MASTER PLAN FOR
MATTANNUR TOWN

Prepared by

MATTANNUR MUNICIPALITY
DEPARTMENT OF TOWN AND COUNTRY PLANNING
GOVERNMENT OF KERALA

2017

FOREWORD

Mattannur town had its glory as the abode of great patriot Veera Kerala Varma Pazhassi Raja who organised the heroic, 'Pazhassi rebellion' against the mighty British Imperialism. Mattanur is going to hog the limelight once again as the Kannur International Airport gets operational in the near future. The development dreams of people of Mattannur will also take wings as the new airport would boost export activities from the region, especially in the textile, fisheries and spice industries. As North Malabar has no dearth of places of natural and scenic beauty and historical importance, the airport would also enhance the tourism potential of the region.

And it is the right time for us to equip ourselves to rise to the occasion for utilizing in maximum the opportunities lying ahead. At this occasion, it is with great pleasure that I present this Master Plan for Mattannur Town. The plan, as intended, will be used as a general guide for the future development of land within the municipal area for many years to come.

The plan is the product of extensive community participation over the last couple of years. Apart from this Master Plan formulation never before was there an active and extensive participation of the people in such a decision making process except for People's Plan Programme. The contribution of every citizen and stakeholder who participated in the preparation of the Master Plan can be seen in the following pages. A special 'thank you' is extended to the members of Spatial Integration Committee and it's working groups who volunteered their precious time to guide the planning process, for their diligence and hard work. I appreciate the efforts put in by the officials of the Town and Country Planning Department who have prepared this development plan through a process of people's participation, carefully understanding the aspirations and expectations of the citizens of the town.

Contained within are people's aspirations, dreams, and vision for emerging as a smart airport town, developing a vital central business district at the heart of the town, urbanization of the surrounding area for a sustainable development, foundation stones for a strong economy with emphasize on the existing agriculture platform and proposed airport based industries. It depicts a transportation plan for accommodating all future needs and which will provide smooth transit for all road users. The Master plan also includes strategies for preserving our invaluable heritage sites, creation of an exclusive export allied zone adjacent to the airport, methods for developing a town that enriches our lives with more urban amenities and precautions to ensure qualitative life with least detriment to the present environment.

I hope that you read this plan with great enthusiasm and find that it addresses the critical problems in the development scenario of the town. Finally the plan is open-ended allowing for revisions and additions at every five years. And I hope this open-ended nature of the plan will help to fine tune the proposed incentives and regulations, if any defects are identified at later stage.

K. Bhaskaran Master,
Municipal Chairman,
Mattannur Municipality.

Mattannur

PREFACE

Rapid urbanization evident in the state has been the result of unbridled urban sprawl and population explosion rather than enlargement of production base and the related economic development. Anthropogenic threats to the environment due to this trend of widespread urbanization occupying a large percentage of the state's landed resources are not fully comprehended by the civil society. Limiting the ecological and physical footprints of urbanization to an environmentally sustainable level is crucial for the overall development of the state both in terms of environmental quality and economic sustenance.

The 74th Constitutional amendment and subsequent state legislations have put forward a paradigm shift in the development planning process. The focus has shifted from physical planning to spatial planning for economic development. The inclusiveness of the development process is another important consideration in the nation at present. The Planning Commission, Government of India, in the Approach to 12th Five Year Plan, articulated this view by saying *Urban planning cannot be limited to spatial allocations and engineering solutions: It must encompass and connect various socio-technical considerations too*. The development plan has multiple objectives in this backdrop - to ensure efficiency of built form of the town so as to augment economic development, facilitate inclusive and faster development by the impetus given to various sectors of economy and put in place a regulatory mechanism for limiting the anthropogenic threats to the scarce environmental resources, keeping the demands of development well within the carrying capacity of our precious environment.

The Department of Town and Country Planning has been instrumental in the preparation of Town Planning Schemes in the State as per the provisions contained in the Town Planning Acts in force. Accelerated urbanization in the State, a fact underlined by the 2011 Census of India figures, made it imperative to prepare Master Plans for all urban settlements in the State on a priority basis. The Department has taken up the challenging task of preparation of 32 Master Plans in the first stage and further and further 29 in the next stage to cover all the municipal areas in the State. The preparation of Mattannur Master Plan was included in the latter list of 29 schemes.

Mattannur town was upgraded as a municipality in 1990 and hitherto no development plan was prepared for the town. This is the first venture in its kind and will be a base for the future plans to be followed in the coming decades. The study and analysis reveals that Mattannur is an emerging town with a strong agriculture background and expecting momentum with the functioning of Kannur International Airport. The urban facilities and civic amenities available for the citizens are very meagre and the economic activities are found very poor. Urban character is seen only at the core area of the town and the exterior portions remain as hinterlands. In this context, the advantage available with Mattannur town is that it's underdeveloped nature provides ample room for shaping it to the desired form. The planning intervention for the town is occurring at the right time and can therefore harness the town to a controlled and planned growth without much disturbance to the qualitative environment present in the town.

I take this opportunity to appreciate the officials of the Kannur District office of the Department, especially Sri .Ranjith.K.V, Town Planner and Sri.Sathyababu.K, Sri. Nidheesh K. P, Deputy Town Planners in the preparation of this document. The State Project Cell played anchor role in this regard, right from conceptualization to completion. I also appreciate the consistent efforts of Smt. Darley D S Mony, Sri. K. Devarajan, Additional Chief Town Planners (Retd), Sri. K. Ramanan, Chief Town Planner (General), Smt.C.K.Sabithamini, Town Planner and other officials of the State Project Cell and Division III for their efforts in vetting and finalizing the Master Plan for Mattannur town.

Certainly, this plan document for Mattannur town will provide a frame work for development of the town for years to come.

Shaji Joseph
Chief Town Planner (Planning),
Town & Country Planning Department
Government of Kerala.

06.07.2017
Thiruvananthapuram.

ACKNOWLEDGEMENT

The Master Plan for Mattannur Town is prepared as a part of preparation of Master Plans for 29 towns in the Kerala State vide G.O (Rt) No.1376/2012/LSGD of Local Self Government Department dated 17.05.2012. A methodology was evolved for the preparation of Master Plans at the state level and the same was adopted with suitable modifications at the town level. People's participation has been a crucial element in the methodology. The Master Plan once sanctioned shall give directions to the development process in the municipal area for years to come. Suitable provisions for monitoring and review of the Master Plan is inbuilt.

We are highly spirited by the interest and enthusiasm shown by Sri. K. Bhaskaran Master, Honourable Chairman of Mattannur Municipal Council. Without his constant support, timely advices and valuable suggestions, this draft plan would not have reached this stage. We have heavily relied on statistical data from various Development Departments. Their readiness to share the data is gratefully acknowledged. The collection of data, analysis and preparation of this report would not have been possible without the active involvement and painstaking efforts taken by Councillors of Mattannur Municipality, members of Spatial Integration Committee and its various working groups. We are indebted to the earnest endurances offered by Sri. P.K.Govindan Master, Co-ordinator of Spatial Integration Committee whose devoted service was a persistent source of inspiration throughout the process of preparation of the Master Plan.

I am also very much grateful to Sri. Shaji Joseph, Chief Town Planner (Planning), Sri. K. Ramanan, Chief Town Planner (General), Smt. Darley D.S. Mony, Sri. K. Devarajan, Additional Chief Town Planners Retd., Smt. T.M. Sudha, former Chief Town Planner, for guiding us in the right direction in the fulfilment of this study. I whole-heartedly acknowledge the able and valuable support given by Smt.C.K.Sabithamini, Town Planner, Sri.P.G.Pradeep Kumar, Assistant Town Planner, Office of the Chief Town Planner, Thiruvanathapuram and all staff members of the State Project Cell, Thiruvanathapuram.

I take this opportunity to acknowledge the valuable contribution to the Town Planners, Smt.Indu Vijayanath, Sri.Gopi.V.A and Sri.G.Sasikumar (Retd.). The contributions made by Sri.K.Sathyababu and Sri.Nidheesh. K.P, Deputy Town Planners, Sri. O.C. Rajan, Smt.Sanma Jishnudas, Assistant Town Planners, were key to the successful completion of this report. The assistance offered by Sri. Arun Chandran, Ist Gr. Town Planning Surveyor/Draftsman, Smt.Anupama K.M., Planning Assistant, Sri.Gopalakrishnan P.P, Planning Assistant (GIS) , Smt.Raji.G.Nair, Computer Assistant and Sri. Solaman.K.G, Sri.Ajesh.K, Sri.Ramachandran Kothila and Sri.Niral N.C.M, Statistical Investigators of this office for the preparation of this report, needs special mention. All the staff members of the District Town & Country Planning Office need to be specially acknowledged for their keen participation in various stages without which this work would not have been completed in the present form and time frame.

Place: Kannur,
Date : 06.07.2017

RANJITH K.V.
Town Planner,
Kannur.

LIST OF MUNICIPAL COUNCILLORS, MATTANNUR

Ward No	Name of Ward	Councillor
1	MANNUR	KUNHIKKANDY VIJAYAN
2	PORORA	SUSHAMA K
3	ELANNUR	SHYLAJA M
4	KEECHERY	SHAHINA P P
5	ANIKKARI	USHA K
6	KALAROAD	P P ABDUL JALEEL
7	PALOTTUPALLI	SHAMSUDHEEN E P
8	PERUVAYALKKARI	SOBHANA K
9	MUNDAYODE	RADHIKA K R
10	BERAM	ISMAIL V
11	KAYALOOR	ISMAIL V P
12	KOLARI	NALINI T
13	PARIYARAM	SATHYENDRANATHAN V N
14	AYYALLUR	HARINDRANATHAN A K
15	EDAVELIKKAL	RAJATHA K
16	URUVACHAL	KODANCHERRY RAJAN
17	PAZHASSI	SAJITHA C
18	KARETTA	DAMODARAN V
19	KUZHIKKAL	RAJEESH K
20	KAYANI	SUBAIDA TEACHER
21	PERINJERY	BHASKARAN MASTER K
22	DEVARKADU	DEEPA M K
23	KARA	PRASEETHA C
24	KALLERIKKARA	GIRIJA P V
25	MALAKKUTHAZHE	ANITHA VENU P
26	NELLOONNI	SATHYAKUMAR P
27	ILLAMBHAGAM	REKHA P
28	TEMPLE	PRASANTH K V
29	MATTANNUR	DHANALAKSHMI P V
30	KOKKAYIL	MUHAMMED V N
31	UTHIYOOR	SASEENDRAN C V
32	MARUTHAYI	NARAYANAN N
33	METTADI	ANITHA C
34	NALANKERY	THASLEEMA V

Spatial Integration Committee

Chairman : Sri. K. Baskaran Master
Co-ordinator : Sri. P.K. Govindan Master

Members of working groups of SIC

Animal Husbandry

1. Sri. M.Damodaran Master (Convener)
2. Sri. Vinodan (Livestock Inspector,Marythayi)
3. Sri. Aarish (Livestock Inspector,Perincheri)
4. Sri. M.Premarajan

Heritage /Environment

1. Sri. K.K Raveendran Master (Convener)
2. Sri. Dr.P.M.Raveendran
3. Smt.Subaida Teacher

Education

1. Sri. Shajith Master
2. Sri. K.Rameshan
3. Smt.K.Bindu
4. Smt.P.Sulochana
5. Sri. K.Prakash

Social Welfare

1. Smt.Dhanalakshmi .P.V (Convener)
2. Smt.Usha (Councilor)
3. Smt.Saritha (SC Promoter)
4. Sri. Bhaskaran

Industry

1. Sri. M.C. Kunhammad (Convener)
2. Smt. Shahina .P.P

Trade & Commerce

1. Sri. K.K.Kunjahammad Master (Convener)
2. Smt. Radhika .K.R

Agriculture

1. Sri. Raveendran Mundayadan (Convener)
2. Sri. Ashokan
3. Sri. C.Balan

Recreation/Culture

1. Sri. Dr.G.Kumarana Nair (Convener)
2. Sri. Dr.Sudheer
3. Sri. Mahroof

Energy

1. Sri. Aravindan (Convener)
2. Sri. Rajeesh.K

Health

1. Sri. Kaippacheri Balakrishnan (Convener)
2. Sri. Kalasseri Damodaran

SC/ST Development

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3. Sri. V.Ramadasan
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2. Sri. V.P.Manoharan
3. Sri. Dinesan
4. Sri. M.Purushothaman

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1. Sri. Balakrishnan K.V (Convener)
2. Sri. Narayanan.M

Water Supply

3. Smt.Seena Ismayil (Convener)
4. Sri. Jayaparakash (KWA, AE)
5. Sri. Muhammed

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Abbreviations

ADB	Asian Development Bank
ADS	Area Development Society
ATM	Automated Teller Machine
BMW	Bio Medical Waste
BOD	Bio Chemical Oxygen Demand
BPL	Below Poverty Line
CBD	Central Business District
CI	Concentration Index
CDS	Community Development Society
CFU	Colony Forming Unit
CWRDM	Centre for Water Resources Development and Management
DO	Dissolved Oxygen
DPR	Detailed Project Report
DUR	District Urbanisation Report
DTPC	District Tourism Promotion Council
DIC	District Industries Centre
dB	Decibel
FAR	Floor Area Ratio
GIS	Geographical Information System
HP	Horse Power
Ha	Hectare
HQ	Head Quarters
IHSDP	Integrated Housing and Slum Development Programme
HORTICORP	Horticulture Products Development Corporation Ltd.
IMA	Indian Medical Association
IMAGE	Indian Medical Association Goes Eco-Friendly
IT	Information Technology
IFS	Indian Foreign Service
IDMST	Integrated Development of Small and Medium Towns
KIAL	Kannur International Airport Ltd.
KINFRA	Kerala Industrial Infrastructure Development Corporation
KW	Kilo Watt
KITTS	Kerala Institute of Tourism and Travel Studies
KMBR	Kerala Municipality Building Rules
KSIDC	Kerala State Industrial Development Corporation
KSPCB	Kerala State Pollution Control Board
KSRTC	Kerala State Road Transport Corporation
KTDC	Kerala Tourism Development Corporation
KWA	Kerala Water Authority
KSIDC	Kerala State Industrial Development Corporation
KRFB	Kerala Road Fund Board
KSTP	Kerala State Transport Project

KINFRA	Kerala State Infrastructure Development Corporation
KSEDM	Kerala State Entrepreneur Development Mission
KVIB	Khadi and Village Industries Board
KVASU	Kerala Veterinary and Animal Science University
KSFDC	Kerala State Film Development Corporation
KIRTADS studies of	Kerala Institute for Research Training and Development Scheduled Caste and Scheduled Tribe
KSEDM	Kerala State Entrepreneur Development Mission
LSG	Local Self Government
MDR	Major District Road
MLD	Million Liters per Day
MSME	Micro, Small and Medium Enterprises
Mg/l	Milligram per litre
MSL	Mean Sea Level
M	metre
m^2	square metre
NH	National Highway
NRHM	National Rural Health Mission
NREGS	National Rural Employment Guarantee Scheme
NGOs	Non Governmental Organisations
NATPAC	National Transportation Planning and Research Centre
PCB	Pollution Control Board
Pp sq.km	Persons per square kilometer
PWD	Public Works Department
PPP	Public Private Participation
PH	Potential of Hydrogen Ions
PCU	Passenger Car Unit
R.S. No.	Resurvey Number
SH	State Highway
STP	Sewage Treatment Plant
SIDBI	Small Industrial Development Bank of India
SSA	Sarva Siksha Abhiyan
Sq.km	Square Kilometer
TC Road	Thalassery Coorg Road
UDPFI	Urban Development Plans Formulation and Implementation
VCB	Vented Cross Bars
VAMBAY	Valmiki Ambedkar Avas Yojana
V/C Ratio	Volume/Capacity Ratio
WFPR	Work Force Participation Rate
WTP	Water Treatment Plant

PART - I

STUDY AND ANALYSIS

Chapter-1

INTRODUCTION

1.1 THE TOWN

The planning area delineated for the Master Plan of Mattannur Municipal Town is the administrative area of the Mattannur Municipality, which comes to 54.15 sq.km. The area has a typical midland character of Kerala with undulating terrain mainly used for dry agriculture activities. The geographical area of municipal town stretches between Irikkur river (portion of Valapattanam river) at north and Anjarakandy river at the south. The town is located at the foothills of the western shoulders of the western ghat rising majestically at the east side, while the western boundary portion is the part of the gradual sloping terrain leading to the Lakshadweep sea.



Mattannur Junction on TC Road(SH30)



Municipal Bus stand, Mattannur



Sree Mahadeva Temple premise



Municipal office, Mattannur

Thalasseri - Coorg road (SH30) passes through Mattannur Municipal Town. The major urban development and activities are confined to the Mattannur junction area where Kannur road meets with State Highway. All other parts of the Municipal area except Palottupally junction and Uruvachal junction are yet to be developed as urban areas.

Mattannur Municipal town is comprised of two villages namely Pazhassi and Kolari. The Pazhassi Desom is the abode of Sri. Veera Kerala Varma Pazhassi Raja who led the *Pazhassi Revolution* against the mighty British Empire gallantly till his death in 1805.

Pazhassi barrage and a garden of Pazhassi Irrigation Project is located very near to the town and the spot is a major tourist destination. The main entrance of the forthcoming Kannur International Airport is in the municipal area and is just 5km away from Mattannur junction. The whole developmental dreams of the town is now concentrated around the airport which is expected to be operational soon. Other major landmarks of the town are the Sree Mahadeva Temple, Palottupally makham, IB hill where the Inspection Bungalow built in British days and PWD Rest House are situated and Poongottukavu vanam, a rain forest spreading over 45 Acres within the town itself etc.

1.2 NEED OF MASTER PLAN

The 73rd and 74th Constitutional Amendment (1992) brought about new development standards by prescribing urban planning, regulation of land use and construction of buildings, planning for economic development, social justice etc. as the functions of urban Local Self Governments. The Kerala Municipal Act, 1994 which followed the Constitutional Amendment Act, 1992 necessitates every municipality to prepare a master plan for its development, in the prescribed manner with focus on Scientific Spatial Planning, taking into account its resources and fiscal investment and submit the same to the District Planning Committees (DPC).

A master plan will facilitate improvement of basic infrastructure including roads, power and water supply, facilities for parking, telecommunication, facilities for commercial development including modern markets, shopping centers, high level hotels, recreational facilities like parks, play grounds, stadium, multiplex theaters and community halls. It will also accommodate systems for effective solid and liquid waste management.

As per census 2011, the population of Mattannur Municipal Town is 47078 and the density of population is 869 persons per sq.km. By 2031 the town will have to cater the needs of an estimated population of 53,818 with an expected population density of nearly 1000 persons per sq.km and in addition a large number of floating population once it functions as a full-fledged air port city.

The formulation of a master plan for Mattannur Municipal Town has become a necessity as there is a need for such a plan that will co-ordinate the activities triggered by new investments in the airport scenario and address the acute problems generated by these activities as well. As all these investments provide new set of livelihood for the people in the region, it will challenge dynamic systems of environment that the people live in and may affect sustainability of development. The potential of the city has to be tapped effectively. The challenges created to its environment and its own sustenance has to be negated by prior planning, management and governance measures.

Moreover, as the development activities in the town has not reached to the haphazardous level, Mattannur Municipality has got the advantage of getting a planning process at the right time for moulding the town to the desired shape. Therefore the political leadership has initiated Master Plan process with the motto *Sustainable development through good governance* and accordingly the Municipal Council took a Resolution as No.14 in its meeting on 21.07.2012 for

the preparation of a Master Plan of Mattannur Municipal Town. The Plan period has been judiciously taken as 20 years which is neither a short period nor a long period, as far as a medium town is concerned.

1.3 METHODOLOGY

The guidelines issued by the Government for the Scheme for the preparation of master plan for Municipalities aim to prepare statutory town planning schemes for towns as per Town Planning Act in force in a time bound participatory manner. The general process of preparation of master plan involves four major steps which are schematically represented in figure 1.1

The first step of the planning process is data collection and compilation. The second step is analysis in which two types of analysis namely spatial analysis and local analysis are to be carried out. Spatial analysis is done by the Town and Country Planning Department and local level analysis is carried out through Spatial Integration Committee (SIC) and working groups. Consolidation of findings of both the analysis will reveal the development issues. The third step is envisioning process in which development goals and objectives are formulated, the development concept is formed and suitable policies and strategies are evolved for achieving the development goals. Last step is the detailing where sectoral projects, land use planning, zoning regulations and report preparation are attempted.

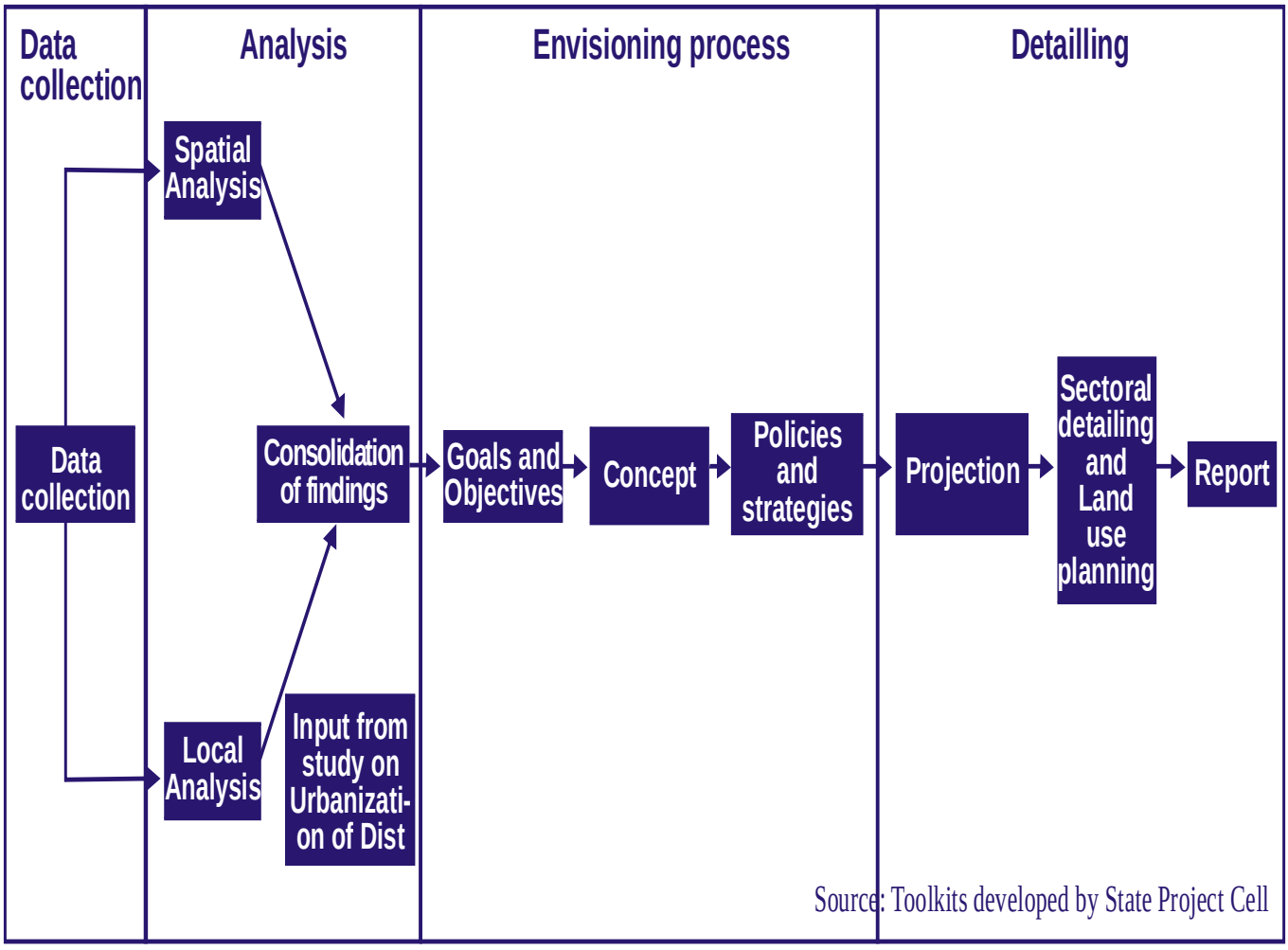


Figure 1.1 General Methodology for the preparation of Master Plans

1.4 PEOPLE'S PARTICIPATION IN THE PREPARATION OF MASTER PLAN

The people's participation is inevitable in the preparation of a meaningful master plan. In the preparation of Master Plan for Mattannur Municipal Town, the first level of consultation with the stake holders was through questionnaire and interviews. The household survey conducted using a well framed questionnaire helped to extract the citizen's vision regarding the development priority in wards as well as the town as a whole.

An initial seminar was conducted on 07.11.2012 to give awareness of citizen's participation in framing the master plan of the town and got very good response from the stake holders. Municipal Chairman, Municipal councillors, Plan Co-ordinator and other personalities from all walks of life were present in the seminar and gave significant suggestions about their vision of the town. The participants of the seminar pin pointed the issues unresolved hitherto and shared their development dreams.

A Spatial Integration Committee (SIC) was constituted to help and monitor the work related to master plan under the chairmanship of Municipal Chairperson. The formation of Spatial Integration Committee and working groups incorporating experts from various sectors and officials from line departments helped to collect data as well as analysis of data from various sectors. The working group along with SIC helped to finalize the findings in various sectors. The participant' approach in planning gave considerable momentum in shaping the master plan and in prioritization of the findings.

The second seminar held on 19.07.2014 to formulate the draft master plan incorporating peoples aspiration was inaugurated by Sri. E.P. Jayarajan, Hon. MLA of Mattannur Legislative Assembly Constituency. Several prominent members of the society and NGO's representatives shared their opinion and detailed group discussions in various development sectors had also been conducted. Suggestions and proposals evolved from group discussions were also presented in the seminar by the group conveners and these were consolidated in formulating the draft report of master plan.

The concepts evolved in this plan is based on the surveys, studies, analysis and consultations with the concerned stake holders, concerned departments, public in general and the commuters. The present trend of development is considered for evolving the concept plan. The jurisdiction of the Mattannur Municipality at present has a vast area of 5415 Hectares and the serving population of this town certainly includes the people from surrounding region and the airport users also. The influence of the airport and activities in the neighbouring local bodies have been also considered while formulating the final plan.



Inauguration of 1st seminar by Municipal Chairman



SIC Meeting



Presentation by Deputy Town Planner



Inauguration of 2nd seminar by Sri. E.P. Jayarajan, Hon. M.L.A



Subject presentation by Town Planner



Stake holders participated in seminar



Group Disussions during 2nd seminar

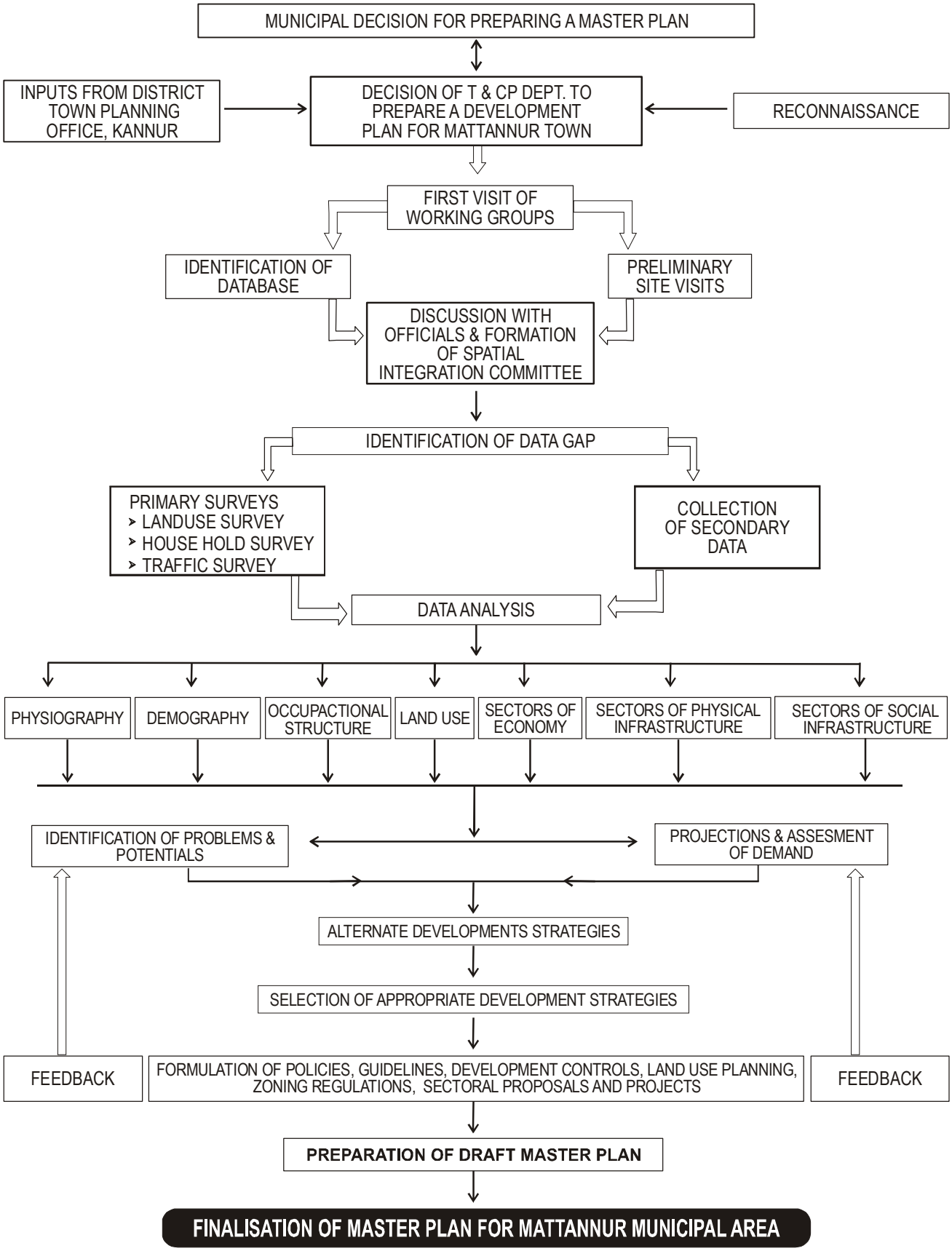


Figure 1.2 Methodology adopted for the preparation of Master Plan of Mattannur Municipal Town

The break - up details of methodology adopted in the planning process of Master Plan of Mattannur Municipal Town including peoples participation is described in figure 1.2.

1.5 EARLIER PLANNING EFFORT

The preparation of IDSMT (Integrated Development of Small and Medium Towns) project for Mattannur in 2004 by the Town and Country Planning Department was the only notable planning effort that had been taken since the formation of Mattannur Municipality in 1990. The genesis of the scheme of IDSMT Projects dates back to sixth five-year plan period. The program operates with the objective of improving Infrastructure and essential basic amenities of a town in an integrated and co-ordinated manner.

The total estimated cost of the IDSMT project was Rs. 220.46 lakhs. Mattannur Municipality was vested with the responsibility to implement the project under the guidance of Department of Town & Country Planning, Govt. of Kerala. The project selected under the IDSMT Scheme are enlisted as below.

i) Commercial building complex
ii) Pazhassi Raja Memorial Art Gallery
iii) Community cum wedding Hall
iv) Slaughter House
v) Crematorium
vi) Solid waste Management (window Compost Plant)
vii) Street Lighting
viii) Construction of Drains
ix) Bus stand yard concreting

1.6 DELINEATION OF PLANNING AREA

Delineation of planning area in the preparation of a master plan is the first stage in the preparation of a master plan and is mainly done based on a regional level study. The role of the town under consideration in the overall development of the region and the primary influence zones of the town are the major deciding factors. As far as Mattannur municipal town is concerned, it is not a Taluk head quarters and not got any administrative role to perform. First Class Judicial Magistrate Court, Treasury offices, Employment Exchange, P.R.N.S.S College and Poly Technic College are the major public institutions functioning in the municipal area and that can make some influence in the surrounding region. But the presence of the forthcoming international airport is a major influencing factor which has a vast influencing area that extends beyond the Kannur District and even reaches up to Kanhangad in the north direction, Koyilandi in the south direction and includes the entire Coorg and Wayanad districts in the east direction.



Municipal shopping complex, Mattannur



Pazhassi Raja Memmorial Art Gallery

Functional character of settlements surrounding the town under consideration is also another major factor to be taken in to account for the delineation of planning area. There are 9 surrounding Panchayaths for Mattannur town namely Irikkur, Padiyur, Keezhur-Chavasseri, Malur, Thillankery, Mangattidam, Vengad, Keezhallur and Koodali. As said in the District Urbanization Report, all these local bodies have rural character. Keezhur-Chavasseri Panchayath can be considered as an exceptional case where the fast growing Iritty town, declared as the new taluk head quarter, is located. But the Iritty town is located at a distance of nearly 13.5km away from Mattannur town and a continuous urban pattern is not found even along the connecting Thalasseri-Coorg road, a major State Highway. Moreover, there exists Cholathode, a natural boundary between these two local bodies for a considerable distance.

Natural boundary is also another crucial deciding factor for the delineation of planning are for a master plan. Mattannur town has Irikkur river at north which separates it from Irikkur Panchayath and Padiyur Panchayath. Anjarakandy river, another natural boundary at south side separates Mangattidam Panchayath and Vengad Panchayath from Mattannur town. While Thillankery Panchayath and Malur Panchayath at east and Keezhallur Panchayath and Koodali Panchayath at west have no clear geographically demarcating boundary division but have continuous agricultural land use pattern along the sharing boundaries.

Considering all these factors and since there is no other legally designated urban body or urban growth centre contiguous to Mattannur town, the planning area delineated is confined to the administrative area of Mattannur Municipality.

Chapter-2

PROFILE OF THE TOWN

2.1 LOCATION

Mattannur town is located at the midland of the Kannur District and lies between 11^0 52'34'' and 11^0 58'51'' North latitudes and 74^0 32' 24'' and 75^0 37' 38'' East longitudes. It is surrounded by nine Panchayaths, namely Irikkur and Padiyur at north side, Keezhur-Chavasseri Thillankeri and Malur at east side, Mangttidam and Vengad at south side and Koodali and Keezhallur at west side. The nearest municipal town Koothuparamba is just 10km away from Mattannur town.

The town is located at about 500km north of Thiruvananathapuram, the state capital and about 25kms east of Kannur Town, the district head quarters. Kochi, known as commercial capital of Kerala, is about 280km and Kozhikode which is a major urban centre of North Kerala is 93km away from Mattannur; both towards south.

Mysore and Bangalore, two major cities of Karnataka State are 154km 290km far from Mattannur town towards east, and Mangalore an important port city, is about 166km away towards north.



Figure 2.1 Municipal towns and surrounding local bodies

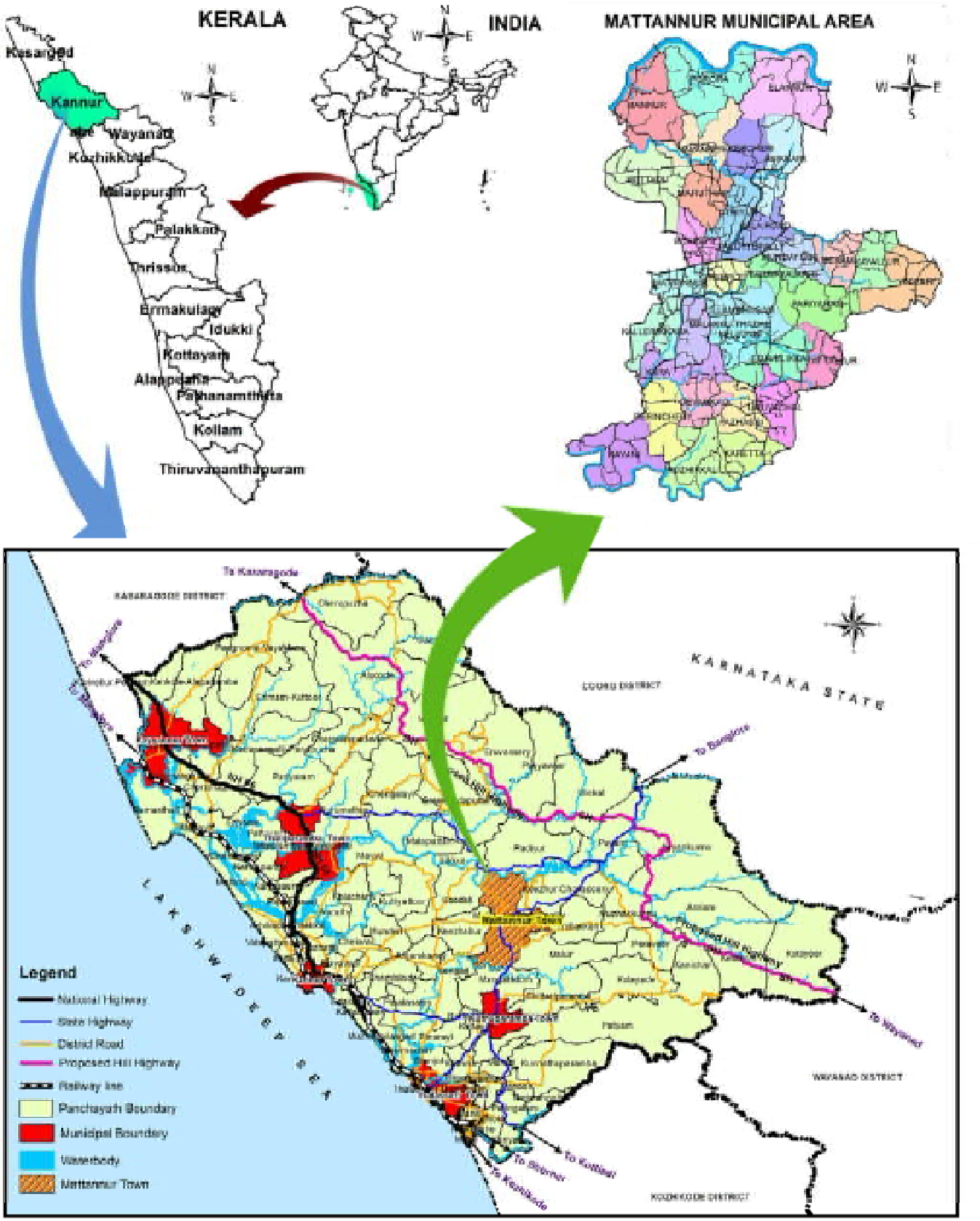


Figure 2.2 Locations of Kannur District in the state and Mattannur town in the Kannur District

At present Mattannur Municipal Town is part of Kannur Parliament Constituency and newly formed Mattannur Legislative Assembly Constituency.

2.2 CONNECTIVITY

Mattannur Town is well connected to the neighbouring towns in Kerala and Karnataka. SH30, part of Thalassery-Coorg Road passes through the town and connects it to other nearby towns like Thalasseri, Koothuparamba, Iritty, Mercara and also have linkages to cities like Mysore, Bangalore, Kozhikode, Kochi, Thiruvananthapuram etc. while Mattannur-Kannur road towards west connects to Kannur Municipal town, the district head quarters. Mattannur-Maruthayi-Mannur road towards north provides accessibility through Nayikali bridge and newly built Mannur bridge to SH36 (Thaliparamba-Iritty Road) thus getting easy access to towns like Irikkur, Sreekandapuram, Thaliparamba and Payyannur. Anjarakandy road passes touching at the entrance of airport and connects settlements like Anjarakandy, Chakkarakkal etc. The Thalasseri-Coorg road also connects the proposed Hill Highway at Iritty which in turn provides connectivity to all major settlements in the western ghat area.

There is no rail connectivity to Mattannur now but the proposals for Thalassery-Coorg railway line and Kannur South-Airport Railway line are still active now and give hope for a rail connection in near future. The nearest railway station is Thalassery and is located at a distance of 26km from Mattannur town. The Kannur railway station, located at 27km from Mattannur is the major station in the district having access to all trains including superfast trains to north and south of the country.

The two longest rivers of the district namely Valapattanam river and Anjarakady river flow through the northern and southern borders of the municipal area but water transport system is not active in these parts, even though there is a boat service upto Parassinikkadavu from Mattul and Azheekal port at downstream side of the Valapattanam River. The nearest all weather sea port is Mangalore in Karnataka.

The forthcoming Kannur International Airport is located just 5km from the town and provides the opportunity of air connectivity. It is expected that the flight schedule from here will have linkage to major airport cities in Kerala, India and abroad.

2.3 AREA AND POPULATION

Mattannur Municipal Town is the second largest municipal town in Kannur district and have a geographical area of 54.15 sq.km. next to Payyannur Municipal Town which stands the largest in the district with an area of 54.63sq.km. The present population of the town as per 2011 census is 47,078 and the density is found to be 869 persons per sq.km, which is the lowest among the municipal towns in the Kannur district. The decadal growth rate for 2001-2011 period is 6.23% and ranks second position in the district behind Thaliparamba town. Mattannur town possess the least value of sex ratio (1078 female per 1000 male) and highest value of work force participation ratio (36.75%) among the municipal towns in the Kannur district.

2.4 ADMINISTRATIVE DIVISION

The area of Mattannur town consists of two villages namely Kolari and Pazhassi villages. There are 12 desoms in Pazhassi village and 10 desoms in Kolari village as shown in fig. 2.3. and table 2.1.

At present there are 12 revenue wards in the municipality. The 31 election wards existed in 2011 have been reorganised and increased to 34 in 2012 and are shown in the following figure 2.4 and table 2.2. The census data available are based on the 31 wards existed in 2011 while some other data obtained are based on 34 wards.

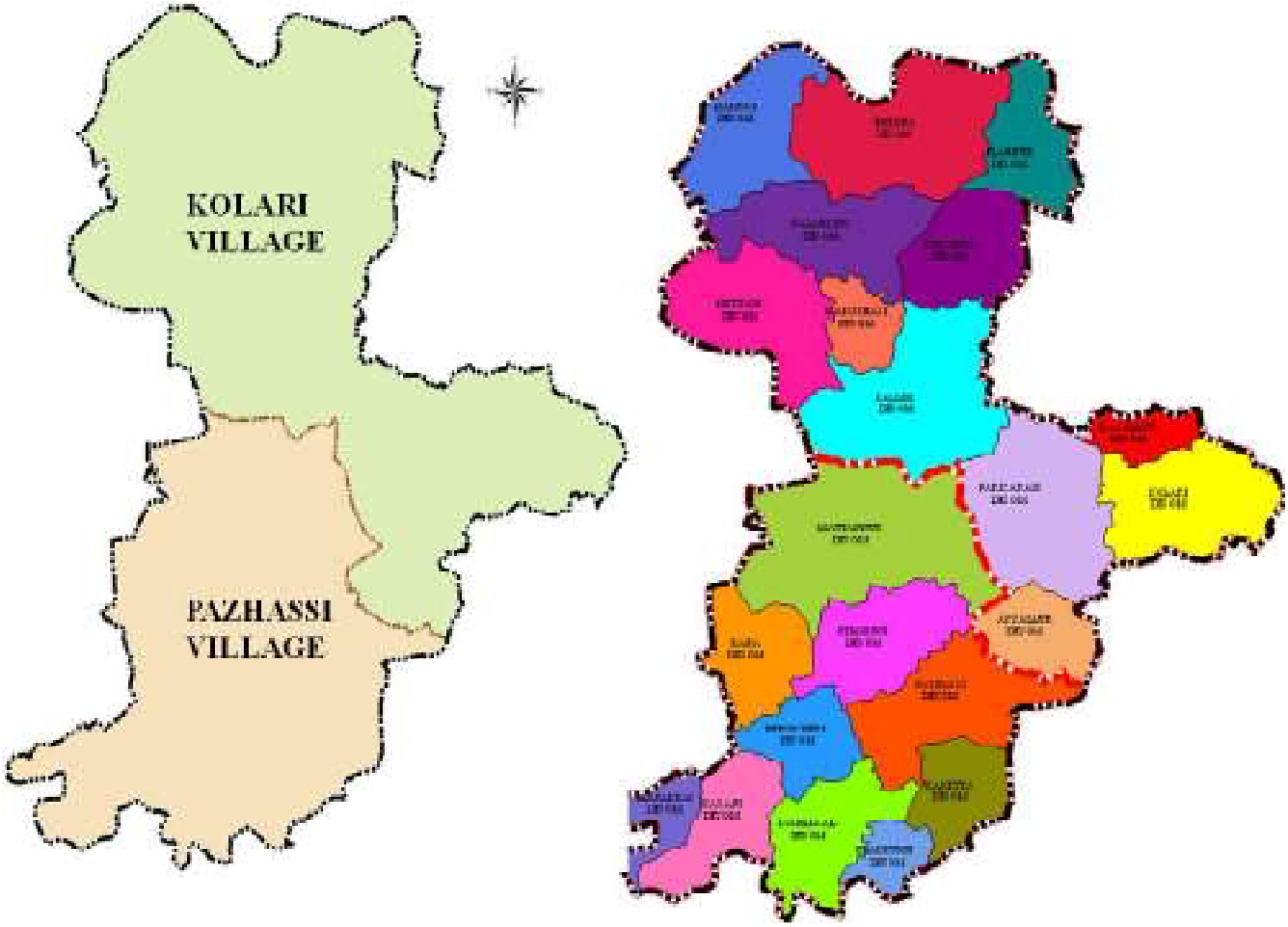


Figure 2.3 Villages and Desoms

VILLAGE	DESOM	VILLAGE	DESOM
KOLARI	1. Mannur 2. Porora 3. Elannur 4. Keecheri 5. Nalankeri 6. Mettadi 7. Maruthayi 8. Kallur 9. Pariyaram 10. Kayallur 11. Kolari 12. Ayyallur	PAZHASSI	1. Mattannur 2. Nelloonni 3. Kara 4. Perincheri 5. Pazhassi 6. Karetta 7. Elakkuzhi 8. Kuzhikkal 9. Kayani 10. Manakkayi

Table 2.1 Administrative Divisions (Revenue)

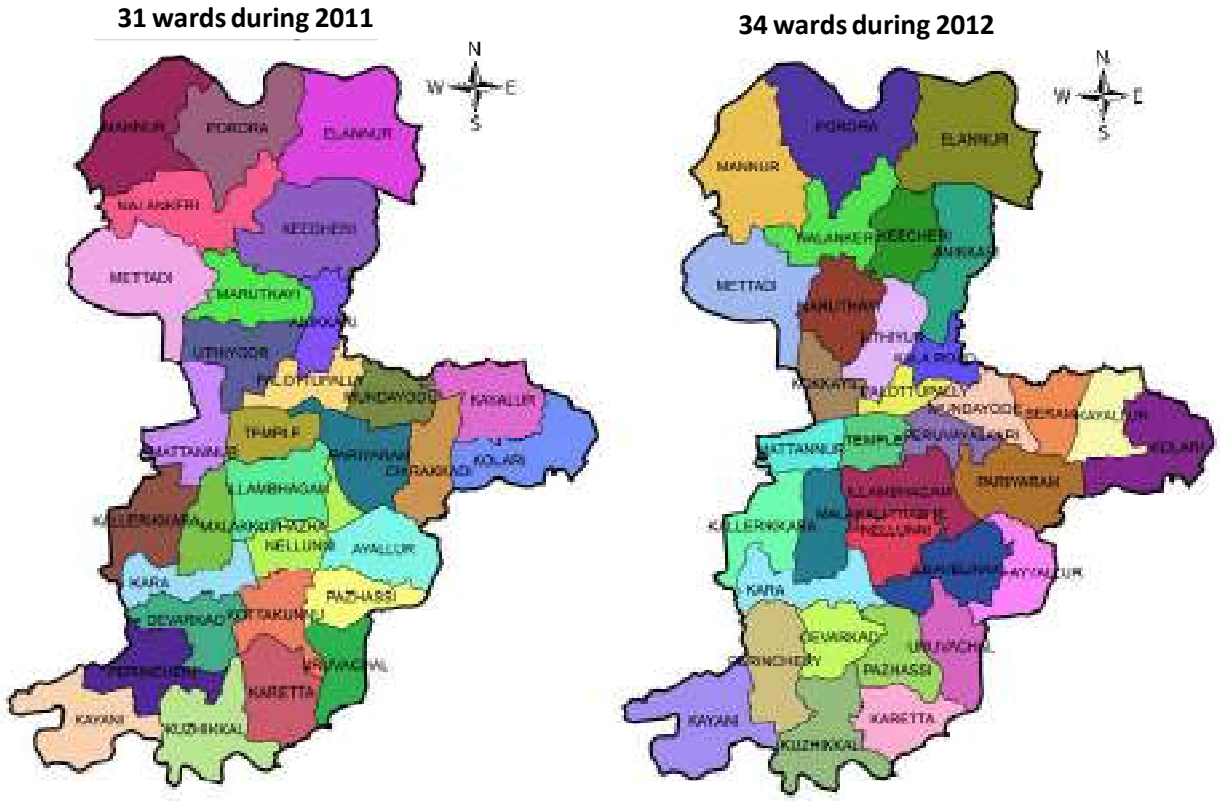


Figure 2.4 Election wards in 2011 & 2012

Election wards in 2011			
Ward No.	Ward Name	Ward No.	Ward Name
1	Mannur	17	Karetta
2	Porora	18	Kuzhikkal
3	Elannur	19	Kayani
4	Keecheri	20	Perincheri
5	Anikkari	21	Devarkad
6	Palottupally	22	Kara
7	Mundayod	23	Kallerikkara
8	Kayallur	24	Malakkuthazhe
9	Kolari	25	Illambhagam
10	Chirakkadi	26	Temple
11	Pariyaram	27	Mattannur
12	Ayyallur	28	Uthiyoor
13	Nellunni	29	Maruthayi
14	Pazhassi	30	Mettadi
15	Uruvachal	31	Nalankeri
16	Kottakkunnu		

Election wards in 2012			
Ward No.	Ward Name	Ward No.	Ward Name
1	Mannur	18	Karetta
2	Porara	19	Kuzhikkal
3	Elannur	20	Kayani
4	Keecheri	21	Perinchery
5	Anikkari	22	Devarkkad
6	Kalaroad	23	Kara
7	Palottupally	24	Kallerikkara
8	Peruvayalkari	25	Malakku thazhe
9	Mundayod	26	Nellunni
10	Beram	27	Illambhagham
11	Kayallur	28	Temple
12	Kolari	29	Mattannur
13	Pariyaram	30	Kokkayil
14	Ayyallur	31	Uthiyoor
15	Edavelikkal	32	Maruthayi
16	Uruvachal	33	Mettadi
17	Pazhassi	34	Nalankeri

Table 2.2 Election wards during 2011 & 2012

2.5 CLIMATE

The region has a tropical humid climate with hot summer and abundant rainfall. The rainfall is available throughout the year except during the months from January to April. Average rainfall is 3438mm. The rainfall during July is very heavy and the region receives 68% of the annual rainfall during this season. The region has a humid climate with an oppressive hot season from March to the end of May. This is followed by south west monsoon which continues till the end of September. October and November witness the post-monsoon (North-East monsoon) or retreating monsoon season.



Fully climatic station at Malakuthazhe, Mattannur

During the months of April and May, the mean daily maximum temperature is about 35^{0}C. The temperature is low in December and January and the minimum temperature is about 20^{0}C. On certain days the night temperature may go down to 16^{0}C, although this is extremely rare.

2.6 PHYSIOGRAPHY

The land in Kerala especially in Malabar, undulates from Western Ghats in the east to the seashore in the west having a series of hills and valleys intersected by rivers and streams. The land in Kerala state has four natural divisions viz, 'The Low Lands' (upto 7.5m above MSL), 'The Midlands' (7.5 -75m above MSL), 'The High Lands' (75 - 750m above MSL) and the 'The high ranges' (above 750m MSL). As far as Mattannur Municipal area is concerned, its landscape is found undulating with a

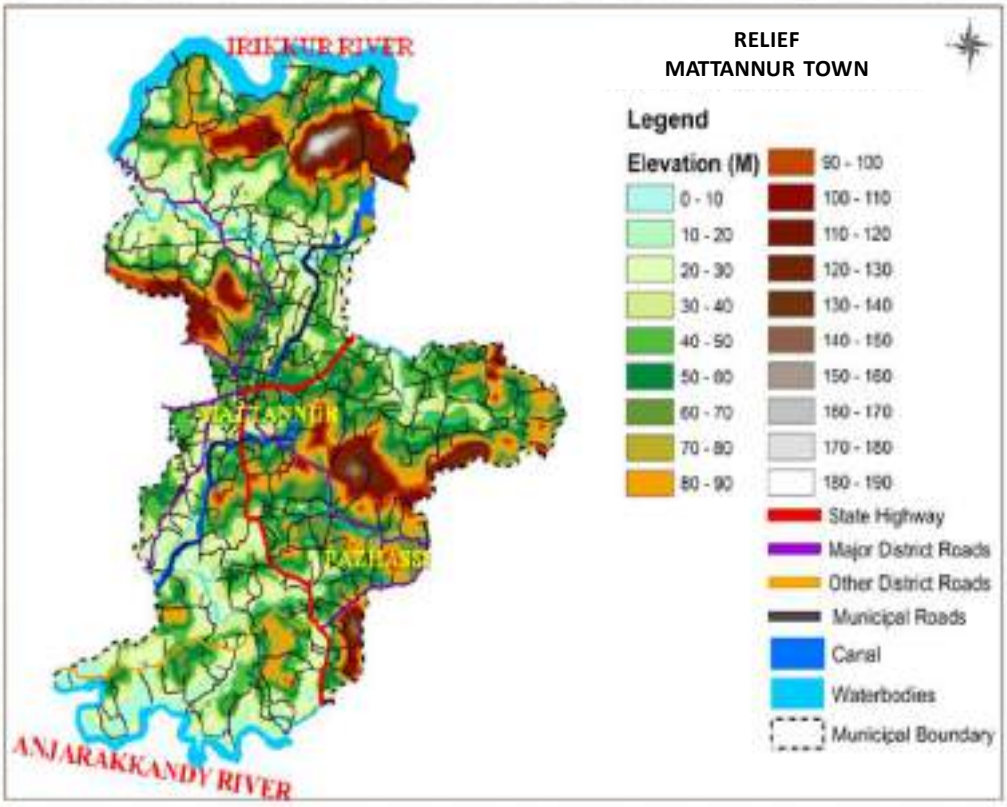


Figure 2.5 Physiography of Mattannur town

combination of hills and valleys, elevated plain terrain, steep terrain, moderate slopes, plane areas and water bodies. The height above MSL varies within a range of 8m to 175m. Valapatanam river basin at Mannur rises from a height of nearly 8m above MSL and Anjarakkandy river basin at Manakayi rises from a height of nearly 17m above MSL.

Most of the municipal area can be included into the classification of midlands having a height upto 75m above MSL. The height of some portions at Porora, Kaalampara, Aringodukunnu (near PRNSS College), Oyalakunnu, Marolikunnu (near Karetta) etc. has a range of 75m to 175m from MSL and therefore can be included to high lands group of Kerala physiography and its lower reaches as in Mattannur is occupied by plantations like rubber, cashew etc.

The midland portion lying between low land and highland occupies the larger area of the Mattannur Municipal town. Agriculturally this tract assumes much importance as crops like coconut, arecanut, cashew, pepper, cassava, rubber etc are extensively grown on the slopes of hills and paddy in the valleys.

2.7 WATER BODIES

The two major rivers of Kannur district are flowing along the borders of Mattannur Municipal Town. Valapattanam river locally known as Mannur river or Irikkur river or Ayipuzha makes its course along the northern periphery. Anjarakandy river and Karetta thodu, one of its tributary stream flow through the southern periphery of municipal area. Valapattanam river is the longest river in Kannur district and originates from Karnataka forests and has tributaries from Wayanad hills and finally makes river confluence with Kuppam river at Azhikkal before joining Lakshadweep Sea. The length of the river that serves as municipal boundary is 8.82km. Anjarakandy river (63km long) originates from the hills near Kannavam forest and flows through Thalassery taluk and drains into the sea at Koduvally near Thalassery. The stretch of the river flowing through municipal boundary has a length of 8km.

Cholathode, the major stream in the municipal area originates from the poongottukavuvanam, a rain forest existing within the municipality at eastern portion near Kolari and finally joins Valapattanam river at Nayikali bridge. During its course it has different local names like Marakkara thodu, Kuleri thodu etc and serves as eastern boundary between Mundayod and Anikkari. The total length of Cholathode is found to be 10.3km. Vayanthode is another important stream flowing through the municipal area which flows southward through the paddy fields of Kallerikkara and Kara area and finally joins Anjarakandy river at Keezhallur located outside of the Municipality. Total length of all other major and minor streams in the municipal area excluding Cholathode is 29.3km.

The main canal of the Pazhassi Irrigation project passing through the municipal area is another major water body. The tunnel from Pazhassi reservoir emerges out in the municipal area at Anikkari at north east portion of the town and from there the canal passes to south west part of town. The entire length of the canal in the municipal area is 9.3km and there is a cut and cover portion at the town when it crosses the state highway at Iritty road. The Irrigation Project is defunct and is under the threat of winding up

2.8 SOIL

There are mainly four types of soil namely red earth, gravel, loamy soil and black soil in the region, The midland portion of the municipality has lateritic soil with underlying rocks of laterite and granite.

2.9 HISTORY

Mattannur has a rich historic background. Historical remains ranging from the Stone Age to the modern age can be seen here and in the surrounding region. The Umbrella stones and Nannangadis that found in various parts of the municipal area shows the importance of history back to centuries in the region. Mesolithic implements and tools obtained from Nirmalagiri just 5kms from the town at some decades back and the discovery and excavations by Babington in 1823 of a few burials at Bangala Motta Paramba, a

nearby place, are some evidences of the life existed in the pre-historic period.

There are different thoughts about the origin of the term "Mattannur". The name is derived from the word "Mottannur" which means the place (Ooru) of barren hills (Mottakkunnu). As per the survey records it is assumed that the name Mattannur is the corrupted form of 'Pattinikkadu'. 'Pattini' is another name of Sagesess 'Kannaki', mentioned in the 'Chilappathikaram'. Legends say that Plini, the famous Egyptian traveler had visited Mattannur in millenniums back. Another theory is that the famous Malabar King Hannan or Nannan had ruled the area with capital as Mattannur and the place got the name as land of MahanaNannan. It is also believed that another Egyptian traveler Ptolomy reached Mattannur in the year 150AD and named the region as "Mastannur" which means a high land or elevated land. The name mentioned as 'Masthanagari' in the ancient historical records is also believed to be the present Mattannur.

2.9.1 Political History

Kottayam Dynasty

In the historic book in 'Keralolpathi', a text book on Kerala history, it is mentioned that the native Kerala Brahmins brought a new ruler named 'Harischandra' from outside and he constructed a fort at the peak of Puralimala hills, which is located very near to the municipal town. Thereafter the history of Mattannur is related to Kottayam Kingdom, which is not fully traceable now. It is believed that Kottayam rajas are migrants and descendants of Kongu Cheras of Tagadur. They settled and ruled Puranat or Purakeeshnat, the territory which covered the hilly areas falling under former thaluks of Wynad, Guduloor and Kottayam. In the period of Kolathiris, Kottayam rajas acquitted supremacy over the territory on the south-eastern tract of the present district. This royal house was divided into three branches- the eastern, southern and western. Of these the first two branches had their seat at Kottayam. The last branch, known as Padinjare Kovilakom settled at Pazhassi. The three famous rules of Kottayam family were Kerala Varma Tampuran who wrote Kerala Varma Ramayanam – a translation of Valmeeki Ramayanam, Vidwan Thampuran who composed Attakkathas and Kerala Varma Pazhassi Raja who fought with British.

Pazhassi Raja

Kerala Varma Pazhassi Raja (3 January 1753 – 30 November 1805), also known as Cotiote Rajah or Pychy Rajah, as recorded by the British, was one of the earliest freedom fighters in India. He was the prince regent of the princely state of Kottayam between 1774 and 1805. His struggles with English East India Company is known as Pazhassi wars or Cotiote War. He is popularly known as Kerala Simham (Lion of Kerala) on account of his martial exploits and super abilities.

Pazhassi Raja was a member of the western branch of the Kottayam royal clan. When Hyder Ali of the Kingdom of Mysore occupied Malabar in 1773 the Raja of Kottayam found political asylum in Travancore like



many of the rulers and chieftains in Malabar did during the invasion by Mysore Kingdom.

Pazhassi Raja, the fourth prince in line for succession to the throne during this period, became one of the de facto heads of state surpassing several of his elder royals. He fought a war of resistance on Mysorean army from 1774 to 1793. On account of his refusal to flee and resolve to fight invaders, people of Kottayam stood firmly behind the Raja who had not abandoned them in their hour of misfortune. Raja's troops were drawn from ranks of the Nambiar, Thiyya and also the tribal clans like Kurichias and Mullukurumbas. In 1792, after the Third Anglo-Mysore War, English imposed their paramountcy in Kottayam in violation to their earlier agreement of 1790 which recognized independence of Kottayam. Vira Varma, to whom Raja was a nephew, was appointed by the East India Company authorities as the Pazhassi Raja of Kottayam. To meet revenue target fixed by Company authorities, Vira Varma ordered exorbitant rate of tax to be collected from the peasantry and this move was met by a mass resistance led by Pazhassi Raja in 1793 who was opposed to surrender to English right from beginning. In 1796, the Company made an attempt to arrest Pazhassi Raja, but he evaded capture and instead fought back using guerrilla warfare. After a string of serious setbacks, the Company sued for peace in 1797. The conflict was renewed in 1800 over a dispute on Wayanad and after an insurgent warfare lasted for five years, Pazhassi Raja was found dead on 30 November 1805 after a gun-fight at Mavila Todu in Wyanad near Kerala-Karnataka border.

The active involvement of an aggressive peasantry suffered from excess taxation and of Hill tribes of Wyand like the Kuriechyas and the Kurumbars added to the Pazhassi struggle the dimensions of an agrarian upheaval as well. By all account, it was a real people's war in which all classes of people, irrespective of caste or religion, took an active part for the vindication of a noble cause. The Raja himself preferred death as a man to a life of ease and comfort in conditions of slavery. And therefore, the gallentic Pazhassi wars led by Pazhassi Raja are considered as ever memorable in the history of Indian Freedom Struggle.

The British Raj

With the death of Pazhassi Raja, the supremacy of British extended to the Kottayam and Kurumbrand portions of the Malabar area. Other parts of the North Malabar were already under British control when Arakkal Beevi and Chirakkal Raja were forced to accept their supremacy after the death of Tippu Sultan at Sreerangapatanam. In 1790, St.Angelos fort was forcibly taken by Ambercrombi, the British General. Kannur, an important port on the Arabian Sea, which carried out trade with Persia and Arabia in the previous centuries, was the British military headquarters on India's west coast up to 1887. The region remained in the Malabar District, an administrative district of British India under the Madras Presidency until 1947. The administration of Malabar was considerably improved under the British, especially in fields like social reformation, communication, judicial system, education, local self government etc. But, the prior credit for the well laid road net work system of Malabar goes to Tippu Sulthan, though it had been developed for his military advancement in the region.

The Joint Commissioners Duncan and Botham, who were deputed to establish the British administration in Malabar, had ordered the abolition of all forms of slave trade existed here. Another British administrator who worked to abolish slavery in Malabar was Thomas H. Baber, the Sub-Collector of Tellicherry, better known for his success in eliminating Pazhassi Raja and his loyal soldiers. Baber's fight against domestic and agrarian slavery in Malabar saw him give evidence before a parliamentary committee. He had the welfare of the people at heart and had repeatedly protested against the unjust revenue assessments made by the East India Company against poor farmers. It was more than a 100 years later, in 1907, that the British government officially acknowledged that its land revenue policy in Malabar was flawed. Conolly, who was the Collector in the 1840s, will be remembered for his pioneering effort

to cultivate teak and for planning a waterway from Payyoli to Mathilakam in Thrissur district-what is known today as the Conolly Canal. William Logan was not only a brilliant administrator but a painstaking chronicler of Malabar's history. His contribution to bringing about peace in strife-torn Malabar was as valuable as his effort in compiling important papers relating to British affairs in Malabar (1879) and his monumental Malabar Manual(1887). Logan's successor in office, Evans was also a chronicler as well as a hard-working administrator. Innes, his collaborator in writing the Malabar Gazetteer, was another illustrious administrator of Malabar.

Nationalist Movement and Freedom Struggle

Independence struggle in Mattannur begins with the Pazhassi Revolution as said before. Mattannur also proudly keeps the record of its contribution towards Nationalist Movement. An office of Indian National Congress was set up in the early year 1926 with the aim of awakening nationalism among the people and also for getting their participation in the freedom struggle. Though the people were suffering from famine due to the First World War, they had actively involved in the Swadeshi and Boycott movements held at Mattannur. Sen Guptha and T. Prakasham, the national leaders of the Congress had visited the Congress office at Mattannur and addressed the workers on their way to Bangalore after Vatakara Session of the Party. National Hotel at Iritty road was another camp for freedom fighters and the name of the hotel itself provoked the British People here which led to the arrest of Kunhikannan and Thottathi Kunhiraman, the proprietors of the hotel.

Freedom struggle was getting momentum in 1930 onwards and the works of Congress leaders like A.K.Gopalan, L.S.Prabhu, Adv.T.Narayanan Nambiar etc. helped to ensure the peoples participation from Mattannur area in protest against the Colonial rule as well as the feudal system prevalent in that period.

The campaign against untouchability, led by the renowned freedom fighter Sri. Vishnu Bharatheeyan was held in Mattannur in the year 1934. In the same year, Mahatma Gandhi came to Thalasseri and a large number of Congress workers from Mattannur rallied there to welcome him. BabuRajendraPrasad, another national leader, visited Mattannur in 1935 as a part of his fund raising campaign for the earth quake victims of Quetta in Baluchistan. The year 1936 witnessed an active participation of peasants from Mattannur in the Peasant rally held at Thalassery. A reading room was set up at Mattannur in the same year for attracting more local people to nationalist movements but later it was closed by the British authorities.

September 15, 1940 was a remarkable day for Mattannur in the history of freedom struggle. In response to the call of KPCC for protest against the unnecessary dragging of Indians to the Second World War, a protest day was organized at Mattannur. And peasant mobs from the surrounding area like Pazhassi, Idavelikkal, Chavasseri, Pattannur and Vayamthode reached for a gathering at Mattannur in spite of the police blockades on the way. When the meeting started police interfered and demanded to disperse the meeting in the light of a prohibition order. The crowd didn't obey and the meeting was continued which brought lathi-charges. A police man named Raman Nair brought guns which provoked the crowd and led to stone throwing at him. The injured police man was taken to hospital but he dies at Thalasseri. The incident caused terrible consequences like deployment of armed forces in Mattannur and the arrest of more than forty five people who were put in to jail for different periods of time. Among these, four freedom fighters who were punished for life imprisonment were later released by the Prakasham Ministry of Madras Presidency in 1946. This incidence that took place in Mattannur, the land of the great patriot Kerala Varma Pazhassi Raja, is another chapter in the history of war of Indian Independence.

The important political events of the freedom movements in the surrounding region of North Malabar were the Third Malabar District Political Conference (1918) and the Khilaphath Conference (1923) at Thalasseri, The fourth All Kerala Congress

Conference at Payyannur (1928), Salt Sathyagraha at Payyannur (April 21, 1930), North Malabar District Conference (June, 15, 1932), Civil Disobedience Movements during 1932-34, rise of Muslim League and Communist Party (1937) and the Quit India Movement (1942). The impact of these movements had the influence on the politics of Kerala.

After independence, Mattannur became part of India's Madras State along with Malabar District until 1st November 1956, on which the state of Kerala was formed by the States Reorganisation Act, comprising Malabar and Travancore-Cochin.

2.9.2 HISTORY OF DEVELOPMENT

The rural character of the Mattannur got changed after the opening of Thalassery-Coorg road by British, connecting coastal and port areas in Kannur with Coorg in Karnataka state. Also the then only way to the famous Kottiyur Temple was passing through Mattannur. Hence Mattannur was functioning as a wayside station for the travellers and the traders to and fro from the port town Thalasseri and the remote trade centres of Coorg and Western Ghat. The present Municipal Bus stand area was known as 'Vandithavalam' where bullock carts with commodities like agro products and spices were halted around the Banyan tree there. The presence of Sree Mahadeva Temple also increased the importance of this place and the fair held during the festival time attracted many traders who supplied all necessary commodities required. Thus Mattannur became a pilgrim cum commercial centre and actually the town was developed around the temple.

The police out post set up in 1872 was later up graded to the police station in 1881 which can be considered as the first Public office established in Mattannur. Mattannur Board Elementary School was started in the early year 1928. A judicial court known as Bench court or Village court or Panchayat court was established in Mattannur during the British time. The first cinema theatre named 'Supreme Talkies' was started in 1949 at Palottupally in a temporary tent.

In the post independence period several roads were formed connecting this place with other major towns of the district. As this area was in the possession of a few landlords, the population was very less. After 1957, due to the implementation of Land Reforms Act, the population began to increase. It started attaining the character of a town when a large-scale construction work of Pazhassi Irrigation Project was initiated in 1961. Mattannur High School established in the year 1953 and Pazhassi Raja N.S.S College established in the year 1964 gave new awakenings in the field of education.

Mattannur Panchayat was formed in 1963 comprising the revenue areas of Kolari, Pazhassi and Porora Villages existing at that time. Sri. K T Madhavan Nambiar, a renowned freedom fighter, was the president of Mattanur Panchayat for 16 years till his death in 1972. During his tenure as the president, a lot of development took place in the area which includes new roads, electrification etc. The Government Hospital at Mattanur, which now caters to the health needs of hundreds of poor people, was established during his tenure. He took initiative in setting up a Fruit Canning Unit in Kallur under Co-Operative Sector and after some time it was taken over by the Khadi Board and later by RAIDCO. This is one of the important industrial units in the area.

On April 1, 1990 this Panchayat was upgraded to the status of a municipality. But, In 1994 municipality was degraded as panchayath and in 1996 Municipal status was reinstated. The IIIrd grade Municipality was then upgraded to IInd grade in 2014.

2.9.3 SOCIO-CULTURAL HISTORY

The present areas of Mattannur Municipal Town was part of erstwhile Kottayam (Malabar) Kingdom which is included in the North Malabar region along with adjacent erstwhile Kurumbranad, Chirakkal and Kolathunadu Kingdoms and therefore share a common socio-cultural history. In the pre-democratic era, Marumakkathayam-matriarchy was widely prevalent among the natives of North Malabar and included Muslim and some Nambudiri communities in

addition to other traditional matriarchal communities such as the Nayars, Nambiars and Thiyyas.

Landlords from upper castes like Nambudiries, Nairs, Nambiars etc. in North Malabar during colonial and pre-colonial times were the feudal landlords who enjoyed immense power and special privileges as political authority remained decentralized during this time. In the pre-capitalist society, the ownership of land enabled the landlord to exploit the surplus labour of the downtrodden classes like agricultural labourers, and tenants and other occupational or service classes'. For the landlord, the ownership of land had enabled him at the same time to extract rent from his tenants and also enabled him to enjoy the free service of his labourers. Even though the categories of kinship prevalent among different castes varied, it was the kinship norms that determined their social relations.

Besides the matriarchal taravads (ancestral home), the villages in the region contained a cross section of other independent castes also. It was the Thiyyas, Muslims and some groups of Nayars who acted as cultivator tenants in this system. Castes like Parayas, Pulayas etc were the main agricultural classes. Most of the agricultural landless labourers were belonging to the low castes and were attached labourers to the janmis and were occupying small plots of janmis land with a hut. Besides these, other servile castes like washermen, carpenters, blacksmiths etc were also engaged as seasonal agricultural labourers. Every agrarian village was self sufficient and had within it all the essential artisan and servicing caste. In these villages, the institution of tara right guaranteed the availability of the services of the occupational groups within the specified area. These servile class or the occupational class formed the basic and permanent group in these villages.

In the kin based society, there existed a particular type of tenurial system called janmi-kudiyan pattern. In this pattern there existed a three tier division of land rights known as janmam, kanam and verumpattam or verumkozhu. 'Janmam' is a word of Sanskrit origin and is usually interpreted as birth or birthright and therefore the hereditary rights in the soil conferring absolute rights of ownership. In these relations, when the janmis found themselves in need of money they leased out their lands for enjoyment as compensation for the money received by them. 'Kanam' in North Malabar was really a mortgage with Possession while 'Kuzhikanam' was a tenure under which the tenant was allowed to make improvements. 'Verumkozhu' in North Malabar means lease of trees alone which was otherwise known as melpattam.

The colonial rule affected the whole village social structure. In the place of old village assemblies, new administrative systems emerged. And property rights over the lands which were earlier vested with the hands of janmi's were replaced by the rights decided by the British legal code. The settlement register was the foundation on which the whole revenue administration rested.

The major festivals observed by Hindus in this region are Vishu, Onam and Pooram. In North Malabar, Vishu had more importance than Onam, 'State Festival of Kerala', and is celebrated as New Year, because, the Kollavarsham month Medam - which is parallel to first Tamil month Chithirai - is the first month of the year for natives of North Malabar. The Vishu festival is spread over two days and comprises the Cheriya or small Vishu and the Valiya, or main Vishu.

'Poorolsavam', a spring festival, in North Malabar is celebrated on the Pooram day (the eleventh lunar asterism) of the Malayalam month Meenam. (March-April). Poorakkali is a ritual performing art performed by men in the premises of Poomalakavu (Bhagavathi Shrines) and other kavus during pooram festival. Pooram festival can be considered as a fertility ritual in North Malabar with the active participation of girls and women in all aspects of the celebration.

The ancient temples and mosques with their traditional fanfare are eloquent testimony of the rich cultural and religious heritage of the region. Kannur district has been, since olden days, the cradle of ancient folk arts and music like Theyyam, Poorakkali, Kolkkali,

Oppana, Vadakkanpattukal etc. and is popularly known as 'Land of Looms and Lores'. The kavus (small shrines) which are found everywhere in North Malabar are the centres of 'Theyyam', the famous performing art of the region, a ritual dance in which men impersonate supernatural beings.

Kalaripayattu is a well known martial art from this region and many 'Kalaries' were established throughout the area for giving training which includes fight using weapons like sticks, knives, daggers, swords, shields, 'urumies' etc. Legends say that Marthanda Varma, the great King of Travancore visited Kottayam Nadu secretly for learning this practice of warfare.



Theyyam

Temple arts like Chakiarkoothu, Kathakali, Ottanthullal, Thayambaka etc. were active in this region till the recent time. The important temples in and around Mattannur includes Sree Mahadeva Temple, Mattannur, Kallur Sree MahaVishnu Temple, Pariyaram Sree Subrahmanya Swamy Temple having valuable mural paintings, Perinchery SreeVishnu Temple, Illam Moola DharmaShastha Temple etc. The Palottupally Makham and Masjid is a famous pilgrim centre for Muslims. A Christian Church was built in 1977 near Mattannur Junction, though the Christian population is nominal in Mattannur area.

The State Literature Conference held in the year 1934 was a mile stone in the cultural history of Mattannur. Renowned poets like Mahakavi Vallathol, P.Kunhiraman Nair, Kuttamath etc. participated in debates on various sections of art and literature.

2.10 EMINENT PERSONALITIES

Veera Kerala Varma Pazhassi Raja is the most prominent and eminent person from Mattannur area and there are many other eminent personalities from Mattannur who had contributed well in different walks of life like politics, religion, arts, culture etc. It is believed that Sri.Keralavarmathampuran, the author of Valmiki Ramayanam Kilippattu, was from Kottayam Dynasty. Legends say that he later settled in Venad to suppress the attacks of Mukilappada as per the request of Umayamma Rani, Regent of Venad. One more Keralavarmaraja, known as Vidwan Thampuran, composer of 'Attakkathas' was also from Kottayam dynasty, and was referred to in 'Ithihyamala'. His literary works 'Bakavadham', 'Kirmeeravadam', 'Kalyanasougandhikam', and 'Nivathakavacha kalakeya vadham' are known as 'Kottayam Kathakal'.

Late P.K. Shankara Varma Raja, the famous Carnatic musician was the 'Thampuran' of Pazhassi Kottayam Kovilakam. He was known as the 'thampuran' (lord) of music among his disciples and music circles. He was born on June 1 in 1920 to Jayanthan Bhattathiripad of Mannyathu Illam and Kunhulakshmi Amma Raja. After



Pulleri Illathu Madhusoodanan Thangal

graduating in economics from Government Victoria College, Palakkad, he became a disciple of Chembai Vidyanatha Bhagavathar and participated in many concerts including 'Guruvayur Ekadasi' with his master since 1942. In 1963, Shankara Varma Raja became the head of the kovilakam. He also worked as a musician in Akashavani, Kozhikode since 1957. The Raja passed away on March 1, 2011 while he was teaching music at his residence at Pazhassi.

One of the eminent personalities from Mattanur was Pulleri Illathu Madhusoodanan Thangal in the pre-independent era. During the British rule, he represented the area in Madras Legislative Council for the period of 1929 to 1934. He was born on August 18 in 1900 to Mahalakshmi Antharjanam and became the head of a rich family at an early age.

He was the trustee of Mattannur Mahadeva Temple and as a social reformer he opened the Temple to devotees even before the 'Temple Entry Proclamation'. He was the President and Judge of the Pazhassi Pachayat Court and took many other positions like President of Namboodiri Yogakshema Sabha, Malabar District Board Member, President of Kottayam Taluk Board, President of erstwhile Kottayam Panchayath etc. He presided the State Religious Conference held at Kalady in the year 1951.

Mattanur is famous for its players of the ethnic drum called chenda. Mattanur Panchavadya Sangham, which is a troupe that plays another classical percussion ensemble called Panchavadyam, also hails from this place. The most prominent among them are Padma Shri Mattannur Sankarankutty Marar and Kalanilayam Udayan Namboodiri.

Mattannur Sankarankutty Marar is a famous thayambaka artiste as well as 'panchavadya vidwan'. He was Melapramani for the famous Thrissur Pooram. He made so many stage performance in India and abroad and also participated in the composer of 'Vadyaamanjari' for Kalamandalam and "Vadyalahari, for Dooradarshan. This great master of rhythm was honoured by the Government of India with the 'Padmasree' award in



Mattannur Sankarankutty Marar

2009. He has also bagged prestigious awards like the Kerala Sangeeta Nataka Akademy Award, the Kerala Kalamandalam Award and Mayilpeeli award.

Late Valiyullahi V. Mammu Musaliyar (1905-1976), an Islamic scholar and saint was another renowned person from Mattannur. He was considered as an able counsellor in complicated problems and a master consultant in matters related to Islam. He passed away in 1976 March 14 and thousands of people attended the burial rituals held at Palottupally. Later



Palottupally Makham

a makham (tomb) was built there and 'Uroose Mubarak' is being conducted every year in the month of 'Rabi-Ul-Awwal' of Hijara Year for which thousands of men and women are found participating.

Salim Ahamed, the award winner film director, screen writer and producer also hails from Mattannur. His directorial debut, 'Adaminte Makan Abu' fetched him numerous accolades and awards including National Film Award for Best Feature Film, Kerala State Film Awards for Best film and screenplay and Academy nominations.

Two more personalities, Smt. Anju Aravind, film and television serial fame actress and A.Ajaya Kumar, a Senior IFS officer and current Indian Ambassador to Iraq also hailed from Mattannur town.



Sailm Ahamad receiving 'Golden Lotus Award'

Chapter-3

REGIONAL SETTING AND URBANIZATION TRENDS IN THE DISTRICT

Mattannur Municipal Town does not have any administrative role in the district scenario as it is not even a taluk head quarters . But the location of the town has got some strategic importance as it is connecting points of Kannur town to the Thalasseri – Mysore road, the major inter district traffic corridor of the district. The status of airport town brings new regional significance to the town, as good connectivity to Mattannur town is required for all urban as well as rural settlements in Kannur district and some portions of neighbouring districts ike Kozhikode, Wayanad, Kasaragod and Coorg. Therefore any physical development plan for the town should take into account the regional profile, population growth, its spatial distribution, trends in urbanization, service facilities required for the surrounding region etc.

3.1 REGIONAL SIGNIFICANCE

The regional setting of a town is determined by its hierarchy of settlement in the District, the activity that the town has to perform in the district and its connectivity with different nearby settlements.

The District Urbanisation Report , 2011 prepared by the Town & Country Planning Department, details the functional importance and specific role of every local body in the district, after studying various aspects and urban parameters. This includes land use concentration pattern, functional character, hierarchy of settlement and urban profile of local bodies in the whole district. The report classifies Mattannur town as one among the third order settlements in functional hierarchy among the towns in the district. The other third order town in the district is Kuthuparamba.

Generally, such a third order classification indicates the absence of higher order infrastructure facilities in the town. Also it reflects the relatively low dependence of population of the surrounding areas to Mattannur town for their various urban services and facilities when compared to other higher order towns in the district. The higher order towns in the district are Kannur and Thalassery, which are equidistant from Mattannur.

Mattannur town is classified as a rural settlement of the district based on the study of functional character. And from the study of land use concentration pattern, it is revealed that Mattannur town has an agro based economy. Thus at present Mattannur is an Agriculture town, but a rapid commercialization can be seen in last three years as a result of the ongoing construction activities of the mega project of Kannur International Airport Limited, within 5 km from the town centre.

The District Urbanization Report presents the spatial structure of the district which is derived by overlaying activity pattern of the settlements, connectivity, physiographical limitations and functional hierarchy of settlements. The paddy fields are seen in almost all parts of the district and the dry agriculture cultivation mainly rubber and cashew in the high land areas.

The economic activities and various land use based workers are evenly distributed in the district. The urban nodes and inter connectivity of various nodes are also evenly distributed showing disbursed urban growth of the district. Fig 3.1 shows the regional settings of Mattannur Municipal Town.



Figure 3.1: Regional setting

In Kannur district, there are seven statutory urban bodies namely, Kannur, Thalassery, Payyannur, Taliparamba, Kuthuparamba, Mattanur municipalities and Kannur Cantonment. Among the urban centres of the district, the coastal towns of Kannur and Thalassery are the major ones, which are only 23km apart. These two towns are functioning as twin towns to certain extent. Iritty, Peravoor, Pazhayangadi, Irikkur, Alakkode and Sreekandapuram are the notable commercial centres other than the above municipal towns of the district. Iritty (Keezhur-Chavasseri), Sreekandapuram and Panoor towns are now being elavated to the status of Municipal towns while a new municipal town namely Anthoor is being carved out from the Taliparamba Municipal Town as per Government's decision. It is also decided by the Government to form Kannur Corporation by merging with Kannur Municipal town the surrounding



Figure 3.2: Municipal towns - Kannur District

Table 3.1 Demographic details of surrounding settlements and other municipal towns in the District

Description	Name of local body	Population (2011)	Total Area in sq.km	Density (p.p sq.km)	Total workers	Sex ratio
LSGS under study	***Mattannur***	***47,078***	***54.15***	***869***	***17,303***	***1,078***
Near by LSGs	Vengad	38,606	28.09	1,374	12968	1,133
	Irikkur	13,820	11.22	1,232	3712	1,066
	Keezhur-Chavassery	42,968	46.65	921	14265	1,061
	Koodali	30,239	40.27	751	10608	1,122
	Keezhallur	20,440	29.02	704	6886	1,095
	Thillankeri	14,583	25.06	582	5568	1,093
	Malur	22,314	41.38	539	8649	1,092
	Padiyur	21,524	54.09	389	8321	1,041
	Mangattidam	34,652	33.31	1,040	11435	1,118
Other municipal towns in the District	Kuthuparamba	29,619	16.76	1,767	9656	1,202
	Kannur	56,823	11.03	5,152	15325	1,161
	Payyannur	72,111	54.63	1,320	25484	1,159
	Thalassery	92,558	23.96	3,863	26879	1,180
	Thaliparamba	72,465	43.08	1,682	21312	1,145
District	***Kannur***	***2523003***	***2969.76***	***851***	***8,24,116***	***1,136***

Source : Census 2011

local bodies like Puzhathi, Pallikkunnu, Edkkad, Elayavoor and Chelora Panchayaths. The location of Mattannur town, spatial distribution of the other municipal towns in Kannur district and the major transport corridors are presented in fig 3.2.

Table 3.1 presents the demographic details of the town and the neighboring LSGs as well as other urban settlements in the district.

3.2 INFLUENTIAL REGION OF THE TOWN

As said earlier in planning area delineation in chapter 1, Mattannur town is not a Taluk head quarters, and does not possess much public institutions having regional importance. The Community Health Centre, Treasury offices, Judicial Magistrate Court, Employment Exchange Office, Police Station, Fire Station, Poly Technic College and P.R.NS.S College are the available major public institutions that can attract people from outside the municipal area. There is no major industry or service centre functioning within the town as an influencing factor to enhance the regional importance of the town. But the town is located at the junction of Thalassery-Coorg road and Kannur road which imparts some strategic importance to the town and this helped the town to flourish as a trade centre in the region.

In this context the area of surrounding local bodies can be considered as the influencing area of Mattannur town. Malur, Thillankeri, Keezhur-Chavasseri, Padiyur, Irikkur, Koodali, rural Keezhallur, Vengad and Mangattidam are the nine adjacent Panchayaths of

Mattannur town. As per District Urbanisation Report, functional character of all these Panchayaths is rural. And primary activity pattern is found in all Panchayaths in which plantation type activities are predominant in Padiyur Panchayath while agriculture and animal husbandry activities are most predominant in all other Panchayaths. Iritty town in Keezhur-Chavasseri Panchayath is the only urban growth centre in the influence area. Mangattidam Panchayath sandwitched between Mattannur town and Koothuparamba town now shows some urban characters like higher density and growth rate of population. Padiyur Panchayath located across the Irikkur river at north side was not an influencing area before but the connectivity obtained after the opening of Mannur bridge brought this area also in to the influencing zone.

The Kannur International airport at Mattannur is expected to become functional next year and influence of airport will not only cover the entire Kannur District but also the major parts of adjacent districts like Kasaragod, Kozhikode, Wayanad and Coorg.

3.3 URBANIZATION TRENDS IN THE DISTRICT

As per the 2011 census, the population of Kannur district is 25,23,003, which constitutes about 7.56% of the total population of the state. The density of population is about 852 persons per sq.km. The District has 4 taluks namely Taliparamba, Kannur, Thalassery and Iritty.

The population growth of Kannur District since 1901 is furnished in Table 3.2.

As per the census Kannur Urban Agglomeration consists of six Municipal Towns, one Cantonment Board and sixty two Census Towns. All this urban area constitutes fifty four LSG's and most of this 54 urban LSGs are located in western half of the district along NH-66, in and around the major settlements Kannur and Thalassery, as presented in fig 3.3 and 3.4. As per 2001 Census report, 37 LSG's where urban in Kannur district. This shows a growth rate of 46% of LSG's became urban during 2001-2011. It can also seen that the coastal stretch is completely urbanised except Mattool and Ramanthali. Mattannur town was an isolated urban body in the western side of the district in 2001, and it can be seen that urbanisation had extended upto Mattannur town covering all panchayats lying in the western side of Mattannur town in 2011.

The proportion of rural and urban population of Kannur District as well as the state is furnished in table 3.3. A steady progress in urbanisation is seen from the

Table 3.2 Growth of population in the District

Census Year	Population	% decennial Variation
1901	7,60,903	
1911	8,12,728	6.81
1921	8,35,611	2.81
1931	9,64,758	15.46
1941	10,85,623	12.53
1951	13,15,501	21.17
1961	16,90,094	28.48
1971	22,35,829	32.29
1981	19,30,722	-13.65
1991	22,51,727	16.63
2001	24,08,956	6.98
2011	25,23,003	4.73

Source: 2011 Census

Table 3.3 Rural-Urban break up of Population (Kannur District)

Census Year	No. of persons			
	Rural in %		Urban in %	
	Kannur	Kerala	Kannur	Kerala
1901	93	93	7	7
1911	92	93	8	7
1921	93	91	7	8
1931	93	90	7	10
1941	93	89	7	11
1951	91	87	8	13
1961	83	85	17	15
1971*	86	84	14	16
1981	77	82	23	18
1991*	49	74	51	26
2001	50	74	50	26
2011	35	52	65	48

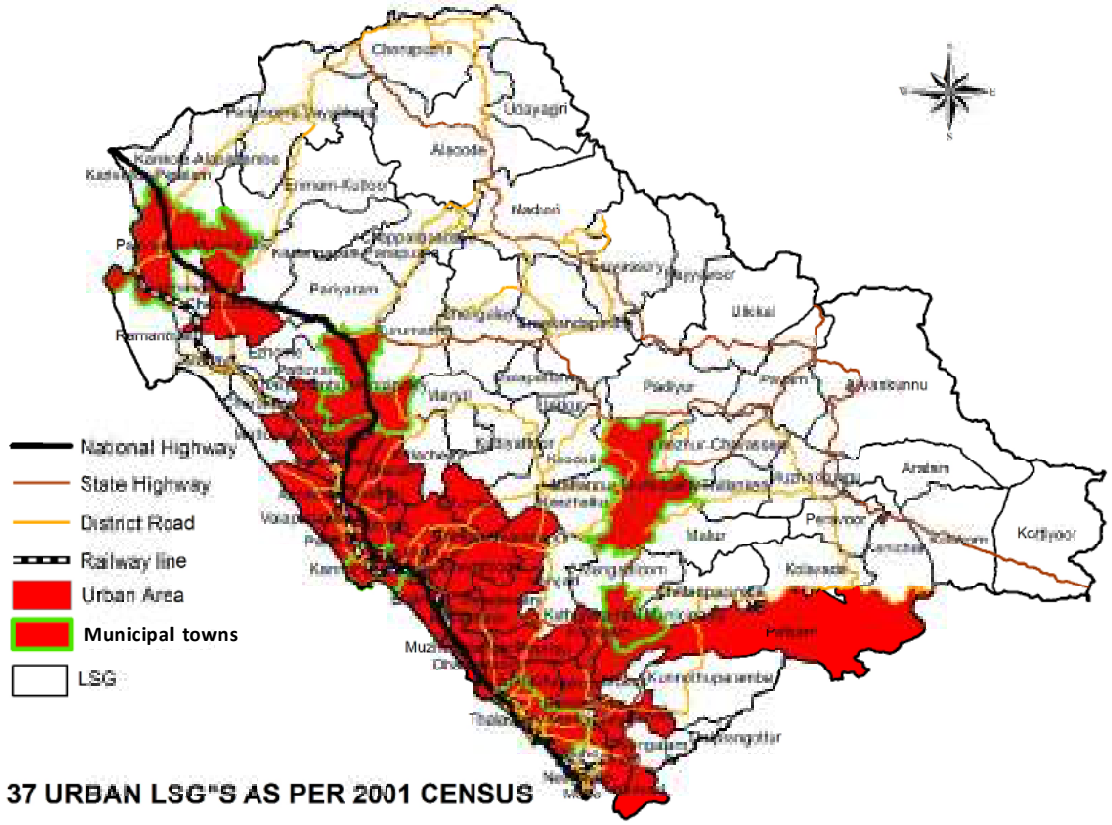


Figure 3.3: Census urban area - Kannur 2001

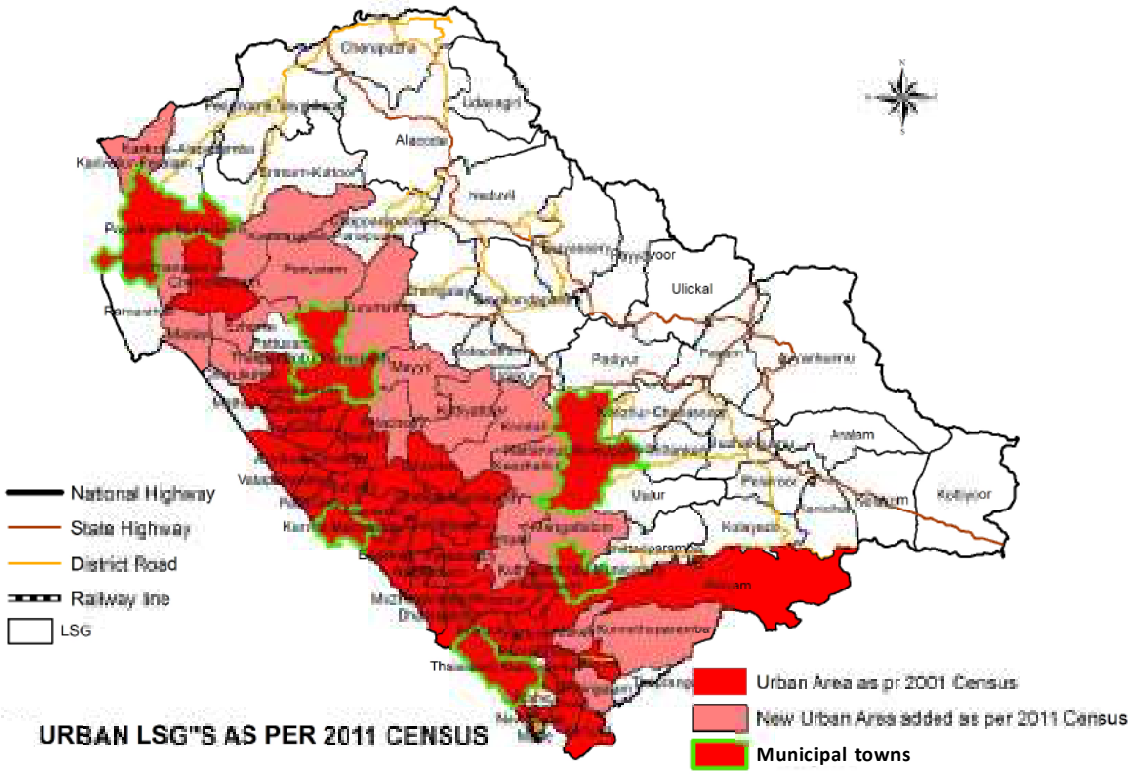


Figure 3.4: Census urban area - Kannur 2011

data. At present Kannur is the highly urbanised district of Kerala, with nearly two third of its population living in urban areas.

** The decline of urban population in 1971 in Kannur district is due to the change in concept of urban area and the resultant declassification of urban areas of 1961 census. The high increase of urban population in 1991 is due to carving out of Kanhangad and Kasaragode taluks having mostly rural population to form the Kasaragode district (in 1984).*

Kannur district which ranked first in urban content (urban population 50.45%), but 11th in per capita income among the districts in Kerala as per 2001 Census, has ranked fourth in urban content (65.05% urban population) as per the 2011 census. Whereas, Ernakulum district which ranked second in urban content (47.6%) and first in per capita income as per 2001 Census, has ranked first in urban content (67.5%) as per 2011 Census. This relative reduction in the urbanisation in Kannur district may be due to prevalence of low income generating small-scale industries, compared to the large scale industrialisation in Ernakulam District.

In connection with the preparation of development plan for the municipal towns, the Department of Town & Country planning has conducted Urbanisation study of the district and published the Urbanisation report. In this brief report, the urbanisation trend and pattern of development of district at present as well as in the future contexts has been studied in detail. The current trend of urbanization of the district has been analysed using different growth parameters, infrastructure and urban facilities.

3.3.1 Spatial structure of the district

The regional setting of a Town can be arrived at only from the regional plan which spells out hierarchy of the town in the district scenario, the activity of the town has to perform and its connectivity with different settlements. The study on urbanization of the district gives the hierarchy of the local body which forms a part



Figure 3.5: Spatial structure- Kannur District

of the regional road network. The study of activity pattern based on the land use data is also an important component. The activity pattern of a district is the sum total of a pattern of functional character among various settlements, land use concentration pattern and urban profile within the district. This in effect integrates the land use distribution, population distribution, occupational structure, average plot size and distribution of facilities within the district. The functional character is determined based on the population, average plot size and land use. The urban profile is derived taking in to account of occupational structure, and hierarchy of settlements.

The spatial structure of the district is the resultant of heirarchy of settlement, connectivity and activity pattern.

Fig 3.5 shows spatial structure of Kannur district.

3.3.2 Activity pattern of the Towns in the District

The activity pattern is determined based on three important parameters, ie. land use concentration pattern, future urban profile and functional classification of that area. The Urbanisation studies conducted in the district, clearly shows that Kannur municipal town and neighboring panchayats in north and east of the town are mainly having urban activities.

The activity pattern arrived from the analysis shows that the urban activities are mainly concentrated in two first order municipal towns ie, Kannur and Thalassery and the five local bodies surrounding them. Of these five local bodies Azhikode, Chirakkal, Pallikkunnu and Puzhathi are located near Kannur while New Mahe is near to Thalassery.

The secondary activities are concentrated mainly in local bodies along coastal areas in between Kannur and Thalassery, Thaliparamba, Kottiyur and Aralam. The intensity of secondary activity is less in municipal towns like Payyannur, Kuthuparamba and Mattannur. Fig 3.6 shows activity pattern of Kannur District.

The Activity Pattern of Mattannur Municipal Town

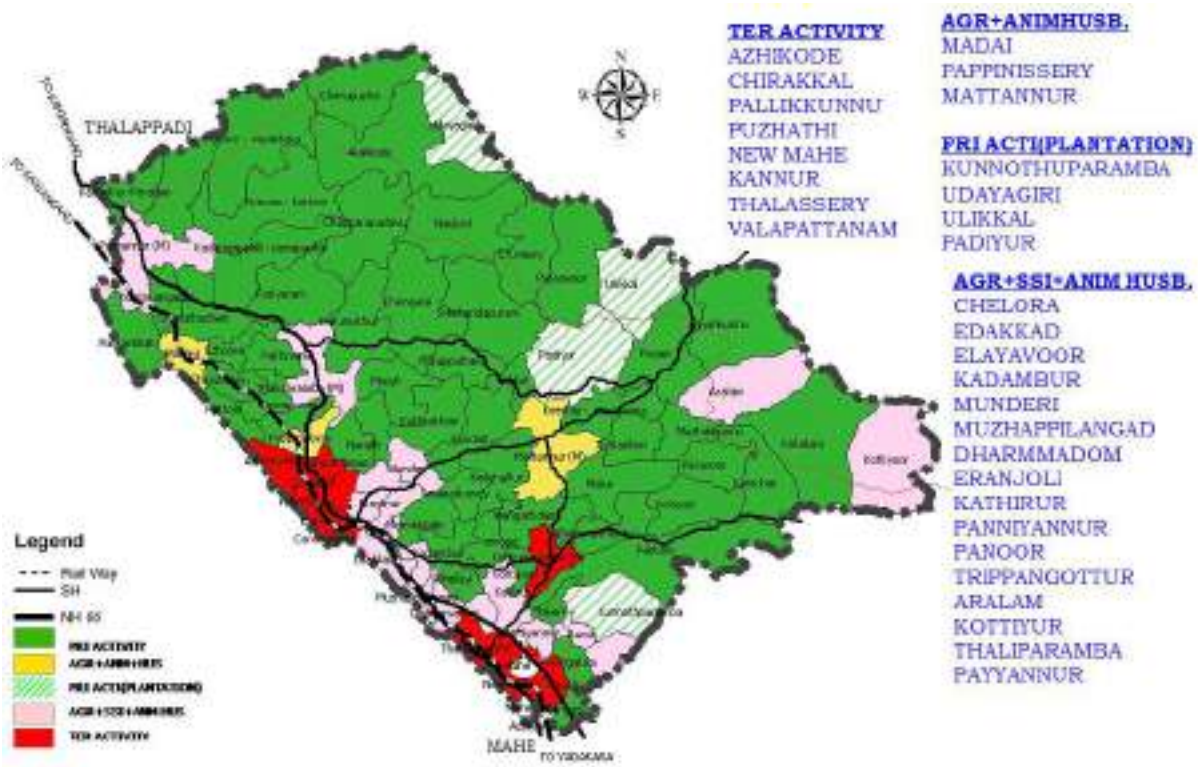


Figure 3.6: Activity pattern of towns in Kannur District

is as primary with Agriculture and Animal Husbandary activities.

3.3.3 Functional Character of the towns in the District

The functional character of a region is determined on the basis of population distribution within the region, average plot size and land use of that area. Function of a settlement is determined based on the major activity within the settlement. This may be rural if it has agriculture and allied activity or urban if it has secondary or tertiary sector activities. The methodology used here to determine the major function of the settlements is by studying the land use and the average plot size within the settlement.

The LSG's in Kannur district were classified as urban, semi urban, semi rural and rural. Fig. 3.7 shows the details of the Functional characteristics found in the study and functional character of Mattannur Municipal Town is found semi urban in the map.

The ward wise study of Functional Character is shown in detail in succeding chapter 24 (Spatial Structure).

3.3.4 Connectivity

The road network is the most important mode of transportation in the district connecting almost all important nodes. The district has comparatively good connectivity due to the existence of National Highway (NH-66) and three state high ways. Broadly, the transport network structure in the district has two major corridors running through the district and these roads and railway routes are running parallel to each other. One of the above North-South corridor connecting Kozhikode to Mangalore, running parallel to coastline and passing through Kannur Municipal area.



Figure 3.7: Functional character of towns in Kannur District



Figure 3.8: Road connectivity- Kannur District

The second corridor runs through the center of the district and connecting Thalassery to Mysore. Both of these act as main inter-state traffic movement corridor. The district has three important state highways SH-30 (Thalassery-Mysore), SH-36 (Thaliparamba-Iritty) and SH-38 (Kannur – Kuttyaadi) are serving all the mid land and high land areas of Kannur district. The proposed Hill highway; linking Cherupuzha at north end and Adakkathod at south end passing through western ghat areas of Kannur district and it connects Alakkode, Payyavur, Ulikkal, Iritty and Peravur nodes of the district. Fig 3.8 shows road connectivity in Kannur.

3.4. INFERENCE

The study of regional setting reveals that Mattannur town has a strategical location nearly at the centre of Kannur district. Though the influencing area is confined to the surrounding local bodies, the forthcoming airport can extent the influencing area beyond the district which covers the tourist districts like Wayanad and Coorg and also the tourist spots like Bekal Fort.

The trend of urbanization as emerged from the studies brings out a number of interesting points. It may be apparent from the demographic point of views that the district urbanization is growing very slow especially during last two decades up to 2001. But the scenario is changing fast in recent years. The urbanization is viewed as a multiple process involving spatial as well as social process and the result is quite different. The advantage in our physiographical as well as the settlement pattern is helpful in development of small towns in Kannur District. The natural development of 20km in all direction throughout the district is an example of urban development with regional resource base.

The study shows that functional character of Mattannur town is semi urban and the activity pattern for Mattannur town is primary with agriculture and animal husbandary activities.



Chapter-4

DEMOGRAPHY

Demography deals with the study of human population, their structure and change (through birth, death and migration), and their relationship with natural environment, social and economic changes. The various parameters considered for the analysis of population are population size, growth rate of population, population density, population concentration pattern, sex ratio, literacy rate and population projection are described in this chapter.

4.1 POPULATION AND ITS GROWTH PATTERN

4.1.1 Population size

The population of Mattannur Municipal Town as per 2011 census is 47078, which constitute about 1.82% of District population and 0.14% of the State population.

4.1.1.1 Comparison with District and State

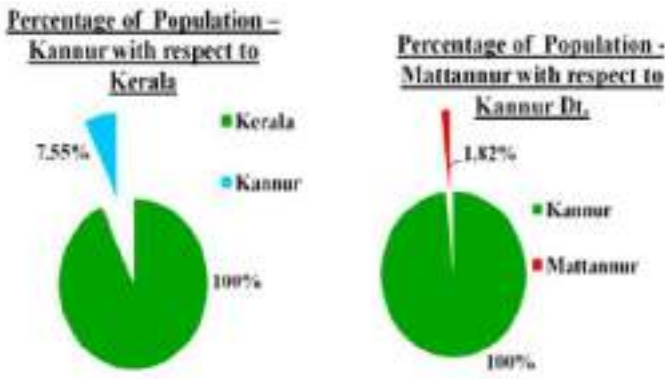


Fig 4.1 Percentage of population of Kannur District w.r.to Kerala State and Mattannur town w.r.to Kannur District

The decadal variation of population size of the Kerala, Kannur and Mattannur Municipal Town is shown in table 4.1.

Table 4.1 Decadal variation of population

Year	Kerala State	Kannur District	Mattannur
1981	2,54,53,680	19,30,722	32,157
1991	2,90,98,518	22,51,727	40,506
2001	3,18,41,374	24,08,956	44,313
2011	3,34,06,061	25,23,003	47,078

The table shows that an increasing trend is observed in population size of Mattannur Municipal Town and similar trend is observed in District as well as in State.

4.1.1.2 Comparison with other towns in the district

The comparison of population size of Mattannur town with other municipal towns in the district during 2001 and 2011 is shown in Table 4.2.

Table 4.2 Comparison with other municipal towns within the District

No.	Municipal Town	Population	
		2001	2011
1	Thalassery	99,387	92,558
2	Taliparamba	67,507	72,465
3	Payyannur	68,734	72,111
4	Kannur	63,797	56,823
5	**Mattannur Town**	**44,313**	**47,078**
6	Kuthuparamba	29,532	29,619

From the table it is clear that population size of all municipal towns in Kannur has an increasing trend, except Thalassery and Kannur. Out of six towns Mattannur ranks fifth position in population size.

4.1.1.3 Comparison with similar municipal towns within the state

The comparison of population size of Mattannur Municipal Town with similar municipal towns in the State during 2001 and 2011 is shown in Table 4.3 .

Table 4.3 Comparison with similar municipal towns within the State

Sl. No.	Municipal Towns	Population 2001	Population 2011
1	**Mattannur**	**44,313**	**47,048**
2	Manjeri	83,707	97,102
3	Tirur	53,654	56,058
4	Ottapalam	49,242	53,792

The table shows that Mattannur has the smallest population when compared to similar municipal towns within the State. It also reveals that all municipal towns have an increasing trend during last decade.

4.1.1.4 Comparison with adjoining panchayaths

The table 4.4 shows the population size comparison of population size of Mattannur town with its adjacent panchayaths.

Table 4.4 Comparison of Mattannur Municipal towns with its adjoining panchayaths

Sl No.	Local bodies	Population size	
		2001	**2011**
1	Irikkur	12,510	13,820
2	Keezhallur	19,130	20,440
3	Keezhur- chavassery	37,358	42,968
4	Koodali	28,502	30,239
5	Mangattidam	30,975	34,652
6	Malur	21,259	22,314
7	Padiyur	20,562	21,524
8	Thillankery	13,661	14,583
9	Vengad	35,801	38,606
	Mattannur Town	**44,313**	**47,078**

Mattannur Municipal Town has highest population when compared to the adjoining Panchayats. However all adjoining panchayaths mark increasing trend in population size during the last decade.

4.1.1.5 Ward wise population data

Ward wise population of Mattannur Municipal Town as per 2011 census, listed in the following Table 4.5.

Table 4.5 Ward wise population in Mattannur Municipal towns, as per census 2011.

Ward No.	Name of ward	population size (2011)
1	Mannur	1321
2	Porora	1100
3	Elannur	1400
4	Keecheri	2271
5	Anikkari	1895
6	Palottupally	2199
7	Mundayodu	1205
8	Kayalur	1547
9	Kolari	1539
10	Chirakkadi	1484
11	Pariyaram	1478
12	Ayyalur	1269
13	Nellunni	1167
14	Pazhassi	1462
15	Uruvachal	1236
16	Kottakkunnu	1547
17	Karetta	1608
18	Kuzhikkal	1238
19	Kayani	1246
20	Perincheri	1302
21	Devarkad	1259
22	Kara	1211
23	Kallerikkara	1317
24	Malakkuthazhe	1404
25	Illambhagam	1712
26	Temple	1777
27	Mattannur	2330
28	Uthiyoor	1744
29	Maruthayi	1646
30	Mettadi	1631
31	Nalankeri	1533

The ward wise population size of Mattannur Municipal Town ranges from 1100 to 2300. The figure 4.2 shows that highest population size is observed in Mattannur, Keecheri and Palottupally wards.

Medium size of population ranges from 1501- 2000 is seen in eleven wards which are mainly located at the central portion of municipal town. The population size is low (1000 -1500) in other wards located at south west and northern portion.

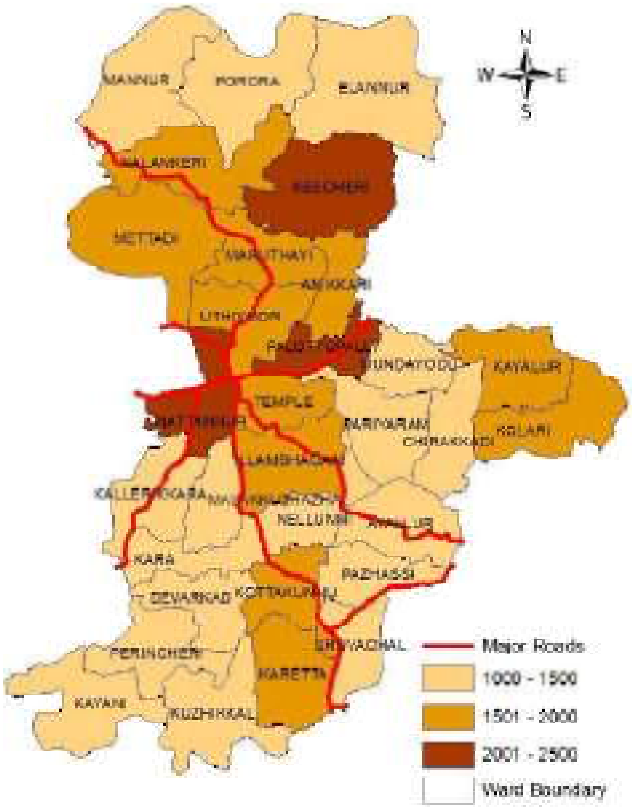


Figure 4.2 Ward wise population size

4.1.2 Growth pattern

4.1.2.1 Comparison with District & State

The decadal population growth rate of the State, District and Mattanur town during 1981-1991, 1991-2001 and 2001-2011 are given in Table 4.6 and its graphical representation is shown in Figure 4.3.

A sudden decline in population growth rate observed in Mattannur town and Kannur District during 1981-91 to 1991-2001. However Kerala State shows a steady decrease during the last three decades. During the last

Table 4.6 Percentage of Population Growth rate of Kerala, Kannur and Mattannur Municipal Town

Region	Growth rate (%)		
	1981-1991	1991-2001	2001-2011
Kerala	14.32	9.43	4.91
Kannur	16.63	6.98	4.73
Mattannur (M)	25.96	9.41	6.23

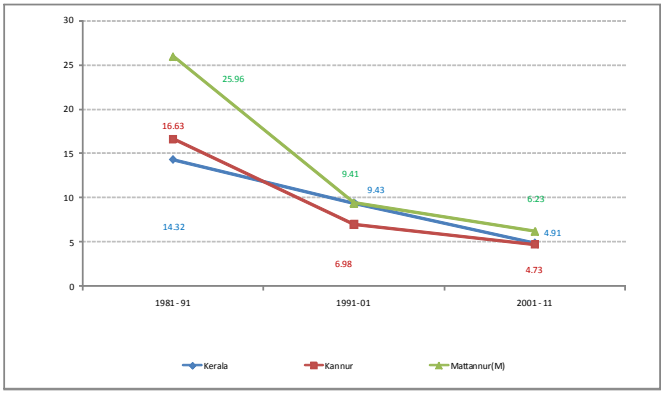


Figure 4.3 Population growth rate-comparison with District and State.

decade, growth rate is found higher in Mattannur (6.23 %) when compared to District average (4.73%) and State average (4.91%). In 1991– 2001 Kerala State marked the highest population growth rate when compared to District and Mattannur Town.

4.1.2.2 Comparison with other Municipal Towns within the District

Comparison of growth rate with other Municipal Towns in the district is given in Table 4.7.

Table 4.7 Comparison of growth rate with other Municipal Towns in District

Sl No.	Municipal Towns	Growth Rate (%)	
		1991 - 01	2001 - 11
1	Taliparamba	12.09%	7.34%
2	***Mattannur***	***9.41%***	***6.23%***
3	Payyannur	7.31%	4.95%
4	Kuthuparamba	2.16%	0.29%
5	Thalassery	-4.41%	-6.87%
6	Kannur	-2.21%	-10.93%
7	Keezhur-Chavasseri (Panchayat)	10.73%	15.02%

A decreasing trend is observed in the population growth rate of all Municipal Towns in the Kannur District and Mattannur ranks second position (6.23 %) during last decade. Negative growth rate is observed in two municipal Town namely Thalassery and Kannur.

The adjacent panchayath Keezhur-Chavassery is also included in the study as it shows higher growth rate during the last two decades when compared to Mattannur town.

4.1.2.3 Comparison with other Municipal Towns within the District

Table 4.8 Comparison of growth rate with similar municipal Towns in the State.

No.	Municipal *Towns*	Growth Rate(G.R)	
		1991-01	2001-11
1	Mattannur	9.41%	6.23%
2	Manjeri	20.73%	16.00%
3	Tirur	8.49%	4.48%
4	Ottapalam	11.44%	9.24%

Mattannur town ranks 3rd position in population growth rate when compared to similar Municipal Towns of the State. During the last decade a declining trend in growth rate is observed in all Municipal towns.

4.1.2.4 Comparison with adjoining Panchayaths

Comparison of growth rate with adjacent panchayaths during last two decades is given in Table 4.9 and Figure 4.4.

Table 4.9 Comparison of growth rate with adjacent panchayaths

No.	Local Bodies	Growth rate(G.R)	
		1991-2001	2001-2011
1	Koodali	11.69%	6.10%
2	Vengad	11.00%	7.83%
3	Keezhur-chavassery	10.73%	15.02%
4	Thillankery	10.64%	6.75%
5	Padiyur	9.69%	4.68%
6	**Mattannur**	**9.41%**	**6.23%**
7	Keezhallur	9.15%	6.85%
8	Malur	7.08%	4.96%
9	Irikkur	5.31%	10.47%
10	Mangattidam	4.06%	11.87%

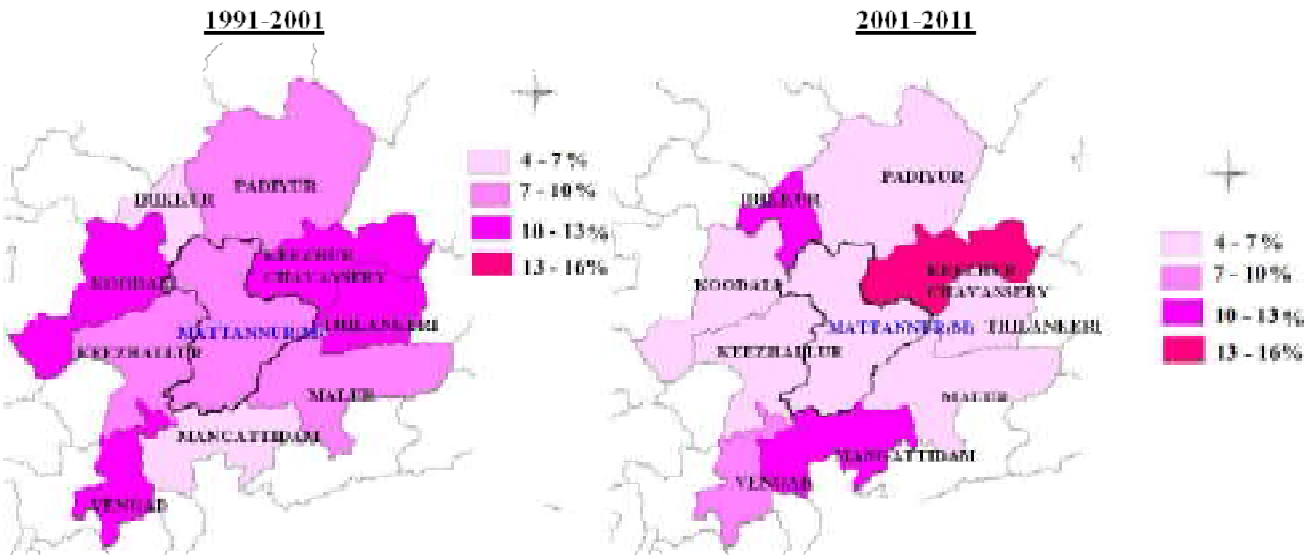


Figure 4.4 Comparison of growth rate with adjacent panchayaths during 1991 – 2001 & 2001 - 2011

Mattannur town and six adjoining panchayaths show a declining trend in growth rate during the last decade. An increase in population growth rate is observed in three adjacent panchaytahs namely Keezhur-Chavassery, Mangattidam and Irrikkur. Keezhur-Chavassery marks the highest growth rate (15.02%), more than twice the growth rate of Mattannur town (6.23%) during 2001-2011 mainly due to the rapid urbanization occurring at Iritty town.

4.2 POPULATION DENSITY

4.2.1 Comparison with District and State

Gross population density – It is defined as the number of people living per unit of an area (e.g. per square kilometer) considering the gross area. The gross population density of the Mattannur Town, District and State for the last four decades are given in Figure 4.5.

Table 4.10 Gross population density

Year	Mattannur (M)	Kannur District	Kerala State
1981	594	650	655
1991	748	759	749
2001	818	812	819
2011	869	851	860

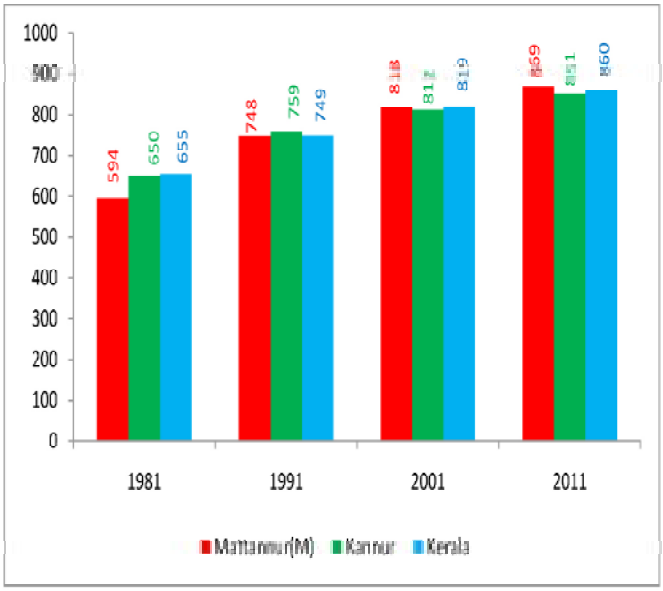


Fig 4.5 Gross population density

Decadal variations of gross population density of Mattannur Town, District and State show almost similar trend.

The gross population density in Mattannur Town as per census 2011 is 869 which is slightly higher than that of Kannur District (851) and Kerala State (860). An increasing trend of gross population density is observed in Mattannur Town, Kannur District and Kerala State.

4.2.2 Comparison with other Municipal town with in the District

A comparison of the gross population density among other municipal towns in the Kannur in 2011 is shown in Table 4.11.

Table 4.11 Comparison with other Municipal towns in the District

Sl. No.	Municipal Town	Population	Area in Sq.Km.	Gross Density (Sq.km)
1	Kannur	56,823	11.03	5,152
2	Thalassery	92,558	23.96	3,863
3	Kuthuparamba	29,619	16.76	1,767
4	Taliparamba	72,465	43.08	1,682
5	Payyannur	72,111	54.63	1,320
6	**Mattannur**	**47,078**	**54.15**	**869**

Among the six municipal towns, Mattannur Municipal Town shows the least value of gross population density. Kannur and Thalassery Municipal Towns rank first and second position respectively in the case of gross population density.

4.2.3 Comparison with similar Municipal towns in the State

Comparison of gross population density of Mattannur Municipal Town with similar municipal towns in the Kerala State is shown in Table 4.12.

Table 4.12 Comparison of gross population density with similar towns in the State

Sl. No.	Municipal Town	Population	Area in Sq.Km.	Gross Density (Sq.km)
1	Tirur	56,058	16.55	3,387
2	Manjeri	97,102	53.1	1,829
3	Ottapalam	53,792	32.66	1,647
4	Mattannur	47,048	54.15	869

The table shows that gross population density is lowest for Mattannur Municipal Town and highest for Tirur Municipal Town.

4.2.4 Comparison with adjoining Panchayaths

Gross population density of Mattannur Municipal Town is compared to adjoining panchayaths during 2001 and 2011 are given in Table 4.13 and Figure 4.6.

Table 4.13 Gross population density-comparison with adjoining panchayaths during 2001 & 2011

Sl.	Description	Gross density 2001 (sq.km)	Gross density 2011 (sq.km)
1	Vengad	1,275	1,374
2	Irikkur	1,115	1,232
3	**Mattannur Town**	**818**	**869**
4	Keezhur-Chavassery	801	921
5	Koodali	708	751
6	Keezhallur	659	704
7	Thillankery	545	582
8	Malur	514	539
9	Padiyur	371	389
10	Mangattidam	371	1040

When compared with nine adjacent panchayaths, Mattanur town has a moderate value of gross population density (869 persons per sq.km). The highest value is observed in Vengad panchayath located in the southern part and least value is observed in Padiyur panchayath located in the northern part of the town. Mattannur town and all adjoining panchayaths except Mangattidam show a slight increase in gross population density during the last decade. However, Mangattidam panchayath records a sharp increase in gross population density (from 371 in 2001 to 1040 in 2011) as it is sandwiched between Mattannur Municipal Town and Koothuparamba Municipal Town.

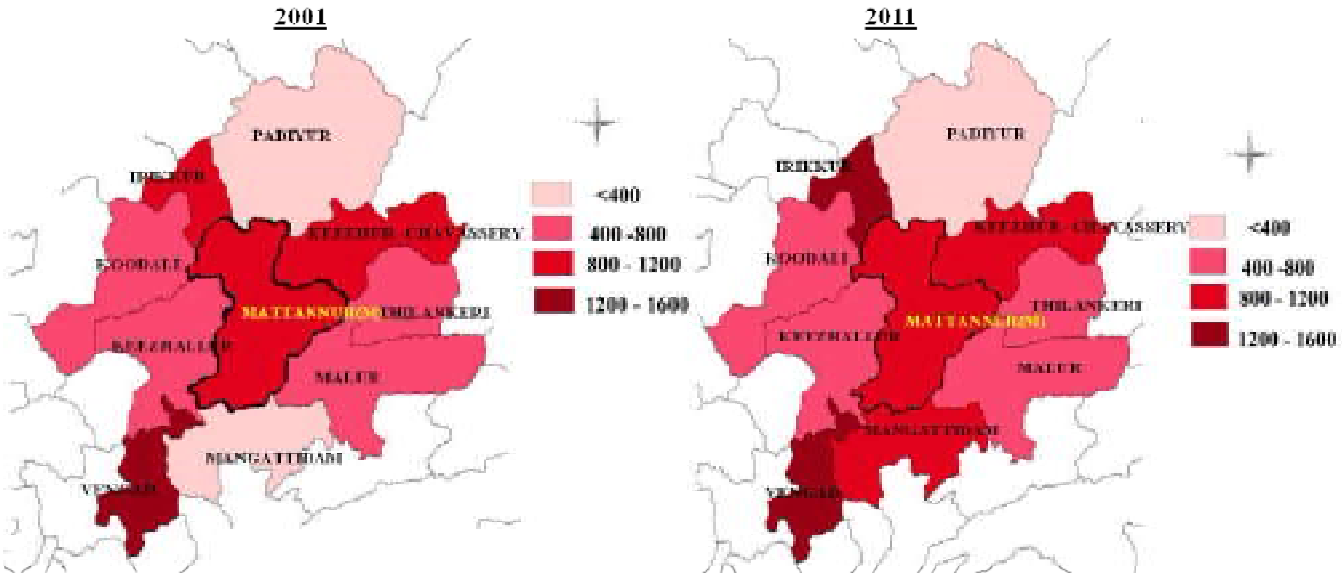


Figure 4.6 Gross population density comparison with adjoining panchayaths during 2001 & 2011

4.2.5 Ward wise gross and net population density

The ward wise gross population density of Mattannur town ranges from 401-2400 persons per sq.km. It is observed high in the middle portion of the town especially along major corridors. Highest gross density of 2120 persons per sq.km is found at Palottupally ward closely followed by 1918 persons per sq.km at Anikkari ward located at north of Palottupally ward.

Gross population density is low in 12 wards located in north and south portion of Municipal town and ranges

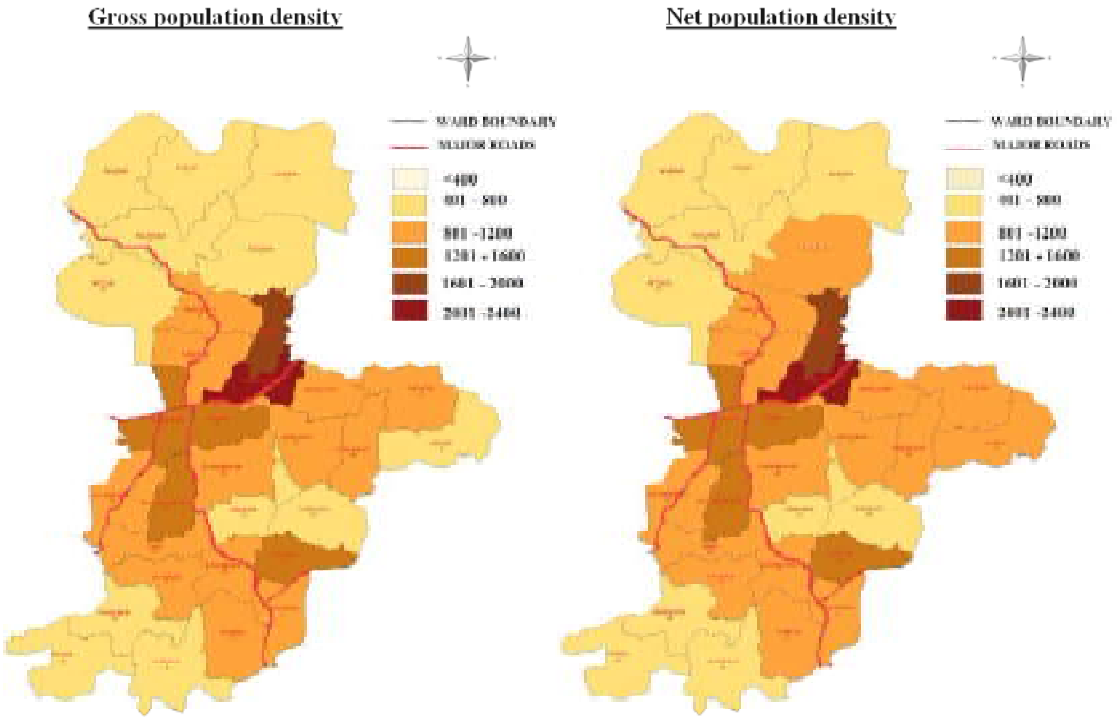


Figure 4.7 Ward wise Gross & Net population density of Mattannur Town

from 401-800 persons per sq.km. In all wards gross population density is above 400 persons per sq.km.

Net Population Density- It is defined as the number of people living per unit of an area (e.g. per square kilometer) considering the net area. Net area is the area obtained after deducting the non-occupable areas like water bodies, forest, paddy fields and mangroves etc. from the gross area.

Figure 4.7 shows the net population density of wards in the town. Net population density in wards also ranges from 400 – 2400 persons per sq.km and follows the pattern of ward wise gross population density.

4.3 SPATIAL DISTRIBUTION OF POPULATION

Population concentration pattern of one-third population size, half population size and two-third population size in the year 2011 is shown in Figure 4.8.

The highest one-third population is concentrated in the 9 wards of the middle portion of the Municipal Town including the core area. More than half of population size is concentrated in 14 wards. These wards are scattered in which 10 wards are in the center portion, 2 wards located at the east and other 2 Wards located at the South. The two-third of population size is concentrated in 19 wards, in which most of the wards are located in central and eastern portion.

4.4 SEX RATIO

Sex ratio is defined as the number of females per thousands males. It is an important and useful indicator to assess relative excess or deficit of men or women in a given population at that point of time.

4.4.1 Comparison with District and State

The comparison of temporal variation of sex ratio of Mattannur town with District and State is given in Table 4.14 and is graphically represented in figure 4.9.

When compared with District and State average, Mattannur Municipal Town has least value of Sex ratio, however an increasing trend is observed in the Municipal Town, District and State. According to census 2011, the sex ratio of Mattannur Municipal Town, Kannur District and Kerala State are 1078, 1136 and 1084 respectively.

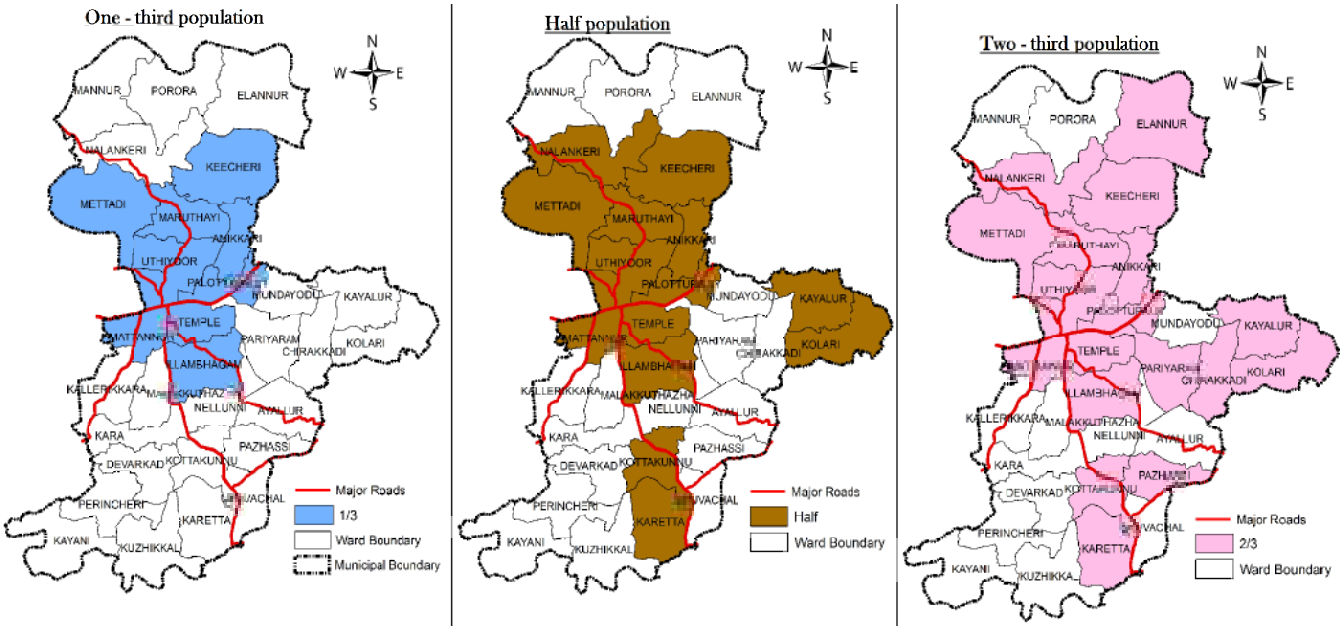


*Figure4.8 Population concentration pattern -2011 (*one-third*, half and* two-third*)*

Table 4.14 Temporal variation of sex ratio

Year	Mattannur Municipal Town	Kannur District	Kerala State
1991	1,009	1,049	1,036
2001	1,046	1,090	1,058
2011	1,078	1,136	1,084

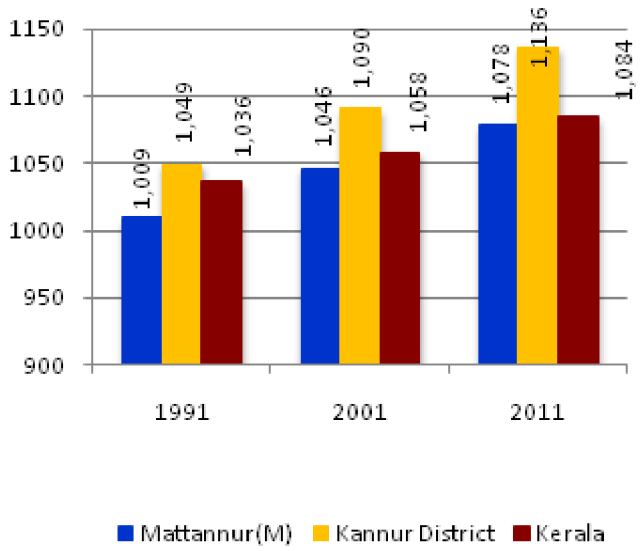


Figure 4.9 Temporal variation of sex ratio

4.4.2 Comparison with other Municipal town with in the District

Comparison of Sex ratio with other municipal towns in the district is given in Table 4.15.

Table 4.15 Comparison of Sex ratio with other municipal town in the District

Sl. No.	Municipal Town	Sex Ratio 2001	Sex Ratio 2011
1	**Mattannur**	**1,046**	**1,078**
2	Payyannur	1,102	1,159
3	Kannur	1,091	1,161
4	Thalassery	1,125	1,180
5	Koothuparamba	1,124	1,202
6	Taliparamba	1,074	1,145

As per 2011 census, Mattannur Municipal Town marks the least value of sex ratio (1078) when compared to other municipal towns in the district and the rate of increase is also minimum during the last decade.

4.4.3 Comparison with similar Municipal towns in the State

Comparison of Sex ratio with similar municipal towns in the State is given in Table 4.16.

Table 4.16 Comparison of Sex ratio with similar municipal towns in the State

Sl. No.	Municipal Town	Sex Ratio 2001	Sex Ratio 2011
1	**Mattannur**	1,046	1,078
2	Manjeri	1,023	1,059
3	Tirur	1,069	1,131
4	Ottapalam	1,122	1,121

Mattannur Municipal town ranks 3rd position in sex ratio when compared to the three similar municipal towns of the State. Except Ottappalam all other municipal towns show an increasing trend during last decade.

4.4.4 Comparison with adjoining Panchayath

Table 4.17 and Figure 4.10 shows the comparison of sex ratio with adjacent panchayaths.

Table 4.17 Comparison of sex ratio with adjacent panchayaths – 2001 and 2011

LOCAL BODIES	2001	2011
Mangattidam	1,104	1,118
Thillankeri	1,086	1,093
Malur	1,081	1,092
Vengad	1,078	1,133
Keezhallur	1,076	1,095
Koodali	1,049	1,122
Mattannur	**1,046**	**1,078**
Keezhur-Chavasseri	1,034	1,061
Padiyur	1,004	1,041
Irikkur	1,000	1,066

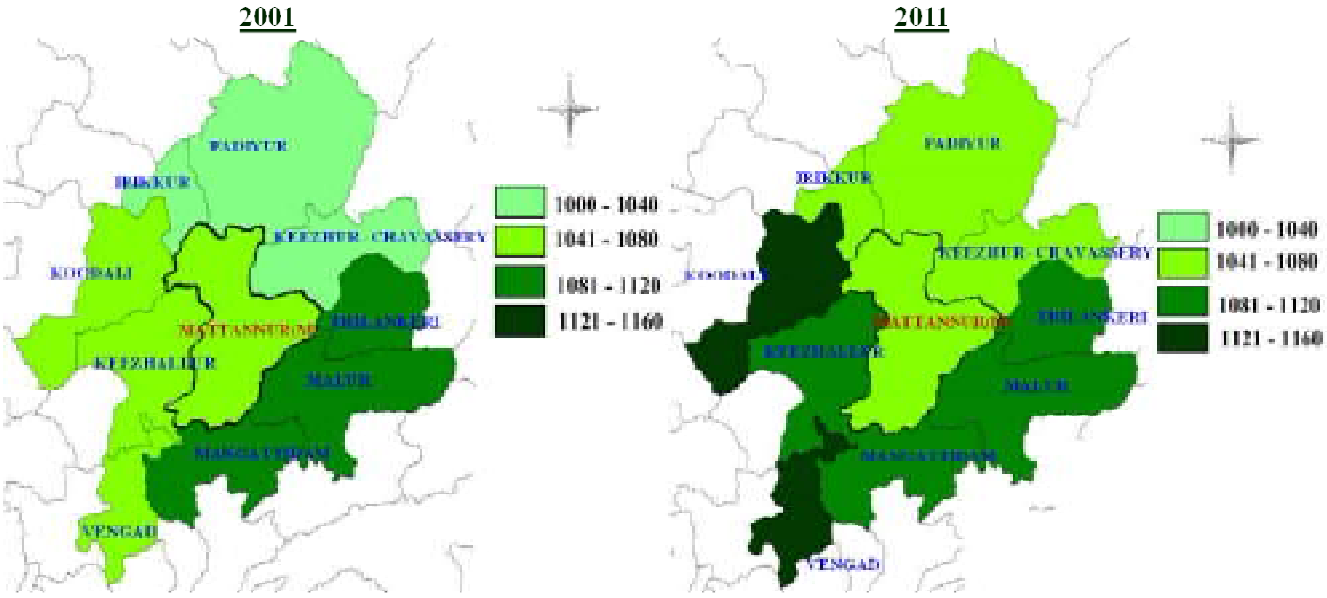


Figure 4.10 the comparison of sex ratio with adjacent panchayaths -2001 & 2011

Sex ratio has increased in Mattannur Municipal Town and all adjoining panchayaths during the last decade. Figure 4.10 shows that two panchayaths namely Vengad and Koodali experienced a sharp increase in sex ratio. The proximity to Kannur town leads to urbanization of panchayaths located at the western portion of the Mattannur Municipal Town.

Child sex ratio

Child sex ratio of Mattannur Municipal Town compared to District and State average during last three decades are given in Figure 4.11.

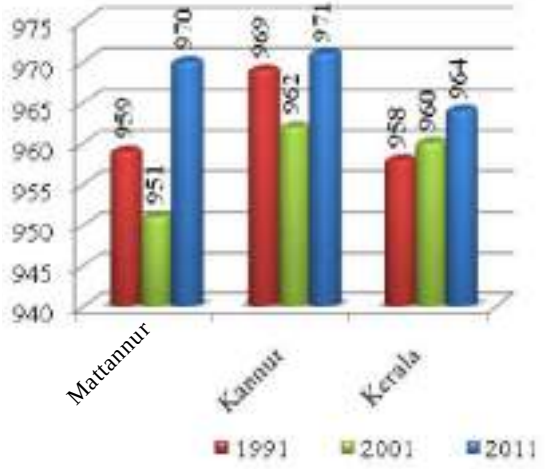


Figure 4.11 Child sex ratio -comparison with District and State

Child sex ratio is less than 1000 in Mattannur Municipal Town, however the ratio has increased from 951 to 970 during the last decade. A similar trend is observed in the District and State. Moreover the child sex ratio of Mattannur Municipal Town almost matches that of the District as per census 2011.

4.5 AGE-SEX PYRAMID

Age sex pyramid is a graphical representation of the age and sex of a population. The vertical axis represents the different age groups. The horizontal axis is divided into two parts. Female population details is plotted on the right hand side and male population details plotted on the left hand side as a mirror image in the graph. The figure obtained is called the age-sex pyramid.

Figure 4.12 shows the age sex pyramid of Mattannur municipal town. It reveals that both male and female population are highest in the age group of 25 to 30. The percentage of male population in this age group (25 to 30) comes to around 13% where as that of female population accounts to 11%. Though the overall picture represents a healthy diagram with similar halves for both male and female population, the percentage of male population within the age group is found slightly

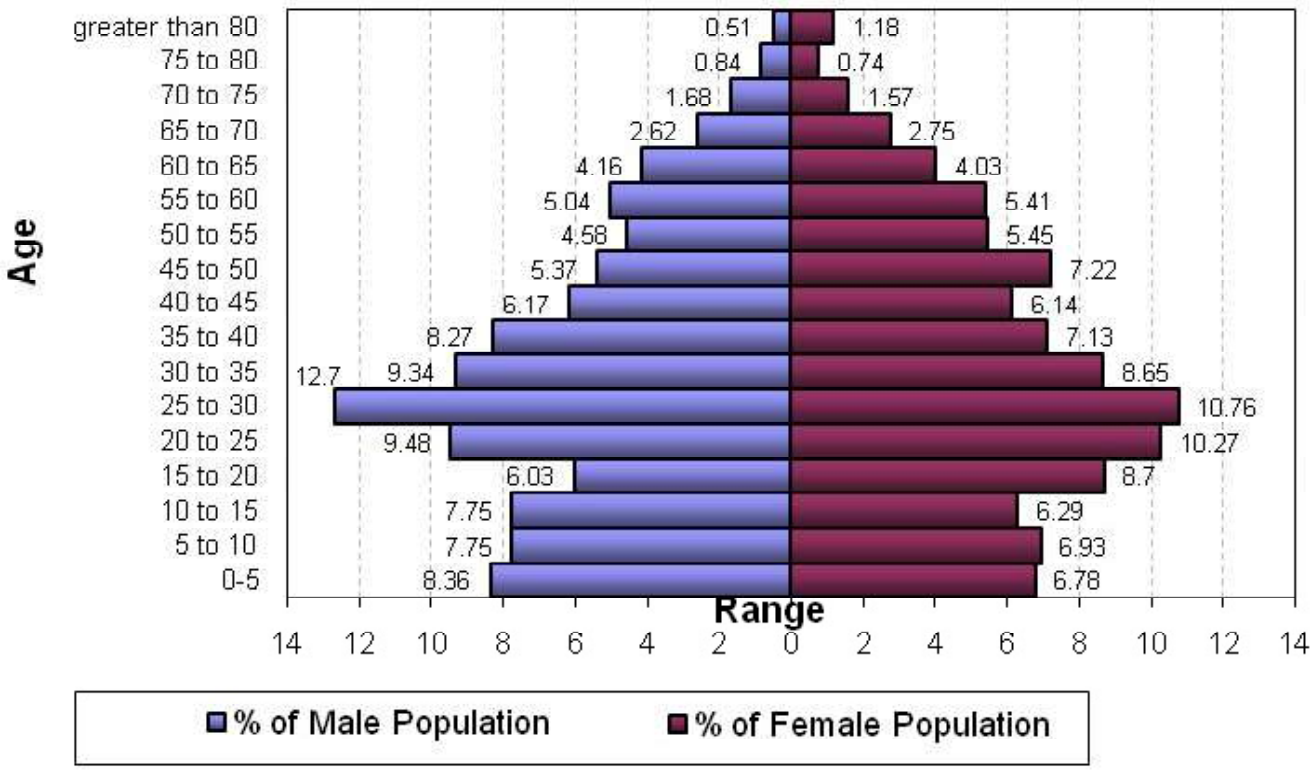


Figure 4.12 Age-sex pyramid

greater than that of female population, which is to be noted with due consideration.

The age group falling between 20 to 60 years can be considered as the effective working group of the population. The percentage of that age group for Mattannur town is found as 60.88% which indicates a positive sign for the economic productivity. Similarly the age group of 0-20 years can be considered as the productive group for the future and in the case of Mattannur town their percentage is 29.19% which also indicate a positive sign.

4.6 LITERACY

Literacy is the quality or state of being literate, especially the ability to read and write. Kerala is the most literate State in India with a literacy rate of 94%.

4.6.1 Comparison with District and State

Figure 4.13 represents the comparison of literacy rate of Mattannur Municipal Town with District and State average.

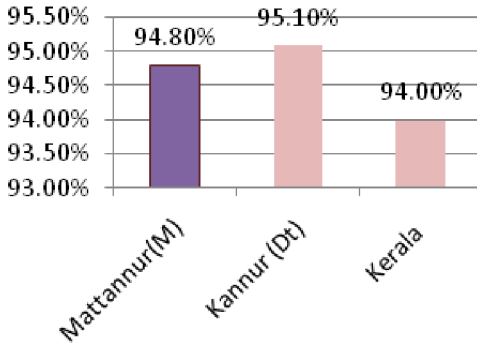


Figure 4.13 Literacy rate comparison with District and State

The literacy rate of Mattannur Municipal Town is slightly lower when compared to District (95.10%) and slightly high when compared to State (94%).

4.6.2 Comparison with Other towns in the district

Literacy rate (in percentage) of Mattannur Municipal Town compared to other municipal towns in the District is shown in figure 4.14.

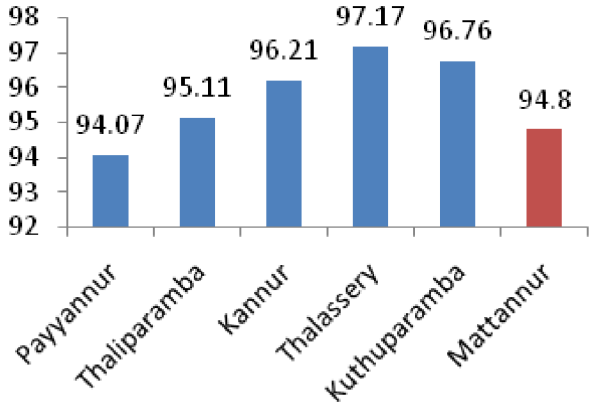


Figure 4.14 Comparison of literacy rate with other municipal towns in the District.

Mattannur Municipal Town has second least literacy rate (94.80%) among the six municipal towns of the District where as Thalassery Municipal Town has the highest value (97.17%).

4.6.3 Comparison with similar towns in the state

Figure 4.15 represents the histogram showing the comparison of literacy rate in percentage of Mattannur Municipal Town with similar municipal towns in the State.

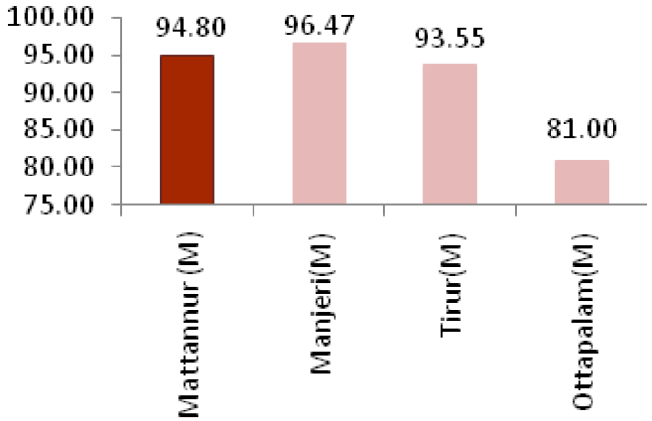


Figure 4.15 Comparison of literacy rate of Mattannur Municipal Town with similar municipal towns in the State.

Literacy rate of Mattannur Municipal Town is second highest among the similar municipal towns of the State and Ottapalam town has the lowest value.

4.6.4 Comparison with adjoining Panchayats

Figure 4.16 gives the comparison of literacy rate in percentage of Mattannur Municipal Town with adjacent panchayaths.

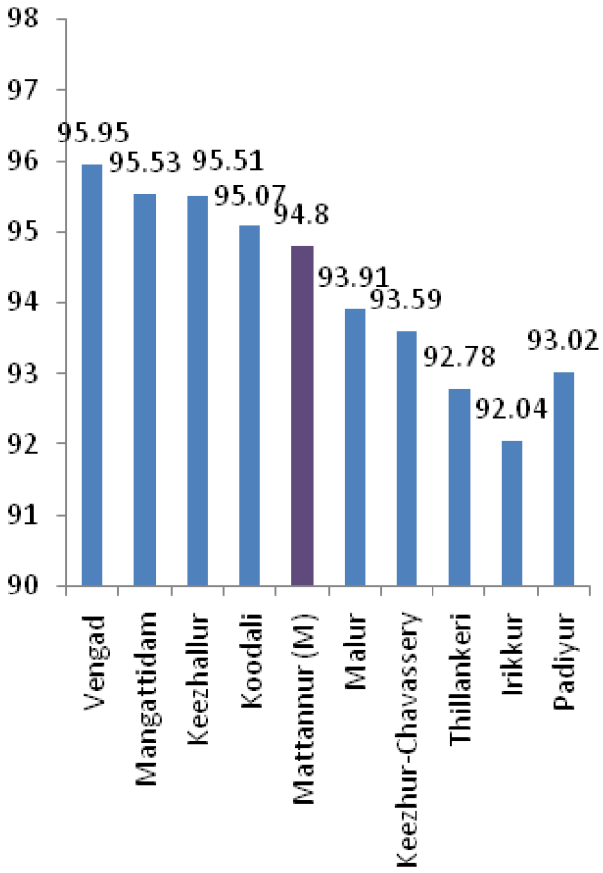


Figure 4.16 Comparison of literacy rate of Mattannur Municipal Town with adjacent panchayaths.

Mattannur Municipal Town keeps a median value of literacy rate while compared with the neighboring panchayaths. Literacy rate is highest in Vengad Panchayath and lowest in Irikkur Panchayath.

4.6.5 Female Litaracy

Female literacy is the percentage of female literates to the total female population. It can be considered as an indicater of the position of the ladies in a society.

4.6.5.1 Comparison with district and state.

Comparison of literacy rate in percentage of female population in Mattannur Municipal Town with District and State are given in Figure 4.17.

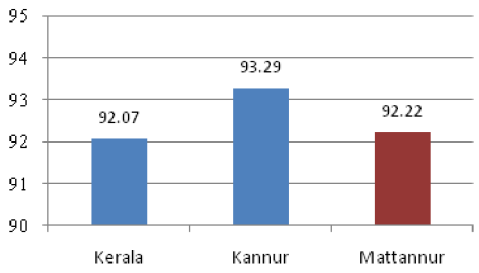


Figure 4.17 Female literacy rate – comparison with District and State

Female Literacy rate of Mattannur Municipal Town (92.22%) almost matches the State average but is lower than that of the District.

4.6.5.2 Comparison with adjoing Panchayats

Comparison of female literacy rate of Mattannur Municipal Town with adjacent panchayaths are given in figure 4.18.

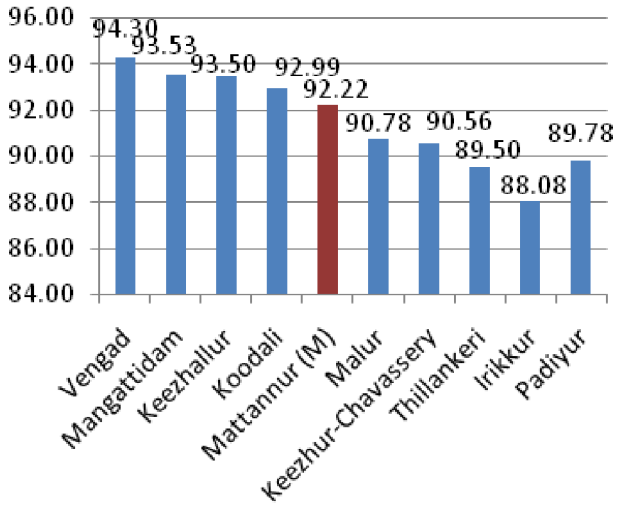


Figure4.18 Female literacy rate- comparison with adjoining panchayaths

Mattannur Municipal Town keeps a median value of female literacy rate while comparing with the neighbouring panchayaths. Female literacy rate is highest in Vengad Panchayath (94.30%) and lowest in Irikkur Panchayath (88.08%).

4.7 INFERENCE

The population density of Mattannur Municipal Town (869 person per sq.km) almost matches the District (851 person per sq.km) and State average (860 person per sq.km). Mattannur Municipal Town has the least population density when compared to other municipal tows in the District and similar towns in the State. When compared to adjacent panchayaths, population density of Mattannur Municipal Town is moderate. The growth rate of Mattannur Municipal Town has significantly declined from 25.96% to 6.23% during the last two decades indicating that there will not be much increase in the gross population density in the Municipal Town in future if the present trend continues. However, the growth rate of Municipal Town is greater than the District (4.73%) and State (4.91%). Moreover, the population concentration pattern reveals that majority of the population is concentrated in the middle and eastern part of the Municipal Town.

The adjacent panchayath, Mangattidam shows a sharp increase in population density during the last decade (371 person per sq.km to 1040 person per sq.km) due to the increased growth rate (4.06% to 11.87%). Mangattidam is sandwiched between two municipal towns namely Mattannur and Koothuparamba and this may be the reason behind the abnormal increase in growth rate and population density.

The study on age-sex pyramid reveals a healthy pattern for the town except in the case of child sex ratio, were percentage of girls is found less than that of boys.



Chapter - 5

OCCUPATIONAL STRUCTURE

The chapter deals with the existing economic base of the Municipal town based on the occupational structure as per census 2011. The various changes occurred in the economic base of the Municipal town over a period of years is studied.

5.1 WORK FORCE

The Work Force Participation Rate (WFPR) is a measure of the active portion of an economy's labour force expressed in percentage of total population. It refers to the number of people who are either employed or are actively looking for work.

Comparison with District and State

Figure 5.1 shows the temporal variation of WFPR in Mattannur Municipal Town, District and State.

The figure shows that WFPR in Mattannur Municipal Town, District and State has an increasing trend. As per 2011 census Mattannur Municipal Town marks the highest WFPR value (36.75%) when compared to District (32.66%) and State (34.78%) average.

Comparison with other towns in the District

Comparison of WFPR of Mattannur Municipal Town with other municipal towns in the District during last two decade is given in Figure 5.2.

All the municipal Towns in the district show increasing trend in WFPR value during the last two decades except Taliparamba Municipal Town. Among the six municipal towns, Mattannur ranks first position in WFPR during 2001 as well as 2011.

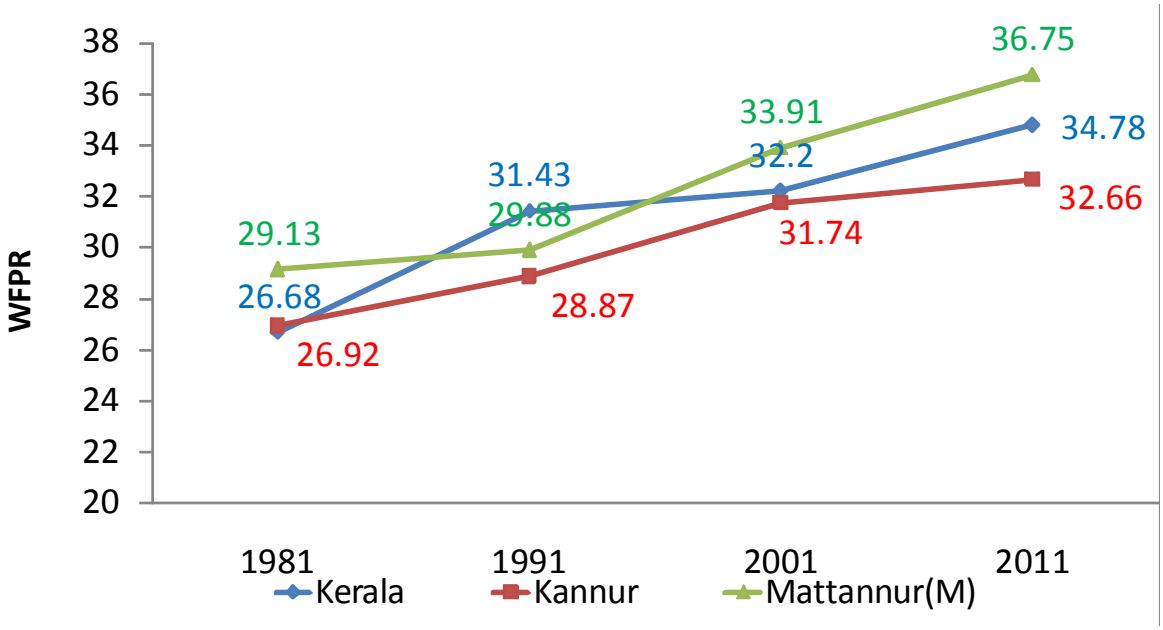


Figure 5.1 Comparison of WFPR with District and State Average.

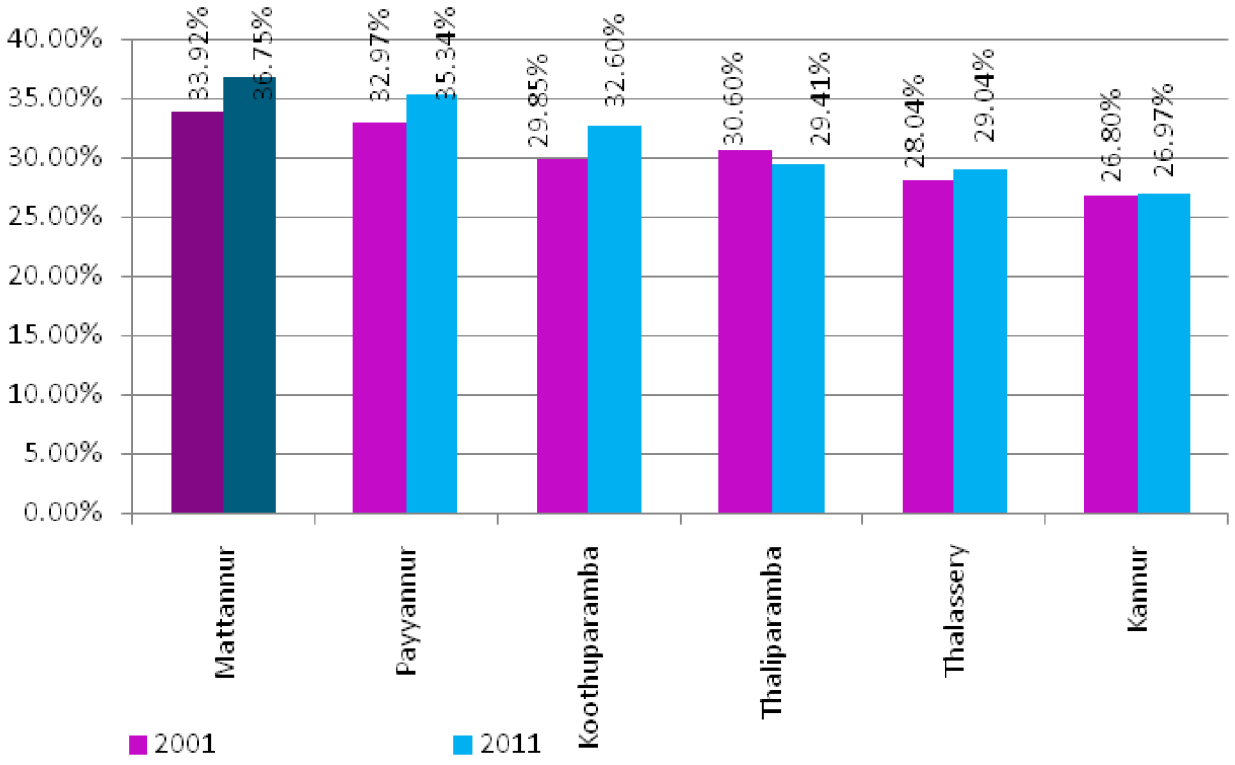


Figure 5.2 Comparison of WFPR with other municipal towns in the District

Comparison with similar towns in the State

Figure 5.3 shows the comparison of WFPR of Mattannur Municipal Town with similar towns in the State.

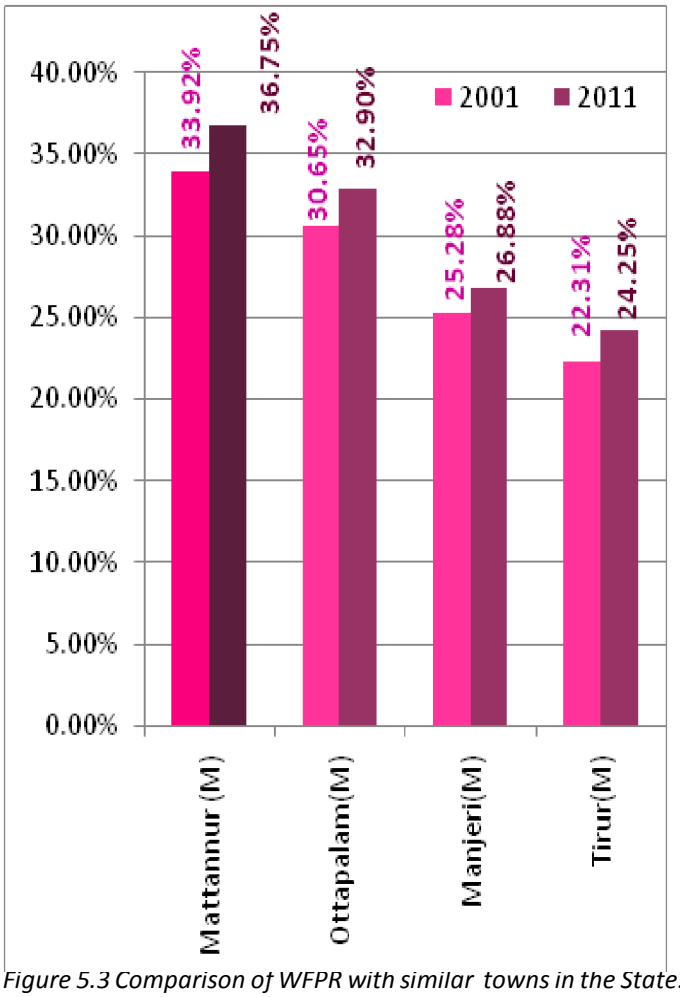


Figure 5.3 Comparison of WFPR with similar towns in the State.

An increasing trend is observed in Mattannur Municipal Town and all similar municipal towns compared. Mattannur has the highest WFPR value when compared with municipal towns in the District and similar municipal towns in the State. Ottapalam Municipal Town ranks 2nd position in the case of WFPR followed by Manjeri and Tirur.

Comparison with adjacent Panchayats.

Comparison of WFPR value of Mattanur Municipal Town with adjacent panchayaths during the last two decades is shown in Table 5.1 and Figure 5.4.

Table 5.1 Comparison of WFPR with adjacent panchayaths

Sl.No.		WFPR 2001	WFPR 2011
1	Malur	35.38%	38.76%
2	Padiyur	36.84%	38.66%
3	Thillankeri	37.60%	38.18%
4	**Mattannur**	**33.91%**	**36.75%**
5	Koodali	32.81%	35.08%
6	Keezhallur	34.08%	33.69%
7	Vengad	32.38%	33.59%
8	Keezhur Chavassery	31.33%	33.2%
9	Mangattidam	32.23%	33%
10	Irikkur	25.58%	26.86%

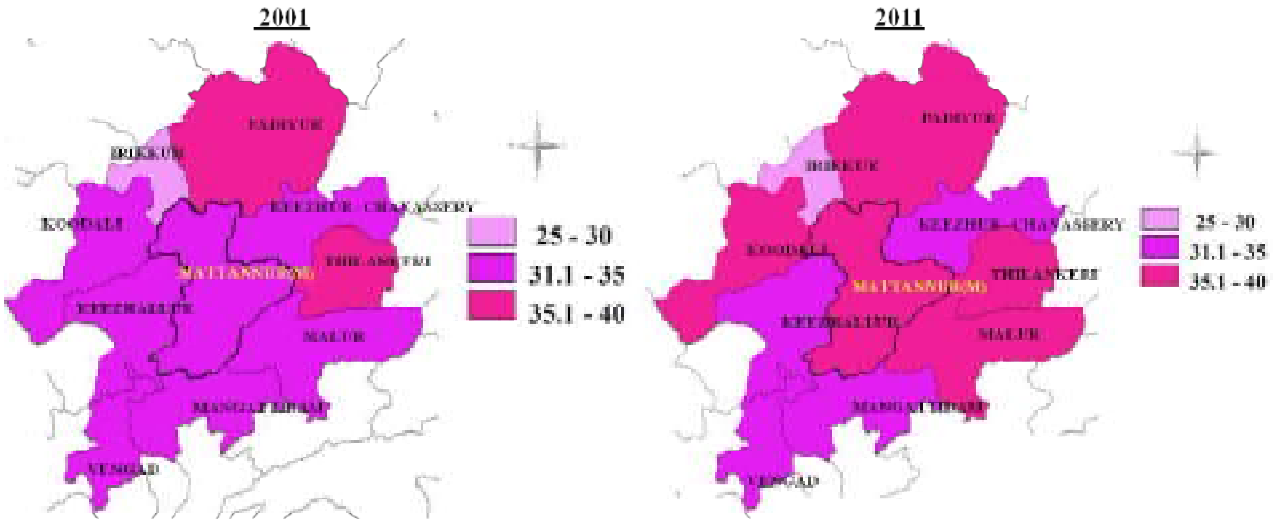


Figure 5.4 Comparison of WFPR with adjacent panchayaths as per 2001 & 2011 census

On comparing Mattannur Municipal Town to nine adjoining panchayaths, it is observed that Mattannur ranks 4th position with WFPR of 36.75% as per census 2011. Malur, Thillankeri and Padiyur are the panchayaths with higher values of WFPR than Mattannur Municipal Town. The remaining six panchayaths have lower WFPR values and Irikkur has the least value (26.86%).

Mattannur Municipal Town and two adjoining panchayaths namely Malur and Koodali show considerable increase in WFPR where as Keezhallur shows a slight decrease during the last decade.

Wardwise WFPR

Figure 5.5 shows the wardwise concentration index of work force participation rate in Mattannur Municipal Town.

Wardwise concentration index of WFPR ranges from 0.60 to 1.40. Mettadi, Ayyallur, Nellunni, Kallerikkara and Devarkadu are the wards having highest WFPR values (1.20 – 1.40). Almost all wards having moderate value of WFPR. Least WFPR concentration index (0.60 - 0.80) is shown in 3 wards namely Nalankeri, Palottupally and Mattannur.

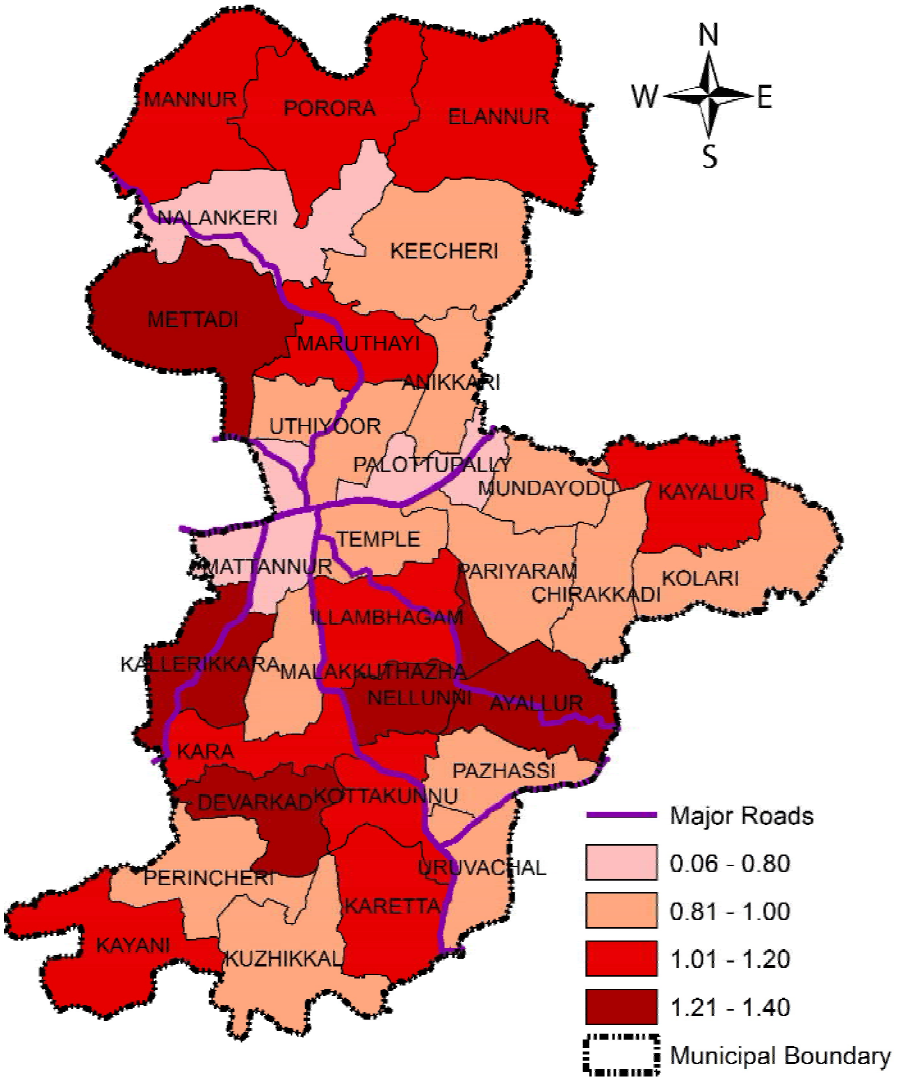


Figure 5.5 Ward wise WFPR concentration index in Mattannur Municipal Town

Female Work Force Participation Rate

Female WFPR is a useful measure of involvement of female population in the economic activity and is computed as the ratio of total female workers to the total female population, expressed as percentage. Women's economic productivity is a critical factor, as the dependence of the family on their contribution to household resources increases with the poverty status of the household.

Comparison with District and State

Female WFPR of Mattannur Municipal Town, District and State are shown in figure 5.6a, 5.6b and 5.6c.

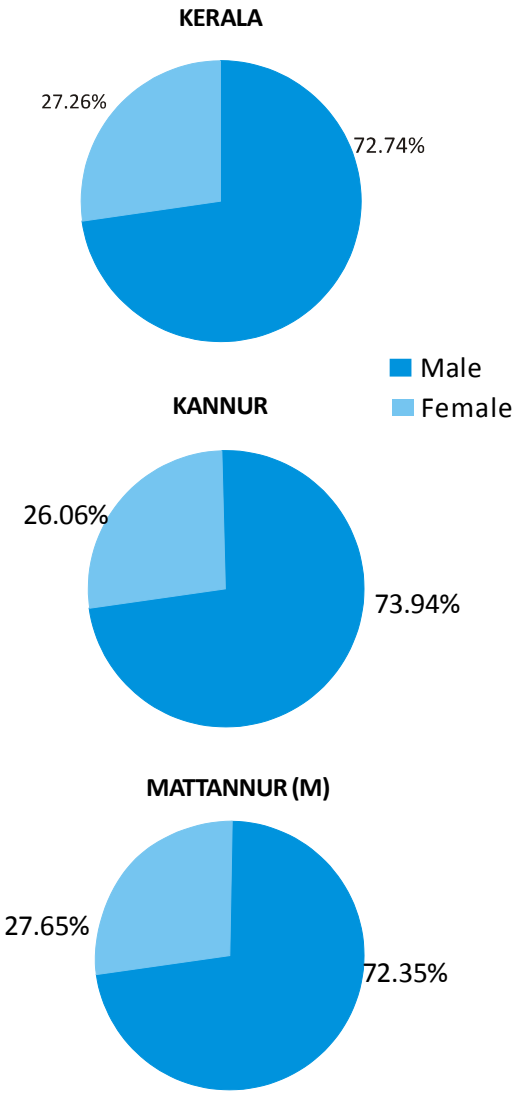


Figure 5.6a Percentage of male and female workers with respect to total workers.

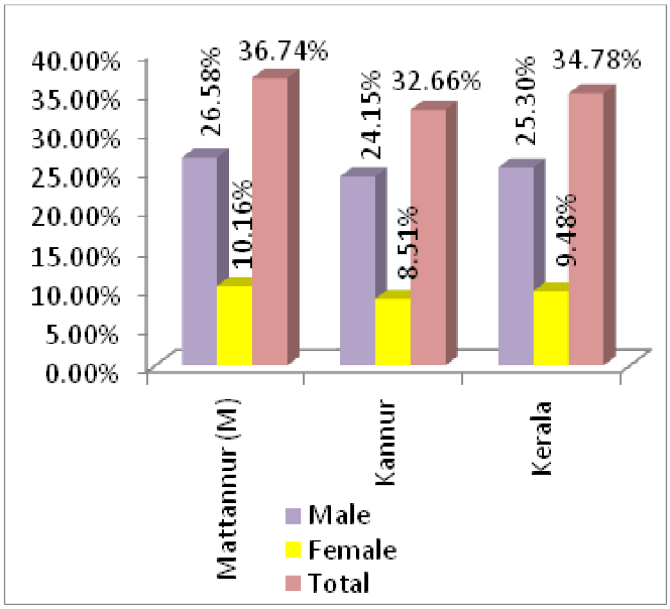


Figure 5.6b Percentage of male & female workers with respect to total population

The Female WFPR in Mattannur Municipal Town (27.65%) is highest when compared to District (26.06%) and State (27.26%).

Percentage of female workers with respect to total population is highest in Mattannur Municipal Town (10.16 %) when compared to District (8.15%) and State (9.48%).

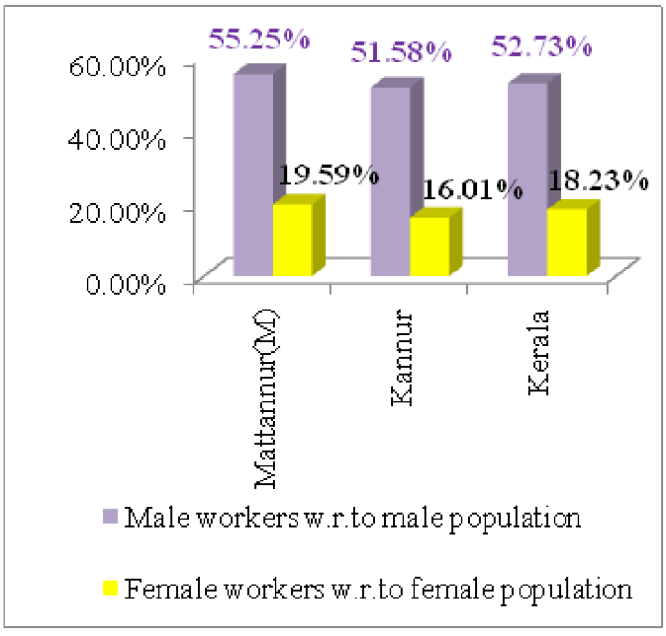


Figure 5.6c Percentage of male workers with respect to male population & female workers with respect to female population

Percentage of female workers with respect to female population is also highest in Mattannur Municipal Town when compared to the District and State.

Comparison with adjoing Panchayats

Comparison of female WFPR with adjoining panchayaths are shown in figure 5.7a and 5.7b.

From figure 5.7a, it can be seen that WFPR are higher than female WFPR in all the cases. The lowest value of WFPR is observed in Irrikkur panchayath.

From figure 5.7b it is clear that the percentage of male workers with respect to male population is more than two times the percentage of female workers with respect to female population. Highest WFPR values in

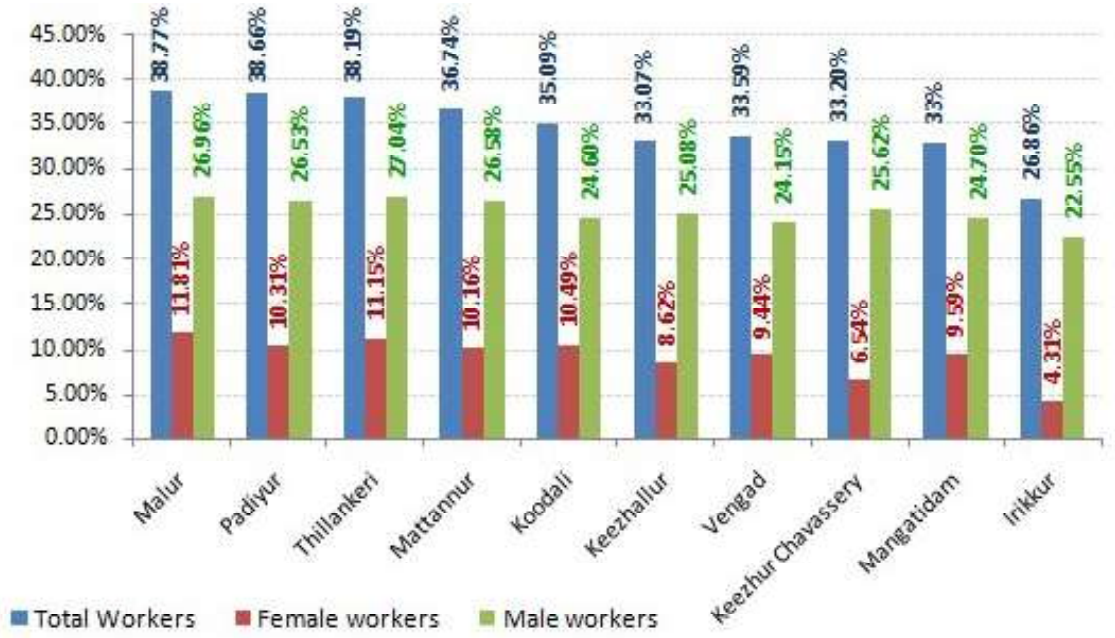


Figure 5.7a Female WFPR comparison with adjoining Panchayaths

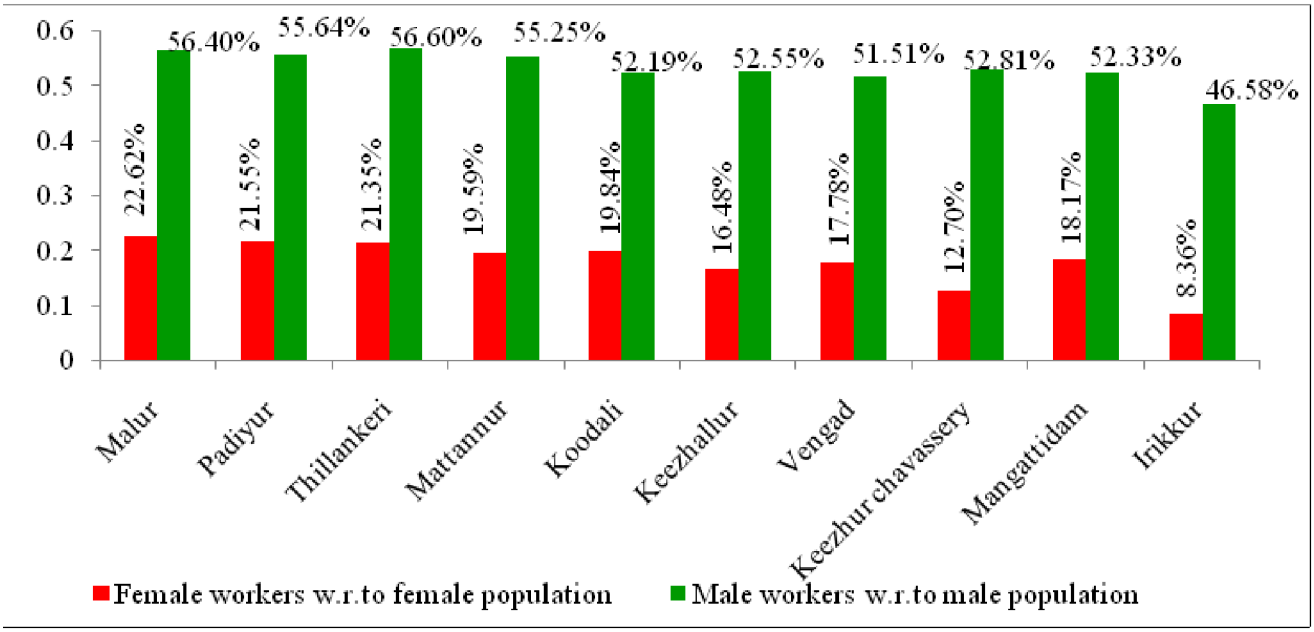


Figure 5.7b Percentage of Female workers with respect to female population and male workers with respect to male population

Malur, Padiyur and Thillankeri panchayaths are reflected in female WFPR also.

Main workers and Marginal workers

Basically the total population is classified in to three categories i.e., Main workers, Marginal workers and Non-workers. Main workers are those who are engaged in any economically productive activity for 6 months or more. Marginal workers are those who work for a period less than 6 months and non-workers are those who are not involved in any work throughout the year.

Figure 5.8 shows the percentage of Main workers, Marginal workers and Non-workers in Mattannur Municipal Town as per 2011 census. Out of total workers (36.8 % of population) main workers constitute 30% and marginal workers constitute 6.8%.

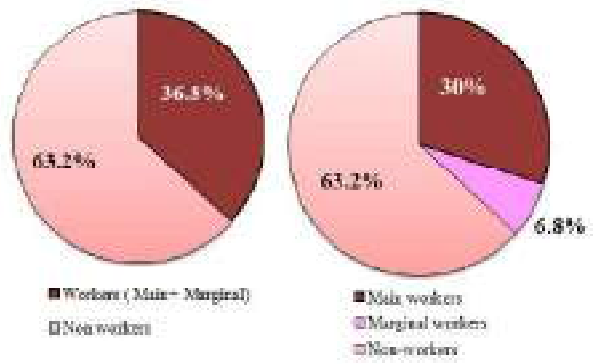


Figure 5.8 Percentage of Main workers, Marginal workers and Non-workers in Mattannur Municipal Town

Comparison of percentage of total workers, main workers and marginal workers in Mattannur Municipal Town with District and State are given in Table 5.2.

Table 5.2 Comparison of percentage of total workers, main workers and marginal workers in Mattannur Municipal Town

category	Kerala State	Kannur District	Mattannur Municipal Town
Total workers(%)	34.78	32.66	36.75
Main workers(%)	27.93	27.51	29.97
Marginal workers (%)	6.85	5.15	6.78

The Table and Figure show that the percentage of total workers in Mattannur Municipal Town (36.75%) is higher than that of District (32.66%) and State (34.78%) as per census 2011. However percentage of marginal workers is highest in Kerala (6.85%) followed by Mattannur Municipal Town (6.78%) and Kannur District (5.15%).

The decadal variation in occupational size in Mattannur Municipal Town is given in Figure 5.9.

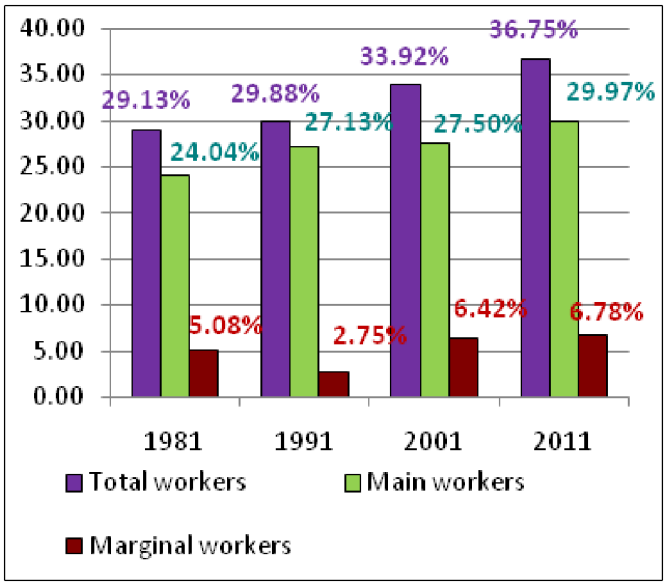


Figure 5.9 Decadel variation in occupational size in Mattannur Municipal Town

From the figure it is clear that there is a gradual increase in total workers during last four decades. The decadal variation in percentage of Main workers also shows an increasing trend. However the percentage of marginal workers shows a slight decrease during 1991.

5.2 OCCUPATIONAL STRUCTURE

Occupational structure is the distribution of population according to the different types of occupations. Occupations are generally classified as primary (agriculture, mining, fishing, etc.), secondary (manufacturing industry, building and construction work, etc.) and tertiary (transportation, communications, banking, etc.).

As per 2011 Census main and marginal workers are classified into four categories namely cultivators, agricultural labourers, household industrial labourers and other workers.

Fourfold classifications of main and marginal workers in Mattannur Municipal Town is shown in figure 5.10.

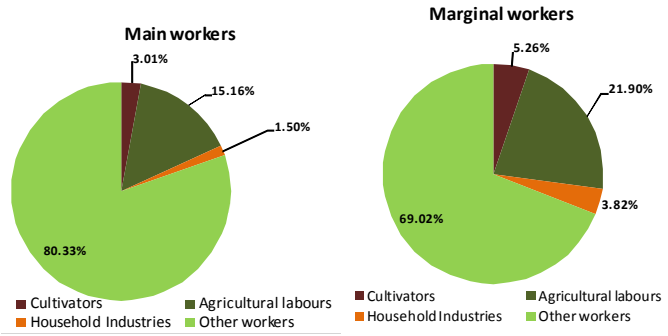


Figure 5.10 Fourfold classification of Main and Marginal workers

The percentage of primary workers constituting cultivators and agricultural labourers is 18 % in the case of main workers.

A comparative study of fourfold classification of workers is done and is represented in figure 5.11.

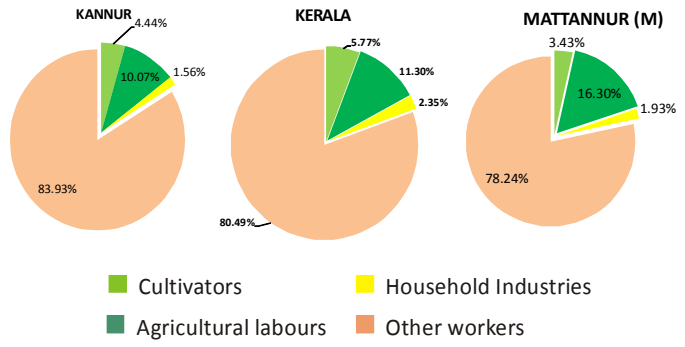


Figure 5.11 Comparison of fourfold classification of workers

From the figure it can be seen that the percentage values of cultivators and other workers in Mattannur Municipal Town are less when compared to the average values of the District and State. But the percentage value of agricultural labour is high when compared to the district and state. And the percentage value of house hold industrial workers is found less than the State average and higher than theDistrict average.

The decadal variation of fourfold classification of main workers in Mattannur Municipal Town is given in Table 5.3 and Figure 5.12.

Table 5.3 Decadal variation of fourfold classification of main workers

Type of workers	1981	1991	2001	2011
Cultivators	689	1,085	525	425
Agricultural labourers	2,290	3,770	2,849	2,139
HH industrial workers	120	174	200	212
Other workers	4,633	10,991	8,612	11,335

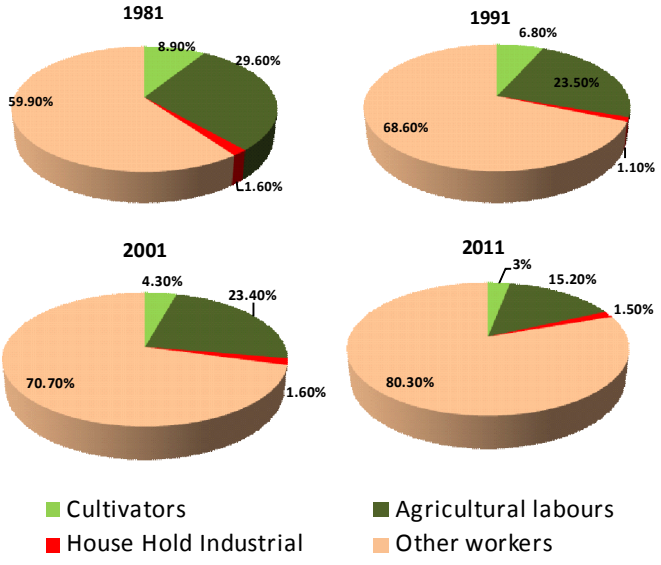


Figure 5.12 Decadal variation of fourfold classification of main workers

From the analysis it is clear that the percentage of other workers shows an increasing trend. The decrease in the percentage of cultivators and agricultural labours during last three decades shows the decline in primary activity. The decadal variation of percentage of household industrial labourers almost remains the same.

The decadal variation of fourfold classification of main workers in Mattannur Municipal Town comparing to the District and State is given in Figure 5.13.

Analysis of the figure 5.13 shows that the decadal variation in percentage of workers (fourfold classification) of Mattannur town, District and State are in a similar trend. The percentage values of cultivators

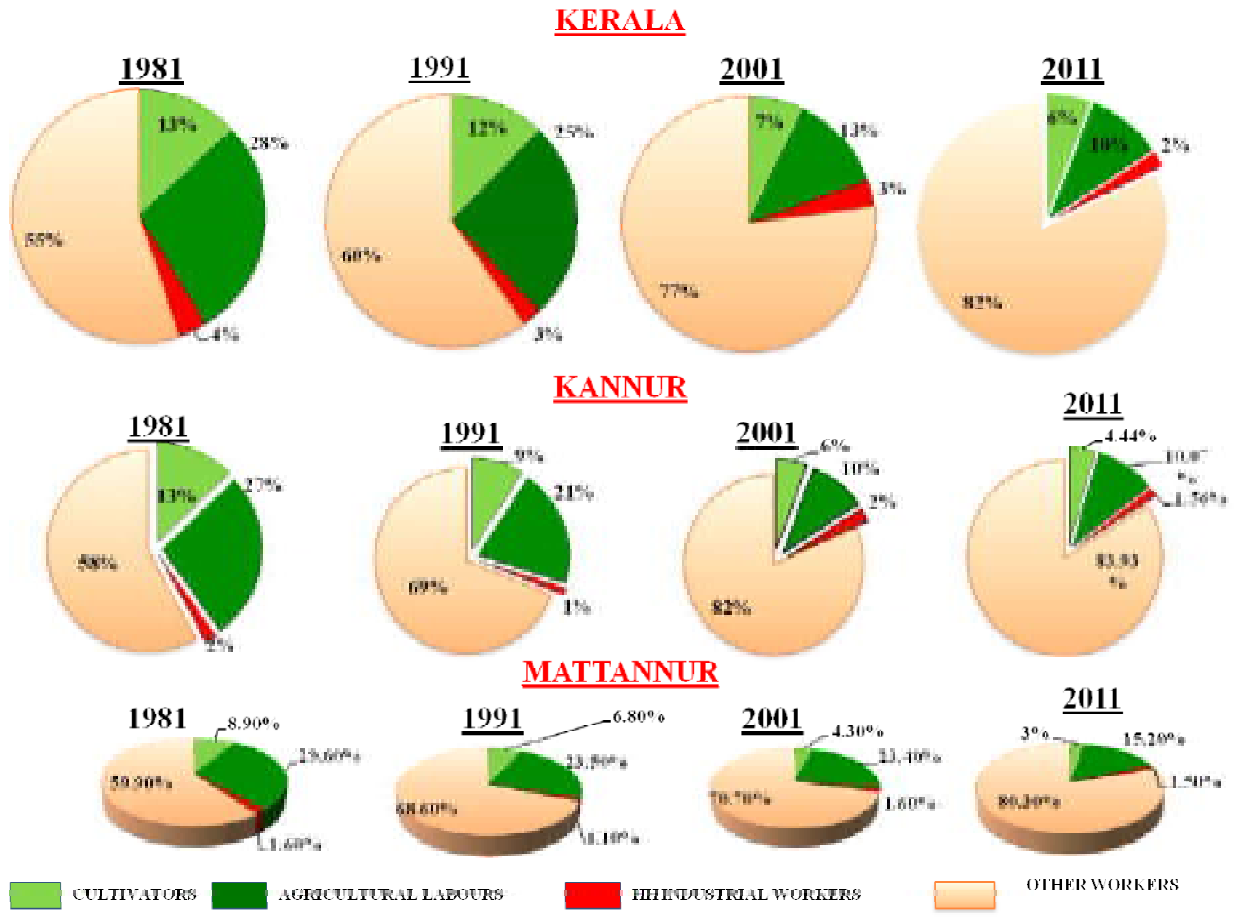


Figure5.13 Decadal variation of fourfold classification of main workers in Mattannur Municipal Town comparing with District and State

and agricultural labourers show a decreasing trend while that of other workers shows an increasing treand during last three decades. However percentage of household industrial labourers is almost steady during the period 1981-2011.

The percentage of workers involved in primary activity is highest in Mattannur Municipal Town (18.2%) when compared to the District (14.51%) and State (16%) during the last decade. Percentage of workers involved in house hold industry in Mattannur town, District and State ranges from 0 to 5% during last three decades. The percentage value of other workers in Mattannur Municipal Town is 80.03% and is less when compared to the district average value (83.95%) and State average value (82%).

5.3 SPATIAL DISTRIBUTION OF MAJOR CLASS OF WORKERS

The ward wise occupational structure of Mattannur Municipal Town is shown in Table5.4 and Figure 5.14. The figure shows that the percentage of other workers is high in all wards. Percentage of cultivators and agriculture labourers have higher values in wards situated in northern and eastern portion of the town.

The concentration index {(Number of workers of a particular class of workers in the ward/ total number of workers)/(Number of workers of the same class of workers in the Municipal town/ total number of workers in the Municipal town)} of the four classes of workers viz; Household industrial labourers, Cultivators, Agricultural labourers and Other workers are calculated and its spatial variation is analyzed.

Table 5.4 Ward wise occupational structure of Mattannur Municipal Town

Ward No.	Total Cultivators	Total Agricultural Labours	Total Household Industries	Total Other Workers
1	15	250	0	253
2	7	157	43	256
3	53	197	7	308
4	12	160	7	595
5	94	109	4	468
6	7	19	12	606
7	13	45	0	378
8	13	119	20	458
9	11	110	19	341
10	36	63	2	428
11	6	63	0	416
12	18	161	43	341
13	20	27	3	532
14	30	38	0	394
15	6	38	0	366
16	28	63	10	503
17	16	65	0	519
18	17	108	6	317
19	18	47	2	417
20	11	63	2	389
21	0	197	1	435
22	19	98	1	369
23	28	75	0	496
24	10	54	11	440
25	8	62	44	537
26	10	9	34	522
27	1	15	21	644
28	6	60	28	497
29	43	92	5	527
30	22	224	5	481
31	15	50	4	305

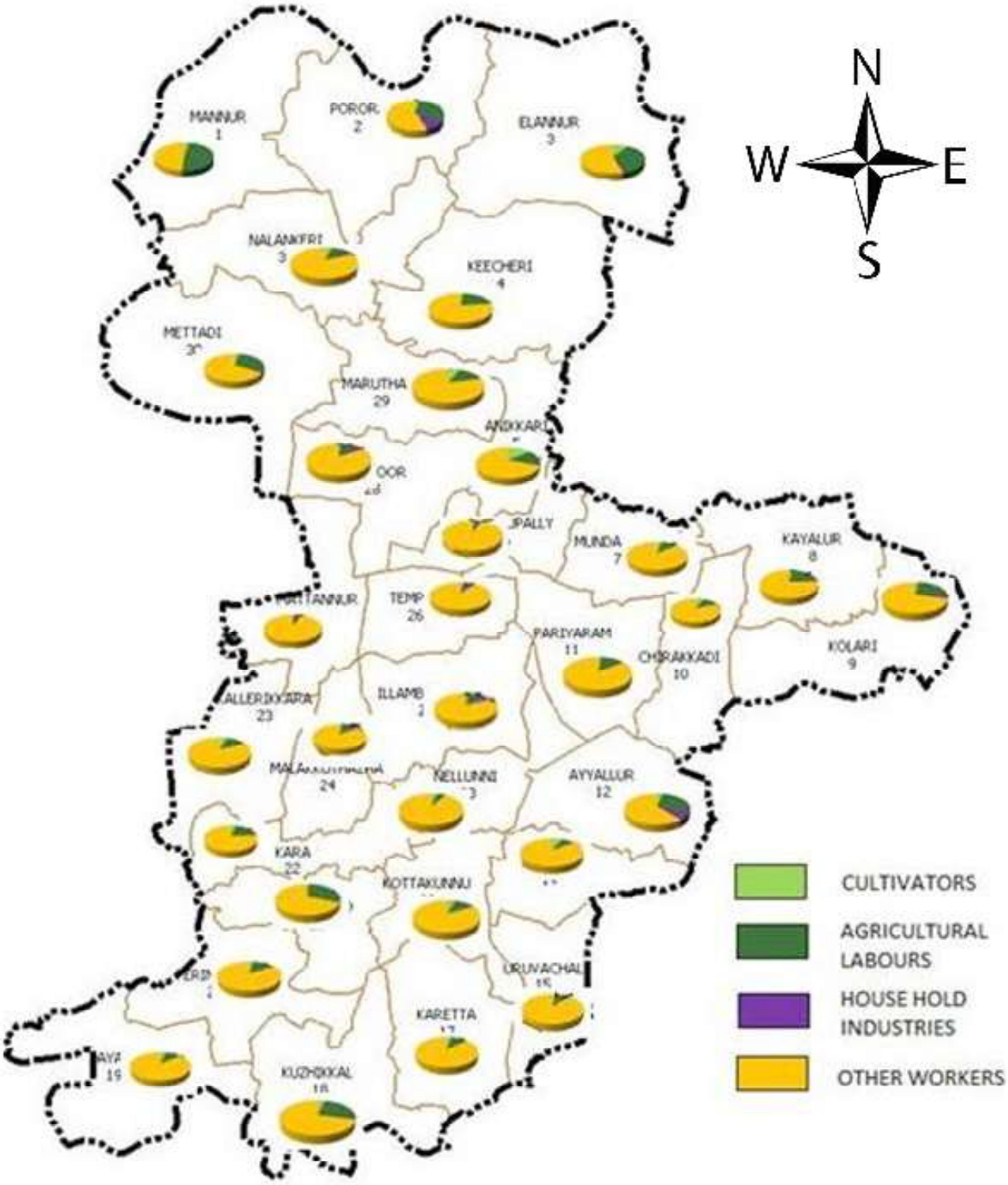


Figure 5.14 Wardwise occupational structure of Mattannur Municipal Town

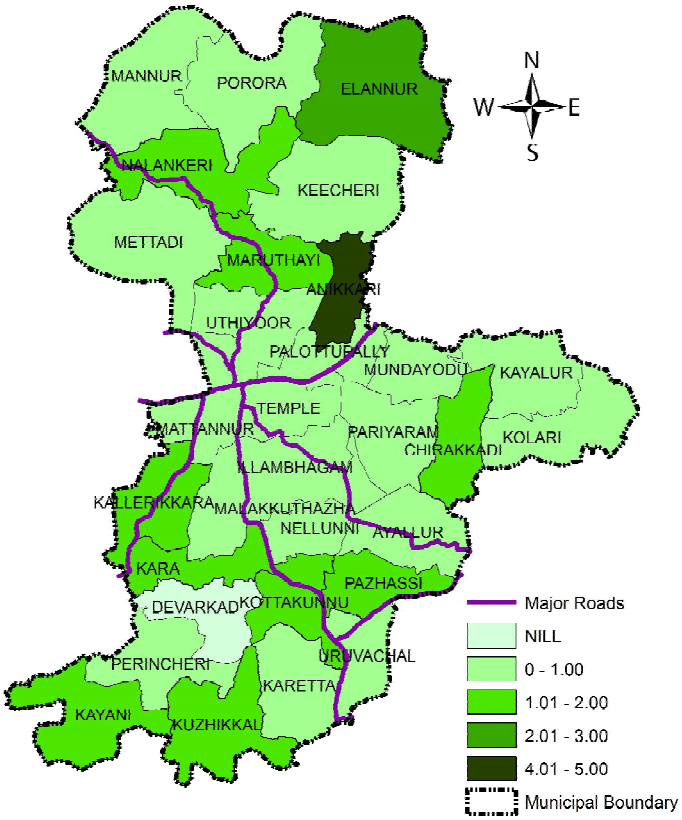


Figure 5.15 Spatial distribution of the concentration index of cultivators in Mattannur Municipal Town

The figure shows that cultivators are mainly concentrated in Anikkari and Ellannur wards. Almost all wards have concentration of cultivators except Devarkad ward.

Spatial distribution of concentration index of agricultural labourers is represented in figure 5.16.

Concentration index of agricultural labours ranges from 0 to 3.00. Wards situated in the northern portion of the town namely Mannur, Ellannur and Porora have higher values of concentration index. Concentration index is moderate in 7 wards (Keecheri, Mettadi, Kayalur, Kolari, Kara, Devarkkad and Kuzhikkal) scattered in northern, eastern and southern portion of the town. All other wards have minimum values of concentration index and are situated mainly in the middle portion of the Municipal town.

Spatial distribution of concentration index of household industrial labourer is shown in figure 5.17.

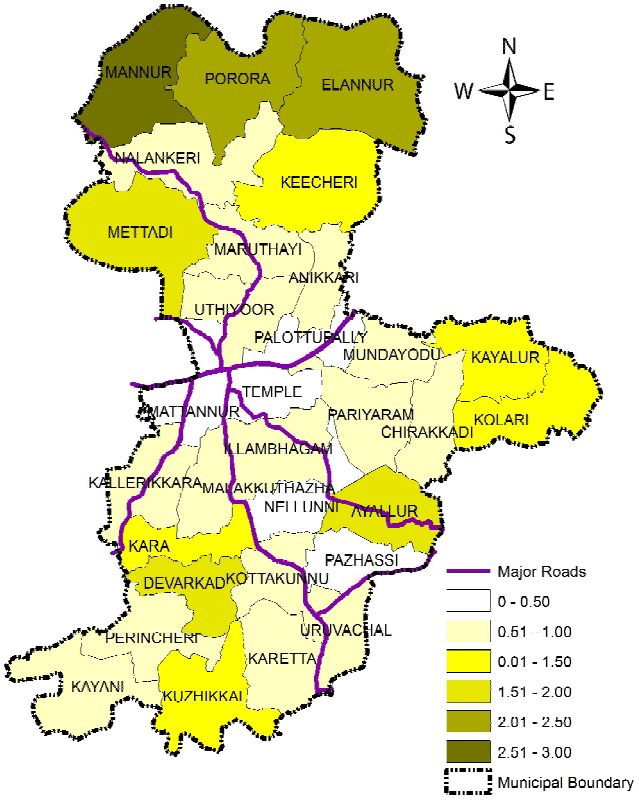


Figure 5.16 Spatial distribution of concentration index of agricultural labourers

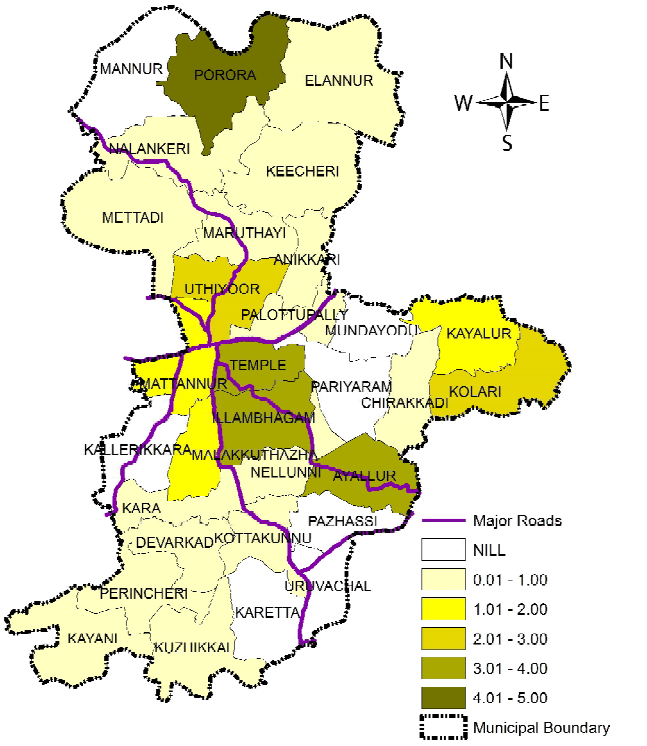


Figure 5.17 Spatial distribution of concentration index of household industrial labourer

House hold industrial labourers concentration index ranges from 0.01 to 5.00. The category of households industrial labourers does not have much significance in Mattannur Municipal Town. Porora is the ward having the highest concentration index and is located in the northern portion. Moderate concentration index of house hold industrial labourers are seen in middle and south-east portion of the Mattannur Municipal Town. Concentration index is much less in wards namely Mannur, Kallerikkara, Karetta, Uruvachal, Pazhassi, Mundayodu and Pariyaram.

Figure 5.18 shows the spatial distribution of concentration index of other workers in Mattannur Municipal Town.

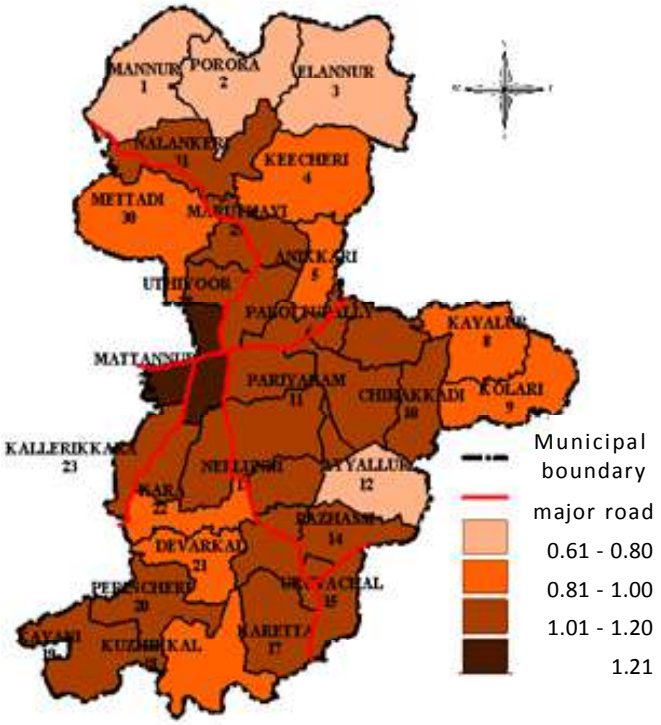


Figure 5.18 Spatial distribution of concentration index of other workers in Mattannur Municipal Town

From the figure it is clear that the other workers are mainly concentrated in the central portion of the Municipal town and concentration decreases towards peripheral areas. The concentration index ranges from 0.61 to 1.21. Mattannur ward has highest concentration index. Mannur, Porora, Ellannur and Ayallur are the wards having least values of concentration index out of which three wards are situated in the northern periphery of the Municipal town.

5.4 INFERENCE

The value of WFPR is higher in Mattannur Municipal Town when compared to the District and State average values. Mattannur Municipal Town ranks first among the six municipal towns of the district and similar municipal towns in the State. The female WFPR value is also highest in Mattannur (27.65%) when compared to the District and State.

The occupational structure of the municipal town reflects its urbanization trends. Even though the percentage of cultivators (3%) and agricultural labours (15.2%) in Mattannur Municipal Town is highest when compared to the District and State, it shows a declining trend during the last three decades. The sector which shows growth is the service sector which includes other workers (80.30%), and this is an indication of urbanization trend.



Chapter-6

LAND USE

Land use classification is based on the functional dimension of land for different human purpose or economic activities. Typical categories of land use are residential use, industrial use, transportation use, recreational use or nature protection areas. Land use analysis has a key role in spatial planning in which use of every part and parcel of land is to be specified, both existing and desired in future. Analysis of existing land use is done to determine the predominant economic activities of an area as well as the availability of land for future economic activities. Spatial analysis is carried out by conducting primary survey of existing land use in all 34 wards of the Mattannur Municipal Town. The land use pattern, economic activity and linkages between them are to be analyzed.

6.1 LAND USE AT TOWN LEVEL

The existing land use breakup of Mattannur Municipal Town is shown in Figure 6.1a and 6.1 b.

The total land area of Mattannur Municipal Town is 54.15 Km^2 out of which 23.59 Km^2 (43.54%) is dry agricultural land. The second highest land use is identified residential (coconut mix) which contributes 21.06 Km^2 (38.89%). Total paddy field constitutes 3.18 Km^2 in which cultivated paddy field has a share 1.06 Km^2 (1.96%) and uncultivated paddy field has a share of 2.12 Km^2 (3.92%). Other categories of land uses are commercial, public & semipublic, industrial, transportation, hazardous, forest, canal land of Pazhassi Irrigation Project, park and open spaces, water bodies which constitutes 0.15%, 1.05%, 0.09%, 5.95%, 0.07%, 0.26%,1.13%, 0.01% & 2.2% respectively.

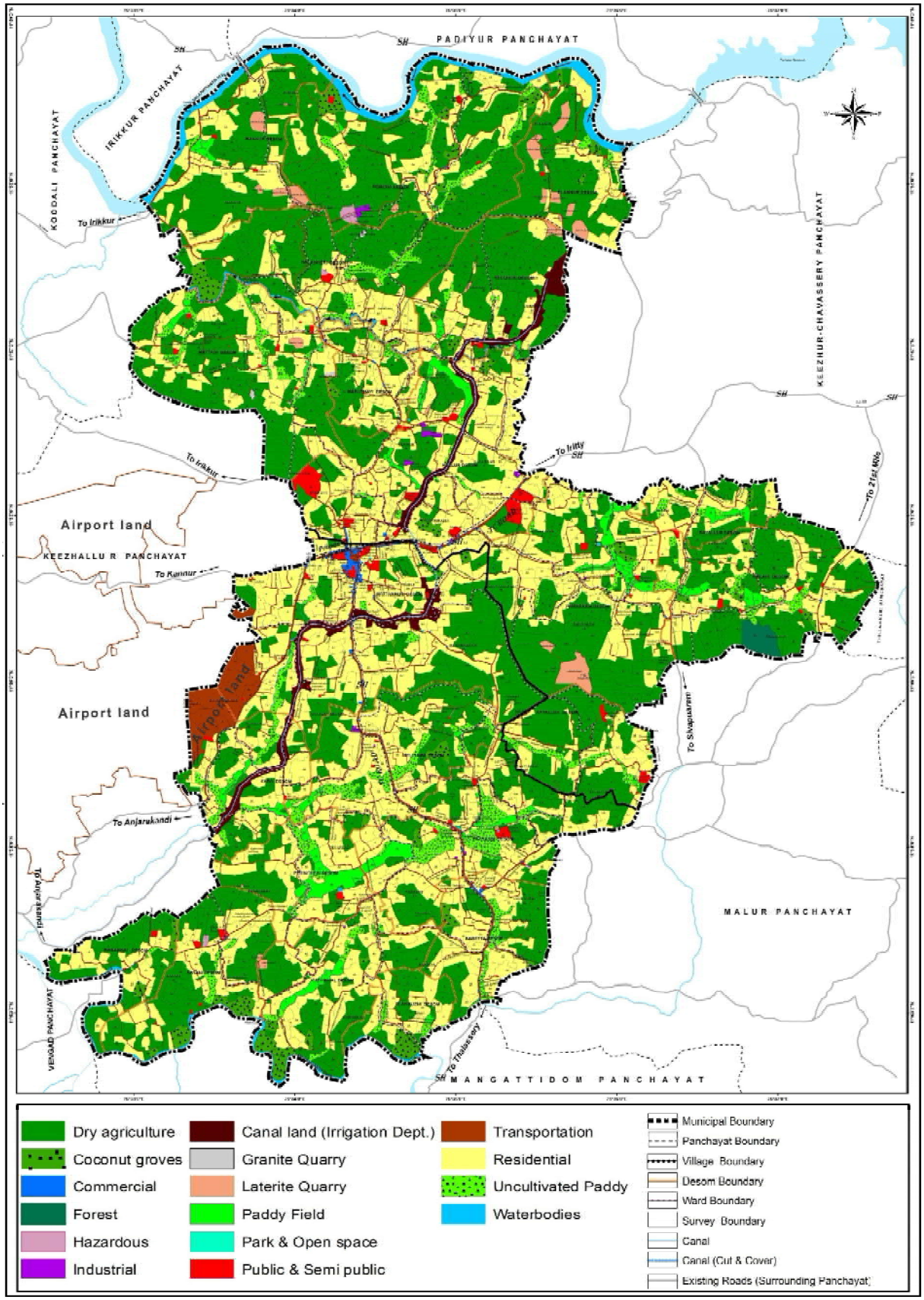


Figure 6.1a Existing land use map of Mattannur Town

Sl.No.	Landuse	Area in km^2	% of Total area
1	Dry agriculture	23.588	43.54
2	Residential	21.06	38.89
3	Transportation	3.22	5.95
4	Paddy field	1.06	1.96
5	Canal Land (Irrigation dept.)	0.61	1.13
6	Public & Semi public	0.57	1.05
7	Quarry (Laterite & Granite)	0.42	0.78
8	Forest	0.14	0.26
9	Commercial	0.08	0.15
10	Industrial	0.05	0.09
11	Hazardous	0.04	0.07
12	Park & open spaces	0.002	0.01
13	Uncultivated paddy	2.12	3.92
14	Water bodies	1.19	2.20
	Total	**54.15**	**100.00**

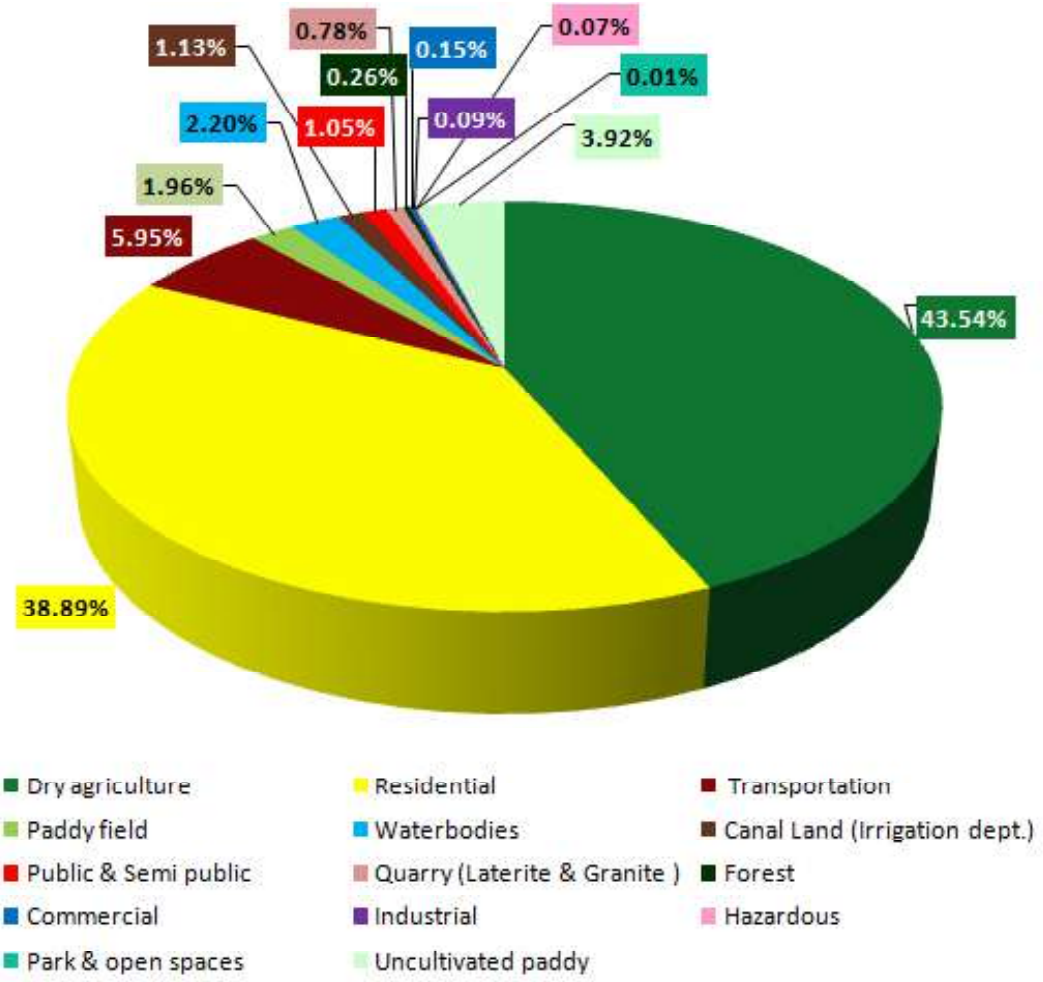


Figure 6.1b Land use break-up of Mattannur Town

Figure 6.1 a reveals that the agricultural land use is more predominant in northern and eastern portion of the Municipal Town where residential land use is less. However residential land use is high in central and southern portion of the Municipal Town. A small portion of the air port land (KIAL -Kannur International Airport Limited) within the Municipal Town constitutes an area of 0.502sq.km and is shown as transportation land use in the south-west portion of the Municipal Town. The remaining portion of air port land comes under Keezhallur panchayath.

There exists a small patch of vested forest land namely Poongottukavu Vanam, and is located at Kolari, Eastern portion of the town . The extent of land is nearly 45 acres.

The main canal of Pazhassi Irrigation Project passes through municipal area and has an extent of 0.61sq.km, nearly 1.13% of total municipal land area.

6.2 LAND USE CONCENTRATION PATTERN

The concentration pattern of land use gives an idea about where a particular land use is concentrated within the Municipal Town.

Concentration index of land use in a ward

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

(Area of that land use of Municipal Town /Total area of the Municipal Town)

The concentration index value may be greater than one, equal to one or less than one. The wards with concentration index greater than one indicates that the land use under consideration is intensively concentrated in these wards than in other wards of the Municipality. According to the above method the concentration index of various categories of land uses are analyzed.

6.2.1 Residential land use

The distribution of concentration index of residential land use is shown in Figure 6.2. From the figure, it is clear that the residential land use is concentrated mainly in the middle and southern portion of the Municipal town. Anikari, Palottupally, Kallerikkara and Mattannur are the wards having high concentration index (greater than 1.5) and are situated along the major corridors. However, residential land use concentration is greater than 0.5 in all wards of the town.

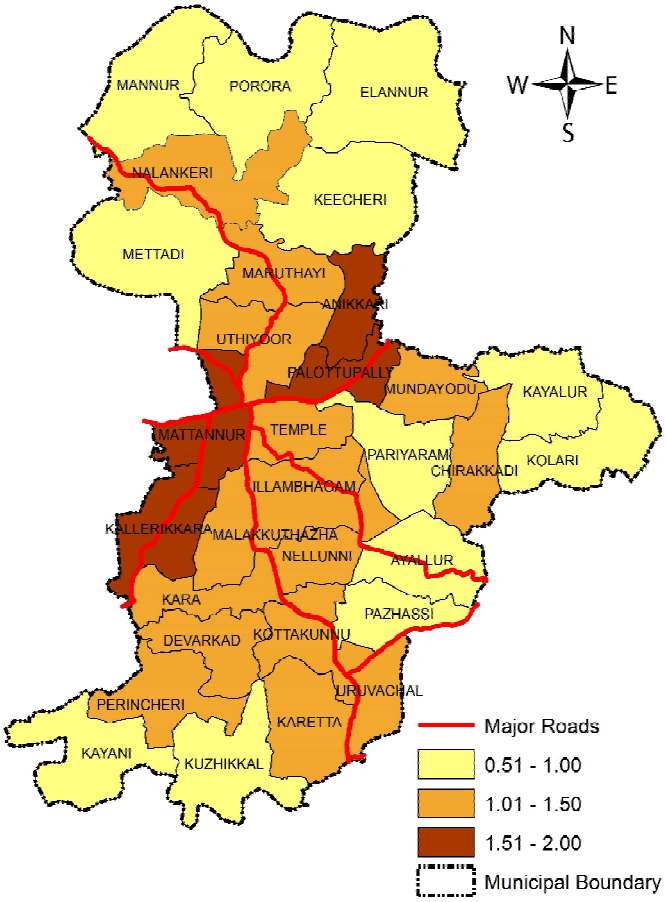


Figure 6.2 Concentration pattern of residential land use

6.2.2 Commercial land use

Figure 6.3 represents the distribution of concentration index of commercial land use in Mattannur town. It is evident that the commercial land use is mainly concentrated in the core of the town comprising of three wards namely Mattannur (concentration index-13.20), Temple ward (concentration index-5.49) and Palottupally (concentration index-4.71). Commercial activities are

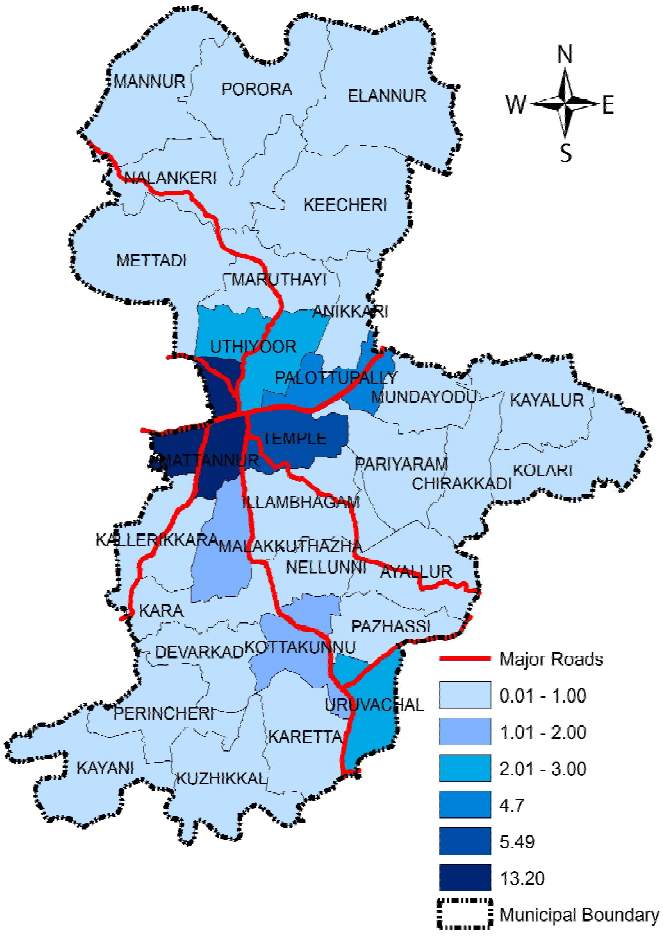


Figure 6.3 Concentration pattern of commercial land use

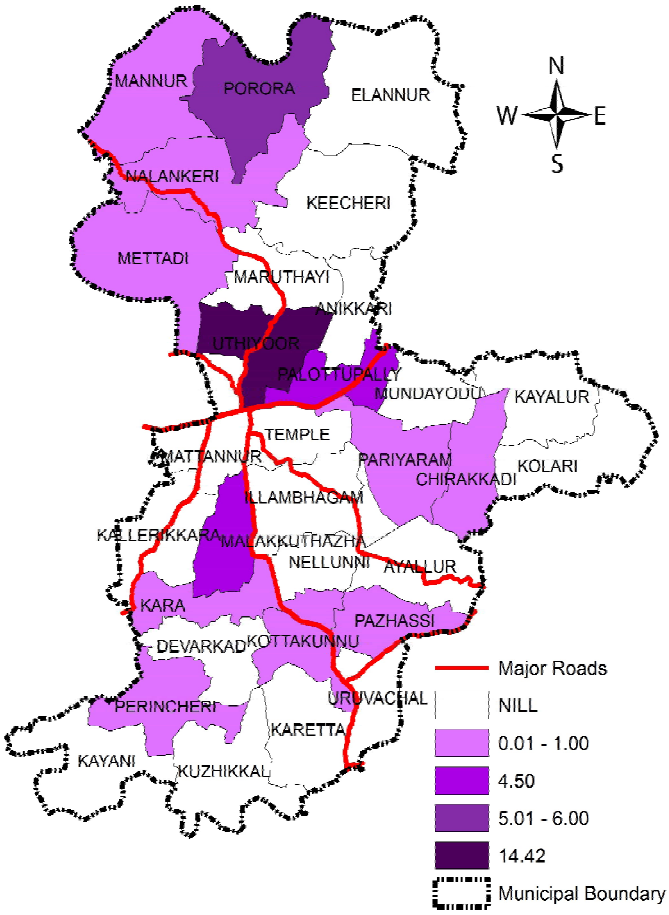


Figure 6.4 Concentration pattern of industrial land use

also seen in the middle and southern portion to a small extent. These wards include Uthiyoor, Uruvachal, Malakuthazhe and Kottakkunnu and has concentration index ranging from 1 to 3. All other 24 wards have concentration index less than one.

Commercial activities are also seen in the middle and southern portion to a small extent. The wards include Uthiyoor, Uruvachal, Malakuthazhe and Kottakkunnu and has concentration index ranging from 1 to 3. All other 24 wards have concentration index less than one.

6.2.3 Industrial land use

The distribution of concentration index of industrial land use in Mattannur town is given in figure 6.4. The ward Uthiyoor, situated in the middle portion has the highest concentration index (14.42) for industrial land use.

Industrial land use concentration is high in three other wards namely, Porora, Palottupally and Malakkuthazhe with concentration index ranging from 4.5 to 6. Eleven other wards in the north-west and southern portion have concentration index less than one. However, the remaining sixteen wards do not have industrial land use concentration.

6.2.4 Public and semi public land use

Figure 6.5 shows the distribution of concentration index of public and semi public land use. Concentration index is high in the central core of the Municipal town comprising of three wards namely Uthiyoor, Mattannur and Temple ward and values are 3.65, 1.91, 1.39 respectively

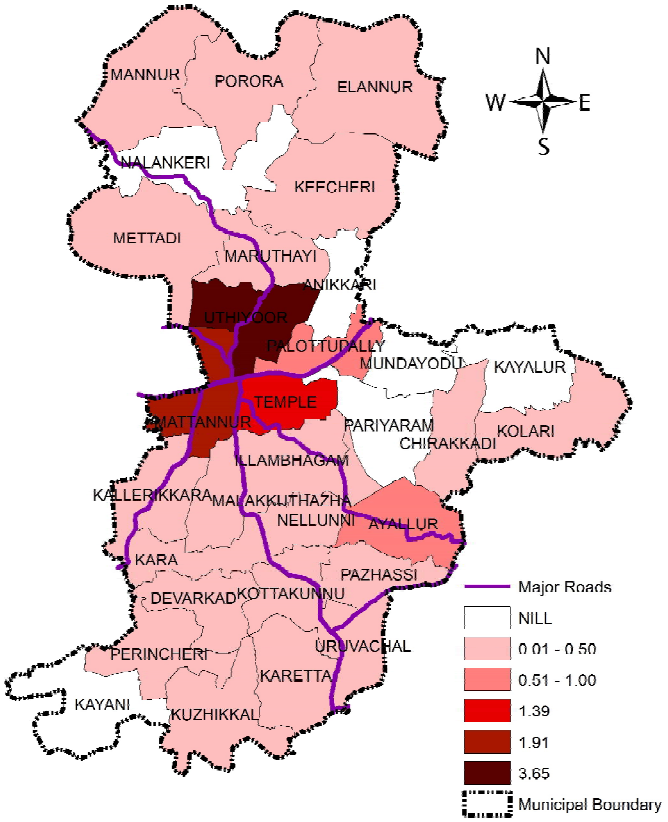


Figure 6.5 Concentration pattern of public and semi public land use

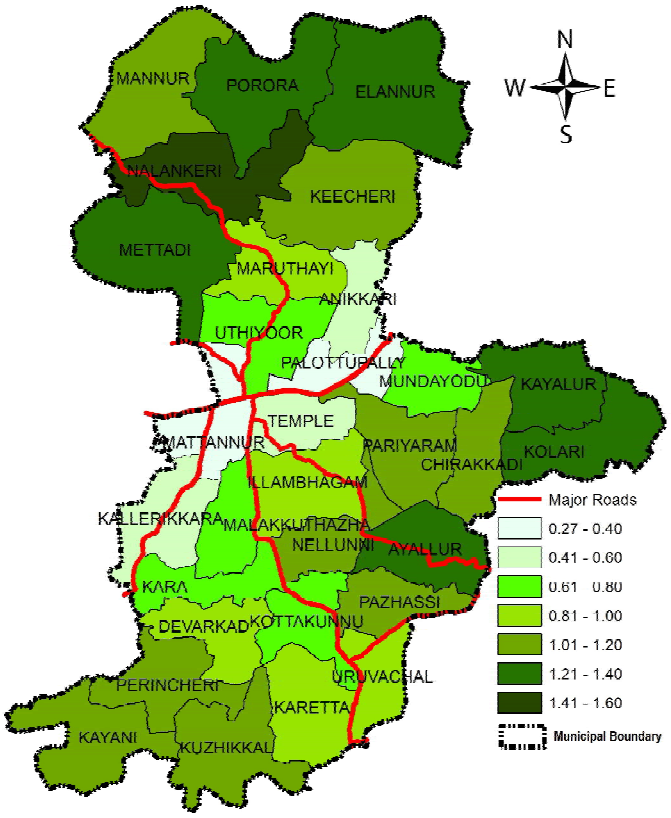


Figure 6.6 Concentration pattern of agricultural land use

Concentration index of public and semi public land use is zero in six wards namely, Nalankeri, Aanikkari, Mundayode, Kayallur, Pariyaram and Kayani. The remaining 22 wards situated in the northern and southern portion of the Municipality have low concentration index (less than one).

6.2.5 Agricultural land use

Figure 6.6 shows the distribution of concentration index of agricultural land use in Mattannur town. High concentration of agricultural land use is seen in wards situated along the northern, eastern and southern periphery of the Municipal town (Concentration Index greater than 1.0). Agricultural predominant wards in Mattannur Municipal town includes Nalankkeri, Mettadi, Porora, Elannur, Kayallur, Kolari and Ayyallur with concentration index ranging from 1.21 to 1.42

Agricultural land use concentration is low in the middle portion of the Municipal town where other activities are mainly concentrated. However all wards of the town have agricultural concentration index greater than 0.2.

6.2.6 Water bodies and Paddy fields

Spatial distribution of water bodies and paddy fields within the municipal area is shown in figure 6.7. The major water bodies in Mattannur town includes Irikkur river (Valapattanam river) at northern boundary, Anjarakkandy river at southern boundary, Cholathodu a tributary of Irikkur river, Vayanthode and Karetta thodu, tributaries of Anjarakkandy river, many other small streams, ponds and canal of Pazhassi Irrigation Project. There is no branch canal found constructed in the municipal area. And there is no water logged area, marshy land or mangrove area within the town. The water body covers an area of 1.19 sq.km. which constitutes nearly 2.2% of taotal land use area of the town.

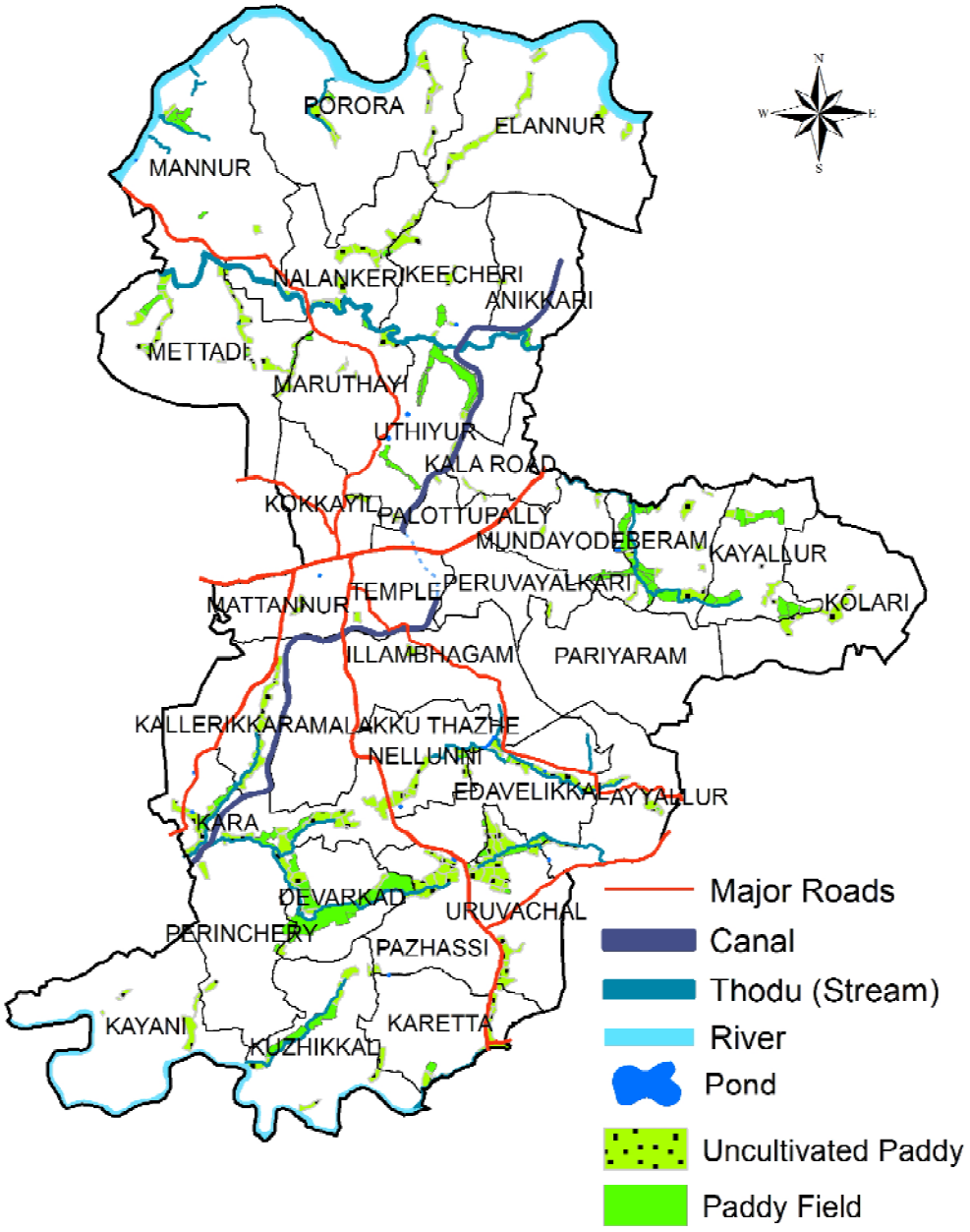


Figure 6.7 Spatial distribution of water body and Paddy fields

Paddy fields are evenly distributed in all portions of the municipal area and the total land use area is 3.18sq.km. which constitutes 5.88% of the total municipal area. The paddy fields are identified as cultivated area and uncultivated area. The cultivated portion constitutes 1.06sq.km.(1.96% of municipal area) while uncultivated portion constitutes nearly double the area with 2.12sq.km. (3.92% of municipal area). The rapid urbanisation has resulted in higher demand of land which in turn resulted in higher cost of land and hence the paddy fields are being converted to other uses, mainly residential uses.

6.2.7 Other land uses

The other land uses include Transportation, Forest, Park and Open Spaces, Canal land of Irrigation Department and Quarry land. The spatial distribution of other major land uses in Mattannur Municipal town is shown in Figure 6.8. The transportation network within the town includes State Highway (SH-30), Major

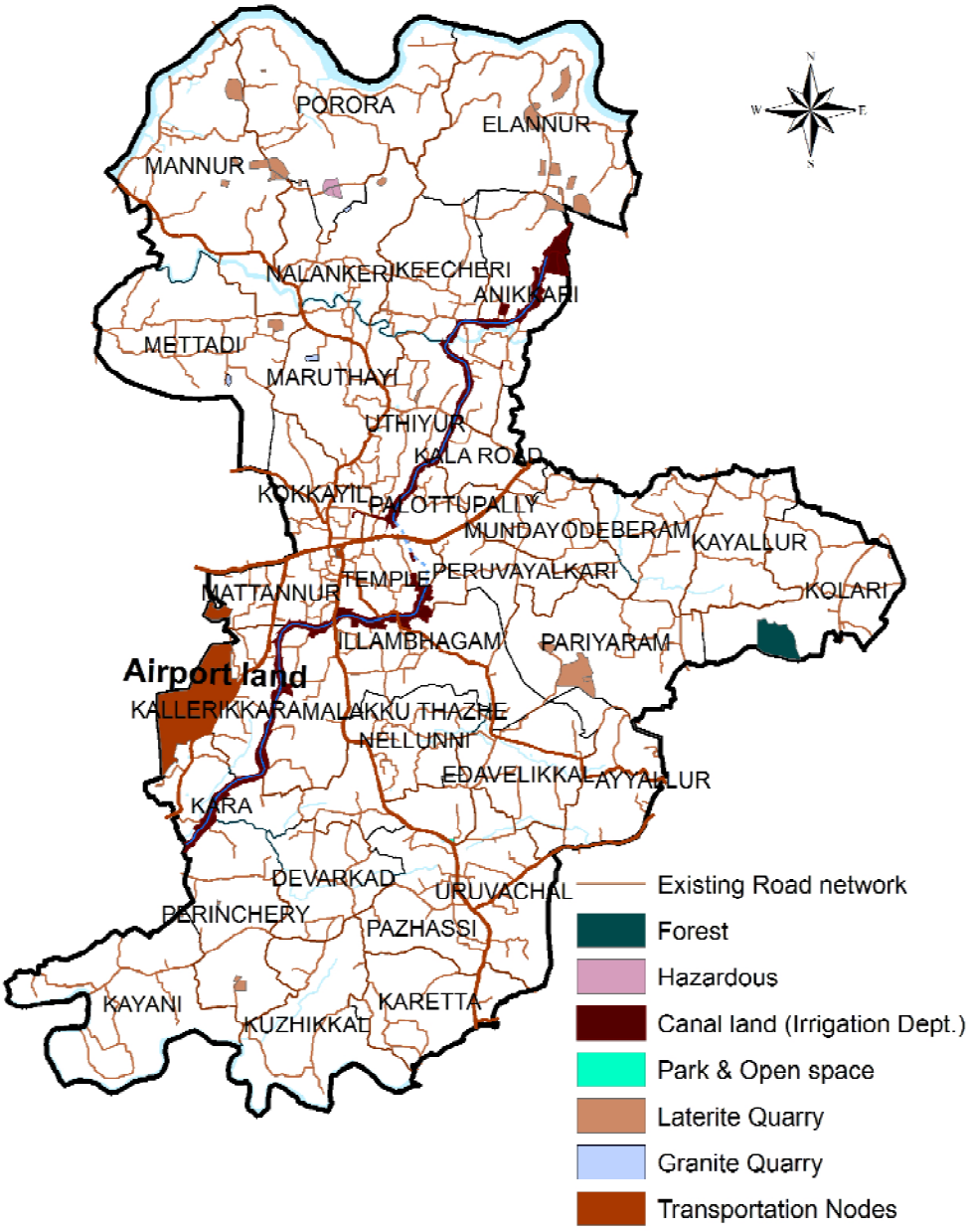


Figure 6.8 Spatial distribution of other major land uses

District Roads (MDR), Other District Roads (ODR) and Municipal roads, exisitng bus stand and airport land. Major roads are Thalassery - Coorg road (SH-30), Kannur road, Mannur-Irikkur road, Kololam–Irikkur road, Anjarakandy road and Sahina Theatre-Ayyallur-Sivapuram road

The highest density of road network is seen in the core area and decreases towards periphery. A small portion of forth coming airport (Kannur International Airport Limited-KIAL) is located in the western part of the municipal town and covers an area of 0.502 Km^2. The total area occupied by transportation land use is 3.22sq.km. which accounts for 5.95% of the total municiapl area. Parks, Play ground and other recreational land uses are very meagre in the municipal area. Only 0.002Km^2 area is used as park and playground which constitutes 0.004% of total municipal land area.

The main canal of Pazahassi Irrigation Project passes through the Mattannur town. The canal and related lands owned by Irrigation Department have an area of 0.61sq.km. which constitute 1.13% of total land use area. There exists a small patch of forest land, namely Poongottukavu vanam, within the municipal area. This evergreen vested forest has an extent of 0.14sq.km. which comprises 0.26% of total municipal land.

There are a lot of abandoned and active quarries in Mattannur municipal area. Laterite mining is a major activity in northern parts of the town. Most of the abandoned laterite quarries are now got filled and converted either for rubber plantation or for residential purposes. There is only one granite quarry found working at the south side of the Municipal trenching ground at Karithurparamba. A defunct and abandoned quarry is situated at the north side of P.R.N.S.S. College and another one at the north-east side at Mettadi area. The total land use area of quarries is 0.42sq.km. and constitutes 0.78% of the total area. In this, 0.29sq.km. is laterite mining area and 0.13sq.km. is granite mining area.

6.3 COMPARISON OF LAND USE OF OTHER MUNICIPAL TOWNS IN THE DISTRICT

Kannur Town and Thalassery town are excluded from the land use comparison of adjoining towns in the district owing to the large percentage of built-up area in the existing land use. The land use pattern of the remaining towns, Thaliparamba, Payyannur and Koothuparamba along with Mattannur town is compared as shown in Table.6.1 and Figure 6.9.

All major urban land uses like commercial, public and semi public, industrial, recreational etc. are found nominal in the case of Mattannur town and their percentage values are also found least when compared to other municipal towns like Koothuparamba, Taliparamba and Payyannur within the district.

The residential land use percentage is only 38.89% which is of least value when compared to other towns. The percentage of transportation land use is the highest in the comparison only because of the inclusion of 0.502sq.km of airport land into transportation land use. The percentage of dry cultivation area of Mattannur

Table 6.1 Comparison of Land use of other Municipal Towns in the district

Land use	Mattannur		Koothuparamba		Taliparamba		Payyannur	
	Area in Sq.km	% of Area	Area in Sq.km	% of Area	Area in Sq.km	% of Area	Area in Sq.km	% of Area
Residential	21.06	38.89	10.52	62.74	25.81	59.92	26.10	47.80
Commercial	0.08	0.15	0.11	0.68	0.22	0.52	0.38	0.70
Public and semipublic	0.57	1.05	0.54	3.22	1.73	4.01	1.01	1.80
Industrial	0.05	0.09	0.03	0.19	0.29	0.67	0.06	0.10
Transportation	3.22	5.95	0.71	4.23	1.55	3.59	1.79	3.20
Paddy & Uncultivated paddy	3.18	5.87	0.47	2.80	4.06	9.43	5.37	12.30
Dry Agriculture & Coconut groves	23.59	43.56	4.18	24.93	5.04	11.71	12.86	23.50
Parks & Open space	0.002	0.01	0.02	0.12	0.1	0.24	0.06	0.10
Water bodies	1.19	2.20	0.06	0.37	2.62	6.09	4.56	8.30
Others	1.21	2.236	0.12	0.72	1.66	3.82	2.44	2.20
Total	***54.15***	***100***	***16.76***	***100***	***43.08***	***100***	***54.63***	***100***

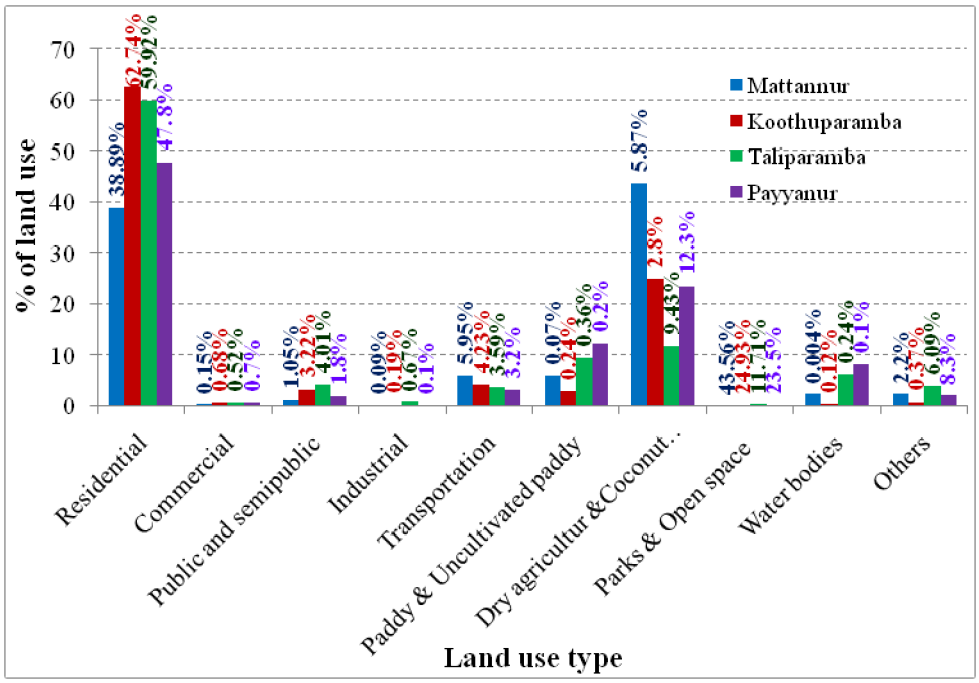


Figure 6.9 Comparison of land use of other municipal towns in the District

town is highest among the towns in the district and has a high value of 43.56%. percentage of paddy field land use is second largest among the towns just behind the Payyannur town.

6.4 COMPARISON OF LAND USE WITH SIMILAR TOWNS IN THE STATE

Table 6.2 Shows the comparison of land use pattern of Ottappalam and Thirur towns along with Mattannur town.

Table 6.2 Comparison of land use with similar towns in the State

Land use	Mattannur		Ottappalam		Thirur	
	Area in Sq.km	% of Area	Area in Sq.km	% of Area	Area in Sq.km	% of Area
Residential	21.06	38.89	11.98	36.69	7.58	45.78
Commercial	0.08	0.15	0.23	0.71	0.52	3.14
Public and semipublic	0.57	1.05	0.91	2.79	0.54	3.28
Industrial	0.05	0.09	0.28	0.85	0.01	0.06
Transportation	3.22	5.95	1.60	4.89	0.92	5.56
Paddy & Uncultivated paddy	3.18	5.87	6.80	20.83	1.19	7.16
Dry Agriculture & Coconut groves	23.59	43.56	6.27	19.21	4.82	29.1
Parks & Open space	0.002	0.01	0.02	0.07	0.01	0.04
Water bodies	1.19	2.20	1.39	4.24	0.37	2.26
Others	1.21	2.23	3.18	9.72	0.60	3.62
Total	***54.15***	***100***	***32.66***	***100***	***16.56***	***100***

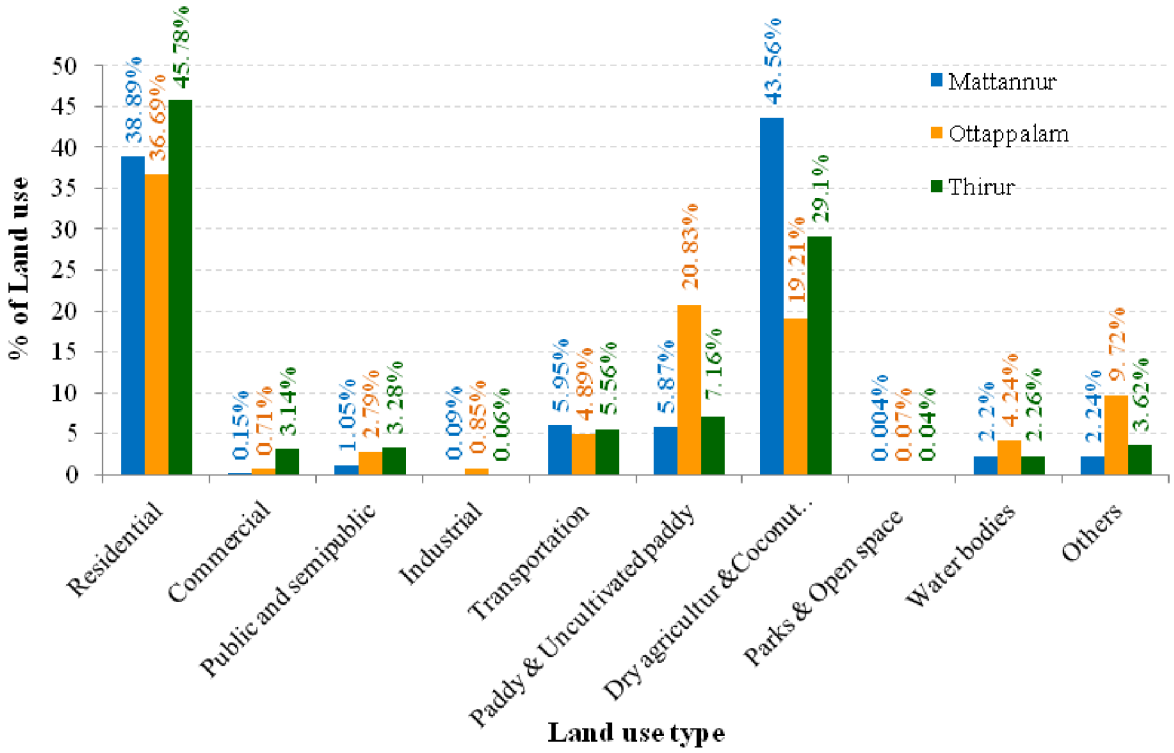


Figure 6.7 Comparison of land use of similar towns in the State

Among the towns Mattannur has got a high percentage value for dry cultivation land use. The inclusion of airport land into transportation zone accounts for the highest percentage of transportation land use when compared to the other two towns. The percentage values of residential land use and industrial land use have middle values but all other major land uses like commercial, public and semi public, paddy field and uncultivated paddy field etc. have least value of percentage when compared to Ottappalam and Thirur.

6.5 COMPARISON OF EXISTING LAND USE WITH PLANNING STANDARDS.

As per the criteria given in UDPFI guidelines, Mattannur town can be identified as a 'small town in hilly area' for the comparison with planning standards. For this purpose the developed area is calculated as 25.022Ha which is the sum of land use areas of residential, commercial, industrial, public and semi-public, transportation, hazardous and park and open spaces. The developed land use is only 46.21% of the

Table 6.3 Comparison of existing land use with planning standards

Sl. No.	Land Use	Area in Sq.km	Existing Percentage of total area	% of Developed Area	Requirement for Small Hill towns as per planning standard
1	Residential	21.06	38.89 %	84.17 %	50 – 55 %
2	Commercial	0.08	0.15 %	0.32 %	2 – 3 %
3	Industrial	0.05	0.09 %	0.20 %	3 – 4 %
4	Public and Semi-public	0.57	1.05 %	2.27 %	8 – 10 %
5	Recreational	0.002	0.004 %	0.008 %	15 – 18 %
6	Transport & Communication	3.22	5.95 %	12.87 %	5 – 6 %

total municipal area due to the large share of dry agriculture area within the town.

The comparison of existing land use with planning standard is shown in the table 6.3 In the developed land use portion, a lion share of 84.71% is for residential land use which exceeds the normal range of planning standards. Since, the airport land within the municipal town is included in the transportation land use, it's share also found increased (12.87%) when compared to the planning standard. While the percentage of all other important urban land uses such as commercial, industrial, public and semi public, recreational etc. are very much nominal and far below the required standard. The percentage of ecological land use is high when compared to the planning standards and is mainly due to the presence of paddy field found in abundance within the municipal area.

The developed land use calculated above excludes the ecological land use. UDPFI guidelines suggest a range of 8-10% for the ecological land use in a small hill town. Mattannur town possesses a higher value (18.02% of developed area and 8.33% of total area) for ecological land use which constitutes forest, paddy and water body land uses.

6.6 INFERENCE

The spatial distribution of land use in Mattannur Municipal town reveals that the agricultural activities are mainly concentrated in the northern and eastern portion of the Municipal town. Dry agriculture is more prominent in northern part where as paddy fields are mainly concentrated in the eastern and southern part of the Municipality. Non agricultural activity including residential land use is mainly concentrated in the middle portion. Commercial, industrial and Public & semi public land use are concentrated in the core area of the town along the major corridors.

Activity pattern and functional character are the two major Urban parameters determined by the analysis of land use concentration pattern in conjuction with demographic details, hierarchy of junctions, hierarchy of settelements etc. The ward wise study of functional character and activity pattern are shown in detail in succeding chapter 24 (Spatial Structure).

The ward wise analysis of functional character reveals that there are only five urban wards out of wards in the municipal area and are situated at the middle portion of the town along major corridors like Thalassery-Coorg road, Kannur Road and Anjarakkandy Road. The six peripheral wards are found to be rural in character and six wards around the urban wards show semiurban character and all remaining fourteen wards have semirural character.

The ward wise study of activity pattern shows that there are only six wards with urban activity pattern. In the remaining wards thirteen wards have secondary activity pattern and twelve wards have primary activity pattern.



Chapter-7

AGRICULTURE AND IRRIGATION

Majority of the population of Kannur District depends on agriculture, fisheries and other related industries for their livelihood. Mattannur town being one among the six municipal towns of Kannur District, is agriculturally predominant. Paddy, coconut, pepper, cashew, tapioca and arecanut grow abundantly in this area. Plantation crops like rubber are also cultivated in the hillocks of the municipal area.

The types of soil in Mattannur Municipal town are red earth, gravel, loamy soil and black soil. The red earth and lateritic soil are generally suitable for most of the dry land crops. It is mainly cultivated with coconut, arecanut, banana, tapioca, vegetables, yams, pepper, pineapple, fruit tree, cashew etc.

Water is an essential production factor in agriculture, both for crops and for livestock. Climate change will have a significant impact on agriculture in terms of water quantity and quality, thus creating a need for irrigation during the dry season. Irrigation is the artificial application of water to the land or soil. It provides assistance in the growing of agricultural crops, maintenance of landscapes and revegetation of disturbed soils in dry areas. Mattannur Municipal Town depends on some localized minor irrigation facilities for cultivation during dry season.

Table 7.1 Temporal variation in area, production and productivity of major crops of Mattannur Municipal town

Type of crop	Area (Ha)				Production (Tonne)				Productivity (Tonne/Ha)			
	2003-04	2007-08	2009-10	2011-12	2003-04	2007-08	2009-10	2011-12	2003-04	2007-08	2009-10	2011-12
Coconut	3440	3406	3406	3366	2,70,90,000 (Nuts)	2,68,22,250 (Nuts)	2,50,34,100 (Nuts)	2,62,71,000 (Nuts)	45 Nuts/Palm	45 Nuts/Palm	42 Nuts/Palm	45 Nuts/Palm
Rubber	177	225.9	316.26	357.7	247.80 Ton	332.70 Ton	541.36 Ton	643 Ton	1.4 Ton/Ha	1.47 Ton/Ha	1.71 Ton/Ha	1.79 Ton/Ha
Cashew	800	745	645.98	332	640 Ton	596 Ton	678.28 Ton	379.84 Ton	0.80 Ton/Ha	0.80 Ton/Ha	1.05 Ton/Ha	1.14 Ton/Ha
Plantain & Banana	145.32	157.5	168.75	193.75	1412.5 Ton	1593.9 Ton	1705.2 Ton	2128 Ton	9.72 Ton/Ha	10.12 Ton/Ha	10.10 Ton/Ha	10.98 Ton/Ha
Paddy	180	180	150	120.85	477 Ton	491 Ton	450 Ton	402.52 Ton	2.65 Ton/ Ha	2.73 Ton/ Ha	3.00 Ton/ Ha	3.3 Ton/ Ha
Arecanut	215	200	200	160	3,22,50,000 (Nuts)	3,00,00,000 (Nuts)	3,60,00,000 (Nuts)	2,92,00,000 (Nuts)	Nuts/Palm	150 Nuts/Palm	150 200 Nuts/Palm	183 Nuts/Palm
Pepper	210	189	189	189	84 Ton	75.60 Ton	86.95 Ton	88.20 Ton	0.40 Ton/Ha	0.4 Ton/Ha	0.46 Ton/Ha	0.47 Ton/Ha

7A. AGRICULTURE

7A.1 ANALYSIS OF EXISTING STATUS

Even though there is a decline in primary activities, agriculture is still the main occupation in Mattannur Municipal Town. The total agricultural land in Mattannur Municipal Town is 26.77sq.km which constitutes about 49.44% of the total municipal area. Out of the total 28.44 sq.km land, dry cultivation accounts for 23.59 sq.km constituting 43.55% of the total municipal area. Paddy fields are broadly classified into two- active paddy and uncultivated paddy. Active paddy fields covers 1.06sq.km which constitutes only 1.96% of the total area whereas uncultivated paddy covers 2.12 sq.km constituting 3.92% of the municipal area.

7A.1.1 Major crops

The major crops cultivated in the Municipal area are coconut, rubber, cashew, plantain and banana, paddy, arecanut and pepper. Table 7.1 shows the temporal variation in area, production and productivity of major crops of Mattannur Municipal Town.

The table given below indicates that the area under cashew, paddy, arecanut, coconut and pepper has decreased whereas the area under rubber, plantain and banana has increased considerably during the period 2003–2012.

The production of rubber and plantain and banana has increased with the increase in its area under cultivation. The decrease in the land under paddy, coconut, cashew and arecanut has resulted in a decrease in its production. However, the production of pepper has increased in spite of the decrease in its area during 2003-2012

The productivity of all major crops has increased during the period 2003 – 2012 which indicates the significance of agricultural sector in Mattannur Municipality.

7A.1.2 Existing pattern of agricultural land use

The figure 7.1 shows the distribution of existing agricultural land use and its concentration. The land

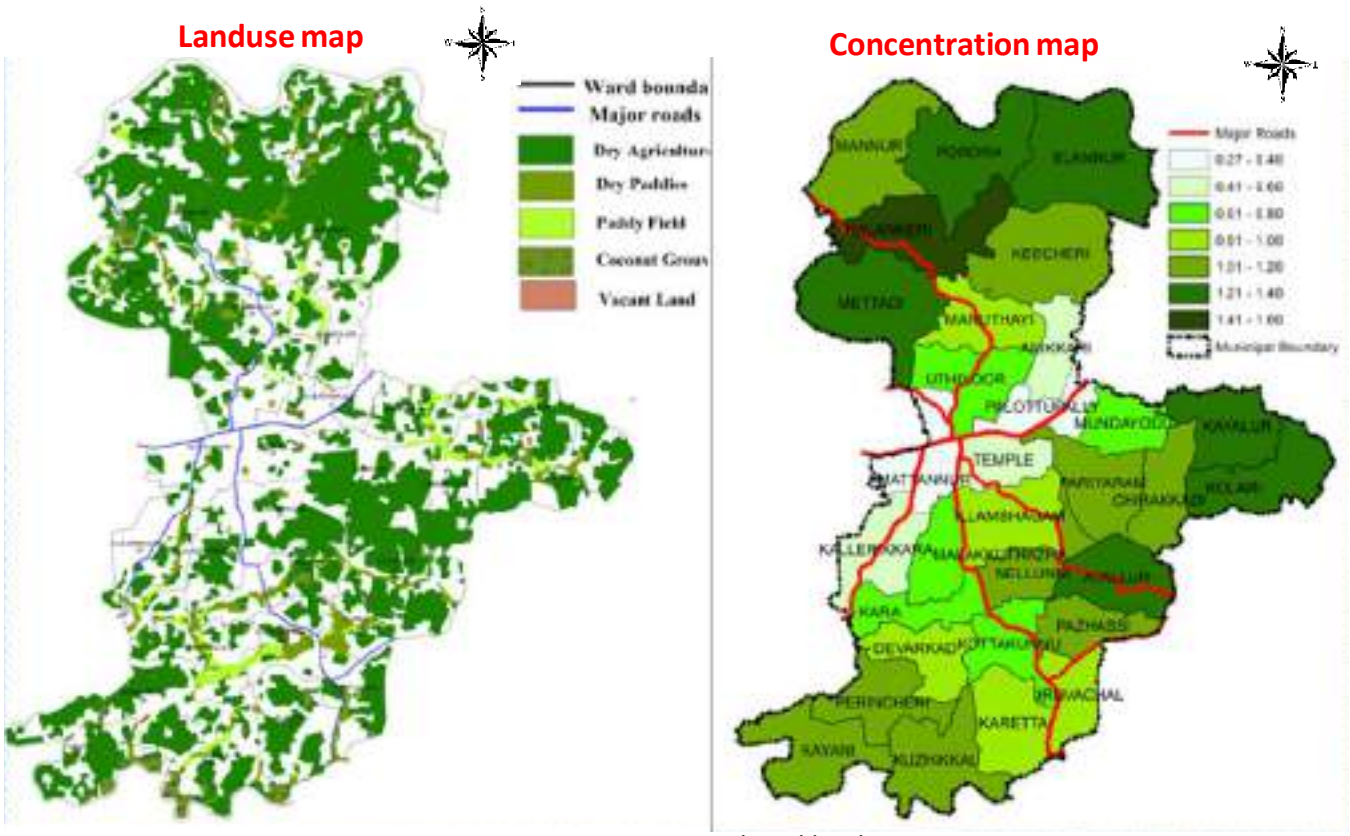


Figure 7.1 Existing agricultural land use

under agriculture includes dry agriculture, active paddy fields and uncultivated paddy fields.

The figure shows that the agricultural concentration is high in the northern and eastern part of the town. The concentration is low in the middle portion of the Municipal town along the major corridors.

7A.1.2.1 Paddy

The figure 7.2 shows the concentration of active and uncultivated paddy in Mattannur Municipal Town.

High concentration of active paddy fields are in the southern and eastern portion of the Municipal town, comprising of five wards namely Maruthayi, Mundayodu, Kara, Kottakkunnu and Devarkkadu. The highest concentration index is seen in Devarkadu ward. However the concentration index is zero in 9 wards of which 7 wards being located in the middle portion.

The uncultivated paddy fields are distributed in all wards except Malakkuthazhe where the concentration index is zero. High concentration is observed in 4 wards (Kara, Kottakkunnu, Pazhassi, Uruvachal) situated in the southern portion .

From table 7.2 it is clear that the area, production and productivity of paddy are more in 2nd crop than that of the 1st crop.

Paddy field committees known as 'Padasekhara Samithi' are constituted in 13 paddy fields.

The production of first crop (24.39 Tonne) as well as second crop (27.76 Tonne) is highest in paddy field at Perincheri, the largest paddy field in the municipal area. In Kozhumbil thazhe and Pariyaram puzha vayal only second crop is cultivated.

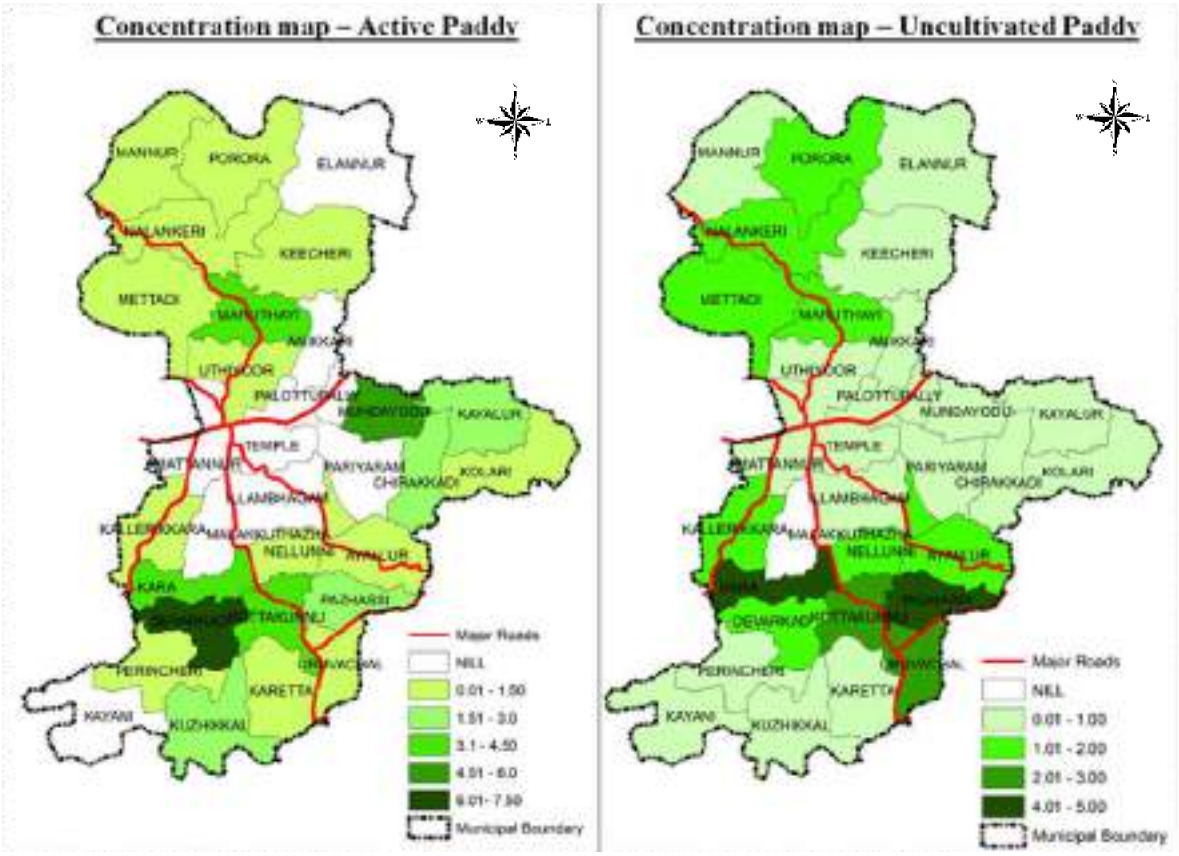


Figure 7.2 Concentration of active and uncultivated paddy in Mattannur town

The table 7.2 the crop wise details of paddy field.

Crop Type	Area of Paddy (Ha)	% Area of Cultivable land	Production (Ton)	Productivity (Ton/Ha)
First Crop	58.10	21 %	185.53	3.19
Second Crop	71.05	29 %	244.01	3.43

From table 7.2 it is clear that the area, production and productivity of paddy are more for second crop than that for the first crop.

Table 7.3 Details of existing paddy field committees

Sl No.	Name of paddy field	Included wards	Cultivable land (Ha)	Paddy in Ha		Production in tonne	
				1st crop	2nd crop	1st crop	2nd crop
1	Nalankeri	3, 32, 34	14.47	3	2.5	9.6	8.5
2	Kallur	7, 31	10.68	2	2.5	6.4	8.5
3	Kiliyangad	33	7.2	1.5	2.75	4.8	9.35
4	Pazhassi	14, 16, 17	25.52	7.5	7.5	24	25.5
5	Kuzhikkal	19	16.81	2	2	6.4	6.8
6	Kara	23, 24, 26	22.2	10	8	32	27.2
7	Kozhumbil thazhe	10	18.89		10		34
8	Nellunni	14, 15, 26	17.75	6	7	19.2	23.8
9	Mettadi	32, 33	8.9	4	2.5	12.6	8.62
10	Poonkottum kavil thazhe	11, 12	21.96	2	5	6.4	18
11	Pazhassi raja (Thazhe Pazhassi)	17, 22, 23	26.06	6	8	19.2	27.6
12	Pariyaram puzha vayal	9	7.44		3.5		11.9
13	Perincheri	21, 22	26.45	7.6	8	24.39	27.76
	Total		**224.33**	**51.6**	**69.25**	**164.99**	**237.53**

7A.1.2.2 Cash crops

Major cash crops in Mattannur Municipal town includes coconut, pepper, arecanut, rubber and cashew.

The ward wise distribution of cash crops in Mattannur Municipal Town is shown in Table 7.4.

The table shows that coconut (residential coconut mix) covers largest area (3522.7 Ha) constituting 65% of municipal land area followed by Rubber (358.7 Ha), Cashew (330.5 Ha), Pepper (189 Ha) and Arecanut (160 Ha). The wards namely, Mannur, Porora, Elannur, Mettadi and Kayani are the leading producers of cash crops in Mattannur municipal area.

Land use concentration index map for the major cash crops are given in the figures 7.3, 7.4, 7.5, 7.6 and 7.7. The spatial distribution of cash crops can be analysed by using these maps.

Table 7.4 Ward wise distribution of cash crops (area in Hectares)

Ward No.	Ward Name	Coconut	Pepper	Arecanut	Rubber	Cashew
1	Mannur	179.3	7.8	8	43.9	39.2
2	Porara	167.9	16.2	9.6	41.7	45.13
3	Elannur	224.72	20.4	10.5	46.1	36.7
4	Keecheri	88.08	7.2	3.8	8.6	4.6
5	Anikkari	118.9	4.9	5.7	1.6	0.9
6	Kalaroad	54.5	1.2	2	0.5	0.3
7	Palottupally	49	0.5	0.5	0.5	0.4
8	Peruvayalkari	67	0.8	0.5	5.6	3.1
9	Mundayod	69.7	2.1	4.3	3.1	1.2
10	Beram	78.2	2.8	4.6	1.8	1.5
11	Kayallur	106.6	2.9	4	16.5	17.2
12	Kolari	99.7	2.5	4.5	28.2	24.3
13	Pariyaram	113.3	6.9	6.2	10.7	11.2
14	Ayallur	91	10.2	4.2	5.4	5.6
15	Edavelikkal	93.7	11.4	3.4	4.3	4.8
16	Uruvachal	69.6	4.2	3.8	5.6	4.5
17	Pazhassi	78.2	3.3	3.7	3.8	2.9
18	Karetta	88.4	9.6	5.2	13.4	15.2
19	Kuzhikkal	118.5	5.9	5.8	12.7	14.8
20	Kayani	168.32	9	7.5	21.3	16.3
21	Perinchery	86.2	8.5	4.4	5.9	6.8
22	Devarkkad	109.1	4.9	4	3.8	4.2
23	Kara	98.2	10.1	5.8	8.6	6.1
24	Kallerikkara	118.2	6.2	5.1	3.8	2.7
25	Malakku thazhe	114.9	4.1	3.1	1.4	1.2
26	Nellunni	76.98	3.2	4.5	8.7	7.2
27	Illambhagham	99.5	2.2	4.2	3.4	2
28	Temple	63	0.8	2.1		0.5
29	Mattannur	78.3	0.2	3		0.4
30	Kokkayil	66.3	0.3	2.7		0.7
31	Uthiyoor	89.1	2.4	4.1	3.7	4.1
32	Maruthayi	89.6	4.2	4.4	9.6	10.7
33	Mettadi	159.8	5.6	7.8	18.2	19.4
34	Nalankeri	148.9	6.5	7	16.3	14.67
Total		**3522.7**	**189**	**160**	**358.7**	**330.5**

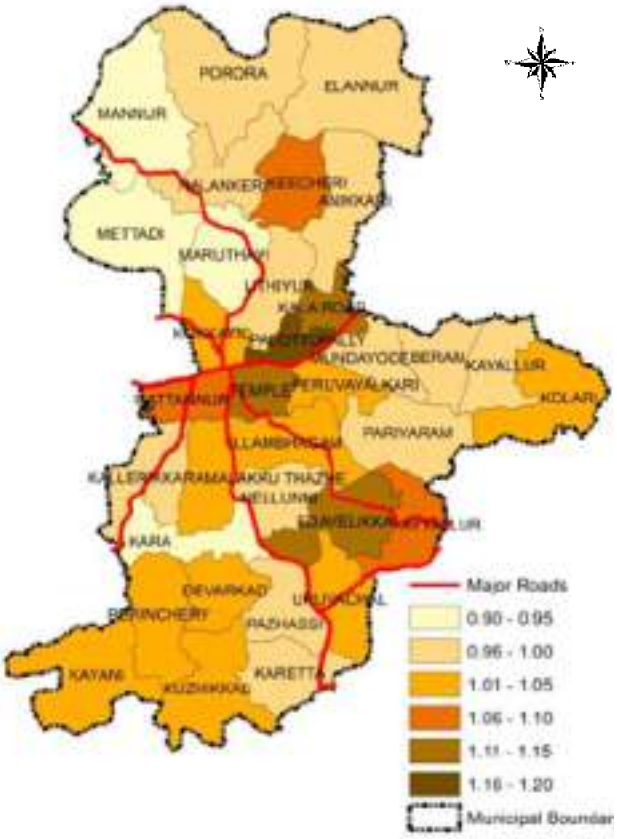


Figure 7.3 Land use concentration index of coconut in Mattannur Municipal Town



Figure 7.5 Land use concentration index of pepper in Mattannur Municipal Town

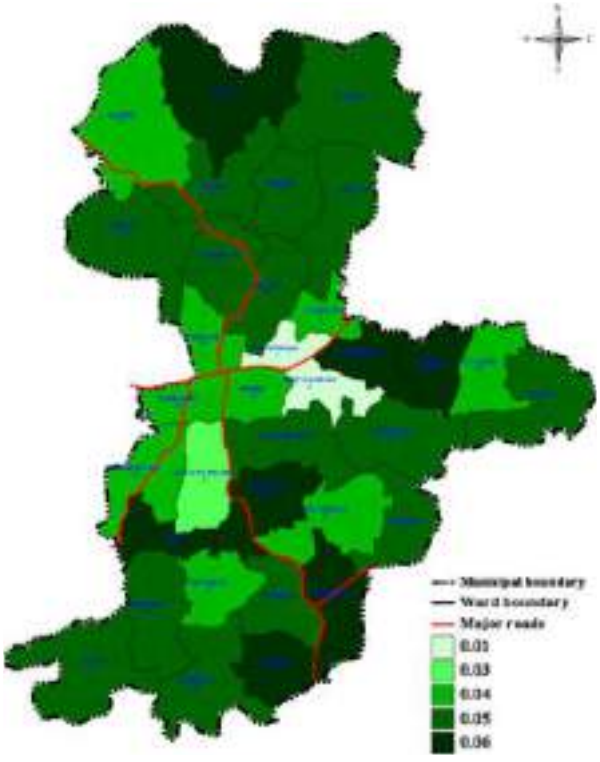


Figure 7.4 Land use concentration index of arecant in Mattannur Municipal Town



Figure 7.6 Land use concentration index of cashew in Mattannur Municipal Town

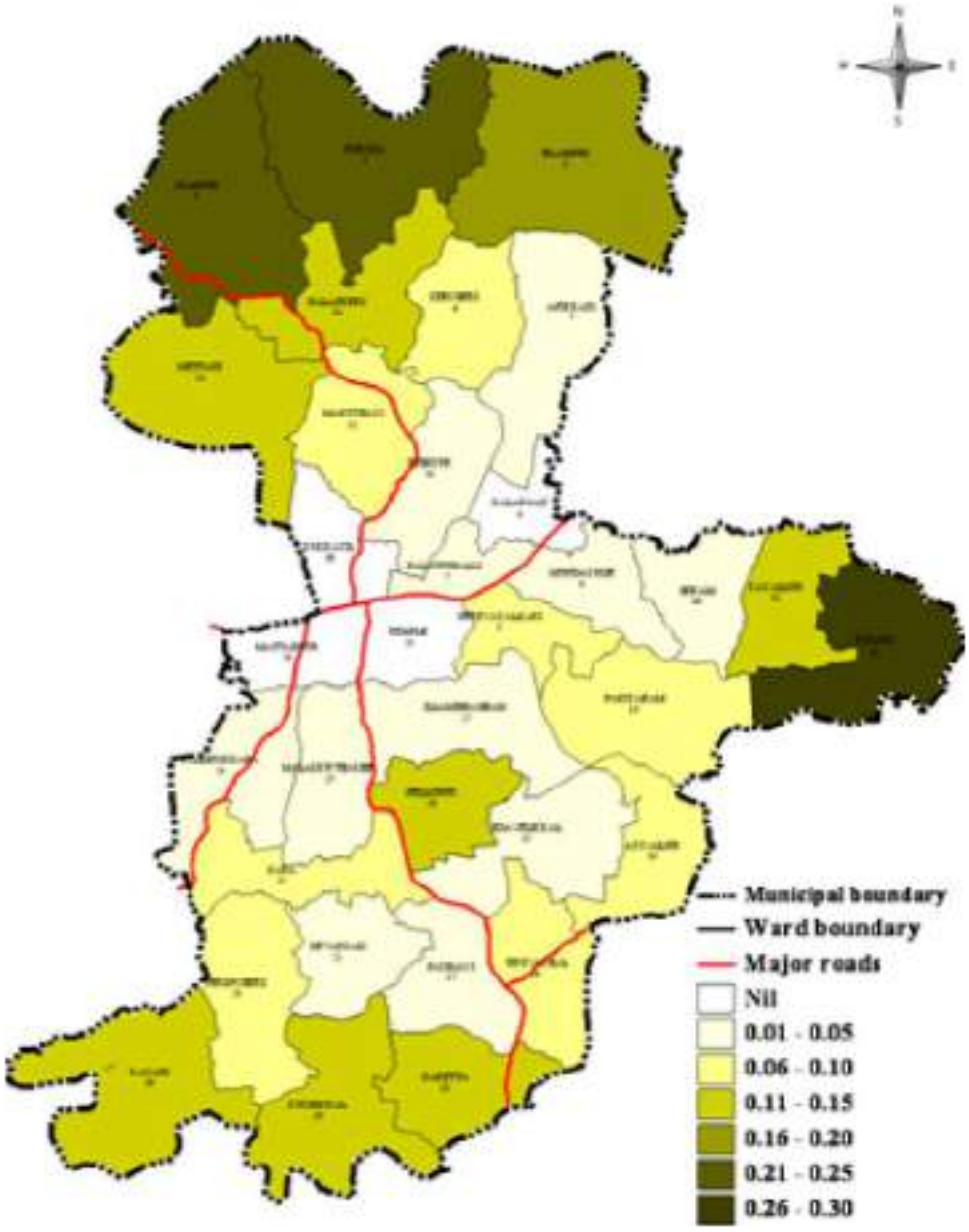


Figure 7.7 Land use concentration index of rubber in Mattannur Municipal Town

7A.1.3 Minor crops

Minor crops in Mattannur Municipal town includes banana, plantain, tapioca, yam, colocasia and vegetables



Wards situated in the northern portion of Mattannur municipal town (Mannur, Porora, Elannur, Keecheri, Maruthayi, Mettadi and Nalankeri) are the leading wards in the producers of Vegetables, Banana, Plantain and Tuber crops.

Table 7.5 Area and production of miner crops

Ward No.	Ward Name	Banana		Plantain		Tapioca		Yam, Colocasia etc.		Vegetables	
		Area in Ha.	Production tone	Area in Ha.	Production tone	Area in Ha.	Production tone	Area in Ha.	Production tone	Area in Ha.	Production tone
1	Mannur	9	126	3	12	4	81.6	1.5	22.5	16	220
2	Porara	13	182	2	8	3	61.2	1.5	22.5	12	168
3	Elannur	12.5	175	3	12	3	61.2	1.5	22.5	1	14
4	Keecheri	10	140	2	8	3	61.2	0.75	11.25	0.5	7
5	Anikkari	1.5	21	1	4	1	20.6			0.25	4
6	Kalaroad	0.25	3.5	1	4						
7	Palottupally	0.25	3.5	1	4	0.5	10.2			0.2	2
8	Peruvayalkari	1	14	1	4	0.5	10.2			0.25	3
9	Mundayod	2	28	1.5	6	1	20.4			0.5	6
10	Beram	7	98	2	8	2	40.8	0.25	3.75	1	13
11	Kayallur	7	98	2	8	3	61.2	0.75	11.25	1	13
12	Kolari	7	98	2	8	3	61.2	0.75	11.25	1.5	20
13	Pariyaram	5	70	4	16	2	40.8	0.75	11.25	1.5	20
14	Ayallur	1	14	5	20	2	40.8			1	14
15	Edavelikkal	1	14	2	8	2	40.8			1	14
16	Uruvachal	4	56	1	4	3	61.2			1	14
17	Pazhassi	7	98	1	4	2.5	51	1.25	18.75	5	70
18	Karetta	7	98	1	4	1	20.4			1	13
19	Kuzhikkal	4	56	2	8	2.5	51	0.75	11.25	1.5	20
20	Kayani	5	70	2	8	2	40.8	0.75	11.25	1.5	20
21	Perinchery	4	56	2	8	1	20.4			2	24
22	Devarkkad	2	28	4	16	1	20.5			4	48
23	Kara	6	84	2	8	2.5	51	1.25	18.75	2	25
24	Kallerikkara	2	28	1	4	0.5	10	0.25	3.75	1	12
25	Malakku thazhe	0.5	7	0.25	1	0.25	5	0.75	11.25	0.5	7
26	Nellunni	2	28	1	4	2	40	0.75	11.25	1	13
27	Illambhagham	0.25	3	0.5	2					0.25	4
28	Temple			0.25	1						
29	Mattannur					0.25	5				
30	Kokkayil			0.25	1	0.25	5			0.25	3
31	Uthiyoor	0.5	7	0.25	1	0.25	5			0.5	7
32	Maruthayi	8	112	1	4	3	60.1	0.75	11.25	8	120
33	Mettadi	7	98	1.5	6	4	80.2	0.75	11.25	8	120
34	Nalankeri	8	112	2	8	6	120.2	0.75	11.25	4	60
	Total	136.75	1914	53.5	214	56	1138.8	15	225	75.2	1038
Rate of Production			**14t/Ha**		**4t/Ha**		**20.3t /Ha**		**15t/Ha**		**13.86t /Ha**

7A.1.4 Classification of land holdings

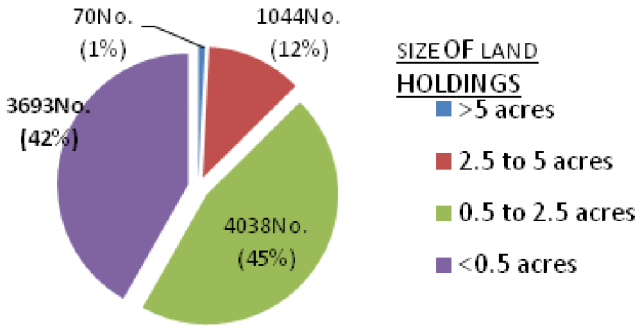


Figure 7.8 Classification of land holdings in Mattannur Municipal Town

The pie chart shows that the major land holding size in Mattannur Municipal Town falls in the groups of 0.5-2.5 acres (45%) and below 0.5 acres (42%) which indicates the trend of fragmentation of agriculture land. The total number of land holdings is 8845.

7A.1.5 Agricultural infrastructure

Agricultural Department is giving much importance to farm mechanization for tackling the problem of labour shortage and to improve the productivity .

7A.1.5.1 Mechanization Detail

Table 7.6 gives the details of agro based machineries available to the various paddy field committees.

7A.1.5.2 Agriculture Markets

Table 7.6 Details of Mechanization

Sl. No.	Name of paddy field	Included wards	Available Agro-Machines							
			Power Tiller	Weeding Machine	Harvesting Machine	Threasurer machines	Winnower	Knap sack Sprayer	Rocker Sprayer	Power Sprayer
1	Nalankeri	3, 32, 34	1	1	1	1	1	2	1	
2	Kallur	7, 31	1	2				1		1
3	Kiliyangad	33	1			1		2		
4	Pazhassi	14, 16, 17	1	2		1		1	1	
5	Kuzhikkal	19	1					2		
6	Kara	23, 24, 26	1	2						1
7	Kozhumbil thazhe	10	1	2	1	1	1	2		
8	Nellunni	14, 15, 26	1		1			1	1	
9	Mettadi	32, 33	1	1		1		1	1	
10	Poonkottum kavil thazhe	11, 12	1	2		1				
11	Pazhassi raja (Thazhe Pazhassi)	17, 22, 23	1	2		1		2	2	
12	Pariyaram puzha vayal	9	1					1		
13	Perincheri	21, 22	1	2	1	1		2		
	Total		*13*	*15*	*4*	*8*	*2*	*16*	*7*	*3*

The marketing and storage centres of agricultural products and its details are given in Table 7.7.

Table 7.8 gives the details of coconut oil mills in Mattannur Municipal town.

Table 7.7 Marketing and storage centres of agricultural products

Sl. No.	Name	Marketing Centres		
		Private	Co-operative	Farmer's partici-pation
1	Hill Products	17	1	1
2	Kopra	17	1	Nil

7A.1.6 Fertilizer Markets

Table 7.8 Details of coconut oil mills

Sl. No.	Ward No.	Name of ward	No. of units
1	30	Kokkayil	3
2	28	Temple	1
3	13	Pariyaram	1
4	7	Keecheri	2

The details of marketing centres of agricultural production aids (chemical fertilizers, pesticides and insecticides) are given in Table 7.9.

7A.1.7 Financial input

Table 7.9 Marketing centres of agricultural production aids

Sl. No.	Product	Marketing Centres		
		Private	Co-op-erative	Farmer's Participation (VFPCK)
1	Chemical fertilizers	3	2	1
2	Pesticides and Insecticides	2	Nil	1

Table shows that there are 16 Financial Institutions

Table 7.10 List of institutes giving financial inputs in agriculture sector.

Sl. No.	Ward	Name of ward	Name of Bank	Remarks
1	3	Elannur	Porora Co-operative Bank	
2	8	Peruva yalkari	Kolari Co-operative Bank	
3	16	Uruvachal	North Malabar Grameen Bank	
4	18	Karetta	Pazhassi Co-operative Bank (Karetta Branch)	
5	22	Devarkad	Pazhassi Co-operative Bank (Perincheri Branch)	
6	28	Temple	Syndicate Bank	Nationa-lised Bank
7	29	Mattannur	Pazhassi Co-operative Bank	
			Mattannur Urban Co-operative Bank	
			State Bank of Travancore	Nationa-lised Bank
			Union Bank of India	Nationa-lised Bank
			Canara bank	Nationa-lised Bank
			Federal bank HDFC	Scheduled Bank
8	30	Kokkayil	Kolari	
9	32		Co-operative Bank Maruthayi	Porora
10	33	Mettadi	Co-operative Bank (HO) Porora	
			Co-operative Bank (Maruthayi Branch)	

functioning in Mattannr municipal area providing agriculture loans to farmers. Out of these, 4 are Nationalized banks and 9 are under Co-operative sector. Most of the banks are located in town wards. There are no farmer's bank or credit societies with in the municipal area.

7A.1.8 Agricultural Labours

One of the major problem in agricultural sector is the non availability of agricultural labourers. The agricultural labourers includes both agricultural workers and cultivators.

The temporal variation of agricultural labourers is given in Figure 7.9.

The graph shows a sudden decline in number of agricultural labourers as well as cultivators since 1991. Cultivators and Agriculture labourers together constitute 18.16% of Main workers and 27.20% of Marginal workers as already explained in chapter 5.

7B. IRRIGATION

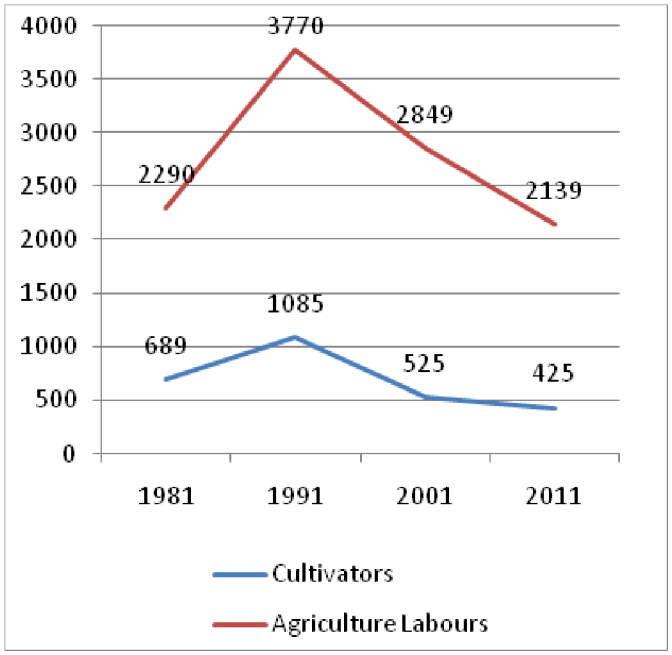


Figure 7.9 The temporal variation of agricultural labours

7B.1 ANALYSIS OF EXISTING STATUS

Agriculture is a predominant production sector in Mattannur Municipal area and hence irrigation has a significant role. The two rivers bordering the Municipal town, namely Anjarakkandy river at the southern periphery and Irrikkur river at the northern periphery and the streams running within the Municipal area are the major source of irrigation. The method of irrigation followed is lift irrigation and the water is mainly pumped using electrical motor. Though the main canal of Pazhassi Irrigation Project passes through the Municipal area, there are no branch canals in the municipal area and the project is kept defunct now. The canal emerges out to the municipal area from the dam through a tunnel at Nalankeri. And it is having another narrow tunnel at the 'cut and cover' portion while crossing the Irrity road. And since it has not got much width at some portions, the scope of using canal for navigation purpose is found very much limited.

7B.1.1 Existing Irrigation Projects



Cross drainage work with Pazhassi Canal over Cholathode

Minor Irrigation Projects includes the Lift irrigation Scheme and the details of the existing irrigation facilities in Mattannur municipal area are given in Table 7.11.

Table 7.11 Details of Irrigation facilities

Well (No.)	Pond (No.)	Thodu/ Rivers (km)	Pumpset			Area of land irrigated
			Diesel	Kero-sene	Electri-cal	
70	1044	29.30	6	78	2084	272.10

The total area of irrigated land in Mattannur Municipal Town is 272.10 Ha and it is essential to maintain the existing minor irrigation facilities.

7.2 DEVELOPMENT POTENTIALS AND PROBLEMS

Agricultural sector has vital importance for Mattannur Municipal Town. For enhancing this sector we need to find out the problems and potentials.

7.2.1 DEVELOPMENT POTENTIALS

The great potentiality of Mattannur Municipal Town is the availability of land in abundance and its proper utilization can promote the agricultural sector. The hilly terrain in the northern part of the Municipal Town supports rubber plantations. Proximity of airport offers potential for venture like floriculture and vegetable cultivations. The river banks and stream shores have the potentials for bamboo and screw-pine cultivation.

7.2.2 PROBLEMS

The land available for agriculture is quite sufficient but unfortunately it is not properly utilized. Filling up of existing paddy fields and keeping the cultivable paddy fields as uncultivated are the major problems of production fall. The paddy fields are being converted mainly for residential use. Change of the agricultural land for housing plots, construction of roads and other infrastructures, have reduced the agriculture land area. One of the major problem faced by agricultural sector is the acute shortage of agricultural labourers. Agricultural activity in Mattannur Municipal town is weakened mainly due to the fragmentation of land. Other major problems include the damages of plants caused by new variety of plant diseases and animal attack at certain area.

Moreover, the Pazhassi Irrigation project became defunct and is now under the threat of winding up.

7.3 INFERENCE

The study reveals that agriculture is the predominant and essential sector in the development scenario of Mattannur Municipal Town and this sector can serve as the backbone for economic development of the town. Off-season cultivations and various processing methods for value added products can be practiced for making agriculture more profitable.

The recent trend of organic farming using bio-fertilizers should be encouraged and the demand for it's products should be exploited fully. As ground water level is depleting and irrigation facilities are diminishing modern methods like precision farming, high-tech farming, drip irrigation, etc should be practised.



Chapter-8

ANIMAL HUSBANDRY

Animal husbandry is the management and care of farm animals by humans for food and profit. It provides productive employment, especially self employment and the most valuable supplementary income to a vast majority of rural households. Livestock available in our area enhances the economy by providing milk, egg, meat and value added products.

8.1 EXISTING SCENARIO

In Mattannur Municipal Town, animal husbandry is a sector which has high potential for growth. The potential of the sector needs to be exploited as it can play a key role in providing sustainable employment in its location.

The number of live stocks in Mattannur Municipal Town is less when compared with its vast agricultural area. The main live stock includes Cow, Buffalo, Goat and Hen. Mainly egg, meat and milk are the products obtained from live stock.

8.1.1 LIVE STOCK POPULATION

Temporal variation of live stocks are given in table 8.1 and figure 8.1

Table 8.1 Temporal variation of live stock

Year	Live stock population					
	Cow & Buffalo	Goat	Hen	Duck	Pig	Others
2007	2120	674	5202	40	1	Rabbits 46
2012	1886	591	6744	98		Dogs - 655

The decrease in the number of cattle population during the last five years is mainly due to the decline in the agricultural activities. However fowl population marks an increasing trend in connection with the huge demand raised by the recent change in food habits of the society.

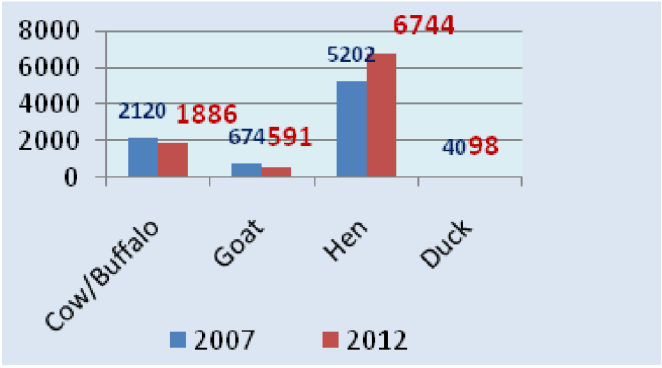


Figure 8.1 Temporal variation of main live stock.

8.1.2 PHYSICAL INFRASTRUCTURE

Physical infrastructure includes poultry farms, slaughter houses, dairy farms and veterinary hospitals.

8.1.2.1. Poultry Farm

The location of poultry farms in Mattannur Municipal town is shown in table 8.2.

There are 13 small scale poultry farms functioning within the municipal area. Moreover, one large size poultry farm is about to start at Elannur. Mettadi ward has three poultry farms. However there are no Hatchery units within the municipal area, or in the nearby region.



Poultry farm at Maruthayi

Table 8.2 Poultry farms in Mattannur Municipal town

Sl. No.	Ward/Location	No. of Poultry Farms
1	I Mannur	1
2	IV Keecheri	2
3	XI Kayalloor	1
4	XIV Ayyallur	1
5	XV Edavelikkal	1
6	XXIV Kallerikkara	1
7	XXV Malakkuthazhe	1
8	XXXIII Mettadi	3
9	XXXII Maruthayi	1
10	XXXIV Naalankeri	1
	TOTAL	**13**

8.1.2.2. Cattle Farm

There is a cattle farm functioning in private sector at Maruthai with a population of 20 cows. Quantity of milk produced here is 100Ltr per day approximately.



Cattle farm at Maruthayi

8.1.2.3 Dairy Outlets and Collection Centres

Table 8.3 Details of dairy outlets and collection centers in Mattannur Municipal Area

Ward No.	Name of Ward/Place	Type of outlets and collection centres	No.	Average Quantity collected per Month (Ltrs)
16	Uruvachal	Uruvachal Milk producers Co-operative Society	1	39000
32	Maruthayi	Maruthayi Milk producers Co-operative Society	1	15000

Both the milk societies mentioned in the table above are working in co-operative sector and are under the control of Deputy Director, District Dairy Development Office, Kannur.

8.1.2.4 VETERINARY HOSPITAL AND CLINICS

The veterinary hospital located at Palottupally and two ICDP sub centers located at Maruthayi and Perinchery are the available treatment centres for the existing live stock. While the hospital is located at the central portion of the Municipal Town, the two ICDP sub centres are ideally located at north and south portions of the town. The diseases like milk fever (Hypocalcaemia) and hoof diseases are the main cattle diseases diagnosed in the region.



Veterinary Hospital, Mattannur

8.1.2.5. SLAUGHTER HOUSES

There are no authorised slaughter houses functioning within the municipal area. However there are 2 meat stalls and several chicken stalls functioning within the town.

8.2 DEVELOPMENT POTENTIALS AND PROBLEMS

8.2 .1 DEVELOPMENT POTENTIALS

Animal husbandry has a significant role in Mattannur Municipal town and can be supported and supplemented by the vast agricultural land within the municipal area. Economic growth of the town can be promoted as this sector requires only minimum skill and resources. Moreover, the inputs are locally available and the marketing is also easier, thereby generating huge income. New cattle farms and poultry farms can be started in the ideal land available within the municipal area. The forthcoming Kannur International Airport provides enough scope for export of processed meat and milk products.

8.2.2 PROBLEMS

Animal Husbandry is mainly affected by the declining trend of agricultural activities within the municipal area. This in turn reduces the availability of cheap fodder for cattle. The decrease in the number of livestock population may be due to increased prize of cattle feeds and poultry feeds. There are no hatcheries within the municipal area and hence the production of fowls is only minimum. Lack of processing units for value added products often weakens the economic potentiality of this sector. Another major problem faced by the sector is the lack of authorized and modern slaughter house. Mattannur town is not self sufficient in milk production and therefore depends on MILMA and other distributors. Like most of the local bodies in

Kerala, Mattannur town also depends on neighbouring states for egg and meat.

8.3 INFERENCE

Mattannur municipal area being an agriculturally predominant land has enough scope for animal husbandry as both these sectors are inter related and inter dependent. The exploitation and proper utilization of all available resources and introduction of new and modern techniques in animal husbandry can generate huge income. In order to achieve self sufficiency in the field of milk, meat and egg production, strengthening of animal husbandry sector both in quality and quantity is needed. The infrastructural and marketing facilities need to be strengthened to attract more people towards livestock farming. A modern slaughter house is essential in the municipal area for catering the demand for meat in a hygienic and scientific manner. Co-operative societies shall be formed among farmers working groups for producing meat and milk especially in Kolari and Kayani areas. Various schemes like rabbit rearing, small scale dairy farms, fodder development projects etc. shall be implemented for the economic growth of Mattannur town.



Chapter-9

FISHERIES

Fisheries is an another production sector like Agriculture, Animal husbandry and Industry. Mattannur Municipal Town lies in the midland portion of Kannur District and hence is devoid of coastline and backwaters. The presence of Irikkur River in the Northern periphery and Anjarakandy River in the southern periphery provides considerable scope for inland fishing.

Fisheries will contribute nutritional requirements, economical benefits and also employment to the local bodies. The forthcoming international airport at Kannur is a major development thrust in this sector. It will promote the export of live and fresh fish.

9.1 ANALYSIS OF EXISTING STATUS

Mattannur Municipal Town is blessed with two rivers namely Valapattanam river (Irikkur river) and Anjarakkandy river located in the northern and southern periphery of the municipal area, and manmade impoundments like ponds, check dams etc. which offers high potential for fresh water fish production. Pazhassi dam which is located very close to Mattannur town also offers potential for inland fishing activity.

The water bodies within the municipal area offer great potential for fisheries but significant fishing activities are not yet identified.

9.1.1 Water bodies

The town is enriched with considerable supply of water through canal, check dams other than the natural water resources like rivers, ponds and streams.

Anjarakkandy river makes border for a length of 8km at north and Valapattanam river makes border for a length of 8.82km south and these are the major water bodies within the municipal town. Cholathode, Vayanthode, Karettathode and many other streams are also flowing through the municipal area.

The ward wise details of ponds and streams in Mattannur municipal town is given in table 9.1

The table shows that there are 77 ponds and 29.3 km long streams / rivers within the municipal area. Cholathodu is the major stream passing through the municipal area and has a length of 10.3Km. Pazhassi canal which is defunct now is the major water resource which can be utilized for fish cultivation, if perennial water supply is ensured. About 9.3Km of Pazhassi canal lies within the municipal area.

Table 9.1 Details of ponds and rivers/streams in Mattannur Municipal Town.

Sl. No.	Ward name	Ponds (No.)	Streams/Rivers (Approx. length in km)	Sl. No.	Ward name	Ponds (No.)	Streams/Rivers (Approx. length in km)
1	Mannur	3	2.0	19	Kuzhikkal	-	-
2	Porora	2	3.0	20	Kayani	1	1.0
3	Elannur	2	-	21	Perinchery	2	2.0
4	Keecheri	1	-	22	Devarkad	5	1.0
5	Anikkeri	1	2.0	23	Kara	6	3.0
6	Kalaroad	-	-	24	Kallerikkara	1	-
7	Palottupalli	1	-	25	Malakkuthazha	2	-
8	Peruvayalkari	3	-	26	Nellunni	5	2.0
9	Mundayodu	2	1.0	27	Illambagam	5	-
10	Beram	-	-	28	Temple	2	-
11	Kayalur	3	1.5	29	Mattannur	2	0.3
12	Kolari	-	-	30	Kokkayil	-	-
13	Pariyaram	1	2.0	31	Uthiyoor	3	-
14	Ayyallur	-	-	32	Maruthayi	3	2.0
15	Edavelikkal	-	-	33	Mettadi	2	0.5
16	Uruvachal	12	2.5	34	Nalakkeri	2	1.5
17	Pazhassi	2	-				
18	Karetta	3	2.0	***Total***		***77Nos***	***29.3 km***

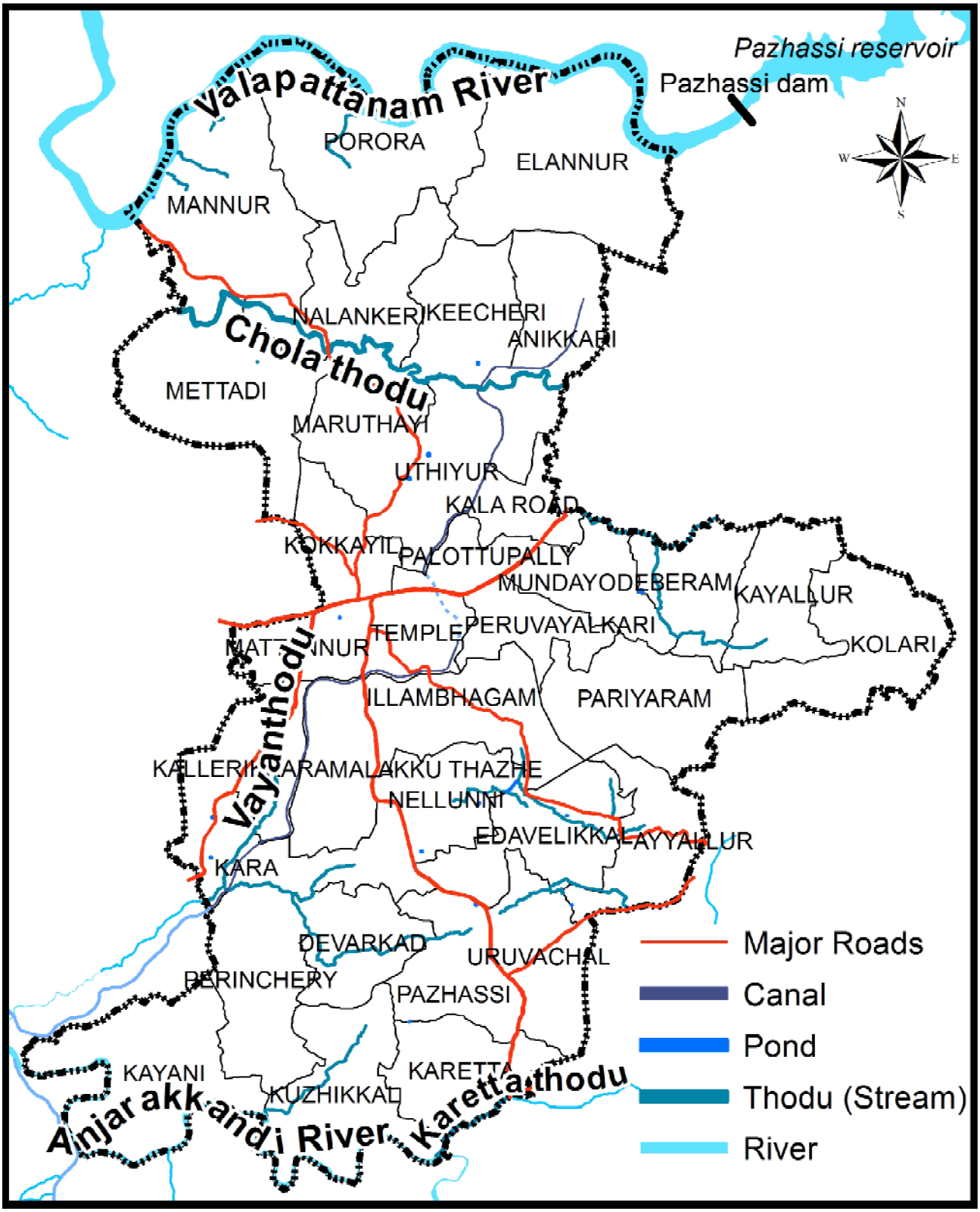


Figure 9.1 Water bodies in Mattannur municipal town

Water bodies in Mattannur municipal town is shown in figure 9.1

9.2 DEVELOPMENT POTENTIALS

Water bodies available in Mattannur municipal area can be experimented for inland fish cultivation. By adopting scientific cultural practice in ponds, the production of fishes can be made beneficial. Introduction of seed production center within the municipal area is also essential. Now a days the demand for ornamental fishes has increased to a large extent. The greatest potential of this sector other than water resource is the forth coming airport. Export of fishes, both national and international level will be easy with the functioning of airport.

9.3 INFERENCE

The potential area for fish cultivation in Mattannur municipal Town need to be identified and utilized for fish cultivation. Ornamental fish culture is an emerging sector with opportunities for self employment and income generation. Fish based industrial units and by-product units are helpful to get value addition to the products. The assurance of perennial water supply in Pazhassi canal can bring immense chance for fish cultivation. Marketing facilities for fish farmers to sell fish is very essential for encouraging this sector.



Chapter-10

INDUSTRIES

Industry is an economic activity concerned with the processing of raw materials and manufacture of goods in factories. The chapter deals with the study and analysis of the existing industries, availability of raw materials and infrastructural facilities and scope for future development of the sector.

According to MSME Act 2006, industries are classified mainly into three categories; Micro, Small and Medium industries. Table 10.1 shows the categorization of industries based on the manufacturing and service enterprises.

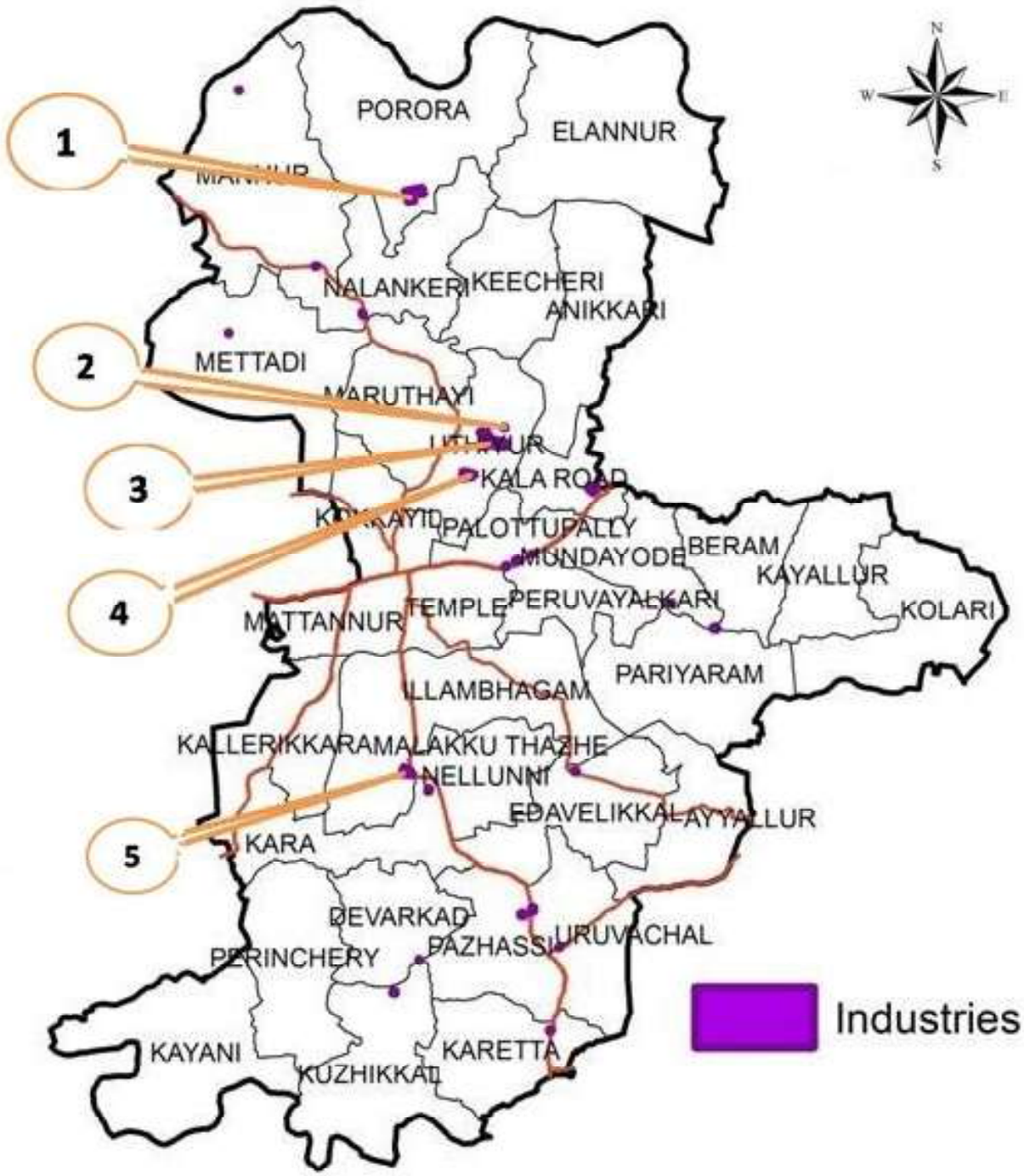
Based on MSME Act 2006, the industries in Mattannur municipal area falls under Micro and Small industries.

Table 10.1 Categorization of industries based on the manufacturing and service enterprises

Category	Micro	Small	Medium
Manu-facturing enterprises	Up to 25 lakhs	25 to 500 lakhs	500 to 1000 lakhs
Service enterprises	Up to 10 lakhs	10 to 200 lakhs	200 to 500 lakhs

10.1 ANALYSIS OF EXISTING STATUS

Industrialization is poor in Mattannur municipal area. Earlier, household industries such as weaving, yarn spinning and mending of palm leaves were common. Weaving and yarn spinning were more prominent in



1. **STONE CRUSHER**
2. **SAW MILL**
3. **MINI INDUSTRIAL ESTATE AT KALLUR**
4. **RAIDCO UNIT**
5. **MINI INDUSTRIAL ESTATE AT NELLUNNI**

Figure 10.1 Location map of Major Industries

Perincheri, Moonam peedika and Manakkayi area of Mattannur Municipal Town. However, at present there are only a few industries and all of them fall under the category of micro and small industries.

The Mini industrial estates functioning within the municipal area includes the one at Kallur and the other at Nellunni.

Mini industrial estate at Kallur is functioning with 6 industrial units with a labour strength of 37 numbers and is spread over an area of 1.18Ha. The working unit includes Unique Global industry (Manufacturing of Interlock and Tiles), Copra yards (Coconut products), Mahesh Grills and Bakery and saw mill.



Mini Industrial Estate at Nellunni



Mini Industrial Estate at Kallur

The formation of Mini industrial estate at Nellunni is a milestone in the growth of industries in Mattannur municipal area. There are 7 Units covering an area of 0.38Ha with 33 labours. The main units within the industrial estate are Midas offset printers (Printing unit), Rahul body works (Automobile repair service), Kavitha spray painting works (Spray painting) Malabar tyre works (tyre resole), Diamond ropes (Plastic ropes) and Aadhi engineering (Grills and gates). The fruit canning unit of RAIDCO at Kallur is another major industrial unit in the municipal area. The unit was set up under co-operative sector decades back and was taken over by the Khadi Board and then by RAIDCO. Nearby 20 labours are working in the unit.

The industry related to weaving and yarn spinning is located in Mattannur town, Perincheri and Nelluni which are under Kerala Sarvodaya Sangam. Weaving unit at Nellunni is functioning under Payyannur Khadi which has high production and conducts training programs. So many labourers are working under weaving and yarn spinning.

The existing status of ward wise details of industrial units in Mattannur Municipal Town is given in Table 10.2.

From the table itself, it is clear that the industrial units in Mattannur municipal area belongs to small scale industries. Temple ward has the highest number of industrial units, about 14 units which includes 7 workshops and 4 printing presses. It is followed by Kokkayil ward having 7 units and then Mattannur ward having 6 units. 16 wards does not have a single industrial unit.

Types of industrial units based on raw materials and the number of labourers involved in each category are shown in Figure 10.2 and 10.3.

In Mattannur municipal area maximum industrial units belong to the engineering industry (automobile workshops, tyre works, welding units etc.). It is then followed by wood Industry (Saw Mills, Furniture, etc.), agro based industry and food based industry.

Table 10.2 Ward wise details of industrial units in Mattannur Municipal Town

Ward name	No. of Industrial Units	Products	No. of Labours
Keecheri	4	Inter locks, Tiles, Coconut products, Grills ,Bakery and Saw mill	37
Kalaroad	2	Wood industry, Automobile	10
Palottupalli	3	Flour mills , Saw mills	29
Mundayodu	1	Coconut products	20
Kolari	1	Grills	2
Edavelikkal	1	Printing unit	3
Pazhassi	4	Wood industry, Tyre works, Flour mills, Akshaya Kendram	13
Perinchery	1	Spinning and weaving unit	40
Devarkkad	1	Flour mill	2
Kara	1	Welding unit	4
Kallerikkara	2	Furniture, Wood works	6
Nellunni	6	Printing, Auto mobile repair & service, spray painting, Tyre resole, Plastic ropes, Grills, Gate	33
Illambagam	1	Auto mobile work shop	4
Temple	14	Printing units, presses, Manufacture of Pappadam	32
Mattannur	6	Flour mill, Bakery units	13
Kokkayil	7	Spinning unit, Flour mills ,Candle making, Oil mills, Pappadam and murukku manufacturing unit	8
Uthiyoor	3	Ply wood, switch box, Pineapple jam and pickle	32
Naalankeri	4	Stone crusher, Metal crusher, Wood plane, Ply wood, Work shop, Bakery	39

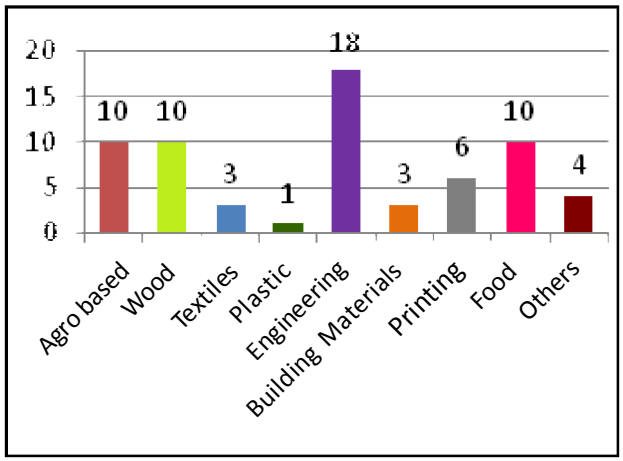


Figure 10.2 Types of industries

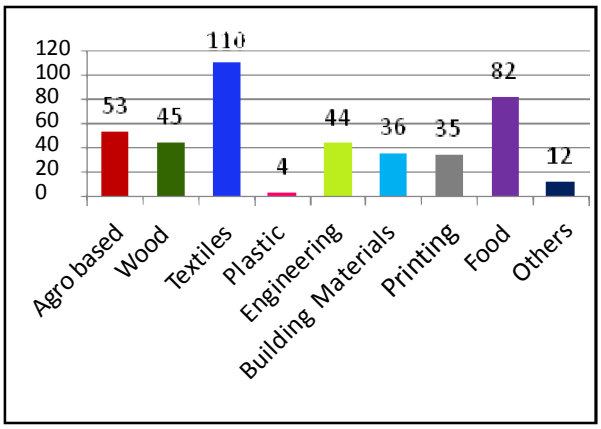


Figure 10.3 Number of labours employed

Maximum numbers of labourers are engaged in textile industry (Yarn spinning, weaving etc.), then in food related industries (Bakery, etc.) and followed by agro based industries (Oil mills etc.)

10.2 DEVELOPMENT POTENTIALS AND PROBLEMS

10.2.1 Development potentials

The existing scenario of Mattannur Municipal Town shows that at present industry is a weak sector but in future there is a possibility of improvement. The forthcoming airport offers enough scope for the development of existing industries and introduction of new units within the municipal area and surrounding local bodies. The availability of land for the development as well as introduction of new industries is a major thrust. There is enormous scope for agro based value added processing units, as raw materials like coconut, cashew, rubber, pine apple etc. are available in plenty in the municipal town and surrounding area. A portion of forthcoming KINFRA Industrial park falls within the municipal area and will provide great opportunity for auxiliary industries to flourish within the municipal area.

10.2.2 Problems

Industrial area in Mattannur Municipal town is only 0.10% of total municipal area which indicates the backwardness of the sector. This sector faces so many problems like inadequate infra structural facilities, absence of training centres and lack of technical institutes and expertise. There are no industrial units under co-operative sector. Due to the absence of large scale industries within the municipal area, the chances for auxiliary units are also minimum. The establishment of new industries requires proper support and encouragement.

10.3 INFERENCE

As Mattannur municipal town is blessed with varied resources and vast manpower, the proper utilization of which will lead to the growth of industries thereby resulting in the overall economic development. The available resources in Mattannur Municipal Town are agro based raw materials, medicinal plants, mulberry, wood, water bodies, etc. The forthcoming Kannur International Airport offers enormous scope for the export of processed products from various industrial units. The proposed KINFRA industrial park located adjacent to the municipal area provides high potentiality for IT oriented industries. The existing handloom industry can be enhanced by scientific methods there by introducing readymade textile industries.

The existing pottery making units at Chavassery paramba can be clustered and extended to the municipal area. In addition to this, training facilities can be



A Private saw mill at Kallur



Stone Crusher Unit at Karithurparamba





RAIDCO unit at Kallur

provided to improve the quality of the products. Other industries which have scope includes timber mills, electronics and hard ware industries, light engineering, Biotechnology, Rubber based industries and food processing units.



Chapter-11

HERITAGE AND TOURISM

Tourism is an important production sector and hence develops the economy by contributing towards foreign exchange reserves, creating income and employment oppurtunities and strengthening national integrity. The sector includes pilgrim tourism and heritage tourism. Heritage tourism includes cultural, historic and natural resources. The chapter analyses the existing status and development issues of the sector.

11.1 PRESENT SCENARIO

Even though tourism has emerged as an important production sector in Kerala as well as in the District, its significance is quite negligible in Mattannur municipal area. The existing tourist spots within the municipal area are not yet utilized and maintained.

The details of existing tourist destinations in and around the municipal area and its surroundings are given in Table 11.1. From the table it is in the most of the tourist sports are located at religious areas. The festivals and Theyyam performance at temples and shrines in the area can be considered as a source of tourist attraction.

Table 11.1 Tourist Destinations (at a glance)

Sl. No	Tourist Attractions	Ward No.(Year-2011)	Type	Tourist Season
1	Mahadeva Temple	28, Temple	Religious	Throughout the year
2	Poongottum kavu	9, Kolari	Religious, Natural (Eco-Tourism)	September to May
3	Inspection Bungalow Premises	26, Near Bus stand	Architectural Heritage, Wildlife (Bats)	September to May
4	Maruthayi Illam	29, Maruthayi	Architectural Heritage (Nalukettu, Pond)	September to May
5	Perumannu River	1, Porora & Perumannu	Fishlife, Religious	Throughout the year
6	Arayalthattu Kavu	1, Mannur	Heritage, Natural (Eco-Tourism)	September to May
7	Durgha Temple, Kara	23, Kara	Architecture, Religious	Throughout the year
8	Pazhassi Kovilakam	14, Pazhassi	Heritage	September to May
9	Subrahmanya Temple	7, Pariyaram	Religious, Cultural (Mural Paintings)	Throughout the year
10	Palottupally Makam	6, Palottupalli	Pilgrimage	Throughout the year
11	Mangalathu vayal	30, Mettadi	Natural	September to May
12	Pazhassi project	Outside Municipal area (Veliyambra)	Dam, Garden	September to May
13	Puralimala & Harichandrakkotta	Outside Municipal area (Muzhakkunnu)	Adventure, Heritage	September to May
14	Mamanathu Temple	Outside Municipal area (Irikkur)	Religious	Throughout the year
15	Nilamuttam Mosque	Outside Municipal area (Irikkur)	Religious	Throughout the year
16	Kammadan Kunnu	Outside Municipal area (Velliyam paramba)	Natural	September to May

11.1.1 TOURISM SPOTS - CLASSIFICATION

The tourist spots in Mattannur municipal area can be classified into four categories namely Pilgrim Tourism, Heritage Tourism, Cultural tourism and Natural Tourism.

11.1.1.1 PILGRIM TOURISM SPOTS

A) Mattannur Mahadeva Temple

The Shiva Temple is located in the heart of the town. The Annual festival, Utsavam of Mattannur 'Sree



Sree Mahadeva Temple



'Aratu' using chariot at Sree Mahadeva Temple, Mattannur

Mahadeva Temple' commences from February 27 every year. The eight day long festival ends up with the 'Aarattu' using chariot. In North Kerala, the only other temple where chariot is used for Aarattu is the famous Kalpaathi Temple at Palakkad. The 'Mattannur Fest' is also organized at this time.

B) Palottupalli Makham

Palottupally Makham is located in Palottupally ward which is famous for 'Uroos', a festival celebrated every year at the tomb of Saint Mammu Musaliyar.



Palottupalli Makham

C) Kallur Mahavishnu Temple

This ancient Vishnu temple is located at Kallur about 5 kms north of Mattannur town.



Kallur Mahavishnu Temple

D) Perinchery Sri Vishnu Temple

Perinchery Sri Vishnu temple is a famous temple located at Perinchery. The large pond and it's stone



Temple-Pond at Perincherry- Sree Vishnu Temple

steps add charm and heritage value to this ancient temple.

11.1.1.2 HERITAGE TOURISM SPOTS

A) Pariyaram Subramanya Temple

Similar to the famous Thodikkulam Temple, Pariyaram Subrahmanya Temple also has mural paintings and art works in laterite. This precious heritage temple is now under deteriorating condition.



B) Pazhassi Kovilakam and Pazhassi Madam area

The monumental site brings about the gallant memories of Veera Kerala Varma Pazhassi Raja who fought against the British Imperial power.

There are three temples located very near to Pazhassi Kovilakam.



Pazhassi Kovilakam



Shrine for Pazhassi Raja near Kottakunnu



Sree Porkali Bhagavathi temple

Pazhassi Raja was considered as idolatrous and there exists a shrine for Pazhassi Raja in the Kottakkunnu area.

A shrine of Sree Porkali Bhagavathi the war goddess of Pazhassi clan is situated at Pazhassi Madam.

C) Inspection Bungalow precinct

The colonial building with its architectural heritage value, built during British period and the garden in the precinct is a tourist spot in the heart of the city.



Inspection Bungalow

Sub-Tresury building and PWD Guest house are situated in the same compound.

11.1.1.3 ENVIRONMENTAL TOURISM

A) Poongottukavu

This splendid site offers the coldness of a vested rain forest within the Municipal Town itself, an eco-tourist centre with an extent of nearly 45 acres. Poongottukavu scared grove is a tall ever green forest with records of some kind of migratory birds like Western Yellow Wagtail, Large-billed Leaf-warbler, Western Crowned Leaf-Warbler etc. Poongottukavu is located in Kolari ward which is almost 5km away from State Highway. There is a stream passing through Poongottukavu which is the origin of Cholathodu.



The remnants in Poongottu Kavu

There is an idol of 'Lord Ayyappa or Sasthavu' in Poongottukavu. It is believed that the custom of oblation of animals existed here and later got replaced with oblation of statues of animals. Their ruins and remnants still exist in this place.



Stream at Poongottu Kavu

B) Arayathattukavu

Arayathattukavu is another natural heritage site, a sacred grove with small patch of greenery located at Mannur in the northern part of the Municipal Town.



Arayathattu Kavu

11.1.1.4 TOURIST SPOTS NEAR MATTANNUR MUNICIPAL AREA.

The Main tourist centers outside and near to Municipal area includes

A) Pazhassi Dam and Reservoir Site

The Dam, Reservoir and Garden at Pazhassi irrigation Project at Veliyambra, about 10Kms from Mattannur town makes a favourite destination for tourists.



Pazhassi Barrage

B) Mamanikkunnu Temple and Nilamuttam Makham

The two famous religious sites adjacently located are just 12 Kms away from Mattannur town. Mamanikkunnu Durga Temple attracts Pilgrims from outside Kerala also.



Mamanikkunnu Sree Mahadevi Temple

C) Perumannu Temple and River

Feeding of 'holy' fishes in the river at this religious site is a major tourist attraction and is situated across the Mannnur river (Irikkur river), at the northern border of Municipal Town.



Fishes in Perumannur river

D)Puralimala and Harichandrakotta

Purali hills located outside the municipal area is a natural tourist site with remnants of ancient temples and forts built by the kings of erstwhile Kottayam Dynasty, ancestors of Veera Pazhassi Raja.

11.1.2 DETAILS OF TOURISTS

The tourist destinations within the municipal area are not yet flourished and hence the number of tourists are also meagre. The approximate number of tourist visited in the year 2012 is given in table 11.2.

Table 11.2 Details of tourists

Number of Tourists		
Year	Foreign	Domestic
2012	500	5000

11.1.3 DETAILS OF TOURIST INFRASTRUCTURE

The infrastructure existing in the municipal area for tourism generation and promotion is given in table 11.3. Number of tourists visited and the infrastructure

Table 11.3 Details of Tourist Infrastructure

Sl.	Number of Hotels			Tourist inform-ation centre	House boats (no)
	Four star and above	3 Star/ 2 Star hotels	Economy hotels		
1	Nil	1	3	Nil	Nil

facilities well reveal the meagre level of tourism activities in the municipal area.

11.2 DEVELOPMENT POTENTIALS AND PROBLEMS

11.2.1. Development potentials

Proximity to the forthcoming airport can promote the tourism sector for a giant leap. The presence of Poongottukavu Vanam offers the town the scope of environmental tourism. Pazhassi Kovilakam premises and temples in the Municipal town provide a platform for heritage and religious based tourism. The beautiful banks of Valapatanam River and Anjarakandy River can be used for water-front tourism with boating activities. The Town has the potential for a conducted tourism circuit. Town can serve as a halting place for tourists visiting the spots outside the municipal area namely Pazhassi Dam, Mamanikunnu Temple and nearby tourist district like Wayanad, Coorg, Mysore etc.

11.2.2. Problems

Some of the problems identified include lack of basic infrastructure facilities like star level hotels, tourist information centre etc. Most of the hotels are economy type and there is no home stay facility. Tourism sector is weak in the Municipal area for want of major well known destinations.

11.3 INFERENCE

Though there are quite a number of tourist spots in and around Mattannur municipal area, it is unfortunate that some of these centres and their potentials still remain unidentified and unexplored. The forthcoming international airport offers great potential to this sector as ayurvedic resorts can be introduced thereby promoting health tourism within the municipal area. Moreover, new tourism circuits need to be developed by connecting the various tourist destinations of Kannur District as well. It is necessary to provide basic amenities including accommodation facilities at all prominent tourist spots considering the growth of this sector in the near future.



Chapter-12

TRADE AND COMMERCE

Trade and commercial activities in a particular area often attract the public which leads to the overall economic growth. The chapter deals with the various commercial activities taking place within the municipal area and existing trade centres. The development of commercial activities is only nominal in Mattannur Municipal area. The commercial land use area is only 0.1% of total municipal area.

12.1 EXISTING SCENARIO

A city grows as trade and commerce flourishe. At present the commercial activities as well as trade centres are mainly concentrated in and around Mattannur Junction, Palottupally and Uruvachal area. The data regarding commercial activities in Mattannur municipal area is given in Table 12.1.

Table 12.1 Types of Shops in Mattannur municipal area

Sl No.	Types of Shops	Total No.
1	Clinic & Medical stores	20
2	Textile shop	63
3	Stationary fancy & foot wear shops	111
4	Provision stores	178
5	Jewellery	27
6	Hotel & bakery	167
7	Vegetables, fruits & flower shops	39
8	Electronics, Hardwares & Home appliances	73
9	Bank	30
10	Small stores	18
11	Computer centre/Internet cafe	3
12	Small Industries	28
13	Mobile shop	19
14	Others	388
15	Other service shops	143
	TOTAL	**1307**

The table shows that most of the commercial activities are based on provisional stores, hotels and bakeries.

12.1.1 Commercial centres

The fast growing Iritty town and neighbouring Koothuparamba Municipal town hinder the growth of Mattannur town as a collection and distribution centre of goods and commodities. However the town looks forward to the International Airport for growing as a trade centre.

Major commercial nodes in Mattannur Municipal Town is shown in figure 12.1.



Fish market near bus stand



Figure 12.1 Major commercial nodes

The area around Mattannur Junction is categorized as 1st order commercial node. This node fulfills most of the basic needs as it is facilitated with markets (fish, vegetables, fruits), wholesale shops, medical shops, bakeries etc. More over it is located in the heart of the town and has got separate taxi stand and autoriksha stand. Palottupally and Uruvachal are the 2nd order commercial nodes which serves the locals. Both are located along SH 30 (Thalassery-Coorg Road) with Palottupally along Mattannur- Iritty road and Uruvachal along Mattannur-Thalassery road. Commercial activity is minimum in Maruthayi and is categorized as 3rd order node.

12.1.2 Informal sectors

Informal sector encompasses all jobs which are not recognized as normal income sources, and on which taxes are not paid. The informal sector mainly comprises of street vendors who offers goods or services for sale to the public without having a permanent built-up structure but with a temporary static structure or mobile stall.

About 140 street vendors find their livelihood in this small town. Fruit stall and tea stall are the major items found. Informal sector activities are mainly concentrated around Bus stand area. The details of informal sector in Mattannur municipal area is given in

Table 12.2 Informal sector in Mattannur municipal area.

Sl No	Area of concentration of informal sector activities	Type of activity – fruits and vegetables, garments, tea and snacks, home appliances, books etc	Extent of informal sector activity in each area (no. of shops/cart, no of street vendors)	No of units under Informal sector activity having the approval of Municipality- Location wise	Labour force (men, women, children separately) in informal sector
1	Bus stand	Fruits, vegetables, garments, tea and snacks, home appliances, books.	65	62	135
2	Market	Fruits, vegetables, garments, tea and snacks, home appliances.	26	24	49
3	Iritty Road	Fruits, vegetables, garments, tea and snacks, home appliances, books.	32	30	68
4	Uruvachal	Fruits, vegetables, garments, tea and snacks..	11	11	20
5	Thalassery Road	Garments, tea and snacks, home appliances..	12	11	21
6	Maruthai	Fruits, vegetables, tea and snacks.	10	9	23
7	Nellunni	Garments, tea and snacks, home appliances, books.	6	6	11

Table 12.2. From the table, it is evident that the maximum number of units as well as labourers employed are in the bus stand area.

12.2 DEVELOPMENT POTENTIALS AND PROBLEMS

12.2.1 Development potentials

The upcoming Kannur International Airport offers great potentiality for the growth and development of trade and commercial activities within the municipal area. Thalassery-Coorg road (SH 30) passing through the Mattannur municipal area is one of the major traffic corridors of the district and is another potential.

12.2.2. Problems

Mattannur Municipal Town is in the preliminary stage of developments in trade and commerce sector. Commercial land use is only a modest 0.10% of municipal area. It has no major significance in the District scenario of trade and commerce. The commercial activities especially whole-sale trade in the town is sidelined by the higher order facilities in Iritty town and neighboring municipalities. The town lacks separate organized vegetables, fish and meat markets. The co-existence of fish and vegetable markets by the side of taxi and auto-rickshaw stand creates congestion and chaos. At present there are no lorry stand, warehouses and cold storage facility.

12.3. INFERENCE

At present the development of trade and commerce in Mattannur municipal area is meagre. Most of the commercial centers in Mattannur municipal area have very few shops which indicates the poor development of the sector. Trade and commerce activity should be well equipped with adequate infrastructural facilities to exploit the opportunities to be created by the forthcoming airport. Municipality has to acquire suitable land for warehouse, cold storage, truck parking etc. for competing in the air trade.



Chapter-13

HEALTH

Health is the level of functional or metabolic efficiency of a living organism. In humans, it is the general condition of a person's mind and body, usually meaning to be free from illness, injury or pain. Good health facilities are essential for building up healthy society which in turn promotes the economic growth of the area. The chapter deals with the existing health facilities, development issues and projected requirements of the sector.

13.1 ANALYSIS OF EXISTING STATUS

Analysis of existing status includes the study on the availability of infrastructural facilities, spatial distribution of various health centers and data obtained from socio-economic survey regarding common diseases occurred during the last five years.

13.1.1 Infrastructural Facilities

The infrastructural facilities available in Mattannur municipal area are given in Table 13.1.

The table reveals that most of the hospitals in Mattannur municipal area are under private sector. Community Health Centre, Mattannur is the only Government Allopathic hospital within the municipal area and has a bed strength of 38 beds only. It lacks the required number of doctors and adequate infrastructural facilities, and hence needs to be upgraded.

There are 4 family welfare centres functioning within the municipal area. In addition to the Community Health Centre in Government sector, there

Table 13.1 Existing Health Facilities

System of medicine	Category	Government	Private	Total numbers	Number of beds	Number of Doctors
Allopathic system of medicine	Hospital	1	8	9	159	17
	Clinic					
Ayurvedic system of medicine	Hospital/Dispensary	1	1	2		2
	Clinic		1	1		1
Homoeopathic system of medicine	Hospital					
	Clinic	1	5	6		6
Others	Visha Chikilsa Kendram		1	1		
	Clinic (Dental etc.)		5	5		7
Ambulance		1	1	2		

are eight more allopathic hospitals working in private sector.

There exists one Ayurveda Dispensary in Government sector and is located at Pazhassi. Another private Ayurvedic hospital is also functioning in the town. But bed facility is not available in any of the Ayurvedic hospital. In addition to these hospitals, one ayurvedic clinic is functioning in the municipal town.



Govt. Ayurveda Dispensary, Pazhassi



Community Health Centre, Mattannur



Govt. Homeo dispensary, Maruthayi

The six homoeopathic clinics in the municipal area includes the Government Dispensary at Maruthayi and the five private clinics.

13.1.2 Spatial distribution of Health Centres

The spatial distribution of various heath centres including allopathic, ayurvedic and homoeopathic hospitals and clinics are shown in Figure 13.1.

Most of the hospitals are located in and around the core area. The northern and eastern portion of the municipal town lacks hospital facilities. The Community Health Centre is located in the middle portion of the municipal town and is the only Government hospital offering bed facility. The Government Homoeo dispensary is located at north central portion of the town while Government

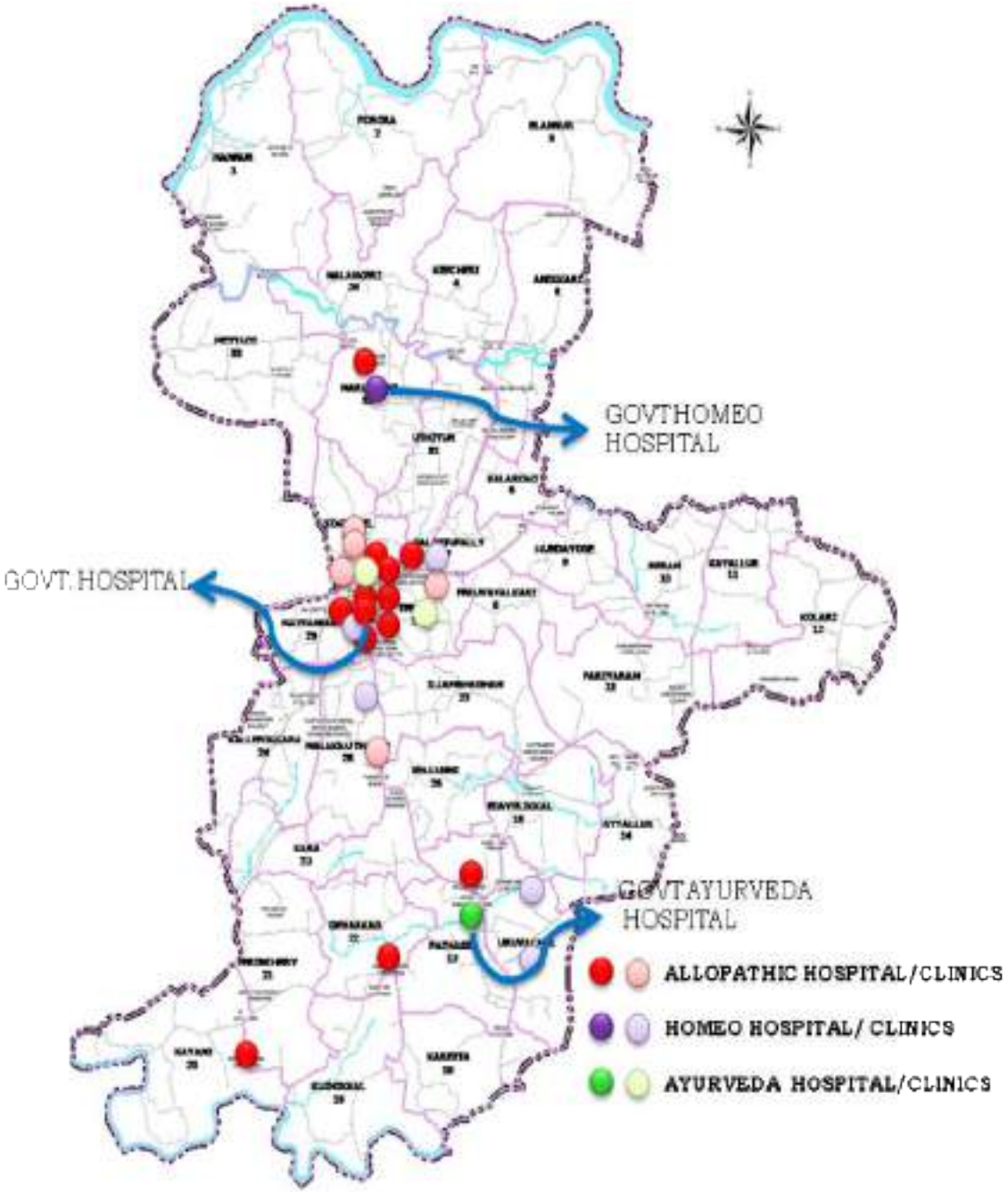


Figure 13.1 Spatial distribution of Health Centres in Mattannur municipal area

Ayurveda hospital is located at southern portion of the town.

13.1.3 Studies on Health Issues

Data regarding the history of diseases during last 5 year in the municipal area was obtained through socio-economic survey. Table 13.2 gives the percentage of houses diagnosed with diseases during the last five years.

Table 13.2 Percentage of houses diagnosed with diseases during last five years

Type	Dengue fever	Chickun guinea	Hepatitis	Typhoid	Chicken pox
Average % for the town in each category	0.49	17.32	0.25	0.37	1.6

From the table above, it is clear that Chickunguinea is one of the remarkable disease that affected about 17.32% of the total population during last five years.

13.2 DEVELOPMENT POTENTIALS AND PROBLEMS

13.2.1 Development potentials

The health facilities in Mattannur municipal area are inadequate at present, but there is enormous scope for the introduction of super specialty hospital with all modern equipments and technologies. The forth coming international airport has significant role for the development of this sector. Health tourism can be promoted in Mattannur town by starting new Ayurvedic Resorts which provides naturopathic ayurveda treatments. The popularity of Ayurvedic treatment in Kerala will attract large number of tourists from different parts of the world with the functioning of the international airport.

13.2.2 Problems

In Mattannur municipal area most of the hospitals are functioning in private sector. There is only one Community Health Center under government sector with 38 beds which is not sufficient for the population of Mattannur Municipal Town. The number of doctors as well as existing infrastructural facilities also is inadequate, and hence need to be upgraded. There are no super specialty hospitals within the municipal area hence the people have to depend on hospitals in Kannur and Thalassery. However the Kannur Medical College at Anjarakandy (12km from the town center) which has started functioning recently offers health facilities to a certain extent. Nine Allopathic hospitals functioning in the municipal area also serve the people of the region.

13.3 INFERENCE

In Mattannur municipal area, the health sector faces various problems due to the inadequate health facilities. Newly emerging diseases like Chikungunia, Dengue fever, Leptospirosis etc are caused mainly due to improper waste management and polluted drinking water supply. Hence proper waste management system and safe drinking water system need to be ensured so as to safeguard the health of the people. More over, super specialty hospitals with modern techniques and medical instruments need to be introduced for proper diagnosis of diseases. The forth coming international airport offers high potentiality for Ayurvedic treatment, thus leading to the promotion of health tourism with in the municipal area.



Chapter-14

HOUSING

Buildings or structures that individuals and their family live in is known as house. Different housing situations vary for individuals and may depend on age, family, and geographic location. The Kerala State Housing Board was established in 1971, which provides the organized direction and planning in the preparation and execution of housing and improvement schemes in the State.

In Mattannur Municipal Town about 38.89% of the total land is of residential use. At present household size shows a decreasing trend which will create more housing demand in future. The expected development with the operation of international air port at Kannur will have great influence on the housing demand in future.

14.1 ANALYSIS OF EXISTING STATUS

Household Size:-

Household size is the number of members in a private household.

Comparison with District and State

Household size in Mattannur Municipal Town compared with the District and State and its graphical representation is shown in figure 14.1.

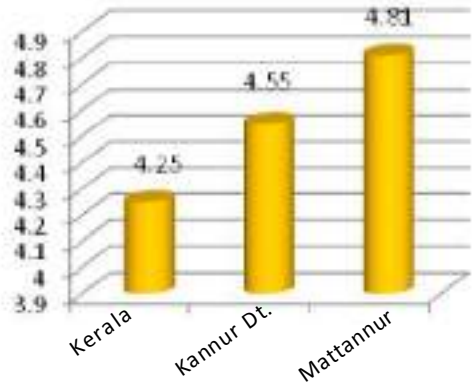


Figure 14.1 House hold size - Comparison with District and State

As per Census 2011, household size of Mattannur Municipal Town is 4.81 and the value is higher when compared to Kannur District and Kerala State.

Comparison with other municipal towns in the District

Household size in Mattannur Municipal town compared with other municipal towns within the district during 2001 and 2011 is shown in figure 14.2.

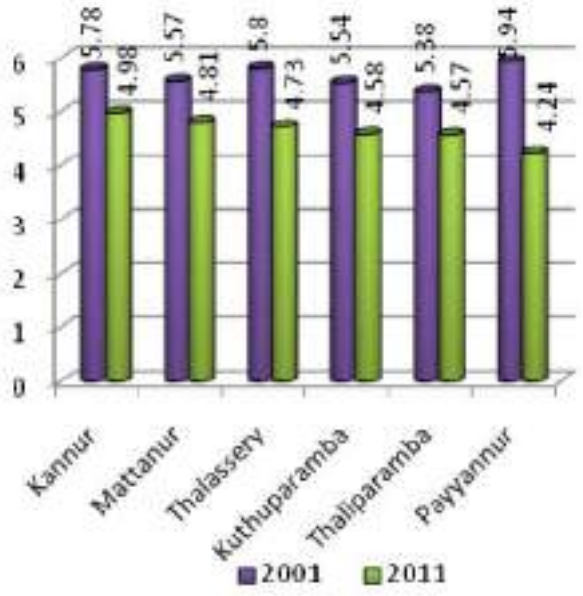


Figure 14.2 Household size - Comparison with other municipal towns within the District

From the figure it is clear that household size of all municipal towns within the district shows a decreasing trend during last decade. 2011 Census data reveals that household size in Mattannur town ranks second position among six municipal towns.

Comparison with adjoining Panchayats

Household size in Mattannur town when compared to adjoining panchayaths during 2001 and 2011 are given in Figure 14.3a & 14.3b and in Table 14.1.

The table and figures show that the highest house hold size is seen in Irikkur panchayath (7.05 in 2001 and 5.94 in 2011). As per Census 2001 Mattannur Municipal Town ranks third position in household size (5.57) which is similar to the household size of Vengad Panchayath. 2011 Census shows that the husehold size in Mattannur Municipal Town and all adjoining panchayaths show a decreasing trend during the last decade.



Figure 14.3a Household size - Comparison with adjoining panchayats (2001)

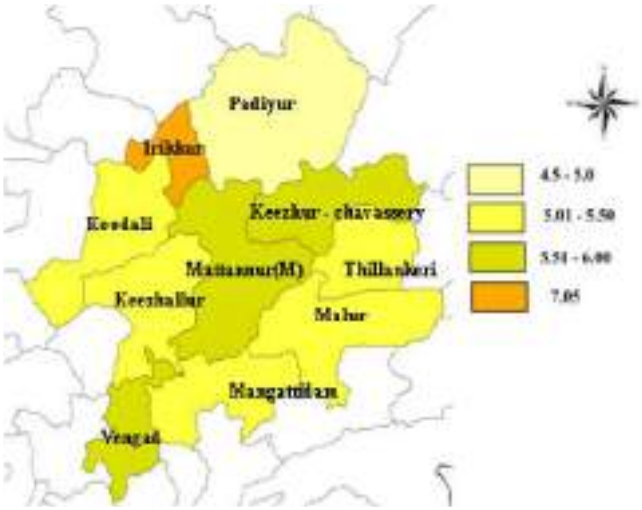


Figure 14.3b Household size - Comparison with adjoining panchayats (2011)

Table 14.1 Household size - Comparison with adjoining panchayaths (2001 and 2011)

No.	Adjoining Panchayaths	Household Size	
		2001	*2011*
1	Padiyur	4.94	4.37
2	Thillankery	5.06	4.55
3	Malur	5.11	4.54
4	Mangattidam	5.3	4.66
5	Keezhallur	5.4	4.61
6	Koodali	5.42	4.61
7	Vengad	5.57	4.75
8	Mattannur(M)	5.57	4.81
9	Keezhur-Chavassery	5.64	4.8
10	Irikkur	7.05	5.94

Ward wise data

The ward wise details of household size in Mattannur Municipal Town as per 2011 Census is given in figure 14.4 and table 14.2.

Household size is found highest in Keecheri ward (5.66) and the lowest in Nellunni ward (4.08).

The figure 14.4 reveals that house hold size in Mattannur municipal area ranges from 4 to 6. Highest range of household size (5.5 to 6) is seen in 2 wards namely Keecheri and Palottupally. In the town, 8 wards have household size ranging from 5 to 5.5 and remaining 21 wards have household size ranging from 4 to 5.

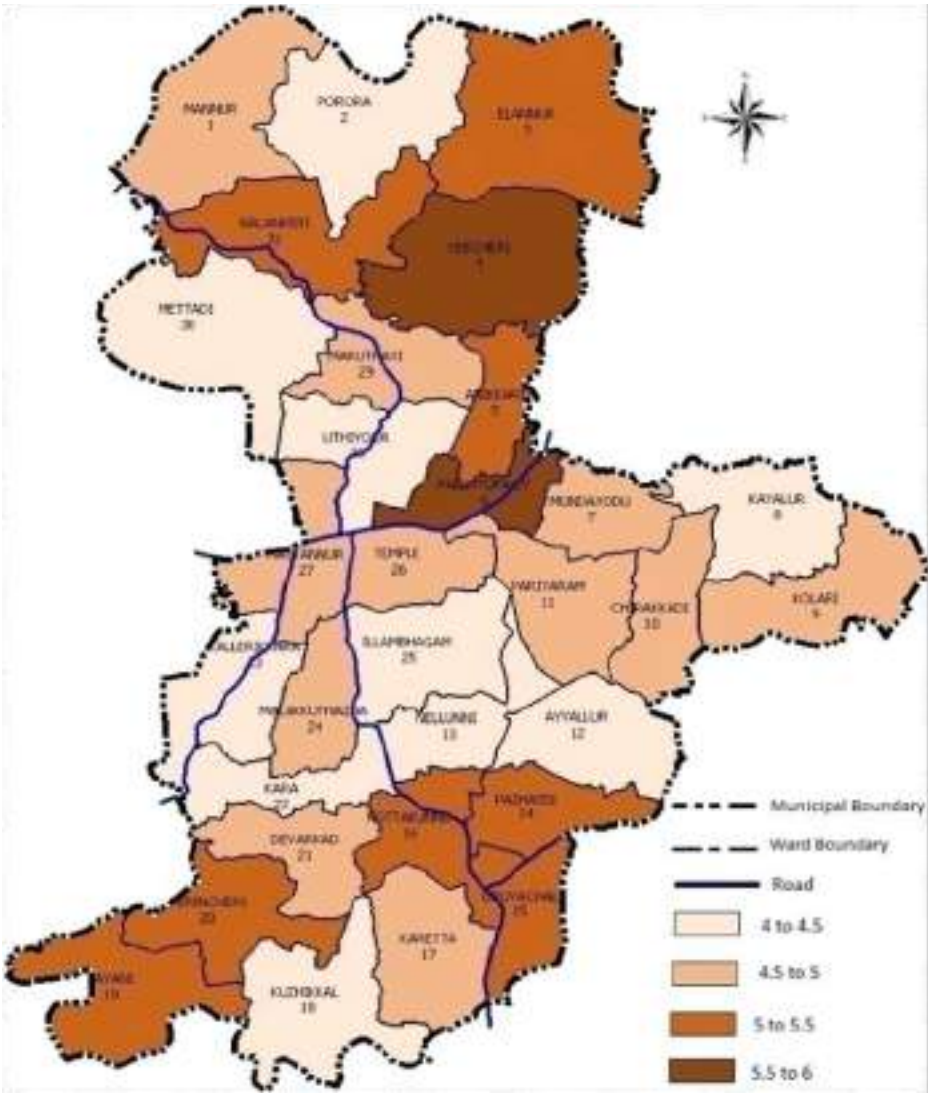


Figure 14.4 Ward wise data of house hold size.

Table 14.2 Ward wise data of household size

Sl No.	Name of ward	Population	No. of house hold	Average house hold size	Sl No.	Name of ward	Population	No. of house hold	Average house hold size
1	Mannur	1321	277	4.77	17	Karetta	1608	341	4.72
2	Porora	1100	254	4.33	18	Kuzhikkal	1238	279	4.44
3	Elannur	1400	260	5.38	19	Kayani	1246	230	5.42
4	Keecheri	2271	401	5.66	20	Perincheri	1302	246	5.29
5	Anikkari	1895	352	5.38	21	Devarkad	1259	279	4.51
6	Palottupally	2199	397	5.54	22	Kara	1211	270	4.49
7	Mundayodu	1205	252	4.78	23	Kallerikkara	1317	296	4.45
8	Kayalur	1547	345	4.48	24	Malakkuthazha	1404	303	4.63
9	Kolari	1539	312	4.93	25	Illambhagam	1712	389	4.40
10	Chirakkadi	1484	310	4.79	26	Temple	1777	388	4.58
11	Pariyaram	1478	318	4.65	27	Mattannur	2330	474	4.92
12	Ayyalur	1269	292	4.35	28	Uthiyoor	1744	394	4.43
13	Nellunni	1167	286	4.08	29	Maruthayi	1646	360	4.57
14	Pazhassi	1462	284	5.15	30	Mettadi	1631	375	4.35
15	Uruvachal	1236	233	5.30	31	Nalankeri	1533	285	5.38
16	Kottakkunnu	1547	306	5.06		**TOTAL**	**47078**	**9788**	**4.81**

Plinth Area Details

Plinth area wise data of houses in the municipal town is obtained through socio-economic survey. Figure 14.5 indicates the percentage variation of houses in each range of plinth area and figure 14.6 shows the percentage variation of different types of buildings.

From the figure it is clear that majority of the houses are having a plinth area of 75-150 m^2 (42.63%) which is closely followed by 50-75 m^2 (38.94%) indicating the poor economic status of the town. Only 0.61% of the houses have plinth area larger than 250 m^2.

Different Types of Houses

Figure 14.6 obtained as per socio-economic survey conducted reveals that 52.21 % houses in the town are pucca type, 42.01% houses are moderate type, 5.65 % houses are kutcha type and 0.12% houses are huts.

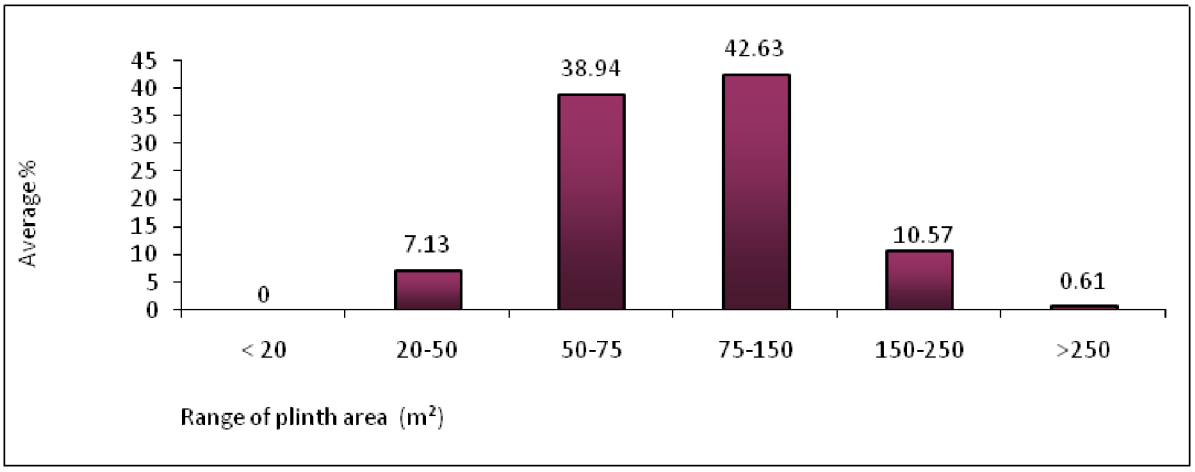


Figure 14.5 Percentage variation of houses in each range of plinth area

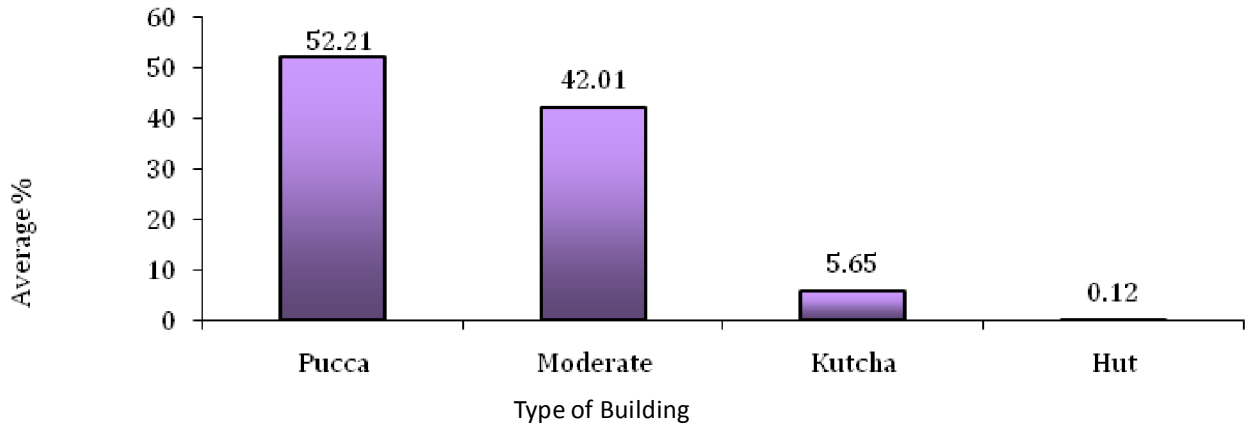


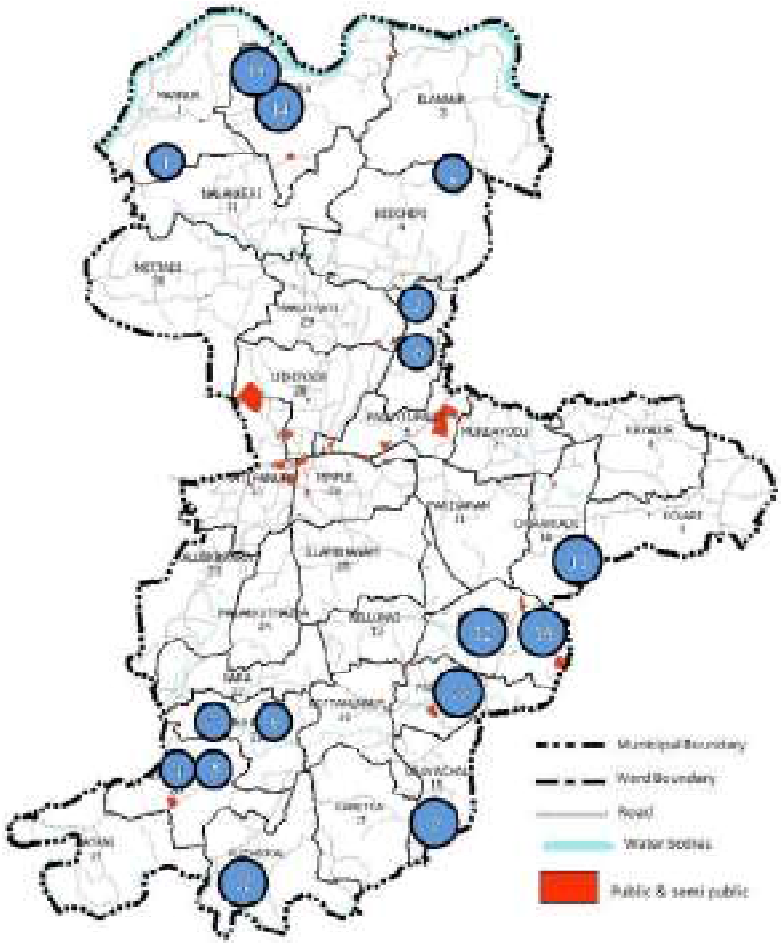
Figure 14.6 Percentage variation of houses for different types of building

Slums

A slum is a densely populated urban area that is characterized by a generally low standard of living.

Figure 14.7 shows the location of slums in Mattannur municipal area.

There are 33 slums located within the municipal area, out of which 16 are listed slums. Majority of the



Sl. No.	Name of listed slum
1	Mannur Michabhoomi colony
2	Mancha colony
3	Kallur Pattikajathisanketham
4	Kayani Pattikajathisanketham
5	Kayani Laksham Veedu colony
6	Laksham Veedu colony Kallur
7	Kara Karimbalan colony
8	Devarkattu Nellunni
9	Kunhikannoth cluster
10	Edapazhassi cluster
11	Vembadi Laksham Veedu colony
12	Ayyallur cluster
13	Mancheripoyil cluster
14	Periyachoor cluster
15	Mokrengode cluster
16	Bhoothanam colony Ayyallur

Figure 14.7 Location of listed slums in Mattannur municipal area

Table 14.3 Physical conditions of listed slums in Mattannur municipal area

Name of the Slum	Ward No.	Listed/ non listed slum	No of Houses	**Housing Category**			**Source of drinking water**		**Method of sanitary waste disposal**
				Pucca	moderate	Kutch	Public Tap	Well	Leach Pit (Individual)
Mannur Michabhumi colony	1	Listed	13	7	4	2	Yes	Yes	Yes
Mancha colony	3	Listed	14	0	14	0		Yes	Yes
Kallur Pattikajathi Sanketham	5	Listed	18	4	10	4		Yes	Yes
Kayani Pattikajathi Sanketham	20	Listed	9	7	2	0		Yes	Yes
Kayani Laksham veedu Colony	11	Listed	4	0	4	0		Yes	Yes
Laksham veedu Colony Kallur	5		24	17	7	0		Yes	Yes
Kara Karimbalan colony	21	Listed	10	5	5	0	Yes	Yes	Yes
Devarkattu,Nellunni	22	Listed	7	2	5	0		Yes	Yes
Kunhikannoth Cluster	16		21	0	21	0		Yes	Yes
Edapazhassi Cluster	9		56	56	0	0		Yes	Yes
Vembadi Laksham veedu Colony	5		11	0	11	0		Yes	Yes
Ayyallur Cluster	9		12	4	8	0	Yes		Yes
Mancheripoyil	11		29	2	27	0		Yes	Yes
Periyachur Cluster	1		27					Yes	Yes
Mokrengod Cluster	1		24	0	24	0		Yes	Yes
Bhoothanam Colony, Ayyalur	9		37	6	31	0		Yes	Yes
Total			**303**	**110**	**173**	**6**			**Yes**





slums are either SC/ST colonies or Laksham veedu colonies. Most of the slums are located in the southern and south-east portion of the municipal town. There are 4 slums located in Mannur ward.

Table 14.3 shows the physical conditions of slums in Mattannur municipal area which has been prepared based on the secondary data obtained from the Municipality. The table gives the data regarding number of houses in each slum, housing category, source of drinking water and method of sanitary waste disposal etc.

As per the table, there are altogether 303 houses in the 16 slums. Most of the houses come under pucca or moderate type and electricity has reached to all slum areas. Almost all slums have approach roads but some slums lack internal roads. Except Ayyallur cluster, all others have well and three colonies have public tap. But all colonies face water scarcity during summer season and have to depend on tanker supply. Almost all the slums possess individual toilet and leach pit arrangements while there are no facilities for solid waste disposal. Street light facilities exist in only 4 colonies and proposals are made for some more colonies.

Housing and Slum improvement schemes

a) Valmiki Ambedhkar Avasan Yojana (VAMBAY)

Housing Scheme: -

Valmiki Ambedkar Avasan Yojana (VAMBAY) is a centrally sponsored scheme for the benefit of slum dwellers. The scheme is primarily aimed at solving the housing problems for the slum dwellers living Below Poverty Line in different towns and cities of the Nation.

This scheme was started in 2003-2004 with a project cost of 32 lakhs for the Mattannur Municipal Town. Total beneficiaries selected were 77 and out of these houses 75 were completed so far.

b) Integrated Housing and Slum Development Programme (IHSDP) Scheme: -

The Integrated Housing and Slum Development Programme targets the poor living conditions of slums and clusters in cities and mofussil towns and attempts to improve the housing stock and basic infrastructure and coverage service delivery to the poor. There are 53

Table 14.4 Details regarding I.H.S.D.P Scheme

	PHASE 1	PHASE 2	TOTAL
No of clusters	6	10	16
Total no. of new houses	97	280	377
Total no. of house for repair	44	340	384
Total cost	13,110,000	67,596,362	80,706,362
Expenditure till now	80.37%	55.00%	59.00%
Project period	27.02.2007 to 26.08.2008	5.03.2010 to 4.09.2011	
	Project period now extended up to 31/03/2015		

IHSDP projects running in 45 cities/ towns in Kerala. The scheme consists of two phases. First phase was started in 2007 and ended up in 2008 and the phase 2 was between 2010 and 2011. This project is now extended up to 31/03/2015. The details regarding this scheme for Mattannur Municipal Town are given in table 14.4.

b) E.M.S Housing Scheme: -

The EMS Housing Scheme envisioned with the objective that there should be no homeless family in the state. It was estimated that there are 2 lakh landless families and a total of 5 lakh houseless families in the state as on June 2008. EMS total Housing scheme launched by Government of Kerala during 2009 - 10 aims at providing house sites to all landless families and houses to all houseless families coming under the BPL category. In Mattannur municipal area 305 houses were selected for the scheme. Out of this, only 199 houses had been completed so far and the remaining 106 houses needs completion.

d) Bhadrata Housing Scheme: -

Mattannur Municipality has started its own housing scheme named 'Bhadrata' for the poor and 200 beneficiaries are selected for the present year (2014- 2015).

14.2 DEVELOPMENT POTENTIALS AND PROBLEMS

14.2.1 Development potentials

Around 38.89% of municipal land area is used for residential purpose and availability of land when compared to other municipal towns is a great potential for Mattannur Municipal Town. An important potential is the availability of drinking water, the major source of water is ground water from open wells and only 5% of the population depends on piped supply. Electricity is yet another important factor in day–to-day life, even though Mattannur Municipal Town covers certain remote areas, electricity has reached everywhere.

14.2.2 Problems

Housing sector faces several problems. It is seen that the household size is found decreasing which may create more housing demand in future. In Mattannur Municipal Town, there are 17 slums existing which can in turn affect the development of such areas.

14.3 INFERENCE

Housing is an important sector to be considered for the study and analysis of future development of a city. All over Kerala, house hold size shows decreasing trend, which will in turn create more housing demands for the future. The expected rapid development and urbanization in connection with the airport will create more housing demand in Mattannur municipal area. This impact will create higher land cost and is to be considered in housing planning as majority of the inhabitants in the area belong to lower income group.



Chapter-15

RECREATION AND CIVIC AMENITIES

Civic amenities are cultural elements of a community with which residents and visitors engage; which enhances our quality of life; promotes life-long learning and social exchange; promotes regional economic development etc. Examples of these amenities are facilities and programs that span the arts, entertainment, theaters, museums, cultural attractions, sports, parks and recreation areas.

The chapter deals with recreational facilities existing in Mattannur municipal area and the present status of civic amenities.

15.1 ANALYSIS OF EXISTING STATUS

The various existing recreational facilities and civic amenities within Mattannur municipal area are explained in detail below.

15.1.1. RECREATION

Recreational facilities include Parks, playgrounds, auditoriums, theaters, libraries, and institutions for arts.

Parks and Play grounds

The recreational facilities like parks and playgrounds are very much nominal in the case of Mattannur Municipal Town. The non availability of a cinema theater within the municipal area also affects the people.

But there exists a number of arts training schools within the municipal area which promotes artistic talents. Libraries and reading rooms available within



Sl. No.	Parks & Playgrounds	Ward
1	Park near KWA Office	Temple Ward
2	Park at Inspection Benglow hill	Temple Ward
3	Play ground near Pazhassi U.P. (on Tellicherry Road)	Kottakkunnu
4	Mattannur U.P. School ground	Mattannur
5	PRNSS college ground	Uthiyoor
6	Ploytechnic ground	Mundayodu
7	Mattannur H.S. School	Mundayodu
8	Mini Stadium at Municipal office compound	Uthiyoor

Figure 15.1 Location of parks and playgrounds

the municipality enhance the reading habits of people, and also act as cultural centre and meeting places.

The location of parks and playgrounds in Mattannur municipal area is given in figure 15.1.

There are two parks and five play grounds in the Mattannur municipal area. The mini stadium situated within the municipal office compound lacks ~~ample~~ space and facilities. There are no large size parks, play grounds and stadium in Mattannur Municipal Town. Parks at Inspection Bungalow Hill and park near KWA Office are the only major recreational spaces available for public within the municipal area. Most of the playgrounds are owned by Educational Institutions.

Mattannur was once well-known for Volley ball. P.R.N.S.S College and Udaya Sports Club had strong teams and contributed many University and State level players. The glory of volley ball got premature extinct and one of the reasons might be the conversion of the court near Police station to Police quarters.

Assembly Halls

Location of meeting halls in Mattannur municipal area is given in figure 15.2



Kailas Auditorium



Sl. No.	Major Meeting Halls
1	Kailas Auditorium (in front of Mahadeva Temple
2	Athulya Tourist Home (Nr. MIM Hospital-Thalassery Road)
3	Lakshmi Hall (Nr. Temple pond)
4	Lion's Den
5	Sky Park Auditorium, Iritty Road
6	CDS Hall at Municipal Office compound

Figure 15.2 Location of meeting halls

Figure 15.2 shows the location of meeting halls in Mattannur municipal area. Kailas Auditorium is the only large size meeting hall having a seating capacity of 500, it is located at the town center and very close to Sree Mahadeva temple. Sky Park auditorium is another auditorium located along Iritty road with a capacity of 200 seats. All meeting halls are located in the town area. CDS Hall in the municipal office compound is the only hall under public sector and can accommodate only small meetings. All these meeting halls are located in the town area.

Theaters

There were 2 theaters located in the municipal area which had been shut down and demolished. At present there are no theatres at all.

Table 15.1 Details of sports coaching centers

Sl. No.	Name of Centre	Items	No. of Students
1	Mattannur H.S. School	Volley ball	100
		Samagra Arogya Kayika Vidyabhyasa Programme	100 (Selected from Municipal level)
2	Mattannur Govt. U.P School	Karate	100
		Taekwondo	40
3	Udaya Sports Club, Mattannur	Volley ball	60
4	Mini Sports & Arts Club	Football	100
		Swimming	300
5	Kadathanadan Kalari Sangam	Kalari	100

Sports and Arts Centres

Other recreational facilities are sports and arts training centers. The details of sports training centers in Mattannur municipal area are given in table 15.1.

The table 15.1 reveals that a total of 900 students are getting sports coaching within the municipal area. Sports coaching centers provides practice for various sports items like Volley ball, Football and swimming. Classes for martial arts like Karate, Taekwondo and Kalari are also available in 2 institutions within the municipal area. Out of the 5 sports coaching centers in the municipal area 3 are private coaching centers.

Data regarding arts training centers in Mattannur municipal area is given in table 15.2.

Table 15.2 Arts training centers

Sl. No.	Name of Centre	Items	No. of Students
1	Swathi Kala Kshethram	Bharatanatyam Kuchupidi Mohiniattam Ottan thullal Drawing	240
2	Bharatha Sree Kala kshetram	Bharatanatyam Kuchupidi Mohiniattam	200
3	Chidambaram Kala Kshetram	Bharatanatyam, Kuchupidi Mohiniattam Ottan thullal Kathakali	230
4	Mattannur Govt. U.P. School	Instrumental Music	400

At present, there are 4 institutions within the municipal area which provide training for developing the artistic talents and serves almost 1050 students. Classes on Bharatanatyam, Kuchupidi, Mohiniattam, Ottan thullal, Drawing and instrumental music are given in these institutions. Only one government school offers facilities for promoting artistic talents among students.

Clubs and Libraries

List of clubs and libraries in Mattannur municipal area is given in Table 15.3

Table 15.3 List of clubs and libraries

Items	Total Nos.
Clubs	56
Reading Rooms	11
Libraries	21

There are 56 clubs in Mattannur Municipal Town and, out of this 32 clubs have their own building. At present there are 21 libraries and 11 reading rooms with in the municipal area. But only two or three libraries have good collection of books while others have only nominal collection.



James Memorial library

15.1.2. CIVIC AMENITIES

The facilities provided by the Governments and local bodies for common people are called civic amenities and it includes water supply, electricity, roads, bridges, flyovers, public toilets, garbage disposal, crematorium and burial ground, railways, roadways etc.

Police Station and Fire Station

In Mattannur municipal town, police station is located at town center and serves the municipal area and parts of surrounding Panchayaths also.

Fire station is located just outside the municipal boundary and near to town centre. Location of police station and fire station are given in figure 15.3.

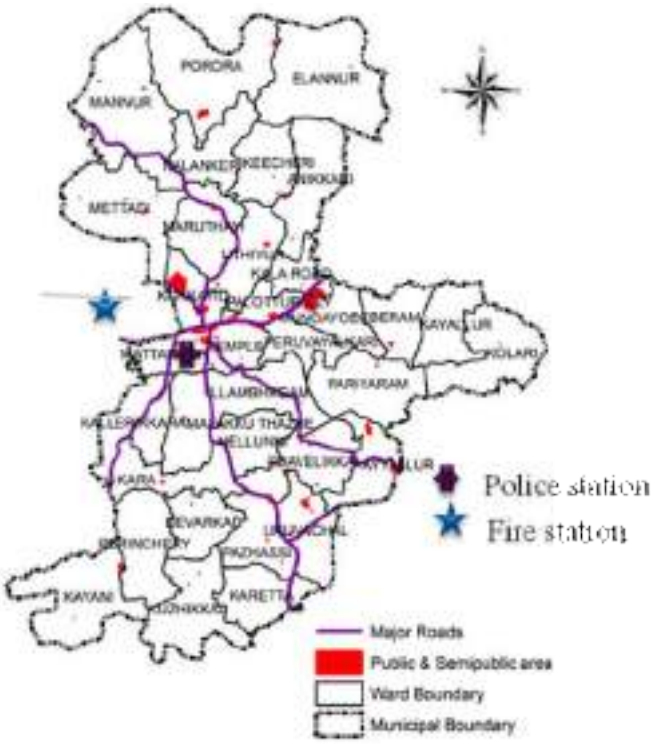


Figure 15.3 Location of fire station and police station

Facilities provided in fire station is given in table 15.4.

Table 15.4 Fire station – existing facilities

Sl. No.	Item	Nos.
1	Fire engines (4500 litres)	2
2	Ground tank at fire station	30,000 litre
3	Sump tanks in the municipality	Nil
4	Delivery hose	19
5	Suction hose	4
6	Float pump	1
7	Portable pump	1
8	B.A set	2
9	Structure	2
10	Branch pipe	8
11	Rope ladder	1
12	Hydraulic set (spreader & cutter)	1 each
13	Chain saw	1
14	Aluminium suit	1
15	Plastic rope	500 metre
16	Life buoy	2
17	Life jacket	3

Post Offices and Telephone Exchages

Mattannur municipal town has one main post office and five sub-post offices, all scattered in Mattannur municipal area. There are two telephone exchanges within the municipal area, one is located very close to the town center. The location of post offices and telephone exchanges are shown in figure 15.4.



Figure 15.4 Location of post offices and telephone exchanges.

Burial grounds and Cremetorium

At present there is no public crematorium or burial ground in Mattannur municipal area. However, there exist two grave yards associated with mosques. Municipality had already acquired land with an extent of 1.3 acres near trenching ground (Porora ward) for public crematorium and the project has been submitted for approval. The grave yards and proposed municipal crematorium are shown in figure 15.5.

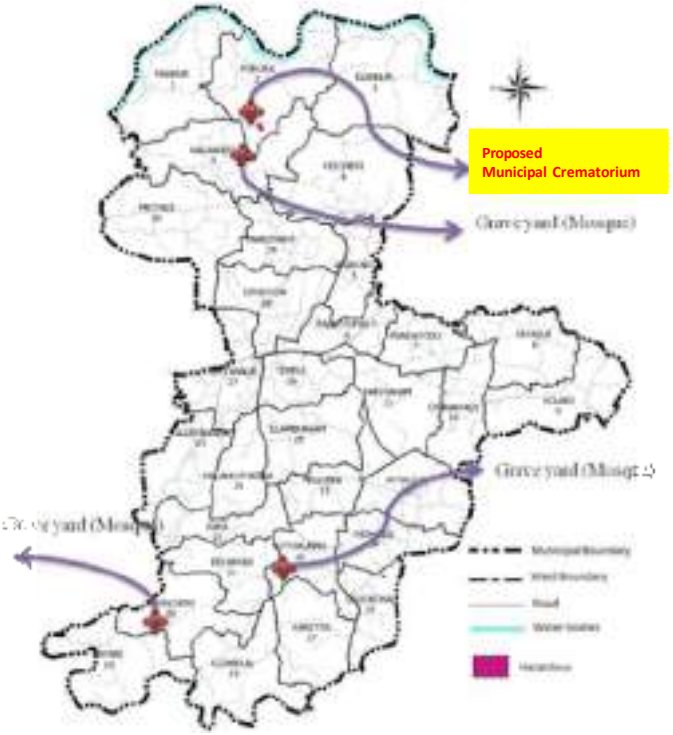


Figure 15.5 Location of grave yards and proposed crematorium



Figure 15.6 Location of comfort stations in Mattannur municipal area

Comfort Stations

There exist only two comfort stations within the municipal area. One is located at Municipal Bus stand and other at Uruvachal town. Comfort station like e-toilets for ladies are yet to be set up in Mattannur municipal area. Location of comfort stations in Mattannur municipal town is shown in figure 15.6.

Oil and Gas Filling Stations

In Mattannur municipal area, there exist two petrol pumps adjacently located along Iritty road. Consumption of diesel is much more than that of petrol. New petrol pump may be required along Thalassery Road considering the air port bound vehicles in future.



Comfort station at Mattannur bus stand



Gas filling station at Karetta

One gas filling station for vehicles is almost ready for service at Karetta. Gas godown is located near P.R.N.S.S. College. The location of petrol, diesel and gas distribution centers are given in figure 15.7.



Figure 15.7 Location of petrol, diesel and gas distribution centers

Public Offices

Major offices under public sector in Mattannur municipal area are given in table 15.5

15.2 DEVELOPMENT POTENTIALS AND PROBLEMS

15.2.1 Development potentials

Vacant land and dry agriculture lands are available in the municipal area and this potential can be utilized for establishing parks, play grounds, stadium etc. Vast extent of canal land of defunct Pazhassi Irrigation Project can also be converted for recreational purposes.

15.2.2 Problems

Recreational facilities are meagre in Mattannur Municipal town. There are no Stadium or major Parks and Play grounds or places for public function or gathering. Presently there are no cinema theatres at all. There are no big convention centres or town halls in the municipal area in public sector and the only one available is the Kailas Auditorium functioning under private sector. The available parks and playgrounds are not properly maintained. The canal banks and river banks can also be used for recreational purposes.

15.4 INFERENCE

Though Mattannur municipal town is provided with basic civic amenities, it lacks good recreational facilities as there are no large size parks, stadium, museum etc. The absence of theatres within the municipal area often affects the locals as they have to travel long distance for entertainment activities.

Table 15.5 Other offices under public sector

Sl. No	OFFICE	LOCATION	REMARKS
1	Municipal Office	Maruthayi Road	Own Building
2	Krishi Bhavan	Maruthayi Road	Municipal Office Compound
3	Employment Office	Maruthayi Road	Municipal Office Compound
4	I.C.D.S. Office	Temple Road	Old Municipal Office building
5	Kolari Village Office	Kannur Road	Own Building
6	Pazhassi Village Office	Pazhassi	Own Building
7	Judicial First Class Majistrate Court	Iritty Road	Own Building
8	KWA Office	Thalassery Road	Own building
9	Irrigation Dept. Office	Iritty Road	Own building
10	District Treasury	Thalasseri Road	Rented
11	A.E.O Office	Near Mahadeva Temple	Rented
12	Sub-Registrar Office	Iritty Road	Rented
13	KSEB Office	Palottupally	Rented



Chapter-16

SOCIAL WELFARE

Social Welfare Services intend to provide needed care and protection and such other services to the economically weaker section of the society, socially backward classes, women, children, physically and mentally challenged, destitute, orphans, aged, infirm etc. It is necessary in the modern age that the society needs to be approached in a holistic manner with remedies for illness at the core level. Instead of encouraging the self-centric attitude, a philanthropic attitude should be promoted among the members of the society towards the poor and the needy.

The Social Justice Department of Kerala was formed on 9 September 1975 for the implementation of social welfare programmes and services in Kerala. The Department initiates and implements welfare programmes and services for women in need and distress, differently abled and mentally challenged persons, women and children, destitute orphans and neglected street children and provides social security for the aged and destitute through a network of organizations, residential institutions and non-institutional schemes.

The chapter deals with the welfare of Scheduled Caste and Tribes, BPL (Below Poverty Line) families, Children and Women in Mattannur municipal area.

16.1 ANALYSIS OF EXISTING STATUS

16.1.1 Scheduled Caste/ Scheduled Tribe (SC/ ST)

The Scheduled Castes and Scheduled Tribes are two groups of historically disadvantaged people recognized in the Constitution of India.

Table 16.1 Temporal variation of SC and ST population in Mattannur town

YEAR	TOTAL POPULATION	SC POPULATION	% OF SC POPULATION	ST POPULATON	% OF ST POPULATON	SEX RATIO	
						SC	ST
1991	40,506	963	2.3	21	0.052	1,049	1,100
2001	44,313	994	2.24	22	0.05	1,041	1,444
2011	47,078	945	2.007	132	0.28	1,086	913

As per census 2011, SC population size is 945 and ST population size is 132 in Mattannur municipal area. The temporal variation of SC and ST population in Mattannur municipal area during the last two decades is given in Table 16.1. The sex ratio of SC and ST population is also calculated.

A slight decrease is observed in the percentage of SC population whereas ST population shows an increase during the last two decades. Sex ratio of SC population has increased while that of ST shows a decline and has a value less than 1000 as per 2011 census. SC population in Mattannur townconstitutes nearly 2 % of the total population which is low when compared to the district (3.30%). ST population (0.28%) is very low in Mattannur town against a district average of 1.64%.

The ward wise concentration index of SC and ST population is calculated and concentration maps have been prepared separately for SC and ST population.

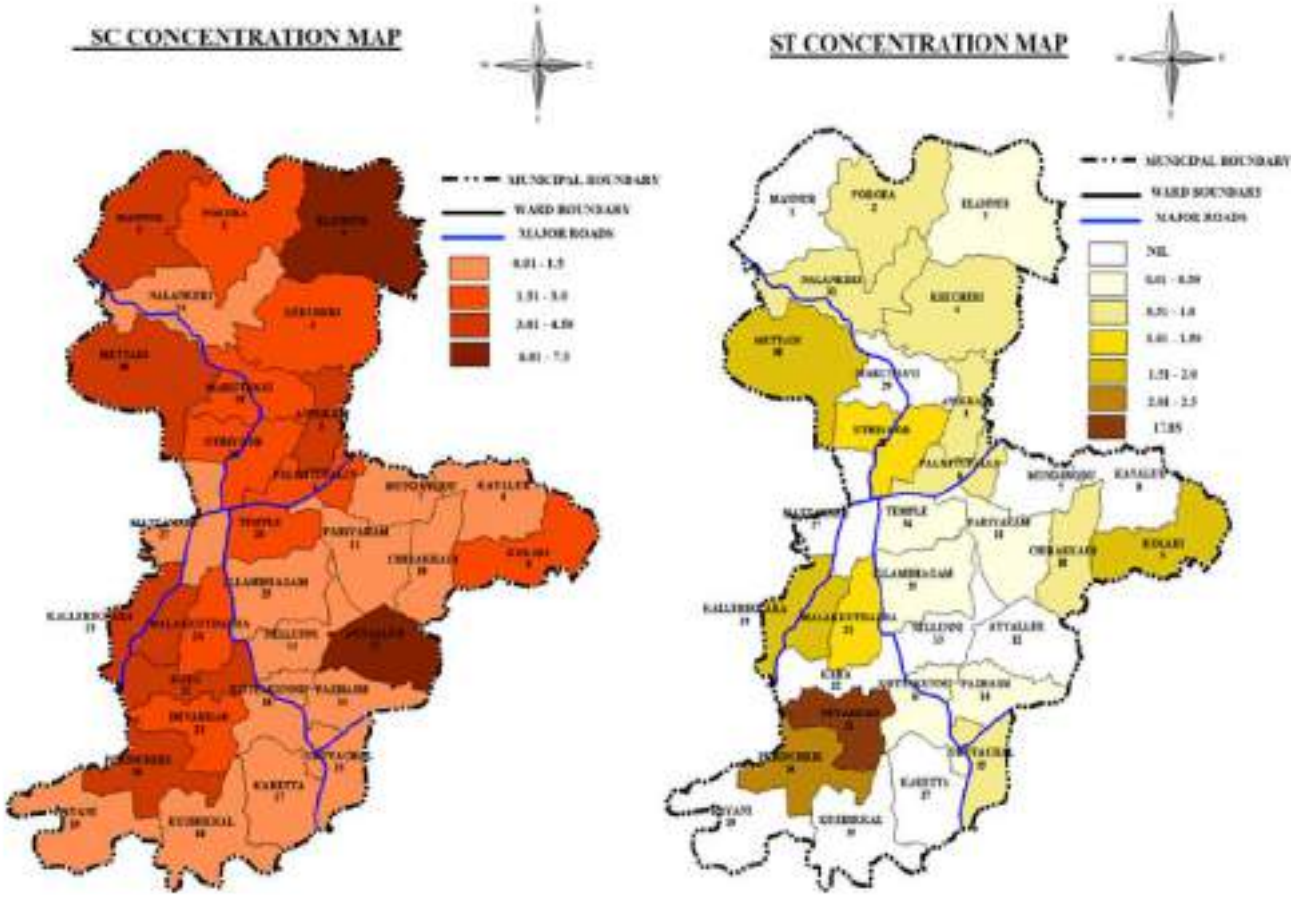


Figure 16.1 Ward wise concentration map of SC & ST population in Mattannur municipal area

The figure 16.1 shows the concentration index maps of SC and ST population.

SC concentration is highest in two wards namely Elannur and Ayyallur. Wards having moderate concentration of SC population are mainly situated in the central portion and along the western periphery of the municipal area. However all wards show SC concentration index.

The concentration of ST population is highest in Devarkkad ward. ST concentration is moderate in Perincheri, Kallerikkara, Mettadi, Kolari, Malakkuthazhe and Uthiyoor wards. Almost 11 wards do not have ST concentration and remaining wards shows very little concentration.

The concentration of SC/ST population is seen in wards where agricultural activities are predominant. It indicates that the socially backward communities are mostly engaged in primary activities like agriculture.

SC and ST colonies are scattered within the Mattannur municipal area, the details of which are tabulated in Table 16.2 and their locations are shown in figure 16.2.

The table 16.2 shows that there are a total of 7 SC/ST colonies comprising of 71 families and a total population of 325 people. Among the 7 colonies, Kallur, Mannur and Manja colonies located in the northern part of the townare the largest with high population.

Table 16.2 Details of SC/ST colonies in Mattannur town

Sl. No.	Name of SC/ST Colonies	No. of families	Population
1	Ayyallur	5	29
2	Kayani	8	33
3	Devarkkadu	6	24
4	Kallur	18	89
5	Mannur	13	55
6	Manja	16	81
7	Kara	5	14
	Total	**71**	**325**



Figure. 16.2 Location of SC/ST colonies in Mattannur municipal area

16.1.2 BPL families

Below Poverty Line(BPL) is an economic benchmark and poverty threshold used by the government of India to indicate economic disadvantage and to identify individuals and households in need of government assistance and aid. It is determined by using various parameters which vary from state to state and time to time.

The ward wise details of BPL families in Mattannur town is given in Table 16.3 and the BPL concentration index map is shown in Figure 16.3.

Table 16.3 Ward wise details of BPL families in Mattannur town

Sl. No.	Name of ward	Total No. of Household	No. of BPL family
1	Mannur	277	145
2	Porora	254	187
3	Elannur	260	150
4	Keecheri	401	231
5	Anikkari	352	187
6	Palottupally	397	42
7	Mundayodu	252	115
8	Kayalur	345	174
9	Kolari	312	124
10	Chirakkadi	310	156
11	Pariyaram	318	140
12	Ayyalur	292	195
13	Nellunni	286	123
14	Pazhassi	284	145
15	Uruvachal	233	97
16	Kottakkunnu	306	95
17	Karetta	341	118
18	Kuzhikkal	279	155
19	Kayani	230	114
20	Perincheri	246	162
21	Devarkkad	279	170
22	Kara	270	141
23	Kallerikkara	296	189
24	Malakkuthazhe	303	108
25	Illambhagam	389	176
26	Temple	388	65
27	Mattannur	474	109
28	Uthiyoor	394	102
29	Maruthayi	360	144
30	Mettadi	375	180
31	Nalankeri	285	133
Total		**9,788**	**4,372**

From the table, it can be seen that there are 4,372 BPL families within the municipal area which constitutes about 44.66% of the total households.

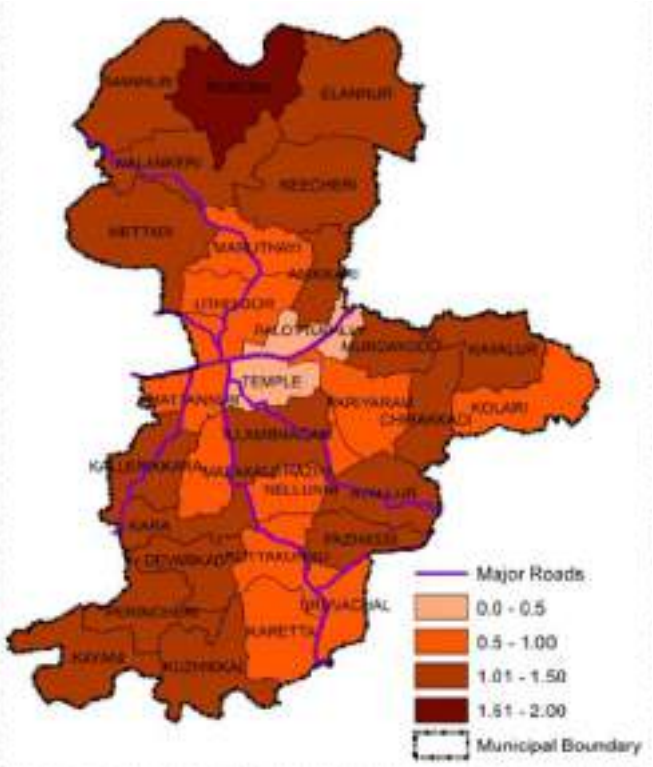


Figure 16.3 Ward wise concentration map of BPL families in Mattannur town

Concentration map shown above indicates that the BPL concentration index is high in remote and agriculture predominant wards in north and south-west region. However, it is observed that the concentration index is comparatively low in the central portion of the municipal area with Palottupally and Temple ward having the least index.

16.1.3 CHILDREN

Children constitute principle assets of any country. Children's Development is as important as the development of material resources and the best way to develop national human resources is to take care of the children. India has the largest child population in the world. All out efforts are being made by India for the development and welfare of children. Significant progress has been made in many fields in assuring

children their basic rights. However, much remains to be done. The country renews its commitment and determination to give the highest priority to the basic needs and rights of all children. Children are most vulnerable to exploitation and abuse. A lot more has to be done for the health, nutrition and education of children. It is unfortunate that girls in particular face debilitating discrimination at all stages. Therefore, specific concentration is being given to the efforts to improve the life and opportunities of the Girl Child.

The figure below shows the location and distribution of Anganvadies within the Mattannur municipal area. There are a total of 43 anganvadies distributed in 34 wards of the municipal town.

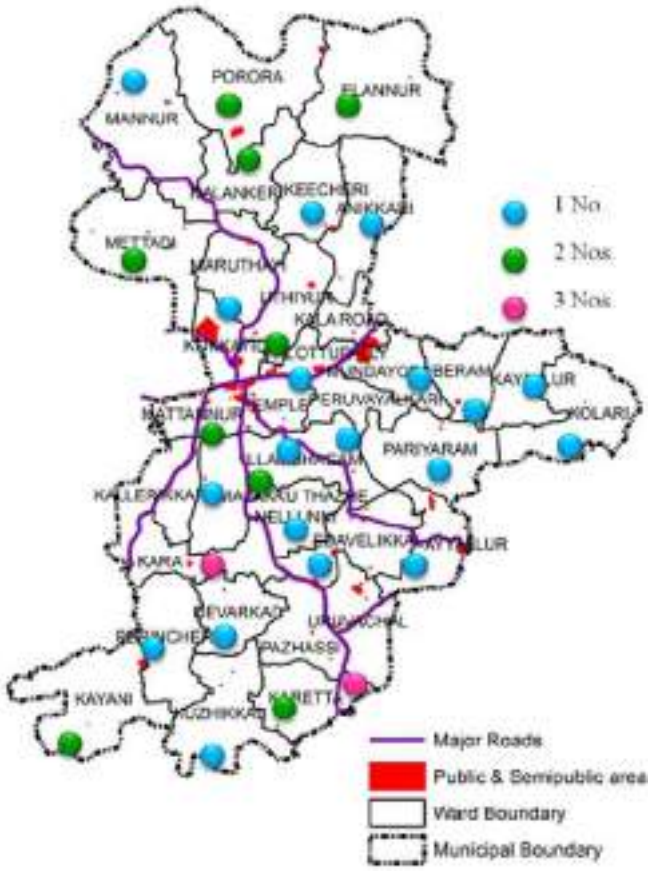


Figure. 16.4 Details of Anganvadies in Mattannur town

Out of the total 34 wards, 4 wards namely, Kala road, Pazhassi, Kallerikkara and Kokkayil do not have anganvadies. However, the children can depend on anganvadies in the adjacent wards as most of the wards have more than one anganvadi. Integrated Child Development Services (ICDS) office is functioning in Temple ward thereby ensuring child welfare.

Table 16.4 Details of orphanages in Mattannur town

Sl No.	Ward	Location	No of Children	Basic Facilities Available
1	11	Palottupally Yathim Khana	25	Water Sanitation Road
2	4	Keecheri Yathim Khana	30	Water Sanitation Road
3	8	Kayallur Balamandiram	40	Water Sanitation Road

There are 3 orphanages and accommodate about 95 orphans. All of them possess basic facilities which include water, sanitation and road.

16.1.4 WOMEN

The Department of Social Welfare, in its welfare programmes for women, emphasizes the need for initiative, advancing and developing economic empowerment. A number of welfare schemes for women have been undertaken by the Government of India.

The Kerala State Women's Development Corporation was incorporated in 1988 with the main objective of implementation programmes for the economic development of women in the State and to formulate, promote and implement any scheme aimed at the welfare of women in Kerala to enable them to earn a better living. The Corporation has been implementing self-employment loan schemes and thousands of women under the poverty line have been benefitted under this scheme. Various schemes

introduced by the Government of Kerala for the welfare of women mainly include-

· Programme for Gender Awareness
· Finishing School for Women
· Implementation of Dowry Prohibition Act
· Implementation of Child Marriage Prohibition Act 2006
· Widow Pension
· Pension to Unmarried Women above 50 years
· Working Women's Hostel (WWH)
· 'She-Taxi'
· Kudumbashree units

In Mattannur town, Kudumbashree units are working effectively in all wards. Ward wise distribution of Kudumbasree units in Mattannur town is given in figure 16.5. There are a total of 384 Kudumbasree units scattered all over the town.

Kudumbashree was conceived as a joint programme of Government of Kerala and NABARD implemented through Community Development Societies (CDSs) of poor women, serving as the community wing for local government. The mission of Kudumbashree is to eradicate absolute poverty in ten years through concreted community action under leadership of local

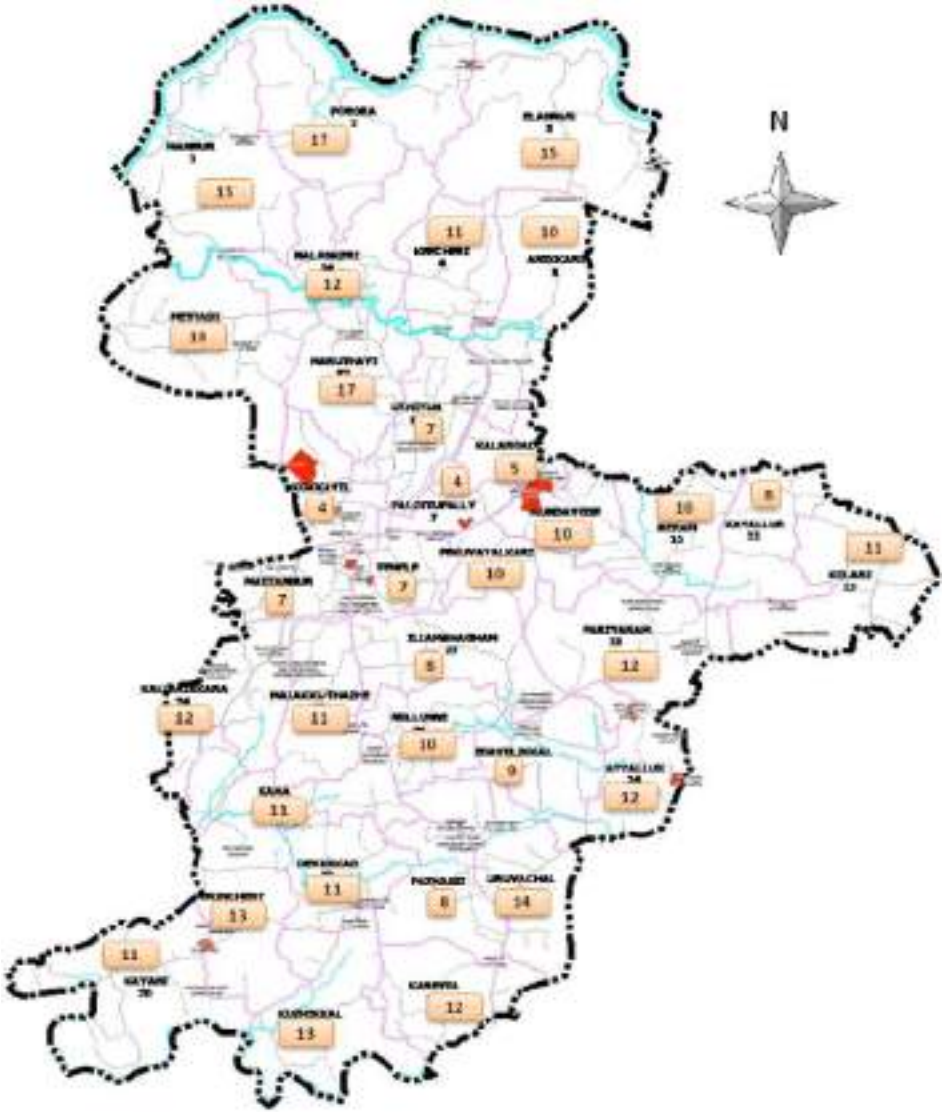


Figure 16.5 Kudumbasree units in Mattannur town

government, by facilitating organization of the poor for complaining self help with demand-led convergence of available services and resources to tackle the multiple dimensions and manifestation of poverty, holistically.

At present, there is no Working Women's Hostel within the municipal town; however the construction work of such a hostel has already been started at Uruvachal and now is in completion stage.

16.1.5 OLD AGED PERSONS AND DIFFERENTLY ABLED PERSONS

Old age homes are meant for senior citizens who are unable to stay with their families or are destitutes. These old age homes have special medical facilities for senior citizens such as mobile health care systems, ambulances, nurses and provision of well-balanced meals. Most of them offer free accommodation. Some homes work on a payment basis depending on the type and quality of services offered. Apart from food, shelter and medical amenities, old age homes also provide yoga classes to senior citizens. Old age homes also provide access to telephones and other forms of communication so that residents may keep in touch with their loved ones. Some old age homes are in the form of day care centres. These centres only take care of senior citizens during the day time. State Government introduced social welfare scheme for old aged persons as per Maintenance and Welfare of Parents and Senior Citizens Act 2007. A municipal level old age home is functioning at Uruvachal in Mattannur municipal area.

The Kerala State Handicapped Persons' Welfare Corporation was established in 1979. Its main aim and objectives are to formulate, promote and implement schemes aimed at the rehabilitation or improvement of the living conditions of the differently abled. This includes the visually impaired, and the physically and mentally challenged. At present there is no rehabilitation center or training center working for physically disabled persons in Mattannur town.

16.2 DEVELOPMENT POTENTIALS AND PROBLEMS

16.2.1 Development potential

The active functioning of Kudumbasree with in the town area is a strong potential which can be utilized for the uplift of the special concern section along with the economic development of the society.

The introduction and implementation of various government schemes for the upliftment of the poor, backward classes, children, women, old aged and physically disabled persons and the availability of fund is another potential.

16.2.2 Problems

Even though the SC/ST colonies in Mattannur town are provided with basic facilities, most of them face water scarcity during summer season. Community hall is not available in any of these colonies. Lack of job training centers is another problem faced by the special concern group. Sanitation facilities are available in most of the colonies but disposal of solid waste is a matter of concern. There are three orphanages within the municipal area, but all are under private sector. Working women's hostel and e-toilets for ladies are lacking within the town.

16.3 INFERENCE

In Mattannur town, the percentage of SC and ST population is low when compared to the district and state average. The weaker section of the society often remains weak due to their negligence; hence all available schemes and funds may be properly implemented and utilized for their uplift. New orphanages, ladies hostel, old age home, centres for physically challenged persons may be established so as to promote the economic and social status of the special concerned section of the society. The State and Central government funds available need to be properly utilized for the uplift of the poor and the needy. Moreover, the rate of crimes and other malpractices can be greatly reduced by providing necessary social measures.



Chapter-18

WATER SUPPLY

Water plays an important role in our day to-day life. About 71 % of earth is covered by water, out of which 96.5 % is found in seas and oceans. Only 2.5 % of earth's water is fresh water which is used for drinking purpose. Kerala is famous for its many lakes, backwaters and the 44 rivers that crisscross its terrain but senseless sand-mining, quarrying and a severe drought brought about partially by climate change have created a situation where drinking water has become a scarce commodity for millions of people. Kerala Water Authority (KWA) is the sole agency for anything and everything related to drinking water distribution in Kerala State.

The Chapter goes through the existing water supply scheme, ground water condition and water scarcity in Mattannur town.

18.1 ANALYSIS OF EXISTING STATUS

At present there is no major issues related to water supply. KWA has an ongoing water supply scheme in Mattannur municipal town and has a proposal to cover the whole area of the municipal town.

18.1.1 SOURCE OF WATER SUPPLY

The studies related to the source of water supply in Mattannur municipal town are based on socio-economic survey conducted and the details are given in table 18.1.

The data obtained from socio-economic survey reveals that well is the major source of drinking water in Mattannur municipal area and comes to 91.09%, KWA and community well contribute 5.70% and 1.19% respectively.

Table 18.1 Source of water supply

Source of water	Well	Municipality/ KWA	Community well	Others
Average% for the LSGI	91.09	5.70	1.19	2.02

18.1.2 GROUND WATER CONDITION

The study of the ground water condition in an area will give an idea about the water availability of that particular area. Central Ground Water Board has conducted a study on ground water condition in Kannur district and categorizes it into two, critical and safe.

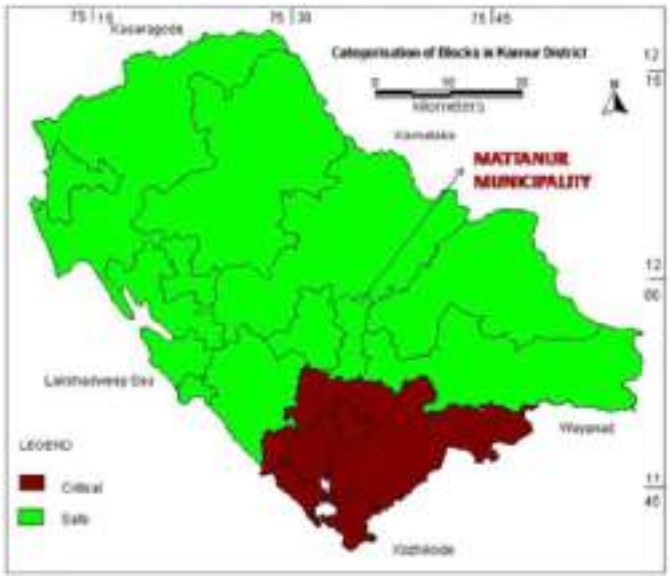


Figure 18.1 Categorization of blocks in Kannur District based on ground water condition

According to this study, Mattannur town is categorized as safe. But it should be noted that as per the categorization of blocks based on 1999 data, all the blocks were under safe category and then later as per the 2004 data computations, Thalasserry and Kuthuparamba blocks adjacent to Mattannur Municipal Town has become 'Critical' and the remaining six blocks are still under 'Safe' category. The figure given below shows the categorization of blocks in Kannur district according to the ground water condition.

18.1.3. REDUCED WATER LEVEL

Reduced Water Level (RWL) is the hight of water table level with respect the Mean Seal Level (MSL) which is taken as the datum level. As RWL increases the depth of water table level decreases. Data regarding Reduced Water Level were obtained from Ground water Department. Figure given below shows the RWL at Mattannur during 2005 to 2013. The location

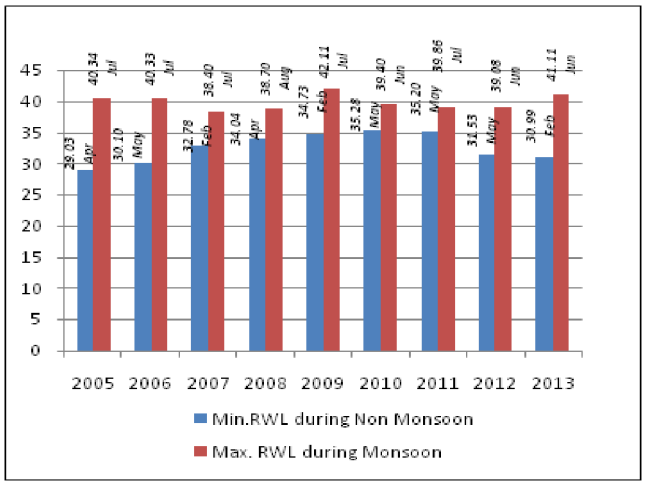


Figure 18.2 Reduced Water Level (2005 – 2013)

selected by Ground Water Department is the Dug well No.KNR-MOW173 at Municipal Bus Stand, Mattannur.

The minimum RWL during non monsoon season for the period 2005-2013 ranges from 25 to 35 metres with respect to Mean Sea Level (MSL). The minimum RWL during non monsoon season were found in the month February, May or April. The maximum RWL during monsoon season ranges from 35 to 45 metres with respect to Mean Sea Level (MSL). June, July and August are the months during which maximum RWL is observed. From the graph it can be seen that water table in summer time has started depleting from the year 2010 onwards.

18.1.4 EXISTING AND PROPOSED WATER SUPPLY SCHEMES

a) EXISTING WATER SUPPLY SCHEME – Kolachery Water Supply Scheme (KWSS)

At present, Water Supply in Mattanur Municipal town is covered under Kolachery Water Supply Scheme. The Scheme covers 7 adjoining Panchayaths also, namely Keezhallur, Koodali, Munderi, Kuttiyatoor, Mayyil, Kolacherry and Narath. The table given below shows the details of water supply scheme in Mattannur municipal town.

Table 18.2 Details of Kolachery Water Supply Scheme (KWSS)

Net work	Source	Area of coverage (ward no.)	No. of connections	No and Capacity (ML) of OH tank	Total Quantity supplied /day	Quality of water (*properly treated/ only chlorination/ no treatment*)
A.C and PVC pipes, Public taps	Pazhassi Reservoir (KWA's, Kolachery WSS and RWSS to Kallur S.C. Colony)	30, 31	839	0.750 M.L Capacity G.L Tank at Kotheri Common for Keezhallur also	2 MLD	Properly treated

From the table given above, it is clear that the existing water supply scheme serves all wards in Mattannur municipal town except two namely, Kokkayil (30) and Uthiyur (31).

Water treatment plant is located at Chavasseryparamba. Here treatment is done by various processes which involves sedimentation, coagulation, filtration and chlorination.

Table 18.3 Details of Water Treatment Plant

Location	Source of water	Capacity of the plant (MLD)	Types of treatment	Working Condition
Chavassery paramba	River	13.7	Sedimentation, Coagulation, Filtration, Chlorination	Good

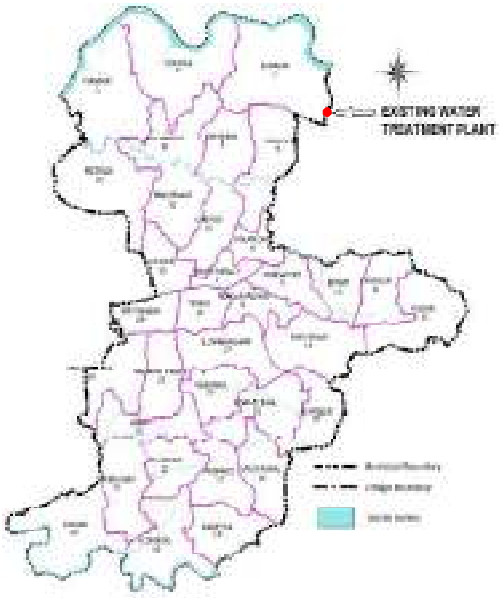


Figure 18.3 Existing Water Treatment Plant at Chavasseryparamba

Figure above shows the location of water treatment plant near Mattannur municipal town.

b) PROPOSED WATER SUPPLY SCHEME (Submitted for Govt. Approval)

Kerala Water Authority had prepared a water supply scheme to the exclusive area of Mattannur Municipal town, which is intended to cover all wards of the municipal town. The project will commence by 2015 with a design period of 30 years. 135 liter/ day is the per capita water supply for the proposed project. Under this project, ultimate demand is 13.43 MLD (Million Litre per Day) and capacity of project is 14 MLD. Pazhassi barrage at Valapattanam River is the source of water supply for this project. Proposed location of water treatment plant and sump tanks are at Kanhiramkari. Water Supply Scheme has a proposal for three ground level tanks and the proposed sites for these tanks are at Manjakkunnu, Chavasseryparamba and P.R.N.S.S College with a capacity of 3.5 LL (Lakh Litre), 4.0 LL and 30LL respectively. Total cost of the project is around 7,100 lakhs. The project has been submitted for approval.

The schematic diagram of proposed Water Supply Scheme for Mattannur Municipal town is given in figure18.4.

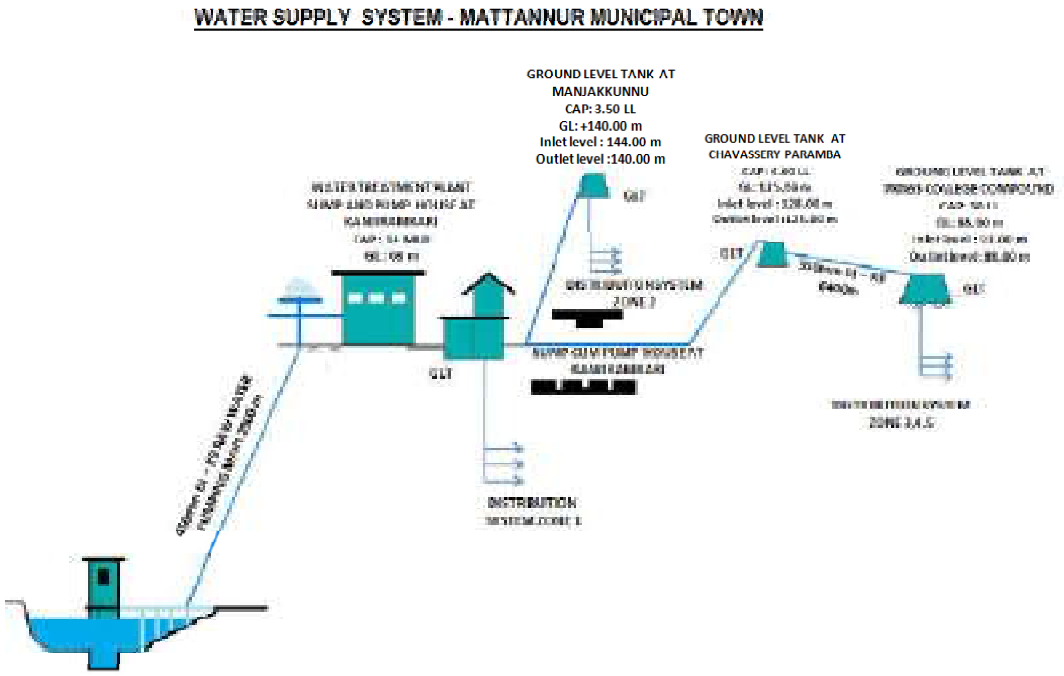


Figure 18.4 Schematic diagram of proposed water supply scheme

As per figure given above, water will be pumped from the reservoir to Water Treatment Plant located at Kanjiramkari. Then the treated water will be pumped to the Ground Level (GL) tank at Manjakkunnu having a capacity of 3.5 LL capacity, followed by tanks at Chavassery paramba (4 LL capacity) and P.R.N.S.S college (30 LL capacity).

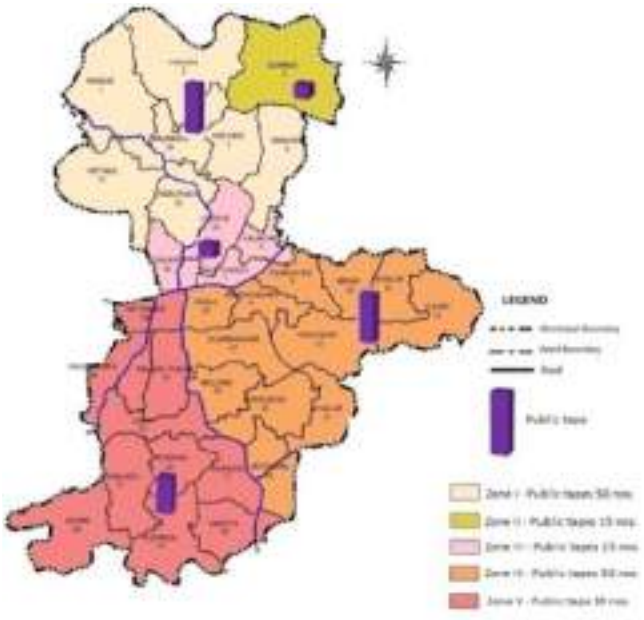


Figure 18.5 Distribution zones

Mattannur municipal area has been divided into different distribution zones as per the proposed project. The fig 18.5 shows the five distribution zones in Mattannur municipal area.

Mattannur municipal area is divided into different zones for regulating the supply of drinking water in each zone by controlling the respective valves. Wards located in the northern portion come under zone I and zone II and the public taps provided in these zones are 50 Nos. and 15 Nos. respectively. And, 4 wards located in the central portion of the municipal area are under zone III with 15 public taps. The Thalassery-Coorg road passing through the municipal area separates Zone IV and V in the southern portion of the municipal town. 10 wards located in the south-west portion of the municipal area comes under Zone IV having 50 public taps and 12 wards in the south-east portion belong to zone V with 30 public taps.

Network details of proposed water supply scheme in Mattannur municipal area are given in figure 18.6.

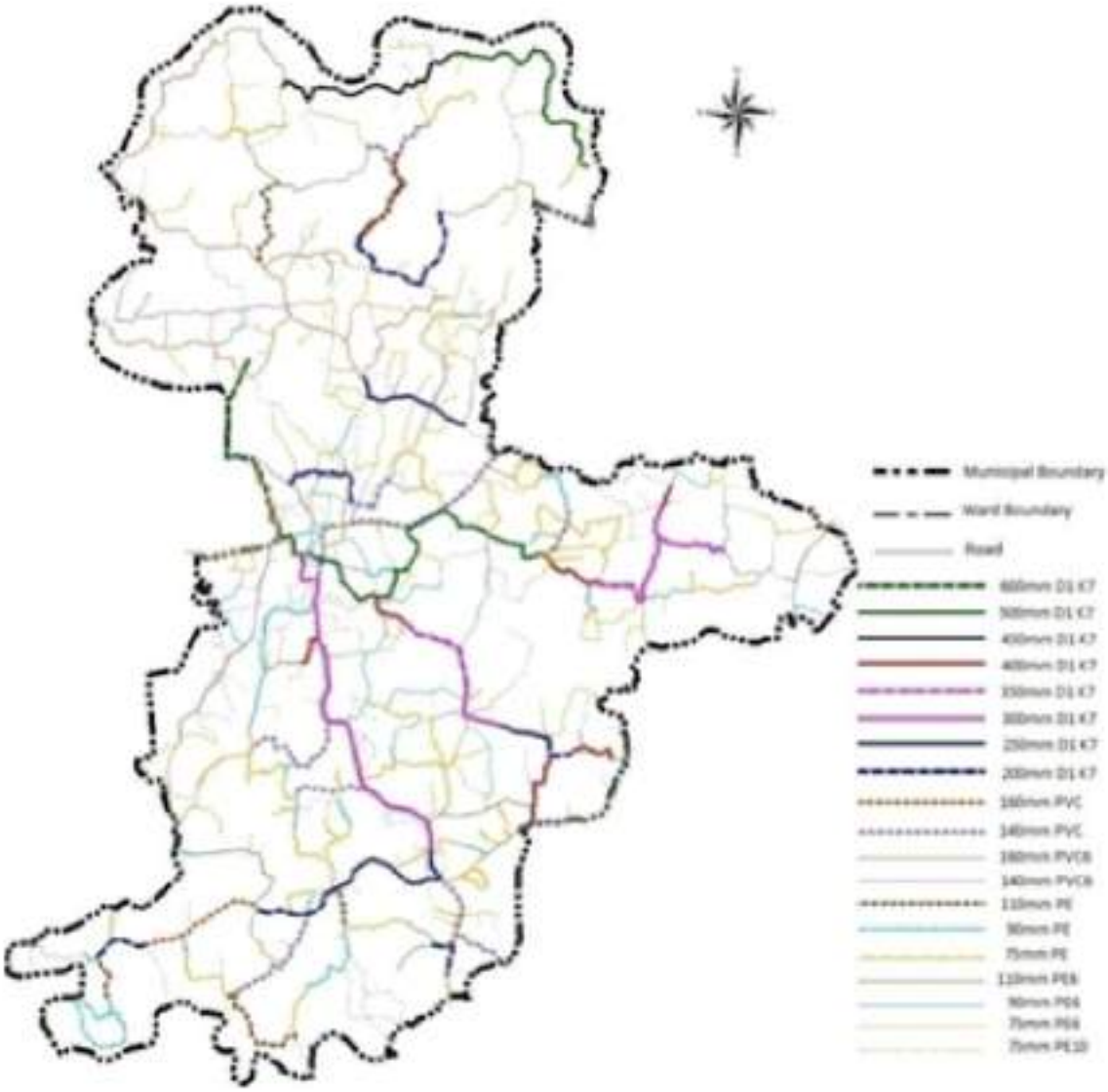


Figure 18.6 Network details – Proposed Water Supply Scheme.

18.1.5 WATER SCARCITY

Data regarding scarcity were obtained from secondary data and socio-economic survey. From secondary data, it is clear that in Mattannur municipal area, out of 34 wards of Mattannur town, 3 wards face severe water scarcity and 11 wards face medium scarcity. Figure 18.7 shows the wards under severe scarcity and medium scarcity.

The figure shows that Anikkeri, Mundayodu and Ayyallur are the areas experiencing water scarcity. At Anikkeri, almost 23 houses face heavy scarcity during the months of December, January and February. In Mattannur Municipal town, work for IHSDP water supply scheme has been already started, however bore well construction works are to be finished. Water scarcity at Mundayodu is mainly due to its topography,

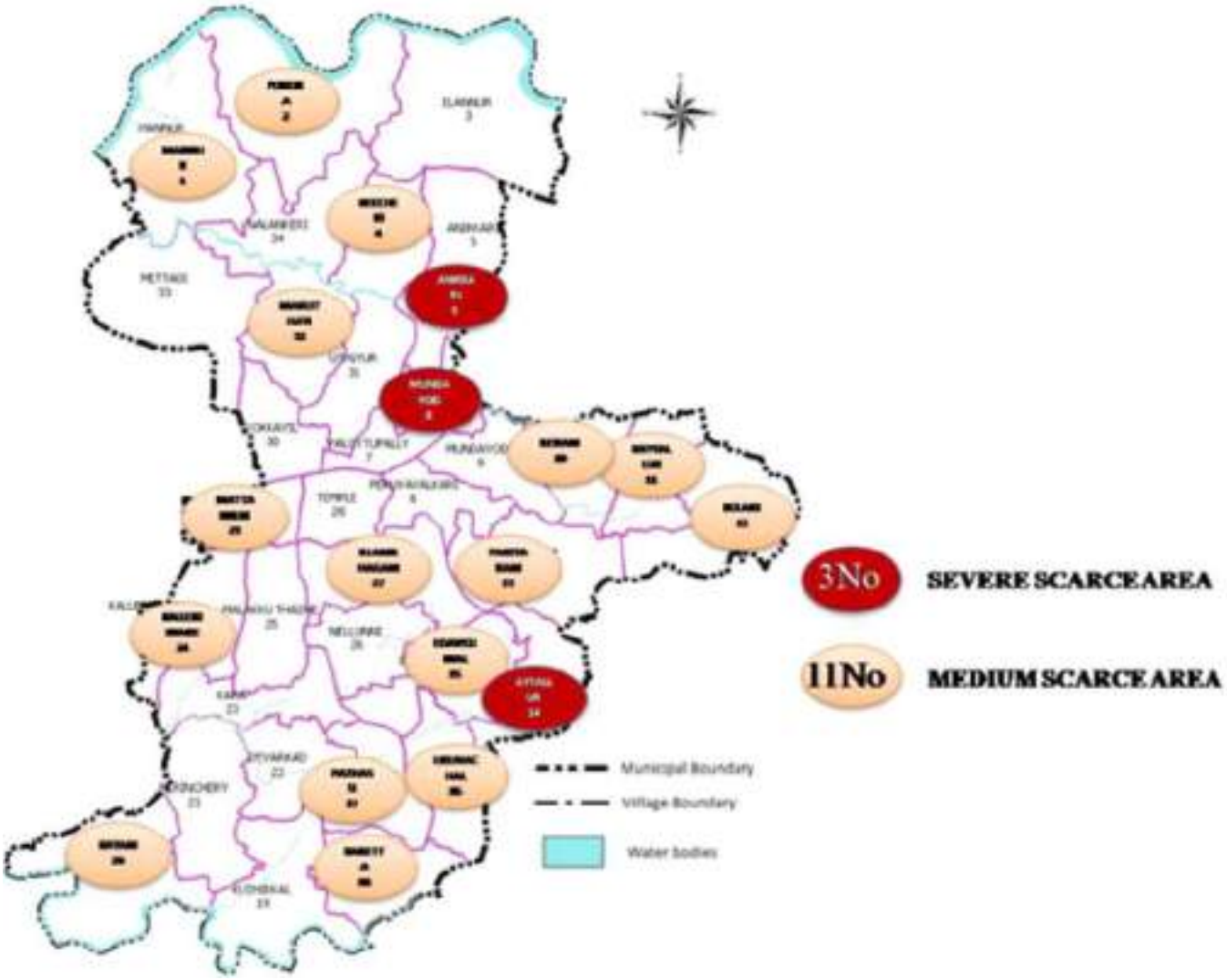


Figure 18.7 Wards facing water scarcity within the Mattannurtown

as it is located in an elevated area. IHSDP water supply scheme has not yet completed in Ayyallur ward also.

The data regarding number of wards having scarcity and the extent of scarcity were obtained from Kerala Water Authority (KWA). The details are given in table 18.4.

Table 18.4 Details of water scarcity - KWA

Wards	Extent of Scarcity		
	No Scarcity	6hrs Supply /day 2days	Once in
1 to 31	4 Wards	6 Wards Wards	21

The data regarding the nature of scarcity in Mattannur municipal area as obtained from Socio-economic survey is given in table 18.5.

Table 18.5 Nature of scarcity in Mattannur town

Category of scarcity	No scarcity	1-2 Months	2-3 Months	3-6 Months	more than 6 Months
Average % for the Municipal town	73.96	18.8	4.18	0.74	2.33

18.2 DEVELOPENT POTENTIALS AND PROBLEMS

18.2.1. Development potentials

In Mattannur municipal area, majority of the houses depend on ground water as major source of drinking water, and have their own well. The proposed water supply project of KWA can easily solve the problem of scarcity in some wards. Socio-Economic survey reveals that there is no water scarcity for 74.08% of the families residing in Mattannur municipal area.

18.2.2 Problems

According to Socio-Economic survey, Anikkari, Mundayodu and Ayyallur wards show severe water scarcity. In Mattannur municipal area, ground water level is found to be lowering during the last 5 years and well dependability is not sustainable in the long future.

18.3 INFERENCE

Majority of municipal population depend on open well for drinking water. Reservoir at Pazhassi dam barrage is the intake source for water supply in the Municipal town and for many other towns and Panchayaths in the district. KWA has already submitted a separate Water Supply Scheme Project for an exclusive area of Mattannur Municipal townand awaits Government approval. The design period taken for the project is 30 years.



Chapter-17

TRAFFIC AND TRANSPORTATION

Traffic and Trasportation study in connection with the preparation of Master plan for Mattannur town was entrusted to NATPAC (National Transportation Planning and Research Centre). The major findings of the study are briefed here under.

17.1 TRANSPORT NETWORK

The transport network mainly comprises of roadways, railways, waterways and airways. The land area under transportation use (including airport land) constitutes 5.95% of the total municipal area. Mattannur municipal town is well connected by roads. However there is no rail accessibility and water transportation within the municipal area. The forthcoming International airport in Kannur is a major thrust in the transportation sector.

17.1.1 ROAD NETWORK

Mattannur municipal town located within Kannur district, has good road connectivity as State Highway-30 passes through the town centre. It connects Thalassery town, Kuthuparamba town, Iritty town (Head Quarters of new Taluk), Coorg District outside and reaches to Mysore and Bangalore. The road is generally referred to as Thalassery-Coorg Road (TC Road). It has a total length of 8.3km within the Mattannur municipal area. The Figure 17.1 shows the existing road network in Mattannur town.

The Major District Roads within the municipal area include Mattannur-Kannur road (1.60 km), Mattannur-Anjarakandy road (2.30 km), Mattannur-Mannur-Irikkur

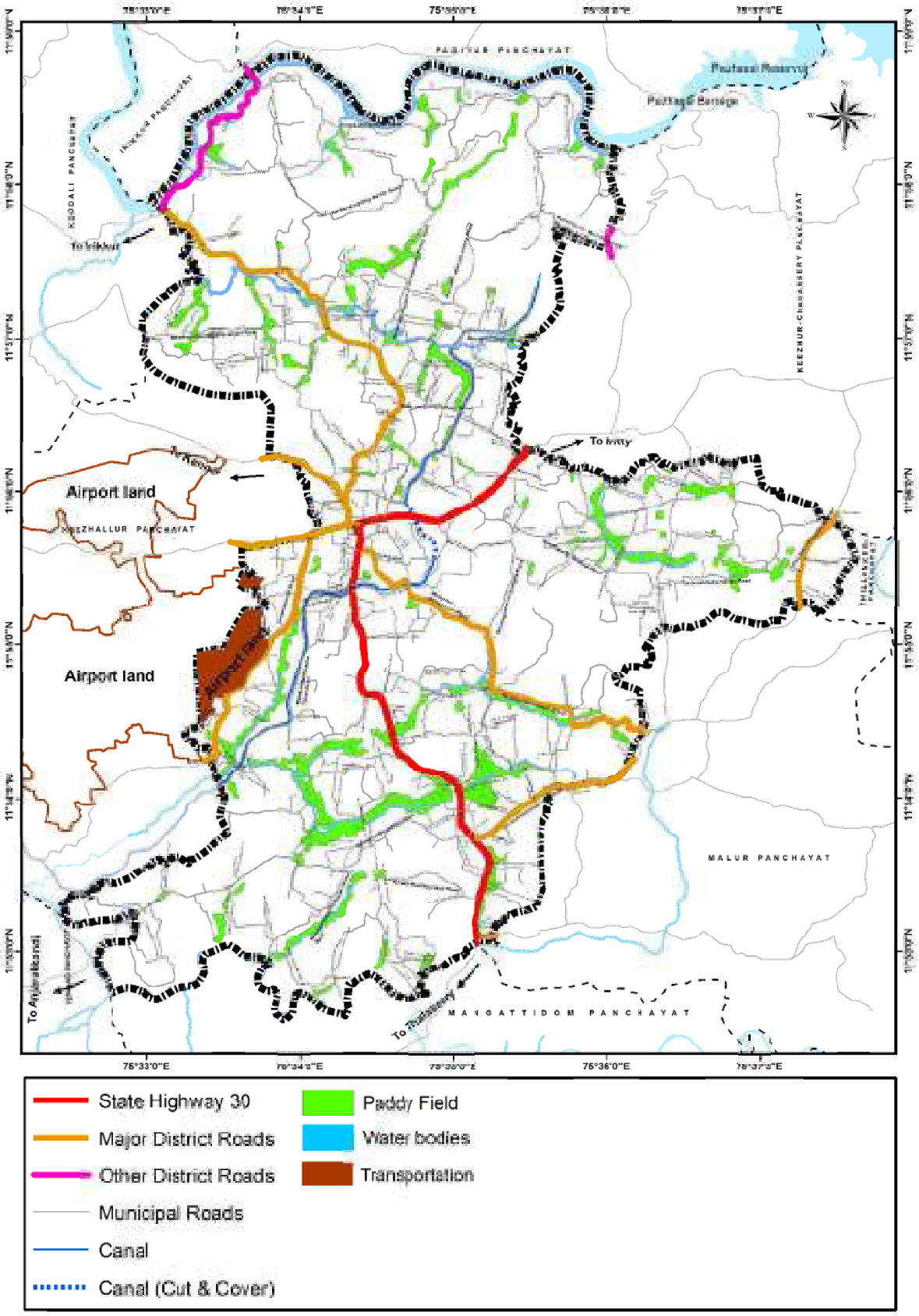


Figure. 17.1 Existing Road Network in Mattannur town

road (5.8km), Mattannur-Kolappa road (1.5km), Mattannur-Ayyallur-Sivapuram road (4.80km), Uruvachal-Kakkayangad road (2.20km), Karetta-Kanhileri-Malur road (0.20 km) and Neduvanadu-Kolari -Sivapuram road (1.30 km). Palottupalli-Vembadi road (2.30 km) and Karithurparamba-Porora road (5.30 km) are the important municipal roads. The total length of Municipal roads is around 211 km.

Kannur road connects the town to the District Head Quarters, Kannur. Anjarkandy road passes through the proposed entrance of the Airport and then leads to nearby devoloping towns Anjarakandy and Chakkarakal. Sahina Theatre-Sivapuram road and Palottupally roads reach to Sivapuram and from there lead to Kottiyur and to Wyanad District. Both Kolappa road and Maruthayi road connect Mattannur town to S.H 36 (Taliparamba-Sreekandapuram-Iritty Road) at Irikkur town. The roads in the town are maintained by PWD and the Municipality.

North and north-east areas of the Municipal town have less road coverage due to its unique topography filled with hillocks.

The existing municipal bus stand is located near Mattannur junction on the west side of Thalassery-Coorg road and lacks sufficient space for handling the high traffic. There is no separate KSRTC bus stand in Mattannur town.

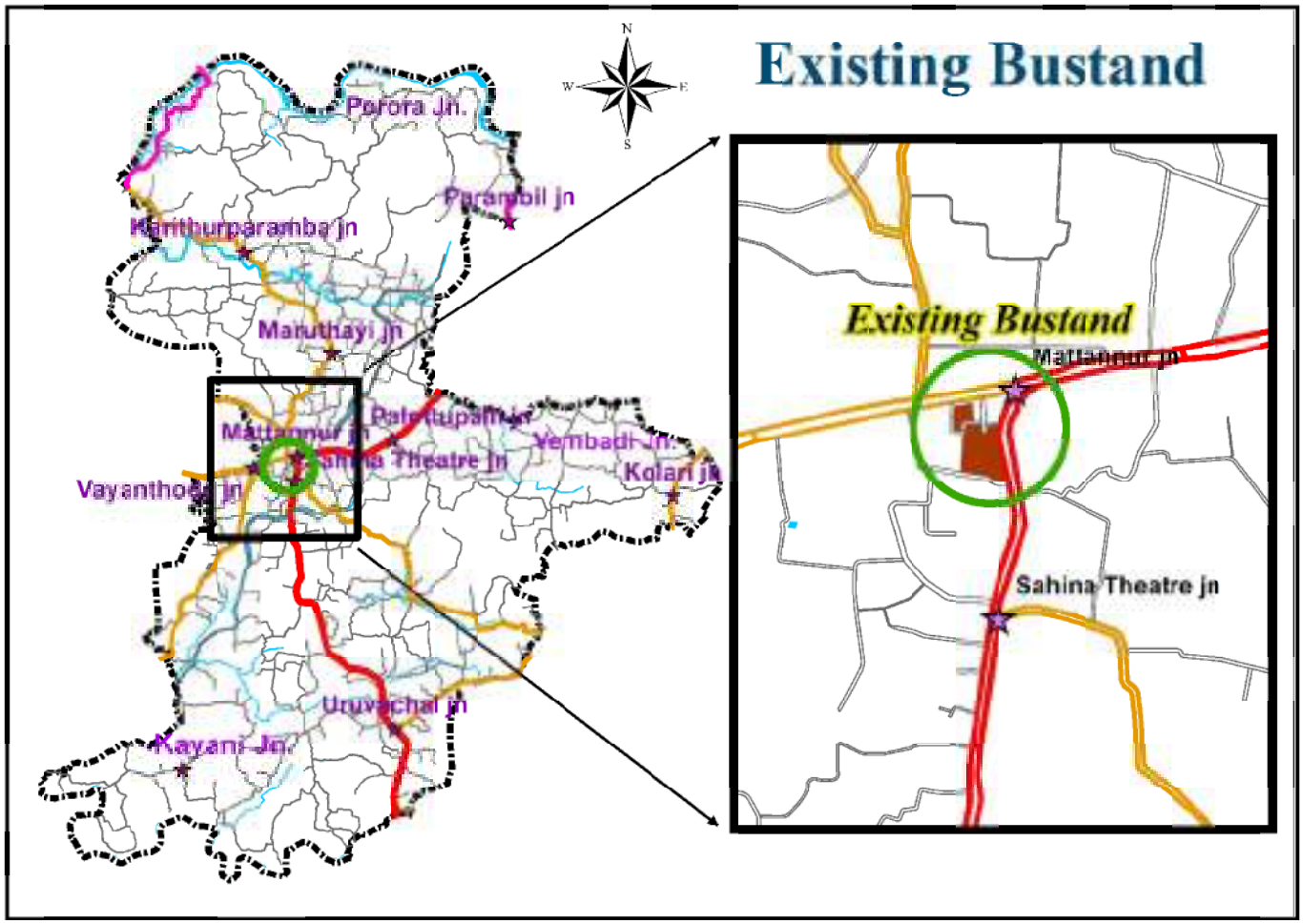


Figure. 17.2 Existing Municipal Bus stand

17.1.2 RAIL NETWORK

Kerala is well connected with other states and major cities like Mumbai, Delhi, Kolkata, Bangalore and Chennai by 13 railway routes. Unfortunately, rail does not pass through Mattannur municipal area. The nearest railway stations are Thalassery railway station located 26.7km apart and Kannur railway station located 27.4km apart. Kannur, also known as Cannanore, is one of the busiest railway station in Kerala situated in Kannur City. It is operated by the Southern Railway of the Indian Railways. The Thalassery-Mysore railway line proposed earlier has great significance as it is the shortest rail link connecting Malabar with Bangalore. Hence a detailed study is still recommended for conducting survey. However, there are many obstacles to overcome ranging from the environmental hazards to the land acquisition, and the State Government should take a proactive role to overcome the hurdles, especially the land acquisition. Mattannur municipal town will be a beneficiary if this railway line becomes a reality.

The State Government has urged the Railways to revive the proposal for a broad gauge line between Kannur and Mattannur to link the forthcoming Kannur International Airport with the existing rail infrastructure and to ensure multi-model access to the Greenfield Airport. The rail connectivity will be a crucial factor in determining the operational success of the airport as the existing and proposed road network would not be sufficient to cater to the huge passenger and cargo movement from the Kannur airport once it becomes operational.

17.1.3 AIR NETWORK

Airways transport are the best means to travel anywhere as it has comfort, luxury and most importantly, it saves a lot of time. It is a perfect way for tourists all over the world to come to this beautiful state of Kerala. There are three airports in Kerala State, namely, Cochin International Airport, Trivandrum International Airport and Calicut International Airport. Kannur International Airport will be the fourth in the line which is expected to become operational soon.

The forthcoming airport is located at Mattannur in Kannur District and offers enormous scope for the development of Mattannur town.



Anticipated model of forthcoming Kannur International Airport at Mattannur

The Government of Kerala initiated planning for Kannur International Airport in 1998. Kerala Industrial Infrastructure Development Corporation (KINFRA) was appointed to undertake feasibility studies, which were submitted to the Government of India in 2005. The proposal was approved in principle by the Ministry of Civil Aviation in February 2008.

Kannur Airport is located at a distance of 25 km from Kannur. Places like Thalassery, Thazhe Chovva and Mele Chovva located along NH-17 have connection road leading airport location and Thalassery-Coorg road, a major State Highway, is located very near to the airport. The airport will be built on 2,500 acres of land. The land acquired for airport within the Mattannur municipal area is 0.502 sq.km and shall acquire an additional land of 0.029056 sq.km in the third phase. The remaining portion of the airport land lies in Keezhallur panchayath.

Kannur International Airport is expected to become operational by the end of the year 2015. The authorities plan to conduct test flights by December 2015 and to commence commercial flight operations by April 2016.

17.1.4 WATER NETWORK

Inland water navigation system is the integral part of transportation in Kerala. Inland water transportation is considered as the most efficient, economic and environment-friendly means of transportation in Kerala. While life in the city has become miserable due to severe traffic congestion and potholed roads, public demand for a better water transport network is getting louder.

At present there is no inland water transportation system existing in Mattannur municipal area. The presence of two rivers namely, Anjarakandy river and Valapattanam river flowing along the municipal boundaries provides scope for the development of the inland water transport system by connecting rivers and backwaters in the region, new canals may be cunstructed to connect the missing links.

17.2 ROAD NETWORK CHARACTERISTICS

Kannur can easily be reached following road route, as it features an effective road network. Bus services are available from various cities in the state. Government buses ply regularly between Mangalore and other cities located in close proximity of Kannur. Mattannur Municipal town has good road network and is the only means of transportation within the municipal area. KSRTC as well as private buses makes regular services to the neighbouring cities.

17.2.1 Type of roads based on material of pavement

The various types of roads in Mattannur municipal area are bitumen road, concrete road, gravelled road and earthen and its details are given in Table 17.1

Table 17.1 Type of roads based on pavement material

Sl. No.	Type of Road	Length in km
1	Bitumen Road	101.974
2	Concrete Road	0.300
3	Graveled road	9.113
4	Earthen Road	29.655
	TOTAL	**141.04**

The percentage of different types of roads is represented in the pie-chart shown below.

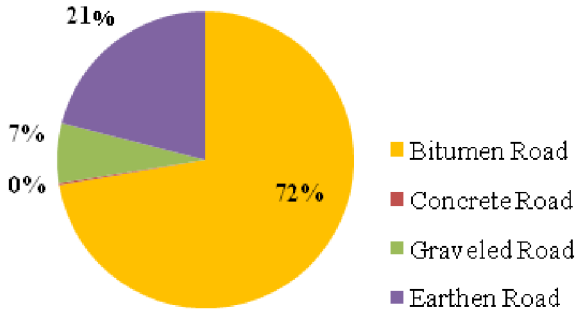


Figure 17.3 Percentage of different types of roads

From the figure above, it is clear that 72% of the roads in Mattannur municipal area are bitumen roads. Concrete road length is negligibly small. Black topping is required for nearly 40Km length of roads that are now either gravelled roads or earthen roads.

17.2.2 Major Road Junctions in Mattannur town

There are three first order junctions in Mattannur Municipal area namely Mattannur junction, Sahina Theatre junction and Uruvachal junction. Palottupally junction and Vayanthode junction are taken as second order junctions whereas Karithuparamba junction is the third order junction. However the suggested third order junctions within the municipal area are Kayani junction and Vembadi junction. The map showing the



SH-30 (Thalassery-Coorg road)

various junctions in Mattannur town is shown in Figure 17.4.

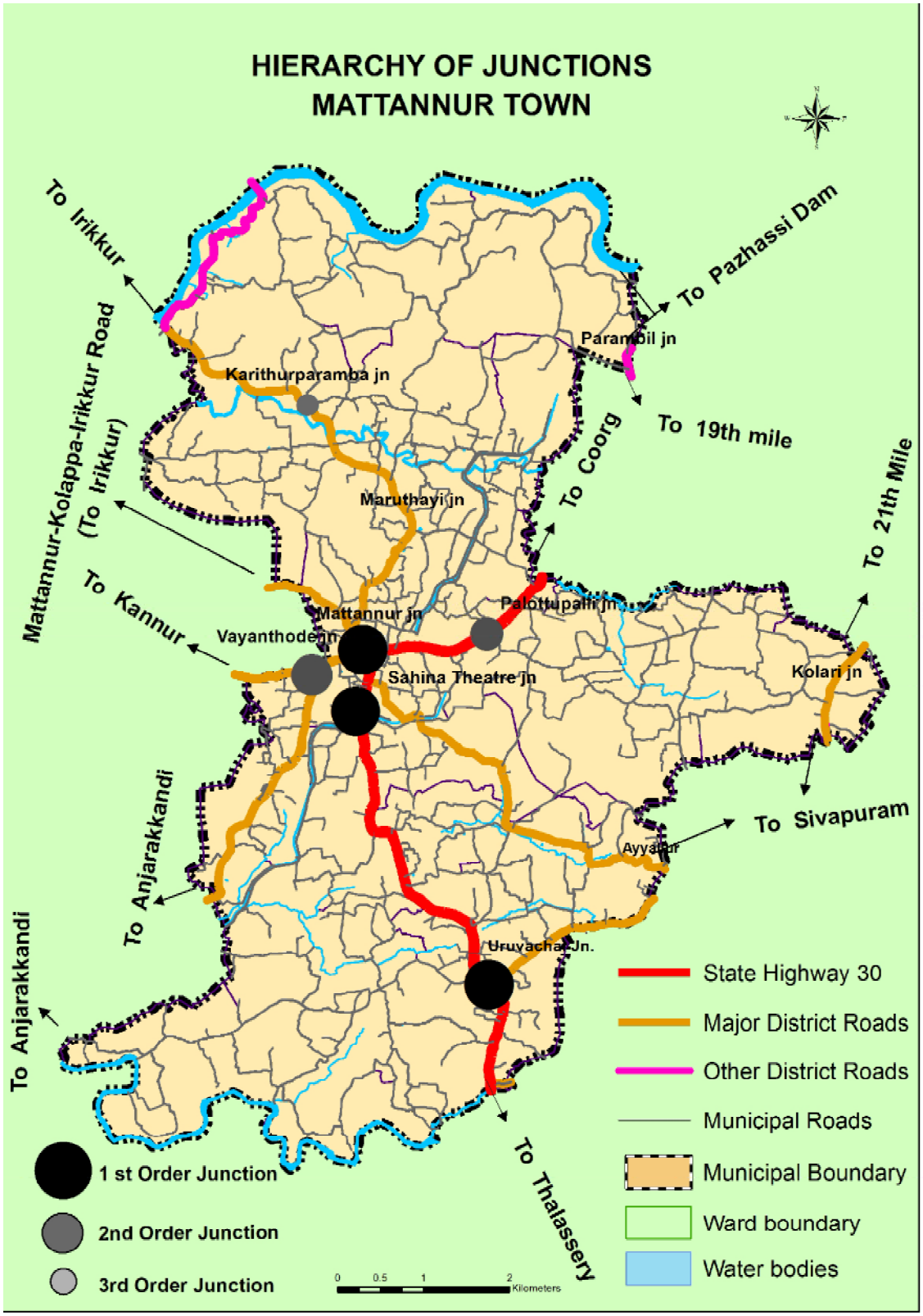


Figure 17.4 Major Road Junctions in Mattannur town

17.3 TRAFFIC VOLUME STUDIES

Knowledge of the traffic volume using a road network is important to understand the efficiency at which the system works and the general quality of service offered to road users. Classified traffic volume counts will be carried out at - i) outer cordon points ii) mid blocks on important corridors and iii) important intersections.

Outer cordon volume counts, Link volume counts survey at the outer cordon locations are desired for establishing intercity goods movements as well as passenger movement to know the trip characteristics based on external to external, internal to external and external to internal traffic movement. Depending on the need, the duration of the survey could be determined, thus to extend for a period of eight to twenty four hours.

Mid-block volume, Link volume counts survey will be carried out at the selected locations on the major and minor arterials of the town network. This is also insisted for a period of eight to twenty four hours based on the nature of flow.

Apart from the above, Intersection Turning movements deserve the smooth flow of traffic in order to avoid the clogging of vehicles. The volume count at the selected intersections would be carried out for a period of four hours duration in the morning and evening respectively to find out the peak flow and the hourly variations for ascertaining the maximum number of vehicles passing over through a particular location. Total volume, composition of traffic and turning characteristics were recorded for different types of vehicles by trained field staff for each intersection separately. The traffic flows were converted into equivalent Passenger Car Units (PCU) by using conversion factors as suggested by Indian Road Congress (IRC).

17.3.1a Average Daily Traffic (ADT) on corridors according to the type of Vehicles

Average Daily Traffic is the average number of vehicles two-way passing a specific point in a 24-hour period, normally measured throughout a year.

According to NATPAC Report the average annual daily traffic was found to be maximum along Mattannur-Thalassery road with 7758 vehicles. Table

Table 17.2 Average Daily Traffic (ADT) on corridors according to the Type of Vehicles (2010)

Name of the road	KSRTC Bus	Private Bus	Other Buses	Bus/Tempo	Car/Van/Jeep	Auto- Rikshaw	Two Wheeler	MAT	Truck	Mini-Truck	Goods-Auto	Bi-cycle	Others	Total	Total (PCU)
Mattannur-Sivapuram Road	14	53	6	43	713	747	1214	3	86	289	186	4	2	3360	3253
Mattannur-Irikkur Road	19	327	14	8	1053	574	752	11	580	318	173	7	7	3843	4595
Mattannur-3 Thalassery Road	25	354	13	20	1446	1625	2194	6	255	261	200	5	5	6409	7758
Mattannur-Kannur Road	120	320	35	60	1521	1106	1123	57	240	397	291	9	2	5281	6580
Mattannur-Iritty Road	77	459	44	85	1272	925	1312	36	364	472	203	7	11	5267	6939
Mattannur – Anjarakkandy Road	9	69	5	9	395	429	431	2	16	129	120	18	1	1633	1686

17.2 shows the ADT on the major roads with respect to the type of vehicles.

17.3.1b Traffic Volume on major corridors

The traffic volumes in major corridors of Mattannur municipal area is shown in Figure 17.5 and Table 17.3.

From the figure and table it is clear that segments of Thalassery-Coorg road (TC road) and Kannur-Mattannur road carry maximum volumes of traffic.

Table 17. 3 Traffic Volume on major corridors - 2010

Sl. No.	Road Section	Volume at 2010 (PCU per day)
1	Mattannur - Sivapuram Road	3253
2	Mattannur- Irikkur Road	4595
3	Mattannur- Thalassery Road	7758
4	Mattannur- Kannur Road	6580
5	Mattannur- Iritty Road (TC Road)	6939
6	Mattannur- Anjarakkandi Road	1686

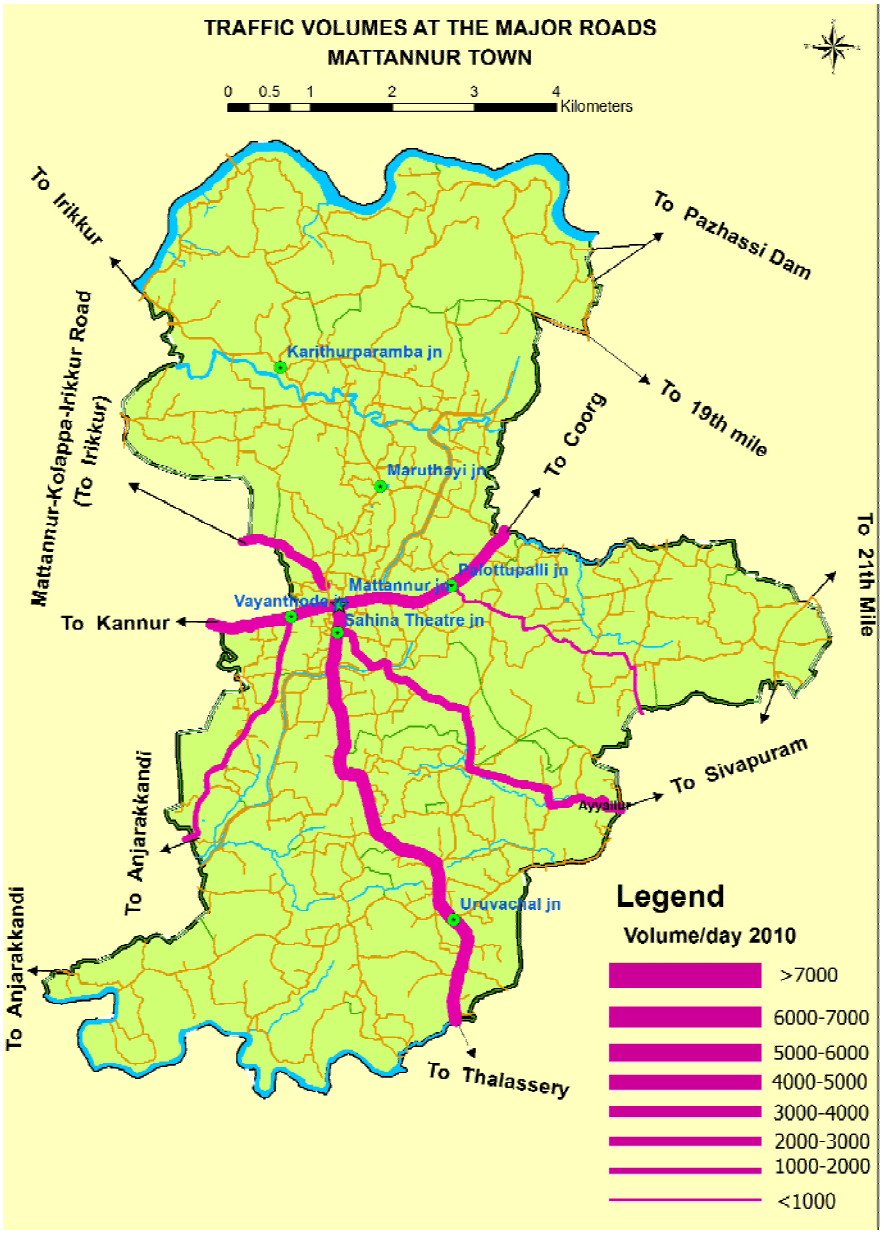


Figure 17.5 Traffic volume in major corridors

17.3.1.c Traffic volume at major junctions

Traffic volume at major junctions as per NATPAC report is given in figure 17.6 and Table 17.4.

The figure and table given below reveal that maximum PCU volume is observed in Mattannur Junction followed by Sahina Theatre Junction.

Table 17.4 Traffic volume at major junctions

Sl. No	JUNCTIONS	Volume at 2010 (PCU per day)
1	Mattannur junction	1755
2	Sahina Theater junction	1143
3	Vayanthode junction	919

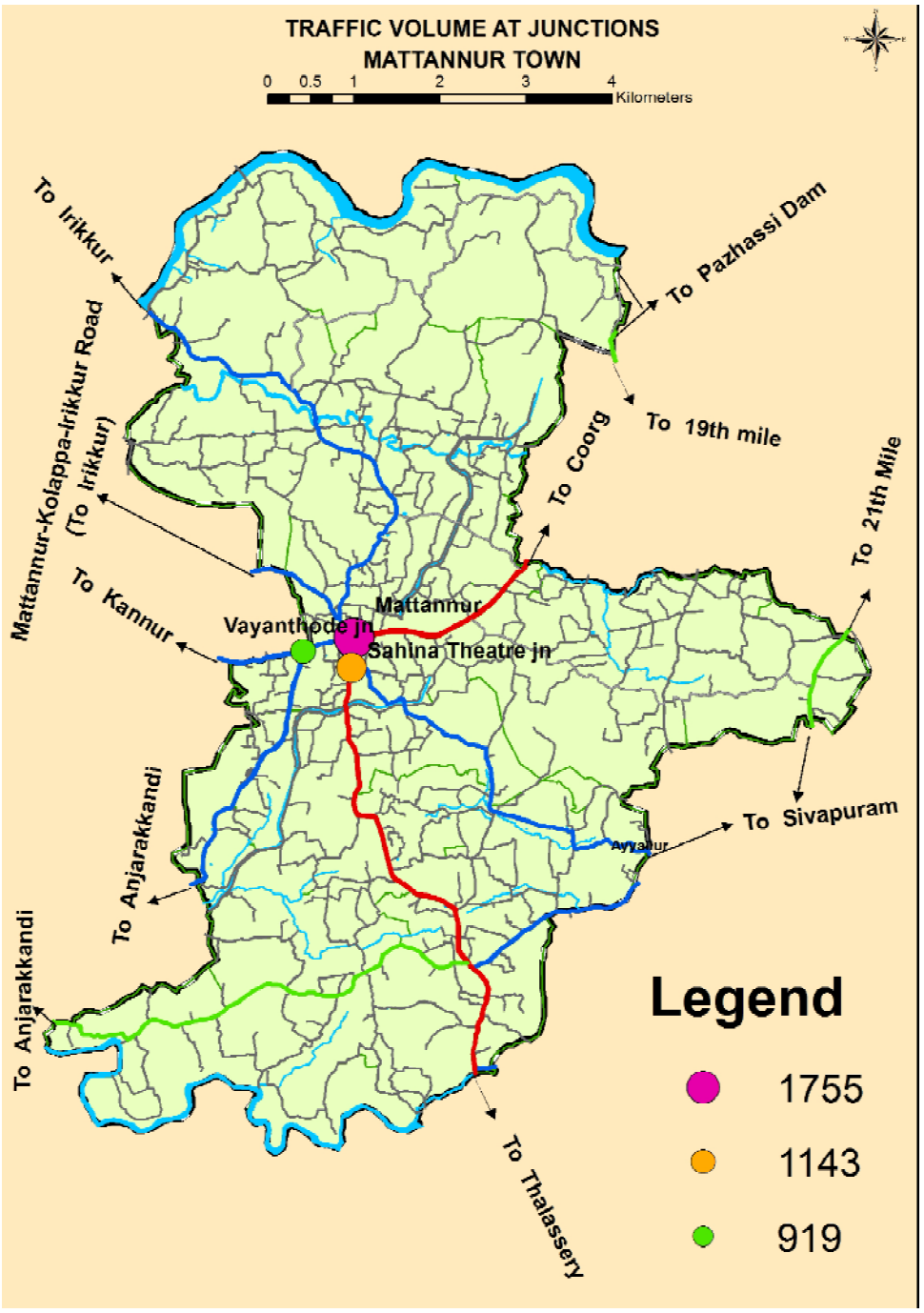


Figure 17.6 Traffic volume at major junctions



Mattannur Junction

17.3.2 Volume-Capacity Ratio of Major roads in Mattannur town

The road capacity is defined as the maximum rate at which vehicles can pass through a given point in an hour under prevailing conditions; it is often estimated based on assumed values for saturation flow. Capacity accounts for roadway conditions such as the number and width of lanes, grades, and lane use allocations, as well as signalization conditions. Capacity utilization of road stretches was measured by volume-to-capacity ratio (V/C ratio). It is the ratio of volume of traffic plying on the road section to the capacity of the road stretch.

For working out the capacity of different road sections, the information compiled during the road inventory survey was compared to the specification of IRC-106-1990 (guidelines for capacity on urban roads). While working out the capacities, due consideration should be given to carriageway width, junctions, parking, lateral clearance, shoulders, surface conditions etc.

In NATPAC report the traffic volume observed at different road stretches were compared with the capacity of road sections, to calculate the volume - capacity ratio (V/C ratio) of the road sections within the study area. The volume capacity ratio of major roads in Mattannur town at the base year and horizon year is presented in Table 17.5.

As per table 17.5, at present, all major roads have V/C ratio below one but will reach above one for all roads and above two for major roads by the year 2031.

Table 17.5 Volume Capacity Ratio of Major Roads in Mattannur Town

Sl. No	Road Section	Exiting Capacity (PCU per day)	Volume at 2010	V/C	Volume at 2015	V/C	Volume at 2020	V/C	Volume at 2025	V/C	Volume at 2030	V/C
1	Mattannur-Sivapuram Road	9000	3253	0.36	6870	0.76	11487	1.27	17379	1.93	24899	2.77
2	Mattannur-Irikkur Road	9000	4595	0.51	9263	1.02	15220	1.69	22823	2.54	32526	3.61
3	Mattannur - Thalasseri Road	12000	7758	0.65	13707	1.14	21300	1.77	30991	2.58	43359	3.61
4	Mattannur - Kannur Road	12000	6580	0.55	14061	1.17	23610	1.96	35796	2.98	51350	4.28
5	Mattannur-Iritty Road	12000	6939	0.58	13387	1.12	21616	1.80	32119	2.68	45524	3.79
6	Mattannur-Anjarakandy Road	9000	1686	0.19	4689	0.52	8522	0.94	13413	1.49	19657	2.18

Mattannur-Thalassery Road has the maximum V/C ratio of 0.65 with a volume of traffic of 7758pcu/day and a capacity of 12000 pcu per day. Mattannur-Iritty Road (Thalassery-Coorg Road) and Mattannur-Kannur Road (Vayanthodu) have the next higher V/C ratio at the base year. Other roads have considerably less V/C ratio at the base year. Considering the horizon year of 2030, traffic volume will exceed much higher than its capacity in 7 roads out of the 8 major roads in the Mattannur town.

17.3.3 Volume of passenger and goods vehicle observed at outer cordon points

According to NATPAC report passenger and goods vehicles making intercity trips were intercepted at the outer cordon points and the volume of both inbound and out bound traffic were separately collected. Pattern of intercity traffic in Mattannur town is shown in Table 17.6

The study has revealed that out of 23036 passenger vehicles, about 6240 passenger vehicle trips were generated from the study area and 16323 passenger vehicle trips were generated from Kannur district. The remaining 473 passenger vehicle trips were generated from other districts/states. *i.e.*, 27.09% passenger vehicular trips generated from the study area, 70.86% passenger vehicular trips generated from Kannur district and the remaining 2.05 percent passenger vehicular trips generated from other districts/states.

Out of 5785 goods vehicles, about 1701 goods vehicle trips were generated from the study area, and 3279 goods vehicle trips were generated from Kannur district. The remaining 805 goods vehicle trips were

Table 17.6 Pattern of intercity traffic in Mattannur town

Sl. No	Originating Region	Terminating Zones			Total	Percentage
		Study Area	Kannur District	Other Districts/ States		
Passenger Vehicles						
1	Study Area	0	6142	98	6240	27.09
2	Kannur District	6599	9364	360	16323	70.86
3	Other Districts/States	87	368	18	473	2.05
	Total	6686	15874	476	23036	100
	Percent	29.02	68.91	2.07	100	
Good Vehicles						
1	Study Area	0	1659	42	1701	29.40
2	Kannur District	850	2207	222	3279	56.68
3	Other Districts/States	67	389	349	805	13.92
	Total	917	4255	613	5785	100
	Percent	15.85	73.55	10.60	100	
Combined Passenger and Goods Vehicle						
1	Study Area	0	7801	140	7941	27.55
2	Kannur District	7449	11571	582	19602	68.01
3	Other Districts/States	154	757	367	1278	4.43
	Total	7603	20129	1089	28821	100
	Percent	26.38	69.84	3.78	100	

generated from other districts/states. *i.e.*, 29.40% goods vehicular trips were generated from the study area, 56.68% of goods vehicular trips were generated from Kannur district and the remaining 13.92% of goods vehicular trips were generated from other Districts/ States.

Out of 28821 total vehicles, about 7941 total vehicle trips were generated from the study area, and 19602 total vehicle trips were generated from Kannur district. The remaining 1278 total vehicle trips were generated from other districts/states. i.e., 27.55% of total vehicular trips were generated from the study area, 68.01% of total vehicular trips generated from Kannur district and the remaining 4.43% of total vehicular trips were generated from other districts/states. The study has further revealed that about 6240 passenger vehicle trips were generated from the town, while 6686 passenger trips were attracted to various areas of the town. The remaining 10110 passenger trips were found to be through traffic with neither origin nor destination within the town. Out of 5785 goods trips, about 1701 goods trips were generated from the town and 917 goods trips were attracted to the town and remaining 3167 trips were through trips.

Table 17.7 Distribution of originating/ terminating/ through passenger trips and goods trips at Mattannur study region.

Vehicle Type	Originating from the study region	Terminating in the study region	Through traffic	Total
Passenger Vehicles	6240	6686	10110	23036
Goods Vehicles	1701	917	3167	5785
Total	7941	7603	13277	28821
Percentage	27.55	26.38	46.07	100

Table 17.7 presented illustrates originating and terminating passenger trips along with through traffic according to vehicle type in Mattannur town. A total of 7941 vehicle trips were generated from the town, while 7603 vehicle trips terminated in various areas in the town. The remaining 13277 vehicle trips were found to be through traffic.

17.3.4 Land use development caused induced traffic – Forth coming international airport

The proposed airport at Kannur is likely to generate and attract intense business and land use activities over a period of time. In the new airport and surrounding

Table 17.8 The land use induced generated / attracted traffic per day in 2012- 2015 in the scenario of 20 lakh sq.ft built up space.

Traffic Attracted/Generated	Car	Bus	Trucks	Two Wheelers	Total
Airport Bound	7497	200	500	500	**8697**
Land Use-Traffic	0.001152	0.000216	0.0014312	0.001728	
Attracted/Generated Factor/ sq.ft Built Space Land use induced traffic	2304	432	2862	3455	**4489**
Total Traffic	**9801**	**632**	**3362**	**3955**	**17750**
Distribution of Traffic					
Northern Direction	1470	95	504	593	**2663**
Kannur Direction	2450	158	841	989	**4438**
Coorg Direction	1960	126	672	791	**3550**
Thalassery Direction	2744	177	941	1107	**4970**
Wayanad Direction	1176	76	403	475	**2130**
Total	**9801**	**632**	**3362**	**3955**	**17750**

region during the early stage itself. For planning of infrastructure and system capacity, it is customary to adopt peak hour or peak season demand. Hence such higher land use growth and real estate development scenarios are adopted in the present case as a scenario exercise.

As per the adopted traffic forecast, it is estimated that around 10000 cars, consisting of 7500 airport bound traffic and 2500 land use induced traffic, are likely to use to the roads per day due to the opening of the airport in 2012. Likewise there will be an addition of around 600 buses, 3000 trucks per day (including for construction activities), which will be distributed over the project roads. Table 17.8 shows the land use induced generated/attracted traffic per day in 2012-2015 in the scenario of 20lakh sq.ft built up space. Figure 17.7 shows Airport areas acquired within and outside the municipal area.

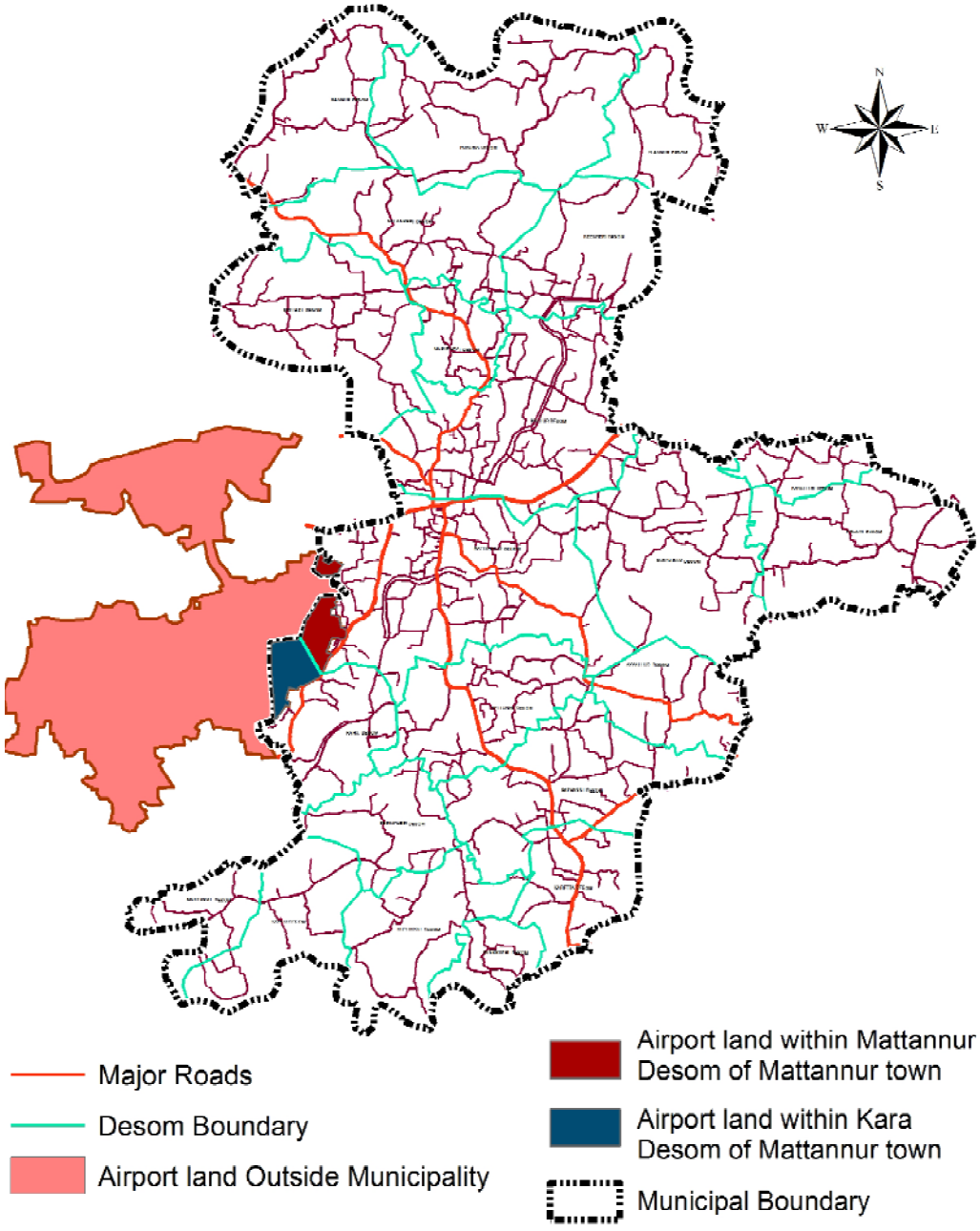


Figure 17. 7 Land acquired for KIAL (Kannur International Airport Ltd.)

The land acquired for airport within the municipal area is 0.502 sq.km and shall acquire an additional land of 0.029056 sq.km in the third phase. The remaining portion of the airport land lies in Keezhallur panchayath.

17.4 PARKING CHARACTERISTICS

Parking is done of the most visible, controversial and often underestimated elements of a downtown environmental infrastructure. A well-managed parking system is vital for attracting and supporting new development and is essential for sustaining healthy and vibrant downtown.

In Mattannur municipal town parking survey was conducted by NATPAC. Locations selected for the parking survey were the following.

1) Magistrate Court to Topco Cloth shop on both sides of TC road.

2) Inside the Bus stand area-Auto parking area, Market place and Taxi stand area.

3) Mattannur-Kannur Road Junction to the Office of the Circle Inspector of Police and beyond all along the Kannur road on both sides.

4) Mattannur-Irikkur road (College road).

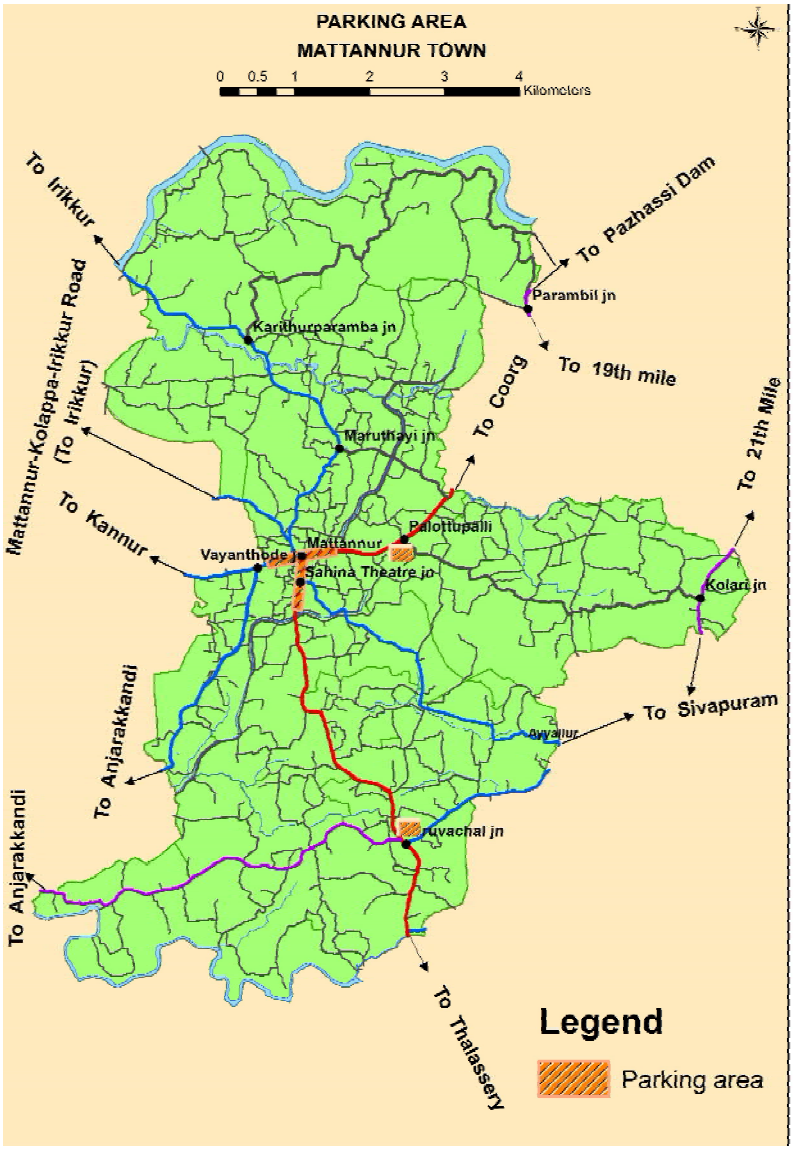


Figure 17.8 Parking survey location in Mattannur town



On street parking on Thalassery road

Map showing the locations selected for parking survey in Mattannur municipal area is shown in Figure 17.8.

In order to assess the parking demand, parking accumulation and duration survey was carried out at selected locations in Mattannur town where parking demand was found to be very high. The procedure involved the noting of registration number of all vehicles parking on a given stretch of road. This was repeated once in every 30 minutes over the same stretch.

Majority of vehicles parked along these corridors were found to be for short duration of less than 30 minutes. 57 to 90 percent of the total vehicles along these road sections parked for less than 30 minutes on a normal working day, while 6 to 25 percent of vehicles were found to be parked for a period of 31 to 60 minutes. Taxi cars and jeeps were found to be parked more than 2 hours at their stands.

The highest parking accumulation was found near police station on Kannur road, near Sahina Theater on TC road and the section between Magistrate Court to Topco Building.

17.5 PEDESTRIAN STUDIES

One of the main reasons for congestion and delay on roads in Mattannur town is the high incidence of pedestrian crossing at important locations.

Pedestrian surveys were conducted by NATPAC at major locations where the pedestrian cross / lateral movements were found to be high. Locations selected for pedestrian survey are shown below:

1) Mattannur town to the Bus stand through T C road Up/Down Cross movement

2) Laksmi Memorial Hospital side to Govt: Hospital side through T C road Up/Down Cross movement

3) Guest House side to Aishwarya Hospital through TC road Up/Down Cross Movement

4) Market side to College road through Kannur Road Up/Down Cross movement.

Map showing the locations selected for pedestrian survey in Mattannur municipal area is shown in Figure 17.9.

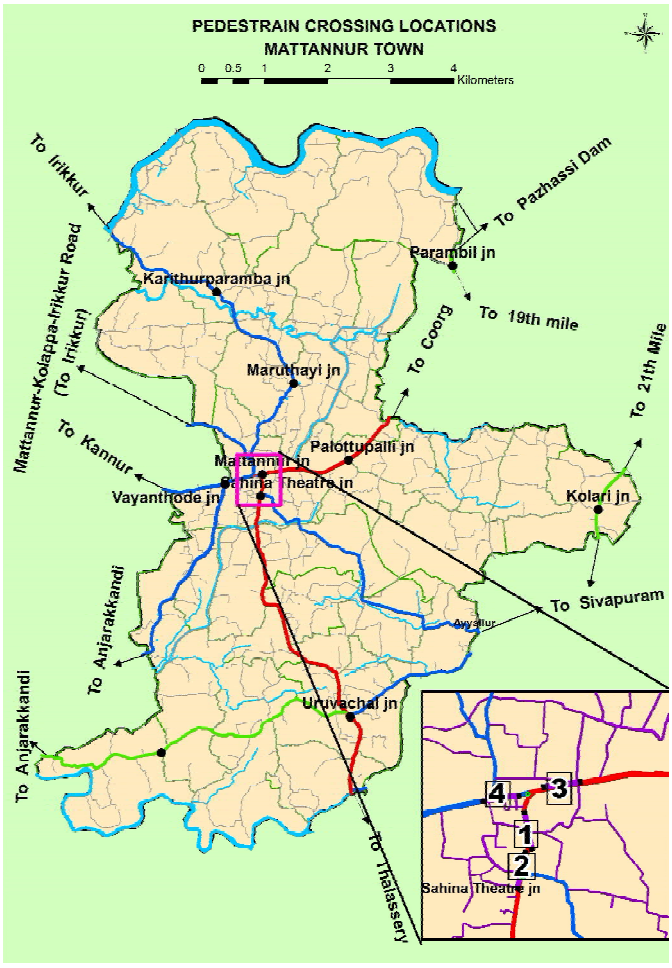


Figure 17.9 Locations selected for pedestrian survey in Mattannur town.

Table 17.9 Peak hour pedestrian cross movements observed at major locations in Mattannur town

SI No.	Survey Location	Peak Hour	Peak Hour Pedestrain Volume
1	a) Mahadeva temple side to bus stand through TC Road	4pm-5pm	277
	b) Bus stand to Mahadeva temple side through TC Road	4pm-5pm	297
2	a) Lakshmi Memorial Hospital side to Govt.Hospital side through TC road	9am-10am	323
	b) Govt. Hospital side to Lakshmi Memorial Hospital side through TC road	9am-10am	229
3	a) PWD guest house side to Chaithanya Hospital and Beverages retail outlet side through TC road	10am-11am	240
	b) Chaithanya Hospital and Beverages retail outlet side to PWD guest house side through TC road	10am-11am	167
4	a) Market side to College road side through Kannur road	4pm-5pm	286
	b) College road side to Market side through Kannur road	4pm-5pm	294

Analysis of pedestrian cross movement at major activity/traffic generation area revealed that high volume of pedestrian cross movements occurred between Market side and College road through Kannur road, followed by the pedestrian cross movements occurred between Mattannur Town and bus stand through TC road. Peak hour pedestrian cross movements observed at major location in Mattannur town is given in Table 17.9.

17.6 ORIGIN AND DESTINATION SURVEY

The objective of this survey is to determine the origin and destination of external-external, external-internal and internal-external passenger and goods movements across the external cordons. An analysis of these traffic movements will give the proportion of bye-passable traffic along with the major external interaction areas.

O-D survey was conducted at all the major entry/exit points of the study area continuously for a period ranging between twelve hours to twenty four hours on a working day depending on the importance of the road. During the survey period, vehicles were stopped at random with the help of police to collect information on trip origin and trip destination. Further information like purpose of trip and occupancy for passenger vehicles and commodity type and quantity carried by goods vehicle were also collected.

Base year inter- city characteristics of passenger and goods movements were obtained by conducting origin -destination (O-D) survey of a sample number of motor vehicles passing through all major outer cordon locations in Mattannur municipal town.

As the origin-destination survey was conducted to get the total number of vehicle passing through the outer cordon points; traffic volume survey was also conducted simultaneously at these locations. This study helps to identify the trip production and attraction of different regions in the town.

For the analysis of the survey the study area and its trip movement influence area have been divided into 14 zones as detailed below:

Table 17.10 Distribution of passenger vehicles according to origin and destination study

Zone No.	Name of Zones	Study Region	Kannur District (West of study Region)	Kannur District (North of Study Region)	Kannur District (East of Study Region)	Kannur District (South of Study Region)	Kasargod District	Wayanad District	Kozhikode District	Districts south of Kannur district (except Kozhikode)	Northern States	Karnataka State North of Kannur district	Karnataka State East of Kannur disrict	Karnataka State - Other districts	Tamil Nadu	Total (pcu)
1	Study Region	0	1051	79	4725	287	10	9	70	9	0	0	0	0	0	6240
2	Kannur District (West of study Region)	110	0	65	397	15	0	6	0	21	0	0	0	0	0	614
3	Kannur District (North of Study Region	22	1762	0	1973	3	0	13	9	12	0	6	0	10	0	3810
4	Kannur District (East of Study Region)	4535	453	798	0	1300	30	10	135	56	0	0	16	0	0	7333
5	Kannur District (South of Study Region)	1932	51	890	1657	0	4	4	3	6	3	12	0	4	0	4566
6	Kasargod District	0	0	0	40	0	0	0	0	0	0	0	0	0	0	40
7	Wayanad District	12	9	28	0	13	0	0	0	0	0	0	6	0	0	68
8	Kozhikode District	59	0	21	137	37	0	1	0	0	0	0	0	0	0	255
9	Kannur district (except Kozhikode)	16	3	9	12	3	0	0	0	0	0	0	6	0	0	49
10	Northern States	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
11	Karnataka State North of Kannur disrict	0	12	16	6	0	0	0	0	0	0	0	0	0	0	34
12	Karnataka State East of Kannur disrict	0	0	0	10	0	0	0	5	0	0	0	0	0	0	15
13	Karnataka State - Other districts	0	0	6	0	0	0	0	0	0	0	0	0	0	0	6
14	Tamil Nadu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**6686**	**3347**	**1912**	**8957**	**1658**	**44**	**43**	**222**	**104**	**3**	**18**	**28**	**14**	**0**	**23036**

Table 17.11 Distribution of total goods vehicle according to origin and destination study

Zone No.	Name of Zones	Study Region	Kannur District (West of study Region)	Kannur District (North of Study Region)	Kannur District (East of Study Region)	Kannur District (South of Study Region)	Kasargod District	Wayanad District	Kozhikode District	Districts south of Kannur district (except Kozhikode)	Northern States	Karnataka State North of Kannur district	Karnataka State East of Kannur disrict	Karnataka State - Other districts	Tamil Nadu	Total (pcu)
1	Study Region	0	144	19	1285	211	0	0	42	0	0	0	0	0	0	1701
2	Kannur District (West of study Region)	55	0	0	132	0	0	6	0	0	6	0	0	6	0	205
3	Kannur District (North of Study Region	9	293	0	125	0	0	9	7	0	4	0	0	0	0	447
4	Kannur District (East of Study Region)	758	265	526	0	658	7	9	156	4	0	0	0	0	0	2383
5	Kannur District (South of Study Region)	28	0	0	208	0	0	0	0	0	4	0	0	4	0	244
6	Kasargod District	0	0	6	0	0	0	0	7	24	0	0	0	0	0	37
7	Wayanad District	0	6	0	6	0	0	0	0	0	0	0	0	0	0	12
8	Kozhikode District	27	21	13	128	6	12	0	0	0	13	0	6	6	0	232
9	Districts south of Kannur district (except Kozhikode)	40	27	13	21	0	27	0	6	0	40	0	6	6	0	186
10	Northern States	0	15	0	3	3	3	0	15	65	0	3	0	0	0	107
11	Karnataka State North of Kannur disrict	0	0	0	13	0	0	0	0	13	0	0	0	0	0	26
12	Karnataka State East of Kannur disrict	0	0	0	3	0	0	0	0	24	0	0	0	0	3	30
13	Karnataka State - Other districts	0	33	3	10	25	4	0	25	13	0	4	0	0	0	117
14	Tamil Nadu	0	15	15	4	0	0	0	4	0	4	0	16	0	0	58
	Total	**917**	**819**	**595**	**1938**	**903**	**53**	**24**	**262**	**143**	**71**	**7**	**28**	**22**	**3**	**5785**

Zone 1: Mattannur study region

Zone 2: Kannur District (West of study Region- Azhikode, Kannur, Dharmadam, Thalassery)

Zone 3: Kannur District (North of Study Region- Payyannur, Taliparamba, Kalliyasseri, Irikkur, Koodali)

Zone 4: Kannur District (East of Study Region- Peravoor, Thillenkeri, Maloor)

Zone 5: Kannur District (South of Study Region- Kuthuparamba, Mangattidam, Chittaripparamba, Kolayad)

Zone 6: Kasargod District

Zone 7: Wayanad District

Zone 8: Kozhikkode District

Zone 9: Districts south of Kannur district (except Kozhikode)

Zone 10: Northern States

Zone 11: Karnataka State North of Kannur disrict

Zone 12: Karnataka State East of Kannur disrict

Zone 13: Karnataka State - Other districts

Zone 14: TamilNadu

Tables 17.10 and 17.11 show the distribution of total passenger vehicles and goods vehicles according to the origin and destination study.

17.7 SPEED AND DELAY CHARACTERISTICS

As part of the study, speed and delay survey was carried out on all the major roads in the town to evaluate the existing speed. Moving car method was used to determine the journey speed and delays. Based on the Test Runs made during the peak and off peak period during the day, the average travel speed of traffic with and without delay was worked out. Table 17.12 gives the average running speed on different sections of the roads in the town. Map showing the delay characteristics is given in figure 17.10.

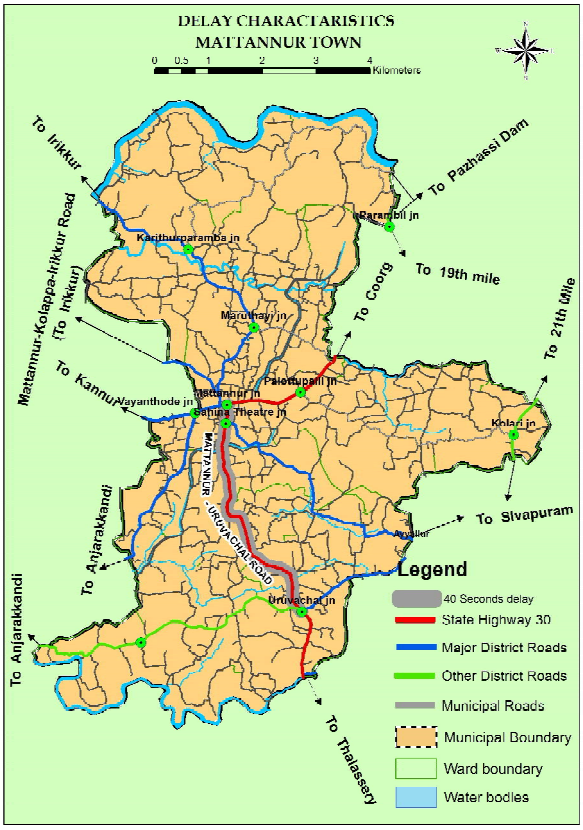


Figure 17.10 Delay characteristics of Mattannur town

Table 17.12 Average Running Speed on road sections having Delay in Mattannur town

Sl. No	Name of road/ Homogeneous section	Distance in (m)	Running time in seconds	Delay time time in seconds	Actual running time in seconds	Speed (km/hr)	
						with delay	without delay
1	Mattannur - Thalassery road (SH)						
	Mattannur-Uruvachal	5,000	520	40	480	34	37

The study of speed and delay characteristics in Mattannur municipal town as per NATPAC reveals that, on Mattannur-Thalassery road, a maximum average running speed of 43 km per hour was noted on a normal working day between Uruvachal junction and Moonnampeedika junction. This followed by an average running speed of 34 km/ hour (with delay) was observed between the section Mattannur junction and Uruvachal junction. A low average journey speed of 30 km/hour was observed between the stretch of Moonnampeedika junction and Thokkilangadi (Wayanad road Junction). An average running speed of 36 km/ hour was noted along this road section.

The average running speed on Mattannur-Taliparamba-Payyannur road varied from 28km/hour (Mattannur junction-Kolappa junction) to 38 km/hour (Irikkur bridge-Sreekandapuram town) during peak hour with delay. An average running speed of 34 km/ hour was noted all along this road section.

The average running speed on Mattannur-Kannur road varied from 37 km/hour (Chalode junction-Melechovva junction NH-17, near Kannur town) to 14 km/hour (Airport Road Junction on Kannur Road to Airport Site) during peak hour with delay. An average running speed of 27 km/hour was noted along this road section.

From the analysis of delays, it could be seen that the major delay of 40 seconds was observed on Mattannur-Thalassery road between Mattannur junction and Uruvachal junction. Unorganized parking of cars and autos and presence of truck traffic were the major causes of delay at this road section.

17.8 DEVELOPMENT POTENTIALS AND PROBLEMS

17.8.1 Potentials

The State Highway, Thalassery-Coorg road passing through Mattannur town is a major traffic corridor in the district and is a great potential for the town. The forthcoming airport can provide not only the air connectivity to Mattannur municipal town but also good linkages like the so called 'Green Field Road', 'Green Field Railway Line' etc. from Kannur and other direction towards Mattannur town. The opening of new bridge at Mannur and the forthcoming bridge at Manakayi towards Vengad side are also of great potential for good connectivity to the Town.

17.8.2 Problems

In Mattannur municipal area due attention is to be given for TC road, Kannur road, Sahina theatre-Sivapuram road and Mattannur Anjarakandy road in near future where projected V/C ratio (volume-capacity ratio) is found crucial**.** Pedestrian crossing facilities are not available in the major roads**.** On-street parking creates traffic congestions at the major junctions like Mattannur junction, Vayanthode junction, Sahina theatre junction**.** Loading/unloading of goods and parking of trucks create traffic problems near market within the bus stand area. Narrow width of major roads and high gradient of roads are also major traffic problems. The existing bus stand lacks space for the smooth operation of buses. Traffic regulatory measures are not provided within the municipal town. Transportation facilities related to forthcoming international airport are to be forecasted .

17.9 INFERENCE

The various survey results clearly imply that the existing road network would not be able to handle the traffic in the horizon year without the up gradation of the transport infrastructure facilities. Augmentation of the capacity of the existing road network by strengthening or widening and the construction of missing links, flyovers, bypasses and link roads is a must considering the dramatic increase in the expected traffic volume. Other traffic infrastructural facilities like new bus stand, truck terminal, parking lots, taxi stand, auto-rikshaw stand etc. are also essential for ensuring smooth mobility for the expected high amount of passenger and cargo traffic in future.



Chapter-19

DRAINAGE AND SANITATION

A. DRAINAGE

Drainage is the natural or artificial removal of surface and sub-surface water from an area. Drainage provides a better environment for the growth of plant, increases microbial decomposition, improves physical properties of the soil, maintain proper soil temperature, promote leaching, less time of labour requirement, better root system, reduce soil erosion and remove toxic substances. The drainage system refers to the system of flow of surface water mainly through rivers. An area drained by a river and its tributaries is called a drainage basin.

This section of the chapter deals with drainage system followed in Mattannur municipal area and the physiography of Mattannur Municipal Town.

19.1 ANALYSIS OF EXISTING STATUS

Mattannur municipal area does not come across serious issues related to the drainage of storm water owing to its unique topographical conditions.

19.1.1 PHYSIOGRAPHY

Drainage of an area is closely related with the physiography of that area. Drainage system is related to a number of factors like slope of land, geological structure, amount and velocity of water. Using GIS (Geographical Information System) software, the physiographic map of Mattannur town has been prepared and is shown in figure below.

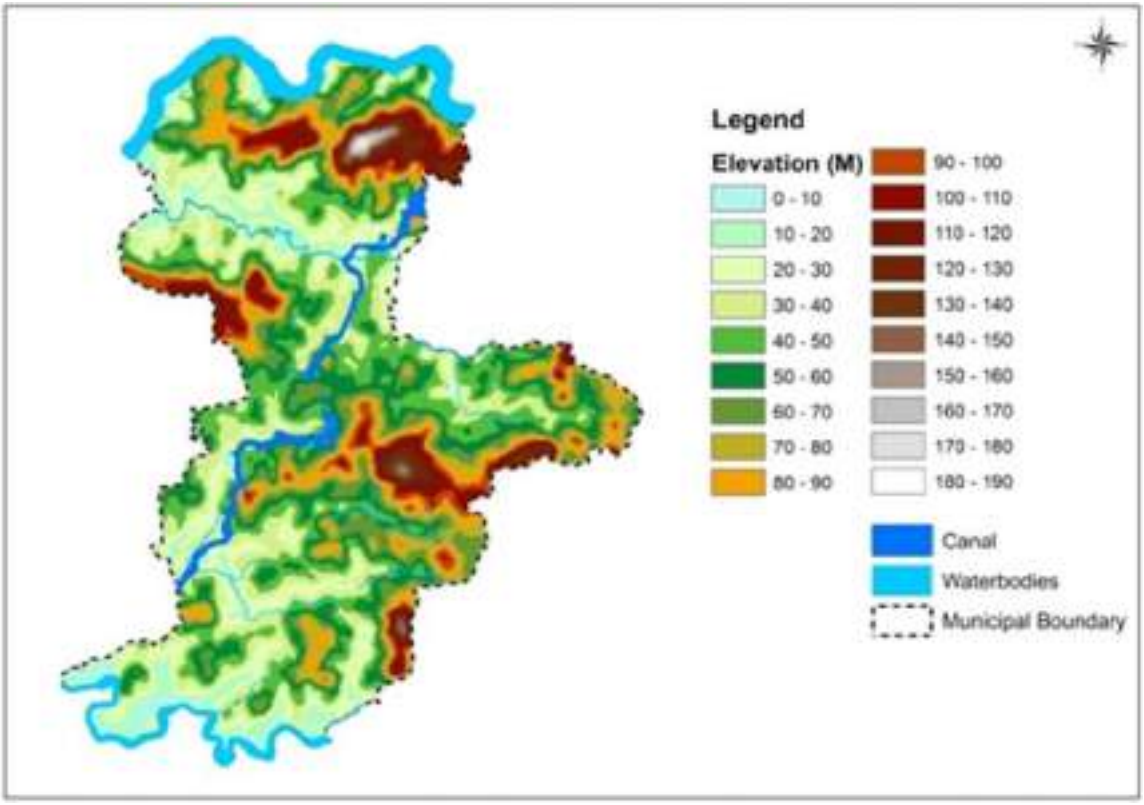


Figure 19.1 Physiography of Mattannur town

The figure above shows that highly elevated areas are located mainly in Porora ward located in the north eastern part of the municipal town. Elevation ranges from 8-190 meter. Majority of the land in Mattannur municipal town has an elevation ranging from 10m-60 m.

The sloping hilly terrain, the paddy fields, the streams at valleys and the two rivers flowing through the north and south borders form a natural drainage system helping the storm water to drain out easily.

19.1.2 EXISTING DRAINAGE FACILITIES

In Mattannur town, there exist covered and uncovered drains. Drains provided in Mattannur town is maintained by both PWD (Public Work Department) and Municipality. Road drains maintained by PWD and Municipality are given in table 19.1 and table 19.2 respectively.

From the table 19.1, it is clear that total length of covered drains in Mattannur town is 2500m and uncovered drain is 4770 m. Most of the covered drains exist near the bus stand area, Uruvachal junction, Maruthayi road and College road. The largest portion of uncovered drain (2300m) in the town, under PWD is located along Irrikkur road (Maruthayi road) .

Table 19.1 Drains maintained by PWD

Name of Road	Length of Covered Drain in metre	Length of Uncovered Drain in metre
Thalassery Road	850	
Iritty Road	600	500
Kannur Road	600	400
Irikkur Road (Maruthayi Road)	400	2300
College Road	50	150
Uruvachal – Kakkayangad Road		1,090
Mattannur - Sivapuram Road		330
TOTAL LENGTH	**2500 m**	**4770 m**

Table 19.2 Drains maintained by Municipality

Name of Road	Length of Uncovered Drain in metre
Tharakkal Pazhassi Road	100
Palayadan-Kottam Road	218
Pariyaram-Kayaloor Road	180
Palottupally-Kunhipoyil Road	117
HassanMukku-Beram Road	300
Palottupally-Vembady Road	200
Karetta Swayamvara Parvathi Road	244
TOTAL LENGTH	**1359 m**

Table 19.2 shows that the total length of drain under the maintenance of Mattannur Municipality is 1359m and all these drains remain uncovered.



19.2 POTENTIALS AND PROBLEMS

19.2.1 Potentials

Major potential for this sector is that at present, there is no major issue regarding the drainage of storm water within the municipal area and water logging areas are not identified. The two major drains of the district, Valapatanam river and Anjarakandy river make border with the municipal area and help for easy draining of storm water with the help of tributary streams running through the municipal area.

19.2.2 Problems

The waste water from houses, shops, hotels and market are disposed into the storm drains and often creates pollution of drinking water sources in the nearby Chekyattu Vayal area which needs urgent intervention from the authorities. The existing drainage system does not cover the entire roads in the Municipal town. The drains provided on major roads are not continuous which may cause poor draining of roads. Storm water flow through the covered drains is blocked by the clogging of wastes dumped in the drains in plastic bags, silt deposit, etc. The water clogged in uncovered drains helps in the breeding of mosquitoes which invites various health related issues. In Mattannur town, roads under the Municipality have only uncovered drains.

B. SANITATION

Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and feaces. Inadequate sanitation is a major cause of disease world-wide and improving sanitation is known to have a significant beneficial impact on health both in households and among communities. The word 'sanitation' also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal.

Waste generation increases with population expansion and economic development. Improperly managed solid waste poses a risk to human health and the environment. Uncontrolled dumping and improper waste handling causes a variety of problems, including contaminating water, attracting insects and rodents, and increasing flooding due to blocked drainage canals or gullies. In addition, it may result in safety hazards from fires or explosions. Improper waste management also increases greenhouse gas (GHG) emissions, which contributes to climate change. Planning for and implementing a comprehensive programme for waste collection, activities for reduction of emission from transport vehicle and recycling of wastes can eliminate these problems to a certain extent.

19.3 PRESENT STATUS

19.3.1 SEWEREAGE

At present, there is no public sewerage system in Mattannur municipal town. Only two public toilets are existing in Mattannur municipal town, one at Bus stand area and the other at Uruvachal town. The data obtained from socio economic survey regarding disposal method is given in figure 19.2.

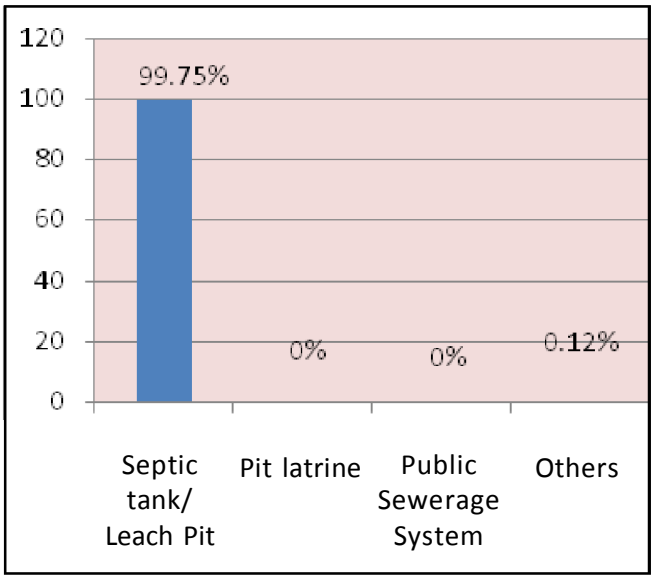


Figure 19.2 Method of sewage disposal in Mattannur town

Figure given above shows that majority of the houses in the municipal area use Leach pit tank/Septic tank for sewage disposal (99.75%). The usage of septic tank is very much less in the town and leach pit is the most practiced method.

Since most of the houses have their own arrangements and most of the areas are topographically undulating, a sewerage system for the whole town is not economically viable in the near future. The number of toilets provided in commercial establishments and offices are far below requirements. Sanitation staff of the Municipality consists 14 Nos. of permanent Contingent employees and 9 Nos. of contract labourers. A nominal fee is charged for the solid waste collection at market area.

19.3.2 SOLID WASTE MANAGEMENT

The details of solid waste management in Mattannur municipal area is obtained from Municipality and also from socio-economic survey.

a) Solid waste composition

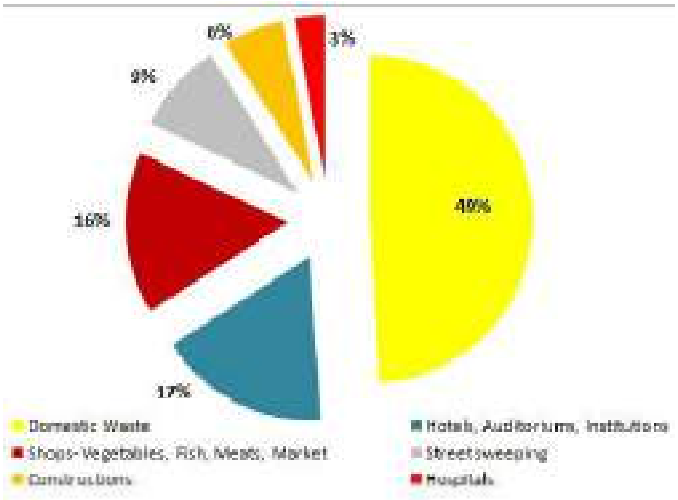


Figure 19.3 Solid waste composition –secondary data

The figure shows that almost 50 % of solid wastes are domestic wastes. About 32% of solid waste is constituted by trade and commercial centers. The percentage of solid wastes from street sweeping, construction sites and hospitals are 9%, 6% and 3% respectively.

b)Solid waste collection

Street sweeping facility is provided in small area of Mattannur municipal town. Figure given below shows street sweeping areas in Mattannur municipal town. Street sweeping covers two wards located in the town centre, namely Mattannur ward and town wards where commercial activities are concentrated. Thalassery-Coorg road, Kannur-Mattannur road, and Mattannur-Marurhayi road are the roads in the municipal area having street sweeping.



Figure 19.4 Street sweeping areas in Mattannur town

Details of solid waste collection centers are given in table 19.3.

Table 19.3 Details of storage and collection centers of solid waste

No.	Secondary Storage Space (Location and extent)	Frequency of Collection (per day)
1	Market	once
2	Iritty road	once
3	Uruvachal town.	once

Solid waste collection centres are located only at Market, Iritty Road and Uruvachal town and do not cover the entire municipal area. Street sweeping covers only the major roads.

A Kudumbasree unit having 10 members is in charge of waste collection from the 300 shops in Mattannur town area. Municipality has 3 hand carts for collection and only one truck for transportation of garbage.

c) Solid waste disposal

The figure given below shows the places of solid waste disposal in Mattannur municipal area. The data were collected by socio–economic survey. From the figure it is clear that about 98.4% of wastes are disposed at own compound and 1.35% is collocted through garbage bin. Only 0.12% is disposed through other modes.

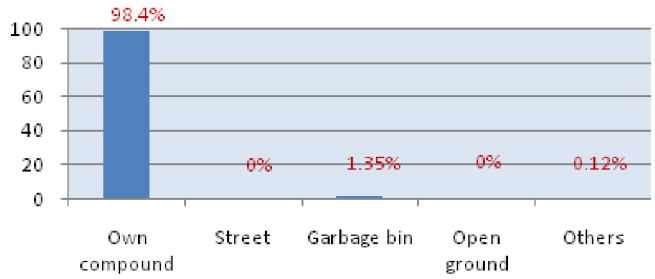


Figure 19.5 Place of solid waste disposal

Mattannur Municipal Town possesses a trenching ground with an area of 1.5Ha located at Karithurparamba. About 25Tons solid waste is generated by houses and firms within the town per day. Domestic wastes contribute 49% of the total solid waste. At present, 5 tons of solid waste is collected per day from the markets, street sweepings and commercial firms. Out of the 5 tons solid wastes collected, 30% constitutes Plastics, Rubber, Glass etc. and land filling method is adopted for its disposal. The remaining 70% is of bio-degradable waste and is used for windrow composting. Hospital wastes (Bio Medical) are collected through IMAGE(Indian Medical Association Goes Eco-friendly). Bio-degradable wastes are collected along with municipal wastes. No market is having own system for solid waste disposal. Market wastes are collected directly by contingent workers. A project for modern Solid waste treatment plant under UISSMT scheme has already been submitted to the Central Govt. for approval.

Location of collection centers and trenching ground in Mattannur municipal area is given in figure 19.6.



Figure 19.6 Location of collection center and trenching ground



Trenching ground at Porora

19.4 POTENTIAL AND PROBLEMS

19.4.1. Potentials

The main potential available is that Mattannur municipal town has its own trenching ground with an approximate area of 1.5Ha located within the municipal territory and capable of handling the present load. The average per capita land is 25 cents and this huge potential should be utilized for promoting source disposal of solid waste. Land had already been acquired for public crematorium near the trenching ground .

19.4.2. Problems

At present centralized collection system is followed in Mattannur municipal area. The collection does not cover the entire municipal area. Sanitation staff and equipments are not sufficient to cope with the future requirement. Dumping yard is located on hill slope and this may cause pollution at underneath portion. Modern processing methods are not used for the disposal of solid waste. At present, there is no modern slaughter house and public crematorium.

19.5 INFERENCE

Mattannur municipal town is blessed with two rivers, one on the northern periphery and the other on the southern periphery of the municipal town which solves major drainage problems within the town. Proper maintenance of existing drains in Mattannur town can reduce the drainage problems to a great extent.

At present, Mattannur town does not have any serious issues related to sanitation and solid waste management due to the availability of land for the disposal of solid waste within the town. However the forthcoming international airport may cause an increase in population as well as quantity of wastes and hence proper facilities need to be provided and maintained in a regular manner.



Chapter- 20

EDUCATION

Education is a form of learning in which the knowledge, skills and habits of a group of people are transferred from one generation to the next through teaching, training and research. Education leads to enlightenment and lays the foundation of a stronger nation. Kautilya, an Indian philosopher said that "Education is an investment in human capital, and it can have great impact on nation's growth and development". Education is commonly divided into stages such as preschool, primary school, secondary school, higher secondary school and then college, university or apprenticeship.

20.1 ANALYSIS OF EXISTING STATUS

Analysis of existing status of education deals with Literacy rate, status of educational institutions and their facilities and the ownership of such institutions.

20.1.1 Literacy rate

Literacy rate comparison with the District, the State, other Municipalities within the District, similar municipalities within the State and Female literacy rate comparison with the District, the State and adjoining panchayaths have already been explained in chapter 4.

Literacy rate of Mattannur Municipal town is 94.80%. It is slightly lower than the State and the District average and is lowest when compared to nearby towns in the District. But it keeps a median value with neighbouring Panchayats. Female Literacy rate also follows similar pattern. When compared to similar towns in the State it is higher than Manjeri and Tirur towns but lower than Ottapalam town.



Govt. U.P. School, Mattannur

20.1.2 Educational status

The present educational status in Mattannur municipal area is shown in the figure 20.1 which has been obtained from the data collected through the socio-economic survey conducted.

The data reveals that about 40% of the people have high school level education, 27% have only primary level education, 17% have acquired pre degree and 8% have attained graduation. Post graduates and Technical experts constitute 4% of the total, each constituting 2% whereas professionally qualified graduates constitute 2.5%. Others constitute 0.5% .

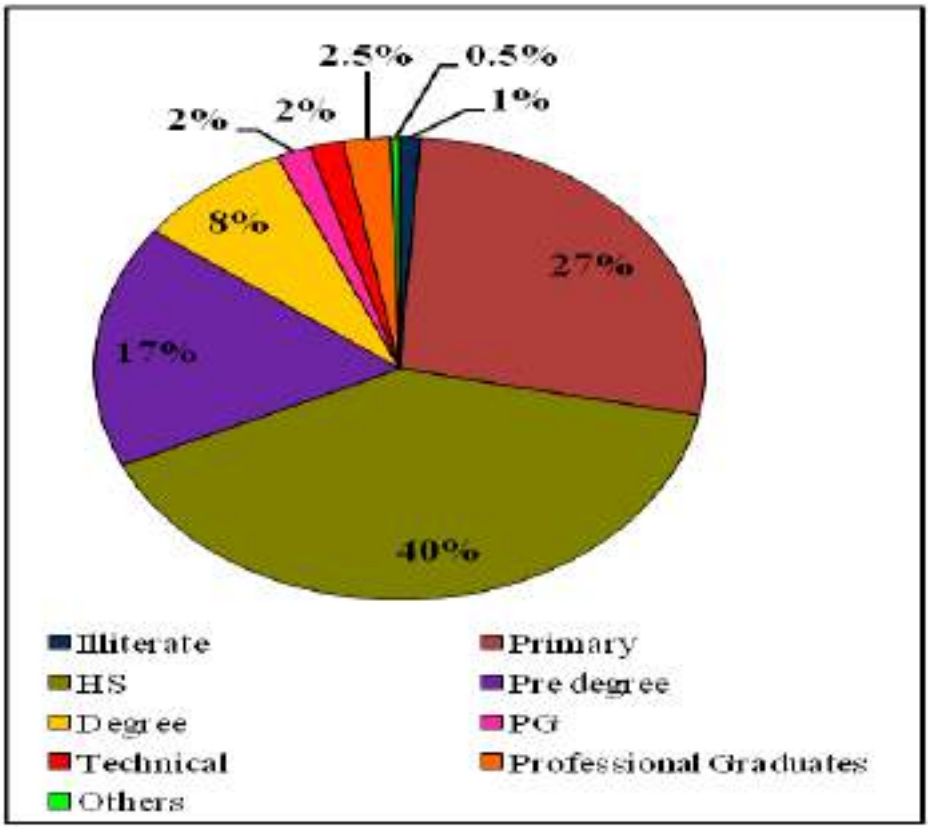


Figure 20.1 Present Educatinal Status

Details of schools and colleges present in Mattannur municipal area is given in Figure 20.2 and their locations are given in Table 20.1.

Figure 20.2 shows the location of educational institutions in Mattannur Municipal town which reveals that educational institutions are scattered within the municipal area. There are 3 colleges located at the middle portion of the Municipal town. Out of the three Higher Secondary Schools 2 are located in the town area.

Table 20.1 shows that there are 26 educational institutions existing in Mattannur municipal area. Out of this 26 institutions there are 3 Colleges, 3 Higher Secondary Schools, 6 U.P School and 13 L.P Schools. The data indicates that the number of colleges in Mattannur municipal area is very much limited.

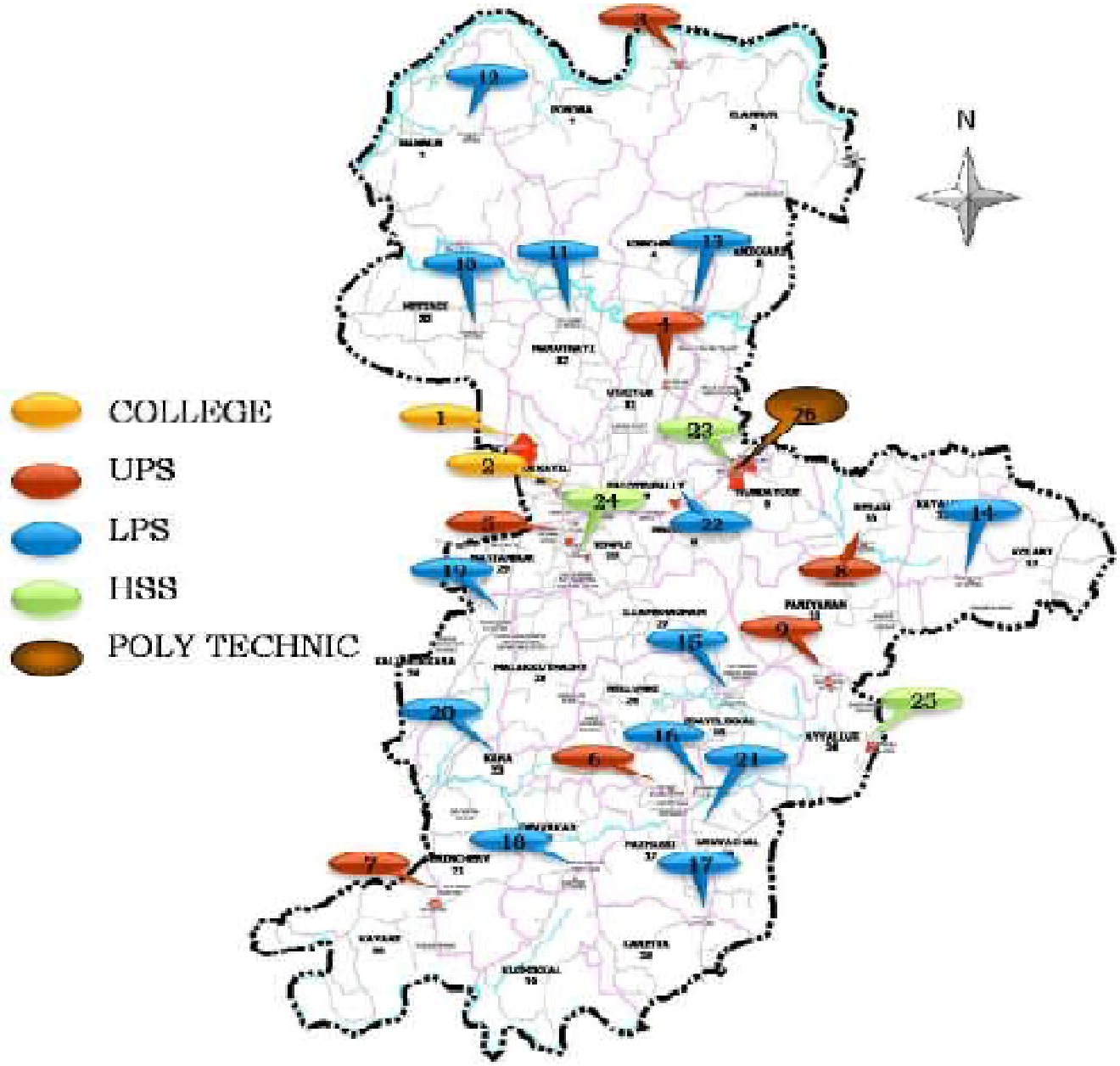


Figure 20.2 Location of Educational Institutions

Table 20.1 Name of Educational Institutions

NO	NAME OF INSTITUTE	NO	NAME OF INSTITUTE
1	P.R.N.S.S.College	15	Ayyallur L.P.S
2	Universal College(Pvt.)	16	Pazhassi East L.P.S
3	Porora U.P.S.	17	Kareta L.P.S
4	Kalloor new U.P.S.	18	Kuzhikkal L.P.S
5	G.U.P.S. Mattannur	19	Kallerikkara L.P.S
6	Pazhassi West U.P.S.	20	Kara L.P.S
7	Kayani U.P.S.	21	G.L.P Pazhassi
8	Pariyaram U.P.S.	22	Palottupally N.I.S.L.P.S.
9	Salil Sivadas Foundation School	23	Mattannur H.S.S
10	Mettadi L.P.S.	24	Sree Sankara Vidya Peedam Senior School
11	Maruthai L.P.S	25	Sivapuram H.S.S
12	Mannur L.P.S	26	Govt. Poly Technic
13	Keecheri L.P.S		
14	Kolari New L.P.S		

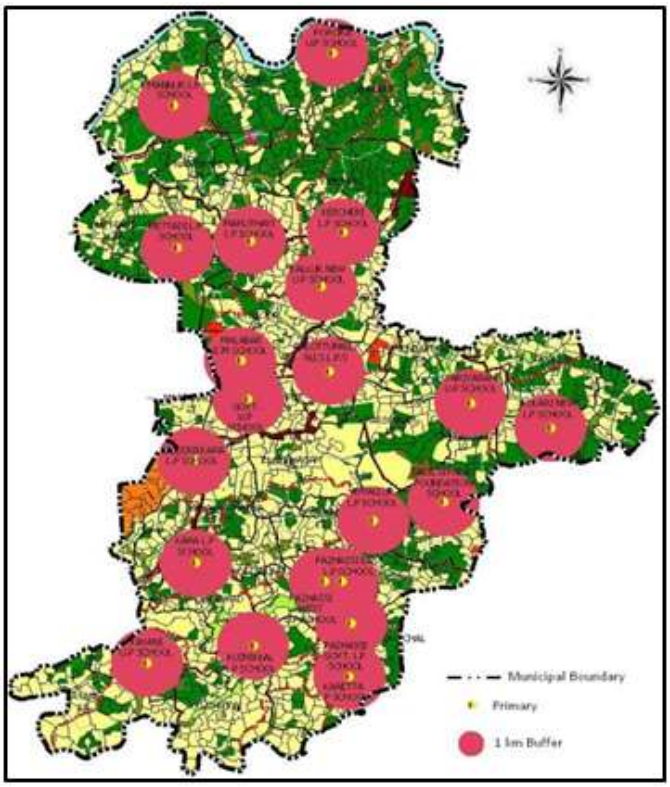


Figure 20.3 1km radius buffering of Primary School

Figure 20.3 shows the 1km radius buffering of primary schools in Mattannur municipal area.

The figure shows that Primary Schools are found fairly distributed within the municipal area except in some portion at north. Most of the Schools face the problem of shortage of students and are under the threat of shutting down.

Figure 20.4 shows the 2 km radius buffering of HSS in Mattannur municipal area



Pazhassi West U.P. School

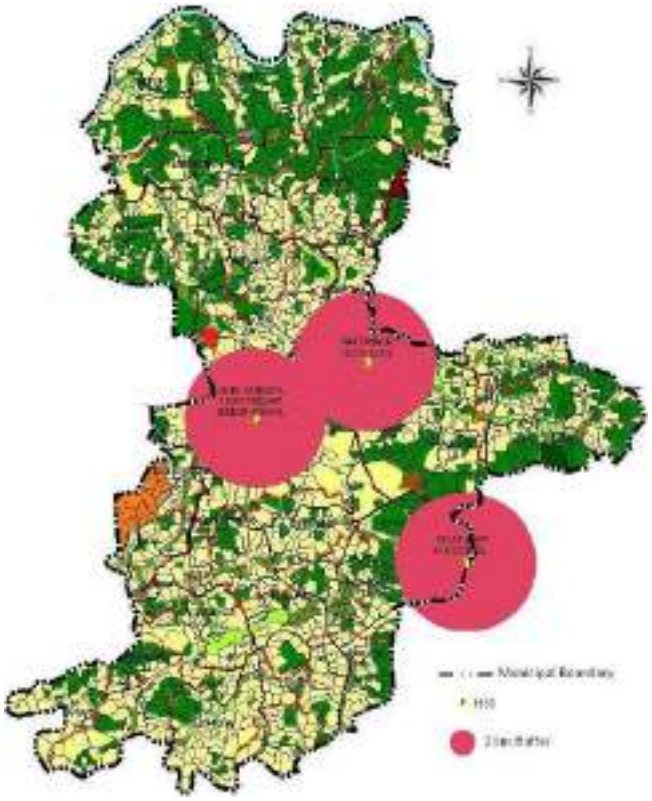


Figure 20.4 2km radius buffering of HSS

The figure given above reveals that there exists only two Higher Secondary Schools within the municipal area and another one is located at the border. New High Schools and Higher Secondary Schools are to be set up at northern and southern portions of the Mattannur town.

20.1.3 Infrastructural Facilities

One U.P School and four L.P School in Aided sector do not possess playgrounds. Four Aided LP School don't have separate toilet for girls. Only a few Schools have Computer labs and internet facilities. Drinking water facility is available in all schools. Five schools depend on tap water and the rest on wells. All schools are connected with motorable roads.

20.1.4 Owner ship of educational institutions

Owner ship of educational institutions in Mattannur town is given in table 20.2.

Table 20.2 Ownership of Educational Institutions

NO	NAME OF INSTITUTE	GOVERN-MENT	PRIVATE	AIDED	UN-AIDED
	COLLEGES				
1	P.R.N.S.S.College			X	
2	Govt. Poly Technic	X			
3	Universal College(Pvt.)		X		
	HIGHER SECONDARY SCHOOLS				
1	Mattannur H.S.S			X	
2	Sree Sankara Vidya Peedam Senior School				X
3	Sivapuram H.S.S			X	
	HIGH SCHOOL				
1	Salil Sivadas Foundation School				X
	UPPER PRIMARY SCHOOL				
1	Porora U.P.S.			X	
2	Kalloor new U.P.S.			X	
3	G.U.P.S. Mattannur	X			
4	Pazhassi West U.P.S.			X	
5	Kayani U.P.S.			X	
6	Pariyaram U.P.S.			X	
	LOWER PRIMARY SCHOOL				
1	Mettadi L.P.S.			X	
2	Maruthayi L.P.S			X	
3	Mannur L.P.S			X	
4	Keecheri L.P.S			X	
5	Kolari New L.P.S			X	
6	Ayyallur L.P.S			X	
7	Pazhassi East L.P.S			X	
8	Karetta L.P.S			X	
9	Kuzhikkal L.P.S			X	
10	Kallerikkara L.P.S			X	
11	Kara L.P.S			X	
12	G.L.P Pazhassi	X			
13	Palottupally N.I.S.L.P.S.			X	
	TOTAL	**3**	**1**	**20**	**2**

As per table 20.2 the three colleges in Mattannur town are P.R.N.S.S College, Govt. poly technic and Universal College working under aided, Government and private sector respectively. Majority of schools are Aided Schools. Out of the 2 Govt. Schools, one is LPS and the other is UPS. There are only three Higher Secondary Schools in the town. There are no separate High School

in Govt./Aided sector in the Municipal town. Government Schools and Aided Schools follow State syllabus while Unaided Schools follow CBSE syllabus.



Mattannur Higher Secondary School



Govt. Poly Technic College, Mattannur



PRNSS College, Mattannur

20.2 DEVELOPMENT POTENTIALS AND PROBLEMS

20.2.1 DEVELOPMENT POTENTIALS

Mattannur Municipal town is having a minimum number of educational institutions, hence the development of this sector is very much essential. The development of Mattannur Municipal town is greatly influenced by the forth coming International Airport at Kannur, and therefore the education sector also has the same impact. Airport offers scope for higher educational institutes with courses like IT, Aviation, IATA, Logistics, Material Management, Hospitality Management, etc. Moreover, there are seven Computer Institutes functioning in the town offering computer courses at various levels.

20.2.2 PROBLEMS

The backwardness of Eastern hill region of the District is reflected in the establishment of educational institutes in Mattannur Municipal town. There exist only one Arts & Science College and one Poly Technic College in higher education sector. There is no Engineering college or similar professional colleges within the municipal area, however one Engineering College has started functioning in the adjacent Thillankeri Panchayat and Kannur Medical College and Malabar Institute of Technology are functioning in the nearby Anjarakandy panchayath. Lack of infrastructural facilities like urinals and toilets exist in some schools. Most of the Primary schools lack play ground. New major educational institutions were not established. It is necessary to improve the existing infrastructural facilities such as library, laboratories, toilets, waste disposal systems, etc. There is a demand for English Medium division in Govt. Schools.

20.3 INFERENCE

In Mattannur Municipal town, the level of education is only moderate and is well revealed by the modest representation of degree holders and high representation of High school educated and Primary school educated groups. Majority of the schools are under aided sector. There are no High Schools and Higher Secondary Schools under Government sector. Spatial disparity is seen due to the concentration of high schools in the middle portion of the town. Higher level education facilities need to be promoted. Considering the development of the sector private participation may be welcomed and measures may be taken to introduce new educational institutions under co-operative sector.



Chapter-21

ENERGY

Energy is the basic necessity for the economic development of a country. Many functions necessary to present-day living grind to halt when the supply of energy is stopped. Electricity provides us with light, heat, refrigeration, communication, elevators, entertainment etc. We are so dependent on electricity that when it is unavailable for even a few minutes, the word 'crisis' comes to mind. Electrical energy is popular because it is so easily transmitted from one place to another, and can be converted into other forms of energy easily. The survival of industrial undertakings and our social structures depends primarily upon low cost and uninterrupted supply of electrical energy. In fact, the advancement of a country is measured in terms of per capita consumption of electrical energy.

21.1 ANALYSIS OF EXISTING STATUS

Data regarding energy supply and consumption in Mattannur municipal area were obtained from electricity board, Municipality and by socio-economic survey. The Kerala State Electricity Board is the single licensee responsible for power distribution in the municipal area Mattannur sub-station is located just outside the municipal area at Iritty road, while there exists a 33KV substation at Pazhassi within the municipal area. The town has a total number of 74 transformers, 84km of HT line 295Km of LT (Lower Tension) line and seven feeders. Power distribution arrangement in Mattannur municipal area is given in figure 21.2.

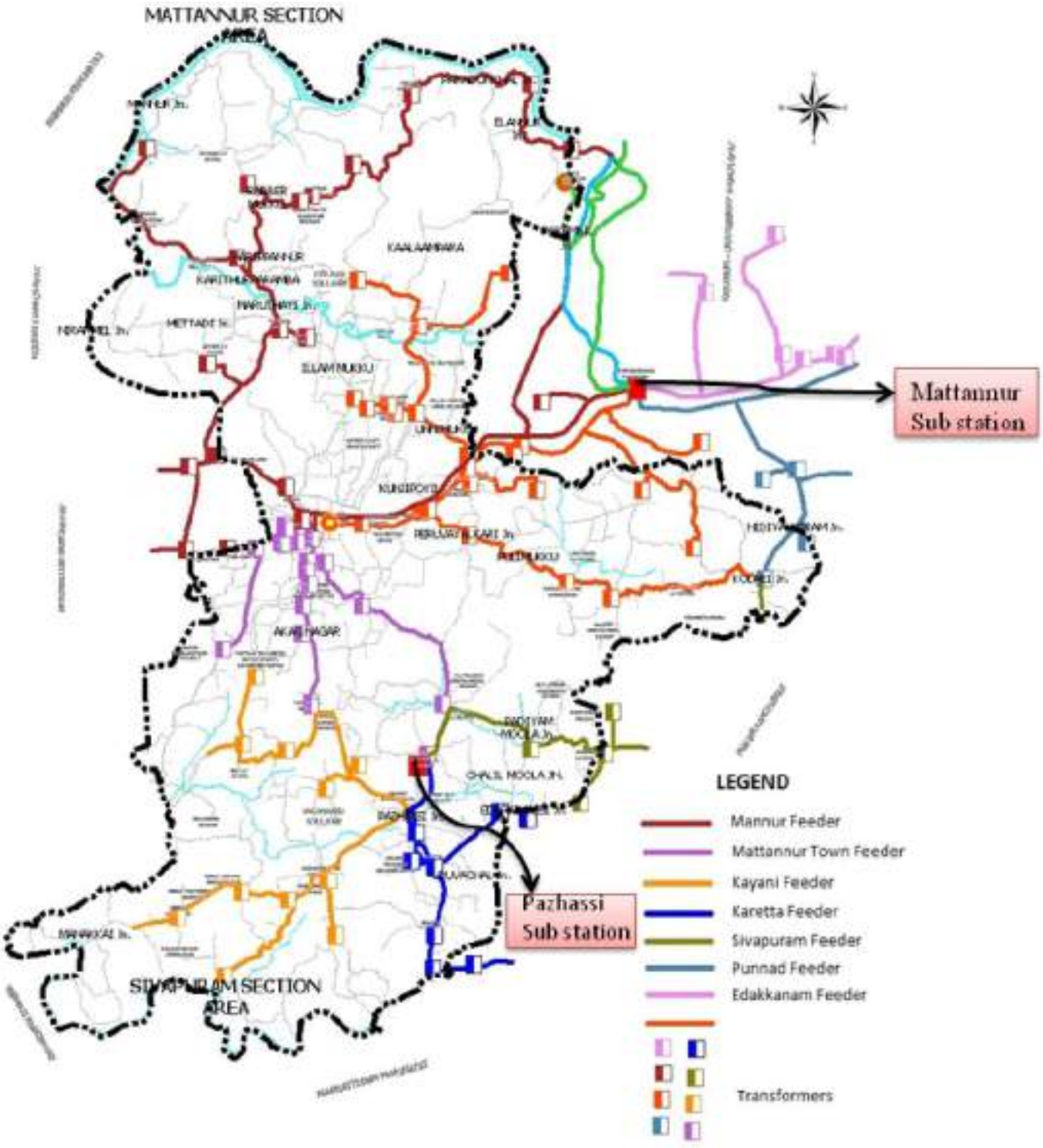


Figure 21.1 Power distribution system in Mattannur town

Category wise monthly consumption of electricity were obtained from socio-economic survey and is given in Table 21.1 and Figure 21.2.

Table 21.1 Category wise monthly average consumption of electricity.

Item	Domestic	Commercial	Industrial	Street lighting	Others (Agriculture)	Total
No. of Connections	8291	1525	76	2	133	**10027**
Monthly Average Consumption (KWh)	615496	86030	48322	24584	1966	**776398**

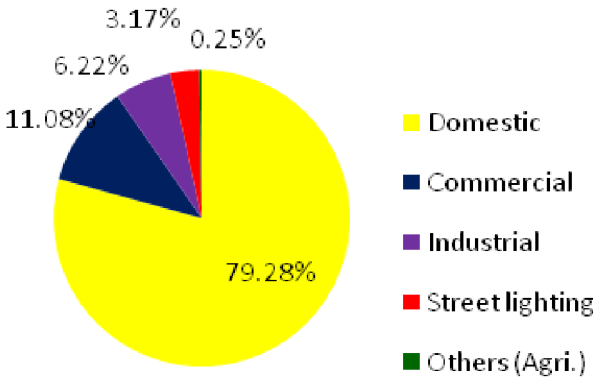


Figure 21.2 Percentage of category wise monthly consumption

The figure and table given above reveals that majority of the electricity consumption in the municipal town is for domestic purpose.

Other sources of energies

a) Fuel pumps

There are 2 petrol pumps in Mattannur Municipal area located both at Iritty Road. The retail sail details of petrol and diesel at both outlets are given in figure 21.3.

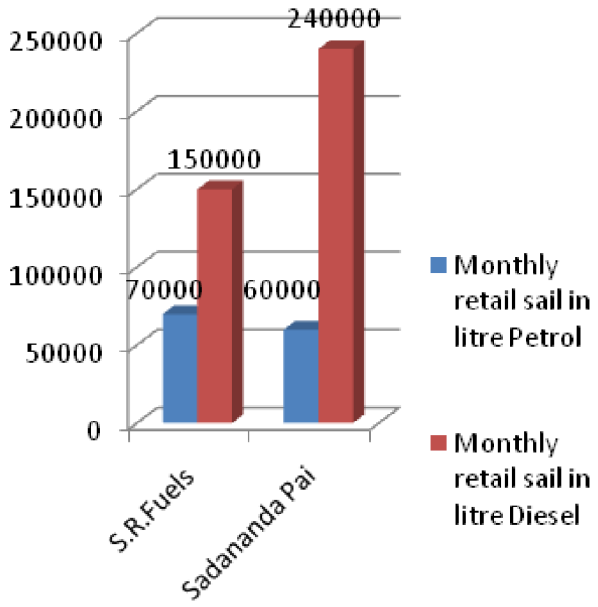


Figure 21.3 Monthly retail sail of petrol and diesel

The total consumption of petrol is less than that of diesel.

b) LPG and Kerosene

One Gas Agency (Pazhassi Raja service center) and Jyothi Kerosene Service function in the Municipal area. The gas agency has a storage capacity of 9,900L and monthly distribution is 20,000L. About 36,000L of kerosene is distributed per month through Jyothi kerosene supply center. The data is given in Table 21.2.

Table 21.2 Details of LPG and kerosene agencies

AGENCY	CAPACITY	MONTHLY DISTRIBUTION
Pazhassi Raja Gas Agency	9,900 L	20,000L
Jyothi Kerosene		36,000L

Pazhassi Raja gas agency is an automobile gas filling station located at Karetta on Thalassery-Coorg Road.

At present there is only one gas godown (T.R. Gas) functioning in the municipal area, and is located near



Gas filling station for vehicles at Karetta.

P.R.N.S.S. College. T.R gas agency act as a gas godown as well as gas distribution center and serving entire municipal area and adjoining panchayaths also.

The location of petrol pumps, gas godown and gas filling station are given in figure 21.4.

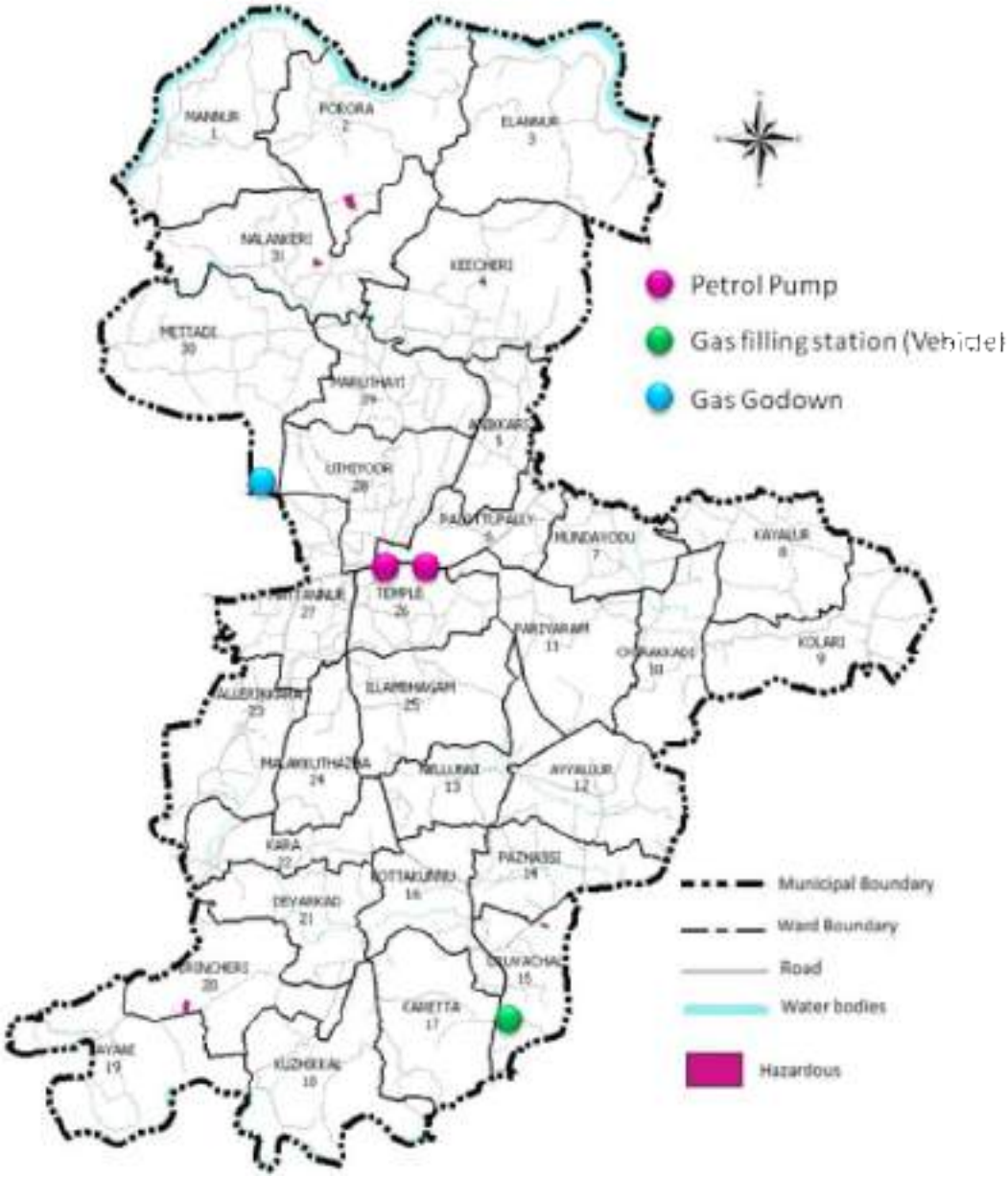


Figure 21.4 Location – petrol pump, gas godown, gas filling station (Vehicles)

21.2 POTENTIALS AND PROBLEMS

21.2.1 Potentials

High altitude areas in Mattannur municipal area offers potential for setting up of wind mills. There is an untapped potential for generating energy from municipal waste.

21.2.2 Problems

New petrol pump is necessary at Thalasseri Road for air port bound vehicles in future. One separate substation is required for meeting the requirements of airport .

21.3 INFERENCE

The feasibility studies for non-conventional energy resources like windmill, municipal wastes, etc. should be initiated by the Municiapality. The methods of tapping solar energy should be encouraged and adopted as far as possible. Methods like UG cable system may be adopted for reducing transmission loss.



Chapter-22

ENVIRONMENT

Environment is everything that makes up our surroundings and affects our ability to live on the earth- the air we breathe the water that covers most of the earth's surface, the plants and animals around us, and much more. If our day-to-day actions are environmentally-friendly we are not only helping the environment, but we can benefit financially, physically and mentally as well.

Kerala has a rich and distinct environment featuring a long coastline, an elaborate waterways system and mountains. However, there exist many threats to the delicate ecological balance here.

This chapter deals with the present status of environment in Mattannur municipal area and the problems faced.

22.1 PHYSICAL ENVIRONMENT

The physical environment comprises all the different factors of nature, including water (Rivers, Seas, Oceans), natural vegetation, landform and rocks, weather etc.

In Mattannur municipal area environmentally sensitive area includes forest land (Poongottu Kavu Vanam), water bodies, prime agricultural lands, wet lands etc. About 2.2% of total land area of Mattannur Municipal Town is constituted of water bodies. There are two rivers passing through the northern and southern periphery, they are Irrikkur river (Valapattanam river) and Anjarakkandy river respectively. Forest, paddy and uncultivated paddy

contribute 0.2%, 2%, and 4.1 % of total land area respectively.

The environmentally sensitive areas in Mattannur municipal town is given in figure 22.1.

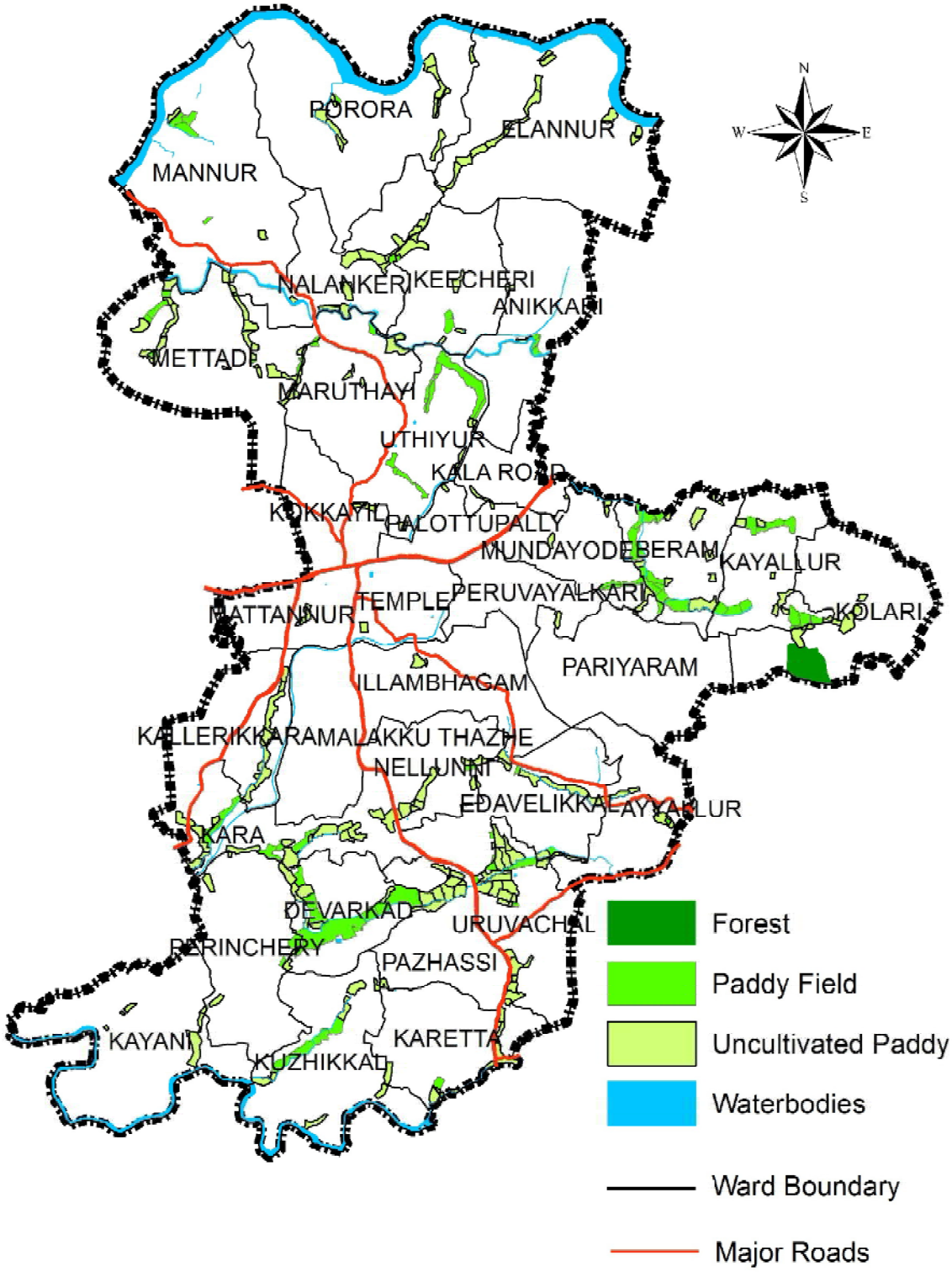


Figure 22.1 Environmentally sensitive areas

Environmentally sensitive areas scattered all over the municipal town. The identification and conservation of environmentally sensitive areas can protect species and ecosystems, preventing further habitat fragmentation and loss. Conservation development also provides for secondary conservation areas, which provide corridors for animals to hunt, mate and travel through. The areas other than the sensitive areas can be considered for the development.

Poongottu Kavu Vanam is a vested forest in Mattannur municipal area having an extent of nearly 45 acres. This sacred grove is a type of tall evergreen forest serving as a habitat for a troop of monkeys and camp for migratory birds. Cholathode, the largest stream in the municipal area, originates from Poongottukavu vanam.

The hill areas under threats are located at Karetta, Elakkuzhi, Mundorapoyil, Chevidikunnu, Kottakkunnu, Maroli, Oyalakunnu, Aringottu, Vegancheri, Narikkunnu and hil near Chekkiyodu.

22.2 POLLUTION ASPECTS

Environmentally sensitive areas are getting polluted by various means. Environmental pollution includes pollution of water, air and land. Industries have a major role in environmental pollution.

22.2.1 Water Pollution

The rivers and water bodies of Mattannur municipal area have been increasingly polluted from the industrial and domestic waste and from the pesticides and fertilizers in agriculture. Industries discharge hazardous pollutants like phosphates, sulphides, ammonia, fluorides, heavy metals and insecticides into the downstream reaches of the river at Valapattanam. The major water quality problem associated with rivers near municipal area is bacteriological pollution.

Water bodies within the municipal area are getting polluted through various sources such as hospitals, industries, house hold wastes etc. Bio- medical wastes include human anatomical waste, animal waste, microbiology and biotechnology waste, sharp waste, discarded medicines and cytotoxic drugs, soiled waste, solid waste, liquid waste, incineration ash and chemical waste. Common biomedical waste treatment facility operated by IMAGE (Indian Medical Association Goes Eco – friendly) is located at Manthuruthy, Kanjikode.

The study of pH, DO (dissolved Oxygen), BOD (Biological Oxygen Demand), Total Coliform and free ammonia can identify the pollution in water bodies.

pH:- pH is an indicator of the existence of biological life as most of them thrive in a quite narrow and critical pH range.

Dissolved Oxygen (DO):- DO is essential for aquatic life. A low DO (less than 2mg/l) would indicate poor water quality and thus would have difficulty in sustaining many sensitive aquatic life.

Biological Oxygen Demand (BOD):- It is a measure of organic pollution to both waste and surface water. High BOD is an indication of poor water quality.

Total Coliform Count:- Microbiological test is to detect the level of pollutions caused by living thing especially human who live or work in the area especially upstream of the site. These tests are based on coliform bacteria as the indicator organism.

Free Ammonia :- Ammonia levels in excess of the recommended limits may harm aquatic life. Although the ammonia molecule is a nutrient required for life, excess ammonia may accumulate in the organism and cause alteration of metabolism or increases in body pH. It is an indicator of pollution from the excessive usage of ammonia rich fertilizers.

Quality of water bodies in Mattannur municipal area were obtained from Pollution Control Board. The studies were conducted in Anjarakandy river at Meruvambai (upstream side of the town) and Valapatanam river at Irikkur (downstream side of the town).

Table 22.1 Data of Primary water quality Parameter for Anjarakandy river at Meruvambai

PARAMETER	PERMISSIBLE LIMIT	APRIL 2009	JULY 2009	APRIL 2012	JULY 2012	APRIL2013	JULY2013
pH	6.5 - 8.5	6.3	5.9	7.6	7.4	6.7	6.4
DO	6 mg/l or more	5.8	6.4	7.2	6.9	5.8	7.2
BOD	2 mg/l	1.3	1.3	1.8	0.7	1	1.3
Total Coliform	50 CFU /100ml	300	330	400	300	600	415
Free Ammonia	2mg/l	Nil	Nil	0.1	Nil	Nil	Nil

The details obtained from Pollution control board are given in table 22.1 and 22.2.

As per the table 22.1 total coliform is found increasing in the river beyond permissible limit. During 2009 April total coliform count was about 300 CFU/ 100ml which was far beyond the permissible limit, and it became double during April 2013 . In July 2013 coliform Bacteria gets down to 415CFU /100 ml. There was a slight decrease in the count of Dissolved Oxygen from permissible limit during April 2009 and 2013. All other parameters are within the permissible limit or ineffective.

From table 22.2 it is clear that in Valapattanam river also there is an increase in total coliform content . But when comparing with Anjarakandy river it is slightly less.

22.2.2 Industrial Pollution

According to the extent of making pollution, industries are categorized as Red, Orange and Green. Categorization of industries in the municipal area is given in Table 22.3.

As per the table given above Crusher and Quarry units are the red category industries in the Municipal town and are located at the northern area. Orange Category industries like Hotels and Auditoriums are concentrated near Mattannur Junction area, Automobile service stations are located along the sides of major roads while Poultry farms and Cattle farms are scattered in the municipal area. Flour mills are the major Green category industries and are mainly located

Table 22.3 Types of industries in category wise

Red	Orange	Green
Crusher & Quarry units	Hotels,Auditorium	Flour Mills
	Rubber based industries & automobile service stations	
	Poultry Farms, Cattle Farms	

Table 22.2 Data of Primary water quality Parameter for Valapatanam river at Irikkur

PARAMETER	*Permissible limit*	JULY2009	APRIL2009	JULY2012	APRIL2012	JULY2013	APRIL2013
pH	6.5 - 8.5	6.1	6.5	6.9	7.45	6.3	7.0
DO	6 mg/l	7.4	7.6	7.8	7.9	7.9	8.2
BOD	2 mg/l	1.3	1.3	1.0	2.7	0.8	1.6
Total Coliform	50 CFU/100ml	NOT TAKEN				300	300
Frequent Coliform		200	500	376	8	80	50
Free Ammonia	2 mg/l	-	-	*BDL	0.12	*BDL	*BDL

**BDL – Below Detection Level*

in and around town wards. Among the 3 categories Mattannur municipal town has only a high concentration of Orange.

22.2.3 Air Pollution

Air is getting polluted day by day mainly due to the increase in number of vehicles. The forthcoming air port will lead to a major extent of air pollution. Sources of air pollution from hospitals are incinerators and generator sets. The incinerators are used for the disposal of Bio Medical Wastes. But all hospitals in Mattannur municipal town are affiliated with IMAGE (Indian Medical Association Goes Eco-friendly) for disposal of Bio Medical Waste.

22.2.4 Noise Pollution

Noise pollution is mainly occurred along major corridors due to vehicular traffic. This is much more in the case of heavy duty vehicles and diesel engine fitted autos. The improper maintenance of vehicles also creates noise pollution. Use of loudspeaker for different functions is another major cause of noise pollution.

22.3 DEVELOPMENT POTENTIALS AND PROBLEMS

22.3.1 POTENTIALS

Mattannur municipal area is blessed with a number of water bodies like ponds, streams and rivers etc. which will create a better environment. The sacred groves, dry agriculture lands, paddy fields etc. are abundant in Mattannur Town which imparts greenery all around. The Pazhassi canal is defunct now and its suitable land can be used for afforestation and for parks and open spaces.

22.3.2 PROBLEMS

The population size is growing day by day and this may lead to the construction of new dwelling units. This will create water pollution and solid waste disposal issues if proper treatment facilities are not adopted. Air pollution and noise pollution are mainly due to growing vehicular population. The wetlands and paddy fields are ruthlessly reclaimed for erecting buildings causing an increase in surface run off and affecting the natural drainage system. The indiscriminate usage of fertilizers and pesticides create soil and water pollution which in turn affects the living organism in the eco-systems. Similarly the excessive earth cutting in the fragile hills cause environmental detriment. Many hills in Mattannur municipal area are now under threat. Another problem is the contamination of water in both Valapattanam river and Anjarakandy river.

22.4 INFERENCE

The sectoral analysis shows that the town is facing major issues related to water pollution. Unscientific use and disposal of plastic and other hazardous substances are to be taken care of with proper planning and regulations. Preventive measures are to be taken for the destruction of sacred groves and fragile hills.



Chapter-23

MUNICIPAL FINANCE AND GOVERNANCE

A. MUNICIPAL FINANCE

Finance is an art of managing various available resources like money, assets, investments, securities etc. Financial system consists of public and private interests and the markets that serve them.

Municipal finances are crucial to many new urban and local governance projects, as their strategic management plays a critical role in ensuring long-term sustainability of local services and infrastructure. However, the tightening of fiscal constraints and the pressure from the global financial and economic downturn require increasingly sophisticated responses from local governments in mobilizing and utilizing financial resources.

23.1 EXISTING STATUS

Presently, municipal budgets, in most cases, cover operating costs and recurrent expenditures, but cannot sufficiently cover capital investments. One key issue faced by local governments is how to expand their resource base beyond transfers. Shortcomings often remain hidden, appearing in the form of missed opportunities, low financial gains or overspending for services. In addition, local governments have potential access to large sources of external funding, but often do not know how to tap these resources. They are keen

Table 23.1 shows the statement of receipt and expenditure of Mattannur municipality.

Sl. No.	Items	2001 - 02	2002 - 03	2003 - 04	2007 - 08	2008 - 09	2009 - 10	2010 - 11	2011 - 12
1	**Opening balance**	2,669,367	2,719,865	5,865,350	58,620,911	57,456,916	37,727,916	31,296,244	62,138,980
2	**Receipt**	7,951,874	11,993,009	10,746,133	58,996,853	78,985,000	66,315,724	122,750,534	201,678,000
3	**Expenditure**	7,901,376	8,847,524	11,073,589	60,160,848	98,714,000	72,747,396	91,907,798	255,267,000
4	**Closing Balance**	2,719,865	5,865,350	5,537,894	57,456,916	37,727,916	31,296,244	62,138,980	8,549,980

to get support on how to program priority investments and prepare projects that can attract funding. For those local governments who are in better shape and can qualify for capital market access, preserving their creditworthiness and sound municipal borrowing practices are key challenges. In all cases, improved governance practices and enhanced accountability mechanisms (e.g., public transparency of budgets, customer service contracts for public utilities, adequate public asset management, clear monitoring of the performance of local governments) have become central to sound city government and municipal management.

Table 23.1 above shows the statement of receipt and expenditure of Mattannur Municipality, during the last decade.

As per table given above, during last financial year the closing balance is very low as Rs. 8,549,980 when compared with the previous financial year (62,138,980).

23.2 SOURCE OF FUND

The Municipality has mainly four sources of funds which are

(i) Own revenues

(ii) State Government Aided funds

(iii) Central Government Aided funds

(iv) Loan from financial institutions.

To improve the financial condition of the municipality, it has to think of increasing the income from its properties and at the same time the physical condition of such properties including buildings must be improved for durability and for attracting tenants or agents.

B. MUNICIPAL GOVERNANCE

23.3 GOVERNANCE

Any project or programme, whether it is Government sponsored or Municipality owned/ sponsored, will be discussed in the standing committee concerned and thereafter if deserved, it will be forwarded to municipal council for discussion. The municipal council will take a resolution and accordingly the secretary passes orders to implement such resolutions.

A standing committee can accord an administrative sanction for a maximum amount of Rs. 50,000/- for the implementation of a project. For amounts greater than Rs. 50, 000/- the municipal council's sanction is required.

There are three tier Technical Advisory Groups in Kerala, namely Municipal Level Technical Advisory Group (MLTAG), District Level Technical Advisory Group (DLTAG) and State Level Technical Advisory Group (SLTAG). The MLTAG can give technical sanction for a

project to a maximum amount of Rs 45,00,000/- only and if the amount is above this technical sanction shall be accorded by DLTAG or SLTAG.

23.4 DEVELOPMENT POTENTIALS AND PROBLEMS

23.4.1 Potentials

The forth coming international airport offer great potential on the exporting of various products like fruits, vegetables, flower, meats etc and this can impart a momentum for raising the municipal income. The renovation and maintenance of existing parks, heritages and tourism spots will increase the tourism potential , there by economic growth of the municipality is possible to a great extend.

23.4.1 PROBLEMS

Mattannur municipal town is an agriculturally predominant area, and as a general trend in Kerala, the return from agriculture sector is not sustainable and diminishing year by year, which in turn reflects in the municipal financial sector. Other productive sectors like industry, commerce and tourism have not been developed in Mattannur Municipal area. In shortly there is no sustainable source of income for Mattannur Municipality, at present.

Though Municipal Office is situated at the geographical centre of the municipal area, the transportation facilities from hinterlands like Porora, Mannur, Elannur, Vembadi, Kayani, Manakayi etc. are meagre and which causes lot of inconvenience to public for obtaining municipal services.

23.5 INFERENCE

At present there is no sustainable source of income in Mattannur municipal area. The upcoming international air port is the major thrust on this sector. The proper utilization of municipal assets and innovative new projects can bring sustainable income generation for the municipality.

Starting up of sub-centres at hinterland portions will be helpful for the public residing at remote wards of the municipality. The mobilization and optimum utilization of resources, implementation of transparency and accountability, improving the efficiency in delivering of services, public participation and co-ordination etc. are the major steps for reaching to a good governance.

Chapter-24

SPATIAL STRUCTURE

24.1 FUNCTIONAL CHARACTER

The major activities within the town decide the function of that town. In order to determine the major functions with in the town, studies and analysis of major land uses were done.

24.1.1 FORMULATION OF FUNCTIONAL CHARACTER

The functional character of Mattannur town has been formulated by the study and analysis of major land use concentration pattern, gross population density of wards and percentage of male workers involved in non-agricultural activities. The major concentration patterns considered are agricultural land use, residential agricultural land use, residential- built-up land use and built-up land use. In addition to this the gross population density and the percentage of male workers involved in non-agricultural activity of all wards are also studied. Based on these factors the wards have been classified as urban, semi- urban, semi-rural and rural.

An area is classified as semi-urban if there exist both urban and rural activities, but predominant activity is urban. And If the predominant activity is rural, it is classified as semi-rural area.

The figure 24.1 shows the formulation of functional character of Mattannur town derived based on the methodology explained above.

The northern portion of the Municipal town and Ayyallur ward in the south-east portion has high concentration of agricultural land use and the percentage of male workers involved in non agricultural activity is less than 25%. More over the population density as well as the built-up land use concentration is very poor, all these features together indicates the rural nature. The wards in the southern periphery also show rural nature as it has low population density and less built-up area.

Wards in the eastern portion, interior wards in the northern and southern portion show semi rural nature due to moderate value of agricultural concentration and population density as well as less built up concentration.

Wards located adjacent to the core area of the Municipal town show semi urban nature due to moderate value of built up land use concentration and population density. However agricultural concentration is less in these wards and majority of the male workers are involved in non- agricultural activities.

Urban nature of the town is seen in the wards located in the core area along the major corridors. Built-up land use concentration and population density are very high whereas agricultural concentration is very low in the core area. Moreover the percentage of male workers involved in non agricultural activities are very high.

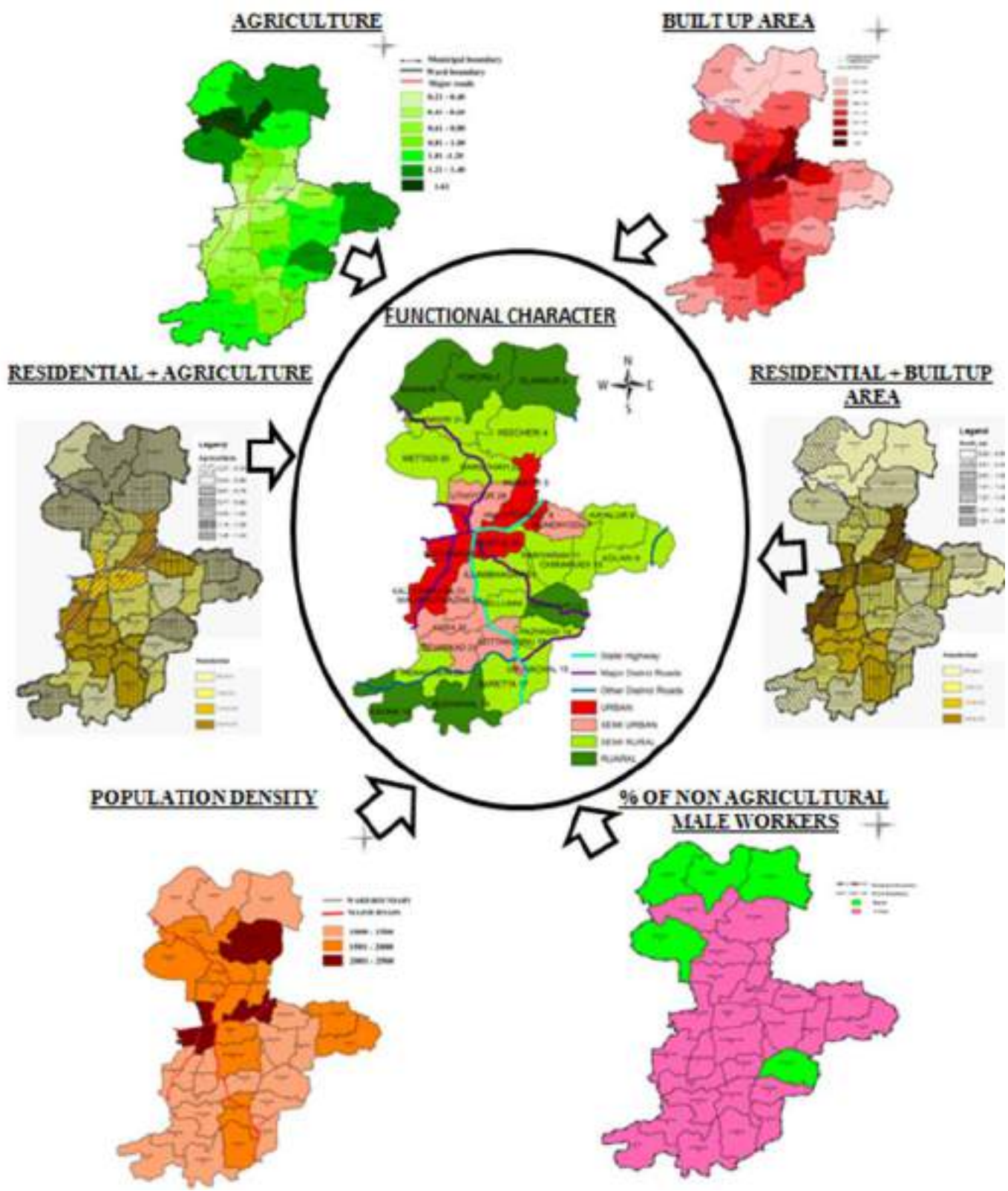


Figure 24.1 Formulation of functional character of Mattannur town

Table 24.1 Functional character of wards in the Mattannur Municipal town

Ward No.	Name of ward	Character	Ward No.	Name of ward	Character
1	Mannur	Rural	17	Karetta	Semi rural
2	Porora	Rural	18	Kuzhikkal	Rural
3	Elannur	Rural	19	Kayani	Rural
4	Keecheri	Semi rural	20	Perincheri	Semi rural
5	Anikkari	Urban	21	Devarkad	Semi urban
6	Palottupally	Urban	22	Kara	Semi urban
7	Mundayodu	Semi urban	23	Kallerikkara	Urban
8	Kayalur	Semi rural	24	Malakkuthazha	Semi urban
9	Kolari	Semi rural	25	Illambhagam	Semi rural
10	Chirakkadi	Semi rural	26	Temple	Urban
11	Pariyaram	Semi rural	27	Mattannur	Urban
12	Ayyalur	Rural	28	Uthiyoor	Semi urban
13	Nellunni	Semi rural	29	Maruthayi	Semi rural
14	Pazhassi	Semi rural	30	Mettadi	Semi rural
15	Uruvachal	Semi rural	31	Nalankeri	Semi rural
16	Kottakkunnu	Semi urban			

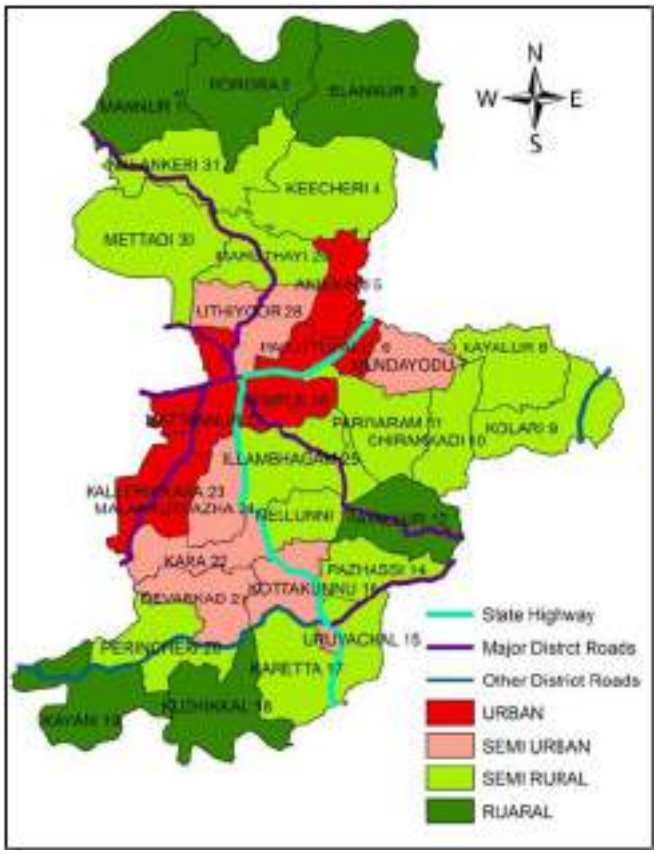


Figure 24.2 Functional character of wards in the Mattannur town

The above said study based on the characters and nature of wards well reveals the clear demarcation of the town into four categories. Mattannur, Temple ward, Palottupally,Kallerikkara and Anikkeri wards show urban character.

Semi urban character is shown by wards namely Mundayodu, Kottakkunnu, Devarkkadu, Kara, Malakkuthazhe and Uthiyoor. While Mannur, Porora, Elannur, Ayyallur, Kuzhikkal and Kayani show rural character. All other wards of the Municipality show semi rural character.

24.2 HIERARCHY OF SETTLEMENT

Hierarchy of settlement is an important factor in spatial planning. Identification of the future hierarchy of various settlements of a region based on certain factors like the trend of physical development, location importance, administrative status of settlements, trend of urbanization in the next twenty years and existing hierarchy of settlement. For the identification of hierarchy of settlement various theories are there elaborating the hierarchy of settlements, its service area, and location of lower order settlements with respect to the higher order settlements.

As per the Urbanization Report of Kannur Mattannur Municipal Town is classified as 3rd order settlement. Figure 24.3 shows the hierarchy of settlement in Kannur District.

24.2.1 EXISTING HIERARCHY OF SETTLEMENTS

Figure 24.4 shows the hierarchy of settlements of Mattannur Municipal town.

The existing hierarchy of settlements of Mattannur Municipal town is analyzed based on the facilities available. The spatial distribution of built-up land use reveals the distribution of urban facilities within the town.

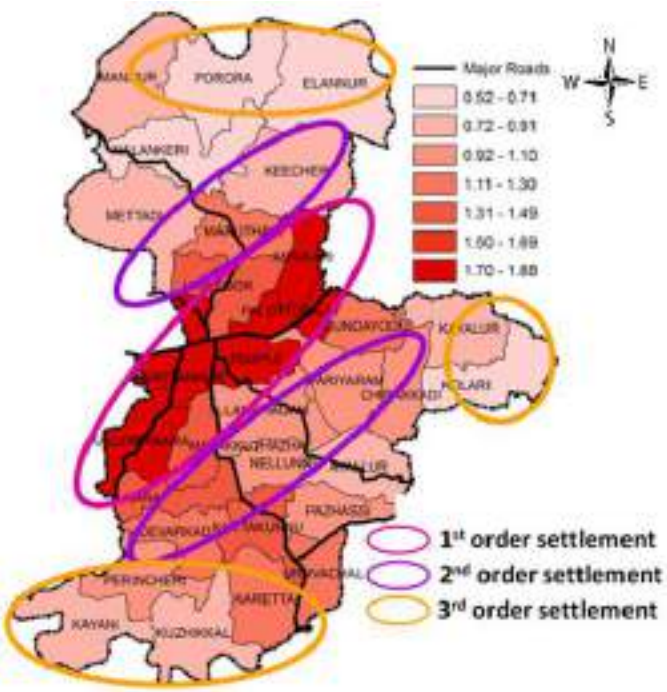


Figure 24.4 Hierarchy of settlements of Mattannur Municipal town.

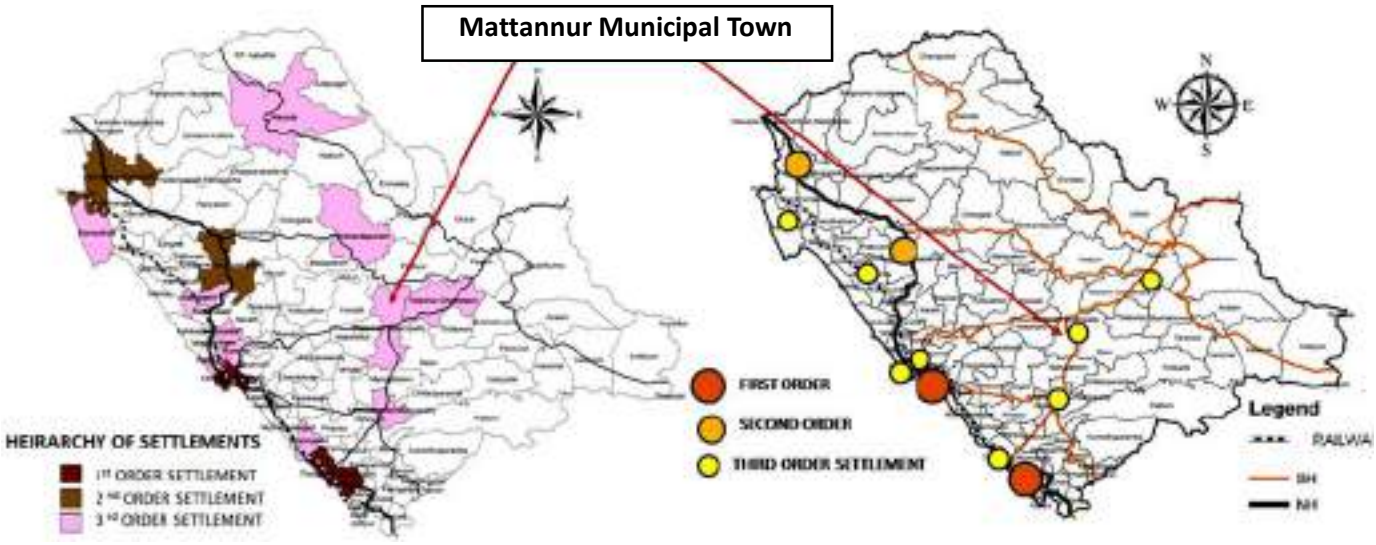


Figure 24.3 Hierarchy of settlement – Kannur District (Source – Urbanization report, Kannur District)

From the figure it is clear that the higher order (1st order settlement) facilities are available in the core area of the Municipal town along the major corridors. Higher order facilities include transportation, trade and commerce, health, education and basic amenities. The 2nd order settlements are seen in areas adjacent to the core of the town (1st order settlement area) both in the northern and southern side. The remaining exterior portions in the north, south and eastern side fall under the 3rd order settlements and have got limited facilities only. In these areas rural activities are more predominant.

24.2.2 CHARACTERISTICS OF HIGHER ORDER SETTLEMENT

The term character of a settlement means, whether it posses urban nature, semi urban nature, semi rural or rural nature.

The hierarchy of settlements of Mattannur Municipal town has been classified into three categories viz, 1st order settlement, 2nd order settlement and 3rd order settlement.

Analysis of functional character and hierarchy of settlements of Mattannur Municipal town reveals that the area under 1st order settlement has urban nature where as area under 2nd order settlement comes under both semi-urban and semi-rural nature. However the area under 3rd order settlement has semi-rural and rural nature.

24.3 HIERARCHY OF JUNCTIONS

Hierarchy of junctions will give the importance of junctions. In Mattannur municipal area hierarchy of junctions are classified into three, 1st order junction, 2nd order junction and 3rd order junction.

The hierarchy of junctions were identified based on the importance of road meeting at the junction. In the case of Mattannur town, 1st order junctions are selected where State Highway (SH) and Major District Roads(MDR) make junctions. The junction of two or more MDR or SH and Ordinary District Road (ODR) were selected as 2nd order Junction. The Junctions with the

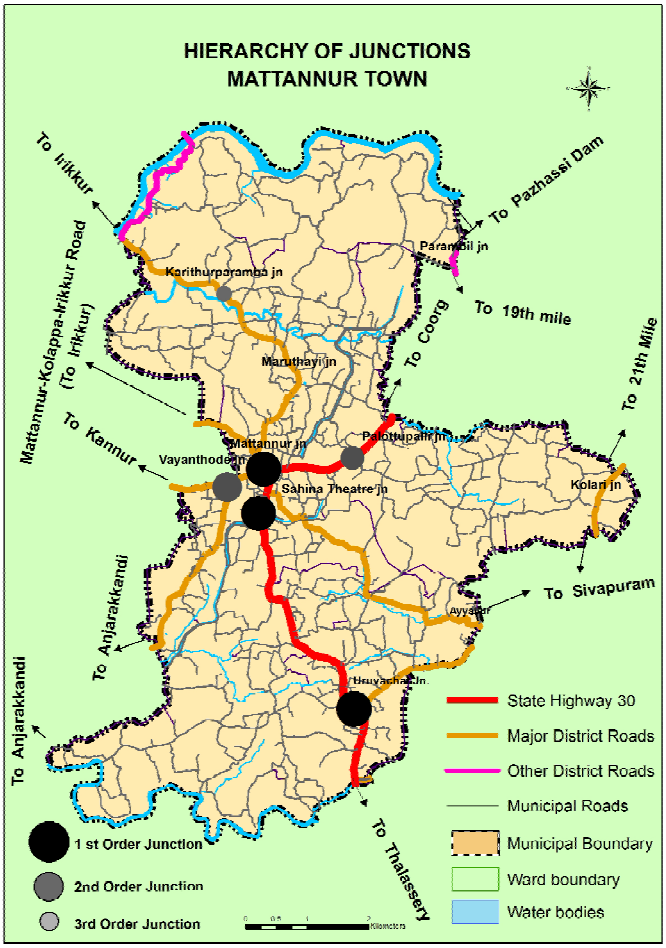


Figure 24.5 Existing hierarchy of junctions in Mattannur town

presence of MDR and ODR is grouped in to 3rd order junction.

The Map showing the existing hierarchy of junctions in the Mattannur Municipal area are given in figure 24.5.

In Mattannur town there are three 1st order junctions, namely Mattannur Junction, Sahina theater Junction and Uruvachal Junction. The junctions grouped as 2nd order are Palottupally Junction. and Vayathodu Junction. Karithur paramba is assigned as the one and only 3rd order Junction in Mattannur town.

24.4 WORK CENTERS

Work centres are the major locations with important activities taking place within the town.

According to the important activities taking place in Mattannur municipal area work centers are classified.

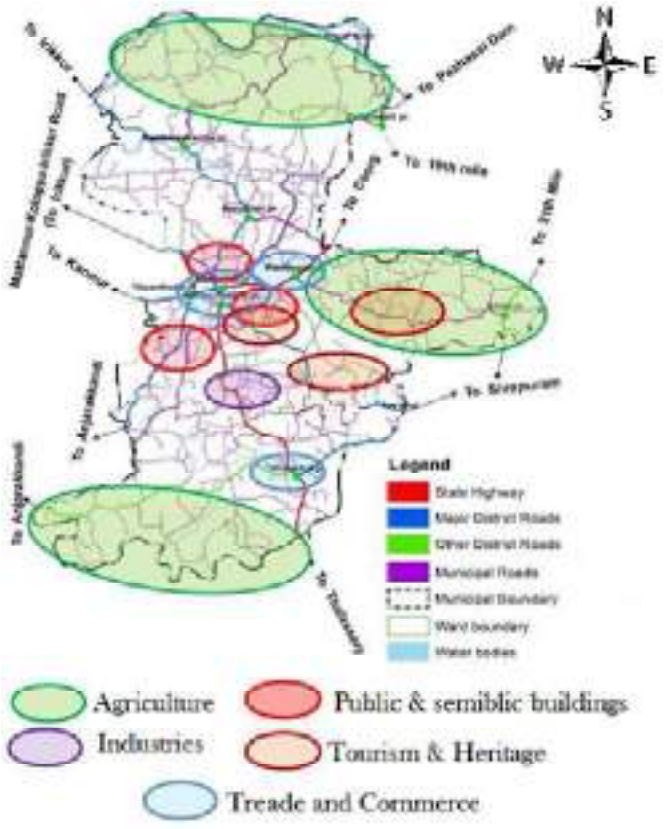


Figure 24.6 Work centers in Mattannur town

There are five types of work centers within the Mattannur town namely, agriculture, trade and commerce centers, public and semipublic office areas, industries, tourism and heritage areas. Areas located in the northern, southern and eastern periphery of the town are classified as agricultural work centers, and agricultural activities are more predominant here. Public and semipublic office centers are located mainly at the middle portion of the town. Trade and commercial work centers are located at Mattannur junction, Palottupally junction and Uruvachal junction, where commercial activities are comparatively high. All these trade centers are located in the Thalassery- Coorg road, the major traffic corridor of the Mattannur municipal town. Industrial activities are noticeable only at the mini industrial estates located at Nellunni and Kallur. Work centres related with tourism and heritage are located mainly at the middle portion near Pazhassi Kovilakam.

24.5 EXISTING CONNECTVITY

At present connectivity of Mattannur Municipality is possible only through road. Mattannur Municipal town has got good road connectivity due to the presence of SH30 (Thalassery- Coorg road) having a length of 8.20 km within the town. This State Highway passes through Mattannur Town and connects Irrity Town (H.Q. of the new Taluk) . It leads to Coorg District outside and connects Mysore and Bangalore in the north-east direction and connects Koothuparamba and Thalasseri Towns in the south-east direction.

Mattannur-Kannur road (Major District Road) connects the town to the District H.Q., Kannur and has a length of 1.6 km within the Municipal town. Other Major District Road (MDR) includes Mattannur-Anjarakkandy road (2.3 km), Mattannur-Irrikkur road (5.8 km), Mattannur-Kolappa road (1.5 km), Mattannur-

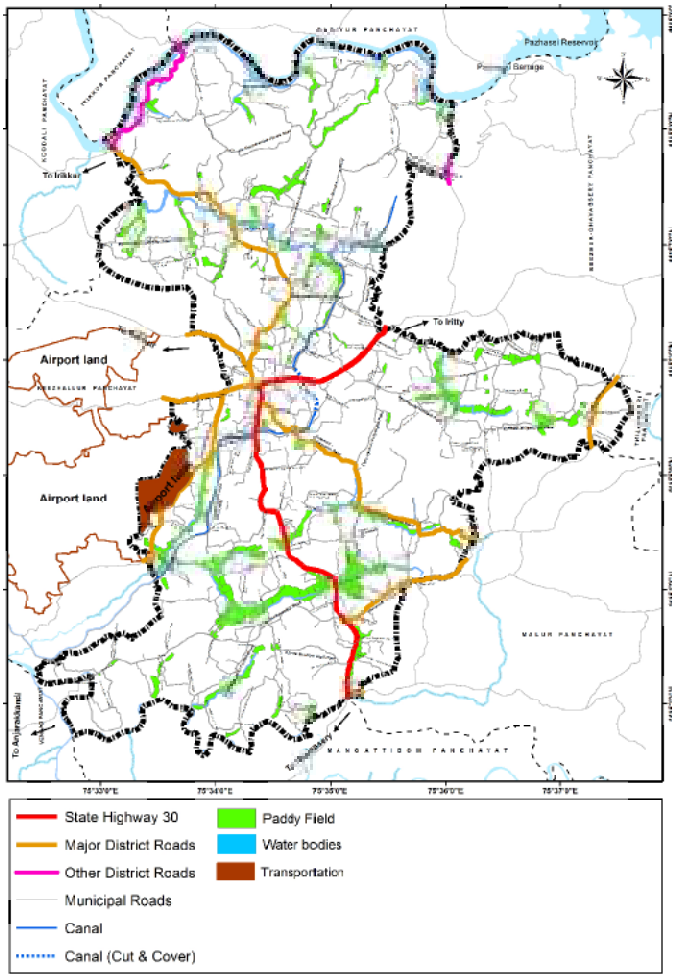


Figure 24.7 Existing road network of Mattannur town

Sivapuram road (4.8 km), Uruvachal- Kakkayangad road (2.2 km) and Karetta-Malurr road (0.2 km). However North and North-east area of the Municipality have less road coverage. Figure 24.7 shows the existing road network of Mattannur Municipality.

There is no railway line passing through the municipal area. However there are two accessible railway stations, one is located at Kannur which is 27 km away from municipal area and the other is located at Thalasseri , 26 km away .

The entrance portion of the forth coming Kannur International Airport is just 5 km away from Mattanur junction, which makes Mattannur the nearest town to the Airport. The other nearby airports are Calicut International Airport(Karippoor) located at 116 km south and Mangalore International airport located at 176 km north of Mattannur town.

24.6 SPATIAL FORM

Spatial form is evolved from the study and analysis of various factors like hierarchy of settlement, hierarchy

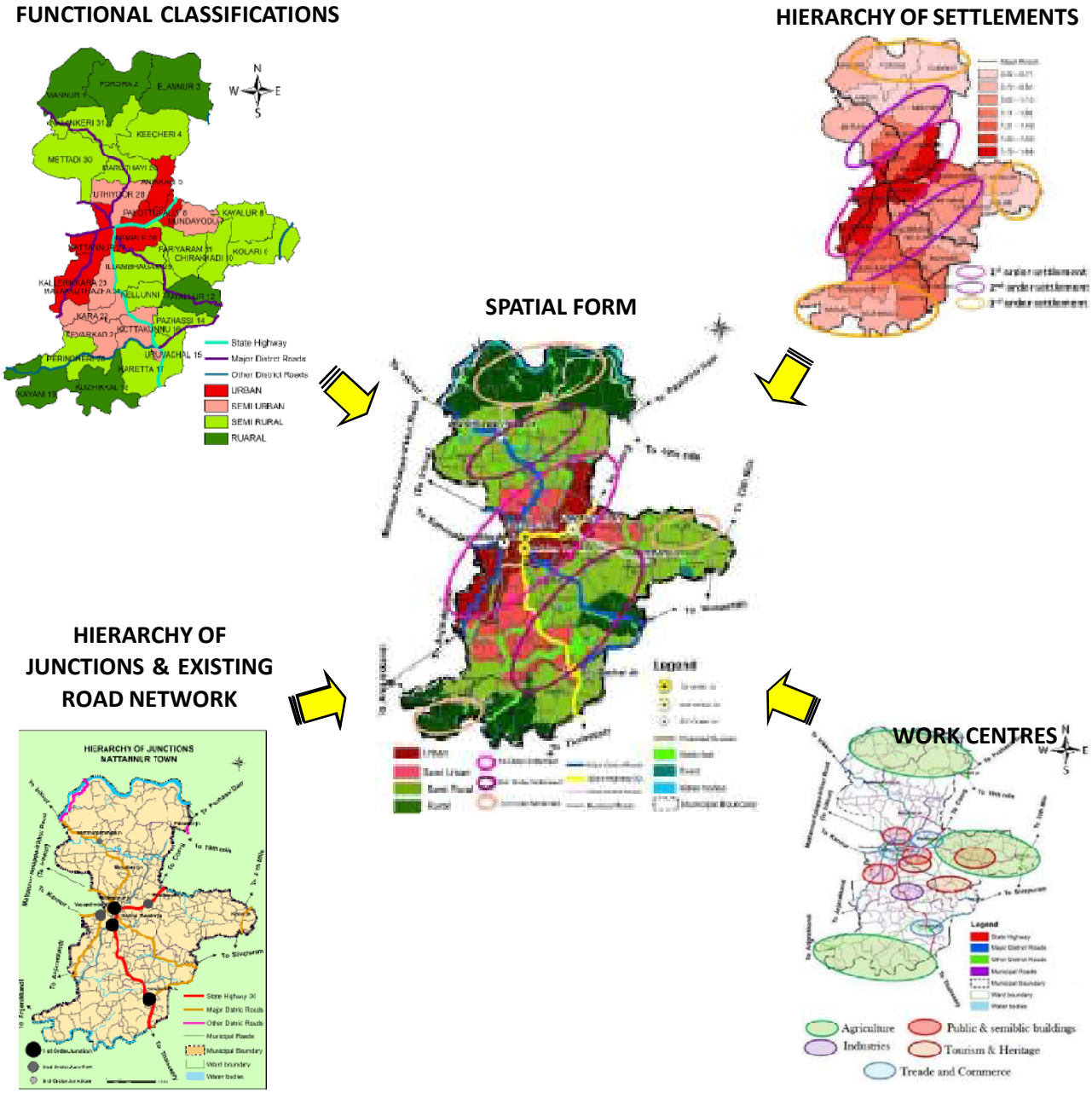


Figure 24.8 Formulation of Spatial form of Mattannur town

of junctions, work centers, existing road network and functional characteristics of the town.

Figure 24.8 shows the formation of spatial form for Mattannur Municipal town and figure 24.9 shows the spatial form.

The figure given above reveals that both the hierarchy of settlement and classification of urban characteristics are closely related with each other. Wards with urban nature have 1st order settlement and 1st and 2nd order junctions are located here. Wards

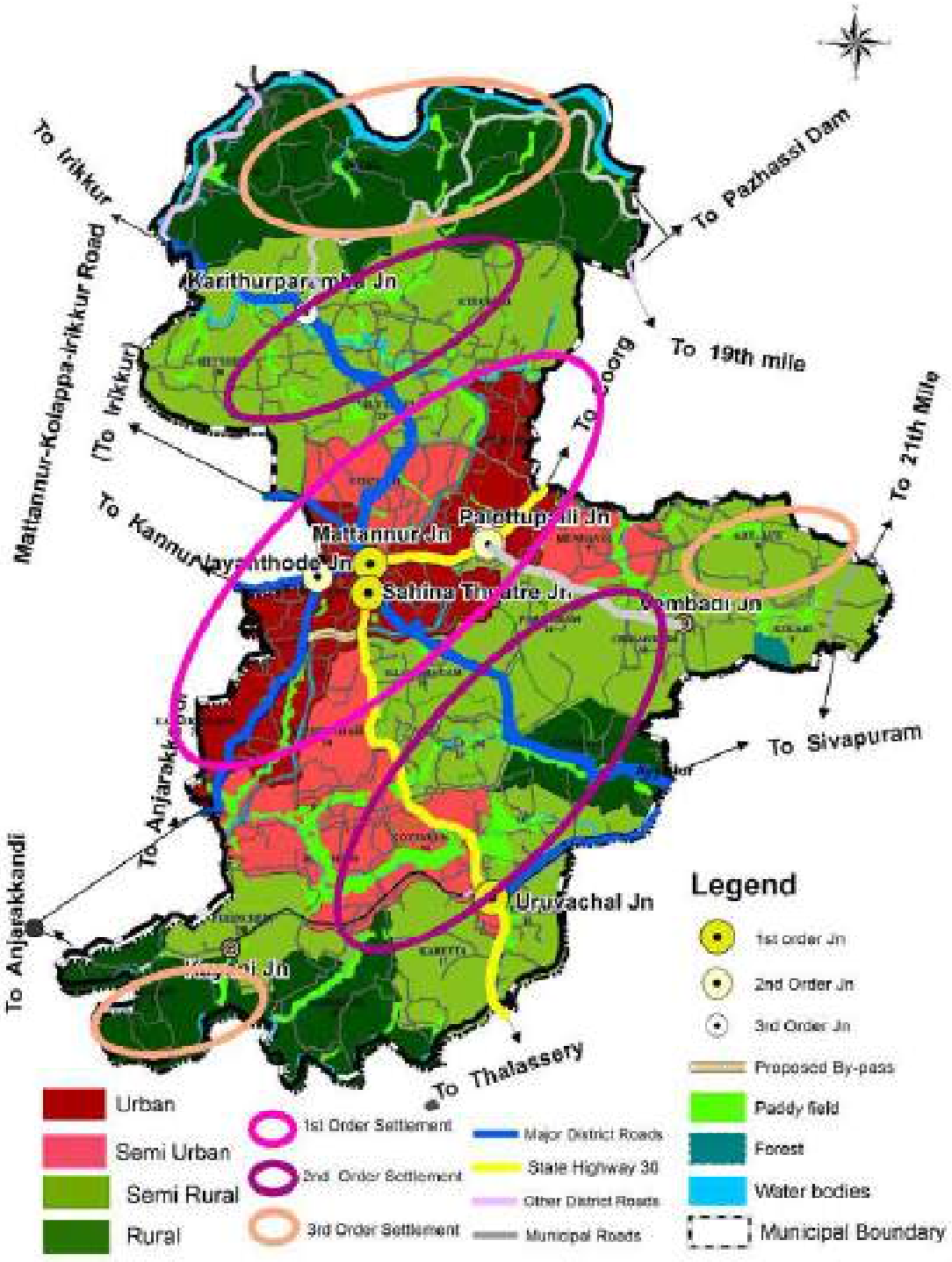


Figure 24.9 Spatial form of Mattannur Municipal town

with semi urban and semi rural nature have 2nd order settlement. Third order settlements are seen in rural areas. And 3rd order junctions are located in areas with 2nd order settlement.

24.7 ACTIVITY PATTERN

For Mattannur Municipal town activity pattern of wards is derived by considering two aspects, that are land use concentration pattern and functional character of the wards.

For finding the major land use concentration pattern of wards of the Mattannur town, following method is adopted. Land use concentration index in Mattannur Municipal town is broadly divided into three, such as primary land use concentration index , secondary land use concentration index and urban land use concentration index.

Primary land use concentration index: - It is the total land use concentration index of various land uses such as coconut groves, dry agriculture, forest, irrigation land, laterite quarry and paddy which can be growth under primary activity.

Secondary land use concentration index: - The land use concentration index of residential and vacant land is secondary land use concentration index.

Table 24.2 Land use concentration pattern of wards

Ward No.	Name of ward	Major land use con-centration	Ward No.	Name of ward	Major land use con-centration
1	Mannur	Primary land use	17	Karetta	Secondary land use
2	Porora	Primary land use	18	Kuzhikkal	Primary land use
3	Elannur	Primary land use	19	Kayani	Primary land use
4	Keecheri	Primary land use	20	Perincheri	Secondary land use
5	Anikkari	Secondary land use	21	Devarkad	Secondary land use
6	Palottupally	Urban land use	22	Kara	Secondary land use
7	Mundayodu	Secondary land use	23	Kallerikkara	Urban land use
8	Kayalur	Primary land use	24	Malakkuthazha	Secondary land use
9	Kolari	Primary land use	25	Illambhagam	Secondary land use
10	Chirakkadi	Secondary land use	26	Temple	Urban land use
11	Pariyaram	Primary land use	27	Mattannur	Urban land use
12	Ayyalur	Primary land use	28	Uthiyoor	Urban land use
13	Nellunni	Secondary land use	29	Maruthayi	Secondary land use
14	Pazhassi	Urban land use	30	Mettadi	Primary land use
15	Uruvachal	Secondary land use	31	Nalankeri	Primary land use
16	Kottakkunnu	Urban land use			

Urban land use concentration index:- It includes land uses such as commercial, transportation, hazardous, industrial, recreation, public and semipublic, religious, etc.

The concentration index of primary land use, secondary land use and urban land use of each ward were calculated, and among them the category having the highest value was taken as major land use concentration pattern of each ward. Classification of wards based on land use concentration pattern is given in Table 24.2 and figure 24.10.

The figure and table given above show that wards located in the northern, southern and eastern periphery of the Municipal town are falling under primary land use category. Wards at core area of Mattannur town are falling under urban land use category. Wards falling under secondary land use category are mainly located in between the primary and urban land use category wards.

As mentioned earlier ,activity pattern is derived from functional character and land use concentration

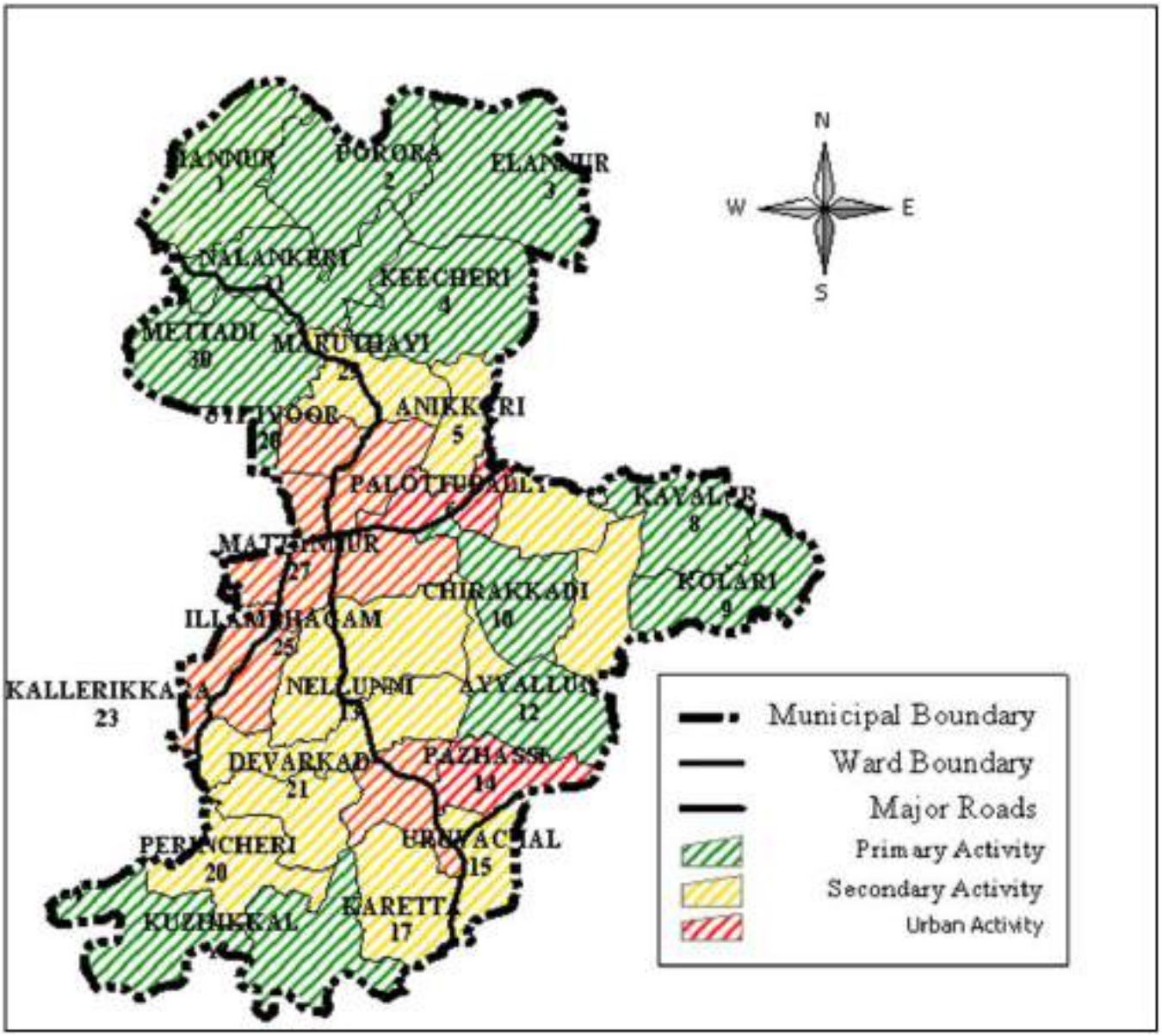


Figure 24.10 Ward wise major land use concentration

pattern. Functional character of a ward is decided based on various factors such as population density, agricultural land use, built-up land use, combination of agricultural and residential land use, combination of residential and built-up land use and concentration of percentage of non agricultural male workers. The resultant activity pattern derived from the analysis categorizes the wards of Municipal town into primary activity, secondary activity and urban activity areas. The criteria of classification of activity pattern of wards of Mattannur municipal town is given in table 24.3

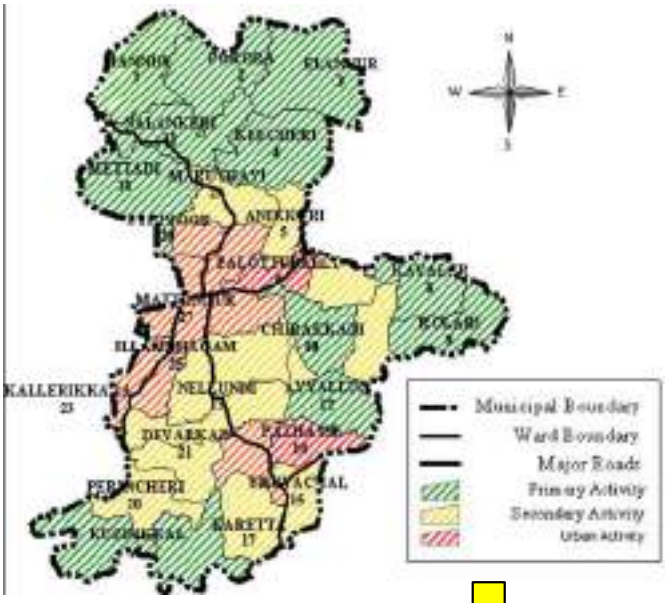
As per table given below Mattannur municipal area can be broadly categorized into three such as primary activity, secondary activity and urban activity pattern. The derivation of activity pattern for wards of Mattannur town is shown in figure 24.11 . The wards having either urban functional character or urban land use pattern are taken as urban activity wards. Similarly wards having either rural functional character or primary land use pattern are grouped as wards with primary activity pattern. All other wards having any of the rest combination are grouped as wards with secondary activity pattern.

From the analysis of figure given below it is clear that most of the wards having semi rural or semi urban functional characteristics are grouped under secondary activity pattern.

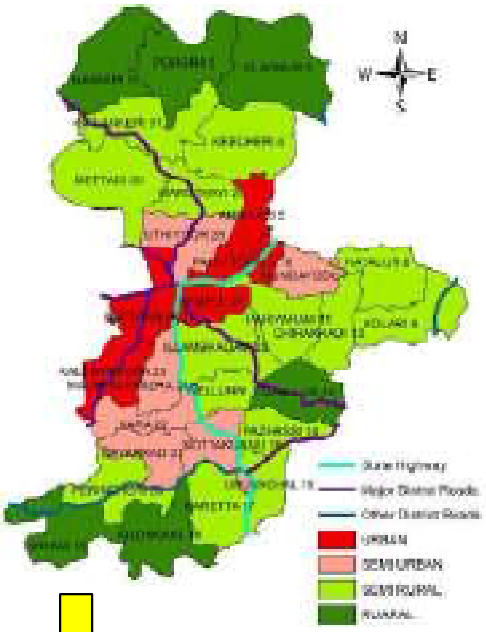
Table 24.3 Determination of Activity Pattern of wards in Mattannur Municipal town

SI No.	Combination of Functional Character and major Land use concentration Pattern		Activity pattern
	Functional Character	**Land use Concentration Index**	
1	Rural	Primary Land use	Primary activity
2	Semi rural	Primary Land use	Primary activity
3	Rural	Secondary Land use	Secondary activity
4	Semi rural	Secondary Land use	Secondary activity
5	Urban	Secondary Land use	Secondary activity
6	Semi urban	Secondary Land use	Secondary activity
7	Semi urban	Urban Land use	Urban activity
8	Urban	Urban Land use	Urban activity

LAND USE CONCENTRATION PATTERN



FUNCTIONAL CHARACTER



ACTIVITY PATTERN

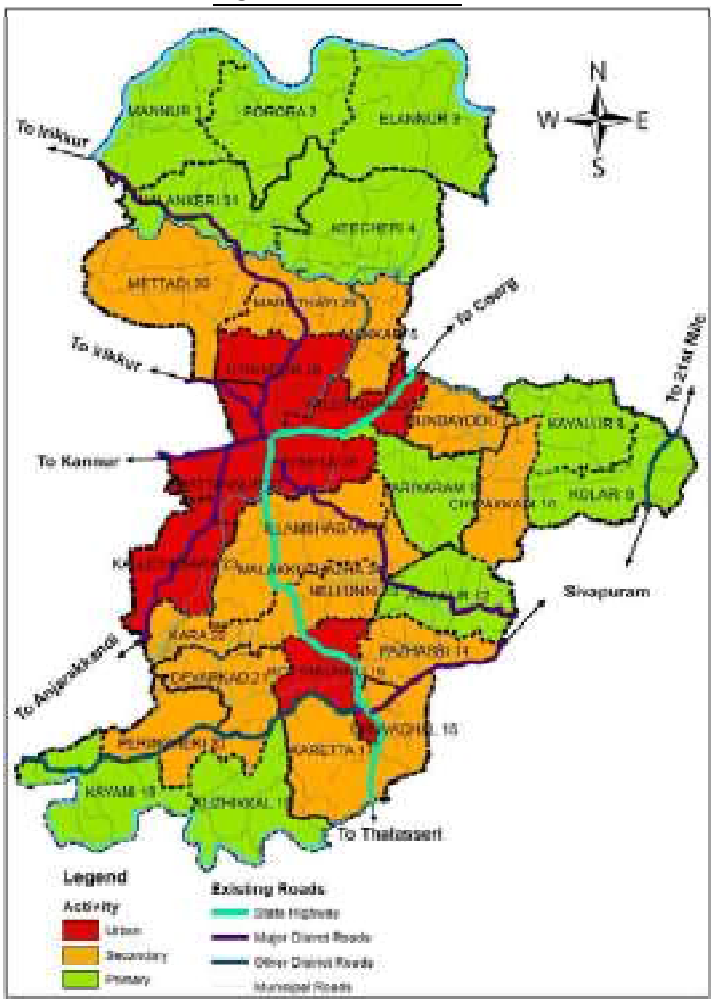


Figure 24.11 Derivation of Activity Pattern of Mattannur Municipal town

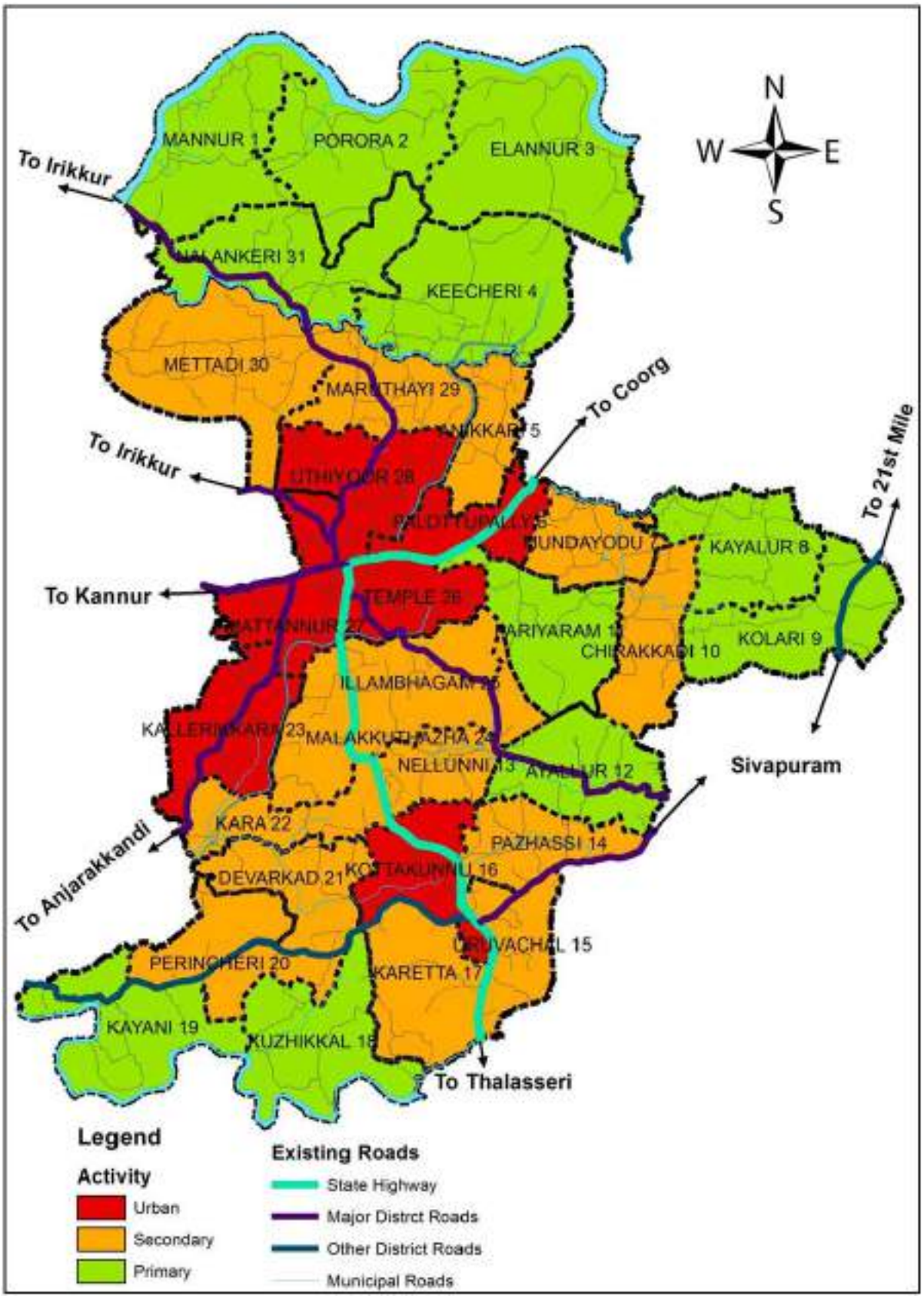


Figure 24.12 Existing Activity Pattern of wards of Mattannur town

Table 24.4 Derived existing activity pattern of wards in Mattannur municipal area

Ward No.	Name of ward	Activity Pattern	Ward No.	Name of ward	Activity Pattern
1	Mannur	Primary activity	17	Karetta	Secondary activity
2	Porora	Primary activity	18	Kuzhikkal	Primary activity
3	Elannur	Primary activity	19	Kayani	Primary activity
4	Keecheri	Primary activity	20	Perincheri	Secondary activity
5	Anikkari	Secondary activity	21	Devarkad	Secondary activity
6	Palottupally	Urban activity	22	Kara	Secondary activity
7	Mundayodu	Secondary activity	23	Kallerikkara	Urban activity
8	Kayalur	Primary activity	24	Malakkuthazha	Secondary activity
9	Kolari	Primary activity	25	Illambhagam	Secondary activity
10	Chirakkadi	Secondary activity	26	Temple	Urban activity
11	Pariyaram	Primary activity	27	Mattannur	Urban activity
12	Ayyalur	Primary activity	28	Uthiyoor	Urban activity
13	Nellunni	Secondary activity	29	Maruthayi	Secondary activity
14	Pazhassi	Secondary activity	30	Mettadi	Primary activity
15	Uruvachal	Secondary activity	31	Nalankeri	Primary activity
16	Kottakkunnu	Urban activity			

The derived existing activity pattern of wards of Mattannur town is given in table 24.4 and figure 24.12. From figure it is clear that 12 wards are agriculturally predominant area and hence they have primary activity pattern. Primary activity wards are located mainly in the northern, southern and eastern periphery of the town. Out of 31 wards only 6 wards have urban activity pattern while 13 wards have secondary activity pattern. Wards having urban activity pattern are mainly located at the core centre of the town and along the major traffic corridors while wards having secondary activity pattern are located at the surrounding area of urban activity wards.

24.8 EXISTING SPATIAL STRUCTURE

Existing spatial structure is derived from existing activity pattern, existing road network, nodes and settlement pattern. After deriving the activity pattern it is overlaid with existing road network, hierarchy of junctions and hierarchy of settlements in order to get the spatial structure of the Municipal town. The derivation of spatial structure of Mattannur town is given in figure 24.13.

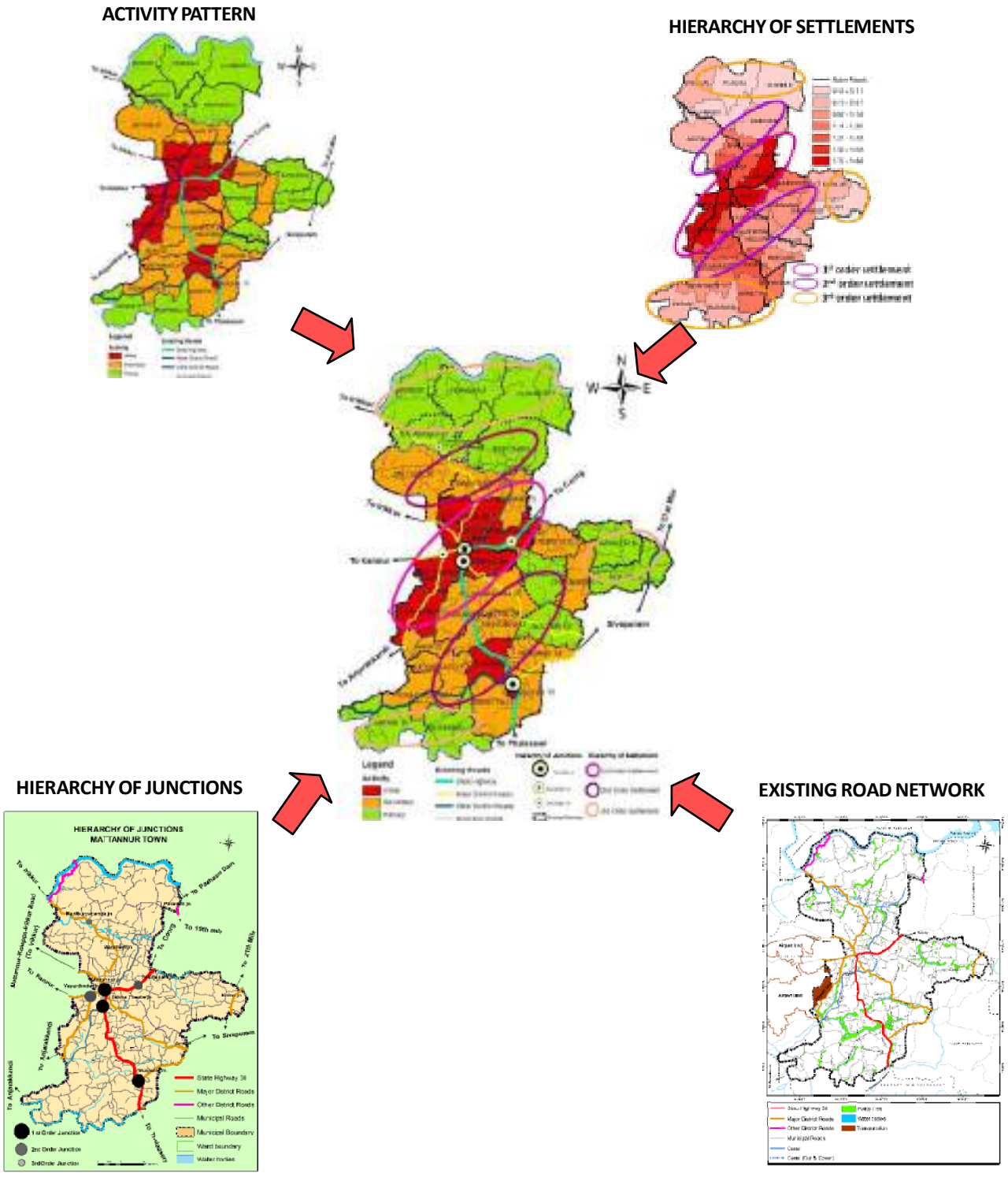


Figure24.13 Derivation of spatial structure of Mattannur municipal town

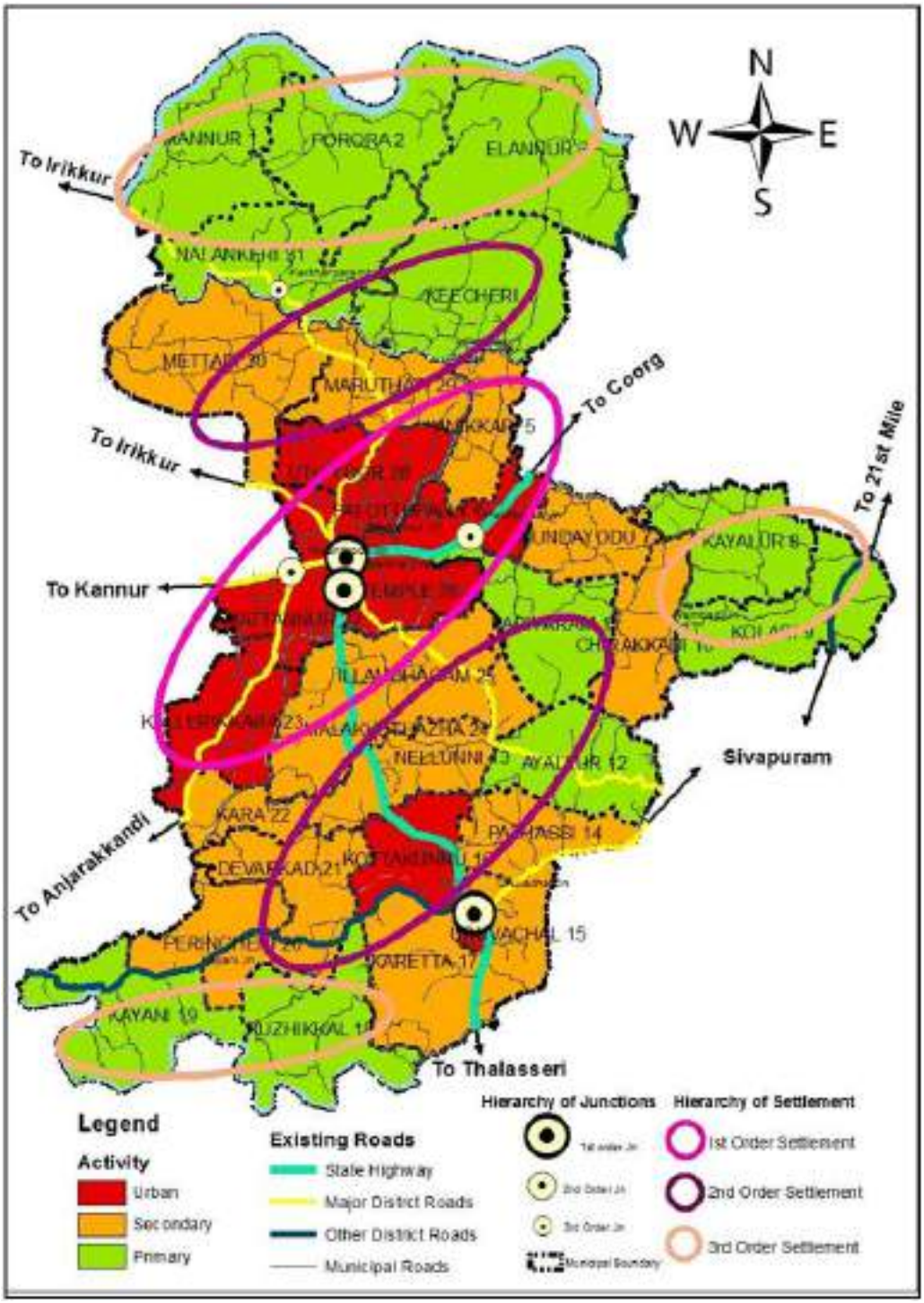


Figure 24.14 Existing spatial structure

24.9 INFERENCE

Through the study of settlements, study of major activities, existing connectivity, work centers it is clear that Mattannur Municipal town has a clear spatial structure in terms of both activity and resource.

The existing spatial structure of the town reveals the development scenario of the town that has an urban growth center at the middle portion surrounded by a developing residential mix area and then the peripheral rural area with primary activities.

Chapter-25

PROJECTED REQUIREMENTS

Future requirements of Mattannur town in various sectors are projected using different principles. Based on the Urban Development Plans Formulation and Implementation (UDPFI) guidelines, data obtained from various departments are used for the projection. Projections have been done for population, work force participation rate and for the requirement of water supply, solid waste management, education, housing, health, traffic and transportation, energy and recreational facilities. The data obtained were already discussed in the chapters of respective sectors.

25.1 POPULATION

Population projection is an estimate of a future population. The population projection for 2021 and 2031 years for Mattannur municipal town is made assuming that the same trend in the population growth in continued. The population is projected by four methods namely, Arithmetical Increase method, Geometrical Increase method, Incremental Increase method, Decreasing rate method. The average values of the four methods is taken as the final population figures of 2021 and 2031 years.

A) Arithmetical Increase method

In this method, the average increase of population per decade is calculated from the past records and added to the present population to find out population in the next decade. However this method gives a low value of projected population.

Figure 25.1 gives the projected values of future population of 2021 and 2031 years. Arithmetical increase method shows that the decadal variation of total population has an increasing trend. The present population in Mattannur town is 47078 and this method projects the values as 52656 and 58234 in the years 2021 and 2031 respectively.

B) Geometrical Increase method

In this method, percentage increase is assumed to be the rate of growth and the average of the percentage increase is used to find out the future increment in population. This method gives much higher values.

The projected population for the years 2021 and 2031 are53822 and 61553 respectively as given in Figure.25.2. Geometrical increase method also shows that the decadal variation of total population has an increasing trend.

C) Incremental Increase method

In this method, the increment in arithmetical increase is determined from the past decades and the average of the increment is added to the average increase.

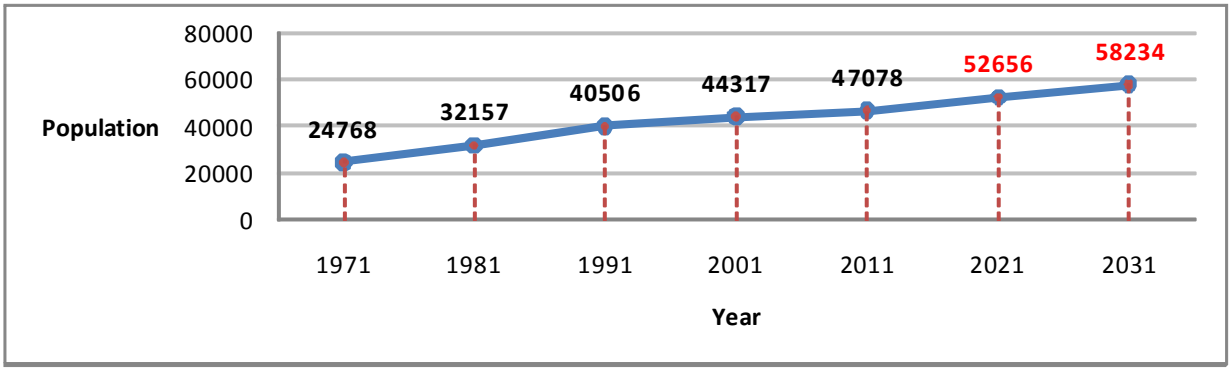


Figure 25.1 Projected Population - Arithmetical Increase method

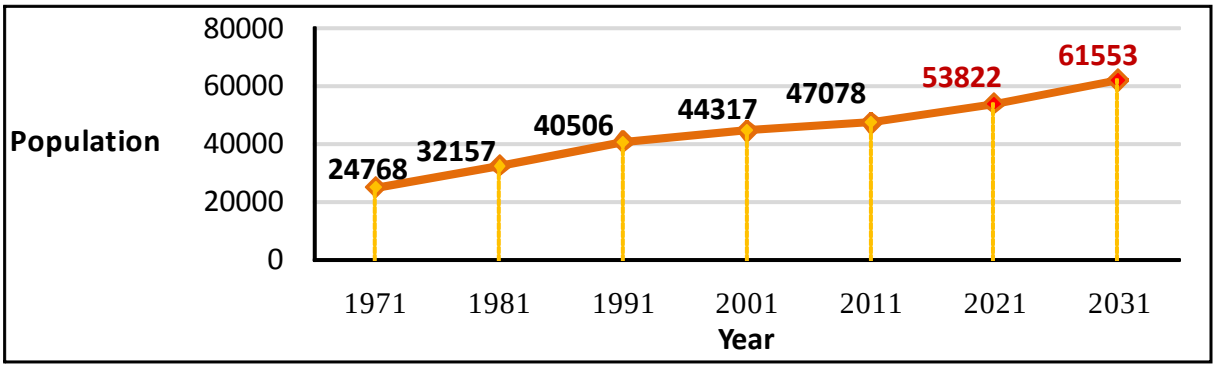


Figure 25.2 Projected Population - Geometrical Increase method

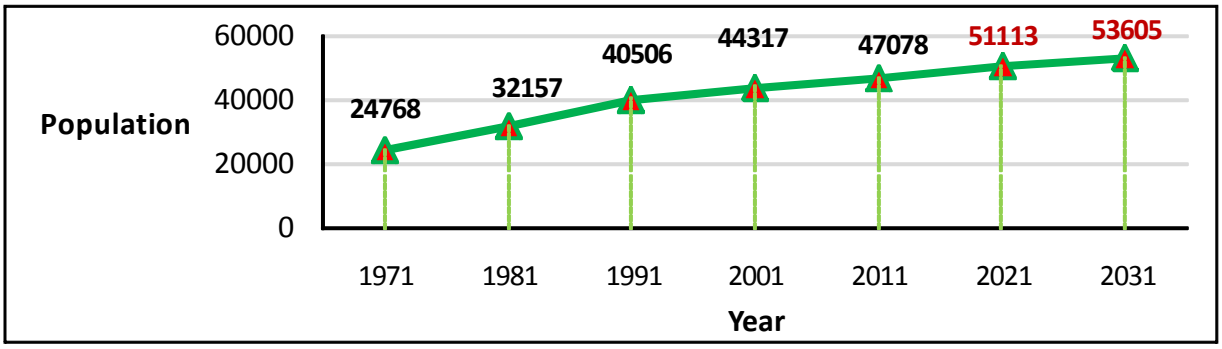


Figure 25.3 Projected Population - Incremental Increase method

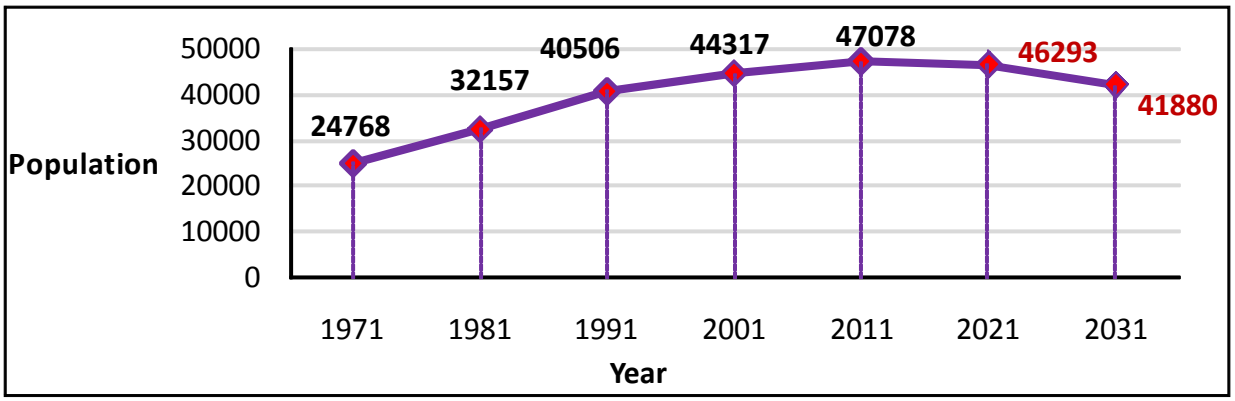


Figure 25.4 Projected Population - Decreading Rate method

Table 25.1 Final projected population figures of the municipal town

Year	Arithmetical increase method	Geometrical increase method	Incremental increase method	Decreasing rate method	Average of 4 methods
2021	52,656	53,822	51,113	46,293	**50,971**
2031	58,234	61,553	53,605	41,880	**53,818**

The projected figures and graphical representation is given in Figure 25.3. The figures obtained are 51113 and 53605 for the years 2021 and 2031 respectively. The decadal variation of total population has an increasing trend.

D) **Decreasing Rate method**

In this method it is assumed that the rate of percentage increases or decreases and the average decrease in the rate of growth is calculated. Then the percentage increase is modified by deducting the decrease in the rate of growth.

Figure. 25.4 gives the projected figures of population for 2021 and 2031. The decadal variation of total population has an increasing trend up to 2011 and therefore the graph with the projected figures shows a decreasing trend and the values obtained are 46293 and 41880 respectively.

The values of projected total population obtained by the four methods differ slightly. The average values of the above four methods are taken as the final population figures of Mattannur municipal town for the years 2021 and 2031 and are shown in Table 25.1.

Hence, it can be concluded that the total population figures of Mattannur town will be **50,971** and **53,818** by the years 2021 and 2031 respectively.

25.2 WORK FORCE

Forecast of future Work Force Participation Rate (WFPR) is an important factor which determines the urban trend of the town. Hence trend line method is used for projecting WFPR in 2021 and 2031.

Table 25.2 Projected WFPR of Mattannur municipal town

Year	Total number of workers	WFPR in %
1981	9367	25.13
1991	12104	25.88
2001	15029	33.91
2011	17303	36.75
2021	19879	39
2031	22334	41.5

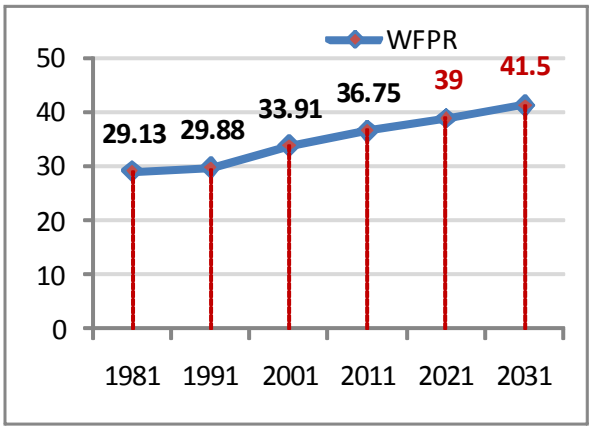


Figure.25.5 Projected WFPR of Mattannur town

The work force participation rate is projected from 2011 to 2031 and is represented in Table 25.2 and Figure 25.5.

From the analysis of table and figure it can be seen that the WFPR of Mattannur town is increasing (25.13% in 1981 to 36.75% in 2011). Using trend line method, the projected value of WFPR obtained for the year 2021 and 2031 are 39% and 41.5% respectively.

25.3 WATER SUPPLY

Kerala Water Authority has already prepared a project for water supply scheme to serve the whole municipal area. Hence the projection of demand for

Table 25.3 Projection – Water Supply

Year	2021	2031	Remarks
Projected Population	50,971	53,818	
a. Domestic Demand (MLD)	6.88	7.26	135 lpcd
b. Non Domestic Demand (MLD)	1.43	1.51	20.8 % of a
c. Fire Demand (MLD)	0.083	0.087	(1%(a+b))
Unaccounted For Water (UFW)	1.26	1.33	(15%(a+b+c))
d. Total Water Demand for the town (MLD)	9.65	10.19	
Storage capacity required	3.18	3.36	33 % of supply
Total storage capacity required	12.83	13.55	

water supply during 2021 and 2031 were obtained from KWA. The details regarding projection of demand for water supply is given in table 25.3. As per projected data, the total storage capacity required during 2021 and 2031 is 12.83 MLD and 13.55MLD respectively and the capacity of upcoming project is 14 MLD.

25.4 SOLID WASTE

The amount of solid waste generation and collection during 2021 and 2031 are projected as per UDPFI standard and are given below in table 25.4.

Table 25.4 Projection - Solid Waste Management

Per capita generation of waste per day- 530gms		
Year	2021	2031
Population	50,971	53,818
Soild Waste generated (Ton/day)	27.01	28.52
Including 30 % extra (Ton/day)	35.11	37.08

Table 25.5 Sewerage treatment plant capacity requirement

Year	2021	2031	
Projected Population	50,971	53,818	
Waste water	5504868	5812344	Litre per day
Peak Factor	2.25	2.25	
Total waste water	12.38	13.07	Mld

From the table the projected generation of solid waste including a 30% extra by the year 2031 is found to be 37.08 Tons/day. Table 25.5 shows the future requirement of sewerage treatment plant capacity.

25.5 HOUSING

Demand for housing has been projected based on planning standards. Projections were done for Census years 2021 and 2031. The details are given in table 25.

As per planning standard, there was a shortage of 2808 houses in 2011. The expected increase in population by 2021 is 3593 people as per population

Table 25.6 Projections – Housing Demand

Year	Population	Existing number of houses	Number of houses required	Existing housing shortage	Additional number of houses required for added population		Total shortage
					Added population	Required number of houses	
2011	47078	7654	10462	2808			2808
2021	50971				3593	798	3606
2031	53818				2847	633	4239

projection and the number of houses required for added population is about 798. During 2031 the houses required for added population will be about 633. Hence the total shortage by 2031 will be 4239 houses including the present shortage of 2808 houses.

25.6 ENERGY

As per standards, consumption of power works out to be 2KW/Household. Therefore, consumption of power by 2031 is worked out to be 12,000KW for a population of 60,000 with household size of 5. In addition to this a separate substation is required to cater the needs of the Kannur International Air port.

Table 25.7 Projected details of energy

Category	Existing Nos	Standards recommended	Demand 2031
11KV substation	(One 33KV)	1 for 15,000 persons	6 Nos
LPG Godowns	1	1 for 40 50,000 persons	

25.7 EDUCATION

Based on the UDPFI guidelines, the requirement of educational institutions for the year 2031 has been projected, shortage calculated and is represented in Table 25.8.

According to the UDPFI guidelines, the demand for schools is high according to the projected population of 2031. Moreover, there exists need for techhnical institutes and professional colleges.

25.8 HEALTH

The demand for health facilities by 2031 has been projected according to Urban Development Plans Formulation and Implementation (UDPFI) Planning standards. Projected data is given in Table 25.9.

The table above reveals that there will be a shortage of 2 Public Health Centers (PHC) by 2031 as per UDPFI standards.

Table 25.9 Projection of health facilities

Category	Planning Standards	Existing Nos.	Demand (2031)	Shortage
P. H. C	1 PHC for 20,000 - 25,000 ppn	1 (C.H.C)	3	2
Beds	4 beds for 10,000 ppn	40 (C.H.C.)	24	NIL

Table 25.8 Future demand of educational buildings based on UDPFI guidelines

Sl. No.	Category	Existing Nos.	Standards recommended	Demand 2031	Shortage
1	LP School	14	1/2500 population	25	10
2	UP School	6	1/7500 population	12	6
3	High School	3	1/13000 population	5	2
4	HSS	3	1/13000 population	5	2
5	Arts and Science College	1	1/80000 population	1	0
6	Poly Technic	1	1/36000 population	2	1
7	I.T.C/I.T.I	0	1/35000 population	2	2
8	T.T.I	0	1/20000 population	3	3
9	Professional College	0	1/250000 population	1	1

25.9 TRAFIC AND TRANSPORTATION

Table 25.10 Projection – (V/C ratio)

Sl. No	Road Section	Exiting Capacity (PCU per day)	Volume at 2010 (PCU per day)	V/C	Volume at 2015 (PCU per day)	V/C	Volume at 2020 (PCU per day)	V/C	Volume at 2025 (PCU per day	V/C	Volume at 2030 (PCU per day	V/C
1	Mattannur-Sivapuram Road	9000	3253	0.36	6870	0.76	11487	1.27	17379	1.93	24899	2.77
2	Mattannur-Irikkur Road	9000	4595	0.51	9263	1.02	15220	1.69	22823	2.54	32526	3.61
3	Mattannur-Thalasseri Road	12000	7758	0.65	13707	1.14	21300	1.77	30991	2.58	43359	3.61
4	Mattannur-Kannur Road	12000	6580	0.55	14061	1.17	23610	1.96	35796	2.98	51350	4.28
5	Mattannur Iritty Road	12000	6939	0.58	13387	1.12	21616	1.80	32119	2.68	45524	3.79
6	Mattannur-Anjarakandy Road	9000	1686	0.19	4689	0.52	8522	0.94	13413	1.49	19657	2.18

The development of an area is closely related to the traffic and transportation facilities available in that area and hence the projection of requirement in this sector is very much important. The study report of NATPAC reveals that the present V/C ratio for all major roads are below one but will be above two by 2031 and it will be critical for some roads in future as shown in table 25.10.

25.10 RECREATION

At present recreational facilities available are very poor, and hence we need to improve the sector in a planned manner. Demand for recreational facilities during 2031 is projected as per Urban Development Planning Formulation and Implementation (UDPFI) standard. Data regarding the requirement of recreational facilities in Mattannur town is given in Table 25.11.

Table 25.11 Recreational facilities – Demand by 2031 according to UDPFI standards

Category	Existing Nos.	Standards recommended	Demand 2031
Park & open spaces (overall town)	NIL	10-12 sq.m /persons	60Ha
Community level Park & Open spaces	NIL	2-3 community level Park & open spaces	2-3
Open spaces (variations by size of settlement)		1.4-1.6Ha/1000 persons	85Ha
Community room	NIL	1/5000 persons	11 Nos (660m^{2}each)
Community hall & library	3	1/15000 persons	4 Nos (2000m^{2}each)
Recreational Club	NIL	1for 50,000persons	2 Nos (0.5Ha each)

PART - II

DEVELOPMENT VISION

Chapter- 26

SUMMARY OF ANALYSIS AND LINKAGE OF SECTORS

Mattannur town has a great potential for development, due to the forthcoming Kannur International Airport. Each and every development sector of Mattannur municipal town has an influence of forthcoming airport. The study and analysis part is broadly divided into two, spatial analysis and sectoral analysis. Spatial analysis deals with regional study, demography, work force, occupational structures and existing land use. While sectoral analysis comprises of detailed study using analytical methods of each development sector indetified in the case of Mattannur Municipal town. This chapter summarizes findings and conclusions of studies and analysis of Mattannur municipal area.

26.1 MAJOR SPATIAL ANALYSIS FINDINGS

The major findings obtained from spatial analysis are given below. It is the study and analysis of various factors like regional study, demography, work force and existing land use.

◈ Regional study

Mattannur municipal area is a mid land region situated 25km east of Kannur town and it is surrounded by nine panchayths. There are two rivers flowing through the boundaries, Anjarakkandy river along the southern periphery and Irikkur river along the Northern periphery. Iritty town and Kuthuparamba Municipal town are situated very close to Mattannur town. Other major nearby settlements are Chalode (North- West) and Anjarakkandy (South-West). Mattannur municipal town has got good connectivity with the presence of SH30 (Thalassery-Coorg Road) and other major roads like Kannur Road, Anjarakkandy Road, Irikkur Road etc. There is no railway line passing through the municipal area.

◈ Demography

According to the 2011 census the population of Mattannur town is 47,078. The decadal growth rate of population for the period 2001-11 is 6.23 per cent in comparison with the district figure of 4.73 per cent. The density of the population is 869 persons per sq.km. The sex ratio of the municipal population is 1078 females for 1000 males. The literacy rate of the town is 94.80 per cent. Keecheri, Palottupalli & Mattannur wards have the highest population size which are located around the core area of the municipal town. Net population density as well as gross population density are more predominant in central portion of the town. As per projected population the municipal area need to cater to a population of 50,971 and 53,818 during 2021 and 2031 respectively.

◈ Work force

The study of work force reveals that the value of WFPR (Work Force Participation Ratio) is 36.75% for Mattannur municipal town and is higher when compared with district and state avarege values and is highest among six municipal towns within the district and the three similar municipal towns in the state (Ottapalam, Manjeri and Thirur). The female WFPR is also high for Mattannur town (27.65%) when compared to avarege values of district and state. The increased WFPR in the area can be considered as a measure of good labor potential. Even though the percentage of cultivators (3%) and agricultural labourers (15.2%) in Mattannur town is higher when compared to district and state, the percentage shows a declining trend during the last three decades. While the

percentage of other workers is 80.30% and shows an increasing trend.

Mettadi, Kallerikara, Ayyallur, Nellunni and Devarkad are the wards having highest WFPR concentration where concentration of agriculture land use, agricultural labourers, cultivators are average. WFPR concentration is least in wards namely Nalankkeri, Palottupally and Mattannur and in which Palottupally and Mattannur wards have higher values of built up and residential land use concentration. Nalankeri ward shows higher value of agricultural land use concentration and minimum values of concentration of built up and residential land uses, house hold size and industrial labourers. Northern periphery of the town consists of wards Mannur, Porora, Elannur and shows higher concentration of agricultural labourers, WFPR, agricultural land use and in these wards minimum concentration values of residential, and built up land use are observed. Porora and Elannur wards show higher concentration of coconut groves. Devarkad ward has higher WFPR concentration where there is lower concentration of cultivators, medium concentration of Agricultural labourers and minimum concentration of house hold industrial labourers. Porora, Temple, Illambhagam and Ayyallur wards have higher concentration of house hold industrial labourers in which Porora and Ayyallur wards have higher concentration of agricultural land use, agriculture labourers and WFPR concentration.

◈ **Existing land use**

The study of existing land use in Mattannur town reveals that higher values of residential and built up concentration are seen at core area where agricultural activities are minimum. Northern portion of the municipal area consists of wards namely Mannur, Porora, Elannur, Keecheri, Nalankkeri and Mettadi and have highest dry agriculture concentration where minimum values of built up and residential land use concentrations are seen. Concentration of active paddy field is almost nil in 6 wards namely Anikkeri, Palottupally, Pariyaram, Illambagam, Temple ward and Mattannur where uncultivated paddy field concentration and dry agriculture concentration are medium and built-up as well as residential land use concentrations are high. Malakkuthazhe ward situated at south middle portion of the town has least concentration of active paddy field, uncultivated paddy field and coconut grove, however there exist average values of dry agriculture, residential and built-up land use concentrations. Dry agriculture concentration is more predominant in peripheral wards in north, east and south-east portions of the town.

26.2 MAJOR FINDINGS OF SECTORAL ANALYSIS

Sectors are mainly classified into three categories according to theirfunction, sectors of economy, sectors of physical infrastructure and sectors of social infrastructure.

1. SECTORS OF ECONOMY

◈ ***Agriculture***

Major portion of Mattannur municipal area is included in dry agriculture land use which constitute of 2359Ha (43.54%). High concentration of dry agriculture land use is observed in wards located in the north and east portions of municipal area. Total paddy land use area including uncultivated paddy fields covers an area of 5.88%



(318Ha) of total land area and its high concentration is seen in middle south wards. Major crops in Mattannur municipal town are coconut, rubber, cashew and banana which show an increasing trend of productivity. Area and production of paddy and cashew are decreasing while that of coconut and rubber are increasing. Rubber plantations are mainly concentrated in northern area due

to the hilly terrain there. Availability of abundant land resource is the major potential in this sector. Major threats of this sector are fragmentation and conversion of agricultural land, lack of irrigation facility, non-utilization of available water resources, scarcity of agricultural labour, plant diseases, animal attack (Near Poongottu kavu etc.)

◈ *Animal husbandry*

The livestock population in Mattannur town is less when compared to its vast available agricultural area. In Mattannur municipal area cattle population shows decreasing trend while fowl population shows increasing trend. Major feedback of this sector is that at present there is no hatchery and modern slaughter house. The production of egg, milk and meat are very meager to the demand.

◈ *Fishing*

There is no significant fishing activity within the municipal area. However presence of water bodies including Pazhassi Canal offers great potential for fishing activities.

◈ *Industries*

Industries in Mattannur town are meagre, only 0.1% (5.00Ha) of the total municipal area is occupied by industries. There are two mini industrial estates functioning within the municipal area in which one is located at Kallur (1.18 Ha) and the other is at Nellunni (0.38Ha). The access road of Kallur estate is with insufficient width. There is scope for agro based value added processing units, as raw materials like coconut, cashew, rubber etc. are available in abundance. Proximity of the forthcoming airport will offer opportunities for export oriented industries, health-care industries, IT parks etc. The forthcoming KINFRA industrial park just outside the town will provide potential for auxiliary industrial units to flourish in the municipal area.

◈ *Heritage, Culture & Tourism*

There are number of tourist spots located in and around the municipal area but unfortunately it is not



yet tapped to its optimum potential. Pilgrim tourism can be promoted with existing temples and mosques. The major potential for this sector is the forthcoming international airport, which will promote the introduction of ayurvedic resorts and thereby give scope for health tourism within the municipal area. Theyyam is a popular ritual form of worship which attracts pilgrim tourists and foreigners. Town can serve as a halting place for tourists visiting spots outside the town by providing adequate facilities. Moreover, new tourism circuits need to be developed by connecting the various tourist destinations of Kannur district as well.

◈ *Trade and Commerce*

Trade and commercial activity is also poor in Mattannur Municipal town. Only 0.15% of municipal area is under commercial activity. Growth of Iritty town located in the adjoining panchayath reduces the trade and commercial activities within the municipal area. Major threats to Mattannur town are congestions created by co-existence of fish and vegetable markets, taxi and auto-rickshaw stand, insufficient parking facilities for goods vehicles and absence of loading and unloading spaces.

2. SECTORS OF PHYSICAL INFRASTRUCTURES

◈ *Traffic and Transportation*

The study of traffic and transportation shows that, at present there is no serious issue related to this sector

but in future the municipal area will suffer from inadequate road width, insufficient parking facilities and traffic congestion etc. Projected volume/capacity ratio is found critical in Major roads namely Thalassery-Coorg road, Mattannur-Kannur road, Mattannur-Anjarakandy road and Mattannur-Ayallur-Sivapuram road. Due to the hilly terrain, north and north-east area of the Municipality have less road coverage. At present, rail does not pass through Mattannur municipal area. The nearest railway stations are Thalassery railway station at a distance of 26.7km and Kannur railway station at a distance of 27.4km away from Mattannur town. The forthcoming airport offers another mode of transportation potential to the town.

◈ *Water supply*

Study of drinking water supply reveals that, at present there exists a water supply scheme in Mattannur municipal area with 2MLD capacity. There is a proposal for a new project of Kerala Water Authority named as Water Supply Scheme to Mattannur municipal town which will serve the entire municipal area with a capacity of 14MLD. Only three wards are facing scarcity problem during hot summer season and this can be solved by the implementation of proposed water supply scheme.



◈ *Drainage*

Studies on this sector show that, Mattannur municipal area doesn't come across with serious issues related to surface drainage due to its topography and the presence of natural drains like rivers and streams. Poor drainage of roads is mainly due to discontinuous drainage system and clogging of wastes dumped in drains. Municipal roads have only uncovered drains, which creates mosquito breeding and invites health related issues. The existing drainage system should be improved and maintenance is needed throughout.

◈ *Sanitation and Sewerage system*

The per capita land availability in Mattannur town is high when compared to other municipal towns. And there exists a municipal trenching ground in its own territory, located far away from the town centre. Due to these reasons, at present, solid waste management is not a serious issue for Mattannur town. But in future,as the town grows to a full fledged air port city there will be increase in population as well as quantity of waste produced. Hence proper facilities need to be provided and to be maintained in regular manner, for keeping the city clean and neat.

Majority depends on leach pit tank and some on septic tank for sewage disposal and there is no public sewerage system. The number of toilets provided in commercial area are far below requirements.

Presently, street sweeping facility is provided only in a small area of Mattannur municipal town. The trenching ground in Mattannur town is with an area of 1.5Ha and is located at Karithurparamba. About 25tons of solid waste is generated by houses and firms within the town per day. Municipal wastes are segregated and methods of land filling and vermi composting are adopted for its disposal at trenching ground. A project for modern Solid waste treatment plant under UISSMT scheme has been already submitted to the Central Govt. for approval.

◈ *Energy*

Study of energy sector reveals that there is one 33KV substation located at Pazhassi in the municipal town with a total number of 74 Transformers, 84 Km of HT line and 295Km of LT line. Another sub-station located at Chavassery, outside the town, serves some wards of the municipal area.

Power comsumption will be increased by the operation of airport, KINFRA Park and other industrial parks. Therefore, separate sub-stations and new transformers will be necessary in future. Laying of UG cable has been started in the town and is to be extended to prevent transmission loss. Municipality should turn its attention to non-conventional energy resources and experiments with solar energy, wind mills etc., should be encouraged.

3. SECTORS OF SOCIAL INFRASTRUCTURES

◈ ***Education***

The sectoral study reveals that in Mattannur town, the level of education is only moderate and is well revealed by the modest representation of degree holders and high representation of High school educated and Primary school educated groups. Majority of the schools are in aided sector. There are no High Schools and Higher Secondary Schools under Government sector. Spatial disparity is seen due to the concentration of high schools in the middle portion of the town. Higher level education facilities need to be promoted. Considering the development of the sector private participation may be welcomed and measures may be taken to introduce new educational institutions under co-operative sector.

As per UDPFI standard during 2031 there will be a shortage of 10 L. P. Schools, 6 U.P. Schools, 2 High Schools, 2 H.S.S., 1 Poly Technique Institute and one I. T. C / I. T.I.

◈ ***Health***

Studies reveals that in Mattannur municipal area, the health sector faces various problems due to the inadequate health facilities. Newly emerging diseases like Chikungunia, Dengue fever, Leptospirosis etc. are occuring mainly due to improper waste management and polluted drinking water supply. Hence proper waste management system and safe drinking water system need to be provided so as to safeguard the health of the people. More over, super specialty hospitals with modern techniques and medical instruments need to be introduced for proper diagnosis of diseases. The forth-coming international airport offers high potential for Ayurvedic treatment, thus leading to the promotion of health tourism within the municipal area.

There will be a shortage of 2 Primary Health Centers (PHC) by 2031 as per UDPFI standards.

◈ ***Recreation and Civic Amenities***

Civic Amenities are meagre in the case of Mattannur town. Large number of Government offices are now functioning in rented buildings and a Mini Civil Station is necessary to accommodate them. Mattannur town lacks recreational facilities and there are no large size parks, stadium, museum etc. All auditoriums available are in private sector and a multi purpose town hall is essential in the municipal area. The absence of theatres within the municipal area often affects the locals as they have to travel long distance for entertainment activities. At present, there is no public crematorium, but the completion of the approved project mentioned earlier, will fulfill the need. The open spaces and recreation clubs can increase the leisure and recreation of the people to a great extent.

◈ ***Housing***

Residential area covers about 38.89% of total municipal area. Household size for Mattannur town is 4.81 and is higher when compared to district average of 4.55 and state average of 4.25. There are 17 slums scattered within the municipal area and all of them are provided with basic facilities. Moreover, no serious problems have been identified so far. Mattannur Municipality has started a new housing scheme named 'Bhadrata' to provide houses for poor families. Housing requirement for 2021 and 2031 were calculated as per Urban Development Planning Formulation and Implementation (UDPFI) Standards and the shortage of houses expected are 3606 and 4329 respectively.

◈ ***Social welfare***

As per censes records, about 2% of total population is SC category and 0.28% is ST category. SC population shows a decreasing trend where as ST population shows an increasing trend. The concentration of SC/ST

population is seen in wards with more agriculture activities. Various facilities required in SC/ST colonies include community hall and job training centers.

Out of 9,788 families in the town 4,372 families are found recorded as BPL category. BPL concentration index is seen high at northern and south-west area of the town.

Municipal level old age home is working at Uruvachal. In Mattannur town there are 3 Orphanages, 43 Anganvadies and 384 Kudumbasree units. There is no ladies hostel or working women's hostel in Mattannur town and the construction work for a ladies hostel at Uruvachal is almost completed now.

◈ ***Environment***

About 8.5% of municipal land area is found as environmently sensitive area. It includes the forest land of Poongottu Kavu, sacred groves like Arayathattukavu, water bodies like Valapattanam river, Anjarakkandy river, Cholathodu, other streams and ponds, Paddy fields and wet lands.

According to the study details of Pollution Control Board, coliform content is found beyond permissible level in the rivers which indicates water pollution. Air pollution and noise pollution are mainly due to the growing vehicular population. The wetlands and paddy fields are ruthlessly reclaimed for erecting buildings causing an increase in surface run off and affecting the natural drainage system. Massive earth cutting at fragile hills is also another threat for the enviroment.

◈ **Linkage of development parameters of Spatial and Sectoral Analysis**

The study of development sectors in Mattannur town shows that middle portion of the town, consists of wards Anikkeri, Palottupally, Temple ward, Mattannur and Kallerikkara along the major corridors, have higher concentration of built up land use with commercial and public and semipublic activities. Here residential concentration is found high and agricultural concentration is found minimum. Wards like Porora, Elannur and Nalankkeri in northern periphery have minimum concentration values of built-up land use, residential land use and commercial land use whereas agricultural concentration is in higher level. Highest value of BPL concentration comes in Porora ward at northern periphery of the town where agricultural land use and agricultural labour concentration are also high and concentration values of residential, SC & ST are minimum. Town wards like Temple ward and Palottupally have minimum values of BPL concentration where agricultural land use, agricultural labourers are also minimum and concentration of residential land use, built-up land use are high. Concentration of SC & ST and BPL is high in northern, south-east and south-west portions of the town, where agricultural concentration is in average level. Solid waste collection centers are located in town center where residential land use is high. Residential land use is found less in high altitude areas. Most of the houses have leach pit tanks which may cause pollution to paddy fields near high residential land use areas.

26.3 INFERENCE

The potentials for development available in Mattannur town is not yet tapped. The forthcoming airport offers great potential for the development of the town. The planning interventions shall focus on identifying such potentials and on linking those synergies to enable the city to function as multi functional face with a conserved ecology and sustainable economy.



Chapter- 27

VISION, GOALS, AIM AND OBJECTIVES

27.1 THE VISION STATEMENT

From the findings of the analysis, the vision carved out for the overall development of Mattannur municipality is as follows.

"Mattannur Municipal Town shall emerge as a smart airport city with sustainable, equitable, integrated and controlled urban development having adequate infrastructure facilities and smooth mobility so as to serve as a mother town for the neighbouring area but without much detriment of the present environment and the qualitative rural life."

27.2 GOALS

The present status of the Mattannur town can be described as a local body having rural nature mostly with a strong agriculture base and the developmental dreams are now based on the opportunities offered by the forthcoming airport. At first, the town has to sustain itself as an urban centre and strategies for making a strong economic base for the overall development of the municipal area are to be sought out. Therefore the following goals are set out based on the vision.

- Sustain itself as an urban body by intensive urbanization and creating a strong economic base for the future growth.
- Enhancing the regional importance of the municipal town by creating adequate and efficient infrastructure commensurate with the status of a mother town for the neighbouring areas.

- Equip itself for serving as a smart airport town by providing required facilities
- Evolve a smooth and efficient mobility plan for handling the high traffic expected along with the development leap in the coming years.
- To make a sustainable development strategy for the town.
- Formulate development concept based on the existing agriculture background and with due consideration for industrial and commercial growth and exploitation of heritage and tourism potential
- Control the spatial development of the municipal town to facilitate more efficient use of land resources
- Enhance sector centres/nodal centres for equitable development of hinterlands
- Preservation of environment and enhancing of qualitative life

27.3 AIM AND OBJECTIVES

The following aims and objectives are formulated to achieve these goals.

AIM

- Design a development area through Proper management of land use in an orderly manner with optimum utilization of all resources through the integration of predominant potential resources.
- To create adequate and efficient infrastructure so as to serve the regional area of the municipal town and conserve the ecologically sensitive areas and natural resources.
- Attain certain level of self sufficiency and ensure the qualitative life to the society.
- To promote the municipality as service centre of forthcoming airport.



OBJECTIVES

- To adopt all possible measures to emerge a central business district for promoting urban activities
- To provide more infrastructure facilities in the municipal area to serve as a mother town for neighbouring area as well as to serve the airport business sector.
- Evolve suitable development control regulations to allow optimum use of land resources of the municipality.
- Formulate a circulation pattern to facilitate efficient intra city transportation and ease the future congestion.
- Utilization of opportunities of airport in every sectors of development.
- Provision of higher order facilities in Education and Health Sectors.
- Enhance industrial sector by promoting MSMEs, cottage industries, agro based industries, IT industries etc.
- Isolation of hazardous and polluting industries to a separate location.
- Restoration of Paddy cultivation in uncultivated paddy fields and promotion of eco-friendly agriculture systems.
- Provide adequate civic amenities and recreational facilities.
- Exploit the heritage and tourism potential of the area.
- Conserve heritage without being detrimental to developmental activities.
- Promote eco-tourism at Poongottukavu forest and water front tourism in the rivers and heritage tourism at spots related to the Great Pazhassi Raja.
- To give special attention to the welfare of weaker sections of the society.
- Equitable distribution of services.
- Development of nodal centres for the development of hinterlands and remote areas.
- To conserve environmentally sensitive areas like forest land, sacred groves, rivers, streams and other water bodies, paddy fields, fragile hills etc.
- To evolve as a smart, clean and green city.



Chapter- 28

DEVELOPMENT CONCEPTS, POLICIES AND STRATEGIES

28.1 SUGGESTED CITY FORM AND DEVELOPMENT DIRECTION

On analyzing the existing land use map a specific pattern of development is seen within the municipal area. A core centre having very much limited area around Mattannur Junction and the bus stand with highly built up density and an adjacent developing area around this core centre with less built-up intensity is also formed. All the remaining portions except Uruvachal town at the south side, show semirural and rural nature. This outer areas can further be classified into town periphery, the area just outside the town area, sub-urban region which is the further outside portion having residential as well as agricultural activities, next is the rural settlements seen at northern, southern and eastern portion of the town and finally the agriculture belt extending upto Valapatanam river at north and upto Anjarakandy river at south and upto municipal boundary at east side.

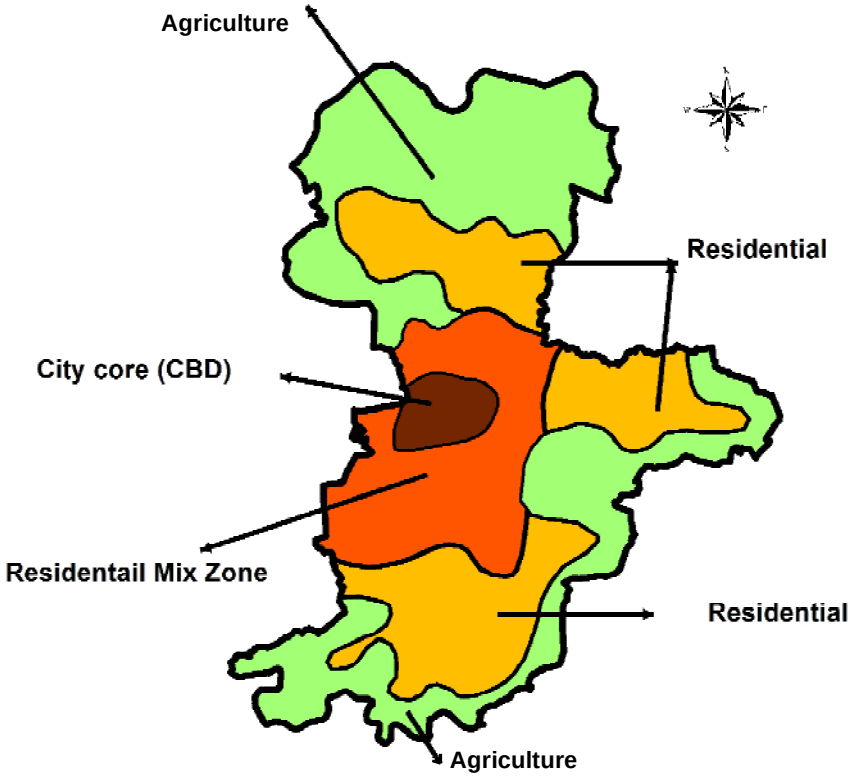


Figure 28.1 suggested city form

While analyzing the population density pattern, it is seen that major concentration is located at wards like Kokkayil, Palottupally and Keecheri. In this, Keecheri is an exceptional case which has less connectivity while comparing to other wards that are located along major traffic corridors. The next range of concentration is also distributed along major corridors like T.C Road and Anjarakandy road.

Considering the above factors the future city form and development direction can be suggested as described below.

The core of the city CBD (Central Business District) can be further expanded to accommodate more commercial and public activities. The town peripheral area also has to be expanded and developed as a residential mix zone to promote urban related activities. In this portion a balance of commercial and residential development is to be formulated for supporting the outside residential developments. And further exterior portion can be developed as residential zone and agricultural zone. The pictorial representation of the suggested development pattern is as shown in fig 28.1.

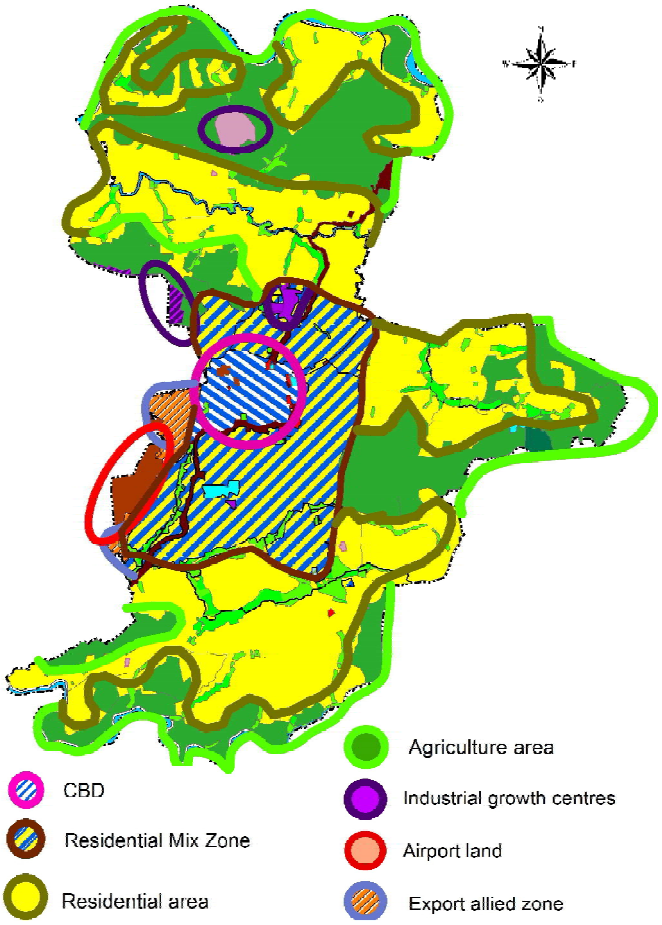


Figure 28.2 Suggested Settlement pattern

28.2 SUGGESTED SETTLEMENT PATTERN

The suggested settlement pattern is as shown in Figure 28.2. Intensive development with focus on commercial activities and public and semi-public uses suggested at the CBD area which constitutes the existing core centre and town area portion. The area extends only up to municipal office compound at north side upto proposed bye-pass roads through canal bund at south side and east side and upto Anjarakandy road at west side.

The next type of settlement pattern is the residential mix zone which constitutes the existing town peripheral areas, surrounding the nucleus CBD and the exterior portions lying nearly upto the proposed ring road. And urban oriented activities are suggested here for further expansion of the city for catering the future needs. In this zone the suggested development activities are for the balancing of residential and urban activities for sustaining the residential and agriculture zone in the further exterior portions.

The remaining outer portions of the municipal town is then subdivided into two categories, such as residential zone and the exterior agriculture belt. The residential zone is suggested for meeting the future housing demand and supporting the outside agriculture belt. Some patches of existing settlements in the exterior agriculture belt is retained as residential zone in order to preserve residential land for the low income group of the society.

The nodes like Vembady Junction, Porora Junction, Kayani etc are to be developed as market and sector centres in the next decade for serving the surrounding remote areas of the municipality.

For utilizing the potential of airport, an export allied zone is suggested near the airport entrance area with an intention of economic development of the municipality.

The industrial growth centres are suggested around the existing Kallur Mini Industrial Estate, Nellunni Industrial Estate, Trenching ground area at Porora and the proposed KINFRA Park at north-west side of P.R.N.S.S. College.

28.3 SUGGESTED HIERARCHY OF NODES

Analysis of existing nodes and transport junctions reveals that the existing 1st order node, Mattannur Junction is confined to a small CBD portion and the adjacent nodes like Vayanthode junction, Sahina Theatre Junction etc are located very near to this nucleus and can be combined to form a bigger suggested first order node.

Palottupally junction is also located near to CBD area and there exist a continous ribbon development along the connecting Irrity road. But the junction itself has an identity with the existence of pilgrimage centre and the formation of ring road through Palottupally will increase the significance of this junction in the coming years. Considering all these facts the Palottupally junction is suggested as a second order node.

Uruvachal town is a major node in the Thalasseri road and from there two other major roads – Manakayi road and Sivapuram road are getting emerged. It is an important node in the southern portion of the municipal town serving the remote and hinterland areas of south side of the town. The geographical position of the

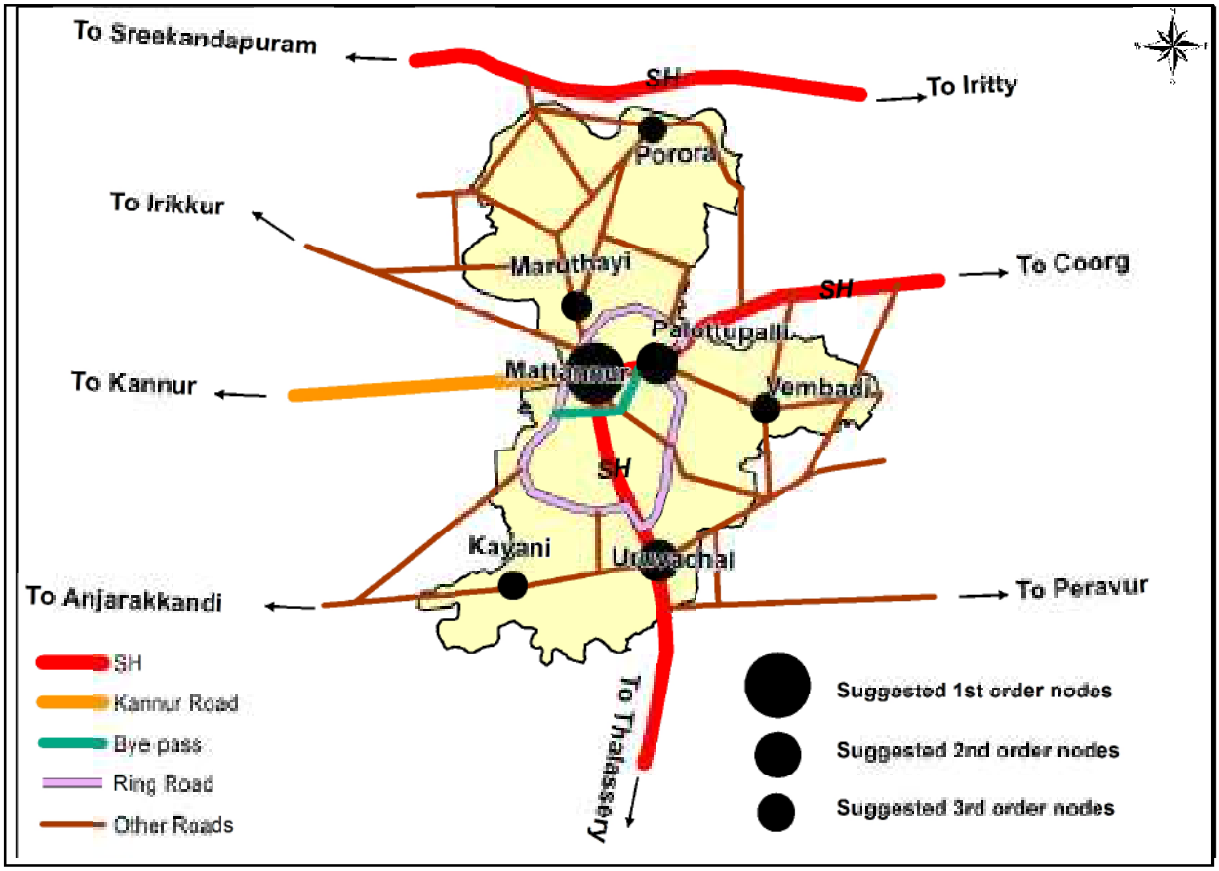


Figure 28.3 Suggested hierarchy of nodes and road network

junction is also significant as it will be the only commercial node in the municipal town to airport passengers coming from the south especially when bye passes are formed avoiding the Mattannur Junction. In the future traffic scenario, the junction should have to play a pivotal role as Uruvachal-Shivapuram-Kolari-Nidiyanhiram-19th mile road can be a useful bypass to T.C. Road and Uruvachal-Manakayi road can be a link road to Anjarakandy road and to the proposed Greenfield road for leading fast connectivity to Kannur town. Uruvachal Junction is therefore suggested to a second order node due to the above said factors.

Transportation facilities are very much limited in hinterlands like Kayani, Manakayi, Porora, Vembadi and the surrounding areas. As a matter of policy, commercial as well as service nodes are to be developed in these portions for the regional development and convenience for the public. The inauguration of new bridge at Mannur, construction of the new bridge at Manakayi to vengad side etc. open new development horizon for these underdeveloped areas. In this context, third order nodes are suggested at Vembadi, Kayani, Maruthayi and Porora.

28.4 SUGGESTED ROAD NETWORK

The concept plan depicting the suggested road connectivity is shown in fig. 28.3.

The most important traffic and transportation issue of the town is the forth coming congestion in the CBD with the functioning of the airport. Hence a road development plan with emphasis to develop alternate links and bye-passes to divert the traffic away from the CBD is suggested.

In the existing condition all regular traffic and airport bound traffic should touch the Mattannur Junction area as all major roads like T.C. Road, Kannur Road, Mannur-Maruthayi Road, Anjarakandy-Mattannur Road and Sivapuram-Mattannur Road meet at a tiny CBD.

The proposed new busstand at Kokkayil will also attract traffic to Maruthayi road junction which will in turn make the situation to the worst level.

As an immediate measure to avoid such a acute congestion at the CBD, two bye-passes are suggested using the existing canal bund road. The Traffic through Thalassery-Coorg road can be bye-passed through the proposed Priya Talkies-canal bund-Lions Park road and its extension to west side upto Anjarakandy road will serve as another by-pass between T.C. Road and Anjarakandy road and Kannur road. More over, these bye-passes will serve as airport road to passengers from south and east direction.

From the suggested urban form, it is recommended to have intensive development within the inner core of the city and expansion of urban area towards exterior portion in all possible directions. The multifunction activities exepted in the residential mix zone around CBD, needs higher level of connectivity to sustain urban activities proposed in this region. For this a ring road is suggested by creating bye-passes and linkage between major roads.

The suggested road network is grid pattern with a central ring road. The major frame work is formed by the Thalassery road and Mannur road as the backbone, Kannur road and Iritty road as the major arterial cross roads at the centre, Anjarakandy road, Mattannur-Sivapuram road, Vembadi Road, Uruvachal-Sivapuram road, Irikkur road, Manakayi road, as the other arterial roads and all other roads serving as feeder roads of the network.

28.5 SUGGESTED SPATIAL STRUCTURE

The suggested spatial structure is developed by overlaying the suggested hierarchy of nodes and suggested connectivity over the activity pattern as shown in Figure.28.4

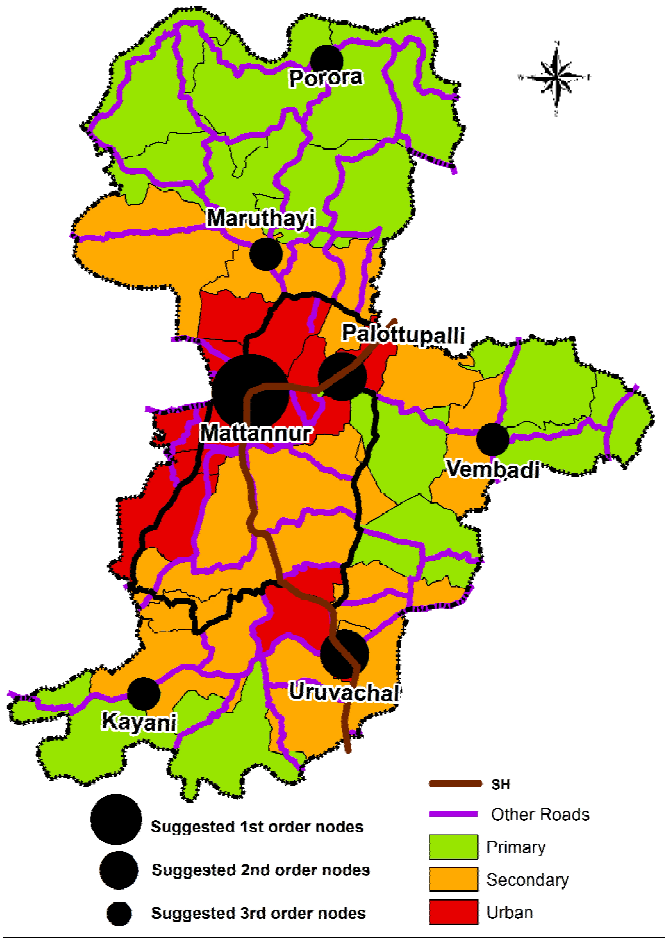


Figure 28.4 Suggested Spatial structure

The suggested spatial structure shows that the Mattannur junction area is the single first order node and is located at the geographical centre portion of the municipality and the proposed CBD is to be developed around this node. Based on the activity pattern, second order nodes, Palottupally and Uruvachal are suggested and are key points in the transportation network. Third order nodes are suggested judiciously at Porora, Maruthai, Vembady and Kayani to serve the surrounding hinterland. All these nodes are connected by the grid pattern of road network with a central ring road.

The future development of the town without considering environmental conservation would be a disaster. So it is suggested that all the rivers and major streams shall have conservation through green buffers along the shores. Poongottukavu forest and existing sacred groves in the municipal area are to be protected and conserved. Similarly all ponds and water bodies existing within the municipal town are to be renovated and all water conservation measures are to be adopted for a better environment. The municipal town has got high percentage of dry agriculture area and some portions of these greenery is to be retained especially along the outer periphery to form a green girdle.

28.6 ENVISAGED CITY FUCTIONS

The major envisaged city functions of Mattannur municipal town are as follows.

Envisioned as an airport city

Kannur International airport is expected to be operational by the end of 2015, and Municipal town should equip itself to emerge as an airport city. The needs of passengers and other airport users are to be catered in the coming decades. Facilities are to be provided for large scale cargo movements and for import and export industries. The present municipal town should be converted to a smart city for the well being of residents, floating population and the passengers and smooth mobility is to be ensured.

Envisioned as a regional centre

Mattannur Municipality has not got administrative role like Taluk headquarter or so. But the geographical location and the hinterlands around the municipal town imparts regional importance to the city to grow as a mother town serving the adjacent Panchayaths also. Being a mother town and a regional centre, areas for public and semi public offices and public spaces are to be reserved and all measures for promoting trade and commerce activities are to be adopted.

Envisioned as an agro- based city

Agriculture is an unavoidable sector for Mattannur municipal town and therefore main focus is to be given on primary sector and strategies for promoting

agriculture, animal husbandry, agro based industries, value addition of products etc. are to be followed in the development concept.

Envisioned as a city of healthcare and tourism

The airport offers potentials in the sectors of heritage tourism and healthcare industries and all facilities required for the promotion of these sectors are necessary in the development plan.

Envisioned as an 'eco city'

Most parts of the municipal town are having rural nature with greenery in abundance. A balanced development can only be allowed with protection and conservation of the environment. The Poongottukavu forest, sacred groves, water bodies, open spaces and parks, canal and related land, paddy fields, dry agriculture land etc. can help the municipal area to flourish as a green city.

28.7 DEVELOPMENT CONCEPT

According to the formed vision, goals and objectives a development concept for Mattannur Municipal area is formulated with an intention to emerge as a 'smart

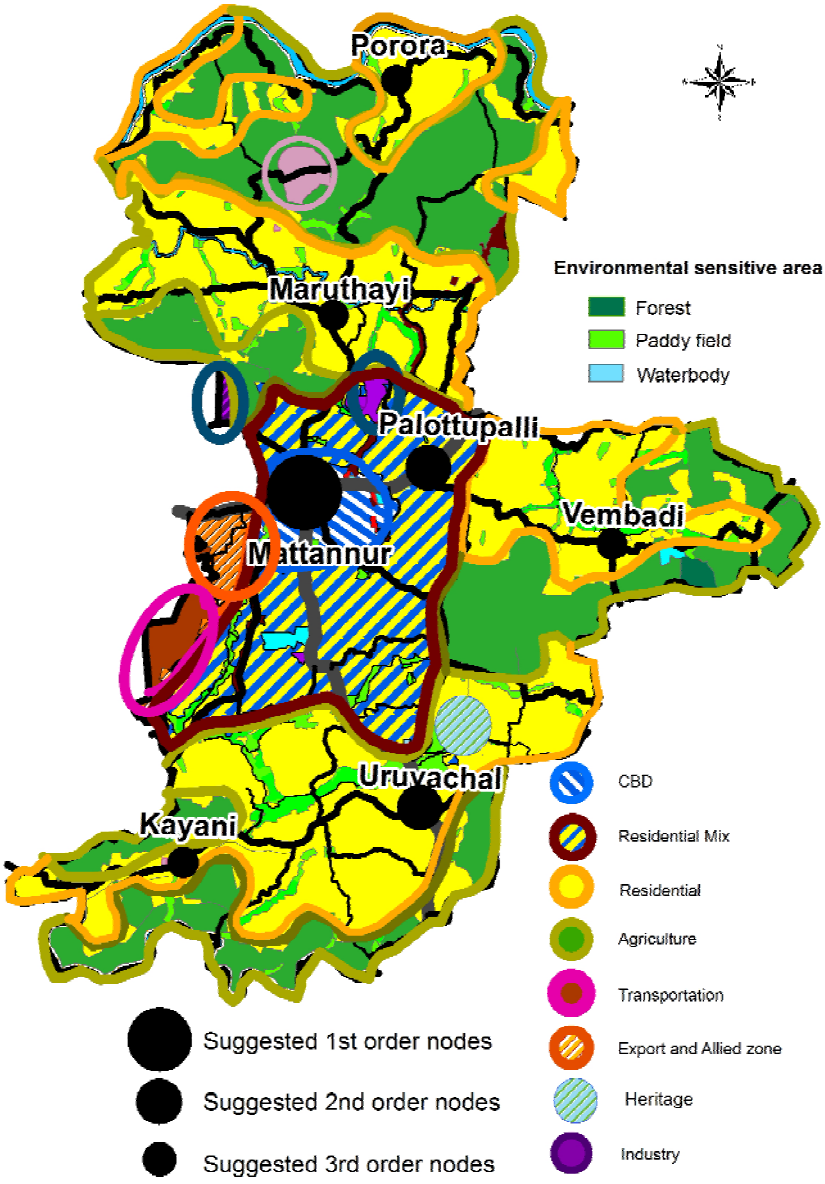


Figure 28.5 Map for Development concept

city'. The major features of development concept are shortly described below.

1) Land use pattern and zoning

- A Central Business District (CBD) portion at town centre for intensive urbanization and for supporting the developmental growth of the municipal town.
- Residential mix area around the CBD for balanced development and multifunctional activities.
- Residential area at outside the mixed zone for catering future housing demands
- Agriculture belts along borders in north, south and east parts
- Environmental sensitive areas that include water bodies, forest land, sacred groves and paddy fields widely distributed along the municipal area.
- Special zones like Export Allied Zone near airport, Hazardous Zone around Trenching ground, Industrial growth centre at proposed KINFRA Park etc.

2) Development of nodes

- Mattannur Junction and surrounding area is suggested as the first order node.
- Palottupally Junction and Uruvachal Junction areas are suggested as second order nodes due to the strategic locations in the future development scenario.
- Third order nodes like Vembadi, Kayani, Maruthayi and Porora are suggested at remote areas for the overall development of the surrounding hinterlands.

3) Mobility Plan

- New Bye pass road to airport to mitigate congestion at core centre of the town.
- Formation of Ring road around the mixed zone for an efficient transport network system.
- Widening of existing roads to accommodate the future traffic.
- Other transportation facilities like New Bus Terminal, Truck Terminal, Parking Plaza and parking lots, Fly over between old bus stand and new bus terminal.
- Strengthening of Public Transport System

4) Sectoral Proposals and projects to accomplish the aim and objectives

- With focus on production sectors for a stable economy
- Providing maximum facilities and amenities in the service sectors for the well being of public
- Due consideration on environment for sustainable development and qualitative life

28.8 POLICIES AND STRATEGIES

Considering the development potential, demand for physical development and the need to conserve certain features and bring in synergy to the development process as a whole the following policies and strategies are considered.

28.8.1 POLICIES

- The plan aims at achieving an urban structure in which component development areas form an integrated system and each area allowed to expand in an orderly manner.
- The proposal shall keep in view the optimum and exact utilization of land, a valuable and limited resource.

28.8.2 STRATEGIES

- Environmental protection and sustainable development Strategies for surveillance of natural eco-system, conservation of paddy fields, water bodies, protection of flora and fauna through traditional methods

- Strategies for exploiting the maximum opportunities offered by the forthcoming air port in all possible sectors like tourism and hospitality, health-care, higher education, trade and commerce etc.
- Strategies to enhance the economic growth through optimum utilization of resources such as adoption of processing methods for value addition, promoting industrial growth centers etc.
- Strategies for provision of equitable distribution of facilities.

PART - III

LAND USE PLAN AND SECTORAL PROPOSALS

Chapter- 29

PROPOSED LAND USE PLAN - 2031

The Planning area of the Mattannur Master Plan is 54.15 sq.km. The analysis of existing land use survey reveals that the first four major land uses identified are dry agriculture (43.54%), residential (38.89%), Transportation (5.95%) and Paddy fields including uncultivated areas(5.88%). Urban land uses like commercial, industrial, public, semi public and all other land uses have very meagre value.

To facilitate the future development as per the concept, the existing land use pattern is to be changed and the proposed land use pattern is to be located spatially. In this chapter the proposed land use pattern for the horizon period is arrived and presented.

29.1 PROPOSED LAND USE PATTERN

The Proposed land use map and the area break up of each of the land use zones are given in Fig 29.2 and Table 29.1

Table 29.1 Proposed Land use - breakup details

Sl.No.	Land use	Area (sq.km)	% of Total area
1	Dry Agriculture zone	18.37	33.93
2	Residential zone	14.45	26.69
3	Residential mix zone	8.09	14.94
4	Traffic and Transportation zone	3.24	5.98
5	Paddy Field	3.18	5.87
6	CBD (Cental Business District)	1.85	3.42
7	Waterbody	1.19	2.20
8	Export and allied zone	0.74	1.37
9	Buffer Zone (Green Belt)	0.71	1.31
10	Public & Semipublic zone	0.67	1.23
11	Canal Land of Irrigation Dept	0.61	1.13
12	Hazardous zone	0.31	0.57
13	Park and Open space	0.17	0.31
14	Industrial zone	0.16	0.30
15	KINFRA Industrial Park	0.15	0.27
16	Forest and sacred groves	0.14	0.26
17	Heritage	0.12	0.22
	Total	**54.15**	**100.00**

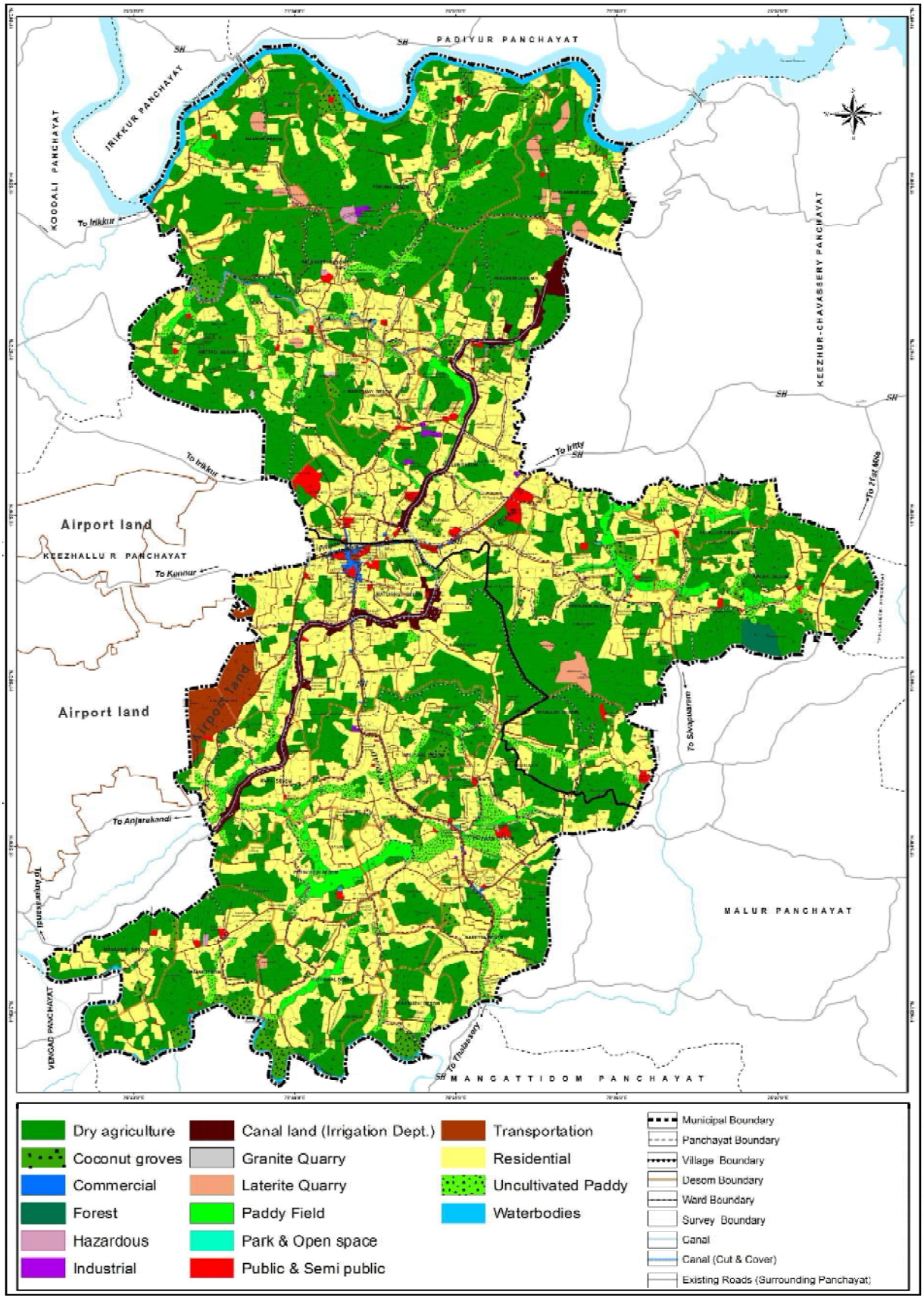


Fig. 29.1 Existing Land use Map

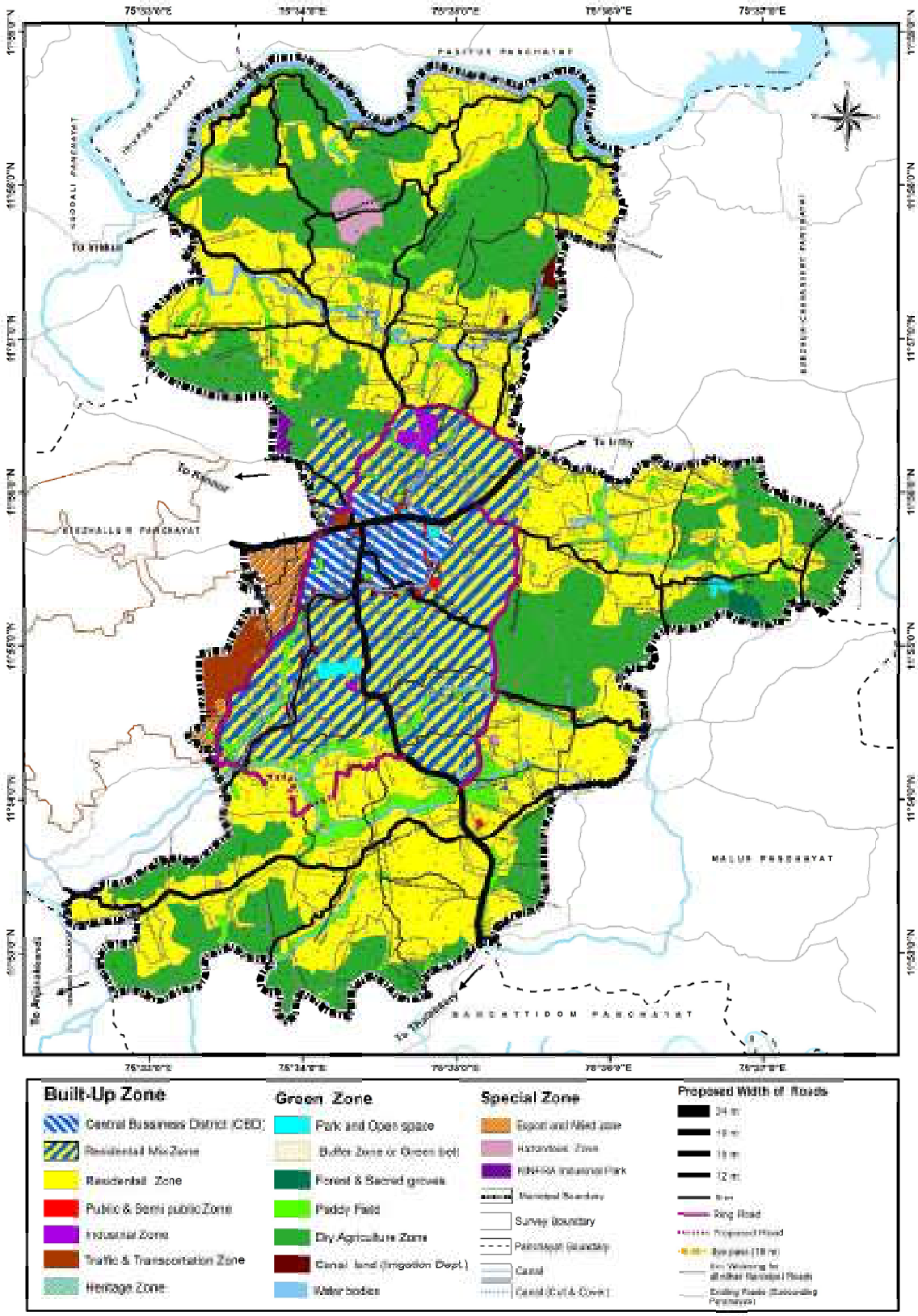


Fig. 29.2 Proposed Land use Map

The category of land use proposed in line with development concept are grouped as follows.

I - Built-Up Zone (52.78%)	II - Green Zone (45.01%)	III - Special Zone (2.21%)
1. Residential Zone 2. Residential Mix Zone 3. CBD (Central Business District) 4. Public and Semi-Public Use Zone 5. Industrial Zone 6. Traffic and Transportation Zone 7. Heritage Zone	1. Park and Open Spaces 2. Buffer zone or Green Belt 3. Forest and Sacred Groves 4. Paddy 5. Dry Agriculture Zone 6. Canal Land of Irrigation Dept. 7. Water Body	1. Export and allied Zone 2. KINFRA Industrial Park 3. Hazardous Zone

I. Built-up-zone: These are the land use zones where Urban activities are concertrated. It includes residential, Commercial, industrial, transportation, heritage and tourism zones and their mix. Built up zone is essential for sustaining the urban nature and status of the town.



II. Green zone : It is the lungs of the city and includes water bodies, bufferzone along shores of rivers and streams, forest, sacred groves, paddy fields, dry agriculture area, parks and open spaces, canal land etc. Green zone is essential for sustaining the urban life with recreation, leisure and refreshment. Extensive built-up development is not expected in this zone.



III. Special zones: The land use zone earmarked for specific development projects falls under this category, and includes Export Allied zone, KINFRA Park, hazardous zone, etc.



29.2. BUILT-UP ZONE

1. Residential use zone

26.69% of the total area of Mattannur town is set aside for residential development. The areas that have already been developed as predominantly residential areas by now, are retained as residential area in the proposed land use plan also.

The general strategy adopted in delineating residential zone is to encourage residential development in all parts of the town except in the core area which is marked for CBD (Central Business District) and in the town periphery area which is marked for agriculture zone.

All types of residential developments including houses, quarters, apartments, residential flats, villa projects etc. are permitted in this zone anticipating the thrusts offered by the forthcoming airport, KINFRA Park etc. A total land area of 14.45sq.km (26.69% of municipal land area) is set aside as an exclusive residential zone.



2. Residential Mix Zone

Most of the portion just outside of the CBD(Central Business District) is earmarked as residential mix zone where both residential and commercial developments are encouraged, but the residential development is given prime importance owing to the existing predominant residential land use in this area. But measures are also to be taken for promoting commercial activities in this area for the future expansion of the town centre into its neighboring area. Mixing of the uses in the same building can also be encouraged in this zone if such option arises.



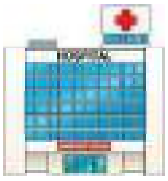
In this mixed zone around CBD, multifunction activities like airport related business and services, industrial auxiliary activities, trade and commercial activities are expected to flourish. The area of this zone is extended up to the proposed ring road that will be formed by connecting all major roads of the municipal town. This transportation access will impart momentum to the development thrust and higher order activities to be set up in this zone.

3. CBD (Central Business District)

In addition to the mixed zone where large scale commercial activities are permitted a CBD area is earmarked in the city centre. The main activities proposed are of commercial and public nature. For promoting these types of land uses area of residential buildings are limited to a maximum of 300m^2.

4. Public and Semi-public use zone

Mattannur Municipal town is not an administrative head quarters of the region and public and semi public zone area has only a meagre share of the total land use area. The existing public and semi public land use that include municipal office compound, educational institutions, religious sites etc are to be retained while new plots are to be reserved for the proposed mini civil station building and similar public buildings which are to be set up in the near future. The intention is to enhance the city as a regional centre by providing maximum public services within the municipal boundary.







5. Industrial Zone



All existing industrial use premises are retained as such in the proposed land use also. The mini-industrial estates at Kallur and Nellunni are expanded including the surrounding area to form industrial centers of the municipal town and to accommodate a cyber park and any other new proposals.

6. Traffic and Transportation Use Zone

As per the development concept, many roads are to be upgraded to form a better transportation network consists of a ring road which will serve as bye-passes and easy access to airport. The proposed width for higher order roads has a range from 9m to 24m and all other municipal roads have a widening proposal of 6 m. In addition to these roads, new bus stand terminal, existing bus stand, proposed truck terminal, parking bays and lots, junctions, airport land etc. also form part of land use under transportation zone. The total share of transportation land use in the proposed land use plan is 5.98% of municipal area.



7. Heritage and Tourism promotion zone

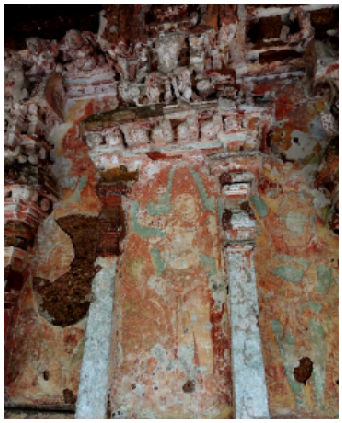
Heritage areas are valuabe assets inherited from our ancestors that are to be proud of, preseved and passed intact to the coming generations. Mattannur Municipal area was the abode of 'Veera Kerala Varma Pazhassi Raja' and every place and things related to this great patriotic hero have immesurable heritage value. Pazhassi Kovilakam precinct is included in the heritage in order to preserve this monumental builidng for the coming gerenration.

Inspection Bungalow is another valuable heritage building built during the British era and this colonial type

acient building has got historical as well as architectural heritage value with it.



Similarly Pariyaram Subrahmanya Temple



precinct having the valuable mural painting in wall plasterings and carved out in laterate stones is also another heritage area to be protected and preserved.

In all these precincts identified as heritage zone, only harmonious developments that do not cause any deterioration to the existing heritage inheritance are allowed.

29.3 GREEN ZONE

1. Park and Open space

Existing parks, proposed organized parks, stadiums, play grounds and open spaces etc are included in this category of land use. The proposed parks and open spaces are Pazhassi Raja Recreation park at Nellunni, stadium near Magistrate court, Mattannur Square (Open Air Auditorium with children's park) at Municipal Office Compound, etc. **T**otal area of land use is 0.17Sq.km, and percentage of total land use is 0.31%.



2. Green belt or Buffer Zone

Green belt zone or no-construction zone is proposed along the banks of rivers and streams in the Municipal area. For Valapattanam river and Anjarakkandy river, the width of the green belt proposed is 30m, for Cholathode stream it is 10m and for other streams it is 5m. Total area of land use - 0.71Sq.km, Percentage of total land use – 1.31 %



3. Forest and sacred groves

This zone consists of the Poongottukavu vested forest area and all existing sacred groves in the Municipal area like Arayathattukavu at Mannur, Pulpeshikavu at Manakkai etc.



4. Paddy Land

The existing paddy fields are retained as such in the proposed land use also. Most of the paddy fields are lying uncultivated now but have scope for agriculture development. In order to conserve these areas, active paddy cultivation needs to be promoted and also strict control on conversion of paddy lands need to be exercised.



5. Dry Agriculture

The existing dry agriculture area in the northern, southern and eastern periphery of the municipal town is retained as such to get a green border. Mostly, agriculture and related uses are permitted in this zone. Single family residential buildings and necessary service buildings with floor area limitations are only allowed in this zone for preserving agriculture land of the town.



6. Canal land of Irrigation Dept.

Main canal of Pazhassi Irrigation Project passes through the municipal town and a total land area of 0.61Ha (nearly 1.13% of Municipal land) is kept idle now and the project is supposed to be wound up in near future. The land use is retained as such in the proposed land use map also but it is proposed that suitable land can be converted to any other land use with the concurrence of the Irrigation Department, Chief Town Planner and authorities concerned.



7. Water Body

The water body zone includes all water courses like rivers, streams, thodus, ponds etc. within the town periphery.

29.4 SPECIAL USE ZONES

The land use zone earmarked for certain specific purposes comes under this category. If the development envisaged does not start within 5 years of sanctioning of the plans, Municipality can change the land use for another use decided in consultation with Chief Town Planner and authorities concerned.



1) Export allied zone

The area lying adjacent to airport land at north-east side between Kannur road and Anjarakandy road and the adjacent area at south east of airport land upto Anjarakandy road fall in this zone. This is like a special Economic zone where export allied activities and incidental uses are permitted while activities like residential uses are restricted.

2) KINFRA INDUSTRIAL PARK



KINFRA had started acquisition procedures for the proposed industrial park of which some portion lies in Kiliyangad area of Mattannur town and remaining portion lies in neighbouring Keezhallur Panchayath. The development activities will be decided by KINFRA with necessary approvals from concerned authorities.



3) Hazardous zone

This include the municipal trenching ground, proposed crematorium and the neighbouring land area. Activities with hazardous or industrial nature will only be permitted in this zone. This zone also includes all the existing burial grounds.

Chapter- 30

TRAFFIC AND TRANSPORTATION PLAN

This chapter explains the proposed road connectivity of Mattannur town in 2031, since the other modes of transportation like railway and waterway have less possibility to be enhanced in the near future. But Mattannur town now possesses the privilege of air connectivity as the KIAL airport becomes operational shortly. The International airport will provide connectivity to foreign cities as well as other Indian cities. The domestic and connection flights can cut short the travel time to Delhi, Bombay, Bangalore and Chennai as well as to cities in Kerala like Trivandrum, Kochi and Calicut.

There is possibility of opening a new railway line from Kannur inorder to cater the transportation requirements of airport. In addition to this, survey works for Tellicherry-Mysore Railway line was carried out in AD 1900 and initials are now being taken for the revival of the proposal. If it comes to a reality, Mattannur Municipal area will have direct railway connection to cities like Tellicherry, Mercara (in Coorg), Mysore, Bangalore etc.,

Valapattanam River and Anjarakkandy river, the two major rivers of the Kannur district flow through the northern and southern borders of Mattannur municipal town and water transportation was alive through these rivers in olden days. The scope of inland navigation through these rivers are to be studied in detail as perennial water flow is not obtained now a days.

30.1 PROPOSED ROAD NETWORK

Till now there was not much traffic problems like traffic jams, blocks etc., in the municipal area as the vehicular flow was in tune with the road capacity. But the scenario started changing as the construction works of the airport got in momentum and traffic jams are reported. The situation will be worse when the airport becomes operational, since the existing road capacity can not afford the enormous flow of airport induced traffic.

The SH-30 (Tellicherry-Coorg road) and Kannur road will be overloaded and this will affect the Mattannur junction severely.

The Volume/Capacity ratio of all major roads will be critical in the projected years and the studies reveal that the existing road network would not be able to handle the traffic in horizon year without the upgradation of the transport infrastructure facilities. Considering these things, augmentation of the capacity of the existing road network by strengthening and widening, construction of bye-passes and link roads, missing links, etc. are proposed to equip with the dramatic increase in the traffic volume.

Proposals

Ring Road

The alignment of this road traces some portions of the existing Anjarakkandy road, proposed Kara-Nellunni Road, Thalasseri Road, Pazhassi-Idavelikkal Road, Mattannur-Sivapuram Road, Peruvayalkari-Puliyangod Road, Palotupally-Vembadi Road, Iritty Road, Kala road-Keecheri Road, Unnimukku-Kallur Palam Road, Kallur Palam-Maruthayi Road, Maruthayi Road, Kokkayil Road and Kannur Road. The widening proposal is not uniform for the entire length of the road and each segment has the widening proposal of the main road of which it forms a part and is as shown in table 30.1.

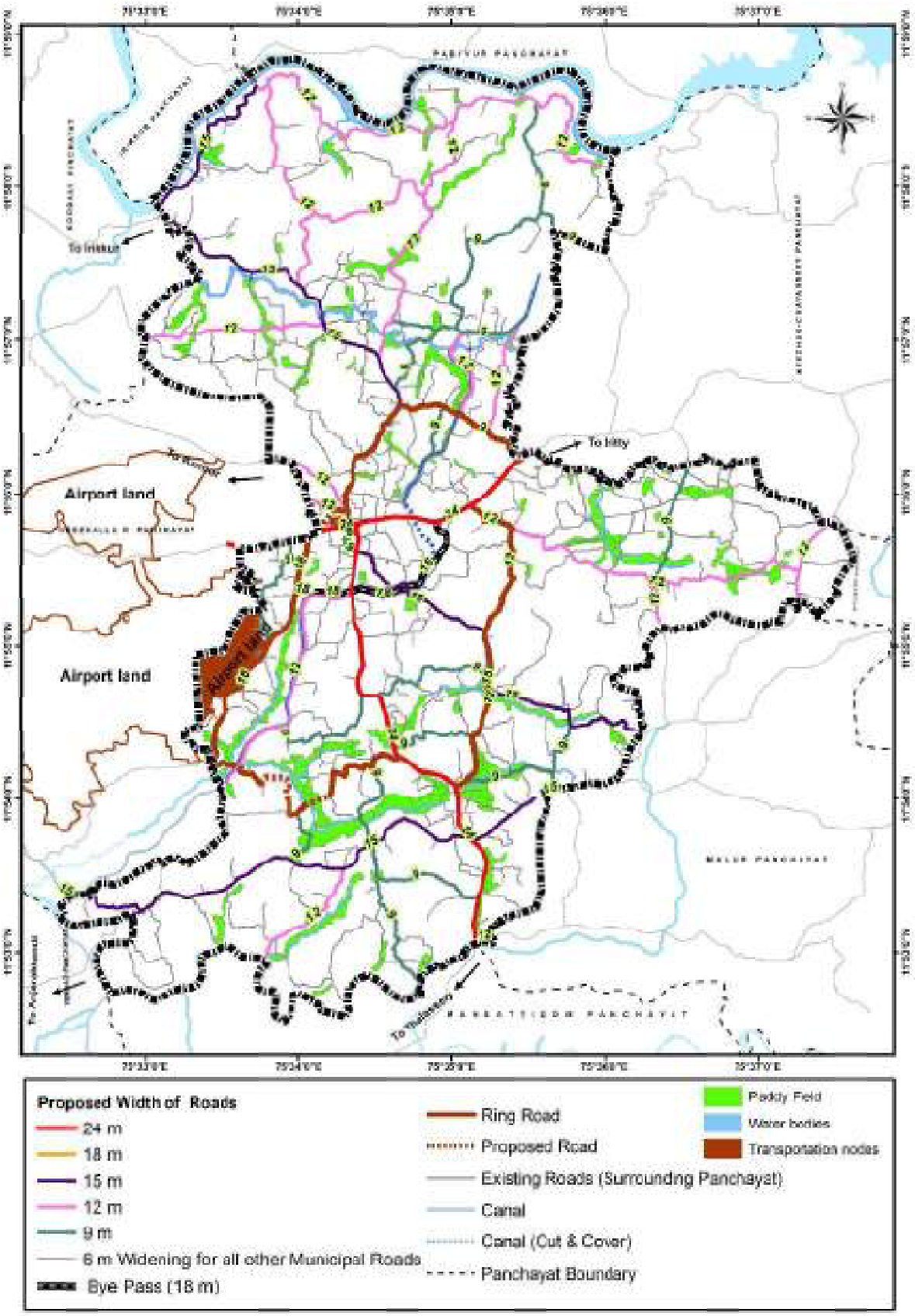


Figure 30.1 Proposed road network

Table 30.1 Widening proposals of ring road segments

Sl.	Name of the main roads included in Ring Road	Proposed width
1.	Anjarakkandy Road	18m
2.	Kara-Nellunni Road	18m
3.	Thalasseri Road (SH-30)	24m
4.	Pazhassi Idavelikkal Road	12m
5.	Mattannur-Sivapuram Road	15m
6.	Peruvayalkari-Puliyangad Road	12m
7.	Palottupalli-Vembadi Road	12m
8.	Iritty Road (SH-30)	24m
9.	Kalaroad- Keecheri Road	12m
10.	Unnimukku-Kallur Palam Road	12m
11.	Kallur Palam-Maruthayi Road	12m
12.	Maruthayi Road	15m
13.	Kokkayil Road	12m
14.	Kannur Road	24m

Except the proposed Kara-Nellunni Road, all other road segments have B.T. surface but need widening and improvement. The proposed Kara-Nellunni Road has got two missing links where new roads, culverts and a small bridge across the canal are to be constructed. Another missing link of the ring road is at the proposed new bus stand area to connect Kannur road and Kokkayil road. There exists a link between these two roads but the major portion is owned by Kerala water Authority and is used for carrying pipe line. The entry road to proposed new bus stand is an alternative but will affect the efficiency of the entrance to bus stand and will also affect the Kannur Road and the adjacent Maruthayi Road junction to a certain extent, leading to traffic hurdles at the core centre of the town. In this context, a new link that starts from very near to Anjarakkandy road junction of Kannur road at Vayanthode to Kokkayil road connecting new bus stand area is necessary to reduce the traffic through Kannur road and Maruthayi Road junction area and a tentative route is now marked with a proposed width of 18m.

This ring road is designed to serve as the backbone of transportation net work and some segments are bye-passes between Thalassery road and Iritty road, Thalassery road and Kannur road, Iritty road and Maruthayi Road, Kannur road and Maruthayi road and will help to reduce the heavy traffic around the Mattannur Junction and adjacent core centre of the city. The construction of the proposed Kara-Nellunni road will be helpful for airport users coming from Thalassery road and can deviate such traffic from the city centre. Opening of this road can bring forward developments to a great extent in the hinterland areas around the road.





30.2 ROAD WIDENING PROPOSALS

Table 30.2 Road widening Proposals

Sl. No.	Name of Road	Length in km	Average width
	24m Widening proposal		
1.	Thalaseri-Coorg Road	8.25	12.00
2.	Kannur Road	1.63	12.00
	18m Widening proposal		
1.	Anjarakandy Road	3.22	12.00
2.	Kara-Devarkad-Nellunni Bypass Road	3.48	5.00
3.	Kallerikara-Lions Park, Canal Bund Bypass Road	0.65	6.00
4.	TC Road-Cut & Cover-Priya Talkies Bypass Road	1.90	6.00
	15m Widening proposal		
1.	Maruthayi Road	8.14	8.00
2.	Uruvachal-Manakayi Road	5.63	6.00
3.	Uruvachal-Sivapuram Road	2.25	6.00
4.	Mattannur-Ayyallur-Sivapuram Road	5.01	9.00
	12m Widening proposal		
1.	Palottupally-Vembady-Kolari Road	4.82	6.00
2.	Vembadi-Sivapuram Road	0.59	7.00
3.	21st Mile-Shivapuram Road(Kolari-Nediyahiram Road)	1.27	6.00
4.	Karithurparamba-Porora Road	3.97	6.00
5.	Mannur-Periyachur-Porora-Elannur-Kanhiramkari Road	6.51	6.00
6.	Maruthayi-Payyaparamba-Nalankeri-Porora Road	2.46	6.00
7.	Kalaroad-Keecheri Road	1.91	7.00
8.	Maruthayi-Mettadi-Kiliyangad Road	2.51	6.00
9.	Peruvayalkari-Puliyangad Road	2.73	6.00
10.	Pazhassi-Idaveli Road	1.36	6.00
11.	Mannur-Podiparamba-Mulliam Road	1.80	6.00
12.	Malakkuthazhe-kara-canal road	3.24	6.00
13.	Karetta-Kanhileri-Maloor Road	0.60	7.00
14.	Mattannur-Velliyamparamba-Irikkur Road (College road)	1.25	9.00
15.	Moonampeedika-Koolikadavu Road	1.6	6.00
16.	Kokkayil Road	0.5	6.00
17.	Kallur palam-Keecheri Road	0.97	6.00
18.	Aayiramchal Road-Canal Road-TC Road (Bypass Road)	0.89	5.00
19.	Unnimukku-Kallurpalam-Kallur Temple Road	1.72	7.00
	9m Widening proposal		
1	Keecheri-Mancha Colony Road	1.86	5.00
2	Hospital Road	0.37	5.00
3.	Gramadeepam Vayanasala-Puliyangad Road	1.78	6.00
4.	Karetta-Mundorapoyil Road	1.83	5.00
5.	Bavottupara-Elakkuzhi Road	1.56	5.00
6.	Manjeripoyil-Mundorapoyil Road	1.32	6.00
7.	Perinchery-Theluppu Road	1.75	6.00
8.	Mukundan Master Road	1.61	6.00
9.	Parambil Junction-Mancha colony-Porora Road	2.39	7.00
10.	Onangalottu-Payyaparamba Road	0.85	6.00
11.	Kayallur-Vembadi Road	1.36	6.00
12.	Keecheri-Chelleri Road	0.81	6.00
13.	Nellunni Kannattumkadavu Edavelikkal Road	1.08	5.00
14.	Maruthayi-Kooleri Road	1.10	7.00
15.	Kallerikkara-Parappoyil-Vayanthodu Road	1.41	6.00
16.	Pazhassi-Edappazhassi Road	0.55	6.00
17.	Ayallur-Edappazhassi Road	1.28	7.00
18.	Nellunni-Bavottupara Road	1.34	6.00
19.	NCC Road	1.33	4.00
20.	Petrol-Pump cut and cover Road	0.60	5.00
	6m Widening Proposal		
1.	All other Municipal Roads	203.40	5.00

Major Town Roads

1) Thalassery-Coorg Road (SH 30)

This is the most important road of Mattannur Municipal town and is the only state highway passing through the municipal area. The road has two segments viz. Thalassery road that stretches from Karetta Bridge to Mattannur Junction and Iritty road that stretches from Mattannur junction to culvert at Kalaroad. The entire length of this major road (8.25km) is proposed to be widened to 24m. This state highway has been selected for KSTP work and widening and improvement works had already been started with some junction improvements also, under the Thalassery-Valavupara Road Project.

2) Mattannur-Kannur Road

This is also another important road passing through the town and connects to Kannur City, the district head quarters and has the status of Major District Road. The length of this road within the municipal area is only 1.63 km and starts from Mattannur junction to municipal boundary at Kotheri. This major road is also proposed to be widened to 24m.

3) Mattannur - Anjarakandy Road

The entrance portion of the proposed Kannur Airport is at Anjarakandy road and hence this road will be one of the significant roads in the municipal area. This road starts from the Vayanthode junction of Kannur road and stretches up to municipal boundary at Kara and further proceeds to Anjarakandy and connects Thalasseri-Irikkur road from there. This road is proposed to be widened to 18m, and the road length within municipal boundary is 3.22km.

4) Mattannur-Maruthayi-Mannur Road

This major road starts from Kannur road at the town centre and passes through Maruthayi, Mannoor and connects to Irikkur town through Nayikali bridge and to Taliparamba-Iritty Road (SH-36) through newly opened Mannur bridge across Irikkur river and now started generating new traffic flow to Mattannur town which will intern be increased with the functioning of airport. This road need high attention and is proposed to be widened to 15m.

5) Kolary-Nediyanhiram Road.

This is a part of 21st Mile-Sivapuram road and include the stretch within the town in the eastern area. This road has great significance as it will be part of a bye-pass to Thalassery-Coorg road in the near future. The length of the road is 1.27km and proposed road widening is given as 12m.

6) Uruvachal-Sivapuram-Kakkayangad Road

This is a PWD road that starts from Uruvachal junction and proceeds to east through municipal area and then through municipal border for a short stretch before reaching Sivapuram and from there further extends to Kakkayangad and then connects to Iritty-Peravoor Road. The length of the road within municipal area is 2.25 km and is proposed to be widened to 15m.

7) Uruvachal-Manakayi Road

This is one of the major municipal road and connects TC road and Anjarakandy road. The total length within municipal area is 5.63km and passes through south-west portion of the municipal town connecting settlements like Perinchery, Kayani, Manakayi etc. Many feeder roads from the surrounding hinterland join this road. The construction works for a new bridge had started at Manakayi to connect Vengad Panchayth and from there to Koothuparamba Town. This road provides an easy access to Anjarakandy road and the proposed Greenfield road from Uruvachal, thus cutting short the distance to Kannur town for passengers from remote towns like Peravoor, Kottiyur, Kelakam, Kakkayangad, Malur etc. Moreover, this road can be further utilized as a bye-pass to airport to travellers from south side, in an emergency. The proposed width of this road is given as 15m.

8) Mattannur-Ayyallur-Sivapuram road

This PWD road originates from Sahina Theatre Junction and passes through Puliyangod and Ayyallur areas and finally connects Uruvachal-Kakkayangad road

at Sivapuram. The total stretch up to municipal boundary near Sivapuram High School is 5.01km. This is a significant road for the municipal town as it connects nearby settlements like Sivapuram, Malur, Thillankeri etc. and tourist destinations like Harichandrakotta and Puralimala. A small portion of this road forms part of the proposed ring road. The widening proposal for this road is 15m.

9) Mattannur-Velliyamparamba-Irikkur road (College Road)

This is also a PWD road and originates from Maruthayi road (near Municipal Office), passes through Velliyamparamba and joins Thalasseri-Irikkur road at Chitrari and from there connects Thaliparamba-Iritty State Highway at Irikkur Bridge. Major Institutes like P.R.N.S.S College, Fire Station, proposed KINFRA Park etc. are located along the side of this road. Length of the road within the municipal town is 1.20km and the proposed width of this road is given as 12m.

10) Karetta-Kanhileri-Maloor Road

This is another PWD road in the Mattannur town but the length within the municipal area is only 0.24km. The road starts from Karetta and traverses to east side and connects settlements like Kanhileri, Maloor etc. A 12m widening proposal is given to this road.

11) Palottupally-Vembady-Kolari-Road

This is an important municipal road that starts from Palottupally and connects settlements at Pariyaram, Kayallur and Kolari desoms in east side of the municipal town and finally joins Kolari-Nidiyanhiram road at Kolari. Total length of the road is 4.82 Km. A small portion of this road forms part of the proposed ring road near Palottupalli area. Poongottukavu forest, the proposed eco-tourism centre, proposed Nature Park, Pariyaram Subrahmanya Temple having mural paintings, Pariyaram L.P.School etc. has got connectivity through this road. Widening proposed for this road is 12m.

12) Vembadi-Sivapuram Road

This road segment starts from the above said Palottupally-Vembadi-Kolari road at Vembadi and connects Sivapuram, located outside the municipal area. The proposed widening for this road is also 12m.

13) Karithurparamba-Porora Road

This municipal road traverses from Karithurparamba junction of Mattannur-Mannur road and take its course to north-east part of Mattannur town through Porora desom and plays vital role in the road communication system of this hinterland portion of the town. The municipal trenching ground, proposed crematorium, proposed hazardous industrial area, Porora U.P .School etc. has got connectivity through this road. A widening proposal of 12m is given to this road.

30.3 PROPOSED BYPASS ROADS

1) Kallerikara-Lions Park, Canal Bund Road (18m wide)

A bye-pass road is proposed to connect Thalassery road with Anjarakandy road so as to bypass the traffic from Thalassery road to Kannur and Anjarakandy direction and vice versa including airport passengers without entering the town. The study reveals that more than 30% of traffic entering the Mattannur Junction at the peak hour can be bye-passed through this road. The alignment is proposed along the existing canal bund road on northern bank of the irrigation canal and a bridge or embankment is required to connect the missing link at the entry to Anjarakandy road. Length of the proposed road will be nearly 0.64km.

2) T.C Road- Cut & cover-Priya Talkies Road (18m wide)

This is an extension of the above said road from Thalasseri road to Iritty road at Priya Talkies utilizing the available portion of existing canal bund road. The traffic through Thalasseri-Coorg road can be bypassed through this road avoiding the entry to Mattannur town and can help in reducing the future congestion expected at the Mattannur Junction.

Alternate proposal for the above two Bypasses

The concept of one way roads along both sides of the existing canal banks with water frontage at middle

portion can also be sought out as an alternate proposal. Street scaping with water frontage for the airport bypass will be an attraction from tourism point of view but new bridges are required for crossing of canal.

3) Aayiramchal Road-Canal Road-TC Road Bye-pass (12m wide)

When the new bus stand at Kokkayil starts functioning there will be high traffic on Mannur Road and from this the traffic intended to Iritty Road should be diverted avoiding Mannur road junction and Mattannur junction. For this the only solution available is widening the Aayiramchal road and extending it up to the Iritty road through the side of the proposed Indoor Stadium.

30.4 PROPOSED LINK ROAD

Kara-Devarkad-Nellunni Road (18m wide)

This proposed link road is to connect Anjarakandy road at Kara and Thalasseri road at Nellunni and traverses through Devarkad area. This is a part of the proposed ring road and has got two missing links and new roads, bridges or culverts are required. In addition another bridge is to be constructed for crossing the canal. The completion of this road will provide easy accessibility to airport for passengers from Thalasseri and Wayanad areas. Once built, this road can play an anchorage role in the development of the hinterland around the road.

30.5 JUNCTION IMPROVEMENT PROPOSALS

1. Mattannur Junction

Mattannur junction is the most important road junction in the municipal town, where two major roads ie Thalasseri-Coorg Road and Kannur Road meet with an acute angle towards Kannur side. The improvement work of this junction by widening is essential on shifting of existing bus stand to the proposed new bus terminal at north of Kannur road.

2. Maruthayi Road Junction

There is chance for severe traffic congestion at this junction with the shifting of bus stand and due to the increased traffic flow through Maruthayi road caused by the opening of Mannur Bridge connecting to Thaliparamba-Iritty State Highway. Junction improvement works are to be made in advance anticipating the high traffic volume.

3. Palottupally Junction

The proposed ring road passes through this junction and junction improvement works considering the expected volume of traffic is also necessary for smooth traffic mobility in the future decades.

4. Uruvachal Junction

Two roads originates from this junction. Kakkyangad road and Manakkayi road traverse in opposite direction within a small distance. Suitable improvement works by widening is necessary for this junction to handle the future traffic which includes the airport bound traffic from Thalasseri and Wayanad sides.

5. Vayanthode Junction

Here the Anjarakandy road to airport meet with Kannur road and the proposed Greenfield road alignment will be near this junction. Considering the future traffic, this junction is also to be improved in advance to match to an airport city.

6. Karetta Junction

7. Sahina Theatre Junction

8. Hospital Road Junction

9. Temple Road Junction

10. Kalaroad Junction

11. Maruthayi Junction

12. Karithurparamba Junction

13. Vembadi Junction

30.6 BUS TERMINAL

The existing bus stand is located at west side of Thalassery road, very near to Mattannur Junction. The bus stand lacks ample space and not capable of handling the expected high traffic in future and therefore a new bus stand with sufficient capacity is essential for ensuring smooth operation of buses. A modern bus stand complex including bus stand, bus bays, parking yards, fuel filling

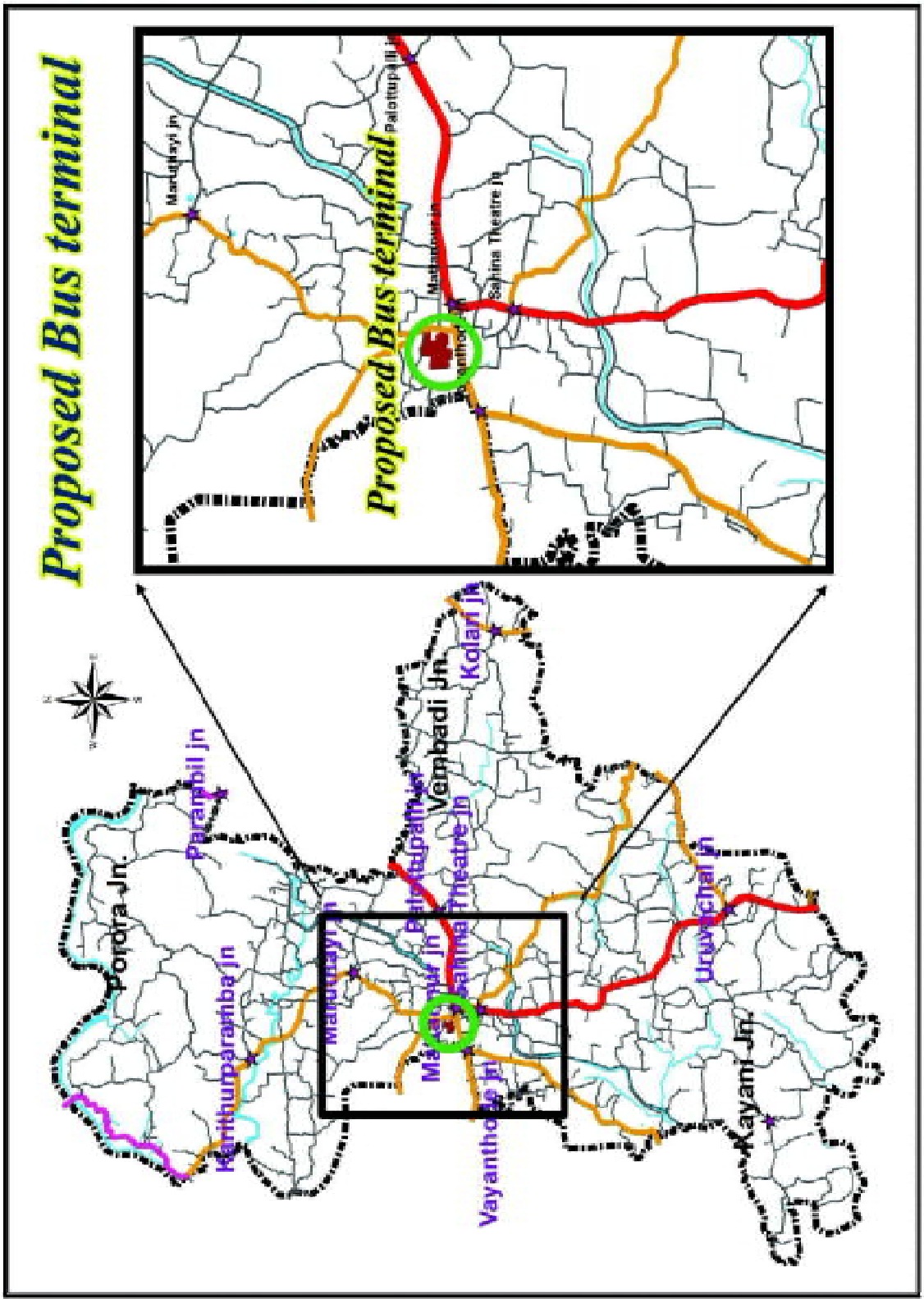


Figure 30.2 Location of Proposed Bus Terminal



station, Service station, comfort stations, rest room, commercial buildings etc. is proposed at Kokkayil on north side of Kannur road and west side of Maruthayi road. The survey numbers identified are 63(P) of Mattannur Desom, Kolari Village and 25(P) of Mattannur Desom of Pazhassi Village.

There are two proposals for the new bus stand with different exit and entry. The features of these two options are described in the sections below.

Recommended Option

Lay out for new bus stand is proposed at the area, which is identified by the Mattannur Municipality to construct a new bus stand. Arrival and departure platforms proposed can accommodate 27 buses at a time.

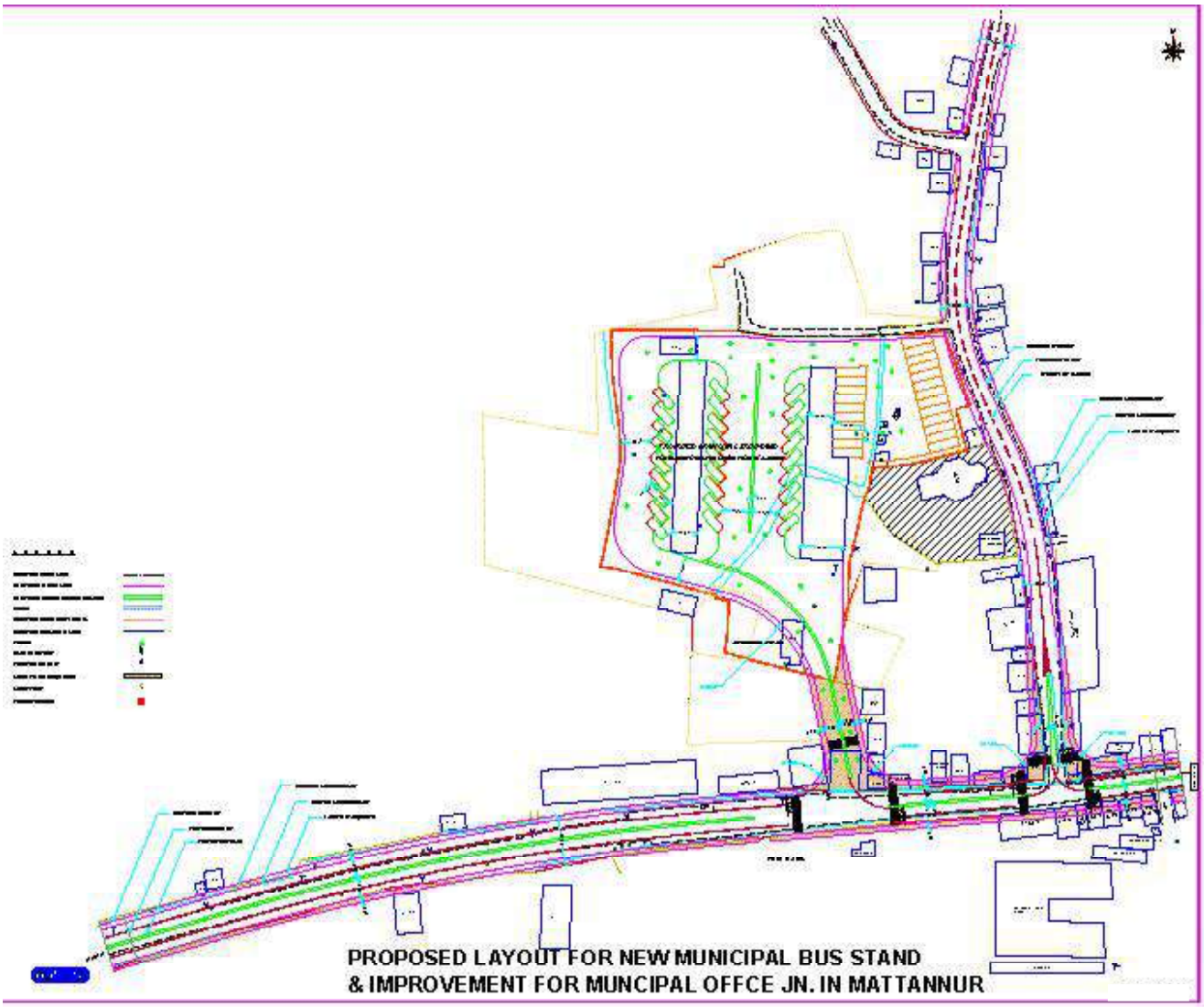


Figure 30.3 Recommended option of new Bus stand

Space for idle parking of 23 buses is also incorporated in this proposal. In this option the entry and exit of buses is provided at the Mattannur-Kannur road, which is creating a junction near to IMaruthayi road junction. The layout of this option is shown in the Figure 30.3.

Alternative Option

Alternative proposal is worked out by providing separate entry and exit to the bus stand. Entry to the bus stand is proposed from Kannur road and exit through Irikkur Road. The main feature of this option is, it can minimize the conflict movement while considering the option of entry and exit at the same location. For that a ramp of width 5.5 m is required at the northern side of the bus stand. This will cause to increase the construction cost of the bus stand. Space for idle parking of 20 buses is also incorporated in this proposal along with accommodating 27 buses of arrival and departure. Circulation plan inside the bus stand is prepared accordingly with minimum conflict. The layout of this option is shown in the Figure 30.4.

30.7 TRUCK TERMINAL AT OR NEAR EXPORT ALLIED ZONE

Commissioning of the airport and establishment of an export allied zone will generate large scale cargo movement. For facilitating the good's traffic, a truck

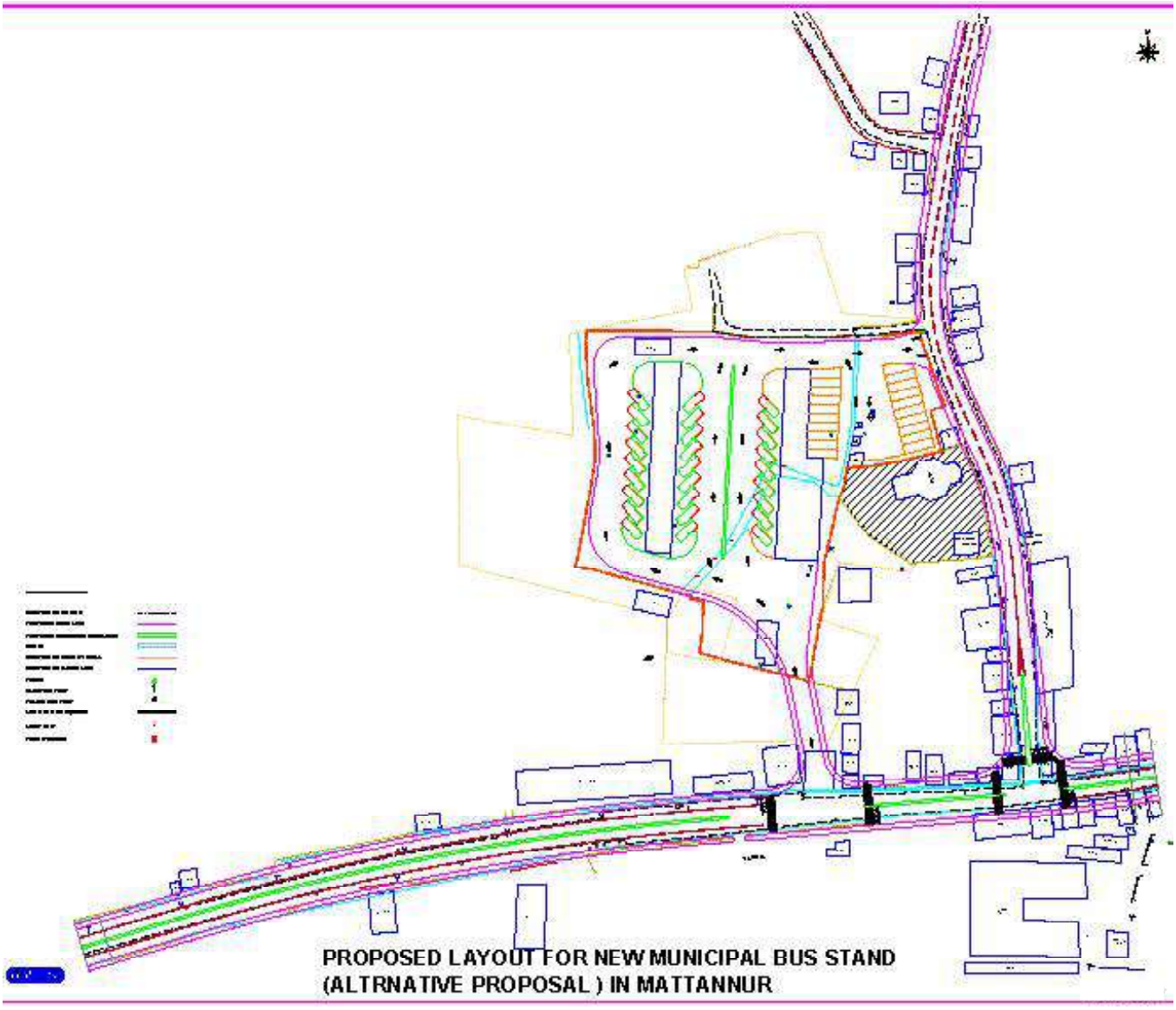


Fig. 30.4 Alternate option of new Bus stand



terminal is essential. All modern facilities like parking yard, loading and unloading facilities, fuel filling station, service station, weigh bridge, rest rooms and dormitories, rooms for booking agents, restaurant, toilets etc. are to be arranged in the truck terminal.

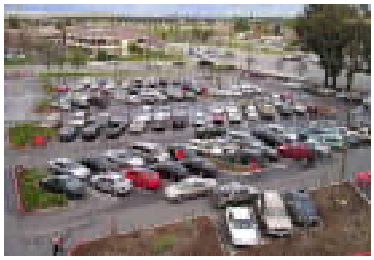
30.8 PARKING FACILITIES

1. Parking Plaza at Existing Bus stand

Every day new cars are getting entered on road but the capacity of existing roads remain unaltered and road side parking creates traffic congestion at all important nodes and centres. Parking problem is a major issue at the commercial node near Mattannur junction and the construction of a Parking Plaza building is an ideal solution for parking problem at the town centre. The shifting of bus stand will make room for construction of a multistoried Parking cum commercial tower which include multiplex theatre.

2. Parking lots at Mattannur, Palottupally, Nellunni and Uruvachal

Road side parking creates traffic blocks and is a major reason for road accidents. Suitable lands are to be identified at areas like Mattannur town, Palottupally, Nellunni and Uruvachal for the construction of parking lots.



30.9 PEDESTRIAN FACILITIES

Pedestrians are the most neglected group in the planning process and these pedestrians includes men, women, children and the elderly people. Footpaths are often reduced to widen roads, which affects the safety and comfort of pedestrian movements.

The pedestrian facilities that need to be considered are

1. Sidewalks or Walkways

Sidewalks and walkways are 'pedestrian lanes' that provide people with space to walk within the public right of way, that is separated from roadway vehicles. The sidewalks help for significant reductions in pedestrian collision with motor vehicles.

In the first phase, the following major roads can be included

1. Kannur road
   (Mattannur junction to Vayanthode junction)
2. Iritty Road
   (Mattannur junction to Palottupally junction)
3. Thalasseri Road
   (Mattannur Junction To Canal Bridge)

2. Pedestrian Crossing Facilities

Marked cross walks indicate optimal or preferred locations for pedestrians to cross the road and it help designate right-of-way for motorists to yield to pedestrians. These are desirable at signalled junctions and some selected locations with high pedestrian crossing



volume. For Mattannur town, these marked cross walks are found necessary at major junctions like Mattannur junction, Maruthayi Road junction, Palottupally junction, Uruvachal junction and high pedestrian volume locations like educational institutions, hospitals and commercial centres.

Pedestrian overpasses/Underpassess allow for the uninterrupted flow of pedestrian movement, separated from vehicle traffic. There are some demerits existing along with these crossing facilities. The steps provided in foot over bride and underpasses are a barrier for disabled persons while elderly people hesitate to use it. Moreover they provide camp for antisocial elements and criminals. Another problem found with underpass is seepage and water logging. In this context, they can only be considered as a measure of last resort, and it is usually more appropriate to use traffic calming measures or install a pedestrian activated signal that is accessible to all pedestrians. This is also an extremely high-cost and visually intrusive measure.

Overpasses can be provided with ramps or escalators for accommodating all persons but escalators are too much expensive for a municipality to accommodate while ramps result in long crossing distance. Studies have shown that many pedestrians will not use an overpass or underpass if they can cross the street level in the same amount of time.

Considering all these factors and after detailed study and analysis, suitable pedestrian crossing facilities are to be provided at the following locations where high pedestrian crossing volume occurs.

1. Kannur Road (Near Maruthayi Road Junction)
2. Tellicherry Road (Near Hospital Road Junction)
3. Iritty Road (Near Asraya Hospital)

30.10 PUBLIC TRANSPORT SYSTEM

Public transport system is the mode of transportation for ordinary people who can not afford a car or private vehicle and car owners are also compelled on many occasions to avail of the public transportation system. The system is to be strengthened in every possible manner as it possesses the following advantages.

1. It is cheap, economical and affordable to all income group of the society.
2. Reduces traffic congestion as number of cars on road are decreased.
3. Reduces consumption of fossil fuel consumption.
4. It is eco-friendly as mitigation of private vehicles reduces emission of *green house gases*.
5. Helps foster a sense of community. People travelling together are more likely to feel a community connection than those travelling in cars in isolation.
6. Encourages people to have a more active healthy lifestyle, particularly if they are walking or cycling to their station or stop.
7. Helps reduce injuries and fatalities caused by car accidents.
8. It is less stressful. Rather than driving in traffic or wasting time looking for an elusive car park, public transport passengers can relax and listen to music, play games in mobile or read a book.

1. Strengthening of Public Transport System

There are hinterlands and remote areas in Mattannur town that has less connectivity to the town or major roads. For serving the public the followings methods for strengthening public transport system shall be adopted

- Extension of existing bus services to remote areas by mandatory provisions of transport authorities using methods of alternate service, alternate day services, weekly services etc.
- Circuit services connecting hinterlands
- Operation of more services of K.S.R.T.C buses
- Use of mini buses
- Sharing services of Jeep/Auto-rickshaw/Van

2. *Town to river service* - Mini Bus Service of Mattannur Municipality

Considering the unique characters of Mattannur Municipal town, its geographical nature, vast extent of remote hinterlands, interior roads having narrow width and number of passengers, a public transport system with mini bus services seems to be ideal and suitable for Mattannur town. Municipality should take initiatives to start such mini bus service to cover the entire municipal region with the assistance of financial institutions and co-operative banks and with co-ordination of Motor Vehicle Department, KSRTC, RTO etc. The mini buses can also be used for the *conducted tourism journeys*. The methods described in the above proposal can be adopted here also for covering all the remote portions of the town.



30.11. OTHER PROPOSALS

1. Fly Over between Old Bus stand and New Bus Terminal

The existing bus stand is located at south side of Kannur road and the proposed bus stand is located at north side of Kannur road. At present buses plying between Thalasseri and Iritty need not pass through Kannur road. But the shifting of bus stand will make it necessary for those buses to travel through Kannur road which will in turn create traffic congestion at adjacently located Mattannur Junction and Maruthayi Road Junction. A parking plaza building proposed at the existing bus stand and the remaining space can be utilized as taxi stand, jeep stand and auto-rickshaw stand and therefore a connection is required between the existing bus stand and the proposed bus stand but without interfering with the traffic flow in Kannur road and Mattannur Junction and Maruthayi Road Junction. In this context, a fly over is essential between the existing bus stand and new bus stand and smooth mobility can be ensured if it is constructed with pedestrian walkway facilities and interchange facilities to Kannur road, Iritty road and Maruthayi road without affecting existing road junctions.

2. Bus bays with Hi-tech waiting shelters

The stopping of buses at bus stop on road makes traffic block forcing vehicles behind for unnecessary halts and delay. Construction of bus bays along road side is the best remedial measure and should be adopted wherever possible. And modern waiting shelters with seating facility, display board of bus timings, Wi-Fi facility, F.M Radio, music system and waste bins are to be provided for the comfort of passengers. Methods like sponsorship, advertising etc. can be adopted for fund raising.

3. Beautification of Mattannur, Palottupally and Uruvachal Towns

Mattannur is going to be an airport city where many tourists and officials from other nations and states are expected to arrive. For getting a smart city image, the above said major junction areas are to be beautified with streetscaping, tree plantation, gardening and essential works like providing of medians, junction improvements, sidewalks, installation of solar lightings, etc.

4. Installation of name boards for all major roads

30.12 OTHER MODES OF TRANSPORTATION

30.12.1 Air Transport

The Kannur International Airport is going to be operational very soon and thereby Mattannur town is going to be included in the privileged group of municipal towns that have air connectivity. The domestic flights from here can connect other airport towns in Kerala and India thus getting fast connectivity to Kochi, Trivandrum, Bangalore, Mumbai, Delhi etc. Similarly international flights and connection flights ensure connectivity to all major cities of the world, including G.C.C countries, U.S and Europe where most of the expatriates from Kerala work. The airport is a blessing not only to the people



from Kannur district but also to the people from adjacent areas of neighbouring districts like Kasaragod, Wyanad, Kozhikode and Coorg. The airport offers opportunities of worldwide cargo movements along with passenger traffic and this can be utilized for the economic growth of the municipal town and its residents.

30.12.2 Waterways

Two major rivers of the district flow through the borders of Mattannur town. Valapattanam river flows through the northern border of the town while Anjarakandy river flows through the southern border. Water transportation was active in these two rivers in olden days. Valapatanam river can connect trade centres like Irikkur, Sreekandapuram, Valapatanam and finally reach to Azheekkal port , one of the emerging ports in North Malabar. While Anjarakandy river provide waterway connection facility to trade centres like Mambaram, Dharmadam and Thalassery. The waterway transportation has completely extinguished in both river portions adjacent to Mattannur town. Boat service now exists from Mattul via Azheekal to Parassinikadavu. The possibility of extending this service and possibility of revival of waterway transportation in Anjarkandy river is also to be studied in detail as water transport is the cheapest one among the existing modes of transportation.



30.12.3 Railways

At present, Mattannur town has no rail connectivity. Nearest railway station is Thalasseri, at 26.7km away closely followed by Kannur, which is located at 27.4km away. The proposal for Thalasseri-Mysore Railway line was raised in 1900 AD and the British Govt. had conducted preliminary surveys also. The presence of evergreen forests and steep mountains in the Western Ghat is a stumbling block for the project to get materialized. Certain strong efforts are now being taken for revival of the project and preliminary survey for the route reveals that it will touch the Mattannur town at it's south-eastern portion. Mattannur town along with entire North Malabar region will get fast rail connectivity to Coorg, Mysore, Bangalore and Hyderabad when the project becomes operational.



Another proposal for rail connection is the proposed railway line from Kannur to Mattannur airport. Airport and railway authorities are taking initiatives for the said rail project for the fast and easy transportation of both passengers and cargo. This railway track can give connectivity to Cities like Mangalore, Goa, Mumbai and other North Indian cities through Konkan railway.

Chapter- 31

SECTORAL PROPOSALS

Based on the primary and secondary data collected, local level analysis, spatial analysis of the data and discussions and suggestions of SIC working groups the following projects and proposals are made in various sectors. Details of all projects and proposals including activities and agencies to be involved, phasing of projects and proposals and prioritization of projects are given in the subsequent tables in this chapter.

Many of the general proposals are people's aspirations raised in working groups of Spatial Integration Committee and given here as guidelines. The Municipality can include these proposals in its annual plan for implementation.

31.1 CIVIC AMENITIES AND RECREATION

Civic amenities including recreational facilities are very less in Mattannur Municipal area. For emerging as a smart city by giving all necessary amenities and recreaion facilities with urban standards, following projects and proposals are suggested.

SPECIFIC PROJECTS

- **Mini Civil Station at South side of the Judicial Court**

The regional importance of Mattannur town is now increasing as a mother town to serve the people in the surrounding Panchayaths also. Besides, certain Govt offices like District Treasury, A.E.O. Office, Sub-Registrar's Office, Post Office, KSEB Offices etc are now functioning in rented buildings. Therefore a Mini Civil Station Project is necessary and land possessed by Irrigation Department, at Survey Nos. 80(P),81(P) and 131(P) of Kallur Desom of Kolari village is identified for this purpose. The land is to be relinquished from Irrigation Department.

- **Convention Centre at Mattannur**

At present there is no convention centre or large meeting hall in the municipal town and its vicinity. A Convention centre with standard facilities for handling international level meeting would be helpful for public gathoring and Municipality will be benefited with sustainable income. The location identified is at Sy.No. 76(P),78(P) of Kallur Desom of Kolari Village, near Veterinary Hospital.



- **Public Crematorium**

The public crematorium project is located at Sy.No 24 (P) of Porara desom of Kolari village, opposite to trenching ground. Land acquisition and other processes have been already started by the Municipality.

- **Stadium at Onaparamba**

Stadium and Play ground are essential for creating a healthy and energetic society and for conducting sports events. Such recreation facilities are seldom found in the municipal area and therefore a big capacity stadium project is planned at Onaparamba at Sy. No. 31(P) of Mattannur Desom of Pazhassi Village. The total land area of the project is 3Acres

■ **Mattannur Square at Municipal Office Compound**

There is no space for public gathering or small meetings in and around the town cente. Similarly, there is no park and open space for the outing of publics, children and kids.

The vacant ground behind Municipal office can be converted in to a town square with open air auditorium



and children's park. The location of the project is at survey No64 (P) of Kallur Desom of Kolari Village.

■ **'Pazhassi Raja Park' - Recreation park at Nellunni.**

A well equipped, well organized and well maintained park with all kind of recreational facilities is essential for a town like Mattannur which is going to be grown up as a smart city. Such an organised park with facilities like walkways, jogging tracks, lawns, botanical gardens, mini zoo, exhibition halls, children's play area, open air auditorium, artisan emporium, comfort stations etc., is proposed at Nellunni. The survey numbers include 82(P), 83(P), 84(P) of Mattannur Desom and 1 of Nellunni Desom of Pazhassi Village. As the location is near to the Pazhassi Kovilakam and Pazhassi Smrithi Mandiram, the proposed park can strengthen the tourism potential of the area also. Total land area for the proposed project is 10.33Ha.



■ **Indoor Stadium near Post Office**

An indoor stadium with facilites for organising sports events like Volly ball, Shuttle Batminton, Ball Batminton, Martial Arts etc. is necessary for a growing town. The location identified is at a Sy. No76(P), 77(P),78(P) of Kallur Desom Kolari Village, near Post Office, Mattannur.

■ **Play ground at Kallur**

Play grounds and open spaces are necessary at different parts of the town for recreation and healthy living of citizen especially for children. Such a play ground project is proposed at Sy. No.8(P) of Maruthai Desom Kolari Village, near Porora Service Co-op. Bank.

General Proposals

♦ **Multiplex Theatre and Mini Movie Halls**

All the theatres in the municipal area had been shut down and people have to depend on other towns for cinema facility. As large theatres are not found profitable now a days, Multiplex theatre and mini movie halls are suggested as a proposal. The service of public, private and co-operative sectors can be utilized for the completion and functioning of this project.



♦ **Community halls at Uruvachal, Kayani, Porora, Vembadi and Maruthayi areas.**

Community halls with dining facilities at regional areas are necessary for conducting public and private functions.

♦ **Swimming Pools - Construction and Improvement**

Swimming is the best sort of exercise prescribed for a healthy living. And now swimming classes are provided to children at schools. There exist a large number of ponds and streams in the town used for swimming. These water bodies can be renovated, new swimming pools can be constructed at ideal locations. The proposal includes swimming coaching classes also.

♦ **Renovation and maintenance of existing parks.**

This proposal includes site clearing, planting trees, gardening, land scaping, beautification works, installation of children play units, posting of Gardener/Watchman etc.

31.2 TRADE AND COMMERCE

Existing commercial land use is only a modest 0.10% of total municipal land. For emerging as a trade centre with the opening of the airport, a 1.85km^2 area (nearly 3.4% of total land) at core centre of the municipal town is demarcated as CBD (Central Business District) with intensive commercial use. For competing with fast growing neighbour towns and in the air trade, Mattannur town should equip well with infrastructure facilities like parking centres, warehouses, efficient road networks, whole sale markets, star hotels etc.



SPECIFIC PROJECTS

■ **Ware houses with Cold storage facility**

In order to facilitate the expected large scale cargo movements and the wholesale trade a ware house with cold storage facility is proposed at the export allied zone.

■ **Separate whole-sale market**

For emerging as a trade centre, whole-sale trade is to be flourished and hence a separate whole-sale market is proposed at the CBD area of the town.

■ **Development of parking centres**

Parking lots or centres are suggested at Mattannur Junction, Palottupally, Nellunni,Uruvachal, Maruthayi, Airport side as adequate parking facilities can attract traders and truck drivers. The Sy.No. of lands identified so far are given below.

Palottupally -111(P) of Kallur Desom of Kolari Village

Uruvachal - 57(P) Karetta Desom of Pazhassi Village

Mattannur Town (Near Sahina Talkies) - 118(P) of Mattannur Desom of Pazhassi Village

■ **Modern markets for Fish, Meat, Fruits and Vegetables.**

Modern and hygienic markets are essential in a civilized society and such markets are proposed in the CBD area of the town to serve the local people as well as the expected settlers at Airport and its Township, KINFRA Park and other Industrial centres. The Sy. No of land identified is 31(P) of Mattannur Desom of Pazhassi Village at south side of Police Station.

General Proposals

♦ **Municipal shopping complexes and markets**

Municipal shopping complexes and markets are suggested at nodes like Uruvachal, Palottupally, Vembadi, Mannur, Porora, Kayani/Manakayi, Maruthayi, Ayyallur, Kolari, Kara etc., These shopping complexes can serve as the focal point and catalyst for the growth of regional centre sin the remote and hinterland areas.

♦ **Construction of Star hotels**

Star hotel accommodation will be essential for attracting traders, business people and tourist and can be started in public/private/co-operative sectors.

- **Weekly markets for farmers and cottage industries.**

Setting up of weekly markets at suitable locations can promote the selling of agriculture products of farmers, products of Cottage industries, etc.

31.3 INDUSTRIES

Industrial sector is weak in the case of Mattannur town. But the forthcoming airport and KINFRA Industrial Park can catalyze the industrial growth in the town. An export allied zone is proposed near the airport area so as to promote industrial and commercial activities. Focus is to be given on processing units of agriculture produces as there exist a strong agriculture sector and scope for export through airport. The proposed projects are enlisted below.

SPECIFIC PROJECTS

- **Industrial city with Cyber Park at Kallur.**

The existing mini-Industrial estate at Kallur has got only a total extent of 1.17Ha. It is proposed to be expanded to an industrial city with 14.00Ha of land extent by the acquisition of surrounding land area in survey Nos.42(P), 43(P), 45(P), 46(P), 47(P), 48, 49(P), 98(P) of Kallur Desom of Kolari Village.

Infrastructure facilities like, new road, extension of existing road, water supply, extension of power line etc. are to be provided at the area. A modern cyber park is also suggested at this industrial city.

- **Industrial Park at Hazardous Zone, Porora.**

Public Crematorium and slaughter house are proposed adjacent to the existing trenching ground at Porora. Two stone crushers are already working at the adjacent plots of the trenching ground. Therefore this entire area now has a hazardous land use pattern and in order to avoid future conflict with other land uses it is proposed that neighbouring area around the existing trenching ground is to be buffered for hazardous land use. An industrial park preferentially with hazardous industries is suggested at this portion and the survey numbers included are 46 of Nalamkeri Desom and 22(P), 23(P), 24(P),25(P), 26(P) of Porora Desom of Kolari Village.

Infrastructure facilities like road, water, electricity etc are to be provided for setting up of industrial units here.

- **KINFRA PARK Portion near PRNSS College.**

An industrial park is being set up near PRNSS College by KINFRA. The total extent of land is 56Ha and in this 15.84 Ha of land area falls within municipal area and remaining portion falls within Keezhallur Grama Panchayath. Mattannur Municipality has to extend its full co-ordination and co-operation with KINFRA for providing infrastructural facilities for setting up of industries. Survey Nos.23(P), 24, 30(P) of Mettadi Desom of Kolari Village fall within the park.

- **Expansion of Mini Industrial Estate at Nellunni.**

The Mini-Industrial Estate at Nellunni, located on TC Road has a land area of only 0.411Ha. Considering the strategic location, it is proposed to expand the industrial plot with inclusion of part of adjacent agriculture land lying at western side (Sy.No.6(P) of Nellunni Desom of Pazhassi Village). The total land extent will be 1.781Ha. Here also, Municipality has a vital role for providing basic infrastructure facilities and promotion of industrial growth.

- **Packing and Labelling Units**

Exporting industry has got high scope in the vicinity of air port. And therefore as an auxiliary industry, packing and labelling units are proposed at the export allied zone, near the airport. Municipality can co-ordinate public and



private entrepreneurs, co-operative societies, Kudumabsree units, Industrial Department, DIC etc. in this venture.

■ **'Malabar Food Package' – Export Program**

Utilizing the opportunities provided by the airport, catering and export industry of indigenous food items to G.C.C. countries is proposed. Many of the families in the Malabar region have one or more members working in the Gulf countries. Collection and supply of food prepared from their own home like the 'Dubbawala' style supply of lunch existing in Mumbai can be experimented here also.

■ **Handloom and handicraft emporium.**

A pavilion in the airport or an emporium outside but near to the airport will be helpful for the artisans in the



region to make familiarise and sell their products to foreign and domestic tourists.

■ **Meat processing and exporting Unit**

The food habits of citizens in Arabian and Europian countries raises high demand for meat products. A meat processing and exporting unit can be a successful venture in Mattannur, an airport town, if higher level of quality control and hygienity is ensured in the production process. The unit can be better attached with the proposed slaughter house at Pazhassi or can be started separately in an ideal location.

■ **Exhibition cum trading centre**

Marketing is the major probelm faced by industrialists working in small scale and cottage industry sectors. A permanent outlet for their products is necessary for strengthening these units. Such a marketing centre can be suitably located near the airport entrance or bus stand area.

■ **Recycling unit for plastic and other wastes at Porora.**

The recyling of plastic wastes helps in environmental protection and making the city clean. A recyling unit can be set up in or near the municipal trenching ground at Porora.

General Proposals

♦ **Processing Units for Agro-products**

The raw materials like, coconut, cashew, Jack fruit etc. are available in abundance in Mattannur town and surrounding areas. Value addition of the products can be achieved by processing and its exporting can generate employment and income to the local people.

♦ **Strengthening of Handloom, Khadi, and Cottage Industries**

Handloom and cottage industries like mat weaving, clay pottery etc. are active in some parts of the municipal town. Proposal is made for the strengthening and setting up of new industries, mobilization of funds, purchase of machineries etc.

31.4 WATER SUPPLY

Some wards in the Mattannur municipl town faces water scarcity during peak summer. Most of the people depend on well water and the ground water table is found depleting. Proposals are made to ensure supply of protected water supply to entire area through out the year and projects for water conservation are also suggested.

SPECIFIC PROJECTS

■ **KWA Project – Water Supply Scheme to Mattannur Municipal Town.**

Kerala Water Authority has already prepared a project named 'Water Supply Scheme to Mattannur Municipality'. This project is exclusively for the municipal town and covers entire municipal area. The design period is 30 years. The project has been submitted to Government for approval. The salient features of this project have been mentioned in Chapter 18 Water Supply.

General Proposals

- **Localised Water Supply Schemes**

This project is proposed to ensure water supply to drought prone areas. Communal water supply schemes can be started for these areas by constructing wells, tanks and distributory systems.

- **Water conservation project.**

All practical measures for replenishing and recharging of ground water are to be adopted and the project components include formation of water conservations Societies, Awareness and Training Programmes, Construction of check dams, rain water pits and recharging units, rain water harvesting tanks etc.

- **Extension of existing pipelines to drought areas.**
- **Construction of Public wells and deepening of existing wells.**
- **Renovations of ponds and spring heads**

31.5 DRAINAGE AND SANITATION

SPECIFIC PROJECTS

- **Sewage treatment Plant at Chekyattuvayal**

At Chekkyattuvayal area near Vayanthode junction, a problem related to discharging of wastes from hotels and markets to the Vayanthode has been originated. The Vayanthode stream passes through the paddy fields at southside and finally joins the Anjarakandy river at Keezhallur Panchayath, at up-stream side of water treatment plant at Mylady of the water supply scheme to Thalassery and Mahe municipal towns and nearby Panchayaths. In this context, a sewage treatment plant at Vayanthode is essential and one is proposed near Chekkyattuvayal area.

General Proposals

- **City drainage project for future.**

At present, Mattannur being a small town, owing to its terrain and due to the presence of natural drains like thods and rivers do not come across with serious issues relating to drainage. But in the next decade as the present town grows to an airport city with higher population and rapid developments all around, there is chance of drainage related issues to occur. To tackle such situation a city drainage project is proposed in the Master Plan now, but the designing of the drainage system and preparations of the Detailed Project Report can only be done at that time according to the future situation.

- **Drains and Slabs to major roads.**

The project is intended to clear solid waste clottings, eradicate mosquito breeding centres, safety of passengers, beautification of roads etc.

- **Plastic Free Mattannur Project**

Plastic and its usage is hazardous to health, earth and environment and a project named 'Plastic free Mattannur' is proposed for eradication of plastic in the municipal area.

- **Decentralized Waste Management Scheme**

For treatment of waste at source itself, decentralised waste management schemes like biogas plants, mini sewage treatment plants, pipe compost, vermi compost etc. are proposed.

- **'Total Collection' - Solid Waste Collection Programme**

For soild waste management, collection is to be strengthened. For this, the service of Kudumbasree units can be used.

- **Modernization of Trenching ground at Porora**.

Treatment plant at trenching ground is to be modernised using modern technology and machinery.

- **Mini-Sewage treatment plants at comfort stations.**
- **Bio-gas plants at Markets, Slaughter house, farms etc.**

- **Improvement of thods and streams**

31.6 HERITAGE, TOURISM AND CULTURE

Heritage, Culture and Tourism are linked sectors and most of the tourist sports are located at heritage centres. The image of Veera Kerala Varma Pazhassi Raja has got high heritage value and all related buildings and remains like Kovilakam, nearby temples, Kottakkunnu, recently opened Pazhassi Smrithi Mandiram etc. should be utilized to promote tourism activities. Similarly the temples, festivals, Theyyam, Palottupally Uroose. Inspection Bungalow, Poongottukavu forest, Valapatanam River, Anjarakkandy River and all other resources are to be highlighted for attacting tourists and proposals are made based on these concept as follows.

SPECIFIC PROJECTS

■ **Conservation of Pazhassi Kovilakam Precinct**

The Pazhassi Kovilakam should be included in the heritage zone for preserving the monumental buildings. The Kovilakam can be renovated and converted as a museum or art gallery for keeping the gallaentic memories of Veera Kerala Varma Pazhassi Raja. The area



Pazhassi Kovilakam

of the precinct is 2Acres and is at Sy.No. 68 of Pazhassi Desom of Pazhassi Village.

■ **Tourist facilitation centre at Inspection Bangalow**

With the functioning of International Airport, Mattannur will be the welcoming town for both domestic and foreign tourists visiting the tourist districts like Wayand and Coorg and also Bekal Fort, a favourite destination. An information and facilitation centre will be helpful for the tourists. The adjacent PWD rest house in the same precinct can be used for accommodation facilities. Thus, the town, as a base camp, can utilise the tourism opportunities in the municipal area to a certain extent.

■ **Eco-tourism at Poongottukavu**

Poongottukavu vanam, a patch of evergreen forest within the municipal town is a splendid location for eco-tourism. But precautions are to be taken for not doing anything harmful to the present environment there. For this, only walk way access can be provided



Poongottukavu

without any vehicular entry to this spot. Necessary facilities like comfort station etc. can be arranged at a base camp in the adjacent municipal land, proposed as a herbal garden.

■ **Paithruka Mandapam-Heritage Complex at Pazhassi**

A monumental building named 'Pazhassi Smrithi Mandiram' had already been built at Pazhassi on the west side of TC Road. As an augmentation project, a'Paithruka Mandapam'-heritage complex is proposed near Kottakkunnu, on the opposite side of the road. This heritage complex building can be used for flourishing for arts and cultural activities. The Sy. Nos. of the location of the projects includes 81, 87(P), of Pazhassi Desom of Pazhassi Village.

- **Presevation of Mural Paintings at Pariyaram Subrahmanya Swami Temple**

The mural paintings and art works in laterite walls in the Pariyaram Subrahmanya Swami Temple is a precious



Subrahmanyaswami temple

heritage inheritance to be preserved. For this the temple precint is included in the heritage zone. Renovation and preservation works for the mural paintings are to be conducted immediately, as most part had already started deteriorating.



Tree house

General Proposals

- **Tourist resorts and tree houses**

Hide outs and retreats are the new face of tourism as people wish to leisure themselve from the routine activities by spending holidays in remote resorts resting in the lap of nature. Ideal places are available in Mattannur municipal town at places like hill areas of Keecheri, Karithurparamba and Mettadi, riversides of Porora, Mannur, Elakkuzhi and Kuzhikal areas and streamside of Mangalathuvayal areas etc. Tree houses can be constructed for an attraction and advertisement through website and internet can be helpful for publicity among foreign and domestic touristis. Domestic food can be served with the help of Kudumbasree units.

- **Pazhassi Smrithi conducted tourism circuit**

The Municipality can take initiatives for a conducted tourism circuit in weekends or holidays. It can be started from the Air port area and connect major spots within and around the municipal area like Pazhassi Kovilakam, Pazhassi Smrithi Mandiram and related monuments, Poongottukavu vanam, religious and heritage spots, Pazhassi Dam area, Perummannu river site etc. Indigenous Malabar food items, served at 'Chappas' (indigenous type of food stalls) through Kudumbasree units, can be made as an attraction.

- **'Kannur Yatra' – District Tour Programme**

This is another conducted tour programme including the major tourist spots in the Kannur District and can be implemented with the co-operation of DTPC, Kannur.

- **Water front tourism at Irrikkur River and Anjarakkandy River.**

Mattannur town is blessed with the presence of Irikkur river and Anjarakandy river. Water front tourism activities like boat journey, petal boating, rowing, etc. can be

started at suitable spots. Check dams can be built across the river for these activities in summer season.

- **Preparation of heritage list and preservation of religious and heritage sites.**
- **Kalarikendram at Kallur Illam**
- **Linking of Mattannur festival and Theyyam season with tourism activities**

Preparation of tourism and festival calendar and promotional activities.



Theyyam

31.7 HOUSING AND SLUM IMPROVEMENT

House hold size (Average number of persons living in a house) of Mattannur is 4.81 which is higher than their district and state average values. The higher value indicates the need for more houses in the near future. Municipality can play a pivotal role in helping homeless poor people to make their shelter. The existing infrastructure facilities and living standards in colonies have to be improved. Land is a limited resource that can never be reproduced or multiplied. This valuable resources should be reserved judiciously for the future generations to meet their housing demand, and hence communal living should be encouraged.

General proposals

- **Comprehensive Housing Schemes for houseless people.**

Effective utilisation, implementation and monitoring of IHSDP, VAMBAY, EMS Housing Scheme, Bhadrata Housing Scheme and all other housing schemes of Central and State Govt. for urban poor.



- **Proposals for slum improvement/redevelopment**
- **Proposals for improvement of other colonies.**
- **'share and save land' -Promotion of Communal living**

Flats, Apartments, Residential quarters, Housing Colony Projects, Communal water Supply Schemes, Common Sewage plants etc. should be encouraged as these projects are helpful for sharing and saving of land.



❖ **Proposals for Public Housings for Urban poor.**

There are a lot of land in the Mattannur town owned by Irrigation Department which were once used for dumping of earth cut during the canal construction of Pazhassi Irrigation Project. Most of these lands are kept idle now and if got relinquished, can be used for the housing needs of urban poor belonging to homeless and land less BPL families.

31.8 ENERGY

There is no unelectrified area within the municipal town and serious problems of voltage fluctuations are not reported. But the forthcoming airport, industrial parks etc. will cause more consumption and therefore power distribution system should be improved and new substations are to be set up to meet the future demand.

Focus is also to be given on non-conventional energy resources. Beautification of street lights is also required to serve as a smart airport city.

General proposals

♦ **Proposal for generating electricity from non conventional sources:-**

There are large number of hills and high altitude areas within the municipal town. Scope for wind mills and exploitation of solar energy are to be studied and analyzed. If found feasible, such projects shall be proposed and implemented.



♦ **Improvement of power distribution system**

♦ **New Substations**

♦ **Underground Cable System**

♦ **Solar Street lights.**

♦ **Modernisation and Beautification of Street lights**

♦ **Homestead Bio-gas plants**.

31.9 EDUCATION

Mattannur town has got sufficient primary schools but lacks higher education facilities. The fothcoming airport offers scope for central School and Courses related to airport, travel and tourism industry. Availability of land makes opportunities for starting of new educational institues in all categories. Modern P.G. Courses can be started in P.R.N.S.S. College which is the only one college in the Municipal town and surrounding area.

All infrastructure facilities and all modern high-tech facilities should be provided to all schools through schemes like PRISM (Promoting Regional Schools to International Standards through multiple Interventions).

The proposals made in education sector as mentioned above are listed below.

SPECIFIC PROJECTS

■ **Upgradation of Govt. U.P. School as High Shool**

There is only one High school in Mattannur town and it is working in aided sector. The Govt. U.P. School, Mattannur, is located at the town centre and is adjacent to the Government Hospital (Community Health Centre). Both these institutions lack land for expansion and up-gradation. In this context, it is proposed to shift the U.P.School to the canal lands kept idle at Illambhagam area and can be up graded as a High School. The survey numbers identified are 100(P) and 105(P) of Mattannur Desom of Pazhassi Village. With the shifting of School, the existing nearby hospital can also be expanded to a higher order one.

■ **Academic and career facilitation Programme**

For improving the perfornamce of students in All India level and state level competitive examinations and for better employment opportunities, a project named Academic and career Facilitation Programme is suggested. For this, a building with necessary facilities is to be constructed as the facilitation centre. The Sy. No. identified fo this purpose are 90(P) and 91(P) of Pazahassi Desom of Pazhassi Village.

■ **Language Research Centre**

A language research centre is proposed for the study and research on regional and foreign languages and for conducting courses like Translation, Communicative English etc. The Sy. No. identified for this purpose are 90(P) and 91(P) of Pazahassi Desom of Pazhassi Village.

General Proposals

- **Higher Education Colleges** with courses like Aviation, Aeronautics, IATA (International Air Transport Association), Hospitality Management, Material Management, Logistics etc.)
- **Proposals for starting new educational institutes.** (Campus for Kannur/Agricultural/Veterinary/Health Universities, Residential/Model Poly Technic and ITI, Central School, International School, Special School, etc.)
- **Mini Science Park**

For making awareness of the methods and benefits of Science and Technology among children and also for creating innovative ideas among them a mini science park is proposed and a suitable location is to be idetified.

- **New PG Courses and Engineering Courses at PRNSS College, Mattannur**
- **Smart Schools and PRISM Schools**
- **High Schools at Northern and Southern Portions of the Municipal town**

31.10 HEALTH

Community Health Centre is the only Allopathic Hospital in Govt. sector and it lacks adequate facilities. Most of the hospitals are in private sector and are located around the town centre. The proposals suggested for the improvement of health sector are as follows.

SPECIFIC PROJECTS

■ **Expansion and Upgradation of Community Health Centre.**

As the regional importance of Mattannur town increases with the airport and expected future growth, the present CHC is to be upgraded to accomodate more patients. Starting of new departments like Gynaecology, Ophthalmology, Cardiology etc is also necessary to get specialised services in the municipal area itself. Construction of buildings for new blocks and staff quarters are also included in this project. Proposed shifting of adjacent Govt. U.P. School to new location can facilitate the expansion of hospital. Adjacent plot in Sy. No. 32(P) of Mattannur Desom of Pazhassi Village is proposed to be acquired for immediate expansion.

■ **Blood Bank and Lab Facility**

A full fledged blood bank is essential for saving many lives and a laboratory with all modern equipments is necessary for diagonising the diseases. These facilities can be attached with Community Health Centre.

■ **Counselling centre for teenagers**

Teenagers of new generation face a lot of problems like depression, lack of confidence, drug abuse, alcoholism etc. For giving them proper guidance and awareness a counselling centre is proposed and can be attached to the Community Health Centre.

■ **Mobile Detection Unit for Life style diseases and Infectious diseases.**

Most of the people are suffering from lifestyle diseases and out break of new types of infectious diseases is a common phenomenon now a days. Early detection of

this diseases can be helpful for preventive measures and for better treatment. This project can be attached to the Community Health Centre.

- **Sub-centre for cancer detection and care.**

The number of cancer patients increases in the society day by day. As said above, early detection is necessary for treatment and remedial measures. A sub-centre for cancer detection and care is proposed in the Master Plan and co-ordination with R.C.C., Cancer Care Societies, Charitable Organisations etc. are essential for the effective functioning of the project. This project can also be attached to the Community Health Centre.

General Proposals

- **Setting up of Allopathic/Ayurvedic/Homoeo hospitals at hinter land areas.**
- **Ayurvedic Health Care Treatments and Resorts.**
- **Disease Preventive Programmes.**

31.11 SOCIAL WELFARE AND SPECIAL CONCERN AREAS

The welfare of women, children, aged people, BPL families, differently abled persons, SC/ST population etc deserve special concern and separate projects are required for uplift of these weak sections of the society and to bring them in the mainstream.

Similarly people living in hazard prone areas are also to be taken into account and disaster management planning is to be prepared in advance to meet emergency situations.

The proposals include sustainable lively hood opportunities, development of basic infrastructure, other social welfare measures and disaster management.

SPECIFIC PROJECTS

- **Ladies Hostels at Uruvachal, Mattannur and Airport side**

The percentage of female workers and students increases day by day. Mattannur municipal town has got working female population from outside and this will certainly be multiplied with the operation of forthcoming airport and industrial parks. A ladies hostel project of municipality has already commenced and more hostels are to be started at work centres like Mattannur town, airport area etc.

- **Ladies Rest rooms and She toilets at major centres**

Ladies rooms, feeding room and toilet facilities are essential for female passengers and working groups. It is the duty of a developed community to arrange such facilities at different parts of the town and hence the project.



- **Rehabilitation centre for differently abled students with job oriented courses.**

Conducting suitable short term job oriented courses to differently abled students through rehabilitation centre aims for creating sustainable livelihood opportunities for the special concerned section of the society.

- **Ambedkar Sevana Kendram**

A facilitation centre exclusively for SC/ST students with facilities like library, internet, tuition classes, coaching classes for Entrance exams and competitive exams, job oriented short term courses with intention of uplift and employment generation for the weaker section of the society.

- **Women's banks**

Women's bank can give employment opportunities for ladies and can be helpful for easy bank dealings among ladies. It can also generate savings habits among

ladies. It can be started in public sector or co-operative sector.

General Proposals

- **Mother and Child Hospital**

There are 4,372 BPL families in the town which constitutes 44.66% of the total house holds. The high percentage of urban poor and lack of Gynacology Department in the CHC make necessity of a mother and child Hospital.

- **Strengthening of Kudumbasree Units**

The working of Kudumbasree units in Kerala is a grand success and many families now find sustainable livelyhood income with the functioning of Kudumbasree units. Kudumbasree members are now involved in all sectors of the society like agriculture, animal husbandry, industry, trade, catering, sanitation, transportation and many more. The forth coming airport brings a lot of development opportunities and Kudumbasree units must be equipped themselves to exploit the opportunities ahead. In projects mentioned in master plan and other municipal projects, prioroty and consideration should be given to Kudumbasree units, wherever possible. Municipality can create a platform for the success of Kudumbasree units by arranging financial aids and loans, industrial subsidies, training programme etc. Women empowerment through Kudumbasree units help in poverty alleviation and for uplift of the weaker section of the society.



- **Strengthening of Anganavadies.**

At present anganawadies are not only a play school for kids. The multifunctions of anganwadies include serving as a venue for small public meetings like Ward Sabha, kudumbasree, Ayalkoottam, etc. serving as a centre for health programmes like vaccination, inoculation, distribution of food and nutrients, class rooms for awareness programmes and many more functions. Anganwadies can play a pivotal role in women empowerment and literacy compaign.



In short, the anganwadies serve as a municipal subcentre and the basic facilities here should be improved by acquisition of more land from neighbourhood, by giving financial aids, by providing more seating arrangements, study aids and play equipments etc.

- **Proposals for sustainable livelihood opportunities for SC/ST population.**

For creating platform for generating sustainable income the proposals suggested are identification of weak, average and excellent students among SC/ST for giving necessary concern, promoting self help groups, reservation for unskilled works, literacy campaign, special nursing schools, Training Institutes for making handicrafts, short term technical courses etc.

- **Improvement works for SC/ST Colonies**

The Proposal includes construction, repair and maintenance of approach roads, construction and repair

of houses to eligible families, installation and maintenance of water supply schemes, community septic tank, construction and repair of community halls, burial grounds and compound walls.

- **Encouragement of mat-weaving**

There exist some families traditionally involved in mat-weaving and they are now facing the problem of shortage of raw materials. For promoting this profession, proposals like cultivation of screw pine along the shores of streams and rivers, financial grants and aids, arranging market facilities etc are suggested.

- **'We Care' Project - Emergency Medical Service**

Road accidents increases day by day and due to the inertness and irresponsibleness of public many people lost their lives without getting timely medical services. Most of the victims are youth or middle aged persons, the bread winners of the family and their death create irreplaceable loss and serious long lasting after effects to the family. Every life is important and being a civilised society, it is our duty to save the life of accident victims by emergency medical services that include provision of first aid and medical care to the victims at the road side, the transport of the victim to a hospital and subsequent provision of a more definitive treatment.

For this, a voluntry forum is to be formed with necessary training and the co-ordination of Municipality with NGO's Social workers, Health Department, Ambulance services, Police Department and Fire and Rescue Department is essential for the successful service of this project.

The service of the 'We Care Project' can further be extended to bring destitutes and aged people to the hospital, to attend the needs of the deserving patients, and also to give food and medicine to poor and BPL patients admitted in the hospital, etc.

- **Social Security Measures**

a) Reduction of anti-social activities by

i) Strict enforcement of law

ii) Timely intimation to police about anti-social activities.

iii) Crime alert system involving public, community and police.

b) Preventive measures for suicides by

i) Ensuring social justice to all

ii) Increasing employment opportunities

iii) Intervention programmes like identification of at-risk families/persons, depression patients, alcoholism, psychiatric illness, terminal illness and remedial measures

c) Discouraging of dowry system by

i) Continous awareness programmes.

ii) Empowering brides.

iii) Timely information to police.

iv) Extending legal assisatnce to victims.

d) Proposals for reduction of accidents

i) Education at school level on good driving practices, adhering to traffic rules.

ii) Better road facilities.

iii) Strict enforcement of law against road rule violators.

iv) Road safety publications and campaigns.

- **Disaster Management Programme**

Nearby area of airport can be considered as hazard prone area. The existance of Pazhassi barrage at upstream side of Irikkur River makes the banks at down stream side as hazard prone area. The flood affecting banks of the Irikkur river and Anjarakandy rivers can also be included in the hazard prone area. In these circumstances, disaster management plan should be formulated, in advance, for a quick response in any emergency. The components of the project includes mapping of rehabilitation areas, permanent

rehabilitation of people from hazard prone area like airport, flood effecting areas etc. training and awareness programmes, safety against fire hazards. Co-ordination with disaster management team of revenue department is essential for the effective implementation of the project.

- **Modernization and strengthening of Fire and Rescue Unit.**

Fire station is situated just outside the municipality and there is no sump tank in the town or municipal area. The project includes modernization of the fire and resque unit with new equipments, increasing staff strength, construction of sump tanks at town, airport side and industrial locations.

31.12 AGRICULTURE

Agriculture sector is the most important sector in the case of Mattannur town. The peripheral wards in north, south and east parts of the town are prominent for dry agriculture activities while paddy cultivation is predominant in wards like Devarkad, Kara, Pazhassi and Mundayode. As a matter of policy, organic farming and homestead cultivation practice are to be encouraged for better health and environment.

Paddy cultivation needs to be promoted for maintaining the environmental balance. Active cultivation now confined only to one-third portion of cultivable land and two-third portion of the land is not used for paddy cultivation.

Shortage of labourers is also a major problem in paddy cultivation. Fragmentation of land, small scale farming etc. result in less profit and methods like group farming and collective farming are the remedial measurers for it. Cultivation of rice varieties like Basmati rice, Nhavara rice etc. can be experimented with arrangement for sufficient processing and marketing facilities.

Coconut, cashew and rubber are the major cash crops cultivated. Production, productivity and processing of these cash crops are to be enhanced in the airport scenario for the economic growth of the town

The high demand for vegetables from organic farming both at domestic and outside should be utilized and the forth-coming nearby airport is a major thrust for vegetable cultivation.

Existing irrigation facilities are to be improved and new projects are to be set up for supporting the agriculture activities.

Considering these facts following projects and proposals are made.

SPECIFIC PROJECTS

- **Agro-Bazaar**

Agro development centre with facilities for training and coaching for farmers, sales and hiring of tools and implements.

- **Agriculture market**

Separate market for agriculture produces with granaries and cold storage facilities.

- **Agriculture Labour Bank**

Labour shortage is one of the main problems faced by agriculture sector at present. But, in contrast, the problem of unemployment also exists in Kerala. In this context, an agriculture labour bank can be formed with the labourers interested in agriculture sector and can be made readily available for the agriculturalists. The labour bank can be attached to the Krishi Bhavan in the Municipal compound.

- **Herbal Garden near Poongottukavu**

Municipality has a 50 cent land at north side of the Poongottukavu vanam. A herbal plantation is proposed in this plot. A base camp including comfort station etc. can also be constructed here for the tourists visiting Poongottukavuvanam. The Survey number for the project is 63(P) of Kolari Desom of Kolari Village.

- **Centre for preservations of native crops**

Most of the native crop varieties have high defensive capacity and are ideal for local conditions.

These crops are to be preserved and a centre for preservations of native crops is suggested which includes facilities for cultivation, preservation and storage of seeds.

General Proposals

- **Restoration of Paddy cultivation in uncultivated paddy fields**
- **Nhavara rice and Basmati rice cultivation**
- **Vegetables and Banana Cultivations**

Off season cultivation also may be experimented for value addition.

- **Vegetable cultivation at homestead and terrace**
- **Floriculture**

Airport offers exporting scope to Arabian and other countries were exists a great demand for flower bouquets.

- **Organic farming**

Organic farming can be defined as an agricultural activity done mainly to maintain the fertility of the soil and for pest control. It does not involve the use of synthetic fertilizers and pesticides, genetically modified organisms, or any kind of plant growth regulators in it. It uses the technology of crop rotation and biological pest control methods. It also strongly prohibits the use of synthetic fertilizers. Products yielded through organic farming have been in great demand since the last decade or so.

Organic farming has got very much relevance in Kerala scenario now, as the State depends on the neigbouring States for vegetables. And it is reported that most of the vegetables imported contain poisonous pesticides and incestisides that causes dangerous diseases like cancer. And now it is a Government policy to promote organic farming for the better health of the citizens and also for making self sufficiency in vegetable production.

- **Precision farming and High-Tech farming**

It uses the optimum amount of water and manure with the help of modern technology.

- **Protected farming**

Poly houses are used for protecting crops from the attack of pests.

- **Lift Irrigation projects at various suitable lands.**
- **Improve the existing community irrigation facilities (VCB, wells, pumps, ponds, streams and thods)**
- **Construction of Tiller roads.**
- **Bamboo and screw-pine cultivation at river and stream sides.**
- **Cultivation of teak and commercial plants at suitable lands.**



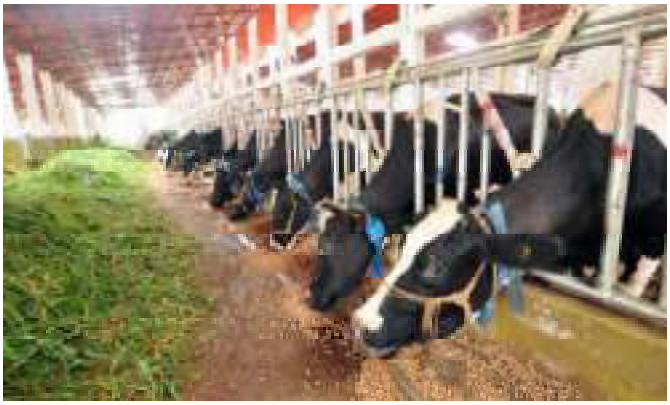
Organic farming



Terrace farming



Bee keeping



Hybrid fram

♦ **Apiculture (Bee-keeping)**

The advantages of bee keeping are many as mentioned below

- ❖ It promotes crop yield by pollination. A worker bee will harvest pollen from one plant until it exhausts that supply while other insects flit between different plants and fruits. Some research says that nearly half of the world pollination is being done by honey bees alone.
- ❖ Honey is a medicine as well as the best nutrient.
- ❖ It offers lively hood income opportunities to many families as self employment scheme.
- ❖ Apiculture can be considered as a good hobby.

31.13 ANIMAL HUSBANDRY

Animal husbandry and agriculture sectors are complementary to each other and Mattannur municipality has high potentials for animal husbandry sector with its vast agricultural back ground.

Airport can play a vital role in this sector also with the exporting facilities for milk, meat and egg. Therefore proposals for meat production. Meat processing, egg productions etc are made as follows, along with other projects.

SPECIFIC PROJECTS

■ **Hybrid farm**

Availability of suitable variety of cattle and calves is a serious problem that most of the dairy farmers face. Indigenous variety has high immunity but less productivity while foreign variety has high productivity but less immunity. And the breed farms outside are not faithful as many farmers raised the complaint of cheating cases. In this context a high breed farm will be beneficial not only to the farmers in the municipality but also to the entire farmers in the district. The Sy.Nos. 40(P) of Nalankeri Desom and 24(P) of Porora Desom of Kolari Village near the trenching ground are identified for this project. Ventures like Mattupetty farm under Indo-Swiss Project can be sought out with the co-operation of Animal Husbandry Dept., Kerala Livestock Development and Milk Marketing Board, MILMA, Co-operative Milk Societies, MPLAD, MLALAD etc.

■ **Animal farm and slaughter house at Pazhassi with meat processing unit.**

Unauthorised slaughter houses working in unhygienic conditions are often a threat to the health of the people. A modern and hygienic slaughter house is not existing in Mattannur town or in the region. Airport offers splendid opportunities for export of meat products to foreign countries. A slaughter house is therefore proposed at Sy No. 102(P) of Pazhassi Desom of Pazhassi village. Since the plot has an area of nearly 2Ha, an animal farm can also be set up as an augmentation project at the same plot.

■ **Hatchery unit near veterinary Hospital**

There is no hatchery unit existing in the municipal town and surrounding region. Therefore the setting up of a hatchery at the plot behind Veterinary hospital is proposed. The Sy.no. of the project is 77(P) of Kallur Desom of Kolari Village.

■ **Mobile Clinic Unit to Veterinary Hospital**

Agriculture areas and therefore livestock population are mainly concentrated on peripheral wards. In this context a mobile clinic unit is necessary and can reduce the inconvenience and hard ships of farmers to take sick animals to the veterinary hospital.

General proposals

- **Small scale Diary farms**
- **Small scale Goat/Rabbit/Pig Farm units**
- **Poultry/Quail farm units**
- **Fodder cultivation**

31.14 FISHERIES

Fisheries is not a major sector for Mattannur Municipality. The single project identified is ornamental fish culture.

31.15 ENVIRONMENT

The very existance of mankind and his settlements depends upon the surrounding environment and it's quality. Environmentally sensitive area in the case of Mattannur town includes vested forest, sacred groves, water bodies, prime agriculture lands, fragile hills, wet lands, heritage sites etc. Conservation of environmentally sensitive areas and heritage centres forms the basic componet of sustainable development. The following proposals are made for achieving the target of protection of environment.

SPECIFIC PROJECTS

■ **Environmental Park near Poongottukavu**

Environmental degradation by pollution and other causes are the main reason behind the present day



problems like global warming, green house effect, climatic variation etc. The awareness and education on environment is necessary for the younger generation for preventing further degradation in the coming years.

Therefore a Nature Park for imparting environmental awareness to the public is proposed at survey No. 60, of Kolari Desom, Kolari Village near to the Poongotukavu Vanam. The total land area of the project is 5.13Ha. The project can promote eco-tourism at Poongottukavu as basic facilities like restaurant and toilets can be arranged here. And the attractions of the project includes botanical garden, bio-diversity research centre, Illustration of environmental protection methods, open air auditorium for exhibition and classes, rain water harvest tanks, rain pits etc.

General proposals

- **Shore protection of rivers and streams.**

The project aims for the ptorection of banks of streams and rivers from encroachments and soil erosion and method of buffering the banks with plantations is suggested. The cultivation of screw-pine and bamboo can earn income to municipality and also support cottage industries by providing raw materials.

- **Conservation of ponds and other water bodies.**

The benefits of the project are ground water recharging and making available of water for drinking and irrigation purpose.

♦ **Rejuvenation of streams and thodus.**

Deepening of streams by cleaning and removing grass and weeds reduces soil erosion and help in effective use for irrigation.

♦ **Protection of Poongottukavu forest and sacred groves.**

Forests and sacred groves protect water sheds and water sources. Cholathode, the major stream in the town originates from Poongottukavu vanam. The sacred groves provides habitat, water and nest sites for wild life and birds. Most of the tree species are protected inside the sacred groves for years. Poongottukavu, Arayathattukavu, Pulpesikavu and other groves sustain many rare species of flora and fauna. At present, most of the sacred groves are under various threats and the importance of sacred groves are not known to most of the people, especially young generation. Old generation worship the sacred groves as they consider this as holy space. Hence one of the aims of this proposal is to impart awareness among youth with the help of Senior Citizens and Environmental Activists.

The existing sacred groves are to be conserved by planting new species wherever required, nurturing and maintenance of plants and trees and by adopting soil and water conservation measures.

Other components of the project include posting stickers against littering, labeling and tagging for trees, making biodiversity register, financial aids and maintenance grants, enforce ban on felling of trees and poaching etc.

♦ **Go Green Project**

The aim of the project is to encourage and promote everything that is eco-friendly. The components of the projects are encouraging eco-friendly ventures, green buiidings, green fencing, avoiding and substituting of plastic, Installation of bio-gas plants, solar lighting etc.

♦ **Conservation of Fragile hills**

Hills are water reservoirs of a region and supply water to the portions at foothill. The large scale and uncountrolled excavation by mechanical means leads to high level deterioration of hills and the impact is seen as lowering of ground water and water scarsity at the downhill regions.

For the conservation of hills, our valuable natural heritage, a Municipal Level Hill Protection Committee is to be formed with Municipal Chairman, Municipal Secretary, Municipal Engineer, Officials of Mining and Geology Department, Ground Water Department, Environmental Department and representatives of Environmental Activists etc. as members of the committee.

Prime duty of the committee is to identify the fragile hills to be protected and notify the land details including survey numbers.

For any excavation or land development permit or building permit for buildings other than single family residential buildings with floor area limited to 200m^2, an NOC from this committee is to be obtained, for permits involving lands in the notified list.

Other components of the projects are banning of large scale excavations, enforcing legal measures, awareness programmes etc.

♦ **Street side Plantation and Social Forestry**

The manifold benefits of street side plantation and social forestry are beautification of streets, increase of oxygen level in the atmosphere, income generation through commercial trees and fruit bearing trees, pharmaceutical usage of medicinal trees nesting facilities for birds, soil conservation etc. Road sides and vacant lands like canal banks etc. can be utilized for this project.

General proposals for reducing of Pollution

❑ **Air Pollution**

- **Automobile**

Reduction of air pollution by conversion of public transport vehicles to CNG/LNG/LPG. Strict rules should be there for giving licenses and car loans to

have a control on emerging number of cars. The enforcement of PUC Test (Pollution under control test) is now mandatory in 3 or 6 months interval and the MVD (Motor Vehicle Department) and Traffic police can monitor this.

Reduce the number of private vehicles on road by implementing efficient and convenient public transport system like mini bus services to all remote routes with adequate time interval.

Impose higher tax on private transport (larger the car, higher the tax), regulation of use of cars with higher engine capacity to payers of higher income tax. Organization of car-free day at least once in a week.

Put up safe and attractive walking and bicycle lanes to encourage walking and cycling to reduce pollution to an extent.

Initiatives for shared transport systems like car pooling, shared auto-rikshaws, cabs etc should considered as serious alternatives to combine the comfort of private and affordability of public transport. Collection of special fee for cars/private vehicles with single passanger through Motor Vehicle Department and Traffic Police. Checking of adequate tyre pressure should be made mandatory for public as well as private vehicles, because a low tyre pressure can increase pollution and fuel consumption.

- **Household and Institutions**

Burning of waste without segregation along road sides and open plots should be regulated to curb plastic fumes from polluting the atmosphere. Burning of leaf litter should be avoided to protect ozone layer and this can be alternatively used for composting, biogas production and making manure.

- **Industries**

Industrial norms are to be abided by and Kerala State Pollution Control Board has to strictly implement it. Shift from fossil fuel based engines to clean technology like solar, electricity, battery powered, CNG etc should be encouraged by reducing tax for those who implement it.

Adequate green belt should be provided around all industrial units/buildings/roads to reduce pollution by dust as well as carbon emissions.

❑ **Water pollution**

- Promotion of organic farming and use of organic manures instead of chemical fertilizers.
- Use of biological control of pests instead of pesticides.
- Strict prohibition of washing of vehicles at streams and rivers.
- Replacing of existing leach pit tanks with septic tanks especially at river sides and stream sides.
- Mandatory use of septic tanks for new houses and buildings to be set up within 200m from banks of rivers and major streams.
- Installation of sewage treatment plants at major drains and streams.
- Frequent testing of ground water and rivers for contamination and adopting remedial measures to control water pollution as per the directions of Kerala State Pollution Control Board, KWA, Ground water Department.
- Monitoring of industries and hospitals for abiding norms of Kerala State Pollution Control Board.

❑ **Land Pollution**

- Adherance to 3-R, Reduce waste, Reuse any item that we can and Recycle Possible things.
- Personal litter should be disposed properly. We can separate household waste at home for recycling. More than half of the household waste could be recycled or re-used but once it is mixed up, it becomes more difficult to separate different components for recycling.

- Prohibition and ban on plastic items of hazardous type.
- Promoting the culture of using paper bags and cloth bags.
- Promoting organic farming.
- Avoiding use of pesticides.
- Installation of collection point for colleting e-wastes including batteries.
- Promoting and buying of bio-degradable products.
- Active participation of Kudumbasree units for the collection of solid waste.
- Installation of more dust bins at various parts of the town.
- Use of different coloured dust bins for the seggregated collection of solid waste.

❑ **Noise Pollution**

a) Transport

- Noise level norms need to be strictly enforced for vehicles and monitored regularly. Restrict the running of heavy vehicle during day time.
- Use of diesel engine fitted autos, which are noisy should be avoided in the city.
- Public transport buses should be properly maintained and lubricated to avoid noise pollution.
- Resurfacing roads with law noise materials for areas with extremely high traffic.
- Houses near busy roads, railways and Airports should be provided noise insulation packages consisting of Venetian blinds and materials for secondary glazing.
- Public and private official buildings near busy roads, railways and airports should install noise insulation for the comfort of employees there.
- Planting of trees at road sides and residential areas is a good way to reduce noise pollution as they absorb sound.

b) Public and Private functions

- Use of loud speakers/crackers for public and private functions (rallies, demonstrations, religious rituals in temples, cultural prgrammes and festivals) should adhere to the noise pollution norms and it should be strictly enforced. Use of modern laser shows should be encouraged in place of large scale fire works.
- Proper training and equipments should be provided to police to ensure noise control.
- Plantation of trees around buildings (schools, houses, offices) should be encouraged.
- Noise zoning should be established as described to in Chapter 32 (Silence Zone) and awareness among residents should be generated.

c) Industries.

- Ensure that all industries corporation should abide by CPCB (Central Pollution Control Board) specification 2 of noise standards.
- Proper maintenance of mechanical components of equipments should be strictly followed in all industries.
- Adequate lubrication to machine parts and providing removable insulation jackets to machines can reduce noise to a large extent.

31.16 MUNICIPAL FINANCE AND GOVERNANCE

SPECIFIC PROJECTS

■ **Municipal Guest House**

A guest house is necessary for the town to give accommodation facilities to officers coming for auditing and routine inspection. The Guest house can also be used for accomodating official guests and

municipal staff coming from other districts. Municipality can also get additional income by renting the available rooms to tourists and other people. Location of the municipal guest house is near Pazhassi sub-station at survey No. 99 Pazhassi Desom, Pazhassi village and the land extent is 25 cents (0.101 Ha).

■ **Municipal Staff Quarters**

Many of the employees in the Municipal office are coming from different parts of the State. And there is not much accommodation facilities available in Mattannur town. Therefore, a municipal staff quarters is essential in the town and will be helpful for municipal administration. The land identified for the project is at Survey No.50(P) of Mattannur Desom of Pazhassi Village.

General proposals

♦ **Good Governance**

For becoming a smart city, smart governance is required and the componets include

- Starting of Municipal sub-centres at Porora, Kayani and Vembadi.
- Strengthening of E-governance, RTI, Cell, RTS Cell, Citizen forum etc.
- Renewal and Publication of brief-lets for municipal services.
- Awareness and training programme for public participation and co-ordination.
- Monitoring cell for accountability and transparancy.

♦ **Proposals for sustainable Income generations.**

Mattannur is a developing town with limited resources of income and the town is looking forwarded the airport and the related developments for the economic growth. Sustainable income generation proposals and financial aids from various funding agencies are essential for developing a stable financial background for the municipality in the coming years. Some proposals for income generation are as follows.

- Plantation of commercial trees like Teak, Mahagony, Jack, Tamarinds etc. on Municipal lands, vacant lands and on road sides.
- Conducting mini bus services.
- Paid parking systems.
- Construction of commercial and residential buildings for rent.
- Users fee collection from Bypass roads to airport.
- Promoting tourism activities.
- Preparation of resource plan.
- Reforms in tax collection.

31.17 PRIORITY WISE LIST OF PROJECTS

Prioritization of projects becomes necessary when the income and resources are limited. Considering the factors like existing facilities in the town, urgency of the proposed projects, the role of the projects in the economy of the town etc., the projects are prioritized as given below.

Sector	First Priority	Second Priority	Third Priority
Traffic and Transportation	1. Ring Road 2. Junction improvement • Mattannur Junction • Maruthayi road Junction • Vayanthode Junction 3. New Bus Terminal 4. Parking lots at Mattannur, Palottupally, Nellunni and Uruvachal 5. Road widening • Anjarakandy road (18m) • Kara-Devarkad-Nellunni-Bye-pass road • Kallerikara-Lions Park, Canal Bund Bye-pass road (18m) • TC Road-Cut & Cover-jPriya Talkies Bye-pass road (18m) • Aayiramchal road-Canal road-TC road (Bye-pass road) (12m) • Mukundan Master road (9m)	1. Uruvachal- Manakayi road 2. Junction improvement • Palottupally Junction • Uruvachal Junction 3. Truck terminal at or near export allied zone 4. Parking Plaza at Old Bus Stand 5. Pedestrian Crossing Facilities 6. 'Town to river service' - Mini Bus Service of Mattannur Municipality 7. Bus bays with Hi-tech waiting shelters 8. Road widening • Thalassery-Coorg road (24m) • Kannur road (24m) • Maruthayi road (15m) • Uruvachal-Sivapuram road (15m) • Mattannur-Ayyallur-Sivapuram road (15m) • Hospital road (9m) • NCC road (9m)	1.Proposed Link road-Kara-Devarkad-Nellunni road (18m wide) 2. Junction improvement • All other junctions 3. Sidewalks or walkways 4. Fly Over between Old Bus Stand and New Bus Terminal 5. Beautification of Mattannur, Palottupally and Uruvachal towns 6. Road widening • Widening proposal of all other roads
Civic Amenities and Recreation	1.Mini Civil Station at south side of Court 2.Convention Centre at Mattannur 3.Public Crematorium at Porora	1. Stadium at Onaparamba 2. ' Mattannur Square' at Municipal office compound 3. Indoor Stadium near Post office	1. Pazhassi Raja Recreation Park at Nellunni 2. Play ground at Kallur

Sector	First Priority	Second Priority	Third Priority
Trade and Commerce	1. Warehouses with Cold Storage facility 2. Developments of parking centres 3. Modern markets for Fish, Meat, Fruit and Vegetables		1. Separate Whole sale Market
Industries	1. KINFRA Park Portion near PRNSS College 2. Packing and Labeling Unit	1. Industrial Park at Hazardous Zone, Porora 2. 'Malabar Food package'- Export Program 3. Handloom and Handicraft Emporium 4. Exhibition cum trading centre for small scale and Cottage industries 5. Meat Processing and Exporting Unit	1. Industrial City with Cyber Park at Kallur 2. Expansion of Mini Industrial Estate at Nellunni 3. Recycling Unit for plastic and other waste at Porora
Water Supply	1. KWA Project– Water Supply Scheme to Mattannur Municipality		
Drainage and Sanitation	1. Sewage Treatment Plant at Chekyattuvayal		
Heritage, Tourism and Culture	1. Conservation of Pazhassi Kovilakam precinct 2. Preservation of Mural Paintings at Pariyaram Subramanya Temple	1. Tourist facilitation Centre at Inspection Bungalow Hills 2. Eco-tourism at Poongottukavu vanam	1. Paithrika Mandapam- Heritage Complex at Pazhassi
Education	1. Upgradation of Government UP School to High School	1. Academic and Career facilitation Centre	1. Language Research Centre

Sector	First Priority	Second Priority	Third Priority
Health	1. Expansion and Development of Community Health Center 2. Mobile Detection Unit for Life Style Diseases and Infectious Disease 3. Sub-center for Cancer detection and care	1. Blood Bank and Lab facilities	1. Counseling centre for Teenagers
Social Welfare	1. Women's Room and Toilets at major centers	1. Women Bank	1. Rehabilitation centre for differently abled students with job oriented courses
SC/ ST Welfare	1. ' Ambedkar Sevana Kendram'		
Agriculture	1. Centre for Preservation of native crops 2. Agriculture Labour Bank	1. Agro-Bazar (Haritha Bhavan) 2. Herbal Garden at Poongottukavu	1. Agricultural Market
Animal Husbandry	1. Animal Farm and Slaughter house at Pazhassi 2. Mobile Clinic Unit to Veterinary Hospital	1. Hatchery Unit	1. Hy-brid Farm
Environment			1. Environmental Park near Poongottukavu
Municipal Finance and Administration	1. Municipal Guest House	1. Municipal Staff Quartrs	

31.18 IMPLEMENTATION DETAILS OF PROJECTS AND PROPOSALS OF TRAFFIC AND TRANSPORTATION

A. PROJECTS

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
1	***New Bus stand complex at Kokkayil***	Construction of complex including bus stand, Bus bays, parking yards, Commercial buildings	50 Crores	Municipality, PWD, Jilla Panchayath, KSRTC
2	***Parking Plaza at Old Bus stand***	Construction of a multi-storied parking cum commercial tower with multiplex	10 Crores	Municipality
3	***Parking lots at Mattannur, Palottupally and Uruvachal***	Identification and acquisition of suitable lands, Construction activities including comfort stations, Commissioning	4.50 Crores	Municipality
4	***Truck Terminal at Export Allied Zone***	Construction of a complex including Parking yard, loading and unloading facilities, fuel filling station, weigh bridge, rest rooms, rooms for booking agents, restaurant, , toilets etc.	8 Crores	Municipality, KIAL
5	***'Formation of Ring Road***	Land Acquisition, Widening and improvement of existing roads, Construction of new roads and missing links including bridges and culverts	It is constituted by 14 road segments	Municipality, PWD, Jilla Panchayath, Kerala Road Fund Board (KRFB)
6	***Construction of new Bye-passes 1.Kallerikara-Lions Park, Canal Bund Road (18m Wide)*** ***2.T.C Road-Cut & Cover- Petrol Pump Road (18m Wide)*** ***3. Ayiramchal Road-Canal Road- TC Road (12m Wide)***	Land Acquisition, Widening and improvement of existing roads, Construction of new roads and missing links including bridges and culverts	10 Crores 18 Crores 5 Crores	Municipality, KIAL, Jilla Panchayath, KRFB

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
7	***Construction of new Link Road for Ring Road*** ***1. Kara-Devarkad-Nellunni Road (12m Wide)***	Land Acquisition, Widening and improvement of existing roads, Construction of new roads and missing links including bridges and culverts	18.50 Crores	Municipality, KIAL, Jilla Panchayath, KRFB
8	***24m Widening proposal*** ***1.Thalaseri-Coorg Road*** ***2.Kannur Road***	Land Acquisition, Widening and improvement of existing roads	115 Crores 24 Crores	Municipality, PWD, KSTP, KRFB, Transport Dept.
9	***18m Widening proposal*** ***1. Anjarakandy Road***	Land Acquisition, Widening and improvement of existing roads	21 Crores	Municipality, PWD, Jilla Panchayath, Kerala Road Fund Board (KRFB), Transport Dept.
10	***15m Widening proposal*** ***1.Maruthayi Road*** ***2.Uruvachal –Manakayi Road*** ***3. Uruvachal-Sivapuram Road*** ***4. Mattannur-Ayyallur-Sivapuram Road***	Land Acquisition, Widening and improvement of existing roads	41 Crores 24 Crores 24 Crores 14 Crores	Municipality, PWD, Jilla Panchayath, Kerala Road Fund Board (KRFB), Transport Dept.
11	***12m Widening proposal*** ***1. Mattannur-Velliyamparamba-Irikkur Road (College Road)*** ***2. Palottupally-Vembady-Kolari Road*** ***3. Vembadi-Sivapuram Road*** ***4. 21th Mile-Shivapuram Road (Kolari-Nediyanhiram Road)*** ***5. Karithurparamba- Porora Road*** ***6. Mannur-Periyachur-Porora-Elannur-Kanhiramkari Road***	Land Acquisition, Widening and improvement of existing roads	140 Crores	Municipality, PWD, Jilla Panchayath, Kerala Road Fund Board (KRFB), Transport Dept.

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
	7. Maruthayi-Payyaparamba-Nalankeri- Porora Road ***8. Keecheri Road*** ***9. Malakkuthazhe-Kara-Canal Road*** ***10. Karetta-Kanhileri-Maloor Road*** ***11. Kokkayil Road*** ***12. Maruthayi-Mettadi- Kiliyangad Road*** ***13. Peruvayalkari-Puliyangad Road*** ***14. Pazhassi-Idaveli Road*** ***15. Mannur-Podiparamba-Mulliam Road*** ***16. Moonampeedika- Koolikadavu Road*** ***17. Kallur palam-Keecheri Road***			
12	***<u>9m Widening proposal</u>*** ***1. Keecheri -Mancha Colony Road*** ***2. Hospital Road*** ***3. Gramadeepam Vayanasala-Puliyangad Road*** ***4. Karetta-Mundorapoyil Road*** ***5. Bavottupara-Elakkuzhi Road*** ***6. Manjeripoyil- Mundorapoyil Road*** ***7. N.C.C Road*** ***8. Perinchery-Theluppu Road*** ***9. Mukundan Master Road*** ***10. Parambil Jn . Mancha colony-Porora Road*** ***11. Onangalottu-Payyaparamba Road*** ***12. Keecheri -Chelleri Road*** ***13. Nellunni-Bavottupara Road*** ***14. Kalaroad- Unnimukku-*** ***15. Kayallur-Vembadi Road*** ***16. Nellunni Kannattumkadavu Edavelikkal Road*** ***17. Maruthayi Kooleri Road*** ***18. Kallerikkara-Parappoyil-Vayanthodu Road*** ***19. Pazhassi-Edappazhassi Road*** ***20. Ayyallur -Edappazhassi Road*** ***21. Petrol Pump-Cut and Cover Road***	Land Acquisition, Widening and improvement of existing roads	40 Crores	Municipality, PWD, Jilla Panchayath, Kerala Road Fund Board (KRFB), Transport Dept.

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
13	***6m Widening proposal*** ***All other Municipal Roads***	Land Acquisition, Widening and improvement of existing roads	75 Crores	Municipality, Jilla Panchayath, Kerala Road Fund Board (KRFB), Transport Dept.
14	***Junction Improvement Works*** ***1. Mattannur Junction*** ***2. Maruthayi-Rod Junction*** ***3.Vayanthode Junction*** ***4.Palottupally Junction*** ***5.Uruvachal Junctions*** ***6.Karetta Junction*** ***7.Sahina-Theatre Junction*** ***8. Hospital Road Junction*** ***9. Temple Road Junction*** ***10.Kalaroad Junction*** ***11.Maruthayi Junction*** ***12.Karithurparamba Junction*** ***13.Vembadi Junction***	Detailed Plan, Land Acquisition, Construction activities	4 Crores	Municipality, PWD, KSTP, Jilla Panchayath, Kerala Road Fund Board (KRFB), Transport Dept.
15	***Footpath construction and beautification works*** ***1.Kannur Road (Mattannur Jn. to Vayanthode)*** ***2. Iritty Road (Mattannur Jn. to Palottupally)*** ***3. Thalasseri Road (Mattannur Jn. to Canal Bridge)***	Detailed Plan, Land Acquisition, Construction activities	2 Crores	Municipality, PWD, KSTP, Jilla Panchayath, Kerala Road Fund Board (KRFB), Transport Dept.
16	***Pedestrian Crossing Facilities at Kannur Road, Tellicherry Road, Iritty Road***	Detailed Plan, Land Acquisition, Construction activities	0.75 Crores	Municipality, PWD, KSTP, Jilla Panchayath, Kerala Road Fund Board (KRFB), Transport Dept.
17	***Beautification of Mattannur, Palottupally and Uruvachal town***	Detailed Plan, Land Acquisition, Junction Improvement works, Construction of footpaths and median, landscaping and gardening	1.50 Crores	Municipality, PWD, KSTP, Jilla Panchayath, Kerala Road Fund Board (KRFB), Transport Dept.

B. PROPOSALS

Sl. No.	Proposals	Activities involved	Agencies involved
1	***Fly over between Old bus Stand and New bus terminal***	Preparation of DPR, Acquisition of Land, Tendering, Construction activities, Commissioning and functioning.	Municipality, PWD, Jilla Panchayath, Kerala Road Fund Board (KRFB), Kerala Roads and Bridges Corporation (Ltd.), MPLAD, MLALAD, Central and State Government Funding Agencies
2	***Bus Bays with Hi-tech Waiting Shelters***	Location of sites, acquisition/ relinquishment of land, tendering, construction activities, commissioning and functioning	Municipality, PWD, Jilla Panchayath, Kerala Road Fund Board (KRFB), Central and State Government Funding Agencies, MPLAD, MLALAD, Sponsors, Advertising agencies
3	***Strengthening Public Transport System***	Extention of existing Bus services to remote areas by mandatory provisions like rotatory system, alternate day system, once or twice in a week service etc., to cover all regions of municipality.	Municipality, KSRTC, Private Bus Operators, RTO, Motor Vehicles Department.
4	***'Town to River' Mini Bus Service***	Mini bus services of Municipality to remote and hinter land areas to provide public transport. (Arranging bank loans/ Sponsors, Purchase of vehicles, appointment of staff, commissioning and functioning)	Municipality, Co-operative Institutes, MPLAD, MLALAD, Financiers and Banks, Passengers, RTO, Motor Vehicles Department, Sponsors, Advertising agencies.

31.19 IMPLEMENTION DETAILS OF SPECIFIC PROJECTS

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
CIVIC AMENITIES AND RECREATION				
1	***Mini Civil Station at south side of Court***	Relinquishment of land from Irrigation Dept., Land Development and Construction activities, Commissioning and Functioning	25 Crores	Municipality, Irrigation Dept., PWD, Jilla Panchayath, Various Departments
2	***Convention Centre at Mattannur***	Identification of land, Relinquishment/ Acquisition of land, Construction activities, Commissioning and functioning	20 Crores	Municipality, Jilla Panchayath, MP and MLA Schemes
3	***Public Crematorium at Porora***	Construction of buildings and compound wall, Installation of crematorium, Posting of staff, Commissioning the project	1 Crores	Municipality
4	***Stadium at Onaparamba***	Acquisition of land, Tendering, Development and Construction activities, Commissioning and Functioning	25 Crores	Municipality, Jilla Panchayath, Dept. of Sports and Youth Affairs, Sports Council, SAI, MP and MLA Schemes
5	***'Mattannur Square' at Municipal office compound***	Land Development works, Construction of open air auditorium, Setting up of Children's Park, Commissioning, functioning and Maintenance	2 Crores	Municipality, Jilla Panchayath, MP and MLA Schemes
6	***Pazhassi Raja Recreation Park at Nellunni***	Acquisition of land, Land Development works, construction of walkways, lawns, Botanical Gardens, Mini Zoo, Exhibition Halls, Toilets, Children's Play area, Play grounds, Restaurants and food pavilions, Open air auditorium, Artisan emporium etc	60 Crores	Municipality, Jilla Panchayath, Dept. of Sports and Youth Affairs, MP and MLA Schemes, Private entrepreneurs, Banks

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
7	***Indoor Stadium near Post Office***	Acquisition of land, Tendering, Development and Construction activities, Commissioning and Functioning	20 Crores	Municipality, Jilla Panchayath, Dept. of Sports and Youth Affairs, Sports Council, SAI, MP and MLA Schemes
8	***Play ground at Kallur***	Land Development works, Construction of open air auditorium, Setting up of Children's Park, Commissioning, functioning and Maintenance	10 Crores	Municipality, Jilla Panchayath, MPLAD and MLALAD Schemes
TRADE AND COMMERCE				
9	***Warehouses with Cold Storage facility***	Identification of locations, Acquisition of land, construction of buildings, Commissioning and functioning	8 Crores	Municipality, KIAL, Private owners, Banks, Traders
10	***Separate Whole sale Market***	Identification and acquisition of land, Construction of Building, Functioning	10 Crores	Municipality, Traders, Publics
11	***Developments of Parking Centres***	Identification and acquisition of land, Construction of Parking lots	5 Crores	Municipality,Private owners, Publics
12	***Modern Markets for Fish, Meat, Fruit and Vegetables***	Acquisition of land, Construction of Building and Waste treatment plant,/Bio-gas Plant, Commissioning of Market Complex	20 Crores	Municipality, Jilla Panchayath, Pollution Control Board, Banks, Beneficiaries
INDUSTRIES				
13	***Industrial City with Cyber Park at Kallur***	Acquisition of land, plot sub division, furnishing of infrastructural facilities including new roads and widening of roads, Construction of industrial and incidental buildings, Setting up of Industrial units, Establishing of Cyber Park	25 Crores	Municipality, Industrial Department, DIC, KSIDC, Kerala State Entrepreneur Development Mission(KSEDM), KINFRA, Investors, SIDBI (Small Industrial Development Bank of India), Banks, Beneficiaries

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
14	***Industrial Park at Hazardous Zone, Porora***	Acquisition/Development of land, furnishing of infrastructural facilities, Construction of Buildings, Setting up of Industries(preferentially Hazardous type)	20 Crores	Municipality, Industrial Department, DIC, KSIDC, Kerala State Entrepreneur Development Mission (KSEDM), KINFRA, Investors, SIDBI (Small Industrial Development Bank of India), Banks, Beneficiaries
15	***KINFRA Park Portion near PRNSS College***	Acquisition of land by KINFRA, Plot Sub division, Construction of Industrial and incidental buildings, Setting up of Industrial units	50 Crores	Municipality, Keezhallur Panchayath, Industrial Department, DIC, KSIDC, KSEDM, KINFRA, Investors, SIDBI, Banks, Beneficiaries
16	***Expansion of Mini Industrial Estate at Nellunni***	Acquisition of more land, Setting up of new Industries, Strengthening of Sick Units	10 Crores	Municipality, Industrial Department, DIC, KSIDC, KSEDM, Investors, SIDBI, Banks, Beneficiaries
17	***Packing and Labeling Unit***	Identification of Site at Export and allied zone, selection of beneficiaries, mobilization of funds, construction of building, purchase of machinery, Commissioning	2 Crores	Municipality, KIAL, Industrial Department, DIC, KSEDM, KSIDC, Investors, SIDBI, Banks, Beneficiaries like Kudumbasree
18	***Malabar Food Package'- Export Program***	Identification of Site, selection of beneficiaries, mobilization of funds, construction of buildings, purchase of machinery, commissioning of industry	2 Crores	Municipality, KIAL, Food Inspector, Industrial Department, DIC, KSIDC, PCB, Banks, Kudumbasree/Private/ Co-operative Entrepreneurs
19	***Handloom and handicraft Emporium***	Identification of Site, construction and commissioning of an emporium	2 Crores	Municipality, Hantex, Khadi and Village Industries Board (KVIB), Industrial Department, DIC, KSIDC, KSEDM, Investors, Banks, Beneficiaries
20	***Exhibition cum trading centre for small scale & Cottage industries***	Selection of suitable location, Establishment of trade centre with infrastructure facilities	2 Crores	Municipality, Industrial Department, DIC, KSIDC, Khadi and Village Industries Board (KVIB), Social Welfare Dept., Investors, Banks, Beneficiaries, Kudumbasree Units

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
21	***Meat Processing and Exporting Unit***	Identification of Site, selection of beneficiaries, mobilization of funds, construction of buildings, purchase of machinery, commissioning of industry	50 Crores	Municipality, Animal Husbandry Dept., KVASU, KIAL, PCB,Industrial Department, DIC, KSIDC, Banks, Private/Co-operative Entrepreneurs
22	***Recycling unit for plastic and other wastes at Porora***	Construction of buildings, setting up of Plants and equipments	1 Crores	Municipality, Industrial Department, DIC, KSIDC, KSEDM, PCB, Investors, SIDBI, Banks, Beneficiaries
WATER SUPPLY				
23	***KWA Project-Water Supply Scheme to Mattannur Municipality***	Approval, Construction of Water Treatment Plant and Water Tanks, Laying of Pipes and Distribution system, Commissioning	71 Crores	Kerala Water Authority, Municipality
DRAINAGE AND SANITATION				
24	***Sewage Treatment Plant at Chekyattu Vayal***	Identification and acquisition of suitable lands, Construction of treatment plants, Commissioning, Functioning and Maintenance	2 Crores	Municipality, Pollution Control Board, KWA, MP Scheme, MLA Scheme
HERITAGE, TOURISM AND CULTURE				
25	***Conservation of Pazhassi Kovilakam Precinct***	Acquisition of land, Conservation and preservation activities at Kovilakam Precinct and outside places like Pazhassikunnu, Pazhassi Madam area, Setting up of Museum and Art Gallery, Tourism Activities	1 Crores	Municipality, Kovilakam Authorities, Heritage Commission of Kerala, KTDC, DTPC, Tourism Dept., Cultural Dept.
26	***Tourist facilitation Centre at Inspection Bungalow Hill***	Conservation and preservation activities, Shifting of PWD Guest House, Setting up of Tourist Facilitation Centre with accommo-dation facility, Setting up of Museum /Art Gallery, Exhibition Hall, Renovation of Park , Tourism Activities	2 Crores	Municipality, Heritage Commission of Kerala, KTDC, DTPC, Tourism Dept., Cultural Dept.

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
27	***Eco- tourism at Poongottu-kavu vanam***	Construction of a Tourist Base camp and Comfort Station at Herbal Garden, Posting of a Watchman, Construction of an eco-walkway from road	1.50 Crores	Municipality, Forest Dept., DTPC, KTDC
28	***Paithruka Mandapam - Heritage Complex at Pazhassi***	Acquisition of Land, construction of buildings, conducting coaching and performance of Arts, Dances folklores, Theyyam, cultural and heritage activities, Heritage gallery for conservation and exhibition of heritage/folk knowledge & culture, heritage tools and implements	0.50 Crores	Municipality, Dept. of Culture, Heritage Commission, Folklore Academy, KTDC, DTPC, Tourists
29	***Preservation of Mural Paintings at Pariyaram Subramanya Temple***	Conservation and preservation works of the existing mural paintings, promotion of tourist activities	0.50 Crores	Municipality, Temple Authorities, Dept. of Culture, Heritage Commission, KTDC, DTPC, Tourists and Pilgrims
EDUCATION				
30	***Upgradation of Govt.UP School to High School***	Relinquishment of land, Building construction work , Installation of facilities, Commissioning and functioning	2 Crores	Municipality, Education Department, SSA, Jilla Panchayath, MLA Scheme, MP Scheme
31	***Academic and Career Facilitation Centre***	Identification and Acquisition of land, Building construction, Setting up of Referral Library and Career Guidance Centre, Coaching centre for competitive exams, NET, SET, TET, and Entrance Exams, Continuing Education Centre etc.,	1 Crores	Municipality, Education Dept., State Library Council
32	***Language Research Centre***	Identification of land, Acquisition of land, Building construction works , Installation of facilities, Commissioning and functioning	1.50Crores	Municipality, Govt./Private owners, Education Department

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
HEALTH				
32	***Expansion and upgradation of Community Health Centre***	Acquisition of adjacent land, construction of buildings for new blocks and staff quarters, Starting of Gynecology, Ophthalmology and Cardiology Depts.	20 Crores	Municipality, Jilla Panchayath, Health Dept
33	***Blood bank and Lab facility***	Selection of location, Construction/Hiring of Building, Installation of facilities, commissioning and functioning	0.50 Crores	Municipality, Health Dept., Jilla Panchayath, Hospitals, Charitable organizations
34	***Counselling centre for Teenagers***	Selection of location, Construction/Hiring of Building, Installation of facilities, commissioning and functioning	0.50 Crores	Municipality, Block Panchayath, Jilla Panchayath, Health Dept., Schools and Colleges
35	***Mobile Detection Unit for Life Style Diseases and Infectious diseases***	Purchase of Vehicle, Installation of Lab facility, Posting of staff, Training	0.50 Crores	Municipality, Health Dept., Social Welfare Dept., NRHM, Kudumbasree units
36	***Sub-centre for Cancer detection and care***	Selection of location, Acquisition of land, Construction/Hiring of Building, Installation of facilities, commissioning and functioning	1 Crores	Municipality, Health Dept., R.C.C., Cancer Care Societies , Charitable organizations, NRHM
SOCIAL WELFARE				
37	***Rehabilitation centre for differently abled students with job oriented courses***	Acquisition/Relinquishment of land, construction of building, teaching and training	2 Crores	Municipality, Social Welfare Dept., Health Department, Jilla Panchayath
38	***Women's Room and Toilets at major centres***	Selection of land, Acquisition/ Relinquishment ,Construction/ Hiring of Building with Toilets, Completion and functioning	0.50 Crores	Municipality, Social Welfare Dept.
39	***Women's Bank***	Selection of land, Acquisition/ Relinquishment ,Construction of Building/ Hiring , Commissioning and functioning	0.50 Crores	Municipality, Central and State Govt., Co-operative Department, Jilla Panchayath, MP Scheme, MLA Scheme

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
SC/ST WELFARE				
40	***'Ambedkar Sevana Kendram'***	Selection of land, acquisition/ relinquishment of land, construction of building, providing library, internet facilities, arrangement of tuition classes to school and college students, coaching classes for Entrance exams and competitive exams, job oriented short term courses	1 Crores	Municipality, Central and State Govt., SC/ST Dept., KIRTADS, Jilla Panchayath, SC/ ST Facilitators
AGRICULTURE				
41	***Centre for Preservation of native crops***	Identification of suitable land for centre and cultivation of crops, Acquisition of land, Building construction, Posting of Technical staff, making land suitable for cultivation including irrigation facilities, procurements of local variety of seeds and manure, Active Cultivation including weed removal, Preservation of seeds	1 Crores	Agriculture Department, Agricultural Universities and Research Centres, CPCRI, State and Central Farms, Municipality, NABARD, Farmers, NREGS Workers
42	***Agro-Bazar (Haritha Bhavan)***	Acquisition of land, building constructions, posting of technical staff, training and coaching for farmers, Procurement, sales and hiring of tools and implements	1 Crores	Agriculture Department, NABARD, Municipality, State and Central Farms, Agricultural Universities and Research Centres
43	***Agricultural Market***	Identification of land, Acquisition, Building construction with granaries and cold storage facilities	2 Crores	Agriculture Department, NABARD, Municipality, Marketing agencies, AGMARK, Departments of Animal Husbandry and Dairy Development
44	***Agriculture Labourer Bank***	Construction of Building, Posting of Staff, Training and registration	1 Crores	Municipality, Agriculture Dept., NREGS Workers, Labours
45	***Herbal Garden at Poongottukavu***	Construction of Building, Making land suitable for plantation, Procurement of medicinal Seeds and seedlings, Active Cultivation, Arrangements for marketing and exporting	0.50 Crores	Municipality, Health Dept., State Medicinal Plant Board, Kerala

Sl. No.	Projects	Activities involved	Approx. Cost	Agencies involved
ANIMAL HUSBANDRY				
46	***Animal Farm and Slaughter house at Pazhassi***	Acquisition of land, Construction of Buildings and sheds, Posting of Staff and labours, procurement and farming of Poultry, Goat, Cattle, Pig, Rabbits etc., Slaughtering and sales, Meat processing, Bio-gas plant, production of manure.	20 Crores	Municipality, Animal Husbandry Dept., Kerala Veterinary and Animal Sciences University (KVASU)
47	***Hatchery Unit***	Construction of Buildings, Installation of hatchery unit, Outlet for baby chicken, farming activities	1 Crores	Municipality, Animal Husbandry Dept., KVASU
48	**Hybrid Farm**	Acquisition of land, Construction of Buildings and sheds, Appointment of Staff and labours, procurement of cattle, production of high breed variety cattle, farming and sales of calves, Installation of Bio-gas plant, production and sales of manure etc	3 Crores	Municipality, Animal Husbandry Dept., Kerala Veterinary and Animal Sciences University (KVASU), Indo-Swiss Project at Mattuppetty, MILMA, Kerala Livestock Development and Milk Marketing Board., MPLAD, MLALAD
49	**Mobile Clinic Unit to Veterinary Hospital**	Purchase of Vehicle, Installation of clinic facilities, appointment of driver and staff, Commissioning and functioning	0.50 Crores	Municipality, Animal Husbandry Dept., KVASU, Jilla Panchayath MPLAD, MLALAD
ENVIRONMENT				
50	***Environmental Park near Poongottukavu***	Land Acquisition, Botanical Garden, Biodiversity research centre, Illustration of environmental protection methods, open air auditorium for exhibitions and classes, rainwater harvest tanks, Rain pits, Restaurant, Toilets	1 Crores	Municipality,Central and State Govt., Forest Dept., Universities, Environment Dept., Water Conservation Society, NGOs
MUNICIPAL FINANCE AND GOVERNANCE				
51	**Municipal Guest House**	Land acquisition, Tendering, Construction activities, Appointment of Staff. Commissioning and Functioning	7 Crores	Municipality, Jilla Panchayath, KTDC, MPLAD, MLALAD
52	**Municipal Staff Quarters**	Land acquisition, Tendering, Construction activities, Commissioning	3 Crores	Municipality, Jilla Panchayath, KTDC, MPLAD, MLALAD

31.20 IMPLEMENTION DETAILS OF GENERAL PROPOSALS

Sl No.	Proposals	Activities Involved	Agencies Involved
CIVIC AMENITIES AND RECREATION			
1	***Community halls at Uruvachal, Maruthayi Vembadi, Kayani, Porora, areas***	Identification of land, Relinquishment/Acquisition of land	Municipality, Jilla Panchayath, Social Welfare Dept., MP and MLA Schemes
2	***Multiplex Theatre and Cinema Talkies***	Identification of land, Approval, Building construction, Licensing and functioning	Municipality, KSFDC, KTDC, DTPC, Private entrepreneurs, Banks
3	***Swimming Pools Construction and improvement***	Renovation and improvement works for existing swimming pools, Site selection and acquisition of land for new pools, Construction activities, Completion and functioning, Swimming coaching etc.	Municipality, Jilla Panchayath, Dept. of Sports and Youth Affairs, Sports Council. Private entrepreneurs, Banks
4	***Renovation of existing parks***	Site Clearing, planting trees, gardening, landscaping , beautification works, installation of Children play units, posting of Gardener/watchman	Municipality, Kudumbasree Units
TRADE AND COMMERCE			
5	***Municipal Shopping Complexes and markets at interior Nodes***	Selection and acquisition of lands at nodes like Uruvachal, Palottupally, Vembadi, Mannur, Kayani/Manakayi Porora, Maruthayi, Ayyallur, Kolari, Kara, etc., Construction of Buildings, Commissioning of the projects	Municipality, Jilla Panchayath, Beneficiaries
6	***Weekly Markets for Farmers and Cottage Industries***	Identification and acquisition of land, Construction of stalls	Municipality, DRDA, KVIB, Social Welfare Dept.
7	***Construction of Star Hotels***	Application from entrepreneurs, Approval, Construction, functioning	Municipality, Private Owners, Banks, Traders and Tourists, DTPC
INDUSTRIES			
8	***Strengthening of Handloom, Khadi and Cottage industries***	Selection of beneficiaries, mobilization of funds, Strengthening and setting up of handloom units and cottage industries, purchase of machinery, construction and commissioning of an emporium	Municipality, Hantex, Khadi and Village Industries Board (KVIB), Industrial Department, DIC, KSIDC, KSEDM, Investors, Banks, Beneficiaries

Sl No.	Proposals	Activities Involved	Agencies Involved
9	***Processing Units for Agro-products (Coconuts, Cashew, Jack fruits etc.)***	Identification of Site, selection of beneficiaries, mobilization of funds, construction of buildings, purchase of machinery, commissioning of industry	Municipality, Industrial Department, DIC, KSIDC, Agriculture Dept., AGMARK, KSEDM, SIDBI, KVIB, Investors, Banks, Beneficiaries
WATER SUPPLY			
10	***Localised Water supply Schemes***	Identification of drought area and formation of Beneficiary Clusters, Selection of Locations for Wells and Tanks, Purchase of Land, Construction of Wells, Tanks, Installation of Pumps and pipes, laying of distribution system	Municipality, Jalanidhi, Ground Water Dept.
11	***Construction of Public Wells and deepening of existing wells***	Selection of locations, Purchase/ Acquisition of land, Digging of Wells, Deepening of existing wells	Municipality, Ground WaterDept
12	***Renovation of Ponds and springheads***	Selection of water sources, Cleaning and deepening of pond, construction of lining, Installation of Pumps, Tanks and distribution system	Municipality, Ground WaterDept.
13	***Extension of existing pipelines to drought areas***	Identification of suitable area, extension of existing network and distribution system	Municipality, Kerala Water Authority
14	***Water conservation Project***	Formation of Water Conservation Societies, Awareness and training programs, Construction of Check dams, rain water pits and recharging units, rain water harvesting tanks	Municipality, Kannur Water Conservation Society (KWCS), Kerala Water Authority, Ground Water Department
DRAINAGE AND SANITATION			
15	***City drainage project for future***	Identification of problem areas, Preparation of Detailed Project Report, Tendering, Construction activities, Commissioning, Maintenance	Municipality, Kerala Water Authority, Government agencies for City sanitation and drainage
16	***'Drains and cover slabs' to major roads***	Identification of sites, drain clearing, construction of new drains, laying of cover slabs	Municipality, PWD, KSTP

Sl No.	Proposals	Activities Involved	Agencies Involved
17	***Improvement of thods and streams***	Rejuvenation of thods by removing grass, weeds, mud etc., deepening and side protection works	Municipality, Jilla Panchayath
18	***Total Collection-Solid waste Collection Programme***	Awareness Programmes, Segregated collection, door to door collection, provision of additional bins and Collection points, Fleet modernization	Municipality, Kudumbasree Units, Merchants Associations, Residents Associations, Ward Sabha, Ayalkootam, Clubs and Cultural Organization
19	***Modernization of treatment plant at trenching ground***	Installation of modern machines and techniques for treatment, landscaping of the area including planting of trees absorbing gases	Municipality
20	***Decentralized waste management***	Individual waste management facilities at source like Bio gas plant, pipe compost, vermin compost etc	Municipality, beneficiaries
21	***Mini Sewage Treatment Plants at Comfort stations***	Identification of locations, constructions of plants, active implementation	Municipality, KWA, beneficiaries
22	***Plastic Free Mattannur' Project***	Awareness programs to reduce usage of plastic materials, Door to door collection of Plastic wastes through special squads, Providing of special bins, legal action against litterers	Municipality, Kudumbasree units
23	***Bio gas plants at Markets, Slaughter house, farms etc.***	Identification of locations, constructions of plants, active implementation	Municipality, beneficiaries
HERITAGE, TOURISM AND CULTURE			
24	***Tourist resorts and tree houses***	Construction of resorts, retreats, tree houses, etc, adversisement through websites and media, functioning with linkage of Tourism Department.	Municipality, DTPC, KTDC,Public, Private and Co-operative enterpreners

Sl No.	Proposals	Activities Involved	Agencies Involved
25	***'Pazhassi Smrithi' Conducted tourism circuit***	Plan preparation, approval, Purchase/ Hiring of vehicles, implementation of tour programme connecting Pazhassi Raja related sites, religious and other tourist spots (including Pazhassi Dam), Installation of food stalls and delivery of local/domestic food through Kudumbasree units	Municipality, nearby Panchayaths, DTPC, KTDC,KIAL, Irrigation Dept., Kudumbasree Units, Tourists
26	***'Kannur Yatra' – District Tour Programme***	Plan preparation, approval, Purchase/ Hiring of vehicles, implementation of tour program connecting major tourist spots in the district	Municipality, KTDC, DTPC, KIAL, Jilla Panchayath
27	***Water front tourism at Irikur River and Anjarakandy River***	Identification of suitable spots, Construction of Boat Jetty and check dams and facilitation centres, Purchase /hiring of Boats, Boating and waterfront activities	Municipality, nearby Panchayaths, DTPC, KTDC, Tourists
28	***Linking of Mattannur festival and Theyyam season with tourism activities***	Preparation of tourism and festival calendar, promotional activities, publicity programmes including renowned persons like Shankarankutty Marar, etc.	Municipality, nearby Panchayaths, DTPC, KTDC, Media, Tourists
29	***Preservation of religious and heritage sites***	Preparation of Heritage list, Planning for preservation works, accumulation of funds, Implementation	Municipality, Temples and Mosque Authorities, Devaswam Board, Waqaf Board, Heritage Commission, Funding Agencies, Tourists and Pilgrims
30	***Kalari Kendram at Kallur Illam***	Acquisition of Kallur Illam, Heritage conservation works for the building, Conversion to coaching and performance centre for Kalari	Municipality, Illam Authorities, Dept. of Sports, DTPC, KTDC, Students, Tourists
EDUCATION			
31	***Proposals for starting new educational institutes***	**Campus for Kannur / Agricultural/ Technical/ Veterinary/ Health University, Residential/Model/Women's Poly Technic and ITI, Central School, Special School, International School, etc.)** Identification of land , Acquisition of land, Building construction work , Installation of facilities, Commissioning and functioning	Municipality, Universities, Education Dept,, Technical Education Dept., Private Owners

Sl No.	Proposals	Activities Involved	Agencies Involved
32	***Higher Education colleges***	***(courses like Aviation, Aeronautics, IATA, Hospitaliy Management, Material Management, Logistic etc.)*** Identification of land, Acquisition of land, Building construction works , Installation of facilities, Commissioning and functioning	Municipality, Universities, Education Dept,, Technical Education Dept., Private Owners
33	***New PG Courses and Engineering courses at PRNSS College, Mattannur***	Approval of Courses, more infrastructure facilities, conducting of courses	PRNSS College, Kannur University, Education Dept.
34	***Smart Schools & PRISM School***	Providing Internet and computer lab, Video Conference facility, Projector, Library, Lab, Play grounds, Toilets, Bio-gas Plants, Water supply, etc. to all schools	Municipality, SSA, IT@School Mission, Education Dept., PTA, School Managers, SSA, Private Owners
35	***High Schools at Northern and Southern portions of Municipal Town***	Identification of land, Acquisition of land, Building construction work , Installation of facilities, Commissioning and functioning	Municipality, Govt./Private owners, Education Department, SSA
36	***Mini Science Park***	Identification of land, Acquisition of land, Building construction work , Installation of facilities, Commissioning and functioning	Municipality, Education Department
HEALTH			
37	***Setting up of Allopathic/Ayurvedic/ Homeo Hospitals at hinterland areas***	Selection of location, Acquisition of land, Construction/Hiring of Building, Installation of facilities, commissioning and functioning	Panchayath, Jilla Panchayath, Health Dept., DRDA
38	***Ayurvedic Healthcare treatments and Resorts***	Identification of lands, Construction of buildings, Herbal Plantation, Installation of facilities and staff, licensing and functioning	Municipality, Private entrepreneurs, Banks
39	***Disease Preventive Program***	Training and Awareness programs, mosquito eradication programs, Sanitation programs	Municipality, Health Dept., Social Welfare Dept., NRHM, Zero Waste Program, Kudumbasree units
SOCIAL WELFARE			
40	***Ladies Hostels at Uruvachal, Mattannur, Airport side***	Identification of land, Acquisition/ Relinquishment of land, Construction of Building, Posting of Staff, Commissioning and Functioning	Municipality, Social Welfare Dept.

Sl No.	Proposals	Activities Involved	Agencies Involved
41	***Mother and Child Hospital***	Selection of land, Acquisition/Relinquishment, Construction of Building, Commissioning and functioning	Municipality, Social Welfare Dept., Health Department
42	***Strengthening of Anganawady***	Acquisition of more land, Improving existing facilities, providing meeting halls, distribution of study aid and play aid	Municipality, Social Welfare Dept., Health Department, Jilla Panchayath
43	***Strengthening of Kudumbasree units***	Imparting more financial aids, creating new job opportunities and ventures like floriculture, bio-farming etc., opening of marketing centres for Kudumbasree units at major nodes	Municipality, CDS, ADS, Banks
44	***Disaster Managemnt***	Disaster management plan, Mapping of rehabilitation areas, Permanent rehabilitation of people from hazard prone areas like Airport, flood effecting areas, training and awareness programmes, Safety agains fire hazards	Municipality,Disaster Management Dept., Revenue Department
45	***Proposals for sustainable livelihood opportunities***	Identification of weak, average and excellent students among SC/ST groups and giving necessary trainings, promoting self help groups, reservation for unskilled works, Literacy campaign, Special nursing schools, Training Institute for making handicrafts, short term technical courses etc.	Municipality, Central and State Govt., SC/ST Dept., KIRTADS, Jilla Panchayath, SC/ST Faciltators
46	***Improvement works for SC/ST Colonies***	Construction, repair and maintenance of Approach roads, construction and repair of houses to eligible families, Installation and maintenance of Water supply Schemes, Community septic tank, construction and repair of Community halls, burial grounds and compound walls	Municipality, Central and State Govt., SC/ST Dept., KIRTADS, Jilla Panchayath, SC/ST Faciltators
47	***Encouragement of mat-weaving***	Cultivation of screw pine along stream and river shores, financial grants and aids, arranging market facilities	Municipality, Central and State Govt., SC/ST Dept., KIRTADS, Jilla Panchayath, SC/ST Facilitators
AGRICULTURE			
48	***Restoration of Paddy Cultivation***	Identification of uncultivated paddy fields, Formation of 'Pada Shekara Samithees' at paddy fields where Samithees are not constituted already, making land suitable for paddy cultivation including irrigation facilities, procurements of high yield variety and local variety of seeds and manure, training on new techniques of farming including mechanization, Active Cultivation, Formation of processing units, Arrangements for collection, marketing and exporting	Cultivators and Samithees, NREGS Workers, Agriculture Department, State and Central Farms, Agricultural Universities, Municipality, Minor Irrigation Departments, Banks and Farmers Credit Societies

Sl No.	Proposals	Activities Involved	Agencies Involved
49	***Organic farming***	Identification of ideal lands, formation of Farmers Societies, making land suitable for cultivation including irrigation facilities, procurements of seeds and manure, training on organic farming, Active Cultivation, Formation of processing units, Arrangements for collection, marketing and exporting	Cultivators and Samithees, NREGS Workers, Agriculture Department, Agricultural Universities,Regional center of organic farming Bangalore Municipality, Minor Irrigation Departments, Banks and Farmers Credit Societies
50	***'Nhavara 'Rice and Basmati Rice Cultivation***	Identification of ideal lands, formation of Farmers Societies, making land suitable for paddy cultivation including irrigation facilities, procurements of seeds and manure, training on new techniques of farming including mechanization, Active Cultivation, Formation of processing units, Arrangements for collection, marketing and exporting	Cultivators and Samithees, NREGS Workers, Agriculture Department, Agricultural Universities, Municipality, Minor Irrigation Departments, Banks and Farmers Credit Societies
51	***Vegetables and Banana Cultivation***	Identification of suitable lands, Formation of Farmer's Societies, making land suitable for cultivation including irrigation facilities, procurements of local and high yield variety of seeds and manure, training on organic farming methods, Active Cultivation, Formation of processing units, Arrangements for collection, marketing and exporting facilities	Cultivators, Societies and Samithees, NREGS Workers, Agriculture Department, Agricultural Universities and Research Centres, State and Central Farms, HORTICORP, Municipality, Minor Irrigation Department, Banks and Farmers Credit Societies.
52 53	***Vegetable Cultivation at Homestead and Terrace***	Selection of households, identification of farmers, formation of Horti-clubs, flexi credit linking of NABARD for implementing the Project, Training to trainers and farmers, Supply of seeds, manure, Active Cultivation, Formation of processing units, Arrangements for collection, marketing and exporting facilities	Cultivators, Societies, NABARD, Agriculture Department, State and Central Farms, HORTICORP, Municipality, Banks and Farmers Credit Societies.
	Precision Farming, Protected farming and High-Tech Agriculture	Training, Construction of Poly house, procurement of seeds and manure, cultivation and maintanence	Agriculture Department, Agricultural Universities and Research Centres, HORTICORP, Municipality, NABARD, Banks, Farmers
54	***Floriculture***	Selection of households and suitable lands, identification of farmers, formation of Flori-clubs, flexi credit linking of NABARD for implementing the Project, Training to trainers and farmers, Supply of seeds, manure, Active Cultivation, Formation of processing units, Arrangements for collection, marketing and exporting facilities	Cultivators, Societies, NABARD, Agriculture Department, HORTICORP, Municipality, Banks and Farmers Credit Societies.

Sl No.	Proposals	Activities Involved	Agencies Involved
55	***Lift Irrigation Projects***	Identification of Lands, Formation of Farmers Societies, Purchase of land, Construction of wells, ponds, pump houses and water tanks, installation of pumps and distribution system	Agriculture Dept., Municipality, Farmers, Banks
56	***Improve the existing Community irrigation facilities***	Deepening of Wells, Ponds and Streams, Installation of Pumps, Repair and Maintenance works of VCB, Construction of new VCB, Construction of check dams and side walls for streams and ponds, Installation of Pumps, Water tanks, distribution system, etc.	Agriculture Dept., Minor Irrigation Dept., Municipality
57	***Construction of Tiller roads***	Selection of lands, formation of tiller road	Municipality, Agriculture Dept., Padashekharasamithees
58	***Bamboo, and Screw-pine Cultivation***	Cultivation of Bamboo, Screw-pine, etc. in the green belt area along river and stream sides and in other suitable lands	Municipality, Agriculture Dept., Forest Dept., Kerala State Bamboo Corporation Ltd, NREGS Workers
59	***Apiculture (Beekeeping)***	Selection of farmers, Formation of Society, Training programs, Purchase and Installation of beehives, Honey extracting, Arrangement for marketing and exporting	Municipality, Agriculture Dept., Khadi and Village Industries Board, AGMARK
ANIMAL HUSBANDRY & FISHERIES			
60	***Small scale Dairy farms***	Identification of farmers and training , construction of farms, procurement of cows, farming activities	Municipality, Animal Husbandry Dept., KVASU, Milk Co-op Societies, Banks
61	***Small scale Goat/ Rabbit/Pig Farm Units***	Identification of farmers and training , construction of farms, procurement of animals, farming activities	Municipality, Animal Husbandry Dept., KVASU, Banks
62	***Poultry/Quail farm Units***	Identification of farmers and training , construction of farms, procurement of baby chickens, farming activities	Municipality, Animal Husbandry Dept., KVASU, Banks
63	***Ornamental fish culture***	Selection of farmers, training, setting up of units, culturing of ornamental fishes, marketing	Municipality, Fisheries Dept.
ENVIRONMENT			
64	***Shore Protection of rivers and streams***	Green belt zone with no construction area, Buffering with trees, screw-pine cultivation, bamboo cultivation, teak plantation, other eco-friendly side protection works	Municipality,Central and State Govt., CWRDM, Water Resources Dept., Revenue Depat., Forest Dept., Environment Dept., NGOs

Sl No.	Proposals	Activities Involved	Agencies Involved
65	***Conservation of Ponds and other water bodies***	Renovation and protection works, deepening	Municipalities, Schools
66	***Rejuvenation of streams and thodus***	Cleaning, removing grass and weeds, increasing depth	
67	***Protection of Poongottukavu forest and Sacred Groves***	Awareness programmes, Stickers against littering, Labeling and tagging for trees, Making bio-diversity register, Financial Aids and Maintenance grants, Enforce ban on felling of trees and poaching, Labeling and tagging for trees	Municipality, Central and State Govt., Forest Dept., Environment Dept., NGOs
68	***Go Green Project***	Encouraging eco-friendly ventures, green buildings, green fencing, Avoiding and substituting plastic, Bio-gas Plants, Solar lightings	Municipality, Central and State Govt., Environment Dept., NGOs
69	***Conservation of fragile hills***	Formation of Municipal level Hill Protection Committee, Identification of hills to be protected, Banning of large scale excavations, Enforcing legal measures, Awareness programmes	Municipality, Central and State Govt., Environment Dept., Revenue Dept., NGOs
70	***Street side Plantation***	Procurements of seeds and cuttings, Plantation, Protection and preservation activities	Municipality, Social Forestry Dept., Educational Institues of concerned areas, NGOs
MUNICIPAL FINANCE AND GOVERNANCE			
71	***Good Governance***	Starting of Municipal sub-centres at Porora, Kayani and Vembadi, Strengthening of E-governance, RTI Cell,RTS Cell, Citizen forum etc., Renewal and publication of brief-lets for municipal services, Awareness and training programmes for public participation and co-ordination, Monitoring cell for accountability and transparency	Municipality, Publics
72	***Proposals for sustainable income generation***	Plantation of commercial trees like Teak, Mahagony, Jack, etc. on river and stream sides, road side and other municipal lands,Conducting mini-bus services,Paid parking system, construction of commercial and residential buildings for rent, Promoting tourism activities, Preparation of resource plan, reforms in tax collection	Municipality, Banks, Transport Dept.

31.21 PHASING OF PROJECTS

TRAFFIC AND TRANSPORTATION

Sl No.	Projects	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
1	**New Bus stand complex at Kokkayil**	D.P.R., Construction , Commissioning and Functioning	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
2	**Parking Plaza at Old Bus stand**	Construction , Commissioning and Functioning	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
3	**Parking lots at Mattannur, Palottupally and Uruvachal**	Identification and acquisition of suitable lands, Construction activities including comfort stations, Commissioning and functioning	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
4	**Truck Terminal at Export Allied Zone**	Identification and acquisition of land, D.P.R., Construction, commissioning and functioning	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
5	**Formation of Ring Roads**	D.P.R., Land Acquisition, Widening and improvement of existing roads, Construction of new roads and missing links including bridges and culverts	Maintenance and Improvement works.	Maintenance and Improvement works.	Maintenance and Improvement works.
6	**Construction of new Bye-passes**	D.P.R., Land Acquisition, Widening and improvement of existing roads, Construction of new roads and missing links including bridges and culverts	Maintenance and Improvement works.	Maintenance and Improvement works.	Maintenance and Improvement works.
7	**Construction of new Link Roads for Ring Roads**	Land Acquisition, Widening and improvement of existing roads.	Maintenance and Improvement works.	Maintenance and Improvement works.	Maintenance and Improvement works.
8	**Road Widening proposal**	D.P.R., Land Acquisition, Widening and improvement of existing roads.	Maintenance and Improvement works.	Maintenance and Improvement works.	Maintenance and Improvement works.
9	**Junction Improvement Works**	Detailed Plan, Land Acquisition, Construction activities	Maintenance and Improvement works.	Maintenance and Improvement works.	Maintenance and Improvement works.

Sl No.	Projects	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
10	Footpath construction and beautification works for Major Roads	Detailed Plan, Land Acquisition, Construction activities, Completion	Maintenance and Improvement works	Maintenance and Improvement works	Maintenance and Improvement works
11	Pedestrian Crossing Facilities at Major Roads	Detailed Plan, Land Acquisition, Construction activities, Functioning.	Maintenance	Maintenance	Maintenance
12	Beautification of Mattannur, Palottupally and Uruvachal town	Detailed Plan, Land Acquisition, Junction Improvement works, Construction of footpaths and median, landscaping and gardening	Maintenance and Improvement works	Maintenance and Improvement works	Maintenance and Improvement works
CIVIC AMENITIES AND RECREATION					
13	Mini Civil Station at south side of the Court	Relinquishment of land from Irrigation Dept., Construction activities, Commissioning and Functioning	Functioning	Functioning	Functioning
14	Convention Centre at Mattannur	Identification of land, Relinquishment / Acquisition of land, Construction activities, Commissioning and functioning	Functioning	Functioning	Functioning
15	Public Crematorium at Porora	Construction activities, Commissioning and functioning	Functioning	Functioning	Functioning
16	Stadium at Onaparamba	Acquisition of land, Construction activities	Commissioning and Functioning	Functioning	Functioning
17	'Mattannur Square' at Municipal office compound	Implementation and Functioning	Functioning	Functioning	Functioning
18	Pazhassi Raja Recreation Park at Nellunni	Acquisition of land, Implementation of the project	Functioning	Functioning	Functioning
19	Indoor Stadium near Post Office	Acquisition of land, Construction activities	Commissioning and Functioning	Functioning	Functioning

Sl No.	Projects	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
20	Play ground at Kallur	Acquisition of land, Construction activities	Commissioning and Functioning	Functioning	Functioning
TRADE AND COMMERCE					
21	Warehouses with Cold Storage facility	Identification of locations, Acquisition of land, construction of buildings, Commissioning and functioning	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
	Separate Whole sale Market	Identification and acquisition of land, Construction of Building, Functioning	Functioning	Functioning	Functioning
22	Developments of Parking Centres	Identification and acquisition of land, Construction of Parking lots, Commissioning and functioning	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
	Modern Markets for Fish, Meat, Fruit and Vegetables	Selection and acquisition of land, Construction of Building and Waste treatment plant/Bio-gas Plant, Commissioning of Market, Functioning	Functioning and modernization	Functioning and modernization	Functioning and modernization
INDUSTRIES					
23	Industrial City with Cyber Park at Kallur	Acquisition of land, plot sub division, furnishing of infrastructural facilities including new roads and widening of roads, Construction of industrial and incidental buildings, Setting up of Industrial units, Establishing of Cyber Park.	Functioning and establishment of new industries	Functioning and establishment of new industries	Functioning and establishment of new industries
24	Industrial Park at Hazardous Zone, Porora	Acquisition/Development of land, furnishing of infrastructural facilities, Construction of Buildings, Setting up of Industries	Functioning and establishment of new industries	Functioning and establishment of new industries	Functioning and establishment of new industries
25	KINFRA Park Portion near PRNSS College	Acquisition of land by KINFRA, Plot Sub division, Construction of Industrial and incidental buildings, Setting up of Industrial units	Functioning and establishment of new industries	Functioning and establishment of new industries	Functioning and establishment of new industries
26	Expansion of Mini Industrial Estate at Nellunni	Acquisition of more land, Setting up of new Industries, Strengthening of Sick Units	Functioning and establishment of new industries	Functioning and establishment of new industries	Functioning and establishment of new industries

Sl No.	Projects	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
27	Packing and Labeling Units	Identification of Site at Export and allied zone, selection of beneficiaries, mobilization of funds, construction of building, purchase of machinery, Commissioning and functioning	Functioning and modernization	Functioning and modernization	Functioning and modernization
28	'Malabar Food Package'- Export Program	Identification of Site, selection of beneficiaries, mobilization of funds, construction of buildings, purchase of machinery, commissioning of industry, Exporting.	Functioning and modernization	Functioning and modernization	Functioning and modernization
29	Exhibition cum trading centre for small scale industries	Selection of suitable location, Establishment of trade centre with infrastructure facilities	Functioning	Functioning	Functioning
30	Meat Processing and Exporting Unit	Identification of site and acquisition of land, setting up of Meat processing unit Commissioning and functioning	Functioning and modernization	Functioning and modernization	Functioning and modernization
31	Recycling unit for plastic and other wastes at Porora	Construction of buildings, setting up of Plants and equipments, Commissioning and functioning	Functioning and modernization	Functioning and modernization	Functioning and modernization
WATER SUPPLY					
32	KWA Project- Water Supply Scheme to Mattannur Municipality	Approval, Construction and Com-missioning	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
DRAINAGE AND SANITATION					
33	Sewerage Treatment Plant at Chekyattuvayal	Identification and acquisition of suitable lands, Construction of treatment plants, commissioning.	Maintanance and Modernization	Maintanance and Modernization	Maintanance and Modernization

Sl No.	Projects	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
HERITAGE, TOURISM AND CULTURE					
34	**Conservation of Pazhassi Kovilakam Precinct**	Acquisition of land, Conservation and preservation activities at Kovilakam Precinct and outside places like Pazhassikunnu, Pazhassi Madam area, Setting up of Museum and Art Gallery, Tourism Activities	Conservation and Tourism activities	Conservation and Tourism activities	Conservation and Tourism activities
35	**Tourist facilitation Centre at Inspection Bungalow Hill**	Conservation and preservation activities, Shifting of PWD Guest House, Setting up of Tourist Facilitation Centre with accommodation facility, Setting up of Museum /Art Gallery, Exhibition Hall, Renovation of Park , Tourism Activities.	Conservation and Tourism activities.	Conservation and Tourism activities.	Conservation and Tourism activities.
36	**Eco- tourism at Poongottukavu Vanam**	Construction of a Tourist Base camp and Comfort Station at Herbal Garden, Posting of a Watchman, Construction of an eco-walkway from road, Tourism Activities	Conservation and Tourism activities.	Conservation and Tourism activities.	Conservation and Tourism activities.
37	**Paithruka Mandapam - Heritage Complex at Pazhassi**	Acquisition of Land, construction of buildings, conducting coaching and performance of Arts, Dances folklores, Theyyam, cultural and heritage activities, Setting up of Heritage gallery for conservation and exhibition of heritage/folk knowledge & culture, heritage tools and implements	Functioning	Functioning	Functioning
38	**Preservation of Mural Paintings at Pariyaram Subramanya Temple**	Conservation and preservation works of the existing mural paintings, promotion of tourist activities	Conservation works	Conservation works	Conservation works
EDUCATION					
39	**Up gradation of Govt. UP School to High School**	Relinquishment of land from Irrigation Dept., Construction activities, Up gradation to High School, Commissioning and Functioning.	Function-ing	Function-ing	Function-ing

Sl No.	Projects	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
40	Academic and Career Facilitation Centre	Identification of site, Acquisition of land, Construction, Implementation	Functioning	Functioning	Functioning
41	Language Research Centre	Land Acquisition, Construction	Commission-ing and Functioning	Functioning	Functioning
HEALTH					
42	Expansion and Development of Community Health Centre	Acquisition of adjacent land, construction of buildings for new blocks and staff quarters, Starting of Gynacology,Ophthalmology and Cardiology Depts.	Commission-ing and Functioning	Functioning	Functioning
43	Blood bank and Lab facility	Implementation of the project, Completion	Functioning	Functioning	Functioning
44	Counselling centre for Teenagers	Implementation of the project, Completion	Functioning	Functioning	Functioning
45	Mobile Detection Unit for Life Style Diseases and Infectious diseases	Implementation	Continuation	Continuation	Continuation
46	Sub-centre for Cancer detection and care	Implementation and Functioning	Function-ing	Function-ing	Function-ing
SOCIAL WELFARE					
47	Rehabilitation centre for differently abled students with job ori-ented courses	Selection of land, Acquisition/ Relinquishment ,Construction of Building.	Commission-ing and functioning	Functioning	Functioning
48	Women's Room and Toilets at major centres	Implementation and Functioning	Functioning and maintenance	Functioning and maintenance	Functioning and maintenance

Sl No.	Projects	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
49	**Women Bank**	Completion	Functioning	Functioning	Functioning
50	**'Ambedkar Sevana Kendram'**	Identification and acquisition of suitable land, construction activities, Commissioning and functioning (Entrance coaching classes, PSC coaching classes, Library, Internet facilities, Information centre etc.)	Functioning and Monitoring	Functioning and Monitoring	Functioning and Monitoring
AGRICULTURE					
51	**Centre for Preservation of native crops**	Identification of suitable land for centre and cultivation of crops, Acquisition of land, Building construction, Posting of Technical staff, making land suitable for cultivation including irrigation facilities, procurements of local variety of seeds and manure, Active Cultivation including weed removal, Preservation of seeds	Cultivation and preservation of seeds	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting
52	**Agro-Bazar (Haritha Bhavan)**	Acquisition of land, building constructions, posting of technical staff, Commissioning, training and coaching for farmers, Procurement, Sales and hiring of tools and implements	Functioning	Functioning	Functioning
53	**Agricultural Market**	Identification of land, Acquisition, Building construction, Commissioning, Functioning	Functioning	Functioning	Functioning
54	**Agriculture Labourer Bank**	Construction of Building, Posting of Staff, Training and registration, Starting of function	Functioning	Functioning	Functioning
55	**Herbal Garden at Poongottukavu**	Construction of Building, Making land suitable for plantation, Procurement of medicinal Seeds and seedlings, Active Cultivation, Arrangements for marketing and exporting	Functioning	Functioning	Functioning

Sl No.	Projects	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
ANIMAL HUSBANDRY					
56	**Animal Farm and Slaughter house at Pazhassi**	Acquisition of land, Construction of Buildings,sheds and Bio-gas plant, Posting of Staff and labours, Farming activities, Meat processing, production of manure	Farming Activities, Sale of Meat and manure	Farming Activities, Sale of Meat and manure	Farming Activities, Sale of Meat and manure
57	**Mobile Clinic Unit to Veterinary Hospital**	Purchase of Vehicle, Installation of clinical facilities, Posting of Driver, functioning	Continuation of Service	Continuation of Service	Continuation of Service
58	**Hatchery Unit**	Construction of Buildings, Installation of hatchery unit, Outlet for baby chicken	Functioning	Functioning	Functioning
59	**Hybrid Farm**	Establishment of farm	Continuation	Continuation	Continuation
ENVIRONMENT					
60	**Environmental Park near Poongottukavu**	Land Acquisition, Construction works	Commissioning and functioning	Functioning	Functioning
MUNICIPAL FINANCE					
61	**Municipal Guest House**	Land Acquisition, Construction and commission	Functioning	Functioning	Functioning
62	**Municipal Staff quaters**	Land Acquisition, Construction and commission	Functioning	Functioning	Functioning

31.22 PHASING OF PROPOSALS

CIVIC AMENITIES AND RECREATION

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
1 *2*	**Community halls at Uruvachal, Kayani, Porora, Vembadi, Maruthayi areas**	Identification of land, Relinquishment/Acquisition of land, Functioning and Commissioning	Functioning, Continuation of the scheme	Functioning	Functioning
3	**Multiplex Theatre and Cinema Talkies**	Implementation and Functioning	Implementation and Functioning	Functioning	Functioning
4	**Swimming Pools Construction and improvement**	Implementation and Functioning	Functioning and maintenance	Functioning and maintenance	Functioning and maintenance
5	**Renovation of existing parks**	Implementation and Functioning	Functioning and maintenance	Functioning and maintenance	Functioning and maintenance
6	**Municipal Shopping Complexes and markets at interior Nodes**	Selection and acquisition of land, Construction of Buildings, Commissioning of the projects	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
7	**Weekly Markets for Farmers and Cottage Industries**	Identification and acquisition of land, Construction of stalls	Continuation of Scheme	Continuation of Scheme	Continuation of Scheme
8	**Construction of Star Hotels**	Application from Ventures, Approval, Construction, functioning	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
INDUSTRIES					
9	**Strengthing of Handloom, Khadi and Cottage industries**	Identification of Site, selection of beneficiaries, mobilization of funds, Strengthening and setting up of cottage industries, purchase of machinery, construction and commissioning of an emporium	Continuation of Scheme	Continuation of Scheme	Continuation of Scheme
10	**Processing Units for Agro-products (Coconuts, Cashew, Jack fruit etc.)**	Identification of Site, selection of beneficiaries, mobilization of funds, construction of buildings, purchase of machinery, commissioning of industry.	Functioning and establishment of new units	Functioning and establishment of new units	Functioning and establishment of new units
INDUSTRIES					
11	**Localised Water supply Schemes**	Identification of drought area and formation of Beneficiary Clusters, Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
12	**Construction of Public Wells and deepening of existing wells**	Construction, Completion and Maintenance	Maintenance	Maintenance	Maintenance
13	**Renovation of Ponds and springheads**	Construction, Completion and Maintenance	Maintenance	Maintenance	Maintenance
14	**Extension of existing pipelines to drought areas**	Identification of suitable area, extension of existing network and distribution system, Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
15	**Water conservation Project**	Formation of Water Conservation Societies, Awareness and training programs, Construction of Check dams, rain water pits and recharging units, rain water harvesting tanks.	Awareness and training programs, Maintenance.	Awareness and training programs, Maintenance.	Awareness and training programs, Maintenance.
DRAINAGE AND SANITATION					
16	**City drainage project for future**	NIL	NIL	Identification of problem areas, preparation of DPR, Construction works, Commissioning	Maintenance works
17	**'Drains and cover slab' to major roads**	Identification of first priority roads, preparation of DPR, Construction works, Maintenance works	Continuation of scheme with 2nd priority roads	Continuation of scheme with 3rd priority roads	Continuation of scheme with 4th priority roads
18	**Improvement of thodu and streams**	Rejuvenation works, deepening and side protection works , Maintenance	Maintenance	Maintenance	Maintenance
19	**Total Collection-Solid waste Collection Programme**	Awareness programme, segrigated collected, provision of additional bins and collection points, fleet modernisation	Continuation	Continuation	Continuation
20	**Moderniza-tion of treat-ment plant at trenching ground**	Installation of modern machines and techniques for treatment, landscaping of the area including planting of trees absorbing gases	Maintanance and Modernization	Maintanance and Modernization	Maintanance and Modernization

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
TRADE AND COMMERCE					
21	**Decentralized waste management**	Installation of Bio gas plant, pipe compost, vermin compost etc.. Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
22	**Mini Sewage Treatment Plants at Comfort stations**	Identification of locations, constructions of plants, Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
23	**'Plastic Free Mattannur' Project**	Awareness programs to reduce usage of plastic materials, Door to door collection of Plastic wastes through special squads, Providing of special bins, legal action against litterers	Continuation of scheme	Continuation of scheme	Continuation of scheme
25	**Bio gas plants at Markets, Slaughter house, farms etc.**	Identification of locations, constructions of plants, Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
HERITAGE, CULTURE & TOURISM					
25	**Tourist resorts and tree houses**	Identification of suitable spots, construction activities, commissioning	Functioning and Maintenance	Functioning and Maintenance	Functioning and Maintenance
26	**'Pazhassi Smrithi' Conducted tourism circuit**	Plan preparation, approval, Purchase/Hiring of vehicles, implementation of tour programme connecting Pazhassi Raja related sites, religious and other tourist spots (including Pazhassi Dam), Installation of food stalls and delivery of local/domestic food through Kudumbasree units	Continuation of Scheme	Continuation of Scheme	Continuation of Scheme

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
27	**'Kannur Yatra' - District Tour Programme**	Plan preparation, approval, Purchase/ Hiring of vehicles, implementation of tour program connecting major tourist spots in the district	Continuation of Scheme	Continuation of Scheme	Continuation of Scheme
28	**Water front tourism at Irikur River and Anjarakandy River**	Identification of suitable spots,Construction of Boat Jetty and check dams and facilitation centres, Purchase /hiring of Boats, Boating and waterfront activities	Maintenance and Tourism Activities	Maintenance and Tourism Activities	Maintenance and Tourism Activities
29	**Linking of Mattannur festival and Theyyam season with Tourism Activities**	Preparation of tourism and festival calendar, promotional activities	Continuation of Scheme	Continuation of Scheme	Continuation of Scheme
30	**Preservation of religious heritage sites**	Preservation and maintenance activities	Preservation and maintenance activities	Preservation and maintenance activities	Preservation and maintenance activities
31	**Kalarikendram at Kallur Illam**	Acquisition of Kallur Illam, Heritage conservation works for the building, Conversion to coaching and performance centre for Kalari, Functioning	Functioning	Functioning	Functioning
EDUCATION					
32	**Proposals for starting new educational institutes**	Land Acquisition, Construction works, Completion and functioning.	Continuation of the scheme for new projects	Continuation of the scheme for new projects	Continuation of the scheme for new projects

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
33	**Higher Education colleges**	Land Acquisition, Construction works, Completion and functioning.	Continuation of the scheme for new projects	Continuation of the scheme for new projects	Continuation of the scheme for new projects
34	**New PG Courses and Engineering Courses at PRNSS College, Mattannur**	Providing of infrastructure facilities, Approval of Courses, conducting of courses			
35	**Smart School & PRISM School**	Identification of 1st priority schools, implimentation of the scheme, monitoring and maintenance	Continuation with 2nd priority schools	Continuation with 3rd priority schools	Continuation with 4th priority schools
36	**High Schools at Northern and Southern portions of Municipality**	Land Acquisition, Construction	Commission-ing and Functioning	Functioning	Functioning
37	**Mini Science Park**	Land Acquisition, Construction	Commission-ing and Functioning	Functioning	Functioning
HEALTH					
38	**Setting up of Allopathic/ Ayurvedic/ HomeoHospitals at hinterland areas**	Selection of location, Acquisition of land, Construction/Hiring of Building Installation of facilities, commissioning and functioning	Installation of facilities, commissioning and functioning	Functioning	Functioning

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
39	Ayurvedic Healthcare treatments and Resorts	Implementation of the project	Continuation	Continuation	Continuation
40	Disease Preventive Program	Implementation	Continuation	Continuation	Continuation
SOCIAL WELFARE					
41	Ladies Hostels at Uruvachal, Mattannur, Airport side	Implementation and Functioning	Functioning and maintenance	Functioning and maintenance	Functioning and maintenance
42	Mother and Child Hospital	Selection of land, Acquisition/Relinquishment ,Construction of Building	Commissioning and Functioning	Functioning	Functioning
43	Strengthening of Anganawady	Completion	Functioning	Functioning	Functioning
44	Strengthening of Kudumbasree units	Completion	Functioning	Functioning	Functioning
45	Disaster Managemnt	Updation, Continuation of awareness programs	Updation, Continuation of awareness programs	Updation, Continuation of awareness programs	Updation, Continuation of awareness programs
46	Proposals for sustainable livelihood opportunities	Implementation and Functioning	Functioning	Functioning	Functioning

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
47	**Improvement works for SC/ ST Colonies**	Implementation and Functioning	Continuation	Continuation	Continua-tion
48	**Encouragement of mat-weaving**	Implementation	Monitoring	Monitoring	Monitoring
AGRICULTURE					
49	***Restoration of Paddy Cultivation in uncultivated paddy fields***	Identification of uncultivated paddy fields, Formation of new 'Pada Shekara Samithees', Making land suitable for cultivation including irrigation facilities, Revival of paddy cultivation, Marketing	Active cultivation, Marketing	Active cultivation , Marketing	Active cultivation , Marketing
50	***Organic farming***	Identification of suitable lands, Formation of Farmer's Societies, making land suitable for bio- farming including irrigation facilities, Cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting
51	***'Nhavara 'Rice and Basmati Rice Cultivation***	Identification of ideal lands, formation of Farmers Societies, Making land suitable for cultivation including irrigation facilities, Starting of Cultivation, Marketing and Exporting.	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting
52	***Vegetables and Banana Cultivation***	Identification of suitable lands, Formation of Farmer's Societies, making land suitable for cultivation including irrigation facilities, Cultivation, Marketing and Exporting.	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
53	**Vegetable Cultivation at Homestead and Terrace**	Selection of households, identification of farmers, formation of Horti-clubs, flexi credit linking of NABARD, Training to trainers and farmers, Supply of seeds, manure, Active Cultivation, Formation of processing units, Arrangements for collection, marketing and exporting facilities.	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting
54	**Floriculture**	Selection of households and suitable lands, identification of farmers, formation of Flori-clubs, flexi credit linking of NABARD for implementing the Project, Training to trainers and farmers, Supply of seeds, manure, Active Cultivation, Formation of processing units, Arrangements for collection, marketing and exporting facilities.	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting
55	**Precision Farming and High-Tech Agriculture**	Training, Construction of Poly house, procurement of seeds and manure. Active cultivation, Marketing and Exporting	Active cultivation, Marketing	Active cultivation , Marketing	Active cultivation , Marketing
	Protected Farming	Training, Construction of Poly house, procurement of seeds and manure, Active cultivation, Marketing and Exporting.	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting	Active cultivation, Marketing and Exporting
56	**Lift Irrigation Projects**	Completion	Repair and Maintenance	Repair and Maintenance	Repair and Maintenance
57	**Improve the existing Community irrigation facilities**	Completion	Repair and Maintenance	Repair and Maintenance	Repair and Maintenance

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
58	**Construction of Tiller roads**	Selection of lands, formation of tiller road	Repair and Maintenance	Repair and Maintenance	Repair and Maintenance
59	**Teak, Bamboo, and Screw-pine Cultivation**	Plantation and Maintenance	Maintenance	Maintenance	Maintenance
60	**Apiculture (Beekeeping)**	Selection of farmers, Formation of Society, Training programs, Purchase and Installation of beehives, Honey extracting, Arrangement for marketing and exporting	Continuation	Continuation	Continuation
ANIMAL HUSBANDRY					
61	**Small scale Dairy farms**	Identification of farmers and training , construction of farms, procurement of cows. Farming activities.	Farming activities	Farming activities	Farming activities
62	**Small scale Goat/Rabbit/ Pig Farm Units**	Identification of farmers and training, construction of farms, procurement of animals, Farming Activities	Farming activities	Farming activities	Farming activities
63	**Poultry/Quail farm Units**	Identification of farmers andtraining , construction of farms, procurement of baby chickens, farming activities	Farming activities	Farming activities	Farming activities
FISHERIES					
64	**Ornamental fish culture**	Selection of farmers, training, setting up of units, culturing of ornamental fishes, marketing	Continuation of Activities	Continuation of Activities	Continuation of Activities

Sl No.	Proposals	First 5 Year	5 to 10 Years	10 to 15 Years	15 to 20 Years
ENVIRONMENT					
65	**Shore Protection of rivers and streams**	Cultivation and Plantation works, Maintenance	Maintenance	Maintenance	Maintenance
66	**Conservation of Ponds and other water bodies**	Renovation and protection works, deepening	Maintenance	Maintenance	Maintenance
67	**Rejuvenation of streams and thodus**	Implementation	Maintenance	Maintenance	Maintenance
68	**Protection of Poongottukavu forest and Sacred Groves**	Implementation	Maintenance	Maintenance	Maintenance
69	**Go Green Project**	Implementation	Continuation	Continuation	Continuation
70	**Conservation of fragile hills**	Formation of Municipal Level Hill Protection Committee, Identification and publishing of fragile hills, Functioning of the committee	Monitoring and Functioning	Monitoring and Functioning	Monitoring and Functioning
71	**Street side Plantation**	Implementation	Maintenance	Maintenance	Maintenance
MUNICIPAL FINANCE AND GOVERNANCE					
72	**Proposals for sustainable income generation**	Implementation and functioning	Functioning and monitoring	Functioning and monitoring	Functioning and monitoring
73	**Good Governance**	Implementation and functioning and Monitoring	Functioning and monitoring	Functioning and monitoring	Functioning and monitoring

Chapter- 32

SILENCE ZONE

As per GO (P) No. 64/02 of Local Self Government (G) Department, Govt. of Kerala, dated 20th April, 2002 Kerala State has been notified into two categories namely 'Area covered under Town Planning Schemes' and 'Areas not covered under Town Planning Schemes' with respect to the Noise Pollution (Regulation and control) Rules, 2000 for categorizing, residential or silence areas / zones for the purpose of implementation of noise standards for different areas.

Since there is no Detailed Town Planning Scheme area in the Mattannur town the entrie municipal areas can be indluded in the second category, ie, 'Areas not covered under Town Planning Schemes'.

The areas where the following land area predominantly exist, shall be categorised under respective categories of areas/zones prescribed in the Noise Pollution (Regulation and Control) Rules 2000 as in the following table.

Sl. No.	Category of Area/Zones Under Noise Pollution (Regulation and control) Rules,2000	Areas with the following land uses predominantly existing which shall be brought under Noise Pollution (Regulation and Control) Rules 2000
1	2	3
1	A Industrial Areas	Industrial activities where products or materials of all kinds and properties are fabricated, assembled or processed which includes Workshops, Assembly Plants, Laboratories, Dry cleaning Plants, Power Plants, Pumping Stations, Smoke Houses, Gas Plants, Regineries, Dairies, Sawmills and other small industrial unit/areas, Industrial Growth Centres industrial Development Areas, Small scale Industrial Estate, Industrial Development Areas, Industrial Parks etc.
2	B Commercial Areas	Areas and buildings which is used for display and sale of merchadise such as Shops, Stores, Markets either wholesale or retail. Banking & Financial Institutions Public and Private Business Houses, Engineers, Architects, Lawyers, Pathological Laboratories, Tailor Shops, Audio-Video shops, Barbar shops, Beauty parlours. New stands, Milk Booths, Restaurants. Non-nuisance types of small scale industrial establishments such as Armature winding shops using motor or machine capacity not exceeding 3 Hp. Lodges Rooming Houses, Tourist Home, Dormitories, Hotels, Hostels. Buildings or parts of Buildings used exclusively for parking of vehicles (Parking Buildings), Parking Plazas. All transportation uses.

3	C Residential Area	Areas and buildings which is used for sleeping accommodation is provided for normal residential purposes with or without cooking or dining facilities and shall also consist of one or multi family apartments, Residential flats. Ancillary uses in residential activity such as small professional officers (for Advocates, Doctors, Engineers, Architects, Chartered Accountants, Beauticians, Tailors, Electrical and Electronic Equipment Service Profesionals, Photographers, Videographers, Telephone Booth Operators) Creche, Day care centres, Children's Nursery, Reading rooms, Libraries, other educational buildings. All other uses not covered under for categories.
4	**D Silence Zone**	**Areas comprising one hundred metre around.** **Hospitals, Educational Institutions and Courts as defined in the Noise Pollution (Regulation and Control) Rules, 2000.** **Religious places** **Reserve forests, wild life sancturies. Any other areas notified by Government of Kerala from time to time.**



The Major extracts regarding silent zone from the Noise Pollution (Regulation and Control Rules), 2000 are reproduced as below:

1. AMBIENT AIR QUALITY STANDARDS IN RESPECT OF NOISE FOR DIFFEREN T AREA ZONES:-

(1) The ambient air quality in respect of Noise for different areas/zones shall be such as specified in the following schedule.

SCHEDULE

Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial Area	75	70
(B)	Commercial Area	65	55
(C)	Residential Area	55	45
(D)	Silence Zone	50	40

Note:- 1. Day time shall mean from 6.00 a.m to 10.00 p.m

2. Night time shall mean from 10.00 p.m to 6.oo a.m

3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent Authority.

4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

*dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A “decibel” is a unit in which noise is measured.

“A”, in dB(A) Leq. Denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human car.

Leq: It is an energy mean of the noise level over a specific period.

Note:- The principal rules were published in the Gazette of India vide number S.O 123(1), dated 14th February, 2000 and subsequently amended vide S.O 1046(E), dated 22nd November, 2000. S.O 1088(E), dated 11th October, 2002, S.O 1569(E), dated the 19th September, 2006 and S.O.50(E), dated 11th January, 2010.

2. RESPONSIBILITY AS TO ENFORCEMENT OF NOISE POLLUTION CONTROL MEASURES:-

(1) The noise levels in any area/sone shall not exceed the ambient air quality standards in respect of noise as specified in the Schedule.

(2) The Authority shall be responsible for the enforcement of noise pollution control measures and the due compliance of the ambient air quality standards in respect of noise.

[1](3) The respective State Pollution Control Boards or Pollution Control Committees in consultation with the Central Pollution Control Board shall collect, compile and publish technical and statistical data relating to noise pollution and measures devised for its effective prevention, control and abatement.]

3. RESTRICTIONS ON THE USE OF LOUD SPEAKERS / PUBLIC ADDRESS SYSTEM [2][AND SOUND PRODUCING INSTRUMENTS:-

(1) A loud speaker or a public address system shall not be used except after obtaining written permission from the authority.

(2) A loud speaker or a public address system or any sound producing instrument or a musical instrument or a sound amplifier shall not be used at night time except in closed premises for communication within like auditorium, conference rooms, community halls or during a public emergency.

(3) Not withstanding anything contained in sub-rule (2), the State Government may subject to such terms and conditions as are necessary to reduce noise pollution, permit use of loud speakers or [public address systems and the like during night hours] (between 10.00 p.m to 12.00 midnight) on or during any cultural or religious festive occasion of a limited duration not exceeding fifteen days in all during a calendar year.] [The concerned State Government shall generally specify in advance, the number and particulars of the days on which such exemption would be operative.].

(4) The noise level at the boundary of the public place, where loud speaker or public address system or any other noise source is being used shall not exceed 10 dB(A) above the ambient noise standards for the area or 75 dB(A) whichever is lower.

(5) The peripheral noise level of a privately owned sound system or a sound producing instrument shall not, at the boundary of the private place , exceed by more than 5 dB(A) the ambient noise standards specified for the area in which it is used].

4. RESTRICTIONS ON THE USE OF HORNS, SOUND EMITTING CONSTRUCTION EQUIPMENTS AND BURSTING OF FIRE CRACKERS.

(1) No horn shall be used in silence zones or during night time in residential areas except during a public emergency.

(2) Sound emitting fire crackers shall not be burst in silence zone or during night time.

(3) Sound emitting construction equipments shall not be used or operated during night time in residential areas and silence zones.]

5. CONSEQUENCES OF ANY VIOATION IN SILENCE ZONE AREA:-

Whoever, in any place covered under the silence zone/ area commits any of the following offence, he shall be liable for penalty .

(i) whoever plays any music or uses any sound amplifiers.

(ii) Whoever, beats a drum or tom-tom or blows a horn either musical or pressure , or trumpet or beats or sounds any instrument.

(iii) Whoever, exhibits any mimetic, musical or other performances of a nature to attract crowds.

(v) Whoever, bursts sound emitting free crackers, or

(v) Whoever, uses a louds speaker or a public address system

6. COMPLAINT TO BE MADE TO THE AUTHORITY:-

(1) A person may, if the noise level exceeds the ambient noise standards by 10 dB(A) or more given in the corresponding columns against any area/zone [2][or if there is a violation of any provision of these rules regarding restrictions imposed during night time], make a complaint to the authority.

(2) The authority shall act on the complaint and take action against the violator in accordance with the law.

7. POWER TO PROHIBIT ETC. CONTINUANCE OR MUSIC SOUND OR NOISE:-

(1) If the authority is satisfied from the report of an officer incharge of a police station or other information received by him [3][including from the complainant] that it is necessary to do so in order to prevent annoyance, disturbance, discomfort or injury or risk person who dwell or occupy property on the vicinity, he may, by a written order issue such directions as he may consider necessary to any person for preventing, prohibiting, controlling or regulating:-

(a) The incidence or continuance in or upon, any premises of

i. Any vocal or instrumental music,

ii. Sounds caused by playing, beating, clashing, blowing or use in any manner whatsoever of any instrument including loudspeakers. [public address systems, horn, construction equipment, appliance or apparatus] or contrivance which is capable of producing or reproducing sound.

[iii) sound caused by bursting of sound emitting fire crackers, or]

(b) The carrying on in or upon, any premises of any trade, a vocation or operation or process resulting in or attended with noise.

(2) The authority empowered under sub-rule (1) o f the rule may, either on its own motion, or on the application of any person aggrieved by an order made under sub-rule (1) of the rule, either rescind, modify or alter any scuh order.

Provided that before any such application is disposed of the said authority shall afford to the applicant [3][and to the original complainant, as the case may be] an opportunity of appearing before it either in person or by a person representing him and showing cause against the order and shall, if it rejects any such application either wholly or in part, record its reasons for such rejection.

Chapter- 33

SMART CITY COMPONENTS

A city can be defined as 'smart' when investments in human and social capital and traditional (transport) and modern (Information and Communication Technology) communication infrastructure, fuel sustainable economic development and a high quality of life, with a wise management of natural resources, through participatory governance.

The smart city infrastructure is introductory step for establishing the overall smart city framework and architecture. Very few smart cities have recently been established in the world i.e. Dubai, Malta, Kochi and Singapore. The presence of international air port imparts the potential for Mattannur Municipality to shape itself as a smart city. The goal of becoming a smart city can not be achieved today or tomorrow but starting with all possible and available components of smart city and through systematic planning and adopting accurate strategies, we can reach to the destination gradually.

Planning urban and development seeks to create an operational platform that would manage the operational resources in order to reduce the overall running operational cost. The smart infrastructure development framework and the surveying positional accuracy of locating assets from the base of smart city development architecture integrated with all the facilities and systems related to the smart city governance.

Smart cities can be identified (and ranked) along six main axes or dimensions. These axes are: smart **economy**; smart **mobility**; smart **environment**; smart **people**; smart



living; and, finally, smart **governance**. These six axis connect with the traditional regional and neoclassical theories of urban growth and development. In particular, the axis is based - respectively - on theories of regional competitiveness, transport and Information and Communication Technology, economics, natural resources, human and social capital, quality of life, and participation of citizens in the governance of cities.

Smart Cities- **"Promoting Sustainable and Smart Cities"**

Large-scale urbanization in India has put severe strain on urban infrastructure which includes water supply, roads and transport, water and sanitation, drainage and solid waste management, etc. If the momentum of economic growth is to be maintained, challenges thrown up by large-scale urbanization need to be addressed on priority. The efficiency of cities in the country largely depends on how well they are planned; how well they are developed and how efficiently they are managed.

Given that the thrust areas of the 12th plan focus is on sustaining economic growth and promoting sustainability and inclusive growth, managing urban development , requires an approach that is both efficient and equitable through developing sustainable and smart cities . A smart city will have to address the efficient use and allocation of present resources that ensures economic viability of cities, and equitable distribution (access to and availability) of resources. This may be achieved through responsive land-use planning, from both a policy perspective and physical planning perspective.

It is the issues governed by sustainability that determine the very notion of a 'smart' city.

A sustainable smart city has to consider issues related to revitalisation and Renewal; low rise versus high rise; heritage and built form; land use transport integration; environmental conservation; mainstreaming disaster management; climate change mitigation and adaptation; inclusiveness etc.

To, create a policy environment where representatives of all sections of people may participate has become one of the greatest challenges which is actually the backbone of a smart city. Power should lie in the hands of people as they live in the city and have the 'Right to the City' Governance includes both power and control which is in the form of accountability, equity and transparency.

This can be achieved first by making plan formulation, implementation and enforcement Municipality centric. Further, specific interventions and solutions will depend entirely on the needs of specific areas/ regions.

Some of the important issues that need to be brought into sharper focus as per the guidelines for smart city and the steps taken in the master plan are as follows

- **Regional Planning to be made mandatory**

Mattannur Municipal Council have already taken resolution for the preparation of a master plan for the city vide Council resolution No.14 dated 21.07.2012 in accordance with the G.O.(Rt) No.1376/2012/LSGD of Local Self Government Department of Govt. of Kerala,dated 17/05/2012.

- **Resisting development in flood plains or along earthquake faults. These areas may be utilised as parks, or open spaces**

No construction zones are delineated along the sides of rivers and streams with buffering of trees and the area is planned for buffering with trees.

- **Formulating transport and major infrastructure plans**

Transportation network and mobility plan have been prepared as part of master plan along with a detailed map of proposed road network.

- **Defining role of settlements in the region**

A proposed land use pattern and detailed zoning regulation are also made as part of master plan

- **Designating essential nuisance land use locations, including waste disposal.**

A hazardous zone is delineated around the existing municipal trenching ground and includes public crematorium, hazardous industries, junk yards etc.

- **Designating Green belt land or similar to resist settlement amalgamation to protect the environment.**

An agriculture zone as green belt is designated in the proposed land use plan in all possible places along municipal border with major focus on agricultural activities and residential land use is mitigated in this zone with a view of environmental protection

- **Considering building codes, zoning laws and policies that encourage the best use of the land *viz a viz* hazard proneness**

All efforts have been taken to minimize the contrast between optimum use of land and hazard proneness by adopting suitable zoning regulations and provisions in the Kerala Municipality Building rules. Provisions as per the silent zone guidelines are also incorporated in the master plan.

What needs to be done

- Delineating of the region based on physical and socio-economic linkages, resources, development potentials and problem identification etc.
- Databased development to address specific issues as each Region would be having a different set of concerns to address.
- Networking and cloud sourcing of all the details of citizens and trade activities need to be in place as they are the major stakeholders.
- To give shape to the policy measures for implementation at the local level through a prioritised and phased plan of action.
- Restructuring the spatial pattern of the city through comprehensive mobility plan. It is imperative to achieve integration between land use and transport as cities expands spatially
- Complying with the provisions of 74th Constitutional amendments in terms of citizen participation in functioning of the municipality.
- Increasing private sector participation.
- **Essential Action Points for achieving Sustainable Smart Cities**

♦ Incorporating regional planning provisions in enabling legislations to address sustainability issues of the town/city and its hinterland for promoting development, efficiency, equity, safety and harmony

♦ Assessment of land use suitability taking into account natural hazard prone areas, mapping of natural hazard prone areas

♦ Assessment of quantum of developed land required for the horizon year based on proposed density pattern

♦ Optimal use of land to promote polynodal/ multinodal growth, land use transport integration and assignment of urban poor pockets near work centers to reduce length of home to work trips and promote livelihood options

♦ Adherence to SLBs for service delivery, transport and e- governance

♦ Promoting environmentally sensitive development to conserve and protect forest belts , water resources, agriculture belts etc.

♦ Promote PPP with attractive incentives for a private developer

Essential Indicators

♦ Including the urban and regional Planning Framework in all enabling legislations to promote sustainable habitat

♦ Assessing Land area made available for development vis-a vis the land area required every 5 years

♦ Revisiting/reviewing the plan every 5 years in respect of status of implementation.

- Defining natural hazards, mapping natural hazard-prone areas and formulating development control thereof
- Designating urban poor pockets near work centres to reduce trip distances and promote livelihood options
- Achieving service level bench marks for service delivery , e-governance , and urban transport

Desirable(Level 2)

- Urban renewal with emphasis on heritage conservation
- Shifting non conforming uses to conforming use zones
- Devising measures for mitigating and adaptation to adverse effects of climate change through incentivizing energy efficiency and green habitat
- Identification and prioritization of specific projects with cost implications and modalities for implementation

Components of a Smart City from the urban planning perspective

Step - 1. Develop a baseline

This is necessary in order to help a city understand where it is in comparison to peer cities. For example it is important to work to develop a comprehensive list of indicators that other cities will be able to use, as well. Leveraging the Smart Cities Wheel, creates indicators for six components, from Smart Economy to Smart People. Even, Low-tech indicators such as walkability, and technology-based indicators such as number of sensors used for communicating traffic data in real-time are important.

Step - 2. Engage people

Put it in public domain with the baseline data on hand and seek to understand challenges, opportunities, and aspirations of stakeholders. Use mobile, web, and offline tools for engagement to ensure a broad outreach.

Step - 3. Develop short- and long-term planning, perspective with measurable targets

The city has to define clear goals for growing the green economy, reducing its carbon footprint, and increasing its non-motorized use, by 2020.

Short- and long-term strategies are necessary and complementary. The short term affords quick wins that can occur, and long-term strategies allow for deeper levels of innovation and investment.

In this phase, it is important not to choose winning technologies. Focus on the end goal instead.

Step - 4. Prioritize projects

Once step 3 is complete, the city may prioritize projects and budget allocation by focusing on areas of need and cost/benefit analysis. All project proponents should establish targets for improving key metrics in the baseline, which may be achieved before the project is deemed successful.

Few senior municipal government officials today have the necessary information to make such determinations. Ideally, a city might experiment with both pilot projects before deciding to roll either out more broadly.

Step - 5. Measure and report results

Proper strategy implementation calls for measuring progress toward objectives on a regular basis — and the right metrics must be selected first. In the smart cities world, the goal is to increasingly generate real-time data. Cities must measure their progress toward long-term targets and engage with citizens and other stakeholders all along the way.

The future is bright for this movement, but in order to get real progress, to occur across the globe, cities must embrace basic principles of proper strategy formulation and execution.

KEY COMPONENTS FOR SMART CITIES

Sl. No.	SMART CITY	INDICATORS
1.	**Smart Economy**	Entrepreneurship &Innovation Productivity Local & Global Interconnectedness
2.	**Smart People**	Embrace creativity Inclusive society 21st Century education
3.	**Smart Mobility**	Mixed-model access Prioritized clean & non-motorized options Integrated ICT
4.	**Smart Living**	Culturally vibrant & happy Safe Healthy
5.	**Smart Governance**	Enabling supply & demand side policy Transparency & open data ICT & e-gov
6.	**Smart Environment**	Green buildings Green energy Green urban planning



Requisites of sustainable and smart cities are as follows

- Responsive Governance with focus on making available information in Public Domain.
- Base Map to a scale of 1:5000 in GIS environment showing roads, buildings, physical features, land parcels and utilities available in public domain.
- Municipality centric Planning and Development.
- Statutory Master Plan/Development Plan/ Comprehensive Development available in public domain.
- Data and Meta Data in respect of Spatial and Attribute Data sets in public domain.
- Zonal Development Plans to be coterminous with the administrative divisions.
- Local Area Plans to be aggregated at the Zonal Development Plan level.
- Development Control Regulations and Building Bye-laws to be responsive to Hazard Proneness.
- Automated Single Window System for according Planning Permissions and Building Permissions.
- Identification of Projects with costs and Modalities for Funding.
- Regularity of Plan Monitoring annually to assess whether course corrections are required .
- Periodic Review every 5 year.
- Public Participation and Stakeholder Consensus



Smart city components that have been included in the master plan for Mattannur Municipal area are listed as below

- Beautification of Towns and major roads
- Street side plantation
- Landscaping and gardening at major junctions, medians, Govt. Offices and public places
- Agriculture zone as green belt along city border
- No construction zone at sides of rivers and streams; buffering with trees
- Organic cultivation for smart health and smart living
- Modernisation of street lighting, using U.G. Cables, ornamental post's and lightings
- Solar lighting system
- Go green project – Green buildings, green fencing etc.
- Exclusive Water Supply Scheme to Mattannur Municipality by KWA to cover entire municipal area.
- Clean city projects
- Comprehensive City Drainage Project for the future decade.
- Plastic eradication project
- Modernisation of trenching ground.
- Separate Hazardous zone around Municipal trenching ground
- Installation of dust bins at all major spots and road sides
- Construction of comfort stations and she-toilets
- Bus bays and modern waiting shelters
- Sewage plants, Bio-gas plants,
- Construction of drains and cover slabs
- Public crematorium and slaughter house
- High-Tech school project
- Good governance project for smart governance which includes strengthening of e-governance, Monitoring cell, Citizen forum etc.
- Proposals for sustainable income generation
- Development of multi nodal points with municipal sub-centres at remote areas
- Organised parks, open air auditoriums, Environmental park.
- Disaster management project for accident prone areas

PART - IV

DEVELOPMENT CONTROLS

Chapter-34

ZONING REGULATIONS

MASTER PLAN FOR MATTANNUR MUNICIPAL TOWN

1. All future developments/ constructions shall be in conformity with the provisions of the Master Plan for Mattannur Municipal Town, the Kerala Municipality Building Rules in force and provisions of the Aircraft Act, 1934, Gazette notification of Ministry of Civil Aviation, Govt. of India, dated 30th June, 2008, in force.

2. For the implementation and enforcement of the proposals envisaged in this Master Plan, Mattannur Municipal Area has been zoned under various categories such as Built-up zone, Green zone and Special zone and further subdivided as shown in the table below.

I Built-up Zone	II Green Zone	III Special Zone
1. Residential Zone	8. Park and Open Spaces	15. Export and Allied Zone
2. Residential Mix Zone	9. Buffer Zone or Green Belt	16. KINFRA Industrial Park
3. CBD (Central Business District)	10. Forest and Sacred Groves	17. Hazardous Zone
4. Public and Semi public Zone	11. Paddy Land	
5. Industrial Zone	12. Dry Agriculture Zone	
6. Traffic and Transportation Zone	13. Canal Land of Irrigation Department	
7. Heritage Zone	14. Water Body	

Details regarding the nature of uses *Permitted*, uses *Restricted* and uses *Prohibited* in each zone are given in the accompanying sheets. These regulations shall be enforced in conjunction with other specific provisions if any elsewhere in the Plan.

Uses ***Permitted*** in a zone cover the uses that can be normally accommodated in the relevant zone. Such uses may be permitted by the Secretary, of the Local Body Concerned, hereinafter referred to as Secretary. In some cases it may be possible to permit some other uses also, which are not likely to affect the quality and environment in a zone specified for a particular use. Such cases have to be individually studied based on their performance characteristics and special location factors. Such cases which come under this category are classified as **Uses Restricted**.

Uses **Restricted -1** Category deals with the uses that shall be restricted by the Secretary with the concurrence of the Town Planner of the District office of the Department of Town and Country Planning having jurisdiction over the area.

Uses **Restricted -2** Category deals with the uses that shall be restricted by the Secretary with the concurrence of the Chief Town Planner concerned of the Department of Town and Country Planning. ***Used prohibited*** enlists the various objectionable uses in each zone which shall not be permitted under normal circumstances.

3. If any space in a zone is put to a ***Use Prohibited*** as stated in Para 2, before the sanctioning of the scheme, such use shall be termed as nonconforming use. A non-conforming use may be allowed to continue in its existing location and essential repairs and maintenance for the structure may be permitted by the Secretary, 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 measure may be permitted for such uses by the Secretary with the concurrence of the Chief Town Planner concerned.
4. Existing areas and structures of archaeological importance, agriculture uses and religious uses may be permitted to continue in all the zones and shall not constitute non conforming uses.
5. Regulation of constructions and/or land developments on the sides of new roads/roads proposed for widening as per the Plan shall be governed by the distance from the centre line of the road, unless otherwise specified in the Plan or in any detailed road alignment approved by the Chief Town Planner concerned.
6. Constructions and/or land developments, if any, in paddy lands and in wet lands, shall be in conformity with the Kerala Paddy land and Wet Land Act in force in the State.
7. Expansion of an existing public, educational or hospital institution shall be permissible in its adjacent plots irrespective of the zoning and development regulations proposed in such plots, subject to Kerala Paddy Land and Wet Land Act in force.
8. If a plot has different land use zones, the major land use zone of that plot can be extended to the remaining portion of the plot that falls within Residential zone, Residential mix zone, Central Business District (CBD), Public and Semi public zone, Industrial zone and Dry Agricultue zone.
9. No other methods of sewage disposals except ETP (Effluent Treatment Plant), STP (Sewage Treatment Plant), Septic tank etc. shall be allowed within a distance of 200 m. from the bank of Rivers, Cholathode, Vayanthode and Karetta thode.
10. The norms and provisions described for silence zone in Chapter 32 should be strictly followed.
11. The Government shall have the power to issue clarifications in respect of technical interpretations, if any, required in any of the provisions of the scheme in consultation with the Chief Town Planner concerned.
12. Any use not specified either in the *uses permitted* or *uses restricted* category of a particular use zone, but which is of a similar nature to any use permitted or restricted in that particular use zone, can be considered by the Secretary, with the concurrence of the Chief Town Planner concerned.
13. The Zoning Regulations for the various zones are given below.

I BUILT-UP ZONE				
Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
1 RESIDENTIAL ZONE				
1.1	Residential buildings consisting of single or multifamily dwellings, residential flats / apartments, residential quarters, night shelters, orphanages, old age homes. Shops, Professional Offices, Commercial Offices, ATMs Banks & other Financial Institutions, Restaurants, Canteen, Hotels - floor area **limited to 200m².** Cottage Industries including coir, Service Industries of non-nuisance Nature (See Annexe-I) Educational institutions essentially serving the needs of residential community such as Day Care, Crèche, Nursery Schools, Kindergartens and schools offering general education (up to High school level). Health institutions essentially serving the needs of residential community such as dispensaries, clinics (Out Patient), Diagnostic Centres etc having a floor area **limited to 200m²**. Community facilities such as Community Halls, Recreational Clubs, Social Welfare Centres, Gymnasium /Yoga Centers, Swimming Pool, Libraries etc. having a floor area **limited to 200m².** Utility Installations and Civic Amenities essentially serving the needs of residential community such as post office, police station, telephone exchange, fire station, tot lots, parks, play grounds, water treatment plants below 5 MLD. Transmission Towers, Telecommunication Towers and Wireless Stations Plant Nurseries, Pump House Wells and Irrigation Ponds incidental to community needs.	Ashram, Mutt, Madrasa. Places of Worship. Public utility areas and Public Utility buildings other than those included in the permitted category.	Vehicle Fuel Filling Stations Cremation Ground/ Crematorium, Burial Ground/ Common Vault.	All other uses not mentiond in column 2,3 & 4

Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
1.2	**Provided that the access road has a width of 5m minimum.**			
	Automobile workshops for two/ three wheelers - floor area **limited to 200 m².**			
1.3	**Provided that the access road has a width of 8m minimum.**			
	Hospitals with 5 beds, Higher Secondary Schools. Convention Centres/ Auditorium/ Wedding Halls/ Community halls/Exhibition Centers and Art Gallery-floor area **limited to 500 m².** Shops/Professional Offices, banking and financial institutions- floor area **limited to 500 m².**	LPG distribution centres (excluding bottling plants and bulk storage) - floor area **limited to 50 m².**		
	2 RESIDENTIAL MIX ZONE			
2.1	Land to a depth of 50 m on either side of roads having existing or proposed width of 12 m and above in resi*dential zone and dry agricultural zone* will also be deemed as Residential Mix Zone			
2.2	All uses that are permitted in Residential Use Zone Automobile workshops for 2/3 wheelers, Service Industries of non-nuisance nature (See Annexure I) Civil defence and home guard. Parking Plaza, Taxi/Jeep Stand	Museum, Exhibition centres and art gallery, Places of worship	Fuel filling stations	All other uses not mentioned in column 2, 3 & 4
2.3	**Provided that the access road has a width of 5m minimum.**			
	Diagnostic Centres, Clinics(Out Patient), - floor area limited to **500 m²**. Commercial builidngs of floor area 200m² - 1000m²			
2.4	**Provided that the access road has a width of 8m minimum.**			
	Shops, Professional Offices, Commercial Offices/ Establishments, Banking and financial institutions, Restaurants/ Canteen, Hotels, IT/ Software units Social Welfare Centres/ Movie Halls/			

Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
	Auditorium/ Wedding Halls/ Community Halls upto 500sq.m. Secondary Schools, Higher Secondary Schools, Technical High Schools. Hospitals and health centres with number of beds limited to 10. Markets of Plot area **limited to 500 m²**. Weigh Bridge Godowns / Warehouses / Storage non-hazardous - floor area limited to **200 m²**. Marble and Granite Storage Centres, Industrial Estates & Industrial Parks Automobile Workshops / Automobile Service Stations for Light Motor Vehicles.			
2.5	**Provided that the access road has a width of 12m minimum.**			
	Educational Institutions of Higher Order, Shops, Offices, Markets. Hospitals & Health centres with number of beds limited to 100. Godowns / Ware houses/ Storage (non-hazardous)-floor area limited to **500m²**. Automobile workshops/ Automobile Service stations for Heavy vehicles/ Movie Halls/ Auditorium/ Wedding Halls/ Community Halls-**floor area limited to 1000m²**	Bus Terminals, Lorry Stands		
2.6	**Provided that the access road has a width of 18m minimum.**			
	Hospitals & Health centres **upto 300 beds** Movie Halls/Auditorium/Wedding Halls/ Community Halls - **floor area above 1000 Sqm** with **parking at 1.2 times that of KMBR.**		Container Terminal stations	

3 CENTRAL BUSINESS DISTRICT (CBD)				
Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
3.1	Allowable coverage is enhanced to 75% for commercial and residential buildings in CBD in view of the height restriction due to proximity of Airport. All shops including shopping complexes, shopping malls, multiplex, hypermarkets, restaurants, hotels, markets. Professional offices, commercial offices & establishments, ATMs, banking and financial institutions, IT software units, Movie halls, Auditorium, Wedding Halls, Community Halls Godowns / warehouse / storage of Non-hazardous materials, stack yards. Gymnasium/ Yoga centres Cottage industries, automobile workshops, automobile service stations, cold storage, service industries of non-nuisance nature (See Annexe-I), weigh bridges, printing press, IT hardware / electronic industries, marble and granite storage / cutting centres. Expansion of existing residential buildings up to **300m²**, Single Family Residences up to **300m²**, Residential flats/apartments with lower floor for commercial use only, night shelters, orphanages, old age homes, Dharmasala, hostels and boarding houses, lodges and guest houses, Ashram, Mutts, Madrasa. Government (Local/State/Central) or Public Sector Offices and other related public buildings. Additions and alterations to the existing public and semi-public buildings including addition of new blocks without altering the use. Buildings for incidental to public & semi public uses with **floor area limited 100m².** 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	Places of worship Other public utility areas as public utility buildings Fuel filling stations Parking buildings and parking lots	Higher Educational Institutions provided the aceess has a width of 8m minimum. Waste Management Plants	All other uses not mentioned in column 2,3 & 4

Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
	Clinics, diagnostic centres and hospitals with number of **beds limited to 50.** Tot lots, Parks & playgrounds, fair grounds, open air theatres Parking plaza, Transport terminals Plant nursery, Storage of agricultural produces and seeds, Pump House and Wells.			
3.2	**Provided that the access road has a width of 12m minimum.**			
	Hospitals & Health centres, Outdoor games stadium.			
	4 PUBLIC AND SEMI PUBLIC ZONE The sacred groves in the religious sites should be retained as such and no development activities are permitted in these areas.			
4.1	Local/State/Central Government/Public Sector Offices and Other Related Public Buildings. Hospitals and allied uses, educational buildings, places of worship and religious buildings, Residential Quarters incidental to public and semi public use. Public Utility Areas and Buildings. Additions and alterations to the existing public and semi public buildings including addition of new blocks without altering the use. Buildings for incidental uses with floor area limited to **100 m²**.	Cremation Ground/ Crematorium, Burial Ground, Common Vault.		All other uses not mentioned in column 2,3 & 4
	5 INDUSTRIAL ZONE			
5.1	All industries other than obnoxious and nuisance type industries, Automobile Workshops & Automobile Service Stations, Spray Painting Workshops, Saw Mills, Timber Yard, Ice Factory, Cold Storage, Fish and Meat Processing Units, Printing Press, Water Treatment Plants, Marble and Granite Storage and Cutting Centres, Industrial Estates & Industrial Parks.	Other Public Utility Areas and Public Buildings. Obnoxious and nuisance type industries Cremation Ground /	Fuel Filling Stations	All other uses not mentioned in column 2,3 &4

Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
	Godowns/Warehouses/Storage of non hazardous material, stack yards, weigh bridge. Dairy and Dairy Farms, Dairy related Industries, Poultry Farms, Piggery Farm, Smoke House. Dry Cleaning Plants, Power Plants, Sub Stations Government or Public Sector Offices Transport Terminals incidental to industrial use. Transmission & Telecommunication Towers, Wireless Stations. Residential Uses incidental to the Industrial Use. Any other activity essentially incidental to Industrial use. Tot lots, Parks and Play Grounds attached to incidental residential use. Single family residences upto 100m^2	Crematorium, Burial Ground, Common Vault. Storage of Explosives and Fire Works, Gas Godowns, Crusher Units. Sewage Treatment Plants, Dumping Yard. Slaughter House Container Terminals with access width of 18m minimum.		
	6 TRAFFIC AND TRANSPORTATION ZONE			
6.1	Transport terminals including constructions that form an integral or essential parts of the terminal. Any incidental uses to the transport terminals such as Retail Shops, Restaurants, Canteen etc. Staff Quarters, Offices, Night Shelters, Guest Houses etc incidental to the transport terminals Parking Plazas, Transmission Towers and Wireless Stations.	Public Utility Areas and Buildings Fuel Filling Stations	Container Terminals provided that the access has a width of 18m minimum. In airport land, all land uses will be governed by KIAL/ Airport Authority of India Limited.	All other uses not mentioned in column 2,3 &4
	7 HERITAGE ZONE			
7.1	Not withstanding anything contained in the zoning regulations of the scheme and subject to modifications as prescribed here under, no development, redevelopment, construction including additions, alterations, repairs, renovations, replacement of special and architectural features, demolition of any part or whole there of in respect of any			All other uses not mentioned in column 2,3 &4

Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
	objects or buildings in the area, shall be allowed except with the prior written recommendation of Art & Heritage Commission constituted by the Government under Rule 154 of the Kerala Municipality Building Rules 1999, in order to conserve the heritage character of the Pazhassi Kovilakam Precinct, Inspection Banglow compound and Pariyaram Subrahmanya Temple Precinct and their environs. Provided that, no area or buildings or objects, which in the opinion of the said commission have architectural, aesthetic, archaeological, cultural or historic value, will be allowed to change from the existing condition without the recommendations of the commission. Provided also that new constructions and additions or alterations to existing buildings may be permitted in this area with the following additional regulations namely; i) The total number of storey's including the existing if any shall not exceed two from the street level. ii)The over all height of the construction including the existing up to the top most point of the proposed construction shall not exceed 9 mts and iii)The architectural character of the facades of the construction shall be as per the advice of the commission. Provided also that the use or reuse of any site or building shall be as per the recommendations of the commission. The Local Self Government institutions concerned shall insist on any such recommendations of the commission. The Art & heritage Commission, if found necessary, may entrust the above regulatory aspects to a committee constituted for the purpose by the commission.			

II GREEN ZONE				
8 PARK & OPEN SPACES				
Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
8.1	Any construction/land development essential for the development/ improvement of open air recreational facilities. Fish Landings, Boat Jetties, Guided Boat Rides, Watch Towers, Eco Walk Ways, Water Sports Facilities, Fair Grounds etc. Tot Lots, Park, Play Grounds, Swimming Pools, Open Air Stadium, Open Air Theatre, Zoological and Botanical Garden, Bird Sanctuary, Eco Walk Way etc.	Public Utility Areas and Buildings which will not affect the character of the area. Restaurants/ cafeteria incidental to main use -floor area limited **200m²**		All other uses not mentioned in column 2,3 &4
	9 GREEN BELT/BUFFER ZONE (Buffer zone of 30 m. from riversides, 5m. from sides of Cholathode, Vayanthode and Karettathode, 3m. from sides of other streams and ponds)			
9.1	Social Forestry Activities like Bamboo Cultivation, Teak cultivation etc., Agriculture and horticulture, Wells, Ponds, Pump houses up to 10m² floor area, Bird Sanctuaries, Bridges, Side Protection Walls, Bathing Ghats, Boat jetty, Ticket Counter etc. may be permitted based on community level requirement. Single family residence with floor area limited to 100m² in area 15m away from river bank.			All other uses not men-tioned in columns 2, 3 &4
	10 FOREST AND SACRED GROVES			
			Religous uses in sacred groves	All other uses not mentioned in columns 2, 3 & 4
	11 PADDY LAND			
11.1	Paddy cultivation Agriculture/ Horticulture/Fodder cultivation, Fish Farms/ Seed Farms/ Pump House/ Wells and Irrigation Ponds without any building construction **OR** Constructions/land developments in conformity with the Conservation of Paddy Land and Wet Land Act in force in lands designated as paddy land or wet land under the said Act.	Minor Public Utility areas & Public utility buildings which will not affect the character of the area.		All other uses not mentioned in column 2,3 &4

12 DRY AGRICULTURE ZONE

Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
12.1	Agriculture, horticulture and fodder cultivation, pastures, grazing ground, and other types of cultivation including social forestry. Dairy Farms, Fish farms, Seed farms, Poultry farms, Plant nursery, pump house, wells and irrigation ponds. Single Family Residential Buildings - floor area limited **250m².** Orphanages, old age homes, dharmasala, ashrams, mutts, madrasa. Clinics(Outpatient) and diagnostic centres - floor area limited to **100 m².** Shops, professional offices, commercial offices and establishments, banking and financial institutions, Gymnasium, Yoga Centres, restaurants, canteens-floor area limited to **100 m².** Police Post/Police Station, Post and Telegraph office, Fire Post / Fire station, Telephone Exchange, wireless stations and Telecommunication towers. Day Care and Creche, Nursery / Kinder Garten / Primary & Upper primary schools. Library and Reading Rooms, Godowns / warehouses/ Storage - non hazardous - floor area limited to **100 m².** Cottage industries, Service industries of non-nuisance Nature (See Annexe -I) Automobile workshops for 2/3 Wheelers Tot Lots/Parks/Play Grounds, Saw Mills, Weigh Bridge.	Cremation ground / crematorium, burial ground, common vault All industries including obnoxious and nuisance type Slaughter Houses.	Storage of explosive and fireworks, Gas Godowns, Dumping Yard. All higher educational institutions including High Schools and HSS.	All other uses not mentioned in column 2,3 & 4

Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
12.2	**Provided that the access road has a width of 8m minimum**			
	Clinics(Outpatient) and diagnostic centres - floor area limited to **200 m².** Shops, professional offices, commercial offices and establishments, banking and financial institutions, Gymnasium, Yoga Centres, restaurants, canteens - floor area limited to **200 m².** Library and Reading Rooms, Godowns/ warehouses/ Storage - non hazardous - floor area limited to **200 m².** Auditorium/Wedding Halls/Community halls floor area limited to **500m².** Hospitals & Health Centres **with number of beds limited to 5.**			
12.3	**Provided that the access road has a width of 12m minimum**			
	Residential buildings consisting of single or multifamily dwellings, residential flats / apartments, residential quarters. Shops, professional offices, commercial offices and establishments, banking and financial institutions, Gymnasium, Yoga Centres, restaurants, canteen - floor area limited to **500 m².**	Stack yards, Godown/ Warehouses/Storage-non hazardous materials. Higher Education Institutions. Health Care Facilities including Diagnostic Centres, Clinics, Hospitals with number of **beds limited to 50.**	Fuel Filling Stations.	
	13 CANAL LAND OF IRRIGATION DEPARTMENT			
13.1		Conversion of land to any other land use with the consent of Irrigation department and concerned authorities.		All other uses not mentioned in columns 2, 3 & 4
	14 WATER BODY			
14.1	All existing water bodies shall be conserved. Bridges, Side protection walls, Bathing Ghats, Floating jetty etc may be permitted based on community level requirements.			All other uses not mentioned in columns 2, 3 & 4

III.SPECIAL ZONE

(Special zones include the areas specifically demarcated for certain projects. No other activity unless otherwise specified shall be permitted in such zones. However, if the development envisaged for certain specific purpose mentioned in the special zone does not start within five years of sanctioning of this plans, Municipality can make changes in this land for another use decided in consultation with Chief Town Planner and authorities concerned.)

Sl. No.	Uses permitted	Uses Restricted-I	Uses Restricted-2	Uses Prohibited
(1)	(2)	(3)	(4)	(5)
	15 EXPORT AND ALLIED ZONE			
15.1	**The following commercial, industrial and storage uses exclusively oriented for export and aviation and incidental uses shall be permitted with floor area limited to 200m²:-** Canteen, Restaurants, ATM, Banks, Financial Institutes, Travel Agency, Cargo and goods handling offices, Ware houses, Storage and cold storage, export allied industries and Workshops **The following uses are permitted with floor area limited to 250m².** Residences, shops.	**The following commercial, industrial and storage uses exclusively oriented for export and aviation and incidental uses shall be permitted with floor area limited to 500m²:-** Restaurants, Banks, Financial Institutes, Travel Agency, Cargo and goods handling offices, Ware houses, storage and cold storage, work shop, export allied industries and Workshops etc.	Truck Terminals, Parking lots, Local, State and Central Govt. offices **The following commercial, industrial and storage uses exclusively oriented for export and aviation and incidental uses shall be permitted with floor area exceeding 500m²:-** Banks, Travel Agency, Cargo and goods handling offices, Ware houses, Storage and cold storage Work shop, export allied industries and Workshops etc.	All other uses not mentioned in column 2,3 & 4
	16 KINFRA INDUSTRIAL PARK			
16.1	The industrial and related developmental activities and incidental uses as envisaged by KINFRA with consent of concerned authorities			All other uses not mentioned in columns 2, 3 & 4
	17 HAZARDOUS ZONE			
17.1	Hospitals, Waste Management Plants, Saw mills with timber yards, industries other than obnoxious and nuisance type	Hazardous and Industrial uses like Funeral, Cremation and Burial grounds with incidental buildings, Trenching ground and related constructions, junk yards, Slaughter house, Poultry/Cattle/Pig/Rabbit farm, obnoxious and nuisance type industries		All other uses not mentioned in columns 2, 3 & 4

General Notes:

1. For the purpose of these regulations, floor area means the total floor area of the building on all floors.
2. Subject to zoning regulations of the respective use zones, more than one uses may be combined in a building, provided that the total floor area on all floors of such a building shall not exceed the maximum floor area permitted for any of such use in that zone.

GUIDELINES FOR LARGE SCALE PROJECTS

Large Scale development proposals in an area not less than 2 hectares, exceeding an investment of Rs.50 crores, which provide direct employment (after commissioning of the project) to the tune of not less than 500 may be permitted in all zones other than Heritage and Park & Open space, subject to the recommendation of a committee to be constituted by the Government for this purpose, under the Chairmanship of the Secretary, Local Self Government Department, consisting of Chief Town Planner concerned of Kerala State Town and Country Planning Department and the Secretary, Mattannur Municipality as members and the District Town Planner, Kannur District of the Town and Country Planning Department as convenor and satisfying the following conditions:-

a) The developer shall produce project cum feasibility report and environmental impact assessment report, if required, of the project to the convener of the committee, 15 days in advance of the committee meeting.

b) The developer shall produce before the committee, all required clearances from the State and Central Government agencies concerned.

c) Adequate provision shall be made for supporting infrastructure such as water supply, Sewerage, Solid Waste Management etc. Separate sewage treatment plant and solid waste management measures shall be provided and maintained by the developer at his /her cost.

d) Adequate Memorandum of Understanding between the developer and Secretary of Local body concerned shall be undertaken to bring this into effect.

e) Maximum floor area ratio shall be 2 and Minimum access width shall be 12 meter.

f) The project shall be completed within a period of 3 years if not specified otherwise.

ANNEXURE 1

Type of non - obnoxious and non-nuisance type of service or light industries permissible in residential zone

1. Production of copra
2. Processing of arecanut
3. Rice and Flour Mills.
4. Production of rice, flour etc., by hand pounding.
5. Processing of Cardamom, ginger, pepper etc.
6. Production of Khandsri for sugar-cane
7. Carrying and preservation of fruits and production of jam, jelly etc.
8. Processing and preservation of cashew nuts.
9. Bakeries.
10. Production of Dairy Products.
11. Oil mills (vegetables)
12. Extraction of oil by ghani.
13. Manufacture of hydrogenated oil.
14. Manufacture of “aval” (Beaten rice) appalam.
15. Production of vinegar.
16. Manufacture of soda, water, lemonade etc.
17. Manufacture of Ice.
18. Manufacture of ice cream.
19. Processing, packing and distribution of tea.
20. Processing, grinding, packing and distribution of coffee.
21. Manufacture of syrup.
22. Manufacture of beedi.
23. Manufacture of Cigar.
24. Manufacture of tobacco snuff.
25. Manufacture of chewing tobacco.
26. Cotton ginning, clearing, pressing etc.
27. Cotton spinning other than in Mills
28. Cotton spinning and weaving in Mills.
29. Cotton weaving in handloom.
30. Cotton weaving in power looms.
31. Handloom weaving.

32. Khadi Weaving in Handloom.
33. Printing of cotton textiles.
34. Manufacture of Cotton thread, rope twine etc.
35. Jute spinning.
36. Manufacture of jute products including repairing of gunny bags.
37. Weaving of silk by Handloom.
38. Manufacture of hosiery goods.
39. Making of embroidery products
40. Tailoring
41. Manufacture of quilts and mattresses.
42. Manufacture of Coir and Coir Products.
43. Manufacture and assembling of umbrellas and production of spare parts of umbrellas.
44. Repairing of umbrellas.
45. Manufacture of wooden furniture and fixtures.
46. Manufacture of structural wooden goods such as doors, beams etc.
47. Manufacture of wooden industrial goods such as parts of handloom ambarcharka, bobbers etc.
48. Manufacture of wooden utensils, photo frames, toys, etc., and photo framing.
49. Cane industry including baskets, weaving etc.
50. Manufacture of miscellaneous wooden articles such as sticks, sandals, rules etc.
51. Manufacture of paperboard and paper hand.
52. Making of paper boxes, bags, envelopes etc.
53. Printing and publishing of newspapers and periodicals.
54. Printing and publishing of books.
55. Miscellaneous printing works including type cutting, book binding.
56. Manufacture and repairing of leather shoes and chap pals.
57. Manufacture of leather products such as suitcase, bag etc.
58. Vulcanizing and repairing of tyres and tubes.
59. Manufacture of rubber gloves.
60. Manufacture of Rubber products such as rubber sheets, nipples and rubber shoes including smoke-rubber.
61. Manufacture of pharmaceuticals, chemicals, Ayruvedic medicine etc.
62. Manufacture of agarbathi and other cosmetics.
63. Manufacture of plastic products such as nameplates etc.
64. Manufacture of lemongrass oil, candles etc.
65. Manufacture of cement products such as well-keros, tube, closets etc.
66. Manufacture of structural stone goods, stone crushing, stone carving, stone dressing, marble carving etc.

67. Manufacture of stone wares.
68. Manufacture of stone images.
69. Manufacture of chinaware's and crockery.
70. Manufacture of large containers and chinaware.
71. Manufacture of glass and glass products.
72. Manufacture of clay models
73. Manufacture of iron and steel furniture.
74. Manufacture and repairing of brass and bell metal products.
75. Manufacture of aluminium utensils and other products.
76. Manufacture of tin cars and copper vessels.
77. Electroplating, tinplating, welding etc.
78. Manufacture of agricultural implements, screws etc. (blacksmith and foundry)
79. Manufacturing assembling and repairing of machinery such as water pumps, oil mill chuck etc.
80. Manufacture of small machine tools and machine parts.
81. Manufacture of sewing machine parts and assembling and repairing of sewing machine.
82. Manufacture of electrical machinery and repairing of electric motors armature winding etc.
83. Manufacture and repairing of electric fans.
84. Charging and repairing of batteries.
85. Repairing of radios, microphones etc.
86. Manufacture of electric meters, production of electric and allied products, repairing and servicing of electrical appliances.
87. Bodybuilding of motor vehicles.
88. Manufacture and repairing of motor engine parts and accessories.
89. Serving and repairing of motor vehicle
90. Manufacture of cycles, parts and accessories.
91. Manufacture and repair of boats and barges.
92. Manufacture and repairing of animal drawn and hand drawn vehicles.
93. Repairing of photographic equipments, spectacles etc.
94. Manufacturing of medical instruments
95. Repairing of watches and clocks.
96. Manufacture of Jewellery.
97. Manufacture, repair and tuning of musical instruments.
98. Manufacture of sports goods, balloons etc.
99. Ivory, carving and ivory works
100. Miscellaneous non-nuisance industries other than those included in Annexure 2 list.

ANNEXURE 2

List of obnoxious or nuisance industries subject to objectionable odours, fumes, effluents or processors to be located in Hazardous zone

(Grouped under Indian Standard Industrial Calssification)

I Manufacture of Food Stuff :

(1) Slaughtering, preservation of meat and fish and canning of fish.

II Manufacture of Beverages:

(2) Production of distilled spirits, wines, liquor etc., from alcoholic malt, fruits and malts in distillery and brewery.

(3) Production of country liquor and indigenous liquor such as toddy, liquor form mahua, palm juice.

III Manufacture of Textiles :

(4) Dyeing and bleaching of cotton

IV Manufacture of Wood and Wooden Products :

(5) Sawing and planning of wood.

(6) Wood seasoning and creosoting

(7) Manufacture of veneer and plywood.

(8) Paper, pulp and straw board.

V Manufacture of Leather and Leather Products :

(9) Currying, tanning and finishing of hides and skims and preparation of finished leather.

VI Manufacture of rubber, petroleum and coal products:

(10) Manufacture of tyres and tubes

(11) Manufacture of Industrial and synthetic rubber.

(12) Reclamation of rubber.

(13) Production of petroleum, kerosene and other petroleum products in refineries.

(14) Production of chemicals and chemical products.

VII Manufacture of chemicals and chemical products:

(15) Manufacture of basic industrial chemicals such as acids, alkali and their salts not elsewhere specified (especially sulphurous, sulphuric, nitric, hydrochloric etc., acids) ammonia, chorine and bleaching powder manufactures.

(16) Manufacture of dyes, paint, colours and varnishes, printing ink.

(17) Manufacture of fertilizers (Especially from organic materials):

(18) Manufacture of disinfectants and insecticides

(20) Manufacture of ammunition, explosive and fireworks.

(21) Manufacture of matches.

VIII Manufacture of Non-metallic mineral products other than petroleum and coal :

(21) Manufacture of cement and cement products

(22) Manufacture of Lime

(23) Manufacture of Plaster of Paris.

IX Manufacture of basic metals and their products :

(24) Manufacture of iron and steel including smelting, refining, rolling and conversion into basic forms.

(25) Manufacture including smelting, refining etc., or nonferrous metals and alloys in basic forms.

(26) Manufacture of Armaments.

X Manufacture of machinery (other than transport) and electrical equipments:

(27) Manufacture of all kinds of battery

XI Miscellaneous items not covered above.

(28) Incineration, reduction or dumping of offal, dead animals' garbage or refuse.

(29) Manufacture of gelatin and glue.

(30) Fat, tallow, grease or lard refining of manufacture.

(31) Bone meal, bone grist and bone powder.

(32) Manufacture of cashew nut shell oil.

Other similar types of nuisance industries.