MASTER PLAN

FOR

KASARAGOD TOWN-2031

KASARAGOD MUNICIPALITY

DEPARTMENT OF TOWN AND COUNTRY PLANNING, GOVERNMENT OF KERALA

FOREWORD

Kasaragod town is the administrative headquarters of Kasaragod district as well as Kasaragod taluk. Its elevation to the status of district head quarter triggered sudden spurt in development in all sectors. Being the district head quarter and the northern most urban centre of the state, the town has immense potential to flourish as a prominent regional centre. The town has seen institutions being set up and investments in commercial ventures and infrastructure development. The efforts of the various developmental agencies in this regard are mostly compartmentalized. Haphazard and lopsided developments have started setting in due to absence of a guiding mechanism to channelize development. The town needs an integrated approach in development to address the plethora of issues in infrastructure, environmental conservation, service delivery in various social sectors etc. A scientific and comprehensive master plan is required to address the problems and to exploit the potentials of the town. Such a Master Plan should necessarily take into account the short term and long-term needs of the people and improve their quality of life and liveability in the town.

I appreciate the efforts put in by the officials of the Town & Country Planning Department who have prepared this Master Plan through a process of people's participation, carefully understanding the aspirations and expectations of the citizens of the town. The Master Plan for Kasaragod town tries to achieve the intended objectives through a system of land use. It provides control measures for restricting haphazard developments as well as act as blue print for positive developments in the future. The guiding policies need necessarily look far beyond the near future to a time when needs and conditions are different from today. I take this opportunity to express my sincere thanks to the Municipal Council of Kasaragod and the various governmental and nongovernmental agencies and public who have rendered help in the preparation of this Plan, by way of valuable data, guidance and suggestions.

I hope this Master Plan shall be the road map for the development of Kasaragod town for years to come.

Kasaragod
7th January,2020

Beefathima Ibrahim
Chairperson
Kasaragod Municipality

PREFACE

Rapid urbanization evident in the state has been the result of increase in the number of designated urban areas 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 73rd and 74th Constitutional Amendments and subsequent state legislations have put forward a paradigm shift in the Master Plan 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 Master 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.

Kasaragod town is the headquarters of Kasaragod Taluk and Kasaragod Dist., and is the most northern municipal town of Kerala. The Scheme of preparing Master Plan for Kasaragod Town was launched by the Department of Town and Planning subsequent to the resolution of the Kasaragod Municipal Council to prepare the Master Plan. The Plan was submitted before the Council during year 2006. Considering the changes in direction of growth and the shift in the planning process, modification of this Master Plan was necessary. Hence, the Government has ordered the preparation of Master Plan for Kasaragod Town afresh along with 32 other towns vide G.O.(Rt) No.3982/2008/LSGD dated 13th November,2008.

I take this opportunity to appreciate the team of officials of the Kasaragod district office of the Department lead by Sri.P.Ravikumar, Town Planner for having completed the task of preparation of the Plan in a fruitful manner. The State Project Cell played an anchor role in this regard, right from conceptualization to completion. I appreciate the consistent efforts put in and guidance rendered by the officials of the State Project Cell under the leadership of Sri P.R. Ushakumari, Senior Town Planner in this regard.

It is hoped that the Master Plan for Kasaragod town will certainly provide a framework for development of the town for years to come.

Thiruvananthapuram
7th January 2020

Gigi George
Chief Town Planner (Planning)
Town & Country Planning Department
Government of Kerala

ACKNOWLEDGEMENTS

The Master Plan for Kasaragod Town is prepared as part of preparation of 32 other Master Plans in the State, vide G.O (Rt) No. 3982/2008/LSGD dated 13/11/2008. 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 municipality for years to come. Suitable provisions for monitoring and review of the Master Plan are inbuilt.

The study has relied on statistical data provided from various development departments. Their inputs and readiness to share the data is gratefully acknowledged. The collection of data and analysis would not have been possible without the active involvement of Municipal Council, Kasaragod, under the chairmanship of former Chairman, Sri. T.E. Abdulla and the present Chairperson, Smt. Beefathima Ibrahim. The leadership provided by Sri. Gigi George, Chief Town Planner (Planning) has been a constant source of inspiration. The guidance by Smt. P.R. Ushakumari, Senior Town Planner and other officials of the State Project Cell is thankfully acknowledged. The other staff members of the office of the Chief Town Planner are also thanked for their highly helpful inputs for the project.

The contributions made by Sri. K.P. Nidheesh, Deputy Town Planner, Sri. Sooraj T.C, Deputy Town Planner and Sujith. P, Asst. Town Planner, were key to the successful completion of this study. Their contributions are gratefully acknowledged. I take this opportunity to appreciate the assistance rendered by Sri. E.V.Narayanan, Town Planning Surveyor, Sri. P.V. Baiju, Ist Grade Draftsman, Sri. Biju Narayanan , GIS Assistant and Smt. Reshma V. Shankaran, Statistical Investigator, of this office, for the successful preparation of this Plan. Sri. Selvaraj. J, Peon of this office needs special mention for his contributions to the plan preparation with his expertise in GIS. 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.

Kasaragod
7th January 2020

P.Ravikumar
Town Planner
Town & Country Planning Office
Kasaragod

CONTENTS

PART I: STUDY AND ANALYSIS

1.0 Introduction……1
2.0 Need for the plan…… 2
3.0 Methodology……3
4.0 Earlier planning efforts……4
5.0 Profile of the Town……5
1.0 Location…… 5
2.0 Area and Population…… 6
3.0 Climate…… 6
4.0 Physiography……7
5.0 History…… 8
5.1 History of development ……8
5.2 History of governance ……9
5.3 Socio-cultural history……10
6.0 Biodiversity…… 12
6.0 Regional Settings……13
1.0 Spatial structure of the district……13
2.0 Activity pattern of the town ……13
3.0 Functional Character of the town……15
4.0 Connectivity…… 16
5.0 Inference…… 17
7.0 Demography ……18
1.0 Population and its growth pattern……18
2.0 Population growth Rate……20
3.0 Population Density……22
4.0 Spatial distribution of Population……23
5.0 Sex ratio……24
6.0 Literacy……26
7.0 House hold size……28
8.0 Inference……29

8.0 Employment 30
1.0 Workers....30
2.0 Workforce Participation Rate....32
3.0 Occupational structure....34
4.0 Inference....37
9.0 Land Use 38
1.0 General Analysis of land use....38
a. Land Use Concentration Pattern....41
b. Residential 43
c. Commercial....45
d. Industrial.... 47
e. Public and Semi public 48
f. Park and open spaces.... 50
g. Transportation.... 51
h. Agricultural.... 52
i. Inference....54
1.0 **Economic Aspects**....56

A Industry.... 56
1. Existing industrial base.... 56
2. Industrial production....57
3. Spatial distribution....57
4. Problems and potentials....58
B Trade and commerce....59
1. Present scenario....59
2. Hierarchy in the district....60
3. Important centers and nodes....61
4. Markets....62
5. Street vendors....62
6. Problems and potentials....63
7. Inference 63

C Tourism 64
1. Places of Tourist interest....64

2. Problems and potentials……66
D Agriculture……68
1. Area under cultivation……68
2. Important crops and production……69
3. Irrigation facilities……70
4. Agricultural inputs……70
5. Marketing of agricultural produces…… 70
6. Problems and potentials……70
E Animal husbandry……71
1. Inference……72
F Fisheries……72
1. Inference……74
11. Traffic and transportation……75
1. Introduction……75
2. Characteristics of transport network……75
2.1 Roads……76
- Existing road network……77
- Transport Terminals……78
- Bottlenecks and Missing links……79
2.2Railways……80
2.2 Air Transport……81
2.3 Water Transport……81
2.4 Existing Traffic Characteristics……81
- Major corridors……82
2.5 Parking facilities……83
2.6 Identification of gaps in network……84
2.7 Inference……84
12. Water supply……87
1. Important sources, treatment facilities, distribution system and consumption……87
2. Scarcity……90
3. Inference……91
13. Sanitation……92
1. Drainage……92

- Inference.....94
2. Sewerage system.....94
3. Solid waste disposal.....95
   - Inference.....97

14. Energy.....98
1. Energy consumption : source wise break up.....98
2. Energy consumption : sector wise break up.....98
3. Electricity.....98
4. Petroleum.....99
5. Non-conventional sources.....100
6. Problems and potentials.....100
7. Inference.....100

15. Education.....101
1. General.....101
2. Existing facilities, students, teachers 102
3. Higher and professional education.....105
4. Problems and potentials.....106

16. Health.....107
1. General.....107
2. Existing facilities.....107
3. Problems and potentials.....109
4. Inference.....109

17. Recreational facilities 110
1. Parks and open spaces.....110
2. Play grounds/stadia.....110
3. Theatres and auditoria.....110
4. Other facilities.....111
5. Problems and potentials.....111

18. Other civic amenities.....113
1. Town hall.....113
2. Reading rooms and library.....113
3. Community centers.....113
4. Crematoria and burial grounds.....114

19. Housing.....115
1. Housing shortage.....115
2. Existing Housing condition.....115
3. Spatial distribution.....116
4. Slums and other sub-standard housing.....117
5. Problems and potentials.....118
6. Inference.....120

20. Special Concern Areas.....121
1. Poverty.....121
2. SC/ST index.....122
3. Other social aspects.....125

21. Environment.....126
1. Present scenario.....126
2. Sensitive / fragile areas.....126
3. Inference.....128

22. Development administration and finance.....129
1. Development administration.....129
2. Municipal finance.....130

23 Linkages & existing spatial structures

1. Linkages.....132
- Effect of population growth on various development sectors.....132
- Land use changes and environment.....134
- Industrial sector – effect on environment, land use and employment.....135
- Effect of various sectors on employment.....136
- Changes in traffic & transportation needs due to growth in various sectors.137
- Changes in traffic & transportation needs due to changes in land use.....138
- Tourism and environment.....139

2. Spatial Structure.....140
2.1 Functional character.....140
2.2 Activity pattern.....141
2.3 Connectivity pattern.....142
2.4 Hierarchy of Space/Nodes/Centers.....143
2.5 Spatial Structure.....145

PART II: INTEGRATED DEVELOPMENT VISION

1.0 Summary and findings.....148

1.1 Regional setting.....148
1.2 Land use.....148
1.3 Population.....150
1.4 Employment.....151
1.5 Economic Aspects.....151
- Industry.....151
- Trade & Commerce.....152
- Tourism.....153
- Agriculture.....153
- Animal husbandry.....154
- Fisheries.....155

1.6 Traffic & transportation.....155
1.7 Water supply.....157
1.8 Drainage.....158
1.9 Sewerage.....158
1.10 Solid waste disposal.....159
1.11 Energy.....160
1.12 Education.....160
1.13 Health.....161
1.14 Housing.....162
1.15 Recreation.....162
1.16 Other civic amenities.....163
1.17 Social backwardness.....163
1.18 Environment.....164
1.19 Development administration and finance.....165

2. Goals and objectives.....166

3. Development concept.....173
4. General Policies and strategies.....179
5. Projected Requirements.....180

PART III: PROPOSED LAND USE AND SECTORAL PROPOSALS

1. **Proposed Land Use Plan**.....188
2. **Traffic and Transportation Plan**.....191
3. **Sectoral Proposals**
   - 3.1 Industry.....196
   - 3.2 Trade & Commerce.....196
   - 3.3 Tourism.....198
   - 3.4 Animal husbandry.....201
   - 3.5 Fisheries 201
   - 3.6 Water supply.....203
   - 3.7 Drainage.....206
   - 3.8 Sewage disposal.....207
   - 3.9 Solid waste disposal.....208
   - 3.10 Energy.....209
   - 3.11 Housing.....210
   - 3.12 Recreation.....212
   - 3.13 Other civic amenities.....213

PART VI: ZONING REGULATIONS

Zoning Regulations.....217
Annexure I.....233
Annexure II.....237

LIST OF TABLES

CHAPTER – 8 EMPLOYMENT

8.1 Classification of Main workers……..30

8.2 WPFR in the Municipality, the District and State……..32

8.3 Details of workers in the town……..32

CHAPTER – 9 LAND USE

9.1 Existing Land use break up 2010……38

9.2 Ward wise distribution of Land Use-2010……39

9.3 Comparison of Land uses 2001 and 2010……..41

9.4 Land use concentration index-Ward wise ……42

9.4 Plot Size Details……45

CHAPTER – 10 ECONOMIC ASPECTS

10.1 Commercial Centres in Kasaragod Town ……61

10.2 Details of Street Vendors in the town……62

10.3 Tourist Destinations in Kasaragod Town ……64

10.4 List of Heritage Buildings……66

10.5 Tourist Infrastructure……68

10.6 Area wise Production of Crops in Kasaragod Municipality……69

10.7 Livestock Production Details of Kasaragod town ……72

10.7 Milk Consumption in Kasaragod town ……72

10.8 Auxiliary Activities in Fishing Sector…..……74

10.9 Fish Available In each Season……74

CHAPTER – 11 TRAFFIC & TRANSPORTATION

11.1 Details of Major Roads in Kasaragod Town……77

11.2 Airports near Kasaragod Town……81

CHAPTER – 12 WATER SUPPLY

12.1 Details of Source of Water in the Municipality.……..88

12.2 Details of Water Treatment Plant.……88

CHAPTER – 13 SANITATION

13.1 Existing Drainage Network……..93

13.2 Solid Waste Collection Details……..97

CHAPTER – 14 ENERGY

14.1 Fuel filling stations in Kasaragod Municipality……99

14.2 LPG Connection Details……100

CHAPTER – 15 EDUCATION

15.1 Details of Educational Institutions in the Municipality……102

15.2 Higher &Professional Institutions in the Municipality……105

CHAPTER – 16 HEALTH

16.1 Health Institutions in Kasaragod town……108

CHAPTER – 17 RECREATIONAL FACILITIES

17.1 Recreational facilities in Kasaragod Municipality……111

CHAPTER – 18 OTHER CIVIC AMENITIES

18.1 Community centres in the Municipality……114

18.2 Crematoriums in Kasaragod Municipality……114

CHAPTER – 19 HOUSING

19.1 Details of Houses in Kasaragod town……115

19.2 Details of slums in Kasaragod Municipality……118

CHAPTER – 20 SPECIAL CONCERN AREAS

20.1 Parameters to assess a BPL family……121

CHAPTER – 22 DEVELOPMENT ADMINISTRATION AND FINANCE

22.1 Budget Estimate 2010-2011-Revenue Accounts……130

22.2 Finance position 2008-09, 2009-10,2010-11……..131

CHAPTER – 23 LINKAGES AND SPATIAL STRUCTURE

23.1 Land use concentration pattern……141

23.2 Urban profile of the wards……142

23.3 Activity Pattern of the wards……143

PART III: LAND USE AND SECTORAL PROPOSALS

CHAPTER 1- PROPOSED LAND USE PLAN

1.1 Proposed Land Use Breakup……188

CHAPTER 2- TRAFFIC AND TRANSPORTATION

2.1 Existing and proposed road width……192

LIST OF FIGURES

PART I: STUDY AND ANALYSIS

CHAPTER – 4 EARLIER PLANNING EFFORTS

4.1 Detailed Town Planning Scheme for Central Area ……4

4.2 Detailed Town Planning Scheme for New Bus Stand Area ……4

CHAPTER – 5 PROFILE OF THE TOWN

5.1 Location of the town……5

5.2 Physiography of the town……6

5.3 Urban Hierarchy……9

CHAPTER – 6 REGIONAL SETTINGS

6.1 Spatial Structure of the District……13

6.2 Activity pattern of the settlements of the district ……14

6.3 Functional classification of the LSGIs of the district ……14

6.4 Connectivity of the District……16

CHAPTER – 7 DEMOGRAPHY

7.1 Growth of Population From 1971 – 2001……18

7.2 % of population in Kasaragod town with reference to the district ……19

7.3 Comparison of Population with other Towns……19

7.4 Comparison of Population with nearby LSGIs……19

7.5 Temporal Growth Rate of Population……20

7.6 Comparison of Population Growth rate with the District and State……20

7.7 Comparison of Population Growth rate with other towns……21

7.8 Comparison of Population Growth rate with nearby LSGIs……21

7.9 Comparison of Population Density with that of District and State ……22

7.10 Comparison of Population Density with nearby LSGIs……22

7.11 Comparison of Population Density with other towns……23

7.12 Comparison of sex ratio with that of District and State ……24

7.13 Comparison of sex ratio with nearby LSGIs. ……24

7.14 Comparison of sex ratio with other towns ……25

7.15 Age Sex Pyramid of Kasaragod town ……25

7.16 Decadal variation in Literacy Rate ……26

7.17 Male– Female Literacy Rate of Kasaragod Town ……26

7.18 Comparison of Literacy Rate with the State, district & other towns in the District…27

7.19 Level of Education in Kasaragod town ……..27

7.20 Comparison of Household Size with that of District and State ……..28

CHAPTER – 8 EMPLOYMENT

8.1 Classification of Workers……31

8.2 Details of Workers in the town……..31

8.3 Temporal Variation of Total Workers and Main workers 1981-2011 ……..33

8.4 Variation of WFPR in the town ……..33

8.5 Comparison of WFPR with District and State ……..33

8.6 Comparison of WFPR with adjoining Grama Panchayats ……34

8.7 Comparison of WFPR of towns in Kasaragod District……..34

8.8 Temporal Variation of Cultivators……35

8.8 Temporal Variation of Agricultural Labourers……..35

8.8 Temporal Variation of Household Industrial Workers……..36

8.8 Temporal Variation of Other Workers……..36

CHAPTER – 9 LAND USE

9.1 Existing Land Use Kasaragod Town……40

9.2 CI of Residential Land use……..44

9.3 Spatial Distribution of Residential Land use……..44

9.4 CI of Commercial Land use……46

9.5 Spatial Distribution of Commercial Land use……46

9.6 CI of Industrial Land use……..47

9.7 Spatial Distribution of Industrial Land use……..47

9.8 CI of Public and semi-public Land Use……49

9.9 Spatial Distribution of Public and Semi-public Land use……49

9.10 CI of Parks & Open spaces……50

9.11 Spatial Distribution of Parks & Open spaces……50

9.12 Transportation Land use……51

9.13 CI of Agricultural Land use……53

9.14 Spatial Distribution Agricultural Land use……..53

CHAPTER – 10 ECONOMIC ASPECTS

10.1 Industrial Units in Kasaragod Municipality……..56

10.2 Industrial Units in Kasaragod Municipality-Wardwise ……57

10.3 Service Industries in Kasaragod Municipality……58

10.4 Commercial Establishments in the Municipality……..59

10.5 Hierarchy of settlements in the District……60

10.6 Spatial Distribution of Commercial Nodes……61

10.7 Tourist Destinations in Kasaragod Municipality ……65

10.8 Tourists Statistics-Kasaragod District……67

10.9 Spatial distribution of Agricultural Land use ……68

10.10 Area wise Production of Crops in Kasaragod Municipality-2001……69

10.11 Livestock % Population in Kasaragod Municipality……71

10.12 Fisheries Sector in Kasaragod Municipality……73

10.13 Fish Processing Plant at Kadappuram……74

CHAPTER – 11 TRAFFIC & TRANSPORTATION

11.1 New Bus Stand Jn. Showing NH-66……75

11.2 Road Network within the Municipality……76

11.3 Major Transport Terminals in Kasaragod Town……79

11.4 Bottleneck at Thayalangadi……80

11.5 Kasaragod Railway Station……81

11.6 Chandragiri Road to Kanhangad……82

11.7 Taxi Parking near Old Bus stand……83

11.8 Auto Parking along MG Road……83

11.9 Pick-Up Parking near Taluk Hospital……83

11.10 Parking inside Taluk Office Compound……..……83

CHAPTER – 12 WATER SUPPLY

12.1 Dependability for Water Requirements by people of the municipality……. 87

12.2 Present Water Distribution System in Kasaragod Municipality ……..……89

12.3 Water Scarcity in Kasaragod Municipality ……..……90

12.4 Ward wise Details of Water Scarcity in Kasaragod Municipality ……..…..90

CHAPTER – 13 SANITATION

13.1 Drainage Map of Kasaragod Town ……..92

13.2 Discharge of Natural Streams to river……94

13.3 Sanitary Waste Disposal Method…….. 95

13.4 Solid Waste Dumping Yard at Kelugudde……..96

13.5 % Wise Split up of Solid Waste Disposal Mechanism…….. 96

CHAPTER – 14 ENERGY

14.1 Electricity Consumption in the Municipality…… ……98

14.2 Petroleum Consumption in the Municipality.……100

CHAPTER – 15 EDUCATION

15.1 Literacy comparison of Kasaragod Municipality with District and State…….101

15.2 Educational institutions in Kasaragod Town……103

15.3 Category of Schools in Kasaragod Town ……104

15.4 Educational status in Kasaragod Municipality……..104

CHAPTER – 16 HEALTH

16.1 Taluk Hospital, Kasaragod……107

16.2 Spatial distribution of Health Institutions in Kasaragod Town…….109

CHAPTER – 17 RECREATIONAL FACILITIES

17.1 Recreation areas in Kasaragod Municipality…….110

CHAPTER – 18 OTHER CIVIC AMENITIES

18.1 Municipal Town Hall……113

18.2 Municipal Library……..113

18.3 Crematorium at Kadappuram……..114

CHAPTER – 19 HOUSING

19.1 % Variation for different types of buildings ……..116

19.2 % Spatial distribution of Residential area……116
19.3 Market kunnu Colony……117
19.4 Slum settlements near beach area……117
19.5 Plinth area details- Average % ……119
19.6 Household statistics of Kasaragod Municipality……119

CHAPTER – 20 SPECIAL CONCERN AREAS

20.1 CI of BPL families in the Municipality……122
20.2 CI of SC/ST population in Kasaragod Municipality……123
20.3 CI of Cultivators and Agricultural laborers in the Municipality……124

CHAPTER – 21 ENVIRONMENT

21.1 Environmentally sensitive areas in the Municipality……127
21.2 Spatial distribution of Paddy in the Municipality……128

CHAPTER 23- LINKAGES AND SPATIAL STRUCTURE

23.1 Connectivity pattern of the town……144
23.2 Hierarchy of Nodes……144
23.3 Spatial structure of the Town……145

PART II: INTEGRATED DEVELOPMENT VISION

CHAPTER 3- DEVELOPMENT CONCEPT

3.1 Development concept for Kasaragod Town……178

PART III: LAND USE AND SECTORAL PROPOSALS

CHAPTER 2- TRAFFIC AND TRANSPORTATION PLAN

2.1 Junctions requiring improvements……..191

2.2 Proposed Road widening and Railway over bridges…..193

2.3 Proposed Ring Road and Foot over bridges……..195

CHAPTER 3- SECTORAL PROPOSALS

3.1 Proposed fishing harbour at Thalangara……..203

3.2 Fishermen settlements & slums in the Municipality……211

PART I

STUDY AND ANALYSIS

1. INTRODUCTION

The fact that Master Plan is a potent tool to streamline developments in urban areas in a scientific and organized manner has received wider acceptance during the last decades. Urban areas are usually a mix of complex natured unorganized activities and they become very complicated to deal with after a few decades of their growth.

Preparation of Master Plan for an urban area is a basic attempt to create an orderly development for the future through suggestions, regulations and development proposals for the physical, social and economic environment of the urban area and better quality of life of the residents in and around of the area.

Kasaragod, the 14th district of Kerala is the Northern most District of the state. Kasaragod municipality is the administrative headquarters of Kasaragod district as well as of Kasaragod Taluk. It is the face of Kerala to the Northern states, and is surrounded on its three sides by water bodies- Chandragiri River and Lakshadweep Sea. Kasaragod Municipality has a high potential for Tourism and it's the main commercial node between Kannur and Mangalore. Kasaragod attains importance because of its proximity to the business cum commercial centre of Mangalore and tourist centres in the northern Kerala. Also, its elevation to the status of a district headquarters triggered a sudden spurt in development in all sectors. This development, without proper development guidelines have started getting manifested in unplanned concentration of activities leading to congestion, ribbon development along major roads and lack of space for infrastructure facilities.

This Master Plan is designed as a balanced one best suited for the need of the projected population for the target year of 2031. It envisages a distribution of projected population taking into account the suitability of land and availability of infrastructure. This is achieved by identifying developable land, and the nature and quantum of development, it t can sustain without harming the environment. An efficient distribution of infrastructure is the thrust area of the Master Plan. The existing infrastructure is evaluated and the infrastructure need of the future is assessed. The infrastructure designed for future is with adequate scope for development beyond the horizon year.

2. NEED FOR THE PLAN



Kasaragod is the gateway to Kerala at the North, from the State of Karnataka. It is the face of Kerala to the Northern states. Kasaragod Municipality has a high potential for Tourism and it's the main commercial node between Kannur and Mangalore. Kasaragod attains importance because of its proximity to the business cum commercial centre of Mangalore and tourist centres in the northern Kerala. The region is well connected by road and rail network. The Shoranur - Mangalore broad gauge line adds to the regional linkage of the town. It directly links Kasaragod with Mangalore in the north and Kannur in the south

With the decentralized and participatory planning, through the constitutional backup of 73rd and 74th Constitutional Amendments, local bodies acquired the momentum of planning process. The importance of spatial planning was more realized and it became established that an actual assessment of potentials and issues is required and also only through a definite planning strategy the development of a local body can be ensured.

Taking into account the known & felt problems and the unexplored potentials of the Municipal area, the Kasaragod Municipal Council decided to prepare a Master Plan for the town. As per the Resolution No. 35 of the Municipal Council dated 01.03.2000, Department of Town and Country Planning initiated action for preparation of a Master Plan for Kasaragod Municipality.

3. METHODOLOGY

As a part of Preparation of Master Plan for Kasaragod various primary and secondary databases were collected regarding each sector. A land use survey was done in order to update the existing land use map. Secondary data were collected mostly from Municipal records, census reports, and other statistical data books.

A stake holders' meeting was conducted in connection with the plan preparation to collect the aspirations and suggestions of the public regarding development of Kasaragod Town.

Meanwhile, the preliminary surveys such as Traffic Survey and Socio – Economic Survey were started and the database inventory was made available. The acquired database was analyzed with regard to each sector. On analysis of the data, the problems, issues and potentials in various sectors were identified. The demands in various sectors for the horizon year of 2031 were estimated.

Having thoroughly understood the problems and potentials and assessed future requirements, various alternate development strategies were formulated from which an appropriate development strategy was selected. Subsequently, based on the formulated development strategies, policies, development controls and regulations, project identification etc. were completed and the same was presented before the Municipal Council.

Initially the Master Plan for Kasaragod was proposed to be brought under the purview of Madras Town Planning Act 1920 applicable to erstwhile British Malabar area. During the entire process of preparation, transparency was observed and, in each stage, idea sharing was done with Municipal Council so as to bring out a participatory democratic plan. The feedback from the resource group and Council was considered while finalizing the draft proposals. Kasaragod Master Plan is prepared in accordance with Kerala Town and Country Planning Act, 2016, which came into effect on 23/09/2013.

4. EARLIER PLANNING EFFORTS

There are two Detailed Town Planning Schemes in the Town, sanctioned by the Government to regulate the developments within the town.

1. Detailed Town Planning Scheme for Central Area sanctioned as per G.O MS No: 4/89/LAD dated 12-1-1989.
2. Detailed town Planning Scheme for New Bus Stand Area as per G.O MS No: 100/91/LAD dated 18-3-1991.

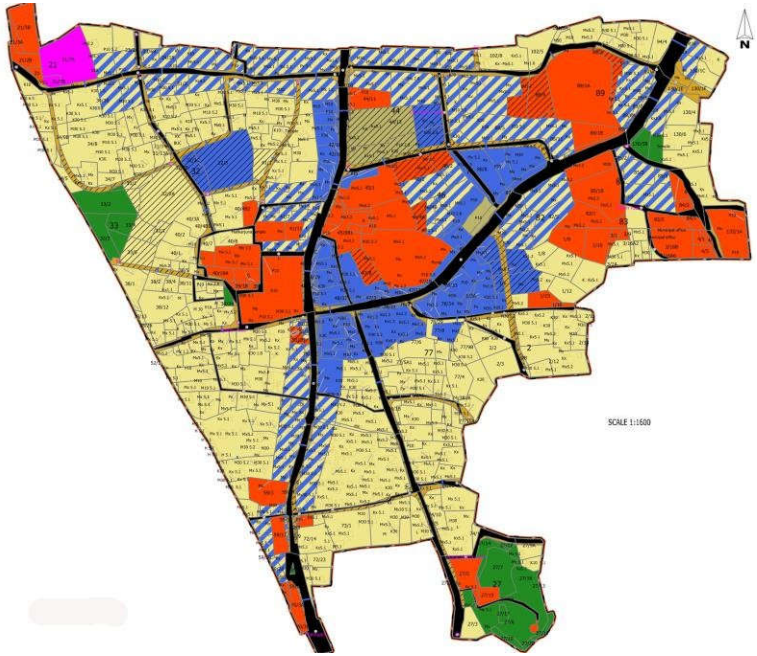


Fig 4.1 Detailed Town Planning Scheme for Central Area

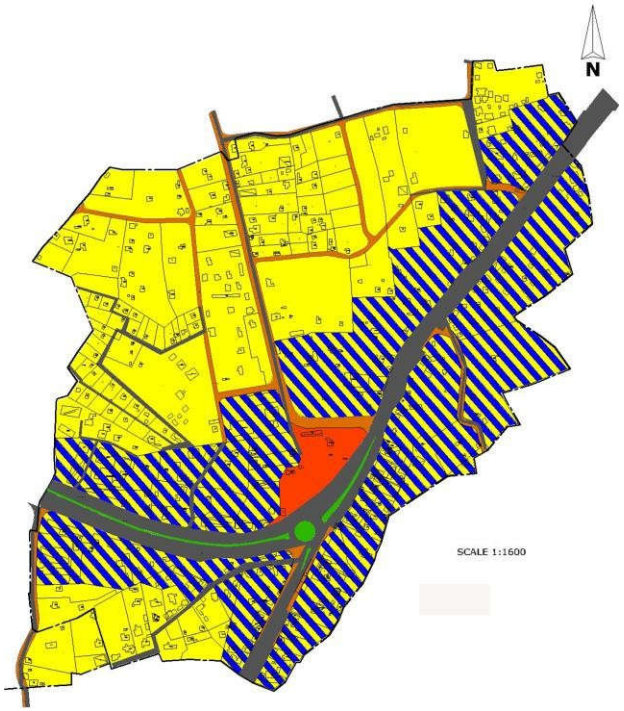


Fig 4.2 Detailed Town Planning Scheme for New Bus Stand Area

CHAPTER 5
PROFILE OF THE TOWN

1.0 LOCATION

Kasaragod Municipality is the administrative head-quarters of Kasaragod District, the northern most district of Kerala. The town is situated on the banks of Chandragiri River. It lies between 11^0 - 18' and 12^0 - 48' north latitudes and 74^0 - 52' and 75^0 - 25' east longitudes. Kasaragod is the farthest Municipality from the State Capital, Thiruvananthapuram, at a distance of 589 km by rail. Mangalore city is nearly 47 Kms north of Kasaragod town and Major State centers like Kozhikode and Ernakulam lie south at 175 km and 369 km respectively from Kasaragod. The nearest Airport is at

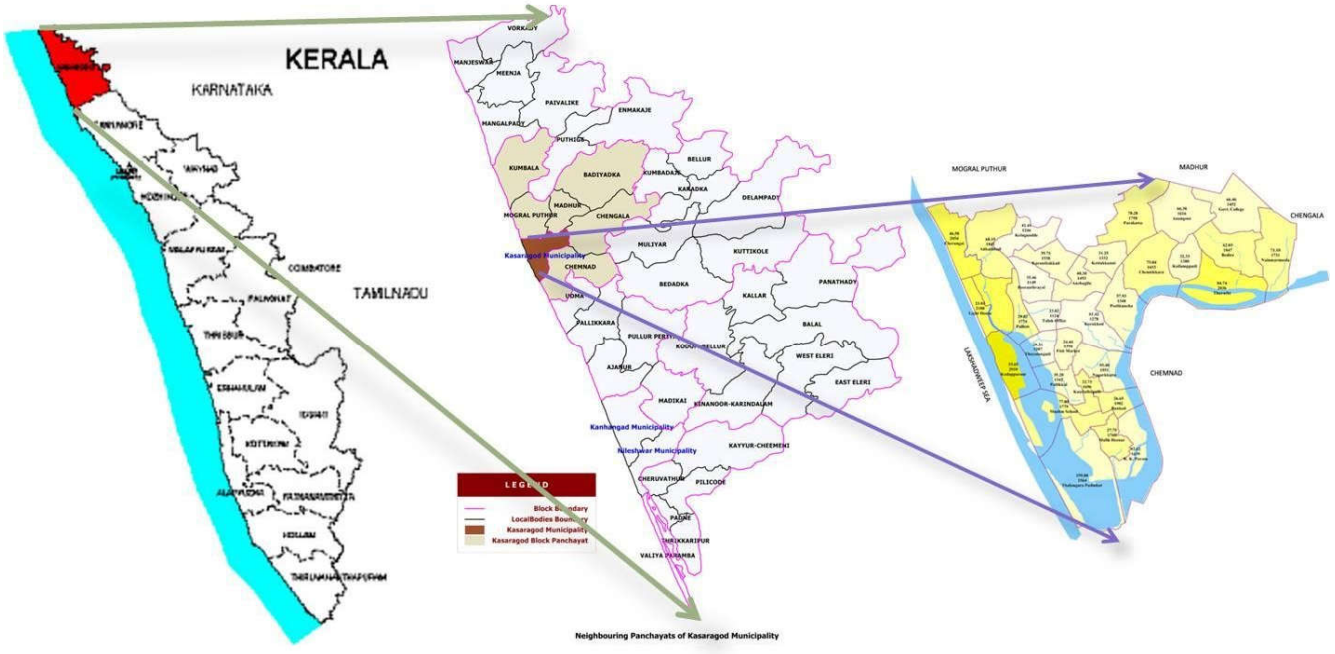


Fig 5.1 Location of the Town

Mangalore, at a distance of 50 km to north of the town. The Kozhikode airport 204 km to south is also fairly utilized. The Kannur International Airport, which became operational from 9th December 2018, is 111 km away from the town. Mangalore and Kozhikode are the major urban centers on to the north and south respectively linked with Kasaragod. Kanhangad, Manjeswaram and Payyanur are the other centers within a distance of 25 to 50 km from Kasaragod town.

2.0 AREA AND POPULATION

The town is bounded by Lakshadweep Sea on west, Mogral Puthur and Madhur Panchayat on North, Chengala Panchayat on East and Chemnad Panchayat on the East and South. Kasaragod Town was elevated to Municipal status in 1969. It spreads over an area of 16.69 sq kms. The town has a total population of 54,172 as per 2011 Census, of which males constitute 49% of the population and females 51%. The overall population density of the town works out to 3246 persons/sq km. There are 35 wards in Kasaragod Municipality, and population growth shows a % decreasing trend. Kasaragod Municipality has an average literacy rate of 94.76%, higher than the national average of 74.04%: male literacy is 96.5%, and female literacy is 93.12%. Average household size is 5.31.

3.0 CLIMATE

Climatic condition of the town is similar to the rest of Kerala. Dry weather from December to February, hot weather from March to May, South West Monsoon from June to September and north-east monsoon from October to November are the main four seasons. The monsoon is characterized by heavy rains with high velocity winds. The town experiences humid atmosphere with temperature ranging from 18^0 C - 34^0 C throughout the year and the average rainfall is 3400 mm. Kasaragod receives the maximum rainfall among the districts of Kerala.

4.0 PHYSIOGRAPHY

The town is in the low land having gentle slope towards sea and steep slope towards Chandragiri River. Northern Part of the town is generally plain.

Sandy soil is seen along the western portion/coast of the town and red laterite on the east. The average altitude is 15.5 m above M S L. The temperature varies from 18^{0}C to 34^{0}C. A part of the town area falls under the development regulation category – CRZ - II. Kasaragod Municipal area is characterized by 4 micro topographical units; they are:

- Shore plain and plain which includes Seashore area, Thalangara, Cherangai, Adakathbayal, Korakkod, Ameyvail, etc.
- Small and medium slopes, inclusive of Anangoor, Thiruvathur, Nelkala,Bangaramkunnu, etc
- ö Valleys of Kollampady, Nelkala, Chennikkara, Badire etc. and
- Upper plain land area of Vidyanagar.

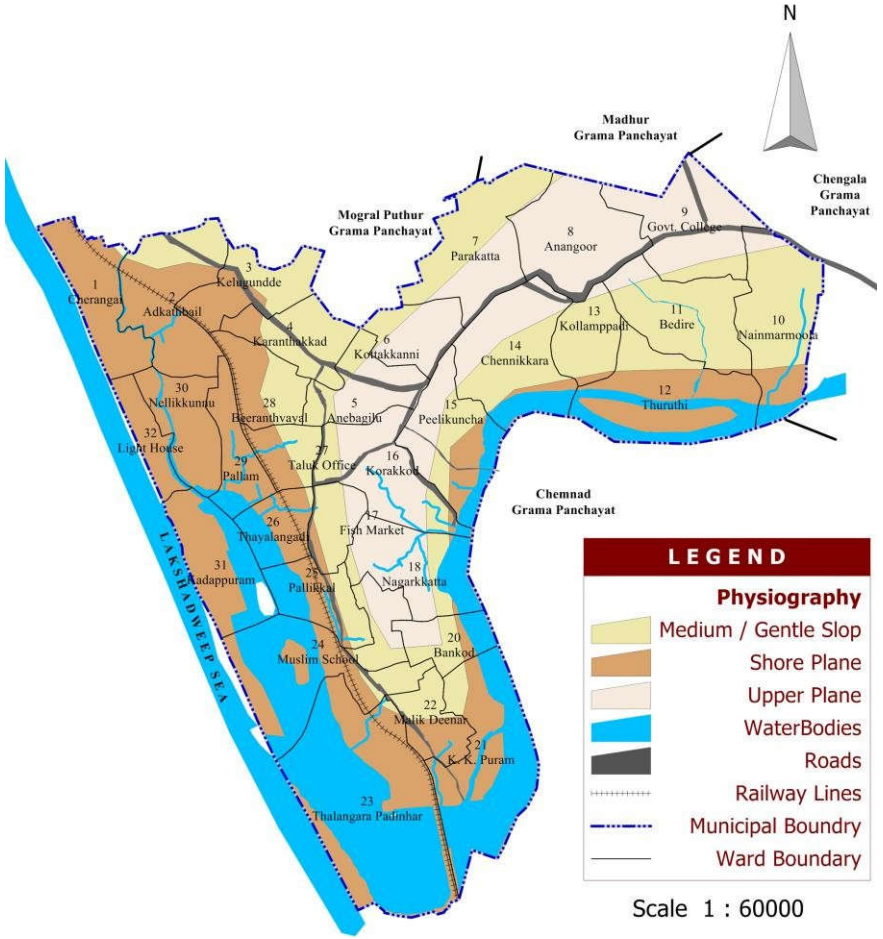


Fig 5.2 Physiography of the Town

5.0 HISTORY



Kasaragod municipal town is situated on the banks of the Chandragiri river and is 31 m. above sea level, and is an important business centre. It is a confluence of several languages and culture where eight languages are spoken. The principal and recognized administrative language of Kasaragod is Malayalam. Tulu, Kannada and Konkani are also widely spoken. Besides these languages, Marathi and Urdu are spoken by minorities. Malayalam spoken here has influences from Tulu and Kannada and known as Kasaragod Malayalam, which varies from the standard Malayalam to a great extent. Likewise, the Tulu and Kannada spoken here are also influenced by Malayalam. Bekal fort, one of the major tourist destinations in the state, is located just 20 Km. south of Kasaragod. The CPCRI, LBS Engineering College etc. in the fringe of Kasaragod Municipality add to the significance of the town in terms of its institutional prominence. The Arabian Sea on west and the state boundary on North and East, limit the growth periphery of the town as unidirectional.

5.1 HISTORY OF DEVELOPMENT



The name Kasaragod is said to be derived from the word 'kusirakood' (kanjirakootam) meaning Nuxvomica forests. Lying on the North Western coast of the state, Kasaragod has attracted many famous travellers from time immemorial. The Arab traders who visited the place, being an important trade centre, between 9th and 14th centuries called the place Harkwillia. Barbose, the Portuguese traveller who visited Kumbala, near Kasaragod in 1514 has

reported export of rice to Male' Island and import of coir from there. Dr. Francis Buccanan, the family doctor of Lord Wellesly, visited Kasaragod in 1800. In the travelogue, he mentions about political and communal features of places like Athiparamba, Kavvai, Nileswaram, Bekal, Chandragiri and Manjeswaram. Earlier this region was under the Nayaks, the vassals of Vijayanagar Empire and it was in their times the forts of Bekal and Chandragiri were constructed. Hyder Ali of Mysore conquered Bednoor in 1763. Failure to capture Thalassery fort put an end to his plans to conquer the entire Kerala. After his death in 1782, his son, Tippu Sulthan continued the campaign and conquered Malabar. Tippu surrendered Malabar excluding Thulunadu (Canara) to the British by Sreerangapattanam treaty of 1792. The British had hegemony over the place since the death of Tippu Sulthan in 1799.

5.2 HISTORY OF GOVERNANCE

Kasaragod Taluk of the erstwhile South Canara district of Madras State was transferred to Kerala on the Ist January 1957. Kasaragod was part of Bekal taluk in the South Canara district of Bombay presidency. Kasaragod taluk came into being when Bekal taluk was included in the Madras presidency on 16th April 1882. Though Vengayil Kunhiraman Nayanar moved a resolution in 1913 on the floor of Madras Governor's Council demanding the merger of Kasaragod taluk with the Malabar district, it had to be withdrawn due to stiff resistance of the members from Karnataka. In 1927, a political convention held at Kozhikode, passed a resolution stressing the above demand. Thanks to the efforts made by many eminent persons like K.P.Kesava Menon, Kasaragod became part of Kerala following the reorganization of state on linguistic basis and formation of Kerala on the first November 1956. Kasaragod is one of the two new districts formed in Kerala State during the inter-census period 1981-1991. It is the most northern

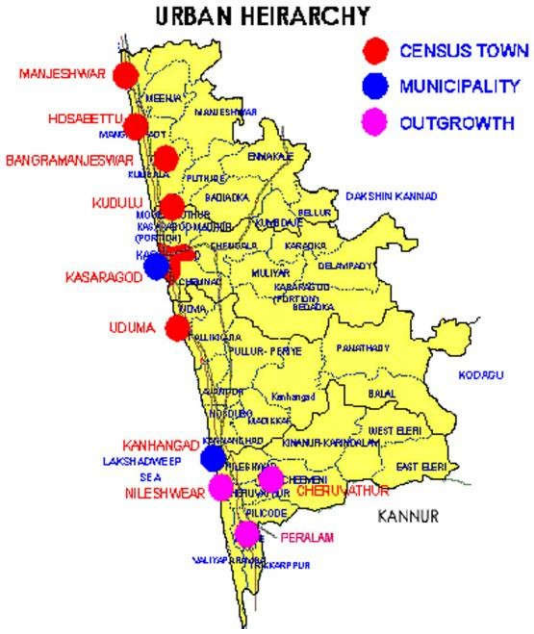


Fig 5.3 Urban Hierarchy

district of the State and was formed on the 24th May,1984 combining Kasaragod and Hosdurg taluks from the Kannur District as per G.O.(MS)No.520/84/RD dated, 19-5-1984. The main intention of the formation of the district was bestowing maximum attention on the development of backward areas in Kasaragod. Kannur district extended over the present Kasaragod District and North Wayanad Taluk of Wayanad district. Kasaragod District was formed by bifurcating Kannur District on 25.5.1984.

There are three statutory towns in the district; Kasaragod, Kanhangad and Nileshwaram. All the urban centres of the district are situated along the seacoast. Being the district headquarters, Kasaragod bears status of first order with a population of 54,172 as per 2011 Census. Kanhangad has a population of 73,342 as per 2011 Census. Hierarchically, Manjeswaram, Cheruvathur, Thrikkarippur and Udma are the other urban centres in Kasaragod District.

5.3 SOCIO CULTURAL HISTORY





The main religious groups are Hindus, Christians and Muslims. Brahmins, Nairs, Ambalavasis, Thiyyas and Kammalas are the major divisions o the Hindu Community. The Christians are early settlers (1943) from the southern part of the state and mainly settled in the eastern hilly areas which were converted to rich plantations. The first group came to Rajapuram in 1943. The Muslims are very pious and follow rigid religious customs. The purdah system is observed more strictly by Muslim women here than in other parts of the State. Cherumas, Mavilans, Parayas are the Scheduled Castes. They are mainly agricultural labourers. The scheduled tribes consist of Koragas of Kasaragod Taluk, Marattis of Kasaragod and Hosdurg Taluks and Adiyans of eravas. The cosmopolitan outlook and character of the people of the district are

because of the contact they had with the trade missions when they visited the place years back. Hindus, Muslims and Christians are getting influenced by the culture of each other. Mosques, Temples and Churches stand side by side as a symbol of communal harmony.



Thalangara is a predominantly Muslim area of Kasaragod town famous for housing the Malik Deenar Jama Masjid and Dargah. Malik Deenar was an Islamic Missionary who brought Islam to the South-West coast of India, during the lifetime of Prophet Muhammad. The area is dependent on money sent home from abroad and most of the families in Thalangara will have a few family members working in the Persian Gulf, particularly Dubai. The major areas of Thalangara are Padinhar, Kunnil, Kadavath (means Ferry Stand) Khazilane, Nuppadamail, Bangod, Theruvath (means street in Malayalam) etc. The areas of Thalangara consist of smaller mohallas (localities) and each locality has its own mosque and madrassa.

Thalangara Thoppi (Cap) was a very popular item in the past. It was produced domestically in the earlier years. In the past years, it was rare to find a home not involved in making these Thalangara Thoppi. Late K.S. Abdul Khader Haji, M.P. Abdul Khader Haji and Padhindadkal Mohammed Haji were the founders of this industry. The products were exported mainly to gulf countries. This industry played an important role in the economy of Thalangara at that time, but due to the introduction of mechanized production of these items, handmade caps cannot compete on the basis of price any longer, and the production of caps has been significantly reduced in the Thalangara area. **T. Ubaid**, the cultural leader of Kasaragod was born at Thalangara in 1908. Proficient in Malayalam and Kannada, T.Ubaid translated many Malayalam literary pieces into Kannada and vice-versa. He was also a researcher of Moppla songs and a noted poet of Arabic-Malayalam. Several of his poems were collected under the titles Navaratna Malika Bashpadhara and Chandrakala. He was an effective speaker and member of Kerala Sahithya Academy. He died in 1972. **C. Raghavan** from

Pulikkunnu, Kasaragod, was a famous Malayalam and Kannada scholar and translator. He received the Kendra Sahitya Academy Award for the Kannada translation of Indulekha. He was said to be the “cultural bridge “between the two languages. He passed away on February 2010.

Kasaragod sarees of Kerala, which were once masterpieces made with high quality yarn using traditional handmade methods, are fast losing their popularity due to the presence of power looms and availability of assembly line cheap sarees. Kasaragod sarees were once known for their design, quality, color pattern and ornamented saris or borders. The prices of these sarees range from ` 300 - 9000 depending on the cotton or silk yarn used. It normally takes up to a week to weave a pure silk Kasaragod sari. A special kind of paste, applied on the silk while weaving the saris, makes them stronger and long-lasting. The Kasaragod Weavers Co-operative Society, set up in 1938, has survived against all odds to carve a niche for itself in the textile market. Earlier, the society had an annual turnover of around ` 75 lakhs. Of late, it has come down to ` 20 lakhs. The society which used to employ more than 400 weavers few years back is now left with 56 employees, including women.

6.0 BIODIVERSITY

Kasaragod district is very rich in natural vegetation. In spite of generally favorable climatic conditions, vegetation is not uniform. In restricted regions with their own microclimate or special edaphic features, plant formations assume different characters. The plant communities ranging from psammophytes and mangroves to evergreen forests are seen here. Thalangara Childrens’ Park located in Thalangara west, 4 km from Kasaragod Town, is right next to the fishing harbour. Many water birds, spotted snakes and foxes are reported here. Bangod Bay Park located 5 km from Kasaragod Town has also different varieties of plants.



CHAPTER 6

REGIONAL SETTINGS

1.0 SPATIAL STRUCTURE

The spatial structure of a region is defined as the geographical distribution of people and land uses across the region and the pattern of trips necessitated by their land uses. Spatial structure of a region defines the functions within the sub regions (LSGs), hierarchy and connectivity. The spatial structural integrity is the key to robust economic development of any region. The major factors affecting the spatial structure of a region are activity pattern of settlements, connectivity & physiographical limitations and functional hierarchy of settlements. The spatial structure can be understood by overlaying the maps of the above three, as shown in *Fig 6.1.*

2.0 ACTIVITY PATTERN

The activity pattern identifies the economic activity for which the settlement under consideration is most suitable. This is derived from the settlement studies based on spatial analysis. The aspects under consideration are land use concentration pattern, functional

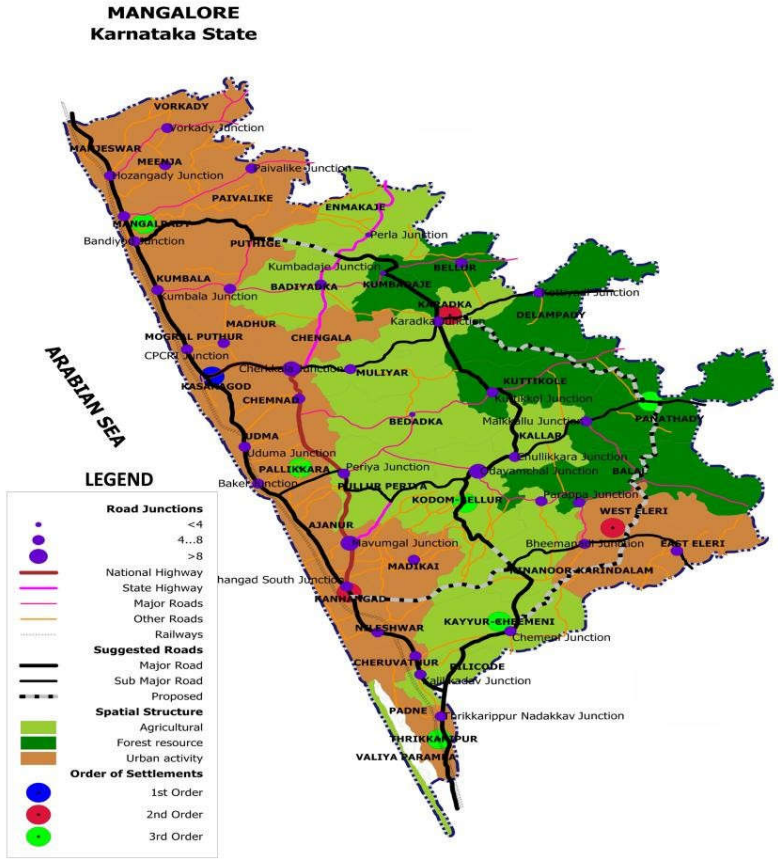


Fig 6.1 Spatial structure of the district

character and urban profile. These three aspects are considered together in judging the most suitable activity pattern for the town under consideration. Activity pattern of Kasaragod Municipality is Tertiary Activity (urban service sector oriented economic activities)

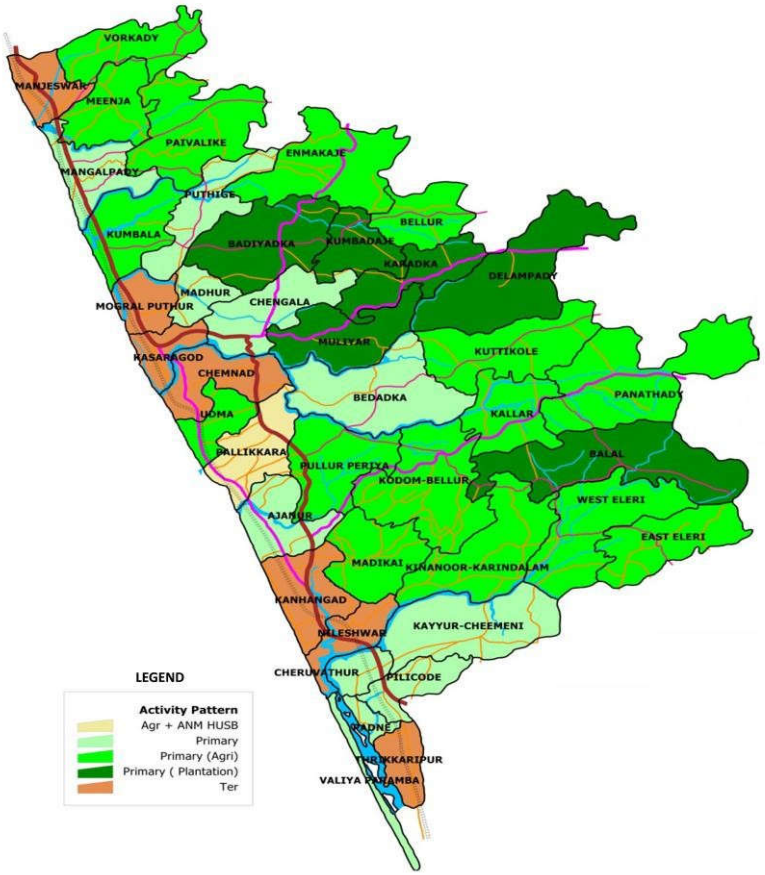


Fig 6.2 Activity pattern of the settlements of the district

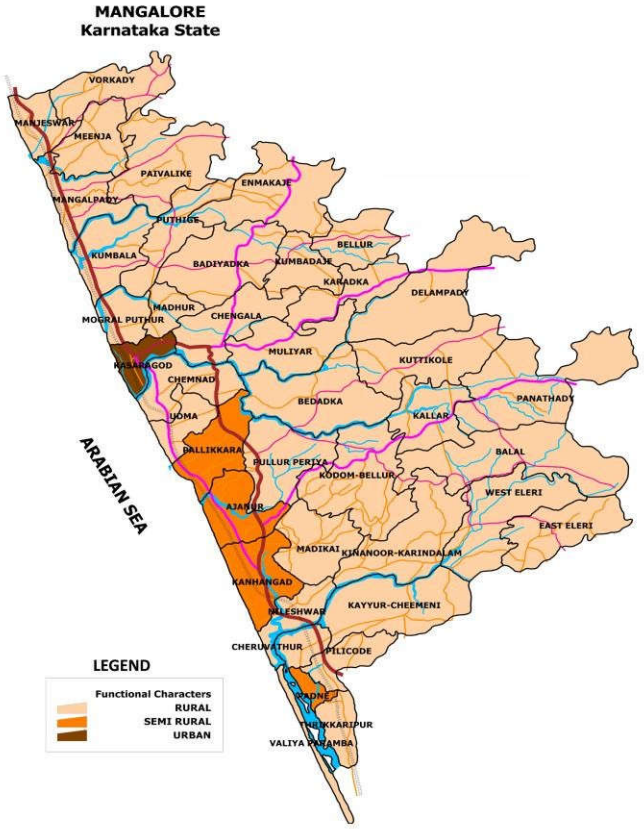


Fig 6.3 Functional classification of the LSGIs of the district

3.0 FUNCTIONAL CHARACTER

The function of a settlement is the major activity within the settlement, be it agricultural and allied activity (rural) or secondary sector and tertiary sector activities (urban activities). Functional character is determined by major land use and the average plot size within the settlement. In the Kerala context, a ward or a local body will be having either pucca urban area, pucca rural area or mixed (Residential cum agricultural) land use area in separate or in combination. Also the mixed land use area can be further classified into – Urban, semi urban, semi rural and rural based on the average plot size. When the total area of a ward or local body is concerned, the predominance of any of the four (urban land use, rural land use, semi urban or semi rural) determines the character of the area

The character of an area can be termed as **Urban**:

1.If the pucca urban land use is >= 25% of the total area.

2.If the urban land use (taking to account the classification of mixed land use) share is >= 50% of the total area.

The character of an area can be termed as **Rural**:

1.If the pucca rural land use is > 50% of the total area.

2.If the rural land use (taking to account the classification of mixed land use) share is >= 50% of the total area.

The character of an area can be termed as **Semi urban**:

1.Urban land use share + semi urban residential land use (mixed land use in classified as semi urban) is >= 50% of the total area.

The character of an area can be termed as **Semi rural**:

1. Rural land use share + mixed land use is category *is classified as semi rural >= 50% of the total area.*

Kasaragod Municipality is the only Urban settlement in the district.

The functional character of the the entire 32 wards of the Municipality are **Semi Rural** in nature.

4.0 CONNECTIVITY

Road Network

NH- 66 passes through Kasaragod town, connecting it with Mangalore, Kannur and other major urban centres in the state. The SH No.57 (Kasaragod- Pallikara- Kanhangad Road) starts from the Municipal area and opens access to the areas beyond the Chandragiri river. It connects to the service hinterlands in the district, from where agricultural products from the hilly areas are brought to Kasaragod Town for trading.
Other major internal roads are Thalangara Road, M.G.Road, Naiks Road, K.P.R. Rao Road, Beach Road, Pallom Road, Ferry Road etc. connecting the length and breadth of the municipality.

Even though the town is well connected with the region, the internal linkages fall short of proper area accessibility, right of way, geometrics etc. Several areas inside the town are isolated.

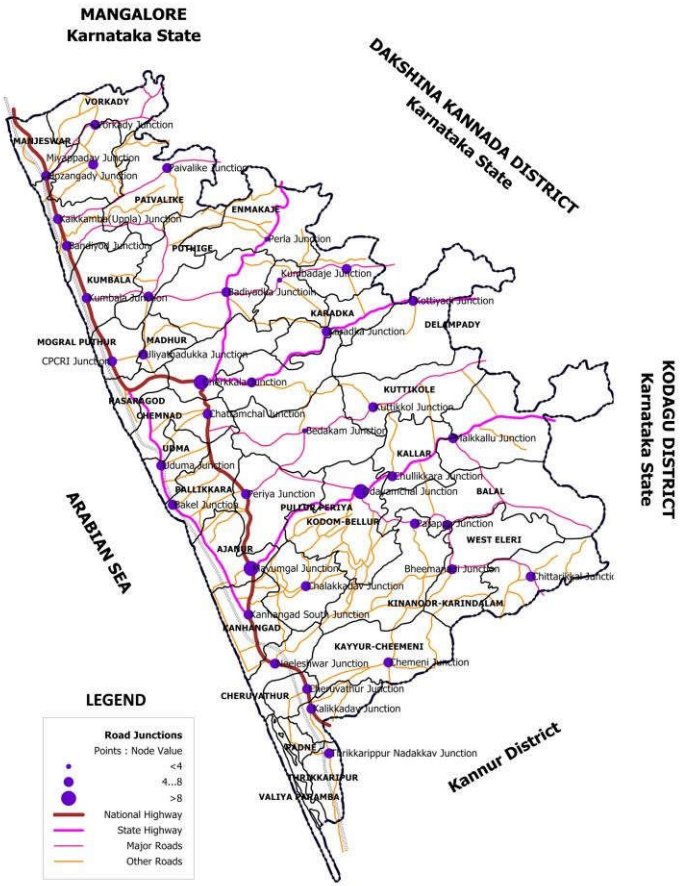


Fig 6.4 District Map showing Road, Railway network and Important Junctions

Rail Network

Kasaragod Railway Station is situated in Kasaragod town. The Railway line from Shoranur to Mangalore passes through the entire length of the district along the coast. It enters the district about 3 km south of Thrikarippur railway station and leaving the district

about 5 km north of Manjeswaram Railway Station. (Total length- 116 Km).

Air Transport

Mangalore Airport is located at 49 km away from Kasaragod Town. The Kannur International Airport in Mattanur, which became operational from 9th December 2018, is 111 km north of the town.

5.0 INFERENCE

Kasaragod Municipality is the district headquarters, well connected to the other parts of the district by Road. Kasaragod Railway station is situated in Kasaragod Town 8 km away from the district headquarters at new Civil Station at Vidyanagar. The initial development of the town concentrated around a central nucleus of Taluk Office and M.G. Road premises, and spread towards south up to Chandragiri Railway Bridge. It was further intensified due to the benefits of the proximity to railway station and the waterbody. With the establishment of new Municipal Bus Stand and Civil Station, it is seen that the direction of spatial growth of development during the last decade has undergone a change. At present, developments are coming around N H - 66. The Chandragiri Road Bridge opened up a direct access towards Kanhangad and hence Chemnad Panchayat became active and close coordinated with the development activities in the Municipality.

Functional Character of Kasaragod Municipality is Urban, Hierarchy of settlement is First Order and Activity pattern of Kasaragod Municipality is Tertiary Activity.

CHAPTER 7

DEMOGRAPHY

1.0 POPULATION AND ITS GROWTH PATTERN

Kasaragod Municipality has a population of 54,172 as per 2011 Census, which is 4.14% of the district (Fig. 7.2) , and this is distributed among 35 wards of Kasaragod Municipality. Figure 7.1 shows the growth of population from the years 1971-2011. There is a steady increase in growth. The distribution of population among the wards varies with respect to the topographical conditions, infrastructural facilities etc.

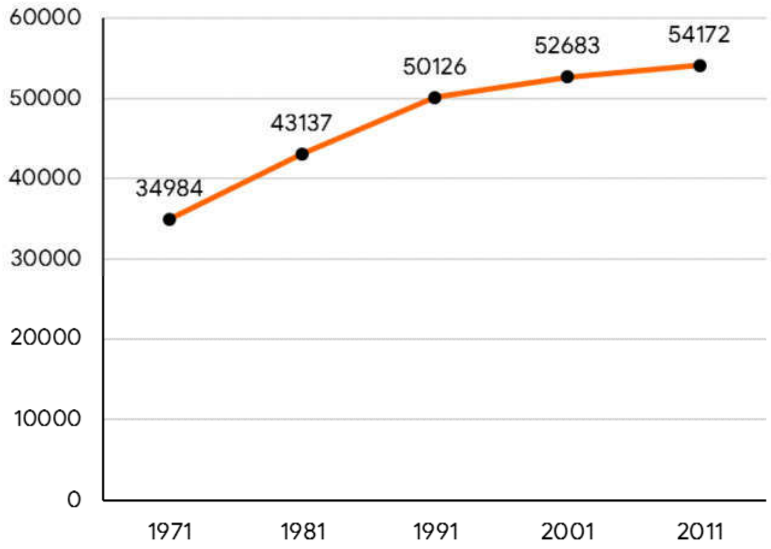


Fig 7.1 Growth of Population from1971-2011

(Source: Census 2011)

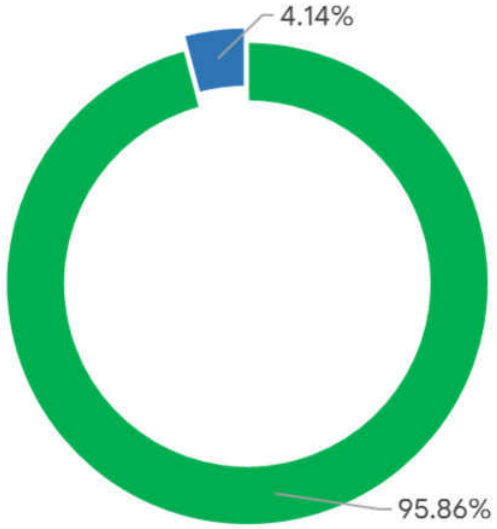


Fig 7.2 % of population in Kasaragod town with reference to the district

(Source: Census 2011)

Fig 7.3 shows the comparison of Population of Kasaragod with other towns. Kasaragod is in 2nd Position compared to other two towns of Kanhangad and Nileshwaram. Kanhangad has the highest population of 73,342.

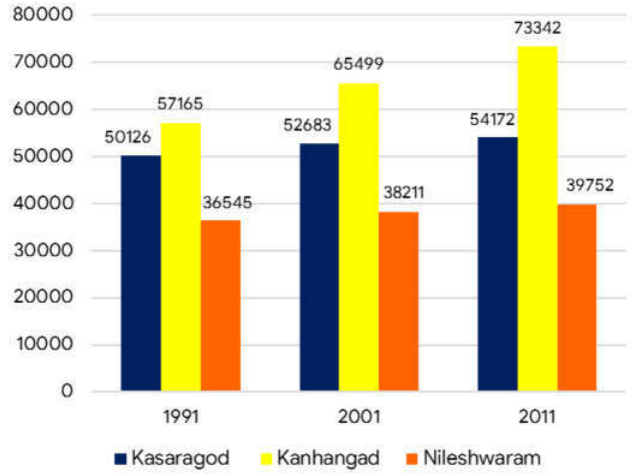


Fig 7.3 Comparison of Population with other Towns (Source: Census 2011)

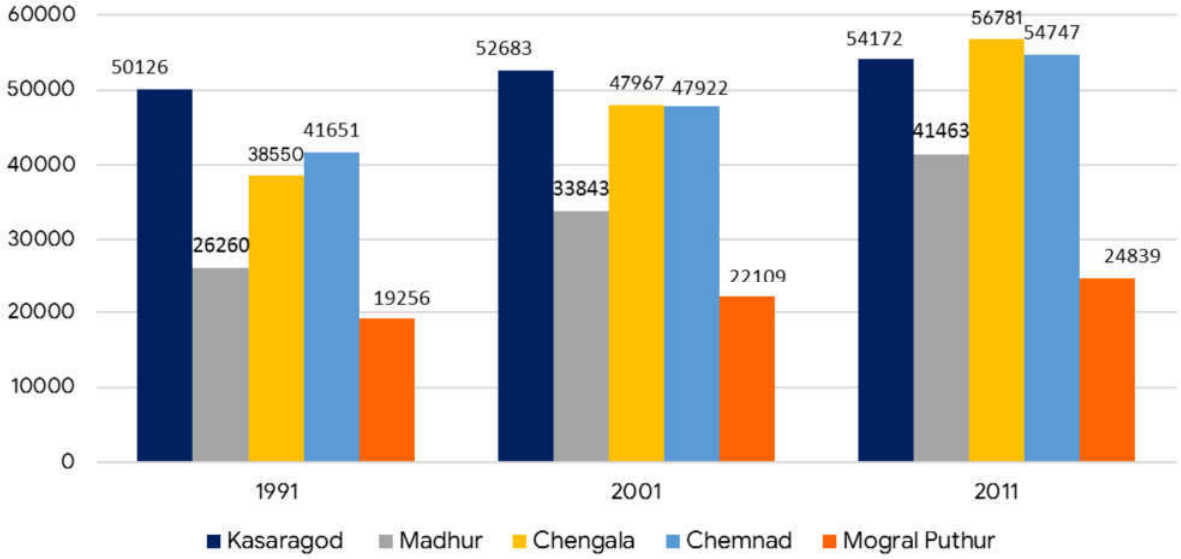


Fig 7.4 Comparison of Population with nearby LSGIs

(Source: Census 2011)

Kasaragod town had the highest population compared to the surrounding LSGIs of Madhur, Chengala, Chemnad and Mogral Puthur in Census 2001, whereas according to Census 2011, the population of nearby Grama Panchayats Chengala and Chemnad are higher than that of Kasaragod town. (Fig 7.4)

2.0 POPULATION GROWTH RATE

The growth rate of population shows a decreasing trend. This is due to the increase in literacy rate, social awareness and improved socio economic conditions. During 2001-2011, the population growth is only 2.92%.

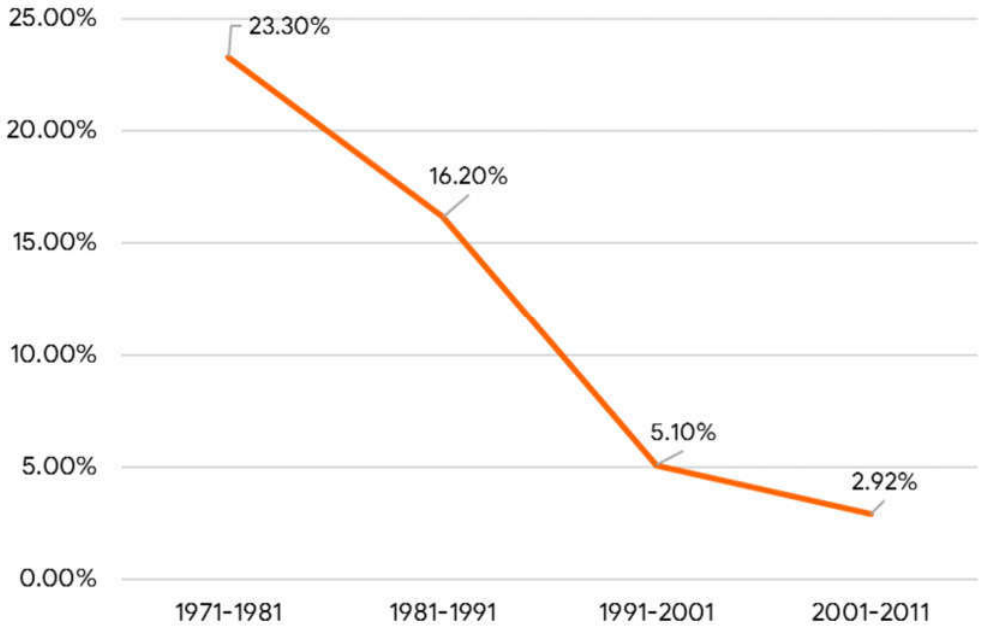


Fig 7.5 Temporal Growth Rate of Population

(Source :Census 2011)

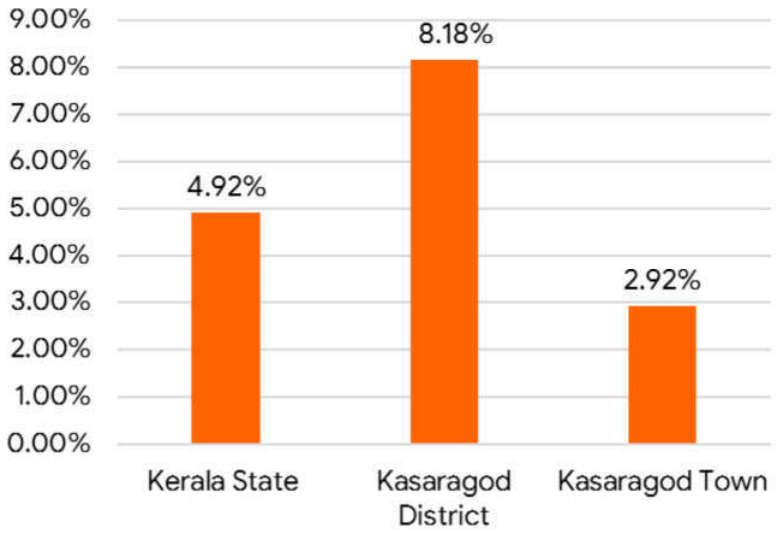


Fig 7.6 Comparison of Population Growth Rate with District and State

(Source : Census 2011)

Figure 7.6 shows the comparison of Population Growth Rate of Kasaragod town with that of Kasaragod District and Kerala State. It is lower than that of both District and State.

Fig 7.7 shows the growth rate of population in Kasaragod is much lower when compared to the growth rate of Kanhangad town, and slightly lower than that of Nileshwaram town.

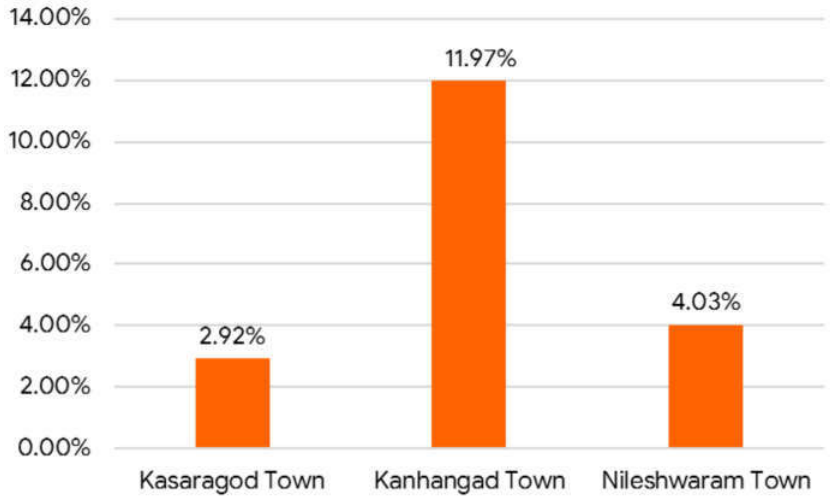


Fig 7.7 Comparison of Population growth rate with other Towns

(Source: Census 2011)

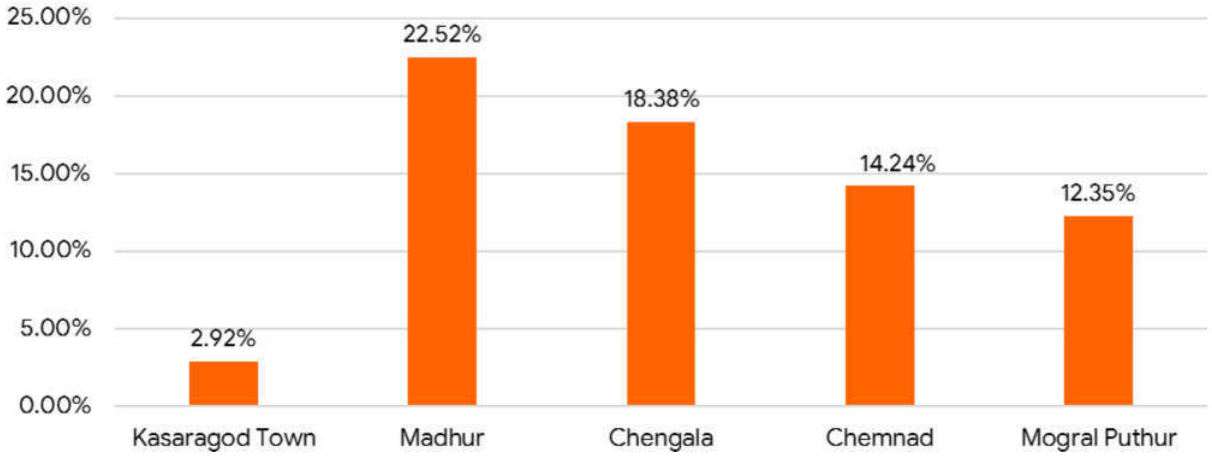


Fig 7.8 Comparison of Population with nearby LSGIs

(Source: Census 2011)

Fig 7.8 shows the growth rate of population in Kasaragod town is much lower when compared to the nearby LSGIs. Madhur Grama Panchayat leads the list with 22.52%, growth rate of population.

3.0 POPULATION DENSITY

There is a steady increase in the density of population of Kasaragod Municipality from 2586 in 1981, to 3005 in 1991 , to 3158 in 2001 and 3248 in 2011.

Fig 7.9 shows that the Population Density of the Municipality is very high when compared to the district and the state.

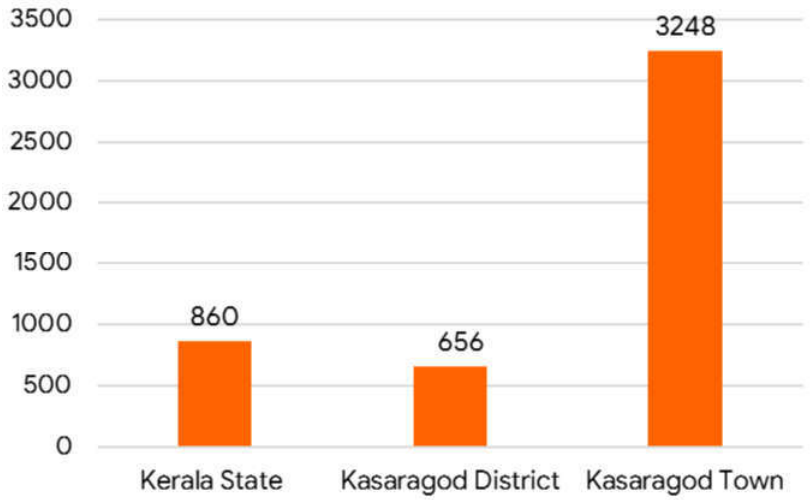


Fig 7.9 Comparison of Population Density with that of District and State

(Source: Census 2011)

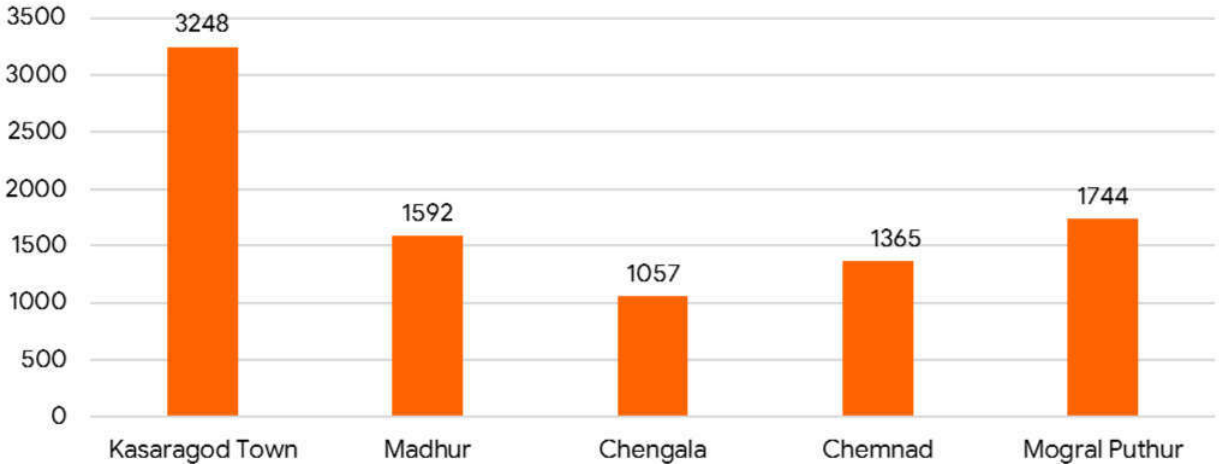


Fig 7.10 Comparison of Population Density with nearby LSGIs.

(Source: Census 2011)

Fig 7.10 shows that the Population density of the Municipality is highest when compared to the nearby LSGIs of Madhur, Chengala, Chemnad and Mogral Puthur.

Fig 7.11 shows the comparison of population density of Kasaragod town with other towns of Kasaragod District. Kasaragod Municipality is in 1st position with a population density of 3248 which is much higher than that of Kanhangad(1855) and Nileshwaram(1516) towns.

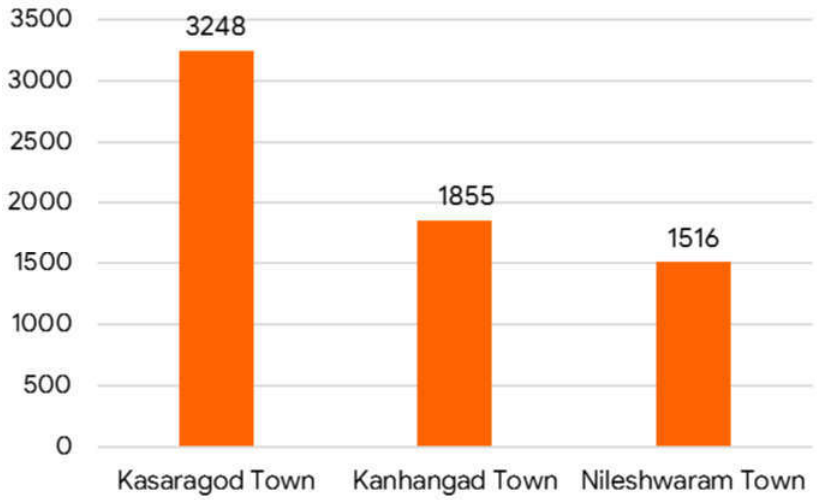


Fig 7.11 Comparison of Population Density with other towns
(Source: Census 2011)

4.0 SPATIAL DISTRIBUTION OF POPULATION

In Kasaragod Municipality, Pallam, Bangod, Malik Deenar & Kandathilpalli shows the highest density distribution of population. Pallam is in the central area of the town with thickly built up residential settlements. But the fringe areas are sparsely built up with comparatively low residential inhabitation intensities. The beach areas are thickly built up with slums and fishermen settlements. The other wards of the municipality are moderately densified. The density distribution is affected by the topographical conditions of the wards.

5.0 SEX RATIO

The sex ratio of Kasaragod town is 1058 as per Census 2011. The value has undergone changes from 1011 in 1981 which has reached 1014 in 1991 and 1050 in 2001. The variation in sex ratio indicates the outmigration of the male population for employment especially, Kasaragod shows a higher out migration due to the proximity of Mangalore, Bombay, Kozhikode etc. Fig 7.12 represents the comparative sex ratio of the Municipality with District and State. The sex ratio of the town is lower than that of both the district and state.

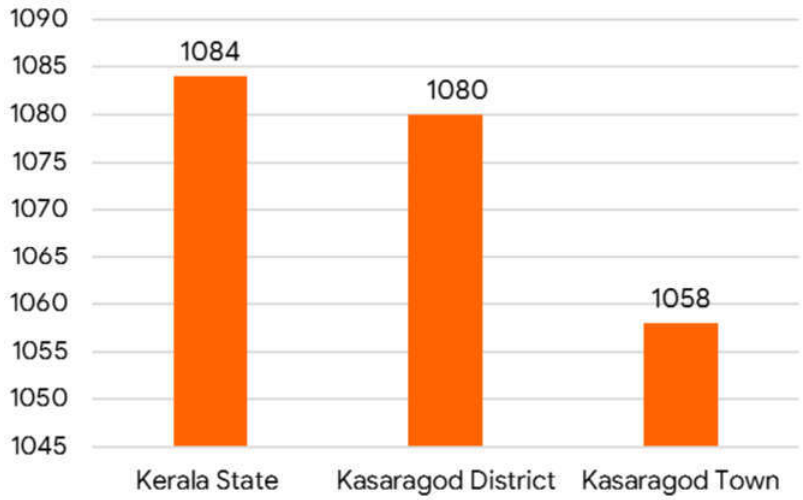


Fig 7.12 Comparison of sex ratio with that of District and State

(Source: Census 2011)

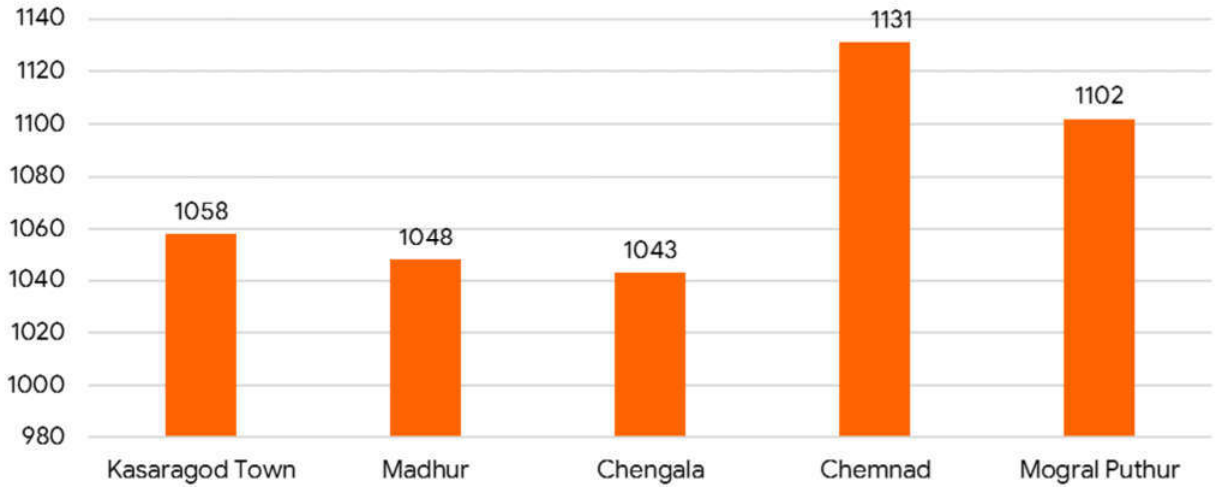


Fig 7.13 Comparison of *sex ratio* with nearby LSGIs.

(Source: Census 2011)

Fig 7.13 shows the comparison of sex ratio of the town with nearby LSGIs. Sex Ratio of the Municipality is slightly lower than that of Mogral Puthur and Chemnad Grama Panchayats and higher than that of Madhur and Chengala Grama Panchayats.

Fig 7.14 shows the comparison of sex ratio of Kasaragod town with other towns in Kasaragod District. Sex Ratio of the town is lower compared to the other two towns of Kanhangad and Nileshwaram. Nileshwaram town has the highest sex ratio of 1148.

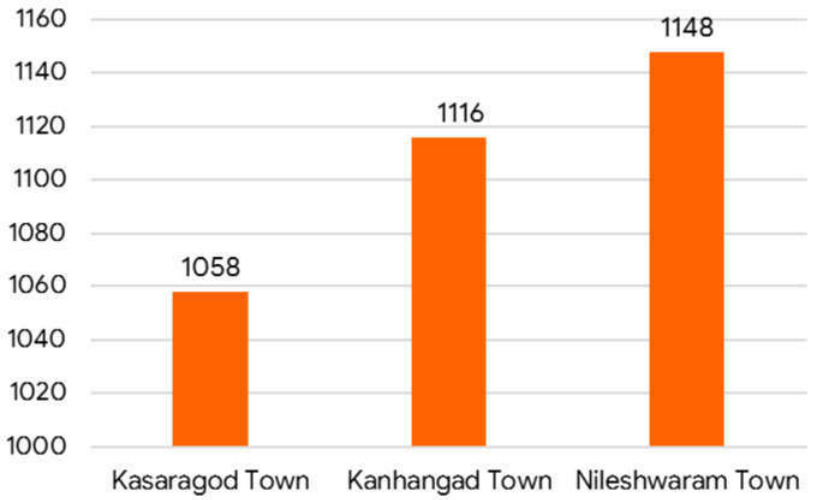


Fig 7.14 Comparison of sex ratio with other towns

(Source: Census 2011)

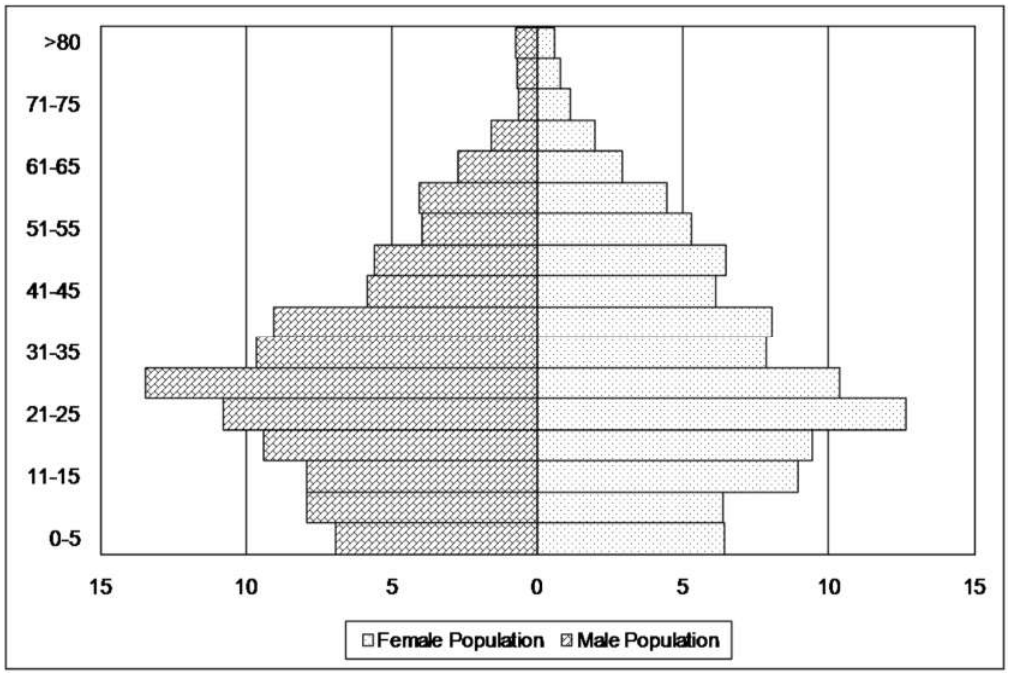


Fig 7.15 Age Sex Pyramid of Kasaragod town

(Source: Socio economic Survey)

An age sex pyramid, also called a population pyramid , is a graphical illustration that shows the distribution of various age groups in a population. It typically consists of two back-to-back bar graphs, with the population plotted on the X-axis and age on the Y-axis, one showing the number of males and one showing females in a particular population in five-year age groups (also called cohorts). In the case of Kasaragod town, the highest number of males are in the age group 26-30 and highest number of females are in the age group 21-25 as shown in Fig 7.15.

6.0 LITERACY

Literacy rate of Kasaragod town is 94.76% as per Census 2011. Fig 7.16 shows the decadal variation in Literacy rate. There has been a steady increase in literacy rate in the town through the decades.

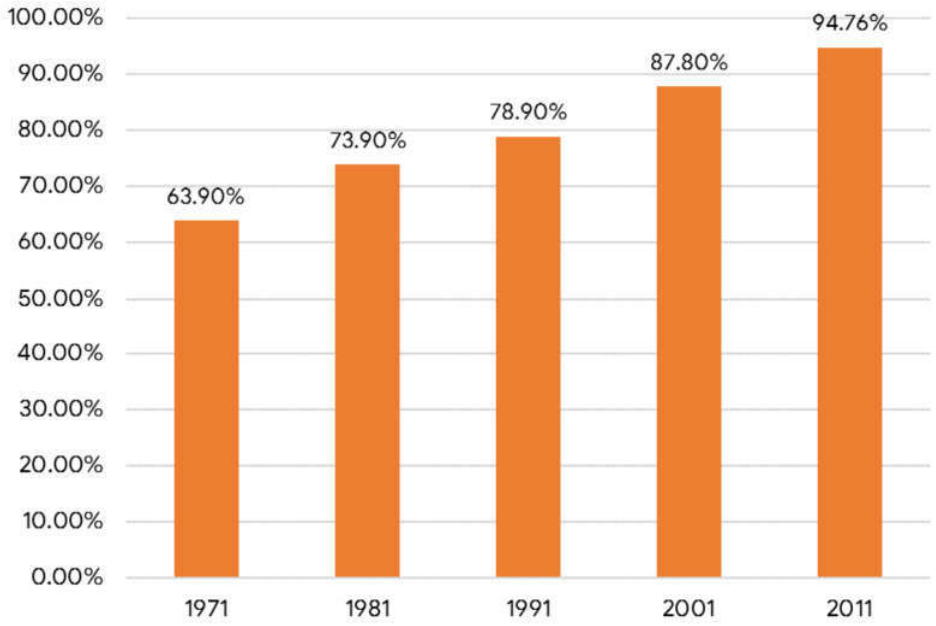


Fig 7.16 Decadal variation in Literacy Rate

(Source: Census 2011)

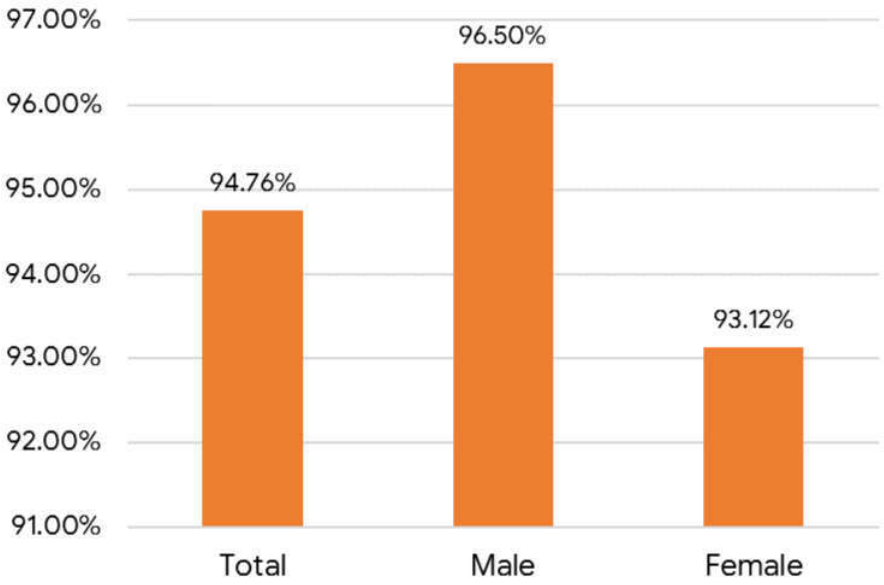


Fig 7.17 Male– Female Literacy Rate of Kasaragod Town

(Source: Census 2011)

Figure 7.17 shows the Male– Female Literacy Rate of Kasaragod Town. Female Literacy is 93.12% and Male Literacy is 96.5% in the town as per Census 2011.

Fig 7.18 shows the comparison of Literacy Rate with the State, district & other towns in the District. When compared to the other towns of the district Kasaragod town shows a higher literacy rate. Kasaragod Municipality shows a higher literacy rate when compared to the District and State also.

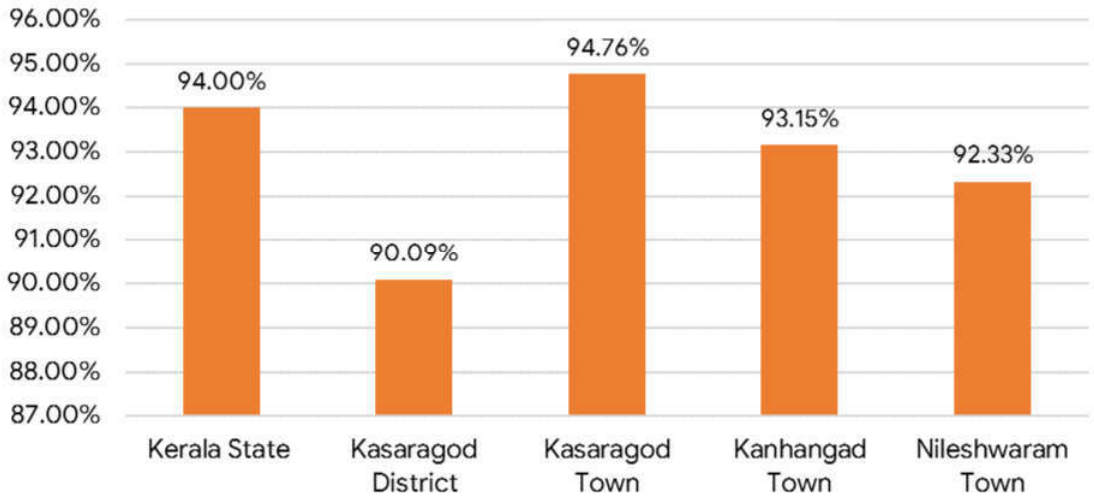


Fig 7.18 Comparison of Literacy Rate with the State, district & other towns in the District
(Source: Census 2011)

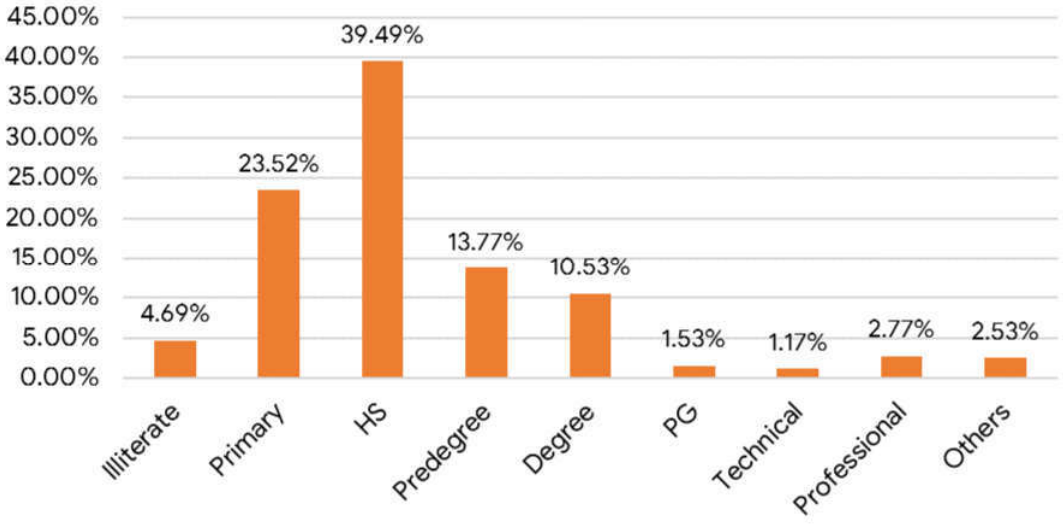


Fig 7.19 Level of Education in Kasaragod town
(Source: Socio economic Survey)

As per Fig 7.19 majority of the population in Kasaragod town belong to the High School educated group. The % of Degree holders is very low. This shows the backwardness of the town in higher educational.

7.0 HOUSEHOLD SIZE

Average household size is 5.31 as per Census 2011. The value of House hold size is an indicator of many factors like culture, socio economic background etc. of the area. The out migration from Kasaragod in search of job influences the value in some wards whereas the existence of many households in a single dwelling in some wards makes the value higher. The higher value is an indicator of the need for more houses in the municipality. Household size varies from 4 to 8. This indicates the existence of joint family system. The high value is due to the existence of multifamily dwellings and cultural influence.

From Fig 7.20 it is seen that, the District shows a higher household size than both State and District. Kasaragod is one of the most backward districts of the State. This can be attributed to the poor socio - economic aspects and the weak industrial developments in the district. Household size is higher in wards of K.K Puram, Pallam, Light house, Kandathilpalli, Thuruthi,Malik Deenar and Nellikkunnu.

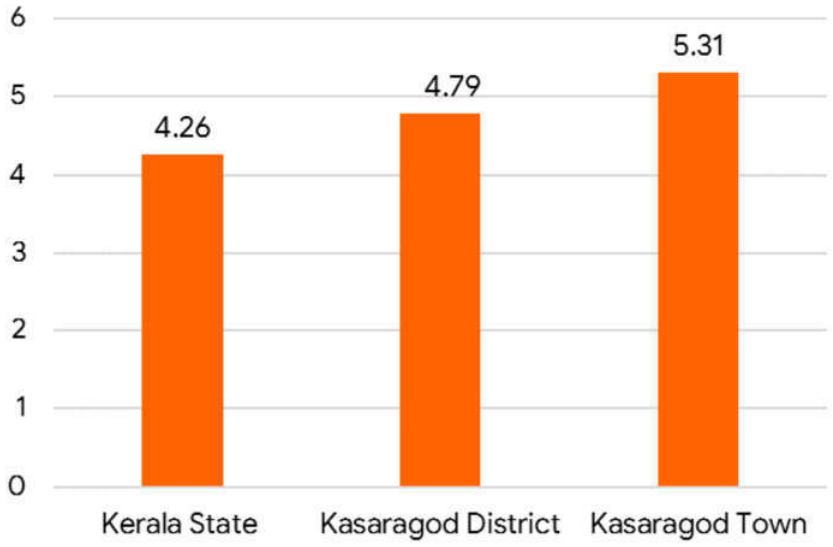


Fig 7.20 Comparison of Household Size with that of District and State
(Source: Census 2011)

5.0 INFERENCE

Although there is a steady increase in growth of population, the rate of population growth shows a decreasing trend. Growth rate of population is lower compared to the district and nearby LSGIs. This is due to the increase in literacy rate, awareness and improved socio economic conditions. Population density is higher among the coastal wards which are thickly built up with fishermen settlements and slums. Sex ratio of Kasaragod town is lower than that of other towns in Kasaragod District. Kasaragod town shows a higher literacy rate than other towns in the district. Average Household size is 5.31. Household size is higher in wards of poor socio economic conditions and along the coastal area.

CHAPTER 8

EMPLOYMENT

1.0 WORKERS

Table 8.1 shows the workforce distribution in the Municipality. It shows a decrease in the percentage of cultivators and agricultural labourers, but an increase in the percentage of Household Industrial workers. As per the land use details of the Municipality, around 12.71% of the land use is under the category of paddy fields and dry cultivation. Many household industrial units are functioning in the Municipal area. There is also an industrial estate in the town.

Figure 8.1 shows the percentage distribution of category of workers in Kasaragod municipality.

Cultivators and agricultural labourers form only 2.6% of the main workers. 2.26% of workers are in household industry and 95.15% of the workforce is in the category of other workers.

Other workers include, all service sector Government servants and marginal workers in tertiary sector.

Classification of Main workers	2001	2011
Cultivators	116	155
Agricultural Labourers	330	242
Household Industrial Workers	939	345
Other Workers	12058	14554
Total	**13443**	**15296**

Table 8.1 Classification of main workers

(Source: Census 2011)

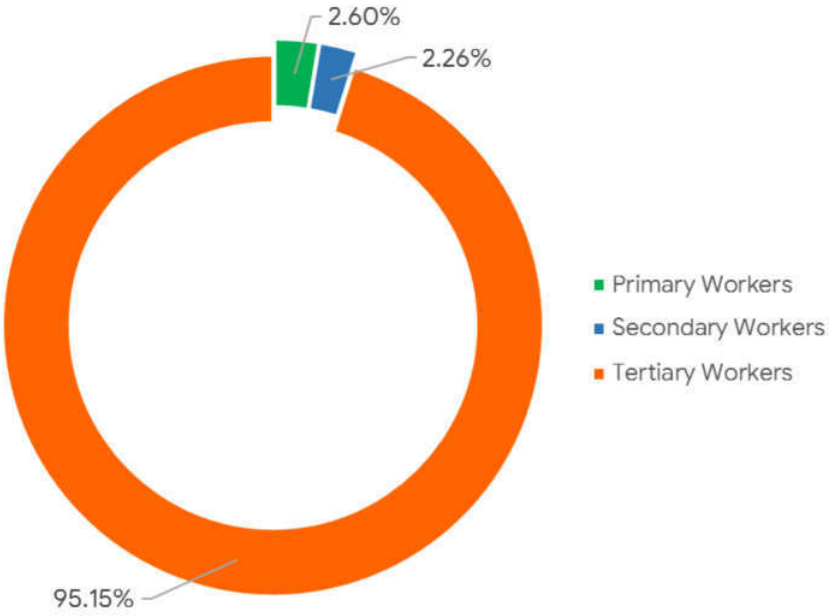


Figure 8.1 Classification of workers

(Source: Census 2011)

According to Socio economic survey- 41.54% come under other workers category, 19.68% are Outside Country and Only 4.67% are Government Employees. Fig 8.2 shows the percentage of workers in each category.

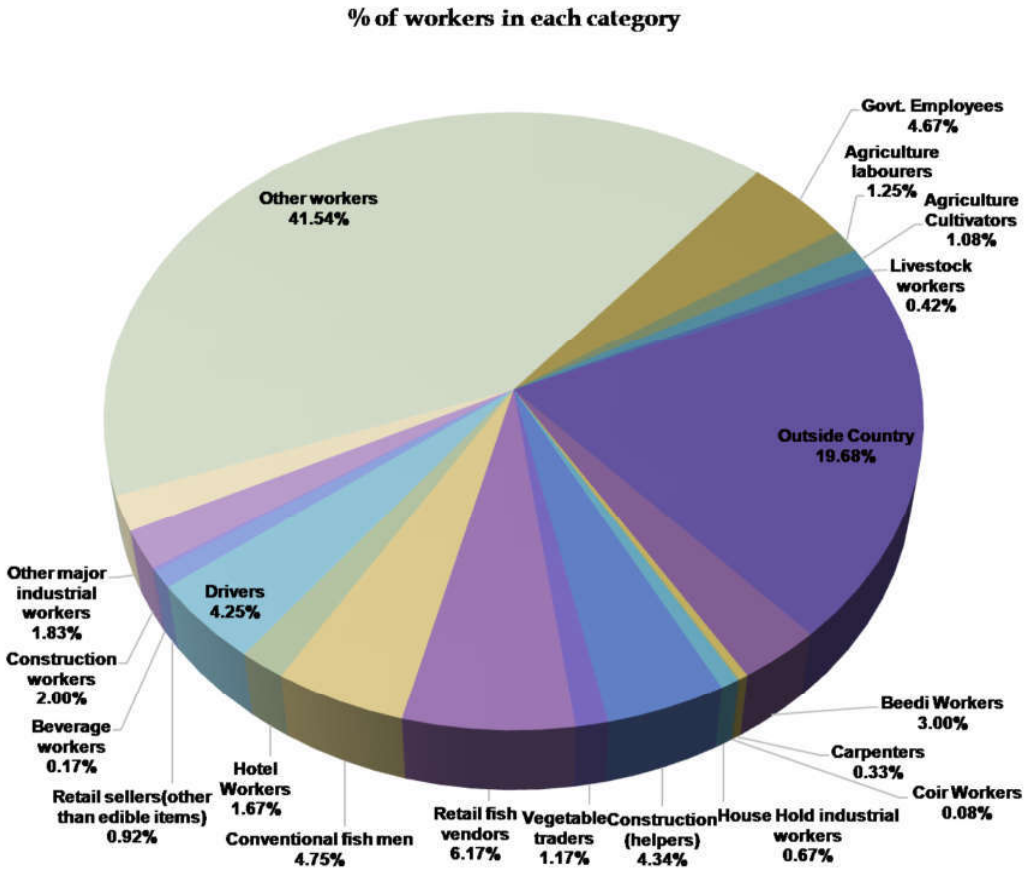


Figure 8.2 Details of workers in the town

(Source: Socio economic Survey)

Description	Population	Main Workers	% of Total Population	Marginal Workers	% of Total Population	Non Workers	% of Total Population	Total Number of workers	WFPR (%)
Kerala State	33406061	9329747	27.93%	2289316	6.85%	21786998	34.78%	11619063	34.78%
Kasaragod District	1307375	372700	28.51%	90298	6.91%	844377	32.66%	462998	35.41%
Kasaragod Town	54172	15296	28.24%	2133	3.94%	36743	35.04%	17429	32.17%

Table 8.2 WFPR of the town, the district and state

(Source: Census 2011)

2.0 WORKFORCE PARTICIPATION RATE

The work force of a place is usually indicated by Work Force Participation Rate (WFPR) which is the ratio of total workers (main and marginal) to the population of the place and it is generally expressed as percentage. Table 8.2 shows the WFPR details of the town, District and State in 2011. Table 8.3 shows the details of workers in the town during 1981 to 2011.

Figure 8.3 shows the temporal variation of Total Workers and Main workers during 1981-2011. Number of total workers declined during 1981-1991, but main workers increased in the same period.

Figure 8.4 shows the temporal variation of WFPR in the Municipality during the period 1981 to 2011. Although WFPR declined during 1981-1991, thereafter it has been steadily increasing.

Year	Population	Total Workers	WFPR (%)
1981	43137	15804	36.64%
1991	50126	14190	28.31%
2001	52683	15804	30.00%
2011	54172	17429	32.17%

Table 8.3 Details of workers in the town

(Source: Census 2011)

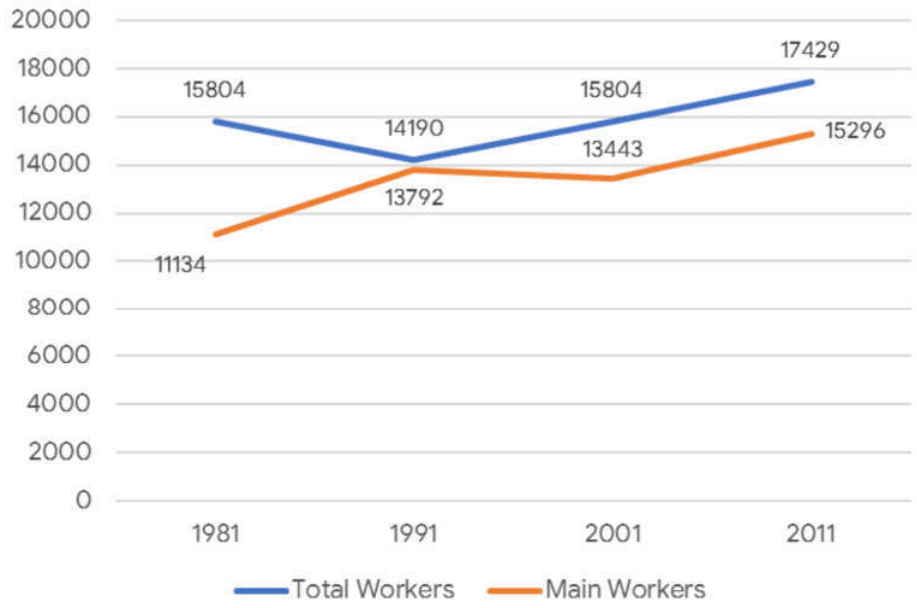


Figure 8.3 Temporal Variation of Total Workers and Main workers 1981-2011
(Source: Census 2011)

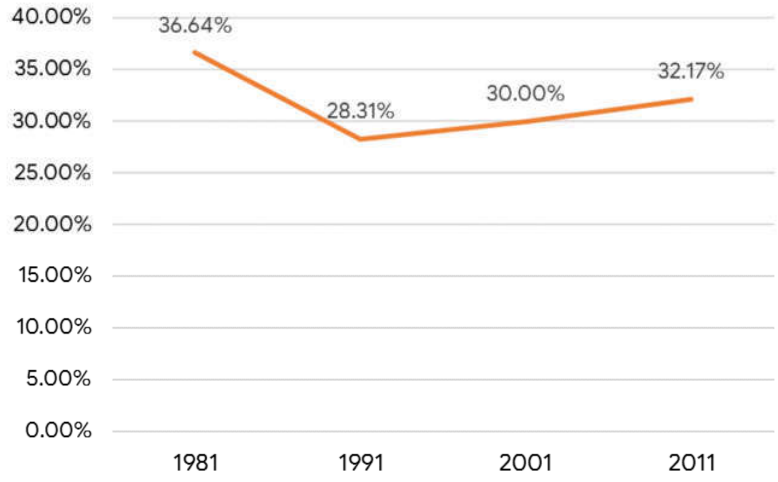


Figure 8.4 Variation of WFPR in the town
(Source: Census 2011)

Figure 8.5 shows the comparison of WFPR of Kasaragod town to the district and state. The Work Force Participation Rate for Kasaragod Municipality is 32.17% in 2011 and this is lower than that of the State (34.78%) and District (35.41%). The backwardness of industrial development in the town is one of the reasons behind the lower value of workforce participation compared to the State as well as the District.

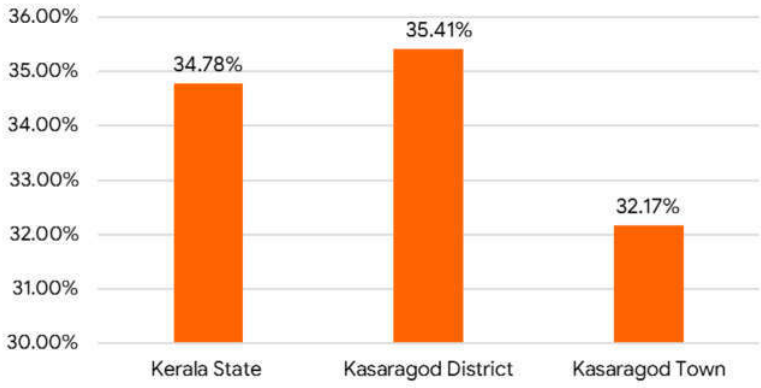


Figure 8.5 Comparison of WFPR with District and State
(Source: Census 2011)

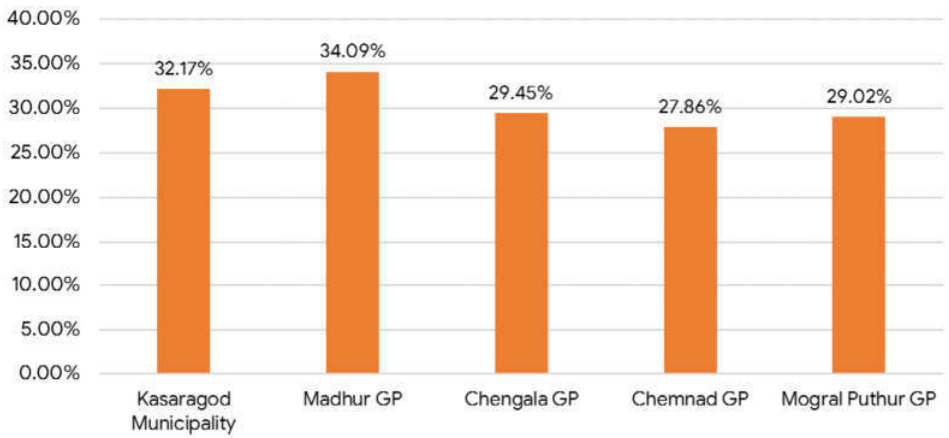


Figure 8.6 Comparison of WFPR with adjoining Grama Panchayats

(Source: Census 2011)

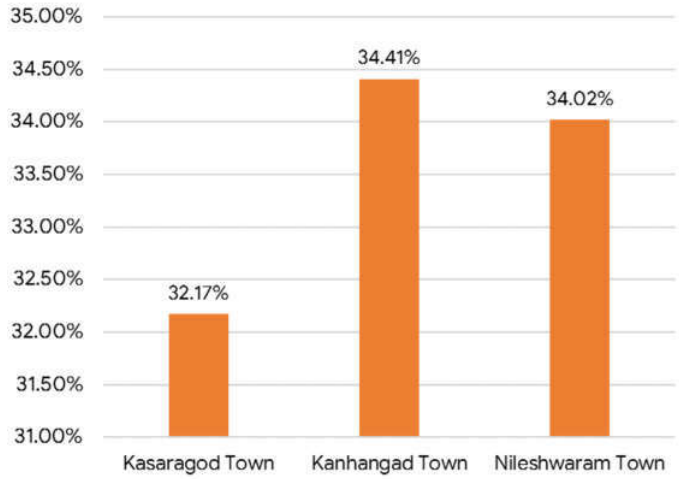


Figure 8.7 Comparison of WFPR of towns in Kasaragod District

(Source: Census 2011)

Figure 8.6 shows that Kasaragod Municipality is 2nd in position, when compared to the adjoining Grama Panchayats of Madhur, Chengala, Chemnad and Mogral Puthur. Figure 8.7 shows that Kasaragod municipality has the lowest WFPR when compared to the municipal towns of Kanhangad and Nileshwaram.

3.0 OCCUPATIONAL STRUCTURE

As per the census 2011, the main workers are classified in to four categories viz. cultivators, agricultural labourers, household industrial workers and other workers. The other workers category mainly includes the primary sector workers like fishermen, workers engaged in mining and plantation workers. The cultivators and agricultural labourers constitute only 2.6% of the total workers (15804) whereas majority of the workers (95.15%) belongs to the other workers category .So a major share of the workers are engaged in Tertiary activities. This is a clear indication of the declining trend of the primary sector in Municipality.

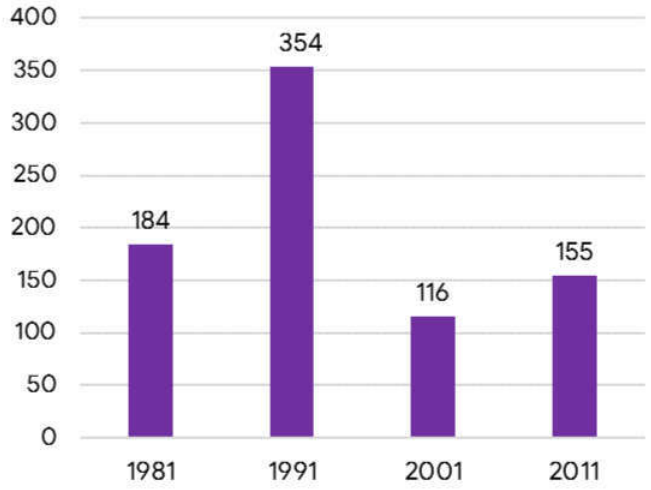


Figure 8.8 Temporal Variation of Cultivators
(Source: Census 2011)

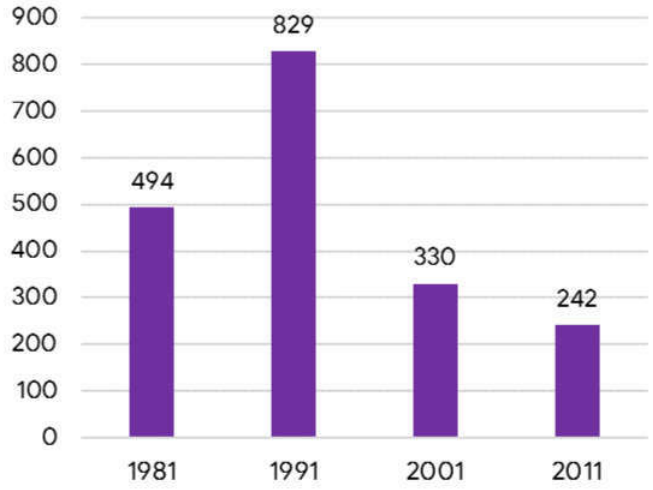


Figure 8.9 Temporal Variation of Agricultural Labourers
(Source: Census 2011)

The Figure 8.8 shows the temporal variation in the number of Cultivators in the Municipality from 1981 to 2011, while Figure 8.9 shows the variation in the number of Agricultural labourers in the Municipality from 1981 to 2011. In the town, 1.01% of workers are Agricultural laborers, and only 1.58% of workers are cultivators.

Cultivators and agricultural laborers show a decrease in total numbers (a decrease of approximately 36%) during the period from 1981 to 2011, This indicates that the primary sector activity, mainly the agricultural activity is on the decline.

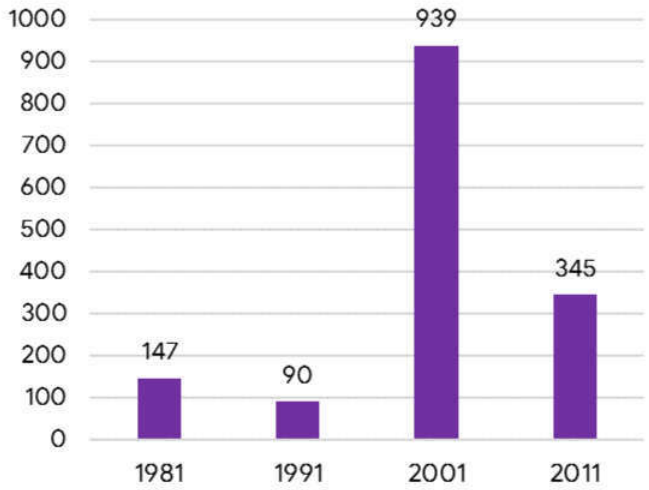


Figure 8.10 Temporal Variation of Household Industrial Workers
(Source: Census 2011)

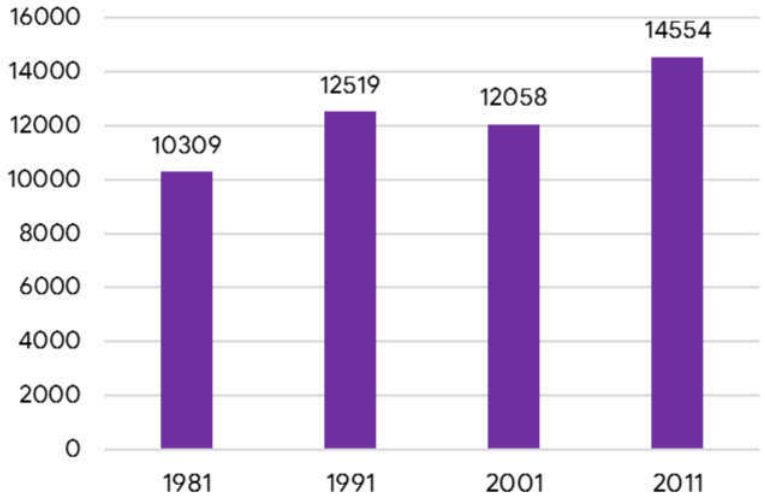


Figure 8.11 Temporal Variation of Other Workers
(Source: Census 2011)

Figure 8.8 shows the temporal variation in the number of Household Industrial Workers in the Municipality from 1981 to 2011, while Figure 8.9 shows the variation in the number of Other Workers in the Municipality from 1981 to 2011. In the town, only 2.26% of workers are Household Industrial Workers , and 95.15% of workers are Other Workers.

During the period from 1981 to 2011, other workers show an increase of 41.17%. This indicates that while the primary sector activity, mainly the agricultural activity is on the decline, Tertiary sector activity is steadily and considerably increasing in the municipality. Tertiary sector mainly involves the supplying of services to consumers and businesses.

4.0 INFERENCE

Workforce distribution in the Municipality shows a decrease in the percentage of cultivators and agricultural labourers. Cultivators and agricultural labourers together form only 2.60% of the main workers. 2.26% of main workers are in household industry and 95.15% of the main workforce is in the category of other workers. The Work Force Participation Rate for Kasaragod Municipality s lower than that of the State and District. The backwardness of industrial development in the Municipality is one of the reasons. Workforce Participation Rate shows an increasing trend during 1991 to 2011. Cultivators and agricultural labourers show decrease in total numbers whereas other workers show considerable increase. This indicates that the primary sector activity, mainly the agricultural activity is on the decline in the Municipality, whereas Tertiary sector activity is steadily and considerably increasing.

CHAPTER 9
LANDUSE

1.0 GENERAL ANALYSIS OF LANDUSE

The nature and composition of land use of a town represent its function and character. Depending on the topographic conditions, the different areas are utilized for various usages which comprehensively form the totality of a town. In traditional settlements, the major portion of the area come under the use for residential developments and a specific percentage of the area will emerge for usages of the people as their work places and other service areas. On the other hand the natural resources like paddy fields, rivers, green areas, rocky areas etc. will supplement the environmental sustainability of the whole area.

The existing land use map prepared for the year 2010 is given in *Fig 9.1*.

Sl No	Land use	Area in Km^2	% of municipal area
1	Residential	9.064	54.347
2	Commercial	0.204	1.223
3	Industrial	0.161	0.965
4	Public & semi public	0.673	4.035
5	Agriculture	2.120	12.71
6	Park & open spaces	0.057	0.341
7	Transportation	1.136	6.811
8	Water bodies	3.263	19.564
Total municipal area		16.678	100

Table 9.1 Existing Land use break up 2010

Split up of various land uses is shown in *Table .9.1* and ward wise distribution of land use is shown in *Table 9.2*.

Classification of Land Use

Ward no	LSGI name	Residential	Commercial	Industrial	Public	Agricultural	Park	Transportation	Water Bodies	Total
1	Cherangai	24.76	0.00	0.00	0.10	17.91	2.10	0.00	1.09	46.87
2	Adakathbail	37.75	0.00	0.03	0.27	25.10	0.00	0.00	1.02	65.49
3	Kelugudde	30.32	0.00	1.60	0.02	2.16	0.00	0.00	0.00	34.86
4	Karanthakkadu	28.04	0.22	0.83	0.41	6.56	0.00	0.00	0.00	36.81
5	Anebagilu	27.75	2.40	0.10	2.33	1.39	0.00	0.83	0.00	35.55
6	Kottakani	27.02	0.63	0.00	0.22	1.20	0.00	0.85	0.00	30.53
7	Parakkatta	59.39	0.60	0.03	0.00	6.92	0.00	0.00	0.00	68.30
8	Anangoor	42.25	0.79	0.24	1.05	17.90	0.00	0.00	0.00	63.51
9	Govt. College	34.54	11.35	8.19	5.50	3.14	0.00	0.00	0.00	64.01
10	Nayanmarmoola	48.15	0.40	0.00	2.94	13.07	0.00	0.00	3.95	69.90
11	Bedira	48.32	0.59	0.00	0.26	10.60	0.00	0.00	0.44	61.44
12	Thuruthi	40.44	0.00	0.00	0.04	18.14	0.00	0.00	27.22	87.54
13	Kollampadi	23.39	0.31	0.00	0.00	7.61	0.00	0.00	0.00	31.95
14	Chennikkara	37.78	1.56	0.00	0.59	21.71	0.17	0.00	11.30	74.60
15	Pilikunje	32.05	0.90	0.00	3.17	11.58	0.00	0.00	9.50	58.35
16	Korakkadu	32.74	7.57	0.00	26.59	4.25	0.33	1.45	1.03	75.32
17	Fish Market	16.96	1.69	0.00	0.07	0.00	0.00	0.00	0.00	19.15
18	Nagarkatta	26.72	0.00	0.00	0.00	13.59	2.44	0.00	12.53	56.38
19	Kandathil Palli	19.09	0.11	0.00	0.00	0.00	0.00	0.00	0.00	19.62
20	Bangod	14.56	0.00	2.94	0.00	2.13	0.00	0.00	6.08	26.23
21	K K Puram	29.10	0.10	0.00	0.10	7.72	0.00	0.00	54.71	93.58
22	Padikunnu	23.04	0.13	0.00	0.00	0.50	0.00	0.00	0.00	24.18
23	Thalangara (W)	24.92	0.24	0.00	5.65	1.49	0.00	0.00	105.38	140.64
24	Muslim H S	17.19	0.00	0.31	0.73	0.00	0.00	0.00	41.58	61.19
25	Pallickal	15.98	0.24	0.00	0.00	0.00	0.61	5.80	10.88	34.19
26	Thayalangadi	14.78	0.49	0.00	0.00	0.00	0.00	0.00	10.04	25.85
27	Taluk Office	17.61	0.00	0.00	2.11	0.00	0.00	0.00	0.00	20.16
28	Beeranthbail	19.51	0.07	0.46	0.36	9.45	0.00	0.00	0.00	30.50
29	Pallam	17.07	0.00	0.00	0.00	0.00	0.00	0.00	4.45	22.02
30	Nellikkunnu	28.24	0.00	1.36	0.05	5.29	0.04	0.00	3.00	38.75
31	Kadapuram	30.08	0.00	0.00	0.10	2.61	0.00	0.00	20.87	54.73
32	Light House	16.91	0.24	0.00	0.12	0.00	0.00	0.00	1.20	18.86
	Total	906.45	30.63	16.09	52.76	212.00	5.68	8.93	326.25	1591.06

Table 9.2 Ward wise distribution of Land use 2010

On a general analysis of the existing land use of Kasaragod town, it is seen that 54.347% of the area is under residential habitation spread over the 32 wards of the town. The quality of residential areas in the town widely varies with respect to the topographical conditions, availability of infrastructure, accessibility, affordability of the people etc. A major portion of the total area is under water bodies ie; 19.564% of the total land. This comprises of the Chandragiri river, the backwater etc. These areas form the most environmentally fragile area of the town. 12.71% of the total land is being utilized for agriculture.

Industrial and commercial land uses constitute a share of 0.965% and 1.22% each and under transport category a share of 6.811%. 4.035% of the total land is utilised for public and semi public usage, and of that a portion is for religious institutions. Though an urban area, the town faces shortage in terms of availability of park and open space area. The land under this is only 0.341%

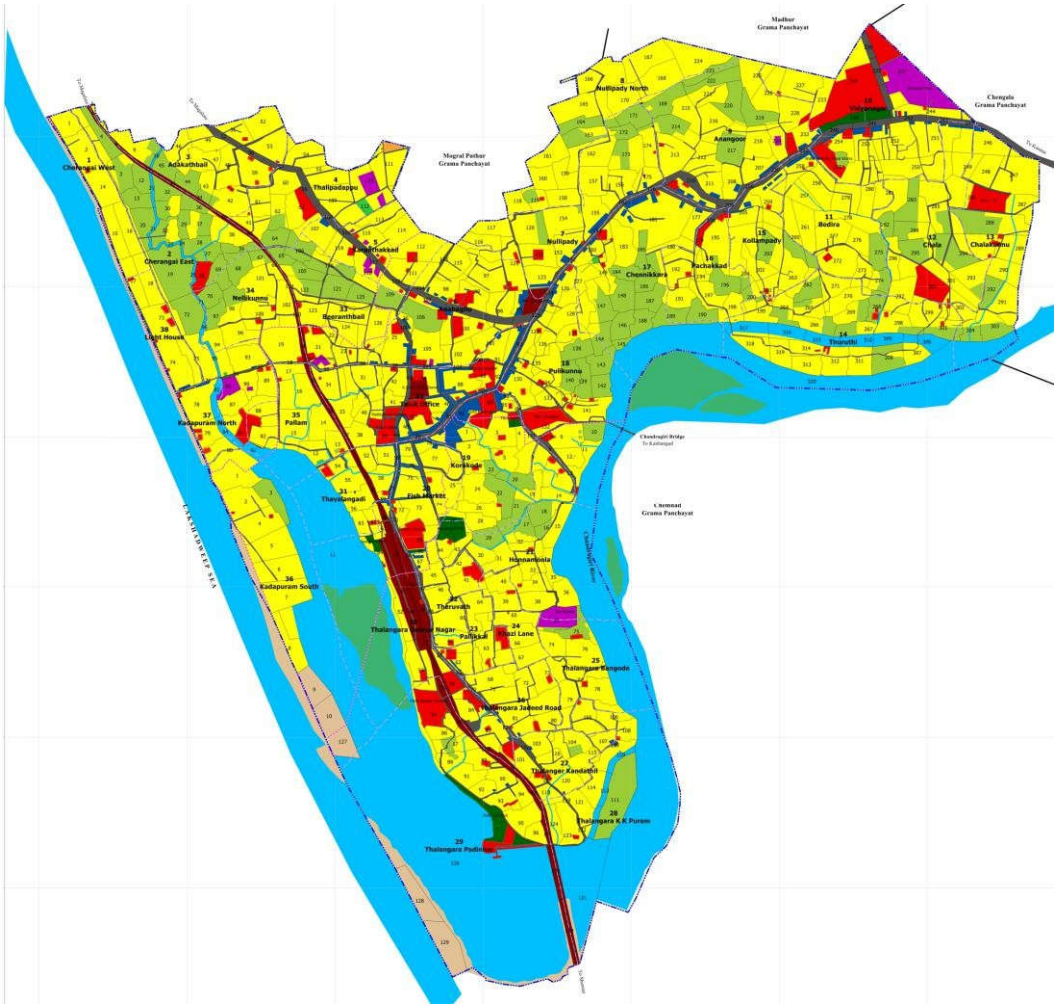


Fig 9.1 Existing Land use-Kasaragod Town

of the total area and is too short to meet the actual requirement, of the town.

Table 9.3 shows the comparison of Land uses of 2001 and 2010.

There is a marginal increase in the share of commercial land. Most of it is concentrated in the central part of the town.

Also there is a decrease in the Agricultural land, from 2.25 Sq km to 2.12 Sq km.

There is a marginal decrease in Industrial land and Residential land, most of which is being converted to commercial and Public & Semi public land uses.

Sl No	Land use	Area in Km²-2001	% of municipal area-2001	Area in Km²-2010	% of municipal area-2010
1	Residential	9.18	55.07	9.064	54.347
2	Commercial	0.19	1.19	0.204	1.223
3	Industrial	0.21	1.24	0.161	0.965
4	Public & semi public	0.61	3.67	0.673	4.035
5	Park & open spaces	0.31	0.77	0.057	0.341
6	Transportation	0.94	7.20	1.136	6.811
7	Agricultural	2.25	11.97	2.12	12.71
8	Water bodies	3.15	18.89	3.263	19.564
	Total		**100**	**16.678**	**100**

Table 9.3 Comparison of Land uses 2001 and 2010.

2.0 LAND USE CONCENTRATION PATTERN

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

Concentration index (C.I) of a particular land use in the municipality

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

——————————————————————————

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

The Concentration Index may be greater than one, equal to one or less than one. Wards with any particular land use concentration index greater than one indicates that the land use under consideration is highly concentrated in that area. *Table 9.4* shows the land use concentration index of various types of land uses, ward wise. This concentration of different categories of land uses are studied in detail in the following paragraphs.

Ward no	LSGI name	Residential	Commercial	Industrial	Public	Agricultural	Total Park & Open Space	Transportation	Water bodies
1	Cherangai	0.98	0	0	0.07	3.02	13.21	0	0.12
2	Adakathbail	1.02	0	0.05	0.13	2.9	0	0	0.08
3	Kelugudde	1.35	0	4.01	0.02	0.41	0	0	0
4	Karanthakkadu	1.3	0.3	2.17	0.32	1.3	0	0	0
5	Anebagilu	1.27	3.24	0.26	1.83	0.27	0	3.83	0
6	Kottakani	1.59	1.1	0	0.22	0.3	0	5.07	0
7	Parakkatta	1.55	0.46	0.04	0	0.77	0	0	0
8	Anangoor	1.17	0.65	0.37	0.5	2.12	0	0	0
9	Govt. College	0.96	9.3	12.78	2.62	0.37	0	0	0
10	Nayanmarmoola	1.25	0.31	0	1.3	1.45	0	0	0.28
11	Bedira	1.43	0.52	0	0.13	1.34	0	0	0.04
12	Thuruthi	0.88	0	0	0.01	1.68	0	0	1.64
13	Kollampadi	1.33	0.52	0	0	1.85	0	0	0
14	Chennikkara	0.93	1.15	0	0.25	2.28	0.65	0	0.77
15	Pilikunje	1.02	0.85	0	1.73	1.57	0	0	0.84
16	Korakkadu	0.98	6.71	0	13.68	0.54	1.58	4.42	0.09
17	Fish Market	1.28	3.76	0	0.09	0	0	0	0
18	Nagarkatta	0.89	0	0	0	1.93	12.9	0	1.15
19	Kandathil Palli	1.55	0.26	0	0	0	0	0	0
20	Bangod	1.01	0	11.44	0	0.63	0	0	1.17
21	K K Puram	0.58	0.06	0	0.04	0.66	0	0	3.02
22	Padikunnu	1.53	0.25	0	0	0.14	0	0	0
23	Thalangara (W)	0.29	0.08	0	1.12	0.07	0	0	3.39
24	Muslim H S	0.41	0	0.42	0.3	0	0	0	2.73
25	Pallickal	0.83	0.36	0	0	0	5.04	30.72	1.58
26	Thayalangadi	0.96	0.94	0	0	0	0	0	1.82
27	Taluk Office	1.36	0	0	2.81	0	0	0	0
28	Beeranthbail	1.01	0.11	1.34	0.32	2.1	0	0	0
29	Pallam	1.08	0	0	0	0	0	0	0.78
30	Nellikkunnu	1.31	0	3.55	0.04	1.05	0.33	0	0.39
31	Kadapuram	1.03	0	0	0.06	0.38	0	0	1.99
32	Light House	1.48	0.61	0	0.18	0	0	0	0.29

Table 9.4 Land use concentration index-Ward wise

a. RESIDENTIAL

The total area under residential use of the municipality comes to around 906.4 Ha and this forms 54.347 % of total town area. Refer *Table 9.3.*

The central and coastal area wards record the highest residential density. The coastal wards are the most densified areas of the town. It is noted that the coastal belt, west of railway line is thickly populated with fishermen settlements and slums. The north eastern and southern side of the town is sparsely populated. New residential developments are mostly seen in the northern portion of the town. The spatial distribution of residential land use is shown in *Fig 9.3.*

Fig 9.2 depicts the comparison of spread of residential land uses among the wards of the municipal town. Kottakanni, Parakkatta, Kandathilpalli and Malik Deenar wards record the higher concentration of residential land in the town. Parakkatta and Kottakanni are in the fringe areas of the town and no other use is predominant here.

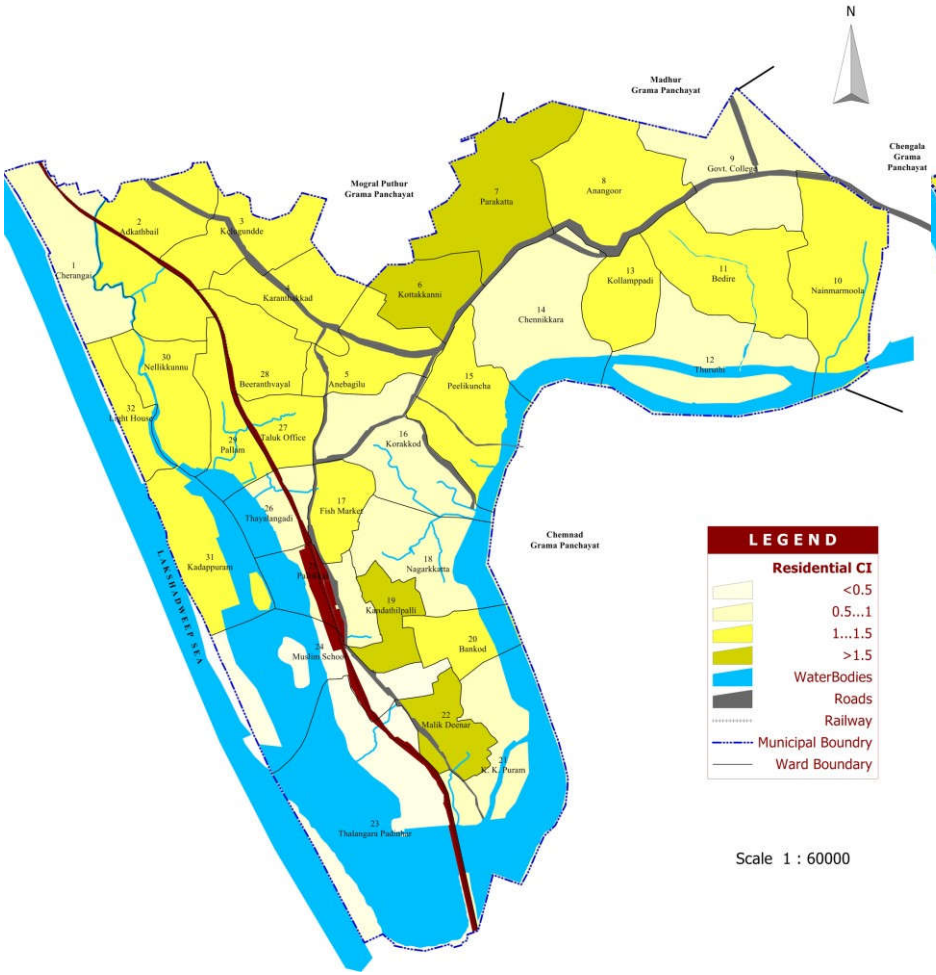


Fig 9.2 C I of Residential Land use

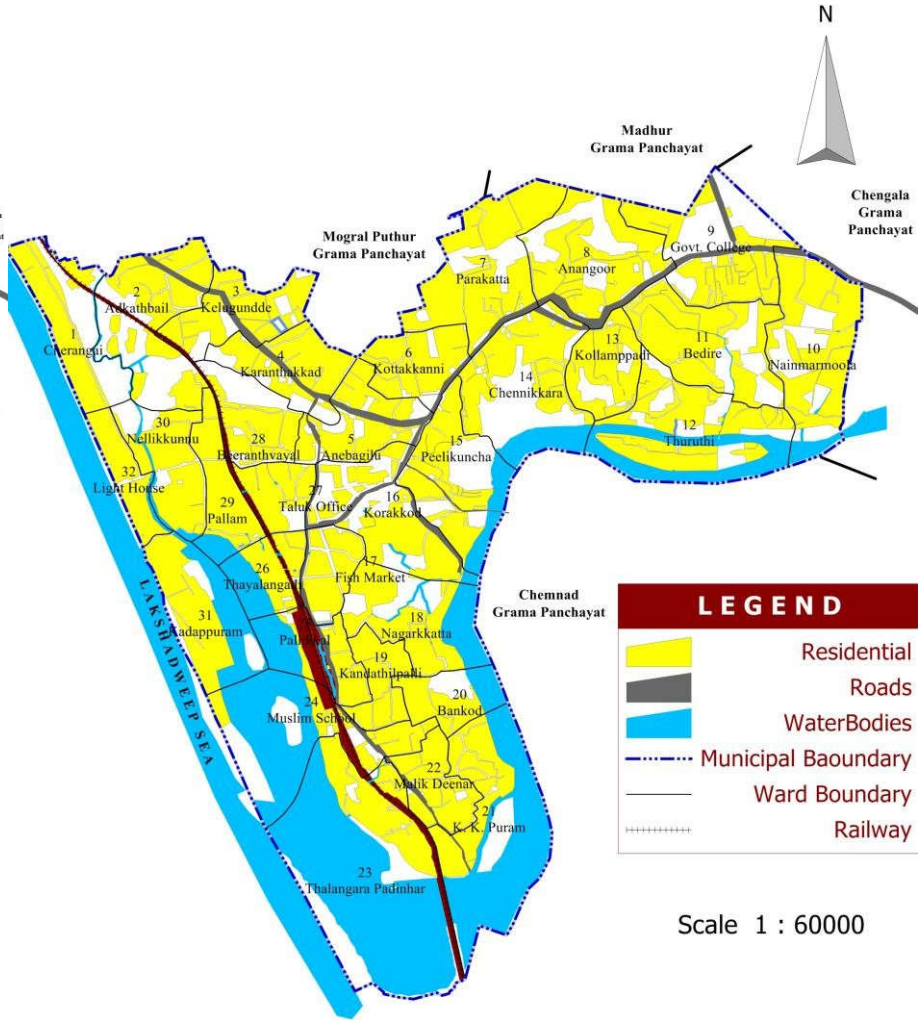


Fig 9.3 Spatial distribution of Residential Land use

Table 9.5 shows the residential plot size distribution among the ward. Of the samples taken, only 4.09% constitutes to plot size of less than 3 cents. A major percentage of the samples ie; 35.4% constitutes to 6-10 cents of plot size. Since the peripheral area wards have a fair land holdings size, around 30.61 % of the samples have greater than 11-25 cents of area.

Range of Plot Area	<=3 cents	4 to 5	6 to 10	11 to 25	26 to 50	51 to 70	>70
Average % for the LSGI	4.09	17.63	35.4	30.61	8.74	1.83	1.13

Table 9.5 Plot size details

(Source: Socio economic survey)

b. COMMERCIAL

Fig 9.5 shows the distribution of Commercial land uses in the Municipality. Commercial land use constitutes about 1.22% of the Municipal area. A number of multi-storied commercial buildings are coming up along the NH and M.G Road side. In addition to this, there are scattered distributions of shops in the form of convenient facilities and stalls along motor able roads and lanes in various parts of the town. Whole sale trade is concentrated mainly by M. G. Road side and other areas cater to retail trade. A fish market is also functioning with in the town. The main commodities handled in these two markets are vegetable, fish, grocery and other household articles. Main problems persisting in the central area is acute congestion of vehicles, lack of parking space, insufficient loading and unloading space, narrow carriage way etc. Commercial developments are seen along the traffic corridors and out of that there are very few organized shopping with modern facilities and related infrastructures like accessibility, parking etc.

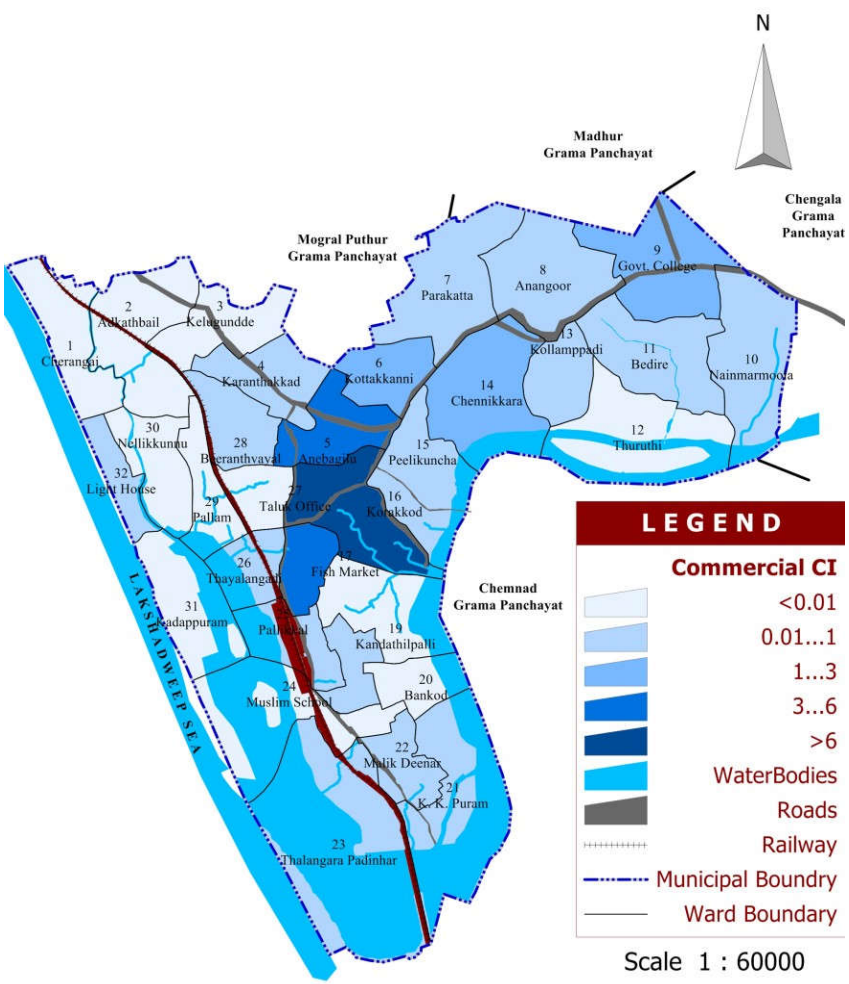


Fig 9.4 C I of Commercial Land use

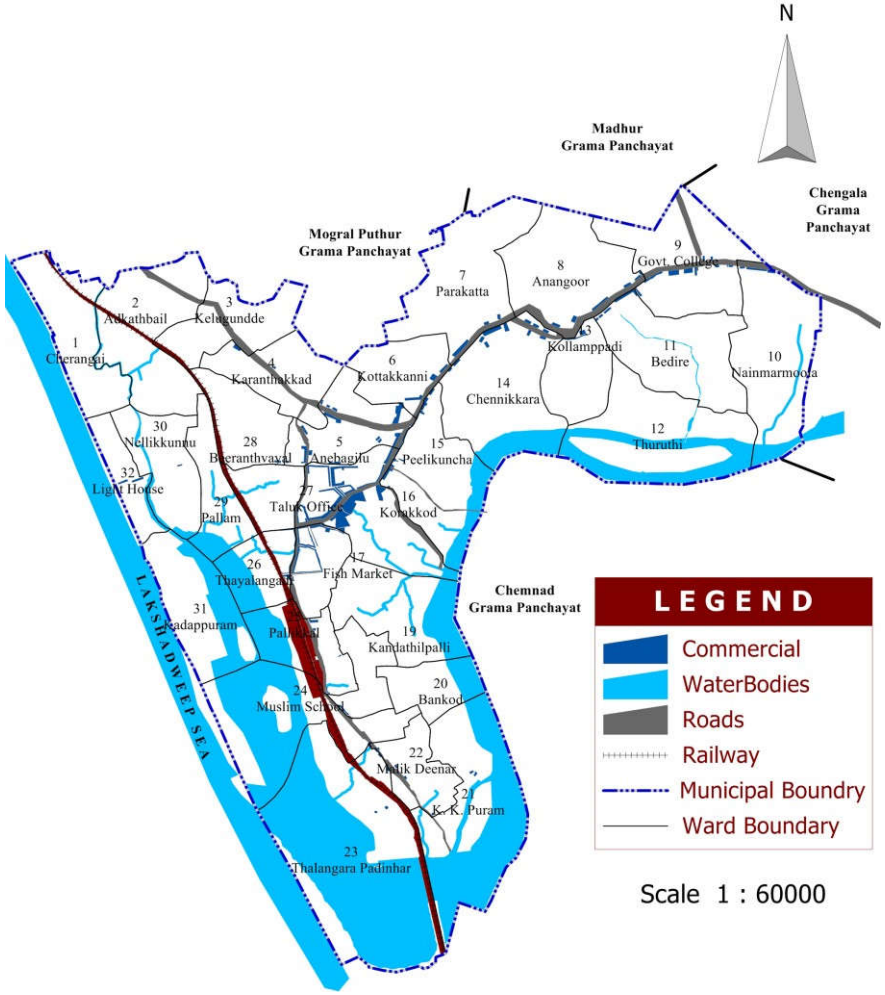


Fig 9.5 Spatial distribution of Commercial Land use

Fig 9.4 shows the split share of commercial land uses among the wards. Here Korakkadu, Fish Market, Anebagilu, Kottakkanni, Chennikkara and Govt. College recorded the greater share of commercial land use of the town. These wards accommodate the major portion of the commercial developments in the central area of the town.

c. INDUSTRIAL

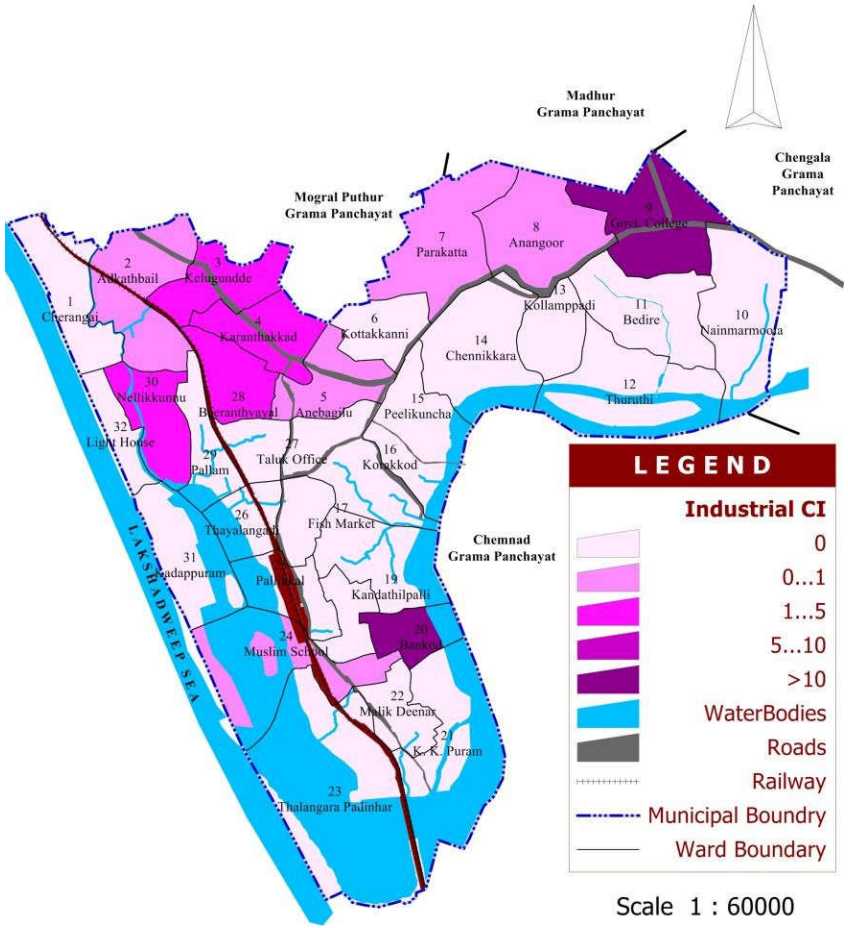


Fig 9.6 C I of Industrial Land use

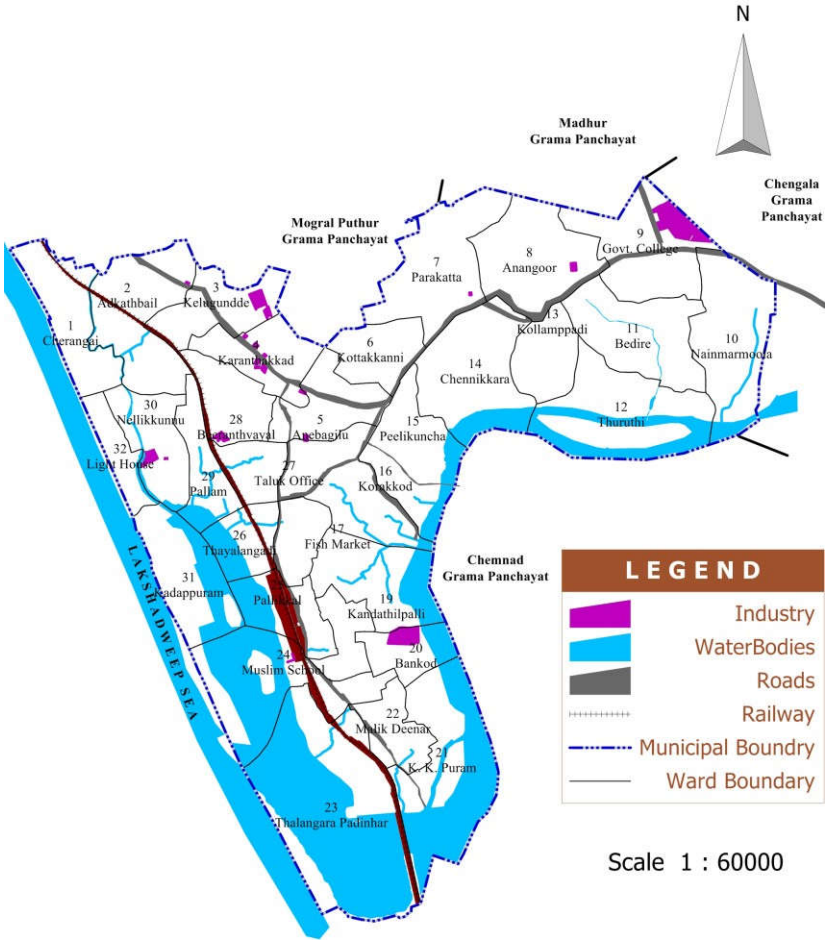


Fig 9.7 Spatial distribution of Industrial Land use

Land coming under the category of industrial use in the urban area is only 1.61 Ha. which constitute only 0.965 %, of the total developed area. Most of the industries in the municipal areas are of household industries category.

Fig 9.6 shows the split share of Industrial land uses among the wards. Here Govt. College, Bangod, Kelugudde and Nellikkunnu recorded the greater share of Industrial land use of the town. These wards accommodate the major portion of the Industrial developments in the central area of the town.

d. PUBLIC AND SEMIPUBLIC

Public offices, educational institutions, health facilities, religious and cultural institutions are grouped under this heading. It constitutes 6.73 Ha of the municipal area.

Kasaragod is the administrative centre of Kasaragod district. It houses 95 offices of State Government and 6 offices of Central Government. The Collectorate building is located at Muttathodi desom, just outside the municipal boundary and accommodates many government offices.

Most of the offices within the municipal area are functioning in rented building and lie scattered in different parts of the town. The Taluk Office complex is located by the side of Court Road. The Taluk Office, Sub Treasury, Sub Jail, Police Offices and Courts are functioning in this compound. The educational institutions in the town comprises of 1 College, 3 High Schools, 1 Vocational Higher Secondary School, 8 U.P. Schools, 1 blind School and 10 L. P. Schools (2 Nos. unaided).

Fig 9.8 shows the share of Public and semipublic land use among the wards. Govt. College, Korakkadu, Fish Market Taluk office and Kandathilpalli recorded the greater share of Public and Semipublic land use of the town. These wards accommodate the major portion of the Public Land use of the town.

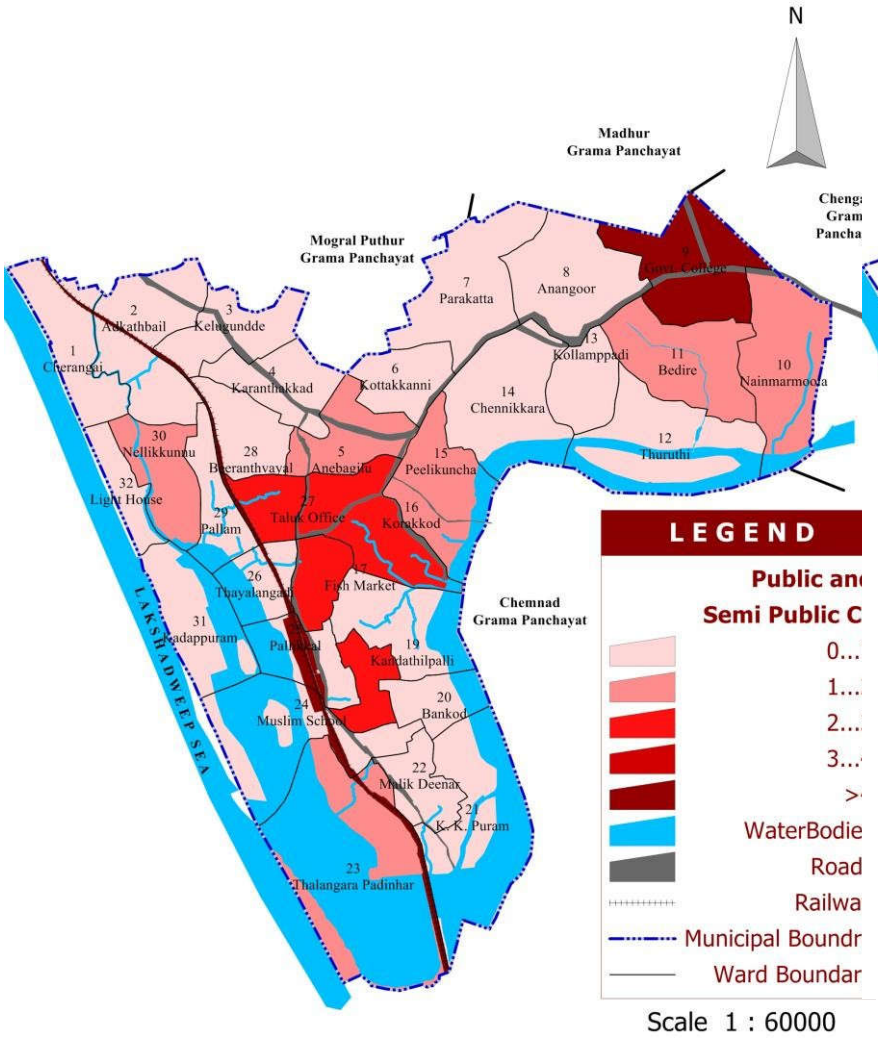


Fig 9.8 C I of Public and Semipublic Land use

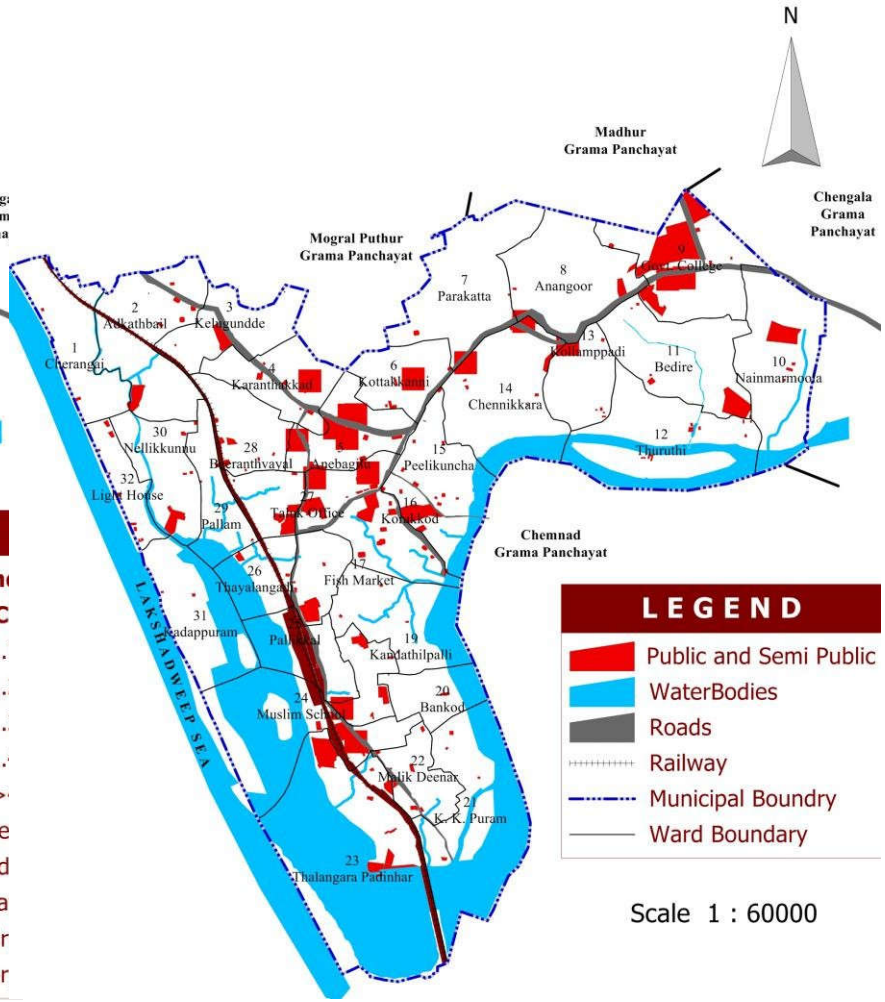


Fig 9.9 Spatial distribution of Public and Semipublic Land use

e. PARKS AND OPEN SPACES

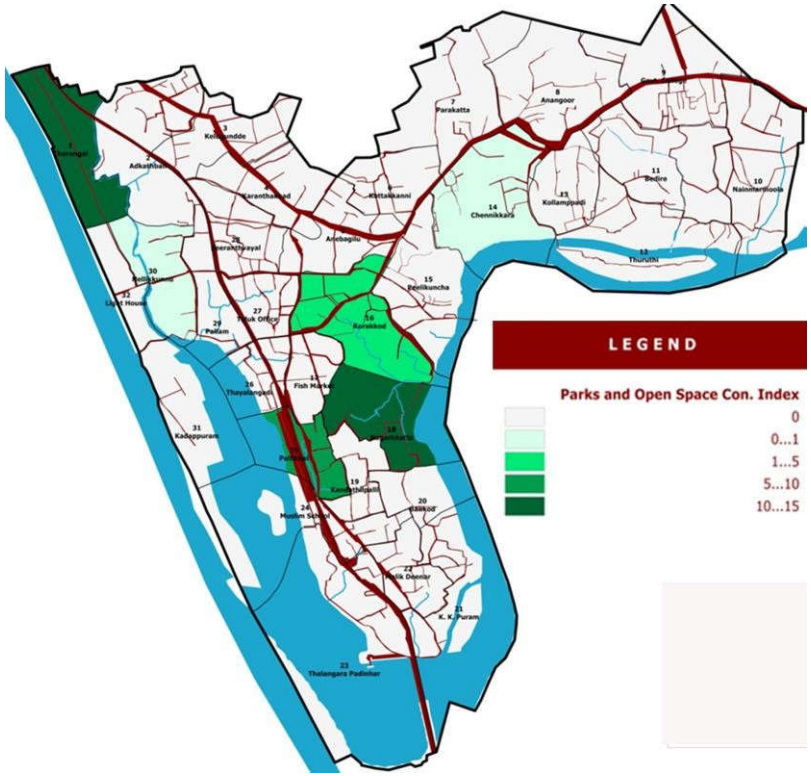


Fig 9.10 C I of Parks and Open spaces

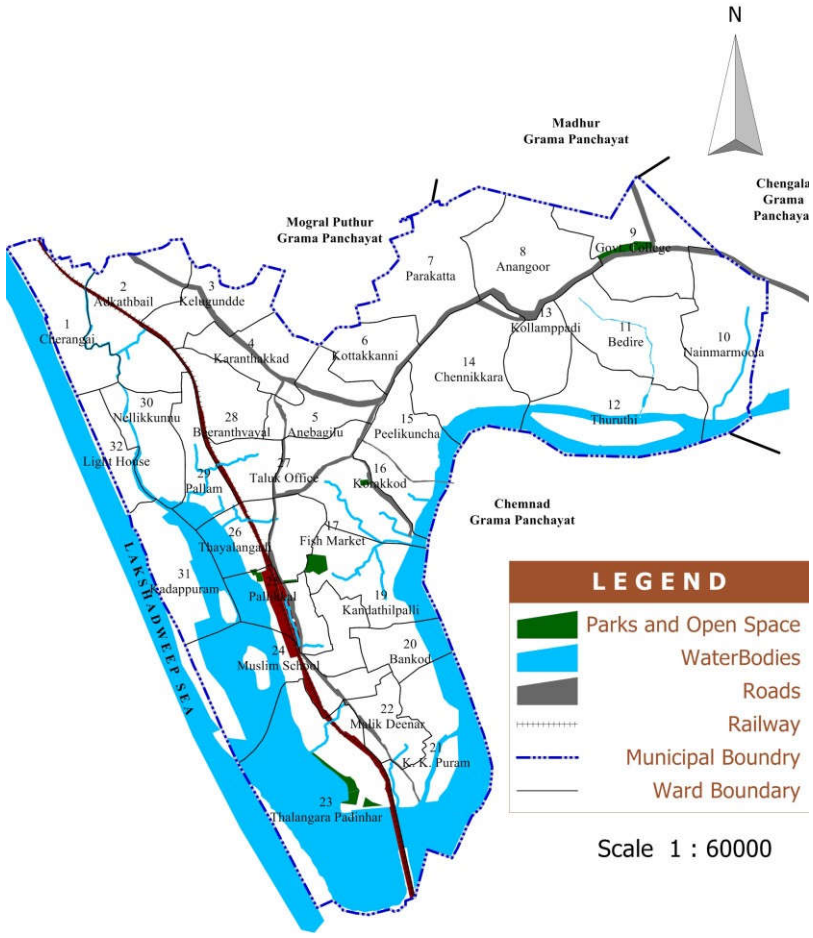


Fig 9.11 Spatial distribution of Parks and Open spaces

There is no organized recreation space at present in Kasaragod town. Municipality has acquired about 6.5 Ha. of land in Muttathody desom for an international stadium. There are 6 Parks and 2 Playgrounds in Kasaragod Municipality.

Kasaragod has a fairly long stretch of beautiful beach. To develop this area, a recreational complex can be created and maintained as a place of attraction for tourists. Sea View park, the only organized park inside the municipal limits, is not utilised properly since it does not have proper accessibility and it is not maintained well. "Sandhyaragam" is an open air located very near to the municipal premises. The park and open spaces constitute 0.57 Ha. of the total town area and is 0.341% of the total developed area. *Fig 9.10* shows the split share of parks and open spaces among the wards. Here Nagarkatta and Cherangai recorded the greater share of parks and open spaces of the town. These wards accommodate the major portion of the open spaces of the town.



Fig 9.12 Transportation Land use

f. TRANSPORTATION

Transportation Land use comes to about 11.36 Ha. NH 66 is the major NH in the District, and passes through Kasaragod town, connecting it with Mangalore, Kannur and other major urban centres in the state. The SH No.57 (Kasaragod- Pallikara- Kanhangad Road) starts from the Municipal area and opens access to the areas beyond the Chandragiri river.

Even though the town is well connected with the region, the internal linkages fall short of proper area accessibility, right of way, geometrics etc. Several areas inside the town are isolated. The Railway line from Shornur to Mangalore passes through the Municipality.

g. AGRICULTURE

Two categories of land uses come in this sector.

1. Dry cultivation. 2. Paddy fields.

Total agricultural area of the Municipality comes to about 212 Ha.

The types of dry cultivation are arecanut, coconut, cashew etc. These areas are mostly in the north-eastern portion of the municipality.

Fig 9.14 shows the spatial distribution of paddy fields and dry cultivation areas. About 6.85 % of the total land area of Kasaragod town is agricultural (wet) land i.e. paddy field, which lie along the western and eastern fringe of the municipal area. Large scale conversion of paddy field for non - agricultural uses particularly for residential development is the common trend and will create problems in natural drainage systems and ecological balance of the area.

It is seen that the town is already endowed with vast tract of vacant developable area and hence large-scale conversion of agricultural land for other urban uses is to be controlled and prevented. This can be achieved by implementing the land utilisation acts strictly.

Fig 9.13 shows the split share of Agricultural landuse among the wards. Here Cherangai ward recorded the greatest share of Agricultural land use. Adkathbail, Chennikkara , Anangoor and Beeranthbail also accommodate the major agricultural land use of the municipality.

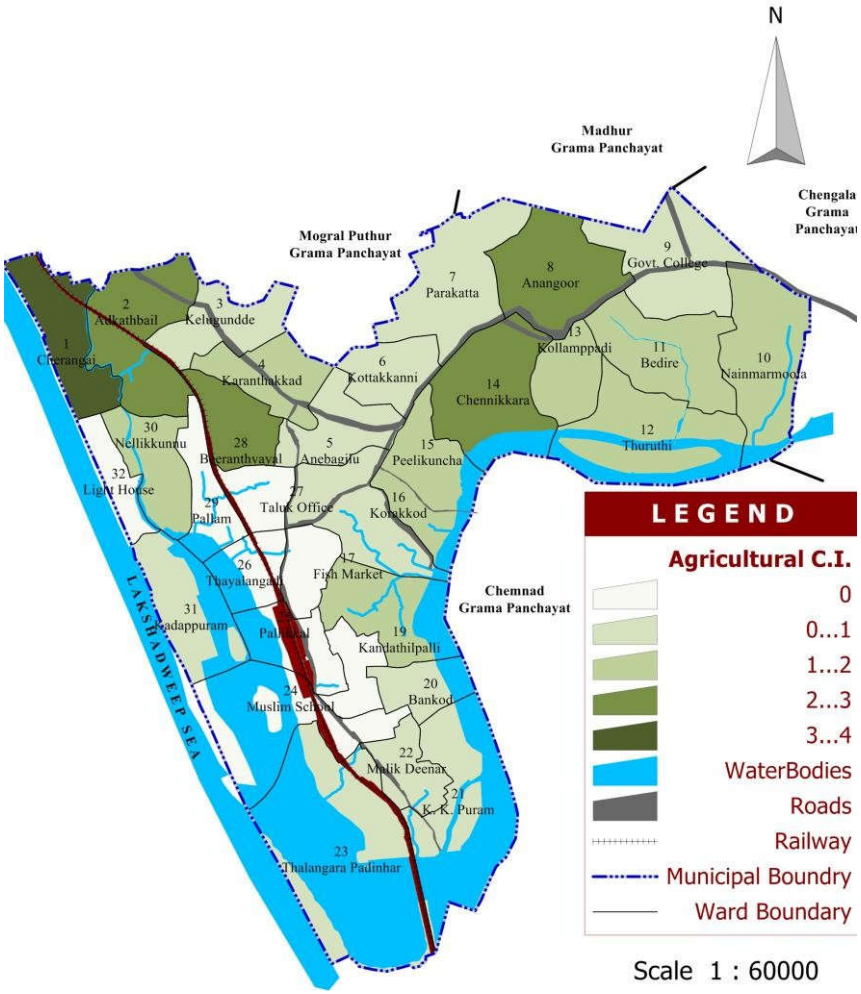


Fig 9.13 C I of Agricultural Land use

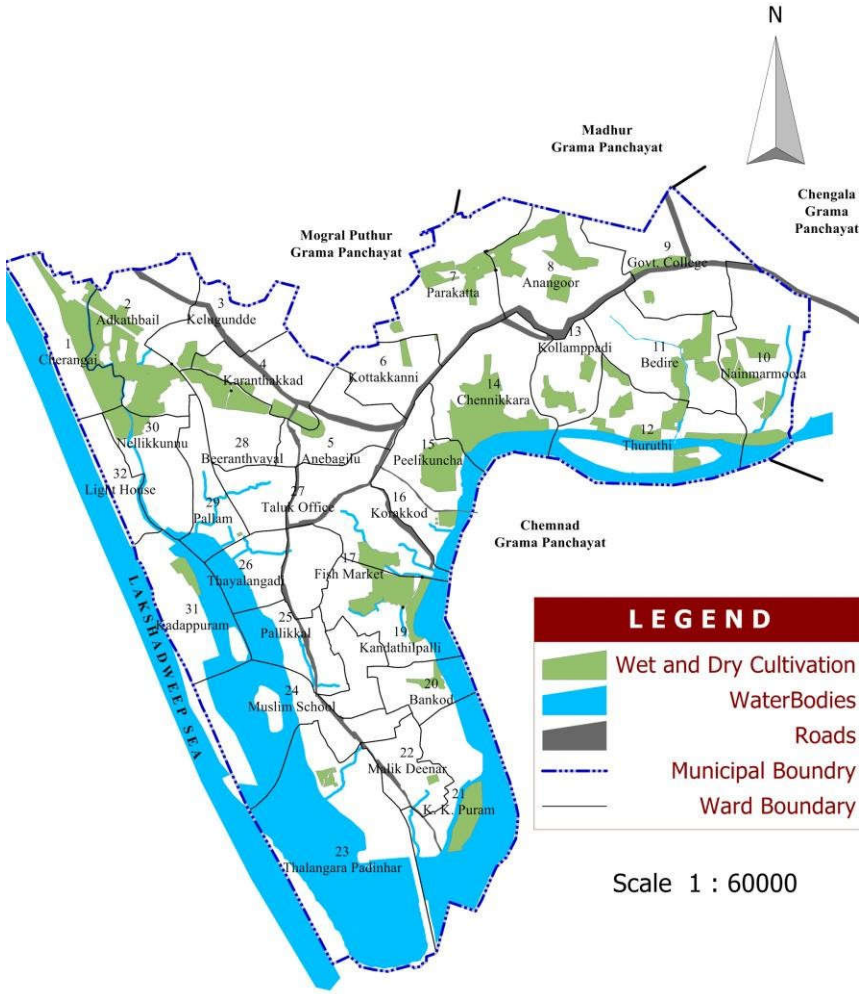


Fig 9.14 Spatial distribution of Agricultural Land use

3.0 INFERENCE

54.347% of the Municipal area is under residential habitation spread over the 32 wards of the town. Kottakanni, Parakkatta, Kandathilpalli and Malik Deenar wards record the higher concentration of residential land in the town.

Commercial land uses constitute a share of 0.965% of the total land. Commercial developments are seen along the traffic corridors and out of that there are very few organized shopping with modern facilities and related infrastructures like accessibility, parking etc. The main problem persisting in the central area is acute congestion of vehicles, lack of parking space, insufficient loading and unloading space, narrow carriage way etc. Korakkadu, FishMarket, Anebagilu, Kottakkanni, Chennikkara and Govt. College recorded the greater share of commercial land use of the town.

Land coming under the category of industrial use constitute 0.965 % only, of the total developed area. Most of the industries in the municipal areas are of household industries category. Govt. College, Bangod, Kelugudde and Nellikkunnu recorded the greater share of Industrial land use of the town.

12.71% of the total land is being utilized for agriculture. Out of which paddy area constitutes 122 Ha. which forms 7.31 % of total municipal area. Dry cultivation area comes to 90 Ha. which constitutes 5.4% of total municipal area. There is a decrease in the Agricultural land, from 2.25 Sq km in 2001 to 2.12 Sq km in 2003. Cherangai ward recorded the greatest share of Agricultural land use. Adkathbail, Chennikkara , Anangoor and Beeranthbail also accommodate the major agricultural land use of the municipality. 4.035% of the total land is utilised for public and semi public usage, and of that a portion is for religious institutions. Govt. College, Korakkadu, Fish Market Taluk office and Kandathilpalli recorded the greater share of Public and Semipublic land use of the town.

Though an urban area, the town faces shortage in terms of availability of park and open space area. The land under this is only 0.341% of the total area and is too short to meet the actual requirement, of the town. Nagarkatta and Cherangai recorded the greater share of parks and open spaces of the town.

6.811% of the total land is utilised for transportation land use. The area of transportation land use has increased from 0.94 Sq km to 1.136 Sq km.

A major portion of the total area is under water bodies i.e.; 19.564% of the total land. This comprises of the Chandragiri river, the backwater etc. The area forms the most environmentally fragile area of the town.

CHAPTER 10
ECONOMIC ASPECTS

A. INDUSTRY

1. Existing Industrial Base

With a variety of resources and sufficient infrastructure facilities available, the planning area has no large scale / medium scale industries. All existing industries are small scale industries (SSI). *Fig 10.1* shows the number of Industrial units in Kasaragod town. There is predominance in Textile and Engineering based Industrial units, followed by agrobased and Electronics based units.

A study on the industrial establishments in Kasaragod reveals that majority of the units depend on locally available raw materials. The manufactured products are sold in the local markets and other districts. Products like clothes are sold even outside the state.

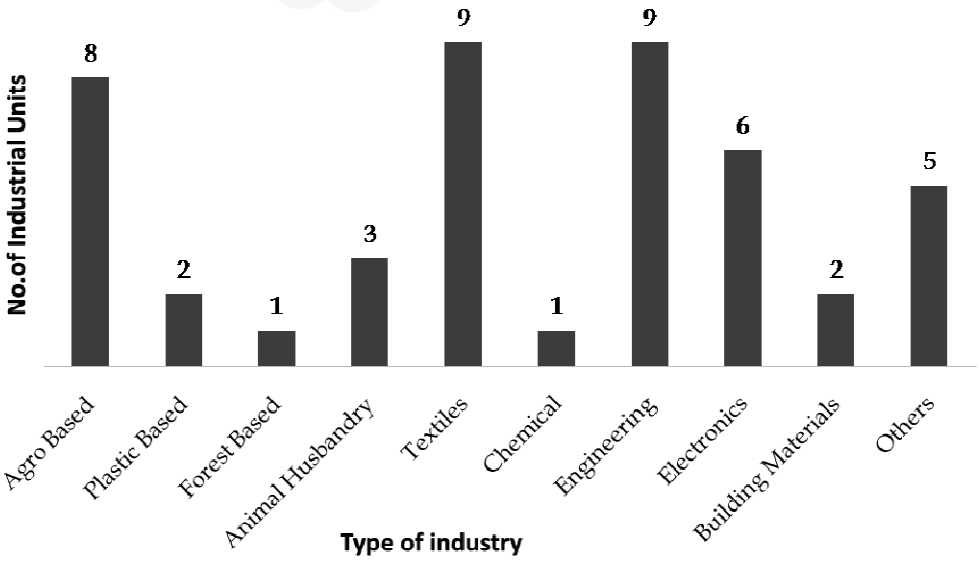


Fig 10.1 Industrial units in Kasaragod Municipality
(Source: District Industries Centre, Kasaragod)

2. Industrial Production

Major industrial products include Rubber Roller, Dyes and moulds, plastic tins, Handloom clothes, wooden and steel furniture, Beedi etc. The exported products are mainly cashew, Handloom clothes etc. Others are service industries like automobile workshop, printing press, flour mills, furniture making, beedi factory, ice factory, saw mills, cashew factory etc. Automobile workshops and service industries are seen scattered in various parts of the town. Ice - factories are located near the beach. A cashew factory is working in Kelugudde ward. National fibre Industries are involved with the process of manufacturing materials out of coconut husks. Apart from this, few other units under the private sector have their own weaving units.

The industrial sector provides employment to more than 2,200 persons in the municipal area. Main sources of water for the industrial units are KWA, open wells etc. For the units in the industrial estate near Vidyanagar, water is provided by SIDCO.

Most of the units have their own arrangements for the disposal of waste.

3. Spatial distribution

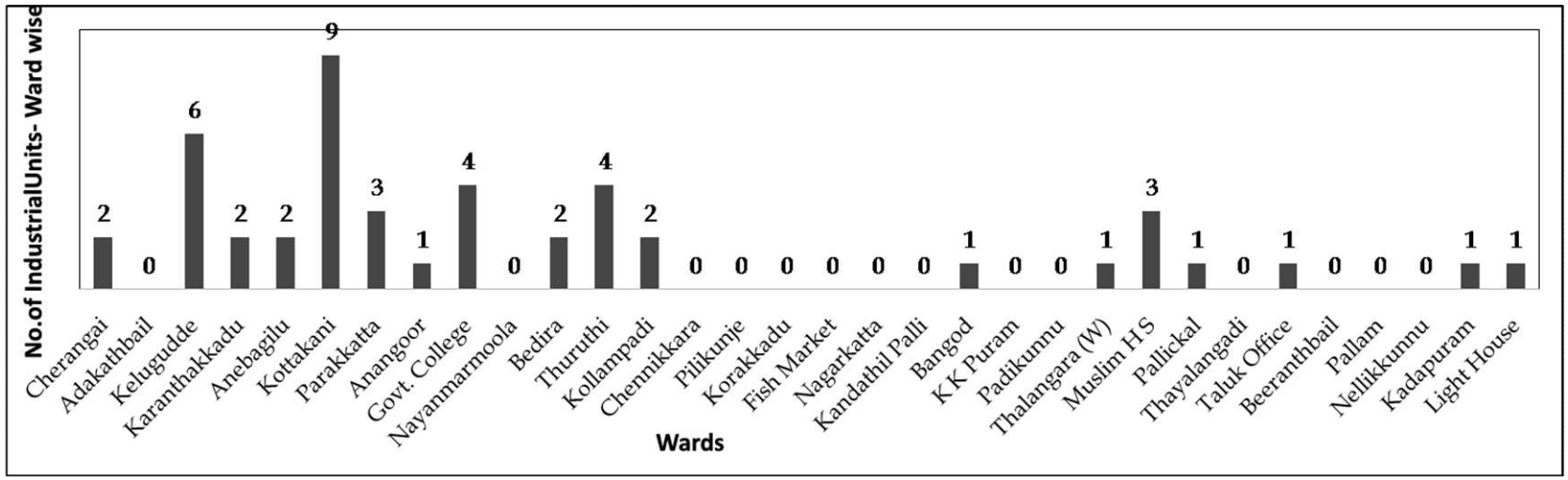


Fig 10.2 Industrial Units in Kasaragod Municipality-Wardwise *(Source: District Industries Centre, Kasaragod)*

The wards of Kottakanni, Kelugudde, Govt. College and Thuruthi comprise the major share of industrial units in the Municipality. These wards are along the NH-66 route, which provides access for trading, to the hinterlands and major urban centres in the district and state.

4. Problems and Potentials

Only 0.965% of the municipal land is being used for Industrial purpose. Most of the organized industries like Astral Watch Factory, Islamia Tile factory are lying un operated during the last few years. These factories had provided employment for about 450 workers. The watch works, tile factories and sawmills are all under this status because of prevalent poor economic viability. But these vacant areas can be utilised for viable economic activities. There is abundant scope for starting small scale industries, as raw materials in the form of cashew, coconut, arecanut, china-clay, lime and bamboo are available or could be transported by cheap modes from the

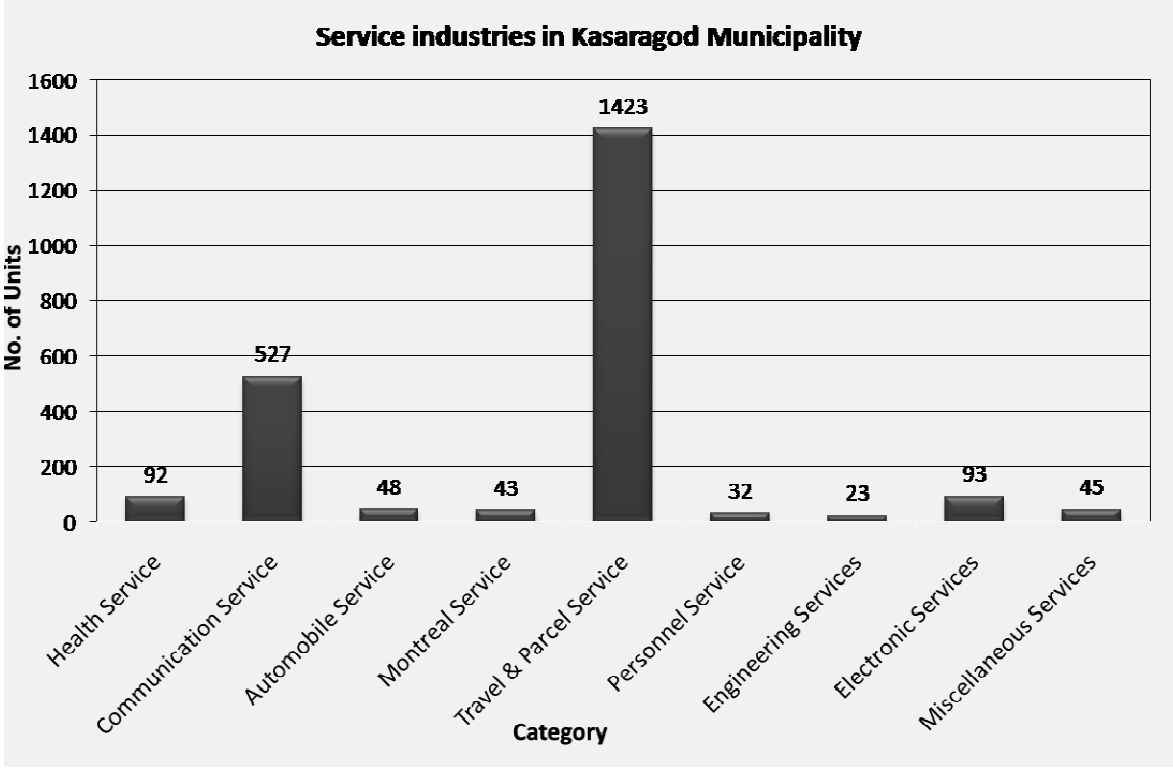


Fig 10.3 Service Industries in Kasaragod Municipality

(Source: District Industries Centre, Kasaragod)

nearby areas. Mining of china clay is done from the clay deposits of Kalanad. Bauxite occurrences have been detected by the Geological survey of India at Kumbala, Perla and Mulleria of Kasaragod Taluk. Now there is only one organized industrial estate in the planning area, on the northern part of municipal area, near Civil Station. District Industries Centre promotes small scale industries here and most of the units in the industrial estate are functioning well.

There are 2326 service establishments in the Municipal area as shown in *Fig 10.3*. There are 11 lodges in the town. Most of them are situated near the Railway Station. Hotels numbered to 93 and Small Tea shop accounted to 60.

B. TRADE AND COMMERCE

B.1 Present Scenario

The number of business units in the municipality has increased from 1264 in 2003 to 1305 in 2010. *Fig 10.4* shows the different types of Commercial Establishments

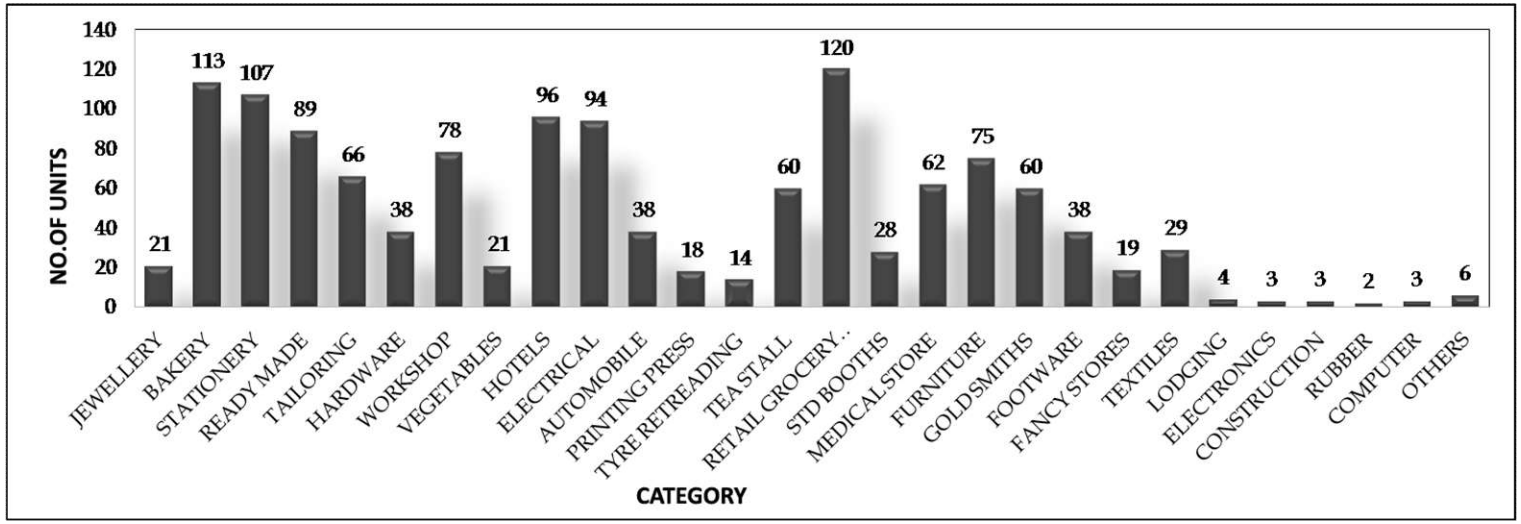


Fig 10.4 Commercial establishments in the Municipality *(Source: District Industries Centre, Kasaragod)*

in the Municipality. Most of the units depend on goods from nearby areas except those in textile and readymade shop. The latter depends upon the goods from Mumbai, Ahmadabad, Bangalore, Erode, Salem, Calcutta etc. Majority of the units are housed in rented buildings. The rent varies from Rs.500/- to Rs.18,000/-. The business establishments are functioning after obtaining license from the Municipality.

B.2 Hierarchy in the district

Hierarchy of settlements is obtained based on the number and order of facilities.

The facilities include

1. Educational facilities
2. Health Facilities
3. Market
4. Facilities in Agriculture and allied sector
5. Physical infrastructure facilities
6. Transportation facilities

In Kasaragod District, Kasaragod town is the only first order settlement. (*Fig 10.5*)

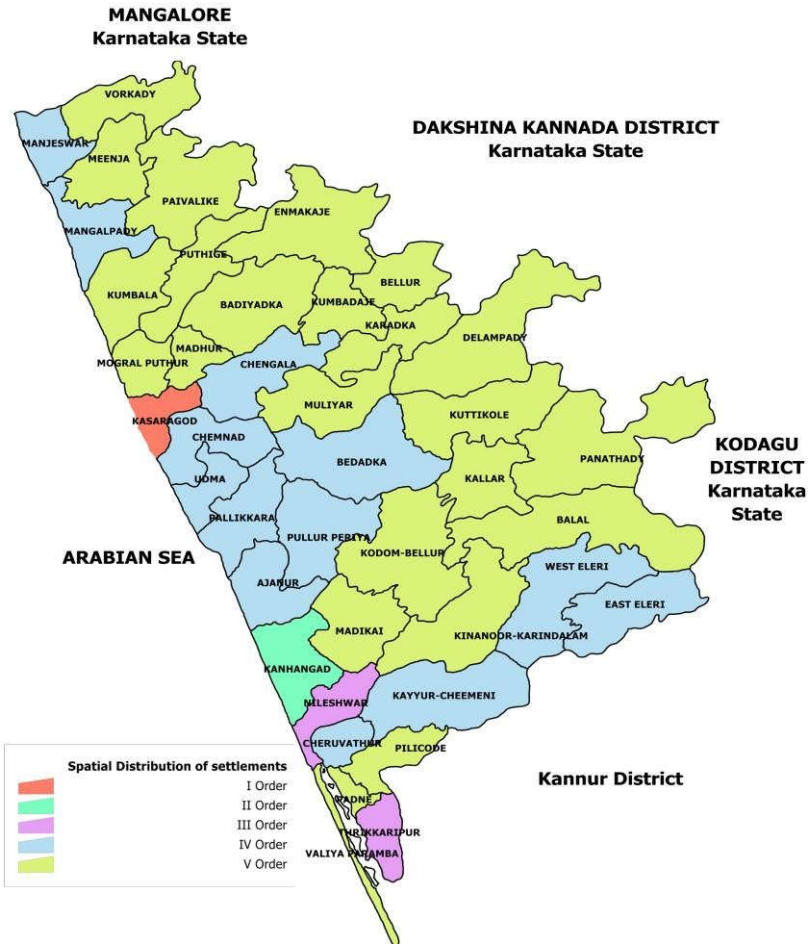


Fig 10.5 Hierarchy of settlements in the district

B.3 Important centers and nodes



Fig 10.6 Spatial distribution of commercial nodes

Kasaragod town is the most important commercial centre of the district. Main commercial nodes are around New Bus stand and M.G Road. Wholesale trade is concentrated mainly on the M.G Road side near the Old bus stand.

The main commercial centres in Kasaragod Municipality and their hierarchy are shown in *Table 10.1*.

Sl. No.	Commercial centre	Hierarchy
1	New Bus Stand	1st Order
2	Old Bus Stand	1st Order
3	K.S.R.T.C Bus Stand	2nd Order
4	Traffic Jn	3rd Order
5	Karanthakkad Jn	3rd Order
6	Anangoor	3rd Order

Table 10.1 Commercial centres in Kasaragod Town

Nodes are identified on all important junctions where there is a concentration of commercial activities, and in case of linear development, commercial activity or physical development for a distance of 250m. *Fig 10.6* shows the important nodes in the Municipality and their hierarchy.

B.4 Markets

A vegetable and fish market is functioning in the Municipality near the M.G Road. Although there is a waste treatment plant, due to proper waste management measures, the fish market is in a poor condition. The fish vendors line the front area of the market, leaving behind the fish stalls built at the rear of the market area. Also, the loading and unloading of the trucks in front of the market causes congestion during the peak hours.

B.5 Street vendors

Street Vendors are an integral part of commercial sector in Kasaragod. There are about **51 street vendors** throughout Kasaragod town. Higher concentration is seen in Old Bus Stand area. Their distribution is not uniform. Majority of them are **Garments**, **fruits** and **vegetables.**

Area	Ward No.	Category	No. Of Units	Approved	Labours
Old Bus Stand-MG Rd	15,16,17	Fruits	15	NA	Varies
		Vegetables	10		Varies
		Garments	15		Varies
		Appliances	6		Varies
		Tea & Snacks	5		Varies
New Bustand Cmplx	5	Informal sector activities often varies			

Table 10.2 Details of Street Vendors in the town. (Source: Local Survey)

B.6 Problems and Potentials

Only 1.223% of municipal area is commercially developed now. There is a lack of parking space and loading unloading space near the fish and vegetable market located alongside the MG road- it causes traffic congestion in the Old Bus stand- Traffic Jn. route. Unorganized distribution of street vendors along the footpath and road side also causes congestion.

There is no industrial development along with commercial development at Old bus stand Jn. which is one of the major commercial centres of municipality. Tobacco and Rubber, mainly cultivated in the eastern foothills of Kasaragod district and hinterlands, mainly depend on Kasaragod town for marketing.

The market which is the main centre for vegetables, fruits and fish commodities are very congested. The waste from the market is not cleared regularly, and this causes environmental and health hazards.

Commercial facilities are seen mainly as ribbon development along the major transport corridor. Fully modernized daily market (separately or fish and vegetables) and slaughter houses shall be opened within the municipality.

B.7 Inference

Kasaragod town is the main commercial node. One of the major reasons is its connectivity to other LSGs in the district and Mangalore. Commercial nodes are mostly characterized by congestion due to vehicular and pedestrian traffic.

Lack of enough space and road width is the major reason for congestion. It prevents smooth maneuvering of vehicles causing frequent traffic block. Many commercial centers within the central area are lying close to Bus terminals which aggravate the congestion problem.

C. TOURISM

1. Places of Tourist interest

Kasaragod has a regional prosperity in terms of heritage sites with tourism potential compared to the rest of the area. Kasaragod urban area can act as the central node for tourism attraction. The inhabitants of the town show a strong binding to culture, faith and emotion. It is seen from the existence of religious centres in the town. Muslims and Hindus are the predominant communities. *Table 10.3* and *Fig 10.7* show the major Tourist destinations in Kasaragod Town.

Tourist Destinations In Kasaragod Municipality

Sl. No.	Name	Locality	Category
1	Kasaragod Fort		Heritage/Architecture
2	Malik Dinar Mosque	Thalangara	Religious
3	Mallikarjuna Temple	Bank Road	Religious
4	Chandragiri River	Thalangara	Natural
5	Sea View Park	Nr. Rly. Stn	Natural
6	Taluk Office (Colonial Building)	Bank Road	Heritage/Architecture

Table 10.3 Tourist destinations in Kasaragod Town

(Source: Tourism Dept.)

The **Malik Dinar Mosque**, which is one of the best kept and most attractive Mosque in the district, which is located at Thalangara. Malik Dinar is one of the oldest mosques in Kerala with traditional architecture and style blending two cultures and remains as a famous land mark of mutual understanding and tolerance. The mosque existed in close proximity to water body can be selected as a place for conservation.

Another notable mosque, in Kasaragod is the **Theruvath Mosque** (Thayalangadi Mosque) which is in the centre of the town. An important local celebration takes place every year in commemoration of the arrival of Malik Ibn Dinar. The Uroos attract pilgrims from all over India.



1. THAYALANGADI MOSQUE



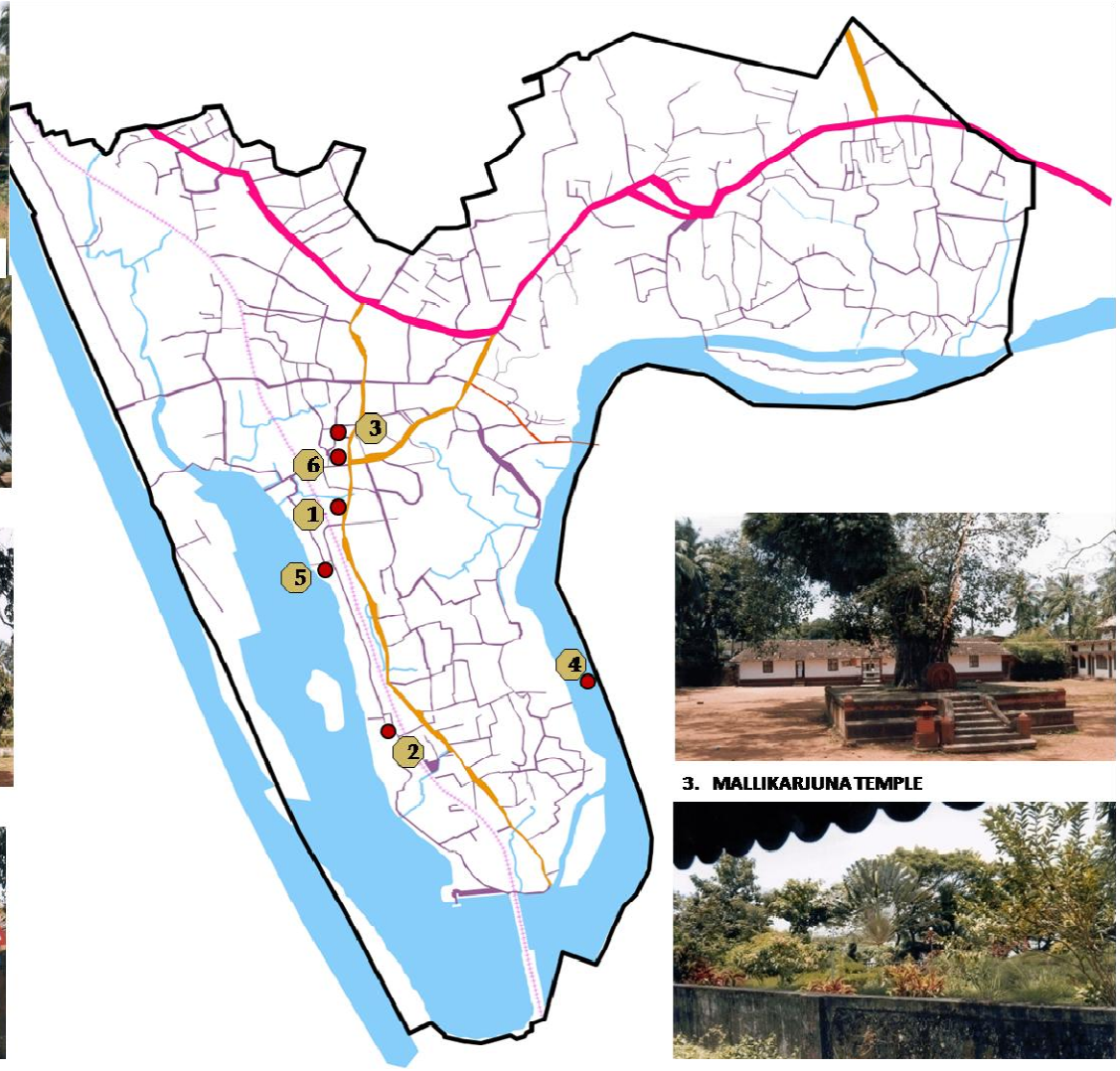
4. CHANDRAGIRI RIVER



2. MALIK DEENAR MOSQUE



6. TALUK OFFICE KASARAGOD



3. MALLIKARJUNA TEMPLE

5. SEA VIEW PARK

Fig 10.7 Tourist destinations of Kasaragod Municipality

The **Mallikarjuna Temple** is situated in the heart of Kasaragod town near the taluk office. The annual five day long temple festival, which falls in the Malayalam month Meenam (March/ April) attracts huge crowds. During Ganesh Chaturthi and Shivaratri, there are special celebrations in the temple premises. Mallikarjuna temple , which is a very old temple with old premises of conservation importance is a major attraction to Hindu pilgrims.

Chandragiri Fort is situated 3Km Southeast of Kasaragod town on the banks of the Chandragiri river. It is a potential place of attraction with heavy scope for further developments in relation with municipal developments.

LIST OF HERITAGE BUILDINGS

NAME	WARD	CATEGORY
DEO Office, Kasaragod	26	Ancient Architecture
Kasaragod Beach	31	Nature
Malik Dinar Mosque, Thalangara	24	Mosque
Mallikarjuna Temple	27	Temple
Pattelar House, Thalangara	23	Ancient Architecture
Residence of T.Ubaid	23	Ancient Architecture
Taluk Office, Kasargod	27	Ancient Architecture

Table 10.4 List of Heritage Buildings in Kasaragod Town (Source: Tourism Dept.)

Right next to the Fishing Harbour at Thalangara is the **Thalangara Children's Park**, which is located 4 Km away from Kasaragod Town.

2. Problems and Potential

Kasaragod is the gateway to Kerala at the North from the State of Karnataka. Bekal Fort at a distance of 20 km from the town is a main attraction of the region and is an established tourism spot of international acceptance and fame. A major project for the development of facilities in this destination is under implementation by the Kerala Tourism Department and has a direct impact on the development of Kasaragod town. Kasaragod Municipality is also blessed with beautiful beaches and ancient religious buildings. Being strongly connected with Mangalore city which is a shopping destination, the city has the potential to develop in to a tourist destination, utilizing its waterfront. The banks of Chandragiri River is beautiful, and is a potential tourist attraction, provided the

river is cleaned up and dumping of waste into the river is prohibited. Kadappuram beach, Lighthouse areas, Nellikkunnu, Thuruthi, Thalangara etc. have beautiful beaches, and are potential recreation centres.

Kasaragod town has a great potential to develop as a tourist centre; but the main problem is lack of infrastructure facilities. Even the existing parks like Sea-View Park at Pulikkunnu and Children's park near Madonna are not being used by the public.

The number of tourists; both International and domestic, visiting Kasaragod District has increased since the last few years (see Fig 10.8).

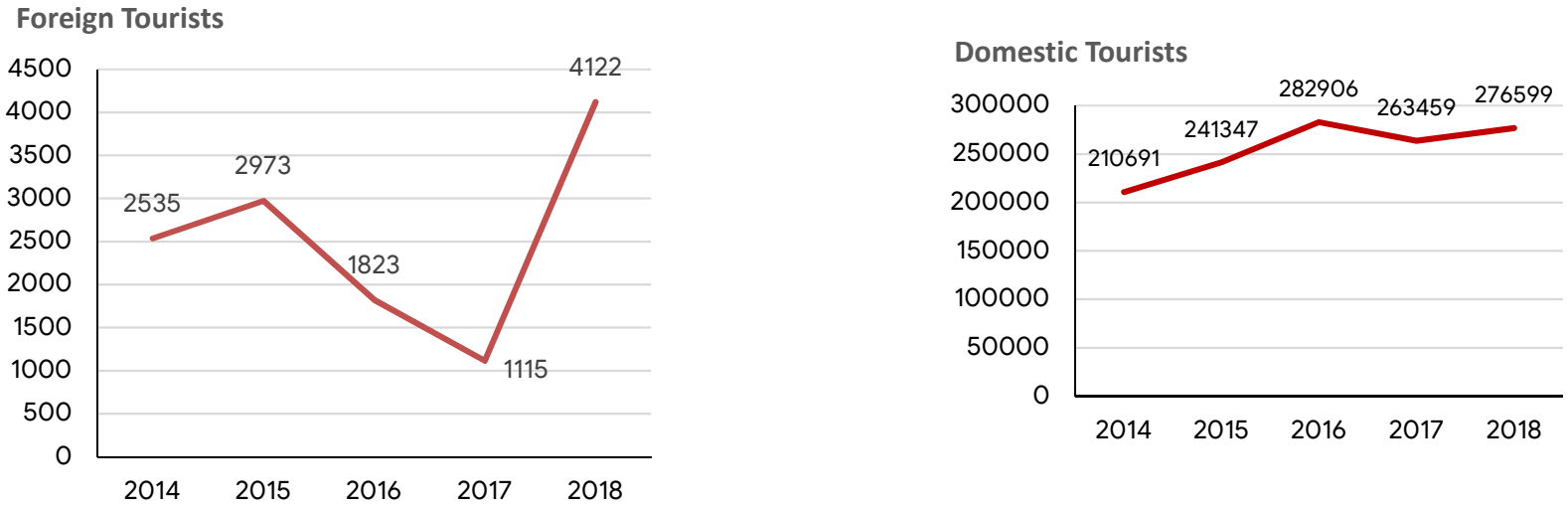


Fig 10.8 Tourist statistics-Kasaragod District

(Source: Tourism Dept.)

Table 10.5 shows the available tourist infrastructures in the municipality. Majority of hotels are of Economy class and there are no home stay facilities.

TOURIST INFRASTRUCTURES IN KASARAGOD MUNICIPALITY

4 Star & Above	3/2 Star Hotels	Economy Hotels	Tourist Info Centre	House Boats
Nil	J K Residency	City Tower	DTPC, Vidyanagar	Nil
	Highway Castle	Apsara Regency	Dist Off. Of Tourism	
		Diera City Residency		
		Speedway Inn		
		Land Mark Inn		

Table 10.5 Tourist infrastructure -Kasaragod town (Source: Tourism Dept.)

D. AGRICULTURE

1. Area under cultivation

Fig 10.9 shows the area under agricultural use in the municipal limits. The agriculture areas are classified as dry areas and wet areas. Total agricultural area inside the Municipality comes to around 212 Ha. Out of which paddy area constitutes 122 Ha. which forms 6.85 % of total municipal area. Dry cultivation area comes to 90 Ha which constitutes

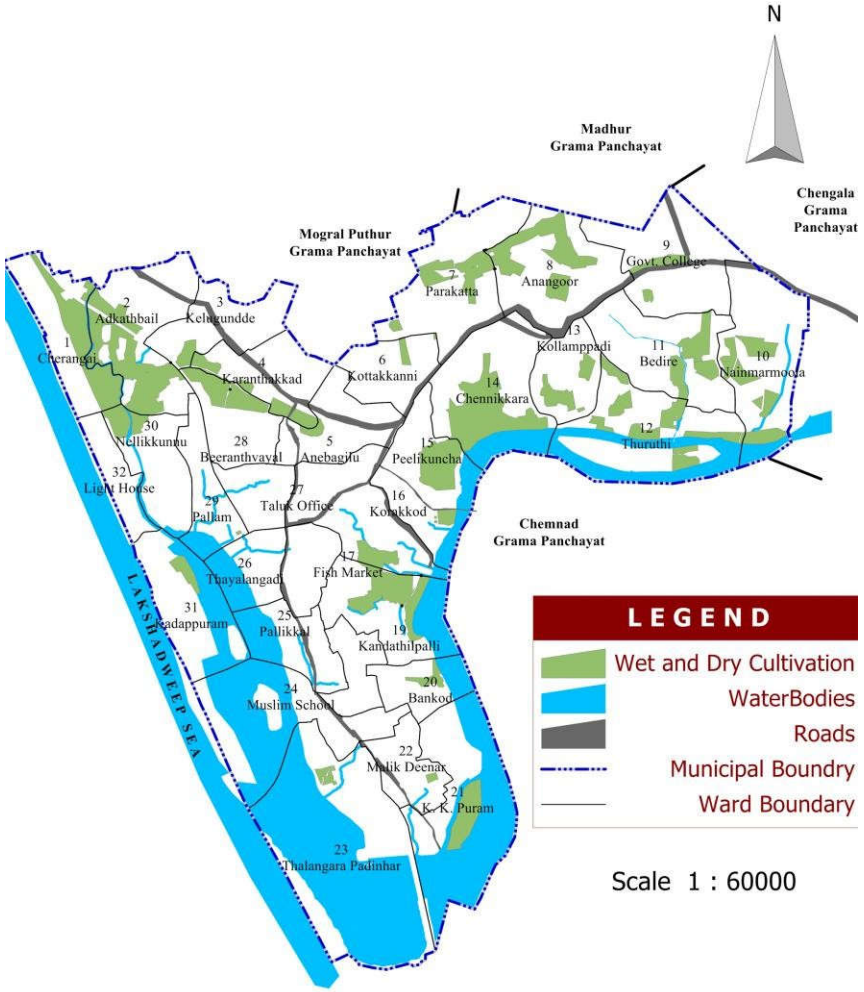


Fig 10.9 Spatial distribution of Agricultural Land use

5.4% of total municipal area. There has been a decrease from 225 Ha of agricultural area in 2001 to 212 Ha of agricultural area in 2010, due to unplanned residential development and land filling. Agriculture areas are distributed mainly in northern portion of the municipal area.

2. Important crops and production

The main agriculture produces in the municipality are coconut, arecanut, paddy, banana, vegetable etc. *Fig 10.10* and *Table 10.6* shows the production of crops in Kasaragod Municipality. Coconut has the maximum production of 15400 Tons followed by Arecanut.

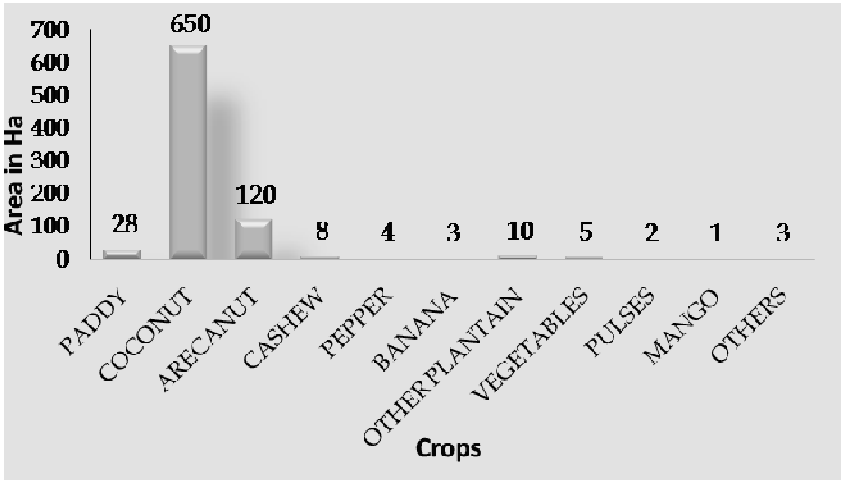


Fig 10.10 Area wise Production of Crops in Kasaragod Municipality-2001 (Source: Agriculture Dept.)

Basic data Of Crops		
Crop	Production	Productivity
PADDY	76.7 Ton	2.74 T/Ha
COCONUT	15400 Ton	23.7 T/Ha
ARECANUT	1800 Ton	15 T/Ha
CASHEW	9 Ton	1.13 T/Ha
PEPPER	2 Ton	0.5 T/Ha
BANANA	60 Ton	20 T/Ha
OTHER PLANTAIN	40 Ton	4 T/Ha
VEGETABLES	10 Ton	2 T/Ha
PULSES	1 Ton	0.5 T/Ha
MANGO	0.2 Ton	0.2 T/Ha
OTHERS	1.2 Ton	0.4 T/Ha

Table 10.6 Production of Crops in Kasaragod Municipality-2001 (Source: Agriculture Dept.)

3. Irrigation facilities

Kasaragod Municipality is surrounded by Chandragiri River on sides and branch streams o the river are the irrigation sources. Irrigation is facilitated by pump sets, ponds, wells, canals and tanks. 28% of the agricultural land is irrigated through the river and 45% through wells, canals and ponds.

There is a network of natural drains interconnecting the paddy fields and low-lying areas. These are natural potentials for further agricultural development. The flooding during monsoon also adversely affects paddy cultivation. To prevent this canal could be protected with retaining walls and irrigation ponds could be constructed at suitable locations.

4. Agricultural Inputs

The Central Plantation Crops Research Institute (CPCRI) at Kudlu village is four Kms away from Kasaragod town. Research studies are going on there regarding plant breeding, protection etc. for coconut, arecanut and other plantation crops.
Fertilizer depots in the municipality include RADCO (near Railway station) and KAICO (near Vidyanagar)- both of which are co-operative enterprises. They supply agricultural equipment also. There are 3 other private depots in the central area of the town. All of the above depots engage in both wholesale and retail trade.

5. Marketing of agricultural produces

There are no markets for selling of agriculture products, which indicates that these products may be sold at open markets by the private agencies.

6. Problems and Potentials

The main problems in agricultural sector are:

- Low fertility of soil

- Unavailability of enough irrigation facilities
- Unplanned residential developments and filling up of paddy fields
- Unavailability of bio-fertilizers
- Unavailability of labor
- Increased production cost

Due to the above reasons, majority of the paddy fields in Kasaragod are lying vacant. Adkathbail, Ameyvail, Kalmadivail etc have around 80 Ha of area suitable for Paddy cultivation. Proper steps could be taken to reuse these lands. Co-operative farming could be introduced with double harvest paddy crops and intermediate crops in the Municipal area. Small scale industries for bio fertilizer manufacturing could be constructed near paddy fields.

Paddy fields act as rain water retention ponds during rainy season and hence these have to be retained especially in view of the depleting ground water levels.

E. ANIMAL HUSBANDRY

There is high demand for meat, eggs, milk etc which is being met by neighboring states. Decline in the availability of grazing land due to increasing urbanization made it uneconomical for the farmers to rear cattle. Since there are no Dairy Farms or Hatcheries in Municipality, the livestock are mostly reared within the household. The District Veterinary Centre is located in Kasaragod town. There is a cattle pound in Chennikara in the Municipality for the grazing of around 35 cattle at a time.

Fig 10.11 and *Table 10.7* shows the Livestock Details of Kasaragod Municipality.

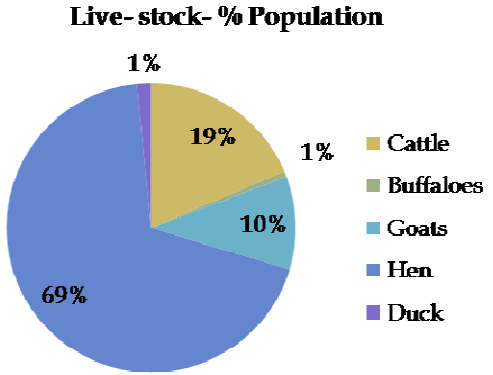


Fig 10.11 Livestock- % Population in Kasaragod Municipality

(Dept. of Animal Husbandry)

Production Details In Kasaragod Municipality			
No. of Poultry Farms	Meat Production	No. of Dairy Farms	Milk Production
5	1275 Kg/Day	2	110 litres/Day

Table 10.7 Livestock Production details of Kasaragod Town
(Dept. of Animal Husbandry)

Production of Meat and eggs do not meet the requirements of the Municipality. Co-operative farming with cattle rearing, milk production, bio fertilizer manufacturing etc. could be encouraged. More marketing facilities for meat and eggs, and modern slaughter houses could be initiated.

Inference

Animal Husbandry is a weak sector in Kasaragod Municipality.

Kasaragod town has a high potential for production, but there is a need for:

1. Supporting infrastructure development (Diagnostic lab, Clinic lab, Calf feed Office and Veterinary Hospital/Dispensary) and
2. Encouragement to invest in this sector.

Milk consumption details in Kasaragod Municipality		
Sl No.	Place	Qty L/Day
1	Vidyanagar	700
2	Vidyanagar	60
3	Bus Stand	160
4	Press Club Jn	100
5	Bus Stand	20
6	Taluk Office	250
7	Bank Road	650
8	Karanthakkad	300
9	Udayagiri	150
10	Adakathbail	110
11	Thalangara	10
12	Railway Stn.	10
13	Vidyanagar	200
14	Market	400
15	Old Bus Stand	140
Total		3260

Table 10.8 Milk consumption in Kasaragod town

F. FISHERIES

Kasaragod is one of the main fishing centres in the district. The 5 km long Kasaba coastline is the main fishing centre in the Municipality. Around 5800 workers are involved in the catching and marketing of the fish. Fishermen settlements of extent around 5 acres along the sea coast are thickly dense areas. Population along the coastal zone live in thickly populated colonies, which give rise to social, health and sanitation hazards. Usually male population is engaged in fishing and women folk sell the fish in the municipal area. This sector faces severe social, physical and environmental problems with regard to their shelter and employment.



Details Of Workers In Fishing Sector

Place	Total No.of Workers	Total No.of Families
Cherankkai		
Kasaba		
Beach Road		
Adakathbail	2450	1978

NO: OF BOATS	
MECHANISED	: 60
MOTORISED COUNTRY BOATS	:150
NONMOTORISED COUNTRY BOATS	: 20

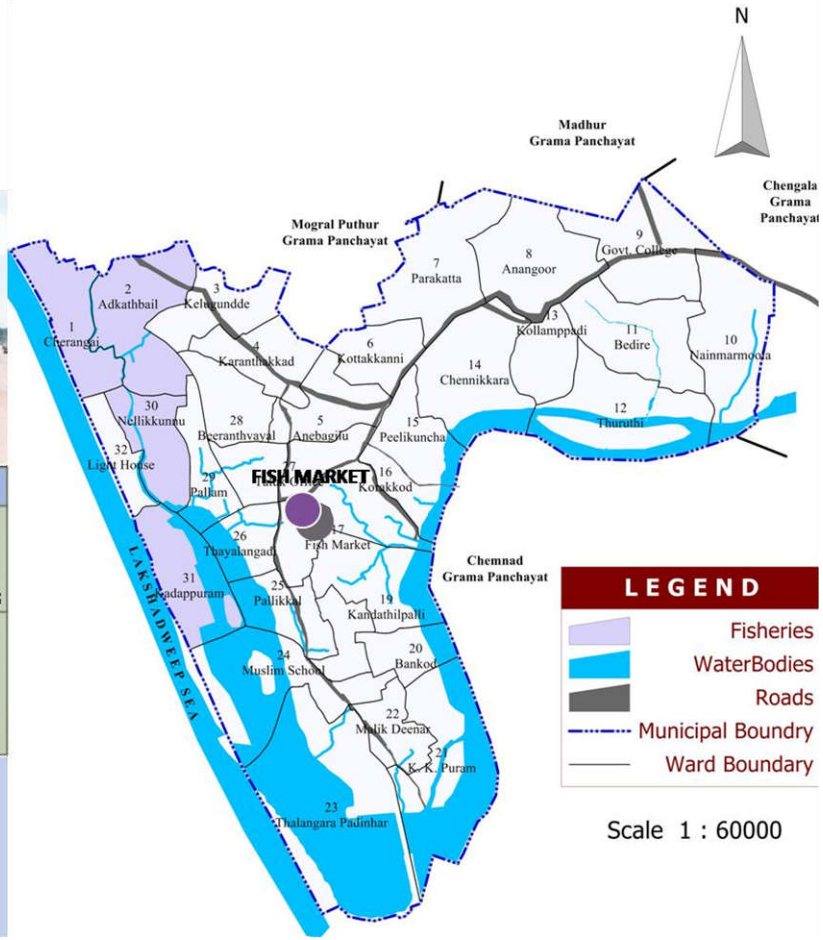


Fig 10.12 Fisheries sector in Kasaragod Municipality
(Source: Fisheries Dept.)

There is one Boat yard and repair unit in Kasaba and 2 ice plants in Nellikunnu and Cherankkai. (*Table 10.9*).

The Chandragiri River is a rich source of fresh fish, and small-scale projects for increasing quantity and different varieties of fish could be introduced to increase the catch. *Table 10.10* shows the different varieties of fish available in each season. **Inference**

There are no facilities for preserving and processing of fish in the Municipality, hence the larger catches are transported immediately to Mangalore. Marketing and sale can be improved by introducing small scale industries aiming at preserving and processing of by products from fish, which have a high potential in the town. Thalangara has a fishing harbor, but the sand bars in the delta of Chandragiri constraints the efficiency of the port.

Details of Auxiliary Activities				
Place	Ice Plants	Boat Yards	Boat Repair Units	Net Making Units
Kasaba	_	1	1	0
Nellikunnu	1	_		_
Cherankkai	1	_		_

Table 10.9 Auxiliary activities in fishing sector



Fig 10.13 Fish processing plant at Kadappuram

Seasonal Fishing		
Sl. No	Season	Type of Fishes
1	March-May	Mathi, Chemeen, Mullan,Ayila
2	June-August	Mantha, Mathi,Nangu,Mullan
3	Septmbr-Novembr	Mathi, Chemeen,Ayila, Avoli
4	Decemb-Febry.	Ayila, Mathi, Natholi,Ayikoora

Table 10.10 Fish available in each season
(Source: Fisheries Dept.)

CHAPTER 11
TRAFFIC AND TRANSPORTATION

1. Introduction

Traffic and transportation is closely related to land use. Transportation corridors are the vital links that connect and correlate the different urban activities and provide the means for efficient movement of men and materials. The primary road circulation system of Kasaragod town is in radiating pattern with the roads radiating in all directions from a central focus. The alignment of major roads was dictated by the irregular topographical conditions of the town. The major zones attracting traffic in the town are the central area dominating with specialized activities and the division where the Govt. College is located.



Fig 11.1 New Bus stand Jn. showing NH-66

The major modes of transport in the town are buses, autorickshaws and other personalized vehicles. Autorickshaws and other personalized vehicles meet the demand of public transport during peak hours. People depend on the rail transport for moving to distant places towards north and south. The town has a railway station in the western part of the town.

2. Characteristics of transport network

The land put to traffic and transportation uses accounts for a mere 6.81% of the municipal area. This low figure represents gross inadequacy of road in the town in terms of width.

Bus services are operated by private companies, individuals and the Kerala State Road Transport Corporation- majority of the services being run by private agencies. The Municipality maintains a bus stand in the town.

The road network is characterized by a central core of Commercial activities circled by a ring road and roads radiating from this core to the Suburban residential areas. The Beach road, Thalangara road (Railway station road), Chandragiri road, N.H 66 and Madhur road are the major feeder roads from the Central area of the town. These corridors are connected by a set of ring roads in the central area of the town. All the roads in the urban area except the NH- 66 are too narrow to cater to even single lane traffic. Out of these NH - 66 cater to maximum traffic followed by Chandragiri road and Railway station road. An interesting factor is that, on all these feeder roads, autorickshaws are dominating.

The narrow roads, congested inter sections, on - street parking; lack of pedestrian facilities etc. are

Major Roads

1. **NH 66** (within Municipal limit)
2. M. G Road
3. Thalangara-Karanthakkad Road
4. Madhur Road
5. Bakel Road
6. Nayak's Road
7. KPRR Road
8. Municipal Office Road
9. Beach Road
10. Sea shore road

The road network within the study area are maintained by both PWD and Municipality.
NH-66 caters to maximum traffic followed by Thalangara Road and M.G Road.



Fig 11.2 Road Network within the Municipality

the major problems experienced. The road network face critical problems of narrow width, bottle necks, narrow junctions, poor geometrics, unorganized parking, poor pavement quality, improper management of road side drains etc. The roads inside the Municipal area are managed by two independent agencies, the PWD and the Municipality.

2.1 Roads

Fig 11.2 shows the network of roads within the Municipality.

Existing Road Network

National Highway -66 is the major arterial road in Kasaragod Town. It connects the central area of the town with other activity centres in the northern parts of the town. The *Table No. 11.1* shows the road particulars.

SL NO	CHAINAGE	LENGTH (KMS)	WIDTH		ADJOINING LANDUSE	
			CW	ROW	L	R
I	NH 66 KSRTC BUS STAND	4.5				
	VIDYANAGR (Municipal limit)					
1	Bus stand- Nellippally	1.5	8.5	13	Commercial	Commercial
2	Nellippally- Karanthakkad	2	15	35.5	Commercial	Commercial
3	Karanthakkad- Vidyanagar	1	7.5-8	30	Commercial	Commercial
	(Municipal Limit)				Commercial	Commercial
II	PWD-KPRR ROAD	0.5	6	8	Commercial	Commercial
III	PWD-NAYAKS ROAD	0.75	5	11	Commercial	Commercial
IV	PWD- MG ROAD	1.25	7.5	25-30	Commercial	Commercial
	(MunicipalBus stand- Traffic Jn)					
V	PWD MUNICIPAL OFFICE ROAD	0.5	5.5	8	Residential	Residential
	(Hospital Jn- Guest House Jn)					
VI	PWD Thalangara- Karanthakkad	4.25				
1	Thalanagara- Taluk office Jn	1.5	4.5		Residential	Residential
2	Taluk Office Jn- Nayaks Road Jn	1.5	15	25-30	Residential	Residential/Commercial
3	Nayaks Road Jn.- Karanthakkad	1.25	8	15-18	Residential	Residential
VII	PWD MADHUR ROAD	2				
	(Karanthakkad Road-Choori)					
1	Karanthakkad- Choori	2	6.5-7.5	8.5-10	Residential	Residential
VIII	PWD BEACH ROAD	1.5				
1	Bus stand-Beach	1.5	5	5 to 10	Commercial	Commercial
IX	BAKEL ROAD	3				
1	Bus stand- Vidyanagar	1	8.5	10	Commercial	Commercial
2	Vidyanagar-Press club Jn	1	7.5	35.5	Commercial	Commercial
3	Press club Jn- Chandragiri Bridge	1	8	15	Residential	Commercial/Residential
	(Municipal Limit)					
X	PWD SEASHORE ROAD	3.5				
	(Fishing Harbour- Chandragiri)					
1	Harbour- Chandragiri	1.5	4	6 to 7	Residential	Residential
2	Chandragiri- Seashore end	2	4.5	10 to 11		

Table 11.1 Details of Major Roads in Kasaragod Municipality

(Source: NATPAC Survey)

Other important road corridor is SH-57 leading to Hosdurg through Chandragiri Bridge road and Kalanad. Another major transport linkage is the SH-31 , which branches off from NH 66 at Cherakla Jn well beyond the Municipality. The Jalsoor Road also branches off from Cherkala Jn. The road towards Madhur originating from Karanthakkad is another important road in Kasaragod town.

Transport Terminals

The KSRTC Bus stand and the municipal Bus stand are the main bus terminals in the municipal area. The KSRTC bus stand is located in the central area, in a most crowded location and needs relocation in future. The Municipal bus stand is functioning at Bangarakunnu by the side of NH. There exists a truck parking area at Anangoor junction on NH. Other organized parking spaces are along MG road,

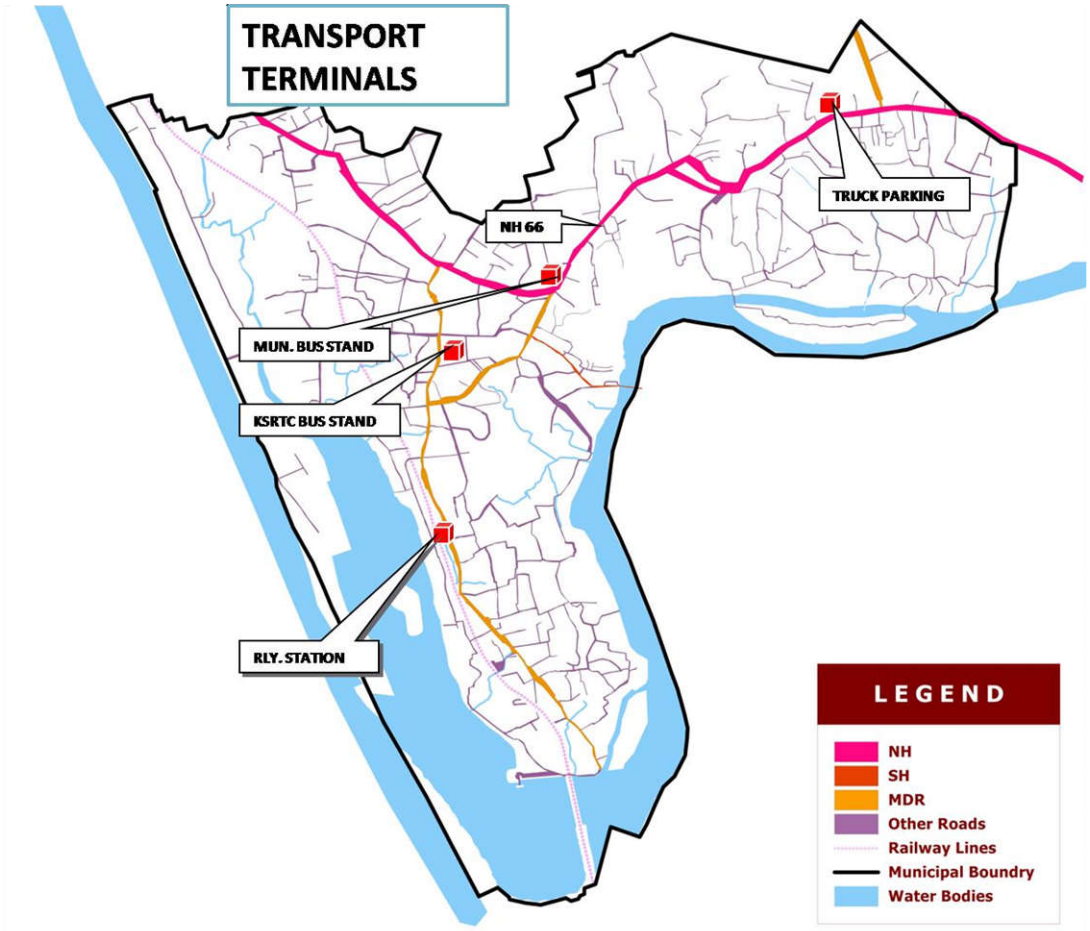


Fig 11.3 Major Transport terminals in Kasaragod Town

Taluk office; Railway station and KSRTC bus stand premises. Vehicles are seen parked along KPR Rao Road during evening. These trips are mainly for shopping in the central area of the town. *Fig 11.3* shows the major transport terminals of Kasaragod Municipality.

Bottlenecks and missing links

There is no direct link between Old bus stand area and Railway Station. The existing road through Taluk office Jn. to Railway station is narrow, with bottleneck at Thayalangadi (*Fig 11.4*), and is regulated as one way. Due to this the commuters have to travel nearly 700 metres to join M.G Road.

The western parts of the beach are presently deprived of bus transport facility, despite being a heavily populated area in the town. The physical constraints are the backwater and Shoranur-Mangalore railway line which hinder development activities in the region.



Fig 11.4 Bottleneck at Thayalangadi

Certain regions like Thururthy, Pallom, Cherangai and Thalangara have roads but lack connectivity. Linkage needs to be provided from Thururthy area to M.G Road through Amey Road, which in turn could be linked to NH-66, via Anangoor to Nullipady, or via Chala to Vidyanagar.

Bottlenecks occur in the following regions;

1. Road between Badriya Hotel to Fort Road junction
2. Road from Central Square to Tower Clock.
3. The Fort Road
4. The Chakkara Bazar Road

5. The Pallam Road
6. The Geetha Theatre Road
7. The I.C Bhandari Road to Traffic Signal light.

2.2 Railways

Kasaragod is a major railway station (Class I) in the Malabar region. It is located at Theruvath in Pallikal ward (*Fig 11.5*). The railway line which forms part of Shoranur - Mangalore stretch of Southern Railway passes through the town. The Shoranur - Mangalore link reduces the distance to Mumbai by 800 kms and makes this the shortest route for Keralites to Mumbai, the commercial hub of India.

About **31 passenger trains** (16 towards Mangalore side and 15 towards Kannur side) halt at Kasaragod daily, along with 24 other special trains on particular days of the week. Goods trains do not halt at Kasaragod. Kasaragod assumed more importance with the completion of the Konkan railway connecting the Malabar Region with Mumbai.



Fig 11.5 Kasaragod Railway station

The State Govt. and the Central Govt. propose to develop the 'BEKAL FORT' area by acquiring 330 acres of land around Bekal Fort and providing all facilities for tourists. The nearest railway station is Pallikkara, a halting station, which is about 22 kms from Kasaragod town. When the proposal is materialized, it will have impacts on the developments in Kasaragod. Being the major town, near Bekal Area, Kasaragod will be an entry point for the Bekal bound tourists. Furthermore, developments in Bekal will give an impetus to the tourism developments in the region and Kasaragod is certain to reap benefits from these developments.

2.3 Air Transport

The nearest Airport is Bajpe Airport, Mangalore about 50 km from Kasaragod. Kannur airport is 111 km to the north of the town.

Around 20% of the population of the Municipality work abroad, and the sole dependence of both the town and District population of Kasaragod is either Mangalore Airport, Kannur Airport or Kozhikode Airport.

Table 11.2 shows the airports from Kasaragod town and their respective distances.

Airports near Kasaragod	Type	Aerial Distance
Bajpe Airport, Mangalore (IXE)	International	50 Km
Kozhikode Airport (CCJ)	International	187 Km
Bengaluru International Airport (BLR)	International	311 Km
Chennai International Airport (MAA)	International	580 Km

Table 11.2 Airports near Kasaragod town

2.4 Water Transport

Kasaragod has beautiful backwaters and beaches, which has a high potential for tourism. House boats/Boating services could be launched especially in the backwaters near Ameyvail and Sea view Park. Thalangara has a fishing harbor, but the sand bars in the delta of Chandragiri constraints the efficiency of the port.

2.5 Existing Traffic Characteristics

Many road stretches within the study area were over- utilized to the extent of more than two times their carrying capacity resulting in congestion, accidents and declining in travel speed.

Traffic volumes on all the road sections in NH-66 have exceeded their capacity. The road section between Anangoor and Civil Station is experiencing two times their capacity.

In the M.G Road also, the congestion rate is rising despite the One- way system introduced between Old Bus Stand and Taluk Office Jn.

The road section between KPRR road to Taluk Jn. is also a congested corridor now.

One of the main reasons for congestion and delay of roads in Kasaragod Town is the high incidence of pedestrian crossing at important locations.

Major corridors

Kasaragod is located along National Highway 66 leading to Mangalore. The town is well connected with major urban centres in the state by rail and roads. SH - 31 to Kalladukka leads to Badiadukka, Perla Vitla and further to Karnataka state. The Jalsoor road passes through Muliyar and leads to Sulliya. The hill produces and vegetables and from these centres are brought to Kasaragod town for trading. The Puthur and Sulliya in Karnataka are famous for educational institutions and trade and commerce. The Madhur road is another important feeder road to the urban area.

The Shoranur - Mangalore broad gauge line adds to the regional linkage of the town. It directly links Kasaragod with Mangalore in the north and Kannur in the south. The rail line to South passes along the Bekal Tourism Development Project area.



Fig 11.6 Chandragiri road to Kanhangad

2.6 Parking facilities

Parking facilities in Kasaragod are inadequate and mostly unorganized, creating congestion and hindering the commercial activities, especially along the MG Road. There is no separate parking area for private vehicles.

The pickup- auto parking near taluk hospital has taken up the space for passenger auto/taxi parking facilities for patients. The Taluk office compound also has unorganized parking arrangement. The truck parking in the Municipality is along the NH 66 in the Anangoor area.



Fig 11.7 Taxi parking near Old Bus stand



Fig 11.8 Auto parking along M.G Road



Fig 11.9 Pickup parking near Taluk Hospital



Fig 11.10 Parking inside Taluk office compound.

2.7 Identification of gaps in the network

Kasaragod attains importance because of its proximity to the business cum commercial centre of Mangalore and tourist centres in the northern Kerala. The region is well connected by road and rail network. Certain stretches have roads with very poor geometrics. The hilly terrain prevailing in the region is the major hindrance for development. Lack of connectivity between roads makes bus transport difficult and people have to travel through circuitous route (by foot and private mode) to reach motor able roads. Also, steep roads with poor geometrics and narrow width increases vehicle operating cost and penetration difficult. Certain areas like Thuruthy, Pallom, Cherangai and Thalangara have roads but lacks connectivity.

2.8 Inference

National Highway -66 is the major arterial road in Kasaragod Town. It connects the central area of the town with other activity centres in the northern parts of the town. Other important road corridor is SH-57 leading to Hosdurg through Chandragiri Bridge road and Kalanad. Another major transport linkage is the SH-31 , which branches off from NH 66 at Cherakala Jn. well beyond the Municipality. The Jalsoor Road also branches off from Cherkala Junction. The road towards Madhur originating from Karanthakkad is another important road in Kasaragod town.

The road network is characterized by a central core of Commercial activities circled by a ring road and roads radiating from this core to the Suburban residential areas. The Beach road, Thalangara road (Railway station road), Chandragiri road, NH 66 and Madhur road are the major feeder roads from the Central area of the town. These corridors are connected by a set of ring roads in the central area of the town. All the roads in the urban area except the N H - 66 are too narrow to cater to even single lane traffic. Out of these N H - 66 cater to maximum traffic followed by Chandragiri road and Railway station road.

The KSRTC Bus stand and the municipal Bus stand are the main bus terminals in the municipal area. The KSRTC bus stand is located in the central area, in a most crowded location and needs relocation in future. The Municipal bus stand is functioning at

Bangaarakunnu by the side of NH. Bus services are operated by private companies, individuals and the Kerala State Road Transport Corporation- majority of the services being run by private agencies. The Municipality maintains a bus stand in the town.

The western parts of the beach are presently deprived of bus transport facility, despite being a heavily populated area in the town. Certain regions like Thururthy, Pallom, Cherangai and Thalangara have roads but lack connectivity. Linkage needs to be provided from Thururthy area to M.G Road through Amey Road, which in turn could be linked to NH-66, via Anangoor to Nullipady, or via Chala to Vidyanagar.

Bottlenecks occur in the following regions;

- Road between Badriya Hotel to Fort Road junction
- Road from Central Square to Tower Clock.
- The Fort Road
- The Chakkara Bazar Road
- The Pallam Road
- The Geetha Theatre Road
- The I.C Bhandari Road to Traffic Signal light.

Kasaragod is a major railway station (Class I) in the Malabar region. About 31 passenger trains (16 towards Mangalore side and 15 towards Kannur side) halt at Kasaragod daily. The State Govt. and the Central Govt. propose to develop the 'BEKAL FORT' area by acquiring 330 acres of land around Bekal Fort and providing all facilities for tourists. The nearest railway station is Pallikkara, a halting station, which is about 22 kms from Kasaragod town. When the proposal is materialized, it will have impacts on the developments in Kasaragod.

Regarding Water transport- Kasaragod has beautiful backwaters and beaches, which has a high potential for tourism. House boats/Boating services could be launched especially in the backwaters near Ameyvail and Sea view Park.

Many road stretches within the Municipality were over- utilized to the extent of more than two times their carrying capacity resulting in congestion, accidents and declining in travel speed. Traffic volumes on all the road sections in NH-66 have exceeded their capacity. The road section between Anangoor and Civil Station is experiencing two times their capacity.

In the M.G Road also, the congestion rate is rising despite the One- way system introduced between Old Bus Stand and Taluk Office Junction. The road section between KPRR road to Taluk Jn. is also a congested corridor now.

Press club Jn and New bus stand Jn handled the maximum traffic volume exceeding 4000 PCU followed by Taluk office Jn. They are the arterial nodal points in the town.

High volume of pedestrian cross movements occurred between HPO Junction and Old bus stand Junction on MG Road, followed by the pedestrian cross movements occurred between Old bus stand Junction and petrol um on MG Road.

Out of the total 33,108 passenger vehicles, the maximum of 33.75% was found to be cars and jeeps, followed by autorickshaws (27.46%) and two wheelers (33.32%). The contribution of buses was only 5.47% of the total flow. The maximum number of inter-city passenger vehicles were observed through Chandragiri Road (31.97%), followed by NH 66 Eriyal- CPCRI point (28.72%).

Parking facilities in Kasaragod are inadequate and mostly unorganized, creating congestion and hindering the commercial activities, especially along the MG Road and New Bus stand area. There is no separate parking area for private vehicles, especially in the MG Road area. The pickup- auto parking near Taluk hospital has taken up the space for passenger auto/taxi parking facilities for patients. The Taluk office compound also has disorganized parking system.

Railway station compound had the highest parking accumulation in the Municipality at 4 pm. Along the NH 66, the parking area inside the New Bus stand area witnessed highest parking accumulation.

CHAPTER 12
WATER SUPPLY

1. Important sources, treatment facilities, distribution system and consumption

Water supply is one of the critical issues, in Kasaragod town. Although the town is locked with water bodies on three sides, the residents suffer from gross inadequacy in water supply in terms of quality as well as quantity. The town population depends considerably on ground water sources like wells and tube wells. Now days the number of tube wells in the town has drastically increased and the situation have lessened the ground water availability in the town. Hence the dependability on ground water resources is not sustainable in the future. In view of the depleting ground water resource,

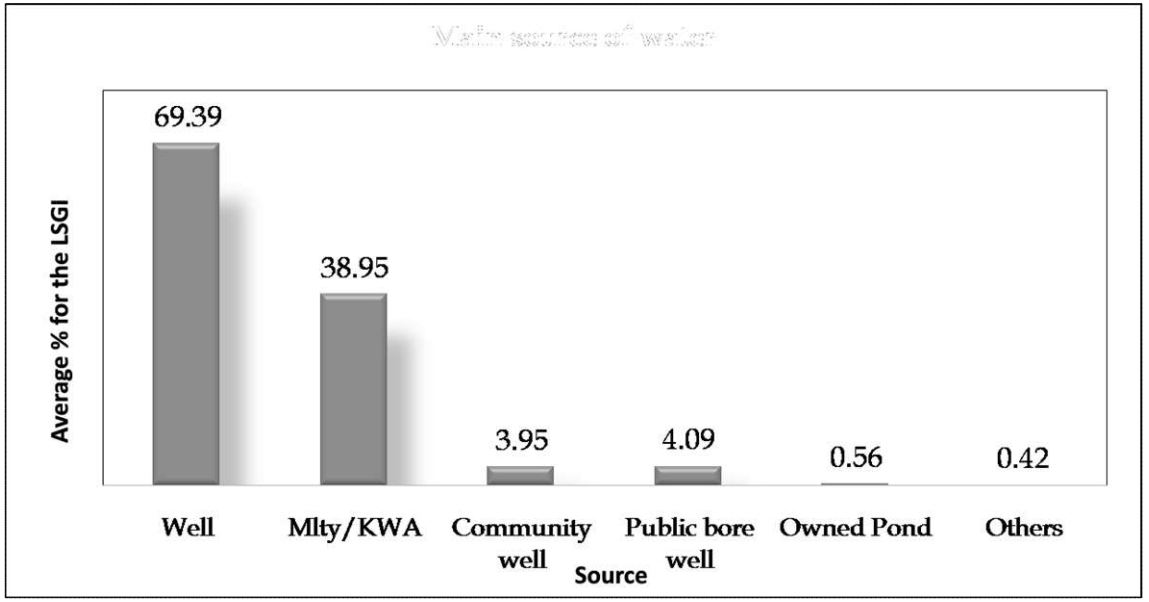


Fig 12.1 Dependability for water requirements by people of the municipality (Source: Socio economic survey)

efforts must be made to reduce ground water consumption and to increase ground water recharge so that the threat to this resource can be minimized. *Fig 12.1* depicts the source dependability for water requirements by the people of Municipality. (Socio-economic survey results). *Fig 12.1* shows that around 69.39% of the population depends on wells. Only 38.95% depend on Public Water Supply system.



The present water supply system is not satisfactory. The only public water supply project in the town commissioned as early as in 1976 was for a design population of 5000 families but the gradual increase in demand has not been met satisfactorily in the subsequent years.
An intake well is located in Chandragiri River at Bavikkara at Muliyar Panchayath. The treatment plant is located at Vidyanagar. The design capacity is 8 MLD but the actual capacity is 4 MLD due to variation in the project and losses in the distribution system.

Details of Source				
Sl. No.	Source	Location	Quality	Yield(MLD)
1	River Payaswini	Bavikkara	good	5
2	Bore Wells	5 Nos. In muni. area	good	2
3	Open Wells	Diff. Places	good	3.35

Table 12.1 Details of source of water in the Municipality

Details of Treatment Plant				
Location	Source	Capacity	Types of treatment	Working condition
Vidyanagar	River Payaswini	8 MLD	Rapid sand filter	good

Table 12.2 Details of Water Treatment plant

The existing system supplies water intermittently and at other times the people depend on open wells and bore wells. The problem of saline water intrusion is severe during the months of April – May.

Fig 12.2 gives the distribution details of the present water supply scheme in the Municipality.

Leakage losses are the main functional problem of the distribution system. The pipes are very old and require urgent replacement.

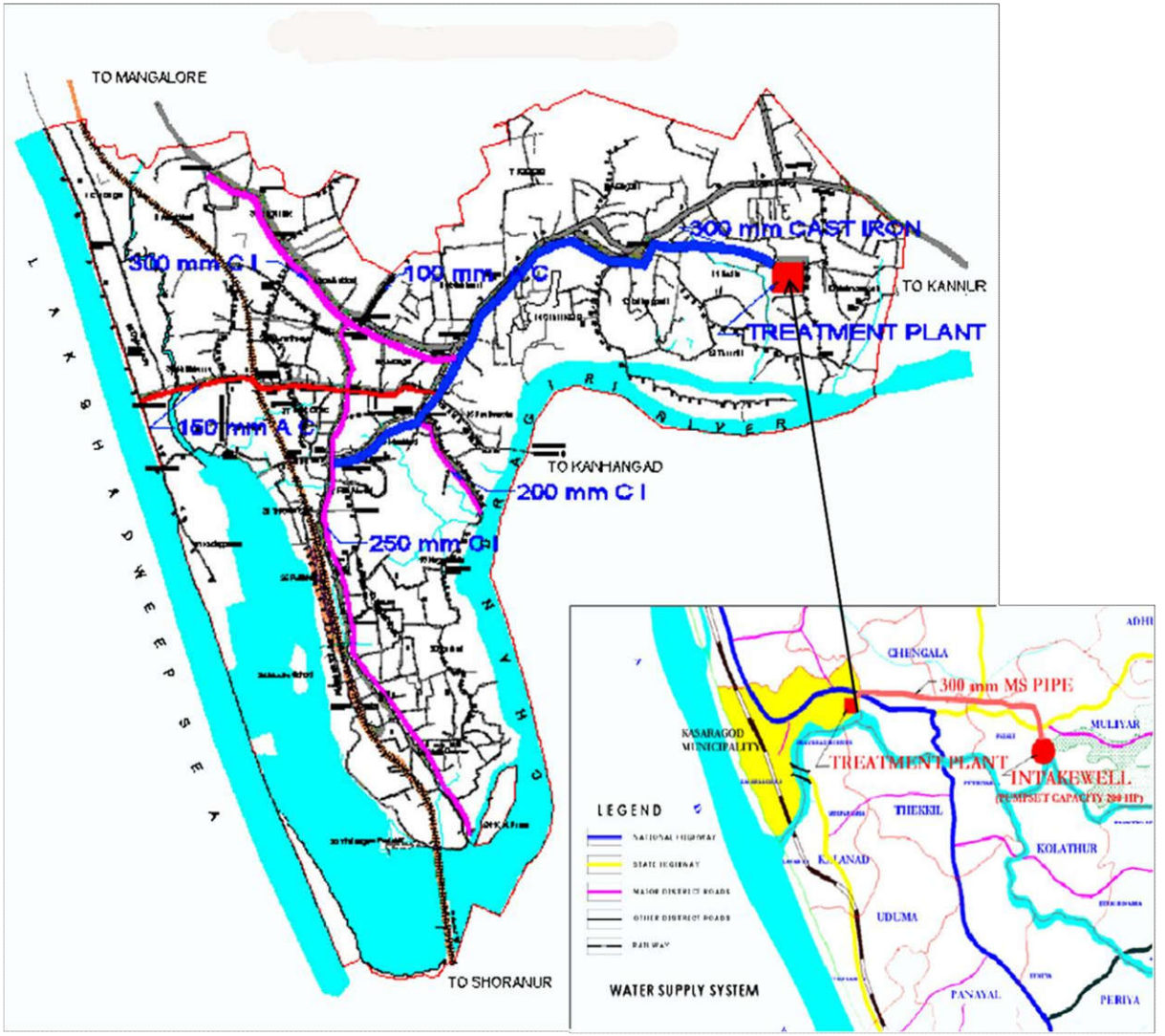


Fig 12.2 Present water distribution system in Kasaragod Municipality

2. Scarcity

Fig 12.3 and *Fig 12.4* shows the scarcity of water for Kasaragod Municipality. 21.16% of the wards experiences water scarcity for more than 6 months, and 19.18% for 1-2 months, i.e during the summer months of April-May. Water scarcity is severe in many parts of the Municipality.

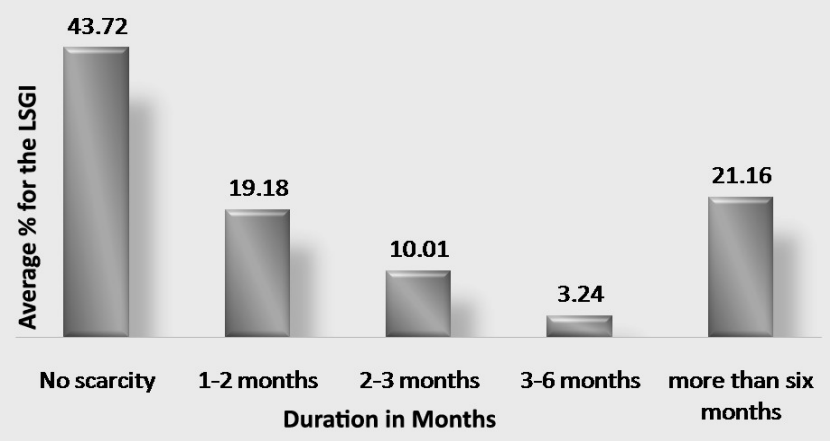


Fig 12.3 Water scarcity in Kasaragod Municipality (Source: Socio economic survey)

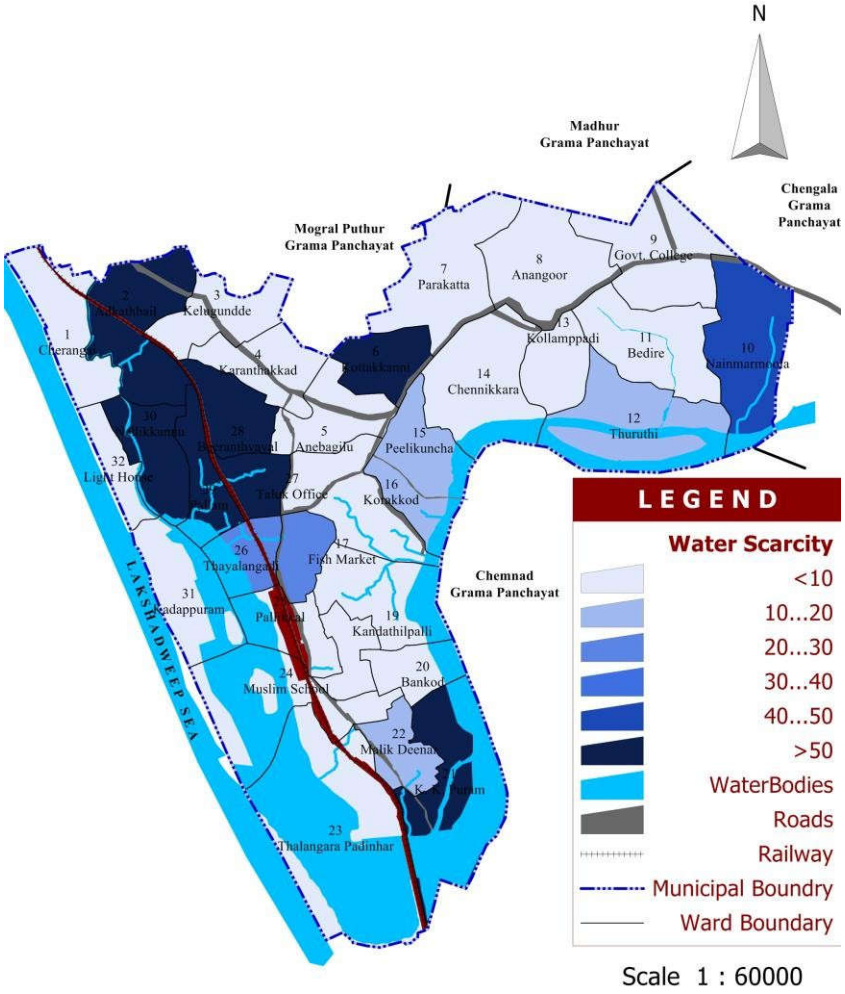


Fig 12.4 Ward wise Details of Water Scarcity in Kasaragod Municipality

3. Inference

- The present water supply system is not satisfactory.
- Owing to threat of ground water depletion well dependability is not sustainable in the long future.
- There is scarcity of water especially in the coastal areas due to saline intrusion during summer months.
- Maximum utilization of surface water and rain water is the best option for the future.
- Leakage loss is the main functional problem of the distribution system. The pipes are very old and require urgent replacement.

CHAPTER 13
SANITATION

1. Drainage

The topographical conditions of the town render the draining of storm water to the surrounding primary streams easy. Surface drains on the sides of the roads do not cover the entire area. Drainage blocks are found at three locations viz; Taluk office junction, Press club junction and New bus stand area and the blocks create unhygienic conditions and in the surrounding. (*Fig 13.1*) Map shows the locations which are frequently affected by flooding due to storm water during monsoon season. All these locations are along the sides of the main roads of the municipality and maintained by Public Works Department. All these spots are in commercially important areas.



Fig 13.1 Drainage map of Kasaragod Town

Existing Drainage System	
Sl. NO.	**Drainage Network**
1	New Bus Stand - Karandakkad - Beeranth bayal - Kalmadi
2	Old Bus Stand - Korakkode - Ceramics Road
3	Fish Market - Fort Road - Thayalangadi - Pallam - Koppal Thode

Table 13.1 Existing Drainage Network of Kasaragod Municipality

There exists a clear hierarchy of drains leading to the water body covering around one third perimeter of the town. On detailed analysis some clear bottlenecks are seen resisting the easy flow of drains. This has to be studied in detail and a drainage plan may be the ultimate remedy for this issue.

Some sort of mechanism is required to regulate and properly maintain the drains coming in the town. Waste disposal from small and medium scale commercial units are found to be a problem in this sector and this has to be controlled. An awareness campaign is also required to propagate the health menaces associated with this issue. Some major streams, which are found to carry waste waters from the surrounding residential areas discharge into Chandragiri River and creates pollution in the river. Storm water flow through the drains especially in covered drains is affected by the blocks due to clogging of waste dumped in the drains in plastic bags, silt deposit etc. Before monsoon, the drains should be cleaned so as to ensure smooth flow of drain water. *Fig 13.2* (Discharge of Natural Streams) depicts the spots of joining of some main streams with the Chandragiri River.

Inference

The existing drainage system should be improved; maintenance is needed throughout.

The bottlenecks in the drainage network have to be studied in detail and a drainage plan should be developed. Efficient drainage network is most necessary in the Municipality, since more building complexes are coming up. Starting and ending point of the network should be clear.



Fig 13.2 Discharge of Natural streams to River

2. Sewerage System

Fig 13.3 gives an idea about the sanitation among the residents of the town from the socio-economic survey. About 69.53% of the sample population depends on Pit Latrine and 22.99% on individual septic tanks. There is no organized sewerage system in the town. There are some typical issues associated with the sanitation scenario of the town.

One of the major issues is the threat of ground water contamination in the low-lying areas especially in the costal stretches. Since the coastal areas are thickly built up with economically weaker sections like fishermen, sanitation is found to be a big issue in the coastal areas.

It is observed that the costal low-lying areas with high water table are prone to the ground water contamination. Urgent measures are required to tackle this issue exclusively in these areas through some organized arrangements.

Since most of the houses have their own arrangements and other areas are topographically undulating, a sewerage system for the whole town is not economically viable in the immediate future.

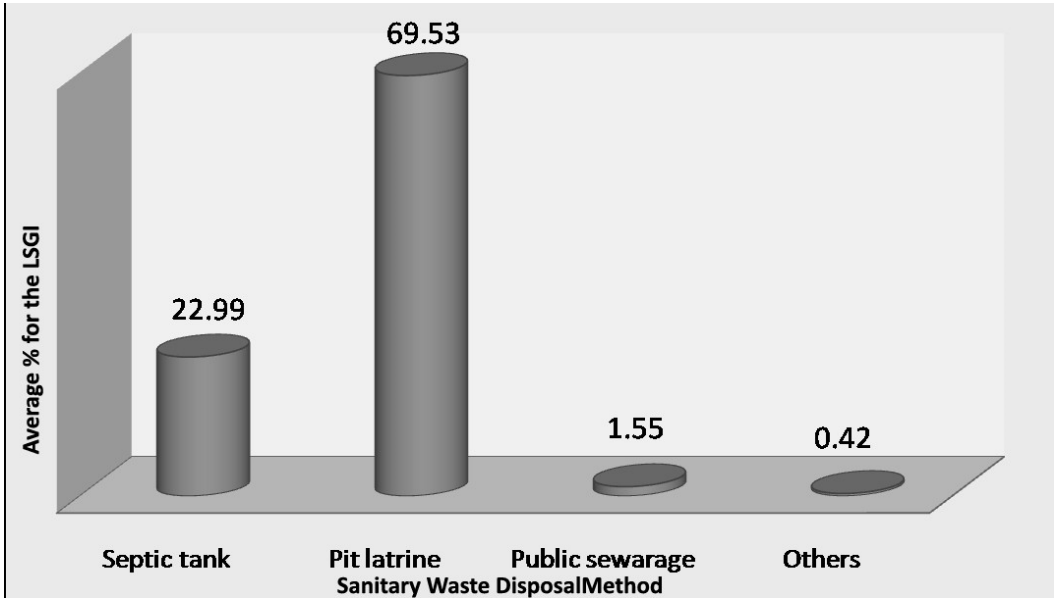


Fig 13.3 Sanitary waste disposal method- Kasaragod Municipality

(*Source: Socio economic survey*)

3. Solid waste disposal

The town follows conventional system of collection and dumping in a yard to tackle the issue of solid waste disposal. The waste is then disposed by Land filling. The present dumping yard is located outside the town near Kelugudde in the northern fringe. The area of yard is not adequate and the collection mechanism does not fully cover the entire municipal area. The present waste generation per day in the town is estimated to be around 15 tonnes, and the waste collected is 13 tonnes. The waste disposal is done by the Municipality by Partially Centralized system.

Fig 13.4 depicts the percentages split-up of solid waste disposal mechanism followed in the town. The results are obtained from the socio-economic sample survey. The results show that, 80.25% of the population has their own arrangements for solid waste disposal. Only 9.59% of the population depends on the public collection and disposal. However compared to households waste generated from non-residential areas are much more in quantum and variety. The composition is also complex in respect of non-domestic waste. It is this sector which requires attention as far as public disposal mechanism is concerned.

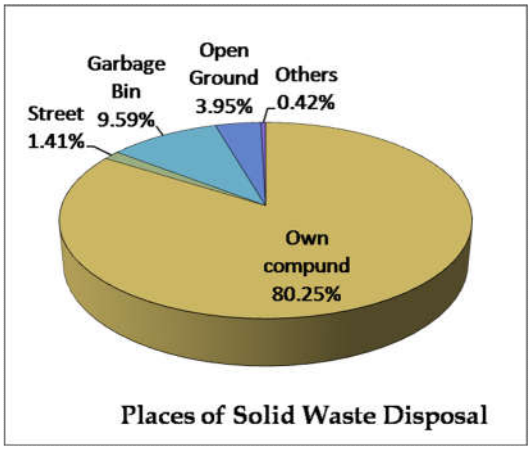


Fig 13.4 % Wise Split up of Solid Waste Disposal Mechanism

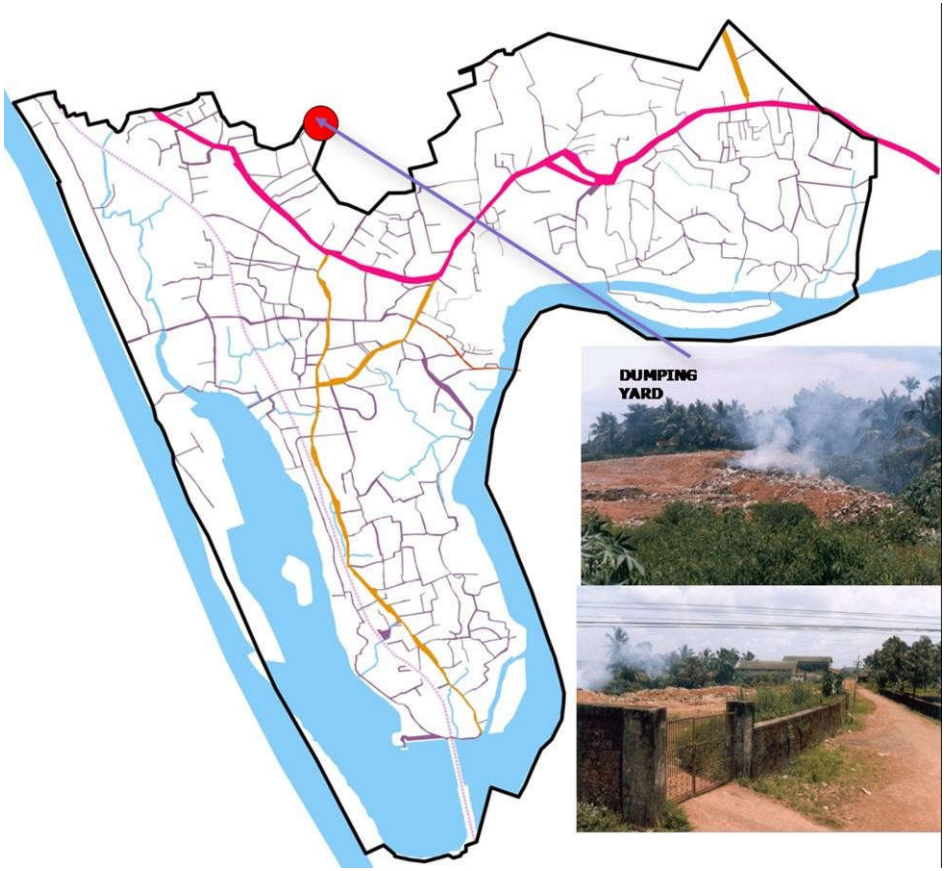


Fig 13.5 Solid waste dumping yard at Kelugudde

Inference

Collection Details			
Collection Points	Workers	Frequency of collection	Vehicles
25 Points	53	Thrice Daily	2

Table 13.2 Solid Waste Collection Details

Solid waste management is a burning issue for the immediate future if not at present, with increase in resident population as well as floating population, urbanization, growth of town etc. Hence this aspect has to be given proper care and attention. The present dumping yard is not enough to meet the present requirement as well as for the future.

The present collection & conservancy is not fully covering the entire municipal area. There needs to be a localized collection & processing with respect to the density distribution of population. Fish market in the municipality is in a poor condition. Waste is not disposed regularly from there, and the market is not cleaned up. There is a Waste Treatment plant for the fish market, but it is not being properly used.

CHAPTER 14
ENERGY

13. Energy

Energy is the resource input by which the human civilization grows. Energy can be in various forms, of which electrical energy is the most adopted form of energy. Electricity has become a fundamental necessity for the development of any society and level of consumption of electricity is often considered an indicator of development.

13.1 Energy consumption: source wise break up

The major energy consumption is the electrical energy generated from hydro electric project. No other non-conventional energy is fed into the main grid. Petroleum products like diesel and petrol, biomass etc are also used.

13.2 Energy consumption: sector wise breakup

Since the energy consumption is mostly electrical energy, the consumption of electricity by various categories is considered.

- **Electricity**

The Kerala State Electricity Board is the single licensee responsible for power distribution in the municipality. There are two 11 KV sub stations in the Municipality- at Kasaragod and Nellikunnu, with a total of 134 Transformers. The details of electricity consumption in Kasaragod municipality are shown in *Fig 14.1*.

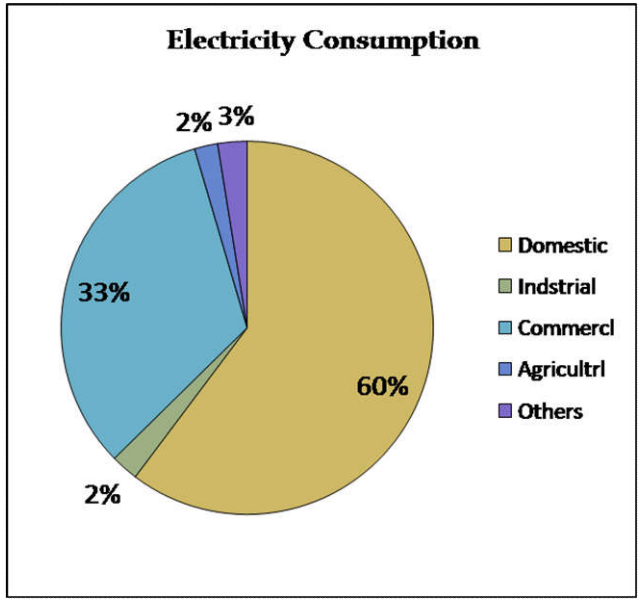


Fig 14.1 Electricity Consumption in the Municipality (Source: KSEB, Kasaragod)

Majority of the electric consumption in the Municipality is for, domestic purpose and then for commercial purposes (See *Fig 14.1*). According to Socio-economic survey, only 0.28% of the houses in the Municipality are un electrified.
The only 2 feeders in the Municipality are overloaded. At least 10 feeders are required to meet the future consumptions.

1. Petroleum

Petrol and Diesel are the major products considered. There are 7 fuel filling stations in Kasaragod Municipality distributed along the major road ways and NH-66. (See *Table 14.1*)
No petrol pumps are seen in the remote areas of the town.
The total capacity of storage of petrol is less than the diesel; this shows a higher use of diesel vehicles (See *Fig 14.2*)
The number of petrol pumps is satisfactory and they are distributed along the major road networks.

Fuel Filling Stations in the Municipality

Sl. No.	Location	Capacity (KL)		Avg. Consumption ltr/Day	
		Petrol	Deisel	Petrol	Deisel
1	Press Club Jn.	25	40	3500	4500
2	Nullipady	20	35	3000	5500
3	Karandakkad	40	40	3200	4000
4	Old Bus Stand	9.5	9.5	1600	3000
5	New Bus Stand	30	40	2800	3800
6	Anangoor	25	25	3200	4400
7	Vidyanagar	35	40	3300	4200
	Total	**184.5**	**229.5**	**20600**	**29400**

Table 14.1 Fuel filling stations in Kasaragod Municipality

2. Non-Conventional sources

LPG- There are nearly 6 Gas Agencies functioning in the district which serves the municipal area, and sufficiently caters to the need of the Municipality.

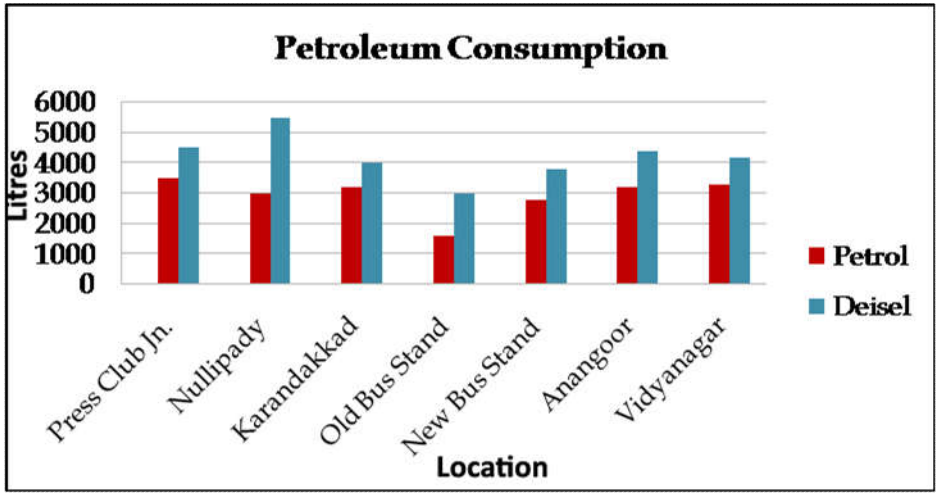


Fig 14.2 Petroleum Consumption in the Municipality

13.3 Problems and Potentials

Kasaragod town does not have major energy problems. But it has to depend on other districts for the energy requirement especially in the case of electrical energy. Kasaragod district does not contribute much to the generation of electrical energy. No other non-conventional energy sources except solar energy are being utilized. Even in the case of solar energy, the use is limited to a few roof top solar heaters. There is a tremendous potential for the development of harnessing solar energy. The town has potential for development of bio gas plants also with a healthy cattle population. The distribution of petroleum products are at a satisfactory level.

LPG Connection Details		
Total Agencies	Subsdised	No. Of Connections
6	2	31,218

Table 14.2 LPG Connection Details

13.4 Inference

The distribution of electrical energy is sufficient. There is an immediate need for tapping solar energy and promoting bio-gas in order to reduce spiraling consumption of fossil fuels.

CHAPTER 15
EDUCATION

1. General

The overall performance and availability of educational institution is very low compared to other districts in the state. Kasaragod being an educationally backward district has its reflection in the Municipality also. Literacy rate of Kasaragod municipality is 94.76% as per census 2011 which is higher than the literacy rate of Kasaragod district, which is 90.09%.
The literacy rate of Kasaragod town compared to the district and state are as follows:

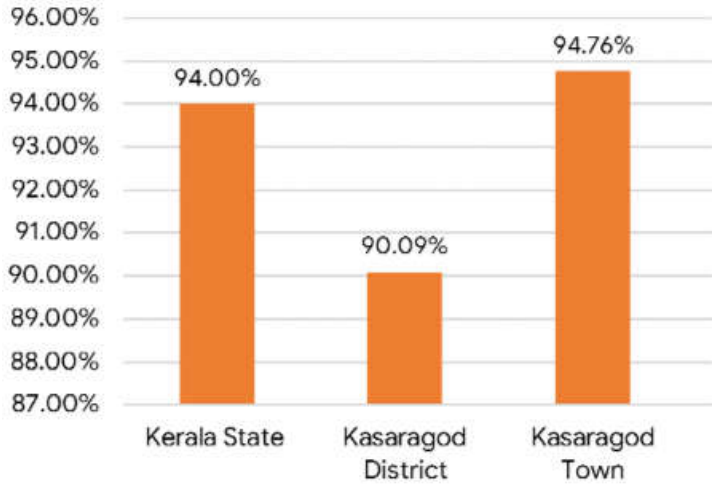


Fig 15.1 Literacy comparison of Kasaragod Municipality with District and State

(Source: Census 2011)

2. Existing facilities, students and teachers

Sl. No.	Name	Location/Ward	Category	No. Of Teachers					Govt/Aided/ Unaided
				Pre-primary	Primary	HS	HSS	VHSS	
1	Dhakeerath E M Nursery	23	1	6					Unaided
2	Jai Matha Nursery School	6	1	5					Unaided
3	Al-Ameen Nursery	24	1	4					Unaided
4	Chinmaya Vidyalaya	15	1	3					Unaided
5	Kasaragod Balabhavan	4	1	4					Unaided
6	Divine English Nurseryl	8	1	2					Unaided
7	Tagore Balanikethan	8	1	2					Unaided
8	GLPS Kolampady	13	2		5				Govt.
9	GWLPS Kasaragod	27	2		4				Govt.
10	GLPS Thalangara (W)	23	2		5				Govt.
11	GLPS Anangoor	8	2		10				Govt.
12	GUPS Kasaragod	27	2		26				Govt.
13	GFUPS Adakathbail	2	2		12				Govt.
14	GUPS Nullipady	6	2		8				Govt.
15	GLPS Theruvath	26	2		5				Govt.
16	GMLPS Thalangara	24	2		6				Govt.
17	Govt. Blind UPS Vidyanagar	9	2		10				Govt.
18	TILPS Pallam	29	2		5				Aided
19	MMAUPS Thuruthi	12	2		10				Aided
20	PTMAUPS Badira	11	2		16				Aided
21	MIALPS Thalangara	24	2		6				Aided
22	AUPS Madona	26	2		17				Aided
23	AUPS Nellikunnu	30	2		29				Aided
24	Tagore Balanikethan	8	2		5				Unaided
25	Kasaragod Balanikethan	4	2		5				Unaided
26	BEMHS Kasaragod	27	4		3	20	11		Aided
27	GHSS Kasaragod	15	4		8	39	13		Govt.
28	GMVHSS Thalangara	24	5		7	12	10	9	Govt.
29	GVHSS for Girls	30	5		0	31	14	9	Govt.
30	Dhakeerath English Medium H.S.S	23	4		13	15	11		Unaided

Educational Institutions		
Sl. No.	Category	Units
1	Anganvady	48
2	Pre-Primary Schools	7
3	L P Schools	8
4	U P Schools	7
5	High Schools	5
6	Higher Secondary	5
7	Vocational H S	2
8	Spl. Schools	1
9	Arts & Science Colleges	1
10	Proffesional Colleges	2
11	Medical Schools	3
12	Paralell Colleges	4
13	Others	6

Table 15.1 Details of Educational institutions in Kasaragod Municipality (Source: D D E, Kasaragod)

The educational institutions in the municipality include 5 Secondary and 5 High Schools, 7 U.P Schools, 8 L.P Schools, one Blind School, 2 Vocational Higher Secondary Schools,1 Arts and Science college (Govt. College), 5 Medical Schools of Nursing and Pharmacy and 6 Computer Education centres.

Table No. 15.1 and *15.2* gives the details of the educational institutions inside the Municipality.

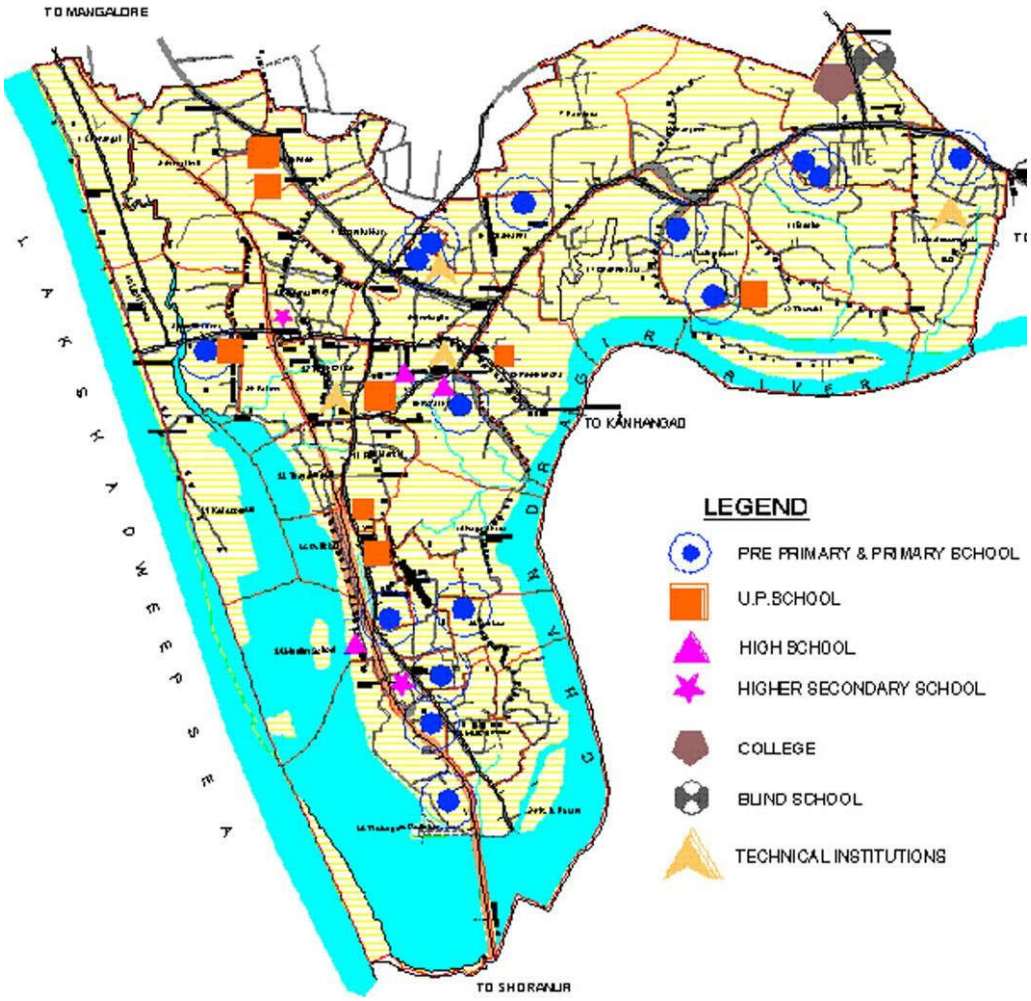


Fig 15.2 Educational institutions in Kasaragod Town

In Kasaragod town there are 30 schools. Majority of schools are under government ownership. There are 13 Government high schools in Kasaragod town. This shows the dominance of Govt. schools. (*Fig 15.3*)

There is an acute shortage of primary educational facilities. The number of dropouts from Schools is much more in Kasaragod Municipality compared to other Municipalities.

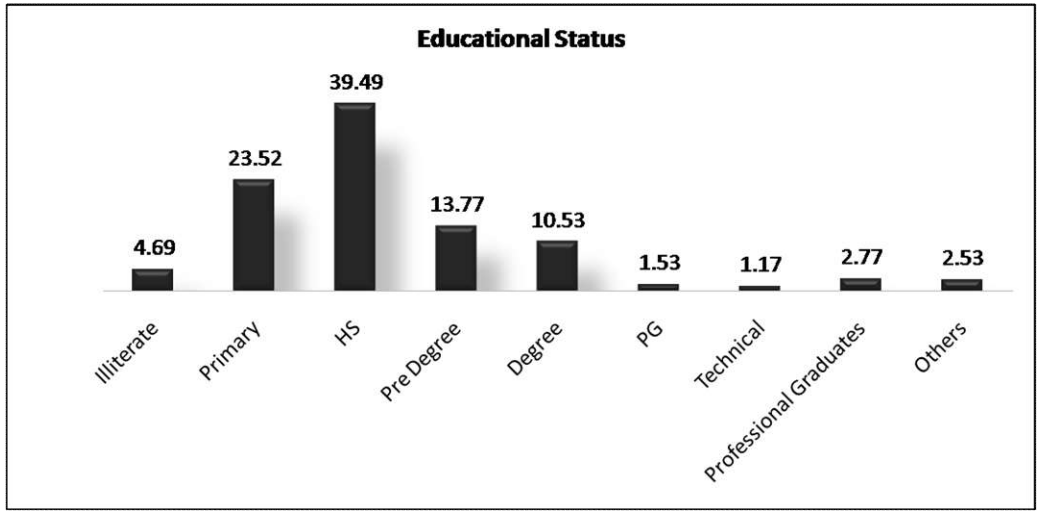


Fig 15.4 Educational status in Kasaragod Municipality

(Source: Socio economic survey)

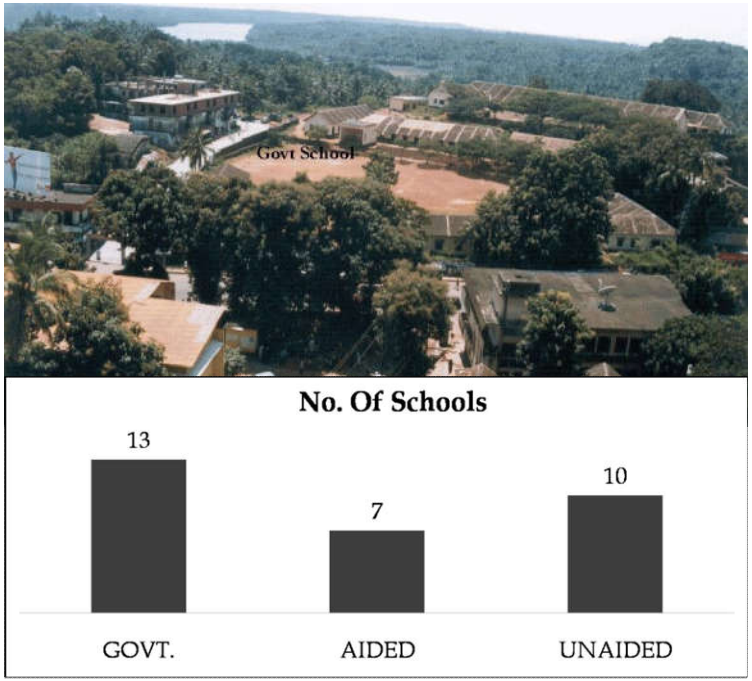


Fig 15.3 Category of Schools in Kasaragod Town

(Source: D D E, Kasaragod)

In the Socio-economic Survey studies, around 4.69% of the population of the Municipality are illiterate and majority (39.49%) are just High School pass outs. Only 10.53% are graduates.

3. Higher and Professional education

Table 15.2 shows the Higher and Professional education centres in Kasaragod Municipality. Majority of the Higher education facilities are Nursing colleges and Computer education centres. These two branches have a high scope for employment opportunities abroad. In spite of being the most urbanized town of the district there are no Medical

Table 15.2 Higher and Professional education institutions

Arts & Science Colleges					
			No. Of Students (UG)		
Sl. No.	Name	Location	BSc.	Bcom.	MSc.
1	Govt. College Kasaragod	Vidyanagar	514	Nil	75
Professional Colleges					
Sl. No.	Name	Location	Courses Offered		No. Of St.
1	Malik Deenar Collg. Of Nursing	Thalangara	BSc Nursg		180
			PcBsc Nrsg		30
			Gen Nursg		140
2	Malik Deenar Schl Of Pharmacy	Seethangoli	B Pharm.		205
			D Pharm.		99
3	Care Well Schl Of Nursing	Nullipady	Gen Nursg		35
4	KIMS Schl. Of Nursing	Karandakkad	Gen Nursg		71
5	Fathima Schl. Of Nursing	Karandakkad	Gen Nursg		40
Other Educational Institutions					
Sl. No.	Name	Location	Courses Offered		No. of St.
1	Triveni College	Vidyanagar	BA. Eco., Eng		155
			Bcom.		210
			BSc. Maths		20
			MA Eng., Mcom		35
			Plus One & Two		70
2	Women's College	Nellikunnu	Plus One		16
			BA.		65
			Bcom.		120
3	Thakshashila College	Bank Road	Plus One & Two		84
			Bcom.		68
4	Tagore College	Vidyanagar	Plus One & Two		55
			BA., BSc., Bcom.		42
			MA., MSc.		15
5	Sri Shankaracharya Comp. Edu.	Bank Road	Diff. Comp. Courses		33
6	Cadd. Centre	Kasaragod	Cadd. Course		20
7	C Nice	Pulikunnu	Diff. Comp. Courses		38
8	New Man Infotech	Kasaragod	Diff. Comp. Courses		23
9	Pentasquare Comp. Edu.	Kasaragod	Diff. Comp. Courses		20
10	SSI Edun. Tally Academy	Kasaragod	Tally Courses		135

or Engineering colleges in the Municipality. Majority of the population depend on Mangalore and other cities for Higher professional education.

4. Problems and potentials

Considering the Physical infrastructure of LP & HSS schools, majority of them have inadequate playground facilities. Computer lab and internet facilities are almost non-existent in all schools.

There is water availability in all schools, but major sources of water are wells. Tap water facility is available only in very few schools. Considering higher education facilities, the number of colleges is in sufficient. There is one I.T.I and a computer centre managed by L.B.S functioning in the Municipal area. Private computer education centres like APTECH, RSCM (Rashtriya Saksharatha Computer Mission), Manipal Institute for Computer education etc. are also functioning in the Municipal area. There are no Medical or Engineering colleges in the town, majority of the students opt or Nursing and Pharmacy courses. The student strength for these courses is not up to the Planning standards. The teacher- student's ratio is less in all HS, mainly due to lack of accommodation and transportation facilities.

5. Inference

The overall performance and availability of educational institution is very low compared to other districts in the state. Kasaragod being an educationally backward district has its reflection in the Municipality also. Literacy rate of Kasaragod municipality is 94.76% as per census 2011 which is higher than the literacy rate of Kasaragod district, which is 90.09%.

In Kasaragod town there is a dominance of Govt. Schools. There is also an acute shortage of primary educational facilities. Majority of the Higher education facilities are Nursing colleges and Computer education centres. These two branches have a high scope for employment opportunities abroad. In spite of being the most urbanized town of the district there are no Medical or Engineering colleges in the Municipality. Majority of the population depend on Mangalore and other cities for higher professional education.

CHAPTER 16
HEALTH

1. General

Kasaragod town depends on Co-operative Medical College, Pariyaram (Kannur) and major hospitals of Mangalore for its moderate and major health issues.

Though Kasaragod is the District headquarters, the district hospital and district medical office are functioning at Kanhangad.

There is a Govt. Sector Taluk Allopathic Hospital available in the CBD area, with 212 beds and 24 doctors. Malik Deenar Hospital is a major hospital in the private sector with 155 beds and 18 doctors.

The medical institutions in the town serve not only the urban population but also a considerable amount of rural population residing in the surrounding Panchayats.

Unfortunately, in Kasaragod municipality there are no super speciality hospitals.



Fig 16.1 Taluk Hospital , Kasaragod.

2. Existing facilities

Table 16.1 shows the type of medical facilities inside the Municipality and the map shows the location and hierarchy of medical institutions inside the town.

Fig 16.2 shown in the next page represents the location and category of various health institutions inside Kasaragod Municipality.

The Govt: Taluk Hospital In MG Road has 212 bed facility. This is the Taluk level institution inside the Municipality. This is followed by Malik Deenar Hosital at Thalangara with 155 bed facility. Majority of the hospitals in the Municipality are concentrated around the Karanthakkad area and along the NH 66.

There are two Ayurveda and Homeopathic hospitals in the Municipality, which include the Govt. Hospitals also. Major problem in the health sector is the insufficiency of facilities in the hospital. There are no super specialty hospitals in the municipality as well as in the district. Most of the hospitals are in private sector. District hospital is the only government hospital in the municipality but it lacks the required number of doctors.

Details Of Hospital (Allopathy)

Sl. No.	Name	Ward	Location	Category	No. Beds	Doctors
1	General Hospital	16	M G Road	4	212	20
2	Chaithra Medical Centre	9	Vidyanagar	4	25	3
3	Mallya City Hospital	4	Karandakkad	4	14	4
4	Malik Dinar Hospital	24	Thalangara	4	155	5
5	Kamath Medical Centre	9	Kasaragod	3	25	3
6	Manipal Uma Hospital	4	Karandakkad	4	35	5
7	Arimala Fathima Hospital	4	Karandakkad	4	65	10
8	KIMS	4	Karandakkad	5	200	14
9	United Medical Centre	6	Kottakanni Road	4	100	10
10	Krishna Maternity Hospital	9	Vidyanagar	4	35	3
11	CareWell Hospital	8	Nullyppady	4	100	11

Details Of Hospital (Ayurveda)

Sl. No.	Name	Ward	Location	Category	No. Beds	Doctors
1	Govt. Ayurveda Hospital	8	Nullypaddy	2	10	2
2	Kerala Ayurveda Hospital	5	Aswini Nagar	2	10	2

Details Of Hospital (Homeopathy)

Sl. No.	Name	Ward	Location	Category	No. Beds	Doctors
1	Govt. Homeo Dispensary	24	Thalangara	1	0	1
2	Co. Op Homeo Hospital	8	Anangoor	1	0	2

Table 16.1 Health Institutions in Kasaragod Town (Source : D M O, Kasaragod)

1. Problems and Potentials

There is one Taluk Hospital which is sufficient for the population of Kasaragod Municipality.

The doctor/bed ratio in District hospital is 1:15, which is insufficient. As per standard 1 doctor is required for 5 beds.

There are only 2 allopathic hospitals (private) in Kasaragod municipality and their number and doctor/bed ratio is not satisfactory.

2. Inference

Major problem in the health sector is the insufficiency of facilities in the hospital.

There are no super specialty hospitals in municipality as well as in the district.

Most of the hospitals are in private sector.

District hospital is the only government hospital in the municipality but it lacks the required number of doctors.



Fig 16.2 Spatial distribution of Health Institutions in Kasaragod

CHAPTER 17
RECREATIONAL FACILITIES

1. Parks and Open spaces

In Kasaragod town there are 6 parks, 2 Playgrounds, 5

Theatres/Auditoriums and 12 Community Halls. (See *Table 17.1*) Sea View Park(near Thayalangadi), Pulikkunnu Park (near Fish Market), Children's Park(near Railway station),Khan Bahadur Schamnad Park (in Pallam ward),Poyakkara Park (in Taluk Office ward)and Light House Park are the major parks in the Municipality.

2. Playgrounds and Stadia

Municipal stadium at Vidyanagar, Adkathbail ground Volley ball stadium at Chala are the major playgrounds in the Municipality.

3. Theatres and Auditoria

There are around 5 theatres distributed in the Korakkod and Nelikkunnu wards. Samrat Theatre near the MG Road is the main theatre, although it is poorly maintained.

The Sandhyaragam Open auditorium and Murali Mukund



Fig 17.1 Recreation areas in Kasaragod Municipality

Auditorium (Korakkod Ward) are the only main auditoriums. Sandhyaragam Auditorium needs development, and there is a need for more auditoriums.

4. Other facilities

The recreational facilities available inside the Municipal limits fail to meet the actual requirements. On the other hand Kasaragod has a handful of open potential areas and a beautiful river with a much more beautiful spread of backwaters and 'Thuruthus'.

The town has a network of paddy areas under cultivation and some of them are converted as coconut gardens. The town requires an organized space for recreation connected to tourism in the town limits.

Recreational Facilities

Parks & Play Grounds In Kasaragod Municipality

Sl. No	Name	Ward No	Extent/Capacity
	Parks		
1	Children's Park, Nr Rly Stn	18	586 Sq.Mt
2	Poyakkara Park	27	453 Sq. Mt
3	Pulikkunnu Park	17	1259 Sq.Mt
4	Sea View Park, Thayalangadi	27	770 Sq.Mt
5	Khan Bahadur Schamnadu Park	29	121.4 Sq.Mt
6	Light House Park	35	2880 Sq.Mt
	Play Grounds		
1	Chala Volley Ball Stadium	11	782 Sq.Mt
2	Municipal Stadium	9	46136 Sq.Mt
	Theatres & Auditoriums/Cummunity Hall		
Sl. No.	**Name**	**Ward No.**	**Extent/Capacity**
	Theatres		
1	Samrat	16	500 Seats
2	Kanyaka	16	350 Seats
3	Narthaki	16	250 Seats
4	Roopesh	30	350 Seats
5	Geetha	30	250 Seats

Table 17.1 Recreational facilities in Kasaragod Municipality (Source: Municipal Office)

5. Inference

Condition of most of the parks and playground is not satisfactory.

Kasaragod Municipality is blessed with many beach areas like Thuruthi, Thalnagara and Nellikkunnu. These could be developed into recreation areas/parks.

Sea-View Park at Pulikkunnu requires development. Even the existing park and facilities are not being used by the public. It could be improved with Boating services and Lighting facilities.

Childrens' park near Madonna Convent could be renovated and provided with modern facilities.

The Municipal Town Hall and the nearby Reception Hall could be renovated and air-conditioned.

The "Sandhyaragam" Auditorium could be developed. The Municipality needs more marriage halls.

There are no other recreation facilities like Zoo, Museum etc.

CHAPTER 18
OTHER CIVIC AMENITIES

1. **Town Halls**

   There is a Municipal Town hall, which is used frequently for meetings, seminars etc. They require maintenance.



Fig 18.1 Municipal Town Hall

2. **Reading rooms and Library**

   There are 2 Public Libraries- The Municipal library and T.I Ibrahim Memorial Library at Pachakkadu. It could be expanded with more reading rooms and facilities. More libraries are required in the Municipality.

3. **Community centres**

   There are around 12 community centres at Nelkala, Chalakkunnu, Theruvath (T.Ubaid Cultural centre), Pattam, Kelugudde, Chennikkara, Kadappuram and TV Station Road.



Fig 18.2 Municipal Library

	Name of Auditoriums/Community Halls	Ward No	Extent/Capacity
1	S.C S.T Community Hall, Nelkala		4047 Sq.Mt
2	Community Hall, Chalakunnu	10	202.35 Sq. Mt
3	Community Hall, TV Stn. Rd.	12	202.32 Sq.Mt
4	Municipal Community Hall	14	121.41 sq.Mt
5	Community Hall, Chenikkara	14	121.40 Sq.Mt
6	Community Hall, Theruvath	27	339 Sq.Mt
7	Community Hall, Pattam	32	121.40 Sq.Mt
8	Community Hall, Kadapuram	34	81 Sq.Mt
9	Community Hall, Kelugudde	3	37 Sq.Mt
10	Municipal Town Hall	16	4452 Sq.Mt
11	Murali Mukund Auditorium	16	2500 Sq.Mt
12	Sandyaragam Open Auditorium	17	1916 Sq.Mt

Table 18.1 Community centres in the Municipality (Source: Municipal Office , Kasaragod)

4.Crematorium and Burial Ground

There are 3 Crematoriums/ Burial grounds at Chennikkara, Pallam & Kasaba, in the Municipality. (See *Table 18.2*)

Public Crematoriums

Sl. No.	Ward No	Location	Capacity
1	14	Chennikkara	3
2	29	Pallam	2
3	31	Kasaba	2

Table 18.2 Crematoriums in Kasaragod town



Fig 18.3 Crematorium at Kadappuram

CHAPTER 19
HOUSING

1. Housing Shortage



As per 2001 census there is an absolute shortage of 181 houses. *Table No. 19.1* (Houses and Households) represents the distribution of households in 32 wards of the Municipality.

From the table, it is seen that there is an absolute shortage of 181 houses as on 2001.

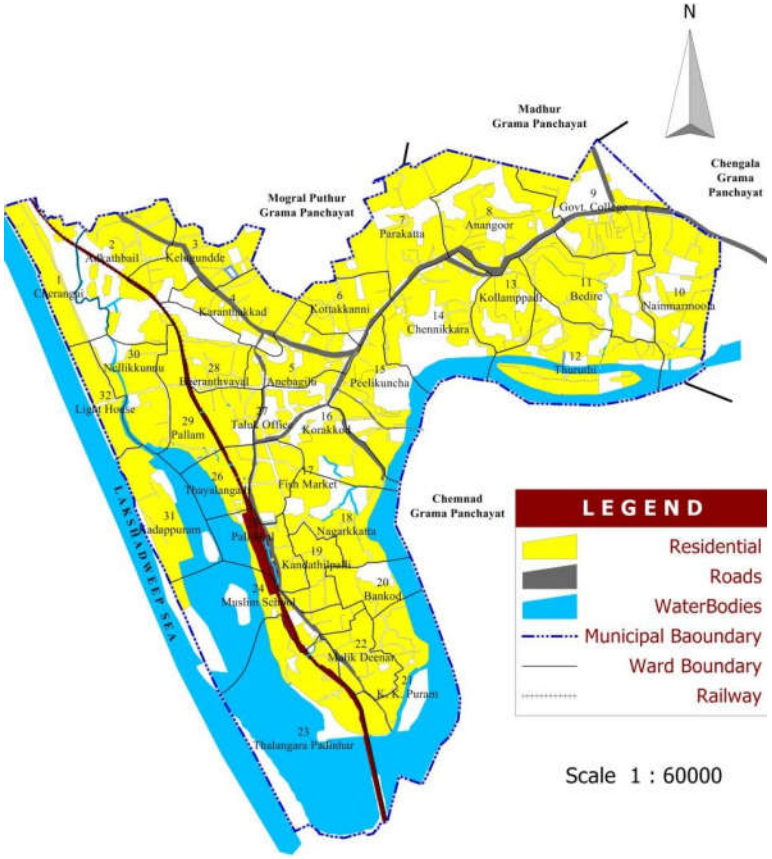
2. Existing housing condition

The houses are classified as pucca and moderate depending on the type of roofing provided. Therefore this does not reflect the actual structural stability of the building. The Kutcha buildings are those having cheap roofing, so they are houses that require replacement. The Socio Economic survey indicates that people, at all levels, give high priority for quality housing.

Sl. No.	Name of Ward	No. of Houses	No. of Households
1	Cherangai	439	441
2	Adkathbail	330	339
3	Kelugudde	355	359
4	Karandakkad	463	471
5	Anebagilu	374	380
6	Kottakkanni	366	372
7	Parakatta	439	445
8	Anangoor	282	286
9	Govt.: College	295	299
10	Nainmarmoola	305	311
11	Bedire	307	313
12	Thuruthi	300	309
13	Kollamppady	197	208
14	Chennikkara	291	298
15	Peelikuncha	252	259
16	Korakkod	278	283
17	Fish market	271	277
18	Nagarkatta	300	303
19	Kandathilpalli	282	284
20	Bankod	222	228
21	KK Puram	227	231
22	Padikkunnu	190	197
23	Thalangara padinhar	255	259
24	Muslim School	302	308
25	Pallikkal	349	356
26	Thayalangadi	270	279
27	Taluk Office	230	233
28	Beeranthbail	135	136
29	Pallom	228	229
30	Nellikkunnu	320	321
31	Kadappuram	191	199
32	Light house	391	404
	Total	9436	9617

Table 19.1 Details of Houses in Kasaragod town (Source: Census 2001)

From the sample survey conducted on households, 53.45% of the buildings inside the Municipality selected for sample analysis were found to be single storied. Around 46.55% of the samples were double storied and there is no building with number of floors more than 2. This shows a moderate range of



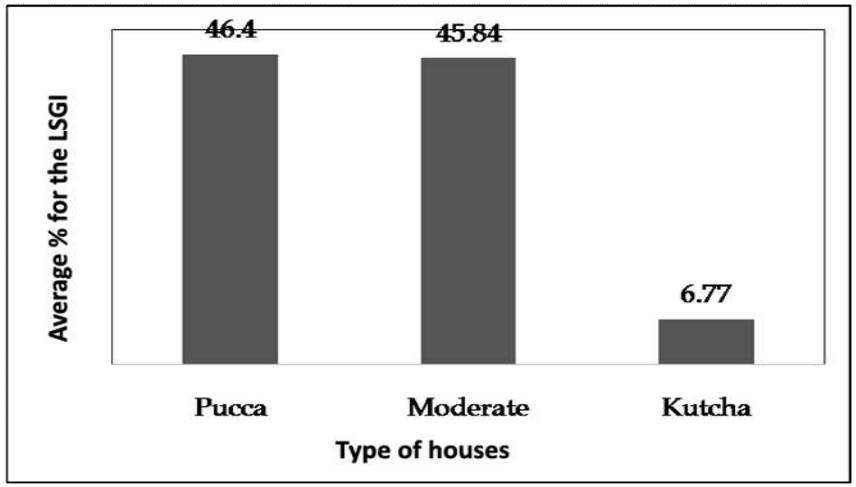


Fig 19.1 % Variation for different types of buildings

(Source: Socio economic Survey)

dwelling units with moderate affordability all over the Municipality. Around 95% of the houses surveyed had houses in their own land. Around 46.4% of the houses are Pucca and 45.84% are moderate types. (See *Fig 19.1*)

3. Spatial distribution

The spatial distribution of residential area is shown in *Fig 19.2*.

Fig 19.2 % Spatial distribution of Residential area

4. Slums and other sub-standard housing

There are 3 slums in Kasaragod Municipality

1. Kasaba
2. Shivanthamanu colony &
3. Market Kunnu colony

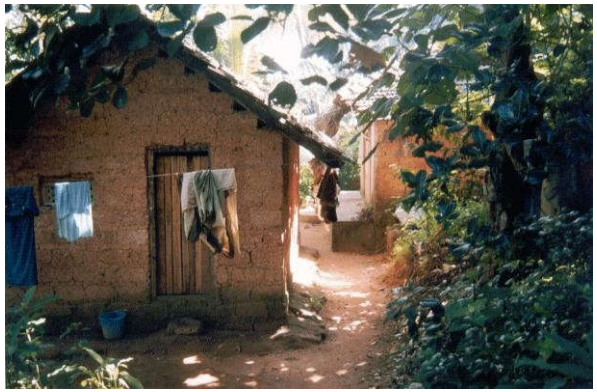


Fig 19.3 Market kunnu Colony

Most of the slum settlements are located along the coastal area where density of population is the highest. Fishermen settlements of extent around 5 acres along the sea coast are highly dense areas, where people live in thickly populated colonies, which give rise to social, health and sanitation hazards. They face severe social, physical and environmental problems with regard to their shelter and employment. Part of this area is squatter settlement and has already been identified by the Town and Country Planning Department as a 'Special slum' in the study on 'Urban slums in Kerala 1995-96'. *Table 19.2* shows the details of slums in Kasaragod Municipality, as per it, Shivanthamanu colony is the most thickly populated slum, where 80% of the houses are moderate type and owned. 43.6% of the houses have bathrooms, whereas 15% use open areas. Water supply is by Hand pump and waste disposal is either open disposal/burning. In Kasaba colony, around 65% of the houses are kutcha, and only 29.4% of the houses have bathrooms.



Fig 19.4 Slum settlements near beach area

Sl. No.	*Slums* Name	Listed Y/N	Area (Ha)	Housing Category					
				Pucca	Moderate	Kutcha	Total	Own	Rent
1	Kasaba	Yes	13	0	71	117	180	145	23
2	Shivanthamanu Coly.	Yes	5	8	169	29	211	180	6
3	Market Kunnu Coly.	Yes	9	2	9	4	15	15	0

Sl. No	Name	Drinking Water		Toilet Facility/House			Waste Disposal Method
		Well	HndPumb	Attached	Public	Open	
1	Kasaba	1	113	53	1	35	Open Disposal/Burning
2	Shivanthamanu Coly.	0	170	92	2	32	Open Disposal/Burning
3	Market Kunnu Coly.		4	15	0	0	Open Disposal/Burning

Table 19.2 Details of slums in Kasaragod Municipality

5.Problems and potentials

Regarding the roofing of construction, the findings of Socio-economic survey reveals that 36.11% of the buildings are Tin/Asbestos/tiled roofed buildings and 62.48 % are RCC buildings. Majority of the houses have brick plaster walls. RCC buildings found are mostly between 10 to 30 years of age. This shows that in the total housing stock, around 6.74% are old buildings and require improvements or reconstruction in the near future. These are located in wards like Korakkod, Nagarkatta, Thayalangadi and Pallom , which are comparatively old settlements.



Fig 19.5 shows that majority of the houses are of plinth area 75-150 Sq.m.

Around 15.38% of buildings are of less than 50 m² plinth area and these are distributed in the wards viz; Cherangai, Anangoor, Bedire, Thuruthi. 53.45% of total houses have more than 75 m² of plinth area and commonly these are seen in Anebagilu, Kandathilpalli, Padikunnu, Muslim School, Thayalangadi, Taluk Office wards. *Fig 19.6* shows the increasing trend in the number of households during the past decades. On an evaluation of the age wise structure, wardwise Cherankai and Kollampady are wards in which recent residential developments have happened, within a time span of 5 years. Cherangai, Nayanmaarmoola, Thuruthi and Peelikuncha are wards where intense residential developments occurred during the last 10 – 15 years.

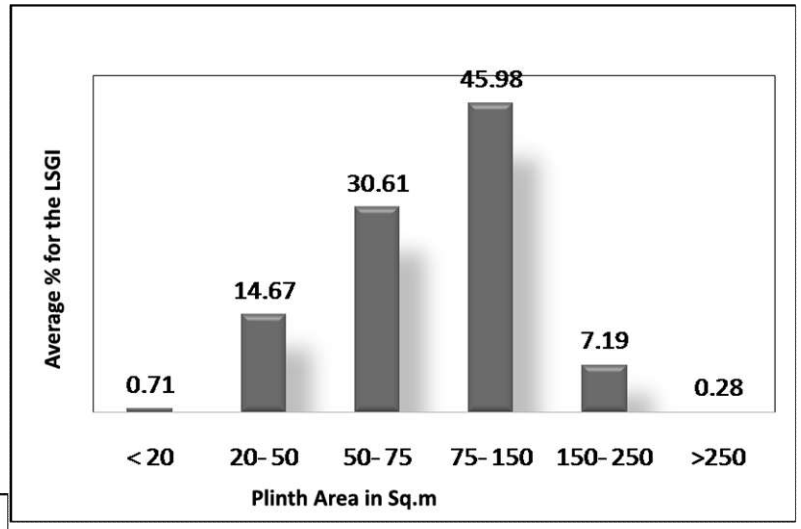


Fig 19.5 Plinth area details- Average %

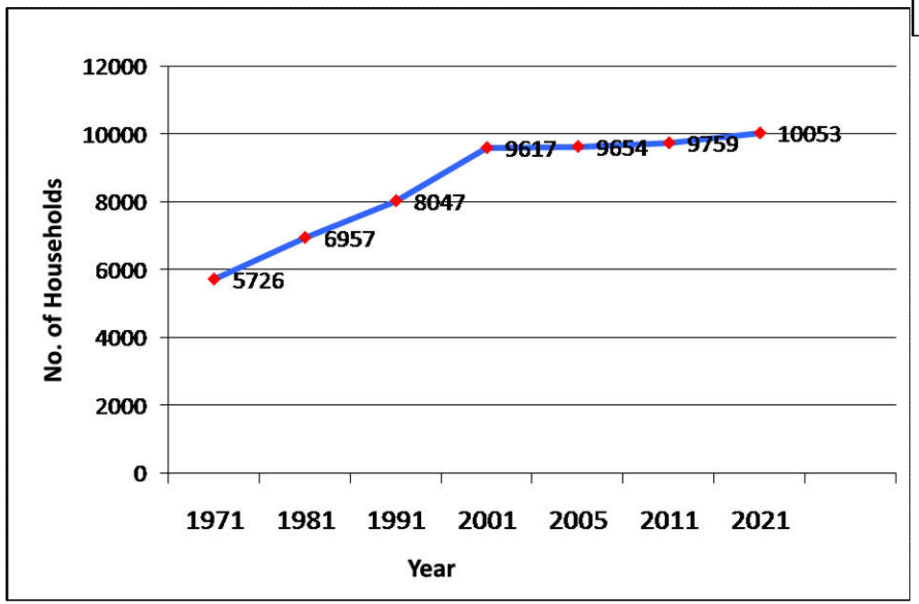


Fig 19.6 Household statistics of Kasaragod Municipality.

6.Inference

There is an absolute shortage of 181 houses as on 2001.

There are squatter settlements of extent around 5 acres along the sea-coast, where people live in thickly populated colonies, which give rise to social, health and sanitation hazards. The north eastern and southern side of the municipality is sparsely populated. New residential developments are more seen in the northern portion of municipality. The peripheral wards have a fair land holdings size, and have greater than 11-25 cents of plot area.

Buildings requiring improvements or reconstruction in the near future are located in wards like Korakkod, Nagarkatta, Thayalangadi and Pallom, which are comparatively old settlements.

There is an increasing trend in the number of households during the past decades. Cherangai, Nayanmaarmoola, Thuruthi and Peelikuncha are wards where intense residential developments occurred during the last 10 - 15 years.

CHAPTER 20
SPECIAL CONCERN AREAS

1. Poverty

- **BPL Index**

Below Poverty Line is an economic benchmark and Poverty threshold used by government of India to indicate economic disadvantage and to identify Individuals and HH's in need of government assistance and aid.

Kerala is one of the few states which has formulated its own criteria.

In Kerala there are 9 parameters, family which lack access to 4 or more parameters are classified as BPL.

1. No land or < 5 cents of land	6. No access to safe drinking water
2. No house or dilapidated house	7. Women-headed HH or presence of widows or divorcee
3. No Sanitation Latrine	8. SC and ST
4. Family without Colour television	9. Mentally retarded or disabled member in the family
5. No regular employed person in the family	

Table 20.1 Parameters to assess a BPL family *(Source: Planning Dept.)*

As per 2001 census, of the 15568 families in the Municipality, 25% are below the poverty line. Majority of the BPL families are around the coastal areas. The physical constraints of the backwater hinder development activities in these regions. This sector faces severe social, physical and environmental problems with regard to their shelter and employment. *Fig 20.1* shows the Concentration index of BPL families in the Municipality. There is a high concentration of BPL families in the wards of Kadappuram, Kottakanni, Beeranthvayal, Bedire, Pallikal and Chennikkara.

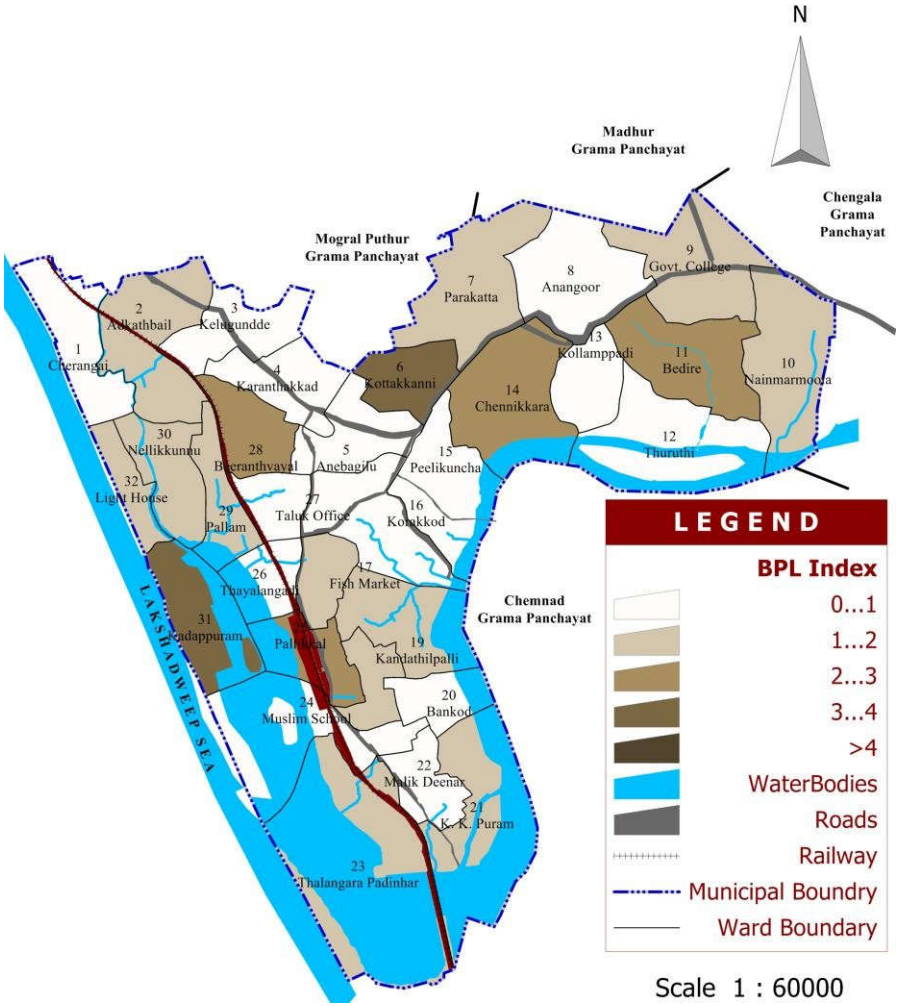


Fig 20.1 C I of BPL families in the Municipality.

2. SC/ST Index

SC/ST index indicates the social backwardness of a region and BPL index shows its economic backwardness. SC/ST Concentration Index is higher in the Northern part of Municipal area. Agriculture labourers and cultivators are distributed more or less in the same area. This indicates that the socially backward communities are mostly indulged in primary

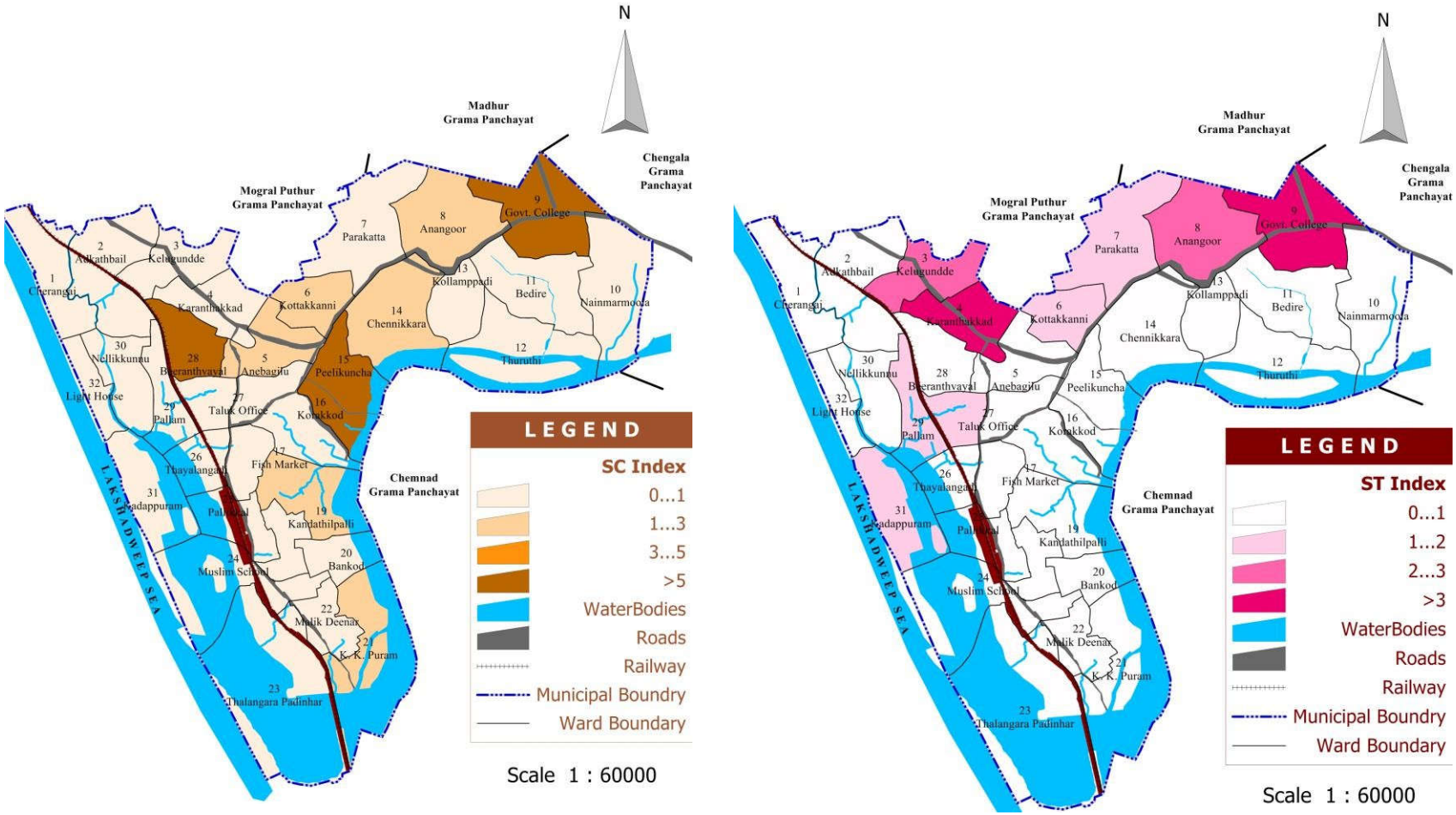


Fig 20.2 CI of SC/ST population in Kasaragod Municipality.

activity like agriculture. The educational status has improvement with year. *Fig 20.1* shows the Spatial distribution of SC/ST population.

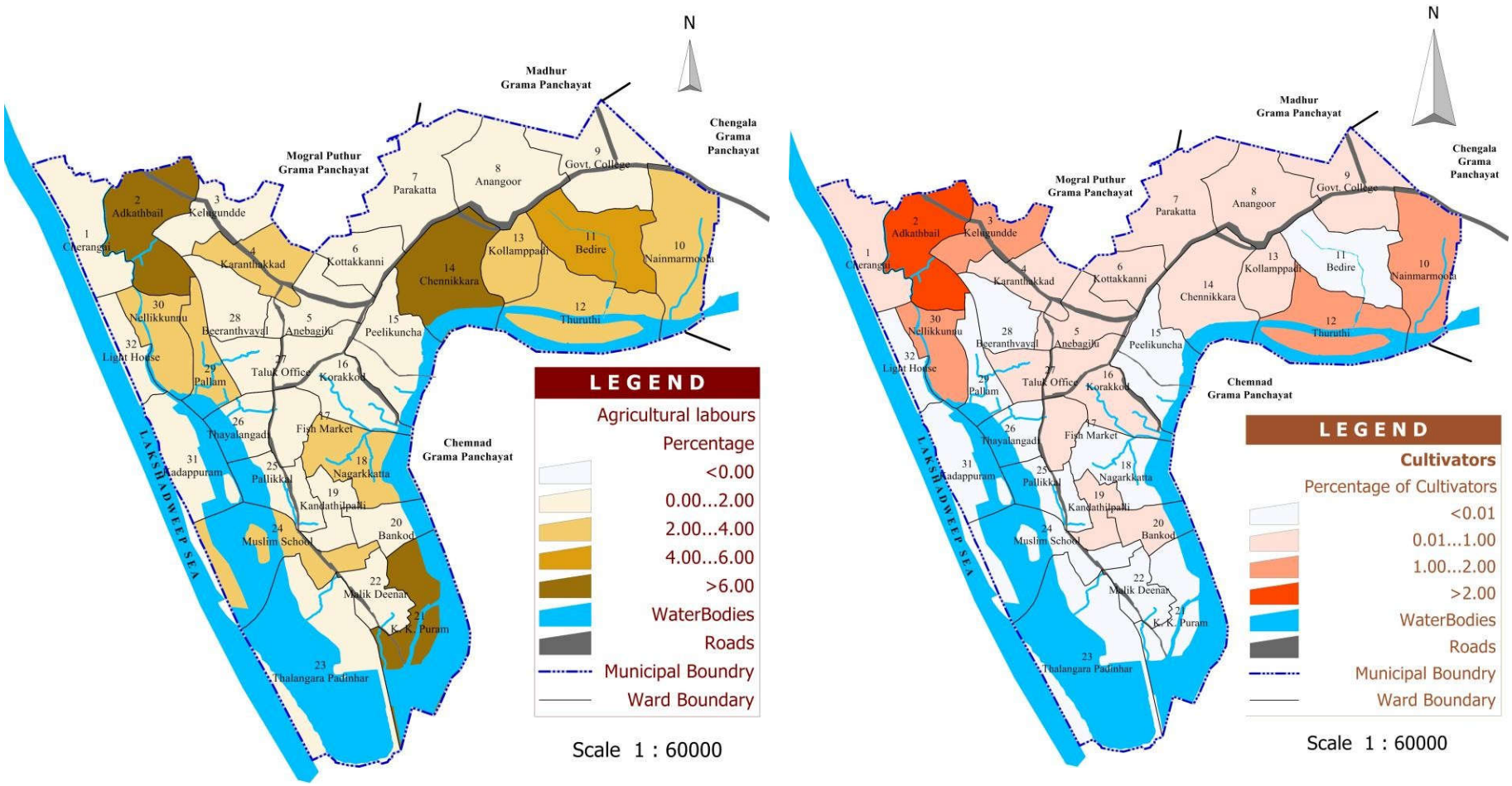


Fig 20.3 C I of Cultivators and Agricultural laborers in the Municipality.

Fig 20.2 shows that SC/ST Concentration Index is higher in the wards of 3,4,5,6,7,8,9,14,15,18,21,27,28,29 and 31(North east and eastern parts of municipality).

Fig 20.2 and *20.3* shows the relation between the distribution of Agricultural workers, cultivators and SC/ST Population. SC/ST Concentration Index is higher in the North east and Eastern part of Municipal area.

3. Other Social aspects

Around 384 SC/ST families earn their livelihood in different areas of Kasaragod Municipality. They belong to the castes of Mogar, Baguda, Thotti, Vannan, Nelkadhaya and Malayan. Since their income from traditional pursuits has become extinct, they are now depending on other modes of employment.

The educational status of SC/ST students have progressed recently and almost all SC/ST children now attend schools. Municipality has acquired 70 cents of land near Anangoor MG Colony, to construct apartments to rehabilitate SC/ST families. There is an SC Office near Vidyanagar Scout Bhavan.

4. Inference

Kasaragod district is a socially backward district. SC population constitutes nearly 2.67% of the municipal population. ST population is very low in Kasaragod municipality (only 0.11% of municipal population). Of the 15568 families in the Municipality, 25% are below the poverty line.

CHAPTER 21
ENVIRONMENT

1. Present scenario



2/3rd of the total peripheral length of Kasaragod Town, abut water bodies such as river and sea. The town assumes a peninsular shape extending towards water body with its end forming the estuary -"POZHI" - confluence of river with sea. The meeting area is a large backwater with heavily fluctuating water levels due to diurnal tidal effects. The whole peninsular portion is thickly built up with residential settlements and fishing activities are prominent on the western side. Due to the same reason, Kasaragod Municipality is an environmentally sensitive town.



2. Sensitive/ fragile areas

The municipality has a few thuruths or islands in which some are uninhabited and some are thickly built up. Thuruths are found in the water bodies on the eastern and western sides of municipality. Four thuruths are seen in the eastern side in Chandragiri River. The largest one, accommodating around 200 families has proper road access. The area is environmentally healthy and living conditions are fairly good but for the likely flooding during monsoon.

Accessibility to the town is the main problem in this area. Two more thuruths in the municipal area are inhabited. Thuruths very near to the sea side houses around 50 families and a major part of the area is put to use for agriculture.



Thuruths found in the seaside are, generally uninhabited and contain mangroves. These mangroves are ecologically sensitive areas and act as fish breeding centres and bird sanctuaries. These thuruths are accessible only through boats or small vanchis. The area is swampy and thickly vegetated with mangroves.

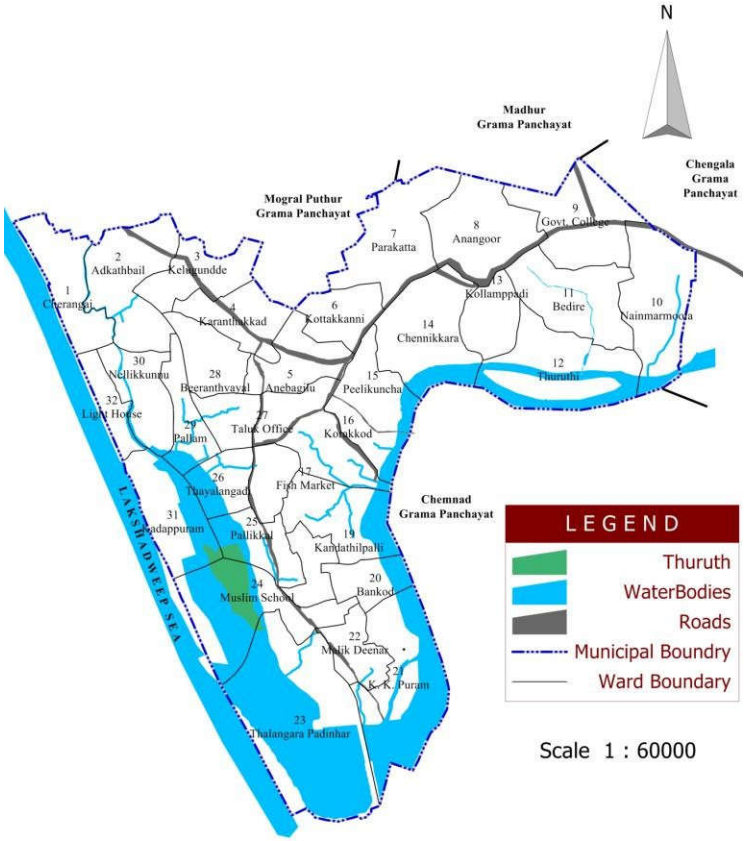


Fig 21.1 Environmentally sensitive areas in the Municipality.

Paddy fields are located in the northern and eastern part of Municipality and a major portion of this is put to cultivation. These act as retention ponds for rain water during monsoon. Also these open areas, act as lungs for the town and conversion of this land for any other use shall not be allowed. In view of depleting ground water levels, the paddy fields assume a vital role in the recharge of ground water.

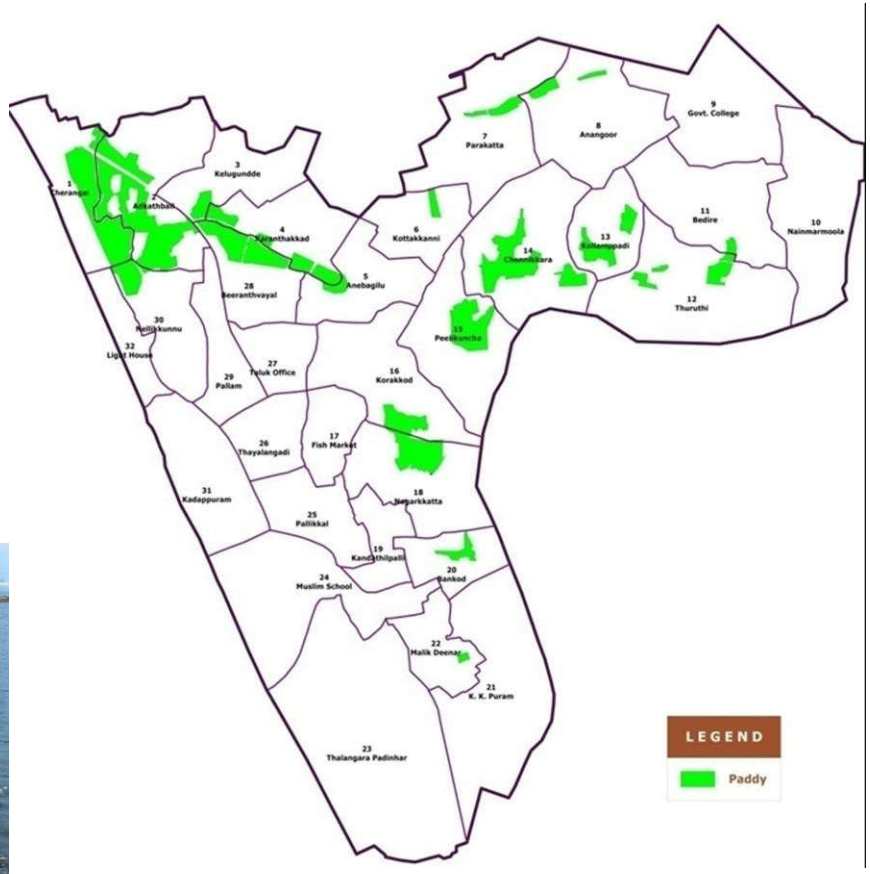


Fig 21.2 Spatial distribution of Paddy in the Municipality

3. Inference



The waste dispersed in water bodies, sand mining, encroachment, depletion of mangroves etc. endanger the fragile environment. On close examination of the present status of these environmentally sensitive elements, it is observed that these areas are either neglected or mismanaged. Solid waste disposal is a critical issue in all these elements. There is an urgent need to conserve the environmentally sensitive elements for a sustainable environmental scenario of the town in the future. Lest the mismanagement can create critical adverse impacts on the residential settlements.

CHAPTER 22
DEVELOPMENT ADMINISTRATION AND FINANCE

1. Development Administration

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

Major development activities undertaken by the Municipality are:

1. Conservation of Paddy fields and dry cultivation.
2. Encouragement of enterprises in Animal husbandry and Fisheries.
3. Industrial development
4. Eradication of poverty
5. Development programs for women and children.
6. Public health.
7. Water supply and sanitation.
8. Education, sports and cultural activities- Youth development
9. Basic amenities and facilities- development of road network, tourism promotion etc
10. Social security
11. Energy
12. Proper administration.

2. Municipal finance

Budget Estimate 2010 - 2011

A. Revenue Accounts

SL.NO.	HEAD OF ACCOUNT	RECEIPTS	SL.NO.	HEAD OF ACCOUNT	EXPENDITURE
	Opening Balance	**3,082,760**	1	Management & Collection	13,888,000
1	Municipal Taxes & Rates	27,639,000	2	Public Works	3,535,000
2	Realisation under spl. Acts	1,330,000	3	Town Planning	620,000
3	Revenue from Mun. Properties	13,320,500	4	Education	841,000
4	Municipal Fees	3,105,100	5	Water Supply & Drainage	1,700,000
5	Govt. grants & contributions	18,875,000	6	Public Health	19,890,500
6	Govt. grants for trnsfd. Instns. (Non Plan)	5,224,000	7	Lighting	4,755,000
7	Miscellaneous Revenue	1,150,000	8	Municipal Properties	910,000
			9	Management of trnsfd. Instns. (Non Plan)	5,224,000
			10	Expenditure - Extraordinary	150,000
	Total	**70,643,600**		**Total**	**51,513,500**

Table 22.1 Budget Estimate 2010-2011-Revenue Accounts (Source: Municipal Office, Kasaragod)

Financial position of Kasaragod Municipality
Budget at a glance

YEAR	OPENING BALANCE	INCOME	AMOUNT TRANSFERRED TO CAPITAL ACCOUNTS	BALANCE AFTER TRANSFER	AMOUNT INCLUDING OPENING BALANCE	EXPENDITURE	CLOSING BALANCE
2009-10	17229323	97227252	190366267	97227252	114456575	974044023	17412552
2010-11	17412552	103805530	16697304	103805530	121218082	102183000	19035082
2011-12	19035082	132590000	35091481	120490000	151625082	146106500	5518582

Table 22.2 Finance position 2008-09, 2009-10, 2010-11 *(Source: Municipal Office, Kasaragod)*

Inference

The statements show that financial position of the municipality is not very robust. The income is almost stagnant and the expenditure is growing. There is no leverage in the financial affairs of the municipality. Financial statements show that revenue is not utilized to the fullest in the above mentioned years indicating poor financial management.

Major sources of revenue income for the municipality are municipal rates and taxes, income from municipal properties and grants (revenue account) from the state government. The major problems faced by the municipality in the finance sector are the leakage in rates and taxes and paucity of funds for developmental activities.

The financial position of the municipality is not very strong. The fiscal surplus of the municipality is not an indication of financial health, but of poor financial management. But the municipality has tremendous potential for development of financially remunerative projects for sourcing funds for urban development.

CHAPTER 23
LINKAGES AND EXISTING SPATIAL STRUCTURE

1. Linkages

Effect of population growth on various development sectors

The growth in population has an all evasive effect on all the development sectors since development is for the people and by the people. The effect of population growth is direct on sectors like water supply, electricity, housing, traffic & transportation, education, health care etc. where there is direct consumption. The rest of the sectors have secondary impact on them.

The growth rate of population shows a decreasing trend. This is due to the increase in literacy rate, awareness and improved socio economic conditions.

Population growth shall have impact on trade and commerce only beyond a threshold population. If we analyze the trade and commerce that take place in a town, distribution of basic necessities of life contributes only to a part of it. The rest of the trade depends on surplus income. So, even though there is an increase in trade due to population growth, the trade volume is more elastic towards the surplus income and thus the significant changes are often related to the change in surplus income rather than population growth. The increase in trade due to increase in demand for basic necessities shall not be apparent if the surplus income is reducing. When both the population and the surplus income grows, the trade & commerce take off at an accelerated pace.

The number of business units in the municipality has increased from 1264 in 2003 to 1305 in 2010. There has been a decrease from 225 Ha. of agricultural area in 2001 to 212 Ha of agricultural area in 2010, due to unplanned residential development and land filling. The north eastern and southern side of the municipality is sparsely populated. New residential

developments are more seen in the northern portion of municipality. The peripheral area wards have a fair land holdings size, and have greater than 11-25 cents of plot area

The demand for Meat, eggs and milk is increasing, but the supply do not meet the requirements of the Municipality.

Population along the coastal zone live in thickly populated colonies, which give rise to social, health and sanitation hazards. The western parts of the beach are presently deprived of bus transport facility, despite being a heavily populated area in the town. The physical constraints are the backwater and Shoranur-Mangalore rail line which hinder development activities in the region.

There is an increase in the % of the population of the Municipality working abroad.

No perceptible impact is anticipated in Industrial sector due to increase in population since the problems faced by the industrial sector in Kasaragod municipality are mostly related to the lack of entrepreneurial impetus rather than anything else. Although there is high potential for industrial development, mainly small scale industries, lack of infrastructure facilities and labourers has led to the decline of the existing industries like Astral Watch factory and Islamia tile factory.

Land use changes and environment

The changes in land use effect the environment to a great extent. The whole peninsular portion of the Municipality is thickly built up with residential settlements and fishing activities are prominent on the western side. This gives rise to social, health and sanitation hazards. The squatter settlements and disposal of solid and liquid wastes cause grave environmental issues in the beaches, which are among the environmentally sensitive areas.

The major land use change thus effecting environment, identified in Kasaragod municipality is the increase in commercial and residential land use and depletion of paddy land . There has been a decrease from 225 Ha. of agricultural area in 2001 to 212 Ha of agricultural area in 2010, due to unplanned residential development and land filling. The agricultural production is not a very significant factor to be considered while formulating land use policy in an urban context. But, the paddy land essentially acts as

green open space and also functions s reservoir of water during rains preventing floods and fast run off. Paddy fields are located in the northern and eastern part of Municipality and a major portion of this is put to cultivation. These act as retention ponds for rain water during monsoon. Also these open areas, act as lungs for the town and conversion of this land for any other use shall not be allowed. In view of depleting ground water levels, the paddy fields assume a vital role in the recharge of ground water.

Likewise the dry cultivation area also provides the necessary green cover in the municipality. Changes in this land use shall reduce the green cover and hence shall adversely affect the environmental quality. The land use policy decides the compactness of built form in the town. A less compact built form (with more than necessary intrusion of residential, commercial and such other land uses requiring built space to agricultural / open land uses) shall mean wider building foot prints. This calls for putting more land under manmade structures detrimental to environmental quality. Reducing the building foot print is the answer to this problem. Reducing the building foot print also shall mean compact development for which it is easier and less costly to provide basic amenities like water, sewerage system, energy, roads etc. Providing waste treatment facilities are also a lot easier for a compact development. All these have positive impact on the quality of environment. The land use also has profound impact on the micro climate. Lesser foot prints shall reduce the possibility of creating heat islands within a town.

Another issue is that of other environmentally fragile areas. Besides paddy land two such classes are identified in Kasaragod municipality. They are the river shore and the 'Thuruths".

The waste dispersed in water bodies, sand mining, encroachment, depletion of mangroves etc. endanger the fragile environment. On close examination of the present status of these environmentally sensitive elements, it is observed that these areas are either neglected or mismanaged. Solid waste disposal is a critical issue the Municipality which affects the environment to a great extent. There is an urgent need to conserve the environmentally sensitive elements for a sustainable environmental scenario of the town in the future. Lest the mismanagement can create critical adverse impacts on the residential settlements.

Industrial sector – effect on environment, land use and employment

In Kasaragod municipality there are very few small scale enterprises, and they are not concentrated in any particular location. The industrial (small) units have come up in various locations in the municipality in a scattered manner. Other than that there is Industrial estate by SIDCO near Vidyanagar. Considering the tremendous potential for employment creation, the Small scale industries have to be promoted. The establishments of small scale units in the residential and commercial areas are to be viewed in this backdrop. However, allowing such industries in residential and commercial areas should not affect the environmental quality of the area. Hence the nature of industries that can come up in such areas should essentially be non-polluting and non-nuisance type. For medium scale and large scale industries, the industrial area of SIDCO shall be sufficient. Thus earmarking the parcels of land owned by private individuals who have no inclination to start an industrial unit can be avoided. Besides the land use policy of allowing non-polluting and non-nuisance industries of small scale in residential and commercial areas, the development of necessary infrastructure required for industrial development such as good road connectivity, availability of water and electricity etc also should be attempted to promote industrial development in the municipality.

In the case of large scale industries of non-nuisance / non-polluting nature, the locations cannot be earmarked in advance due to the problems associated with the acquisition of land and uncertainty regarding the establishment of such units. In such instances considering the location decisions on a case to case basis only is feasible.

There is an issue as to where a polluting (with pollution abatement measures) / nuisance type industry has to be located in the municipality if it is essential from other (economical / locational / strategic) considerations. The solution is to provide for allowing such industries in the less inhabited areas in the municipality with strict guidelines for site selection prior to establishment of such industry and control of other land uses around such industries after their establishment.

Effect of various sectors on employment

The small industrial sector is considered to be the prime provider of employment in small and medium towns. But in the case of many towns in Kerala, including Kasaragod, the employment in industrial sector is not the prominent one. The tertiary sector, mostly various services employ more people than industries. Trade and commerce is an important employment sector, both direct and indirect. However, the employees in this sector are mostly unorganized and hence are not much reflected in the statistics. The fluctuation in employment level is also high in this sector.

Tourism, even though not developed in the town as an employment sector, has much potential in creating more jobs. The investment required to create unit employment is low in tourism sector.

Another area of interest which can bring in employment to the town is IT related activities. The town has a number of well-educated technicians in this area. With a good number of people working overseas, getting BPO assignments to IT units located in the town need to be explored.

Even though studies based on physical features suggest agriculture, animal husbandry and SSI as thrust areas of employment in the town, the number of cultivators and agricultural labourers are on the decline in Kasaragod . This trend is not likely to be reversed. So, increase in productivity with increased technology inputs is imminent in this sector. Organized farming does exist in a few holdings in the municipality. Their potential for creation of further employment is marginal. The case of animal husbandry and fisheries are also the same.

The town being the administrative headquarters of the district attracts a number of district level offices of the government and some of the private sector concerns. However, the employment in this sector is almost at a saturation level and is not expected to grow at a fast pace. Education and healthcare are the major providers of organized employment in the state.

In addition to the direct employment created by these sectors, development in these sectors create number of secondary employment besides making the population more employable. Likewise improvements to the physical infrastructure of the town shall attract employment generating activities to the municipality. So, providing better infrastructure also is a key to the creation of

jobs in the municipal area. So tourism, IT, services, education, health care and physical infrastructure are the thrust areas for employment generation in the municipality. The Master Plan addresses this issue by providing for improvements to existing physical infrastructure and creating new infrastructure facilities in the thrust areas and by putting in appropriate policy measures for the development of the identified thrust areas.

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

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

The growth in industrial sector calls for increased freight traffic both in bound and out bound. The medium and large scale industries shall attract freight traffic to particular locations like the industrial estate in Vidyanagar by SIDCO. So these locations shall be identified in such a manner that connectivity from the existing network is good so that efforts in expansion of network to meet the additional demand are optimum. The trade and commerce sector also poses the same problem. Here, in bound traffic is likely to be more than the out bound traffic. In the case of both the sectors, since the increase in demand shall be for freight transport, development of a truck terminal is essential. So, a truck terminal, easily accessible from the network is a pre-requisite for development of industries and trade & commerce sectors. The increase in trade and commerce increases the intra city traffic also. So development of trade & commerce meant for local consumption should be decentralized to the maximum extent possible in order to reduce new generation of intra city traffic. These efforts shall decongest the town centre, especially Old Bus stand area.

Development of education and health care sectors means establishment of institutions of higher order also. This shall increase the passenger traffic. The locational decisions of such institutions shall be taken so that the existing network is suitably used by the

additional demand and development of the network is possible in a phased manner. Otherwise the cost of development of new links in the network shall hamper the pace of development in these sectors. This is relevant for Kasaragod since new institutions of higher order are anticipated to be located away from arterial roads.

The improvements and new addition of recreational facilities shall also result in changes in demand pattern. The trips generated by these developments shall be intra city in nature. Hence the location of new such facilities should be decided keeping the need to segregate through traffic and intra city traffic. Whereas development in tourism sector means an increase in inter city traffic. So the development in tourism sector should be easily accessible from the arterial or sub arterial roads. For example, a new ring road is needed to connect the riverside and beach areas of Thuruthy and Thalngara to the NH since the existing connection is inadequate to cater to the peak traffic.

There is an increases rate in work related travel, and an increase in private enterprises and business establishments. There is a high parking accumulation concentrated around the transport terminals- Railway station, Old bus stand area and New bus stand area. Many road stretches within the Municipal area are over- utilized to the extent of more than two times their carrying capacity resulting in congestion, accidents and declining in travel speed. There is increased floating population and increased number of personalized vehicles. Traffic volumes on all the road sections in NH-66 have exceeded their capacity. So considering the congestion in the NH and arterial roads, development prospects of the Northern part of the Municipality and arresting the inner city degradation in future, it is highly important to increase the carrying capacity of the priority roads.

Changes in traffic & transportation needs due to changes in land use

The land use pattern and the traffic pattern are inexplicably interconnected. The traffic pattern is the dependent variable in the relation and various models try to define this relation. The changes in traffic pattern due to changes in land use can be studied using these models to a reasonable level of accuracy. The land use pattern can change mainly in two ways. One is due to the growth in

population and subsequent Linkages and spatial structure Master Plan for Kasaragod Municipality Town & Country Planning Department, Government of Kerala. This issue can be addressed in a Master Plan by ensuring adequate spread of residential-commercial land use and making adequate area available for commercial development so that pressure on commercially developable area is released. This will affect the land value in residential area also since there will not be any un satiated demand for commercial use and the resultant attempts by the trade and commerce activities to intrude into the residential areas. The extent zoned for residential use also should be adequate so that the demand for more houses could be met. Another provision that shall reduce the pressure on land for housing is allowing low density EWS and LIG houses in a restricted manner in areas zoned for dry cultivation etc. These policy interventions through zoning (in extent and zoning regulations) are expected to increase the availability of land suitable for residential purpose and hence reduce demand driven increase in land value.

Tourism and environment

Tourism and environment have a dual relationship. Certain level of environmental quality is a must for healthy development of tourism sector. But, unbridled development in tourism sector can adversely affect the environment. Well-developed tourist destinations lose their charm due to deterioration in environmental quality. Kasaragod town has a high potential to be developed as a tourist centre. The places of tourist attractions are mostly nearby the environmentally fragile areas in the municipality. So maintaining the environmental quality should be given top priority while formulating new tourism projects. Provision of basic amenities for the anticipated number of visitors is a must. New concepts like e-toilets etc. merit consideration in this regard.

Waste management practices (for both solid and liquid waste generated by the tourism activities) should be state of art and should not interfere with the biotic systems in any case. At present here is no enough space for proper disposal of wastes in the Municipality. Solid waste from industries, markets, fishing sector and residential areas, are dumped into the Chandragiri River, causing considerable environmental pollution. Also the sand mining going on along the banks of the Chandragiri River, causes encroachment of the water body. Human habitation/intervention beyond holding capacity causes the depletion of “Thuruths” in the Municipality. Maintaining environmental quality around already developed locations of tourist attraction like Thalangara, Sea View

Park etc. needs special consideration. Proper waste management systems are to be provided in these locations. Negligence in this regard shall gradually kill the tourism industry and the municipality shall be let alone with a degraded environment and hence should be taken care of in the planning stage itself.

2. Spatial Structure

The town is at a prominent position in the spatial structures of the district in which the transport network is in the form of a hub and spoke. It forms one of the vertices of the triangle which forms the hub. The activity pattern of the word in the municipality, their connectivity and the hierarchy of nodes/centers within the town are studies in detailed to derive the spatial structure of the town.

2.1 Functional Character

The functional character is determined based on the land use, population distribution and average plot size within the settlement. It is classified as rural, semi-rural, semi urban and urban. The functional character of all wards of Kasaragod town is determined as **Semi- rural.**

The wards in the municipality are studied in detail with respect to aspects like- total area under each land use category, concentration pattern of population percentage of workers engaged in non-agricultural pursuit, average plot size in the residential/agricultural mix use category etc.

2.2 Activity Pattern

The term activity pattern is used to indicate the major economic activity of a place or that can be brought there in future. It may be agriculture/ plantation (Primary activity), industries (Secondary activity), Service activities (Tertiary activity) or a contribution of theses like agriculture and animal husbandry and small scale industries.

The activity pattern can be derived through the integration of the land use concentration pattern, functional character and the urban profile. From the regional setting study the activity pattern of Kasaragod town is obtained as Tertiary activity (urban service sector oriented economic activities). The determination of activity pattern at ward level is attempted here.

2.2.1 Land use concentration pattern

The concentration pattern of a land use gives an idea about where that particular land use is concentrated wit in the LSGI. From the study use pattern of the town it is seen that urban activities are concentrated in those wards near the town centre and those along important roads. *Table 23.1* Shows the land use concentration pattern of the wards within the municipality in 16 wards out of 32, the LU concentration is urban.

2.2.2 Urban Profile

In the context of an urban local body the determination of urban profile can be taken as identification of areas with different levels of urbanization. Depending on the factors such as density of population, proximity to facilities, perspectives in urban development etc. the

Ward No.	Ward Name	Urban	Water bodies	Agri	L U Conc. pattern
1	Cherangai	0.00	0.12	3.02	Agri
2	Adakathbail	0.05	0.08	2.9	Agri
3	Kelugudde	4.01	0	0.41	Urban
4	Karanthakkadu	1.05	0	1.3	Agri
5	Anebagilu	2.50	0	0.27	Urban
6	Kottakani	0.63	0	0.3	Urban
7	Parakkatta	0.63	0	0.77	Agri
8	Anangoor	1.03	0	2.12	Agri
9	Govt. College	19.54	0	0.37	Urban
10	Nayanmarmoola	0.31	0.28	1.45	Agri
11	Bedira	0.52	0.04	1.34	Agri
12	Thuruthi	0	1.64	1.68	Agri
13	Kollampadi	0.52	0	1.85	Agri
14	Chennikkara	1.15	0.77	2.28	Agri
15	Pilikunje	0.85	0.84	1.57	Agri
16	Korakkadu	6.71	0.09	0.54	Urban
17	Fish Market	3.76	0	0	Urban
18	Nagarkatta	0	1.15	1.93	Agri
19	Kandathil Palli	0.26	0	0	Urban
20	Bangod	11.44	1.17	0.63	Urban
21	K K Puram	0.06	3.02	0.66	Agri
22	Padikunnu	0.25	0	0.14	Urban
23	Thalangara (W)	0.08	3.39	0.07	Urban
24	Muslim H S	0.42	2.73	0	Urban
25	Pallickal	0.36	1.58	0	Urban
26	Thayalangadi	0.94	1.82	0	Urban
27	Taluk Office	0	0	0	Urban
28	Beeranthbail	1.45	0	2.1	Agri
29	Pallam	0.00	0.78	0	Agri
30	Nellikunnu	3.55	0.39	1.05	Urban
31	Kadapuram	0.00	1.99	0.38	Agri
32	Light House	0.61	0.29	0	Urban

Table 23.1 Land use concentration pattern

wards are classified into high and low intensity of urbanization only a few wards with low connectivity and population density and where there is no urban activities taking place are termed as less urbanized. This is shown in *Table 23. 2*.

Activity Pattern

The above three factors are considered together to determine the activity pattern most suitable for each ward. It is obtained as shown in *Table 23.3* for 7 out of the 32wards the most suitable activity is small scale industries/Animal Husbandry; for 10 wards is tertiary activity and for 15 wards Primary activity (Agriculture) is most suitable.

2.3 Connectivity pattern

NH- 66 passes through Kasaragod town, connecting it with Mangalore, Kannur and other major urban centres in the state. The SH No.57 (Kasaragod- Pallikara-Kanhangad Road) starts from the Municipal area and opens access to the areas beyond the Chandragiri river. It connects to the service hinterlands in the district, from where agricultural products from the hilly areas are brought to Kasaragod Town for trading. Other major internal roads are Thalangara Road, M.G.Road, Nayak's Road, K.P.R. Rao Road, Beach Road, Pallam Road, Ferry Road etc. connecting the length and breadth of the municipality. The connectivity pattern is shown in *Fig. 23.1*

Ward No.	Urbanised	Less Urbanised
1		Cherangai
2		Adakathbail
3		Kelugudde
4		Karanthakkadu
5	Anebagilu	
6	Kottakani	
7		Parakkatta
8		Anangoor
9	Govt. College	
10		Nayanmarmoola
11		Bedira
12		Thuruthi
13		Kollampadi
14		Chennikkara
15		Pilikunje
16	Korakkadu	
17	Fish Market	
18		Nagarkatta
19	Kandathil Palli	
20		Bangod
21		K K Puram
22	Padikunnu	
23		Thalangara (W)
24		Muslim H S
25	Pallickal	
26	Thayalangadi	
27	Taluk Office	
28		Beeranthbail
29		Pallam
30		Nellikunnu
31		Kadapuram
32		Light House

Table 23.2 Urban profile of the wards

2.4 Hierarchy of space/nodes/Centers

Commercial nodes are identified on all important intersections of roads where there is a concentration of commercial activities and in the case of leaner development, Commercial activity or physical development for a distance of 250 m. The most important commercial nodes thus identified are Old Bus Stand Jn., New Bus Stand Jn., KSRTC Bus stand Jn., Anangoor Jn., Karanthakkad Jn. and Taluk Office Jn. Many of the educational, health, civic and other facilities are also located at these places. The hierarchy of nodes is shown in *Fig. 23.2*.

Ward No.	Ward Name	Activity Pattern
1	Cherangai	Primary Activity (agr)
2	Adakathbail	Primary Activity (agr)
3	Kelugudde	Agr+SSI+Anm
4	Karanthakkadu	Agr+SSI+Anm
5	Anebagilu	Tertiary Activity
6	Kottakani	Tertiary Activity
7	Parakkatta	Primary Activity (agr)
8	Anangoor	Agr+SSI+Anm
9	Govt. College	Tertiary Activity
10	Nayanmarmoola	Primary Activity (agr)
11	Bedira	Primary Activity (agr)
12	Thuruthi	Primary Activity (agr)
13	Kollampadi	Primary Activity (agr)
14	Chennikkara	Primary Activity (agr)
15	Pilikunje	Primary Activity (agr)
16	Korakkadu	Tertiary Activity
17	Fish Market	Tertiary Activity
18	Nagarkatta	Primary Activity (agr)
19	Kandathil Palli	Tertiary Activity
20	Bangod	Agr+SSI+Anm
21	K K Puram	Primary Activity (agr)
22	Padikunnu	Tertiary Activity
23	Thalangara (W)	Primary Activity (agr)
24	Muslim H S	SSI+ Animal Husbandry
25	Pallickal	Tertiary Activity
26	Thayalangadi	Tertiary Activity
27	Taluk Office	Tertiary Activity
28	Beeranthbail	Agr+SSI+Anm
29	Pallam	Primary Activity (agr)
30	Nellikunnu	Agr+SSI+Anm
31	Kadapuram	Primary Activity (agr)
32	Light House	Primary Activity (agr)

Table 23.3 Activity pattern of the wards

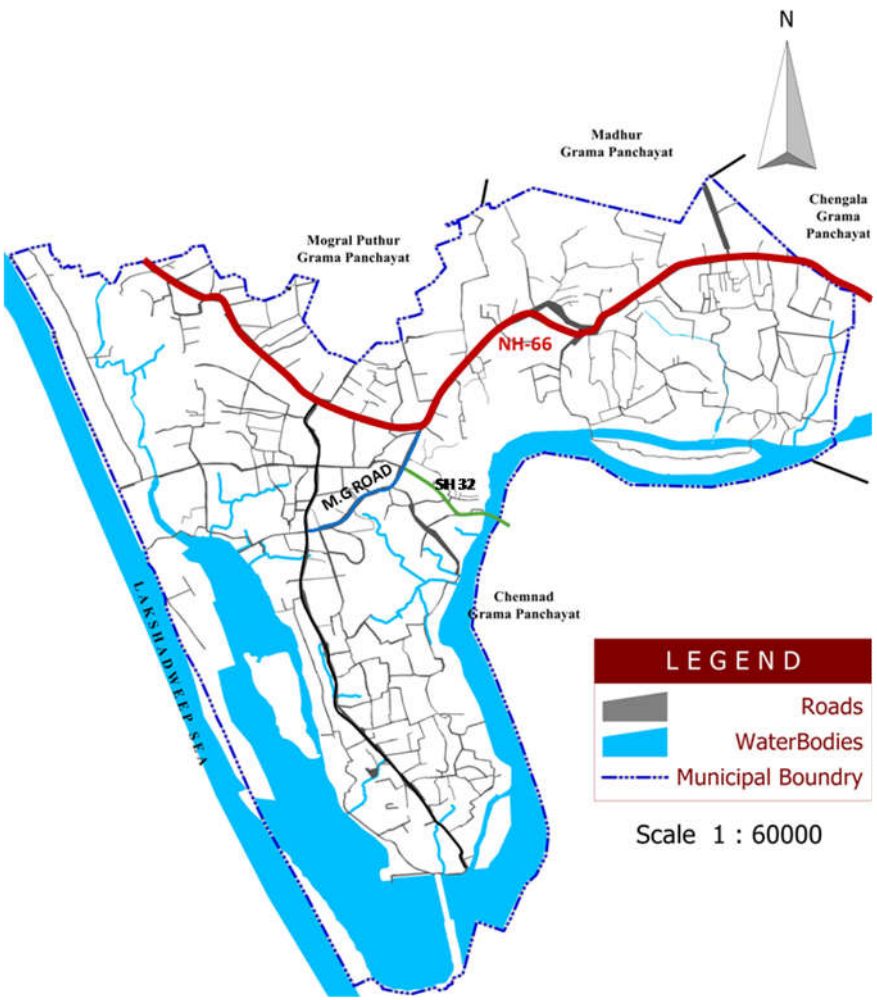


Fig 23.1 Connectivity pattern of the Town

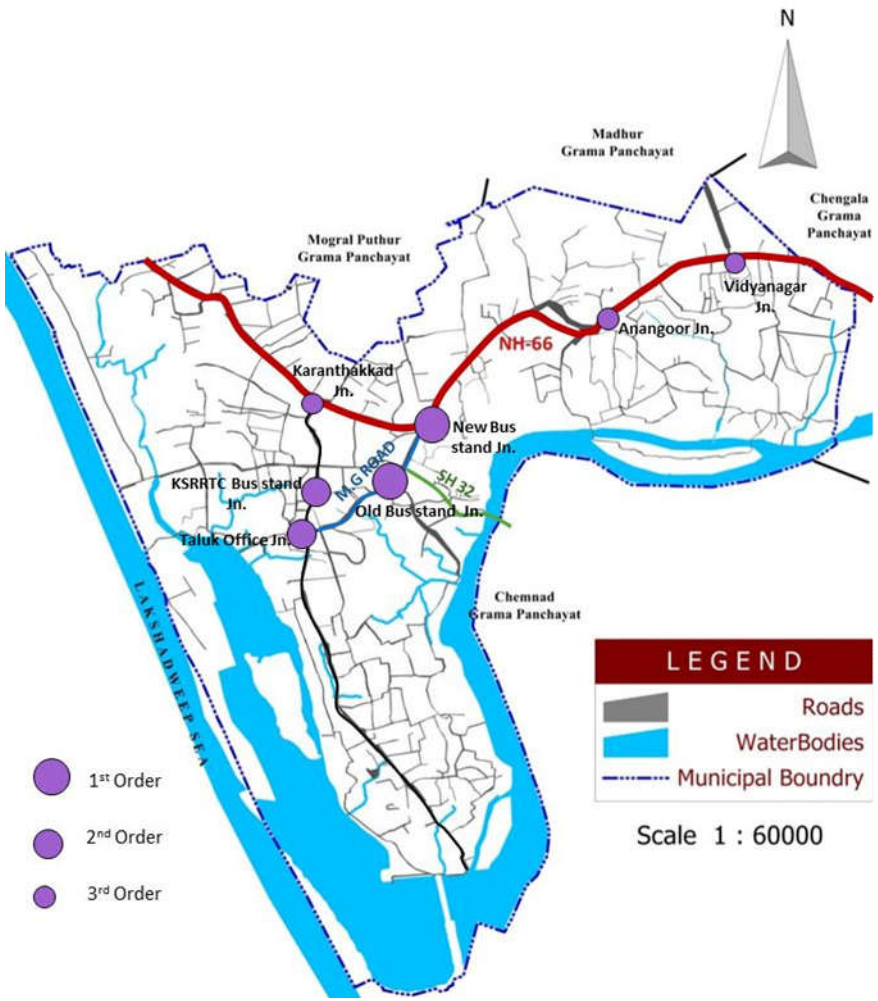


Fig 23.1 Hierarchy of nodes

2.5 Spatial structure

The activity pattern, connectivity and hierarchy of spaces are considered together to formulate the spatial structure of the municipality. The spatial structure obtained by overlaying the maps of the above three is shown in *Fig.23.3*

Majority of the important facilities are located in the town centre which accommodates the General Hospital, Market, Taluk Office, Municipality, KSRTC Bus stand and important commercial establishments. The Civil Station which accommodates the main function of the town that is the administrative headquarters, is located at Vidyanagar, just outside the Municipal boundary near the NH-66. The industrial estate of the Municipality and Govt. College is also located nearby, along the NH.

2/3 rd of the total peripheral length of the Municipality abut the water bodies (the river and sea) and the town assumes a peninsular shape extending towards the water body. This forms an interesting feature and adds to the quality of the spatial structure of the town. The major recreational spaces and the most environmentally fragile areas are located in the above said area.

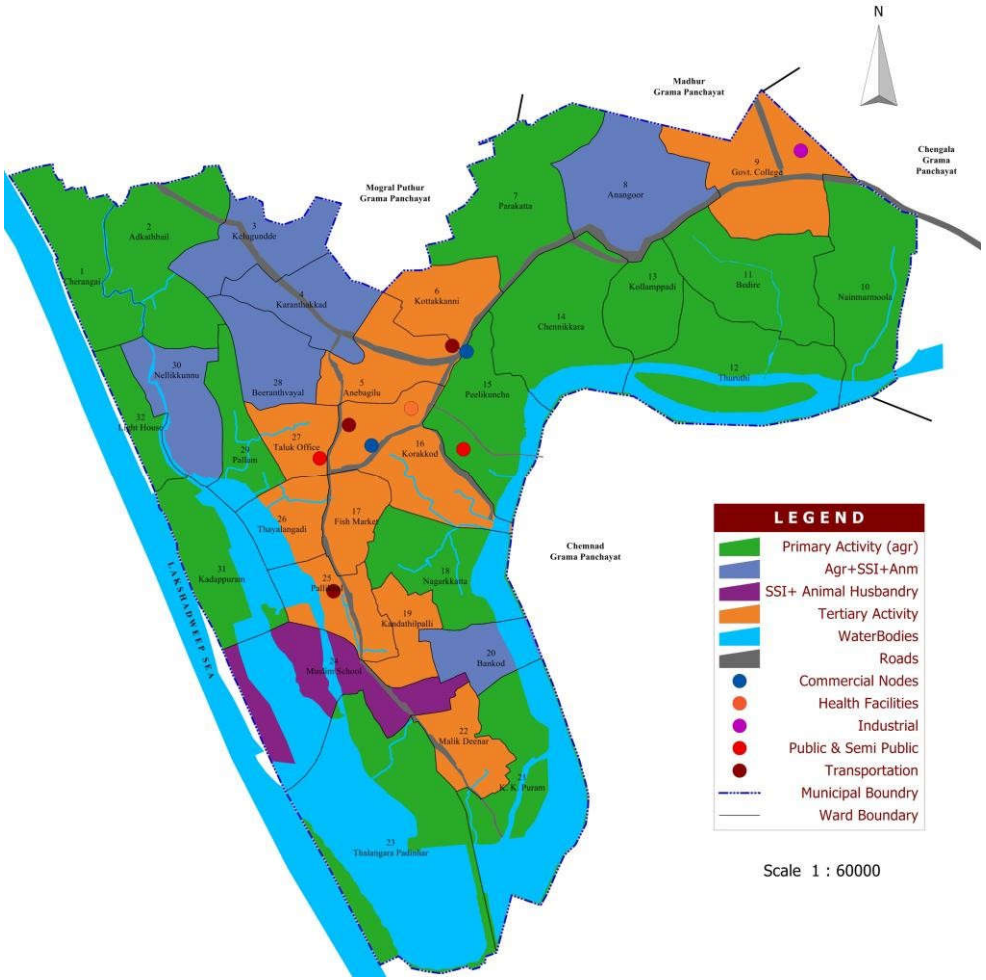


Fig 23.3 Spatial structure of the town

The northern half of the municipality is characterized by a mix of residential and agriculture areas. The NH-66 passes through the northern part of the Municipality and forms an interesting spine for the spatial structure of the town, with commercial establishments developing on either side of it.

PART-II
INTEGRATED DEVELOPMENT VISION

CHAPTER 1

SUMMARY AND FINDINGS

1.1 REGIONAL SETTING

Kasaragod Municipality is the district headquarters, and is well connected to the other parts of the district by Road. Kasaragod Railway station is situated in Kasaragod Town 8 km away from the district headquarters of Vidyanagar. The initial development of the town concentrated around a central nucleus of Taluk Office and M.G. Road premises, and spread towards south up to Chandragiri Railway Bridge. It was further intensified due to the benefits of the proximity to railway station and the water body. With the establishment of new Municipal Bus Stand and Civil Station, it is seen that the direction of spatial growth of development during the last decade has undergone a change. At present, developments are coming along N H - 66. The Chandragiri Road Bridge opened up a direct access towards Kanhangad and hence Chemnad Panchayat became inactive and close co-ordination with the development activities in the Municipality.

Functional Character of Kasaragod Municipality is Semi Rural, Hierarchy of settlements is First Order and Activity pattern is Tertiary Activity.

1.2 LAND USE

54.347% of the Municipal area is under residential land use and spread over the 32 wards of the town. Kottakanni, Parakkatta, Kandathilpalli and Malik Deenar wards record the higher concentration of residential land in the town.

Commercial land uses constitute a share of 0.965% of the total land area of the Municipality. Commercial developments are seen along the traffic corridors and out of that, there are very few organized shopping with modern facilities and related infrastructures like accessibility, parking etc. The main problem persisting in the central area is acute congestion of vehicles, lack

of parking space, insufficient loading and unloading space, narrow carriage way etc. Korakkadu, FishMarket, Anebagilu, Kottakkanni, Chennikkara and Govt. College recorded the greater share of commercial land use of the town.

Land coming under the category of industrial use constitute 0.965 % only, of the total developed area. Most of the industries in the municipal areas are of household industries category. Govt. College, Bangod, Kelugudde and Nellikkunnu recorded the greater share of Industrial land use of the town.

12.71% of the total land is being utilized for agriculture. Out of which paddy area constitutes 122 Ha. which forms 7.31 % of total municipal area. Dry cultivation area comes to 90 Ha. which constitutes 5.4% of total municipal area. There is a decrease in the Agricultural land, from 2.25 Sq km in 2001 to 2.12 Sq km in 2003. Cherangai ward recorded the greatest share of Agricultural landuse. Adkathbail, Chennikkara , Anangoor and Beeranthbail also accommodate the major agricultural land use of the municipality.

4.035% of the total land is utilised for public and semi public usage, and of that a portion is for religious institutions. Govt. College, Korakkadu, Fish Market Taluk office and Kandathilpalli recorded the greater share of Public and Semipublic land use of the town.

Though an urban area, the town faces shortage in terms of availability of park and open space area. The land under this is only 0.341% of the total area and is too short to meet the actual requirement, of the town. Nagarkatta and Cherangai recorded the greater share of parks and open spaces of the town.

6.811% of the total land is utilised for transportation land use. The area of transportation land use has increased from 0.94 Sq km to 1.136 Sq km.

A major portion of the total area is under water bodies i.e; 19.564% of the total land. This comprises of the Chandragiri river, the backwater etc. The area forms the most environmentally fragile area of the town.

1.3 POPULATION

Although there is a steady increase in growth of population, the rate of population growth shows a decreasing trend. Growth rate of population is lower compared to the district and nearby LSGIs.

The existing trend of developments shows clear spill over to the surrounding Panchayat beyond the western boundary of Municipality, especially towards Mogral Puthur, Madhur and Chengala Panchayats. The district Civil Station is located at Chengala Panchayat and this panchayat shows closely related developments with the Civil Station. The Mogral Puthur and Madhur Panchayats shows thick residential developments accommodating the present residential demand. On the other hand these portion of Panchayat clearly depends the Municipality for their daily needs related to shopping, education and health.

Population density is higher among the coastal wards which are thickly built up with fishermen settlements and slums. Pallam, Bangod, Malik Deenar & Kandathilpalli shows the highest density distribution. Sex ratio of Kasaragod town is lower than other towns and nearby LSGIs.

Kasaragod town shows a higher literacy rate than other towns in the districts. But majority of the population in the Municipality belong to the High School educated group. The % of Degree holders is very low- this shows poor educational status of the Municipality.

Average Household size is 5.31. Household size is higher in wards of poor socio economic conditions and along the coastal area. Household size is higher in wards of K.K Puram, Pallam, Light house, Kandathilpalli, Thuruthi, Malik Deenar and Nellikkunnu.

1.4 EMPLOYMENT

Workforce distribution in the Municipality shows a decrease in the % of cultivators and agricultural labourers, but it shows an increase in the % of House hold Industrial workers. Cultivators and agri. labourers form only 3% of the workers. 7% of workers are in house hold industry and 90% of the workforce is in the category of other workers.

The Work Force Participation Rate for Kasaragod Town is lower than that of the State and District. The backwardness of industrial developments in the Municipality as well as the District may be one of the reasons. Workforce Participation Rate shows an increasing trend from 1991-2011. Cultivators and agricultural laborers show drastic decrease in total numbers whereas other workers show considerable increase. This indicates that the primary sector activity, mainly the agricultural activity is on the decline in the Municipality, whereas Tertiary sector activity is steadily and considerably increasing. There is a high concentration of Agriculture Laborers at northern and north eastern areas of the town.

1.5 ECONOMIC ASPECTS

Industry

Only 0.965% of the municipal land is being used for Industrial purpose. With a variety of resources and sufficient infrastructure facilities available, the planning area has no large scale / medium scale industries. All existing industries are small scale industries. Most of the organized industries like Astral Watch Factory and Islamia Tile factory are lying un-operated during the last few of years. The watch works, tile factories and sawmills are all under this status because of prevalent poor economic viability. But these vacant areas can be utilised for viable economic activities. There is predominance in Textile and Engineering based Industrial units, followed by Agro based and Electronics based units.

There is abundant scope for starting small scale industries, as raw materials in the form of cashew, coconut, arecanut, china-clay, lime and bamboo are available or could be transported by cheap modes from the nearby areas. Mining of china clay is

done from the clay deposits of Kalanad. Bauxite occurrences have been detected by the Geological survey of India at Kumbala, Perla and Mulleria of Kasaragod Taluk. Now there is only one organized industrial estate in the planning area, on the northern part of municipal area, near Civil Station. District Industries Centre promotes small scale industries here and most of the units in the industrial estate are functioning well.

Trade & Commerce

The number of business units in the municipality has increased from 1264 in 2003 to 1305 in 2010. Kasaragod town is the main commercial node. One of the major reasons is its connectivity to other LSGs in the district and Mangalore. Only 1.223% of municipality area is commercially developed now. There is a lack of parking space and loading unloading space near the fish and vegetable market located alongside the MG road- it causes traffic congestion in the Old Bus stand- Traffic Jn. route. Unorganized distribution of street vendors along the footpath and road side also causes congestion.

There is no industrial development along with commercial development at Old bus stand Jn. which is the one of the major commercial centres of municipality. Tobacco and Rubber, mainly cultivated in the eastern foothills of Kasaragod district and hinterlands, mainly depend on Kasaragod town for marketing.

The market which is the main centre for vegetables, fruits and fish commodities are very congested. The waste from the market is not cleared regularly, and this causes environmental and health hazards.

Commercial facilities are seen mainly as ribbon development along the major transport corridor. Fully modernized daily market (separately or fish and vegetables) and slaughter houses may be opened within the municipality.

Tourism

Kasaragod town has a great potential to develop as a tourist centre, but the main problem is lack of infrastructure facilities. Kasaragod is the gateway to Kerala from the North. It is the face of Kerala to the Northern states. Bekal Fort at a distance of 20 km from the town is main attraction of the region and is an established tourism spot of international acceptance and fame. A major project for the development of facilities in this destination is under implementation by the Kerala Tourism Department and has a direct impact on the development of Kasaragod town being the District Head Quarters. Kasaragod Municipality is also blessed with beautiful beaches and ancient religious buildings. Being strongly connected with Mangalore city which is a shopping destination, the city has the potential to develop in to tourist destination, utilizing its waterfront. The banks of Chandragiri River is beautiful, and is a potential tourist attraction, provided the river is cleaned up and dumping of waste into the river is prohibited. Kadappuram beach, Lighthouse areas, Nellikkunnu, Thuruthi, Thalangara etc. have beautiful beaches, and are potential recreation centres.

Even the existing parks like Sea-View Park at Pulikkunnu and Children's park near Madonna are not being used by the public. The number of tourists- International and domestic- visiting Kasaragod Municipality has increased sharply since the last few years. Majority of hotels are of Economy class and there are no home stay facilities.

Agriculture

Total agricultural area inside the Municipality comes to around 212 Ha Out of which paddy area constitutes 122 Ha which forms 7.31 % of total municipal area. Dry cultivation area comes to 90 Ha which constitutes 5.4% of total municipal area. There has been a decrease from 225 Ha of agricultural area in 2001 to 212 Ha of agricultural area in 2010, due to land filling

and unplanned residential development and land filling. Agriculture areas are distributed mainly in northern portion of the municipal area.

The main agriculture produces in the municipality are coconut, arecanut, paddy, banana, vegetable etc. Irrigation is facilitated by pump sets, ponds, wells, canals and tanks. 28% of the agricultural land is irrigated through the river and 45% through wells, canals and ponds.

There are no markets for selling of agriculture products, which indicates that these products may be sold at open markets by the private agencies.

The main problems in agricultural sector are:

- Low fertility of soil
- Unavailability of enough irrigation facilities
- Unplanned residential developments and filling up of paddy fields
- Unavailability of bio-fertilizers
- Unavailability of labor
- Increased production cost

Due to the above reasons, majority of the paddy fields in Kasaragod are left uncultivated. Adkathbail, Ameyvail, Kalmadivail etc have around 80 Ha of area suitable for Paddy cultivation.

Animal Husbandry

Animal Husbandry is a weak sector in Kasaragod Municipality. Production of Meat and eggs do not meet the requirements of the Municipality .This high demand for meat, eggs, milk etc is being met by neighbouring states.

Decline in the availability of grazing land due to increasing urbanization made it uneconomical for the farmers to rear cattle.

Since there are no Dairy Farms or Hatcheries in the Municipality, the livestock are mostly reared within the household.

Kasaragod town has a high potential for production, but there is a need for:

Supporting infrastructure development (Diagnostic lab, Clinic lab, Calf feed Office and Veterinary Hospital/Dispensary) and Encouragement to invest in this sector.

Co-operative farming with cattle rearing, milk production, bio fertilizer manufacturing etc could be encouraged. More marketing facilities for meat and eggs, and modern slaughter houses could be initiated.

Fisheries

Kasaragod is one of the main fishing centres in the district. The 5 km long Kasaba coastline is the main fishing centre in the Municipality. Around 5800 workers are involved in the catching and marketing of the fish. There is one Boat yard and repair unit in Kasaba and 2 Ice plants in Nellikunnu and Cherankkai. There are no facilities for preserving and processing of fish in the Municipality, hence the larger catches are transported immediately to Mangalore. Marketing and sale can be improved by introducing small scale industries aiming at preserving and processing of by products from fish, which have a high potential in the Municipality. The Chandragiri River is also a rich source of fresh fish, and small scale projects for increasing quantity and different varieties of fish could be introduced to increase the catch. Thalangara has a fishing harbour, but the sand bars in the delta of Chandragiri constraints the efficiency of the port.

1.6 TRAFFIC AND TRANSPORTATION

Kasaragod Town is located along National Highway 66 leading to Mangalore. The town is well connected with major urban centres in the state by rail and roads. SH - 31 to Kalladukka leads to Badiadukka, Perla Vitla and further to Karnataka state. The Jalsoor road passes through Muliyar and leads to Sulliya. The hill produces and vegetables and from these centres are brought to Kasaragod town for trading.

The Puthur and Sulliya in Karnataka are famous for educational institutions and trade and commerce. The Madhur road is another important feeder road to the urban area. The land put to traffic and transportation uses accounts for a mere 113.6 hectares. This low figure represents gross inadequacy of road in the town in terms of width.

In the MG Road the area between Rest House and Old Bus stand Jn. showed the highest parking accumulation. Commercial nodes are mostly characterized by congestion due to vehicular and pedestrian traffic. Lack of enough space and road width is the major reason for congestion. It prevents smooth maneuvering of vehicles causing frequent traffic block .Many commercial centers within the central area are lying close to Bus terminals which aggravate the congestion problem.

The main problems that Kasaragod town faces are:

- Mixing of intra-city and inter city traffic and absence of adequate bypasses.
- Intercity bus traffic congestion in main roads due to location of intercity bus stand in the central area of the town.
- Narrow width of roads in central parts and bottlenecks.
- Uncontrolled loading/unloading of trucks near wholesale markets/ go downs in the central area.
- Increased floating population and increased number of personalized vehicles.
- Lack of adequate Mass Transport System.
- Absence of proper traffic signs and markings.
- Encroachment of pedestrian facilities and encroachment of right of way.
- Unorganized on-street parking and absence of proper parking lots.

1.7 WATER SUPPLY

Water supply is one of the critical issues, in Kasaragod town. Although the town is locked with water bodies on three sides, the residents suffer from gross inadequacy in water supply in terms of quality as well as quantity. The town population depends considerably on ground water sources like wells and tube wells.

The present water supply system is not satisfactory. The only public water supply project in the town, commissioned as early as in 1976, was for a design population of 5000 families. But the gradual increase in demand has not been met satisfactorily in the subsequent years.

An intake well is located in Chandragiri River at Bavikkara at Muliyar Panchayath. The treatment plant is located at Vidyanagar. The design capacity is 8 MLD but the actual capacity is 4 MLD due to variation in the project and losses in the distribution system.

The existing system supplies water intermittently and at other times the people depend on open wells and bore wells. The problem of saline water intrusion is severe during the months of April – May.

Leakage losses are the main functional problem of the distribution system. The pipes are very old and require urgent replacement.

21.16% of the wards experiences water scarcity for more than 6 months, and 19.18% for 1-2 months, i.e during the summer months of April-May. Water scarcity is severe in many parts of the Municipality. Maximum utilization of surface water and rain water is the best option for the future.

1.8 DRAINAGE

The topographical conditions of the town render the draining of storm water to the surrounding primary streams easy. Surface drains on the sides of the roads do not cover the entire area. Drainage blocks are found at three locations viz; Taluk office junction, Press club junction and New bus stand area and the blocks create unhygienic conditions and in the surrounding. These are the locations which are frequently affected by flooding due to storm water during monsoon season. All these locations are along the sides of the main roads of the municipality and maintained by Public Works Department. All these spots are in commercially important areas.

There exists a clear hierarchy of drains leading to the water body, covering around one third perimeter of the town. On detailed analysis, some clear bottlenecks are seen resisting the easy flow of drains.

Some sort of mechanism is required to regulate and properly maintain the drains coming in the town. Waste disposal from small and medium scale commercial units are found to be a problem in this sector and this has to be controlled. Some major streams which are found to carry waste waters from the surrounding residential areas discharge into Chandragiri River create pollution in the river.

The existing drainage system should be improved- maintenance is needed throughout.

The bottlenecks in the drainage network have to be studied in detail and a drainage plan should be developed. Efficient drainage network is most necessary in the Municipality, since more building complexes are coming up.

1.9 SEWERAGE

About 69.53% of the sample population depends on Pit Latrine and 22.99% on individual septic tanks. There is no organized sewerage system in the town. There are some typical issues associated with the sanitation scenario of the town

One of the major issues is the threat of ground water contamination in the low lying areas especially in the costal stretches. Since the coastal areas are thickly built up with economically weaker sections like fishermen, sanitation is found to be a big issue in the coastal areas.

Since most of the houses have their own arrangements and other areas are topographically undulating, a sewerage system for the whole town is not economically viable in the immediate future.

1.10 SOLID WASTE DISPOSAL

The town follows conventional system of collection and dumping in a yard to tackle the issue of solid waste disposal. The waste is then disposed by Land filling. The present dumping yard is located outside the town near Kelugudde in the northern fringe. The area of yard is not adequate and the collection mechanism does not fully cover the entire municipal area. The present waste generation per day in the town is estimated to be around 15 tonnes, and the waste collected is 13 tonnes. The waste disposal is done by the Municipality by Partially Centralized system.

80.25% of the population has their own arrangements for solid waste disposal. Only 9.59% of the population depends on the public collection and disposal. However, compared to households waste generated from non-residential areas are much more in quantum and variety. The composition is also complex in respect of non-domestic waste. It is this sector which requires attention as far as public disposal mechanism is concerned.

Solid waste management is a burning issue for the immediate future if not at present, with increase in resident population as well as floating population, urbanisation, growth of town etc. Hence this aspect has to be given proper care and attention. The present dumping yard is not enough to meet the present requirement as well as for the future. The present collection & conservancy is not fully covering the entire municipal area. There needs to be a localized collection & processing with respect to the density distribution of population. Fish market in the municipality is in a poor condition. Waste is not disposed regularly from there, and the market is not cleaned up. There is a Waste Treatment plant for the fish market, but it is not being properly used.

1.11 ENERGY

Majority of the electric consumption in the Municipality is for domestic purpose, and then for commercial. According to Socio-economic survey, only 0.28% of the houses in the Municipality are un-electrified. There are only 2 feeders in the Municipality and they are overloaded. At least 10 feeders are required to meet the future consumptions.

There are 7 petrol pumps in Kasaragod Municipality distributed along the major road ways and NH-66. There are none in the remote areas of the town. The consumption of petrol is less than the diesel; this shows a higher use of Diesel vehicles.

There are nearly 6 LPG Agencies functioning in the district which serves the municipal area.

1.12 EDUCATION

The overall performance and availability of educational institution is very low compared to other districts in the state. Kasaragod being an educationally backward district has its reflection in the Municipality also. Literacy rate of Kasaragod municipality is 94.76% as per census 2011 which is higher than the literacy rate of Kasaragod district, which is 90.09%.

In Kasaragod town there is a dominance of Govt. Schools. There is also an acute shortage of primary educational facilities. The number of dropouts from Schools is much more in Kasaragod Municipality compared to other Municipalities. In the Socio-economic Survey studies, around 4.69% of the population of the Municipality are illiterate and majority (39.49%) are just High School pass outs. Only 10.53% are graduates.

Majority of the Higher education facilities are Nursing colleges and Computer education centres. These two branches have a high scope for employment opportunities abroad. In spite of being the most urbanized town of the district there are no Medical or

Engineering colleges in the Municipality. Majority of the population depend on Mangalore and other cities for Higher professional education.

There is one I.T.I and a computer centre managed by L.B.S functioning in the Municipal area.

Private computer education centres like APTECH, RSCM (Rashtriya Saksharatha Computer Mission), Manipal Insitute for Computer education etc. are also functioning in the Municipal area. There are no Medical or Engineering colleges in the town, majority of the students opt or Nursing and Pharmacy courses. The student strength for these courses is not up to the Planning standards. The teacher- student's ratio is less in all HS, mainly due to lack of accommodation and transportation facilities.

1.13 HEALTH

Kasaragod town depends on its moderate and major health issues on Co-operative Medical College, Pariyaram (Kannur) and major hospitals of Mangalore.

Though Kasaragod is the District headquarters, the district hospital and district medical office are functioning at Kanhangad.

The medical institutions in the town serve not only the urban population but also a considerable amount of rural population residing in the surrounding Panchayats.

Unfortunately in Kasaragod Town there are no super specialty hospitals. Major problem in the health sector is the insufficiency of facilities in the hospital. There are no super specialty hospitals in municipality as well as in the district.

Most of the hospitals are in private sector. District hospital is the only government hospital in the municipality but it lacks the required number of doctors.

1.14 HOUSING

As per 2001 census there is an absolute shortage of 181 houses. There are squatter settlements of extent around 5 acres along the sea coast , where people live in thickly populated colonies, which give rise to social, health and sanitation hazards. The north eastern and southern side of the municipality is sparsely populated. New residential developments are more seen in the northern portion of municipality. The peripheral area wards have a fair land holdings size, and have greater than 11-25 cents of plot area.

Buildings requiring improvements or reconstruction in the near future are located in wards like Korakkod, Nagarkatta, Thayalangadi and Pallom, which are comparatively old settlements.

There is an increasing trend in the number of households during the past decades. Cherangai, Nayanmaarmoola, Thuruthi and Peelikuncha are wards where intense residential developments occurred during the last 10 - 15 years.

1.15 RECREATION

The recreational facilities available inside the Municipal limits fail to meet the actual requirements. On the other hand Kasaragod has a handful of open potential areas and a beautiful river with a much more beautiful spread of backwaters and 'Thuruthus'.
The town has a network of paddy areas under cultivation and some of them are converted as coconut gardens. The town requires an organized space for recreation connected to tourism in the town limits. Major issues related to recreation are:

* Condition of most of the parks and playground is not satisfactory.
* Kasaragod Municipality is blessed with many beach areas like Thuruthi, Thalnagara and Nellikkunnu. These could be developed into recreation areas/parks.
* Sea-View Park at Pulikkunnu requires development. Even the existing park and facilities are not being used by the public. It could be improved with Boating services and Lighting facilities.

* Childrens' park near Madonna Convent could be renovated and provided with modern facilities.
* The Municipal Town Hall and the nearby Reception Hall could be renovated and air-conditioned.
* The "Sandhyaragam" Auditorium could be developed. The Municipality needs more marriage halls.
* There are no other recreation facilities like Zoo, Museum etc.

1.16 OTHER CIVIC AMENITIES

There is a Municipal Town hall, which is used frequently for meetings, seminars etc. They require maintenance. There are 2 Public Libraries- the Municipal library and T.I Ibrahim Memorial Library at Pachakkadu. It could be expanded with more reading rooms and facilities. More libraries are required in the Municipality. There are around 9 community halls at Nelkala, Chalakkunnu, Theruvath (T. Ubaid Cultural centre), Pattam, Kelugudde, Chennikkara, Kadappuram and TV Station Road.
There are 3 Crematoriums/ Burial grounds in the Municipality.

1.17 SOCIAL BACKWARDNESS

Kasaragod district is a socially backward district. SC population constitutes nearly 2.67% of the municipal population. ST population is very low in Kasaragod municipality (only 0.11% of municipal population). Since their income from traditional pursuits has become extinct, they are now depending on other modes of employment.
The educational status of SC/ST students have progressed recently and almost all SC/ST children now attend schools.
Municipality has acquired 70 cents of land near Anangoor MG Colony, to construct apartments to rehabilitate SC/ST families.
As per 2001 census, of the 15568 families in the Municipality, 25% are below the poverty line. Majority of the BPL families are around the coastal areas. The physical constraints like backwater, hinder development activities in these regions. This sector faces

severe social, physical and environmental problems with regard to their shelter and employment. There is a high concentration of BPL families in the wards of Kadappuram, Kottakanni, Beeranthvayal, Bedire, Pallikal and Chennikkara.

1.18 ENVIRONMENT

2/3rd of the total peripheral length of the Municipality, abut water bodies such as river and sea. The town assumes a peninsular shape extending towards water body with its end forming the estuary -"POZHI" - confluence of river with sea. The whole peninsular portion is thickly built up with residential settlements and fishing activities are prominent on the western side. Due to the same reason, Kasaragod Municipality is an environmentally sensitive town.

The municipality has a few thuruths or islands in which some are uninhabited and some are thickly built up. Thuruths are found in the water bodies on the eastern and western sides of municipality. Four thuruths are seen in the eastern side in Chandragiri River. The area is environmentally healthy and living conditions are fairly good but for the likely flooding during monsoon. Accessibility to the town is the main problem in this area. Two more thuruths in the municipal area are inhabited. Thuruths, very near to the sea side, houses around 50 families and a major part of the area is put to use for agriculture.

Thuruths found in the seaside are, generally in uninhabited and contain mangroves. These mangroves are ecologically sensitive areas with special eco system and act as fish breeding centres and bird sanctuaries. These thuruths are accessible only through boats or small vanchis. The area is swampy and thickly vegetated with mangroves.

Paddy fields are located in the northern and eastern part of Municipality and a major portion of this is put to cultivation. These act as retention ponds for rain water during monsoon.

The waste dispersed in water bodies, sand mining, encroachment, depletion of mangroves etc. endanger the fragile environment. On close examination of the present status of these environmentally sensitive elements, it is observed that these areas are either neglected or mismanaged. Solid waste disposal is a critical issue in all these elements. There is an urgent need to conserve the environmentally sensitive elements for a sustainable environmental scenario of the town in the future.

1.19 DEVELOPMENT OF ADMINISTARTION AND FINANCE

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

Major development activities undertaken by the Municipality are:

Conservation of Paddy fields and dry cultivation.

Encouragement of enterprises in Animal husbandry and Fisheries.

Industrial development

Eradication of poverty

Development programs for women and children.

Public health.

Water supply and sanitation.

Education, sports and cultural activities- Youth development

Basic amenities and facilities- development of road network, tourism promotion etc.

Social security

Energy

Proper administration.

The financial position of the municipality is not very strong. The fiscal surplus of the municipality is not an indication of financial health, but of poor financial management. But the municipality has tremendous potential for development of financially remunerative projects for sourcing funds for urban development.

CHAPTER 2

GOALS AND OBJECTIVES

An analysis of the land use and development of the town in the past and existing trends of development indicates that there has been a shift in the direction of the growth of development. Due to the geographical constraints on east, west and south, growth towards south is restrained. The congested central area needs reorganization of space and activities for the revitalization of the area. Relatively more availability of developable land, better regional linkages, recent developments etc. make the areas surrounding N H 66 more attractive for future developments especially in respect of higher order facilities. The coastal areas especially fishermen settlements are observed to be in a state of backwardness, economically, socially and environmentally. These areas require care and attention to maintain a healthy atmosphere. Kasaragod because of its, unique geographic and historic features houses areas of ecological ad environmental sensitiveness, buildings and precincts rich in heritage, areas abundant in natural beauty, rivers, beaches, tiny islands etc. which have immense potential for tourism development. The ground water in the town experiences depletion and salinity intrusion and assumes significance as almost half the population depends on ground water.

Hence the various areas in the town requiring individual treatment are identified and proposals are formulated for these delineated areas in particular and the town in general. The plan has been conceived on this notion.

2.1 SWOT Analysis

STRENGTHS

The **strengths** of the Municipality are listed as follows:

- Kasaragod Municipality is the Administrative Head Quarters of the district. The southern part of the state is surrounded by water- The restrictions imposed by the water bodies for the development spread have invariably been directing physical growth towards north.
- The town is well connected to other major urban centres by Rail & NH. The hill produces and vegetables from the remote centres of the district are brought to Kasaragod town for trading.
- The Mangalore International Airport is just 50 km from the town.
- Kasaragod Municipality is also blessed with beautiful beaches and ancient religious buildings. Being strongly connected with Mangalore city which is a shopping destination, the city has the potential to develop in to tourist destination, utilizing its waterfront. The banks of Chandragiri River are beautiful, and are a potential tourist attraction. Bekal Fort is at a distance of 20 kms from the town is main attraction of the region and is an established tourism spot of international acceptance and fame.
- The undulating topography facilitates easy and natural drainage.
- The Municipality is financially well off, and has surplus budget to cater to the development activities.

WEAKNESS

The **weaknesses** of the Municipality are listed as follows:

- The Municipality has no dependable economic activity of its own, utilizing its own natural resources.
- The Commercial nodes of the town are mostly characterized by congestion due to vehicular and pedestrian traffic.
- Though locked by water bodies on three sides, Kasaragod town experiences acute shortage of potable water.
- Due to undulating topography, certain regions like Thururthy, Pallom, Cherangai and Thalangara have roads but lack connectivity.
- The intra-city transportation linkages are weak, with narrow width and bottlenecks and lack of connectivity to many resourceful areas. The road network of the organically developed town had only peripheral and piecemeal improvements in the past.
- Absence of higher order educational and medical facilities.
- There is an absence of liveliness in the city due to Shortage of recreational facilities.
- Absence of solid waste dumping /treatment facilities within the town.
- There is Economic disparity among the residents in the Municipality.
- So there is low land availability under public ownership to cater to the development of the town.

OPPORTUNITIES

The opportunities available for the development of Kasaragod town can be classified as follows:-

- Proximity to Mangalore – an important urban centre of South India
- Strong back up of Foreign Investment
- Availability of Developable Area
- Availability of land under passive industries
- Potential for Water based tourism

THREATS

And the threats hindering the development are:

- Deteriorating environmental Quality in the absence of appropriate Solid Waste Management & Sewage Treatment
- Haphazard growth and increasing congestion in the absence of Development Controls
- Other Fast growing urban centers within and outside the district like Kanhangad and Mangalore
- Unprotected waterfront.

2.2 Development Issues

The development issues in the Municipality are:-

- Absence of 'Pull Factors' -Sidelined by Mangalore/Kanhangad (Though Kasaragod town is the District Headquarters, people depend on Mangalore for higher order facilities)
- No dependable economic source of its own
- Passive industrial sector
- Urban Growth restricted to certain areas
- Congestion due to concentration of urban activities and inadequate transportation & parking facilities
- Emerging ribbon development along existing transportation corridors
- Topographical barriers to reach undeveloped pockets with in the municipality
- Low availability of land under public ownership, high land value
- Absence/Inadequacy of higher order facilities in all sectors
- Inadequate solid waste management, sewage treatment and drainage infrastructure
- Inadequacy of recreational facilities
- Economic disparity of natives
- Unutilized potential of large water front
- Underutilized land resources

2.3 Vision Statement

The vision statement for the development of Kasaragod Municipality is as follows:-

"Kasaragod Municipality shall evolve in to a more attractive urban centre, with adequate infrastructure & amenities and enhanced Quality of Life, catering to the higher order needs of the whole district, while preserving its cultural uniqueness and environmental quality."

2.4 Goals and Objectives

2.4.1 Goals

The Goals for the development are:-

- Enhancing the regional importance of the municipality by creating adequate and efficient infrastructure commensurate with the status of district Head Quarters.
- Promote culturally sensitive and responsible tourism.
- Generation of resources for urban development.
- Enhance the Quality of Life within the municipality.
- Control the spatial development of the Municipality to facilitate more efficient use of land resources
- Provide employment and higher order services.

2.4.2 Objectives

And the Objectives are:-

- 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 congestion
- Provision of higher order facilities in Education and Health- Strengthen the secondary level health care facilities and higher education facilities.
- Revive industrial sector by promoting MSMEs, cottage industries, agro based industries, IT etc. and promotion of non-polluting industrial base
- Develop fisheries sector with proper infrastructure
- Provide adequate recreational facilities, utilizing the potential of water front
- Conserve heritage without being detrimental to developmental activities
- Conservation of wet lands and Preservation of water bodies
- To build a drainage system foreseeing the future demands
- Ensure environment friendly disposal of waste
- Provide adequate civic amenities
- Equitable distribution of services
- Eradicate housing shortage.

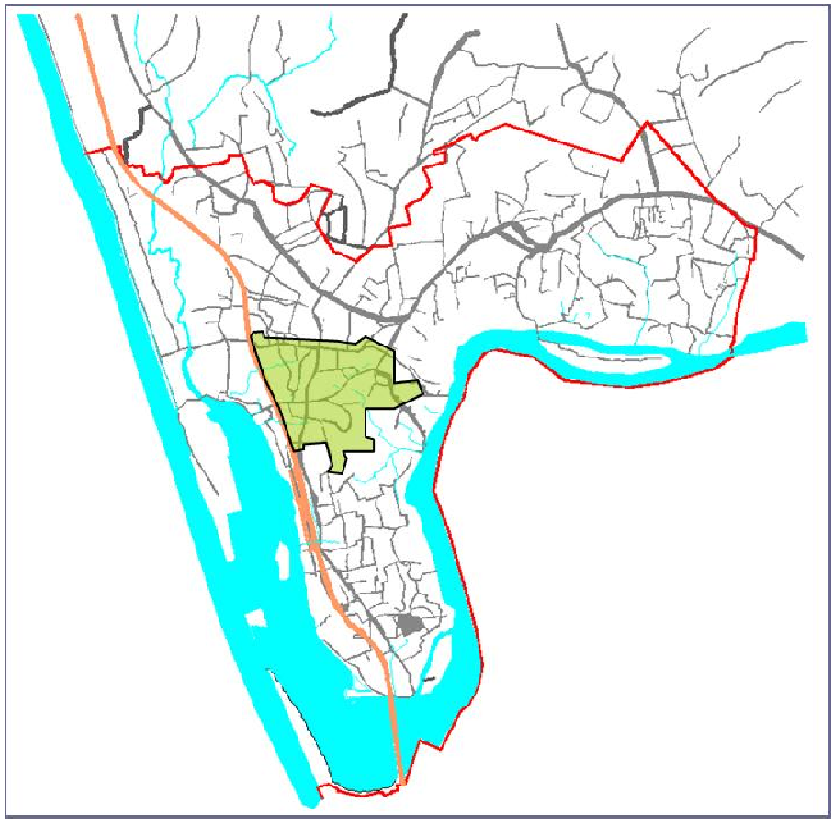
CHAPTER 3

DEVELOPMENT CONCEPT

1. THE CENTRAL AREA OF KASARAGOD TOWN SHALL BE TREATED AS A SPECIAL AREA

The Central Area of Kasaragod Town is the epicenter of physical developments in the region. Like in any other organically developed town, the Central area is the most thickly built-up area, depicting a complex and mixed land use pattern, evolved over a period of time, without adequate planning interventions. Commercial activities of the highest order are mainly concentrated in this area.

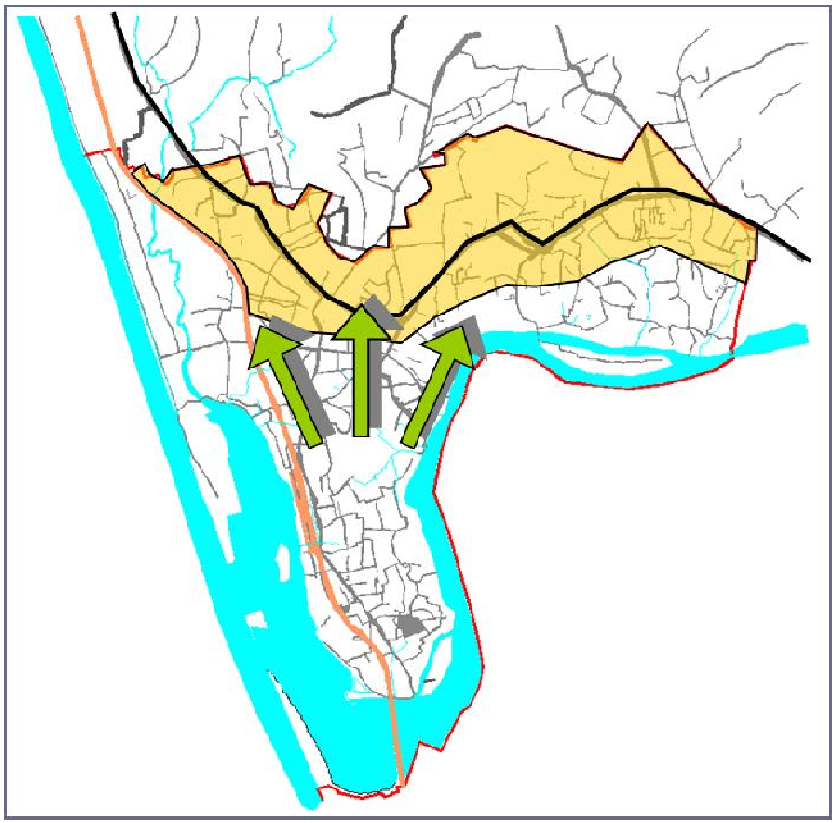
BEING THICKLY DEVELOPED AREA WITH MIXED LANDUSE PATTERN, IT REQUIRES URBAN RENEWAL STRATEGY.



2. THE NORTHERN CORRIDOR [NH-66 & ENVIRONS] SHALL BE DEVELOPED

Waterbodies bound Kasaragod Town on three sides - east, west and south. This geographical feature has been influencing the settlement fabric of the town during its entire period of growth. The restrictions imposed by the river for the development spread have invariably been directing physical growth towards north.

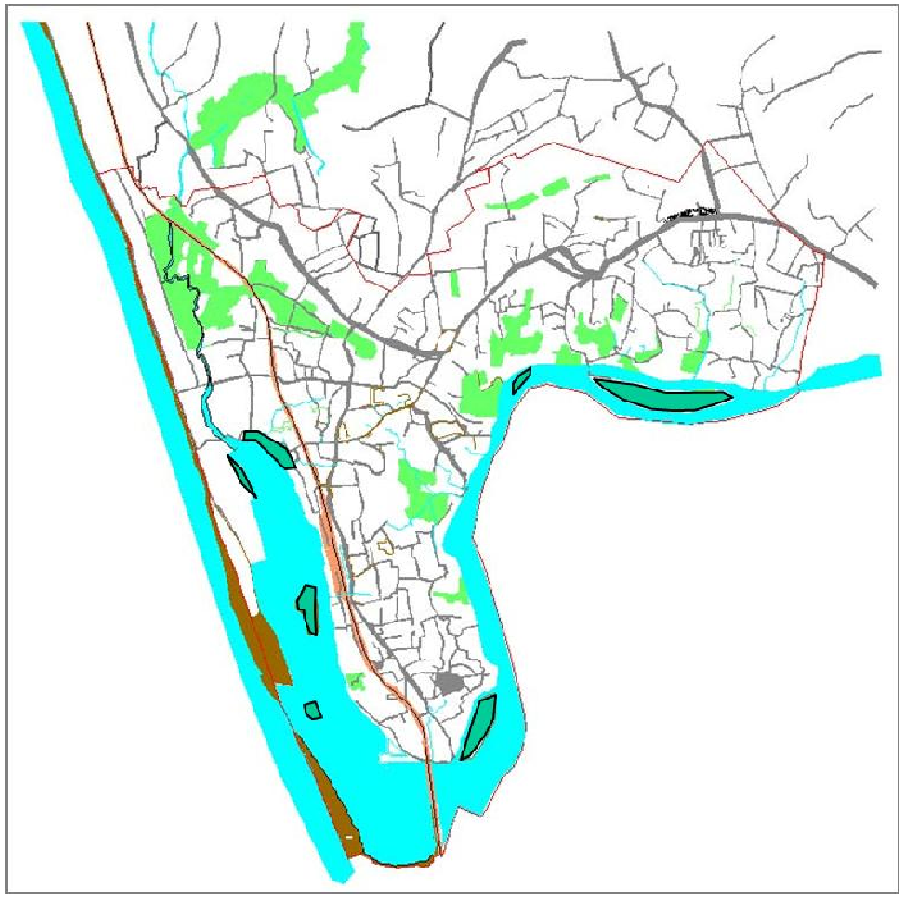
National Highway No: 66, the first order transportation corridor linking the town with rest of the region, passes through the northern area, providing good accessibility. Developable land is relatively more available in this area.



AREAS SURROUNDING THE NH TO BE DEVELOPED FOR FUTURE HIGHER ORDER FACILITIES & ACTIVITES

In addition, major activities like Civil Station, Municipal Bus Stand, Government College, Government Ayurveda Hospital, CPCRI etc. capable of inducing further developments already exist in this area or its close proximity. These aspects open up prospects for future higher order developments in a sustainable manner.

3. CONSERVATION OF ENVIRONMENTALLY SIGNIFICANT /SENSITIVE AREAS, THROUGH LAND USE CONTROLS, THEREBY SUPPLEMENTING AND SUPPORTING THE ABOVE LEGISLATIONS IN FORCE.



Chandragiri River, mangroves, beach, small islands (Thuruths) and groundwater recharge basins (generally characterized by paddy fields) are the major environmentally significant or sensitive areas in the town. It is essential to adopt conservation measures for these areas to the optimal extent. There are legislative measures applicable for the state to conserve these areas/features. Main issues in these areas are:

RIVER - Pollution, Sand Mining, Encroachments

MANGROVES - Depletion due to human interventions, affecting Coastal Ecosystem adversely.

THURUTHS -Human habitation Vs. Holding Capacity

THE BEACH - Squatter settlements, Pollution, Sea erosion.

PADDY FIELDS - Conversion leading to lowering GWL

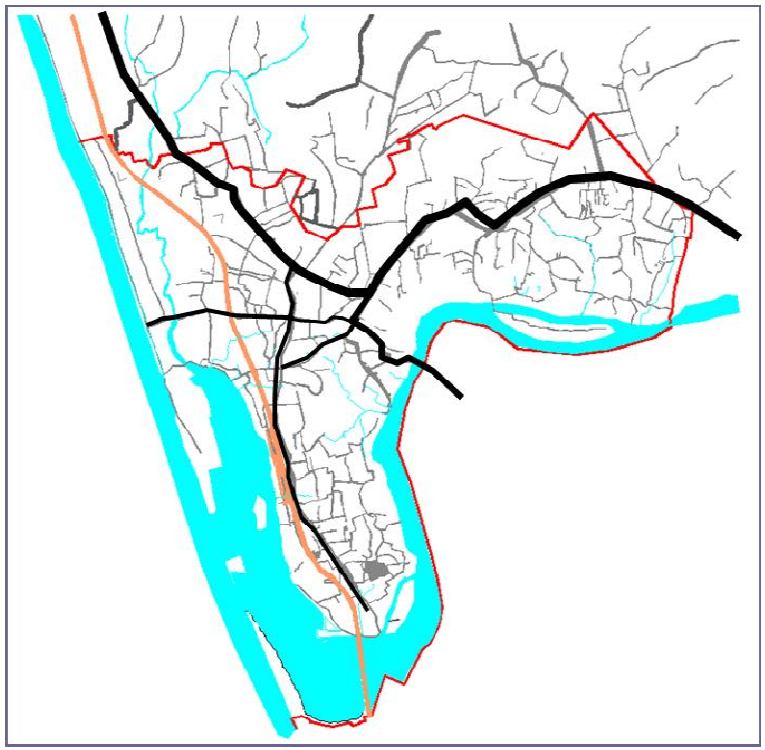
Coastal Zone Regulations II as per notification of Government of India under Environmental (Protection) Act & Rules facilitate legal measures pertaining to conservation of coastal areas i.e.; 500metres from the HTL and the area between LTL & HTL. The

Coastal regulations are applicable to Chandragiri river also for controlling developments on its sides. The small islands, mangroves and mudflats also come under the purview of these regulations.

Paddy fields acting as recharge basins enriching ground water assume significance, considering the increased dependence on groundwater. The Kerala Land Utilization Act and The Kerala Conservation of Paddy Land and Wet Land Act, 2010, is intended to arrest conversion of areas under paddy cultivation.

However, the present scenario in the town warrants necessary steps to formulate regulations to supplement these legislations and to ensure their basic objectives.

4.FORMULATE WORKABLE AND ENFORCEABLE PROPOSALS FOR IMPROVING TRAFFIC AND TRANSPORTATION SECTOR, GIVING OPTIMUM CONSIDERATION TO THE BUILT-UP CHARACTERISTICS, MONETARY ASPECTS, TRAFFIC NEEDS, LAND USE PATTERN AND ROAD STANDARDS



The road network of the organically developed town had only peripheral and piecemeal improvements in the past. This is evident from the deficiencies in road geometrics, carrying capacity, hierarchy and level of service of the road network.

Un segregated vehicular and pedestrian movement, un organized parking space, inadequacy of bus bays, insufficiency of space for accommodating street furniture and improper location of Transport

terminals are the major issues requiring corrective measures.

The UDPFI Guidelines stipulate standard road widths (right-of-way) for urban roads based on hierarchy. However, the characteristic built-up pattern and relatively high land value make the ideal road standards difficult to enforce and implement within the plan period.

4. SUSTAINABLE TOURISM TO CONSERVE MANMADE AND NATURAL HERITAGE

Though rich in resources, Kasaragod Tourism Region covering the entire district, lacks adequate promotion and supporting infrastructure. The potentials are relatively under explored and it is evident from tourist arrival statistics. This is true for Kasaragod town also.

The southern area of the town comprising of the riverfront, small islands (*thuruthu*s), beach, Central Area and the rest of the peninsula is enriched with both man-made and natural heritage. On the other hand, human interference and activities with little consideration to conservation of the rich heritage still continue; which is expected to accelerate in future, but for effective interventions. This area is characterized by environmentally sensitive areas due to presence of riverfront with saline intrusion. This calls for conservation of environmentally sensitive areas and developments without adverse effect on such areas.

However, the standing testimonies of the history & culture of the town and areas of outstanding natural beauty & environmental significance are under threat. The very identity of the town is getting ‘endangered’.

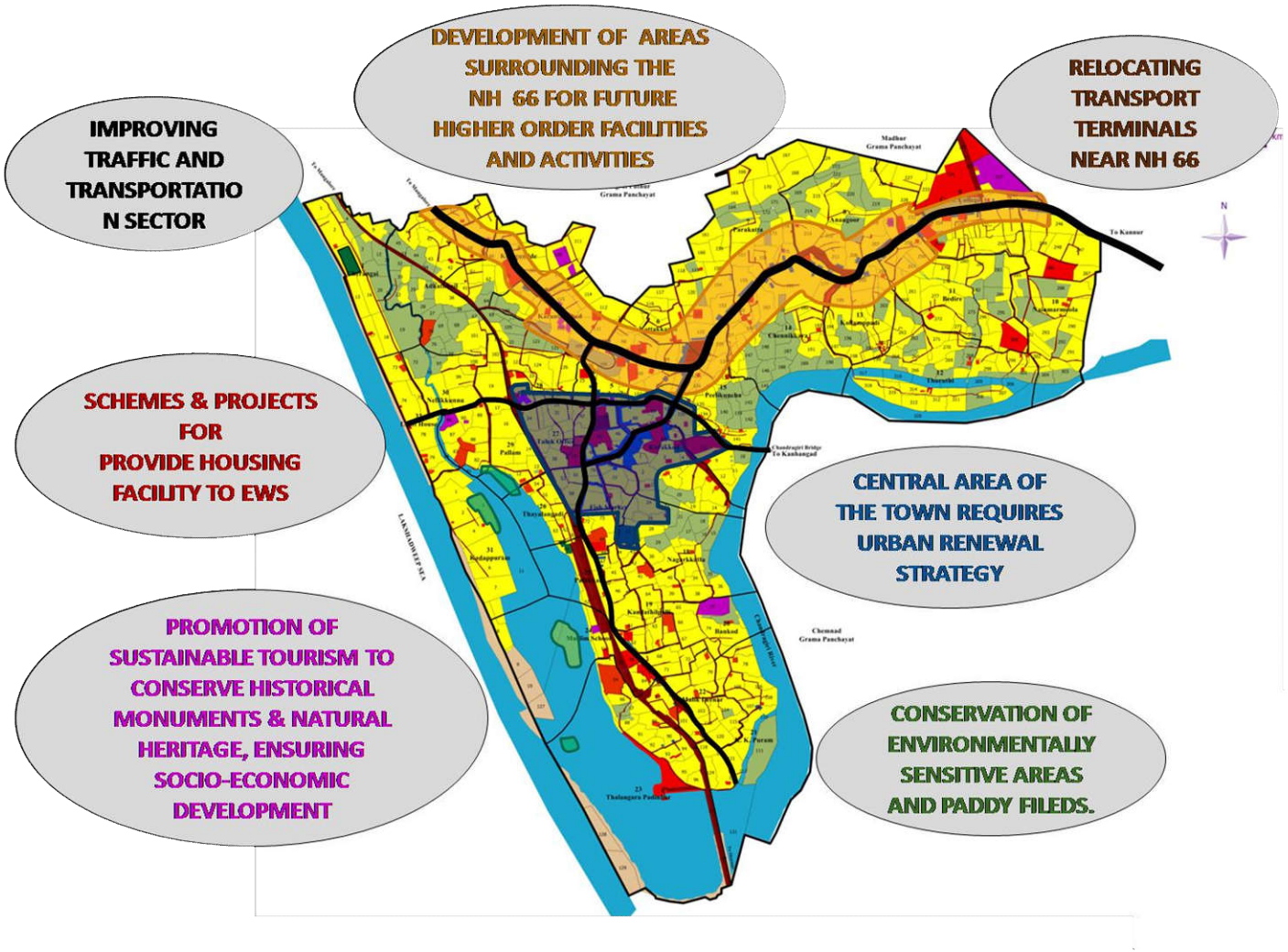


Fig 3.1 Development concept for Kasaragod Town

CHAPTER 4

GENERAL POLICIES AND STRATEGIES

1. **Disperse optimally the concentrated development by**
   - provision of pull factors like roads and relaxed development controls in the less developed areas
   - Discouraging further concentration in congested areas through rigid development controls
2. **Increase economic opportunities**
   - Promoting IT, Agricultural processing, cottage industries (Kasaragod Sarees, Thalangara Caps etc.) and MSMEs
   - Promote fisheries sector by developing harbor, fish processing industries and ancillary industries
3. **Increase regional importance**
   - Provision of higher order facilities
4. **Check degradation of environmental quality**
   - Provision of SWM, Sewage treatment, Drainage infrastructure
   - Protect mangroves, promote social forestry, conserve wetlands
   - Promote breathing spaces – parks and open spaces
   - Improve slums
   - Promote nonpolluting industries
5. **Increase liveliness in the city by providing recreational facilities**
6. **Meet the gap between infrastructure/amenities need and provision**
7. **Utilize innovative techniques like Transferable Development Rights and private – public partnerships to overcome hurdles of land availability and funds.**

CHAPTER 5

PROJECTED REQUIREMENTS

1. POPULATION

Decreasing rate method has been used to project the population of Kasaragod Town by 2031.

This method is used when rate of increase in population reduces with each decade.
Rate of increase in population has been 23.3%, 16.2%, 5.1% and 2.92% during 1981, 1991,2001 and 2011 respectively. The projected population in 2031 is 79,846. for the purpose of assessment of sectoral requirements this is rounded off to **80, 000**.

Sl No	Method adopted	Total projected population	
		2021	2031
1.	Arithmetic method	64, 483	70, 383
2.	Geometric method	1,16,444	1, 70,823
3.	Incremental increase method	99, 881	1,23,480
4.	Decreasing rate method	69, 512	79, 846
5.	Graphical method	76, 000	84, 500
6.	Apportionment method	73, 565	80, 235
	Average projected population	76, 974	87, 038

2. TRAFFIC AND TRANSPORTATION

Sl No	Road Section	V/C Ratio -2010	V/C Ratio – 2020	V/C Ratio – 2030
I	**NH - 66**			
1	Civil Station- Anangoor	2.07	2.41	2.85
2	Anangoor- New Bus stand	1.88	2.22	2.66
3	New Bus stand- Karanthakkad	1.15	1.49	1.93
4	Karanthakkad- Adukathbail	1.16	1.5	1.94
II	**M.G ROAD**			
1	New Bus Stand- Press club Junction	1.57	1.91	2.35
2	Press club Junction-Old Bus stand Jn	1.4	1.74	2.18
3	Old Bus stand Jn- Taluk Office Jn	0.98	1.32	1.76
III	**Thalangara Road**			
8	Karanthakkad- Nayak's Road Jn	1.71	2.05	2.49
9	Nayak's Road- KPRR Road Jn	1.6	1.94	2.38

Sl No	Road Section	V/C Ratio -2010	V/C Ratio – 2020	V/C Ratio – 2030
11	Taluk Office- Railway Station	1.59	1.93	2.37
12	Railway station- Nazrath Road	0.49	0.83	1.27
13	Nazrath Road- Thalangara	0.56	0.9	1.34
IV	**Other Roads**			
14	Mathur Road	0.54	0.88	1.32
15	Bekal Road (Chandragiri Road)	0.7	1.04	1.48
16	Nayak's Road	0.44	0.78	1.22
17	KPRR Road	1.14	1.48	1.92
18	Municipal Office Road	0.13	0.47	0.91
19	Rest House Road	0.14	0.48	0.92
20	Beach Road	0.74	1.08	1.52

3. WATER SUPPLY

Current water supply = 5 MLD

Per capita requirement =135 lpcd

However considering the cultural factors, 200lpcd is taken.

So, requirement by 2031 = 80000*200

= 16MLD

Additional requirement = 11MLD.

4. SOLID WASTE MANAGEMENT

Waste generated = 220gm/Head/day

Waste generation in 2031 = 19.8 tonnes/day

Present waste generated/day = 15 tonnes

Waste collected/day = 13tonnes

Additional 6.8 tonnes/day to be treated

5. EDUCATION

Sl No	Category	Existing Nos	Standards recommended	Demand 2031	Shortage
1.	LP School	8	1/2500 population	32	24
2.	UP School	7	1/7500 population	11	4
3.	High School	5	1/13000 population	6	1
4.	HSS	7	1/13000 population	6	0
5.	Arts & Science	1	1/80,000 population	1	0
6.	Polytechnic	1	1/36,000 population	2	1
7.	I.T.C/I.T.I	0	1/35,000 population	2	2
8.	T.T.I	0	1/1,20,000 population		
9.	Professional college	2	1/2,50,000 population		

6. HEALTH

Category	Existing Nos	Standards recommended	Demand 2031
PHC	0	1/20-25000 population	3
Taluk HQ hospital	1	1 in Taluk	0
District Hospital	1	1/11 lakh population	
District Co-operative	1		
MSP hospital	1		
Ayurveda	2		
Homeo	2		
Private hospital	3		

7. ENERGY

As per standards, consumption of power works out to be 2KW/HH.

Therefore, consumption of power by 2031 is worked out to be 32,000KW for a population of 80,000 with HH size of 5.

8. RECREATIONAL FACILITIES

Category	Existing Nos	Standards recommended	Demand 2031
Park & open spaces (overall town)	6	10-12 sq.m /persons	80Ha
community level Park & open spaces	0	2-3 community level Park & open spaces	
Open spaces (variations by size of settlement)		1.4-1.6Ha/1000 persons	112Ha
Community room	0	1/5000 persons	16 Nos (660m^2each)
Community hall & library	10	1/15000 persons	5 Nos (2000m^2each)
Recreational Club	0	1for 1 lakh persons	1 No (1Ha each)
		1for 50,000persons	2 Nos (0.5Ha each)
		1for 15,000 persons	5 Nos (0.2Ha each)

9. HOUSING

- Present net residential density is 3158 persons/km^2
- Net residential density in 2031 = 4132 persons/km^2
- As per standards average density for developed areas is in the range of 100-150 persons/hectare

10. OTHER FACILITIES

Sl No	Category	Existing Nos	Standards recommended	Demand 2031
1.	fire station	1	1 for 2 lakh persons	
2.	Religious sites	7	2 for 15,000persons	10 Nos

PART-III
LAND USE AND SECTORAL PROPOSALS

CHAPTER 1

PROPOSED LAND USE PLAN

The proposed land use plan is prepared considering the spatial structure of the town, inter linkages between various human activities on land, efficiency of transport network, trip generation characteristics of various land uses and the projected demand for various activities during the plan period.

Sl No.	Land Use Type	Area in sq km	Percentage
1	Residential	5.220857	31.28
2	Commercial	0.193162	1.16
3	Public and semi public	0.780034	4.67
4	Traffic and Transportation	1.808959	10.84
5	Mixed (Residential and Commercial)	3.75744	22.51
6	Industrial	0.108892	0.65
7	Park and Open Space	0.064342	0.39
8	Hazardous	0.023758	0.14
9	Dry Agriculture	0.840104	5.03
10	Wet Agriculture	0.768841	4.61
11	River/Waterbody	2.94504	17.65
12	Environmentally Sensitive Area	0.178571	1.07
	Total	**16.69**	**100**

Table 1.1 Proposed Land Use Breakup-2031

*Note: *Sandy Soil zone not included in this list as it is reclaimed land and not belong to Municipal land*

The proposed land use of Kasaragod Town is shown in Table 1.1. The residential zone comprises of 522.09 Ha which is 31.28 % of the total extent of the municipality. 375.74 Ha is under mixed residential and commercial land use where both the uses are permissible. Hence, the land required for housing needs shall be adequate and the net residential density shall remain below the values stipulated for a medium town throughout the plan period. The residential use is provided in a continuous manner except for natural barriers like water ways, roads etc. in order to ensure compactness and this easy provision for basic amenities and infrastructure.

The commercial land use covers an area of 19.32 Ha. In addition to this area, commercial uses are permissible in mixed residential and commercial zone. This shall cover the demand for commercial development in the town.

An extent of 375.74 Ha is zoned for mixed residential and commercial land use. The identified areas are ideal for both the use and the share of each use in this area shall be determined by the dynamics of development and this offers maximum flexibility in land use regulation.

The area under industrial zone comes to 10.89 Ha. This includes land under both private and public ownership. The practice of zoning land under private ownership without solid acquisition proposals is found to be counterproductive since this necessarily doesn't attract industrial investment, but freezes the valuable urban land. However, small scale non-polluting industries are allowed in the residential-commercial mixed area, and special policy area. All types of industries are allowed in dry cultivation area subject to certain regulations. These policies shall be adequate to ensure the availability of sufficient land for industrial development in the municipality.

An extent of 180.90 Ha is coming under the traffic and transportation zone. The major share of this extent is area covered by roads. Anew Ring road has been proposed to connect the remote areas of the Municipality and to relieve the congestion in the centre of the town. Widening of existing roads and providing a few missing links are also attempted. The land under this zone also covers bus stands, truck terminals, taxi stands etc.

The agriculture zone has an extent of 160.89 Ha. The wet land in the municipality is primarily paddy fields. Conservation of Paddy fields for economic reasons is not relevant in an urban context. However, paddy field works as water sinks and undisturbed open land influencing ground water management and micro climate. Hence this area has environmental significance. The pressure on Paddy field for conversion to other urban land uses is tremendous. So conservation of paddy is proposed wherever essential it is for maintaining environmental quality and the land use in these areas are to be strictly regulated.

The area under public and semipublic land use comes to 78 Ha. Only land under public ownership and private land intended for institutional development are considered in this zone. The municipality anticipates a number of higher level institutions to be set up in the town. This also includes the public and commercial mixed land use zone near Anangoor, and the 1.16 acre land near Beeranthbail. Parks and recreational open space occupy 6.43 Ha of land.

2/3 rd of the total peripheral length of the Municipality, abut the water bodies (the river and sea) and the town assumes a peninsular shape extending towards the water body. The shore line is environmentally sensitive and since any polluting activity in this area shall directly pollute river and pose threats to stability of the environment. Hence regulating development of this area to preserve environmental quality and taking advantage of the water front is considered. The extent of area under this Environmentally sensitive zone in 17.85 Ha.

CHAPTER 2
TRAFFIC AND TRANSPORTATION PLAN

1. IMPROVING THE CIRCULATION SYSTEM

NEED FOR THE PROJECT

The land use pattern of the central area of the town is commercial and related activities. However, the carrying capacities of the roads are poor, which is aggravated by the complex mixed land use pattern. For arresting the inner city degradation in future, it is highly important to take measures to increase the carrying capacity of priority roads, establish a definite hierarchy for the road network and correct the unscientific junctions.

Improving the circulation network in Northern Part of the Municipality assumes paramount significance, considering its development prospects and development priority assigned by the Master Plan.

PROJECT COMPONENTS

[a] ***Junction improvements*:**

Priority junctions within the Central Area requiring improvement include:

Taluk Office Junction

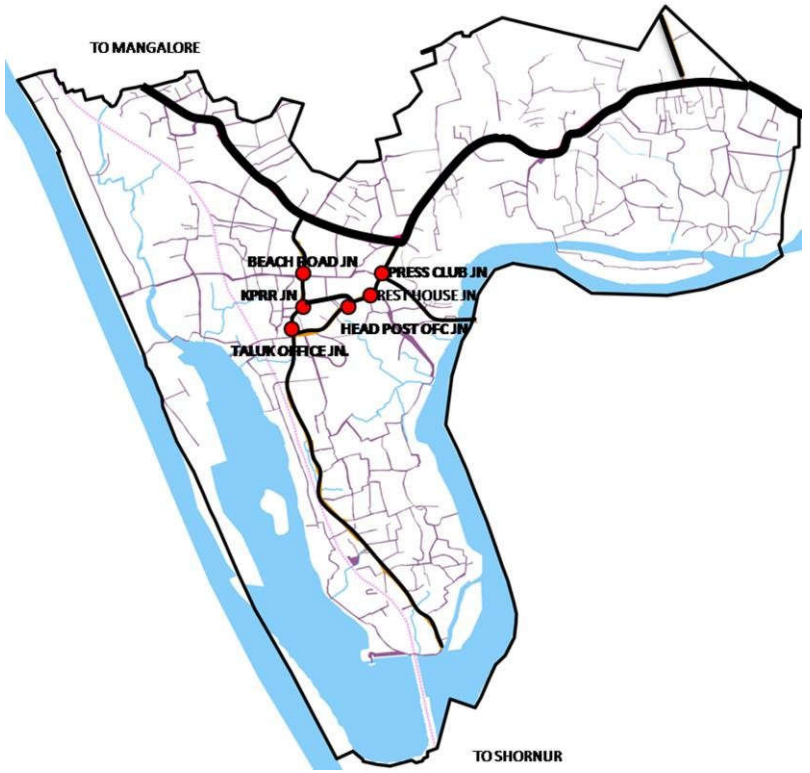


Fig 2.1 Junctions requiring improvements

Head Post Office Junction
Press Club Junction
Airlines Junction
Beach Road Junction
Rest House Junction

[b] ***Widening of Roads*:**

Considering the catalytic effect of the circulation improvement project for the sustainable development of trade & commerce in the central area, the municipality shall take the role of the responsible agency.

However, in the case of roads coming under the purview of the State Public Works Department, the municipality shall play the key role of the facilitator for materialization of the project.

1. WIDENING OF ROADS

SL NO	ROAD	EXISTING WIDTH	PROPOSED WIDTH
1	NATIONAL HIGHWAY	13, 35.5, 30	45 M
2	M.G. ROAD [UPTO P.C. JN]	17, 29 M	30 M
3	M.G. ROAD [FROM P.C. JN	27 M	30 M
4	TALUK OFFICE ROAD [FROM NH]	11- 25 M, 15-22 M	21 M
5	TALUK OFFICE ROAD	12, 15, 25, 30 M	21 M
6	BEACH ROAD	6, 8, 9 M	18 M
7	NAYAK'S ROAD	6, 8 M	18 M
8	THALANGARA ROAD	6, 8, 12, 15, 20 M	18 M
9	VIDYA NAGAR - MAIPADY ROAD	8, 10 M	18 M
10	MADHUR ROAD	8, 10 M	18 M
11	K.P.R.R ROAD	10, 12 M	16 M
12	I.C.B. ROAD	5, 6 M	16 M
13	PALLOM ROAD	4, 5, 6 M	12 M
14	SANTHA DURGA ROAD	4, 5 M	12 M
15	KOTTAVALAPPU-MOIDEENPALLI RD	4, 5, 6 M	12 M
16	MEEPUGURI ROAD	4 to 6 M	12 M
17	KELUGUDDE ROAD	4 to 6 M	12 M
18	KOTTAKANNI ROAD	7 M	12 M
19	VIDYA NAGAR ROAD	6, 8, 10 M	12 M

Table 2.1 Existing and Proposed Road widths

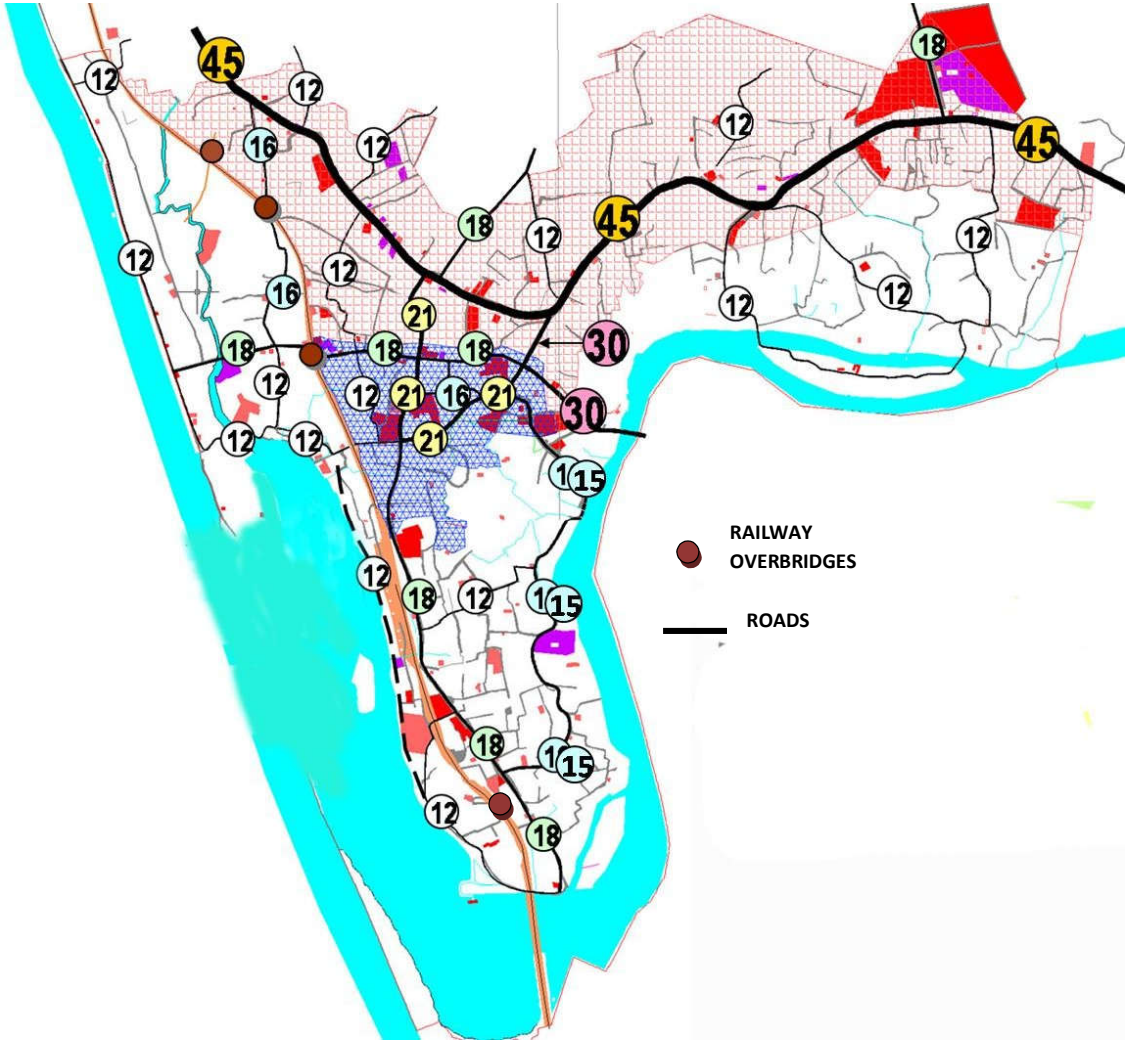


Fig 2.2 Proposed Road widening and Railway Over bridges

[c] ***Railway Overbridges*:**

a. Near Pallam gate- S/No 37 (Kasaragod Village)

b. Near Nellikunnu (Road from Adkathbail) - S/No 40 (Adkathbail Village)

c. Near Adkathbail (Road from Kottavalappu) - S/No 33 (Adkathbail Village

d. Near Hydrose Masjid Road at Thalangara West -S/No 99 (Thalangara Village)

[d] ***Road Overbridges*:**

a. Near General Hospital- S/No. 87 (Kasaragod Village)

b. Near New Bus stand- S/No. 125 (Kasaragod Village)

c. Near B.C . Road (Collect orate)- S/No 245 (Kasaragod Village)

[e] ***Other bridges***

a. Nellikkunnu- Kadappuram bridge near Bangarakunnu Jn. – S/No 85 (Adkathbail Village)

The existing 'Nellikkunnu- Kadappuram' bridge across the Chandragiri River in Nellikkunnu is only 3.5 m without footpath and is too narrow for the heavy traffic of trucks, school buses and pick up vans passing this route daily. The Master Plan proposes the re construction of the existing bridge. The water way at the proposed site is 40 m and the length of the proposed bridge is 45 m. The total project cost is estimated to be 7.25 Cr.

b. Hanging bridge- from S/No 64 to S/No 6 (Kasaragod Village)

2. RING ROAD FROM PERUMBALAKADAVU TO ADKATHBAIL

Many road stretches within the Municipality are over-utilized to the extent of more than two times their carrying capacity resulting in congestion, accidents and declining in travel speed.

Certain stretches have roads with very poor geometrics. The hilly terrain prevailing in the region is the major hindrance for development. Lack of connectivity between roads makes bus transport difficult and people have to travel through circuitous route (by foot and private mode) to reach motor able roads. Also steep roads with poor geometrics and narrow width increases vehicle operating cost and penetration difficult. Certain areas like Thuruthy, Pallom, Cherangai and Thalangara have roads but lacks connectivity.

The Master Plan proposes a Ring Road from Perumbalakadavu- Chala- Bedire- Kollampady- Amey- Chemnad Ferry- Bangod (15 m width)- K.K Puram- Thalangara Kadavath- Thalangara Padinhar- Nechipadappu- Puzhakkara kunnil- Thayalangadi Pallam- Kasaba- Nellikunnu Kadappuram (12 m width).

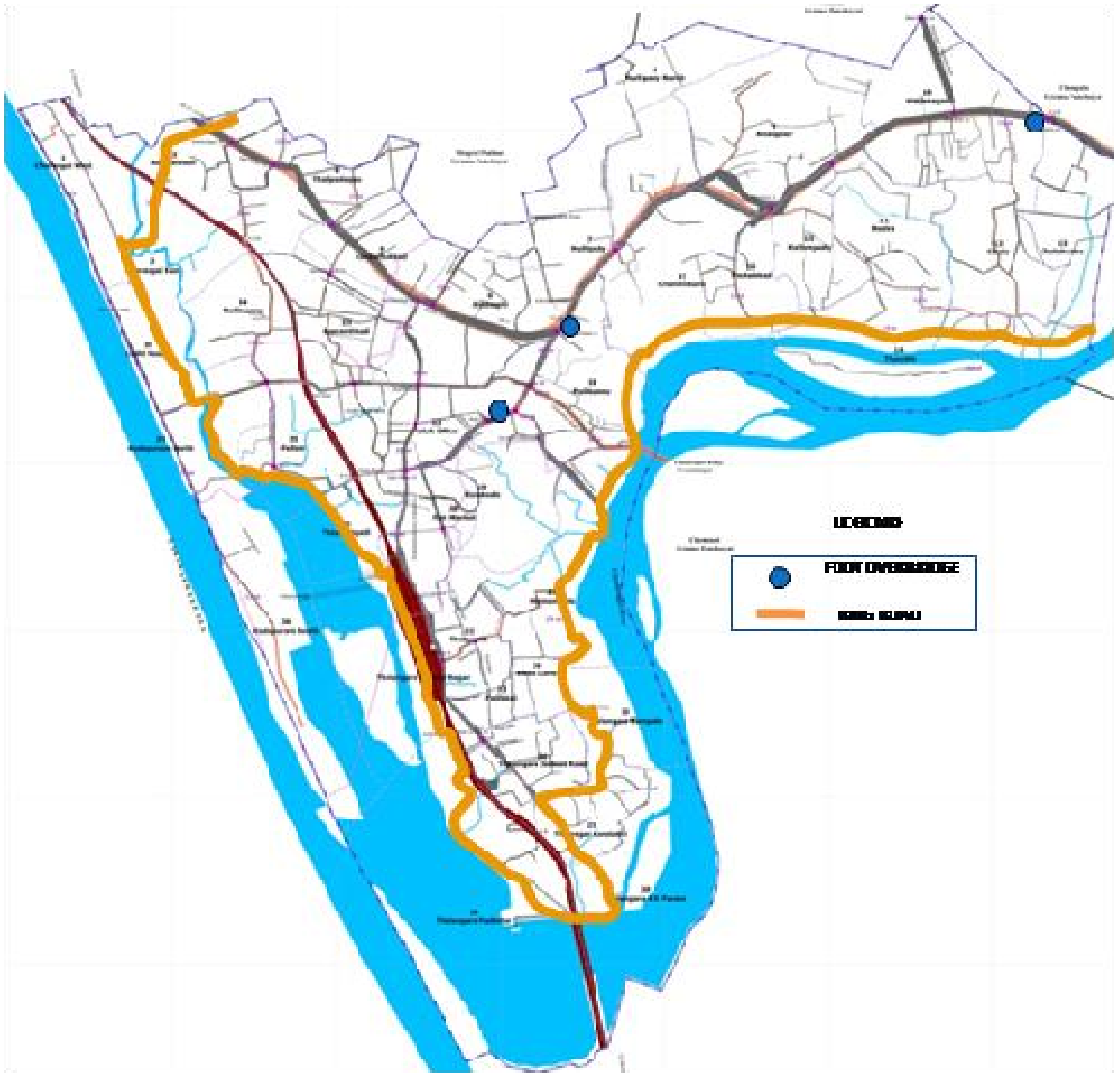


Fig 2.3 Proposed Ring Road and Foot over bridges

CHAPTER 3

SECTORAL PROPOSALS

3.1 INDUSTRIAL

3.1.2 I.T PARK AT BEERANTHBAIL

IT related activities have good scope of bringing employment opportunities to the town. The town has a number of well-educated technicians in I.T sector. With a good number of people working overseas, getting BPO assignments to IT units located in the town need to be explored.

The Master Plan proposes to accommodate an I.T Park at S/No 21[P] at Beeranthbail, at the Astral watch Factory site- the factory being shut down for the last few years. This is located along the Beach Road, which in turn connects to the M.G Road and the town centre.

3.2 TRADE AND COMMERCE

3.2.1 FISH MARKET REDEVELOPMENT SCHEME

At present, the fish and vegetable trade co-exist within the central area. The space constraint, coupled with lack of organized layout depicts chaotic situations in the market area. It is found essential to have separate organized markets for vegetables and meat & fish.

PROJECT COMPONENTS

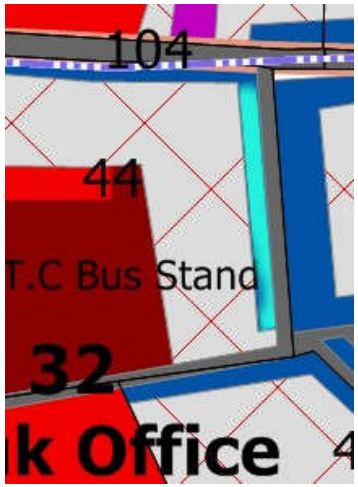
Fish & meat market:

Layout of the market shall be improved so as to accommodate:

Fish stalls	Refrigeration facilities
Meat stalls	Convenient Shopping
Loading/unloading area	Telephone booths
Public Comfort Station	Other ancillary facilities
Waste Collection & Disposal	Improvements to access road

3.2.2 VEGETABLE MARKET AT WAREHOUSE AREA

The Master Plan proposes to develop a vegetable market at the Ware house area, behind the KSRTC Bus stand at S/No.44/17 (Kasaragod Village).
Layout of the Vegetable Market shall accommodate:



[a] Stalls for vegetable trade
[b] Waste Collection & Disposal arrangements
[c] Cold storage facilities
[d] Loading & unloading facilities, Parking lots
[e] Toilets

[f] Other Public conveniences

[g] Rain water Harvesting *and*

[h] Artificial Ground Water Recharging Arrangements

3.3TOURISM

3.3.1 RENOVATION OF SEA VIEW PARK



Sea-View Park is situated near the central area of the town at Thayalangadi, near the Thalangara- Karanthakkad road, with a good view of the Chandragiri River. It is famed for its beautiful views and sereneness, but requires considerable development. Even the existing park and facilities are not being used by the public.

The Master Plan proposes the renovation of Sea View Park, and the project includes:-

- River front Walkway, Landscaping
- Lighting/Illumination
- View point
- Street furniture
- Boat jetty
- Kiosks and Eateries
- Public comfort stations
- Tourist information centre; and

Other tourist and public conveniences

Prospects of public –private partnership shall be explored and assigned priority in materializing the project.

3.3.2 CONSERVATION OF HERITAGE

NEED FOR THE PROPOSAL

The southern part of the Municipality, consisting of the oldest parts of the settlement is characterised by buildings, precincts and natural features of heritage significance. The constitution of India recognizes conservation of heritage as the duty of every citizen. Also, since the economic base identified by the Master Plan for this area is 'Sustainable Tourism', it is essential to conserve these rich heritages. Adequate measures shall be evolved for encouraging and ensuring the conservation of such buildings and areas.

LISTING OF HERITAGE:

The Master Plan identifies the following as listed heritage: [a]

Heritage Buildings & Precincts:

(i) District Education Office
(ii) Kasaragod Fort precinct with the remains of the old fort
(iii) Malik Deenar Mosque including the premises
(iv) Mallikarjuna Temple including the premises
(v) Taluk Office – sub jail precinct
(vi) Thayalangady Mosque including the premises
(vii) Venkitaramana Temple

[b] Natural Heritage:

(i) Chandragiri river and its banks delineated as Riverfront Conservation Area.

(ii) The Beach revitalization project area.

(iii) All islands (*Thuruthu*) in the river and estuary

THE ROLE OF ART & HERITAGE COMMISSION:

The Listed Heritage in the Master Plan is brought under the purview of Art & Heritage Commission for: [a]

Detailed studies & Gradation of Listed Heritage

[b] Encouraging & enforcing promotive regulatory measures.

[c] To advise Municipality, public and private agencies regarding conservation of listed Heritage

[d] To ensure and encourage adaptable uses and reuses

The Municipality shall seek the advice of the commission in respect of listed heritage.

3.4 ANIMAL HUSBANDRY

SLAUGHTER HOUSE

A modern slaughterhouse is essential in any civilized society, for maintaining hygiene. The Master Plan proposes to develop a state-of-the-art slaughterhouse in the existing land owned by the municipality used for Solid Waste Treatment plant, at Kelugudde,, within a distance of 200 metre from the boundary of the site, which is also zoned as Hazardous zone (as per Resolution no. 18 of the municipality, dated 24/6/2011).

3.5 FISHERIES

3.5.1 PROPOSED FISHING HARBOUR NEAR THALANGARA

The Master Plan proposes a Fishing Harbour project at the land identified by the Harbour Dept., nearby the Kadappuram & Thalangara areas of the Municipality. This project is by the Rashtriya Krishi Vikas Yogana Project funded by the Central Govt. The details of the land identified for the project are given below:-

1. S/No 9 &10 (Kasaragod Village)
2. S/No 127& 128 (Thalangara Village)

The project shall be accessed by an approach road, connecting it to the existing road from Kadappuram and encompasses the following:-

- Break water
- Wharf
- Auction hall for auctioning the catch
- Canteen
- Net mending hall
- Commercial building
- Water tank; and
- Workshop for boat mending & repair



Fig 3.1 Proposed fishing harbor at Thalangara

3.6 WATER SUPPLY

INTRODUCTION

The total water requirement of the town by the horizon year is estimated as 16 MLD. The proposal augmentation by Kerala Water Authority will not be sufficient to meet the demand by the year 2031. Availability of potable water is the major thrust area which requires special attention. The Master Plan proposes to ensure sustained availability of water through rainwater harvesting, Ground water recharging and an additional Over Head Tank near Thalangara.

3.6.1 RAINWATER HARVESTING

NEED FOR ASSIGNING PRIORITY

Since Kasaragod is facing acute shortage of drinking water, the plan identifies Rainwater -the purest form of water in the nature- as the best source to supplement water supply by KWA and through other conventional methods.

MEASURES FOR ENFORCEMENT

[a] The municipality shall enforce workable Rainwater harvesting arrangements as an integral part of all new building constructions including additions, alternations and extensions put for the following uses:

(i) Residential
(ii) Offices - Public & Commercial
(iii) Hospitals and other health institutions
(iv) Auditorium, community halls, hotels/restaurants

(v) All educational institutions

Provided that, the floor area to be considered shall be the total floor area inclusive of the existing and proposed buildings. Provided further that, the rainwater harvesting arrangement is not mandatory for thatch roofed buildings.

[b] The component of workable rainwater harvesting arrangement as stipulated in [a] above, shall include:

(i) Roof catchment area

(ii) Roof gutters

(iii) Down water pipe and first flush pipe arrangement

(iv) Filter unit

(v) Storage tank with provision for drawing water.

[c] The minimum capacity of the storage tank as stipulated in [b](v) of the rainwater harvesting arrangement shall be at the rate of 50 litres per sq.m of the plinth area.

[d] The storage tank may be preferably above ground and owner has to give a declaration that the arrangement shall be maintained in healthy working condition.

[e] The arrangements as stipulated in [a], [b], [c] and [d] above shall be maintained in a healthy workable condition by the owner and an agreement to this effect shall be entered with the municipality.

3.6.2 RECHARGING OF GROUND WATER

NEED FOR ASSIGNING PRIORITY

Kasaragod is facing ground water depletion and saline water intrusion and almost half of the population depends on wells for potable water. This necessitates artificial recharging of ground water as a necessity for the sustainable development of the town.

MEASURES FOR ENFORCEMENT

[a] The municipality shall enforce workable artificial ground water recharging arrangements as an integral part of all new building constructions including additions, alternations and extensions

[b] The component of workable artificial ground water recharging arrangements as stipulated in [a] above, shall include:

(i) Roof catchment area
(ii) Roof gutters
(iii) Down water pipe
(iv) Filter unit (if required)
(v) Recharge well / percolation pit

[c] Wherever Rainwater harvesting arrangements as stipulated in [b] above are provided, additional arrangements for carrying the spill over water from storage tank to recharge well or percolation pit need to be provided.

[d] The arrangements as stipulated in [a], [b] and [c] above shall be maintained in a healthy workable condition by the owner and an agreement to this effect shall be entered with the municipality.

[e] The municipality may, in exceptional cases such as impermeable subsoil conditions to considerable depths, exempt constructions from the mandatory Recharging arrangements.

3.6.3 CONSERVATION OF RECHARGE BASINS

NEED FOR ASSIGNING PRIORITY

Lowering water table level and saline intrusion are the real threats to the groundwater availability, as almost half of the population depends on wells for potable water. By the conservation of paddy fields, the ground water recharge basins shall be retained through enforcement of land use regulations for the entire municipal area.

3.6.4 OVERHEAD WATER TANK AT THALANGARA

The Master Plan proposes an Over Head water Tank at Thalangara, near the Govt. Homoeo Hospital (S/No.62-Thalangara Village).

3.7 DRAINAGE

INTRODUCTION

The undulating topography of the town facilitates easy natural drainage in most of the areas, and hence, natural drainage is not a major issue within the Municipality. The paddy fields acting as water collection and retention basins assume significance in the drainage pattern of the town. Moreover, intense construction activities have led to isolated blockages in drains within the central area.

GENERAL PROPOSALS

[1] Conservation of paddy fields to be retained as retention and recharge basins.

[2] Improve/develop connections to major drains, adhering to hierarchy, so as to facilitate effective drainage of storm water to natural drains.

[3] Cleaning/dredging of natural drains.

[4] Setting minor treatment plants at the mouth of the drains discharging water to Chandragiri river and estuary. Priority shall be assigned to drains discharging water from Central Area - an area with relatively higher levels of contamination of surface water.

[5] Awareness creation against discharging waste into drains.

3.8 SEWAGE DISPOSAL

69.53% of the total population depends on pit latrine in Kasaragod Town and 22.99% have individual septic tanks. Almost 3/4th of the residential plots have an area of more than 200 sq.m. [5 cents], justifying availability of land to accommodate septic tanks. There is no organized sewerage system in the town. The sewerage disposal in slums, with specific reference to Kadappuram needs special attention. Low cost sanitation methods shall be adopted in such areas. The method adopted for sanitation in Kadappuram area shall not contaminate ground water - the source of drinking water of that area.



3.9 SOLID WASTE DISPOSAL

The existing dumping yard is situated just outside the town, which will be insufficient to meet the requirements by 2031. The organic component of waste is generally high in urban areas of the State.

The existing land owned by the municipality used for Solid Waste Treatment plant, at Kelugudde, including a distance of 200 Meter from the boundary is zoned as Hazardous zone (as per Resolution no. 18 of the municipality, dated 24/6/2011). This could be used to meet the requirements by 2031.

1. GENERAL PROPOSALS

The Master Plan advises the following general proposals:

[1] Localized methods for collection, sorting and treatment of waste at locations closer to sources of generation shall be considered, rather than major centralized projects to meet the future requirements.

[2] The municipality shall insist sorting of solid waste at the source of generation into biodegradable and non-degradable components for non-residential uses, after formulating an action plan as the first phase. This may be extended into residential areas with relatively high population density.

[3] Environment friendly methods like vermi-composting shall be



adopted for treatment of organic matter at such locations maintaining the same in hygienic conditions.

[4] Projects for recycling of inorganic wastes shall be formulated, through private participation after conducting detailed study and analysis of quantity and composition of waste.

[5] The municipality shall encourage private participation in such ventures.

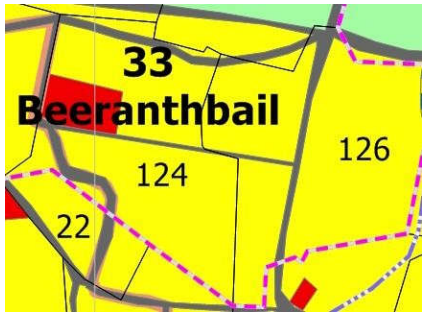
[6] Suggested tentative locations of sites for localized treatment of organic waste in the relatively dense residential areas are shown in the map given below. The municipality shall work out delineation of the area.

3.10 ENERGY

The plan envisages attracting investments in higher order facilities and lays proposals and projects to enhance economic status of the town. The demand for power by the horizon year is expected to be in tune with that of modern cities.

3.9.1 KSEB SUBSTATION AT BEERANTHBAIL

At present there are only two 11 KV sub stations in the Municipality- at Kasaragod and Nellikunnu. Consumption of power by 2031 is worked out to be 32,000Kw for a population of 80,000 with HH size of 5. The existing two feeders of the Municipality are overloaded and more feeders are required to meet the demand for power by the horizon year.



The Master Plan proposes a 33 KV substation at the 20 cents land at S/No.124[P] at Beeranthbail.

Other proposals regarding energy, in the Master Plan include:-

Priority to be given to slums/colonies partially electrified.

Non-conventional energy methods to be popularized in the municipality, in association

with agencies like ANERT.

Energy saved is energy conserved. Popularize C.F.L., electronic choke etc.

3.11 HOUSING

3.11.1 RESIDENTIAL PROJECTS

Actions as per the proposals envisaged in the Master Plan are expected to lead towards induced development in the town. The Plan also estimates a population of 80000 by the horizon year 2031. This necessitates reservation of land for planned residential development in the municipal area. The planned residential developments should accommodate housing for for Economically Weaker Section [EWS] and/or Low Income Group [LIG], which shall be ensured by the municipality.

The details of the land identified for planned residential projects are given below:-

1. S/No- 167/3 -(Kasaragod Village), with an extent of 70 cents, for Residential flat project for S.C, for accommodating 16 families..
2. S/No-17/1- (Thalangara Village), with an extent of 45 cents, and S/No- 20/1 with an extent of 80 cents for the Ashraya Housing Project, for accommodating the poor and landless and the EWS of the Municipality.
3. S/No 123-(Adkathbail Village) for the Tsunami Housing Project- for the rehabilitation of the fishermen families affected by the 2004 Tsunami disaster.

3.11.2 PRIORITY AREA FOR ENVIRONMENTAL IMPROVEMENT & POVERTY ALLEVIATION

NEED FOR THE PROPOSAL

The fishermen settlement area assumes highest environ
Master Plan proposes that the fishermen settlement a
improvement and poverty alleviation.

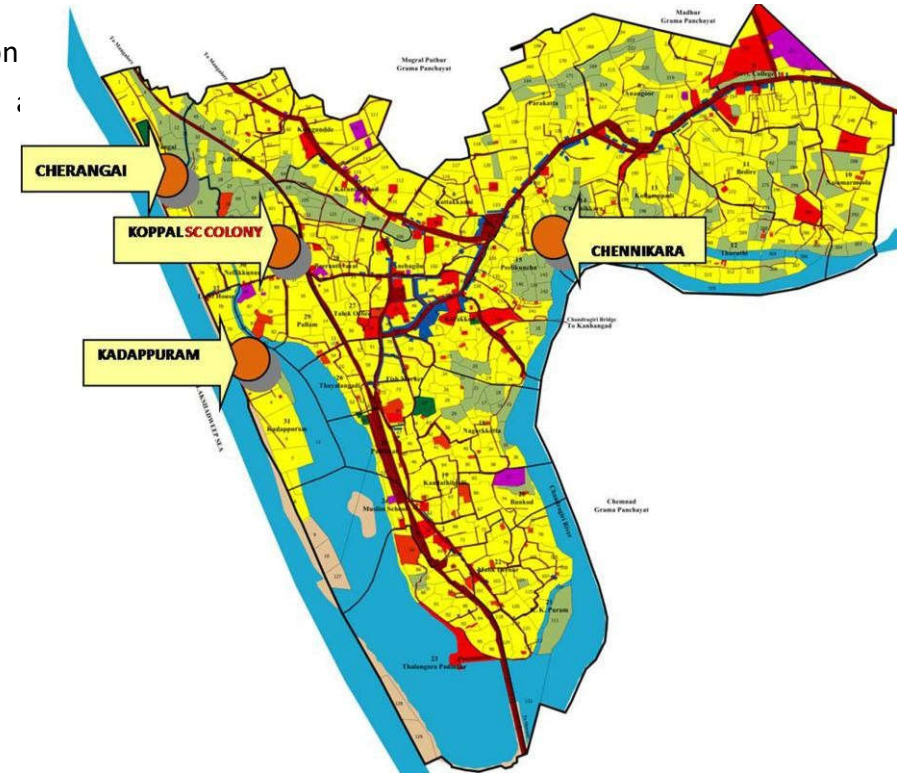


Fig 3.2 Fishermen settlements & slums in the Municipality

ACTION:

[a] Part of this area consists of squatter settlement and has already been identified as a 'special slum' in the study on 'Urban Slums in Kerala - 1995-96'.

However, slum conditions prevail in adjoining areas also; where the inhabitants possess ownership title or occupy rented buildings. The Development Plan proposes to cover the remaining area discussed above under 'slum area classification'. This will facilitate availability of Governmental Grants for slum improvement to a wider area.

The Town & Country Planning Department shall take action for detailed surveys and listing, while updating the list of slums.

[b] 15% of the population in the town is fishermen, whose socio-economic conditions are generally the poorest. The Master Plan recommends that proportionate amount of the municipal allocation in the housing, health care and sanitation sector may be used for this area. Action in this regard shall be taken by the Municipality.

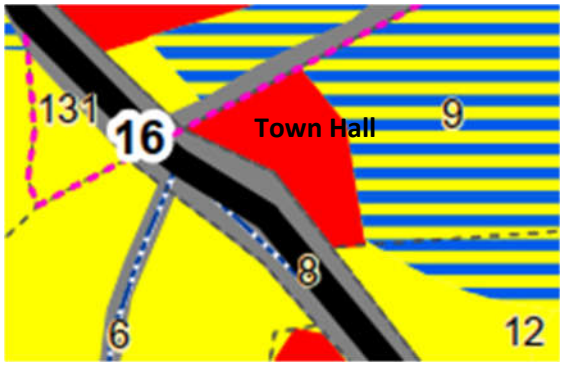
[c] The Governmental actions for poverty alleviation in the region such as Kudumbasree shall assign priority to fishermen settlements. The municipality shall act as facilitator in this regard.

3.12 RECREATION

3.12.1 INDOOR STADIUM AT GOVT.COLLEGE

The Municipal stadium at Vidyanagar and Mini Volleyball stadium at Chala are only 2 stadiums in the Municipality. At present there are no indoor stadiums in the Municipality. The Master Plan proposes an indoor stadium in the Govt. College campus (S/No 234, Kasaragod Village).

3.12.2 TRAFFIC PARK NEAR TOWN HALL



The Master Plan proposes a Traffic Park- an authorized establishment to create awareness about Traffic rules and signals. The proposed site is behind the Municipal Town Hall.
(S/No 9, Thalangara Village, extent- 20 cents).

3.13 OTHER CIVIC AMENITIES

3.13.1 IMPROVEMENTS TO TALUK OFFICE – SUB JAIL PREMISES





Taluk Office premises constitute the major Office complex attracting floating population to the central area. Like in many other towns in Kerala, the location of this land use has its contribution in giving impetus to development of trade and commerce in the central area. However, the layout of the Taluk office-Sub jail premises needs improvement for effectively accommodating the present activity, and equipped to accommodate future requirements. Increasing the built space in harmony with the heritage character of the buildings of yore situated within the compound has to be aimed at.

PROJECT COMPONENTS

[a] Conservation of Heritage Buildings

[b] Transformation / demolition of other buildings to harmonize with the heritage built space

[c] Creation of additional built space in harmony with the heritage built space

[d] Improving the circulation pattern

[e] Creation of organized parking space

[f] Conveniences to the floating population coming to the premises

[g] Landscaping & general improvement of the layout.

3.13.2 VIDYABHYASA BHAVAN OFFICE BEHIND THE A.E OFFICE

The Master Plan proposes a "Vidyabhyasa Bhavan Office" bringing together the D.E.O, A.E.O & S.S.A Departments of Education- in the Town U.P School compound behind A.E. office.

(S/No 41-13 A2, Extent- 7 cents)

PART-IV

ZONING REGULATIONS

ZONING REGULATIONS

1. All future developments shall be in conformity with the provisions of Master Plan for Kasaragod Town and the Kerala Municipality Building Rules in force unless otherwise specified in these regulations.

2. For the implementation and enforcement of the proposals envisaged in this Master Plan, Kasaragod Municipal Area has been zoned under various categories as shown below.

Residential Zone

Commercial Zone

Public and Semi-public Zone

Traffic and Transportation Zone

Mixed Zone

Industrial Zone

Park and Open Space Zone

Hazardous Zone

Dry Agriculture Zone

Wet Agriculture Zone

River/Waterbody

Sandy Soil

Environmentally Sensitive Area

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, Kasaragod Municipality. 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 3, before the sanctioning of the scheme, such use shall be termed as non-conforming use. A non-conforming use may be allowed to continue in its existing location and essential repairs and maintenance for the structure may be permitted by the Secretary, provided that the said use create no adverse environmental influence in the zone. Addition, alteration or reconstruction, if found necessary as part of any mitigation measures may be permitted for such uses by the Secretary with the concurrence of the Town Planner of the District office of the Department of Town and Country Planning having jurisdiction over the area.

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. Uses permitted in residential, commercial and public and semi public zones may also be permitted by the Secretary in land to a depth of 100m in residential, commercial and dry agriculture zones on both sides of roads having an existing or proposed width of 12 m or more (As per Master Plan for Kasaragod Town), if such uses are not permissible otherwise as per these zoning regulations.

7. 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 if the land uses of the plot are among residential zone, residential mix zone ,public and semi public zone ,commercial zone, industrial zone or dry agriculture zone.

8. Constructions and/or land developments, if any, in paddy lands and in wet lands, shall be in conformity with the Kerala Conservation of Paddy land and Wet Land Act in force.

9. Expansion/addition and reconstruction of all existing 'permissible uses' included in Public and Semi Public Zones to the adjacent plots of the same owner at the time of sanction of the Plan, shall be permissible , subject to the Kerala Conservation of Paddy Land and Wet Land Act, CRZ Regulations in force and other applicable Acts, Rules and Government Orders in force in the State 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.

10. Subject to the provisions as applicable to the Kerala Conservation of Paddy Land and Wetland Act, 2008, CRZ Notifications in force and other applicable Acts, Rules and Government Orders in force in the State, 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, shall:-

a) permit in privately owned land which is zoned for Public and Semi Public Use, such uses that are permissible in adjacent land use zone, if there is no records available with the Local Self Government Institution regarding any proposal for acquiring that particular privately owned land for any public use at the time of application for building construction or land development;

b) permit in Wet Agriculture or Water Body, such uses that are permissible in adjacent land use zone, if that particular land in the Wet Agriculture or Water Body is not classified as Paddy land or Wetland as per revenue records;

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 Town Planner concerned.

GENERAL NOTES

1. Zoning Regulations will prevail over the provisions in Kerala Municipality Building Rules.

2.The provisions of Detailed Town Planning Schemes shall prevail over the provisions of the Master Plan where both Plans are in force in an area. There are 2 DTP schemes in Kasaragod Municipality viz; DTP Scheme for Central Area and DTP Scheme for New Bus Stand Area; where scheme rules will be applicable in lieu of the Master Plan.

3. Kerala Conservation of Paddy Land and Wetland Act and Coastal Regulation Zone Notification will prevail over all the provisions in this Master Plan.

4. Silence Zone, as prescribed by the Noise Pollution (Regulation and Control) Rules, 2000 under the Environment (Protection) Act, 1986 and its subsequent amendments, shall be applicable to the area under this Master Plan.

5. Subject to zoning regulations of the respective zones, more than one use may be combined in a building, provided that the total Built- up area of such a building shall not exceed the maximum Built- up area permitted for any of such use, in that zone. Also, the Built- up area of individual uses shall be limited to that prescribed by the zoning regulations for the zone.

6. For the purpose of these regulations, 'Built- up area' means the total area covered by the building at all floor levels.

7. No person shall construct any building within 3 m from any plot boundary abutting waterbodies or drains of width more than 2 m.

The Zoning Regulations for the various zones are as following:

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
1.RESIDENTIAL ZONE				
	Residential buildings consisting of single or multifamily dwellings, residential flats / apartments, residential quarters, night shelters, orphanages, old age homes. Shops, Professional Offices, Commercial Offices, Banks & other Financial Institutions, Restaurants, Canteen, Hotels - **built-up area limited to 200 m^2**. Cottage Industries including coir, Service Industries of non-nuisance nature (Annexure 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 Higher Secondary School level). Health institutions essentially serving the needs of residential community such as dispensaries, clinics (Out Patient), Diagnostic Centres, etc. having a **built-up area limited to 200 m^2**. Community facilities such as Community Halls, Recreational Clubs, Social Welfare Centres, Gymnasium/ Yoga Centers, Swimming Pool, Libraries, etc. having a **built-up area limited to 200 m^2**.	Ashram, Mutt, Madrasa Places of worship Public utility areas and Public Utility buildings other than those included in the permitted category. Government (Local/State/ Central) or Public sector offices. Fuel Filling Stations Cremation Ground/Crematorium, Burial Ground/Common Vault		All uses other than specified.

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Utility Installations and Civic Amenities essentially serving the needs of residential community such as post office, police station, 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, Dairy and Dairy farms and Poultry farms, Fish farm and seed farm Wells and Irrigation Ponds incidental to community needs.			
Provided that the access road has a width of 5 m minimum.				
	Automobile workshops for two/ three wheelers – **built-up area limited to 200 m^2**.			All uses other than specified.
Provided that the access road has a width of 8 m minimum.				
	Hospitals/Convention Centres/ Auditorium/ Wedding halls/ Community halls/Exhibition Centers and Art Gallery-**built-up area limited to 1500m^2** Shops/Professional Offices, banking and financial institutions – **Built-up area limited to 1500 m^2**.	LPG distribution centres/ Gas Go-downs (excluding Bottling plants and bulk storage) - the **built-up area limited to 100 m^2.** Educational institutions of higher order		All uses other than specified.

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
2.COMMERCIAL ZONE				
	All shops including shopping complexes, shopping malls, hypermarkets, restaurants, hotels, Markets. Godowns/ warehouse/ storage of Nonhazardous materials/ Stacking yards. Expansion of existing residential buildings, Single Family Residence **up to a built-up area of 300 m^2**. Residential flats/ apartments with lower two floors for commercial use only, night shelters, orphanages, old age homes, Dharmasala , hostels and boarding houses, lodges and guest houses, Ashram, Mutts, Madrasa. Day care, Crèche, Nursery/ Kindergarten. Transmission & Telecommunication Towers, Wireless Stations. Social welfare centres, library and reading rooms, exhibition centres, art gallery/ museum, auditorium/ convention centres Parking plaza, Transport terminals Gymnasium, yoga centre, recreation club. Office Buildings, Professional offices, Commercial offices & establishments, banking and financial institutions, IT software units.	Places of worship. Other public utility areas & Public utility buildings Fuel filling stations Government(Local/State/Central) or Public sector offices. Slaughter house	Multiplex complex buildings having more than one cinema hall/screen with **built-up area exceeding 12000 m^2**	All uses other than specified.

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	All non—nuisance industries (Annexure I), weigh bridges, printing press, IT hardware, electronic industries Clinics, diagnostic centres and hospitals with number of beds limited to 50. Tot lots, Parks and playgrounds, fair grounds, open air theatres.			
Provided that the access road has a width of 12 m minimum.				
	Hospitals & Health centres, Educational Institutions, Out-door games stadium,			All uses other than specified.
3.PUBLIC AND SEMI PUBLIC ZONE				
	Local/State/Central Government/Public Sector Offices and Other Related Public Buildings, Hospitals and allied uses, educational institutions, places of worship and religious buildings Residential Quarters incidental to public and semi public use. Public Utility Areas auditorium . 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 **built-up area limited to 200 m^2**.	Fuel Filling Stations Cremation Ground / Crematorium, Burial Ground, Common Vault, slaughter house.		All uses other than specified.

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
4. TRAFFIC AND TRANSPORTATION ZONE				
	Transport terminals including constructions that form an integral or essential part of the terminal. Any incidental uses to the transport terminals such as Retail Shops, Restaurants, and Canteen etc. with **built-up area limited to 200 m^2** 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 Commercial, public &semipublic constructions which support transport terminal activities.	Container Terminals provided that the access has a width of 18 m minimum.	All uses other than specified.
5. MIXED ZONE				
	All uses that are permitted in Residential Zone, Commercial Zone and Public and Semi Public Zone Automobile workshops for 2/3 wheelers Service Industries of non-nuisance nature (See Annexure I) Civil defense and home guard. Parking Plaza, Taxi/Jeep Stand	All uses that are in Restricted –1 category of Residential Zone, Commercial Zone and Public and Semi Public Zone	All uses that are in Restricted –2 category of Residential Zone, Commercial Zone and Public and Semi Public Zone	All uses other than specified.

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
6. INDUSTRIAL ZONE				
	All industries other than obnoxious or 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. Solid waste management system.	Public Utility Areas and Public Buildings. Cremation Ground / Crematorium, Burial Ground, Common Vault. Obnoxious or nuisance type industries (See Annexure II) Fuel Filling Stations		All uses other than specified.
7. PARK AND OPEN SPACE				
	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 and similar uses	Public Utility Areas and Buildings which will not affect the character/use of the area. Restaurants/ cafeteria incidental to main use - **Built-up area limited to 200m^2**		All uses other than specified.

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
8. HAZARDOUS ZONE				
	Isolation Hospitals Waste Management Plants Saw mills with timber yards, Industries other than obnoxious or nuisance type Quarrying Solid waste management system. Poultry/Cattle/Pig/Rabbit farms	Hazardous and Industrial uses like Funeral, Cremation and Burial grounds with incidental buildings, Trenching ground and related constructions, junk yards, Slaughter house, obnoxious or nuisance type industries		All uses other than specified.
9. DRY AGRICLTURE ZONE				
	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. Residential Buildings - **Built-up area limited to 300 m^2.** Orphanages, old age homes, Dharmasala, ashrams, mutts, madrasa. Clinics (Outpatient) and diagnostic centres - **Built-up area limited to 200 m^2.**	Cremation ground/ crematorium, burial ground, common vault Slaughter house Obnoxious or nuisance type industries Storage of explosive and fireworks, Gas Godowns, Dumping Yard.		All uses other than specified.

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
	Shops, professional offices, commercial offices and establishments, banking and financial institutions, Gymnasium, Yoga Centres, restaurants, canteens- **Built-up area limited to 200 m^2.** Police Post/Police Station, Post and Telegraph office, Fire Post / Fire station, Telephone Exchange, wireless stations and Telecommunication towers. Day Care and Crèche, Nursery / Kinder Garten / Primary & Upper primary schools. Library and Reading Rooms, Godowns / warehouses/ Storage – non hazardous – **Built-up area limited to 200 m^2.** Cottage industries, Service industries of non-nuisance Nature (See Annexure -I) Automobile workshops for 2/3 Wheelers Tot Lots/Parks/Play Grounds, Saw Mills, Weigh Bridge. Auditorium/Wedding Halls/ Community Halls **Built-up area limited to 750 m^2.**			

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
10. WET AGRICLTURE ZONE				
	Paddy cultivation Agriculture/ Horticulture/Fodder cultivation, Fish Farms/ Seed Farms/ Pump House/ Wells and Irrigation Ponds without any building construction. Constructions/ land developments in conformity with the Conservation of Paddy Land and Wet Land Act in force in lands designated as paddy land or wet land under the said Act.	Minor Public Utility areas & Public utility buildings which will not affect the character of the area 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.		All uses other than specified.
11. RIVER/WATERBODY				
	All existing waterbodies shall be conserved. Bridges, Side Protection walls, Bathing Ghats, Jetty etc. may be permitted based on community level requirements , subject to CRZ Notification in force in CRZ areas. Paddy cultivation and fish farming activities in Waterlogged areas			All uses other than specified.

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
1	2	3	4	5
12. SANDY SOIL				
	All constructions in this zone shall comply with the provisions of CRZ Regulations in force.			All uses other than specified.
13. ENVIRONMENTALLY SENSITIVE AREA				
	All constructions in this zone shall comply with the provisions of CRZ Regulations in force.			All uses other than specified.

32.3 GUIDELINES FOR LARGE SCALE PROJECTS

a) 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 Wet Agriculture Zone, 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 (Urban Affairs/Local Self Government Department) consisting of Chief Town Planner (Planning) concerned, of Kerala State Town and Country Planning Department and the Secretary, Kasaragod Municipality as members and the District Town Planner, Kasaragod District of the Kerala State Town and Country Planning Department as Convener and satisfying the following conditions:-

b) 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.

c) The developer shall produce before the committee, all required clearances from the State and Central Government agencies concerned.

d) 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 own cost. Adequate Memorandum of Understanding between the developer and Secretary of Local body concerned shall be undertaken to bring this into effect.

e) Maximum floor space index shall be 2 and Minimum access width shall be 12 meter.

f) The project shall be completed within a period of 3 years, if not specified otherwise.

ANNEXURE I

TYPE OF NON-OBNOXIOUS AND NON-NUISANCE TYPE OF SERVICE OR LIGHT INDUSTRIES PERMISSIBLE IN RESIDENTIAL ZONES.

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 industries.

ANNEXURE II

LIST OF OBNOXIOUS OR NUISANCE INDUSTRIES SUBJECT TO OBJECTIONABLE ODOURS, FUMES EFFLUENTS OR PROCESSORS TO BE LOCATED IN HAZARDOUS ZONES.

(Grouped under Indian Standard Industrial Classification)

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
(19) Manufacture of ammunition, explosive and fireworks.
(20) 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.