Panchayat which shows Secondary activity, fall under primary activity zone. It can be seen that the immediate surrounding settlements show non-urban nature. Hence the planning area for Master Plan was confined to Chittur-Thathamangalam Municipal area.

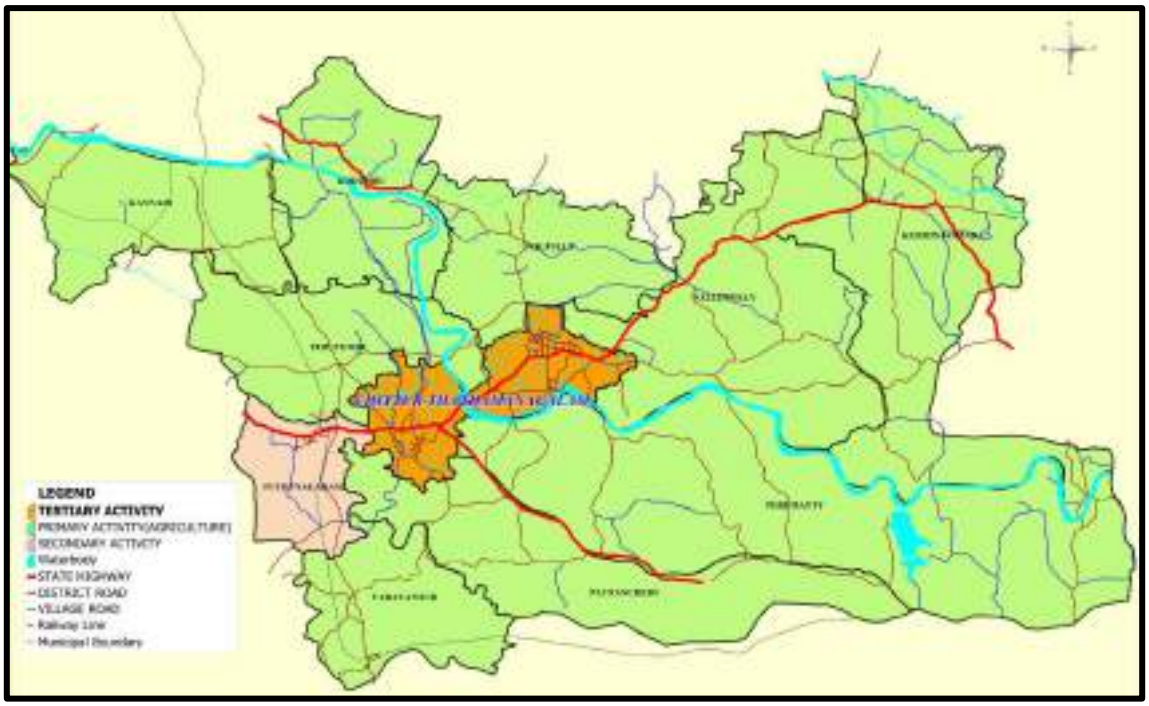


Fig 2.21 Activity Pattern of Chittur-Thathamangalam and surrounding LSGI's

2.10 Inference

The analysis of regional linkage of the town with surrounding District/State and Regional setting of the town within the district based on the decade old "Integrated District Development plan**"** clearly points out the fact that the Chittur-Thathamangalam municipality is well connected with surrounding District/State, Airport, Port, tourist spots, growth centres within the district by road and rail network. The analysis also reveals the fact that though Chittur-Thathamangalam Municipality, a Taluk head quarter was projected to function as a second order settlement, the town in reality continues as a semi-rural, third order node, within its rural hinterland. Based on the Hierarchy of Settlements derived out in the decade-old Integrated District Development Plan for Palakkad, Chittur-Thathamangalam Town was to serve as one of the four second order settlements in the district. However, since its urban status is arising out of its colonial-era granted municipal status and not due to its current reality which is still semi- rural with nearly 50% continuing to be under agricultural use, this projected second order status can be revised acknowledging that it can continue as a third order node. The service population of this third order node in the district is 3,90,192. Though the IDDP expected a lot of development of Chittur-Thathamangalam Municipal area with more improved infrastructural facilities and job opportunities to satisfy its projected second order settlement status, what is perhaps needed is to enable the town to retain its peaceful and charming ambience, improve its quality of life and provide urban amenities in a rural setting. All neighbouring LSGs except Pudunagaram show rural character while Pudunagaram shows semi-rural character. Since none of the neighbouring LSG's show urban character, the Master Plan area is currently limited to be the Chittur-Thathamangalam Municipal Area. However, given the water stressed status accorded to the Chittur block, it becomes imperative while revising the IDDP, which is now due, to rethink the planning boundaries along the watershed boundaries and plan accordingly, even across administrative boundaries, where needed.

Chapter 3: DEMOGRAPHY

Demography is the statistical study of human population. The word comes from the Greek 'Demos' meaning people. It serves as the base for all developmental activities and helps in informed decision making. The ultimate aim of preparing a Master Plan is to improve the standard of living of the people. Demographic study is important for the formulation, implementation and evaluation of the plans, policies and programs for education, housing, health, employment, recreational needs and other forms of social services.

This chapter deals with the study and analysis of population within the planning area with respect to population and its distribution, sex ratio, density and growth rate.

3.1 Population and its Growth Pattern

The Census of 2011 place Kerala's population at 3,34,06,061 persons which includes 1,60,27,412 males and 1,73,78,649 females. Although Kerala accounts for only about 1.1% of the total area of India, it contains about 2.76% of the country's total population. Among the States of India, Kerala stands at 12th position in terms of population.

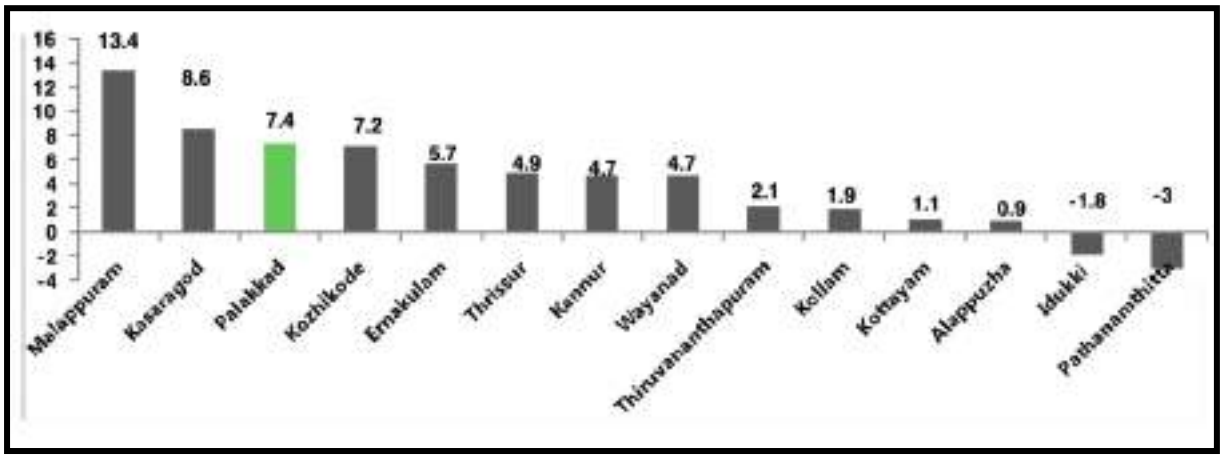


Fig 3.1 Comparison of Population with other districts of Kerala (2001-2011)

The population of Palakkad district as per Census 2011 is 28,09,934 persons consisting of 13,59,478 males and 14,50,456 females and amounts to 8.41% of the total population of Kerala. In terms of area the district, with an area of 4482 sq. km. amounts to 11.53% of the area of the state and is the largest district of Kerala.

As per 2011 Census, the total population of Chittur-Thathamangalam Municipality is 32298, consisting of 15665 males and 16633 females. There are 7974 households in the municipality with an average size of the household as 4.05 persons. The municipality with an area of 14.71 sq. km. shares an area of 0.33% of the total area and 1.15% of the total population of the district. The sex ratio has increased from 1053 in 2001 to 1062 in 2011. The total and gender wise population for Palakkad municipality for the years 1991, 2001 and 2011 are shown in Table 3.2.

Table 3.1 Total Population of Chittur-Thathamangalam Municipality in 1991, 2001, 2011 & 2020

Year	1991	2001	2011	2020
Population	32048	31886	32298	32690

Source: Census 1991, 2001, 2011 and Mid-year Population 2020

Palakkad Municipality has the highest population in the district of 131019 persons followed by Ottappalam and Shoranur Municipalities of 53755 and 43533 persons respectively. Mannarkkad, Cherpulasseri, Pattambi are the three municipalities formed in the year 2015. Mannarkkad Municipality is formed comprising Mannarkkad Panchayat and ward nos.15,16 of Thenkara Gramapanchayat and Cherpulasseri Municipality is formed comprising Cherpulasseri Panchayat and ward nos. 14,15,16 of Thrikkadeeri Gramapanchayat and Pattambi Municipality is same as Pattambi Gramapanchayat. Fig 3.2 shows comparison of population of Chittur-Thathamangalam Municipality with other four municipalities (Census 2011) including newly formed Pattambi Municipality. Population data of other two municipalities ie; Mannarkkad and Cherpulasseri formed in 2015 were not available in Census 2011 data hence not compared.

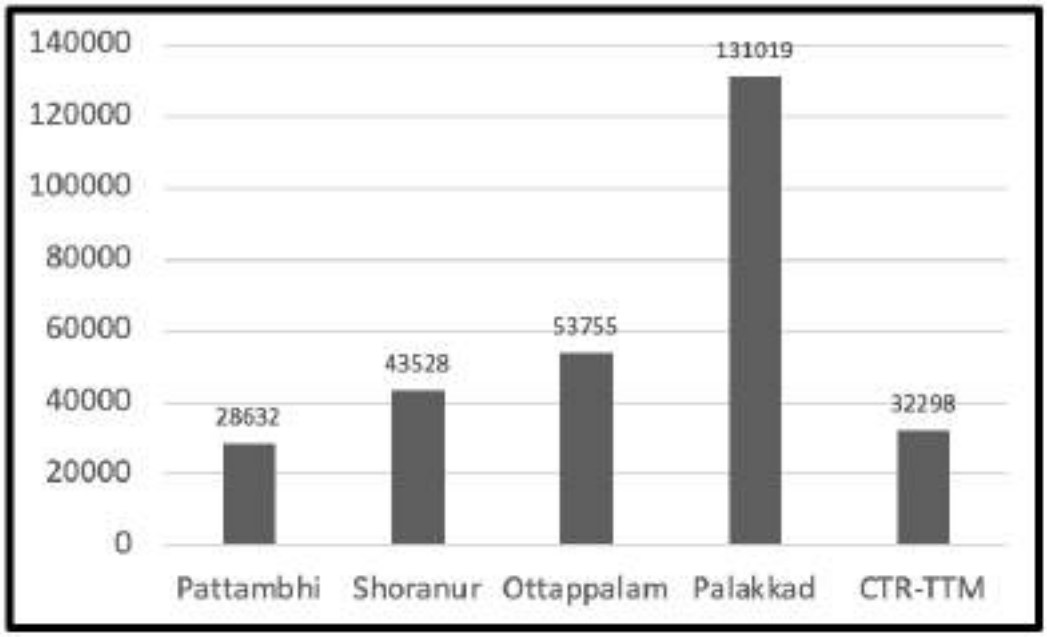


Fig 3.2 Comparison of the population of Chittur-Thathamangalam Municipality with other municipalities in the district

In the municipality, the population has grown by 23.55% over the last 6 decades. The growth rate has been steadily decreasing except for the decade between 1991 and 2001 that showed a negative growth rate of 0.51%. The decadal growth rate has decreased a little (1.21%) compared to the previous decade (1.29%). The population dipped from 32048 to 31886 during this period. The municipality is having six neighbouring LSGI's namely Nalleppilly, Perumatti, Pattancherry, Polpully, Puthunagaram and Peruvemba.

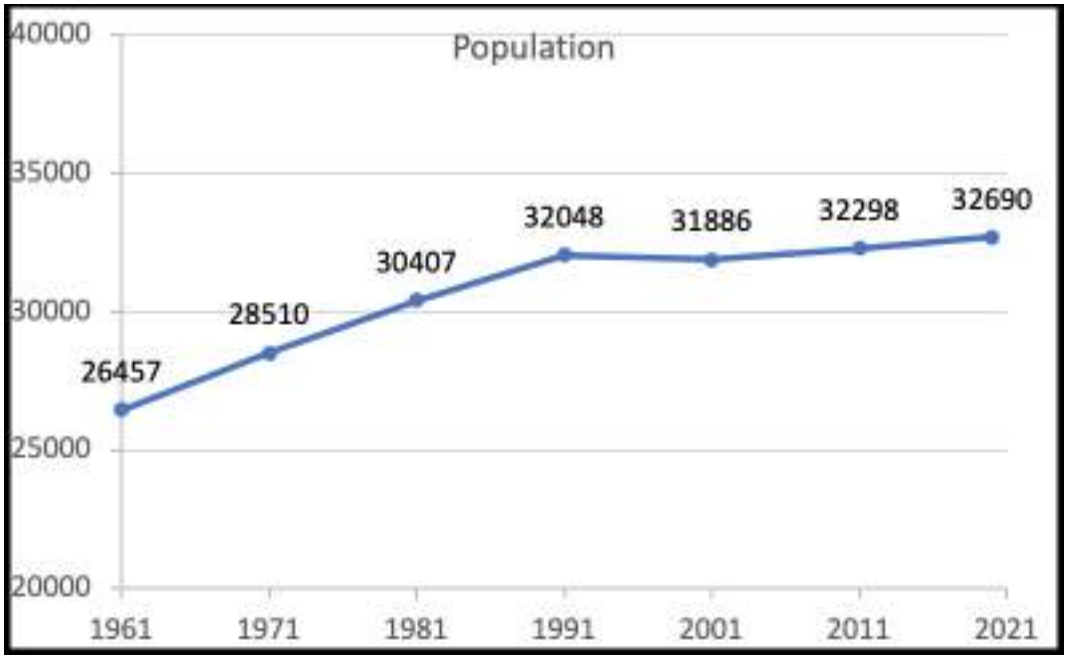


Fig 3.3 Temporal variation of population in the municipality over the decades
Source: Census 1961, 1971, 1981, 1991, 2001, 2011 and Mid-year population 2020

Fig 3.4 and 3.5 shows percentage of total population and urban population in comparison with that of Palakkad district. In both cases, value of municipal population is only less than or equal to five percentage in comparison with the district value. Fig 3.6 shows comparison of population with other towns those having similar growth pattern as that of Chittur-Thathamangalam Municipality. Fig 3.7 shows comparison of population with nearby LSGI's.

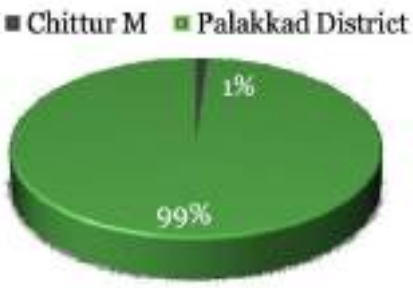


Fig 3.4 Percentage of population within the LSGI with reference to the district-2011

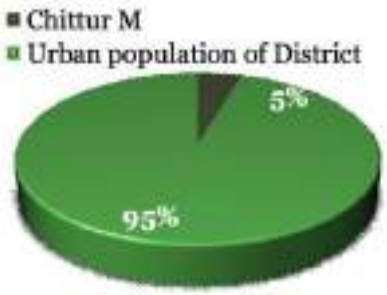


Fig 3.5 Percentage of urban population with reference to district urban population-2011

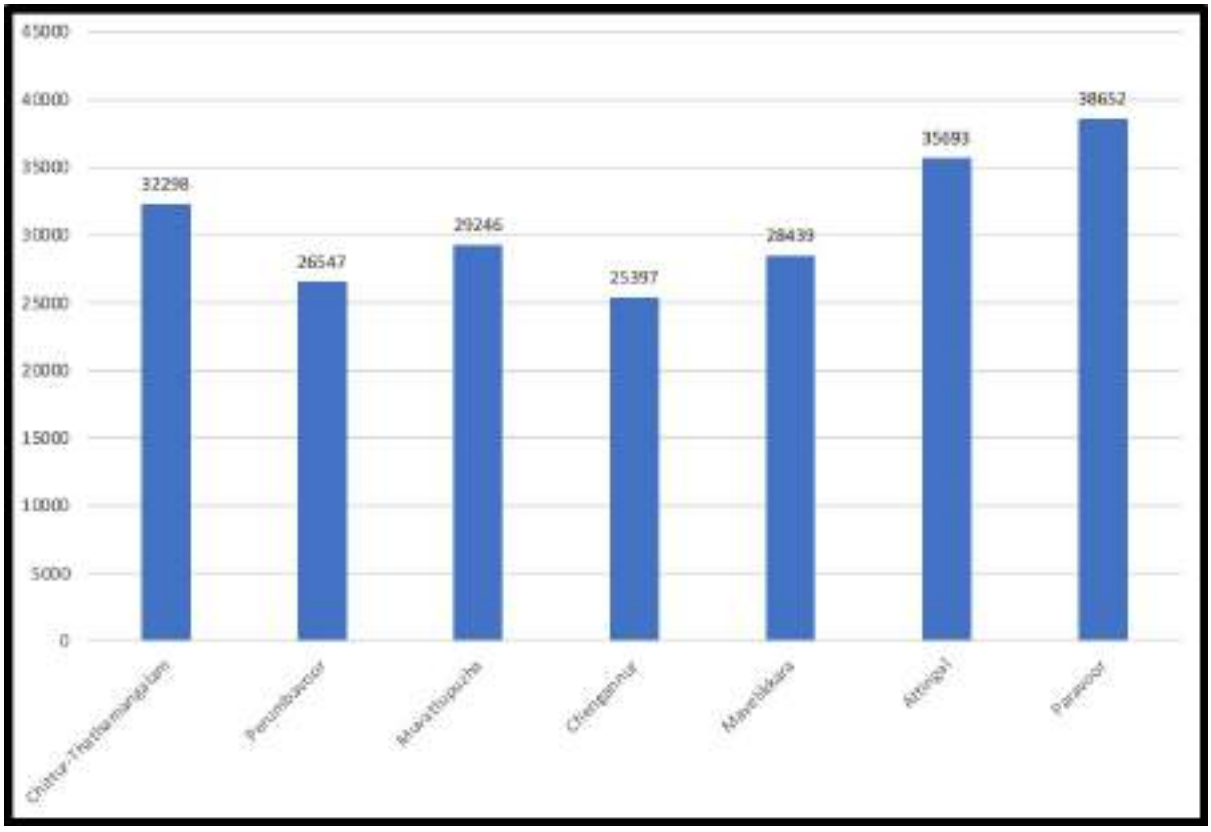
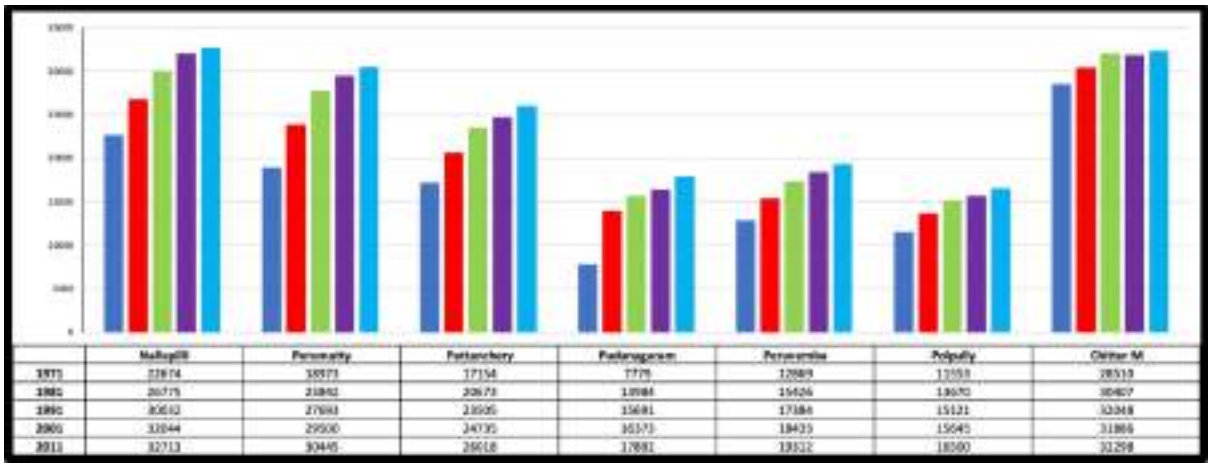


Fig 3.6 Comparison of population with similar towns - 2011



	Nallepilli	Perumatty	Pattanchery	Pudarugaram	Peruvemba	Polpully	Chittur M
1971	22874	18971	17154	7775	12889	11553	28513
1981	26775	21842	20673	10984	15626	13670	30407
1991	30532	27043	23505	15681	17186	15121	32048
2001	32844	29500	24735	16171	18433	15645	31866
2011	32713	30445	26018	17681	19322	18560	31298

Fig 3.7 Comparison of population with nearby LSGI's 1971, 1981, 1991, 2001, 2011

In the analysis of gender wise split up of municipal population it is seen that Female population is higher than that of Male population and follows a healthy pattern. Table 3.3 shows the gender wise population of Census year 1981,1991, 2001, 2011 and Fig 3.8 shows the temporal variation of gender wise population.

Table 3.2 Variation of gender wise population

YEAR	Total Population	Male	Female
1981	30407	14893	15514
1991	32048	15599	16449
2001	31886	15534	16352
2011	32298	15665	16633

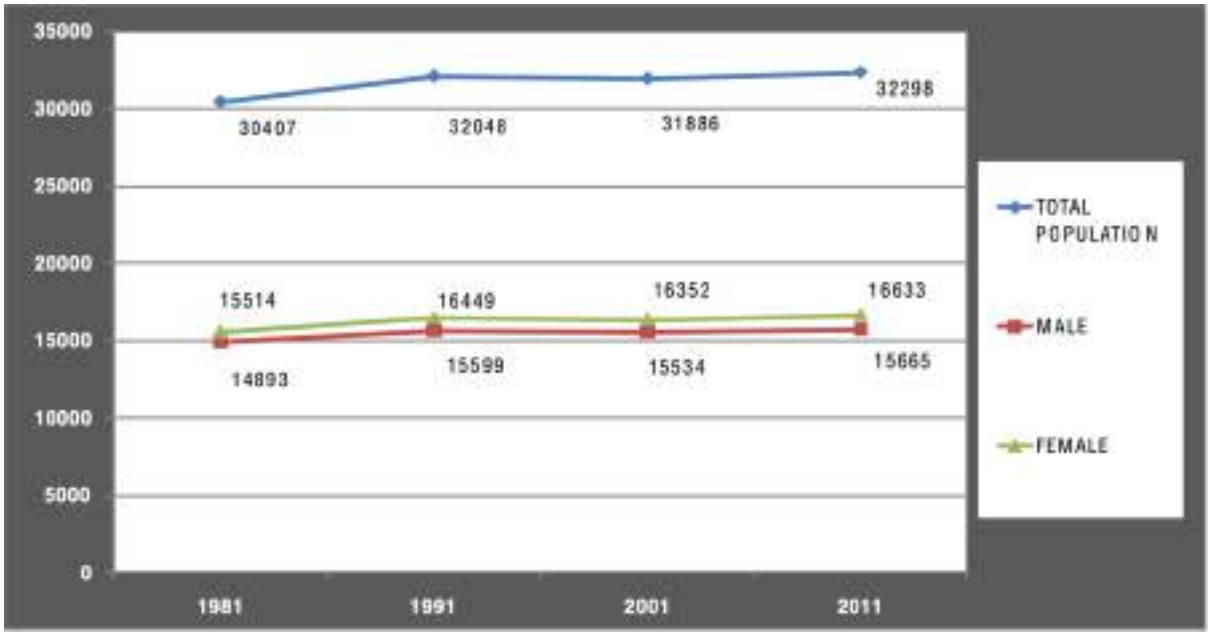


Fig 3.8 Temporal variation of gender wise population
Source: Census 1981, 1991, 2001, 2011

3.2 Spatial Distribution of Population

The ward wise spatial distribution of population in Chittur-Thathamangalam Municipality based on Census 2011 and projected wardwise from the 2020 Mid-year total town population is shown in Fig.3.9. From the figure we can see that the wards Tharakalam (19), Arangam (3), Chembalassery (4), Kunathupalayam (20) Valmutty (16) currently have higher population than the other wards while wards Gramam (28) and Kadambidi (7) have lower population. Table 3.3 shows ward wise population of Chittur-Thathamangalam Municipality.

Table 3.3 Ward wise Population of Chittur-Thathamangalam Municipality in 2012 and mid-year 2020

WARD No	WARD NAME	Pop 2012	Midyear 2020	WARD No	WARD NAME	Pop 2012	Midyear 2020
1	Cherumkode	1067	1298	16	Valmutty	1017	1356
2	Pattani Street	1072	1084	17	Anikodu	1102	1079
3	Arangam	1072	1388	18	Thekegramam	1158	932
4	Chembakassery	1075	1383	19	Tharakalam	1100	1420
5	Ambattupalayam	1061	984	20	Kunnathupalayam	1201	1379
6	Muthukadu	1093	1129	21	College	1079	1146
7	Kadambidi	1140	781	22	Banglaparambu	1111	1080
8	Vadakathara	1097	1236	23	Paruthikkavu	1043	1239
9	Naramkuzhi	1032	971	24	Kammanthara	1115	1290
10	Kizhajethara	1165	1044	25	Mannathukavu	1108	1167
11	Kannanthara	1093	973	26	Srikurumbakavu	1024	965
12	Kosathara	1104	1095	27	Kadavalavu	1097	1274
13	Kacherimedu	1046	984	28	Gramam	1151	780
14	Aryampallam	1046	988	29	Mettuvalavu	1100	1284
15	Devangapuram	1046	961				

Source: Chittur-Thathamangalam Municipal Office, Mid-Year Pop 2020

3.3 Population Density

The gross population density of the town (2012) is 2195 persons/sq. km. much higher than the value of 627 persons/ sq. km. of the district. The average population density of the state is 860 persons/sq.km which is 2.25 times the national average. It has been observed that the density is higher in the northeastern parts of the municipality and in the wards along the main roads. The net area of the municipality is 6.05 sq. km. and the net population density is 5338 persons/ sq. km.

The ward wise gross population density and net population density is shown in Table 3.4. The gross population density in the municipality ranges from 678 persons/sq. km. in Chembakassery ward to 6581 persons/sq. km. in Vadakathara ward. The net population density ranges from 2335 persons/sq. km. in Chembakassery ward to 16316 persons/sq. km. in Kizhakkethara ward. Higher gross population density was observed in Kizhakkethara (10), Vadakkathara (8) and Devangapuram (15) wards on the eastern parts of the municipality. Higher Net Population Densities were observed in Kizhakkethara (10), Vadakkathara (8) and Kunnathupalayam (20) wards. Ward wise gross and net population densities are shown in Fig 3.10 and 3.11 respectively.

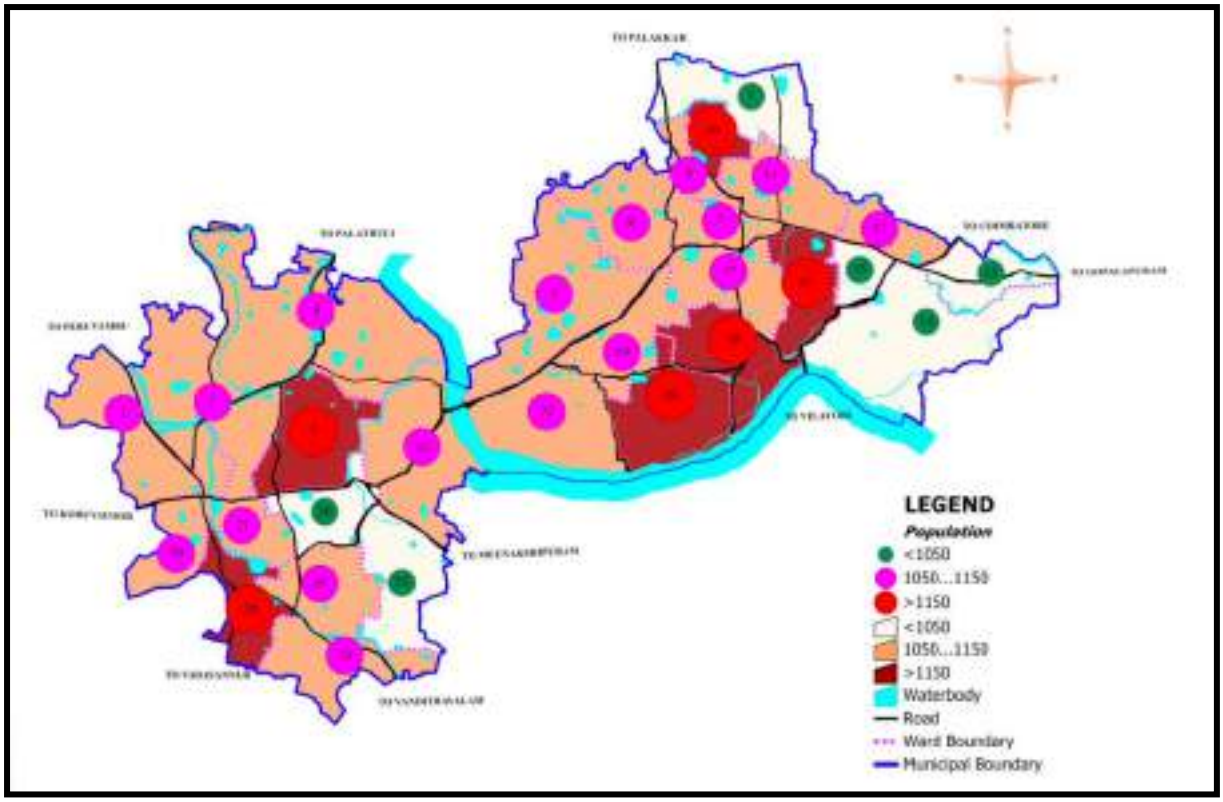


Fig 3.9 Spatial distribution of population (2012)

Table 3.4 Ward wise gross and net population density (2012)

Ward No	Name of Ward	Net Population density	Gross Population density	Ward No	Name of Ward	Net Population density	Gross Population density
1	Cherumkode	3816	1734	16	Valmutty	6232	2876
2	Pattani Street	4178	1170	17	Anikodu	4099	2236
3	Arangam	5961	1904	18	Thekegramam	4093	1985
4	Chembakassery	2335	678	19	Tharakalam	3554	2407
5	Ambattupalayam	3014	1069	20	Kunnathupalayam	9234	1693
6	Muthukadu	6627	1987	21	College	2775	1211
7	Kadambidi	4839	4019	22	Banglaparambu	3554	1267
8	Vadakathara	9321	6581	23	Paruthikkavu	5398	1866
9	Naramkuzhi	3319	1696	24	Kammanthara	4352	1131
10	Kizhakethara	16316	5519	25	Mannathukavu	4366	2295
11	Kannanthara	3216	2278	26	Srikurumbakavu	5395	2899
12	Kosathara	6652	4035	27	Kadavalavu	3879	2799
13	Kacherimedu	4296	2867	28	Gramam	5598	2891
14	Aryampallam	4555	870	29	Mettuvalavu	7426	3311
15	Devangapuram	7278	5548				

Source: Chittur-Thathamangalam Municipal Office

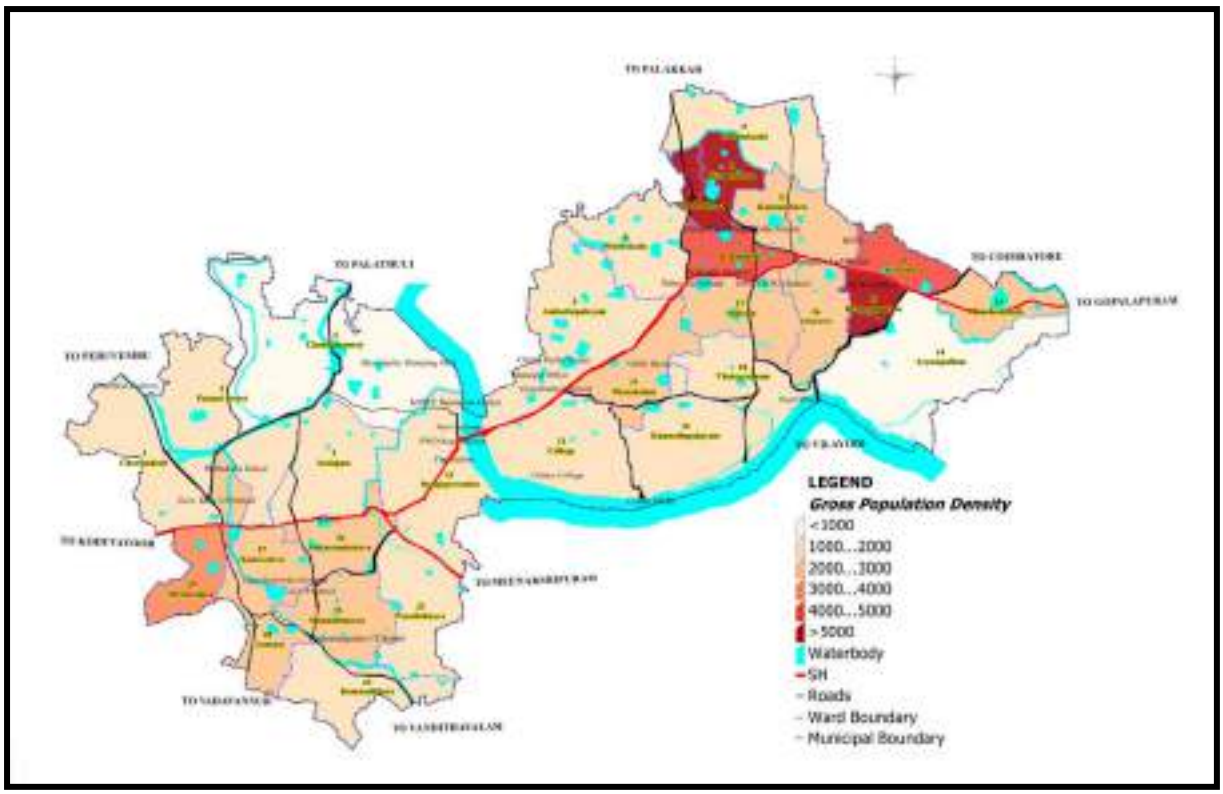


Fig. 3.10 Wardwise gross population density (2012)

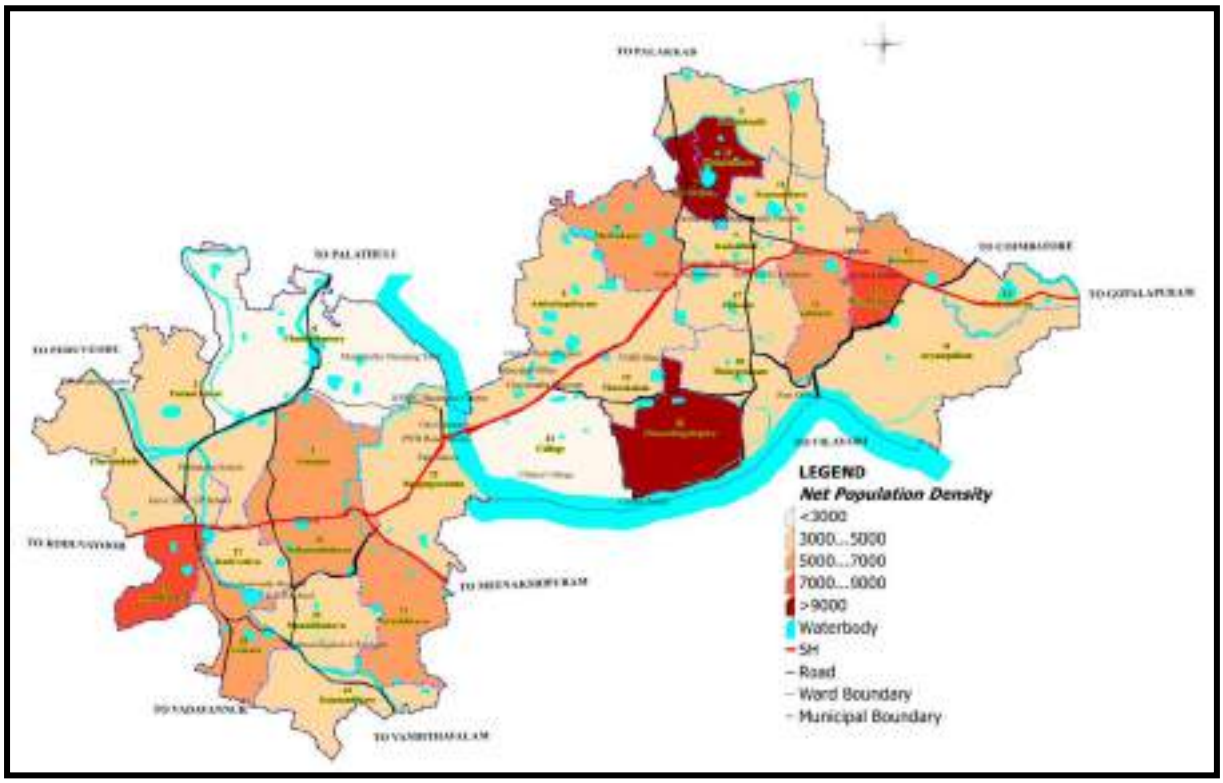


Fig. 3.11 Wardwise net population density (2012)

The gross population density of the municipality comes next to the Palakkad municipality having a density of 4926 persons/sq. km. Although the municipality share 1.15% of the total

population of the district, the urban population in the municipality amounts to 5% to that of the district. For the past two decades the population density has remained nearly constant. The gross population density of the municipalities from 1981 to 2011 is shown in Table 3.5 and Fig 3.12.

Table 3.5 Gross population density of Municipalities in Palakkad District

Name of LSGI	1981	1991	2001	2011
Pattambi M	1160	1396	1526	921
Shoranur M	1088	1225	1302	1348
Ottappalam M	1149	1353	1508	1646
Palakkad M	4182	4635	4916	4926
Chittur M	2067	2179	2168	2195
Palakkad District	456	532	584	627

Source: Chittur-Thathamangalam Municipal Office

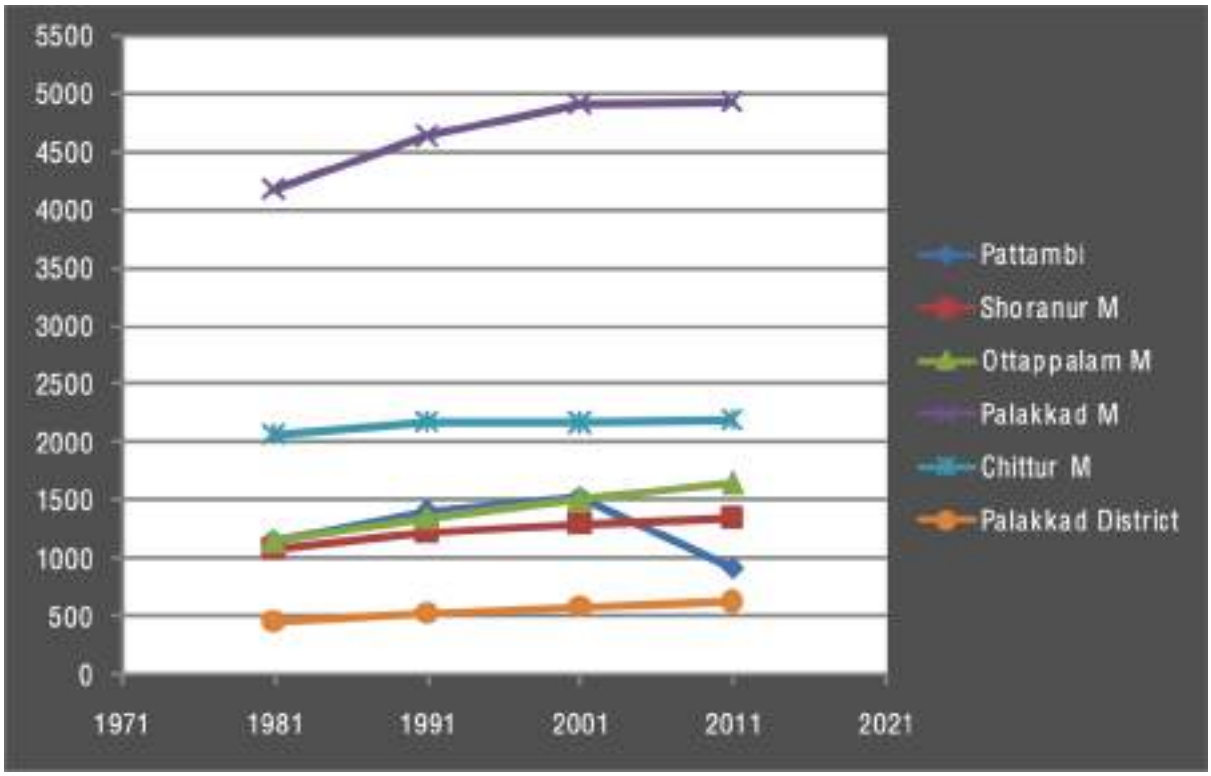
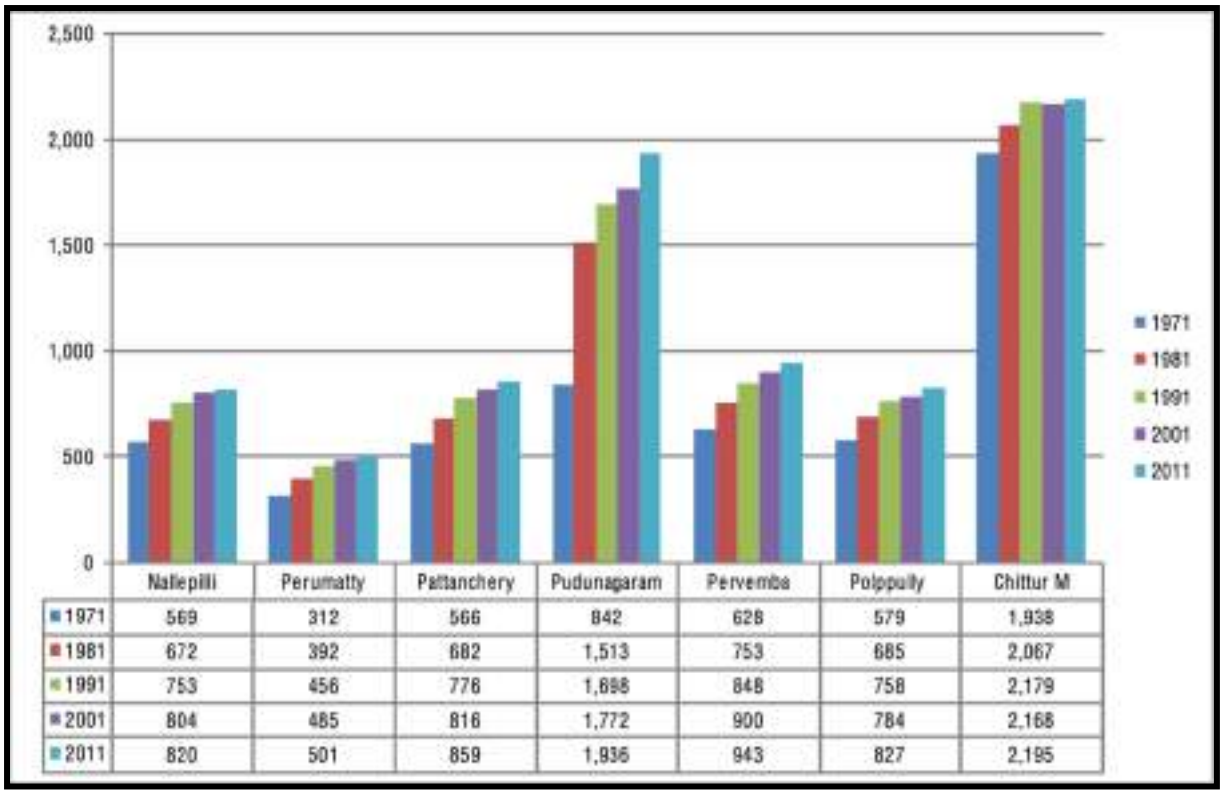


Fig 3.12 Comparison of gross population density with other towns in the district
Source: Census 1971, 1981, 1991, 2001, 2011

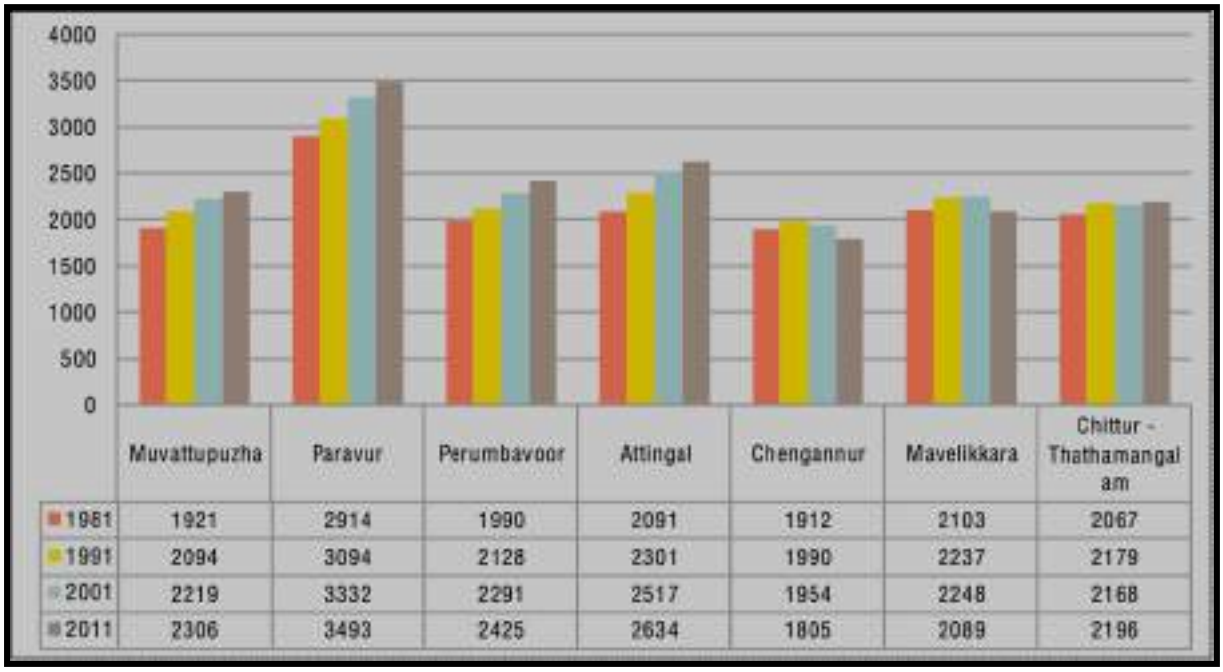
The comparison of population density with nearby LSGI's as per 2011 Census is shown in Fig. 3.13. Pudunagaram Panchayat with a population density of 1936 persons/ sq. km. has the

highest population density among the neighbouring LSGI's. Fig 3.14 shows comparison of Gross population density with similar towns.



	Nallepilli	Perumatty	Pattanchery	Pudunagaram	Pervemba	Polppully	Chittur M
1971	569	312	566	842	628	579	1,938
1981	672	392	682	1,513	753	685	2,067
1991	753	456	776	1,698	848	758	2,179
2001	804	485	816	1,772	900	784	2,168
2011	820	501	859	1,936	943	827	2,195

Fig 3.13 Gross population density comparison with nearby LSGI's
Source: Census 1971, 1981, 1991, 2001, 2011



	Muvattupuzha	Paravur	Perumbavoor	Attingal	Chengannur	Mavelikkara	Chittur - Thathamangalam
1981	1921	2914	1990	2091	1912	2103	2067
1991	2094	3094	2128	2301	1990	2237	2179
2001	2219	3332	2291	2517	1954	2248	2168
2011	2306	3493	2425	2634	1805	2089	2196

Fig 3.14 Gross population density comparison with similar towns
Source: Census 1981, 1991, 2001, 2011

3.4 Population Growth Rate

Table 3.6 shows the comparative growth rate of population of State, District and Municipalities for the last three decades. During 1991-2001, the municipality shows a negative growth rate. The population decreased from 32048 to 31886 during this period. This may be due to migration of people to other districts and neighbouring states for better job opportunities or some other social reason.

Table 3.6 Comparison of population with nearby LSGIs 1991-2011

SL No	Description	Population			Growth rate of population	
		1991	2001	2011	1991-2001	2001-2011
1	Kerala	29098518	31841374	33406061	9.43	4.91
2	Palakkad	2382235	2617482	2809934	9.88	7.35
3	Palakkad Municipality	123289	130767	131019	6.07	0.19
4	Ottappalam Municipality	44186	49242	53755	11.44	9.16
5	Shoranur Municipality	39550	42029	43533	6.27	3.58
6	**Chittur - Thathamangalam Municipality**	**32048**	**31886**	**32298**	**-0.51**	**1.29**

Fig 3.15 shows the comparison of growth rate of municipalities within the district and with district also. The growth rate of the municipality is lower than the other municipalities in the district except for the previous decade when the Palakkad municipality showed a lower growth rate than the Chittur-Thathamangalam Municipality. Fig 3.16 & 3.17 shows the comparison of growth rate of Chittur-Thathamangalam with nearby LSG's and similar towns respectively.

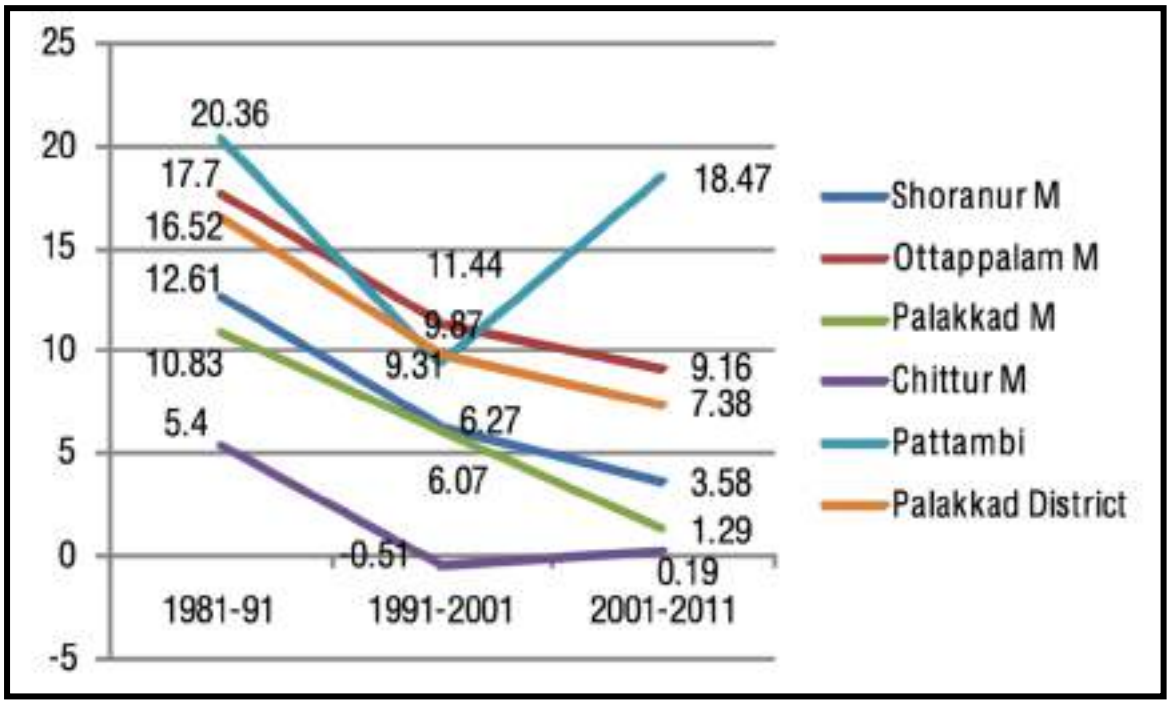
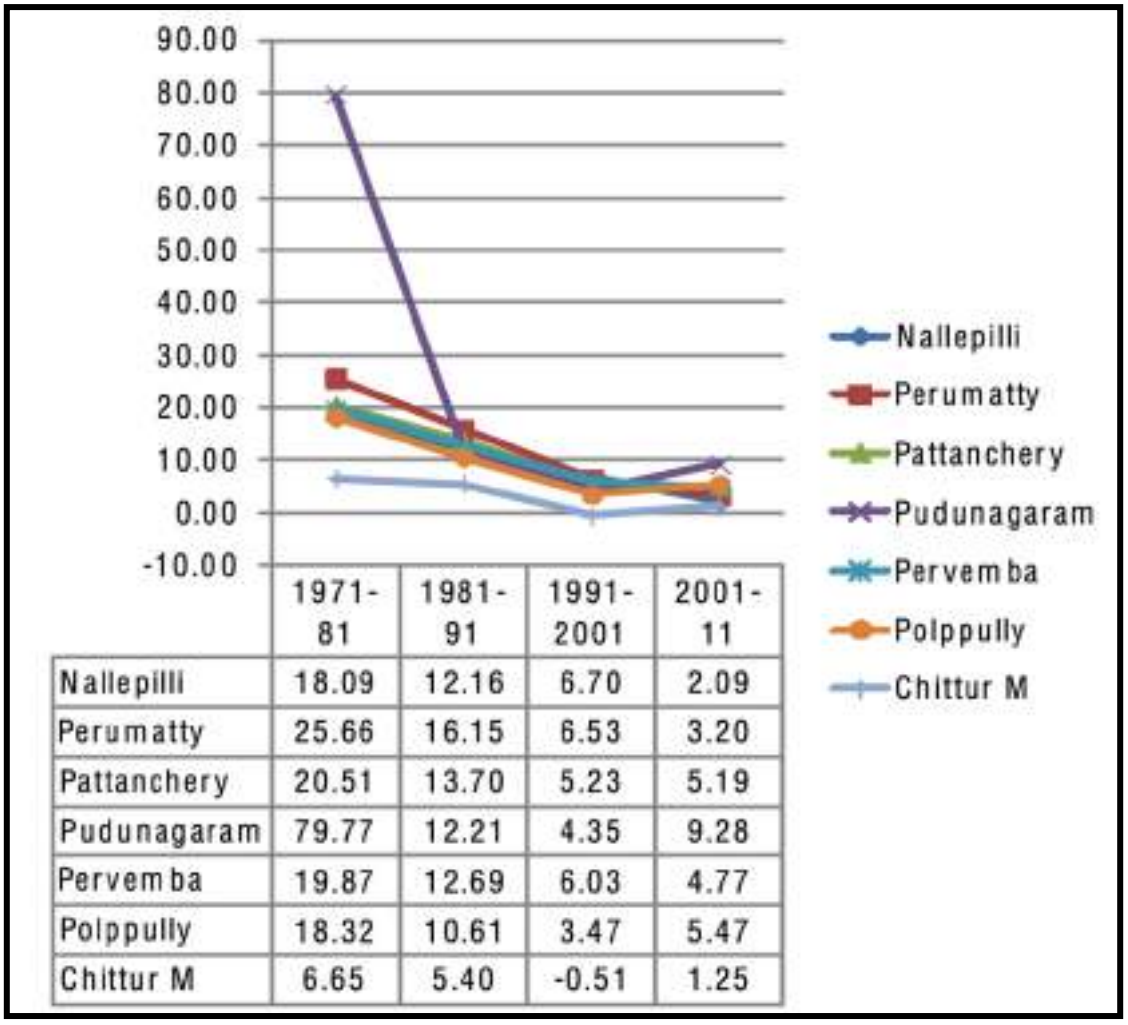


Fig 3.15 Comparison of population growth rate of Chittur-Thathamangalam town with other towns in the district



	1971-81	1981-91	1991-2001	2001-11
Nallepilli	18.09	12.16	6.70	2.09
Perumatty	25.66	16.15	6.53	3.20
Pattanchery	20.51	13.70	5.23	5.19
Pudunagaram	79.77	12.21	4.35	9.28
Pervemba	19.87	12.69	6.03	4.77
Polppully	18.32	10.61	3.47	5.47
Chittur M	6.65	5.40	-0.51	1.25

Fig 3.16 Comparison of population growth rate with nearby LSG's
Source: Census 1971, 1981, 1991, 2001, 2011

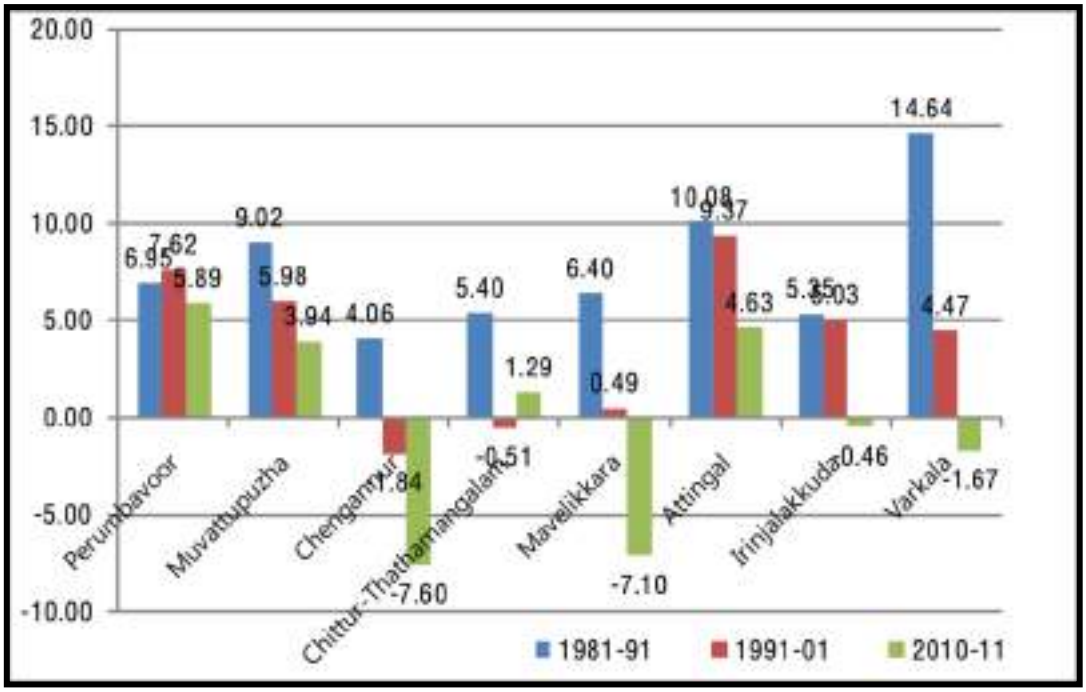


Fig 3.17 Comparison of population growth rate with similar towns
Source: Census 1971, 1981, 1991, 2001, 2011

3.5 Population Concentration

One third of the population is distributed in the wards Kizhakathara (10), Kadambidi (7), Valmutty (16), Thekkegramam (18), Kunnathupalayam (18), Banglaparambu (22), Arangam (3), Mannathukavu (25), Gramam (28) and Kammanthara (24) and half the population will be covered on adding Tharakalam (19), Anikode (17), Kosathara (12) and Mettuvalavu (29). On adding the population of Kadavalavu (27), College (21), Muthukadu (6), Vadakethara (8) and Kannanthara (11) two third population will be covered.

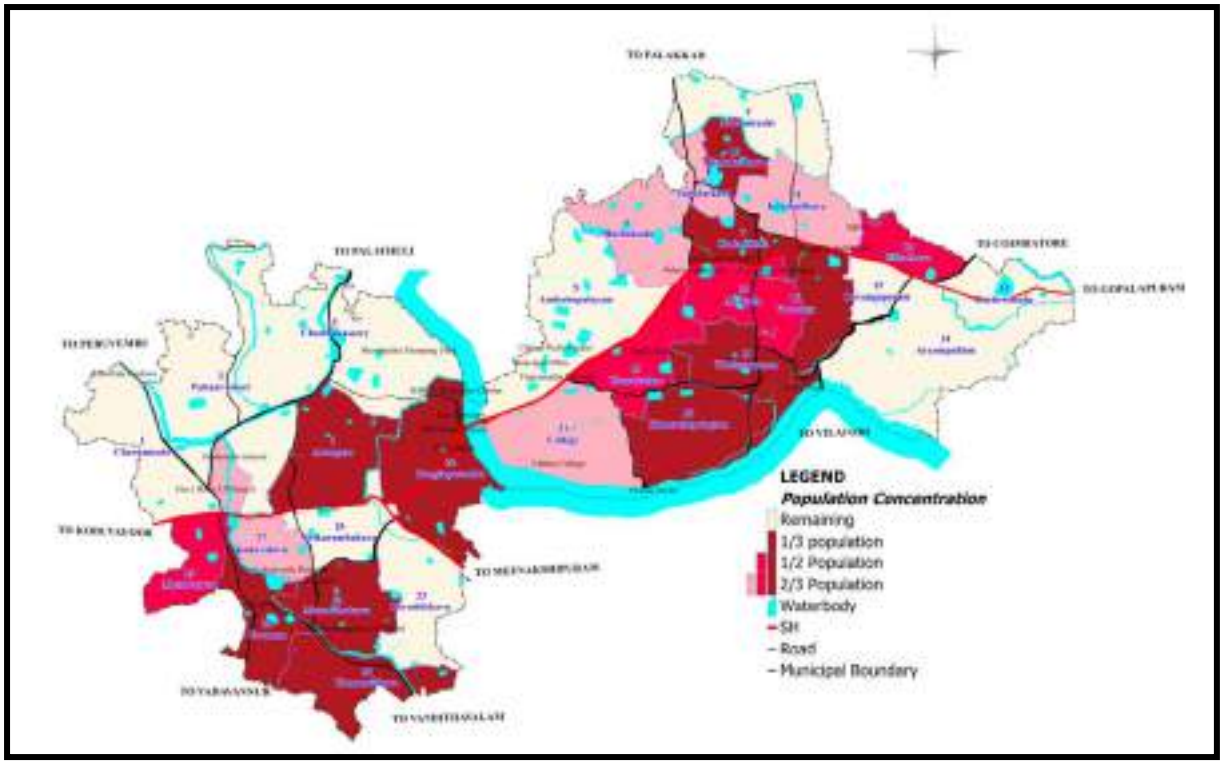


Fig 3.18 Population concentration of Chittur-Thathamangalam Municipality

3.6 Sex Ratio

Sex composition of the human population is one of the basic demographic characteristics, which is extremely vital for any meaningful demographic analysis. It is defined as the number of females per 1000 males. Changes in sex composition largely reflect the underlying socio-economic and cultural patterns of the society. It is a measure of prevailing equity between males and females at a given point of time.

According to the 2011 Census, Chittur-Thathamangalam Municipality is having a sex ratio of 1062, 9 points above the 2001 Census value of 1053. Except for the sex ratio of the municipality, which decreased in 2001 over the previous decade, both the state and the district figures have increased over the last three decades as can be seen from the Table 3.7.

Table 3.7 Temporal variation of sex ratio

	1991	2001	2011
Chittur – Thathamangalam (M)	1054	1053	1062
Palakkad District	1061	1066	1067
Kerala State	1036	1058	1084

Source: Census 1991, 2001, 2011

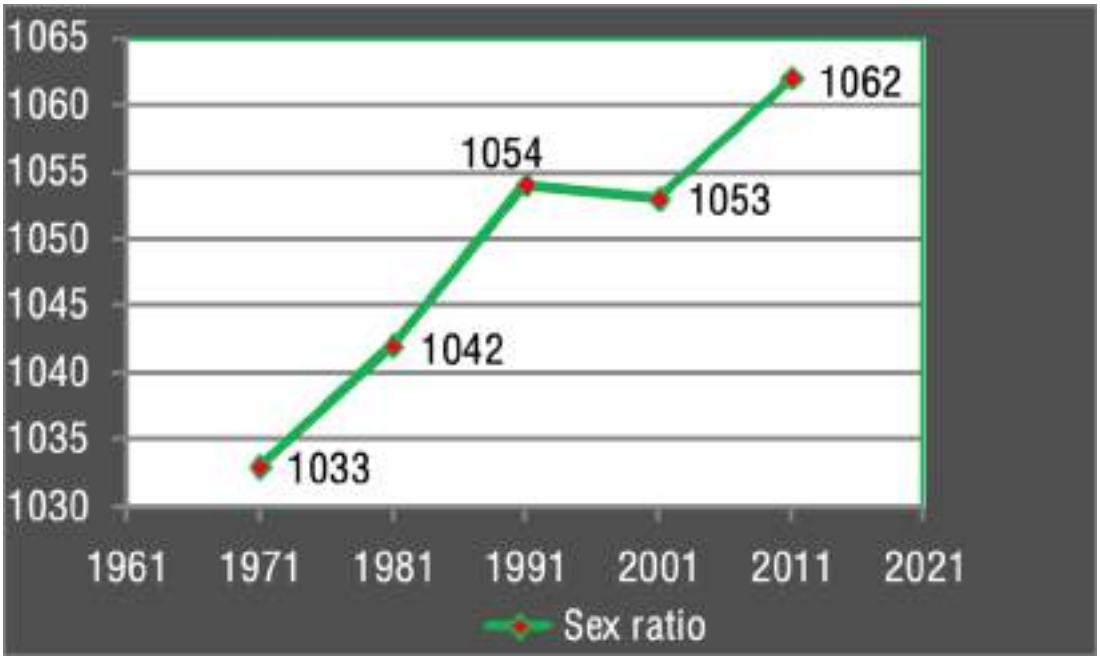


Fig 3.19 Temporal variation of sex ratio

Fig 3.20 shows the comparison of sex ratio with other municipalities and that of the district. In the case of sex ratio, Kerala is unique, being the only state in India where females have predominance over males with a sex ratio of 1084. As per 2011 Census, Palakkad district is having a sex ratio of 1067, 1 point above the previous decade's value of 1066. However, the sex ratio in the municipality is lower than that of the district. Ottappalam municipality is having the highest sex ratio followed by Shoranur and Palakkad district of 1097 and 1067 respectively. Palakkad Municipality is having the lowest sex ratio in the district. The sex ratio of Chittur-Thathamangalam Municipality in 1971 was 1033 which increased to 1062 over the last 4 decades by 2.8% except for a small dip by 1 point in 2001. As per Census 2011 Chittur-Thathamangalam Municipality is having a sex ratio of 1062 whereas the sex ratio for population in the age group 0-6 of the municipality is 1003. Changes in Child Sex Ratio index reflects underlying socio-economic and cultural patterns of the society, especially its attitude towards the girl child. Here Chittur-Thathamangalam Town has a healthy gender ratio and there is absence of discrimination against girls, the absence of female infanticide, which is the killing of girls after birth, or of female foeticide, sex-selective abortion of the foetus.

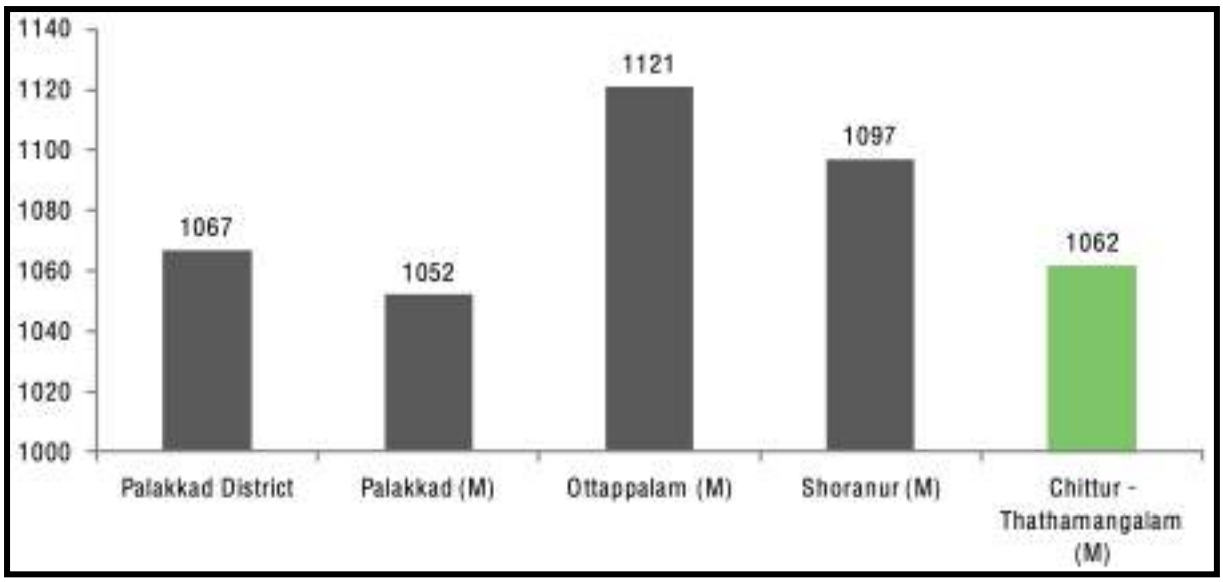


Fig 3.20 Comparison of sex ratio as per 2011 census with other municipalities and that of the district

The child sex ratio of the municipalities and that of the district as per 2011 Census are shown in Fig. 3.21.

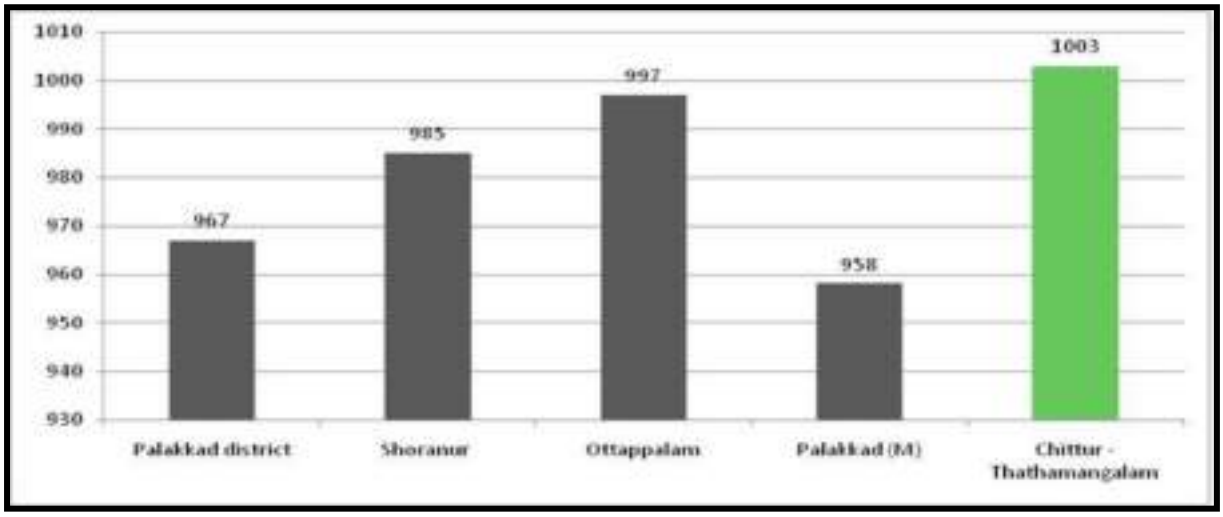
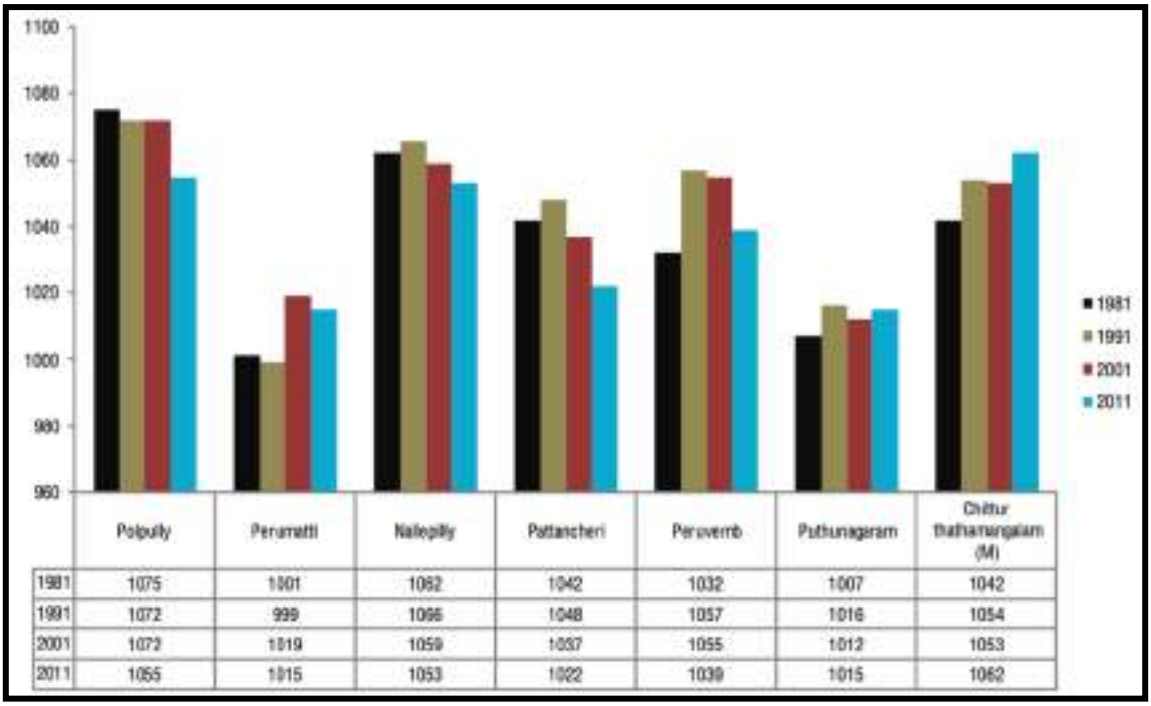


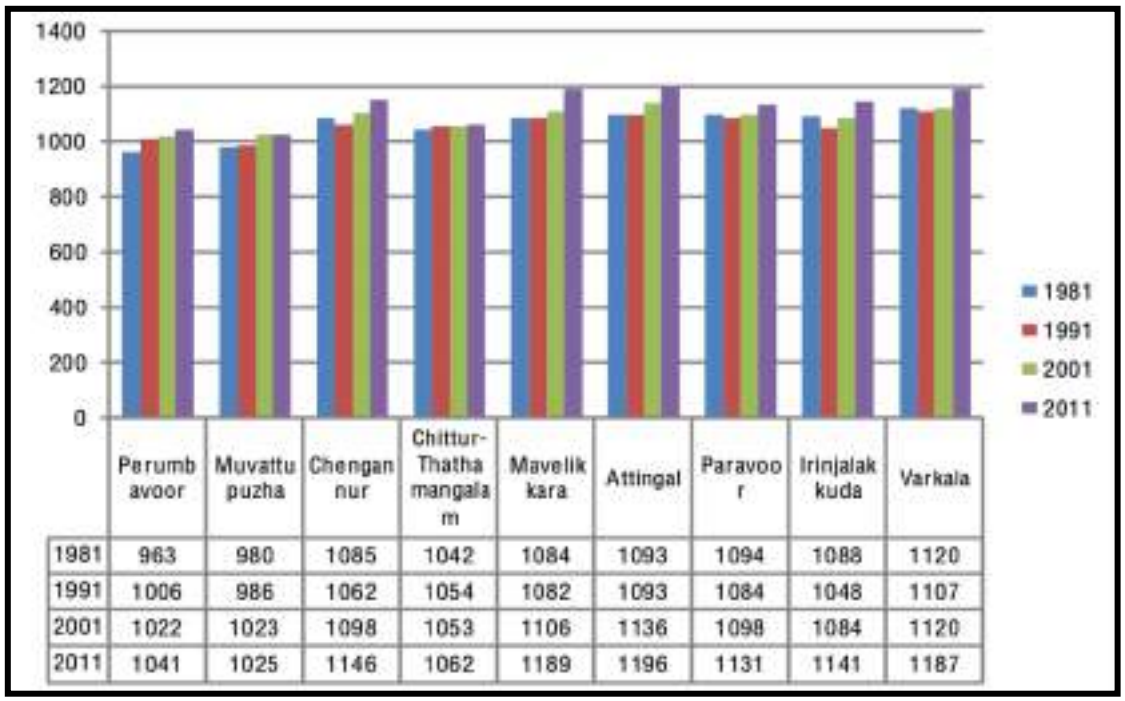
Fig 3.21 Comparison of Child sex ratio with municipalities within the district

However, Chittur-Thathamangalam Municipality is having a much higher child sex ratio than that of other municipalities as well as of the district and it is the only municipality in the district having a positive sex ratio of 1003 i.e; 1003 girls to 1000 boys. The child sex ratio increased from 982 in 2001 to 1003 in 2011 by 21 points in the municipality. Palakkad municipality is having the lowest child sex ratio of 958 which is lower than that of the district's value of 967. Comparison of sex ratio with nearby LSGI's and similar towns are shown in Fig 3.22 and Fig 3.23 respectively.



	Polpully	Perumatti	Nallepilly	Pattancheri	Peruvemb	Puthunagaram	Chittur thathamangalam (M)
1981	1075	1001	1062	1042	1032	1007	1042
1991	1072	999	1066	1048	1057	1016	1054
2001	1072	1019	1059	1037	1055	1012	1053
2011	1055	1015	1053	1022	1039	1015	1062

Fig 3.22 Comparison of sex ratio with nearby LSGI's



	Perumbavoor	Muvattupuzha	Chengannur	Chittur-Thathamangalam	Mavelikara	Attingal	Paravoor	Irinjalakuda	Varkala
1981	963	980	1085	1042	1084	1093	1094	1088	1120
1991	1006	986	1062	1054	1082	1093	1084	1048	1107
2001	1022	1023	1098	1053	1106	1136	1098	1084	1120
2011	1041	1025	1146	1062	1189	1196	1131	1141	1187

Fig 3.23 Comparison of sex ratio with similar towns
Source: Census 1981, 1991, 2001, 2011

3.7 Age Structure

Age structure of population in a city plays a major role in urban planning as it gives an idea about the dependent population, working population, the jobs to be created, the present and future requirements of educational, health and other facilities and amenities. From socio-economic survey the age structure of population (Fig 3.24) is derived which shows that

majority of the people among the males and females are within the age group 25-30 years. The municipality has 8.9% of the population in the age group 0 to 6 years.

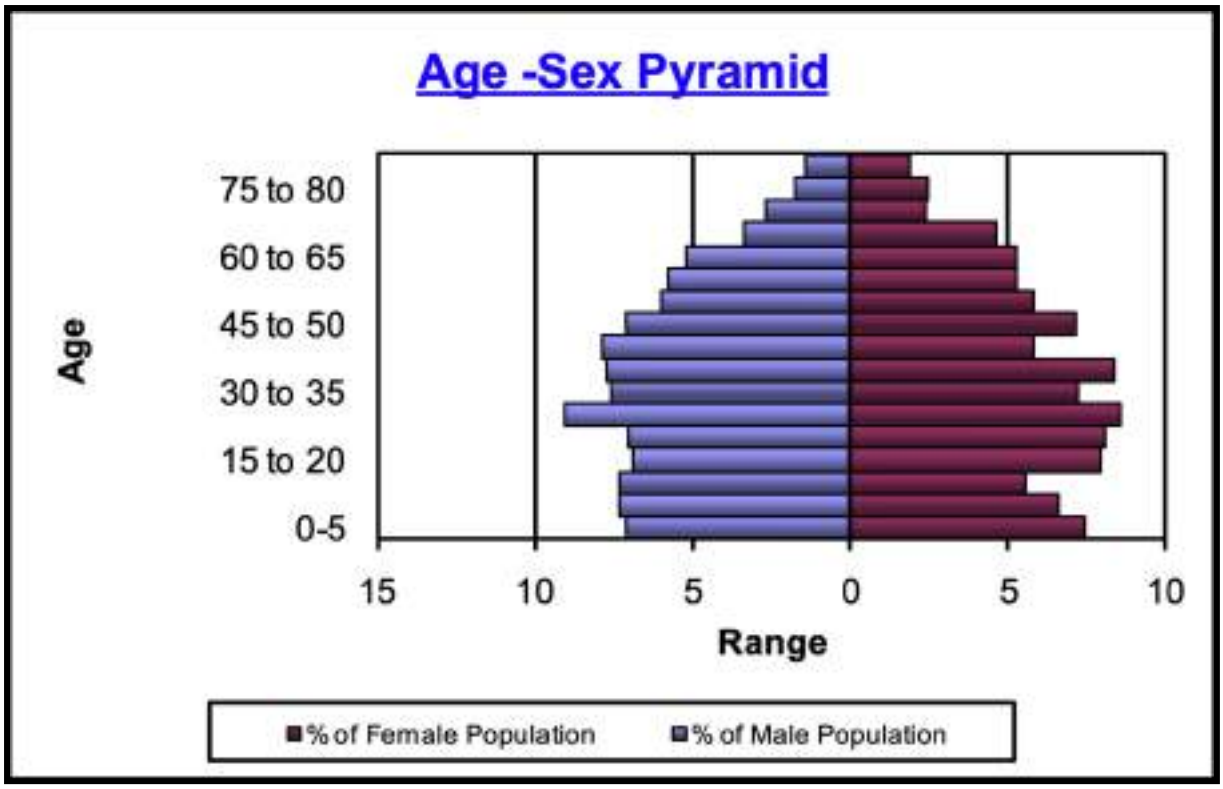


Fig 3.24 Age-Sex Pyramid
Source: Socio-economic survey

3.8 Literacy

The literacy rate of the Municipality as compared to that of the District and the State has been consistently lower than the state but slightly higher than the district as per the The literacy rate of the Chittur-Thathamangalam Municipality has increased from 59.2% in 1971 to 89.7% in 2011 (Fig 3.25). Chittur-Thathamangalam Municipality has the lowest literacy rate than all other municipalities in the district (Fig 3.26). However, this is just above the average literacy rate of 89.31% of the district. Males and females share equal percentage among the literates. In the municipality, 93.8% of the males and 85.8% of the females are literates as per Census 2011. The respective values as per 2001 Census were 92.13% and 81.34%. The municipality has highest literacy rate when compared to the neighbouring LSGI's (Fig 3.27) and the lowest literacy rate when compared to similar towns (Fig 3.28).

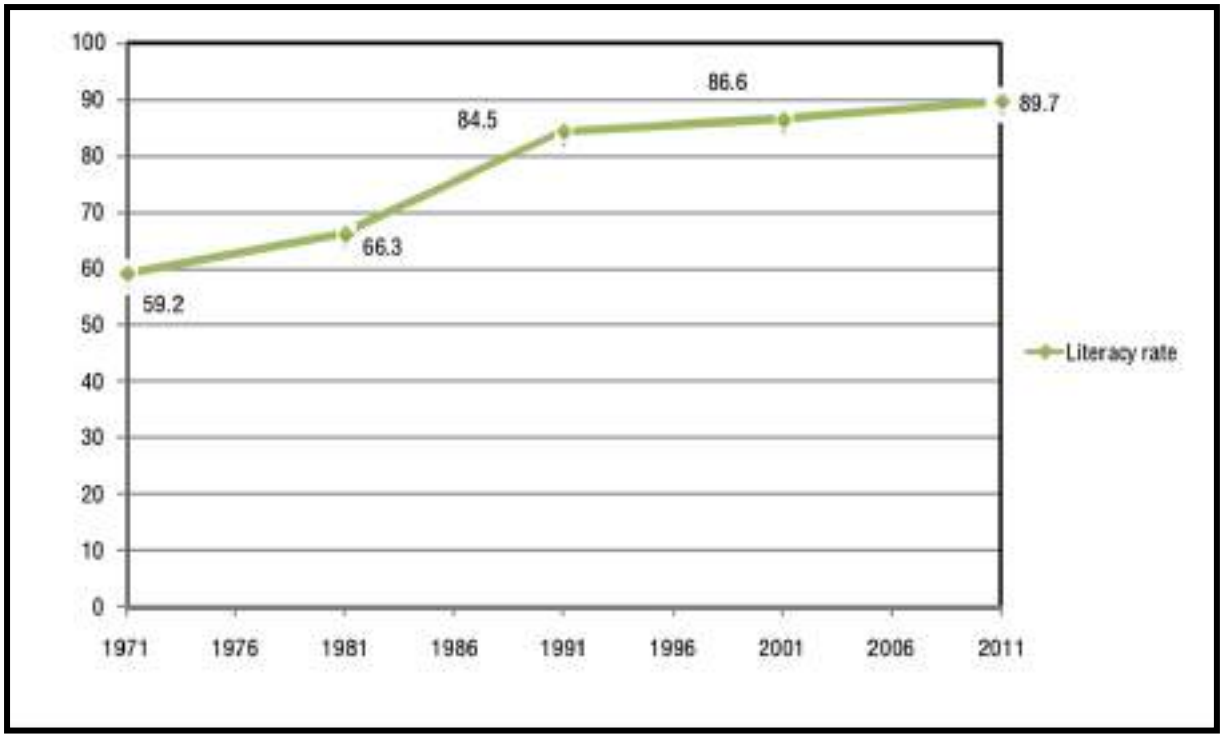


Fig 3.25 Temporal variation of literacy rate in the municipality
Source: Census 1971, 1981, 1991, 2001, 2011

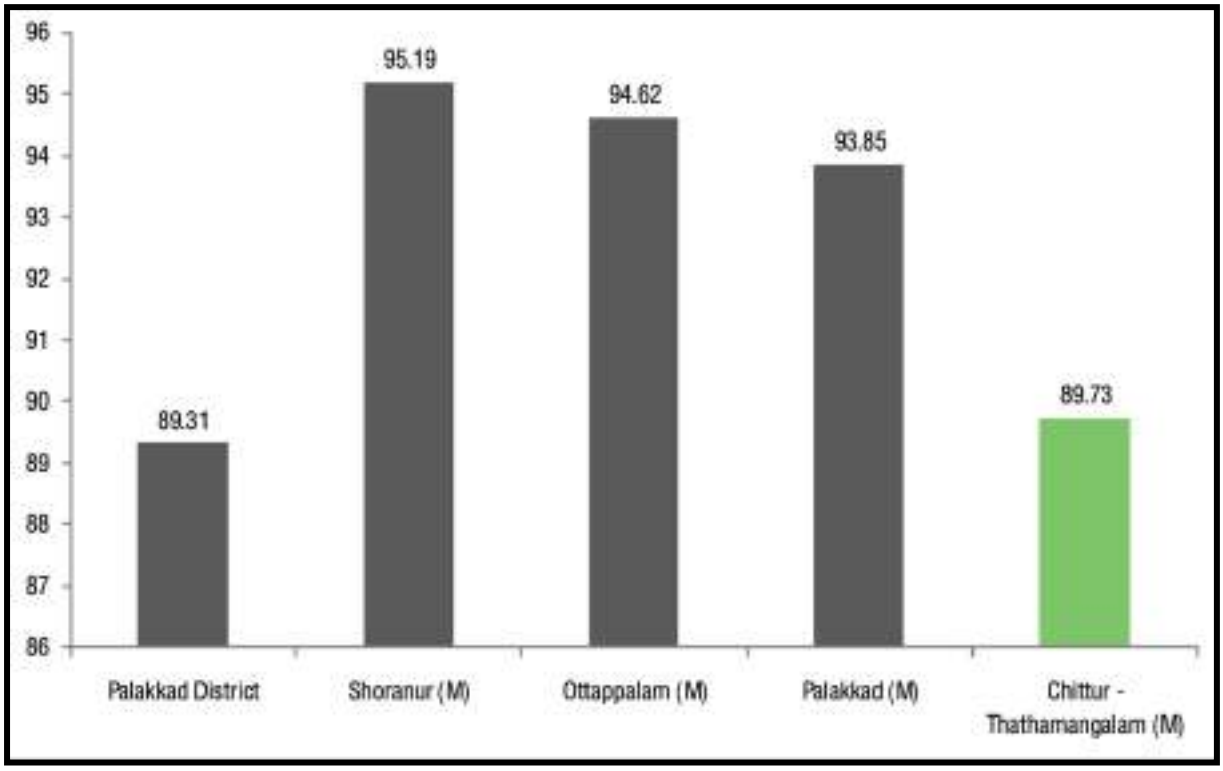


Fig 3.26 Comparison of literacy rate with other municipalities and that of the district
Source: Census 2011

Table 3.8 Comparison of Literacy rate of Chittur-Thathamangalam Municipality with District & State

	2001			2011		
	Total (%)	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)
Chittur - Thathamangalam	86.6	92.13	81.34	89.73	93.8	85.8
Palakkad District	84.35	89.52	79.56	89.31	93.1	85.8
Kerala State	90.86	94.24	87.72	94	96.11	92.07

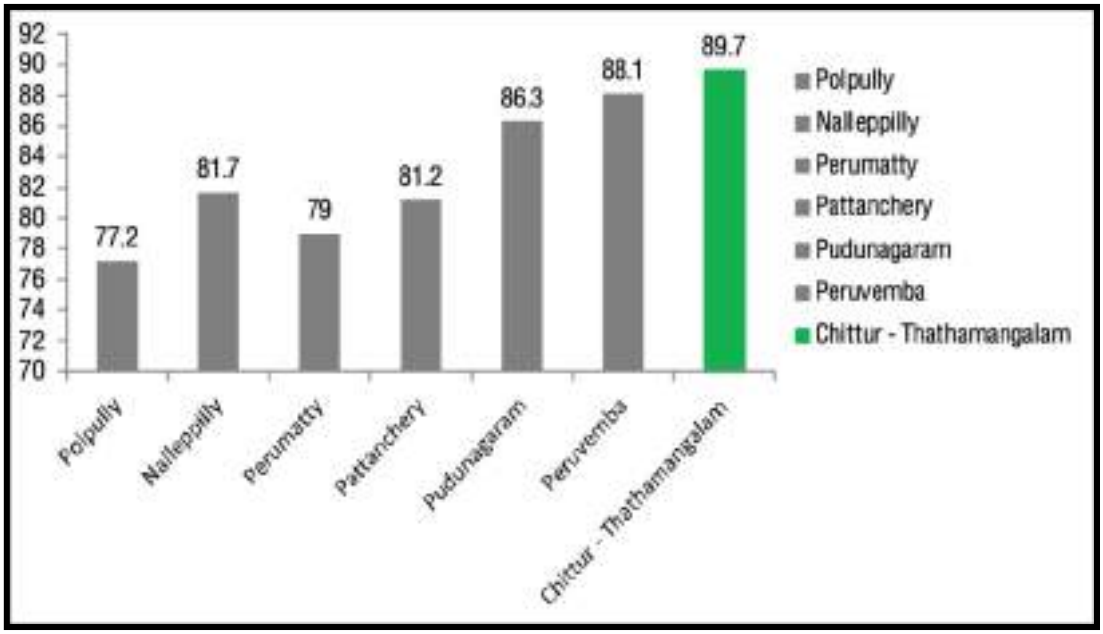


Fig 3.27 Comparison of literacy rate with neighbouring LSGI's
Source: Census 2011

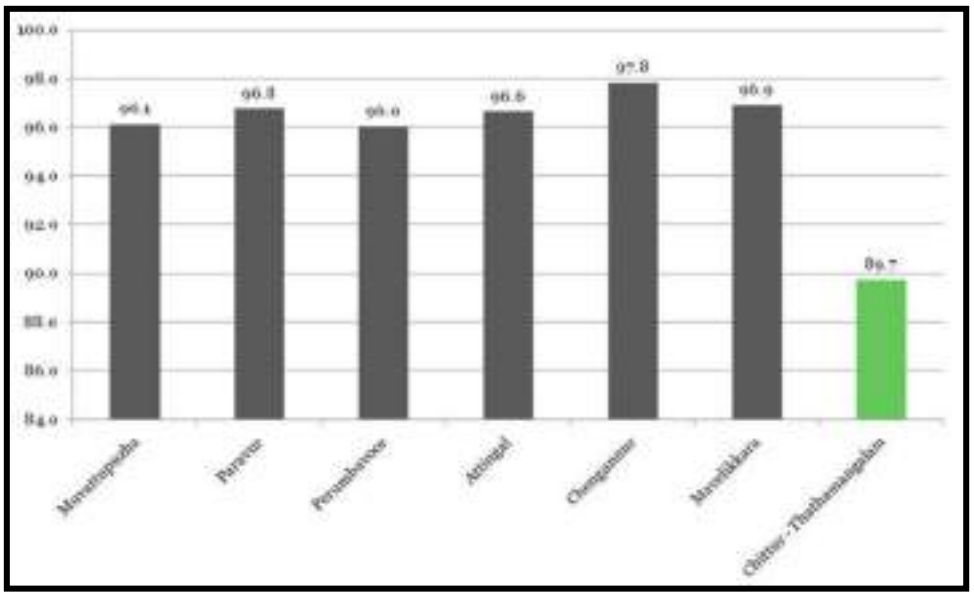


Fig 3.28 Comparison of literacy rate with similar towns
Source: Census 2011

3.9 Size of Households

The total number of households in the municipality as per Census 2011 is 7974. The average household size is 4.05 which is lower than the district average as well as other municipalities in the district (Fig 3.29). When compared with the neighbouring LSGI's also, the municipality is having the lowest household size. Puthunagaram Panchayat is having the highest household size among the neighbouring LSGI's (Fig 3.30). The trend in house-hold size has been steadily decreasing from 5.32 in 1971 to 4.05 in 2011 indicating the shifting of preference from joint families to nuclear households (Fig 3.31). Table 3.9 shows the temporal variation of household size over the decades in the municipality.

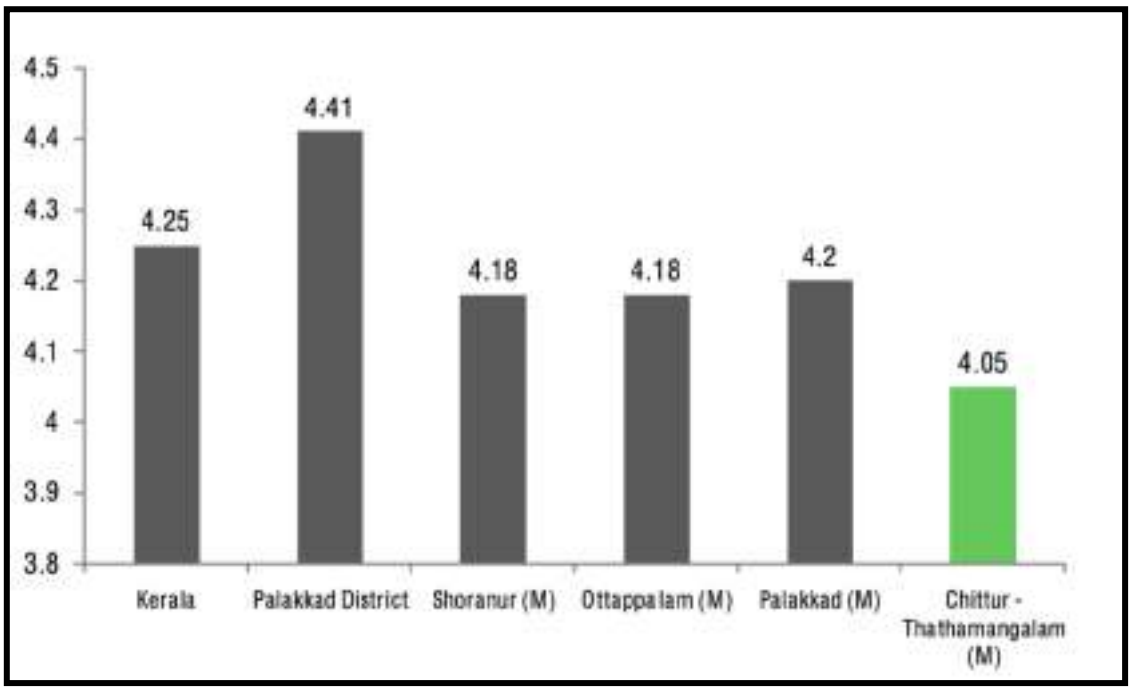


Fig 3.29 Comparison of household size with other municipalities in the district

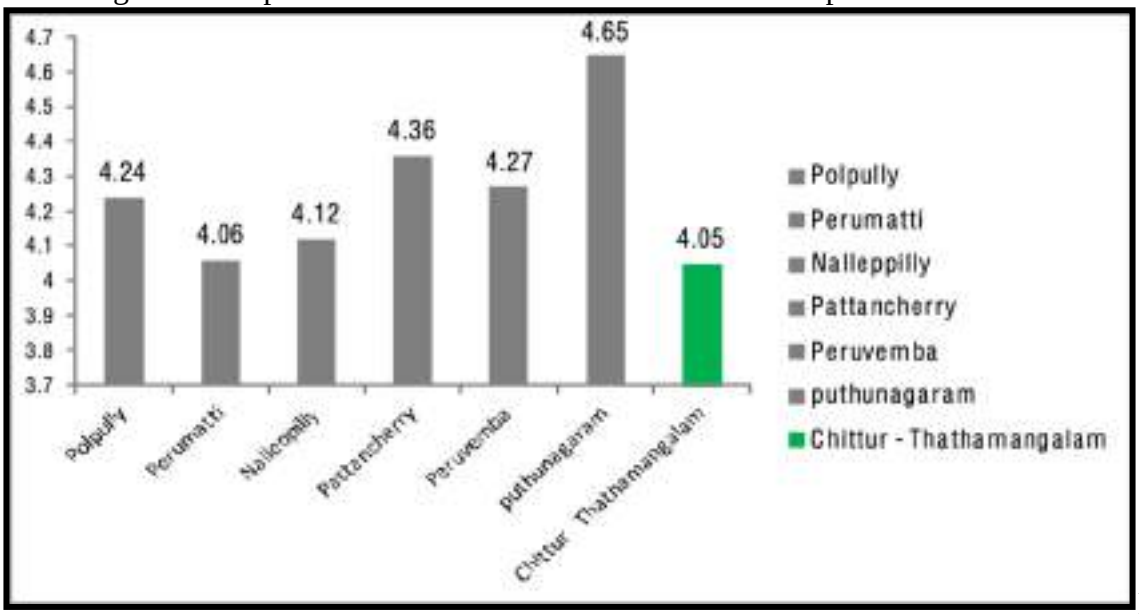


Fig 3.30 Comparison of household size with neighbouring LSGI's
Source: Census 2011

Table 3.9 Temporal variation of household size over the decades in the municipality

Year	1971	1981	1991	2001	2011
Population	28510	30407	32048	31886	32298
Households	5359	5755	6292	6945	7974
HH Size	5.32	5.28	5.09	4.59	4.05

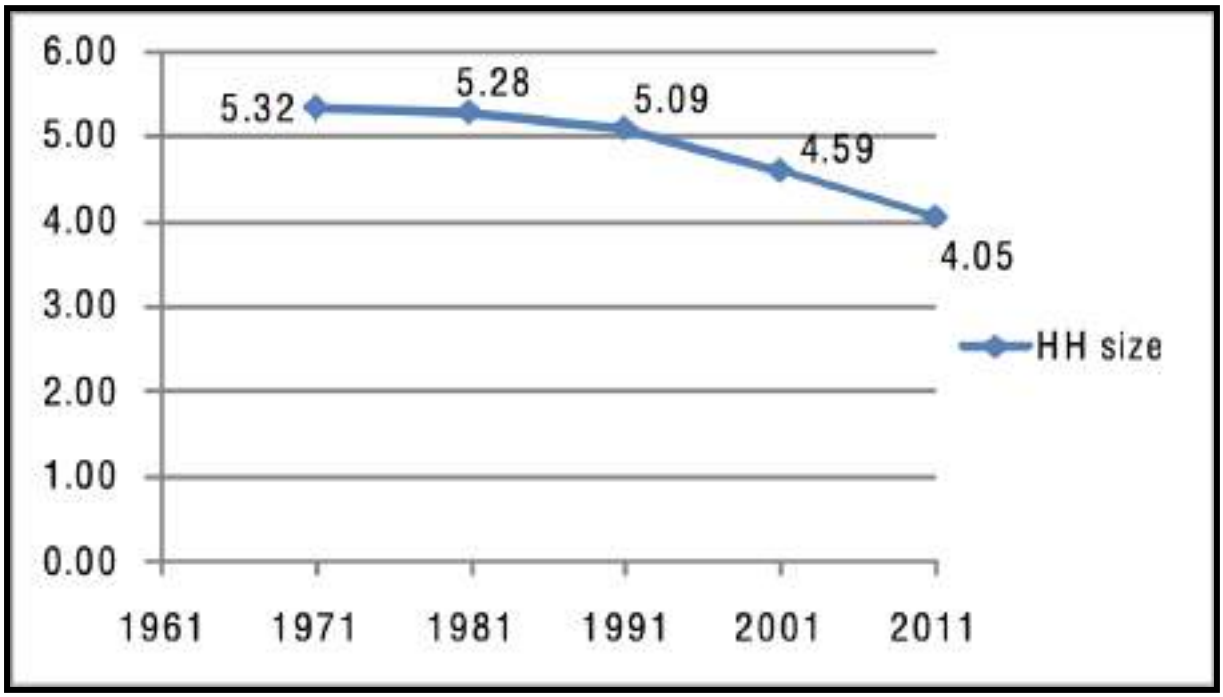


Fig 3.31 Temporal variation of household size in Chittur-Thathamangalam Municipality
Source: Census 1971, 1981, 2001, 2011

3.10 Social Composition

Social composition mainly represents the percentage of Scheduled Castes and Scheduled Tribes population in the municipality. Out of the total population in the municipality 12% are SC's and a negligible 0.09% is ST's (Fig3.32). The religion wise population shows that nearly 87% are Hindus, 11% Muslims and 2% Christians. (Fig 3.33).

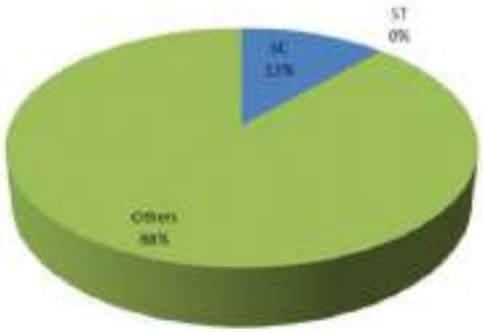


Fig 3.32 SC/ST composition of Chittur-Thathamangalam Municipality

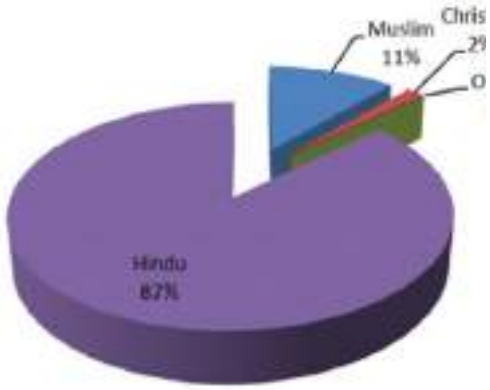


Fig 3.33 Religion wise population break-up

3.11 Inference

Chittur-Thathamangalam Municipality has been recording a decreasing decadal growth rate since 1961, the only exception being the decade between 1991 and 2001 when the town recorded a negative growth rate. The population density of the municipality is comparatively high and is next to the Palakkad Municipality. The smallest household size in the district belongs to Chittur-Thathamangalam Municipality, which indicates the preference of the people to move to nuclear families. Low sex ratio and lowest literacy rate of the Municipality compared to other Municipalities in the district is a cause of concern.

Chapter 4: OCCUPATIONAL STRUCTURE

The occupational structure of the people plays a key role in the economic development of the municipality. To enhance the quality of life of the people, they have to be provided with sustainable employment opportunities. The economic growth is related to a quantitative and sustained increase in the country's per capita output or income accompanied by expansion in its labour force, consumption, capita and volume of trade. The chapter reveals the percentage of workers in different categories of work and work force participation rate in the municipality. 2011 Census details are taken for the analytical purposes of the occupational structure.

4.1 Workers Classification

Work is defined as participation in an economically productive activity with or without compensation, wages or profit. Such participation may be physical or mental in nature. Work involves not only actual work, but also includes effective supervision and direction of work. It also includes part time help or unpaid work on farm, family enterprise or in any other economic activity. All persons engaged in 'work' as mentioned above are workers. The total workers are classified into main workers and marginal workers. A person who has worked for 6 months or more in any economically productive activity is termed as a main worker and those who have worked for less than six months in the last one year preceding to the date of enumeration is termed as marginal worker. For the first time in Census 2011, the marginal workers have been sub divided into two categories, namely persons worked for less than 3 months and those worked 3 months or more but less than 6 months.

The total number of workers in Chittur-Thathamangalam Municipality as per Census 2011 is 12918, which is approximately 40% of the total population of the town. This is more than the district average of 37.1% and other municipalities in the district. The total workers include 34% of the main workers and 6% of marginal workers.

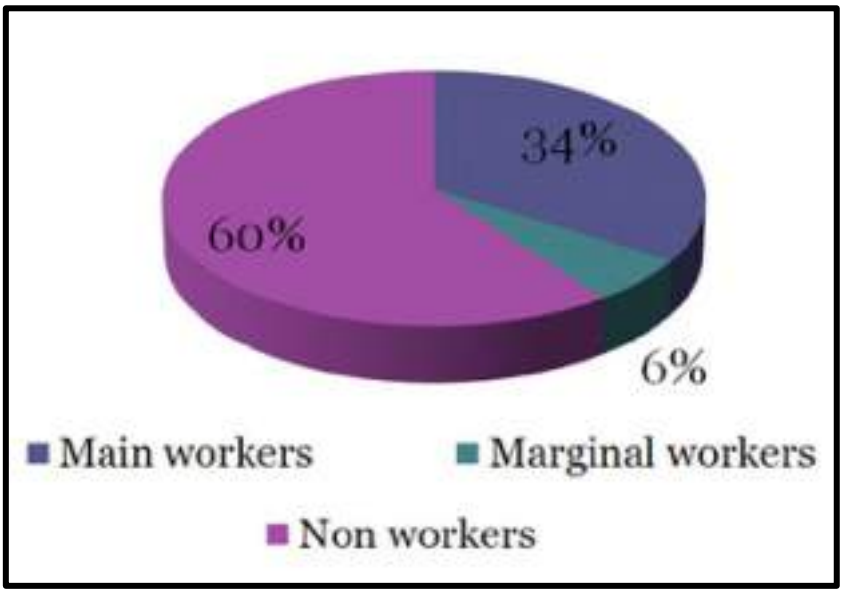


Fig 4.1 Main, Marginal and Non workers in Chittur-Thathamangalam Town (Census 2011)

The classification of main workers is given in Fig 4.1. A person is classified as cultivator if he or she is engaged in the cultivation on land owned or held from government or held from private persons or institutions for payment in money, kind or share. Cultivation includes effective supervision or direction in cultivation. A person working on another person's land for wages

in cash or kind or combination of both is termed as agricultural labourer. Household workers include those working in the house-hold industries engaged in manufacturing, processing, servicing and repair of goods. A person who has been engaged in some economic activity during the reference period but not as a cultivator, agricultural labourer or in household industry is termed as 'other worker'.

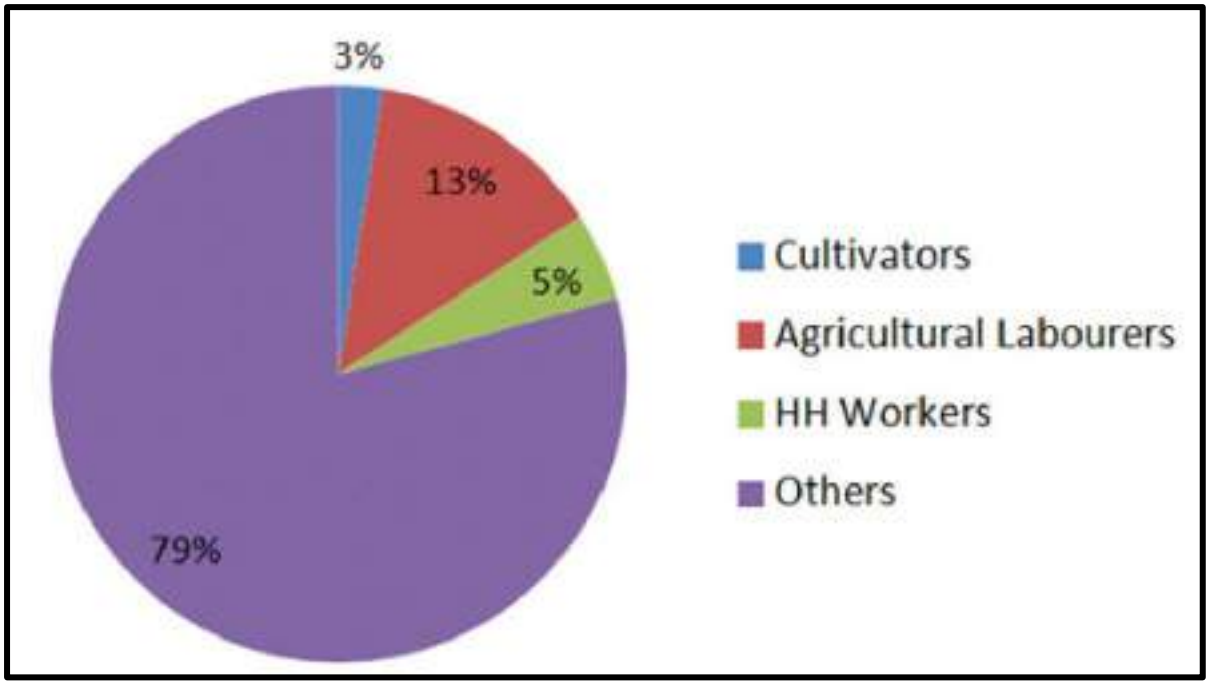


Fig 4.2 Classification of main workers in Chittur-Thathamangalam Municipality

Among the main workers in the municipality, 3% are cultivators, 13% are agricultural labourers, 5% household workers and 79% are other workers. As can be seen from Table 4.1 which shows the decadal change in the percentage of workers and non-workers. The percentage of non-workers has been steadily decreasing in the municipality. The total number of workers have increased from 32.6% of the total population in 1981 to 40% in 2011. Decadal variation of total workers, marginal workers, main workers and non-workers are given in Fig.4.3.

Table 4.1 Decadal Variation in Percentage of Workers

Year	% Main workers	% Marginal workers	% Total workers	% Non-workers
1981	30.4	2.2	32.6	67.4
1991	32.8	1.4	34.1	65.9
2001	30.6	6.2	36.9	63.1
2011	34.2	5.8	40.0	60.0

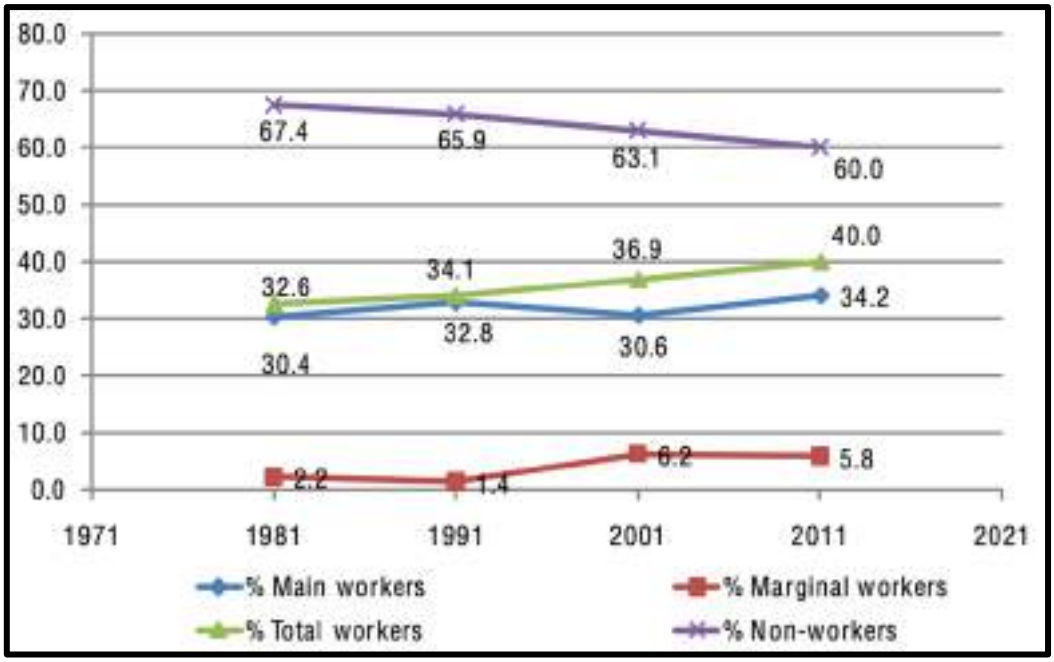


Fig 4.3 Decadal variation of total workers, marginal workers, main workers and non-workers

4.2 Work Participation Rate

Work Participation Rate (WPR) is defined as the percentage of total workers to the total population. WPR of Kerala according to 2011 Census is 34.78% and that of Palakkad district is 37.09%. Fig 4.4 shows that job opportunities are increasing, and economic activities are gaining momentum. However, the WPR among males is quite higher than that of the females, with males contributing to 27.45% and females 12.55% of the total working population in the municipality.

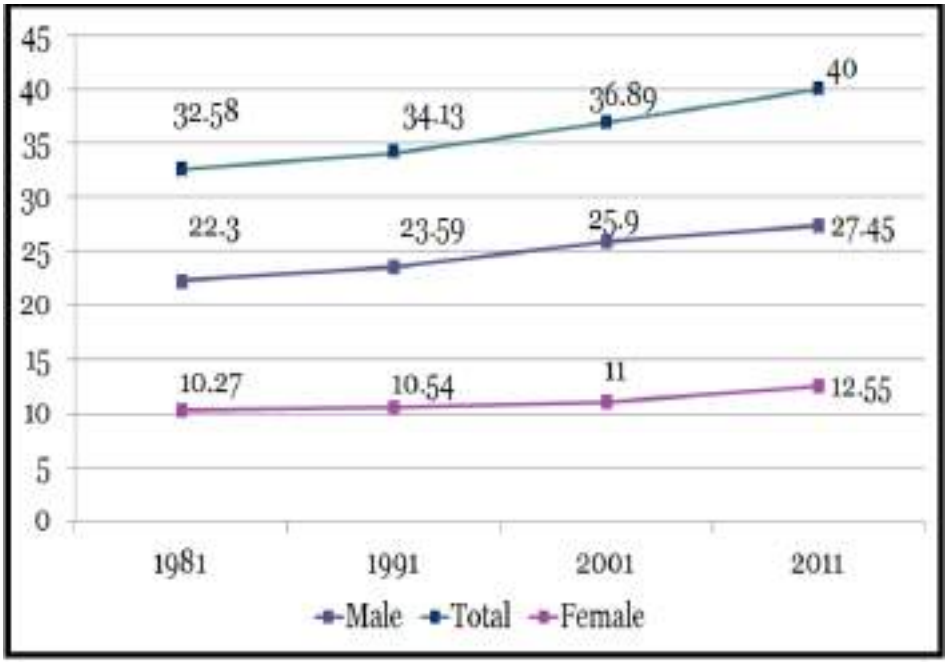


Fig 4.4 Temporal variation of WPR in the municipality

When compared with similar towns, Chittur-Thathamangalam Municipality has the highest WPR of 40% among other municipalities in the district (Fig 4.5), in fact it is more than the average value of the district and the state. The WPR has gently increased from 32.58% in 1981 to 40% in 2011. (Fig 4.6) it can be seen that the WPR of similar towns are much below the value of Chittur-Thathamangalam Municipality the next highest being Muvattupuzha Municipality with a work participation rate of 35.39%. But when compared with neighbouring LSGI's the picture is quite different. Perumatti Panchayat is having a work participation rate of 50.23% followed by Nalleppilly of 48.21%. Puthunagaram panchayat with a WPR of 37.78 is only falling below the corresponding value of Chittur-Thathamangalam Municipality.

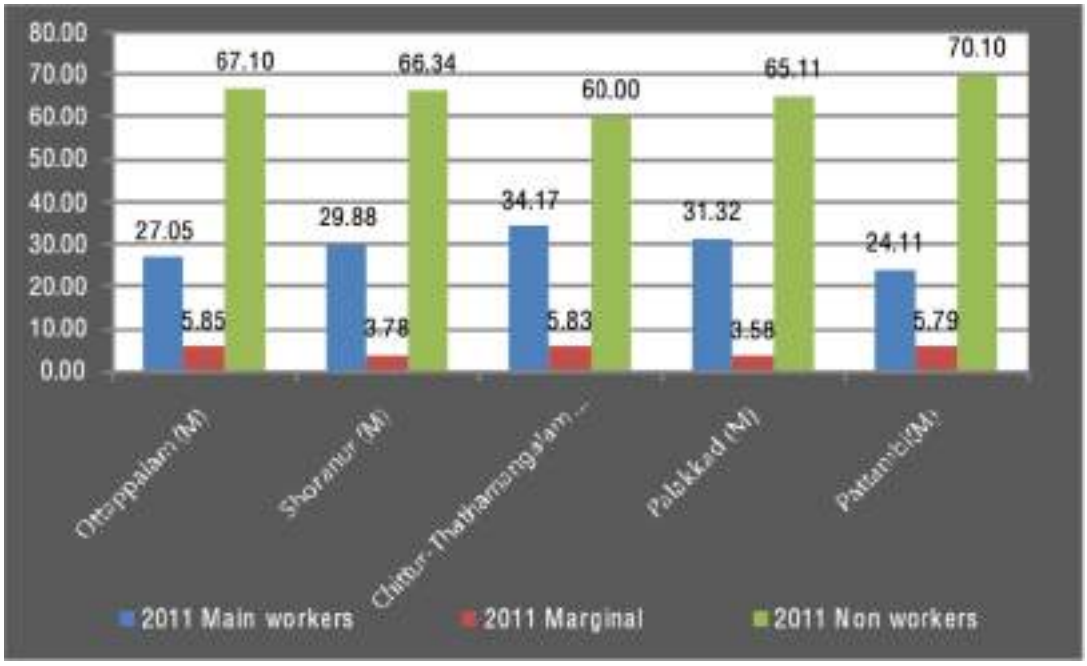


Fig 4.5 Comparison of Main, Marginal and Non workers of Chittur-Thathamangalam with other Municipalities in District

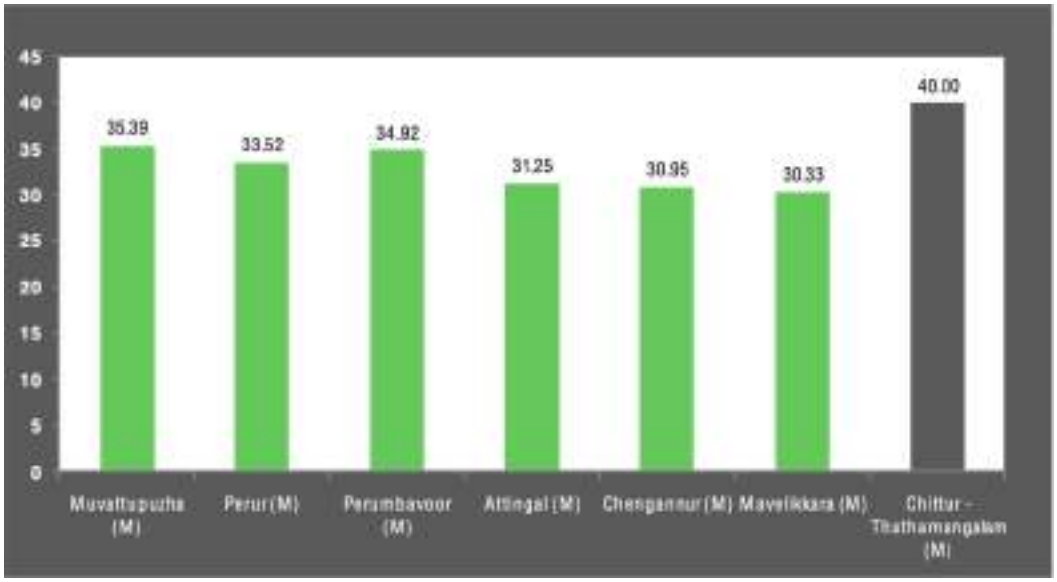


Fig 4.6 WPR Comparison with similar towns

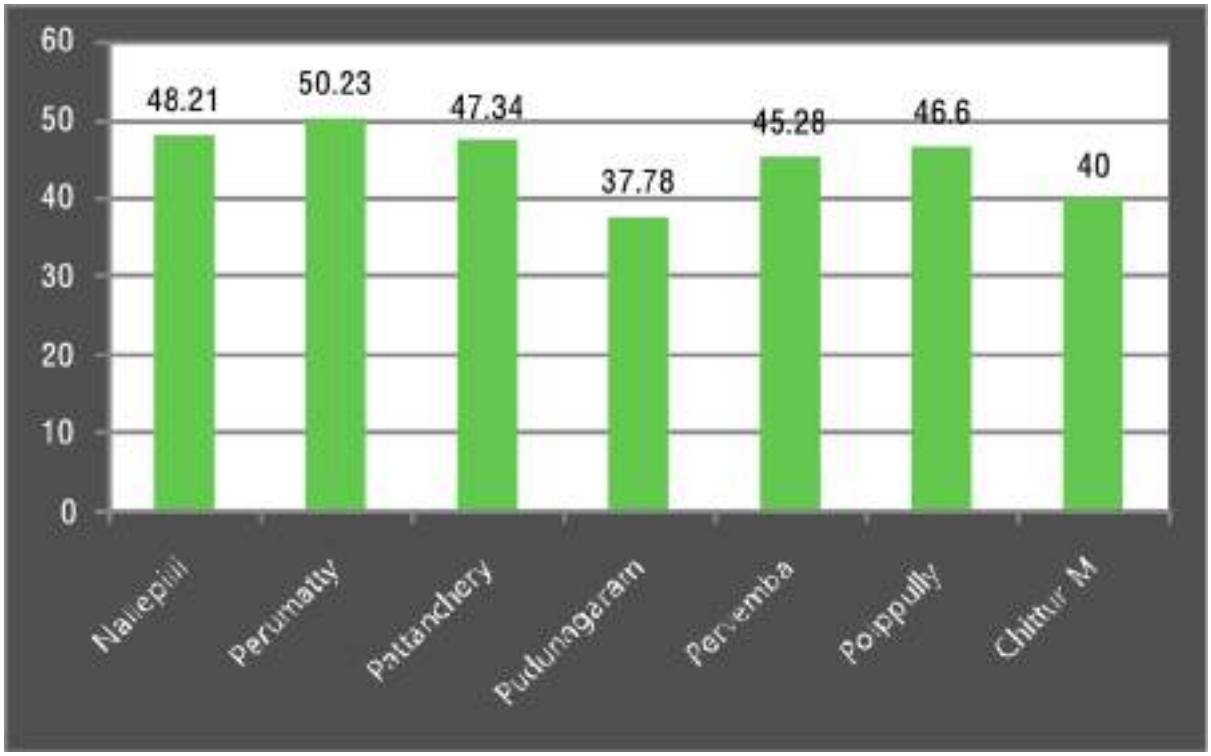


Fig 4.7 WPR comparison with LSGIs

4.3 Occupational Structure

According to 2011 Census 68.6% of the total workers are male workers. There is a clear dominance in all the sections of the workers except in agricultural labourers where the female workers are predominant. As per 2011 Census the total number of agricultural labourers is 1832 in which 1749 are females and 1605 are males. The percentage of female workers in other category (tertiary sector) comes to 27.28% of the total workers in the other category.

Analysing the economic base of the development plan area in past decades will help to understand the direction of growth of area in terms of economy. Percentage of workers in various categories in last 3 decades has been discussed in Table 4.2. It can be seen that except for other workers, the number of agricultural labourers, cultivators and household industrial workers have been constantly decreasing in the municipality (Fig 4.8). This clearly shows that there is a shift from traditional agricultural activities to other activities like trade and commerce, construction activities etc.

When the trends in different categories of main workers were analysed, it could be seen that the total number of cultivators and agricultural labourers have been decreasing while the number of other workers consisting mainly of all government servants, municipal employees, teachers, factory workers, plantation workers, those engaged in trade, commerce, business, transport, banking, mining, construction, political or social work, priests, entertainment artists etc have increased by 55% over the last three decades (Table 4.2). The number of household industrial labourers rose to a maximum in 1991 and showing a decreasing trend towards 2011.

Table 4.2 Occupational Structure of main workers

Year	1981	1991	2001	2011
Cultivators	702(7.60)	604 (5.70)	404(4.13)	272(2.46)
Agricultural Labourers	2015(21.83)	2402(22.87)	1526(15.62)	1472(13.34)
Household Industrial Workers	863(9.35)	1123(10.69)	721(7.38)	549(4.97)
Other Workers	5651(61.22)	6375(60.69	7120(72.87)	8743(79.22)
Total	**9231**	**10504**	**9771**	**11036**

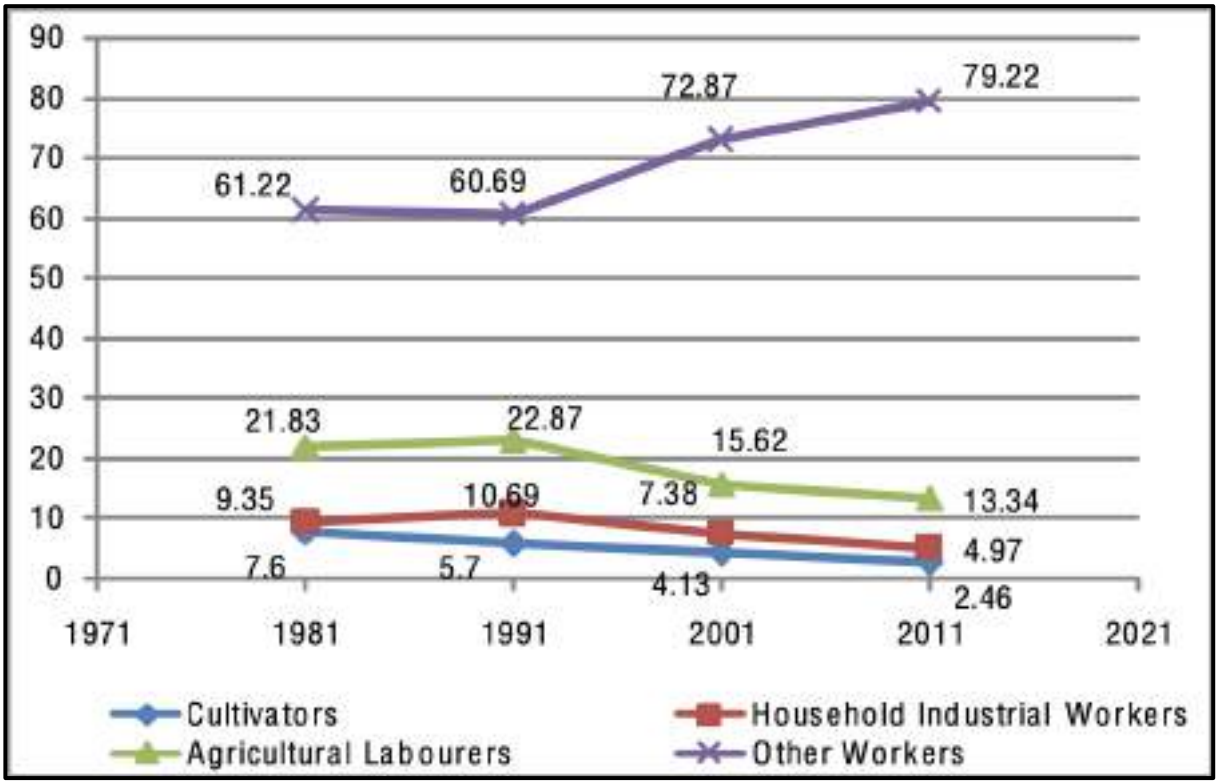


Fig 4.8 Decadal variation of Four-fold classification of main workers

Workers are also classified into primary, secondary and tertiary workers. The workers in other category can be considered as tertiary workers and therefore the increase in the total number of workers is due to an increase in the number of tertiary workers. From the socio-economic survey analysis, it was found that the majority of workers are engaged in tertiary sector. The percentage of workers is shown in Fig 4.9. Secondary workers amount to 2.67%, primary workers to 13.71% and tertiary workers amounts to 83.62% of the total workers in the municipality. Thus, it can be seen that the economic growth of Chittur-Thathamangalam Municipality would heavily depend on the service sector or tertiary sector.

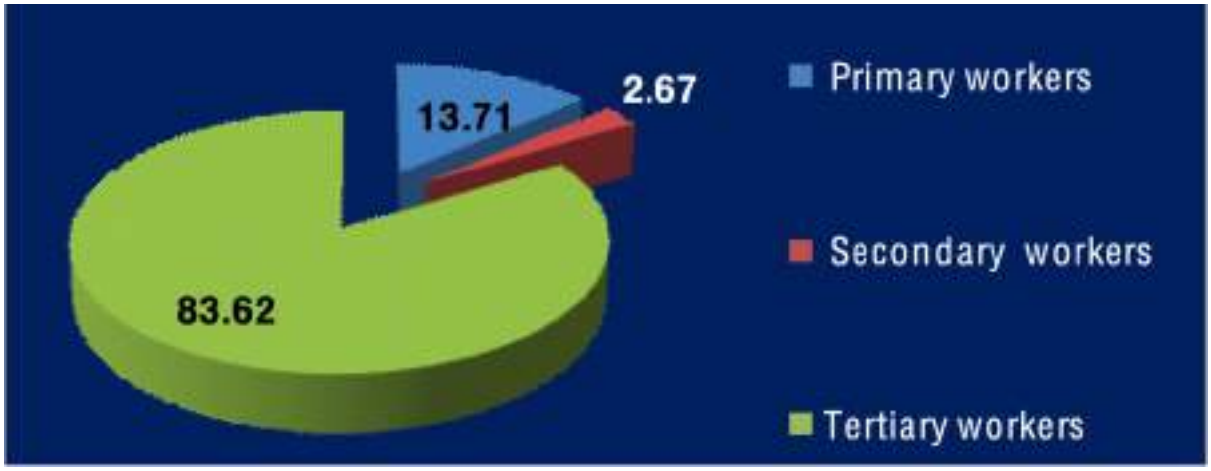


Fig 4.9 Percentage of workers

On analysing the employment pattern from the socio-economic survey (Fig 4.10), it can be seen that the private sector provides major employment opportunities in the municipality followed by self-employment. It can also be seen that the percentage of unemployed population trying for employment is also significantly higher in the municipality. Only 4% among the population are employed in public sector.

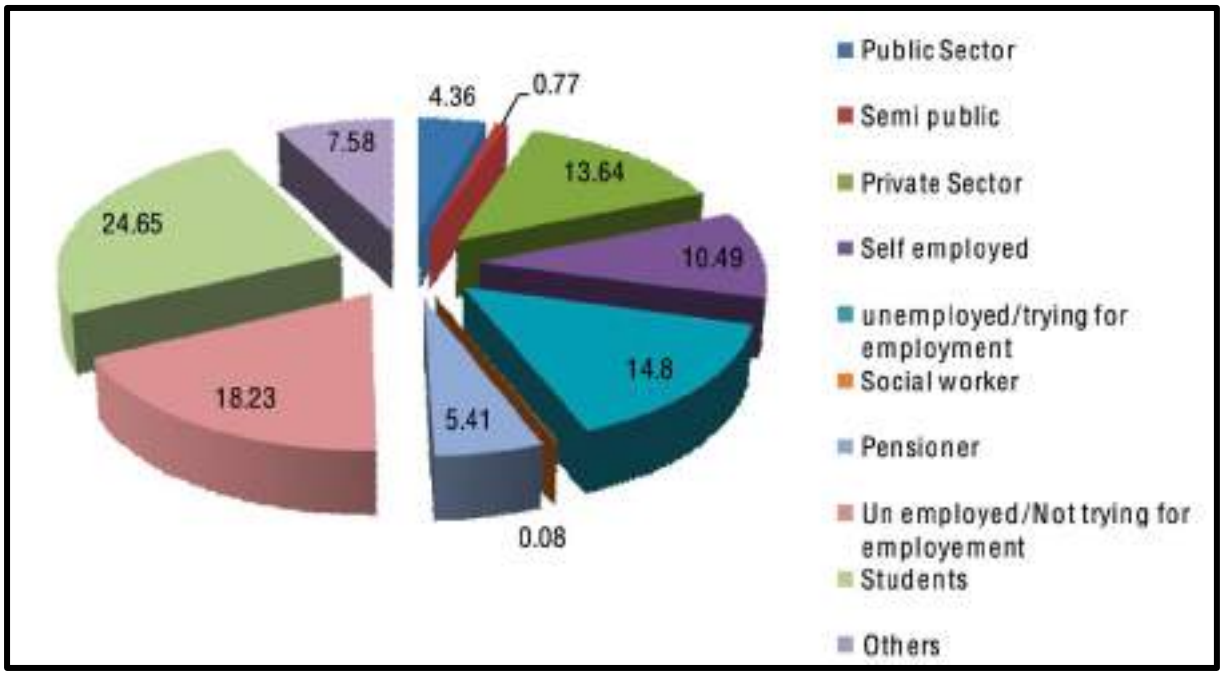


Fig 4.10 Employment Pattern

4.4 Spatial Distribution of Workers

The concentration indices of cultivators, agricultural labourers, household industrial workers and other workers are shown in Fig 4.11, 4.12, 4.13 and 4.14 respectively. It can be seen that the concentration of cultivators is highest in Naramkuzhi (9), Chembakassery (4) and Ambattupalayam (5) wards. The concentration of agricultural labourers was also found to be highest in Naramkuzhi (9) ward followed by Chembakassery (4) and Ambattupalayam (5) wards on the northern periphery of the municipality.

It can also be seen that higher concentration of agricultural labourers were seen in the same wards where the concentration of cultivators was higher which means that both the cultivators and agricultural labourers co-exist in the same wards. Because of the higher concentration of hand weavers in Devangapuram (14) and Vadakkathara (8) wards, highest concentration of house-hold industrial workers was found to be in those wards. The concentration of other workers is distributed more or less uniformly in the municipality however the highest concentration of other workers is found in Mannuthukavu Ward (23) followed by Gramam (24) and Kizhakkathara (10) wards.

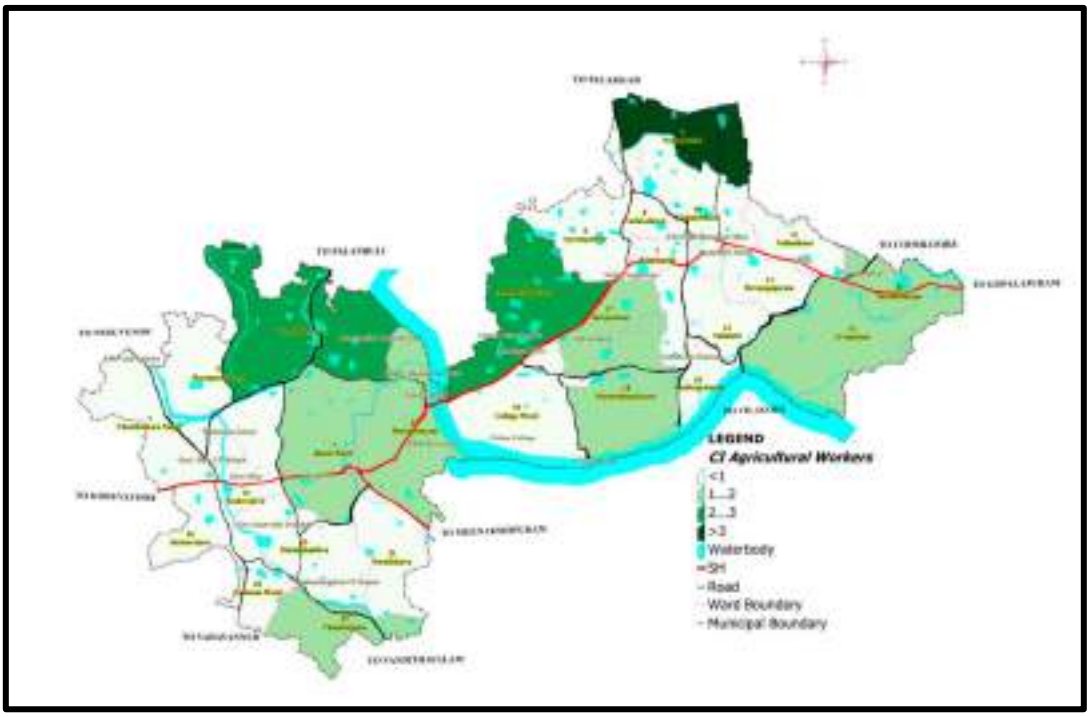


Fig 4.11 Cultivators Concentration Index

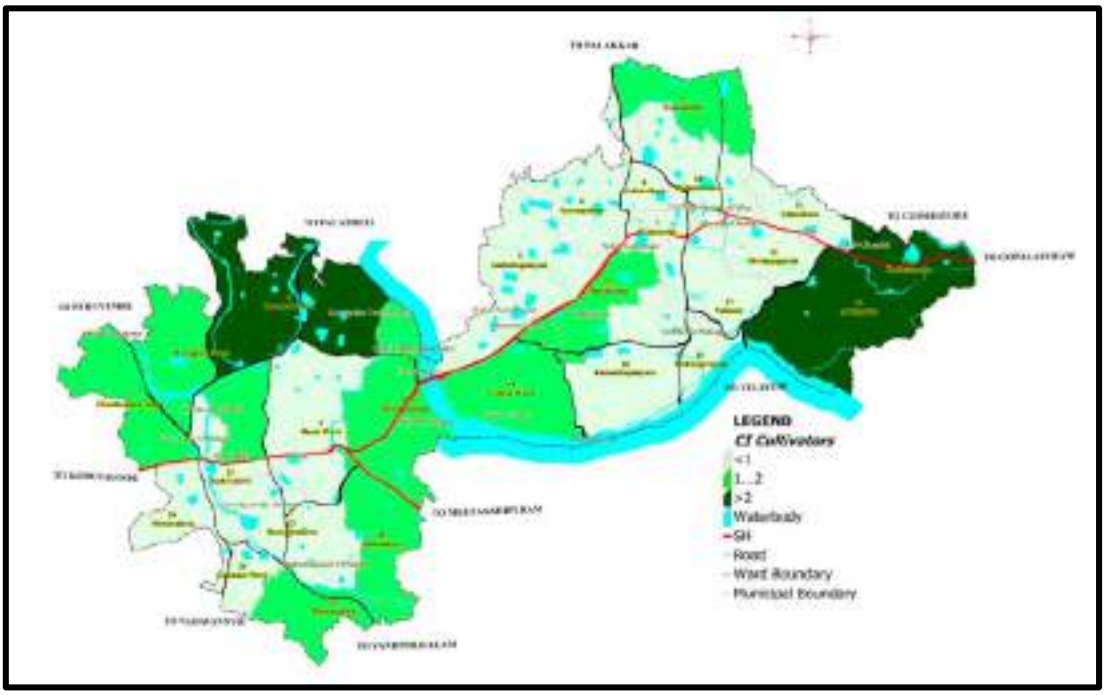


Fig 4.12 Agricultural Workers Concentration Index

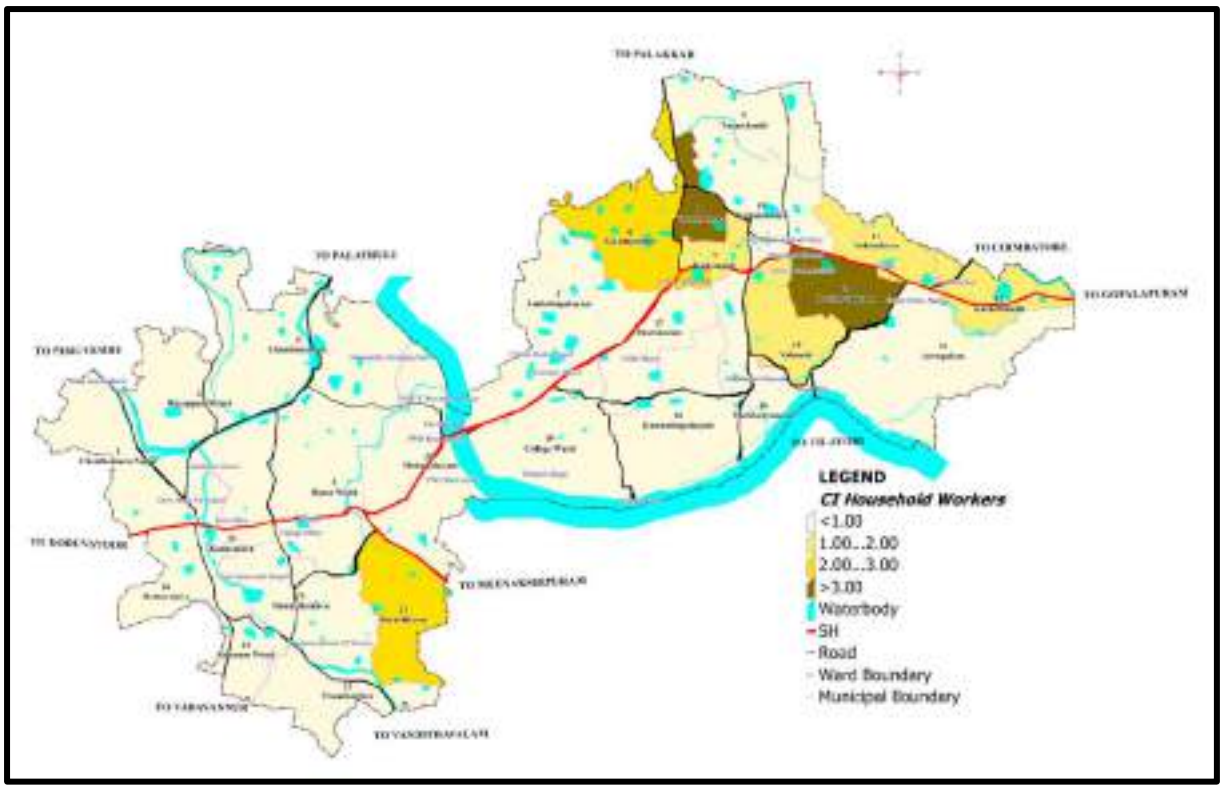


Fig 4.13 Household Industrial Workers Concentration Index

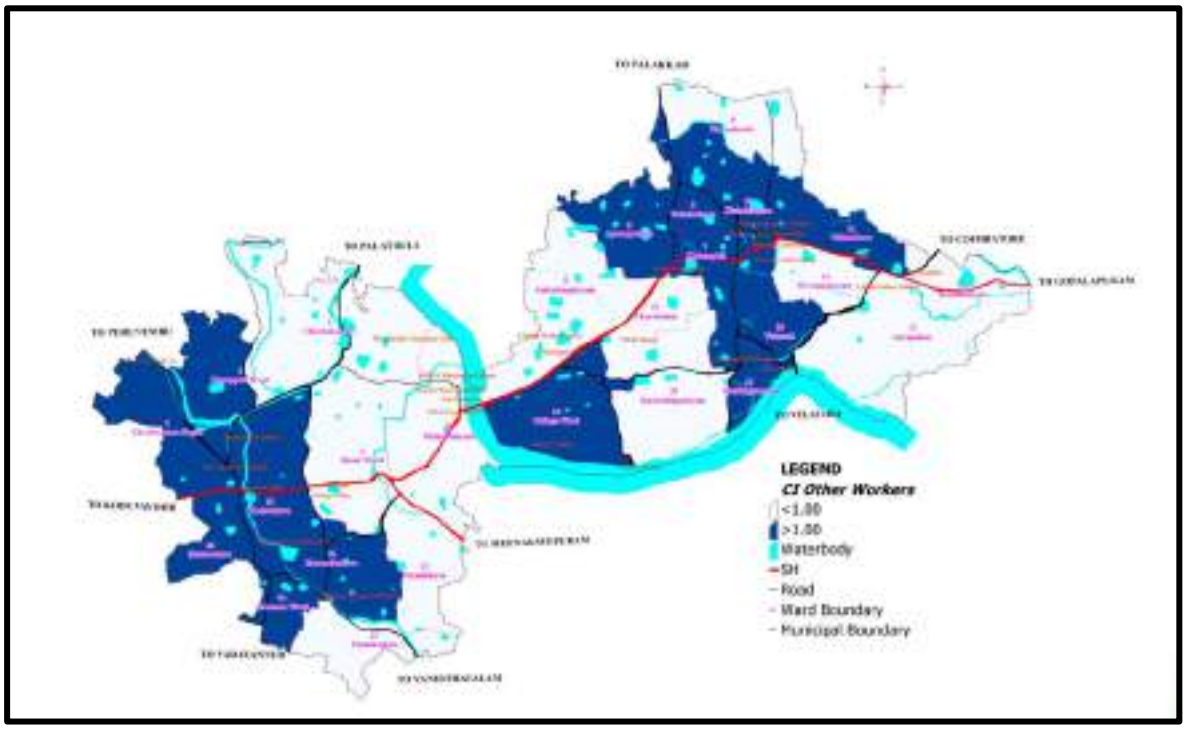


Fig 4.14 Other Workers Concentration Index

The status of employment as per Socio-economic survey 2012 (Fig 4.15) shows 15.72% are Govt employees, 8.10 % are agricultural labourers followed by Drivers 5.5% and cultivators as 3.93%.

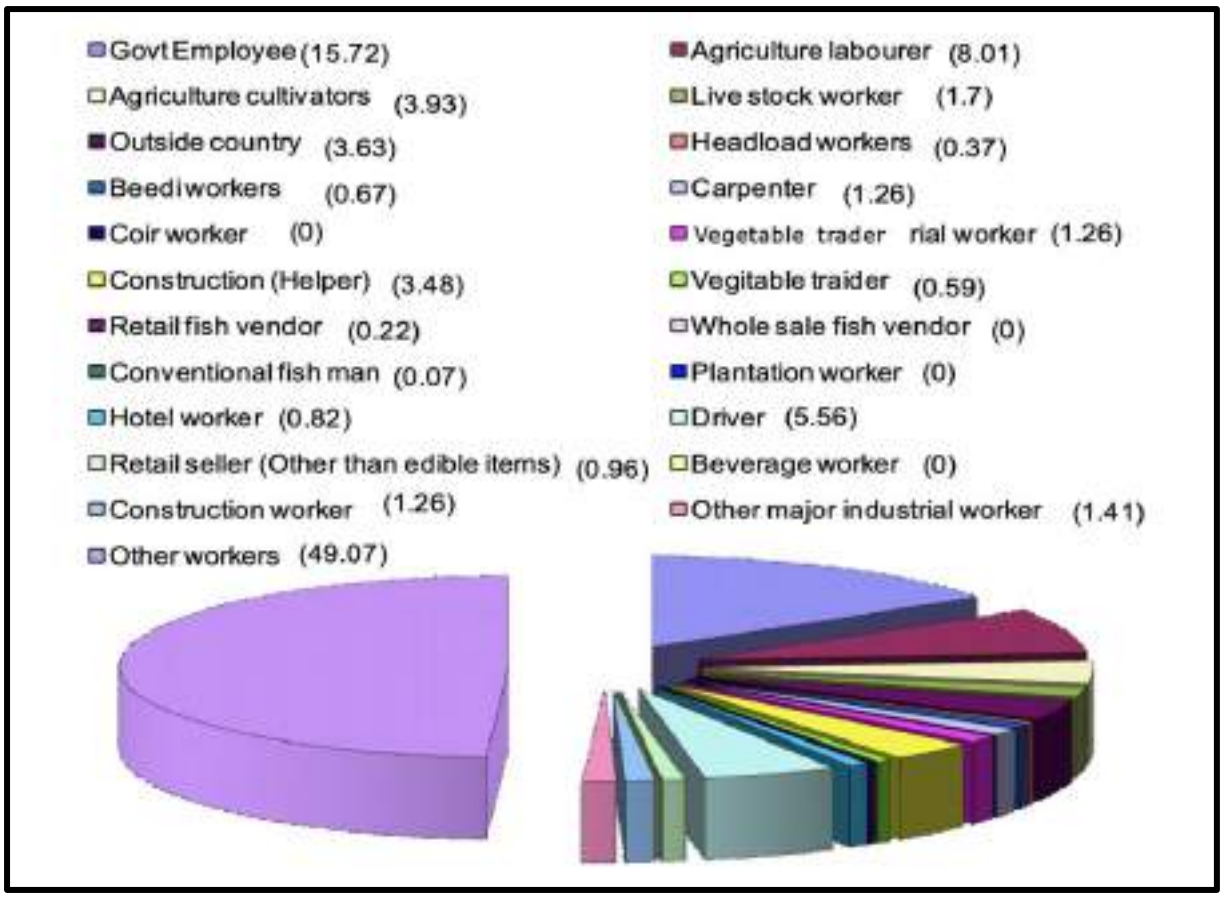


Fig 4.15 Percentage of Workers in each category
Source: Primary survey

4.5 Dependency Ratio

This indicator gives the ratio of non-workers to the workers in the municipality. A high ratio means that the working people and the overall economy face a greater burden in supporting non-working population. Table 4.3 indicates the dependency ratio of the town in comparison with other municipalities in the district, the district and state average. It can be seen that Chittur-Thathamangalam Municipality has the lowest dependency ratio when compared with the state average of 1.88 and district average of 1.70. The municipality with a dependency ratio of 1.50 has also the lowest value when compared with other municipalities in the district indicating lesser burden of non-workers on the working population.

Table 4.3 Dependency ratio of the town in comparison with other municipalities, with the district and the state

	Non workers (2011 census)	Workers (2011 census)	Dependency ratio	Dependency ratio (Dependents /100
Kerala	21786998	11619063	1.88	188
Palakkad District	1767594	1042340	1.7	170
Palakkad Municipality	85259	45696	1.87	187
Chittur - Thathamangalam Municipality	**19380**	**12918**	**1.5**	**150**
Ottappalam Municipality	36092	17700	2.04	204
Shoranur Municipality	28878	14655	1.97	197
Pattambi Muncipality	20071	8561	2.34	234

4.6 Inference

The municipality is having a strong work force participation rate and a low dependency ratio. The increasing trend of WPR clearly shows that the economic base of the municipality is getting stronger with time especially in the tertiary sector. 15.8% of the work force are still working as agricultural labour and cultivators while the secondary sector is showing a feeble contribution to the work force. Considering multiple factors including the fact that a large area of land in the town is still under agriculture, that women's work force participation is higher than males in the agricultural sector and that there are more SC workers in this sector, reinforcing the primary sector and ensuring its vibrancy may be necessary and beneficial not only from a food security or climate change resilience perspective but also in order to improve the life of the marginalised sections of the town.

Chapter 5: ECONOMIC ASPECTS

Economic growth provides a foundation for the future of society. It can contribute to the advancements in all fields, creating beneficial outcomes and solutions to many economic problems. New advances in science and technology have brought society a long way forward and it will continue to change as the time goes on.

The economic sector of the town includes industry, trade and commerce, tourism, agriculture, animal husbandry, fisheries, construction activities, transportation, storage and ware housing.

The Chittur-Thathamangalam Municipality has an agrarian economy. The analysis of significant categories like agriculture, trade and commerce, industry, tourism, animal husbandry is discussed here

5.1 Trade and Commerce

5.1.1 Present Scenario

Main commercial activities in the municipality are retail business concentrated in Chittur Bazaar Road (Anikode to Kacherimedu) in Chittur and central area in Thathamangalam. A weekly market is also organised every Friday near the Municipal shopping complex. The major commercial nodes include Anikode Junction, Hospital Junction, Thathamangalam Junction, Mettupalayam Junction, Town hall Junction, Pallimukku Junction, Chenthamara Junction and Chittur Kavu Junction. Except for Chenthamara and Chittur Kavu Junction all the remaining Junctions are located in the same road stretch connecting Pallimukku and Hospital Junction, passing through the middle of the town. The commercial centres in the Bazaar Road are mostly characterised by congestion due to vehicular and pedestrian traffic beyond the capacity of existing facilities.

5.1.2 Important centres and nodes

The agglomeration of activity area around one or more road Junctions which act as a commercial centre is known as a node. Major commercial nodes include Anikode Junction, Hospital Junction, Thathamangalam Junction, Mettupalayam Junction, Town hall Junction, Pallimukku Junction, Chenthamara Junction and Chittur Kavu Junction. The above nodes are characterized by high concentration of commercial units. The hierarchy of commercial centres in the municipality are given in Table 5.1. They are determined by the extent of activity taking

Table 5.1 Hierarchy of commercial centres

Sl. No:	Name	Hierarchy
1	Anikode junction	I
2	Hospital junction	II
3	Thathamangalam junction	II
4	Mettupalayam junction	II
5	Town hall junction	III
6	Pallimukku junction	III
7	Chenthamara junction	III
8	Chittur kavu junction	III

place there. The number and types of shops, the number of people using the node, the business turn over and extend of traffic, all determine the extent of activity and hence the hierarchy of nodes. Anikode Junction which is at the intersection of SH25 and Palakkad – Chittur road is of hierarchy I followed by Hospital Junction, Thathamangalam Junction and Mettupalayam Junction. Fig 5.1 shows the spatial distribution of commercial centres and nodes.

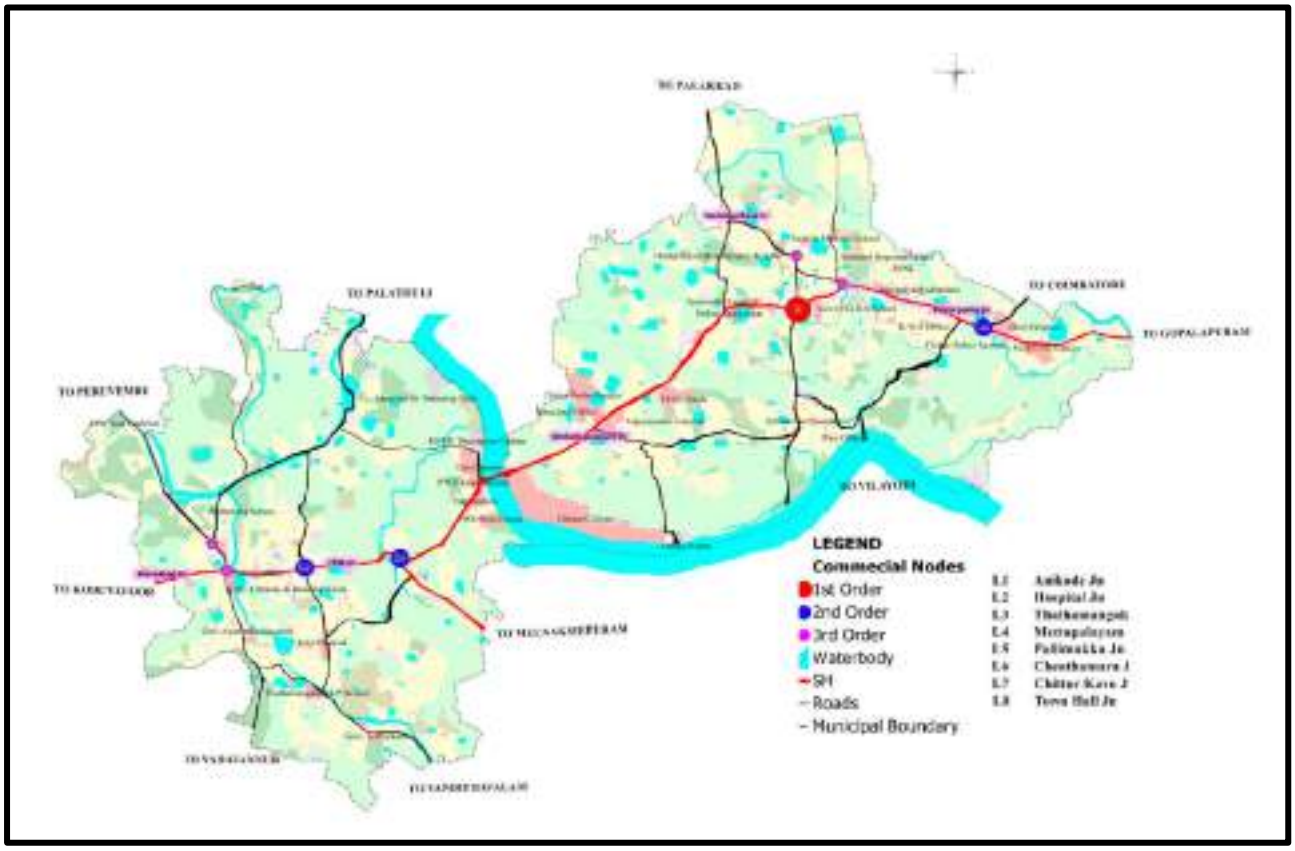


Fig 5.1 Nodes and their hierarchy

5.1.3 Street vendors/ Informal sector

Street vendors are an integral part of urban economies in India. It refers to those who sell goods and services in public space. They provide consumers with convenient and accessible retail options and form a vital part of the social and economic life of a city. The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014, protects the right of street vendors to carry on their business and recognizes the positive role of street vendors being an integral and legitimate part of the urban retail trade and distribution system for daily necessities of the common man.

Street vendors are a common sight in many parts of the municipality. There has been a decadal increase in street vending as the spatial distribution of street vendors in 2012 and 2021 (Fig 5.2a and 5.2 b respectively) indicates. The Street Vendor Survey 2021, carried out under the National Urban Livelihoods Mission, recorded 74 street vendors in Chittur-Thathamangalam. Their tendency is to settle in areas where there is a constant movement of people, especially near the commercial nodes, Junctions and near the bus stand. Majority of them are tea stall owners, fruit and vegetable vendors. Majority of street vendors are in Chittur, concentrated

near Anikode, Post office and Hospital Junction, Civil Station area and Thathamangalam bus stand. They are also present in Thekkegramam, and Mettupalayam Junction.

Table 5.2 Details of Street Vendors in Chittur-Thathamangalam

Sl. No.	Location	Vendors	Sl. No.	Location	Vendors
1	Anicode	17	13	Car stand Thathamangalam	2
2	Bus std, Thathamangalam	6	14	Vadakkathara Jn	2
3	Hospital Jn/Civil stn	6	15	Nehru Auditorium	2
4	Post office	5	16	Holy Church, Chittur	2
5	Chittur College	4	17	Canara bank, Chittur	2
6	Thekkegramam	4	18	Pallimukku,	1
7	Mettupalayam	3	19	Ettumuri Jn	1
8	Chittur kavu / Bheeemathumukku	3	20	Muttiringi Road	1
9	Fire stn, Thathamangalam	3	21	Patashala, Thekkegramam	1
10	KSEB, Thathamangalam	2	22	Catholic Syrian Bank	1
11	Municipality	2	23	South Indian Bank	1
12	Chanthapettah	2	24	Neliayankadu	1
	TOTAL	57		TOTAL	17
GRAND TOTAL					74

Source: Street Vendor Survey 2021, NLUM

The street design should account and provide for street vending, so that vendors can rightfully claim city space and protect their right to livelihood as per the law. Measures should be taken to streamline their activities by the municipality and should be secured with institutional financial support and legally enforceable protection.

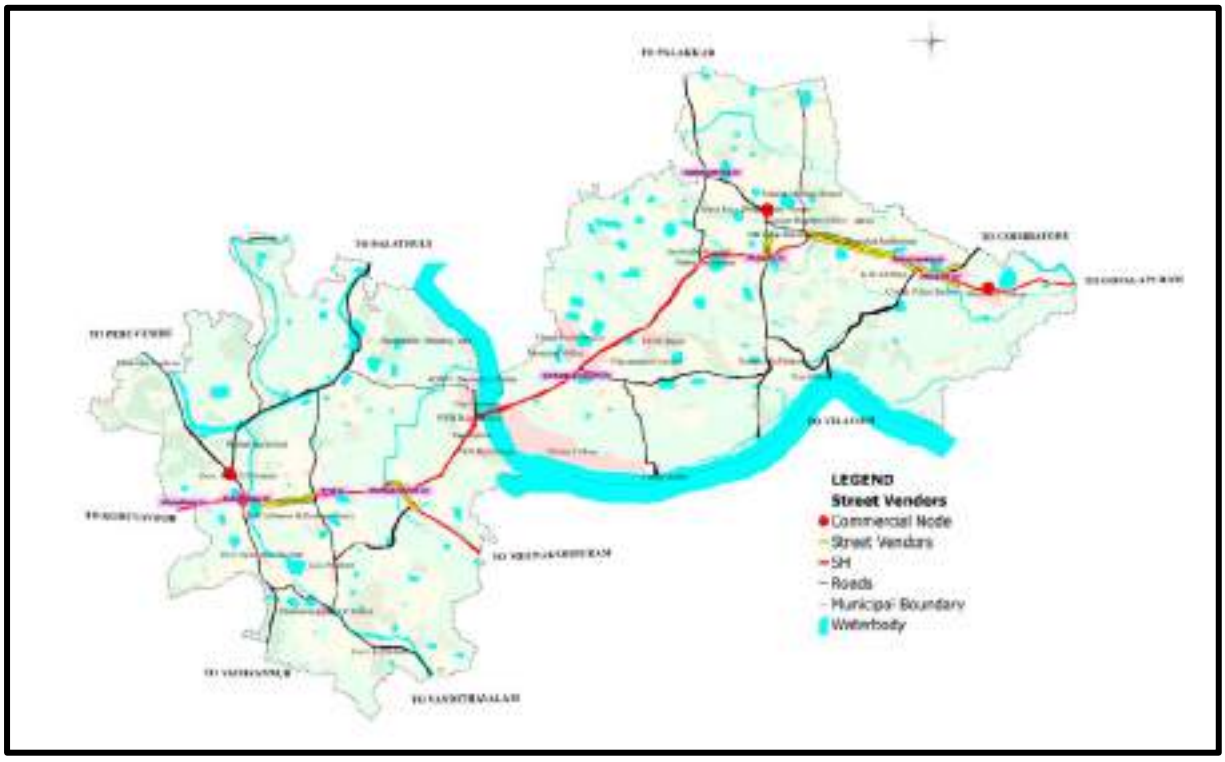


Fig 5.2a Spatial distribution of street vendors in 2012

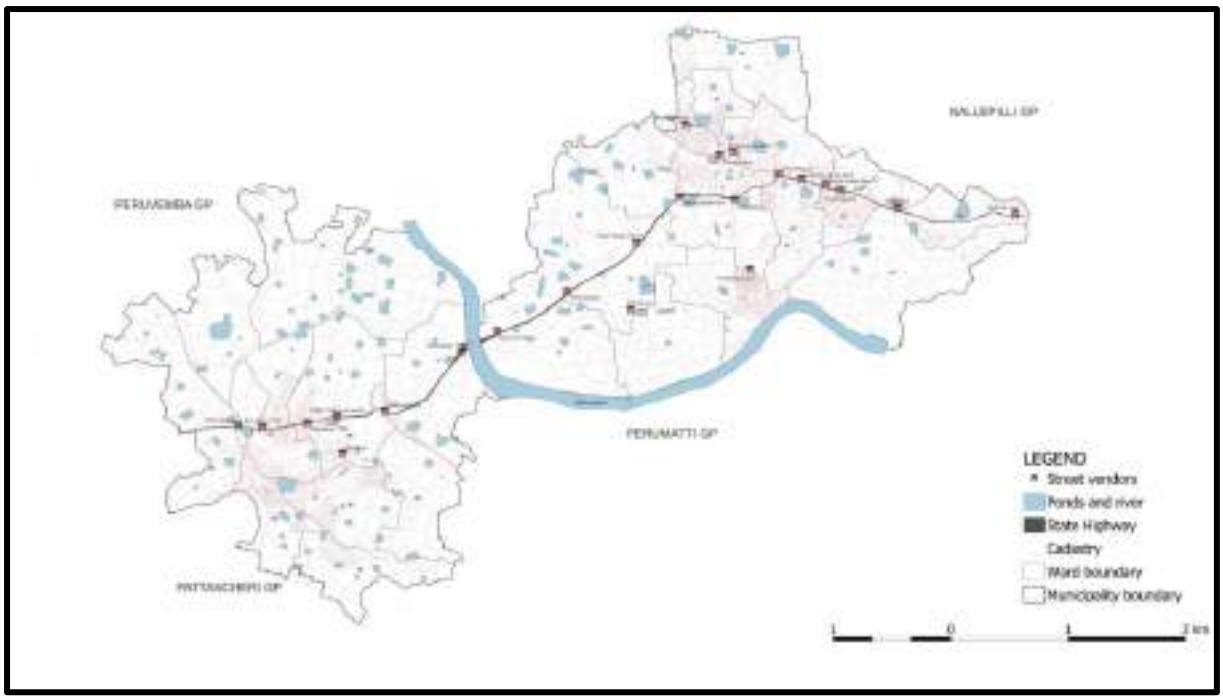


Fig 5.2b Spatial distribution of street vendors in 2021

5.1.4 Financial Institutions

There were 21 financial institutions available in the municipality in 2015-16 as compared to 22 in 2012. Of these 22, 27% are scheduled banks. Table 5.3 shows the details of existing financial institutions present in the municipal area. Three State Bank of India and its associate banks function in the town. It can also be seen that as per the data collected till 2011, no Scheduled tribe Societies and urban co-operative banks function in the municipality.

Table 5.3 Details of financial institutions

Financial Institutions	Numbers
State bank of India and Associates	3
Nationalized Commercial Bank	3
Scheduled and Commercial Banks	6
Harijan Service cooperative Banks	1
Scheduled tribe Societies	-
District co-operative bank branches	2
Service co operative banks	2
Urban co- operative banks	-
Employees credit societies	4
Kerala state agricultural and rural development banks	1

Source: Panchayath level statics – 2011

5.1.5 Problems and Potential

The major problem faced by the town is the non-provision of pedestrian walkways despite the majority of trips in the town being made by walking. The motor vehicle alone is prioritised, and they cause a lot of problems for pedestrian movement. Vehicles also park haphazardly in public space, causing congestion in the Bazaar Road, Thathamangalam Junction and near Thathamangalam bus stand. Commercial facilities are seen mainly as ribbon development along the major transport corridors along SH 25 and 27. Insufficient space for parking, loading and unloading goods also creates problems in the commercial areas. There is no scientific slaughterhouse within Municipality, but some unauthorised slaughterhouses and meat shops are functioning in the municipality. Street vending spaces need to be demarcated along with adequate pedestrian footpaths need to be provided. Measures should be taken to streamline their activities by the municipality and should be secured with institutional financial support and legally enforceable protection.

5.1.6 Inference

Commercial nodes are experiencing congestion largely arising out of poor traffic management, vehicular parking, and non-existent pedestrian walkways. Better positioning of bus stops and Junction improvements are required.

5.2 Industry

5.2.1 Existing Industrial Base

Chittur-Thathamangalam Municipality is basically an agricultural town, and it is rich in traditional craft industries. Even though the industrial sector bloomed very early in the municipality, it did not achieve enough development over the years. Sree Meenakshi Tile works was one of the first industrial establishments in the municipality which was the dream project of the first Chairman, Ambat Eachara Menon. The municipality has no major or medium scale industries however it has many Small-Scale Industrial Units (SSI Units). The number of industrial units has increased over the past 2 decades. It has increased by 326% from 174 SSI units in 1994 to 741 in 2013 (Fig 5.3).

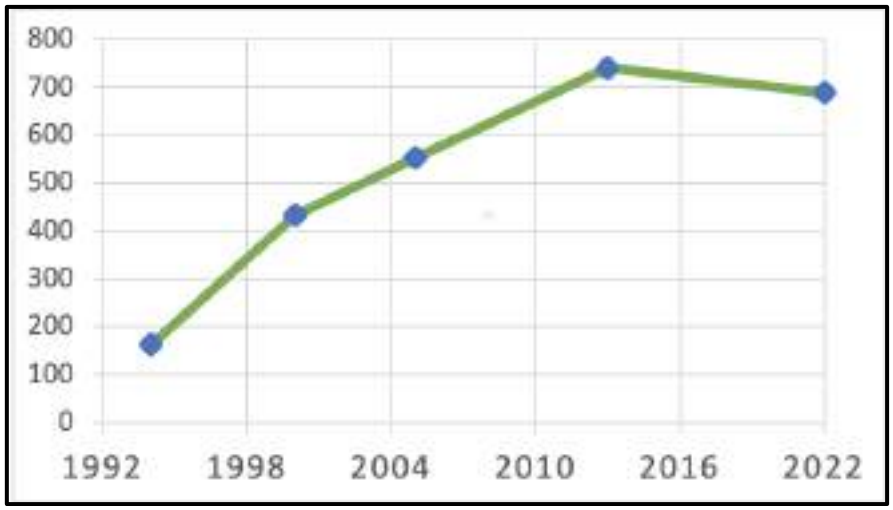


Fig 5.3 Temporal variation of the number of industries in the municipality

Table 5.4 Number of Small-scale industries in town

INDUSTRY	1994	2000	2005	2013	2022
Agro based	51	51	70	92	86
Rubber based	0	2	2	6	0
Plastic	0	1	2	5	34
Forest	4	18	20	25	37
Animal Husbandry	0	1	2	2	0
Textile	11	91	132	184	282
Chemical	5	5	8	27	0
Engineering	34	59	66	84	30
Electronic	1	10	27	44	52
Mineral	0	0	0	0	0
Buildng material	2	8	12	18	16
Others	55	187	212	254	152
Total	163	433	553	741	689

Source: Industries department

Enterprises under MSMED Act 2006 are classified into two types such as Enterprises engaged in the manufacture or production of goods and enterprises engaged in in providing or rendering of services, both types are again classified on the basis of investments into three such as Micro, Small and Medium. Earlier, enterprises are broadly classified into agro-based, Rubber based, Forest based, Animal Husbandry based, Textile materials, Chemical, Engineering, Electronics, Minerals, Plastic based, Building and Others.

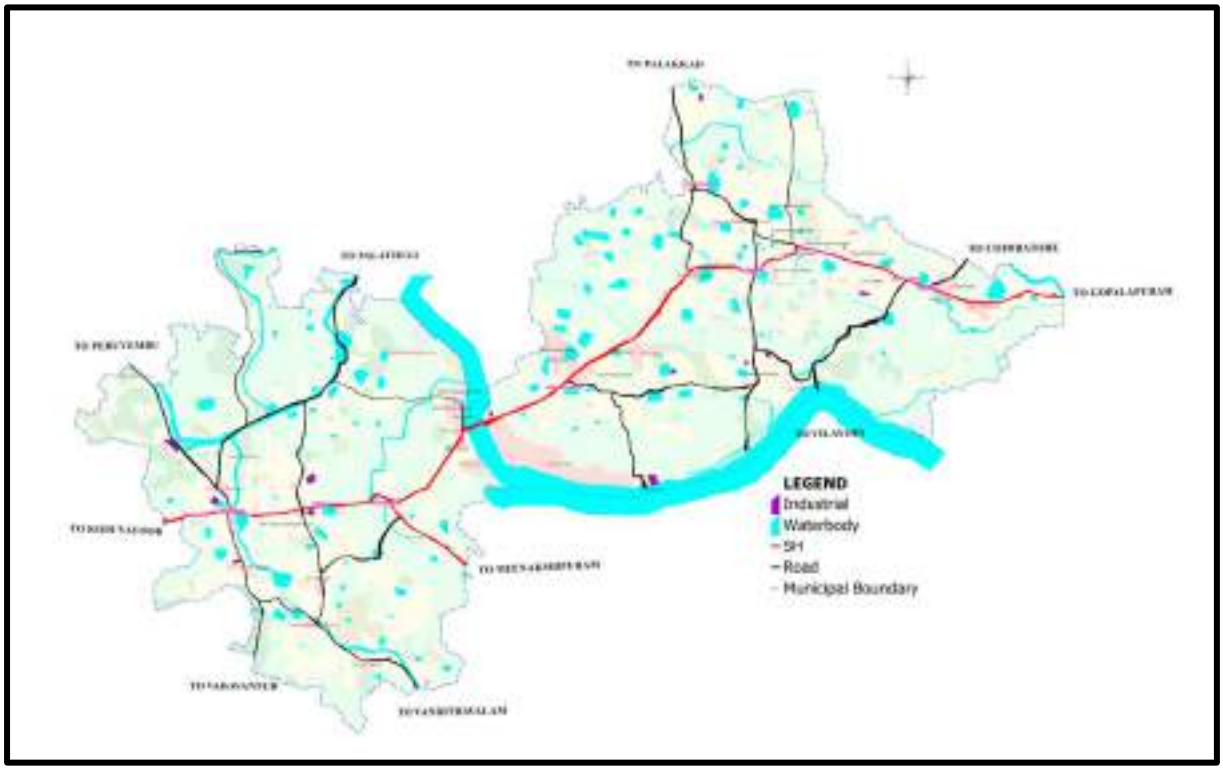


Fig 5.4 Spatial distribution of industrial areas

The number of SSI units that were registered up to 1994, 2000, 2005 and 2013 are given in Table.5.4. It can be seen that the maximum number of units are textile-based industries. This is very evident in the high concentration of textile industry workers in Devangapuram and

Vadakkathara wards. The number of textile-based industries has increased remarkably from 13% in 1994 to 25% in 2013. The textile industry is followed by agro-based industries that amounts to 12.5% of the total industries in the municipality. Fig.5.4 shows the spatial distribution of industries in the municipality.

Traditional Industries

Handloom Industries

In Chittur traditionally people at Devangapuram, Kunnathpalayam and Vadakkathara are engaged in handloom weaving works. Devangapuram in Chittur is famous for its fantastic handloom fabrics since time immemorial. The weavers of this area are experts in weaving finer variety of dress materials like Dothi, Sarees, Settu mundu etc. Even though all communities are engaged in weaving now, the real weaver community is Devangas who emigrated from Mysore during the period of Chera and Chola dynasty. Devanga means the people who make angavastram (cloth) for Devas (God) who worship goddess Chamundeswary. The weaving style of those people showcases most attractive designs. Palakkad cluster proudly presents this uncommon technical skill and manufacturing dexterity under the trade name "Puthunagaram silk fabric". The weavers of Devangapuram are facing tough competition from powerlooms who can sell their produce at cheaper rates.



Mat weaving

Sedge grass, known as kora, grows in profusion in Kerala's marshy regions and along its banks and rivers and is collected by the Kurava, the community who have traditionally woven mats of this material on a low beam floor loom in the ribbed plain weave. These mats serve as floor coverings, mattresses and prayer mats and are made accordingly in a range of sizes.

For instance, long narrow mats known as the panthi are used to seat guests during meals on the floor. The mats that are currently being produced have begun to sport motifs such as elephants, palm trees, the Taj Mahal, lamps and the lotus. The weavers have also begun to create a wider range of products that include table mats, runners and bags of various sizes.

Mat woven with finely split kora grass that has been dyed leaving the central portion in which the pattern is picked up, is shown below.



Table 5.5 gives number of traditional industries which are present in the municipality.

Table 5.5 Number of Traditional industries in town

Ward No.	Name of Ward/Place	Name of Industry	Type of Traditional Industry	Qty of Produce/Year (specify unit)	Ownership	No. of workers	
						M	F
15	Devanagapuram	Textiles	Handloom	5000 Meter	Private	40	30
8	Vadakkethara	Textiles	Handloom	10000 Meter	Private	90	50

Table 5.6 Details of Handloom work shed Projects

Sl No.	Name of project	Estimated cost	Target no of beneficiaries	Present stage	Expected year of completion	Level of project	Type of project	Category of project
1	Handloom work shed	20000	22	20 Nos completed	2012-13	completed	State funded	Local development
2	Handloom work shed	30000	10	Not started	2013-14	completed	State funded	Local development

5.2.2 Problems and Potential

The municipality is basically industrially backward and has not attracted any large-scale industry so far. Since the municipality is largely agrarian in nature, it is necessary to promote agro-based industries including cottage industries. The diversification and value addition of the agricultural produces could also be attempted.

The critical gaps in the Handloom sector are (i) low-income, (ii) lack of diversification of production (iii) lack of skilled weavers (iv) Obsolete technology (v) unawareness of various schemes by the weavers (vi) Relevance to the enter into the industry.

Low volume of sales of handloom cloths, huge stock of finished goods in the societies resulting in the blockage of working capital, non-adoption of modern designs, production of conventional type of fabrics only such as Kaily, Mundu, Thorth, etc., lack of working capital, workers not getting regular employment, huge cash credit arrears by the societies with District Cooperative Bank, delay in getting rebate from Government, scarcity of expert weavers, huge ESI/PF arrears due by the societies, managerial inefficiency of the Board of Directors, dropout of weavers from handloom sector due to low wages, lack of production of export oriented items and unhealthy market competitions (from power loom sector).

5.2.3 Inference

The contribution of existing industrial base to the economy of the town is comparatively small mainly due to the absence of large and medium scale industries. However, the agro based industries have a good potential in the town and this need to be promoted. Female work participation is found to be more in the agrarian sector. Town also has large agricultural land (52%). The working of existing MSME units can produce more output if the units make use of new technologies and good managerial skills. Government can support such developmental programmes with appropriate policies, fiscal incentives and infrastructural support.

5.3 Tourism and Cultural Heritage

5.3.1 Present Scenario

In Chittur-Thathamangalam, history and tradition are manifest in myriad ways ranging from festivals to performance art, traditional industries and settlements with special character

5.3.2 Festivals

While the two festivals of Konganpada and Angadi Vela are the dominant events in the municipality, there are several other festivals too.

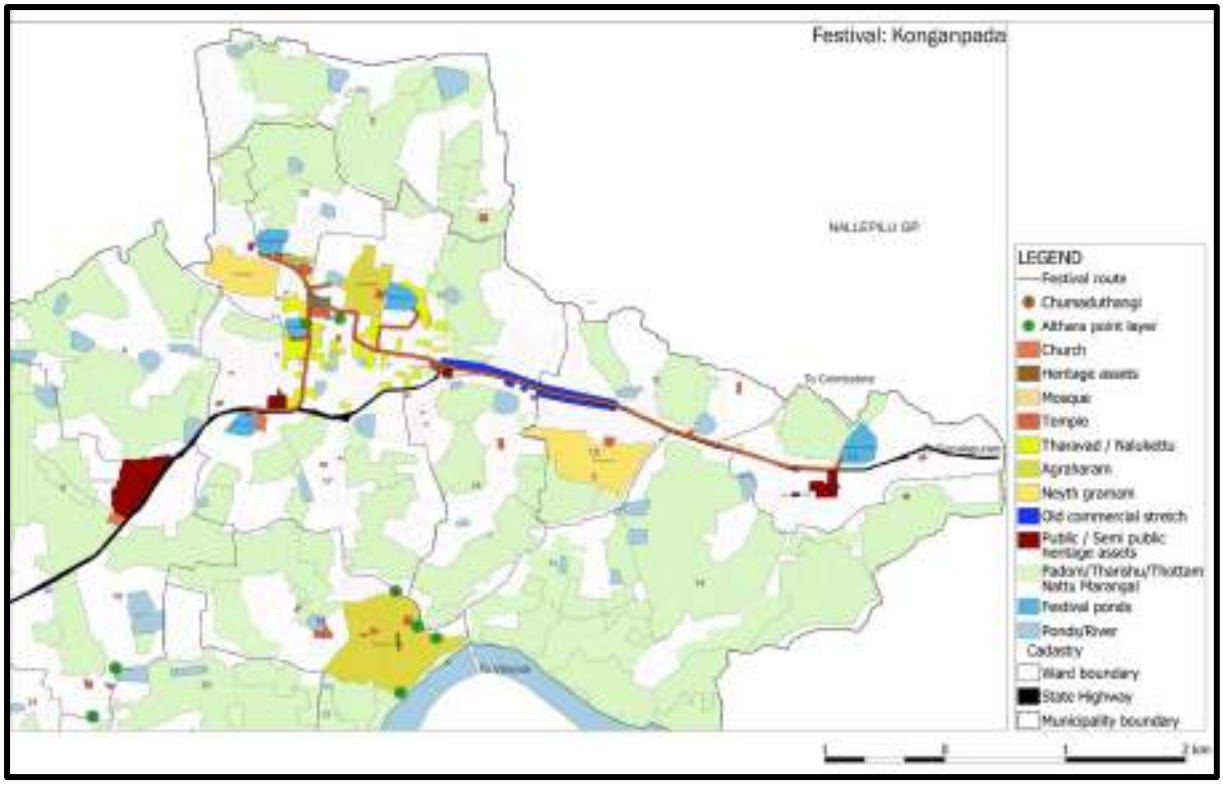


Fig 5.5a Festival Route: Konganpada

Chittur Kongan Pada

Chittur Kongan Pada is a ritualistic drama, celebrated on the first Monday after the dark lunar in Kumbham Malayalam Calendar (February – March). The festival is a continued celebration of the legendary victory over the Kongus by the people of Chittur. It gives great importance to the Mother Goddess of Chittur.

Chittur Kavu

Chittur Kavu, located in Kadambidi ward is believed to be the abode of the Goddess of Chittur. The temple is believed to be the focal point of the development of civilization here. All the myths and heritage of the town are interwoven with the legends of the goddess and the temple. Kongan Pada which is the only war festival in the state is based on this temple. This may be one of the unique festivals of the state which showcases the culture and heritage of the land and its people. Fig. 5.5 (a, b, c, d, e, f, g, h, i, j) are various Festival Routes in Chittur-Thathamangalam. Chittur Kavu attracts considerable number of visitors from Kerala and neighbouring state Tamil Nadu. Chittur Kongan Pada and Thathamangalam Kuthirayottam are the famous festivals celebrated in the town.

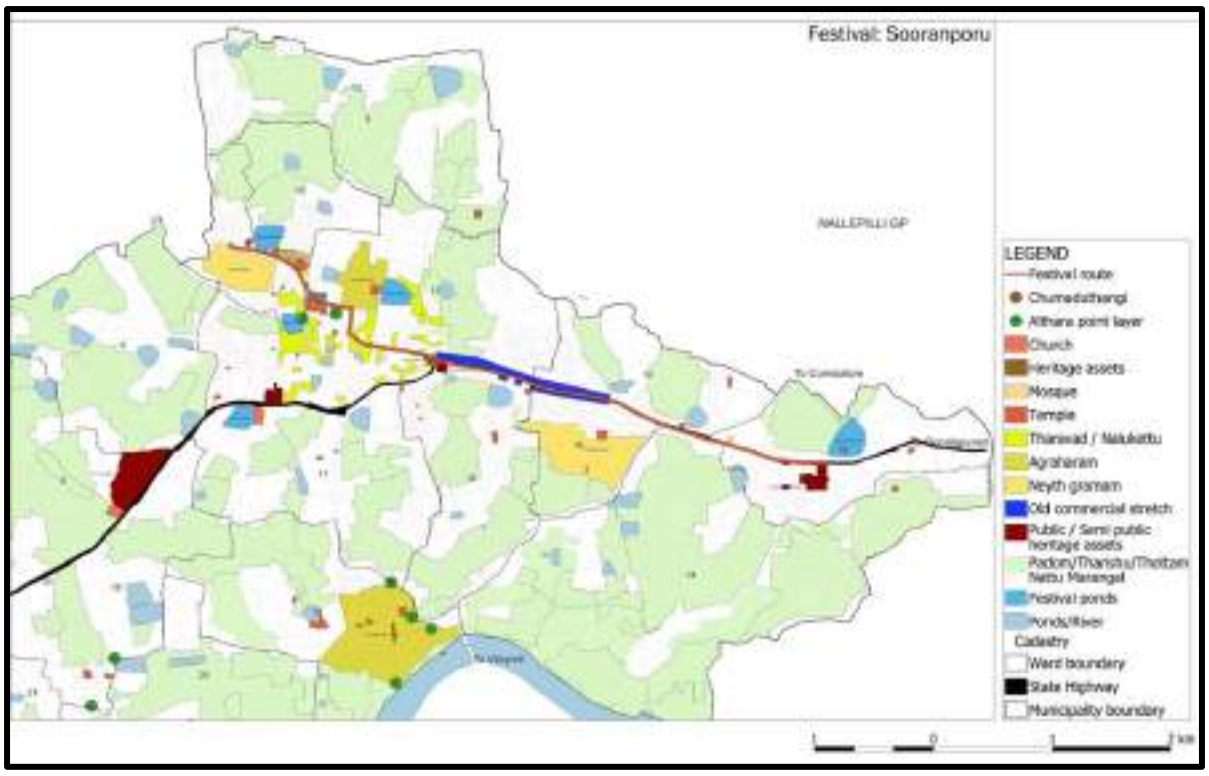


Fig 5.5b Festival Route: Sooranporu

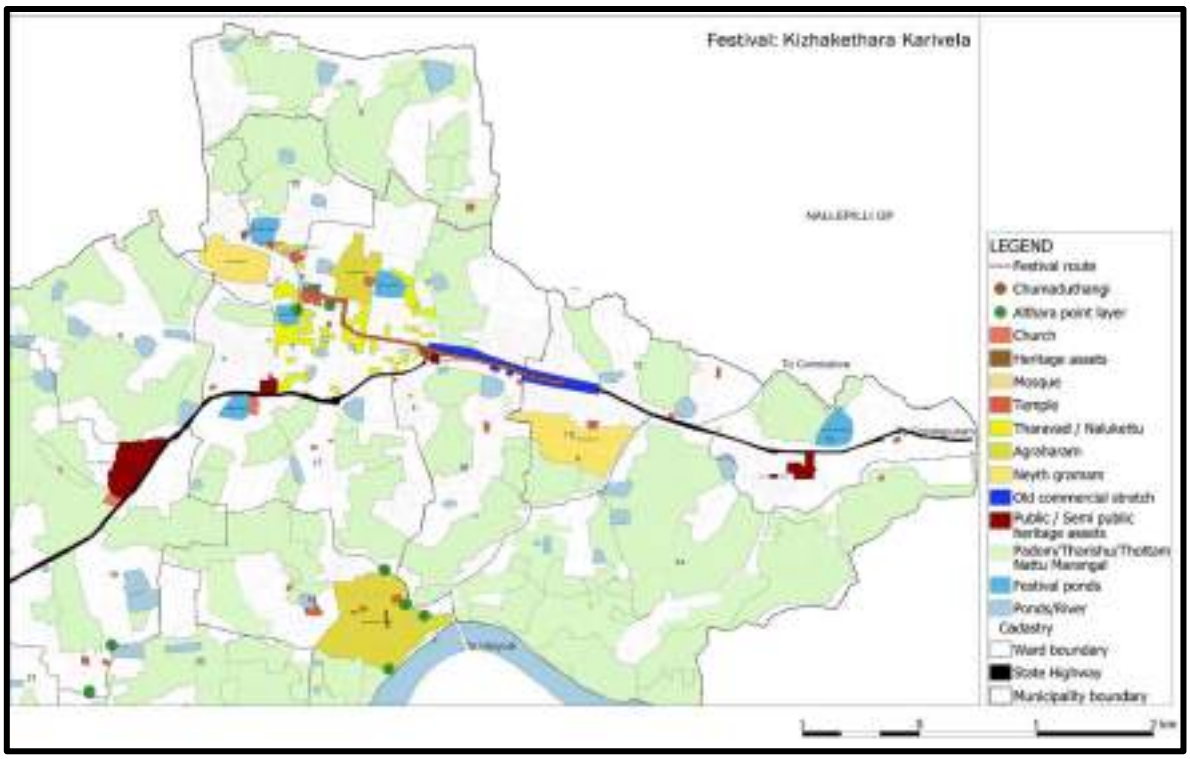


Fig 5.5c Festival Route: Kizhakkethara Karivela

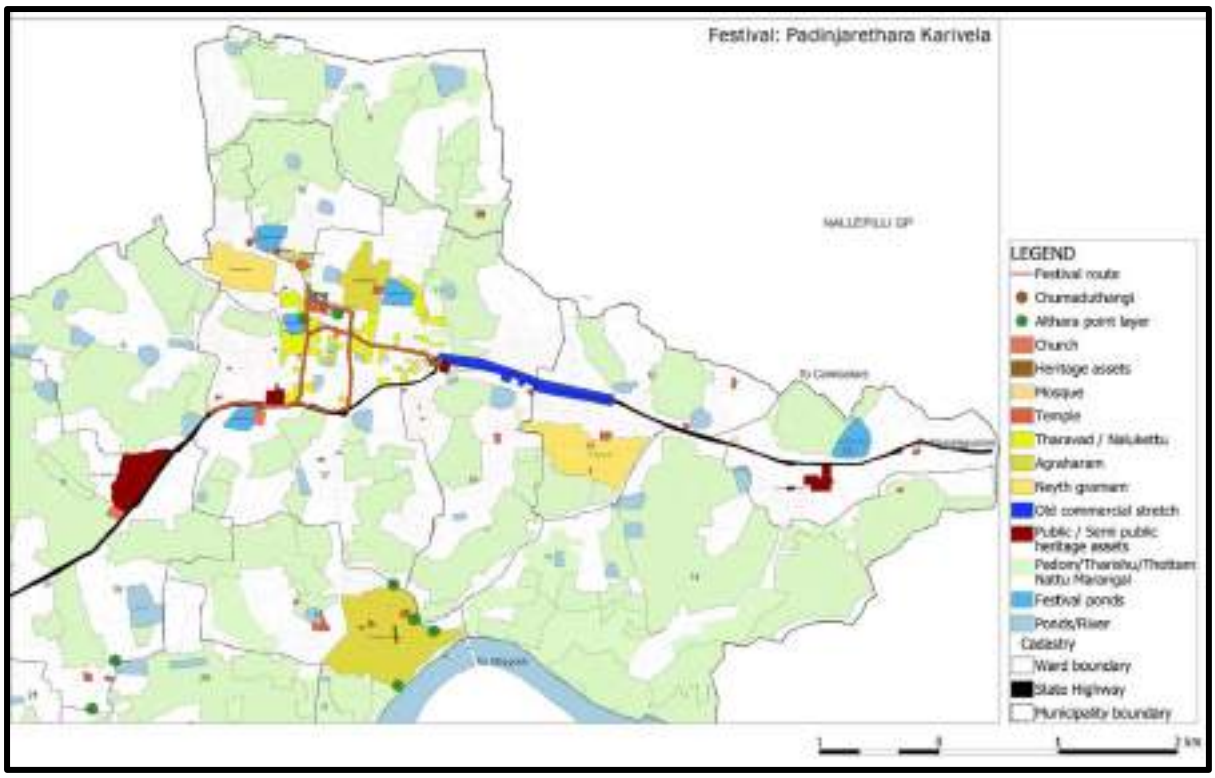


Fig 5.5d Festival Route: Padinjarethara Karivela

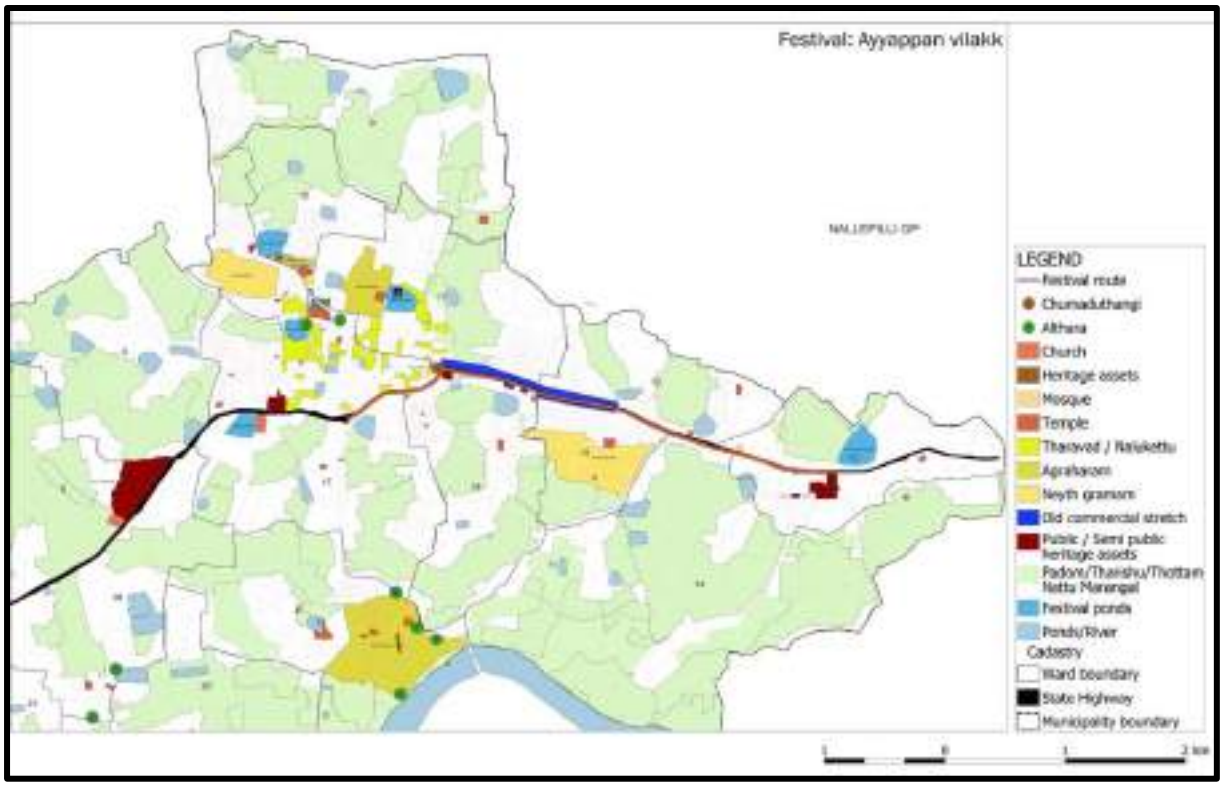


Fig 5.5e Festival Route: Ayyappan Villaku

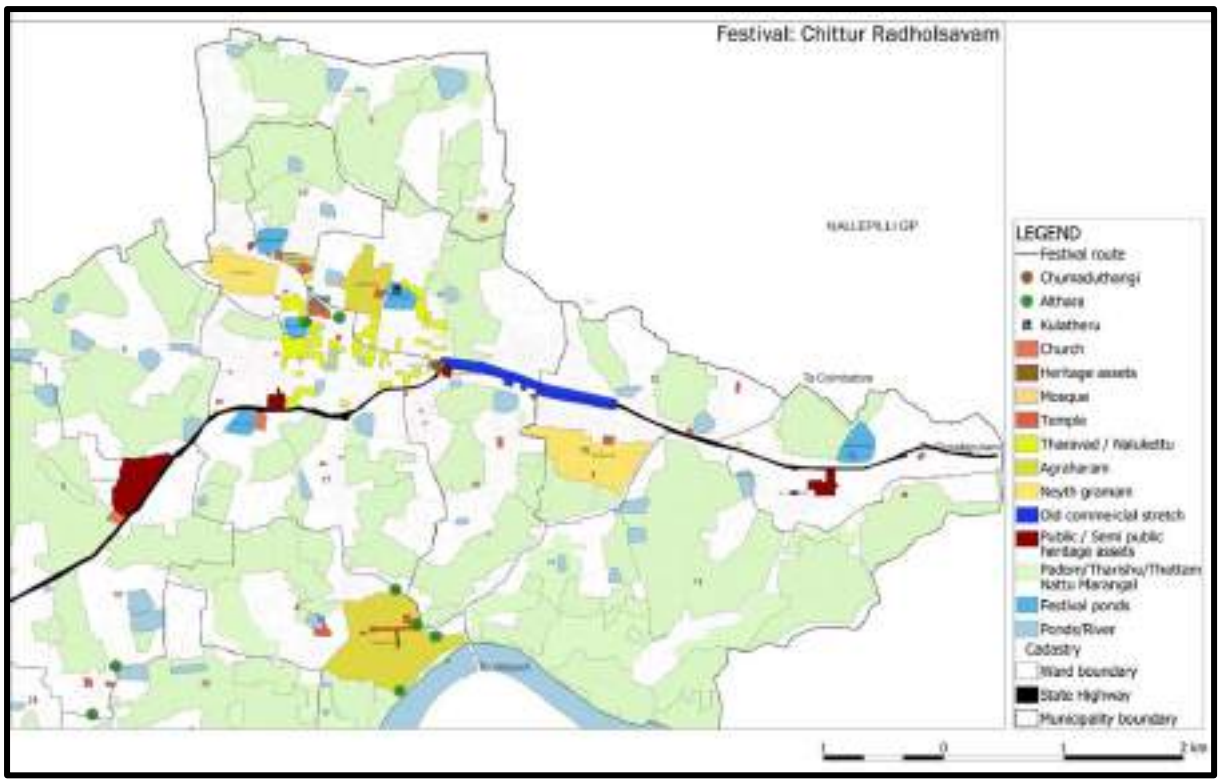


Fig 5.5f Festival Route: Chittur Thekkegramam Radholsavam

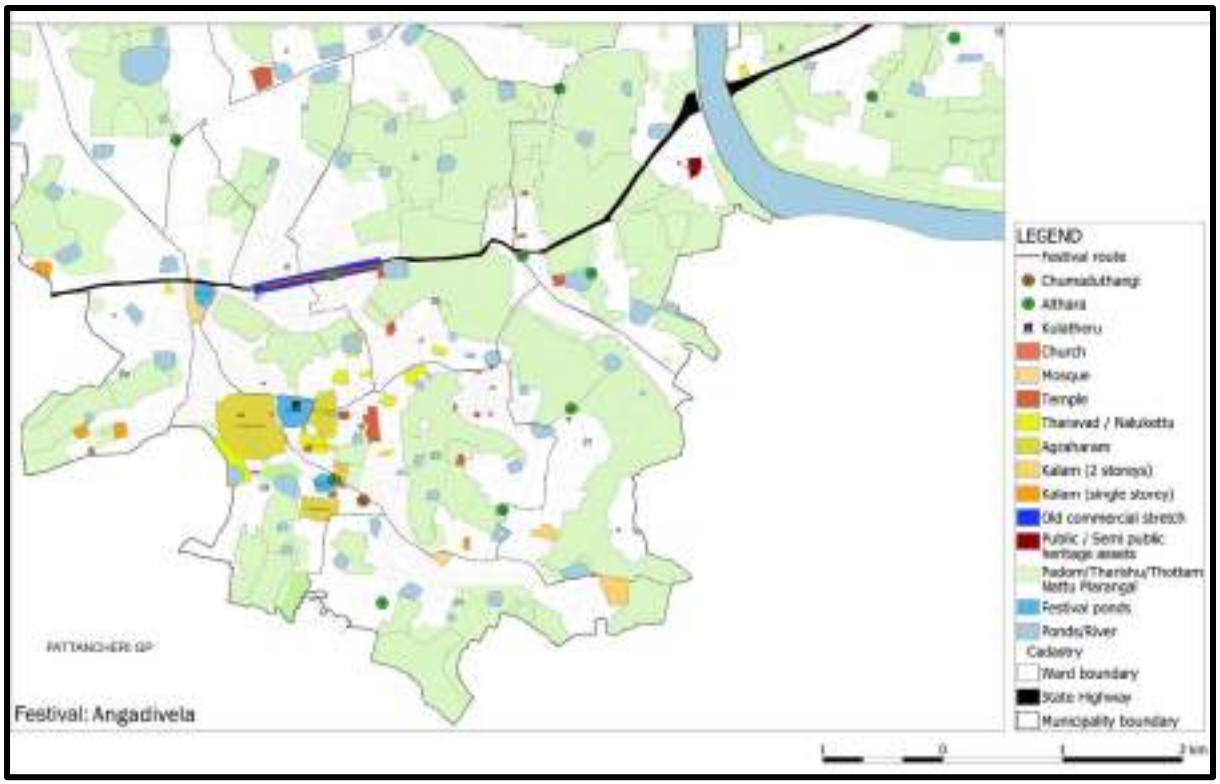


Fig 5.5g Festival Route: Angadi Vela

Angadi Vela

Thathamangalam Kuthira Vela or Angadi Vela is conducted in Thathamangalam. During the festival, a grant horse race is conducted by the local people. Most of the riders are from

neighbouring state of Tamil Nadu. Many volunteers painted in black with charcoal are placed as guards who control the people standing on the sides. Thousands of people gather on both sides of the State Highway 27.

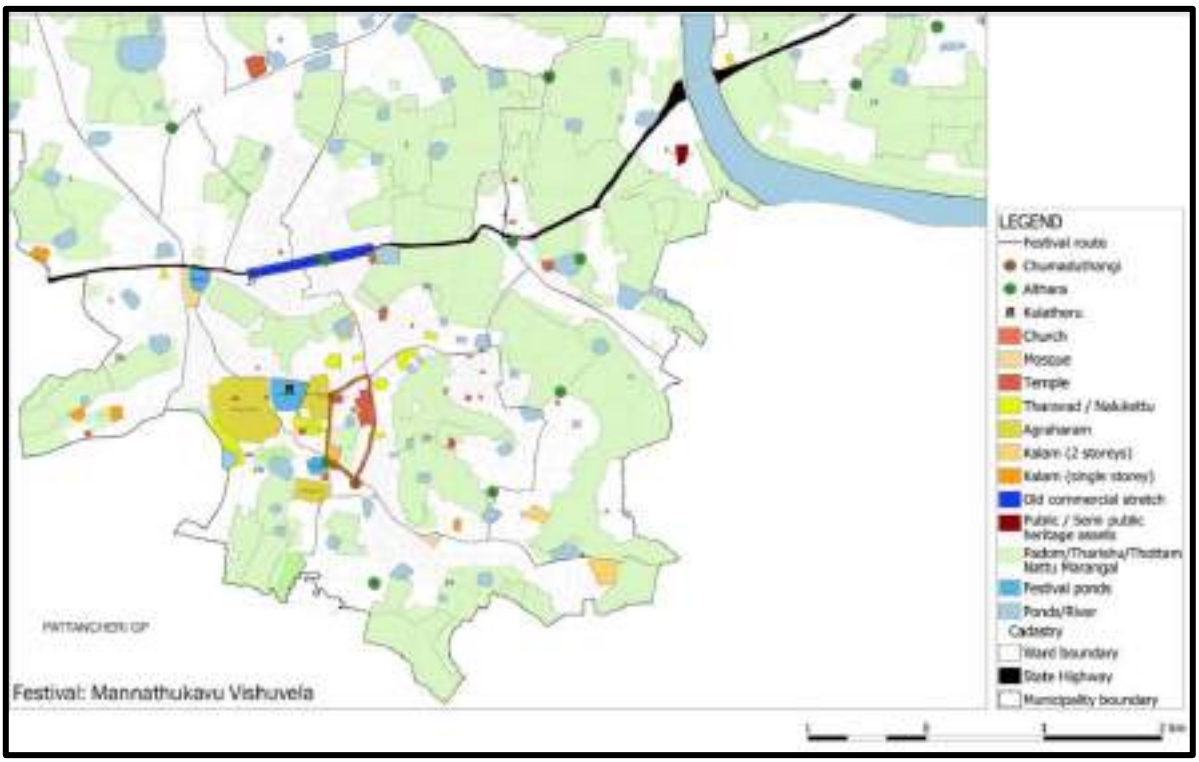


Fig 5.5h Festival Route: Mannathukavu Vishuvela

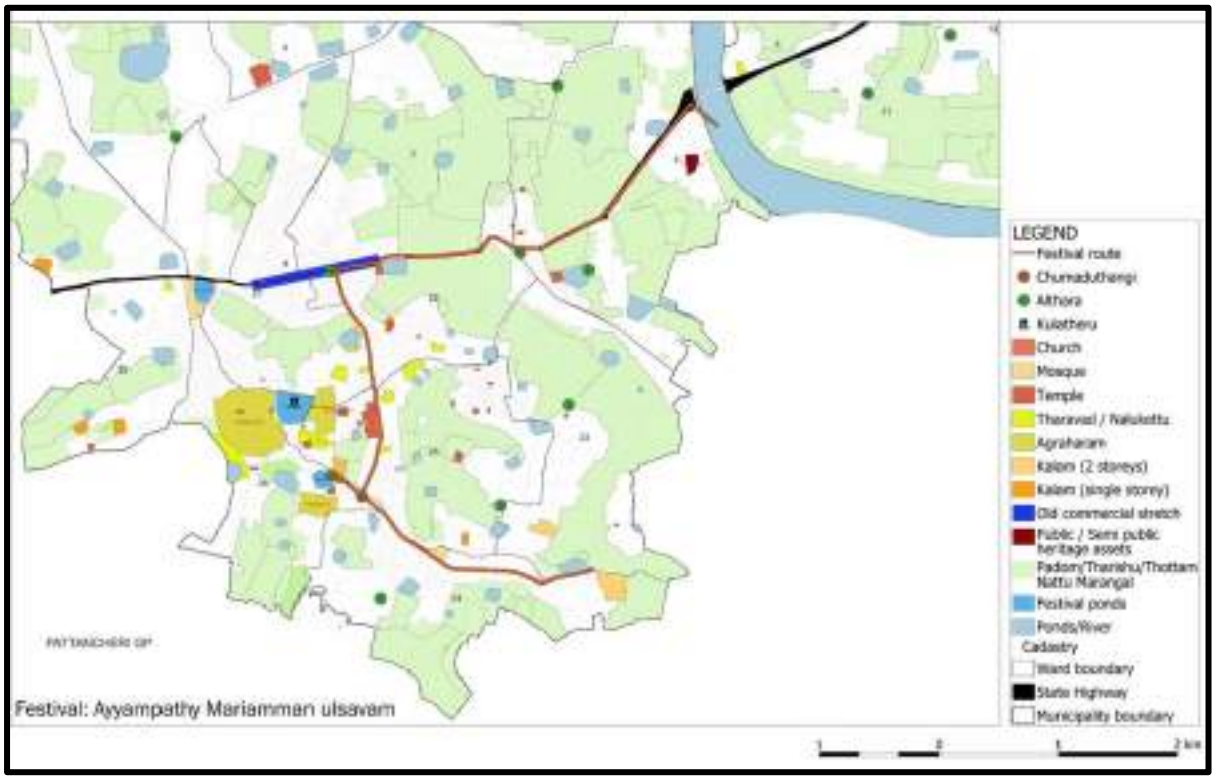


Fig 5.5i Festival Route: Ayampathy Mariamman Ulsavam

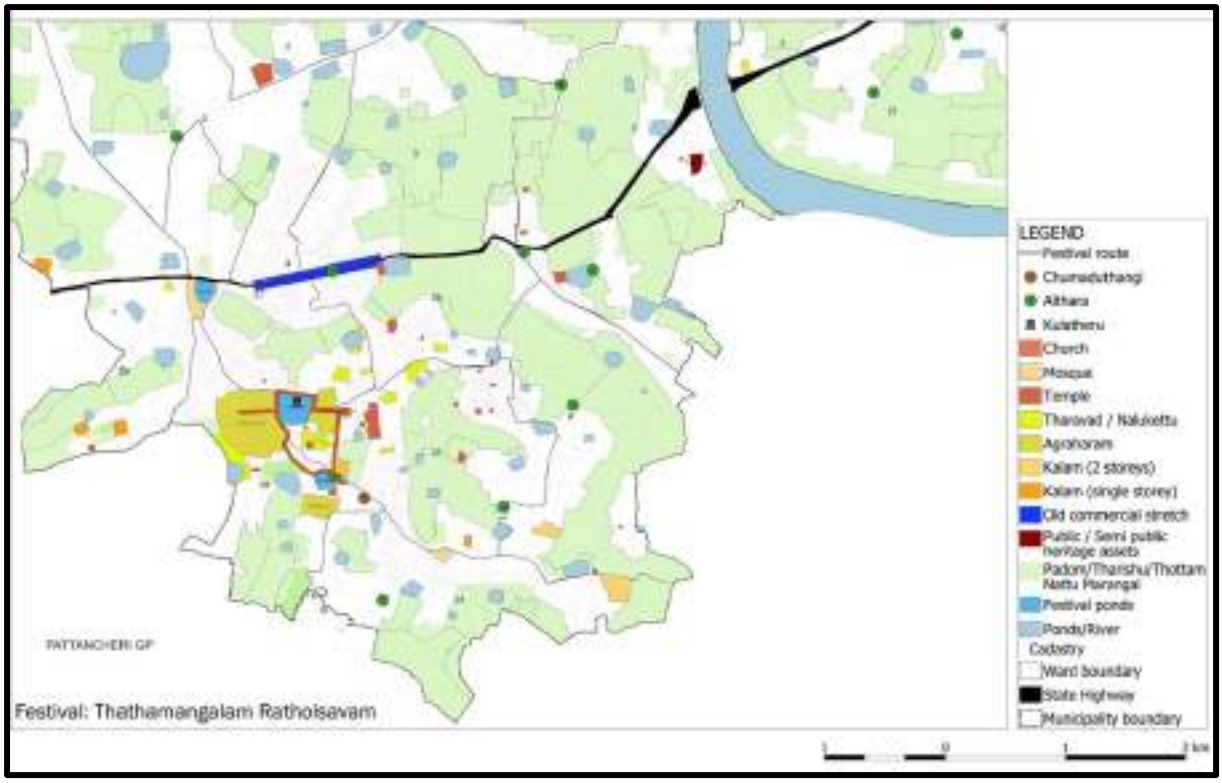


Fig. 5.5j Festival Route: Ratholsavam

5.3.3 Precincts with Special Character: Agraharams and traditional Tharavadus

There are five agraharams (settlement of Tamil Brahmins) namely Thekkegramam, Lankeswaram, Durgagoshtam in Chittur, Padinjare Gramam and Thekkegramam in Thathamangalam. The settlement pattern is similar in all the agraharams with rowhouses on both sides of a central open space and a temple at one end. They may differ in shapes - some are in straight line, some are T shaped, and few have multiple temples within the village. These agraharams are having heritage value and need to be conserved. There are also Nayar Tharavadus in the form of traditional Kerala architecture, popularly known as Nalukettu, whose construction follows the norms and principles of traditional “thachu sasthra” (the science of architecture). These are elegant heritage home built more than 150 years ago. Hence, these may be conserved or be converted as heritage resorts there by linking to tourism sector after conducting detailed studies of heritage value of these. Details of agraharams - Thekkegramam, Lankeswaram, Durgagoshtam in Chittur, Padinjare Gramam in Thathamangalam and Nayar tharavadus and other heritage sites are shown in Fig 5.6, 5.7, 5.8, 5.9, 5.10 respectively.



Fig 5.6 Thekkegramam Chittur



Fig 5.7 Lankeswaram Gramam Chittur



Fig 5.8 Durgagoshtam Gramam Chittur



Fig 5.9 Padinjare Gramam Thathamangalam

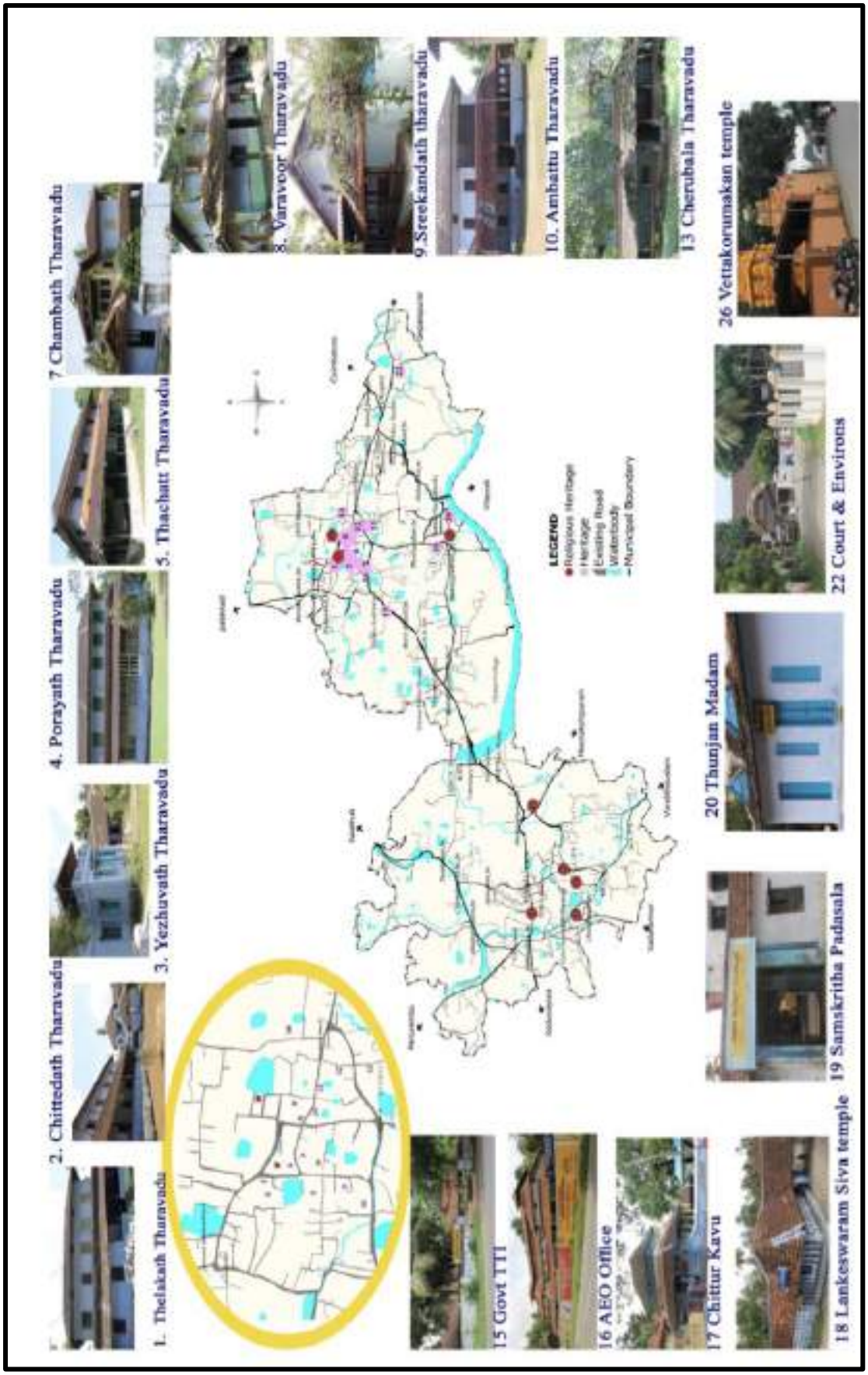


Fig 5.10 Spatial Distribution of Heritage Sites

Chittur Thunchan Madom is situated on the banks of the river Sokanasini in Thekkegramam ward. It is here that Thunchath Ramanujan Ezhuthachan who is regarded as the father of Malayalam language spent last few years of his life in the 16th century. At the Guru Madom, a Srichakra, the Ezhuthani (stylus) he used for writing, the wooden slippers, a few old manuscripts and few idols worshipped by him are kept as precious mementoes. It is on Vijayadasdami day that the memorial gets the maximum number of visitors with hundreds of children brought here for ritualistic initiation of learning. Thunchan Guru Madom is a place of tourist attraction.

Farm Tourism

Located on the banks of Chittur river there exists a farm tourism destination, the Navara organic Eco Farm, that has undertaken the mission to bring back the fast-losing significance of Navara, a grain considered to be of great value from the healthcare point of view. Spread over an area of 18 acres, the farm tourism destination also has other types of crops like coconut, mango, pomegranate, medicinal herbs, bamboo and vegetables. A maximum of eight visitors can be accommodated in the farm at a time, and the stay here gives one the opportunity to enjoy some of the local delicacies.

At the ancestral house located in the farm, we also have the facility to have a close look at some of the old and traditionally used farming implements; varieties of Navara rice seeds and literature on various farm products. The farm has a walkway that is ideal for leisurely strolls and for familiarization with about 80 varieties of trees and plants, most of them fruit bearing. The Navara fields in the farm at Chittur, Palakkad farm tourism destination, can become the activity zone for the visitors, who are interested in various farming tasks available at a particular period of the year; like sowing, weeding, harvesting etc.



Njavara Eco farm

Proximity to other Tourist Spots

Kenampully hill station is an important tourist spot situated within 1 km of the municipal boundary. The main attraction of this hill station is a temple and cave situated on the hilltop. The Idol of the temple is Lord Muruga. The hilltop is an attractive viewpoint from which the vast stretches of Chittur town are visible. Malampuzha Dam, Palakkad Fort, Kalpathy Temple, Shiruvani Dam, Parambikulam Wildlife Sanctuary etc are important tourist places within 50 km of Chittur-Thathamangalam Town.

Scope for River Front Tourism

Rivers are the major spatial elements of the landscape and constitute a significant tourism resource. It has to explore opportunities for developing Chittur Puzha riverfront into a tourist destination. Facilities have to be created on the riverfront that would attract tourists. There needs an in-depth study on the project in order to develop the area into one of the most relaxing public spaces in town.

5.3.4 Availability of Tourism Infrastructure

Since the tourist flow is only seasonal there are no major tourist infrastructural facilities in the town. However, there is a 3-star hotel near Anikode Junction.

5.3.5 Problems and Potential

The tourism sector in the town is not well developed. Cultural heritage and traditional skill-based industry can be a significant driver of economic growth in the town, if dovetailed with various national and state programs. However, tourism is a double-edged sword. Its success often spells the doom of the place. Therefore, rather than focusing on tourism as an economic driver, the focus could be on reviving the craft base, the local skills and the festival season, could be used to invigorate the local economy building on the local crafts and arts. Further, the town should celebrate the Chittur Thunchan Madom, being associated with Thunchath Ramanujan Ezhuthachan, who holds a distinct place in the history of Malayalam literature. The special settlement character of the Brahmin Agraharams and Nayar tharavadus, untouched by modernity, are special features of the town. The streets with long arrays of Agraharams has all the charm and antiquity worth preserving.

5.3.6 Inference

Currently tourism in the municipality is very weak. This is mainly because of the lack of any initiative to promote the various special aspects of the town for tourism. Except during the Kongan Pada and Navarathri season there are no major tourist flows into the municipality.

5.4 Animal Husbandry

A large number of farmers depend on animal husbandry for their livelihood, supplying milk, meat, eggs and hides. Bullocks are the major source of power for farmers. Thus, animal husbandry plays an important role in the rural economy.

5.4.1 Live-stock Population

The main livestock are cattle, buffaloes, goat and fowls. The products obtained from livestock are mainly egg, meat and milk. The total livestock population has increased till 2003, but the decade of 2003-2012 has seen a decrease in the livestock population. This is mainly reflected in the number of cattle and fowls that has decreased 50% and 65% over the last decade (Table 5.7). The variation in the number of livestock population over the past years is shown in Fig 5.11. While the cattle, buffaloes and fowl have shown a decreasing trend, the number of pigs and dogs has shown an increase between 2003-2012. In the last decade between 2012 and 2022, there has been an increase in the total livestock, primarily in the number of fowl and goats. Cattle, buffaloes, dogs and pigs have all showed some decline with cattle registering the highest decline of around 18%.

Table 5.7 Temporal variation of livestock population

Year	1987	1996	2003	2012	2021
Cattle	2011	2413	1954	959	780
Buffaloes	457	149	46	38	33
Sheep	10	0	0	0	0
Goat	609	1133	885	685	1154
Pig	0	15	75	155	150
Dog	486	1518	1724	1853	420
Fowl	8866	13488	15546	5416	8816
TOTAL	**12439**	**18716**	**20230**	**9106**	**11353**

Source: Livestock Census 1987, 1996, 2003, 2012 and Krishi Bhavan data, 2021

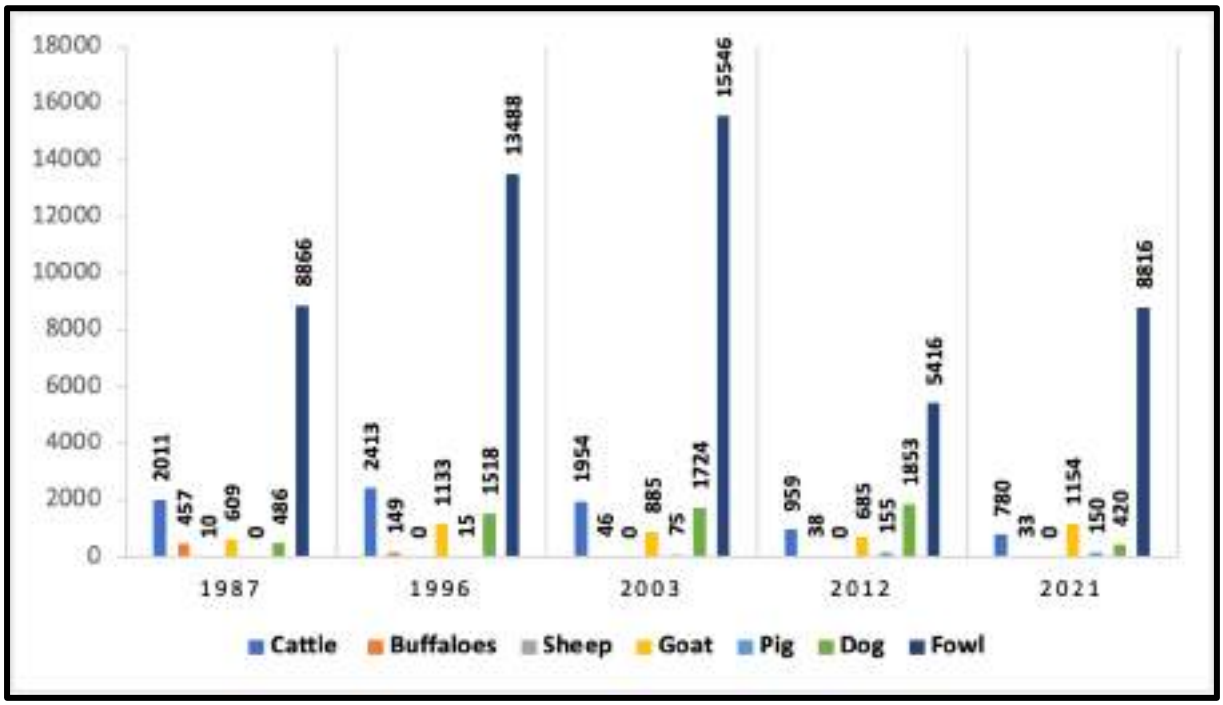


Fig 5.11 Temporal variation in the number of livestock

5.4.2 Production Meat

There are no poultry farms in the municipality, though there is a slaughter shed in Ward 15.

5.4.3 Milk

The milk production unit in Vadakkathara (Ward 8) has an average output of 12000 litre per month in 2012. There are 3 Milk Societies in the town in 2022 with a combined daily production of 900 litres. After catering to local demand to the tune of 450 litres, the rest is supplied to Milma Dairy unit at Kallepully.

5.4.4 Physical Infrastructure

Physical infrastructure in the municipality includes a District Quality Control Office, Veterinary polyclinic, Integrated Cattle Development Programme (ICDP) sub centre and broiler farm. However, there are no dairy farms or hatcheries in the municipality.

5.4.5 Problems and Potential

Animal husbandry, especially of cattle and buffaloes, is getting weak in the municipality which is reflected in their decrease over the years. Cattle rearing is not found to be a profitable venture for many, mainly due to the high price of cattle feed. Also, as mechanization was widely introduced, labour force has become scarce which has made animal rearing to be a burden for farmers. However, both fowl and goats have increased in population since 2012.

5.4.6 Inference

Animal husbandry has become weak in the Town in the past few years. Animal husbandry is a potential sector since town has a vast agrarian hinterland. But due to urbanisation, the shrinking of grazing land and fodder availability has pushed animal production to its limits. The numbers of animal husbandry institutions are found satisfactory in Town. Incentive based dairying has to be promoted to encourage farmers and augment production. Dairy cooperatives have to be provided more infrastructure and automation of milk collection and marketing has to be encouraged. Technology has to be brought into different aspects of animal production since conventional methods of animal production does not yield much and are not sustainable.

5.5 Agriculture

5.5.1 Area under cultivation

Palakkad is one of the districts where the agriculture is having a major role in the economy and hence it is called the ‘Granary of Kerala’. Agriculture sector requires special attention in the district. The economy of Chittur-Thathamangalam Municipality is largely agrarian in nature.

5.5.2 Important crops and production

The agricultural land which was 48% of the total land area in 1986 has increased to 52% in 2012. Important crops in Chittur-Thathamangalam Municipality and its area of cultivation are given in Table.5.8. Paddy is the main agricultural crop in the municipality and serves as the livelihood for large number of people. It has got a lot of ecological significance in the municipality. It can also be seen from the table that the area under the paddy cultivation has decreased considerably (Fig 5.12). But due to the improved agricultural practices and efficient irrigation system in the area, their productivity has however increased substantially from 3900 kg/Ha in 2009-10 to 5000 kg/Ha in 2012-13 (both 1st and 2nd crop).

Table 5.8 Area of cultivation and productivity of important crops

Sl.No.	Type of Crops	2009-10		2010-11		2011-12		2021-22	
		Area (HA)	Productivity (Kg/Ha)	Area (HA)	Productivity (Kg/Ha)	Area (HA)	Productivity (Kg/Ha)	Area (HA)	Productivity (Kg/Ha)
1	Paddy 1st	720	3900	710	4200	690	4500	471	5000
2	Paddy 2nd	720	3900	710	4200	690	4500	471	5000
3	Coconut	250	100 nuts/ha	250	100 nuts/ha	275	120 nuts/ha	300	120 nuts/ha
4	Ginger	10	30000	5	20000	7	25000		
5	Pepper	2	4000	2	4000	2.5	5000	2	5000
6	Banana	1.5	25000	20	30000	15	25000	10	15000
7	Arecanut	3	15916 nuts/ha	3	42871 nuts/ha	4	43712 nuts/ha	4	50000 nuts/ha
8	Turmeric	0.3	17326	0.3	20482	0.1	18886		
9	Mango	5	50000	5	50000	5	50000	6	50000
10	Vegetables	2	5000	2	5000	2	5500	2	6000

Source: Krishi Bhavan

There are mainly two rice growing seasons for paddy, Mundakan or Winter Paddy and Virippu. The latter is the first crop grown in autumn season (From April/May – September/ October) while the former is the second crop, Mundakan (September/October - December/ January). The temporal variation of paddy production in both the seasons are given in Fig.5.12. It can be seen that both the seasons yielded almost equally in the municipality except for the last decade when the first crop or Virippu has shown a greater rate of increase. However, in 2015-16, there seems to be a drop in the second paddy crop cultivation along with a drop in the area under coconut and banana. However, there was a third paddy crop and the area under areca nut, vegetables and ginger grew.

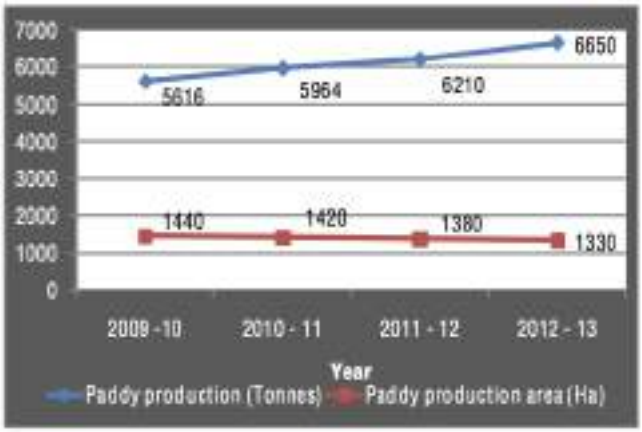


Fig 5.12 Temporal variation of production of paddy

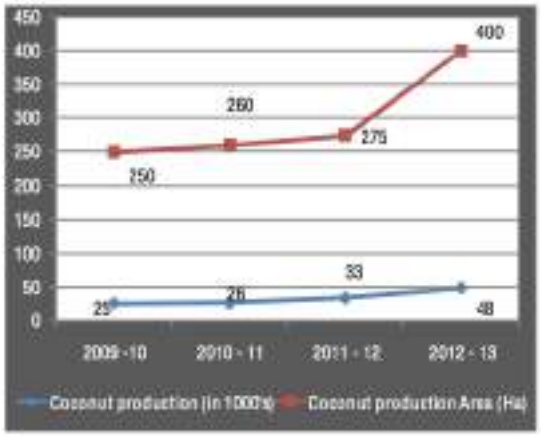


Fig 5.13 Temporal Variation of production of coconut

The cultivation of paddy is followed by the production of coconut. The productivity of coconut which was just 100 Nuts/Ha in 2009-10 has increased to 120 Nuts/Ha in 2012-13 (Fig 5.13). Although area of cultivation is decreasing, the productivity is increasing. This is due to the awareness of better management practices in plantations and due to fertiliser effect. Temporal Variation of area of ginger cultivation and production is shown in Fig 5.14 and Temporal Variation of area of Banana cultivation and production is shown in Fig 5.15. Ginger and banana are usually cultivated in paddy fields also.

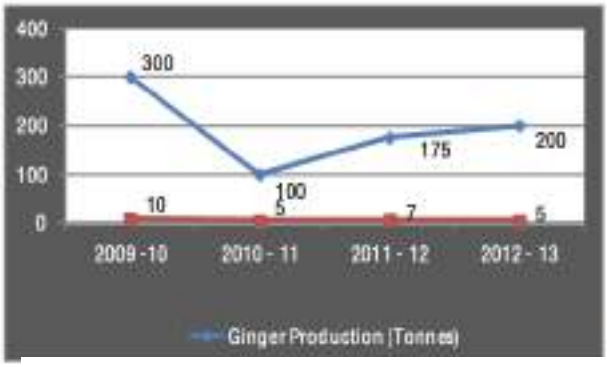


Fig 5.14 Temporal Variation of Ginger production and area



Fig 5.15 Temporal Variation of Banana production and area

5.5.3 Spatial distribution

It can be seen that the paddy has higher concentration in Chittur while Thathamangalam area has higher concentration of dry agriculture. Concentration of agriculture is higher in wards 1, 2, 3, 4, 5, 6, 10, 14 20, 22, 23 and 24 (Fig 5.16).

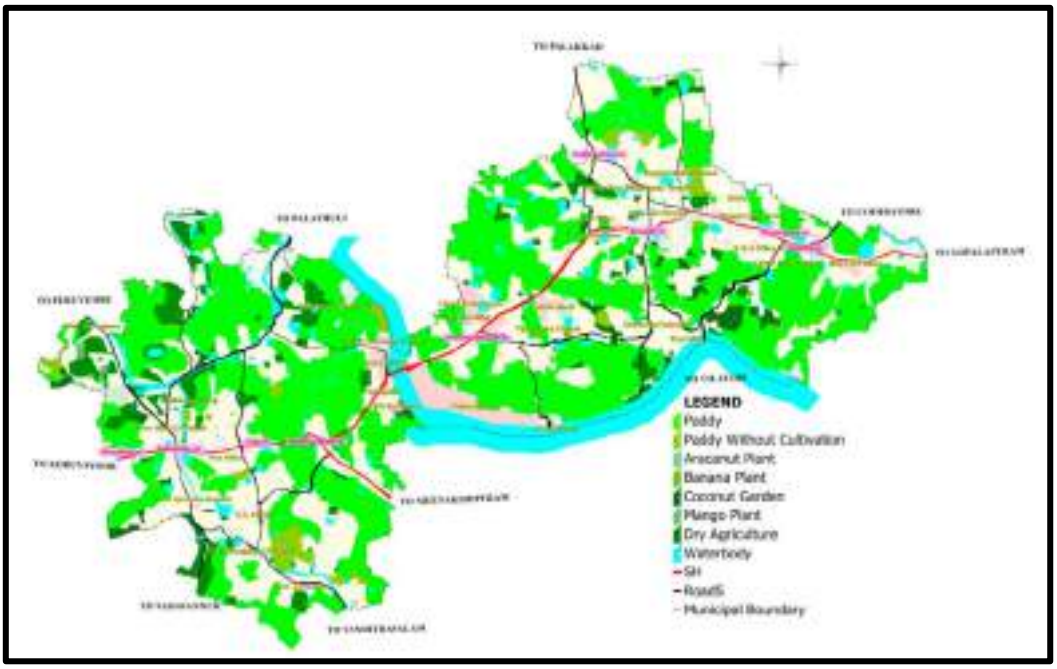


Fig 5.16 Spatial distribution of paddy and dry agriculture in Chittur-Thathamangalam Town

5.5.4 Agricultural Inputs and Marketing facilities Machineries

Agricultural inputs include fertilizer shops, market, units supplying machineries, seed farms etc. In Chittur municipality, there are one Krishi bhavan office, three fertilisers cum pesticides depot and two markets; one located near Thathamangalam bus stand and the other at Devangapuram near Employment exchange.

Table 5.9 Details of machineries in Chittur-Thathamangalam town

Type of Machinery	Tractor	Power Tiller	Power Sprayer	Pump Set
Quantity (Nos.)	20	10	36	315

A weekly market is conducted in Chittur near the municipal shopping complex, mainly of agricultural produces and also in Thathamangalam. There is one retail fish market each in Chittur and Thathamangalam. A wholesale fish market is there in the neighbouring LSGI, Puthunagaram.



Fig 5.17 Concentration index of agricultural land in the municipality

Padasekhara samithis form the driving force for group farming activities. There are eighteen active Padasekhara samithis in Chittur-Thathamangalam Town and the details of them are shown in Fig 5.18 and in Table 5.10

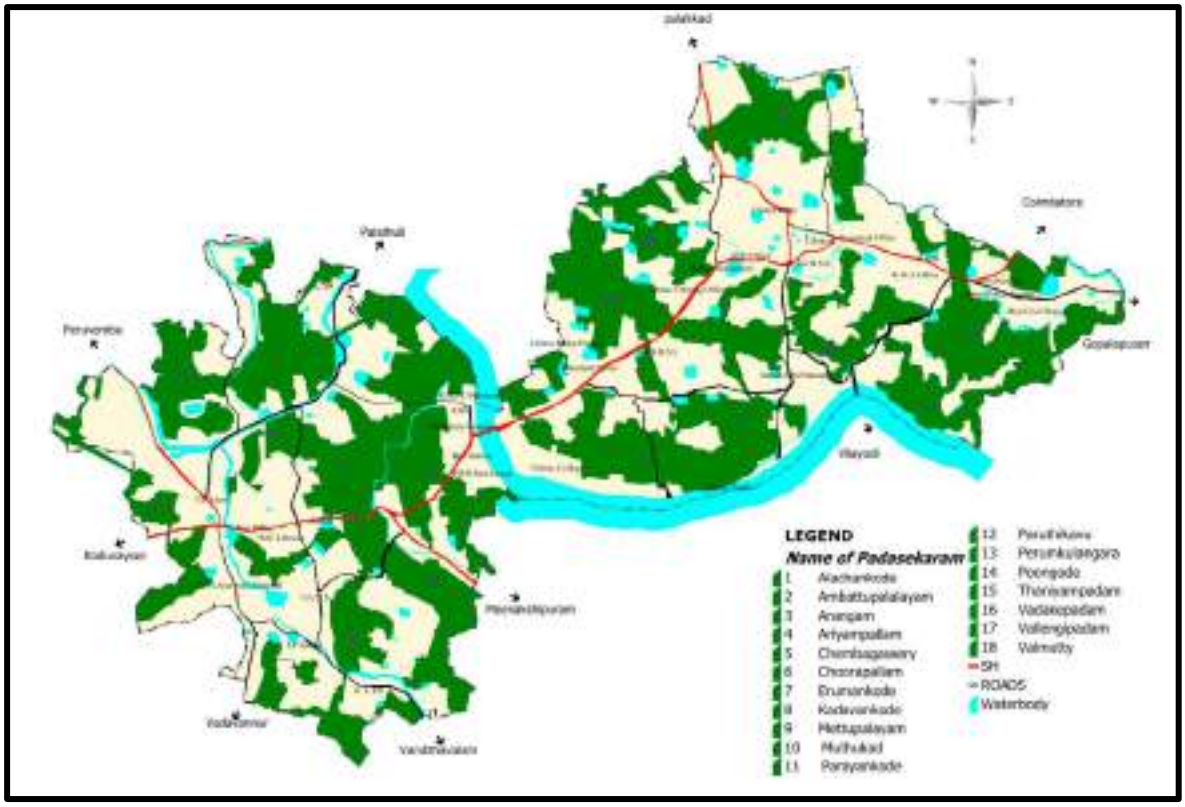


Fig 5.18 Distribution of padasekhara samithis in the municipality

Table 5.10 Details of Padasekhara samithis

Sl. No.	Name of Padasekhara Samithy	No. of Farmers	Total Area (Ha)
1	Alachamkode	49	29.56
2	Ambattupalayam	68	32.46
3	Arangam	13	8.87
4	Aryampallam	45	39.86
5	Chembakassery	46	27.33
6	Choorapallam	41	21.88
7	Erumancode	28	20.43
8	Kadavankode	34	24.66
9	Mettupalayam	43	24.46
10	Muthukad	42	18.46
11	Parayankode	36	21.50
12	Paruthikavu	69	31.77
13	Perumkulangara	41	23.50
14	Poongode	55	32.67
15	Thaniyampadam	32	25.86
16	Vadakkepadam	29	14.39
17	Vallangipadam	27	21.71
18	Valmutty	26	20.15

Source: Krishi Bhavan, Chittur and Thathamangalam

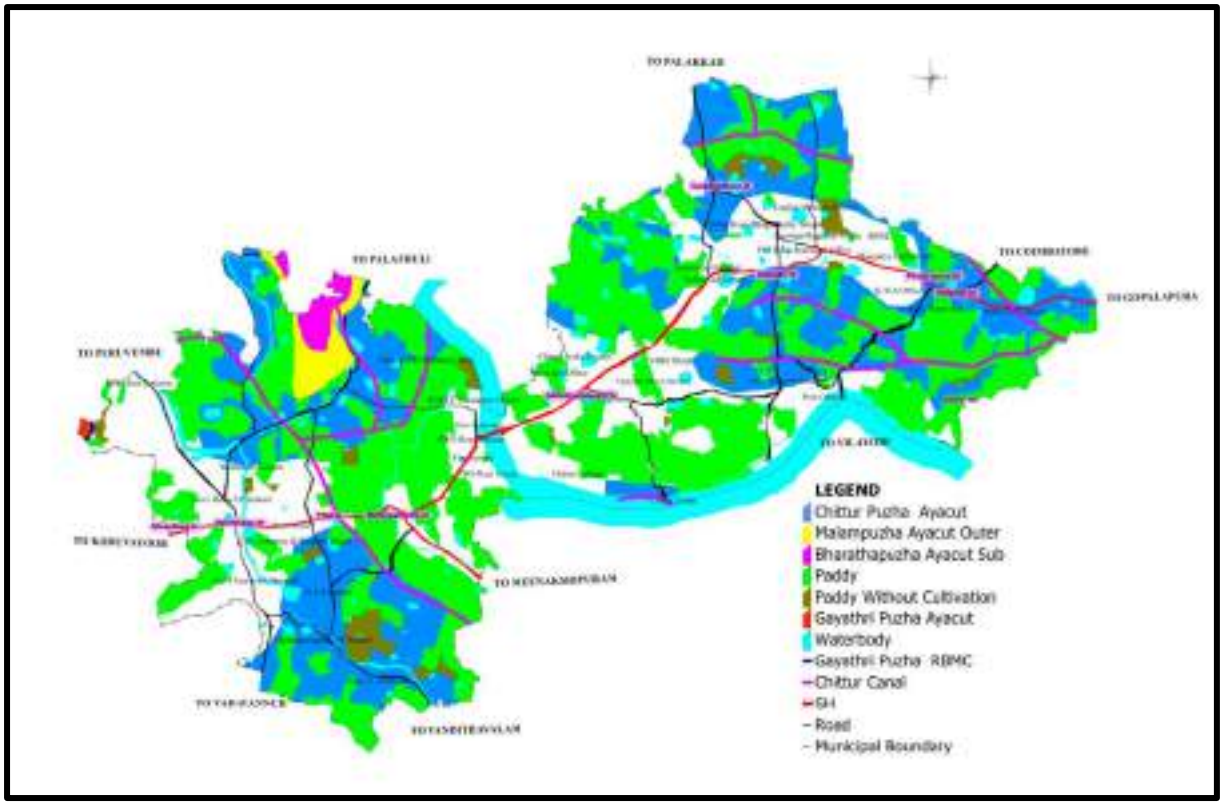


Fig 5.19 Ayacut area
Source: Irrigation office, Chittur

5.5.5 Irrigation Facilities

Paddy is the major crop in the municipality. There is autumn and winter paddy cultivation and in 2015-16 there was also some area (73.79 ha) under summer paddy (third crop). Both first and second crop depends on the water supply from Moolathara canal. The major source of irrigation is the government irrigation canals (Chittur canal and Gayathri Puzha RBMC) and private wells. Fig 5.19 shows the ayacut areas in the municipality. Chittur puzha ayacut serves the municipality primarily covering an area of 9 sq. km. followed by Bharathapuzha and Gayathri Puzha of 0.13 and 0.01 sq. km. respectively.

Table 5.11 Details of Irrigation facilities

Source	Ayacut area in Hectare	Canal/Thodus	Period of water availabilty
Parambikulam Aliyar Project	1180.31	Chittur puzha irrigation canal	June to March

Source: Irrigation office, Chittur

Table 5.12 Details of Ayacut

Ayacut	Area in Hectres
Gayathri Puzha	1.05
Chitturpuzha	908.39
Malampuzha	35.19
Bharathapuzha	12.96
Total	957.59

Table 5.13 Details of Thodu

Nameof Thodu/Canal	Length in Km
Moolathara Left Canal	7.99
Moolathara Right Canal	2.03
Thodu	2.47
Thodu	13.06

Source: Irrigation office, Chittur

5.5.6 Watersheds

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 habitat to numerous plants and animals. Unfortunately, various forms of pollution, including runoff and erosion, can interfere with the health of the watershed and hence its protection is important. The details of water sheds are given in Table 5.14 and their spatial location is given in Fig 5.20.

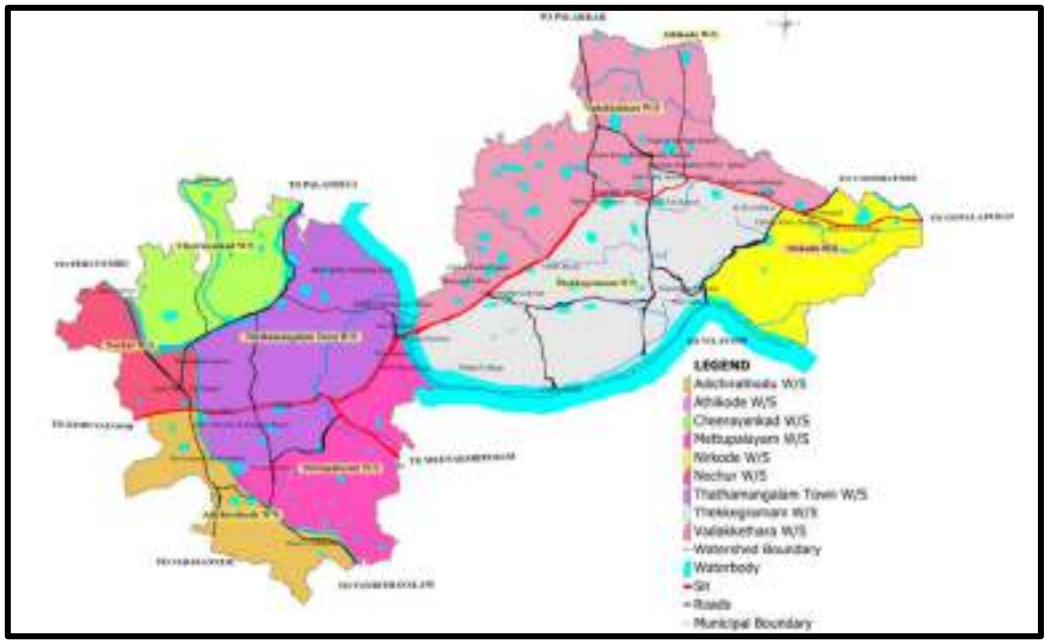


Fig 5.20 Watersheds of the Municipality

Table 5.14 Details of Water sheds

Sl. No	Name of W/S	Local bodies	Total area of watershed in Ha	Area of watershed in Chittur Thathamangalam (Ha)	Priority
1	Nochur W/S	Chittur Thathamangalam (M), Pattancherry, Peruvemba, Pudunagaram	618	289.53	Medium
2	Adichirathodu W/S	Chittur Thathamangalam (M), Pattancherry, Pudunagaram		405.74	Low
3	Cheerayankad W/S	Chittur Thathamangalam (M), Peruvemba	748	483.24	Medium
4	Thathamangalam Town W/S	Chittur Thathamangalam (M), Pattancherry	229	962.95	Low
5	Mettupalayam W/S	Chittur Thathamangalam (M), Pattancherry	389	555.40	Low
6	Thekkegramam W/S	Chittur Thathamangalam (M), Nalleppilly	360	1320.94	Low
7	Vadakkethara W/S	Chittur Thathamangalam (M), Nalleppilly, Pattancherry, Peruvemba, Polppully , Pudunagaram	707	1241.86	Low
8	Nirkode W/S	Chittur Thathamangalam (M), Nalleppilly		557.65	Low
9	Athikode W/S	Chittur Thathamangalam (M), Polppully , Kodumba		2.77	Low

Source: Soil Survey Organisation, Agriculture (S.C.Unit) Department, (Prioritized Watershed Atlas of Palakkad District)

5.5.7 Problems and Potential

There has been a decrease in the land area covered by wet agriculture. Though agriculture productivity has increased considerably, the employment pattern has shown that there is a decrease in the number of cultivators and agricultural labourers in the municipality and more and more people are employed in tertiary sector. There are inputs needed in terms of storage and milling facilities in both Chittur and Thathamangalam, the lack of which puts harvests at peril. Further, despite an extensive network of irrigation canals, a key input needed is the maintenance of the irrigation canals which are currently in a state of disrepair, overgrown with vegetation and filled with solid waste which is not cleared. Therefore, the irrigation of the fields suffers, impeding the flow when the water is released and causing overflow and unintended flooding of areas. In the context of climate change, it is the irrigation canals that need to function so that stored water can be used when rains fail. Organic farming, floriculture and medicinal plant cultivation could be encouraged to increase returns given increasing demand for these.

5.5.8 Inference

The municipality has an agrarian economy and majority of the people depend on agriculture for their livelihood. There has been an increase in the quantity of agricultural products in the municipality. Paddy occupies to 33.9% of the total area followed by coconut. There is a high potential for agriculture in the municipality due to the rising domestic demand and favourable climatic and physiographic conditions. Maintenance of irrigation canals, protection of local

water sources and stream networks, augmenting ground water reserves, so as to secure the water supply for irrigation is crucial for the success of agriculture. Additionally, conservation of paddy fields is also important from a food security perspective. Hence a greater thrust is to be given for paddy development schemes and organic rice cultivation.

5.6 Fisheries

There are a large number of private ponds in the municipality, with most of them having perennial water supply, where inland fishing can be practiced (with the exception of the temple ponds). However, in 2012, there was only limited inland fishing activity within the municipality. Out of the 171 ponds in the municipality, only 2 were under fish farming with about 12 persons engaged in fishing industry. In the last decade, there seems to be an increase in fish farming and in 2022, there are 26 fish farms now being utilised for fish farming in the town. There appears to be initiatives to create new ponds for fish farms on plots, rather than using existing ponds for inland fishing. One of the impacts observed of the new fish farming practice introduced in the town is that it is often accompanied by a foul smell arising out of the pig waste which is feed.

Table 5.15 Details of freshwater fisheries

Sl. No	Ward / Location	Qty of Production per month/ Year	No. of ponds/ water bodies	No. of Persons working in the related activity
1	10	610kg/year	1	7
2	28	550kg/year	1	5

5.6.1 Inference

Chittur Puzha passing through the municipality could also support natural fish population. Stocking of fish seed in open waters with fast growing varieties will increase the availability of fishes. This also ensures a source of income for the local people and availability of fishes in local market. A sustainable system of fish farming could to be encouraged to reach more farmers and which could also help revitalise the many derelict ponds in the town. There is no fish market in the municipality.

Chapter 6: EXISTING LAND USE

Our basic needs of food, water, fuel, clothing and shelter must be met from the land, which is in limited supply. As population and aspirations increase, land becomes an increasingly scarce resource. Land must change to meet new demands yet change brings new conflicts between competing uses of the land and between the interests of individual land users and the common good. Land taken for development is no longer available for farming; likewise, the development of new farmland competes with forestry, water supplies and wildlife. Planning to make the best use of land is very much essential and for that existing land use and existing land use pattern need to be analysed.

6.1 General Analysis of Land Use

Chittur-Thathamangalam Town has an area of 14.71 km^2. In order to understand the breakup of the developed urban area of Chittur-Thathamangalam Municipality under various uses including residential, commercial, industrial, traffic and transportation, recreational utilities, public and semi-public uses; detailed analysis of the city structure has been done on the basis of existing land use plan. Breakup of the existing land use, 2012 based on the manual survey is presented in Table 6.1.

Table 6.1 Land use break up 2012

Land use	Area(Sq km)	% of total area	% of developed area
Residential	4.20	28.54	73.03
Commercial	0.15	1.00	2.54
Industries	0.03	0.24	0.6
Public & semipublic	0.58	3.92	10.02
Dry Agriculture	1.04	7.05	
Paddy	6.43	43.69	
Transportation	0.75	5.08	12.98
Waterbody	1.02	6.94	
Park & Open Space	0.03	0.22	0.56
Vaccant	0.47	3.21	
Cemetry	0.02	0.11	0.27
Total	14.71	100	100.00

Source: Land use survey by DTCP, Palakkad

Land use breakup in percentage is shown in the Fig 6.1.

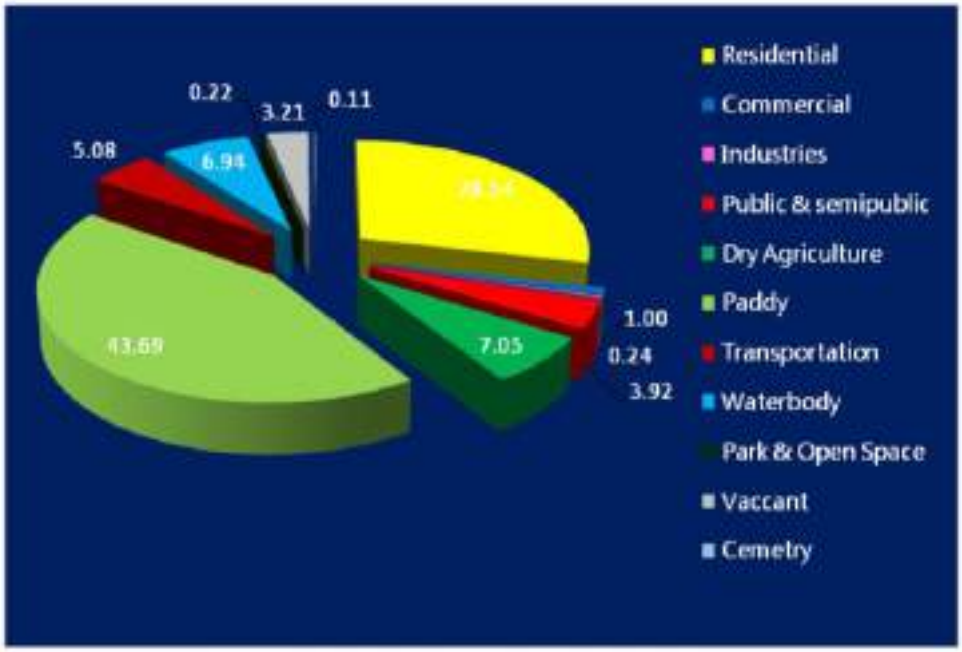


Fig 6.1 Land Use Break up 2012

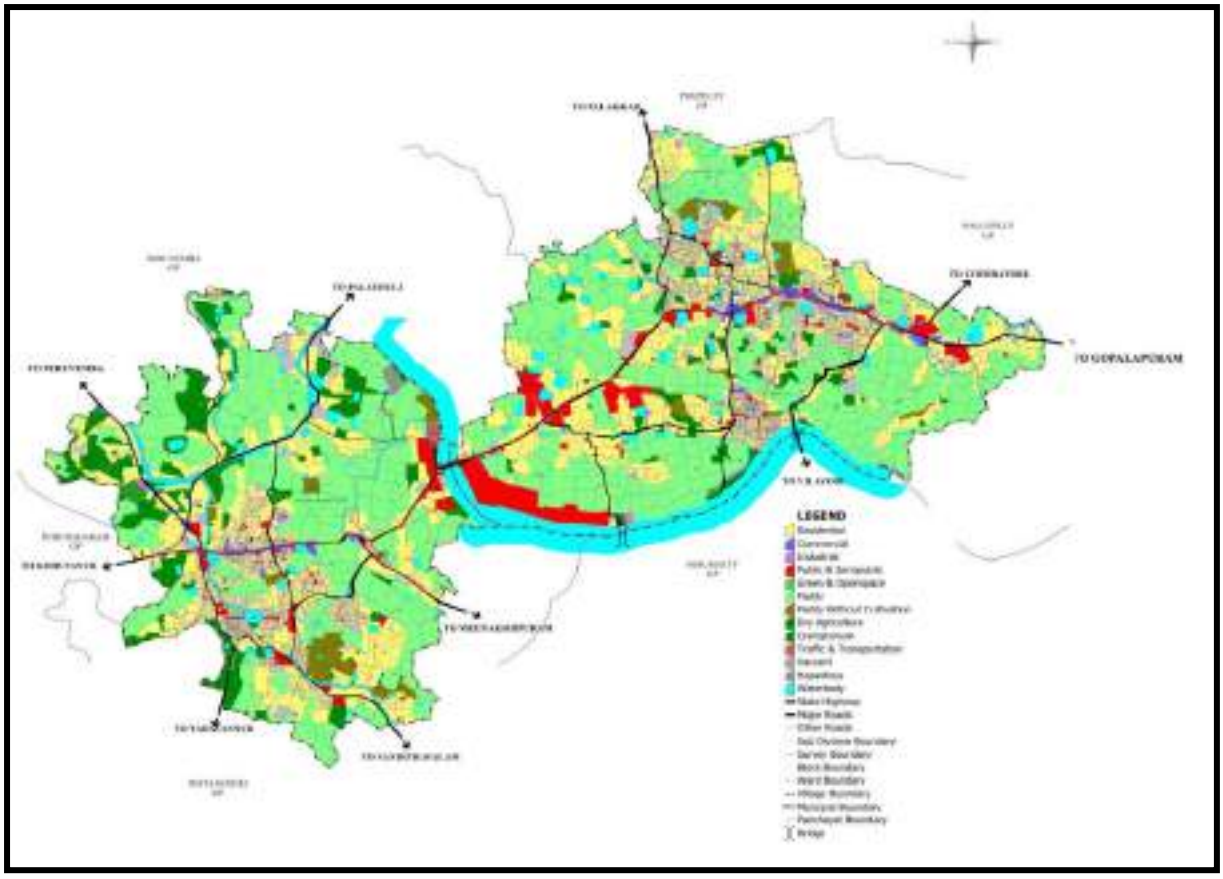


Fig 6.2 Existing land use 2012

As per the existing land use plan 2012 shown in the Fig 6.2, it has been observed that 39% of the total municipal area is developed while the remaining 61 % of the area is under agriculture use or as vacant land at present. The prevailing predominant land use is agriculture. Around 73.04% of the developed area is under residential land use. Nearly 40% of the municipal area have already been developed for various uses such as residential, commercial, industrial etc which have been discussed below.

6.1.1 Residential

As per the existing land use 2012, the major land use is residential. 28.55% of land in the municipality is under residential use. This includes an area of 4.20 km^2. As per URDPFI standards 45 – 50% of area can be developed for residential land use. So, the land available under this use is below the prescribed norms. Residential land use is mainly concentrated in eastern and south eastern portion of Chittur Town and West and South west Parts of Thathamangalam Town. (Fig 6.3).

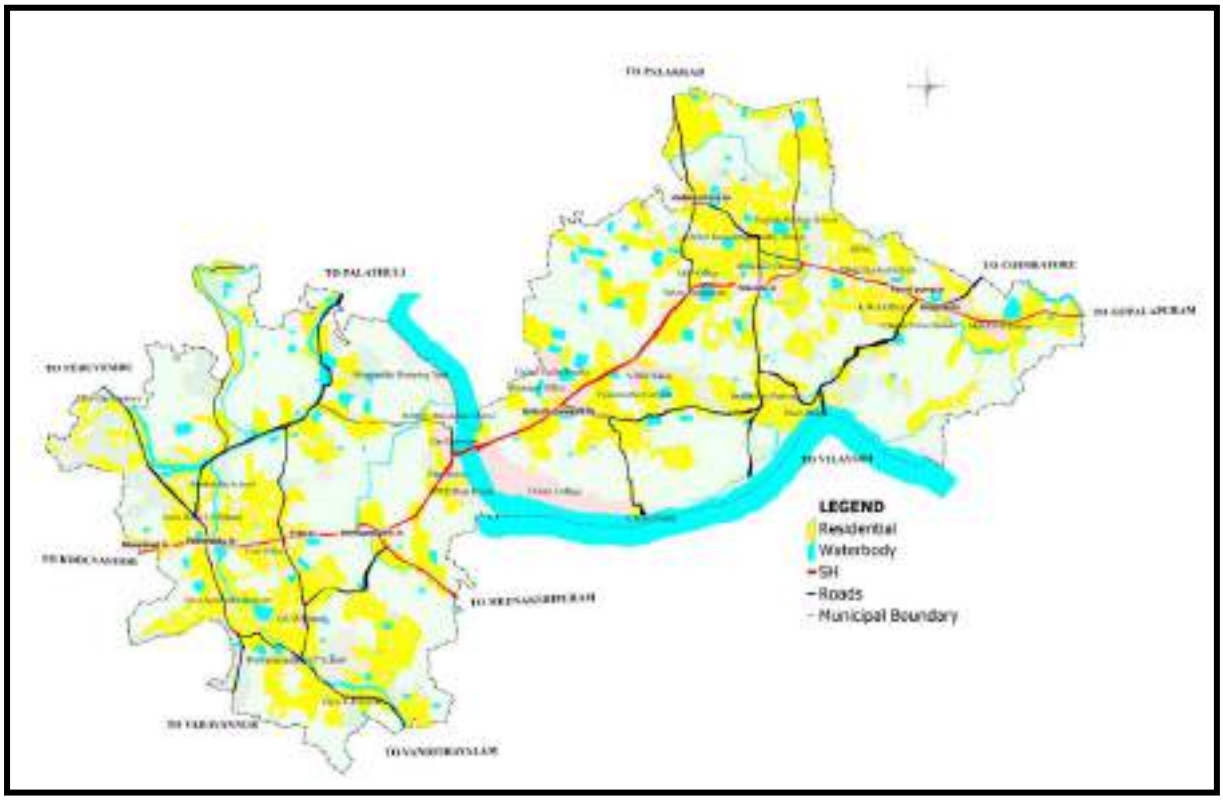


Fig 6.3 Spatial distribution of Residential land use

6.1.2 Commercial

The commercial activities are mainly concentrated along the sides of State highway from Thathamangalam Jn to Pallimukku Jn and from Anikode Jn to Hospital Jn. 0.95% of land in the municipality is under commercial use. As per URDPFI standards 2-3 % of area can be developed for commercial land use. Spatial Distribution of commercial land use is shown in Fig 6.4.

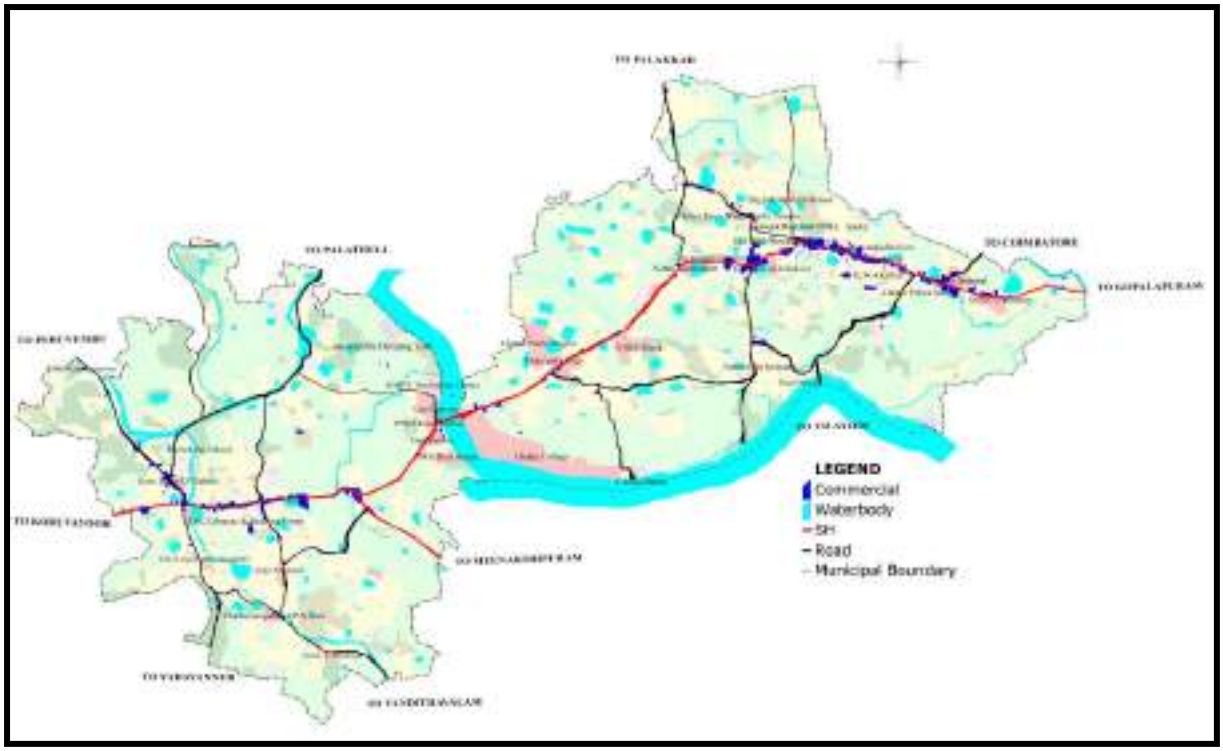


Fig 6.4 Spatial distribution of Commercial land use

6.1.3 Industrial

At present the area under industrial use is around 3 Ha, which is about 0.24% of the total area of town. Industrial use covers 0.60% of the total built up area. As per URDPFI standards 8 – 10% of area can be developed for industrial land use. Industrial use is very less compared to the norms of the URDPFI guidelines. There are no medium and major scale industries in Chittur-Thathamangalam town, and the existing industries are of small-scale type. As per the spatial distribution the major industrial land use is found in wards Aryampallam (14) followed by Kunnathupalayam(20) and Cherumkode (1) (Fig 6.5).

6.1.4 Public & Semi-public

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 of 58 hectares which is 10.02% of the total developed area and 3.92% of total municipal area of the city is under public and semi-public use. As per URDPFI standards 6 – 8% of area can be developed for public use. It is clear that the area under this land use is below the prescribed norms. Public use is concentrated in wards Kacherimedu (13), Tharakkalam(19), College (21) (Fig 6.6).

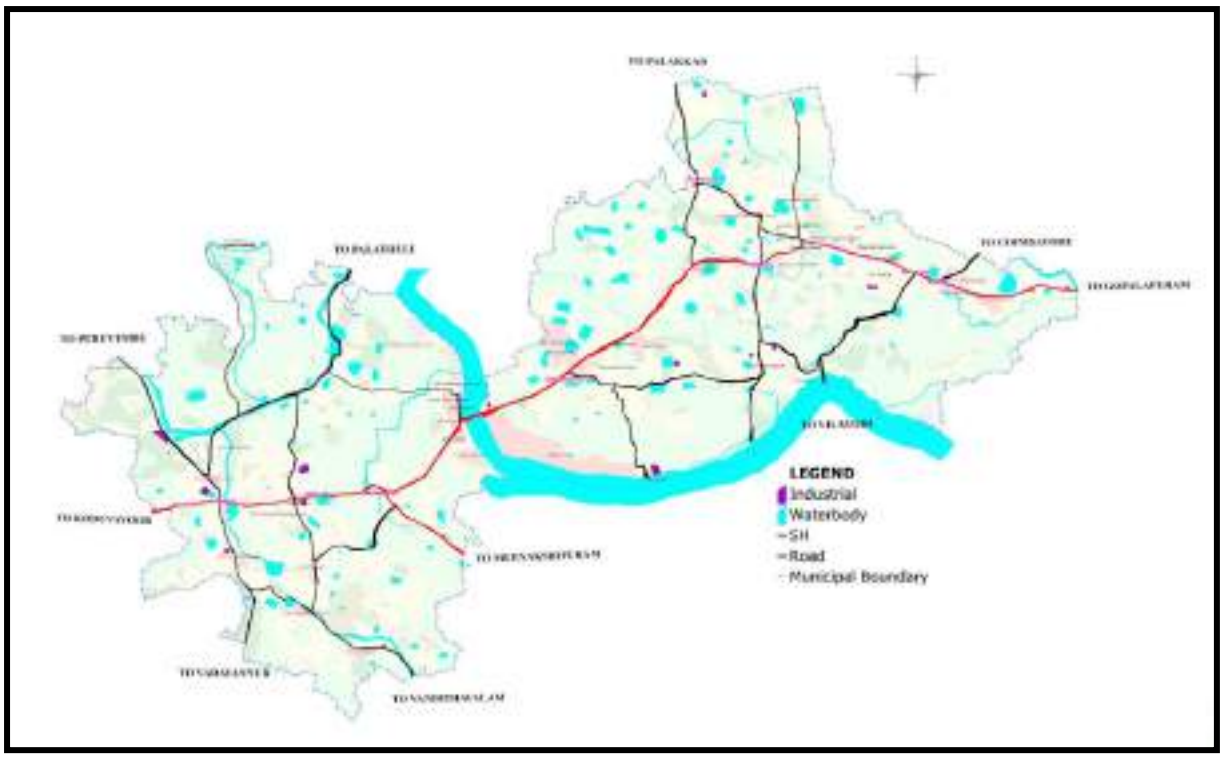


Fig 6.5 Spatial distribution of Industrial land use

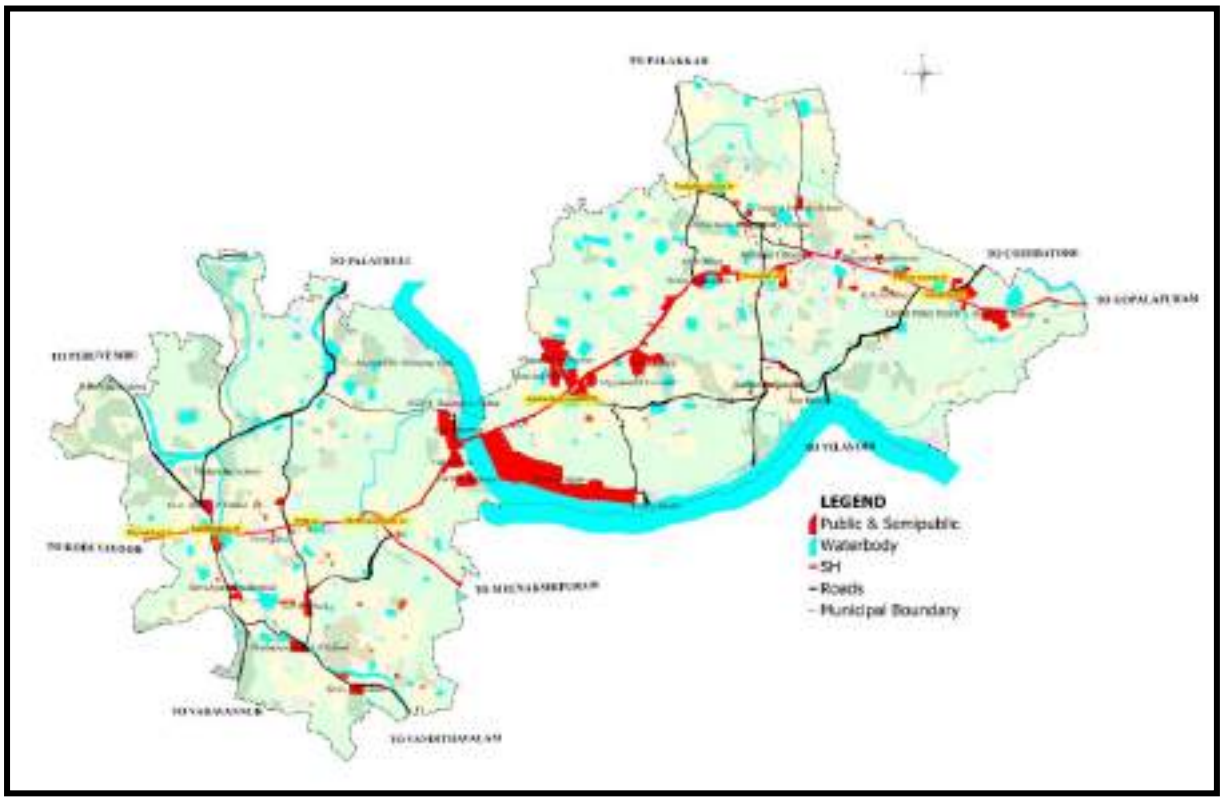


Fig 6.6 Spatial distribution of Public and semi-public land use

6.1.5 Park and Open Spaces

Recreational facilities like parks, playground, stadium, club etc. is important for leading quality social life in any city. Major recreational facilities present in Chittur-Thathamangalam Municipality are two parks, School playgrounds etc. There is lack of recreational facilities in town and existing ones are poorly maintained. The total area under recreational use in the town comes out to be 0.22% of the total Municipal area. The developed area under this use is much less than the prescribed norm of 12 – 14%, reflecting that the city badly lacks in the provision of recreational spaces which requires attention.

6.1.6 Transportation

System of transportation has evolved as a result of the intersection between various land use functions. Its requirement is the physical manifestation of the mobility requirement of people. The area covered by transportation comes to 5.08% of total Municipal area which is below the prescribed by the URDPFI standards which is 10- 12%. The percentage of developed area under this use is 12.98 %. Two state highways connecting Kerala to Tamil Nadu state are passing through the Town. All regions of the municipality are well connected by roads, but their condition need immediate improvement.

6.1.7 Agriculture

Agricultural land use covers dry and wet Agriculture areas. 7.05% of land in the municipality is used for dry agriculture and 43.69% is used for wet agriculture. Agriculture as a whole constitutes about 50.74% of the total municipal area. The major crop is paddy which is spread throughout the Municipal area. Agricultural use under paddy cultivation includes cultivated paddy land and uncultivated paddy fields which are cultivable. Agricultural use is concentrated in northern half of Thathamangalam Village and peripheral wards of Chittur Village. The depletion of agricultural land use is not very severe in the municipality even though paddy fields have been extensively filled up for various other purposes. Fig 6.7 shows the present paddy land distribution in Chittur-Thathamangalam Municipality.

6.1.8 Undeveloped Areas / Vacant Lands

Vacant land includes the area which is presently not being developed and is under no use. In municipality, at present 0.47 sq. km. of lands are seen vacant that is neither occupied by residents nor used for any other developmental purposes. It constitutes 3.21% of the total municipal area.

6.1.9 Land use analysis

The analysis of land use in the 29 wards of municipality shows that majority of wards have higher residential percentage. Fig 6.8 shows ward wise land use split up of Chittur-Thathamangalam Municipality.

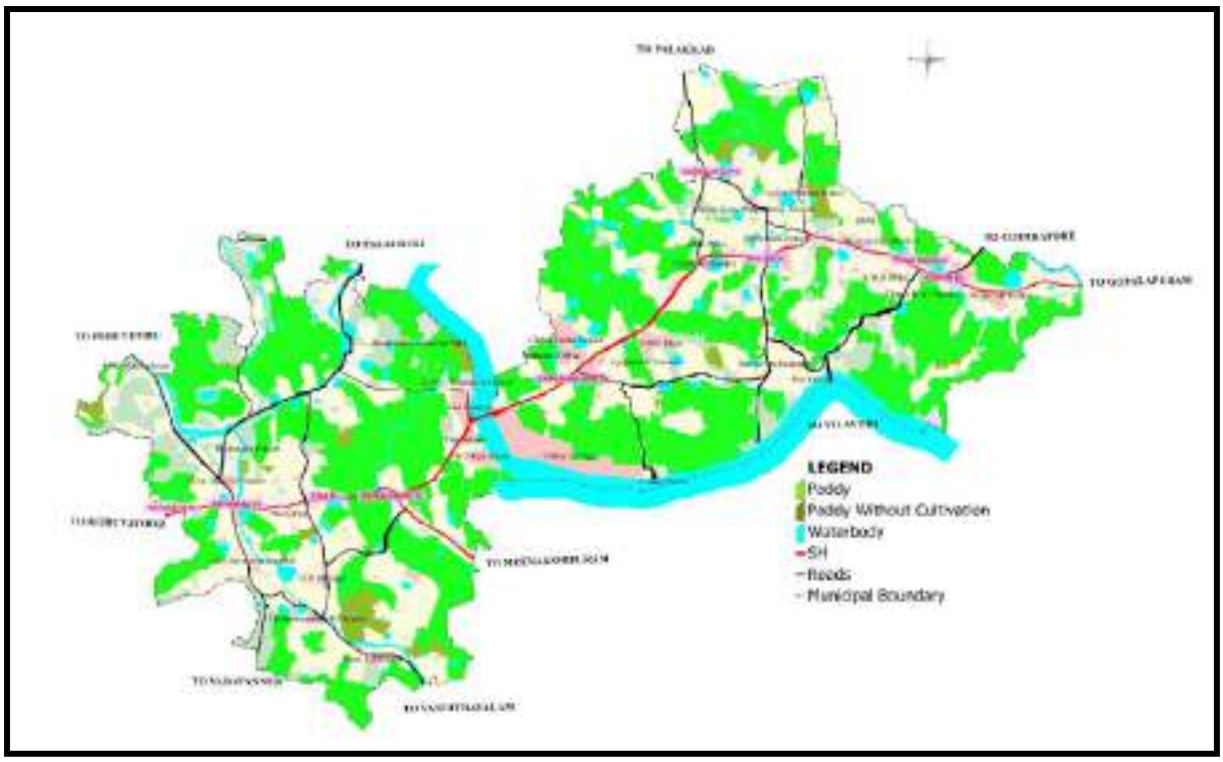


Fig 6.7 Spatial distribution of Wet Agricultural land use

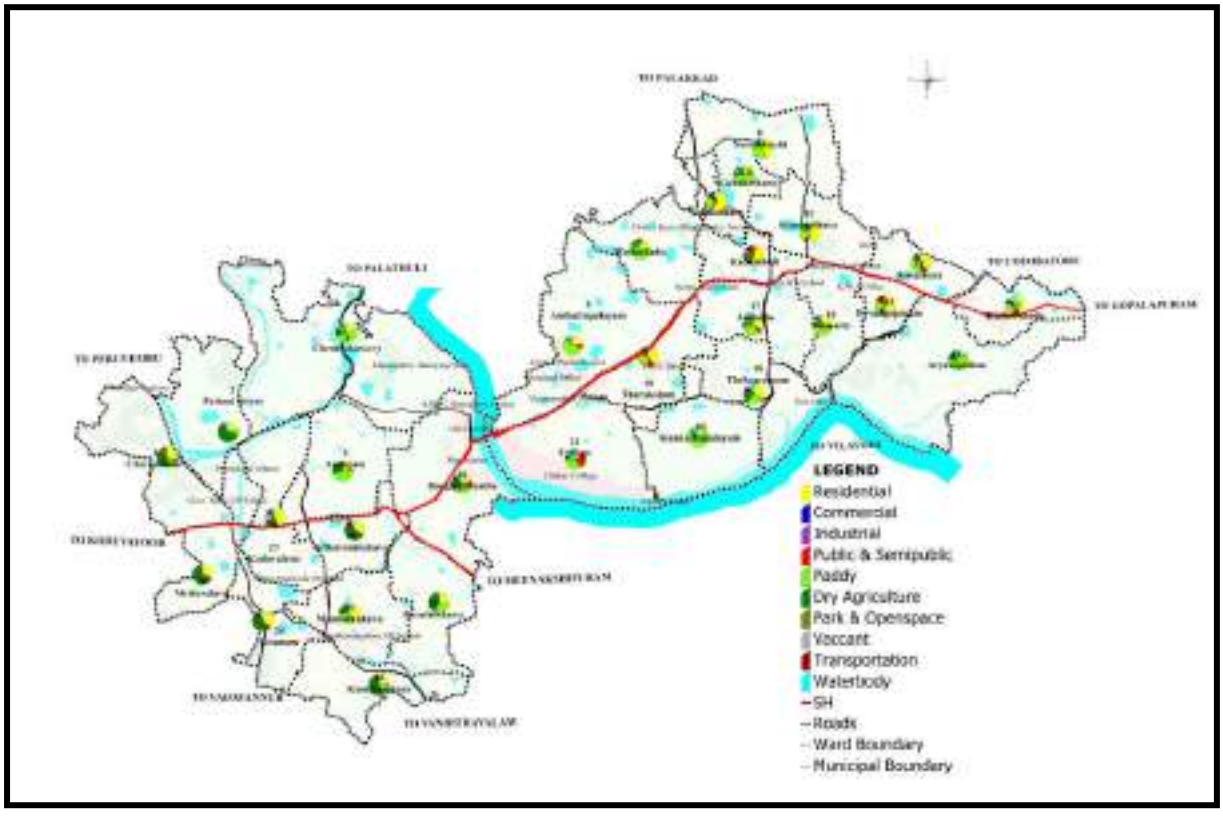


Fig 6.8 Wardwise land use split up of Town

6.2 Analysis of the Land Use Patterns - 1990 & 2012

Spatial distribution of land uses in the year 1990 and 2012 is shown in Fig 6.9. Table 6.2 shows the comparison of change in land use in the year 1990 and 2012.

Table 6.2 Comparison of change in land use in the year 1990 and 2012

Land use	1988 land use (km^2)	2012 land use (km^2)	Increase	Decrease
Residential	4.58	4.2		0.38
Commercial	0.1	0.15	0.04	
Industrial	0.07	0.03		0.04
Public & Semi Public	0.54	0.58	0.04	
Park and open spaces	0	0.03	0.03	
Vaccant land / waste land	0.71	0.47		0.24
Transport & Communication	0.42	0.75	0.33	
Agriculture /Forest	7.09	7.47	0.38	
Water bodies	1.2	1.02		0.18
Cemetry	0	0.02	0.02	
Total	14.71	14.71		

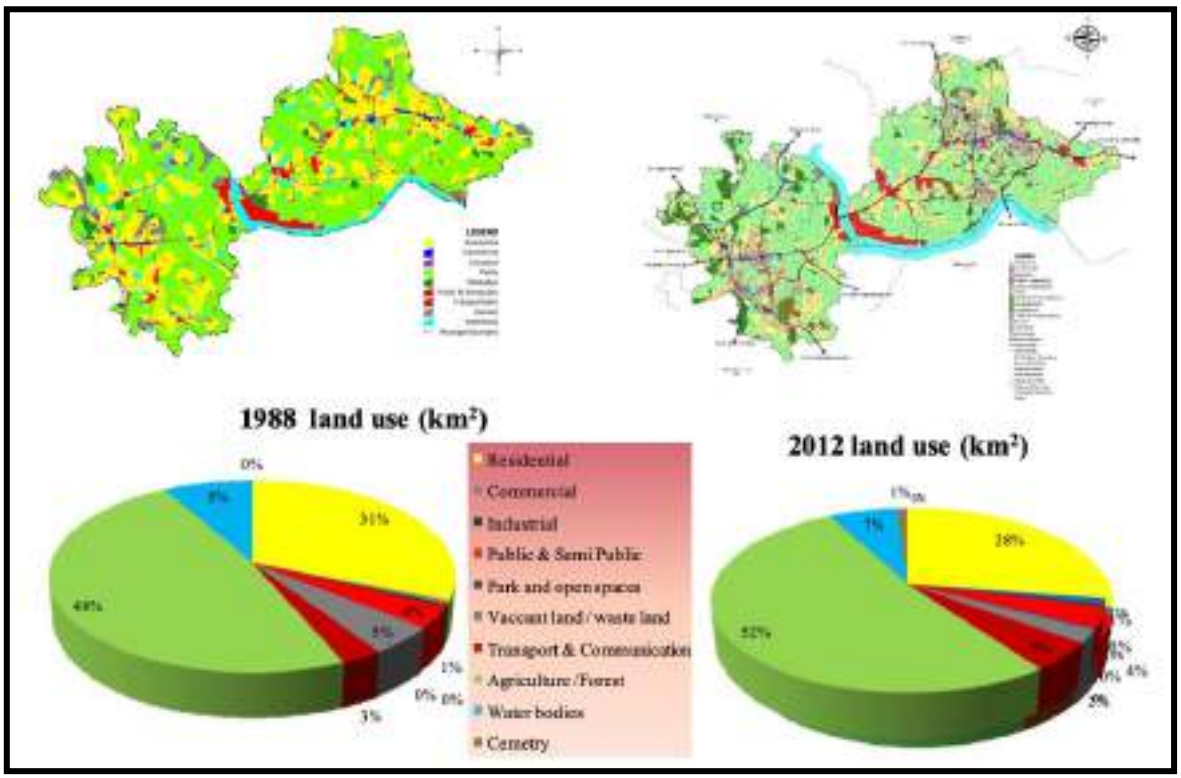


Fig 6.9 Comparison of land use in the year 1990, 2012

Existing land use map of 1988 and 2012 clearly shows that the area of waterbodies residential and industrial land use has reduced. Land under commercial use and transportation uses has increased. The reduction in residential land use may be a result of the land use shifting from residential to commercial, transportation and communication, park and open spaces or cemetery. The decrease in population growth rate may also a reason for the reduction of residential land use.

Table 6.3 Ward wise Land use split up

Ward No	Ward name	Residential	Commercial	Industrial	Public & semipublic	Paddy
1	Cherumkode	0.16	0.01	0.01	0.00	0.12
2	Pattani Street	0.17	0.01	0.00	0.00	0.36
3	Arangam	0.13	0.01	0.00	0.00	0.35
4	Chembakassery	0.26	0.00	0.00	0.00	0.73
5	Ambattupalayam	0.22	0.00	0.00	0.06	0.48
6	Muthukadu	0.12	0.00	0.00	0.00	0.29
7	Kadambidi	0.14	0.01	0.00	0.01	0.01
8	Vadakathara	0.08	0.00	0.00	0.00	0.04
9	Naramkuzhi	0.25	0.00	0.00	0.00	0.20
10	Kizhakethara	0.04	0.00	0.00	0.00	0.11
11	Kannanthara	0.23	0.01	0.00	0.01	0.09
12	Kosathara	0.09	0.01	0.00	0.01	0.08
13	Kacherimedu	0.14	0.01	0.00	0.04	0.07
14	Aryampallam	0.14	0.01	0.00	0.00	0.78
15	Devangapuram	0.08	0.01	0.00	0.01	0.04
16	Valmutty	0.10	0.01	0.00	0.00	0.15
17	Anikodu	0.15	0.01	0.00	0.02	0.13
18	Thekegramam	0.18	0.00	0.00	0.01	0.15
19	Tharakalam	0.16	0.00	0.00	0.07	0.11
20	Kunnathupalayam	0.09	0.00	0.01	0.00	0.43
21	College	0.11	0.00	0.00	0.20	0.29
22	Banglaparambu	0.16	0.00	0.00	0.05	0.39
23	Paruthikkavu	0.14	0.00	0.00	0.00	0.30
24	Kammanthara	0.18	0.00	0.00	0.01	0.18
25	Mannathukavu	0.18	0.00	0.00	0.01	0.18
26	Srikurumbakavu	0.11	0.01	0.00	0.01	0.12
27	Kadavalavu	0.16	0.01	0.00	0.01	0.08
28	Gramam	0.13	0.00	0.00	0.02	0.06
29	Mettuvalavu	0.10	0.00	0.00	0.01	0.09

Table 6.3 (cont'd) Ward wise Land use split up

Ward No	Ward name	Dry Agriculture	Park & open space	Cemetery	Vaccant land	Traffic & Transportation	Water bodies
1	Cherumkode	0.17	0.03	0.00	0.01	0.03	0.01
2	Pattani Street	0.16	0.00	0.00	0.01	0.04	0.06
3	Arangam	0.02	0.00	0.00	0.02	0.01	0.01
4	Chembakassery	0.17	0.00	0.00	0.10	0.05	0.10
5	Ambattupalayam	0.02	0.00	0.00	0.03	0.02	0.06
6	Muthukadu	0.02	0.00	0.00	0.01	0.01	0.03
7	Kadambidi	0.02	0.00	0.00	0.01	0.03	0.01
8	Vadakathara	0.00	0.00	0.00	0.00	0.01	0.01
9	Naramkuzhi	0.03	0.00	0.00	0.01	0.02	0.03
10	Kizhakethara	0.00	0.00	0.00	0.01	0.01	0.02
11	Kannanthara	0.02	0.00	0.00	0.02	0.03	0.02
12	Kosathara	0.00	0.00	0.00	0.01	0.02	0.01
13	Kacherimedu	0.00	0.00	0.00	0.01	0.02	0.04
14	Aryampallam	0.03	0.00	0.00	0.02	0.02	0.07
15	Devangapuram	0.00	0.00	0.00	0.00	0.02	0.00
16	Valmutty	0.03	0.00	0.00	0.03	0.02	0.01
17	Anikodu	0.04	0.00	0.00	0.04	0.02	0.03
18	Thekegramam	0.05	0.00	0.00	0.01	0.05	0.07
19	Tharakalam	0.01	0.00	0.00	0.00	0.04	0.01
20	Kunnathupalayam	0.03	0.00	0.00	0.01	0.01	0.06
21	College	0.00	0.00	0.00	0.00	0.04	0.15
22	Banglaparambu	0.03	0.00	0.01	0.01	0.06	0.08
23	Paruthikkavu	0.01	0.00	0.00	0.01	0.02	0.01
24	Kammanthara	0.03	0.00	0.00	0.02	0.02	0.01
25	Mannathukavu	0.00	0.00	0.00	0.02	0.02	0.02
26	Srikurumbakavu	0.00	0.00	0.00	0.00	0.03	0.02
27	Kadavalavu	0.01	0.00	0.00	0.03	0.03	0.03
28	Gramam	0.08	0.00	0.00	0.00	0.03	0.02
29	Mettuvalavu	0.07	0.00	0.00	0.01	0.02	0.01

6.3 Land Use Concentration Pattern

The concentration pattern of a land use gives an idea about where that particular land use is concentrated within the Municipality. The concentration pattern of land use can be ascertained by the concentration index of the land use which is calculated as follows.

Concentration index (CI) of a particular land use in the municipality =

(Area of that land use in a ward) / (Total area of the ward)

(Area of that land use of the Municipality) / (Total area of the Municipality)

The Concentration Index may be greater than one, equal to one or less than one. Wards with any particular land use concentration index greater than one indicates that the land use under consideration is highly concentrated in that area.

Spatial distribution of concentration of agricultural land use is shown in Fig 6.10 From the map it is clear that agricultural area is mostly concentrated along the north half of Thathamangalam area and peripheral wards of Chittur area of the Municipality.

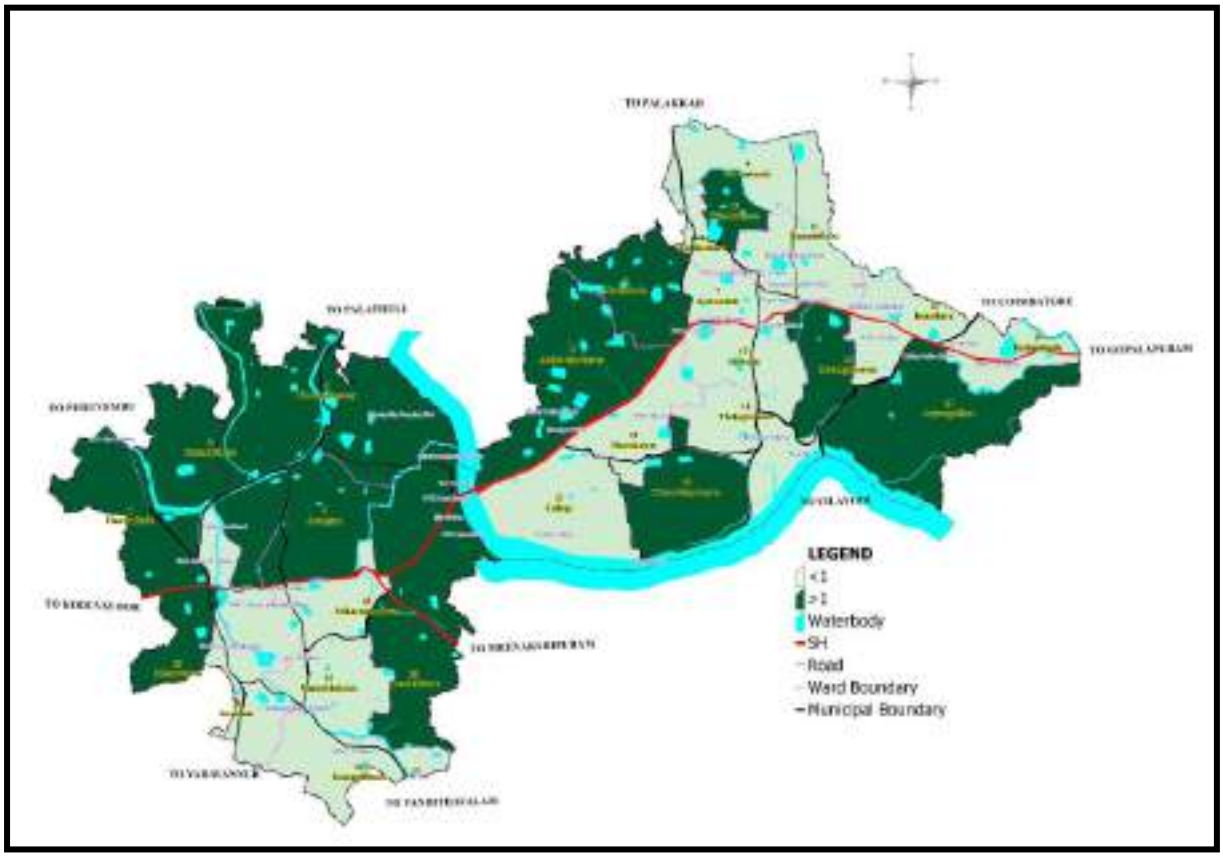


Fig 6.10 Concentration of Agricultural land use

Chittur & Thathamangalam being twin towns, commercial activities are concentrated at Thathamnagalam Jn and Anikode Jn almost in the central part of Thathamangalam and Chittur area respectively. Spatial distribution of concentration of commercial land use is shown in the Fig 6.11 Commercial landuse is mainly concentrated in the wards Kadambidi (7), Kosathara (12), Devangapuaram (15), Sri Kurumbakavu (26). The important commercial centres are Thathamangalam Jn, Anikode JN to Kacherimedu area etc.

Spatial distribution of concentration of industrial land use is shown in Fig 6.12. Industrial land use is mainly concentrated in the wards Cherumkode (1), Aryampallam (14), Kunnathpalayam (20), Peripheral wards of Municipality. Industries are mainly brick kilns near paddy field.

Fig 6.13 shows distribution of concentration index of public and semi-public land use. Majority of public buildings are located in the wards College (21), Tharakalam (19), Kacherimedu (13). Public buildings like Chittur college, schools and other educational institutions, other govt offices etc are contributing for this concentration of public uses in wards.

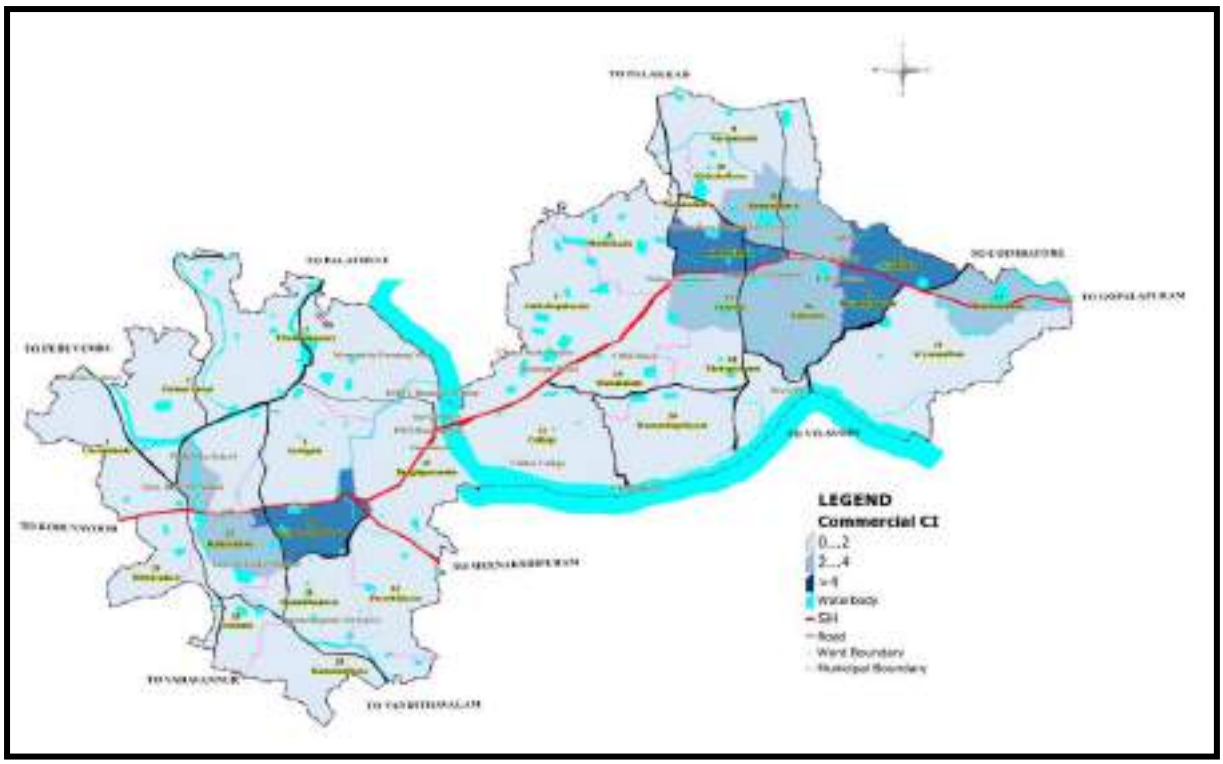


Fig 6.11 Concentration of Commercial land use

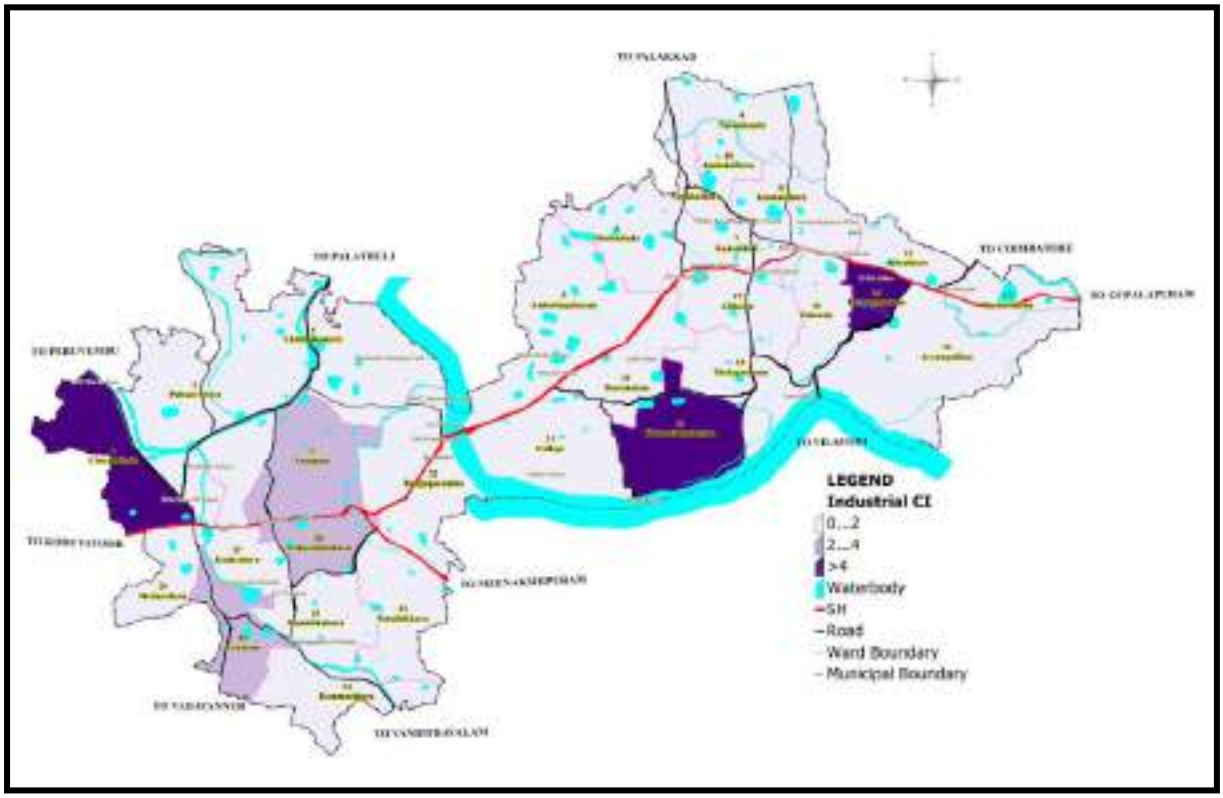


Fig 6.12 Concentration of Industrial land use

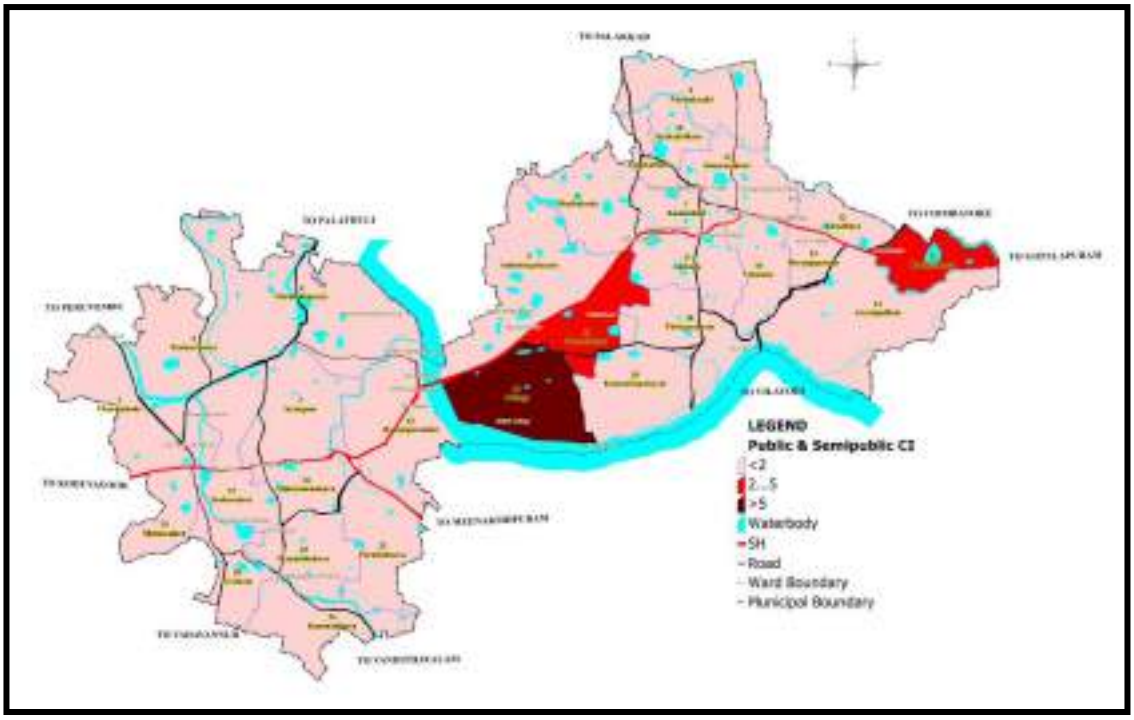


Fig 6.13 Concentration of Public and semi-public land use

Fig 6.14 shows ward wise residential concentration index of Chittur-Thathamangalam Town. Central areas and southern half of town are highly concentrated with residences. On moving to the northern periphery residential dwellings gradually decreases. Easy access to the major roads makes these wards more attracted to residents.

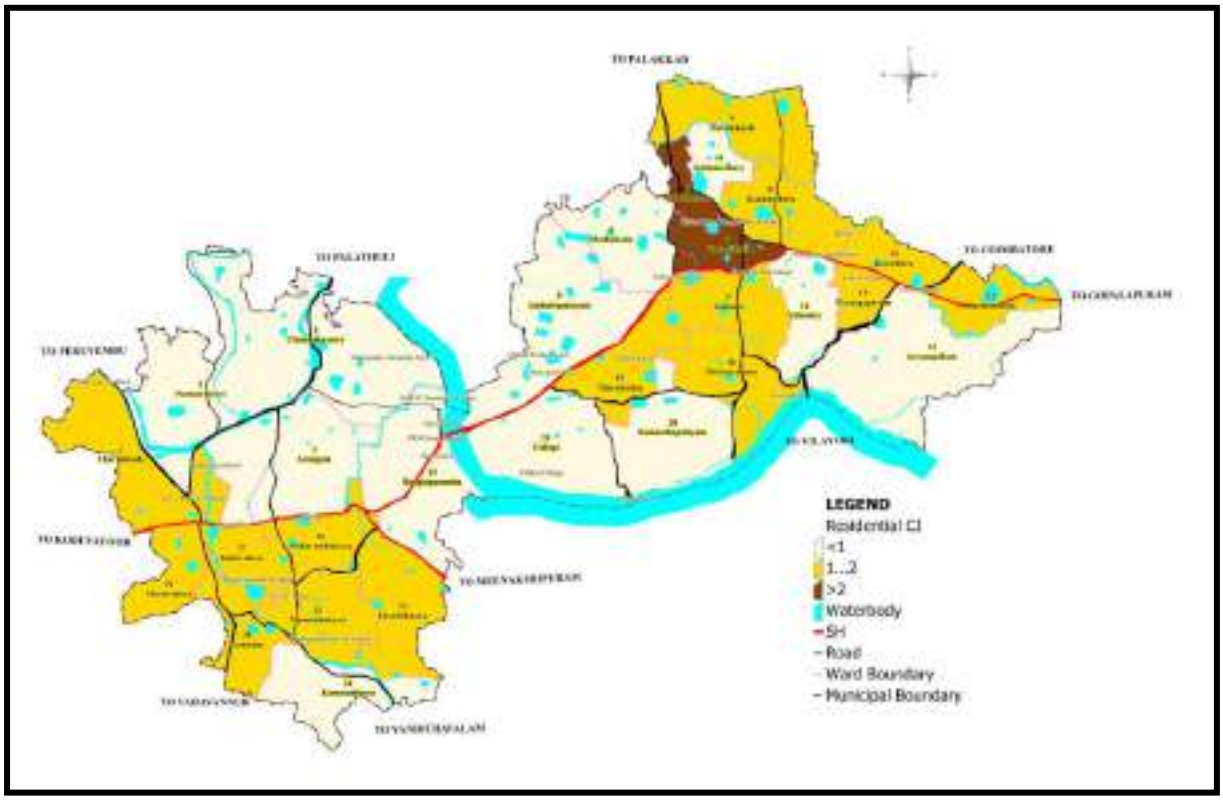


Fig 6.14 Spatial distribution of concentration of Residential land use

6.4 Survey of Land Activities in Chittur-Thathamangalam Municipality 2022

A survey of all activities that the lands in the town were being put to in 2022 was carried out. It was observed that an equal area of land was under residential use and under paddy cultivation. These were the two major activities that the land in Chittur-Thathamangalam was under.

Table 6.4 Break-up of land activities 2022

Land Use	Area (sq km)	Percentage
Residential	5.66	38%
Commercial	0.1	1%
Public and semi public	0.5	3%
Industrial	0.02	0%
Open spaces	0.1	1%
Paddy/Thottam/Mixed crop/Nattu marangal	5.85	40%
Fallow land	0.72	5%
Waterbody	1	7%
Cremation ground	0.02	0%
Transportation	0.75	5%
Total	14.71	100%

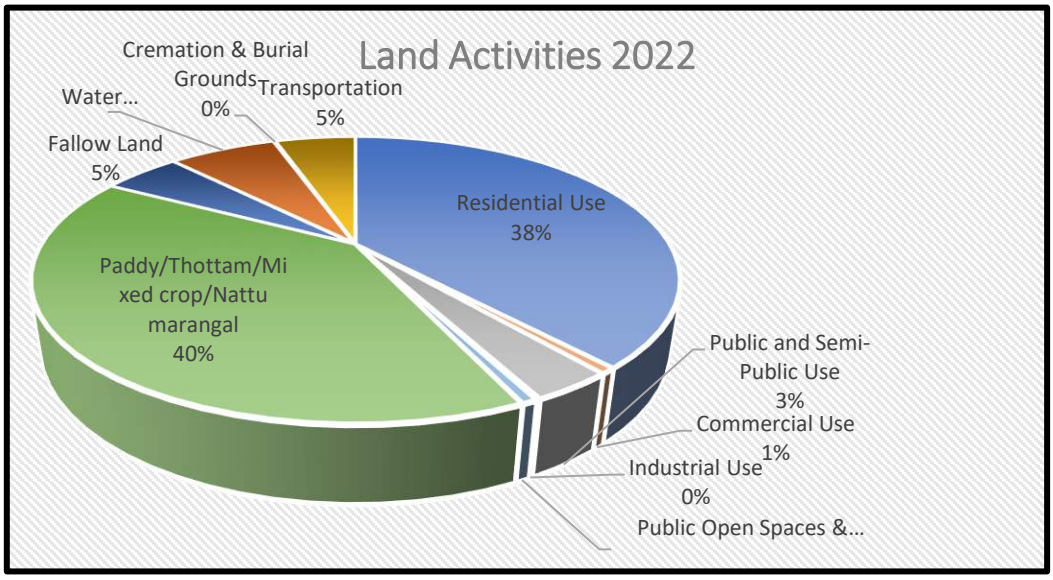


Fig 6.15 Land Activities Break-up 2022

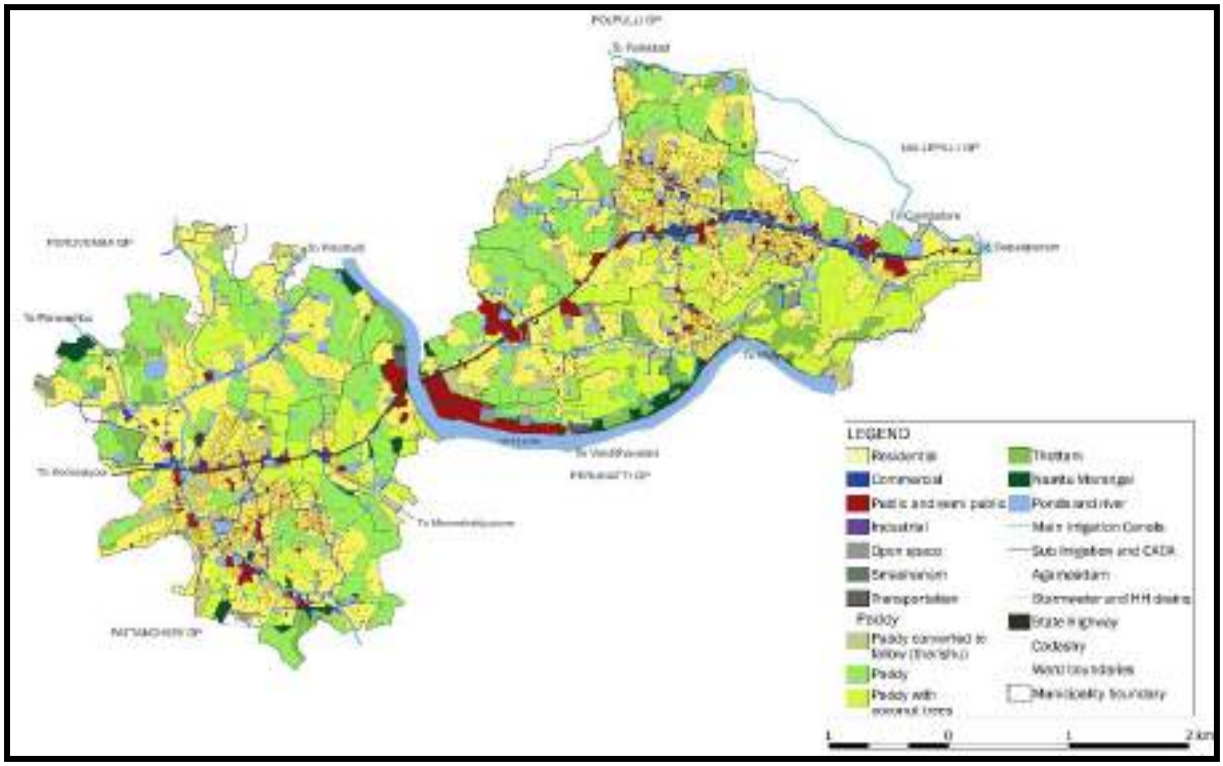


Fig 6.16 Map showing Land Activities 2022
Source: Land activities survey 2022 by Geography Dept, Govt. College Chittur

Table 6.5 Comparison of change in land use in 2012 and land activities in 2022

2012	Area (sq km)	2022	Area (sq km)	Increase in area (sq km)	Decrease in area (sq km)
Residential	4.20	Residential Use	5.65	1.45	
Commercial	0.15	Commercial Use	0.10		0.05
Public and Semi-Public Use	0.57	Public and Semi-Public Use	0.50		0.07
Industrial	0.03	Industrial Use	0.02		0.01
Park & Open Spaces	0.03	Public Open Spaces & Parks	0.10	0.07	
Agriculture/ Forest	7.47	Paddy/Thottam/Mixed crop/Nattu marangal	5.85		1.62
Vacant land/ Waste land	0.47	Fallow Land	0.72	0.25	
Water Body	1.02	Water Body	1.00		0.02
Cemetry	0.02	Cremation & Burial Grounds	0.02		
Transportation & Communication	0.75	Transportation	0.75		
Total area of Municipality	**14.71**	**Total area of Municipality**	**14.71**		

On comparison with the activities that land was put to in 2012 as against current activities, it was observed that the area under residential use has increased with a corresponding decrease in land under agricultural activities.

6.5 Direction of Growth

Agriculture land within planning area can be safeguarded for as long as possible and planned in such a way that the issue of competing land uses can be mitigated while agricultural productivity is kept in pace with population growth. Population density is found higher in the core of the city. Central crowding occurs mainly due to easy access routes, commercial activity and presence of public units.

6.6 Inference

Nearly 47% of planning area is covered by environmentally sensitive areas - water bodies and agriculture. Urban land uses are concentrated in 48% of geographical area of town and 5% is fallow land. Commercial activities are concentrated at Thathamnagalam Jn and Anikode Jn almost in the central part of Thathamangalam and Chittur area respectively. Residential activity is concentrated in central areas and southern half of town. Public and semi-public activity is concentrated along the side of Chittur Puzha. As per the existing land use, major land area is agriculture use. The second major land use is residential which is almost equal to the area under paddy. The net density has to be kept high in order to preserve the valuable agricultural land and to make the residential area more compact and energy efficient. This zone would also provide additional infrastructure and services which are deficient in the core area of the city. To preserve the valuable agricultural land, higher residential density encouraging the vertical development shall be permissible. Large number of recreational open spaces needs to be created in the town in order to improve the quality of life.

Chapter 7: TRAFFIC & TRANSPORTATION

Transportation sector is a vital component of any city. Urban transportation is an integral part of urban planning. A well-arranged layout of a town is spoiled if it does not contain a well-designed road pattern connecting the various parts of the town. A detailed study of the transportation sector helps in analyzing and understanding the role of transport in the present scenario and helps in chalking out long term policies and strategies for the horizon period which form an integral part of the town development plan. As part of this exercise the department of town and country planning had entrusted The Department of Civil Engineering, NSS College of Engineering, Palakkad to carry out traffic and transportation studies for Chittur-Thathamangalam Municipal area. This chapter presents base line traffic and transportation data and analysis of the municipality.

7.1 Vehicle Population

The spectacular growth of the automobile as one of the most convenient modes of travel has brought in its wake frustrating problems of parking, accidents, delay, congestion and environmental degradation. This trend has been phenomenal all over the country and so is Palakkad. The growth of motor vehicles in Palakkad district during the period from 2000 to 2012 is given in the Table 7.1 and graphically represented in Fig 7.1.

Table 7.1 Growth in population of motor vehicles in Palakkad district

Sl. No.	Year	Palakkad District	
		Motor Vehicles	Index
1	2011-12	446083	100.00
2	2014-15	647896	145.24
3	2015-16	675991	151.54
4	2016-17	744908	166.99
5	2017-18	818617	183.51
6	2018-19	904345	202.73
7	2019-20	964941	216.31
8	2020-21	1019082	228.45

Source: Economic Review 2021 Vol. 2 (Appendix 11.1.8)

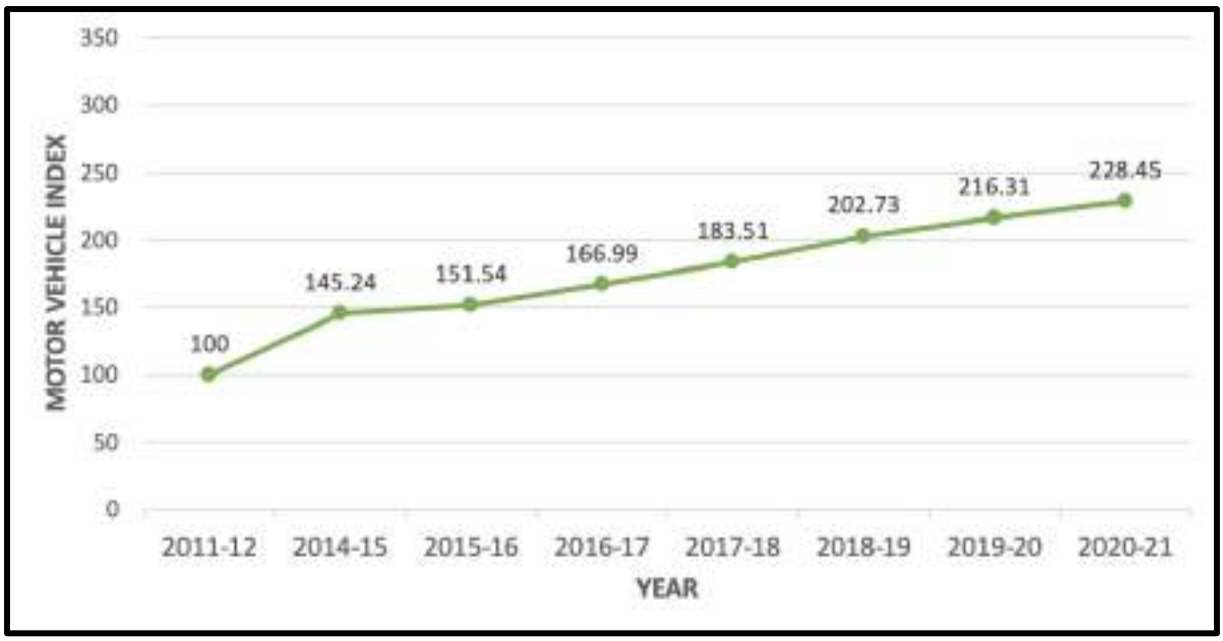


Fig 7.1 Temporal variation of growth index of vehicles in Palakkad district

From the Fig 7.1 it can be seen that the number of vehicles has increased by 3.3 times between 2001 and 2012 and it has increased by 2.3 times over the last decade (2012-2021). Table 7.2 gives the number of motor vehicles having valid registration in Palakkad in 2021.

The analysis of the existing vehicle population in 2021 shows that two wheelers occupy a major share of 71% of the total vehicle population in the district followed by cars (15%) and auto rickshaws (5%) respectively.

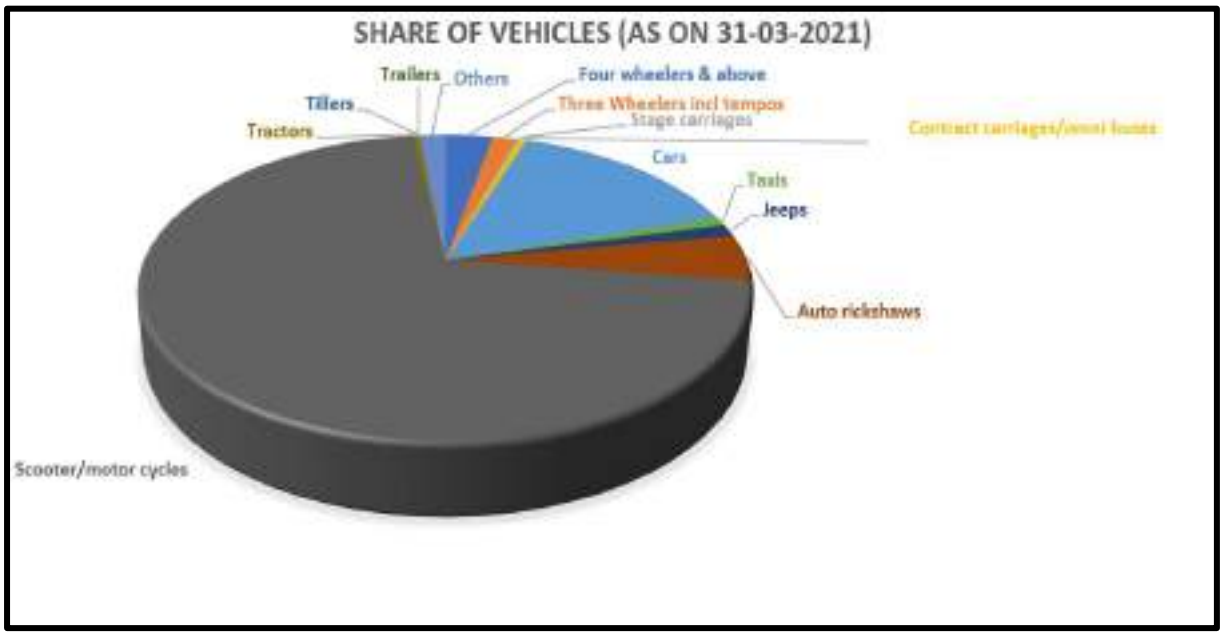


Fig 7.2 Percentage of registered motor vehicles in Palakkad district

Table 7.2 Number of motor vehicles having valid registration in Palakkad district

Sl. No.	Type of Vehicle	Number of vehicles (as on 31-03-2012)	Number of vehicles (as on 31-03-2021)
1	Four wheelers & above	22100	30455
2	Three Wheelers incl tempos	7536	14891
3	Stage carriages	1176	2449
4	Contract carriages/omni buses	9670	4635
5	Cars	50648	153081
6	Taxis	9964	8918
7	Jeeps	3739	12895
8	Auto rickshaws*	42361	49301
9	Scooter/motor cycles	288074	721494
10	Tractors	4713	3626
11	Tillers	969	119
12	Trailers	121	356
13	Others**	4632	16862
	TOTAL	**445703**	**1019082**

* This includes 50 E-autorickshaws
** This includes 5 motorised cycles

Source: Economic review 2012, Economic Review 2021

7.2 Roads

7.2.1 Existing Road Network

An understanding of the extent and quality of road network is very important to formulate the improvement plans. Since Chittur, being the Taluk headquarters the number of people using the road network is quite high and an easy and efficient transportation system is quite necessary. Major roads to Thrissur, Alathur, Coimbatore, Kollengode, Puthunagaram and Pollachi passes through the town. The municipality is having a well-connected network of roads that covers the length and breadth of the municipality most of which are in good condition except in some pockets. State Highway 27 that extends from Palakkad to Meenakshipuram (via Kannadi – Koduvayur – Tathamangalam – Nanniyode) and SH 25 connecting Mettupalayam Junction - Nattukal are passing through the municipality. SH 27 is 0.9 km long and SH 25 extend over a length of 7.6 km. The total road length in the municipality is 156.775 km. A major road connecting Puthunagaram to Hospital Junction runs parallel to the town. This road stretch carries majority of traffic movement in the municipality. The road stretch from Post Office Junction to Mettupalayam Junction is uncrowded, while mild congestion is observed in the Market Road and Mettupalayam Junction – Puthunagaram road stretch during the peak hours. High commercial activity, pedestrian movement and insufficient parking space are the problems in these road stretches.

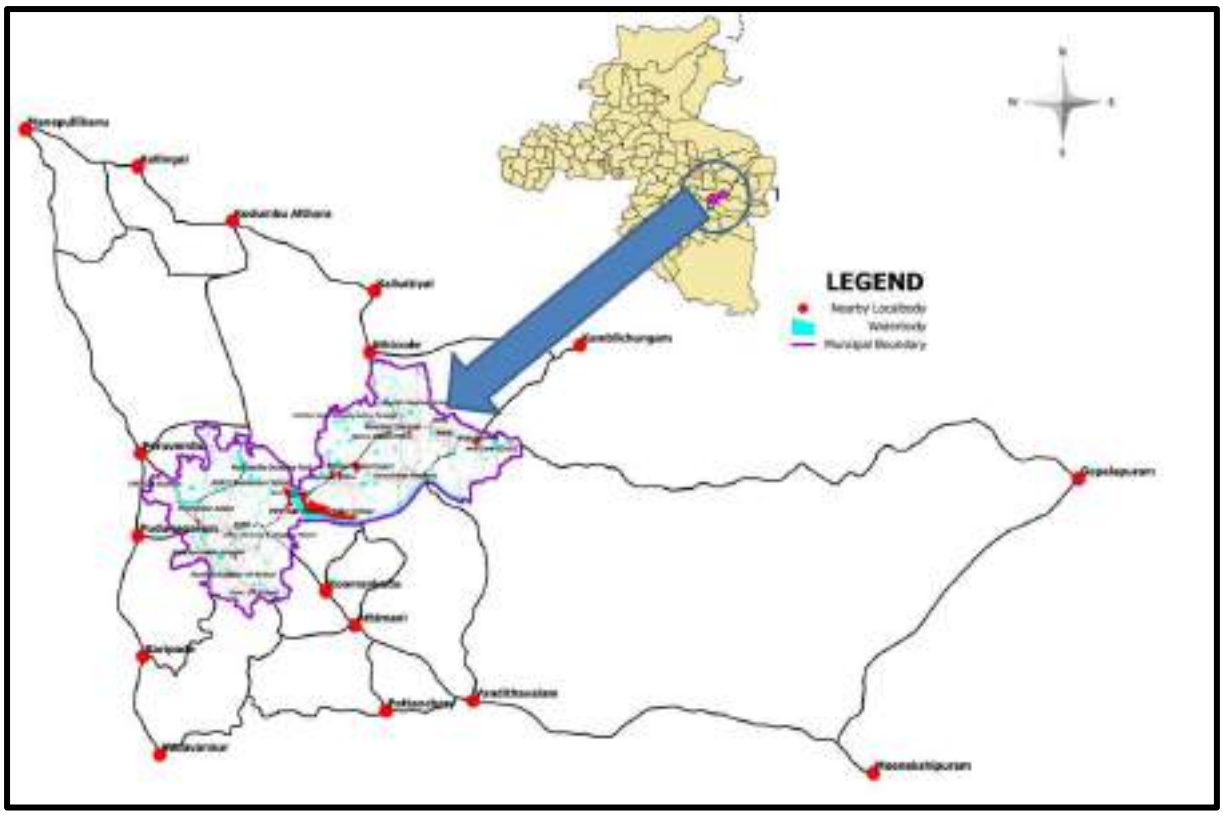


Fig 7.3 Road network around Chittur-Thathamangalam Town

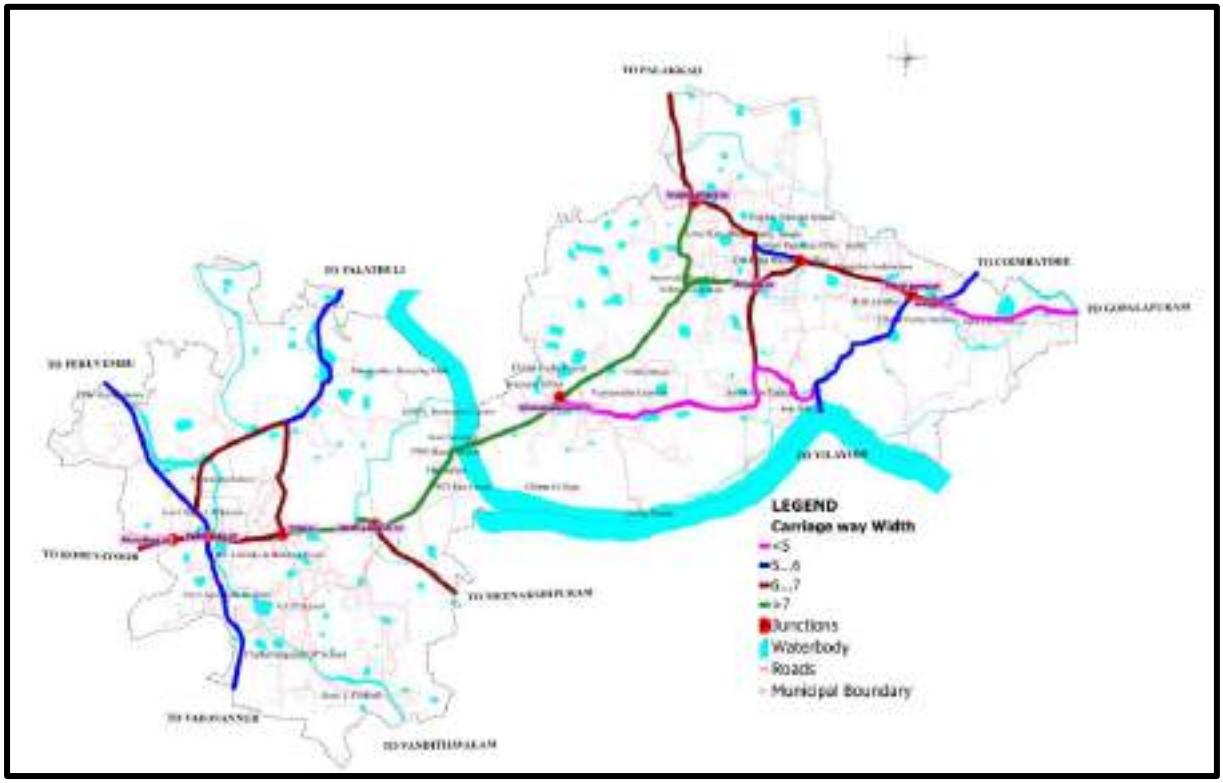


Fig 7.4 Road network in Chittur-Thathamangalam Town based on carriage way width

In the figure 7.4 road stretches based on the carriage way width of the existing roads are shown. It can be seen that only the major central corridor is having width greater than 7m.

Table 7.3 Road length according to the type of surfacing

Sl. No	Type of Road	Road Length(Km)
1	Mud roads	7.77
2	Metalled roads	12.075
3	Tar roads	131.89
4	Concrete roads	5.04
	Total	156.775

The following are the important roads in the municipality:

1. SH 25 (Mettupalayam Junction – Nattukal Road)
2. SH 27 (Puthunagaram – Meenakshipuram Road)

Apart from the two State Highways that runs through the municipality, following are the important roads in the town included in the study:

1. Anikode – Palakkad Road
2. Pallimukku – Vandithavalam Road
3. Pallimukku – Peruvemba Road
4. Chenthamara Junction – Palathully Road
5. Chinmaya Junction – Vadavannur Road
6. Mettupalayam Junction – Meenakshipuram Road
7. Vijayamatha convent – Anikode Road (via Thekkegramam)
8. Ganapathi Kovil – Nilampathy Road
9. Nilampathy – Thekkegramam Road
10. Bheemathumukku – Post Office Junction Road
11. Vadakkathara - Nehru Theatre Road
12. Hospital Junction – Gopalapuram Road

7.2.2 Road inventory Study

Detailed road inventory survey was carried out on all important roads in Chittur-Thathamangalam Municipal area to know about the cross-sectional characteristics of the road. The road from Pallimukku Junction to Hospital Junction is the major arterial road passing through Chittur-Thathamangalam Municipal town. The stretch Pallimukku – Thathamangalam – Mettupalayam – Koomankadu forms part of SH 27 whereas Mettupalayam Junction – Ambattupalayam – Anikode – PO Junction – Hospital Junction and Kambilichungam stretch forms part of SH 25.

All secondary and primary data collected for the study were analysed systematically to obtain the base year traffic characteristics of the study area. For the purpose of studying the traffic characteristics of the study area, major travel corridors were divided into four homogeneous sections. The details of major road intersections in the Chittur-Thathamangalam town are shown in the Table 7.5.

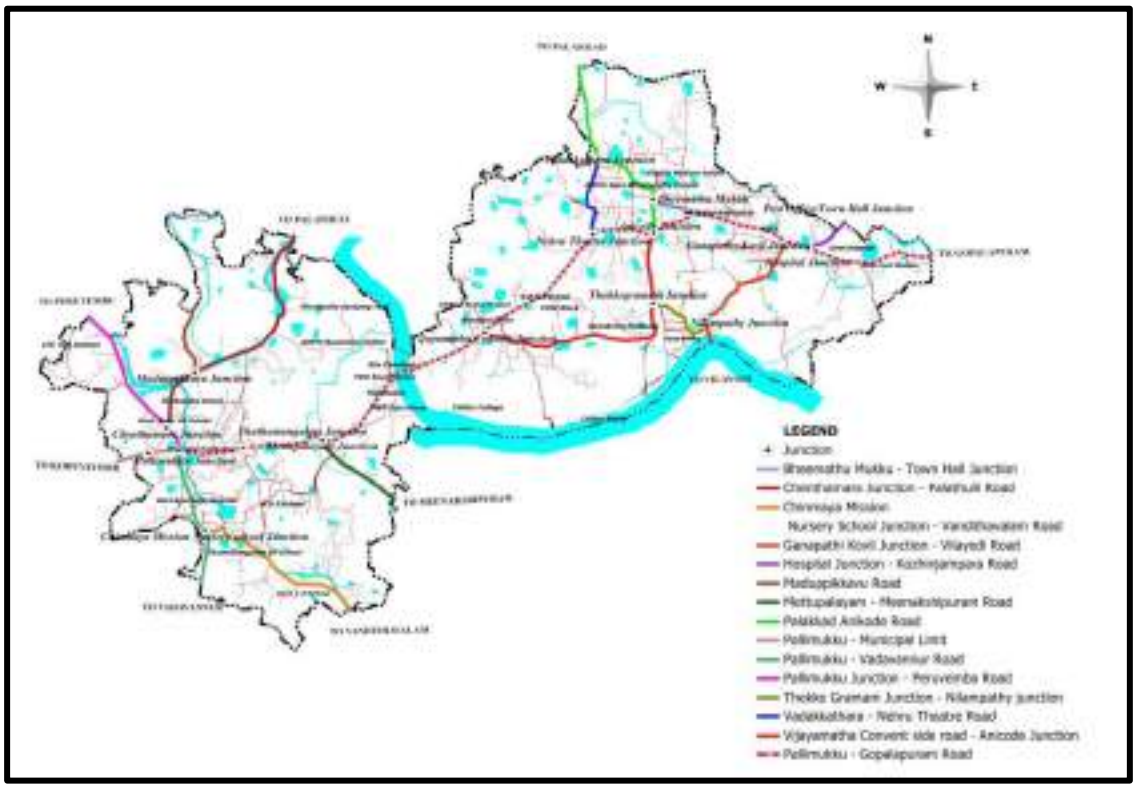


Fig 7.5 Road stretches taken for inventory study

Table 7.4: Summary of Road Inventory

1. Post office Jn – Anicode Jn	Length	m	400 m
	Right of Way	m	8.3
	Carriage Way	m	6.65
	Adjacent Land Use	L	Residential
		R	Residential
	Remarks:		



2 Anicode Jn – Mettupalayam Jn	Length	m	3800 m
	Right of Way	m	11.4
	Carriage Way	m	7.18
	Adjacent Land Use	L	Residential/Paddy
		R	Residential/Paddy
	Remarks:		



3. Mettupalayam Jn - Pallimukku	Length	m	1450 m
	Right of Way	m	8.33
	Carriage Way	m	6.5
	Adjacent Land Use	L	Commercial
		R	Commercial
	Remarks:		



4. Hospital Jn - Gopalapuram Road	Length	m	1950
	Right of Way	m	9.43
	Carriage Way	m	5.27
	Adjacent Land Use	L	Commercial
		R	Commercial



5. Post Office Jn - Hospital Jn	Length	m	1000
	Right of Way	m	9.73
	Carriage Way	m	6.98
	Adjacent Land Use	L	Commercial
		R	Commercial



6. Bheemathu mukku - Town hall Jn	Length	m	300
	Right of Way	m	7
	Carriage Way	m	5.2
	Adjacent Land Use	L	Residential
		R	Residential



7. Hospital Jn – Kozhinjampara Road			
	Length	m	400
	Right of Way	m	8.25
	Carriage Way	m	7.05
	Adjacent Land Use	L	Commercial/ Residential
		R	Commercial/ Residential



8. Ganapati Kovil Jn – Vilayodi Road			
	Length	m	1300
	Right of Way	m	6.5
	Carriage Way	m	5.5
	Adjacent Land Use	L	Residential
		R	Agricultural



9. Chenthamara Jn – Palathulli Road			
	Length	m	1500
	Right of Way	m	7
	Carriage Way	m	5.5
	Adjacent Land Use	L	Agricultural/ Residential
		R	Agricultural/ Residential



10. Pallimukku – Peruvemba Road	Length	m	1000
	Right of Way	m	8.4
	Carriage Way	m	5.75
	Adjacent Land Use	L	Residential
		R	Residential



11.Mettupalayam Jn-Meenakshipuram Road	Length	m	700
	Right of Way	m	9.5
	Carriage Way	m	7.25
	Adjacent Land Use	L	Residential
		R	Residential



12. Vijayamatha Convent side - Anicode Jn (via Thekkegramam)	Length	m	2400
	Right of Way	m	6
	Carriage Way	m	3.8
	Adjacent Land Use	L	Residential
		R	Agricultural



13. Pallimukku – Vadavannur Road			
	Length	m	1200
	Right of Way	m	6
	Carriage Way	m	5.5
	Adjacent Land Use	L	Residential
		R	Residential



14. Chinmaya school Jn – Vandithavalam Road			
	Length	m	1500
	Right of Way	m	6
	Carriage Way	m	3.6
	Adjacent Land Use	L	Residential
		R	Residential



15. Thekkegramam Jn – Nilampathy Jn			
	Length	m	700
	Right of Way	m	6.5
	Carriage Way	m	3.8
	Adjacent Land Use	L	Residential/ Agricultural
		R	Residential/ Agricultural



16. Anicode Jn – Palakkad Road	Length	m	1400
	Right of Way	m	9.35
	Carriage Way	m	7
	Adjacent Land Use	L	Residential
		R	Residential



17. Vadakkathara Jn – Nehru Auditorium Jn	Length	m	700
	Right of Way	m	7
	Carriage Way	m	3.8
	Adjacent Land Use	L	Residential
		R	Residential



18. Maduppikkavu Jn – Municipal limit	Length	m	600
	Right of Way	m	6.5
	Carriage Way	m	4
	Adjacent Land Use	L	Residential/ Agriculture
		R	Residential/ Agricultural



7.2.3 Road Intersections

A Junction or intersection describes all roadway situations where two or more roads meet or cross one another. The capacities of roads in urban areas are governed by the capacity of intersections. Most often, it is the major cause of delay apart from being an accident-prone

zone. While examining the road network of the town, intersections have been identified within the municipality, which remains busy throughout the day. The road intersections are given in the Table 7.5. There are 8 major road intersections out of which 5 are four legged intersections, 2 are Y intersections and 1 is a three-legged intersection. Besides these identified road intersections, there are many other intersections in different parts of the town which have not been listed over here. The position of these intersections and their salient features are given in Fig 7.6 and Table 7.6.

Table 7.5 Details of road intersections in Chittur-Thathamangalam Municipality

Sl. No	Name of junction	Type of junction
1	Anicode Junction	4 legged intersection
2	Hospital Junction	Y junction
3	Thathamangalam Junction	4 legged intersection
4	Mettupalayam Junction	3 legged intersection
5	Pallimukku Junction	4 legged intersection
6	Chenthamara Junction	4 legged intersection
7	Chittur Kavu Junction/ Bheemathu Mukku	4 legged intersection
8	Town Hall Junction	Y junction

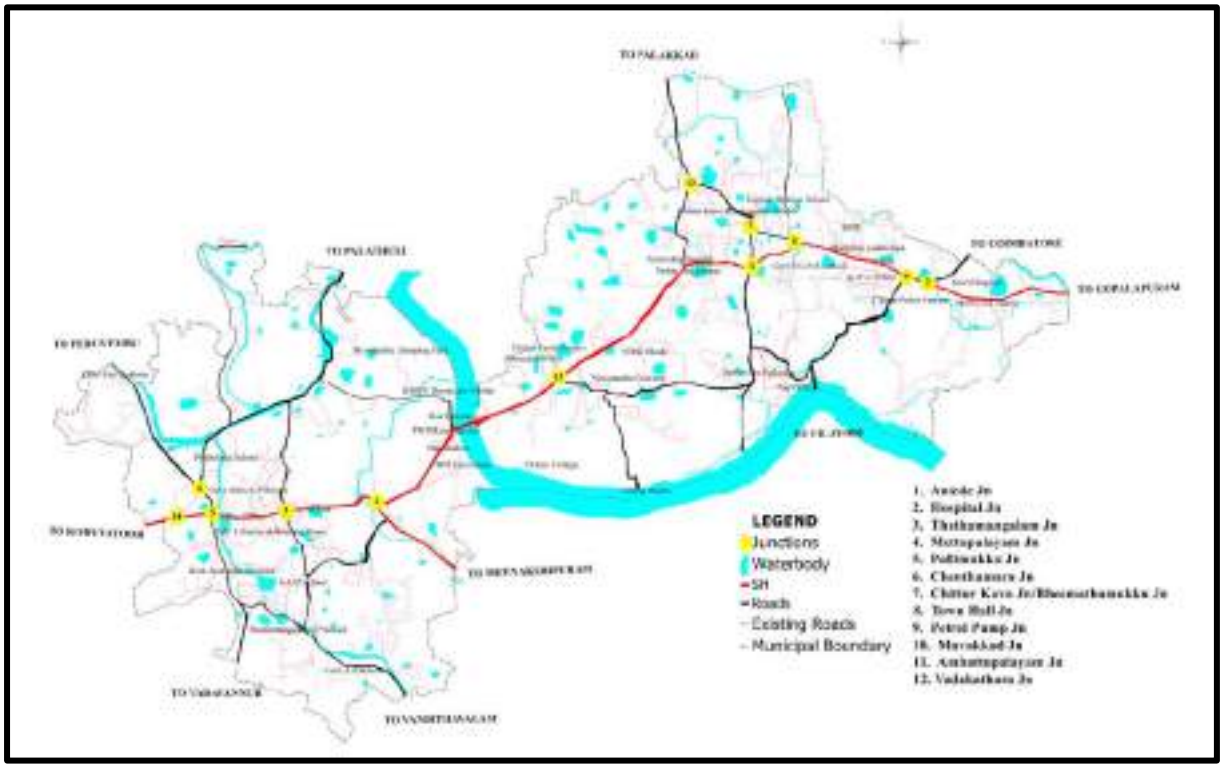


Fig 7.6 Positions of major road intersections in Chittur-Thathamangalam Municipality

7.2.3.1 Salient features of major road intersections

Anikode Junction: This is a first order commercial node and one of the busiest Junctions in the municipality with limbs to Palakkad, Thekkegramam, Thathamangalam and Kacherimedu. Adjoining land use is mainly commercial and many offices, shops, auto and taxi stands are there in this Junction. Traffic signal lights and dividers are installed in this Junction and limited parking space is available. The Junction remains busy throughout the daytime with street side vendors, pedestrians and motor vehicles. The Junction is having a major bus stop, but the bus waiting facilities are inadequate for the people. SH 25 passes through this Junction. Average CW width is 6.4 and ROW width is 8.2m.



Hospital Junction: This is a Y intersection with limbs to Kozhinjampara, Gopalapuram and Anikode on SH 25 at a distance of 1400 m from Anikode Junction. The Junction is narrow and congested with adjoining land use mainly commercial. The Junction is having a bus stop but bus waiting facilities are not adequate. No parking facilities are available and so, the vehicles which are parked on the side of the road create congestion. Average CW width is 6.3m and ROW width is 12.3m.



Hospital Junction



Thathamangalam Junction

Thathamangalam Junction: Thathamangalam Junction is a four-legged intersection with major roads leading to Puthunagaram and Chittur and other roads leading to Palathully and Thathamangalam village office. Situated in SH 27, the Junction is having its adjoining land use as mainly commercial, and no parking facilities are available. The movement of traffic is congested, and the road surface condition is good. The average CW width is 6m and ROW width is 7m.



Mettupalayam Junction

Mettupalayam Junction: Located at a distance of 3.8 km from Anikode Junction, the Junction is the starting point of SH 25 starting from Mettupalayam Junction to Nattukal. This is a three-legged intersection with roads leading to Meenakshipuram, Puthunagaram and Chittur. Relatively speedy movement of vehicles can be seen. The Junction is having its adjacent land use mainly commercial. Parking facilities are provided. An auto and taxi stand are located near to this Junction. The average CW width is 7.1m and ROW width is 8.5m. Fairly good road surface condition can be seen.

Pallimukku: The Junction situated on SH 27 is close to Thathamangalam Juma Masjid with major roads leading to Puthunagaram and Chittur and minor roads leading to Peruvemba and Vadavannur. The Junction is located at a distance of 1.4 km from Mettupalayam Junction with adjoining land use mainly religious and commercial. The average CW width is 6.5m and ROW width is 9.5m.



Pallimukku Junction



Town Hall Junction

Chenthamara Junction: This is a four-legged intersection with limbs to Peruvemba, Palathully and Pallimukku. The other limb is a minor road from Kozhikkada. The adjacent land use is mainly commercial and public and semi-public as Thathamangalam Govt. UP School is situated close to this. The average CW width is 4.5 m and ROW width is 6 m.



Chenthamara Junction



Bheemathumukku Junction

Chittur Kavu Junction/ Bheemathumukku: This is also a four-legged intersection with limbs to Anikode, Post Office Junction and Palakkad. The other limb is a minor road from Bhagavathi Kulam. The Junction is mainly used by pedestrians and motorists from Palakkad side to access market road without touching the busy Anikode Junction. Although the Junction is less congested, sight distance is a major problem from the different limbs and many accidents have occurred in the past. The traffic police have installed a reflecting mirror in this Junction. There is no space for parking. The adjacent land use is mainly residential.

Town Hall Junction/ Post Office Junction: This Junction is located in State Highway 25. This is a Y Junction with limbs to Hospital Junction and Anikode Junction. The other limb is a minor road to Bheemathumukku. Except for the latter which has limited space for parking, the other two limbs remain busy and congested throughout the day as the adjacent land use is mainly commercial and public use. The Junction is a major bus stop with bus waiting facility available. The average CW width is 6.9 m and ROW width is 8.2 m. Salient features of major Junctions are shown in Table 7.6.

Table 7.6 Salient Features Observed at Major Intersections

Sl No	Intersection	Salient features & Problems Identified	Location Map
1	Anicode Jn	• Coordinates 10 ? 42?N, 76? 44 ? 22?E • Carriage Way Width: 6.4m • Right Of Way Width:8.2m • Type Of Road SH • Signalised Traffic • Bus Stop Facility • Adjoint Land : Commercial • Limited Parking • Drainage Facility On Both Sides • Fairly Good Road Surface Condition • No Cross Drainage Structures • Congested Traffic	
2	Mettupalayam Jn	• Carriage Way Width: 7.1m • Right Of Way Width:8.5m • Type Of Road SH • Signalised Traffic • Bus Stop Facility • Adjoint Land Use:Commercial • Parking Facilities Are Provided • Drainage Facility On Both Sides • Fairly Good Road Surface Condition • No Cross Drainage Structures • Congested Traffic	
3	Thathamangalam Jn	• Carriage Way Width: 6m • Right Of Way Width:7m • Type Of Road SH • Non Signalised Traffic • Bus Stop Facility • Adjoint Land Use:Commercial • No Parking Facilities • Drainage Facility On Both Sides • Fairly Good Road Surface Condition • No Cross Drainage Structures • Congested Traffic	

5	**Town Hall Junction**	• Carriage Way Width: 6.9m • Right Of Way Width:8.2m • Type Of Road SH • Non Signalised Traffic • Bus Stop Facility • Adjoint Land Use :Commercial,Residential • Limited Parking Facilities • Drainage Facility On Both Sides • Fairly Good Road Surface Condition • No Cross Drainage Structures • Congested Traffic	
6	**Pallimukku Junction**	• Carriage Way Width: 6.5m • Right Of Way Width:9.5m • Type Of Road SH • Signalised Traffic • Bus Stop Facility • Adjoint Land Use :Commercial • Parking Facilities Are Provided • Drainage Facility On Both Sides • Fairly Good Road Surface Condition • No Cross Drainage Structures	
7	**Chenthamara Junction**	• Carriage Way Width: 4.5m • Right Of Way Width:6m • Type Of Road: Village Road • Un Signalised Traffic • No Bus Stop Facility • Adjoint Land Use :Residential • No Parking Facility • No Drainage Facility • Fairly Good Road Surface Condition • No Cross Drainage Structures	
8	**Chitturkavu/ Beemathumukku Junction**	• Carriage Way Width:5.2m • Right Of Way Width:7m • Type Of Road: PWD Road • Un Signalised Traffic • No Bus Stop Facility • Adjoint Land Use :Residential • No Parking Facility • No Drainage Facility • Fairly Good Road Surface Condition • No Cross Drainage Structures	

7.3 Characteristics Studies of Transportation Network

The travel characteristics of the existing transportation network is found out by carrying out a number of traffic surveys so as to enable the estimation of travel demand in Chittur-Thathamangalam Municipality. This includes traffic volume counts at identified locations in inner cordon, outer cordon and intersections, speed and delay studies, pedestrian survey, parking survey, origin destination surveys, travel characteristics and modal choice.

7.3.1 Traffic Volume at Outer Cordon Points on Roads

Link volume counts on outer cordon points are required for assessing intercity passenger movement through the study area covering external-internal, internal-external and external-external trips. Ten outer cordon points were considered for the survey which includes Palakkad, Coimbatore, Gopalapuram, Vilayodi, Meenakshipuram, Vandithavalam, Vadavannur, Koduvayur, Peruvemba and Palathully. The maximum peak hour volumes were observed in State Highway at Koduvayur and Gopalapuram outer cordon points with a maximum peak hourly volume of 1101 and 1065 PCU/hr. This is followed by Palakkad Outer cordon point with a peak hour volume of 777 PCU/hr. The peak hour outer cordon volume counts are shown in Table 7.7.

Table 7.7 Peak hour outer cordon volume counts

Location	Direction	Peak Hour Volume (PCU/ hr)	Total	Peak Hour Time
Palakkad	Inbound	391	777	11:00am – 12:00pm
	Outbound	386		11:00am – 12:00pm
Coimbatore	Inbound	314	660.5	11:15am - 12:15pm
	Outbound	346.5		10:00am - 11:00am
Gopalapuram	Inbound	467.5	1065.5	10:30am – 11:30am
	Outbound	598		10:45am – 11:45am
Vilayodi	Inbound	142.5	276.5	02:45pm – 03:45pm
	Outbound	134		02:45pm – 03:45pm
Meenakshipuram	Inbound	393.5	882	10:00am – 11:00am
	Outbound	488.5		10:00am – 11:00am
Vandithavalam	Inbound	396	640	01:30pm – 02:30pm
	Outbound	244		01:30pm – 02:30pm
Vadavannur	Inbound	35.5	79.5	11:45am – 12:45pm
	Outbound	44		10:30am – 11:30am
Koduvayoor	Inbound	642.5	1151	11:45am – 12:45pm
	Outbound	508.5		11:15am – 12:15pm
Peruvembu	Inbound	67.5	110.5	11:45am – 12:45pm
	Outbound	43		11:15am – 12:15pm
Palathully	Inbound	76.5	143.5	10:30am – 11:30am
	Outbound	67		10:30am – 11:30am

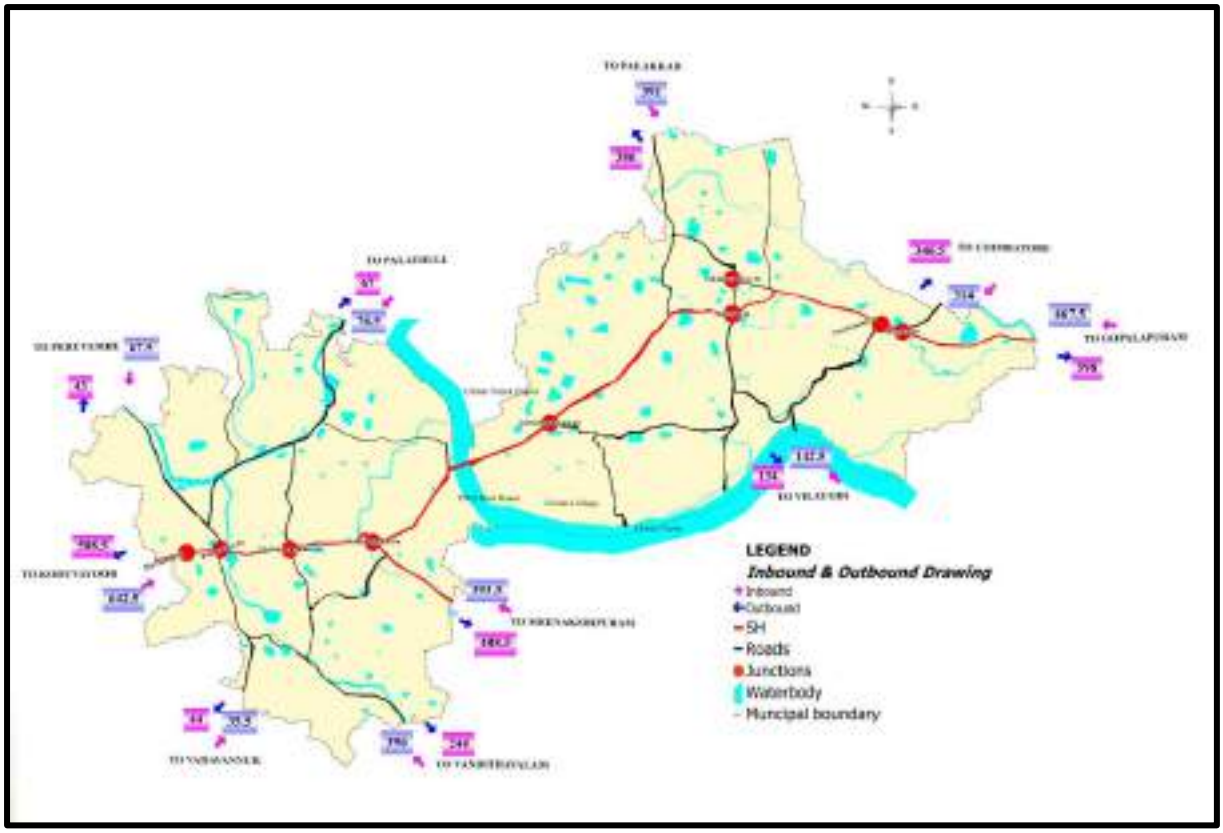


Fig 7.7 Inbound - outbound traffic of Chittur-Thathamangalam town

7.3.2 Traffic Volume/Capacity studies

Traffic volume studies are conducted to determine the number, movements, and classifications of roadway vehicles at a given location. These data can help identify critical flow time periods, determine the influence of large vehicles or pedestrians on vehicular traffic flow, or document traffic volume trends. The length of the sampling period depends on the type of count being taken and the intended use of the data recorded. One of the fundamental measures of traffic volume on road stretch is the volume of traffic using the road in a given interval of time. It is also termed as vehicles per hour and vehicles per day. For working out the capacity of different road sections, the information compiled during the road inventory survey was compared with the specifications of IRC-106-1990 (Guide- lines for capacity on urban roads).

The peak hour outer cordon volume counts are given in the Table 7.8, Roads are arranged based on their congestion intensity. Hospital JN to Gopalapuram road stretch possess highest traffic congestion rate in the town.

Table 7.8 Peak hour outer cordon volume counts in the increasing order of traffic congestion

SL NO.	NAME OF JUNCTION	Existing V/C RATIO	Sl No.	NAME OF JUNCTION	Existing V/C RATIO
1	MADUPPIKAVU ROAD TO MUNICIPAL LIMIT	0.09	13	THEKKEGRAMAM JN TO NILAMPATHY JN	0.55
2	VADAKKANTHARA JN TO NEHRU	0.1	14	ANICODE TO METTUPALAYAM	0.67
3	PALLIMUKKU TO VADAVANNUR ROAD	0.13	15	HOSPITAL JN TO KOZHINJAMPARA	0.83
4	THATHAMANGALAM TO PALATHULLY	0.14	16	ANICODE TO TOWNHALL JN	0.84
5	CHENTHAMARA JN TO PALATHULLY ROAD	0.16	17	PALLIMUKKU TO KODUVAYUR OUTLET	0.96
6	CHENTHAMARA JN TO PERUVAMBU ROAD	0.18	18	CHITTURKAVU TO PALAKKAD	0.97
7	THATHAMANGALAM TO MANNATHUKAVU	0.2	19	ANICODE TO CHITTURKAVU	1.02
8	VIJAYAMATHA CONVENT SIDE ROAD (VIA THEKKEGRAMAM) TO ANICODE	0.24	20	THATHAMANGALAM TO PALLIMUKKU	1.05
9	TOWNHALL TO CHITTURKAVU	0.28	21	METTUPALAYAM TO THATHAMANGALAM	1.06
10	PALLIMUKKU TO CHENTHAMARA JN	0.33	22	METTUPALAYAM TO MEENAKSHIPURAM	1.1
11	GANAPAPATHY KOVIL TO VILAYODY ROAD	0.38	23	TOWNHALL TO HOSPITAL JN	1.12
12	ANICODE TO THEKKEGRAMAM	0.49	24	HOSPITAL JN TO GOPALAPURAM	1.78

The vehicle counts on six road stretches indicates elevated V/C ratios. Typically, this would have called for road widening measures. However, for Chittur-Thathamangalam, widening roads is considered as the last resort to deal with capacity constraint given the high level of commercial and residential development (including assets of local value) along these road stretches. It is clear that these capacity constraints have to be managed through both local and regional interventions. Local interventions like better public transport, parking provisions including paid parking, along with transport demand and supply management, etc. have to be pursued. Additionally, rerouting of long distance through traffic that currently goes through the town needs to be done. To this end, the augmentation of some existing village roads in nearby panchayats will be needed to create regional bypasses (see Fig 7.30) that will facitlitate the reduction of traffic passing through Chittur-Thathamangalam town.

7.3.3 Speed and Delay Studies

These studies are used to determine speed variations along a route at different times; number, location, cause, frequency, and duration of delays, and overall speed and travel time along a

route. The speed and delay studies give the running speeds, overall speeds, fluctuations in speeds and the delay between two stations of a road spaced far apart. They also give the information such as the amount, location, duration, frequency and causes of the delay in the traffic stream. The results of the speed and delay studies are useful in detecting the spots of congestion, the causes and in arriving at suitable remedial measures.

Floating car method was adopted to conduct speed and delay study in Chittur-Thathamangalam study area. In this method the driver tries to float in the traffic stream passing as many vehicles as pass the test car. If the test vehicle overtakes as many vehicles as the test vehicle is passed by, the test vehicles should, with sufficient number of runs, approach the median speed of the traffic movement on the route. In such a test vehicle, one passenger acts as observer while another records duration of delays and the actual elapsed time of passing control points along the route from start to finish of the run.

Locations were identified for conducting the survey in the town. They are as follows:

1. Anikode to Gopalapuram - 3.3 km
2. Anikode to Pallimukku - 6.3 km
3. Hospital JN to Vilayodi - 2 km
4. Pallimukku to Palathully - 3 km

The summary of the results of speed and delay survey conducted at all the above stretches is given in Table 7.9.

Table 7.9 Summary of results of speed and delay survey

Road Section	Length (km)	Average Traffic Volume (pcu/min)	Delay (Sec)	Average Journey Time (min)	Average Running Time (min)	Average Journey Speed (kmph)	Average Running Speed (kmph)
Direction: N-S							
Anicode to Gopalapuram	3.3	6.93	10.33	8.15	7.98	24.3	24.81
Anicode to Pallimukku	6.3	7.16	123.5	13.63	11.57	27.73	32.67
Hospital Jn to Vilayodi	2	4.36	9	4.28	4.13	28.04	29.06
Pallimukku to Palathulli	3	1.18	0	4.1	4.1	43.9	43.9
Direction: S-N							
Anicode to Gopalapuram	3.3	7.1	21	7.78	7.43	25.45	26.65
Anicode to Pallimukku	6.3	8.35	21	10.77	10.42	35.1	36.28
Hospital Jn to Vilayodi	2	2.97	9.5	4.51	4.35	26.61	27.6
Pallimukku to Palathulli	3	0.97	0	5.18	5.18	34.75	34.75

Table 7.10 shows the speed and delay characteristics of major roads in Chittur-Thathamangalam town. Anikode Jn. and Hospital Jn. are facing major congestion in the town. Junction improvements have to be carried out to meet the needs of the future.

Table 7.10 Speed and Delay Characteristics of Major Roads

Road No	From	To	Distance (km)	Delay Location	Delay time (s)	Cause of Delay	Overall speed (km/h)
1	Anicode	Gopalapuram	3.3	Anicode	52.82	Congestion	24.88
				Hospital jn	16.70	Intersection	
				Kacherimedu	23.08	Bus stop	
2	Anicode	Pallimukku Junction	6.3	Pallimukku	18.24	Congestion	31.42
				Mettupalayam	16.79	Intersection	
				Thathamangalam	6.15	Intersection	
				Anicode	20.56	Intersection	
				Municipal Bus stand	239.8	Procession	
3	Hospital Jn	Vilayodi	2	Hospital Jn	36.75	Congestion	27.33
4	Pallimukku	Palathully	3	No delay	0.0	Nil	39.33

7.3.4 Turning Movements at Intersections

The level of service of urban roads to a great extent depends on efficient control of traffic at road intersections. Thus, the intersections have an important role to play in efficient and smooth traffic flow in the network. The surveys were carried out for a period of four to eight hours during the morning and evening peak periods depending on the availability of past data. Total volume, composition of traffic and turning characteristics at major intersections were recorded. The observed traffic flows were converted to equivalent passenger car units (PCU) by using equivalency factors suggested by the IRC. The main aim of the survey is to estimate the peak hour traffic volume (in PCU) along with the turning movement of vehicles from one arm to other arms of the intersection. Peak hour traffic volume is estimated for preparation of improvement plans for the intersections. Peak Hour Traffic Volumes at Major Junctions in Chittur-Thathamangalam Study Area is shown in Table 7.11 and the peak hour turning traffic volumes obtained in various arms of the eight Junctions are given in Table 7.12.

Table 7.11 Peak Hour Traffic Volumes at Major Junctions

Sl No	Name on junction	Total peak hour volumein PCU/hr	Peak hour timing
1	Anicode	1471.5	5.00 pm to 6.00 pm
2	Thathamangalam	1308.5	3.30 pm to 4.30 pm
3	Chenthamara	180	10.30 am to 11.30 am
4	Hospital	1620.5	11.15 am to 12.15 pm
5	Town Hall	1274.5	9.45 am to 10.45 am
6	Mettupalayam	1481	10.30 am to 11.30 am
7	Pallimukku	1431	10.15 am to 11.15 am
8	Chittur kavu	818.5	5.00 pm to 6.00 pm

Table 7.12 Peak hour traffic turning flow at major Junctions

Sl. No.	Name Of Junction	Name of Arm	Direction Of Flow	Peak Hour Turning Volume (Pcu/Hr)	Peak Hour Time
1	ANICODE	PALAKKAD	L	115.5	5:00 pm to 6:00 pm
			R	93.0	
			S	72.0	
		TOWN HALL ROAD	L	69.5	
			R	86.0	
			S	303.5	
		THEKKEGRAMAM ROAD	L	59.5	
			R	46.0	
			S	84.0	
		METTUPALAYAM ROAD	L	125.0	
			R	60.5	
			S	357.0	
2	THATHAMANGALAM	PALATHULLY ROAD	L	38.5	3:30 pm to 4:30 pm
			R	21.0	
			S	21.0	
		CHITTUR ROAD	L	38.5	
			R	35.5	
			S	457.5	
		VILLAGE OFFICE ROAD	L	58.5	
			R	40.5	
			S	33.5	
		PALLIMUKKU ROAD	L	20.5	
			R	46.5	
			S	497.0	
3	CHENTHAMARA JN	PALLIMUKKU ROAD	L	10.5	10:30 am to11:30 am
			R	32.5	
		PALAKKAD ROAD	L	28.5	
			S	39.0	
		ATHICODE ROAD	R	32.5	
			S	37.0	
4	HOSPITAL JN	PALAKKAD ROAD	L	290.5	11:15 am to12:15 pm
			S	548.5	
		KOZHINJAMPARA ROAD	L	49.5	
			R	264.5	
		POLLACHI ROAD	R	56.0	
			S	411.5	
5	TOWN HALL JN	ANICODE ROAD	L	35.5	9:45 am to10:45 am
			S	482.0	
		POCKET ROAD	L	187.0	
			R	25.0	
		HOSPITAL ROAD	R	76.0	
			S	469.0	

6	METTUPALAYAM JN	CHITTUR ROAD	L	102.5	10:30 am to11:30 am
			S	378.5	
		THATHAMANGALAM ROAD	R	386.0	
			S	220.5	
		MEENAKSHIPURAM ROAD	L	321.5	
			R	72.0	
7	PALLIMUKKU JN	PUTHUNAGARAM ROAD	L	75.0	10:15 am to11:15 am
			R	14.0	
			S	553.5	
		ANICODE ROAD	L	20.5	
			R	105.0	
			S	428.5	
		AYURVEDA HOSPITAL ROAD	L	10.5	
			R	16.5	
			S	8.5	
		CHENTHAMARA ROAD	L	120.0	
			R	69.5	
			S	9.5	
8	CHITTUR KAVU JN	PALAKKAD ROAD	L	96.0	5.00 pm to 6.00 p.m.

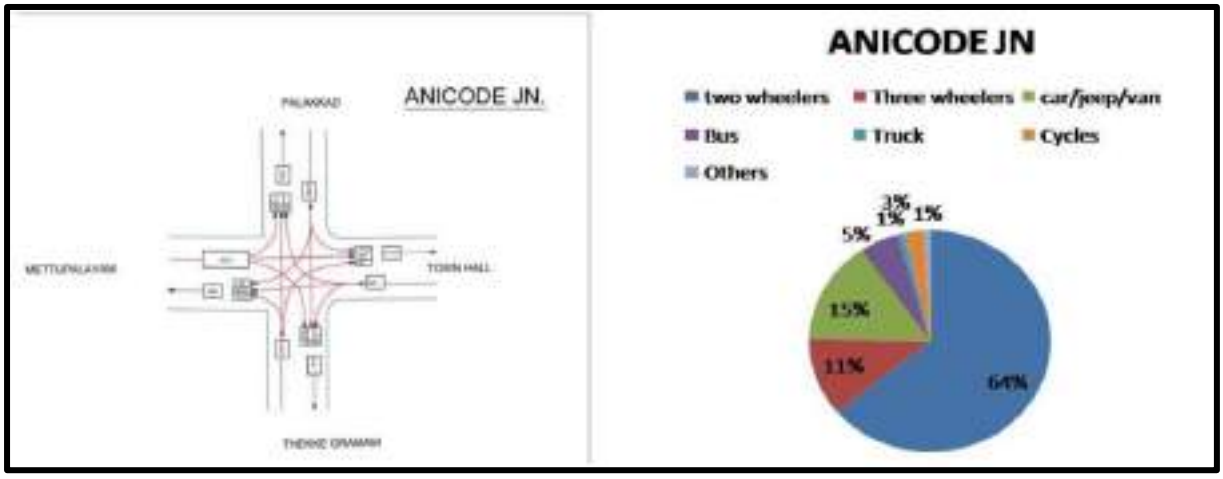


Fig 7.8 Peak hour Volume of Turn out movements and its composition at Anikode Junction

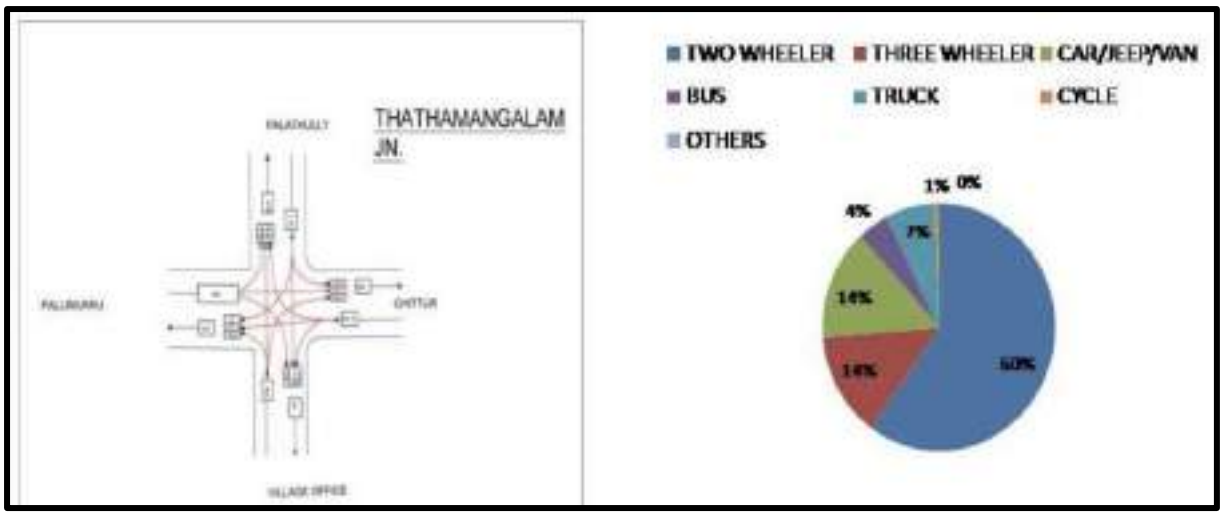


Fig 7.9 Peak hour Volume of Turn out movements and its composition at Thathamangalam Junction

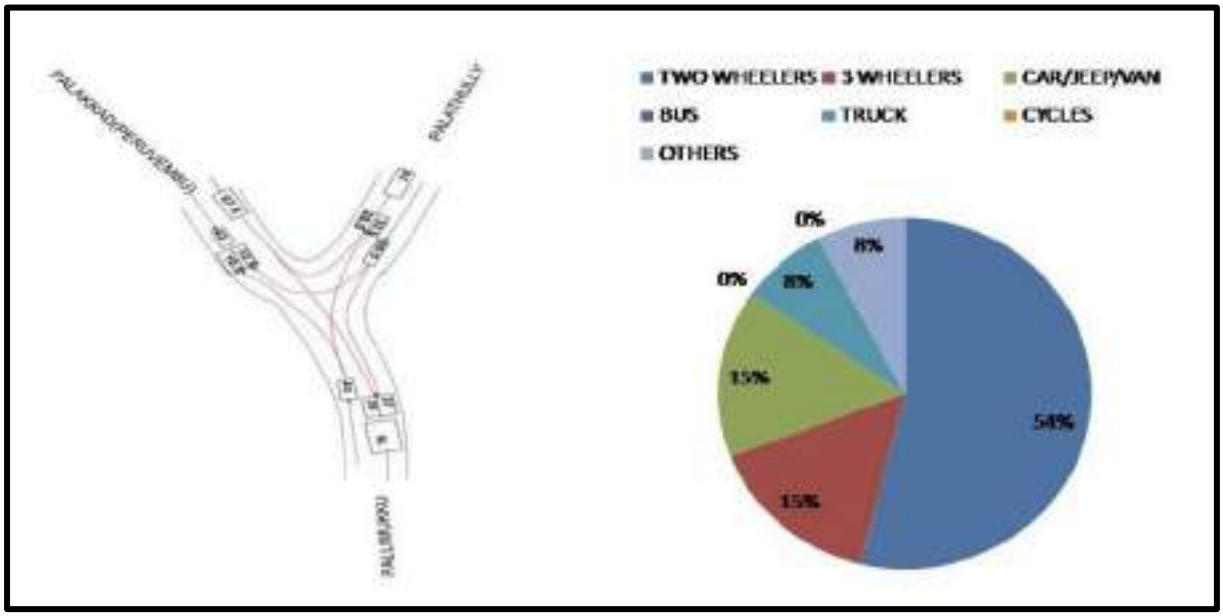


Fig 7.10 Peak hour Volume of Turn out movements and its composition at Chenthamara Jn

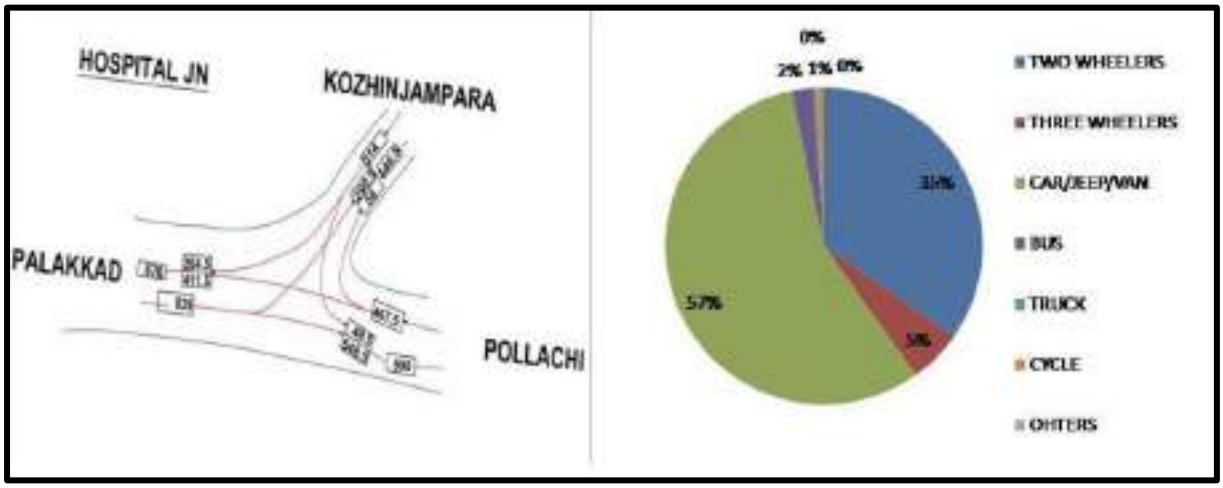


Fig 7.11 Peak hour Volume of Turn out movements and its composition at Hospital Jn

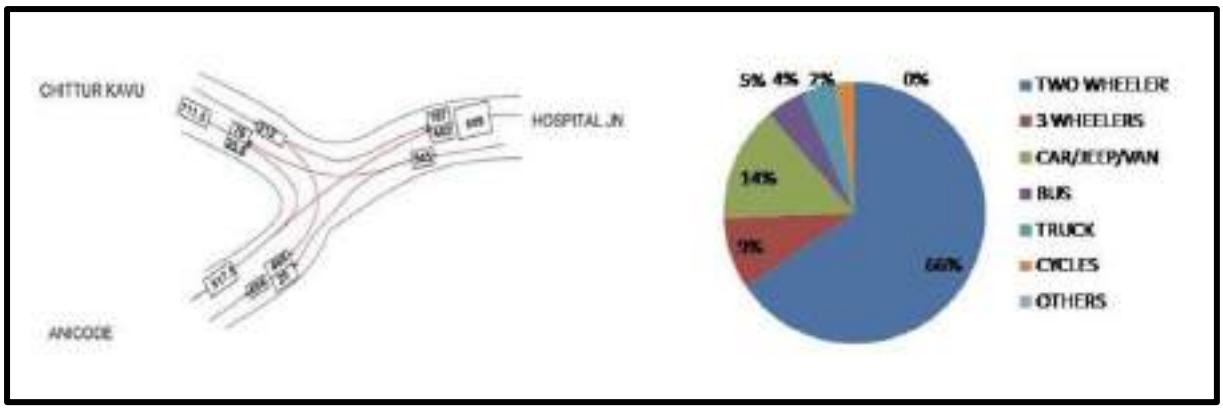


Fig 7.12 Peak hour Volume of Turn out movements and its composition at Post office Jn

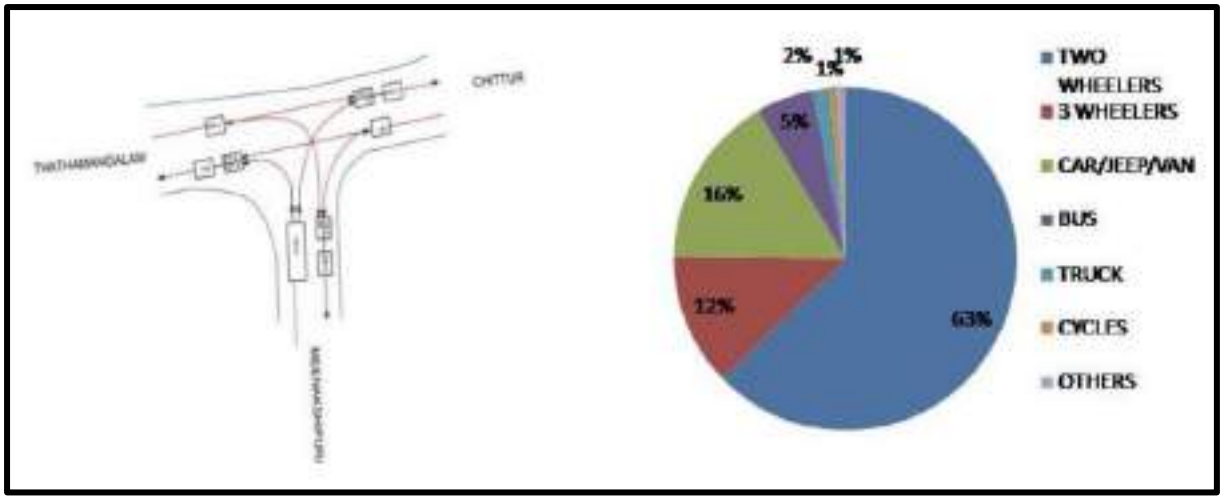


Fig 7.13 Peak hour Volume of Turn out movements and its composition at Mettupalayam Jn

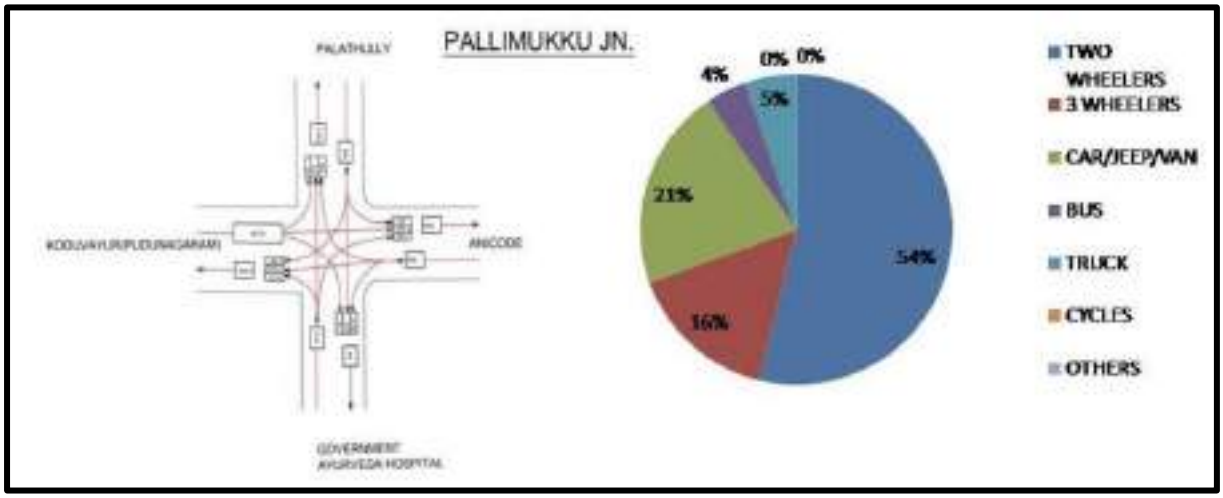


Fig 7.14 Peak hour Volume of Turn out movements and its composition at Pallimukku Jn

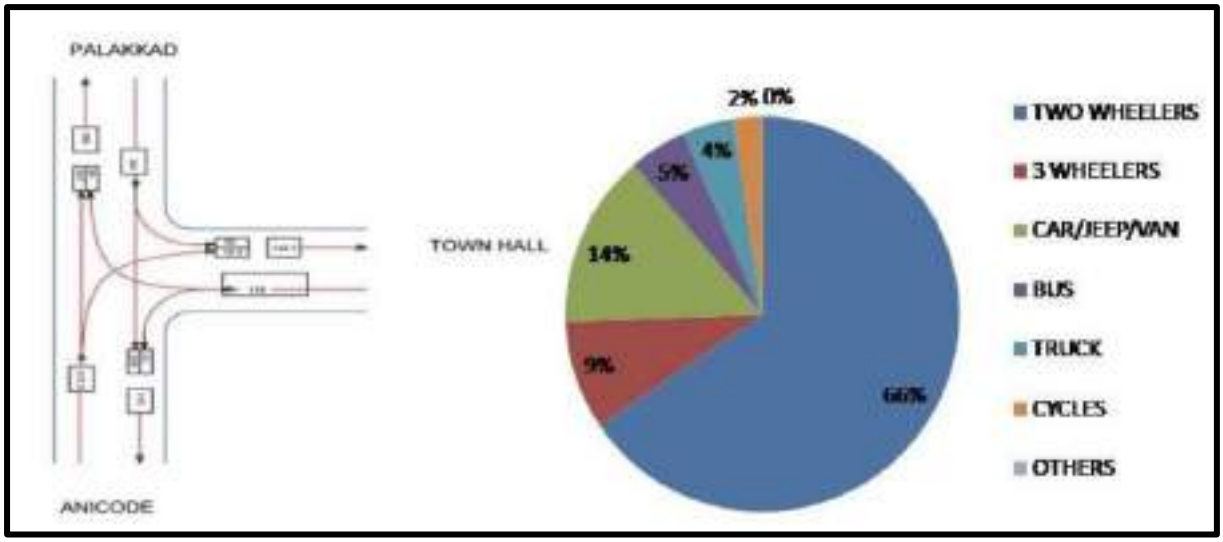


Fig 7.15 Peak hour Volume of Turn out movements and its composition at Chittur Kavu Jn office Jn

7.3.5 Parking Survey

Selection of Stretches for Parking Surveys

Parking surveys were carried out on major road sections of Chittur-Thathamangalam Town to obtain the peak parking demand and parking duration of various categories of vehicles on these road sections. Peak hour parking accumulation observed at major corridors are given in Table 7.13.

Majority of the vehicles parked at most of the parking corridors were found to be for a short duration of less than 30 minutes. Nearly 90 per cent of the vehicles parked on selected parking corridors were found to be parked for a duration less than 30 minutes. Less than 10 per cent of these vehicles were parked for a period ranging between 30 minutes and one hour. Long duration vehicles constituted only around 5 per cent of the total vehicles.



Off street parking

Table 7.13 Peak hour parking accumulation observed at major corridors

Location	Direction	Side	2 Wheeler	3 Wheeler	Car	Bus	Truck	Cycle	Others
Anicode	To Vandithavalam	Right	19	14	13	0	0	1	0
		Left	25	13	7	0	0	1	0
	To Palakkad	Right	70	28	10	0	0	0	0
		Left	73	21	15	0	0	2	0
	To Thathamangalam	Right	77	10	18	0	1	1	0
		Left	54	12	11	0	0	0	0
	Post Office Junction	Right	37	9	6	0	0	1	0
		Left	48	9	11	0	0	2	0
Hospital junction	To Kozhinjapara	Right	28	27	11	0	0	2	0
		Left	44	30	20	0	0	2	0
	To Post Office	Right	85	32	31	0	0	1	0
		Left	114	32	13	0	0	2	0
	To Kacherimedu	Right	33	47	19	3	0	3	0
		Left	59	37	9	2	0	1	0
Mettupalaya m	To Meenakshipuram Road	Right	56	21	5	0	0	0	0
		Left	38	11	2	0	0	0	0
	To Anicode	Right	12	0	2	0	0	0	0
		Left	24	0	2	0	0	0	0
	To Thathamangalam	Right	17	2	5	0	0	0	0
		Left	7	1	1	0	0	0	0
Pallimukku	To Thathamangalam	Right	11	2	3	0	0	2	0
		Left	14	5	1	0	0	0	0
	To Palathuly	Right	28	13	3	0	0	1	0
		Left	24	2	1	0	0	1	0
	To Puthunagaram	Right	19	1	7	0	0	0	0
		Left	6	0	3	0	0	1	0
Post office jn	To Chittur Kavu Road	Right	12	6	3	0	0	1	0
		Left	15	3	4	0	0	0	0
	To Hospital Jn	Right	60	8	7	0	0	0	0
		Left	56	5	4	0	0	1	0
	To Anicode	Right	13	4	6	0	0	1	0
		Left	6	5	1	0	0	1	0
	To Palathuly	Right	23	6	3	0	0	3	0
		Left	7	6	1	0	0	0	0
Thathamang alam	To Mettupalayam	Right	25	5	5	0	0	0	0
		Left	19	3	2	0	0	1	0
	To Village Office Road	Right	31	16	7	0	0	1	0
		Left	16	8	1	0	0	1	0
	To Pallimukku	Right	31	22	4	0	0	1	0
		Left	36	11	4	0	0	1	0

7.3.6 Pedestrian Survey

Pedestrian surveys were conducted at major locations where the pedestrian cross movements were found to be high. Among them, Anikode Jn witnesses the majority of pedestrians crossing the Junction, both up and down. Table 7.14 shows the intensity of pedestrians crossing each Junction at respective peak hours.

Table 7.14 Peak hour pedestrian traffic intensity in the town

Sl. No.	Name of Location	No. of Pedestrians/hr			Junction Total	Peak Hour
		Up	Down	Total		
1	**Anicode Junction**				539	11.00 a.m. to 12.00 p.m.
	i. Palakkad Road	68	47	115		
	ii. Post office road	60	39	99		
	iii. Padassala road	92	97	189		
	iv. Thathamangalam road	80	56	136		
2	**Mettupalayam junction**				117	2.00 p.m. to 3.00 p.m.
	i. Thathamangalam road	38	30	68		
	ii. Chittur college road	27	22	49		
3	**Pallimukku Junction**				140	2.00 p.m. to 3.00 p.m.
	i. Palathully road	35	19	54		
	ii.Puthunagaram road	41	18	59		
	iii. Thathamangalam road	12	15	27		
4	**Town Hall junction**				87	11.45a.m. to 12.45 p.m.
	i. Hospital road	26	23	49		
	ii.Anicode road	19	19	38		
5	**Hospital junction**				166	10.00a.m to 11.00a.m
	i. Kacheri medu road	25	28	53		
	ii.Kozhinjapara road	39	40	79		
	iii. Post office road	18	16	34		
6	**Thathamangalam Junction**				85	2.15 p.m. to 3.15 p.m.
	i. Palathully road	6	7	13		
	ii.Pallimukku road	21	11	32		
	iii. Anicode road	21	12	33		
	iii. Village office road	2	5	7		

7.3.7 O-D Survey

The objective of Origin and Destination survey is to determine the origin and destination details of through-traffic, inter-city and intra-regional passenger and goods movement across the external cordons. An analysis of the traffic movements will provide the proportion of bye-passable traffic along with the major external interaction areas. Home Interview technique was adopted to extract O-D data.

Table 7.15 Traffic Zones Adopted in Chittur-Thathamangalam Municipal Town study area

Code No.	Name of places included (With Ward No.)
Internal Zones	
1	Muthukadu , Kadambidi, Vadakathara, Naramkuzhi, Kizhakethara, Kannanthara, Anikodu, Valmutty. (6,7,8,9,10,11,16,17,18)
2	Devangapuram, Kacherimedu, Aryampallam, Kosathara, (12,13,14,15)
3	Ambattupalayam, Tharakalam, College, Kunnathupalayam, (5,19,20,21)
4	Arangam, Chembakassery, Banglaparambu, Paruthikkavu, Srikurumbakavu, Mannathukavu, Kammanthara, (3,4,22,23,24,25,26)
5	Cherumkode, Pattani Street, Mettuvalavu, Gramam, Kadavalavu, (1,2,27,28,29)
External Zones	
6	Koduvayur side and Vadavannur side
7	Peruvambu side and Palathulli side
8	Vandithavalam side ,Meenakshipuram side and Vilayodi side
9	Palakkad side
10	Coimbatore side and Gopalapuram side

Chittur-Thathamangalam Municipality area is divided into five internal zones and four external zones. Name of places included with ward number is shown in the Table 7.15. Fig 7.16 depicts the same in map. From the Home interview survey data, the existing inter-zonal as well as intra-zonal trip distribution is tabulated as the present OD Matrix in Table 7.16. It is observed that at present a total number of 59914 trips are produced in the study region on a day. Among the internal zones, the major trip producing zone is Zone No. 1 producing 56.3% of the total trips/day. Zone 1 comprises the areas of Muthukadu, Kadambidi, Vadakathara, Naramkuzhi, Kizhakethara, Kannanthara, Anikodu, Valmutty etc. The desire line map drawn for the present OD matrix is shown in Fig. 7.17.

Using the projected population of the study area and applying expansion factor for trip rate, the projected OD matrix estimated for the design year 2031 is given in Table 7.17. The desire line diagram drawn for the projected travel demand matrix is shown in Fig. 7.18. It could be learnt from the desire line diagram that the major traffic corridor is the one connecting the zones 1 and 9 (Chittur to Palakkad), followed by zones 1, 3 and 4. Hence the highest priority for future development for road network shall be given to these zones.

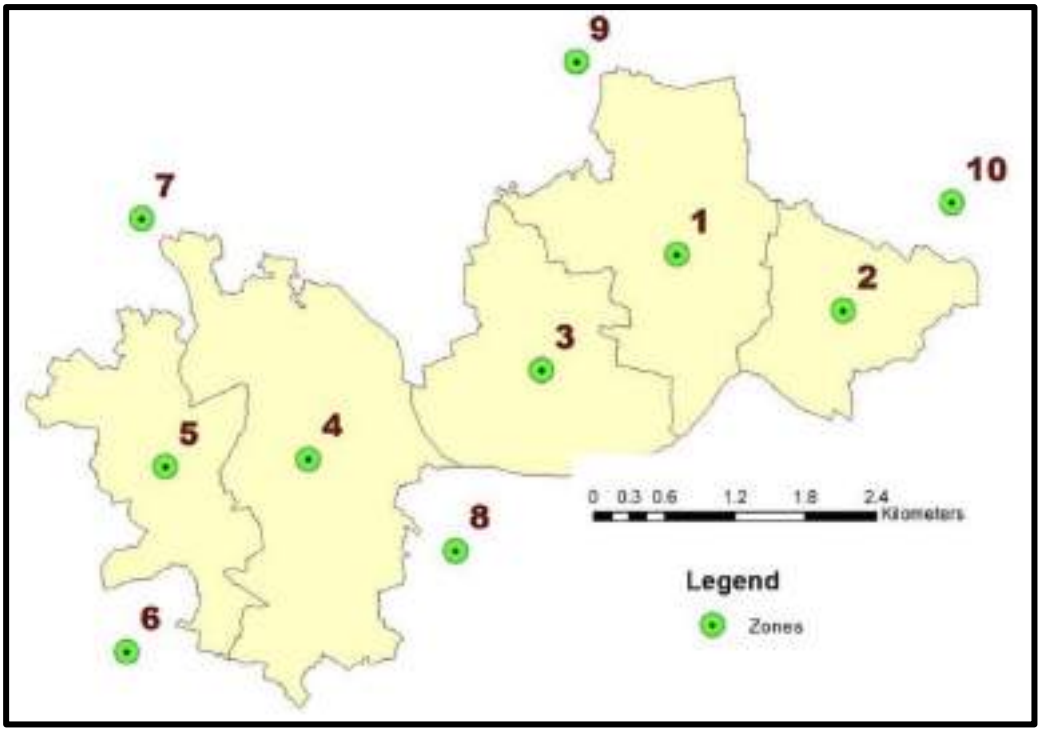


Fig 7.16 Distribution of zones in Chittur-Thathamangalam town

Table 7.16 Present O-D Matrix of Chittur-Thathamangalam town study area

Zone	1	2	3	4	5	6	7	8	9	10	Total Trips
1	24906	1362	1860	878	331	257	40	218	2772	1109	**33733**
2	1362	1062	384	16	33	24	16	65	392	122	**3476**
3	1860	384	2734	1764	462	122	0	61	535	152	**8074**
4	878	16	1764	862	256	184	152	32	535	295	**4974**
5	331	33	462	256	802	24	24	19	184	94	**2229**
6	257	24	122	184	24	0	0	0	0	0	**611**
7	40	16	0	152	24	0	0	0	0	0	**232**
8	218	65	61	32	19	0	0	0	0	0	**395**
9	2772	392	535	535	184	0	0	0	0	0	**4418**
10	1109	122	152	295	94	0	0	0	0	0	**1772**
Total Trips	**33733**	**3476**	**8074**	**4974**	**2229**	**611**	**232**	**395**	**4418**	**1772**	**59914**

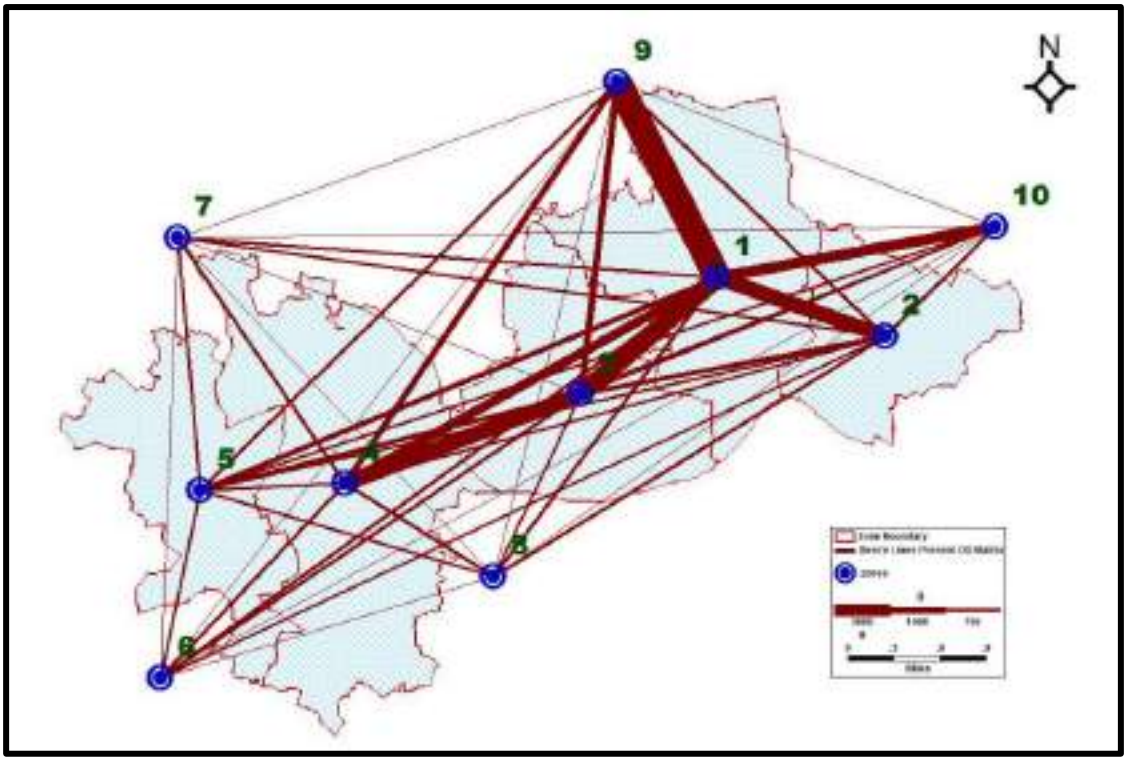


Fig 7.17 Desire line map for present OD matrix Chittur-Thathamangalam town

Table 7.17 Projected O-D Matrix of Chittur-Thathamangalam town study area

Zone	1	2	3	4	5	6	7	8	9	10	Total Trips
1	35616	1948	2660	1256	473	368	57	312	3964	1586	**48238**
2	1948	1519	549	23	47	34	23	93	561	174	**4971**
3	2660	549	3910	2523	661	174	0	87	765	217	**11546**
4	1256	23	2523	1233	366	263	217	46	765	422	**7113**
5	473	47	661	366	1147	34	34	27	263	134	**3187**
6	368	34	174	263	34	0	0	0	0	0	**874**
7	57	23	0	217	34	0	0	0	0	0	**332**
8	312	93	87	46	27	0	0	0	0	0	**565**
9	3964	561	765	765	263	0	0	0	0	0	**6318**
10	1586	174	217	422	134	0	0	0	0	0	**2534**
Total Trips	**48238**	**4971**	**11546**	**7113**	**3187**	**874**	**332**	**565**	**6318**	**2534**	**85677**

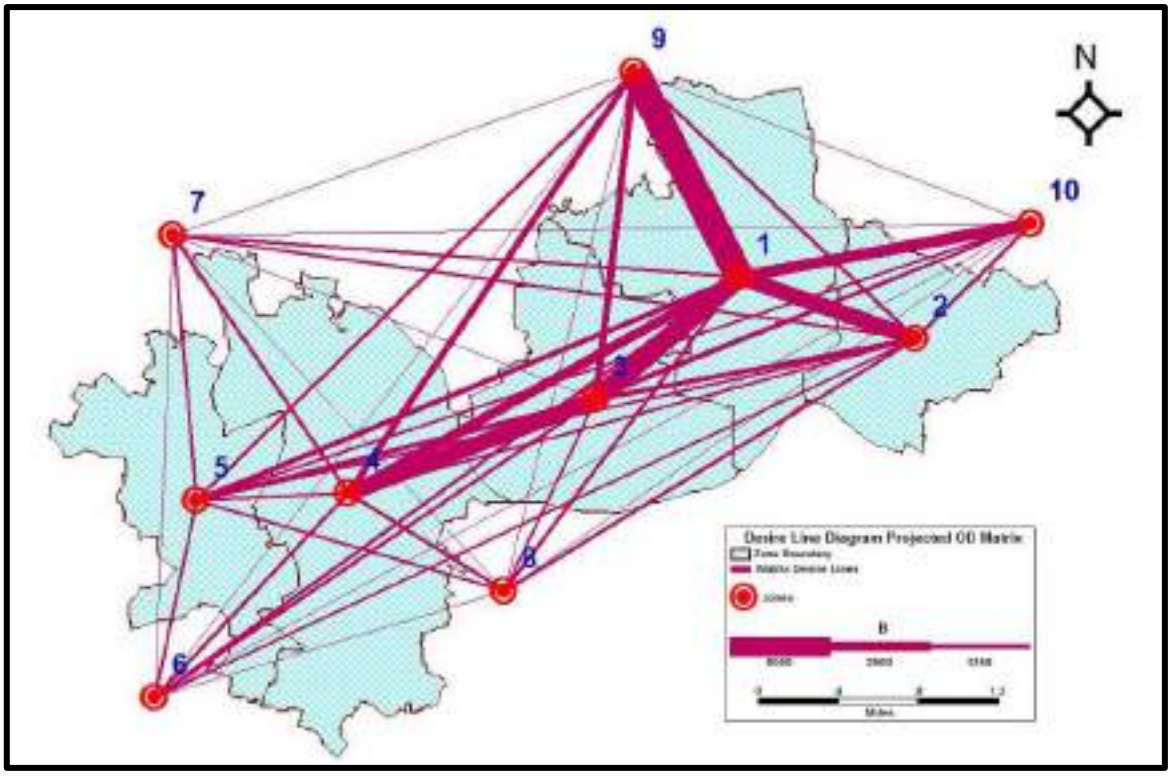


Fig 7.18 Desire line map of projected OD matrix for Chittur-Thathamangalam town

7.3.8 Characteristics of Passenger Traffic Modal Split

Table 7.18 Mode of travel in Chittur-Thathamangalam town study area

Sl No	Mode of travel	No of passengers	% of passengers
1	Bus	14001	43.94
2	Walk	10716	33.63
3	Auto - Rickshaw	2008	6.3
4	Mini Bus/School Bus	1291	4.05
5	Two - Wheeler	2360	7.41
6	Car/Van/Jeep	1121	3.52
7	Others	365	1.15
	Total	**31860**	**100.00**

The passenger transport in Chittur-Thathamangalam Town area is predominantly met by road based KSRTC buses and private buses, i.e. nearly 43.94 per cent. Another special feature noted is that walk trips also constitute a significant share (33.63%). Next important mode is 2-wheeler (7.41%), followed by autorickshaw (6.3%) and Minibus (4.05%). Table 7.18 gives the mode split of passenger traffic in the study area. Fig. 7.19 presents the same in a pie diagram.

Fig 7.19 shows modal split up of daily passengers in Chittur-Thathamangalam town. It can be seen that more than 70% of people in the town travel either by bus or foot. In which 43.94% people depends on public transport and 33.63% covers distances by walking.

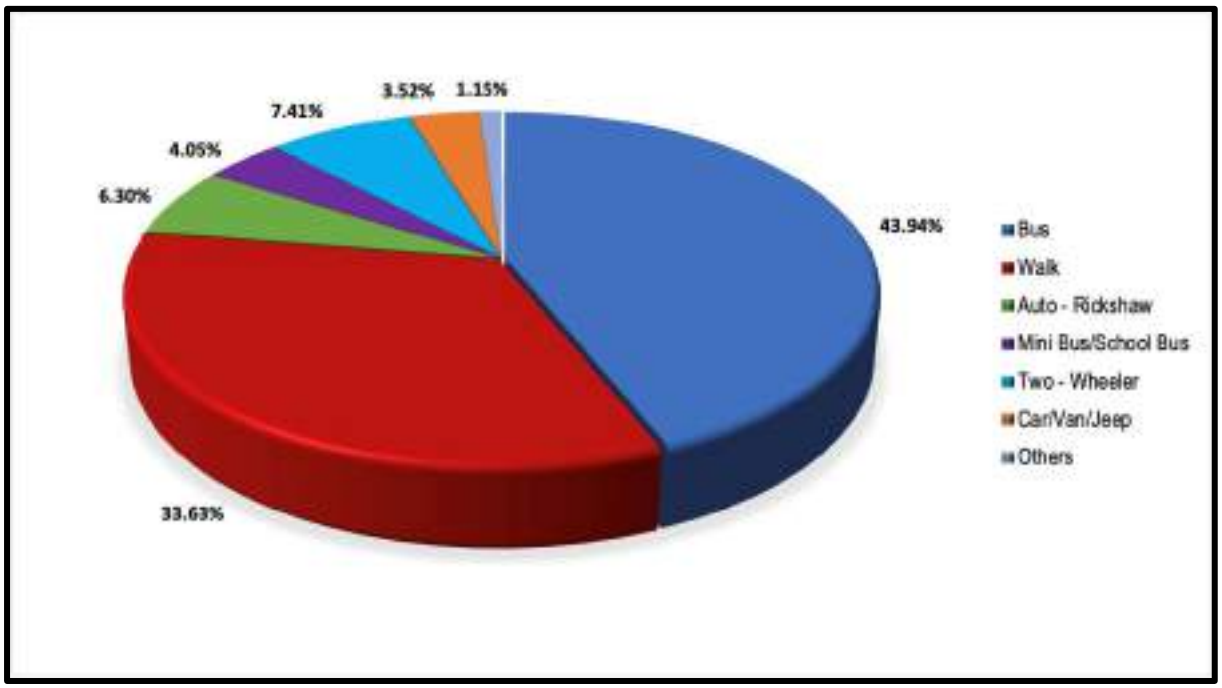


Fig 7.19 Modal split up of daily passengers in the town

Fig 7.20 is the graphical representation of trip makers based on their age. Almost equal percentile division is seen between age groups 7 to 25, 26 to 40 and 41 to 60. Children having age less than 7 and those in the age group greater than 60 together constitute a percentage of 22.73.

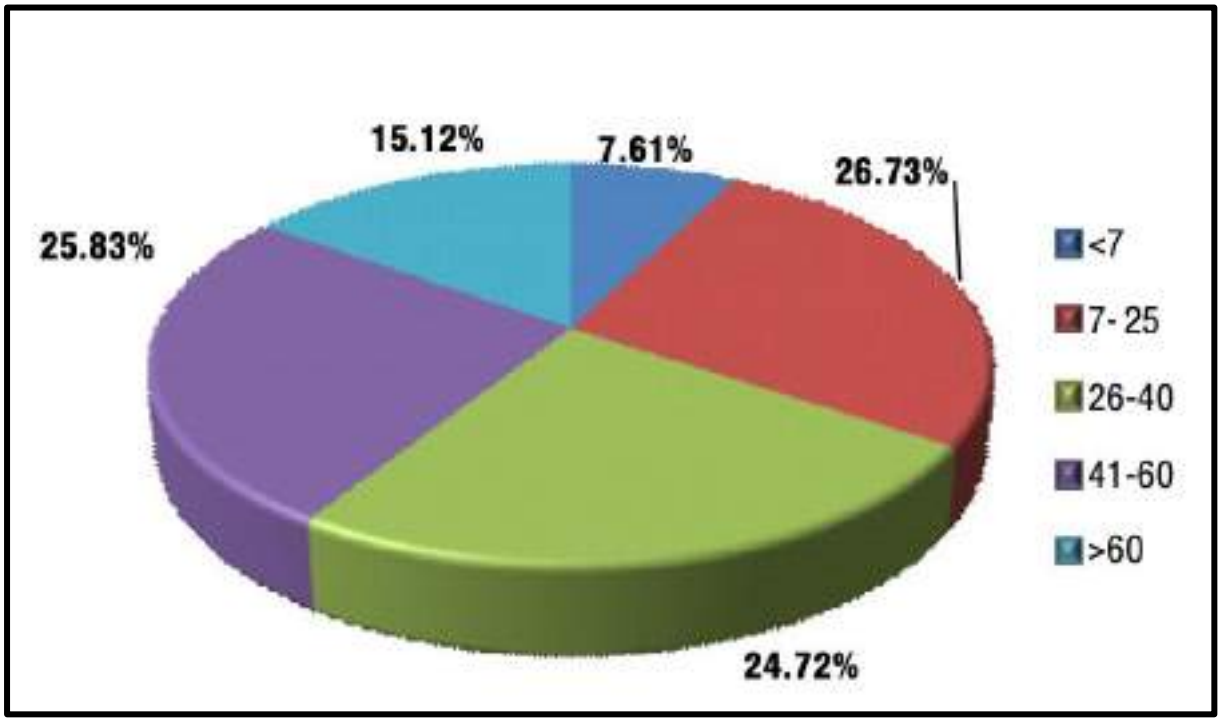


Fig 7.20 Distribution of trip makers according to their age

Fig 7.21 shows the distribution of passenger trips according to their gender in the town. Percentage split up is almost equal in the distribution. Women exceed men only by 0.01% value.

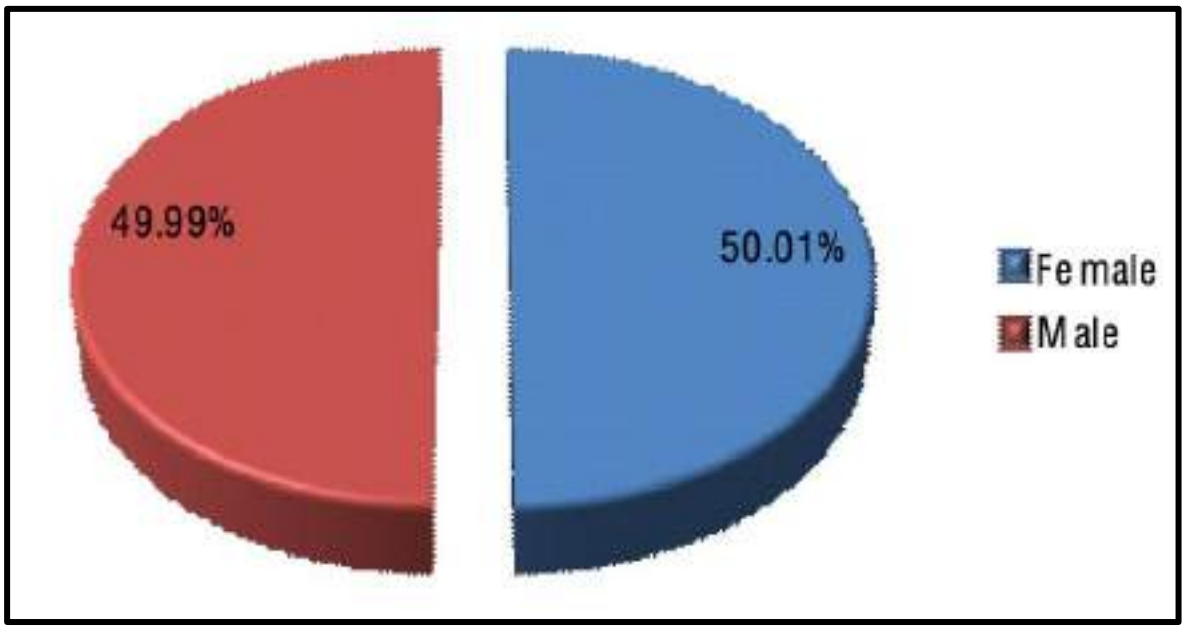


Fig 7.21 Distribution of passenger trips according to their gender in the town

Passenger trip distribution can be split again based on their income as shown in Fig 7.22. Analysis of graph shows that middle class family is travelling more compared to both upper and lower classes. Highest majority trip of 35% belongs to families having monthly income between 3000 and 8000.

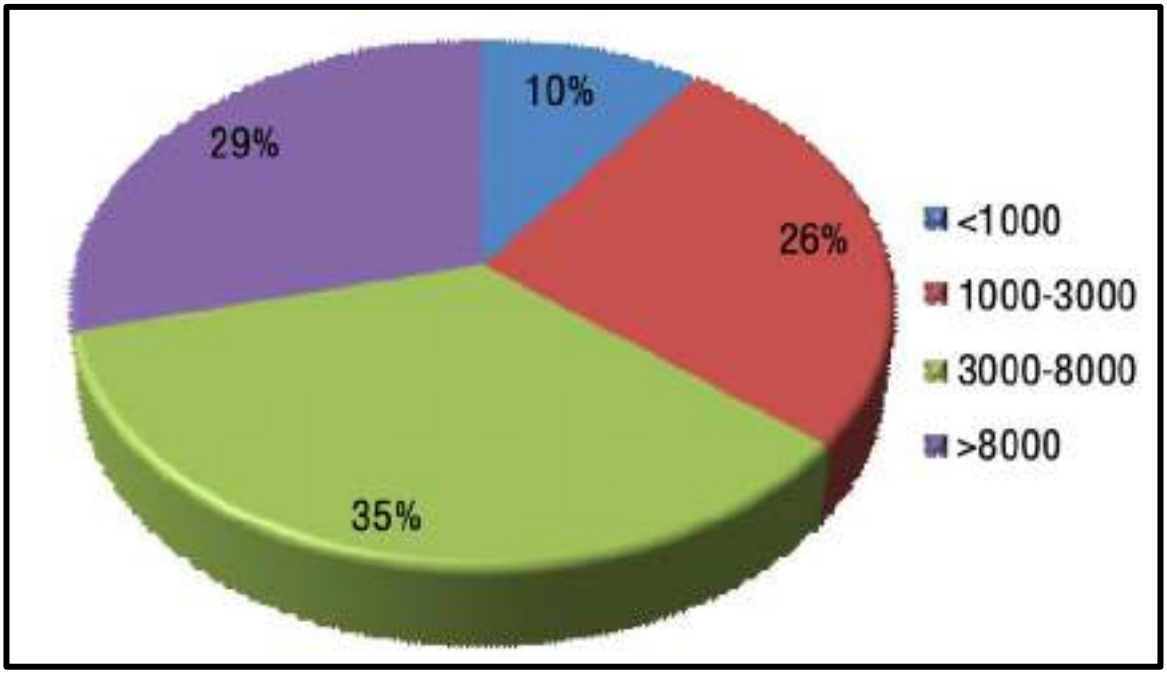


Fig 7.22 Passenger trip distribution according to their income

Fig 7.23 and 7.24 shows another classification of passenger trips. Fig 7.23 depicts the distribution based on purpose of travel whereas Fig 7.24 shows distribution based on

occupation. More than 60% of people travel for work, work related trips or education. Only less than 30% is travelling for other purposes.

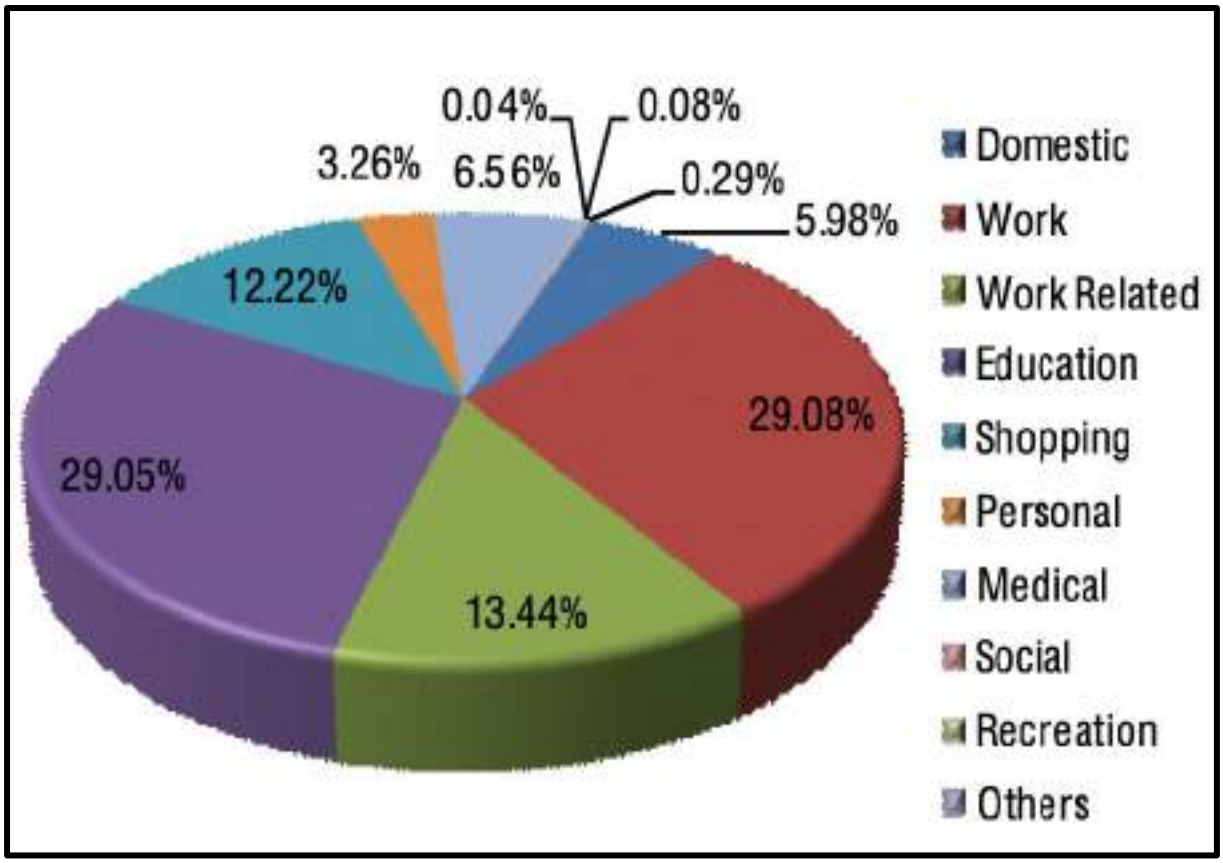


Fig 7.23 Distribution of daily passenger trips based on Purpose of Travel

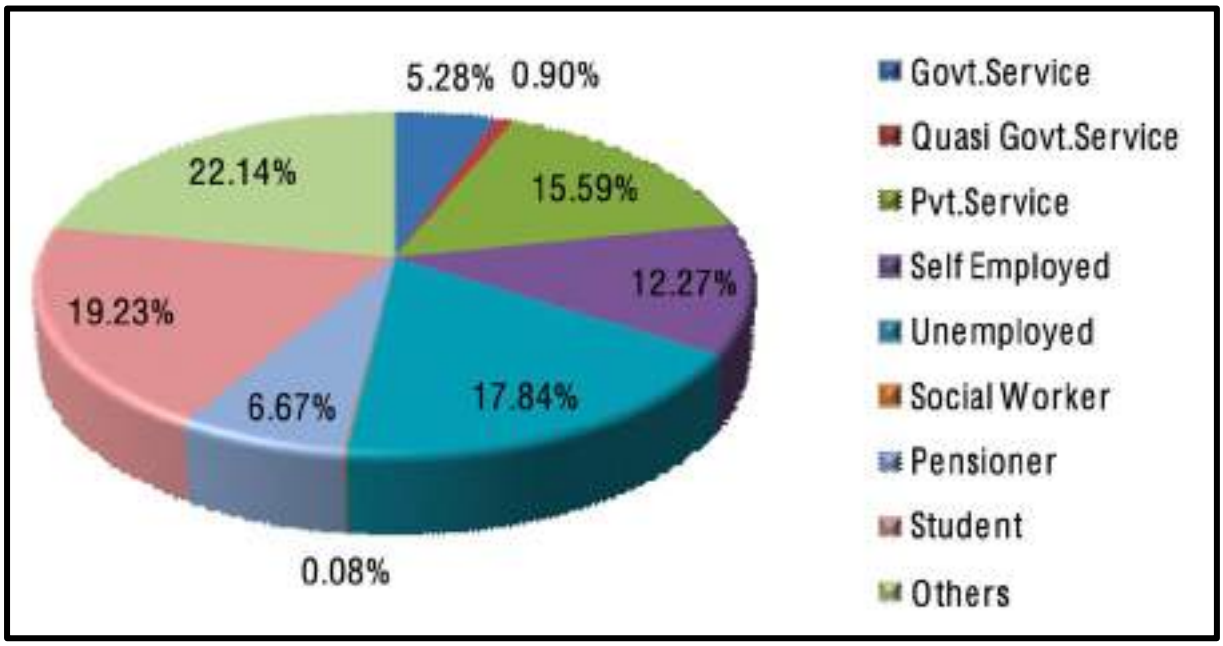


Fig 7.24 Distribution of daily passenger trips based on Occupation

7.4 Accident Prone Areas

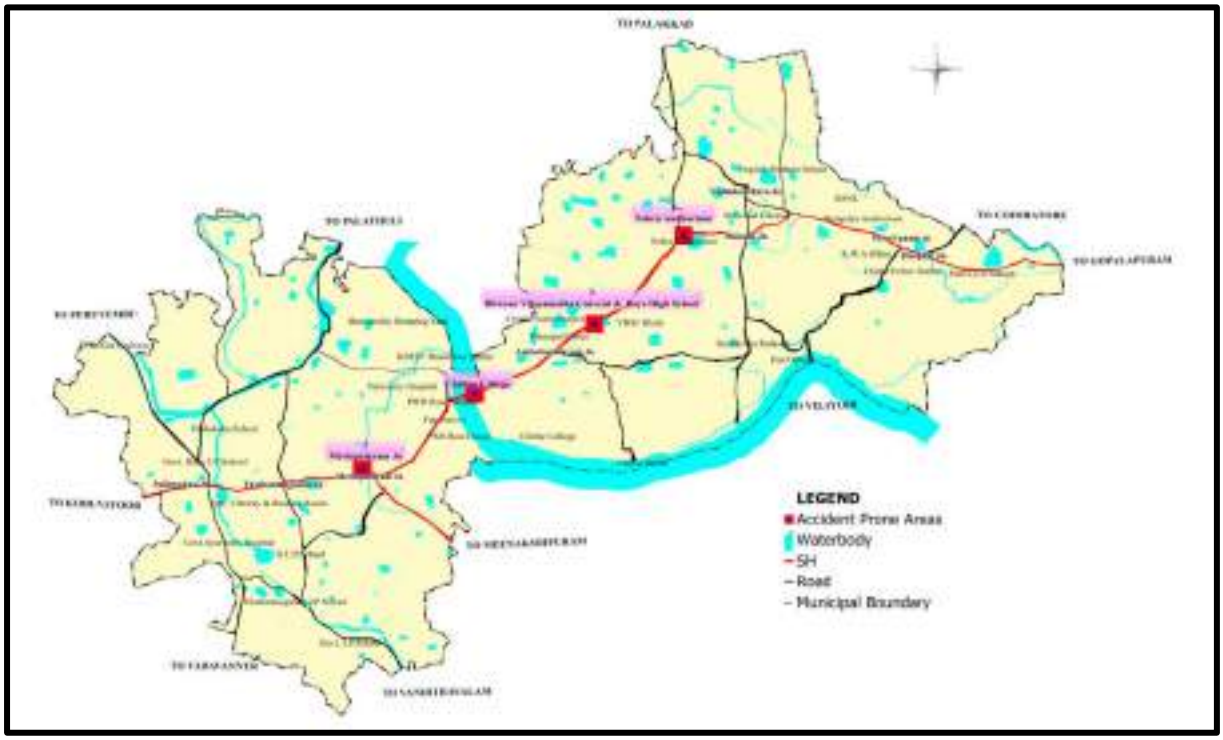


Fig 7.25 Accident prone areas in Chittur-Thathamangalam town

There are four frequently accident occurring spots in Chittur-Thathamangalam Town which is shown in Fig 7.25. They are Mettupalayam Curve, Sowdambika Junction, Chittur, Petrol Pump Junction, Chittur, Ambattupalayam, Kacherimedu, in front of Chittur Municipal office, in front of Nehru Auditorium, Chittur and Vadakkathara. The main reason for accidents is over speeding of vehicles (and in a couple of cases due to poor geometry of road due to sharp bends etc.). The correlation between width of road and over speeding should be noted, since all the accidents are occurring in Anikode Jn to Mettupalayam Jn stretch. This stretch has the highest road width among all roads in the town, 11.4 m, which encourages vehicles to speed, naturally resulting in accidents considering that there is dense settlement stretches along the highway and no footpaths provided for pedestrians.

Table 7.19 gives the Number of accidents between 2011-2022. There seems to be some drop in the number of accidents in the last few years, but this could also be an impact of the pandemic lock down and reduced mobility overall.

Table 7.19 Number of accidents between 2011-2022

Year	Accidents	Year	Accidents
2011	28	2017	8
2012	26	2018	15
2013	15	2019	20
2014	20	2020	8
2015	16	2021	9
2016	19	2022	11

7.5 Transport Terminals

The study of transportation terminals is very important in traffic and transportation as these act as nodal points in the transportation network. In Chittur-Thathamangalam Town there are two bus stands – Municipal bus stand for private buses at Thathamangalam and KSRTC bus stand near Chittur puzha bridge. Spatial distribution of two bus stands are shown in Fig 7.26.

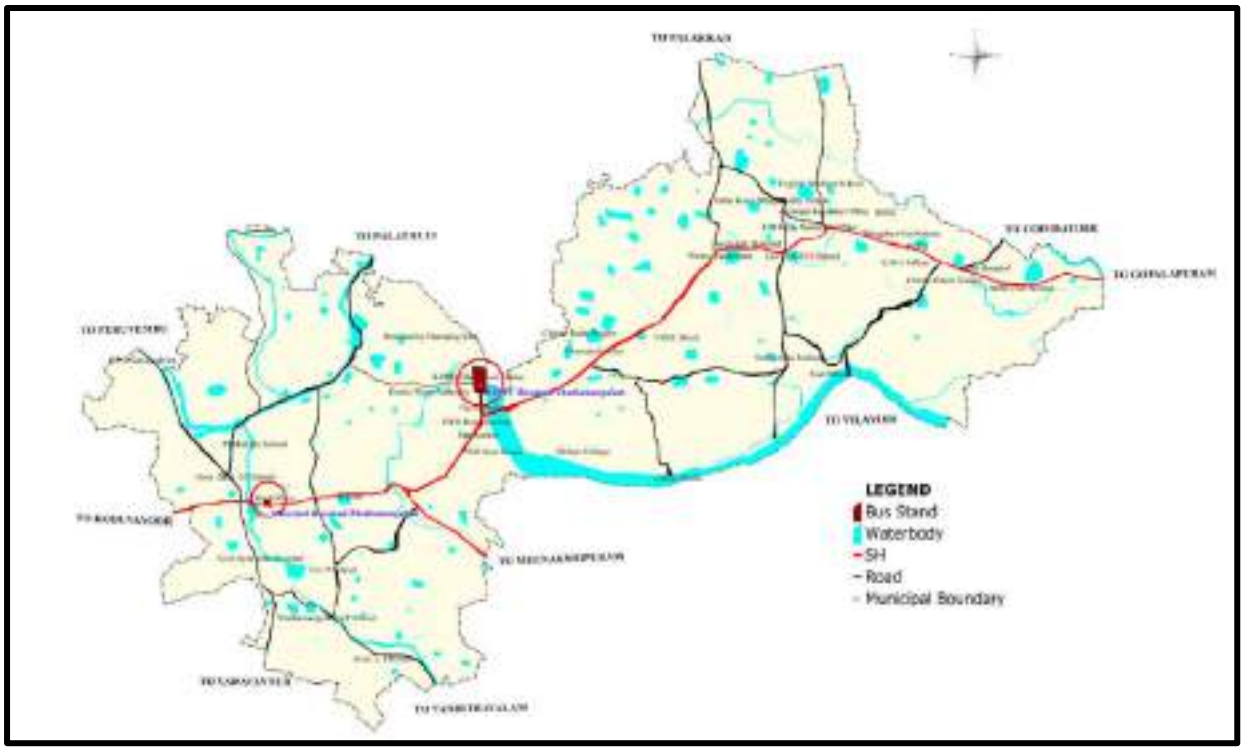


Fig 7.26 Spatial distribution of existing transport terminals in Chittur-Thathamangalam town

There are regular private bus services from these bus stands to Thrissur, Palakkad, Kollengode, Kozhinjampara, Coimbatore, Pollachi. More than 300 buses are plying through town every day. It is highly essential to have a bus stand in the Chittur area. Long distance bus transport is provided by KSRTC. There are 30 schedules operating from this depot out of which eleven are interstate services. Intra state bus services connects Chittur town to other District headquarters. KSRTC Bus depot is having an area of nearly 5 acres and Municipal bus stand at Thathamangalam is having an area of 1 acre and 36 cents.



KSRTC sub depot, Chittur and Municipal Bus stand, Thathamangalam

7.6 Railway

Chittur-Thathamangalam Municipality is not connected by railway lines. Those who wish to travel by train will have to depend on Palakkad Jn. as it is the closest major railway station.

7.7 Bridges



Nilampathy bridge and Vilayodi bridge at Chittur

Chittur-Thathamangalam town is abundant with waterbodies. Many thodus flows elegantly through the municipal area creating provisions for more bridges. Chittur puzha palam and Nilampathy bridge, near Chittur College and at Vilayodi, respectively are the major bridges situated in the town. Location of Bridges are shown in Fig 7.27. There is an old abandoned bridge near Chittur College, which offers the opportunity to be rejuvenated as a vibrant public space.

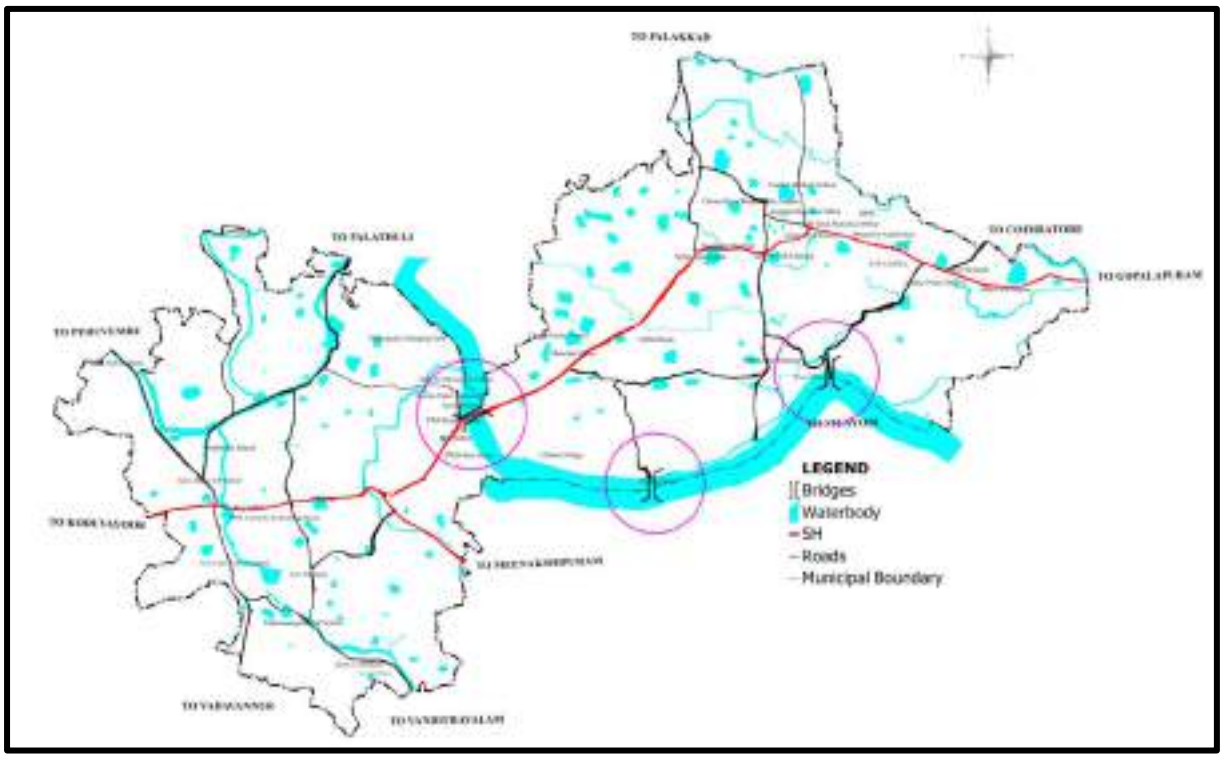


Fig 7.27 Location of bridges in Chittur-Thathamangalam town

7.8 Parking Facilities

Parking is another major area of concern for almost all towns/cities. Increasing number of vehicles, narrow road networks, absence of parking lots/spaces within majority of built spaces renders parking as a critical area for planning and development.

Chittur-Thathamangalam town has an authorised taxi stand at Anikode Junction. In many other places off street parking of vehicles are seen. More than ten auto stands situated near all bus stands and public spaces at Hospital Jn, near Civil station, Anikode Jn, Chanthapettah, Marketing complex etc are seen in Chittur-Thathamangalam Municipality.

On street parking causes congestion at major roads which are mostly minimum 2 lane road width. Even though difficulties arising due to lack of parking is less in the present condition, considering future demand, more facilities are to be incorporated. Location of all auto stands, taxi stands, and other parking areas are shown in Fig 7.28.



Taxi stand at Anikode Junction



Auto stand at Chittur Anikode Junction


Taxi stand at hospital Junction

Along the major commercial areas such as Anikode Jn, Thathamangalam Jn etc., organized parking spaces are not found sufficient, hence this results in on-street parking. Even the areas where organized parking spaces have been provided are facing the problem of traffic congestions and bottlenecks due to on-street parking of vehicles. Parking areas are not provided

in most of the old commercial establishments. This causes increased on-street parking along the major roads in the main market stretches in both Chittur and Thathamangalam.

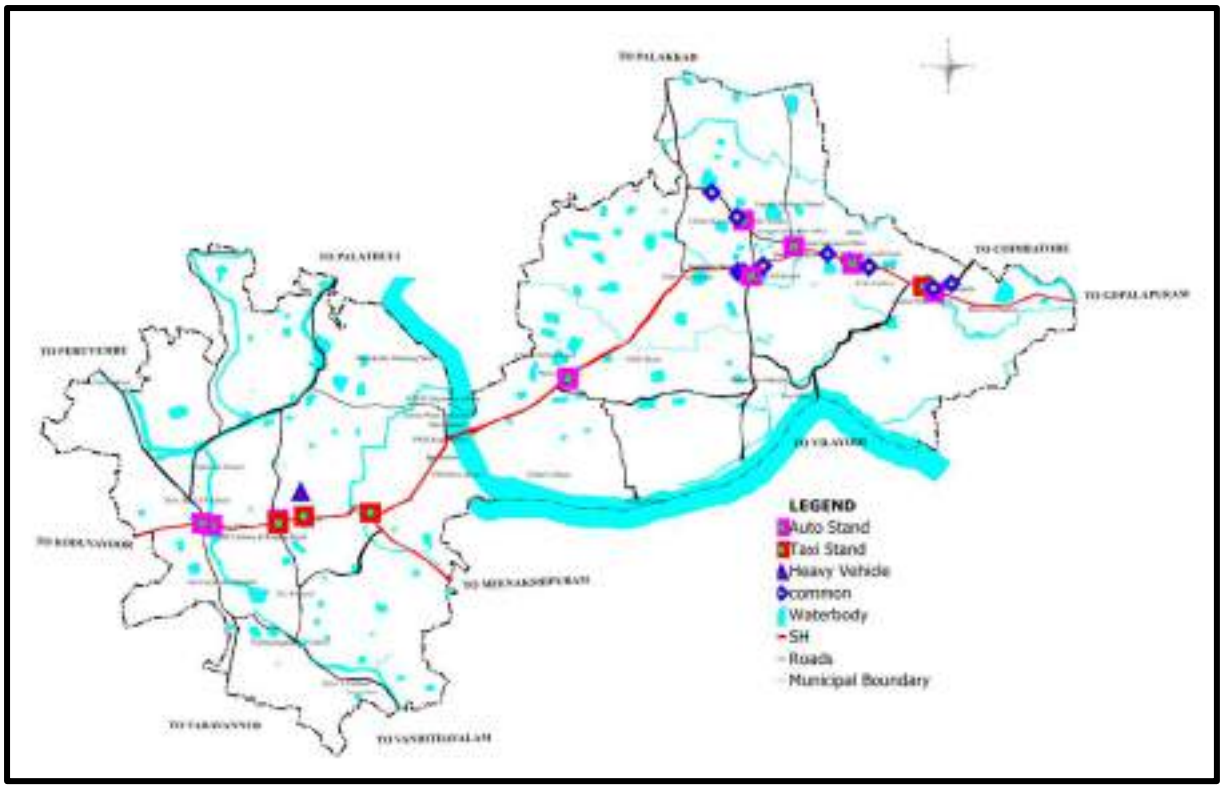


Fig 7.28 Location of parking areas in Chittur-Thathamangalam Town



Auto stand at Mettupalayam Junction



Off street parking

7.9 Inland Water Transport

The scope for development of the Inland water transport is non-existent due to the highly unstable nature of water bodies and the rolling condition of the terrain.

7.10 Truck Terminals

At present, Chittur-Thathamangalam town does not have any truck parking terminals. However, it must be noted that though most of the trucks and lorries are parked on the roadside, as mentioned earlier, this parking is for a very limited duration. Hence, a truck terminal or such an arrangement that provides for longer term truck parking is not required.

7.11 Bus Routes in Chittur-Thathamangalam Town

Efficient bus routing can minimize the number of routes which must terminate in busy central areas, while efficient scheduling and regulation of departures can minimize vehicle waiting times. Bus routes in Chittur-Thathamangalam town is shown in Fig 7.29

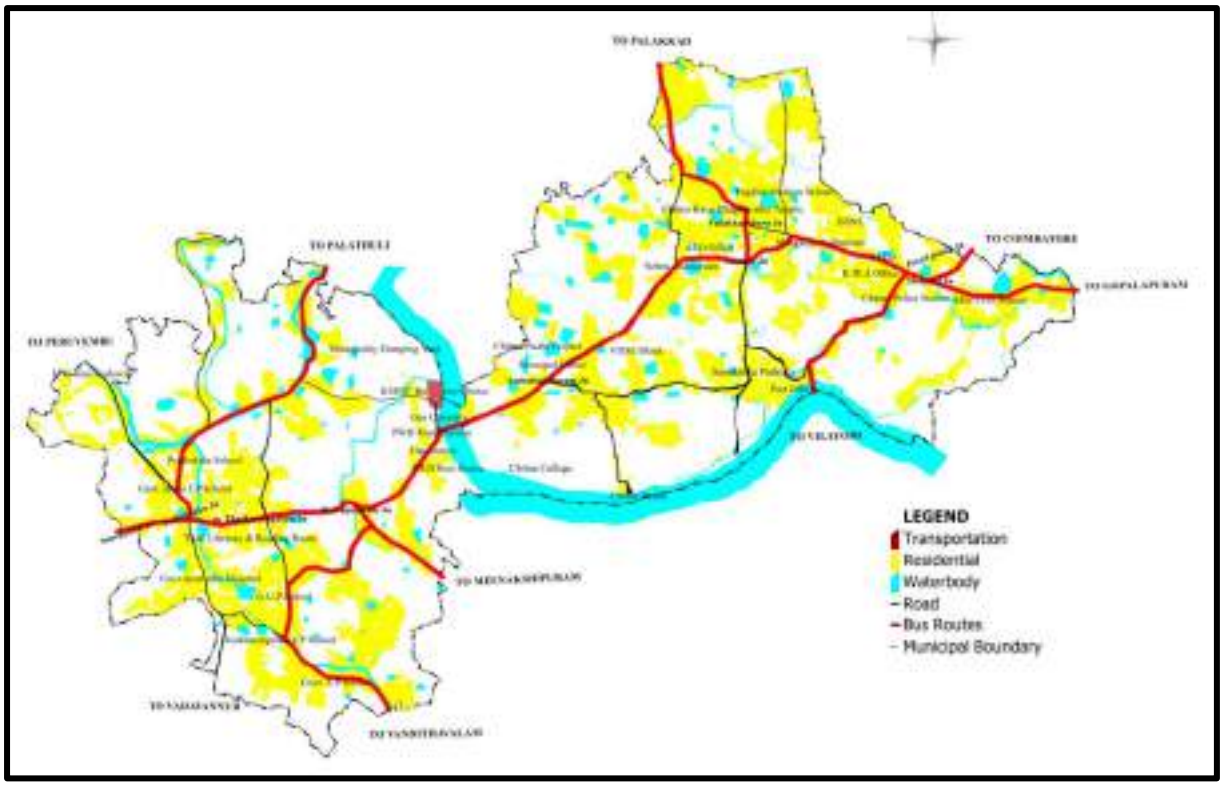


Fig 7.29 Bus routes in Chittur-Thathamangalam town

It must also be noted that buses travelling from Kozhinjampara to Thrissur currently must travel through Chittur town. Similarly, Gopalapuram - Palakkad bus route also passes through Chittur town. Such long-distance buses may benefit from bypassing the town, if majority of the passengers are point to point destination travellers, also resulting in faster travel times and greater fuel efficiency.

7.12 Problems

There are hundreds of frontages and accesses to the road network in Chittur-Thathamangalam municipal area including the State Highways characterised by commercial movement and local traffic having scores of pedestrians and users of public transport. For these reasons, the roads traversing through the area including SH25 and SH27 can best be classified as urban roads.

Though named as highways, the State Highways passing through the municipal areas in all its right transport sense cannot be termed as 'highways', rather should be designed as 'urban roads', due to the nature of land use (shops, residences, religious places, academic institutions, etc.) having direct access or frontage to the roads. In terms of road users, the road network in the region including the current SH25 and SH27 are used by pedestrians, cyclists and motor cyclists along with cars, buses, trucks and others. It is evident that most of this traffic caters to the local needs of the municipal area. The planning and design requirements of urban roads or urban streets significantly vary from rural roads and highways. While the highways cater to long distance traffic having higher speeds, the urban roads or streets places priority for local traffic and local requirements. The highways are characterised by fully or partial access control, while urban roads allow any number of frontages or accesses to the road. Therefore SH25, and SH27 passing through Chittur-Thathamangalam shall be considered as urban roads for planning and design purposes.

Speed is another differentiator while planning and designing a road. While a rural highway with limited of fully access control can have speeds ranging from 50 km/hr to 100 km/hr, the speeds in urban roads and urban streets must be restricted from 30 km/hr to 40 km/hr. Pedestrians (mostly local residents) shall have to be kept at the centre of the planning and design paradigm in such an environment. It shall be noted here that probability of pedestrian deaths is more than 80% in the event of a collision between a pedestrian and a vehicle traveling at around 40 km/hr and the probability reaches 100% for speeds greater than 50 km/hr.

Further it is viewed that for Chittur-Thathamangalam the road widening requirements (including State Highways) need not be developed using volume capacity relationships which in fact would be applicable for access controlled inter-state highways elsewhere having different land-use environment. The capacity constraints in urban areas have to be managed through various other interventions like better public transport, paid parking, transport demand and supply management, etc. Hence widening roads is considered as the last resort to deal with capacity constraint.

The town is well connected with neighbouring villages and towns but unfortunately, the town has a high number of accident spots along its main street, the state highway. This is a result of two issues: one, it currently has roads that are wider than necessary which encourage vehicle over speeding and two, there are no pavements for pedestrians. Some areas like Thathamangalam do not need external traffic calming measures since the current road widths ensure safety. All major Junctions need redesign.

7.13 Potential

Fully lit streets and roads are a hallmark of Chittur-Thathamangalam Municipal area. Once the bypass connecting Mettupalayam Junction and Pallimukku - Palathully road, (which is a PWD project for which acquisition has been almost completed) is finished, some of the vehicular load at Thathamangalam Jn will be reduced. Larger regional networks when studied indicate that provisions can be made to strengthen existing road networks in the neighbouring panchayats with a view to enable regional-through traffic so as to bypass Chittur-Thathamangalam town causing least disruption of everyday life in the town and its surroundings. The above identified regional connections (see Fig 7.30) may be augmented to enable the town to retain its peaceful ambience.

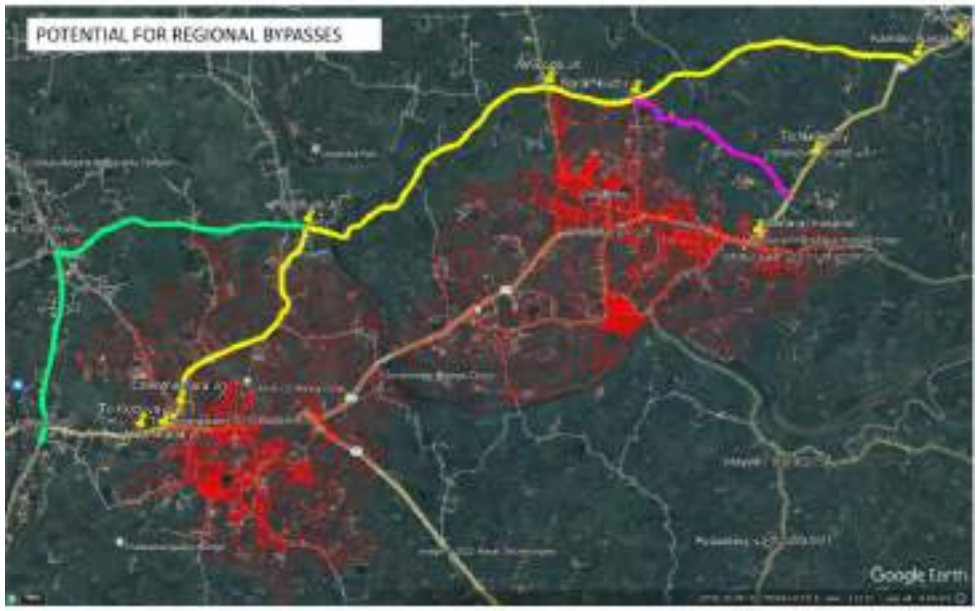


Fig 7.30 Potential for Regional Bypasses

7.14 Inference

Chittur-Thathamangalam is predominantly a semi-rural settlement. The current road network is mostly adequate, however it largely caters to the needs of motorized traffic with a complete lack of any infrastructure for pedestrians and cyclists in the current road design. This is a key issue that needs to be rectified. All of the major Junctions in the Chittur-Thathamangalam Municipality area lack any Junction form and need to be engineered to include elements for safe travel of all types of road users – pedestrians, cyclists, high speed motor vehicles – using the Junction. The traffic operations in Junction areas and urban sections are chaotic, triggered by chaotic road engineering. Due to the lack of specific parking spaces, two wheelers and cars park on the roadside in a haphazard manner creating congestion and putting the vulnerable road users at risk. Chittur and Thathamangalam settlements are of walkable scale and many daily activities can be undertaken by walking or cycling. A large chunk of road users are pedestrians and hence better quality of life can be restored by enhancing pedestrian movement. Since the state highway passes through dense settlement areas, the entire town should be a 'slow speed zone'. Traffic calming is essential for this one-street town to increase safety and livability. The town does not see major traffic snarls and the little bit of congestion experienced currently can be resolved through traffic management measures, some parking provisions. Further, more than 50% of the town area is under paddy cultivation, which needs to be protected. Hence, the requirement for Chittur-Thathamangalam town is selective upgrades of existing infrastructure with functional interventions and policy measures that enable sustainable mobility and active travel. There is a need for traffic proposals that are a combination of traffic management solutions like one-ways and traffic calming along with road design solutions like continuous pedestrian walkways throughout the town, road Junction improvements and small amount of road widening in a few, selected spots. Most importantly, the road transport proposals should not significantly disturb the economic and social fabric of the region, should improve the safety of all users of the roads, in particular the vulnerable road users including cyclists, pedestrians including senior citizens, should accommodate the expected traffic to ply on the road network in the future and should promote 'active travel'.

Chapter 8: PHYSICAL INFRASTRUCTURE

The primary components of City Infrastructure are roads and transportation services, Water supply and distribution, sanitation – wastewater collection and removal, and solid waste management. These services are often called as “Urban services”. To facilitate and sustain the growth of cities, they have to provide efficient infrastructure facilities. It becomes very important to study the existing situation of the amenities, before an improvement proposal is made.

8.1 Water Supply

8.1.1 Existing Water Supply System

Water is one of the major urban services and lack of it will result in unhygienic conditions and deterioration of living standards. Kerala Water Authority is the agency responsible for planning, design, construction, implementation, maintenance, operation and management of water supply system within the entire Kerala state. Kerala Water Authority works on commercial basis by generating usage tariff so as to meet the operational cost and capital expenditure.

Important Sources

Major source of water in Chittur-Thathamangalam Municipality is piped water supplied by Kerala Water Authority followed by water from open well. Figure. 8.1shows source of water in the municipality. It can be clearly seen that water supply by Kerala Water Authority is mostly used compared to all other sources. Well water stands next to the piped water supply water usage. The existing scheme has two sources in Chitturpuzha.

1. An intake well of diameter 8.50 m and depth 14.80 m is located on the north-western side of the Chitturpuzha bridge. This WSS was commissioned in the year 1978. The raw water is pumped through 350mm CI pipes for length of 250m to the MLD WTP using 2 nos (1no. stand by) Vertical Turbine pumps of capacity 35 HP. This source caters to the Thathamangalam & Ambattupalayam Zones.

2. An intake well of dia 4.0 m and depth 14.80 m located in the bank of Chitturpuzha at Koompanparakkadavu. The raw water is pumped through 250 mm DI K9 pipes for length of 200 m to the 3.45 MLD WTP using 2 nos submersible pumps of capacity 25 HP to cater to the Chittur Zone having a yield of 6.75 MLD is the main source for WSS. It is located on the northwestern side of Chittur Puzha bridge.



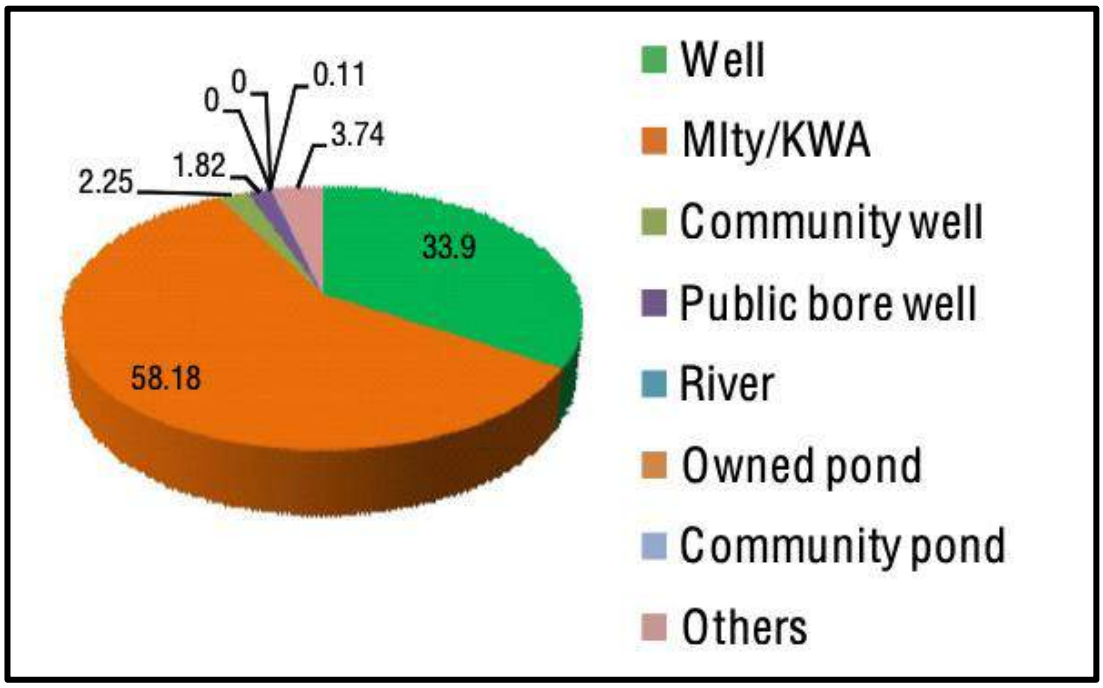


Fig 8.1 Sources of water

As per the above data it is revealed that major share of population (58.18 %) depends upon KWA followed by well water, (33.9%). 1.82 % of people depend on public bore well and 2.25 % of population use community well.

Existing Transmission, Distribution and Storage Capacities

Water from Chittur puzha is collected in an intake well and using motor it is pumped into two treatment plants, one of 8 MLD WTP (of which 5 MLD is shared with Thathamangalam and Ambattupalayam Zone of Municipal area and 3 MLD is shared with Vadavannur Panchayat) and another of 3.5 MLD WTP for the Chittur Zone, water is then treated using processes like Clarification, Aeration, Filtration and Disinfection. After treatment it is collected in tank of 3 Lakh litre capacity. From that it is pumped into three Overhead Service Reservoirs (OHSR), one situated at Telungu Street, Devangapuram having a storage capacity of 10 lakh litres in Chittur Zone; another situated in Municipal Compound, having a storage capacity of 7 lakh litres in Ambattupalayam Zone and the third at Thathamangalam having a storage capacity of 7 lakh litres in Thathamangalam Zone. The total distribution lines are divided into 3 zones via Chittur, Ambattupalayam and Thathamangalam zones. The total length of distribution network is 95 km (Chittur and Ambattupalayam Zone: 56.50 km and Thathamangalam Zone 38.50 km). Distribution pipes ranges from 300 mm to 63 mm PVC and 4534 number of service connections are provided. The total quantity of water supplied daily is 11.5 MLD and the coverage is 100%. Details of WSS is shown in Table 8.1 and their spatial distribution is shown in Fig 8.2.

Table 8.1 Details of WSS

Sl. No.	Net work	Sources	Area of Coverage (wards)	No of houses covered/no. of connections	No. & capacity (LL) of OH tank	Total Quantity supplied per day	Quality of water
1	Chittur Zone: 95 kms, Ambattupalayam Zone: 56.5 km, Thathamangalam Zone: 38.5 kms.	Chittur puzha	29 wards	Domestic connections- 9549, Non- Domestic-530. Industrial- 1, Others- 438. Public taps- 91	3 OHSRs: Chittur Zone: 10LL, Ambattupalayam Zone: 7 LL, Thathamangalam Zone: 7 LL	11.5 MLD	Properly treated

Source: KWA, Chittur & Thathamangalam

There are a total of 10080 water connections, 9549 numbers are domestic connections. The remaining 530 non-domestic connections are distributed between Industrial (1), public and others. There are 91 Nos of public taps. There are three zones, Zone I: Chittur Zone, Zone 2: Ambattupalayam, serving wards of Chittur area and Zone 3: Thathamangalam, serving wards of Thathamangalam area. Of these three zones, the Thathamangalam Zone is relatively a water scarce area at the tail end.

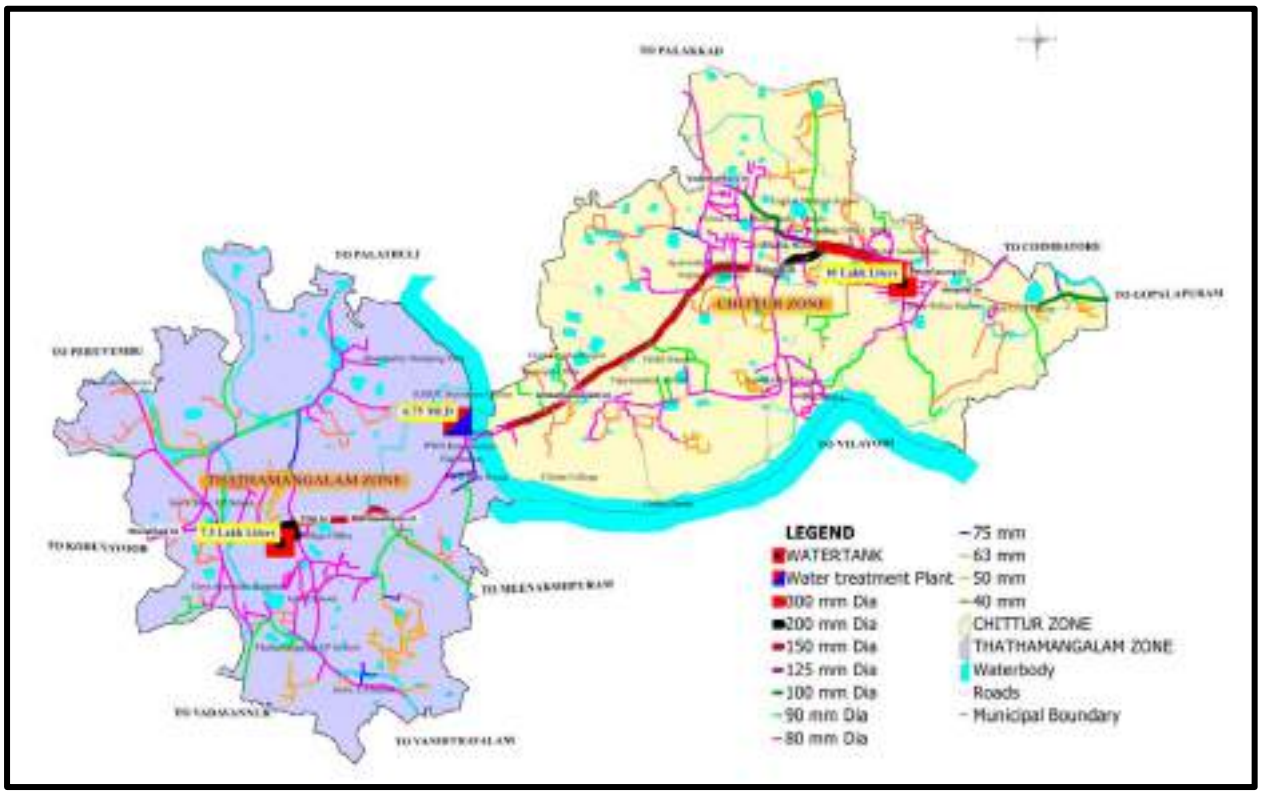


Fig 8.2 Water Supply distribution system of Chittur-Thathamangalam Municipality

8.1.2 Distance to Water Sources

From the socio-economic survey 2012, it is observed that more than 87% of water sources are located within the compound of dwellings. Fig.8.3 clearly depicts accessibility of water in terms of distance to it.

8.1.3 Duration of Water Supply

According to data collected from the 2012 Socio-Economic Survey about 49.95% of the houses are having water availability for 24 hours, 19.25% of houses having 12-24 hours, 8.34% of houses having 6-12 hours, 18.82% of houses 1-6 hours, 0.96% of houses receives less than one hour and 0.21% receives once in 2 days or more. The nature of water availability as per Socio-Economic survey is shown in Fig 8.4.

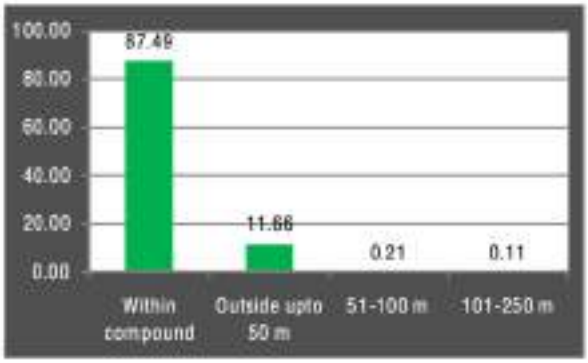


Fig 8.3 Distance to water sources

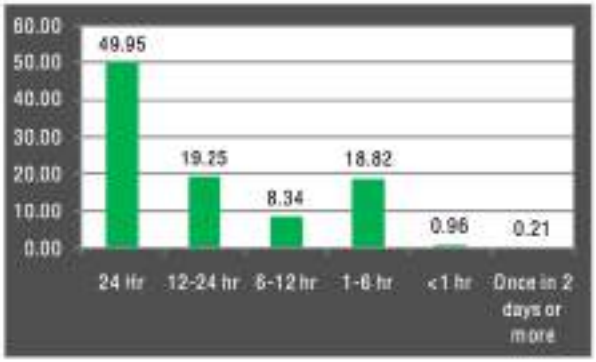


Fig 8.4 Duration of water availability



Pumphouse of Chittur WSS



Well and Pump House at Chittur



Water Treatment Plant at Chittur





Reservoir at Chittur

8.1.4 Ground Water Table Depth

There are two observation wells in the town. Depth of water table from ground level in bore well near Government Ayurvedic Dispensary, Thathamangalam which is the observation bore well of Ground water department is 6.99 m average of 10 years in peak summer. Hydrograph of the observation well for the period March 2003 to December 2012 is shown in the Fig 8.5.

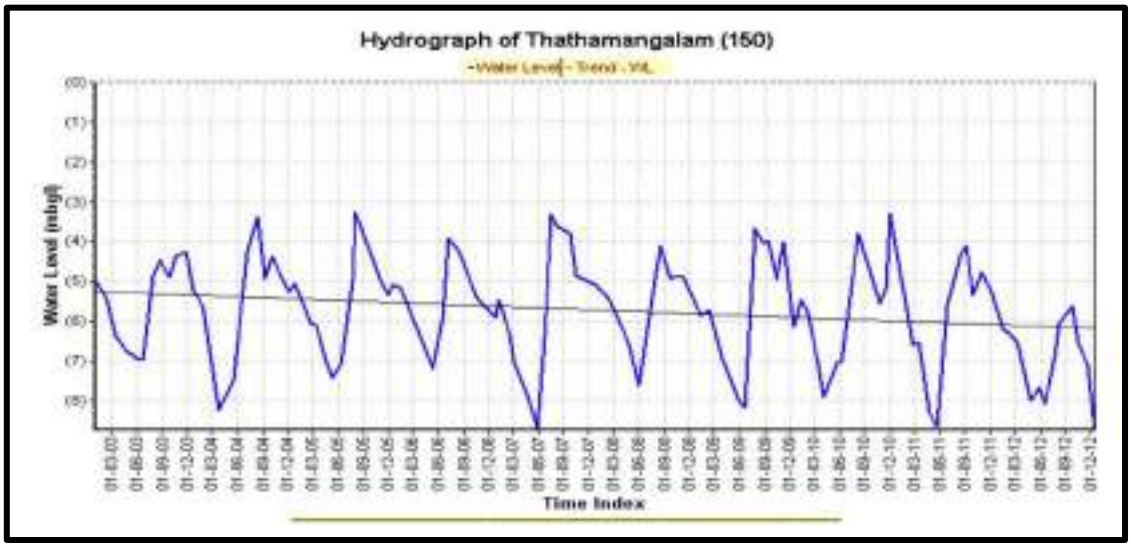


Fig 8.5 Hydrograph of observation well

Ground water has been declining rapidly in the town over the last decade. The average Ground Water table depth in borewell at Govt Ayurvedic Dispensary Thathamangalam was 6.99m (10 years average in peak summer) in 2012. The details of ground water levels since 2012 in the two wells in the town also show a declining trend till the floods of 2018, after which there has been a slight increase in the ground water table. (Refer Fig 11.1) However, the town is listed in the national list of water stressed municpalities due to over extraction and inadequate recharging of the ground water.

8.1.5 Water Scarcity

In summer water scarcity used to be an issue in the town. High temperature in the district causes summer drought in majority of the portions; some parts of Chittur-Thathamangalam Municipality also gets affected by this climate. Water level in wells fall beyond usable limit in some regions of the city. Water availability from Chitturpuzha reduces considerably in summer season and it forces inhabitants to depend on some other means (water distributed by tanker lorries) especially in summer.

According to data collected in the 2012 Socio-Economic Survey about 75.83% of the houses are not having water shortage, 14.97% of houses having scarcity for 1-2 months, 5.56 % of houses having scarcity for 2-3 months, 0.75% of houses having scarcity for a period of 3-6 months and 2.89 % of houses having scarcity for more than 6 months. The nature of water scarcity as per Socio-Economic survey is shown in Fig.8.6

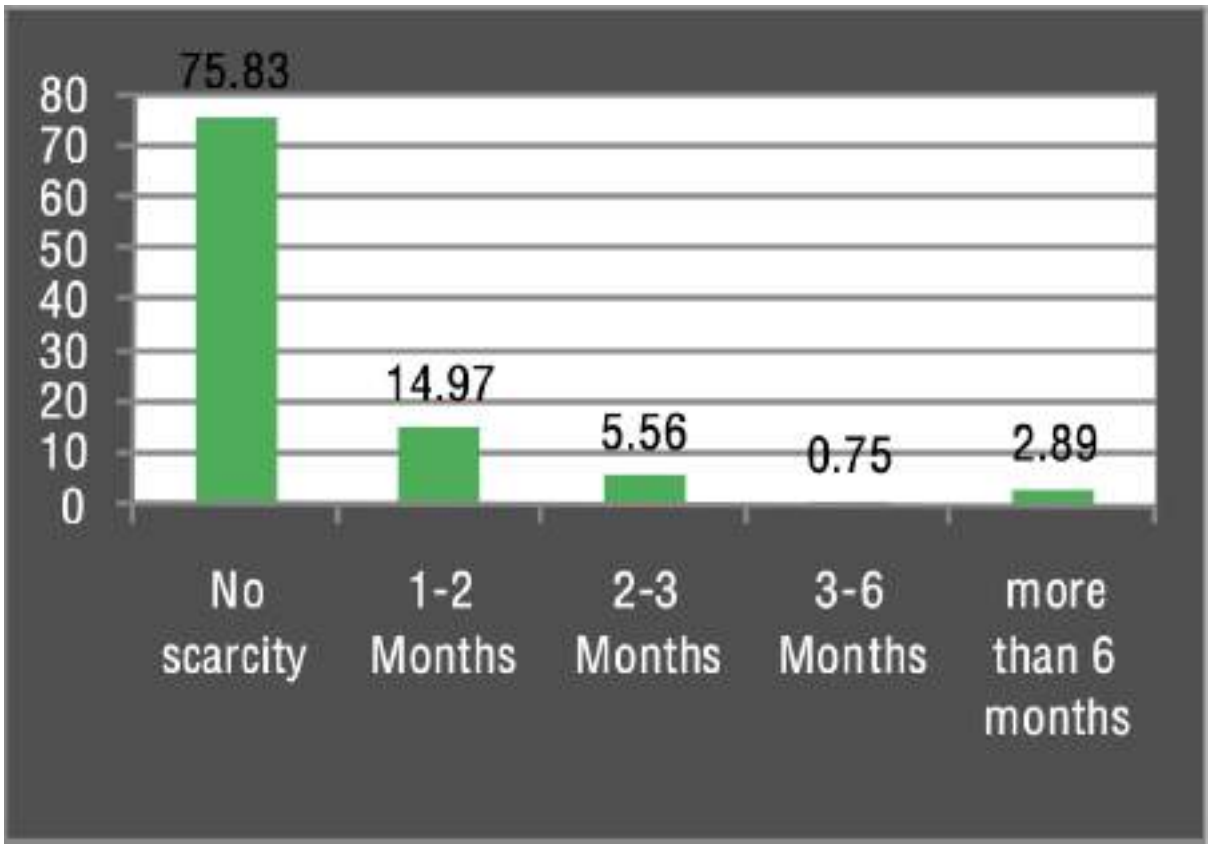


Fig 8.6 Nature of water scarcity

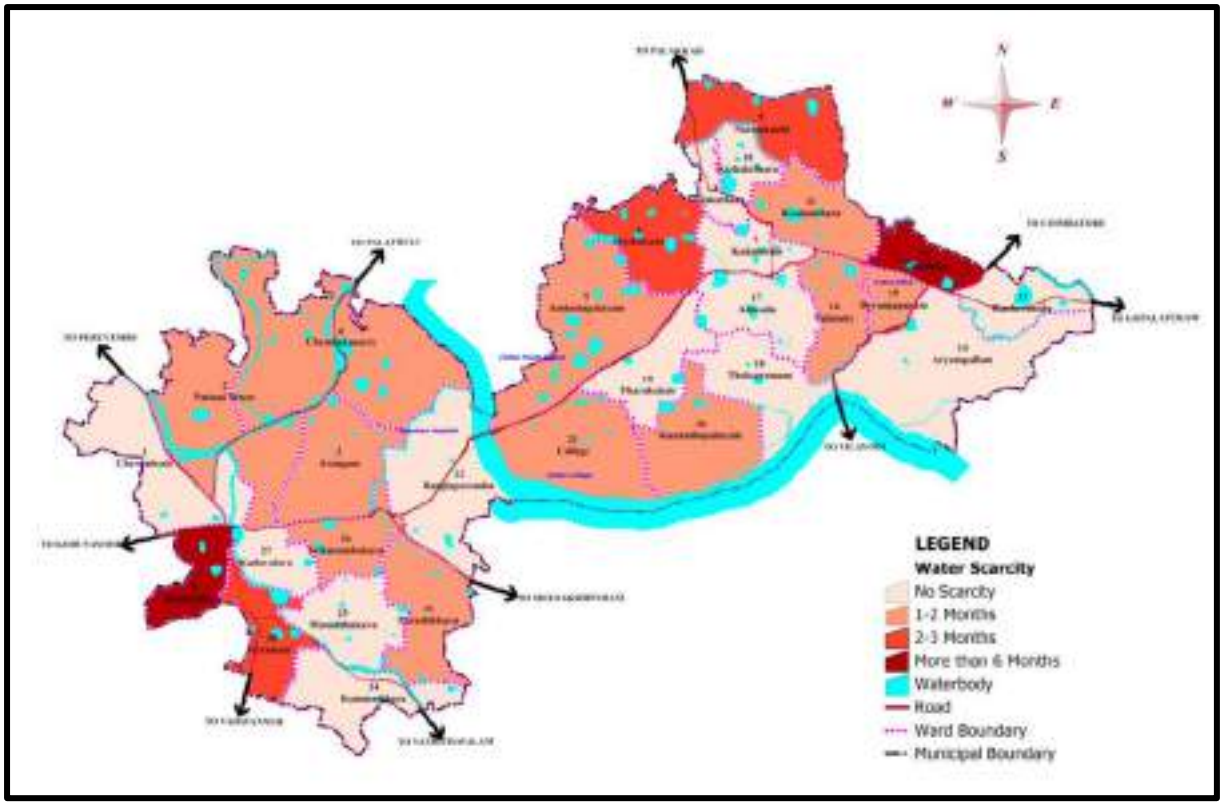


Fig 8.7 Spatial distribution of water scarcity

As per the above Fig 8.7, it is seen that the ward 12 Kosathara, ward 29 Mettuvalavu were experiencing acute water scarcity and Ward 9 Naramkuzhi, ward 6 Muthukadu, ward 28 Gramam were facing moderate water scarcity. However, since the Aryampallam water supply scheme under UIDSSMT scheme was implemented in the municipal area, this issue seems to have been resolved. Currently, only some areas in Thathamangalam are facing issues of low pressure and some water scarcity.

8.1.6 On Going /Committed Projects

There is a new proposal to add a 5-lakh litre OHSR at Thathamangalam along with supply and erection of motor pump sets, pumping main, distribution main, pipeline extensions and providing fhtcs, under AMRUT 2.0. As stated in the DPR, this proposal aims to address issues in the Thathamangalam Zone of the CWSS which is relatively a water scarce area at the tail ends due to dearth of sufficient storage capacity and inadequate command of OHSR and also due to lack of rider mains for effective and equitable distribution of water, even though sufficient installed capacity of Treatment Plant is available.

8.1.7 Problems and Potential

As Chittur puzha dries up in summer, the main source of drinking and irrigation water, has led to water shortage in the town in the past. With depletion in the ground water level, wells, ponds and small streams too have dried up. Unregulated sandmining of Bharathapuzha has formed firm earthen banks and beds with wild growth, which could lead to virtual death of the river. Source is not adequate during the month of December to May. There is dependence on well water and bore wells leading to unregulated over extraction of ground water.

8.1.8 Inference

Existing water sources should be protected, and water conservation techniques should be implemented to meet the water demands of people in the municipality. Transmission and distribution losses unaccounted for water need to be minimised. Source of surface water supply should also be explored so as to minimize dependence on the ground water and to minimize the fast depletion of water table. Appropriate strategies and mechanism need to be explored including recycling of wastewater. Mechanism of rainwater harvesting should also be encouraged at the household/commercial/institutional/industrial level in order to reduce dependence on the ground water. Efforts shall be made for focused planning and action to prepare and implement rainwater harvesting schemes including roof water harvesting schemes both with the aim of optimizing water use and ground water recharge. For this suitable mandatory provision to be made for planning and construction of various schemes. Roof top rainwater harvesting already made part of mandatory building bylaws.

8.2 Drainage

There is no organized drainage network in the town. Drainage facility on roads other than main roads is not continuous and this causes water logging in many of the roads during rainy season. Overflowing of drains in rainy season due to improper cleaning also exists at many commercial nodes. The wastewater from houses, shops and hotels are also disposed into the storm drains.

8.2.1 Existing Drainage Network

The drainage system consists of natural and artificial drains that ultimately discharge into Sokanasini river flowing through the centre and southern territory of Chittur town. Canals and thodus existing in the municipality play an important role in draining out the rainwater to rivers and ponds. A planned drainage system is a necessary ingredient of an urban area for creating a clean and conducive atmosphere for healthy urban habitation. But there is no such drainage system seen in the municipality. The natural drainage system of municipality is shown in the Figure 8.8. Municipality shows an undulating topography and presently the major drainage system is natural drainage system. Only major roads have drains and most of them are not continuous. Based on the covering the drainage system is classified in to covered drains and uncovered drains. The domestic and kitchen wastes from nearby houses fill the drainage channel and this adversely affects the water flow through the drain.

A comprehensive drainage Master Plan is to be planned with a perspective of 20- years for the Town. By analysing the general topography of town from contour maps, it is observed that the town has a natural gradient from east to west in Chittur area and from west to east in Thathamangalam area, discharging Storm surface water into Chittur puzha which flows through the centre of the town dividing the town into two. There are a large number of ponds too in the town.

Table 8. 2 Details of drains

Type	Length in Km	% of road length
Drain covered	3.85	2.81
Drain uncovered	24.35	17.77
Total drain length	28.2	20.58



Drains without covering

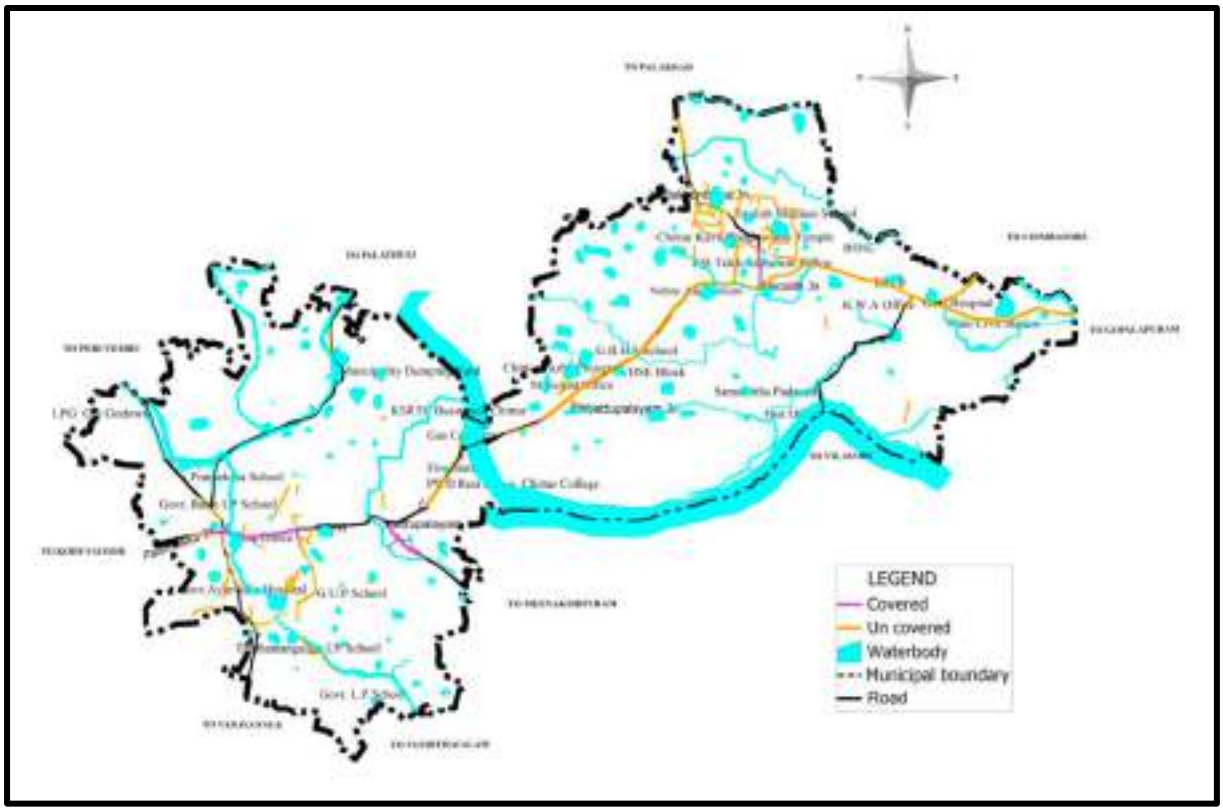


Fig 8.8a Existing drainage system



Uncovered drains with waste dumped and weeds growing in it

Existing Drainage Facilities

The irrigation canal network in Chittur starts from Ward 13. The irrigation canal diverges near the petrol pump at Mantakkad. The diverged canal flows through wards 15, 16 and 18. In Ward 18, it again diverges into two canals. One network joins the river while the other flows through Wards 20 and 19 and ultimately enters the ponds. Additionally, one akampadam canal originates from this irrigation canal and flows through the farms and joins the irrigation canal in near Chamaparamba from where it flows across the fields through wards 19 and 5.

The main irrigation canal continues to flow along the main road and incurs a second diversion at (C. Ganpati stores). The main road canal becomes underground at this junction and flows through ward 7 to the Bhagavati Kulam. There's a sump at this point and the water flows to Bhagavati Kulam and the excess water flows through the canal to the Vadakketara pond. The canal diverged to the left flows through (area) towards Anikode pond. At the Anikode Junction, the canal diverges. A branched canal flows to the left along the main road and ultimately enters the fields. The right-branched canal flows along main road towards Nehru Pond. At the Nehru Pond, the irrigation canal diverges and flows across ward 6, and connects several ponds alongside.

In Thathamangalam region, the irrigation canal from the Aliyar dam joins in 2 distinct places in ward 24 and 23 near the Aayyampati area where toddy shops are located. The irrigation canal flowing from ward 24 follows the ridge line and flows across the Telugu settlement and further diverts in two directions in ward 2. Several sub-irrigation canals divert water from the main irrigation canal to the farms located on the left. One CADA canal originates from Pallimukh region and flows nearside a defunct pond. At a couple of places, a sub-irrigation canal diverts from the right of the main irrigation canal, flows as an akampadam across the fields and joins the canal network in the Parakalam region, which happens to be the low-lying region of Thathamangalam. Unfortunately, the akampadams flowing in this region receive household wastewater through stormwater drains.

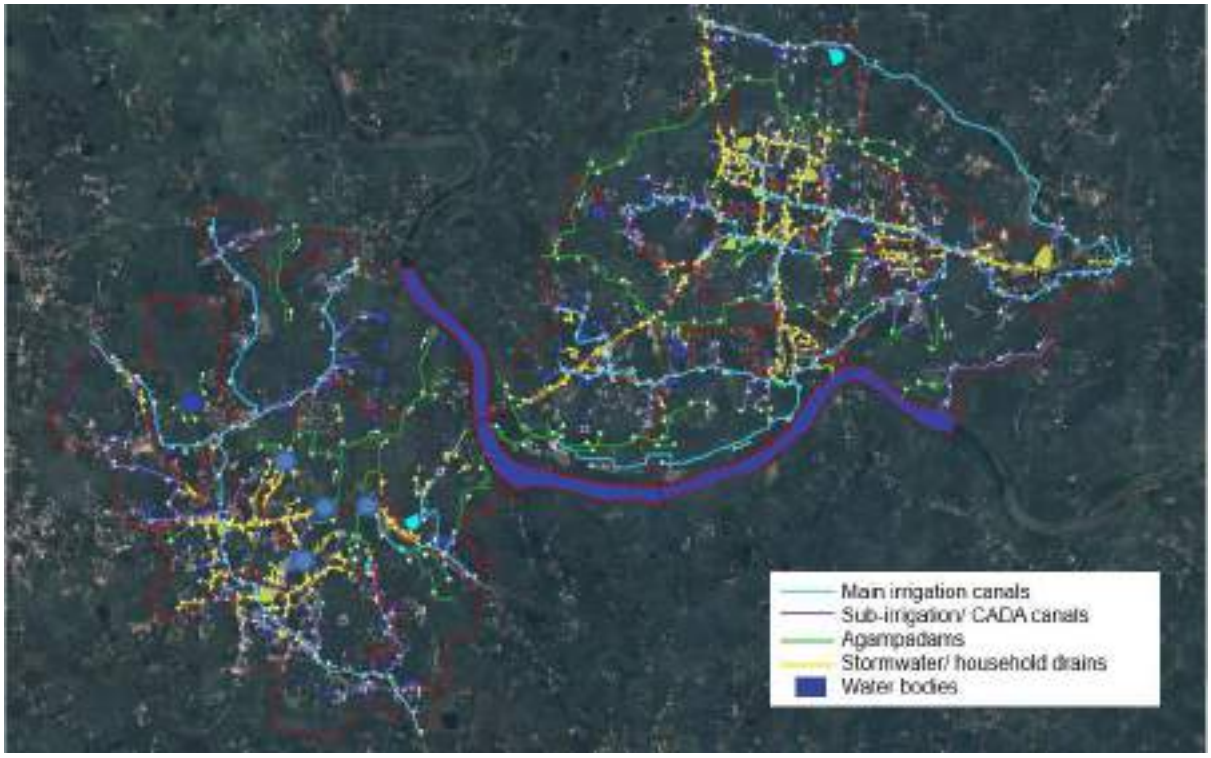


Fig 8.8b Drainage network with flow direction

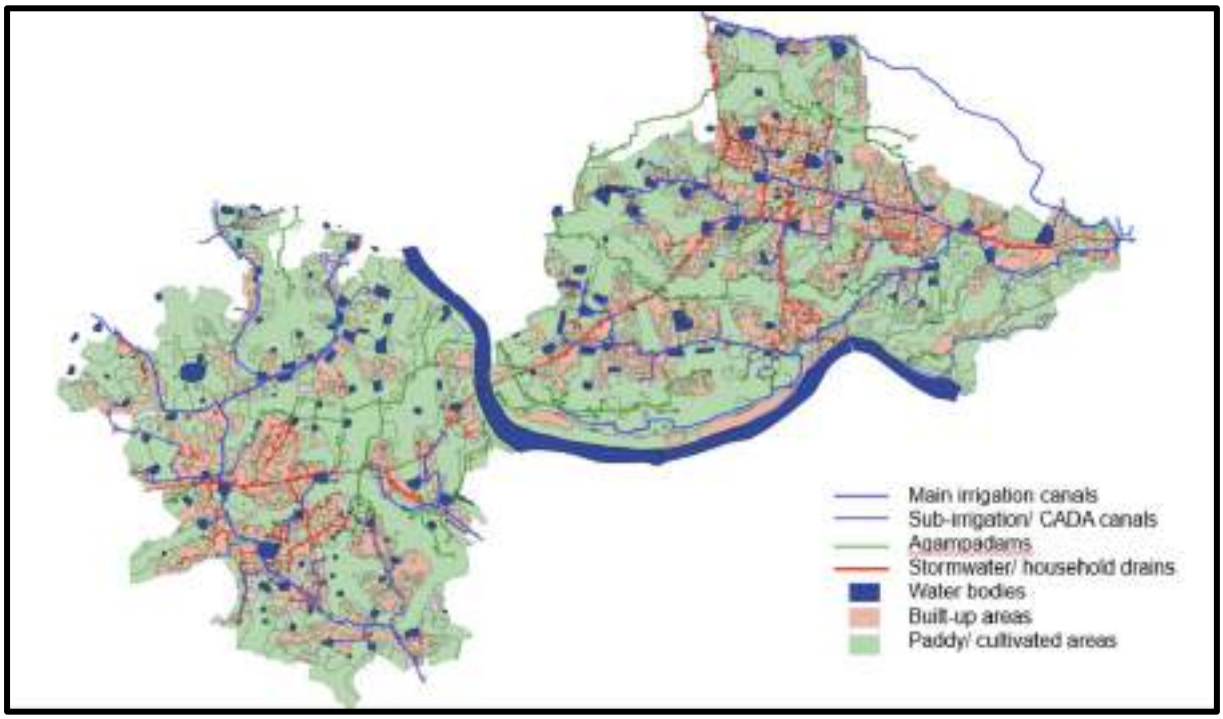


Fig 8.8c Irrigation canals, drains, akampadam canals and ponds

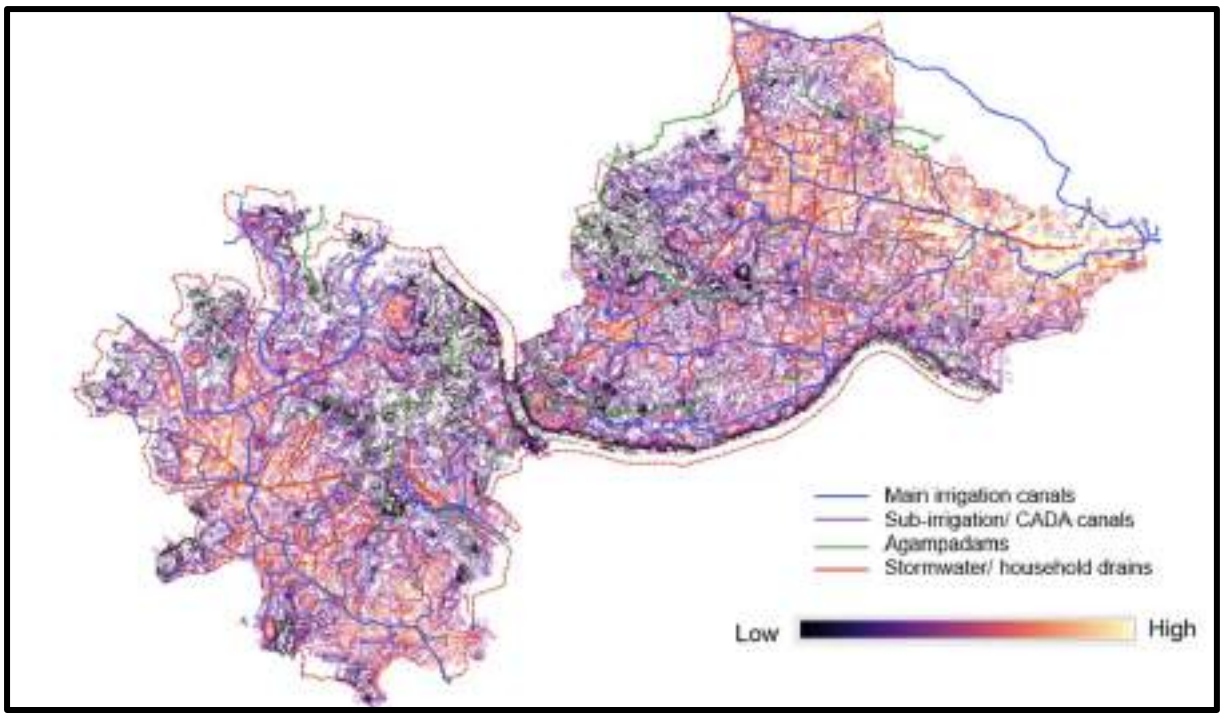


Fig 8.8d Drainage network and topography

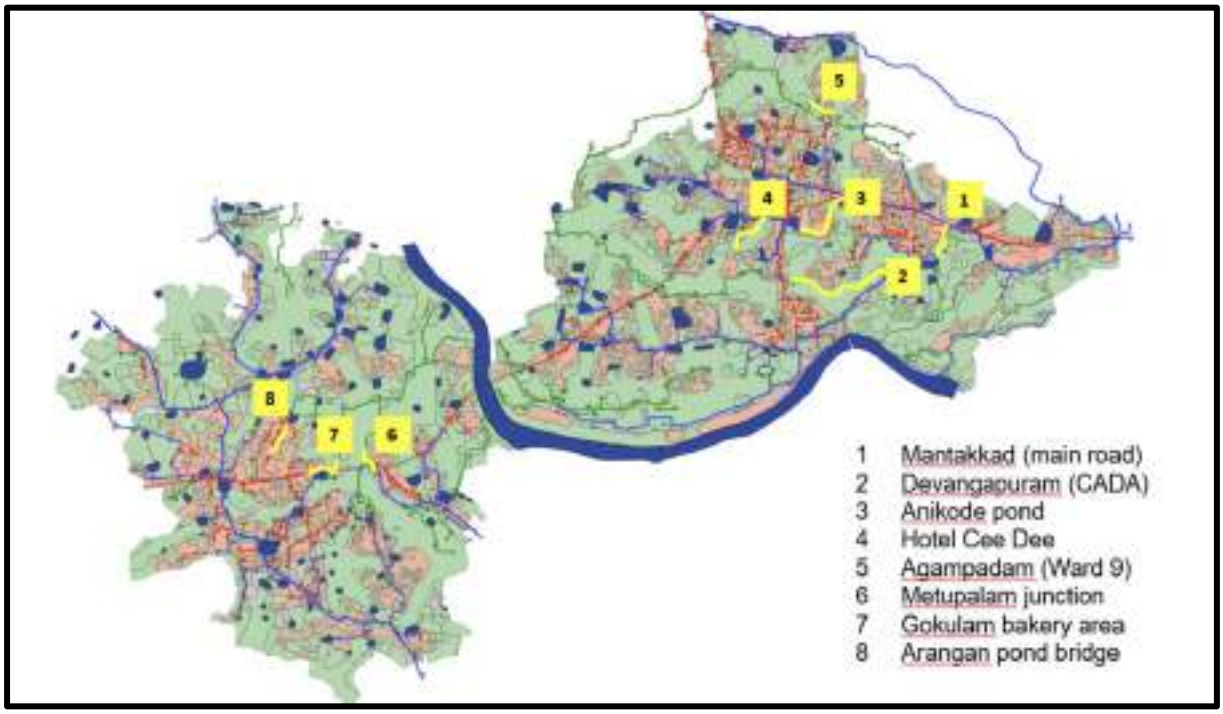


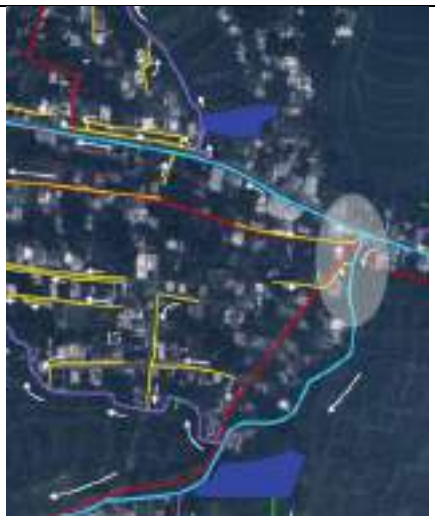
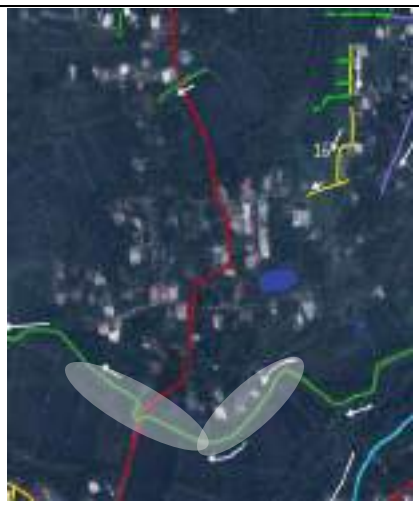
Fig 8.8e Location of polluted drains

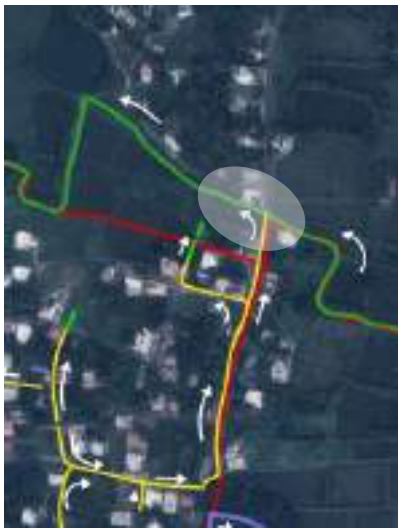
8.2.2 Problems and Potential

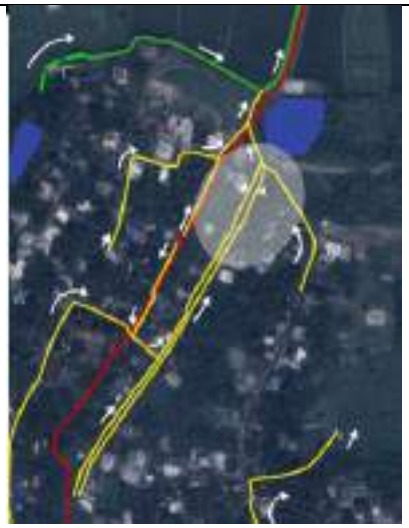
- No organized drainage networks
- Only 20.58% of roads have drains out of which only 2.81% are covered drains
- Water logging and flooding problems during monsoon season

- Poor coverage of drainage system due to inadequacy of funds
- Majority of drains are unlined and uncovered
- Drains choked by garbage and solid waste like plastic covers, papers, wrappers etc. results in clogging of drains and this causes foul smell in the town and pollutes the environment, breeding of mosquitoes, flies and harmful bacteria and viruses
- Silting and clogging of drains cause overflow during peak flows of rainy season in certain areas
- Unplanned development by filling low lying areas especially paddy fields and blocking of natural drainage is hazardous for hygienic living
- Poor maintenance of natural drains, irrigation canals and household drains
- Mixing of sewerage with storm water
- Needs a robust landuse strategy that will ensure that the surface drainage ecology will be protected and flooding prevented.

Table 8.3: Status of polluted drains

Sl. No.	Location	Drain map	Photograph
1	Manthakkad (main road)		
2	Manthakkad (CADA canal)		

3	Anikode pond		
4	Hotel Cee Dee		
5	Akampadam in Ward 9		

6	Mettupalayam Junction		
7	Gokulam bakery area		
8	Arangam pond bridge		

A system of storm water drains needs to be provided in future to drain off storm water to the river. It is suggested to strengthen the existing drainage network, adding the missing links, so as to enhance proper drainage network in the municipality. Temporary cleaning of open irrigation canals by removing leaves must be resorted to in advance of irrigation water conveyance. Else, the closing of the canals by using mesh must be adopted for the stretches directly below large trees.The provision of adequate sanitation and better sewage system is not

only a development-oriented strategy in itself, it can also yield other socio-economic benefits in terms of improved health status, quality of labour force and reduced burden of disease.

8.3 Sanitation and Sewerage

8.3.1 Existing System

Presently there is no underground sewerage system in Chittur-Thathamangalam Town. At present sewage disposal is mainly through septic tank. About 61.39 % of the total households have septic tanks, 37.75% use pit latrines and 0.43% of the households have no access to individual toilets (Fig 8.9). An efficient means of sewage waste disposal is required in the municipality. Ward wise Sanitation system is shown in Fig 8.10.

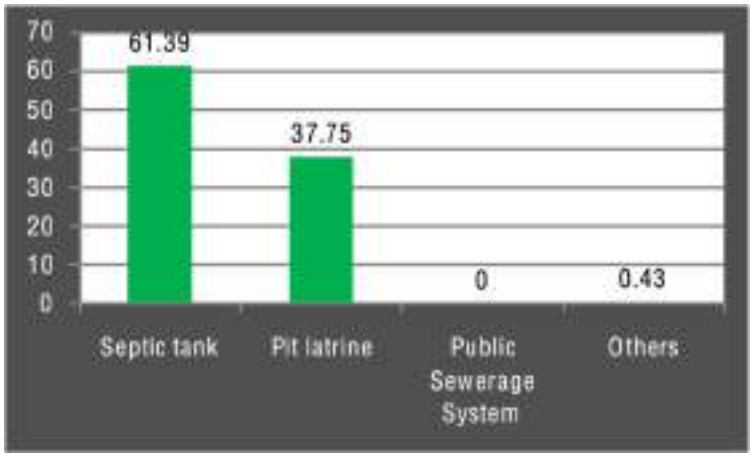


Fig 8.9 Sanitation Details

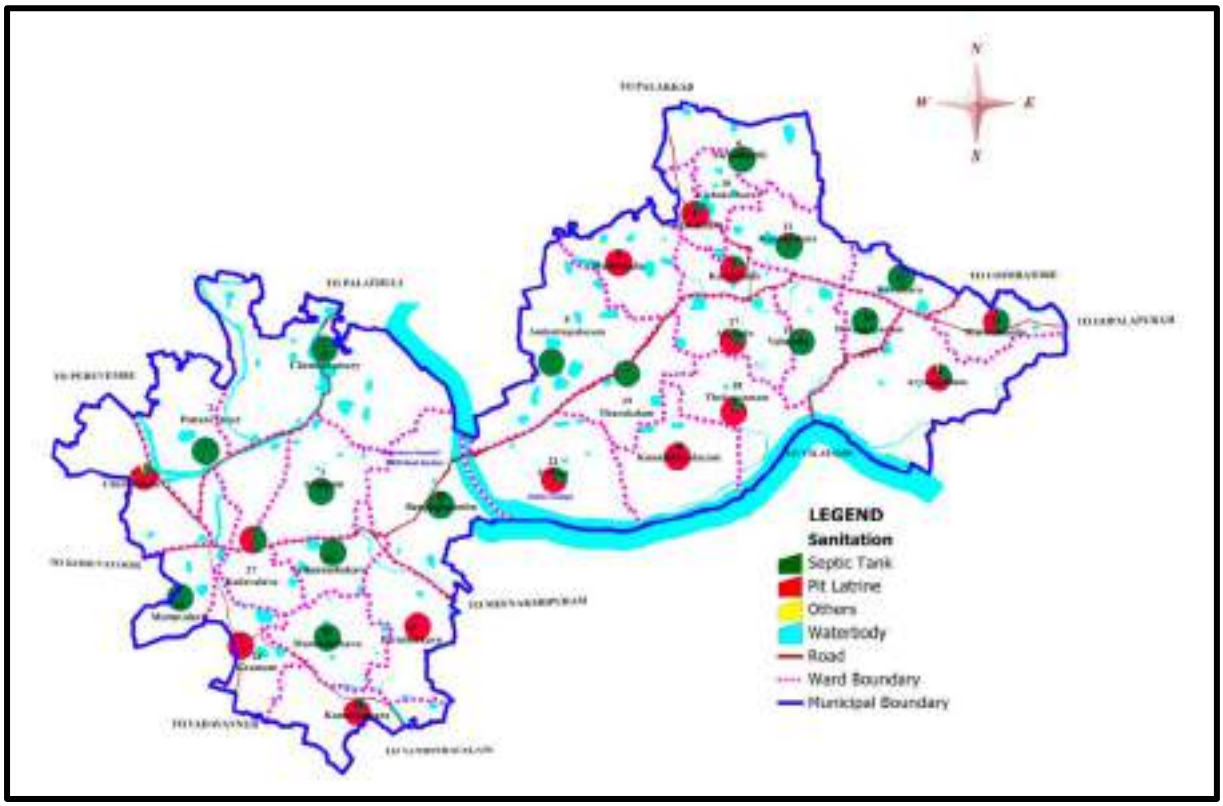


Fig 8.10 Wardwise Sanitation system

8.3.2 Issues

The current sewage treatment is through individual plot level septic tanks while the sullage generated from kitchen and bathrooms etc, is let out into the open mostly through storm drains as seen in the figures in the previous section. Given the high population density, the current individual plot level treatment of sewage and wastewater is a concern since it can lead to environmental and health issues if not properly managed. Facilities like public pay & use toilets in Market places, shopping areas need to be enhanced. There is also need to prevent solid waste from entering the canals too as it is also an impediment to the performance of the drains.

Chittur has a network of irrigation canals facilitating water for irrigating the paddyfields. During the site visits to various areas and streets in Chittur, grey water and solid waste from households were prominently observed to be dumped in the open drains. Also, it is a practice to let domestic wastewater into the canal network meant to transport water for irrigation, thereby posing a risk to the farmers of being exposed to contaminated wastewater. Further, there are no sewage treatment facilities owned by the CTM. The domestic wastewater is either polluting the underground table or is transported through irrigation canals and is utilized for agriculture or disposed of in the river or ponds. The presence of E-coli in almost all the ponds signifies microbial contamination and hence indicates the presence of domestic sewage. The open drains along the main road are mostly covered with concrete lids. Most of the drains were observed to be infested with weeds and plant growth within the channel. Additionally, the dumping of solid waste has blocked the canals. Along the Thathamangalam road, the shops are prone to flooding during the monsoon. Also, when the irrigation canals were opened lately, at several locations the water had overflown on the roads due to blockages in the canals. This had resulted in water wastage and ultimately the water meant for irrigation failed to reach the fields. The local people mentioned about issues with the irrigation canals such as blockages and silting, due to which many farmers have started using groundwater for irrigation lately.

8.4 Solid Waste Management

Providing clean and healthy environment is the primary concern of urban local bodies. Economic development, urbanization and improved living standards in cities increase the quantity and complexity of generated solid waste. If accumulated, it leads to degradation of urban environment and leads to health problems. Cities in the world are facing a high level of pollution; the situation in developing countries is more acute, this is partly due to inadequate provision of basic services like water supply, sanitation facilities, infrastructure for waste collection and waste transportation.

8.4.1 Waste Generation and Current Practices of Solid Waste Management

As per socio-economic survey conducted majority of people are disposing solid waste in their own compound. But the highest priority of development at all levels is for sanitation. It shows that the collection efficiency of waste is not satisfactory. Locations of collection points are at

markets and dustbins are installed and treatment is done by Municipality. The waste generated from hospitals is treated by IMAGE operated by Indian Medical Association.

Solid waste is mostly generated from households, shops and small-scale industries. Solid waste collection system for the town is a centralized one with full coverage of town. Based on the daily waste collected, the total quantity of solid waste collected from 29 wards is 1.78 ton (from 6 wards). The waste is collected daily from 6 wards using vehicles mostly owned by Kudumbashree units. However, the actual waste generated daily must be higher since not all households are covered under the Kudumbashree system. Assuming 30% over and above the waste collected as the total waste generated by the town, the total quantity of solid waste generated is estimated at 11.2 Tonnes. Waste collection details are shown in Table 8.4.

Table 8.4 Waste collection system

Type of system	Source of solid waste (Area/Ward)	Total quantity of solid waste generated	Total quantity of solid waste collected	Coverage area/wards	Location of collection points	Frequency of collection	Vehicles used
Centralised	Shops, House (all 29 wards)	13.75 Tonnes per day (estimated)	8.60 Tonnes per day	29 wards	At source	6 wards per day	Tipper, Tractor, Tiller

Source: Municipal Office, Chittur-Thathamangalam

The Health Department of Chittur-Thathamangalam Municipality is responsible for the collection and disposal of solid waste within the town limits consisting of one Health supervisor and 1 Health inspector, 4 nos. of junior health inspectors and 21 nos. of sanitation workers. Door to door waste collection method is adopted weekly once in the municipality. Collected waste is transported to treatment site situated at Parakkalam in 40 cents of land. There exists a 3-tonne capacity Compost Plant and 750-1000 kg compost is manufactured using windrow composting method at 40 days interval. There is a trenching ground having an extent of 37 cents at Aryampallam also. Plastic and other nondegradable waste is segregated from the waste and remaining biodegradable waste is converted to compost. Chittur-Thathamangalam Municipality has been declared as complete plastic ban area and plastic waste is collected from institutions and houses. There are 250 nos. of dustbins and 1650 nos. of household level compost units. The Municipality owns 3 vehicles for different activities of solid waste management. There is one tipper, one trailer and one tractor meant for the collection and transport of waste from the collection points to the disposal site.



Waste dumping along the roadside



Waste dumping inside SWT Plant Compound



Solid Waste Treatment plant at Parakkalam

8.4.2 Issues

- Though there is an efficient solid waste collection system in place, there are problems still due to dumping of wastes on roadside and in drains due to unwillingness of all households to pay for solid waste collection.
- Open storage bins lead to environmental problems and health hazards
- Lack of segregation of waste at source
- Bio-hazardous waste (sanitary napkins and diapers,), electronic waste still needs effective collection and disposal.

8.4.3 Inference

Except in the core area of town, size of land holdings is more, hence solid waste treatment is possible with in compound itself. The waste collection system is not very efficient and segregation at source needs more rigour. The total solid waste generated is not collected completely. More decentralization can be attempted in this sector. Bio-hazardous and electronic waste needs to be tackled. Solutions need to be arrived at for complete resource recovery from waste.

8.5 Energy

Power is a basic infra-structure influencing the growth of industrial, agricultural and service sectors and ultimately economic development. One of the determinants for quality of life is the level of availability and acceptability of affordable and quality power. The power requirement of town is now being covered by KSEB (Kerala State Board of Electricity). There is a 66 KV capacity substation located at Vilayodi commissioned in 30/4/1990, which serves the areas Chittur-Thathamangalam, Pattancherry, Perumatty, Koduvayur, Polpully and Peruvemba. Details of substation is shown in Table 8.5.

The major energy consumption is the electrical energy generated from hydroelectric project. No other non-conventional energy is fed into the main grid. Apart from the electrical energy supplied, people also use energy generated from petroleum products like Petrol, LPG, Diesel, Kerosene etc. Since majority of consumption is from electrical energy, category wise break up of electrical energy only is considered. Year wise and category wise consumers are shown in

figure no. 8.11. Temporal variation of category wise Power consumption is shown in figure 8.12.

Table 8.5 Details of substation

Sl No	Sub station	Capacity in KV	Number	Location	Serving area
1	Chittur	66KV	1	Vilayodi	Chittur Thathamangalam, Pattancherry, Perumatty Koduvayur, Polppully, Peruvemba

Source: KSEB Office, Chittur

Table 8.6 Details of Transformers in Chittur-Thathamangalam Municipality

Sl. No.	Name of Transformer	Capacity (KVA)	No. of Consumers	Sl. No.	Name of Transformer	Capacity (KVA)	No. of Consumers
1	Vellapana	100	171	13	Chenthamara	100	202
2	Pallathumpally	100	215	14	Devinagar	100	168
3	KSRTC	50	48	15	Chenthamaranagar	100	173
4	Bridge	160	129	16	Chembankulam	250	339
5	Neelikad	160	293	17	Mavukad	100	146
6	Thachankulam	100	318	18	Town	160	330
7	Kammanthara	160	310	19	Kozhikada	100	215
8	Ayyampathy	100	87	20	Arangam	100	337
9	Chala	100	273	21	Mettuvalavu	100	287
10	Mannatukavu	100	299	22	Pallikulam	100	190
11	Pencose	160	198	23	Chungamokku	63	353
12	Sreekurumbakavu	100	275	24	Chembakassey	100	170
					Total		5526

Source: KSEB Office, Chittur

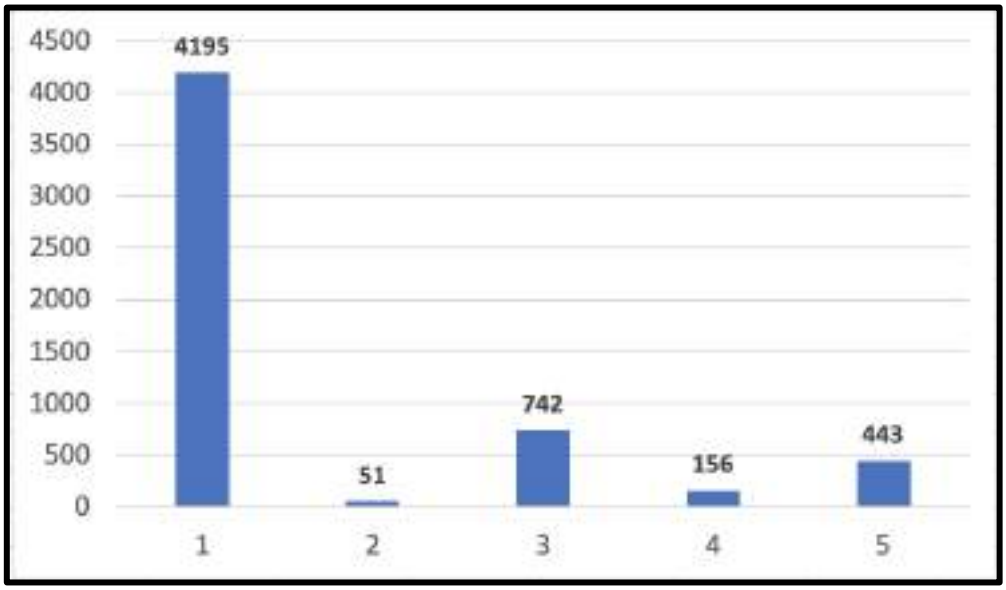


Fig 8.11 Number of Consumers in Chittur-Thathamangalam Municipality

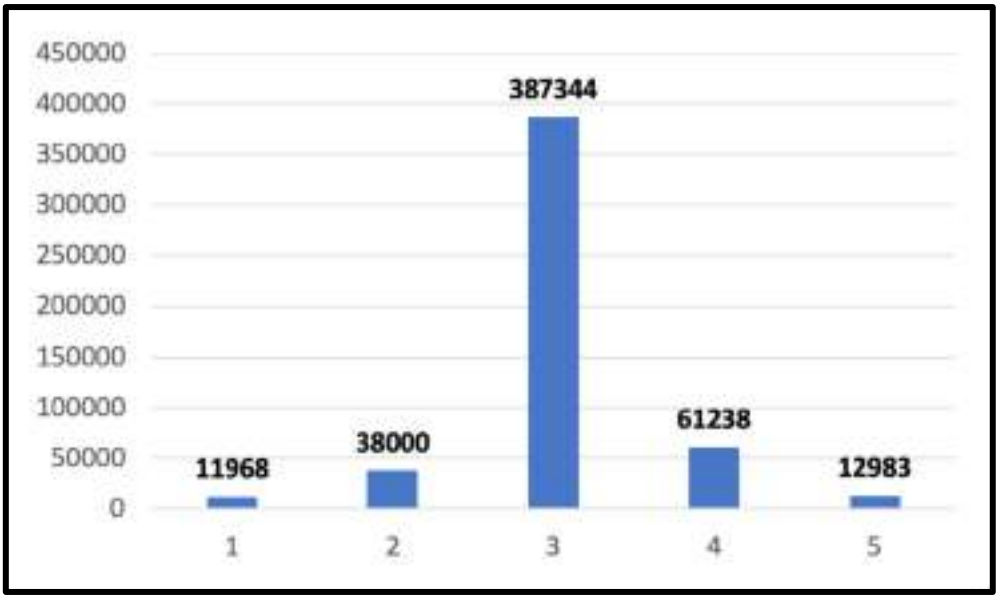


Fig 8.12 Average power consumption in Chittur-Thathamangalam Municipality (Kwh)

Table 8.7 Category wise details of connections in Chittur-Thathamangalam area

Sl. No.	Name of Tot	Total Load (KW)	Total Consumers	Average KWH	Sl. No.	Name of Tot	Total Load (KW)	Total Consumers	Average KWH	Sl. No.	Name of Tot	Total Load (KW)	Total Consumers	Average KWH
1	Vellapara	199	171	15028	9	Chale	883	273	26607	17	Mavilod	159	145	8662
	Agriculture	11	5	198		Agriculture	14	5	135		Agriculture	12	6	286
	Commercial	8	11	264		Commercial	11	15	991		Commercial	2	6	118
	Domestic	176	149	11939		Domestic	567	228	23154		Domestic	113	125	8640
	General	4	6	127		General	92	20	667		General	6	9	218
	Industry	0	0	0		Industry	97	5	1670	18	Town	529	880	31598
2	Pallathumpa	303	215	16873	10	Mannakulam	688	299	25376		Agriculture	0	2	2
	Agriculture	40	15	2125		Agriculture	17	8	104		Commercial	93	111	4535
	Commercial	13	10	722		Commercial	92	25	867		Domestic	349	189	18145
	Domestic	221	174	13254		Domestic	604	247	23091		General	55	28	1631
	General	2	7	251		General	35	21	1154		Industry	30	3	602
	Industry	43	3	521	11	Perooca	429	188	21179		ITI Vaikkal Jn	1	1	113
3	KSRTC	157	48	4579		Agriculture	42	13	2753	19	Kozhikada	495	353	21899
	Agriculture	10	4	52		Commercial	3	4	53		Agriculture	33	8	728
	Commercial	0	1	32		Domestic	333	163	15907		Commercial	105	41	3904
	Domestic	83	42	1590		General	19	14	358		Domestic	300	131	13954
	General	9	4	865		Industry	56	1	1983		General	17	8	1240
	Industry	35	7	1039	12	Sreekrishnapu	686	275	25740		Industry	39	4	124
4	Bridge	212	129	10887		Agriculture	2	1	29		Malavai Pum	1	1	99
	Agriculture	16	6	71		Commercial	10	10	733	20	Anegam	639	337	29887
	Commercial	1	1	130		Domestic	618	227	22802		Agriculture	38	9	110
	Dhoby Light	1	1	124		General	66	36	2190		Commercial	12	21	559
	Domestic	159	108	8229	13	Chemboora	349	203	17300		Domestic	560	285	28039
	General	9	5	583		Agriculture	8	4	83		General	17	18	666
	Industry	26	4	870		Commercial	22	1	208		Industry	7	2	542
5	Nadiad	894	298	25758		Domestic	281	172	16541	21	Mekunnam	480	287	25974
	Agriculture	11	6	455		General	30	22	471		Agriculture	4	3	40
	Charging Stat	3	1	11		Industry	7	1	0		Commercial	31	37	1598
	Commercial	34	42	1919	14	Devinagar	408	168	17877		Domestic	410	225	23548
	Domestic	809	227	17418		Commercial	32	40	2256		General	35	22	990
	General	25	16	1150		Domestic	343	113	11610	22	Pallikulam	372	180	22535
	Industry	12	1	609		General	32	15	1747		Agriculture	4	2	5
6	Thathamkula	619	318	26899		Malavai Pub	2	1	166		Commercial	74	67	4290
	Agriculture	22	8	932	15	Chemboora	248	178	14488		Domestic	188	96	10888
	Commercial	1	3	85		Agriculture	5	1	18		General	102	24	7580
	Domestic	540	293	22597		Commercial	82	39	1128		Industry	4	2	18
	General	43	13	1413		Domestic	193	124	12862	23	Chungamall	460	353	28525
	Industry	2	1	6		General	7	11	456		Agriculture	33	13	286
7	Kannanthar	611	310	37336		Industry	5	2	42		Commercial	6	11	302
	Agriculture	16	14	1951	16	Chemmanki	563	339	49987		Domestic	389	309	22684
	Commercial	4	11	242		Agriculture	8	2	94		General	16	19	318
	Domestic	470	261	32250		Commercial	166	118	11242		Industry	16	1	135
	General	24	20	765		Dhoby Light	8	1	150	24	Chembakara	502	175	12650
	Industry	76	4	2154		Domestic	143	102	8774		Agriculture	51	12	1396
8	Ayyanpathy	147	87	6535		General	110	33	9242		Commercial	93	9	713
	Agriculture	28	9	245		Industry	18	5	2543		Domestic	152	143	10170
	Commercial	8	15	838		Malavai Pub	117	58	18390		General	6	7	971
	Domestic	111	58	4791										
	General	2	5	81										

Source: KSEB Office, Chittur

Total length of HT and LT lines in Chittur-Thathamangalam Municipality is 33 km and 200 km respectively. The total number of Transformers in Chittur-Thathamangalam Municipality is 65 Nos. There are no areas of frequent power cuts or low voltage. The distribution of power is only by overhead lines and underground lines are not used causing various inconveniences in the town centre. Distribution network is shown in Fig 8.13.

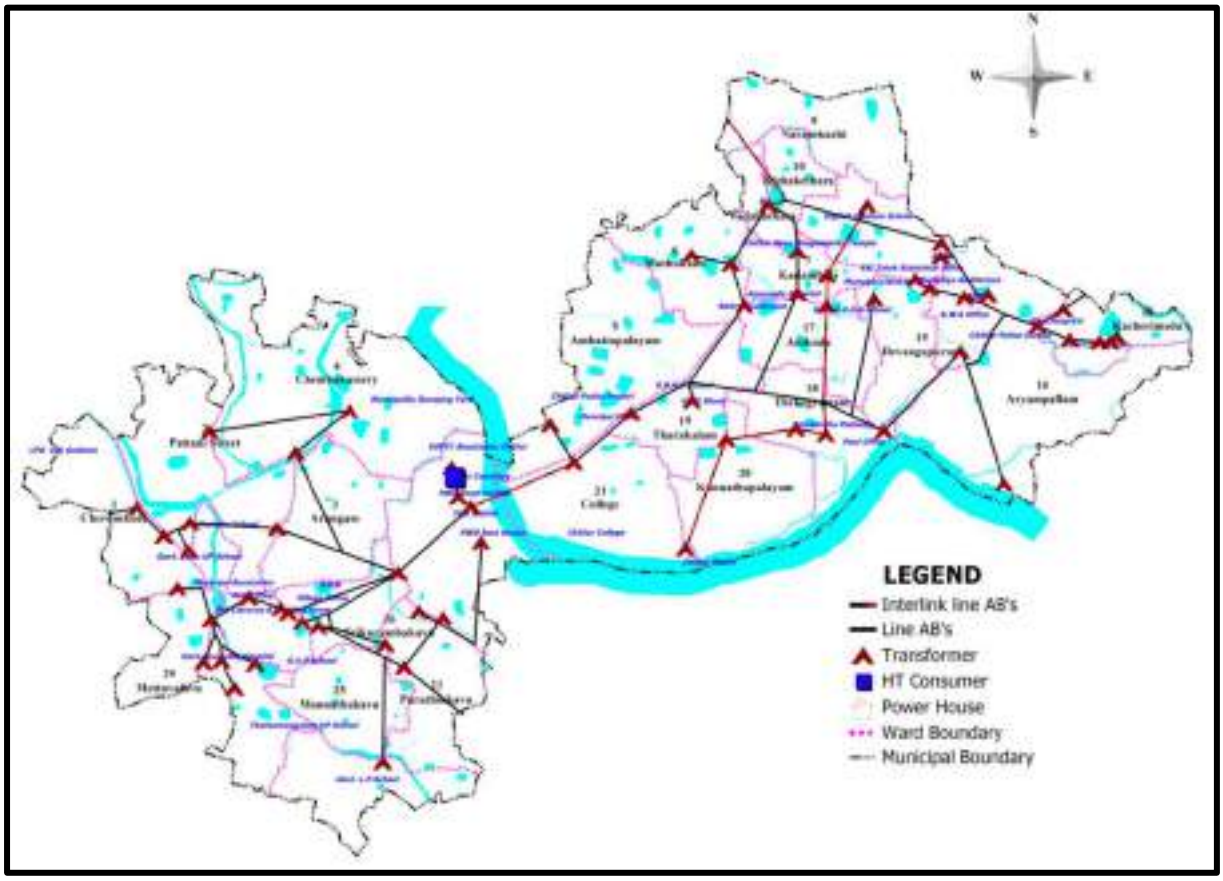


Fig 8.13 Distribution network in 2012

8.5.1 Street Lighting

The Municipality maintains around 4394 streetlights and detailed data is given in Table 8.8 The municipality paid Rs. 23.27 Lakhs in 2021-22 towards electricity charges of streetlights.

Table 8.8 Details of street lighting in Town

Sl. No.	Type of Luminary	2021-22	Percentage
1	LED	3525	80.22%
2	Tube light	705	16.04%
3	CFL	149	3.39%
4	SVL	4	0.09%
5	Mini mast	7	0.16%
6	High mast	4	0.09%
	Total	**4394**	**100%**

Source: Municipal Office, Chittur-Thathamangalam

8.5.2 Details of Fuel used for Cooking

In Chittur-Thathamangalam Town, 39.12% of households are using Firewood, 58.36% households are using LPG/PNG for cooking.

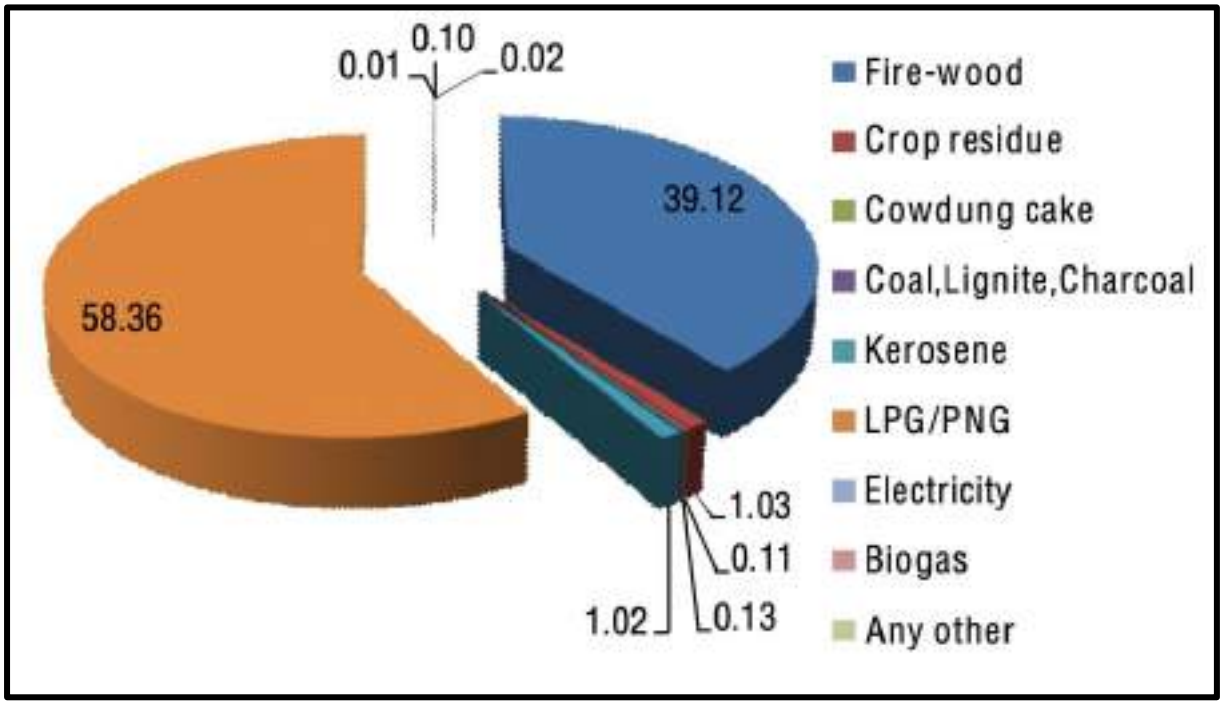


Fig 8.14 Percentage of Households based on Fuel used for Cooking

8.5.3 Problems and Potential

Chittur-Thathamangalam Municipality does not have major energy problems, but it has to depend on other districts for the energy requirement especially in the case of electrical energy. Palakkad district does not contribute much to the generation of electrical energy. No other non-conventional energy sources except solar energy can be utilized.

8.5.4 Inference

Chittur-Thathamangalam town does not have major power problems. Use of non-conventional energy is very much limited. Even in the case of solar energy the use is limited to a few roof top solar water heaters. There is tremendous potential for the development of non-conventional energy especially solar energy. For Chittur-Thathamangalam area, it was assessed that 70 per cent of the households have clear shade-free roof area. This assessment means that practically 90 per cent of those can be used for solar Photo Voltaic power packs. The town has potential for development of biogas plants also with a healthy cattle population. The organic component of Municipal Solid Waste and animal wastes (MSW) are considered as feedstock for biogas generation. As the inorganic component of MSW is also a by-product of the MSW pre-treatment process and final disposal, a separate assessment for the Inorganic component of MSW is considered for biomass combustion-based electricity generation.

Chapter 9: SOCIAL INFRASTRUCTURE

Social infrastructure refers to the facilities and the process involved, health facilities and community development in any town. The Social Infrastructure includes the education system, health care, social and cultural facilities, parks and open spaces, etc. The different components of social infrastructure will help to know how well a city or town is equipped with facilities. The provision of education, health, etc. defines the quality of life. As the city expands and population increases, the gap between demand and supply of these essential services increases, which deteriorates the quality of life in urban areas.

9.1 Education

Education is the single most important instrument for social and economic transformation. Educational facilities play an important role in the overall development of a Town. These facilities enhance economic growth and employment. As per 2011 Census Chittur-Thathamangalam Municipality has a literacy rate of 89.7%. which is just above the average literacy rate of 89.31% of the district.

9.1.1 Existing Facilities

Undoubtedly the government is constitutionally responsible for provision of public-school education. The fact is that the government schools stand alone with a proven record of educating the educationally backward, despite very poor resources. In Chittur-Thathamangalam municipality there are 17 state board schools and 4 CBSE schools. 2 are aided

Table 9.1 Overview of the Total number of Educational institutions in Chittur-Thathamangalam Municipality (2022)

Sl. No.	Name of School	Ward	Number of Students				
			Pre Primary	Primary	High School	HSS	VHSS
	GOVT						
1	GSM LPS Thathamangalam	24	28	61			
2	GVLPS, Chittur	17	90	330			
3	GLPS, Chittur	19	25	68			
4	GUPS, Thathamangalam	25	169	718			
5	GBUPS, Thathamangalam	27	115	613			
6	GUPS, Chittur	12	25	138			
7	GHS, Chittur	14	25	70	1026		
8	GVGHS, Chittur	17		757	1468		
9	GSM HS Thathamangalam	24		116	654		
10	GSM HSS Thathamangalam	24				250	
11	GSM VHSS Thathamangalam	24					120
12	GVGHSS, Chittur	17				614	
13	GHSS, Chittur	14				648	
14	GVHSS, Chittur	17					122
	AIDED						
1	SSKASNUPS, Thekkegramam	18	15	155			
2	PSHS, Thekkegramam	18		121	114		
	UNAIDED						
1	Chinmaya Nursery, Thathamangalam	28	186				
2	Royal Indian School, Ambattupalayam*	21	173	154			
3	Vijayamatha Convent, Ambattupalayam	19	317	1121	397	305	
4	Akshara School, Chittur*	12	40	30			
5	Gurukulam Play School, Chittur*	11	28				
6	Young World, Chittur*	11	107	61			
7	Rosi English Medium, Thekkegramam*	18	23	36			
8	Pratheeksha Special School			15			
	Total		1366	4564	3659	1817	242
	* Data taken from Draft Master Plan 2031						

schools, 7 are unaided schools and 8 state Government schools. There is also 1 Government College and 1 other Technical Institute in the town. There are no professional colleges or Polytechnics. In the last decade, the number of educational institutions has not changed much in terms of the number of Government schools or aided schools in the town. However, there is a change in the number of unaided schools, which seems to have gone down from 8 to 5 in the last decade

Table 9.2 Details of the total number of schools and higher educational institutions in Chittur-Thathamangalam Municipality (2022)

Sl. No.	Municipality	Lower Primary School				Upper Primary School				High School				HSS/VHSC				CBSE			ICSE			Grand
		Govt	Pvt Aided	Pvt Unaided	Total	Govt	Pvt Aided	Pvt Unaided	Total	Govt	Pvt Aided	Pvt Unaided	Total	Govt	Pvt Aided	Pvt Unaided	Total	Regis tered	Unregi stered	Total	Regis tered	Unreg istere d	Total	
1	Chittur-Thathamangalam	8	0	0	8	5	1	0	6	8	1	0	4	5	0	1	6	0	4	4	0	0	0	25

Sl. No.	Municipality	Colleges				Professional Colleges												Polytechnic			Other Technical Institutions				Grand Total
						Medical				Engineering				Nursing											
		Govt	Pvt Aided	Pvt Unaided	Total	Govt	Pvt Govt Controlled Self Financing	Pvt Self Financing	Total	Govt	Pvt Govt Controlled Self Financing	Pvt Self Financing	Total	Govt	Pvt Aided	Pvt Unaided	Total	Govt	Pvt Aided	Pvt Unaided	Total	Registered	Pvt Aided	Pvt Unaided	Total	
1	Chittur-Thathamangalam	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2

Details of the number of Govt, Aided and Unaided schools in 2012 are given in the Figure 9.1. From the figure we can see that 58% of schools are Govt and 33% of schools are unaided in Municipal area and remaining 9% schools are aided. About 70% of students are studying in Government schools, 4% in aided schools and 26% in unaided schools. There are 89 % students studying in State Syllabus and11% in CBSE syllabus. Spatial distribution of educational facilities in 2012 is shown in Fig 9.2.

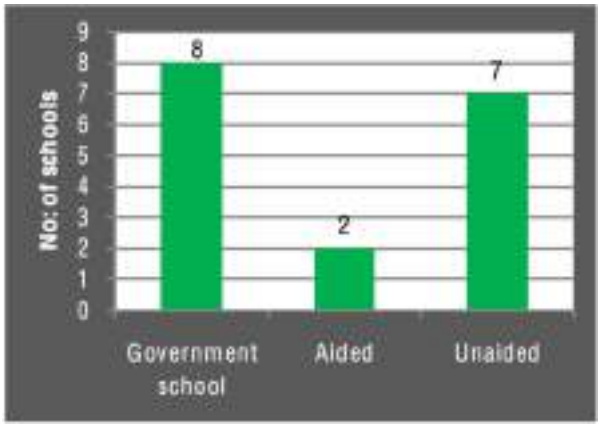


Fig 9.1 Details of Number of Schools



GSMVHSS, Thathamangalam



Govt U P School, Chittur

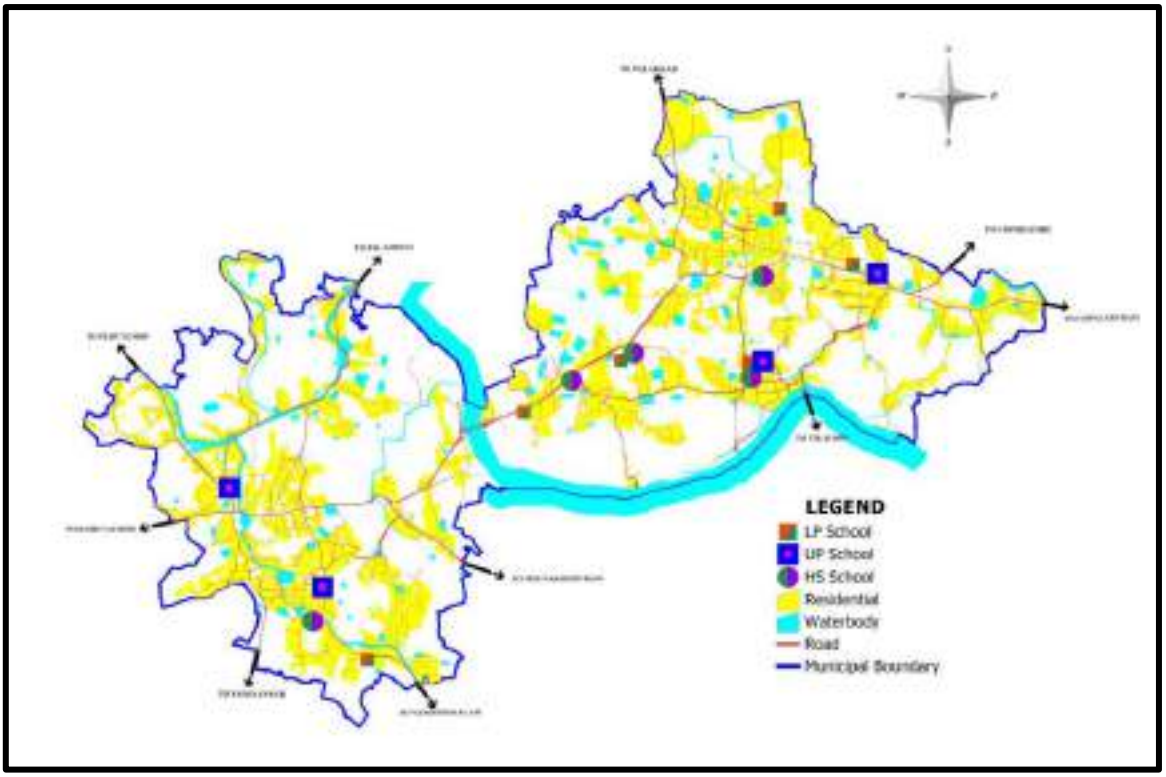


Fig 9.2 Spatial Distribution of Educational Facilities



GBHSS, Chittur



GVGHSS, Chittur



Vijayamatha Convent, Chittur



Govt College, Chittur

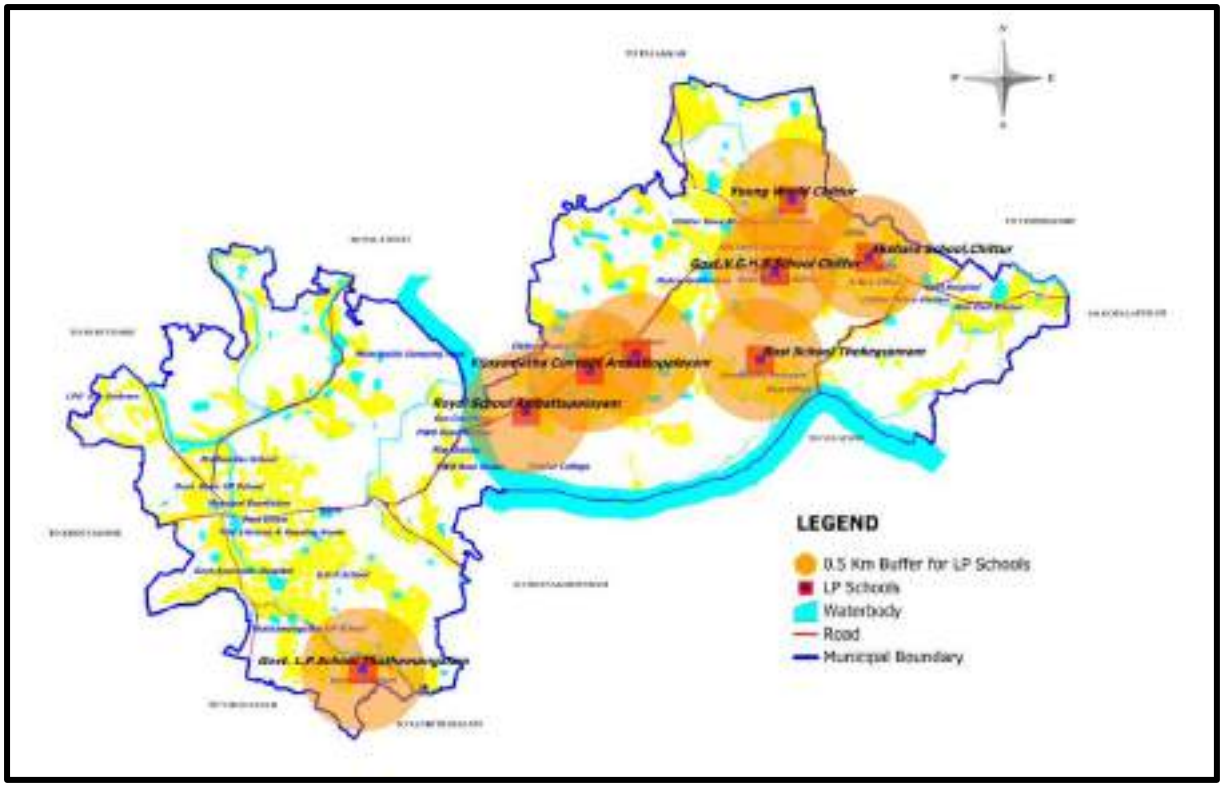


Fig 9.3 Service Area of existing Primary Schools

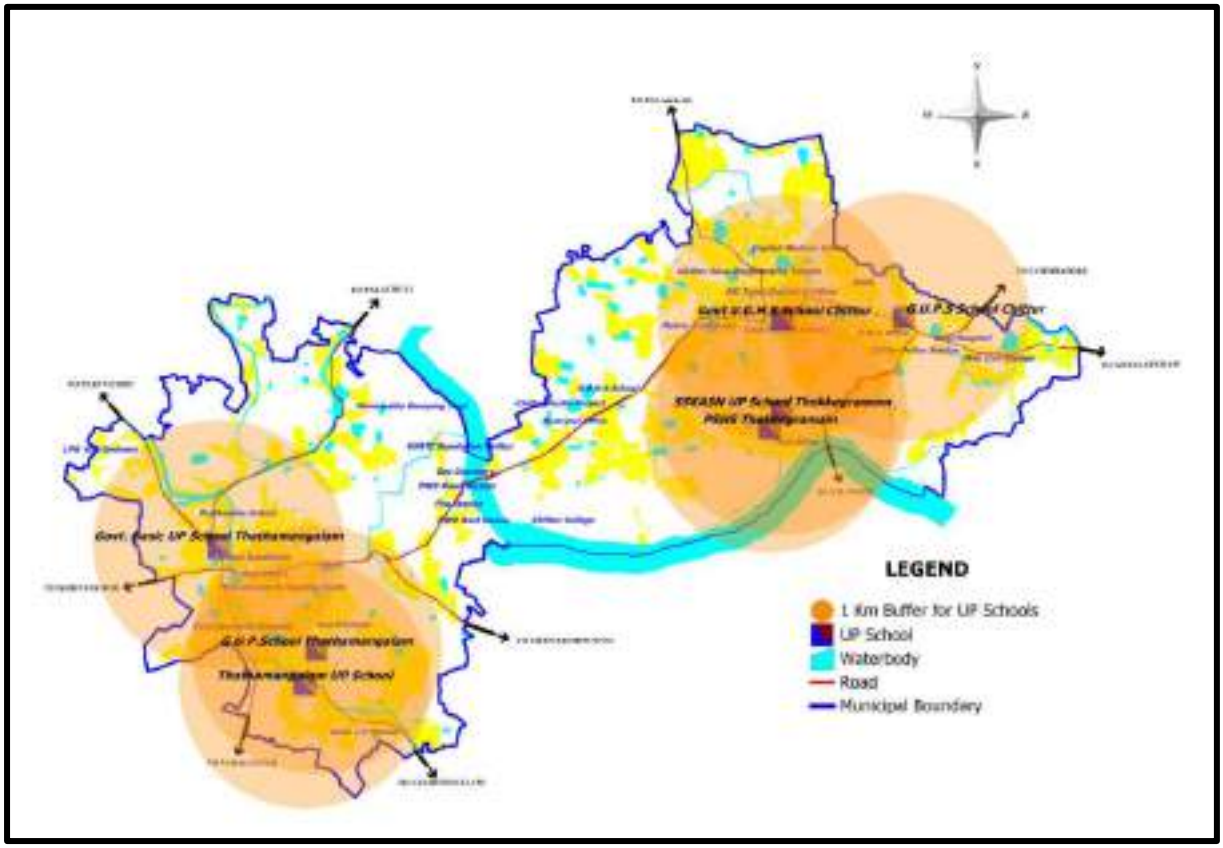


Fig 9.4 Service Area of existing Upper Primary schools

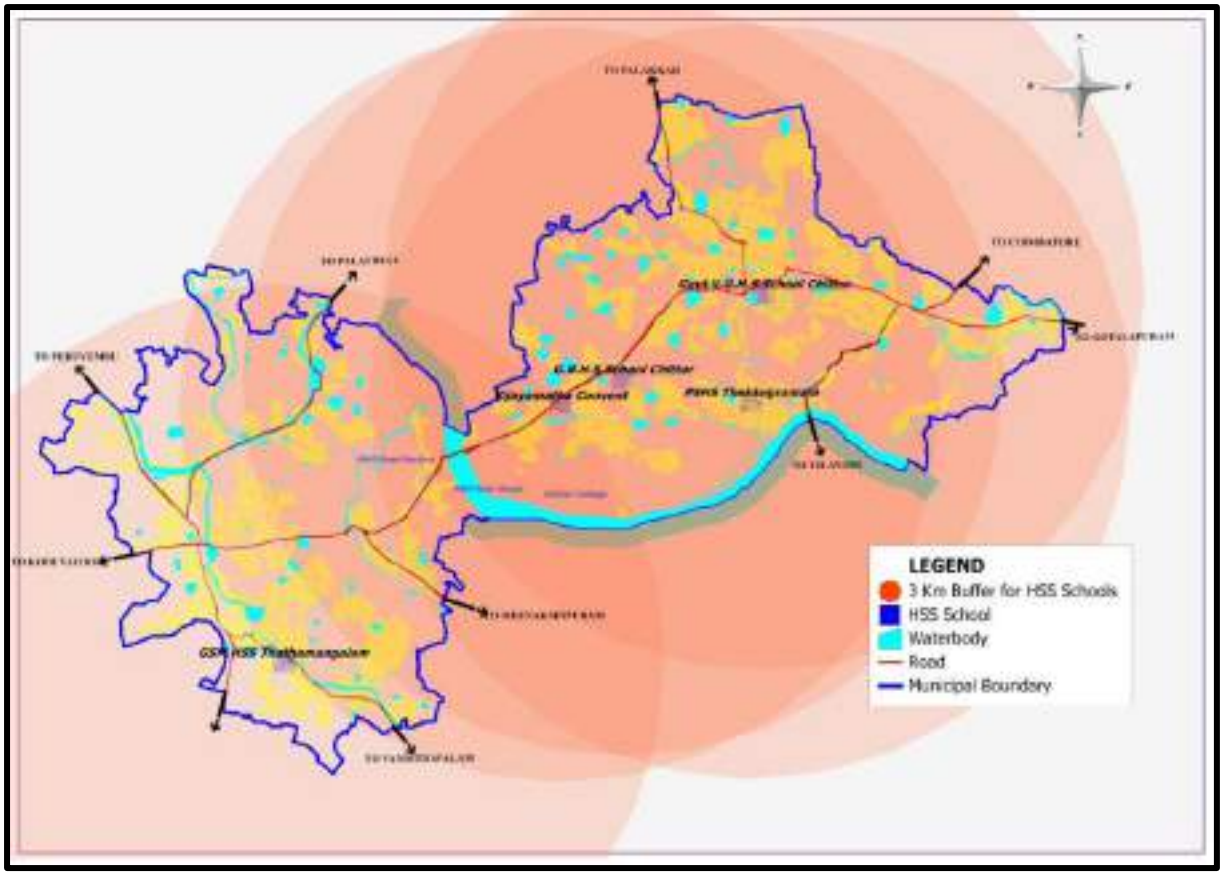


Fig 9.5 Service Area of existing Higher Secondary Schools

Service Area of existing Primary Schools, High schools and Higher secondary schools are shown in Fig 9.3, 9.4 and 9.5 respectively. Sector wise breakup of primary schools and number of students are given in Figure 9.6 and 9.7. In 2012,47% of students are studying in Government sector, 12% of students were studying in aided schools where 41% in unaided schools.

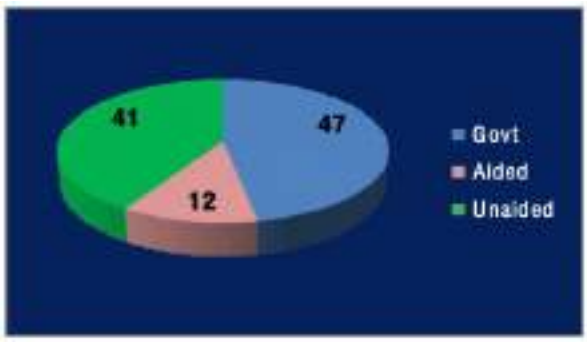


Fig 9.6 Percentage of Primary Schools in various sectors

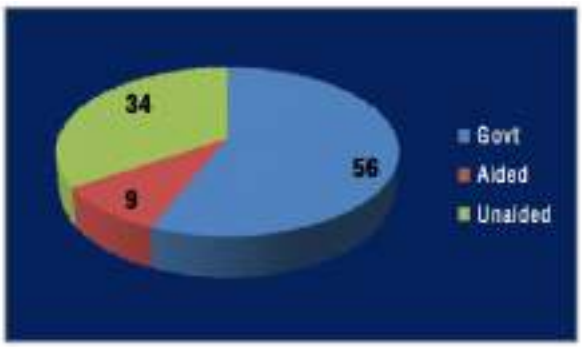


Fig 9.7 Percentage of Primary School Students studying in various sectors



GSMLPS, Thathamangalam



GBUPS, Thathamangalam

Sector-wise breakup of High schools and number of students are given in Figure 9.8 and 9.9. 60% of students were studying in Government schools, 20% in aided schools and 20% in unaided schools.

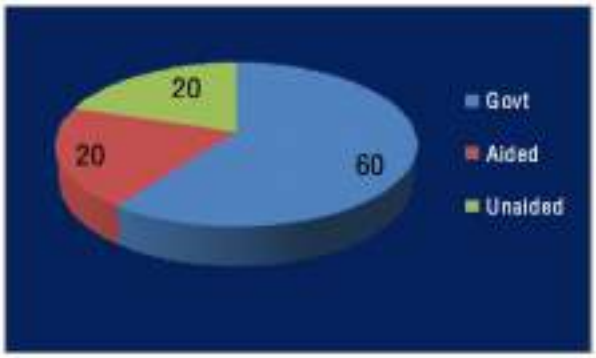


Fig 9.8 Percentage of High Schools in various sectors

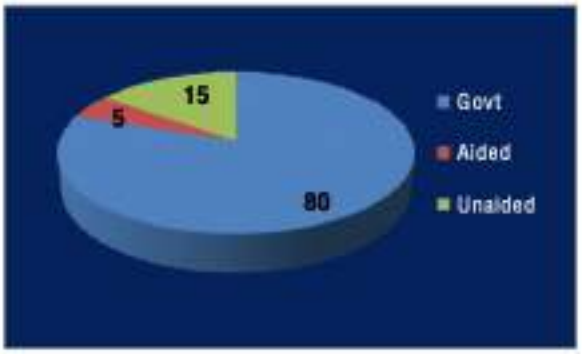


Fig 9.9 Percentage of High School Students studying in various sectors

Higher Secondary Schools and number of students in 2012 are given in Figure 9.10 and 9.11. 75% students were studying in Government schools and 25% in aided schools.

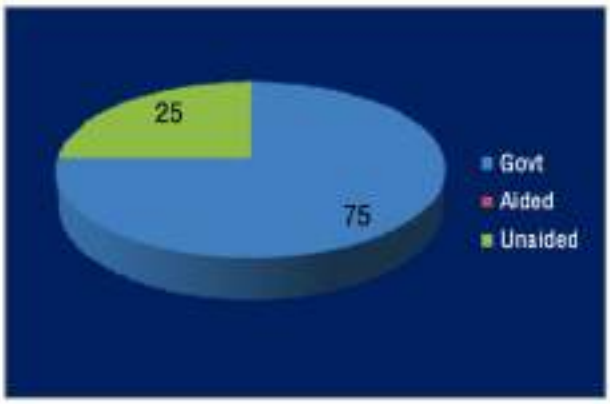


Fig 9.10 Percentage of Higher Secondary Schools in various sectors

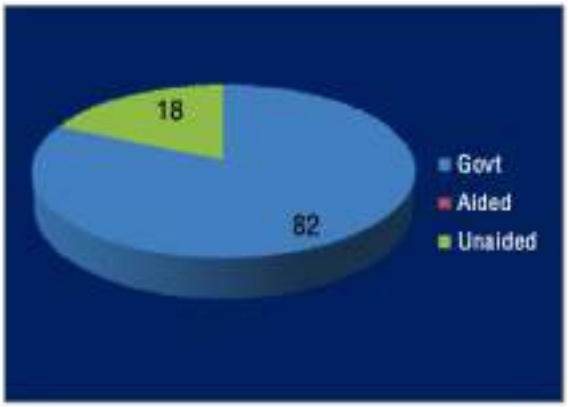


Fig 9.11 Percentage of Higher Secondary School Students studying in various sectors



Govt TTI, Chittur

There is no professional college in Chittur-Thathamangalam Municipality. There is one Arts and Science college (Government College, Chittur) in the municipality. There are 19 departments, and 1428 students are studying in various graduate and post graduate courses. There is one Govt Teachers Training Institute in Tamil and Malayalam medium with 80 students. There are two private ITI/ ITC s - one is M-ITC, Mettupalayam, Thathamangalam and other is SCDD ITC Chittur.

9.1.2 Other Educational Institutions

There are other educational institutions in the Municipal area, which offer computer courses, technical courses, driving schools etc.

9.1.3 Infrastructure Details of Schools

In the municipality, most of the schools have comparatively good infrastructure facilities, but some schools do lack sufficient number of basic amenities like toilets.

Table 9.3 Comparison with Planning Standards (Kerala)

Year	Existing	Required
Population		32298
1. Nursery: 1 for every 2500	13	13
2. Primary: 1 for every 5000	8	6
3. High School: 1 for every 13000	5	2
4. **Higher Secondary School**: 1 for every 13000	3	2
5. Arts & Science College: 1 for every 80000	1	1
6. Professional College: 1 for every 250000	0	1
7. Polytechnic College: 1 for every 36000	0	1
8. ITC/ITI: 1 for every 35000	2	1
9. TTC: 1 for every 120000 population	1	1

As per planning standards of Kerala in Chittur-Thathamangalam Municipality number of schools are sufficient. The higher educational facilities are also satisfactory. There is no professional college in Chittur-Thathamangalam Municipality.

9.1.4 Problems and Potential

The literacy rate of Chittur-Thathamangalam Municipality is higher than that of the district. Educational facility is found satisfactory in Chittur-Thathamangalam Municipality. There is no Professional college within the Municipality. But there are professional colleges in adjacent local bodies. Main problem faced by the Government and Aided schools are the shortage of teachers and staffs. There is shortage of toilets, buildings and compound wall for the schools in municipality. Most of the colleges are offering only the conventional course which is one of the reasons for students approaching colleges in nearby districts.

9.1.5 Inference

In comparison with District and other municipalities the literacy rate of Chittur-Thathamangalam Municipality is in third position after Shoranur and Ottappalam Municipality. The infrastructural facilities available in many government schools can be improved. Proper planning should be done to overcome this problem and that will attract the students towards government institutions. Private schools are having better facilities. More number of government technical institutions have to be introduced. Most of the colleges are offering only the conventional courses.

9.2 Health

Human development and improvement in quality of life are the basic aims of any planning process. Health facilities, if provided on prescribed norms and standards within any settlement, help to improve the quality of life of inhabitants. The progress of a town largely depends on the quality of health enjoyed by its citizens, besides its location and accessibility to the community at large.

9.2.1 Existing Facilities

In Chittur-Thathamangalam Municipality, there is one Taluk Government hospital, one Govt Ayurvedic Hospital and one Private Allopathic hospital. Taluk Hospital is the only Allopathy hospital in Government Sector situated in Municipal ward 13. There are 7 allopathic clinics and 5 Ayurvedic and Homeo clinics.

The facilities available in Taluk Head quarter hospital are General Medicine, Anaesthesia, Gynaecology, Surgery, Pediatrics, Ophthalmology, ENT, Orthopaedics, Dental, Casualty, Delivery (General), Laboratory, X-ray, Pharmacy, ECG, USS, Pain & Paliative care, JSSK, JSY Aids (ICTC), TB unit (RNTCP), Ambulance Service and Mortuary. Details of hospitals in Allopathic sector is shown in Table 9.4. There are 8 /6 doctors/ specialists and 29 other staffs in the government hospital. The available data shows that there is a tremendous increase in OP category patients. The Taluk Government hospital is being upgraded to a 200 bedded facility. Fig 9.12 shows the variation in the number of people in IP & OP category.

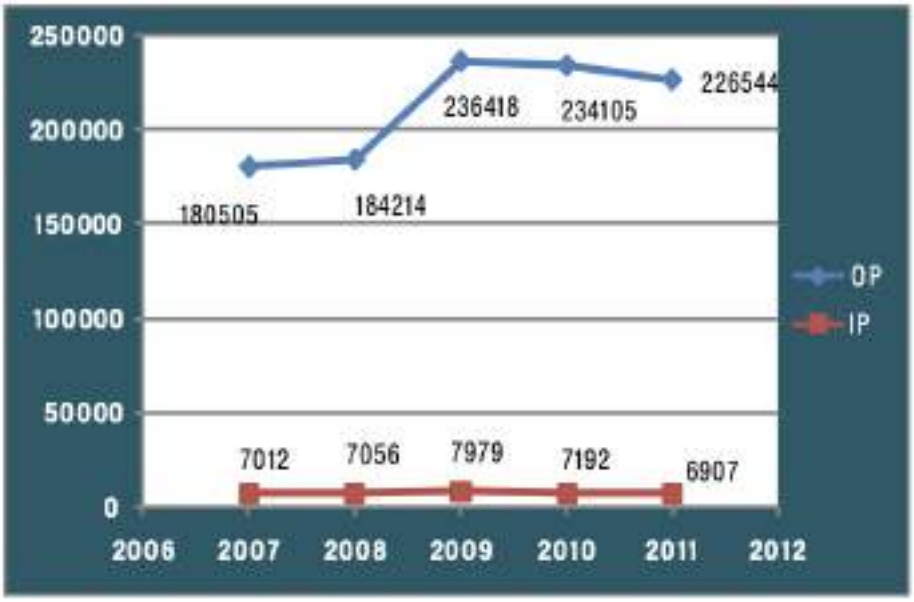


Fig 9.12 Variation in the number of IP&OP category people

Table 9.4 Details of hospitals in Allopathic sector

Sl. No	Name of Hospital	Location (Ward No)	No of beds	Doctors/Specialists	Other staff	Facilities	Govt/ Private /Co-operative society	Disposal of hospital waste
1	Govt. Hospital Chittur	13	108	8/6	Nurse- Gr II-1 Head nurse -4 Staff nurse -14 Nursing Asst -10	Lab Pharmacy Ambulance Operation theatre	Govt.	IMAGE
2	St Francis Santhi hospital	22	15	2	GNM-3 ANM-2 Lab technician-1 Pharmacist -1	Lab ,X ray,Pharmacy	Pvt.	Incinerator
3	Vinodhini	26		1			Pvt	
4	M V Clinic	27		1				
5	Chaithanya	16		1	2			
6	Prasad Clinic	29		2				
7	SK clinic	13						
8	Moses Dental clinic	12		1				
9	Chittur Dental clinic	13		2				



Santhi Hospital and Diabetic centre

There is one Government Ayurveda hospital functioning at Thathamangalam. The treatment facilities available are General Medicine, Pediatrics, Geriatrics, Panchakarma etc.

Table 9.5 Details of hospitals in Ayurvedic sector

Sl. No.	Name of Hospital	Location (Ward)	Number of beds	Number of Doctors	Govt/ Private / Cooperative society	Workers	Disposal of hospital waste
1	Govt. Ayurvedic hospital	28	General 20 Pay ward-6	3	Govt.	Pharmacist-1 Nurse 2 Nursing asst-3 Pharmacy attender 1 Others -3	Collected by Municipality
2	AVM	3		1		1	
3	A M clinic	19		1			
4	JJ clinic	28		1			
5	SV clinic	22		1			
6	S K clinic	13		1			

There is one Government Homeo hospital. There are 5 homeo clinics functioning in private sector. Fig 9.13 shows the spatial distribution of health facilities in the municipality. From the

Fig 9.13, it is seen that all the health institutions available in the municipality are concentrated in the core area. Hinterlands are devoid of health facilities.



Taluk hospital, Chittur

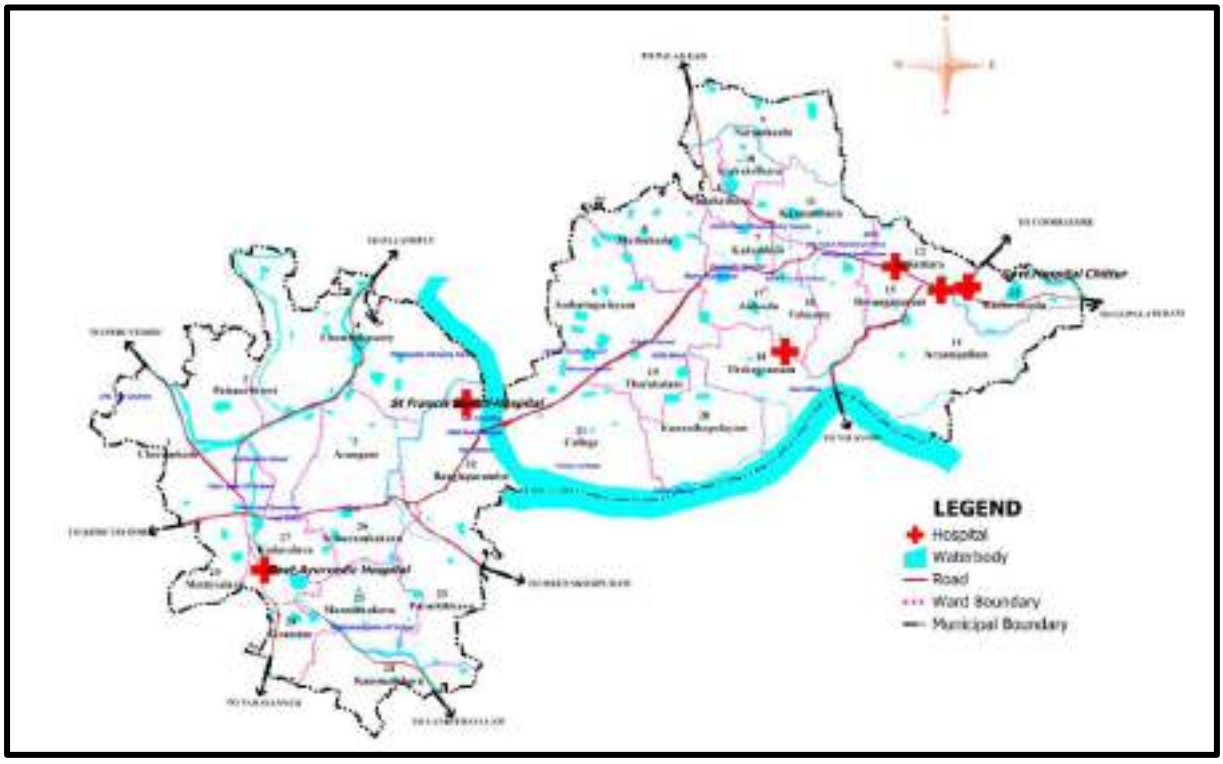


Fig 9.13 Spatial location of health institutions



Govt. Ayurvedic Hospital

9.2.2 Comparison with Planning Standards

Chittur-Thathamangalam has a population of 32298 as per 2011 Census. As per standards 50 beds are required for 1 lakh population in Taluk hospital. The number of beds is 123 at present. As per standard, bed strength available in these hospitals are enough to serve the people in the municipality. The major incidence of epidemics such as Dengue and Leptospirosis shows an increase, other diseases like H1N1, Chikungunya were not reported.

There is no super speciality hospital in the municipal area as well as district. Major problem in the health sector is the insufficiency of facilities in hospitals. The government hospitals and dispensaries do not have good infrastructural facilities, modern treatment facilities and modern equipment. Currently, with the Government Taluk hospital being upgraded to a 200 bedded facility, this may provide an opportunity to address some of the gaps in accessing quality medical care in the District.

Now a Medical college is started by the Schedule Castes and Schedule Tribes (SCs/STs) Department in Palakkad Municipality. The construction work of the building is fast progressing at Yakkara and the academic block has almost been completed. At present the people of the district are forced to travel to Thrissur or Coimbatore for better medical facilities owing to lack of such facilities here. There are also no facilities to handle emergency accident cases, causing large number of deaths in the district. Hopefully the functioning of a medical college will solve these problems in the near future.

9.2.3 Inference

Existing health services in the government sector are currently being upgraded for improving their capacity to provide desired level of service to the people. Spatial distribution of health institution facilities is also being augmented through the provision of two Urban Health Centres, one in Chittur and one in Thathamangalam. This will enable equitable and accessible primary health infrastructure. Proper infrastructural developments should be applied in allopathic, ayurvedic and homeopathic sectors. There gap of super speciality hospitals in the municipality for which people seek better treatment people in the neighbouring districts and

Coimbatore in Tamil Nadu, still persists but may be mitigated by the Taluk Govt. Hospital upgradation that is currently underway.

9.3 Recreational Facilities

Places of recreation, specialized institutes, and clubs will provide new avenues for the residents to spend their leisure time for productive purposes enhancing their capabilities as well as for specific occasions.

9.3.1 Parks and Play Grounds

There are two parks in the municipality which are Priyadarsini and Devinagar, but these are not functioning. It is noticed that the playgrounds attached with various schools are being used for public function especially those located near to the town centre. Since the town lacks such a facility in the town centre, there is public demand for requirement of open space/parks near to the town centre.



Private property used as a playground near Pencos

9.3.2 Libraries

There are two Municipal libraries, one at Chittur and other at Thathamangalam. There are two more libraries in private sector, one is Panchajanyam library and other is Deveikalakshethram library. Panchajanyam is also an organisation actively involved in the promotion of Arts, Sports and Culture. It started functioning in 1982 in the village of Thekkegramam in Chittur as a small library and is today affiliated to the Kerala Grandhasala Sangham and is rated as an A Grade library. Panchajanyam has also added a Reference Library section, and this is the first such in Chittur. Panchajanyam also conducts an annual International Film Festival (PIFF) at Chittur.



Municipal Library, Chittur



Municipal Library, Thathamangalam

9.3.3 Theatres and Auditoria

There are two cinema halls in Chittur-Thathamangalam Municipality. They are Sree and Kairali theatres (housed in the same building; formerly called Chitranjali Theatre) owned by Kerala State Film Development Corporation. There are 10 community halls /Auditorium in Chittur-Thathamangalam Municipality, among them Nehru Auditorium is owned by Municipality. The details of which are shown in Table 9.6, and they are used frequently for meeting, seminars etc. There are several NGOs in the town working for the social cause of the town people. Spatial distribution of recreational facilities of the municipality is shown in the Figure 9.14.

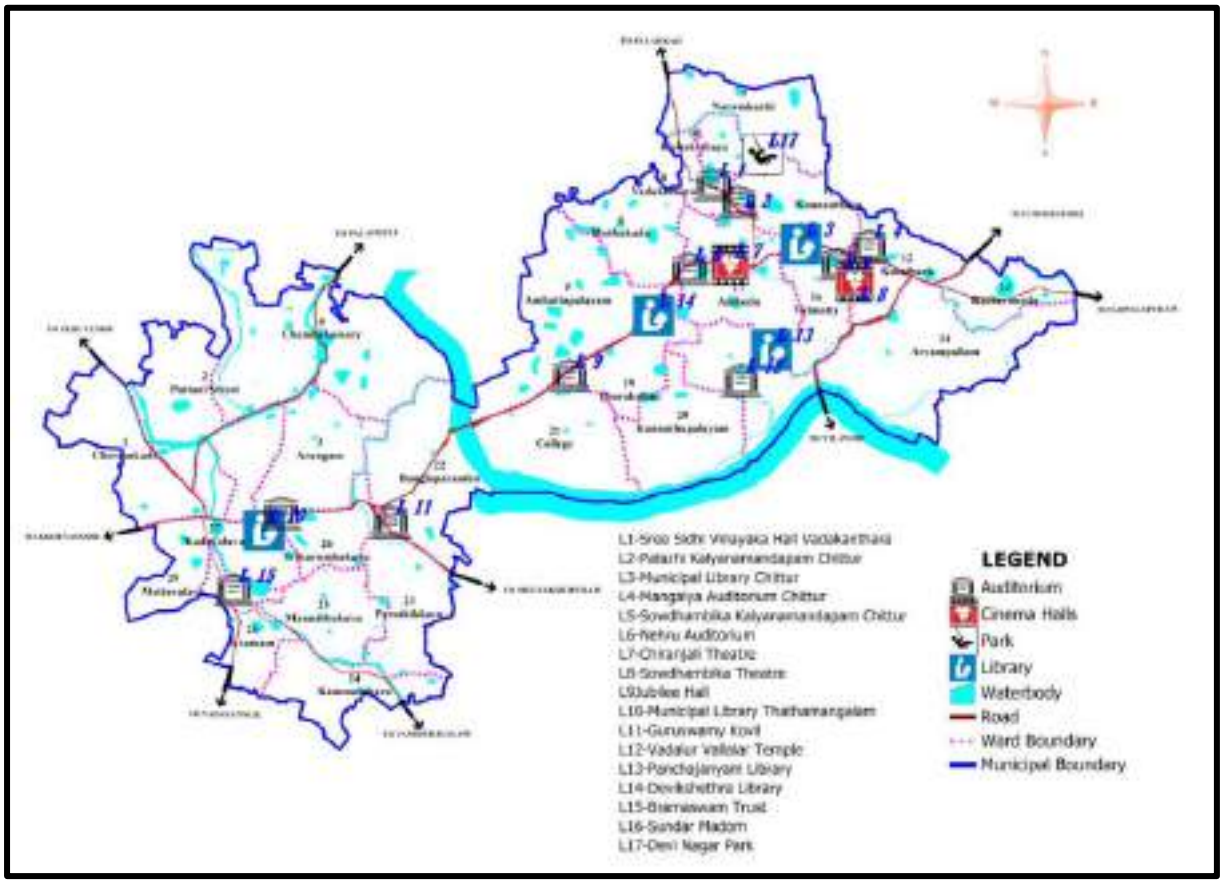


Fig 9.14 Spatial Distribution of Recreational Facilities



Cinema Theatre



Nehru Auditorium



Stayfit Auditorium and Badminton Club

Table 9.6 Recreational open spaces/ Recreational facilities

Sl. No.	Facility	Name	Location / Ward	Ownership	Extent / Capacity
1	Park	Priyadarsini Park	Thathamangalam	Public	38 Cents
		Devi Nagar Park	Thathamangalam	Public	53 Cents
2	Open (Play ground)				
3	Community Hall / Town Hall	Bramaswam Trust	Thathamangalam / 28	Private	10 Cents / 250 Seats
		Guruswamiyar Madom	Mettupalayam / 2	Private	1 Acre / 300
		Sundar madom	Thathamangalam / 3	Private	15 Cents / 300
		Jubilee Hall	Ambattupalayam	Private	10 Cents / 150
		Nehru Auditorium	Anikode / 17	Public	128 Cents / 1000
		Sidhi Vinayaka Hall	Vadakkathara / 10	Private	20 Cents / 300
		Palazhi Kalyana Mandapam	Chittur / 10	Private	30 Cents / 600
		Vadalur Vallalar	Kunnathupalayam / 18	Private	30 Cents / 300
		Mangalya	Chittur / 12	Private	50 Cents / 500
		Rajiv Gandhi Auditorium	Thathamangalam	Public	
		EMS Hall	Chittur / 15	Public	
		Cosmopolitan Recreation Club	Chittur / 10	Private	
		Kadambidi Mariyamman Kovil Community Hall	Vadakkathara / 10	Private	
4	Public Library	Municipal Library	Thathamangalam / 27	Public	1000 sq ft / 12000 books
		Municipal Library	Chittur / 15	Public	12164
		Kalakshetram Library	Chittur / 19	Private	5 Cents / 6291
		Panchajanyam Library	Thekkegramam / 17	Private	5 Cents / 15000
5	Cinema Hall	Sree Theatre (KSFDC)	Chittur / 17	Public	250
		Kairali Theatre (KSFDC)	Chittur / 17	Public	320

9.3.4 Inference

There is a need to increase access to recreational spaces, and public parks for people of all ages in different neighbourhoods. There is need for children's playgrounds and a stadium, pools for encouraging sports activities in the town. Open spaces could be augmented by providing green areas in specific locations along major roads, irrigation canals, water bodies, the river etc. The open space has not been distributed evenly to serve the community needs. The northern portions of the town do not have any major open space.

9.4 Other Civic Amenities

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

9.4.1 Police Station

As per URDPFI guidelines one police station is required for every 90000 population. Chittur-Thathamangalam Municipality has one police station in which Sub-inspectors' office is functioning. Police station is functioning in own building. Police station is located at Kacherimedu having an extent of 30 cents. It has total of 29 staffs in which 7 are females. The police station has 2 sub inspectors and 2 additional sub inspectors. The office of Sub Inspector has service area distributed over Chittur-Thathamangalam (M), Polpully GP Nalleppilly GP, Moolathara Village, 3 wards of Pattancherry GP, 3 wards of Kozhinjampara GP. Location of police station is shown in Fig 9.15.

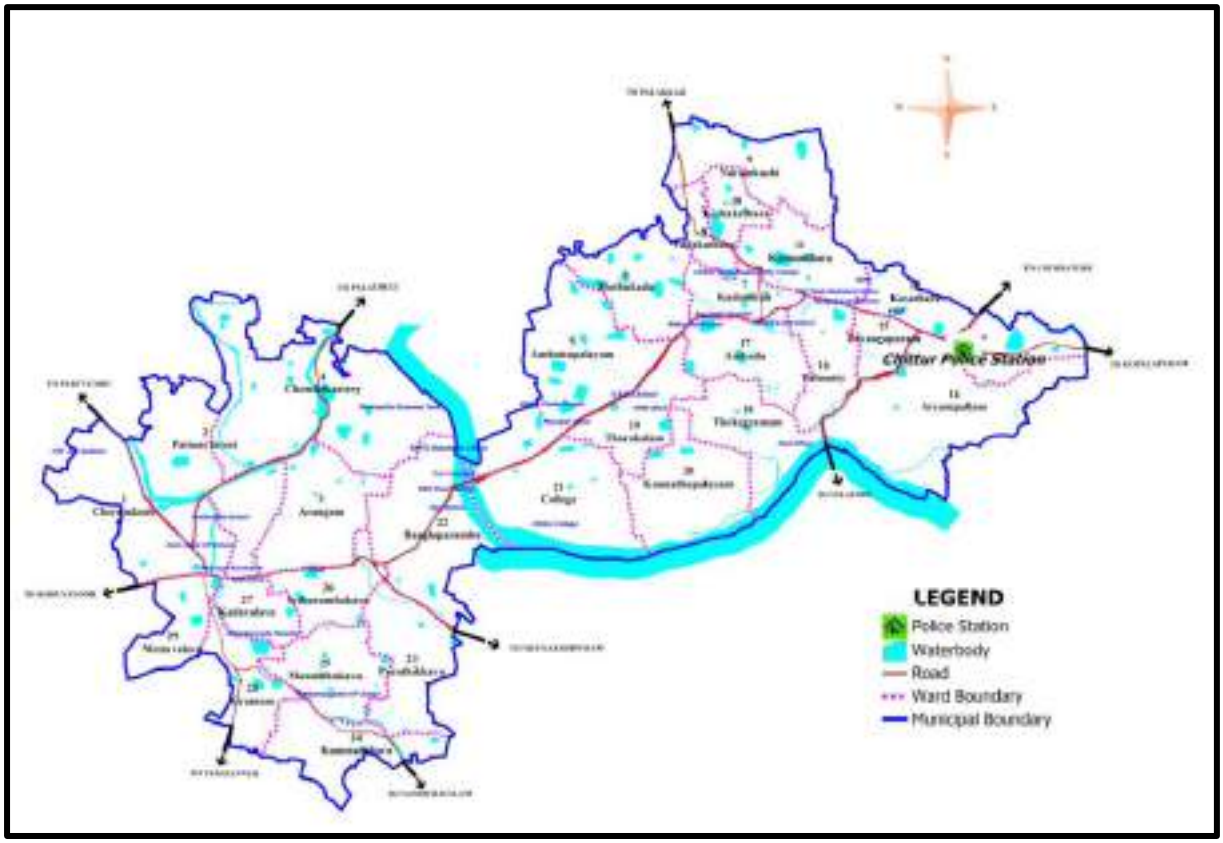


Fig 9.15 Spatial location of Police station

9.4.2 Fire Station

As per URDPFI guidelines one fire station is required for two lakh population. There is one fire station in the municipality which is located near Puzhappalam at Thathamangalam. Fire station building has a built-up area of 6500 sq. feet. The above fire station serves entire Chittur Taluk area.

Table 9.7 Details of existing fire station

Sl No	Name	Location	Ward	Extent	Capacity	Vehicle	Service Area
1	Fire & Rescue station	Thathamangalam	22	1.92 acres	60000 ltr under ground water storage, 2500*2 on the top of building	Water lorry 6000litre -1 No MTU -4000 Liter -1 MTU -2500 Liter -1 Ambulance-1 Jeep -1	Chittur Taluk



Police station, Chittur



Fire station, Thathamangalam

9.4.3 Fuel Station

There are 3 petrol pumps and one LPG godown in Chittur-Thathamangalam Municipality. Petrol pumps located in wards Kurumbakavu, Anikode, Kallanchira. LPG supply centres are situated in Cherumkode. As per URDPFI guidelines, one petrol pump serves for 150 ha of residential area and an LPG gas godown serves 45000 - 50000 population. Chittur-Thathamangalam Municipality with 404 Ha of residential area requires 3 petrol pumps. The number of LPG godowns and petrol pumps are found satisfactory. Details of the fuel stations and LPG godown are given in the Table.9.8 and spatial distribution of fuel station is shown in Fig 9.17.



Gas Godown (Indane), Kallanchira

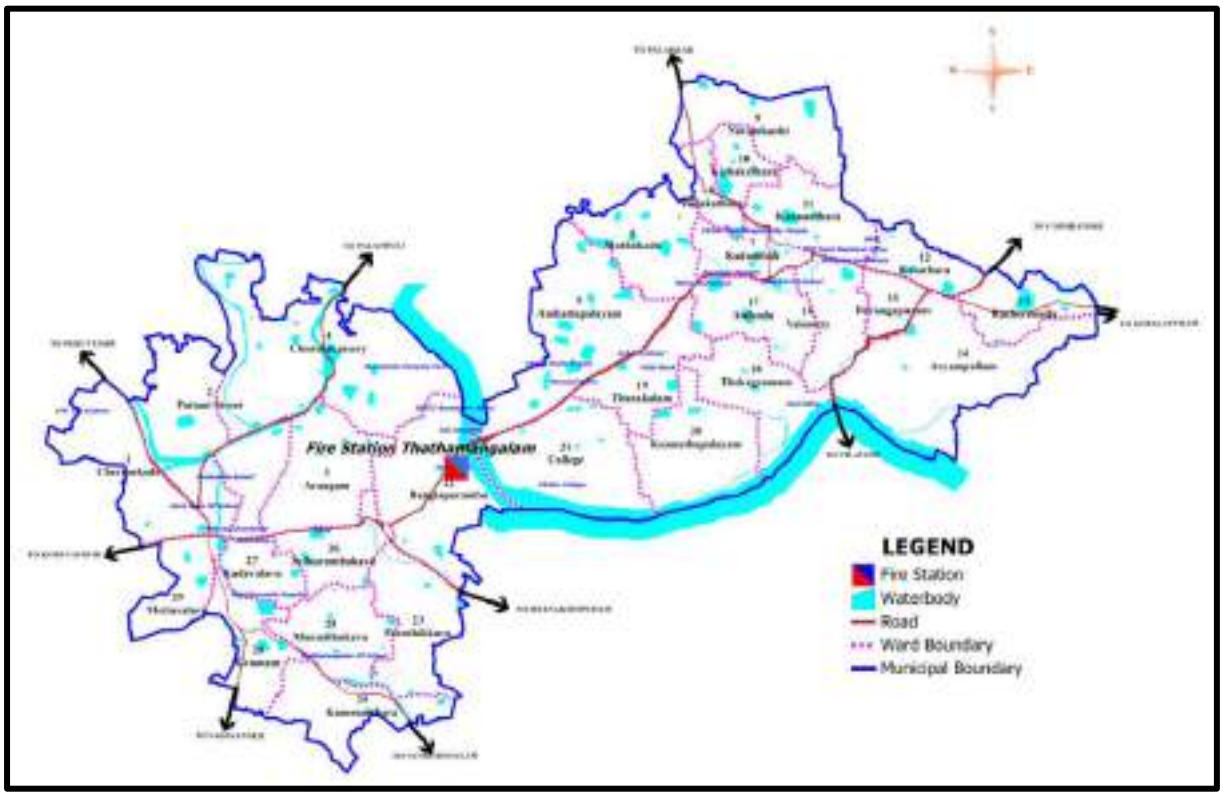


Fig 9.16 Spatial location of Fire station

Table 9.8 Details of Fuel Stations and LPG Godowns

Item	Name/ numbers	Location	ward	Extent	Capacity/ service area	
					Petrol	Diesel
Petrol Pump	SS Fuels (Indial Oil)	Thathamangalam	26	27.50 cents	15000 ltr	15000 ltr
	Sakthi Auto Fuels (Bhatrath Petroleum)	Chittur	12	20 cents	10000 ltr	15000 ltr
	Sarada Fuels (IOC)	Anikkode Jn	17	11 cents	25000 ltr	40000 ltr
LPG Godown	Kumar Gas agencies (Indane)	Kallanchira	1	50 cents	8000Kg	Chittur Thathamangalam (M),Polppully Pt , Perumatty Pt, Nallepilly pt





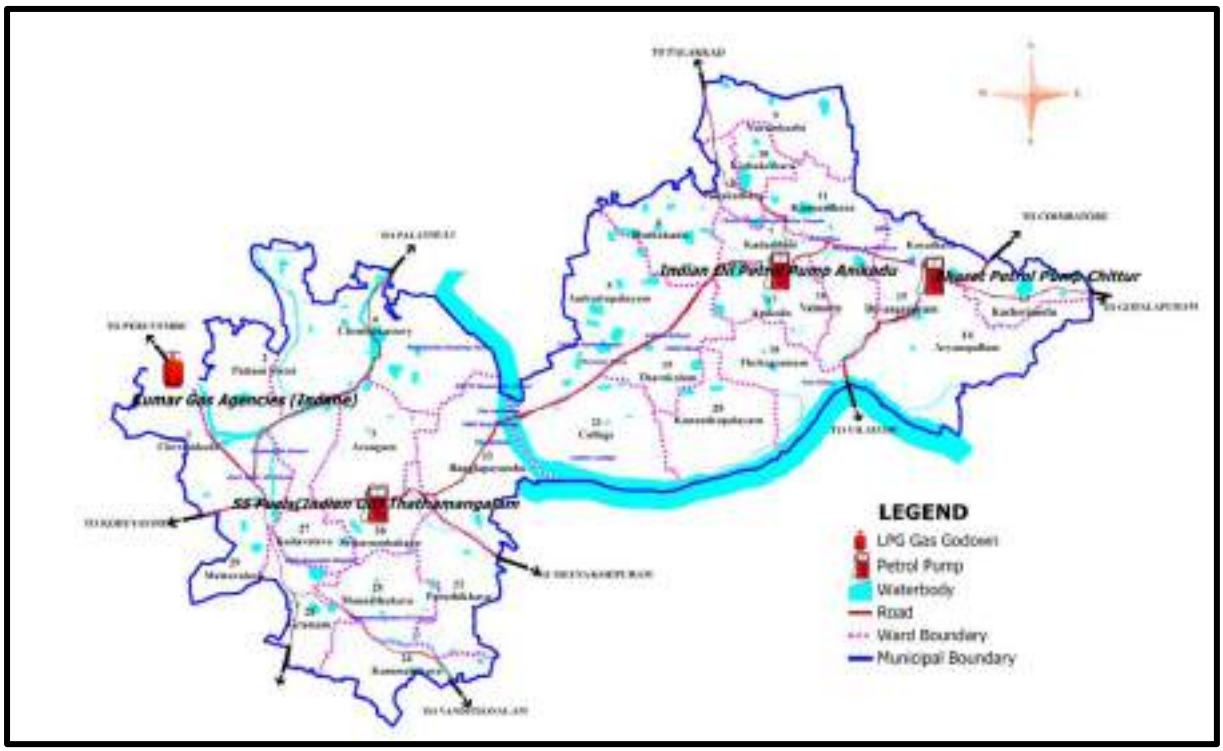


Fig 9.17 Spatial location of Fuel stations and Gas Godowns

9.4.4 Crematoria and Burial Ground

There are four crematoria owned by municipality, located near Puzhappalam which is a Gas Crematorium and other three located at Aryampallam, Koombanpara and Kottakadavu. In addition to these, there are five other burial grounds owned by religious institutions. These are Christian cemeteries at Aralikkadavu and Kabarasthan at Pallimunkku and Kammanthara. Spatial distribution of crematoria and burial ground is shown in the Fig 9.18.


Gas crematorium

Table 9.9 Details of Crematorium and Burial Grounds

Sl. No	Name	Location	Ward	Extent
1	Juma Masjid - Kabarsthan	Pallimukku, Thathamangalam	29	1 Acre
2	Madeena Masjid	Kammanthara, Thathamangalam	24	50 cents
3	Puzhappalam (owned by Municipality)	Puzhappalam	4	17 are
4	St Marys Cemetery	Aralikkadavu	20	47 cents
5	St Antonys Cemetery	Aralikkadavu	20	1 acre
6	St Gregorious Cemetery	Aralikkadavu	21	10 cents
7	Koombanpara (owned by Municipality)	Koobampara	20	20 are
8	Kottakkadavu(owned by Municipality)	Kottakkadavu	14	43 are
9	Aryampallam(owned by Municipality)	Arayampallam		15are

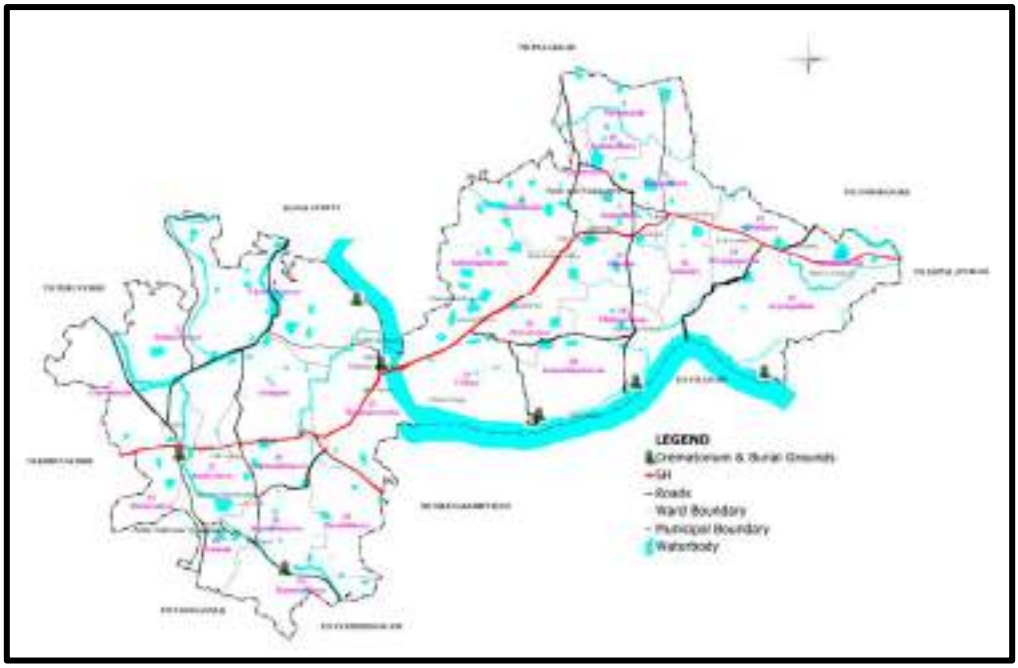


Fig 9.18 Spatial location of crematorium and burial grounds

9.4.5 Communication Facilities

Communication facilities mainly include post office, telephone service, internet facilities and fax services. As URDPFI guidelines one post office is required for 10000 - 15000 population. There are 2 post offices in the municipality, and it is capable to serve the requirements of the municipality. Spatial distribution of communication facilities is shown in the Figure 9.19. BSNL is the major service provider in the town. Only one telephone exchange is present in municipality.

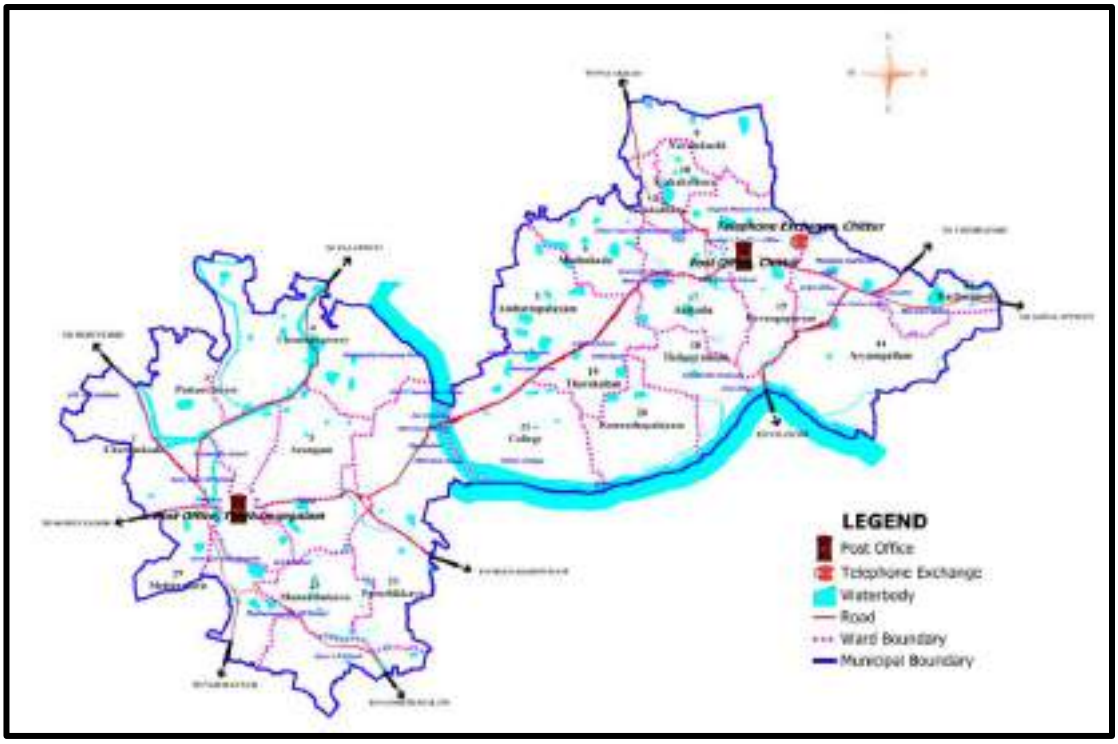


Fig 9.19 Spatial distribution of communication facilities

9.4.6 Public Toilets / Comfort Stations

The town lacks in public comfort stations to cater to the large number of commuters. There are five Comfort Stations at Anikode, Mini Civil Station, Market Shopping Complex, Post office Library, Thathamangalam Library, Thathamangalam Bus stand.

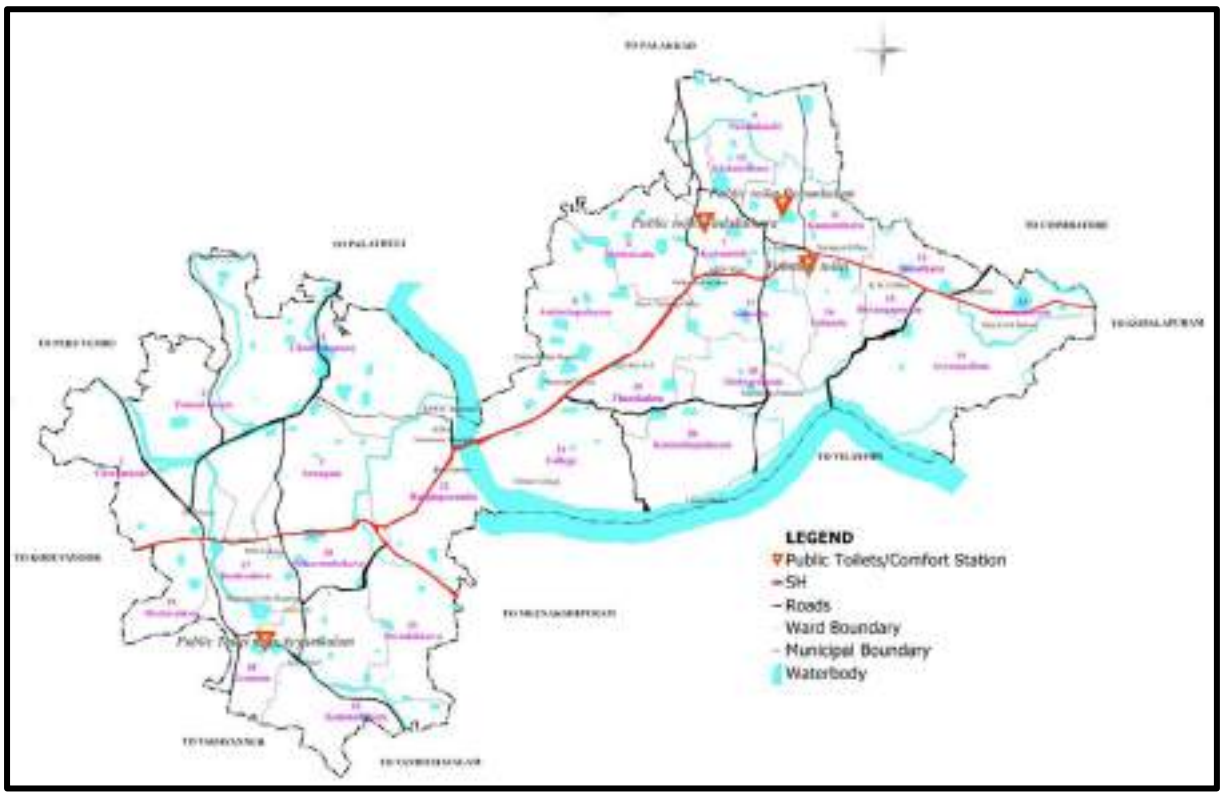


Fig 9.20 Spatial distribution of public toilet/Community Latrine facilities





Public toilets

9.4.7 Civil Station

A mini civil station, housing nearly 15 State government offices at the taluk headquarters, Chittur was inaugurated on 25/1/2015. The largest of its kind in the State, the three-storied 5824.43 sq. m. building was built at an expense of Rs.6.7 crore in land having an extent of 123 cents near hospital Junction. It has ample vehicle parking facilities.



Civil Station

9.5 Housing

9.5.1 Existing Housing Stock

In Chittur-Thathamangalam Municipality there are 29 wards. Almost 27% of the total land in the municipality is of residential use. As obtained from the socio-economic survey the average size of households in 2012 is 4 and majority of houses are having plinth area of 20 to 75 m^2. The decreasing trend in HH size may be the indications into a low fertility regime. About 43% of the houses are pucca. 92 % of the people are having their own land. As per socio economic survey only 1.4% of the total housing comes under kutcha and hut. Almost 55.6% of the total houses are moderate type. Spatial distributions of different types of buildings are given in the Figure 9.21. However, it must be recognised that these categories are not very reliable indicators of 'poor' housing stock, given that much of the older housing stock using indigenous pre-modern construction materials (mud, lime mortar, tile/thatch) have actually proved their robustness through their longevity, often lasting a few hundred years with regular maintenance.

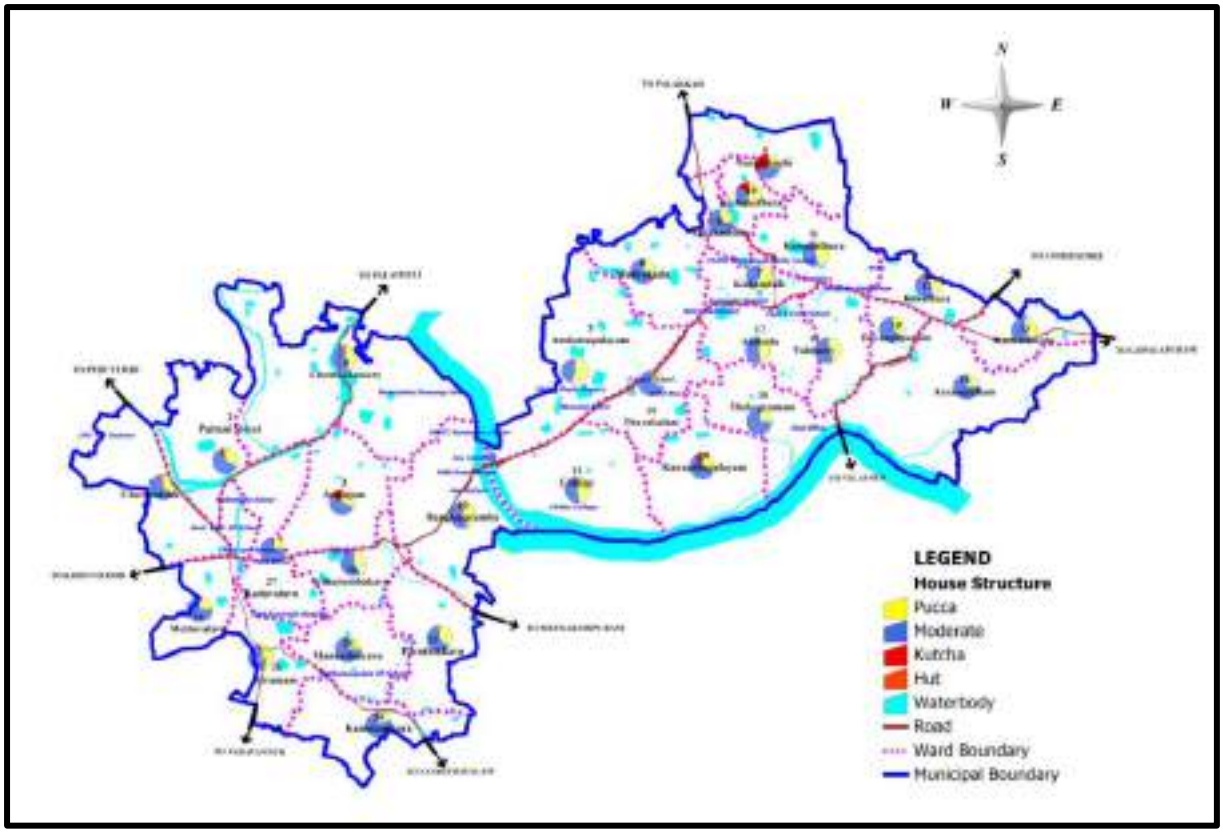


Fig 9.21 Wardwise housing types

9.5.2 Land Tenure

Land tenure reflects relationships between people and land directly. Details of Operational Holdings of Municipality are shown in the Table 9.10.

Table 9.10 Distribution of Operational Holdings- Agricultural Census 2010-11

Scheduled Caste		Scheduled Tribe		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	No. of Holdings	Area of Holdings
100	1363	0	0	1155	51184	16	190	1271	52737

Source: Panchayat level statistics 2011

From the socio-economic survey we can see that most of the people have their own land for housing. This is shown in Figure 9.22. It is also pertinent to note that if we compare SC holdings to that of others, they are more than 3 times in area than that of the SC holdings, thereby reinforcing their marginal status and limited access to property.

As per Census 2011 there are 7974 numbers of households in Chittur-Thathamangalam Municipality. The total number of houses in the municipality is 10495. As per socio-economic survey obtained the average size of households in 2012 is 4.

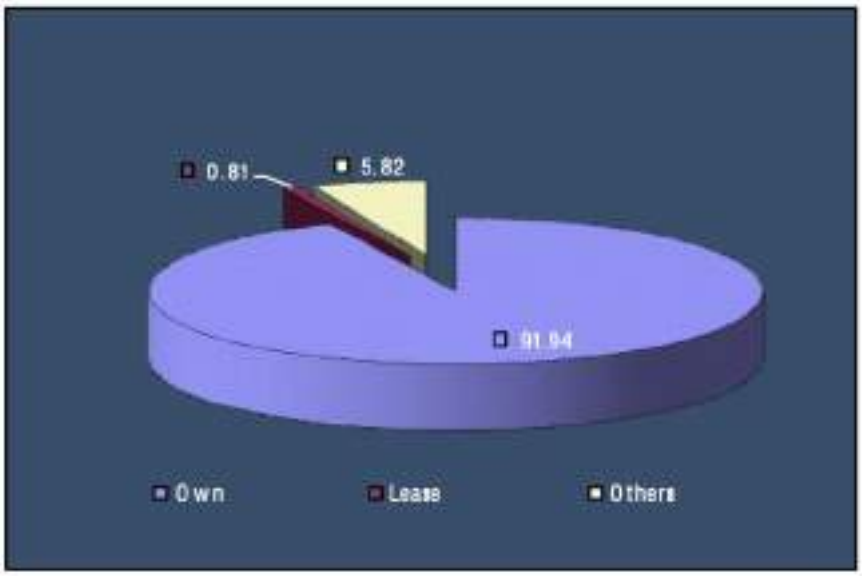


Fig 9.22 Land ownership details

Table 9.11 Residential plot size of Chittur-Thathamangalam Municipality

Range of Plot Area in cents	<=3	4 to 5	6 to 10	11 to 25	26 to 50	51 to 70	>70
Average % for the munucipality	17.86	32.51	31.98	13.9	2.14	0.21	0.43

Source: Primary survey

From the Table 9.11, it can be seen that 82.35% of the residential plots are below 10 cents, which implies that the Chittur-Thathamangalam Municipality has an urban character in terms of plot size.

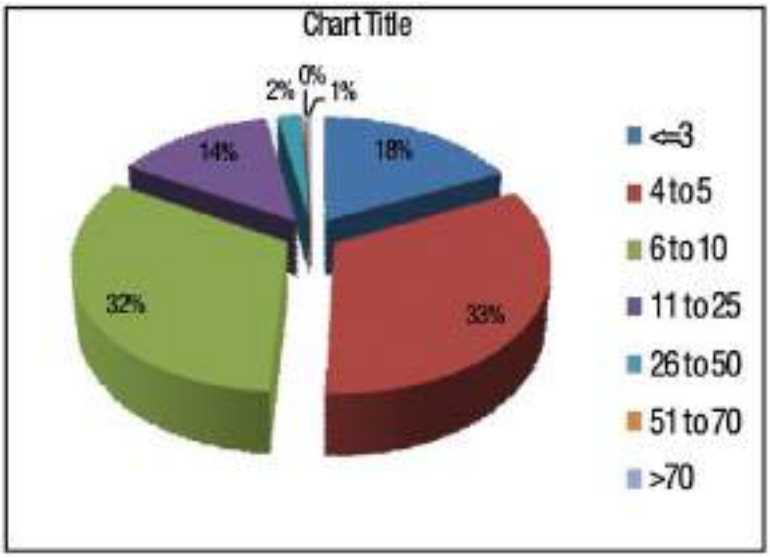


Fig 9.23 Variation of plot area

9.5.3 Housing Types and Area

As per socio-economic survey total number of kutcha and hut houses comes to 3.85% of the total houses (Fig 9.24). (Fig 9.25) shows percentage houses in each range of plinth area.

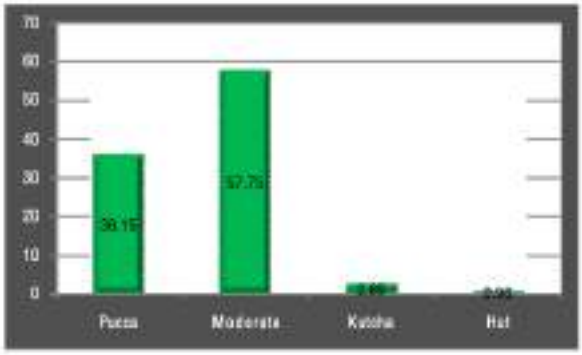


Fig 9.24 Percentage of Different Types of Buildings

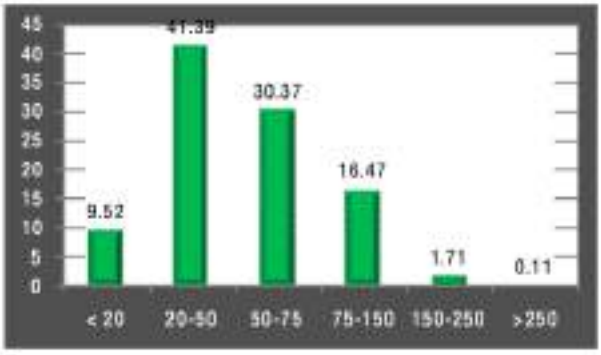


Fig 9.25 Percentage of Houses in Each Range of Plinth Area

9.5.4 Type of Housing Structures

The residential houses are broadly classified into three categories namely Pucca, moderate and kutcha according to the construction material used and considering the durability of structure. According to the socio-economic survey the majority of houses are either pucca or moderate type. The houses are classified as pucca and moderate depending on the type of materials used for construction. Nearly 58% houses are having ordinary tile / cement floors and 17% mosaic/ marble floors. There are 7974 households in the municipality as on 2011 and at present, total number of houses in the municipality is 10495 and all are occupied by owner, or otherwise given for rent. The data shows that number of houses in the municipality is more than the households, hence it is assumed that there may be a chance of more than one houses owned by some of the high/middle income group population.

Table 9.12 Decadal Variation of population & HH size

Census Year	Population	No of House holds	HH size
1971	28510	5359	5.32
1981	30407	5755	5.28
1991	32048	6292	5.09
2001	31886	6945	4.59
2011	32298	7974	4.05

Source: Census 1981,1991,2001,2011

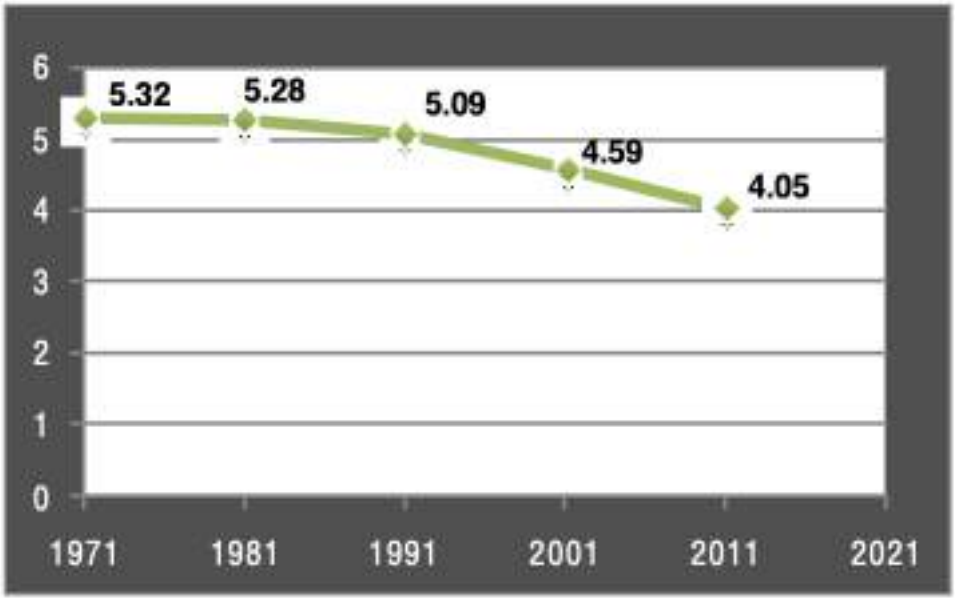


Fig 9.26 Decadal Variation of HH size

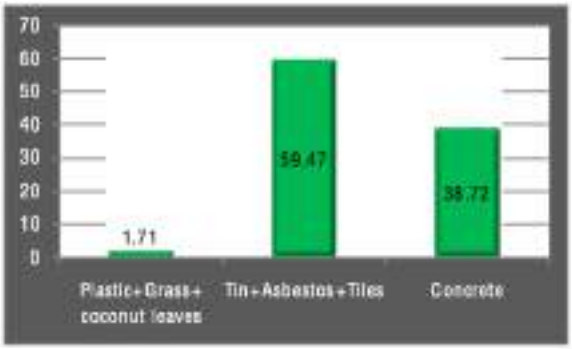


Fig 9.27 Percentage Variation for Different Types of Roofs

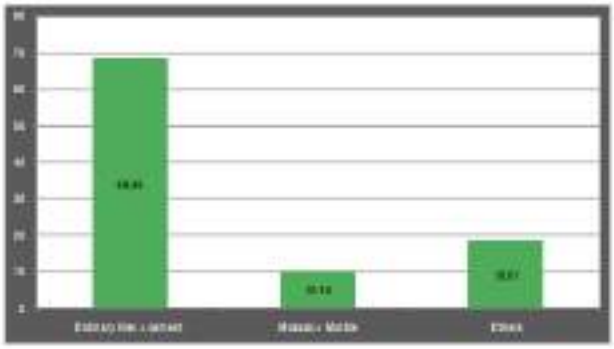


Fig 9.28 Percentage Variation for Different Types of Floors

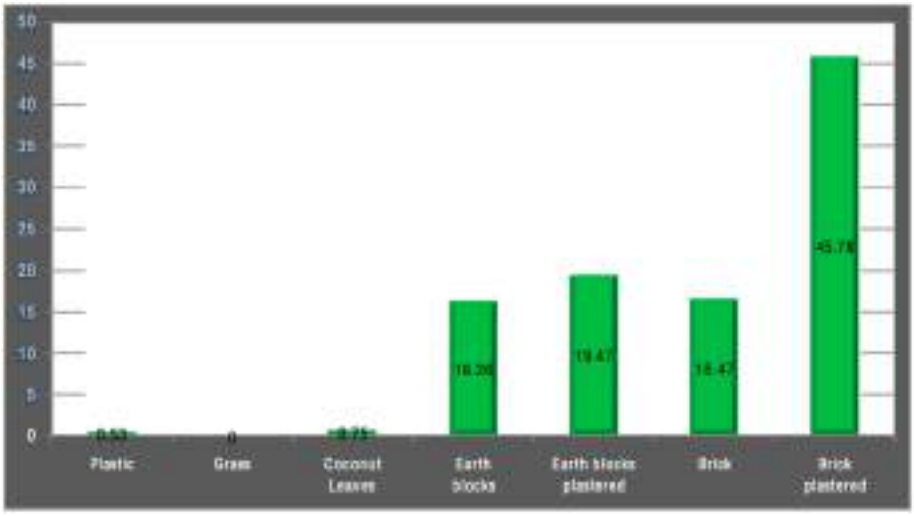


Fig 9.29 Percentage Variation for Different Types of Walls

There are 151 Kutcha houses. Decadal variation of population and households is shown in Table 9.12.

9.5.5. Agraharams

One particular feature which distinguishes Chittur-Thathamangalam town from other towns is its pattern of human habitations, which is huddled mostly in closed and compact settlements of Gramams. This settlement pattern is more akin to that found in the neighbouring state of Tamil Nadu.



Durgakoshtam Gramam



Thekkegramam

Row houses edging the street on either side and centered around a temple form nucleated communities. There are five important gramams, ie Lankeswaram, Durgakoshtam,

Thekkegramam in Chittur area and Thekkegramam and Padinjaregramam in Thathamangalam area. It is estimated that there are about 2500 people distributed in such gramams. Spatial distribution of these agraharams is shown in Fig 9.30.

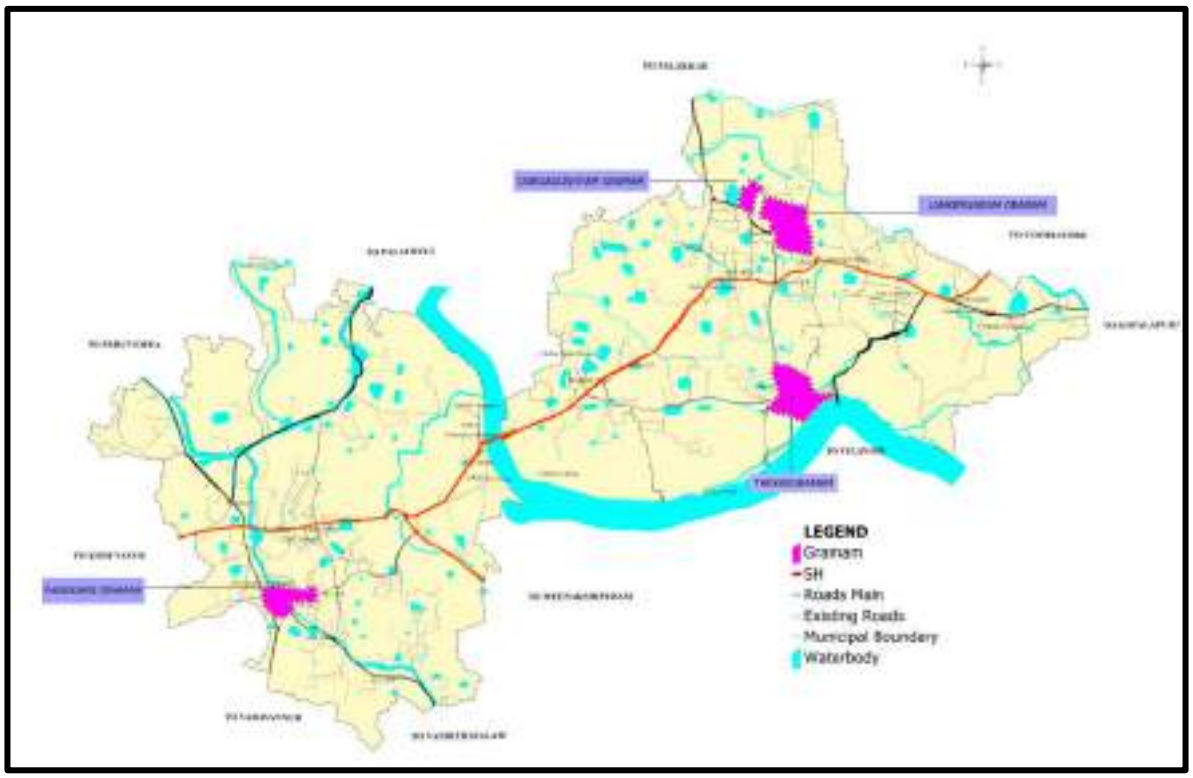


Fig 9.30 Spatial distribution of Agraharams

9.5.6. Public Housing

The town has a range of public housing provision ranging from Government Quarters to public housing for the urban poor.

Government Quarters: There are several government housing colonies in the town, though some of them are currently in a state of disrepair. These include PWD Quarters, Water Authority Quarters, Police Quarters to name a few.

Public Housing for the Urban Poor: The IHSDP is a scheme undertaken by the municipality to tackle problems in a holistic way adopting a multi-pronged approach of improving the living condition and enabling construction of affordable housing for the urban poor. The objective of the scheme is to provide basic services viz. solid waste management, water supply, improvement of informal settlements, construction and improvements of drains/storm water drains, sewerage, drainage, street lighting, health care etc. to the urban poor in the cities covered under the Mission.

In Chittur-Thathamangalam Municipality there were 36 settlements that were 'listed slums' taken under IHSDP project which covers an area of nearly 429 hectares. The settlement covering the largest area (64Ha) is Kanjirakadavu in ward 11 while that in Mooppanthara colony has maximum number of houses numbering 170. The highest number of these listed settlements is seen in ward number 5. (Details of the IHSDP project are provided in Section 10.2.1.

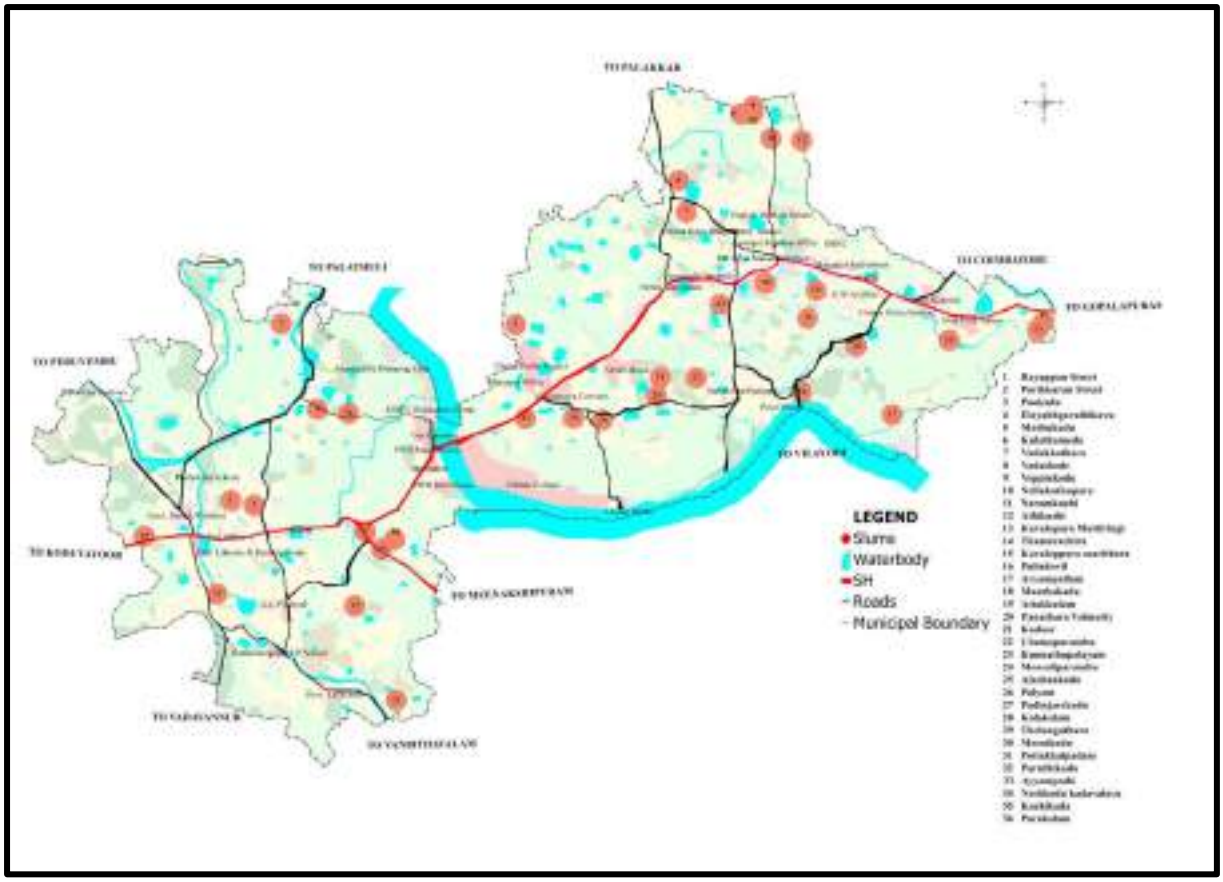


Fig 9.31 Location Map of settlements identified for IHSDP

9.5.7 Inference

Around 80% of the developed area is under residential use. Proper planning should be implemented to upgrade the infrastructural facilities of informal settlements, like sanitation, waste disposal, water and electricity. Implementation of IHSDP project within Municipality has almost developed all settlements that were lacking in amenities in the Municipality. As far as households are considered, number of houses are more. Mechanisms to encourage vacant houses to enter the housing market should be pursued. There is a significant older housing stock as well as government quarters that are in bad condition, that through innovative policies/programs and financing could be encouraged to contribute to a range of housing needs, either rental housing or tourist needs or cultural activities.

Chapter 10: SPECIAL CONCERN AREAS

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 are discussed.

10.1 Social Exclusion & Poverty

Poverty is a social phenomenon in which a section of the society is unable to fulfil even its basic necessities of life. Poverty continues to prevail among the downtrodden and depressed sections of the people. It is often concentrated in certain segments of the society, generally defined by social group. Socio economic inequalities between place and people have sharpened over the years. In fact, poverty amid plenty is the world's greatest challenge. Social backwardness is in the ultimate analysis the result of poverty to a large extent. Social backwardness which results from poverty is likely to be aggravated by considerations of their caste. This shows the relevance of both caste and poverty in determining factor of social backwardness of citizens. Hence study of Social backwardness of Chittur-Thathamangalam town is done based on BPL population and Scheduled caste and Scheduled tribe population and their spatial Distribution.

10.1.1 BPL Household

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 satisfies four or more parameters are classified as BPL. (Table 10.1)

Table 10.1 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

In Chittur-Thathamangalam Municipality, there were 4344 BPL families in 2022. This is only marginally more than the total number of the BPL families in the records of 2012, when 4237 families were categorized as BPL and BPL households are concentrated in 12 wards. The existing economic standard of people as obtained from the 2012 socioeconomic survey was that the average monthly income was Rs. 7830 and the average monthly expenditure per house was Rs 8183. This gives an insight into the economic status of the people of Chittur-Thathamangalam Municipality, a decade ago. The earning capacity was very less. The BPL

population is quite substantial and continues to constitute 53% of the total households in the municipality as in 2012. BPL concentration is more where the agricultural activity is more. Wardwise BPL households are shown in Table 10.2 and BPL population concentration is shown in Fig. 10.1.

Table 10.2 Ward wise number of BPL Households

Ward No	Ward Name	No:	Ward No	Ward Name	No:
1	Chenthamara Nagar	197	14	Devangapuram	156
2	Rayappan street	239	15	Valmutty	247
3	Bassar ward	220	16	Thekke Gramam	106
4	Chembakassery	188	17	Tharakkalam	166
5	Ambattupalayam	127	18	Kunnathupalayam	212
6	Ayyamputur	103	19	College ward	176
7	Kadambidi	86	20	Mettupalayam	148
8	Vadakkathara	177	21	Paruthikavu	227
9	Naramkuzhy	185	22	Thumbichira	162
10	Kizhakkathara	94	23	Mannathukavu	110
11	Vellanthara	129	24	Gramam Ward	94
12	Kacherimedu	143	25	Kadavalavu	186
13	Aryamballam	188	26	Mettuvalavu	171

Source: BPL Survey, 2009

10.1.2 SC/ST Population Index

Palakkad is a socially backward district. According to the 2011 Census, SC/ST population constitutes 16.11% of the total population in the district out of which 14.37% are SC's and the remaining 1.74% are ST's. SC population constitutes nearly 11.9 % of the total population in the Chittur-Thathamangalam Municipality whereas ST population is very meagre and constitutes just 0.09% of the total population. The temporal variation of SC/ST population from 1981 to 2011 is given in Fig. 10.2. The trends have shown that the SC population has increased over the years, but ST population has been fluctuating. The SC population has increased by 18% over the past three decades, but the ST population is far below the SC population. Currently there is no ST population in the town.

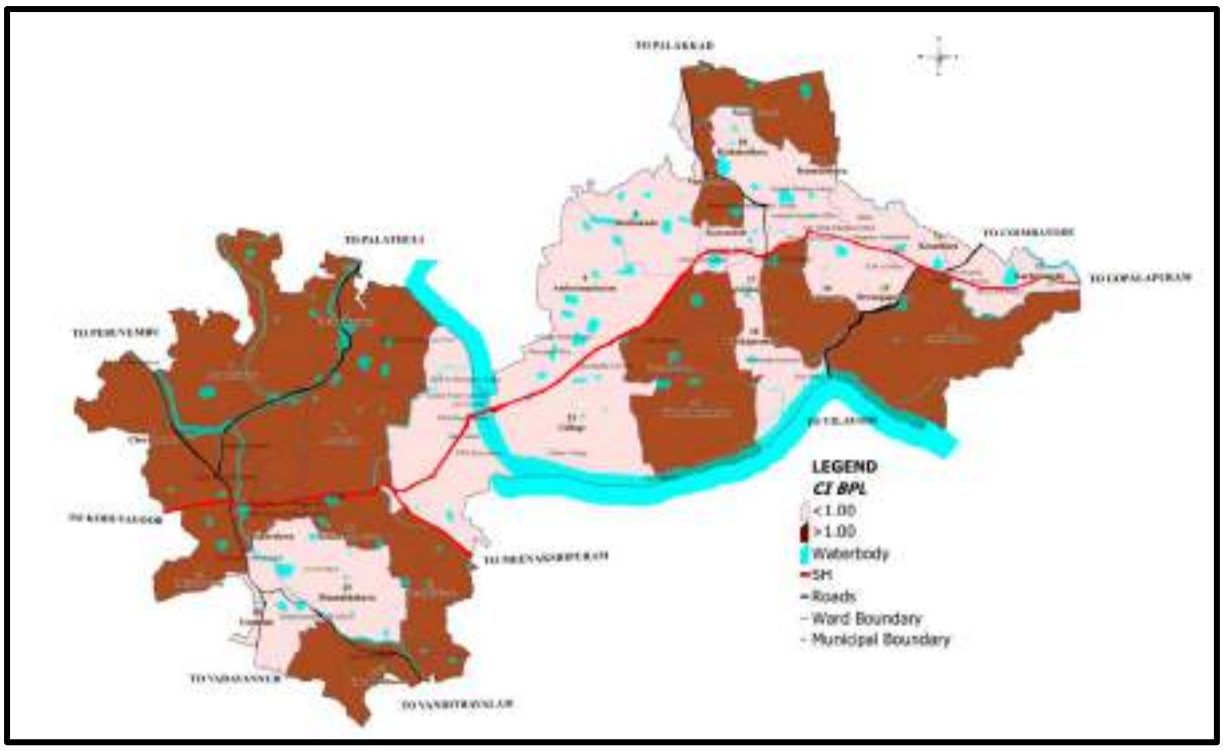


Fig 10.1 Wardwise BPL population concentration
Source: BPL Survey, 2009

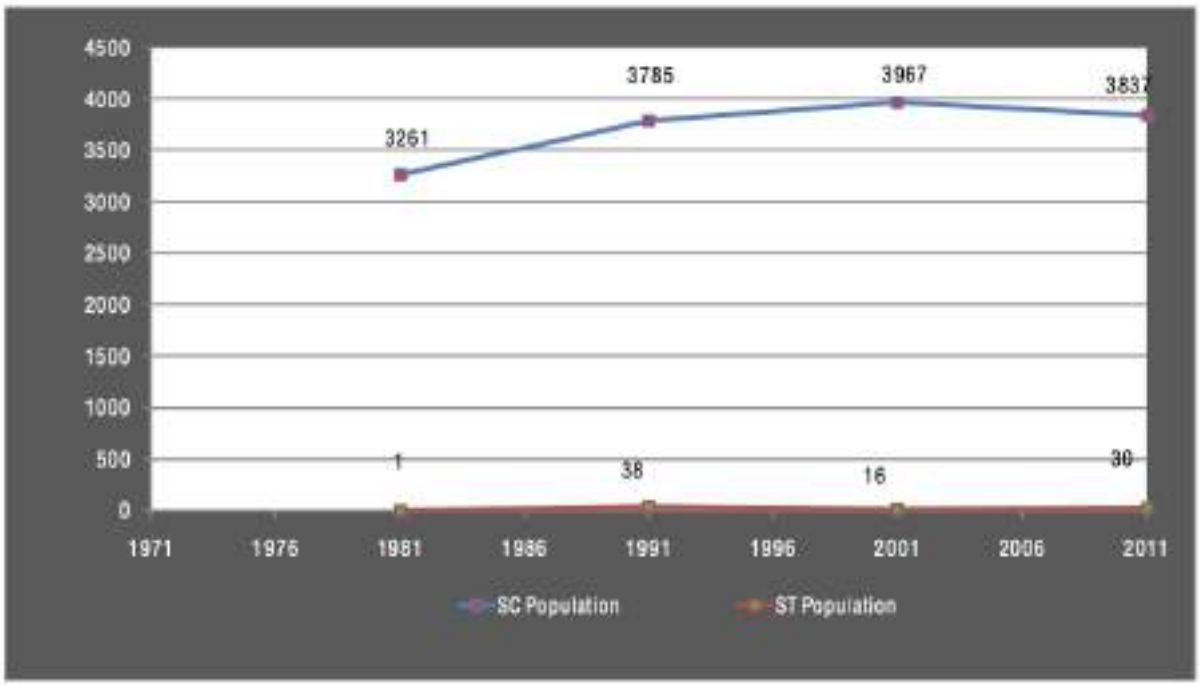


Fig 10.2 Temporal variation of SC/ST population
Source: Census

The SC population concentration and ST population concentration in the municipality are given in Fig 10.3, 10.4 respectively. The SC population is mainly concentrated along the north side of Thathamangalam Village and east and west ends of Chittur village. Ward 4 (Chembakasseri) and Ward 5 (Ambattupalayam) and Ward 14 (Aryampallam) are having the maximum SC concentration. Although the ST population is very less when compared with that of the SC,

their population is mainly concentrated in Ward 16 (Thekkegramam) and Ward 17 (Tharakkalam). BPL concentration is observed in the wards having higher concentration of SC's and ST's indicating the social backwardness of the group. Agricultural labourers were also observed to be predominant in these wards.

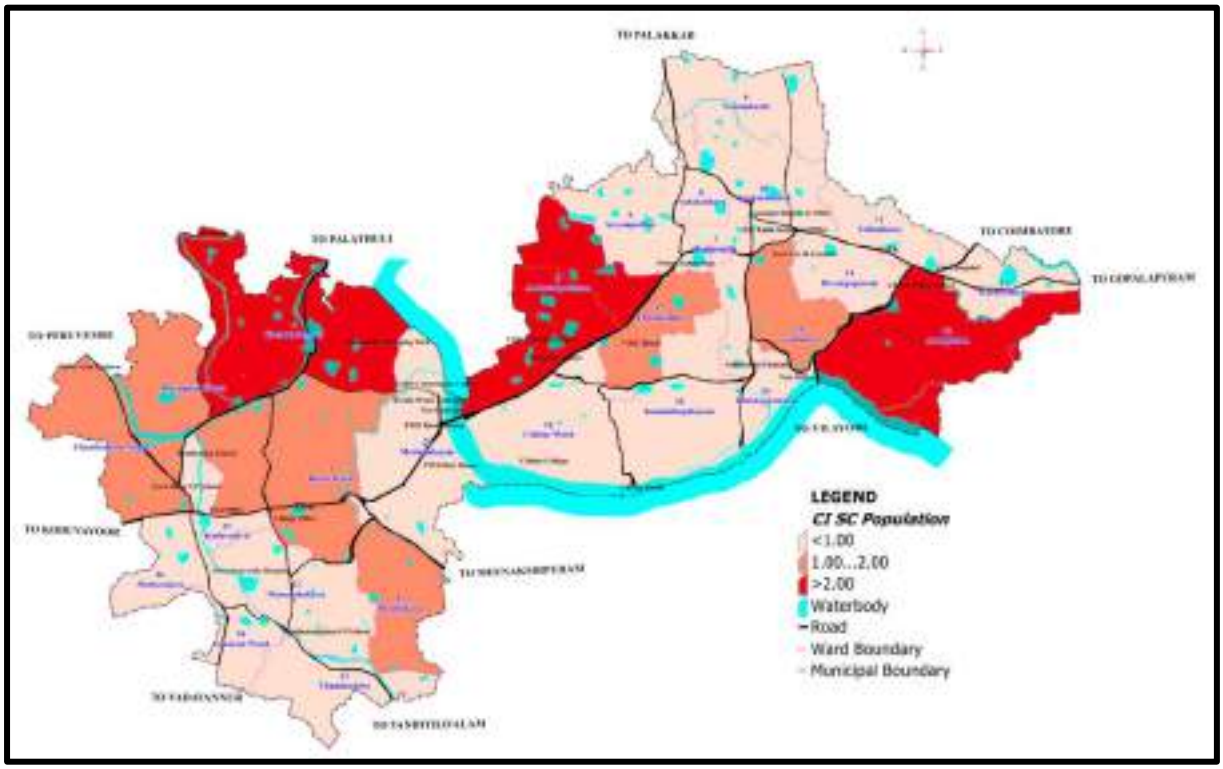


Fig 10.3 SC Concentration Index

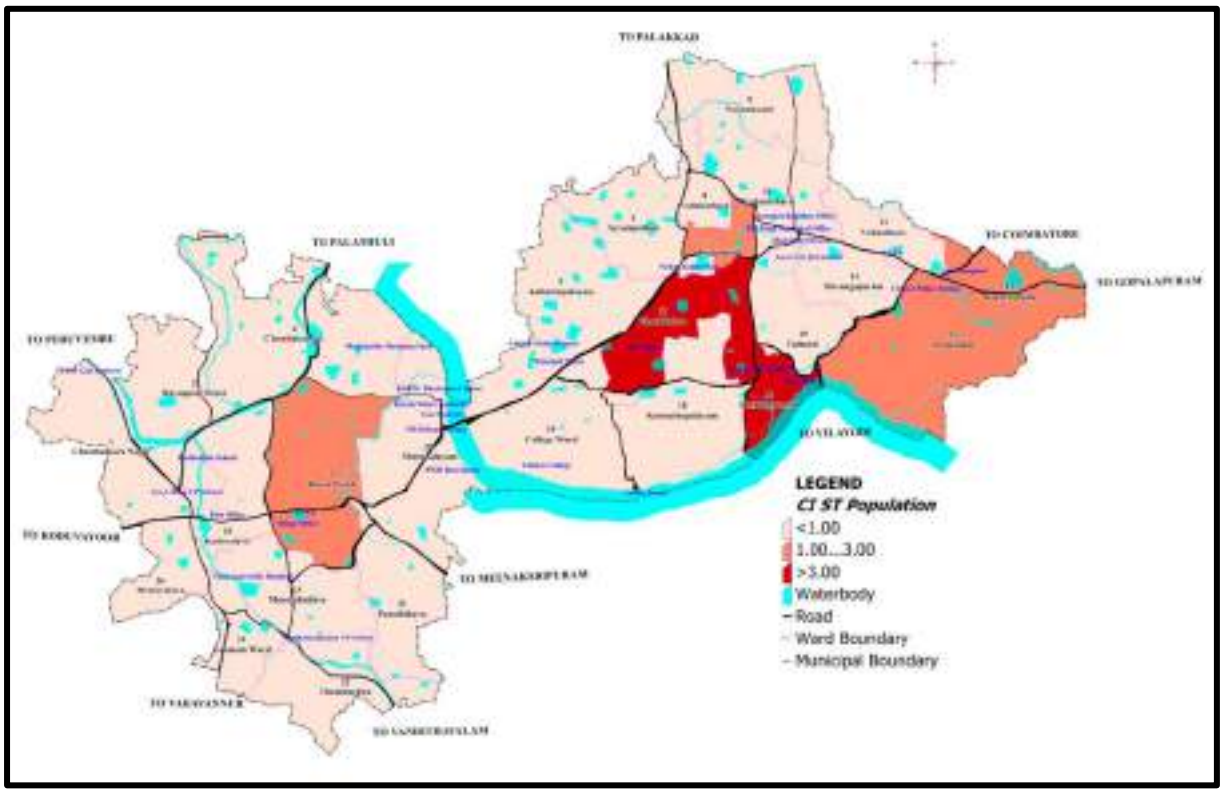


Fig 10.4 ST Concentration Index

10.1.3 General Condition of SC/ST Population

There are a total of 46 SC/ST colonies in the municipality comprising of 594 families and 67 % of the total SC population in the municipality are residing in these areas. According to the socio-economic survey, 98.6% of the houses in these colonies are electrified. However, the toilet facility is available in only 71 % of houses and 66.33 % of houses have accessibility to Potable Water.

Sex Ratio

Compared to the overall sex ratio of the municipality, the sex ratio of SC's and ST's are higher. The sex ratio among the SC's have shown a slight decline during 2001-2011. The variations of sex ratio for SCs over the last four decades are given in Fig 10.5.

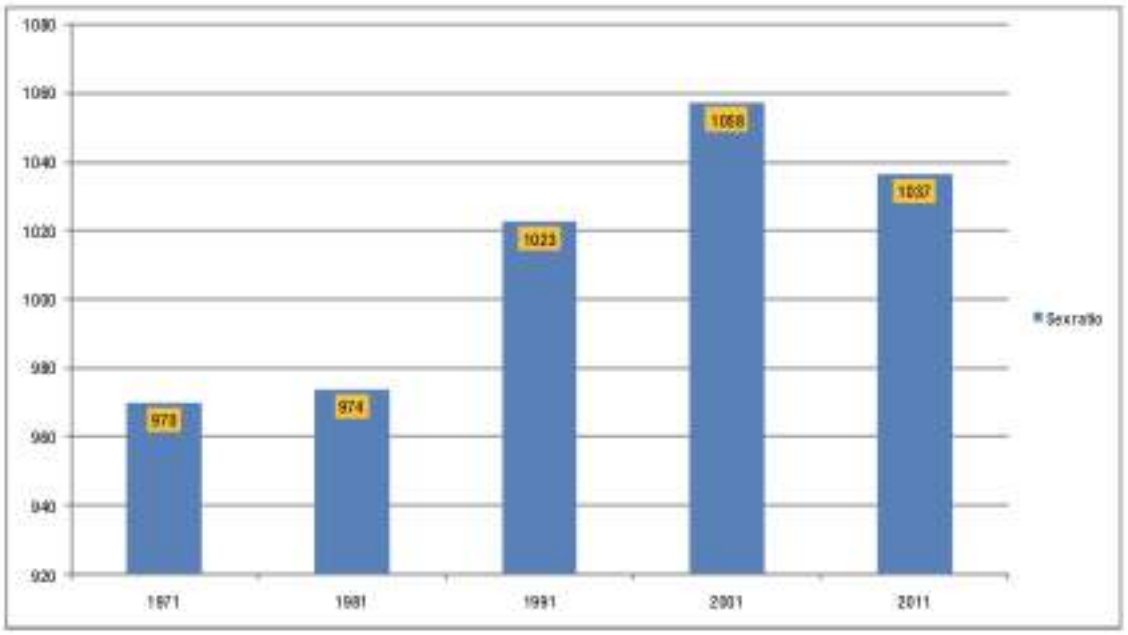


Fig 10.5 Temporal variation of SC sex ratio

Literacy

Literacy rate of SC population in Chittur-Thathamangalam Municipality according to the 2001 Census is 64.9%. This is low as compared to the overall literacy rate of 89.70 % of municipality. However, the literacy rate has increased over the previous decade. (Fig 10.6)

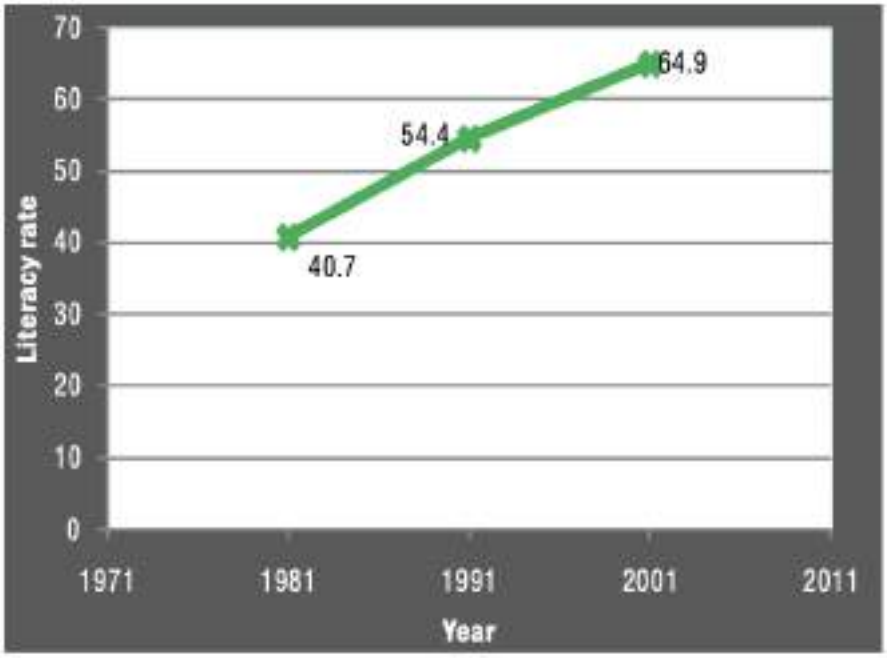


Fig 10.6 Decadal variation of literacy rate of SC population

10.1.4 Scheduled Caste Settlements

SC/ST settlements are areas which require special attention as the living conditions are comparatively poor. The BPL distribution shows that most of them are concentrated away from the urban centres where agricultural labourers and cultivators are predominant. So, there is a need to provide basic infrastructure facilities to each settlement to upgrade the living condition. The BPL population and SC/ST population are concentrated more or less in the same wards where there is high concentration of agricultural labourers and cultivators. But the high-income population occupied those lands where land value is more which is linked with accessibility. In Chittur-Thathamangalam Municipality there are 46 SC settlements and details of SC settlements are shown in Table 10.3. There are 594 houses in 46 sankethams total population being 2588. The total SC population of Municipality is 3837 persons as per Census 2011. 67% SC people are living in these settlements. Various institutions that address the welfare of SC's & ST's in the municipality are Women Industries Centre and Ambedkar Cultural Centre at Manthakkad Ward 14.


Women Industries Centre


Ambedkar Cultural Centre at Manthakkad

Table 10.3 Details of SC settlements

1. Total number of Sangethams (SC colonies)	46
2. Number of houses	594
3. Population	
Total population	2588
Male	1251
Female	1337
4. Sewerage Facilities	
Toilet facilities available	427
Toilet facilities not available	167
5. Water Availability	
Water available all over the year	376
Water available for more than 6 months	11
Water available for less than 6 months	7
Water scarcity areas	0
6. Electricity	
Electrified houses	457
Houses not electrified	137
Street lights	45
7. Land less and house less	30

Source: SC Survey, 2009-10

10.1.5 Inference

The SC/ST population are mainly concentrated in wards having greater concentration of agricultural labourers and cultivators. Socially backward communities are mostly engaged in primary activities like agriculture. Government's financial assistance for education at all levels and reservations in educational institutions was found effective as their education status has also improved over the years.

In spite of several initiatives taken towards poverty alleviation, there are several critical issues and challenges remaining unsolved. The analysis clearly reveals that the planned development of the town has to be achieved by giving due consideration to economically and socially backward sections of the community.

10.2 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.

The State Poverty Eradication Mission (SPEM)- Kudumbashree, started in the year 1998, aims at eradicating absolute poverty within 10 years under the leadership of the Local Self Govts in Kerala. As per the Section 284 of the Kerala Municipality Act 1994, 2% of the income of each ULB is to be spent for Urban Poverty Alleviation Programme. The ULBs are transferring such amount to the CDS annually, as its share for UPA budget. The other sources of income to the CDS for UPA activities, include the transfer from GOK under Kudumbashree centrally sponsored UPA programmes and institutional finance for Self Help Groups.

10.2.1 Major Poverty Alleviation Interventions

Pradhan Mantri Awas Yojana

Pradhan Mantri Awas Yojana (PMAY) is a credit-linked subsidy scheme by the Government of India to facilitate access to affordable housing for the low and moderate-income residents of the country. It envisaged a target of building 2 crore (20 million) affordable houses by 31 March 2022. In Chittur-Thathamangalam, a total of 1029 persons have been identified as beneficiaries of this scheme and in the case of the latest batch of beneficiaries identified (290 in number), the initial formalities are underway such as geotagging etc prior to release of funds.

Table 10.4 Chitttur-Thathamangalam Municipality PMAY Status as on 28-04-2023

Sl. No.	Date	No. of Beneficiaries			Funds Released
		Sanctioned	In Progress	Pending	
1	21-03-2017	274	236	38	100%
2	30-10-2017	167	143	24	99%
3	29-11-2017	31	23	8	99%
4	07-02-2018	34	25	9	100%
5	30-01-2019	186	145	41	96%
6	23-11-2021	47	0	47	93%
7	23-03-2022	290	0	290	0%
	Total	1029	572	457	

IHSDP project

The Integrated Housing and Slum Development Program (IHSDP) targets the poor living conditions of settlements and clusters in cities and towns and attempts to improve the housing stock and basic infrastructure and coverage service delivery to the poor. The program runs on a project mode.



Houses constructed under IHSDP scheme

The financing pattern is in the ratio of 80:20 by Central and State Governments. Beneficiary share (12% for General and 10% for SC/ST) is stipulated for beneficiaries of housing projects. Out of 20% State share the balance fund after deducting beneficiary share will be borne equally by the ULB and State (Maximum state share is 10% of the total Project Cost). The components for assistance under IHSDP include all housing development / upgradation / relocation projects including new house construction/ upgradation of houses and infrastructural facilities. Components under IHSDP are:

- Provision of shelter including up-gradation & construction of new houses
- Provision of community toilets
- Provision of physical amenities like water supply, storm water drains, community bath, widening and paving of existing lanes, sewers, community latrines, streetlight etc.
- Community infrastructure and social amenities like provisions of community centres to be used for pre-school education, non-formal education, adult education, recreational activities, and Community Primary Health care centre Buildings
- Provision of Model demonstration projects
- Informal settlements improvement and rehabilitation projects
- Details of settlements identified for IHSDP programme are shown in Table 10.5 and infrastructure details are shown in Table 10.6. Most of these settlements that are ‘listed slums’ in the municipality have good infrastructural facilities. The total population in such informal settlements is 4866 which is 15% of the town population. There are 36 such settlements and the numbers of households is 1937. There is a lack of community halls, open spaces and social infrastructure within these settlements.

Table 10.5 Details of settlements under IHSDP project

Sl. No	Name of slum	Ward	Location	Total area	No of houses	No of HHS			No of BPL HHs	Destitute families	Population		
						SC/ST	Others	Total			Male	Female	Total
1	Aryampallam	2	2.2 km South east from Anikode	4.5	116	87	32	119	118	95	253	264	517
2	Rajappan Street	3	35. km west of municipal office	4.5	74	7	79	86	70	57	184	157	341
3	Porikkaran Street	3	50 meter north of Thathamangalam Town	7.3	76	3	85	88	70	46	185	186	371
4	Elayabhagavathy kavu	3	1 km North from Pallimukku junction	5.3	62	30	32	62	58	38	180	139	319
5	Mudukadu	6	2.3 km North - West side of Anikode Junction	6.6	37	23	14	37	35	27	92	76	168
6	Vadakathara	8	0.7 km North west to Anikode junction	6.4	129	0	137	137	91	82	278	292	570
7	Vadathodu	8	1.5 km North to Chittur post office Junciton	4.8	41	0	42	42	21	17	102	120	222
8	Veppinkodu	9	2 km North from Anikodu Junction	2.1	23	4	23	27	23	22	68	75	143
9	Neilukuthupara	9	2 km North from Chittur Post Office Junction	3	29	15	14	29	27	26	52	70	122
10	Naramkuzhi	9	1.5 km Nort east of Chittur post office junction	3.5	35	2	35	37	29	24	76	79	155
11	Athikuzhi	9	1.5 km North west from Chittur hospital junction	2.2	54	0	54	54	54	34	112	121	233
12	Kavalapara Asari thara	11	0.8 km South east from Chittur hospital	2.5	36	4	32	36	26	18	70	80	150
13	Pulinkovil	13	1 km South east from Thekkegramam junction	0.8	21	11	10	21	18	11	48	60	108
14	Manthakadu	13	2 km South east from Anikode junction	1	31	22	10	32	28	24	59	68	127
15	Attakulam	13	0.3 km South of soudambika junction	1.98	23	4	23	27	24	17	71	78	149
16	Panathara vaimutty	14	0.7 km South east from anikode junction	4.3	106	42	69	111	89	87	261	306	567
17	Chamaparambu	14	0.4 km South to Anikode juction	4.8	29	5	30	35	20	20	72	82	154
18	Kunnathupalaya m	14	0.5 km South of Thekkegramam junction	3.7	70	4	66	70	27	11	129	153	282
19	Moosaliparambu	15	0.3 km South West of Anikode Junction	7.6	69	3	78	81	38	30	152	168	320
20	Alachankode	16	0.3 km East to Govt. Boys High School	0.9	18	2	16	18	11	9	42	37	79

Table 10.5 (cont'd) Details of settlements under IHSDP project

Sl. No	Name of slum	Ward	Location	Total area	No of houses	No of HHS			No of BPL HHs	Destitute families	Population		
21	Padinjare kadu	15	0.3 km south West to Municipal Office	2.6	36	15	21	36	29	22	75	79	154
22	Meenikode	17	2 km West to Chittur Municipal Office	2.9	38	10	29	39	34	24	72	53	155
23	Ayyampathy	18	2 km South of Mettupalayam Junction	4.2	72	1	71	72	59	29	208	210	418
24	Nellikode	19	0.6 km North West to Thathamangalam Junction	3.2	62	14	48	62	52	29	150	151	301
25	Kozhikkadu	20	.5 km West of Thathamangalam Padamukku Junction	0.8	20	9	11	20	18	16	51	56	107
26	Paruthikkadu	21	1 km South of Mettupalayam Junction	7.1	77	25	52	77	72	28	150	163	313
27	Kavalapara Mutturungi	21	1 km East of Chittur police Station	1.5	25	3	22	25	17	15	53	65	118
28	Parakkalam	21	Thathamangalam Junction	7.2	95	26	69	95	81	0	183	197	380
29	Kuruthumedu	22	0.5 km North of Abaikode Junction	3.3	31	0	31	31	18	0	54	70	124
30	Thamarachira	22	1 km west of Kacherimedu Junction	4.4	37	7	30	37	23	0	74	78	152
31	Kadoor	22	SouthEast of municipal office	5.8	90	15	80	95	60	0	182	194	376
32	Palayam	23	.6 km South east of VijayaMatha convent school	2.4	54	0	55	55	24	0	106	112	218
33	Kolakkulam	24	Near Vijayamatha Convent	5.3	48	2	46	48	23	0	102	110	212
34	Tolunkuthara	24	2 km south west of Chittur Municipal office	3	40	1	40	41	31	0	112	121	233
35	Potakkal Padam	29	2.2 km South of Municipal Office	3	28	2	26	28	18	0	35	40	75
36	Pookadu	4	2 km North to Thathamangalam junction	2.8	27	7	20	27	27	0	56	73	129
	Total			136.18	1841	403	1516	1919	1451	849	4107	4346	8453

Table 10.6 Infrastructural details of settlements under IHSDP project

Sl. No	Name of slum	Housing condition			No of HH withoutToilets	No of HH withToilets		Electricity		Water availability status			
		Pucca	Semi pucca	Kutcha		APL	BPL	Existing length in meter	Street lights	Open well	Bore well	Piped Distribution	Others
1	Aryampallam	24	63	29	47	1	71	1150	14	0	0	0	994*
2	Rajappan Street	44	20	10	31	16	39	905.5	16	0	0	0	0
3	Porikkaran Street	42	25	9	25	18	45	665	24	3	0	0	643*
4	Elayabhagavathy kavu	24	14	24	39	4	19	1466	26	0	0	0	1466*3**
5	Mudukadu	10	21	6	13	2	22	210	0	0	0	0	3.49**
6	Vadakathara	55	62	12	34	46	57	717	11	0	0	0	644*
7	Vadathodu	25	12	4	9	21	12	582	21	0	0	0	582*2**
8	Veppinkodu	5	12	6	13	4	10	100	4	0	0	0	169*
9	Nellukuthupara	3	17	9	11	2	16	414	13	0	0	0	120*
10	Naramkuzhi	13	12	10	14	8	15	482	17	0	0	0	496

Table 10.6 (cont'd) Infrastructural details of settlements under IHSDP project

Sl. No	Name of slum	Housing condition			No of HH without Toilets	No of HH with Toilets		Electricity		Water availability status			
		Pucca	Semi pucca	Kutcha		APL	BPL	Existing length in meter	Street lights	Open well	Bore well	Piped Distribution	Others
11	Athikuzhi	20	18	16	20	0	34	617	13	0	0	0	320
12	Kavalapara Asari thara	18	12	6	13	10	13	375	17	0	0	0	375
13	Pulinkovil	10	6	5	13	3	5	284	9	0	0	0	229
14	Manthakadu	8	7	16	22	4	6	335	13	1	1	0	249
15	Attakulam	10	13	0	14	3	10	351	10	0	0	0	351
16	Panathara valmutty	24	60	22	48	22	41	800	26	0	0	0	614
17	Chamaparambu	15	9	5	13	15	7	407	3	0	0	0	403
18	Kunnathupalayam	59	6	5	13	43	14	555	7	0	0	0	440
19	Moosaliparambu	51	8	10	28	43	10	543	12	10	0	0	543
20	Alachankode	9	3	6	8	7	3	229.5	3	3	0	0	166.5
21	Padinjare kadu	14	16	6	7	8	21	227	12	0	0	0	227.3
22	Meenikode	15	15	8	12	5	22	494.3	14	1	0	0	330
23	Ayyampathy	43	12	17	19	13	40	912	12	2	0	0	912
24	Nellikode	33	11	18	31	10	21	930	14	0	0	0	383
25	Kozhikkadu	4	9	7	7	2	11	288.6	3	0	0	0	141
26	Paruthikkadu	49	16	12	29	5	43	1388	17	2	0	0	1170
27	Kavalapara Mutturungi	10	11	4	10	8	7	208	7	0	0	0	208
28	Parakkalam	53	23	19	45	14	36	2027	25	0	0	1	0
29	Kulathumedu	13	11	7	7	13	11		6	0	0	1	
30	Thamarachira	16	13	8	12	14	11	548.4	3	1	0	0	0
31	Kadoor	38	41	11	25	35	30	1306	19	0	0	1	0
32	Palayam	32	15	7	10	31	13		10	1	0	1	0
33	Kolakkulam	24	20	4	0	25	23	0	8	0	0	0	0
34	Telunkuthara	21	12	7	16	10	14	526.5	6	1	0	0	Pond-1
35	Potakkal Padam	15	10	3	3	10	15	300	6	0	0	1	Pond-1
36	Pookadu	21	2	4	4	0	23	626	6	0	0	1	Pond-1
	* linking with existing water supply												





Projects completed under IHSDP

Swarna Jayanti Shahari Rozgar Yojana

Swarna Jayanthi Shahari Rozgar Yojana was introduced by Government of India in all urban local bodies to alleviate urban poverty. The main objective of SJSRY is to provide self-employment and wage employment to unemployed urban poor. Community Based Organizations in partnership with local bodies and women's Self-Help Groups are the implementing agencies of this scheme. This scheme is applicable not only to urban informal settlements but also to urban poor who do not live in these settlements. Under SJSRY, funds are provided by Central and State Government in ratio of 75:25. SJSRY consists of two special

schemes – Urban Self Employment Program (USEP) and Urban Wage Employment Program (UWEP). USEP provides assistance for setting up gainful employment for individuals, DWCUA /women groups and Thrift and Credit Societies (T&CS), training to individuals/groups for up gradation of vocational and entrepreneurial skills, and infrastructure support (setting up community service centres) for setting up micro-economic enterprise models. UWSP, on the other hand, provides direct wage employment by undertaking construction of durable community assets.

10.2.2 Urban Poor Programmes in Chittur-Thathamangalam

Kudumbashree/UPA cell functions in Chittur-Thathamangalam Municipality also. A Community Development Society (CDS) and, under that, 29 Area Development Societies (ADS) and 253 numbers of neighbourhood groups /SHG s consisting of 2500 members are functioning in Chittur-Thathamangalam. There are 10 group enterprises and 35 nos of individual enterprises in the Municipality. Details of Kudumbashree Group enterprises are shown in Table 10.7. Further, in 2021-22, as many as 55 women who are Kudumbashree members, have been given financial assistance for setting up independent home businesses such as food services (catering, cake making) or help with buying a sewing machine to set up a tailoring facility.

Several programs are undertaken by the Kudumbashree sub-units for poverty alleviation through women's empowerment. Through the micro thrift program, the women of Kudumbashree in Chittur-Thathamangalam have been able to save an amount of 1.2 crore Rupees. Number and distribution of women self-help groups in Chittur-Thathamangalam Municipality is shown in Table 10.8.

Table 10.7 Details of Kudumbashree Group Enterprises

Sl. No	Ward No	No.of enterprises
1	2	5
2	3	6
3	8	1
4	9	1
5	11	1
6	15	6
7	16	5
8	17	3
9	19	4
10	25	1
11	27	1
12	29	3

Table 10.8 Number and Distribution of Women Self Help Groups in Municipality

Sl. No.	Ward	No. of SHGs	Sl. No.	Ward	No. of SHGs
1	1	13	16	16	9
2	2	11	17	17	8
3	3	13	18	18	6
4	4	11	19	19	13
5	5	6	20	20	13
6	6	9	21	21	12
7	7	8	22	22	11
8	8	8	23	23	9
9	9	13	24	24	8
10	10	4	25	25	7
11	11	8	26	26	5
12	12	10	27	27	8
13	13	14	28	28	3
14	14	11	29	29	13
15	15	9	Total		273

10.3 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. Accident and crime data of Chittur-Thathamangalam Municipality for the year 2011- 2015 are shown in Table 10.9. Accident data for the period upto 2022 is provided in Chapter 7, Traffic and Transportation, Table 7.19.

Table 10.9 Accidents & Crimes Data in Chittur-Thathamangalam Municipality

Sl No.	Details of crime	No. of cases				
		2011	2012	2013	2014	2015
1	Theft	-	5	3	5	2
2	Robbery	-	-	-	1	-
3	Cheating	12	7	3	6	7
4	Violence against women	4	3	11	5	6
5	Accidents	28	26	15	20	16
6	Suicide	15	10	12	10	7
7	Attempt to Murder	-	1	1	2	-
8	Murder	-	-	-	-	-
9	Petty cases	1420	2340	1475	2360	1891

Source: Police station, Chittur

10.3.1 Social Welfare Programmes and infrastructures

Social welfare schemes are introduced with the objective of benefiting various marginalised 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, seven types of social security pensions are being distributed through local bodies. The types of Pensions are agricultural labour pension, Destitute pension, Widow pension, old age pension, disability pension etc. The details of pension schemes and no of beneficiaries in Chittur-Thathamangalam Municipality are shown in Table 10.10.

Table 10.10 Pension schemes and number of Pensioners

Sl. No	Type of Pension	No. of Beneficieries				
		2010-11	2011-12	2012-13	2013-14	2014-15
1	Unmarried Women above 50 years	45	56	60	88	94
2	Agricultural Labour Pension	425	451	459	449	445
3	Special Disabled Pension	176	218	243	270	284
4	Old Age Pension	280	358	606	655	1455
5	Widow Pension	412	518	982	967	1082

In 2021-22, except for agricultural labourers who availed pension (numbers declined to 302) the number of beneficiaries has grown for each type of pension with 122 unmarried women beneficiaries, rs, 317 physically challenged and 66 mentally challenged, 2935 old age pensioners and 1414 widows.

Table 10.11 Details of expenditure of pension funds

Sl. No.	Type of Pension	Total Amount Disbursed				
		2010 -11	2011-12	2012-13	2013-14	2014-15
1	Unmarried Women above 50 years	170100.00	260400.00	323062.00	733938.00	1026759.00
2	Agricultural Labour Pension	1629603.00	2276748.00	2278133.00	2107812.00	3253836.00
3	Special Disabled Pension	674730.00	943530.00	1721257.00	1874452.00	3322351.00
4	Old Age Pension	915075.00	1707118.00	3093500.00	1590296.00	12473233.00
5	Widow Pension	1624897.00	2975740.00	5683378.00	7539927.00	10936454.00

Table 10.11 shows amount spent for each scheme during the period from 2007 to 2012. Total of Seventy-One lakhs were spent. Social degrading of women is a primary concern in all societies. Even though many advances were made in economic and social aspects, children living in lower class families still suffer from mental and health problems. To reduce such problems among inhabitants, Chittur-Thathamangalam Municipality is doing supply of balanced diet. To ensure health of children, youngsters, pregnant women, lactating mothers etc supply of such food items through anganwadis are helping a lot.

Additionally, there are allowance schemes such as unemployment allowance and marriage assistance to daughters of widows. The unemployment allowance was availed by 2 persons in 2020-21 and 4 persons and in 2021-22, while the marriage assistance was availed by 15 persons and 11 persons in 20020-21 and 2021-22 respectively.

There are many socio-economic developmental activities conducted in the municipality which includes Pension schemes, Asraya schemes, helping schemes for physically and mentally challenged persons etc. The depth of these problems prompts continuation of these schemes in the twelfth five-year plan also.

ICDS Projects

I.C.D.S. is an integrated approach for the development of women and children from disadvantaged sections across their life cycle. ICDS Programme was conceived in Kerala in 1975 with an integrated delivery package of early childhood services so that their synergistic effect can be taken full advantage of by the schemes. The Scheme targets the most vulnerable groups of population including children up to 6 years of age, pregnant women and nursing mothers belonging to poorest of the poor families and living in disadvantaged areas including backward rural areas, tribal areas and urban informal settlements. The identification of beneficiaries is done through surveying the community and identifying the families living below the poverty line.

The scheme envisages the holistic development of women and children. A package of services is being rendered to women and children through ICDS Projects. The grass root level service delivery points are anganwadi centres. In each Anganwadi there is an Anganwadi Worker and Helper to look after the activities. ICDS projects provide supplementary nutrition, NHED, immunization and awareness on different subjects etc to women. These projects also provide a package of services for the development of children such as Non-formal pre-school education, Supplementary nutrition, Immunization, Health check-up, Referral services, Health and nutrition education for the development of children such as Non formal preschool education,

Supplementary nutrition, Immunization, Health check-up, Referral services, Health and nutrition education. Various welfare schemes of ICDS programmes are under SNP, the Supplementary nutrition programme for Children and SABALA scheme for Adolescent girls (11-18), for their empowerment, especially in the tribal areas. Under this Scheme training is accorded to the adolescent girls regarding Education, Personal hygiene and other skill development programmes.

Children

- Supplementary Nutrition Programme (SNP)
- Immunisation
- Pre-School Education
- Health Check-up
- Referral Service
- Early Detection and Early Intervention of Childhood Disabilities (EDEICD)
- State Plan of Action for the Child in Kerala (SPAC)
- Balika Samridhi Yojana (BSY)

Women

- Kishori Sakthi Yojana (KSY)
- National Nutrition Mission (NNM)
- Nutrition Programme for Adolescent Girls (NPAG)
- Integrated Women Empowerment Programme (IWEP) or SWAYAMSIDHHA
- Take Home Ration Scheme (THRS)

There are 531 beneficiaries under the age group of 6 months to 3 years and 659 of beneficiaries under the age group of 3 to 6 years. Under SABALA scheme there are 969 No's of beneficiaries. IGMSY (Indira Gandhi Mathruthva Sahayog Yojana), is a conditional Maternity benefit scheme for pregnant and lactating women. A benefit of Rs. 6000/- was given under this scheme. This Scheme for promoting health & nutrition improvements to pregnant and lactating women is being implemented only in Palakkad District. There are 259 No's of beneficiaries in Pregnant woman l category and 244 No's in the lactating woman category.

10.3.2 Status of Anganwadi

Anganwadi's are the grass root level service delivery point of social welfare activities. Anganwadi Centre 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 the criteria, there should be one anganwadi for 1000 population. There is a total of 24 anganwadis of which 21 are working in their own buildings. Although Anganwadis are having toilets, all toilets are not baby friendly. Spatial distribution of anganwadis in Chittur-Thathamangalam Municipality is shown in Fig 10.7. Details of Anganwadis are shown in Table 10.12.

Table 10.12 Details of Anganwadis

Sl.No	Name of institution	Own land	Own building	Sanitation	Compound wall	Electrified	Water supply	Gas connection	Cooking utensils	Play materials
1	Muttirinji	Yes	Yes	No	No	No	Yes	No	No	No
2	Aryampallam	Yes	Yes	Yes	No	No	Yes	No	No	No
3	Athikuzhi I	Yes	Yes	Yes	No	Yes	Yes	No	No	No
4	Naramkuzhi	Yes	Yes	Yes	No	No	Yes	No	No	No
5	Vadakkathara	Yes	Yes	Yes	No	No	Yes	No	No	No
6	Valmutti	Yes	Yes	Yes	Yes	No	Yes	No	No	No
7	Parayankode	Yes	Yes	Yes	Yes	No	Yes	No	No	No
8	Kunnathupalayam	Yes	Yes	Yes	No	No	Yes	No	No	No
9	Ambattupalayam	Yes	Yes	Yes	No	No	Yes	No	No	No
10	Mettupalayam	Yes	Yes	Yes	No	No	Yes	No	No	No
11	Parakkalam	Yes	Yes	Yes	No	No	Yes	No	No	No
12	Maduppikavu	Yes	Yes	Yes	No	No	Yes	No	No	No
13	Vellappana	Yes	Yes	Yes	No	No	Yes	No	No	No
14	Meetuvalavu	Yes	Yes	Yes	No	Yes	Yes	No	No	No
15	Paruthikavu	Yes	Yes	Yes	No	No	Yes	No	No	No
16	Ayyampathy	Yes	Yes	Yes	No	No	Yes	No	No	No
17	Thekkinkadu	Yes	Yes	Yes	No	No	Yes	No	No	No
18	Devangapuram I	Yes	Yes	Yes	No	Yes	Yes	No	No	No
19	Arangam	Yes	No	Yes	No	No	Yes	No	No	No
20	Kadavalavu	Yes	Yes	Yes	No	No	Yes	No	No	No
21	A E M nagar	Yes	No	Yes	No	No	Yes	No	No	No
22	Athikuzhi II	Yes	No	Yes	No	No	Yes	No	No	No
23	Devangapuram II	Yes	Yes	Yes	No	No	Yes	No	No	No
24	Sreekurumbakavu	Yes	Yes	Yes	No	No	Yes	No	No	No



Anganwadi at Vadakkathara

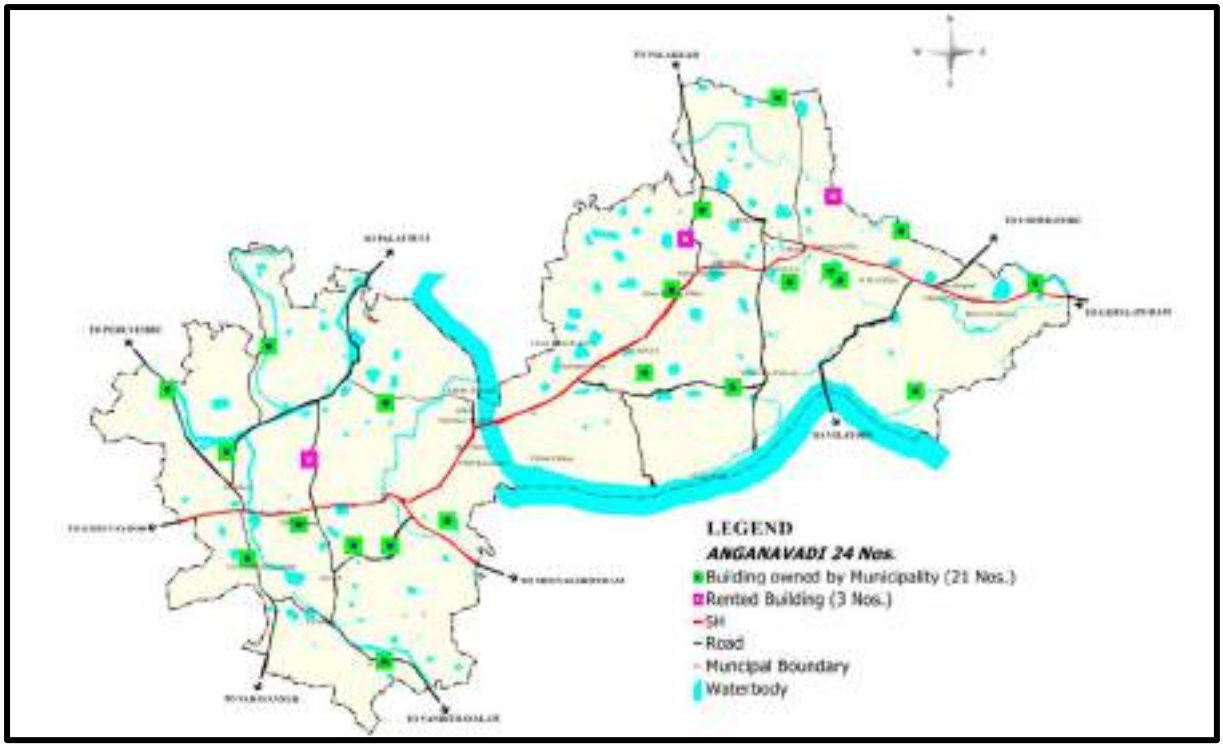


Fig 10.7 Spatial distribution of Anganwadis

10.3.3 Inference

53 % of families of Chittur-Thathamagalam Municipality is below poverty line. There are certain areas of concern in the development of BPL population including animal husbandry, agriculture has a good potential in Chittur-Thathamangalam Municipality. Therefore, the development programmes in these sectors should be given priority to include the BPL population especially the SC/ST and other socially weaker sections of the society. Also, infrastructure facilities including safe drinking water, electricity, solid waste disposal system etc. should be provided in the BPL concentration areas.

Chapter 11: ENVIRONMENT

The quality of natural environment is directly related to the quality of life of inhabitants in the urban region. It is a critical determinant of the health of the inhabitants and consequent urban productivity. This is in turn determined by water and air quality. The ever-increasing human population has placed tremendous burden on our natural resources. Due to excessive farming, use of chemicals, pesticides and excessive use of ground water, the natural resources have been badly affected. The emission of toxic fumes from the industries and automobile exhausts have deprived us of clean air. This industrialisation and a growing consumer economy have led to the problem of indisposed garbage and uncontrolled sewage.

The Kerala State Pollution Control Board (KPCB) is the agency responsible for monitoring water and air quality. It includes under its purview, testing of both surface water and ground water and testing the ambient air quality. In this chapter an attempt is made to describe the present scenario of the natural environment of the town, the pollution levels and the spatial location of environment sensitive areas.

11.1 Present Scenario

Currently, Chittur-Thathamangalam Municipality has an area of 4.39 sq. kms. under paddy cultivation. Due to the high vegetation cover and lesser percentage of industries the chances of pollution are comparatively less in the peripheral areas. However, the urban areas are witnessing the impacts of pollution in the form of degrading quality of air, water, natural resources and sound pollution. The last decade is seeing the impacts of climate change and Chittur-Thathamangalam has been witnessing extreme events (heavy rains) and rising heat.

11.1.1 Water Pollution

Water is an essential need of life. Hence the protection of it is very important. Water pollution is a major environmental issue in India. The discharge of untreated sewage is the single most important cause for the contamination of surface and ground water. Other sources include agriculture run off and emissions from unregulated small-scale industries. Aquatic ecosystems are badly affected when pollutants are discharged directly or indirectly into water bodies without adequate treatment to remove harmful components. In almost all the cases, the effect is damaging not only to the individual species and populations, but also to the natural biological communities.

Water quality of surface water sources

Chitturpuzha is the only river passing through the southern limit of the municipality. This river is fast becoming the cause of health hazards for the people of several panchayats and municipalities on its banks. An examination of water by the Kerala Water Authority has revealed that it is not fit for human consumption.

The Chitturpuzha, a tributary of Bharathapuzha, acts as a major source of drinking water for people living on its banks. Years of steady dumping of effluents, pollutants and waste into the river, from human habitats have contaminated the water of Bharathapuzha, which is already in the process of sand mining and encroachments. There is no water quality monitoring station in Chitturpuzha.

Ground water quality

Groundwater quality comprises the physical, chemical and biological qualities of ground water. The quality of ground water obtained from well at Karukamani, Chittur is given in Table 11.1 and 11.2. The results show high contamination by E.coli, a major cause of food borne and water borne diseases. Not a health threat in itself, it is used to indicate whether potentially harmful bacteria may be present.

Table 11.1 Ground Water Quality of Well at Karukamani, Chittur

	pH		Cond.(Conductivity)		BOD (Biochemical Oxygen Demand)	
	2012	2013	2012	2013	2012	2013
Unit			umhos/cn	umhos/cm	mg/l	mg/l
Max	8.3	8.7	580	699	0.8	0.6
Min	8.2	8.4	483	650	0.4	0.4
Mean	8.25	8.55	531.5	674.5	0.6	0.5
Std.Dev.	0.07	0.21	68.59	34.65	0.28	0.14
Des:Lmt.	6.5-8.5	6.5-8.5			2	2

	Nitrate N		TC (Total Coliforms)		FC (Fecal Coliforms)	
	2012	2013	2012	2013	2012	2013
Unit	mg/l	mg/l	no/100ml	no/100ml	no/100ml	no/100ml
Max	1.8	2.5	50	1600	300	1100
Min	0.43	0.05	300	80	110	60
Mean	1.12	1.28	400	840	205	580
Std.Dev.	0.97	1.73	141	1075	134	735
Des:Lmt.			50	50		

Source: Water & Air Quality Directory-2013, State Pollution Control Board

Table 11.2 Quality of water from various sources

Sl No	Parameter	Limit	Chittur tap water	Chittur Vadakkanthara Well	Karukamani well
1	PH	6.5-8.5	7.86	7.87	6.68
2	Turbidity	10NTU	Nil	Nil	Nil
3	Colour	5Hazen	5	5	
4	So4	150mg/l	14.26	22.91	
5	Mg	30mg/l	13.6	17.5	
5	Ca	75mg/l	38	66.25	
6	COD	Nil			
7	BOD	Nil			0.6
8	EColi	absent	Nil	402.50	540
9	Total hardness	300mgl	151.3	237.50	
10	TDS		245.66	655.75	

Source: Kerala State Pollution Control Board

A recent August 2022 study of water quality across Kerala under the Suchitwa Mission, revealed that out of 83 water samples collected- 14 along Chittur puzha and 69 ponds, only 10 ponds are good in water quality and only one spot in the river seems non-contaminated. All other ponds show faecal coliform. Following is a list of ponds that were uncontaminated:

1. Karukamani Road Kulam, Karukamani
2. Cherukode pond, Cherumkode Thathamangalam, Thathamangalam Peruvemba Road
3. Polani Pond, Polani Thathamangalam, Polani
4. Kundaneri, Erumankode
5. Aanamudikulam, Parayankode, Parayankode
6. Eattumurri near Mariyaman kovil, Ambattupalayam, Nadukalam road
7. Chalakulam, Thathamangalam, Aarampadam Road
8. Poothankulam, Parayankode, Parayankode
9. Kundam Kulam, Polani Thathamangalam
10. Chettiyar Pond, Vellappana Thathamangalam, Vellapana

Only one Chittur puzha stretch out of many checked for pollution along Chittur puzha road was uncontaminated.

As mentioned earlier this means that the current sewage system in the form of individual septic tanks is not functioning very efficiently and are contaminating the surface water sources in the town.

Ground water table depletion

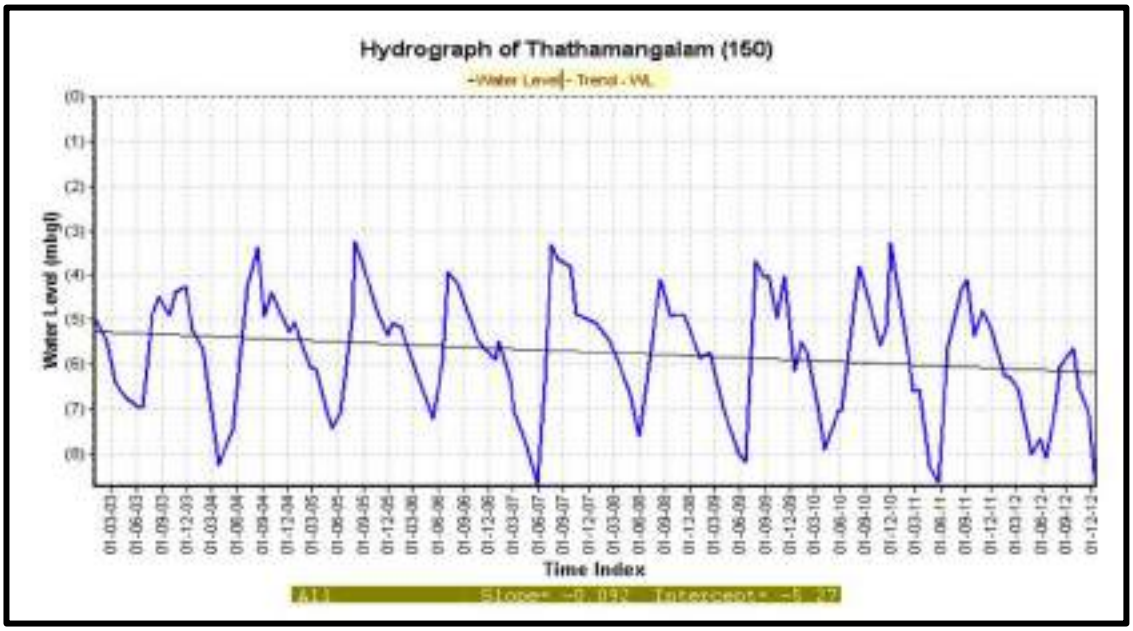
Ground water depletion is caused when the ground water is pumped out faster than it can be replenished. Some of the negative effects of ground water depletion are drying up of wells, reduction of water in streams and lakes, deterioration of water quality, increased pumping costs and land subsidence. The ground water table is showing a decline in some of the areas in the municipality. GWT was declined by 2 meters in Chitturpuzha during the last 25 years.

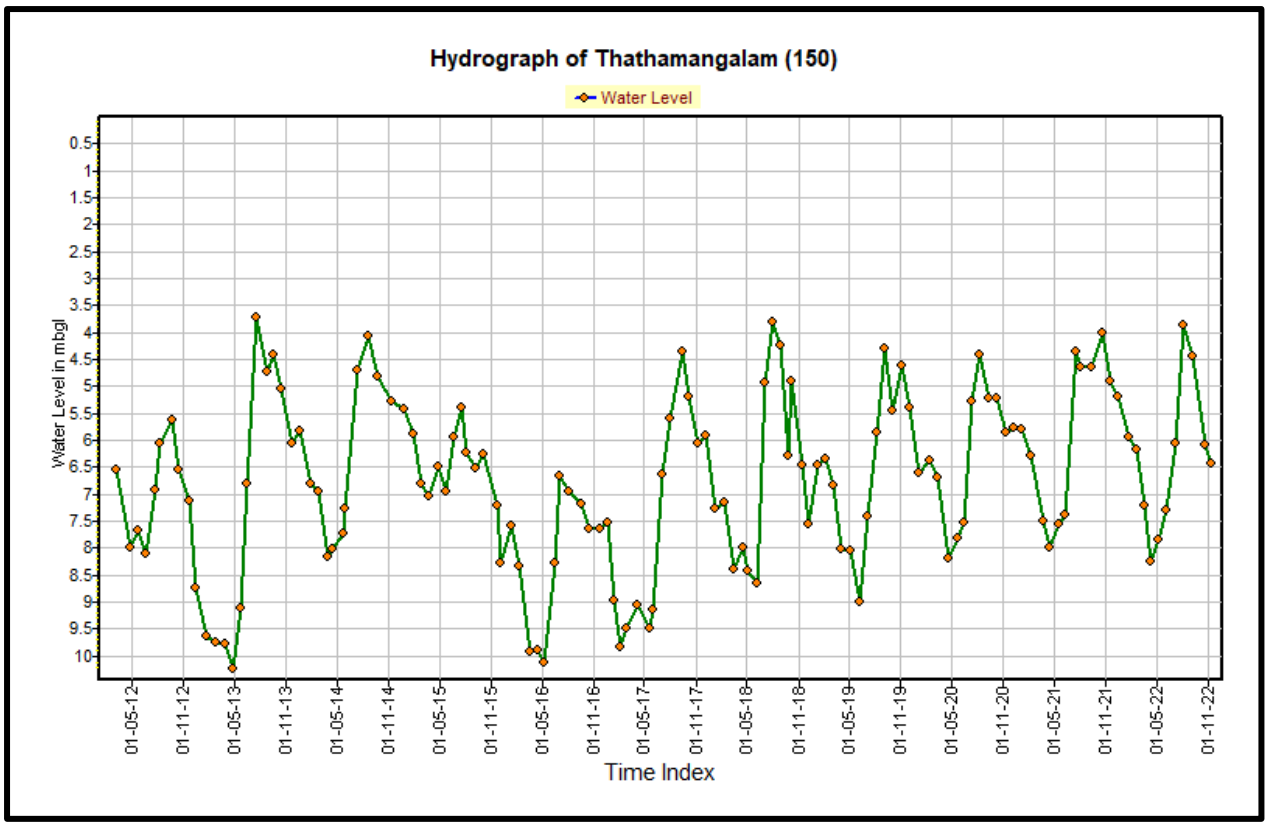
There are two observation wells in Chittur-Thathamangalam Municipality:

1. Borewell in Govt. Ayurvedic dispensary shows minimum of 1.15 m below ground level dated 5/8/2022 and maximum 10.24 m dated 24/4/2013
2. Open well near Chittur Kavu shows reading of 9.32 m below ground level on 24/8/2013 and 24.99 m on18/05/2017

Both the municipality as well as Chittur block are in the list of critical areas in terms of ground water due to over extraction. Chittur block as a whole shows a minimum reading 0.52m on 17/3/2022 and max 24.99m on 18/5/2017. (There are 6 observation wells in Chittur block).

Average Ground Water table depth in borewell at Govt Ayurvedic Dispensary Thathamangalam is 6.99m (10 years average in peak summer) in 2012. This is due to conversion of paddy field for other development purposes and lack of proper ground water recharging measures. Hydrograph of borewell at Govt Ayurvedic Dispensary, Thathamangalam and of the open well in Chittur is shown in Fig 11.1





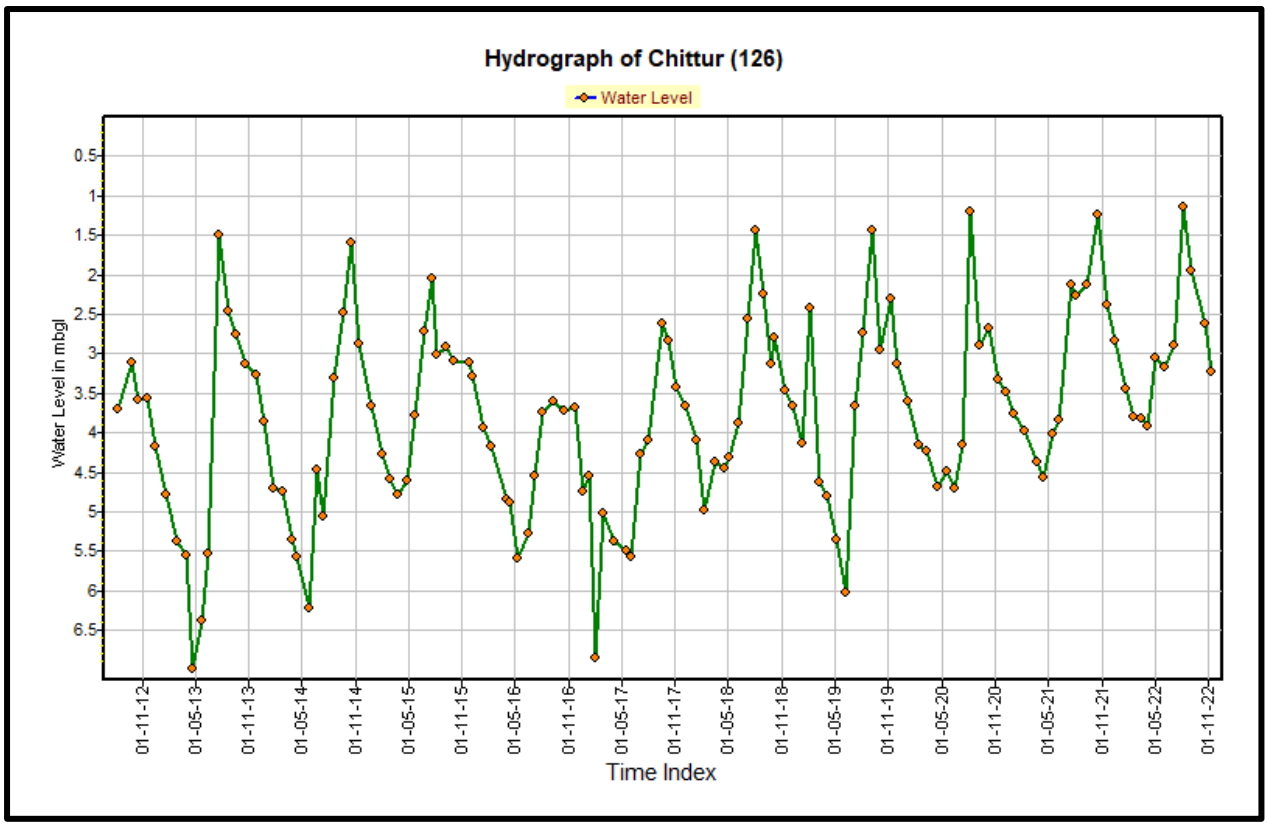


Fig 11.1 Hydrographs of borewell at Govt. Ayurvedic Dispensary, Thathamangalam 2003-2012 and 2012-2022 and Hydrograph of Open well at Chittur 2012-2022

11.1.2 Land Pollution

Land pollution is the deterioration (destruction) of the earth's land surfaces, often directly or indirectly as a result of man's activities and their misuse of land resources. Human actions have also caused many large areas of land to lose or reduce their capacity to support life forms and ecosystems. This is known as land degradation. Land degradation can result from many factors, and land pollution is only one of them. In Chittur-Thathamangalam Town Solid waste management is almost proper and attempts are done to reduce the usage of plastic, and plastic wastes are collected by Municipality directly and transferred to Clean Kerala Company.

11.1.3 Air Pollution

Majority of the land in the municipality is under agricultural use mainly paddy and a river frontage area of 40.21 ha. Also, there is no large-scale industries in the municipality, the only possibility of air pollution is due to the vehicular traffic along the traffic corridors. There is no air quality monitoring station in the municipality.

11.1.4 Noise pollution

The municipality is having an agrarian nature and there is no large-scale industries, hence noise pollution due to industrial activities are absent in the municipality. However, noise pollution due to vehicular traffic is a general problem in the traffic corridors and commercial centres. Control measures are to be taken to regulate the noise pollution due to vehicular traffic near to public institutions like schools, colleges and hospitals.

The Kerala State Pollution Control Board has imposed strict control on the maximum limit of sound produced on the various land use zones. The permissible and actual noise levels during the daytime at the respective zones are compared in Table 11.3.

Table 11.3 Existing and maximum limits of noise in different land use zones of Chittur-Thathamangalam

Sl. No	Area	Limit in dB(A) L_{eq}*		Sound Level dB(A) on Sundays	
		Day Time	Night Time	Day time	Night time
1		55	45	59	No night time monitoring results
2	Commercial	65	55	67	
3	Industrial	75	70	71	
4	Silent	50	40	-	

Source: Kerala State Pollution Control Board

*The dB(A) L eq denotes the time weighed average of the level of sound in decibels on scale A which is relatable to human hearing.

This is divided into daytime (6 am to 10 pm) and nighttime (10 pm to 6 am). The analysis shows that the town is facing noise pollution mainly in the residential and commercial areas while the existing noise levels were found to be below the permissible limits in the industrial areas. Silence Zone, as prescribed by the Noise Pollution (Regulation and Control) Rules, 2000 under the Environment (Protection) Act, 1986 and its subsequent amendments, shall be made applicable to the Planning area.

11.1.5 Environmental Health and Well-being

The latest 2022 ward-wise data communicable and non-communicable diseases collected from the Government Taluk Hospital is revealing. The most common non-communicable diseases were Hypertension and Diabetes followed by cancer and kidney disease. While both hypertension and diabetes are typically seen as life-style diseases, there could also be environmental reasons for this higher incidence of these diseases. The noise pollution data indicates that the noise levels in residential areas in the town are higher than permissible limits. This could be one reason for the high number of persons with hypertension since high noise pollution levels seem to increase stress reaction that elevates blood pressure. The other reason could be the poor quality of walking infrastructure and poor provision of parks and public space that also dissuades people from pursuing active lives, which result in poor overall health and fitness. There is also a high incidence of cancer which indicates some possible exposure to carcinogens. Burning of household plastic waste is routine in households in the town which may be carcinogenic or exposure to pesticide contaminated food or water could be possible reasons.

Table 11.4 Details of Non-Communicable Diseases at Chittur-Thathamangalam (October 2022)

WARD No	Diabetic		Hypertension		Cancer		Palliative	Kidney		Uncommon		Dialysis	
	Male	Female	Male	Female	Male	Female	Total	Male	Female	Male	Female	Male	Female
1	39	33	43	36	2	3	18	2	1	15	18	1	1
2	22	20	20	13	1	1	13	0	0	6	7	0	0
3	26	40	27	37	0	3	11	1	1	17	12	0	0
4	42	43	35	43	4	1	12	0	0	15	17	0	0
5	25	17	43	32	0	1	6	1	0	5	0	0	0
6	19	12	24	19	3	1	12	0	0	0	0	0	0
7	20	30	20	25	1	2	5	0	0	0	0	0	0
8	22	30	20	26	1	0	9	0	0	3	5	1	1
9	23	29	21	25	1	0	5	2	0	0	0	0	0
10	10	13	71	91	2	3	11	0	1	0	0	1	0
11	42	56	46	42	2	2	5	0	0	0	0	0	0
12	30	40	25	34	2	1	10	0	0	0	0	0	0
13	29	53	84	109	2	2	6	0	0	0	0	0	0
14	4	3	28	10	2	1	11	0	0	0	0	0	0
15	36	30	42	53	0	0	6	0	0	22	6	1	0
16	35	33	36	43	1	3	12	0	0	2	0	2	0
17	28	39	80	90	3	1	8	0	0	6	2	0	0
18	100	50	100	100	0	5	8	1	0	0	0	0	0
19	55	85	160	70	3	3	11	1	0	0	0	1	0
20	90	87	85	68	2	6	14	1	0	0	0	1	0
21	65	65	120	90	0	7	13	1	0	0	0	1	0
22	180	100	200	150	2	1	12	1	3	0	0	2	2
23	32	37	35	57	2	2	18	1	1	14	16	0	0
24	54	39	40	48	1	0	13	0	0	8	11	0	0
25	81	21	92	28	0	0	11	1	0	18	22	0	0
26	45	37	48	33	4	1	10	1	0	5	10	0	0
27	41	27	39	43	2	1	15	1	1	11	18	1	0
28	51	32	63	33	1	0	5	1	0	9	9	1	1
29	72	43	52	46	3	2	9	0	1	14	11	0	0
TOTAL	1318	1104	1699	1492	47	53	297	18	9	170	184	13	5
TOTAL	2420		3191		100		297	25		334		18	

Table 11.4 Details of Non-Communicable Diseases at Chittur-Thathamangalam (October 2022) cont'd

Ward	Mental disorder		Asthma		Psoriasis		TB	
	Male	Female	Male	Female	Male	Female	Male	Female
1	0	1	1	1	0	0	1	1
2	1	0	0	2	0	0	1	0
3	0	0	1	5	1	0	0	0
4	4	0	0	2	1	0	0	1
5	2	0	0	0	0	0	1	0
6	0	1	1	0	1	0	0	0
7	1	0	0	0	0	0	0	0
8	1	0	2	0	0	0	0	0
9	4	0	2	0	0	0	1	1
10	4	0	1	2	0	0	1	1
11	4	0	3	2	1	0	0	0
12	1	1	0	2	0	0	0	0
13	3	0	0	0	0	0	1	0
14	1	0	3	2	0	0	0	0
15	0	0	1	0	0	0	1	0
16	2	1	0	0	0	0	2	1
17	1	2	3	0	0	0	0	0
18	1	1	3	2	0	0	0	0
19	4	0	1	1	0	0	0	0
20	2	4	2	4	0	0	1	0
21	2	0	0	6	0	0	1	0
22	0	2	1	1	0	0	3	2
23	5	1	1	5	0	0	0	0
24	0	0	4	3	0	0	1	0
25	0	0	1	0	0	0	0	1
26	1	1	6	5	0	1	0	0
27	1	1	3	3	0	0	0	0
28	0	1	0	0	0	0	0	0
29	0	1	0	0	0	0	0	0
TOTAL	45	18	40	48	4	1	15	8
TOTAL	63		88		5		23	

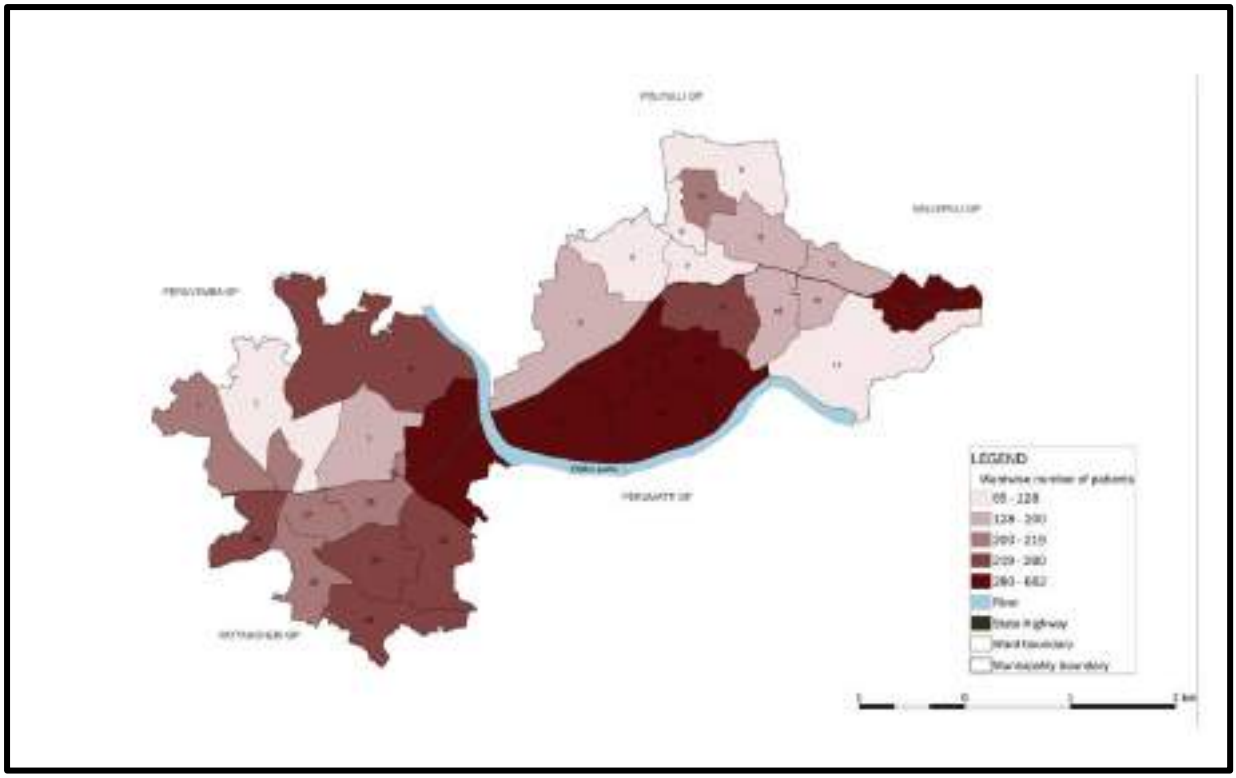


Fig 11.2a Wardwise Morbidity: Non-Communicable Diseases

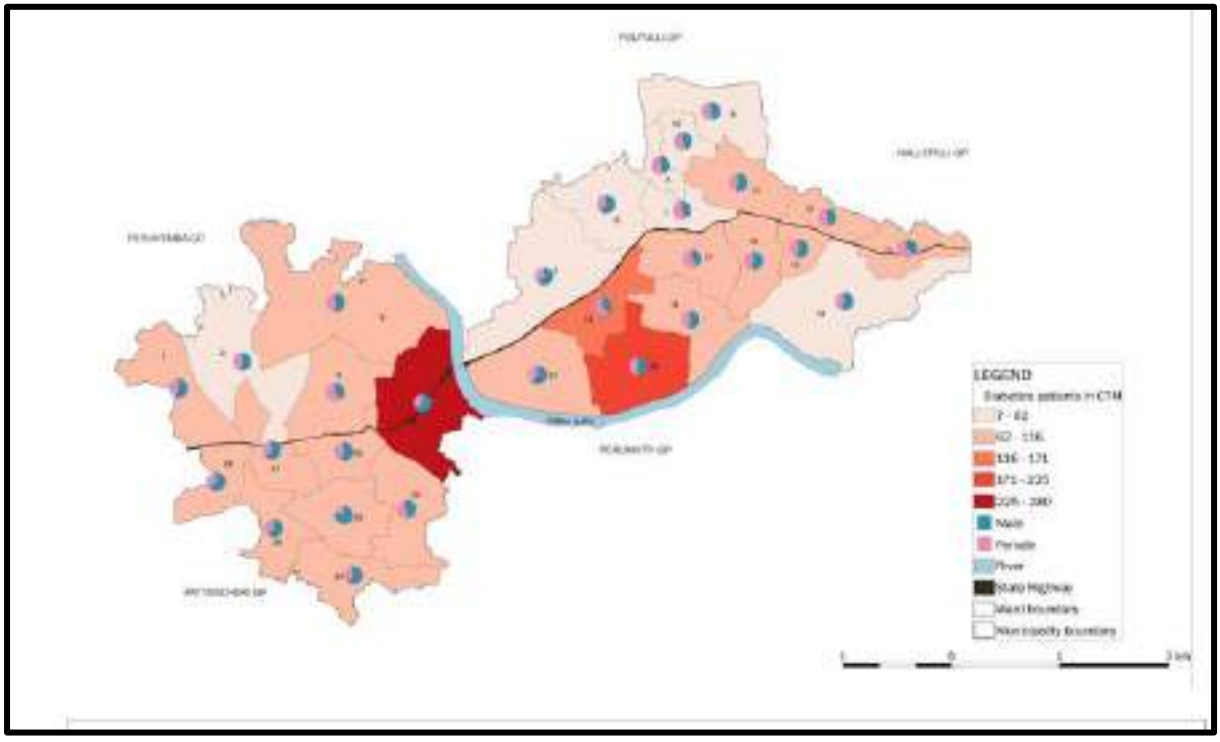


Fig 11.2b Wardwise Morbidity: Diabetes

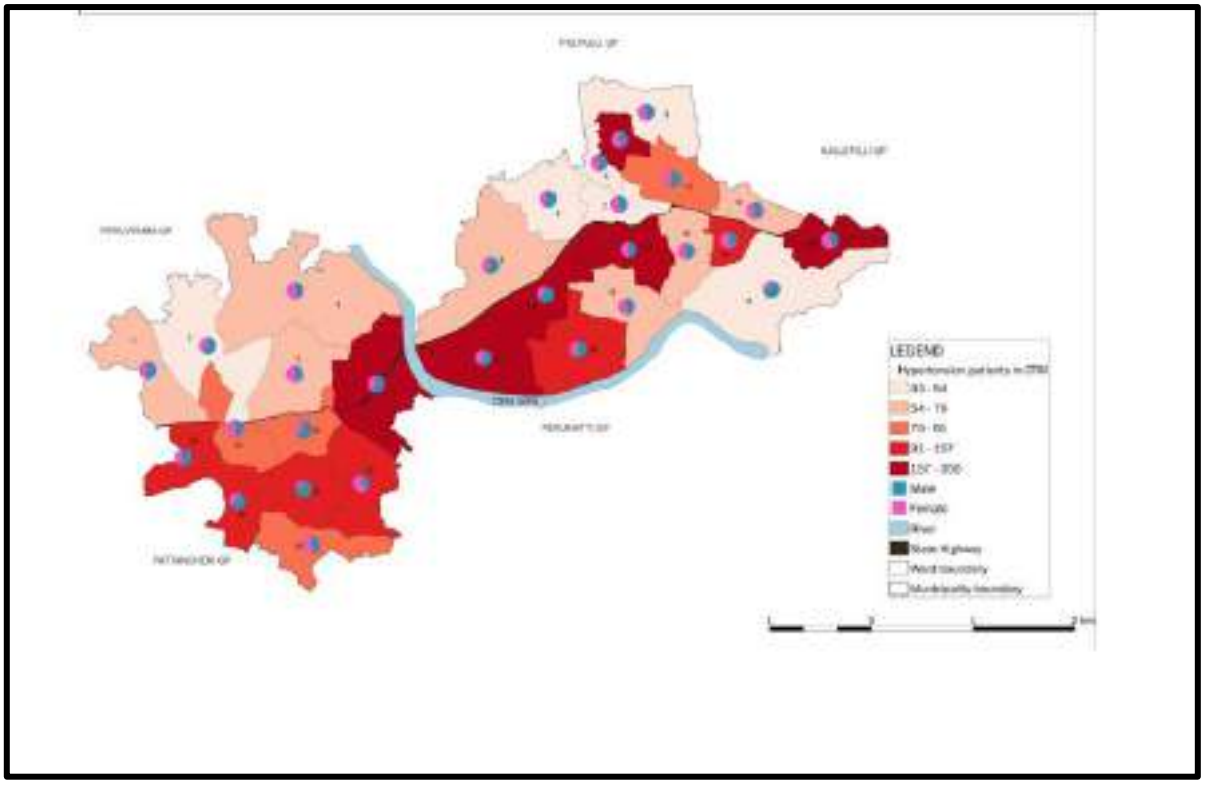


Fig 11.2c Wardwise Morbidity: Hypertension

11.2 Ecologically Sensitive & Fragile Areas

Ecologically Sensitive Areas (ESAs) are to be viewed as areas where human activities will continue but be prudently regulated under the Environment (Protection) Act, 1986. ESAs are not at all meant to stop development in ways that would hurt local people, but to ensure that development is environment friendly, and people oriented, as well as serve to preserve the ecological heritage on a long-term basis. Ecologically Sensitive areas of the Chittur-Thathamangalam Municipality include surface water sources (river, thodus, ponds), paddy fields that serve as water recharging areas as well as water retention areas and heritage areas.

11.2.1 Paddy Field

5.59 sq. km. of paddy fields (Fig 11.3) are remaining in Chittur-Thathamangalam Municipality that accounts to 39% of the total land area in the town. These low-lying areas have to be conserved for food security and ground water recharge also. There are padasekharams named Paruthikavu, Poogode, Perumkulangara, Arangam, Vallangipadam, Chembakassseri, Mettupalayam, Kadavankode, Thaniyampadam, Erummancode, Ambattupalayam, Valmutty, Vadakkepadam, Ambattupalayam, Choorapalam, Alachankode, Aryampallam and Muthukad.



Paddy fields at Thathamangalam area

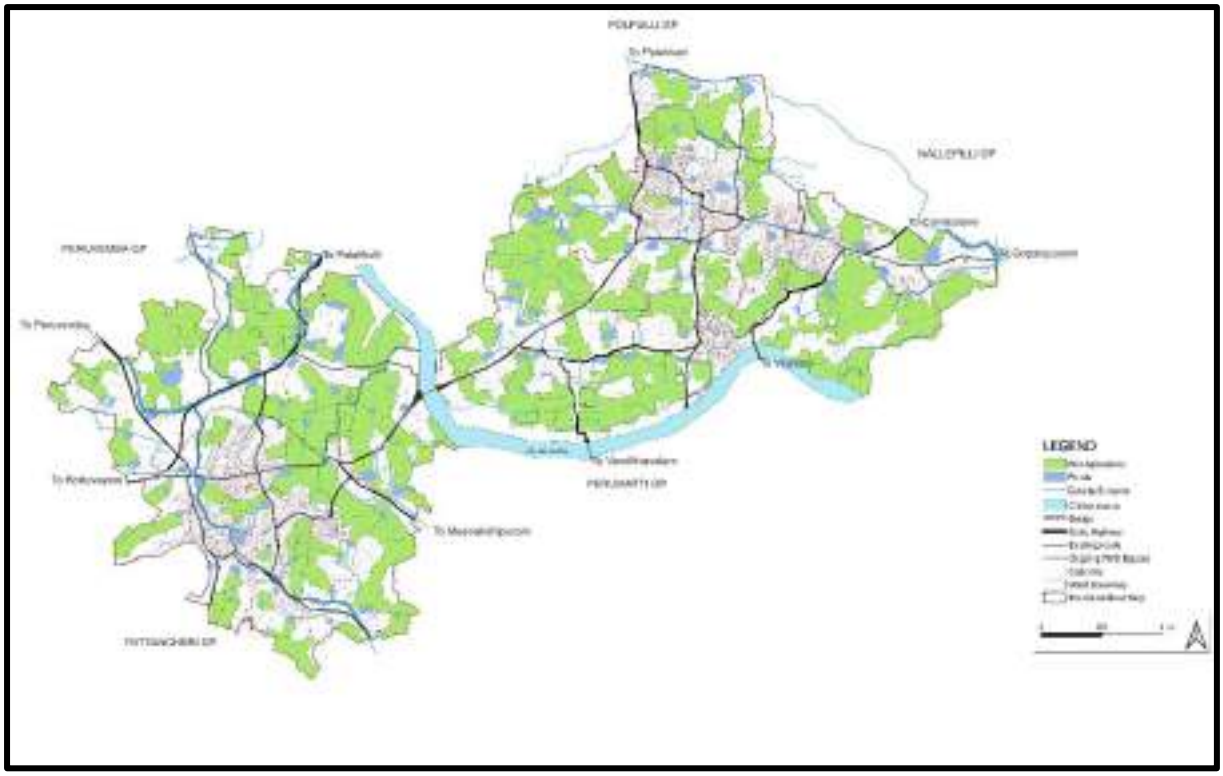


Fig 11.3 Environmentally Sensitive Areas - Paddy

11.2.2 Surface Water Sources

There is an ever-increasing need for the protection and preservation of surface water sources as they are part of an interrelated system that is paramount when the demand for water exceeds the available supply. They also help in sustaining the water table since major ground water recharge areas are diminishing drastically. Chittur Puzha flowing along the town, has to be

protected by restricting discharge of sewage and dumping of solid waste into it. Natural drainage like thodus have to be side protected and made free from encroachment.

There are a total of 171 ponds within Chittur-Thathamangalam Town. Among them, 18 ponds are having an area greater than 1.00 acre and more. There are a total of 10 ponds owned by Municipality and others are privately owned. Details of major ponds are shown in Table 11.4. These ponds have to be conserved for ground water recharging and for irrigation purposes.



Chittur Kavu Bhagavathi Kulam



Lankeswaram Kulam

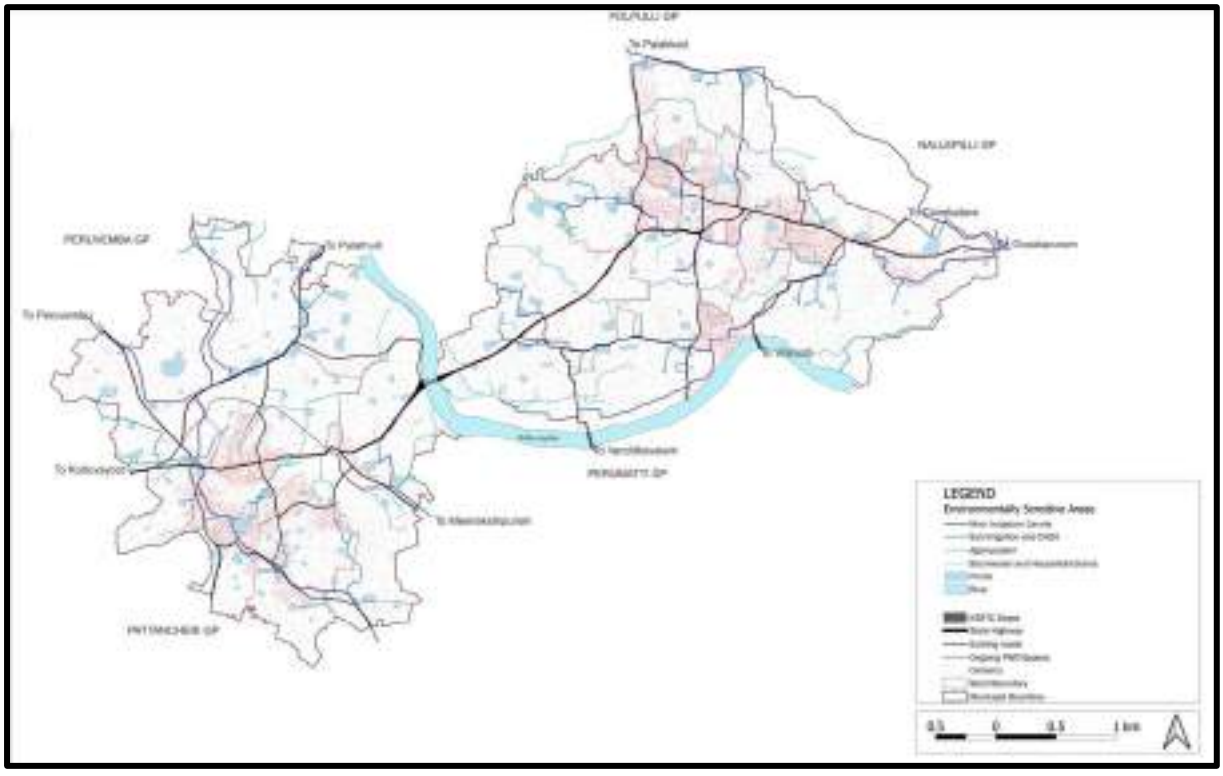


Fig 11.4 Environmentally Sensitive Areas - Water bodies (Ponds, Thodus, River)

Table 11.5 Details of Major Ponds

Sl. No.	Name of Ponds	Extent (Hectare)
1	Perunkulangarakulam	2.221
2	Kacheri Kulam	1.7784
3	Peringottukulam	1.462
4	Lankeswara Siva Kshethra Kulam	1.1442
5	Muthaliyar Kulam	1.0871
6	Neelan Kulam	1.018
7	Guruswami Kulam	0.925
8	Chembankulam (Meppadam Kulam)	0.775
9	Muthukkadu Kulam	0.672
10	Alachankodu Kulam	0.666
11	Bhagavathi Kulam	0.655
12	Chembankulam	0.608
13	Vallikulam	0.5700
14	Kurukkalude Kulam	0.494
15	Mannathukulam (Aiyyan Kulam)	0.4727
16	Chungam Kulam	0.4400
17	Devinagar Kulam	0.4300
18	Karyakar Kulam	0.4238
19	Kadambirikulam	0.3941
20	Poongodukulam	0.3600
21	Arangam Kulam	0.287
22	Konderi Kulam	0.2754
23	Parakkundu Kulam	0.1364

11.2.3 Aalmarams/Sacred Groves/Naatumarangal

In the town there are many very old trees (banyan and peepul) that also often serve as public spaces of gathering, often with an ‘aalthara’ around the tree. Many older traditional homes of the Nayar taravads or the kalams also continue to have ‘sarpa kavus’ or serpent groves, which are remnants of the sacred groves that were common in such houses in their large landholdings. Many homesteads in the town continue to be full of many varieties of native trees and teem with biodiversity. All these heritage trees, sarpa kavus and naatumarangal are special natural heritage features that need to be protected.



Aalthara



Chumaduthangi

11.2.4 Heritage Market Streets and Loading Stones

The main street is an ancient trading route and even today several loading stones, Chumadathangi are present in both Chittur and Thathamangalam. These must be protected as historical vestiges.

11.2.5 Heritage Precincts

a. Shrines (including subaltern shrines) and individual properties

There are many shrines that dot the town, ranging from well-known ones to obscure ones along the river's edge, under an old heritage tree.

Chittur Bhagavathi Temple

Chittur Bhagavathi, *Chittur Kavu*, is quite a contrast to the majestic Hindu temples of Kerala. Except during the holy period of *Mandalam*, this temple opens only on Tuesdays and Fridays. All families in the village, irrespective of their caste, who are in any way connected to the temple, hold hereditary rights to perform certain functions and duties during the festival of this temple "Kongan Pada".

Thunchan Guru Madom

In Chittur town on the banks of River Sokanasini (Destroyer of sorrow), exists an old building where Thunchath Ramanujan Ezhuthachan, regarded as the father of Malayalam language, who lived in the 16th century, spent his last years. People call it Guru Madom and it is here that he transcreated the two great Sanskrit epics, the Ramayana and the Mahabharata, for the common people with the subtle and meaningful mingling of Sanskrit and Dravidian streams to the prevailing language and literature. The main three festivals celebrated here are Navarathri, Karkidakam and Uthram pooja.

b. Community Clusters

Nayar Tharavadus - Nalukettu, Ettukettu

Tharavadu is a traditional social organization, a maternal joint family. There are two sections of tharas namely Padinjare thara and Kizhake thara. In Padinjare thara quarter there are Chambath, Ambat, Thachat, Unnikandath, Sreekandath, Varavoor, Erat, Bheemath tharavadus and in Kizhakethara quarter there are Porayath, Yezhuvath, Cherubala, Telekkat, Chittdath, Puthukulangara tharavdus. These tharavadus have traditional Kerala architecture styled Nalukettu, Ettukettu, Pathinaru kettu etc which have been ignored and transforming rapidly.

Agraharams

There are five agraharams (settlement of Tamil Brahmins) namely Thekkegramam, Lankeswaram, Durgagoshtam in Chittur, Padinjare Gramam and Thekkegramam in Thathamangalam. The settlement pattern is similar in all the agraharams with rowhouses on both sides of a central open space and a temple at one end. The internal spatial arrangement

follows a linear pattern with rooms arranged one after the other, with an internal courtyard. These agraharams are having heritage value and need to be conserved.



Built heritage in Chittur-Thathamangalam Municipality, Community Clusters and old Historic market

Weavers' Settlements: Devangapuram and Vadakkathara

Houses are simple, cob construction homes and common spaces for warping the thread. Pit looms in the houses are unique. The settlement pattern is different in Devangapuram and in Vadakkethara because of different communities residing in each. Devangapuram is row house settlement while Vaddakathara is individual small homes.



Built heritage in Chittur-Thathamangalam Municipality, Nair tharavads and kalams

Kalams: Thathamangalam

There are other interesting typologies of houses in Thathamangalam, the granaries and kalams in Thathamangalam that are very tied to the agrarian lifestyles in the settlement.

11.3 Conservation Efforts

11.3.1 Chitturpuzha - a Tributary of Bharathapuzha

The Bharathapuzha basin is the lone source of drinking water for 175 villages in Palakkad, Thrissur and Malappuram districts. The basin is the chief source of water for a large number of drinking water and minor irrigation schemes. The river has an annual water discharge of 7,478 million cubic metres. The river passes through Palakkad, Thrissur and Malappuram districts before emptying itself into the Arabian Sea at Ponnani. Indiscriminate and illegal sandmining affects the drinking water supply schemes and threatens the very existence of the river. The first biodiversity study on the Bharathapuzha conducted by the University Grants Commission in 2001 had found indiscriminate sandmining as the main reason for the degradation of the river. Indiscriminate sandmining is a dominant environmental issue throughout the river basin. The State government has carried out a project to protect and conserve the Bharathapuzha using the River Management Funds (RMF). The government is planning to divert construction of more check-dams at sites identified as part of the Rajiv Gandhi National Drinking Water Mission. As many as 14 check-dam sites have been identified along the 209-km stretch of the Bharathapuzha some of which have been completed.

11.3.2 Thunchan Guru Madom

The building where the Acharya lived is nearly four centuries old which was constructed by him on land that was donated by Nair families. N.S.S Central Karayogam, Chittur is entrusted with the possession and management of Thunchan Guru Madom. Thunchan Guru Madom had only 20 cents of land where the Acharya lived and penned his works. However, People of Chittur demand a fitting memorial to the Acharaya near Sokanasini river where there is a ‘japappara’ on which the Acharya used to meditate. Government of Kerala has to declare it as a protected monument after completing necessary procedures. Very recently in 2022, the structure has been given a face-lift and has been completely renovated beyond recognition, unfortunately not cognising the basic tenets of conservation, which is to preserve the character of the original building.



View of interior of Thunchan Guru Madom



View of street of Thunchan Guru Madom


View of Thunchan Guru Madom, unrecognisably altered in character, given a facelift (2022).

11.3.3 Paddy Fields

Paddy fields give far more benefits than merely that of rice cultivation like ground water recharge, water purification, flood control, soil erosion control, air cooling effect, aesthetics of landscape and green lungs. Paddy fields become part of a new environment with ecological processes that reflect the influences of both man and nature. The paddy fields act as artificial wetlands, where certain type of aquatic ecosystem suitable for plant and animal forms, such as aquatic birds, insects and animals, including fish is maintained. Paddy field are usually filled with a water depth of 100 to 150 mm and this standing water is maintained until prior to harvesting. Some water percolates through the heavy soils and moves into the ground as ground water recharge. Most of the percolated water flows back into the rivers and drains and are an important source of water for irrigation reuse or recycling. An estimated 7 percent goes towards recharging the underground aquifers and this will be an important source of groundwater recharge in the future, when dependence on groundwater supply is expected to increase as competition for surface water increases.

Hence existing paddy fields have to be conserved. If all the sections of people are made aware of the serious consequences of the conversion of paddy lands, it would make implementation of the law easier and more effective. In order to conserve paddy land and restrict the conversion/reclamation of it, the Government has enacted "The Kerala Conservation of Paddy and Wetland Act, 2008''.

11.4 Problems and Potential

11.4.1 Water Pollution

The current state of all the southern tributaries of Bharathapuzha, especially Chittur Puzha is symptomatic of the damaged catchment area. In the larger interest of protecting Bharathapuzha for meeting the water needs of a huge agricultural command area in the Palakkad District no large scale manipulation of the catchment area of these rivers should be permitted. The Chittur Taluk is the only area in Kerala with black cotton soil i.e. soils formed from old lava flows. Such soils, although very fertile, do not permit adequate water infiltration. Hence natural groundwater replenishment is very slow. This is further curtailed by the destruction of the small hillocks and deforestation of the higher mountains, both of which modifies the natural drainage channels and accelerates runoff which in turn further reduces groundwater recharge.

The primary environmental problem of this region is recurring drought, depletion of ground water and mineralization of groundwater, especially salts of fluoride which is a serious health hazard. Heavy blasting in such sort of a terrain would most probably have deleterious consequences on the groundwater reserves.

Since crematorium is situated on the banks of Chittur puzha, special care has to be taken to avoid any type of waste dumping into the river from the crematorium. The contamination of surface water with sewage, solid wastes must be stopped and there should be periodic water quality monitoring. A water quality monitoring station should be established in the municipality. The leaching of water from paddy fields using pesticides and fertilizers to aquifer should be checked by all means. Many people depend on well water. Sample studies show that well water has high content of e- coli bacteria. So, a 24 X 7 piped water supply scheme is to be ensured for all residents.

11.4.2 Air Pollution

There are no major air pollution problems in the municipality. However, measures have to be taken to control pollution in the urban areas. There should be strict air quality monitoring system in the town to check the emission of pollutants from automobile and industrial exhausts.

11.4.3 Land Pollution

Integrated policy for waste management which covers collection and waste storage, segregation of waste, littering, transportation and waste processing should be adopted as per the Municipal Solid Wastes (Management and Handling) Rules, 2000 under the Environment (Protection) Act, 1986.

Measures are already taken to check the use of plastic carry bags and other non-reusable plastic products in the municipality. The dry and wet solid wastes are to be properly segregated and disposed off accordingly. There should be adequate provision for the disposal of wastes from fish markets and slaughter houses. The disposal of wastes on the road side should be strictly curbed and those who violate the rules should be brought in front of the law.

11.5 Inference

Man is a part of the environment and its protection is very important for a healthy living. Hence air, water and land have to be properly conserved and its pollution should be prevented by all means.

Given the water scarce nature of the municipality, it is imperative that rain-water harvesting and ground water recharging be made mandatory in all new construction and enforced. Existing building must also be encouraged to undertake this. Further, the natural drainage systems that exists need to be protected. There must also be a focused effort to protect the river of pollution and rejuvenate it by identifying its feeder network, cleaning and maintaining those. Further the surface drainage ecology of the town facilitated by the network of paddy fields, ponds, canals, thodu and the river needs to be protected inorder to prevent the settlement from disastrous environmental risk and hazards like drought and flooding.

Pollution problems are not severe in the municipality. However, measures are to be taken to control the air and noise pollution along the traffic corridors and noise pollution near to hospitals and educational institutions.

Chapter 12: DEVELOPMENT ADMINISTRATION AND FINANCE

12.1 Development Administration

The states must ensure the autonomy of the local bodies and their capacity to take up routine activities. Growing dependence on private initiatives for provision of basic amenities, without a perspective of covering larger sections of population, is likely to enhance disparity in accessing basic amenities. 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. Construction and Maintenance of Public markets, public burial grounds, parks and playgrounds
4. Providing basic facilities to informal settlement areas
5. Protection of Public ponds
6. 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 channelled through the municipality.

12.2. Urban Governance

12.2.1 Organization Structure of the Municipality

The structure of the municipality consists of two wings, i.e. the administrative wing and the executive wing. The administrative wing is headed by Chairperson and consists of the council members. The executive wing is headed by Secretary and consists of revenue, health, accounts, general, engineering and town planning department. Organizational structure in Chittur-Thathamangalam Municipality is shown in Fig 12.1.

Administrative Wing

The municipal council, the political arm of the municipality consists of 29 elected councillors, each representing a ward. The chairman (elected from among the councillors) heads the municipal council, which performs its duties as per the provisions of the Kerala Municipalities Act 1999. The political wing provides an overall direction to the municipality and performs its functions through a set of committees constituted for different purposes.

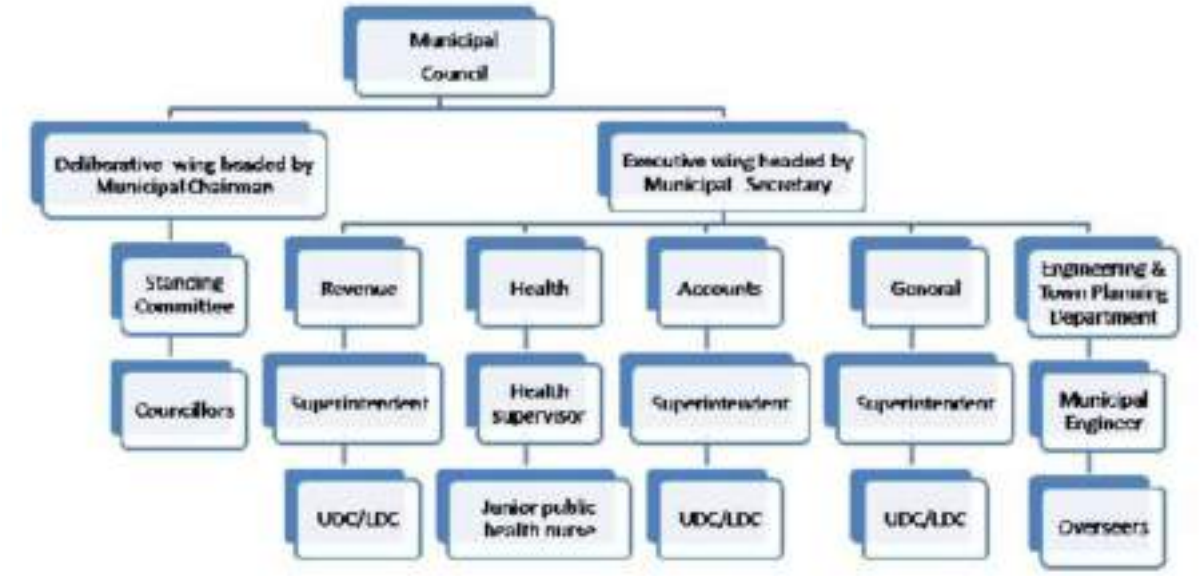


Fig 12.1 Organizational structure in Chittur-Thathamangalam Municipality



Municipal Office, Chittur-Thathamangalam

12.3 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 Chittur-Thathamangalam 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. Irrational rates, reductions given due to various non-financial reasons, tax avoidance and evasion, leakages in collection system and improper records keeping and monitoring are some of the problems faced by revenue generation through property taxes. Another source of own revenue for the municipality is entertainment tax. The scope of this source of revenue is shrinking due to reduction in public interest on cinema theatres. Receipts from municipal properties also could be a major source.

The Chittur-Thathamangalam Municipality maintains a municipal fund for managing the finances of the municipality. The accounts of the municipal fund are maintained on a cash based double entry approval system. The financial status of the Municipality has been reviewed for the past twelve years, commencing from the financial year 2010-11. 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 Fig 12.2



Fig 12.2 Hierarchy of Municipal Finance

Revenue Account: All recurring items of income and expenditure are included under this head. The revenue account comprises of two components, revenue income and revenue expenditure. 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, streetlights, 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.

Temporal variation of total receipts and expenditure is shown in Table 12.1 and pictorial representation is shown in Fig 12.3.

Summary of financial status of Chittur-Thathamangalam Municipality is shown in Table 12.2

Table 12.1 Temporal variation of total receipts and expenditure 2010-2022

Year	Total Income (Lakhs)	Total Expenditure (Lakhs)	Growth in Income	Growth in Expenditure
2010-11	890	706		
2011-12	1,302	845	46.24	19.6
2012-13	1,408	933	8.12	10.46
2013-14	2,312	1,887	64.18	102.13
2014-15	2,094	1,783	-9.4	-5.48
2015-16	994	777	-55.42	-56.43
2016-17	1,511	929	52.08	19.57
2017-18	1,213	910	-19.74	-2.06
2018-19	1,830	1,067	50.87	17.26
2019-20	1,960	768	7.11	-28.03
2020-21	2,172	1,485	10.81	93.35
2021-22	1,482	1,006	-31.17	-32.24

Source: Chittur-Thathamangalam Municipality

Table 12.2 Summary of Municipal Finance

Item	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Amount in Lakhs						
Opening Balance	220.96	184.00	457.29	474.64	425.05	433.41
Revenue Account						
Revenue Income	301.80	470.05	382.35	439.15	698.41	295.70
Revenue Expenditure	495.20	525.00	639.20	1,525.79	1,185.87	354.70
Surplus/Deficit	-193.40	-54.94	-256.85	-1,086.64	-487.46	374.41
Capital Account						
Capital Income	330.67	631.03	526.38	1,325.56	843.46	890.48
Capital Expenditure	51.31	23.36	179.54	96.66	81.30	706.48
Surplus/Deficit	279.36	607.67	348.84	1,228.90	762.16	184.00
Debt Head Account						
Income	37.04	17.17	41.93	72.17	127.38	
Expenditure	159.97	296.59	114.57	264.05	515.86	
Surplus/Deficit	-122.93	-279.42	-72.64	-191.88	-388.48	
Closing Balance	183.99	457.29	474.63	425.04	311.25	
Total Income	890.48	1,302.25	1,407.95	2,311.52	2,094.29	
Item	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Amount in Lakhs						
Opening Balance	268.76	550.03	278.46	433.53	399.57	374.63
Revenue Account						
Revenue Income	454.57	470.12	520.47	398.93	299.23	336.69
Revenue Expenditure	455.20	515.56	561.14	476.58	505.82	410.66
Surplus/Deficit	268.13	504.59	237.79	355.88	192.98	300.66
Capital Account						
Capital Income	1,302.25	1,407.95	2,311.52	2,094.29	2,172.21	1,482.19
Capital Expenditure	844.95	933.31	1,886.50	1,783.03	1,484.83	1,006.22
Surplus/Deficit	457.30	474.64	425.02	311.26	687.38	475.97

Source: Chittur-Thathamangalam Municipality

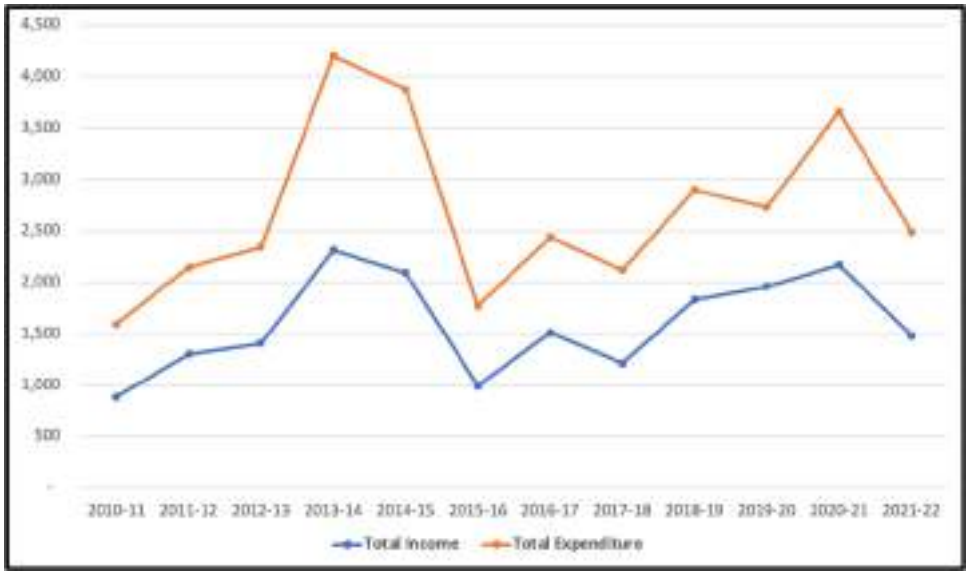


Fig 12.3 Total receipts and expenditure trend

The following sections present detailed review of revenue and capital accounts, primarily aimed at assessing the municipal fiscal status and providing a base for determining the ability of Municipality to sustain the planned investments.

12.3.1 Revenue Accounts

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.

Taxes: Property Tax, Professional Tax, Advertisement Tax & Show Tax
Non-Taxes: Building license fee, Compounding fee, D & O Trades, Penalty on food adulteration act, encroachment fee, Rents on lands and buildings, Registration fees for birth, death & marriage, Library fees, Fees for market and slaughterhouse, bus stand fees, fees from rest houses, fees from cart stands & lorry stands, interest on investments and user charges from public comfort stations
Assigned revenues: Surcharge on stamp duties
Compensation: Motor Vehicles Tax
Grants: Maintenance Grants and Capital Grants.
Borrowings: From financial institutions such as HUDCO, KUDFC, GoK and Banks

Revenue expenditure comprises of expenditure incurred on establishments, operation & maintenance and debt servicing. This is broadly classified under the following heads:

- General management & collection of taxes
- Public works
- Town planning
- Education
- Water supply & drainage
- Public health & sanitation
- Streetlights
- Municipal properties
- Running expenses of transferred institutions Miscellaneous expenses

Revenue Income

Temporal variations of total revenue income show fluctuations. The major fluctuation is seen in the income from Nontax category. The temporal variation of the revenue income from FY 2010-11 to 2021-22 are presented in Table 12.3.

Table 12.3 Temporal variation of revenue income

Item	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Tax	94.47	103.65	110.03	121.97	137.15	138.90
Non-tax	78.84	81.32	81.33	107.39	83.47	106.93
Grants, Contributions & Subsidies	127.91	284.88	190.99	209.79	477.79	49.86
Assigned/Shared Revenue	0.59	0.20	0.00	0.00	0.00	0.01
Total Revenue Income	301.81	470.05	382.35	439.15	698.41	295.70
Item	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Tax	158.13	158.10	158.23	177.68	167.85	183.59
Non-tax	146.88	158.50	160.36	180.95	113.77	131.57
Grants, Contributions & Subsidies	148.51	152.07	191.08	39.57	17.56	21.25
Assigned/Shared Revenue	1.05	1.45	10.8	0.73	0.05	0.28
Total Revenue Income	454.57	470.12	520.47	398.93	299.23	336.69

Source: Chittur-Thathamangalam Municipality

Major sources of fund for Municipality are shown in Fig 12.4

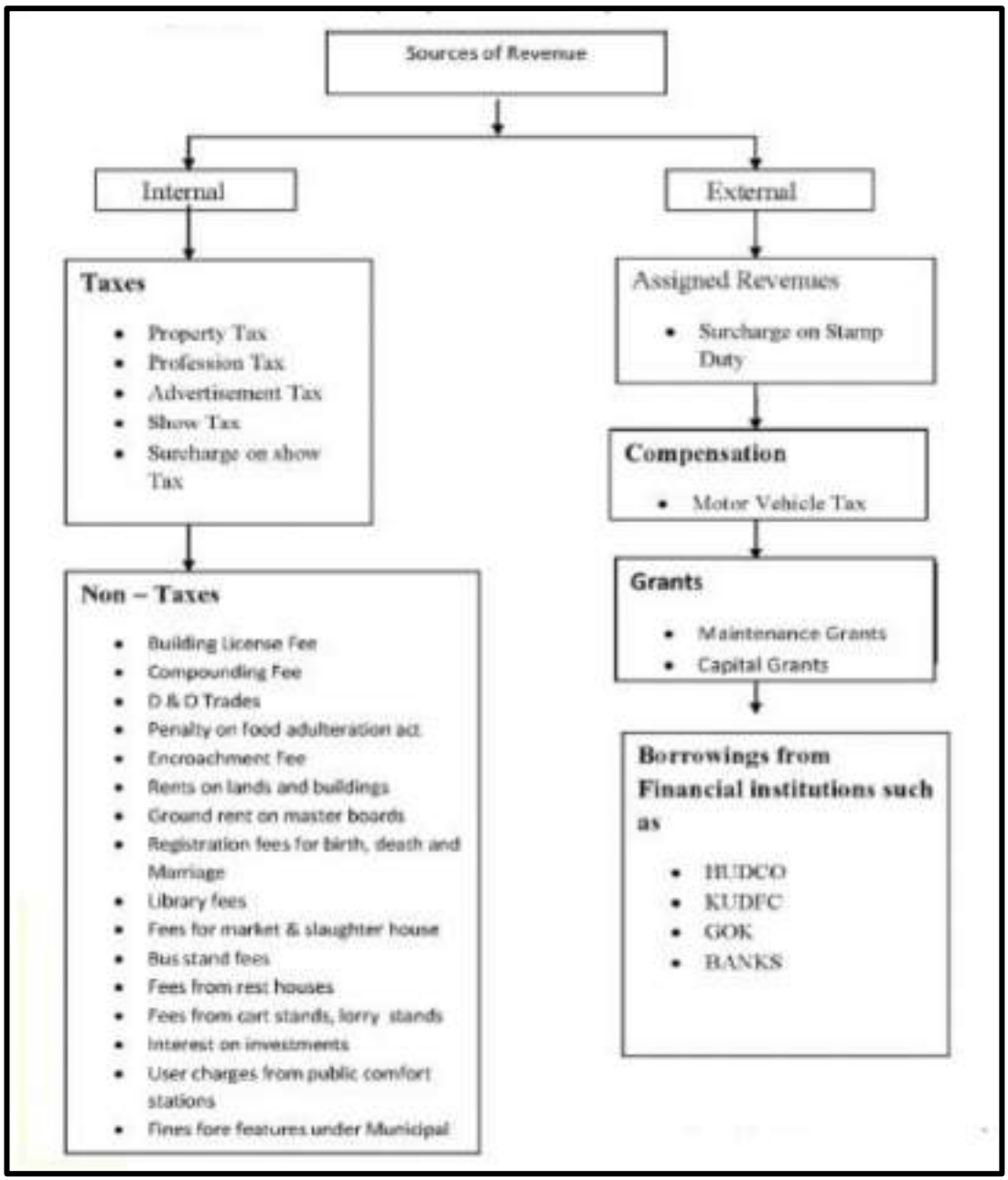


Fig 12.4 Sources of fund

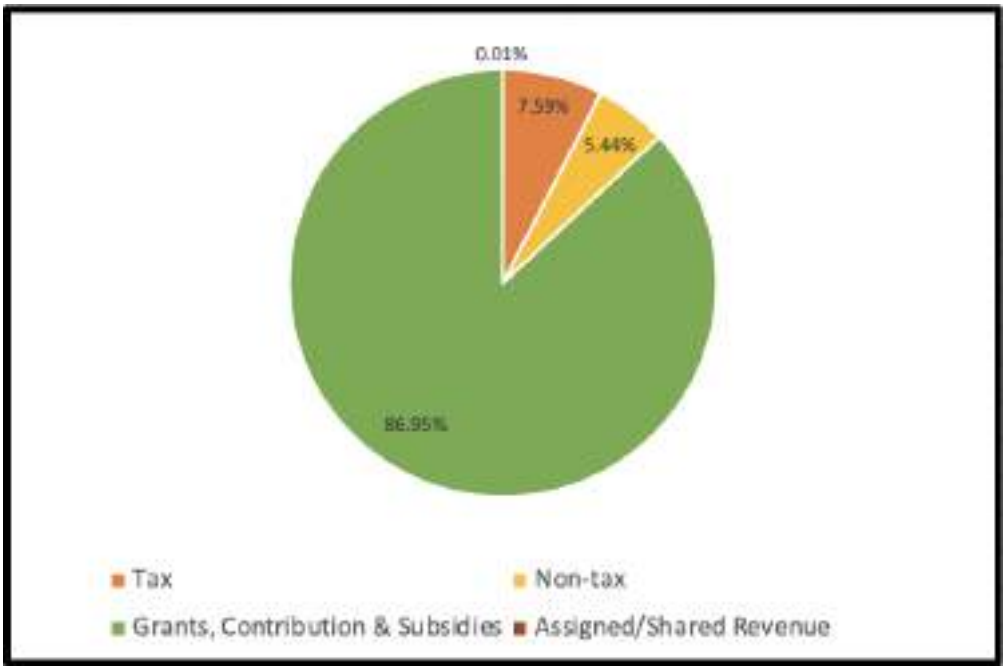


Fig 12.5 Split up of revenue income for 2021-22

When the split up of revenue income for 2021-22 was analysed, it was seen that the income from tax sources accounts to 7.59%, whereas that from Non-tax is 5.44%, which includes building license fee, compounding fee, penalty on food adulteration act, encroachment fees, interest on investments, user charges for public comfort stations, rents on land and buildings, birth death registration and fees on library, market, bus stand, lorry stand, rest house and slaughter house.

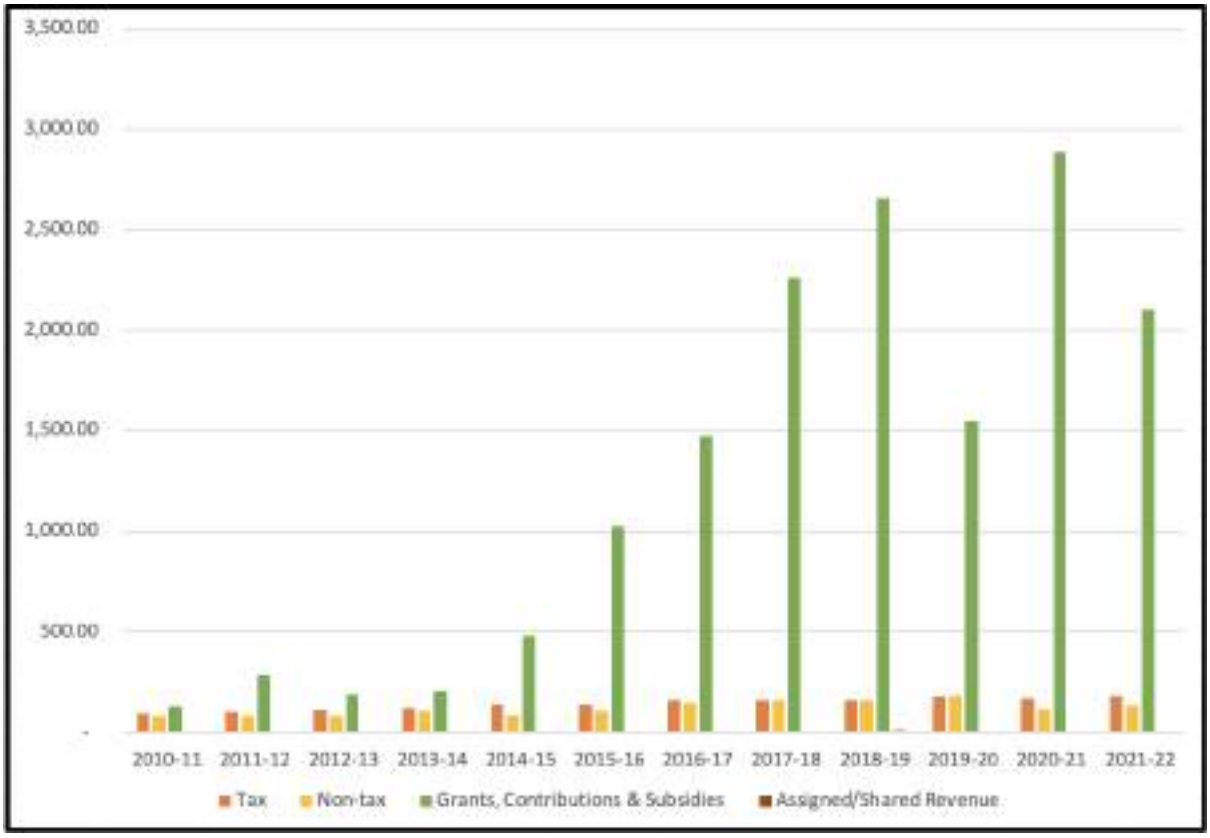


Fig 12.6 Temporal variation of item wise revenue income

Own Sources: Own sources include tax and non-tax sources. The item head comprises of income sourced primarily from property tax (General purpose tax, Lighting tax, Scavenging tax and Education tax excluding water and drainage tax), professional tax and other taxes.

Table 12.4 Revenue income - Own sources

Item	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Taxes - Own Sources						
Property Tax	50.54	93.72	58.89	67.82	80.32	75.32
Professional Tax	38.29	5.93	44.14	48.15	50.29	53.87
Advertisement Tax	1.07	0.16	0.92	0.24	0.83	1.36
Show Tax	0.00	0.00	0.00	0.00	0.00	0.00
Entertainment Tax	4.61	3.85	6.08	5.77	5.66	8.29
Other Taxes	-0.05	0.20	0.00	0.00	0.05	0.06
Non-tax - Own Sources						
Income from ULB properties	20.08	18.69	25.35	39.47	35.23	44.01
Income from sales, fines and recoveries	3.06	285.88	5.45	5.33	34.60	9.43
Fees	27.21	26.34	22.16	41.41	13.05	40.39
Other/miscellaneous income	22.20	0.00	0.00	0.00	0.00	2.38
Total	**167.01**	**434.77**	**162.99**	**208.19**	**220.03**	**235.11**
Item	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Taxes - Own Sources						
Property Tax	89.21	95.53	96.19	111.40	101.45	116.98
Professional Tax	58.11	59.15	61.44	62.11	66.23	65.35
Advertisement Tax	1.91	0.55	0.08	0.03	0.00	0.06
Show Tax	0.00	0.00	0.00	0.00	0.00	0.00
Entertainment Tax	7.57	2.26	0.00	4.33	0.16	1.25
Other Taxes	0.00	0.69	0.69	0.00	0.00	0.00
Non-tax - Own Sources						
Income from ULB properties	50.83	63.30	60.90	75.32	41.02	57.04
Income from sales, fines and recoveries	12.20	20.90	24.38	20.44	24.76	17.43
Fees	51.82	68.53	69.30	57.83	43.88	48.95
Other/miscellaneous income	2.27	3.68	3.30	5.23	2.30	5.24
Total	**273.92**	**314.59**	**316.28**	**336.69**	**279.80**	**312.30**

Source: Chittur-Thathamangalam Municipality

Among the own sources property tax is the largest revenue generating item. This has increased from 50.54 Lakhs in Financial Year 2010-11 to 116.98 Lakhs in 2021-22. Tax income of Own sources is presented in Table12.4. Share of own income also comes from sales, fines and fees collected by Municipality and income from ULB properties i.e. nearly 41.20% of total own income. Property tax and Professional tax together constitutes nearly 58.39 of own income.

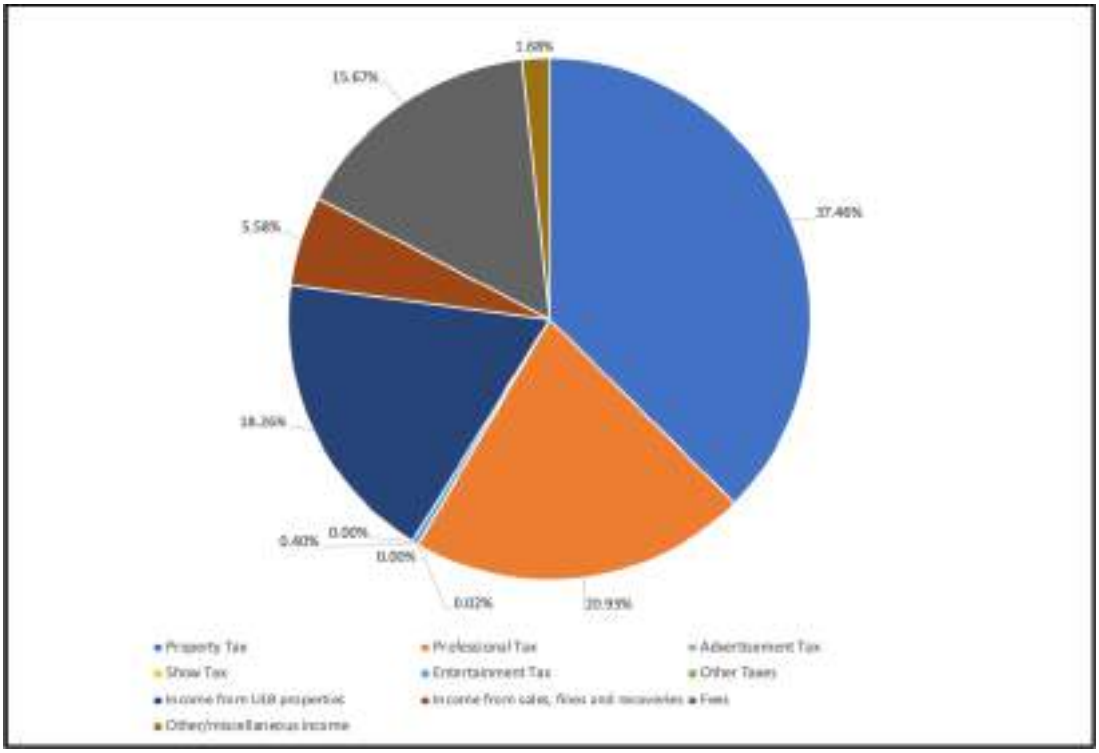


Fig 12.7 Split up of Own sources

Property Tax

This is the most important category of own source income to the municipality. The details of demand collection and balance statement of property tax are provided in Table 12.5 and Fig 12.8. The property tax collection has increased from 52.37 Lakhs in 2010-11 to 116.64 Lakhs in 2021-22 while the demand has increased from 59.19 Lakhs in 2010-11to 159.66 Lakhs in 2021-22. Tax collection performance ratio has decreased from 88.48% in 2010-11 to 73.05 % in 2021-22.

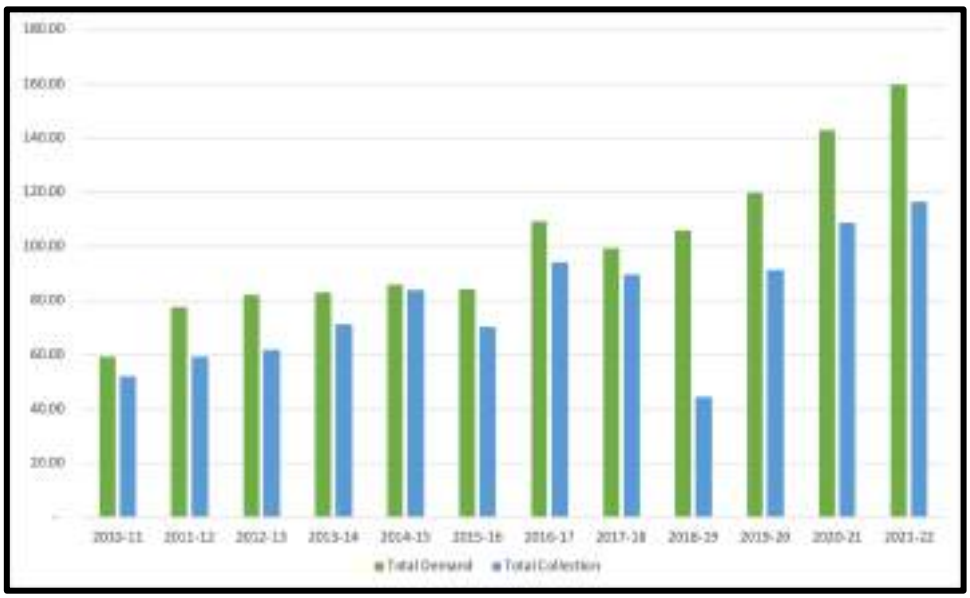


Fig 12.8 Property tax collection performance

Table 12.5 Property tax demand collection and balance statement

Item	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Demand in Lakhs						
Arrear Demand	13.25	17.32	18.34	20.28	17.30	8.99
Current Demand	45.94	60.30	63.79	63.00	68.74	75.32
Total Demand	59.19	77.62	82.13	83.28	86.04	84.31
Collection in Lakhs						
Arrear Collection	12.37	14.55	11.82	13.26	16.27	7.20
Current Collection	40.00	44.73	50.04	58.06	67.86	63.10
Total Collection	52.37	59.28	61.86	71.32	84.13	70.30
Collection Performance (%)						
Arrear	93.36	84.01	64.45	65.38	94.05	80.09
Current	87.07	74.18	78.44	92.16	98.72	83.78
Total	88.48	76.37	75.32	85.64	97.78	83.38

Item	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Demand in Lakhs						
Arrear Demand	29.66	19.28	9.68	23.53	41.68	42.69
Current Demand	79.54	80.16	96.19	96.19	101.45	116.97
Total Demand	109.20	99.44	105.87	119.72	143.13	159.66
Collection in Lakhs						
Arrear Collection	29.16	18.28	9.55	16.91	24.83	32.38
Current Collection	64.89	71.48	34.79	74.42	83.80	84.26
Total Collection	94.05	89.76	44.34	91.33	108.63	116.64
Collection Performance (%)						
Arrear	98.31	94.81	98.66	71.87	59.57	75.85
Current	81.58	89.17	36.17	77.37	82.60	72.04
Total	86.13	90.27	41.88	76.29	75.90	73.06

Source: Chittur-Thathamangalam Municipality

Professional Tax

Professional tax is collected by municipality from all registered organisations, companies or firms, public or private, individuals and state & central government departments. The details of demand collection and balance statement of professional tax are provided in Table 12.6 and Fig 12.9.

The professional tax collection has increased from 5.44Lakhs in 2010-11 to 64.35 Lakhs in 2021-22 while the demand has increased from 10.71 Lakhs in 2010-11to 66.07 Lakhs in 2021-22. Tax collection performance ratio has also increased from 50.84% in 2010-11 to 97.39 % in 2021-22.

Table 12.6 Professional tax demand collection and balance statement

Item	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Demand in Lakhs						
Arrear Demand	6.49	5.26	6.50	14.84	4.60	0.79
Current Demand	4.21	6.61	14.30	7.69	16.36	52.50
Total Demand	10.70	11.87	20.80	22.53	20.96	53.29
Collection in Lakhs						
Arrear Collection	3.38	0.14	0.19	10.88	1.08	0.75
Current Collection	2.07	5.23	5.78	7.04	16.13	51.07
Total Collection	5.45	5.37	5.97	17.92	17.21	51.82
Collection Performance (%)						
Arrear	52.08	2.66	2.92	73.32	23.48	94.94
Current	49.17	79.12	40.42	91.55	98.59	97.28
Total	50.93	45.24	28.70	79.54	82.11	97.24

Item	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Demand in Lakhs						
Arrear Demand	0.89	0.89	1.47	1.47	1.88	1.83
Current Demand	57.74	59.15	60.79	60.79	61.96	64.24
Total Demand	58.63	60.04	62.26	62.26	63.84	66.07
Collection in Lakhs						
Arrear Collection	0.38	0.28	0.23	0.29	0.56	1.35
Current Collection	57.17	58.18	27.23	60.76	58.09	63.00
Total Collection	57.55	58.46	27.46	61.05	58.65	64.35
Collection Performance (%)						
Arrear	42.70	31.46	15.65	19.73	29.79	73.77
Current	99.01	98.36	44.79	99.95	93.75	98.07
Total	98.16	97.37	44.11	98.06	91.87	97.40

Source: Chittur-Thathamangalam Municipality

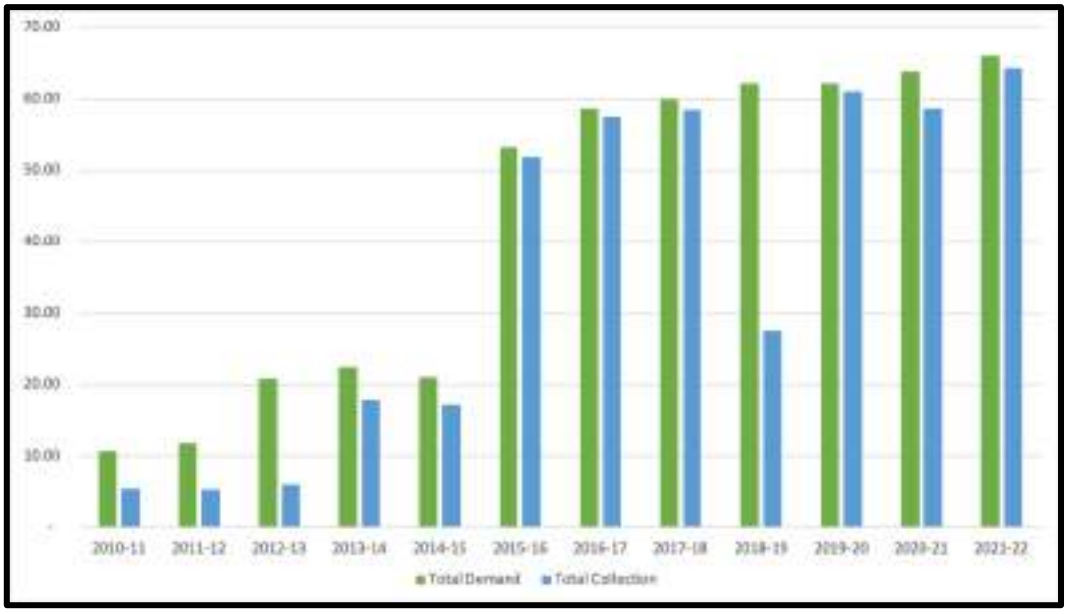


Fig 12.9 Professional tax collection performance

Assigned Revenue

This item head comprises of income from Government of Kerala State transfers of Municipal income collected by the state line department. Transfers are in the form of Municipality's share of taxes levied and collected by GoK from establishments/operations within the municipal limits. Surcharge on transfer of immovable properties and entertainment tax, are the major items on which these revenues are realized by Municipality. Income through assigned revenues contributes meagre share of the revenue income.

Revenue Grants & Contributions

This item mainly comprises revenue grants and compensations from the State Government under various heads. The regular grants include the SFC grants and the others include aid grants, grants for services like roads, buildings, maternity and child welfare, public health, contributions for elementary and secondary schools and etc. Grants which are for specific purposes are ad-hoc in nature. In case of this Municipality, revenue grants and contributions constitute about 86.95 percent of the total revenue income.

Revenue Expenditure

Revenue expenditure increased 36 percent in 12 years period i.e. during 2010-11 to 2021-22 from Rs. 301.80 Lakhs to Rs. 410.66 Lakhs. Revenue expenditure includes mainly Establishment expenses, Administrative expenses, Operation and Maintenance, Programme expenses, other liabilities, unsecured loans etc. The split up and temporal variation of revenue expenditure/ operating payments in the municipality is shown in Tables 12.7 and 12.8.

Percentage of components of revenue expenditure is shown in fig 12.10. Administrative and establishment expenses i.e., salary and other allowances for elected members and staff of Municipality accounts 8%, nearly 50% for programme expenses, 5% for operation and maintenance of revenue expenditure.

Table 12.7 Temporal variation of Total Revenue income and revenue expenditure

Item	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Revenue Income	301.80	470.05	382.35	439.15	698.41	295.70
Revenue Expenditure	495.20	525.00	639.20	1,525.79	1,185.87	354.70
Surplus/Deficit	-193.40	-54.94	-256.85	-1,086.64	-487.46	374.41
Item	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Revenue Income	454.57	470.12	520.47	398.93	299.23	336.69
Revenue Expenditure	455.20	515.56	561.14	476.58	505.82	410.66
Surplus/Deficit	268.13	504.59	237.79	355.88	192.98	300.66

Source: Chittur-Thathamangalam Municipality

Table 12.8 Components of revenue expenditure

Item	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Amount in Lakhs						
Opening Balance	220.96	184.00	457.29	474.64	425.05	433.41
Revenue Account						
Revenue Income	301.80	470.05	382.35	439.15	698.41	295.70
Revenue Expenditure	495.20	525.00	639.20	1,525.79	1,185.87	354.70
Surplus/Deficit	-193.40	-54.94	-256.85	-1,086.64	-487.46	374.41
Capital Account						
Capital Income	330.67	631.03	526.38	1,325.56	843.46	890.48
Capital Expenditure	51.31	23.36	179.54	96.66	81.30	706.48
Surplus/Deficit	279.36	607.67	348.84	1,228.90	762.16	184.00
Debt Head Account						
Income	37.04	17.17	41.93	72.17	127.38	
Item	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Amount in Lakhs						
Opening Balance	268.76	550.03	278.46	433.53	399.57	374.63
Revenue Account						
Revenue Income	454.57	470.12	520.47	398.93	299.23	336.69
Revenue Expenditure	455.20	515.56	561.14	476.58	505.82	410.66
Surplus/Deficit	268.13	504.59	237.79	355.88	192.98	300.66
Capital Account						
Capital Income	1,302.25	1,407.95	2,311.52	2,094.29	2,172.21	1,482.19
Capital Expenditure	844.95	933.31	1,886.50	1,783.03	1,484.83	1,006.22
Surplus/Deficit	457.30	474.64	425.02	311.26	687.38	475.97

Source: Chittur-Thathamangalam Municipality

12.3.2 Capital Account

Capital account consists of non-recurring income and expenditure items. It is subdivided into:

1. Capital Income
2. Capital expenditure

Capital Income

Capital income consists of loans, grants and own sources like revenue account surplus transfer for capital works. Capital income includes:

1. Govt. grants & contribution
2. Govt. loans
3. Loans from financial institutions
4. Investment realized
5. Initial deposit
6. Receipts by way of property transferred to municipality u/s 30 (Plan fund)
7. Grants for Kerala Development Projects and
8. Beneficiary share

Table 12.9 The trend in capital income and expenditure

Item	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Capital Account						
Capital Income	330.67	631.03	526.38	1,325.56	843.46	890.48
Capital Expenditure	51.31	23.36	179.54	96.66	81.30	706.48
Surplus/Deficit	279.36	607.67	348.84	1,228.90	762.16	184.00
Item	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Capital Account						
Capital Income	1,302.25	1,407.95	2,311.52	2,094.29	2,172.21	1,482.19
Capital Expenditure	844.95	933.31	1,886.50	1,783.03	1,484.83	1,006.22
Surplus/Deficit	457.30	474.64	425.02	311.26	687.38	475.97

Source: Chittur-Thathamangalam Municipality

Capital Expenditure

Capital Expenditure consists of loans, grants etc spent for creation of assets. Analysis of the past five years indicated a financial surplus and lesser utilization of the available resources.

Component wise Capital Income

The detailed components of capital income are presented in Table 12.10 An analysis of the account indicates that government grants and contribution and plan funds have contributed the maximum share of income under this account.

Table 12.10 Trend in capital receipts

Item	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Grants Contributions for Specific Purposes	329.71	630.72	520.69	1,324.49	842.46	937.22
Loans, Advances and Deposits	0.95	0.30	5.68	0.96	0.99	8.38
Secured Loans	0.00	0.00	0.00	0.00	0.00	0.00
Fixed Assets	0.00	0.00	0.00	0.10	0.00	0.00
Total	330.66	631.02	526.37	1,325.55	843.45	945.60
Item	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Grants Contributions for Specific Purposes	1,283.50	467.93	1,075.94	283.66	225.55	409.68
Loans, Advances and Deposits	6.11	10.18	6.96	7.19	7.86	9.23
Secured Loans	0.00	0.00	0.00	0.00	0.00	0.00
Fixed Assets	0.00	0.00	0.00	0.00	0.00	0.00
Total	1,289.61	478.11	1,082.90	290.85	233.41	418.91

Source: Chittur-Thathamangalam Municipality

Capital Expenditure

The majority of capital expenditure has been directed towards loans, advances and repayments sector. The trend in capital expenditure is shown in Table 12.11.

Table 12.11 Trend in capital expenditure

Item	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Grants Contributions for Specific Purposes	0.18	2.52	22.97	10.89	12.68	62.16
Loans, Advances and Deposits	0.91	3.56	26.71	8.83	38.31	0.29
Reserves / Prior Period Items / Work in Progress	40.80	0.18	47.75	10.93	3.06	20.85
Others (Secured Loans, Fixed Assets)	9.42	17.09	82.10	66.01	27.25	122.06
Total	51.31	23.35	179.53	96.66	81.30	205.36
Item	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Grants Contributions for Specific Purposes	3.32	261.68	13.01	0.00	0.29	0.00
Loans, Advances and Deposits	0.04	0.45	0.32	0.56	2.72	3.60
Reserves / Prior Period Items / Work in Progress	58.15	255.36	120.04	78.46	305.00	91.51
Others (Secured Loans, Fixed Assets)	10.70	183.16	178.06	94.54	204.06	123.82
Total	72.21	700.65	311.43	173.56	512.07	218.93

Source: Chittur-Thathamangalam Municipality

12.3.3 Liabilities

Under the cash system of accounting, 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.

Debt Servicing

A review of the outstanding loan statement of Chittur-Thathamangalam Municipality reveals that the net outstanding debt liabilities are Rs 430.48 lakh in the assessment year 2021-22. Liabilities of Municipality as on 31.3.2022 are shown in Table 12.12.

Table 12.12 Liabilities of Chittur-Thathamangalam Municipality as on 31-3-2022

Sl. No.	Liabilities as on March 2022	Amount in Lakhs
I	**Reserves and Surplus**	
	Municipal General Fund	193.17
	Earmarked Fund	15.53
	Reserves and Surplus	1254.77
	Total Reserves & Surplus	1493.47
II	**Grants, Contribution for Specific Purpose**	288.05
	Total Grants, Contribution for Specific Purpose	288.05
III	**Loans**	
	Secured Loan	878.37
	Total Loan	878.37
IV	**Current Liabilities and Provisions**	
	Deposits Received	127.33
	Other Liabilities	303.14
	Total Current Liabilities and Provisions	430.48
	Total Liabilities	3090.37

Source: Chittur-Thathamangalam Municipality

12.4 Key Financial Indicators

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. 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.

Operating Ratio

Operating Ratio (OR) is the ratio of revenue expenditure to revenue income, and it indicates financial status or "profitability" of local body operations. Sound financial management requires that this ratio should be less than unity. The average OR of Chittur-Thathamangalam Municipality works out to 1.51. The OR greater than 1.0 in Chittur-Thathamangalam Municipality indicates that it has had a deficit revenue account over the last six years. Revenue deficit means revenue income is not in a position to support capital investments useful for capital works. This is an unhealthy situation.

Debt Servicing Ratio

Debt Servicing Ratio (DSR) is the ratio of debt payment to total revenue income. This indicator helps in assessing the implication of debt on the local body's finances. It has been observed that Chittur-Thathamangalam Municipality services its debts on a regular basis. The analysis indicates that the DSR as on 2021-22 is 1.28%. It gives an indication of debt payment to the total revenue income. The outstanding loan amount with Chittur-Thathamangalam Municipality was Rs. 430.48 Lakhs and there are no over dues to any of the lending organisation with respect to principal as well as interest.

Capital Utilisation Ratio

Capital Utilisation is the ratio of capital expenditure to the capital income. This ratio indicates the performance of the local body in terms of utilisation of capital income. It could also be an indicator of the local body's capacity to utilise capital resources. A capital utilisation ratio of greater than unity indicates that the revenue account surplus has been utilised for capital works, which is a positive feature. A CU Ratio below unity indicates that either capital income is being diverted for revenue expenditure (when OR is also above 1), or that part of the capital income was unspent during the financial year under consideration. The average CU Ratio of Chittur-Thathamangalam Municipality is less than unity at 0.49. However, the situation also refers to non-utilisation of the capital available in that financial year to the complete extent, which Chittur-Thathamangalam Municipality will need to plan accordingly. Table 12.13 presents these indicators. These indicators are used to assess the municipal performance with regards resource mobilization, fund utilization, financial performance and collection efficiencies.

Table 12.13. Key Financial indicators

Key Financial Indicators (Based on 2021-22 Financials)		
A	**Resource Mobilisation**	
	Per Capita Revenue Income	Rs. 1,029.95
	Share of Own Sources in Total Revenue Income	92.76%
	Share of Property Tax in Total Revenue Income	34.74%
	Share of Revenue Grants & Subsidies in Total Revenue Income	6.31%
	Growth in Revenue Income (over previous year)	12.52%
	Growth in Own Sources of Revenue Income (over previous year)	11.61%
	Per Capita Own Income	Rs. 955.34
B	**Fund Application**	
	Per Capita Revenue Expenditure	Rs. 1,256.23
	Growth in Total Revenue Expenditure (over previous year)	-18.81%
	Outstanding Debt Per Capita	Rs. 1,316.86
	Outstanding Debt as % of Property Tax Demand	368.03%
	Outstanding Debt as % of Own Revenue Sources	137.84%
	Debt Servicing Ratio	1.28
C	**Performance Indicators**	
	Operating Ratio	1.22
	Capital Utilisation Ratio	0.68
D	**Efficiency Indicators**	
	Tax Collection Performance	
a	Property Tax	73.05%
b	Professional Tax	97.39%

Source: Chittur-Thathamangalam Municipality

12.5 Problems and Potential

The major problems faced by the municipality in the finance sector are the leakage in taxes and paucity of funds for developmental activities. The municipality 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.

12.6 Inference

Municipality has to identify new sources for resource mobilization. Most of the municipal revenue assets are poorly maintained and their regular maintenance and repairs are necessary to increase the revenue.

12.7 Asset Management Plan

Asset management is the systematic and coordinated activities and practices through which an organization optimally and sustainably manages its assets and asset systems, their associated performance, risks and expenditures over their life cycles for the purpose of achieving its organizational strategic plan. While the need for Asset Management is clearly felt, it is equally important to have appropriate management information on asset condition, infrastructure costs and performance, and the consolidated requirements for repairs and maintenance, as well as appropriate maintenance standards. This section will deal with the elements that are essential in an asset management program for movable and immovable infrastructure.

12.7.1 Municipal Assets

Water Supply

Water supply in the town is operated and maintained by Kerala water Authority. 72 Public open wells constructed and maintained by Municipality and Municipality is paying the water charges for 91 public taps.

Irrigation

There are 10 ponds owned by Municipality used for irrigation purposes. They are Ramottukulam, Pallikulam, Karyakarkulam, Vadakkepadam, Veppinkode, Perumkulam, Guruswamiyarkulam, Vadakkanthara, Pavodithara, Bhagavathikulam, Perumkulam, Chalaroad, Ayyankulam, Devinagar, Chittadikulam, Padinjaregramam, Perumkulam for irrigation purposes.

Sewerage and Sanitation

There is no specific sewerage system for the town and the population is dependent on septic tanks and low-cost sanitation units. The role of the municipality in this sector is limited to provision of publiccomfort station/latrines and giving financial aids through schemes. There

are five comfort stations at Anikode Junction, Market Shopping Complex, Post Office Library, Thathamangalam library and Thathamangalam bus stand.

Roads

141 km road of are constructed and maintained by Municipality of which 116 km roads are bitumen surfaced, 5km cement concrete, 12km metalled and 8km of mud roads.

Land and Buildings

Municipality owns 79 numbers of plots having an extent of 20.24 acres in the town. Details of land is shown in Table 12.14. Total built up area of all Municipal owned buildings is 26216 sq. m. of which 6262.40 sq. m. area (24%) is income generating ones. Others are non-remunerative buildings. Non remunerative assets of the Municipality are the office buildings, assets which are either acquired or purchased or transferred by state government as per 74th CAA on which the municipality incurs considerable expenditure for operation and maintenance. They are maintained by the municipality under the general, water supply & drainage and elementary education funds separately. The municipality has vehicles which are used for service delivery and for administration purposes. Apart from these there are 1 jeep and 1 Car with the municipality which are used for administrative purposes. The details of Municipal assets - land and buildings are presented in Tables 12.14 and 12.15 respectively.

Major municipal assets are shown in Fig 12.10.

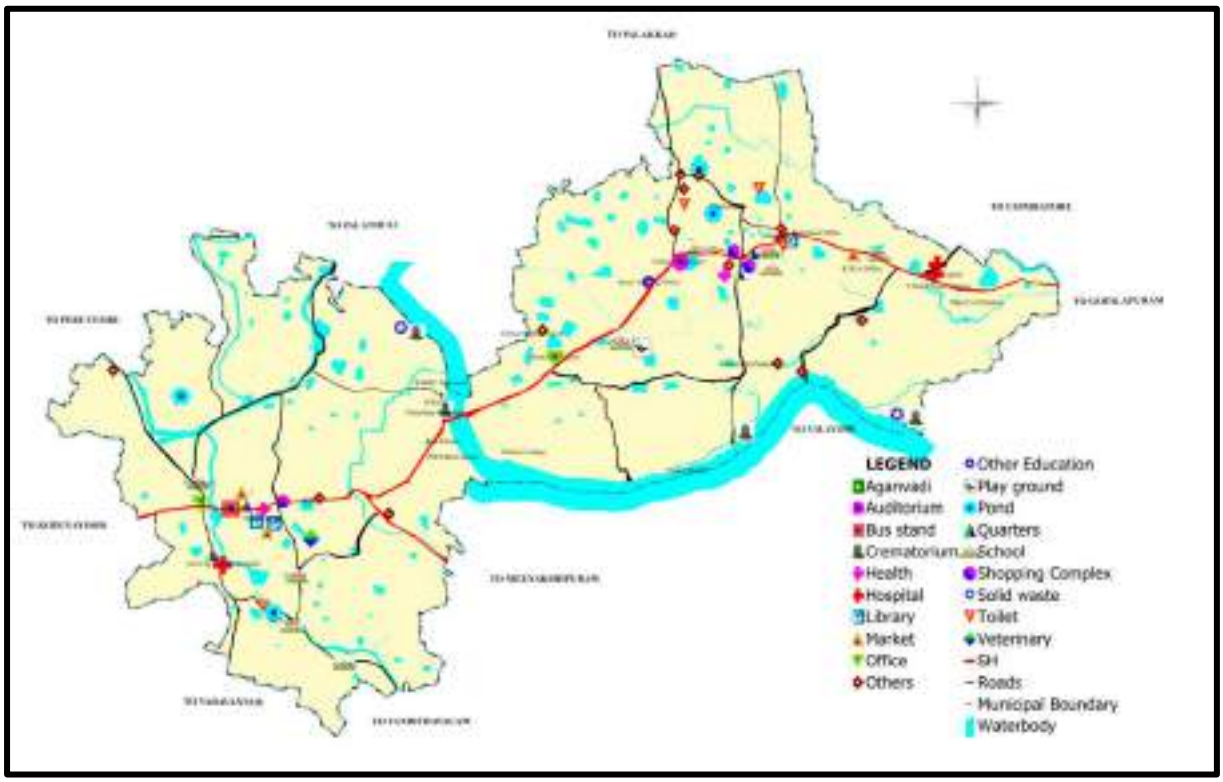


Fig 12.10 Municipal assets

Table 12.14 Municipal Assets - Land

Sl.No:	Name of Asset (land)	Extent in cents
1	Chandapetta-Chittur	67.60
2	Industrial Center	119.30
3	Govt. Hospital Quarters	30.58
4	Parakkalam Trenching Ground	39.99
5	Thathamangalam Bus Stand	157.93
6	Puzhappalam Gas Crematorium	42.98
7	Aryamballam Trenching Ground	38.74
8	Koombanpara Crematorium	50.96
9	Kottakadav Crematorium	107.42
10	G.S.M.H.S.Thathamangalam	709.11
11	G.L.P.S.Thumbichira	165.93
12	G.U.P.S,Sreekurumbakkav	196.91
13	G.L.P.S.Ambattupalayam	26.48
14	G.B.U.P.S.Thathamangalam	150.92
15	Govt. Hospital,Chittur	378.73
16	Govt. Ayurvedic Hospital, Thathamangalam	72.96
17	Govt. T.T.I ,Chittur	264.49
18	Veterinary Poly Clinic	74.10
19	Ambattupalayam Anganavadi	2.99
20	Kunnathpalayam Anganavadi	3.93
21	Mettupalayam Anganavadi	8.47
22	Paruthykkavu Anganavadi	3.56
23	Mettuvalav Anganavadi	7.31
24	Vellappana Anganavadi	2.99
25	Vadakkathara Anganavadi	2.99
26	Athikkuzhy Anganavadi	6.55
27	Valmutty Anganavadi	3.80
28	Parayankode Anganavadi	2.99
29	Aryamballam Anganavadi	2.10
30	Parakkalam Anganavadi	1.98
31	Muttirangy Anganavadi	1.98
32	Devangapuram Anganavadi	1.98
33	Thekkinkadu Anganavadi	1.98
34	Kadavalav	5.14
35	Athikkuzhy	5.14
36	Maduppikkav Anganavadi	3.09

Sl.No:	Name of Asset (land)	Extent in cents
37	Thumbichira Anganavadi	2.10
38	Naramkuzhy Anganavadi	3.09
39	I.C.D.P Subcentre	7.98
40	Anikkode Shopping Complex	76.57
41	Jawaharlal Nehru Shopping Complex	127.45
42	Taxi Stand Shopping Complex	21.98
43	Secretary Quarters Building	10.28
44	Arangam Anganavadi	5.14
45	Chittur-Thathamangalam Municipality Office	192.56
46	Priyadarsini Park,Thathamangalam	37.79
47	Devi Nagar Park.	51.97
48	G.U.P.S,Chittur	202.54
49	Shanmugham Cross Veneer Land	1.28
50	Place Near Nedumbura	0.54
51	Perunkulam	253.67
52	Bhagavathykkulam	14.57
53	Karyakkarkulam	22.60
54	Vellappana Colony	7.98
55	Site Near KSEB	3.46
56	Site Near KSEB	3.71
57	Arangam Anganavadi site	4.00
58	Govt.Victoria Higher Secondary	261.97
59	Thathamangalam Library Ground Stage	22.08
60	South of Karyakkarkkulam, North of Palakkad Road, and in front of Ganapathy Temple.	14.94
61	Near Pavodiparambil Anganavadi	1.98
62	Athikkuzhy	2.00
63	Opposite to Bajath Complex	1.01
64	Opposite to Dhanalakshmi Bank	0.64
65	Vellappana Street	36.98
66	Site of Working Women's hostel (Chala Road)	34.09
67	East side of Devinagar Park	6.99
68	Devi Nagar Park.	42.98
69	West of Ayyamkulam	6.00
70	Asharithara Priyadarsini Club	0.25

Sl.No:	Name of Asset (land)	Extent in cents
71	Mettuppalayam (Near milma booth,infront of well)	1.48
72	Thevunguthara (East of Anganavadi,South of Guruswamiyar Pond)	3.71
73	Staff Quarters Near Thathamangalam Bus Stand	5.98
74	G.V.H.S.S	261.89
75	Vacant Plot,Chittur	7.45
76	Veterinary Sub Centre	19.36
77	Thathamangalam Market	44.46
78	Municipality Town hall	24.21
79	Chittur-Thathamangalam Stage and Library	1.75

Source: Asset Register, Chittur-Thathamangalam Municipality

Table 12.15 Municipal Assets - Buildings

Sl.No	Building details	Ward No	Total Floor area
1	Thathamangalam Bus Stand	2	1149.92
2	Slaughter House- Thathamangalam	27	89.52
3	Kunnathupalayam Anganavadi	18	41.31
4	Ambattupalayam Anganavadi	5	41.16
5	Vellappana Anganavadi	1	44.89
6	Maduppikkavu Anganavadi	2	39.36
7	Vadakkathara Anganavadi	8	71.7
8	Public Latrine	17	45
9	Anikkode Shopping Complex	17	500
10	Athikkuzhy Anganvadi No:133	9	36.1
11	G.U.P.School, Chittur	12	234.5
12	G.V.G.H.S.S	17	1500
13	Chittur- Thathamangalam municipality Anganavadi	5	34.4
14	Veterinary subcentre	22	190.24
15	Kallankadu Anganavadi (A W No:139)	19	44.16
16	Alachunkode Anganavadi		60
17	Mettuppalayam Anganavadi (A W C No:140)	20	121.4

Sl. No	Building details	Ward No	Total Floor area
18	Paruthikkavu Anganavadi	23	121.41
19	Ayurvedic Hospital	28	273.84
20	Thathamangalam library	27	110.45
21	Mettuvalav Anganavadi	26	43.46
22	Women's Industrial Centre	14	193.51
23	Nehru Auditorium	17	3336.46
24	Taxi Stand Shopping Complex	17	503.48
25	Secretary Quarters	17	106.82
26	Parayankode Anganavadi	5	31.28
27	Aryamballam Anganavadi	14	85.2
28	Parakkalam Anganavadi	4	31.38
29	Kacherimedu Anganavadi	13	31.38
30	Devangapuram Anganavadi	15	31.53
31	Kunnathupalayam Anganavadi(Transferred)	20	60
32	Thekkinkad Anganavadi	4	31.38
33	G.S.M.H.S.Thathamangalam	28	1839.11
34	G.B.U.P.S, Thathamangalam	19	475
35	G.L.P.S, Ambattupalayam	19	2065.72
36	G.L.P.S, Thumbichira	24	4000
37	TTI, Chittur	5	187
38	I.C.D.P Subcentre Chittur	16	79.98
39	Govt. Hospital,Chittur	13	2325.24
40	Maduppikkavu Anganavadi	2	121.41
41	Thumbichira Anganavadi	24	31.38
42	Naramkuzhy Anganavadi	9	31.38
43	Nayadi Colony	5	420
44	Valmutty Toilet	15	10
45	Workshop	17	60
46	Vadakkathara Common Toilet	8	8
47	Common Toilet Near Perumkulam	8	10
48	Agricultural Office	1	60
49	Padinjare Gramam Common Toilet	28	10
50	New Municipal Office Building	5	1248.1
51	Arangam Anganavadi	3	25.6
52	Kadvalav Anganavadi	27	34.4
53	A.E.M Nagar Anganavadi	6	25.2
54	Muttiringy Anganavadi	13	31.38

Sl.No	Building details	Ward No	Total Floor area
56	Veterinary Poly Clinic,Chittur	17	350
57	G.U.P.S, Sreekurumbakkav	25	256
58	Old Shopping Complex Anikkode	17	468
59	Market Complex	16	1059.5
60	Bajath Complex Thathamangalam	3	114
61	G.V.L.P. School	17	432
62	G.H.S.S, Ambattupalayam	19	176.72
63	Worker's Quarters	1	200
64	Worker's Quarters-Manthakkadu	14	150
65	Chittur Library	16	70.98
66	ChenthamaraNagar Anganavadi	1	45
67	Thelunguthara Anganavadi	22	45
68	Kosathara Anganavadi	11	46
69	Continuing Education Centre	26	69
70	Family Welfare Centre,Thathamangalam	27	100
71	Working Women's Hostel	29	231

Source: Asset Register, Chittur-Thathamangalam Municipality

12.7.2 Key issues in Asset Management

Municipality's assets are seen ill maintained even in the core area. Municipal roads are also seen poorly maintained.

12.7.3 Inference

Remunerative assets mainly markets, commercial complexes, bus stands etc are seen underutilized. Land for Parks are available but not developed. An assessment of existing condition of assets which need urgent repair works are to be done. Asset Management Plan shall be prepared depending on priorities and constraints.

Chapter 13: DISASTER AND CLIMATE: RISK AND VULNERABILITY ASSESSMENT

13.1 Introduction

This chapter highlights the key risks and vulnerabilities in Chittur-Thathamangalam, that must be assessed and addressed through local spatial planning process using the relevant tools as mandated by law. The legal and policy context for the plan across scales - national, state, and local government - is first discussed. The chapter then elaborates on the general and specific context of climate change impacts for Kerala, Palakkad district and then Chittur-Thathamangalam municipality. This is followed by the outputs and conclusions from a techno-legal analysis highlighting the implications for a land use planning program for the town. Specific planning proposals to address the risk and vulnerabilities highlighted here are presented in Chapter 20 of this report.

13.2 Legal and Policy Context

Human settlements across the world are struggling with an unprecedented frequency of disasters in recent decades causing significant damage to life, livelihoods, wealth and assets. These disasters have both man-made and natural causes. However, except for a few exceptional extreme weather events, most disasters are a consequence of how natural events are converted into human disasters by specific ways in which we shape our habitat engaging with or not with the many known risks.

The National Disaster Management Act 2005 defines Disaster "as a catastrophe, mishap or grave occurrence in any area arising from natural or man-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area." (DMA 2005, 2d).

The majority of extreme natural events get converted into humanitarian disasters due to where and how we build our habitats and how we relate to other nonhuman aspects of the environment. For example, our habitats on low-lying lands and water courses are vulnerable to floods, on risky coasts are vulnerable to cyclones and hurricanes, on risky slopes are vulnerable to landslides and buildings without earthquake proofing are vulnerable to devastating damages. This situation has now been exacerbated by Climate Change in recent decades.

Damage from floods, drought, cyclones, earthquakes and landslides, have become very common in India. Recurrent floods in all major urban areas in India since 2005, and all across Kerala since 2018 have demonstrated the extent to which such events can destroy life, livelihoods, public and private property, assets and wealth to reverse the development and progress painstakingly archived in the post-independent decades. People and communities with weaker social and economic security suffer the most from these disasters. To be foresightful about the risk and vulnerabilities through prevention, mitigation and adaptation is a bare minimum requirement of any responsible land use planning program today.

The National Disaster Management Act 2005 defines disaster management as "a continuous and integrated process of planning organising coordinating and implementing measures which are necessary or expedient for:

1. Prevention of danger or threat of any disaster
2. Mitigation or reduction of risk of any disaster or its severity or consequences"

(NDMA 2005, 2e)

The Act mandates that "all local authorities shall ensure that all construction projects under it or within its jurisdiction conform to the standards and specifications laid down for prevention of disasters and mitigation by national authority, state authority and district authority. (NDMA 41.1d). It confers powers to local authorities to "take such other measures as may be necessary for the disaster management (41(2) and make DM plans."

The National Disaster Management Policy 2009 draws attention to the fact that the current pattern of urbanisation in India creates heightened vulnerability to disasters due to the promotion of development in zones that are not conducive for building (NDMP, 1.2.1). It highlights the disproportionate levels of impact from disasters borne by socially and economically weaker sections of the population given that the hazard-prone land parcels, for example, along the water courses and low-lying regions, tend to be occupied by less well-off communities. Therefore, it emphasises the importance of proactive measures for prevention, mitigation and preparedness, supported by relevant technologies including community participation, capacity development, multi-sectoral synergy, traditional wisdom, and environmental sustainability. It proposes to mainstream disaster management through the planning process to create an enabling regulatory environment and a compliance regime to prevent hazards from occurring in risk-prone areas (NDMP 2009, 2.3.1, 2.4.1). Risk and vulnerability assessment and mapping, using Geographic Information Systems, modelling and ground verification (NDMP 2009, 5.1.2) are important methods to identify the key brief for any land use planning process that integrates disaster prevention and mitigation.

The National Disaster Management Policy 2009 specifically recognises the alarming rate of increase of disasters in urban areas in India, the increasing role of climate change in inducing these hazards and emphasises that priority should be given to ensuring safer human habitat through planning. It particularly highlights urban floods and stresses the risks involved in using unsuitable and vulnerable areas for construction and the importance of focussing on urban drainage systems and sustainable drainage ecology to arrest urban floods.
It calls for the use of zoning and development control regulations, for the restoration of the agricultural eco-systems, and preservation of the natural habitats to ensure sustainable urban development, (5.1.4, 5.1.5). The policy mandates land use planning to identify safer locations for habitats as follows: "As far as urban settlements are concerned, the future land use is to be assessed keeping in view the anticipated intensity of development" (6.3.1, 6.2.1)

Similarly, the National Disaster Management Guidelines for the Management of Urban Flooding (2010) [6] draws our attention to the increasing number of disastrous flood incidents across the country due to rapid urbanisation. The major causes identified are significantly reduced percolation due to the build-up of catchments resulting in increased flood volumes, built up of watersheds and natural drainage corridors resulting in flood accumulation, and intense monsoon rainfall patterns due to climate change among others. The report clearly identifies, "rapid urbanisation has resulted in increased non-permeable surface in the form of pavements, roads, built-up areas, reducing the infiltration and natural storage…" (NDMA,

[6] The National Disaster Management Guidelines for the Management of Urban Flooding. A publication of the National Disaster Management Authority, Government of India. ISBN: 978-93-80440-09-5, September 2010, New Delhi.

2010; 4.1, p 40). Therefore, it proposes that all land use planning programs to develop urban flood prevention and mitigation measures through a proper risk and vulnerability assessment using mapping of existing drainage ecology using GIS modelling and ground verification using accurate contour data and flow directions. It emphasises land use planning to foreground urban drainage design based on catchments (where water drains) and watersheds (where water accumulates) (NDMA 2010, 4.7). The report proposes to repair, restore and protect urban water bodies like lakes, tanks and ponds - as key detention and retention infrastructure - to capture the rainwater.

Similar to the national policies, Kerala State Disaster Management Policy 2010 follows these national regulations and guidelines. It notes that in the context of heavy rains during the monsoons and the subsequent flooding followed by drought in summer, flood prevention as well as water protection through drainage management are crucial. It mandates Local Authorities to ensure such an integrated approach using building byelaws, land use zoning and development control regulations and with the aid of Geographic Information System (Section 6.7, 6.10). It proposes planning process should conduct hazard analysis and risk and vulnerability assessment (7.1.2.1) and prepare a zonal map.

The Kerala Town and Country Planning (Amendment) Act, 2021 specifically suggests including situational analysis in respect of hazard, vulnerability, risk and proposals for mitigation and resilience in the master plan for a local planning area. (page 1, 2). Similarly, the Guidelines for Risk-Informed Master Plan 2022, [7] calls for integrated risk informed planning to reduce the hazards on life property and environment and develop risk-informed urban plans.

The next few sections will provide the risks and vulnerabilities that settlements at all three scales- the state, the district and the town- are exposed to and have to address.

13.3 Climate Change and Kerala

Climate Change is, as Antonio Guterres, the UN Secretary-General warned a "code red for humanity".[8] The rise in global temperature is a threat to Agriculture, Animal Husbandry, Water Resources, Forestry, Biodiversity (both land and ocean), Infrastructure and Health. The adverse impacts are already here in the form of cyclones, floods, droughts, cold and heat waves, heat bursts, sea level rise, and diseases. All countries will have to adopt extensive measures to adapt to the effects. Further, to limit global temperature rise to below 2°C aiming for 1.5°C, as promised in the Paris Agreement, countries must cut 30 gigatonnes of GHG emissions annually by 2030. Town Planning is a central pathway for achieving climate change mitigation and adaptation strategies.

In India, changing weather patterns are affecting human health, agriculture, wildlife, access to clean water and the economy as a whole. This is also true for Kerala, which is warming. The maximum temperature across the State has increased by 1.0 degrees centigrade and minimum by 0.35 degrees centigrade over the last six decades. The average temperature has increased

[7] Risk informed Master Plan is a Master Plan defined under Section 2 (r) of the Kerala Town and Country Planning Act, 2016 (KTCP Act, 2016). (1.1)

[8] IPCC Working Group I's Sixth Assessment Report 2021

by 0.7 degrees centigrade during the same period. Coastal areas are more susceptible to warming than highranges according to a new observation. The major climate change-related issues that Kerala has begun facing are as follows:

- Declining annual as well as monsoon rainfall
- Increasing atmospheric temperatures
- Recurring summer drought periods
- Increasing flood events
- Increasing landslide/mud slip events across the mid and high ranges
- Declining wetlands including paddy fields
- Depleting groundwater resources
- Loss of biodiversity (inland and ocean)
- Sea level rise and coastal erosion
- Increasing events of forest fires across the Western Ghats during the summer period
- Indiscriminate sand mining
- Indiscriminate landfilling
- Saltwater intrusion (in coastal areas)
- The threat being faced by Idukki-Wayanad agro-ecological zone. Thermo-sensitive crops under threat

Climate-sensitive health risks are increasing, such as from heat stress, indiscriminate flooding, impacts on air quality, water quality and quantity, food security and safety, and distribution and ecology of vectors. Health-related impacts include temperature-related illness and death, extreme weather-related health effects, air pollution-related health effects, water and food-borne diseases, effects of food and water shortages, higher pesticide usage and vector-borne diseases.

13.4 Climate Risk and Vulnerability for Palakkad District

The State Climate Action Plan on Climate Change 2023-2030 report[9] identifies Palakkad as one among nine districts in the state that is highly vulnerable to climate change (p.vi). The drivers of this high vulnerability for Palakkad district have been identified as "High variability in principal crop yields; poor groundwater quality; fewer relief shelters available relative to the district's population; fewer healthcare professionals and poor spread and coverage of local meteorological monitoring stations" (p.64). In terms of Priority interventions towards adaptation strategies, the report recommendations are that "[t]he major interventions include land use planning and zoning, sustainable shore protection and riverbank stabilization, rehabilitation of vulnerable communities, sustainable drainage systems for better flood management, integrated coastal zone management, climate change monitoring mechanism, climate proofing of local government's development plans, and climate education and awareness" (p.xviii). In terms of specific vulnerabilities, Palakkad district was ranked as the most vulnerable district in terms of Agriculture, Livestock and Health. There are increasing chances of heat waves, sunstroke and sunburns in Palakkad district along with most of the building stock becoming uninhabitable in summer. The two key issues that the district is facing due to climate are as under:

[9] State Action Plan for Climate Change, Dept. of Environment, Government of Kerala, 2022

Variations in rainfall
Increasingly, there has been a variation in the monsoon pattern in the Palakkad district, with June-July months having lesser rainfall and the subsequent months of August and September having unusually heavy rains. There are also some breaks between rain spells. Extreme events are increasing in frequency as the Kerala floods of 2018 and since then bear testimony.

Increasing Temperature
Palakkad district is one of the hot spots as identified by the State Action Plan on Climate Change (SAPCC)[10]. In Palakkad district, summer day temperatures are shooting up to 40 + degrees centigrade (even up to 41.9 centigrade) and people have been subject to sunburn and sunstroke events. In 2016, the Indian Meteorological Department (IMD) declared a heat wave in Palakkad for the first time in its history and such cases will be on the rise hereafter.

The impacts, in turn, of these key changes in rainfall and temperature are:

13.4.1 Impact on Agriculture

Palakkad is known as the "rice bowl of Kerala". First crop paddy (virippu) is traditionally raised as a rainfed crop and the monsoon is the water source. However, in recent decades, vagaries in the onset and distribution of monsoons is noticed. Crop failure looms in this context of warming climate, unseasonal rains, and increasing or decreasing rainfall as under:

Unpredictable rains:

- There is a kind of paradigm shift with June –July rainfall becoming less while August-September rains increasing. This led to crop failure in *virippu* in some years and even had the unusual event of Malampuzha dam water being released for irrigating the first crop in the district!
- Unseasonal rainfall/unprecedented summer showers during February-May is detrimental to the crop. The state noticed this type of rainfall in recent years (March 2008, 2021 January).
- Flooding during the crop period either in monsoon (*virippu*-first) or in post-monsoon (*mundakan*-second crop) is a threat to paddy.
- Prolonged dry spells during the first crop or second crop will also adversely affect the crop (as noticed in several years across the State including Chittur).
- Drought is the major constraint for crop productivity, more so in plantation crops since they are widely grown in different soil types such as sandy, sandy loam, laterite and forest soils in the state. These crops are mainly grown under rainfed conditions. Hence, productivity is affected due to the dry summer. Soil water deficit coupled with changes in atmospheric parameters aggravate the situation leading to soil as well as atmospheric drought.

[10] State Action Plan Climate Change (SAPCC) 2021

Increasing temperatures:

- The scorching temperature during the critical periods of crop growth will adversely affect the growth and development. In the case of paddy, chances for chaff are higher in such a situation.
- Temperature variations may lead to outbreaks of insects, pests and diseases in paddy.

13.4.2 Impact on Livestock

The productivity of animals are being affected due to heat stress. New diseases and pattern change of existing diseases observed. Large numbers of animals are unproductive and are in competition for resources. Lack of sanitation, improper utilization & storage of dung, and lack of balanced diet for livestock fodder and pastureland are the main concerns for livestock rearing.

13.4.3 Impact on Health

People of Palakkad are most vulnerable to the adverse impacts of rising heat given that Palakkad will see an increase in the incidence of heat-related extreme events. Sunburn, sunstroke and heat waves are likely to increase, and they are now included in the list of State-specific disasters according to Kerala State Disaster Management Authority. Additionally, there will be greater exposure to a broader spectrum of infectious diseases along with pest-related diseases and effects due to high heat exposure. During summer, Palakkad often experiences temperatures of the order of 40+ degrees centigrade and even shoots up to 41.9 degrees. This is not likely to come down in a warming and climate change scenario.

13.4.4 Impact on Water Resources

There is an increased possibility of droughts which would lead to water scarcity and water shortages. The quality of available water resources is also likely to be compromised due to increased concentration of pollutants along with reducing ground water levels, as well as in surface water bodies like rivers and lakes.

13.5 Climate Risk and Chittur-Thathamangalam Municipality

Chittur-Thathamangalam Municipality's landscape ecology, like the rest of Kerala, is shaped over centuries by close human interactions with the monsoon and the scorching summer. In recent times, climate change has had adverse impacts for the town. Among the many aspects of climate change, two that are of significance and are sought to be urgently attended to by Chittur-Thathamangalam Municipality are the effects of **variations in rainfall** and **increasing temperature** that in turn affect **agriculture, livestock, water resources, and public health**.

13.5.1 Impacts on Agriculture

In Chittur-Thathamangalam town, 50.74% of the land is under agriculture, of which 43.69% is used for wet agriculture and 7.05 % is under dry agriculture.[11] A significant proportion of people depend on agriculture for their livelihood. About 1 out of 6 workers are in agriculture. Paddy is cultivated extensively in the municipal area too. Of the two paddy crops (Virippu and Mundakan), the first is mostly rain-fed and has been significantly affected by the change in rainfall pattern, making it highly dependent on unreliable and unequally distributed dam-based irrigation. The second paddy crop is also threatened by unseasonal rain. High as well as varying temperature also leads to pest outbreaks in Paddy, Coconut (subsequently Toddy) and other marginal crops are also significantly affected by the rising temperatures and scorching summers combined with paucity of irrigation. These rainfall variations increase farmers' dependency on Parambikulam Aliyar water supply project which currently only meets drinking water needs and not irrigation needs. Due to drought conditions often prevailing between November to May, the perennial as well as annual crops are in danger.

13.5.2 Impacts on Livestock

A significant number of farmers rear cattle, buffaloes, goats and fowl supplying milk, meat, and eggs.[12] The productivity of animals is being affected due to heat stress. New diseases and changes in the pattern of existing diseases are observed. Large numbers of animals are unproductive as a result. Climate change results in animals competing with humans for shrinking resources leading to decreasing pasturelands.

13.5.3 Impacts on Health

Concerns about the quality of drinking water as water levels drop, an increase in gastrointestinal illnesses, illnesses triggered by extreme heat events, and fear of epidemic outbreaks are some of the climate change-related health impacts in the town. Increases in temperature and precipitation increase the relative humidity of the state which in turn paves the way for new pests and diseases. Minor pests can turn into major pest epidemics.

13.5.4 Impact on Water network and Drainage Ecology

The town is highly vulnerable to extreme rainfall events, since it is situtated on the banks of the Sokanasini river. At the same time, Chittur-Thathamangalam is identified as one of the most water-stressed urban local bodies in the country.[13] Being a low rainfall area, CTM often faces the issue of severe drought starting from November to the end of May or till the onset of monsoon. Over-exploitation of groundwater is routinely carried out in various parts of the Municipality. The levels of both surface water resources as well as water in the surface wells from which drinking water is being used by many households may go down and even dry up in the long run.

[11] ELU 2012

[12] As per the latest data, in November 2022 there were 780 Cattle, 33 buffaloes, 1154 goats, 150 pigs, 8816 fowl and 420 dogs in CTM (Krishi Bhavan 2022)

[13] Jal Shakti Abhiyan, Guidelines for Urban Water Conservation, GoI, 2019

13.6 Combating Climate Change: Opportunities for Building Climate Resilience

Chittur-Thathamangalam Municipality's landscape is shaped by a large number of water bodies, rivers, rivulets, irrigation canals and drainage channels networked with each other to form a cascading drainage ecology of water flows defining also the micro-climate. The settlement geography within Chittur-Thathamangalam Municipality is part of a much wider agrarian regional landscape founded on a sophisticated drainage ecology and associated biological diversity, culture and economy. This system is vulnerable to changing rainfall patterns, floods, rising temperatures and other impacts of climate change.

This simply means that all elements of the productive economy and culture connected to this drainage ecology are under significant threat due to global-warming-induced change in rainfall patterns and climate-unfriendly building practices. It is therefore important that climate change mitigation and adaptation measures are at the centre of our plan priorities for social, economic and ecological security. The next section details out the ways in which these can be addressed.

13.6.1 Drought Management

Drought management will become very important to address both water scarcity and crop failure. Better crop management practices coupled with summer irrigation will be necessary to save the crops from the ill effects of drought. Surface water bodies and wet agricultural lands in the town, ensure that there is enough water during the summer and serve as sinks during monsoon. Conservation of water bodies is critical to prevent drought.

13.6.2 Climate Sensitive Buildings

Impermeable materials that block water percolation, absorb and radiate large amount of heat is increasingly used to pave our ground and construct our buildings, like iron, steel, reinforced cement concrete, cement tiles, and stones. All of these make our settlements highly vulnerable to flooding, rising temperatures and other multiplier effects of climate change. Since the town is likely to face severe temperatures during summer, all future construction works of the Municipality should adopt eco-friendly construction methods. Climate-sensitive design with an emphasis on natural ventilation needs to be encouraged, use of minimum steel and concrete, recycling old building stock, and permeable paving materials that do not block water flows, would be ideal. This would also help reduce the urban heat island effect and have a smaller carbon footprint. Afforestation programmes are to be encouraged in the municipal area, which would serve as a carbon sink in a warming scenario and will reduce the ambient temperature.

13.6.3 Managing Flash Floods

The *Sokanasini* is the only river in the municipal area that divides the twin settlements of Chittur and Thathamangalam. Flood mapping of the river was carried out to determine areas at risk from flooding, given that extreme rainfall events are going to increase in frequency in future. (see fig 13.1 Flood map) Unlike several other towns including nearly Palakkad, during the Kerala floods of 2018, only a small area along the river's edge in Chittur was flooded, thanks to the channels leading to the low-lying paddy fields that served as the crucial disaster mitigation infrastructure- the holding ponds for the flood waters- buffering the town from the

worst effects of the floods. The low-lying paddy fields, thus, are the unrecognised backbone of the town's climate resilience system and need to be conserved. A buffer can be provided on both sides of the river to future-proof the town against flash floods.

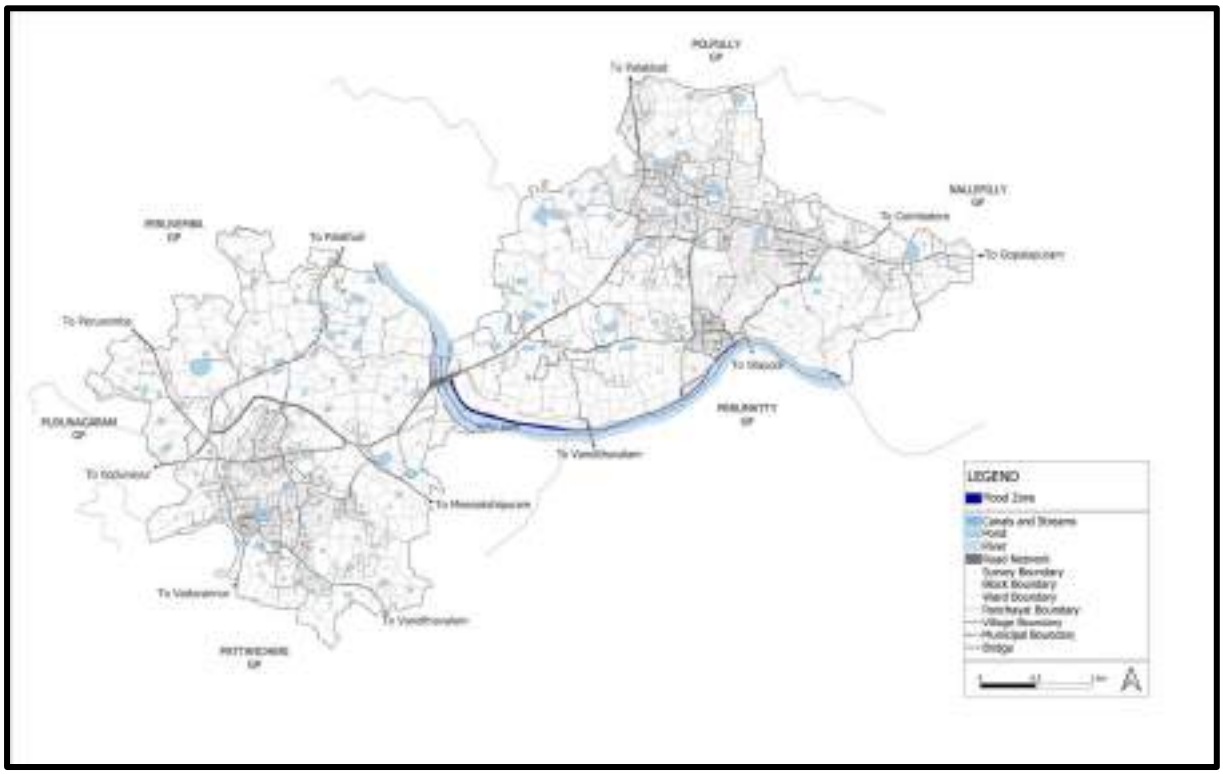


Fig 13.1 Flood Modelling

13.6.4 Ground Water Recharge

Groundwater overexploitation needs to be checked. Rainwater harvesting needs to be practiced and ideally recharging of ground water needs to be initiated. Rejuvenating all wells, *kulams*, *kokkarnies*, and water bodies in the town should be undertaken on a war footing to address summer water shortage.

13.6.5 Escalating Ambient Air Temperature

In Chittur-Thathamangalam wet agriculture lands constitute nearly half of the total area and therefore are central to controlling the microclimate. Therefore, they need to be conserved. If this is lost, the local climate will change. Flooding due to extreme rainfall events or droughts leading to water shortage during summer, and local heating would result. Since a dense network of temperature measurement systems are scarce, the municipality may think of setting up an Agro-meteorological observatory in Government College Chittur. The data generated can be utilized for research and can serve as an early warning system for citizens. Afforestation programmes, covered walkways and water kiosks in public spaces (so that drinking water is assured during summer periods for the public) are to be encouraged in the municipal area.

13.6.6 Water Network and Drainage Ecology

Given the fact that in Palakkad district, extreme heat events are on the rise, with increasing construction, landfills, and reclamation of wetlands and paddy fields, local temperatures have been rising and if unaddressed could also result in serious flooding and drought and contribute to scorching summers. It is unplanned urbanisation processes that result in the conversion of wetlands or water accumulation areas into other land uses which in turn hamper the ecosystem services rendered, including groundwater recharge and carbon sequestration. Further, the increase of impermeable surfaces accompanying the increase in built-up areas results in increased run-off rates and volumes. This hastening of the hydrological cycle will inversely impact the region's ability to mitigate climate change-induced variable rainfall scenarios. However, systematic delineation of the town's unique drainage ecology / blue-green infrastructure network has the potential to achieve integrated resilience that addresses water and biodiversity conservation. Towards this end, a detailed mapping and analysis of the existing water flows was conducted as detailed below.

Delineating the Water Network and Drainage Ecology

Morphologically, CTM falls into two categories: denudational hills and depositional plains. Currently, CTM land use at the hills is built up and dry farming, and the plains that are part of the larger floodplain of the Bharathapuzha basin are under wet farming that functions as wetlands. The Chitturpuzha or the Sokanasini river, a tributary of the Bharathapuzha runs through the town. In 2012, water bodies occupied 1.02 sq. km. in area (recording a decrease from an area of 1.2 sq. km. in 1988).[14] The town currently has 171 ponds, of which 18 are over 1 acre in area and only 10 are publicly owned. The ponds on the higher reaches are located along the ridge line interconnected by the irrigation canals. The ponds in the floodplain perform both irrigation and flood control functions. The river, canals, channels, waterbodies and paddy fields work together as a drainage ecology, and uninterrupted path for cooling wind flow, and greenery and influence the microclimate significantly. This is part of the heritage ecology that had developed in South India over 1500 years from the Sangam period, which has provided the backbone of food and water security and microclimate.

This entire drainage network was mapped with GIS techniques using 1-metre contour interval maps, DEM (Fig 13.2a, b), and extensive ground truthing of all water bodies. All lakes/ponds, streams, canals and drainage channels were mapped using satellite maps and ground verification (Fig 13.2c, d). Once this was mapped using contour maps, the accumulation/water retention zone was mapped, which needed protection (Fig 13.3a). Within this area, there were already some built-up areas that were in conflict with the water retention function of the zone. A map showing some conflict areas where development has already occurred has also been prepared (Fig 13.3b). In these conflict areas, the drainage channels are of utmost importance to ensure that the water retention as well as the drainage network function well. Accordingly, the drainage channels that need protection and augmentation have been identified to be taken up later after assessment as critical drainage projects to maintain drainage flows and ensure that water flows are not obstructed, and the stormwater channels are sufficient (Fig 13.3c).

[14] ELU 2012

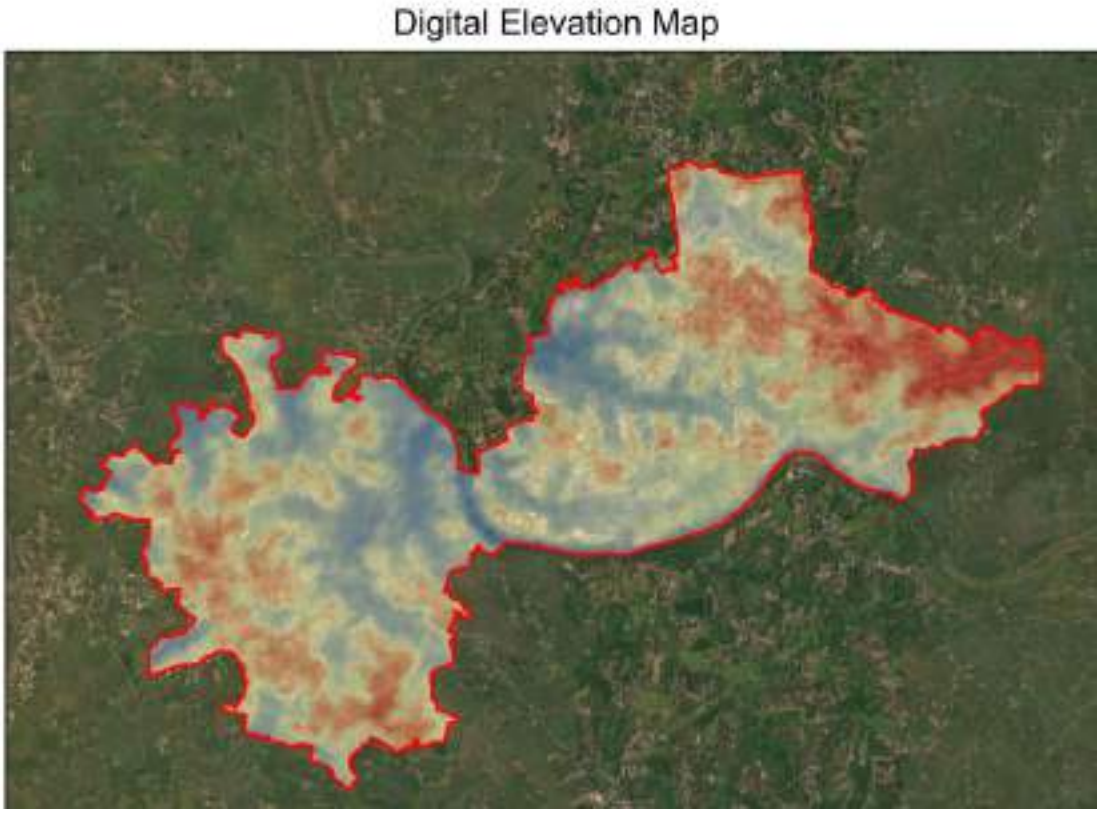


Fig: 13.2a Digital Elevation Model of Chittur-Thathamangalam (DEM) with 1Metre contour

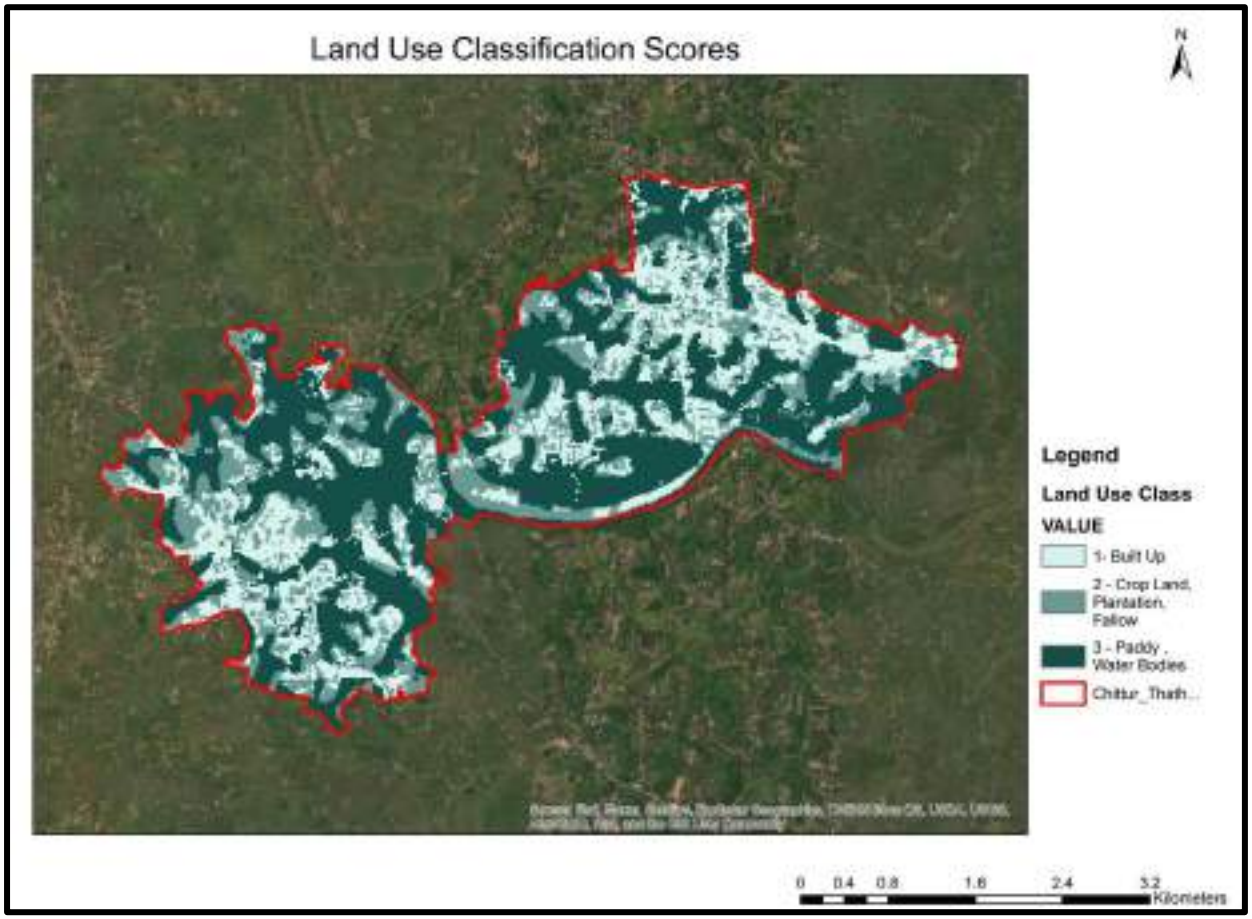


Fig: 13.2b Landuse Classification Model Chittur-Thathamangalam (DEM)

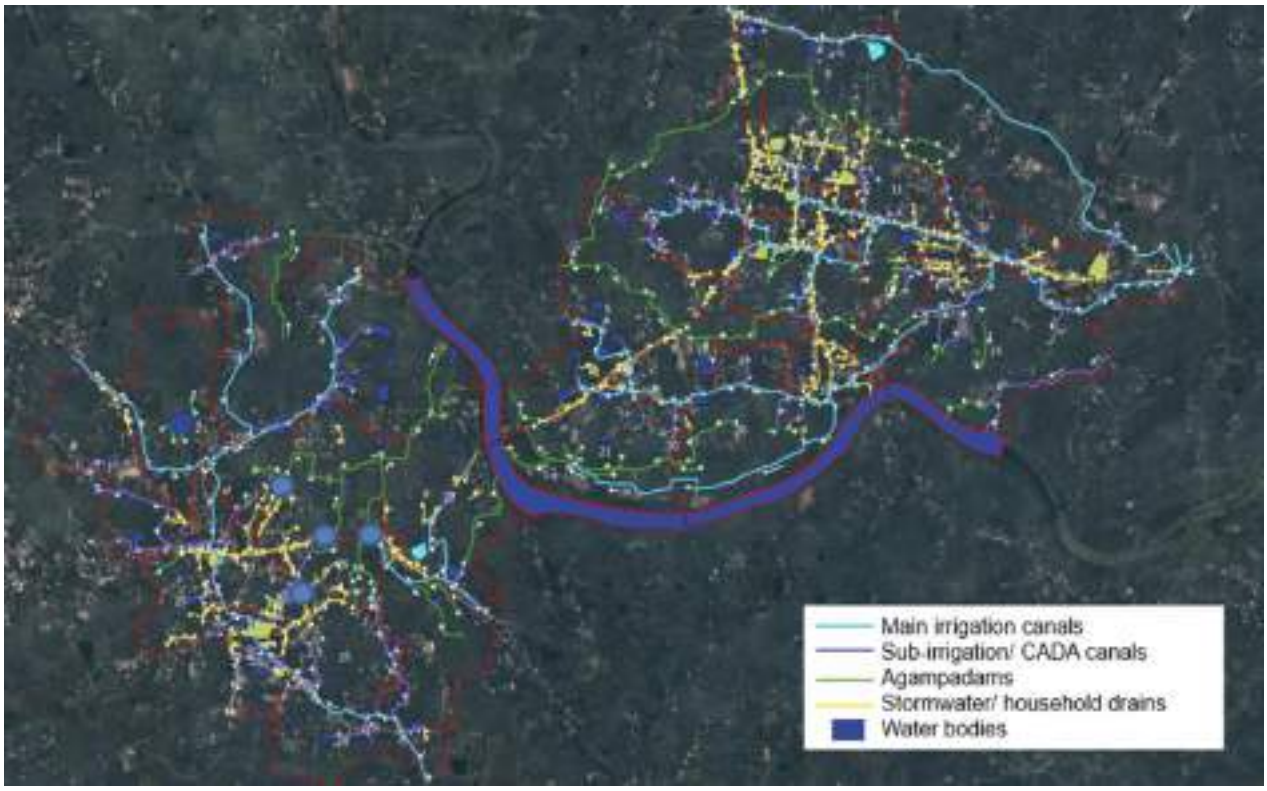


Fig: 13.2c Existing Drainage and Water Flow Infrastructure Network – Chittur-Thathamangalam

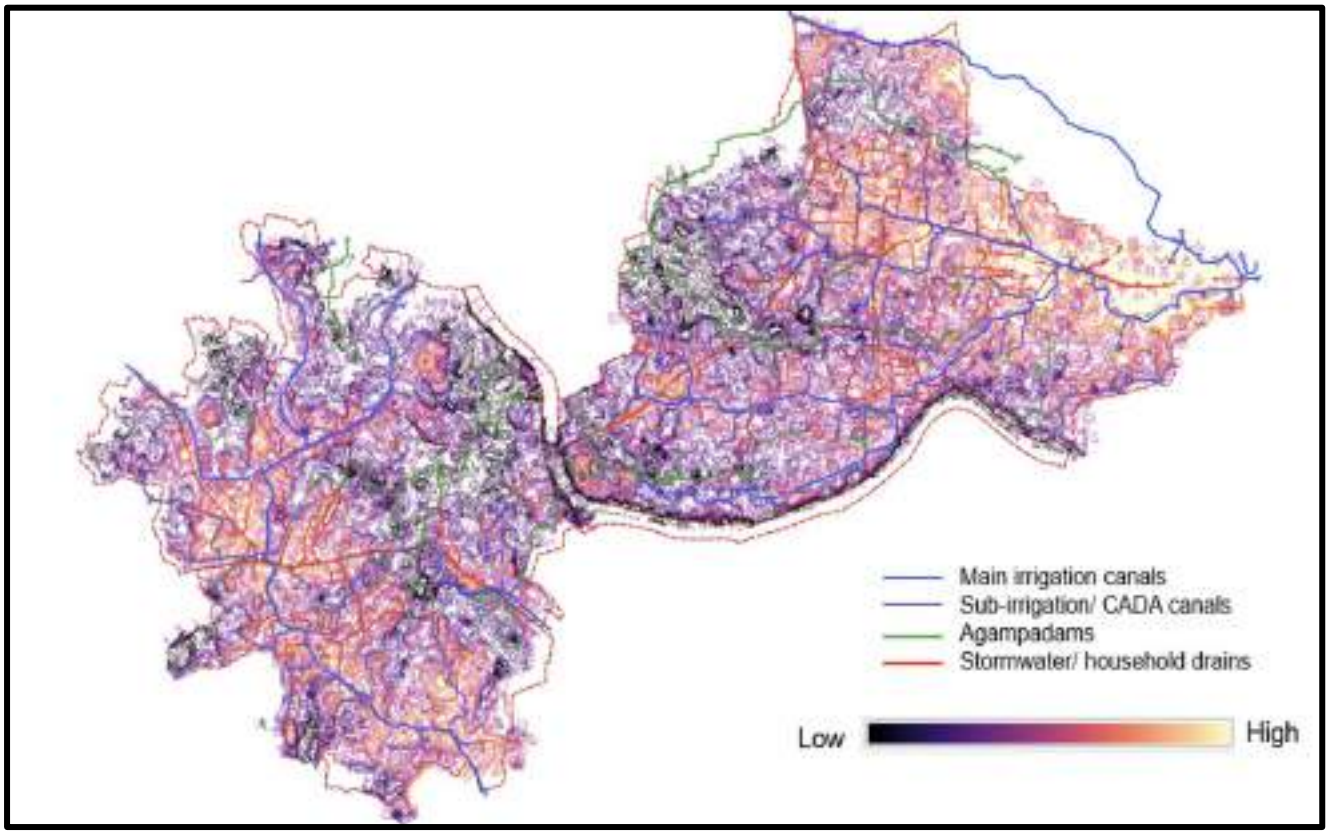


Fig 13.2d Contours overlaid on Existing Drainage Network (correlated with 1Metre contours from NRSA)

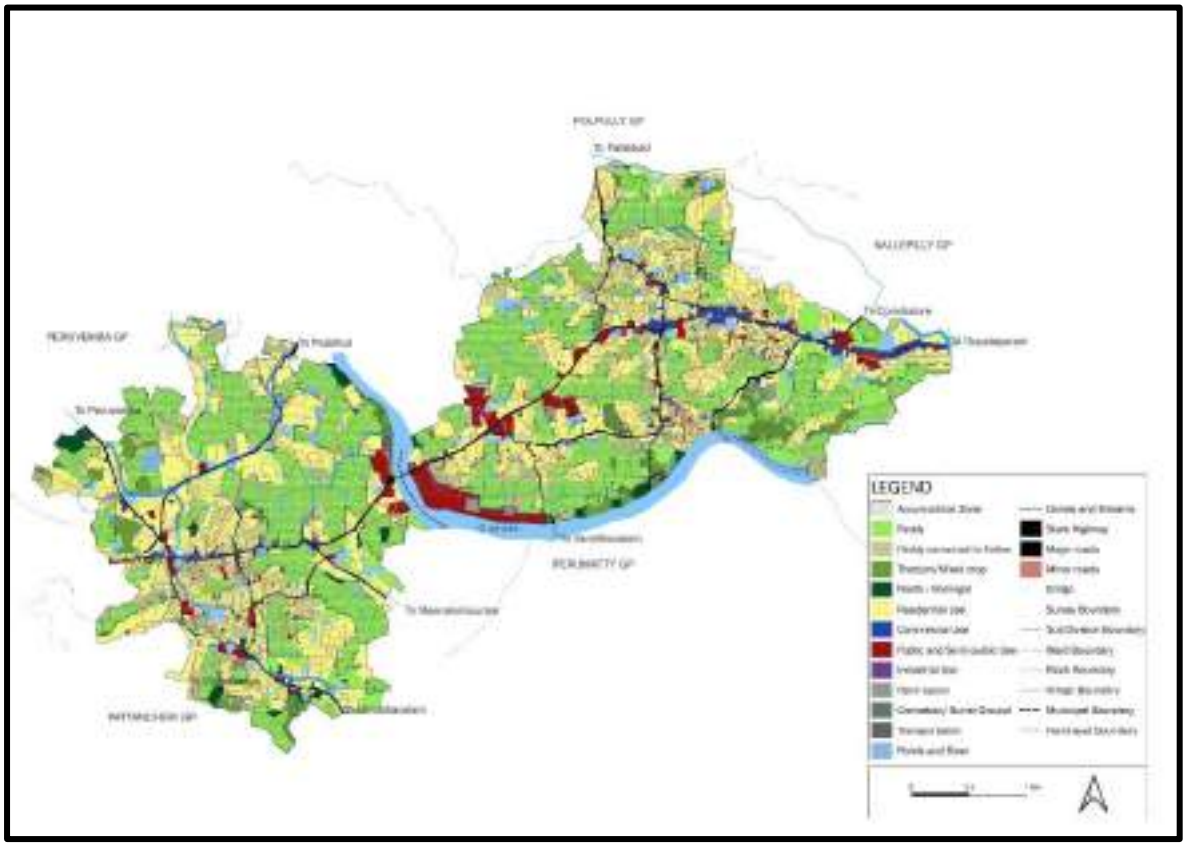


Fig. 13.3a Demarcation of Drainage Flows and Water Accumulation Zone

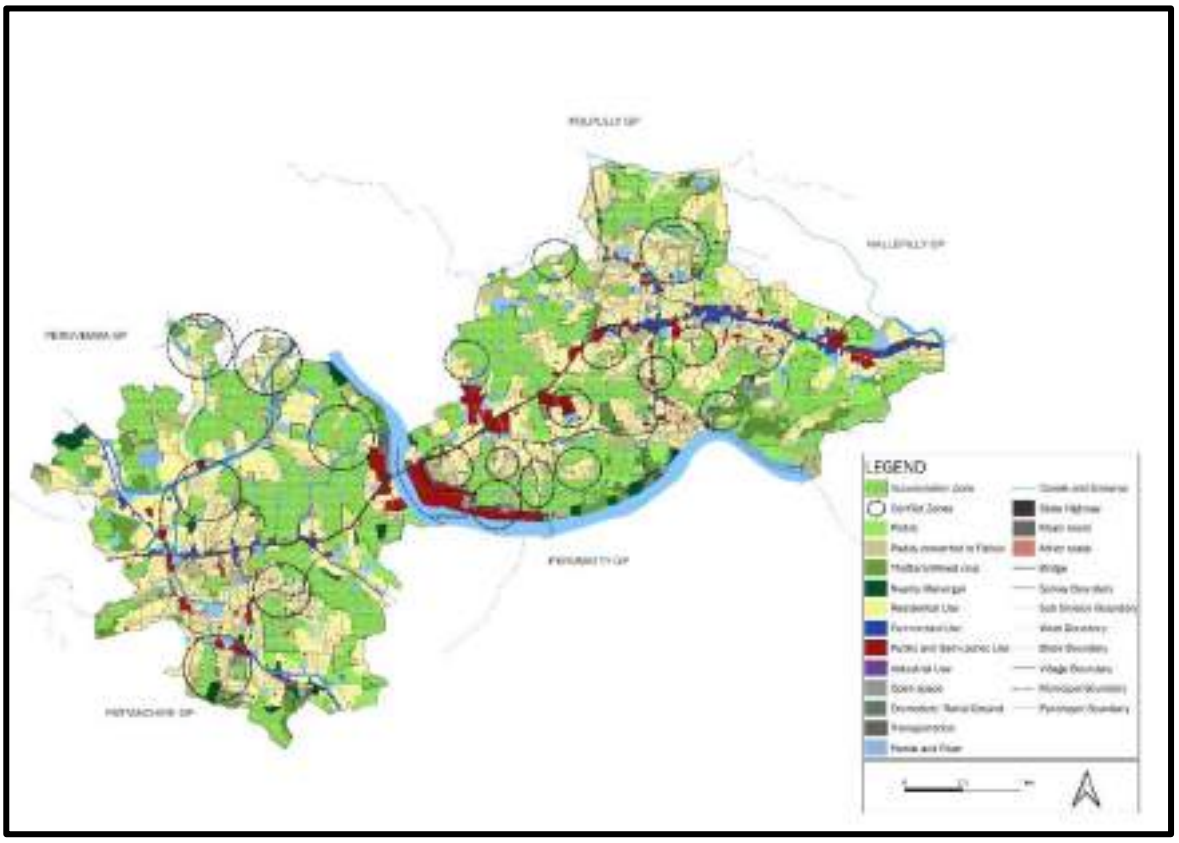


Fig 13.3b Demarcation of Areas in Conflict (built-up areas) with Water Accumulation Zone

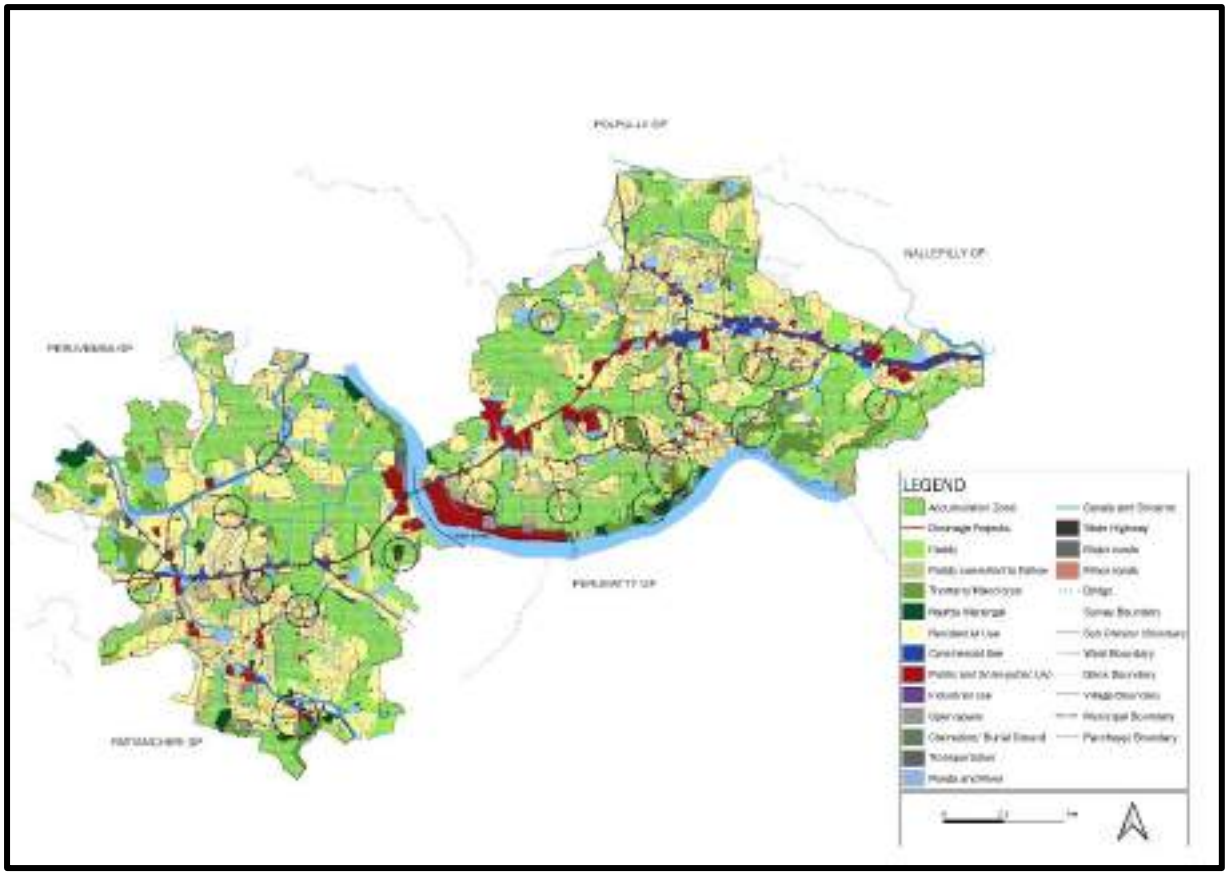


Fig 13.3c. Demarcation of drains in conflict areas critical to maintaining water flows

Accordingly, what emerges as inferences from the detailed mapping of the drainage flows and water networks are the following aspects, which are critical for ensuring climate resilience:

1. Chittur river and its riparian zones
   The riparian zones were delineated using terrain attributes, that can consider a flood depth arrived at by prior knowledge of the river's characteristics. The vegetative cover at the riparian zones needs to be maintained or created using native species. Maintenance and revegetation of riparian areas with native species will maintain the river morphology, provide bank stability, filter pollutants and maintain flow during lean periods.

2. The flood plain
   The flood plains were delineated using suitable techniques. It is imperative that the flood plain not be converted to other land uses. This area is vital to the overall ecosystem health and resilience to disasters, not to mention the flow attenuation and carbon sequestration services rendered. The flood plain of CTM is predominantly under wet farming, mostly paddy, that render the ecosystem services of wetlands. Flood plain restoration (as is happening elsewhere) after conversion to other uses will be a gargantuan undertaking.

3. Stream network
   Lower order streams are critical to the overall health of the watershed. The importance of headwater reaches cannot be overstated. At CTM, the stream network were delineated with a suitable threshold using maps and ground verification. While some

headwater reaches are under built cover, some are located at headwaters. However, second order streams appear to be in agricultural areas. Based on ground surveys, suitable measures need to be identified to bring the stream network under vegetative cover. This could be in the form of swales where availability of space is constrained, and as green corridors of agriculture or relevant native species, where it is not.

4. *Kulams* - Tanks
   The *kulams* in CTM are of two types according to their location. The ones on the higher reaches are located along the ridge line. The canals interconnect them. The flow pattern that ensures maximum harvest needs to be rejuvenated where required. To maintain a self-sustaining system, at least one embankment of the pond where possible may be vegetated. In addition, contamination from sewage needs to be stopped. The tanks in the flood plain are possibly meant for agricultural uses, which have a flood control function as well. The water quality in these ponds might be monitored.

5. An interconnected open space system:
   The hydrological connectivity that can be achieved by bringing the stream network including the headwater reaches, the flood plain and the riparian zones under native vegetative cover will ensure the overall health of the region. Both the quality, flow regime and resilience to disasters can be addressed. This can also become a tourism spine that has the potential to integrate cultural sites as well.

13.7 Inference

Rising heat, changing rainfall patterns, and increasing changing pest regimes undoubtedly have a significant impact on Chittur-Thathamangalam's economy and ecology. To combat climate change, a host of measures ranging in line with the directives of the Kerala Heat Action Plan 2020 and the State Climate Action Plan 2021 needs to be adopted including afforestation, climate-friendly buildings, conservation of water resources and sustainable agricultural practices. At the core of the measures to be undertaken is the conservation of water networks and drainage flows, which needs to be embedded into the spatial plan. This includes restoration and maintenance of Chitturpuzha and its riparian zones, conservation of the riverine flood plains, the stream networks (under vegetative cover as far as possible) and maintaining the water flows and water quality of the kulams, all aimed at establishing and maintaining the hydrological connectivity in the region.

Chapter 14: SUMMARY OF FINDINGS, INTERSECTORAL LINKAGES & EXISTING SPATIAL STRUCTURE

This chapter provides a summary of findings along with a clear idea on the potential relationship between various sectors. Understanding of inter-sectoral linkages helps us to formulate better development perspective and will give a possible feedback mechanism that will exist among sectors.

14.1 Findings as per Integrated District Development Plan for Palakkad

- The cultural uniqueness of this town, where four languages continue to be spoken, where diverse communities and settlement patterns including many handloom and craft traditions continue precariously, needs to be foregrounded. It is a melting pot for diverse cultures and traditions over centuries, due to its location in the Palakkad gap, on a historic old trading road.
- The Integrated District Development Plan 2013 for Palakkad is nearly a decade old and is due for revision. Many of its projections for Chittur-Thathamangalam have not materialised.
- Firstly, as per Integrated District Development Plan 2013 for Palakkad, Chittur-Thathamangalam Municipal area is identified to have urban character. This is due to its municipal status which was given to it in colonial times. However, the town continues to have a declining growth rate and continues to be semi-rural in character.
- Chittur-Thathamangalam Municipality was suggested as a second-order Settlement (sub-regional centre) and supposed to provide second order facilities like Taluk Hospitals, Marketing facilities to the LSGIs in their respective service areas. However, though it has Taluk Hospital, marketing facilities to neighbouring LSGIs continue to be provided by other neighbouring towns that have historically been market hubs.
- As per development concept of IDDP, Chittur-Thathamangalam Municipality comes under multi-functional Zone (IInd Order) of Palakkad District and acts as a service centre for the hinterland and this zone is very much suitable for industries utilizing agricultural products of hinterland. However, in reality, as outlined above, despite its historically accorded municipal status, it continues to be semi-rural, housing government functions that have been thrust upon it due to its Taluk headquarter status. For all practical purposes, it continues as a small semi-rural peaceful town in an agrarian context.
- Chittur town Junction in Chittur-Thathamangalam Municipality is coming up as a third order node which have to fulfil the functions of a community centre for commercial facilities and service population is taken as approximately 80000.
- Though according to the suggested road network for the district, Chittur-Muthalamada road stretch is to be strengthened, ideally roads bypassing the town as a whole need to be strengthened so that the quality of life in the town is not affected by increasing regional through traffic.

14.2 Regional Setting

- Chittur-Thathamangalam town lies just 15 km southeast of the district headquarters allowing it easy access to various amenities without the negative externalities of a big town.
- Chittur-Thathamangalam Municipality is situated in Chittur Thaluk, the south-eastern Taluk of Palakkad district, located at the centre of the 32 km wide Palakkad gap.

- Thrissur the cultural capital of Kerala is situated at 67 km west of town.
- The port towns Kozhikode and Kochi are at a distance of 147 km and 145 km respectively from the town.
- Coimbatore city, the second largest city after Chennai in Tamil Nadu is located at 40km east of Chittur-Thathamangalam Town.
- The nearest international airports are Coimbatore (40 kms), Kochi (145 kms) and Kozhikode (147 kms).
- Two State Highways pass through the town. They increase the connectivity of the town, but at the same time they have also exposed pedestrians and two-wheeler traffic to high risk of accidents.
- There is a need to strengthen regional connecting roads so as to bypass Chittur-Thathamangalam town and spare it from long distance through traffic.

14.3 Sectoral Findings

14.3.1 Land Use

- 58 % of planning area is covered by environmentally sensitive areas - water bodies and agriculture. Around 80% of the developed area is under residential land use.
- As per the existing land use, majority of land area is under agriculture that accounts for 43 % % of the total area and is the largest land use in the municipality.
- Industrial use is very less compared to the norms of the URDPFI guidelines.
- The depletion of agricultural land use is not very severe in the Municipality even though land under paddy cultivation is declining and lands are also being filled up for various other purposes.
- The central area has a higher population density and almost all commercial and public activities are concentrated here.
- Sokanasini puzha, a tributary of Bharathapuzha river, divides the town in the north south direction.

14.3.2 Population

- It is a unique town with a cultural context where all four South Indian languages are spoken. Its location in the Palakkad pass has meant that it has been a melting pot for various cultures and traditions.
- Chittur-Thathamangalam town has lesser population density than Palakkad Municipality but more density than State, District and other municipalities within district.
- Core areas of town is thickly populated but the fringe area is free to hold more population.
- The population growth rate of municipality is declining. Growth rate of population is found to be lesser than other urban areas within district and nearby LGIs and the town recorded negative growth rate during 1991-2001 and a growth rate of 1.29% during 2001- 2011. The population is showing a decreasing growth rate, as per the 2020 mid-year population statistics. This may be due to migration of people to other districts or neighbouring states for better job opportunities.
- Spatial analysis shows population is concentrated in wards where better connectivity is available.

- Sex ratio of Chittur-Thathamangalam town is higher than state, lesser than District, but child sex ratio is higher than other municipalities within the district. This indicates discrimination against the female foetus is absent and socio-cultural factors of town encourage survival chances of the female childbirth.
- Chittur-Thathamangalam Municipality has more literacy rate than the district, but lowest literacy rate than all other municipalities in the district.

14.3.3 Employment

- The work force participation rate has shown an increase during the last decades. This indicates that job opportunities are increasing, and the economic base is gaining momentum.
- Majority of workers are in tertiary sector, while the primary sector (cultivators and agricultural workers) constitutes 15.8 percent of the workforce in 2011. The persistence of the share of primary workers though showing a slight decline, from 20 percent in 2001, gives us a clear sense of the continuing semi-rural setting of Chittur-Thathamangalam Municipality
- Chittur-Thathamangalam municipality is having a strong work force participation rate and a low dependency ratio.
- WPR of Chittur-Thathamangalam town is higher than that of the State, District and other municipalities within the district.

14.3.4 Economic Aspects

14.3.4.1 Trade & Commerce

- Chittur town is a main commercial node, and it is highly connected to other LSGI in the district and nearby districts. It experiences some congestion at peak hour, largely caused by vehicles parked haphazardly along the road, reducing available road width for through traffic.
- Street vendors are expectedly located around major transport hubs ie bus stand areas and street Junctions or specific locations that see heavy footfall.
- Lack of sufficient parking space especially for heavy vehicles for loading and unloading goods are the main problems. This could be resolved by some traffic management and scheduling hours for goods vehicles entering the town, so that they do not coincide with peak hours.
- For stabilizing the agrarian economic base of the town, trade and commercial activities have to be strengthened.
- Main commercial establishments of the town are concentrated along state highway 25 (Thathamangalam – Chittur – Nattukkal Road) and state highway 27 (Palakkad – Koduvayur – Thathamangalam – Meenakshipuram Road).
- There are two municipal markets, one near Thathamangalam Bus stand and other at CBD area of Chittur.

14.3.4.2 Industry

- In Chittur-Thathamangalam Municipality there are no major and medium scale Industries. There are only small-scale industries (SSI).

- The town still has sizeable agricultural lands. It has a strong traditional handloom industry and also has local crafts and arts which have potential if supported. There is potential for processing units (value addition) for agricultural products of the town and local food products.

14.3.4.3 Tourism

- This town is very vibrant, home to diverse languages and communities who have settled here over the last few hundred years. It has rich traditions of arts and crafts including performance arts and cultural traditions. There are several unique festivals in this town including the only war re-enactment festival in Kerala, the Konganpada.
- The town has several old community clusters like that of Tamil Brahmins or Nayar taravads or of the weaving community, each with their unique built form and settlement character, that would be interesting for tourists.
- Thunchan Guru Madom is one of the most important heritage sites in the town.
- There are places that are ideal for farm tourism both within the town and adjacent rural areas.
- Tourism is weak in Chittur-Thathamangalam Municipality, and it has not been developed in Palakkad district as a whole.
- The quality of infrastructure required for promoting tourism is not satisfactory. Hence infrastructure development needs special attention.
- Tourist trails could be developed connecting local and other regional assets of value, along with farm tourism, heritage hotels and home stay options. Museums and tourist information centre are missing.
- The river edge of the Sokanasini puzha can be developed as a prominent recreation area.

14.3.4.4 Agriculture

- Municipality has an agrarian economy.
- 43% of the area is currently covered by agriculture.
- Paddy is the major crop (39% area) followed by coconut.
- There is a steady decrease in the land area covered by agriculture.
- By improved methods of irrigation and agriculture the productivity has increased considerably.
- The major source of irrigation are government canals (Chittur canal and Gayathri Puzha RBMC) and private wells.
- No permanent markets for selling agricultural products within the municipal area.
- Thrust is to be given for paddy development schemes and organic rice cultivation and cultivation of peculiar varieties of rice like Njavara.
- Scope for increasing production and productivity of paddy by augmenting irrigation facilities by renovating existing ponds, thodus and canals.
- Scope for vegetable cultivation on the banks of Chittur puzha and homestead cultivation.
- By giving more collection, storage and processing facilities and linking with industrial sector diversified products can be manufactured and exported.

14.3.4.5 Animal Husbandry

- Animal husbandry has become weak in the past few years in the town, though goats and fowl have increased, there has been a continuous drop in the number of cattle.
- The 3 milk units in the town have an average output of 30000 litres per month as a single unit in 2012 and 12000 litres monthly. This may be because of procurement from the rural hinterland considering the drop in cattle. It also shows that people still are interested in animal husbandry.
- Providing adequate infrastructure in this sector will help to develop the animal husbandry of municipality.
- The numbers of animal husbandry institutions are satisfactory in the town.

14.3.5 Traffic and Transportation

- The town is mainly connected by Palakkad – Thathamangalam – Pollachi Interstate Highway (SH 27) Palakkad – Chittur – Nattukal Highway (SH 25) that cut through the town.
- Post Office Junction - Hospital Junction & Mettupalayam –Koduvayur road stretch - the busiest of all the roads, experience heavy traffic movement during peak hours.
- Pedestrian infrastructure is non-existent though majority of trips are on foot. This needs to be rectified. Only high-speed motorised traffic is being catered to by the current road network.
- The high-speed state highways make it unsafe for motorists and pedestrians with as many as 8 accident spots located along them. Noise levels are also beyond permissible limits.
- After the completion of the railway meter gauge to broad gauge conversion works in Puthunagaram, more road traffic is expected in the municipality.
- Regular bus services connect the town with Pollachi and Coimbatore.
- At major commercial Junctions organized parking spaces are not found sufficient, hence results in on-street parking. A dearth of parking spaces for private vehicles in the municipality causing kerb parking affecting the carrying capacity of the roads.
- Almost all the loading and unloading activities are done on either side of roads.
- Geometry of all road Junctions needs improvement for safe travel of all road users.
- New bus interchange is required for Chittur area.
- Need for traffic proposals that are a combination of traffic management solutions like one-ways and traffic calming along with road design solutions like continuous pedestrian walkways throughout the town and road Junction improvements.
- The road transport proposals should not significantly disturb the social fabric of the region, should improve the safety of all users of the roads and should promote ‘active travel’.

14.3.6 Water Supply

- Major source is piped water supply of KWA (58.18%), source being the Chittur Puzha. 33.9% of people depends on well water.
- The Suchitwa Mission study of water quality of surface bodies (August 2022) shows that out of 69 ponds tests, all are contaminated with E-coli, with only 10 of the ponds testing negative. Similalry out of 14 water samples tested at different points along the Sokanasini river, only one was not contaminated, indicating widespread contamination of water bodies across the town.

- From the socio-economic data collected, about 76% of the houses are not facing water scarcity.
- 87.5% of the population have water sources within the compound.
- The distribution network is totally 95 kms long, covers 29 wards (3 zones Chittur zone and Amabattupalayam zone, totalling 56.5 kms and Thathamangalam zone being 38.5 km long).
- The total water supplied is 11.5 MLD. There are 2 Water treatment plants, one of 8 MLD and the other 3.5 MLD. And three Overhead Service Reservoirs of 10 lakh litres, and 2 of 7 lakh litres at Devangapuram, Municipal Compound and Thathamangalam respectively.
- There are water scarcity issues and some low-pressure issues in some areas of Thathamangalam due to tail end issues.
- There is some shortage during summer leading to over-extraction of ground water.
- Existing water sources need to be protected. Water conservation techniques need to be implemented with rainwater harvesting and ground water recharge also to be undertaken
- To combat low pressure, decentralised water supply solutions like shafts can be used, starting with a pilot.
- To ensure universal potable water, given the poor water quality, water ATMS may be provided for drinking water needs especially of poor communities, along with decentralised sanitation solutions.

14.3.7 Drainage Ecology

- The terrain is defined fundamentally by the historic drainage ecology that enabled food and water security, delineated buildable areas, enabled flood mitigation, river recharge, biodiverisity and micro climate for centuries.
- The drainage system consists of a combination of natural drains, ponds and artificial drains (irrigation canals) and paddy fields all of which mobilise water ultimately discharging into Chittur puzha flowing through the centre and southern boundary of the town. The irrigation canals distribute water to ponds and fields and water descends across fields as a cascading system of water flows, eventually discharged into the river through a system of akampadam drains in the fields or ground seepage.
- The drainage networks along the main road alone are seen to be continuous.
- Drainage facility on other roads is not continuous and this causes water logging on many of the roads during rainy season.
- The wastewater from houses, shops and hotels are also disposed into the storm drains, or irrigation canals, depending on their proximity
- Very small percentage of drains is covered, and since solid waste is often thrown into the open drains blocking water flow, hence they breed mosquitoes, causing health problems.
- The elaborate system of natural and artificial drains which is at the heart of all the water flows in the town, is thus the receptacle of all the liquid waste of the town, which flows into the fields and finally into the river. Thus, food production can be compromised due to untreated wastewater flowing into the paddy fields.
- This system needs to be strengthened and existing irrigation canals maintained so that the entire storm water flows are ensured.

14.3.8 Sewerage and Sanitation

- The number of toilets provided in commercial establishments and offices are far below requirements.
- About 61% of the total households have septic tanks, 38% use pit latrines. The sullage generated from kitchen and bathrooms etc, is let out into the open mostly through storm drains.
- The current sewage treatment is through individual plot level septic tanks while kitchen and bathroom waste is let out into the open through storm drains or the nearest irrigation canals.
- The contamination of majority of surface water sources with E-coli, indicates that the current plot level sewage treatment is ineffective and can lead to health issues.
- Provide public pay & use toilets in Market places, shopping areas.
- Decentralised sanitation systems would work best in this town using natural treatment systems like constructed wetlands, waste stabilisation ponds or duckweed ponds, after dividing the town into cluster and sub-clusters.

14.3.9 Solid Waste Disposal

- The Windrow compost plant of capacity 3 T is treating the biodegradable waste generated in Town.
- There is an efficient solid waste collection system in place, but collection is not 100%
- There is dumping of wastes on roadside and in drains due to unwillingness of all households to pay for solid waste collection.
- Open storage bins lead to environmental problems and health hazards
- More rigour in segregation of waste at source
- Bio-hazardous waste (sanitary napkins and diapers,) and electronic waste still need effective collection and disposal.
- Solutions need to be arrived at for complete resource recovery from waste.

14.3.10 Energy

- Municipality does not have major energy crisis, but problem lies in the fact that it has to depend on other districts, especially in electrical energy requirement.
- As per data there are no areas of low voltage.
- Installation of solar panels in houses will be highly beneficial and should be encouraged since domestic consumption is the highest.
- The town has a comparatively good LPG and petrol supply system in existence.
- The use of non- conventional energy in the municipality is very much limited. But there is a high potential for development of solar energy.

14.3.11 Education

- Town is well ahead in case of higher education facilities especially in Public sector Chittur-Thathamangalam presently has one arts and Science College and one Teachers' Training institute. There is no professional college in the municipality.
- Literacy rate of Chittur-Thathamangalam Municipality is lesser than the literacy rate of other municipalities in Palakkad district.

- Student strength of high school as per standard value is 700, but GVGHS, Chittur and GSM HS Thathamangalam have student strengths of 1285 and 907 respectively. Other than these schools all other schools have fewer students than the required standard.
- As per standards only 2 High Schools are required in Chittur-Thathamangalam Municipality, but at present there are 5 High Schools.
- Even though the town does not require addition of educational institutions, standard of education needs to be improved.
- Apart from conventional courses now offered, other courses also have to be started to bring back students depending on colleges outside the district.
- Traffic congestion and parking problems are caused by educational institutions.
- Lack of adequate playgrounds, parking areas, etc. in the institutions located in the congested areas.

14.3.12 Health

- Chittur Taluk hospital and Govt. Ayurvedic hospital not only serves the people of the municipality, but also the neighbouring LSGI's as well. As per standard, bed strength availability in these hospitals are enough to serve the people in the municipality, but there needs improvement of infrastructural facilities.
- Lack of super speciality hospitals in municipality forces inmates to depend on neighbouring districts or states.
- The Government Taluk hospital is currently being upgraded to a 200 bedded facility which will help in addressing even some super speciality medical needs of people in the area. Additionally, two Urban Primary health centres are coming up, once each in Chittur and Thathamangalam which will improve overall access to medical services.

14.3.13 Housing

As obtained from socio economic survey:

- Majority of houses are having a plinth area of 20-50 sq. m.
- Average household size is 4.
- 93% of the people have own land.
- 69% of the houses have flooring of ordinary tiles and cement.
- 46% of the walls are brick plastered and 60% have roofing made of tin, asbestos or tiles.
- Lack of Planned housing in the Town.
- There are 36 settlements with inadequate housing that were taken under IHSDP project which covers an area of nearly 429 hectares. Nearly 15 % of the town population lives in inadequate housing.
- There are large public properties under Government quarters that are in disrepair, that could be set aside for public housing.
- The number of houses outnumber the households in the town. Mechanisms to encourage vacant houses to enter the housing market should be pursued.
- There is a significant older housing stock in the town. Innovative policies/programs and financing should be explored encourage their optimal use

14.3.14 Recreation

- Inadequate recreational spaces at the neighbourhood and town level.
- Although there are two parks in town, they are poorly maintained.
- Other recreational facilities in town are theatres.
- More recreational facilities need to be provided in the town as they will play a vital role in the development of the Town.
- Active play and sports need to be encouraged. There is need for children's playgrounds and a stadium, pools in the town.
- The town lacks cultural centre/ art gallery/ museum.
- Linear parks and active recreation areas can be developed along the river edge, or canal embankments, wherever appropriate space is available.

14.3.15 Other Civic Amenities

- Facilities like Petrol pumps and communication facilities are found sufficient.
- In order to hold future population various community level services are to be planned properly.

14.3.16 Social Equity

- The SC/ST population are mainly concentrated in wards having greater concentration of agricultural labourers and cultivators.
- The literacy rate among SC population (64.90) is less than that of the general population.
- 53.13% of households in the municipality are below poverty line.
- Concerted effort needs to be made to help these households, access social and physical infrastructure and livelihoods, to enable upward social mobility.

14.3.17 Development Administration and Finance

- Low level of resource mobilization.
- The municipality has tremendous potential for development of financially remunerative projects for sourcing funds for urban development.

14.3.18 Environment

- There is no air quality monitoring station in the municipality.
- Measures are to be taken to control air and noise pollution along the traffic corridors
- Proper control on Noise pollution near to hospitals and educational institution has to be made with the enforcement of strict laws from the government.
- Water bodies (River and Ponds), Paddy fields, banyan trees/aaltharas, Heritage sites are to be conserved being environmentally sensitive areas.

14.4 Inter Sectoral Linkages

Chittur-Thathamangalam municipal area is well known for its paddy, coconut and other agricultural products like toddy. Vast area of paddy fields play an important role in the town's

economy. While paddy lands cover a larger area, paddy cultivation is currently being practiced over an area of 4.4 sq. km. out of 14.71 sq. km. area in Chittur-Thathamangalam town, which is 30%.

Agriculture and Employment: Even though, currently, Chittur - Thathamangalam town has lesser industrial base its agricultural base should be capitalised for the establishment of agro based industries. Vast area of paddy fields and coconut groves not only create a unique condition and beautiful landscape to develop farm tourism, but more importantly can be exploited to play an important role in the future economic base of the town. Manufacturing establishments based on value addition of rice and coconut produce can create more job opportunities to boost up the local economy, particularly also focussing on women empowerment. New agro based industries should not increase in the pollution level. Further, given that socially marginalised and economically weaker section work in agriculture, promotion of a sustainable agricultural sector is important to support the socially and economically weaker sections. Agricultural sector can benefit immensely from marketing of local farm products. An agricultural centre for renting tractors and for all types of agro machineries and equipment can help different padasekhara samithis to make use of these equipment without spending much money. Apart from that paddy, there may be possibilities for farm tourism also.

Road network and mobility: An appropriate transport network, traffic system and mobility scheme are important for any town. In Chittur-Thathamangalam Municipality, two major state highways pass through the heart of the town connecting its twin settlements together. The main high street along which the town developed connects to Koduvayur - Coimbatore Road stretch and provide a wider connectivity. This street connects the two main markets at both the ends as well as acts as an important spine that integrates many public activities. Roads from Palakkad, Vilayodi, Meenakshipuram, Palathully, Vandithavalam, Vadavannur, and Peruvemba are also connected to the Koduvayur - Coimbatore stretch creating more wider connectivity. Chittur- Thathamangalam Town being a town with more agricultural area, is highly sensitive to environmental changes. Therefore, future oriented transport network and infrastructure upgradation should not damage environmental balance or heritage assets and should be achieved by sensitive transport proposals along with creation of regional bypasses to prevent unnecessary traffic through the town.

In this municipal area majority of travellers use public transport systems or foot to reach their destination. Promoting this mode of transport will not only reduce pollution but also create more convenience for economically weaker sections of society.

Agriculture and Environment: Agriculture and environment have a close relationship with each other. Drastic change in one will cause destruction of the other. Paddy fields have a role to play to mitigate the effects of rising heat, retention and percolation of water in the current climate change context. Improper use of chemical pesticides and fertilizers cause imbalances not only in environment cycles but also have undesirable health impacts. Chittur-Thathamangalam Municipality being a town with a large area covered with paddy needs special consideration in techniques of farming. Mainly economically backward population with more women than men work in agricultural sector. Hence changes in agricultural sector are likely to affect marginalised sections of the population. Therefore, special programs to promote sustainable farming techniques are important.

Landuse Change and Agriculture: Conversion of paddy fields, for developmental activities will heavily affect the existing water table level and thus should be a key consideration in land use proposals.

Water bodies, Economy, Food: Chittur-Thathamangalam town is abundant with ponds and surface water resources. These sources can be utilised for inland fish cultivation and culturing. It not only provides job opportunities, but also enriches fish abundance in the land mass.

Industry and Environment: Chittur being an agricultural town, has less to do with industrial pollution but as mentioned previously susceptible to high levels of chemical fertiliser and pesticide pollution. The town can grow by introducing new agro based industries, which may cause increase in the pollution level. Hence to prevent that danger from its initial stage itself protective measures have to be adopted.

Handloom and Employment: Chittur-Thathamangalam municipal area has some handloom units, and they can be used as tourist cum commercial sites. Handloom unit situated at Devangapuram produces and supplies a variety of garment materials. Its existence can be promoted well to boost traditional craft-based economy.: Traditional handloom skills within the Chittur - Thathamangalam municipal area and wider region should be supported and promoted as a viable employment sector for textile manufacturing, online marketing and tourism. Well organized markets and marketing of handicrafts and value-added agriculture produce are the emerging needs in this sector.

14.4.1 Transportation Effect on Environment, Areas of Special Concern and Tourism

Mobility is central to any town. All activities depend in one way or the other on people and goods being able to move easily. Construction of a well-defined network of transport has to be set up in such a way that it will encourage active travel, it will be inclusive, it will not adversely impact the environment nor negatively impact the lives and livelihoods of people. Chittur-Thathamangalam Town being a town with more agricultural area, is highly sensitive to environmental changes. Conversion of paddy fields for developmental activities will heavily affect the existing water table level. Similarly, while the state highways see a lot of commercial and residential activity along them, all roads in the town have residential areas built on both sides of roads in the town. Hence care should be taken in both selecting routes of newly proposed road network as well as in widening roads since their impacts on peoples' lives is. Since there is a declining growth rate overall, traffic demand can be achieved without widening of existing road network, maintaining two lanes carriageway widths everywhere, and new proposals can be avoided.

Since there are two state highways that cut through both Chittur and Thathamangalam, the high volume and speed of vehicles on these roads can have a negative impact on the everyday lives of people, due to noise and air pollution, risk of accidents and increased poor health impacts. These ill-effects need to be recognised and mitigated through traffic calming, through regional bypasses for non-town destination traffic, pedestrian footpaths and avenue plantation.

In this municipal area majority of travellers use public transport systems or foot to reach their destination. Therefore, road design incorporating pedestrian pathways on all roads along with avenue plantation, across the town, to facilitate and make the predominant mode of walking comfortable, is essential Tourism potential areas are to be sensitively developed keeping the

settlement character intact. Narrow roads should be maintained if they are central to the overall settlement character, since retaining them may be necessary for the tourism experience, though, provision for common parking areas for tourist and resident vehicles close by will have to be made.

14.4.2 Tourism Effect on Environment and Areas of Special Concern

Areas with scenic beauty can be developed as tourism spots. In Chittur-Thathamangalam Municipality, there are many such areas. Tourism and environment have a dual relationship. The main attraction of the town is its calm and serene environment and scenic beauty, hence eco-friendly and non-polluting tourism activities are preferred. While strengthening the tourism sector will provide employment opportunities for local people on one hand, on the other, greater the success of tourism, the detrimental impacts on the environment increase, along with negative social impacts, with the place losing its pristine status and the very reason for attracting tourists in the first place. Thus, it may be preferable to promote festival tourism rather than all year-round tourism, so that the place retains its peaceful ambience for most of the year.

14.4.3 Effect of Various Sectors on Employment

From the analysis of occupational structure, it can be seen that agricultural labour population is decreasing after a hike in 1991. All labourers except other workers have been decreasing. People find it difficult to sustain in the field of agriculture. It is a relief to note that even though a decrease is seen in the number of agricultural labourers, the rate of decrease is much less compared to other municipal areas.

Agro based industries can flourish well in Chittur-Thathamangalam Municipality as the town is covered with paddy for more than 40% of total area. Handloom Industries, local arts and crafts, skills and Food based industries can be promoted in the town. Festivals in the town create various employment opportunities during the festival duration. The construction industry in another contributor to employment in the town.

Chittur-Thathamangalam town is abundant with ponds and surface water resources. These sources can be utilised for inland fish cultivation and culturing. It not only provides job opportunities for those who need it, but also enriches fish abundance in the land mass.

Tourism sector creates job opportunities both directly and indirectly. The direct ways are hotels, restaurants, taxis etc. and the indirect opportunities are related to the supply of goods and services needed by tourism sector. Trading always play a lion’s share in creating job opportunities. Public sector employment is also a significant contributor to employment in the town, which also enhances service sector in turn. Proper implementation of commercial centres or market facilities can help support all other sectors in creating job opportunities. Marketing of farm products, agricultural sector inputs can also provide an impetus to employment.

14.5 Existing Spatial Structure

The existing spatial structure of town is derived taking into account the activity pattern based on land use concentration and functional character, existing connectivity pattern and existing hierarchy of nodes.

14.5.1 Functional Character of the Town

Settlements can be classified into urban, semi-urban, semi-rural and rural based on the land use, population distribution and average plot size in the town area. Analysis based on land use and plot size shows that there exists semi-urban and semi-rural character of settlement in addition to urban and rural character. An area can be classified as semi-urban, if there exists both urban and rural character, but predominant activity is urban, if the predominant activity is rural, it is classified as semi-rural area. Fig 14.1 shows the ward wise functional character distribution for Chittur-Thathamangalam town. It is seen that urban activities are concentrated in those wards near the town centre and those along important roads. The town as a whole is semi-rural in character due to the fact that the majority of land holdings are still under agricultural activity in the town.

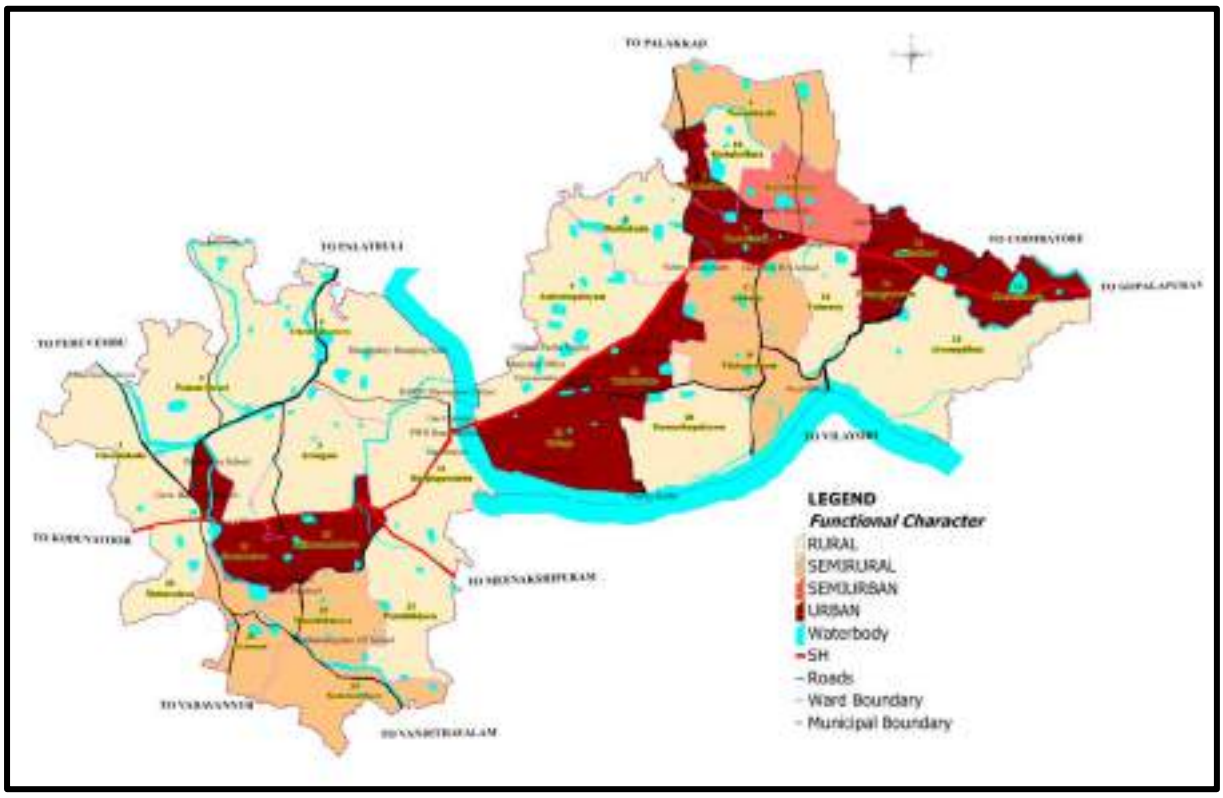


Fig 14.1 Wardwise functional character of the town

14.5.2 Activity Pattern

The term activity pattern is used to indicate the major economic activity of a place or that can be brought there in future. The activity pattern can be derived through the integration of the land use concentration pattern, functional character of the Town. The determination of activity pattern at ward level is attempted here. Table 14.1 shows the land use concentration of the wards within the municipality and Figure 14.2. shows the land use concentration of the wards in the Municipality. From the study of the land use concentration pattern of the town it is seen that urban activities are concentrated in those wards near the town centre and those along important roads. Figure 14.3 shows the activity Pattern of the wards within the municipality.

Table 14.1 Land use Concentration Index – ward wise

Ward no	Ward Name	Residential CI	Commercial CI	Industrial CI	Public CI	Agricultural CI
1	Cherumkode	1.06	1.31	6.89	0.07	1.07
2	Pattani Street	0.76	1.11	0	0.08	1.3
3	Arangam	0.85	1.24	3.38	0.22	1.35
4	Chembakassery	0.66	0.15	0.03	0.01	1.29
5	Ambattupalayam	0.88	0.29	0.58	1.81	1.15
6	Muthukadu	0.87	0.13	0	0.01	1.3
7	Kadambidi	2.06	4.84	0	0.89	0.25
8	Vadakathara	2.03	1.66	1.11	0.18	0.52
9	Naramkuzhi	1.65	0.24	1.43	0.03	0.88
10	Kizhakethara	0.8	0	0	0.42	1.16
11	Kannanthara	1.95	3.06	0.37	0.5	0.5
12	Kosathara	1.39	4.06	0	1.58	0.7
13	Kacherimedu	1.51	3.63	1.75	2.88	0.42
14	Aryampallam	0.49	0.5	0	0.09	1.52
15	Devangapuram	1.83	5.6	5.85	0.83	0.46
16	Valmutty	0.99	2.43	0.36	0.35	1.01
17	Anikodu	1.21	2.16	0	1.42	0.78
18	Thekegramam	1.23	0.1	1.87	0.64	0.78
19	Tharakalam	1.42	0.71	0.2	4.29	0.6
20	Kunnathupalayam	0.53	0	4.39	0	1.46
21	College	0.5	0.31	0	6.49	0.76
22	Banglaparambu	0.72	0.33	0.34	1.79	1.09
23	Paruthikkavu	1.03	0.11	0	0.23	1.27
24	Kammanthara	0.72	0.14	0.25	0.34	0.48
25	Mannathukavu	1.48	0.06	0	0.66	0.85
26	Srikurumbakavu	1.25	4.69	3.5	0.54	0.81
27	Kadavalavu	1.68	2.32	0	0.64	0.51
28	Gramam	1.3	0.67	2.02	1.38	0.84
29	Mettuvalavu	1.17	1.16	0	0.69	1.04

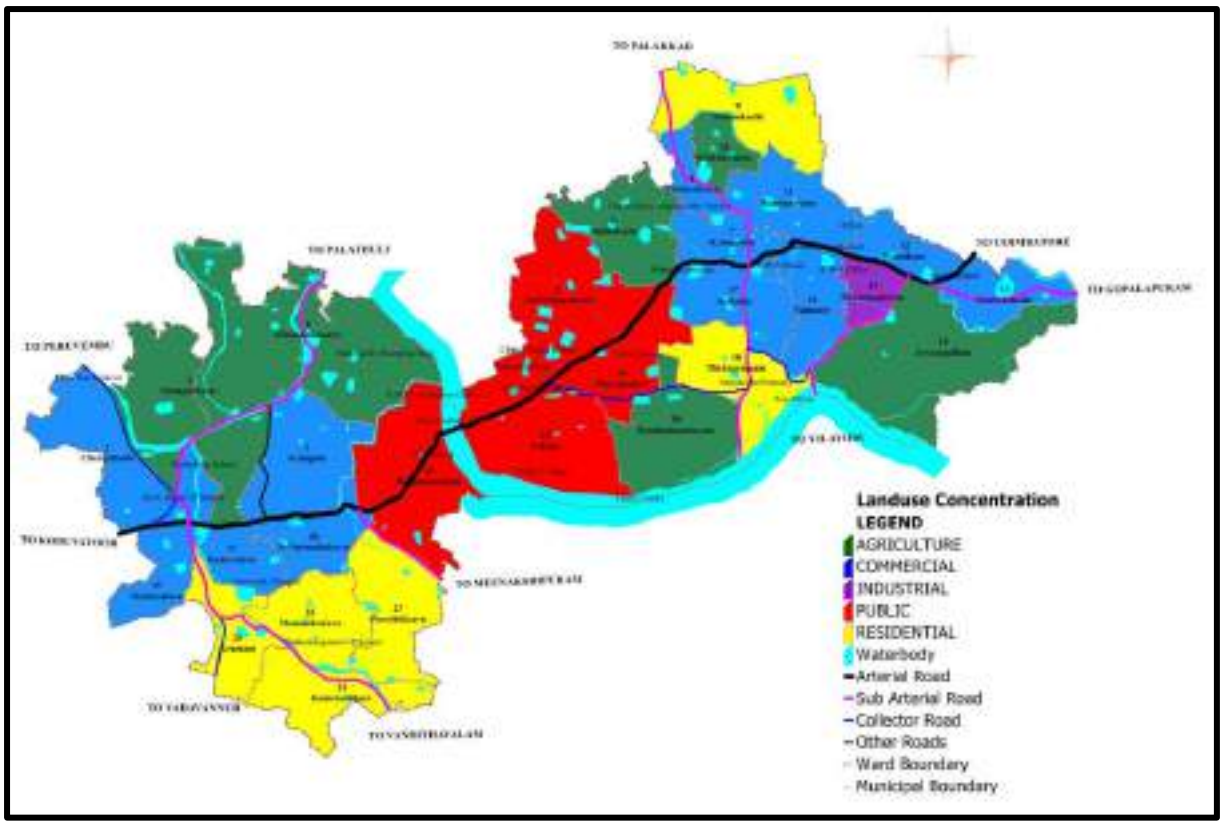


Fig 14.2 Wardwise land use Concentration pattern

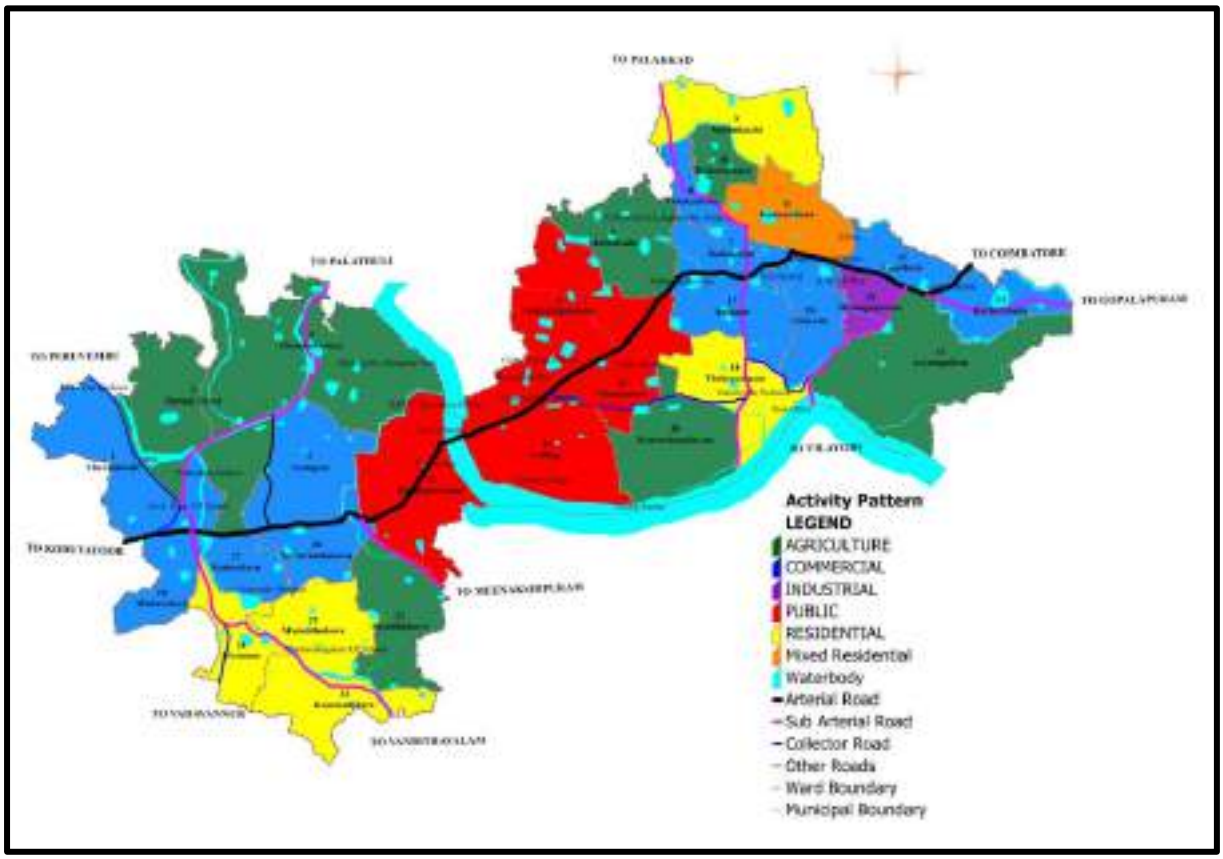


Fig 14.3 Activity Pattern

Table 14.2 Ward wise Activity Pattern derivation

Ward no	Ward Name	Land use CI	Functional Character	Activity
1	Cherumkode	Commercial	Rural	Commercial
2	Pattani Street	Agriculture	Rural	Agriculture
3	Arangam	Commercial	Rural	Commercial
4	Chembakassery	Agriculture	Rural	Agriculture
5	Ambattupalayam	Public & Semi Public	Rural	Public & Semi Public
6	Muthukadu	Agriculture	Rural	Agriculture
7	Kadambidi	Commercial	Urban	Commercial
8	Vadakathara	Commercial	Urban	Commercial
9	Naramkuzhi	Residential	Semi rural	Residential
10	Kizhakethara	Agriculture	Rural	Agriculture
11	Kannanthara	Commercial	Semi urban	Mixed Residential
12	Kosathara	Commercial	Urban	Commercial
13	Kacherimedu	Commercial	Urban	Commercial
14	Aryampallam	Agriculture	Rural	Agriculture
15	Devangapuram	Industrial	Urban	Industrial
16	Valmutty	Commercial	Rural	Commercial
17	Anikodu	Commercial	Semi rural	Commercial
18	Thekegramam	Residential	Semi rural	Residential
19	Tharakalam	Public & Semi Public	Urban	Public & Semi Public
20	Kunnathupalayam	Agriculture	Rural	Agriculture
21	College	Public & Semi Public	Urban	Public & Semi Public
22	Banglaparambu	Public & Semi Public	Rural	Public & Semi Public
23	Paruthikkavu	Residential	Rural	Agriculture
24	Kammanthara	Residential	Semi rural	Residential
25	Mannathukavu	Residential	Semi rural	Residential
26	Srikurumbakavu	Commercial	Urban	Commercial
27	Kadavalavu	Commercial	Urban	Commercial
28	Gramam	Residential	Semi rural	Residential
29	Mettuvalavu	Commercial	Rural	Commercial

The activity pattern defines the town into agriculture activity, industrial activity, Mixed residential activity, residential activity, Public & Semi-public activity and commercial activity. Commercial, Public & Semi-Public, Industrial activities are concentrated along major traffic corridors. Agricultural activity is concentrated along town periphery.

14.5.3 Connectivity Pattern

Chittur-Thathamangalam municipal area is connected only by road. Koduvayur - Coimbatore Road stretch passes through the centre of the town connecting its two ends together. Roads from Palakkad, Vilayodi, Meenakshipuram, Palathully, Vandithavalam, Vadavannur, and Peruvemba are connected to the Koduvayur - Coimbatore stretch creating more wider connectivity.

14.5.4 Existing Hierarchy of Nodes

Commercial nodes are identified on all important intersections of roads where there is a concentration of commercial activities and in the case of linear development, where there is commercial activity or physical development for a distance of 250 m is considered. Many of the educational, health, civic and other facilities are located in these places. The Connectivity pattern and existing hierarchy of nodes is shown in Fig. 14.4.

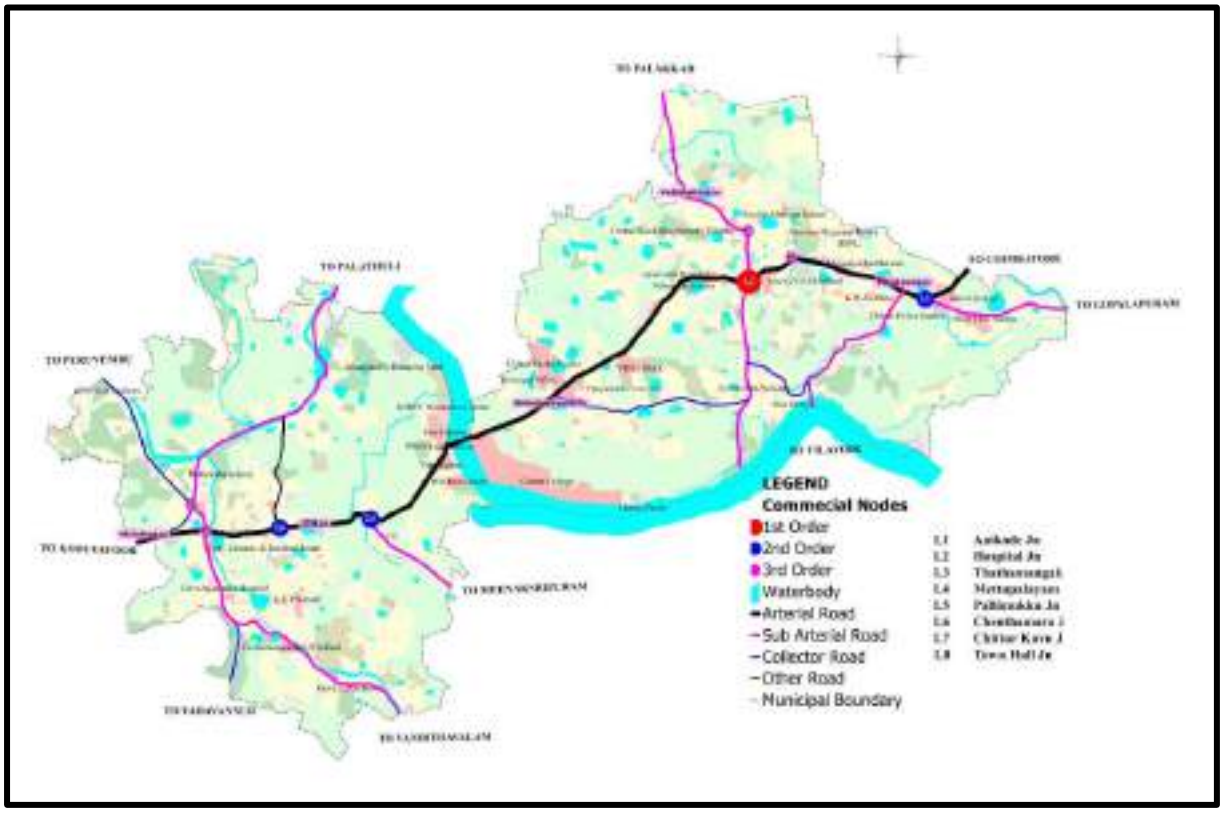


Fig 14.4 Hierarchy of existing nodes and road network

Following are the existing commercial nodes in the Chittur-Thathamangalam town

First order Junctions

1. Anikode Junction

Second order Junctions

1. Hospital Junction
2. Thathamangalam Junction
3. Mettupalayam Junction

Third order Junctions

1. Pallimukku Junction
2. Chenthamara Junction
3. Chittur Kavu Junction
4. Town Hall Junction

14.5.5 Spatial Structure

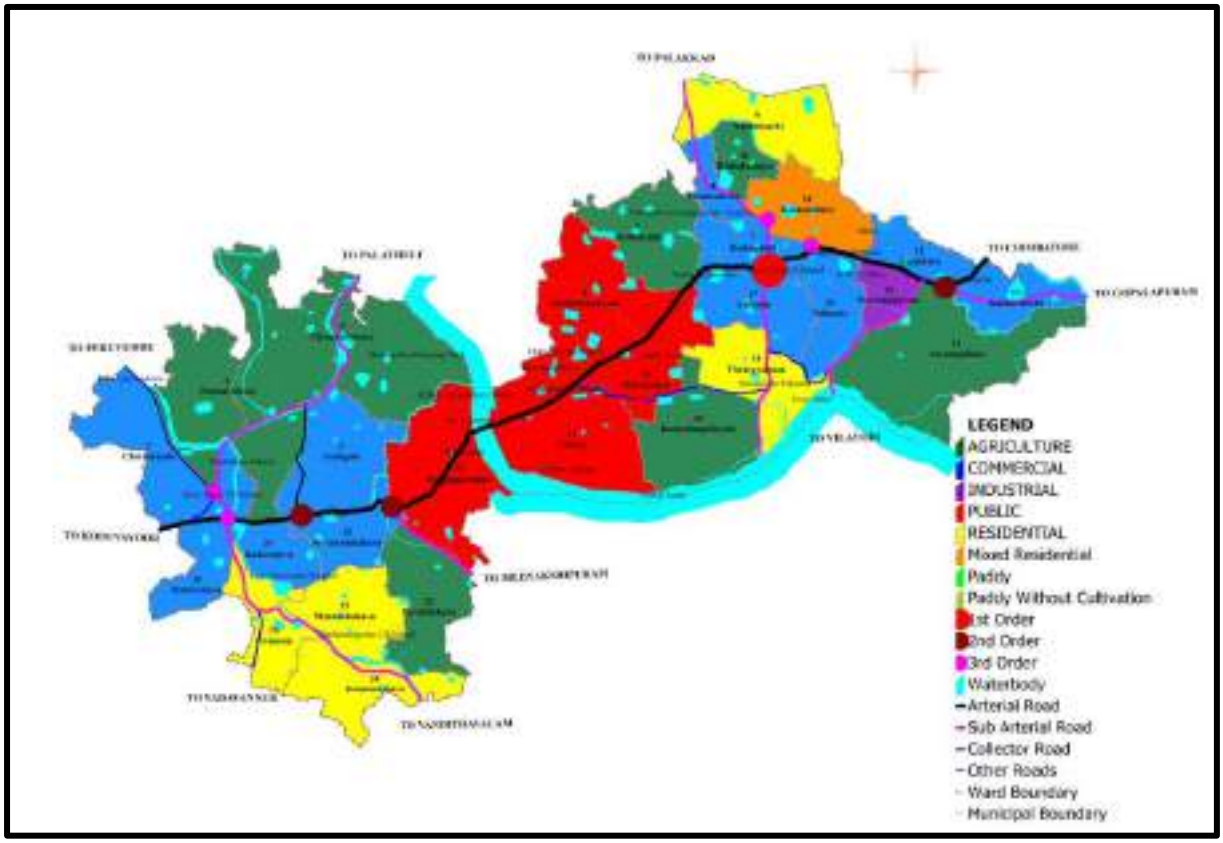


Fig 14.5 Existing spatial structure

Spatial structure of the municipal area is formulated from the activity pattern, connectivity pattern and hierarchy of nodes. Fig 14.5 shows the existing spatial structure of the Chittur-Thathamangalam town. Middle portion of the town is predominant with public and semi-public activity. In Chittur and Thathamangalam portions of the town, core area is concentrated with

commercial /mixed activity and also along major transport corridors. Agricultural and residential activities are concentrated in peripheral wards.

14.6 Inference

The study reveals the need of critical linkage between different sectors within the municipal limit. When the connectivity pattern and nodal hierarchy is placed over spatially distributed activity pattern, it gives rise to the spatial structure of the town. Chittur puzha divides the town into two, ie Chittur and Thathamangalam areas. Chittur portion is having more concentration of Public and semi-public activity. Hence Chittur is showing slightly more urban character as compared to Thathamangalam. Urban activities are concentrated in those wards near the town centres and those along important roads. Commercial, Public & Semi-public, Industrial activities are concentrated along major traffic corridors. Agricultural activity is concentrated along town periphery.

Chapter 15: DATA THROUGH DEMOCRATIC PARTICIPATORY PROCESS

This chapter collates data from democratic participatory planning processes conducted by the Chittur-Thathamangalam Municipality for 12 months from December 2021 till December 2022. Chapters 3 to 12 represent what can be called desktop data, i.e. data collected using Census, spatial documentation, and socio-economic survey – all of which are data collected using planning expert's tools and understanding of what is required to be collected. This kind of data gives a broad understanding of the place based on specific templates and can be useful in planning to some extent. However, such data fails miserably to understand place and people specific information that is unique to specific places including peoples' lived experiences, perspectives, aspirations, and imagination.

For the past many decades, Kerala established invaluable milestones in Independent India the beacons of democratic deepening through decentralised participatory planning processes. Decentralised, participatory democratic planning process brings together information, understanding and perspective of experts along with that of people, officials and representatives in particular places to generate analysis as well as ideas for future development. It helps to decolonise and democratise the baggage of colonial planning in India which was used to exploit and control people and in which far-removed expert planners decided what is best for a place and its people. It empowered people as authors of their plans giving value to their voice, belonging, experiences, knowledge, and aspirations. The Kerala Town Planning Act 2016 that mandates complete people participation during plan preparation is a significant instrument to democratise planning process in Kerala.[15]



The first stage process involved Facebook based social media campaign, online Ward Sabha meetings and 9 in-person ward cluster meetings attended by more than 300 people. These meetings focussed on eliciting peoples' opinion on the Master Plan 2031 Draft[16] as well as their needs and aspirations for Chittur-Thathamangalam. Through this process, the Municipality received an overwhelming 1200 written responses from individuals, institutions and associations that represents thousands of individuals like for example the Vyapari Vyavasi

[15] Section 34 of the Kerala Town Planning Act 2016, states "The Master Plan shall be prepared through a participatory process",

[16] Prepared and submitted to the municipality by the Town Planning Department

Ekopana Samithi, Thathamangalam Mosque Committee or various temple committees, experts and planning specialists from Chittur, Palakkad and other parts of India. This was followed up with in person hearings in municipality attended by more than 300 people.



Photographs from Focus Group Discussions

In the second stage Chittur-Thathamangalam Municipality conducted 20 separate recorded Focus Group Discussions/Meetings (FGD) topics and dates as follows.

- Children – 23.06.2022
- Education – 01.06.2022
- Festivals – 03.08.2022

- Agriculture (Padashekara Samithi)- 10.08.2022
- Commerce and Trade (Vyapara Vyavasyi Ekopana Samithi) – 11.08.2022
- Women and Gender – 19.08.2022
- Crime and Safety – 23.08.2022
- Traditional Art, Theatre and Local Libraries – 27. 08. 2022
- Heritage and Local Assets of Value – 31. 08. 2022
- Sports – 05. 09. 2022
- Youth and Youngsters – 05. 09. 2022
- Tourism – 13. 09. 2022
- Transportation and Mobility – 14. 09. 2022
- Building Construction (Lensfed members) – 16. 09. 2022
- Public Housing – 16. 09. 2022
- Solid Waste and Sanitation – 17. 08. 2022
- Public Health – 20. 09. 2022
- Lakes, River, Canals and Water 22. 09. 2022
- Climate change – 24. 09. 2022
- Caste and Social Equity – 06. 10. 2022

MASTER PLAN SHILPASHALA / CHARETTE – DAY I



MASTER PLAN SHILPASHALA/CHARETTE – DAY 2



As third stage, a 3 day public participation workshop (on 14, 15, and 16th of October) was conducted by the Municipality with the support of Town Planning Department and KILA at the end of these FGD. This workshop titled as Master Plan Shilpashala was attended by 186 number of people, brought together 15 planning experts [17], scholars, NGO activists and campaigners, invited from across the country worked with local community, politicians, municipal office bearers and town planning officials to shape priorities, proposals, planning policy options, instruments and implementation frameworks that could address the key concerns, aspirations and vision and to be prioritised for the Peoples' Master Plan 2042.

MASTER PLAN SHILPASHALA/ CHARETTE – DAY 3 MINI PUBLIC



[17] List of planning experts and Master Plan Shilpashala process brief – in Appendix I

This workshop integrated 1) expert sectoral understanding and experience, 2) peoples' aspiration and ideas, 4) already ongoing projects in Chittur-Thathamangalam Municipality [18], state government missions[19] and national government missions[20] , various other law and judicial rulings,[21] and international campaigns and guidelines.[22]

The following section summarises the peoples' opinions and their aspirations about the Master Plan.

15.1 Peoples' Opinions, Needs and Aspirations

15.1.1 Traffic and Transport

Bypass: Make bypass not through but outside Chittur Town; think about transport strategies considering a wider area than the municipality boundary alone. Road starting from Kambilichugam, Kozhinjapara connecting to Kuzhalmandom highway is developed, it will connect with Puthunagaram, Peruvemba and Koduvayoor. It is a parallel road to Chittur-Thathamangalam road. It will act as a bypass road reducing the traffic.

Public Transport Connections: Appropriate intra-city public transport service should be developed.

Road Safety: Foot over bridges or subways are not appropriate for Chittur - Thathamangalam context. Speed breakers and regulation are required. Reduce traffic speed and prioritize pedestrian movement; Run road safety campaigns. Resolve accident hotspots and Rectify Dangerous Road geometries. Establish Zebra line, speed breakers, cycle tracs. There should be a traffic regulatory committee in the municipality.

Traffic congestion. Address traffic congestion along main market areas; promote cycling and walking to reduce congestion, explore making cycle and walkways using slabs on canals, Vehicles coming to pick the students from schools should be allowed to enter into the school premises to avoid traffic congestion. One way system should be promoted where appropriate. The URDPFI guidelines is only a national guideline and should not be used to decide adequacy of roads in this specific town. Improve widths of inner streets appropriately. Improve Thathamangalam - Chemakulam - Pallimukku traffic block and road width. Upgrade Ambattupalyam/Manthacaud road.

Inclusive Mobility: In this town with significant senior citizen population and children, focus on inclusive mobility; make walking safe and pleasurable for all including disabled people. Pocket routes to be maintained.

Bus Stand: A new location needs to be identified, taking into consideration the real purposes that the bus stand will serve. Market shopping complex is ideal space for the bus stand.

[18] A list of projects in Appendix II
[19] Nava Kerala, Clean Kerala, Life mission, etc.
[20] Amrut, Heritage, GIS Master Plan
[21] National Green Tribunal ruling on buffer zones
[22] UNSDGs, Wetlands conservation/guidelines, water management, ecology etc.

Location of bus stand should be such that it is accessible to all people. Have a bus washing and night parking facility. Promote bus bays. Chanthapettah Municipal owned Complex should be explored for bus stand. It has almost same area of Alathur bus stand. Will be great if we could acquire nearby land as well. Market (Chantha) can be relocated to Anikode. Provide toilet facilities.

Waiting shed and Public Toilets: A public toilet is necessary between Puthunagaram to Mettupalayam, waiting shed consisting public toilets and nursing room is required near the bus stop in Anikode. Public toilet facility should be there in all major traffic interchanges.

Auto/Taxi Stands: Current Auto Taxi Stands are not scientific – it creates road congestion, it blocks commercial spaces, and very crowded. Rationalise auto and taxi stand locations exploring more appropriate/nonintrusive locations (for example, irrigation canal near the Federal Bank can be used by putting a slab over the canal, space near registrar's office, or along Anikode- Thekkegramam road etc) and introducing electronically assisted (button or phone call) methods to call auto/taxi. There should be a covered taxi stand in Thathamangalam as in Anikode. Need a Municipality approved auto stand in front of civil station.

Electric Vehicles: Promote Electric mobility vehicles and charging points.

Encroachments: Encroachments on the roadside should be removed.

Parking: 'Satram' can be used for a parking space for vehicles. To control traffic, the parking near civil station should be limited to one side parking. Hospital Junction – Near the Federal bank, there is an irrigation canal which can be covered with concrete slabs. All the autos can be parked there in 2 rows. This place is always congested due to on-street parking on both sides of the road.

Other issues: In front of Govt Hospital, the uphill terrain of the road and the accelerated vehicles pose danger and accidents. Either side of the road is parked with Auto rickshaws and 2 wheelers. Measures to be taken to address this issue.

Thathamangalam Junction is a narrow road. At a time, only a bus can pass. Schools and temples are there in the vicinity, creating dangerous situations. At least a zebra crossing can reduce the accidents to a great extent.

Alternate route for buses during the festival events such as Konganpada is needed.

15.1.2 Health

Communicable diseases: Promote Campaigns for mosquito destruction in monsoon, enforce safe drainage and wastewater disposal practices including for any popup tea shop or street side food stall. Mandatory inspection and fining by the public health official.

Lifestyle Diseases and Health Care: Promote healthy living campaigns, including health eating, active lifestyle, provide parks and public walks, Establish / promote Yoga training centres and Gymnasiums, Promote organic vegetable cultivation in all houses,

Pharmacy and Treatment: Make 24-hour doctor facility available, need medical shop in front of municipality, Build primary health centre in Thathamangalam, Improve the public hospitals and health care centres. Promote Alternate health care, like Ayurveda, and Sidha Vaidya and other similar practices.

Addiction: Alcohol and drug addiction to be addressed, a deaddiction and rehabilitation centre is needed. Have Clear Anti-drug use campaign and projects in schools and colleges and among young and middle-aged people.

Mental health: Promote Mental health support centres and campaigns. Activities for older citizens should be promoted, Support to address Illness and mental difficulties of people above 60 years of age

Safe physical and social Infrastructure: Good condition road network - for transporting patients without difficulties and to reduce road accidents. Air, water and environment quality to be increased for a better health. Unemployment, community safety and financial instability can also affect the public health. Disaster management also to be considered

15.1.3 Regional Spatial Interconnections

Diverse possibilities of Chittur's connection with Coimbatore, Palakkad, Koduvayur, Trissur and Pollachi should be exploited.

15.1.4 Water/ Waterbodies

Water should be kept as central issues in planning, have self-reliance on water; water scarcity in summer, declining surface water quality, decreasing ground water and pluvial flooding needs to be addressed.

Low pressure in supply system is to be addressed. No pipeline system for SC colonies in Neelikad, Thathamangalam. Provision for pipeline is only possible if some land under the ownership of Devasom is acquired.

Warning system should be established in municipality about dam opening during heavy rains.

Protect ponds and public wells, protect 3 public wells in Kozhikada bypass, Disused wells can be refilled instead of being a space of mosquitoes and waste dumping. There are 30 – 35 public wells in Chittur.

Water logging in drains causes health issues, Ground water recharging by maintaining ponds

Akambadam stream (neerchaal) flowing from Anikode to Chittur college. Block in the tail end because of encroachment for building construction and new ground. Due to the lack of maintenance or monitoring towards the end, during the events of rainfall, water clogging in the tail end area affects the agricultural area, ladies' hostel and houses in the adjacent regions.

Government is maintaining the irrigation canals – Akampadam canals are in the hold of the revenue division. Check dams between 50 m distance in the Akampadam canals will improve irrigation.

No need to build the boundary walls all around the pond. Boulder construction around the ponds can be limited to 1 side instead of 4, so the people can make use of the area near to the hard wall construction. Other 3 sides of the pond can be strengthened using biological measures such as trees and vegetation. Thus, we can efficiently utilize the funds allocated for 1 pond to 4 ponds. Growth of vegetation along the ponds develop an ecosystem as well.

Revival of ponds are leading to its degradation due to its lack of maintenance. Converting the ponds for useful activities will provide monitoring of the maintenance works. Options for new activities under the control of local bodies: Aquaculture, Lotus farming, Local tourism- parks, Swimming training.

Revival of the pond shouldn't be limited to the area of the pond; the adjacent land also should be considered. Earlier, people used to sit near the Edayar pond. It was a social gathering space.

Ideas for pond improvement: Bhagvathikulam – Benches can be installed near the Baghvathikulam, where it is concreted, Karyagar pond – A small children's park can be installed. A walking trail near the larger ponds. Connecting storm water canals to ponds reduces the issues of floods and improves recharge.

Ponds should generate some revenue which will attract people for conservation.

'Kulatheru' – a festival conducted in ponds during Thiruvathira. Encouraging the custom and ritual associated with ponds will help to its revival and sustainability.

Trees within 3m distance on either side of the Canal bund should be removed. After each monsoon, actions to clean all canals, drains and ponds.

15.1.5 Climate Change

The only way to adapt to climate change is by allowing water to flow. The uninterrupted flow of water reduces floods. Focus on infiltration in ponds, water bodies, refill Aquifer depletion, Rejuvenation of Sokanasini.

Divide the area into a 3km grid and install a thermometer, rain gauge and UV Biometer (preferably in schools), to observe the pattern of climate at the local level. If it is possible to develop a pattern in variation, it helps in predicting rainfall and seasons – beneficial for agriculture.

Crops which give yield in a short life span and climate resistant crops should be promoted.

15.1.6 Social Infrastructure

Promote more Anganwadis, Parks including park for children, Gym including Women's Gym and Public Gym in Parks, A Public Room for Women, Libraries including upgrading Municipal Library, Government Clinics, safety through CCTV, Support to address illness and mental

difficulties of people above 60 years of age, Employment Exchanges, Thunchan Madom improvement, Public toilets in Municipal Office, Excellent sports infrastructure including Swimming pool by renovating the ponds, and developing the ground in front of Boys High School

15.1.7 Physical Infrastructure

Roads: Vadakkepadam to Kanyarpadam Children's Park; Kulathumedu to Durgagoshtam**; from** Kanyarpadam Karthikeyan house to Balakrishnan house.

Repair/ improvements: To hospital park, drainages and wastewater carriers, Anikode Pond, Proper marking on the side and centre of roads, Kottakadavu crematorium, access road and road to BMBC, facilities in government schools, Move the electric posts from middle of roads, Repair the difference of heights and gaps between road and footpaths.

Drainage: Make storm water drainage in scientific manner, Repair/ renovate Kanyarpadam drainage, Repair the damaged drainage channels due to building or other development work identifying from each ward- like Akampadam canal near Chittur College, improve drainage system where there is frequent water logging on roads when the shutters are open for agriculture.

Upgrading Traditional Settlements: Improving Agraharam wastewater management infrastructure, Urban design and street furniture and pavement improvement of Lankeshwaram pond precincts, E-Toilets in Lankeswaram temple and Chittur temple

Public Space: Promote Walkway along river, promote Pedestrian infrastructure/ Walking paths especially that is friendly for elderly, cycling infrastructure- cycling paths, Playgrounds, provide solar powered Streetlights, promote underground cabling, promote Mini conference hall

Recreation and Entertainment: Provide riverside promenade and public park along Chittur puzha, provide entertainment spaces/facilities in wards, make a cltural centre from AEO Office and Konganpada museum.

Markets: Promote Market/sales centre for meat and fish in Thathamangalam

15.1.8 Cleaning

Clean Town: Have Consistency in street Cleaning, Eradicate mosquitoes, Improved waste management , Remove pig nuisance, Clean the drainage canals/channels, Clean Attakulam, Clean Anikode pond for swimming, Clean Irrigation canals, Clean the wastewater logged in channels in public areas , Run a campaign against wastewater logging in private plots, Cleaning river edge , Clean ponds, promote Regular river cleaning campaigns and remove blockages to enable free flow, Clean the mud accumulated on road edges, Cleaning the front of the Thathamangalam Bus Stand front elevation, Waste mountains need to be removed – Waste Landfills to be removed, enforce ban on waste dumping on roads

15.1.9 Protect Environment

Drainage Ecology: Protect water bodies, Protect the paddy fields and ponds, Preserve Attakulam, Edayarkulam, Improve, restore and protect the river, Protect the Grameenatha/ the rural character of Chittur-Thathamangalam, Ban plastic, Large public institutions like college schools offices to develop a proper sewage and drainage system and protect ecology, Repair the damage to natural drainage caused by building construction and developments in Chittur College, Make all public buildings need planning permission from the municipality.

15.1.10 Waste and Pollution

Prevent water and air pollution, stop waste dumping in public spaces, Waste Landfills to be removed /reclaimed, provide waste bins at all establishment for better waste segregation at source, make a plant for comprehensive waste management, Support homes to process wastewater at home itself, Address vehicle noise and air pollution on the main roads

Households should be given manuals and guidelines about mandatory solid waste disposal policy including Strict imposition of fees, enforcing Haritha Karma Sena' approval building permits. promote award for the cleanest ward and ward member (Devi Nagar Residential Association is ready to sponsor the award). Municipality should supply bins to every house to collect and segregate the waste.

There is a need to uplift the dignity and status of 'Haritha Karma Sena' employees including higher wages.

There is a need to install camera at waste dumping hot spots; provide animal meat disposal plant (Chopping centres).

Promote decentralised safe sewage strategy and Wastewater treatment strategy.
Promote an Electronic waste disposal strategy and unit.

15.1.11 Encroachments

Clear All encroachment on shopping streets and residential areas and by individuals and institutions, Remove encroachment in Thekkegramam to Vijayamatha road.

15.1.12 Employment

Address joblessness, Increase employment opportunities in the Agri sector, Address questions of labour supply, Promote new employment opportunities, Support traditional skills-based workers – weavers and makers of textile, grass mat, bamboo products etc., Support to develop new markets for products, promote Low interest loan for start-ups for young people and women, Promote enterprise, especially among youth and women, Promote a vegetarian restaurant, Promote employment/industrial parks, Promote Kudumbashree Stalls, Support the explore of online employment opportunity, Promote the value addition possibilities of local produce Toddy, Coconut, Rice etc. production, distillation/ filtration, promotion, etc.

15.1.13 Gender

Make public space safe for women, promote women enterprise, provide financial support for women start-ups, build a women's hostel, women and children only public room, promote gender Equality.

15.1.14 Sports

Promote a strong sporting culture to aim for a healthy society as well as producing successful athletes.

- **Stadium:** Complete the stadium project near boys high school to help those currently depending on Palakkad medical college grounds for practice. Football, Basketball, Volleyball grounds can be set up within it and conduct taluk, district and state level events and competitions. User charged can be introduced to make it economically viable/maintenance.
- **Swimming Pool:** Improve and complete/repair the swimming pool in Chittur college as a place for teaching swimming training for small children. Promote Edayarkulam as swimming training and diving facility.
- **Athletic Track:** Complete and manage the athletic track – or football? – in the college under construction.
- **Sports Hostel:** To construct a sports hostel to support candidates training needs.
- **Fitness Training:** Provide fitness training sessions for people suffering from lifestyle diseases - the service of physical education teachers within the Chittur-Thathamangalam Municipality can be used for this as part of special events or regular sessions. Can also conduct special sessions for women and middle-aged groups.
- **Indoor Stadium:** An indoor stadium for badminton, basketball, judo, chess, boxing, gusti/wrestling, etc- this can also help to attract people and athletes from different parts of the state to Chittur.
- **Yoga/Gym:** Start vocational courses on yoga, nutrition, fitness training, sports management, life guard, B.Physical Ed, sports psychology, diet and health management courses in the school and college within Chittur-Thathamangalam Municipality. A sporting culture will help to counter the threat of drugs.
- **Sports Promotion Committee:** A dedicated sports committee should be made for the improvement and development of sports and physical activity within CTM.
- **Play Grounds:** Promote Play grounds. Main ground with synthetic track should be provided. Football ground with a 400 m track around with a gallery is the most important thing to be provided in the municipality, even a mud track is enough. There should be space for all types of players. Jumping pits required, badminton court, kabaddi ground, basketball court
- **Supporting Athletes:** Athletic first aid equipment to be provided. Nutrition food to be provided to all athletes. Insurance or treatment facilities should be provided for the sports person.
- **Events:** Chittur-Thathamangalam municipality should be able to organise programs, sports tournaments, inter school sports camps, athletic group and sports group all separate groups and a core committee.

15.1.15 Heritage

Conserve built heritage - Old Tharavads, Thunchan Madom, Agraharams, Restore and protect the Townhall building, and Old Chittur Puzha Bridge, Restore and protect Girls school, Kannadi school, AEO office, Village office. Heritage conservation strategy should integrate with festivals, everyday life, young generation. Teach about built heritage to the new generation using help of INTACH; Promote heritage Walks on weekends and holidays, promote/support Financially viable historic building conservation projects; To give people some orientation on what to do with the built heritage. Promote modern economy out of handicraft skills through promoting cooperatives, expanded markets and branding, design support etc.

15.1.16 Public Housing

Improve the disbursement of study room project funds; reserve all government housing quarters areas as space for public housing/ government quarters. The width of the road near public housing colonies are not wide enough for 4 wheelers.

15.1.17 Tourism

Tourism Infrastructure: Identify, document and mark the tourism infrastructure – nature and natural assets, visual sceneries, old buildings and settlements, cultural institutions, festivals, performance art forms, traditional craft practices and archive local history. A calendar highlighting the dates of festivals and artforms in Chittur with the help of a committee. Booklets, brochures and videos can used for tourism. In the **tourism website** of Kerala, under Palakkad taluk, at least 20 places in Chittur can be exhibited. Kerala tourism website is the best platform for promotion.

Health tourism has potential in Chittur where Ayurveda can be involved as a key element. It can be marketed with the involvement of travel agencies.

1. Local tourism is promoted with budget friendly amenities like small tents and huts.
2. In ward 14, the stretch from Aryampallam to bridge is a high potential spot for health tourism.

Organic farming (Jaiva Krishi) – Tour package

1. Experiencing traditional and modern cropping methods for 2-3 days
2. Marketing of indigenous crops and rice varieties.
3. Rice park, a unique concept can be implemented in Chittur due to its preservation and potential for indigenous crop varieties.
4. Similarly, aquaculture at homes (varal krishi), duck farms, egg villages, milk villages etc can encourage tourism and business which enriches local economy

Toddy, which is an intangible asset, can be promoted for the enrichment of local tourism. Toddy produced in Chittur can develop as a unique brand to market in the tourism sector.

Chittur Kavu – cultural aspects and ecology should be conserved along with tourism development. Traditional cuisine, festivals, culture will invite seasonal tourists to Chittur.

Peruvambu –In India, the best quality percussion instruments such as edakka, madhalam, mridangam are produced in Peruvambu. Even people from Paris comes to Peruvambu to but these instruments. It is one of the best ways to promote Chittur in an international platform.

Tourism shouldn't limit to a municipality level, it should extent to taluk level. Farm, Craft and Health/Wellness Tourism should be the focal point of tourism development in Chittur.

15.1.18 Public Safety

Have a police post in Anikode, Town Hall Jn and Hospital Jn.

15.1.19 Energy

Promote Self-reliance on energy, reform energy policy for agriculture, use solar for streetlights and public buildings, Explore and implement Solar for public and private energy use.

15.1.20 Education

Promote a music School, promote the learning of Pradeshika kalaroopangal (vernacular / traditional art forms) children have not seen, Art gallery is required in CTM Chittur-Thathamangalam Municipality for educating and exhibiting different art forms, Child friendly labs or science centres or science visits should be there, Skill oriented programs for agriculture or field-oriented classes should be there; History, Language, IT, Science, geography labs should be promoted; Geology. Relief maps should be there in each school; Classes by Experts should be conducted like Vijayatheri in Malappuram; Padana veedu in all wards, everybody should be able to read and write; Stores to sell palaharangal, paaya, mannu ulpannangal, thakkali etc should be there; Cycling tracks should be there along the roadside; Open/public gyms in different areas to promote health; Trade fests for children; Sports facilities should be increased.

15.1.21 Ambience and Peace

Retain Chittur Ambience and Peace and Green and promote liveability.

15.1.22 Master Plan Principles

Master Plan needs to be remade in an environmentally friendly manner, New participatory Master Plan needs to be made, Establish a bottom-up participatory process in all planning related processes.

15.1.23 Cultural

Promote Konganpada and Angadi Vela as main revenue generator and regional festival, promote a program called ‘Pride of Chittur’ that will calendar and interconnect all festivals and arts in Chittur, make a Konganpada Museum, make a cultural centre and art gallery out of adaptive reuse of AEO office named Thunchan Smaraka Samskarika Kendram with library, museum, performance hall etc; promote handicraft fest during the time of Konganpada.

Promote Traffic regulations and disaster management regulations during festivals. Konganpada, Angadivela, Mariyamman pooja etc, making also sure that horses and elephants are safe and do not cause danger to people during the festival time; Electric wires which are an obstruction during the festivals should be changed to underground cable; Provide Public toilet facility during the festival near Chittur Kavu, Thathamangalam and Sreekurumbakavu.

Aryamala drama, Kannyarkali, Kannyar porratt, Purana nadakangal, 42 nadan kalakal etc should be documented and digitalized; Malama should be considered as an art form; Mini

performance hall should be there; One week of art festivals should be there every year; Municipality can have an App to reach the public; Kuttettan Smaraka Library can be proposed in Thathamangalam; An art hub can be proposed along the river edge; FM Radio exclusive for CTMC; Traditional crafts should be introduced to the new generation

15.1.24 Land Use

Promote Mixed use zone on both sides of Thathamangalam bypass wherever it is not environmentally destructive, promote mixed use more widely, Protect Paddy fields, make sure the plan guidelines are also in concurrence with the 2019 KMBR, Reform zoning regulations method, Enable people who let their property for development through higher FSI and TDR methods, Think outside and beyond the regulatory zoning based land use control methods, Regulate plot reconstitution and layout making.

15.1.25 Agriculture

Support Agriculture, promote Sensor solar lights in paddy fields which do not affect biodiversity; promote Seed stores, drier units and godowns are for Paddy, coconut etc; Ponds should be cleaned and maintained to hold more water; Tractor getting stuck in mud due to water logging; Maintenance of Canals should be done regularly; Canal encroachments should be cleared; To restart the lift irrigation system in Thekkegramam; By products/value added from Paddy and coconut to be promoted; support Solar fencing to protect from wild boars; promote Fish farming in ponds; provide Cold storage for fish, meat, chicken etc; support Mechanisation working with bank with 50 tractors; Warehouses to be proposed through NABARD; Mushroom cultivation to be promoted using the paddy hay.

15.1.26 Child Friendly Town

Promote adequate Anganwadis. Signals in front of schools and in Junctions, SPC to help pedestrian crossing, Special education - vocational rehabilitation unit of students after tenth standard, Footpaths which are friendly to differently abled people , Swimming classes should be mandatory for students, Proper bus stops in front of schools, Solar panels in schools for electricity generation, Self-defence awareness class, counselling classes to reduce drug usage, promote Study tours by municipality/schools, Playground for different sports/games, Signages at different points in CTM Chittur-Thathamangalam Municipality , Dustbins at various points, To plant trees along road sides, inside school premises etc.

15.1.27 Young People

Promote Physical training centres for PSC aspiring candidates; Ground, Walkways & public gym should be there; Roads should be developed with footpaths; “Public spaces in private spaces” - informal gathering spaces in communities; More public toilets and restrooms are required; Factories/manufacturing units, ware houses and employment opportunities should be increased; Cultural tourism should be promoted; Cultural centre/ performance areas should be built; Commercial units should be open for 24X7; More arts and sports clubs should be formed; Indoor stadium in front of the Boys school should be completed soon.

15.1.28 Trade and Commerce

Promote Trade and Tourism route connecting Madurai, Tirupati, Pazhani; Thunchan madom and precincts to develop as a tourist hub, promote public space along the river; Toddy business to be increased; To change the KSRTC stand to some other place which is more accessible to the public; More parking spaces are required along the main road; Comfort stations are required for ladies and children on all shopping streets; support better processing units and marketing facilities for local unique craft products like (textile from Devangapuram, food items like pappadam, kondattam, craft items like grass mats, bamboo products etc); promote Trade fest in connection with Konganpada/Angadi vela.

15.1.29 Crime and Public Safety

One main concern is a water facility for the fire engine. A waterbody can be used to fill up the water tanks, hydrants can be provided at regular intervals; CCTV cameras are very necessary every half kilometre and should be connected to the police station; Better medical system with road facilities should be there to avoid the deaths in between the travel from one hospital to the other; Redesign of accident hotspots to prevent accidents and death; During festival seasons, an emergency rescue road network is necessary; Night-time Shelter for women and elderly is required; Public areas and streets should be well lit in the night.

15.1.30 Others

Agmark office in Thathamangalam was damaged in rain and fell down; the office function has now been changed to civil station. Requesting Municipality to take over the building and start agriculture support office and allied functions. Promote Swap shops - Collection and selling units for different products (cloths, vegetables, crafts etc), Kudumbashree supermarket in Chittur-Thathamangalam Municipality.

Chapter 16: GOALS AND OBJECTIVES

In the previous chapters, outcomes of various sectoral, settlement conducted in connection with preparation of Master Plan for Chittur-Thathamangalam Town were discussed. The development issues specific to the town, be it a problem or potential pertaining to various aspects were identified. Now it is time to set the goals and objectives for the planning area based on the data as well as what the people have put forth very clearly in the various public participatory consultations held.

16.1 Development Goals

Chittur-Thathamangalam is a historically important town in the district, that continues to be a semi-rural town, despite its urban status. Culturally diverse and vibrant, as seen in the Existing Land Use map, agriculture occupies a predominant economic position in the town. From a food security perspective, these agriculture areas should ideally be retained for as long as possible beyond the planning period 2042. More importantly, the conservation of ecologically sensitive areas - primarily the network of artificial and natural drains, ponds and fields that ensure that water is retained, engineered and flows through the town, finally draining into the river- is central to the current and future well-being of the town. Optimum use of available resources is another aspect to be taken care of. Ensuring the wellbeing of people and the environment through a development model that retains the peace and tranquillity of the town is a key consideration voiced repeatedly by the people of the town. In the above backdrop, development goals for the Master Plan can be listed out as follows:

Goal: I

To make the town climate resilient.

Objectives:

- To improve resilience to the effects of **variations in rainfall** through water conservation, sustainable agricultural practices, conservation of the drainage ecology.
- To improve resilience to **increasing temperature** by increasing shade and tree cover; promoting more environment friendly, low-carbon and carbon-sink building materials (like locally available materials, recycled materials, fast growing timber and bamboo), climate sensitive designs and methods of building.
- To minimise the impacts of climate change on **agriculture, livestock, water resources and public health**.

Goal: II

To ensure the sustainable management of fresh water, wastewater, and geography of water flows.

Objectives:

- To safeguard the drainage ecosystem that connects water flows, food production, vegetation and biodiversity through the demarcation of an Ecological Protection Zone.
- To repair, protect and conserve all existing private and public Kulams, tanks and water bodies within the municipality, prohibit any form of reclamation or filling.

- To clean and repair the entire natural and artificial irrigation canals which will be declared 'protected infrastructure' and to develop public open spaces, walkways, linear parks where appropriate along canals embankments, or to use canals to align pipes as part of decentralised sanitation and waste water systems.
- To connect the river more intimately with people by opening up the riverine edge as a public open space, a walkway and linear park for sustainable, responsible leisure activities.
- To address ground water scarcity and low pressure though decentralised solutions like shafts which must first be tested through pilot projects.
- To address universal access to good quality drinking water through the provision ATMs for poorer households.
- To address sewage and liquid waste with decentralised sanitation systems using natural treatment systems like constructed wetlands, duckweed ponds and waste stabilization ponds using existing water bodies that can also serve as public spaces, which must first be tested through a pilot project.
- To develop a detailed action plan for household waste water and building institution level solutions for educational and public offices.

Goal: III

To enhance and protect the natural and cultural resources within the community to reinforce its rural past and history.

Objectives:

- To identify Local Assets of Value and Local Precincts of Value,
- To create Local Precinct Plans and a Manual for Building responsibly in each precinct and institute a committee that oversees and issues permissions and NOCs for any changes to the properties, addition/alteration/repair/demolition etc.
- To preserve and promote the rich cultural traditions of the region and the crafts/arts of the town like handlooms, bamboo products, kora grass, pottery etc.
- To enforce existing rules to protect the environment including protection of *Aal marams* and heritage trees.
- To have a Konganpada Musuem- along with setting up a Story-telling Academy to bring together diverse local capabilities in performance art practices.
- To promote Tourism, especially Festival Tourism, which fulfils an important socio-cultural as well as economic function, ensuring that they are safe, inclusive, enjoyable with enough amenities and crowd control.
- To conduct a Crafts and Trade fair during the festival season to promote local arts and handlooms and handicrafts.
- To develop attractive tourist trails connecting all local and regional assets of value, develop exciting cycling and walking routes, a local tourism information centre, information brochures, branding, advertisements, promoting Farm Tourism, Heritage Hotels, and Home Stays, etc.

Goal IV

To help support the currently struggling agriculture sector.

Objectives:

- To support farmers and farming, enable modernisation of agriculture sector for increased productivity.
- Maintain irrigation canals.
- Promote pesticide free food production, promote environmentally sustainable and viable food production practices.
- To provide necessary inputs and infrastructure such as seeds, farm equipment, godowns, processing space, etc. To promote productive linkages (markets, financial institutions, knowledge producers, etc)
- To develop the agro based industries, value added horticulture products, agriculture allied sectors and farm tourism.
- To minimise the conversion of agricultural land use for other development purposes
- To set up an Agro-meteorological observatory in Govt College, Chittur.

Goal: V

Ensure sustainable, active travel and inclusive mobility for people across age, gender and ability.

Objectives:

- To introduce traffic calming throughout the town to prevent accidents and reduce health impacts of high speed and noise pollution of traffic.
- To ensure continuous pedestrian friendly tree-lined footpaths in each street throughout the town.
- Redesign and improve unsafe road geometries, and improve main Junctions along SH25, including Anikode Junction, Fire Station Junction, Hospital Junction, Mettupalayam Junction, Pallimukku Junction and Chenthamara Junction working with PWD.
- To build accessible, universal design streets that promote walking and cycling and reduce private car use.
- To provide parking facilities for automobiles, taxi stand and appropriate locations for parking autos.
- To provide adequate street lighting for visibility, appropriate signage and speed limits
- To upgrade existing transport infrastructure, with minimum social disruption, to include footpaths on every road and where possible provide cycle tracks, street vending and parallel parking.
- Propose regional transport strategy with bypasses to reduce regional traffic that is passing through the town.

Goal: VI

Protect, conserving and upgrading existing open spaces and developing recreational facilities and opportunities.

Objectives:

- To integrate existing open spaces with parks, active play areas, promenades (around ponds), playgrounds and walking along the river.
- Convert the existing AEO office to a cultural centre and art gallery.
- Developing new pocket public parks/linear parks equipped with outdoor exercise equipment (along the river, main streets, irrigation canal embankments, or water bodies) within walking distance of different housing neighbourhoods.
- Provide shaded public spaces and shaded streets through avenue plantations.
- Opening up the river edge as a public open space with shaded walkways.
- Providing a public room for women and children with a children's library and children's adventure playground.
- To develop selected ponds as community open spaces and public parks.
- Develop a recreational cycling trail connecting scenic landscapes of paddy fields, open spaces country roads and the river.
- Develop state of the art sports infrastructure including indoor/outdoor stadium, upgrade infrastructure in existing schools, developing local ponds for swimming.

Goal: VII

To enhance access to livelihoods and boost the economy of the town.

Objectives

- Promote career support guidance and entrepreneurial training to young people and will extend employment support for disabled people who want to work.
- Promote business support grants bringing together local banks and financial institutions to promote local enterprise.
- Extend support to the street vendors in making a sustainable livelihood and waste management.
- Attract new age employment providers, through employment fairs and providing start up facilities and co-working spaces.
- Support the traders' guild and trader's collectives to collaborate with relevant enterprise promoting organisations to provide training for businesses to thrive in a world of ecommerce and online shopping.
- Promote vocational courses in Government College Chittur- like course on swimming instructors, gym trainers, physical education, nutritionist, etc that can lead into local and regional employment pathways.
- Support Women entrepreneurs connecting with relevant state and national missions including finance support/grants for local business start-ups.

Goal: VIII

To garner support for traditional skill based industrial sector – textile and mat weaving, bamboo craft, metallurgy, and pottery etc

Objectives

- To link with social enterprises that are experienced in building cooperative networks, branding, and promoting new design ideas linking with design schools
- To help identify and access handicraft markets, enabling finance, and promotional avenues, explore innovative ways to market products, including online, local and international airport outlets.
- To provide enterprise training, modernisation, and skill building support
- To prepare a detailed action plan for the economic development of handloom and handicraft household enterprises

Finally, the Development Vision can be summarized as follows

To develop Chittur-Thathamangalam focussing on liveability **such that the town will retain its peaceful ambience, will be an enabling place for all persons to lead healthy and fulfilling lives, regardless of income, caste, community, physical ability, gender, sexuality or where they come from.**

Chapter 17: DEVELOPMENT CONCEPT

17.1 Master Plan as Opportunity

A Master Plan is a significant legal opportunity for the people and their local public authority to collectively outline their social, political, ecological, spatial and aesthetic aspirations and priorities to guide short, medium and long-term transformations in and of their habitat. Through this Peoples' Master Plan 2042, Chittur-Thathamangalam Municipality outlines its vision, priorities and commitments for the next 20 years that can address the challenges and aspirations of the people. As mentioned in previous chapters, this is synthesised by bringing together:

1. Relevant ideas from Draft Master Plan 2031
2. Peoples' knowledge, needs and aspirations collated through extensive participatory avenues outlined in Chapter 15
3. Expert advice and technical analysis
4. Already ongoing projects in Chittur and Thathamangalam
5. Ongoing missions, policies, programs, and campaigns at local, regional, national and international levels.[23]

This chapter will outline the main values that underpins the plan as well as the implementation process, along with policy commitments, regulations, projects, and implementation frameworks to deliver those.



The most important thing to consider is that Master Plan 2042 is the first ever Master Plan for Chittur-Thathamangalam Town. Until now developments in Chittur have been regulated through by specific pieces of state level legislation, like the Kerala Municipal Building Rules

[23] Refer to Section 1.5 Methodology

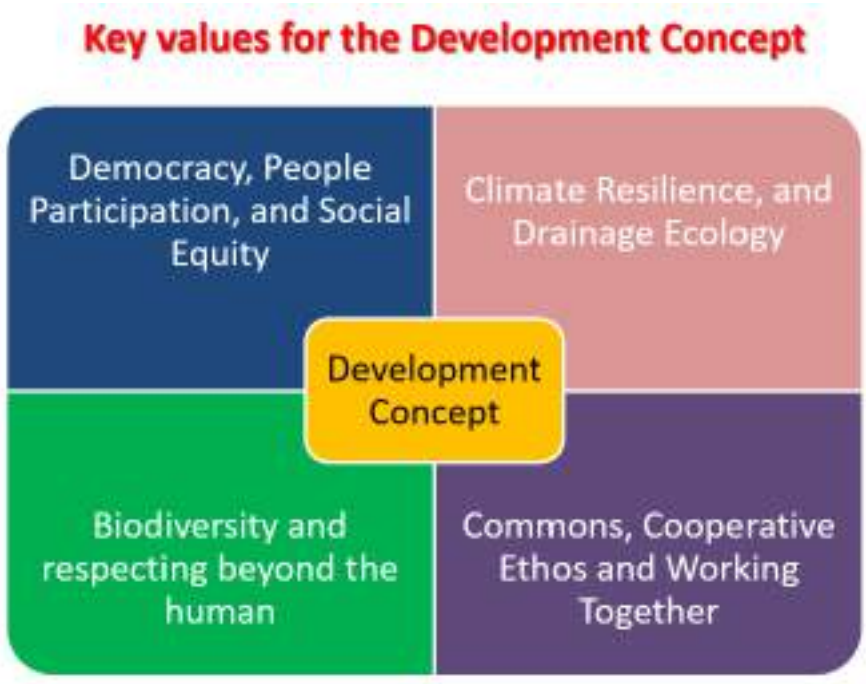
or the Kerala Conservation of Paddy Land and Wetland Act, and development projects identified or implemented by state level departments like Public Works Department, irrigation department etc. In addition, specific local level projects were identified and proposed for funding through the 5-year plan process. This 20-year Master Plan process is therefore the first legal opportunity to outline a long-term vision and development priorities. This has two significant implications.

First, along with providing the Municipality a framework for future investments, regulating spatial development, and providing infrastructure and services this plan will develop close interactions with the everyday life of people. For example, it will help to enable safe public space for people across age group, gender, and social background or it will play a significant role in the building permission process. Therefore, it is very important for the plan to make sure that its foundations are democratic, equitable, humanising and enabling for the people and nature in Chittur and Thathamangalam and beyond.

Secondly, through this plan the people of Chittur-Thathamangalam articulate their values, priorities, aspirations and adaptations collectively to define a foundation for development and change and to decide how Chittur-Thathamangalam should change and how fast or slow that should be. This opportunity is grabbed to address issues of local, regional and global concern. This plan will therefore establish what can change fast, what needs cautioned change and what assets needs to be preserved and protected from change altogether as a foundation upon to build a sustainable future for Chittur-Thathamangalam. For example, it will define where we can build, where we should not, what needs preservation and what can be changed. It will outline what and how to equitably compensate for the trading of development rights for the protection of the commons. Given that subsequent plans will be developed over this foundation in the coming decades, this plan is the first and most important opportunity for people of Chittur to define the relationship between the boundaries of change and horizons of their aspirations.

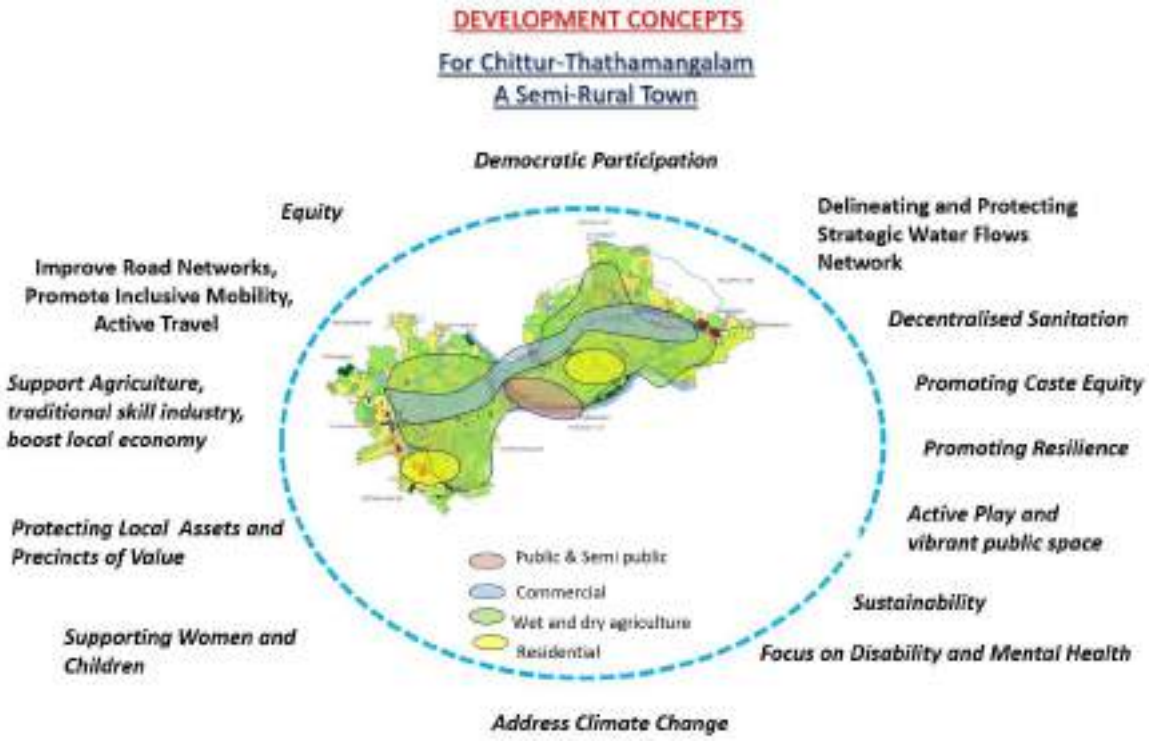
17.2 Development Concept

It is clear that Chittur-Thathamangalam is at the cusp of generational change. On the one hand the new generation is closely networked with a very wide world, immensely aspirational, confident, futuristic and expects a planning process to include them and address issues of concern for their sustainable future - including questions of climate change, mental health, environment and ecology, employment, gender and sexuality and inclusive public space. On the other hand, many people in Chittur and Thathamangalam have been born in the last century and have been living here for decades establishing its social, cultural, environmental and economic base, and they do not want the transformations to alienate them from the place, rather want to preserve unique assets of Chittur-Thathamangalam and pass it on for the future generations. Therefore, this plan aims to bridge these two extremes by catering to the aspirations across generations by building on sustainability and progressive values.
Over the next 20 years the plan's focus will be on liveability to ensure that Chittur-Thathamangalam will retain its peaceful ambience, will be an enabling place for all persons to lead healthy and fulfilling lives regardless of income, caste, community, physical ability, gender, sexuality or where they come from.



Towards this the key values that guide this plan are:

1. Democracy, People Participation, and Social Equity
2. Climate Resilience, and Drainage Ecology
3. Biodiversity and respecting beyond the human
4. Commons, Cooperative Ethos and Working Together



Based on detailed studies, analysis and peoples' inputs it is observed that Chittur-Thathamangalam, is primarily a semi-rural town, despite its urban status. It is set in a largely agrarian setting of palms, paddy fields and associated ecology, with a unique cultural heritage due to its location on an old historic road that connects Kerala to the rest of India through the Palakkad pass. It has historically been an important town, a melting pot of various cultures, where even today 4 languages are spoken and where diverse local arts and crafts and festivals and settlement patterns are observed. Preserving its unique ecological assets and cultural diversity, while building on its proximity to larger towns like Palakkad, Thrissur and Coimbatore, ChitturThathamangalam can provide a high quality of life, with the best of urban amenities in a scenic rural setting. These are the key development concepts.

Chapter 18: POLICIES AND STRATEGIES

It's so hot! I see peacocks now in the town!

18.1 Climate Change Impacts

Climate-sensitive health risks are increasing, such as from heat stress, indiscriminate flooding, impacts on air quality, water quality and quantity, food security and safety, and distribution and ecology of vectors. Health-related impacts include temperature-related illness and death, extreme weather-related health effects, air pollution-related health effects, water and food-borne diseases, effects of food and water shortages, higher pesticide usage and vector-borne diseases. There are increasing chances of heat waves, sunstroke and sunburns in the Palakkad district along with most of the building stock becoming uninhabitable in summer.

Policy: To address the twin challenges arising out of climate change, that of rising heat and managing water flows.

Strategies:

18.1.1 Rising Heat

a. Afforestation; Shade:

1. Following the guidelines of the Kerala State Heat Action Plan, Chittur-Thathamangalam Municipality will focus on increasing shade by **providing permanent and temporary shelters** as appropriate in public areas including at bus stands/stops and waiting areas and by promoting sheltered spaces within public, commercial and office spaces.

2. Chittur-Thathamangalam Municipality will increase the tree cover in the town, by carrying out large-scale afforestation, especially along all the major streets and open spaces of the town. This will be carried out with community involvement or under the Ayyankali Urban Employment Guarantee Scheme (AUEGS). Local species like neem, tamarind, mahogany, *ungu, kanikonna, neer maruthu*, arrayal, peral, athi, ethi (the four ficus species) shall be planted that will bear both flowers and fruits, host native birds, and provide shade. They shall be used as **avenue plantations, on the riverbanks, and around ponds and canals** ensuring that they do not affect the agricultural crop. Bamboo and vetiver shall be planted along riverbanks to stabilize them from erosion. A sustainable bamboo growing and harvesting program will be promoted for environment-friendly material for buildings and products supported by training programs in collaboration with expert institutions. Existing acacia and eucalyptus plantations shall be replaced with ficus species in due course. Tree felling will be generally discouraged.

3. A Chittur-Thathamangalam Municipality-wide **Tree Survey** shall be carried out with ward-level participation to prepare a tree register that will include all the significant trees in public and private properties which will be banned from cutting/felling without appropriate permission from the Municipality in a prescribed form. Felling trees in the register without permission will attract stringent fines and

potential refusal of building permission.[24] Connecting the tree register with Forest Act shall be explored, to enable strict enforcement.

4. **A Local Tree Action Plan** will be developed outlining these details in a participatory manner to achieve sustainable outcomes.

b. Site Planning, Building Materials and Design:

1. All building permissions will be mandatorily evaluated for **shading and ventilation strategies**. Building permission application should be accompanied by details of plot level sustainable design detail for trees/plants preservation or planting, ground paving, kitchen gardens, onsite sewage and wastewater management that complies with the objectives of this plan. Any violation of the details committed in the building permission application shall result in the automatic cancellation of the building permit and attract enforcement action from the municipality.
2. More **environment-friendly, low-carbon and carbon-sink building materials (like locally available materials, recycled materials**, fast-growing timber and bamboo), climate-sensitive designs and methods of building will be promoted through incentives, awareness campaigns, training programs and evolving Development Control Regulations. Relevant sections of Kerala State Heat Action Plan 2020 and State Climate Action Plan 2021 shall be adopted as guidelines to promoting climate-friendly building practices.

   Current building practices using high heat absorbing, emitting, and trapping materials like RCC, glass and aluminium-cladded buildings shall be discouraged. Buildings with asbestos sheet roofs and paving open yards entirely with stones, blocks, tiles, and any other material that blocks soil's water percolation capacity will attract strict and heavy fines. Existing impervious paving will be encouraged to be replaced with a permeable alternative. Metals that have high embodied energy in terms of extraction, production and transportation costs shall be discouraged, except for recycled metals. Green concrete, fly ash bricks, timber, bamboo and other environment-friendly materials shall be promoted as better building alternatives. A manual with guidelines for sustainable building practices shall be made to support the building industry.
3. Buildings above a conditioned area of 500m2, connected load of 100 kW, and contract demand of 120kVA must follow the Kerala State Energy Conservation Building Code of 2017.
4. Buildings above 250 m2 of area should submit an environment and sustainability report along with the application for building permission, which will enumerate in detail how the building achieves environment-friendly and sustainable planning, design and construction.
5. **Restoration of the old building stock** in the town (timber roofs and mud or brick buildings with mud and lime mortar) along with **adaptive reuse** shall be promoted through campaigns. Older buildings are naturally climatically more comfortable and with minor additions can serve current needs. This would help combat climate change and prevent further resource extraction and environmental impact.

[24] Permission for tree cutting by the Municipality will consider evidence of specific reasons for cutting including health of the tree, potential danger to human life, and compensatory feasible and appropriate afforestation strategy.

6. A **detailed local building practice code** will be prepared to enable the function of regulating and promoting climate friendly building culture.

18.1.2 Managing Water and Drainage Ecology

a. Water Conservation: Chittur-Thathamangalam Municipality is committed to conserving water to assuage water scarcity in a rising temperature scenario, by protecting, safeguarding, rejuvenating and conserving surface as well as groundwater resources, mandatorily promoting rainwater harvesting at the individual household level as suggested in the Kerala State Heat Action Plan 2020.

b. Sustainable Agriculture: Chittur-Thathamangalam Municipality will work with State Climate Action Plan 2021 to encourage farmers to move away from water-intensive crops like sugarcane and banana plantations, adopt drought management strategies for crops, promote of climate-friendly food and nutrition strategies including promotion of climate-appropriate seeds, inland fisheries, multi-cropping, rotational cropping, inter-cropping, and mixed-cropping practices and horticulture, agro-forestry, and apiculture, promoting crops conducive to local agroclimatic conditions, creating resilient women communities in livelihood sectors through strengthening the women self-help groups,

c. Conservation of Drainage Ecology: Chittur-Thathamangalam Municipality is committed to the protection of its drainage ecology as the main ecological foundation of Chittur-Thathamangalam. This will be achieved through the **creation of a water-food-drainage-vegetation infrastructure called an Ecological Protection Zone conservation zone** integrating paddy fields, ponds, irrigation canals, rivers and other drainage channels along natural drainage ecological pathways. This infrastructure will be preserved protected and developed for posterity as the ecological foundation to guide Chittur-Thathamangalam's growth and transformation and as a core public space network through sustainable management of diverse elements in this network. This will include the protection, maintenance and restoration of the stream network, irrigation canals, natural channels all ponds and the river along with the associated vegetation of riparian areas with native species. **An integrated action plan in consultation with Padashekara Samitis**, aided by detailed GIS mapping and ground truthing will be developed to protect this infrastructure using zoning and buffer zone instruments drawn from the Town Planning Act 2016. A **detailed participatory action plan will be formulated** to ensure that the policy is developed to a realistic, equitable and implementable program. If found necessary, Development Control Regulations (DCRs) will develop adequate development rights compensatory guidelines drawing from the Transfer of Development Rights instrument in the Town Planning Act 2016. **Detailed Priority Action Plans** will be developed to ensure that elements in this network will contribute to cross cutting sectoral solutions including decentralised sanitation, promoting employment, creating inclusive accessible public spaces and opportunities for active play, entertainment, swimming/physical education, and sports.

d. Energy – Mitigation: Chittur-Thathamangalam Municipality will work with the State Climate Action Plan 2021 and the implementing agency Kerala's State Climate Change Cell in in the Directorate of Environment and Climate Change to implement relevant and appropriate state and national level mitigation and adaptation policies and programs. These shall include replacing the streetlights with solar lights, promoting

energy efficient appliances, promoting renewable energy-based technology in private and public buildings, renewable energy generation (solar, wind, waste to energy, etc) including micro-generation, sustainable transportation program, promoting carbon sinks including increased forest/tree cover, solarisation of agriculture.

"Well water is not fit for drinking anymore."

18.2 Managing Water

Networked Water Flows: Water bodies and networked water flows occupy a prominent role in the physical landscape, and social, economic and cultural life of Chittur-Thathamangalam. The Sokanasini River networked with 171 *kulams* or ponds, many natural streams, drainage channels and irrigation canals form the geography of a cascading water flow system of productive and protective drainage ecology. This network both helps to prevent floods during heavy rains and monsoons as well as retain groundwater supporting productive agriculture and a stable groundwater condition during drier months along with its significant cultural role in ritual, worship, bathing, washing and also as spaces of social interaction. In addition, there are many open wells (public and private) and borewells.

Drinking Water: The majority of people (58.18%) depend on piped water supplied by the Kerala Water Authority for their needs followed by dependence on well water (33.9%).[25] However, during summer, many parts of the town face drinking water scarcity. For example, a few areas in Thathamangalam are currently experiencing a drop in pressure and inadequate supply. Similarly, a few places like Neelikad, do not have a water supply network.

Water for Agriculture Irrigation: Monsoon is the main water source for agriculture in the town. In addition to monsoon, however, water is also drawn from Parambikulam Aliyar Project, and supplied through the extensive canal network and water bodies. The three types of irrigation canals named Main canals, CADA canals and Akampadam canals supply water to the large water bodies and agriculture fields and these form a sophisticated network of water flows to substitute the monsoon. Water bodies not only work as reservoirs for agriculture but also integrally part of cultural institutions, like temples and mosques and are also used by people for bathing, washing cattle and fish cultivation.

Stormwater Drainage: Stormwater drainage is enabled through a combination of absorption by permeable ground, drainage through the irrigation canal network, natural streams and channels linked to the cascading water bodies and agricultural fields network and the river. Some stormwater drains on main roads are discontinuous. The irrigation canals also serve as stormwater drains. Despite the high level of subsidiarity, heavy monsoon downpour results in strong stormwater flow.

Sanitation: Chittur-Thathamangalam has no networked sewerage infrastructure. Sewage disposal in Chittur-Thathamangalam is through individual household septic tanks. The current scenario has changed a lot since 2012 when 61.39% had toilets with septic tanks, while 37.75%

[25] Socio-economic survey 2012, T&CP Dept

used pit latrines, and 0.43 % had no access to individual toilets.[26] All houses currently have access to individual toilets and to septic tanks. Pit latrines are no longer used.

Issues: Despite the extensive water resource and network, during summer, many parts of the town face water shortage. Chittur- Thathamangalam municipality was listed among India's list of water stressed urban local bodies (Jal Shakti Abhiyan's Guidelines for Urban Water Conservation, GoI, 2019). Over-extraction of ground water for agriculture through bore wells is routine.

Currently *Kulams* where its economic and cultural functions dwindled, for example not integrally connected to either irrigating paddy fields or ritually connected to religious or cultural institutions are in a state of disrepair and disuse. The future of water bodies/*Kulams* after their economic role of irrigating agriculture fields is a matter of concern. This is further augmented by the conversion of land use from paddy cultivation and agriculture to housing/building/housing layouts is one of the main threats for water percolation, water flows, and drainage ecology and foundational landscape ecology of Chittur-Thathamangalam.

Some irrigation canals and stormwater drains are used by individual houses and establishments located near them to discharge their untreated sullage, and even sewage in some places which either stagnate or eventually find its way into paddy fields, Kulams, and river. A recent study by the Suchitwa Mission (Aug 2022) found that out of the 14 samples taken from different locations of Sokanasini only 1 was E-coli free. Similarly, out of 69 samples from various Kulams, only 10 were free of E-coli, indicating contamination.[27] (refer Section 11.1.1) The poor quality of surface water indicates that there is widespread contamination of groundwater from inadequately performing septic tanks and soak pits. The high density of settlements and proximity of wells and other water sources to septic tanks, combined with inadequate size, poor construction, or poor design of the septic tanks leads to the inefficient functioning of the existing sewage disposal system.

Policy: Sustainable management of fresh water, wastewater, and geography of water flows.

Strategies:

Sustainable Water Conservation: Sustainable management of fresh water, wastewater, and geography of water flows is one of the core concerns of Chittur-Thathamangalam Municipality's plan for the future. Chittur-Thathamangalam Municipality is committed to **addressing pollution, contamination, scarcity, inundation and flooding,** through water conservation and safeguarding the geography of water flows that integrate the surface and groundwater resources, mandating rainwater harvesting at collective and individual household level, promoting less water-intensive crops, developing **a detailed drought management strategy** for individual consumption and agriculture, and solving drinking water scarcity and addressing water pollution through innovative plumbing and land use conservation tools.

Ecological Protection Zone: At the core of this strategy is a policy to delineate and regulate a land use conservation corridor to safeguard drainage ecosystem, connecting, water flows, food production, vegetation and biodiversity. This will be called the Ecological Protection Zone

[26] Suchitwa Mission Water Quality Study August 2022
[27] Suchitwa Mission Water Quality Study August 2022

(EPZ)[28]. The Ecological Protection Zone will ensure that Chittur-Thathamangalam's fundamental productive ecological assets are conserved for posterity by establishing a sustainable spatial foundation to guide the town's transformation. Diverse elements of this interconnected network include irrigation canals, waterbodies/Kulams, natural streams, cascading paddy fields, and the river. This conservation policy has been developed from detailed documentation with ground verification to establish connections and hierarchy within this network. This zone will be enhanced in due course through participatory and supportive projects and programs and a detailed action plan will be developed working with farmers collective, landowners, other relevant stake holders, and state and national government agencies.

Elements of the existing drainage network, that was mapped, (see Fig 13.2c) will be further integrated into supporting life in Chittur-Thathamangalam Municipality in a cross-cutting manner including sanitation, public space and biodiversity. Chittur-Thathamangalam Municipality will exploit all available state, national and international funding opportunities to develop and implement this strategy like PMKSY (Pradhan Mantri Krishi Sinchayee Yojana), AMRUT 2, etc. Chittur-Thathamangalam Municipality will run effective public education campaigns to enable this purpose.

Kulams, Tanks, Ponds, Waterbodies: Chittur-Thathamangalam Municipality is committed to the repair, protection and conservation all the existing private and public Kulams, tanks and water bodies within its boundary and prohibits any form of reclamation or filling. All Kulams are banned from any changes to their boundaries, reclamation, or development. Kulams are placed under protected zones restricting any land use change. Chittur-Thathamangalam Municipality will prepare as a matter of urgency **a detailed map and a register of every Kulam, tank and water body delineating its protective boundary and appropriate buffers** and development rights compensation in collaboration with relevant stakeholders. Relevant Kulams will be utilised for a decentralised nature-based sanitation system for Chittur-Thathamangalam. In the short term, the Kulam behind Anikode taxi stand shall developed as a pilot project for nature-based wastewater treatment integrated into public open space. Wherever appropriate, Kulam embankments shall be developed/promoted:
1) As Parks/parklets with vegetation,
2) For Boating facilities,
3) For inland fish cultivation,
4) For swimming training,
5) To support farming/agriculture.

Adoption of some of the larger ponds by specific schools in the town to develop a strong water activity stream in their curriculum, including diving and swimming/water sports will be explored. Chittur-Thathamangalam Municipality will organise a Kulam Owners Cooperative or Collective to develop and realise this in a participatory manner. Chittur-Thathamangalam Municipality will support the protection, repair and maintenance of both Public and Private Kulams drawing from state, national and other relevant programs. Water quality in all Kulams will be regularly monitored and any cause of pollution shall be rectified. Further, Chittur-Thathamangalam Municipality is committed to restoring and protecting the existing public wells and explore options for their adaptive reuse, including its role as ground water recharge aquifers, public drinking water facility, or public space.

[28] Please see Fig 21.10.7 in Chapter 21 Land Use and Sectoral Proposals

Canals, Channels, Streams: Main, and subsidiary canals (CADA and Akampadam form the three types of irrigation canals in Chittur-Thathamangalam Municipality that distribute water from the dam-based irrigation projects onto the Kulams, tanks and water bodies, distribute across to paddy fields and drain finally into the river. These canals along with the stormwater drains are an integral element of this drainage ecology network; therefore, are declared hereby as protected infrastructure and any changes or damages to these canals that will disrupt its flow or damage the embankments, edges and retaining walls are banned, will attract enforcement action, withdrawal of building permission where applicable and heavy fines. Disrupters will have to rebuild it at their own cost. Further bed concreting of canals, streams and channels by public or private agencies that currently enable water percolation is banned. Chittur-Thathamangalam Municipality will clean and repair all irrigation canals and drains, promote public open spaces, walkways, and linear parks along canals embankments wherever appropriate in an enabling manner and will explore using the canals to align pipes to collect and transport wastewater as part of developing a decentralised sanitation and wastewater treatment program. Any letting of sewage or wastewater from individual houses and institutions onto the canals is banned and will attract significant fines, and if multiple warnings go unheeded will result in the cancellation of the building permit and issuance of a 'hazardous building' notification.

Connecting the River: Chittur-Thathamangalam Municipality is committed to connecting the Sokanasini River with people more closely by opening up the river edge as a public open space, walkway and linear park, and for sustainable and responsible leisure activities, like boating, and cultural events. This no-building zone will be detailed, guided by the River Flood and Buffer Zone Maps.[29] Maintenance and revegetation of riparian areas with native species shall be a priority to maintain the river morphology, provide bank stability, filter pollutants and maintain flow during lean periods. The water quality of the river shall be regularly monitored, and any cause of pollution shall be rectified.

Water Supply and Sanitation: Chittur-Thathamangalam Municipality is committed to solving water scarcity, through working with the KWA, solving plumbing and grid-related problems, including water scarcity and low pressure, or laying new water supply networks.

a) **A detailed wastewater action plan** will be developed to address pollution and treatment by establishing decentralised sanitation systems for managing sewage and sullage as discussed above. This will be done through:
    a. Developing **a detailed action plan for individual household sewage and liquid waste management** infrastructure and practices with detailed regulations and guidelines that will be implemented through the building permit and premises maintenance regulation.
    b. Developing **specific nature-based liquid waste management projects** using the ponds and water bodies based on adjacent density clusters (for example Agraharam row houses house 2500 persons) and also to be developed as public spaces integrated with the water network.
    c. Building institution-level sustainable sanitation solutions for all education institutions and public offices.
b) **Water Supply:** Chittur-Thathamangalam Municipality is committed to a water supply system that is equitable in terms of distribution, low-cost and energy efficient and responsive to requirements on the ground. To address the issue of contaminated river

[29] Please see PLU Map Fig 19.8 in Chapter 19

water due to the overuse of fertilisers and pesticides in the basin, (for which the current Water treatment plant is inadequate), it is necessary to provide potable water through local neighbourhood water ATMs, at least for marginalised communities. To address low-pressure issues at the tail end of the supply, low-cost interventions like shafts or small water reservoirs are to be pursued as pilot interventions which can be scaled up. Innovative treatment methods will be developed working with KWA to purify the drinking water extracted from the river from pesticides and chemical fertilisers leached from the agricultural fields.

Others: Chittur-Thathamangalam Municipality will use the local knowledge as well as technical expertise to build a **map of hydrogeology**. With the assistance of the Ground Water Department, Chittur-Thathamangalam Municipality will augment knowledge of groundwater and identify best zones for recharge including the use of cartographic data to **delineate micro-catchments** for scoping pilot interventions. New Building permits will be issued to both individual buildings or to residential layouts, only with the condition that sewage and sullage will be contained within premises, and not let out to a public drain unless it is part of a designed neighbourhood-based decentralised nature-based sanitation system. Wherever relevant, especially in restrictive or small sites, Chittur-Thathamangalam Municipality will promote innovative design or support periodic emptying and safe disposal. Working with the Swacch Bharat Mission, Chittur-Thathamangalam Municipality will run a communication and awareness-building campaign to ensure wastewater is not let out to storm water drains and also to advice and ensure adequately designed septic tanks and soak pits are installed. Chittur-Thathamangalam Municipality is committed to addressing the problem of contamination and pollution of ground and surface water sources, water bodies and the river. A **detailed sanitation action plan and practice manuals** shall be developed to support this program.

'Where are the jobs? Youth migrating' Which youngster wants to farm anymore?"

18.3 Livelihoods, Employment

Chittur-Thathamangalam had a high work participation rate of 40% in 2011 which is higher than the state and district averages. The number of agricultural labourers, cultivators and household industrial workers have all declined over the decades since 1981 while other workers have been increasing, indicating a shift to other activities like trade, commerce, construction activities etc. According to the socio-economic survey of 2012 (Draft Master Plan 2031), 83% of people work in the tertiary sector (Government employees were a significant 15.72 %), while 14 % are in the primary sector and less than 3% in the secondary sector. One-third of the population is unemployed and half of those are actively looking for employment. This indicates that jobs were not easily available, and people were moving away from agriculture and existing local household-based livelihoods of handloom weaving, pottery, bamboo products, mat weaving etc. The recent years have seen a sharp growth in the number of small-scale industrial units which has grown from 174 units in 1994 to 741 units in 2013. Textile units are the largest number, followed by agro-based industries with engineering units with a close third.

Traditionally Chittur-Thathamangalam has been a farming town with rich household craft-based industries including handloom weaving of silk and cotton textiles, pottery, sedge grass (kora) mats and bamboo products. Even though currently close to half of all the land is used for agriculture, only about 17% of people are employed in the sector - Tertiary sector

employment is rapidly overtaking primary and secondary sector occupations. Paddy, Coconut, and Toddy are the main produce, with a mix of other crops. Currently, there are 18 Padashekara Samithis within the Chittur-Thathamangalam Municipality. Shift away from agriculture is rapid due to economic viability problems caused by intersections of changing weather patterns, water scarcity and erratic supply, productivity, production cost including labour cost/shortage and generational shift. Erratic monsoon patterns and increased heat have affected crop yields in recent years. Further, despite the Paddy Fields Act, real estate speculation and house construction has been nibbling away productive agricultural fields. Further, as a sector, its high level of female worker participation is being slowly replaced by increasing male migrant workers from Northern India. Land is increasingly left fallow or converted into residential use. Animal husbandry (of cattle) is also in decline but fish farming on agriculture fields is on the rise. There is also a shift to fish farming resulting in the conversion of paddy fields into fish ponds. In 2012, there were 2 fish farms (Draft Master Plan 2031) which has grown to 26. The social and environmental implications of increasing fish cultivation ponds are not clear yet. There is no fish market in the town; the nearest is in Pudunagaram village.

Local weaving practices continue in two wards in the town - Devangapuram and Vadakkethara, employing 70 and 140 workers respectively. (Draft Master Plan 2031) Though other communities are also engaged in weaving nowadays, there is a decline now due to competition from power looms, low returns, lack of skilled weavers lack of diversification of production and lack of access to enabling markets. A weaver's cooperative which could help the individual units scale up has become dysfunctional. The weaving of mats from Kora grass is done on a low-beam floor loom. This occupation is under threat of extinction in Chittur-Thathamangalam since the number of families working on producing these ribbed plain weave mats has reduced from 60 families to just 1 individual. The cost of the hand-woven mat is expensive compared to plastic mats in the market. Bamboo craft products such as baskets and winnows etc, also became unviable due to the competition from plastic-based products.

Policy: To support farming, traditional skill-based industries, and local crafts and promote opportunities and skill base for the service sector and new-age employment sectors

Strategies:

Farming, Agriculture: The future of farming, farmlands and its associated ecology, its potential transformation and its implications on the economy, culture and society is a matter of significant concern to Chittur-Thathamangalam Municipality. The Municipality is committed to supporting farming and farmers and to promoting pesticide-free food production. CTM will promote the modernisation of the agriculture sector to increase productivity and economic viability. The Municipality will support farming and agriculture through specific actionable tasks such as

- Repair and maintenance of irrigation canals
- Removing encroachments on the irrigation canals
- Support solar fencing to protect from wild boars
- Promoting sustainable irrigation methods
- Promoting mechanisation and provision of seed stores, farm equipment, godowns, storage facilities, warehouses
- Information and advice for farm diversification including farm tourism, crop diversification, crop rotation, multi-cropping
- Linking solid waste composting with manure supply

- Promote productive linkages (markets, financing institutions, knowledge producers, social enterprises, businesses)
- Promote agriculture tourism
- Promote facilities for value-added production from paddy and coconut
- Enable farmlands to retain their reciprocal linkages to water networks to sustain the drainage ecology
- Protecting highly productive farmlands from the threat of real estate speculation
- Promote organic food production within homesteads
- Promoting degree courses and research centre on farming and agriculture in Chittur College
- Setting up an Agro-meteorological observatory in Government College Chittur
- Promoting environmentally sustainable and economically viable food production practices through outreach, information campaigns, training, and support

- Chittur-Thathamangalam Municipality will work with agriculture cooperative banks, NGOs and private organisations as well as NABARD to implement enabling programs and accessible markets. Potential opportunities from the Mission for Integrated Development of Horticulture and schemes of the Department of Agricultural Development and Farmers' Welfare will be explored. Chittur-Thathamangalam Municipality will work with the Padashekara Samithis, experts and government agencies to develop and implement a **10-year perspective action plan on agriculture**, productively connecting to various state and national missions (like horticulture, coconut development, farmers welfare, insurance), including the National Food Security Action Plan.

Skill-based Enterprises: The Chittur-Thathamangalam Municipality will garner support for the traditional skill-based industrial sector – textile and mat weaving, bamboo craft, metallurgy, and pottery etc by

1. Connecting with state and national employment and craft promotion missions
2. Linking with social enterprises that are experienced in building cooperative networks, branding, and promoting new design ideas linking with design schools like the National School of Design, Industrial Design Centre in IIT-Mumbai, practising fine artists and fine art promotion institutions.
3. Providing enterprise training, modernisation, and skill-building support.
4. Supports to identify and access handicraft markets, enabling finance, and promotional avenues. Handloom and handicrafts of sustainable products should not be competing with industrial plastic-based mass-produced consumables markets, particularly cheap imported products. Therefore, innovative ways to market handlooms and handicraft products will be explored with the participation of co-operatives including online platforms, local outlets, and outlets in international Airports and metropolitan high streets.
5. A detailed action plan for the economic development of handloom and handicraft household enterprises will be prepared working with relevant government agencies and expert organisations.

Others: In addition, Chittur-Thathamangalam Municipality will aim to

1. Attract new-age employment providers, through employment fairs and providing start-up facilities and co-working spaces.
2. Support the traders' guild and trader's collectives to collaborate with relevant enterprise-promoting organisations to provide training for businesses to thrive in a world of e-commerce and online shopping.
3. Promote vocational courses in Government College Chittur- like courses on swimming instructors, gym trainers, physical education, nutritionists, etc that can lead to local and regional employment pathways.
4. Support Women entrepreneurs connecting with relevant state and national missions including finance support/grants for local business start-ups.
5. Promote career support guidance and entrepreneurial training to young people and extend employment support for disabled people who want to work.
6. Promote business support grants bringing together local banks and financial institutions to promote local enterprise.
7. Extend support to the street vendors in making a sustainable livelihood and waste management.
8. Promote Tourism by developing attractive tourist trails connecting all local and regional assets of value, developing exciting cycling and walking routes, a local tourism information centre, information brochures, branding, advertisements, promoting Farm Tourism, Heritage Hotels, and homestays, etc.

'Where to pass the time/gather?'

18.4 Public Spaces/Active Mobility/Active Play

Even though visitors would be struck by the beauty and peaceful ambience of Chittur-Thathamangalam, it is a very scenic landscape of paddy fields and coconut palms, religious institutions and display of cultural richness during the annual festivals, the people living in the town feel the lack of vibrant enjoyable public spaces where people across gender and age groups can hang out, entertain, socialise, exercise, conduct morning and evening walks, or for sports training. Sports and physical activity are paramount for confidence building, learning about teamwork, and self-care, and keeping young people away from increasing substance addiction. Chittur-Thathamangalam has produced highly successful national and international athletes and sports persons despite its meagre sports infrastructure. This infrastructure has currently declined even more and there is a significant lack of play spaces.

The town has never had a very active river's edge despite the immense potential. The river has always been a backyard that was intensely exploited to support the material requirements of life – like sand, water, fishing etc. Except for one node in Thekkegramam, the town had always turned it back to the river, and most land uses along the river are farmlands and paddy fields with the exception of a kilometre-long stretch that abuts the campus of Govt College, Chittur. The points of entry into the river are very few and are from Thekkegramam or near the bridges and causeways. The riverine edge is rich in biodiversity and is largely wild, with vegetation, and naturally grown large trees and shrubs. The banks are crisscrossed by many drainage channels finally making their way into the river. The riverine edge offers many possibilities for public gathering or spending time, but since it is not habitable, it is not accessible to all sections of the population and its use is currently limited to the young and able.

Currently, there are many shrines, the banyan trees or *aaltharas* distributed across the town, especially in the older settlement clusters, some public ponds that serve as public gathering places. Many of these date from pre-independence times. Beyond these, there are hardly any new secular public gathering areas developed for the use of the general public. Bus stops, the *chaikada* (tea-stall), and the *kallushapu* (toddy shop) are other public spaces but these are largely male spaces. The street too is largely a male space that is off-limits to others. Walking itself is not a pleasurable activity in the town, since pavements are either not provided or not continuous or ill-maintained. There are a couple of municipal parks, two municipal libraries and two libraries run by civil society.

Recreational facilities are few and include a couple of cinema halls while college grounds and school grounds provide some play space for children. Apart from these, there are other open spaces like the playground near Pencos in Thathamangalam that are used by children for active play. An interesting simple open-air performance space created in January 2018 (through civil society action by the Panchajanyam Library's efforts) along the river's edge indicates the huge potential that exists in the town to create effective and wonderful public places (see below).



Fig: 18.1 Open-air performance space on Sokanasini Riverbank in action

Health statistics tell us that the current major diseases in the town are non-communicable diseases (hypertension and diabetes). People who are suffering from these would definitely benefit from active mobility. There are also indications that accidents are quite common in the town (Refer Fig 11.2a, b, c).

The large number of *aal marams* (banyan trees), *kulams* (water bodies), paddy fields and the *puzha oram* (river edge) all offer great potential for public spaces. Therefore, there is a need to protect, conserve and upgrade existing public spaces: create parks, active play areas, promenades (around ponds), playgrounds, and river walks.

Policy: With the goal of 'inclusive active mobility, to develop a diverse set of indoor and outdoor public spaces in the town that can cater to people across gender, sexuality, ability and age group for entertainment, walks, sports and physical activity, socialising, learning, and relaxing.

Strategies:

Chittur-Thathamangalam Municipality will conduct public campaigns to promote healthy and active living. **Inclusive active mobility** shall be the goal so that all ages, genders, and differently-abled populations can move around freely in the town. An action plan detailed with specific projects for inclusive active mobility, entertainment and recreation, public open spaces, sports and play spaces will be developed to achieve these. The plan will include among other things:

a. **Cultural Facilities:** The existing AEO office will be converted to a cultural centre and art gallery working in collaboration with the Department of Culture and Lalitha Kala Academy. Chittur-Thathamangalam Municipality will continue to augment existing public libraries, provide support and assistance to existing libraries, and promote new ones. The Municipality will develop a public room for women and children with a children's library and children's adventure playground.

b. **Pocket Public Parks/Parklets**: New pocket parks within walking distance of different housing clusters will be made with outdoor exercise equipment exploring the opportunity to utilise municipal land and puramboke inside each ward including excess land in Anganwadis. Chittur-Thathamangalam Municipality will work with different institutions like the Irrigation Department, PWD, Kerala Water Authority etc. to make walkways and linear parks along large irrigation canals, and water reservoirs, that have existing buffers. Semi-open public socialising spaces will be provided in the public housing clusters (known locally as colonies).

c. **Inclusive Access:** All public spaces and public buildings in the town will be made accessible for disabled people. Disability access will be made a mandatory aspect of the building permit for private projects that gather people for public, commercial or religious/cultural functions. Chittur-Thathamangalam Municipality will work with Police and volunteers to make sure public spaces are accessible and safe for women, girls, trans people and disabled people as much as they are for men and boys all the time. Community groups that promote secular public events for socialising and entertainment will be supported.

d. **Shaded Spaces**: Given the rising temperatures in Palakkad district, shaded public spaces will be taken up as a priority. An afforestation plan will be actioned throughout the town along the major road network so that tree canopies like the beautiful welcoming archway in Chittur College entry is developed in different parts of the town. To facilitate this, the Municipality will work with organisations to make all cabling underground, so that no power disruptions occur due to branches of trees and other disruptions due to storms etc. Further, the tree canopied walkway of the Chittur College is hereby declared as protected and any construction or development activity that will damage it is banned and will attract heavy fines and automatic withdrawal of building

permission. Chittur-Thathamangalam Municipality will work with the Govt. College, Chittur and the local community to nurture this iconic walkway and its biodiversity.

e. River Edge: The entire River edge will be protected from any building activity using restrictive land use zoning, and development rights compensation (if applicable) and will be opened up as a public open space edge connecting the length and width of the town with quiet walkways, and open spaces with minimum construction and pavements, and enhancing biodiversity. Opportunities for recreational activities like boating, kayaking and socialising will be explored. Existing Cremation grounds will not be bothered but building activity will be completely banned within this restricted zone. The old bridge near Chittur College will be revived and restored as an active public space. A detailed town planning scheme for the river edge will be developed outlining the buildable line, and mechanism for any development rights compensation and design of active public nodes and walkways. An in-principle outline of such a scheme is illustrated below.

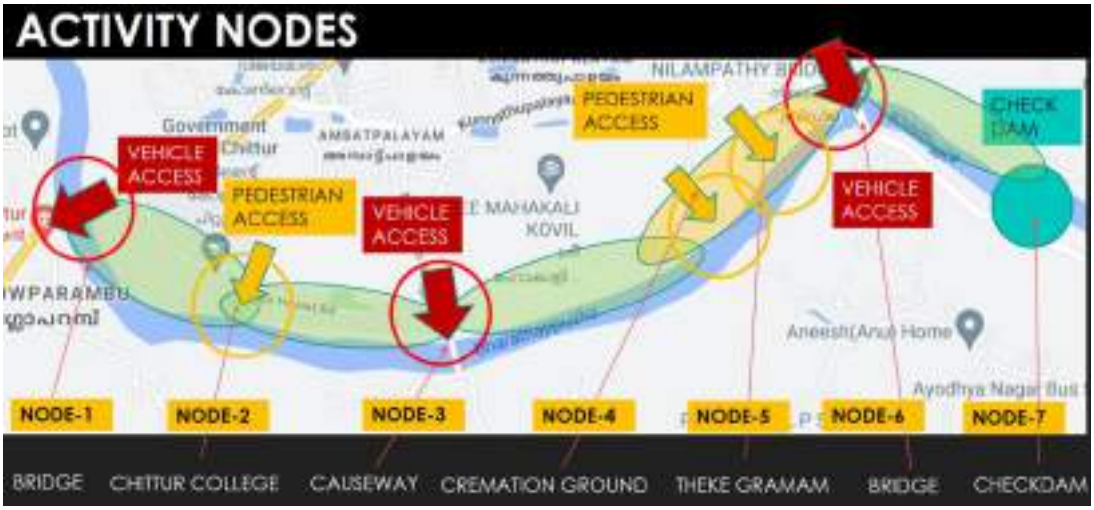


Fig 18.2 Activity Nodes proposed along the river edge

f. Others: Selected water bodies and ponds will be developed as public parks and open spaces. Sidewalks will be provided along major roads in Chittur and Thathamangalam to promote and facilitate walking. Chittur-Thathamangalam Municipality will promote cycling paths along the main road to integrate cycling with everyday mobility[30]. In addition, a recreational cycling route will be identified within the town connecting the wetlands, open spaces, paddy fields, country roads and river which can attract young people and cyclists from the region.

g. Aalmaram/Aalthara Protection: *Aalmarams*, as heritage trees, *Sacred groves/kaavus* (along with the *Aaltharas, as public places of value)* are identified as Local Assets of Value protected from any form of damage, including cutting of branches without the municipality's explicit permission, based on the tree preservation strategy outlined above. Further, any demolition or building works that will cause damage to existing *Aaltharas* and Banyan trees (*Aal maram* or *Vaaka marams*) and sacred groves/*kaavus* are prohibited (and covered under the Guidelines for Felling and Removal of Trees from Public Places, 2011) and will attract enforcement action and stringent fines.

[30] Please see Fig 19.14, Fig 19.15 and 19.16 and Table 19.2 and Table 19.3 in Chapter 19

h. **Playground/ Sports Facilities:** Chittur-Thathamangalam Municipality is committed to providing state-of-the-art infrastructure for the full range of indoor and outdoor games, athletics, swimming and physical training to build competitive athletes and sportspersons of the future. A detailed Sports and Active Play Action Plan will be developed in consultation with relevant stake holders integrating the facilities in schools. This will include strategies and projects like:
    1. The management of the forthcoming new outdoor stadium,
    2. An indoor stadium and playgrounds with state-of-the-art facility to be promoted by upgrading the infrastructure of existing educational institutions and exploring alternate sites.
    3. Swimming training in collaboration with Fire Force for children and young people, using appropriate Kulams, and the swimming pool in Government College Chittur.
    4. A local sports promotion committee shall be established to initiate, promote, support and oversee the various activities and commitments.

"I thought I would be crushed in the crowd in Konganpada this year!'

18.5 Festivals and Folk Art Traditions

Festivals are an integral part of Chittur-Thathamangalam's annual calendar. The town has several unique annual festivals like Konganpada, Angadivela, Karivela, Suran poru, Chariot festivals/Theru, Ayyappa vilakku etc. There are also more modern and secular fixtures like the Panchajanyam International Film Festival. Some earlier festivities like the Paana have vanished altogether. The majority of the main festivities in the municipality take place in the relatively cooler and drier six months from November to April. Konganpada and the Angadivela attract large crowds and include public processions along select public roads. Caparisoned elephants and horses take part in some of them. These festivals are often accompanied by locally produced fireworks displays. The festivals are varied in duration, spanning a single day to a week or two weeks. Currently, these festivals are all organised through community participation with local committees managing each event.

Given the increasing visitor participation in all festivals and that most festivals occur on the narrow streets in the town, it is important that there needs to be some crowd control measures instituted at these festivals to ensure safe festivals for all. Facilities such as restrooms, emergency medical care and waste disposal provisions are limited. A large informal market also comes up around these festivals. Space and amenities to manage the varied kinds of stalls need to be managed and properly allocated. Most festivals are changing in character in response to new realities with certain rituals, arts and practices discontinued.
The region is also home to a number of folk performance forms that employ music, mime and dance like Kanyar, Porattu, Malama, Ayyappanpattu, etc. Though many of these are continued due to ritual relevance, they are also experiencing decline due to limited demand, and poor rewards. Some of the practitioners are supported through Sangeet Natak Akademi and some charity sector grants and fellowships. A better future for the art forms of the region should be developed.

Policy: To support and promote the rich and diverse traditional and modern festivals and performance art forms to be entertaining, ethical, safe, economic opportunity and sustainable.

Strategies:

Chittur-Thathamangalam Municipality recognises the important social cultural religious and economic role of festivals. Over the years these festivals have also started attracting large number of people from across the region and have also become a potential site of impending disaster. Therefore, the Municipality will work with festival organisers to

1. Ensure that the festivals are ethical, enjoyable, sustainable, safe and inclusive
2. To provide restrooms and makeshift toilets and green environment-friendly fireworks.
3. Regulate festival conductance to ensure public safety based on an agreed disaster mitigation and crowd management plan that all festival organisers need to follow for their license to be valid.
4. Provide drinking water stalls, mobile restrooms, medical emergency stations, solid waste collection and liquid waste collection systems from popup shops.
5. Assign areas for vending during the festival.
6. Support through infrastructure improvement working with the local communities, like declaring the Kummatti path as shared commons (not as exclusive private property) and restoring the broken Kummati paths through the fields to augment the ritual significance of the procession and its safe conductance.
7. The tourism potential of festivals will be explored by working jointly with cultural businesses, the Department of Tourism, District Tourism promotion Councils, and social enterprises.
8. Conduct a crafts and trade fair during the festival season in the Nehru auditorium to promote local handlooms and handicrafts.
9. Set up a Cultural Centre/Art Gallery after conserving and adaptively reusing the old historic AE Office building.
10. Set up a Konganpada Museum by conserving and adaptively reusing the traditional building currently used as a Village Office near Chittur Kavu.
11. Working with Sangeetha Nataka Academy and cultural industries working with social media and other potential partners, Chittur-Thathamangalam Municipality will set up a storytelling academy bringing together the diverse local capabilities in performance art practices.
12. Heritage market street stretches are to be identified along with the old historic road and its *chumadathangis* (head loading stones). These need protection and architectural building guidelines to be drawn up.

'I hardly go anywhere. I am afraid to cross the street'

18.6 Inclusive Mobility/Active Travel

The majority of the people of all ages walk in the town despite the poor walking infrastructure in the town. Walking and public transport carry the greatest number of people, however, the number of private transport in the form of cars and two-wheelers is increasing at an alarming rate. Speeding on the road is a common issue; this combined with the lack of separate walkways or cycle paths has meant that accidents have become common and there are recurring accident spots. Chittur-Thathamangalam very rapidly moved from a pedestrian and cycle-friendly town

to an unfriendly one over the decades. Even though majority of the people still walk, cycle or use public transport, the peak time congestion on main roads, speeding two-wheelers, busses and cars, and frequent accidents and casualty are not uncommon. There are accident hotspots that needs attention. Main roads are extremely unsafe for pedestrians – especially old people and children, and fully unsuitable for disabled people. Most public and commercial activities are concentrated along the main SH25 making it busier, however, it is the most pedestrian-unfriendly road.

Two wheelers dominate the vehicle proportion. Indiscriminate two and four-wheeler parking on the main roads reduces the available road widths mainly in commercial streets contributing to peak time congestion. Lack of adequate traffic management in front of schools contributes to peak time congestion, given most of the schools are along the main roads. Adequate bus stop infrastructure, especially near main activity areas is lacking. Autorickshaws and taxis perform a very important role within the transport system, however, the location of auto and taxi stands contribute to traffic congestion and crowding in many important Junctions. There are parts of main roads where road geometry is unsafe and road width extremely narrow. Many new housing areas have very narrow street widths and road geometry that will not allow two vehicles to cross each other or allow fire engine access. There is high demand in Chittur-Thathamangalam for a bus interchange facility, given that the KSRTC bus stand is unscientifically located in a remote corner.

Policy: To achieve sustainable, active travel and inclusive mobility

Strategies:

Sustainable / Active/Inclusive Mobility: Chittur-Thathamangalam Municipality is committed to achieving sustainable, active and inclusive mobility where people across age group, gender, and abilities feel safe to be on the road, especially as a pedestrian and cyclist. The Municipality will build accessible wheelchair-friendly, children-friendly and safe walking and cycling infrastructure along main roads and promote walking and cycling and reduce private car use. It will promote the adoption of zero-emission electric vehicles – cars, scooters and cycles and traffic calming measures. Using resources from diverse sources such as national and state missions, and international campaign opportunities, Chittur-Thathamangalam Municipality will explore the possibility of introducing free of cost electric mini-bus for inclusive community transport – to help old and disabled people from the region to access public spaces and community facilities during the day.

Promote Walking: River walks and good pedestrian infrastructure will provide for morning walkers and entertainment walkers. Walking festivals will be promoted to generate awareness and fitness.

Road Safety: Chittur-Thathamangalam Municipality will make road safety paramount by introducing speed regulation on all roads, rectifying dangerous road geometries, removing causes of accidents at hotspots, introducing speed breakers, zebra crossing and sidelining on all major roads and signalised Junctions where it is necessary. The Municipality will strictly promote the culture of stopping for pedestrians at zebra crossings with the help of volunteer road stewards and public education campaigns. Adequate lighting on the main roads will be ensured for the visibility of pedestrians and motorists and appropriate Signage will clearly demarcate pedestrian zones and speed limits with CCTV cameras. Limits will be displayed clearly on road stretches and will be enforced also with speed breakers located at appropriate

locations for road and pedestrian and cyclists' safety – this will include near schools and colleges, main Junctions, public offices, and areas where speeding has been observed.

Bus Interchange: A new bus interchange will be built at the Chanthapettah, Municipal Complex in Chittur.

Shaded Streets: Trees on the side of roads will be protected, and new trees planted, to reduce pollution from particulate matter from emissions, as well as to provide a pleasant ambience.

New Housing areas: New residential layouts or houses in green field sites will need to follow stipulated road widths of a minimum 7 meters carriageway, and provide associated infrastructure like sidewalks of 1.5 meters each on either side, parking spaces where applicable, and drains and streetlights for obtaining building and planning permission. Parking on the roadside blocking moving traffic or on a walkway will attract heavy fines.

Junction Improvements: Identified specific Junctions (refer Fig 19.17) will be improved to ease traffic movement, and pedestrian, shoppers and cyclist experience and imageability by working with relevant stakeholders including the PWD and local building and property owners.

Auto/Taxi Stands: Appropriate locations for autorickshaw and taxi stands will be identified by working with the stakeholders. A call facility for autos and taxis will be established which can enable people on the road as well as at home to call the number or press a button to request the service. This will also reduce the road width taken by auto and taxi stands on main roads.

Parking: Adequate parking facilities with parking charges will be introduced on the main roads.

Regional bypass: A regional transport strategy will be developed working with the neighbouring panchayats, and PWD and transport organisations to enable bypass and alternate routes for through traffic at more appropriate regional scale (refer Fig 7.30).

A detailed perspective action plan for inclusive, sustainable, and active mobility will be developed detailing out strategy, road and sidewalk design, parking and bus bays, street furniture, tree planting strategy, campaigns, etc., building also upon the national and other state missions on mobility. The outline road design template provided in Table 19.3 will be adopted in principle and a detailed design will be developed in the action plan.

'I don't like it when my neighbour burns her plastic waste'

18.7 Solid Waste

Solid waste in Chitttur-Thathamangalam is relatively well managed compared to many other municipalities in Kerala. At Parakkalam solid waste treatment plant, there is a 3 T compost plant and compost is manufactured using the windrow composting method. An incinerator has recently been set up to take care of hazardous waste. A small landfill site with legacy waste is present towards the north of the site. The municipality has bought an incinerator for biohazardous waste. However, collection is an issue. There is a pilot being run in the town using a black-soldier fly for food waste by a private company that has been given the space by

the municipality. There is the Haritha Karma Sena team that manages waste collection daily based on a monthly fee paid per household. However, all households are not part of the current house-to-house waste collection system leading to some waste being dumped in public space. Hazardous waste, electronic waste and sanitary napkins and diapers need a clearer policy and implementation method. Currently, sanitary napkins and diapers are being burned or dumped, both of which are damaging to the environment and people. People burn plastic waste in their compounds, which is harmful to their health and the environment.

Policy: To transform waste into resources and move towards 'zero waste'

Strategies:

Transforming waste to resource: The future envisioned for Chittur-Thathamangalam's solid waste is to slowly move towards 'zero waste' and transform waste into resource. Chittur-Thathamangalam Municipality will work with government agencies, non-government organisations and private companies as appropriate to develop and implement a sustainable solid waste management program which can address past, present and future waste. This will be adopted as the key principle to guide the ongoing Solid Waste Management Master Plan project funded by the World Bank.

Collection: Waste collection will be strengthened and house-to-house collection against a fee will be changed to buying waste from households for a price. The municipality will explore the option of being the agency responsible for the waste collection and hiring Haritha Karma Sena to manage the waste-to-resource conversion. Chittur-Thathamangalam Municipality will develop and implement a strategy of distributing sorting as well as composting bins to individual households and will be integrated with the collection and processing system.

Segregation: CTM will ensure the segregation of biodegradable (BDW) and non-biodegradable waste at user premises prior to collection. This will be made mandatory for both residential, office, institutional, cultural, and commercial premises. The option of distributing well-designed easy-to-use municipal bins for segregating waste will be explored. Recyclables like plastic will be collected following a calendar that will be regularly reviewed based on performance.

Recycling/ Disposal: Plastic/non-biodegradable waste collected will be processed and sold to local scrap dealers or Clean Kerala Company based on competitive rates; the inert non-sellable components will be converted into energy using appropriate collaboration.

Sanitary and Medical waste: The Chittur-Thathamangalam Municipality will explore collaboration with IMAGE, run by the Indian Medical Association, and assisted by the Taluk Hospital to develop an interim arrangement to pick up bio-medical waste and sanitary napkins from households, schools and establishments along with hazardous hospital waste that they already collect. A detailed sustainable and long-term strategy shall be developed in the Solid Waste Management Master Plan project.

Electronic Waste: A detailed strategy for dealing with Electronic waste will be developed as part of the Solid Waste Management Master Plan led by the World Bank funded project.

Composting: The scope of composting will be expanded and linked with the manure need for agricultural lands and household cultivation/growing. Chittur-Thathamangalam Municipality

will work with Haritha Karma Sena members to improve/ repair/retrofit existing facilities with a clear idea of circulation (persons, vehicles), storage (manure, tools, dresses), working conditions (wash/changeroom, toilet, water, resting space) and reduce fly/insect problem at site (use of better inoculum or alternative composting/conversion methods like in-vessel or black soldier fly etc)

Land fill: The legacy waste that is currently at the Solid waste site, though small will be stopped and will be bio-mined, leaching remediated and the land will be reclaimed and afforested or utilised for more sustainable and appropriate function.

Penalty and Fines: Waste dumping/throwing on water bodies and canals, roadsides, public or private open spaces and indiscriminate burning of waste is banned and will attract hefty fines and other penalties.

'Many old houses are empty and crumbling'

18.8 Housing

Chittur-Thathamangalam is a historic town with a unique amalgamation of cultures due to its location in the Palakkad Pass and en route to states and kingdoms outside Kerala. According to the 2011 Census, the total population of the Chittur-Thathamangalam Municipality was 32298, with 7974 households and 10495 houses. Independent house on a piece of land is the dominant typology with most people owning their house and land. More than 80% of lots are small, measuring under 10 cents. [31]

Housing is a mix of new independent bungalows, row housing in the Agraharams and traditional settlements, old tharavads and nalukettus. The town has many old settlements that are largely community/trade-based. For example, the row houses in the five Agraharam settlements house around 2500 persons – almost eight percent of the total population. These include the Durgagoshtam, Lankeshwaram and Thekkegramam in Chittur and Thekkegramam and Padinaregramam in Thathamangalam. While older buildings were constructed using more sustainable and low energy/low carbon materials, new buildings are entirely constructed out of unsustainable, locally inappropriate and non-durable materials like reinforced cement concrete, glass, and marble etc. With a higher level of out-migration or generational shift, many houses are empty and locked with owners living elsewhere. Row housing agraharams are being reconstructed into independent units. Paddy fields are being converted to housing needs resulting in the destruction of drainage channels.

New housing areas do not build adequate infrastructure like wide enough roads, stormwater drains, walkways and wastewater management facilities. Land and house building costs together are very high often trapping people onto long-term and unaffordable debts. Individual house sanitation systems – mainly septic tanks are extremely inefficient and lead to pollution of ground and surface water sources like tanks/ kulams and water bodies, and natural streams. Houses do not have a system to manage their sullage which is mostly let out to lower-lying plots, public drains or neighbouring ponds. Large campuses with public housing Quarters – like PWD and Police Quarters are currently either empty or breaking down with inadequate

[31] Socio economic survey 2012, TCP Dept

maintenance. Several public housing blocks for the poor have been built under various schemes over the years which require maintenance and upgradation of infrastructure and services.

Policy: To promote adequate, sustainable housing for all.

Strategies:

Sustainable Housing

Promoting adequate, people-friendly, environmentally sensitive and sustainable habitats across socio-economic groups is Chittur-Thathamangalam Municipality's priority and focus.

The Master Plan envisages increasing demand for land for housing. The Municipality will support well-designed group housing schemes, whether as flats or town houses on brownfield land or on land parcels that are not restricted and protected from development. This is also envisaged to reduce the pressure on Paddy fields/agricultural land/wetlands conversion as envisaged in the Kerala Conservation of Paddy and Wetland Act 2008 as well as on the Ecological Protection Zone. The Master Plan 2042 aims to prevent any disruption of the stream network and hence prohibits any conversion within the Ecological Protection Zone, (see EPZ Overlay control map Fig 19.10c in Chapter 19) even under the smaller plots category. The Ecological Protection and Disaster Mitigation Technical Committee will help resolve conflict zones within the EPZ.

Public housing: All existing public housing land use in Chittur-Thathamangalam Municipality, especially defunct large sites like Police Quarters and currently undermaintained PWD Quarters is earmarked for public housing in the proposed land use, and the Municipality will work with the respective institutions to repair and regenerate the sites for public housing and build sustainable sewage and sanitation infrastructure as well as public open space for socialising and community building. All Public housing clusters will be provided with collective sanitation and liquid waste management infrastructure as well as semi-open socialising spaces.

Rental housing: A survey of the closed houses will be conducted, and owners contacted to develop a strategy for putting the house to use/ rent. Chittur-Thathamangalam Municipality wants to avoid the pressure on land for housing due to long-term vacancy of habitable houses. In due course, a detailed action plan with regulations that mandate compulsory renting will be developed to discourage long-term vacancy of existing habitable housing stock.

Sustainable housing: Adopting sustainable practices while building in the town like rainwater harvesting, building sensitively to the prevailing climate, reusing older housing stock, and enabling water percolation are encouraged. Through the planning and building permission process, Chittur-Thathamangalam Municipality will regulate surface water percolation, liquid waste management, row housing typology, plot subdivision and housing layouts, and group housing schemes. A manual will be produced and distributed by the Municipality to support house builders and house owners with adequate information about the regulations.
For the building permission and occupancy certificate process, the following will become essential:

1) Rainwater harvesting infrastructure,
2) Permeable ground for rainwater percolation,

3) Quality controlled and standard marked high-quality Septic Tank installation,
4) Liquid waste/Sullage management/recycling infrastructure. Letting of liquid waste from individual houses or establishments onto public canals and water bodies or open spaces will attract fines and even cancelation of building permit.

In areas declared as Residential Local Precincts of Value, a detailed action plan and a design manual will be developed with the local community, INTACH and other experts and specialists in the field. This Manual will act as a guidance for building in these neighbourhoods for landowners, building permission applicants, designers and contractors. In rebuilding housing or construction in areas declared as Residential Local Precinct of Value 1- row housing clusters (as mentioned above and as in the proposed zoning plan attached – Fig 19.12), all housing construction must demonstrate how it follows the guidelines in the planning and design manual mentioned above. It must follow wall to wall row building without gaps. This is one of the most common typologies in the town with as many as 2500 people living in row houses. Continuing the settlement pattern and repurposing the house has several benefits, including retaining the unique settlement character and climatic benefits. Violations will be fined heavily, building permit and completion/occupancy certificates cancelled and mandatorily rectified at the owner's own cost. Chittur-Thathamangalam Municipality will undertake special neighbourhood-level sanitation infrastructure development programs in high-density housing areas including row housing neighbourhoods.

Housing Layouts: All housing layouts made from the reconstitution of greenfield sites in non-restricted areas must obtain a layout permission first before any building permit can be applied for. Building permit applications will not be accepted/received from a green field (paddy field/agriculture land/Paadam/Nilam) plot survey number that has not obtained layout permission first demonstrating details of layout outlining access roads, drains, walkways and open spaces. It is the responsibility of the landowner who sold the land to obtain this layout permission first in order for any building on that land to apply for building permission. All housing layout applications should demonstrate the clear demarcation of 5.5-metre road, storm water drains and 1.5-metre sidewalk on both sides (which can be built on top of the stormwater drains) of the road not higher than 15 centimetres above the road level, parking if applicable and open spaces. House builders can follow the Road template provided in the Mobility section of this Plan. (Table 19.3) All housing layouts of more than 2 acres of land should provide a park not less than 10 cents of area. They should demonstrate clearly their road and drain strategy is acceptable and based on the mobility template provided in the Master Plan Mobility Section (Table 19.3). All group housing (apartment) projects with more than 5 units should provide children's play areas of not less than 40 square meters.

Chittur-Thathamangalam Municipality will promote campaigns and training sessions on sustainable building materials and construction.

In addition to commercial farming, the Municipality is committed to promoting the productive homestead, where every household continues to grow a range of trees, plants, vines and shrubs for wood, fruits, vegetables, herbs, flowers and medicinal plants. Homesteads will be an integral part of retaining local plant and medical knowledge, biodiversity and micro-food production. This will be promoted through education and awareness campaigns, sapling fairs, and appropriate technical support working together with government and non-government agencies, and agricultural universities and research centres. The Municipality will run campaigns and distribute plants and seeds to promote homestead biodiversity including a variety of local flowering plants, fruit trees and vegetables.

18.9 Public Health

Existing health services in the government sector within Chittur-Thathamangalam Municipality are currently being upgraded significantly. This includes the new 200-bed Chittur Taluk Hospital as well as the new primary health care centres being built in Chittur and Thathamangalam respectively. Medical colleges and other large hospitals in neighbouring centres like Palakkad, Thrissur and Coimbatore fill the gap in the specialist care sector. Therefore, with a diverse range of ayurvedic, allopathic and homeopathic hospitals and clinics, within the municipality, as well as within the accessible region, people in the town have access to a range of treatment facilities including medical colleges. However, with the increasing trend of accidents, communicable and lifestyle diseases, cancer, mental health issues, and alcohol and drug addiction, what needs improvement in the public health sector is in health care, prevention, early detection, mental health and de-addiction.

Policy: While continuing to work with public and private institutions to upgrade the treatment facilities, Chittur-Thathamangalam Municipality will focus on improving timely diagnosis, family health, health care, prevention, early detection, mental health and deaddiction.

Strategies:

Mapping of illnesses using data from the government hospital shows the pattern of the ward-wise concentration of illness (refer to Table 11.4 and Figs 11.2 a,b,c). Collaborating with the Taluk hospital and primary care centres, spatial ward-wise analysis of illness patterns will be conducted regularly using data collected from the hospitals in the region. This will be further corroborated by the ASHA health workers' household-based analysis to develop a health map of the municipality to offer support and target programs and campaigns in an effective manner. A municipal-level committee on public health will be constituted to enable the implementation of policies.

Safe and pollution-free public spaces and active lifestyles will be promoted through events, programs, and campaigns to address the increasing communicable, lifestyle and respiratory diseases. Accessible and safe walkways and cycle paths will be built along main roads. Sports and active lifestyles should be promoted across age groups through sustained programs, infrastructure, and campaign. Swimming, Yoga, and martial arts like Karate and Kalari will be promoted among the young and the middle-aged. The school curriculum will aim to emphasize physical activity. Parks and public spaces will be installed with open-air gyms walking paths and exercise equipment; a women's gym will be promoted through appropriate collaboration. Road accidents will be addressed through road safety measures mentioned above like introducing speed limits, rectifying dangerous road geometries, and speed breakers. Chittur-Thathamangalam Municipality will ensure a **clean environment:** adequate wastewater strategy mentioned above will be prioritised in implementation to eliminate wastewater letting by individual properties and institutions on public spaces, drains, canals, ponds, lakes, and rivers. Clean public toilets will be built and maintained through collaborations in public places. Dumping of waste in public spaces will be eliminated through a strict enforcement process. Special attention will be given to eliminating the dangers posed by stray dogs and other animals.

Chittur-Thathamangalam Municipality will promote **healthy living, healthy eating, and self-care** through the school curriculum as well as through 'health as wealth' campaigns. It will run campaigns on the dangers of pesticides and promote pesticide and dangerous chemical fertiliser-free food production and consumption. The Municipality will promote Kitchen gardens in houses and institutions and encourage household composting. A Kudumbashree restaurant selling tasty, nutritious, pesticide-free free affordable food will be promoted as a benchmark initiative. Through the ASHA workers, the Municipality will run campaigns focussing on family health, nutrition, and care. Regular inspection of hotels, restaurants, and catering centres, it will ensure the quality of products and premises. Campaigns to minimise and eliminate the unhealthy junk food culture will be promoted.

Deaddiction and Rehabilitation: To address the rising alcohol and drug addiction across age groups, Chittur-Thathamangalam Municipality will run effective campaigns in all schools against drug use and alcohol consumption. Campaigns will also focus specifically on the vulnerable groups in society. Campaigns on the dangerous effects of irresponsible consumption of alcohol will be promoted to target adults across generations and socio-economic groups. Working with the Taluk Hospital, Health department, Private hospitals, and other organisations, The Municipality will promote a deaddiction and rehabilitation centre within the municipality. Mental health and counselling support programs will be promoted through appropriate collaborations. A toll-free number to report abuse will be established collaborating with appropriate organisations.

The Municipality will promote **early cancer detection centres** within the municipality working with Taluk Hospital, private hospitals, health departments and other organisations. Through regular campaigns, genetic testing and regular testing for vulnerable populations shall be promoted.

18.10 Education

In Chittur-Thathamangalam municipality there are 21 schools, one Teacher Training Institute, one Government Arts College and a Technical Institute which attracts students from the wider region. The literacy rate of Chittur-Thathamangalam Municipality is higher than that of the district with Tamil, Malayalam and English common among the instruction languages and spoken among students. There are many professional colleges within travel distance. The main problem faced by the Government and Aided schools is the shortage of infrastructure such as toilets, labs, sports facilities, as well as teachers. Further, the conventional courses offered by higher education and vocational training institutions don't do justice to the skills required for job market competition, as well as the capability and ambition of new generation students. Further, there is a need for the notion of education to be understood in a creative and wider sense than it is understood and practised currently.

Policy: To provide the state-of-the-art infrastructure for schools, promote existing higher education options through promoting attractive arts, science, technical and vocational courses, and enable a wider culture of learning through generative curiosity for scientific thinking, creative imagination, and grounded learning through connecting context more closely with learning programs.

Strategies:

Upgrading and modernising school infrastructure will be a priority including well-equipped labs for digital, science and language learning, hi-tech classrooms, state-of-the-art libraries, open/closed auditorium, sick room, lunch halls, fan and lights, renewable energy fittings, indoor and outdoor sports facilities, and playgrounds. Where relevant, to improve efficiency and infrastructure, the option of merging schools or reconstructing buildings shall be considered. Further, there will be a focus on building adequate toilets – especially girl-friendly toilets with napkin facilities and sanitary incinerators-, water supply and sustainable sanitation systems within schools. Chittur-Thathamangalam Municipality will seek to ensure adequate road signages to slow down traffic and provide bus stops near schools, and safe child-friendly walkways along main roads. School premises will be made disabled-friendly. Leasing of agricultural land to schools for learning as well as vegetable cultivation for their use shall be explored.

The Municipality will work towards making full-time Physical Training teachers available in schools and will promote extracurricular and self-defence activities including Kalari and Karate, self-care activities like yoga, swimming and games like chess as part of the learning program. Breakfast clubs will be promoted to support students from difficult economic backgrounds. Cycling will be encouraged among the school children through campaigns and events. Chittur-Thathamangalam Municipality will promote special learning support schemes for students lagging in studies or facing learning disabilities. Regular health check events to deal with anaemia among girl children will be promoted. The Municipality will seek to introduce a school bus run by the municipality for schools collectively, which will also reduce the individual peak time traffic. It will promote deaddiction programs and addiction awareness (drug, alcohol phone) campaigns in schools. Introducing a toll-free number to report abuse shall be explored in collaboration with relevant departments and organisations.

Libraries to be strengthened through the existing Anganwadi network in each ward and they are envisaged as a community hub of learning/craft centre and archive. The existing libraries in the school network could also be seen as part of a new library-centred education beyond books.

Chittur-Thathamangalam Municipality will promote value education– by encouraging students to practice personal and premise cleanliness, promoting participatory sustainable waste management within schools, including bio-gas plants to make manure and energy from food waste, nature-based treatment systems, etc. It will seek to promote cultural exposure connecting the school with artists and experts and events like Kochi Muziris Biennale or Panchajanyam Film Festivals etc. Field visit component shall be introduced in the curriculum, and students shall be encouraged to visit agriculture fields and farms and understand local and regional ecology and economy. Curiosity for scientific thinking shall be promoted through science museum/ science gallery visits and conducting science events collaborating with Sastra Sahitya Parishad and Chittur Government College, etc.

Working with relevant stakeholders, the Municipality will seek to expand the student numbers catered by Government College Chittur by promoting courses that are more attractive to new-generation students, connecting with job market realities and context-specific challenges. These will include applied arts, agriculture technology, vocational and technical courses.

18.11 Caste and Social Equity

SC and ST have been historically marginalised, excluded, and severely exploited, for centuries. SC and ST population comprise 12% of the total population of Chittur-Thathamangalam Municipality and 67% of them live in the 46 public housing colonies and only hold a literacy rate of 64.9% compared to the 89.70 % of the town. Wherever they own their own houses the land holding is less than 1/3rd of the median land holding in the municipality. Infrastructure, services and living conditions in these settlements are below par and need significant upgradation. These include toilets, drinking water, solid and liquid waste management, sanitation facilities, and community facilities including open spaces and libraries. The majority of the SC/ST population lives Below the Poverty Line. Large numbers had and continue to work as daily wage agriculture workers, skilled craftsmen musicians etc. The decline of these sectors as well as social exclusion continue to affect their social and economic stability resulting in low education attainment, higher levels of alcohol addiction, and health-related problems. Many government support schemes do not reach the population due to a lack of awareness among the community and a lack of enthusiastic officials within the Chittur-Thathamangalam Municipality. Women Industries Centre and Ambedkar Cultural Centre at Manthakkad are some institutions that operate to support the community.

Policy: Chittur-Thathamangalam Municipality will ensure to annihilation of all forms of caste inequality, caste discrimination, and socio-economic exclusion and support everyone within the SC/ST community to achieve their best.

Strategies:

Chittur-Thathamangalam Municipality will conduct a participatory audit of the condition and adequacy of **physical and social infrastructure and services** in all the public housing colonies and upgrade it to the best of the standards. This will not only include adequate roads, drains, water supply (for example at Neelikad), sanitation, and solid and liquid waste disposal system, but also community facilities like libraries, internet facilities and reading rooms, socialising spaces, and individual study rooms. Waste disposal tendencies near the public housing colonies will be eliminated through strict surveillance and fines. A Vigynan Vadi shall be promoted in Valmutty Ward Sabha Kendram and a children's library in Nellicode. The Municipality will support the SC/ST households to **own their own houses** and move on from public housing colonies in due course – by working with state missions like LIFE, and other relevant public-private and philanthropy schemes.

Chittur-Thathamangalam Municipality will initiate targeted **counselling, deaddiction, and rehabilitation** support, and will run targeted campaigns for preventive physical and mental health care and healthy and nutritious food culture. Through participatory campaigns with the community, higher attention to family health and **children's education** shall be emphasised.

The Municipality will promote strict **enforcement against caste exclusions** in schools, public and private institutions, and social spaces. **Higher education attainment** and better **access to jobs** will be achieved through special schemes for better learning, support tuitions, improved confidence, higher aspirations, career counselling, PSC coaching classes, vocational training, skill building and job fairs. The regular attendance of parents in PTA meetings will be encouraged through sustained campaigns. Special sports scholarships will be established for children good in sports and games.

Through improved outreach into the community, enabling government schemes like the Ayyankali scholarship, study room projects etc. will be made within the reach of the community members. Better **economic opportunities** for the abundant handicraft and performance art skills existing within the community shall be explored. Better modern laundry equipment will be supplied to the washer community collective to help to improve their business. A cooperative society for the bamboo, grass mat weaving and other craft and performance art workers within the community will be organised to diversify design, and art forms and to capture markets. Working with the state government a dedicated official to support the community shall be appointed to lead these initiatives.

18.12 Heritage and Local Assets of Value

Chittur and Thathamangalam are old settlements with many local assets of value that have the potential to act as a foundation for a sustainable future if protected and conserved for posterity as well as for revenue generation through tourism. This includes the extensive architectural heritage of old row housing neighbourhoods like Agraharams, wooden Nalukettu-type buildings like Tharavads, etc., that are among excellent examples of climate-friendly, and community-sustaining vernacular building and residential neighbourhood design in the world. There are many excellent large and small religious, devotional and cultural buildings and precincts, as well as public institutional buildings like schools, municipal office, library and town hall, village office etc that are more than a hundred years old. In addition, there are many forms of foundational assets of value that are simultaneously social economic and ecological like the local tree and plant species, herbs and medicinal plants, large banyan trees, the interconnected network of canals, ponds, water bodies, streams, cascading paddy fields and river that form the drainage ecology and sustainable foundation for water management, disaster mitigation, agriculture and biodiversity. Further, there are rich traditional occupational skills and cultural economy practices like traditional theatre, music, performing arts, festivals, craft and weaving skills, and so on that need to be protected, conserved and made viable for contemporary society and economy.

Policy: CTM is committed to preserving and conserving its local assets of value for a sustainable future through regulations, enabling support, adaptive reuse, and enhancing social and economic viability.

Strategies:

Chittur-Thathamangalam Municipality recognises that its ecological assets of value are foundational to a sustainable development future and disaster mitigation including flooding, drought, heatwaves, and related incidents due to climate change and local regional and global challenges to microclimate, biodiversity and food security. A **water flow accumulation zone** that forms the core of this drainage ecology shaped by the above-mentioned networked elements is delineated using GIS techniques and extensive ground truthing and earmarked as a restricted Ecological Protection Zone (see Fig 19.10c), protected from any development that will alter water percolation characteristics of the soil and water flow within the channels and streams. Specific boundaries of this restricted zone, its geographic form, implementation mechanisms, detailed regulations, and compensatory mechanisms will be developed through a detailed consultation and participatory process with Padashekara Samithis and related stakeholders. The Municipality will form an environment and disaster mitigation technical committee to develop, implement and oversee this.

Chittur-Thathamangalam Municipality recognises the significance of its architectural and cultural assets of value not only from the historic and cultural perspective but also from a sustainable development perspective. Therefore, **local assets and precincts of value are identified and demarcated for conservation**[32] through participatory heritage management programs, campaigns, community agreements, new social contracts, and other effective instruments. A detailed participatory heritage management action plan will be developed with the help of INTACH and other experts in the field. Among others, this will also include

A) A design manual developed in collaboration with building owners and tenants etc., to guide the transformation in domestic buildings where people currently live like the Agraharams;
B) A detailed preservation, conservation and adaptive reuse program for religious, institutional and cultural buildings.
C) Revenue generation opportunity from heritage buildings and cultural skills.
D) Sustainable economic development programs for cultural and occupational practices like theatre and performing arts, music, craft skills, festivals, and so on.
E) A heritage tourism development cooperative society with equity shareholders from the landowners of large heritage buildings that can be developed as cultural centres, heritage hotels and allied tourism purposes.
F) Tourism facilities, and tourist trail and developed and marketed widely to support heritage and farm tourism.

18.13 Municipal Finance

Policy

- To improve the financial base of the city

Strategies

- Conduct an audit and valuations of the municipal assets and identify sustainable investment and revenue optimisation opportunities
- Relying on people as resources and lowering O&M costs through innovative participatory approaches of resource management and 'working together.'
- Exploring various partnerships with public-private modes.
- Optimisation of available municipal lands for generating resources for municipality development
- Making use of good practices in urban development for resource generation
- Improving the revenue base of the town through GIS-based property tax system
- Optimizing the use of available resources through better prioritization of projects and improved management
- Achieving continuous reduction in cost for service delivery and other overhead charges through better financial management

[32] Please see Fig 19.12 and 19.13 In Chapter 19: PLU

Chapter 19: VISUALIZING THE FUTURE

Projections are conditional statements about the future. They refer mostly to the exercises of extrapolation of the past trends into the future; and they do not take into account changes in the policy parameters.

19.1 Population Projection

Knowledge about past populations and assumptions about future populations are fundamental to planning decisions in every aspect of community life. A population projection estimates the needs and resources that has to be distributed to satisfy such needs. To arrive at a conclusive projection figure, five methods of population projections have been used. The methods used for projecting population are

1. Arithmetical Increase Method
2. Incremental Increase Method
3. Geometric Increase Method
4. Decreasing Rate of Growth Method
5. Exponential Method

Average of the five methods is considered as the projected population. Table 19.1 shows projected population calculated for years 2021, 2026, 2031 and 2041 of Chittur-Thathamangalam Town to implement the proposals on a short-term, medium and long-term basis.

Table 19.1. Projected Population of Chittur-Thathamangalam Town

Sl. No	Method	Population (2011)	Projected population			
			2021	2026	2031	2042
1	Arithmetic mean method	32298	33466	34050	34634	35919
2	Incremental increase method	32298	33056	33281	33404	33314
3	Geometric increase method	32298	33628	34314	35014	36605
4	Decreasing growth method	32298	32589	32672	32754	32840
5	Exponential method	32298	43259	45189	47204	58122
	Average of (1) and (4)		**33028**	**33361**	**33694**	**34380**

From the current 2021 vital statistics data it appears that the population is closer to the projected population of the Decreasing rate of growth method. This has implications in the sense that the demand for amenities to be planned for the future would be lower than if there was an increasing population growth rate. Further, the idea of projecting the town as a higher level taluk centre and an urban second order settlement as proposed by the IDDP 2013 is clearly not

supported and Chittur-Thathamangalam needs to be more realistically repositioned as a tertiary level semi-rural settlement, recognising that it acquired an 'urban' status purely by the historical accident of having been accorded municipal status during colonial times, and not due to its settlement character It is observed that the population is showing a decreasing growth trend. Among the five methods of population forecasting, the arithmetic increase method and decreasing rate of growth method give the projections on a lower side. Considering their suitability and representativeness for the expected growth in Chittur-Thathamangalam, average of arithmetic increase and decreasing rate of growth method is considered for estimating future population.

19.2 Work Force Projection

Chittur-Thathamangalam town has a high WPR compared to the state and local average. Acknowledging the decreasing growth rate, the population is estimated at 34296. As per the projection of workforce shown in Table 19.2, the average WPR targeted for the Municipality by 2031 and 2041 is 42%. Accordingly, the projected number of workers is expected to be 14152 in the year 2031 and 14440 in 2041. With the introduction of new policies to improve local crafts and arts, and new projects, the economic base will be strengthened, which will further result in the increase of job opportunities in the town.

Table 19.2 Total Projected Workforce of town and WPR

item	1981	1991	2001	2011	2021	2031	2042
Total no. of workers	9905	10937	11763	12918	14412	14152	14440
WPR	32.57	34.12	36.89	39.99	41	41	42

The projection of four-fold classification of workers has been done based on category wise employment data available from the Census. It can be seen that the percentage of cultivators, agricultural labourers and Household industrial workers are decreasing over decades Adopting the policy of conserving existing agricultural land and by enforcing zoning regulations, expected number of workers in agricultural field (i.e. both Cultivators and agricultural labourers) are assumed to continue the same. Identifying one of the future potential sectors of development as industrial sector this sector has to be strengthened by induced intervention. Therefore, based on the proposed, development estimated occupational structure by 2031 is given in Table 19.3.

Table 19.3 Category wise Projected Workforce of town

Year	2001		2011		2021		2031		2042	
Workers Classification	Person	%	Person	%	Person	%	Person	%	Person	%
Agricultural Labourers	404	4.13	272	2.46	355	2.46	348	2.46	846	2.46
Cultivators	1,526	15.62	1,472	13.34	1,923	13.34	1,888	13.34	4,586	13.34
Household Workers	721	7.38	549	4.97	1,009	7.00	1,274	9.00	3,094	9.00
Other Workers	7,120	72.87	8,743	79.23	11,125	77.20	10,642	75.20	25,854	75.20
Total Main Workers	9,771	100.00	11,036	100.00	14,412	100.00	14,152	100.00	34,380	100.00

19.3 Infrastructure Projection

Infrastructure facilitates the provision of basic social services such as sanitation, water supplies, education, health care and recreation. Infrastructure projects may be funded publicly, privately or through public private participation. Infrastructure systems tend to be high-cost investments however they are vital to a town's social and economic development and prosperity.

19.3.1 Physical Infrastructure

The physical infrastructure is a set of interconnected structural elements that provide a framework for the development of urban centre. It is an important parameter for judging a region's development. The infrastructure backlogs and demand has been calculated on the basis of projected population and standards given in URDPFI guidelines.

Water Supply

The estimated water demand for a city is broadly classified as domestic and nondomestic. The domestic water demand includes per capita consumption and system losses, while nondomestic water demand includes industrial and commercial consumption, institutional consumption and firefighting demand. Table 19.4 shows the estimated water demand for the horizon years.

As per URDPFI guidelines, the desirable standard of water for domestic use for a medium size town is 135-450 lpcd. As per CPHEEO guidelines, the domestic water requirement is 135 lpcd. For assessing the future water requirement 135 lpcd is taken.

Considering nondomestic demand such as industrial, commercial and institutional uses, the quantity is the same as 20% of domestic supply. An additional 1% is given for fire demand. As per Central Public Health and Environmental Engineering Organisation (CPHEEO) manual, a maximum provision of 15% towards unaccounted water losses shall be made. An allowance of 33% has to be given for elevated storage capacity. 100% of supplied water is to be properly treated. Table 19.4 shows the estimated water demand of the town.

At present 11.5 MLD water is supplied to the municipality and also to nearby Panchayats like Pudunagaram, Peruvemba, Nalleppilly, Polpully and Pattancherry. As per projections the total water demand required for the town by 2031 would be about 6.29 MLD while by 2041 it would be around 6.41 MLD, hence existing water supply schemes will meet future water supply requirement of Chittur-Thathamangalam Town. In order that water is supplied in all the households at adequate pressure head, decentralized and low-cost interventions such as shafts are suggested. The plan should identify and allocate land for pilot-scale projects.

Table 19.4 Estimated Water Demand

Year	Unit	2021	2026	2031	2042
Population		33028	33361	33694	34380
1. Domestic water demand @135 l/d	MLD	3.303	3.337	3.37	3.438
2. Non-domestic water demand @20.8% of (1)	MLD	0.688	0.695	0.701	0.716
3. Fire demand = 1% of (1) + (2)	MLD	0.04	0.041	0.041	0.042
4. UFW @15% of (1) + (2) + (3)	MLD	0.605	0.611	0.617	0.63
5. Total water demand @ (1) + (2) + (3) + (4)	MLD	4.636	4.684	4.729	4.826
6. Storage capacity required @ 33% supply	MLD	1.53	1.546	1.561	1.593
7. Total storage capacity required @ (5) + (6)	MLD	6.17	6.23	6.29	6.42

Sewerage

In Chittur-Thathamangalam municipal area there is no public sewerage system. As per CPHEEO norms, sewage generated is considered as 80% of the water reaching the consumer end. 135 litres/capita water supply has been considered for the wastewater generation. Now peak factor should be considered for the total discharge to be generated for the STP. Peak factor depends upon the density of population, topography of the area and hours of water supply for the design based on contributory population recommended by CPHEEO manual. The population of Chittur-Thathamangalam Municipality comes in the range 20000 and 50000 hence peak factor is taken as 2.50. The sewage generated is estimated at the rate of 80% of the water supply in any area. By 2031, the estimated capacity for sewage treatment is 9.1 MLD while it is around 9.26 MLD for 2041.

It is suggested that sewage treatment for 9 MLD in Chittur-Thathamangalam should not be planned in the conventional centralized manner. Given the scale, the current settlement pattern with ponds and agricultural lands interspersed with dense settlement areas, a decentralised sewerage system is ideal to manage the sewerage in the town. Studying the current topography, various physical barriers like the existing road network and canal networks, the town could be divided into smaller clusters and further sub-clusters. Decentralised systems using natural treatment systems such as constructed wetlands, duckweed ponds and waste stabilization ponds would be ideal to manage the sewage generated in a decentralized manner. For this purpose, government or public land should be identified in various zones identified and reserved for future interventions of sewage treatment using natural treatment systems. Also, campaigns for preventing the dumping of solid waste in the storm drains or irrigation canals is necessary to ensure only liquid waste flows unobstructed through the canals or drains. Table 19.5 shows the Projection and Requirements of Sewerage System.

Table 19.5 Projection and Requirements of Sewerage System

Year	Unit	2021	2026	2031	2042
Population		33028	33361	33694	34380
80% of per capita demand	Litres/ day	3567024	3602988	3638952	3713040
Peak factor	-	2.5	2.5	2.5	2.5
Total wastewater	MLD	8.92	9.01	9.1	9.29

Storm Water Drainage Network

Drainage of stormwater is not a major issue in Chittur -Thathamangalam Municipality. The drainage system consists of natural and artificial drains and the total drain length of municipality is 28.20 Km. Chittur-Thathamangalam municipal area has a drainage system covering 48% (28.20 km) of the total road length of 58.21 km out of which only 6.6 % (3.85 km) are pucca covered. 24.35 km are uncovered. Protecting the existing natural drains, desilting and side protection of irrigation canals, CADA canals and the akampadam canals running through the paddy fields is necessary to ensure drainage. Drains are required for 30 kms of road. Several areas are prone to flooding during monsoon season. This can be attributed to the blockage of drains and nuisance of solid waste present in the drains that prevents the flow of

water during monsoon or when the irrigation canals receive water. Thus, conducting awareness campaigns for behavioural changes regarding prevention solid waste from entering the drains are necessary as well as periodic cleaning of the drains are essential to maintain the stormwater drainage network and ensure its functioning.

Solid Waste Management

As per URDPFI guidelines, the waste generation varies from about a quarter of a kilogram per capita in small towns to about half a kilogram per capita in large and metro cities. Chittur-Thathamangalam is a small town and the assumed waste generation is 320 g/c/d. During treatment both biodegradable and non-biodegradable wastes are to be separated. About 30% is taken for extra waste generation considering other institutions. In 2031 the estimated waste generation will be around 14.03 tonnes per day while it will be 14.28 tonnes per day in 2041. Table 19.6 shows the projection of solid waste generated for the town.

Table 19.6 Projection of Solid Waste

Year	Unit	2021	2026	2031	2042
Population		33028	33361	33694	34380
1. Solid waste generation @320 g/h/d	tonnes/ day	10.57	10.68	10.79	11.01
2. Including 30% extra for other institutions	tonnes/ day	13.75	13.89	14.03	14.32
3. Area required for composting plant	acres	1.37	1.38	1.39	1.42

Traffic & Transportation and Street Lights

Growth of urban transport along a sustainable path in cities is the foremost need of the country and is an important part of the nation's economy. The total road length comes out to be 115.38 kms, with per capita availability of 3.49 m against the URDPFI standard of 0.96m. The available road length is sufficient as per the standards.

Table 19.7 Projections of Traffic and Transportation requirements, Streetlights

Year		Unit	2022 (Existing)	2026	2031	2042
Population			33028	33361	33694	34380
1. Road length @0.96 m per capita		m	115380	32027	32346	33005
Road Surface	Concrete (km) @ 15% of total road length	km	12.7	4.8	4.85	4.95
	Bituminous (km) @ 85% of total road length	km	102.68	27.32	27.49	28.06
2. Lamp poles @ 30 m c/c		Nos		1112	1123	1146
3. Street Lights	Tube Light.CFL/Ordinary bulb @ 30% of lamp poles	Nos	854	334	337	344
	High power lamps @ 70% of lamp poles	Nos	3536	777	785	802
	High Mast Lamps @ 0.1% of lamp posts	Nos	4	1	1	1
4. Parking Facilities @ 0.4 Ha of land per 10000 population		Ha		1.33	1.35	1.38

The projections are made taking the viewpoint that only two types of roads should be built with major share to bituminous roads (85% of total roads), and the rest 15% to concrete roads. Accordingly, while earthen road and WBM roads are proposed to be converted to bituminous or to concrete road, improvement of major roads and construction of new roads are necessary for a growing town. Among various categories of streetlights priority is given to power lamps (70%), followed by tube lights and high mast lamps (30). Streetlights are seen sufficient as per the standards.

Traffic Projection

Traffic flow is an important macroscopic traffic characteristic in transportation systems. The measurement and forecasting of traffic flow are crucial in formulating a long-term transportation plan serving the community in the future. Traffic forecasts are used for several key purposes in transportation policy, planning, and engineering: to calculate the capacity of infrastructure.

Method of Traffic Projection

For projecting the future demand, various methods of traffic projection including statistical, economical and mathematical models are available. These could be judiciously utilized depending upon level of accuracy warranted and the extent of database available.

Projected Link Volume of Existing Network

Volume-capacity ratio for the horizon years is given in the table below. It can be seen that almost all the major road corridors in town would be severely congested in the horizon year with anticipated traffic more than the capacity of the roads. The capacity utilisation of major corridors will carry heavy traffic. But most of the minor roads are not so severely loaded. Table 19.8 shows the Projected Daily Volume-Capacity ratios for different horizon years in Chittur-Thathamangalam study area.

However, though these volume capacity ratios seem alarmingly high, it must be noted that it is inappropriate to determine the road widening requirements (including State Highways) in Chittur-Thathamangalam municipal area using volume capacity relationships developed that are applicable for access controlled inter-state highways and urban roads elsewhere having different land-use environment. Capacity constraints in urban areas have to be managed through various other interventions like better public transport, paid parking, transport demand and supply management, etc. Widening roads is the last resort to deal with capacity constraint. Further, it is proposed to develop a few regional bypasses (see Fig 7.30) that will help decrease the current volume capacity ratios by diverting all long-distance-through traffic that is currently needlessly passing through the main street of the town.

Additionally, in the case of Chittur-Thathamangalam, typical projections of traffic volume-capacity ratios etc. have little meaning since the town has been seeing declining growth and the focus should be on active travel. World over, the move is towards traffic calming and traffic management. Hence in the context of this town, it is possible to manage traffic flows current and future through a combination of demand management, traffic management, increasing options for local public transport and active travel.

Table 19.8 Projected Daily Volume-Capacity ratios for different horizon years in Chittur-Thathamangalam study area

Sl.No.	Name of the Junction	Carriageway Width (m)	Capacity (PCU/hr)	2013		2021		2031		2042	
				Vehicle (PCU)	V/C	Vehicle (PCU)	V/C	Vehicle (PCU)	V/C	Vehicle (PCU)	V/C
1	Anicode to Chitturkavu	6.4	1200	1226	1.02	1811	1.51	2681	2.23	3708	3.09
2	Anicode to Town Hall Jn.	6.9	1200	1013	0.84	1497	1.25	2216	1.85	3070	2.56
3	Anicode to Thekkagramam	8	800	391.5	0.49	578	0.72	856	1.07	1188	1.49
4	Anicode to Mettupalayam	7.1	1500	999	0.67	1476	0.98	2185	1.46	3027	2.02
5	Town Hall Jn. to Chitturkavu	5.2	800	226	0.28	309	0.39	416	0.52	583	0.85
6	Chitturkavu to Palakkad	6.2	800	777	0.97	1148	1.44	1700	2.13	2357	2.95
7	Town Hall Jn. to Hospital Jn.	6.3	1200	1345	1.12	1987	1.66	2941	2.45	4075	3.40
8	Hospital J. to Kochinjampara	5.5	800	661	0.83	905	1.13	1216	1.52	1509	1.89
9	Hospital J. to Gopalapuram	4.7	600	1065.5	1.78	1458	2.43	1959	3.27	2436	4.06
10	Mettupalayam to Thathamangalam	7	1200	1269	1.06	1875	1.56	2775	2.31	3841	3.20
11	Mettupalayam to Meenakshipuram	6	800	882	1.10	1303	1.63	1929	2.41	2670	3.34
12	Thathamangalam to Palathuly	6.5	1200	170	0.14	251	0.21	371.5	0.31	514	0.43
13	Thathamangalam to Pallimukku	6.5	1200	1259	1.05	1860	1.55	2753	2.29	3812	3.18
14	Thathamangalam to Mannathukavu	7	1200	238.5	0.20	352	0.29	521	0.43	724	0.60
15	Pallimukku to Chenthamara Jn.	5.5	800	264.5	0.33	362	0.45	485.5	0.61	604	0.76
16	Pallimukku to Koduvayur Outlet	6.3	1200	1151	0.96	1700.5	1.42	2517	2.10	3489	2.91
17	Pallimukku to Vadavannur Road	5.2	600	79.5	0.13	109	0.18	146.5	0.24	191	0.32
18	Chenthamara J. to Peruvambu Road	5	800	110.5	0.18	151	0.25	203	0.34	269	0.45
19	Chenthamara J. to Palathuly Road	6	800	130.5	0.16	193	0.24	286	0.36	397	0.50
20	Ganapathy Kovil to Vilayody Road	5.9	800	301	0.38	448	0.56	663	0.83	909	1.14
21	Vijayamatha Convent Side Road (via Thekkagramam) to Anicode	4	500	118	0.24	162	0.32	217	0.43	286	0.57

Power

As per the standards given in URDPFI guidelines, the power consumption works out to be 2KW per household. Average household size is taken as 4. Based on above, the power consumption for Chittur-Thathamangalam Municipality has been calculated for different phase in Table 19.9 below.

As per standards one electric substation of 11 KV is required for every 15000 population. The town has a 66 KV capacity substation located at Vilayodi, Chittur, which serve the areas. 33 KV substation is required for serving Chittur-Thathamangalam municipal area by the year 2031.

Table 19.9 Power requirement for horizon years

Year	Existing	2021	2026	2031	2042
Population		35152	35763	36324	34380
Household		8788	8941	9081	8595
Power Consumption (MW)		18	18	18	18
Sub Stations: One 11 kV sub-station for every 15000 population	1	2	2	2	2

19.3.2 Social Infrastructure

Education

Education plays an important role in shaping an individual's career. Hence it is the prime duty of mankind to try to make education available in every part of the world. Presently Chittur-Thathamangalam Municipality has improved educational background. Projection of education is made based on the norms and standards given in URDPFI guidelines and other standards of different aspects of social infrastructure. Number of High schools, Higher Secondary Schools and Colleges are seen satisfactory for Chittur-Thathamangalam Municipality. Currently there is no special school for handicapped and one special school is needed for the horizon year 2031. All levels of educational institutions, nursery, primary, secondary and high school are sufficient and will suffice for the horizon year of 2042.

Table 19.10 Projection of Educational Facilities

Year	Existing	Required			
	2013	2021	2026	2031	2042
Population	32298	33028	33361	33694	34380
1. Nursery: 1 for every 2500	13	13	13	13	14
2. Primary: 1 for every 5000	8	7	7	7	7
3. High School: 1 for every 13000	5	3	3	3	3
4. Higher Secondary School: 1 for every 13000	3	3	3	3	3
5. Arts & Science College: 1 for every 80000	1	1	1	1	1
6. Professional College: 1 for every 250000	0	0	0	0	0
7. Polytechnic College: 1 for every 36000	0	1	1	1	1
8. ITC/ITI: 1 for every 35000	2	1	1	1	1
9. TTC: 1 for every 120000	1	1	1	1	1

Health Care

The provision of high-quality, affordable, health care services is an increasingly difficult challenge. Chittur-Thathamangalam Municipality has a number of hospitals to serve the inhabitants.

There is 1 Government Taluk hospital with 108 beds and one private hospital with 10 beds in the town, along with one Government Ayurvedic hospital (30 beds) in the town. Additionally, there are 2 Govt dispensaries and 4 private ones are also present. Two new Urban Primary

Health Centres are commissioned and will shortly be operational, one each in Chittur and Thathamangalam. With that there will be no additional need for 2042. The details of the hospitals needed by 2042 are given in the Table 19.11. With the current ongoing upgradation of the Govt Taluk hospital to a 200 bedded facility, there will be no further health infrastructure needed for the horizon period 2042.

Table 19.11 Projection of health infrastructure

Year	Existing	Required			
	2011	2022	2026	2031	2042
Population	32298	33028	33361	33694	34380
Primary Health Centre: 1 for every 20000	0	2	2	2	2
Primary Health Centre (no. of beds): 1 for every 2500 (4 beds for every 10000)	0	14	14	14	14
Taluk Hospital: 1 for every Taluk	1	1	1	1	1
Taluk Hospital (no. of beds): 1 for every 2000 (50 beds for every 100000)	108	17	17	17	17

Socio-Cultural Facilities

According to URDPFI standards one community room is required for every 5000 population and community centre per 15000 population. 7 community rooms would be required by the planning year 2042. No additional community rooms should be needed as the existing 11 is more than the requirement. Presently there is no facility of public recreational club, meditation and spiritual centre and music, drama centre in the town. Each of these facilities are required, 1 for every lakh population. There is no museum in the District.

Table 19.12 Projection of Community Facilities

Year	2021	2026	2031	2042
Population	33028	33361	33694	34380
1. Community Room: 1 for every 5000	7	7	7	7
2. Community Hall & Library: 1 for every 15000 (2000 sqm)	3	3	3	3
3. Recreation Club: 1 for every 15000 (2000 sqm)	3	3	3	3
4. Music, Dance & Drama Centre: 1 for every 50000	1	1	1	1
5. Meditation & Spiritual Centre: 1 for every 50000	1	1	1	1

19.3.3 Utility Services Petrol Pump

As per URDPFI guidelines one petrol pump is required for every 15000 population. Presently there are 3 petrol pumps in the town and given the declining growth rate, there is no need for any more provision.

Milk Distribution Outlets

As per the URDPFI guidelines, one milk Distribution outlet is required for every 5000 population. According to the present population there should be 10 milk booths which should be increased to 13 at the end of the horizon year. At present Chittur-Thathamangalam Municipality has only one milk distribution outlet located at Vadakkathara, having average collection of 12000 ltrs per month.

LPG Godown

There is only one LPG godown located at Kallanchira covering an area of 50 cents. As per URDPFI guidelines one LPG godown is to be provided for every 40000 population. There is no need of anymore LPG godowns in the municipality till the horizon year as the requirements are already met with.

Police

As per URDPFI guidelines one police station is required for every 90000 population. Chittur-Thathamangalam Municipality has one police station in which Sub-inspector's office is functioning. Police station is functioning in its own building. Police station is located at Kacherimedu having an extent of 30 cents.

Fire Station

As per URDPFI guidelines one fire station is required for two lakh population. There is one fire station in the municipality which is located near Puzhappalam at Thathamangalam. Fire station building has a built-up area of 6500 sq. feet. The above fire station serves entire Chittur Taluk area.

Postal and Telephone Facilities

As per URDPFI guidelines one post office is required per 15000 population and one head post office is required per 250000 population. Presently there are three post offices in the municipal area which is less than the requirement of 4 numbers for the year 2031. Considering the standards one telephone exchange per 40000 populations is required and no more has to be provided to meet the requirement.

Table 19.13 Projection for Utility Services

Year	Existing	2021	2026	2031	2042
Population		33028	33361	33694	34380
1. Petrol pump: 1 for every 15000	3	2	2	2	2
2. Milk booth: 1 for every 5000	19	7	7	7	7
3. LPG godown: 1 for every 40000	1	1	1	1	1
4. Police station: 1 for every 90000	1	1	1	1	1
5. Fire station: 1 for every 200000	1	1	1	1	1
6. Post office: 1 for every 10000-15000	2	2	2	2	2
7. Telephone exchange: 1 for every 40000	1	1	1	1	1

Chapter 20: DISASTER RISK REDUCTION

20.1 Disaster Management in a Changing Climate

Introduction

Based on the mandate and powers conferred by the National Disaster Management Act 2005, National Disaster Management Policy 2009, National Disaster Management Guidelines: Management of Urban Flooding (2010), Kerala State Disaster Management Policy 2010, Guidelines for preparing Risk Informed Master Plans (RIMP) 2022 and KeralaTown and Country Planning Act 2021, the CTM Master Plan has identified an Ecological Protection Zone, which serves as a regulated overlay over other existing use zones, as a measure for flood prevention and mitigation where building construction and development are prohibited.

As explained in Chapter 13, there are legal provisions, policies, and Guidelines that require that local planning processes give special attention to hazards, risks, and vulnerabilities in the planning area to ensure disaster prevention and mitigation. The Prime Minister's 10-point agenda on disaster management emphasizes that planned development can help reduce the risk of disasters, while the lack of proper planning can aggravate them. Therefore, all development schemes should incorporate a disaster risk reduction approach. The agenda also highlights the importance of drawing from indigenous knowledge and traditional best practices, which is especially relevant in the case of Chittur-Thathamangalam, as discussed in Chapter 13 and reiterated below.

The RIMP 2022 - notes that the most important step in managing a disaster is the identification of likely hazards that can occur in an area (5.1). In Chapter 13, it is highlighted that Chittur-Thathamangalam is particularly vulnerable to severe flooding if the natural terrain and water flows (comprising of an intricate water management system of water bodies, cascading paddy fields, canals, and drainage networks) are damaged through improper land use practices. Non-conducive land use changes in ecologically sensitive areas are the root cause of urban flooding in India as has been evidenced repeatedly over the last few years in all metro cities in India as well as various towns in Kerala. As a response to urban flooding, the RIMP 2022 calls for establishing land-use policies that discourage development or redevelopment within natural hazard-prone areas and provide adequate space for expected future growth in areas located outside natural hazard areas. It calls for restricting developments on flood plains of rivers, water courses, watersheds and catchments and proposes a sponge city approach to enhance the water cycle, permeable surface, greener healthier urban spaces, and biodiversity for a sustainable urban development (RIMP 2022).



Fig 20.1a



Fig 20.1b



Fig. 20. 1 a, b Bangalore (above) and 20c. Thrissur (left) Cities submerged in monsoon rains[33]

Fig 20.1c

Chapter 13 demonstrated the logic of the unique regional drainage ecology that defines the geography of the Chittur-Thathamangalam planning area; also summarised below in Fig 20.2.

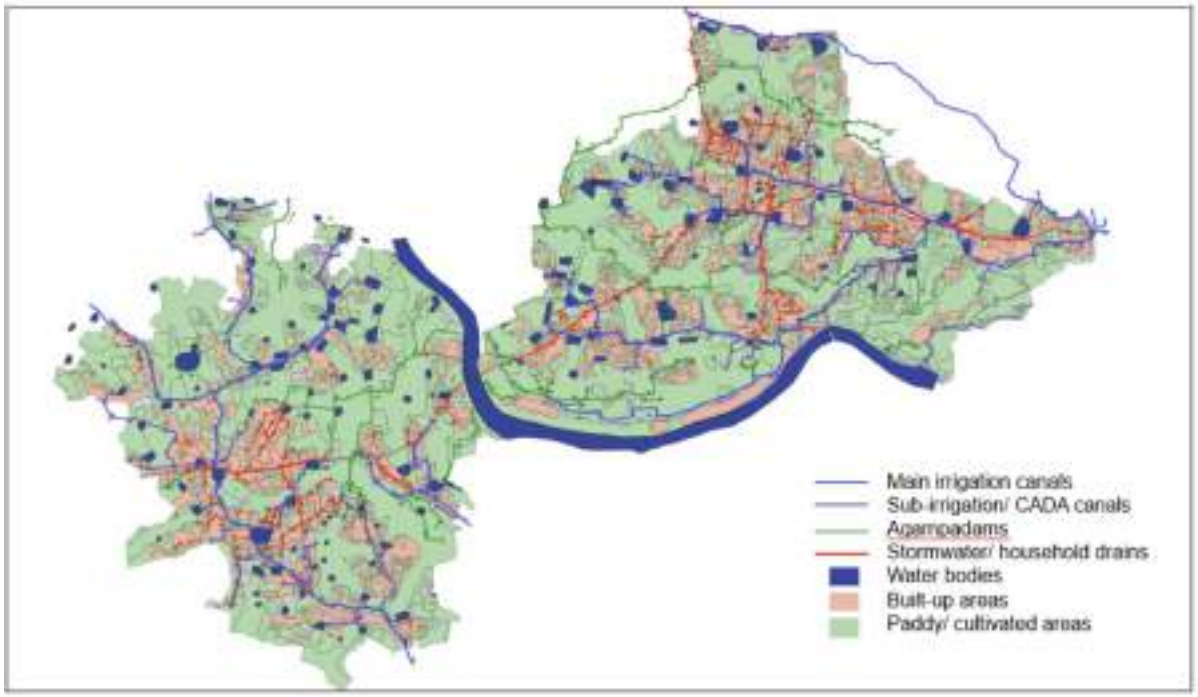


Fig. 20.2 Map of the drainage ecology in CTM formed of integrated water networks (ponds, canals, steams, drainage) paddy fields, and the river

The terrain of CTM is not just a barren ground with soil, roads, and buildings where new construction can happen anywhere. Instead, it is characterised by a sophisticated network of landscape elements such as natural drainage channels, rivulets, irrigation canals, lakes and ponds, cascading paddy fields, natural slopes, permeable soil and vegetation. Water flows along these elements in a particular manner, creating a productive drainage ecology, ground

[33] https://www.aljazeera.com/news/2022/9/6/indias-tech-hub-bengaluru-flooded-after-days-of-torrential-rains
https://www.bbc.co.uk/news/world-asia-india-62849937
https://www.thehindu.com/news/national/kerala/rain-leaves-swathes-of-thrissur-flooded/article28661834.ece

water, flood mitigation, microclimate, and biodiversity. This network of natural elements defines a structure for economic and cultural activities, buildings, and movement. Over the years, this terrain (*bhu-prathalam*) has been shaped by generations for social, religious and material needs such as places of worship, social gatherings, or water, food and medicinal plants. The natural features of the landscape have been engineered to create a productive drainage ecology, which has resulted in a structured terrain. This has created a specifically engineered landscape that has sensitively responded to and moulded the landscape that has the following features:

1. Main roads and buildings are located along ridges and on the land at higher elevations.
2. Irrigation canals are also along these main roads that in turn supply water to ponds and water bodies
3. Waterbodies, ponds and lakes located at the edge of this ridge collect water and if let out will irrigate the cascading paddy fields below.
4. Paddy fields and areas of cultivation that cascade down from the ridge towards the river also accommodate many ponds and water bodies, natural channels, rivulets, and man-made canals forming an interconnected network enabling the water flow.
5. This method of shaping a productive drainage ecology was developed during the Sangam period (300 BC – 300 AD) and further on – collecting water from the irrigation canals, during the rain, draining it away from buildings and roads, slowing it down during heavy rains thus mitigating any flood, enable percolation into the soil increasing the groundwater during dry seasons, enable a subsoil water flow metabolising its way slowly and eventually draining into the river. Thus, there is an engineered water accumulation area (Fig 20.2 b) at the core of this elaborate heritage water management system.
6. Thus, the spatial, ecological as well as economic logic of the entire terrain is defined by this drainage ecology (the spatial logic that manages the massive amount of rainwater flows and the biodiversity that it enables). This existing water flow network is not only a significant sustainable drainage and disaster mitigation infrastructure that prevents serious flooding but also a significant spatial corridor of biodiversity, productive ecology and microclimate stabilisation.
7. Therefore even if all domestic wastewater is collected through pipes, and if all agricultural land is reclaimed and converted for buildings, diminishing the demand for irrigation water, the massive amount of rainwater flow generated within the town and its surroundings will still need to be drained into the river moving through this water network - canals and rivulets, 171 ponds, and large swathes of permeable soil surface that allows seamless percolation and seepage.

Evolved over centuries, the water flow logic of the terrain in Chittur-Thathamangalam is not only a heritage ecology but also an integral part of the social, ecological, and economic geography of the region. Neglecting this important aspect could be hazardous to the entire settlement, making it vulnerable to severe floods, inundation, and damage to life, livelihood, assets, and wealth. Therefore, it is of utmost importance for the town's first land use plan to recognise this network and consolidate these foundations for disaster prevention by guiding the future development within the municipality in a sustainable manner, serving as a legal regulatory instrument. Accordingly, the Master Plan has created a couple of zoning control overlays for regulating future development in areas that are sensitive and need to be conserved. These zoning overlays include the Ecological Protection Zone (EPZ) Overlay, the Flood and Riverine Buffer Zone (FRBZ) Overlay. In addition, it has identified Local Assets of Value (LAV) that need to be protected and conserved and demarcated Local Precincts of Value (LPV) that need a Local Area Plan to be drawn up through a community participation effort.

20.2 Zoning Control Overlays

20.2.1 Ecological Protection Zone (EPZ)

As described in Chapter 13, through extensive mapping, the contiguous land parcels that are paramount for the water flow, percolation, accumulation, and drainage as well as for open space, biodiversity, food production and micro-climate, are identified and have been proposed to be protected from developments under a special Ecological Protection Zone (EPZ). The EPZ (Fig 21.10.3) is aimed to protect this fundamental spatial logic of CTM's landscape, against extensive building activities that will block the water flow or decrease the soil percolation capacity. Most of these areas are a network of existing paddy fields, ponds and irrigation tanks, natural streams, manmade canals and river edges (see Fig 20.3) and existing paddy fields that are made part of the EPZ. These land parcels are not suitable for intense development as they will obstruct the water flow during heavy monsoons, significantly reduce groundwater percolation, and cause a high risk of inundation. EPZ also establishes a spatial logic for the growth and development of CTM by establishing a metabolised corridor of ecological assets that will sustain a benevolent microclimate and productive biodiversity. The EPZ also prevents buildings from being built in a way that causes its own flooding. Thus, the EPZ ensures the protection of water percolation and recharging, preventing disruption of stream network, ecology of drainage flows and potential flooding as well as drought. Therefore, all building construction and developments on EPZ is prohibited using the powers conferred by the Town Planning Act 2016 and the National Disaster Management Act 2005. Relevant exemptions are outlined in Chapter 23.1.3.a. Further, it is important to note that while demarcating the EPZ overlay, the overlay has been rationalised (Fig 20.6) by carefully taking into account already developed areas within the water accumulation zone (Fig 20.4) that are currently in conflict with the accumulation zone (Fig 20.5). In such areas, a number of critical drain projects have been identified as a mitigation measure to ensure drainage flows are not compromised in future (Fig. 20.7).

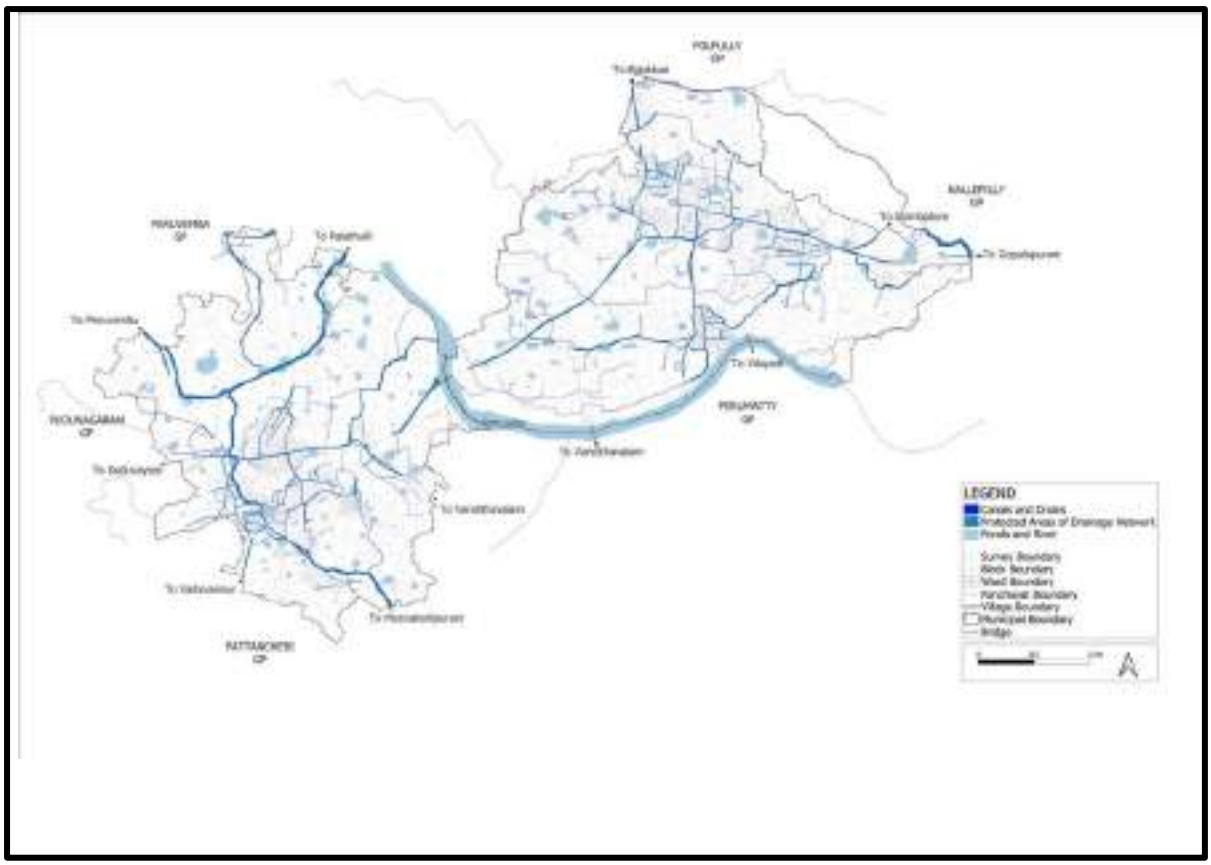


Fig 20.3 Protected Areas of Drainage Network

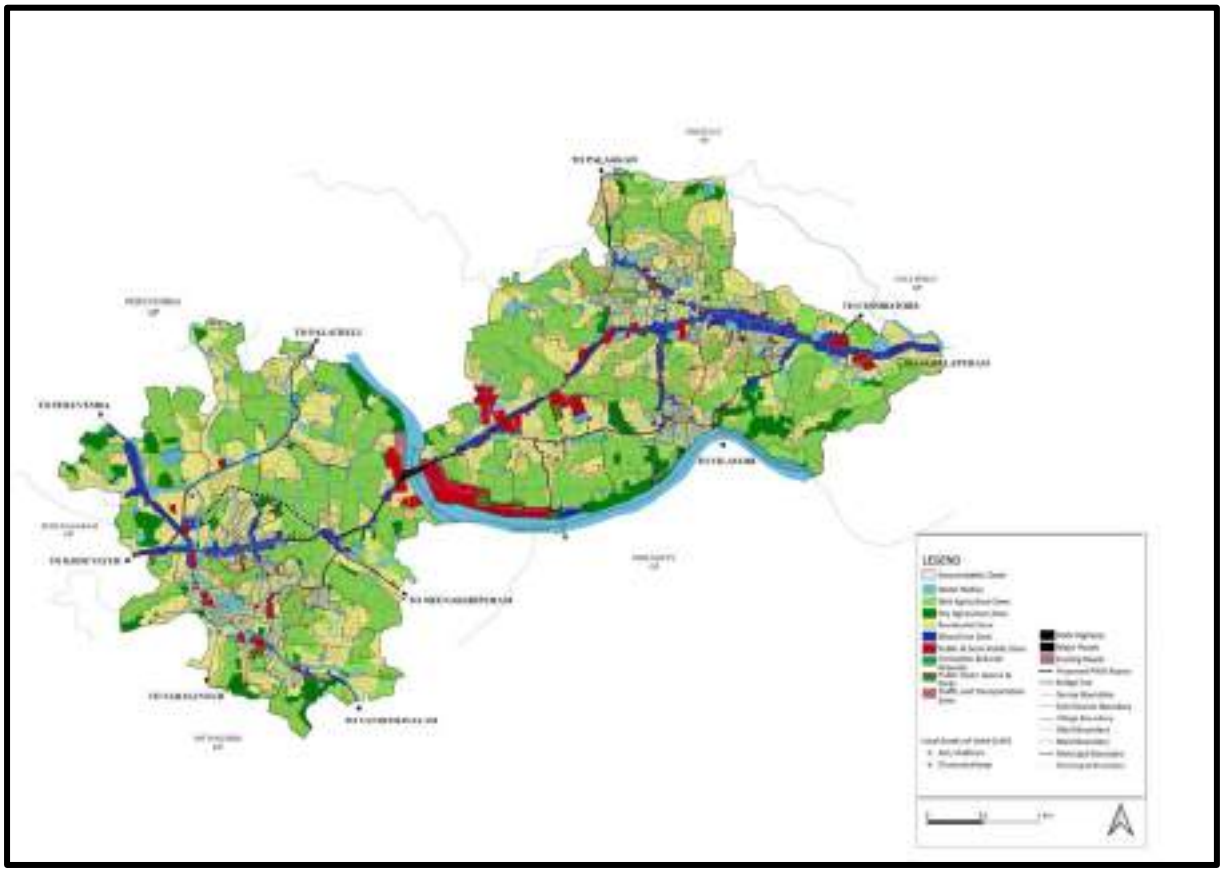


Fig 20.4 Demarcation of Water Accumulation Zone

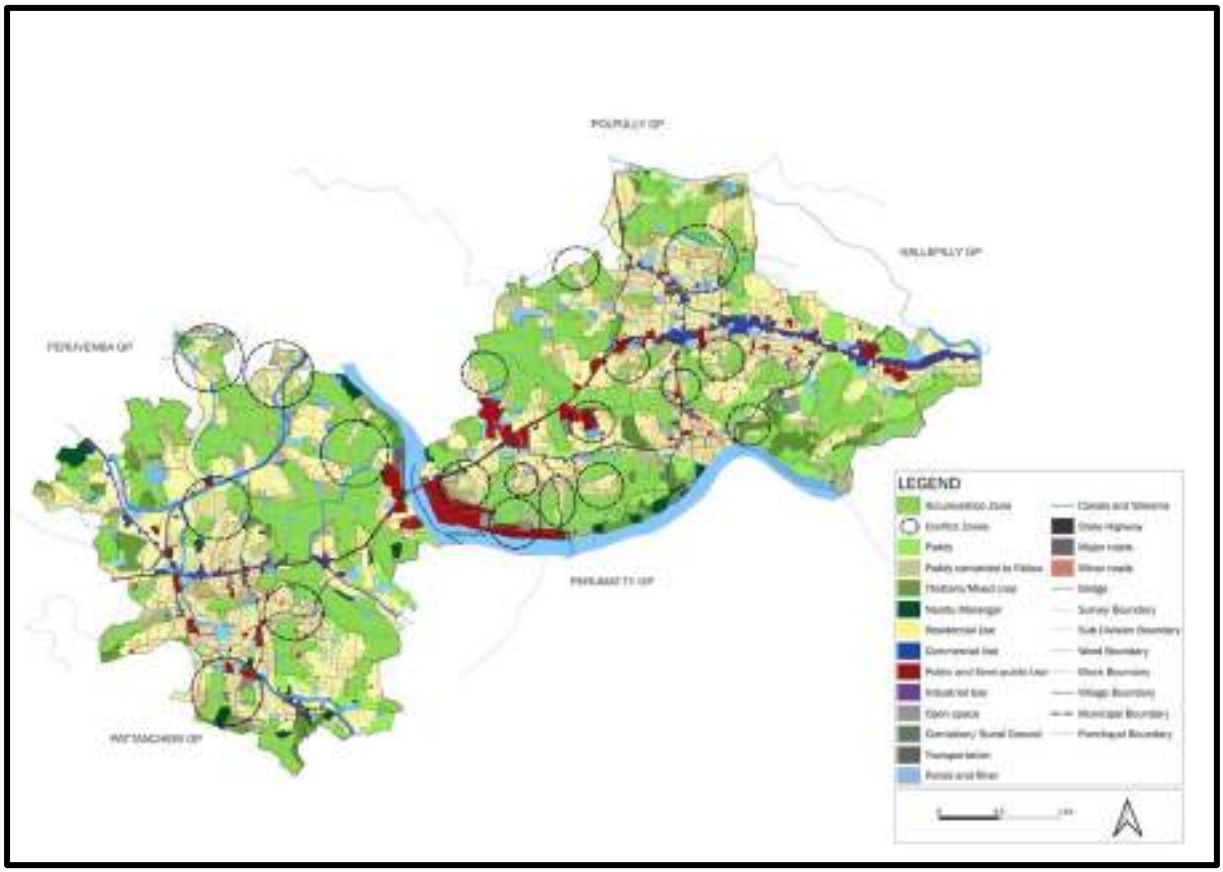


Fig 20.5 Demarcation of Built-up areas in conflict with the Water Accumulation Zone

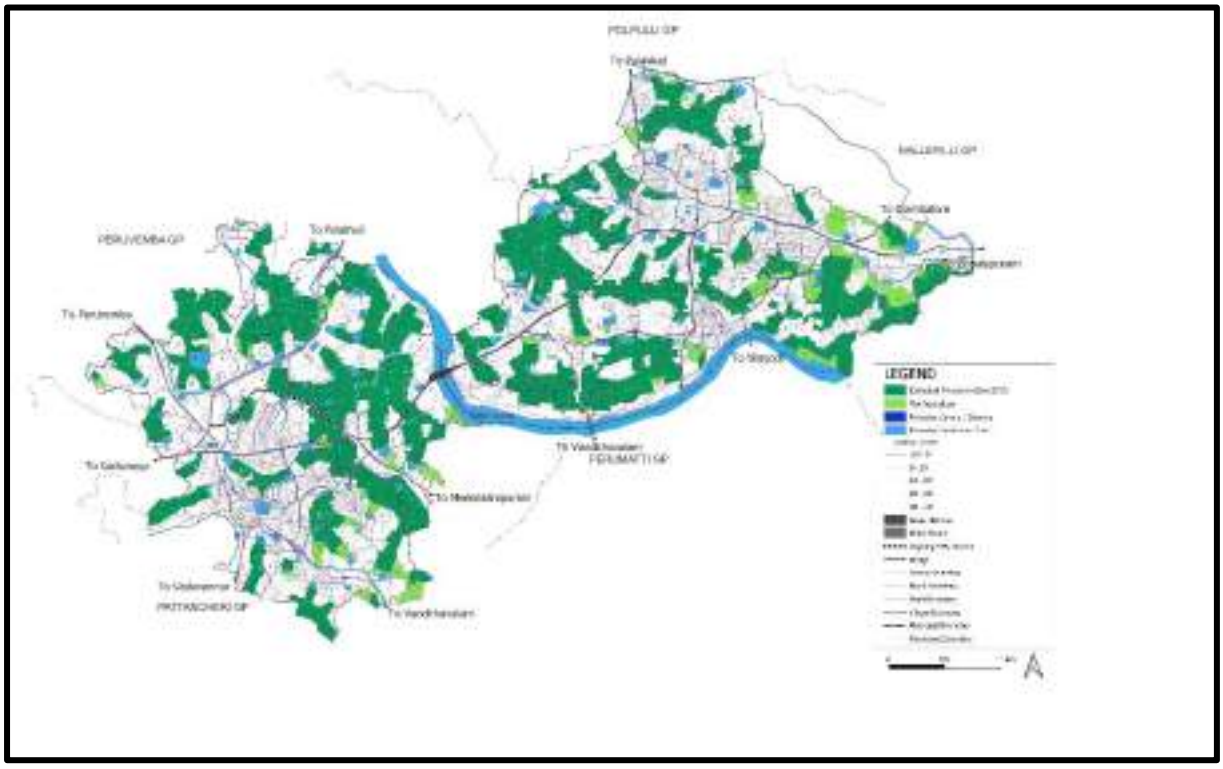


Fig 20.6 Rationalisation of Ecological Zone acknowledging Conflict areas

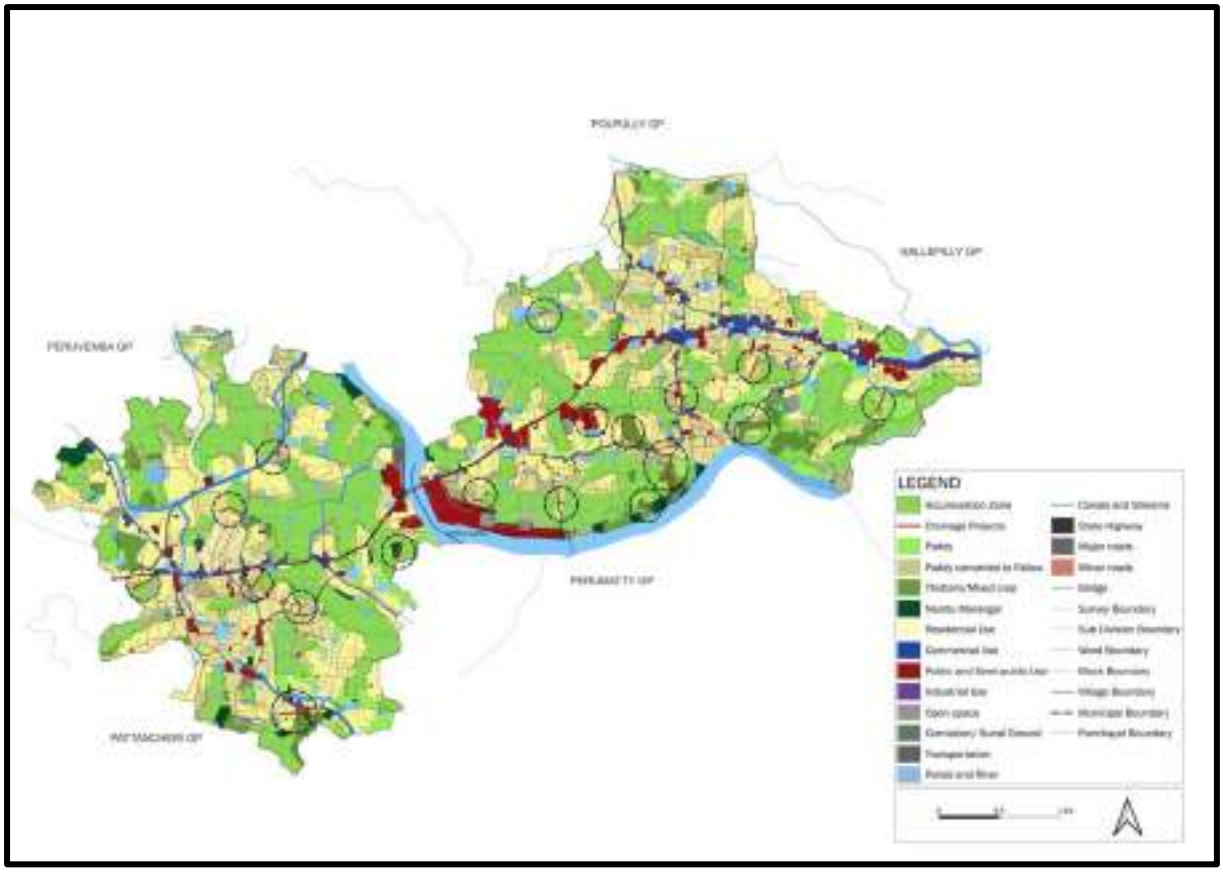


Fig 20.7 Identifying Critical Drain stretches that may need strengthening in EPZ Conflict Areas (mitigation measures for conflict zones)

EPZ is identified using a sophisticated, state-of-the-art technology and methodology, by the Master Plan Expert Committee with the help of experts in the field. A report has also been prepared for the Municipality on 'Making Chittur-Thathamangalam Climate resilient' which informs the demarcation of the EPZ. It is mapped by using satellite imagery, remote sensing data, slope modelling, and GIS mapping along with robust ground verification. It is developed with the help of experts as well as through local consultation. [34] All the land parcels that occur within the EPZ zone are identified through a detailed analysis of how water flows on the terrain of Chittur -Thathamangalam based on the slope of the land and elements of landscape that constitute the drainage ecology. The methods used to document this include topographical analysis using a DEM and 1-meter contour, on-the-ground/field verification and documentation of all the elements that constitute the water network. The accuracy of this terrain modelling is self-evident from the way the output maps overlap with cascading paddy fields and water networks on the ground during verification (see Fig 13.3).

Protection of paddy fields and related drainage ecology is one of the key demands that was articulated by many people during public consultations and participatory meetings. People in large numbers expressed their desire and strongly demanded the protection of the water networks in CTM during focused group meetings and participatory workshops. This includes

[34] Dr. Anjana Bhagyanath (NIT Calicut), Dr. Richard Scaria (GCC-Calicut University), Mr. Pankaj Chirayil (GCC- Calicut University) with the support of Dr. Pradip Kalbar (from IIT Mumbai), and with the close involvement of Dr. Malini Krishnankutty (IIT Bombay) and Dr. Jayaraj Sundaresan (London School of Economics and Political Science).

individuals across age groups as well as paddy field collectives (padashekarasamithis). Further, a special focus group meeting was conducted in December 2022 with all the padashekarasamithy representatives in which the EPZ zoning proposal map was presented and passed by their unequivocal consent and support. For the equitable implementation of EPZ, relevant exemptions have been provided in the development control regulations. (refer chapter 23 section 23.1, 3 for all regulations pertaining to EPZ).

20.2.2 Flood & Riverine Buffer Zone (FRBZ)

The municipality has a 4.44 km long riverfront. Though the town was not affected by the Kerala floods of 2018, and only a small area along the river's edge in Chittur was flooded, to prevent the effect of flash floods in future, (as stipulated in the RMIT 2021, and the National Disaster Management Policy 2009, p. 75), a Flood and Riverine Buffer Zone (FRBZ) has been demarcated as a zoning control overlay. This FRBZ draws upon the flood mapping of 2018 floods along with demarcating the low lying areas based on the topographical map of the town and ranges between a maximum of 50 meters in some low-lying areas to 0 or 3 metres from the river's edge in other areas, depending on the topography. Where the river bank has considerable elevation, there is no buffer provided. In this zone, building construction and developments are prohibited. (see Chpt 23, 3b for details).

20.2.3 Local Assets of Value Overlay (LAV)

Given that biodiversity is our best natural defence against climate change, with a view to building climate resilience, the Master plan identifies and seeks to protect special local assets of ecological value as well as public assets that have cultural and historic value. Accordingly, it has mapped a) water bodies in the town along with banyan trees *aalmarams* and declared them as 'local assets of value (ecological)' Similarly, it has mapped old '*aaltharas*' – gathering spaces around *aalmarams* and historic loading stones '*chumadathangis'* as 'local assets of value (public).' Regulations have been framed to conserve and protect these Local Assets of Value (refer to chapter 23 section 23.1.4 for all regulations pertaining to LAV)

Chapter 21: LAND USE AND SECTORAL PROPOSALS

21.1 Proposed Land Use Plan

The proposed land use plan for the Chittur-Thathamangalam town has been prepared for the year 2042. The Category of land use proposed, and the spatial distribution of various land uses is shown in Fig 21.1.

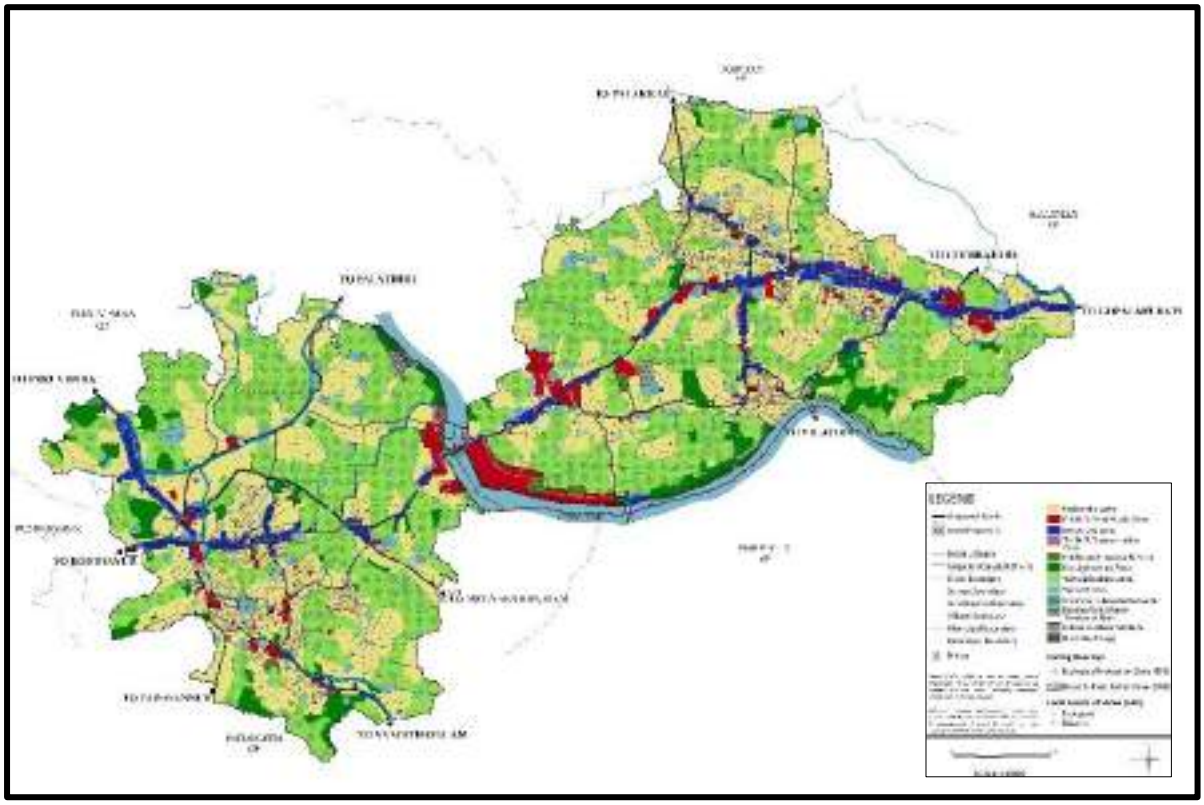


Fig 21.1 Proposed Land Use 2042

Table 21.1 Proposed Land Use 2042

Sl. No.	Zone	Area (sq km)	%
1	Residential Use	5.33	36.2%
2	Mixed Use	0.58	3.9%
3	Public and Semi-Public Use	0.52	3.5%
4	Public Open Spaces & Parks	0.05	0.3%
5	Wet Agriculture	5.59	38.0%
6	Dry Agriculture	0.81	5.5%
7	Cremation & Burial Grounds	0.02	0.1%
8	Water Bodies	1.06	7.2%
9	Transportation	0.75	5.1%
	Total Area of Municipality	**14.71**	**100%**

21.1.1 Residential Zone

Most of the higher elevation areas in the town are built up and the predominant use everywhere is residential. There are many older historic community-based settlements in the town with distinctive settlement character. These areas have been identified as Local Precincts of Value (LPV) and local area plans have to be created for them through a participatory process. In this predominantly residential zone, small commercial activity is permitted, small clinics and compatible uses, that do not disturb the residential character of the zone. The land zoned for residential use is 5.33 sq. km.

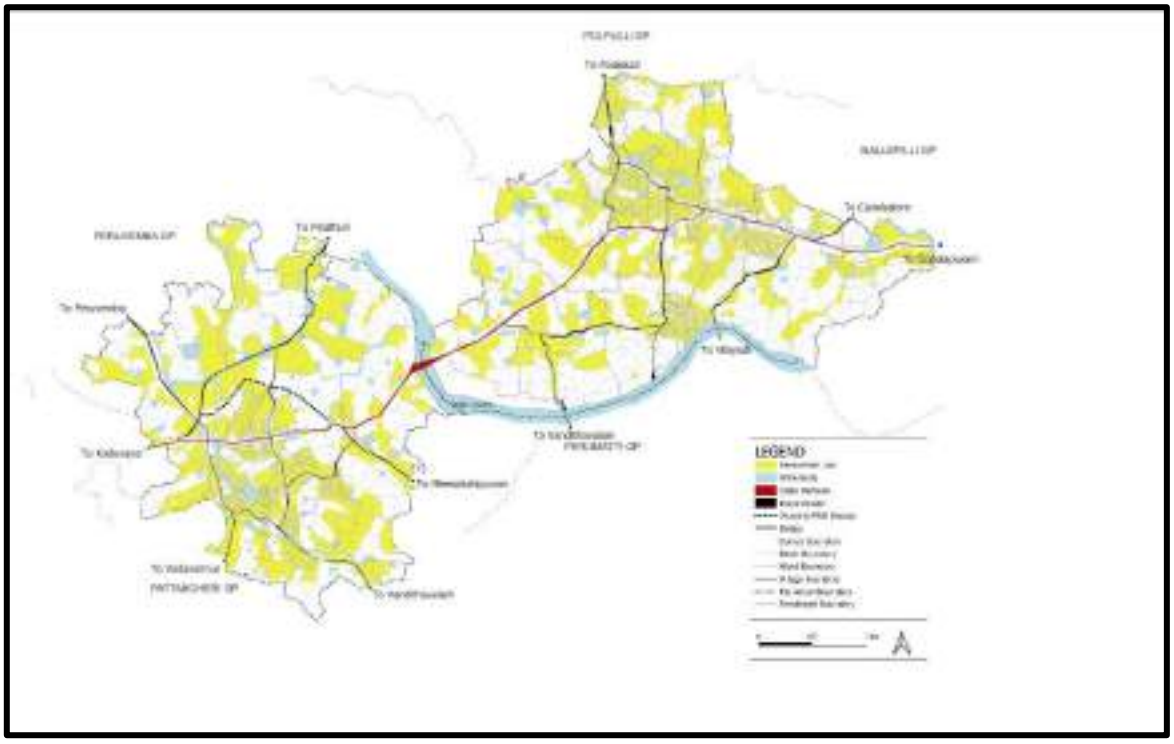


Fig 21.2 Residential Zone

21.1.2 Public and Semi-public Zone

Public and semi-public land use accommodate Government offices, education institutions and health related and religious institutions. The land zoned for public and semi-public use is 0.52 sq. km. In the proposed land use plan, no additional land for public and semi-public use is earmarked. Priority is to be given for accommodating additional facilities in the existing public and semi-public zones by utilizing the land optimally.

At the same time public and semi-public uses, i.e., religious, educational offices and health related facilities to be provided with some restrictions are also permitted in the proposed predominantly residential, commercial zones. Some public buildings have been identified and listed as local assets of value. A Heritage Action Plan, that through participatory processes, needs go be prepared for these Local Assets of Value and Local Precincts of value.

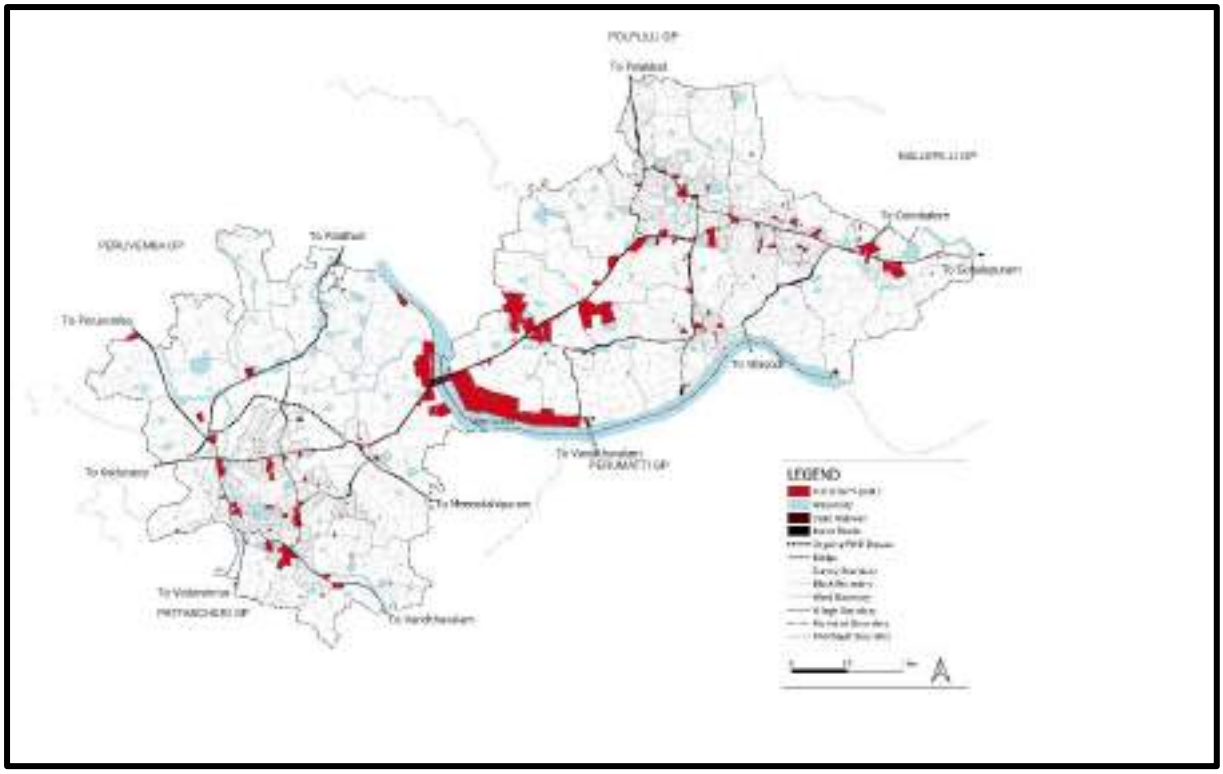


Fig 21.3 Public and Semi-public Zone

21.1.3 Mixed use Zone

At present most of the commercial activity is concentrated in the core area of the town and along the major road network passing through the town. The commercial activity is mixed with residential uses as well as public semi-public uses and some industrial uses. Therefore, the area adjacent to the main road running through the town is demarcated as a mixed-use zone whereby the existing pattern of commercial development in the CBD area, the residential uses as well as all other uses can be retained. The mixed-use zone is also proposed to be developed along other stretches of the main roads, taking cues from the current commercial activities seen along road stretches, so as to cater entire municipal area and to help make all residential areas self-contained and self-sufficient in terms of basic day to day needs of commercial uses as well as other uses.

There are a couple of old historic market stretches one in Chittur and one in Thathamangalam that still retain the old shophouse character with tiled roof and ground or ground plus one structure. These have been identified as Commercial LPV and a LAP is to be prepared with some architectural controls through a participatory process, so as to retain the character of the old market stretch. . There are no restrictions imposed for further residential activities in this area. The most important commercial nodes are Chittur Town Junction and Thathamangalam Junction. Along the four arms of these Junctions of nearly 0.50 km length are having commercial development. The existing land use in this CBD reveals that majority of commercial developments are along the State highways (SH 25and SH 27). More thrust can be given to commercial activities both retail and wholesale, since commercial markets are already established in this area with good connectivity. The commercial area is subsumed within the proposed mixed-use zone. The land zoned for mixed use is 0.58 sq. km.

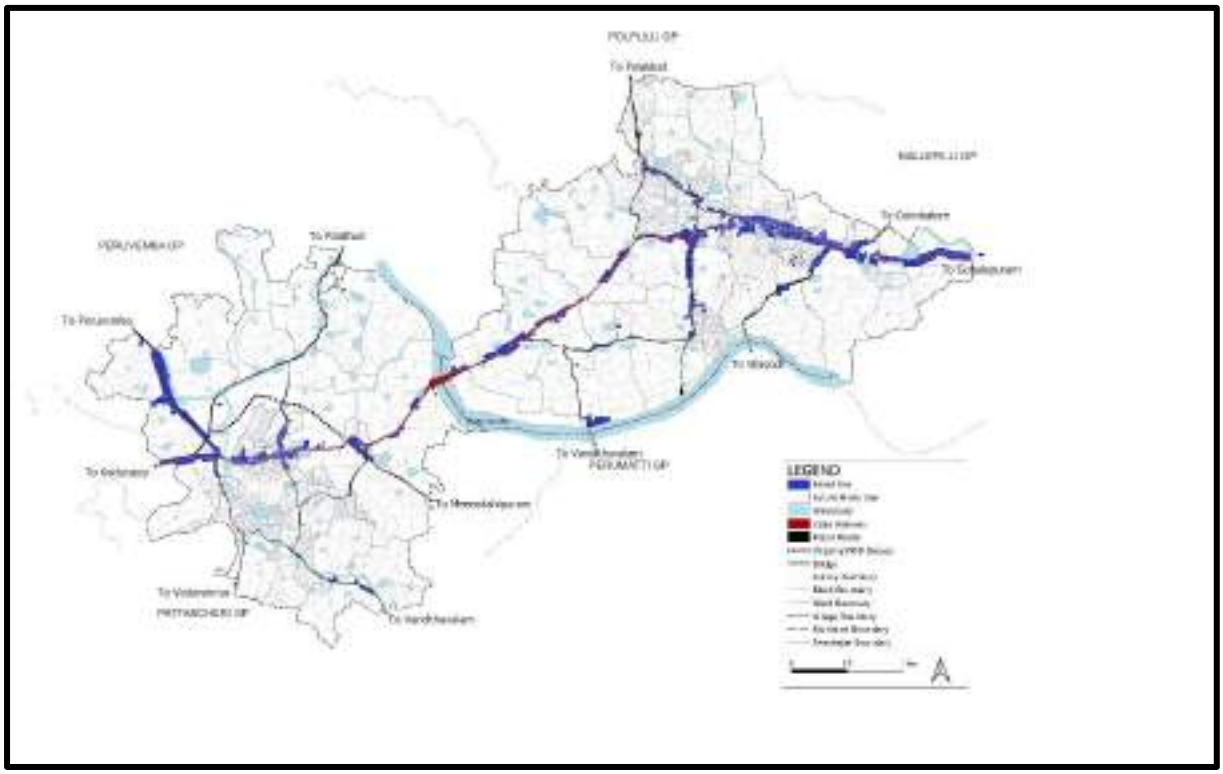


Fig 21.4 Mixed Use Zone

21.1.4 Traffic and Transportation Zone

The major share of this zone is area covered by roads. The municipal road network has a fair coverage. The land under this zone also covers existing bus stand, KSRTC bus depot and proposed bus interchange, parking lots, auto parking, taxi stands etc. The land zoned for traffic and transportation is 0.75 sq. km.

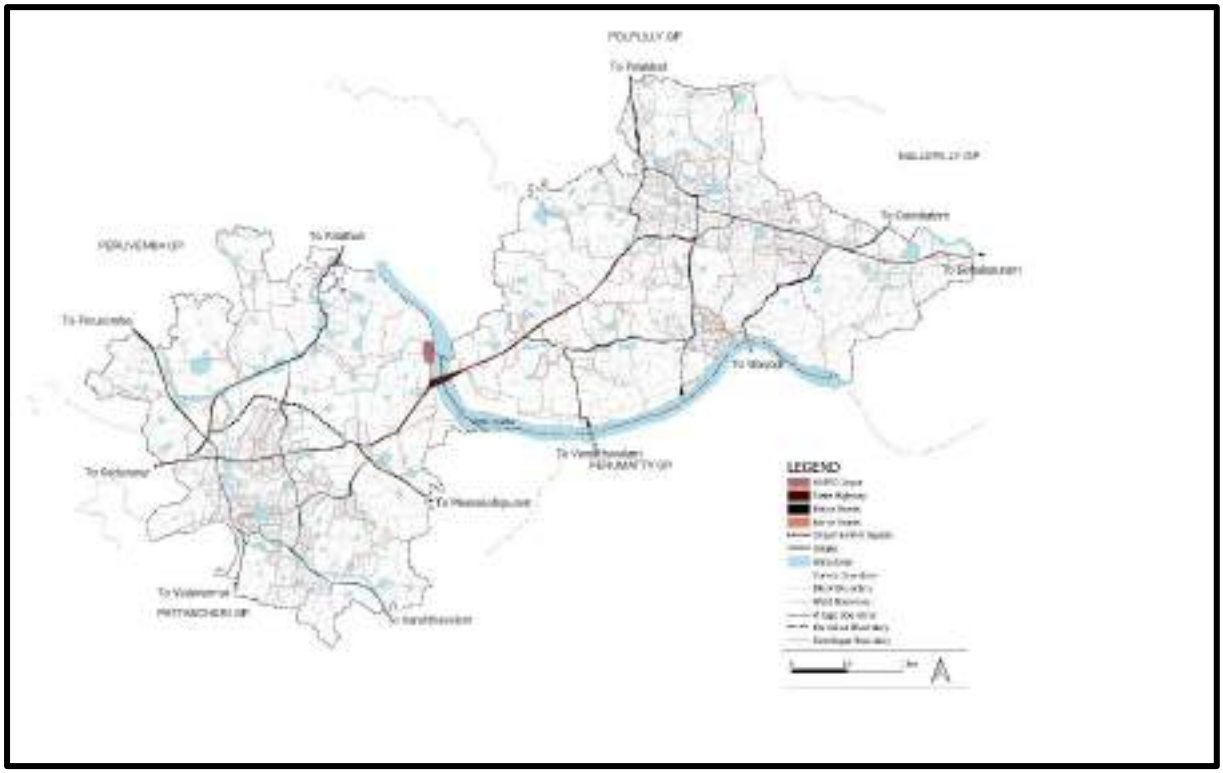


Fig 21.5 Traffic & Transportation Zone

21.1.5 Public Open Spaces & Parks

This zone includes public commons and parks and playgrounds. There is a restricted zone overlay over much of the public semi-public uses, whereby all commons, open spaces, parks and public playgrounds have to be maintained as is and cannot be built upon. The land zoned for public open spaces is 0.05 sq. km.

Open grounds and Public Commons

There are many open grounds in the town that are used as public commons, which were traditionally linked to ritual practices, annual festival usages and livelihood practices. These have been identified and included the *velaparamb* outside shrines, the *vediparamb* linked with festivals and firecrackers, the *pavodi* which are used by the weaving community for stretching their yarn.

Parks/ Public Playgrounds/Recreational Grounds

The town suffers from a lack of recreational areas. But due to the presence of paddy fields, water bodies the shortage of open spaces are not felt much. At present there are only two parks in Chittur-Thathamangalam town but they are in disrepair. This zone includes parks, public school playgrounds, and recreational grounds. There are private lands that are in use as children playgrounds but these were not included in the PLU given the constrained municipal revenues.

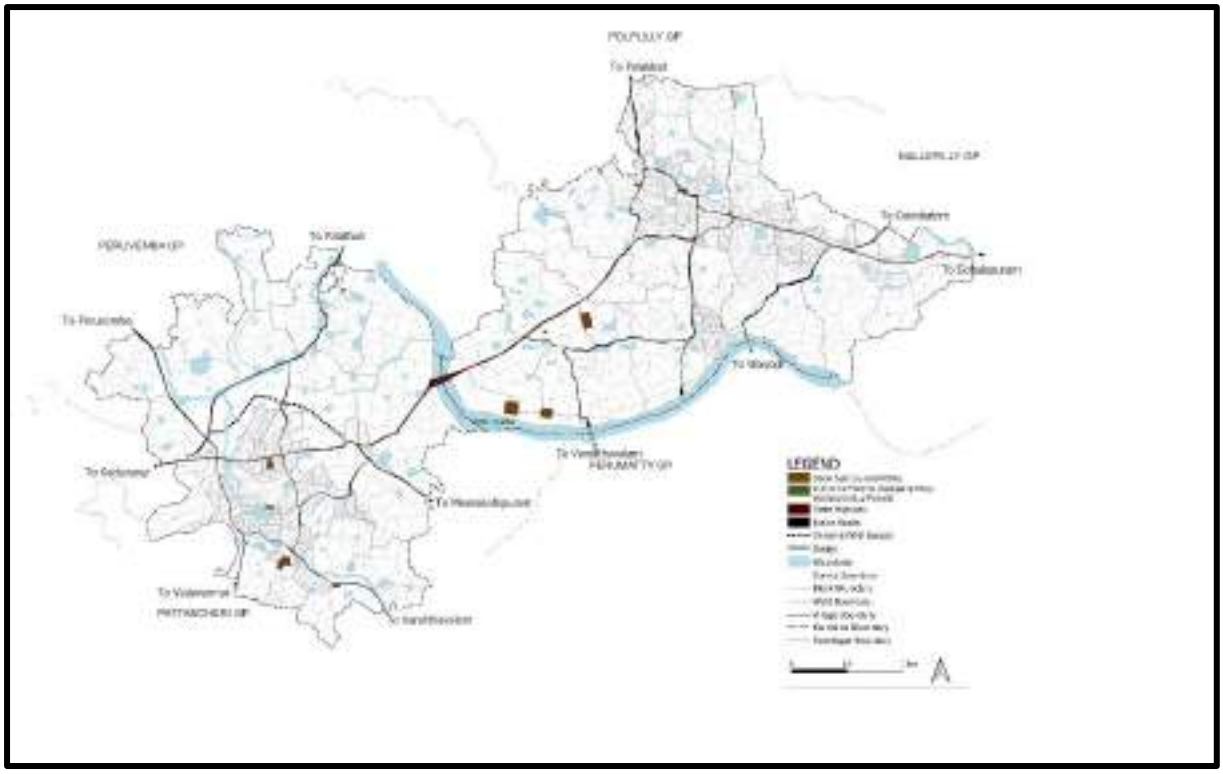


Fig 21.6 Public Open Spaces & Parks

Since there is a demand for recreational facilities, sports facilities and improving walkability, many active recreational areas with exercise equipment, and cycle tracks are proposed along the existing roads which are redesigned roads where there is space available after provision of 2 lanes and footpaths, along with one indoor/outdoor stadium and recreational grounds for sport facilities in all public schools are proposed in the town.

21.1.6 Dry Agriculture Zone

The land zoned for dry agriculture zone is 0.81 sq. km. This area besides its economic value due to agricultural production, is significant since large tracts of land are available in this zone within the municipality. Low density residential development shall be allowed in this zone. The industrial and public semi-public land uses also shall be permitted in this zone with certain regulatory measures.

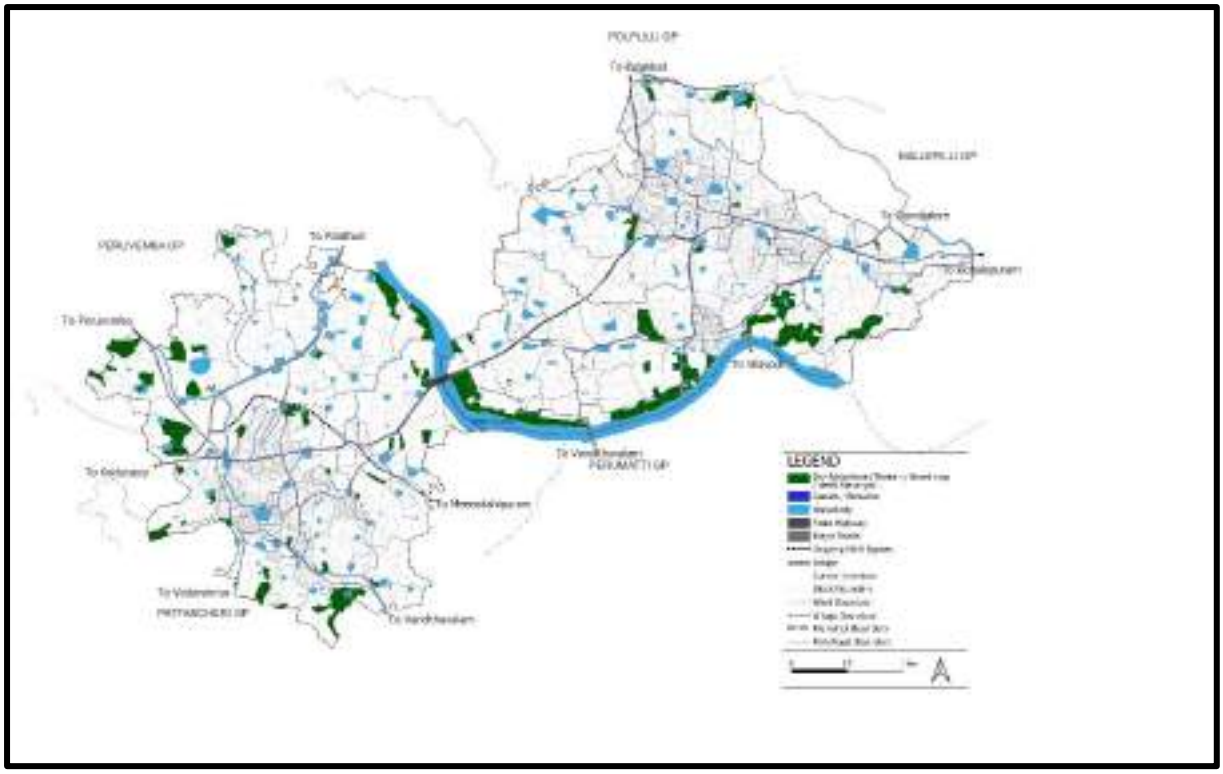


Fig 21.7 Dry Agriculture Zone

21.1.7 Wet Agriculture Zone

This zone includes areas under paddy cultivation. Most of the area is a water recharging area and hence has ecological sensitivity. Most of this area comes under the Ecological Protection Zoning Control Overlay, which is to protect the drainage network and water flows.

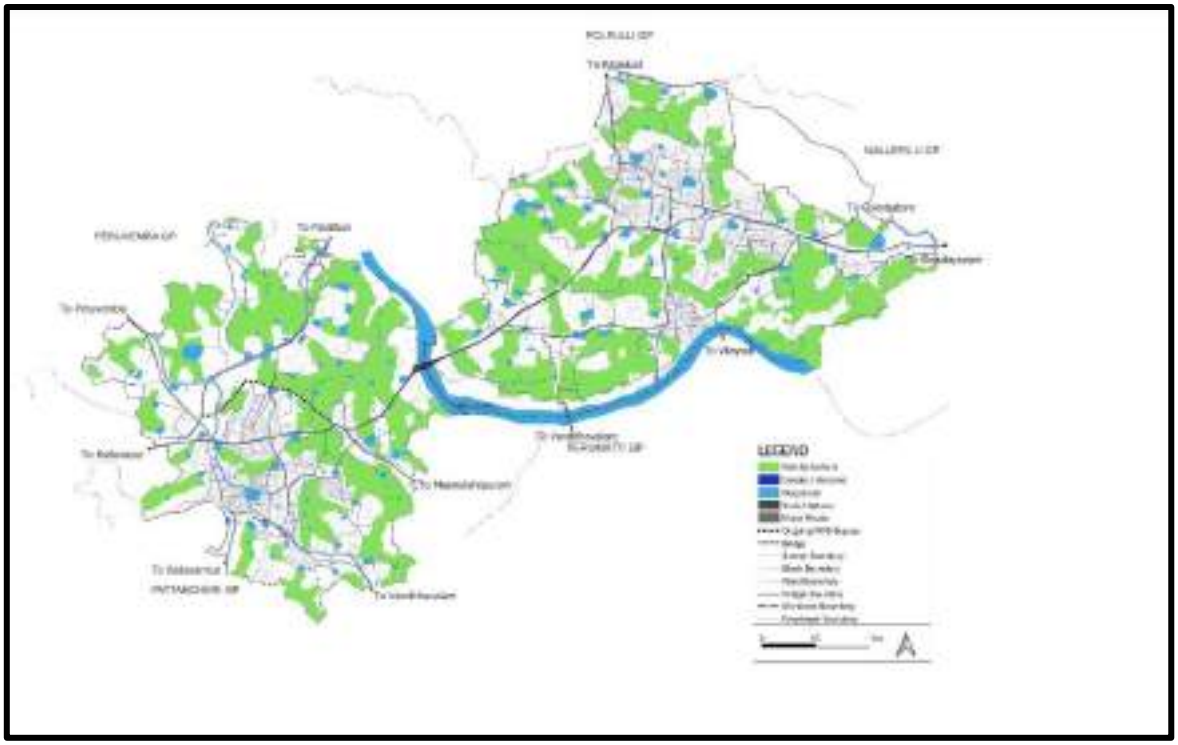


Fig 21.8 Wet Agriculture Zone

In Kerala, all paddy areas are protected under the Kerala Paddy and Wetland Conservation Amendment Act 2018, which is no development zone except for very small housing that is permitted (5-10 cents). The land zoned for Wet Agriculture Zone is 5.59 sq. km.

21.1.8 Water Bodies (Canals/Streams/Ponds/River)

This zone includes the river, ponds, and all storm water drainage networks, manmade and natural. This zone has an Ecological Protection zone control overlay over it. The land zoned for canals, streams and ponds is 1.06 sq. km.

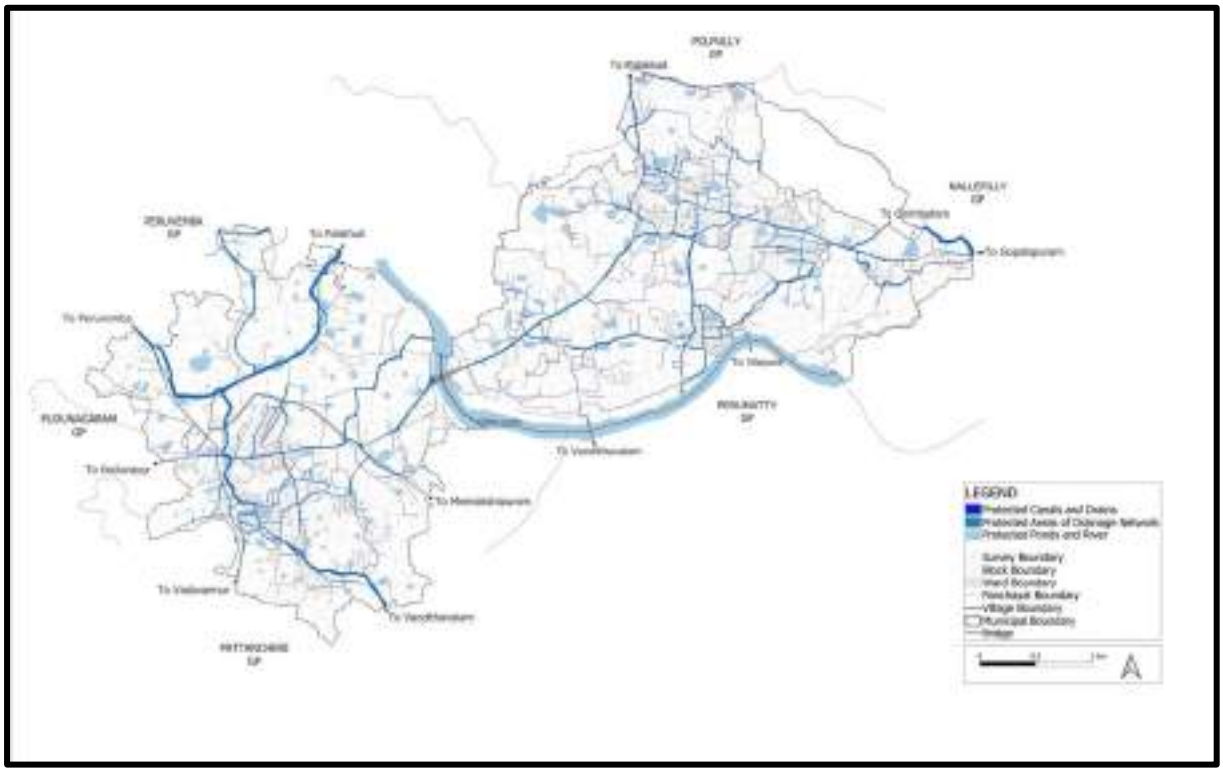


Fig 21.9 Water Bodies

21.1.9 Crematoria & Burial Grounds

This zone includes existing cremation and burial grounds. The land zoned for crematoria and burial grounds is 0.02 sq. km.

21.2 Zoning Control Overlays

Zoning controls serve as overlays over certain special precincts or plots which are identified. Generally, they can be either prohibitive, restrictive, regulatory or promotional in nature. In Chittur-Thathamangalam, the following zoning overlays are proposed:

1. Ecological Protection Zone
2. Flood & Riverine Buffer Zone
3. Local Precincts of Value/Local Assets of Value

21.2.1 Ecological Protection Zone (EPZ)

This zone includes areas that largely serve as the water recharging area, the water retention area in case of heavy rains as well as the artificial canals as well as natural streams through which through which water flows and gets discharged finally into the river. Irrigation canals (main and subsidiary CADA canals) are also part of this storm water network. This zone is earmarked as a restricted Ecological Protection Zone, where any development that will alter water percolation characteristics of the soil and water flow within the channels and streams is prohibited.

It includes most of the area that is currently under paddy cultivation and the entire network of streams and ponds and canals, which need to be conserved so as to ensure that the town is safeguarded from future impacts of climate change arising out of extreme events, water depletion and rising heat.

Development in these areas are to be strictly regulated to prevent any obstruction of the water flows through this area. No construction will be permitted in future in the wet agriculture zone that falls under EPZ. However, with a view to not cause hardship to small landowners who wish to house themselves and to accomodate for natural increase of homesteads in this zone some exemptions with regulations over how to build sensitively in this zone are envisaged.

In all water bodies that fall within this zone, the EPZ controls will prevail. Areas that do not fall within this zoning overlay are not critical for maintaining future drainage flows and could be developed in future. However, it must be noted that all wet agriculture areas outside the EPZ are governed by the provisions of the Kerala Paddy and Wetland Conservation Act 2008.

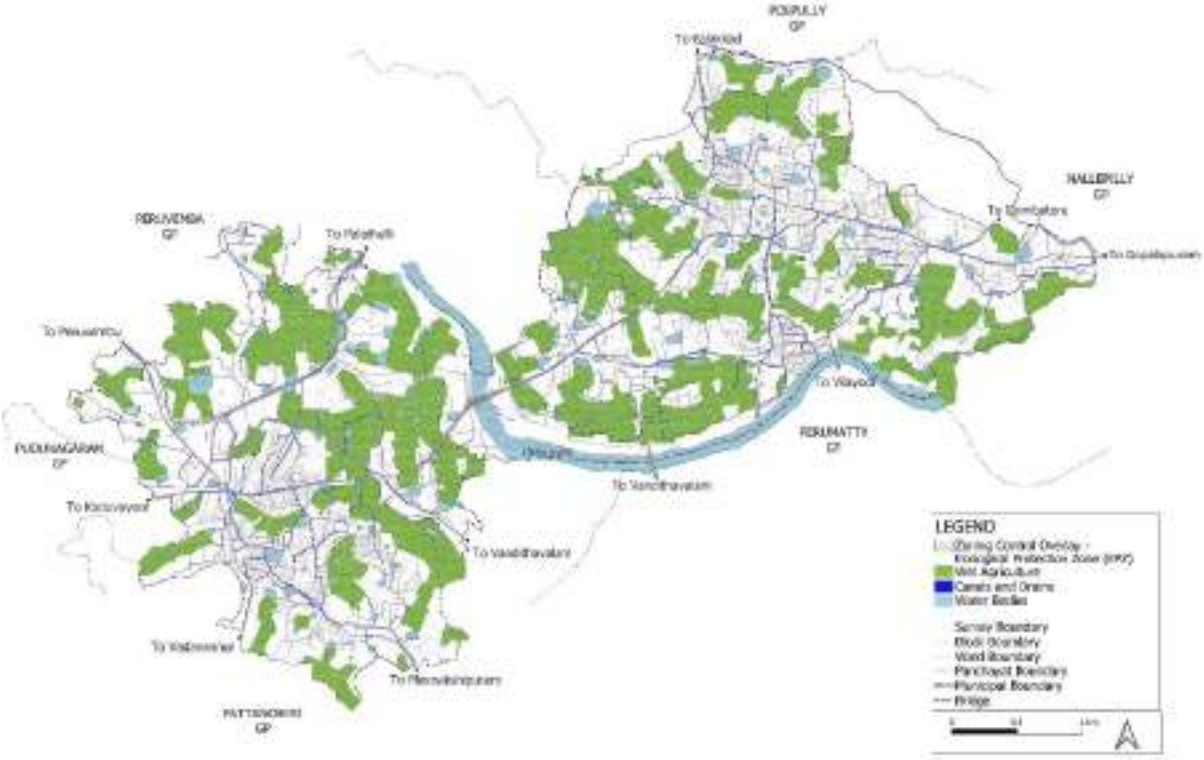


Fig 21.10 Zoning Control Overlay – Ecological Protection Zone

21.2.2 Flood & Riverine Buffer Zone (FRBZ)

The municipality has 4.44 km of river frontage. Some of this area was flooded during the recent Kerala floods in 2018. To enable more 'room for the river' and to increase flood resilience, a a flood and riverine buffer zone has been demarcated as an overlay, that ranges between a maximum of 50 meters in some low-lying areas to 3 metres from the river's edge in other areas, depending on the topography. Where the river bank has considerable elevation, there is no buffer provided (see Fig. 21.11) No permanent construction will be permitted in this zone. Any existing public amenities in this zone will be regulated and kept to a minimum.

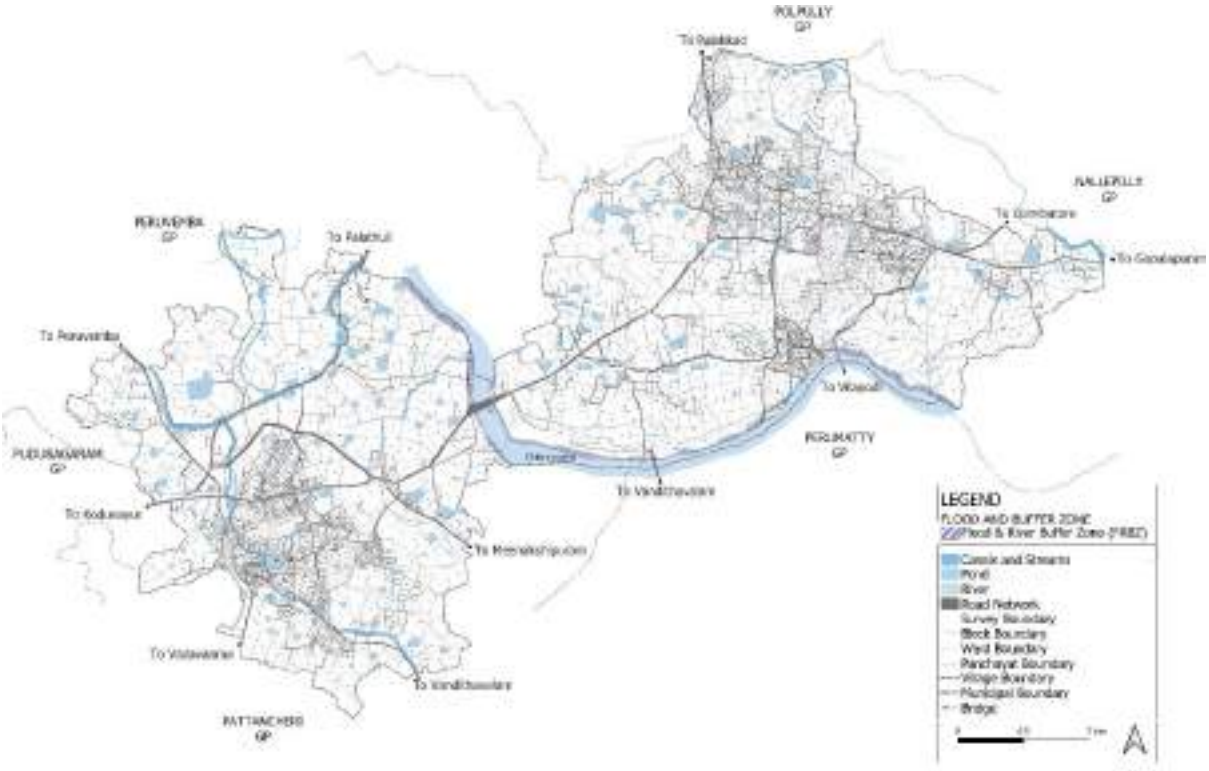


Fig 21.11 Zoning Control Overlay – Flood & Riverine Buffer Zone

21.2.3 Local Precinct of Value/Local Asset of Value (LPV/LAV)

I. Local precincts and assets of value have been identified. For each precinct, a detailed strategy and Local Area Plan (LAP) with a manual of how to manage development in this zone will be detailed out through community participation. Chittur-Thathamangalam has many older community settlements and older historic buildings within its limits. These tell us stories about the past and help us understand how the town came to be and that helps us understand the present better. Preserving community memory and its stories can be an important part of building a strong community. Further, by preserving the settlement character and heritage of a community helps provide a sense of place and continuity. Additionally, it is an efficient use of resources, that helps reduce waste, reusing existing buildings instead of tearing it down. It also helps to reduce the carbon footprint of the building while preserving old methods of building craftsmanship, creating new skills and techniques in the process. Conservation of old neighbourhoods can also serve as an attraction for tourists, due to their uniqueness, while also contributing to community pride.

This in turn can provide more employment overall not only in the building crafts but also in other service industries.

II. Local Precinct of Value (LPV): Four areas with special settlement character have been identified and have been demarcated as Local Precinct of Value precincts (see Fig. 2112). Local Area Plans are to be prepared for each precinct through a participatory process with special guidelines that will differ for each Precinct.

a. Residential LPV 1 (Agraharams)
This zone demarcates the area based on presence of traditional row houses, which presents a unique settlement type and neighbourhood.

b. Residential LPV 2 (Nayar tharas)
This zone demarcates area largely occupied by Nayar tharas, large independent homes with compound walls, gatehouses and courtyard houses set in large plots.

c. Residential LPV 3 (Neyath Gramam)
There are settlements of weaver communities in two areas in the town- Devangapuram and Vadakkethara. Each has a different settlement pattern, united though by their work and the mixed-use nature of the settlements and the nature of their open spaces.

d. Commercial LPV 1 (Historic market)
The old historic market stretches in Chittur and Thathamangalam have been separately zoned as Commercial LPV. Guidelines for architectural design a that would enable some visual coherence for the historic market will be drawn up through community participation.

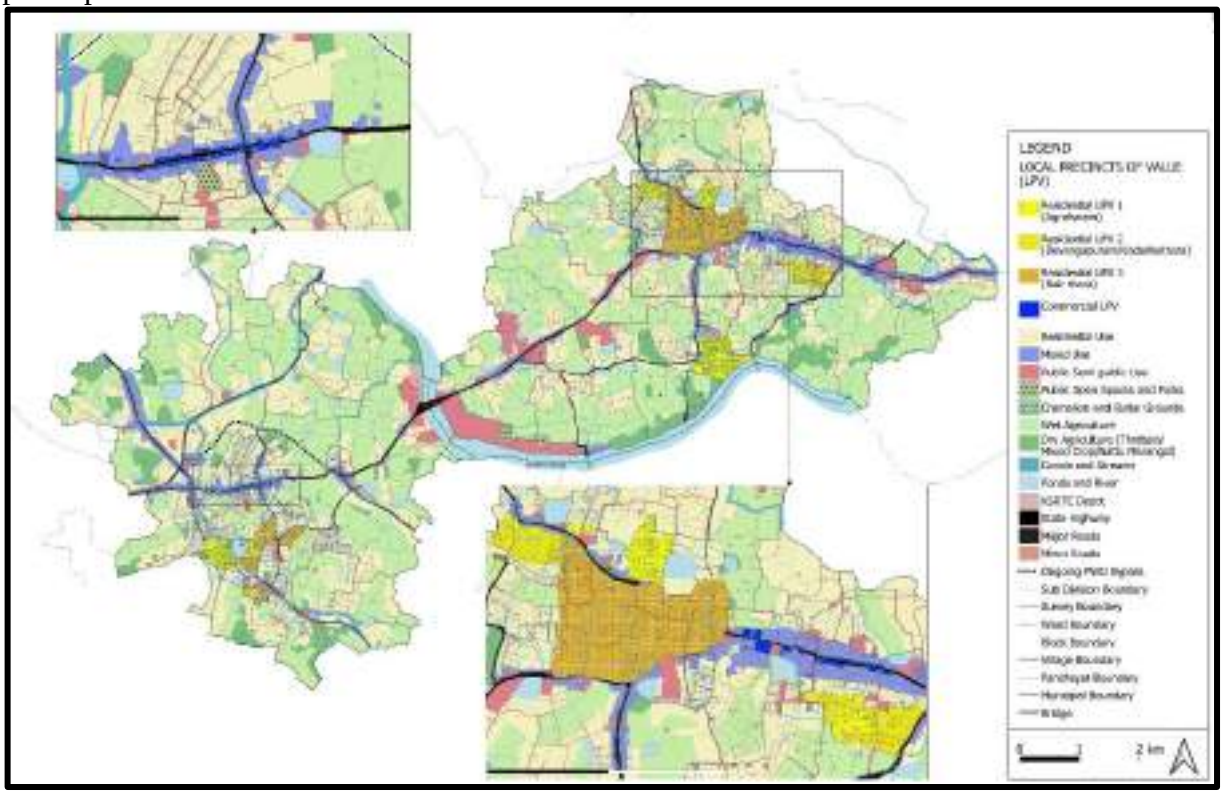


Fig 21.12 Local Precincts of Value – LPV

III. Local Asset of Value (LAV)

In addition to the four precincts, local individual assets have also been identified that need to follow some guidelines in the event of any alternation, modification, repair. For each asset that is a built asset, a detailed strategy, a manual and guidelines will be detailed out through community participation.

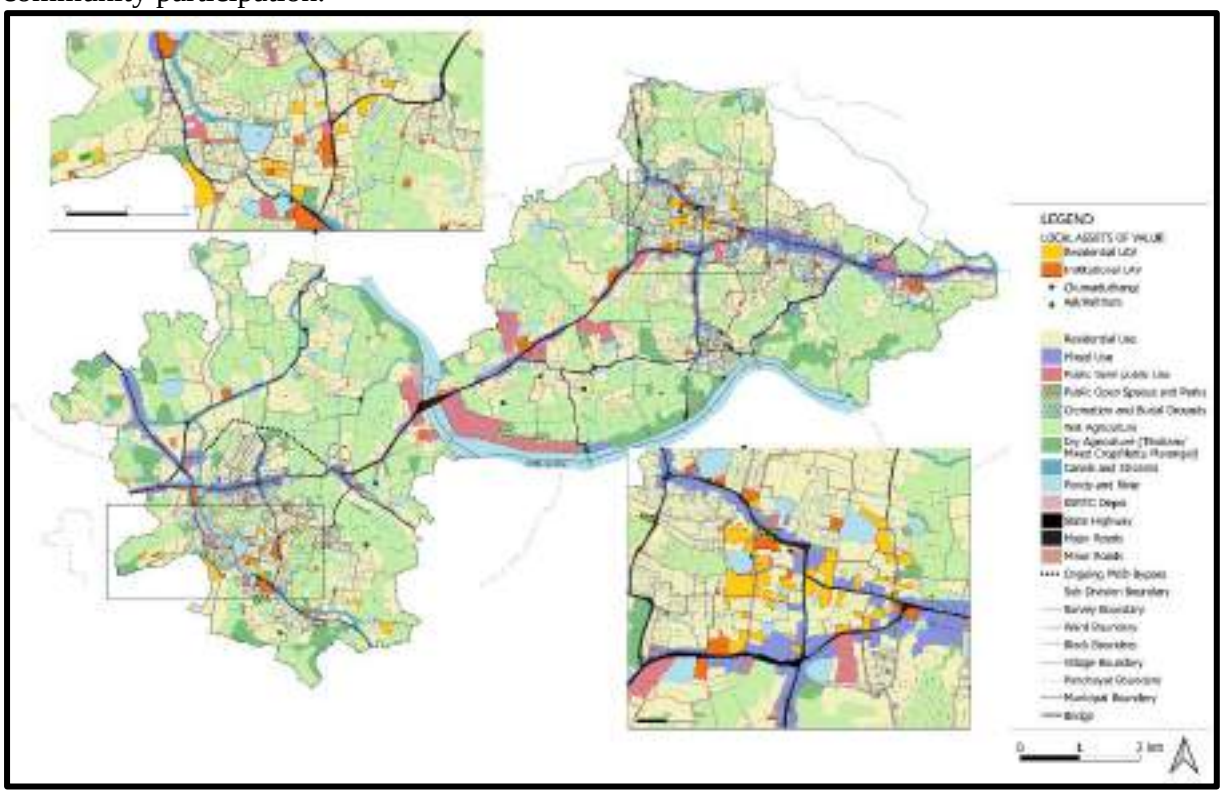


Fig 21.13 Local Assets of Value LAV

a. Local Asset of Value (Residential): These assets of value have been identified (see Fig 21.13).

b. Local Asset of Value (Public): A number of individual public buildings have been identified and included in a list as 'Local Asset of Value' (LAV) There is aneed for a special Heritage Action Plan for their conservation. Three of these public structures have been proposed for new adaptive reuse. The AE office and the Village Office have been proposed as a Cultural Centre/Art Gallery and the Village Office as a Konganpada Museum, and a Storytelling Academy. The old Municipal Office building is also proposed as an Exhibition space/art gallery for temporary exhibitions of photography and art.

   The list of Local Assets of Value include the following public assets:

   - Court Complex
   - Town Hall
   - Chittur Village Office
   - AE Office
   - Girls' School, Boys' School (old building)
   - KSEB building
   - PWD Rest House
   - Municipal Building
   - Thathamangalam High School Building

c. Local Asset of Value (Ecological): *Aalmarams* (local banyan trees that often have an *aalthara*, where people gather or they have local shrines associated with them), ponds and water bodies are considered as local assets which have great ecological value apart from other values as public open spaces. These have been identified and are protected through regulations. *Kaavus*/sacred groves, often attached to large Nayar taravads are other local assets of ecological value that need to be conserved and they need to be protected as per the regulations. These have not been mapped yet and first need to be mapped as part of a Heritage Action Plan for the town that needs to be drawn up.
d. Local Asset of Value (Historical): Chumaduthangi (Goods loading stones) are present along a historic trade route that is now part of the State highway. These need to be preserved as per the regulations. Aaltharas associated with the Aalmarams have value as public gathering places, that often have long cultural history. These need to be preserved as per regulations.

21.3 Traffic and Transportation Plan

Transportation planning is long range and involves planning for a future target year. In order to meet the base year and projected demand for various horizon years, a long-term traffic and transportation plan has been formulated for the town. This covers planning for future transport development and network improvements such as parallel road links, bypasses for intercity arterial roads, over bridges and development of integrated bus terminals and public transportation system etc. The Traffic and Transportation proposals for town revolve around defining a hierarchy ranging from R1 to R2 of road pattern catering to various needs and land uses of the Master Plan. The future pattern is designed in such a way that with focal point as Anikode Jn in Chittur portion and Thathamangalam Junction in Thathamangalam portion. A bypass road is currently underway and land acquisition completed in order to avoid congested CBD area around Thathamangalam Jn. This **Thathamangalam bypass (1.93 km)** is an ongoing PWD project for vehicles coming from Koduvayur side to Mettupalayam Junction bypassing the busy Thathamangalam Junction. 1.63 km of this road is fully new alignment, while the rest is existing road widening to 21 m. The land acquisition for this road is almost complete.

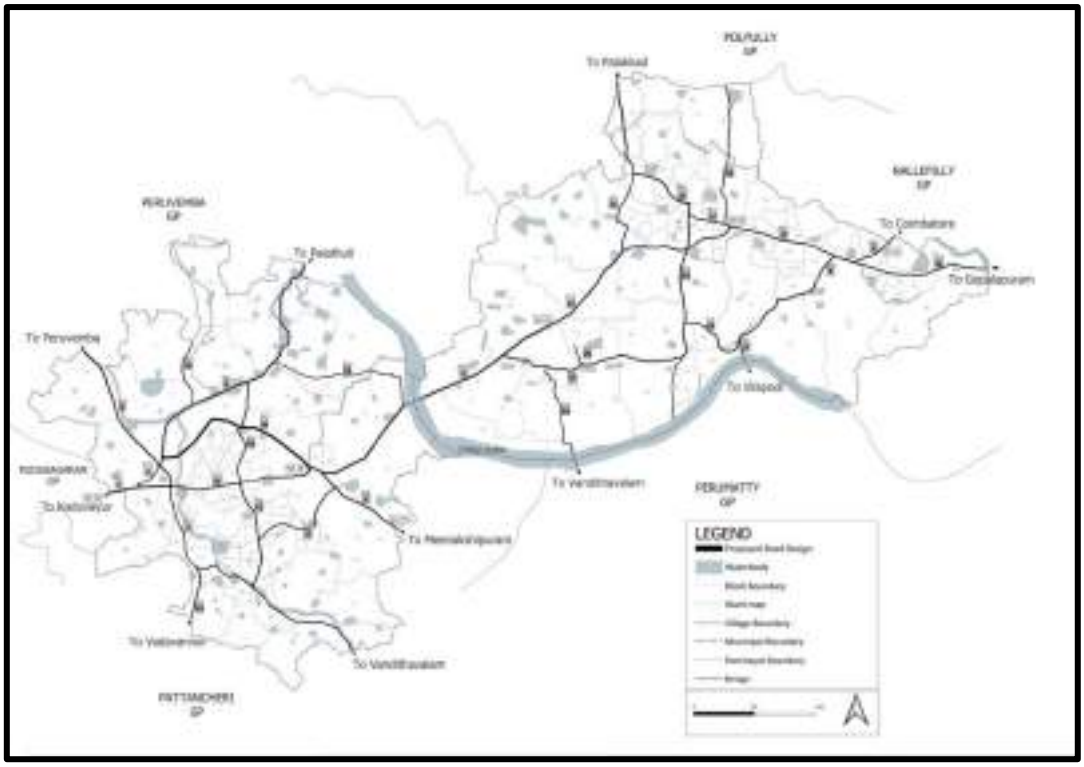


Fig 21.14a Details of Proposed Road design in Transportation network

Proposed minor Rectifications stretches based on Road proposals

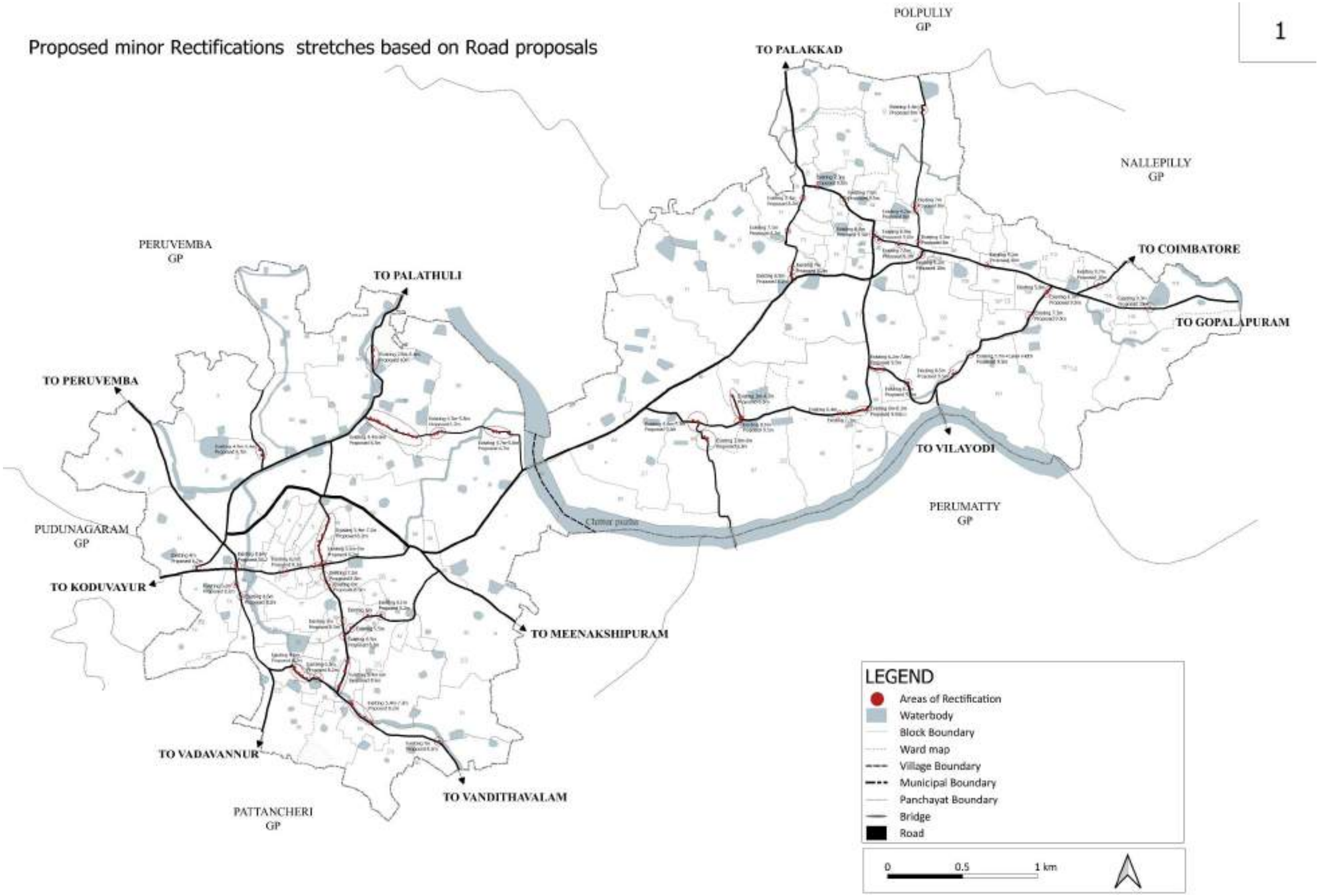


Fig 21.14b Proposed minor Road Rectification stretches based on Road proposals

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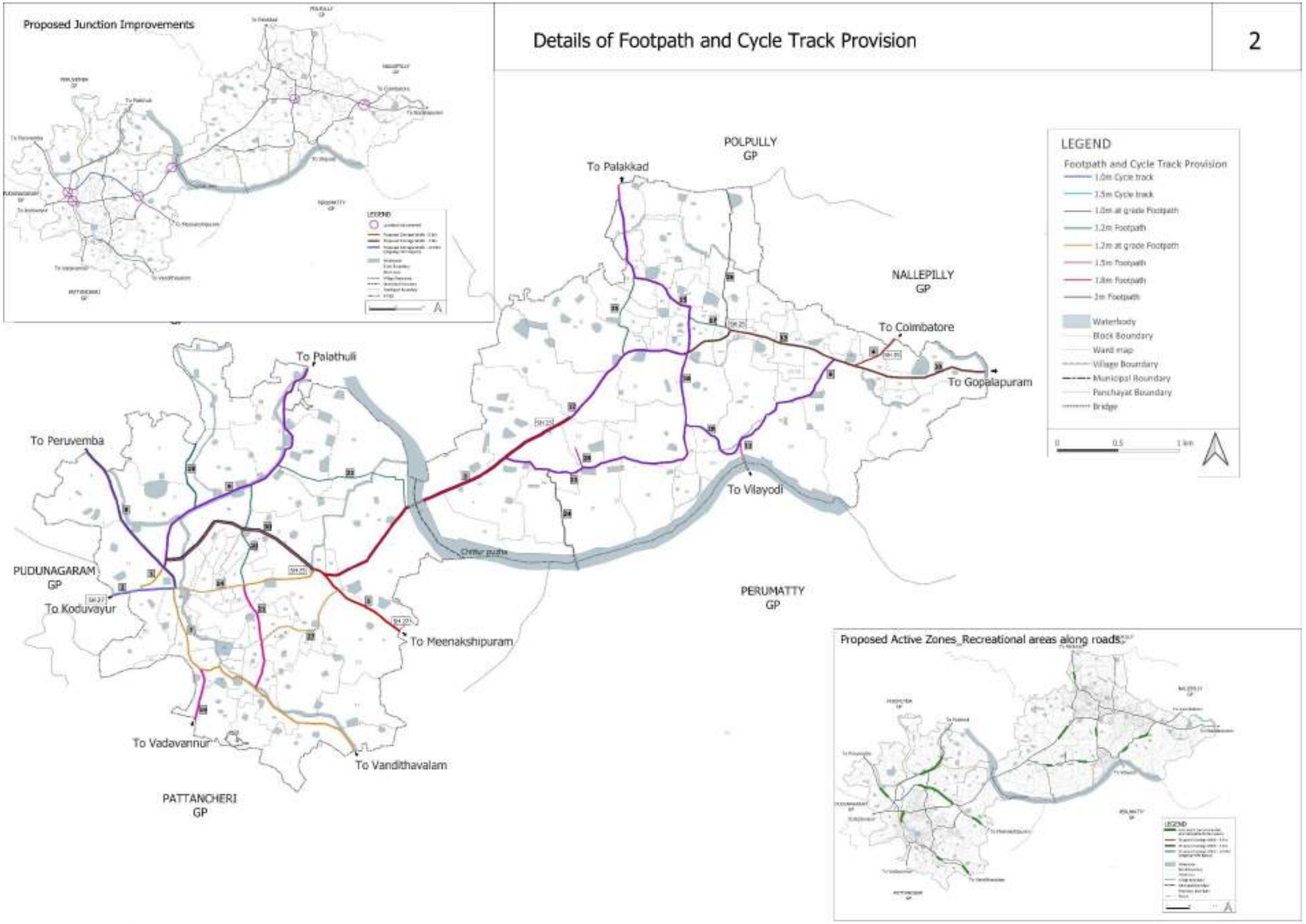

Fig 21.15 Details of Footpath and Cycle Track Provision

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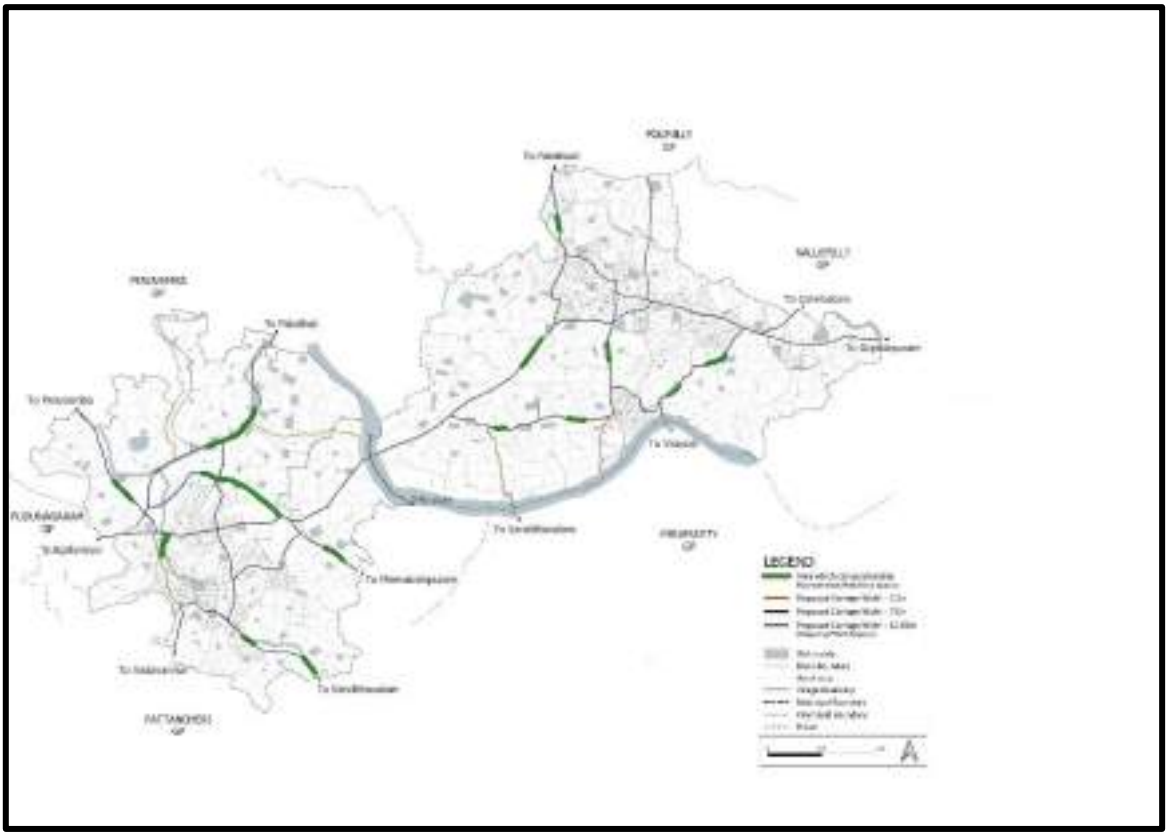


Fig 21.16 Proposed Active Zones/Parklets along roads

21.3.1 Road Hierarchy

The hierarchy of roads and its details are shown in Table 21.2 and C/S details in Table 21.3. Detailed traffic and transport Priority Action Plan with detailed design of Roads, footpaths, cycle trails, parking, street vending and parklets/active recretation areas will be developed and DPRs drawn up for implementation. These will be as per the Table 21.2 below.

Table 21.2 Road details of proposed transportation network

SL NO	ROAD NAME	EXISTING VARIABLE SECTION WIDTHS AS PER SITE (M)	PROPOSAL IN DETAIL
1	Muvakkad (Kozhikkada Jn.) to Chenthamara Jn. Road	4.0, 12.5	5.5 m CW + 1.0 m FP on any one side at grade near Kozhikkada Jn., 7.0 m wide CW and 1.5 m wide FP near Chenthamara Jn. on one side – RoW ranging from 6.5 m to 10m & parking on the other side wherever width permits + Recreational/ parking/ vending space wherever width is available
2	Koduvayur Chittur Road (Western Municipal limit to Pallimukku Jn.)	11.5	7.0 m CW + 1.5 m FP on both sides + 1.5 m cycle track on any one side = 11.50 m RoW

3	Koduvayur Chittur Road (Mettupalayam Jn. to Boy's School Jn.)	15.0	7.0 m CW + 1.8 m FP on both sides+ 1.0 m cycle track on both sides = 12 m RoW + Recreational/ parking/ vending space wherever width is available
4	Hospital Jn. to Coimbatore Road (upto Municipal Limit)	9.7 to 12.0	7.0 m CW + 1.8 m FP on one side and 1.2 m FP on the other side = 10 m RoW + Recreational/ parking/ vending space wherever width is available
5	Mettupalayam Jn. to Meenakshipuram Road (upto Municipal limit)	9.4 to 14.0	7.0 m CW + 1.8 m FP on both sides = 10.60 m RoW + Recreational/ parking/ vending space wherever width is available
6	Petrol pump to Manthakkad Jn.	8.7 to 12.0	7.0 m CW + 1.5 m FP on both sides + 1.0 m cycle lane = 11m RoW + Recreational/ parking/ vending space wherever width is available
7	Pallimukku Jn. to Vandithavalam Road via Chalakallam Jn.	4.9 to 8.0	5.5 m CW + 1.2 m FP on both sides at grade = 6.70 RoW
8	Pallimukku Jn. to Peruvembu Road via Chenthamara Jn.	11.5	7.0 m CW + 1.2 m FP on one side and 1.5 m on the other side + 1.0 m cycle track on one side (After Chenthamara Jn.) = 10.70m RoW + Recreational/ parking/ vending space wherever width is available
9	Chenthamara Jn. to Palathuly Road via Maduppikavu, Chunghamukku & Parakalam Junctions	12.5	7.0 m CW + 1.5 m FP on both sides + 1.0 m cycle track on one side = 11m RoW + Recreational/ parking/ vending space wherever width is available
10	Hospital Jn. to Gopalapuram Road	9.3 to 10.1	7.0 m CW + 1.8 m FP on one side & 1.2 m on the other side = 10m RoW + Recreational/ parking/ vending space wherever width is available
11	Manthakkad Jn. to Vilayodi Road	8.5 to 12.2	7.0 m CW + 1.5 m FP on any one side = 8.50m RoW + Recreational/ parking/ vending space wherever width is available
12	Anikode Jn. to Boys School	8.9 to 12.7	7.0 m CW + 1.5 m FP on both sides + 1.0 m cycle track on one side = 11m RoW + Recreational/ parking/ vending space wherever width is available

13	Hospital Jn. to Anikode Jn.	9.1 to 11.6	7.0 m CW + 1.8 m FP on one side + 1.2 m wide FP on the other side = 10m RoW + Parking/ vending space wherever width is available
14	Koduvayur - Chittur Road (Pallimukku Jn. to Mettupalayam Jn.)	8.6	7.0 m CW + 1.2m at grade FP on any one side = 8.20m RoW
15	Anikode Jn. to Palakkad Road via Kadambidi Jn.	7.3 to 10.1	7.0 m CW + 1.5 m FP on both sides + 1.0 m cycle lane where space available = 11m RoW
16	Anikode Jn. to Thekkegramam Road via Thottupalam Jn.	9.3 to 13.0	7.0 m CW + 1.5 m FP on both sides + 1.0 m cycle lane on one side = 11m RoW + Recreational/ parking/ vending space wherever width is available
17	Bheemathamukku Jn. to Post Office Jn.	7.5 to 8.6	7.0 m CW + 1.2 m FP on any one side = 8.20 m RoW
18	Perumkulangara Road (Maduppikavu Jn.- Northern Municipal Limit)	6.8 to 7.4	5.5 m CW + 1.2 m FP on both sides = 7.90 m RoW
19	Vadavannur Road (Chalakalam Jn.- Vadavannur Outlet)	10.0	7.0 m CW + 1.5 m FP on both sides = 10m RoW
20	Thathamangalam Jn. to Palathulli Road (Chunghamukku Jn.)	6.0 to 15	7.0 m CW + 1.2 m FP on any one side + Recreational/ parking/ vending space wherever width is available = 8.20m RoW
21	Thathamangalam Jn. to Vandithavalam road (HS Jn.)	8.2 to 10.0	7.0 m CW + 1.5 m FP on both sides = 10m RoW
22	Parakalam Road (KSRTC Jn. to Parakalam Jn.)	5.7 to 6.4	5.5 m CW + 1.2 m FP on any one side = 6.70m RoW
23	Vijayamatha Convent side Road (Ambattupalayam Jn. to Thekkegramam Jn.	5.0 to 11.3	7.0 m CW + 1.5 m FP on any one side + 1.0 m wide cycle lane on any one side = 9.50m RoW + Recreational/ parking/ vending space wherever width is available
24	Aralikadavu Road (Kolakallam Jn. Chittur College Bridge Outlet)	4.6 to 6.4	5.5 m CW+1.0 m FP on any one side at grade = 6.50m RoW
25	Vadakkathara Jn. - Nehru Auditorium road	5.3 to 9.0	7.0 m CW+1.2 m FP on any one side = 8.20m RoW

26	Naramkuzhi Road (Post Office Jn. to Northern Municipal Limit via Devi Nagar Jn.)	4.2 to 8.0	5.5 m CW+1.0 m FP on any one side at grade = 6.50m RoW
27	Nellikkad Road (Sree Kurumba Kavu Jn.- Guruswamiyar Madom Jn.)	6.2 (Constrained width at one point only)	7.0 m CW+1.2 m FP on any one side at grade = 8.20m RoW
28	Road to proposed stadium	8.0	7.0 m CW + 1.5 m FP on any one side = 8.50m RoW
29	Road near Thekkegramam	7.4 to 8.2	7.0 m CW+1.5 m FP on any one side + 1.0 m cycle track on any one side = 9.50m RoW
30	Proposed road from Mettupalayam to Chenthamara Jn.	22.0	14 m CW + 1 m Cycle track on one side + 2 m footpath on both sides + Recreational/ parking/ vending space on one side (To negotiate with PWD and maximize use of space acquired) = 22m RoW

Note: CW - Carriage way, FP - Footpath

Proposed detailed design to be followed where existing road width is less than the proposal, minor acquisition (1-2 m) may be required. Where width exceeds the design, existing width to be retained and Recreational/ parking/vending spaces to be accommodated.

R1 Roads - 7 m Carriage Width

Thathamangalam bypass (1.93 km): This road is proposed and the land for this proposal is already accrued by PWD. This ensures easy and faster connectivity for vehicles coming from Koduvayur side to Mettupalayam Junction by passing the busy Thathamangalam Junction. 1.63 km of this road is fully new alignment. 12.65 m Carriage width equips 2 lanes on one side and single lane on the other side with 1 m Cycle track on one side and 2 m footpath on both sides. Along with these, Recreational/ parking/ vending spaces to be provided on one side of the road (To negotiate with PWD and maximise use of space accrued).

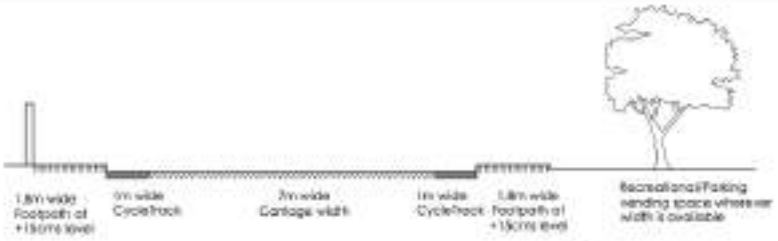
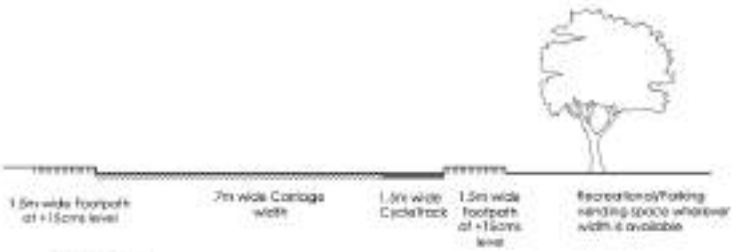
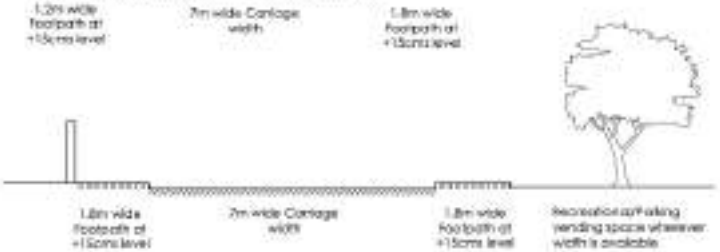
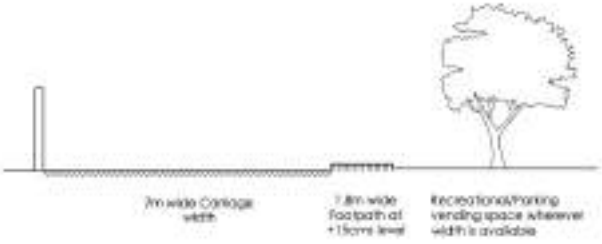
Koduvayur – Chittur road (7.61 km): This road stretch connects Koduvayur outlet to Gopalapuram outlet. 3.26 km of this road stretch is proposed to have 7m Carriage width.

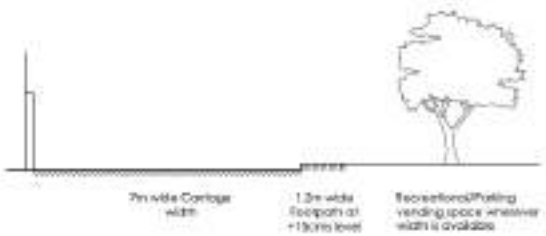
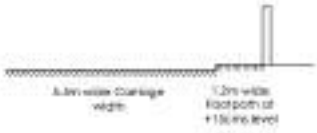
From **western municipal limit of Koduvayur Chittur Road to Pallimukku Junction**, in addition to the 7 m carriage width, 1.5m Foot path to be provided on either side and one 1.5m cycle track on any side.

From **Pallimukku Junction to Mettupalayam Junction** is proposed with 7m Carriage way with 1.5m FP on any one side and Recreational/ parking/ vending space wherever width is available.

From **Dwaraka Junction to Boys' School Junction**, in addition to 7m carriage width, 1.8m Footpath and 1 m cycle track to be provided on either side along with some Recreational/ parking/ vending spaces wherever width is available.

Table 21.3 Cross sectional details of proposed roads

Road Hierarchy	Sample Cross Section
R1B	
R1C	
R1D	
R1E	
R1G	
R1H	
R1I	

Road Hierarchy	Sample Cross Section
R1J	
R1J	
R1J	
R1K	
R1L	
R2A	
R2B	
R2C	
R3A	

From **Boys' School Junction - Anikode Jn**, the road is proposed with 7m wide carriage width with 1.5m FP on either side and 1 m cycle track on one side and Recreational/ parking/ vending space wherever width is available.

From **Anikode Jn - Hospital Jn**, proposal is to have a 7m wide carriage way with 1.8 FP on one side and 1.2 m wide footpath on the other side and Parking/ vending space wherever width is available.

From **Hospital Junction to eastern municipal limit of Chittur - Coimbatore and Gopalapuram Road** (1.17 km), in addition to the carriage width, 1.8m and 1.2 m footpaths on either side with Recreational/ parking/ vending space wherever width is available.).

Mettupalayam – Meenakshipuram Road (0.85 km): This road is proposed with 7m carriage width with 1.8m footpath on either side and Recreational/ parking/ vending space wherever width is available starting from Dwaraka Junction and extends till the Meenakshipuram.

Pallimukku – Peruvemba road (1.5 km): The existing road which is to be 7m carriage width with 1.2 m FP on one side and 1.5 on the other side and 1 m cycle track on one side (After Chenthamara Jn) and also Recreational/ parking/ vending spaces can also be provided wherever width is available. This road connects Pallimukku to Peruvemba.

Thathamangalam Chenthamara Jn - Palathully Road: (2.2 km) This road starts from Chenthamara Junction till the Palathully outlet. The road is proposed with 7m carriage width with 1.5m FP on either side and 1 m cycle track on one side. Also, Recreational/ parking/ vending spaces to be provided wherever width is available. This road provides easy access for vehicles coming from Koduvayur side to Palathully side.

Petrol pump Jn to Vilayodi Road (0.67 km): This road starts from the petrol pump near Ganapathi kovil to Manthakkad Jn. This road is proposed with 7m carriage width and 1.5m FP on either side with 1 m cycle track on both sides.

Manthakkad Jn to Vilayodi Road (1 km): This road starts from Manthakkad Jn and extends southwards to Vilayodi bridge. This road is proposed with 7m carriage width with 1.5m footpath on any one side with Recreational/ parking/ vending spaces wherever width is available.

Anikode – Palakkad Road (1.85 km): This is the main road that connects traffic from Palakkad side to Chittur. The road starts from Anikode Junction and extends till Palakkad outlet. The road is proposed with 7m carriage width with 1.5m FP on either side and 1 m cycle lane where space is available.

Anikode - Thekkegramam (1.52 km): This road with a proposed with 7m CW + 1.5m FP on either side with 1m cycle lane on one side and Recreational/ parking/ vending space wherever width is available.

Bheemathumukku – Post Office (0.37 km): The road connects vehicles from Palakkad side to Post office Junction without touching the busy Anikode Junction. Proposal is 7m CW + 1.2m FP on any one side.

Perumkulangara Road: (2 km) The road starts from Maduppikkavu Jn in Palathully road and provides access to the border of the municipality with the Peruvemba Panchayat. Proposal is to have 7m carriage width with 1.2m FP on either side.

Vadavannur Road (0.48 km): The road starts from the Chinmaya Junction in Pallimukku – Vandithavalam road and connects Vadavannur outlet. The proposal is to have a 7m carriage width and 1.5m footpath on either side.

Thathamangalam–Palathully Road (0.93 km): The existing road connecting Thathamangalam Junction to Chungamukku Junction in Palathully road is to have a 7m carriage width with 1.2m footpath on any one side and Recreational/ parking/ vending space wherever width is available.

Vijayamatha convent side Road (1.6 km): This road starts from the side road of Vijayamatha school (from Ambattupalayam Junction) and joins Anikode – Thekkegramam road just after Sanskrit Padasala. Proposal is 7m carriage way with 1.5m footpath on any one side and 1m wide cycle lane on any one side. Also, Recreational/ parking/ vending space wherever width is available.

Thathamangalam – Mannathu Kavu (1 km): The road starts from Thathamangalam Junction southwards through Govt UP School and connects Vandithavalam road. Proposal is 7m carriage way with 1.5m footpath on either side.

Vadakkathara – Nehru Theatre Road (0.77 km): This road connects Vadakkathara Junction to Nehru Theatre Junction and provides access to vehicles coming from Palakkad side to Thathamangalam road without touching the busy Anikode Junction. Proposal is to have a 7m carriage width with 1.2 m footpath on any one side.

Nellikkad Road (0.93 km): The road starts from GUPS Junction to Meenakshipuram road from Mettupalayam Junction. Proposal is to have a 7 m carriage width with 1.2 m at grade footpath on any one side.

Road to Proposed Stadium (0.365 km): The road starts from Vijayamatha Convent side road and passes through the proposed Stadium. Proposal is to have a 7m carriage width with 1.5m footpath on either one side.

Road near Thekkegramam: This road connects Anikode - Thekkegramam road with Vilayodi road. The proposal is to have a 7 m carriage width with 1.5 m footpath on any one side with 1m cycle track on any one side.

R2 Roads - 5.5 m Carriage Width

Pallimukku – Vandithavalam Road (2.41 km): This road with a proposed 5.5 m carriage width with 1.2m at grade footpaths on both sides, starts from Pallimukku Junction through Govt. Ayurvedic hospital to Vandithavalam outlet.

Naramkuzhy Road (1.24 km): This road starts from Post office Junction, passes through the Kanyar padam, crosses the proposed Chittur bypass (upper) and extends till the boundary of the municipality. Proposal is to have a 5.5m CW with 1m FP on any one side at grade.

Aralikadavu Road (1 km): Aralikadavu road starts from the Vijayamatha convent side road and leads to Aralikadavu Nilampathy. Proposal is 5.5m carriage width with 1m at grade footpath on any one side.

21.3.2 Junction Improvement & Redesign

Road intersections present safety problems as accident rates are usually higher at intersections than at other sections of the road. Many factors affect accident occurrence at intersections, including, traffic volume, traffic control, and frequency of access points, the number of legs, the speed limit, the median type and width, the number of traffic lanes, the existence of turn lanes, and the lighting level, as well as human factors. As such it is very critical that the intersections be properly designed. Fig. 21.17 shows locations of proposed Junction improvements. It is planned to undertake redesign and improvement projects for all the main Junctions along SH25 including Anikode Junction, Fire Station Junction, Hospital Junction, Mettupalayam Junction, Pallimukku Junction and Chenthamara Junction, working with PWD and other relevant institutions. All Junction improvements should consider ample space for pedestrians. Parking shall not be allowed in Junction area, i.e. 20m to 30m from the mouth of the Junction to all arms. Bus stops should be at least 20m away from the Junction central point.

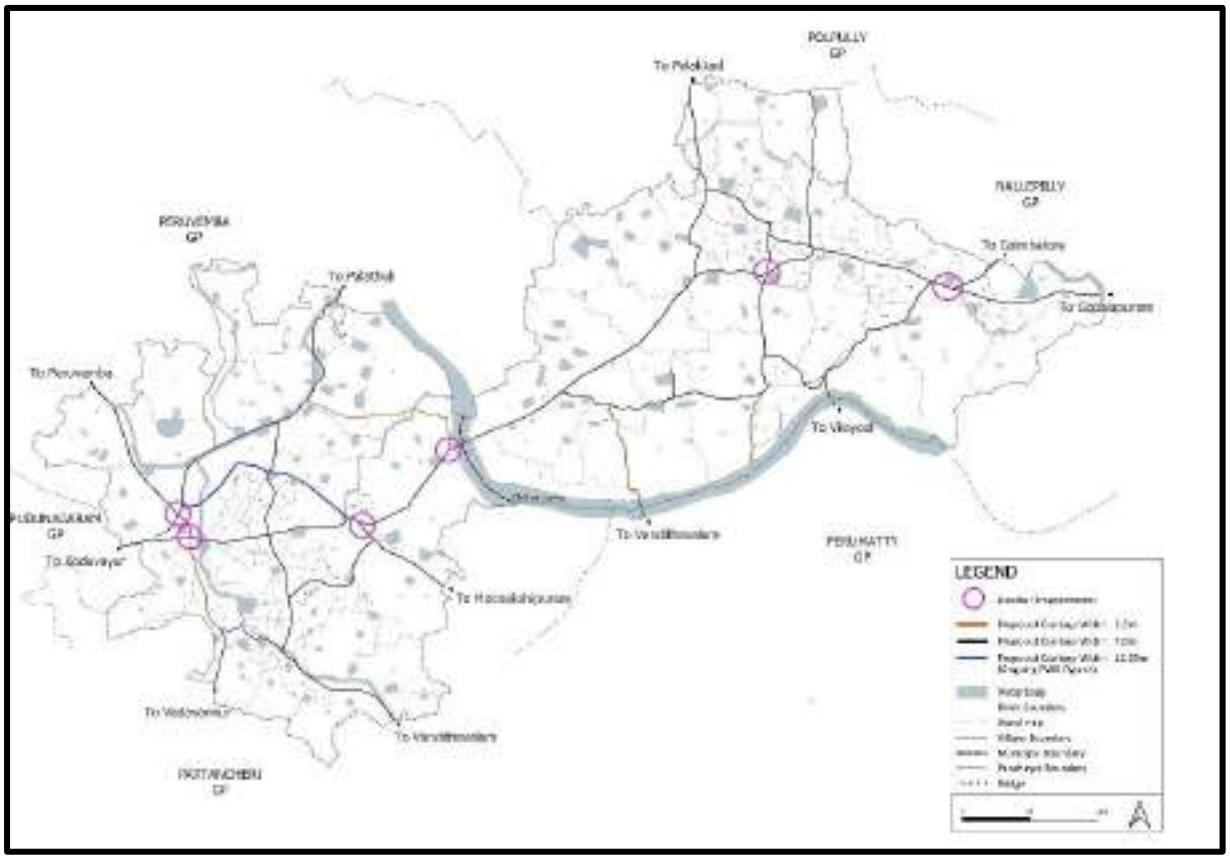


Fig 21.17 Junction Improvements proposed

Junction improvement involves among other things the following key elements:

- Closure of medians at certain intersections
- Prohibition of right turns
- Providing adequate corner radii
- Providing sufficient turning radii
- Flaring approaches towards intersections
- Providing channelizers / division islands
- Providing signs / lane markings / lighting

21.3.3 Proposed Bus Interchange

A bus stand location is typically determined considering criteria such as location near to points of high demand for maximum passenger convenience, the availability of sites, vehicle operating costs, degree of deviation from main routes etc. Accordingly responding to the current situation, a new Bus Interchange facility is proposed at Chanthapettah, Municipal Complex building.

21.3.4 Pedestrian Facilities

Walking constitutes the largest share of trips made in the town currently. It is also one of the most efficient and environmentally sustainable means of making short trips. Hence it is proposed to have walkable and usable footpaths on both sides for all existing roads (except for the really narrow streets where footpath is proposed on one side only and where the width of the road widens to support both sides, a crosswalk at the same height as the footpath is proposed where the double footpath becomes single footpath, connecting the footpath that terminates to the single footpath. For Chittur-Thathamangalam town, sidewalks typically with widths ranging from 1.5m to 1.8 m is proposed for all types of roads including arterial, sub-arterial, collector and local roads. In a few cases, footpaths are narrower at 1.0 m while the widest sidewalk catering to heavy pedestrian footfalls is 2.0 m wide. Recreational mini parks/parkets, street vending and parallel parking spaces are also accommodated within the available right of way, wherever possible depending on available road width (see Fig 21.14, Fig 21.15, Fig.21.16 and Table 21.2 and Table 21.3).

Where grade separated facilities cannot be provided, at-grade facilities such as zebra crossings, striping, pedestrian flashing signals etc would be provided. Cross walk markings are desirable at all arms of the major intersections. Apart from these intersections, cross walk markings are proposed at major high pedestrian volume locations like educational institutions, hospitals and commercial centres. People with disabilities, including those using special walking aids or wheelchairs, need facilities for moving.

21.3.5 Parking facilities

In the absence of adequate parking facilities, the vehicles are parked on the side of the street leading to a major bottleneck in the smooth flow of traffic. In addition, pavement hawkers, and sidewalk encroachments along with the heterogeneous nature of traffic and commercial area development along all the major roads have compounded the problem of congestion on the main roads.

Since there is no planned parking space available within town, currently, the ULB and the city traffic police allow parking of passenger vehicles on the side of the road thereby allowing to eat away a sizeable portion of motorable road. The precious time of citizens is wasted due to traffic jams and if this problem is not solved at this stage, then it would become a serious and complicated problem in future. Auto parking spaces (not auto stands) are provided at various locations (Palimukku-Chenthamara route, RG Auditorium, Mettupalayam Meenakshipuram Road, Chittur Kavu, Mun Office, Thekkegramam, PO Junction, Anikode Jn - Thekkegramam route, at Federal Bank (near Govt Hospital), Bus interchange at Chanthapettah) to ease congestion at Junctions, so that autos can be on call (and arrive when a bell is rung). A taxi stand is also proposed at Thathamangalam bus stand. This can ease the traffic congestion in the

town. On-street parallel parking is provided on the sides of selected roads wherever width is available.

Proposal for Informal Sector

Street vendors are an integral component of urban economies around the world. Distributors of affordable goods and services, they provide consumers with convenient and accessible retail options and form a vital part of the social and economic life of a city. Street vending as an occupation has existed for hundreds of years and is considered a cornerstone of many cities' historical and cultural heritage. Street vendors may have fixed stalls such as kiosks, semi-fixed stalls like folding tables. They may operate from crates, collapsible stands, or wheeled pushcarts that are moved and stored overnight. The current vendors locations have been mapped as per the NULM Street Vendor Survey 2021 and accordingly, suitable provisions have been made to accommodate them around the same area, so as to not disturb their livelihoods and is convenient for customers as well. Basic facilities for drinking water and sanitation are to be provided. Facilities to provide for vendors include provisions for solid waste disposal, public toilets to maintain cleanliness, aesthetic design of mobile stalls and push carts, provisions for electricity and drinking water and providing protective covers for protecting themselves as well as their properties from heat, rain, dust etc.

21.4 Proposals for Amenities

Amenities have been proposed only on public lands keeping in view the considerable municipal assets as well as to avoid the travails of acquisition of private lands. Spatial distribution of major amenity proposals is shown in Fig 21.18.

The following amenities are being proposed:

21.4.1 Public Space Upgradation

1. Riverwalk (5 approaches) and Ward 22 Thathamangalam river edge development
2. Old Bridge across River near Chittur College as a public space
3. Recreation Spaces along Roads, Canals, Ponds where possible (1. Facing fields-Palakkad Chittur Road, Thekkegramam Kunnathupalayam Road, Petrol Pump-Thekkegramam Road, near Boys School (Koduvayur Chittur main road) 2. along edge of new bypass from Mettupalayam Jn to Chenthamara Jn, 3. along Chenthamara Jn to Peruvemba Road, Chenthamara Jn to Palathuli Rd., near Palikulam, Vandithavalam road); Meenakshipuram Road)
4. Covered Community gathering spaces (Thathmangalam 3-4 along canals) Vandithavalam road
5. Comfort stations 4 nos. (Bus interchange, Chittur Kavu, Sreekurumba Kavu, Thathamangalam Bus stand)
6. Indoor/Outdoor Stadium, opp Boys School
7. Thathamangalam, School Ward 24, Recreation Ground
8. All Public Schools - Recreation Ground

21.4.2 Transport

1. Bus Interchange (Chanthapettah, Chittur Municipal Complex)
2. Parking Spaces (along roads where width is available –detailed design prepared)
3. Auto parking areas (along Palimukku-Chenthamara route, RG Auditorium, Mettupalayam Meenakshipuram Road, Chittur Kavu, Mun Office, Thekkegramam, PO Junction, Anikode Jn - Thekkegramam route, at Federal Bank (near Govt Hospital), Bus interchange)
4. Taxi Stand at Thathamangalam Bus Stand – 1 no.
5. Comfort stations 4 nos. (Bus interchange, Chittur Kavu, Sreekurumba kavu, Thathamangalam Bus stand)

21.4.3 Livelihoods

1. Agricultural storage godown/Rice processing/Agmark office – 2 nos - RG Auditorium, Thathamangalam, Aryampallam Anganwadi Puramboke
2. Weavers' Cooperative, Devangapuram (redevelop dilapidated structure)
3. Hi- tech Slaughter house with Fish and Meat Market, behind Thathamangalam Bus stand.
4. Agro-meteorological Observatory in Government College, Chittur

21.4.4 Socio-Cultural and Educational

1. Restoration/Conservation of Local Institutional Assets Value:
    a. Court Complex,
    b. Town Hall,
    c. Chittur Village Office,
    d. AE Office,
    e. Girls' School, Boys School (old building),
    f. KSEB building,
    g. PWD Rest House,
    h. Thathamangalam High School Building
    i. Old Bridge, near Chittur College
2. Konganpada Museum/Story Telling Academy- Village Office
3. Cultural Centre/Art/Theatre/Performance - AE Office
4. Exhibition space/Art Gallery - Old Municipal Building
5. Anganwadis - 2 new (in Ward 21)
6. Community Centre/Library in each ward using Schools/Anganwadi network and a new library at Neelikad.

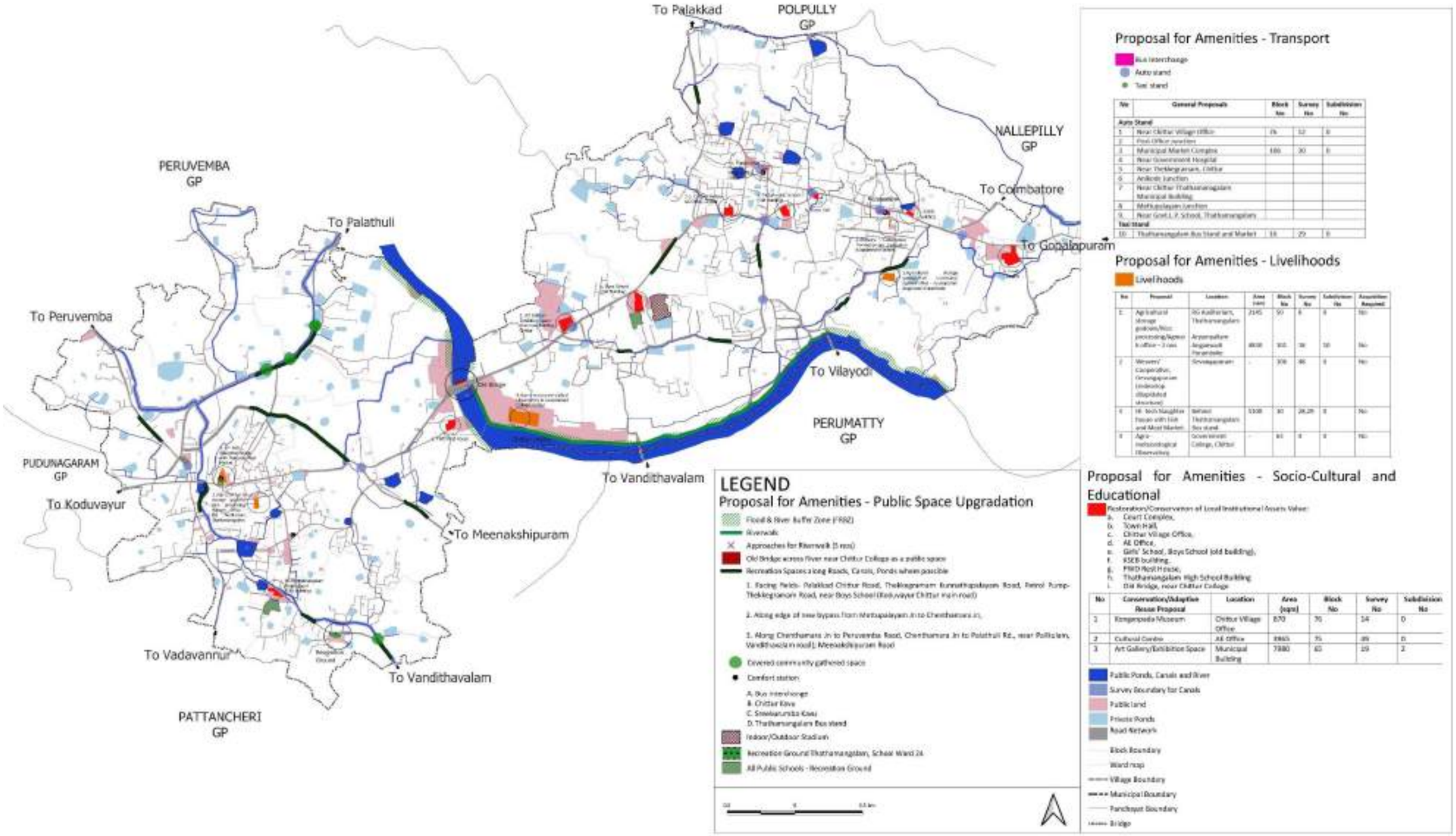


Fig. 21.18 Proposals for Amenities

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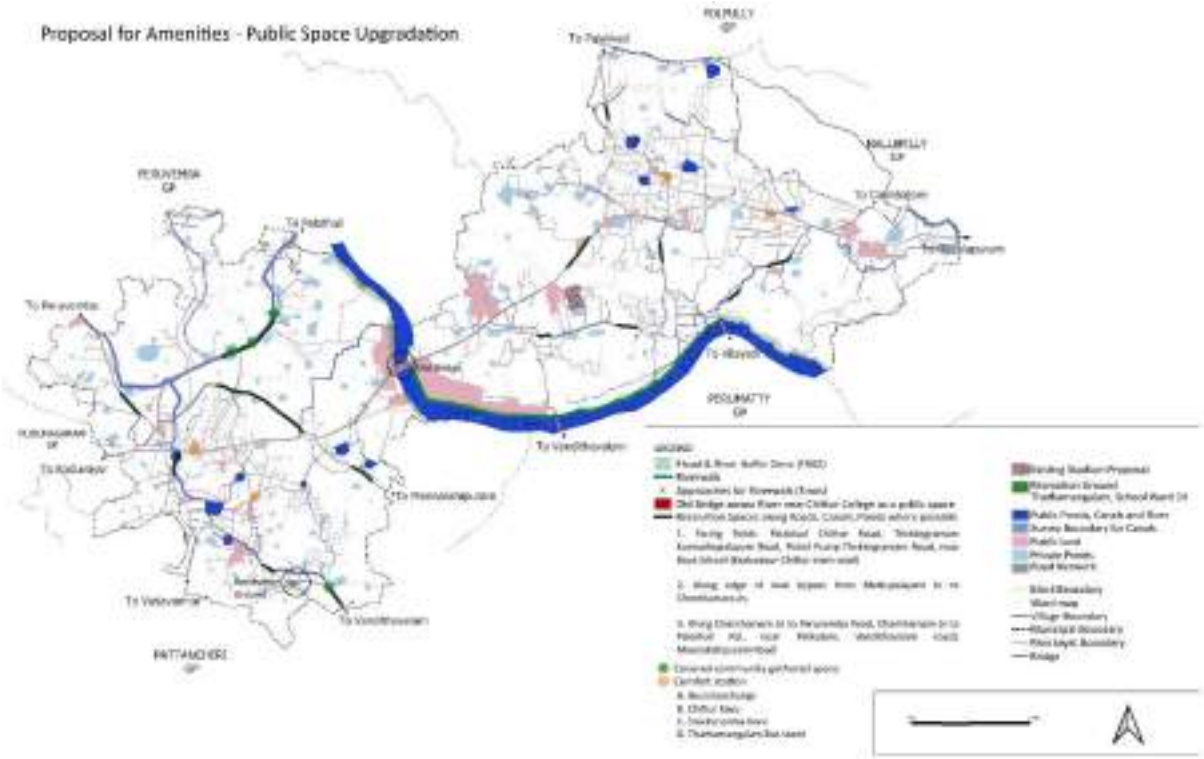

Fig 21.18-1 Proposals for Amenities: Public Space Upgradation

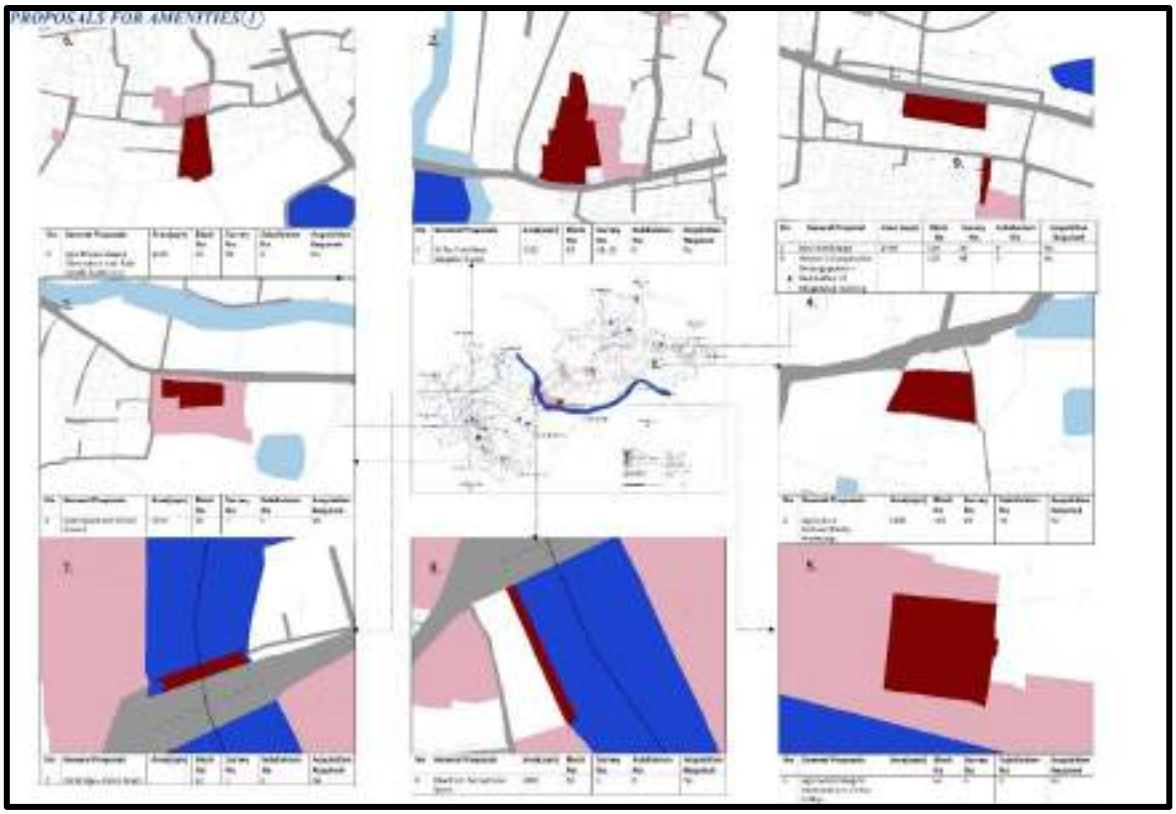

Fig 21.18-1a Details of Proposals for Amenities

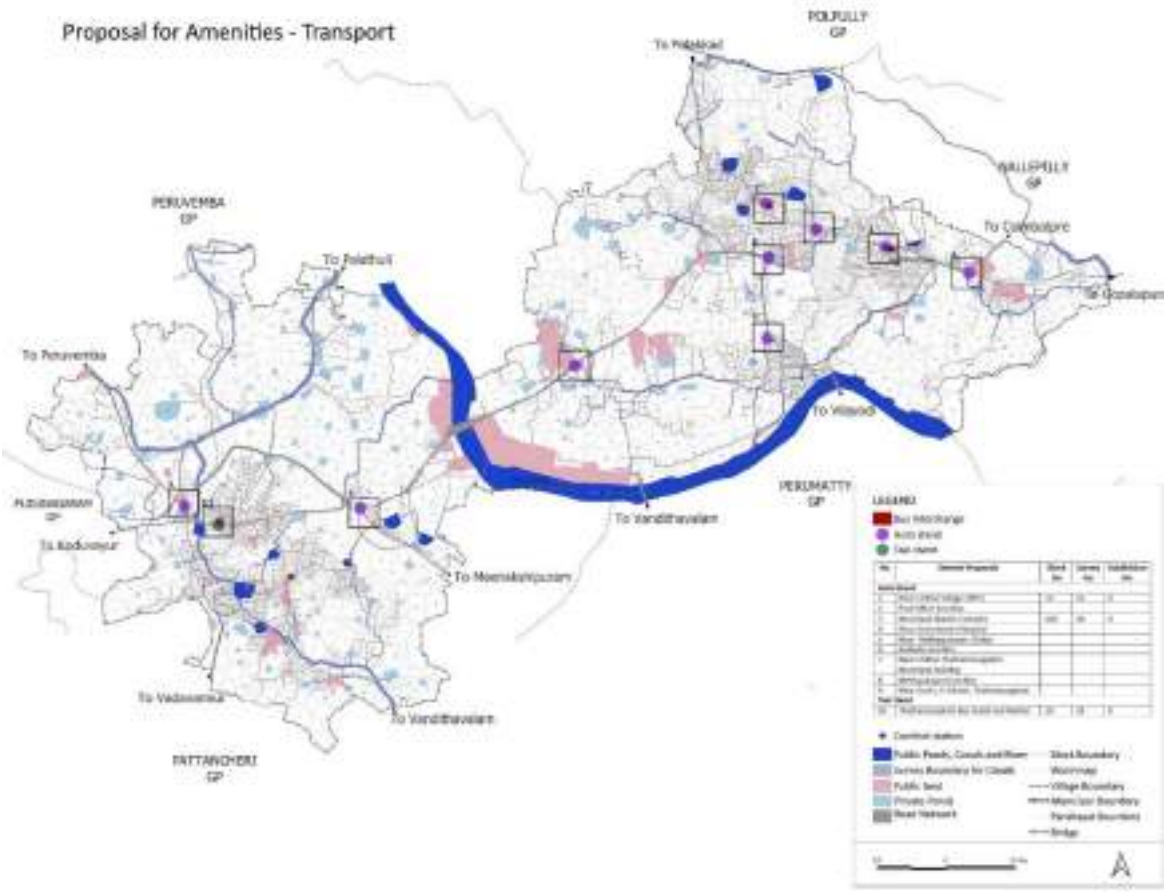

Fig 21.18-2 Proposals for Transport Amenities

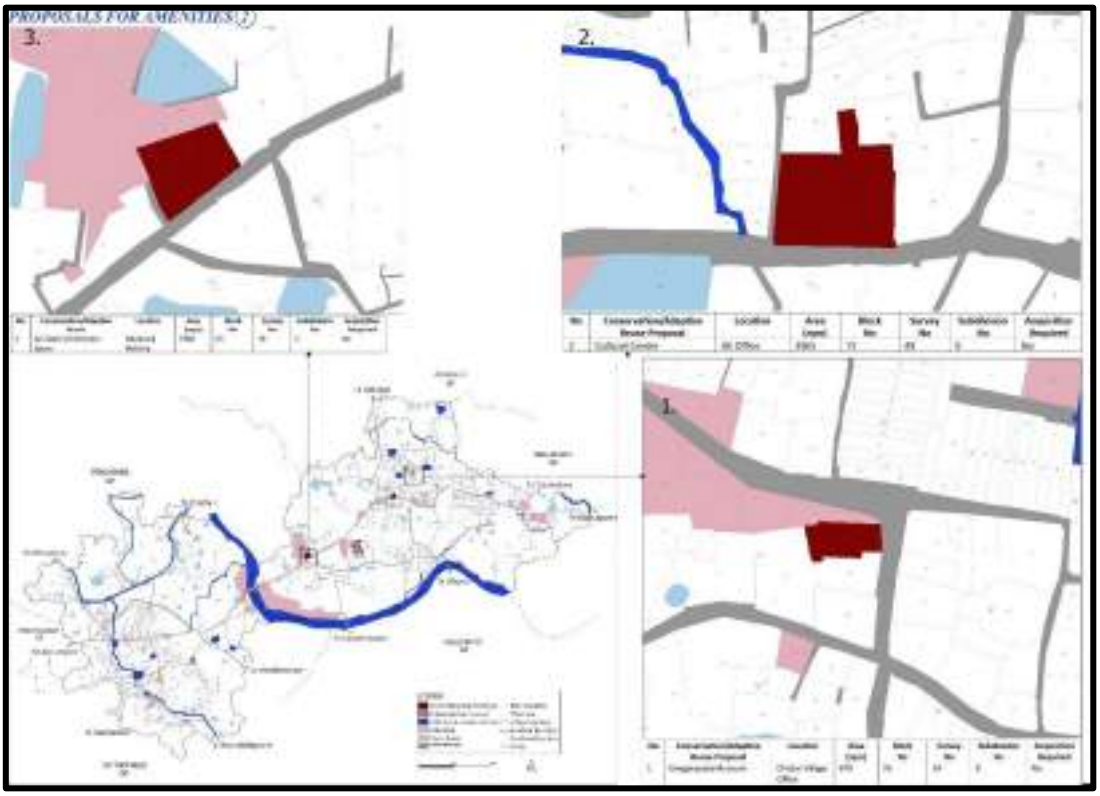

Fig 21.18-2a Details of Proposals for Amenities

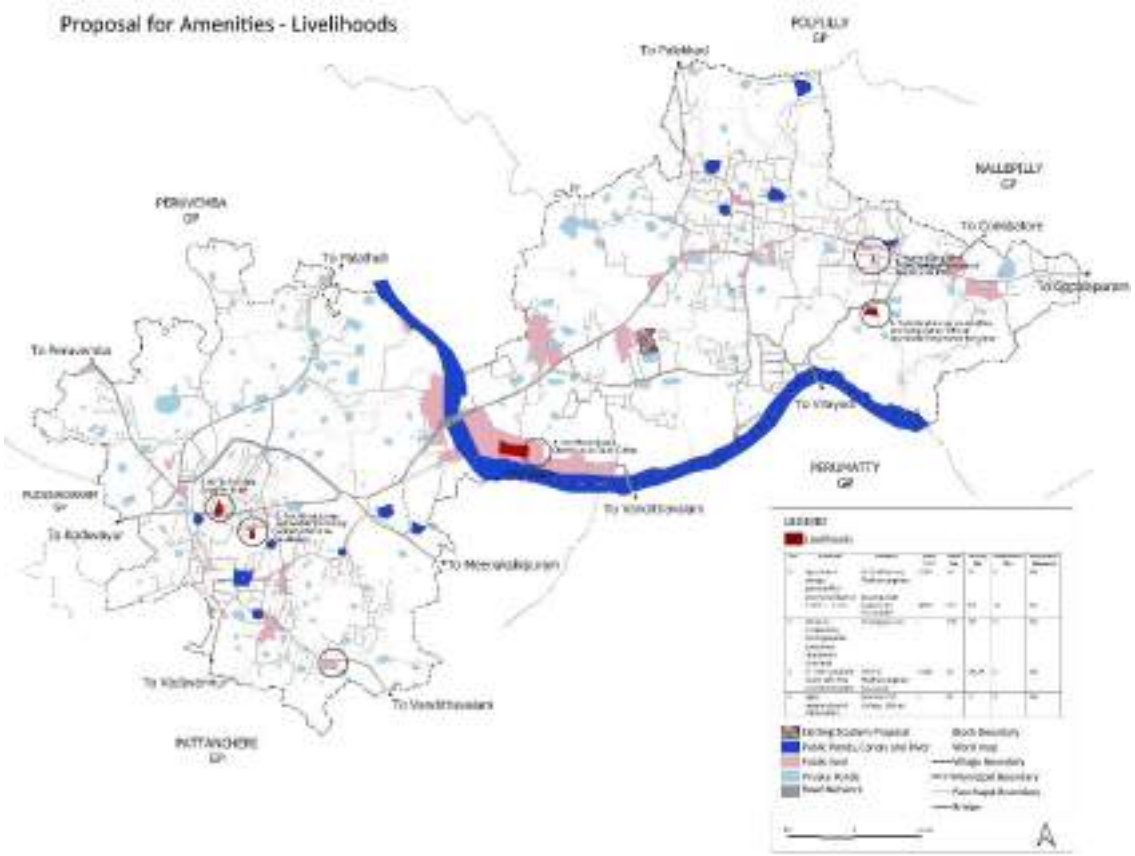

Fig 21.18-3 Proposals for Livelihoods Amenities

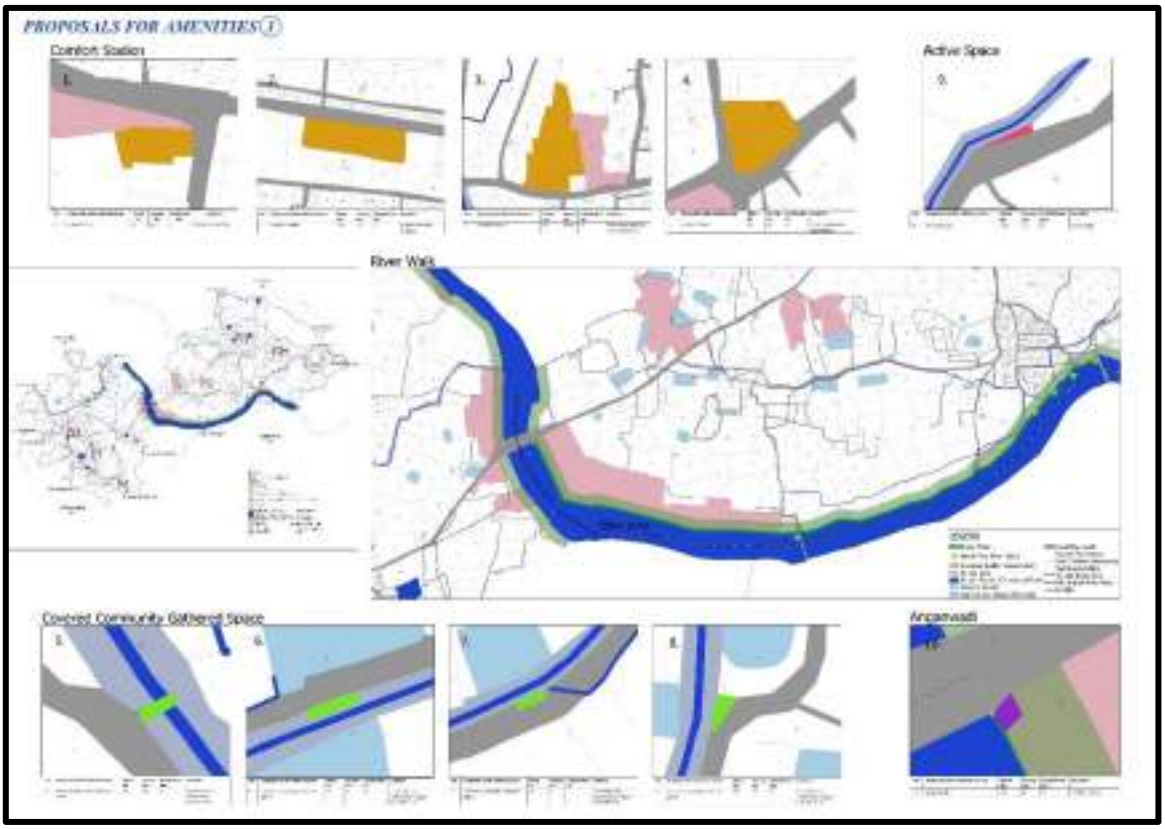

Fig 21.18-3a Details of Proposals for Amenities

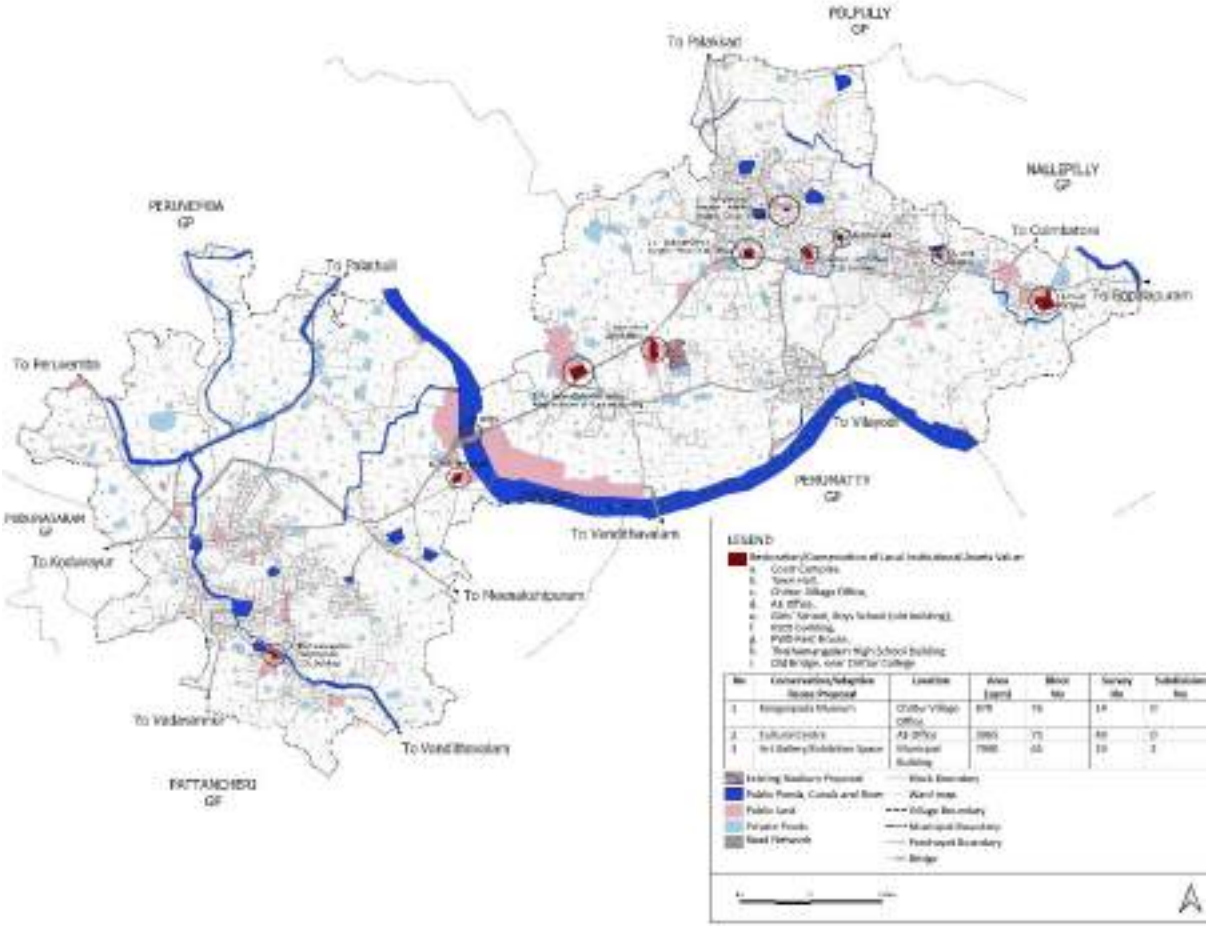

Fig 21.18-4 Proposals for Socio-Cultural and Educational Amenities

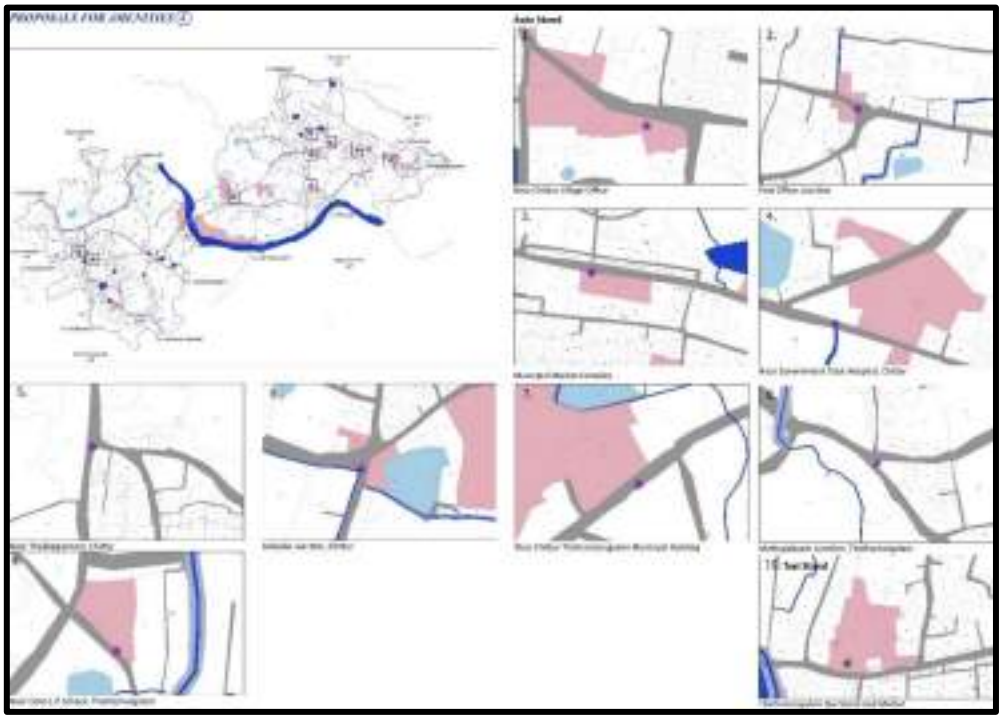

Fig 21.18-4 a Details of Proposals for Amenities

21.5 Details of Sectoral Proposals

21.5.1 Agriculture

Go-downs with drying yard

Drying yard for processing of paddy immediately after harvest is not available in some paddy tracts. This results in harvested paddy getting damp and germinating and losing quality. Hence a Drying yard cum go-down of 20-30 MT capacity is proposed at Aryampallam anganwadi puramboke, where the land is available. This will be useful for farmers in Chittur. This facility will also have a tractor bank. A temporary drying and processing facility can be put up during harvest time for Thathamangalam farmers on the grounds of the Rajiv Gandhi Auditorium.

Hitech Slaughterhouse with Fish and Meat Market

Lack of appropriate slaughtering facilities and unsatisfactory slaughtering techniques may cause unnecessary losses in meat as well as in valuable by-products and may be a major constraint in increasing animal production. Animals are frequently slaughtered in places which are frequently polluted with blood, intestinal contents and dirty effluents, which are not protected against insects, rodents and dogs.

Meat produced in such conditions will quickly deteriorate due to bacterial load and cause food poisoning. Furthermore, meat quality is adversely affected by careless handling under unsanitary conditions in the meat market and shops. In addition, the by-products are not utilized and instead of being an asset they are considered as a nuisance.

The establishment of a hi-tech slaughter facility would improve the situation. Slaughterhouses are the key element in meat production and distribution chain. Therefore, Municipality has committed the construction of a small-scale modern slaughterhouse in 22 cents of land behind Thathamangalam Bus stand on Municipal land which meets the environmental and legal requirements as an immediate necessity. Hence a slaughterhouse with all the modern facilities to process 50 -100 animals per day is proposed with facilities for chilling and processing of meat. This is to be combined with a fish and meat market. It is also essential to provide adequately trained staff to improve slaughter hygiene and meat quality, reduce raw material losses, increase utilization of by products, and thereby increasing profitability and financial returns to livestock producers. It should have its own method of solid waste disposal facility in a sustainable way or should be well connected with municipality in disposing their waste. Training courses should also be given for slaughterhouse workers who are to operate these facilities.

21.5.2 Socio-Cultural Amenities

To provide new and improved amenities for the town and provision of cultural institutions, recreational facilities, trade and fair facilities for the business community have been included in this section.

Cultural Centre/Performance Space/Art Gallery

A cultural centre that can host a range of functions including performances, art gallery is proposed to be developed after conservation and adaptive reuse of the AE Office, which is a very unique heritage building. Land acquisition is not required.

Exhibition Space/Art Gallery

An art gallery/exhibition space for temporary art/photography shows etc. including public events is proposed to be developed in the old Municipal Building after conservation and adaptive reuse. Land acquisition is not required.

Konganpada Museum and Story Telling Academy

The Village Office, Chittur is proposed to be conserved and converted into a Museum on the Konganpada. Chittur-Thathamangalam would also benefit from a Story Telling Academy, which could also be housed here. Land Acquisition is not required.

Anganwadis / Libraries

Two Anganwadis are proposed (in ward number 21), a Vigynan Vedi is proposed in Valmutty Ward Sabha Kendram, and a children's library in Nellicode. A Community Centre/Library in each ward using Schools/Anganwadi network shall be promoted.

21.5.3 Public Housing

Several Government Quarters lands are currently in disuse, like the PWD Quarters and Police Quarters. So, considering the chance that these land parcels will come up for development soon or in the future, this plan reserves all government quarters land for government and public housing with adequate support infrastructure like recreation facilities open spaces and play areas.

21.5.4 Recreational Facilities

Recreational facilities are important to the quality of life and communities. It also helps decrease issues related to being overweight and to obesity with regular physical activity among people and communities. The activities create positive outcomes such as confidence, self-respect, self- esteem, trust, self-reliance and leadership abilities. Recreational facilities in Chittur-Thathamangalam Municipality are not up to satisfaction. There are no parks within town. Serious considerations are needed to provide recreational facilities in the town. Hence, the following recreational centres are proposed in the town.

Pocket Parks/Parklets

Many pocket parks/parklets are proposed where space is available along main roads, along irrigation canals. The road sections have been proposed taking into consideration this need for recreation and physical activity and footpaths, cycle tracks and recreational pocket parks or parklets have been proposed wherever possible (see Fig 21.14, Fig 21.15, Fig. 21.16 and Table 21.2 and 21.3). Recreational grounds are to be developed in all current school grounds. One

such school ground in Thathamangalam is already being fitted with courts for various outdoor games. An indoor-outdoor stadium is also proposed.

River front Pedestrian Path and Bicycle Tracks for Recreation

A 3m wide road needs to be provided next to the river, in order to enjoy the river by the residents and tourists. It is proposed that a meandering road be aligned to hug the riverbanks as much as possible. Evening and morning walkers can enjoy the scenic beauty of river while doing their daily exercise. Footpaths and bicycle tracks are to be provided. A linear riverfront park shall be implemented in stretches wherever feasible including on the public lands like the Govt College, Chittur stretch. Ample vegetation like bamboo and vetiver should be planted within this zone to provide shade. 5 points of entry are proposed to access the river. (See Fig 18.3). The old bridge near Chittur College is to be developed as a vibrant public space.

Indoor and Outdoor Stadium

Chittur-Thathamangalam Municipality at present does not have an indoor/ outdoor stadium to promote sports. Many schools in the nearby LSGs have performed well in state and district athletic meets. Creation of sufficient facilities are needed for the promotion of their sports activities. A proposal for an indoor and outdoor stadium, at Tharakkalam, that has been submitted for state funding and is currently under review. This proposal should be retained.

21.5.5 Sanitation and Sewerage

Considering the size and economy of Chittur-Thathamangalam, 'decentralization' is the ideal principle on which all strategies and approaches to managing liquid waste should be based. Decentralized treatment systems are economical and offer several benefits such as sustainability and resilience. Decentralized sewage systems are usually small-scale and relatively low-cost systems. Decentralized wastewater treatment also includes systems treating wastewater from small households or groups of dwellings and disposing of the effluent near the point of waste generation itself. These systems can operate at different spatial scales, viz., onsite scale (operated by property holders); cluster or development scale (operating under shared ownership) and distributed systems serving large developments.

Centralized treatment systems are often based on mechanized treatment technologies. These are energy-intensive and do not remove nutrients and coliforms adequately. In comparison to centralized treatment systems, decentralized treatment systems are capable of achieving better coliform and nutrient removal and are hence suitable for attaining the emergent water quality norms. Hence, their usage is suggested when treated wastewater is to be disposed of in nearby water bodies or recycled for non-potable purposes.

The topography as well as site barriers such as roads, rivers and canals, necessitated zoning of the Municipality area for the convenience and practical feasibility of planning liquid waste management. Accordingly, ten clusters have been identified in the Chittur area while seven have been identified in Thathamangalam (see Fig. 21.19). Further, based on the condition of drains and pollution sources, priority sub-clusters were identified within these clusters where liquid waste management needs to be undertaken urgently (see Fig 21.20).

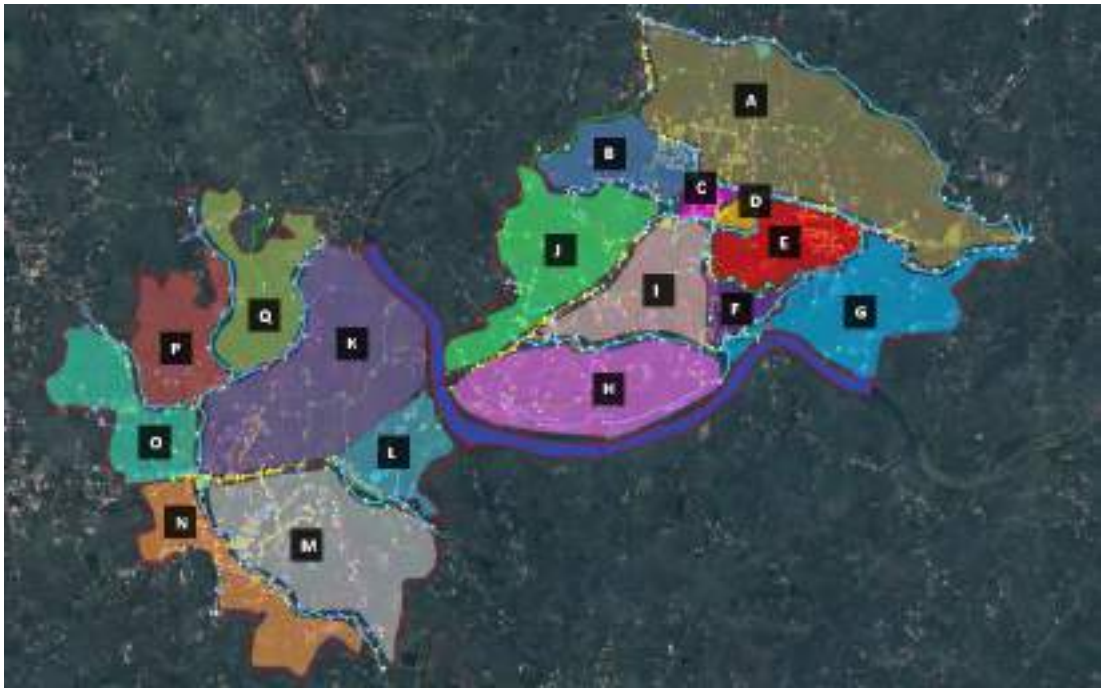

Fig 21.19 Proposed clusters for Decentralised Sewage Treatment

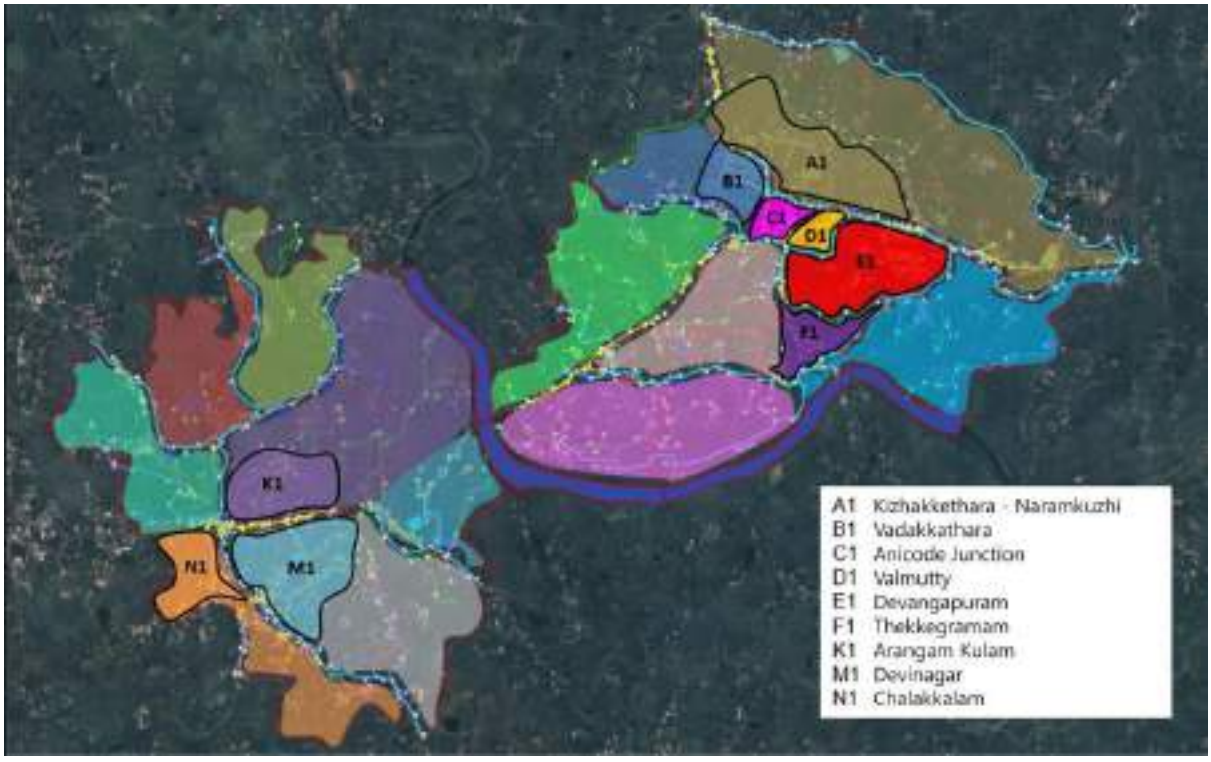

Fig 21.20 Proposed Priority Sewage Treatment Sub clusters

Pilot Project: Priority Sub-Cluster D1, Anikode Pond

As a pilot intervention, the pond behind the Anikode bus stand is proposed to be adopted for rejuvenation to its natural state. Currently, the pond as well as the irrigation canal in its vicinity receives wastewater from the growing settlements (1 room kitchen colonies) in its adjoining area. There is a school in the neighbourhood of this pond. Moreover, the untreated wastewater from canals is directly used by farmers for irrigating the neighbouring paddy fields which poses a risk to the farmers and crop yield. Therefore, the Anikode pond needs to be first desilted and cleaned. After desilting, inlet traps (screens) should be provided to capture the waste material flowing into the pond. After careful analysis of contours and site survey, an area for sedimentation and constructed wetlands is to be adopted along the periphery of the pond. The water flowing through the irrigation canal needs interception and made to flow through a constructed wetland along the periphery of the pond. After treatment, the effluent can further be used for agriculture.

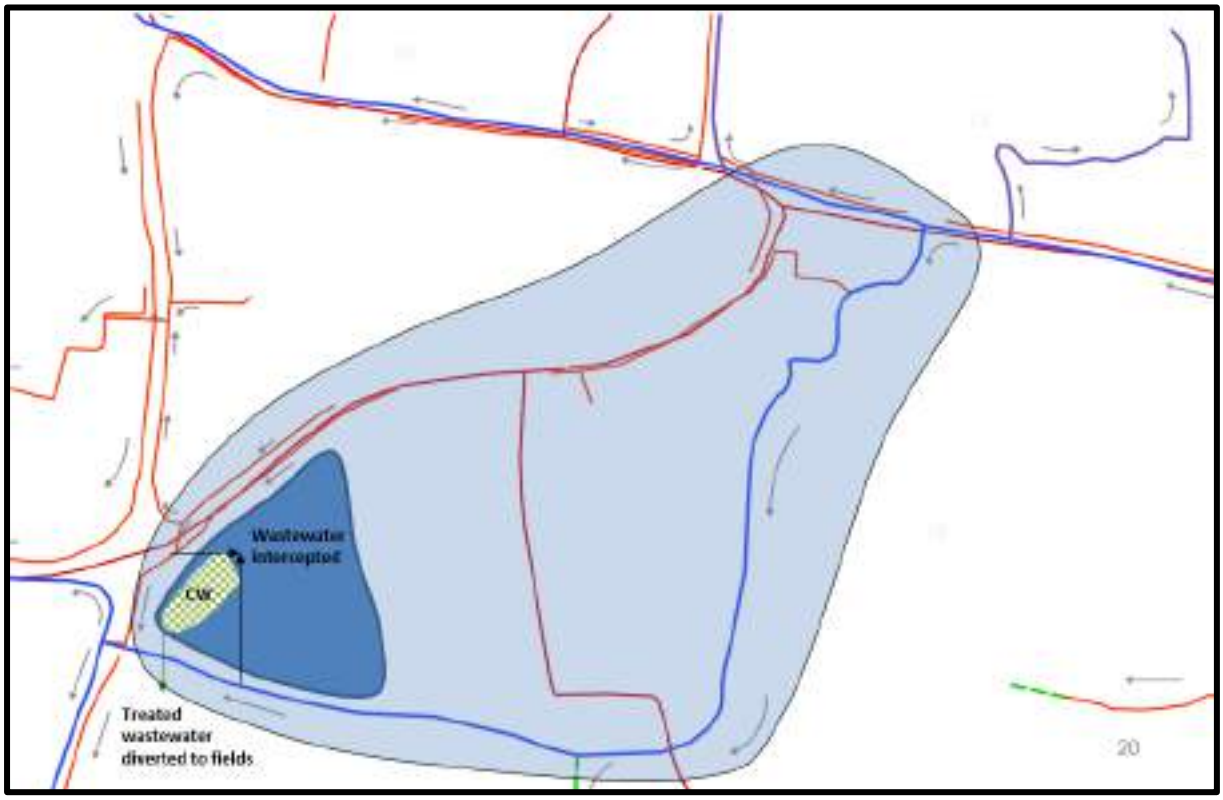

Fig 21.21 Line diagram for pilot intervention at Anikode pond

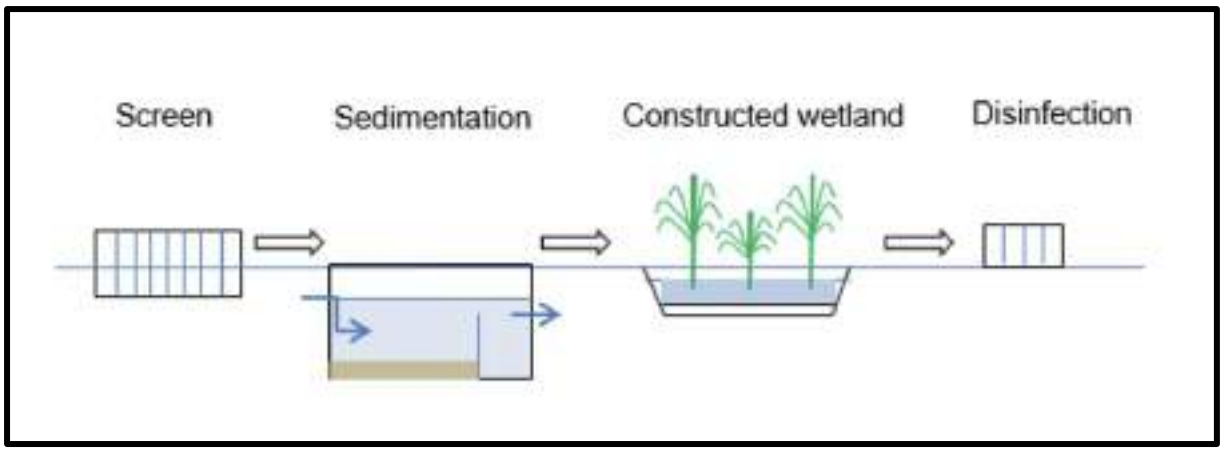

Fig 21.22 Proposed treatment process for pilot intervention at Anikode pond

Implementation framework and next steps

Presently, the potential sites for sanitation interventions have been identified through ground surveys and the mapping of drains. However, detailed planning of sanitation and liquid waste management for the current and future population will include a detailed analysis and surveys in the future. Detailed water quality testing is essential to include organic pollutant parameters such as BOD, COD, and nutrients Nitrogen and Phosphorus. Further, though liquid waste management using natural treatment systems is a sustainable strategy, however it requires land area that should be planned and set aside in advance. Open spaces and ponds across the town need to be identified and set aside for liquid waste treatment. High sewage generating sites like schools or hospitals can have onsite sewage treatment solutions. The use of constructed wetlands for wastewater treatment is an aesthetic option that can achieve landscaping along the periphery of the pond, thus serving as recreational spaces for residents to interact with nature.

21.5.6 Water Supply

To address the issue of low pressure zones in the town, keeping in mind that we are interested in creating equitable distribution systems that are low-cost, energy-efficine hydraulic systems, the following are proposed:

a) Shaft based distribution systems
b) Water ATMs for areas for low income areas
c) GIS based consumer survey and mapping of all households and properties
d) Existing defunct lift irrigation system can be rejuvenated to supply iorrigation needs.

Accordingly, a pilot project on improving distribution systems using shafts and other low-cost hydraulic interventions can be first initiated. Based on the results of pilot projects, the municipality can apply for larger funding to the state government to implement successful low-cost energy efficient solutions throughout the municipal area.

Chapter 22: DEMOCRATIC CITY - WORKING TOGETHER

22.1 Working Together

At the core of this plan is the Municipality's commitment to work together with citizens, experts, state and central government institutions, NGO s and businesses, and international institutions. Through this Master Plan 2042, and its Priority Action Plans (PAPs), Chittur-Thathamangalam Municipality aims to have periodic five year reviews of the Plan through participatory process, implement priority projects through these PAPs integrated with Annual Plans of the ULBs.

Any and all projects of the State and its parastatals that are to be actioned within the local body should be presented to and reviewed by the Municipality and passed by the Council resolution for it to commence.

All sectoral projects have to be reviewed relative to this Master Plan 2042 and should be in synergy with its vision and projects. The review should be through a special local committee constituted for the purpose.

Chittur-Thathamangalam Municipality sees its people as its primary resource and will create new institutional structures to manage growth demands in each sector. New technical committees will be constituted for various sectoral interventions as follows:

- Ecological Protection and Disaster Mitigation Technical Committee
- Sports and Schools Committee
- Health Committee
- Tree Action Committee
- Local Precincts of Value Committee

This first plan provides the opportunity to improve and strengthen the urban local body's capacity of management and delivery, its data systems, organisational structure and quality of manpower and resources.

There is a need to create appropriate mechanisms for promoting higher interface between the municipality and communities on a regular basis at both the ward and town levels as urban governance has to become increasingly citizen centric.

Chittur-Thathamangalam Municipality is committed to working with various agencies and state departments like the PWD for improvement of Anikode Junction, with Lalitha Kala Academy for adaptive reuse of AEO office for cultural centre, MLA office for development of river edge as a public space, with NABARD to work on supporting local weavers, with the local fire force to provide swimming lessons to children, and other organisations to address questions of employment and economy, waste management, and so on.

The plan preparation with citizen participation and on GIS platform is a good first step to better data dissemination and consolidation. The spatial platform is a good base to build upon and adopt best practices for improving transparency, accountability, efficiency and equity of service delivery.

It is envisaged that the Master Plan will be implemented through priority projects in phases-short-term, medium term and long term. However, a series of priority action plans need to be parallely drawn up at the outset. Both of these need to be taken up by the municipality, with

the help of technical committees and experts who can help towards the preparation of the necessary DPRs that need to be drawn up to avail funding from various central and state government schemes. The Priority Action Plans are listed below along with the identification of all the Priority projects that need to be implemented in the town.

22.2 Priority Action Plans and Key Projects

Detailed priority action plans to be prepared in the short term

1. Traffic, Transport, and Mobility Action Plan to enable pedestrian-friendliness, road safety and a parking program.
2. Participatory Heritage Action Plan to be developed in collaboration with INTACH and similar organisations for local assets and precincts of value.
3. Active Puzhayoram- Walkways, Public spaces and Activities along the river Edge to establish meaningful connections with adjacent neighbourhoods and the rest of the town.
4. Ponds/lakes/water/drainage network conservation plan bringing together the diverse stakeholders.
5. Decentralised sanitation action plan, connecting the lakes, ponds, and river, with the housing areas and institutions nearby.
6. Tree Census, Tree Preservation and a Biodiversity Action Plan
7. Waste Management Action Plan

Decentralised Sanitation and public space

1. Anikode pond – connecting institutions, commercial centres and housing in the neighbourhood
2. River edge at Thekkegramam connecting housing in Thekkegramam
3. Victoria Girls School sanitation plan

Public Space Upgradation

1. Riverwalk (5 approaches) and Ward 22 Thathamangalam river edge development
2. Old Bridge across River near Chittur College as a public space
3. Recreation Spaces along Roads, Canals, Ponds where possible

    a. (1. Facing fields- Palakkad Chittur Road, Thekkegramam Kunnathupalayam Road, Petrol Pump-Thekkegramam Road, near Boys School (Koduvayur Chittur main road)
    b. along edge of new bypass from Mettupalayam Jn to Chenthamara Jn,
    c. Along Chenthamara Jn to Peruvemba Road, Chenthamara Jn to Palathuli Rd., near Palikulam, Vandithavalam road); Meenakshipuram Road)

4. Covered Community gathering spaces (Thathmangalam 3-4 along canals) Vandithavalam road
5. Comfort stations 4 nos. (Bus interchange, Chittur Kavu, Sreekurumba Kavu, Thathamangalam Bus stand)

Transport

1. Pedestrian walk way along the main Chittur-Thathamangalam road
2. Bus Interchange (Chanthapettah, Chittur Municipal Complex)
3. Parking Spaces (along roads where width is available –detailed design prepared)
4. Auto parking areas (along Palimukku-Chenthamara route, RG Auditorium, Mettupalayam Meenakshipuram Road, Chittur Kavu, Mun Office, Thekkegramam, PO Junction, Anikode Jn - Thekkegramam route, at Federal Bank (near Govt Hospital), Bus interchange)
5. Taxi Stand at Thathamangalam Bus Stand – 1 no.
6. Comfort stations 4 nos. (Bus interchange, Chittur Kavu, Sreekurumba kavu, Thathamangalam Bus stand)
7. Anikode Junction urban design and traffic engineering.

Livelihoods

1. Agricultural storage godown/Rice processing/Agmark office – 2 nos - RG Auditorium, Thathamangalam, Aryampallam Anganwadi Puramboke
2. Weavers' Cooperative, Devangapuram (redevelop dilapidated structure)
3. Hi- tech Slaughter house with Fish and Meat Market, behind Thathamangalam Bus stand.
4. Agro-meteorological Observatory in Government College, Chittur

Socio-Cultural and Educational

1. Restoration/Conservation of Local Institutional Assets Value:
    a. Court Complex
    b. Town Hall
    c. Chittur Village Office
    d. AE Office
    e. Girls' School, Boys School (old building)
    f. KSEB building
    g. PWD Rest House
    h. Thathamangalam High School Building
    i. Old Bridge, near Chittur College
2. Konganpada Museum/Story Telling Academy- at Village Office
3. Cultural Centre/Art/Theatre/Performance – at AE Office
4. Exhibition space/Art Gallery – at Old Municipal Building
5. Anganwadis - 2 new (in Ward 21)
6. Community Centre/Library in each ward using Schools/Anganwadi network and a new library at Neelikad
7. Children's Library and Women's Room

Chapter 23: ZONING REGULATIONS

23.1 Zoning Regulations

General Guidelines

1. All future developments shall be in conformity with the provisions of the Master Plan for Chittur-Thathamangalam Town. The implementation and enforcement of the Master Plan for Chittur-Thathamangalam Town shall be in conformity with the zoning regulation prescribed hereunder. These regulations shall guide the granting or refusal of permission for land development. All future considerations within the boundary prescribed in the Master Plan for Chittur-Thathamangalam Town shall prevail over the respective provisions of Kerala Municipal Building Rules in force.
2. For the implementation and enforcement of the proposals envisaged in the Master Plan for the town, areas have been zoned under various uses such as Residential, , Public & Semi-Public, Mixed-use, Traffic & Transportation, Public Open Spaces & Parks, Dry Agriculture, Wet Agriculture, Water Bodies, and Crematoria & Burial Grounds. Details regarding the nature of uses 'permitted', uses 'restricted' and uses 'prohibited' in each zone are given in Table 23.1 below.
3. Zoning overlays: In addition to the above zones in the Master Plan, there are special zoning overlays which will apply to special zones. These include the following:
    a. Ecological Protection Zone (EPZ): This EPZ has been demarcated due to its ecological sensitivity to ensure the protection of water percolation and recharging, prevent disruption of stream network, ecology of drainage flows and potential flooding as well as drought. All of the following conditions apply:
        i. All building construction is prohibited in the EPZ other than the exemptions below.
        ii. Applications for building permission in plots up to 10 cents in area, which are registered (at the Sub-Registrar's office concerned) prior to the date of publication of the Master Plan shall be considered. In addition, such applications shall conform to the provisions of The Kerala Conservation of Paddy and Wetland Act, 2008 and its amendments. The applicant shall file an affidavit that he/she does not own another land categorised as dry land within Chittur taluk.
        iii. On all other plots larger than 10 cents in area, registered (at the Sub-Registrar's office concerned) before the date of publication of the Master Plan, applications from legal heirs of the property owner for building permission for a total area of up to 20 cents of land, either as a single parcel or contiguous parcels, (without restriction on number of subdivisions), shall be considered. However, the owner of the land under EPZ must obtain permission from the Municipal Secretary for this land conversion prior to submission of application for building permission. Within these 20 cents, upto a maximum built-up area of 600 m^2 is permitted where no single structure shall have a built -up area measuring more than 300 m^2 shall be considered. In addition, such applications shall conform to the provisions of The Kerala Conservation of Paddy and Wetland Act, 2008 and its amendments. The applicant shall file an affidavit that he/she does not own another land categorised as dry land within Chittur taluk.
        iv. The application shall be for residential buildings upto a total built-up area of 300 m^2 in the case of plots measuring up to10 cents. The total built up area shall not exceed 600 m^2 for plots greater than 10 cents up

to 20 cents, with no single building having built up area more than 300 m^2 and the number of floors in all cases is limited to two floors. Ground floor built-up area is permissible only up to a maximum of 200 m^2 in plots measing 10 cents. In plots up to 20 cents, no single building will measure more than 200 m^2 on the ground floor. The development of buildings should be limited to coverage of 50 per cent, and 50 per cent of the plot should be left open to sky. At the open space/ground left open to the sky, only water-permeable pavement (like pervious concrete, porous asphalt, or permeable interlocking concrete pavers that allow water to soak through the surface rather than flow over the surface into storm water drains) should be used in this EPZ zone. The soil percolation capacity should not be affected in the unbuilt portion of the plot. Repair and reconstruction of any existing structures is permitted, with additions upto a maximum of 15 percent over and above the existing structure.

v. The natural streams and rainwater drains shall be conserved as it is, without causing any type of pollution or contamination from the sewerage system and wastewater drains. The proposed development within the plot should be developed without any negative impact or disturbance to the existing natural drainage flows in the locality and rainwater should be able to easily flow from surrounding areas to main drains and canals.

vi. The development shall not adversely affect the ecological condition and the cultivation in the adjoining paddy lands. Adequate mitigation measures including mandatory rainwater harvesting and afforestation should be adopted to offset any environmental impacts of the residential project.

b. Flood and Riverine Buffer Zone (FRBZ): No permanent construction of any kind will be permitted in this demarcated zone other than the ones mentioned below. Public amenities such as public crematoria, public conveniences, walkways, and play and exercise equipment related to the park (kept to the minimum of 15 per cent ground coverage) may be permitted. Repair or reconstruction of existing structures may be permitted, but not more than 15 % increase in area will be permitted in either case.

4. Local Assets of Value (LAV) : All *Aalmarams, kaavus*/sacred groves and water bodies in the town are declared local assets of value (ecological) and Chumadathangis and Aaltharas are declared along with other public assets as Local Assets of Value (historical). The following regulations apply to them:
    a. Local Assets of Value (Ecological): No alteration, destruction, reclamation, or development of any kind will be permitted to Aalmarams or water bodies so as to ensure the protection of these assets. All types of changes as mentioned above are prohibited.
    b. Local Assets of Value (Historical): Specific public assets of value - Chumadathangis and Aaltharas among listed public assets of value cannot be disturbed through construction or development of any kind that destroys their original character. Repairs may be carried out only if strictly necessary from a conservation perspective, with adequate permission from the municipality.
5. Further, guidelines for regulating developments are also provided herein.
    a. 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 of Chittur-

Thathamangalam Municipality (hereinafter referred to as Secretary) if in accordance with other relevant rules/orders concerned in force.

b. 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"**.
    i. Uses Restricted-1 category deals with the uses that shall be restricted by the Secretary with the concurrence of the District Officer of the Local Self Government Department (Planning) having jurisdiction over the area (hereinafter referred to as Town Planner).
    ii. 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 Local Self Government Department (Planning).
c. "**Uses Prohibited**" enlists the various objectionable uses in each zone which shall not be permitted under normal circumstances. All uses which does not come under 'Uses Permitted' or 'Uses Restricted' shall be considered as 'Uses *prohibited'*. Any use not specified either in the 'uses permitted' or 'uses restricted' category of a particular use zone but which is of a similar nature to any use 'permitted' or 'restricted' in that particular use zone, may be permitted by the Secretary with the concurrence of the Town Planner.

6. If any portion of a zone is put to a "**Use Prohibited**" as stated above, before the coming into operation of this Master Plan, such use shall be termed as *non-conforming use*. A non-conforming use may be allowed to continue in its existing location and essential repairs and maintenance for the structure may be permitted by the Secretary, provided that the said use creates 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 Town Planner. The total built-up area of such non-conforming use shall not exceed 1.5 times the existing built-up area.
7. Zoning regulations are not intended to prohibit existing uses that have been lawfully established prior to the enforcement of these regulations, unless otherwise specifically mentioned in this Master Plan. Zoning Regulations are essentially intended to help the competent authority in taking decisions regarding the granting or refusal of permits for land development and construction of buildings/structures. Existing areas and structures of archaeological importance, agricultural uses and religious uses may be permitted to continue in all zones and shall not constitute non-conforming uses.
8. Subject to the zoning regulations of the respective use zones, more than one use may be combined in a building/ plot, provided that the area of individual uses shall be limited to that prescribed for each such use in the zoning regulation for the respective zone.
9. All future developments shall also be in conformity with the provisions of Kerala Municipality Building Rules unless otherwise specified in these regulations or in any Detailed Town Planning Scheme in force.
10. Provisions/regulations under the Disaster Management Act, Archaeological Sites and Remains Act, Aircraft Act 1934, and Environment Protection Act 1986 shall prevail over the Master Plan.
11. In the case of land which are categorised as a water body (River / Pond / Stream and such other water bodies) as per revenue records, no construction or development or conversion of such land shall be permissible, irrespective of the proposed land use zone of such lands and such lands shall be retained as water bodies. However, side protection

walls, bathing ghats, boat landing facilities and necessary works related to decentralised sanitation systems and such similar works shall be permissible. Any form of reclamation or filling or changes to boundaries is prohibited. Bed concreting of canals, streams and channels, that currently enables water percolation, is prohibited.

12. Silence zone, as prescribed by the Noise Pollution (Regulation and Control) Rules, 2000 as amended from time to time, shall be applicable to such areas under this Master Plan.
13. Provisions/regulations under the Kerala Conservation of Paddy Land & Wetland Act 2008 shall apply to those areas under the Wet agriculture zone that are not overlaid by the Ecological Protection Zone (EPZ) overlay.
14. Regulation of constructions and land developments on the sides of new roads / roads proposed for widening shall be governed by the distance from the centreline of the road, unless otherwise specified in the Master Plan or Detailed Town Planning Scheme in force or any Detailed Road Alignment approved by Government. If widening on one side of any stretch of the road is constrained due to the physical barriers of the water body zone, the road widening in that stretch shall be accounted for from the other side.
15. In the event of a change in the alignment of the Thathamangalam bypass road proposal in the Master Plan, after the commencement of land acquisition of the new alignment, the land parcels in stretches excluded from the original alignment may be changed to adjacent suitable land use zone with the concurrence of the Town Planner. This provision is applicable only to the new road development proposals and not to road widening proposals.
16. Operational constructions as defined in the Kerala Town & Country Planning Act 2016 shall be treated as permitted use in the Master Plan Area. It is reiterated that this does not include "the construction of a building, structure, installation or any extension thereof, as the case may be, used for residential, commercial, public and semi-public, industrial and warehousing purposes."
17. The Government shall have the power to issue clarifications in respect of technical interpretations, if any, required on any of the provisions of the Master Plan in consultation with the Chief Town Planner concerned of the Local Self Government Department (Planning).
18. Expansion of existing Public and Semi-Public Institutions and existing Industrial units including their incidental uses to adjacent plots shall be treated as permitted use irrespective of the zone in which such adjacent plot lies, except in Ecological Protection Zone, Public Open Spaces & Parks and Residential zone.
19. Only the existing areas under Public and Semi-Public uses and Industrial uses are intended to be included under Public and Semi-Public zone and Mixed-use zone respectively. If any private property put under uses other than those permitted or restricted in the above zones has been included within such zones, the Secretary may, with the concurrence of the Town Planner, after verification of the revenue ownership documents, accord sanction for development by adopting the regulations of the surrounding land use zone in the proposed land use map, subject to the provisions as per applicable Acts, Rules and Government Orders in force in the State.
20. If public activity ceases or does not exist in private land, uses permitted/ restricted in the surrounding land use zone shall be allowed in the plot with the permission of the Municipal Secretary.
21. If more than 50% of the area of a plot is included within the Mixed-use Zone, the entire plot shall be deemed to be included under such Mixed-use Zone, except if it has an EPZ overlay over it or if it is in the Wet Agriculture Zone.
22. Disaster mitigation projects by competent authorities shall be permitted in all zones.

23. Transmission/telecommunication towers, wireless stations, ATMs, water tanks, waste management units and public utility buildings/structures shall be treated as permitted uses in all zones except in the Ecological Protection Zone.
24. Projects of Central/ State Government, Local Self Government Institutions, Public Sector Undertakings and other Government Institutions may be permitted with the concurrence of the Town Planner in all built up zones such as Residential, Mixed-use, and Public & Semi-Public Zone if such uses are not included in the permitted uses or restricted uses as per the zoning regulations applicable. All such projects must follow Section 65 of the Kerala Town Planning Act 2016.
25. Actual shape, size and alignments of all waterbodies (river, pond, canals and drains) shown in the plan to be verified on site since the map may not be to scale. Tthe existing on-ground condition and drainage flows are to be maintained.. In case of uncertainty in identifying the alignment and boundary of thodu, canal, river, existing public road and in the absence of survey boundaries for the same in the Proposed Land Use Maps, it shall be referred to the actual position on ground as well as revenue records and decision taken by the Secretary in this regard shall be final.
26. The land specially demarcated for the proposed Stadium may be procured as per the provisions of the Kerala Town & Country Planning Act 2016, by Chittur-Thathamangalam Municipality or other agencies concerned. If the proceedings to procure such land have not been initiated within 7 years from the date of sanctioning of this Master Plan, the areas so specifically demarcated may be released and assigned to use permitted/restricted in the surrounding land use zone in the Proposed Land Use Map by the Secretary with the concurrence of the Town Planner, based on the application for building permit received.
27. If different land use zones fall within a single plot, all uses permitted as per zoning regulations of such land use zones may be permitted by the Secretary in the plot. If the application submitted includes any of the restricted uses and is not included in such permitted uses, the Secretary shall issue the permit with the concurrence of the Town Planner/Chief Town Planner, as the case may be. However, for the part of the plot which comes under EPZ or Public Open Spaces & Parks zone, this provision shall not be applicable.
28. Electric charging stations for vehicles may be permitted in all zones other than EPZ or Public Open Spaces & Parks zone.
29. Buildings with asbestos sheet roofs and paving open yards entirely with stones, blocks, tiles, and any other material that blocks soil's water percolation capacity are prohibited.
30. Large Scale development projects in an area of 1 hectare or more, exceeding an investment of Rs.100 Crores, which provide direct employment (after commissioning of the project) to the tune of not less than 500 may be permitted in the Mixed-use zone or in the Public- semi-public use Zone, if not included in Permitted or Restricted use as per Zoning regulation applicable. Notwithstanding anything mentioned elsewhere in this clause, such projects shall not be permitted in any of the other zones.

Such proposals should without fail be accompanied by the following reports: 1) demonstration of economic benefit and employment generation analysis with credible and robust evidence, 2) environmental impact assessment to demonstrate compliance with the policies in this plan, 3) sustainable development assessment to demonstrate the compliance with this plans' social economic and environmental priorities and policies. Also, adequate provision shall be made for supporting infrastructure such as water supply, sewerage, solid waste management, power supply, parking, etc. Separate systems for management of solid waste, liquid waste and sewerage shall be provided and maintained by the developer at his cost. The project shall be

completed within a period of 5 years or as suggested by a Committee with the constitution as below. For all proposals, the recommendation of the committee shall be obtained, subject to satisfying the procedures laid out here and the Secretary shall comply with the same while issuing the permit.

Procedure to be Followed

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

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

Principal Secretary/Secretary to Government, Local Self Government Department	- Chairperson
The Director, Local Self Government Department (Urban)	- Member
The Chief Town Planner, Local Self Government Department (Planning)	- Convenor
The District officer of the LSGD (Planning) having jurisdiction over Palakkad	- Member
Secretary(s), Chittur- Thathamangalam Municipality	- Member(s)
Chairperson of Chittur-Thathamangalam Municipality	- Member
Chairperson of Standing committee, Development Affairs, Chittur-Thathamangalam Municipality	- Member

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

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

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

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

(g) Land to a depth of 30m on either side of the Thathamangalam bypass road with proposed width of 21m in Residential zone and Dry Agriculture zone, uses permitted in Mixed use, Public and Semi-public zones may also be permitted by the Secretary and Restricted uses under category I & II may be permitted by Secretary with the Concurrence of the Town Planner and with the concurrence of the Chief Town Planner concerned of the Department if Town and Country Planning respectively.

Table 23.1 Zoning Regulations

ZONING REGULATIONS				
Sl. No.	**Uses Permitted**	**Uses restricted-1**	**Uses restricted - 2**	**Uses prohibited**
	(1)	(2)	(3)	(4)
1	**Residential Zone**			
1.1	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 station, crematoria.	Any other uses not specified under (1), (2), (3).
	Shops, Professional Offices, Commercial Offices, Banks & Financial Institutions, Restaurants, Canteen, Hotels - floor area limited to 200 sq. m.	Places of worship.		
	Cottage industries, including coir, service industries of non-nuisance nature (see Appendix-III) with numbers of workers limit to 6 without power or 3 workers with power limited to 5 HP.	Public utility areas and Public utility buildings.		
	Educational institutions essentially serving the needs of residential community such as Day Care, Creche, Nursery schools, Kindergartens and schools offering general education (up to High School level).	Museum, exhibition centres and art gallery.		
	Health Institutions essentially serving the needs of residential community such as dispensaries, clinics (out-patient), diagnostic centres etc having a floor area limited to 200 sq. m.	Dharmasala, hostels, boarding houses, lodges and guest houses, places of worship, ashrams, mutts, madrasas.		
	Library and reading rooms.			
	Automobile workshops for 2/3 wheelers, service industries of non-nuisance nature (see Appendix III) engaging not more than 19 workers without power or 9 workers with power limited to 15 HP, civil defence and home guard.			
	Parking plaza, taxi/jeep stand.			
1.2	Provided that access road has a width of 5 m minimum**			
	Diagnostic centres, Clinics (outpatient), - floor area limited to 500 sq. m.	Government (local / state / central) or public sector offices		

1.3	Provided that access road has a width of 8 m minimum**			
	Shops, Professional Offices, Commercial offices/establishments, banking and financial institutions, restaurants/canteen, hotels, IT/software units- floor area limited to 1000m^2	Marble and Granite storage Centres, industrial estates & industrial parks, automobile workshops/automobile service stations for Light Motor Vehicles		
	Secondary/higher secondary schools, Technical High Schools	Social welfare Centres/movie halls/auditoriums/wedding halls/community halls- floor area limited to 1000m^2		
	Hospitals and health centres with number of beds limited to 10	Weighbridges, godowns/ warehouses/ storage non-hazardous- floor area limited to 200m^2		
	Markets of Plot area limited to 500 m^2	Service industries of non-nuisance nature (see Appendix III) engaging not more than 9 workers with power limited to 30 HP		
2	**Public & Semi-public Zone**			
2.1	Local/State/Central Government/Public sector offices and other related public buildings	Cremation Ground/Crematorium, burial ground, common vault		Any other uses not specified under (1), (2), (3)
	Residential quarters incidental to public and semi-public use, public housing projects with required open spaces and amenities.	Privately owned residential buildings, large commercial buildings.		
	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 sq. m.			
3	**Mixed Use Zone***			
3.1	All uses that are permitted in Residential Zone	Slaughter houses	Multiplex	Any other uses not specified under (1), (2), (3)
3.2	All uses that are permitted in Public Semi-Public Zone			
3.3	All shops including shopping complexes, shopping malls, hypermarket, restaurants, hotels, swimming pool, markets, professional offices, commercial offices & establishments, banking and financial institutions.			
	Educational institutions of higher order, hospitals and health centres with floor area limited to 2000 sq. m.			
	Godowns/warehouses/storage (non-hazardous)			
	Automobile workshops/automobile service stations for heavy vehicles/movie halls/auditoriums/wedding halls/community halls- floor area upto 1000 sq. m.			
	Gymnasium/Yoga centres			
3.4	All industries other than obnoxious and nuisance type industries (see Appendix-IV), automobile workshops, automobile service stations, cold storage, service industries of non-nuisance nature with number of workers limited to 19 without power or 9 with power limited to 30 HP (see Appendix-III), saw mills, weigh bridges, printing press, IT hardware/electronic industries, spray painting workshops, timber yard, ice factory, fish and meat processing units, marble and granite storage/cutting centres, water treatment plants, industrial estates & industrial parks.			

	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			
3.5	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 with floor area limited to 1000 sq. m.			
3.6	Clinics, diagnostic centres and hospitals with number of beds limited to 50			
	Tot lots. Parks & Playgrounds, fair grounds, open air theatres			
	Plant nursery, storage of agricultural produces and seeds, pump house, wells and irrigation ponds			
4	**Traffic & Transportation Zone**			
4.1	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 18 m minimum	Any other uses not specified under (1), (2), (3)
	Any incidental uses to the transport terminals such as retail shops, restaurants, canteen etc. which are integral or essential part of a transport terminal with maximum % of coverage permissible for the project as a whole limited to 30 % and FAR 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			

5	**Public Open Spaces & Parks**			
5.1	Only temporary construction/land development essential for the development/improvement of open air recreational facilities or public commons like pavodi, velaparamb, vediparamb.	Public utility areas and buildings which will not affect the open character of the area/land		Any other uses not specified under (1), (2), (3)
	Watch towers, eco walk ways, water sports facilities, fair grounds, etc.	Parking plaza – without impervious paving of ground.		
	Tot lots, park, play grounds, swimming pools, open air stadium, open air theatre, zoological and botanical garden, bird sanctuary, eco walkway etc.			
	Comfort stations/public toilets			
6	**Dry Agriculture Zone**			
6.1	Agriculture, horticulture and fodder cultivation, pastures, grazing ground and other types of cultivation including social forestry			Any other uses not specified under (1), (2), (3)
	Dairy farms, fish farms, seed farms, poultry farms, plant nursery, pump house, wells and irrigation ponds			
	Single family residential buildings upto 300 sq. m.			
	Orphanages, old age homes, dharmasala, ashrams, mutts, madrasa			
	Clinics (outpatient) and diagnostic centres - floor area limited to 100 sq. m.			
	Shops, professional offices, commercial offices and establishments, banking and financial institutions, gymnasiums, yoga centres, restaurants, canteens- floor area limited to 100 sq. m.			
	Police post/police station, post and telegraph office, fire post/Fire station, telephone exchange, wireless stations and telecommunication towers			
	Day care and creche, nursery / kindergarten / primary & upper primary schools			
	Library and reading room floor area limited to 100 sq. m.			

	Godowns/warehouses/storage- non-hazardous- floor area limited to 100 sq. m.			
	Cottage industries, service industries of non-nuisance nature (see Appendix-III) engaging not more than 6 workers without power or 3 workers with power limited to 5 HP			
	Automobile workshops for 2/3 wheelers			
	Tot lots/parks/play grounds			
	Saw mills/weigh bridge			
6.2	**Provided that access road has a width of 8 m minimum**			
	Clinics (outpatient) and diagnostic centres -floor area limited upto 200 m^2			
	Shops, professional offices, commercial offices and establishments, banking and Financial institutions, Gymnasium, yoga centres, restaurants, canteens – floor area limited to **200m²**			
	Library and reading rooms, godowns /warehouses /storage – non-hazardous – floor area limited to **200m²**			
	Auditorium /wedding halls /community halls floor area limited to **500m²**			
	Hospitals & Health Centres **with number of beds limited to 5**.			
6.3	**Provided that access road has a width of 12 m minimum**			
	Residential buildings consisting of single or multifamily dwelling, residential flats/apartments, residential quarters	Stacking yards, Godowns/warehouses/storage non-hazardous materials	Fuel filing stations	
		Higher education institutions, health care facilities including Diagnostic Centres, clinics and hospitals with number of beds limited to 50.		

7	**Wet Agriculture Zone**			
7.1	Paddy cultivation			Any other uses not specified under (1), (2), (3)
	Agriculture/horticulture/fodder cultivation, fish farms/seed farms/ pump house/wells and irrigation ponds without any building construction.			
8	**Water Bodies**			
8.1	All existing water bodies shall be conserved.	Any form of reclamation or filling. No changes to boundaries, reclamation, or development of ponds. Bed concreting of canals, streams and channels that currently enable water percolation		Any other uses not specified under (1), (2), (3)
	Bridges side protection walls, bathing ghats, floating jetty, etc maybe permitted based on community level requirements.			
9	**Crematoria & Burial Grounds**			
9.1	Cremation grounds, burial grounds/Common Vault, Buildings/Structures incidental to the permitted use.			Any other uses not specified under (1),(2),(3)
10	**General Notes:**			
	* The Mixed use Zone will apply upto a depth of 42m from cenre of the main road or 36m from the edge of the roadside plot, whichever is greater.			
	** Residential uses permitted, based on width of road access available, will apply upto a depth of 200m from SH 25.			
	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 uses in that zone.			

APPENDICES

Appendix I: Shilpashala List of Invitees and Process

SHILPASHALA PARTICIPANT LIST
Overall process will be anchored for the Municipality by

Dr. Jayaraj Sundaresan (https://www.lse.ac.uk/geography-and-environment/people/academic-staff/jayaraj-sundaresan) and
Dr. Malini Krishnankutty (https://www.linkedin.com/in/malini-krishnankutty-6a3a5511/?originalSubdomain=in)
Supported by Planners Anupama Sivaram and Shilpa Sojan.

Resource Institutions
Kerala Institute of Local Administration
Kerala Town &Country Planning Department

Resource persons attending the Workshop

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2. Mr. Sreekumar Kumaraswamy, Head of Mobility, World Resource Institute, Mumbai https://wri-india.org/profile/sree-kumar-kumaraswamy
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4. Dr. Himanshu Burte, Professor of Urban Studies, Indian Institute of Technology, Mumbai, https://www.cps.iitb.ac.in/people/himanshu-burte/
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7. Mr. Renjith B.R., CEO Agro nature, Aluva, https://www.agronature.org/the-team/
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11. Mr. Arun Narayanan, Convenor, INTACH Palakkad, http://getintachtive.com/about-me/
12. Mr. Nirmal Panicker – Entrepreneur, Campaigner, and Advocate for Zero Waste, Kannur https://www.linkedin.com/in/nirmal-panicker-29ba424/?originalSubdomain=in
13. Mr. Sunil CP, Architectural Consultant, Thrissur, Kerala, https://www.linkedin.com/in/sunil-cp-b97621b/?originalSubdomain=in
14. Ms. Lakshmi Menon, Social Entrepreneur, Ernakulam, Kerala, https://www.linkedin.com/in/lakshmi-menon-7b3773202/?originalSubdomain=in
15. Dr. Richard Scaria, Professor Geography Dept., Chittur College
16. Mr. Kalayanakrishnan, Chittur, Environmental Policy Specialist, Advisor to Kerala Government
17. Mr. Cholayil Gopakumar, Climate Change Specialist, Advisor to Kerala Sastra Sahitya Parishad, Thrissur: https://www.linkedin.com/in/dr-gopakumar-cholayil-64b8a623/?originalSubdomain=in

SHILPASHALA PROCESS- PLAN LAB GUIDE

Dear Participant

Hope you are keeping well. Thank you very much for being with us at Chittur-Thathamangalam for this workshop. We are looking forward to receiving you.

Through extensive public consultation in the past 6 months, the municipality has identified problems, needs, priorities and aspirations of diverse groups of people and establishments within Chittur-Thathamangalam Municipality to be considered for the 20 year Integrating Plan. These meetings also created discussions on how people see the various proposals in the current Draft 'Master Plan' prepared without any public consultation. Further there are ongoing missions, projects and campaigns at local, regional, national and international level on infrastructure, waste, climate change, equity, design and so on.

With this information as a working brief, in this 3-day deliberation event, a select collective of professional planning experts, scholars, NGO activists and campaigners, invited from across the country will work with local community, politicians, municipal office bearers and planning officials to develop planning policy options, instruments and implementation frameworks that can address the key concerns, aspirations and vision. They will engage with the material from all the various processes to develop ideas, options and strategies that can use used to update, correct and amend the Draft plan towards an integrating plan for Chittur-Thathamangalam Municipality.

Each day of the workshop will focus on one specific activity.

1. Day 1 (14 October) of **Plan Lab** will be Introduction, Orientation, Understanding the context, including site visits, interactions, reflections, experience sharing and talks by specialists, participants and officials
2. Day 2 (15 October) of **Plan Lab** where experts and local informed citizens will work together to develop ideas, options and strategies for the Integrating Plan.
3. Day 3 (16 October) called **Mini Publics** will gather peoples' responses to proposals and strategies evolved during the Plan Lab.

We would like you to contribute to the Plan Lab in the following way. You will be assigned to one of five groups based on your area of expertise/interest. The groups are:

1. Ecology/Environment
2. Public Space/Heritage
3. Mobility
4. Land use/Housing
5. Livelihoods

A set of broad questions have been posed to frame the discussions in each group. **(see Plan Lab Guide attached)**. You will be familiarised with the context of Chittur-Thathamangalam through the orientation on Day One. On Day Two, in your group, we would like you to give a short 5-10 minutes' talk/presentation (a laptop and projector will be available) that

a) frame your response to the questions posed to your group

b) share some of your experiences in other relevant contexts

c) Share very specific projects, if any, that you think would be worth developing for Chittur-Thathamangalam.

We would then invite each group to collectively brainstorm on the individual inputs from each of the members in each group, so as to arrive at broad sectoral strategies as well as work towards identifying key projects that could be further detailed out as proposals by the end of the Plan Lab on 15 th Oct. These would be presented to all the participants for discussion and debate, so that these inputs can inform a final set of proposals and strategies that can be presented before the Mini publics on Oct 16 for their responses.

We look forward to meeting you. Travel to and from the airport or train station has been arranged by the municipality.

Best wishes
Jayaraj and Malini

Central values suggested to guide the PLAN LAB process

- Equity
- Resilience
- Climate change
- More than Human

For Each Group, some questions to consider are listed below:

Group 1: Environment - Ecology, Water, Ecosystem services/Health/Biodiversity/ Sanitation/ Waste etc

Some questions:
A. In the context of climate change, what is it that Chittur-Thathamangalam Municipality needs to address as key concerns to address issues arising out of

a. Rising Heat
b. Changes in Water cycles – extreme events, overconsumption, scarcity.
c. How should the Municipality address issues pertaining to water management – managements of 171 networked ponds, irrigation canals, river/watersheds and natural streams?

B. How should the Municipality address loss of biodiversity, and environmental pollution and health concerns arising out of land pollution and degradation (including through invasive species), solid waste, liquid waste, sanitation, fuel, pesticides, etc

Group 2: Public space/ Parks/ Heritage / Tourism/Art/ Sport

Some questions:

A. How can Chittur-Thathamangalam Municipality create vibrant inclusive public spaces strategy integrating all the diverse potential in the municipal area which people of all ages, gender and ability can use meaningfully and contribute productively. How can a strategy be developed that caters through a diversity of public spaces – Religious Institution and their grounds, fair grounds, open playgrounds, athletic tracks, outdoor and indoor sports facilities, public nodes and important Junctions (*Kavala*), public institutions – like libraries, reading rooms - river edge, ponds, irrigation canal and their usable edges, parks, paddy field walks, gallery/art exhibition spaces, cultural centre etc?
B. How can the Municipality's unique cultural diversity/history and older settlements become cherished and given a new lease of life? (traditional festivals, rituals, performances, buildings).
C. How can we make Chittur-Thathamangalam Municipality processes, facilities and spaces enabling and enriching for Children across age, ability, gender, caste, class?
D. How can we make the Municipality processes, facilities and spaces enabling and enriching for women and transgender people across age, ability, caste, class?
E. How can Chittur-Thathamangalam Municipality processes, facilities, spaces address issues faced by disabled people?

F. How can the Municipality promote Arts and Design?
G. How can Chittur-Thathamangalam Municipality promote Tourism as an economic contributor and heritage conservation mechanism simultaneously?
H. How can we open up the river as a unifying public edge for the Municipality?

Group 3: Transport/Mobility/ parking/ accidents/ road safety/ Bus-stand

Some Questions:
A. How can we make Chittur-Thathamangalam Municipality safer from accidents?
B. How can we make walking and cycling in the Municipality pleasurable for people across age, gender, ability, caste and class?
C. How can we help people of the town to keep using public or sustainable transport options and not increase car-based mobility?
D. Does option exist to move along the river/by the river/through the river?
E. How to solve the existing traffic problems, including parking, congestion at bottlenecks, road visibility due to problematic geometry, unfriendly for pedestrians, speeding traffic, accidents, need for alternate route for passing through vehicles,
F. What should be the strategy on street furniture, trees and vegetation, etc?
G. How should the drainage strategy and road strategy be linked?
H. What main pointers for the new Bus Stand design and planning?

Group 4: Land Use Change/Bldg. codes/ building material/ design policy/ settlement structure and form/ Density/ FAR etc/Public Housing colonies? Dilapidated buildings and campuses, regeneration, etc

Some questions:
A. If for a moment, space in Chittur-Thathamangalam Municipality was viewed as a resource available and not through property rights lens, what use could these resources be put to? How can older building stock be viewed.
B. If we want to reduce env and health impacts what materials should we pursue? What changes should we institute in the building rules, practices and how to bring about those?
C. How should we view current housing types (single family dwelling), no public spaces etc. and what would they suggest as alternative desirable housing?
D. Should Chittur-Thathamangalam Municipality approach multiple family housing (apartments?) – regulate? Promote? What should guide those?
E. How can housing me made affordable? Currently building a house is very expensive and beyond many people.
F. What to do with the large dilapidating housing sites like PWD, Police Quarters, and such?
G. How should the Municipality improve the public housing – so called colonies? What should be the strategy on the life mission houses – are they environmentally spatially sustainable and just?
H. Should Chittur-Thathamangalam Municipality use Zoning at all? How should land use be regulated and What kind of instruments will be appropriate and realistic? Should models such as land pooling and TP schemes etc. encouraged/ and facilitated to ensure an ordered development in the future?
I. Should certain areas have higher FAR than others?
J. 43% of land use is agriculture now- how to see the transformation of these lands and its implication in the future?

Group 5: Livelihoods/Employment/Tourism/Agriculture/Craft/ traditional economy

Key questions:

A. How to make Chittur-Thathamangalam Municipality a place to stay than get away from for youngsters from the perspective of Employment?
B. How to support immigrants? How to engage more with the Diaspora?
C. There is a shift away from traditional livelihoods. How should these be viewed? Agriculture, weaving, grass mats, pottery, food practices, art forms, everyday cultural practices…
D. How to address questions of Paddy is not economically viable currently in the context of rising costs, reduced yields, uncertainty, etc?
E. How to attract new Economy and new sectors of employment to the town?
F. How to enable the multiple economic base at Chittur-Thathamangalam Municipality viable and towards growth trajectory than decline?

At the end of the workshop the recommendation is to articulate clearly in Each Sector/ Problem / Concern

1) **Issues under consideration,**
2) **Principles -and ideas to address issues?**
3) **What projects and process can address those**
4) **How to realise those projects and establish those process?**
5) **What should be the next steps?**

SCHEDULE

Chittur-Thathamangalam Master Plan Shilpashala

14th ,15th and 16th October 2022

Nehru Auditorium, Chittur

Day 1 14 October 2022 **Plan Lab**	
Time	**Tasks/ activity**
0730-0930	Registration
1000-1100	Inaugural Ceremony Inauguration: Shri MB Rajesh, Minister – Local Self Governments & Excise
1100-1115	Tea Break
1115-1120	Planning with People – a 5 Minute Video briefing by Anchors
1120-1230	Experience Sharing by Participants. Living in Chittur - experience along timelines- including round of quick introduction of all participants
1230-1315	KILA risk and resilience integrated Planning - Guidelines and case studies
1315-1415	Lunch Break
1415-1700	Site visits
1700-1730	Reflections on Chittur after site visits – sharing by participants
1730	Disperse to accommodation
Day 2 15 October 2022 **Plan Lab**	
0700-0930	Any outstanding Field visits, breakfast etc.
0900-0930	Registration
0930-1000	Brief introduction on What this workshop will look like, and how it will be conducted, what general protocols Rules for the day Agenda for the day

1000-1030	Where we started, where are we now and where we want to go, Key principles. Followed by Q & A
1030-1100	Climate Change overview - implications for Chittur-Thathamangalam Municipality, by Gopakumar
1100-1115	Tea Break
Session 1 1115-1330	Break up into 5 Thematic Working Groups: Experts and members present are asked to appreciate a shared/collective understanding of key issues on that sector, from their knowledge and experience, insights, perception, site visits; Documents shared will include FGD, OBJ/SUGG/ongoing Schemes, existing plan Draft etc.
1330-1430	Lunch
Session II 1430-1630	Develop Proposals + tea break
Session III 1630-1730	Each Group to present to all others.
1730-1830	Each group to make any additions changes etc with the new inputs List/Write key proposals and projects for next day Mini public presentation.
Day 3 16 October 2022 **Mini Public**	
0900-0930	Registration- + Welcome by VC/CP/Municipality for 15 minutes
0930-1000	- Welcome - Where are we now and where we want to go - Rules for the day - Agenda for the day - Q & A
1000-1330	First inquiry + Second Enquiry + Tea Break
1330-1420	Lunch
1420-1600	Third inquiry / question

1600-1700	Coming back to the home group/ station Prioritization
1700-1800	Plenary
1800-1830	Concluding- Feedback on process and PDF copy of the workshop prioritization shared with citizens, local officials and media persons
1830	Thanking by Municipality and Facilitators and Anchors

Appendix II - Ongoing projects in Chittur-Thathamangalam Municipality

PWD ROADS

- Thathamangalam bypass (22m) - Mettupalayam Jn to Chentjamara in under PWD. 95% of land acquisition completed.
- Anikode Jn redevelopment - PWD (proposal stage)
- 13.5 m widening of road from General hospital to Thekkegramam - KIFBI

MUNICIPAL FUND PROJECTS

- Manthakkad vyavasyika kendram renovation - Vyvasaya vakup (SC fund).
- SMLP School to Thumbichira road - widening
- Kittuman nagar Ct avenue road widening
- Vadaloor Vallalaru manadapam road - widening
- Thathamangalam - Pallikulam side protection
- Nadukalam to Ilamadachi road - widening
- Vadathodu to Nellukuthupara - Vellanthara - Athikuzhi roadside protection
- Muthukad SC colony side protection

MP FUND PROJECTS

- Devi nagar Park
- River front development proposal - MP fund
- Social welfare - Pakalveedu
- Taluk hospital - Ongoing

OTHER PROJECTS

- Water tank at Thathamangalam for Vellapana colony - AMRUT scheme
- Project at Thathamangalam under LIFE mission scheme for Vellapana colony - Proposal is for 44 units - KIFBI (ongoing)
- Navukod, Nadukalam road concreting to avoid water logging during the rainy season.
- Kottakadavu smashana renovation.
- Padanamuri, Melkura (roof repair), RC repair - SCDO
- General - Melkura (roof repair), RC repair - Janakeeyasootranam.
- Drinking water scheme - AMRUT
- Nilavu scheme - KSEB scheme funded by municipality
- Incinerator in solid waste plant - CFC tied grant
- Child friendly toilets in Athikuzhi anganwadi, Muttirinji anganwadi - state sponsored schemes
- Preparation of solid waste management DPR - CFC tied grant
- Take a break

Appendix III – List of non-obnoxious and non-nuisance type of service or light industries

1. Flour Mills
2. Embroidery and Lace manufacturing
3. Gold and silver smithy
4. Watch, pen and Spectacle repairing
5. Laundry, dry cleaning and dying
6. Photo and picture framing
7. Manufacture and repair of musical instruments
8. Automobile servicing (excluding repair)
9. Radio servicing and repairing
10. Cotton and silk printing
11. Bakeries
12. Confectioneries
13. Cold storage
14. Aerated waters and fruit beverages
15. Manufacture of tobacco products
16. Garment making
17. Electroplating
18. Bamboo and cane products
19. Sports goods
20. Card-board box and paper products
21. Domestic electrical appliances
22. Toy making
23. Furniture without machinery
24. Wooden electrical accessories
25. Copper, brass and metal utensils
26. Small foundries
27. Padlock
28. Sanitary fittings and other similar industries

Appendix IV – List of obnoxious or nuisance industries subject to objectionable odours, fumes, effluents or processes, located in hazardous zones

(Grouped under Indian Standard Industrial Classification)

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 malt, fruits and malts in distillery and brewery
3. Production of country liquor and indigenous liquor such as toddy, liquor from malwa, palm juice.

Manufacture of wood and wooden products:

4. Sawing and planning of wood
5. Wood seasoning and creosoting
6. Manufacture of veneer and plywood
7. Paper, pulp and straw board

Manufacture of leather and leather products:

8. Currying, tanning and finishing of hides and skins and preparation of finished leather

Manufacture of rubber, petroleum and coal products:

9. Manufacture of tyres and tubes
10. Manufacture of industries and synthetic rubber
11. Reclamation of rubber
12. Production of petroleum, kerosene and other petroleum products in refineries
13. Production of coal tar and coke in coke oven

Manufacture chemicals and chemical produces:

14. Manufacture of basic industrial chemicals such as acids, alkali and their salts not elsewhere specified (especially sulphurous, sulphuric, nitric, hydrochloric etc., acids) ammonia, chlorine and bleaching powder manufactures.
15. Manufacture of dyes, paints, colours and varnishes, printing ink
16. Manufacture of fertilizers (specially from organic materials)
17. Manufacture of disinfectants and insecticides
18. Manufacture of ammunition; explosive and fire works
19. Manufacture of matches

Manufacture of non-metallic mineral products other than petroleum and coal:

20. Manufacture of cement and cement products
21. Manufacture of lime

22. Manufacture of plaster of Paris

Manufacture of basic metals and their products:

23. Manufacture of iron and steel including smelting, refining rolling and conversion into basic forms
24. Manufacture including smelting, refining etc., or nonferrous metals and alloys in basic forms
25. Manufacture of armaments

Manufacture of machinery (other than transport) and electrical equipment:

26. Manufacture of all kinds of battery

Miscellaneous items not covered above:

27. Incineration, reduction or dumping of offal, dead animal's garbage or refuse
28. Manufacture of gelatin and glue
29. Fat, tallow, grease or lard refining of manufacture
30. Bone meal, bone grist and bone powder and other similar types of nuisance industries.

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മാസ്റ്റർപ്ലാൻ 2042



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