PONNANI 2035



Department of Town and Country Planning
Government of Kerala
&
Ponnani Municipality


GOVERNMENT OF KERALA
सत्यमेव जयते

PONNANI MASTER PLAN 2035

February 2019
PONNANI MUNICIPALITY &
DEPARTMENT OF TOWN AND COUNTRY PLANNING,
GOVT. OF KERALA
MASTER PLAN FOR PONNANI TOWN - 2035

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FOREWORD

കേരളത്തിലെ പ്രധാനപ്പെട്ട തുറമുഖ നഗരമാണ് പൊന്നാനി. പ്രാചീന കാല തുറമുഖങ്ങളിൽ ഒന്നായ തിണ്ടീസ് പൊന്നാനിയാണെന്ന് ചരിത്രം പറയുന്നു. കച്ചവടത്തോടൊപ്പം സംസ്ക്കാരങ്ങളേയും വിനിമയം ചെയ്ത നാടാണ് പൊന്നാനി. വിദേശ വ്യാപാരികളെ ഏറെ ആകർഷിച്ചിരുന്ന നാടാണിത്. കടലിന്റെ താരാട്ട് കേട്ട് ഉറങ്ങുന്ന ഈ പട്ടണം തീർത്ഥാടകരുടേയും വിനോദ സഞ്ചാരികളുടേയും ഇഷ്ട ദേശമാണ്. വടക്ക് ഭാരതപ്പുഴയും തെക്ക് പൂക്കൈതപ്പുഴയും, കിഴക്ക് കനോലി കനാലും, പടിഞ്ഞാറ് അറബിക്കടലും അതിരിട്ട പൊന്നാനി നഗരം ഒരു കൊച്ചു ദ്വീപാണ്. സ്പെഷ്യൽ ഗ്രേഡ് പഞ്ചായത്ത് ആയിരുന്ന പൊന്നാനി 1977 നവംബർ 15 ന് തേർഡ് ഗ്രേഡ് മുനിസിപ്പാലിറ്റി ആയി. 2004 ഒക്ടോബറിൽ ഈഴുവത്തിരുത്തി പഞ്ചായത്ത് പൊന്നാനി നഗരസഭയോട് കൂട്ടിച്ചേർത്തു. ഇപ്പോൾ പൊന്നാനി ഒരു ഫസ്റ്റ് ഗ്രേഡ് മുനിസിപ്പാലിറ്റിയാണ്. ഫിഷിംഗ് ഹാർബറും, കാർഗോ പോർട്ടും വ്യാപാര രംഗത്തെ കുതിച്ചു ചാട്ടത്തിന്റെ തുടക്കമാണ്. കൂടാതെ വിനോദ സഞ്ചാര മേഖലയിലും പുതിയ സാധ്യതകൾ പൊന്നാനിയിലുണ്ട്. വികസന രംഗത്ത് ഒരു കുതിച്ചു ചാട്ടത്തിന് മുന്നൊരുക്കം നടത്തുന്ന ഈ വേളയിൽത്തന്നെ വികസന പ്രവർത്തനങ്ങൾ കൃത്യവും, കാര്യക്ഷമവും സർവ്വോപരി പാരിസ്ഥിക, സാമൂഹിക സന്തുലനം നിലനിർത്തുന്ന രീതിയിലും ക്രോഡീകരിക്കപ്പെടേണ്ടത് അത്യന്താപേക്ഷിതമാണ്. നിലവിലുള്ളതും, വരാനിരിക്കുന്നതുമായ വികസന ആവശ്യങ്ങൾ മുന്നിൽ കണ്ടു കൊണ്ട്, ലഭ്യമായ വിഭവങ്ങളുടെ കാര്യക്ഷമമായ വിനിയോഗത്തിലൂന്നിക്കൊണ്ടുള്ള വികസന നയം രൂപപ്പെടുത്തേണ്ടതുണ്ട്. ഇതിലേക്കായി സമഗ്രവും, ശാസ്ത്രീയവുമായ പഠനങ്ങൾ വഴി, വരുന്ന ഇരുപത് വർഷത്തേക്ക് അനിവാര്യമായ വികസന വിശദാംശങ്ങൾ പ്രതിപാദിക്കുന്ന മാസ്റ്റർ പ്ലാൻ തയ്യാറാക്കാനായി 2011 ഡിസംബർ 19-ാം തീയതി ചേർന്ന മുനിസിപ്പാലിറ്റി യോഗം തീരുമാനി.ച്ചു. പൊന്നാനി മുനിസിപ്പാലിറ്റിയും, കേരള നഗരഗ്രാമാസൂത്രണ വകുപ്പും, മറ്റ് വിവിധ മേഖലകളിലുള്ള വിദഗ്ദ്ധരും, ഉദ്യോഗസ്ഥ വൃന്ദവും, സർവ്വോപരി നാളത്തെ പൗരന്മാർ ഉൾപ്പെടുന്ന പൊതുസമൂഹവും പല ഘട്ടങ്ങളിലായി ചേർന്നു കൊണ്ട് തയ്യാറാക്കിയ "പൊന്നാനി മാസ്റ്റർ പ്ലാൻ 2035" ഇവിടെ യാഥാർത്ഥ്യമാവുകയാണ്. പൊൻ നാണയങ്ങളുടെ നാടായിരുന്ന പൊന്നാനി ഇനിയും പൊന്നാകട്ടെ എന്ന് ആശംസിക്കുന്നു പ്രസ്തുത പ്ലാൻ അതിവേഗം പ്രവർത്തിപഥത്തിൽ എത്തിക്കുന്നതിനായുള്ള യജ്ഞത്തിലും നമുക്കൊരുമിച്ച് കൈകോർക്കേണ്ടതുണ്ട്, നമ്മുടെ നഗരത്തിന്റെ നല്ല നാളേക്കായി .....!

സ്നേഹപൂർവ്വം

ശ്രീ സി പി മുഹമ്മദ് കുഞ്ഞി
ചെയർമാൻ
പൊന്നാനി മുനിസിപ്പാലിറ്റി

PREFACE

Rapid urbanization evident in the state has been the result of unbridled urban sprawl and population explosion rather than enlargement of production base and the related economic development. Anthropogenic threats to the environment due to this trend of widespread urbanization occupying a large percentage of the state's landed resources are not fully comprehended by the civil society. Limiting the ecological and physical foot prints of urbanization to an environmentally sustainable level is crucial for the overall development of the state both in terms of environmental quality and economic sustenance. The 74th Constitutional Amendment and subsequent state legislations have put forward a paradigm shift in the development planning process. The focus has shifted from physical planning to spatial planning for economic development. The inclusiveness of the development process is another important consideration in the nation at present. The Planning Commission, Government of India, in the Approach to 12th Five Year Plan, articulated this view by saying "Urban planning cannot be limited to spatial allocations and engineering solutions: It must encompass and connect various sociotechnical considerations too". The development plan has multiple objectives in the 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. I take this opportunity to appreciate the officials of the Malappuram District Office of the Department, especially Smt. Isha P.A, Sri. K.V Ranjith and Sri. K.V Abdul Malik, Town Planners, for the preparation of this development plan. The Planning section played anchor role in this regard, right from conceptualization to completion. I also appreciate the consistent efforts of Smt. Girija K S, Chief Town Planner, Sri. Ramanan K, Chief Town Planner (Rtd.), Smt. T.M. Sudha, Chief Town Planner (Planning) (Rtd.), Sri. Ajayakumar, Chief Town Planner (Rtd.), Sri. K Devarajan, Additional Chief Town Planner (Rtd.), Smt. Darly D S Mony, Chief Town Planner (Rtd.), Smt. Ushakumari P.R, Senior Town Planner, Sri.Jayakumar J, Smt. Asha Ajoy Ghosh, Smt. Sabithamini C K, Sri. Ravikumar P, Town Planners and other officials of the office of the Chief Town Planner (Planning). Certainly the development plan for Ponnani will provide a frame work for development of the town for years to come.

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

Thiruvananthapuram
Date:

ACKNOWLEDGEMENT

The preparation of Development plan for Ponnani town was taken up by the end of the year 2011, following the direction of the Government and felt need of the Municipality, in the absence of a development plan for the town and changes in development planning process brought forward by the 74th Constitutional Amendment and the subsequent state legislations. A methodology was evolved for the preparation of development 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 development 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 development plan is inbuilt. We have heavily relied on statistical data from various development departments. Their readiness to share the data is gratefully acknowledged. The collection of data and analysis would not have been possible without the active involvement of Spatial Integration Committee under the Chairmanship of the Municipal Chairpersons Smt. Padinharakath Beevi and Sri. C P Muhammed Kunhi. The unique leadership provided by Smt. Girija K.S, Chief Town Planner, Smt. T.M Sudha and Sri.K Remanan, Smt. Darly D S Mony, Sri. Shaji Joseph , Chief Town Planners (Rtd.) and Sri. Gigi George, Chief Town Planner (Planning) has been a constant source of inspiration. Also mention the efforts of Sri. Ajayakumar, Chief Town Planner (Rtd.) and Sri. K Devarajan, Additional Chief Town Planner (Rtd.). The resourcefulness of Smt. Usha Kumari P.R, Senior Town Planner, Smt. Asha Ajoy Ghosh, Smt. Sabithamini C K and Sri. Ravikumar P, Sri.Jayakumar J, Town Planners of the Planning section has been a constant guidance throughout the project. The other staff members of the Office of the Chief Town Planner (Planning), have been highly helpful in giving various inputs for the project. Sri. Khaja Sharafudheen, Smt. Athira Ravi, Smt. Leelitty Thomas, Smt. Preeja Padmanabhan Mavoor, and Sri. Mohammed Musthafa K, Deputy Town Planners and Smt. Reni L.J, Sri. Shameer K, Sri. Hamza M and Sri. Sasidharan Pillai Assistant Town Planners have spear-headed office and field activities in the project. The assistance offered by the statistical wing of this office and Sri. Sreekanth O and Kum. Ranjusha V, Planning Assistants is remarkable. The efforts put in by Sri. Saheer Poovanthodi, Smt. Sini G Nair, Sri. Anilkumar, Town Planning Surveyors and Smt. Sudha T, Computer Assistant for the preparation of the report needs special mention. Smt. Reshma C.R has efficiently co-ordinated the Traffic &Transportation Survey, which was conducted in-house.

Smt. Isha P A
Town Planner
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Date :

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PART I

STUDY AND ANALYSIS

PART II

INTEGRATED DEVELOPMENT VISION

PART III

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PART IV

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ANNEXURES

1 NEED FOR THE PLAN

Ponnani town is a known trade centre in the history of Malabar and is situated in the Malappuram District. Ponnani, the taluk headquarters is enriched with rivers, lakes, canals and sea shore. With large facilities for eco tourism options, rich tradition, trade and service, the city is blooming as one of the major urban centre in Malappuram District. The chapter gives an insight into the town and specifies the need for a Master Plan in the area. For this the Master Plan area/ Ponnani town is delineated as the Ponnani Municipal area.

1.1 The Town

Ponnani is an ancient coastal town and an important fishing center in Malappuram District. Spread over an area of 24.82 km^2, the town is situated at the mouth of Bharathapuzha, the second longest river of the State, and is bounded by the Lakshadweep Sea on the west. Thus the town was prominent as a scenic, coastal town since ancient times. Being a major coastal town, the place has much historical significance too. It is often regarded as one of the oldest ports in South India and has contributed to the trade and economy of Malabar from very early times.

Ponnani formerly known as Ponani and Paniyani is sometimes roughly identified with the port Tyndis of the Roman accounts. Ponnani taluk is the smallest taluk in Malappuram District. Panvel-Cochin national highway NH 66 (formerly NH 17) passes through the heart of the town. Ponnani has found a renowned place in the history related to Islamic history. The town,Ponnani today emerged as a focal commercial point in Malappuram district as a coastal town with fishing as one of its main commercial activities. The construction work already started in one of India's biggest fishing harbour at Ponnani by the Government of Kerala in 2011. The harbour was constructed by reclaiming 18 hectares from the estuary where the Bharathapuzha falls into the Lakshadweep Sea. This is one of the rare places in the world, where peculiar marine phenomenon, called 'Chakara' in which a large number of fishes and prawns throng together during a particular season, as a result of mud bank formations, where it has proved to be a boon for the local fisher folk.

1.2 Need for a Master Plan

Every growing urban area needs a Master Plan. A Master Planspells out development strategies and policies in the physical, social andeconomic aspects suitable for the planning area for

the next 15- 20 years. The need for a Master Plan for Ponnani town arose due to the four major factors. They are

1. Ponnani is an emerging centre in Malappuram district next to Tirur and Chavakkad Municipalities. As a growing urban centre, Ponnani will have to face many of the urban problems like growth of slums, migration, solid waste disposal, traffic congestions, environmental degradation etc. Only a strategic Master Plan will help to attend to these problems.
2. Ponnani is the taluk headquarters of Ponnani Taluk in Malappuram district. As a taluk headquarters, the population to be served is 379798, as per 2011 census, out of which 161956 is rural population. Ponnani municipal area should provide the urban amenities and facilities to this service population and at the same time should maintain a give and take relationship with them for self existence. For this, the land use of Ponnani should be designed scientifically which can be ensured by an efficient Master Plan.
3. Based on urbanization studies in Malappuram District, Ponnani should be a facilitator which acts as a tertiary activity centre for a service population of 412148by 2021. Surrounding 5 local bodies will depend on Ponnani for the urban facilities.
4. The sanctioned cargo port and existing fishing harbour in Ponnani will really change the face and growth pace of the present Town. Once the cargo port starts functioning, the changes in and around the Town will be drastic with increased goods movements, high commercial developments, congested traffic, growth of slums, social and economic changes. Since the National Highway passes through the core area of the town, there will be overcrowded built spaces within the town area. A Master Plan with proper studies, proposals and development controls can solve this problem very effectively.

Apart from these major factors, long term perspectives for development have to be formulated as an urban local body having Municipal status. Also the database of the Municipality should be improved using modern scientific techniques. Therefore a Master Plan should be prepared with an integrated development vision which specifies development suggestionsfor the comprehensive development of the planning area.

1.3 Planning area Delineation

Ponnani is the only coastal town and an important fishing centre in Malappuram District.It is a tidal port and one of the oldest ports in Southern India.Inland water way (Connolly Canal) adds to the importance of town.It is an important centre for education in the Philosophy of Islam. The town is bounded by Lakshdweep sea on the west, Bharathapuzha river on the North, Kanhiramukku River on the South, Kalady and Edappal Panchayats on the east and it bears a natural boundary. Hence the administrative boundary of the municipality is considered as the planning area.

1.4 Inference

As an emerging urban centre which acts as a service provider and a facilitator to the nearby local bodies and which look forward to the sanctioned cargo port and existing fishing harbour, Ponnani surely needs an integrated Master Plan for a dynamic planned development which conserves the rich heritage, vast area of water bodies and other natural resources.

2 EARLIER PLANNING EFFORTS AND STUDIES

A good urban planning product can help to promote development in an area as well as solve some of the problems that face urban areas such as high population and sanitation problems. PonnaniMaster Plan 2035 is the first Master Plan attempt in the area.

2.1 CBD Level Plans

On 15th November 1977, Ponnani became a third grade municipality having an area of 9.32 sq. km. On 2nd October 2000 the area of the Municipality was increased to 24.82 sq.km by adding Ezhuvathiruthi Grama Panchayath comprising of Ponnani Nagaram and Ezhuvathiruthi villages. The town centre is concentrated on the west side of municipal area in between the Lakshdweep sea and Connolly Canal. NH 66 bisects the town and new town is being developed at Chamravattom Junction. Government offices, trade and commercial establishments, religious centres, burial grounds, schools and hospitals, bus stands etc are scattered in the town. The sanctioned cargo port and existing fishing harbour will really change the face and growth of the town. There is no existing sanctioned master plan for the town.

The area on the western side of the canal is heavily built up and the area on the eastern side is not so. The road system in the central area is far below satisfactory. There are no organised shopping centres and most of the taluk level offices are accomodated in rental buildings. There are hardly any recreational or other facilities worth mentioning. In order to balance the development on both sides of the Connolly canal and to provide adequate facilities in the town a detailed town planning scheme for the central area of Ponnani Municipality was sanctioned as per G.O (MS) 165/87/LAD dated 24-07-1987. The scheme covers an area of about 75.39 hecatres. The scheme variation programme 1 is sanctioned as per G.O (MS) 97/2010/LSGD dated 18-05-2010. The developments in the scheme area are controlled by the zoning regulations of the said scheme. No other detailed town planning scheme exists for the Town. Hence rest of the town is growing in an uncontrolled manner. The major factors which hinder the development of Ponnani are the traffic congestion and associated problems in the town due to narrow roads and lack of parking facilities. The town also lacks good quality spacious commercial buildings like shopping malls, markets and also spacious industrial buildings. Due to the increase in nuclear families demand for residential plots increased and

much of the waterlogged swampy lands and ponds are filled up and leveled for constructing households.



Figure 2-1Detailed Town Planning Scheme Location in Ponnani Town

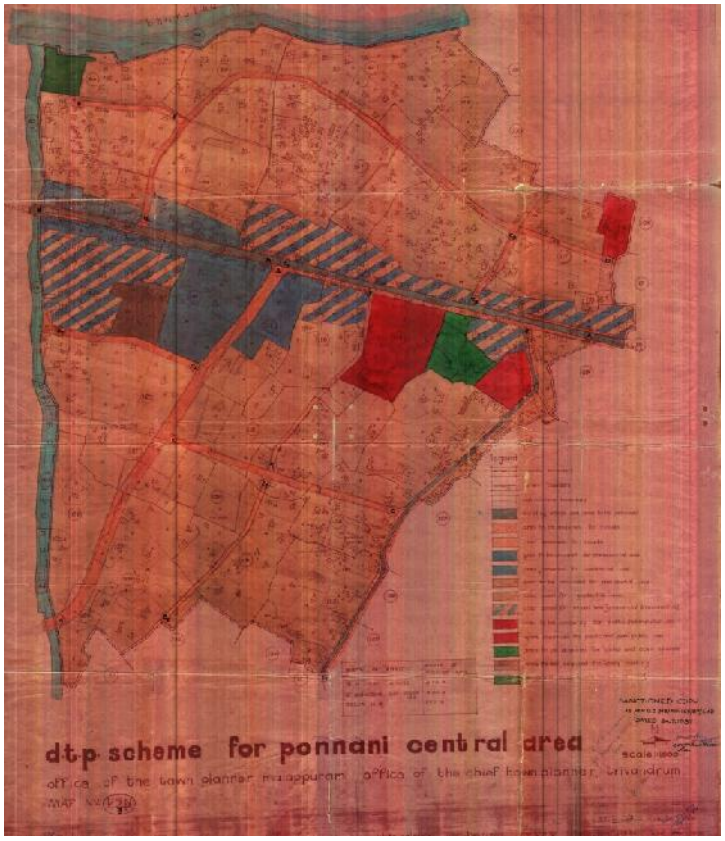


Figure 2-2 DTP Scheme for Ponnani Central Area

Taking into consideration the development needs of the town and provision of sufficient infrastructure facilities catering to the needs of the people and to ensure sustained development promoting the growth of the town with optimum utilization of available resourcesas per the request of the local body under Resolution number E2-15958/11 on 19.12.2011, this Master Plan prepation was initiated by the Department of Town and Country Planning in 2012.

An integrated master plan with adequate political decisions can surely change and control the growth of the town and provide the basic amenities to the public.

2.2 Plan for and by the people

One of the major paradigm shift brought about by the 73rd & 74th constitutional amendments and the subsequent state legislations is the participation of common people in the planning process. The methodology for the preparation of this development plan was also formulated ensuring people's participation at all levels of plan preparation and implementation. The Spatial Integration Committee formed at the municipal level and chaired by the Chairperson of the municipality spear-heads the plan making process. The Municipal Secretary was the convenor and the Municipal Engineer the joint convenor of this committee. One representative from each of the working groups (the subject wise working group, constituted for the formulation of annual plans of the municipality), Town planner and a resource person (a non-official who has enough knowledge and experience to advice the committee on matters related to spatial planning) were the members of the committee.

The collected data and their analysis were presented in a one day workshop conducted at Mas auditorium on 26.06.2013 for evaluating the collected data. The workshop was attended by the councilors; SIC members, working group members, department officers and representatives of various stakeholder organizations.

Detailed Focus Group Discussions were conducted with the stakeholders, regarding the problems, their solutions and the development potential of the town. Various views, suggestions and requirements proposed by the direct end-users were discussed in detail and were noted so as to be addressed in the Master Plan. The following stakeholder groups forming a cross section of the society were consulted with.

- Chamber of Commerce on 19.09.2012
- KARMA on 06.10.2012
- Licensed Engineers And Supervisors Federation(LENSFED) on 09.10.2012

2.3 Inference

The town has no statutory master plan currently in place. The sanctioned cargo port and existing fishing harbour will really change the face and growth of the town which leads to densification and congestion of the town. Hence an integrated Master Plan is urgently required for the Ponnani town area.

3 PROFILE OF THE TOWN

A detailed study of the urban profile of the town is an important step during the preparation of Master plan as this forms a platform for the further studies about the area and this study should be updated during every attempt of plan preparation. The chapter discusses the profile of Ponnani Municipal area describing its location, topography, climate, administrative set up and socio-economic details.

3.1 Location

Ponnani, the coastal municipal town in Malappuram District is located between North latitudes 10^0 47' 00" and 10^0 47' 12" and East longitudes 75^0 55' 00" and 75^0 54' 59". NH 66 Panvel - Kochi passes through the core area of the Municipality. Ponnani is 55 Km away from Malappuram, the head quarter of the District. It is bounded by Lakshadweep Sea in the West, Bharathapuzha River in the North, Kanhiramukku Puzha in the South, Kalady and Edappal Grama Panchayats on the East and it bears a natural boundary. Hence the administrative boundary of the Municipality is considered as the planning area and comes under Ponnani Parliament and Assembly Constituency. The scheme area is surrounded by the back waters, river Bharathapuzha and the Arabian Sea. In general, the location is waterlogged with lots of swampy lands and small ponds made for small scale agriculture activities, by the local people.

3.2 Topography

On the basis of the physical and geographic features, the town belongs to the low land region. The terrain is generally flat with an average level difference 3 to 5m. Though the underwater column is rich, the quality is highly affected due to the presence of iron and saline intrusion.Soil is sandy. Water is available at 3.7m from ground level within the municipal area. Town is having 8.25 km of coastal strip and an average elevation 5m above mean sea level. Town is borded by water on three sides and connected to main land. Cannolly Canal, one of the oldest inland navigation system is passing through the municipal area connecting the Bharathapuzha River and Kanjiramukku River.

The Bharathapuzha or the Ponnani river is the second longest river of Kerala, originating from the Anamalai Hills (1964 m from MSL) in the Western Ghats. The river below the confluence of Bharathapuzha and Gayathripuzha is called the Ponnani River. It flows through

the districts of Palakkad, Malappuram and Thrissur and drains to the Lakshdweep Sea at Ponnani. River alluvium is seen along the river. The coastal zone is covered with sand and sandy clay soil. In general, soil is fertile and is suitable for any type of cultivation. Deposits of limeshells are found in the coastal belt. The coastal sand of Ponnani contains minerals like Ilmanite and Monosite.

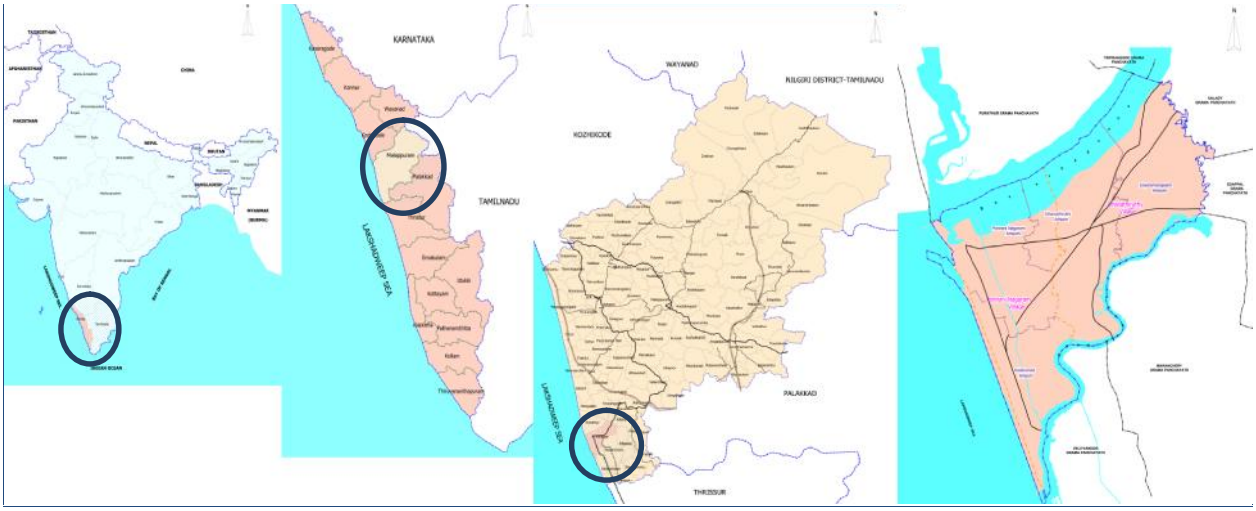


Figure 3-1 Location and Boundaries



Figure 3-2 Terrain map of Ponnani town area

3.3 Climate

Ponnani has a tropical climate. In most months of the year, there is significant rainfall in Ponnani. There is only a short dry season from January to April and it is not very effective. The average annual temperature in Ponnani is 27.4 °C. The average annual rainfall is 2877 mm. The driest month is January with 3 mm. Most precipitation falls in July, with an average of 711 mm. The warmest month of the year is April with an average temperature of 29.5 °C. In July, the average temperature is 25.6 °C. It is the lowest average temperature of the whole year. The difference in precipitation between the driest month and the wettest month is 708 mm. The average temperatures vary during the year by 3.9 °C. The average relative humidity in the area is 72%.Ponnani is unique with its specialty to observe the adverse affects of both, draught and flood almost every year.

3.4 Administrative set up

Municipalities are the urban local governments that deal with civic functions and local development functions in the municipal area. The 74th Constitutional amendment provided for a national framework for municipal governance in the country andKerala is following that pattern since 1994. Consequent to this amendment, several changes have occurred in the functions, powers, and responsibilities of the municipalities and the states had to make necessary amendments to the legislation on the local governments in the respective states. Kerala Municipalities Act 1994, enacted as per the constitutional amendment, governs the pattern, functions and services of the municipalities in Kerala. The Kerala Municipalities Act of 1994, an integrated act for the municipalities and corporations in the state, laid out the constitution of the town panchayats, municipalities and municipal corporations.

As per the details of Department of Urban Affairs, Ponnani is a first grade Municipality in Malappuram District. Ponnani special grade Panchayath became Gr.III Municipality on 15th November 1977 with 24 wards and expanded by attaching Ezhuvathiruthy panchayath in October 2004 to the present status, having 51 wards. It has an administrative area of 24.82 sq.km spread in the two villages of Ponnani Nagaram and Ezhuvathiruthi. Ponnani is the headquarters of Ponnani Taluk and forms part of Ponnani Parliament Constituency

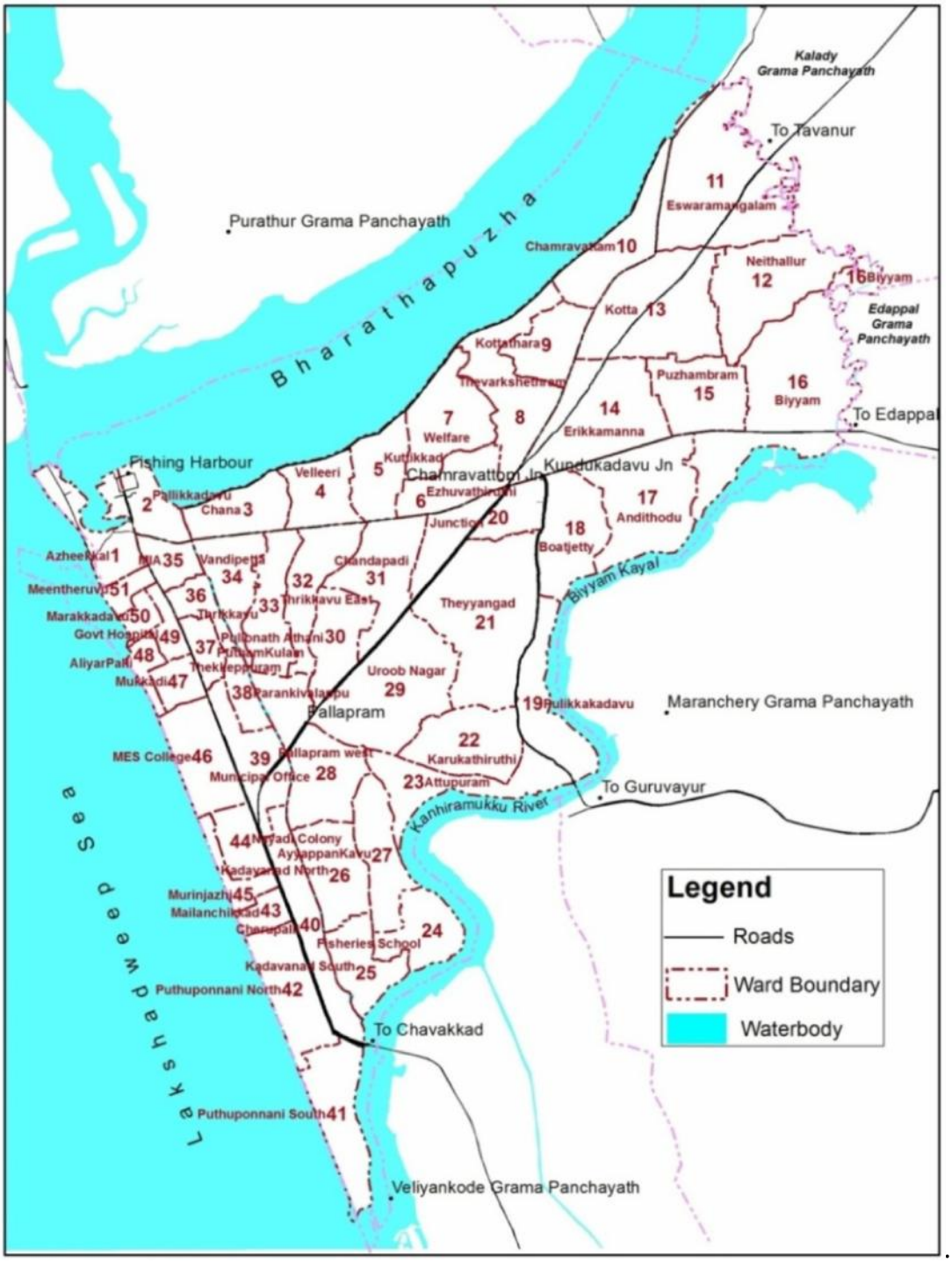


Figure 3-3Administrative wards -51

There are 4 desoms namely Puzhambram, Punathiruthi, Ponnani Nagaram and Puthiya Ponnani and 4 amsoms namely Eswaramangalam, Ezhuvathiruthi, Ponnani Nagaram and Kadavanadin the Municipal area. The number of revenue wards in the Municipal area is 44 and

the number of electoral wards is 51. As per 2011 census the total population is 90491 persons with a density of 3646 persons per sq.km living in 51 wards. Figure 3.2 shows the 51 administrative wards of Ponnani Municipal area.

3.5 Socio-economic aspects

As per 2011 census, the literacy rate of PonnaniTown is 90% which is lower than the State and District average of 94% and 93.57% respectively but shows an increase from 84.6% in the previous decade. The rate is less when compared to other towns in the District.

The general sex ratio of the town is 1123 which is greater than the State average (1084) and District Average (1098) and the child sex ratio is 967 which is also higher when compared to the State (964) and the District (965).

As per BPL Survey conducted in 2009, 50.92% ofthe families in the town are classified as BPL.According to the socio economic survey, the pattern of average monthly income perhousehold is worked out and is shown in Figure 3.3. 79% of the households have anincome of less than Rs. 1000/- per month. 10% of households earn Rs.1000/- to 3000/- permonth. 8% of the households has a monthly income between Rs. 3000 and Rs. 8000/-. Only 3% of the households earn more than Rs. 8000/- per month. This givesan insight in to the prevailing economic conditions of the town.

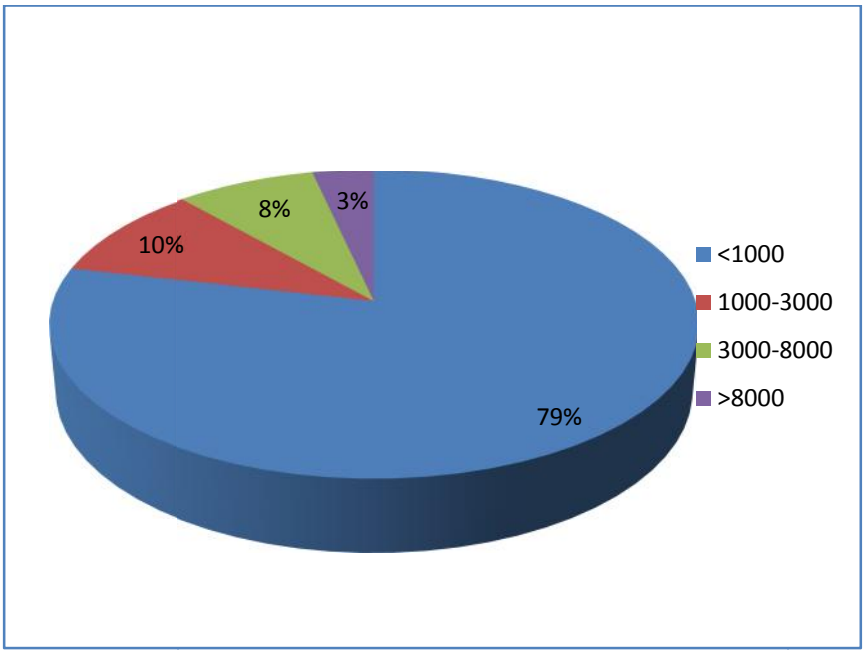


Figure 3-4Monthly Household Income (Source: Socio economic Survey 2012)

The economy of Ponnani depends on fishing, agriculture, local businesses and remittance from Gulf. The work participation rate (25.21) is low compared to the District (30.75) and the State (34.78). Also the female work participation rate (5.31) is very low in the Town when compared to Malappuram District (7.63) and Kerala State (18.23).The falling prize rate of agriculture and fisheries commodities, closure of small scale, heritage and other traditional industries etc. aggravated the economic decline of the town.

3.6 Inference

Ponnani is a first grade municipality having 51 administrative wards. The scheme area is surrounded by the back waters, river Bharathapuzha and the Arabian Sea. The town belongs to the low land region with flat terrain and sandy soil. The Townis traditionally famous and blessed due to the presence of the natural harbour and it was one of the premier trade centers of the Malabar area.

4 HISTORY AND REGIONAL LINKAGES

Ponnani enjoys a noteworthy position in the history that dates back to centuries. This town was once the second capital of Malabar and served as an abode of power for Samoothiri Kings. A brief description of the history, regional linkages and connectivity is meant in this chapter.

4.1 History

Ponnani has a history that dates back to centuries. Remarks about Ponnani Juma Masjid can be found in the colonial historian William Logan's Malabar Manual. This town was once the second capital of Malabar and served as an abode of power for Samoothiri Kings. It enjoys a noteworthy position in the history of Indian Freedom as many freedom fighters emerged from this small town.Ponnani is popularly known as 'Makkah of South India' for it has been a prominent Islamic education center for many centuries.It is the headquarters of the Moplah or Mappilla community of Mahommedans, with a religious college and many mosques, one of which is said to date from 1510.

According to some historical records, Ponnani's history dates back to 2000 years. There are differences of opinion regarding the evolution of the name 'Ponnani'. Legend has it that the Ponnana (meaning a type of elephant in Malayalam) was auctioned in the Brahmin temples here and thus came to be known as Ponnani. Yet another legend says that a king called 'Ponnan' ruled the land and was thereafter called Ponnani. Historical records rather point to another truth. The use of Gold coins ('Ponn - nanayam' in Malayalam). This represents the wealth that was brought in by the trade relations with the Arabs and Europeans.

Malik Ibn Dinar, the first islamic missionary to come to Kerala, is believed to have visited Ponnani. William Logan, the British historian records in his Malabar Manual that the Ponnani Juma Masjid was built in 925, Hijrah Era.Ponnani was considered as the second capital of Malabar during the reign of Zamorins of Calicut and was the headquarters of Kunjali Marakkar, the Naval Chief of Zamorin. In the early period, Ponnani was considered the Al Azhar University of Kerala, for its great religions schools and teachers. Ponnani was called the "Small Mecca" of South India. It has attained a status as an important centre for education in the philosophy of Islam. Hyder Ali of Mysore conquered Malabar in 1766 and established an outpost in Ponnani. During his son Tipu Sultan's regime Ponnani became an important centre for Islamic studies. Tipu developed the port at Ponnani for trade and security reasons. Ponnani

was the southernmost town of Tipu's regime. After Tipu's defeat in 1799, the British took the territory of Malabar under their control. Trikkavu in Ponnani was the summer capital of Zamorins of Calicut, the rulers of Malabar.

Ponnani is a name very much associated with the nationalist movements in the freedom struggle. A number of prominent leaders from this taluk had contributed in soul and spirit towards realizing the dream of independent India. Role of great freedom struggle leaders like Zainuddin Makhdoom II, who wrote a book Tuhafat Ul Mujahideen, which is the first authentic book on Kerala history, to inspire people to fight Portuguese invasion is remembered for ever. Ponnani has also contributed a great deal to the cultural and literary heritage of Kerala.

Ponnani is well known for its numerous mosques. One of the oldest mosque Ponnani Juma Masjid is a religious and heritage monument five hundred years old. People from Ponnani had contributed much for Kerala's rich cultural treasure and plays a significant role in the cultural history of Kerala. Thunchathu Ezhuthachan, who is considered as the father of the modern malayalam language, Vallathol Narayana Menon, Kuttikrishna Marar, Krishna Panikkar, Illustrious novalists P.C. Kuttikrishnan (Uroob), M.T. Vasudevan Nair, Madhavikkutty andC. Radhakrishnan, Edassery Govindan Nair who is a famous poet, well known painters are K.C.S Panikkar, Namboothiri, Edassery Govindan Nair are some of the personalities linked with Ponnani.



Figure 4-1Ponnani in 1930

4.2 Regional Linkages

The town is bounded by Bharathapuzha river in the North, Kanjiramukku river in the South, Edappal and Kaladi Grama Panchayats in the East and Lakshdweep Sea in the West. Nearby Grama Panchayats of Ponnani is shown in Figure 4.2. The nearby panchayats include Tripangode, Purathur, Kalady, Edappal, Maranchery and Valiyankode. Figure 4.3 shows the regional linkages of the town.Ponnani is identified as one of the second order settlement in Malappuram district based on the economic activity of the town, as per the District Urbanisation Report 2010.

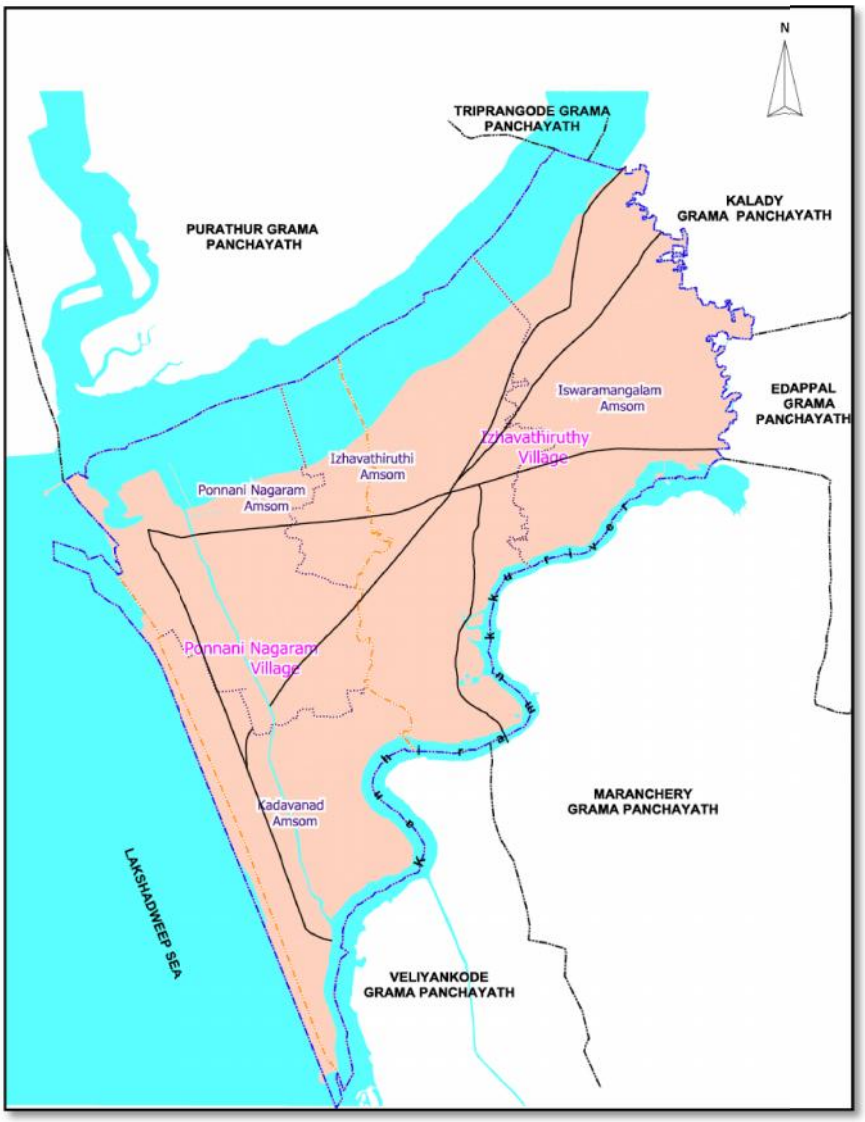


Figure 4-2Ponnani and nearby grama panchayats

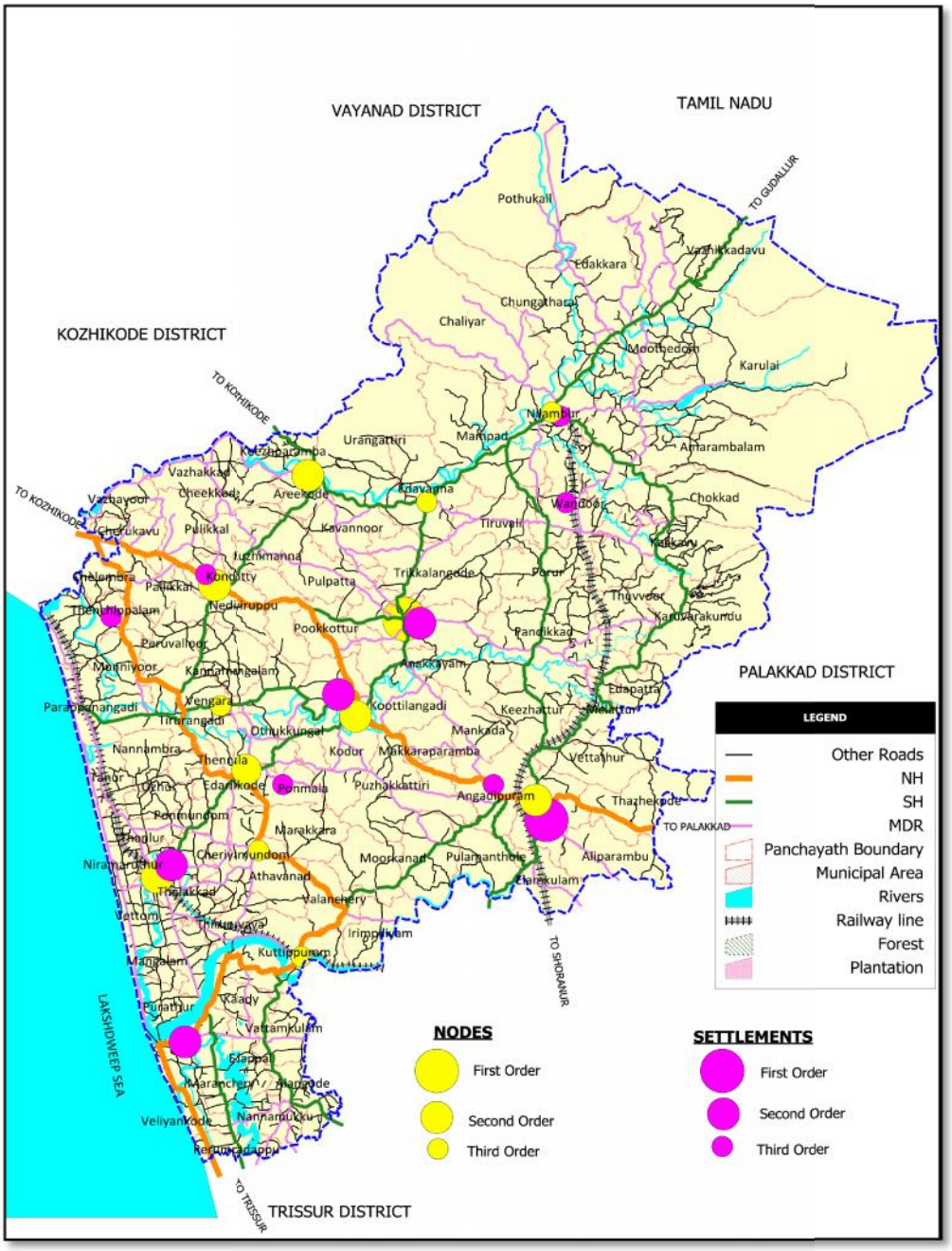


Figure 4-3Regional linkages of Ponnani (Source : DUR 2010)

4.3 Connectivity

Ponnani Townhas a good connectivity. Panvel Cochin National Highway (NH 66) passes through Ponnani and Guruvayoor – Ponnani State Highway (SH62) joins at Kundukadavu on Palakkad- Ponnani Road which link this place to other parts of the State. The railway stations which provide rail connectivity to the town areKuttippuram, Tirur and Guruvayoor which are 19 Km, 21 Km and 28 Km away from the Townrespectively.Calicut International Airport at Karipur

located 55 Km away from the town, is the nearest airport. The inland water transport system namely Connolly Canal is also passing through the town.

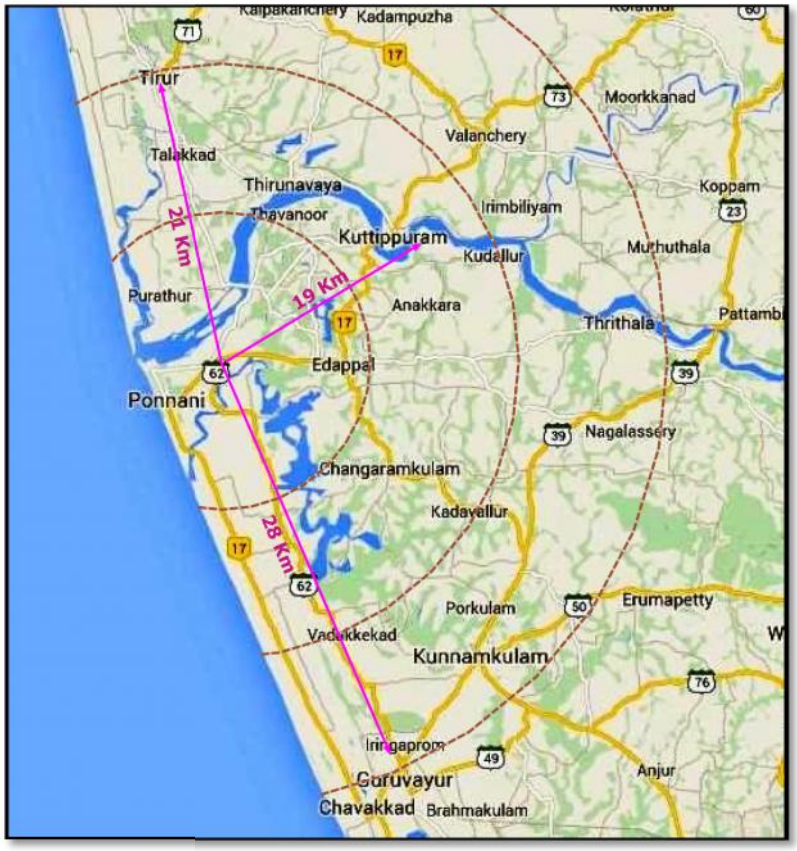


Figure 4-4 Regional Connectivity

The cargo port shall make use of 15 m wide Karma Road which is being developed by government of Kerala along the southern bank of Bharathapuzha River connecting the port area to NH 66 near the Chamravattom Barrage and the existing road network of NH 66.

4.4 Spatial Role in the District

Figure 4.4 depicts the spatial structure of the district. In the west, the coastal strip is segregatedfrom the rest of the District by railway line running in the north-south direction. This isa constraint on connectivity. The plantation and forest resources are concentrated in theeastern high land region. The economic activities, various land uses, workers and peopleare almost evenly distributed in the rest of the District. The urban nodes are also evenlydistributed showing a dispersed urban growth. In addition to Ponnani, there are sixmore municipalities in the District namely, Malappuram, Tirur, Manjeri, Perinthalmanna, Kottakkaland Nilambur.

Of the seven municipalities in the District, Malappuram Municipality is the administrativeheadquarter of the District. Facilities related to district administration are concentrated inMalappuram Municipality, around the Civil Station, which houses major offices like theDistrict Collectorate, District Treasury, Regional Transport Office, Employment Exchange,Office of the District Town Planner, District Panchayath Office and so on.Tirur Municipality is considered as the gateway to the District as it houses the oldest railwayline of the State and the major railway station of the District, on theShoranur - Mangalore section of Southern Railways, under Palakkad Railway Division. Tiruralso gains importance due to the presence of foreign goods markets which attract customersfrom allover the region.

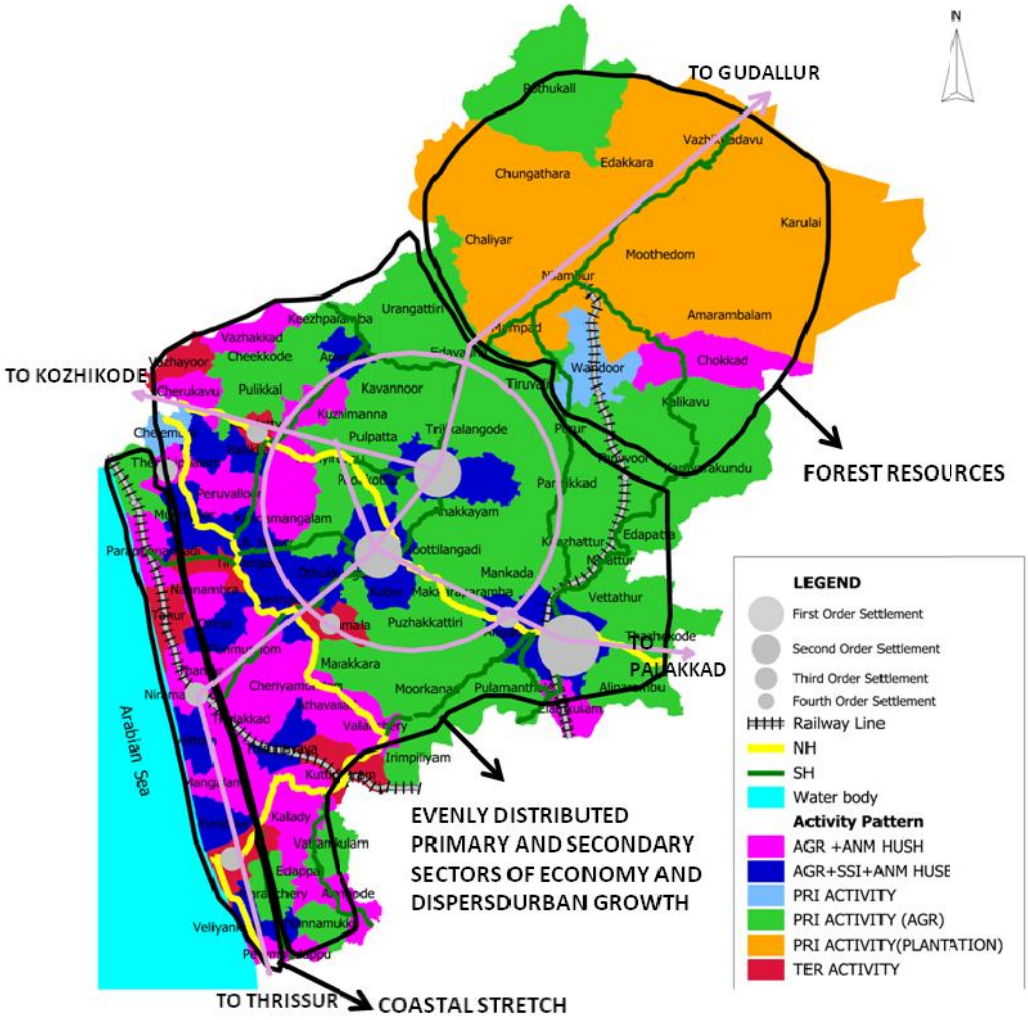


Figure 4-5 Spatial structure of the Malappuram District (Source : District Urbanisation Report 2010)

Perinthalmanna is an important healthcare facilities provider, commercial node and an intermediateservice center between various important cities within and outside the state. Manjeri Municipality is the largest municipality in the District in terms of area and population. Manjeriis one of the major and oldest commercial centers of the region and also houses major institutionslike the Govt. Medical College.Nilambur, the forest reserve town well known for Nilambur teak plantations, houses the NilamburRoad Railway Station- last station of the Nilambur–Shoranur railway line, Teak museum and places ofcultural and heritage importance.Kottakkal is a well known center for Ayurveda; the Kottakkal Arya Vaidya Salaattracts patients and health tourists from the worldover. Kottakkal Municipality is a major transportation node in the District, as the NationalHighway 66 (Panvel ~ Kochi), and the State highway 71 (Malappuram ~ Tirur) intersectsin the town.

Ponnani is the only coastal municipal town in the District, and a major fishing harbour.Ponnani,once an important centre for education in the philosophy of Islam and the second capitalof Kingdom of Calicut during the reign of Zamorins, is one among the oldest port townsin the State. Ponnani acts as a gateway to southern districts.

4.5 Inference

With a history that is culturally rich and ethnically diverse, Ponnani carves itself a niche in the history of Malabar and the country as a whole. This tiny sea side town was the naval base of Kunjali Marakkar, the army chief of the Samoothiri, whose reign is known as the 'Golden era' of Malabar. A good masterplan can retrieve the old history and prejudice of the town at the same time dealing with modern issues.

5 DEMOGRAPHY

Demographic data analysis is essential for any planning process and will lead to many findings essential for a planned development of an area. The size of population, its growth rate, density, concentration pattern and population projections for the Town are discussed in this chapter.

5.1 Population

The population of Malappuram District is 4112920 as per Census 2011. This comes to about 12.31% of the State's population. Table 5.1 shows the increase of population from 18.5 lakh in 1971 to 41.1 lakh in 2011.

Table 5.1Total Population

	1971	1981	1991	2001	2011
Kerala	21347375	25453680	29098518	31841374	33406061
Malappuram	1856362	2402701	3096330	3625471	4112920
Ponnani	55596	67640	82522	87495	90491

Source: Census of India

Table shows that Malappuram District has a linear increase of population from 1856362 to 4112920 (ie.2.2times) from 1971 to 2011.But during the same period population of Ponnani increased 1.62 times only. The population of Ponnani Town as per 2011 census is 90491 which form about 2.2% of Malappuram District as shown in Figure 5.1.

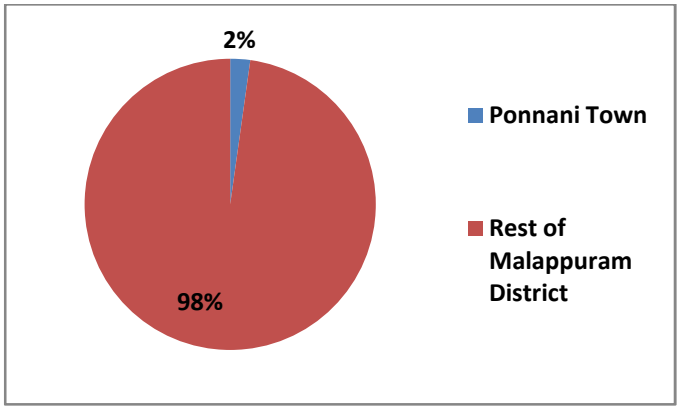


Figure 5-1Population of Ponnani as percentage of District population
Source: Census of India 2011

Figure 5.2 shows the change in population in Ponnani Town throughout the years and shows that the population in the Town is increasing. Ponnani ranks second while comparing with other urban local bodies in the District as shown in the Figure 5.3.

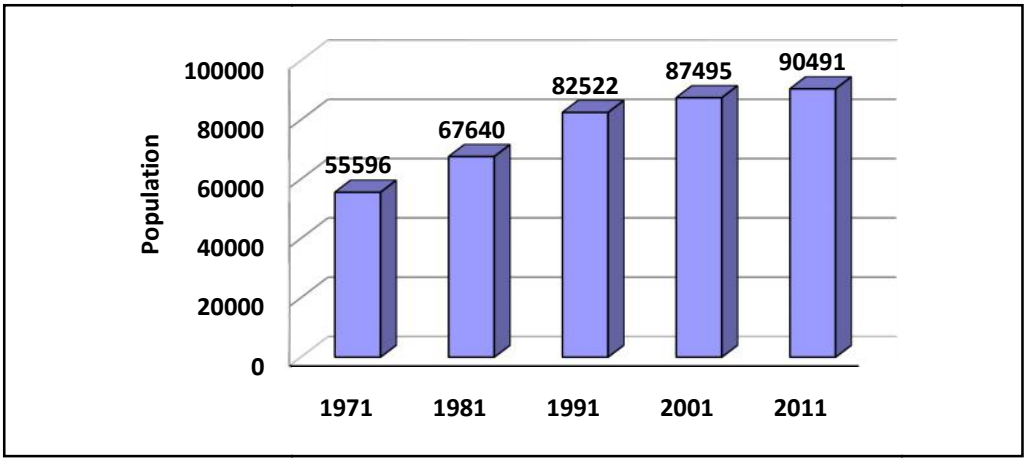


Figure 5-2Total Population of Ponnani 1971 -2011
Source: Census of India

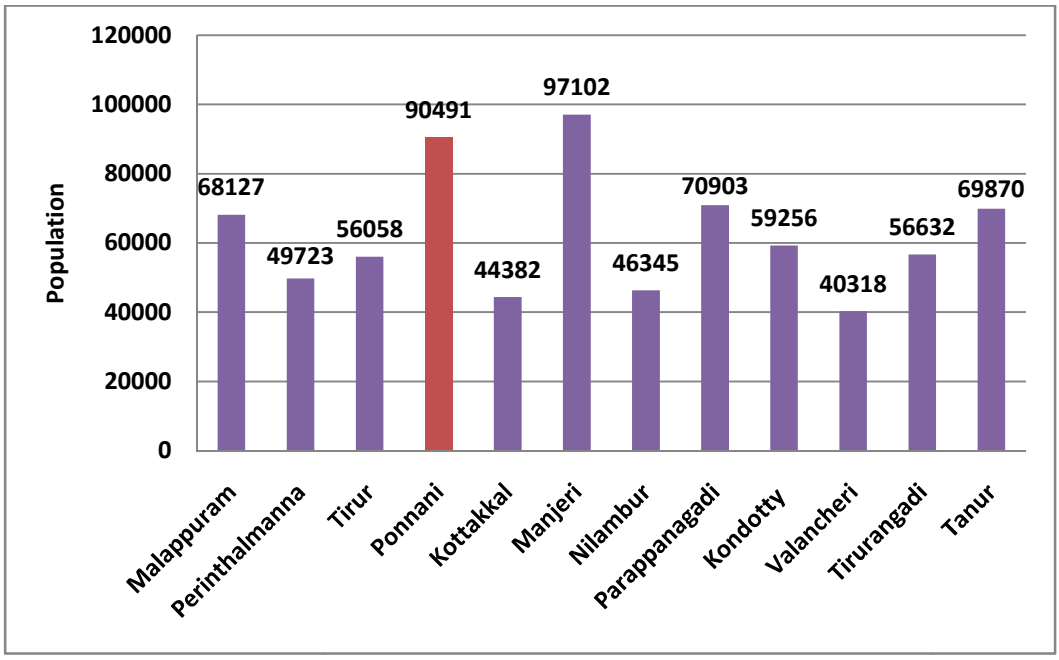
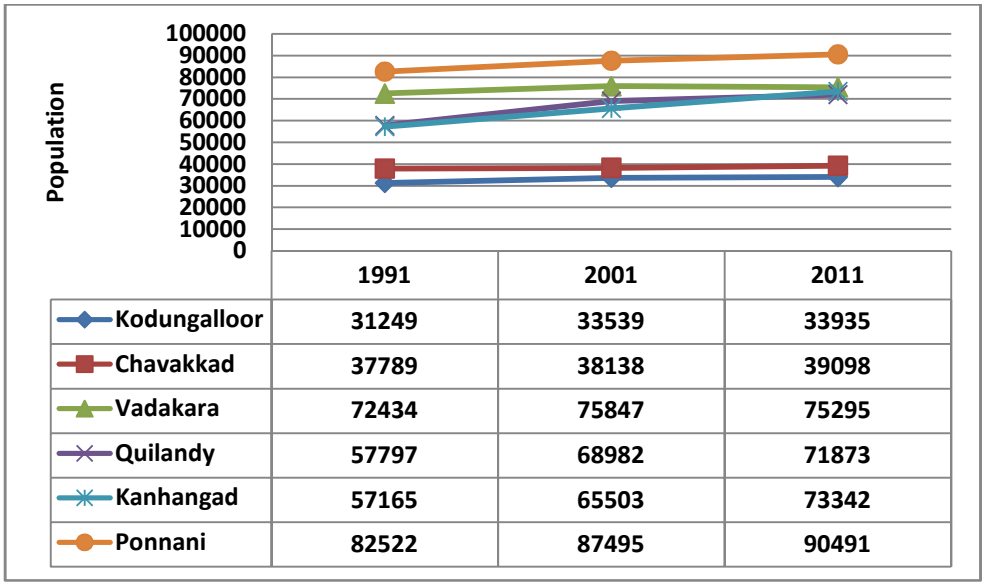


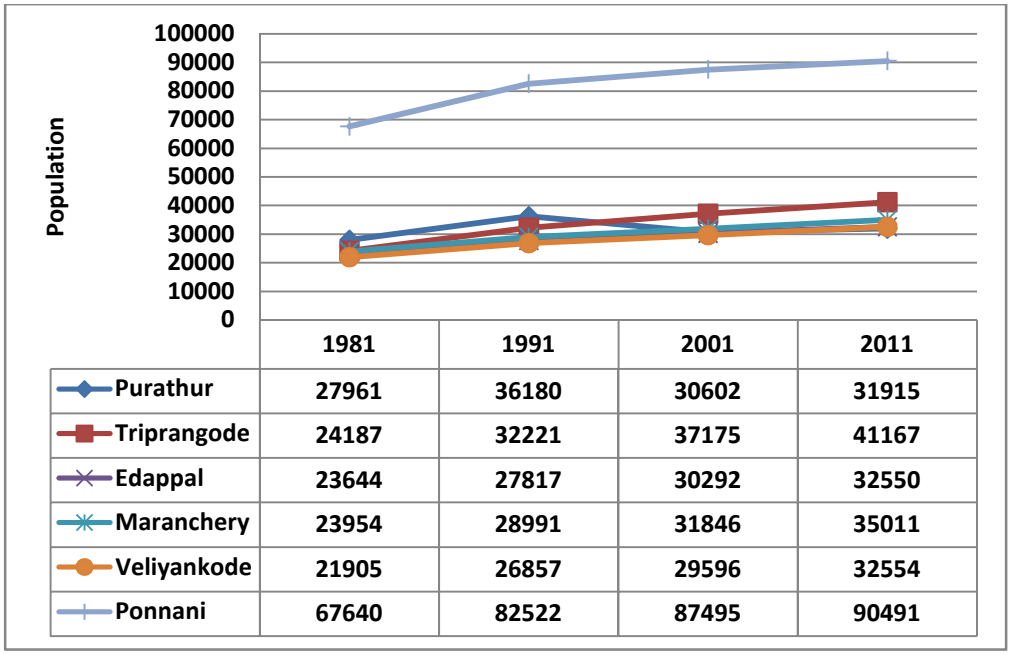
Figure 5-3Total Population – Comparison with other urban local bodies in the District
Source: Censusof India

Comparison of population of Ponnani with similar towns which showed similar characteristics, and growth pattern are the coastal municipalities Koyilandi, Kanjangad, Kodungaloor, Chavakkad and Vatakara Municipality as shown in the Figure 5.4. As per 2011 census the neighbouring grama panchayats also shows similar trend as shown in Figure 5.5.



	1991	2001	2011
Kodungalloor	31249	33539	33935
Chavakkad	37789	38138	39098
Vadakara	72434	75847	75295
Quilandy	57797	68982	71873
Kanhangad	57165	65503	73342
Ponnani	82522	87495	90491

Figure 5-4Total Population –Comparison with other similar towns in the State
Source: Censusof India



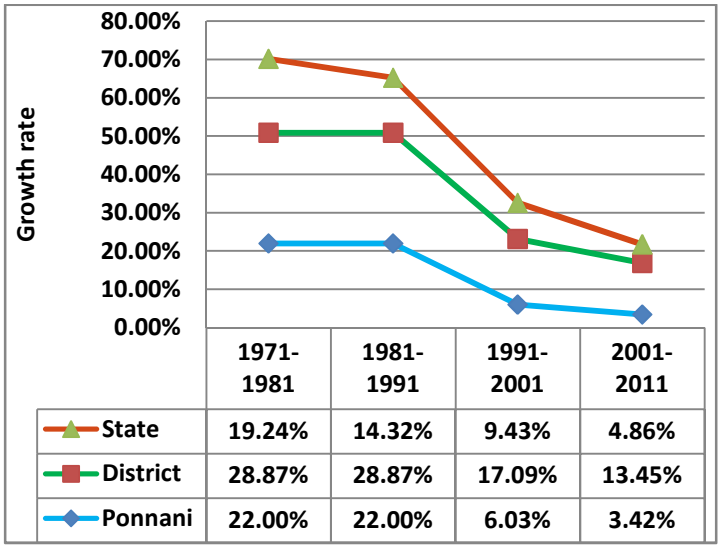
	1981	1991	2001	2011
Purathur	27961	36180	30602	31915
Triprangode	24187	32221	37175	41167
Edappal	23644	27817	30292	32550
Maranchery	23954	28991	31846	35011
Veliyankode	21905	26857	29596	32554
Ponnani	67640	82522	87495	90491

Figure 5-5Total Population –Comparison with nearby LSGIs
Source: Census of India

The average population size in the wards is 1715 persons. The total population is more in Ward 42 (Puthuponnani North -1938 persons) and least in Ward 2 (Pallikkadavu-1499 persons).

5.2 Population growth rate

As per 2011 Census, the population growth rate of Kerala state has decreased from 9.43% to 4.86%. The District is also showing the decreasing trend from 17.09% to 13.45%. Figure 5.6 shows the growth rate trend in Kerala, Malappuram and Ponnani.



	1971-1981	1981-1991	1991-2001	2001-2011
State	19.24%	14.32%	9.43%	4.86%
District	28.87%	28.87%	17.09%	13.45%
Ponnani	22.00%	22.00%	6.03%	3.42%

Figure 5-6 Comparison of growth rate of population
Source: Census of India

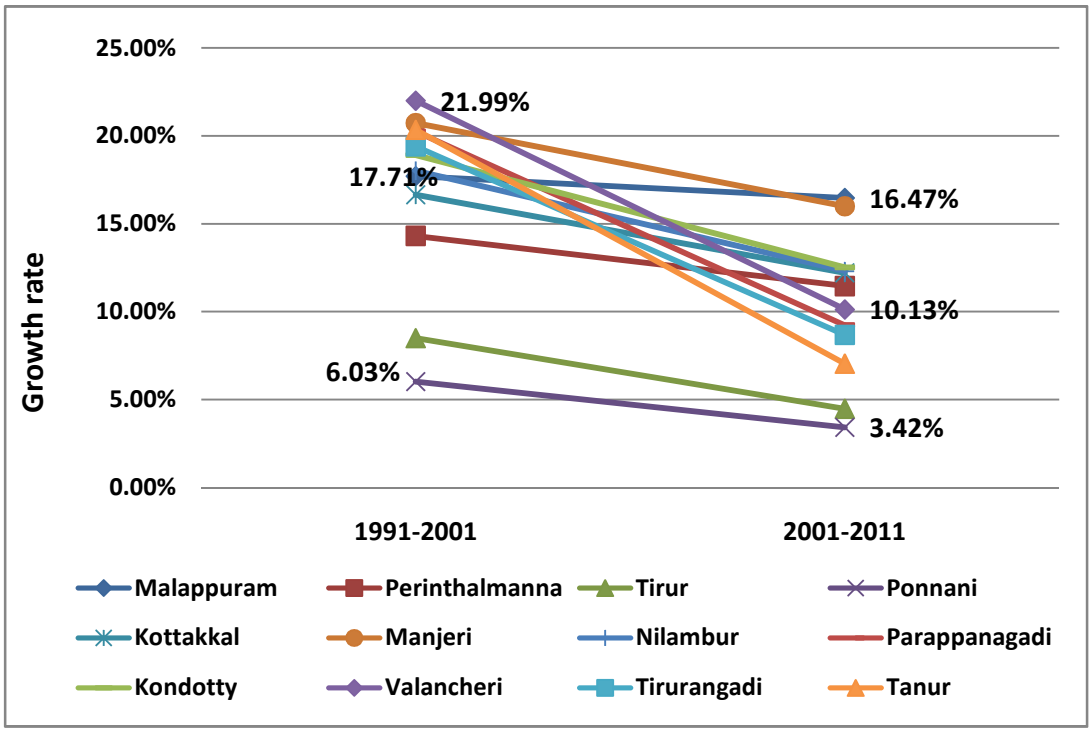
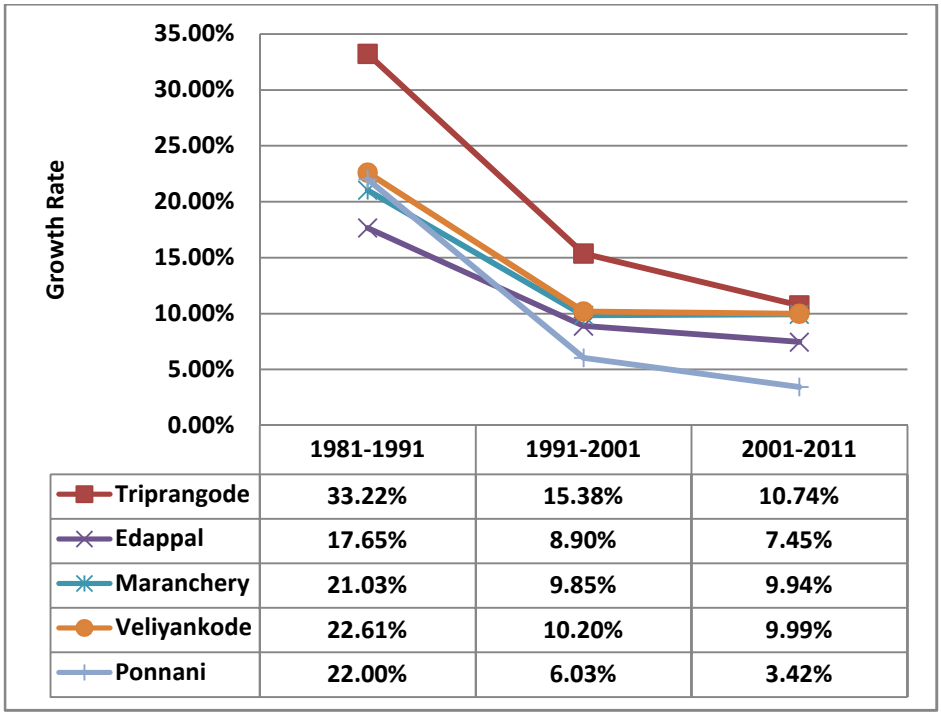


Figure 5-7Comparison of growth rate of population with ULBs within the District
Source: Census of India

The population growth rate in Ponnani is decreasing from 6.03% to 3.42%. But the rate of decrease is not that much steep when compared to the District and the State and other urban local bodies in the District as shown in Figure 5.7 .

When compared to the nearby LSGIs, the change in growth rate is more for Triprangode Gramapanchayat as per 2011 census. This is shown in Figure 5.8.



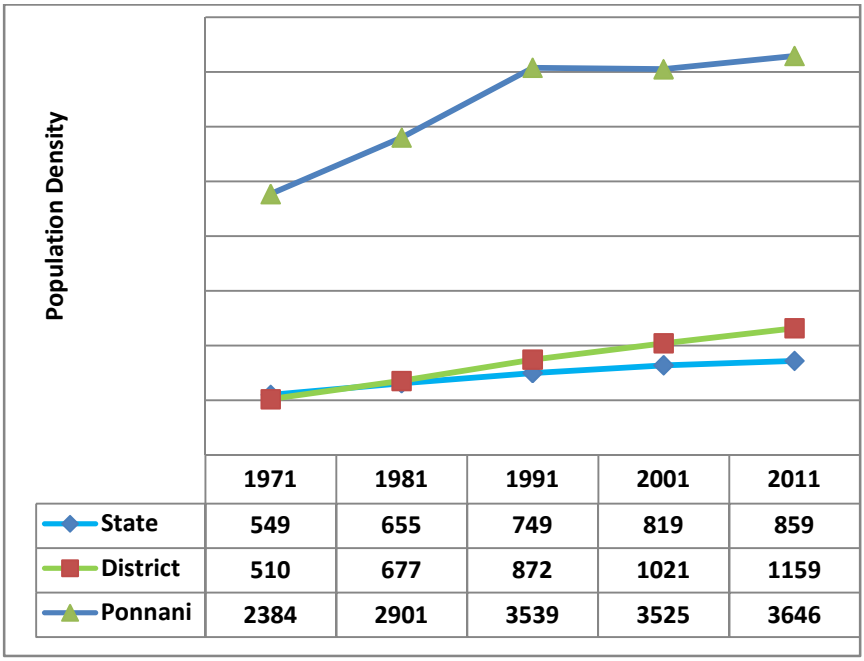
	1981-1991	1991-2001	2001-2011
Triprangode	33.22%	15.38%	10.74%
Edappal	17.65%	8.90%	7.45%
Maranchery	21.03%	9.85%	9.94%
Veliyankode	22.61%	10.20%	9.99%
Ponnani	22.00%	6.03%	3.42%

Figure 5-8Change in growth rate in nearby LSGIs
Source: Census of India

5.3 Density of Population

The comparison of gross density of population with the State, Malappuram District and PonnaniTown is shown in the Figure 5.9.Rate of increase of population density of the district is more compared to that of state. As per 2011 census the density of Ponnani Town comes to 3646 persons per sq.km which is greater than the State (859 persons per sq.km) and the District (1159 persons per sq.km).

Figure 5.9 shows that the population density of Ponnani is three times that of the District. The net density of Ponnani Town is 4600persons per sq.km. Gross density comparison with the existing urban local bodies within the District is shown in Figure 5.10. Figure shows that the density of Ponnani is more than other towns within the District.



	1971	1981	1991	2001	2011
State	549	655	749	819	859
District	510	677	872	1021	1159
Ponnani	2384	2901	3539	3525	3646

Figure 5-9 Gross Density (Source: Census of India)

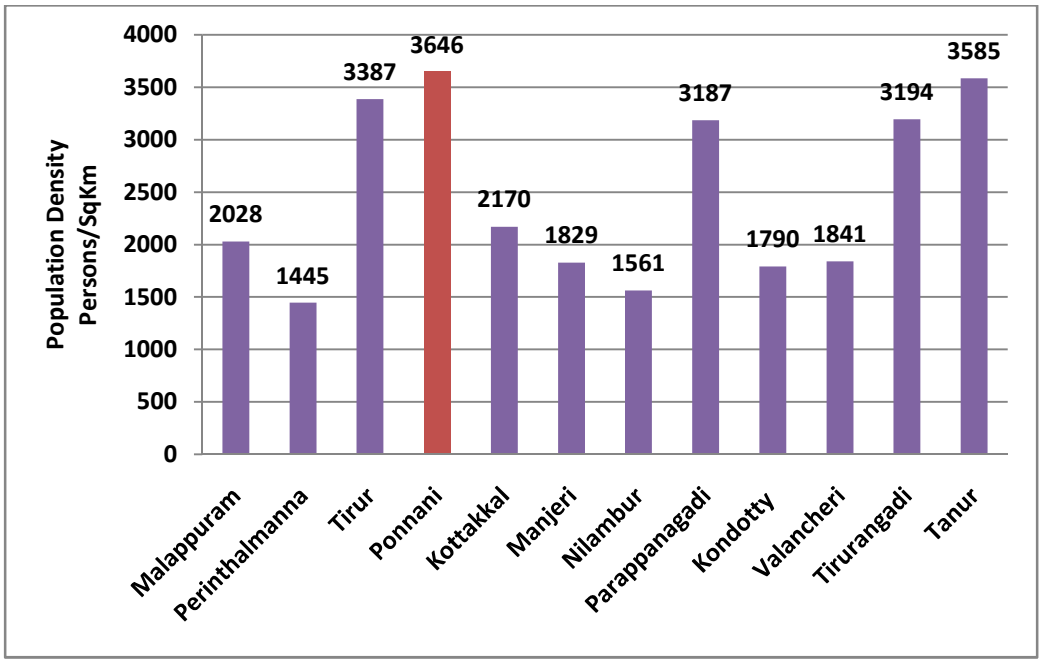
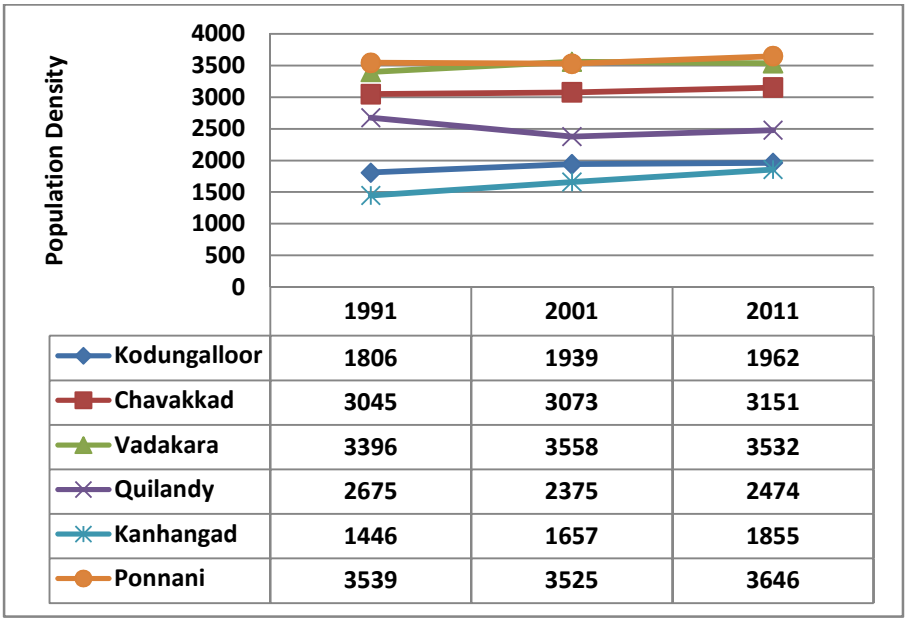


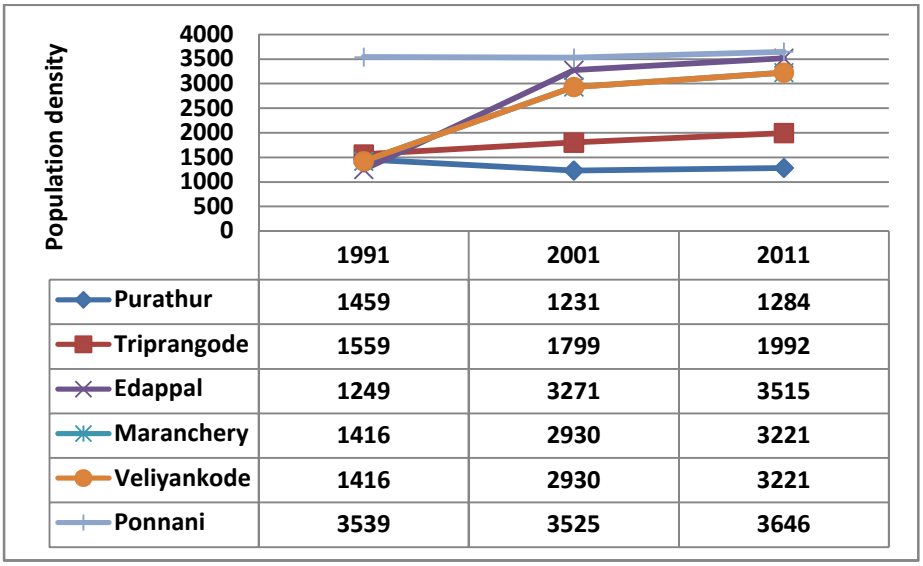
Figure 5-10 Density Comparison (Source: Census of India)

Figures 5.11 and 5.12 shows the comparison of population density with nearby grama panchayats and other similar towns in the State. The figures shows that the density is more when compared to the nearby grama panchayats and similar towns.



	1991	2001	2011
Kodungalloor	1806	1939	1962
Chavakkad	3045	3073	3151
Vadakara	3396	3558	3532
Quilandy	2675	2375	2474
Kanhangad	1446	1657	1855
Ponnani	3539	3525	3646

Figure 5-11 Gross Density- Similar Towns (Source: Census of India)



	1991	2001	2011
Purathur	1459	1231	1284
Triprangode	1559	1799	1992
Edappal	1249	3271	3515
Maranchery	1416	2930	3221
Veliyankode	1416	2930	3221
Ponnani	3539	3525	3646

Figure 5-12 Gross Density- Nearby Grama Panchayaths
Source: Census of India

In the Town, density is more in the coastal wards and wards along the sides of major roads. Among the wards, highest density is seen in Ward 50 (Marakkadavu -27753 persons per sq.km) and lowest in Ward 16 (Biyyam -1482 persons per sq.km). The ward wise distribution of population density is shown in Figure 5.13.

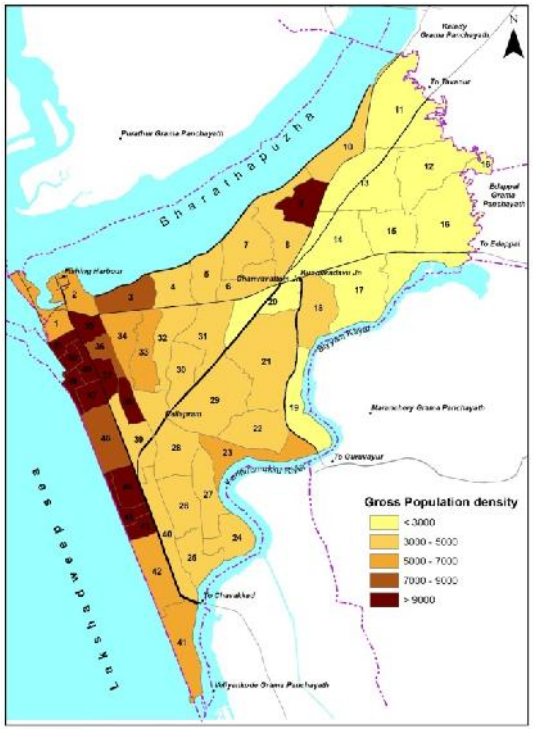


Figure 5-13Ward wise distribution of Population density – Census 2011

5.4 Sex ratio

As per 2011 Census, the sex ratio of Malappuram District (1098) is more than that of the State (1084). The sex ratio of Ponnani Town (1123) is greater than both the District and the State. The child sex ratio (0-6) of Ponnani is 967 which is also higher than the District (965) and the State (964). The comparison is shown in Figure 5.14.

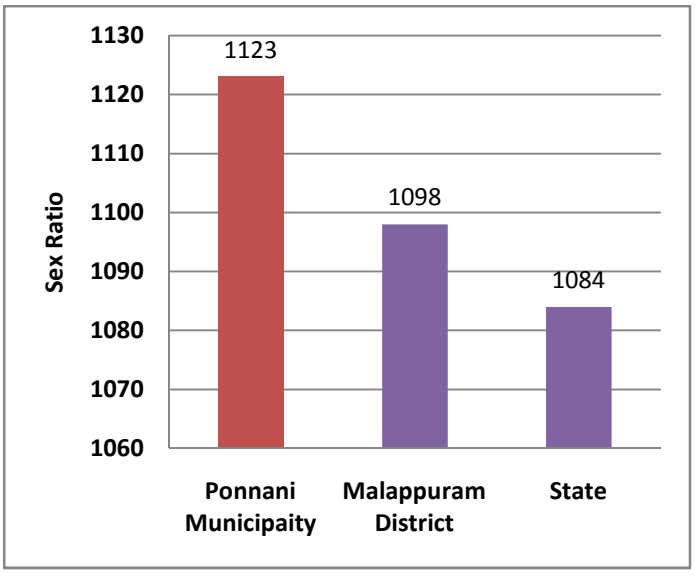


Figure 5-14Sex ratio - comparison with the District and the State

Source: Census of India 2011

The sex ratio of Ponnani Town has increased from 1100 to 1123. The child sex ratio, 0-6 has also increased from 940 in 2001 to 967 in 2011.

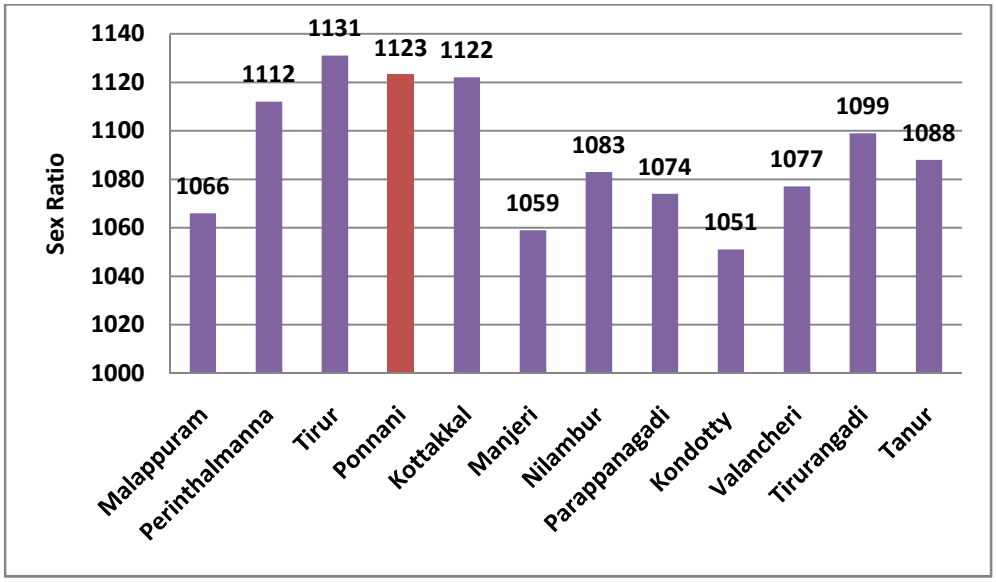


Figure 5-15Sex Ratio –Comparison with other urban local bodies
Source: Census of India 2011

As per 2011 census the comparison of sex ratio with other urban local bodies is shown in Figure 5.15. It shows that Ponnani stands second position for general sex ratio in the District.The lower rate of decadal growth rate of population combined with a higher sex ratio indicates that there is an out migration of male population from the town for employment purpose.

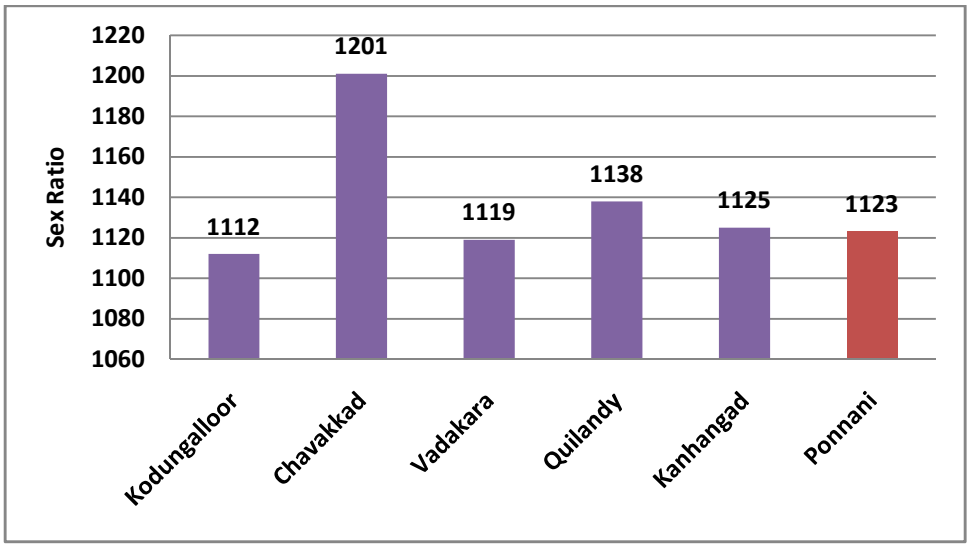


Figure 5-16Sex Ratio –Comparison with similar towns
Source: Census of India 2011

As per 2011 census the comparison of sex ratio with the similar towns is shown in Figure 5.16. It shows that Ponnani stands in fourth position for general sex ratio.

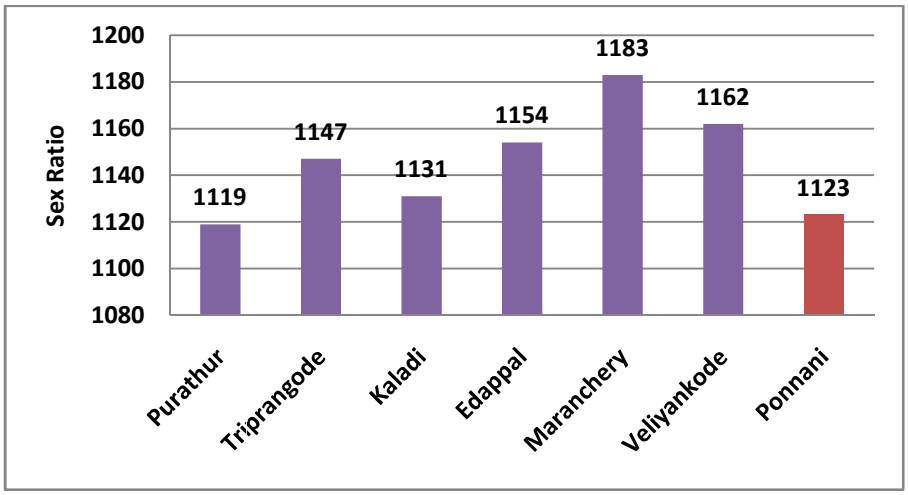


Figure 5-17 Sex Ratio –Comparison with nearby Grama Panchayats
Source: Census of India 2011

As per 2011 census the comparison of sex ratio with nearby Grama Panchayats are shown in Figure 5.17. It shows that the sex ratio is less than other grama panchayats except for Purathur Grama Panchayat.

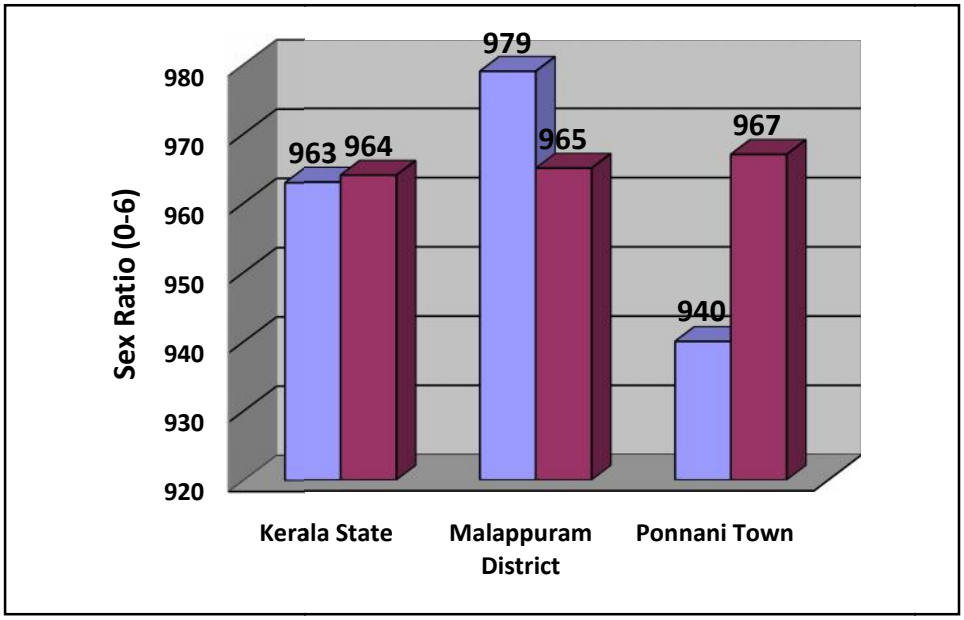


Figure 5-18Sex Ratio 0_6 –Comparison with district and state
Source: Census of India 2001, 2011

Among the population (0-6 age group) 50.84% are male and the remaining 49.16% are female. It indicates that in future, the male working population will be more than female.

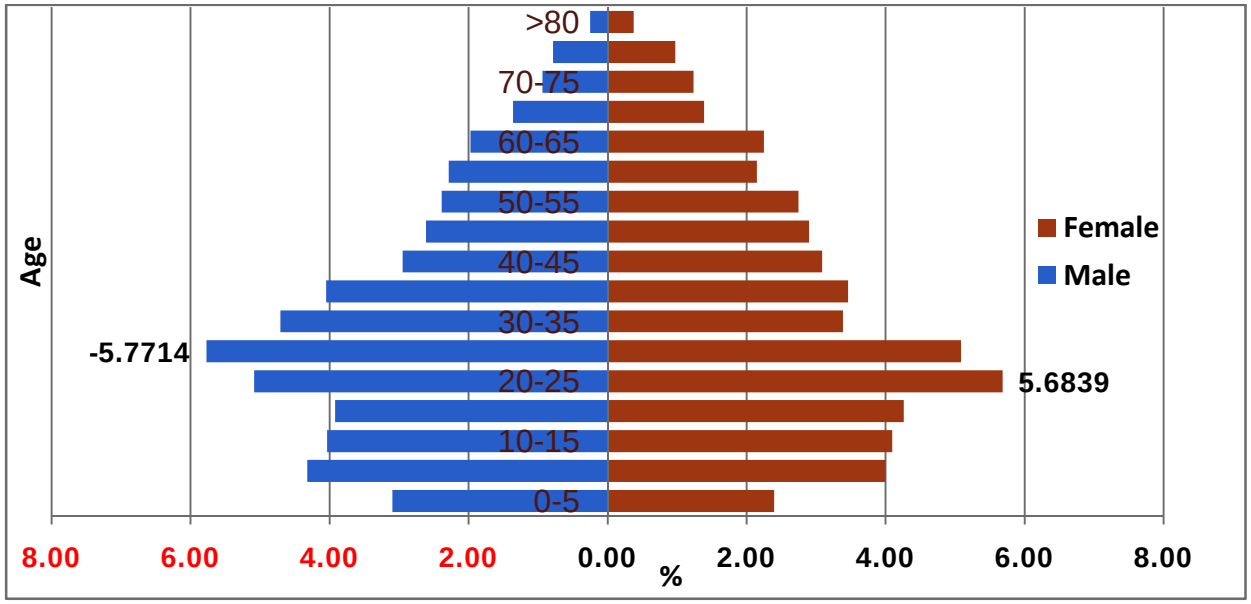


Figure 5-19Age Sex Pyramid– Ponnani
Source: Socio economic Survey 2012

Age sex pyramid of Ponnani shows that 50% of the population is in the age group below 30 years. This productive population needs more employment opportunities in the coming years.At the same time the age sex pyramid shows a weak base which also high lights the policies are to be mended for strengthening the age group less than 20-25. Within the age group 20 to 55, population is more which indicates the presence of skilled and experienced work force. Moreover a weak base and a strong working population show the quantum of migrant population.

5.5 SC/ST POPULATION

The following table and figure will show the statistics of SC/ST population.

Table 5.2 SC/ST Population

	SC	ST
Kerala	3039573	484839
Malappuram District	308266	22990
Ponnani	5202	196

Source: Census of India 2011

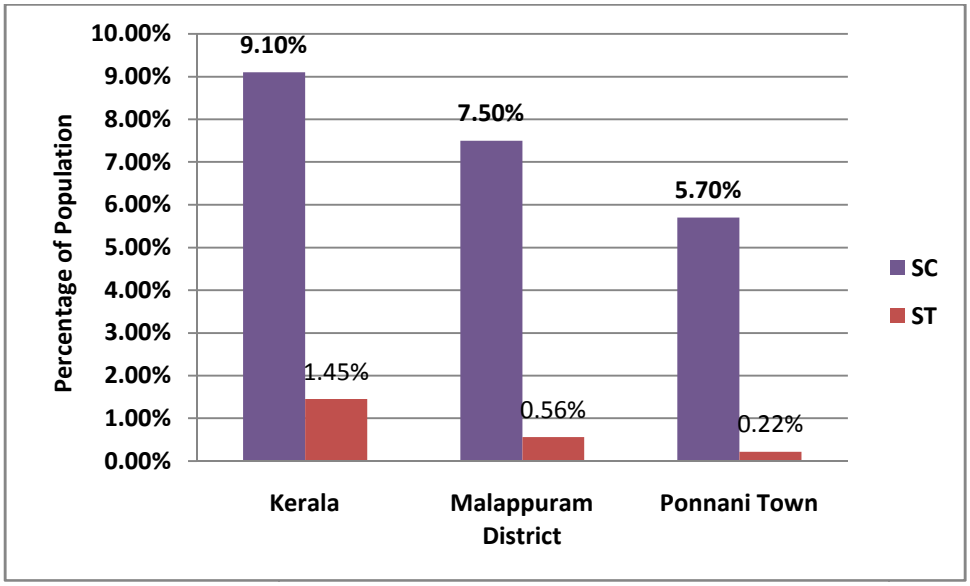


Figure 5-20 SC/ST %
Source: Census of India 2011

The SC/ST composition is low when compared to the State and District.

5.6 BPL Population

As per the BPL survey reports 2009, about 50.92% of the total population belongs to the BPL category. The community status of the BPL population is shown in Figure 5.21.

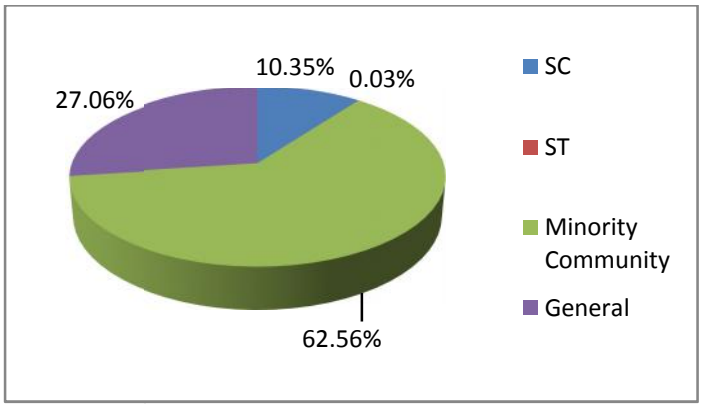


Figure 5-21Community Status of BPL Population
Source: BPL Survey of Kerala, 2009

5.7 Population Projection

In the field of demography, population projection is an estimate of a future population. For the study, population projection is done by five methods. They are Arithmetical Increase Method, Geometric Increase Method, Incremental Increase Method, Decrease Rate of Growth Method, and Apportionment Method. In these Decrease rate of Growth Method is avoided due

to lesser values. The final projected population is taken as the average of population arrived at using the above four methods and shown in Table 5.3.

Table 5.3 Projected Population

Sl. No.	Method	2021	2031
1	Arithmetical increase Method	99215	107939
2	Geometric increase Method	102507	116119
3	Incremental increase Method	96199	101907
4	Apportionment Method	90057	

Table 5.4 Design Projected Population

Year	Projected Population
2021	96995
2031	108655

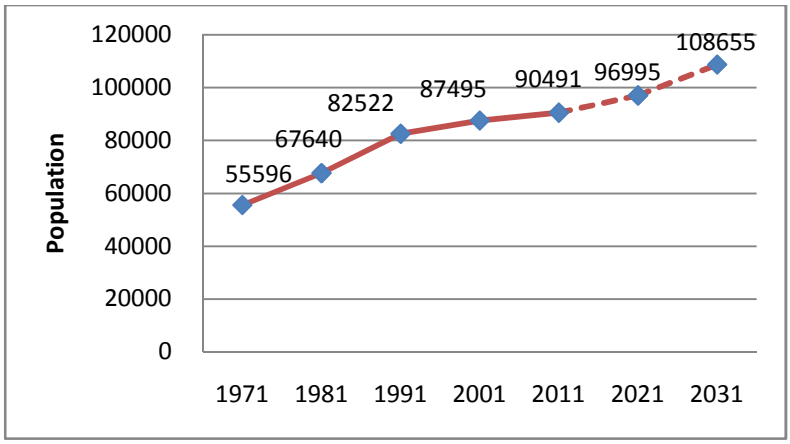


Figure 5-22Final projected population -2031

5.8 Inference

The population of Ponnani Town as per 2011 census is 90491 which form about 2.2% of Malappuram District. There is gradual and steady increase in population over the years and shows a similar pattern with other urban local bodies in the District. The population growth rate in Ponnani is decreasing from 6.03% to 3.42%. But the rate of decrease is not that much steep when compared to the District and the State and other urban local bodies in the District. The net density of Ponnani Town is 4600persons per sq.km. Gross density comparison with the existing urban local bodies within the District shows that the density of Ponnani is more than other towns

within the District. The age sex pyramid of Ponnani shows that more than 50% of population in the age group of below 30years. This productive population needs more employment opportunities in the coming years. At the same time the age sex pyramid shows a weak base which also high lights that policies are to be mended for strengthening the age group less than 20-25. From the projection studies it can be inferred thatthe population to be accommodated by the Town for the perspective year for 2031 for trend based growth is 108655.

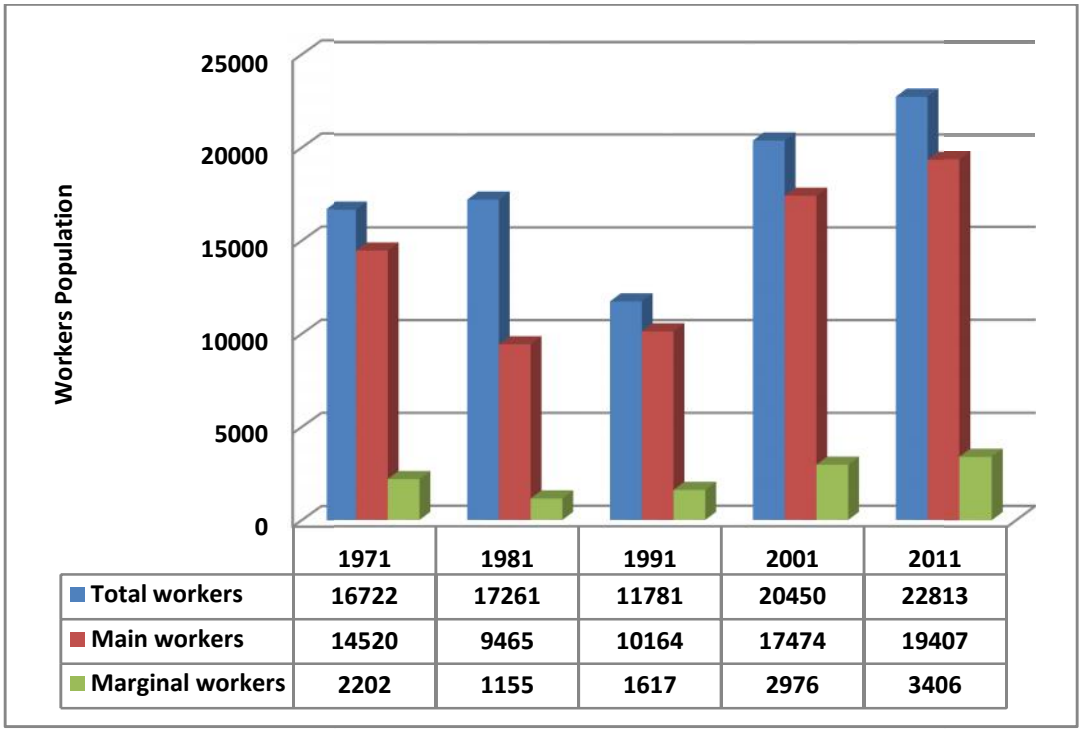
6 OCCUPATIONAL STRUCTURE

By studying the occupational structure of Ponnani, the pattern of workforce and their distribution, the existing economic base of the city is described in this chapter.

6.1 Work force

The percentage of workers gives an insight into economic development and urbanization. There is a steady increase in the percentage of workers in the State. As per 2011 census data, only 25.8% of the population of the Malappuram District is workers. Malappuram District experiences only nominal increase in this percentage. This is mainly due to out migration of male population to Middle East countries in search of employment. Ponnani town also follows this trend in the district in general.

The total number of workers of Ponnani Town as per 2011 Census is 22813. Out of this 19407 are main workers and 3406 are marginal workers. The scenario is shown in Figure 6.1.



	1971	1981	1991	2001	2011
Total workers	16722	17261	11781	20450	22813
Main workers	14520	9465	10164	17474	19407
Marginal workers	2202	1155	1617	2976	3406

Figure 6-1 Temporal variation of workers (Source: Census of India)

The percentage of workers is low compared to the state average and the district. This is shown in Figure 6.2.

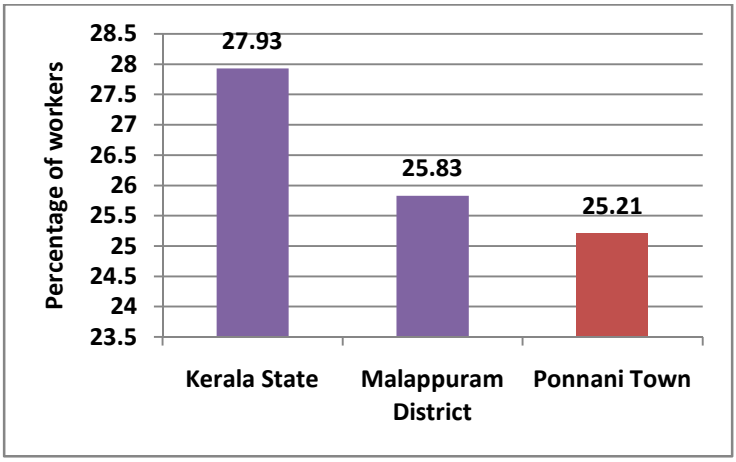


Figure 6-2 Percentage of workers- Comparison with State and District
Source: Census of India 2011

Malappuram district has the lowest workers participation rate as 25.83% in the state and the value of Ponnani town is 25.21%. The total workers are classified into main and marginal workers. As per 2011 Census, marginal workers have been classified into two categories viz., (i) worked for 3 months or more but less than 6 months (ii) worked for less than 3 months. Accordingly the marginal 3_6 constitutes to about 81.83% and marginal 0_3 constitutes 18.17%. The work participation rate (WPR) which indicates the workforce of an area, of Ponnani Municipality has increased from 23.37 to 25.21 in 2011. The trend and comparison is shown in Figure 6.3.

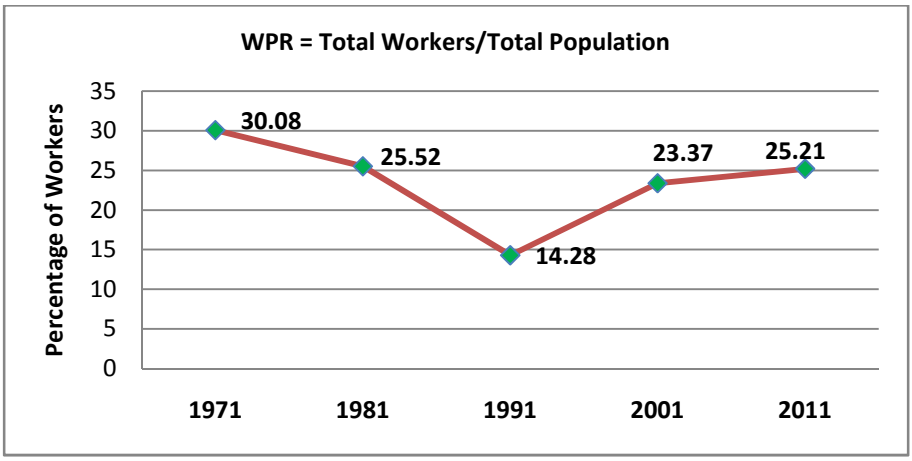


Figure 6-3 Temporal variation of WPR (Source: Census of India)

The workers participation rate is less compared to the other urban local bodies in the District except Tirur, Malappuram and Kottakkal towns shown in Figure 6.4. The Figure 6.5 shows that WPR is less compared to the similar towns. The Figure 6.6 shows that WPR is more compared to the nearby grama panchayaths.

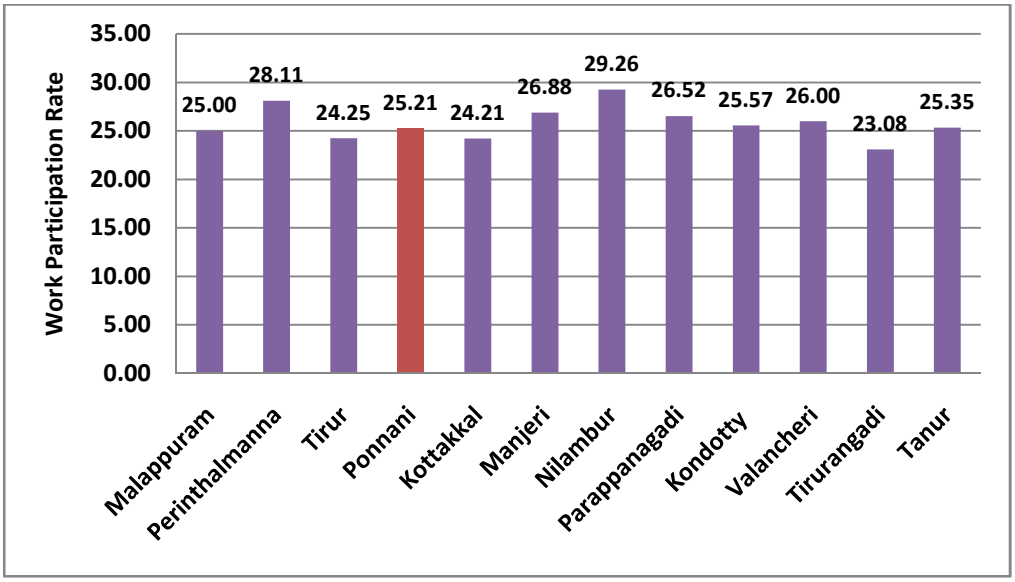


Figure 6-4 WPR- Comparison with other towns in the district
Source: Census of India 2011

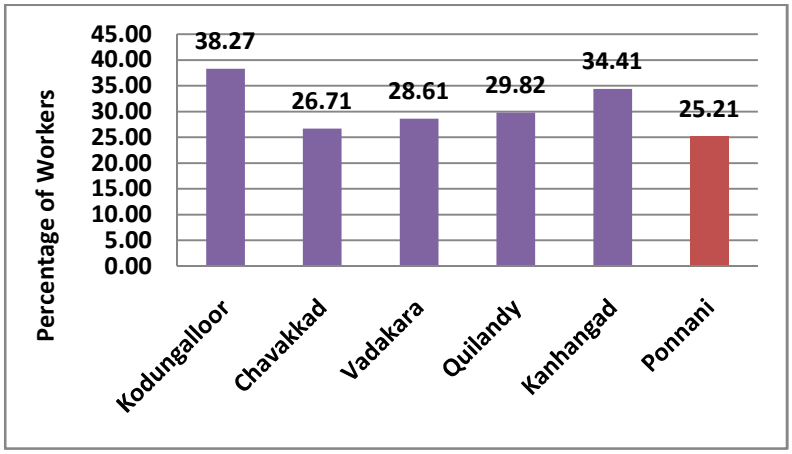


Figure 6-5 WPR- Comparison with similar towns
Source: Census of India 2011

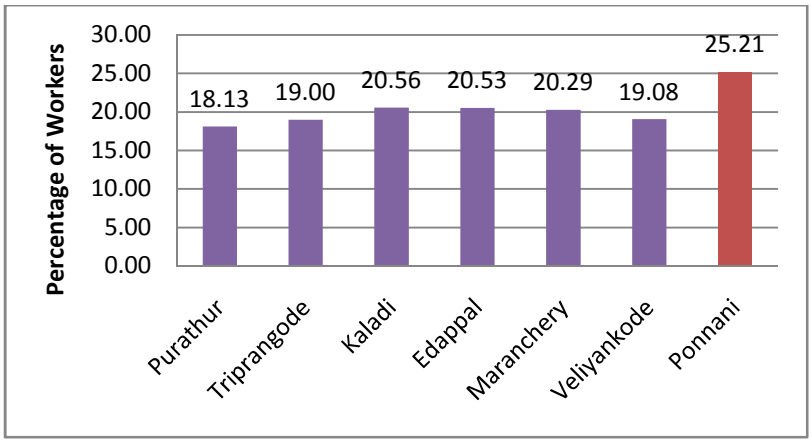


Figure 6-6 WPR- Comparison with nearby grama panchayaths
Source: Census of India 2011

6.2 Occupational Structure

Census 2011 classifies the main workers into four categories viz. cultivators, agricultural labourers, household industrial workers and other workers. Figure 6.7 shows that other workers are more compared to District and the State as per census.

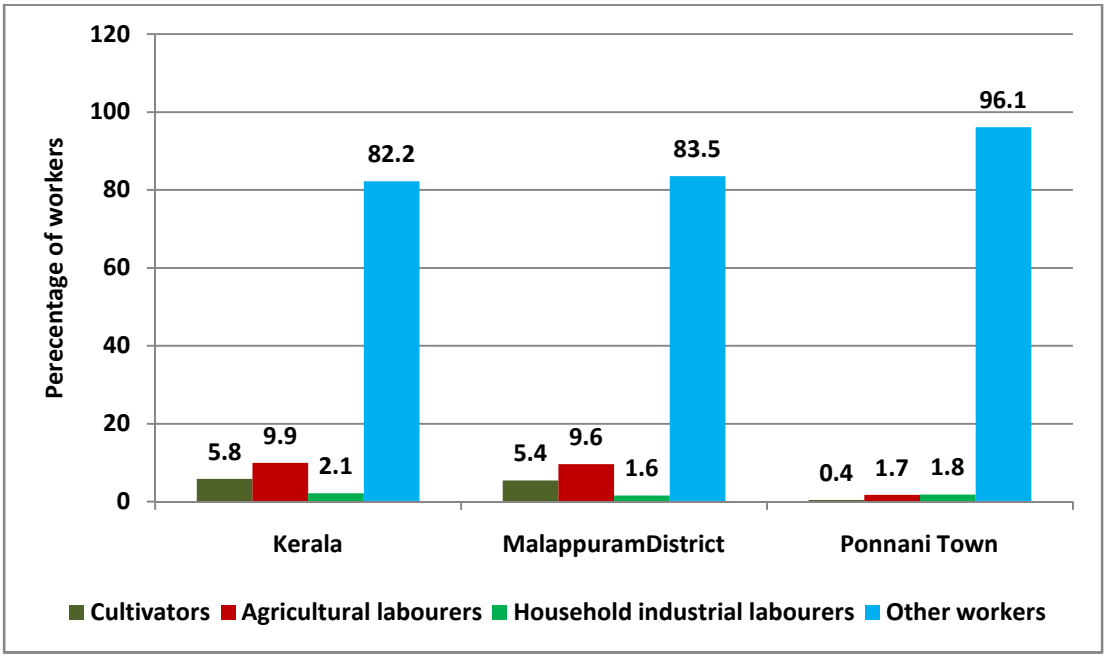


Figure 6-7 Occupational Structure –Comparison with District and State (Source: Census of India 2011)

While considering the Ponnani Town, majority of the workers are coming under 'Other workers' category. Agricultural labourers and Cultivators constitute 2.1% of the total workers as per 2011 Census, whereas other workers form about 96.1% of total workers. This shows an inclination of people towards service sector. Comparison of occupational structure between the other towns in the district is done considering all workers including main workers and marginal workers as per Census 2011.

Among 22813 workers in Ponnani, 19407 are main workers and 33406 aremarginal workers.Among the main workers other workers constitute the majority in comparison with the other classification of workers. Other workers were around 18649 whereas cultivators and agricultural labourers form only 68 and 331 respectively. Among the marginal workers also other workers constitute the majority in comparison with the other classification of workers. Other workers were around 3111 whereas cultivators and agricultural labourers form only 29 and 87 respectively.

Figure 6.8 shows the temporal variation of categories of main workers from 1971 to 2011. The percentage of main workers decreased from 26% to 12% in 1991 and has been increasing since 2001. As per 2011 census 21% of total workers are main workers. Also the percentage of non workers is on an increase which will affect the work participation rate. As per the socio economic survey, 71% of workers are found involved in tertiary activities.

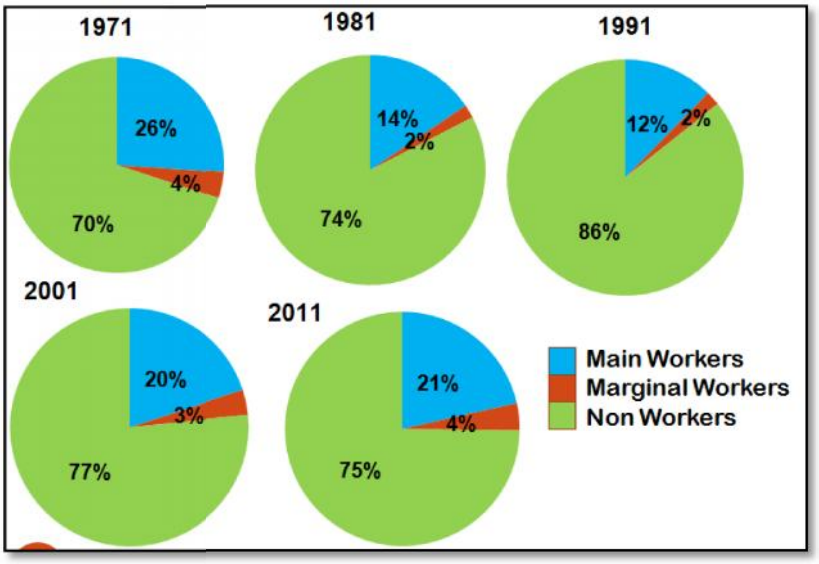


Figure 6-8 Occupational Structure – Temporal Variation (Source : Census of India)

As per the socio economic survey conducted in Ponnani Town in 2012, among the workers only 0.76% are government employees and 0.34% are quasi government employees. It is found that 24.68% is of the opinion that there is no need for job. Most of the males are working abroad in the town and so the females opt for not working in order to take care of the house.

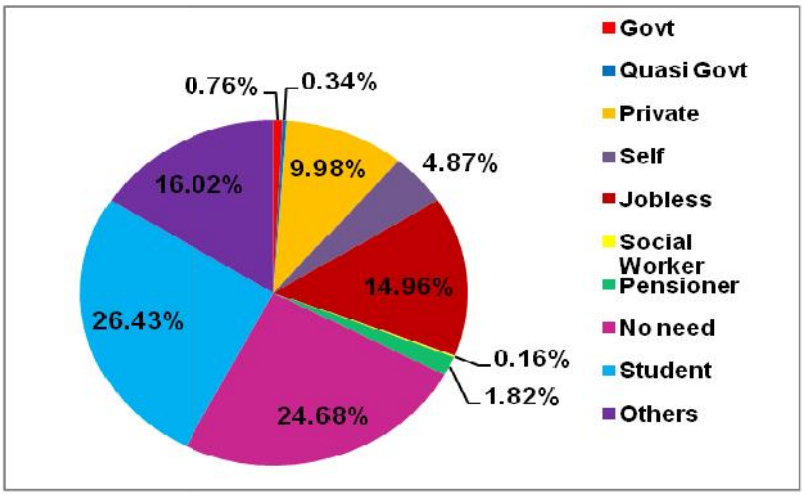


Figure 6-9 Type of Employment (Source: Socio Economic Survey-2012)

6.3 Distribution of major class of workers

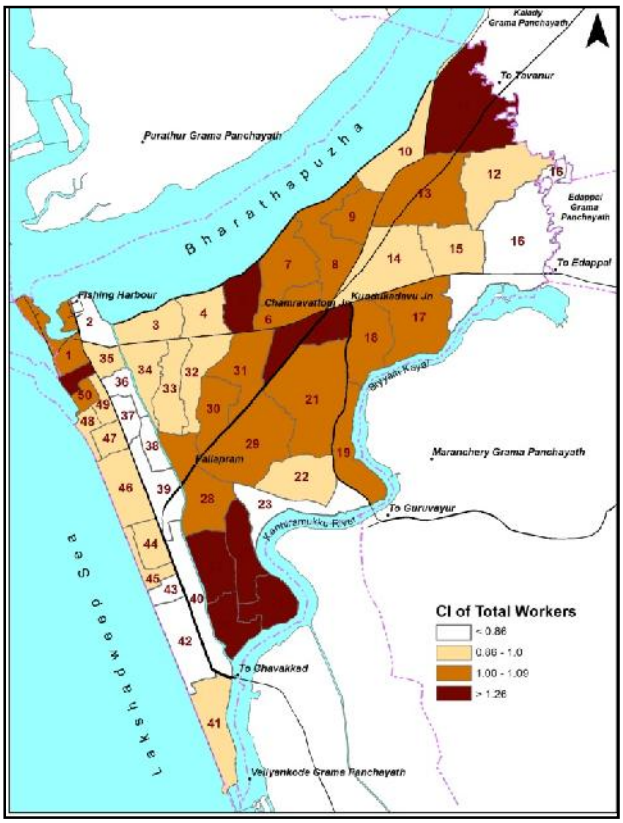


Figure 6-10 Concentration of total workers (Source: Census,2011)

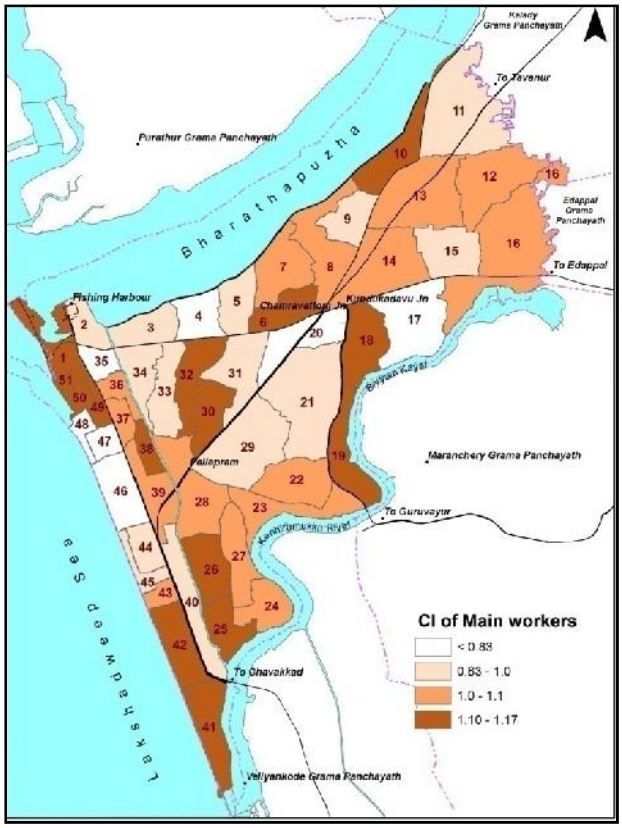


Figure 6-11 Concentration of main workers (Source: Census,2011)

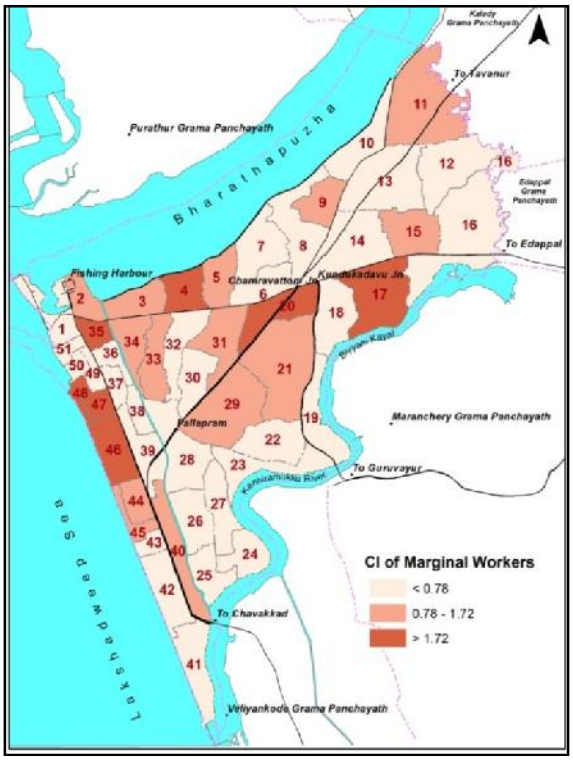


Figure 6-12 Concentration of marginal workers(Source: Census,2011)

The total workforce concentration is more in the wards 5, 11, 20,24,25,26,27 and 51 which are near to the water bodies and central wards. Main workers are concentrated at the north and south part of the Town whereas the marginal workers concentration is more in coastal wards and central wards. These are shown in Figure 6.10, 6.11and 6.12.Also the concentration of cultivators, household industrial workers, agricultural workers and other workers are shown in figure 6.13, 6.14, 6.15 and 6.16 respectively. The ward wise occupational structure is shown in figure 6.17.

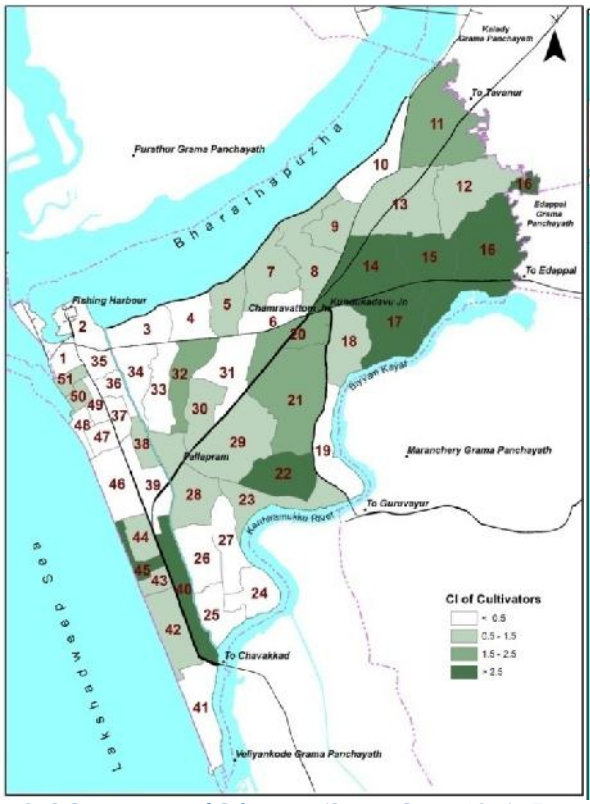


Figure 6-13 Concentration of Cultivators (Source: Census,2011)

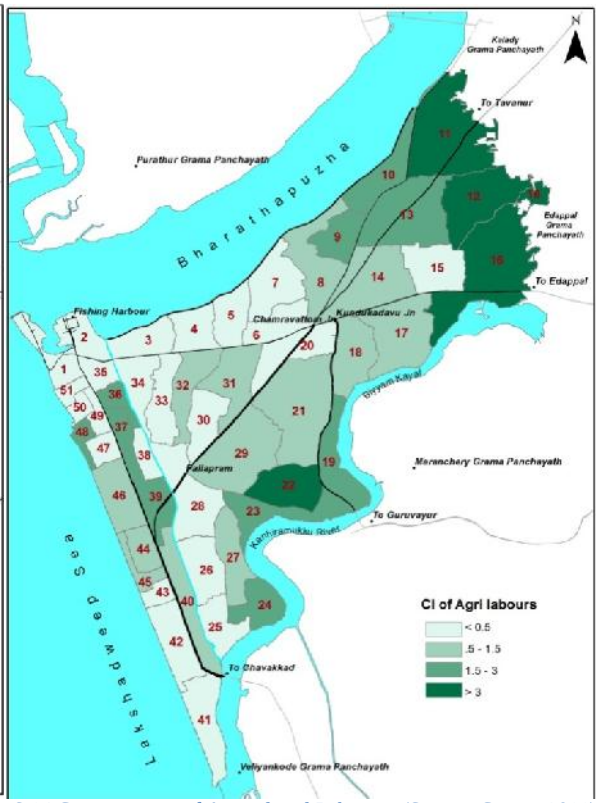


Figure 6-14 Concentration of Agricultural Labourers(Source: Census,2011)

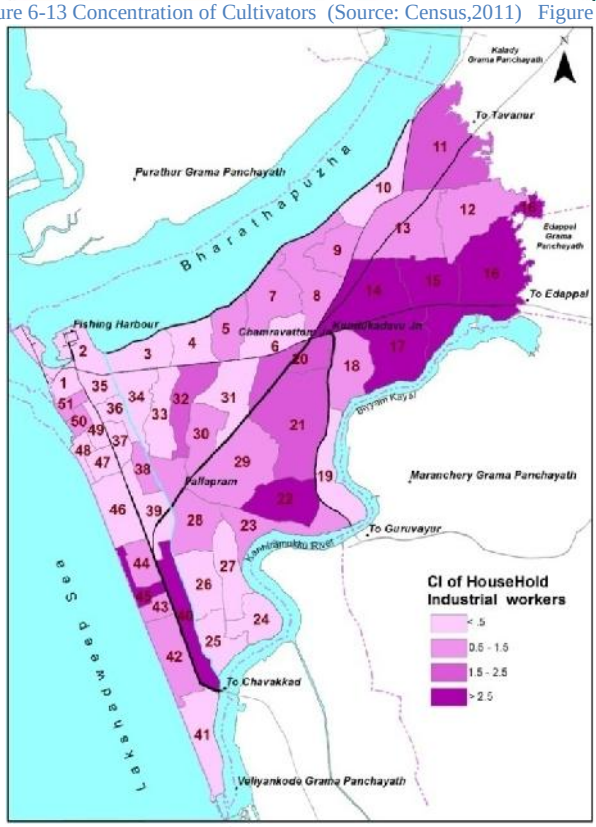


Figure 6-15 Concentration of Household Industrial Workers

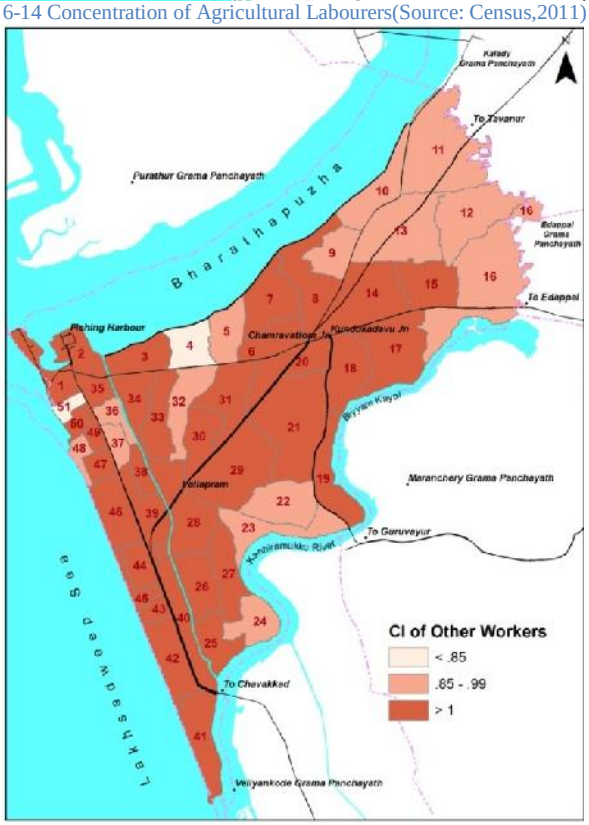


Figure 6-16 Concentration of Other Workers (Source:Census,2011)

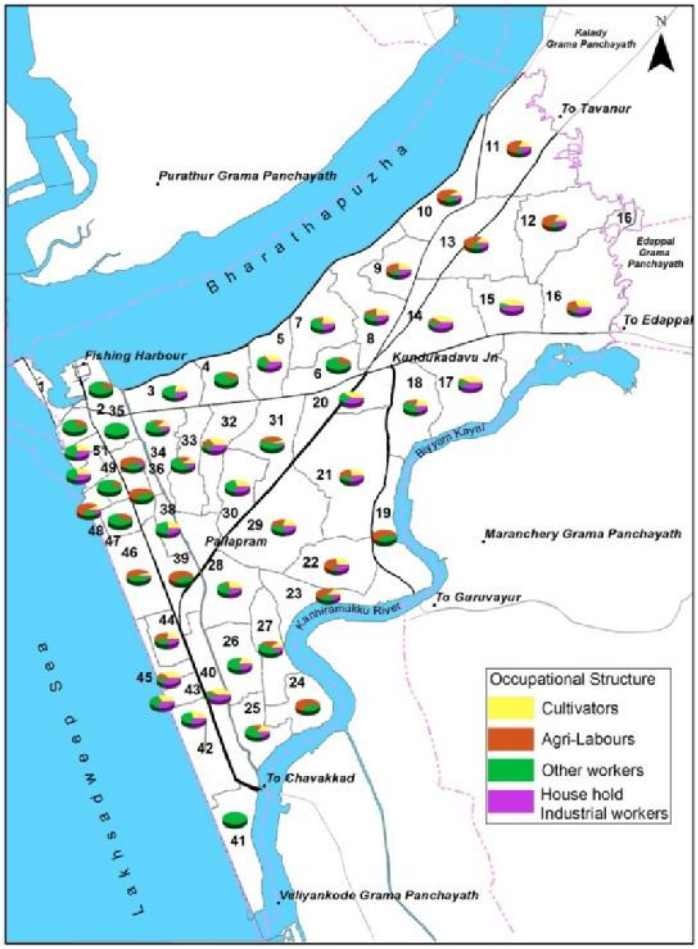


Figure 6-17 Ward wise occupational structure (Source: Census,2011)

6.4 Inference

The work participation rate of the town (25.21) is low compared to the District (30.75) and the State (34.78). Also the female work participation rate (5.31)is very low in the Town when compared to Malappuram District (7.63) and Kerala State (18.23).Concentration of Main workers and Marginal workers are more in wards near to the water bodies and along the main roads. Concentration of Cultivators, House hold Industrial workers and Agriculture labourers are more in the eastern part of the town. Concentrations of other workers are more towards the western side of the town and around the main junction.Studies carried out reveal that there is decrease in participation rate in primary and secondary sector and increase in participation in tertiary sector activities. Lack of opportunities and low income from these sectors can be attributed to this decrease. However with the development of cargo port and fishing harbour this trend may reverse in future.

7 LAND USE AND BUILT UP DENSITY

7.1 General Analysis of Land use

The land use break up of Ponnani Town in terms of area as well as percentage with respect to the total area is given in Table 7.1 & Figure 7.1. About one third of the total geographical area of the Town is covered by dry cultivation (both farm and homestead cultivation) and paddy fields. Another one third area is residential. 21.54% of the municipal area is covered by water bodies and 0.06% is covered by open spaces. The existing land use map of Ponnani town is shown in Figure 7.2.

Table 7.1Existing land usebreakup 2014

Sl. No.	Land Use	Area in Sq. Km	Area in %
1	Residential	7.99	32.21
2	Commercial	0.26	1.05
3	Industrial	0.05	0.19
4	Public & Semipublic	0.78	3.12
5	Traffic &Transportation	1.12	4.50
6	Parks & Open Spaces	0.01	0.06
7	Crematoriums/Burial Ground	0.06	0.25
8	Vacant Land	0.29	1.17
9	Dry Cultivation	7.48	30.13
10	Wet Cultivation	1.26	5.08
11	Mangroves	0.01	0.06
12	Social Forestry	0.05	0.18
13	Water Logged	0.11	0.46
14	Water Bodies	5.35	21.54
	Total	24.82	100.00

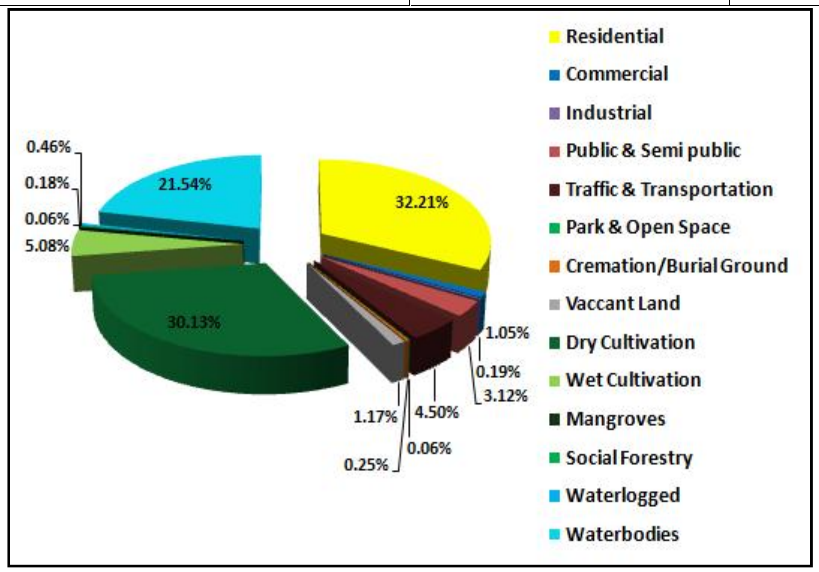


Figure 7-1Existing Land Use (2014) break up

The table and the figure shows that the major land use is residential which covers 32.21% of the municipal area followed by dry cultivation area which includes coconut, areca nut etc. covering 30.13% andpaddy spreading about 5.08%.

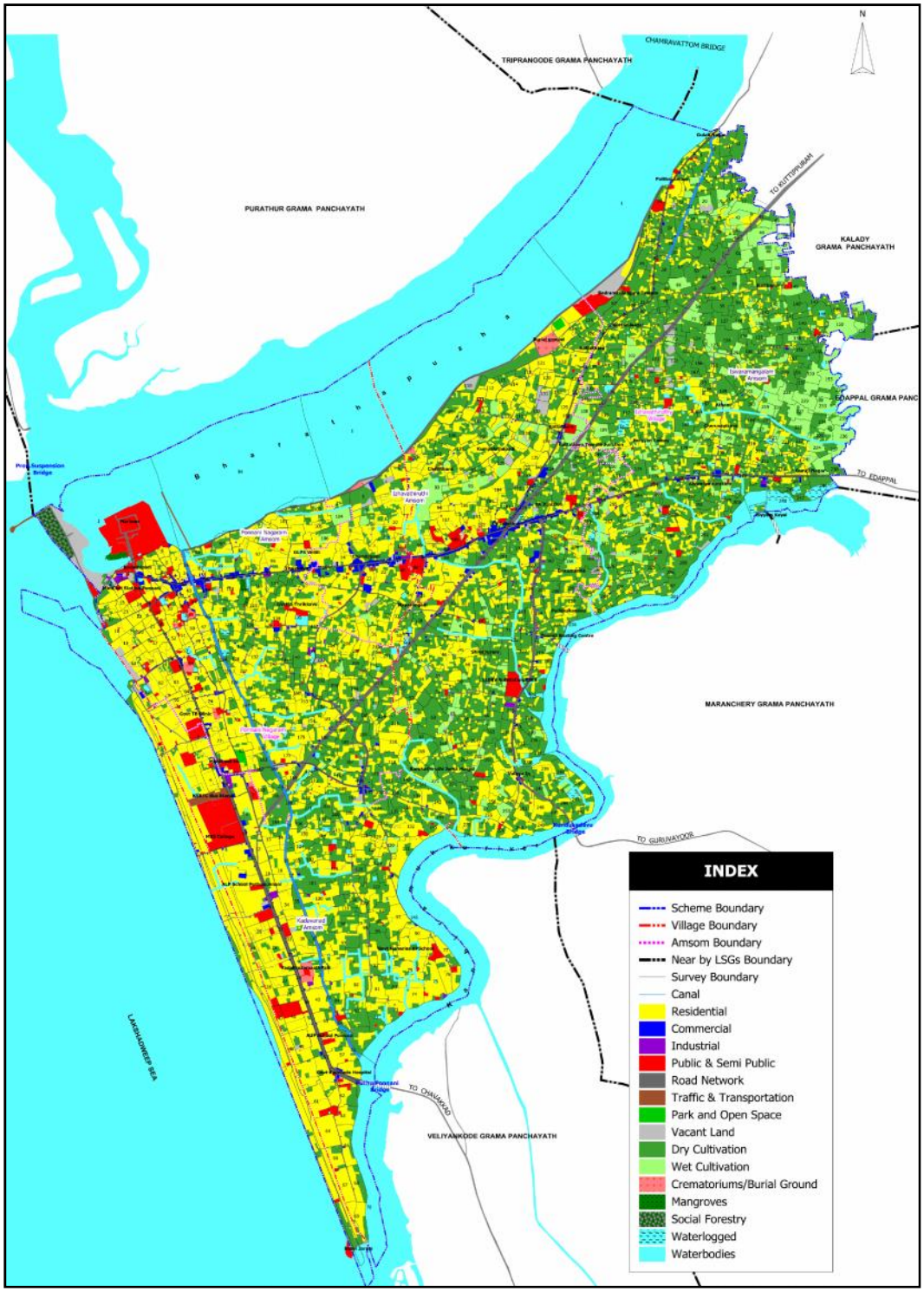


Figure 7-2Existing Land Use Map -2014 (Source: Landuse Survey, T&CPD, MPM)

7.2 Land use concentration

Within the Town, the concentration pattern of land use gives an idea aboutwhere that particular land use is concentrated. The concentration pattern of a landuse can be ascertained by the concentration index of the land use which is calculatedas follows;

Concentration index (C.I) of a particular land use in a ward =

$$\frac{\text{(area of the land use in the ward)/(total area of the ward)}}{\text{(area of the land use in the Town)/(total area of the Town)}}$$

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.

7.3 Residential

The total extent of land occupied by residential land use comes to 32.21% of the Municipal area. Its distribution is shown in Figure 7.3. The figure shows that the residential areas are developed mostly in places with accessibility and proximity to facilities. The concentration index of the residential land use is shown in Figure 7.4. Higher concentration of residential land use is seen in 35 wards ie., the western side of the town. Out of 51 wards only 16 wards have residential concentration less than one. In the absence of a development plan and any sort of controls on land use, the residential development has taken place in a scattered manner. This causes inefficient use of resources and makes the provision of various infrastructureand amenities comparatively costlier.



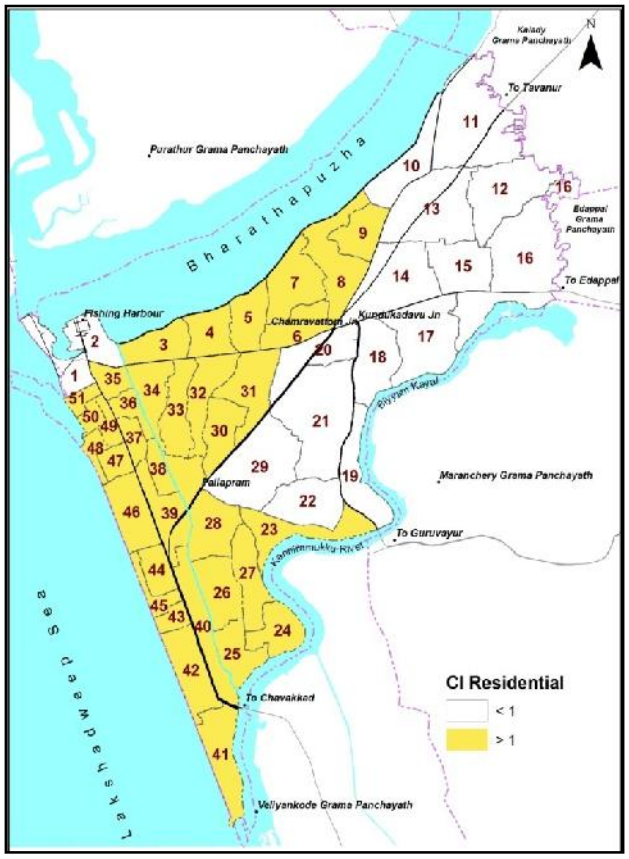


Figure 7-3Residential land use(Source: T&CPD, MPM) **Figure 7-4C I of residential land use(Source: T&CPD, MPM)**

7.4 Commercial

Commercial land use in Ponnani town is about 26 Ha and it is about 1.05% of the municipal area. The main junctions named CV Junction, Chandappadi Junction, Kundukadavu Junction and Municipal Junction are the important commercial nodes in the town and shown in Figure 7.5.The spatial distribution is shown in Figure 7.6 and concentration index of commercial land use is shown in Figure 7.7. The commercial development has taken place mostly as ribbon development along the major transport routes and centers around road junctions. No large scale commercial development has taken place in the town.

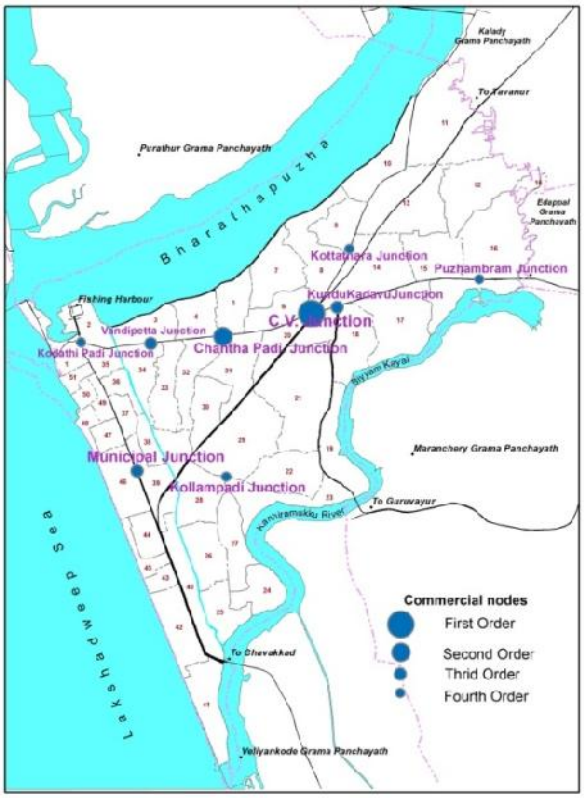


Figure 7-5 Location of Commercial Nodes(Source: Primary survey, T&CPD,MPM)

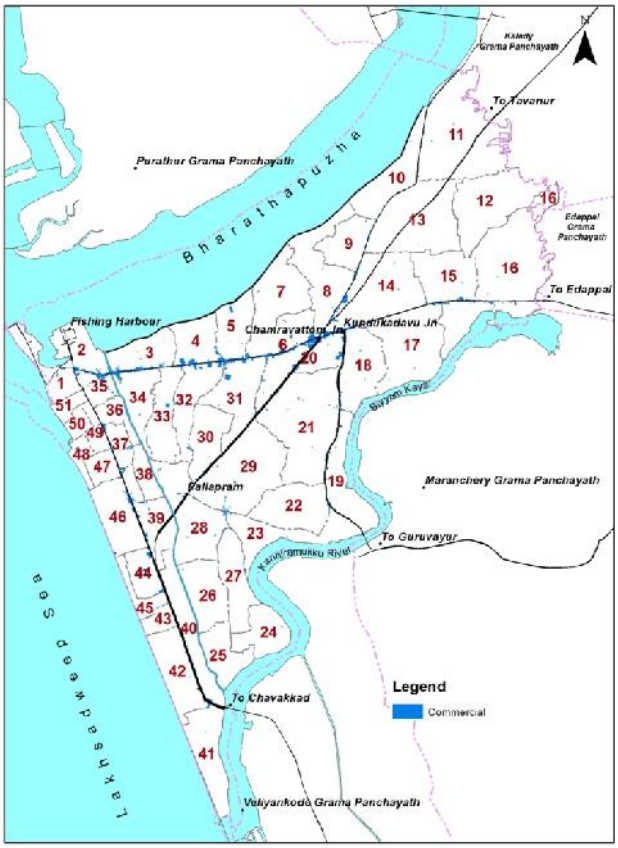


Figure 7-6Spatial distribution of Commercial land use (Source: T&CPD, MPM)

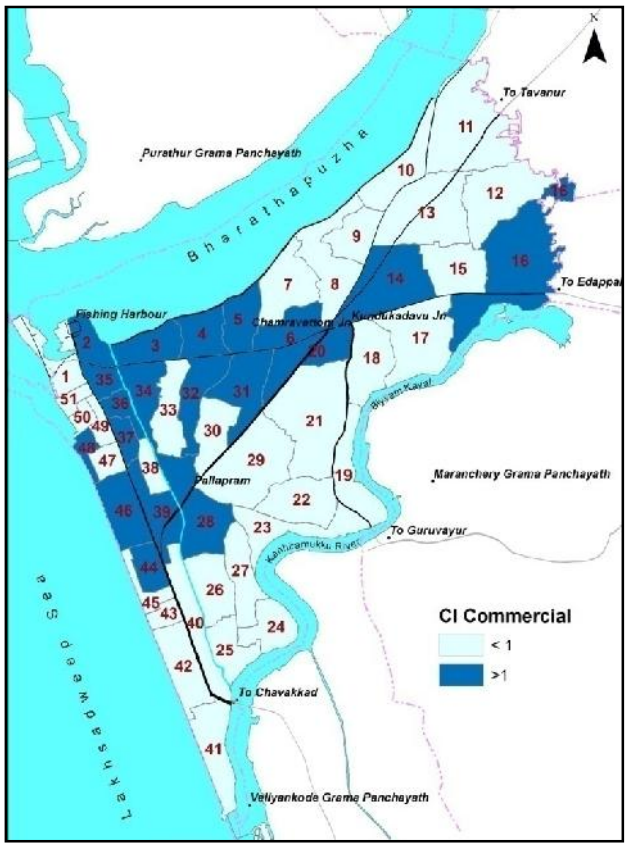


Figure 7-7CI of commercial land use(Source: T&CPD, MPM)

7.5 Industrial

There are no large and medium scale industrial units in Ponnani town, but there are four smallscale industrial units and 110 micro industrial units which are scattered in and around in theresidential areas. Total industrial land usein the municipality is only 4.7Ha whichconstitutes only 0.19 % of the municipalarea. This indicates that the industriesplay only a minor role in the economy ofPonnaniTown. The spatialdistribution of industrial units is shownin Figure 7.8 and the concentration index of industrial land use is shown in Figure 7.9

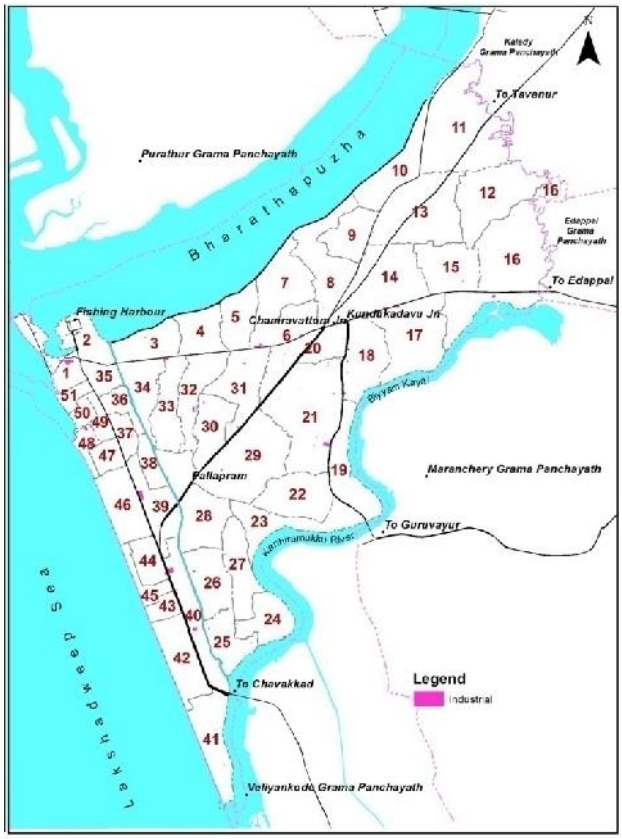


Figure 7-8Spatial distribution of Industrial land use(Source: T&CPD, MPM)

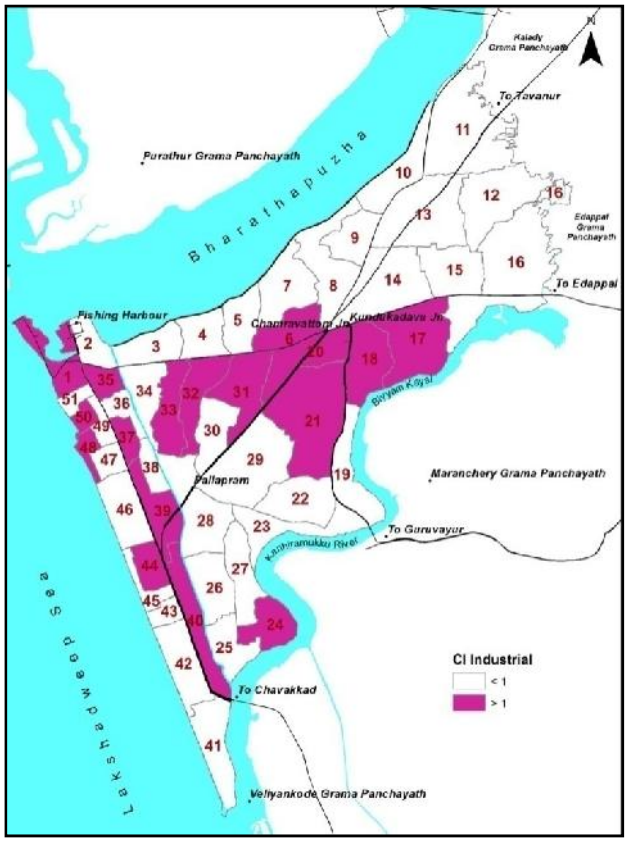


Figure 7-9CI of industrial land use(Source: T&CPD, MPM)

7.6 Public and semi public

Public and semi public land use constitutes 3.12%. Offices, educational institutions, hospitals, police station, court, religious and cultural institutions are grouped under this category. Spatial distribution of public and semi public land use is shown in Figure 7.10 and the concentration index is shown in Figure 7.11. It is seen that the public and semi public land use is scattered around in the residential areas and is concentrated on the coastal side of the municipal area. The Government offices are scattered in and around the Civil Station area in separate small buildings. There is scope for a Revenue Tower to bring all these offices under a single roof; making land available for other uses. Educational institutions of lower order and religious institutions are spread evenly over the town. The spatial distribution of religious land use is shown in Figure 7.12.

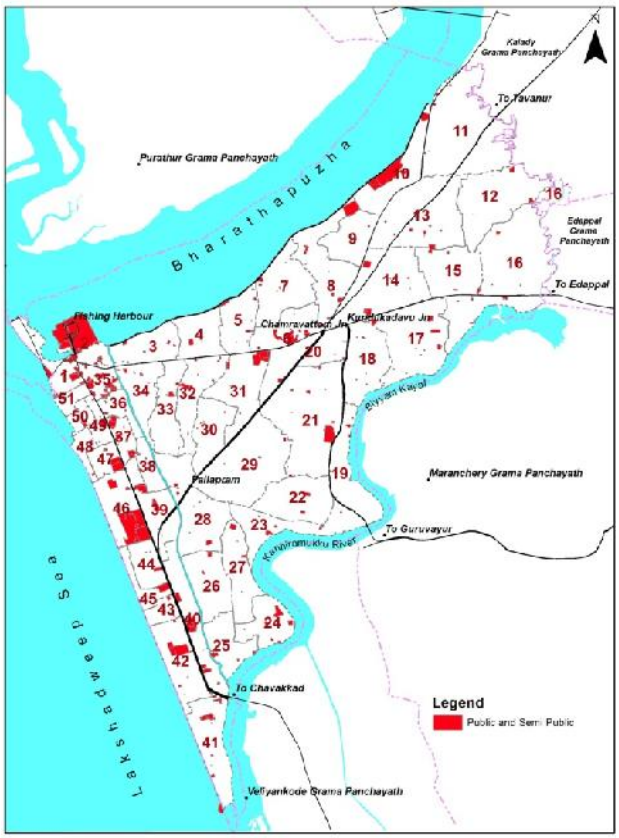


Figure 7-10Spatial distribution ofPublic and semi public land use(Source: T&CPD, MPM)

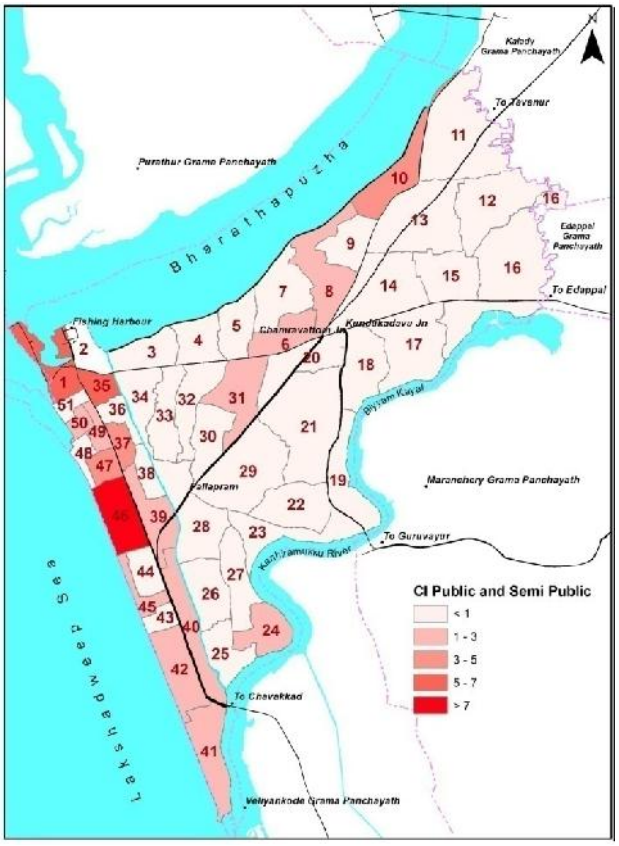


Figure 7-11CI ofPublic and semi public land use (Source: T&CPD, MPM)



Fire and Rescue Station, Ponnani



Fire and Rescue Station, Ponnani

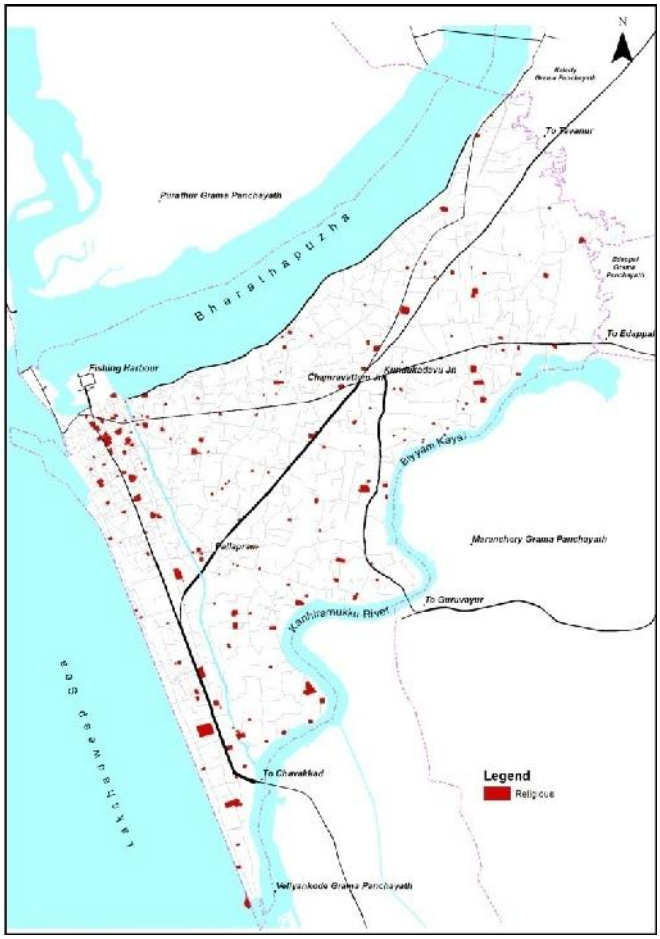


Figure 7-12 Spatial distribution of religious land use (Source: T&CPD, MPM)

7.7 Parks and Open Spaces

Parks and open spaces include stadium, recreational area etc and it constitutes only 0.06% of the municipal area. The spatial distribution of the park and open spaces is shown in Figure 7.13 which shows that the distribution is comparatively very less and there is a lack of organized recreation area in the town.

7.8 Vacant land

Vacant land includes those areas which did not have any specific use at the time of the survey, but land development and conversion to an urban use in the near future. This use constitutes1.17% of the municipal area, indicates the presence of developable land. The spatial distribution of vacant land is shown in Figure 7.14. It can be seen that this use is concentrated in and around the important transportation corridors.

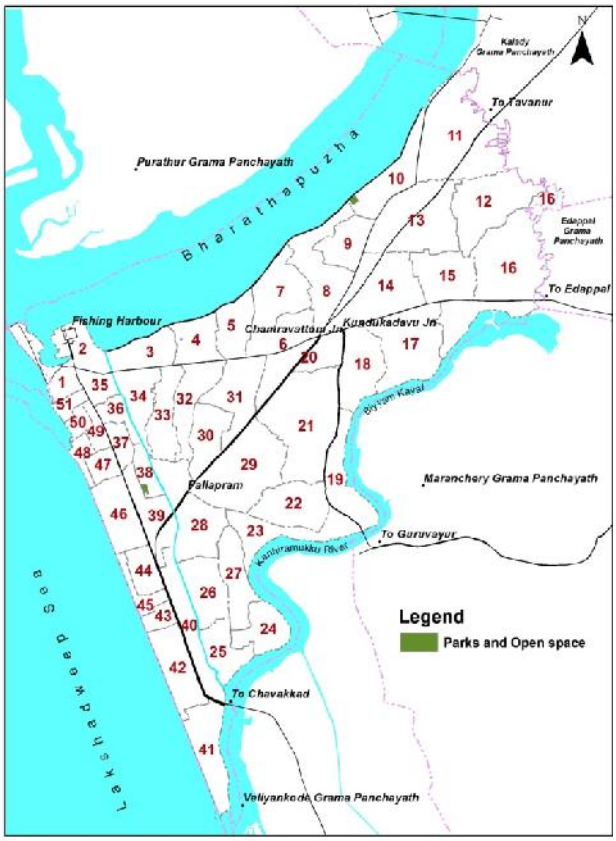


Figure 7-13Spatial distribution of parks and open space (Source: T&CPD, MPM)

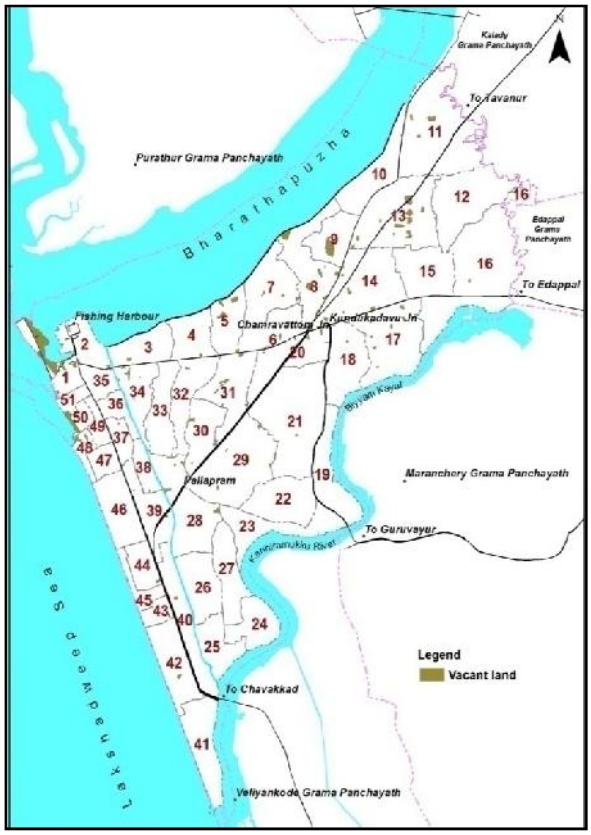


Figure 7-14Spatial distribution of Vacant land (Source: T&CPD, MPM)

7.9 Traffic and Transportation

Land occupied by road, taxi stand and bus terminals are grouped under this category. NH 66, SH 62 are the important roads passing through the town. KSRTC bus stand near MES College, Ponnani and bus stand near municipal office are the existing bus stands. The extent of transportation land use in the Town comes to 112.3 Ha which constitute 4.50% of the municipal area. At present the area occupied by the private bus stand at northern side of the municipal office is very congested and have an area of only 0.098 Ha. But the KSRTC bus station is spacious occupying an area of 1.97 Haand land is available for future expansion. The spatial distribution of Traffic and transportation use is shown in Figure 7.15.



Figure 7-15 Spatial distribution of transport and communication(Source: T&CPD, MPM)

7.10 Agriculture

One third of the land in the town is occupied by agriculture. The wet and dry agriculture jointly constitute 35.11% of the total municipal area. A considerable portion of agricultural land has been filled up for commercial and residential purpose. The extent of paddy land comes to 126.09 Ha which is 5.08% of the municipal area. Spatial distribution of paddyfields is shown in Figure 7.16.

The dry agriculture is seen distributed in the entire municipal area. The important crop in the municipal area is coconut and areca nut. The dry cultivation constitutes 30.13 % of the total area. The spatial distribution of dry cultivation is shown in Figure 7.17. The concentration index of wet cultivation is shown in Figure 7.18 and dry cultivation is shown in Figure 7.19. 87.97 Hectare of municipal area is water logged and it constitutes 0.46%. The water logged areas are marshy lands where vast range of aquatic plants, birds and animals thrive. The marshy lands near the NH bypass comes is an abode of 'Kulakozhi' a water bird. Thus the water logged areas can be fully utilized for fish farming and for balancing the flood problems.

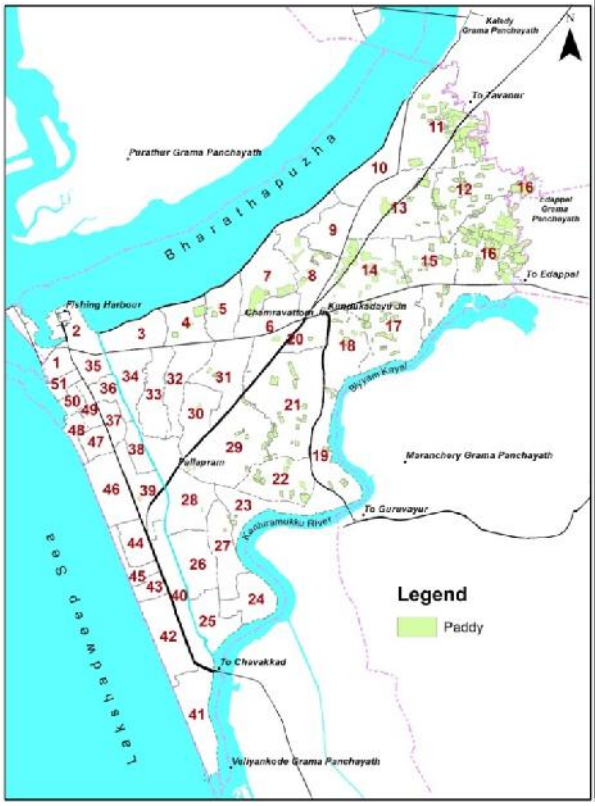


Figure 7-16Spatial distribution of wet cultivation

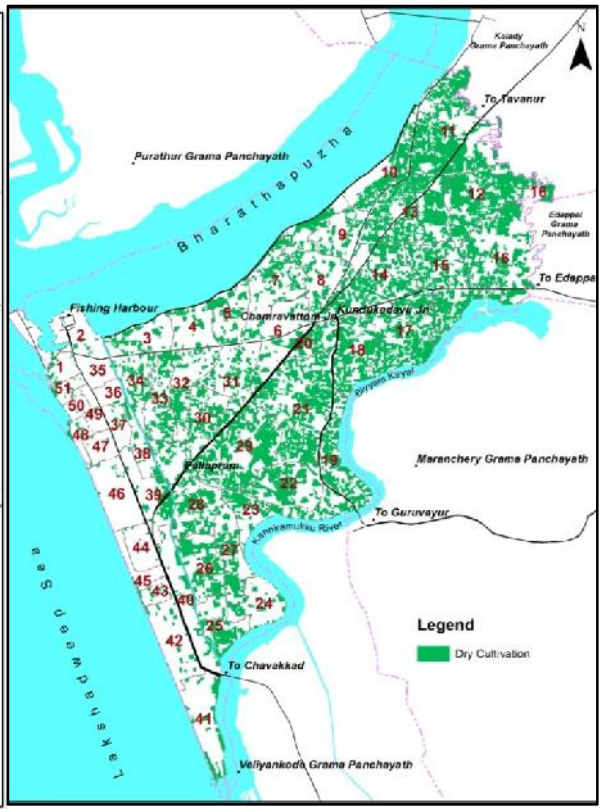


Figure 7-17Spatial distribution of dry cultivation(Source: (Source: T&CPD, MPM)

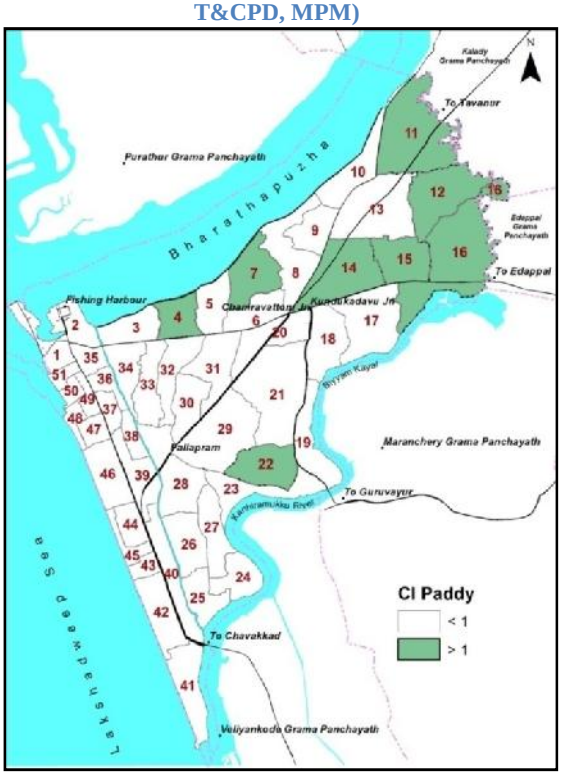


Figure 7-18 CI of Wet cultivation(Source: T&CPD, MPM)

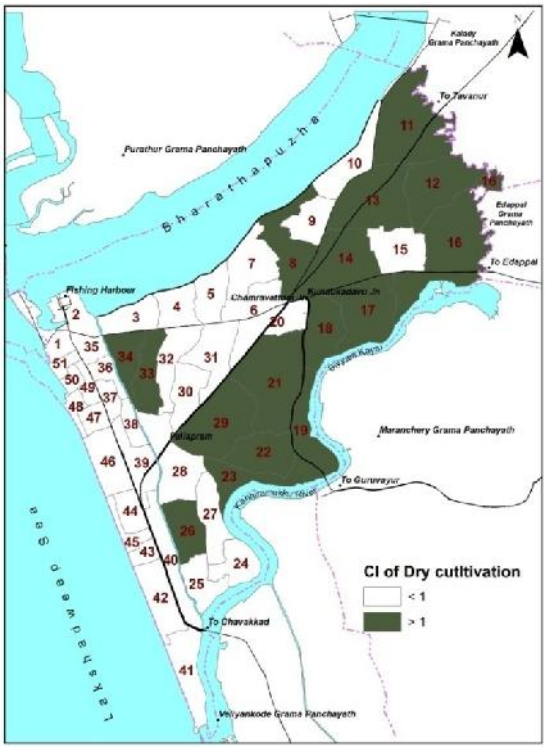


Figure 7-19 CI of dry cultivation(Source: T&CPD, MPM)

7.11 Mangroves

Mangroves area constitutes 0.06% of the municipal area and can be seen at Vandipetta and nearharbor area, which provides better environmental quality. It preserves water quality and reduces pollution. Spatial distribution of the mangroves area is shown in Figure 7.20.

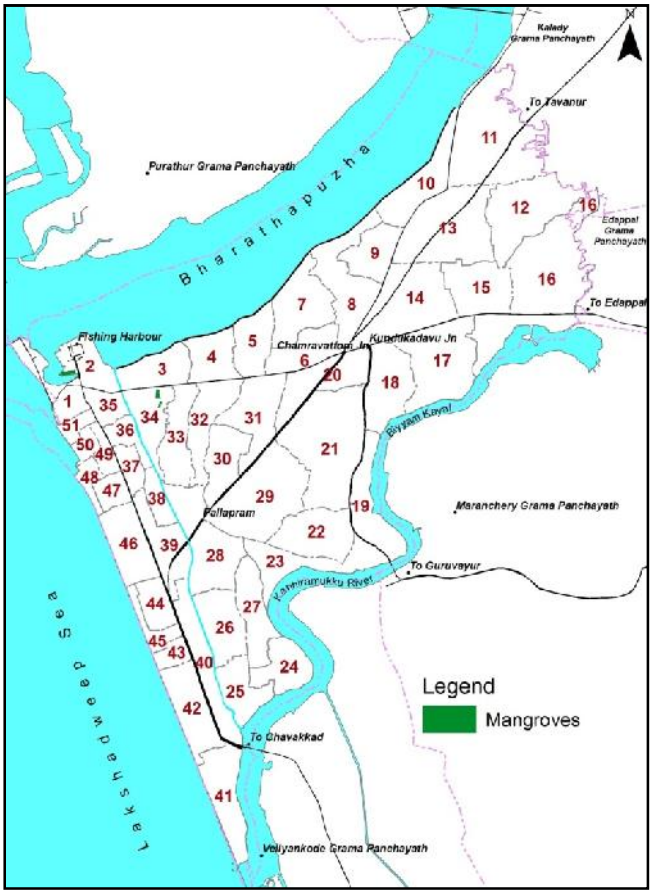


Figure 7-20 Spatial distribution of Mangroves(Source: T&CPD, MPM)

7.12 Built up density

The built up density of the town is studied from the satellite imagery and land use surveysheets for identifying the intensity of human activities in various parts of the town. Agraphical representation of built up density is given in Figure 7.21. Built up density is highest in the CV junction and along the coastal side of the municipal area.In the residential front, the Eastern side of the municipality shows a denser development than otherareas. Considering the built up density and the land use pattern, the town can be divided into two cores viz, multi nuclei core where further compaction is possible and peripheral area, area of lesser compaction.

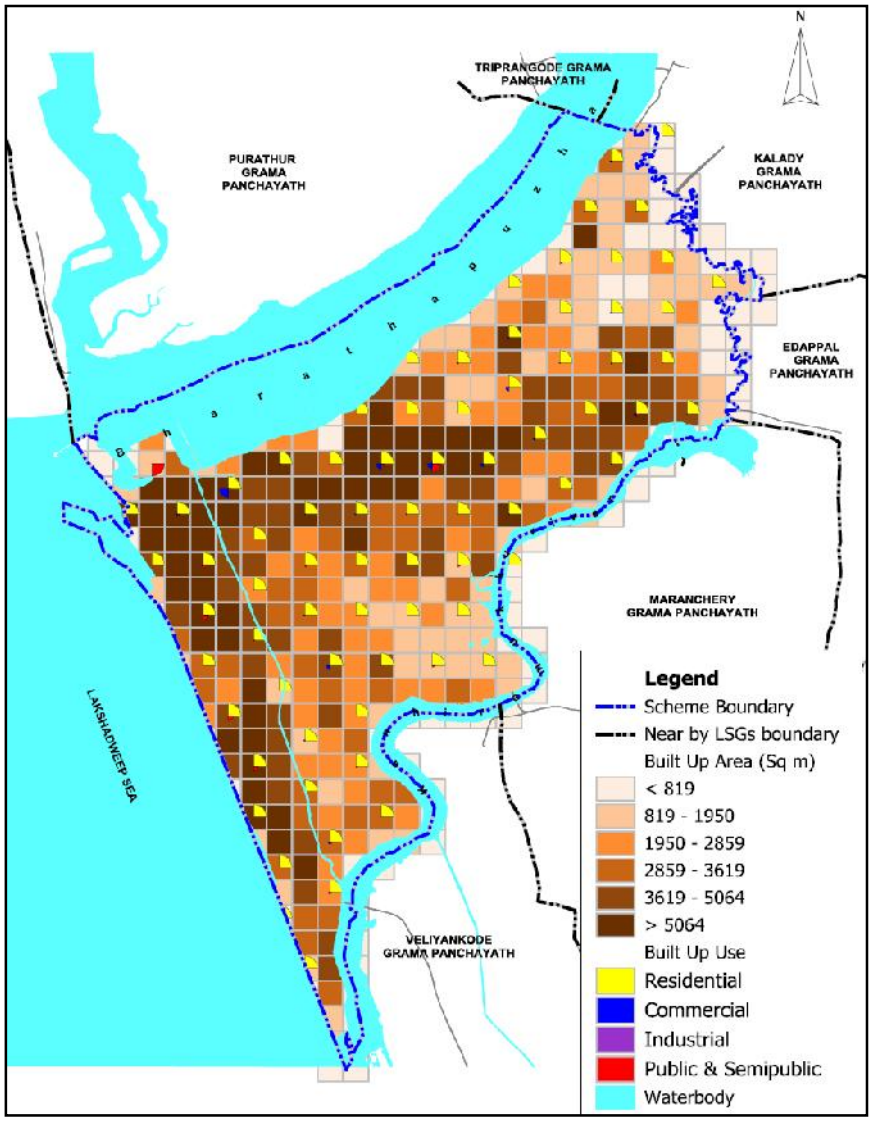


Figure 7-21 Built up density

7.13 Inference

The town has a scattered residential development which makes civic services costlier.The commercial development is concentrated at the junctions and as ribbondevelopment along the major transport corridors. Industrial land use is significantlylow. There are no large and medium scale industrial units located in the town. Space for public recreation is almost non-existent. Public and semi public landuse also tends to concentrate towards the coastal side. Area under transportationuse is quite inadequate to cater to the economic activities inthe town. Based on the built updensity and land use pattern, two distinct areas of development pattern can be foundin the town, the multi nuclei core where further compaction is possible and peripheral area of lesser compaction.

8 AGRICULTURE, ANIMAL HUSBANDRY & FISHERIES

In this chapter the agricultural profile, details of the animal husbandry and fisheries sector of the Municipalityis detailed and the problems and potentials in this field are identified.

8.1 Agricultural sector

Ponnani town is a local body which has not acquired fully the urban character. It was a place where vast land of paddy land existed. Agriculture is one of the major source of income for the people.Agricultural area constitutes 35.11% of total land use. Rice, coconut, arecanut are the main cultivation. The major agricultural produces in the town are rice, coconut, pepper, banana, areca nut, vegetables, tapioca and spices. Ramacham is cultivated within the town at MES College compound using the fund of NAC. Sandy soil is suitable for the cultivation. Even though the coastal area is thickly populated, there is shortage of open land and no Ramacham cultivation is seen anywhere in the town. It is commonly cultivated in the Perumpadappu grama panchayath. There is scope for ramacham cultivation in the town by utilizing vacant sandy fields. Table 8.1 shows the existing area of agricultural cultivation.



Ramacham cultivation at MES College

Table 8.1 Agricultural cultivation (Source: Krishi Bhavan, Ponnani and Ezhuvathiruthi)

Type of crops	Area (HA)
Coconut	1665.88
Areca nut	22
Banana	25
Paddy	45
Vegetables	20
Tapioca	2
Pepper	4.1
Cashew	4
Spices	2
Fruits	4
Rubber	Nil
Pulses	5
Oil Seeds	1
Other Crops	Nil

The spatial distribution of agricultural land of Ponnani town is given in Figure 8.1. From the figure it is evident that the agricultural activity is spread over the entire town except for the coastal area. Paddy constituted 5.08% of the municipal area. The dry cultivation constitutes 30.13 % of the total area. The spatial distribution of the existing paddy is given in Figure 8.2. The spatial distribution of dry cultivation area is given in Figure 8.3.

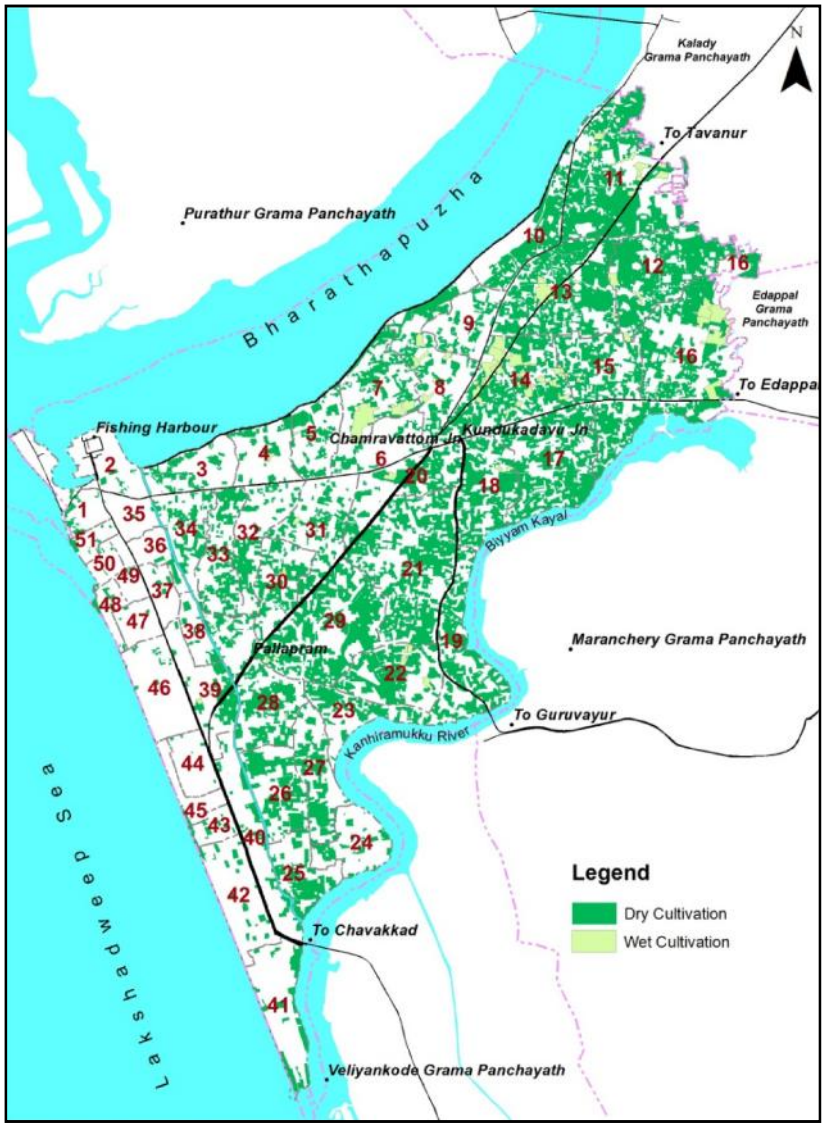


Figure 8-1Spatial Distribution of agricultural land in the town(Source: T&CPD, MPM)

As per the existing land use survey- 2014, the extent of paddy land comes to 126.09 Ha which is 5.08% of the town. Details from the two Krishi Bhavans show that the active paddy fields comes only 45 Ha. In many places, the residential land use has encroached the paddy fields to a large extent. Paddy fields are concentrated at Neithalloor area.

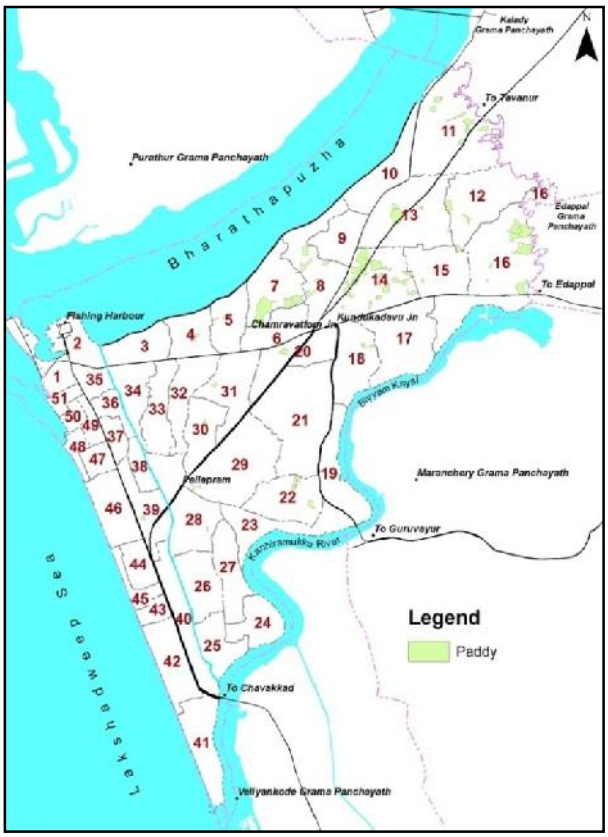


Figure 8-2Spatial Distribution of Wet Cultivation(Source: T&CPD, MPM)

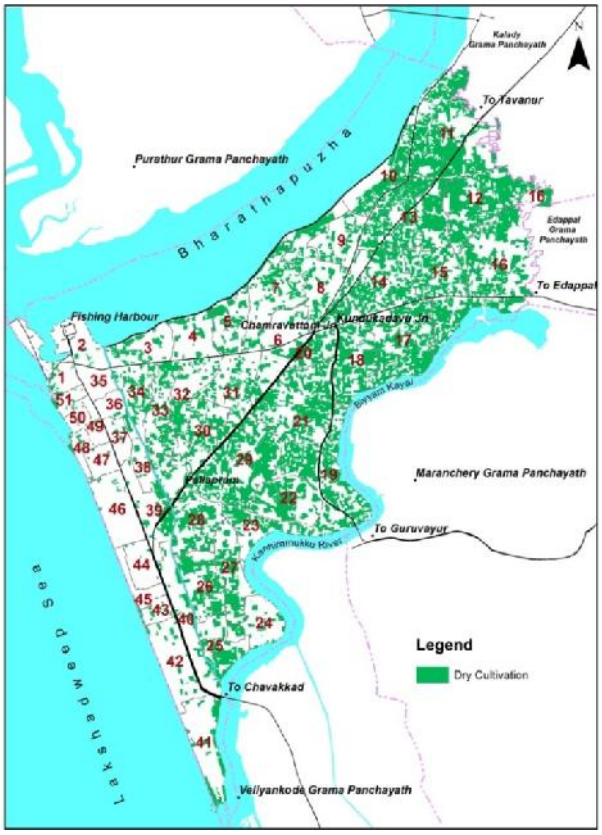


Figure 8-3Spatial Distribution of dry Cultivation(Source: T&CPD, MPM)

Figure 8.4 shows the temporal variation of agricultural labourers which shows a decreasing trend. As per the existing land use survey, 2013, the extent of dry cultivation land comes to 748 Ha which is 30.13% of the town. Details from the two Krishi Bhavans show that the coconut cultivation is done in 1665.88Ha. This also includes the area of coconut cultivation existing in residential areas having extent less than 25 cents which is purely considered as residential area in the existing land use survey. Concentration index of wet cultivation is shown in Figure 8.5 and dry cultivation is shown in Figure 8.6.

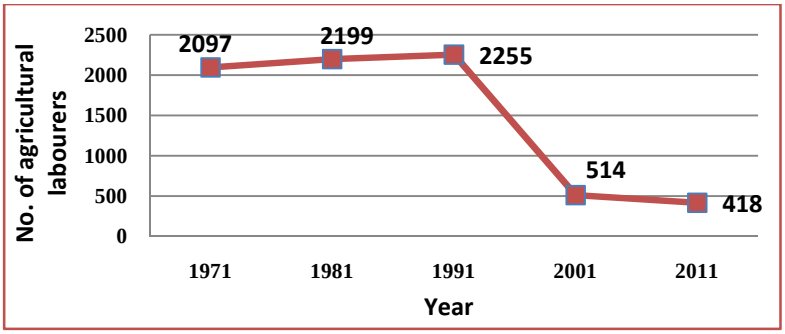


Figure 8-4Temporal variations of Agricultural labourers (Source: Census of India)

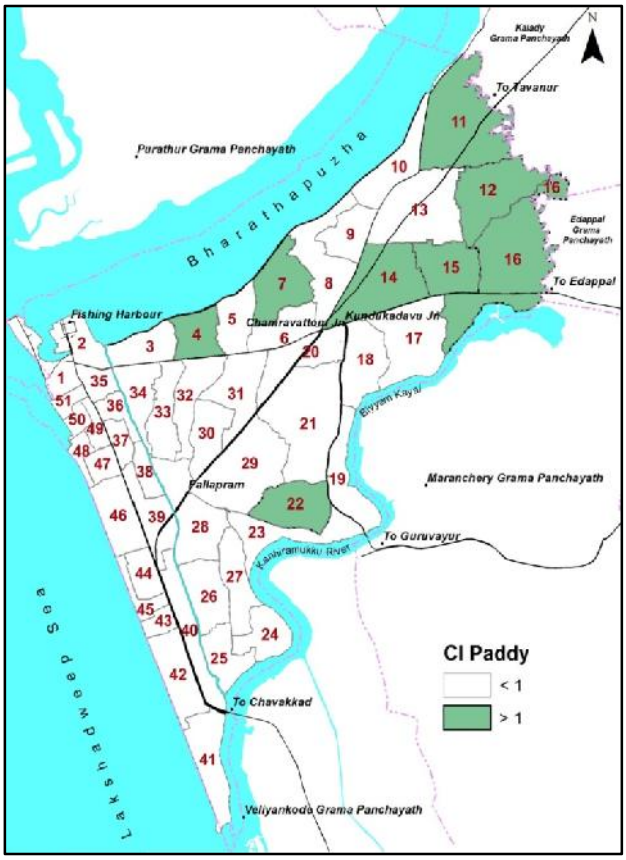


Figure 8-5Concentration index of Wet cultivation (Source: T&CPD, MPM)

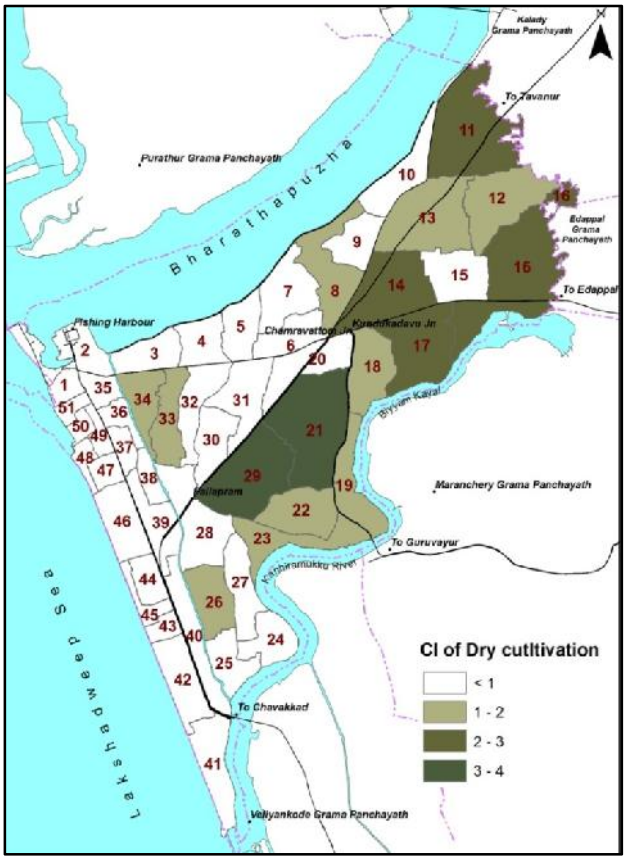


Figure 8-6 Concentration index of Dry cultivation (Source: T&CPD, MPM)

Two Agricultural Offices at Ponnani and Ezhuvathiruthi are functioning in the town. Good quality seeds are available at College of Agriculture at Thavanoor, situated in the nearby grama panchayath. School and home based vegetable gardens are done in the town. There is a lack of fertilizer shops, seed farms, agricultural machinery shops and organized market to improve the agricultural facilities.

8.2 Problems

The problems identified under this sector are

- Lack of agricultural labourers
- Shifting of the labourers to the tertiary sector
- Lesser use of mechanized techniques
- Problems due to saline water intrusion
- Crop diseases
- Large scale plot development for non agricultural purposes

- Conversion of paddy fields
- High cost for cultivation and irrigation facilities
- Lack of market facilities and processing centers
- Reduction inagricultural subsidy
- Increase in price of bio-fertilizers

8.3 Potentials

The potentials of the sector in PonnaniTown are

- Availability of fertile agriculture land
- Flat topography
- Large area available for coconut cultivation
- Large area available for paddy cultivation
- Ramacham cultivation in the town
- School and home vegetable gardens
- Two Krishi Bhavans are situated in the municipal area, Ponnani and Ezhuvathiruthi

8.4 Inference

Even though agriculture is one of the main source of income of the people of the Town having large area of fertile agricultural land and favorable terrain and climatic conditions the existing agricultural land constitutes only 35.18% and 2.85 % of workers are engaged in the agricultural sector. The drastic change of agricultural labourers is due to the lack of profit and employment in the sector. Lack of agricultural laborers,shifting of the laborers to the tertiary sector, lesser use of mechanized techniques, problems due to saline water intrusion at various places especially in the Kadavanad area, large scale plot development for non agricultural purposes, conversion of paddy fields, lack of market facilities and processing centers etc can be attributed to this decline of production in this sector.

8.5 Animal Husbandry

Animal products like meat, milk, egg plays an important role in Kerala economy. Ponnani is a local body where large consumption of animal products takes place. The Figure 8.5 gives the live stock population in the town. From the population it is evident that animal husbandry practiced in the town is not on a commercial basis. Compared to the size of the town and extent of undeveloped areas, animal husbandry has a wide scope.

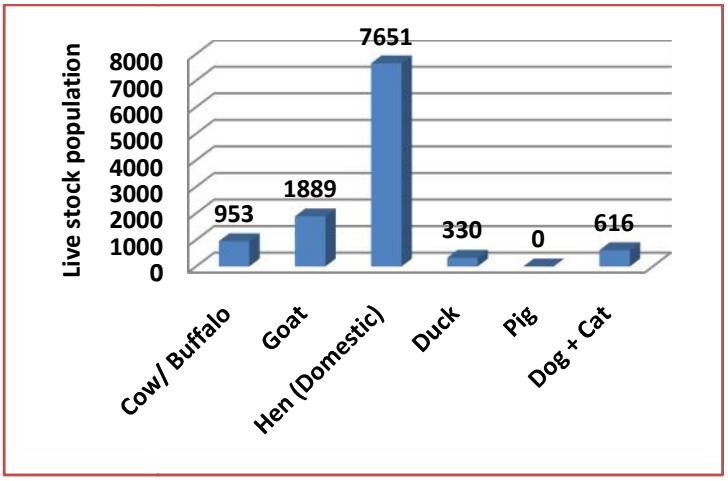


Figure 8-7Live stock population (Source: Veterinary Department)

The town has a hatchery named Anugraha hatchery located at Theyyangad. 75 hens and 1000 eggs are produced per month. There are 13 private dairy farms with 5 to 11 cattle and produces 50 to 110 litres of milk per day. The consumption, production and shortage of milk in the town is shown in Figure 8.6.

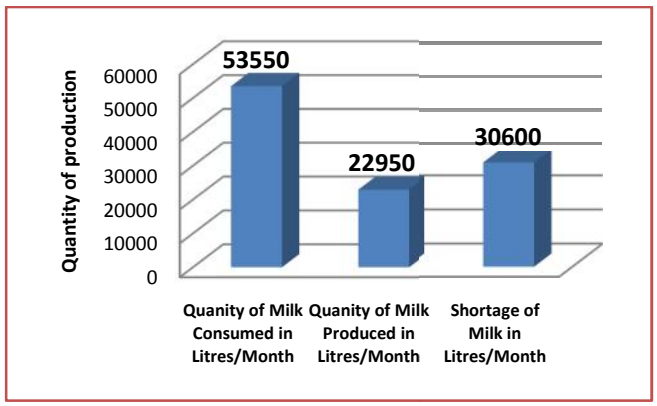


Figure 8-8Production & consumption details (Source: Veterinary Department)



Veterinary Hospital at Easwaramangalam

The average consumption of red meat is 77400 Kg per month in the town. The per capita consumption is not very high but the consumption is more than the production. For meeting the

demand, the town depends on neighboring states; Tamil Nadu and Karnataka for supply of meat, egg and milk.The average consumption of chicken is 12300 Kg per month and is low compared to other nearby local bodies. This is due to the easy availability of sea fish and inland fish. The consumption of milk is 53550 litres per month which is more than double the quantity which is produced. The details are shown in Figure 8.9.

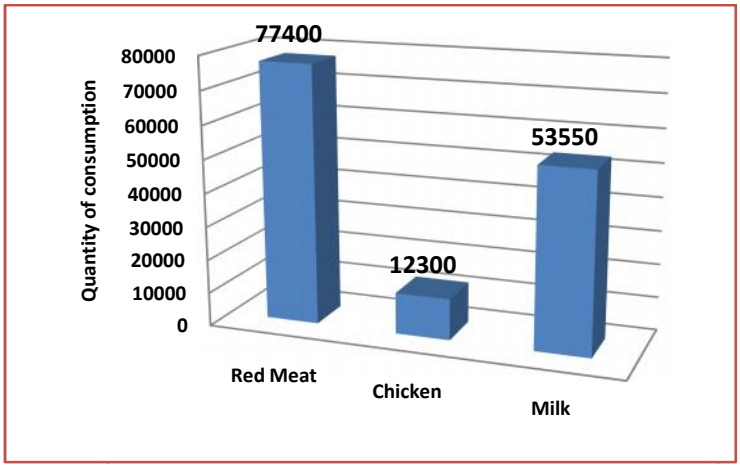


Figure 8-9Monthly consumption (Source: Veterinary Department)

There is lack of abattoirs in the town. Even though the red meat consumption is more the presence of the same is a must. There are two veterinary poly clinics situated in the municipal area at Easwaramangalam and Puzhambram.

8.6 Projected requirements

- At present there are 11 milk booths functioning in the municipality
- As per standards One Milk booth/5000 population is required.
- Hence a total of 24 Nos, additional 13 Nos are required by 2031.
- Average Consumption of meat is 89.7 Kg/1000 population and also high consumption of eggs and other animal based products. This highlights the requirements of slaughter house, dairy farms, poultry farm etc in the Municipal area.

8.7 Problems

- The present livestock produces can cater only 10% of the municipal population
- Conversion of vacant lands and agricultural lands reduce the availability of fodder.
- Lack of interest to this field
- High maintenance cost
- High cost of animal and poultry feeds

- Lack of financial assistance to this sector
- Poor infrastructure facilities in the veterinary hospitals
- Lack of authorized abattoirs
- Insufficient processing and deep freezing facilities

8.8 Potentials

The potentials of the sector in PonnaniTown are

- Community level cattle and poultry farming thereby promoting biogas production and manure and organic farming.
- Micro finance for poultry farming

8.9 Inference

Even though animal husbandry is practiced in the town not on a commercial basis, Ponnani is a local body where large consumption of animal products takes place and there is vast area of undeveloped land to promote this sector. The present animal products can cater only 10% of the municipal population and that too the quality cannot be assured. Lack of authorized abattoirs, insufficient processing and deep freezing facilities and poor infrastructure facilities in the veterinary hospitals are the issues urgently attended in this sector. Also conversion of vacant lands and agricultural lands reduce the availability of fodder and lack of interest in animal husbandry from new entrepreneurs, high maintenance cost and high cost of animal and poultry feeds and lack of financial assistance to this sector make the sector very week in the town.

8.10 Fisheries sector

Fisheries sector of Kerala is considered as one of the important productive and development sectors of the State. Being a coastal town, Ponnani's economy also depends on this sector. Ponnani town has a total coastal length of about 8.75 km. About 3100 families are related to this sector and 4120 labourers are registered in this sector. The fishing activities are mainly concentrated at Azheekkal ward No.1. There are no significant of commercial activities related to fisheries sector in the town. However the town has wholesale fish trading activity which is carried out on the fishing harbour itself. About 130 fishing boats, 60 small boats and 60 conventional fishing boats are fishing daily (Morning - Evening). About 3 Tonnes/day of Squid and Shrimp are exported through Kochi market subject to availability. The supply to local markets in Kerala is not significant. The remaining fish are transported to other states viz.Karnataka, Maharashtra and Goa. The retail vendors supply fish to households in residential

areas. Within the municipal area several fish markets are functioning. Municipal fish market at Koravalappu is the only fish market owned by Municipality. Details of type of fish and quantity of fish catches are shown in Table 8.2.



Fish market in Ponnani

Table 8.2Details of type of fish and quantity of fish catches (Source : Local enquiry)

Sl. No.	Ward No.	Name of Ward/Place	Major type of fish	Quantity of fish catch/month (Specify unit)
1	Ward 1	Ponnani Fishing Harbour (Azheekkal)	Sardine	10 Tonne/day
2			Mackerel	2 Tonne/day
3			Silver belly	0.5 Tonne/day
4			Ribbonfish	1 Tonne/day (Seasonal)
5			Sole fish	5 Tonne/day
6			Seer fish	1 Tonne/day
7			Pomfret	1 Tonne/day
8			Sea catfish	1 Tonne/day
9			Anchovies	1 Tonne/day
10			Shark	1 Tonne/day
11			Rays	100 Kg/day
12			Shrimp	3 Tonne/day (Seasonal)
13			Squid	0.5 Tonne/day (Seasonal)

Eleven numbers of ice plants are situated in the municipal area which identifies the importance of the fisheries sector. Details of ice plants are shown in Table 8.3 and the spatial distribution is shown in figure 8.10.

Table 8.3Details of Ice plants (Source: Local body)

Sl. No.	Name of Ice factory	Qty/day
1	Bismilla Ice Plant, Fishing Harbour	20 Tonnes
2	Jasmin Ice Plant, Fishing Harbour	10 Tonnes
3	New Jasmin Ice Plant, Fishing Harbour	25 Tonnes
4	Saleem Ice Plant, Fishing Harbour	25 Tonnes
5	Crown Ice Plant, Fishing Harbour	10 Tonnes
6	Rifayath Ice Plant, Fishing Harbour	25 Tonnes
7	E.K.S Ice Plant, Fishing Harbour	20 Tonnes
8	Rahath Ice Plant, Fishing Harbour	20 Tonnes
9	Crescent Ice Factory, Badarupalli Road	20 Tonnes
10	Malappuram Ice Factory, Near Police Station	20 Tonnes
11	Sakthi Ice Factory, Kodathippadi	10 Tonnes

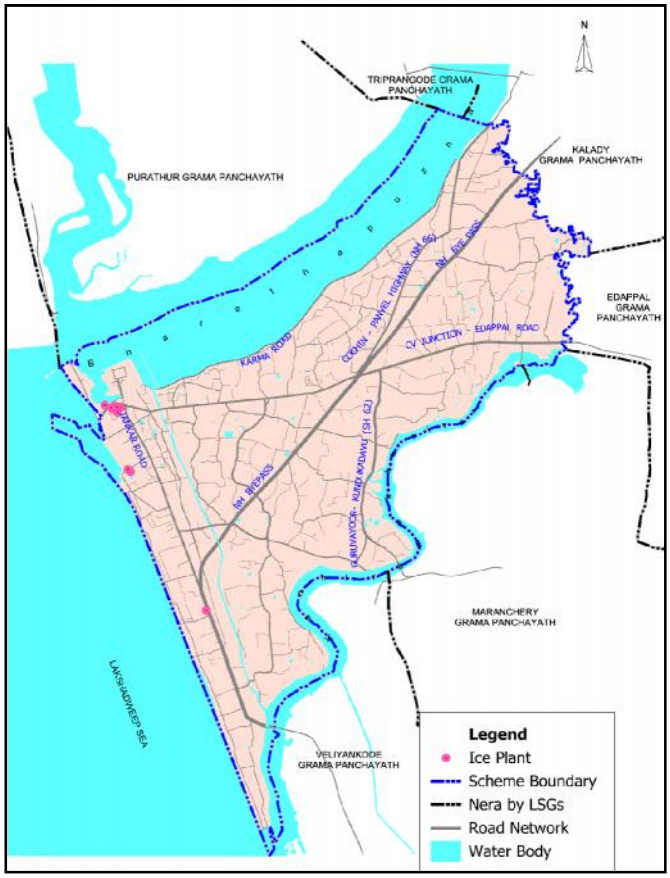


Figure 8-10 Spatial distribution of Ice Plants in Ponnani

About 4120 labourers are working in the fisheries sector in Ponnani. This is very high on comparison with the labourers of Beypore,Koyilandi, Vatakara which is only 532, 2832, 620 respectively.Sardine (Mathi), Sole fish (Manthal) and Mackerel (Ayala) are the prominent fish types available from the Ponnani harbor.About 3 Tonnes/day of squid and shrimp are exported through Kochi market subject to availability. About 150 fishing boats are fishing daily and 9700 tonnes/year fish catch are done in Ponnani.Annual fish landings in a harbor depend on fleet size (number of boats) and rich fishing grounds at sea. On comparing with the fish catch at Puthiyappa and Beypore Harbor, Kozhikode, it is found that about 500 boats are fishing daily and fish catch of 12000 and 11000 tonnes/year respectively, is reported here.

A well established fishing harbour functioning as an estuarine port as well as a fish landing centre in the town. In this region sand bars are formed during monsoon which creates sufficient tranquility to vessels. The formation of sand bar forms a dangerous obstacle to shipping so that the fishing boats are not using the newharbour. Now they use the old harbor for trading facilities.This attracts the fishermen from adjoining village to migrate to this region to exploit the rich resources and the existing facilities are quiteinadequate to cater to their needs.The construction of break water, wharf, auction hall,canteen building, gate and gate house,water supply arrangements, electrification and lighting are completed.



Ponnani Fishing Harbour

The occurrence of mud banks is not a regular phenomenon and cannot be relied upon to provide tranquil conditions for the fishermen of this area throughout the fishing season. Hence an artificial tranquil basin is created to ensure fishing activity throughout the year. There have been persistent demands from the fishermen to develop this area in to a fisheries harbour, the present fishing activities, fishing fleet, proximity to NH, topographic features and the marketing potential emphasize the necessity to construct a full fledged harbour in this locality.

There is a light house in Ponnani under the control of Government of India, which highlights the importance of fishing in this area very long back.The number of people involved

in fisheries is increasing and the catch indicates a decline, the reason for which cannot be attributed locally.


Ponnai Light House

The sanctioned and inaugurated cargo port is located on the coastal side of the town and the south of Bharathapuzha River near the light house. On the northern side, Tirur Puzha joins with Bharathapuzha River and together drains in to the Lakshadweep sea.

The port is proposed to be developed on predominantly reclaimed land of about 82 HA (203 acres) in phase 1 and 206.1 Ha (510 acres) in phase 1A. An area of approximately 12.14 Ha (30 acres) of unsurveyed coastal land belonging to government of Kerala has been allotted to Malabar Port Private Limited for development of the cargo port and remaining land will be reclaimed. It is proposed to develop a green belt in an area of about 12 Ha around the port area and this will function as a shield preventing the pollution of the surrounding areas and thereby maintaining the environmental balance of the area. The major commodities to be handled are containers, general cargo and thermal coal. The port development involves creating a turning circle besides adequate harbour basin and breakwaters. The port also provides pilot assistance for safe maneuvering of ships and suitable capacity tugs to bring vessels safely along the berths for loading and unloading operations. The proposed construction activities involve dredging, construction of approach trestle and cargo berths which may likely impact the fishing activity at nearby villages. The existing fishing harbour is located at about 1.5 km from the site of port and traditional and mechanized fishing is being carried out by fishermen. The cargo port will be commissioned by March 2016.



Layout of proposed cargo port

The fishermen access the sea through the mouth of Bharathapuzha River which is being protected by two breakwaters on either side. Construction of a boat repair yard is also proposed

for the urgent repairs and maintenance of the fisherman boats which spread over an area of one acre.

Ponnani's economy is largely based on the fisheries sector. The functioning of cargo port and the full fledged fishing harbour will create a boom in this sector, which will demand more physical and infrastructure facilities. The future land use should be proposed in such a way that this sector especially in the coastal area should be attended in depth. Initiatives should be there to attract more people to this field.

8.11 **Problems**

The problems faced by this sector are

- Lack of organized market and cold storage.
- Under utilization of new fishing harbour
- Formation of sand bars
- It is reported that in the Kerala coast, about 50% of the commercially important marine fish species are over exploited. The catch indicates a decline in Ponnani also.
- Auxiliary activities are inadequate
- Lack of facilities for fish processing
- Lack of financial assistance
- Unemployment of female in the fisheries group
- Lack of adeqate infrastructure facilities
- Fish markets lacks adequate space for loading and unloading and parking facilities

8.12 **Potentials**

Even though there are many problems, this sector offers much potential in the field of harbour and river based fisheries and tourism projects.

- The only coastal town in the district
- Important Fishing centre.
- Oldest Port.
- Sanctioned Cargo Port.
- More labourers working in this sector
- One of the important sectors of economy.

- Existing fishing harbour.
- A boat repairing unit is working at harbour
- One boat yard is located in the fishing harbour
- Exporting squid, shrimp etc
- Ice plants are situated near the harbour.

8.13 Inference

Being a coastal town, Ponnani's economy also depends on this sector but there are no significant activities of commercial scale development in fisheries sector of the town. The present fishing activities, fishing fleet, proximity to NH, topographic features and the marketing potential emphasize the necessity to construct a full fledged harbour in this locality.Studies carried out reveal that there is decrease in participation rate in primary and secondary sector and increase in participation in tertiary sector activities. Lack of opportunities and low income from these sectors can be attributed to this decrease. The functioning of cargo port and the full fledged fishing harbour will create a boom in this sector, which will demand more physical and infrastructure facilities. The future land use should be proposed in such a way that this sector especially in the coastal area should be attended in depth. Initiates should be there to attract more people to this field. Inland fishing activities are to be promoted as there are many uncultivated paddy field and ponds in the town.

9 INDUSTRIES AND TRADE

The fact that industries and trade wax and wane is a reality of any economic system that wants to remain dynamic and responsive to people's changing tastes. The industrial profile and trade of Ponnani is described in this chapter.

9.1 Industries

In the early days, Ponnani was a notable place for the manufacture of big wooden boats called "Uru" or "Pattemari". Though this place is industrially backward now, some traditional industries based on coir and coir products, marine products, etc. are dominating from the very early times. There are no large/medium scale industries in Ponnanitown. The traditional industries are mainly producing marine products, coir products, handicrafts etc.

About 4 small scale industries and 110 micro industrial units which are registered in the industries department are functioning in the town. Figure 9.1 shows the details of industrial units functioning in Ponnani.

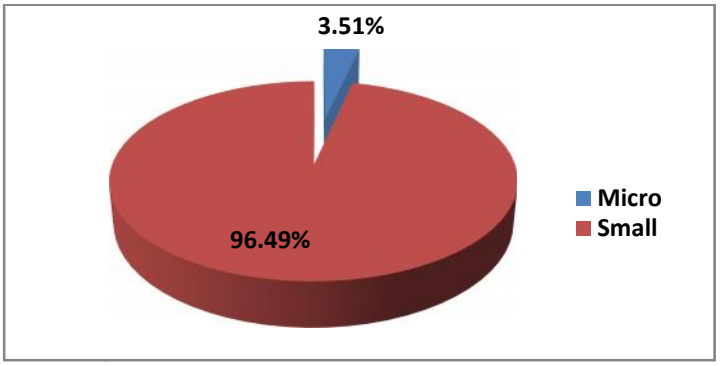


Figure 9-1 Details of Industrial units (Source : District Industries Centre, MPM)

The total area under industrial land use comes to only 0.19% in the town, which is very less. There are no specific concentrations of industrial use in any of the wards in the municipality. The spatial distribution of industrial units is shown in Figure 9.3. Most of the units being micro in scale are scattered around the municipal area. Sanctioned cargo port and the existing fishing harbor are the potentials in the industrial sector. So there is a potential for developing industrial units relating the same. Industries based on the manufacturing of building materials which forms a major group in the micro and small scale industries.

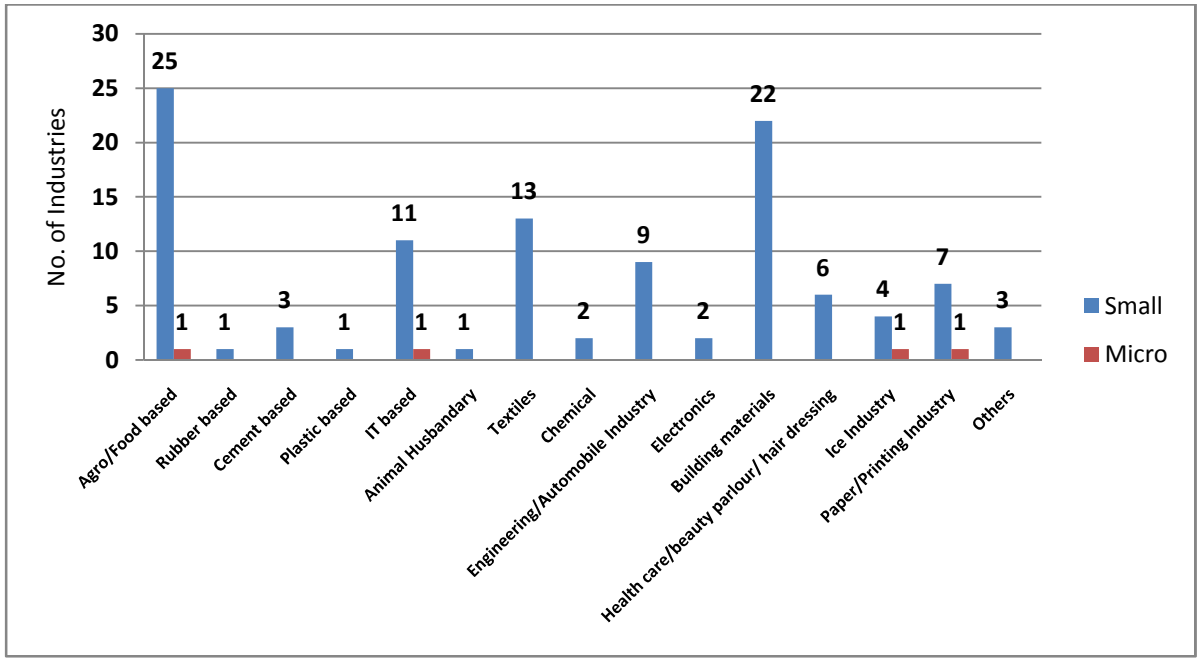


Figure 9-2 Types of Industries (Source : District Industries Centre, MPM)

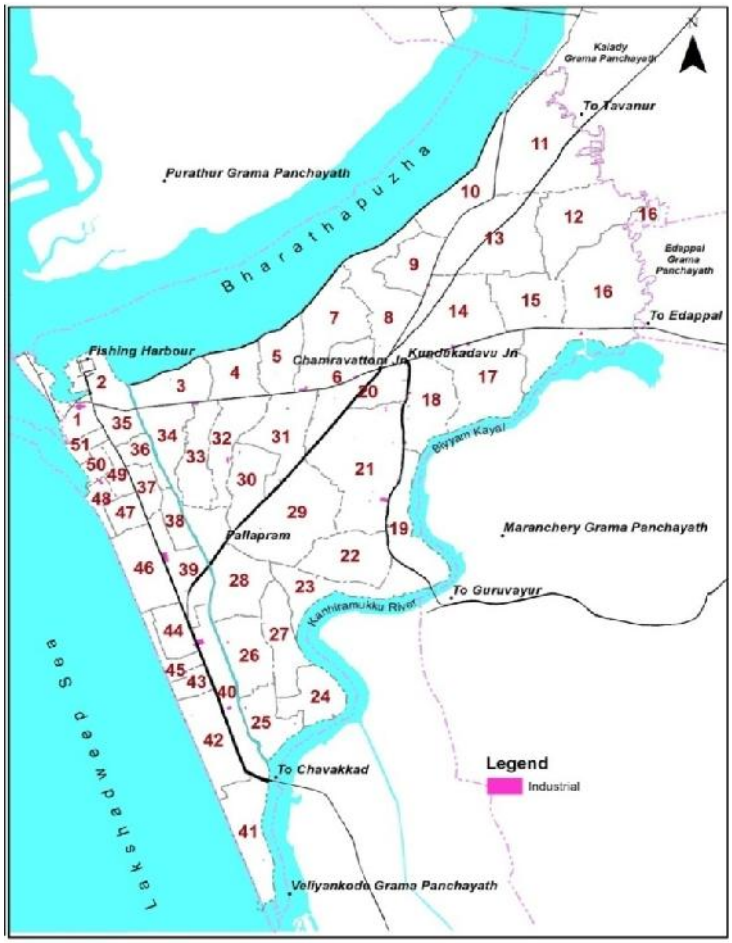


Figure 9-3Spatial distribution of existing industrial units

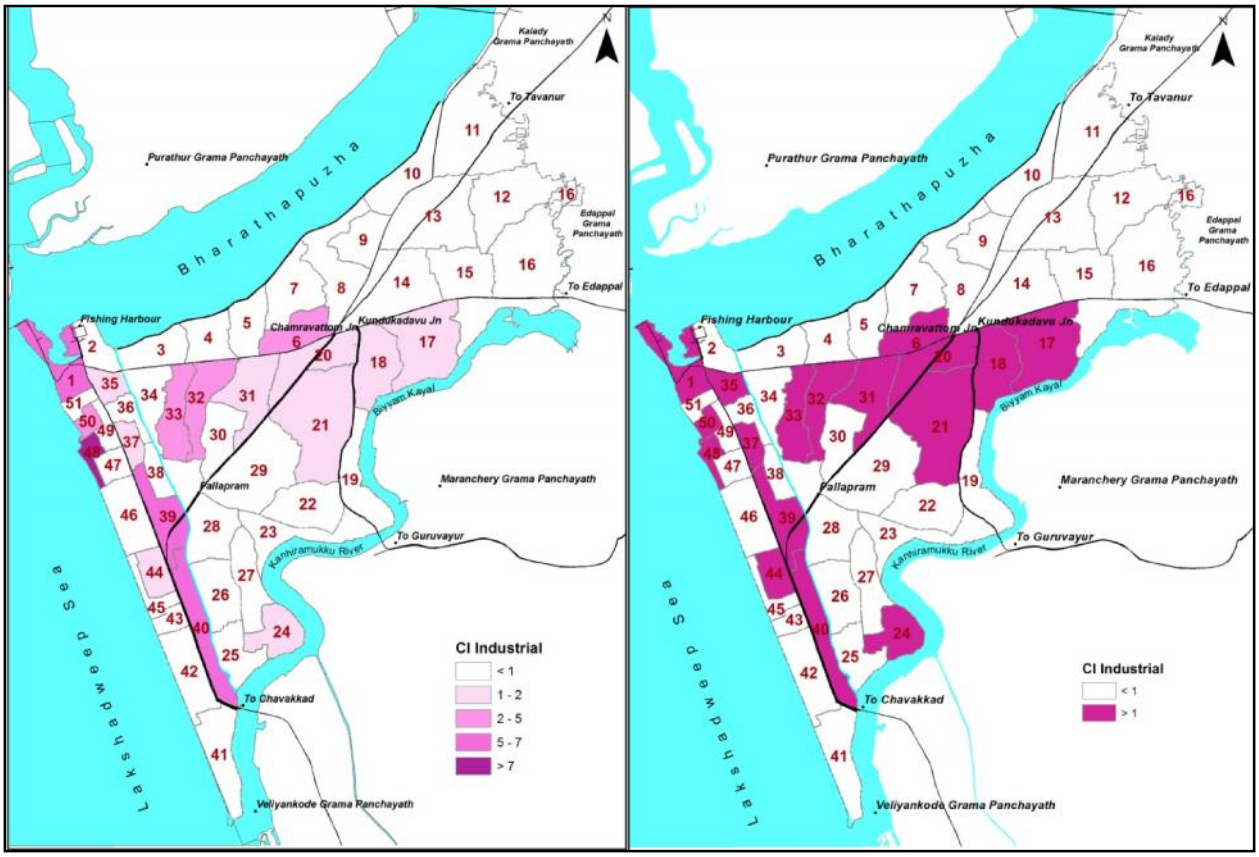


Figure 9-4 CI of industrial land use(Source: T&CPD, MPM)

The traditional industries based on coir and coir products are dominating from the very early times.The details of coir industries functioning at present in the town at various places is shown in the table 9.1. But now a days coir industry is very weak in the town.

Table 9.1 Details of coir industries (Source: Coir Board, Ponnani)

Sl. No.	Name Industry	Type of Traditional Industry(Coir)	Recognized or not	Quantity of produce/Year (Coir Yarn 2013-14)	No. of Workers
1	Pallappram CVCS Ltd No:598	Coir Vyavasaya Sahakarana Sangam	Recognized Cooperative	40.03 Qntl. Yarn	8
2	Ezhavathuruthi CVCS	Coir Vyavasaya Sahakarana Sangam	Recognized Cooperative	57.98 Qntl. “	13
3	Kadavanad CVCS Ltd No;233	Coir Vyavasaya Sahakarana Sangam	Recognized Cooperative	12.65 Qntl”	3
4	Easwaramangalam CVCS Ltd No: 222	Coir Vyavasaya Sahakarana Sangam	Recognized Cooperative	93.81 Qntl “	9
5	Chanakkal Coir Works, Kadavanad	Coir Vyavasaya Sahakarana Sangam	Recognized Private	295 Qntl “	22
6	Padinjarayil Coir Works, Kadavanad	Coir Vyavasaya Sahakarana Sangam	Recognized Private	115 Qntl “	18

9.2 9.1.1 Problems

The problems identified in this sector area

- Land availability is less due to high land price
- Lack of modern facilities.
- Lack of scientific facilities to improve the quality and productivity of existing industrial produces.
- Lack of training programmes
- Shortage of power
- Lack of marketing facilities of traditional products
- Lack of investment in coir industries other traditional industries
- Lack of large scale industries
- Shifting of the labourers to the tertiary sector
- Dedicated industrial land use very low
- Under utilization of new fishing harbor

9.1.2 Potentials

The following are the potentials in this sector in PonnaniTown

- Industries using coconut shell products can be improved.
- Modernization of coir industry
- Connolly Canal, the inland waterway gives better trading facility.
- Scope for industries based on marine products.
- Scope for industries related to Cargo port and harbour
- Scope for industries based on agriculture
- Modernization of industries based on food products and building materials
- Development of industrial units related to IT and tourism
- Construction of industrial estates**.**

9.3 Inference

The industrial sector is very weak in the town even if there is large scope for industrial promotion in this area. Dedicated industrial land use is very low in the town. The existing traditional industries producing marine products, coir products, handicrafts etc are to be rejuvenated which are a good source of income. Sanctioned cargo port and the existing fishing

harbor are the sectors which input a better investment in industrial sector. So there is a potential for developing industrial units relating the same. Also IT based and tourism based industries are to be promoted.

9.4 Trade and commerce

Ponnani is one of the oldest port on Malabar Coast and has contributed to the trade and economy of Malabar from very early times. Tippu Sulthan developed the port for trade and security reasons.It is the only port in Malappuram District.This port was used as a hub for trading with Arabs and Europeans in the early ages of British Colonial rule in Malabar. Thrikkavu in Ponnani was one among the seats of the Zamorin of Calicut from where he controlled the trade and commerce. The economy of the town is predominantly based on agriculture and marine products. Coconut, Copra, Fish, Tiles and Coir etc were traded by ships and is mainly used for the fishing industry.New cargo port also sanctioned and inaugurated. Better road transportation facilitiesare to be ensured for theprominence of the port. Chamravattom Regulator cum Bridge provides the basic infrastructure to the new port. A Central Government Port Customs Office also functions in Ponnani.

Vandippetta, the oldest commercial town is situated within the municipal area. The main commercial centers are CV Junction and Chandappadi Junction. The existing commercial centers are seen in the following locations and are shown in Figure 9.5.

- C.V. Junction
- Chandappadi
- Kundukadavu Junction
- Municipal Junction
- Vandipetta
- Kodathippadi
- Kollanpadi
- Puzhambram
- Kottathara

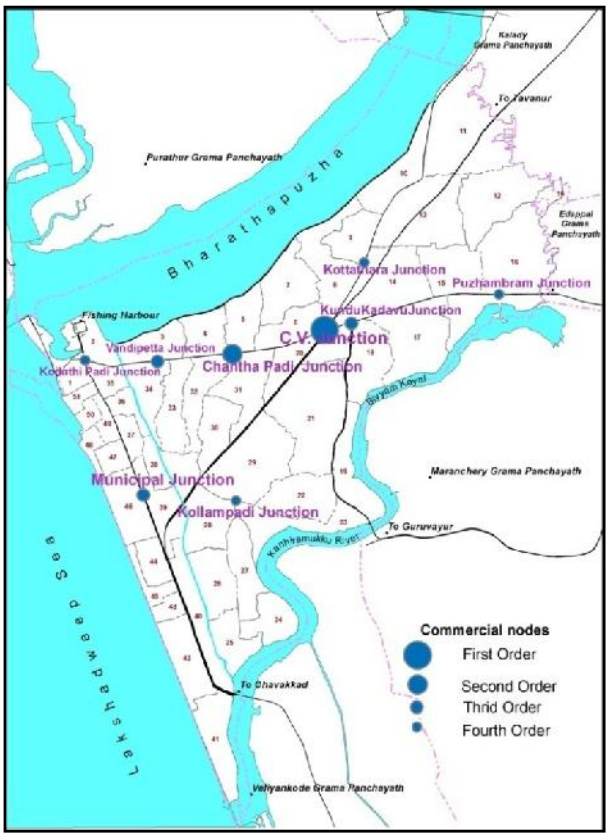


Figure 9-5 Hierarchy of existing commercial centers (Source: T&CPD, MPM)

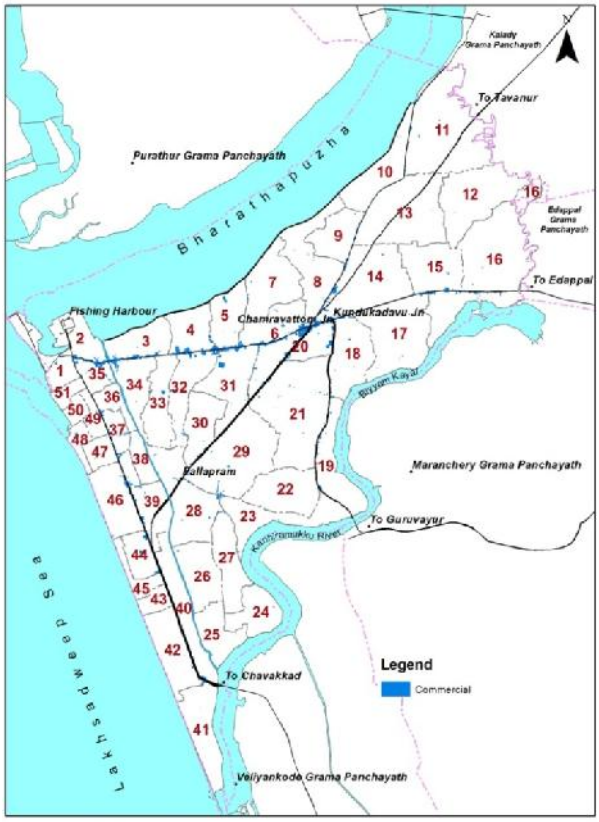


Figure 9-6Spatial distribution of existing commercial land use (Source: T&CPD, MPM)

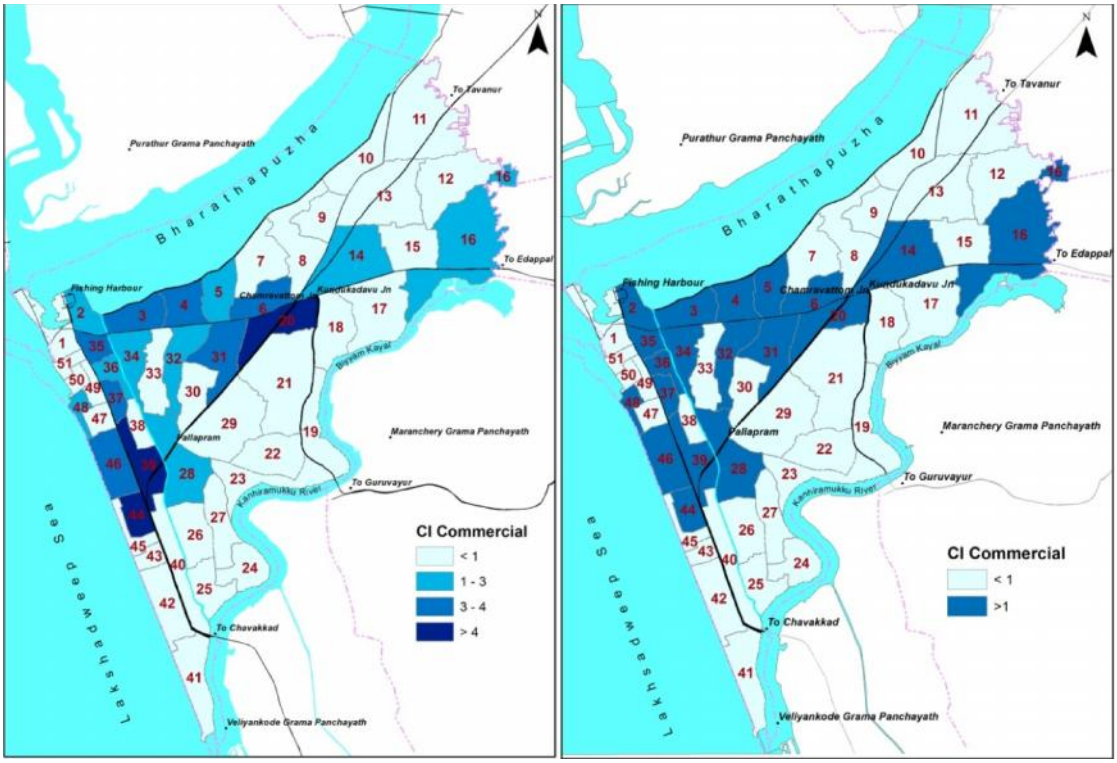


Figure 9-7 CI of Commercial land use(Source: T&CPD, MPM)

Figure 9.5 gives the spatial distribution of commercial nodes in the town according to the scale. The commercial land use takes only 1.05% of the total land in the town. The commercial development is limited to main road junctions and as contiguous ribbon development along the major transport routes. Beyond this, no independent, planned commercial area has come up in the town. Figure 9.6 shows that the concentration is more in the CBD area and along the sides of roads.

Coconut & Copra are traded to markets at Karnataka and Maharashtra.Areacnut and other commodities are traded to the market at Changaramkulam, nearest Grama Panchayat.No organised marketsare available in Ponnani. There is potential for a fully developed modern market with cold storage within the Municipal area.In addition to this various informal sector activities are seen at C.V. Junction. Fruits, garments, vegetables and snacks are their products.A fish market at Koravalappu and meat market near koravalappu are the two existing markets under the ownership of municipality. The infrastructure facilities for these markets are very poor. They have no parking facilities and loading and unloading spaces.Provision for better infrastructure facilities to the existing markets and new markets to be developed, are to be ensured in future.

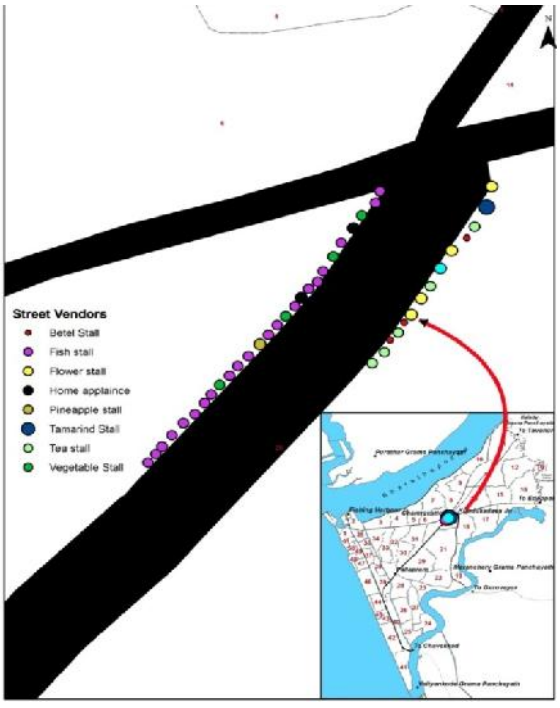






Figure 9-8 Street Vendors in CV Junction (Source: T&CPD, MPM)

9.2.1 Cargo Port

Ponnani port is close to industrial towns of Tamil Nadu (Coimbatore,Tiruppur, Namakkal, Salemand Erode etc.), Kerala, northern Tamil Nadu, westernTamil Nadu and South Karnataka and requires import and export of containers and other general cargo. The major commodities to be handled are containers, general cargo and thermal coal. The cargo port shall make use of 15 m wide Karma Road which is being developed by government of Kerala along the southern bank of Bharathapuzha River connecting the port area to NH 66 near the Chamravattom Barrage and the existing road network of NH 66. The port benefits a positive impact on the socio economic condition of the town including education and health facilities and employment opportunities for skilled, semi skilled and unskilled workforce. Thus the cargo port ensure overall economic growth of the town, the district and the state.

9.6 9.2.2 Projected requirements

As per the UDPFI guide lines, the population range for a medium town is 50,000 – 5,00,000. Thus Ponnani is considered as a medium town.

- Commercial area required is 0.24-0.32 Ha/persons
- Requirement by 2031 is 38 Ha

9.7 9.2. 3 Problems

- Almost all commercial centers are not having separate parking spaces, authorized auto stand, taxi stand, lorry stand, public comfort station, proper drainage facilities and organized markets.
- The solid waste management in these centers is also a major issue.
- Lack of better road transportation facilities
- Unorganized informal sector is making many traffic problems.
- Lack of trading and exporting facilities and an organized market.
- Under utilization of inland water transport system.

9.8 9.2.4 Potentials

- With the functioning of cargo port new markets and commercial centers will come up.
- The only cargo port in Malappuram District is sanctioned for Ponnani Town that leads to better trading facilities.
- Marketing and trading facilities of coir products

- Scope for exporting marine, industrial and agricultural products
- The existing inland water navigation system Connolly Canal provides better trade linkages.
- Economic condition of the town will improve.

9.2.5 Inference

The commercial land use takes only 1.05% of the total land in the town. The commercial development is limited to main road junctions and as contiguous ribbon development along the major transport routes. Beyond this, no independent and planned commercial area has come up in the town. The infrastructure facilities for these markets are very poor. They have no parking facilities and loading and unloading spaces. The solid waste management in these centers is also a major issue. Provision for better infrastructure facilities to the existing markets and new markets to be developed, are to be ensured in future. Unorganized informal sector is making many traffic problems. Lack of trading and exporting facilities and an organized market and under utilization of inland water transport system weakens this sector.

With the functioning of theonly cargo port in Malappuram District, new markets and commercial centers will come up that leads better trading facilities. With the development of a new transport corridor through the Town the commercial centers are seen shifting to the Chamravattom Junction. This haphazard shift will create unwanted problems in future and hence the commercial developments in this area are to be controlled by appropriate zoning regulations. The existing inland water navigation system Connolly Canal will provide better trading linkages as in ancient days. Hence the inland navigation system is to be improved.

10 TRAFFIC AND TRANSPORTATION

Ponnani is the only one coastal town *and an important fishing centre in Malappuram District. The sanctioned cargo port ensures the importance of traffic and transportation plan for the town. The traffic and transportation sector is described in this chapter*

10.1 Existing scenario

10.2 Road Networks

Ponnani is well connected by roads to the neighbouring towns such as Thrissur, Guruvayoor, Edappal, Kuttippuram, Tirur, Calicut and Palakkad. The NH 66 Panvel-Cochin National Highway (former NH17) passes through the core area of the town. The State Highway SH 62 Guruvayoor-Ponnani joins at Kundukadavu Junction on Palakkad -Ponnani road. Recently inaugurated Chamravattom regulator cum bridge acts as a gateway to Ponnani town from Tirur side. Also the work of bypass road parallel to the existing NH 66 is started and already completed the central reach. Besides these roads, the town has a network of numerous collector roads. The existing road network is shown in Figure 10.1. However these roads are not a part of an efficient network, narrow and often ill formed. So the road hierarchy of the town consists of arterial roads (NH and SH), the sub-arterial roads (MDR) and the collector streets.The roads in the town are maintained by PWD (NH, SH and MDRs) and municipality. The road density of the town comes to 6.91 km per sqkm which is less compared to other similar towns in the State.



CV Junction

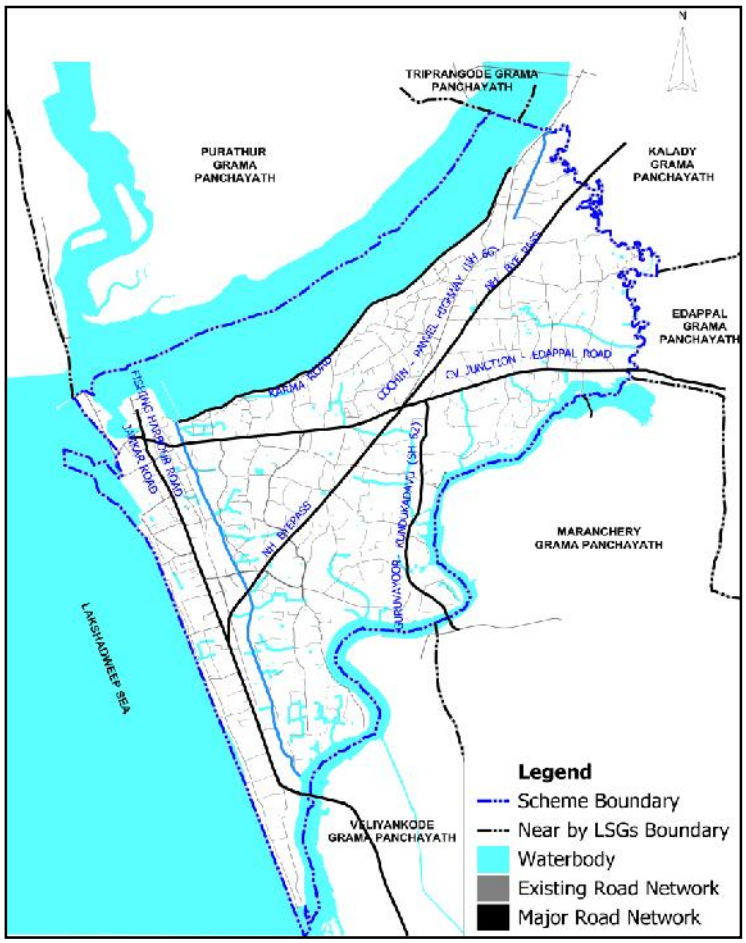


Figure10-1Existing Road Network(Source: T&CPD, MPM)

10.3 Railways

There is no railway line passing through the municipal area. The railway junctions of Thrissur and Kozhikode are at a distance of 56 km and 70 km respectively from the town. Thirunavaya railway station is the nearest railway station from the town but it is a minor one. Nearest major railway stations are Tirur, Kuttippuram and Guruvayoor. Tirur railway station is about 21 Km, Kuttippuram is about 19 Km and Guruvayoor is about 28 Km away from the town. Land acquisition work of proposed Guruvayoor-Thirunavaya railway line is progressing, which passes through the municipal area. There is also a proposal for connecting the cargo port to the proposed Guruvayoor Thirunavaya railway line. But the alignment is not yet finalized.

10.4 Air transport

Calicut international airport at Karipur in Malappuram District is the nearest airport to the town and is at a distance of 55km away from the Town.

10.5 Water transport

Ponnani was a famous sea port in ancient times. The inland water navigation system, Cannolly Canal passes through the town. There is a ferry service (jankar) in between Ponnani and Padinjarekkara beach. Biyyam Kayal is a popular lake destination for travelers interested in water sports. A boat race is conducted here annually, during onam celebrations.

10.6 Transport terminals

The town has two bus terminals at present and the municipality plans to construct one more near the Chamravattom junction. Theexisting bus terminals areKSRTC bus stand which is exclusively used by KSRTC buses and is located near the MES College on the side of National Highway and municipal bus terminal near the municipal office for private bus operations. There are plenty of private and KSRTC buses available to the nearest towns such as Guruvayoor, Kuttippuram, Edappal, Tirur, Kunnamkulam, Palakkad, Thrissur, Ernakulam and Kozhikkode. The town has no truck terminal at present.

10.7 Existing traffic characteristics

A detailed survey of existing road network was carried out to obtain information like road length, cross-section, hierarchical pattern of roads, surface conditions, intersections, street furniture, parking area, bus bays etc. Road inventory survey was conducted on main roads passing through the municipal area to determine the present level of service and these roads may get affected by the augmentation of traffic due to the sanctioned cargo port in future. The road inventory survey reveals the physical condition of the roads. Table 10.1 gives details of road inventory.

Table 10.1Details of Road inventory(Source : Traffic Survey – 2013)

Sl. No.	Road Links	Name of road	Type of Carriageway	Road Length (Km)	Pavement Width (m)
1	Chamravattam Bridge- Puthu Ponnani	NH 66	2 lane, 2 way	11.5	4.7
2	Municipal Junction - CV Junction	NH Bypass	2 lane, 2 way	3.3	5.6
3	CV Junction - Cheriya Palam	Edappal road	2 lane, 2 way	2.8	5.8
4	KK Junction – Purangu	SH 62	2 lane, 2 way	2.8	5.6
5	Valavu-Kollan Padi-Pallapram	Kollan padi road	2 lane, 2 way	2	3

The NH 66 Panvel-Cochin National Highway (former NH17) and the State Highway SH 62 Guruvayoor Ponnani are the two major roads passing through the Municipal area. Major geometric constraint of the NH is that it passes through the core area of the town and is generally narrow in nature. There are no major curves or steep slopes along this road. The State Highway is also narrow. The speed and delay analysis conducted on the various roads stretches point out the congestion areas in the town with low level of service. The results of this analysis are given in Table 10.2.

Table 10.2Speed and Delay Analysis

Sl. No.	Stretch	Distance (km)	Journey Time (s)	Delay Time (s)	Actual Running Time (s)	Speed (km/hr)	
						Journey Speed	Running Speed
1	Alankar to CV Junction	0.6	109	1.5	107.5	19.8	20
2	CV Junction to Chandappadi	1.2	149	2	147	29.3	30
3	Chandappadi to Court	1.5	269	22	247	20	22
4	Court to Municipal Junction	3.2	193	2.5	190.5	59.6	60
5	NH Bypass	3.2	250	2.5	247.5	46	46.5
6	CV Junction to KK Junction	0.29	57	4	53	18.3	19.6
7	KK Junction to Cheriyaplam	2.4	197	2	195	43.8	44.3
8	KK Junction to KSEB	1.5	142	0.5	141.5	38	38.2

On NH 66, a maximum of 60 km/hr was noted between Court junction to bus stand on a normal working day. The lowest journey speed experienced within the Town, 19.6 km per hour was along the CV junction to KK junction stretch. The main reason behind this variation in the journey speed could be due to the heavy parking on the roadside, which mainly constitutes cars and auto rickshaws, lack of road standards& the dangerous driving behaviour of bus and auto drivers.

The heavy lateral and cross pedestrian movements could also have led to the interference with the smooth flow of traffic. The sections along the NH-66 were found to have a v/c ratio greater than 1, indicating utilization greater than its capacity.

Traffic volume counts were taken at 8selected locations (being the mid section points ofthe identified homogeneous sections) and 4 outer cordon points. Volume capacity ratiosworked out based on these volume counts and road inventory details at these sections/points are depicted in Table 10.3. The values show that all stretches on NH 66 through Ponnani town were found to be over utilized. Among the twelve selected sections/roads, the section between CV Junction and Chandappadi constituted the highest v/c ratio of 2.01 and thus leading to inevitable traffic congestion and delay. Overcrowding of traffic in a considerablenumber of sections which warrant immediate improvements to the road infrastructure inthe town.

Table 10.3Existing volume and V/C Ratio

Sl. No	Road Links/Count Stations	Capacity (PCU/hr)	Volume (PCU/hr)	V/C Ratio
Mid-Block volume Survey Links				
1	Chamravattom-CV Jn	1500	1489.5	0.99
2	CV Jn-Chandappadi	1500	3016	2.01
3	Chandappadi-Court Jn	1200	1404	1.17
4	Court Jn-Municipal Jn	1500	1536	1.02
5	NH Bypass	1500	1017	0.84
6	CV Jn-Cheriya Palam	1500	1491	0.93
7	Gym Road	700	243.5	0.27
8	Harbour road	700	347	0.38
Outer Cordon Stations				
9	Gulab Nagar	1500	786	0.524
10	Puthu Ponnani	1500	929	0.619
11	Cheriya Palam	1500	1004	0.669
12	KK Bridge	1200	488.5	0.407

A schematic presentation of the volume-capacity ratio at count locations (both mid-blockand outer cordon location) is shown in Figure 10.2.

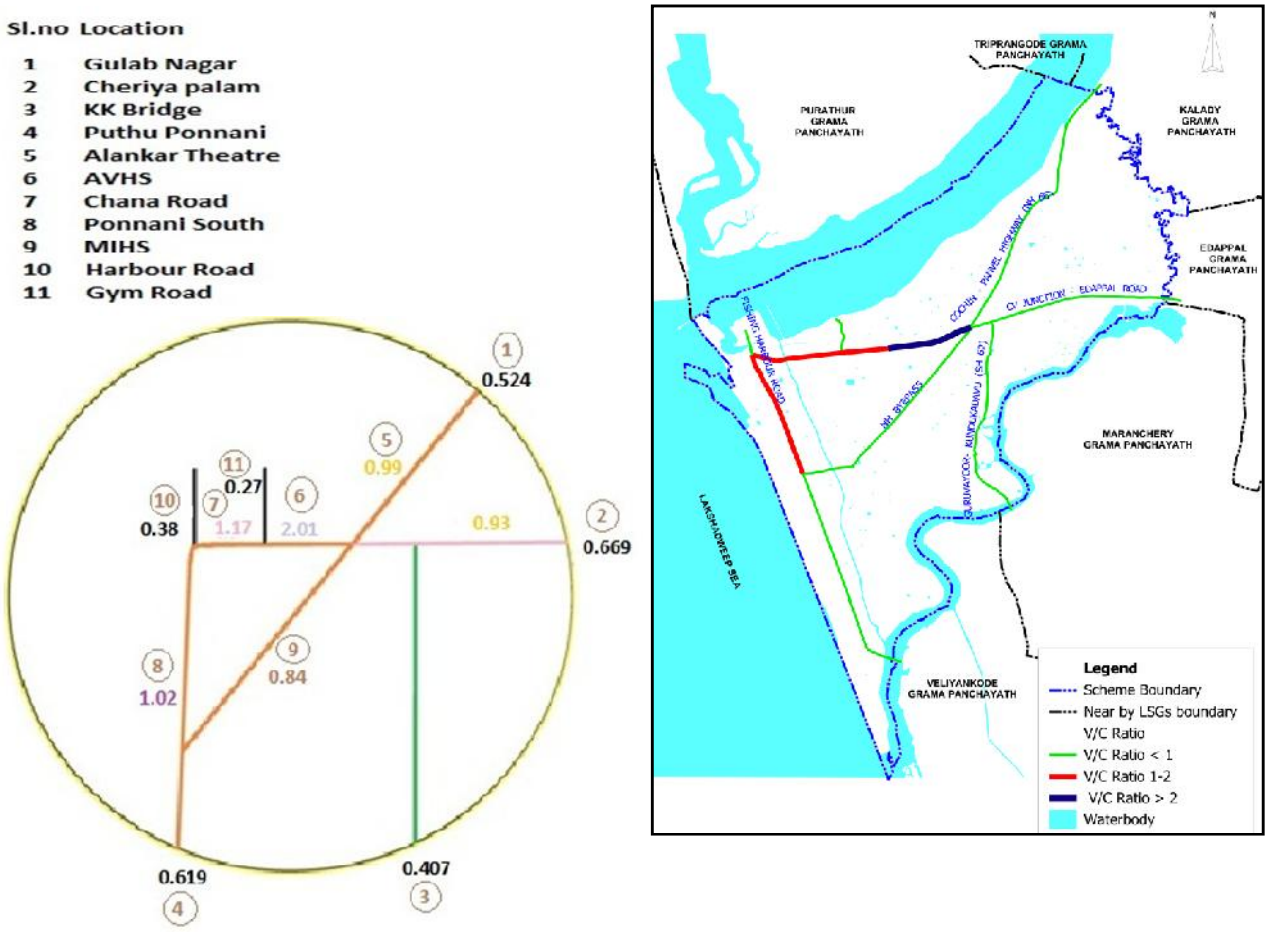


Figure 10-2Existing V/C Ratio of the major roads (Source: Traffic survey, T&CPD, MPM)

The traffic flow at 3 major intersections of the town were measured and compared with their capacities. The CV junction, KK junction and the municipal junction need immediate attention. The peak hour traffic volume on major intersections in Ponnani town is given in Table 10.4

Table 10.4Peak Hour Traffic Volume on Major Intersections

Sl. No.	Name	Peak Hour	No. of Arms	Total junction Volume (PCU)	Type of Traffic Control
1	CV Junction	10 AM – 11 AM	4	4019	UC
2	KK Junction	1 PM – 2 PM	3	2160	UC
3	Municipal Jn	6 PM – 7 PM	3	1550	UC

(Note: P-Police Control, UC-Uncontrolled, S-Signalized control)

The parking characteristics of the town were studied. The parking accumulationsand durations at various stretches of the roads were observed. The vehicles coming to the commercial centers are forced to be parked in the public roads which reduce the carrying capacity of the roads. The existing taxi/auto standsand parking lot for commercial vehicles were also studied. The pedestrian movementcharacteristics at various points (12 points) in the town were surveyed and analyzed.The details of parking survey are given in Table 10.5.

Table 10.5 Details of Parking survey

Sl No	Roads	Parking Volume (30 mts)	Peak Period
1	Edappal Road	193	6.30 pm-7.00 pm
2	CV Junction to Tirur Road	95	4.00 pm-4.30 pm
3	Chamravattom Road	80	8.30 am-9.00 am
4	AVHS	383	6.00 pm-6.30 pm
5	NH Bypass	362	6.00 pm-6.30 pm
6	Bypass 150m	266	5.30 pm-6.00 pm
7	Edappal to Ponnani	427	6.30 pm-7.00 pm
8	KK Junction to Purangu	68	10.00 pm-10.30 pm
9	Maranchery Road	117	9.30 pm-10.00 pm
10	Municipal Office	266	4.00 pm-4.30pm
11	Vijayamatha to AVHS	202	4.00 pm-4.30 pm
12	Kollanpadi to Chanthappadi	114	4.00 pm-4.30 pm

Out of the 12 corridors studied it was found that the section between Edappal and Ponnani had the highest parking accumulation of 427 vehicles consisting of 392 two-wheeler,13 cars, 6 passenger autos, 14 goods autos at a peak period ranging from 6.30 to 7.00 pm. About 383 vehicles were parked at AVHS location. In the Bypass section 362 vehicles were parked at the peak period ranging from 6.00 to 6.30 pm. Only 68 vehicles were parked at KKjunction.Majority of the vehicles parked along the identified corridors were found to be parked for a short duration of less than 15 minutes.More than 70% of the vehicles were parked for less than 15 minutes on a normal working day.

Facilities for parking of private vehicles as well as public carriers are vital for the smooth functioning of the traffic system of any town. Commercial buildings have come up without

adequate parking facilities due to various reasons. The vehicles coming to these commercial centers are forced to park in the public roads seriously reducing the carrying capacity of these roads. The draft transport policy for the state states that “For existing buildings /commercial complexes built without providing adequate parking space, such parking facilities will be built off-street by the local bodies at suitable locations at costs from the building owners”. Further the policy outlines the initiatives required by the government by saying “Open and multi-storied parking facilities will be constructed by the government at important terminals, market centers multi-modal logistic centers to promote inter-modal transfers. The authorized taxi or auto stand areas of Ponnani town are given in Table 10.6.

Table 10.6 Details of authorized Parking areas

Sl. No.	Location	Authorized Stand
1	C.V. Junction	Auto stand, Taxi Stand
2	Chandappadi	Auto stand, Taxi Stand
3	K.K. Junction	Auto stand, Taxi Stand
4	Ponnani South	Auto stand, Taxi Stand
5	Vandipetta	Auto stand, Taxi Stand, Lorry Stand
6	KollanPadi	Auto stand, Taxi Stand
7	Puzhambram	Auto stand, Taxi Stand

Pedestrian survey was carried out at 12 selected locations in Ponnani town and the summary is shown in Table 10.7.It is advisable to continue the existing safety measures such as zebra crossing, police control etcand provide a side walk of adequate width, suitable railing barriers etc for controlling the lateral movement.

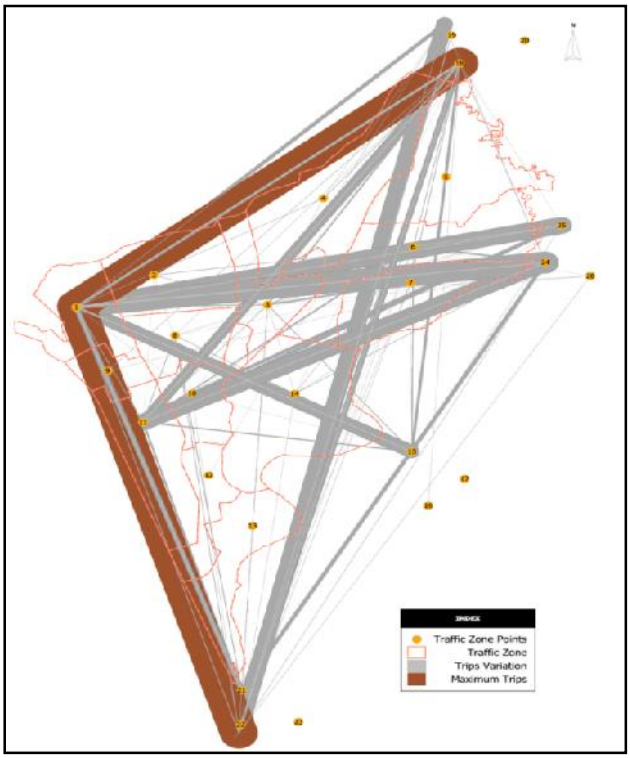
Table 10.7 Summary of Pedestrian Survey

Sl. No.	Location	Lateral Movement		Cross Movement	
		Morning	Evening	Morning	Evening
1	Chandappadi	173	326	137	185
2	Near ISS	428	213	202	41
3	KK Junction	429	1481	200	317
4	Near Vijayamatha	222	140	189	233

5	Near AVHS	900	990	340	350
6	CV Junction-NH	209	236	52	113
7	CV Junction-NH Bypass	117	585	68	243
8	Civil Station	63	66	41	31
9	CV Junction-Tirur Road	235	335	90	483
10	Near MES	463	310	90	88
11	Municipal junction	387	184	281	219
12	TalukHospital	243	156	247	91

The origin-destination studies were conducted by two means. One is by conducting roadside interviews in the field. Another method employed was by conducting household surveyfor identifying passenger travel characteristics. The objective of this survey is to determine the origin and destination details of through-traffic, inter-city and intra-regional passenger and goods movement across the external cordons and those obtained from the household survey. An analysis of the traffic movements will provide the proportion of bye-passable traffic along with the major external interaction areas. For a meaningful analysis of O-D survey data, the study region was divided into fourteen traffic zones and outside study region was divided into twelve traffic zones, which included the immediate surrounding areas within the District, adjoining Districts etc. Base year inter-city travel characteristics of passenger and goods movements were obtained by conducting origin-destination survey of a sample number of motor vehicles passing through all major outer cordon locations in Ponnani town.

The figures 10.3 and 10.4 give desire linesfor passenger and goods transport respectively in the town. The OD matrix and desirelines generated from the house hold surveys give insight into the travel characteristics of theinhabitants of the town. The desire lines from house hold survey is given in Figure 10.5.



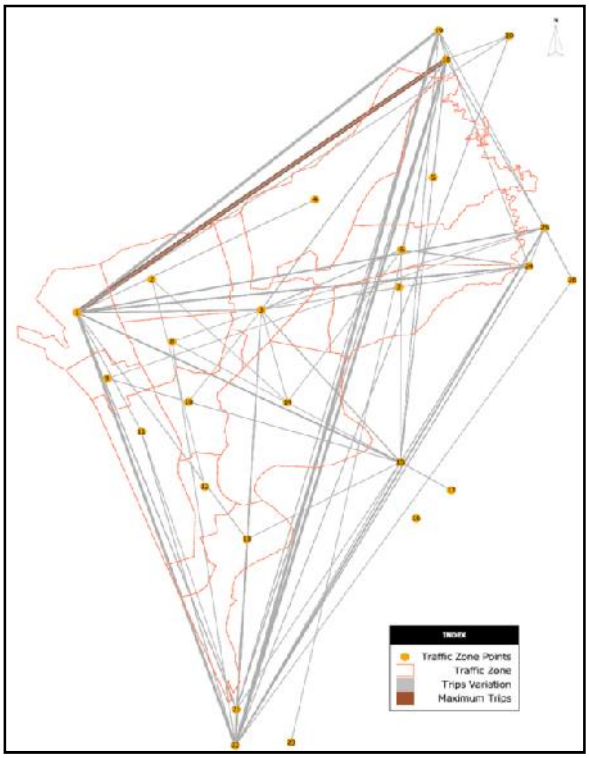


Figure 10-3Desire Line Diagram of total passenger **Figure 10-4Desire line diagram of total goods**

(Source : Traffic Survey – 2013)

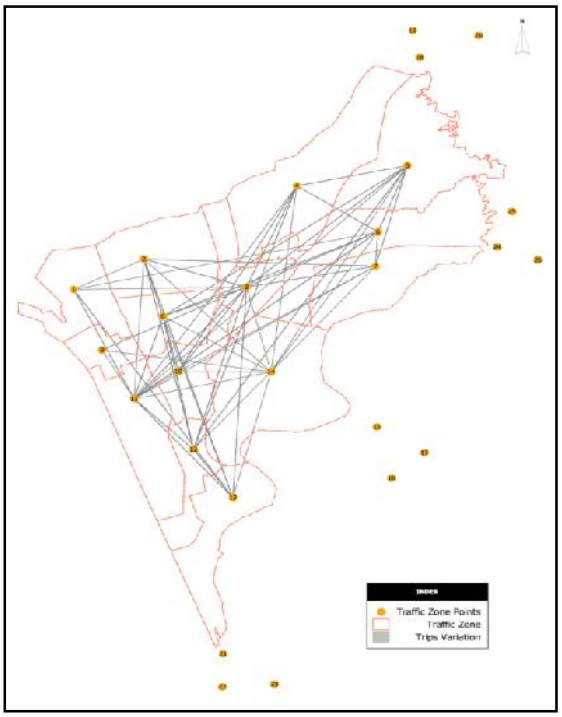


Figure 10-5 Desire Line Diagram of total internal trips from Household Travel Survey
(Source : Socio economic Survey- 2012)

10.8 Bottlenecks and missing links

Bottlenecks are narrow entrance to a stretch of the road and a narrow or confined space where traffic may become congested.The major bottlenecks in the road networks of the Ponnani Municipality are C.V. Junction to Municipal Junction stretch on NH 66, and C.V. Junction to KK Junction on Edappal Road. An uncontrolled vehicle turning on the C.V. junction and the lack of pavement width are the major factors leading to the formation of bottlenecks on the both stretches. Presence of Commercial shops, lack of pedestrian facility such as sidewalks or foot over bridges, presence of a narrow bridge over Connolly Canal, and unauthorized parking on the road sides are the main problems from C.V. junction to the Municipal Stretch. In between CV junction and KK Junction, presence of shops and lack of pedestrian facilities are the major problems. The lack of adequate space for parking is another major issue in this area. They don't have proper road markings and have improper road alignment and road geometrics.

Missing links can bring about a situation in which the quality of service has extreme low values due to the fact that no direct link exists between two points. Some missing links in the Ponnani Town are identified based on the Desire lane diagram for the socio economic survey on the municipal area. It was identified that there was a high demand for traffic movement between two routes, such as, Zone 01 (Azheekkal, MIA, Puthankulam and Meentheruvu wards) to Zone 02 (Chana and Velleeri wards), and Zone 12 (Kadavanad South, Ayyappankavu and Puthuponnani wards) to Zone 14 (Uroob Nagar, Karukathiruthi and Theyyangad wards), but since there was no direct link between these two points, this constitutes an important missing links.

10.9 Traffic Projections

The National Highway Authority of India (NHAI) is developing a new 4-lane NH bypass, connecting CV Junction to Kuttippuram Bridge. Another road named Karma road is under construction which will connect the Cargo port area to Chamravattom barrage along the banks of Bharathapuzha.Proposed Ponnani-Vengalam (Kozhikode) four line coastal highway will pass through the existing road networks of Ponnani.The section between Puthuponnani-CV Junction-Chamravattom is a part of these proposed coastal highway and it will attract traffic from parallel routes of Ernakulam-Thrissur-Kozhikode through the town. This route is parallel to the Arabian Sea. But, no definitive plans or schedule are currently available for these proposed coastal

highway, which, for this reason, it is just ignored in the traffic projection. Both new NH bye pass and Karma road were not considered during the volume study. Karma road is a river side road and it has not followed any standard specifications, hence it cannot support heavy traffic, but it may useful for the passage of private vehicles of the staffs of the port. Hence Karma road is not considered for the future traffic projection due to its inability to support heavy traffic movement. The new NH bye pass connecting CV junction to Kuttippuram Bridge will attract traffic from the existing CV junction-Tavanur to Kuttippuram stretch on NH 66. This diversion would affect only the traffic in the existing Chamravattom to CV junction stretch and the external cordon at Gulab Nagar on NH-66. A certain percentage of traffic shall be diverted to the new NH bye pass after opening it by taking an assumption that the major share of traffic is through the road which have more capacity than the existing portion of the NH between CV junction to Chamravattom. After the opening of NH new bye pass connecting CV junction to Kuttippuram in 2015, about 70% of the traffic of the existing CV junction to Kuttippuram stretch will be divert to the new NH and remaining 30% will be continued through the existing route.

The sanctioned cargo port is likely to augment the traffic on Ponnani to Palakkad road (MDR) and NH 66 especially in the section between Kuttippuram to Chavakkad. Based on the potential of the Hinterland it is assumed that the major share of the cargo from the Ponnani port is mainly towards East, which is Palakkad-Coimbatore-Tirupur-Erode-Salem region and it constitutes about 75-85% of the total cargo. Tirur-Malappuram-Calicut-Mysore region attracts about 10-20% of total cargo and the remaining cargo is attracted towards the southern parts of Ponnani which includes Kodungallore-Guruvayur-Thrissur regions. Based on these assumptions the cargo route assigned from the port is as follows;80% of the total cargo from the Ponnani port will pass through the route of cargo port-Court junction-Municipal junction.-CV junction - Edappal, 15% will pass through Port-Court junction - Municipal junction -CV junction - Chamravattom via new NH byepass and only 5% of total trafficis assigned on Port-Court junction -Municipal junction -Puthu Ponnani-Chavakkad road.

Table 10.8Volume-Capacity Ratio of Major Corridors after Diversion (2015) and Port Commission (2017)

Sl. No.	Road Links/Count stations	Capacity	2015		2017	
			Volume	V/C	Volume	V/C
1	Gulab Nagar	1500	285	0.19	351	0.234
2	Chamravattom-CV Jn	1500	540	0.36	665	0.443
3	New NH Bypass	3600	1295	0.36	1625	0.451
4	CV Jn-Chandappadi	1500	3716	2.4	4579	3.05
5	Chandappadi-Court	1200	1729	1.4	2131	1.78
6	Court-Municipal Jn	1500	1892	1.3	2522	1.68
7	Municipal Jn.-Puthu Ponnani	1500	1144	0.7	1420	0.947
8	NH Bypass	1500	1253	0.8	1724	1.15
9	CV Jn-Cheriya Palam	1500	1837	1.2	2415	1.61
10	Cheriya Palam	1500	1237	0.8	1676	1.12
11	KK Bridge	1200	601	0.5	742	0.618
12	Gym Road	700	300	0.43	370	0.528
13	Harbour road	700	428	0.61	527	0.753

The diverted traffic at 2015 was projected for 2017 along with port generated traffic. All the stretches were found to exceedingly increase their capacity utilization values. While some of the stretches along the NH and Edappal road were found to even exceed the v/c ratio of 1. The maximum v/c ratio in 2017 of 3.05was found along the stretch of CV junction to Chandappadi. Table 10.8 shows the volume capacity ratio of major corridors after diversion(2015) and Port Commission (2017) and Table 10.9 shows the volume capacity ratio of major corridors on and after 2020.

It is complicated to land acquisition for the widening of the road between CV junction to Municipal junction ofNH66, but due to the huge increase in traffic for the upcoming years it is must widenthe existing two lane roads, such as CV Junction to Puthuponnanistretch of NH and CV junction to Cheriyapalam stretch of Edappalroad intoat least four lane standard on or before 2020 for reducing traffic complication in future.

Table 10.9 Volume-Capacity Ratio of Major Corridors on and after 2020

Sl. No.	Road Links/Count stations	Capacity	2020		2025		2030	
			Volume	V/C	Volume	V/C	Volume	V/C
1	Gulab Nagar	1500	467	0.31	724	0.48	1121	0.74
2	Chamravattom-CV Jn	1500	885	0.59	1371	0.91	2125	1.47
3	New NH Bypass	3600	2178	0.605	3366	0.935	5199	1.44
4	CV Jn-Chandappadi	1500	6089	4.16	9439	6.3	14630	9.75
5	Chandappadi-Court	1200	2835	2.36	4394	3.66	6810	5.68
6	Court-Municipal Jn	1500	3471	2.314	5313	3.542	8107	5.4
7	Municipal Jn.-Puthu Ponnani	1500	1894	1.26	2933	1.95	4539	3.026
8	NH Bypass	1500	2405	1.6	3664	2.44	5556	3.7
9	CV Jn-Cheriya Palam	1500	3306	2.2	5071	3.38	7757	5.17
10	Cheriya Palam	1500	2323	1.55	3547	2.36	5395	3.6
11	KK Bridge	1200	986	0.82	1529	1.27	2370	1.975
12	Gym Road	700	492	0.7	762	1.08	1181	1.68
13	Harbour road	700	701	1.0	1086	1.55	1683	2.4

10.10 Inferences

In the absence of railways and limited use of the water ways, the transportation system in the town entirely depends on its road network. The existing roads in the town have resemblance of a network, though inadequate in many counts like width, geometry, hierarchy etc. The lowest journey speed experienced within the town, 19.6 km per hour was along the CV junction to KK junction stretch. The main reason behind this variation in the journey speed could be due to the heavy parking on the roadside, which mainly constitute of cars and auto rickshaws, lack of road standards, the dangerous driving behaviour of bus and auto drivers.The heavy lateral and cross pedestrian movements could also have led to the interference with the smooth flow of traffic.The observed traffic volume in many stretches exceeds the existing capacity left alone the projected volume for 2030. Hence drastic improvement to the network is required to cater to the projected traffic volume and to maintain a reasonable level of service on the roads.

11 WATER SUPPLY AND ENERGY

This chapter briefs the water supply system and energy sector in the town.

11.1 Water Supply

11.2 Existing water sources

The Bharathapuzha river being the only sustainable and perennial source available nearby the Municipal area. The dependability on ground water is poor due to chemical pollution and salinity. The recently commissioned Chamravattom regulator cum bridge will ensure adequacy of water at the intake even in the acute summer and restrict the intrusion of saline water as well. The main quality problem pointed out by the Quality monitoring wing of the Kerala Water Authority is high turbidity at the source site. It is equally important to establish a scientific and efficient method for disposing the waste water, as the accumulation and miss use of this will directly affect the surface water as well as the ground water quality. The major reason for degradation in the under water quality is the saline intrusion which can be avoided only by efficient ground water recharging techniques. Majority of the people of the town depend on their own wells as shown in Figure 11.1. Dependence on Kerala Water Authority water is only 24%. The average ground water table depth in the town is 3.70 m. The distance to major source of water is shown in Figure 11.2. About 76.24 % of the houses have water within their plot.However during the hot summer, majority of the public depend solely on the piped water supply. So the need of improving the present water supply level and quality is widely accepted and preferred for the people of Ponnani Town.

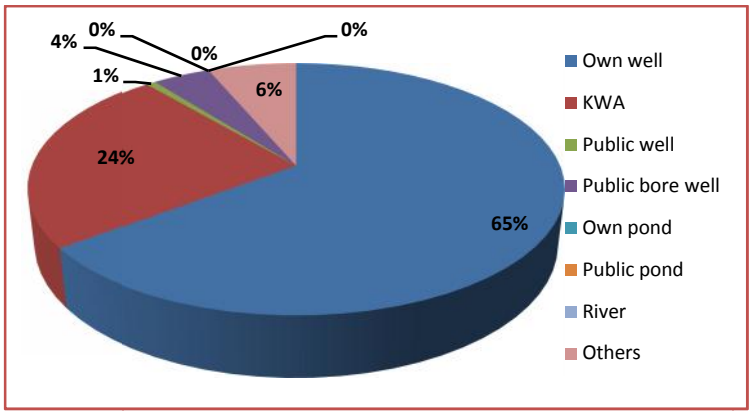


Figure 11-1Source of water (Source: Socio Economic Survey-2012)

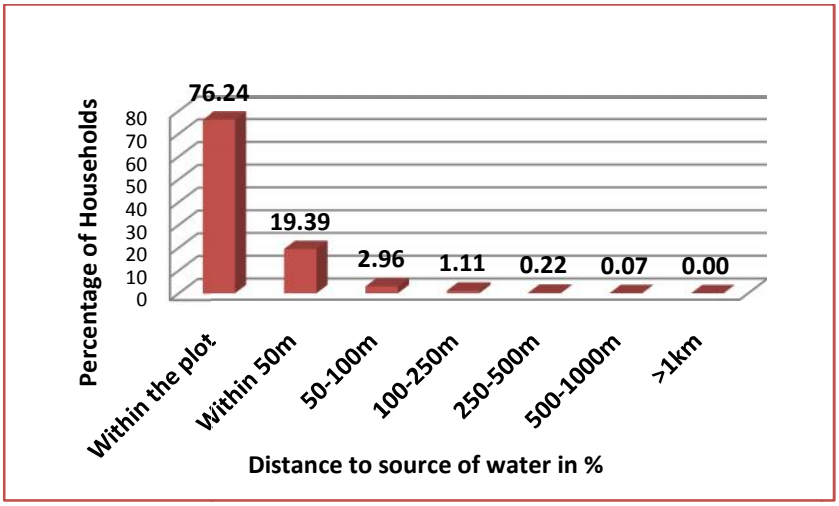


Figure 11-2Distance to source of water in % (Source: Socio Economic Survey-2012)

11.3 Existing Network

Bharathapuzha river water project at Nariparamba is the existing major water supply scheme in the area. Though the design capacity of UWSS (Urban Water Supply Scheme) is 10.0 mld and that of RWSS (Rural Water Supply Scheme) is 4.87 mld, the actual production at present is 5 mld and 3.9 mld respectively.



OH Tank at Thrikkavu

The headwork of the scheme is located at Naripparambanear the bank of Bharathapuzha River. After collecting water through infiltration galleries in an 8 Mtr dia. Intake well, it is pumped to the distribution networks. As per the basic design, water from the intake well will be pumped using 100 HP pump sets to the 5.0 lakh litres ground level tank situated at

Chamravattam Junction, and then the same will be pumped to a 32.0 lakh ltrs. Over head tank situated at Thrikkavu, using 150 HP pump sets fitted at the Chamravattam sump cum booster station, which then become ready for distribution through networks. But, due to the practical difficulty in maintaining sufficient water pressure in the line, especially at very remote places located far away from the OH Tank, direct pumping is being adopted for Municipal area. Hence, the OH Tank is providing water to a very small area at a rate of some 8 to 10 lakhs litres a day.

The pumping main for the scheme is 450 and 400 mm cast iron pipe, the distribution network has 400 to 150 mm AC, 160 to 63 mm PVC, and all together approximately 100 kms. The water is being supplied through 400 public taps, 3116 domestic connections and 131 non domestic connections. Direct pumping is adopted for about 60% area, 20% from Thrikkavu tank and remaining around 40% (old EzhavathirutyPanchayath) from Chamravattam tank.

Since majority of the people are dependingon their own wells, no direct data is availableon the quantity. On a rough estimate (90000 persons and 300 liters per capitaper day) the present consumption is found to be 27 MLD. Out of this theKerala Water Authority supplies 7 MLD.

11.4 Scarcity

Figure 11.3 shows the water scarcity in the town. Majority of the households do not have scarcity of water.Figure11.4 also shows that water scarcity is very low.

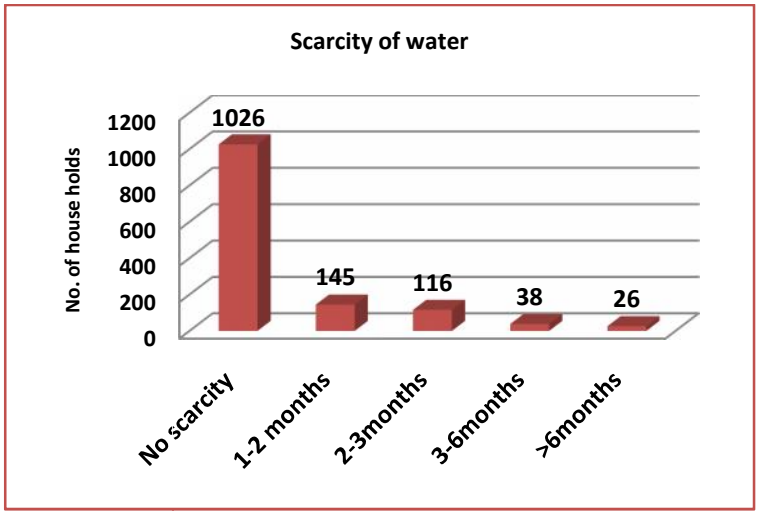


Figure 11-3Scarcity of water (Source: Socio Economic Survey-2012)

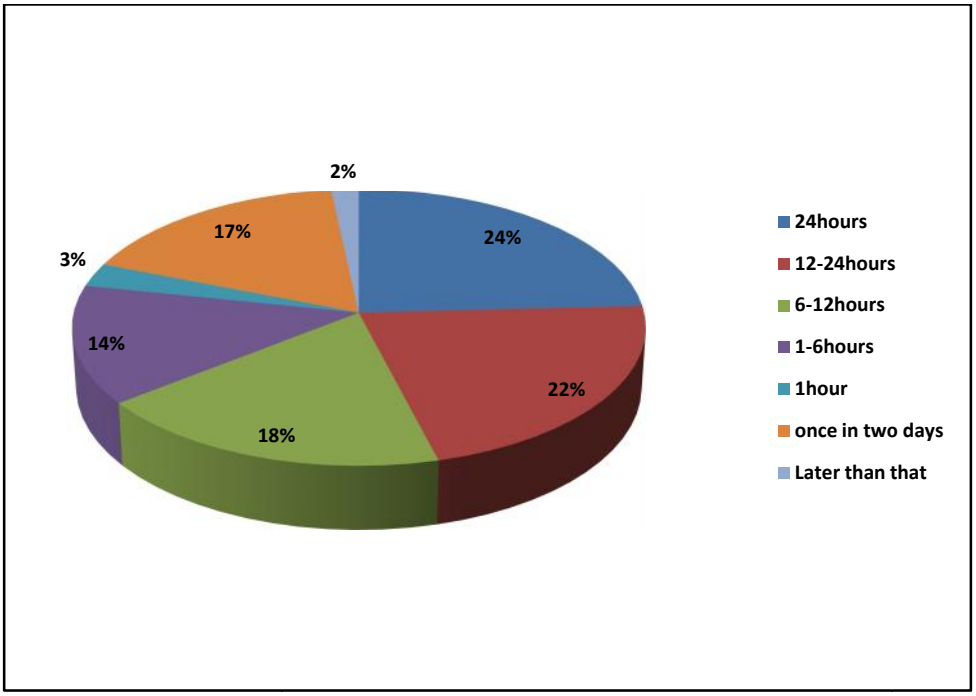


Figure 11-4Frequency of public water supply (Source: Socio Economic Survey 2012)

11.5 Deficiencies of existing water supply scheme

(A) Head works

It is already noted that the scheme started its functioning in full swing by 1990. The designed life period of rotating machineries are almost finished with respect to the installation date and the present level is maintained at a huge risk, thus leading to frequent failures. A direct indication of tear and wear of the machineries can be adjudged by verifying the discharge details, which has been reduced to a rejection level. A revamp of the existing system must be begun from the head works.

The head works do not have proper treatment plant and filtration of river water is achieved through infiltration galleries laid in the river bed. It is a well known fact that the bed level of Bharathapuzha is reduced due to unscientific and uncontrolled sand mining which leads to exposure and failure of infiltration galleries. Few galleries have already been exposed and washed away in the monsoon river flow. The low voltage problem is another headache faced at the source site. This becomes prominent during the peak load period. So the pumping is stopped during this period. Supplying and installation of a new voltage stabilizing unit will help the authority to utilize this period also for pumping, having direct positive impact on the water production and supply.

(B) Piping Networks

As stated before, around 100 Kms piping network in being maintained for the Urban Water Supply Scheme (UWSS), exclusively in the Town area. The pipelines are made of AC, PVC, HDPE and GI, majority of this lines were laid at the time of commissioning itself, hence the quality cannot be guaranteed and the present performance is satisfactory up to an extent only. Majority of the piping network needs to be replaced because of the frequent breakages resulting in regular disruption of water supply and also resulting in mixing of outside water with treated water. A study also disclosed that all type of safety arrangements like air valves, scour lines, branch and main valves fitted on the pipelines either damaged or not functioning properly and unfortunately these components are very much vital as far as a water supply system is concerned.

(C) Quality

Compared to all other deficiencies, maintaining the quality of the water is the major hurdle being faced by the KWA due to many factors detailed above. Presence of iron and salinity is the main threat faced in the equality part of the water supply. Several scientific studies have been conducted already and the contradiction was only in the level of contamination, but everybody unanimously agrees on the fact that the intrusion of saline water, and chemical contamination is increasing at an alarming rate. A decade before Ponnani was famous for ponds and other water logged places intended for small scale irrigation purposes for agriculture. Other swampy areas and paddy fields were also filled up for residential purposes and buildings. Thus the urbanization finally leads to a collapse in the quality of ground water. In addition to this, due to the geographical location, i.e. being a coastal area the intrusion of sea water to the residential area seems to be dominative in nature day by day. This process of intrusion of saline water is occurring as surface and subsurface flow through rivers and canals, due to the huge reduction in fresh water level ashore. The very basic character of fresh water to push the sea water against intrusion due to the difference in specific gravity became out of role due to the afore mentioned facts.Lack of proper and efficient sewage & drainage system also alleviates the quality problems. Thus an eco-friendly development, protecting the natural resources has to be adopted at a place like Ponnani.

As far as the existing piped water supply is concerned the quality is maintained by mixing bleaching powder at the source point. Since the direct pumping method is adopted, a

partial failure in maintaining the minimum quality standards prescribed for potable water occurred. The distance between the source and tap point also became a cause for the potential loss in the residual chlorine content.

11.6 Proposed project

In order to improve the service, delivery by increasing the frequency of pumping to a daily basis, the Kerala Water Authority has taken up a number of initiatives. New project named Ponnani water supply scheme for an amount of 62.6 crores was submitted for approval.

The project envisages construction of a 10m. dia well cum pump house in Bharathapuzha at Naripparambu in Thavannurpanchayath, about 500 m. upstream of the Chamravattom regulator cum bridge. There will be adequate water in this part of the river even during summer season due to this regulator. The raw water will be pumped to the treatment plant having a capacity of 24 mld proposed at the existing KWA land in the existing headworks at Naripparambu using one 100 HP V.T. pump set, through a 600 mm. dia DI-K9 pumping main, for a length of 200 mts. Aeration, filtration units etc are proposed to be constructed nearby. All the structures need to be constructed above the mean flood level (MFL) which is almost a meter above the existing land level. Treated water is then conveyed to the clear water sump near the plant site, the scheme area is divided in to four zones for easy distribution of the drinking water. The treated water is proposed to be pumped from the 11 LL C.W sump to OH tanks through a 600mm dia K9 pipe (6700m) which shall be branched to two OHSRs –

1) Existing 32 LL OHSR at Thrikkavu through 450mm dia K9 pipe (1200m) and

2)Proposed 22 LL OHSR at Kodathipadi through 350mm dia K9 pipe (2400m).

Clear Water from plant shall be pumped to the OHSRs using 175 HP centrifugal pump set. Zone I & II is proposed to feed from existing 32 LL OHSR at Thrikkavu and Zone III & IV is proposed to feed from 22 LL OHSR at Kodathipadi. The proposed distribution network shall comprise of Pipe size ranging from 600mm DI K9 to 90mm PVC Cl.3. The zone-I mainly covers the old Ezhavathiruthypanchayath area, zone-II the balance east side of the Connolly canal and zone – III & IV the west side of Connolly canal (coastal area). The water demand for zone –I is 5.8 MLD with a distribution length of 58264m, demand for zone-II is 9.35 MLD having a network coverage of 63523m, while zone-III demand is 5.14 MLD with a network coverage of 21864m and finally for zone-IV have water demand of 4.21 MLD with its coverage for 27449m.

Hence, the ultimate water demand of 24.5 MLD will be distributed through a network length of 171.1 Km.

The CW pumping main is intended to lay along the newly constructed KARMA road to bifurcate and connected to OHSRs at Thrikkavu and Kodathipadi. Separate headers are provided at either side of the main BT roads to enable water tapings without disturbing the road surface. Gravity headers are leading from the reservoirs for zone-I and Zone-IV from Thrikkavu and Kodathipadi tanks respectively. Being highly populated and densely resided, high sized pipeslike 110mm PVC is mostly used at the tail ends ignoring the low velocity and bit more initial investment cost.

11.7 Proposed source of water supply for Cargo Port

For the port operations and other related activities, the water requirement is proposed to be met from Bharathapuzha River at upstream of the Chamravattom regulator cum barrage located from the proposed site where the river water quality meets the requirement of potable use. The water from the river will be collected and treated before pumping into an overhead tank for storage purpose. From the overhead tank, the water will be distributed to the port under gravity.

11.8 Projected requirement

- Current water supply = 7 MLD
- Per capita requirement = 135 lpcd
- However considering the cultural factors, 200 lpcd is taken.
- So, requirement by 2031 = 120000*200 = 24 MLD
- Additional requirement = 17 MLD

11.9 Inference

The Bharathapuzha river is the only sustainable and perennial source available nearby the Municipal area. The dependability on ground water is poor due to chemical pollution and salinity.Majority of the people depend on private open wellsto meet their domestic and drinking water needs at present. However, this is not a dependable source due to high density and the town lacks a scientific sewerage system. Another problem is the waste disposal and saline water intrusion. Proper treatment of water and proper quality monitoring should be assured. The proposed project can meet the future water demands of the town and futurewater security is

possible only through conservation of water resources, rain water harvesting, ground water recharging, reducing wastage and prevention of water pollution incorporating scientific disposal.

11.10 Energy sector

11.11 Existing scenario

There are 25,385 electricity connections in the municipal area. The distribution of these connections among different type of consumers is given in Figure 11.5.There is no facility for electricity generation in the town. The town has a 110 KV sub-station.

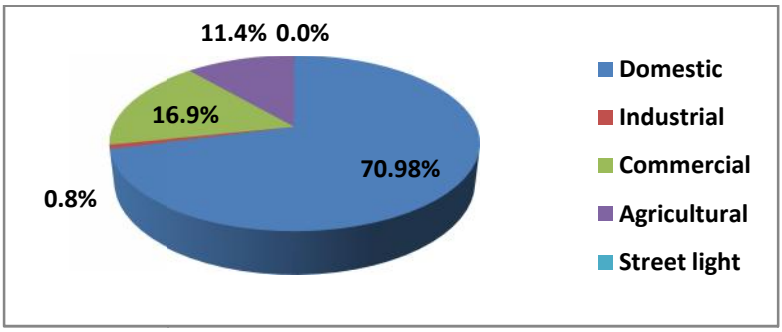


Figure 11.5 Electricity connections (Source : Kerala State Electricity Board)

Figure 11.5 shows that domestic connections are more in the municipal area and figure 11.6 shows that domestic consumption is more.

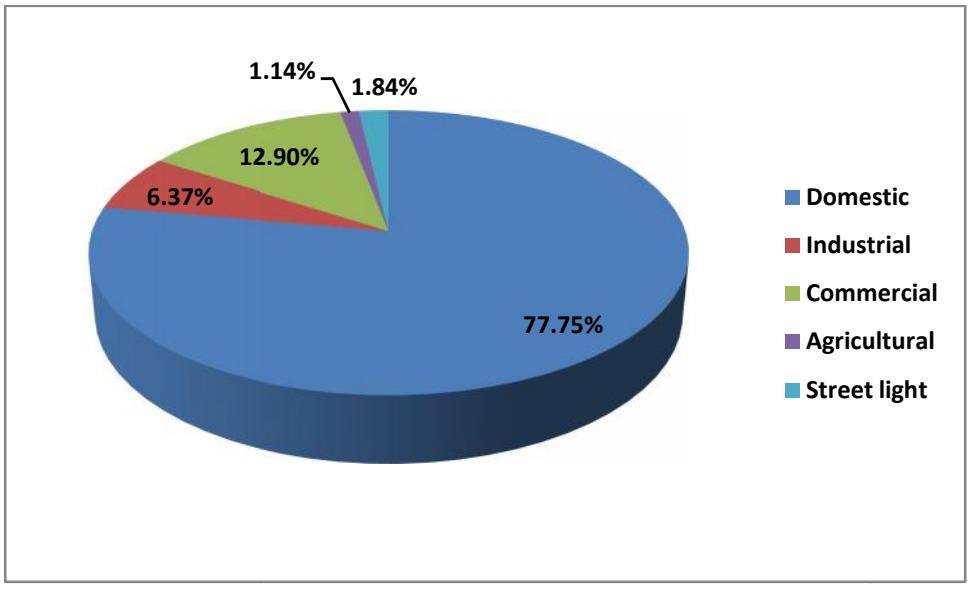


Figure 11.6 Electricity consumption (Source : Kerala State Electricity Board)

The areas which face low voltage problems in the town are Easwaramangalam area, Erikampadam, Sreelankan Colony and Chana road.

The socio-economic survey revealed that for 87% of the household's major domestic fuel is fire wood, 6% use electricity and the rest 7% depend solely on LPGwhich are shown in figure11.7. Only 2% of the people resort to non-conventional sources of energy (like solar power, bio gas etc) for their domestic needs. Figure 11.8 shows the details.

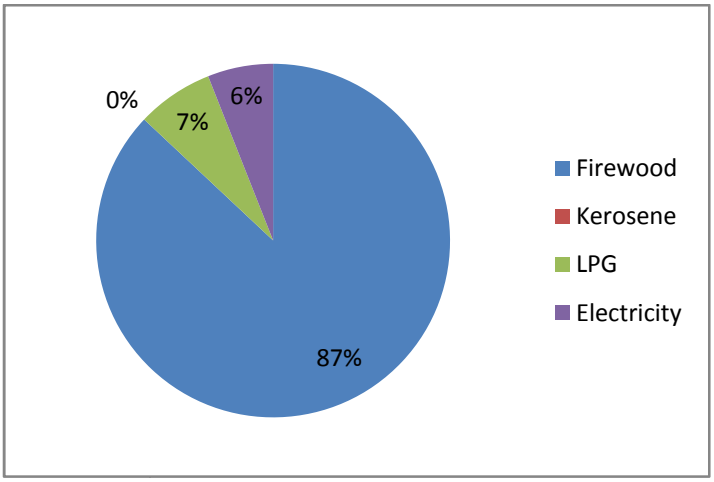


Figure 11.7 Type of domestic fuel (Source : Socio economic survey-2012)

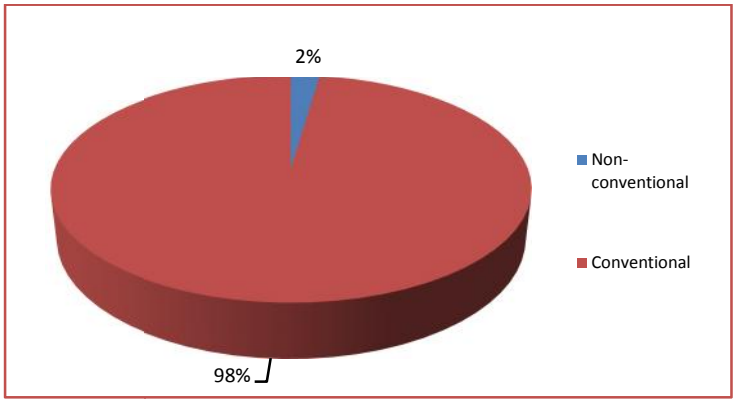


Figure 11.8 Use of non conventional energy (Source: Socio economic survey-2012)

There are four petrol/diesel pumps and two gas distribution agencies in the municipal area. 1.84 lakhs litres of petrol and 31 lakhs litres of diesel are sold in thetown annually. The consumption of diesel is higher than that of petrol. Figure 11.9 shows the details. The motor fishing boats use diesel as fuel. Since there are a number of fuel filling stations in the nearby LSGs, the sale can be taken as almost equal to consumption in the town. So, approximately, the per capita fossil fuel consumption works out to be 1 litre/day.

Number of domestic gas consumers are 61793 and commercial consumers are 2490. Kottakkal Arya Vydya Sala is the main commercial consumer.

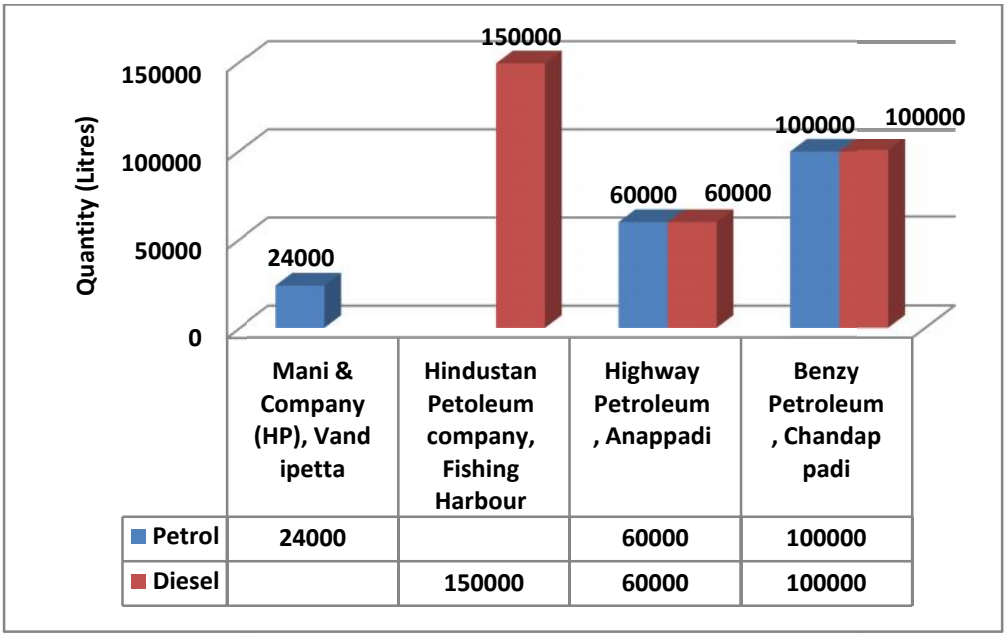


Figure 11.9 Use of fossil fuels (Source : Local enquiry)

11.12 Proposed source of power supply for Cargo Port

Power requirement during construction phase is expected to be 3MW. The power demand is estimated at 8 MW during operation of Phase 1 and additional 2MW during Phtase 1A. During construction phase, power will be drawn from DG sets and nearest 110 KV sub station at Ponnani, 2 Km away from the port. During operation of port, power will be drawn from 230 KV sub station at Edappal about 7 Km away from the port.

11.13 Ongoing projects

1. Restructured Accelerated Power Development and Reinforced Project (RAPDRP)
2. Construction of a new 11 KV line at Puzhambram
3. Insertion of distribution transformers (3 Nos.)
4. Conversion of 1 phase to 3 phase line (Puzhambram Village Road)
5. Reconducting 11 KV line with Aerial Bunched Cable
6. Replacement of old faulty meters with Electronic meters
7. Street light Metering

11.14 Projected requirement

As per standards, consumption of power works out to be 2KW/HH.Consumption of power by 2031 is worked out to be 48,000KW for apopulation of 120,000 with HH size of 5excluding the requirements for Port, Harbour and other major industries.

Table 11.1 Projected requirements

Category	Existing Nos.	Standards recommended	Requirement 2031
11 KV substation	One 110 KV substation	1for 15000 persons	To cater the port activities additional 66 KV sub station is required at harbor area/near to port
LPG Godowns	2	1 for 40-50000 persons	1Nos
Petrol Pumps	4	1/150 HA of gross residential and 1/40 Ha of industrial area	1Nos

11.15 **Problems**

- Non-conventional energy has not been tapped to the required levels.
- High cost of solar panels does not allow solar energy to be used in domestic sector.
- High T&D losses has been observed in electric energy distribution sector.

11.16 **Inference**

The energy position in the town is satisfactory. But there are significant energy losses. Also additional energy is to be provided for the harbor and proposed cargo port. There is wide scope for relying on non conventional energy sources if the mechanisms to tap these sources are subsidized.

12 WASTE MANAGEMENT

Managing waste is one of the most important issues in urban governance. With the rapid urbanization and the lack of due consideration for the conservation of natural environment, the issues related to urban waste has become difficult to manage. Also the solid waste management problem is increasing day by day in many urban areas of Kerala. The existing condition and the problems are analyzed in this chapter.

12.1 Storm water

12.2 Drainage

Both drainage and flood control deals with the problem of disposing of unwanted water, and the distinction between the two fields is not very sharp. The problem of drainage congestion is a common phenomenon for the most of the city, the urban town and the rural areas. Frequent water logging and surface inundation are reported whenever there is small precipitation and situation turns worst in cases of incessant rain for hours or days together. The net result of urban development brings a gradual transformation in land use pattern and there by worsens the drainage problem unless adequate provisions are made for its proper conveyance and disposal keeping pace with the perspective planning.



Condition of drains

The terrain of Ponnani Town is flat with an average ground level of +5m and the terrain map is shown in Figure 12.1. The shape of the land is like a truncated cone having a bottom

width of around 5km at the sea coast and around 2 km at the apex. All the sides are surrounded by drainage outlets of rivers and sea except the apex. An inland navigation canal viz. Connolly Canal is flowing through the western partof the town. The town is surrounded by Bharathapuzha on the north, Kanjiramukku River on the south and Lakshdweep Sea on the west. Even though large drainage outlets are available on all sides there is no effective storm water drainage system. The advantages of short distance to the outfalls are lost due to uncontrolled developments within the municipal area. Paddy fields which earlier acted as drainage storage ponds also, before discharging into the rivers are now filled up for construction activities obstructing drainages. After the formation of roads the natural tendency is to have a ribbon development along the road. Like in all the other towns of Kerala the primary drains are side drains of road. Due to uncontrolled development activities along the road continuity and integration with natural drains are always absent. The existing drainage network isshown in Figure12.2.

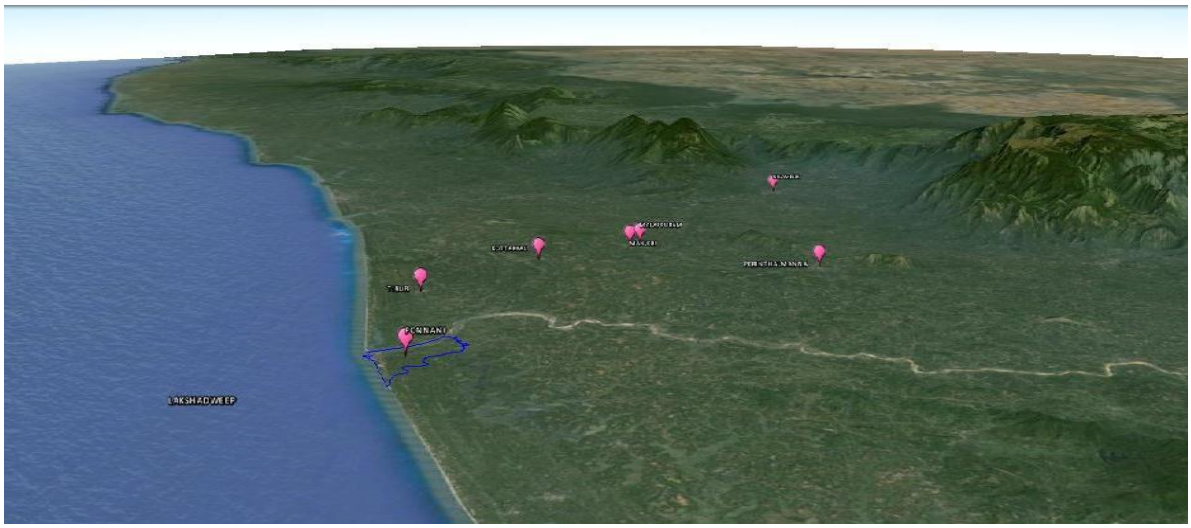


Figure 12-1 Terrain map (Source: Google earth)

While dealing with the drainage system of Ponnani, the following data has to be considered for analysis.

- Situation of town, its present population and expected rise in the next thirty years.
- Present condition of existing drainage and its disposal.
- Enumeration of the roads in the congested area with and without side drains.
- Position regarding water supply, existing and proposed if any
- Contour of the town and its effect on the design of drains as regards self-cleansing velocity.
- The requirement of covered drains to act as footpaths and to restrict dumping of garbage.

- Main and branch drains.
- Disposal works at outfalls.
- Any pumping required and power for working pumps.
- Design of drains and available construction material
- Fluctuation of subsoil water table.

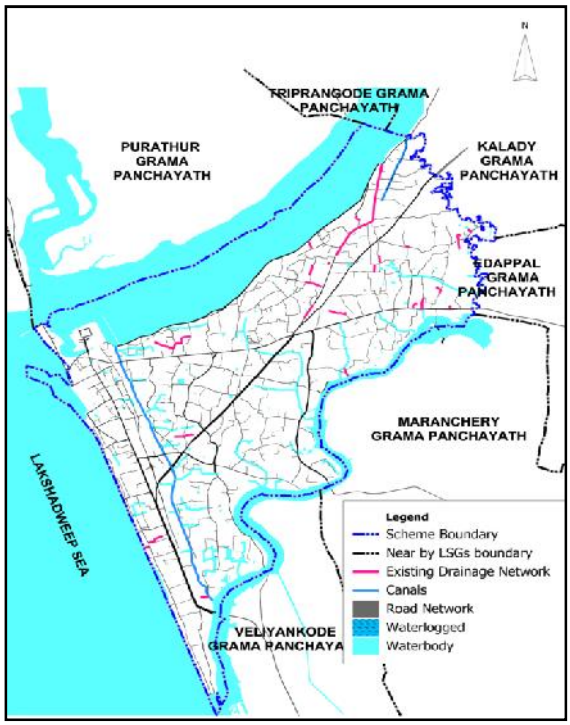


Figure 12-2Existing drainage network (Source: Primary Survey, T&CPD, MPM)

12.3 Projected requirements

- Waste generated = 220gm/Head/day
- Waste generation in 2031 = 26 tons/day
- Waste collected/day = 5 tons
- Hence additional 21 tons/day to be treated

12.4 Problems

- Encroachment developed on either side of the roads obstructing flow in the side drains.
- Dumping of debris and solid waste.
- Poor maintenance of road side drains.
- Absence of adequate drainage network and inadequate section of road side drains.
- Absence of road side drains in the junction of the municipal area
- Choking of inlets on road side drains

- There are no suitable inlet chambers with catch pits along the existing drain alignment for connecting storm drainage of individual houses or clusters of houses within the town area.
- Damaged drains require revamping
- Absence of integration of side drains with natural drains.
- Contour restricting adequate bed fall of drains.

12.5 Sewerage

Ensuring proper sanitation arrangement for the public is basically the responsibility of the Government/ Municipality. There is no sewerage system in the town. All the households in the town have their own toilets. 41% of the people use septic tanks, 58% of the people use pit latrines and the rest 1% use open defecation, shown in Figure 12.3. With the presence of large number of pit latrines and the majority of plot size being 5 to 10 cents which is shown in Figure 12.4, the quality of water available from the open well is questionable. With the increase in population projected and the envisaged densification of the town, a sewerage system is inevitable.

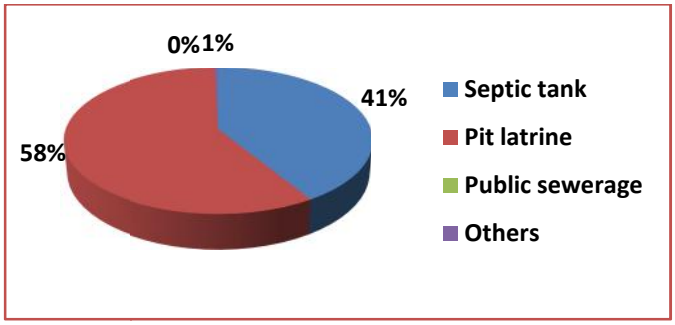


Figure 12-3Type of toilet (Source: Socio Economic Survey-2012)

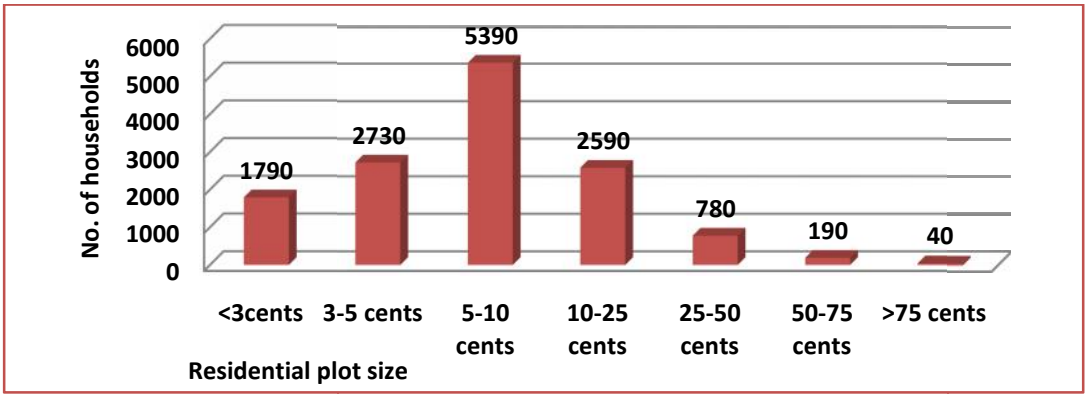


Figure 12-4Residential plot size (Source: Socio Economic Survey-2012)

In general terrain of Ponnani Town is flat with an average ground level of +5m, the water table will be very high. As such, the treatment of night soil by way of septic tank with leach pit will not be successful especially where the population density is higher. The things will be worse in rainy seasons. Only one public comfort station is situated in the town, at the Municipal Bus Stand under the ownership of Ponnani Town and about 100 persons use the comfort station daily. In the above circumstances a sewerage system with facility for co-treatment of the septage is essential for the town.

12.6 Ongoing and committed projects

There are no ongoing and committed projects in this sector.

12.7 Bio medical waste

Though the town has comparatively less medical institutions, proper disposal of bio-medical waste is a must. The Indian Medical Association (IMAGE) has a centralized collection system in the town. However the untreated or partially treated waste water from the hospitals is let out intonatural drains which are a health hazard to the local population by way of infection andthe immunity of the new strains of disease causing micro-organisms to the normally useddrugs. This can be prevented by stringent control on the quality of effluent from healthcare institutions.

12.8 Municipal solid waste

12.9 Solid waste characteristics

Increasing municipal waste and inadequacy of treatment facilities is experienced by almostall towns in the state. The situation of Ponnani is also worse. The socio-economic survey reveals that almost all the households treat/dispose their waste in their own premises as shown in figure 12.5. They segregate non bio degradable and bio degradable wastes. The bio degradable wastes are disposing in their own premises using pipe composting methods etc. Kudumbasree unit is functioning in the town for the collection of plastic wastes from shops and are transported to the markets in Tamilnadu.

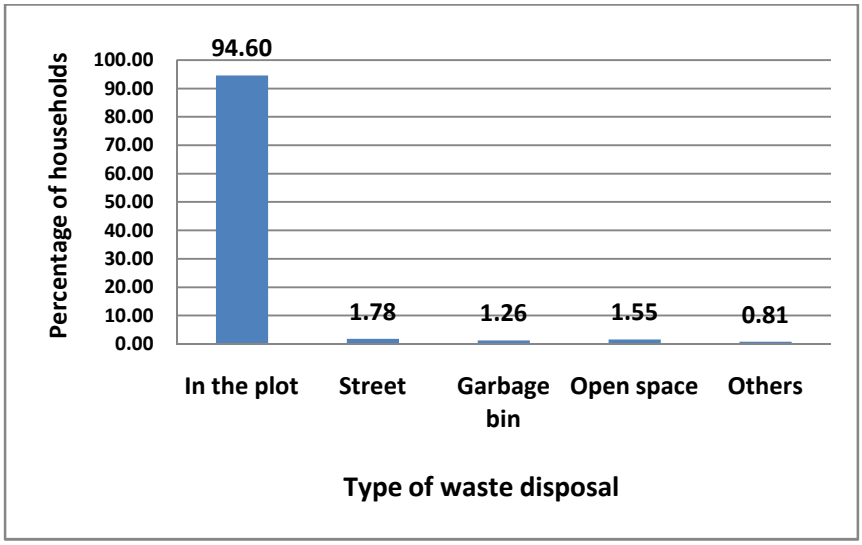


Figure 12-5Type of waste disposal in % (Source: Socio Economic Survey-2012)

Total of 5 Tones/day of solid wastes are collected. Total workers employed are 55 and two numbers of trucks are used for the collection. The wastes are directly collected from the collection points situated within the Municipal area daily.The wastes collected are then transported to the Kuttikkad dumping yard (On the banks of Bharathapuzha) and covered it with red earth.

A) Waste generating sources and Quantity of waste

The major waste generating sources are house holds, hotels and restaurants, commercial establishments, markets, meat/chicken stalls, offices and institutions, hospitals, clinics, paramedical labs, community halls, workshops, industries. Other sources are construction, demolition waste and drain cleaning silt etc.

The studies conducted in 2007 by Government of Kerala have estimated the solid waste generation in urban local bodies of Kerala. As per the estimate, generation of municipal solid waste (MSW) in Ponnani Municipal area was 229 gram/per capita per day in 2007. As per 2014 statics the waste generation is 253 gram per capita per day. This comes to about 23 MT of solid waste every day. A significant portion of this waste currently finds its way on to streets, open collection points, land reclamation, recycling units, streams etc. As per a study conducted by M/s. IL & FS Environment, IL & FS Environmental Infrastructure and Services Ltd., Andheri (East), Mumbai, the estimated quantity of MSW reaching the Municipal stream is 18 TPD.

B) Physicochemical characteristics

No detailed analysis of physical composition of MSW is available in the Town. Physical composition of MSW at Ponnani Municipal area has been arrived at on the basis of the studies done for the sectoral status study on SWM in Kerala((WSP- South Asia, 2007)and JNNURM-Kochi Urban Agglomeration – 2007, supplemented by the field studies carried out by the IEISL in Ponnani. The physical characteristics of MSW reaching the Municipal stream are shown in Figure 12.6.

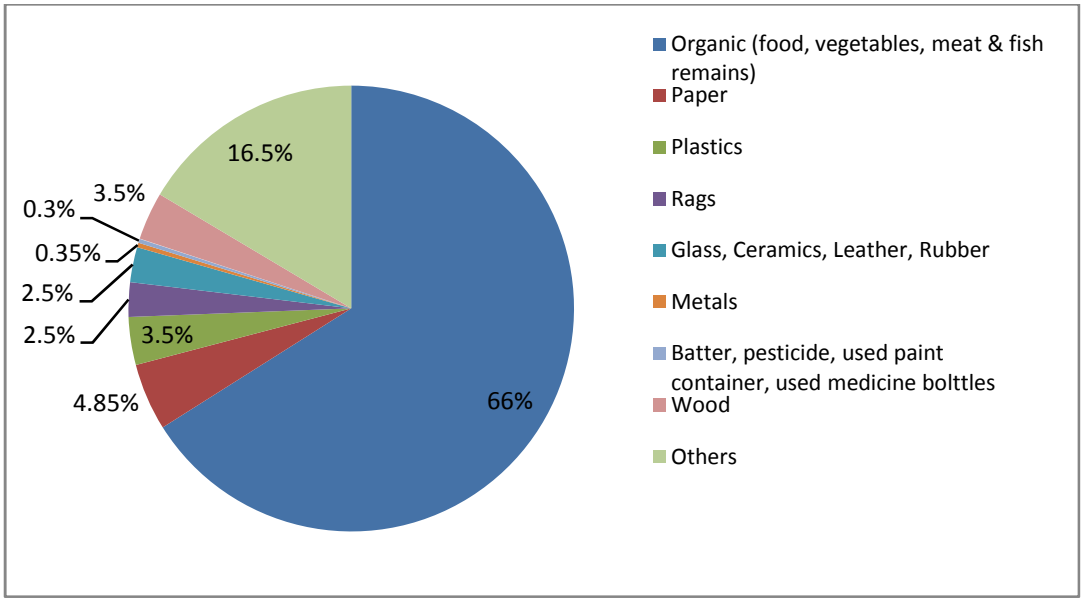


Figure 12-6Composition of waste (Source: IE&FS Environment Report)

12.10 Present solid waste management practices

Health Department (HD) of the Municipality is responsible for sanitation facilities, SWM and other public health duties. Present scenario of SWM in Ponnani Municipal area is given in Table 12.1.

Table 12.1Present scenario of SWM in Ponnani Municipality

Functional element	Present scenario
Waste generation	Municipal estimation is around 18 TPD at a per capita waste generation rate of 200 gm/day.
Segregation at source	Generally absent except segregation of some recyclable fractions.
Storage at source	Recyclables are partly stored for selling to vendors. Around 30% hotels and restaurants store in gunny bags and plastic containers and 25% of other non domestic generators store waste at source.

	Most of the chicken stalls store waste in gunny bags.
Primary collection	No door step collection and no regular collection from the open community dumps except door step collection of plastic and recyclables by one unit of Kudumbashree (10 Nos.) covering 270 shops – twice a week. Segregated plastic waste is sent to vendors.
Street sweeping	Daily coverage is less than 10 % of the roads (around 50% of major roads). Occasional sweeping done on 30% of the roads and no sweeping in 60% of the road/ public place. The street sweeping and drain silt is collected and transported in wheel barrows. Around 50% of the wheel barrows are used, resulting in multiple handling of waste/ litter/ drain silt.
Secondary storage	There are only open collection points; the major ones are located in the town area.
Transportation	Occasional; No regular transportation of waste
Frequency of removal	Irregular – Only town centre is attended regularly. Around 48% of collection points are cleared daily. Limited operations during Sundays and holidays.
Processing	No municipal waste processing facility. Four hotels have treatment units of their own using composting process.MES college operates a bio gas plant to treat the organic waste generated in the college. Most of the chicken stalls sent their waste to Palakkad.
Disposal	Dumping of waste is done in the beach area near the light house and in private lands where the same is covered after dumping. Burning of waste is a common practice during summer.
Vehicle, tools, equipments	Primary collection – No vehicles are in use. Three auto three wheelers – no tipping type are available but not being used. Two open non tipping type trucks are being used occasionally for transporting of waste, 10 wheel barrows used for collecting drain silt.

12.11 **Ongoing and committed projects**

Ponnani municipality proposes to set up the SWM plant in 2.0683 acres of land in survey no. 232/11,12,1,5,9,16 and 243/3 in Ezhuvathiruthi village. The proposed integrated solid waste management plan for the Townfocuses on the following key components.

1. Promoting segregation and storage of waste at source in two bins so as to facilitate an organized and hierarchical system of waste collection and disposal.

2. Organization of door- step/ kerb side collection with community participation on cost recovery basis and minimize the multiple handling of waste, improvement in the productivity of labour and equipment.
3. Drop off centers to receive recyclable wastes
4. Direct transportation without intermediate storage
5. Daily transportation of organic waste/mixed waste to treatment site either by motorized primary collection vehicle or in refuse compactor vehicles.
6. Need based transportation of inorganic and other dry waste to sorting area
7. Collection and transportation of garden waste on pre fixed days in tipper trucks.
8. Awareness creation for segregation, storage at source, home level composting, waste reduction at source
9. Institutional strengthening and capacity building
10. Monitoring system to increase productivity and for timely redressal of complaints.

12.12 Problems

- No adequate facilities for sewage disposal
- Lack of an efficient treatment plant and collection system
- Quantity of E-wastes are increasing

12.13 Potentials

- Land available at Neithalloor for the construction of a Solid Waste Treatment Plant

12.14 Inference

Even though large drainage outlets are available on all sides there is no effective storm water drainage system. The advantages of short distance to the outfalls are lost due to uncontrolled developments within the town. Paddy fields which earlier acted as drainage storage ponds also, before discharging into the rivers are now filled up for construction activities obstructing drainages. The drainage system needs total revamping to form efficient, effective and clean storm water drainage.There is no sewerage system in the town. As such the treatment of night soil by way of septic tank with leach pit will not be successful especially where the population density is higher. The things will be worse in rainy seasons. The raising density of land use calls for a sewerage system inorder to protect the water resources.In the above circumstances a sewerage system with facility for co-treatment of the septage is essential for the

town. Similar problems are also facing with solid waste management. The disposal system must be improved. So there is an urgent need for the construction of solid waste treatment plant and sewerage cum drainage treatment plant for the Town.

13 EDUCATION

The right to education includes a responsibility to provide basic education for individuals who have not completed primary education. In addition to these accesses to education provisions, it encompasses the obligation to rule out discrimination at all levels of the educational system, to set minimum standards and to improve quality of education. Ponnani has a prominent place in the educational history of Kerala. The educational sector is detailed in this chapter.

13.1 Existing scenario

Ponnani is popularly known as 'Makkah of South India' for it has been a prominent Islamic education center for many centuries. Ponnani enjoyed a status as an important centre for education in the philosophy of Islam. In the early period, Ponnani was considered "the Al-Azhar University of Kerala", for its great Muslim religious schools and teachers.

But a few years back there was a decline in the educational status of the people. Now the situation is widely changed. This is evident from the results of different entrance examinations. Ponnani MES College established in 1968, affiliated to Calicut University,has played a significant role in providing good quality higher education to the youth especially from Ponnani, Tirur and Chavakkad Taluks. AV Higher Secondary school, established in 1885 is one among the oldest in Malabar, MI High School established in 1947 has a very important role in educating the backward people who mostly come from coastal areas. Figure 13.1 shows that literacy rate of Ponnani Town is less than that of the state and district average.

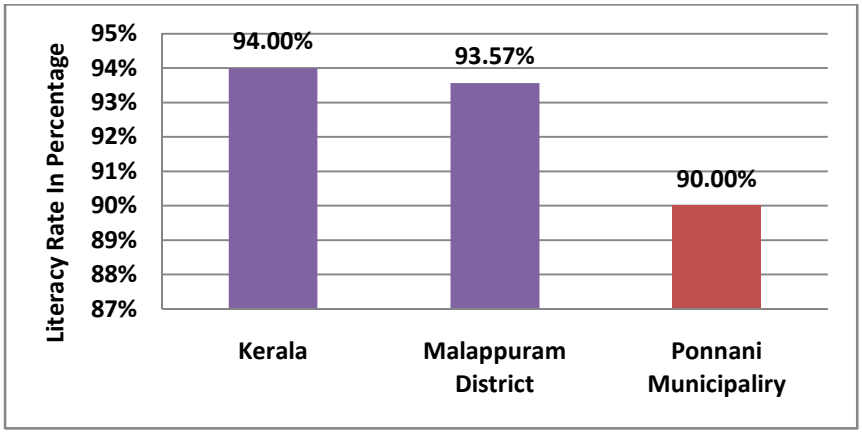


Figure 13-1Comparison of literacy rate with state and district
Source: Census 2011

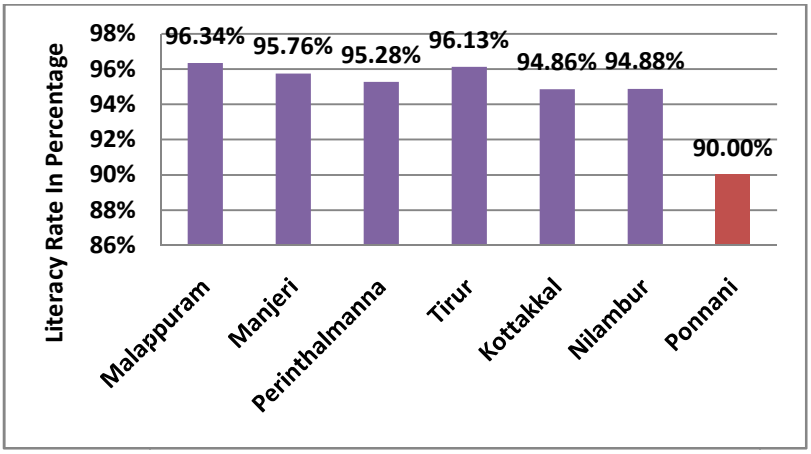


Figure 13-2Comparison of literacy rate with other municipal towns in the district
Source: Census 2011

Figure 13.2 shows that literacy rate of Ponnani town is less than other municipal towns in the district.



MES College

13.2 Educational profile

The socio economic survey reveals the educational profile of the people of Ponnani Town as shown in Figure 13.3.

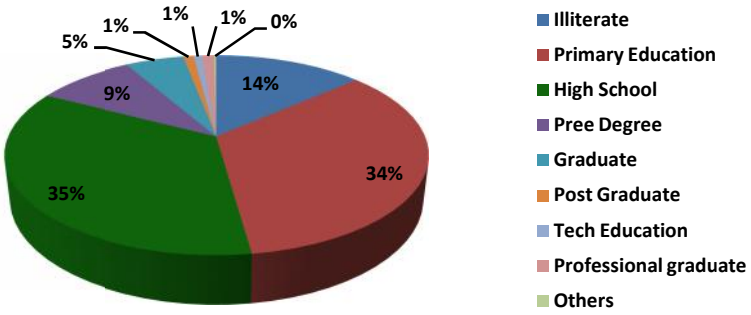


Figure 13-3Educational profile
Source: Socio Economic Survey-2012

The figure indicates that 35% of the people are educated up to high school level, 34% of people have only primary education 14% are illiterates and professional graduates are less than graduates.

13.3 School Education

The existing number of schools in the Municipal area is 33. Out of which lower primary educational facilities are available in 25 schools, upper primary educational facilities in 15 schools, high school educational facilities in 9 schools and higher secondary educational facilities in 7 schools. The details of educational facilities are tabulated in Table 13.1.

Table 13.1Number and type of educational institutions
Source: Education Department

Sl. No.	Type of Institutions	No: of Institutions			Total
		Government	Aided	Unaided	
1	Anganwadi				83
2	Pre-Primary	5	7	5	17
3	L P School	9	11	5	25
4	U P School	3	8	4	15
5	High School	1	5	3	9
6	Higher Secondary School	1	4	2	7
7	Arts & Science College	0	1	5	6
8	Polytechnic	0	0	0	0
9	Teacher’s Training Institute	0	1	0	1
10	ITI	1	0	0	1

Out of the 33 schools in the town 11 are government schools and 18 are aided by the government. The rest of schools are under private ownership.

13.4 Details of students and teachers

The student-teachers details inschools of Ponnani are shown in Table 13.2. The total number of students studying in the schools in the town is 21703 and the numberof teachers is 857. The teacher-student ratio is less then 1:30. Out of the 33 schools only five schools have the ratio greater than the limit.Among the schools, NSS English medium school, Thrikkavu has higher student-teacher ratio (60).

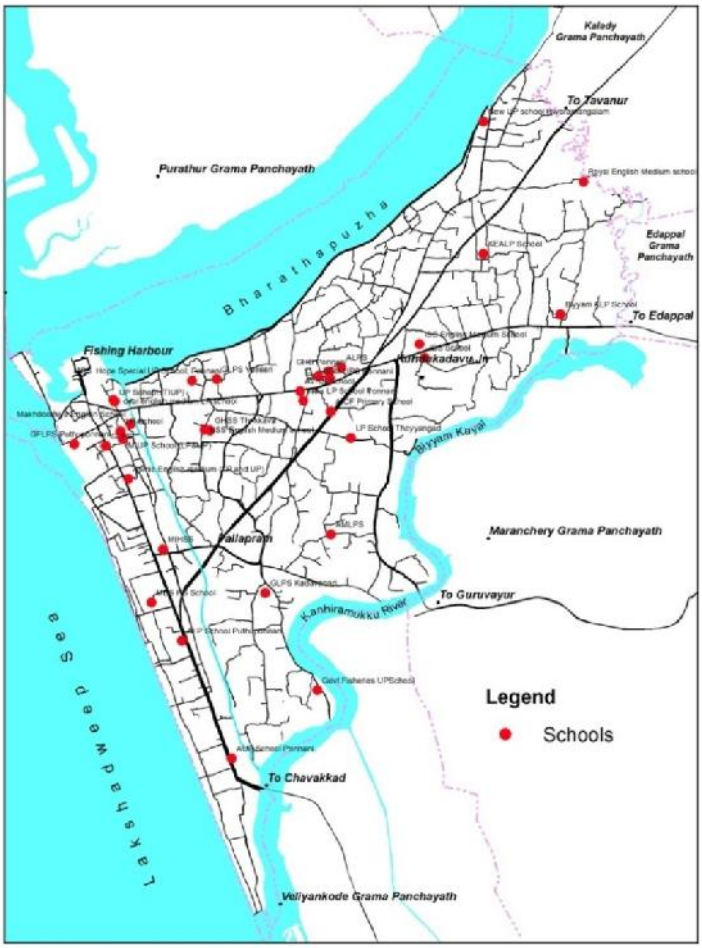
Table 13.2 Student-teacher details

Sl. No.	Name of School	No. of Students	No. of Teachers	Student -Teacher Ratio
1	GUPS Cheruvaikkara	231	12	19
2	GFUPS Kadavanad	372	17	22
3	GLPS Kadavanad	142	9	16
4	GFLPS Puthuponnani	134	12	11
5	GFLPS Ponnani	57	5	11
6	GMLPS Ponnani	41	5	8
7	GLPS Theyyangad	144	6	24
8	GLPS Velleeri	97	6	16
9	New UPS Eswaramangalam	224	21	11
10	BEMUPS Ponnani	1117	28	40
11	TIUPS Ponnani	536	29	18
12	MIUPS Ponnani, Kinarstop	545	27	20
13	AUPS Puduponnani	464	20	23
14	AMLPS Biyyam	160	7	23
15	KEALPS Eswaramangalam	153	6	26
16	AMLPS Karukathiruthy	182	9	20
17	NEW LPS Ponnani	703	20	35
18	ALPS Puthuponnani	686	28	25
19	AMLPS Pallapram	252	10	25
20	ALPS Ezhuvathiruthy	105	10	11
21	NSS English Medium School, Thrikkavu	420	7	60
22	Makhdoomiya English School	285	14	20
23	Asmic English Medium School, Ponnani	85	4	21
24	MSS Hope Special School, Ponnani	49	6	8
25	Govt. Higher Secondary School, Thrikkavu, Ponnani	493	24	21
26	Govt. High School, Thrikkavu, Ponnani	360	19	19

27	MI Higher Secondary School for Girls	2788	101	28
28	MI Higher Secondary School for Boys	2212	80	28
29	MES Higher Secondary School, Ponnani	766	31	25
30	AV High School, Ponnani	2916	82	36
31	Girls High School, Ponnani	1097	54	20
32	Vijayamatha High School, Ponnani	1574	43	37
33	ISS Higher Secondary School, Ponnani	2313	105	22

13.5 Spatial distribution of schools

The spatial distribution of LP, UP, High schools and Higher secondaryschools are shown in Figure 13.4.The schools are spatially well distributed in tune with the distribution of population density.



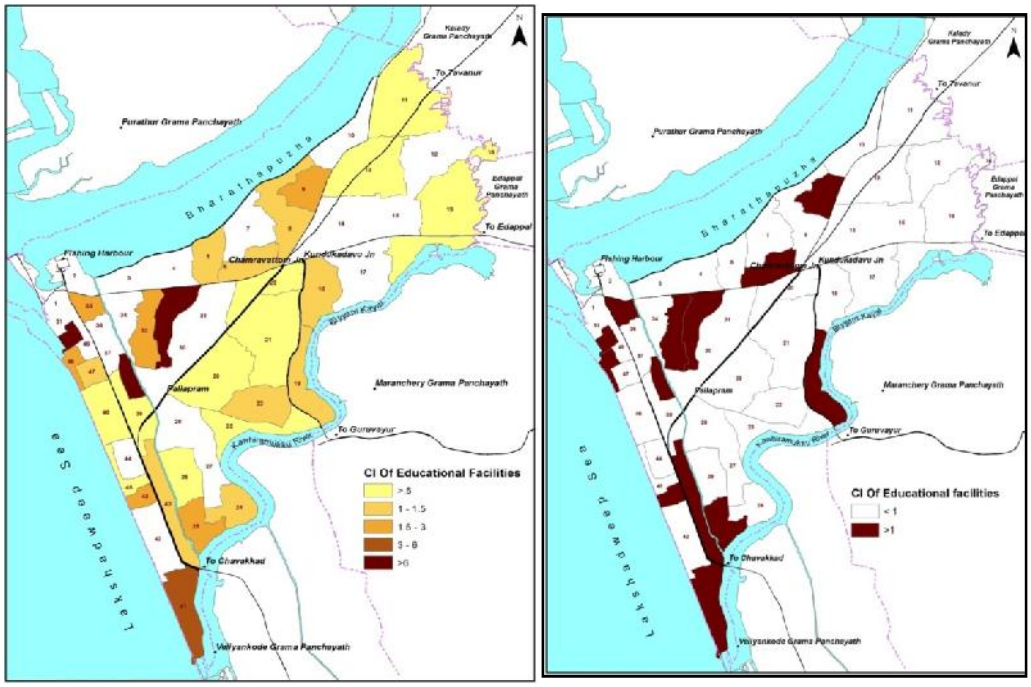


Figure 13.5 CI of Education facilities

Figure 13.4Spatial distribution of schools

13.6 Infrastructure details of schools

13.7 Government schools

Most of the government schools in Ponnani town have betterinfrastructure facilities. Play ground facility is available for 60% of the schools. 90% of the schools have separate toilet facility. 60% have computer lab facility, 80% with internet facility, 90% with water availability and 100% with road connectivity.

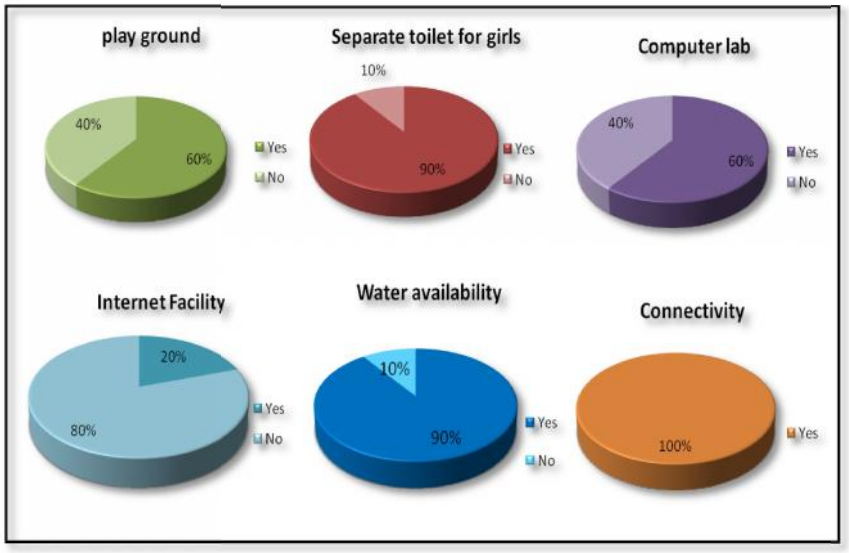


Figure 13.6 Infrastructure facilities in government schools

13.8 Aided schools

In ponnani town there are seventeen aided schools. Of these 82% of the schools have play ground facility, 100% have separate toilet for the girls, 82% have computer lab facility, 71% with internet facility, 94% with water availability and all the schools have road connectivity.

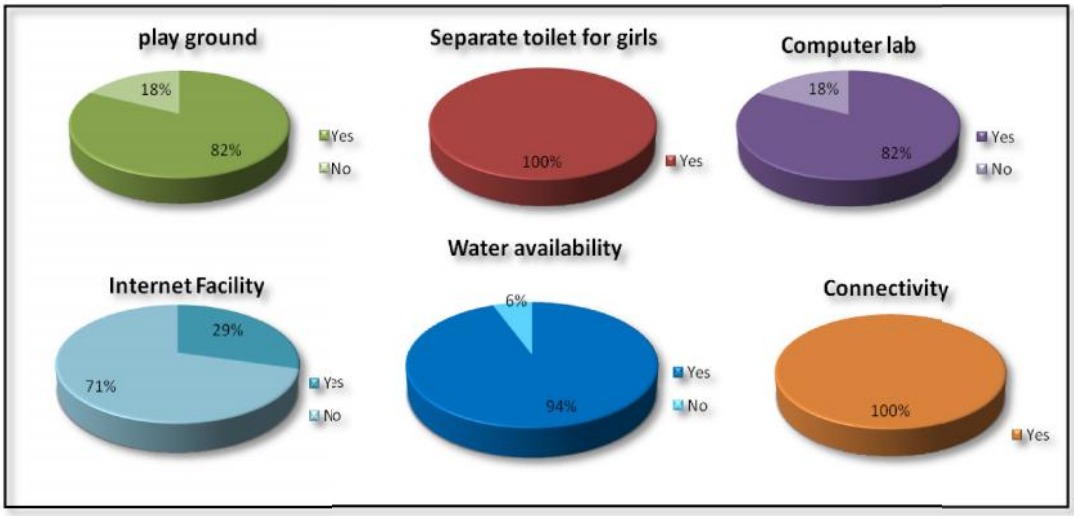


Figure 13.7 Infrastructure facilities in Aided schools

13.9 Un aided schools

Most of the unaided schools in Ponnani town have comparatively less Infrastructure facilities. In ponnani town there are only six unaided schools. Of these 67% have play ground facility, 83% have separate toilet for the girls, 67% have computer lab facility, 86% have water availability and 100% have road connectivity.

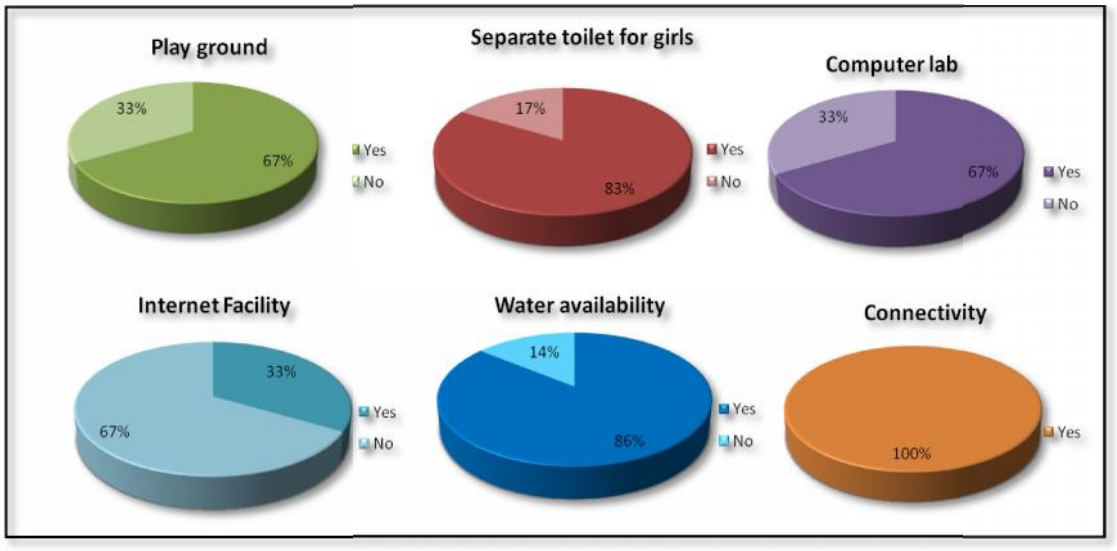


Figure 13.8 Infrastructure facilities in Unaided schools

13.10 Higher and professional education

13.11 Arts and Science Colleges

Ponnani town has a number of higher educational institutions offering courses invarious branches. There are 6 arts and science colleges in the area in which one college isin aided sector and five are in the unaided sector. Table 13.3 gives the details ofthe arts and science colleges.

Table 13.3 Details of arts and science colleges

Name of College	Whether having PG course (Y/N)	Number of Students course wise (UG)				Number of Students course wise (PG)				Govt/ Aided/ Unaided
		BA	B Sc	B Com	BBM/ BBA	MA	M Sc	M Com	MBA	
MES College	Yes	159	466	143		36	58	34		Aided
ISS HSS	No			16						Un Aided
Plus College	No	60		60						Un Aided
Scholar College	Yes	254		464		17		21		Un Aided
Presidency College	No	120		88						Un Aided
Regional College	No	90		140						Un Aided

13.12 Professional educational institutions

There are two professional educational institutions in the municipality. Around 125 students study in these institutions. These students are coming from the municipal area and nearbyLSGs. Table 13.4 gives the details of the professional educational institutions.

Table 13.4 Details of professional educational institutions

Sl. No.	Name of College	Location	Details of Ownership	Specify the professional courses offered	Number of students course wise
1	ITI, Ponnani	Ezhuvathiruthi	Govt., Sc Development	Electrician (2 year)	42
2	MI Bed Training Centre, Puthuponnani	Puthu ponnani	Un aided, Recognized	English	22
				Physical Science	27
				Mathematics	15
				Social Science	21

13.13 Other institutions

The other institutions include nine computer centers and two fashion designing centers. An IAS coaching academy is functioning in the campus of Chamravattom Project Division office at Easwaramangalam. Also PhD facilities are available at MES College, Ponnani, seven seats for Aqua culture and Microbiology and two seats for Geology.

13.14 Projected requirements

Table 13.5 Projected requirements

Sl. No.	Category	Existing Nos.	Standards recommended	Requirement 2031
1	LP School	25	1/2500 population	23
2	UP School	15	1/7500 population	1
3	High School	9	1/13000 population	0
4	HSS	7	1/13000 population	2
5	Arts & Science college	6	1/80000 population	0
6	ITI/ITC	1	1/35000 population	2
7	TTI	1	1/120000 population	0
8	Professional College	0	1/125000 population	1

13.15 **Problems**

The education sector in the Town face the following problems

- Literacy rate of Ponnani Town is lower than the District and State averages
- The student - teacher ratio is less than 1:30 in most of the schools, but 5 out of 33 schools exceed the limit.
- Lack of professional education facilities in government sector
- Only 73% of the schools are having playgrounds
- 6% of the schools are not having separate toilet for girl students
- 27% of the schools are not having computer lab and only 27% are having internet facilities

13.16 **Potentials**

The town has good potential for the housing of higher level professional institutions and centers of excellence. Land is available for establishing technical, marine and medical educational institutions in the Town.

13.17 **Inference**

The literacy rate of Ponnani Town is less compared to the district, state and other towns within the district. The student - teacher ratio is less than 1:30 in most of the schools, but 5 out of 33 schools exceed the limit. There is scope for better educational facilities including an integrated school. The scope of educentre at Chamravattom project division area to establish the town as a coastal education hub should be explored.Govt. Fisheries School at Kadavanad to be upgraded and courses relating to fisheries, marine technology, marine investigation, adventure sports training institute etc to be introduced.

14 HEALTH

Health is the level of functional or metabolic efficiency of a living being. In humans, it is the general condition of a person's mind and body, usually meaning to be free from illness, injury or pain. Health is another sector in which the state of Kerala has achieved remarkable progress which is comparable to that of developed countries. However, at micro level certain problems like quality of services, reach and affordability do exist. This sector is receiving prime importance in Kerala due to the changing life styles, culture, employment etc. Ponnani has an important place in the health sector of Ponnani Taluk. The status of the town in this sector is described in this chapter.

14.1 Existing Scenario

Being a coastal town in Malappuram District, there is a lack of health care facilities in the town. There are three allopathic hospitals and clinics in the town, out of which only one hospital; the Imbichibava Memorial Government Taluk Head Quarters Hospital is functioning with OP and IP consultation. It gives 24 hours service and having single operation theatre. Clinics with only outpatient consultation are two numbers. No advanced diagnostic facilities are available in the town. There are 8 ayurvedic hospitals and clinics in which 6 clinics have OP only. Two ayurvedic hospitals also offer the 24 hour services. There are 5 homeopathic clinics and 8 dental hospitals in the town. A number of medical laboratories and X-ray units are situated in the town. The existing institutions and details under this sector are given in Table 14.1, 14.2 and 14.3.

Table 14.1 Details of allopathic hospitals in Ponnani

Sl. No.	Name of Hospital	Location	Category	No. of beds	No. of Doctors	No. of O.P/ month	No. of I.P/ month	Govt./ Private/ Cooperative society
1	Imbichibava Memorial Govt. Taluk Head Quarters Hospital	Ponnani	3	125	19	30000	3264	Govt.
2	Primary Health Centre	Ezhuvathiruthi	1	Nil	2	1368	Nil	Govt.
3	Ponnani Nursing Home	Near Civil Station	2	Nil	1	600	Nil	Private
4	Ponnani Modern Hospital	Eswaramangalam	1	40	1	2000	Nil	Private

Category 1 -	*Clinics only OP*
Category 2 -	*Hospitals with 24hrs service*
Category 3 –	*Hospitals with single Operation theatre [Specify no. of operation theaters and category i.e.major/minor]*
Category 4 -	*Hospitals with more than one OT*
Category 5 -	*Hospitals with advanced diagnostic facilities like CT scan, EEG*
Category 6 -	*Super specialty hospitals*
Category 7 -	*Referral Hospital (Govt. Sector)*

Table 14.2 Details of Ayurvedic hospitals in Ponnani

Sl. No.	Name of Hospital	Location	Category	No. of beds	No. of Doctors	No. of O.P/ month	No. of I.P/ month	Govt./ Private/ Co-operative society
1	Govt. Ayurveda Hospital	Puthuponnani	2	20	3	5000	35	Govt.
2	Govt. Ayurveda Dispensary	Ezhuvathiruthi	1		1	2000		Govt.
3	Ayurveda Clinic	Ponnani	1		1	750		Private
4	Ayurveda Clinic	Ponnani	1		1	400		Private
5	Biyyam Ayurveda Marma Chikithsa Kendram	Biyyam	2	9	2	30	6	Private
6	MSS Physio Therappy Centre	Gim Road	1		1	110		Private
7	Salama Ayurvedic Hospital	Chana Road	1		2	30		Private
8	Ayurveda Speciality Medical Centre, Ponnani	Opp. Municipal Office	1		1	150		Private

Table 14.3 Details of Homeo hospitals in Ponnani

Sl No	Name of Hospital	Location	Category	No. of beds	No. of Doctors	No. of O.P/ month	No. of I.P/ month	Govt./ Private/ Cooperative society
1	Govt. Homeo Hospital	Kollanpadi	1	Nil	1	1646	Nil	Govt.
2	S.R Homeo Clinic	C.V Junction	1	Nil	1	2500	Nil	Pvt.
3	Ponnani Homeo Clinic	Kinar stop	1	Nil	1	300	Nil	Pvt.
4	Alshifa Homeo Clinic	Ponnani					Nil	Pvt.
5	Clare House Homeo	Vijayamatha	1	Nil	1	200	Nil	Pvt.

Table 14.4 Details of Dental hospitals in Ponnani

Sl No	Name of Hospital	Location	Category	No. of beds	No. of Doctors	No. of O.P/ month	No. of I.P/ month	Govt./ Private/ Cooperative society
1	Modern Dental Hospital	K.K. Junction	1	Nil	2	500	Nil	Private
2	Al Shifa Dental Clinic	C.V. Junction	1	Nil	5	625	Nil	Private
3	Nila Dental Clinic	C.V. Junction	1	Nil	3	500	Nil	Private
4	I.J. Dental Hospital	Chandappadi	1	Nil	2	600	Nil	Private
5	Cymar Ortho Dontic Clinic	Near AV HS	1	Nil	2	675	Nil	Private
6	Arafa Dental Hospital	Kodathippadi	1	Nil	2	800	Nil	Private
7	Satellite Dental Hospital	Opp. Govt. Hospital	1	Nil	1	200	Nil	Private
8	Dava Dental Hospital	Near Bus Stand	1	Nil	3	500	Nil	Private



Govt. Taluk Hospital



Mother and child hospital under construction

14.2 Spatial Distribution of Health Care facilities

The spatial distribution of the hospitals shows that they are located mostly along the major transport corridors and are shown in Figure 14.1.

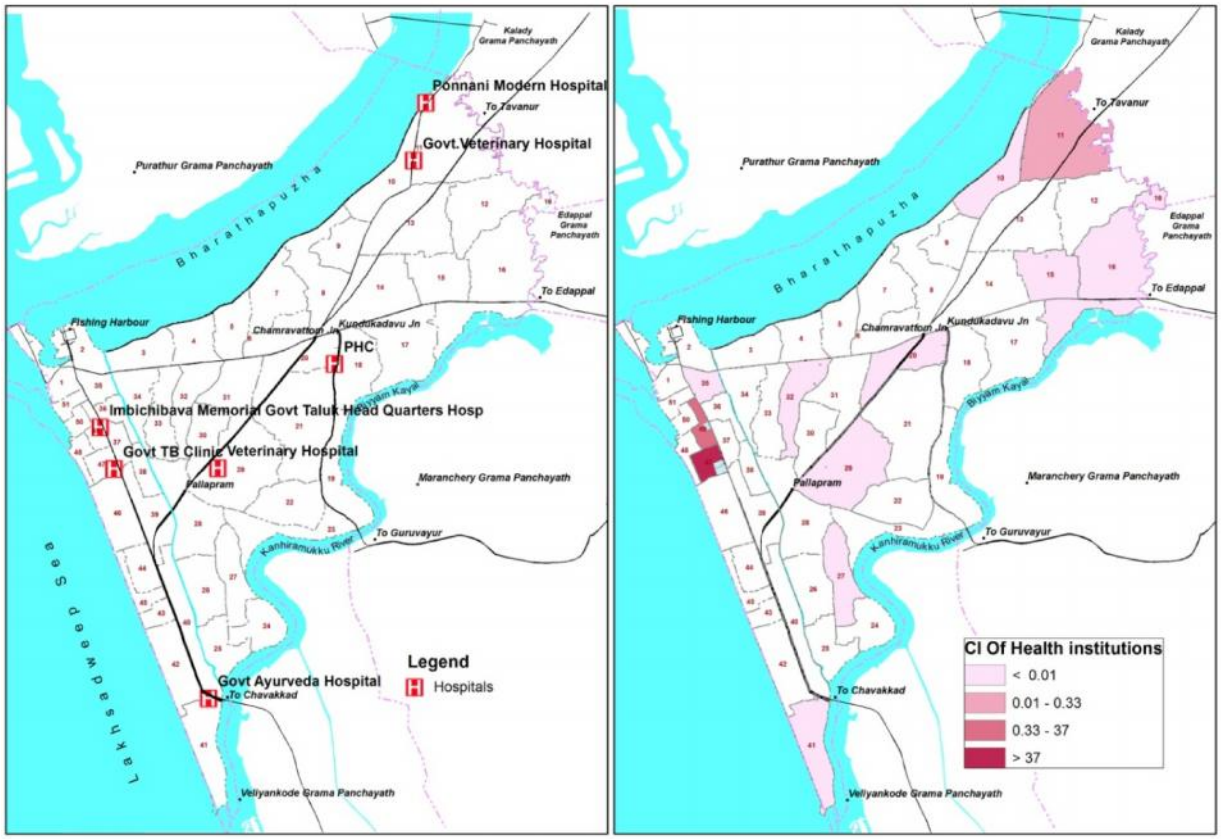


Figure 14-1Spatial distribution and CI of health care facilities

14.3 Projected requirements

Table 14.5 Projected requirements

Category	Existing Nos.	Standards recommended	Requirement 2031
PHC	1	1/20-25000 population	5
Taluk HQ Hospital	1	1 in taluk	0
Ayurveda Hospital	2		
Homeo Hospital	1		

14.4 Problems

- Waste management in Govt. Taluk Hospital is a big problem.
- 50% of the biomedical waste reaches the Municipal streams.
- Infrastructure facilities inadequate especially in the TB clinic, ayurveda and homeo dispensary.
- Lack of health care facilities in the super specialty category
- Trauma care facilities are not available in the Town.
- Eastern side of the Town lacks health care facilities.
- Waste management - solid, liquid and bio medical
- Inadequate infrastructure facilities in the ayurveda and homeo dispensary

14.5 Potentials

Physical and infrastructure development in Govt. Taluk Hospital will improve the health sector and it provides 24 hours service in Ponnani town. The TB clinic situated within the compound of new Mother and Child hospital may be shifted as a separate unit. There is a scope for setting up a fisheries dispensary near the existing Civil Station compound at court junction. The existing Ayurveda Hospital must be enhanced to a full fledged hospital. Coastal side being a disaster prone area, there is a scope for setting a hospital complex in the eastern side of the Town. The Ayurveda dispensary at Ezhuvathiruthi, existing homeo dispensary and the TB clinic can be shifted to this complex.

14.6 Inference

Being the coastal town, Ponnani needs to address several issues in health care. There is no advanced diagnostic centre or super specialty hospital facilities available in the town. The bed capacity per 1000 population is less than two and much is less than required as per the standards.

15 HOUSING

The draft housing policy, 2011 of the Government of Kerala states that "the international covenant of United Nations on economic, social and cultural rights, to which India is a signatory, upholds the right to adequate housing as a human right. Article 21 of the constitution of India, which defines the protection of life and personal property encompasses the right to shelter and right to livelihood also which are integral to the dignified living of the individual". The draft housing policy upholds the need for adequate and affordable housing for all.

15.1 Existing housing condition

Residential areas are located over almost all parts of the town. About 50% of the total developed area is under residential use. Coastal area of the town is thickly populated compared to the eastern part. Non residential uses are comparatively meager in this part. Majority of the houses are in the 50-150 m^2 category, built in own land, of sizes ranging between 5 – 10 cents and are having 3 habitable rooms each. The typology of houses in the town is given in Figure15.1.

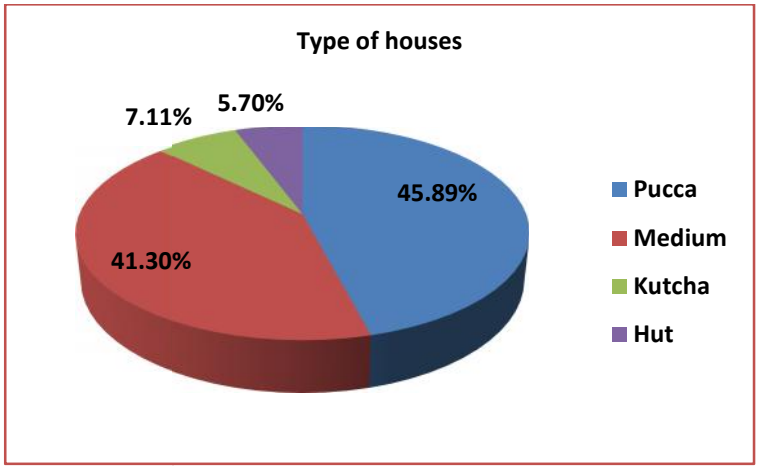


Figure 15-1 Typology of houses (Source: Socio Economic Survey-2012)

As per the figure, 45.89% of the houses are pucca houses. Being a coastal town, there are 7.11% of Kutcha houses and 5.7% of Huts. Housing finance is provided by agencies like HUDCO, LIC etc. The following figures show the built up area of houses within the Municipal area.

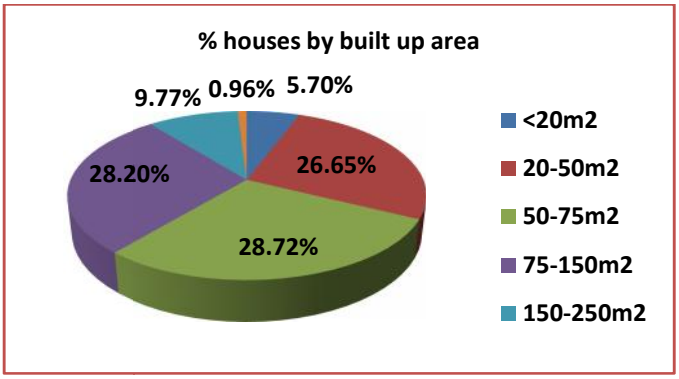


Figure 15-2% Variation of built up area of houses (Source: Socio Economic Survey-2012)

Majority of the houses are in the 50-150 m^2 categories. Only 5.7% of the houses are lessthan 20 m^2 in size. 26.65% of the houses are in 20-50 m^2 categories. 150-250 m^2categorieshas only 9.77% and houses with size above 250 m^2 is only 0.96%. Figure 15.3 gives the natureof land ownership for housing purposes.

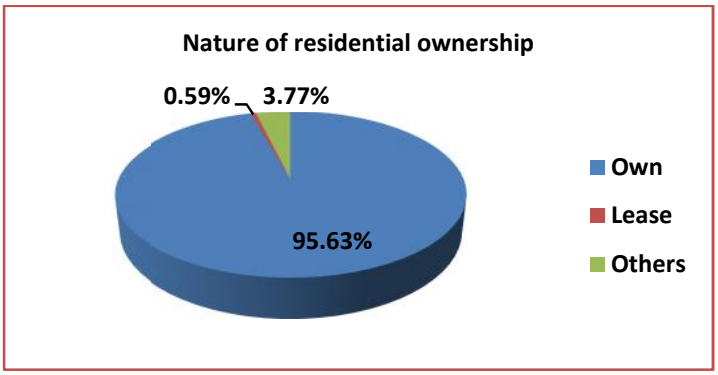


Figure 15-3Nature of land ownership (Source: Socio Economic Survey-2012)

95.63% of the houses are built in own land. The residential plot size is given in Figure 15.4.Majority of the plot sizes range between 5 - 25 cents.

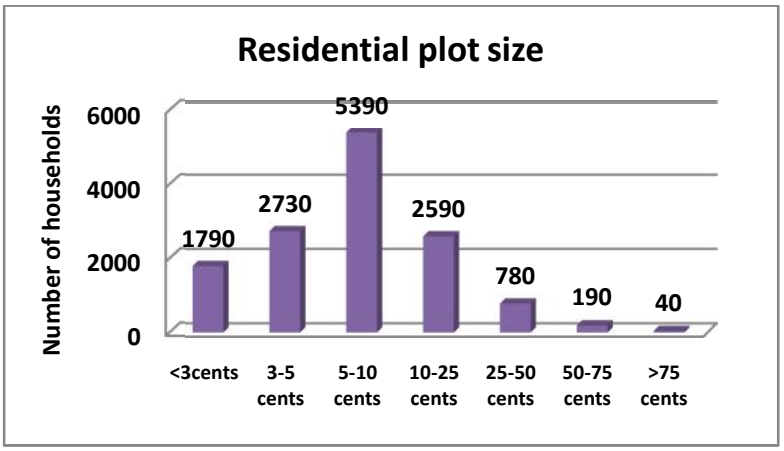


Figure 15-4Residential plot size (Source: Socio Economic Survey-2012)

The Figure 15.5 shows the houses bynumber of habitable rooms. The majority of the houses have 3 habitable rooms each.

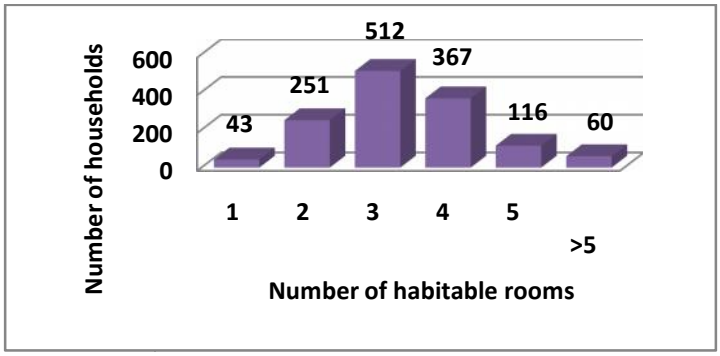


Figure 15-5Houses by number of habitable rooms (Source: Socio Economic Survey-2012)

House hold size has decreased from 7.08 in 1971 to 5.72 in 2011. The temporal variation of household size is shown in Figure 15.6.The household size of Ponnani town according to the census data is 5.72. On comparing with the household size of state and the district the value is higher and shown in Figure 15.7.

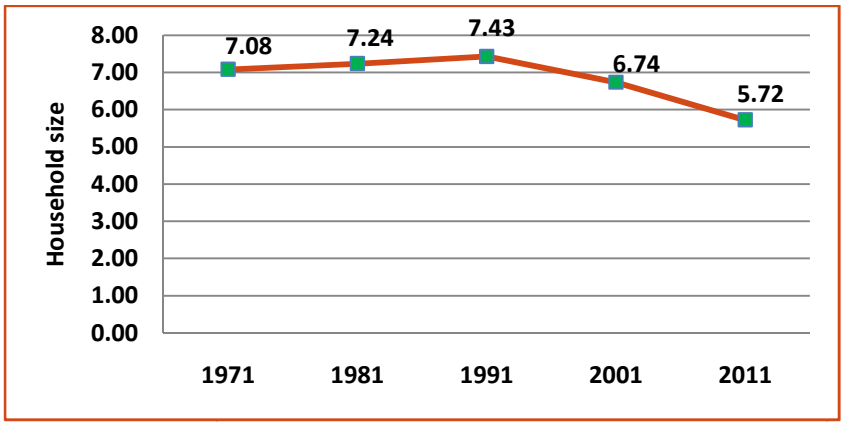


Figure 15-6 Temporal variation of household size (Source: Census data)

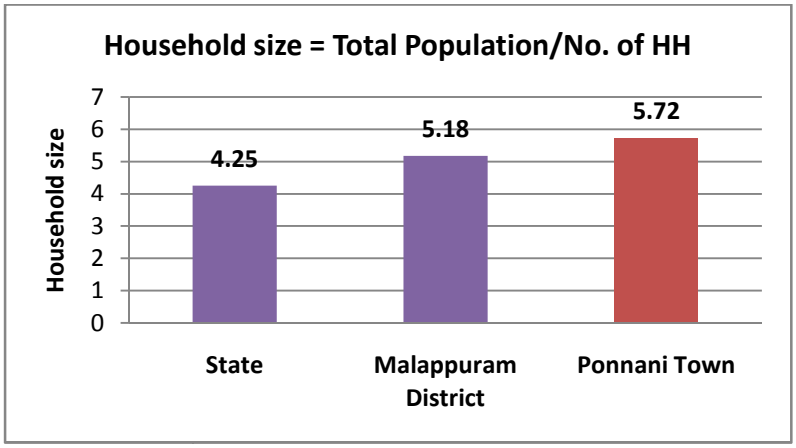


Figure 15-7 Comparison of house hold size with state and district (Source: Census-2011)

On comparing the household size of Ponnani with other urban local bodies within the district, the value is higher which shows in Figure 15.8. Figure 15.9 show that the house hold size of Ponnani is 5.72 which is greater than other similar towns in the state. Figure 15.10 shows that the house hold size of Ponnani is greater than the nearby grama panchayaths.

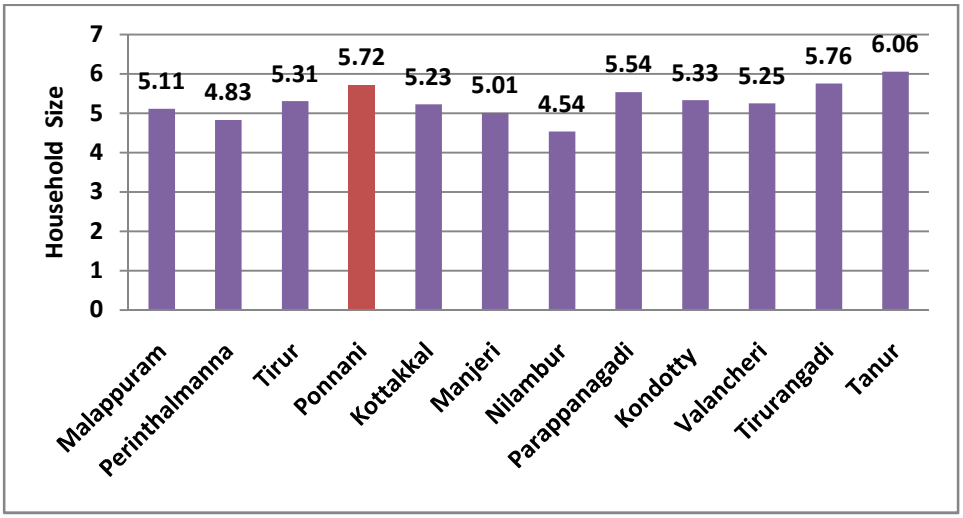


Figure 15-8 Comparison of house hold size with other urban towns in the district (Source: Census-2011)

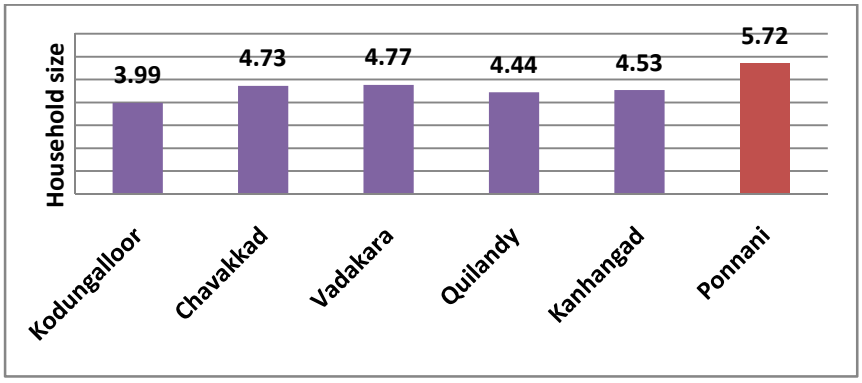


Figure 15-9 Comparison of household size with other similar towns in the state (Source: Census-2011)

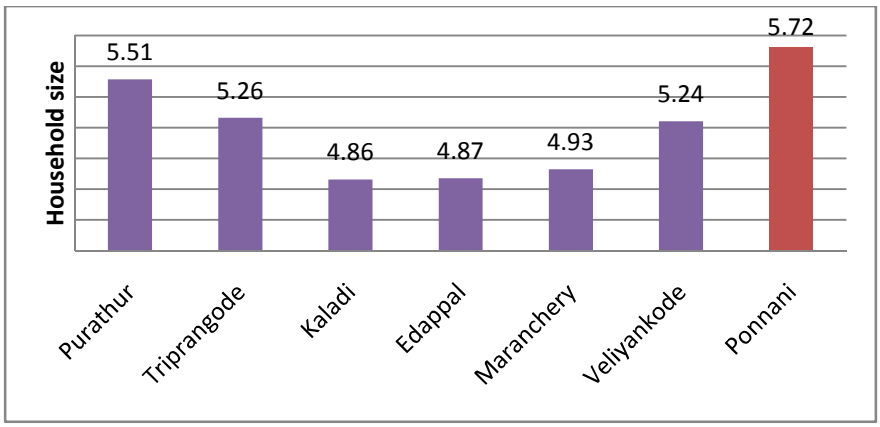


Figure 15-10 Comparison of household size with nearby gramapanchayats (Source: Census-2011)

15.2 Housing demand and shortage

The housing shortage is worked out by adding the difference between the number of households and number of houses and the number of houses that need replacement. So, the present and the projected housing shortage is worked out. Considering the service life of a normal residential building to be 40 years, it ispresumed that 25% of the housing stock shall need replacement in a decade.To this value the number of houses to be renovated (kutcha and Hut) is also added to get the housing shortage.

The Town has 13520 houses spread over in its 51 wards. The number of households as per Census 2011 was 15816, with a household size of 5.72. From the socio-economic survey the present day household size is assessed as 5.38. Such gradual decrease in household size is to be anticipated since the present household size is higher than the state average. The difference between houses and households is 2296. The kutcha housesand huts existing in the town, which is 13% of the total houses is to be replaced compulsorily. Therefore the present net housing shortage in the development area becomes 4054 (2296+1758). The housing shortage is depicted in Table 15.1.

Table 15.1Projection of housing shortage

Year	Population	HH Size	No.of Households	No.of Houses	Diff. b/n houses and households	Replacement	Total Shortage
1971	55596	7.08	7853				
1981	67640	7.24	9343				
1991	82522	7.43	11107	-	-	-	-
2001	87495	6.74	12990	-	-	-	-
2011	90491	5.72	15816	13520	2296	1758	4054
2021	96995	5.38	18022	15816	2206	3380	5586
2031	108655	5.04	21548	18022	3526	3954	7480

15.3 Slums and other sub standard housing

According to the survey done by municipality there are 2 listed slums in PonnaniTown. They are Kundukadavu Cheri and Murinjazhi Fisherman Colony. The source of water in these schemes is public tap, well and bore well. Pit latrines, leach pits are the places of sanitary waste

disposal in Kundukadavu cheri and septic tanks are in Murinjazhi Fishermen Colony. Streetlights are provided in these slums. Access is provided with motorable roads, 3m wide road.

15.3.1 Slum improvement programmes

Integrated housing and slum development programme (IHSDP)is a centrally sponsored scheme formulated by Ministry of Urban Employment and Poverty Alleviation,Government of India aims at up gradation of the housing and infrastructure facilities of slum dwellers and improves their socio-economic status. Two slums are selected in this scheme. Objectives of the IHSDP projectincludes

- To provide basic amenities to the poor families living in slum area.
- To make available permanent shelter hutment dwellers including improvement in the existing damaged structures.
- To provide community toilet, drinking water taps and community wells.
- To provide footpath, roads and drains wherever needed.
- To provide sanitary facilities.
- To generate confidence among the people about the worthiness of the project.

Ongoing project in the Town under IHSDP is Samyojitha Bhavana Nirmana Cheri Vikasana Padhadi. The aim of the project is to relocate and accommodate 120 fishermen families into 5 Acre plot owned by Fisheries Department to the west side of MES college (Malappuram District, Ponnani Taluk, Kadavanad Amsom, Ezhuvathiruthi Village) and construction of a Model Village in1.5 acres plot at Neithallur area to relocate and accommodate 109 families residing at puramboks (Dual Houses).



IHSDP project near MES College

The construction work of 120 dwelling units alreadycompleted near MES Collegeto relocate the households who are residing within 10 m from the high tide line, near the coastal area. But none of the dwelling units are occupied yet and the construction work of second project at Neithalloor yet to be started. The plinth area of single door dwelling unit is 26.6m^{2}having a bed room(280X240), kitchen(160X170), toilet(90X100), bathroom (90X170), living (260X240) and work area (170X170). Each unitis placed in a row such that front side facing the backside of the

other.Estimated cost for a unit is Rs. 80,000. Under IHSDP scheme a maximum of 1.3 lakh can avail for a beneficiary. Out of the 120 beneficiaries only 83 are living in their own houses. The others are living with their relatives in the nearby wards and houses. Some of the reasons for not occupying dwelling units are: dwelling unit size, single door dwelling unit, no sitout, congested rooms, poor quality of walls which are not plastered and different opinion about the toilet and washing space such as inside or outside the houses.

The issues identified are mainly categorized in the fields;

- Institutional and managerial issues such as lack of technical staff, lack of beneficiary participation, consensus, support and mobilization
- Cultural dimension such as architectural design of housing in relation to cultural values of residents, suitability of housing to occupants‟ natural way of life
- Social dimension such as security and safety issues, quality of internal spaces of housing units, privacy in dwelling units
- Economic dimension such as housing affordability, adaptability of housing units for future needs
- Environmental & Technological Dimensions such as architectural solution to energy consumption issues (e.g. ventilation, lighting, building morphology), landscaping Elements

15.4 Projections

- Present net residential density is 4607 persons/sqkm
- Net residential density in 2031 = 6110 persons/sqkm
- As per standards average density for developed areas can be the range of 100-150 persons/hectare

15.5 Inference

The housing sector needs more enhancements in the town. IHSDP project can solve the existing problems in slums if supported by people's aspiration. Adequate rehabilitation is to be provided for the people who are affected by future projects in the Town in the coming years. However the projected demand for housing during the plan period indicates the need for public intervention in providing affordable housing and further densification of residential land use. IHSDP project can solve the existing problems in slums.

16 RECREATION AND OTHER CIVIC AMENITIES

The chapter focuses on the recreation and civic amenities of Ponnani Town.

16.1 Parks and open spaces

There are no organized recreation spaces in the town. The town has no parks and open spaces which are open to public.

16.2 Play ground/stadia

Municipalmini stadium at Easwaramangalam is the only stadium under the ownership of the Municipality which is not in use. So the construction of new stadium at Easwaramangalam to be included in the master plan. Other play grounds available in the town are attached to the MES College, AV School and MIHS School which are not available for public use. There are no indoor stadia or open air theatre in the town.



Municipal Stadium

16.3 Theatre and auditoria

There are five Cinema theatres in the town and nine auditoria functions in the town. They are listed in Table 16.1 and 16.2.

Table 16.1Details of Auditoria (Source: Local body)

Sl. No.	Name of Auditorium	Location
1	Shadi Mahal	Chandappadi
2	R.V. Hall	Chana
3	S.B Auditorium	Near T.B Hospital
4	Breez House	Anappadi
5	R.V. Palace	Near Alankar Theatre
6	Akbar Auditorium	K.K. Junction
7	Nishad Palace	Anappadi
8	Mas Auditorium	Thrikkavu
9	New Auditorium	Kollanpadi

Table 16.2Details of Cinema Theaters (Source: Local body

Sl. No.	Name of Cinema Theatres	Location	Extent
1	Pournami	Chandappadi	1.50 Acre
2	Aiswarya	Puzhambram	50 cent
3	Lakshmi	C.V Junction	40 cent
4	Sakthi	C.V Junction	33 cent
5	Alankar	Erikkamanna	1.20 Acre

16.4 Town hall/community hall

Ponnani Town is prominent for its cultural activities. There is no town hall for the municipality. New proposal for a town hall is incorporated in the master plan with all facilities including parking.

16.5 Reading rooms and libraries

The details of important public libraries and reading rooms in the Town are given in Table 16.3. The conditions of these buildings are to be improved.

Table 16.3Details of public libraries and reading rooms (Source: Local body)

Sl. No.	Name of Public Libraries	Location
1	Thrikkkavu Grandhalayam	Thrikkavu
2	Krishnapanikkar Vayanasala	Ponnani
3	Krishnapilla Vayanasala	Puzhambram
4	Kairali Vayanasala	Kadavanad
5	Municipal Reading Room	Mukkadi
6	Municipal Reading Room	Meentheruvu
7	Municipal Reading Room	Municipal Office
8	Souhridaya Vayanasala	Kottathara
9	Uroob Smaraka Library	Kinar Stop, Ponnani Nagaram

16.6 Crematoria and burial grounds

There are two public crematoria under the ownership of the Municipality, the Easwaramangalam and Kuttikkad. Under the religious ownership, there are several burial grounds situated near the mosques within the municipal area.

16.7 Others

The town has a fire and rescue station having an extent of 4 acre. The town also has a police station (Circle Office) having an extent of 2 acre and sub jail in the core of the municipal area. Future expansion of this can be possible in the current premises. Also there are 23 banks including KSFE facilitating the town and its details are given in Table 16.4.

Table 16.4Details of Banks (Source: Local body)

Sl. No.	Name of Bank	Location
1	State Bank of Travancore	Chandappadi
2	State Bank of India	Near AV School
3	Punjab National Bank	Chandappadi
4	Dhanalakshmi Bank	C.V. Junction
5	Vijaya Bank	Chandappadi
6	Canara Bank	C.V. Junction
7	Federal Bank	C.V. Junction
8	MDC Bank	Kuttikkad
9	MDC Bank (Evening)	C.V. Junction
10	Ponnani Service Cooperative Bank	Head office, Kuttikkad
11	Ponnani Service Cooperative Bank	Head office Branch
12	Ponnani Service Cooperative Bank	C.V. Junction
13	Ponnani Service Cooperative Bank	Ponnani Town
14	Ponnani Service Cooperative Bank	Chandappadi
15	South Malabar Gramin Bank	C.V. Junction
16	South Malabar Gramin Bank	Municipal Stand
17	Ponnani Cooperative Urban Bank	K.K Junction
18	Ponnani Cooperative Agricultural Development Bank	Near AV School
19	South Indian Bank	Kuttikkad
20	Catholica Syrian Bank	Near Vijayamatha
21	Ponnani Taluk Government Employees Cooperative Society Ltd No. M 298	Chandappadi
22	KSFE Ltd	C.V. Junction
23	Ponnani Taluk Government Employees Cooperative Society Ltd No. M 421	Chandappadi

The financial institutions mentioned in Table 16.4 give financial assistance for agricultural, educational, industrial, fisheries, commercial, construction activities etc. In addition to these, there are many authorized and unauthorized private micro financial institutions in the Town.

16.8 Projected requirements

Table 16.5Projected requirements

Category	Existing Nos	Standards recommended	Requirement 2031
Park & Open spaces	Nil	10-12 Sq.m/persons	144Ha
Community level park & open spaces	Nil	2-3 community level park& open spaces	
Community room	9	1/5000 persons	15
Community hall & library	9	1/5000 persons	15
Recreational Club	Nil	1 for 100000 persons	2
		1 for 50000 persons	
		1 for 15000 persons	
Fire station	1	1for 2 lakh persons	0
Religious sites	>50	2 for 15,000 persons	0

16.9 Inference

Even though Ponnani is a coastal town, there is not even a beach recreation centre worth mentioning. Munambam Beevi Jaram located in Munambam area is a place of public attraction which has the potential to be developed into a beach recreation centre. The civic amenities like Public parks, Play grounds,library, Cinema theatres and Auditorium in the town are to be improved for the Town.

17 ENVIRONMENT AND HERITAGE

Kerala, the God's own country is enriched with Rivers, Lakes, Canals, Ponds, Back waters etc.which empower the environment. Presence of Mangroves gives better environmental conditions.Also the magnificent Temples, Mosques, Cathedrals and Forts are the living examples of the rich historic and cultural heritage of our state. Kerala is also notable for its fragile ecological equilibrium. The frequent and indiscriminate intervention of human beings disturbs and destroys this balance. Hence the conservation of environment, heritage monuments and natural heritage becomes the imperative demand for future generation.

17.1 Environment

The town is enriched with water bodies and other environmental factors which ensure better environmental conditions and desirable living standards. Bharathapuzha, the second longest river of Kerala, drains to the Lakshadweep Sea at Ponnani river.Cannolly Canal, one of the oldest inland navigation system passes through the municipal area connecting the Bharathapuzha River and Kanjiramukku River.The details of rivers and ponds are shown in Table 17.1.

Table 17.1Details of rivers and ponds (Source: Land use survey, T&CPD, MPM)

Sl. No.	Name and Type(River, Pond, Back water, Major Streams, Canal& other Water Bodies)	Present use (source of drinking water, Irrigation, Temple pond, no specific use)
1	Bharathapuzha	Drinking water, Irrigation, Agriculture
2	Biyyam Kayal	Transportation
3	Puthankulam	Pisci Culture
4	Chullikulam	Pisci Culture
5	Avikulam	Pisci Culture
6	Barlikulam	Pisci Culture
7	Boat Office Kulam	Pisci Culture
8	Perumbilayi Parambu Kulam	Pisci Culture
9	Thrikkavu Temple Pond	Temple pond, Fresh Water
10	Kandakurambakavu Ambalakulam	Temple pond, Fresh Water
11	Avaran Pallikulam	Mosque
12	Hajiyar Pallikulam	Mosque

13	Badar Pallikulam	Mosque
14	Siyarath Pallikulam	Mosque
15	Kallittakulam	Mosque
16	Chembele Pallikulam	Mosque
17	Valiyajaramkulam	Mosque
18	Valiya Juma at Kulam	Mosque
19	Kulam of Ashokan, Pathiravalappil	Pisci Culture
20	Kulam of P.T. Sivashankaran, Kottathara	Pisci Culture
21	Kulam of Cholakkathodiyil Pathuttiumma	Pisci Culture
22	Kulam of Sundararajan Sreeragam	Pisci Culture
23	Kulam of Santhosh vadakkeppaatt, Puzhambram	Pisci Culture
24	Kulam of Abutty	Pisci Culture

The natural drainage channels draining through the paddy fields form the component of environmental sensitivity in the town. The town has 126.09ha of paddy fields. Only a fraction of this area is cultivated. The town has 63.7 km of arterial drains feeding the paddy fields. The Ponnani town as a whole is not heavily polluted due to the absence of large scale industrial units in the town. Air pollution due to vehicular traffic is limited to a very small area in the town centre.

17.2 Sensitive areas

The Kerala Conservation of Paddy and Wet Land Act, 2008 is in force in the Town.Large scale conversion took place due to economic pressures and the legislations werenot effective in preventing such conversions. Likewise, the land belonging to the arterialdrainage is encroached upon in a number of places. In the absence of a master plan for thetown, such physical controls had been difficult. Figure 17.1 shows environmentally sensitiveareas of the PonnaniTown. The area includes the wet lands, mangroves, rivers, waterlogged areas and the other water bodies in the town.

17.3 Conservation efforts

One of the major environmental threats is due to sand mining. The sand mining mainly takes place on the river basin of Bharathapuzha which increases the revenue income of the local

body. Kadavu (7 nos.) are functioning under the permission of the Municipality and another seven are functioning under the permission of the Port. Sand-mining has become a lucrative business in view of the boom in the construction sector and the absence of alternatives to river sand. Therefore illegal mining are also very common in the area but not that much drastic as in the upper stretches of the river. As a result of this the river which used to dry in April is getting dried up in February month, river has become turbulent resulting in seepage of sea water in River. Due to entry of saline water, ecosystem of River has got destroyed. Fresh water fishes are no longer breeding and birds like storks and egrets have become endangered. River bank has got eroded due to high velocity of river leading to turbulence during monsoon season. Therefore sand mining is not a sustainable method of income generation; opportunities in other sectors are to be improved so as to attract more people to such methods.

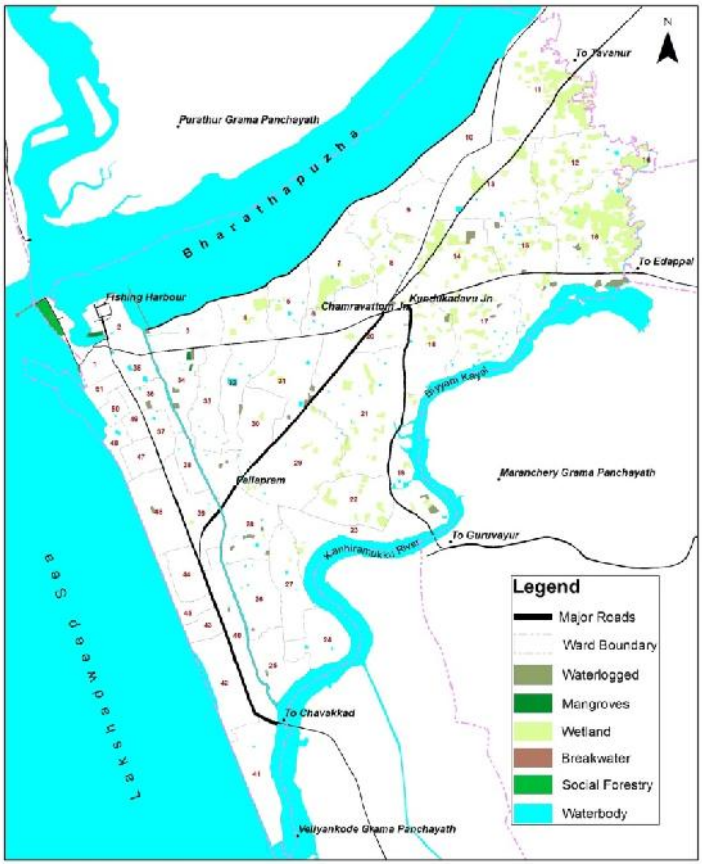


Figure 17-1.Environmentally sensitive areas

The letting out of waste water into the stormwater drainage is another important severe environmentalissue in the town. The paddyfields have become uncultivable due to lack ofcontinuity in some places and bad quality/shortageof water. The conservation of paddyfields is

required not only for agricultural production but mainly for other functions like providing open spaces, water storage etc. So conservation of paddy fields is important forthe healthy and environment friendly developmentof the built environment. The townhas potential for further densification in thealready inhabited areas and the scope for leavingthe cultivable paddy and other environmentallysensitive land alone.



Mangroves in Ponnani

In Ponnani town discontinuous patch of mangrove vegetation was observed near harbor and vandipetta area. Developmental activates paved the way for sand filling and reclamation of mangrove habitat resulting in their degradation followed by succession of beach runners and creepers.

17.4 Heritage

Ponnani Taluk is famous for many heritage locations in Malappuram District. Ponnani is well known among Keralites for its numerous mosques build across Ponnani Town. The one among the oldest is the mosque Ponani Juma Masjid which is five hundred years old. It is also famous for Hindu temples such as Thrikkavu Temple and the Navamukunda Temple in Thirunavaya, located on the northern banks of river Barathapuzha. Another famous temple in Ponnani is Mookkuthala Bhagavathy



Old Town

Temple. As per the heritage study conducted by the Town and Country Planning Department, the heritage locations are classified into built heritage, cultural heritage and natural heritage.

17.5 Built Heritage

Built heritage means those buildings, artifacts, structures, areas and precincts that are of historic, aesthetic, architectural or cultural significance and also include natural features within such areas or precincts of environmental significance or scenic beauty such as sacred groves, hills, hillocks, water bodies, open areas, wooded areas etc. The heritage buildings in this category identified within the municipal area are the Valiya Juma Ath Palli and Thrikkavu Saraswathi Temple and nearby gramapanchayaths are Kodancheri Juma Masjid, Pakaravoor Siva Temple.Valiya Juma Ath Palli was built by Sheik Zainuddin Makhdoom in the 16th Century. It was one of the biggest Mosques.

Kodancheri Juma Masjid is located in Maranchery Grama Panchayath. This is the first three storied mosque in the Malabar area which is completely constructed using wood and laterite masonry. The ceiling and round pillars are done purely in Jack wood. Pakaravoor Siva Temple is located in Nannamukku Grama Panchayath. 41 multicoloured pictures which even now stands enchanting on the walls of this temple is a real beauty.

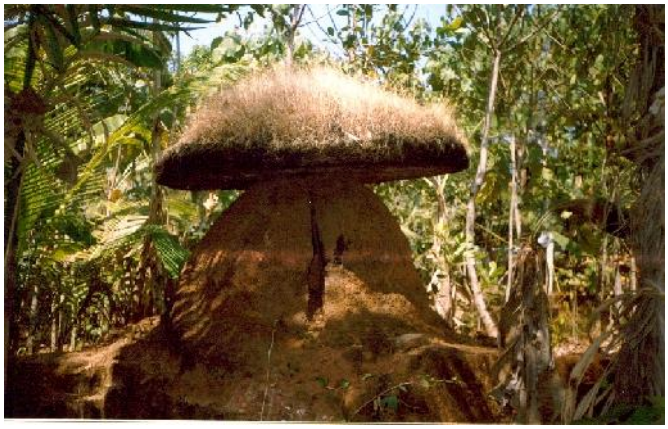


Valiya Juma Ath Palli

17.6 Cultural Heritage

Cultural heritage is the legacy of physical artifacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations. Kodakkalluis located in Veliyamcode Grama Panchayath.

'Kudakkallu' is constructed as a commemorative figure of 'Nannangadi', which is a big clay pot that was used earlier to burry dead bodies. Kudakkallu is a fourfold structure.



Kodakkallu

17.7 Natural Heritage

Natural heritage refers to the sum total of the elements of biodiversity, including flora and fauna and ecosystem types, together with associated geological structures and formations. There are no notablenatural heritage centers within the town.

17.8 Problems

Waste disposal is a major problem affecting the heritage sites. The increased interventions in the river banks and beach front and the destructive activities have resulted in the loss of vast stretches of· mangroves.

- Contamination of water due to improper waste disposal and saline water intrusion.
- Plastic waste generation
- Poor environmental conservation
- Sand mining

17.9 Potentials

The town is enriched with two rivers, 22 ponds, Connolly Canal and Lakshadweep Sea. Also heritage monuments are located within the town and nearby grama panchayats, which are to be preserved. A detailed study in the town area will help to prevent the monument destruction.

17.10 **Inference**

Proper planning techniques should be applied for the preservation of environment and conserve the existing mangrove belt. The proper maintenance of water resources in the area will reduce the water scarcity and water logging problems to considerable extent.Planning techniques should be applied for the preservationof heritage sites and buildings. Adequate weightage has to be given for regulations for ensuring and promoting conservation of environment, buildings, artifacts, structures, areas, and precincts of historic, aesthetic, architectural and cultural significance, natural and other manmade features of environmental significance or ecological significance, scenic beauty etc.

18 TOURISM

Tourism plays an important role in the development of an area. Though Ponnani is enriched with tourism destinations, there is a good potential for this sector. Major tourist attractions, tourism infrastructure and existing tourism circuit are described in this chapter

18.1 Major Tourist Attractions

The tidal mouth of Bharathapuzha in Ponnani, where Bharathapuzha and Tirur River join together to traverse into the Lakshadweep Sea, is a seasonal home to hundreds of migratory birds and attracts a large number of bird watchers and ornithologists. No one can miss the sights of lovely flocks of birds while crossing the Bharathapuzha by ferry from Ponnani to Pandinharekkara in the summer months of March to May. Nearly 25 varieties of birds have been identified in this area. The major tourisms spots inside the Municipal limits are Biyyam Kayal one of the natural tourist destination, light house, heritage destinations like Valiya Juma Ath Palli, Trikkavu Temple etc., Beevi Jaaram at Munambam, Harbour area situated close to the sourthern bank of Bharathapuzha and Ferry service at Azheekkal. The coastal area of Ponnani also offers good tourism potential. There are several Jaarams located within the municipal area related to pilgrim tourism.

Biyyam Kayal located just 3km from Ponnani and 8 km from Edappal on the State Highway 66, is a placid, green fringed waterway with excellent boating facilities. The water body borders Ponnani Municipality and Maranjeri Panchayat. In 1936, a regulator was constructed across the Kanjiramukku River North East of Biyyam to segregate water from the adjoining swamps. The water oozing through the regulator from swamps spread over 279 sq. km catchment area created a 6 km long water body which is popular known as the Biyyam Kayal. The backwater joins the Lakshadweep Sea at Pudu Ponnani through Veliyamcode Azhi. The famous Connolly Canal, the inland water way passes through this river connecting Bharathapuzha in the North and Chettuvapuzha in the South. The place is easily accessible from the Temple Town of Guruvayur Via Chavakkad.



Light House



A view of Canolly Canal



Beevi Jaaram at Munambam



Tourist Boat Jetty at Biyyam Kayal

18.2 Tourism Infrastructure

There are no star hotels or good homestays to attract the international tourists. Very few economy hotels are functioning in the Town. Even though there is good potential for river based tourism, facilities to attract tourists like home stay, house boats etc are not present in the town.

18.3 Existing Tourism circuit

There is no existing tourism circuit in the town area and no organized efforts are taken. Nearest tourism spots are Padinharekkara Beach, Thunchanparambu at Tirur, Mookuthala Bhagavathi Temple, Sukapuram Temple, etc.

18.4 Ongoing projects

Biyyam Bridge Renovation project for an amount of two crore fifty seven lakhs rupees have been sanctioned by the Government of Kerala. The concept of the project is Ponnani Heritage cum Cultural Circuit enhancement which included the old Juma Masjids, temples and Id houses including the house stayed by Kastoorba Gandhi. Malappuram District Tourism Promotion Council will be the implementing agency as the custodian of the land belongs to DTPC.

Speed boats, pedal boats and row boats are available in Biyyam Kayal. During Onam, the Kayal is the venue of annual boat race or vallamkali. Malappuram DTPC has constructed a pavilion at Pulikkakadavu near the boat terminal for watching the boat race. The migratory birds from even Siberia come to this place annually.

The infrastructure components developed are amphi theater, Boat jetty, covered roof area, Bridge and Path way, Entrance and parking area, Fishing deck, Watch tower, Lighting, View point, Children's park etc. The benefits of the project are overall development of the destination and surroundings, economic impact and growth in the surrounding regions& employment opportunity for local community.

18.5 Problems

All the tourists' spots are facing accessibility problems. Adequate road network is to be proposed to these areas. Tourist infrastructure facilities are also to be improved in the town.There are no home stay facilities for tourists. Also there is lack of facilities like tourist information centre, economy hotels, star hotels etc.

18.6

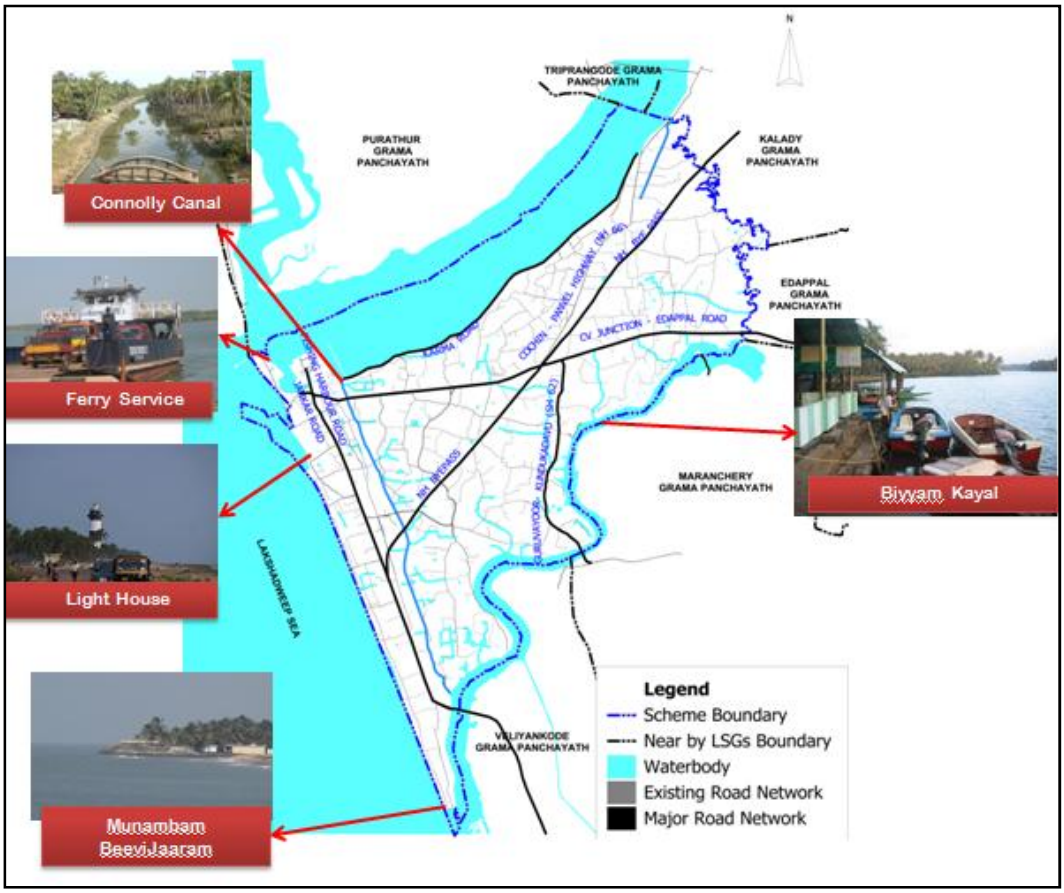


Figure 18-1 Tourist locations in Ponnani town

18.7 Potentials

Town is enriched with a lots of tourism destinations.The Biyyam Kayal situated in the heart of the city is having a high potential to be developed as a tourism hotspot. Heritage monuments are located within the town and nearby Grama panchayats. Ponnani has also contributed a great deal to the cultural and literary heritage of Kerala. Ponnani has also contributed a great deal to the cultural and literary heritage of Kerala. Harbour and river based tourism projects should be initiated. Chamravattom regulator cum bridge is a major connecting road between Tirur and Ponnani.

18.8 Inference

Ponnani is enriched with lots of tourism destinations. The Biyyam Kayal situated in the heart of the city is having a high potential to be developed as a tourism hotspot. All the tourist's spots are facing accessibility problems. There are no home stay facilities for tourists and lack of facilities like Tourist Information Centre, Economy Hotels, Star Hotels etc.

19 DISASTER PRONENESS

19.1 Introduction

Kerala State is vulnerable, in varying degrees, to a large number of natural and man-made disasters of recurrent nature that result in loss of life, livelihoods, infrastructure and property, and cause immense hardships to the affected population, besides resulting in disruption of economic activity. The increasing vulnerabilities due to a variety of factors such as rapid urbanization, environmental degradation, growing population and climate change compounded the disaster risks in the State and this mandated a paradigm shift from a relief centric approach to a proactive and comprehensive mindset towards disaster management covering all aspects from prevention, mitigation, preparedness to response and recovery. The enactment of Kerala State Disaster Management Rules, 2007 and promulgation of Kerala State Disaster Management Policy, 2010 in line with National Disaster Management Act, 2005 marked defining steps towards holistic disaster management in the State.

The Kerala State Disaster Management Policy defines disaster as ‘a serious disruptionof the functioning of a society caused by a hazard or otherwise, having widespreadhuman, material or environmental and other losses, which exceed the ability of theaffected society to cope using its own resources’.

The term ‘disaster’ includes thefollowing events.

Category 1-Water and Climate related disasters - Drought, Flood, Cyclone, Heavy rains, Cloudburst, Gale wind, Whirlwind, Tornado, Hailstorm, Lightening, Tsunami and Heatwave etc.

Category 2-Geologically related Disasters - Earthquakes, Volcanoes, and Landslide etc.

Category 3-Chemical Industrial and Nuclear related disasters - Leakage of hazardous materials at the time of their manufacture, processing and transportation and Disasters due to manufacture, storage, use and transportation of products, pesticides etc and waste produced during the manufacturing process etc

Category 4-Biological related disasters – Epidemics, Food poisoning and Pest attacks etc

Category 5 - Accident related disasters like air crash, rail collision etc

Category 6-Man-made disasters - Forest fire, Festival related disasters, Serial Bomb blast, Drug abuse, Major building collapse, Oil spill, Illicit Liquor Tragedy, Tanker lorry mishaps,Pollution (water, air and soil) Communal riots and Drowning etc.

19.2 Disaster proneness in Ponnani town

Being a coastal and river side town and a low lying area disasters to which Ponnani town is vulnerable are flood, coastal erosion, cyclone and storms, earthquakes, tsunami;disasters due to manufacture, storage, use and transportation of products, pesticides etc and waste produced during the manufacturing process etc; epidemics, urban fire, road accidents, boat capsizing, oil spill, drug abuse etc.The town had not experienced by major flood in past few years. But the gradient and topography of the region combined with heavy rain and high tide condition causes flood in the two side of the town. These disaster prone areas are identified on the basis of flood mapping in the area and during the land use survey as shown in Figure 19.1. Various mitigation measures undertaken in this town, so far,are structural measures like embankments, flood wall and sea wall, natural detection basin, channel improvement, drainage improvement, diversion of flood waters etc.

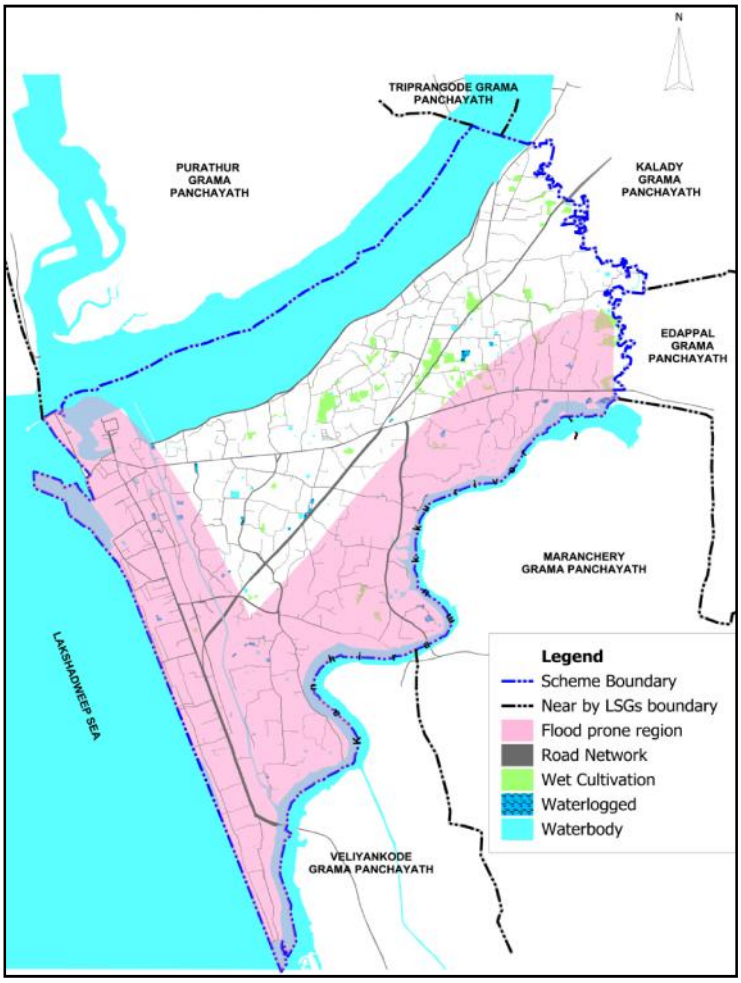


Figure 19.1 Disaster prone areas in Ponnani Town
Source: Primary Survey

20 DEVELOPMENT ADMINISTRATION & FINANCE

20.1 Development administration

The municipality is responsible for developmental activities likeconstruction & maintenance of municipal roads, public health, watersupply, sewage disposal, poverty alleviation, street lighting etc. Besidesthese traditional municipal functions, the activities of the various linedepartments of the state government at the municipal level are coordinatedby the municipality. State plan schemes of these departmentsare channelled through the municipality.

The municipal area is divided into 51 electoral wards (44 revenue wards). Chairperson chairs/heads the council. The Secretary is the administrative head of the Municipality and carries out the decisions of the council, reports complaints to the council, exercise powers and discharges duties conferred under the Kerala Municipality Act. General administration, revenue, health, engineering/town planning departments assists the Secretary in discharging the duties and responsibilities of the Municipality. Health department is headed by a health inspector who is responsible for sanitation and solid waste management.

20.2 Municipal Finance

The financial position of urban local self governments is very precariousthroughout the nation except for a few very large urban centers. Mostof the urban local self governments in the state, especially the smallerones like Ponnani are not financially self sustaining. These municipalitiesdepend on grants from central and State governments forfunding their day to day affairs and fulfilling their constitutional obligations.The major source of income for urban local self governmentsis the property tax levied on the buildings in the Town. Thissource has immense potential, but is not being tapped to the full extentat present. The problem faced in revenue generation through propertytax are irrational rates, reductions given due to various (non-financial)reasons, tax avoidance and evasion, leakages in collection system andimproper record keeping and monitoring. Almost all these handicapscan be overcome by digitizing the data base and managing this spatialinformation in a GIS platform with stake holder interface. The timelydetection of unauthorized construction, bringing the evaders to thetax net and ensuring compliance of regulations, also can be effectivelycarried out using remote sensing applications once the GIS data baseis in position and regularly updated.

Another source of own revenue for the Municipality is the entertainmenttax which is shrinking due to reduced public interest in cinematheatres.Receipts from municipal properties also could be a major source. Infact Ponnani municipality has more income under this headthan that from rates and taxes. However, the full potential of thissource of revenue is not utilized. The municipal budgets from 2010-11 to 2013-14 are presented in Table 20.1 and Table 20.2 respectively.

Table 20.1 Municipal budgets - Revenue Account (Source: Local body)

Sl No	Item	Amount			
		2010-2011	2011-2012	2012-2013	2013-2014
INCOME					
1	Municipal taxes & rates	10527207	11710783	6855076	7911832
2	Income from other legislations				
3	Income from municipal property	11115268		16558007	
4	Municipal fees	3281780	10006478	9580187	3726663
5	Grants and aid from the Govt.	18712057	44040851	1391332	3159839
6	Non plan allocations to transferred institutions	23157220		25861515	32245452
7	Pensions				
8	Miscellaneous	66547295	181475884	199235852	249865332
9	Total	133340827	247233996	259481969	296909118
EXPENDITURE					
1	Tax collection expenses				4700
2	Public works	2120885	1648223	4162975	6315289
3	Town planning	21665		65022012	57208432
4	Education	11900	28671	220894	1561311
5	Water supply & drainage	1957785	680213	2909	44160
6	Public health	2748052	6608567	733325	2023587
7	Street lighting	2288481	2966663	246118	4040913
8	Property maintenance	5598206	59930199	12625	3250
9	Transferred institutions				
10	Pensions	21003264	18807016		
11	Municipal development activities (transfer to capital A/c)				
12	Poverty alleviation	20000			
13	Miscellaneous	73389020	107190105	178067270	227131341
14	Total	109159258	197859657	248468128	298332983
15	Surplus/(deficit)	24181569	49374339	11013841	-1423865

Table 20.2 Municipal budgets (Capital Accounts) (Source: Local body)

Sl No	Item	Amount			
		2010-2011	2011-2012	2012-2013	2013-2014
INCOME					
1	Grant from government	3306000		1391332	3159839
2	Loan from government				
3	Loan from financial institutions	2410000	1220000		
4	Grant: Decentralised planning	49592500	67076988		
5	MLA/MP fund			2299558	3213078
6	Transfer from revenue				
7	Poverty alleviation (transfer from revenue A/c)			1900000	2486750
8	**Total**	**55308500**	**68296988**	**5590890**	**8859667**
EXPENDITURE					
1	Management	3252676	4424173		
2	Public works-municipal development	25027662	17109958		
3	Public health & welfare		1000000	733325	2023587
4	Poverty alleviation		300000		
5	Street light		300000	2461118	4040913
6	Endowment				
7	Plan scheme of transferred institutions				
8	Decentralized planning				
9	Water supply & drainage			2909	44160
10	Other plan schemes	27028162	45162857	2393538	2751007
11	**Total**	**55308500**	**68296988**	**5590890**	**8859667**

The budget shows over dependence of the municipality on state funds. The increase in expenditure is not commensurate with the increase in income. The revenue stream is not tapped to the fullest extent indicating poor financial management.

20.3 Governance

Municipal accounting system has started using IT enabled solutions. However, the managementof spatial data for governance and fine tuning of revenue stream, which is notpossible without the use of IT solutions, is lacking in this town also, as elsewhere in the State.

20.4 Existing source of funds

Major sources of revenue income for the Municipality are municipal rates and taxes, incomefrom municipal properties and grants from the state government. The municipalrates and taxes contribute only 2.67% of the revenue income during 2013-14.This indicates the need to

concentrate on efficient collection of rates and taxes and enhancing income from properties for the financial health of the municipality.

20.5 Problems and potentials

The major problems faced by the municipality in the finance sector are the leakage in ratesand taxes and paucity of funds for development activities. The Municipality has a number of prime opportunities like cargo port, fishing harbor, tourism facilities etc in the town which should be effectively tapped for the economic development of the town.

20.6 Inference

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

21 LINKAGES & EXISTING SPATIAL STRUCTURE

Spatial structure of the town is derived and detailed in this chapter. The spatial structure gives a frame work for determining the location of future development activities rationally.

21.1 Linkages

Intra sectoral relationships of various development parameters are examined in thesectoral analysis. The impacts of some of these parameters are felt across the sectors andhence inter sectoral linkages also need to be explored while formulating the integrateddevelopment vision. Such prominent linkages are discussed in the following sections.

21.2 Effect of population growth on various sectors

Changes in population has pervasive effect on all the development sectors since theextent of human activity and thus economic activity depends on the population sizeto a large degree. The effect of population growth is direct on sectors like watersupply, electricity, housing, traffic and transportation, education, health care etc wherethere is a direct consumption. The rest of the sectors experience secondary impacts.

No perceptible impact is anticipated in industrial sector in Ponnani town due toincrease in population since the employment in industrial sector is not very significantin the town. Besides, increased consumption due to population growth is not likelyto be met by additional industrial production in the town since the share of internalproduction in the consumption pattern is also negligible in the town.

The trade and commerce shall be affected by population growth only beyond athreshold population. The distribution of basic necessities of life contributes onlyto a part of the total trade and commerce that take place in a town. The rest ofthe trade, ie., beyond the distribution of basic necessities of life, depends on surplusincome. 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 significantchanges are often related to the change in surplus income rather than populationgrowth.

The growth of population has bearing on the performance of tourism sector inthe town. Similarly, in the case of animal husbandry, agriculture and fisheries also,the town’s population has much influence since such produces consumed in thetowns are generally available to a large extent and are not generally imported.

The human activities grow exponentially with population growth and this translates to increase in transportation needs of the people. The physical improvement to the transport network shall be attempted with this in view. During the commencement of the port related activities the transportation needs of migrant and floating population is to be taken into account. The demand for water supply, sewerage system, solid waste management system, energy, education, health care, recreational and other civic amenities has direct relations to the increase in population. But physical infrastructure for these services cannot be built incrementally. Hence these facilities are to be developed in a phased manner with regard to the respective threshold population. The demand in housing sector also has direct relation to growth in population.

21.3 Land Use changes and Environment

The land use changes invariably change the environmental factors in the region. Depletion of paddy fields and larger building foot prints due to scattered, low density residential development are the major land use issues related to environment in the town. There has been a considerable reduction in both the area of paddy fields and the extent under cultivation. The agricultural production is not a significant economic factor in an urban context. But the paddy fields essentially act as green and open spaces and as reservoir of water during rains preventing floods and fast run off. The dry cultivation provides green cover and helps in carbon sequestration. Changes in this land use shall adversely affect the micro climate and increase net carbon emission. The land use policy decides the compactness of the built form. A less compact built form (with more than absolutely 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 shall result in putting more land under manmade structures which is detrimental to environmental quality. Besides, the scattered, low density development necessitates costlier systems for providing basic amenities like water, sewerage, energy, roads, waste management etc. All these call for a compact nature of development in order to maintain required levels of environmental quality. The land use pattern has profound impact on micro climate also. A compact development shall prevent wide spread heat inlands in the town. Another environmentally fragile physical component in the town is the network of drainage channels interwoven with the paddy fields. With the loss of paddy fields due to land use conversions, these channels are broken in many places by human intervention hampering its

smooth functioning. Besides, these channels are widely polluted by waste water ingress. The distribution of various land uses in the town decides the traffic pattern of the town and hence has environmental implications. So, the changes in land use shall be managed in such a way that the traffic and transportation needs are optimized causing less pollution from vehicular traffic and less consumption of precious fossil fuels.

21.4 Industrial Sector – effect on Environment, Land use and Employment

Micro, small and medium enterprises (MSME) sector is an important generator ofemployment. The small and micro enterprises in the town are not concentrated inany particular location. The municipality's efforts to bring in small enterprises to anindustrial estate have not succeeded. The small industrial units have come up at variouslocations in the municipality in a scattered manner due to the entrepreneurs' preferencefor utilizing the land which is already under their possession rather than acquiringthe required land in an earmarked industrial estate. Considering the tremendouspotential for generation of employment, the MSMEs have to be facilitated in theTown. Establishment of non-polluting small scale units in residential andcommercial areas are to be viewed in this backdrop. The development of necessaryinfrastructure required for industrial development such as good road connectivity,availability of water and electricity etc also should be attempted to promote industrialdevelopment in the Town.In the case of medium and large scale industrial units, earmarking of parcels of landowned by private individuals who have no inclination to start an industrial unit in themaster plan is to be avoided. For non nuisance/non-polluting industries of this scale,the location cannot be earmarked in advance due to the problems associated withthe acquisition of land and uncertainty regarding the establishment of such units. Insuch instances considering the location decisions on a case to case basis only is feasible.There is an issue as to where a polluting (with adequate pollution abatementmeasures)/nuisance type industry has to be located in the town if it is essentialfrom other (economic/locational/strategic) consideration. The solution is to providefor allowing such industries in the less inhabited areas in the Town with strictguidelines for site selection prior to establishment of such industry and control ofother land uses around such industries after their establishment.

21.5 Effects of various sectors on employment

The small scale industrial sector is considered to be the prime provider of employmentin small and medium sized towns. But in the case of many towns in Kerala, includingPonnani, this

sector is not the prominent employer. The tertiary sector, mostlyvarious services, employs more people than industries. Trade and commerce is animportant employment sector, both direct and indirect. However, the employees inthese sectors are mostly unorganized and hence do not reflect much on the statistics.The fluctuation in employment level is also high in this sector. Tourism, eventhoughnot developed in the town as an employment sector, has much potential in creatingmore jobs. The investment required to create unit employment is low in tourismsector. Another area of interest which can bring in employment to the town is ITrelated activities. The town has a number of well educated technicians in this area.Even though studies based on physical features suggest agriculture, animal husbandryand SSI as thrust areas of employment in the town, the number of cultivators andagricultural labourers are on the decline in Ponnani. This trend is not likelyto be reversed without immediate intervention. So, increase in productivity withincreased technology inputs is imminent in this sector. Organized farming does existin a few holdings in the Municipality, which needs to be strengthened and rolledout. Strengthening of animal husbandry and inland fisheries can also provide betterlivelihood to atleast a small section of the society, especially the women, whileensuring better quality animal products for all. Women and men self help groups,employees under employment guarantee schemes etc can be put to efficient use forthe strengthening the primary sector activities in the Municipality. The town beinga revenue division head quarters attract a number of sub district level offices of thegovernment and some of the private sector concerns. However, the employment inthis sector is almost at a saturation level and is not expected to grow at a fast pace.Education and health care are the major providers of organized employment in thestate. In addition to the direct employment created by these sectors, development ofthese sectors create number of secondary employment besides making the populationmore employable. In the case of Ponnani, the fisheries sector is the prime employment sector, this will create a jump in employment bothin fisheries and tourism sector. Likewise improvement to the physical infrastructureof the town shall attract employment generating activities to the Town. So,providing better infrastructure is also a key to creation of jobs in the town. Hencetourism, activities related to port and harbour, education, health care, industries and physicalinfrastructure are the thrust areas for employment generation in the town.

21.6 Changes in traffic and 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 results in instantaneous changes in the demand pattern for transportation infrastructure. However, transportation infrastructure cannot be added in incremental manner. This can be expanded only in a phased manner. Hence careful consideration of the traffic generation aspects is required in any development plan while dealingwith development in major sectors of economy and social infrastructure.The growth in industrial sector calls for increased freight traffic both in bound and outbound. The location policies regarding medium and large industries should take careof the connectivity aspect also. The newly located industries are to be encouragedto use the existing network to the extent possible. The trade and commerce sectoralso poses the same problem. In the case of both the sectors, since the increase indemand shall be mainly for freight transport, development of a truck terminal isessential. So, a truck terminal, easily accessible from the network is a pre-requisite fordevelopment of industries and trade & commerce sector. The increase in trade andcommerce increases the intra city traffic also. So, development of trade & commercemeant for local consumption should be decentralized to the maximum extent possiblein order to reduce new generation of intra city traffic. These efforts shall decongestthe town centre, especially the main junction.

Development of educational 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 Ponnani since new institutions of higher order are anticipated both in and around the town. The creation of new recreational facilities shall also result in changes in demand pattern. The trips generated by these developments shall be mostly intra city in nature. Hence the location of such facilities should be decided considering the need to segregate through traffic and intra city traffic. Whereas development in tourism sector means an increase in inter city traffic. So, such developments should be easily accessible from thearterial or sub-arterial roads.

21.7 Changes in traffic and transportation needs due to changes in land use

The land use pattern and the traffic pattern are interwoven inexplicably. The traffic pattern is the dependant 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 growth in population and subsequent increase in economic activities. The other is due to changes or increase in the pace of economic activities due to other impacts rather than population growth. The population growth is apparent mainly on the residential land use, its geographic spread and densification. The trips generated increases in proportion to the growth in population and the origin of these trips are decided by the spatial distribution and density of residential land use. The change is generally increase in volume and not in pattern since thevarious destinations are normally in place in the case of Ponnani since no major shifts in social infrastructure is anticipated. The land use changes attributable to changes in the pattern of economic activity recast the existing traffic pattern and needs special consideration. Distribution of commercial land use has great impact on both the intra city and inter city traffic demand. This indicates need to locate commercial land use easily accessible from arterial and sub-arterial roads. But the experience in the state in this regard is the occurrence of ribbon development which is detrimental to the proper development of roads and result in inefficient use of land. So care shall be taken to prevent ribbon development while considering development of commercial land use along the arterial and sub-arterial roads. The attempt to re-route intra city traffic away from NH also shall prompt dispersion of commercial use, discouraging ribbon development.

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

The draft housing policy, 2011 of the Government of Kerala recognizes the right to adequate housing based on the covenant of United Nations on economic, social and cultural rights and the Article 21 of the Constitution of India. The trend in urban development in the state had been such that more and more people are forced to out migrate from the towns. The draft housing policy upholds the need for adequate and affordable housing for all. The spatial distribution of trade and commerce activities has a significant impact on the land value in any town. Development of a speculative market on land in the State cannot be ignored. The land banks amassed by private individuals in the State play a vital role in this speculative market.

Investments are being made in this market on land for speculative purposes and only a small fraction of the buyers are real users. Due to such multiple transactions, the end user of the landends up paying a highly jacked up price which seriously affects the economic viability of the venture. The increase in land value in commercial zones has a ripple effect on the price of residential plots also. This issue can be addressed in a development plan by ensuring adequate spread of commercial land use 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 unstated demand for commercial use and the resultant attempts by the trade and commerce activities to intrude into 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 housingis allowing low density EWS and LIG houses in a restricted manner in dry agriculture areas. 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.

21.9 Tourism and Environment

Tourism and environment move in a vicious circle. Certain level of environmentalquality is a must for healthy development of tourism sector. But, unbridleddevelopment in tourism sector can adversely affect the environment. Welldeveloped tourism destinations often lose their charm due to deterioration inenvironmental quality. The PonnaniTown has a serene environment tostart with. The places of tourist attractions lying around the Townaremostly in environmentally fragile areas. So, maintaining the environmental qualityshould be given top priority while formulating new tourism projects. Provisionof basic amenities for the anticipated number of visitors is a must. New conceptslike e-toilets, kiosks, tourism facilities centre, etc merit consideration in this regard. The marine tourism is expectedto take off in the town. Hence, the waste management practices (for both solidand liquid waste generated by the tourism activities) should be state of the artand should not interfere with biotic system. Negligence in this regard shall gradually kill the industry and theTown shall be let alone with a degraded environment and hence shouldbe taken care of in the planning stage itself.

21.10 Inclusive growth in various sectors

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

In the industrial sector, allowing micro enterprises in residential and commercial zones is a policy measure for ensuring inclusive growth in the sector. The zoning regulations in general have to be lenient towards the housing needs of the poor, being inclusive. The water scarcity in some wards of the Town needs serious consideration in the development plan since such areas are inhabited by the marginalized population in general. The spatial distribution of educational and health care facilities is also important from the inclusiveness point of view. Access to school and primary health care facilities at walkable distance is essential for bringing in inclusiveness in the growth of these sectors. Ensuring proper sanitation by giving sanitary toilets, efficient collection of wastes, abatement of waste water logging etc should be given top priority in alleviating slum like conditions within the Town. In the traffic and transportation front,

widening of interior collector roads so that mass transport systems like buses can reach the remote habitations, measures for the safe passage of pedestrian traffic etc can be considered as attempts at inclusive growth. In the energy sector no additional effort is required since the town is almost fully electrified. Enhancing the capacity of existing Substation is in consideration of KSEB. Also a new substation is proposed in port area as part of the upcoming cargo port. Various policy and other measures for creating employment in the town shall also contribute towards inclusive growth.

21.11 Energy efficiency and land use

Energy efficiency is a very important consideration in the design of any systemthat uses energy. The urban system as a whole is a guzzler of energy. The energyrequirement of an urban area is much more compared to a rural area of the samesize. Conservation of energy is a need of the day due to various reasons such asdepletion of fossil fuels, carbon emission and related climate change, depletionof ozone layer etc. The energy saved is considered to be energy produced. Thebenefits of energy saved by land use planning measures are of long term and henceneed careful consideration. The compact nature of development reduces intra citytraffic and thus saves fossil fuel. Efficient layout of various land uses based on theircompatibility and trip generation characteristics shall result in reduction in use ofenergy for transportation needs. The compactness and proper lay out shall promptpedestrian traffic also contributing to energy conservation. This also shall helpconserve energy in sectors like water supply, electricity etc. The formation of urbanheat islands within the town can be avoided by appropriate land use measures. Thisshall cause saving in energy by reduced demand for air conditioning and artificialventilation. Another emerging area in this regard is the Energy Conservation BuildingCode (ECBC) and the practice of green buildings. As a direct policy measure thegreen buildings and the use of non-conventional sources of energy needs to be inincentivized by appropriate development control regulations.

21.12 Spatial Structure

The spatial structure of the town was evolvedconsidering the activity pattern, functional character of settlements, existing connectivity pattern,existing hierarchy of nodes and the environmentally sensitive areas in the Town.

21.13 Functional character of the wards

In context ofKerala, a ward of a local self government institution will be having either pucca urban area, pucca rural areaor mixed (Residential cum agricultural) use area inseparate or in its combination. The Functional character of a ward denotes the major activity within thesettlement. The Functional character of the local self government institution can be pucca Rural (Agriculture and alliedactivities), Pucca Urban (secondary sector and tertiarysector activities) or a Combination of Both (Semi Ruralor Semi Urban). The land uses in the local self government institutions arecategorized in to Urban, Rural and Residential-Agriculture Mix. The area under each of thesecategories of land use, population concentrationpattern, % of workers engaged in non-agriculturalpursuits and the average plot size in the Residential-Agriculture Mix zone are integrated to categorize theLSGs in to Urban, Semi-Urban, Semi-Rural and Rural. Table 21.1 shows the classification and function of each character. The Functional character of wards in the Town is shown in Figure 21.1.

Table 21.1 Functional character and its functions

Activity	Compatible/ Confirming Activities
Urban	Mainly Service sector Activities with limited industrial activity
Semi Urban	Predominantly service sector and secondary sector activities together with limited Agriculture Activities
Semi Rural	Predominantly Agriculture Activities together with limited Service sector and industrial activities
Rural	Predominantly Agriculture Activities

The ward level analysis of functional character reveals that 36 wards of the Townshows urban character and two wards shows semi-rural character and 13 wards shows rural character. Thus the predominantly urban nature of the town is evident. It is clear that wards showing urban character are concentrated in the western part and northern part along the coastal line and Bharatapuzha. The central portion of the town also shows the urban character.

21.14 Activity pattern based on land use concentration

The activity pattern identifies the economic activity and is derived from the studies based on spatial analysis and spatial distribution of various aspects such as land use concentration

pattern, functional character and urban profile. The activity pattern based on land use concentration is shown in Figure 21.2.

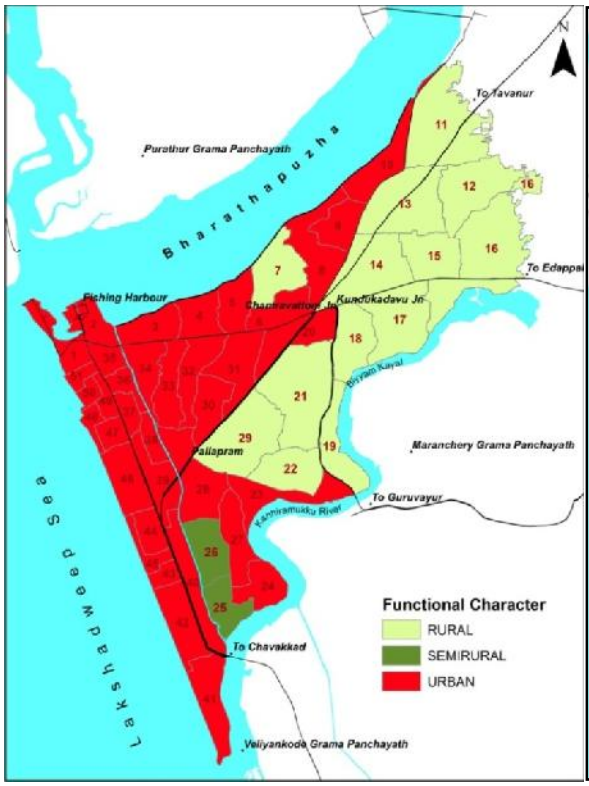


Figure 21-1Functional character of wards

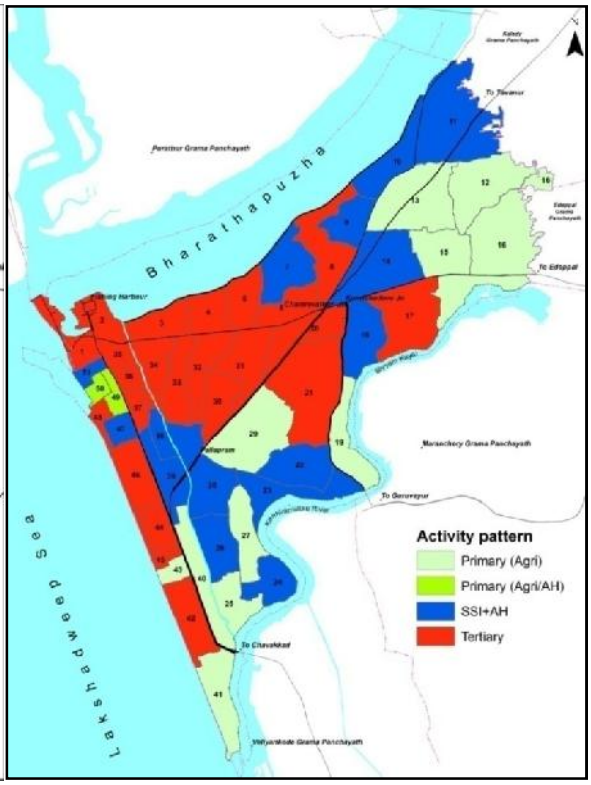


Figure 21-2Activity pattern of wards

The commercial concentration is more in the wards in the central portion and along the sides of major roads. The public and semi public activities are seen in the coastal part. Agricultural concentration is towards the north eastern side of Town. Industrial concentration is seen in the eastern side of the new NH. Residential concentration is seen dominating in some coastal wards and in some wards by the side of Bharathapuzha and Biyyam kayal. The table 21.2 shows the ward wise functional character and activity pattern.

Table 21.2 Ward wise functional character and activity pattern

Sl. No.	Name of Wards	Land use Concentration	Functional Character	Activity pattern
1	AliyarPalli	Urban	Urban	Tertiary
2	Andithodu	Urban	Urban	Tertiary
3	Attupuram	Agri	Urban	SSI+AH
4	AyyappanKavu	Agri	Rural	Primary (Agri)
5	Azheekkal	Urban	Urban	Tertiary
6	Biyyam	Rural	Rural	Primary (Agri)
7	Boatjetty	Agri	Urban	SSI+AH

8	Chamravattam	Agri	Urban	SSI+AH
9	Chana	Urban	Urban	Tertiary
10	Chandapadi	Urban	Urban	Tertiary
11	Cherupalli	Agri	Rural	Primary (Agri)
12	Erikkamanna	Agri	Urban	SSI+AH
13	Eswaramangalam	Agri	Urban	SSI+AH
14	Ezhuvathiruthi	Urban	Urban	Tertiary
15	Fisheries School	Agri	Urban	SSI+AH
16	Govt Hospital	Agri	Semirural	Primary (Agri/AH)
17	Junction	Urban	Urban	Tertiary
18	Kadavanad North	Agri	Urban	SSI+AH
19	Kadavanad South	Agri	Rural	Primary (Agri)
20	Karukathiruthi	Agri	Urban	SSI+AH
21	Kotta	Agri	Rural	Primary (Agri)
22	Kottathara	Agri	Urban	SSI+AH
23	Kuttikkad	Urban	Urban	Tertiary
24	Mailanchikkad	Agri	Rural	Primary (Agri)
25	Marakkadavu	Agri	Semirural	Primary (Agri/AH)
26	Meentheruvu	Agri	Urban	SSI+AH
27	MES College	Urban	Urban	Tertiary
28	MIA	Urban	Urban	Tertiary
29	Mukkadi	Agri	Urban	SSI+AH
30	Municipal Office	Agri	Urban	SSI+AH
31	Murinjazhi	Urban	Urban	Tertiary
32	Nayadi Colony	Urban	Urban	Tertiary
33	Neithallur	Agri	Rural	Primary (Agri)
34	Pallapram west	Agri	Urban	SSI+AH
35	Pallikkadavu	Urban	Urban	Tertiary
36	Parankivalappu	Agri	Urban	SSI+AH
37	Pulikkakadavu	Rural	Rural	Primary (Agri)
38	Pullonath Athani	Urban	Urban	Tertiary
39	PuthamKulam	Urban	Urban	Tertiary
40	Puthuponnani North	Urban	Urban	Tertiary
41	Puthuponnani South	Agri	Rural	Primary (Agri)
42	Puzhambram	Rural	Rural	Primary (Agri)
43	Thekkeppuram	Urban	Rural	Tertiary
44	Thevarkshethram	Urban	Urban	Tertiary
45	Theyyangad	Urban	Urban	Tertiary
46	Thrikkavu	Urban	Urban	Tertiary
47	Thrikkavu East	Urban	Urban	Tertiary
48	Uroob Nagar	Rural	Rural	Primary (Agri)
49	Vandipetta	Urban	Urban	Tertiary
50	Velleeri	Urban	Urban	Tertiary
51	Welfare	Agri	Urban	SSI+AH

21.15 Existing connectivity pattern

The major regional linkage Panvel- Cochin national highway (NH 66) passing through the town. Also the state highwayGuruvayoor-Ponnani (SH 62) joins at Kundukadavu Junction.There is no railway line passing through the town. The inland water navigation system, Cannolly Canal passes through the town. The existing connectivity pattern showing the NH,SH, major roads and other roads are given in Figure 21.3.

21.16 Existing hierarchy of nodes

In the Kerala context where urban rural continuum persists, each local government is having at least one node. The agglomeration of activity area around one or more (adjacent) road junctions which act as commercial centre of a local government is termed here as a node. The node need not be confined fully within a local body area and in most of the cases its service area goes beyond the boundary of the localgovernment within which it is located. In certain cases the nodes may be located at the meeting point of the boundary of one or two local governments. This means that the nodes have an entity independent of the local government area and necessitates a separate study other than the settlement study.

The hierarchy of the nodes is determined by the extent of activity taking place there. The number and type of shops, the number of people using the node, the business turn over, the traffic volume and traffic pattern, all determines the extent of activity taking place there and hence the hierarchy ofnodes. But extensive surveys and studies are required to assess all these factors. Nodes are identified on all important intersections of roads where there is a concentration of commercial activities and in the case of linear development, where is a commercial activity or physical development for a distance of 250m is considered. Whereas it can be seenthat the extent of development of a node is directly proportional to the hierarchy of the roads meetingat a node, commercial development and other infrastructure developments. The hierarchy of the nodes is shown in Figure 21.4.

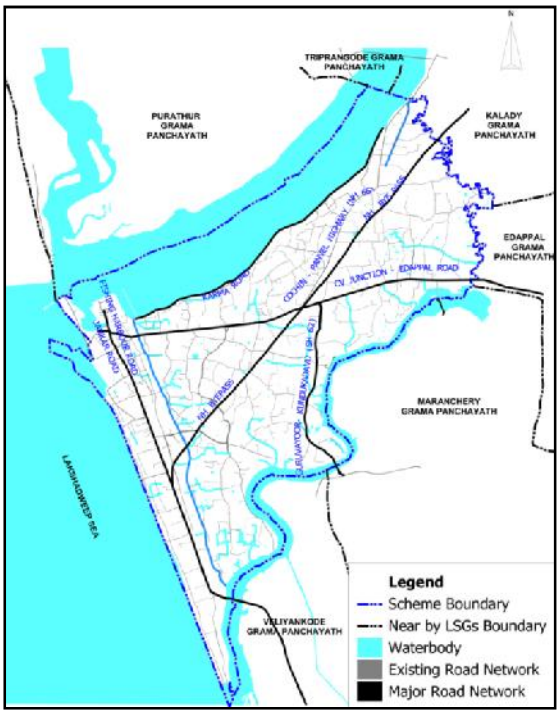


Figure 21-3Existing connectivity pattern

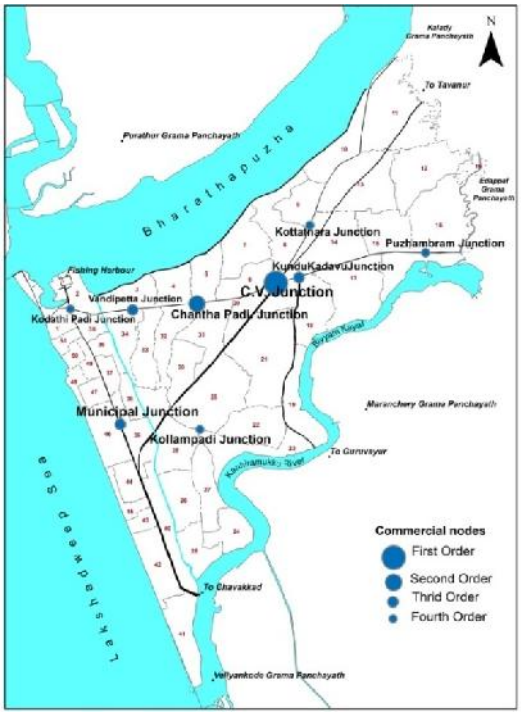


Figure 21-4Existing hierarchy of nodes

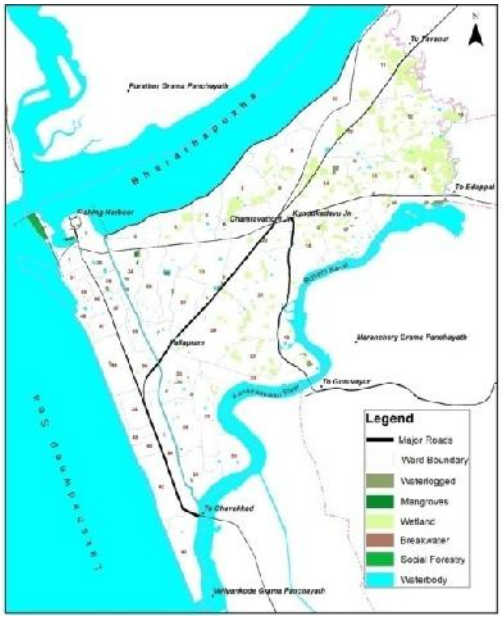


Figure 21-5Environmentally sensitive areas

21.17 Environmentally sensitive areas

The main sensitive areas in Ponnani are coastal stretch, river side, the other existing water bodies and the mangrove areas. There exists many water logged areas in many parts of the Municipality. The wet lands also form part of the sensitive area. The sensitive areas are shown in Figure 21.5.

21.18 Existing spatial structure

The town is one of the second order settlement in the District as per the District Urbanisation Report,2011), andacts as a gateway to southern districts.Considering the activity pattern, functional character of settlements, existing connectivity pattern,existing hierarchy of nodes and the environmentally sensitive areas in the Town, the existing spatial structure of the town is evolved as follows and shown in Figure 21.6.

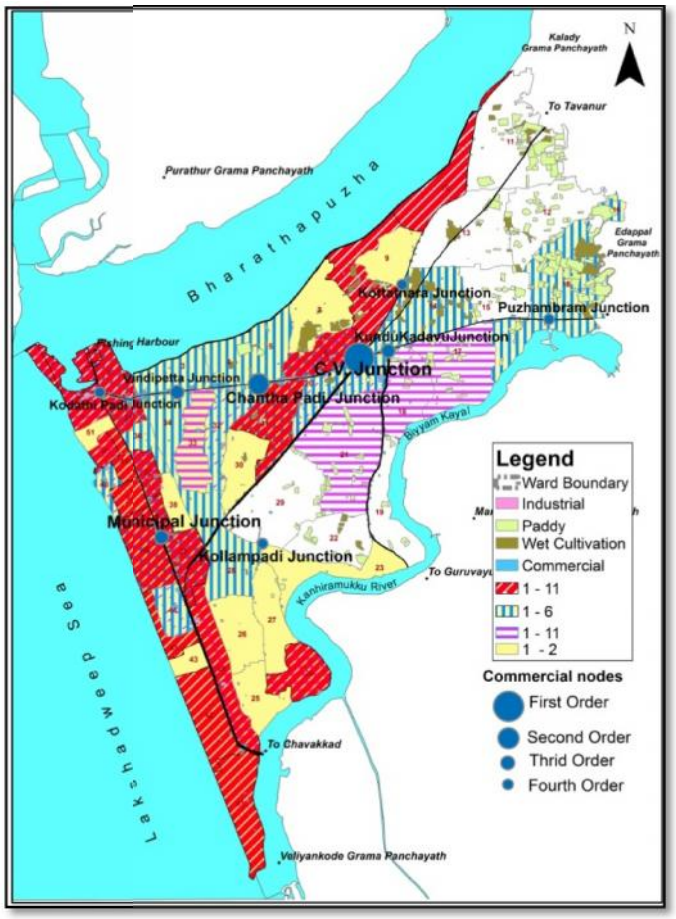


Figure 21-6Existing spatial structure of the town

21.19 Inference

As per the derived spatial structure of the town commercial concentration is seen more in the CBD area and along the major roads. The north eastern part is highly agriculture oriented. The residential activity is seen in all parts with more concentration in some coastal wards and along the banks of Bharathapuzha and Kanhiramukku river. The growth of the town is restricted by the water bodies, by three sides. Cargo port and fishing harbor increase the prominence of the town and become a root for the future growth of the town.

22 SUMMARY AND FINDINGS

22.1 Regional Setting

Ponnani the first grade municipality having 51 administrative wards is bounded by water bodies on all sides. The Townis traditionally famous and blessed due to the presence of the natural harbour and once it was one of the premier trade centers of the Malabar area. With a history that is culturally rich and ethnically diverse, Ponnani carves itself a niche in the history of Malabar and the country as a whole. This tiny sea side town was the naval base of Kunjali Marakkar, the army chief of the Samoothiri, whose reign is known as the 'Golden era' of Malabar. A good masterplan can retrieve the old history and prejudice of the town and at the same time dealing with modern issues.

22.2 Land use

The town has a scattered residential development which makes civic services costlier.The commercial development is concentrated at the junctions and as ribbondevelopment along the major transport corridors. Industrial land use is significantlylow. There are no large and medium scale industrial units located in the town. Space for public recreation is almost non-existent. Public and semi public landuse also tends to concentrate towards the coastal side. Area under transportationland use is only 4.3% which is quite inadequate to cater to the economic activities in the town. The town has 5.12% of the land under paddy (both cultivated and uncultivated). 0.06% of the land area in the Town is mangroves. Based on the built updensity and land use pattern, two distinct areas of development pattern can be foundin the Town, the multi nuclei core where further compaction is possible and peripheral area of lesser compaction.

22.3 Population

The population of Ponnani Townas per 2011 census is 90491 which form about 2.2% of Malappuram District. the change in population in Ponnani Townthroughout the years shows that the population in the Townis increasing and shows a similar pattern with other urban local bodies in the District. The population growth rate in Ponnani is decreasing from 6.03% to 3.42%. But the rate of decrease is not that much steep when compared to the District and the State and other urban local bodies in the District. The net density of Ponnani Townis 4600 persons per sq.km. Gross density comparison with the existing urban local bodies within the District shows that the density of Ponnani is more than other towns within the District. The age sex pyramid of Ponnani

shows that more than 50% of population in the age group of below 30years. This productive population needs more employment opportunities in the coming years. At the same time the age sex pyramid shows a weak base which also high lights that policies are to be framed for strengthening the age group less than 20-25. From the studies it can be inferred thatthe population to be accommodated by the Townfor the perspective year for 2031 for trend based growth is 96995.

22.4 Employment and Economic Aspects

The work participation rate (25.21) is low compared to the District (30.75) and the State (34.78). But the female work participation rate (5.31) is very high in the Townwhen compared to Malappuram District (7.63) and Kerala State (9.48).Concentration of Main workers and Marginal workers are more in wards near to the water bodies and along the main roads. Concentration of Cultivators, House hold Industrial workers and Agriculture labourers are more in the eastern part of the town. Concentrations of other workers are more towards the western side of the town and around the main junction. Studies carried out reveal that there is decrease in participation rate in primary and secondary sector and increase in participation in tertiary sector activities. Lack of opportunities and low income from these sectors can be attributed to this decrease. However with the development of cargo port and fishing harbour this trend may reverse in future.

The economy of Ponnani depends on fishing, agriculture, local businesses and remittance from Gulf. The falling prize rate of agriculture and fisheries commodities, closure of small scale, heritage and other traditional industries etc. aggravated the economic decline of the town.

22.5 Agriculture

Even though agriculture is one of the main source of income of the people of the municipality having large area of fertile agricultural land and favourable terrain and climatic conditions the existing agricultural land constitutes only 35.18% and only 0.46% of people are engaged in the agricultural sector. Lack of agricultural laborers,shifting of the laborers to the tertiary sector, Lesser use of mechanized techniques, Problems due to saline water intrusion at various places especially in the Kadavanad area, Large scale plot development for non agricultural purposes, Conversion of paddy fields, Lack of market facilities and processing centers etc can be attributed to this decline of production in this sector. To enhance this sector

- More agricultural oppurtunities have to identified with the help of Krishi Bhavans

- Bunds to be provided at necessary places
- Existing paddy fields are to be conserved.
- A most modern agricultural market is essential

22.6 Animal Husbandry

Even though animal husbandry is practiced in the town not on a commercial basis, Ponnani is a local body where large consumption of animal products takes place and there is vast area of undeveloped land to promote this sector. The present animal products can cater only 10% of the municipal population and that too the quality cannot be assured. Lack of authorized slaughter house, insufficient processing and deep freezing facilities and poor infrastructure facilities in the veterinary hospitals are the issues urgently attended in this sector. Also conversion of vacant lands and agricultural lands reduce the availability of fodder and lack of interest in animal husbandry from new entrepreneurs, high maintenance cost and high cost of animal and poultry feeds and lack of financial assistance to this sector make the sector very week in the Town.

22.7 Fisheries Sector

Being a coastal Town, Ponnani's economy is also depends on this sector but there are no significant activities of commercial scale development in fisheries sector of the town. Municipal fish market at Koravalappu is the only one fish market owned by Municipality. Ponnanihas an existing well established fishing harbour and the necessity to develop the area in to a harbour area has become imminent as better fishing methods and more crafts are put to use in this area now a days.There have been persistent demands from the fishermen to develop this area in to a fisheriesharbor. The present fishing activities, fishing fleet, proximity to NH, topographic features and the marketing potential emphasise the necessity to construct a full fledged harbour in this locality.

Lack of organised market, processing centre and cold storage, under utilisation of new fishing harbor, inadequate auxilliary activities, negligance to traditional fishing techniques, lack of mortgage facilities, unemployment of female in the fisheries group and inadequate infrastructure facilities in fishermen families are the major issues faced by this sector.The functioning of cargo port and the full fledged fishing harbour will create a boom in this sector, which will demand more physical and infrastructure facilities. The future land use should be

proposed in such a way that this sector especially in the coastal area should be attended in depth. Initiates should be there to attract more people to this field. Inland fishing activities are to be promoted as there are many uncultivated paddy field and ponds in the Town.

22.8 Industries

The industries sector is very weak in the Towneven if there is large scope for industrial promotion in this area. The existing traditional industries producing marine products, coir products, handy crafts etc are to be rejuvenated which are a good source of income. Sanctioned cargo port and the existing fishing harbor are the sectors which input a better investment in industrial sector. So there is a potential for developing industrial units relating the same. Also IT based and tourism based industries are to be promoted. Dedicated industrial land use is very low in the Town.

22.9 Trade and Commerce

The commercial land use takes only 1.04% of the total land in the town. The commercial development is limited to main road junctions and as contiguous ribbon development along the major transport routes. Beyond this, no independent, planned commercial area has come up in the town. The infrastructure facilities for these markets are very poor. They have no parking facilities and loading and unloading spaces. The solid waste management in these centers is also a major issue. Provision for better infrastructure facilities to the existing markets and new markets to be developed, are to be ensured in future. Unorganized informal sector is making many traffic problems. Lack of trading and exporting facilities and an organized market and under utilisation of inland water transport system weakens this sector.With the functioning of theonly cargo port in Malappuram District, the coastal area near to the harbour and CBD will have to find spaces for new markets and commercial centers relating to these sectors. With the development of a new transport corridor through the Town the commercial centres are seen shifting to the Chamravattom Junction. This haphazard shift will create unwanted problems in future and hence the commercial development in this area are to be controlled by approporiate land use controls and zoning regulations. Port is sanctioned for Ponnani Town and leads better trading facilities.The existing inland water navigation system Connolly Canal will provide better trading linkages as in ancient days. Hence the inland navigation system is to be improved.

22.10 Traffic and Transportation

In the absence of railways and limited use of the water ways, the transportation system in the town entirely depends on its road network. The existing roads in the town have resemblance of a network, though inadequate in many counts like width, geometry, hierarchy etc. The observed traffic volume in many stretches exceeds the existing capacity leave alone the projected volume for 2033. Hence drastic improvement to the network is required to cater to the projected traffic volume and to maintain a reasonable level of service on the roads.

22.11 Water Supply

There are adequate water resources in the Town. The designed life period of rotating machineries of the existing water supply schemes are almost finished with respect to the installation date and the present level is maintaining at a huge risk, thus leading to frequent failures. The major problems are the waste disposals and saline water intrusions. Proper quality control and continuous monitoring will assure good water supply to the inhabitants of the Town. The proposed project by KWA can meet the future water demands of the municipal area. Rain water harvesting, recycling of waste water, reducing waste etc need serious consideration. Proper treatment of water and proper quality monitoring should be assured.For the port operations and other related activities, the water requirement is proposed to be met from Bharathapuzha River at upstream of the Chamravattom regulator cum barrage located from the proposed site where the river water quality meets the requirement of potable use. The water from the river will be collected and treated before pumping into an overhead tank for storage purpose. From the overhead tank, the water will be distributed to the port under gravity.

22.12 Energy

The energy position in the Town is satisfactory. But there are significant energy losses. And also additional energy is to be provided for the harbor and proposed cargo port. There is wide scope for relying on non conventional energy sources if the mechanism to tap these sources is subsidized.

22.13 Waste Management

Even though large drainage outlets are available on all sides there is no effective storm water drainage system. The advantages of short distance to the outfalls are lost due to uncontrolled developments within the municipal area. Paddy fields which had acted as drainage

storage ponds also, before discharging into the rivers are now filled up for construction activities obstructing drainages. There is no sewerage system in the town. As such the treatment of night soil by way of septic tank with leach pit will not be successful especially where the population density is higher. The things will be worse in rainy seasons. In the above circumstances a sewerage system with facility for co-treatment of the septage is essential for the town.Similar problems are also facing with solid waste management. The disposal system must be improved. So there is an urgent need for the construction of solid waste treatment plant and sewerage cum drainage treatment plant for the Town.

22.14 **Education**

The present education status is satisfactory in the town. But while considering future population and comparing with standards there is shortage in primary schools, higher secondary, professional colleges and higher education colleges. Also the public sector should take active role in this sector as the literacy rate of Ponnani Townis less compared to the district, state and other towns within the district.

22.15 **Health**

Being the coastal town, Ponnani needs to address several issues in health care. Physical and infrastructure development in Govt. Taluk Hospital will improve the health sector in Ponnani. There is a scope for setting up a Fisheries dispensary near the existing Civil Station compound. The existing Ayurveda Hospital must be enhanced to a full fledged hospital. Coastal side being a disaster prone area, there is a scope for setting a hospital complex in the eastern side of the Town. The Ayurveda dispensary at Ezhuvathiruthi, existing homeo dispensary and the TB clinic can be shifted to this complex.

22.16 **Housing**

The housing sector needs more enhancements in the town. IHSDP project can solve the existing problems in slums if supported by people's aspiration. Adequate rehabilitation is to be provided for the people who are affected by future projects in the Townin the coming years. However the projected demand for housing during the plan period indicates the need for public intervention in providing affordable housing and further densification of residential land use. IHSDP project can solve the existing problems in slums. Adequate rehabilitation is to be provided for the people who are affected by future projects in the Townin the coming years.

22.17 Recreation and Civic Amenities

Even though Ponnani is a coastal town, there is not even a beach recreation centre worth mentioning. Munambam Beevi Jaram located in Munambam area and most of the people attaracted to this area and to be developed as a beach recreation centre. The civic amenities like Public parks, Play grounds,library, Cinema theatres and Auditorium in the town have to be improved by the Municipality.

22.18 Environment and Heritage

Proper planning techniques should be applied for the preservation of environment and conserve the existing mangrove belt. The proper maintenance of water resources in the area will reduce the water scarcity and water logging problems to considerable extent. Planning techniques should be applied for the preservation of heritage sites and buildings. Adequate weightage has to be given for regulations for ensuring and promoting conservation of environment, buildings, artifacts, structures, areas, and precincts of historic, aesthetic, architectural and cultural significance, natural and other manmade features of environmental significance or ecological significance, scenic beauty etc.

22.19 Tourism

Townis enriched with lots of tourism destinations.The Biyyam Kayal situated in the heart of the city is having a high potential to be developed as a tourism hotspot. Heritage monuments are located within the Townand nearby Grama panchayats. Ponnani has also contributed a great deal to the cultural and literary heritage. All the tourist's spots are facing accessibility problems. Adequate road network is to be proposed to these areas. Tourist infrastructure facilities are also to be improved in the Town. There are no home stay facilities for tourists. Also there is lack of facilities like Tourist Information Centre, Economy Hotels, Star Hotels etc.

22.20 Governance and Finance

The financial position of the municipality is not very strong. The fiscal surplus of the municipality till two years back is not an indication of financial health, but of poor financial management. However, this trend is weaning off. The municipality has tremendous potential for development of financially remunerative projects for sourcing funds for urban development.

23 SWOT ANALYSIS

SWOT analysis is attempted at based on the various focus group discussions conductedas part of the stake holder consultations. The results of the SWOT are as follows:-

STRENGTH

- The only coastal Townin Malappuram District
- Three sides of the town covered by water bodies which can tap the tourism potential from these resources.
- Existing fishing harbor which is an economic asset.
- Chamravattom regulator cum bridge provide easy traffic
- Easy to construct roads due to the topography of the town (5m elevation)
- Coastal Highway – Gate way to southern districts
- Strong fisheries sector
- 20 to 55 population is more which leads the strong work force
- Per capita cost for services shall be less (comparatively denser Town)
- Water bodies inside the town is high (land use)
- Better environmental quality in the absence of large scale industrial units.
- Presence ofterrestrial and aquatic which are the authentic habitats ofmigratory birds at Biyyam Kayal
- The environmental factors and heritage sites enhance tourism potential.

WEAKNESS

- Difficult to provide drainage facilities due to the topography of the Town(5m elevation)
- Commercial land use very low
- Green and open space very low
- Weak industrial base (Industrial land use very less)
- Lack of fish processing units
- Lack of organized market & cold storage
- Due to the formation of sand bards new fishing harbor under utilized
- Lack of infrastructural facilities for tourism
- Lack of infrastructural facilities for agriculture

- Inadequate traffic and transportation facilities
- Inadequate coverage of public water supply system
- Absence of sewerage system
- Absence of solid waste treatment plant
- Lack of health care facilities
- No public facilities for recreation
- Shortage in proper housing

OPPORTUNITIES

- New Cargo Port
- Existence of Connolly Canal – Water way
- Water logged areas can be used for pisciculture and agricultural activities.
- Chances for fish processing units
- Scope for modernization of Coir Industry
- Scope for tourism, heritage, environmental features

THREATS

- Prone to flooding, Tsunami
- Sand mining -Environmental threat
- Poor environmental conservation (Swamps wet lands need to be conserved due to various reasons. They protect the fragile fabric of ecological balance)
- Heavy dependence on open wells (contamination of water)
- Sand mining considered as a source of income to municipality

24 DEVELOPMENT ISSUES, VISION AND CONCEPT

24.1 Development Issues

Based on the various studies and analysis including SWOT analysis, the key development issues in thetown were identified as:-

- Inadequate traffic and transportation infrastructure
- Absence of recreational facilities
- Disaster proneness being a coastal town
- Absence of Solid waste treatment system
- Absence of sewerage system
- Absence of proper drainage network
- Absence of significant industrial activities
- Lack of Health care facilities
- Shortage in proper housing
- Absence of organized market & cold storage
- Under utilization of new fishing harbor
- Lack of infrastructural facilities for tourism
- Lack of infrastructural facilities for agriculture
- Sand mining being considered as a source of income to municipality
- Questionable quality of water due to water logging, high density and absence of sewage treatment plant
- Street vendors are not properly accommodated
- Inadequate coverage of public water system

24.2 Vision Statement

"To achieve and sustain desirable living standards for all spectrum of people while deriving economic momentum from being a modern port, a transport corridor, a hub for fisheries and related industries and a tourism destination with serene environmental quality".

24.3 Goals and Objectives

24.3.1 Goals

Broad goals are formed for the realization of the vision based on the various studies and analysis.

- Ensure desirable living standards for the dependent population
- Ensure preservation of environmental quality
- Ensure economic sustainability by developing the town as a modern port city, a hub for fisheries and related industries and anattractive tourism destination

24.3.2 Objectives

For realizing the goals formulated, specific objectives are derived as follows,

Ensure desirable living standards for the town and dependent population

1. Improve housing and living standards of the needy and facilitate affordable housing
2. Improve pedestrian facilities
3. Improve connectivity
4. Provide adequate drainage and sanitation facilities
5. Strengthen public water supply system
6. Provide better health care facilities, higher education facilities, shopping facilities, recreational facilities and other civic amenities

Ensure preservation of environmental quality

1. Conservation of paddy and mangroves
2. Ensure environmental friendly disposal of waste
3. Preservation of water bodies and sensitive areas

Ensure economic sustainability by developing the town as a modern port city, a hub for fisheries and related industries and an attractive tourism destination

1. Implementation of the Cargo Port project

2. Strengthen the existing transport system to absorb the additional demand created due to Cargo Port
3. Provision of facilities for processingand trading of fish
4. Create marine industrial infrastructure
5. Strengthen the existing transportation system which interconnects major urban centers in the District and improve the accessibility to port area for strengthening the economic sustainability of a port city.
6. Develop water transport facilities
7. Explore the potential of beach tourism and water front and facilitate heritage and pilgrim tourism by creating sufficient tourism infrastructure

24.4 Development concept

The basic concept of town planning schemes is pooling together all the land under different ownerships and redistributing it in a properly reconstituted form after deducting the land required for open spaces, social infrastructures, services, housing for the economically weaker section, and road network. This process enables the local authority to develop land without fully acquiring it and gives it a positive control over the design and the timing of the urban growth.

The population parameter serves as the base in all development endeavors. One of the objectives of all sorts of planning is providing maximum benefits for the maximum number of people. Estimate of future population is therefore required for planners to visualize the future development scenario and development concept which is resultant of the current trends and differentials and consequences of interventions made. As explained in Chapter 5, the projected population of Ponnani Town is shown in Table 24.1 and Figure 24.1. As per the projections the Town have to accommodate about 108655 population by 2031.

Table 24.1 Design Projected Population

Year	Projected Population
2021	96995
2031	108655

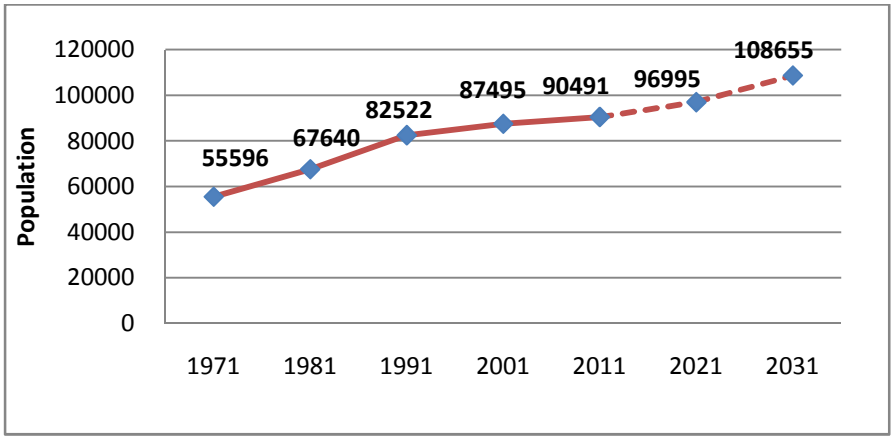


Figure 24.1 Final projected population -2031

The development concept of the town also stems from the existing spatial structure, its strengths, in adequacies, need to rationalize land use and the new impetus required in various development sectors in order to achieve the goals set by this development plan and thus fulfill the development vision.

As per the existing spatial structure of the town, the commercial concentration is seen more in the existing active zone which is in the coastal side of the Townwhere the administrative centres, health care centres, educational centres and transport facility centres are located and along the major roads. The eastern part is highly agriculture oriented. The residential activity is seen in all parts with more concentration in some coastal wards and along the banks of Biyyam kayal. The industrial concentration is more on the south east side of the new NH. The public and semi public land use concentrations are seen in the coastal stretch and along the banks of Bharathapuzha. The new activity area is seen developing in and around the CV Junction which is a major traffic corridor connecting to the various parts of the District. The existing road network is sufficient in quantity but the quality has to be improved. Also the major roads have to be widened and junctions have to be improved.

It is expected that the future development of Ponnani town will depend on the development of fishing harbor and related industries, commissioning of cargo port, inter linkage between the major urban centers inside and outside the District through the new transport corridors including the extension of water way network through the Connolly Canal from the South Kerala and the tourism attractions in the town. So the development concepts have to be derived based on these future prospects. At the same time as a taluk head quarter the

administrative and infrastructural facilities and functions of the Municipality to the serving and dependent populations are also to be accounted. Therefore adequate planning measures are required for structuring these developments. But the land allocation for the future developments and essential amenities for the town will be difficult as 1/3rd area of the Townis under the flood prone zone as shown in Figure 24.2.

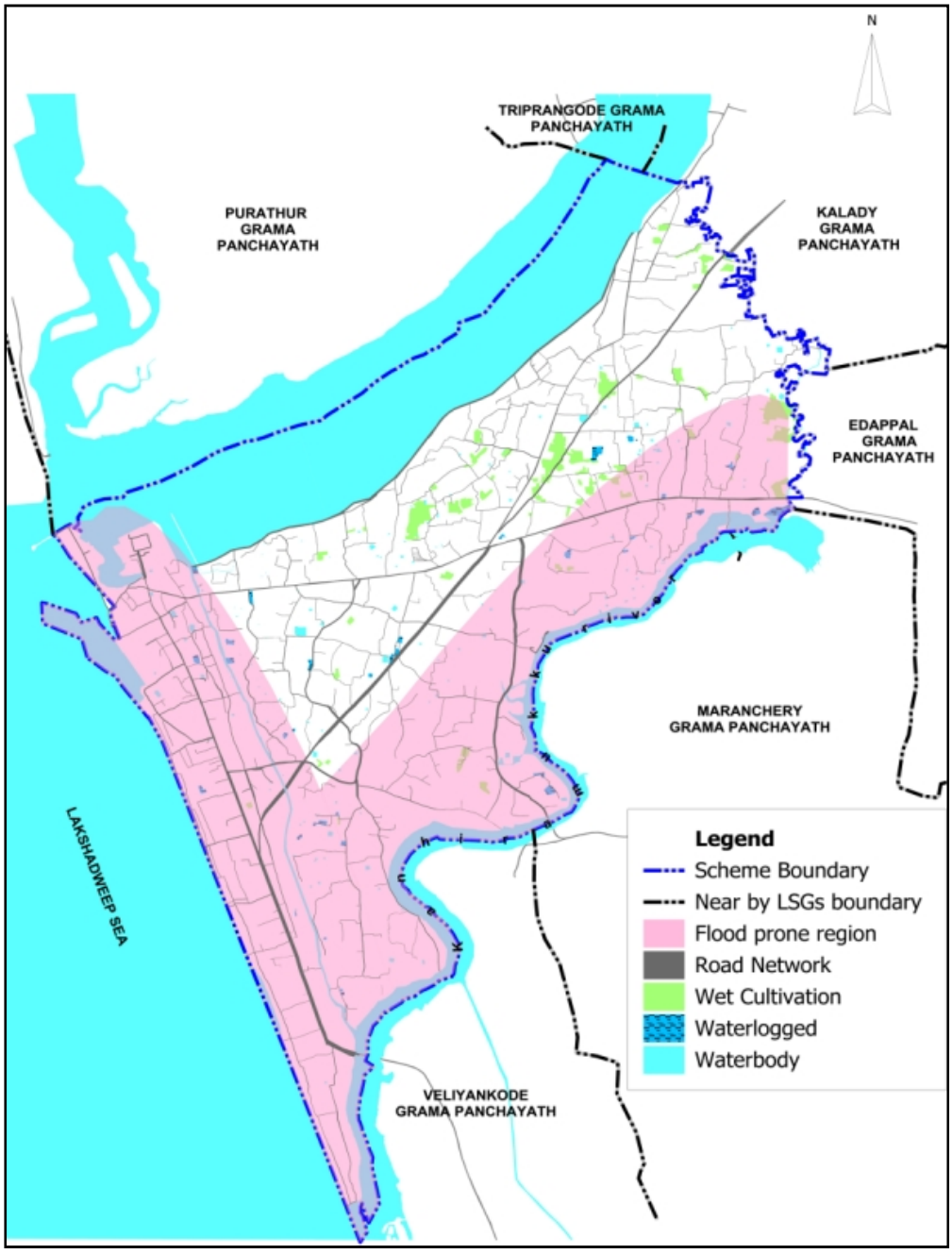


Figure 24.2 Flood map of Ponnani Municipality

The coastal stretch of the town is highly vulnerable but almost all the administrative, health, educational, transport and commercial activities are scattered in this stretch. The essential facilities of this have to be shifted to the north eastern side of the town near to the emerging centre at Chamravattom junction as these facilities become nonfunctional in case of a calamity in the coastal stretch. The southern side of new NH along the sides of Biyyam kayal is inferred best for tourism related activities as this location has many tourist attractions and can also attract the tourists passing through the new transport corridor. With the commissioning of port and fishing harbor the existing CBD area can be earmarked for the port and allied activities without affecting the environmental quality. A new satellite centre should be developed at the CV Junction to promote the commercial and mixed use zones in the western side of the junction. High density residential promotion with commercial activities should be provided in the stretches along the sides on NH and agricultural promotion in the other residential areas or conservation in the existing wetlands should be encouraged. Taking into consideration the above said facts the proposed spatial structure of the town can be derived as follows.

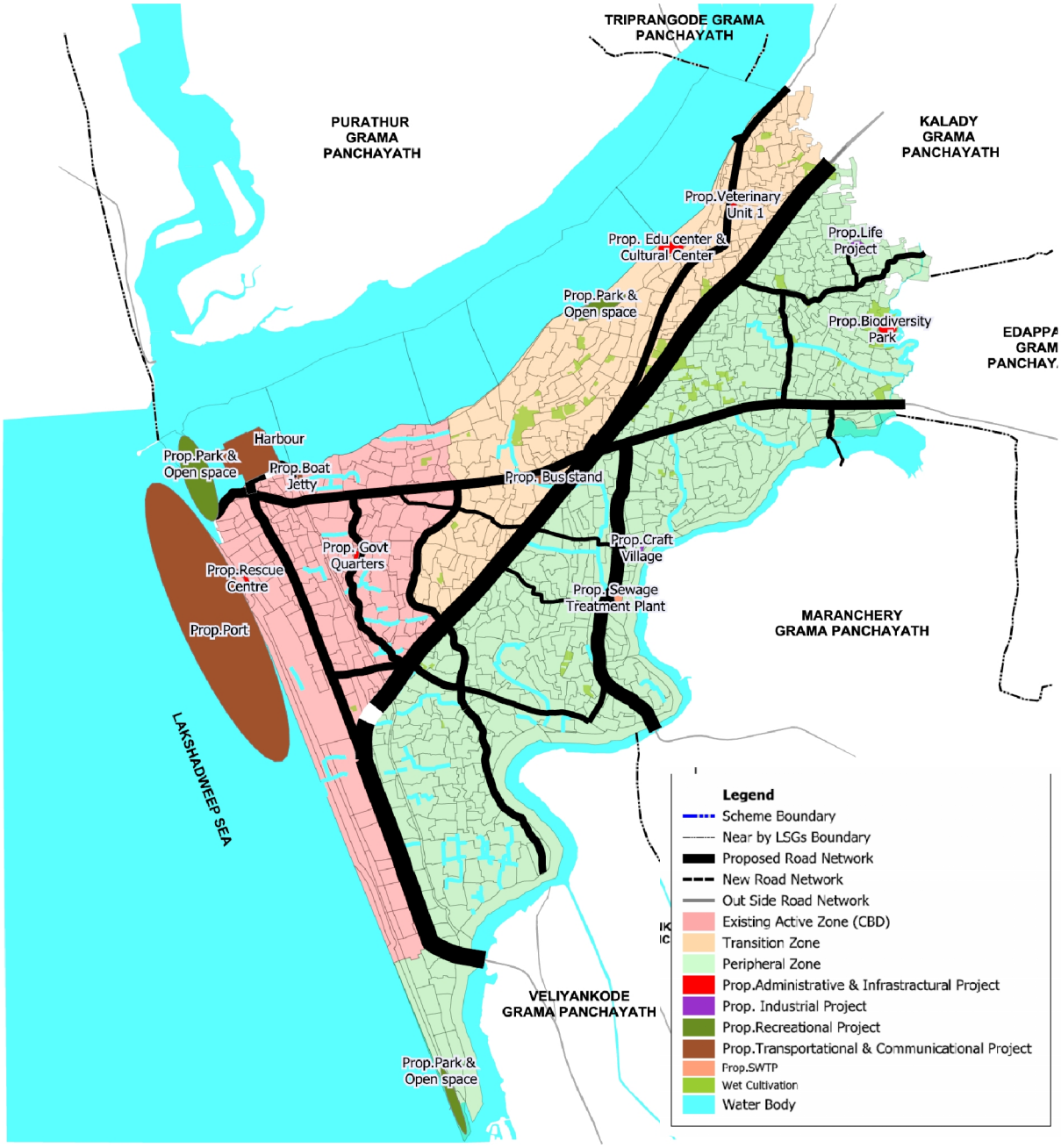


Figure 24.3 Proposed Spatial Structure

25 LAND USE PLAN

25.1 Land use zones

The 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. The chapter defines each zone in detail, explain the purpose of the zone and calculate the total extent of each zone. The detailed zoning regulations are explained in chapter 32.

With the commissioning of cargo port and active fishing harbor the residential and commercial density increases in the town.The coastal area is dominated by dense fishermen population which cannot be moved to other areas. Considering the projected and migrant population relating to the new projects like cargo port and fishing harbor, and focusing on the conservation of existing paddy fields and other wet lands in the scheme area and the objectives formulated the proposed land use plan is broke up as the following zones shown in Table 25.1 and Figure 25.1.

Table 25.1 Proposed land use– 2035

Sl. No.	Proposed Land Use	Area in Sq. Km	Percentage
1	Commercial Zone	0.33	1.32
2	Industrial Zone	0.04	0.15
3	Public & Semi Public Zone	0.71	2.86
4	Residential Zone	7.19	28.95
5	Residential Mix Zone	3.19	12.85
6	Multi Functional Zone	1.26	5.06
7	Park and Open Space Zone	0.13	0.51
8	Traffic & Transportation Zone	1.38	5.58
9	Dry Cultivation Zone	1.78	7.17
10	Wet Cultivation Zone	1.24	4.99
11	Environmentally Sensitive Zone	0.17	0.68
12	Tourism Promotion Zone	1.65	6.65
13	Cremation/Burial Ground	0.03	0.10
14	Mangroves	0.01	0.05
15	Waterlogged Area	0.11	0.43
16	Water bodies	5.12	20.62
17	Harbour Development	0.15	0.61
18	Proposed Port	0.35	1.39
20	Sewage Treatment Plant	0.01	0.04
	Total	**24.82**	**100**

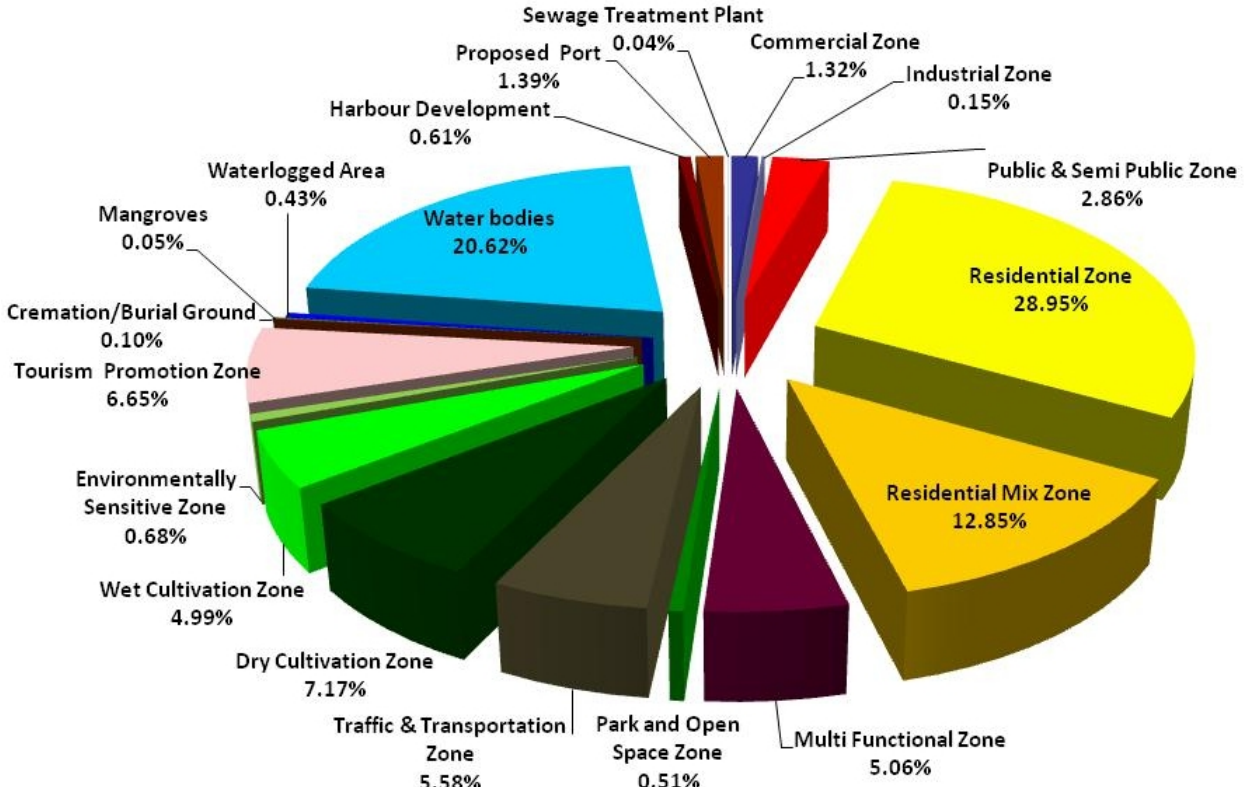


Figure 25-1 Proposed land use - 2035

The proposed residential zone comprises of 719Ha, which is 28.95%of the total municipal area. Besides in residential mix zone (Residential & Commercial), residential use is also permissible in high density. In addition to this, low density residential activity is permissible in commercial zone, multi-functional zone, environmentally sensitive zone and tourism promotion zone. 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.

319Ha is under residential mix zone where residential and commercial land use is permissible. With these provisions, the land required for housing needs shall be adequate at a reasonable net residential density. In addition, considering the high population density of the town controlled residential use is permitted in all zones as per zoning regulations except for natural barriers like water bodies, roads etc.

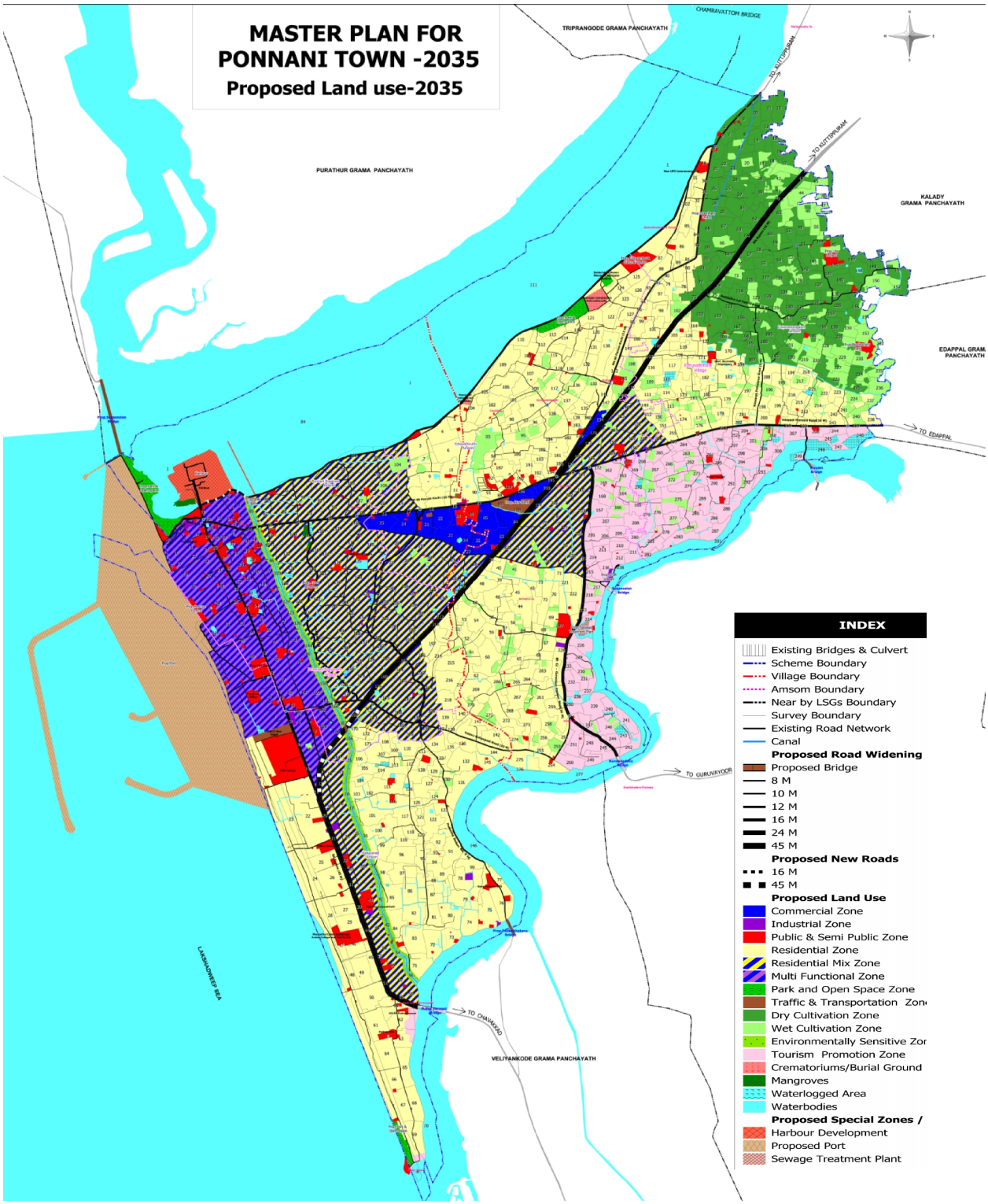


Figure 25-2 Proposed land use map - 2035

The new CBD area flourishing at the CV Junction is earmarked for commercial purpose comprising of 33.0Ha, which is 1.32%of the total extent of the town. Besides, commercial uses are permissible in the mixed zone where residential and commercial land use is permissible. In addition to this, commercial activities related to port and harbor is provided in the Multi-functioinal zone.

An extent of 319 Ha is zoned for mixed residential and commercial land use in residential mix zone. The identified areas are ideal for both the uses 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 and prevents unnecessary ribbon development. This shall cover the demand for commercial development in the town.

An extent of 126Ha is zoned as Multi Functional Zone in which residential, commercial, industrial and public and semi public activities are promoted without disturbing the existing residential land use. Also service industries of non-nuisance nature listed in annexure I are promoted in this zone.

Industrial zones in the land use plan comprises of 4.0Ha, which is 0.15% of the total extent of the town. In addition to this, small scale non- polluting industries are permissible in the multi functional zone for an extent of 126Ha and tourism promotion zone and existing medium scale industries are allowed to ensure the availability of sufficient land for industrial developments in the town.

The road network of the town has fairly good coverage. But the road width is inadequate in most of the stretches. The projected traffic volume for 2031 far exceeds the capacity of the road network. Hence widening of the existing roads to cater to this increase in volume is attempted. An extent of 138Ha is coming under the traffic and transportation zone, which is 5.58%of the municipal area, which includes transport terminals, bus stand, parking plazas and roads. The major share of this extent, around 5.35% is the area covered by roads. Walkways are proposed in the environmentally sensitive zone. The proposals in this sector are detailed out in chapter 26.

Proposed dry agricultural land comes to 178Ha. Proposed wet agricultural land use comes to 124Ha. Paddy fields working as water sinkand undisturbed open land influencing ground water management and microclimate, which is of environmental significance, is preserved in this zone. However, the pressure on paddy fields forconversion to other urban land

uses is tremendous, especially on those, which fall alongmajor transportation corridors or are contiguous with urban uses. So, conservation of paddyis proposed in all possible areas for maintaining environmental quality and the land usein these areas are to be strictly regulated. Some areas that were earlier under paddy, andrelease of which for urban land use shall be desirable from the development perspective ,are included in the appropriate land uses and such developments shall only be permittedwith strict measures to ensure environmental quality and intactness of natural drainage,with due permission from the concerned authorities and regulatory bodies.

Parks and open spaces are proposed in Munambam, Eswaramangalm, Vandippetta and near Jankar jetty. This comes to 13.00 Ha of land. The identified mangrove area in Vandipetta is proposed to preserve as a mangrove park which can act as a lung of the congested CBD area of the town.Area earmarked as wet agriculture can function as open space providing good quality environment in urban area.

The area under public and semi public land use comes to 70Ha. Only land under public ownership and private land intended for institutional development are considered in this zone. Also edu centers are proposed at the site of Chamravattom Project Division Office, Existing ITI campus, Fisheries school at Kadavanad and GFLP School Puthuponnani. Sewerage treatment plant, rescue centers, etc are earmarked as special zones. Besides, to address the capacity enhancement requirements of existing public and semipublic institutions, suitable regulatory measures are in built in the zoning regulations.

Proposed tourism promotion zone comes to 165Ha of land which is 6.66% of the municipal area. Commercial activities and recreational activities promoting tourism development including Farm Tourism, Home stays, Cottage industries will be permitted in this zone. Handicraft village near boat jetty are specially zoned for tourism promotion. All uses permitted in Park and Open spaces Zone are also acceptable. It is assured that only low density residential structures will be permitted here.

20m along both sides of Connolly Canal is earmarked as environmentally sensitive area and assigned with special developmental controls, in view of protecting the bio-diversity, natural drainage, and encroachment of river banks and water bodies. Developmental and construction activities are not envisaged in this area other than those structures required for water supply and irrigation, embankment protection, activities for biodiversity and environment

conservation,agriculture, horticulture, aquaculture, fisheries related infrastructure like Fish landingcentres and boat jetties. These areas are also expected to serve as a recreational open spacefor the locality. All uses permitted in 'Water bodies' is also permitted.

Existing burial grounds/cemeteries/ crematoriums are included in the Crematorium/Burial Ground zone and modernisation/reconstruction/addition to the existing facilities are permitted in these areas, complying with the provisions of the Kerala Municipality Building Rules in force. This zone constitutes an area of 3.00Ha, which is 0.10%.

Considering the disaster proneness of the area, rescue centers and rehabilitation area are also proposed in the master plan. The unsurveyed land at the coastal area is zoned for the implementation of the cargo port. This zone is earmarked as Proposed Port.

Considering the future expansion of the existing harbor, it is zoned as harbor development within which the developments related to harbor activities are promoted.

25.2 Special Projects

Developments in these zones may be permitted by the Secretary of the LSG with the concurrence of the Chief Town Planner.

1. **Life Mission Project at Neithalloor:** The land owned by municipality in Survey No. 146/2,3 of Ezhuvathiruthi Village is earmarked for Life Mission project of the State government.
2. **Veterinary unit 1:** The existing veterinary hospital and its surrounding area of 0.16 Ha, is zoned for a veterinary unit including training centre and veterinary hospital.
3. **Bio-diversity Park:** The land owned by municipality in Survey No.232 of Ezhuvathiruthi village is earmarked as Bio-diversity park.
4. **Sewage Treatment Plant:** Part of Survey No.224 of Ezhuvathiruthi Village is earmarked for the construction of the plant and its ancillary facilities. The detailed lay out design and DPR shall be subject to the approval of the Chief Town Planner.
5. **Edu centers:** The land at Kadavanad fisheries school, Puthuponnnai GFLP School, existing ITI and the land under Chamravattom project division are zoned for edu centers. The detailed lay out design and DPR shall be subject to the approval of the Chief Town Planner.

6. **Government Quarters:** The area reserved in Sy. No. 129 of Ponnani Nagaram village is zoned for Govt. quarters and the detailed lay out design and DPR shall be subject to the approval of the Chief Town Planner.
7. **Bus stand:** Bus stand, Town Hall and Slaughter House are proposed in Sy. Nos. 88,198 &199 of EzhuvathiruthiVillage. The extent of land, excluding the area specified in the DPR prepared for the above use, shall be considered as commercial zone. The detailed layout design and DPR shall be subject to the approval of Chief Town Planner**.**
8. **Rescue center:** The area reserved for rescue centre, in Sy No. 60 of Ponnani Nagaram Village, should accommodate facilities as per the guidelines of disaster Management Authority and separate DPR should be provided.
9. **Craft Village:** The area reserved in Sy. No. 216 of EzhuvathiruthiVillage is earmarked for Craft village

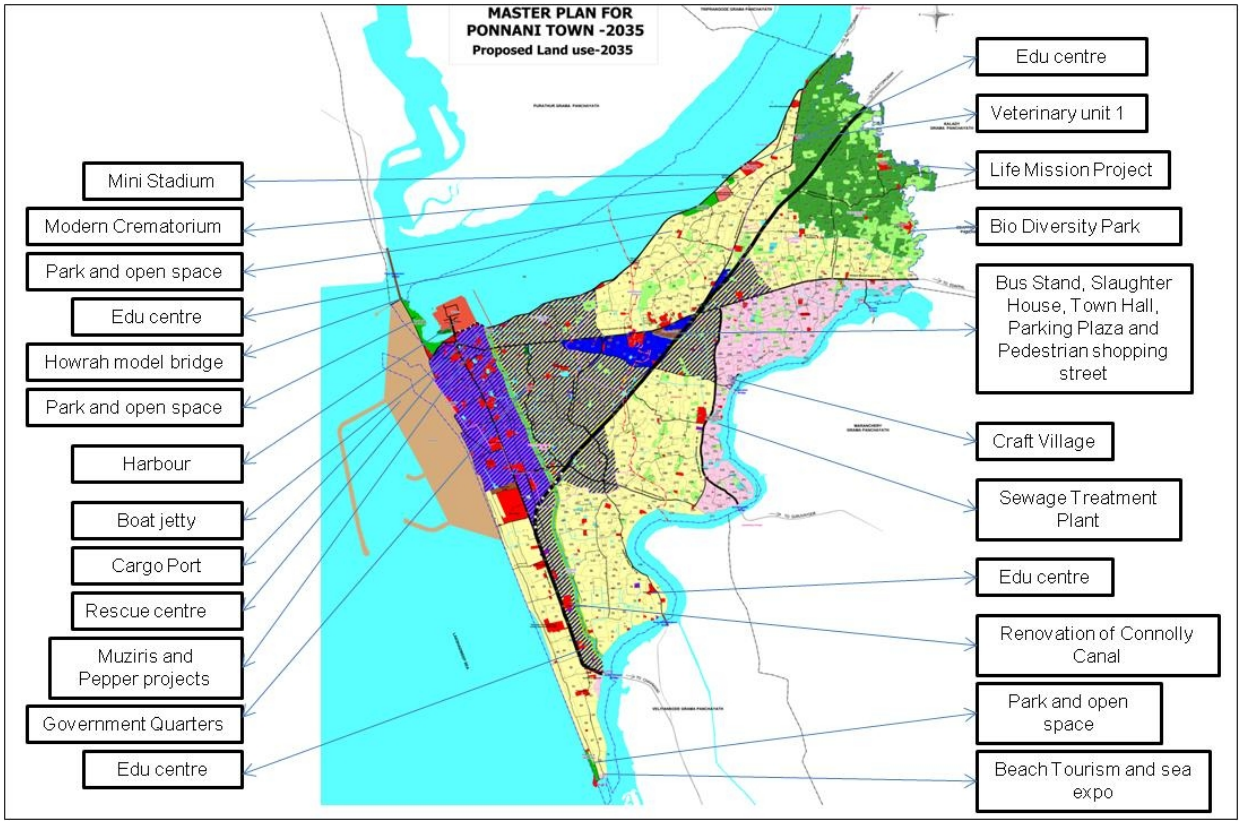


Figure 25-3 Location of projects

26 TRAFFIC AND TRANSPORTATION PLAN 2035

As part of the preparation of master plan for Ponnani town, traffic survey was conducted. The various inferences drawn from the analysis of the data obtained from the traffic survey is relied upon to formulate traffic and transportation related proposals in the master plan. As stated earlier, Ponnani is well connected by roads to the neighbouring towns such as Thrissur, Guruvayoor, Edappal, Kuttippuram, Tirur, Calicut and Palakkad. Recently innaugurated Chamravattom regulator cum bridge acts as a gateway to Ponnani town from Tirur side. Also the work of bypass road parallel to the existing NH 66 is started and the central reach is already completed. Besides these roads, the town has a network of numerous collector roads. However these roads are not a part of an efficient network, narrow often ill formed. Even though the town has good road connectivity, the infrastructural facilities are very poor. So, additional input is needed for the existing road network. In the absence of railways and limited use of water ways, the transportation system in the town entirely depends on its road network. The existing roads in the town have resemblance of a network, though inadequate in many counts like width, geometry, hierarchy etc. The observed traffic volume in many stretches exceeds the existing capacity the projected volume for 2033. Hence drastic improvement of the network is required to cater to the projected traffic volume and to maintain a reasonable level of service on the roads. Table 27.1 summarizes the proposals suggested in order to accommodate the increase in the traffic demand in the years of 2020 and 2030.

Table 26.1 Important Proposals-Summary

Sl. No.	Stretch/Location	Road Name/Category	Proposals	
			2020	2030
1	Gulab Nagar	NH 66	-	Four lane
2	Chamravattom-CV Jn	NH 66	-	Four lane
3	New NH Bypass	NH By pass	-	Six lane
4	CV Jn-Chandappadi	NH 66	Four lane	Four lane
5	Chandappadi-Court	NH 66	Four lane	Four lane
6	Court-Municipal Jn	NH 66	Four lane	Four lane
7	Municipal Jn.-Puthu Ponnani	NH 66	Four lane	Six lane
8	NH Bypass	NH Bypass	Four lane	Six lane
9	CV Jn-CheriyaPalam	Edappal Road (MDR)	Four lane	Four lane
10	CheriyaPalam	Edappal Road (MDR)	Four lane	Four lane
11	KK Bridge	SH 62	-	Four lane
12	Gym Road	Municipal Road	-	Two lane
13	Harbour road	Municipal Road	-	Two lane

26.1 National Highway

The NH 66 Panvel-Cochin National Highway (former NH17) passes through the town and is the main arterial road for the town's traffic. In the present scenario, the V/C ratio on this road from Gulab Nagar to CV Junction is 0.99, CV Junction to the Chandappadi Junction is 2.01, Chandappadi Junction to the Kodathippadi Junction is 1.17 and Kodathippadi Junction to the Anappadi Junction is 1.02. The present right of way varies from 7.5m to 8.9 m. The projected V/C ratio in 2030 with the existing width for this road varies from Gulab Nagar to CV Junction is 1.47, CV Junction to the Chandappadi Junction is 4.06, Chandappadi Junction to the Kodathippadi Junction is 1.89 and Kodathippadi Junction to the Anappadi Junction is 2.25. It is proposed to widen Gulab Nagar to CV Junction road stretch to 12m and remaining stretch from CV Junction to Anappadi to 16m. Since the sides of this road are heavily built up in the town, large scale widening is not feasible and hence the possibility of elevated highway in CV Junction – Kodathippadi and CV Junction- Cheriyapalam stretches are also to be taken into account in future. Also it is proposed to widen CV Junction- Cheriyapalam stretch of Palakkad Ponnani Road to 16m.

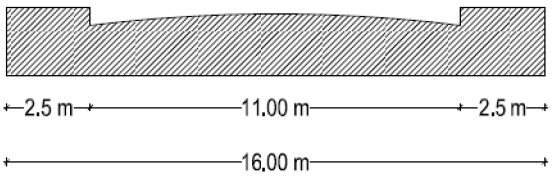


Figure 26-1 Cross Section of 16 m wide road

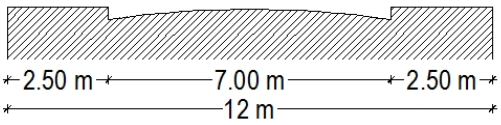


Figure 26-2 Cross Section of 12 m wide road

26.2 Bypass Roads

The construction work of three stretches of new bypass is now in progress. Naripparambu- CV Junction stretch and Pallapram Anappadi stretch is under progress and the existing stretch from CV Junction to Pallapram already started functioning. In the present scenario, the V/C ratio of the bypass road from CV Junction to the Pallapram is 0.84. The projected V/C ratio in 2030, with the existing width for this road from CV Junction to the

Pallapram Junction is 1.54. On completion, the road acts as NH 66 in future. The proposed width of new bypass road limits to 45m as per the decision of the government.

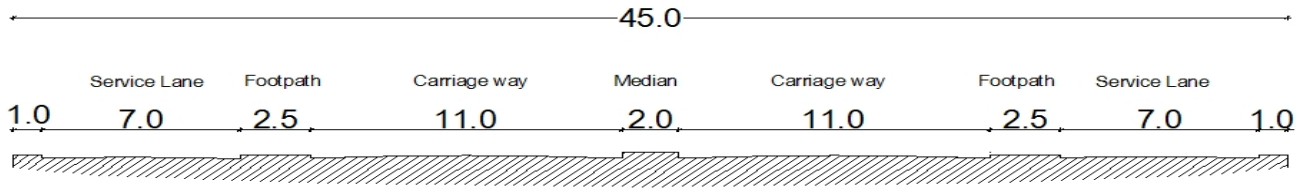


Figure 26-3 Cross section of the 45m road

26.3 State Highway

The State Highway SH 62 Guruvayoor Ponnani joins at Kundukadavu Junction on Palakkad - Ponnani road. Thissur arterial road has a width of 21 m at present. This road stretch has a V/C ratio of 0.407 at present and this is projected to reach 1.975 by 2030. SH gives connectivity to the Biyyam Kayal, the tourism hotspot. The eastern part of the road is identified as tourism potential zone and hence a width of 24 m is suggested for this road.

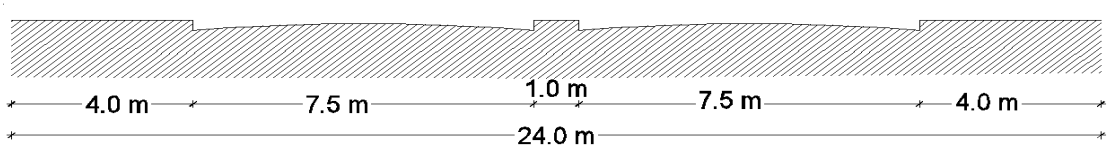


Figure 26-4 Cross Section, 24 m wide road

26.4 Link roads

The town has a few link roads, one from Chandappadi Junction to Oroob Nagar, and other from Uroob Nagar to Municipal Junction, which crosses the NH 66 (Existing NH bypass) at Pallapram. The road has an existing width of 11.5 m. This is a low traffic road now and acts as oneway traffic road, which gives easy access to the national highway. Considering the port traffic, there is need for the diversion of traffic volume. Therefore, it is proposed to divert the projected volume of traffic from the arterial routes and town centre, on this widened road of 12m width to ensure easy traffic.

26.5 Junction improvement

As per the traffic study report, three main junctions in the town ie, Chamravattom junction, Kundukadavu junction and Municipal junction require immediate improvement measures. The four arm Chamravattom junction at present has an almost constant volume (nearly 4019 pcu) per hour passing through from 8.00 am to 8.00 pm. The three arm Kundukadavu

junction at present has an almost constant volume (nearly 2160 pcu) per hour and the municipal junction has 1550 pcu per hour. Also Chandappadi junction, Kodathippadi Junction and Uroob nagar junction need junction improvements. In all these junctions, volumes are almost level without any very significant peaks showing continuous snarls in traffic which warrants engineering measures to improve these junctions.

26.6 **Pedestrian Safety**

Pedestrians can be segregated from the main traffic flow by providing sidewalks or by providing guard stones and railing, imparting greater safety. Raised sidewalks are always preferable for segregating pedestrians from traffic flow. Railings along walkways and central dividers are particularly important near intersections so as to force pedestrians to cross only at the designated crossing. But in the Ponnani town it was seen that there was absence of adequate walkways for the pedestrians and also the markings were absent or faded. Hence proper measures should be adopted for the safety of pedestrians. Provide facilities like walk ways, foot over bridges or sub ways along with hand rails and barricade and traffic calming measures for the safe movement of pedestrians on high pedestrian movement areas such as municipal junction, CV junction, Court junction etc. As part of Tourism promotion zone JM Road is proposed to be converted to pedestrian lane.

26.7 **Transport terminals**

A Bus stand cum shopping complex is proposed in Survey No.88, 198& 199 of Ezhuvathiruthi Village.It is proposed to develop anew bus stand complex, taxi stand and auto stand near CV Junction with all facilities. Most of the taxi stands and auto stands in the townmake use of the carriageway. Separate ways must be earmarked for taxi and auto parkingin the town. Strengthening the facility of KSRTC bus stand is also suggested.

26.8 **Parking**

It is evident from the road inventory and analysis of data that most of the parking problems arise due to the shortage of parking space. Locations of auto rickshaws and taxi stands within the bell mouth of the junctions and haphazard parking of vehicles on the curb space of the narrow width roads are a few of the caustics factors for causing traffic chaos in the Ponnani Town. Also the presence of unauthorized parking at main of the locations within the town becomes a catalyst to the parking problems in the town. In addition to insisting uponmandatory

parking facilities for all buildings, parking plazas are proposed at the proposed bus stand area, the civil station area and at the harbor area.

Table 26.2 Details of Parking survey (Source Traffic Survey)

Sl. No	Roads	Parking Volume (30 mts)	Peak Period
1	Edappal Road	193	6.30 pm-7.00 pm
2	CV Junction to Tirur Road	95	4.00 pm-4.30 pm
3	Chamravattom Road	80	8.30 am-9.00 am
4	AVHS	383	6.00 pm-6.30 pm
5	NH Bypass	362	6.00 pm-6.30 pm
6	Bypass 150m	266	5.30 pm-6.00 pm
7	Edappal to Ponnani	427	6.30 pm-7.00 pm
8	KK Junction to Purangu	68	10.00 pm-10.30 pm
9	Maranchery Road	117	9.30 pm-10.00 pm
10	Municipal Office	266	4.00 pm-4.30pm
11	Vijayamatha to AVHS	202	4.00 pm-4.30 pm
12	Kollanpadi to Chanthappadi	114	4.00 pm-4.30 pm

26.9 **Evacuation Route**

Considering the disaster proneness of the town, an evacuation route has to be identified. Since there is risk of floodwater to enter the town from the south and west side, various protection measures may be implemented with special design considerations.

26.10 **General Proposals**

All roads should have a building line of 3m from the edgeof the road, as per Kerala Municipality Building Rule 1999. Table 27.2 gives the major road widening proposals in this development plan.

Table 26.3 Major road Proposals

Sl No	Name	Length	Existing Width	Existing Type	Proposal/ Widening	Proposed Width
1	NH Bypass (Pallapram - Anappadi)	952.96	0		Proposed	45
2	NH Bypass (Anappadi - Puthuponnani) (45 M)	2152.79	30	Tar	Widening	45
3	NH Bypass (CV Junction -Pallaprpam)	2636.16	30	Tar	Widening	45
4	NH Bypass (Gulab Nagar - CV Junction)	3338.03	30	Mud	Widening	45
5	SH 62 - Guruvayur-Ponnani Road	2830.76	21.3	Tar	Widening	24
6	Edappal-Ponnani Road(CV Jn to Cheriyapalam Bridge)	2806.18	11.5	Tar	Widening	16
7	NH 66 Panvel-Kochi (CV Jn -Anappadi)	5580.73	12	Tar	Widening	16
8	Kodathipadi junkar road	457.38	7.5	Tar	Widening	16
9	Harbour Road	119.03	7	Tar	Widening	16
10	Karma Road	539	0		Proposed	16
11	NH 66 Panvel-Kochi(Gulab Nagar- CV Jn)	3647.20	9.5	Tar	Widening	12
12	MLA road	1802.66	6.5	Tar	Widening	12
13	Chandapadi uroob nagar bypass road	3364.51	11.5	Tar	Widening	12
14	Valavu-Kollanpadi Road	1773.29	6	Tar	Widening	10
15	Biyyam Regulator cum bridge Road	297.04	6	Tar	Widening	10
16	Nayarangadi-Pulikkakadavu road	1065.80	5.5	Tar	Widening	8
17	Thrikkavu junction -Nayarangadi road	1270.25	6	Tar	Widening	8
18	Neithallur-Lal Centre Road	1969.03	5	Tar	Widening	8
19	Aiswarya Pothannur Road	1035.97	6	Tar	Widening	8
20	Pookaitha Kadavu Road	1699.01	7.2	Tar	Widening	8
21	Barlikulam substation road	1121.47	5	Tar	Widening	8
22	Life Road	350.31	4.25	Mud	Widening	8

But even these suggestions will not be sufficient to accommodate the traffic condition in some of the listed stretches. Thus as a solution, following suggestions are also recommended:

1. The width of all important road stretches should be increased to ensure a smooth traffic flow. All the municipal or local road stretches must be upgraded to at least sub-arterial road standard to increase the capacity.
2. The proposed extension of NH bypass from Pallappram to Anappadi area on NH should be made into a reality soon.
3. Construct a Bridge on Pookaitha kadavu across Kanjiramukku River which will connect Kollanpadi Kadavanad road to the Veliamcode on NH 66, and also it is recommended to develop these road to two lane standard, hence the Chavakkad to Edappal or Kuttippuram traffic will be diverted from the town centre.

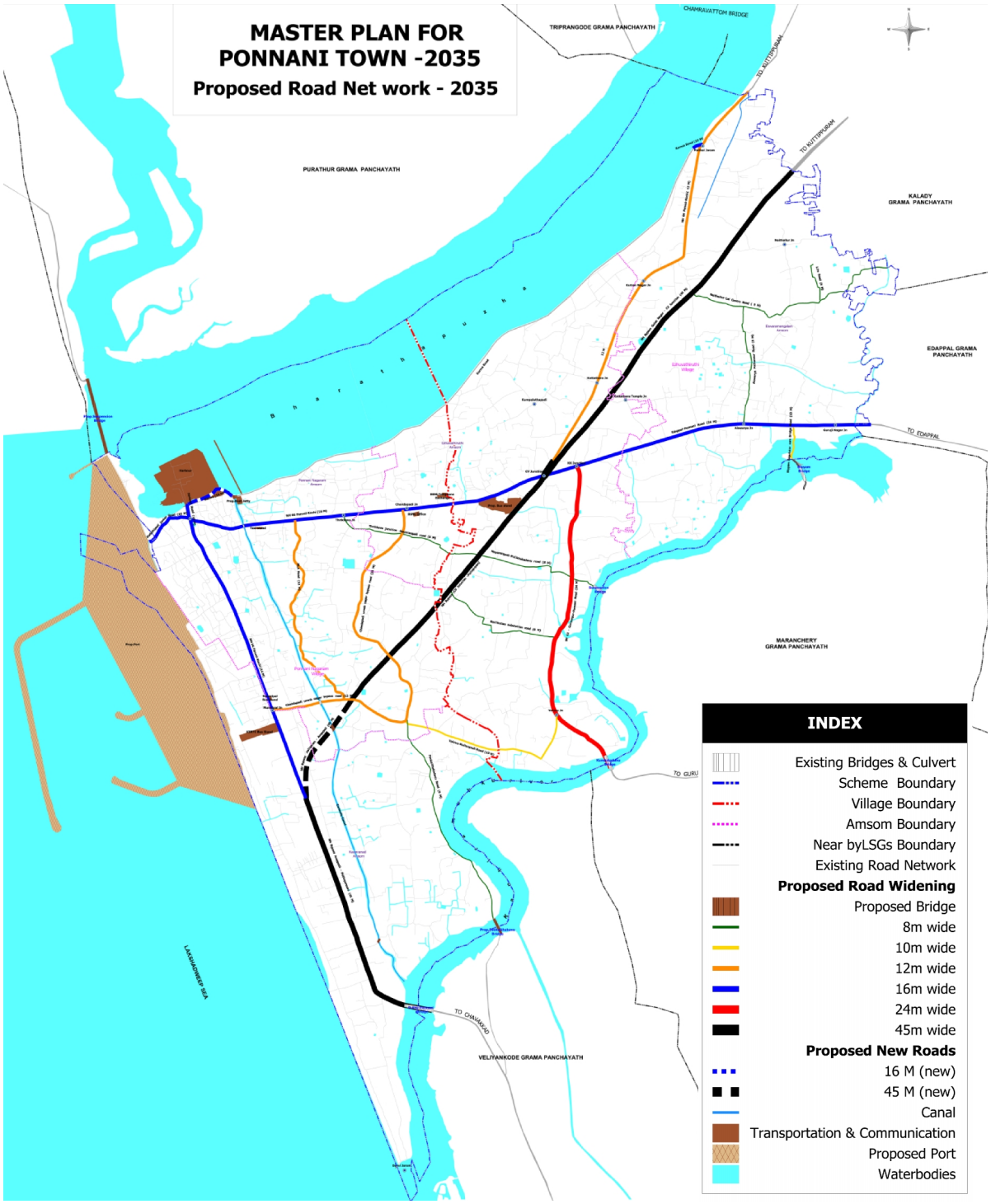


Figure 26-5 Proposed road network

4. Facilities like walkways, foot over bridges or sub ways along with hand rails and barricade and traffic calming measures for the safe movement of pedestrians on high pedestrian movement areas such as municipal junction, CV junction, Court junction etc.
5. It is also recommended to develop an outer ring road to divert the Edappal or Kuttippuram bound traffic from Chavakkad side or vice versa, by strengthening the three existing roads connecting Palappetti on NH 66 with Perumbadappu on SH 62, Biyyam on Edappal road with Athani on SH 62 and Puzhambram on Edappal road with Kandamkurumbu kavu on NH 66. In this Palappetty Perumbadappu road and Biyyam Athani road is outside the municipality.
6. The use of public transport should be encouraged in municipal area. This can be done by means of introducing an effective public transport system such as low floor buses to the nearest towns or as city services. This will reduce the volume of private vehicles on the entire road stretch. In addition, proper traffic regulatory measures should be adopted in the municipal areas such as one way measures, especially on CV Junction to Court Junction stretch of NH 66.
7. It is recommended to provide proper regulatory measures for the improvement of traffic condition in the Ponnani Town. After the implementation of the 4 lane, it is recommended to provide proper signals at the junctions for the effective regulation of both the vehicles as well as the pedestrians. The proper road markings such as zebra crossing, carriageway lines etc. are vital for the safety of the road users. Provision of hand rails along the legs of the junction ensures pedestrian safety. Thus the effective designing of the junction plays an important role in the efficient and smooth flow on road network.
8. Traffic control devices:

   The traffic control devices such as signs, signals, marking and devices placed on or adjacent to the street would help to regulate, calm or guide the traffic in the municipality.

   - Traffic signs:

   Traffic signs are traffic control devices fixed or portable for conveying warning, information, requirements, restrictions or prohibitions to traffic on road. The Ponnani municipality lacks the proper placement of such traffic signs which helps to promote road user safety.

   - Traffic signals:

Traffic signal ensures the effective and orderly traffic movement, provides the continuous flow of traffic, allows the crossing of pedestrians and vehicles and helps to reduce accidents. But in this town it was seen that there are no signals provided yet.The installation of traffic signal at all the three intersections such as Chamravattom junction, Kundukadavu junction and Municipal junction will reduce the number of vehicle stops and overall delay for all vehicles passing through this intersection. It will also reduce congestion at these intersections and approaching roads. Pedestrian phase should be included in the signaling system on all three intersections. And also it is recommended to develop a grade separated intersection at CV junction in future.



Figure 26-6 Recommended Outer Ring Road by Strengthening Three Existing Roads*(Source: Google map)*

9. In order to take into account the overall traffic safety, the implementation of the 3 Es (engineering, enforcement, education) through the 3Cs (coordination, cooperation, control) is one of the most effective measure.

27 SECTORAL PROPOSALS

27.1 Agriculture

With a view to enhance this sector and protect the vast area of agricultural land and environment and to promote sustainable food habits, the following proposals are earmarked in the Master Plan.

- The residential use zone proposed in the master plan promotes the small scale agricultural activities in the town in addition to residential development and the wet agricultural zone is intended to promote large scale agricultural activities.
- More agricultural opportunities have to be identified with the help of Krishi Bhavans. Vacant land to be converted for value added products like Basmati rice cultivation. Organic and e-farming techniques, Poly house technique, Grow bag technique etc should be initiated. School and home vegetable gardens should be encouraged. Distribution of high quality seeds from nearby agriculture research centre should be promoted. Construction at wet land to be regulated. Funds for fertilizer units, compost pit etc. to be provided.
- Check dams are to be provided at suitable places to arrest the intrusion of saline water from Kanhiramukku River. A separate DPR is to be prepared to address this problem. Proper drainage and recharge system to be developed to remove the water logging problems. Chamravattom project canal to be extended to Eswaramangalam, Neithalloor, Cheruvaikkara, Biyyam, Theyyangad, Kadavanad and Nooradithode.
- Existing paddy fields are to be conserved especially at Neithalloor and Biyyam area. Provide additional infrastructural facilities for the improvements of the paddy cultivation. The zoning regulations prescribed in the Master Plan especially for the paddy zone and the provisions of the Conservation of Paddy Land and Wet Land Act must be observed strictly.
- Survey no. 232/11,12,1,5,9,16 and 243/3 in Ezhuvathiruthi Villageat Neithalloorowned by the municipality, is proposed to be reserved as Bio-diversity Park.
- The town has no organized agricultural market even though it is a service center for a vast agrarian hinterland. Hence a modern wholesale agricultural market with cold storage facilities promoting rice, coconut and vegetable products including process centre may be promoted in the municipality.
- Ramacham cultivation to be promoted in the coastal area.

- New canal connecting Bharathapuzha River and Biyyam Lake from the upstream of Chamravattom Regulator cum bridge to the down stream of Biyyam Regulator cum bridge is proposed. This will be benefitial in agriculture and tourism aspect.

27.2 **Animal Husbandry**

Concerned by the fact that there is no authorized abattoir inside the Municipal limits and the poor infrastructural facilities in the existing Veterinary hospital, veterinary unitsare proposed in the town. The first unit will comprise the Veterinary hospital and the training centre. The infrastructural facilities in the existing veterinary hospital compound can be enhanced for this purpose. Processing, deep freezing and marketing facilities, milk cooperative societies and poultry and cattle farmscan be promoted in the municipality.Grass cultivation can be promoted in the uncultivated paddy lands in the eastern part of the town. A slaughter house withmodern facilities under the inspection of the veterinary doctor is proposed in Survey no. 88, 198& 199 of Ezhuvathiruthi Village at Chamravattom Junction, which is included in the area earmarked for Proposed Bus Stand.

27.3 **Fisheries sector**

Ponnani is a coastal town and an important fishing centre. The town is bounded by water bodies and water logged areas in parcel within the municipal area.To enhance this sector the Master plan proposes the following

- Existing fish market at Koravalappu owned by the municipality to be renovated.
- A centralized fish market with cold storage for sea fish and inland fish is to be established in the harbor area.
- Develop the uncultivated paddy fields and existing ponds in the municipal area to new fish farms. Hence, fresh water fisheries including ornamental and marine aquaculture can be promoted.
- Full-fledged harbor and port based fishery activities are widely promoted in Multi-functional zone, Park & Open space as well as Tourism promotion zone.
- Establishment of a fisheries higher education complex to house fisheries based training centers, higher education in Marine and Fisheries Technology etc. inthe existing Government Fisheries UP School at Kadavanand.

- Infrastructure facilities for drainage, water supply and roads are to be improved in the coastal area. Separate DPR have to be prepared exclusively for this.
- Establishment of inland fish landing centres and setting up a fishermen's village; protecting their traditional rights to land and other resources that sustain them and their way of life.
- Enhance GFLP School, Puthuponnani to a technical school to enhance livelihood options, especially of the children from fishermen community.
- Small and traditional fishing fleets should be protected.

27.4 **Industries**

Forecasting the boom of traditional, marine, agriculture and fisheries based industries marine products and port related industries like fish processing unit, net manufacturing unit, rope factory, fish fertilizing unit, boat-manufacturing unit, boat repairing unit, engine-manufacturing unit, instruments related to fishing are promoted in the area marked for Multi functional zone.Agrobasedindustries shall also be promoted, as the town has an agricultural hinterland.

Considering the state's focus on the IT sector, it is proposed to promote IT based industries in the municipality to enhance the employment oppurtunities. There is scope for coir related industries and trading centers at Kadavanad area. Industries of appropriate nature are allowed in all the zones in the zoning regulations to promote household industries.

27.5 **Trade and Commerce**

Trade and commerce being a mainstay of the local economy, a number of projects are proposed for the strengthening of this sector. 33.0 Hectares of land near C V Junction is zoned mainly for commercial activity. This will act as the new CBD for the town. A new bus stand is also proposed near this zone. Space for street vendors, parking plazas, commercial complexes with proper drainage and sanitation facilities, etc. shall be provided in this zone.The new CBD will also promote centers of tourism importance. A shopping street with only pedestrian entry shall be developed near the proposed new bus stand from CV junction to the new bus stand. The development of trade and commerce sector can be enhanced by urban renewal projects at various locations in the town centre. Separate land use policies shall be framed in order to facilitate such developments. The existing CBD will take care of the trade related requirements of the proposed fishing harbor and cargo port activities and will cater to the need for public and semi public activities in that area. Modern market cum cold storage including all the facilities for trading and

marketing the marine products are to be developed at the harbor area. Marketing of coir and coir products are to be developed in the CBD area.The inland navigation and trading through the Connolly Canal are to be started with a view to enhance this sector.

27.6 **Water supply**

The present system caters only 20% of the population in the Municipal area. Remaining 80% of people depend on shallow open wells, tube wells.However water quality in the area is low due to saline water intrusion, a significant share of population depends on water supplied by the Municipal authorities in tanker Lorries. The Kerala Water Authority has to increase its capacity by five folds to cater to present population itself.Besides a dedicated water supply system isrequired in future for the whole municipal area. The proposed water supply scheme by KWA is estimated to meet the demands of the present and future population.

The proposed water supply scheme by the KWA will be having the source and Head Works at Nariparamba in Kaladi panchayath. The Intake will be a 10m. Dia well in Bharathapuzha in the upstream of Chamravattam Regulator cum bridge. Then water is treated in the proposed treatment plant at Nariparamba in the land available with KWA (Division store compound) and clear water then pumped through transmission mains to collect in the over head reservoirs at two different locations. The town is divided in to four zones so that the water stored in the two over head tanks (OHT) can be distributed evenly and effectively in the whole Municipal area. It also purviews to supply treated water to entire habitations of the townand proposed to serve its purpose up to the year 2045.

The land required for the main components like Intake well, Treatment plant, and OH tanks are available with Kerala Water Authority at suitable locations. The source is perennial and is located in the upstream of the recently commissioned Chamravattam Regulator cum Bridge. The project cost is estimated to be 6213.56 Lakhs**.**

Rain water harvesting methods and recharge of ground water should be strictly enforced in all constructions including residential constructions. The usage of septic tank for all families should be ensured to prevent ground water pollution. Sewerage treatment plant for the entire townis the only solution to prevent the ground water pollution and to ensure healthy well being of the citizen. Also provides suitable methods for the treatment of water pollution due to saline water intrusion.

Projects which incorporate the treatment of sea water and ground water and using for various purposes are to be identified and encouraged.

27.7 Energy

The routine expansion programme of KSEB is expected to cover the increased energy demand. However strict measures have to be there to control the energy loss and waste of energy and to conserve the energy. The KSEB shall put forward proposals for tapping the non conventional energy sources. To promote use of non-conventional sources of energy it is proposed to use solar panels for street lighting in the town. Also, incentives for solar powered industries are to be permitted as per government policies from time to time.New substation is to be constructed at the harbor area, for smooth functioning of the existing fishing harbor and proposed cargo port. The conversion of overhead electric lines to underground cables is proposed in this Master Plan. Measures to tap the wind energy are also recommended by this masterplan.

27.8 Waste management

Due to the absence of proper drainage and sewerage system and the small plot sizes,the ground water is getting contaminated. A drainage network is urgently required in the Municipal area especially in the coastal wards. A detailed drainage plan is to be prepared for the town before taking up works on the drainage network. The Master plan proposes to improve the Connolly canal and other major drains by side protection works, deepening and construction of check dams. A proper system for storm water drainage is to be formed by establishing the links wherever needed in the existing road side drain and integrating this properly to the natural drainage channels.

The master plan proposes strict restriction on the let out waste water to the drainage channels from residential and commercial establishment which is very much practiced in the town. An integrated sewerage system with a waste water treatment plant is also proposed. The sewage treatment plant is proposed in survey no. 224 of Ezhuvathiruthi Village is earmarked for the construction of the plant and its ancillary facilities.

Eco san toilets are very effective for high water table area. This system safely recycle excreta resources and to convert human excreta into nutrients, to be returned to the soil and water to be returned to the land.

Decentralised waste management and management of waste at source may be promoted in the municipality. A requirement analysis (ward wise) and technology feasibility study along with a comprehensive implementation plan need to be charted out for the planning area.Funds need to be earmarked to popularize bio-gas plants/ pipe composting/vermi composting and to provide subsidy to set up the units. Individual pipe/vermi composting or biogas plants has to be mandated in residential areas as well as hotels/restaurants etc.., whereas collective plants of similar nature can be mandated ward-wise as well as for plotted developments, residential colonies, villa projects etc.., as a criteria for their permit. Awareness programs for the waste generators are to be taken up to reduce the quantity of solid waste, segregation, self-help methods for disposal of bio degradable solid waste at source etc, through social workers, media etc. Decentralised solid waste disposal would not only help to bring down the volume of waste dumped, but also increase the environment friendliness.

The three R's of waste management; Reduce, Reuse and Recycle will help to cut down on the amount of waste we throw away. Reducing is the best way to go about managing solid waste. Reuse is the one becoming more and more popular with the surge of up cycling and craft projects all over the web. Recycling is the process of manufacturing a product to be sold as new. Without this, a port based town cannot survive, as a large quantity of waste will be produced due to port based activities. Port produces a lot of waste in terms of dredging, maintenance, navigation, industries etc. Otherwise, the waste will be let out to sea, which will pose a serious health hazard to the marine life which will in turn affect the marine catch and affect the quality and thus affects the inhabitants of the town.

Cost-effective, eco-friendly and non labour intensive waste management models like Thumburmuzhy model should be promoted in the town. The lesser carbon dioxide and methane emissions make the model best and ideal one. Rapid development and urbanization, constant change in consumption pattern, social behavior and uncivil attitude had a great role on waste dumping which is difficult to manage.



Thumburmuzhy model of waste treatment

The plan shall aim and accomplish a "zero waste city" system for the town.

27.9 **Education**

Though there are no higher education centers within the town, number of such institutions exist in the surrounding LSGs which are expected to cater to such needs of the people in the town. With better connectivity and locational advantages the town has scope for developing as a facility centre for the students in these institutions. Job oriented education courses and training centers are proposed to be provided in the town. For that, Edu Centers are proposed in the land under Chamravattom project division. Besides in the existing ITI, additional courses are to be introduced. The existing Puthuponnnai GFLP School may be upgraded as Technical School. This will help establish the town as a coastal educational hub. The Govt. Fisheries School at Kadavanad has to be upgraded and more courses relating to fisheries and marine technology have to be introduced. Courses regarding marine investigation and adventure sports training are also to be included in this. In addition, the municipality shall focus on the setting up of the required number of institutions as per the planning standards and improve the quality of education. Infrastructure developments are to be provided in all the existing education institutions including Anganwadis to improve the quality.

27.10 **Health**

The infrastructure and other facilities in the Imbichibava Memmorial Taluk Head Quarters Hospital, annex hospital functioning in the TB clinic compoundand the existing Ayurveda Hospital are to be improved for meeting the health care needs of the common public.An appropriate location near Kollanpadi Uroob Nagar area is to be identified by the municipality to shift the existing homeo dispensarypresently functioning in rented building.Proper waste management facilities to be ensured in all health care institutions. Improvement of infrastructure facilities to the agricultural, water supply, sanitation and industrial sector are also recommended in the master plan to improve the health condition of the town.

27.11 **Housing**

There is a shortage of 4054 housing units at present. Government housing schemes from time to time cancover this shortage to an extent. Existing 120 houses near MES College are to be renovated. Still there is a need for public intervention in providing affordable housing. In the absence of planned development the residential land use is spread out all over the town encroaching upon the valuable paddy lands. So further densification of residential land use is

necessary for protecting the paddy fields. Hence appropriate zoning regulations for densification of residential land use, affordable housing and promotion of green architecture are incorporated in the development plan.Enhance the techniques of rain water harvesting, reduction of solid waste generation, energy savings, pollution preventing etc. in the household level. Physical and infrastructure development for the urban poor through the government housing schemes to be initiated. Land is available at Neithalloor in Survey No. 146, of Ezhivathiruthi Village for the construction of flatsunder the Life Mission, Housing Scheme project. Renovation of Nayadi colony is also proposed. The Master plan also proposes a residential quarter's project in survey nos. 129 & 131 of Ponnani Nagaram Village to ensure housing provisions for employees from outside and inside Kerala working in the government sector. A ladies hostel is proposed in Ponnani Nagaram Village in the land owned by municipality. It is also proposed to promote geriatric care centers in the town.

27.12 **Recreation and civic amenities**

There is scope for better recreational facilities in the town. A recreation centre with water game facilities, socio cultural and recreational club, bio Park, exhibition centre and an open air theatre are proposed near the Biyyam Regulator cum bridge. 1.75 Hectares of area is zoned for beach recreation including aquarium and sea expo near Munambam Beevi Jaaram at Puduponnani. Master Plan also proposes to modernize the existing Municipal Mini stadium near the Karma Road by providing additional facilities like Indoor stadium, Gymnastic centre, Ladies health club, construction of Sport's Complexwhich includes facilities like coaching centres for Kabadi, Volleyball, football, cricket etc. Jogging tracks are proposed along the sides of Connolly Canal, Bharathapuzha and Biyyam Kayal in the area marked as Buffer zone. Neighborhood parks are proposed at Azhimugham, near the social forestry area and on the banks of Bharathapuzha near the existing burial ground. Proper infrastructural facilities like reading rooms, water supply, electric connections, sanitation facilities, parking facilities etc and proper maintenance of books are to be provided in allexisting libraries. This will attract people to libraries which will enhance the proper use of the libraries and large cultural heritage. At the same time a transition of these to e-libraries is a need of the hour so as to reduce the use of paper thereby saving trees and environment.The master plan also proposes the construction of a Town Hall in the proposed Bus stand area in Survey no. 88, 198 & 199 of Ezhuvathiruthi Village. Upgradingthe existing municipal crematoriums at Eswaramangalam and Kuttikkadand providing

infrastructural facilities are also proposed in the Master Plan. Renovation of the old buildings consisting Court complex and other offices by preserving its heritage valueand thereby providing basic facilities to them are also stressed in the Master Plan.

27.13 **Environment and heritage**

Environment protection and management are given due consideration in the developmentplan. Appropriate zoning regulations are formulated for the conservation of paddylands, control of various land uses and thus protection of the environment. Regulationfor promotion of green buildings and renewable sources of energy are also put forward.20m wide buffer is provided on twosides of Connolly Canal. No intense activity which is likely to pollute the water body or affect the stability of slope shall be permissible in these buffer zones.

The proper maintenance of water resources in the area will reduce the water scarcity and water logging problems to considerable extent. There are number of ponds in the town, majority being unusable due to intrusion of saline water, dumpingof waste and neglect. These ponds are proposed to be renovated so that they can act aswater reservoirs improving the ground water table and also can be used for recreation and fish farming.Besides, the master plan also proposes revitalization and ensures intact connectivity of natural drainage channels and Connolly Canal.Adoption of biological protection measures for protecting the natural streams and river banks in the town is also envisaged.

Avenue plantation along the major corridors is another proposal for improvement of environmental quality. Conservation of the existing mangrove belt in the Connolly Canal area and the protection and preservation of kavus' in the area are also recommended. Sand miningthough poses a great threat to ecological balance of the area, is a source of income for the local population. However, this not being a sustainable method of income generation, opportunities in other sectors is to be improved so as to attract more people to them. Silence zones 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 scheme.

The existing court complex is of heritage value and should be protected asheritage monument. Heritage site preservation and protection is also an important focus of the Master Plan.

The environmental and social impacts of the proposed port projets were studied as part of preparation of this master plan based on the Comprehensive Environmental Impact Assessment Study (CEIA) carried out and submitted by M/s. Malabar Port Private Limited through M/s. L&T Ramboll consulting Engineers Limited, Hyderabad. The assessments were as follows:

The land for the proposed port is predominantly reclaimed land. A small portion of available land to be used for the port area is government land and unsurveyed coastal sand area. The proposed port and its infrastructure development do not envisage rehabilitation and resettlement. Impacts on the movement of the fishing trawlers/fish crafts during the construction and operation activities of the port are also envisaged. Construction and operational activities are not anticipated to disturb the Bharathapuzha River which is being used by fishermen to enter into the sea for fishing. Separate facilities will be provided for the port with utmost care to see that the fishing activities are not disturbed. Safe navigation routes will be earmarked for movement of fishing vessels and the route will be finalized in consultation with fish landing authorities and fishing communities. Signboards and necessary marker buoys shall be installed and interactions shall be initiated with the fishing community about the marker buoys indicating the areas of operation so that they would avoid those areas during the construction and operational phases of the port. Hence, no hindrance to fishing activity is anticipated during construction and operation phases of the proposed port. MPPL proposes to take up following activities for improving the living standards and providing facilities to the people in the town and nearby areas.

- Public Health Centre (PHC) with outpatient facility is proposed to be constructed
- Two fully equipped Mobile Dispensaries are proposed to be provided to cater to the basic medical needs of the local public.
- A skill development centre is proposed to be constructed which shall provide training
- A public library and book bank is proposed to be constructed
- A boat repair yard for attending to the urgent repairs/maintenance of the fishermen boats is proposed to be developed

With rapid industrialization and consequent deleterious impact of pollutants on environment, values of environmental protection offered by trees are becoming clear. Green belt development not only functions as foreground and background landscape features resulting in

harmonizing and amalgamating the physical structures of the plant with surrounding environment, but also acts as pollution sink. It will also check soil erosion, make the ecosystem more complex and functionally more stable and make the climate more conducive. Objectives of greenbelt plan are

- Enhancement of the overall environmental quality
- Provide a shelter belt around the port bulb for dust absorption
- Compliance of the conditions stipulated in the environment clearance
- Improve ambient air quality
- Conserve soil and moisture and provide healthy climatic conditions
- Increase aesthetic value
- Create awareness for environmental conservation and tree planting
- Provide adequate shelter and habitat to the local fauna
- Generate employment for the local people
- Protect human health and prevent pollution

Economic contribution due to the presence of port can take its toll on social, cultural and environmental health. The net benefits due to the presence of a port may include

- The construction phase is estimated to provide employment opportunity to about 1500 people, during operation phase an estimated 100 direct and 500 indirect employment opportunities can be estimated.
- Employment opportunities to the local people for skilled, semi skilled and unskilled work force during the construction and operation phases
- Improvement of education and health facilities in the project area
- Significant benefits to local people and to the region as a whole and positive impact on the socio economic conditions of the project region
- Proposed dedicated rail corridor and existing national and state highways will provide good connectivity and also offers an efficient and cost effective supply chain/value proposition to the local importers and exporters in the Kerala state and neighbouring states.
- Overall economic growth of Malappuram District and Kerala state.

27.14 **Tourism**

Ponnani's huge potential to lure tourists with its rich traditions in art, culture, craft and music is linked to its location near estuary of Nila (Bharathapuzha). This characteristic of the town has paid way for the implementation of People's Participation for Participatory Planning and Empowerment through Responsible Tourism (PEPPER) Project of the State Tourism Department in Ponnani. Farm stays, resorts, boating and various other water tourism activities can be promoted at Easwaramangalam area as part of enhancing responsible tourism in the town.

Improper utilization of the rich natural resources reduces the tourism potential of the town. Biyyam kayal, one of the major tourism destinations within the municipal area can be developed as a tourism hotspot. Tourism promotion zones are well identified in the master plan and this zone will look forward to many developments in the tourism sector and thereby boosting the economy. Tourist information centre and star hotels are proposed to be provided within the tourism potential zone. Provisions for beach tourism and sea expo are proposed in the Master Plan. Cultural centre, Marine museum, 7 D Theatre, Aquarium hall etc are proposed at Easwaramangalam in the land owned by the Chamravattom Project Division under DTPC. Also Amphi Theater, boat jetty, watch tower, lighting, view point, children's park, fishing deck, bridge and pathway, parking area etc are proposed in the Biyyam regulator cum Bridge area. The proposal coveres two sides of Biyyam Kayal. 3.07 hectares of land is zoned for craft village near Biyyam boat jetty. A tourism village is proposed near Veliyamkode Bridge.Project regarding Connolly Canal beautification is an important part of the tourism plan. Detailed project report has to be prepared for this. The existing waterway network through Connolly canal to be improved and a tourism network is proposed to be developed connecting the Bharathapuzha and Kanhiramukku River through Cannoly Canal. Heritage walks connecting heritage sites within the municipal area has to be developed.Also projects like bus stand, shopping complex etc may be developed (through PPP mode or otherwise) for enhancing the income of the municipality.Sea side heritage is also to be protected for the enhancement of the tourism sector.

Steps are to be taken by the Municipal authorities for establishing harbour based tourism projects near fishing harbor and additional ferry service to be done to connect Ponnani to the Padinjarekkara beach. Adequate transportation to the heritage areas without affecting the sensitive area is provided. New suspension bridge in the model of Howrah Bridge is proposed at

Ponnani azhimugham across Bharathapuzha river connecting Padinharekkara beach and Harbour area. It attracts tourists without disturbing the harbor and port activities.

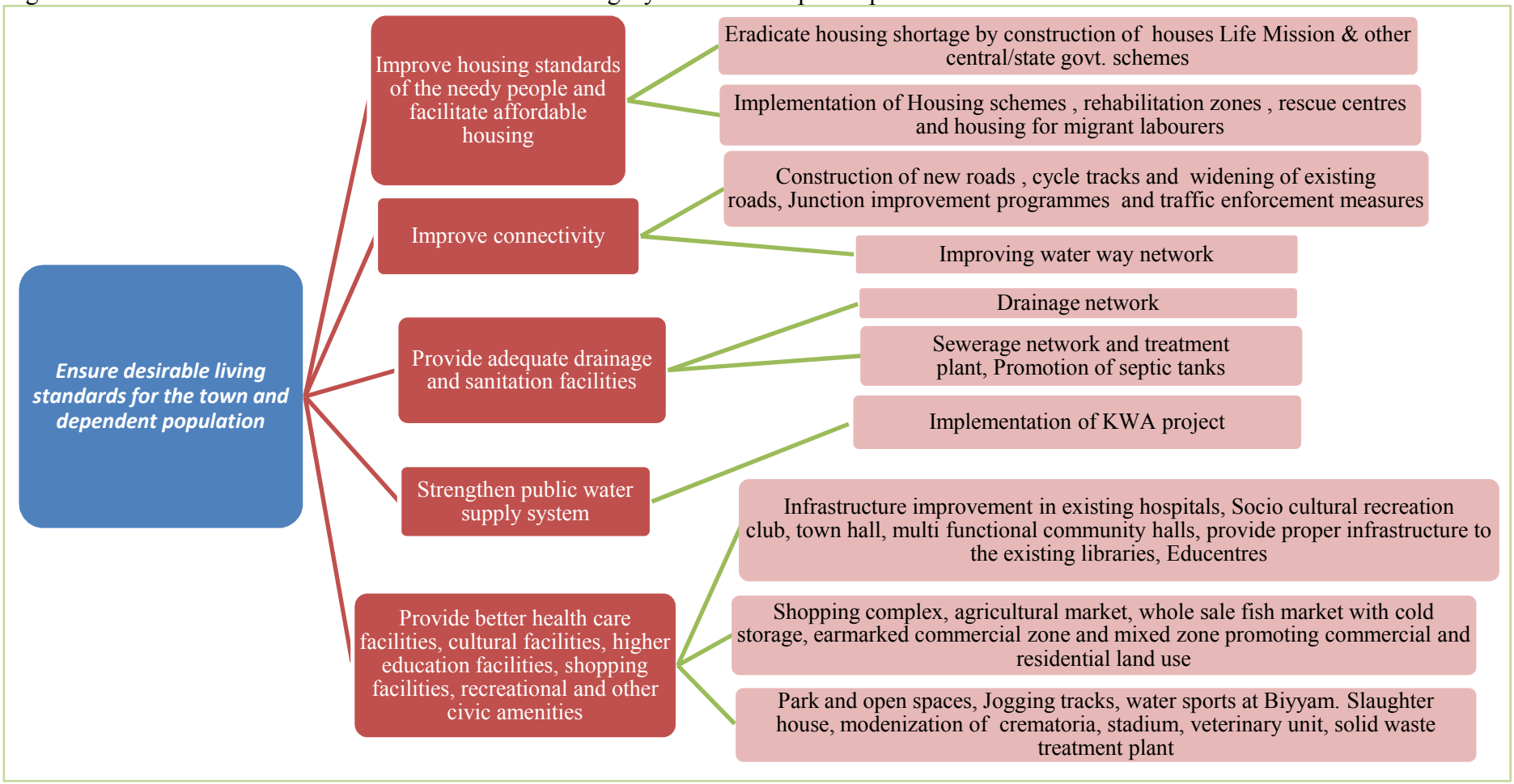
The Government of Kerala has initiated the Muziris Heritage Project to reinstate the historical and cultural significance of the legendary port of Muziris. The Muziris heritage Project utilizes at a global level the possibilities of a region, which lost its glory centuries ago. A heritage tag for the 'Spice Route' is needed as it is essentially a journey through places connected with the State's ancient trade links with the West. The project envisages linking the State, from Thiruvananthapuram to Kasaragod, through the spice route to trigger tourism. The tourism authorities are trying to link Spice Route to the Muziris Heritage Project, focusing on the ancient port town of Kodungalloor as the epicentre of India's spice trade with West Asia and Europe including other ancient trade ports all along the state, including Ponnani.

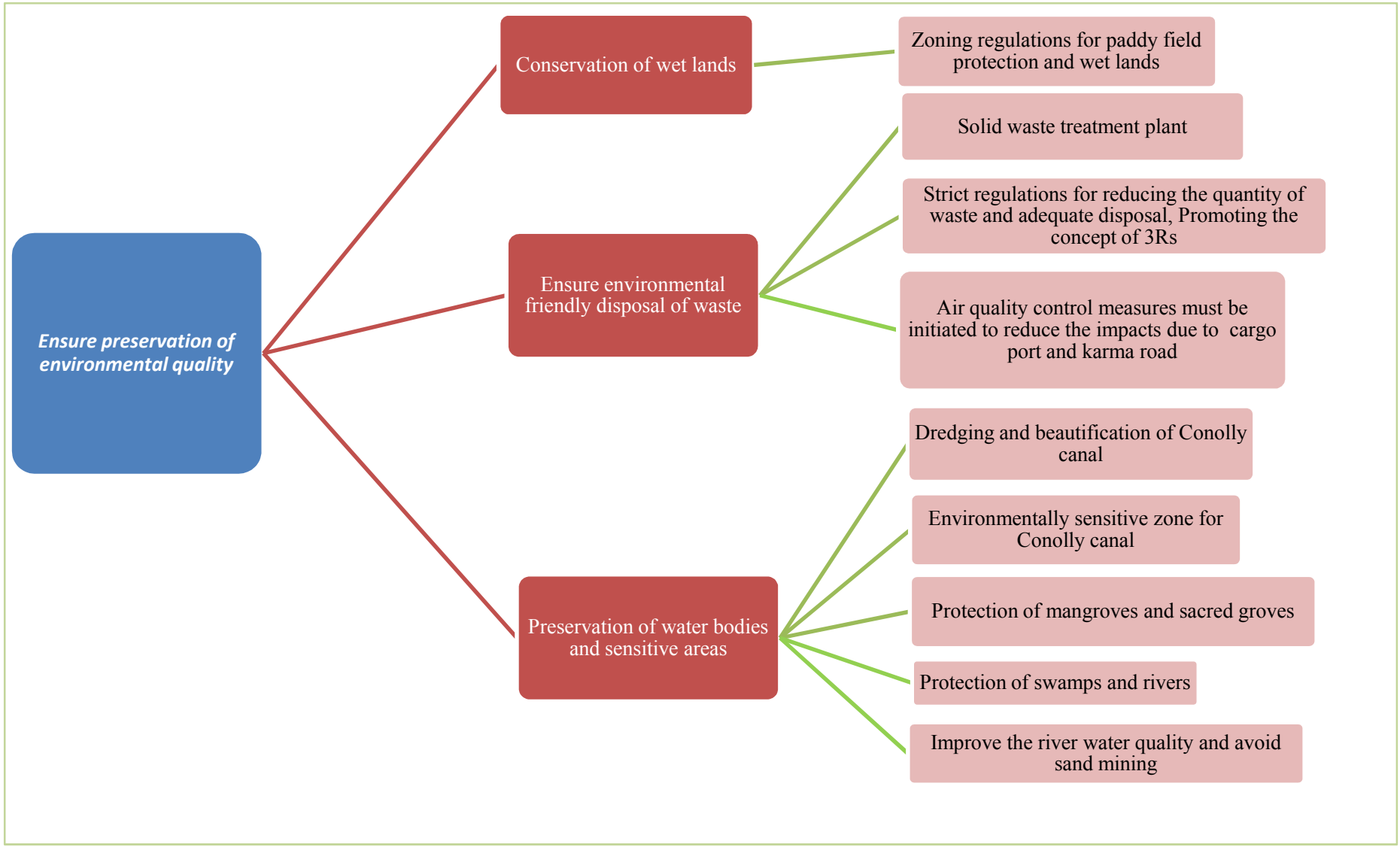
The main objective of the Spice route project is to promote awareness and understanding of the cultural distinctiveness and also conserve cultural assets and safeguard them for the present and future generations. Conservation of Old Ponnani Town, by preserving the physical artefact and cultural value of the existing buildings in this area and conserving various heritage buildings in Ponnani like the Court Complex, Valiya Juma Masjid, Trikkavu Kshethram etc, will be taken care of in this project. This may also include heritage walks through certain pedestrian lanes like JM Road etc.

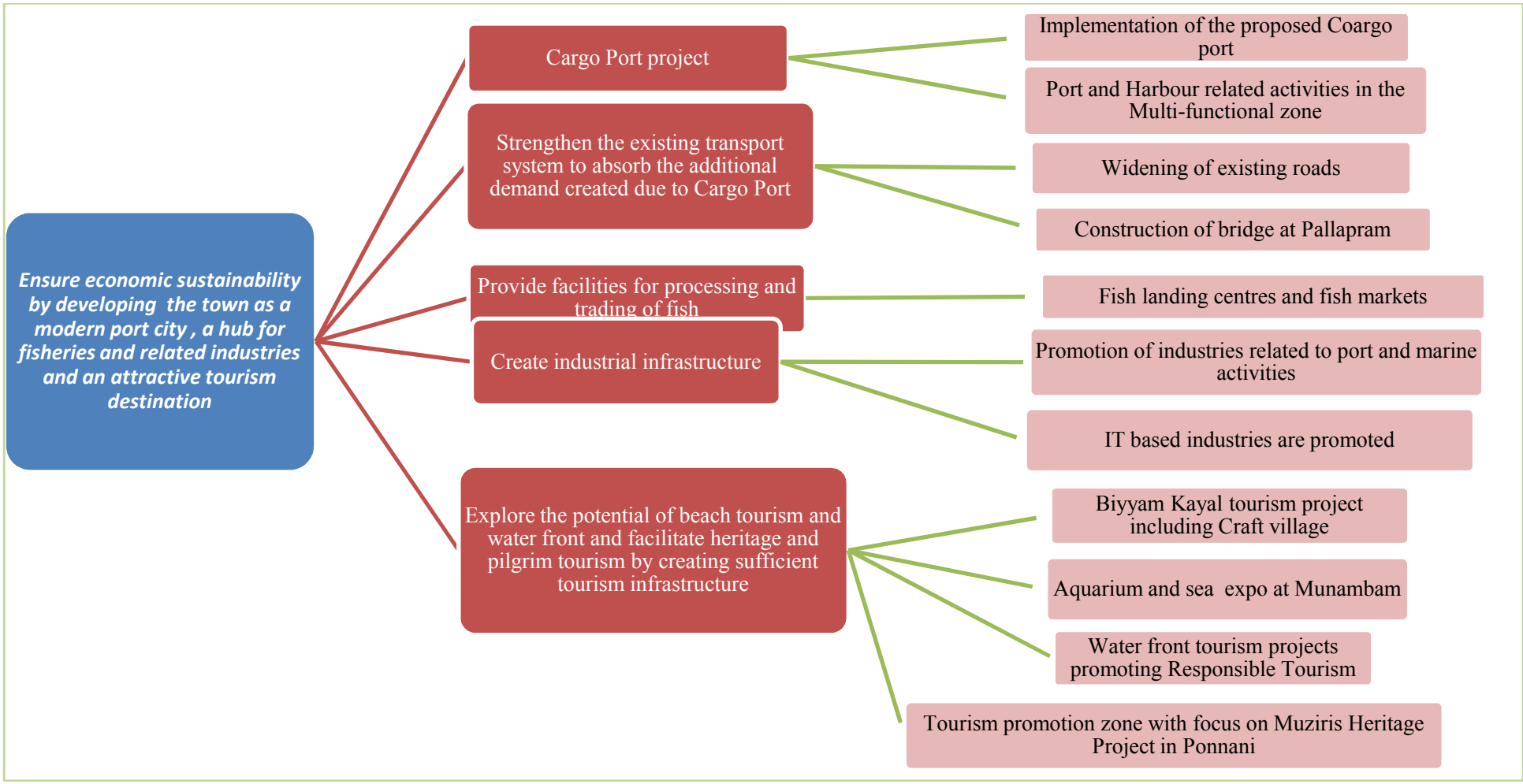
28 GOAL BASED DECISION TREE AND SMART CITY INITIATIVES

28.1 Goal based decision tree

A goal based decision tree is constructed to ensure the integrity of the development plan as follows.




Ensure preservation of environmental quality
Conservation of wet lands
Zoning regulations for paddy field protection and wet lands
Ensure environmental friendly disposal of waste
Solid waste treatment plant
Strict regulations for reducing the quantity of waste and adequate disposal, Promoting the concept of 3Rs
Air quality control measures must be initiated to reduce the impacts due to cargo port and karma road
Preservation of water bodies and sensitive areas
Dredging and beautification of Conolly canal
Environmentally sensitive zone for Conolly canal
Protection of mangroves and sacred groves
Protection of swamps and rivers
Improve the river water quality and avoid sand mining



It can be seen that each objectives has been derived from any of the identified goals and each of the projects proposed has an objective behind it. Various land use policies adopted in the development plan also emanate from the identified objectives. Thus the development plan aims at realizing the development vision formulated for the town.

28.2 **Smart city Initiatives**

Cities become smart while achieving smart economy, smart environment, smart mobility, smart living and smart governance by smart people. It is a combination of sustainable habitat and environmentally sensitive and sustainable development and practice. Treated potable water, clean environment with less waste and proper management, energy efficient systems, healthy environment, smart planning and good governance are all components of a smart city.

While formulating the development concept and deciding the future proposals, the smart city indicators were considered. Smart city can be possible through the smart economy of the city. The potential of the city as a port city, transport corridor, tourist destination and taluk headquarter is utilized to develop the town as a special economic zone in the District. Buffer zones for the major water bodies, coastal area, wet land protection, mangrove preservation, promotion of septic tanks and strict regulations for waste disposal etc proposed in the Master plan will add to the environmental protection and quality. Smart mobility is envisaged to be achieved through strengthening of existing corridors, by providing missing links, ring road, evacuation routes, water way network through Canolly canal, walkways and jogging tracks and by providing adequate traffic enforcement measures. Smart living can be achieved while feeling safety in movement, healthy environment and overall satisfaction in living conditions. Allocation of land uses were made to bring about balance in land utilization by providing ample green space, recreational open space, neighborhood parks, healthcare facilities and other amenities reachable to all. Quality of environment must be ensured by providing proper sanitation facilities including solid and liquid waste management. Incentives are proposed for green energy and green buildings in the Master Plan. Inclusive development of all classes of inhabitants is taken care while zoning the land use. Affordable land can be made available to the economically weaker sections, in low density residential zones. The interactive plot level GIS data base for the town, utility mapping, property tax management system, Management information system, birth registration, death registration, various other registrations, building permit applications, issue of various certificates, utilities management, other service delivery etc. and a enable web GIS with user interface proposed in the Master plan is expected to solve many of the urban governance issues prevailing in the municipality.

29 DISASTER MANAGEMENT

The disaster management part of this Master Plan enforces the following general measures to prevent, mitigate and get prepared for a disaster, respond for a disaster and get recovered from any of the disasters affecting the scheme area.

- A data base of past disasters should be prepared
- Attempt shall be made to identify hazards and to classify the region in to zones based on hazard potential. Hazard Specific Zonation Maps shall be prepared. Measure of the expected losses of people, structures and region and assessment of degree of vulnerability of any given structure/people/region to the impact of the hazard shall be made. These analyses shall be made in consultation with local community so that they should realize the hazards, risks and vulnerabilities in their villages to prepare for reducing the risk.
- Multipurpose Permanent Community Shelters shall be constructed in vulnerable villages with due provisions for accommodating displaced families. These shelters may be used as Community Centers during normalcy.
- Provisions in the Calamity Relief Fund shall be utilized to procure equipments necessary for different departments, subject to need assessment and availability of funds.
- An alternative wireless based communication mechanism shall be introduced for communication from state to districts and from districts to taluks and villages.
- Training and mock drills at regular intervals help in the Capacity building of the community. It is proposed that a Village Disaster Management Plan consisting of local hazard and vulnerability assessment be prepared and executed by the Village Committee at the village level. As part of the plan, Task Forces shall be formed at village or ward level and trained in rescue and relief, first aid, water and sanitation, psychosocial care, early warning, water and sanitation etc.
- The relevant authorities, departments and agencies would ensure precise communication of the impact of disaster and relief measures being taken. The agencies concerned should set up toll free numbers for emergency information assistance and establish help lines for providing, directing and coordinating logistical operations. While providing relevant information and handling enquiries, necessary care will be adopted to prevent panic reactions from the community.

- Disaster situations typically result in an immediate need for food, temporary shelter and protection against incidences of epidemics. The relevant government departments should give priority to ensure sufficient food and water supply, sanitation mechanisms and temporary shelters to the affected population. The Multipurpose Community Centres shall be converted to temporary shelters to accommodate the displaced population. Necessary arrangements to house the affected families separately with sufficient provisions for sanitary facilities and privacy for adolescent girls and ladies shall be made at these centers. Shelters for milch animals shall also be arranged, if necessary.
- The activities in the Post Disaster Phase characteristically involve the harmonized efforts of several government departments and entities. A well structured project implementation unit dispensed with proper authority under State Disaster Management Authority shall be institutionalised for successful implementation and monitoring. Steps would be taken to follow the best practices in the past project management experience of the state and to curb lack of coordination, multiplicity of committees, complexity of composition and lack of accountability of implementing units.
- Land use control will reduce danger of life and property when waters inundate the floodplains and the coastal areas. The number of casualties is related to the population in the area at risk. In areas where people already have built their settlements, measures should be taken to relocate to better sites, to reduce vulnerability. No major development should be permitted in the areas, which are subjected to high flooding. Important facilities like hospitals, schools should be built in safe areas. In urban areas, water holding areas can be created like ponds, lakes or low-lying areas.

These general requirements are to be done in phase with the activities of the disaster management authority of the state. However, urgently Ponnani Town requires the following immediate measures.

- Coastal belt plantation

Green belt plantation along the sea and river coastal line in a scientific interweaving pattern can reduce the effect of the coastal erosion and flooding. Providing a cover through green belt sustains less damage. Forests act as wide buffer zone against strong winds, flash floods and Tsunami attacks. Without forests the cyclones can travel freely inland. The lack of protective forest cover allows water to inundate large areas and cause destruction. With the loss of the

forest cover, each consecutive cyclone can penetrate further inland. Therefore, the buffer area marked in and around the water bodies of the townin the Master Plan should ensure plantation which can prevent erosion and floods.

- Coastal Wall Protection

Adequate engineered structures are to be provided along the sea coast and river coast where ever necessary.

- Hazard mapping and warning centres

Meteorological records of the wind speed and the directions give the probability of the winds in the region. Cyclones can be predicted several days in Advance. Therefore, hazard mapping is very essential for Ponnani Municipality.

- Disaster resistant buildings

The buildings should be constructed on an elevated area in the coastal areas. Highly vulnerable areas should be built on stilts or platform. Good construction practice should be adopted such as:

- A row of planted trees will act as a shield. It reduces the energy.
- Buildings should be wind and water resistant.
- Buildings storing food supplies must be protected against the winds and water.
- Protect river embankments. Communication lines should be installed underground.

- Rescue centers

A rescue center is proposed in the master plan, for the municipality, in the coastal area near the proposed port.

- Evacuation Route

Considering the disaster proneness of the town, an evacuation route has to be identified.

30 GOVERNANCE

The issues in urban governance are almost uniform across the urban LSGs in the state. The weak financial position of the urban LSGs affects the service delivery. Transparency in service delivery is often suffered due to the system of keeping manual registers and avoidance of digitization. Even though sufficient funds are made available by the government under various schemes for the last few decades, the computerization of the operation of the municipality is in a very slow pace. This affects the quality of service and prompts unhealthy, unethical practices and evades transparency.

The problem in assessment and collection of property tax, the main income of the municipality, is very acute. The municipality is only able to collect only 60 % of the tax. Evasions of assessment also do happen and cannot be quantified. With the introduction of the GIS based property tax management system 20 to 30 % increase in tax collection is observed elsewhere.

Besides, unauthorized construction also do come up which are public hazards and drains the municipal revenue. Another issue is lack of information system for planning and implementing development activities and providing various relief measures to the citizens at large. All these issues can be addressed by a properly co-ordinated management information system and property tax management system in a GIS platform with user inter phase and constant updating of the data base.

Therefore, a GIS based system of urban governance shall be put in place in Ponnani Municipality. The first step towards this is creation of an interactive plot level GIS data base for the municipality and training of municipal staff for the usage and updation of the same. In the subsequent phases the municipality shall add various layers and applications to the data base like utility mapping, property tax management system, Management information system, birth registration, death registration, various other registrations, building permit applications, issue of various certificates, utilities management, other service delivery etc. and enable web GIS with user interface. This is expected to solve many of the urban governance issues prevailing in the municipality. The creation of GIS database for Malappuram municipality can be taken as a model project.

31 PLAN IMPLEMENTATION AND MONITORING

31.1 Financial Resources and Planning

The development plan details out land use regulations and development activities to be taken up by the various agencies and stake holders. The projects coming under the scope of the Municipality itself may be financed byother schemes/agencies etc. The following table 31.1 and 31.2 gives broad phasing, approximate costs of the proposed projects, and indicate the implementing agencies. The source of funds for projects indicated as external are various plan schemes of Central /State governments borrowing from lending agencies etc. This will be taken up by the municipality on a case tocase basis.

Table 31.1 Sectoral proposals (Phasing & costing)

Sl. No.	Project	Approximate cost Rs. in Lakhs	Duration (Years)	Source of funds	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Slaughter House	300	4	Own		■	■	■	■															
2	Veterinary hospital with training centre	100	3	Own					■	■	■													
3	Renovation of fish market at Koravalappu	25	1	Own		■																		
4	Centralised fish market with cold storage	200	3	PPP		■	■	■																
5	Fish farms (uncultivated paddy fields & ponds)	25	1	PPP					■															
6	Establishment of fish landing centres	50	1	Own						■														
7	Biodiversity park	30	3	Own	■	■	■																	
8	New Bus stand	1000	3	PPP	■	■	■																	
9	Shopping street	50	1	Own			■																	
10	Junction improvement	1500	5	PWD		■	■	■	■	■														
11	Parking Plaza	1000	3	Own				■	■	■														
12	Engineering measures for Pedestrian safety	50	3	PWD		■	■	■																
13	Augmentation of Water Supply system	6214	5	KWA	■	■	■	■	■															
14	Solid Waste Treatment Plant	50	2	Own			■	■																
15	Integrated sewerage & sewage treatment plant	2000	20	State	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
16	Storm Water Drainage	5000	20	Own	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

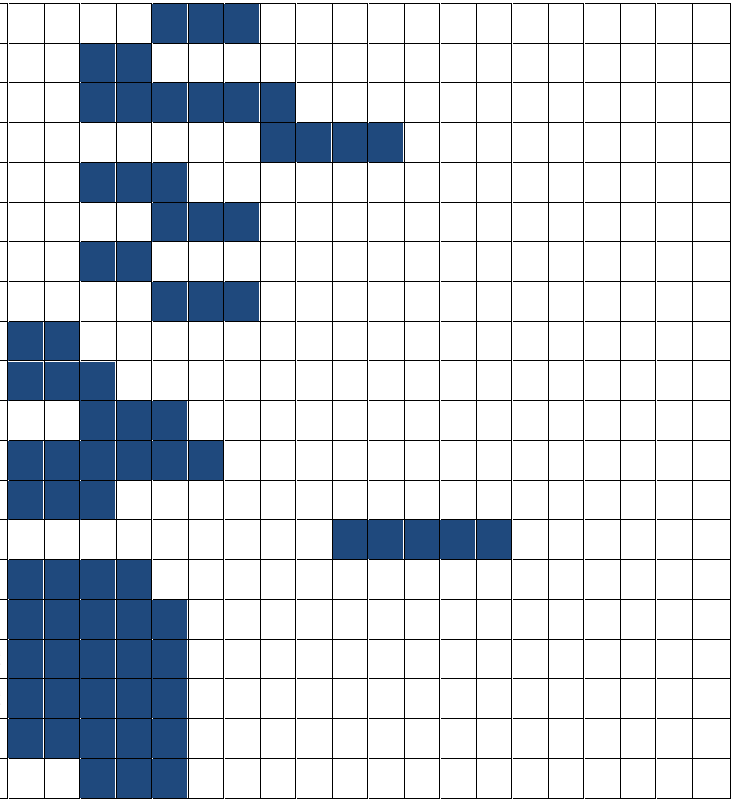
17	Edu centers	400	3	State	
18	Improvement of physical infrastructure in existing hospitals	100	2	State	
19	Implementation of Life Mission project	500	6	State	
20	Govt. quarters	200	4	Own	
21	Recreation centre near Karma road	250	3	State	
22	Aquarium and sea expo	75	3	PPP	
23	Modernization of mini stadium	100	2	Own	
24	Construction of town hall	75	3	Own	
25	Jogging tracks along the sides of Connolly canal	300	2	State	
26	Infrastructural facilities to the existing Crematoriums	300	3	Own	
27	Renovation of Ponds	150	3	Own	
28	Solar powered street lights	80	6	State	
29	Avenue Plantation	100	3	Own	
30	Tourist information centre & star hotel	500	5	PPP	
31	Beautification of Connolly canal	100	4	State	
32	Implementation of cargo port	148800	5	PPP	
33	Construction of Culturalcentre, marine museum	30	5	DTPC	
34	Construction of Ambhi theatre, watch tower at Biyyam Bridge	257	5	DTPC	
35	Construction of Howrah model suspension bridge	2380	5	PWD	
36	Construction of Pookaithakadavu Bridge	50	2	PWD	

Table 31.2 Road proposals

Sl. No.	Major Road Proposals	Length (m)	Existing Width (m)	Proposal / Widening	Proposed Width (m)	Approximate cost Rs. In Lakhs	Source of funds	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	NH Bypass (Pallapram - Anappadi)	952.96	0	Proposed	45	714	NH																				
2	NH Bypass (Anappadi - Puthuponnani) (45 M)	2152.79	30	Widening	45	540	NH																				
3	NH Bypass (CV Junction - Pallaprpam)	2636.16	30	Widening	45	660	NH																				
4	NH Bypass (Gulab Nagar - CV Junction)	3338.03	30	Widening	45	835	NH																				

5	SH 62 - Guruvayur-Ponnani Road	2830.76	21.3	Widening	24	505	PWD	
6	Edappal-Ponnani Road(CV Jn to Cheriyapalam Bridge)	2806.18	11.5	Widening	16	960	PWD	
7	NH 66 Panvel-Kochi (CV Jn - Anappadi)	5580.73	12	Widening	16	1120	NH	
8	Kodathipadi junkar road	457.38	7.5	Widening	16	126	PWD	
9	Harbour Road	119.03	7	Widening	16	47	PWD	
10	Karma Road	539	0	Proposed	16	216	PWD	
11	NH 66 Panvel-Kochi(Gulab Nagar-CV Jn)	3647.2	9.5	Widening	12	882	NH	
12	MLA road	1802.66	6.5	Widening	12	166	PWD	
13	Chandapadi uroob nagar bypass road	3364.51	11.5	Widening	12	807	PWD	
14	Valavu-Kollanpadi Road	1773.29	5.5	Widening	10	272	PWD	
15	Biyyam Regulator cum bridge Road	297.04	6	Widening	10	20	PWD	
16	Nayarangadi-Pulikkakadavu road	1065.8	5.5	Widening	8	116	PWD	
17	Thrikkavu junction -Nayarangadi road	1270.25	6	Widening	8	128	PWD	
18	Neithallur-Lal Centre Road	1969.03	5	Widening	8	230	PWD	
19	Aiswarya Pothannoor Road	1035.97	6	Widening	8	70	PWD	
20	Pookaitha Kadavu Road	1699.01	6.5	Widening	8	30	PWD	
21	Barlikulam substation road	1121.47	5	Widening	8	94	PWD	
22	Life Road	350.31	4.25	Widening	8	34	PWD	

31.2 **Monitoring and review**

Implementation of the Master plan is equally or more importantthan preparation of the Master plan. In order to ensure timelyimplementation of the development plan, a permanent system formonitoring and review is envisaged.

31.3 **Monitoring**

A monitoring committee shall be set up based on the KeralaTown & Country Planning Act, 2016 to review the progress of implementation.

The monitoring committee shall meet as and when required. Thecommittee shall also scrutinize the annual plan proposals of themunicipality for compatibility with the development plan and also makesuggestions regarding projects listed in the development plan that maybe included in the annual plan proposals to the concerned working groups.

31.4 **Review**

The sanctioned Master plan shall be reviewed and a committee shall be constituted for the review of the Master plan as per the provisions of the town planning legislations in force.The committee shall review the implementation of the Master plan, direction of growth, new major investments that have come up in the municipality, financial position of the municipality, adherence to development regulation etc. and shall advice the council regarding maintaining status quo, making minor variations or revision in tote.

32 ZONING REGULATIONS

For the implementation and enforcement of the proposals, zoning regulations are to be made. All zones mentioned in this plan are controlled with appropriate regulation for proper activity distribution at those areas, as detailed in Table 32.1. The following guidelines are to strictly follow, to ensure the planned development of the town.

1. All future development shall be in conformity with the provisions of the Master plan for Ponnani Town.
2. For the implementation and enforcement of the proposals envisaged in the master plan areas have been zoned under various uses such as Residential, Residential Mix, Commercial, Industrial, Public and semi public, Multifunctional, Traffic and Transportation, Park and open space, Wet cultivation, Dry Cultivation, Water bodies, Tourism Promotion, Environmentally sensitive, Water logged areas, Special use zones etc. Details regarding the nature of uses permitted, uses restricted and uses prohibited in each zone are given below. These regulations shall be enforced in conjunction with other specific provisions if any mentioned elsewhere in the plan.

   Uses **'Permitted'** in a zone cover the uses that can be normally accommodated in the relevant zone. Such uses may be permitted by the Secretary, Ponnani Municipality, hereinafter referred to as Secretary. In some cases it may be possible to permit some other uses also, which are not likely to affect the quality and environment in a zone specified for a particular use. Such cases have to be individually studied based on their performance characteristics and special location factors. Such cases which come under this category are classified as "Uses Restricted".

   Uses **Restricted -1** Category deals with the uses that shall be permitted 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 permitted by the Secretary with the concurrence of the Chief Town Planner concerned of the Department of Town and Country Planning.

   "Used prohibited" enlists the various objectionable uses in each zone which shall not be permitted under normal circumstances.

3. If any space in a zone is put to a "**Use Prohibited**" as stated in Para 2, before the sanctioning of the scheme, such use shall be termed as nonconforming use. A non-conforming use may be allowed to continue in its existing location and essential repairs and maintenance for the structure may be permitted by the Secretary, provided that the said use create no adverse environmental influence in the zone. Addition, alteration or reconstruction, if found necessary as part of any mitigation measures may be permitted for such uses by the Secretary with the concurrence of the Chief Town Planner concerned.
4. 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 centreline of the road, unless otherwise specified in the Plan or in any detailed road alignment approved by the Chief Town Planner concerned.
6. The Secretary shall ensure that all constructions and land developments, if any, in paddy lands and wetlands are in conformity with the provisions of the Conservation of Paddy Land and Wet Land Act in force in the state. The applications for land development or building construction in wet cultivation zone shall be considered in accordance with the provisions of the Conservation of Paddy Land and Wet Land Act, in force, in the state and othergovernment orders in the matter.Coastal Regulation Zone Notification will prevail over all the provisions in this Masterplan.
7. 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.
8. Any use not specified either in the 'uses permitted' or 'uses restricted' category of a particular use zone, but which is of a similar nature to any use permitted or restricted in that particular use zone, can be considered by the Secretary, with the concurrence of the Chief Town Planner concerned.

Table 32.1 Zoning regulations

Sl No.	Uses Permitted	Uses Restricted-1	Uses Restricted-2	Uses Prohibited
9	**Residential Zone**			
9.1	Residential buildings consisting of single or multifamily dwellings, residential flats / apartments, residential quarters, night shelters, orphanages, old age homes, Ashram, Mutt, Madrasa. Cottage Industries including coir, Service Industries of non-nuisance Nature (See Annexure-I), with number of workers limited to 10 with power limited to 20 HP Educational institutions essentially serving the needs of residential community such as Day Care, Crèche, Nursery Schools, Kindergartens and schools offering general education (up to High school level). Utility Installations and Civic Amenities essentially serving the needs of residential community such as post office, ATM, police station, telephone exchange, fire station, tot lots, parks, play grounds, water treatment plants below 5 MLD Plant Nurseries, Fish farms, Pump House, Wells and Irrigation Ponds incidental to community needs. Zoological and Botanical Gardens / Bird Sanctuary, Camping Site Transmission Towers, Wireless Stations and Telecommunication Towers Floor area **limited to 300 m^2** Shops, Professional Offices, Commercial Offices, Banks & other Financial Institutions, Restaurants, Canteen, Hotels, Health institutions essentially serving the needs of	Places of Worship Public utility areas and Public Utility buildings Dairy & Dairy Farm, Poultry Farm	Cremation Ground/ Crematorium, Burial Ground/ Common Vault.	Any other uses not specified in column 2, 3 and 4.

	residential community such as dispensaries, clinics (Out Patient), Diagnostic Centres, Community facilities such as Community Halls, Recreational Clubs, Social Welfare Centres, Gymnasium /Yoga Centers, Swimming Pool, Libraries etc.			
9.2	**Provided that the access road has a width of 7m minimum.**			
	Higher Secondary Schools, Hostels and boarding houses. Floor area **limited to 500m^2** Hospitals Floor area **limited to 1000 m^2** Convention Centres/ Auditorium/ Wedding Halls/ Community halls/Exhibition Centres and Art Gallery, Shops/Professional Offices, banking and financial institutions, IT Hardware/ Software units	Government (Local/ State/ Central), Public sector offices. Floor area **limited to 100 m^2** Automobile workshops for two/ three wheelers		
9.3	**Provided that the access road has a width of 10m minimum**			
	Floor area **limited to 2000 m^2** Hospitals, Convention Centres/ Auditorium/ Wedding Halls/ Community halls/Exhibition Centreswith **parking at 1.2 times that of KMBR.** Art Gallery, Shops/Professional Offices, banking and financial institutions, IT Hardware/ Software units.	Parking plazas	Fuel Filling Stations	
10	**Residential Mix Zone**			
10.1	All uses that are permitted in Residential Use Zone Hostels and boarding houses. Automobile workshops for 2/3 wheelers, Service Industries of non-nuisance nature (See Annexure I) engaging not more than 25 workers without power or 15 workers with	Museum, Exhibition centres and art gallery, Places of worship Dairy & Dairy Farm, Poultry Farm	Fuel filling stations	Any other uses not specified in column 2, 3 and 4.

	power limited to 50 HP Local/State/Central Government/Public offices and other related public buildings Taxi/Auto/Jeep Stand			
10.2	**Provided that the access road has a width of 7m minimum**			
	Marble and Granite Storage Centres, Industrial Estates & Industrial Parks Automobile Workshops / Automobile Service Stations for Light Motor Vehicles, Service Industries of Non Nuisance Nature (see Annexure I) engaging not more than 20 workers with power limited to 75 HP. Floor area **limited to 200 m^2** Weigh Bridge, Godowns/ Warehouses/ Storage non-hazardous Floor area **limited to 500 m^2** Diagnostic Centres, Clinics (Out Patient) Floor area **limited to 1000 m^2** Shops, Professional Offices, Commercial Offices/ Establishments, Banking and financial institutions, Restaurants/Canteen, Hotels, IT Hardware/ Software electronic industries, Social Welfare Centres / Movie Halls/ Auditorium/ Wedding Halls/ Community Halls Floor area **limited to 3000m^2** Hospitals			
10.3	**Provided that the access road has a width of 10m minimum**			
	Educational Institutions of Higher Order, Shops, Offices, Markets, Parking plazas Floor area **limited to 800 m^2** Godowns / Ware houses/ Storage (non-hazardous) Floor area **limited to 2000 m^2** Automobile workshops/ Automobile Service stations for Heavy vehicles/	Bus Terminals, Lorry Stands		

	Movie Halls/ Auditorium/ Wedding Halls/ Community Halls Floor area **limited to 5000 m^2** Hospitals & Health centres			
10.4	**Provided that the access road has a width of 16m minimum**			
	Hospitals & Health centres, Movie Halls/Auditorium/Wedding Halls/ Community Halls		Container Terminal	
11	**Commercial Zone**			
11.1	All shops including shopping complexes, shopping malls, multiplex, hypermarkets, restaurants, hotels, markets. Professional offices, commercial offices & establishments, ATMs, banking and financial institutions, IT software units, Movie halls, Auditorium, Wedding Halls, Community Halls, Gymnasium/ Yoga centres Godowns / warehouse / storage of Non-hazardous materials, stacking yards. Cottage industries, automobile workshops, automobile service stations, cold storage, service industries of non-nuisance nature with number of workers limited to 25 without power or 15 workers with power limited to 50HP (See Annexe-I), saw mills, weigh bridges, printing press, IT hardware /software electronic industries, marble and granite storage / cutting centres, Ice plants Expansion of existing residential buildings, Single Family Residences, Residential flats/apartments with lower floor(s) for commercial use only, night shelters, orphanages, old age homes, Dharmasala, hostels and boarding houses, lodges and guest houses, Ashram, Mutts, Madrasa.	Fuel filling stations Saw Mills with Timber Yards Slaughter House Place of worship, Fisheries related industries		Any other uses not specified in column 2, 3 and 4.

	Government (Local /State/Central) or Public Sector Offices Day care, Crèche, Nursery/ Kindergarten, Renovation/Expansion of existing educational institutions Transmission & Telecommunication Towers, Wireless Stations. Social welfare centres, library and reading rooms, exhibition centres, art gallery museum, convention centres Tot lots, Parks & playgrounds, fair grounds, open air theatres, Parking plaza, Transport terminals Plant nursery, Fish farms, Storage of agricultural produces and seeds, Pump House, Wells and Irrigation Ponds Floor area **limited to 3000 m^2** Clinics, diagnostic centres and hospitals			
11.2	**Provided that the access road has a width of 10m minimum**			
	Hospitals & Health centres, Outdoor games stadium.			
12	**Industrial Zone**			
12.1	All industries other than obnoxious and nuisance type industries (Annexure I), 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, IT software/Hardware related industries, Government or Public Sector Offices Godowns/Warehouses/Storage of non-hazardous material, stacking yards, weigh bridge.	Other Public Utility Areas and Public Buildings. Cremation Ground / Crematorium, Burial Ground, Common Vault. Storage of Explosives and Fire Works, Gas Godowns, Crusher Units.	Fuel Filling Stations, obnoxious & nuisance type industries included under Annexure II	Any other uses not specified in column 2, 3 and 4

	Dairy and Dairy Farms, Dairy related Industries, Poultry Farms, Piggery Farm, Smoke House, Fisheries related industries, Ice plants, Dry Cleaning Plants, Power Plants, Sub Stations Transport Terminals incidental to industrial use. Transmission & Telecommunication Towers, Wireless Stations. Residential Uses incidental to the Industrial Use. Any other activity essentially incidental to Industrial use. Tot lots, Parks and Play Grounds attached to incidental residential use.	Sewage Treatment Plants, Dumping Yard. Slaughter House Container Terminals if access width more than 16m minimum.		
13	**Public & Semi Public Zone**			
13.1	Local/State/Central Government/Public Sector Offices and Other Related Public Buildings, Residential buildings incidental to public and semi-public use. Education buildings including Day Care, Crèche, Nursery Schools, Kindergartens, Secondary/Higher Secondary Schools, Technical High Schools, Educational Institutions of Higher Order Hospitals and Health Centres, Parking plazas Public Utility Areas and Buildings, Community Halls, Recreation club, auditorium etc. Places of worship, Tourism Facilitation Centres and related infrastructure, IT software/Hardware related industries Floor area **limited to 200 m^2** Buildings for incidental uses	Cremation Ground / Crematorium, Burial Ground, Common Vault.	Fuel filling stations	Any other uses not specified in column 2, 3 and 4.

14	Multi functional Zone			
14.1	All uses that are permitted in residential use zone, Tourist resorts, Local/State/Central Govt. or Public sector offices. Automobile workshops for 2/3 wheelers, Fisheries based industries, Service Industries of Non-nuisance nature (See Annexure I) engaging not more than 25 workers without power or 15 workers with power limited to 100 HP, Fisheries related industries, ice factory, Cold storage, stacking yards Printing press Parking Plaza, Taxi/Auto/Jeep Stand	Museum, Exhibition centres and art gallery, places of worship, outdoor games stadium	Fuel filling stations	Any other uses not specified in column 2, 3 and 4.
14.2	**Provided that the access road has a width of 7 m minimum**			
	Marble and Granite Storage/ Cutting Centres, Industrial Estates & Industrial Parks Automobile Workshops / Automobile Service Stations for Light Motor Vehicles. Service Industries of Non Nuisance Nature (see annexure I) engaging not more than 30 workers without power or 20 workers with power limited to 150 HP. Floor area **limited to 300 m^2** Weigh Bridge, Godowns/ Warehouses/ Storage non-hazardous Floor area **limited to 1000 m^2** Hospitals and health centres, Diagnostic Centres, Clinics Floor area **limited to 1500 m^2** All Shops including shopping complexes, shopping malls, multiplex, hypermarkets, Professional Offices, Commercial Offices/ Establishments, Banking and financial institutions, Restaurants/ Canteen, Hotels, ITHardware/Software related industries, Social Welfare Centres / Movie Halls/	Automobile service stations- heavy vehicles, saw mills, sewerage treatment plants Floorarea **limitedto 3000m^2** Hospitals and health centres.		

	Auditorium/ Wedding Halls/ Community Halls, Museum, Exhibition centres and Art gallery. Markets of **Plot area limited to 5000 m^2**.			
14.3	**Provided that the access road has a width of 10 m minimum**			
	Secondary/Higher Secondary Schools, Technical High Schools, Educational Institutions of Higher Order, All Shops including shopping complexes, shopping malls, multiplex, hypermarkets, Professional Offices, Commercial Offices/ Establishments, Banking and financial institutions, Restaurants/ Canteen, Hotels, IT Hardware/Software related industries, Markets. Floor area **limited to 2000 m^2** Godowns / Ware houses/ Storage (non-hazardous), Automobile workshops/ Automobile Service stations for Heavy vehicles/ Movie Halls/ Auditorium/ Wedding Halls/ Community Halls Floor area **limited to 5000 m^2** Hospitals & Health centres.	Bus Terminals, Lorry Stands		
14.4	**Provided that the access road has a width of 16 m minimum**			
	Hospitals & Health centres, Movie Halls/ Auditorium/ Wedding Halls/ Community Halls, Godowns / Ware houses/ Storage (non-hazardous)		Container Terminal	
15	**Traffic and Transportation Zone**			
15.1	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, Canteen etc. Staff Quarters, Offices, Night Shelters, Guest Houses etc incidental to the transport terminals Local/State/Central Government/Public Sector Offices and Other Related Public	Public Utility Areas and Buildings Fuel Filling Stations	Container Terminals provided that the access has a minimum width of 16m	Any other uses not specified in column 2, 3 and 4.

	Buildings Parking Plazas, Transmission Towers and Wireless Stations.			
16	**Park & Open Space Zone**			
16.1	Any construction/land development essential for the development/ improvement of open air recreational facilities. Fish Landings, Boat Jetties, Guided Boat Rides, Watch Towers, Eco Walk Ways, Water Sports Facilities, Fair Grounds etc., Side protection works of water bodies. Tot Lots, Park, Play Grounds, Swimming Pools, Open Air Stadium, Open Air Theatre, Zoological and Botanical Garden, Bird Sanctuary, Caravan park	Public Utility Areas and Buildings which will not affect the character of the area. Incidental buildings such as Club, Reading Room, Cafeteria (up to 100m^2) etc. and Water Treatment Plants below 5 MLD, Parking Plazas		Any other uses not specified in column 2, 3 and 4.
17	**Wet Cultivation Zone** **Land development or building construction in wet cultivation zone shall be considered in accordance with the provisions of the Conservation of Paddy Land and Wet Land Act in force in the state and other government orders in the matter.**			
17.1	Paddy cultivation Agriculture/Horticulture/Fodder cultivation, Fish Farms/ Seed Farms/ Pump House/ Wells andIrrigation Ponds without any building construction.	Minor Public Utility areas & Public utility buildings which will not affect the character of the area.		Any other uses not specified in column 2, 3 and 4.
18	**Dry Cultivation Zone**			
18.1	Agriculture, horticulture and fodder cultivation, pastures, grazing ground, and other types of cultivation including social forestry. Dairy Farms, Fish farms, Seed farms, Poultry/piggery farms, Plant nursery,	Cremation ground / crematorium, burial ground, common vault Slaughter Houses	Storage of explosive and fireworks, Gas Godowns, Dumping Yard.	Any other uses not specified in column 2, 3 and 4

	pump house, wells and irrigation ponds. Single Family Residential Buildings, Orphanages, old age homes, Dharmasala, ashrams, mutts, Madrasa, Police Post/Police Station, Post and Telegraph office, Fire Post / Fire station, Telephone Exchange, wireless stations and Telecommunication towers, Parking plazas Zoological and Botanical Gardens / Bird Sanctuary, Camping Site Day Care and Creche, Nursery / Kinder Garten / Primary & Upper primary schools. Cottage industries, Fisheries based Industries, Service industries of non-nuisance Nature (See Annexe -I)engaging not more than 10 workers without power or 15 workers with power limited to 30HP, Automobile workshops for 2/3 Wheelers Tot Lots/Parks/Play Grounds, Saw Mills, Weigh Bridge. Floor area **limited to 200 m^2** Clinics(Outpatient) and diagnostic centres, Shops, professional offices, commercial offices and establishments, banking andfinancial institutions, Gymnasium, Yoga Centres, restaurants, canteens, Library and Reading Rooms, Godowns/ warehouses/ Storage – non hazardous			
18.2	**Provided that the access road has a width of 7m minimum**			
	Floor area **limited to 400 m^2** Clinics(Outpatient) and diagnosticcentres, Shops, professional offices, commercial offices and establishments, banking andfinancial institutions, Gymnasium, Yoga Centres, restaurants, canteens, Library and Reading Rooms, Godowns/ warehouses/ Storage – non hazardous			

	Floor area **limited to 1000 m^2** Auditorium/Wedding Halls/Community halls, Hospitals & Health Centres			
18.3	**Provided that the access road has a width of 10m minimum**			
	Residential buildings consisting of multifamily dwellings, residential flats /apartments, residential quarters, Hostels and boarding houses. Service Industries of Non-nuisance nature (See Annexure I) engaging not more than 25 workers without power or 15 workers with power limited to 100 HP Floor area **limited to 1000 m^2** Shops, professional offices, commercial offices and establishments, banking andfinancial institutions, Gymnasium, Yoga Centres, restaurants, canteens, Library and Reading Rooms, Godowns/ warehouses/ Storage – non hazardous.	Stacking yards, Godowns/ Warehouses/Storage - non hazardous materials, Higher Education Institutions. Floor area **limited to 10000 m^2** Health Care Facilities including Diagnostic Centres, Clinics, Hospitals	Fuel Filling Stations.	
19	**Water bodies**			
19.1	All existing water bodies shall beconserved. Bridges, Side protection walls, Bathing Ghats, Floating jetty etc may be permitted based on community level requirements.			Any other uses not specified in column 2, 3 and 4.
20	**Tourism Promotion Zone**			
20.1	Residences, Home stays, Hostels and Boarding Houses, Restaurants / Canteen/ Resorts/ Hotels, Orphanages / Old Age Homes / Dharmasala, Night Shelters, Guest Houses, Lodges, Movie Halls, Convention Centre Ashram / mutt, Museum, Exhibition Centres and Art Gallery, Open air Theatre, Amusement Parks, Stadium, Fair Ground, Gymnasium / Yoga Centers, Tot Lots/Parks/Play Grounds, Swimming Pools, Cottage Industries Zoological and Botanical Gardens / Bird Sanctuary, Camping Site		Fuel Filling Stations	Any other uses not specified in column 2, 3 and 4.

	Day Care and Creche, Nursery / Kinder Garten, Primary/Upper Primary School Police Post/Police Station, Post and Telegraph office, Fire Post/Fire Station, Telephone Exchange, Library and Reading Rooms Social Welfare centers, Public Utility Areas & Buildings Automobile workshops for 2/3 Wheelers, Auto/Taxi / Jeep Stand Transmission towers, Telecommunication towers and Wireless Station, Parking plazas, Fish landing center Floor area **limited to 700m^2** Retail Shops/Professional offices and other offices, Travel and Tourism Institutions, Bakeries and Confectionaries, Commercial Offices / Establishments, Banking and Financial Institutions Floor area **limited to 1000m^2** Hospitals & Health Centers			
21	**Environmentally Sensitive Zone** **Land development or building construction in this zone shall be considered in accordance with the provisions of the Coastal Regulation Zone notification in force in the state and other government orders in the matter**			
21.1	Residential buildings, Parks and open space, playgrounds, Small services industries of non-nuisance nature (as per Annexure 1) engaging not more than 10 workers with power limited to 30Hp or 20 workers without power, construction of non-hazardous and non-nuisance nature all limited to 2 storeys. Zoological and Botanical gardens, Bird sanctuary, Horticulture, Fish Farms, Seed Farms, Fish landing center, Bathing places, Check dams, Retaining walls, boat jetty, Jogging tracks			Any other uses not specified in column 2, 3 and 4.
22	**Water logged Areas**			
22.1	Bathing places, Check dams, Retaining walls, Zoological and Botanical gardens, Bird sanctuary, Horticulture,	Repair works of existing structures		Any other uses not specified in

	Fish Farms, Seed Farms, Fish landing centers, boat jetty	without increasing the totalfloor area		column 2, 3 and 4.

Special Zones

23	Mangroves	Existing mangroves to be conserved.
24	Crematoriums/ Burial Ground	Existing burial grounds/cemeteries/ crematoriums are included in this zone and modernization/reconstruction/addition to the existing facilities are permitted in these areas. Developments in these zones may be permitted by the Secretary of the LSG with the concurrence of the Chief Town Planner
25	Sewage Treatment Plant	Sewage Treatment Plant and its ancillary facilities is proposed to be constructed in Survey No.224 of Ezhuvathiruthi Village. The detailed lay out design and Detailed Project Report shall be subject to the approval of the Chief Town Planner
26	Proposed port	Exclusively for the construction of port related activities specified in the sanctioned Detailed Project Report
27	Harbour development	Exclusively for the development of harbor related activities specified in the sanctioned Detailed Project Report
28	Bus Stand	Bus stand, Town Hall and Slaughter house are proposed in Survey No.88, 198 &199 of EzhuvathiruthiVillage. Extent of land, excluding the area specified in DPR prepared for the above use, shall be considered as Commercial zone. The detailed layout design and DPR shall be subject to the approval of Chief Town Planner.
29	Rescue center	The area reserved for rescue centre, in Sy No. 60 of Ponnani Nagaram Village, should accommodate facilities as per the guidelines of disaster Management Authority and separate DPR should be provided.
30	Government Quarters	The area reserved in Sy. No. 129 of Ponnani Nagaram village is zoned for Govt. quarters and the detailed lay out design and DPR shall be subject to the approval of the Chief Town Planner.
31	Craft Village	The area reserved in Sy. No. 216 of EzhuvathiruthiVillage is earmarked for Craft village.

32.1 General Guidelines

1. The General Guidelines shall apply to all zones irrespective of the zoning regulations for individual zones.
2. For the purpose of these regulations, floor area means the total floor area of the building on all floors.

3. Subject to zoning regulations of the respective use zones, more than one uses may be combined in a building, provided that the total floor area on all floors of such a building shall not exceed the maximum floor area permitted for major use in that zone.
4. Urban renewal: In pockets where old and dilapidated structures do exist in clusters and which cannot be re-developed in normal course, urban renewal proposals can be considered as per land pooling/plot reorganization techniques, as permitted by the Town Planning legislation in force. The proposals shall be made by all the land owners in the area under consideration jointly.
5. No building shall be constructed (other than that is essential for the bonafide use of the water body under consideration) within 3m from the boundary of any water body of width 3m and where the width of water body is less than 3m this distance shall be reduced to 1m.
6. Incentives for Green buildings and utilization of solar power and other renewable energy may be permitted as per government policies from time to time.
7. Addition/ alteration/ reconstruction of lawfully established non-conforming uses may be allowed, provided that the total area shall not exceed 1.5 times the existing floor area.
8. Expansion of existing public educational and health institutions to adjacent plots shall be permissible without any regard to the land use in which such adjacent plot is zoned and the development regulation imposed by such zoning, except in wet cultivation zone.
9. 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.
10. Fisheries related industries are permitted in areas within a distance of 500m from High Tide Line of Sea irrespective of other Zoning regulations and subject to satisfying the provisions of CRZ Notification.
11. Public and Semi public uses may be permitted any where in the plan area except the zone viz. Park and open spaces, Wet cultivation, Water Body, Water Logged/Marshy Areas and Environmentally Sensitive Zones.

GUIDELINES FOR LARGE SCALE PROJECTS

Large scale development proposals in area not less than 2 ha., exceeding investment of Rs.50 Crores, which provide direct employment (after commissioning) of not less than 500 may be permitted in zones other than wet cultivation zone and park & open space subject to the recommendation of committee to be constituted by the Government for this purpose, under the Chairmanship of the Secretary (Urban Affairs/ Local Self Government Department), consisting of the Chief Town Planner (Planning), State Town and Country Planning Department, the Town Planner, District Office of the Kerala State Town and Country Planning Department being the Convener and the Secretary of Ponnani Municipality and satisfying the following conditions:

a. The developer shall produce project-cum-feasibility report and Environmental Impact Assessment Report, if required, of the Project to the Convener of the Committee, 15 days in advance of the committee meeting.

b. The developer shall produce before the committee all required clearances from the State and Central Government agencies concerned.

c. Adequate provision shall be made for supporting infrastructure such as water supply, sewerage, solid waste management etc. Separate sewage treatment plant and solid waste management measures shall be provided and maintained by the developer at own cost. Adequate Memorandum of Understanding between the developer and the Secretary of the local body concerned shall be undertaken to bring this into effect.

d. Maximum Floor Area Ratio shall be 2 and Minimum Access Width shall be 12 meter.

e. The project shall be completed within a period of 3 years, if not specified otherwise.

12. In land up to depth of 100m, on either side of the road from the edge, having an existing or proposed width of 16m or more, uses listed under Commercial Zone, Residential mix zone may be permitted in Residential zone, Tourism promotion zone and Dry cultivation zone if not allowed otherwise by these zoning regulations.

13. The areas specially demarcated for certain projects as special zones (Bus stand, Sewage treatment plant, Craft village, Government quarters, Rescue centre, Boat jetty, Park and open spaces) are to be acquired by the Municipality within a period of seven years from the date of sanctioning of the Master Plan. If the acquisition proceeding has not been initiated within this stipulated period, these lands may be released and returned to that land use zone

which may be deemed appropriate based on the surrounding land uses and developments, with the concurrence of the Chief Town Planner concerned.

14. Projects implemented by LSG/State/Central Government can be permitted anywhere in the Planning area.
15. Zoning regulation will prevail over the provisions of KMBR.

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 Khandasari for sugar-cane
7. Carrying and preservation of fruits and production of jam, jelly etc.
8. Processing of 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), Pappad.
15. Production of vinegar.
16. Manufacture of soda water, lemonade, mineral water 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,bobbirs etc.
48. Manufacture of wooden utensils, choto 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.
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 chappals.
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 shoesincluding 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, stonedressing, 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 aluminum 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 sewingmachine.
82. Manufacture of electrical machinery and repairing of electric motors armaturewinding 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. Servicing 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 processes 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 andmalts in distillery and brewery.

(3) Production of country liquor and indigenous liquor such as toddy, liquor formmahua, 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 finishedleather.

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 notelsewherespecified (especially sulphurous, sulphuric, nitiric, hydrochloric etc., acids) ammonia, chorine and bleaching powder manufactures.

(16) Manufacture of dyes, paint, colours and varnishers, printing ink.

(17) Manufacture of fertilizers (Specially 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 conversioninto basic forms.

(25) Manufacture including smelting, refining etc., of nonferrous metals and alloys inbasic forms.

(26) Manufacture of Armaments.

X Manufacture of machinery (other than transport) and electrical equipments:

(27) Manufacture of all kinds of battery

XI Quarrying and stone Crusher

XII 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.

(33) Other similar types of nuisance industries.

ANNEXURE III

പൊന്നാനി നഗരസഭ

19.12.2011 ലെ കൗൺസിലിലെ 12-ാം നമ്പർ കൗൺസിൽ തീരുമാനം

അജണ്ട:

12. ഇ2-15958/11 വിഷയം: പൊന്നാനി നഗരസഭ – സാങ്കേതിക വിഭാഗം – പൊന്നാനി മാസ്റ്റർ പ്ലാൻ തയ്യാറാക്കുന്നത് സംബന്ധിച്ച്.

സൂചന: ബഹു: പൊന്നാനി നഗരസഭാ ചെയർപേഴ്സന്റെ 10.10.2011ലെ നിർദ്ദേശം.

പൊന്നാനിക്ക് വേണ്ടി ഒരു നിയമാനുസൃത പ്ലാൻ തയ്യാറാക്കുന്നതിന് ആവശ്യമായ നടപടി സ്വീകരിക്കുവാൻ സൂചന പ്രകാരം നിർദ്ദേശിച്ചിരിക്കുന്നു. മാസ്റ്റർ പ്ലാൻ തയ്യാറാക്കുന്നത് സംബന്ധിച്ച വിഷയം ബഹു: കൗൺസിൽ മുമ്പാകെ.

തീരുമാനം:

മാസ്റ്റർ പ്ലാൻ തയ്യാറാക്കുന്നതിന് വേണ്ട നടപടി സ്വീകരിക്കുവാൻ തീരുമാനിച്ചു.

(ഒപ്പ്)
ചെയർപേഴ്സൺ,
പൊന്നാനി നഗരസഭ.

/ശരിപകർപ്പ്/

സെക്രട്ടറി,
പൊന്നാനി നഗരസഭ.

ANNEXURE IV

LLA Photos





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