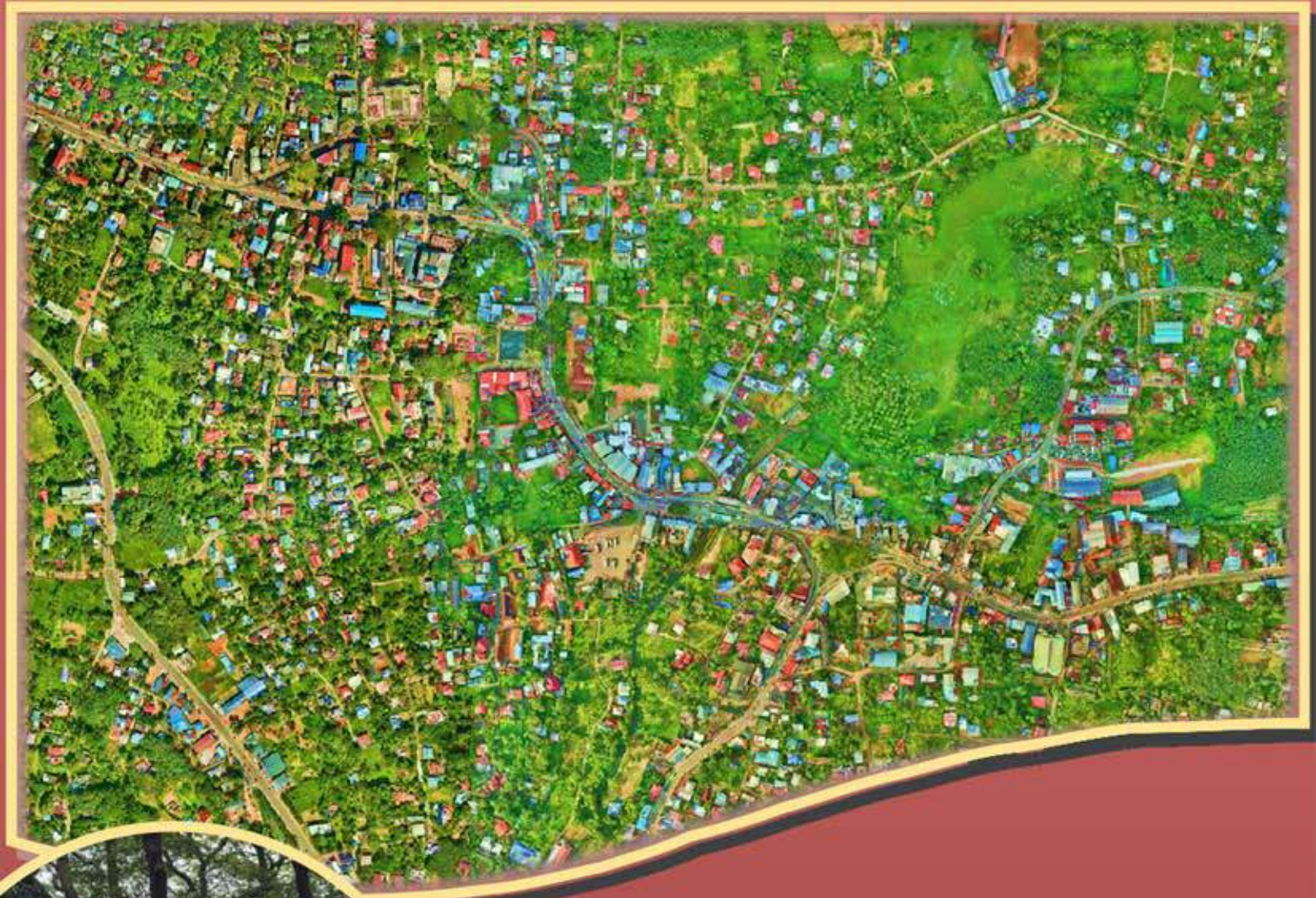



MASTER PLAN FOR ADOOR TOWN 2045

August 2025

LOCAL SELF GOVERNMENT DEPARTMENT PLANNING, PATHANAMTHITTA

&

ADOOR MUNICIPALITY

RISK INFORMED MASTER PLAN FOR ADOOR TOWN 2045



AUGUST –2025

LOCAL SELF GOVERNMENT DEPARTMENT PLANNING, PATHANAMTHITTA
&
ADOOR MUNICIPALITY

FOREWARD

Adoor has always held a unique place in the history and culture of Kerala. Known as a vibrant town with deep-rooted traditions, Adoor has served as a commercial, cultural, and educational hub for the surrounding region. The town is also blessed with rich natural resources, fertile agricultural lands, and a legacy of social and religious harmony. Over the decades, Adoor has grown steadily, adapting to changing times while retaining its distinct identity. Today, Adoor stands at a crucial juncture. Rapid urbanization, increasing population, changing mobility patterns, and new aspirations of the people call for a planned approach to development. The need of the hour is to balance growth with sustainability, enhance infrastructure and services, protect our environment, and create vibrant public spaces that improve the quality of life for every citizen. It is in this context that the preparation of the Adoor Master Plan becomes significant. This plan is not just a document; it is a vision for the future – a roadmap that integrates economic growth, environmental protection, social inclusion, and urban resilience.

I take this opportunity to extend my heartfelt appreciation to the Local Self Government Department (LSGD) Planning for their technical guidance throughout the process. I also sincerely thank my fellow council members of Adoor Municipality for their unwavering support and active participation in shaping this vision. Most importantly, this plan has been enriched by the voices of our people – the local residents, community organizations and all stakeholders who actively engaged with us during consultations. Their inputs and aspirations have been the guiding light in preparing this master plan.

I firmly believe that with the cooperation of all, this plan will not remain on paper but will be translated into action on the ground, leading Adoor towards a future that is sustainable, inclusive, and prosperous.

CHAIRMAN
Adoor Municipality

K Mahesh Kumar
Chairperson
Adoor Municipality

Place: Adoor
Date: 19.9.2025

MUNICIPAL OFFICE • ADOOR •

PREFACE

The preparation of the Adoor Master Plan marks a significant milestone in the planned development of the town. Adoor, with its unique socio-cultural identity, strong commercial base, and strategic location as a transit point to other major urban nodes including the pilgrim centre of Sabarimala, demands a clear vision for its future growth and development.

This Master Plan has been prepared with the objective of guiding Adoor towards becoming a sustainable, resilient, and people-friendly urban centre. The plan lays emphasis on balanced land use, improved mobility, infrastructure upgradation, environmental conservation, and enhancement of open spaces and recreational facilities. Special attention has also been given to disaster risk mitigation, wetland conservation, and urban heat reduction strategies, considering the ecological sensitivity of the region.

The preparation process of the Master Plan involved a series of surveys including land use, transportation, socio-economic, LIDAR mapping, and risk assessments. Equally important were the extensive public consultations, focus group discussions, and reviews with various stakeholders, ensuring that the plan truly reflects the aspirations and needs of the people of Adoor.

The successful implementation of this Master Plan will depend on effective phasing, budgetary prioritisation, and coordinated efforts of the Adoor Municipality, the State Government, and the active participation of citizens. The plan is not merely a statutory document but a roadmap for transforming Adoor into a town that harmonises tradition with modernity.

I would like to appreciate the dedicated efforts of the Adoor Municipality under the Chairmanship of Sri. K Mahesh Kumar. The Master Plan committee constituted for the preparation of the Risk Informed Master Plan for Adoor town has made significant contributions in finalising the proposals.

I also take this opportunity to acknowledge the officials of District office of LSGD Planning Pathanamthitta, under the leadership of Sri. Arun G, Town Planner and Smt. Nimmy Kurian, Deputy Town Planner for their role in the preparation of this document.

I would further like to extend my sincere appreciation to the team members of the Project Implementation Unit of the Program for Results of the Rebuild Kerala Initiative of the Government of Kerala, under the leadership of Sri. P.N. Rajesh, Former Additional Chief Town Planner, for the support and suggestions put forth by them to incorporate risk information in this Master Plan.

I also extend my appreciation to Smt. Salini KM, Town Planner, Smt. Priya N, Assistant Town Planner and the team of officials in the office of the Chief Town Planner for their efforts in coordinating and finalising the Risk Informed Master Plan for Adoor town.

It is my sincere hope that this Master Plan serves as a guiding framework for the holistic and sustainable development of Adoor, ensuring that the town continues to thrive as a hub of commerce, culture, and community.

Asha

Place: Thiruvananthapuram
Date: 27.9.2025

Smt. Asha Ajoy Ghosh
Chief Town Planner (Planning)



ACKNOWLEDGEMENT

The Master Plan for Adoor has been prepared with a forward-looking and risk-informed approach, envisioning the town's development in harmony with its natural environment, socio-economic strengths, and cultural identity. Recognizing the growing urban challenges and the increasing frequency of climate-related risks, the plan integrates strategies for resilience, sustainability, and safety, ensuring that future growth does not compromise the well-being of the community or the ecological balance of the region.

At the core of this plan lies the vision of Adoor as a regional transit hub. Situated strategically with strong road connectivity and proximity to pilgrimage and cultural destinations, Adoor has immense potential to emerge as a nodal point for mobility, commerce, and services. The Master Plan seeks to leverage this locational advantage to strengthen transport infrastructure and create vibrant public spaces that support economic activity while enhancing accessibility for residents and visitors alike. By combining resilience-based planning with the concept of transit-led growth, the Adoor Master Plan sets a framework for a safer, more connected, and prosperous future.

I take this opportunity to express my sincere gratitude to all who have extended their support in the preparation of the Adoor Master Plan. We have also relied on statistical data from various line Departments. Their readiness to share the data is gratefully acknowledged. Special thanks are also due to various line departments, officials, experts, and field staff, whose coordination and technical inputs were critical in refining the proposals.

At the outset, I thank the Adoor Municipal Council under the leadership of Sri. K Mahesh Kumar as well as the Former Chairpersons Sri. D Saji and Smt. Divya Reji Mohammed for their keen interest, guidance, and wholehearted cooperation throughout the process. I am especially grateful to the Special Committee constituted for the Master Plan, whose valuable suggestions and constructive discussions helped in shaping this document meaningfully. The sincere efforts put in by the Secretary and Municipal Engineer also needs special mention here. I extend my heartfelt thanks to the people of Adoor, whose participation, feedback, and aspirations provided the foundation for envisioning the future development of the town in a truly inclusive manner.

I sincerely acknowledge the unique leadership provided by Smt. Asha Ajoy Ghosh Chief Town Planner (Planning), Smt. Salini K.M Town Planner, Smt. Priya N Assistant Town Planner and other staff members of the Office of the Chief Town Planner (Planning) for their guidance, leadership, and constant support throughout the process.

I sincerely thank all the team members of Project Implementation Unit of Program for results of Rebuild Kerala Initiative by the Kerala Government headed by Team leader Sri. P N Rajesh, Former Additional Chief Town Planner, LSGD Planning. The timely advice and efforts of Sri. Ramachandran A, Retired Senior Town Planner & Consultant Town Planner and Sri. Baiju K, Retired Senior Town Planner & Consultant Town Planner and Smt. Rini Chandra Town Planner of the Project Implementation Unit are also remembered with gratitude. I take this opportunity to appreciate all the officials of the Project Implementation Unit for their enthusiastic approach and dedicated effort to complete the work in a time bound manner.

I sincerely appreciate the dedication, efforts and commitment by Smt. Nimmy Kurian, Deputy Town Planner who led the planning team during each of their tenure to shape the plan and to ensure timely completion of the work. Smt. Geetha K First Grade Draftsman, Kum. Ranjusha.V, Geospatial Analyst, Sri. Prashanth A P and Sri. Sharon W G Planner Associates and all the staff members of LSGD Planning, Pathanamthitta need to be specially acknowledged for their keen participation at various stages, without which this work would not have been successfully completed.

The dedication and hardwork of Sri. Anil Kumar P Former Town Planner, Sri. Mohammed Siddik Former Assistant Town Planner, Sri. Anver T.M Former Research Assistant, Kum. Chandralekha S.K former Second Grade Draftsman and Sri. Vishnu M Former Planner Associate was also invaluable in preparing the plan.

With the combined involvement of all these stakeholders, the Adoor Master Plan has taken shape as a collective vision for a planned, sustainable, and vibrant future for the town.

Place : Pathanamthitta
Date : 19.09.2025

Arun G
Town Planner
Pathanamthitta

ARUN. G. B.Tech. M.Plan
Town Planner
LSGD Planning
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PEN No. 431223

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PART I



CHAPTER 1
PROFILE OF THE TOWN AND EARLIER PLANNING EFFORTS

1.1 Background

Kerala, located in the southwestern region of India, is a narrow strip of land bordered by the Arabian Sea to the West and the Western Ghats to the East. Despite its limited geographical expanse, it ranks as the fourth most urbanised state in the country and is witnessing rapid urbanisation. A unique characteristic of Kerala is the absence of a distinct rural–urban divide, unlike most other Indian states. The state is highly susceptible to natural hazards and has experienced several major disasters in recent years, including Cyclone Ockhi in 2017, followed by severe floods and landslides during 2018, 2019, and 2020. The floods of 2018 were the most devastating since 1924, affecting approximately 5.4 million people and revealing significant gaps in disaster preparedness and response mechanisms (Figure 1.1).

In the aftermath of the 2018 floods, the Government of Kerala adopted a forward-looking approach, opting for long-term resilience over conventional recovery and reconstruction. This led to the launch of the Rebuild Kerala Development Program (RKDP), aimed at promoting risk-informed urban planning and development. To integrate risk information into land use planning and enhance disaster resilience while ensuring climate change preparedness, Risk-Informed Master Plans (RIMPs) are being prepared. The methodology for preparing these plans, aligned with the Kerala Town and Country Planning (Amendment) Act, 2021, was notified by the Government vide G.O. (Ms) No. 120/2022/LSGD dated 09.06.2022.



Figure 1.1 Flood 2018 affected villages in Kerala

Source: Kerala State Disaster Management Authority (KSDMA)

During the 2018 floods, Adoor town and its surrounding areas remained largely unaffected and played a critical role as a hub for rescue and relief operations in Pathanamthitta and the Kuttanad region of Alappuzha district. While other towns in the district were cut off, Adoor maintained connectivity with the rest of the state, underscoring its strategic importance. The preparation of the Risk-Informed Master Plan for Adoor was a collaborative initiative involving Adoor Town, LSGD Planning, and the Project Implementation Unit (PIU) under LSGD. The Municipality, in accordance with the Kerala Municipalities Act, 1994, led the process by passing necessary resolutions, forming committees, conducting stakeholder consultations, and finalising the

plan. LSGD Planning provided essential technical support, including data collection, sectoral surveys, stakeholder engagement, and the preparation of reports and maps, in compliance with the Town and Country Planning Act, 2016. PIU contributed through the provision of technical consultants and training for municipal representatives and departmental staff on climate change, disaster risk reduction, and risk-informed planning.

1.2 Introduction

Adoor Municipality was formed on 1st April 1990 as the 47th urban local government of the state. Adoor was a Grama Panchayat till 1990 and many parts of the town, still has rural character. Adoor is the headquarters of Adoor Revenue Division and Adoor Taluk. It is a growing town in the region and recorded comparatively high growth rate in population. A number of new institutions/ establishments including educational institutions, industrial parks, police camp etc. came up in and around the town recently which has accelerated the growth of the town.

Major portion of the town is still under agriculture use and irrigation facilities are available in the town. The town has grown as a trade and service centre and still trade and commerce is one of the major activities of the town. Primary and secondary sectors of the town are not showing much growth. The town that is in transition stage is facing problems associated with change of character from rural to urban. Many of the physical and social infrastructure facilities are inadequate or absent. Being a Revenue Divisional and Taluk headquarters, large numbers of State and central Government offices are functioning in the town along with a number of educational and medical institutions.

1.3 Town at a glance

Adoor, a vibrant town in the Pathanamthitta district of Kerala, is known for its rich cultural heritage, bustling commercial activity, and educational institutions. It serves as a key junction connecting major towns and cities, with well-developed road networks. Adoor is home to several reputed schools, colleges, and healthcare facilities, making it a prominent center for education and medical services. With a mix of traditional and modern elements, Adoor offers a blend of historical significance and contemporary growth, making it a significant hub in Central Travancore.

1.4 Location

Adoor is one of the four urban local governments of Pathanamthitta district and is situated in the south-west part of district. It is situated at the meeting point of two major state highways of the state namely the M.C. Road (SH-01) and the Kayamkulam – Punalur (KP) Road (SH-05). Also, National Highway 183A connecting Kollam to Vandiperiyar passes through Adoor which connects the town with the district headquarters. The geographical location of the town is between 9 degree 8.278 minute & 9 degree 11.486 minute North latitudes and between 76 degree 42.430 minute & 76 deg 46.092 minute East longitudes. The location of the town is shown in Figure 1.2.

The municipality is surrounded by Pandalam Thekkekkara Grama Panchayat in the North, Kodumon Grama Panchayat in the East, Ezhamkulam Grama Panchayat in the South. Erath Grama Panchayat shares boundary with Adoor in the southern and western part while the Palikkal Grama Panchayat is situated in the western part of the town.

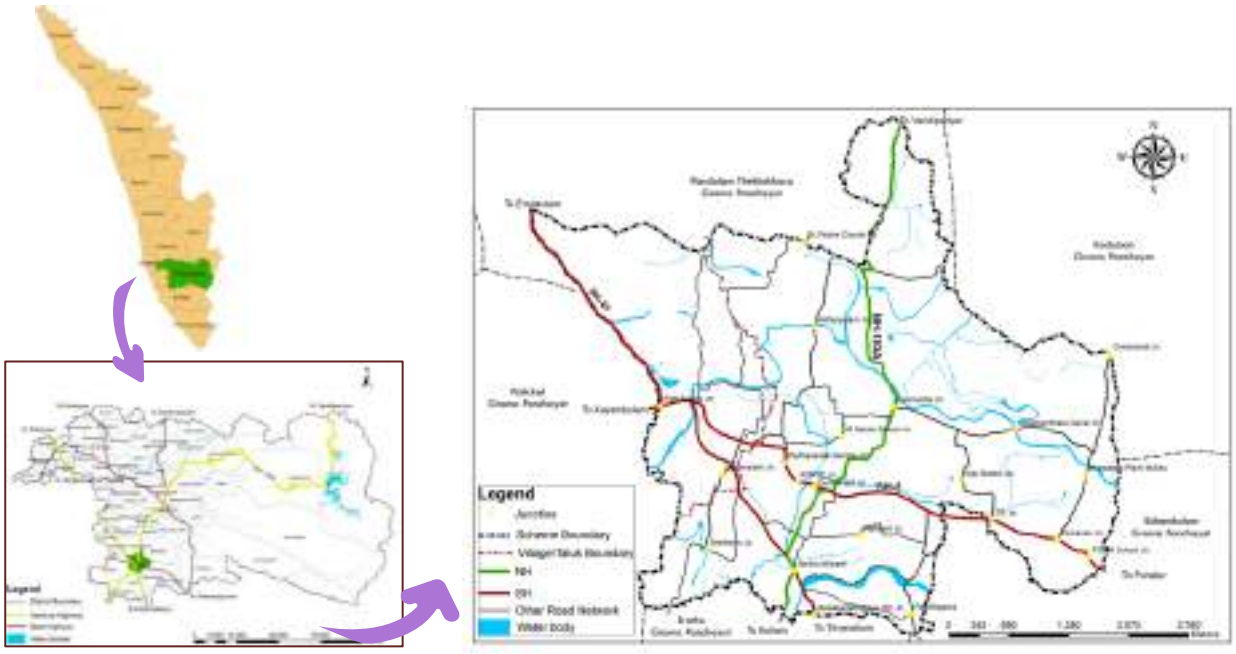


Figure 1.2 Location of Adoor Town

1.5 History

1.5.1 History of Governance



Figure 1.3 Anantharamapuram market

In Sangam Era literature, also there is mention about places adjacent to Adoor like Kodumanom (Kodumon) and Koodalai (Koodal). The name Anandappally was related with 34th Budha saint Anandan and it is mentioned in famous Budha philosophical book 'Lalitha Vistharam'. During the period of Cheras of Mahodayapuram (during 8th and 12th centuries), Adoor was part of self-ruling division of Chengazhoor (Chenneerkkara). Adoor was part of Elayedathu Swaroopam till it was annexed to Travancore by King Marthanda Varma in 1741. As per Thiru-Kochi survey report (1816-1820) by Ward and Corner, Adoor was 5th division among the 8 divisions of Kunnathoor district. Diwan of Travancore Raja Kesavadasan established the Parakode Anantharamapuram Market (Figure 1.3).

Adoor Panchayat was constituted by the Village Panchayat Regulation VIII of 1110 ME. The Panchayat was later reconstituted on basis of the Travancore Panchayat Act.II of 1950 and the reconstituted Panchayat came in existence on 15 th August 1953. Later in 1962 the Panchayat was divided into Adoor and Erath Panchayats. Adoor was part of Kollam district and was the headquarters of Kunnathoor taluk till 1982. Adoor became the headquarters of Adoor taluk of Pathanamthitta district, which was formed in 1982 by carving out portions of erstwhile Kollam and Alappuzha districts. Adoor was also the headquarters of the Adoor revenue division. Adoor became a Municipality in 1st April 1990.

1.5.2 History of Development

Adoor's development progressed gradually, with significant advancements in infrastructure and connectivity. The town's initial development was rooted in agriculture, with surrounding rural areas relying heavily on the fertile land. The construction of the MC Road (Main Central Road) during the 20th century brought increased trade and communication between Adoor and other regions of Kerala, stimulating commercial activities. With the rise of educational institutions, healthcare centers, and a growing small-scale industry sector, Adoor transitioned into a semi-urban area. The establishment of the municipality in 1990 provided the framework for structured urban growth, promoting systematic development in housing, sanitation, and public amenities. More recently, Adoor has focused on enhancing resilience through risk-informed urban planning in response to the challenges posed by climate change and natural disasters.

1.5.3 Socio Cultural History

Adoor has a rich socio-cultural heritage shaped by its diverse communities and traditions. The town is known for its sacred places, including ancient temples and churches, which play a central role in the cultural life of its residents. The Sree Parthasarathy Temple (Figure 1.4) and St. Mary's Orthodox Church (Figure 1.5) are among the prominent religious landmarks.



Figure 1.4 Sree Parthasarathy Temple



Figure 1.5 St. Mary's Orthodox Church

The town is also renowned for its local art forms, including the celebrated Adoor Gajamela and Kathakali performances, which showcase Kerala's vibrant cultural traditions. Over the years, Adoor

has become a melting pot for various cultural practices, as residents from different regions and backgrounds have contributed to the town's vibrant social fabric. Additionally, the town hosts festivals that bring together people from all walks of life, further enriching its social and cultural landscape.

1.6 Earlier Planning efforts

Adoor Town does not have any Master Plans or Detailed Town Planning (DTP) schemes in force. Therefore to ensure planned development of the growing town, the formulation of a Master Plan is essential.

1.7 Regional Setting

Regional linkages play a crucial role in development of social and economic conditions of a town. Adoor is located 15 km South-West of the district headquarters Pathanamthitta and 91 km North of the state capital Thiruvananthapuram. The distance to Adoor from the major towns like Kollam, Kayamkulam, Punalur, Pathanamthitta, Kottayam and Kochi are 40km, 25km, 20km, 20km, 60 km and 130 km respectively. The regional setting of Adoor town is shown in Figure 1.6.

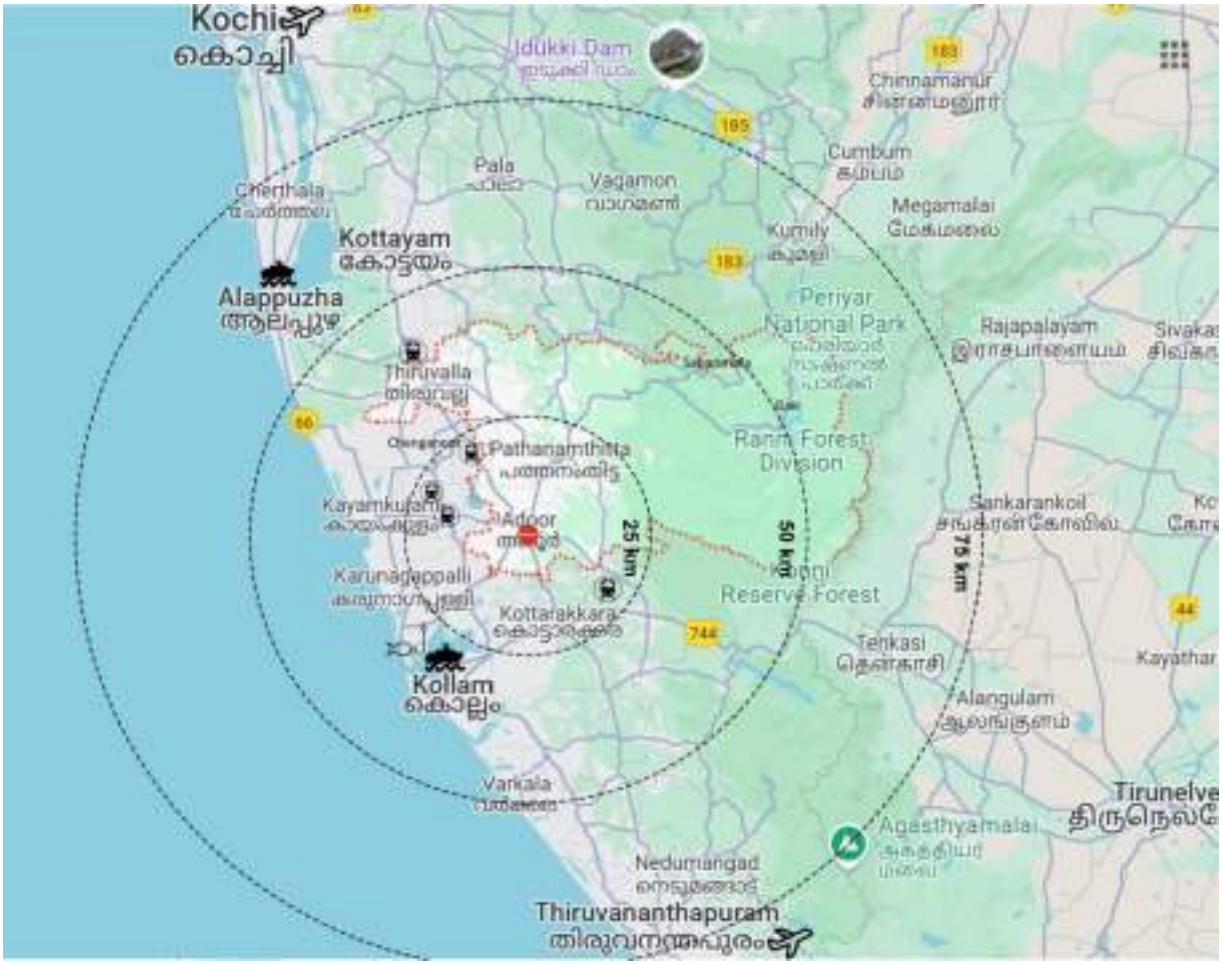


Figure 1.6 Regional Setting and connectivity of Adoor Town

Source: Generated from Google map

Extensive regional setting study has been carried out in connection with the preparation of District Urbanization report of Pathanamthitta in 2010-11. The District Urbanisation report defines the spatial structure of the district which is arrived by integration of hierarchy of settlements, function of settlements and the connectivity between settlements.

1.7.1 Regional Connectivity

Adoor being the center of southern Kerala, has got strong regional connection through highways and modern roads for travel and the shipment of goods. Major State Highways MC Road (SH-01), KP Road (SH-05) and National Highway 183A are passing through Adoor Town. KP Road and NH 183A connects Adoor to Tamil Nadu. The regional connectivity network of Adoor is shown in Figure 1.6.

1.7.1.1 Road Network

Adoor has major road connections to Ernakulam, Thiruvananthapuram, Kayamkulam, Punalur, Pathanamthitta and Kollam. The only means of transport in Adoor is roadways. Adoor has the MC Road (SH-01) passing through it from Angamaly until Thiruvananthapuram. MC road built during the era of the Travancore Dynasty, recently from Kazhakoottam to Adoor was raised to the status of safety road. This is the first safety road project to be built in Kerala. Adoor bypass starts from Nellimutilpadi in Adoor, passes through Moonnalam, and ends at Karuvatta in Adoor.

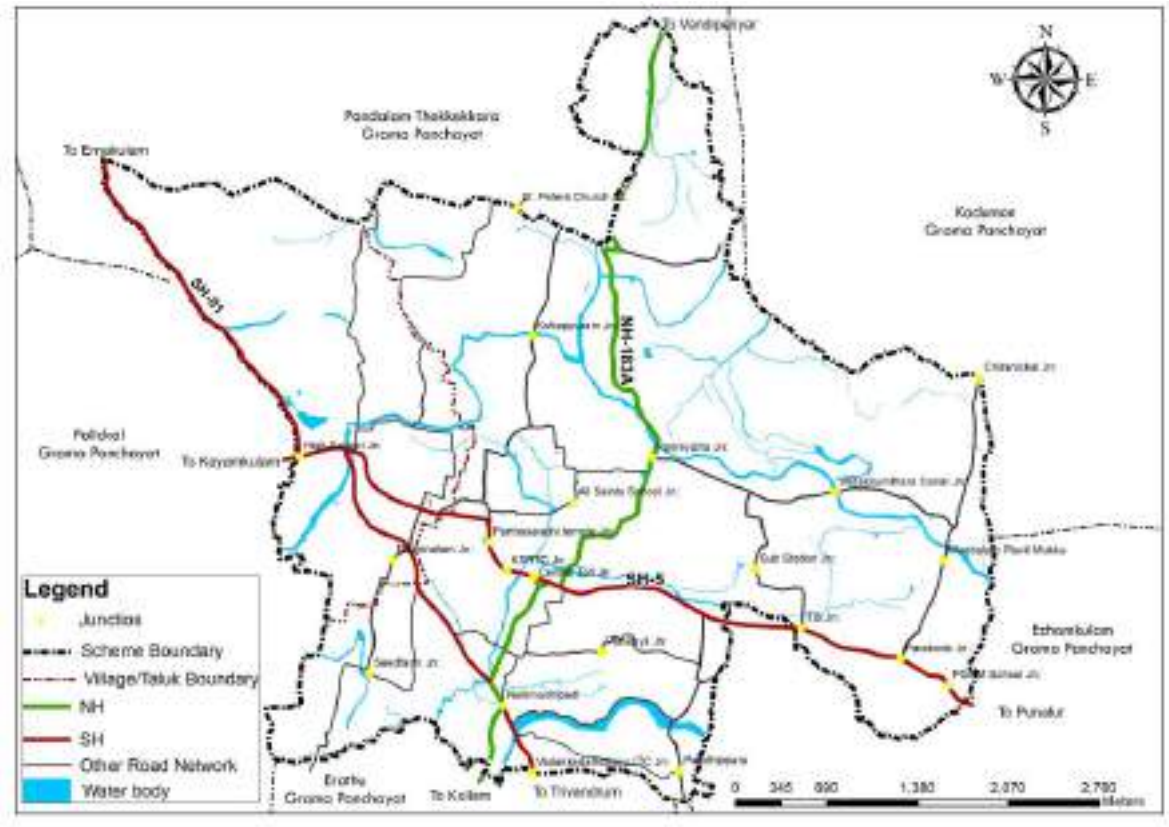


Figure 1.7 Road Network in Adoor Town

The Kayamkulam-Punalur(KP) Road (SH-05) also passes through Adoor making it the centre of Kayamkulam and Punalur. KP Road connects Adoor to various places like Charummood, Pathanapuram. The National Highway 183A, which Starts from Kollam, passes through Adoor, Pathanamthitta towns and ends in Tamil Nadu. The Road Network in Adoor Town is shown in Figure 1.7. Adoor is connected to almost all the Grama Panchayats in the influence region by State Highways / Major District roads. In addition to this, these Panchayats are connected to Adoor by other minor roads also. A good public transport system is available connecting Adoor with these settlements.

1.7.1.2 Railway

Adoor town does not have a direct rail connection. The nearest railway stations are Chengannur (21.3 km), Mavelikkara (21.6 km), Kayamkulam (24 km), and Thiruvalla (35.3 km). Among these, Chengannur Railway Station is often preferred due to its better connectivity to Adoor through frequent bus services and the MC Road. Thiruvalla, however, is the only railway station located within the district. In addition, Kottarakkara Railway Station, situated about 19 km from Adoor, provides connectivity to the Kollam–Shenkottai line extending into Tamil Nadu. The locations of these nearest railway stations are shown in Figure 1.6

1.7.1.3 Air Transport

The nearest airports to Adoor are Trivandrum International Airport, located about 92 km away, and Cochin International Airport, and situated approximately 127 km away. Trivandrum Airport is generally preferred due to its closer proximity and better road connectivity through the MC Road (SH-01), with an average travel time of 2 to 2.5 hours. Although farther, Cochin Airport is also a viable option, offering a wider range of both international and domestic flight services, with a travel time of about 3 to 3.5 hours. The locations of these airports are shown in Figure 1.6

1.7.1.4 Water Transport

Adoor does not have direct water transport access, but the nearest boat terminals are in Alappuzha (55 km) and Kollam (50 km). These locations are part of Kerala's backwater network, offering boat services to nearby destinations. From Alappuzha and Kollam, travelers can reach Adoor by road within 1.5 to 2 hours via buses or taxis. Neendakara Port (60 km) in Kollam district is primarily a fishing port with limited passenger transport options. The locations of the Ports are shown in Figure 1.6.

1.7.2 Hierarchy of Settlements

The hierarchy of settlements in Pathanamthitta as revealed from regional setting study in District Urbanisation report is shown in Figure 1.8. Thiruvalla and Pathanamthitta are the suggested first order settlements. Adoor is a suggested second order settlement along with Pandalam, Mallappally, Ranni and Konni.

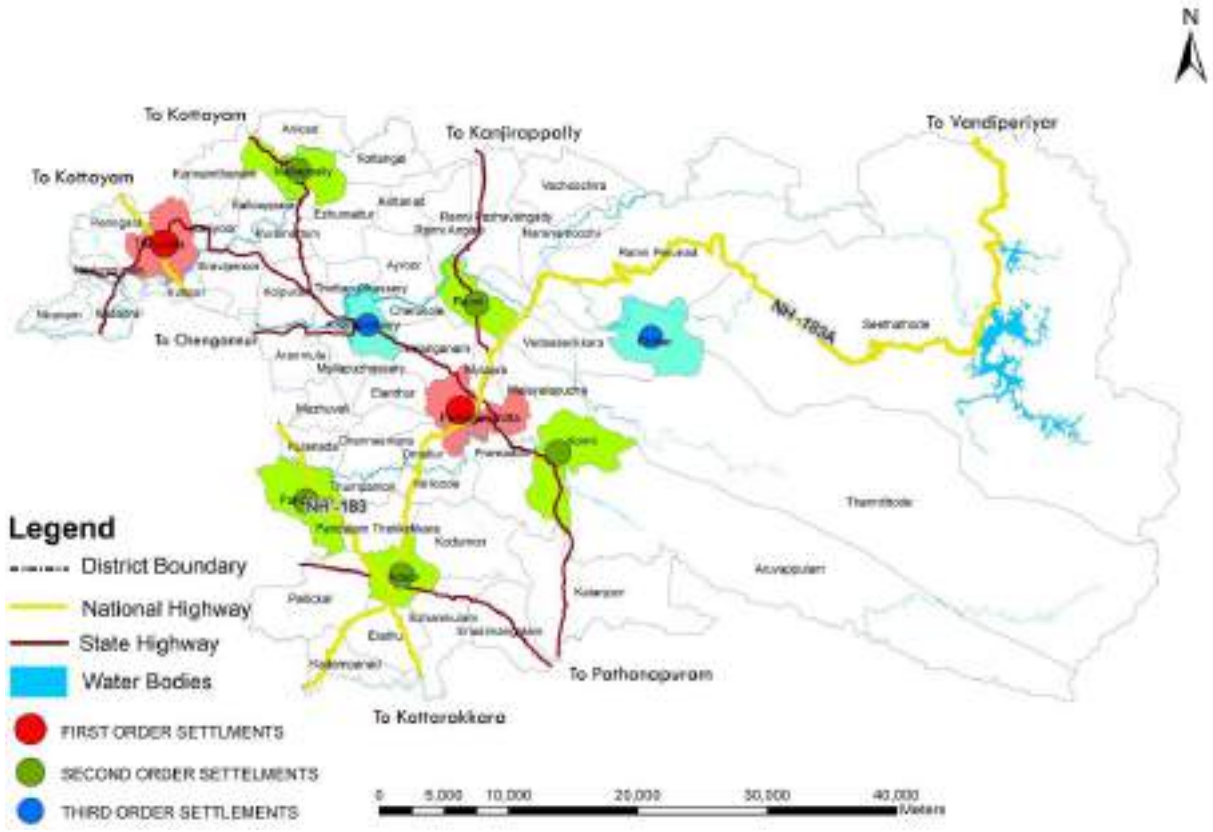


Figure 1.8 Hierarchy of Settlements in Pathanamthitta District

Source: District Urbanisation Report 2010-11

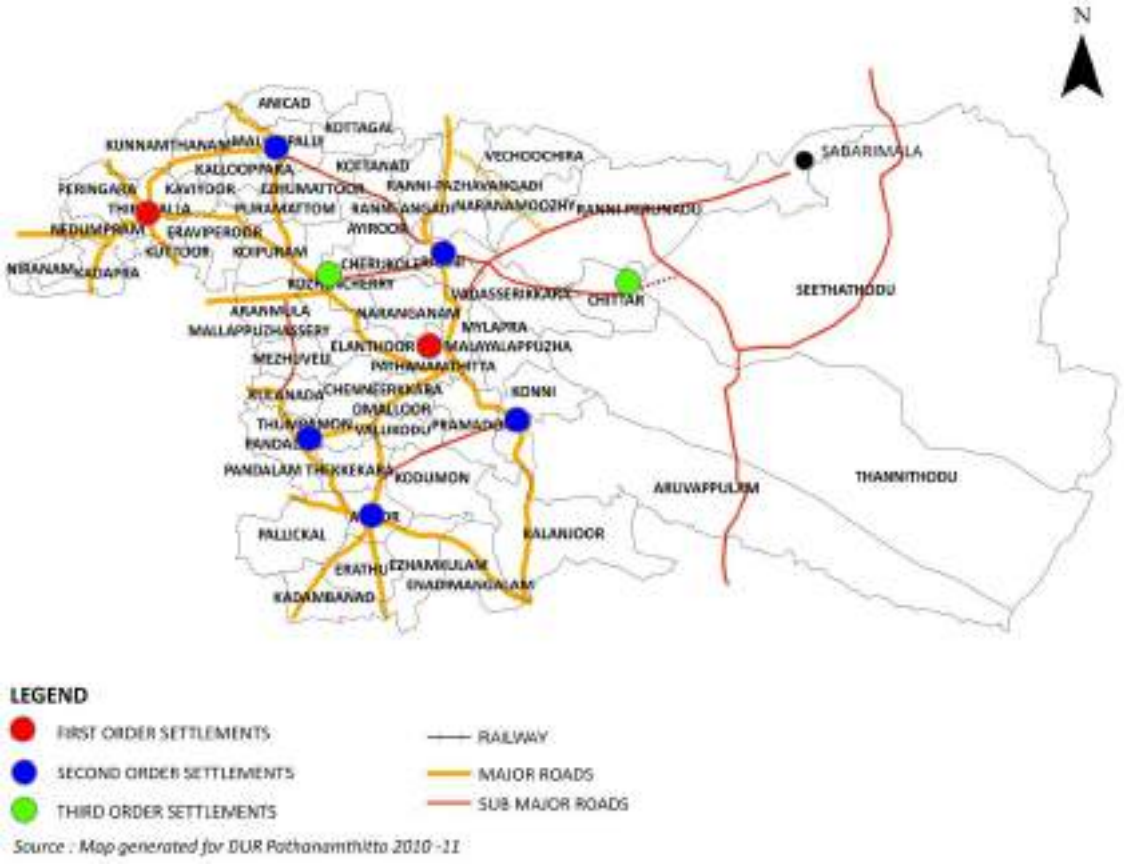


Figure 1.9 Hierarchy of Nodes in Pathanamthitta District

Source: District Urbanisation Report 2010-11

1.7.3 Hierarchy of Nodes

A node is formed by the agglomeration of commercial activity around one or more adjacent road junctions. The hierarchy of node is identified by the extent of activity taking place in the node. As per District Urbanisation Report, Adoor is a second order node of the district acting as a Commercial Center serving the district. Figure 1.9 shows the Hierarchy of Nodes of Pathanamthitta district

1.7.4 Spatial Role in the District

Adoor town influences surrounding Grama Panchayats in many ways. Adoor is the headquarters of Adoor taluk and Adoor Revenue Division. A large number of State and Central Government offices are functioning in Adoor. For the administrative needs, people from the entire Taluk are depending Adoor town. Also Adoor act as a major trade and commerce centre for the Eastern region of the District. The Activity pattern of Pathanamthitta district is shown in Figure 1.10. In this study, Agriculture, Animal husbandry and small scale industrial activities are the important activities of Adoor town.

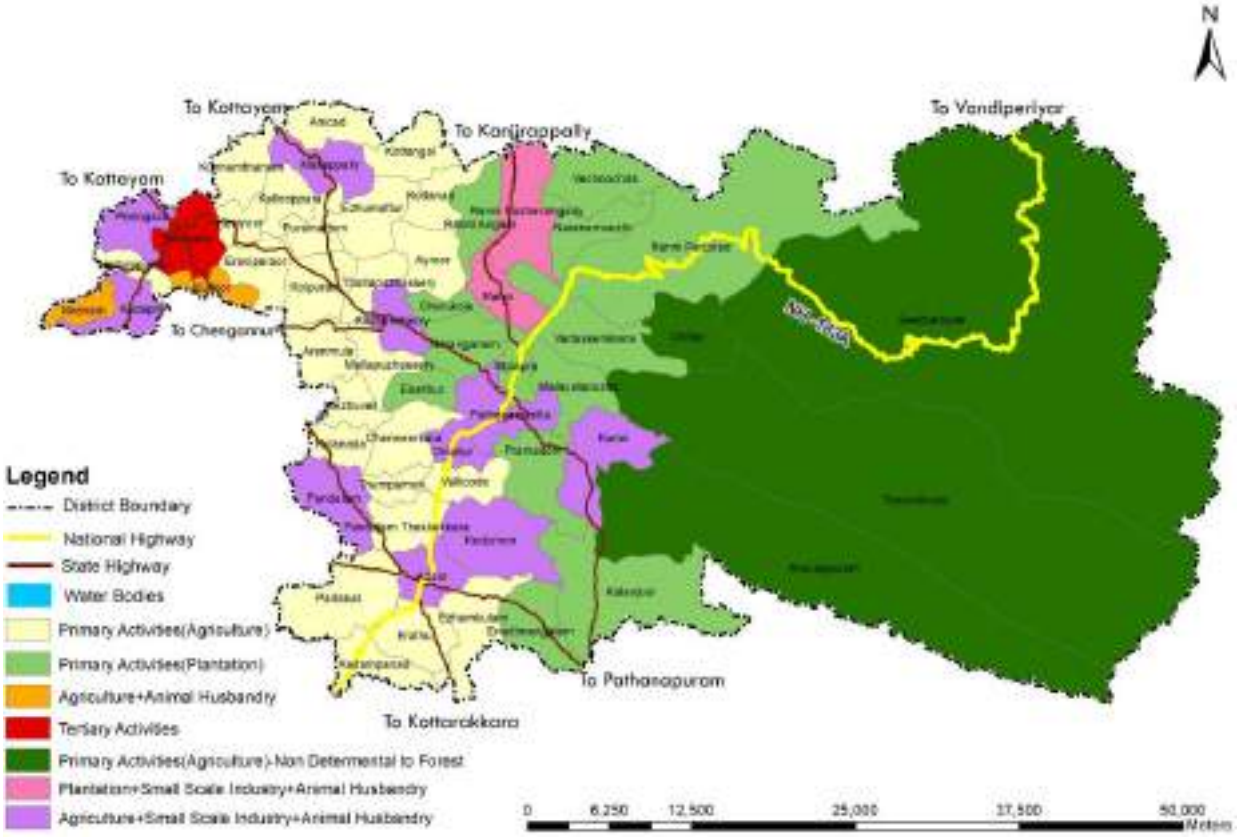


Figure 1.10 Activity Pattern in Pathanamthitta District

Source: District Urbanisation Report 2010-11

The spatial distribution of the settlements based on its character shows a clear demarcation in the pattern of the settlements into Urban, Semi Urban, Semi Rural and Rural. Adoor Town shows Rural character. The functional character of the district is shown in Figure 1.11.

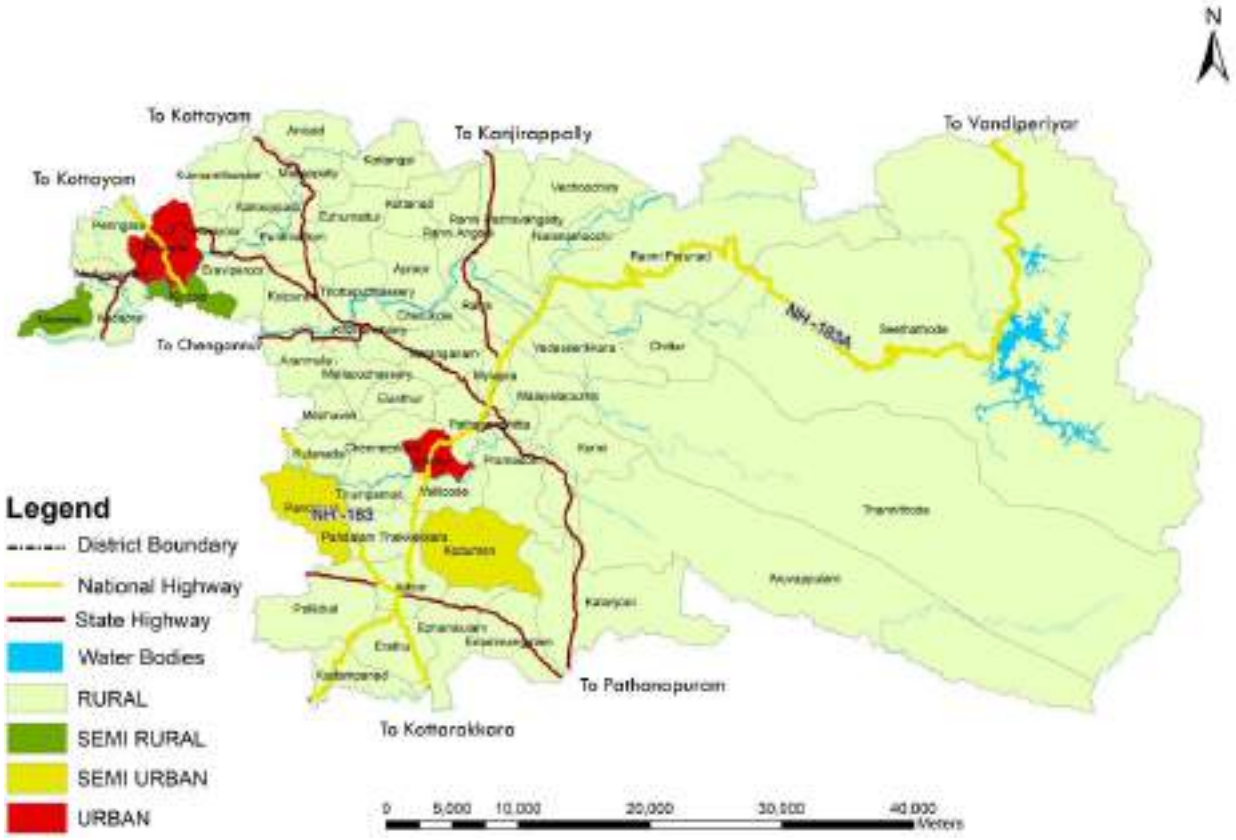


Figure 1.11 Functional Characters of Settlements in Pathanamthitta District

Source: District Urbanisation Report 2010-11

Parakode Anantharamapuram market is the major whole sale market of the region. Adoor taluk and part of the adjacent taluks, viz Kozhencherry, Mavelikkara and Kunnathoor come under the influence of Anantharamapuram market. Other commercial establishments of the town also attract people from entire taluk. Many of the rural roads from the surrounding area end at Adoor town. Also because of its location at the meeting point of two major state and a National Highway, Adoor is a regional transportation node and large number of KSRTC and Private Buses passes through Adoor town. Hence the town is meeting the travel demand of the taluk. Large numbers of educational institutions including higher education centers are functioning in and around Adoor town. Students from the surrounding areas and even from other districts depend on Adoor for higher education institutions. A General Hospital is functioning at Adoor. A few major hospitals in private sector are also functioning in Adoor and its immediate surroundings. For medical and educational purposes, people from entire Adoor taluk and even beyond depend on Adoor town.

Considering the above facts, Adoor taluk has been considered as the influence area of Adoor town. 9 Grama Panchayats and a municipality- Pandalam(M), Pandalam Thekkekara, Thumpamon, Enadimangalam, Erath, Ezhamkulam, Kadambanad, Kalanjoor, Kodumon and Pallikkal gramapanchayats are coming under the influence area. The influence area of the town is shown in

Figure 1.12. Total extent of the influence area is 321.22 sq.km and total population as per 2011 census is 303065.



Figure 1.12 Influence area of Adoor town in the district

The population growth rate of the region is shown in Figure 1.13. The LSGIs in the Western region are showing positive growth rate and the population growth rate is negative towards East. Towards Eastern side of the district, there are forests and the urban regions as well as better connectivity are towards west.

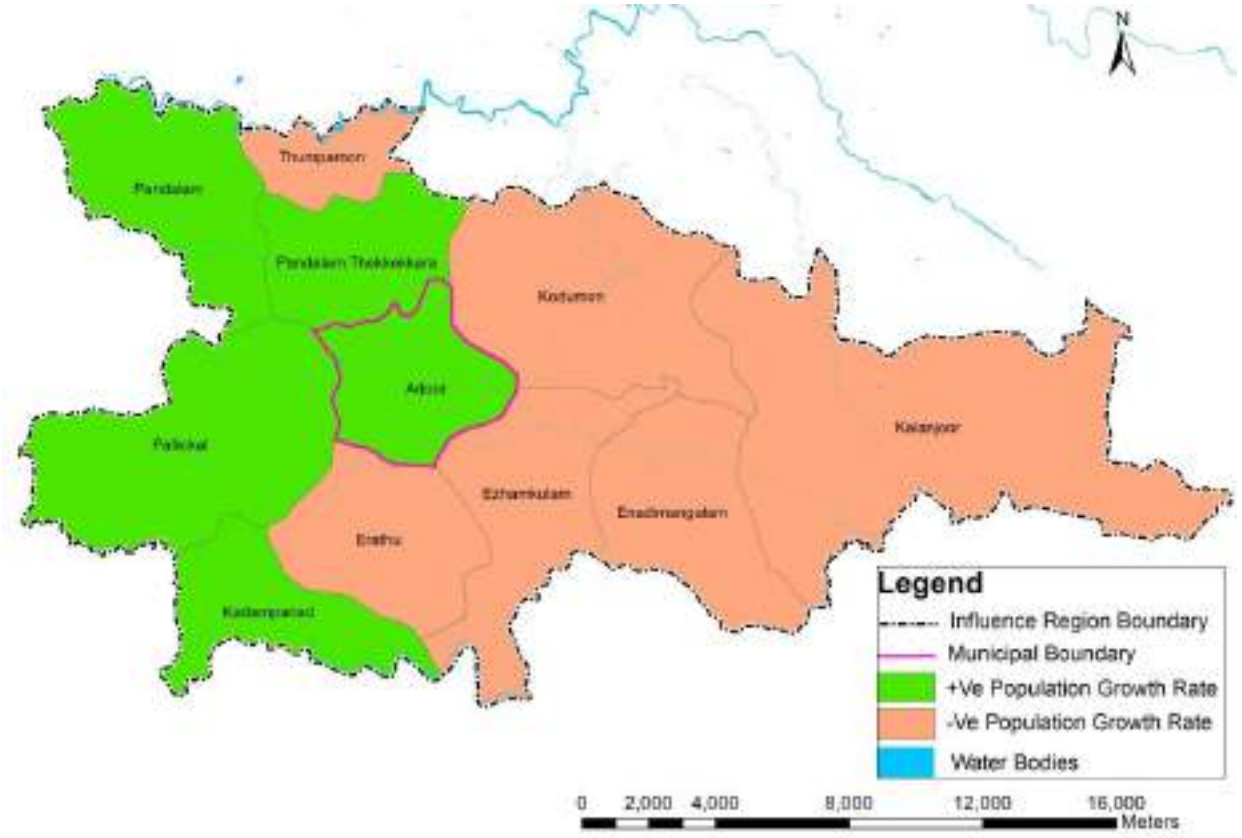


Figure 1.13 Population growth rate in Influence area

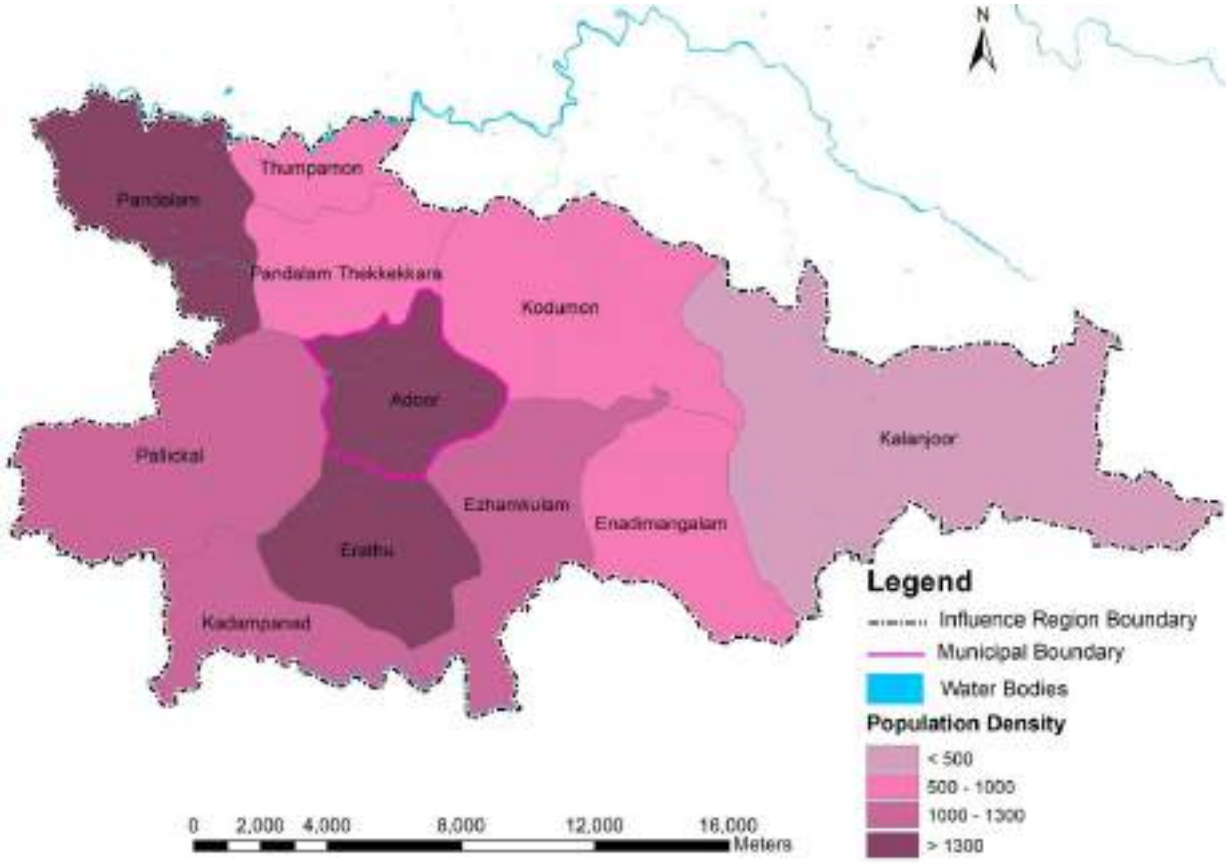


Figure 1.14 Population Density of influence area

Source: District Urbanisation Report 2010-11

The population density of the region is shown in Figure 1.14. Adoor and Pandalam Municipal towns along with neighboring Erath Grama panchayat have higher population density where as other adjacent settlements has lesser density of population. Public infrastructure facilities are almost distributed in all constituent local bodies with some concentration in Adoor and Pandalam Municipality. Facilities like Primary Health Centre, Ayurvedic and Homeo medical centers and educational facilities like L.P.School, U.P.School, and High School etc. are available in all constituent LSGIs of the region. Markets and banking facilities are also available in all LSGIs. Higher order facilities are almost equally available in Adoor and Pandalam municipality with slightly more facilities at Adoor. But Adoor being in the central part of the region, the constituent Grama Panchayats of the region has more dependency on Adoor.

The development scenario shall govern the Planning Area of a Master Plan. The regional setting study has been resorted for delineation of planning area. Planning Area has been delineated by studying the character of the influence region. The functional character of the influence region is shown in Figure 1.15. From the above figure, it is clear that none of the adjacent Grama Panchayats in influence region is showing an urban character and they are predominantly rural. But certain wards of the neighboring local governments outside the municipal limit exhibits a continuum of physical development with the character of Adoor town. But these areas being small and other

Municipal areas are ignored and the planning area is taken as Adoor Municipal area itself. But the above said areas which show continuous physical growth of the town can be considered for inclusion in the Municipal limit in the later stage.

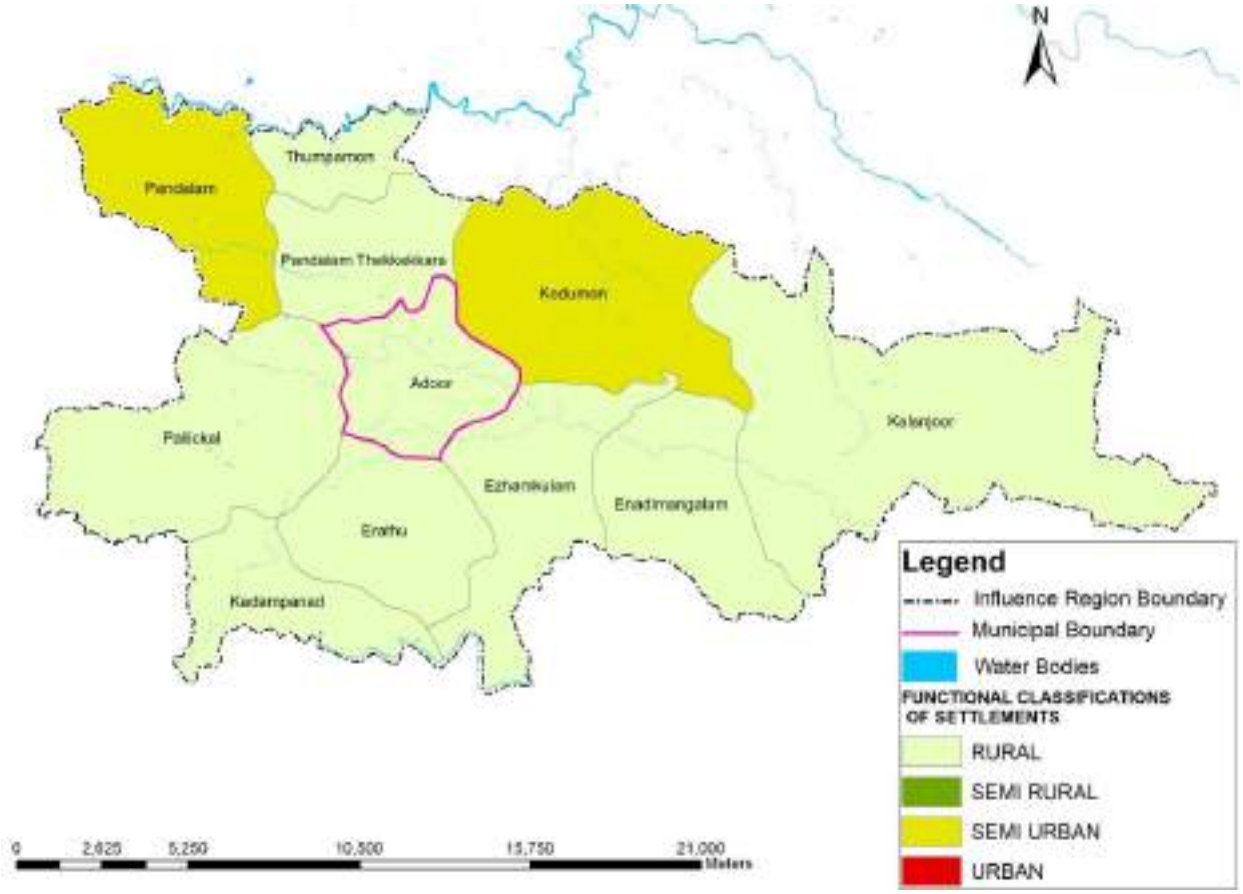


Figure 1.15 Functional Characters of influence area

Source: District Urbanisation Report 2010-11

1.7.5 Area and Administrative Divisions

Adoor Town extends over an area of 20.82 Sq.Km. Adoor Municipal Town falls in Adoor and Peringanad villages of Adoor Taluk in Pathanamthitta District. Adoor is the Headquarters of Adoor Revenue Sub Division and Adoor Taluk . There are 28 wards in the Municipality. Taluk, village and ward boundaries are shown in Figure 1.16 and Figure 1.17.

1.7.6 Population size

The population of Adoor town as per 2011 census was 29,171. It was 18,907 as per 1961 census and there after showing a steady increase.

1.8 Climate

Adoor has a tropical climate and it is characterized by hot summer and fairly good rainfall. The season varies like: dry weather from December to February, hot weather from March to May, south-west mansoon from June to September and north-east mansoon from October to November.

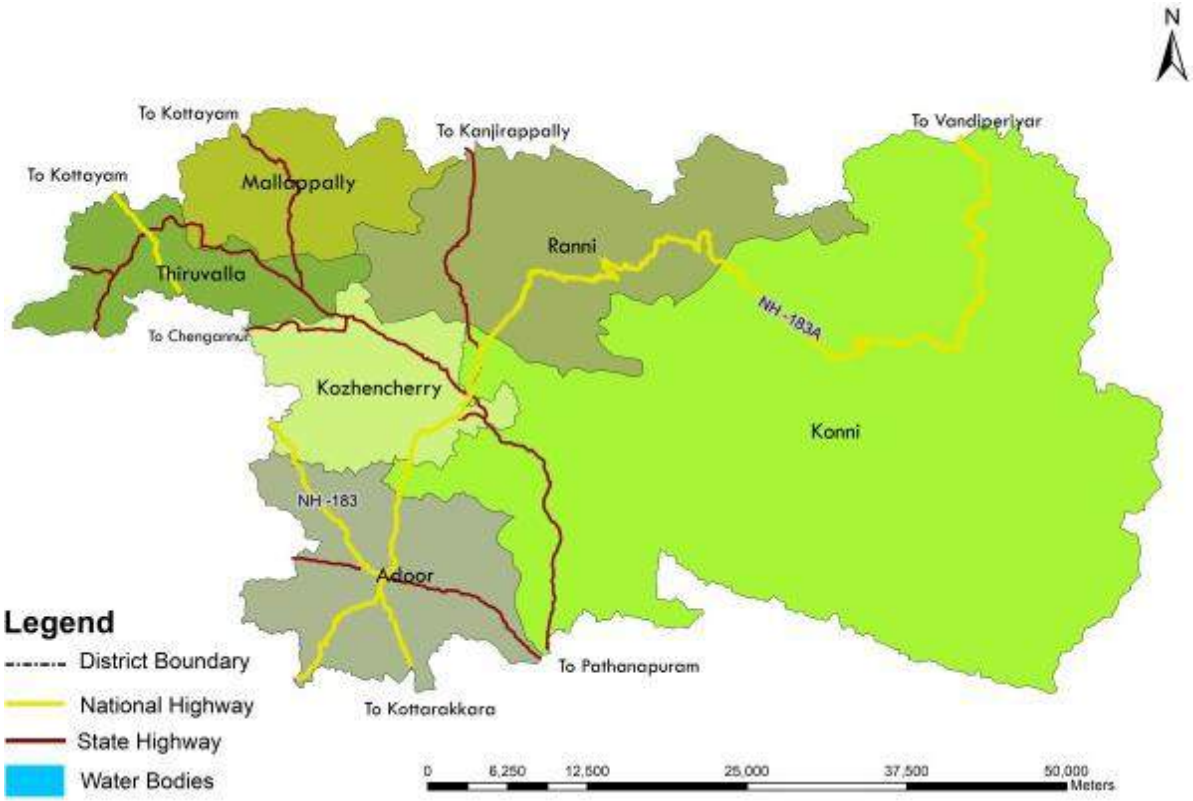


Figure 1.16 Adoor Taluk in Pathanamthitta District



Figure 1.17 Village and Ward Boundaries in town.

According to the information from the Central Meteorological Department and Local Action Plan on Climate Change (LAPCC) report, the details of the average annual rainfall in the Adoor municipality from 1992 to 2021 are given in Figure 1.18. Adoor experiences a tropical monsoon climate, with distinct wet and dry seasons. The town enjoys abundant rainfall, primarily during the southwest monsoon (June to September), which supports its lush vegetation and agricultural activities. The dry season lasts from December to February, with moderate temperatures throughout the year. Just as people evaluated it in the Focus Group discussion and others, it is understood that huge variations occurred in the amount of rainfall in the past years. On an average, the rainfall measures around 3000 millimeters/year. The highest amount of rainfall during the period from 1992 to 2021 was received in the year 2021. This increased and unexpected rainfall causes flash flooding in some parts of the municipality. The temperature of the area varies from 15.7^{0}C to 36.20^{0}C. The highest percentage of mean relative humidity is above 90 in the month of June and July and the lowest percentage of mean humidity is below 45 in the month of February. The temperature and humidity relatively increased in the past years as per the LAPCC report.

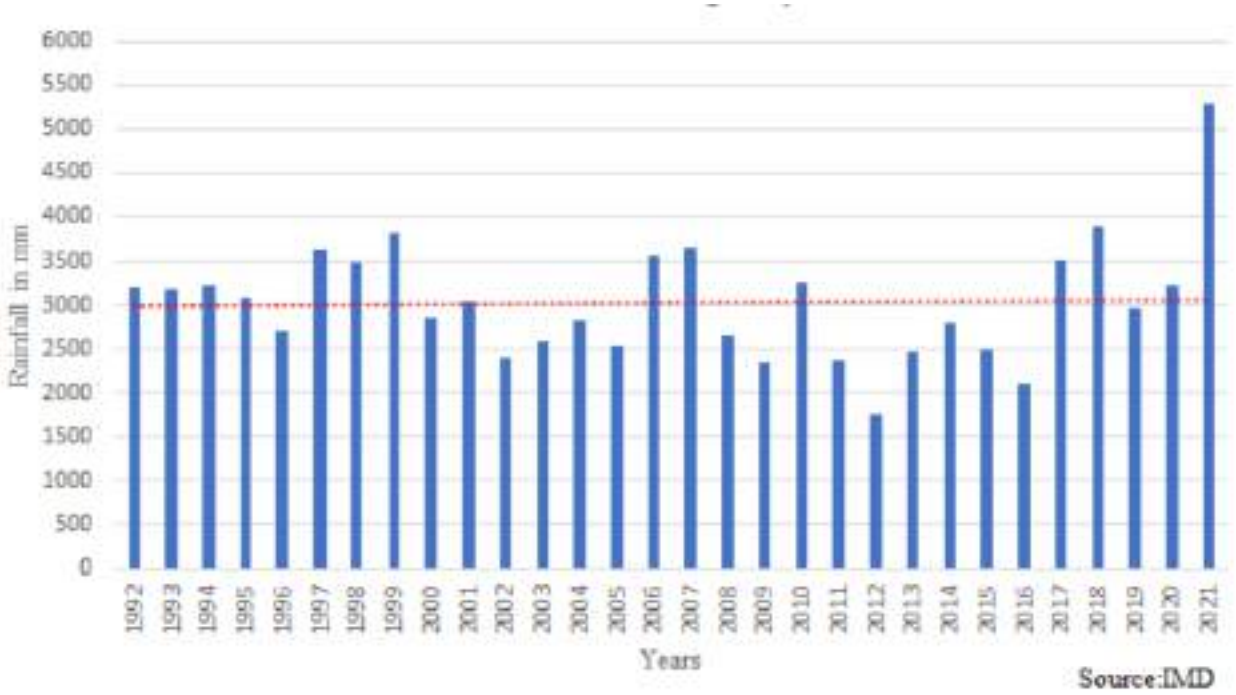


Figure 1.18 Average annual rainfall in Adoor Town from 1992-2021

1.9 Physiography

Based on physiographic nature, Kerala is divided into three regions namely highland, midland and lowland. Pathanamthitta district falls under five sub micro regions viz. i) Chengannur rolling plain ii) Kuttanad low lying plain iii) Kottarakkara undulating upland iv) Pamba kakki forest hills v) Adoor rolling plain. Adoor and Peringanad villages in Adoor Town falls under Mid Land category. Physiographic Divisions in the District is shown in Figure 1.19.

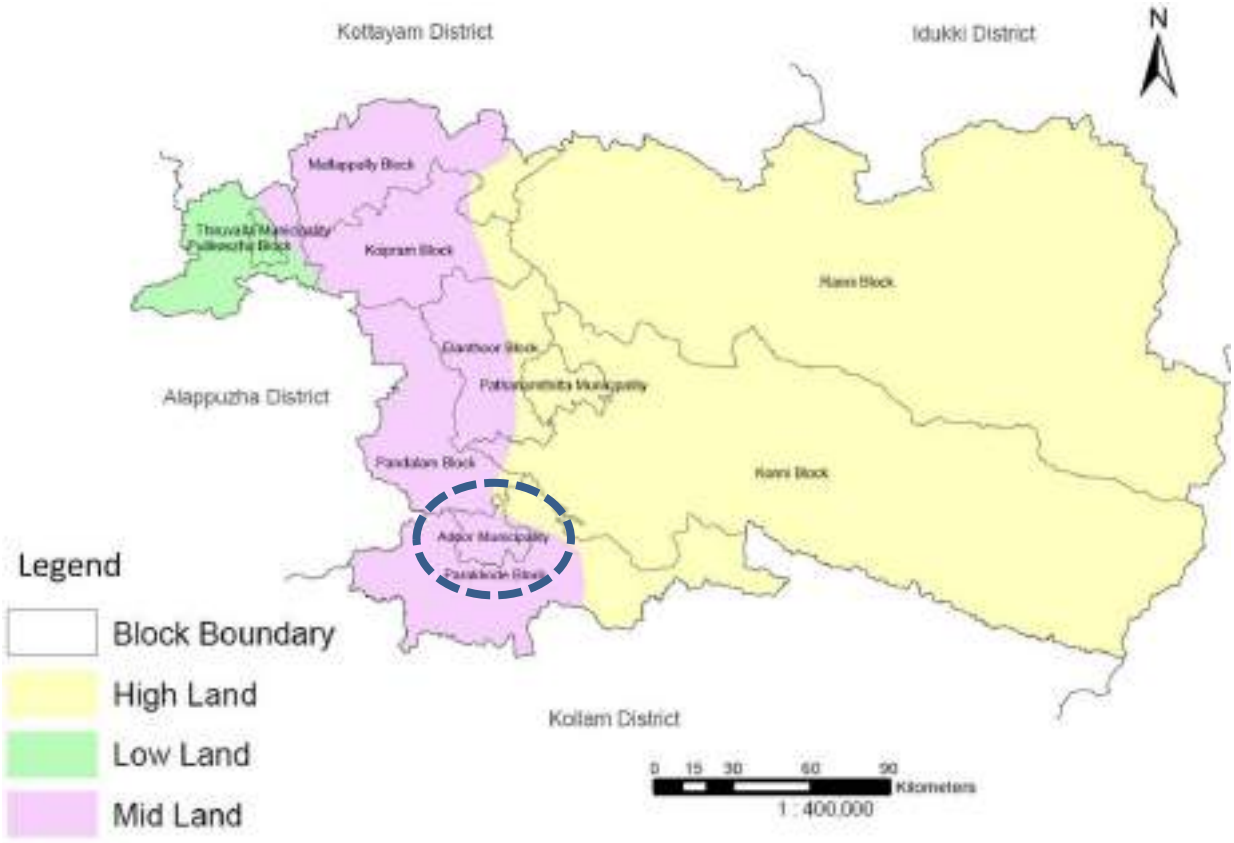


Figure 1.19 Physiographic Divisions in the District

Source: Kerala State Land use Board

1.9.1 Soil

Pathanamthitta district has very fertile soil and rich in all plant nutrients. District covers kari, alluvial, laterite and sandy soil. In Adoor rolling plain there is recent formation of sandy soil and alluvial soil.

1.9.2 Geomorphology

Broadly the district can be divided into three physiographic zones viz., the coastal plain in the northwest, the midland region and the high hills to the east. The coastal plain is characterized by fluvial landforms, which extend further west to Alappuzha district. The midland region has elevations ranging from 30 to 300m. It is characterized by undulating topography with numerous small ridges, spurs and laterite interfluves, with moderate to gentle slope, intervened by narrow valleys. The hilly region to the east is relatively wide and occupies a major part of the district. The hills that are either structural or denudational in origin are very steep with narrow summits. Some of the peaks in the east are more than 1500m high and form part of the Western ghats. In Adoor, 86% of area falls under the category of Lower Plateau (Lateritic)- Dissected,0.4% falls under Residual Mount and 13.6% falls under Valley Fill. Geomorphology of the District is shown in Figure 1.20.

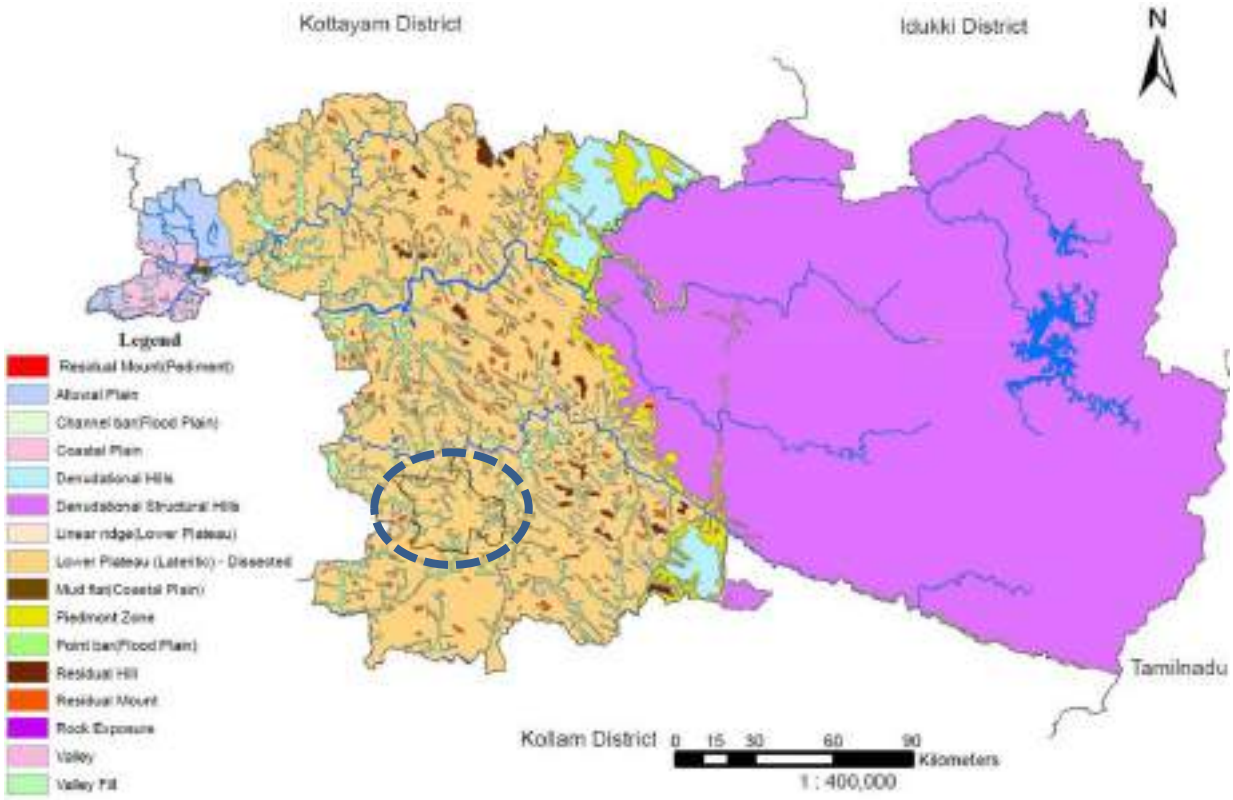


Figure 1.20 Geomorphology in the District

Source: Kerala State Land use Board

1.9.3 Geology

Geologically, the district forms part of the Precambrian metamorphic shield comprising (1) Charnockite group, Khondalite group and Migmatite complex of Archaean age, (2) Acid intrusive of Proterozoic age and (3) rocks of Cenozoic age (basic intrusive, Neogene and Quaternary). At places, charnockite is migmatised resulting in the formation of biotite gneiss and garnet-biotite gneiss (Migmatite complex). These rocks are predominant towards South. The area witnessed a period of igneous activity during the Proterozoic as evidenced from the granite and syenogranite (acid intrusive) bodies. Pegmatite and quartz veins traverse the older rocks parallel to the regional foliation. Basic igneous activity, probably of Late Mesozoic age, is evidenced from the dolerite and gabbro dykes cutting across the older rocks. These dykes have a general NW-SE trend. Warkalli sediment of Neogene age is exposed near Thiruvalla. Along the western margin the basement and sedimentary rocks have been lateritised. The quaternary sediment mostly of fluvial origin, are the flood plain deposits and they valley fills. In Adoor Town, 14% forms laterite,76% magmatic complex and 10% sand and silt. Geology of the District is shown in Figure 1.21.

1.9.4 Topography

Adoor is located in the mid land region of Kerala. Town has an undulating topography. The hills and valleys are distributed in all parts of the town. The height of the town above M.S.L varies from 8m to 85m. The topography of the town is shown in Figure 1.22. The elevated areas of the town are

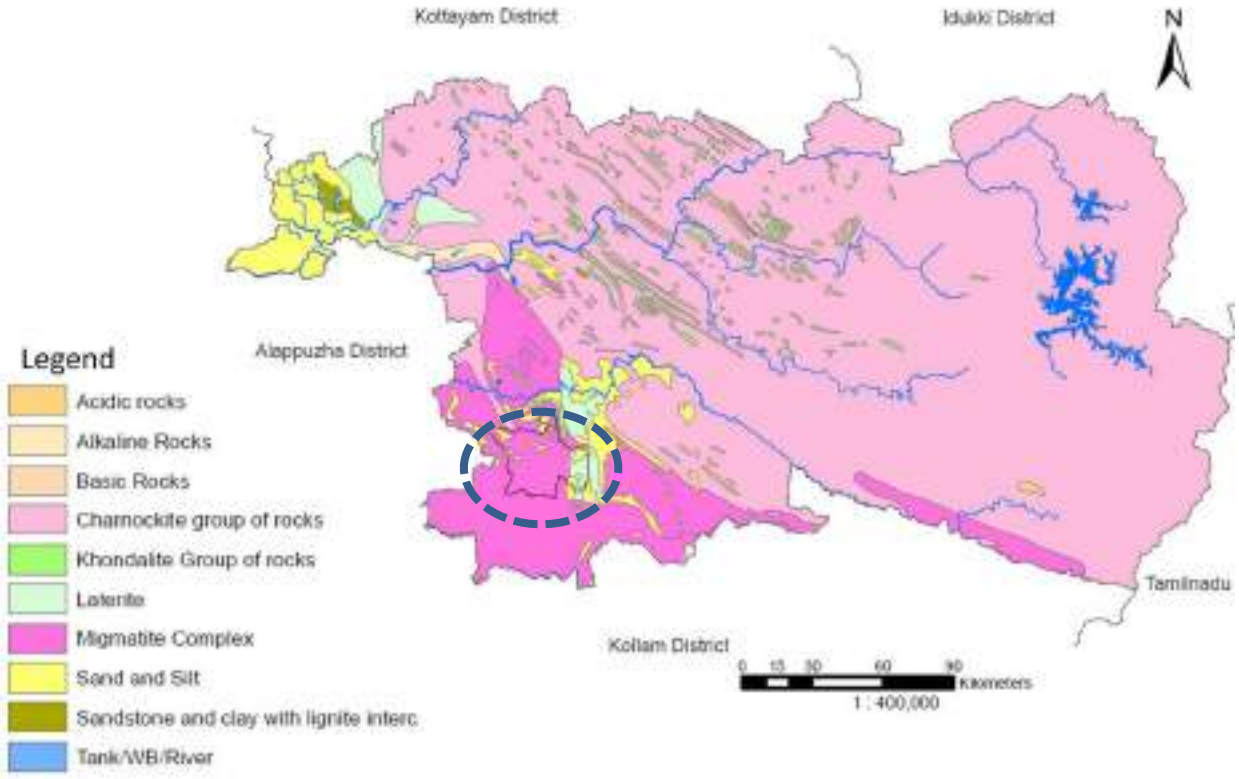


Figure 1.21 Geology in the District

Source: Kerala State Land use Board

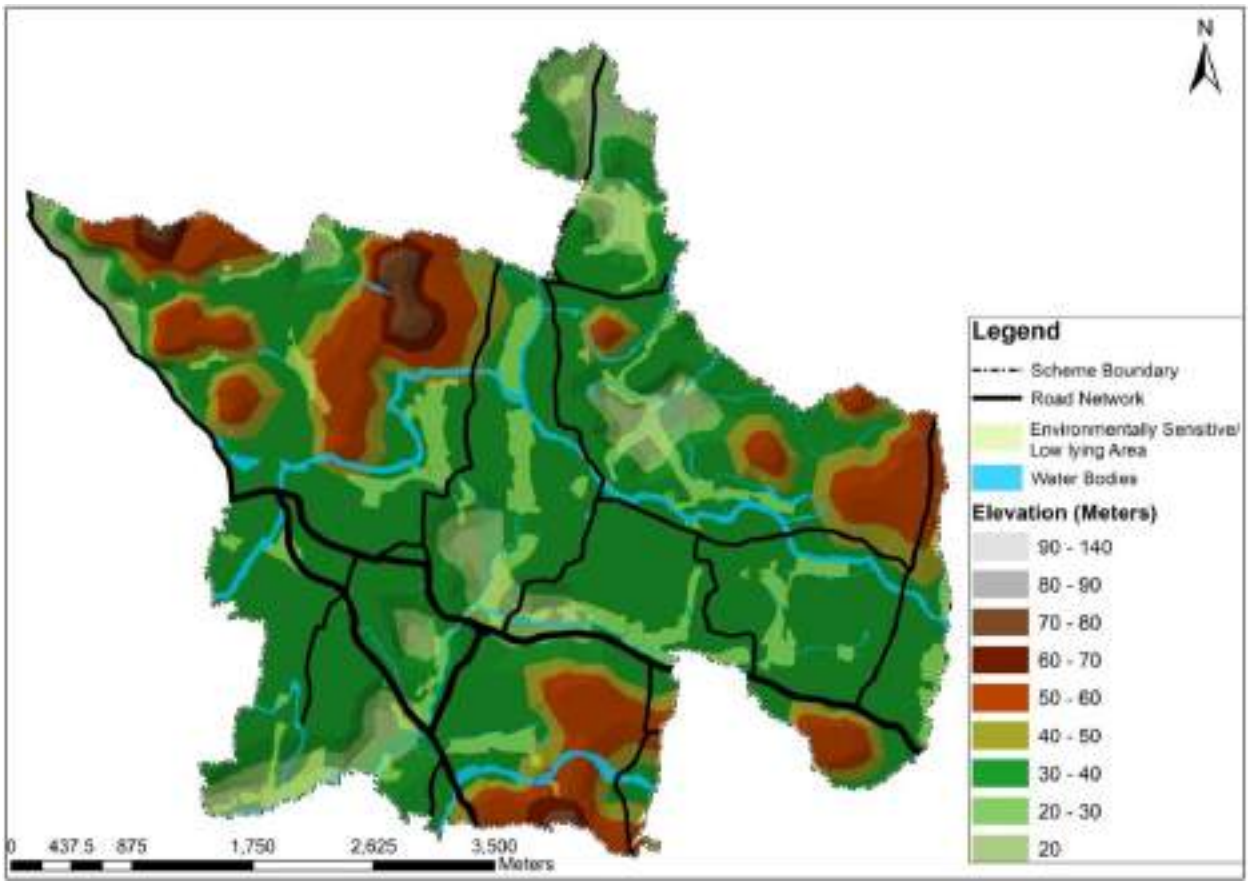


Figure 1.22 Topography of the town

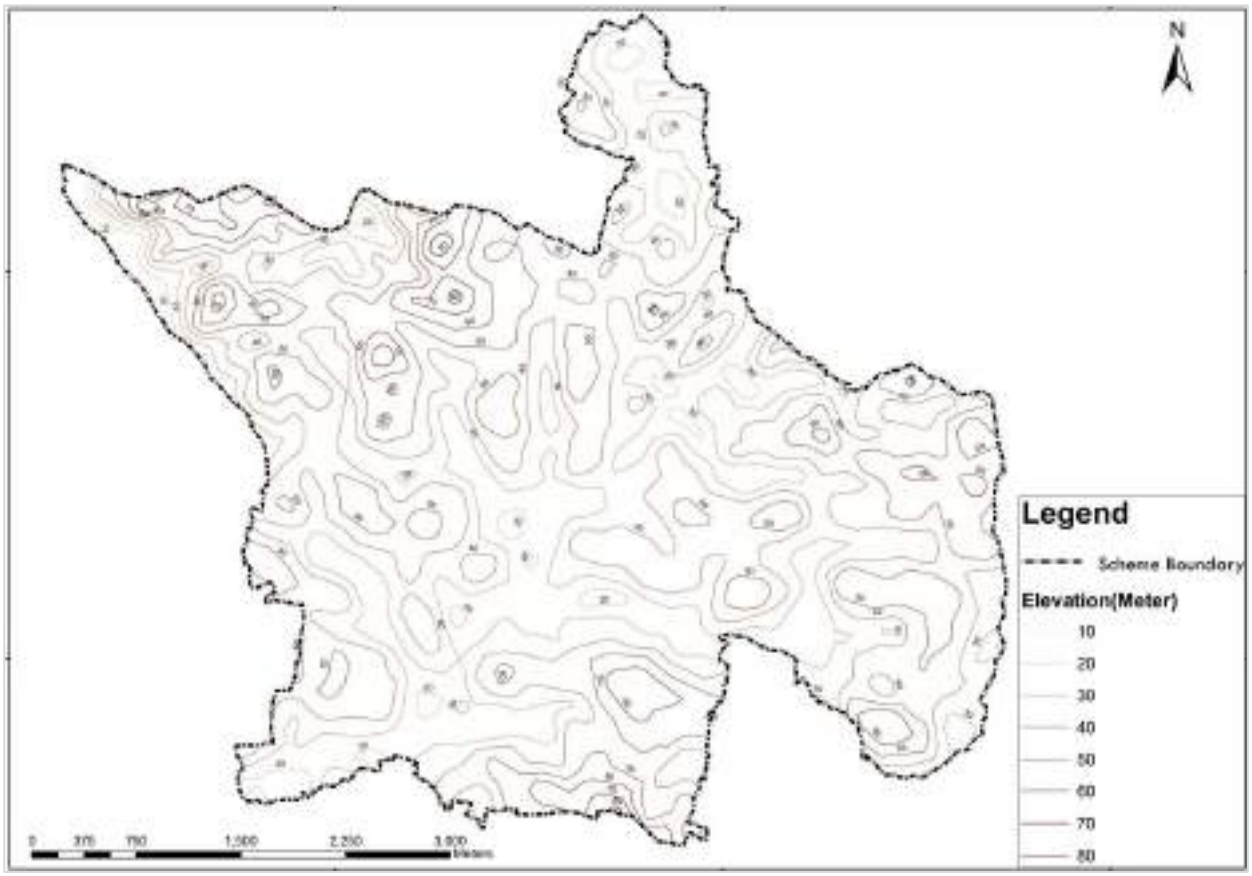


Figure 1.23 Contour map of the town

Kaimalappara, T.B.Hill and Pullippara. The elevated areas are mainly located in the Northern and Eastern parts of the town. The slope of the terrain varies from 00 to 230. The contour map of the town is shown in Figure 1.23. Sufficient land is available for development purpose as far as topography is concerned. Major roads of the town are generally formed along the valleys. Areas in the town with higher elevations are remaining as Agriculture land (dry cultivation). Major Urban developments in the town are along the valleys. More percentage of elevated land and land with steep slopes are in the Northern and Eastern parts of the town.

1.10 Biodiversity

Pallikkal thodu is the major water body passing through the town. There are no major rivers passing through the town. About 20 ponds and 19 streams are there in different parts of the town. Wetlands in the town are the prominent Environmentally Sensitive area. There are Sacred Groves also in town. A main canal and a branch canal of Kallada irrigation project are passing through the town. Details of water bodies, wetlands, sacred groves are shown in Figure 1.24. Rubber is the Major crop of Adoor town. Other horticultural crops like plantains, mango trees, jackfruits, and cashew trees are also grown here.



Figure 1.24 Environmentally Sensitive area of town

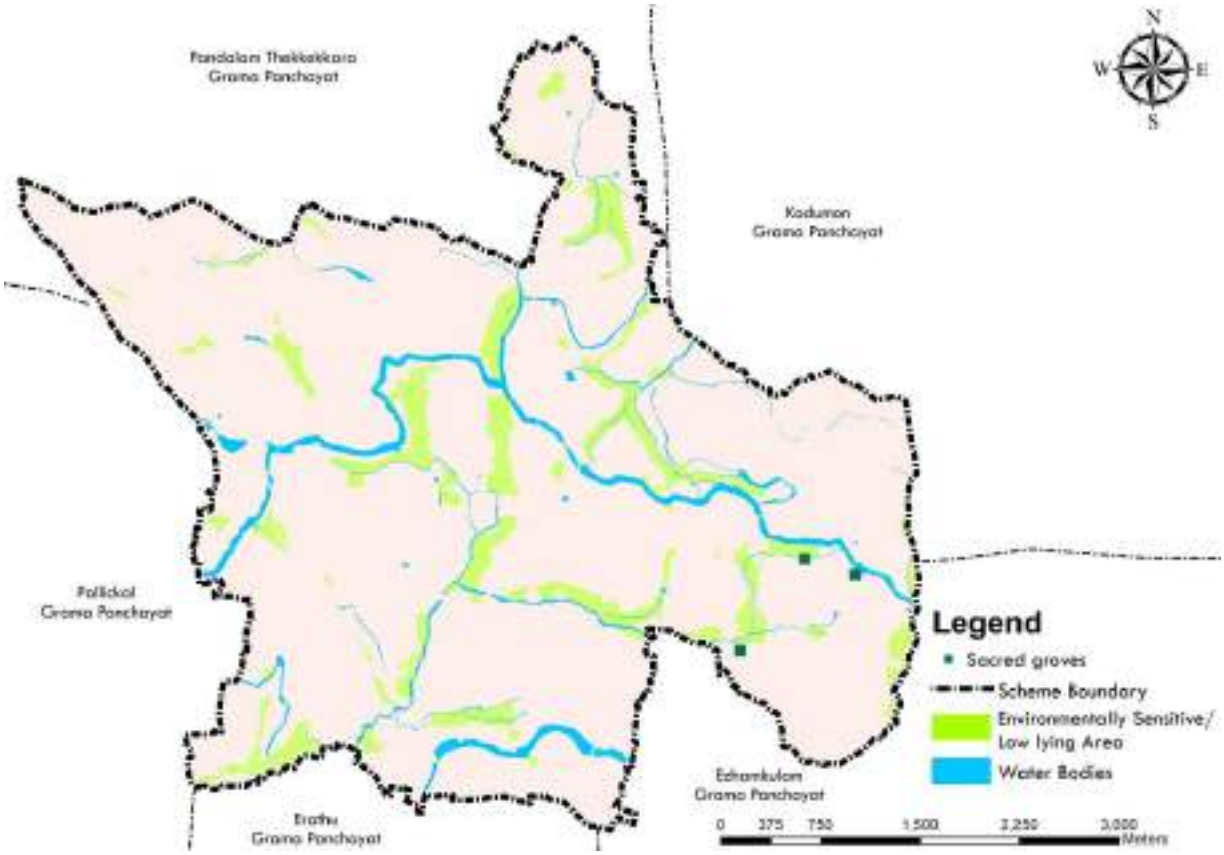


Figure 1.25 Biodiversity in town

1.11 Inference

Adoor, located in the central part of Pathanamthitta District, is well connected by an extensive road network. The establishment of the Parakode Anantharamapuram market marked a major milestone in the town's development. The topography of Adoor is undulating, with scattered hills and valleys, and it shows a significant variation between the highest and lowest elevations. Despite the slopes, adequate land is available for urban development. The town experiences a moderate climate, although variations in rainfall in recent years have caused flash flooding in certain areas. Within the district's regional framework, Adoor is proposed as a second-order settlement. Agriculture, animal husbandry, and small-scale industries form the town's primary economic activities, with agro-based products serving as its major resources. The region has a high population growth rate and comparatively high population density, while industrialization remains at a low level. Grama

Panchayats in the surrounding areas are more or less equally developed in terms of lower-order facilities, but for higher-order functions, people depend largely on Adoor Town. Strong transportation linkages further enhance Adoor's role as a central hub for the settlements in its influence region.



CHAPTER 2
DEMOGRAPHY

2.1 Introduction

The population parameter serves as the basis of all planning process. The estimation of future population is needed for the assessment of various needs and distribution of activities in available land.

2.2 Population and its growth pattern

The population of Adoor town as per 2011 census was 29,171. It was 18,907 as per 1961 census and there after showing a steady increase. The temporal variation of population size of the town since 1961 is shown in Figure 2.1. When comparing the population size of Adoor with other three towns of Pathanamthitta district ie, Thiruvalla, Pandalam and Pathanamthitta, Adoor is the least populated town in the district as represented in Figure 2.2.



Figure 2.1 Population size of Adoor town

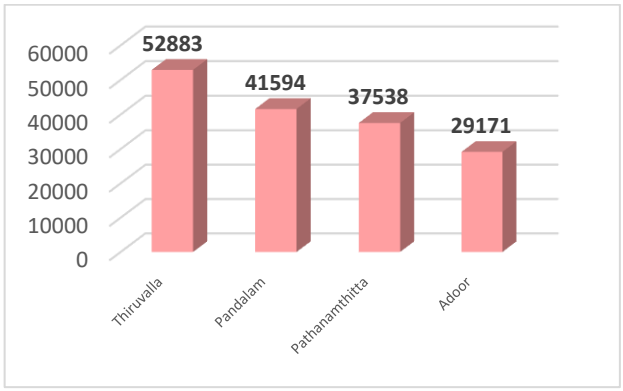


Figure 2.2 Population size-comparison with other Towns of the district

Source: Census 2011

2.3 Spatial Distribution of Population

Ward wise spatial distribution of Population is shown in Figure 2.3. Population is the highest in EV ward and Jawahar wards.

2.4 Population Density

The population density of Adoor town as per 2011 census is 1401 persons/sq km. It is lower than the population density of other three towns in the district, viz Thiruvalla, Pathanamthitta and Pandalam which have density of 1948 persons / sq km, 1597 persons/sq km and 1436 persons/sq km respectively and it is shown in Figure 2.4. In the district scenario also, the population density of Adoor is not high. Certain Grama Panchayats also have population density more than that of Adoor. The population density of Adoor town is also compared with the density of surrounding Pandalam Thekkekara, Kodumon, Ezhamkulam, Erath and Pallikkal Grama Panchayats and it is shown in Figure 2.5. The density of these Grama Panchayats are lower than the density of Adoor town.

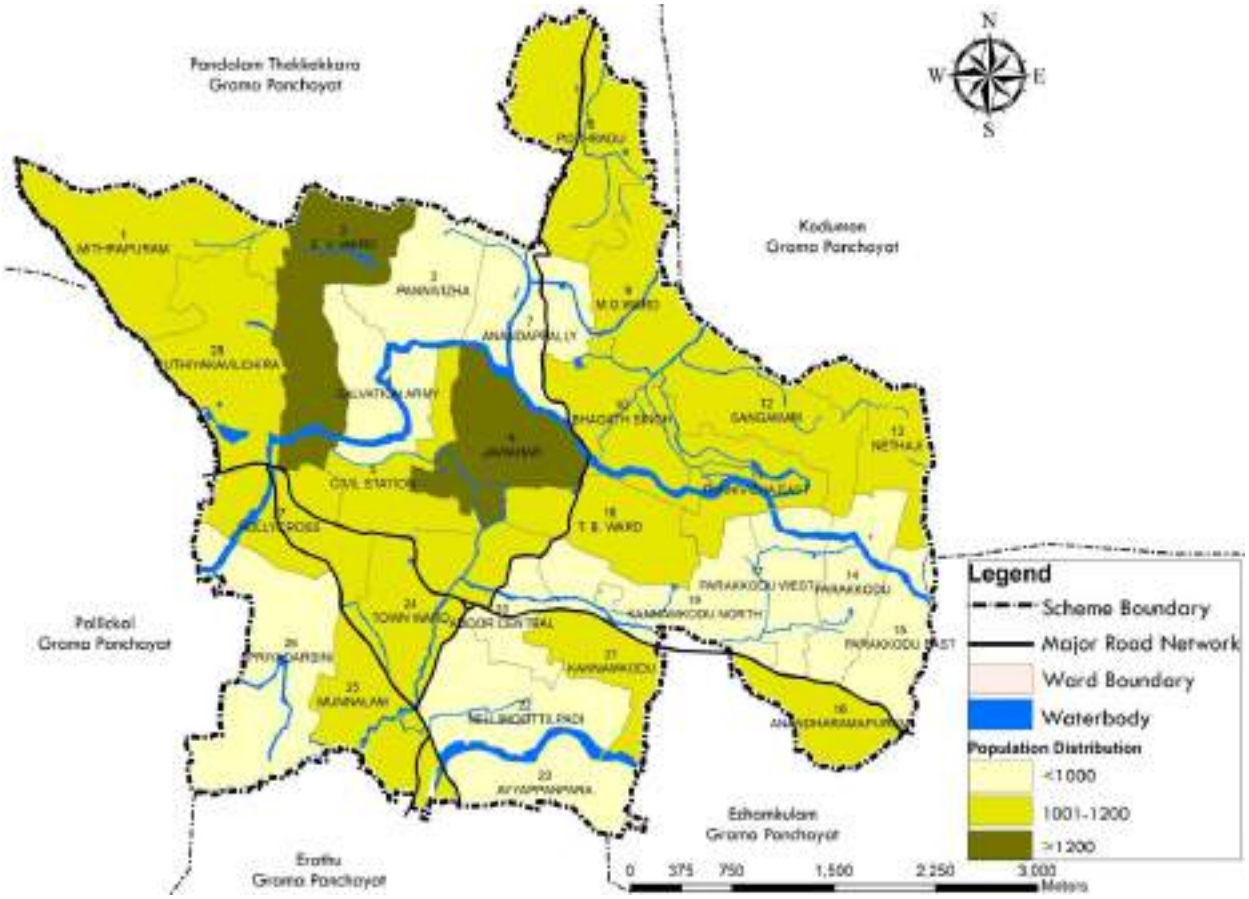


Figure 2.3 Ward wise spatial distribution of Population

Source: Municipal Records

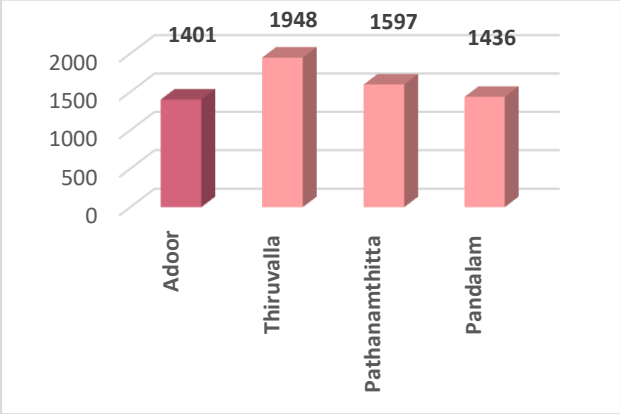


Figure 2.4 Population density- comparison with other Towns

Source: Census 2011

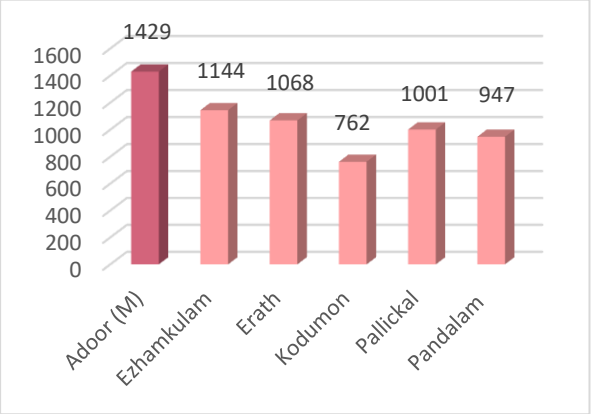


Figure 2.5 Population Density-comparison with Near by LSGs

2.4.1 Ward wise Population Density

There is large variation in density of population among different parts of the town. To study the variation an analysis of ward wise population density (gross and net) has been done and it is shown in Figure 2.6 and Figure 2.7.

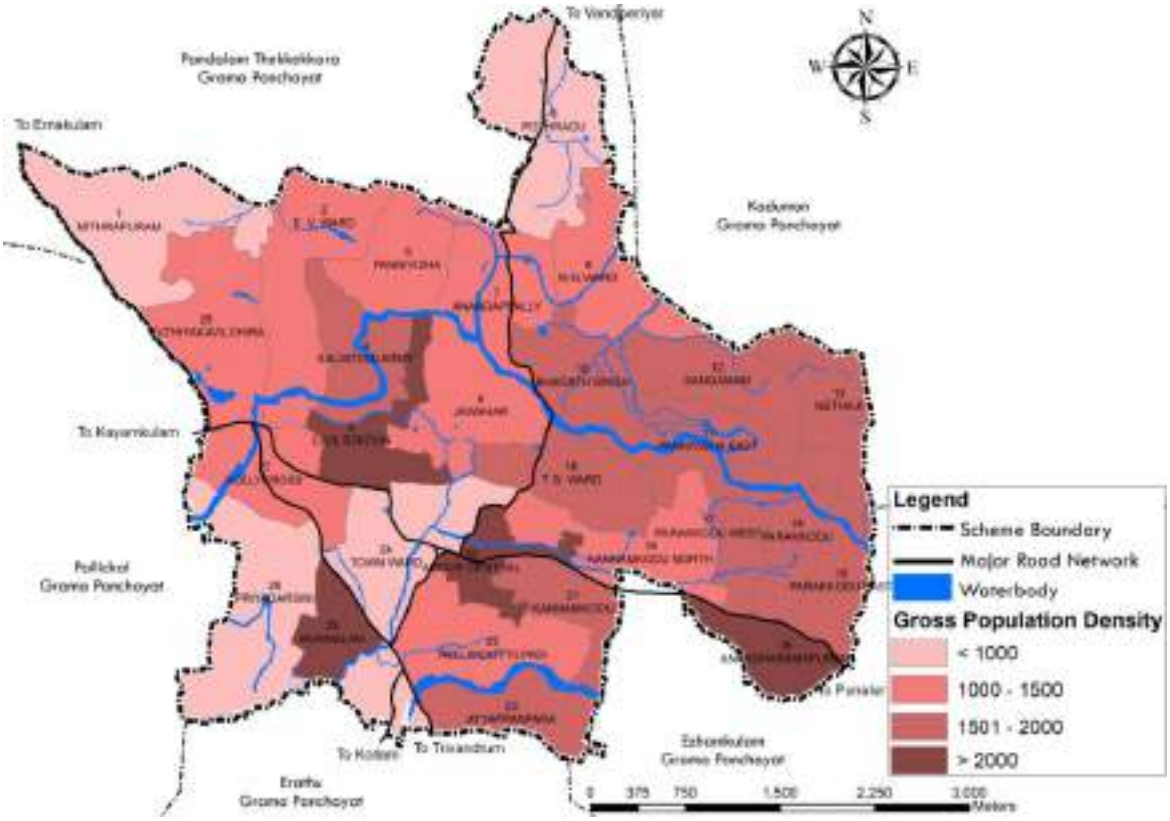


Figure 2.6 Ward wise Gross Population Density

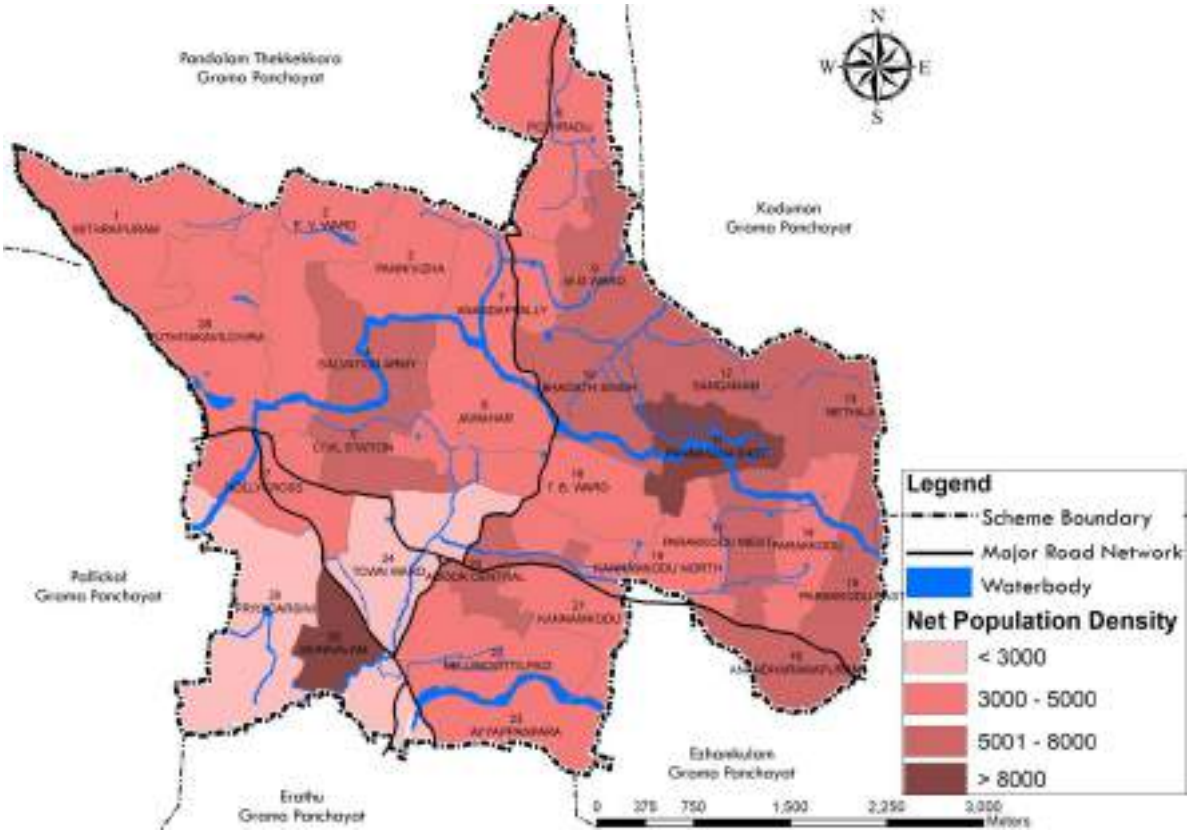


Figure 2.7 Ward wise net population density

The gross population density of the town varies from 768 persons/sq km to 2779 persons/sq.km and the average population density is 1401 persons sq km. The wards Munnalam, Civil Station, Anantharamapuram, Adoor Central has high gross population density, while Priyadarsini, Mithrapuram, Town, Potharad has low gross Population density. The net population density of the town varies from 2620 persons per sq km to 9008 persons per sq km. Pannivizha East, Munnalam, Adoor central, Civil Station, Parakode East wards has high net population density. Wards in and around Parakodee Junction has high population density, followed by the wards adjacent to present town center. These wards are located along Kayamkulam- Pathanapuram road.

2.5 Population Growth Rate

The decadal population growth rate of Adoor town from 1961-71 to 2001-11 is shown in Figure 2.8. The growth rate of Adoor during 1961-71 was 21.04% and then it reduced to 9.22% during 1971-81 and further reduced to 6.58% during 1981-91. There after the growth rate increased to 8.68% during the period 1991-2001. But it is dipped to 0.75% during the decade 2001-11. It is interesting to note that the growth rate in population shows increasing trend immediately after elevating Adoor to a town on 1.4.1990. A number of new institutions were set up in and around Adoor town since 1990.

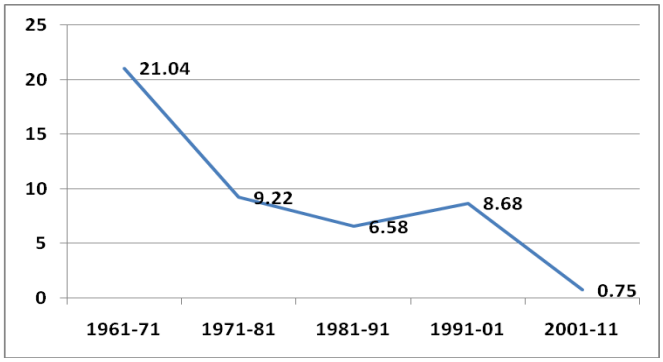


Figure 2.8 Growth rate of population of Adoor town

Source: Census 2011

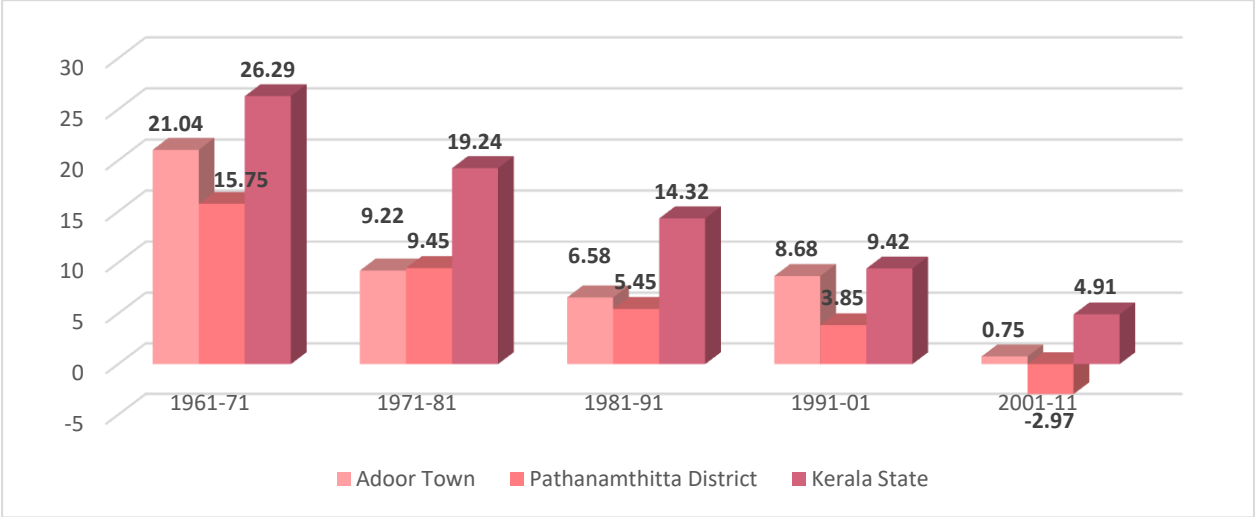


Figure 2.9 Comparison of population growth rate (in %) with state and district

Source: Census 2011

Comparison of population growth rate of Adoor town with that of Pathanamthitta district and State are shown in the Figure 2.9. The growth rate of Adoor is greater than the district growth rate and less than state urban growth rate. When compared to the other towns in the district Figure 2.10 Pathanamthitta, Thiruvalla and Pandalam. The population growth rate of Adoor Town is less than the growth rate of Thiruvalla, Pathanamthitta and Pandalam during 1971-1981 decade. In the period 1981-91 the growth rate of population of all these towns reduced. During the period 1991-2001 the population growth rate of Adoor and Pandalam have increased, while the growth rate of Pathanamthitta and Thiruvalla has decreased. During 2001-2011 the population growth rate of Pandalam is greater than the other three Municipalities. Pathanamthitta and Thiruvalla municipalities recorded negative growth rate.

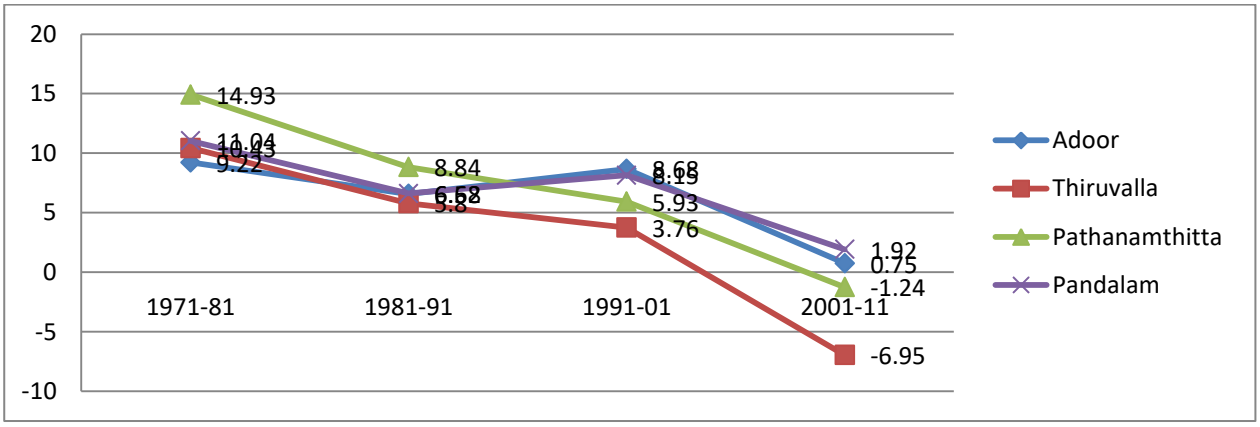


Figure 2.10 Comparison of Population growth rate (in %) with other towns in the district.

Source: Census 2011

The growth rate of population (2001-2011) of Adoor town has been compared with Nearby LSGIs in the immediate surroundings. It is shown in Figure 2.11. The population growth rate of Adoor town and surrounding Grama Panchayats is in the range of -0.66% to 1.44 %. Two Grama Panchayats, Pallikkal and Pandalam recorded more population growth rate than Adoor and other three Grama Panchayats – Ezhamkulam, Erath and Kodumon shows negative growth rates.

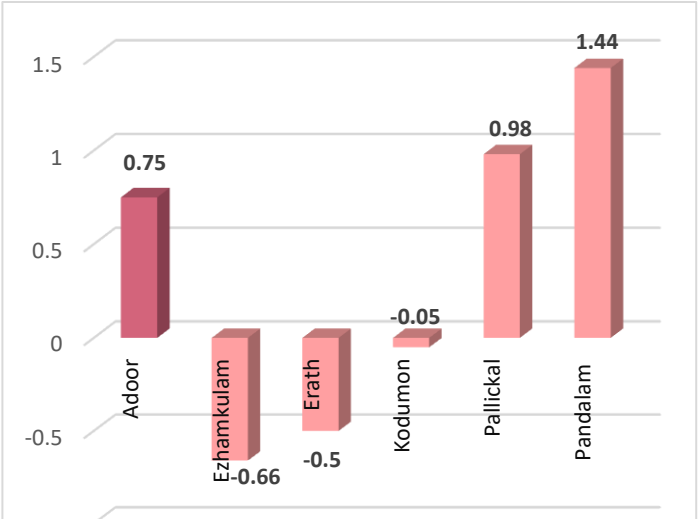


Figure 2.11 Comparison of population growth rate of Adoor with surrounding LSGIs

Source: Census 2011

2.6 Population Concentration

The population concentration pattern is derived by calculating the cumulative population after arranging the wards in descending order of density. The population concentration pattern of Adoor town (2011) is shown in Figure 2.12. It shows that 1/3 population of the town is concentrated in 10 wards, with an area of 4.95 sq km. which comprising 23.88% of total town area. 1/3 population of the town is concentrated in Moonnalam, civil Station, Anantharamapuram, Adoor central, Parakode west, Ayyappanpara, Parakode East, Parakode, Pannivizha East, Kannamkode wards. The 2/3 of population of the town is concentrated in 19 wards with total area of 11.35 sq km (54.75% of total town area).

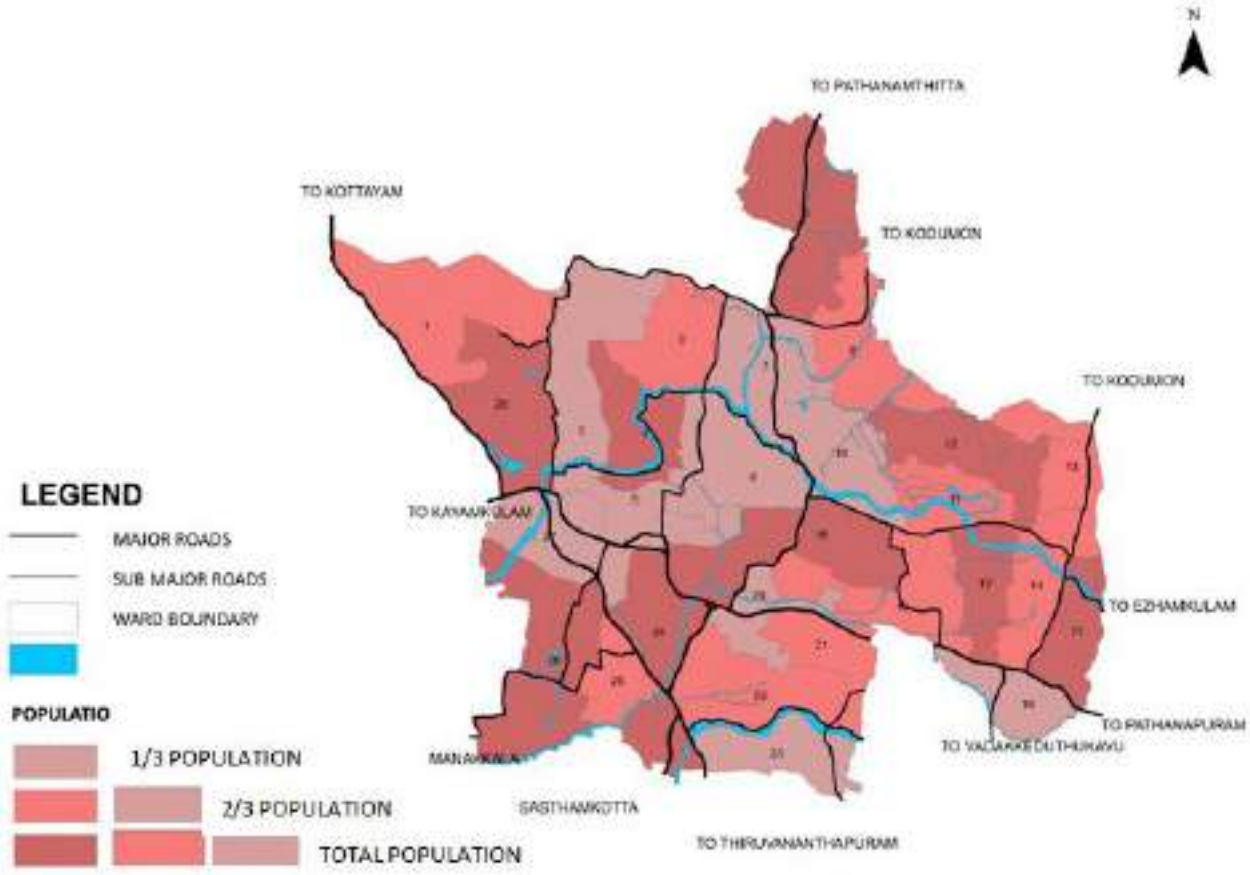


Figure 2.12 Population Concentration pattern of Adoor town

Source: Municipal Records

2.7 Sex Ratio

The total male and female population of Adoor as per 2011 census is 13972 and 14980 respectively and the sex ratio of the town is 1123. The variation in sex ratio of the town from 1961 is shown in Figure 2.13. It shown that, the sex ratio of the town has gradually increased from 1014 in 1961 to 1123 in 2011. The sex ratio of the district and state are 1132 and 1084 respectively and the sex ratio of Adoor is higher than that of state and lower than that of district. While comparing with other three towns in the district, the sex ratio of Adoor is lower than Thiruvalla (1130) and higher than

Pathanamthitta (1116) and Pandalam (1100) is shown in Figure 2.14. The child sex ratio of Adoor is 986.

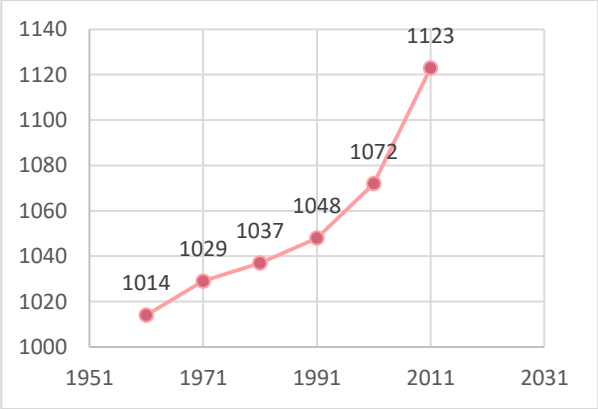


Figure 2.13 Sex ratio of the town from 1961

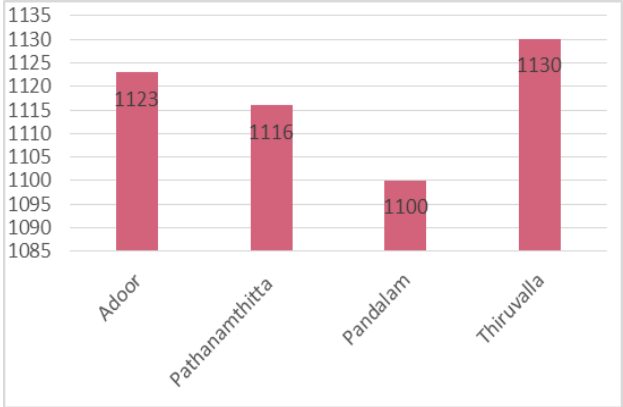


Figure 2.14 Comparison of sex ratio of Adoor with other towns in the district

Source: Census 2011

2.8 Age Structure

The Age –sex pyramid of Adoor Town was derived from the Socio-Economic survey (2019). Percentage of Male and Female Population in different age group is shown in Figure 2.15. The narrowing down of the base of the pyramid shows that there is decrease in the birth rate. The number of male and female varies in different age group. It is a regressive pyramid like that of a developed country, where there are fewer children and more old people and the population is likely to decrease in future. The bulges of the pyramid in the age group of 15 to 40 show the high growth of population during 1970-1995.

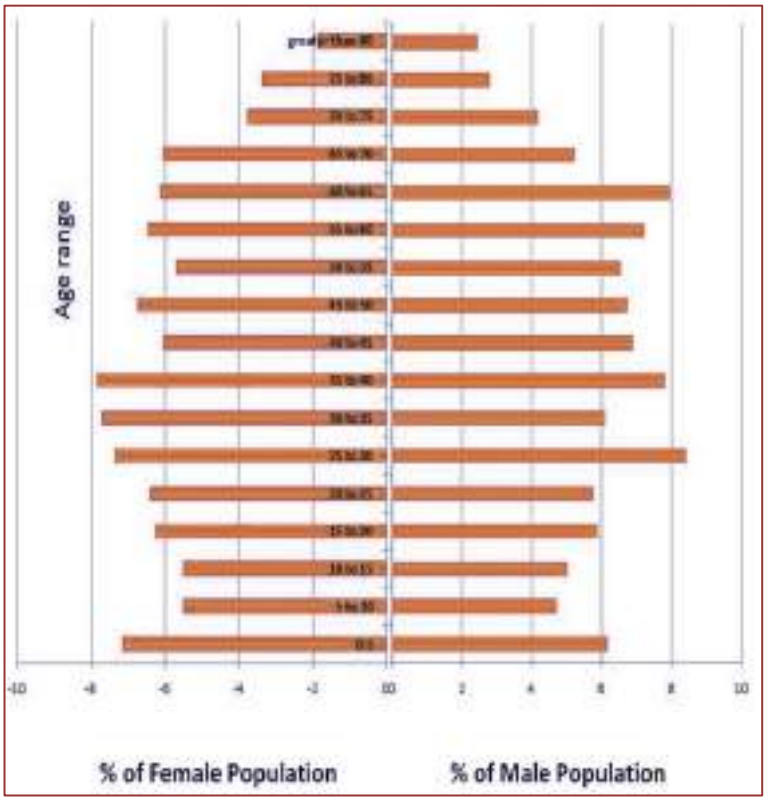


Figure 2.15 Age –sex pyramid of Adoor Town

Source: Census 2011

2.9 Literacy rate

The literacy rate of Adoor Town as per 2011 census is 96.31 %. The literacy rate of Pathanamthitta District and Kerala State are 96.5 % and 93.91% respectively. The literacy rate of

Adoor Town is slightly less than the district and higher than the State literacy rate. Figure 2.16 shows the literacy rate comparison with State and district. The Comparison of Literacy rates with surrounding LSGs are shown in Figure 2.17. Comparing with the nearby Municipalities Adoor is having the least Literacy rate. Male literacy rate is more than female literacy rate in all years. The trend in growth of both male and female literacy rate follows similar pattern. The variations in Male and Female literacy rate in Adoor Municipality over last few decades are shown in Figure 2.18.

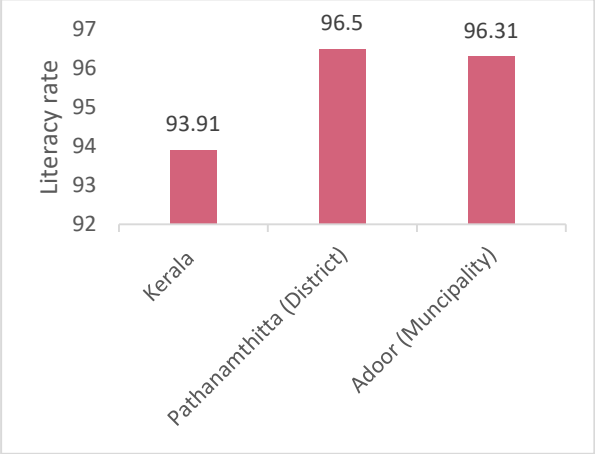


Figure 2.16 Comparison of Literacy rate with State and District

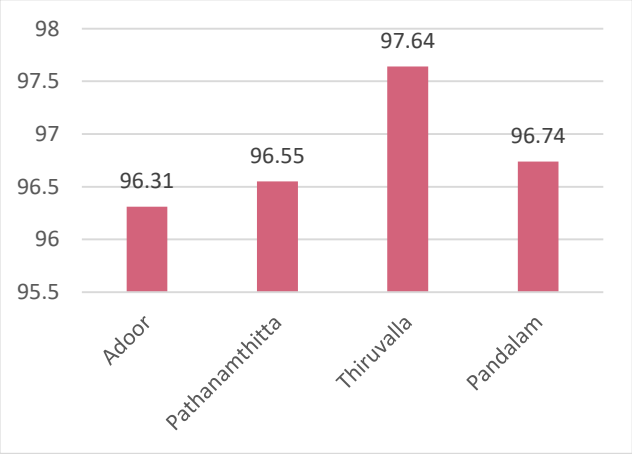


Figure 2.17 Comparison of Literacy rate with surrounding LSGs

Source: Census 2011

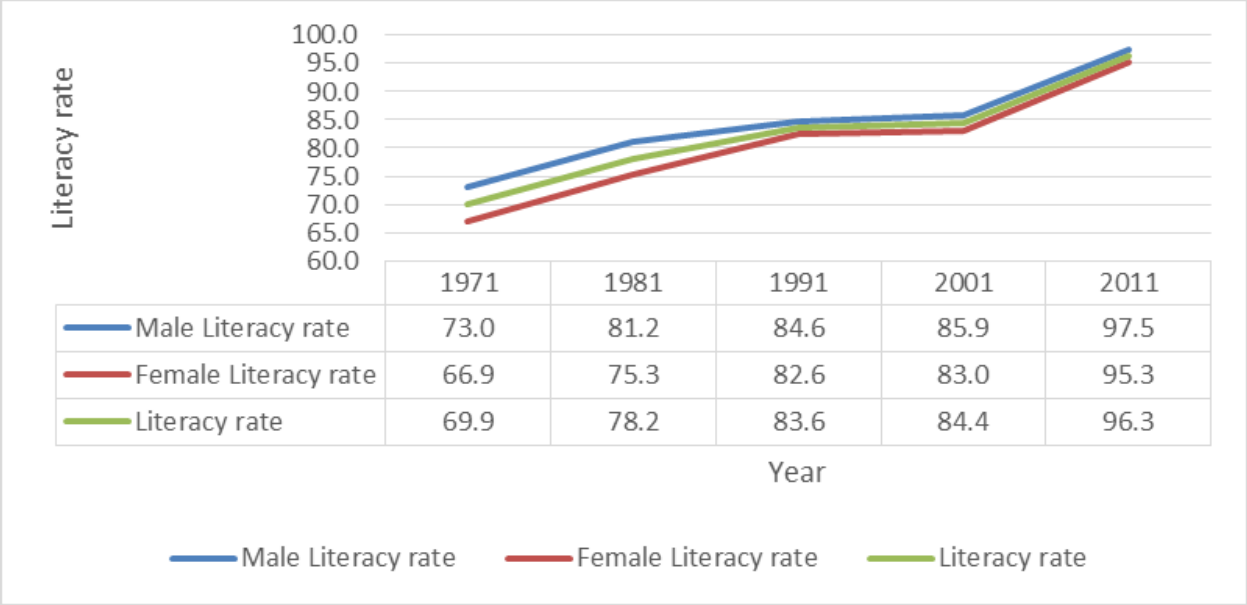


Figure 2.18 The variation in Male and Female literacy rate in Adoor Town

Source: Census 2011

2.10 Size of Households

Number of Households as per 2011 census is 7911. Average Household size in the town is 3.01. The ward wise distribution of Households in town is shown in Figure 2.19. The Household size varies in wards from 6.43 (Ward 19) to 1.55 (ward 17).

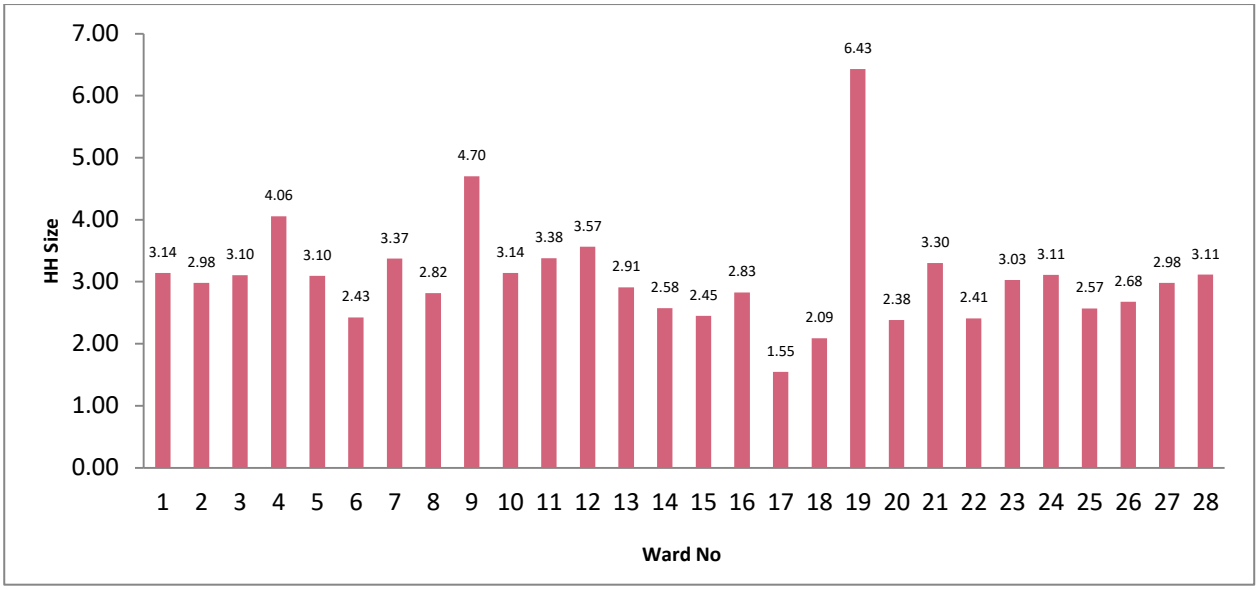


Figure 2.19 Ward wise distribution of Households

Source: Municipal Records

2.11 Social Composition

Social composition refers to the structure and characteristics of the population based on various social factors such as socioeconomic status, Religion and Beliefs. As per census 2011, Schedule Caste (SC) constitutes 8.77 % while Schedule Tribe (ST) was 0.13 % of total population in Adoor Town. The religion wise population shows that nearly 53.97% of the total population are Hindus, 9.43% Muslims and 36.6% Christians.

2.12 Migration

Eight percentage of the population in Adoor are Non-Resident Keralites. 18% of the Households in Adoor have at least one Non-Resident person from their household. 83% of the NRK population is male as shown in Figure 2.20. Percentages of NRIs by their regions are shown in Figure 2.21. More than 80% are residing in Gulf countries. Percentage distribution of Non-resident employees by their job categories are shown in Figure 2.22. Major share are labourers followed by Nurses.

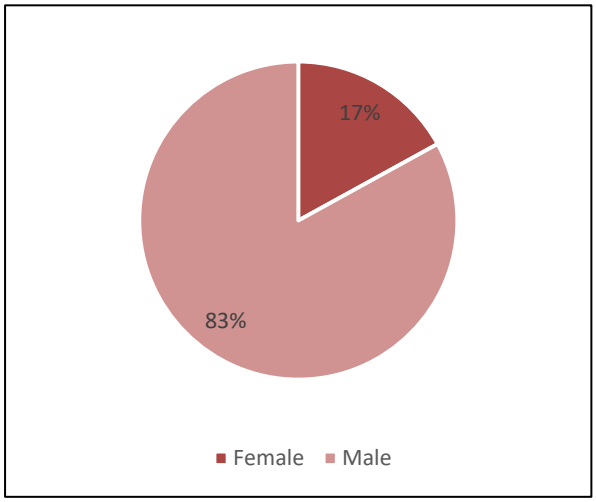


Figure 2.20 NRK population

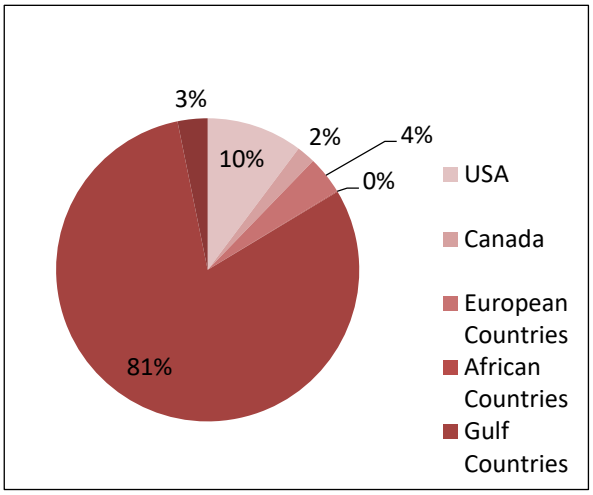


Figure 2.21 Percentage of NRIs by their regions

Source: Municipal Records

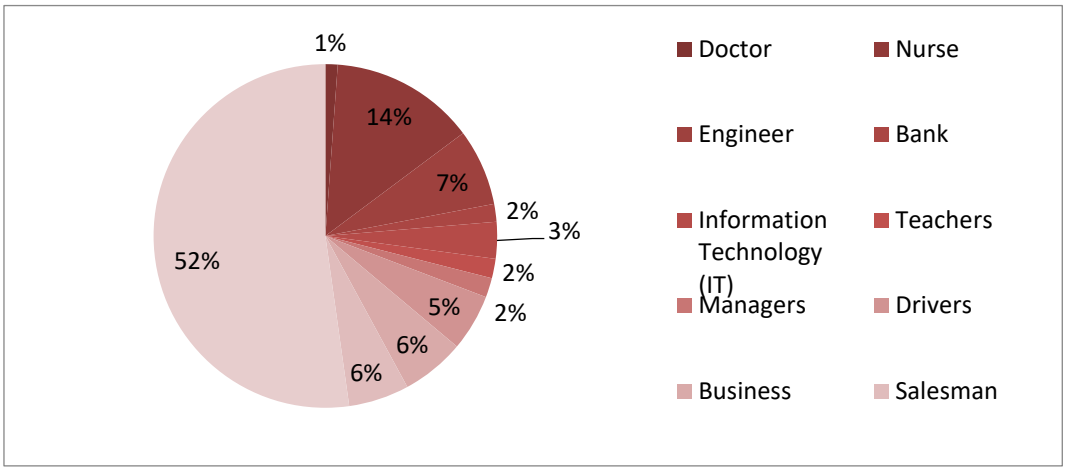


Figure 2.22 Nonresident employees by their job categories

Source: Municipal Records

2.13 Inference

Among the four towns in the district, Adoor has the lowest population size; however, it records the second-highest population growth rate among them. The surrounding Grama Panchayats also show relatively high growth rates. Although the overall population density of Adoor is low, the Parakode area within the town has a comparatively higher density. The age-sex pyramid of Adoor resembles a regressive pyramid, similar to that of developed countries, characterized by fewer children and a larger proportion of elderly people, indicating a potential decline in population in the future. The sex ratio of Adoor is also lower than the corresponding figures at both the state and district levels.



CHAPTER 3
EMPLOYMENT

3.1 Introduction

In this chapter, the existing economic base of the town based on the occupational structure is studied. Work participation rate and its temporal variation, the occupational structure and the change that has happened over a period of time, spatial distribution of workers in the town have been analyzed.

3.2 Workers

Total number of workers in Adoor town is 8323. The total workers are further divided into main workers and marginal workers. The total number of main workers of the town is 6852, which constitute 23.5% of total population and total number of marginal workers of the town is 1471, which constitute 5.04% of total population and remaining 20848 persons are non-workers which is 71.46.% of total population. It is shown in Figure 3.1.

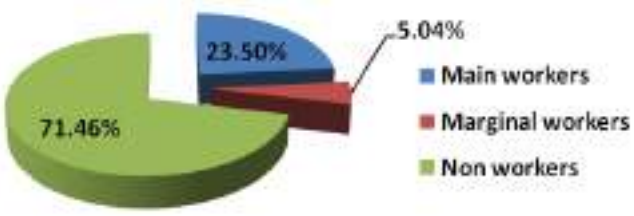


Figure 3.1 Main, Marginal and Non-Workers of Adoor town 2011

Source: Census 2011

3.3 Work force Participation Ratio

The work force of a place is usually indicated by work participation rate (WPR) which is the ratio of total workers (main and marginal) to the population of the place and it is generally expressed as percentage. As per 2011 census the work participation rate of Adoor Town is 28.53%. It means, out of total population of 29,171 persons, 8323 people are workers. The temporal variation of work participation rate of Adoor is shown in Figure 3.2. The work participation rate shows fluctuations but have a general decreasing trend. The work participation rate of Adoor was 32.44% in 1961 and reduced to 28.53 % in 2011. The work participation rate for the years 1971, 1981, 1991, 2001 and 2011 are 27.02, 26.75 ,29.94 ,26.38 and 28.53 % respectively.

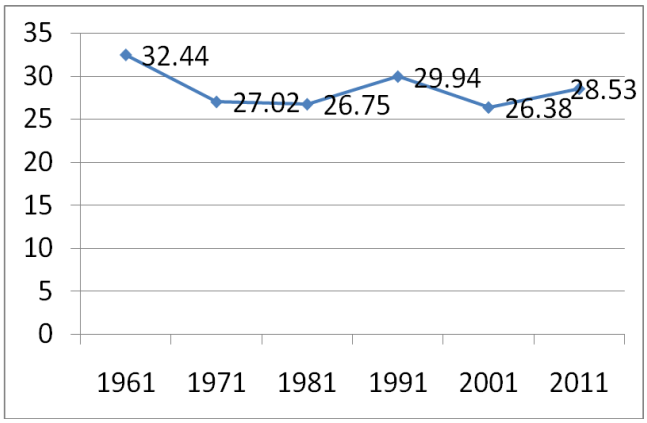


Figure 3.2 Temporal variation of Work Participation Rate

Source: Census 2011

A comparison of growth rate of population and the growth rate of workers are shown in Figure 3.3. Even though the number of workers is increasing over the years; generally the growth rate of workers is less than the population growth rate. It indicates that employment opportunities are not increasing in proportion to growth of population. This may be due to the shrinkage of economic base of the town in that decade. But in 2001 to 2011 the growth rate of workers are increased to

8.98%, effectively 12% increase in the growth of workers, even if the Population growth rate is 0.75%. It indicates the improved employment generation during the decade.

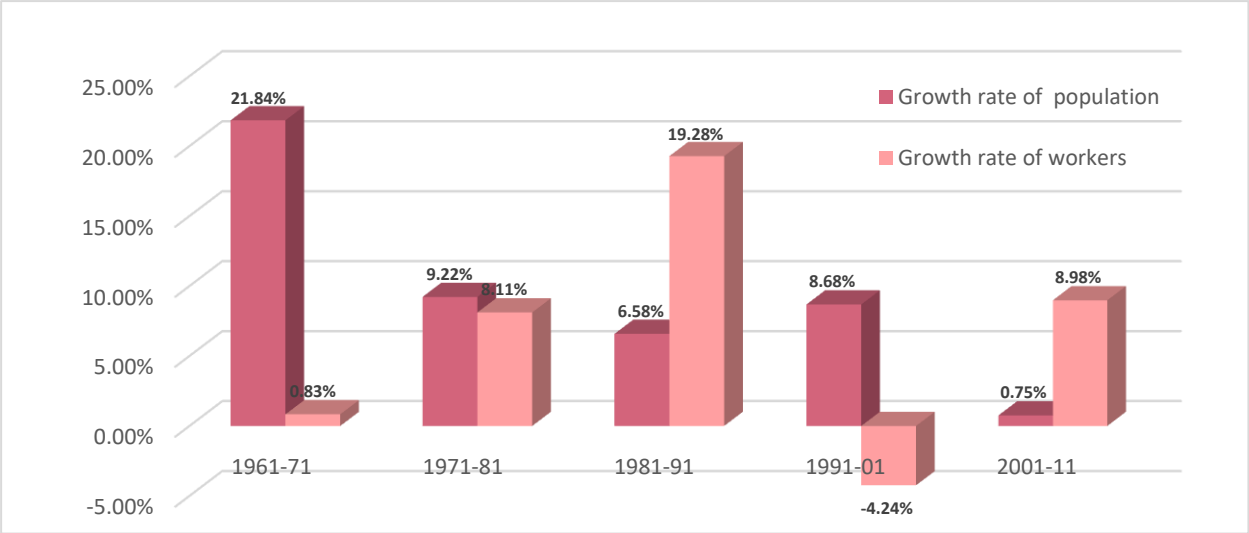


Figure 3.3 Comparison of Growth rate of Population and Workers

Source: Census 2011

Comparison of work participation rate of Adoor is made with corresponding figures of Pathanamthitta district, other urban centers of the district and surrounding Grama Panchayats. Comparison of work participation rate of Adoor with surrounding Grama Panchayats is shown in Figure 3.4 The work participation rate of the district is 32.8%, which is greater than the work participation rate of Adoor of 28.53%. The other two urban centers of the district - Thiruvalla and Pathanamthitta has work participation rate of 30.83% and 32.64% respectively. So the work participation rate of Adoor is lower than the rate of the district and other urban centers and it is shown in Figure 3.5 and it shows that work participation rate of all Grama Panchayats are greater than that of Adoor Town. The Male WPR and Female WPR of Adoor is lower than that of the surrounding Muncipalities and it is shown in Figure 3.6.

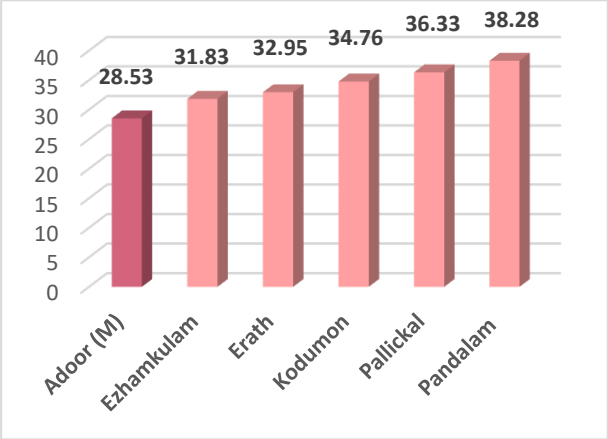


Figure 3.4 Work Participation Rate (%)- Comparison with surrounding Grama Panchayats

Source: Census 2011

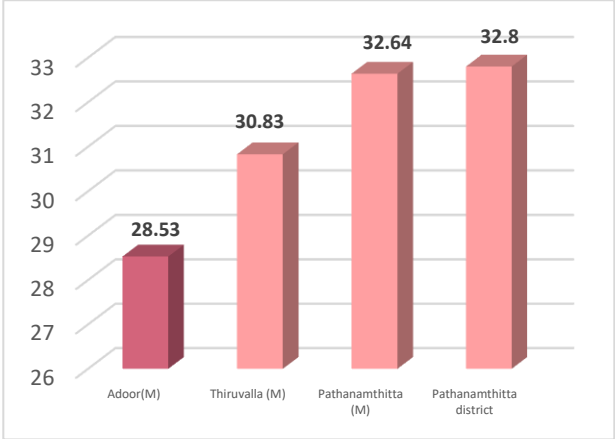


Figure 3.5 Work Participation Rate (%)- Comparison with other urban centres in the district

Source: Census 2011

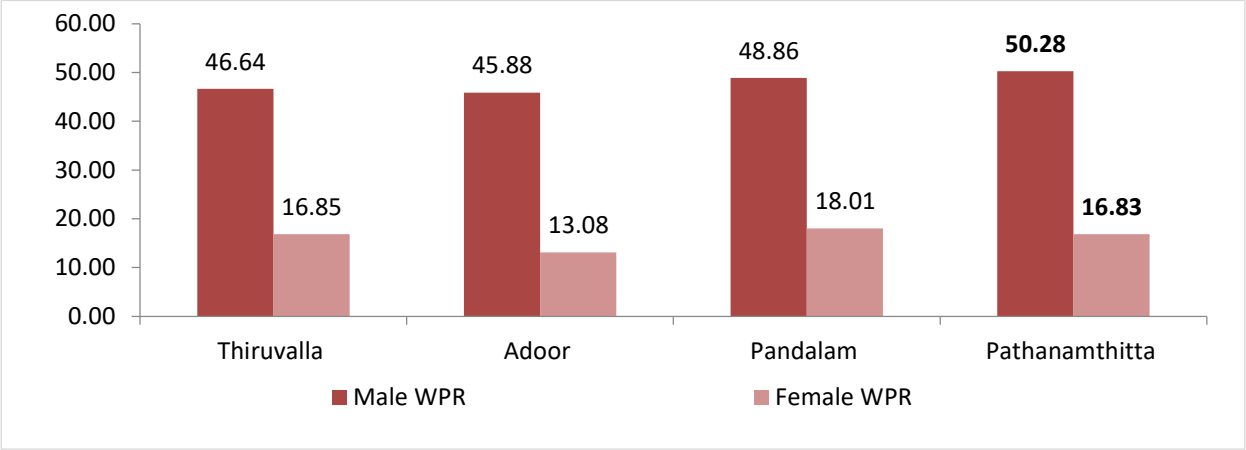


Figure 3.6 Male & Female WPR compared to other towns of the district

Source: *Census* 2011

3.4 Segregation of work force – Sex wise

As per 2011 census the work participation rate of Adoor Town is 28.53%. It means, out of total population of 29,171 persons, 8323 people are workers. Out of 8323 workers, 6305 are male workers and 2018 are female workers. The spatial distributions of Female and Male workers are shown in Figure 3.7 and 3.8.

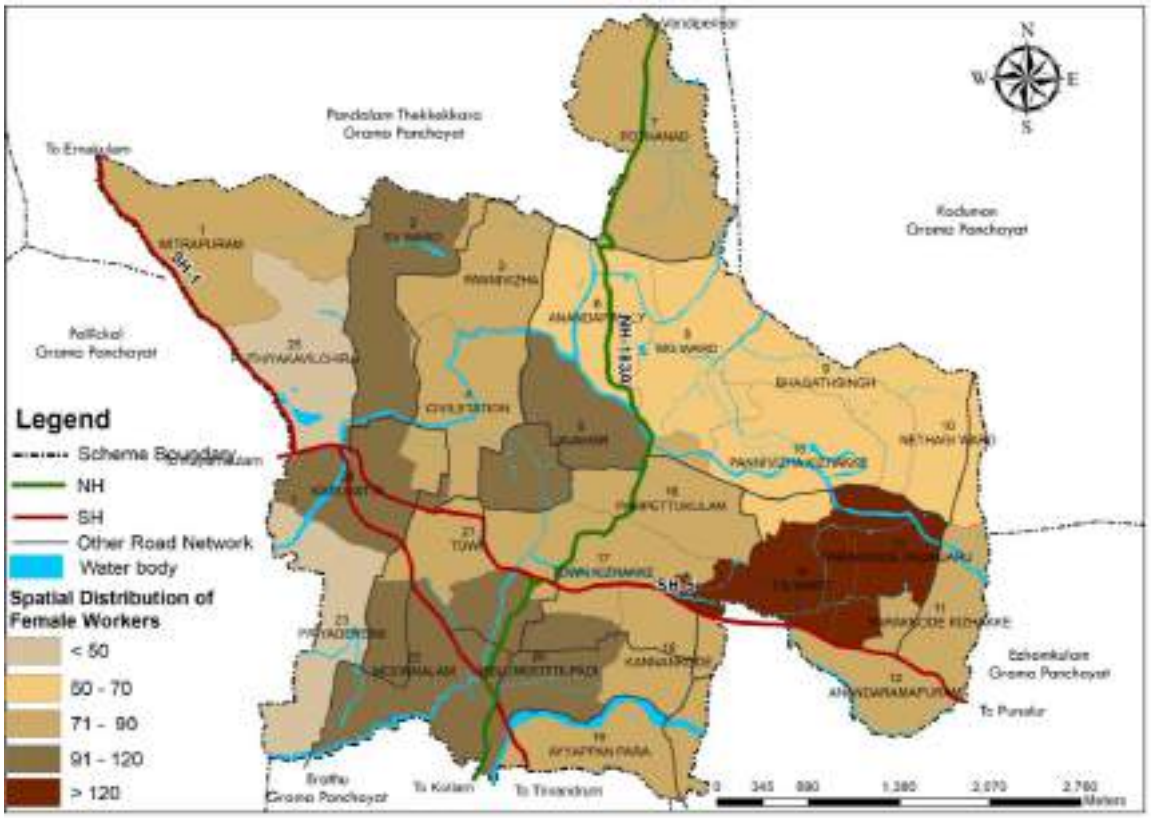


Figure 3.7 Spatial Distribution of Female workers

Source: Census 2011

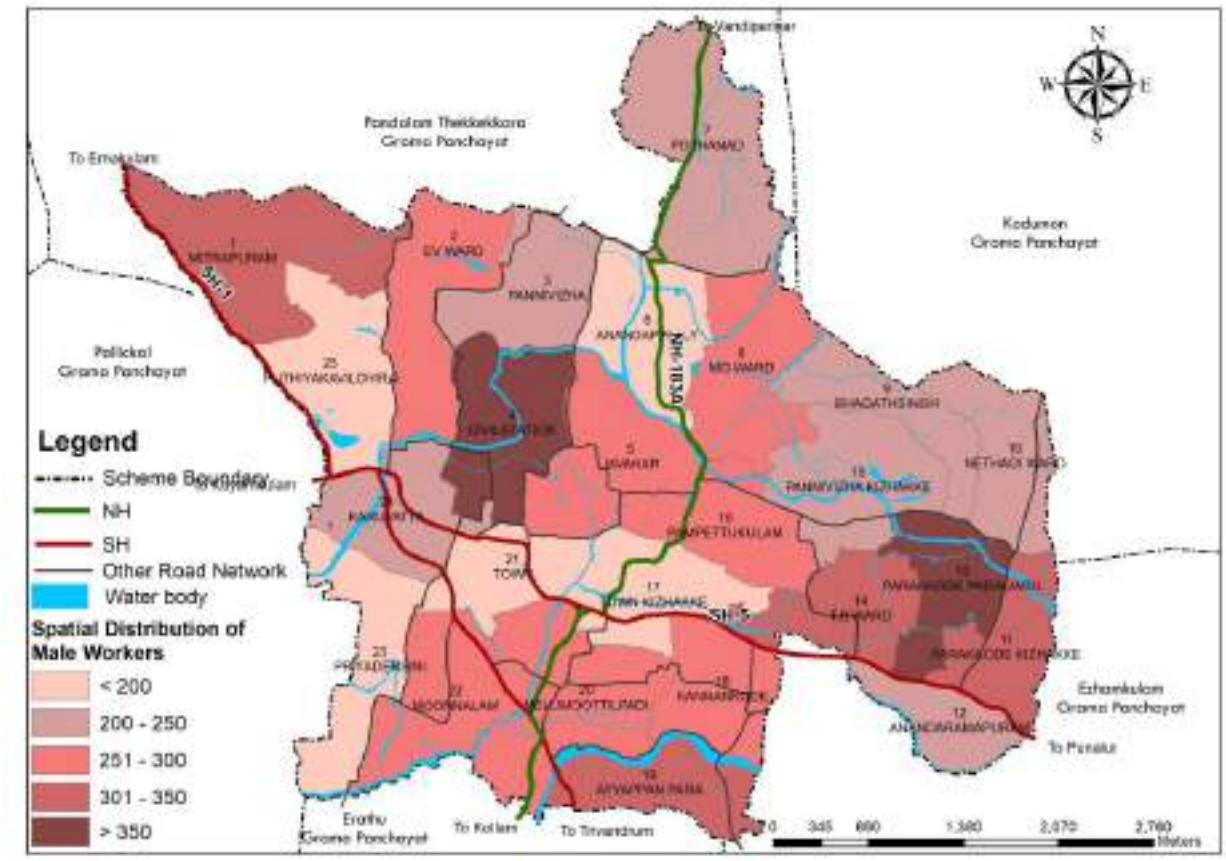


Figure 3.8 Spatial Distribution of Male workers

Source: Census 2011

3.5 Occupational structure

In the 2011 census, the main workers are classified into four categories viz. Cultivators, Agricultural laboures, Household industrial workers and other workers. The Other workers category includes the primary sector workers like fishermen and workers engaged in mining and plantation work. In the town, 83.46% of main workers belong to other workers category, 9.08% of main workers are Agricultural laborers, 4.91% of main workers are Cultivators and the remaining 2.55% is Household industrial workers as shown in Figure 3.9.

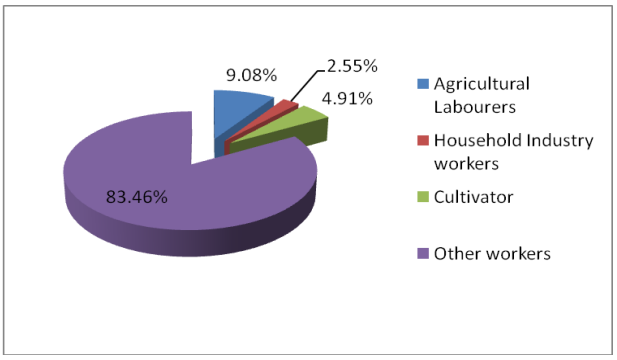


Figure 3.9 Occupational Structure of Adoor 2011

Source: Census 2011

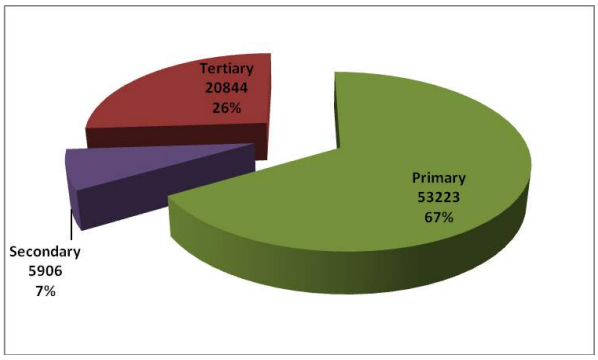


Figure 3.10 Workers classification

Source: Census 2011

In the region workers in the primary sector constitute 67% tertiary sector constitute 26% and the secondary sector constitute the remaining 7% of total workers as shown in Figure 3.10. More detailed composition of workers is available from the socio-economic survey 2019 and it is shown in Figure 3.11. The survey reveals that, 16.00% of workers are working outside the country and 8.00% of workers are Government employee. Workers engaged in agriculture and allied sector constitute 16.00% (Agriculture laborers 6.00%, cultivators 8.00% and livestock workers 2.00%) It indicates that agriculture and allied sector still occupies a major share in the town.

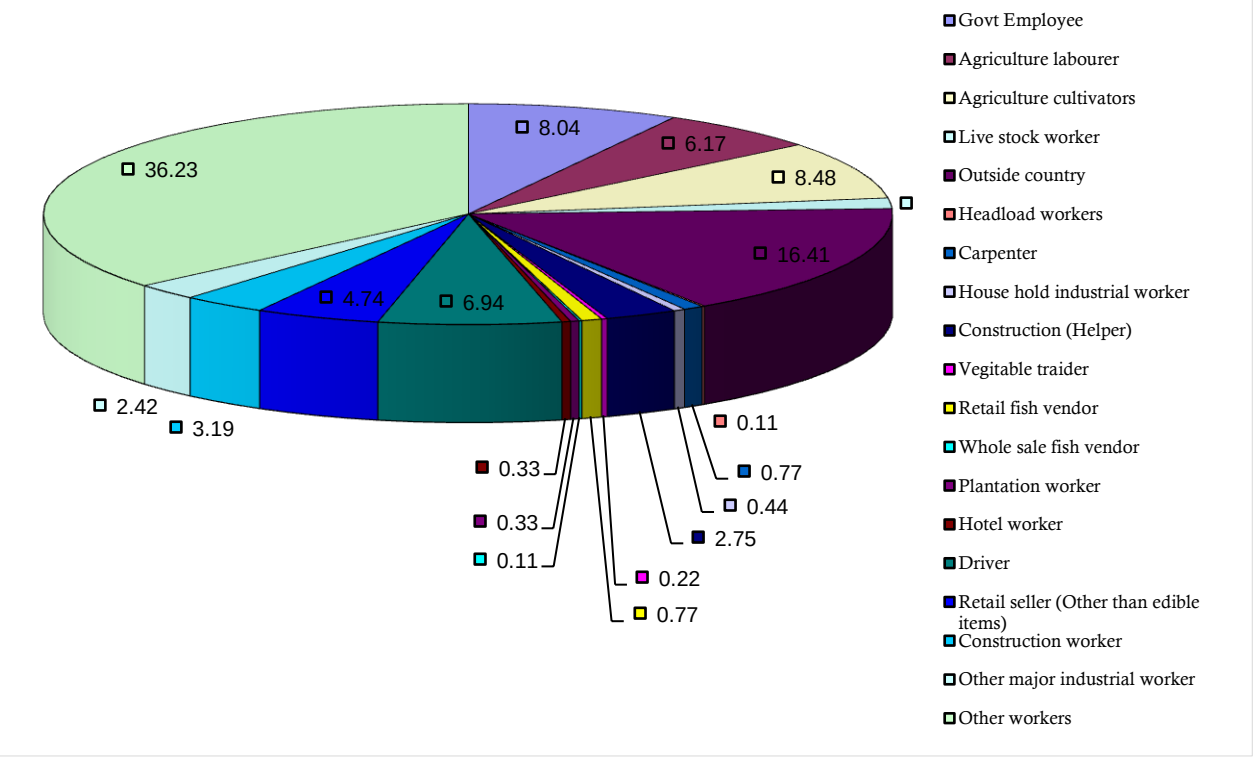


Figure 3.11 Composition of workers

Source: Socio Economic Survey 2019

3.6 Spatial Distribution of Workers

Spatial distribution of total workers in Adoor town is shown in Figure 3.12. More number of workers are concentrated in Parakode West ward. The ward wise distribution of four classes of workers viz Cultivators, Agriculture labourers, Household industrial workers and other workers among main and marginal workers are shown in Figure 3.13 and 3.14. The labourers related with agriculture sector are concentrated in the peripheral wards of the Town especially in the Eastern part of the Town. Household industrial workers are mainly concentrated in the eastern part and northern part of the town. From the central core there is gradual reduction of concentration in number of other workers towards peripheral area of the town. In fact it is in the reverse order of concentration of agriculture labourers and cultivators.

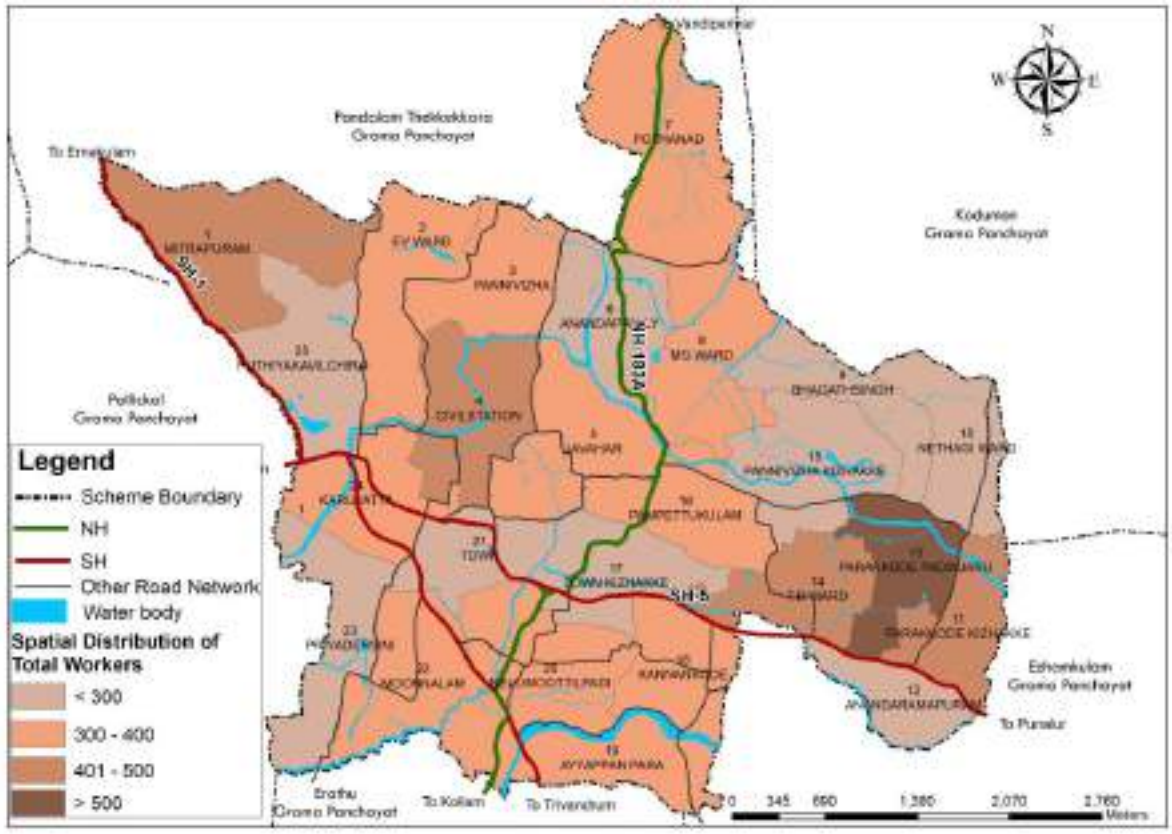


Figure 3.12 Distribution of workers

Source: Census 2011

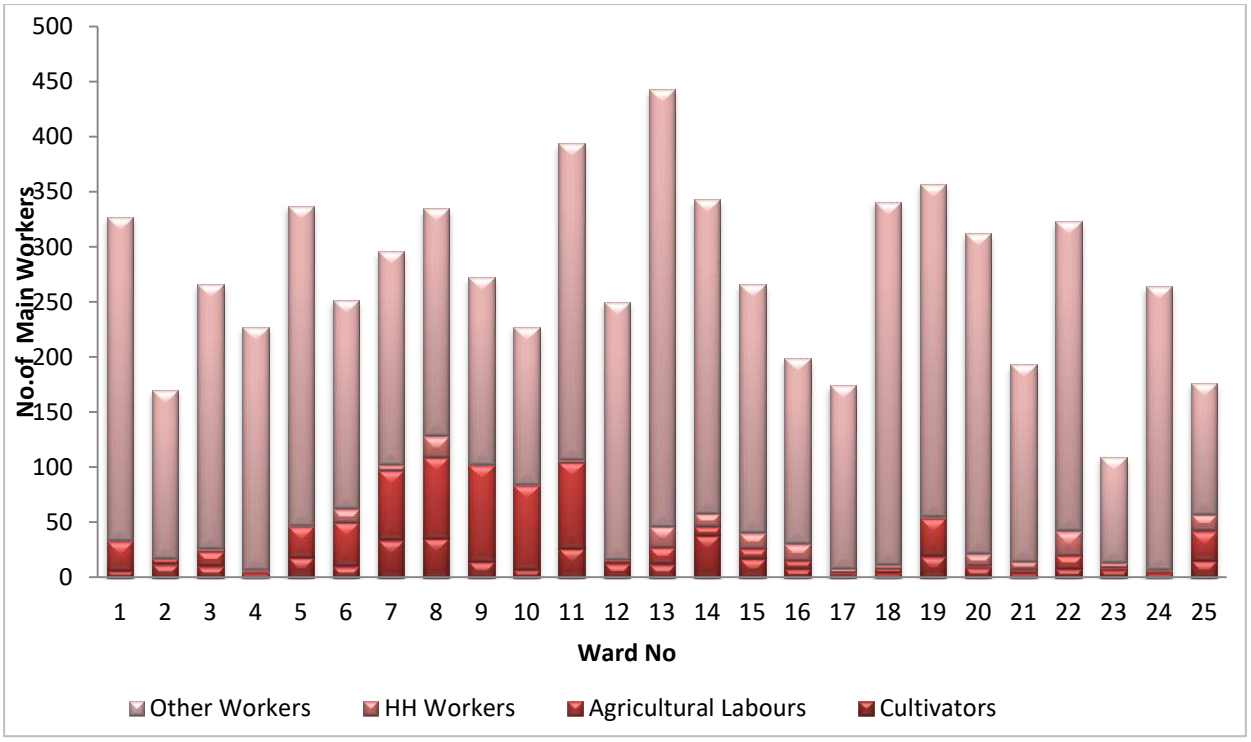


Figure 3.13 Distribution of Main workers

Source: Census 2011

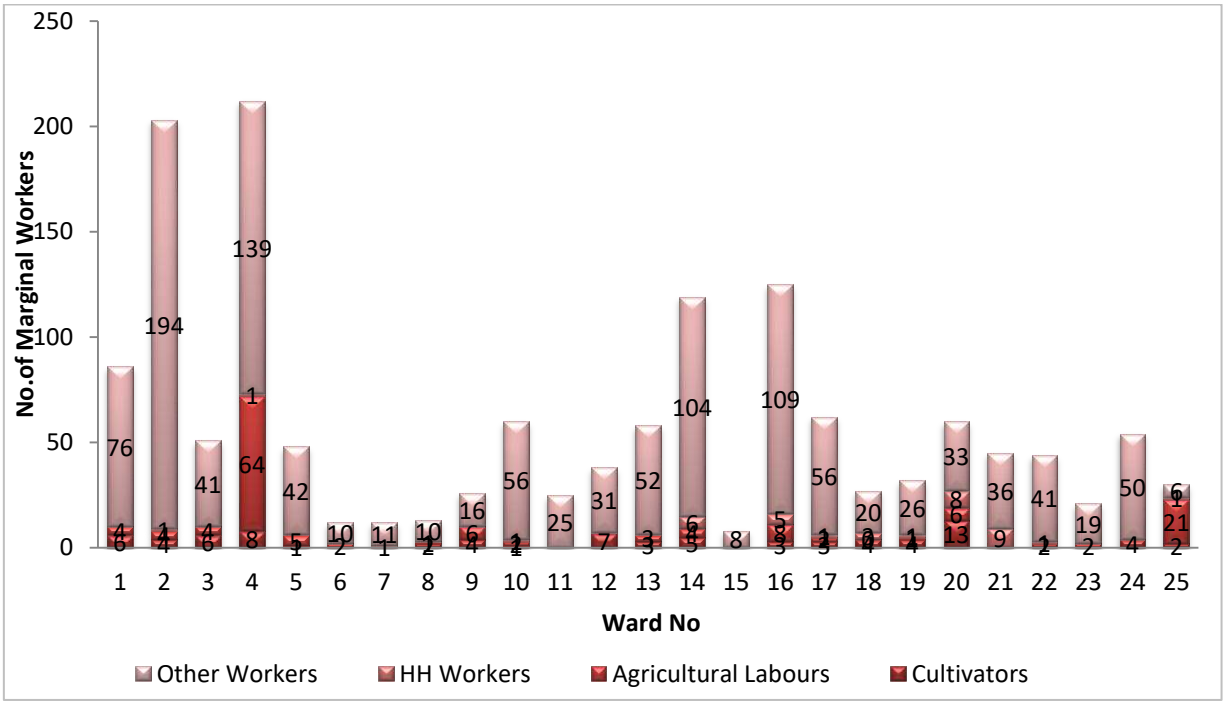


Figure 3.14 Distribution of Marginal workers

Source: Census 2011

3.7 Migrant Labours

Adoor town is a hub of migrant labourers from other States similar to other hubs such as Thiruvalla, Kozhencherry, Ranni and Konni. Most of these labours in adoor are from West Bengal (47%) followed by Tamil Nadu, Karnataka and Assam. Till 2001, migrants to Kerala were primarily from the neighbouring States of Tamil Nadu, Karnataka, and Maharashtra. However, in recent years, migrants are mostly from West Bengal, Assam, Odisha, and Bihar. The construction sector has the largest number of migrant workers in the State followed by manufacturing sector. As per AAWAZ Registration (Migrant Labours health Insurance scheme) highest concentration of migrant labour is in Ernakulum District (1, 15,053). As per the statistics from labour office, 625 migrant workers are residing in Adoor Town in 37 labour camps. Major share of labourers are working in Hotels (30%) and Construction sites (20%).

3.8 Inference

The work participation rate of Adoor town is lower than that of the district and other urban centers of the district as well as surrounding grama panchayats. The occupational structure shows that more percentage of workers belong to the other workers category. There is gradual reduction in the number of workers engaged in agriculture and related activity and there is corresponding increase in other workers category. The agricultural sector workers are concentrated in the peripheral area of the town and non-agriculture workers concentrated engaged in the central part of the town. The analysis shows that in production sector the agriculture sector shows a declining trend and the industrial sector not recording any growth. The only sector, which shows growth, is service sector.



CHAPTER 4
LANDUSE AND BUILT UP DENSITY

4.1 Introduction

The land use of an area is indicated by the predominant activity of that area, be it agriculture, residential, commercial, public and semi-public, transportation, park and open spaces, industrial etc. Hence, the analysis of existing land use is inevitable to understand the predominant economic activity of the area and to assess the availability of suitable land for the future urban development activities of the town. From this, it is possible to draw the future requirement of land for various uses in the town. LSGD Planning conducted detailed land use survey in the year 2010, 2019 and finally updated in 2023, as part of preparation of Master Plan for Adoor.

4.2 General Analysis of Land use – Land use breakup

As per the land use survey 2023, Dry Agriculture, Environmentally Sensitive Area, Residential, Commercial, Public and semi- public, Industrial, Park and Open spaces, transportation and water bodies are the major land use classifications of Adoor Town. The land use break up of Adoor town is given in Table 4.1 and ward wise land use of Adoor Town is given in Annexure 4.1. The land use break up of Adoor town is also represented in Figure. 4.1. The Figure 4.2 shows the Existing land use map of Adoor 2023.

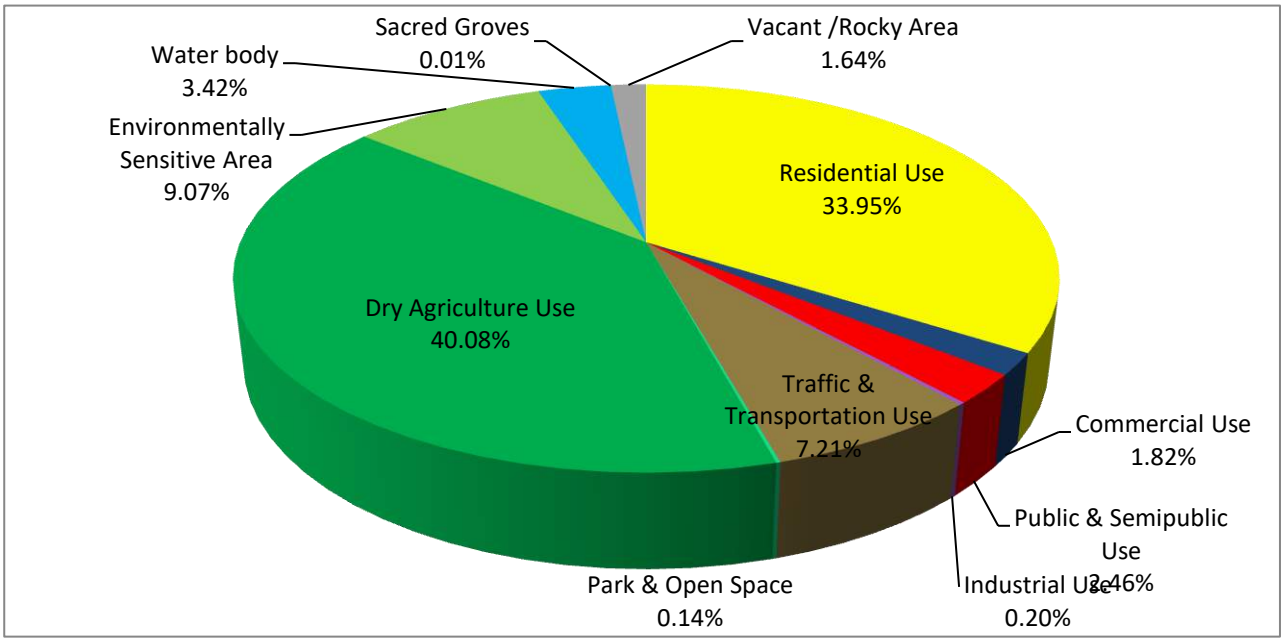


Figure 4.1 Existing Land use split-up

Source: Land use survey 2023

Table 4.1 Land use break up of Adoor Town 2023

Sl.No	Land use	Area in Ha	% of total Area
1	Residential Use	703.7	33.95
2	Commercial Use	37.68	1.82
3	Public & Semipublic Use	50.95	2.46
4	Industrial Use	4.1	0.2
5	Traffic & Transportation Use	149.55	7.21

6	Park & Open Space	2.85	0.14
7	Environmentally Sensitive Area	188	9.07
8	Dry Agriculture Use	830.94	40.08
9	Water body	70.95	3.42
10	Sacred Groves	0.26	0.01
11	Vacant /Rocky Area	34.02	1.64
	Total	2073	100

Source: Land use survey 2023

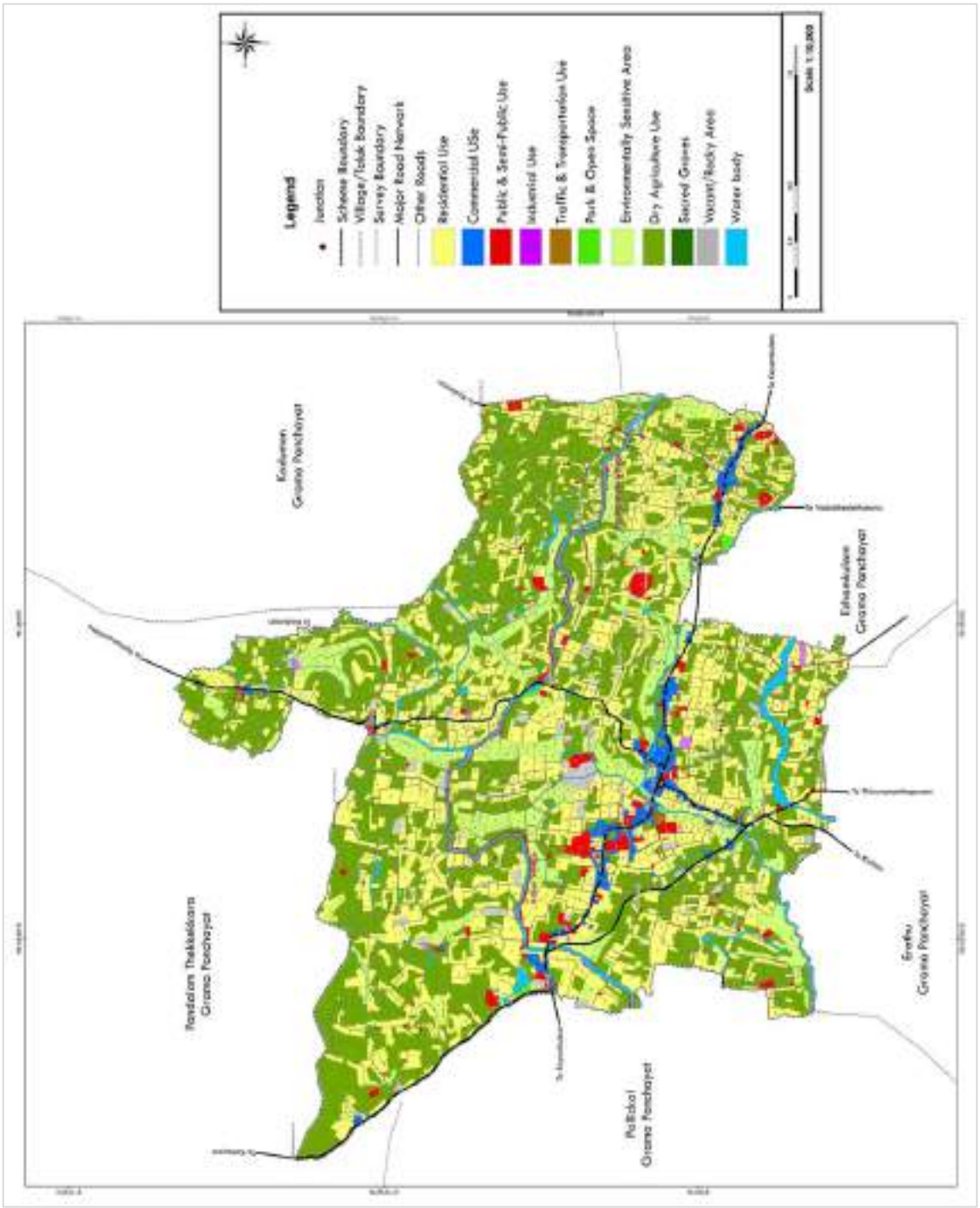


Figure 4.2 Adoor town existing land use map 2023

Source: Land use survey 2023

4.3 Spatial Distribution & Concentration Pattern of Land Use

Land use pattern is the layout or arrangement of uses of the land. It gives an idea about where a particular land use is concentrated within the study area. The concentration pattern of a land use can be ascertained by the Concentration Index of the land use which is calculated as follows.

Concentration Index (CI) of a land use in a ward = {(Area of that land use in the ward/ Total area of the ward)} / {(Area of that land use in municipal town/ Total area of the municipal town)}

The concentration index value may be greater than one, equal to one or less than one. The wards with concentration index greater than one indicates that the land use under consideration is intensively concentrated in these wards. According to the above method, the concentration indices of various categories of land uses are analysed. The spatial distribution of land use refers to how different types of land uses such as residential, commercial, industrial, agricultural, Public and semi-public recreational, and open space etc., are arranged or allocated across a geographic area, typically within a town.

4.3.1 Residential Land Use

The residential land use distribution and ward wise residential land use concentration of Adoor town area is shown in Figure.4.3 and Figure.4.4 respectively. Residential land use occupies the second-largest share, covering 703.70 hectares or 33.95% of the total town area, and is distributed across nearly all parts of the town. In the planning area, the residential land use concentration index ranges from less than 1 to greater than 1.50, with the highest value observed in Kannamkodu.



Figure 4.3 CI of Residential Land Use



Figure 4.4 Spatial distribution of Residential Land use

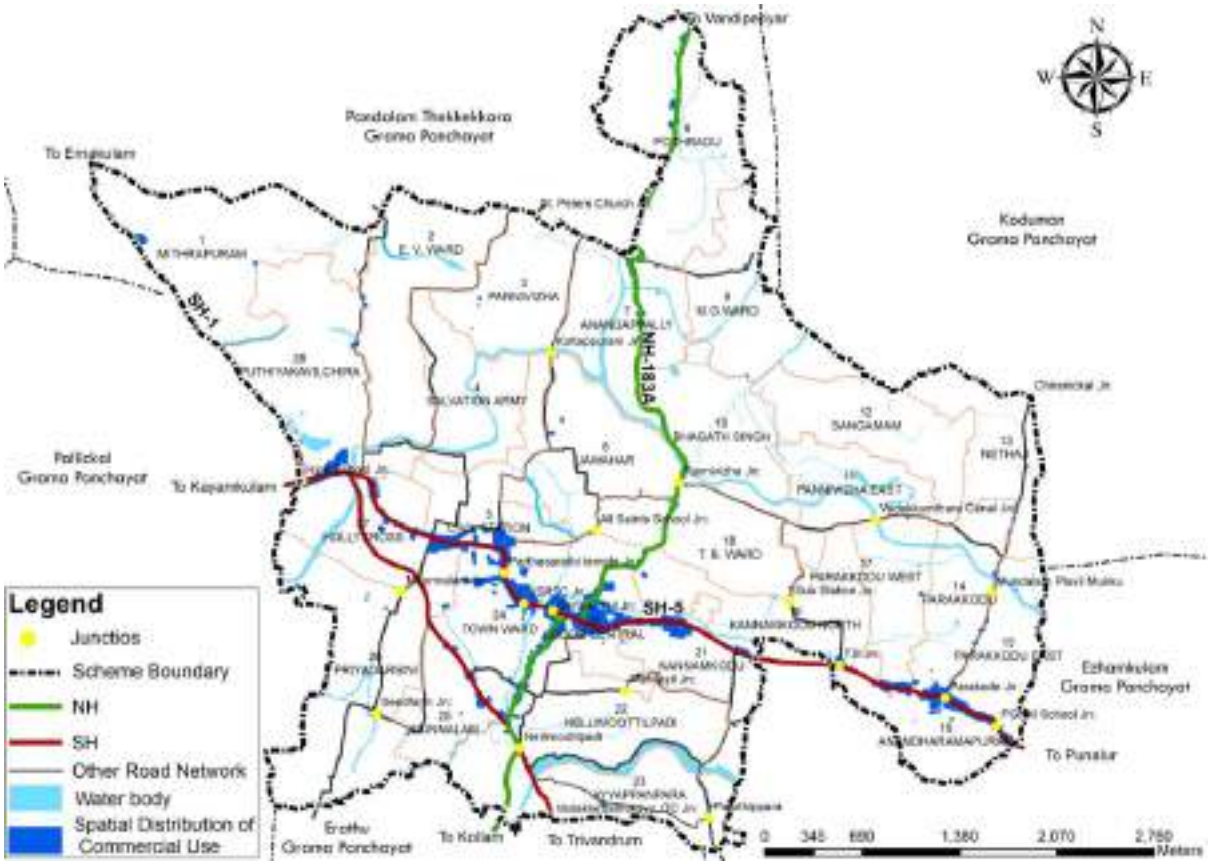


Figure 4.5 Spatial Distribution of Commercial Land Use

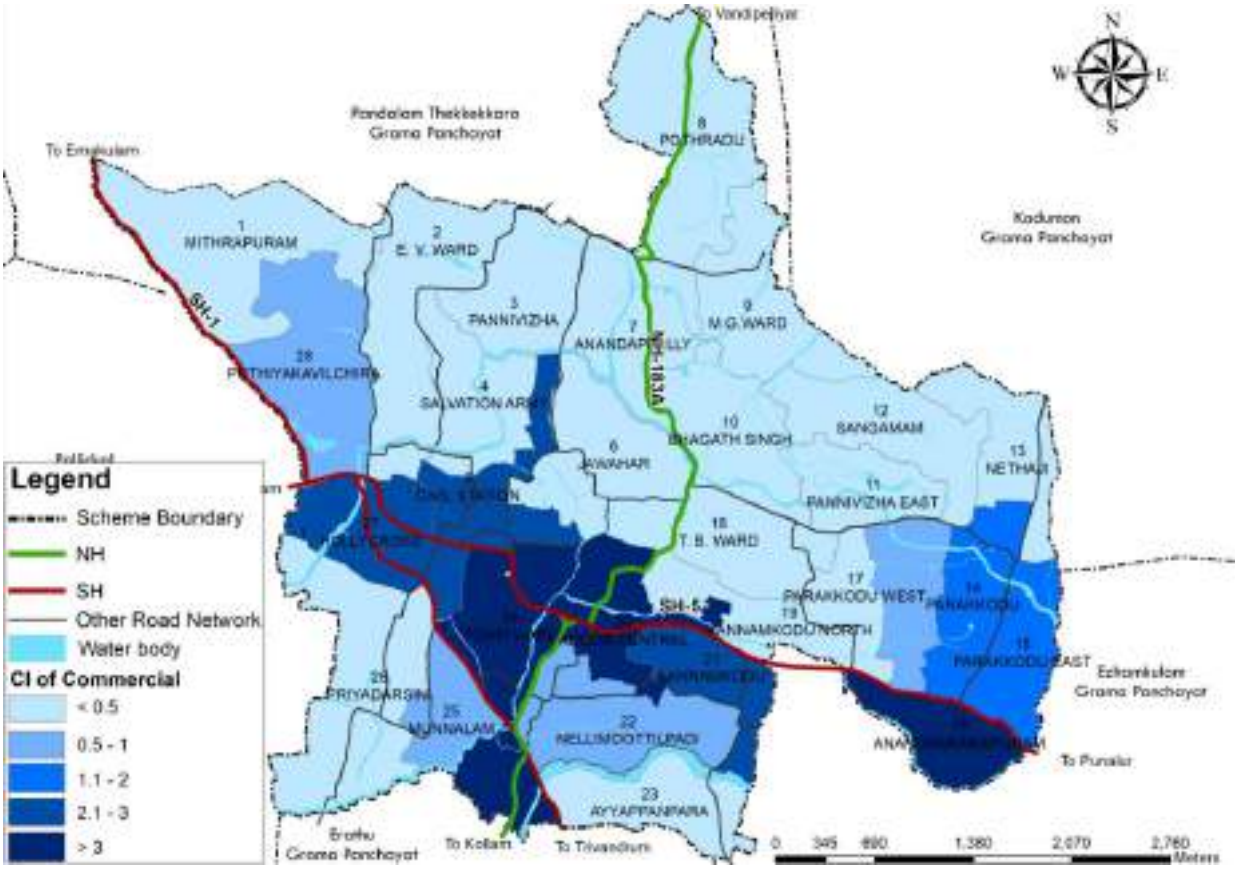


Figure 4.6 CI of Commercial Land Use

4.3.2 Commercial Land Use

The Figure 4.5 and Figure 4.6 represents the distribution and concentration index of commercial land use in Adoor Town area respectively. The commercial area is primarily concentrated in the town center along the major travel corridors. The central toll area and its surroundings function as the Central core of the town, while Parakode serves as another key commercial center. A total of 37.68 hectares of land is designated for commercial use, with a few smaller pockets distributed in other parts of the town as well. The figures indicate that commercial land use is predominantly concentrated in the wards located at the core of the planning area. Town Ward, Adoor Center, and Anantharamapuram show the highest concentration index values, all above 3.00. The second-highest commercial concentration is observed in Holy Cross, Civil Station, and Kannamkodu, with values ranging from 2.01 to 3.00, followed by Parakode and Parakode East, with values between 1.01 and 2.00. All other wards have a concentration index of less than 0.5.

4.3.3 Industrial Land Use

The distribution and concentration index of industrial land use in the Corporation area shown in Figure.4.7 and Figure.4.8 respectively. The concentration Index of industrial land use is highest seen in Ayyappanpara, Adoor Center and Pothradu wards. Hollycross and Bhagath Singh wards have the second highest industrial concentration index, followed by Parakode East and Puthiyakavil Chira wards.



Figure 4.7 Spatial Distribution of Industrial land Use

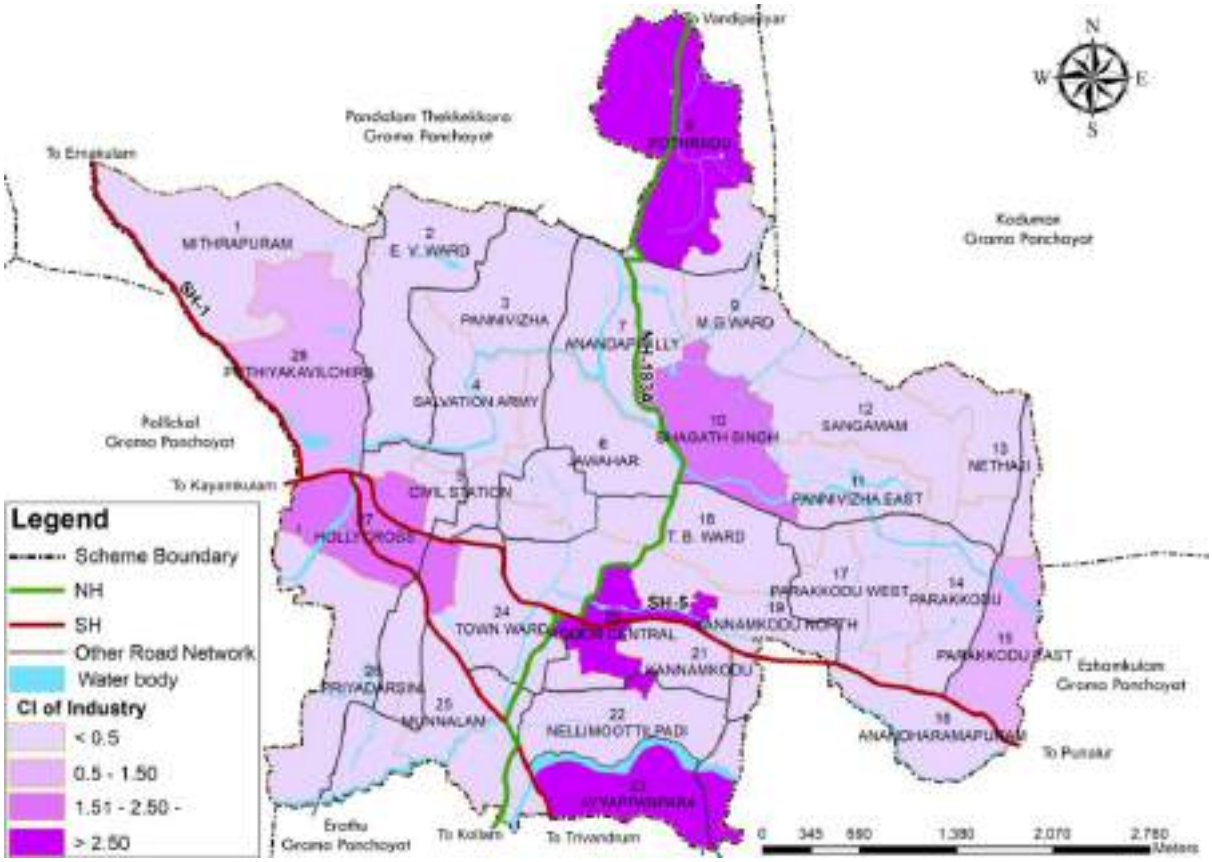


Figure 4.8 CI of Industrial Land Use

Remaining wards have industrial concentration index ranging from less than 0.5. There is no specific pattern on concentration of industries. In fact only 4.10 hectares of land is coming under industrial land use, which constitutes 0.20%. Mini industrial Estate in ward No. 19 (Ayyappanpara) is the major industrial land use. In addition to this, there are only a few units under MSME category. No major industrial units are there in the town. Only few micro and small units are there in other wards.

4.3.4 Public & Semi- public Land Use

The distribution of public and semi-public land use includes government establishments, educational institutions, healthcare facilities, social institutions, religious establishments, etc. Figures 4.9 and 4.10 illustrate the ward-wise distribution and concentration patterns of public and semi-public land use in the Adoor Town area. The highest concentration index for public and semi-public land use is recorded in Civil Station Ward (Ward 5), which is due to the presence of government establishments like Mini Civil Station, DMO Office, and Court Complex etc. The second highest value of public and semi-public land use concentration index is seen in Town Ward (Ward 24), Adoor Center (Ward 20), Kannamkodu North (Ward 9), Parakode West (Ward 17), and Anantharamapuram (Ward 16). Public and semipublic land use distributed in almost all wards of the town and 50.95 hectares, of land, which is 2.46% of town area comes under this land use.

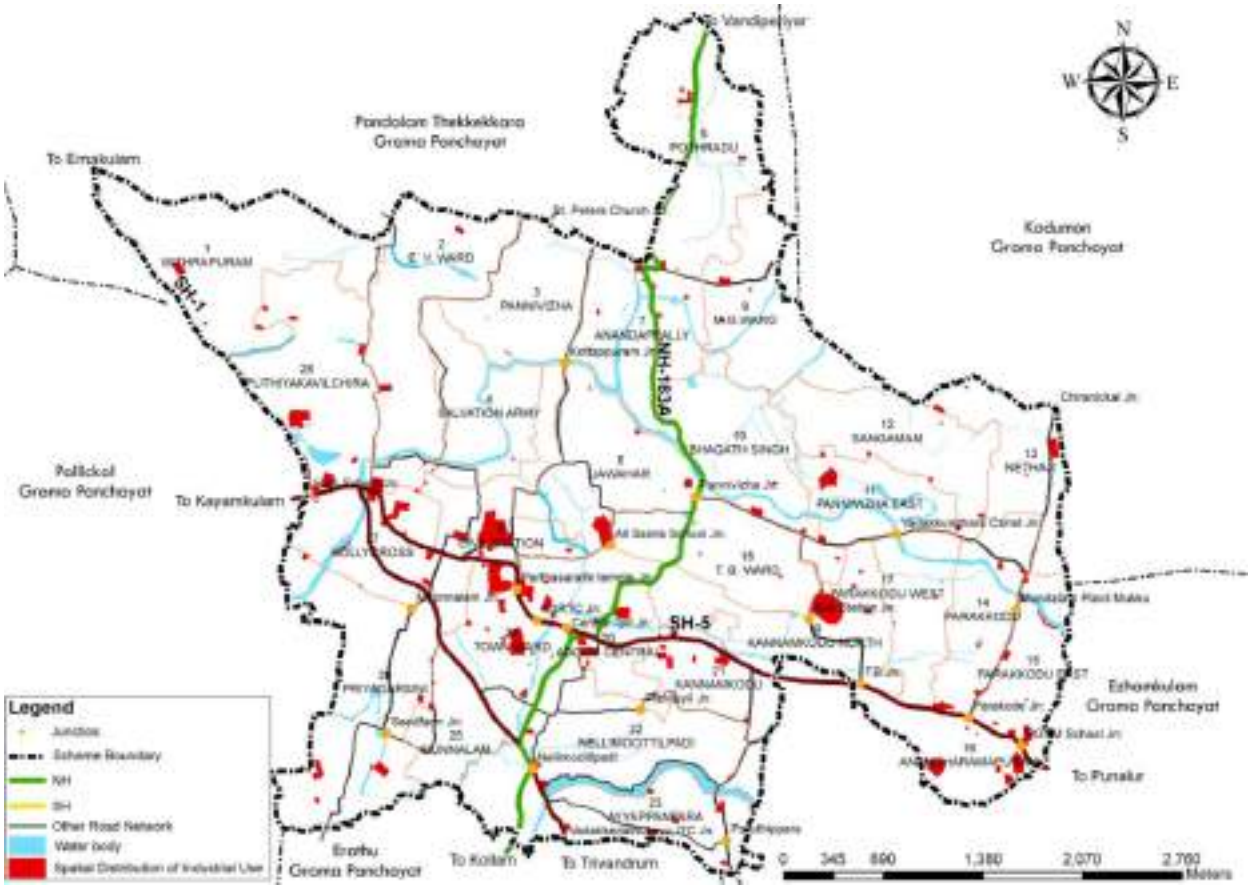


Figure 4.9 Spatial Distribution of Public & Semi-public Land Use

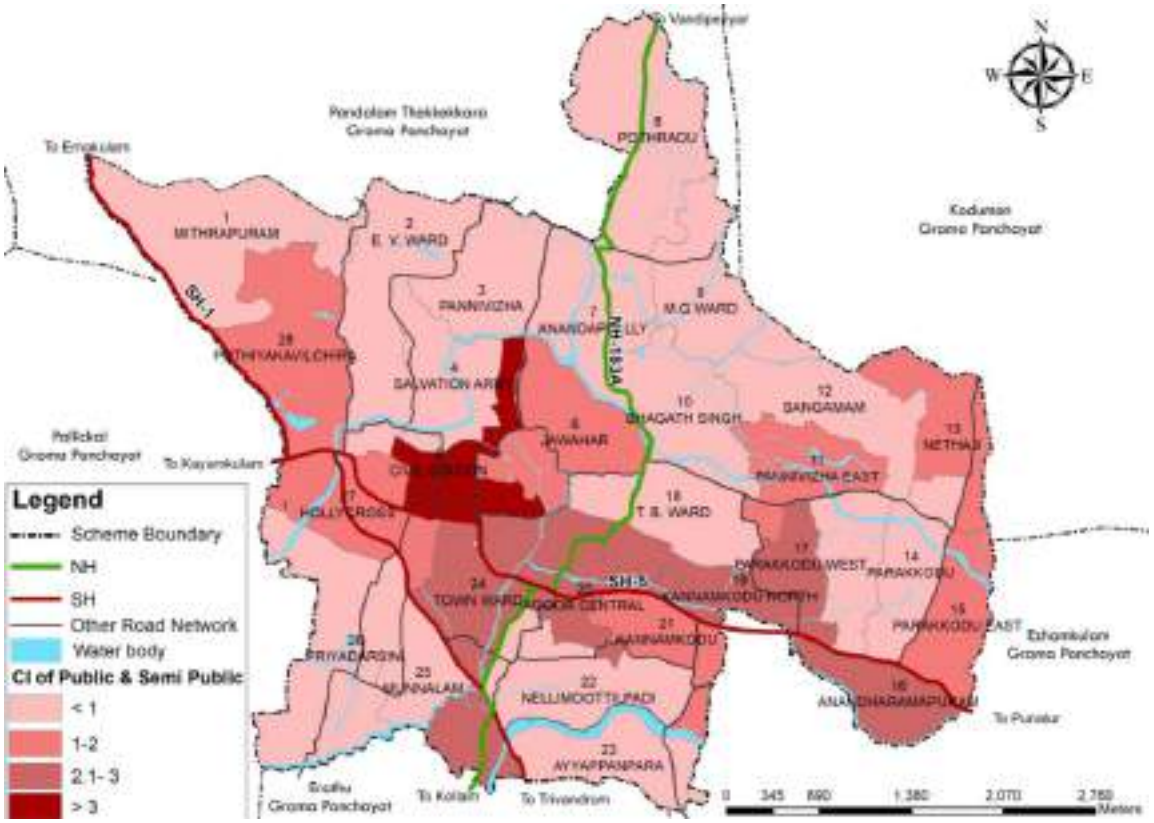


Figure 4.10 CI of Public & Semi-public Land Use

4.3.5 Dry Agriculture Land Use

Dry agricultural land use distribution and its concentration pattern in the planning area are shown in Figure.4.11 and Figure.4.12 respectively. The concentration index of Dry agriculture land use is high in the wards of Mithrapuram (Ward 1) and Sanganamam (Ward 12) Wards (1.65to 1.75). These wards are located on the peripheral area of the town. The dry agricultural land use is primarily divided into three categories: rubber, mixed crops, and coconut.

4.3.6 Environmetally Sensitive Area

The Spatial distribution and concentration of Environmentally Sensitive Area in the planning area are shown in Figures 4.13 and 4.14 respectively. The figures reveal that Environmentally Sensitive Area is scattered and primarily located in three wards of the town—Salvation Army, Kannamkodu North, and Parakode West. Environmentally Sensitive Areas are mainly concentrated in the central part of Adoor Town Higher values are observed in wards located town center. Most of them are under cultivation of vegetables and other seasonal crops.



Figure 4.11 Spatial Distribution of Dry Agricultural Land Use



Figure 4.12 CI of Dry Agricultural Land Use

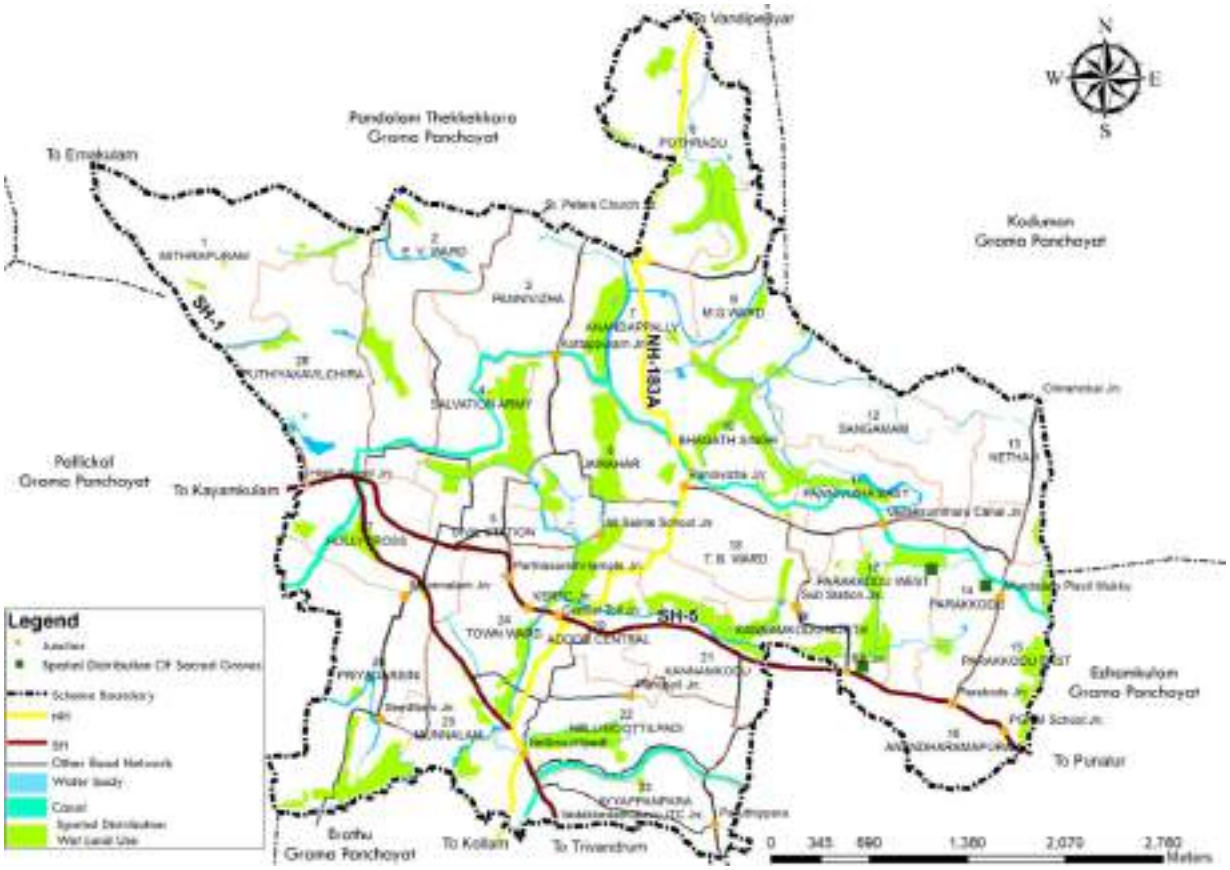


Figure 4.13 Spatial Distribution of Environmentally Sensitive Area

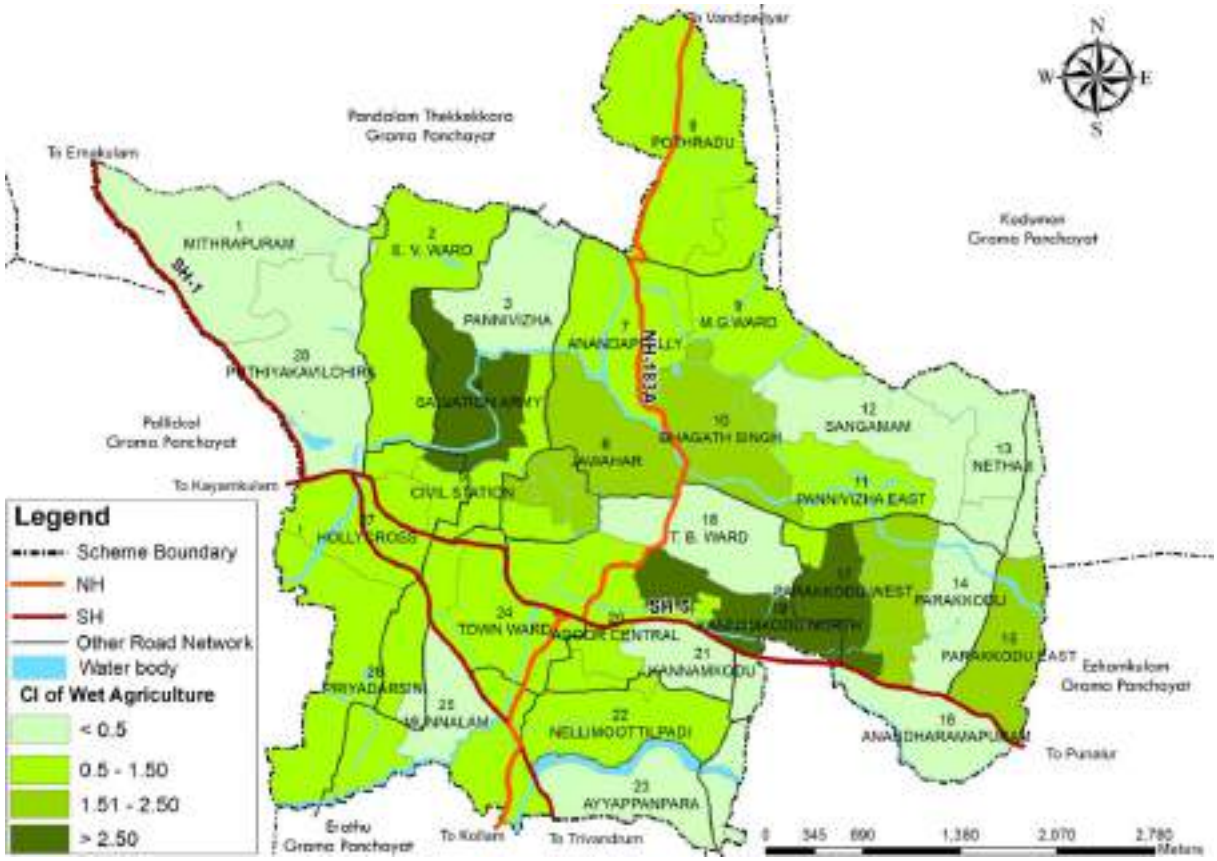


Figure 4.14 CI of Environmentally Sensitive Area

4.3.7 Traffic & Transportation Use

Transportation land use includes road network, bus stand, Traffic island etc. Traffic & Transportation land use distribution and concentration of the planning area are shown in Figure.4.15 and Figure.4.16 respectively. The highest concentration is observed in Town Ward (above 2), followed by



Figure 4.15 Spatial Distribution of Traffic & Transportation Use

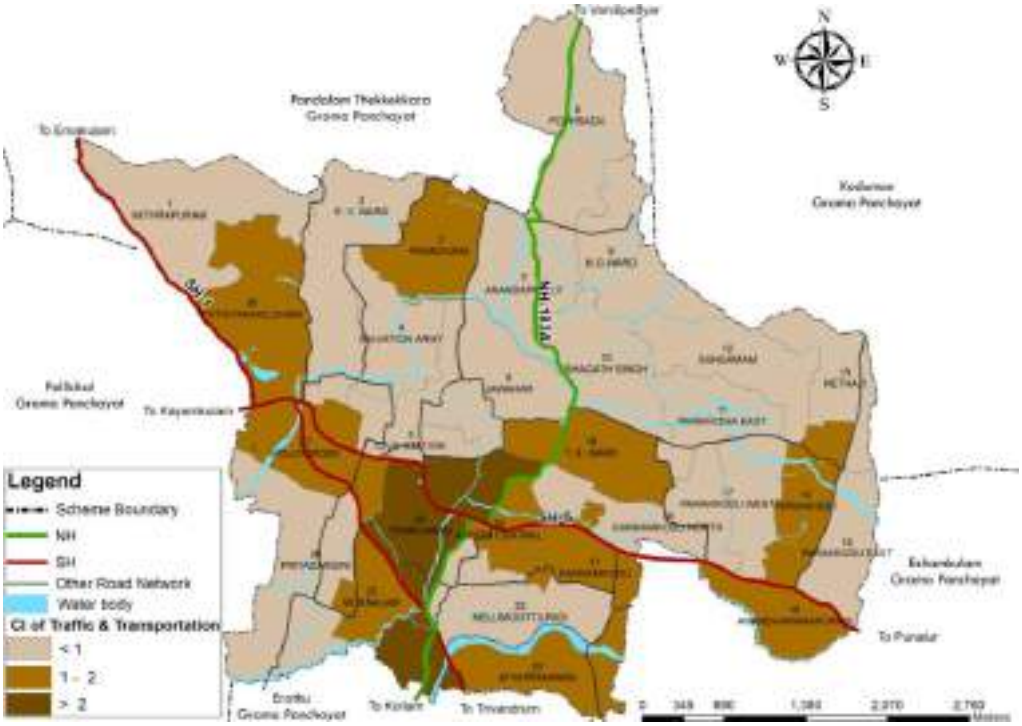


Figure 4.16 CI of Traffic & Transportation Use

Pannivizha,Puthiyakavilchira, Holy Cross, Munnalam, TB Ward, Kannamkodu, Ayyappanpara, Parakode, and Anantharamapuram wards (ranging from 1 to 2.00), primarily due to the presence of the KSRTC bus stand. The total area under traffic and transportation use in the town is 147.39 hectares, which accounts for 7.11% of the total land use.

4.3.8 Water bodies

Water bodies include Thodu, Canal and Pond etc. Water bodies distribution and concentration of the planning area shown in Figure.4.17and Figure.4.18 respectively. The highest concentration is observed in Nellimoottilpadi (Ward22) , Anandapally (Ward7), Pannivizha East (Ward 11) and Salvation Army wards (Ward 4). 82.96 hectares of land which is 4.05 % of total area comes under Water bodies. There are no rivers or major water bodies in the town. The Kallada Irrigation Project (KIP) Canal, which passes through the town for a length of 12.50 km occupies major share of the water bodies. In addition to this there are a few small drains and ponds within the town.

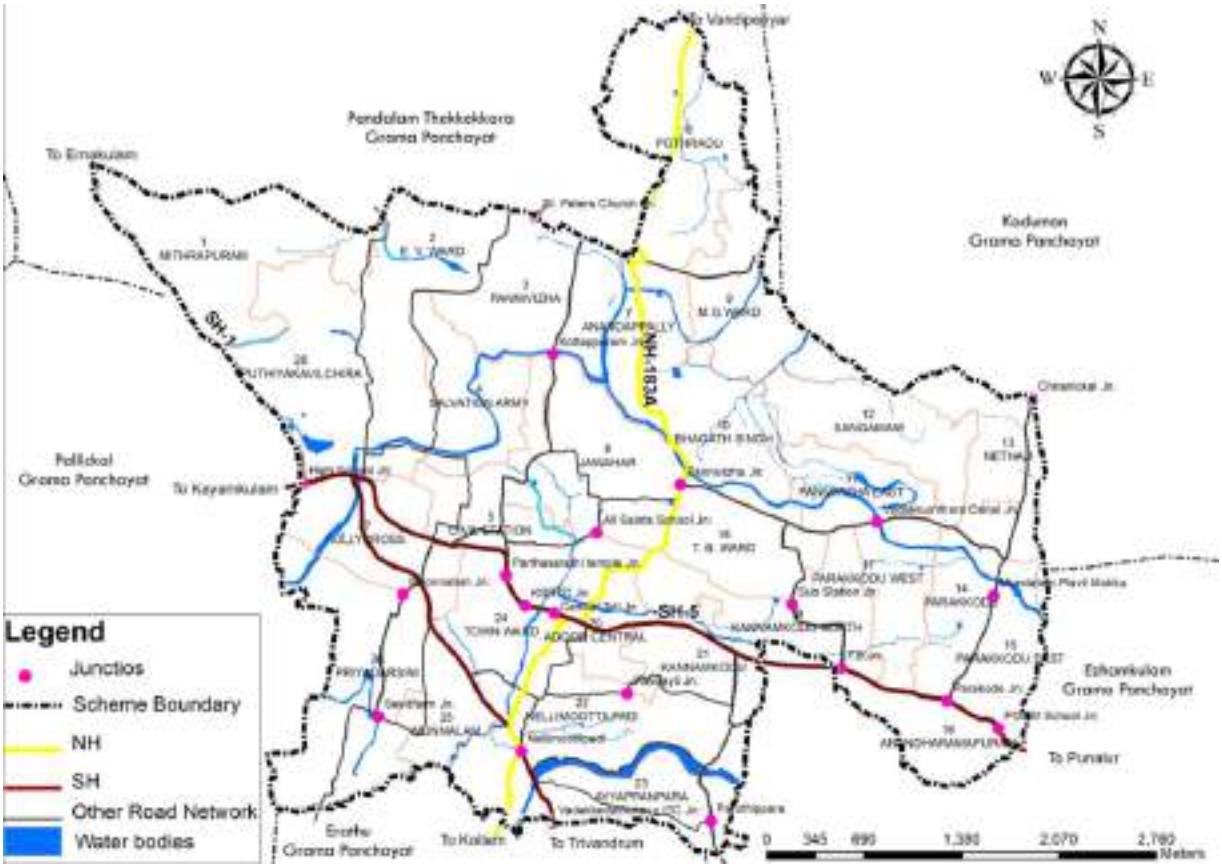


Figure 4.17 Spatial Distribution of Water bodies

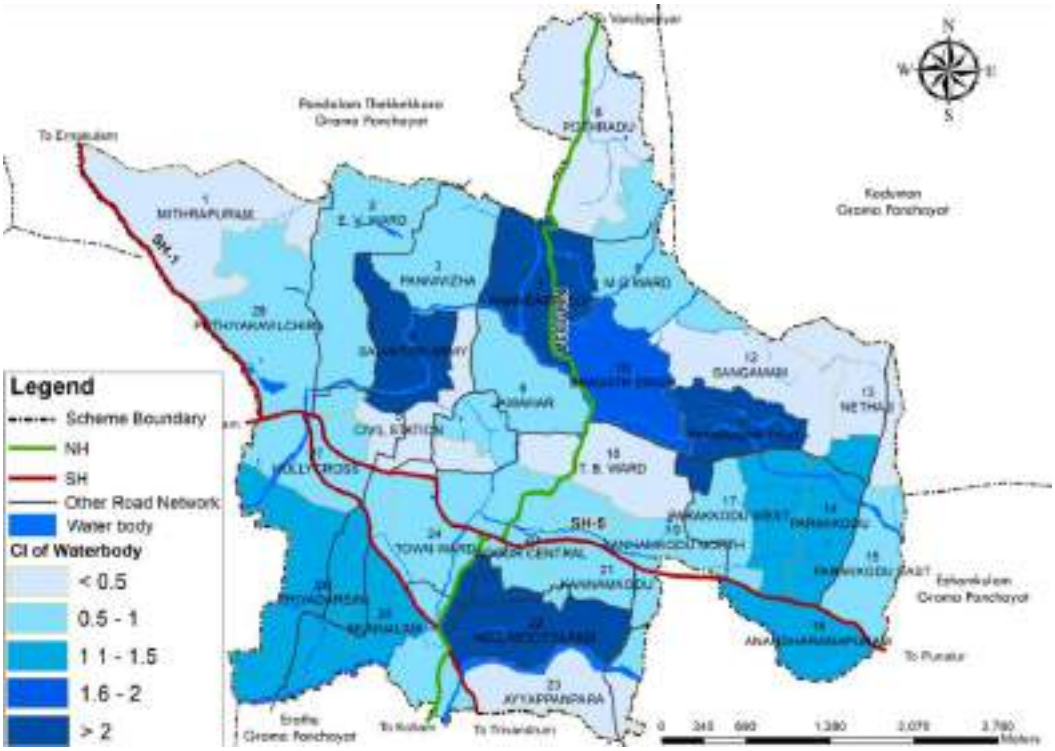


Figure 4.18 CI of Water bodies

4.3.9 Park & Open Space

The spatial distribution and concentration of Park & Open space is shown in the Figure 4.19 and Figure.4.20. The highest concentration is observed in Anatharamapuram ward (> 9), followed by Salvation Army and Puthiyakavilchira wards (3 – 9). The total area under Park & Open space in the town is 2.85 hectares, which accounts for 0.14% of the total land use.



Figure 4.19 Spatial Distribution of Park and open space



Figure 4.20 CI of Park and open space



Figure 4.21 Spatial Distribution of Other Landuse

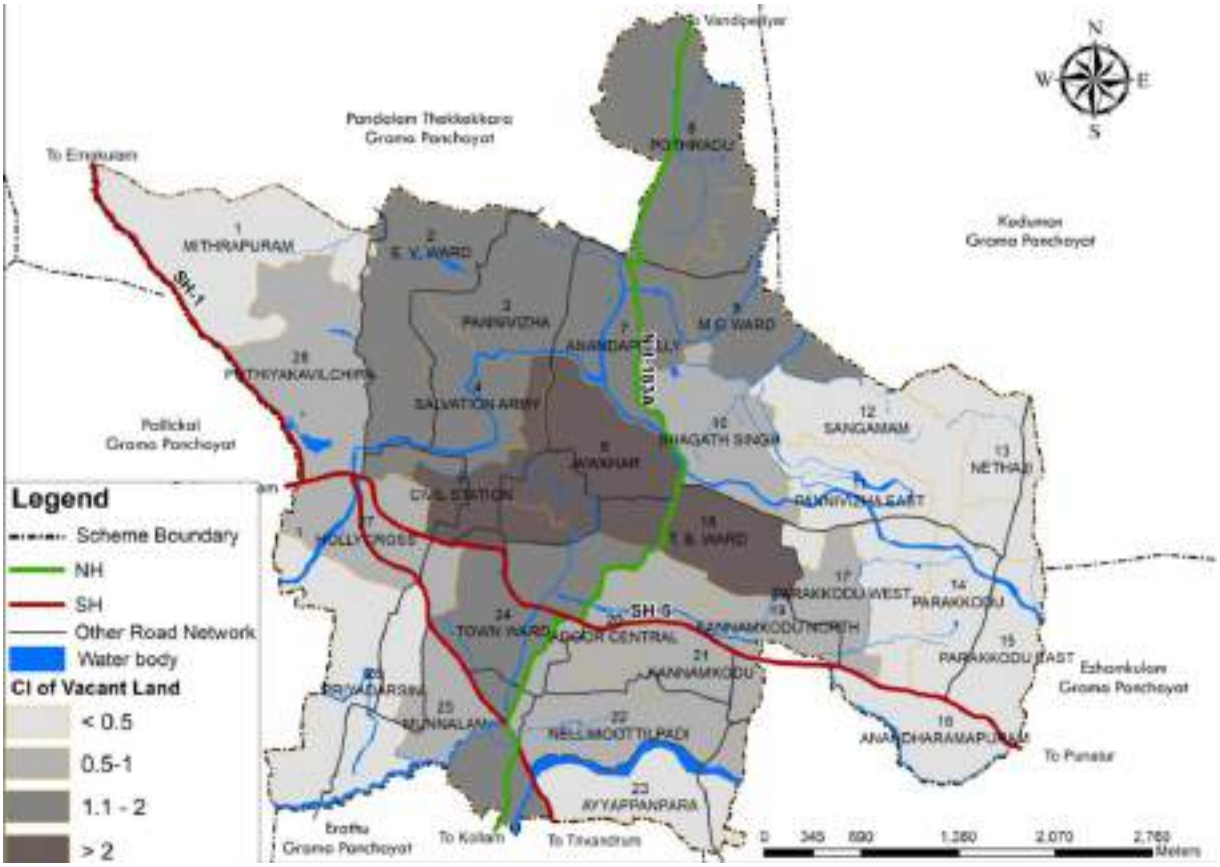


Figure 4.22 CI of Other Landuse

4.3.10 Other Land Use

The spatial distribution and concentration of other land use is shown in the Figure 4.21 and Figure.4.22. Other land use included vacant land and Sacred Groves. The total area under vacant land and Sacred Groves in the town is 34.28 hectares, which accounts for 1.65% of the total land use.

4.4 Comparison with planning standards

Comparison of land use breakup of Adoor with the proposed land use structure as per URDPFI Guide line has been made and it is shown in Table 4.2. The percentage of residential use and transportation use is far above the suggested standard as per URDPFI guide lines. The percentage of commercial area is also higher than the URDPFI standard. The percentage of industrial and recreational use is far below the suggested URDPFI standard. But the percentage of public and semipublic land use is slightly below the URDPFI standard. As per URDPFI standards, Adoor Town comes under the category of small towns, Sub Category – Small Town II with population range 20,000 to 50,000.

Table 4.2 Comparison of existing land use and proposed land use structure as per URDPFI Guide line

Sl. No	Land use	Adoor Town		Proposed land use structure as per URDPFI Guide line (for small towns)
		Area of existing land use (in Ha)	% of total (existing) developed area	% of Developed area
A	Developed Area			
1	Residential	705.15	75.25	45.00-50.00
2	Commercial	37.68	4.02	02.00-03.00
3	Public and Semi public	40.48	4.32	06.00-08.00
4	Industrial	4.10	0.44	08.00-10.00
5	Transportation	147.39	15.73	10.00-12.00
6	Recreational	2.26	0.24	12.00-14.00
	Total Developed Area	**933.14**	100.00	

4.4.1 Growth of the town

Adoor town has grown around two focal points (Figure 4.23);one with Parakode market which is one of the oldest weekly market and cattle market in Central Travancore as the focal point and the other with the Parthtasaradhi temple as focal point. Establishment of bus stands, offices etc in this area has intensified the activities in this area. Gradually, ribbon development came in between these two centers. Now the commercial and other urban developments are taking place along the major travel corridors- M.C.Road and K.P.Road.



Figure 4.23 Two Focal Points in growth of Adoor Town

4.5 Comparison with Other Towns within the District

Comparison of land use of Adoor town is made with other similar towns like Pathanamthitta, Thiruvalla, Chengannur and Changanassery. The percentage of different land use of these towns is shown in Table 4.3. The percentage of Transportation Land Use is highest in Adoor and followed by Thiruvalla.

Table 4.3 Comparison of percentage of land use of similar towns

Towns / Land use (%)	Pathanamthitta (2023)	Pandalam (2013)	Adoor (2019)	Thiruvalla (2010)
Residential	36.24	33.82	33.13	45.45
Commercial	2.67	0.83	1.5	0.97
Public & Semi public	3.45	2.96	1.92	16.39
Transportation	0.72	1.06	6.9	5.8
Industrial	0.13	0.41	0.18	0.54
Dry Agriculture Use	43.44	35.02	40.08	11.45
Environmentally Sensitive Area	8.61	22.19	9.07	13.10
Water Body/canal	2.41	3.29	4.08	3.94
Total Area (sqkm)	23.43	28.42	20.73	13.06

4.6 Land use activity pattern

As per the regional setting study the activity identified for Adoor town is Agriculture. The activity pattern of Adoor Town based on land use is evolved here. Only four major category of land uses, viz residential, commercial, agriculture, public (excluding religious use) are considered in this regard. The concentration index of the above four category of land use is shown in Table 4.4. That activity (land use) with higher concentration index has been assigned as the activity of the particular ward. The activity pattern of the town based on the land use is shown in Figure.4.24.

Table 4.4 Concentration index of major land uses and Activity Pattern of Wards

Ward No	Ward Name	Concentration index				Land use Activity Pattern
		Residential	Commercial	Public	Agricultural	
1	Mithrapuram	0.70	0.24	0.18	1.38	Agriculture
2	E. V. Ward	1.14	0.12	0.58	1.03	Residential
3	Pannivizha	1.39	0.54	0.03	0.79	Residential
4	Salvation Army	0.87	0.00	0.03	1.12	Agriculture
5	Civil Station	1.02	2.68	2.97	0.85	Public
6	Jawahar	1.16	0.12	0.92	0.81	Residential
7	Anandappally	1.13	0.50	0.43	0.75	Residential
8	Pothradu	0.71	0.42	0.24	1.33	Agriculture
9	M.G.Ward	0.70	0.10	0.21	1.31	Agriculture
10	Bhagath Singh	0.91	0.08	0.31	1.06	Agriculture

11	Pannivizha East	0.58	0.00	0.95	1.20	Agriculture
12	Sangamam	0.67	0.01	0.18	1.43	Agriculture
13	Nathaji	0.98	0.06	1.11	1.16	Agriculture
14	Parakode	1.41	1.25	0.58	0.73	Residential
15	Parakode East	0.80	1.55	0.95	1.14	Commercial
16	Anantharamapuram	1.18	3.40	2.11	0.67	Commercial
17	Parakode West	1.22	0.90	0.04	0.90	Residential
18	T. B. Ward	1.07	0.08	0.04	1.01	Residential
19	Kannamkodu North	0.82	0.26	1.56	1.14	Public
20	Adoor Central	0.79	9.15	1.73	0.66	Commercial
21	Kannamkodu	1.57	1.12	1.01	0.51	Residential
22	Nellimoottilpadi	1.00	0.60	0.25	0.95	Residential
23	Ayyappanpara	1.42	0.15	0.72	0.76	Residential
24	Town Eard	1.02	4.60	1.77	0.71	Commercial
25	Munnalam	0.96	0.73	0.11	1.06	Agriculture
26	Priyadarsini	1.07	0.07	5.22	1.04	Public
27	Hollycross	1.23	2.31	0.87	0.74	Commercial
28	Puthiyakavilchira	1.05	0.99	0.97	0.94	Residential

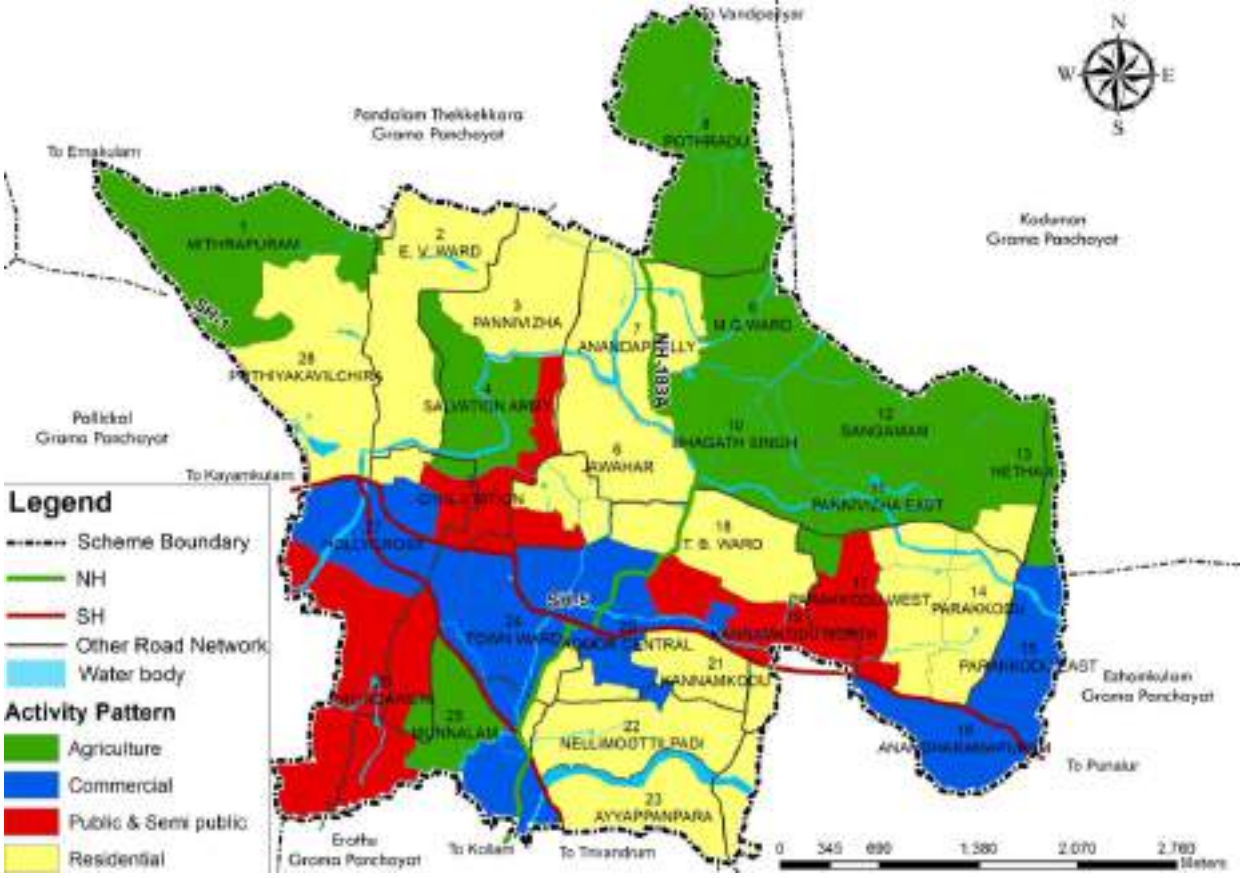


Figure 4.24 Ward wise Activity Pattern

From the above figure it can be inferred that, the commercial activity is concentrated at two parts of the town at the Central toll and surroundings and Parakode. Public activity is concentrated in wards adjacent to town center. The residential activity is concentrated in wards around the central nucleolus consisting of commercial and public activity. The agricultural activity is concentrated in wards along the periphery of the town.

4.7 Functional Character of the Town

functional character is determined based on population distribution, average plot size and land use. As per the regional studies Adoor has rural character. The functional character of different wards of Adoor town has been determined and it is shown in Figure 4.25. In this analysis it is found that only six wards of the town, ie. Civil Station, Parakode, Anantharamapuram, Parakode west, Adoor Central and Ayappanpara has urban character.Pannivizha,Salvation Army, Holycross, Munnalam, Kannamcode, TB Ward, Pannivizha east, Nethaji, and Parakode East Ward has semi-urban character, Town Ward and Sangamam wards has semi-rural character and the remaining wards(mithrapuram,Puthiyakavilchira, EVward, Anandapally, Pothradu, MG ward, Bhagath singh,Kannamcode North,jawahar,Priyadarshini, and Nellimoottilpadi) have rural character. The study shows that, wards with urban and semi urban characters are located along the major travel corridors of the town, M.C.Road and K.P.Road. The study also shows the predominantly rural character of the town.

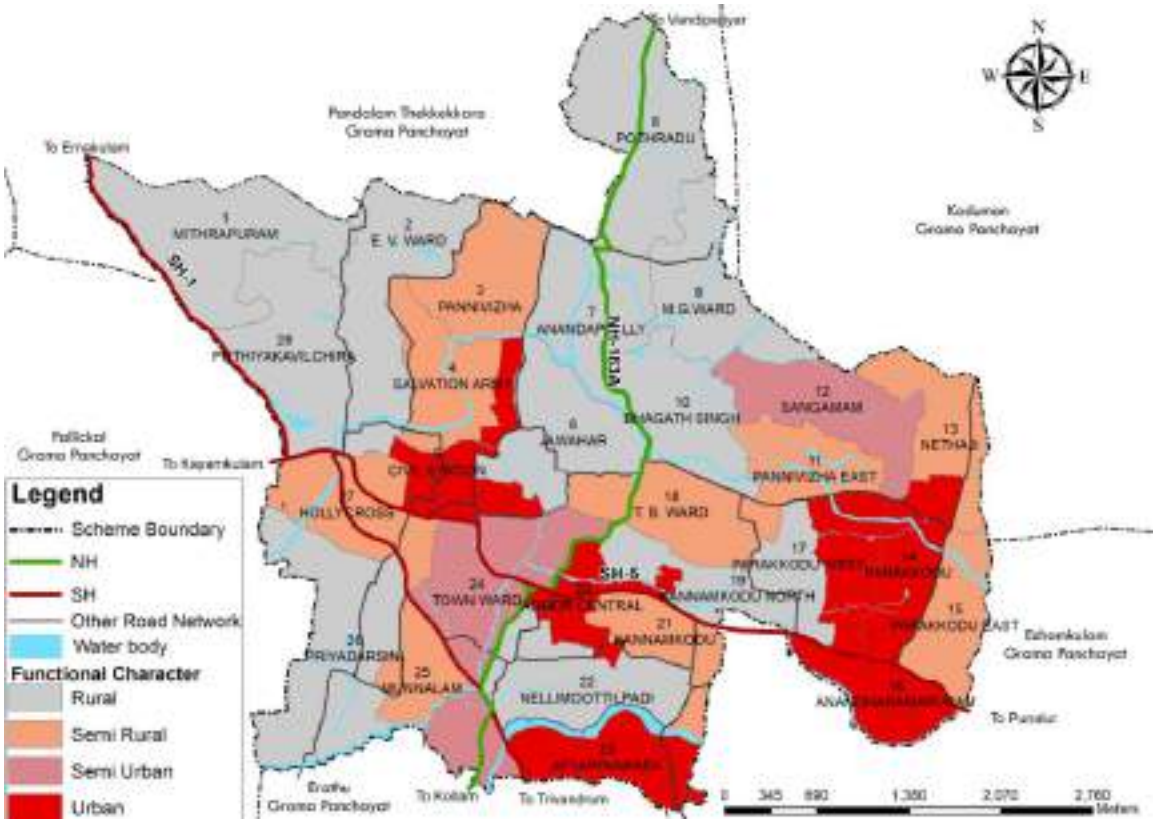
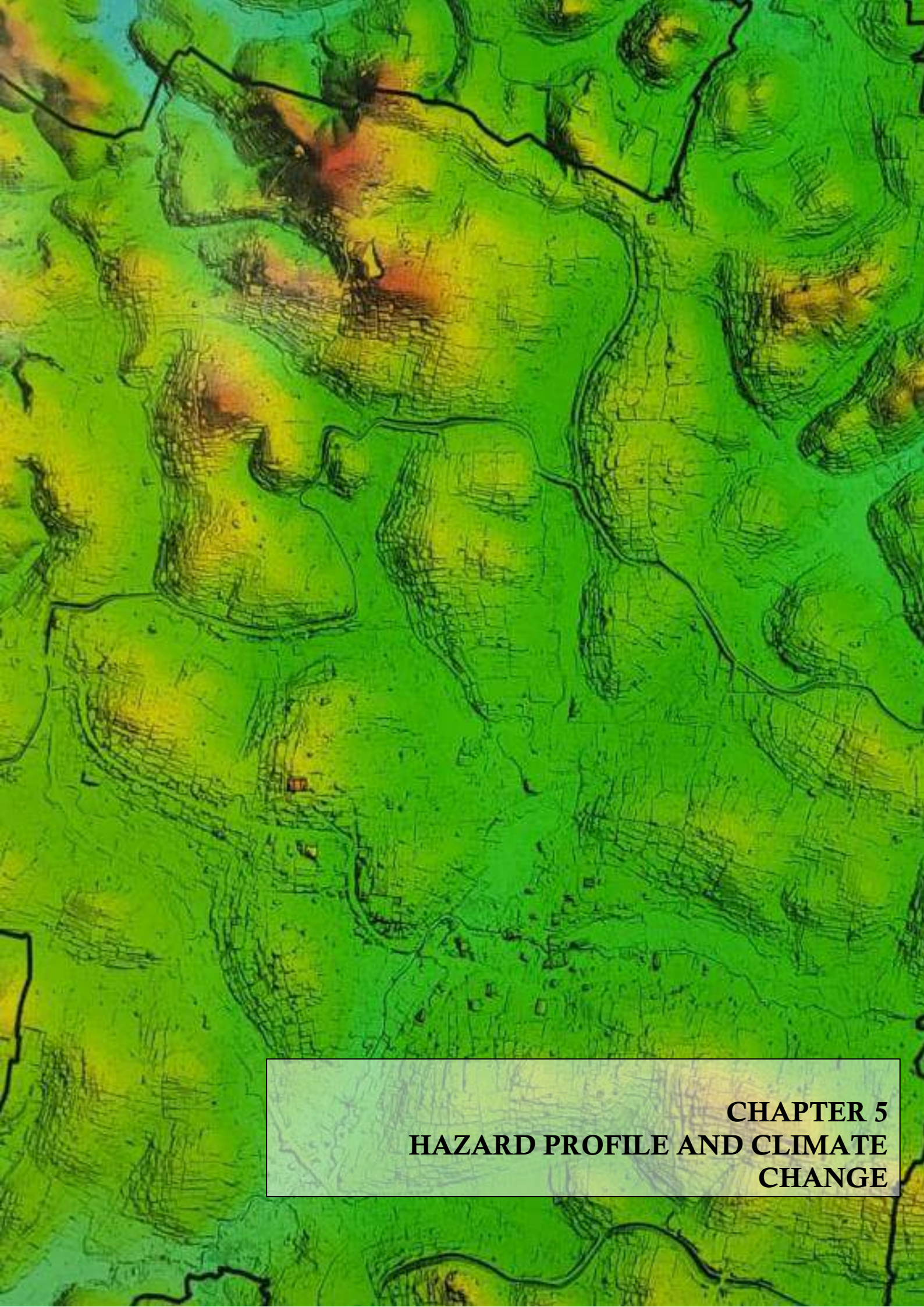


Figure 4.25 Ward wise Functional Character

4.8 Inference

The land use pattern of Adoor shows that 49.15% of the town area is coming under Agriculture land. The commercial and other urban activities have taken place along the major travel corridors- M.C. road and K.P road and concentration of non-agriculture activities to an extent is there in this area. The two main canals of KIP, which pass through the town, act as physical barriers. The residential land uses is scattered all over the town area and mixed with agriculture land uses. It is creating problems in provision of infrastructural facilities, especially in low-density wards in the peripheral area of the town. As per the regional setting study, the activity identified for Adoor town is Agriculture. Non-agriculture activities are concentrated around the central part of the town and the agriculture activities in the periphery of the town. The study on functional character of the town shows the predominantly rural nature of the town with 2 wards of semi-rural character and 11 wards of rural character.



CHAPTER 5
HAZARD PROFILE AND CLIMATE CHANGE

5.1 Introduction

Understanding the priority Hazards and assessing the disaster risks are prerequisites for preparing a Risk Informed Master Plan for a town. This chapter primarily deals with identifying the existing hazards and studying their potential impacts in Adoor town. It also analyses how these hazards are going to impact various sectors given the context of climate change which is an undeniable reality. The chapter also analyses the gaps in the existing management of these hazards and the areas that need to be taken care of going forward. The impact of climate change in precipitation during near term, medium term and long term is tabulated and its impacts in various sectors are also analyzed. This chapter will act as a guiding framework while contemplating the risk informed planning of Adoor town.

5.2 Hazard profile

Kerala State, nestled in the southwestern tip of India, showcases a unique hazard vulnerability profile owing to its diverse geographical features and climatic patterns. Blessed with lush greenery, expansive coastlines, and towering Western Ghats, Kerala is prone to a myriad of hazards ranging from floods and landslides to cyclones and tsunamis. The state's monsoon season, characterized by heavy rainfall, often leads to devastating floods, exacerbating vulnerabilities in its densely populated regions. Additionally, Kerala's unique socio-economic fabric, with a significant population dependent on agriculture and tourism, amplifies the impacts of these hazards, making comprehensive risk management strategies imperative for resilience and sustainable development in the region. Floods, landslides (debris flows), heat related disasters and lightning are the most commonly occurring natural Hazards in Pathanamthitta district. Drought and minor earth tremors also occur occasionally. Even though Adoor town is slightly less susceptible to natural disasters, it also possesses numerous hazards which, if not properly managed or addressed, can cause damage to life and property.

5.3 Hazard Profile of Adoor Town

Adoor town is a historical marketing centre in southern Kerala. It used to be a hub of marketing and distribution of agricultural produce from the Western Ghats mountain ranges. Adoor Town is comparatively less prone to major hazards such as landslide and flood. As per the District Disaster Management Plan of Pathanamthitta, 2015 (DM Plan), Heat stroke/ Sun burn is identified as the hazard with the highest degree of threat. While drought is categorized as a hazard with a moderate degree of threat.

Table 5.1 Hazard Seasonality Diagram of Adoor Town

Disaster	J	F	M	A	M	J	J	A	S	O	N	D
Earthquake												
Drought												
Heat Stroke/ Sun burn												
Lightning												
Flood												
Landslide												

(*Source: DDMP, Pathanamthitta 2015 and LSGDMP 2022, Adoor Municipality)*

According to the Hazard Seasonality Diagram shown in Table 5.1, Adoor Town is prone to earthquake. In fact, the seismic hazard map of India was updated in 2000 (11) by the Bureau of Indian Standards (BIS). All districts in Kerala lie in Zone III. The town is vulnerable to drought during the months from February to May. Heat related disasters such as heat stroke, sun burn/ sun stroke is also highly possible during this period. The number of lightning strikes is very high during the months of April and May. March, October and November months also record moderate number of lightning strikes in Adoor. Even though area affected by flood are very less, considering the climate change factor the flood prone period is identified from June to September.

Climate change is predicted to make the scenario of natural disasters worse. The IPCC report on Climate change is predicting drastic changes in the maximum and minimum mean temperature and rainfall in the State. Adoor Town won't be any different in this regard.

5.3.1 Flood

As per the DM Plan, the areas such as broad flat bottom valleys (Paddy fields), Parakode, Adoor Centre, Munnalam and Pannivizha are moderately susceptible to flooding in Adoor town (Figure 5.1). Even though the town is not historically severely affected by flood, the possibility of such an event in future cannot be ruled out. The KSDMA has prepared hazard probability/ susceptibility maps for various return probabilities using modeling techniques for all the local bodies in Kerala. As per this map, there is no threat of fluvial flood for Adoor town for the 50-year return probability scenario.

5.3.2 Lightning

According to the DM Plan, Lightning is another moderately dangerous hazard in Adoor town. The National Disaster Management Authority (NDMA) has identified groups that are vulnerable to lightning strikes. These groups include people who work outdoors, such as farmers, labourers and grazers. Even though lightning is identified locally as a moderate hazard, the data collected from KSDMA on lightning strikes shows no peculiar trends in Adoor Town when compared to surrounding areas.

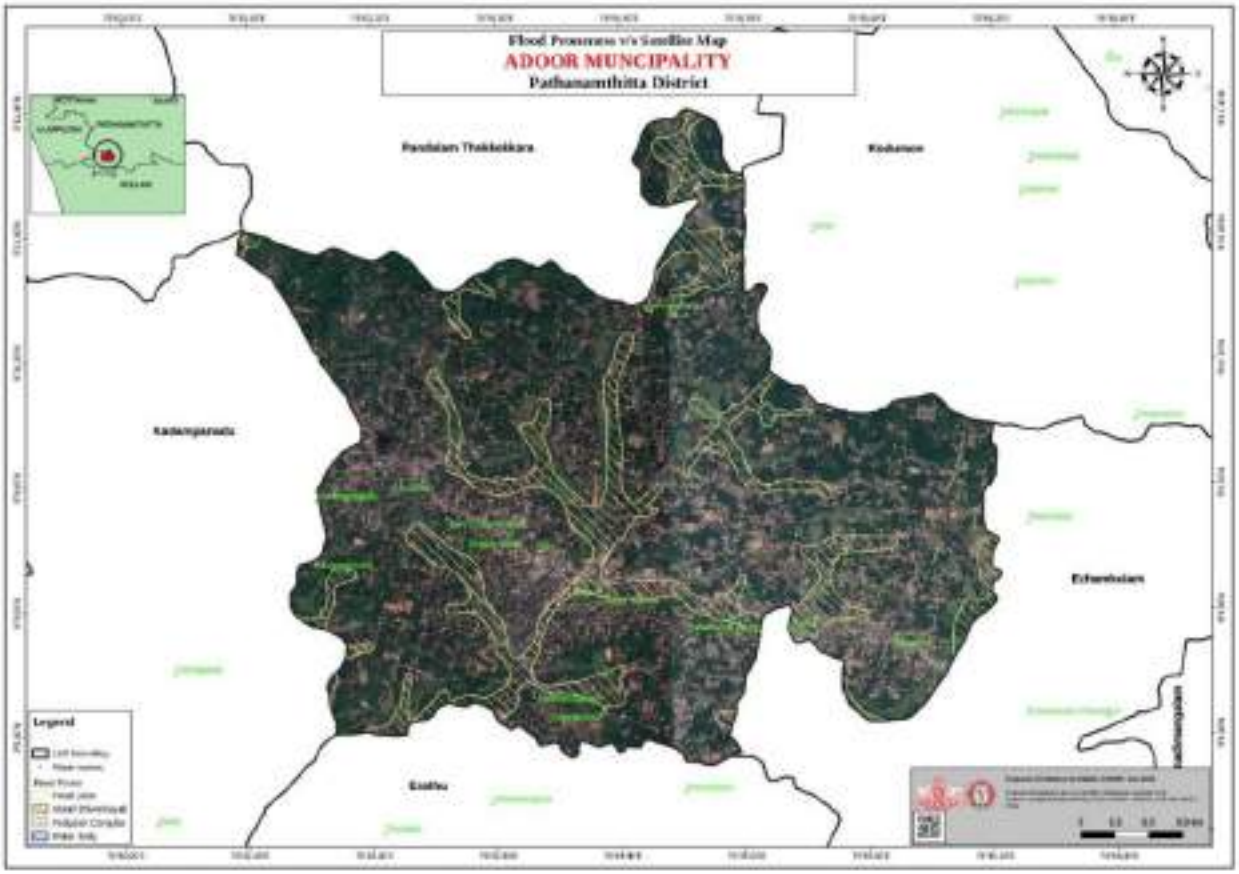


Figure 5.1 Flood prone area map of Adoor town extracted from DM Plan

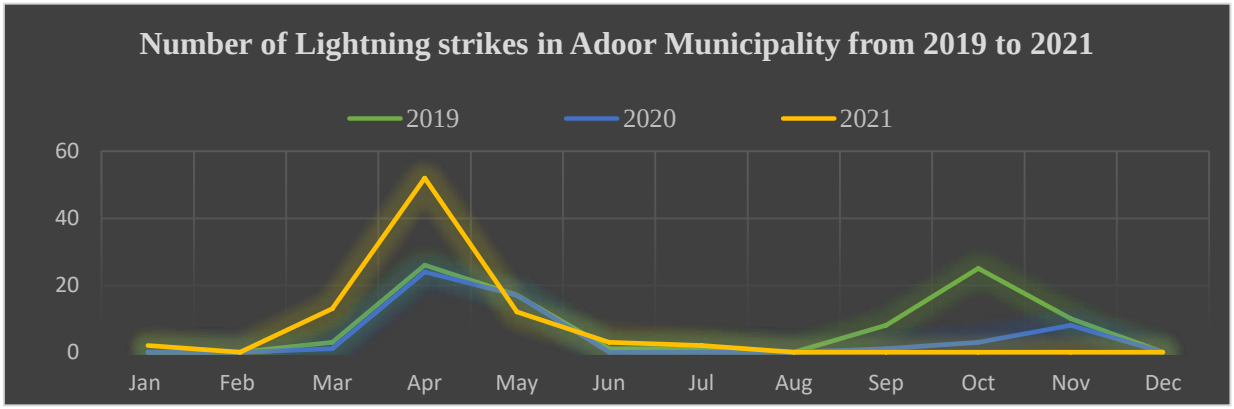


Figure 5.2 Graphical representation of lightning seasonal trends in Adoor Town

Source: KSDMA

The KSDMA has provided local body wise lightning strike data in the state for a period from February 2019 to July 2021 based on which they have prepared the Kerala State Lightning Action Plan, 2022. The analysis of KSDMA's lightning data also led to the following conclusions. Adoor town receives an average of 76 lightning strikes per year. Whereas Kodumon, an adjoining local body, receives an average of 210 strikes per year. Other nearby local bodies such as Erathu and Ezhamkulam receives 78 and 98 strikes per year respectively on an average. When analysing taluk wise data, Adoor comes fourth in the district behind Konni, Ranni and Kozhanchery. It may be

interesting to note that Aruvappulam and Seethathodu in Konni Taluk in the Pathanamthitta district had an annual strike of 958 and 943 in the year 2019. Map of lightning prone wards in Adoor based on DM Plan (Ward no. 13, 14, 15, 16, 17, 20, 21, 22, and 23) (Figure 5.3).



Figure 5.3 Lightning Prone Wards in Adoor Town

A study was conducted to further investigate the lightning hazard situation in the lightning prone wards of Adoor town (Figure 5.4). As per the guidelines of NDMA and the Kerala State Lightning Action Plan (2022), critical infrastructural facilities, places of mass gathering, high rise buildings and structures, isolated structures in elevated areas, heritage sites etc. need to be militated against lightning strikes. On investigating, it was observed that all the major high-rise buildings were protected with lightning arresters. In high elevation areas also, isolated structures were equipped with lightning mitigation measures. Some of the buildings / premises coming under the vulnerable groups in the town are listed in Annexure5.1. The study included consultations with elected representatives, historians and local public that substantiated the data on lightning strikes in Adoor town gathered from KSDMA.

Even though there were human fatalities in one incident in the distant past, no such incidences have been reported over the last 25 years. In 1998 four people who were engaged in construction work in an open area near Parakode were hit by lightning leading to their death. The damage due to lightning is restricted mainly to destruction of household equipment such as ceiling fan, refrigerator

and television. KSEB has its own protection measures against lightning strikes for their critical facilities such as substations and transformers.




Figure 5.4 Consultation with public in Adoor regarding lighting hazard assessment

5.3.3 Heat Stress

Abnormal increase in atmospheric temperature during summer season is mentioned to be a high-risk hazard in the local DM Plan. Given the global warming scenario and the climate predictions for the future, this is something that needs to be addressed while planning. The DM Plan and the Local Action Plan for Climate Change (LAPCC) report of Adoor Town have identified heat stress as a critical environmental hazard affecting urban sustainability. Increasing temperatures caused by deforestation, urbanization, and climate change worsen the Urban Heat Island (UHI) effect. With dire climate projections, addressing heat stress has become essential in urban planning. To mitigate the impact of heat stress on human health and well-being, various measures like reducing atmospheric temperatures through microclimate creation and integrating green techniques in transport, construction, and urban design can be adopted. To address this issue and to identify areas for intervention, a study on urban heat island effect in the town has been conducted.

5.3.3.1 Urban Heat Island

The UHI phenomenon is characterized by elevated air and land surface temperatures (LST) in urbanised regions compared to their rural surroundings. Over the past several decades, this temperature disparity has intensified, driven by increased human activities, the expansion of built-up areas, and the decline of natural landscapes such as vegetation and water bodies. Understanding these changes is essential for developing effective mitigation strategies. A study on the Urban Heat Island effect in Adoor town has been done to analyse historical and present-day temperature patterns and assess their contributing factors. The study focuses on:

- Analysing historical and present-day temperature trends by assessing Land Surface Temperature (LST) during the summers of 2015, 2020, and 2024,
- Validating satellite-derived temperature data with recorded data from the India Meteorological Department (IMD),
- Analysing the relationship between LST, Normalized Difference Built-up Index (NDBI), and Normalized Difference Vegetation Index (NDVI) to understand urban heat dynamics,

- Examining Land Use and Land Cover (LULC) changes between 2015 and 2024,
- Identifying Urban Heat Hotspots (UHS) in 2024 and evaluate their spatial distribution.

5.3.3.1.1 Methodology

To ensure the accuracy and reliability of this study, high-resolution satellite images from the LANDSAT 8 TIR OLI and the LANDSAT 9 TIR OLI sensors were utilised. Also, LISS4 (Linear Imaging Self-Scanning Sensor 4) data with a high spatial resolution of 5.8 meters for 2015, 2020, and 2024 are being incorporated in the study. It captures imagery in three spectral bands—green, red, and near-infrared, making it suitable for detailed land observation and analysis. Additionally, temperature data recorded by the India Meteorological Department (IMD) for the same years were incorporated to validate the findings.

5.3.3.1.2 Land Surface Temperature (LST) Analysis

Figure 5.5, 5.6 and 5.7 show the land surface temperature profile of Adoor town in the years 2015, 2020, and 2024. Between 2015 and 2024, the maximum LST increased by 4.05°C, while the minimum LST rose by 2°C. The temperature range between the highest and lowest LST widened from 4.13°C in 2015 to 6.18°C in 2024, indicating an increase in temperature variability. The mean LST also showed an upward trend, increasing by 2.93°C over a decade (from 27.15°C in 2015 to 30.08°C in 2024). The temperature increase is primarily attributed to factors such as urban expansion, reduction in vegetation cover, and transformation of water bodies into impervious surfaces.

Table 5.2Year wise Land Surface Temperature trends of Adoor Town

LST Trends (°C)			
Year	Minimum LST	Maximum LST	Mean LST
2015	25.68	29.81	27.15
2020	27.20	32.14	28.56
2024	27.68	33.86	30.08

Source: Satellite Data

Figure 5.8 shows Temporal Changes in LST of Adoor Town over three years 2015, 2020, and 2024. The overall trend in the chart highlights a progressive warming pattern, with each temperature measure increasing steadily over the years. The rise in minimum temperatures suggests a decline in the town's ability to cool down during the night, potentially linked to the urban heat island effect, where built-up areas retain heat longer than natural landscapes. Meanwhile, the significant increase in maximum temperatures points to intensifying heat conditions, which could have implications for public health, agriculture, and local climate patterns.

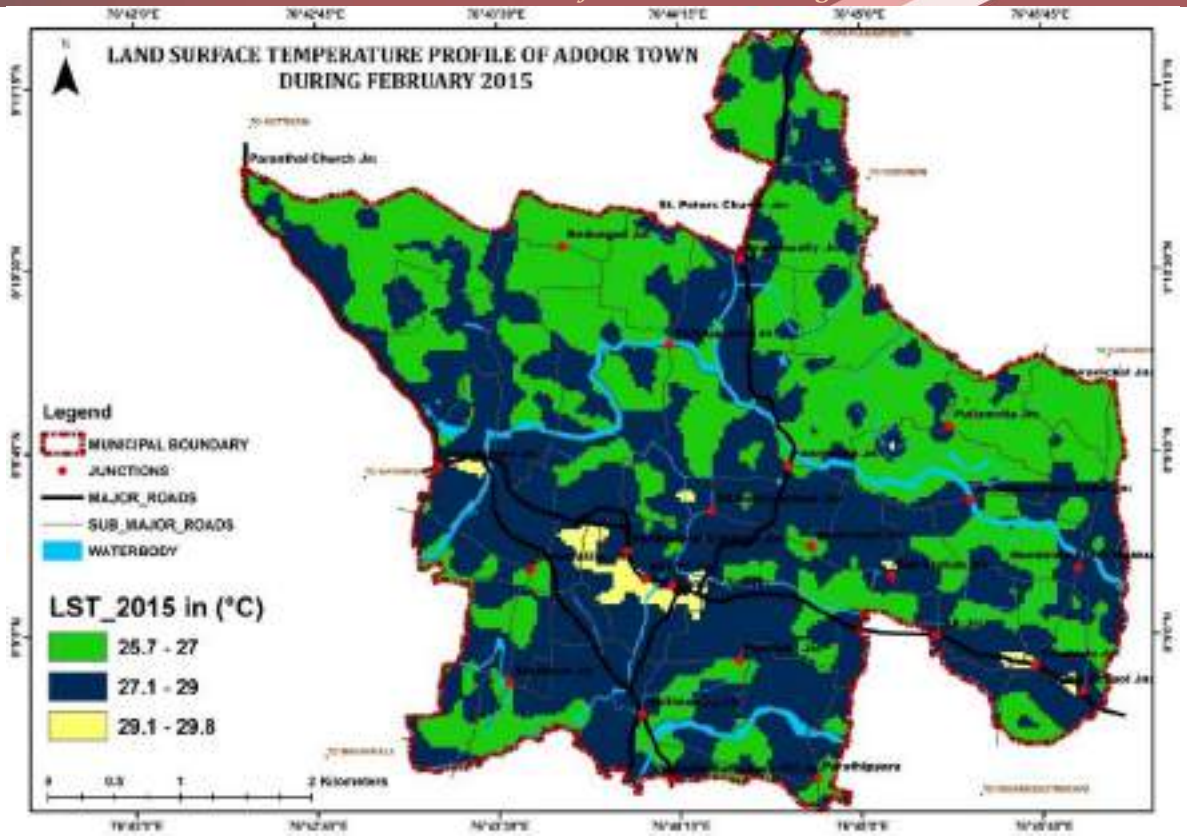


Figure.5.5 Land Surface Temperature profile of Adoor town during February 2015

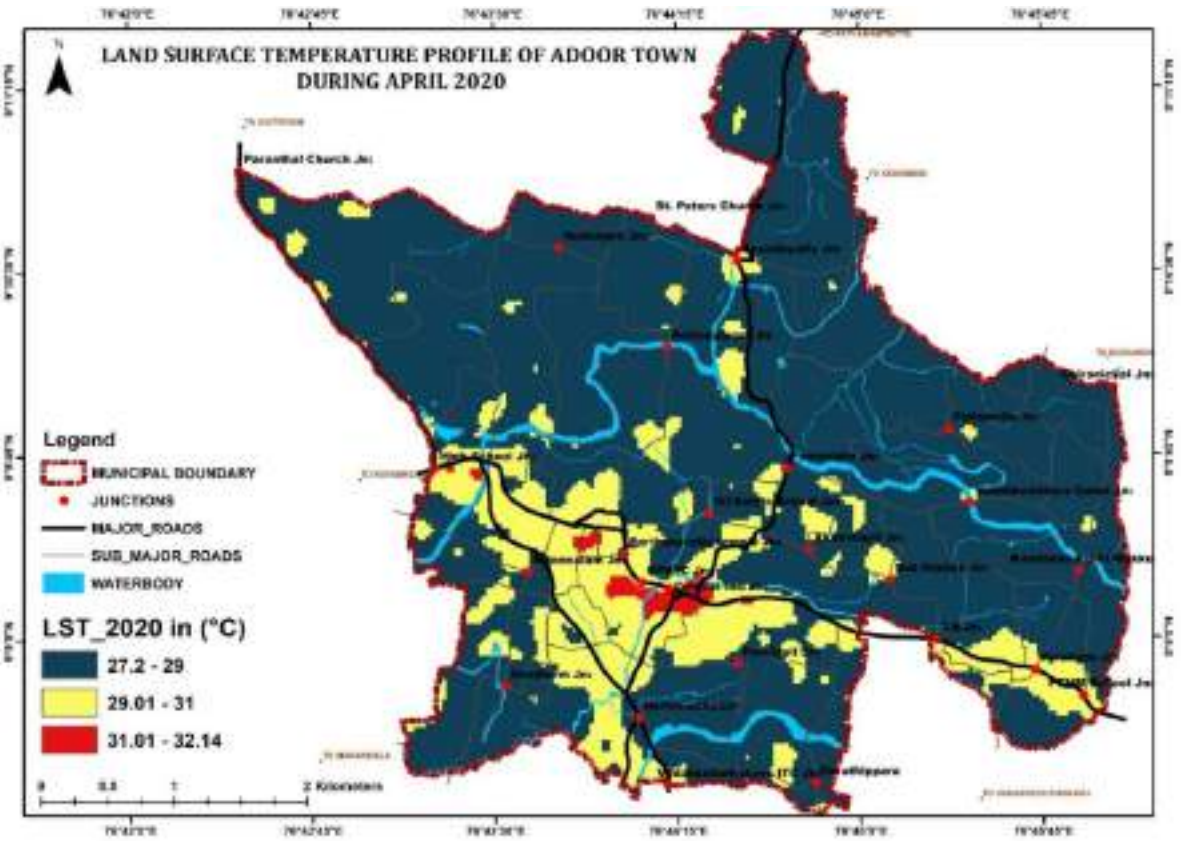


Figure 5.6 Land Surface Temperature profile of Adoor town during April 2020

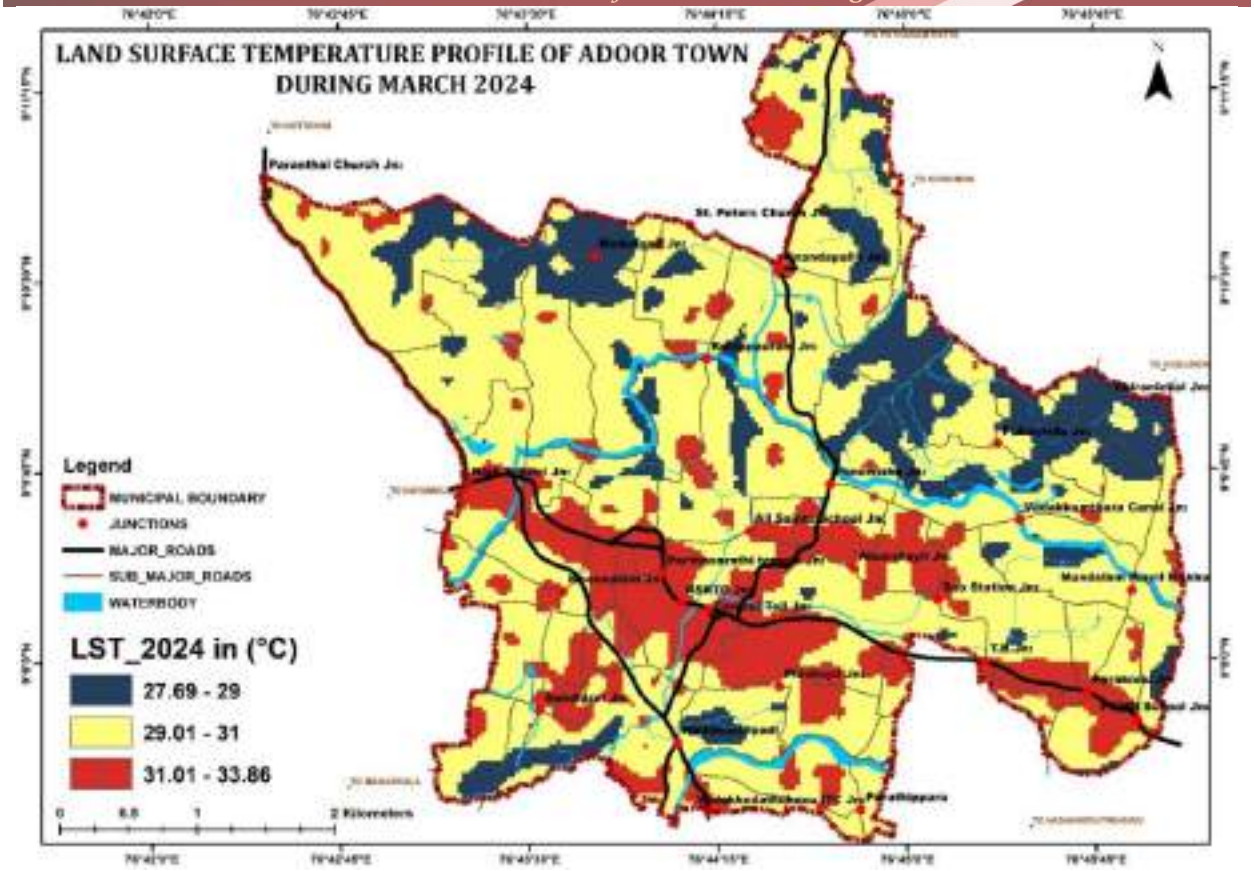


Figure 5.7 Land Surface Temperature profile of Adoor town during March 2024

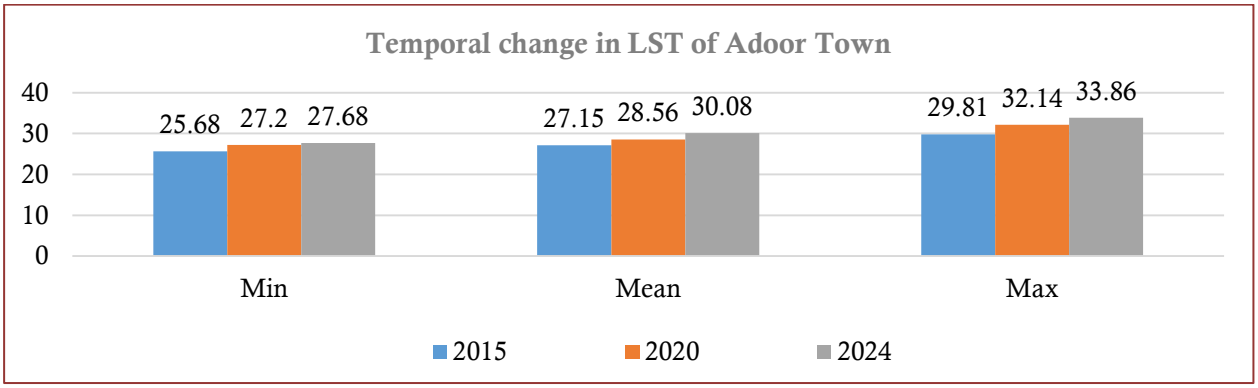


Figure 5.8 Temporal changes in Land Surface Temperature of Adoor town

5.3.3.1.3 Validation of LST with IMD Data

To validate the reliability of Land Surface Temperature (LST) values, temperature records from the India Meteorological Department (IMD) for 2015, 2020, and 2024 were compared. The results, as shown in Table 5.3, indicate a strong correlation between the satellite-derived LST values and ground-recorded IMD temperatures, confirming the accuracy of the LST analysis. Both maximum and minimum temperatures exhibit an upward trend over the years. The increasing LST minimum temperatures indicate reduced night-time cooling, potentially caused by urbanization and surface heat retention.

Table.5.3 Comparison of Monthly Average temperature data from IMD of Adoor town and LST from satellite data processing on the same day

	Date	IMD (°C)	LST_LANDSAT (°C)		Date	IMD (°C)	LST_LANDSAT (°C)
Max	14-02-2015	32.39	29.8	Min	14-02-2015	22.32	25.68
	16-04-2020	34.54	32.1		16-04-2020	24.36	27.20
	10-03-2024	34.38	33.9		10-03-2024	22.48	27.69

Source: IMD Temperature data of Adoor town using Google Colab, Satellite data

Despite slight differences arising from measurement methods, the consistency between the datasets confirms the reliability of LST analysis for further research. The findings highlight the importance of studying temperature changes, land use, and their effects on the climate. Tools like NDBI and NDVI play a crucial role in examining urban growth and vegetation loss, providing valuable insights into how these factors drive temperature trends.

5.3.3.1.4 NDVI (Normalized Difference Vegetation Index) of Adoor Town

The Normalized Difference Vegetation Index (NDVI) is a widely used remote sensing index that measures vegetation health and density using satellite imagery. It helps in monitoring plant growth, assessing drought conditions, and analysing land cover changes. The NDVI values may be interpreted as follows:

- High NDVI (> 0.5) →Dense, healthy vegetation.
- Moderate NDVI (0.2 – 0.5) →Sparse or stressed vegetation.
- Low NDVI (< 0.2) →Bare soil, urban areas, or water bodies.

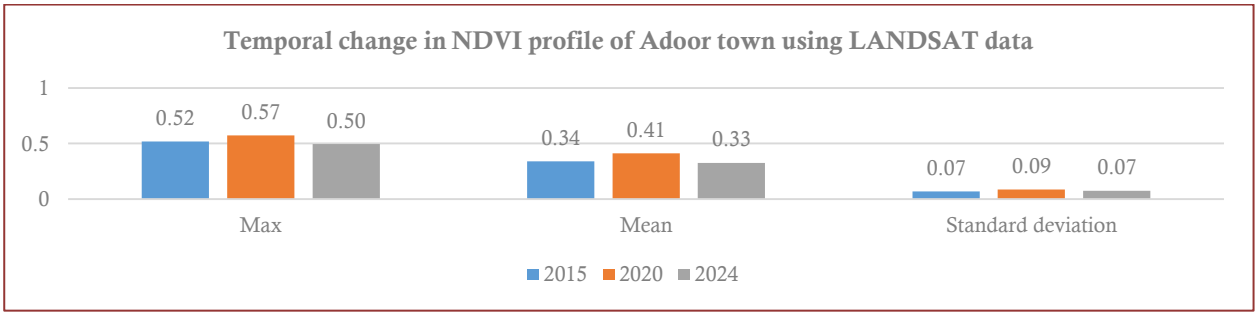


Figure 5.9 Temporal Changes in the NDVI profile of Adoor Town for the years 2015, 2020, and 2024.

Source: Processed using LANDSAT Satellite data

5.3.3.1.5 NDVI (Normalized Difference Vegetation Index) using LANDSAT data

The LANDSAT-based NDVI analysis reveals a declining trend in vegetation density over time. Mean and maximum NDVI peaked in 2020, with fluctuations leading to a decline in 2024. Minimum NDVI values showed slight improvement in degraded areas in 2024, while standard deviation remained stable, indicating consistent vegetation distribution across the town.

5.3.3.1.6 NDVI (Normalized Difference Vegetation Index) using LISS4 data

To improve the accuracy of the analysis, LISS4 (Linear Imaging Self-Scanning Sensor 4) data with a high spatial resolution of 5.8 meters for 2015, 2020, and 2024 are being incorporated in the study. Additional parameters, including Normalized Difference Built-up Index (NDBI), land use/land cover changes (LULC changes), and IMD temperature data, are considered to comprehensively assess the interactions between land surface temperature and urban environmental factors.

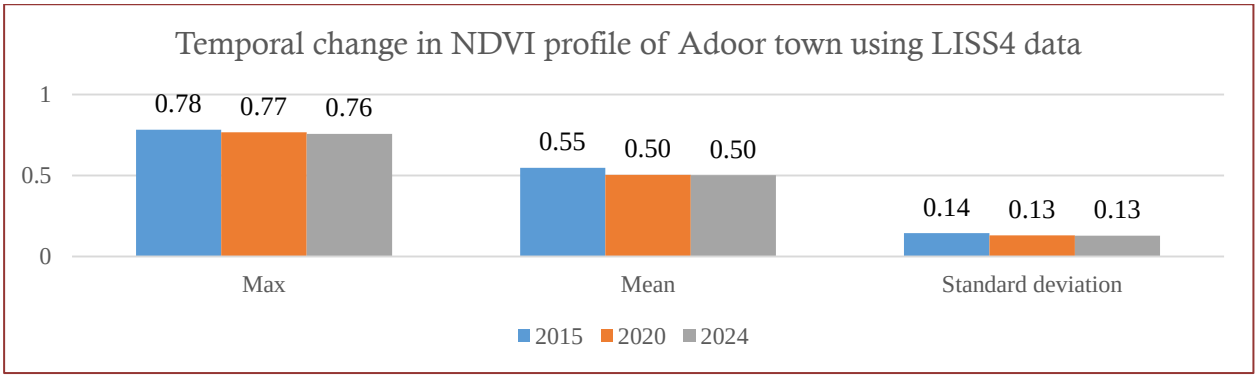


Figure 5.10 Temporal Changes in the NDVI profile of Adoor Town for the years 2015, 2020 and 2024

Source: Processed using LISS4 data

Table.5.4Temporal change in the mean NDVI of Adoor town

Normalized Difference Vegetation Index (NDVI)	
Year	Mean NDVI Value
2015	0.55
2020	0.50
2024	0.50

Source: Satellite Data

Table5.4 indicates a gradual decline of vegetation density in Adoor town. The mean NDVI dropped from 0.55 in 2015 to 0.50 in 2020 and remained unchanged in 2024. This subtle decline reflects urban expansion, infrastructural development, and land use changes, reducing green cover and impacting the town's environmental balance. Additionally, NDVI itself depends on several variables, such as vegetation canopy type, colour, and density, all of which fluctuate seasonally and impact its relationship with temperature.

The negative correlation between NDVI and LST highlights that reduced vegetation leads to higher surface temperatures. Vegetation cools the environment through shade, evapotranspiration, and reduced heat absorption. The NDVI stabilization at 0.50 (2020–2024) indicates slowed vegetation loss but minimal green space recovery, leaving the area prone to further temperature increases and intensifying the urban heat island effect.

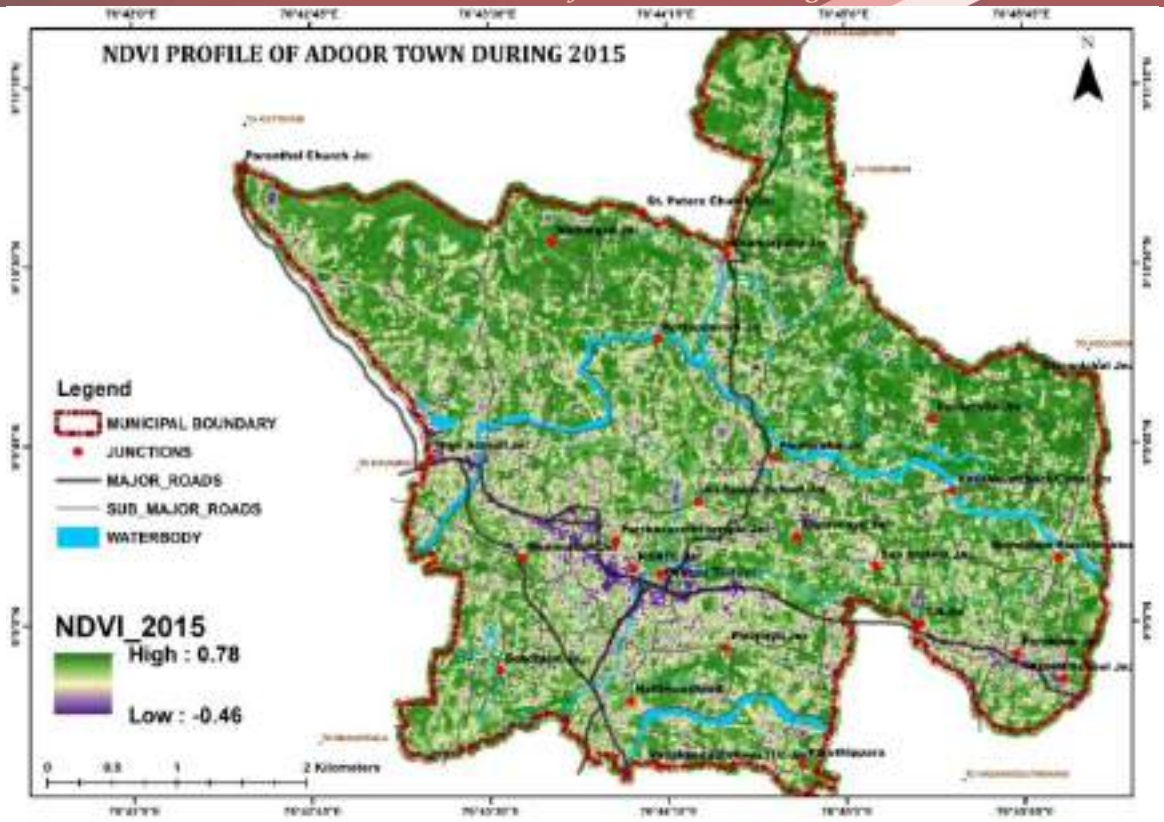


Figure 5.11 NDVI profile of Adoor town during 2015

Source: Satellite data



Figure.5.12 NDVI profile of Adoor town during 2020

Source: Satellite data

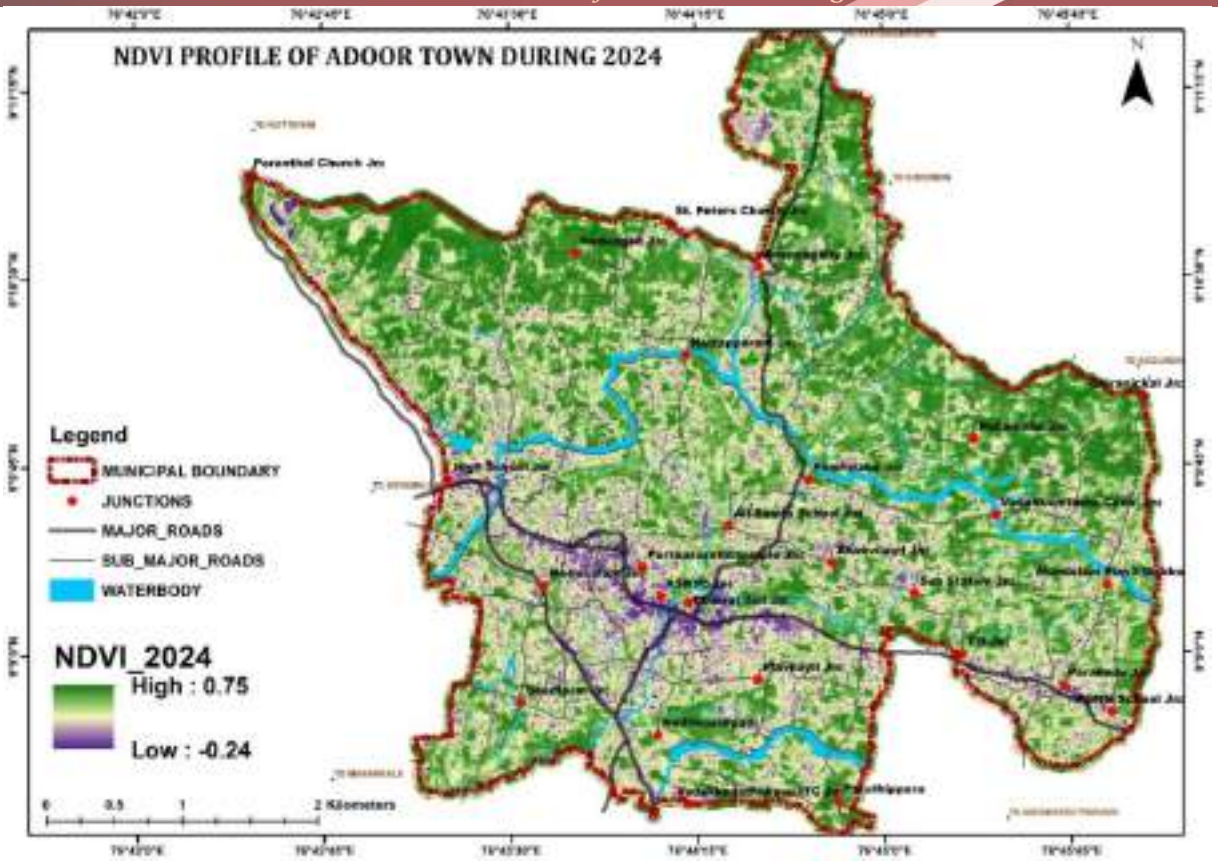


Figure 5.13 NDVI profile of Adoor town during 2024

Source: Satellite data

Relying solely on the vegetation indices is insufficient for accurately assessing temperature changes. By integrating high-resolution LISS 4 data and LANDSAT data, accuracy of the analysis can be enhanced. Both datasets confirm a gradual decline in maximum NDVI values, indicating a reduction in highly vegetated zones, which could be attributed to urban expansion, deforestation, or land-use changes. The negative correlation between NDVI and Land Surface Temperature further reinforces that declining vegetation cover is contributing to higher surface temperatures, intensifying the urban heat island effect.

5.3.3.1.7 Normalized Difference Built-up Index (NDBI) of Adoor Town

NDBI is a remote sensing index that detects and analyzes built-up areas in satellite imagery. By extracting built-up pixels from NDBI raster data, we can estimate the total built-up area within a specific region. A higher NDBI value indicates more built-up areas, while lower values suggest vegetation or water bodies. It is often used alongside NDVI to differentiate urban and vegetated regions. NDBI values range from -1 to +1, with positive values typically indicating built-up areas and negative values representing vegetation, water bodies, or bare soil. A suitable NDBI threshold must be chosen to classify built-up areas. Table 5.5 shows the year wise total Built-up area of Adoor Town.

- Common threshold: NDBI > 0 is a widely used baseline for detecting urban surfaces.

- Region-specific adjustment: In some cases, a refined threshold (e.g., NDBI > 0.2) may be needed based on local conditions and calibration with ground truth data.

Table.5.5 Year wise total built-up area from NDBI analysis of Adoor Town

Year	Built-up Area (sq. km)
2015	0.2718
2020	0.3168
2024	0.828

Source: Satellite data

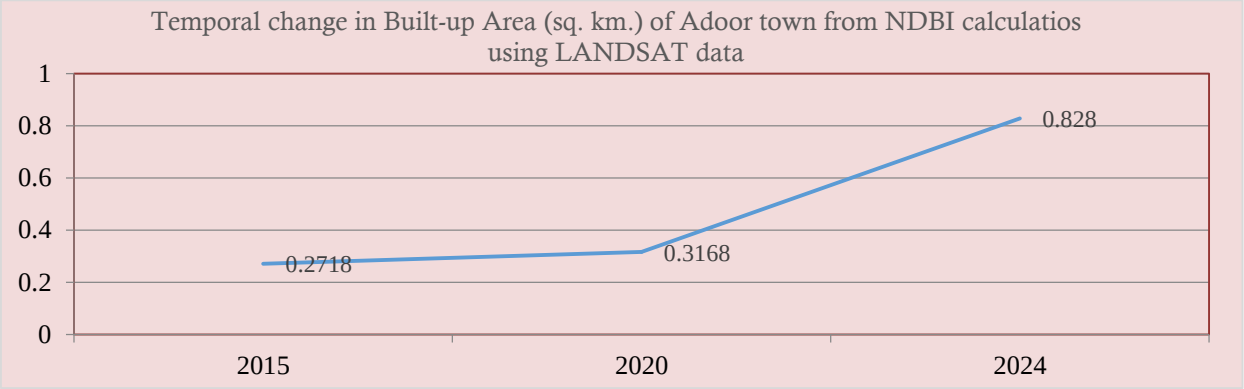


Figure.5.14 Temporal Change in Built-up area of Adoor town using LANDSAT data

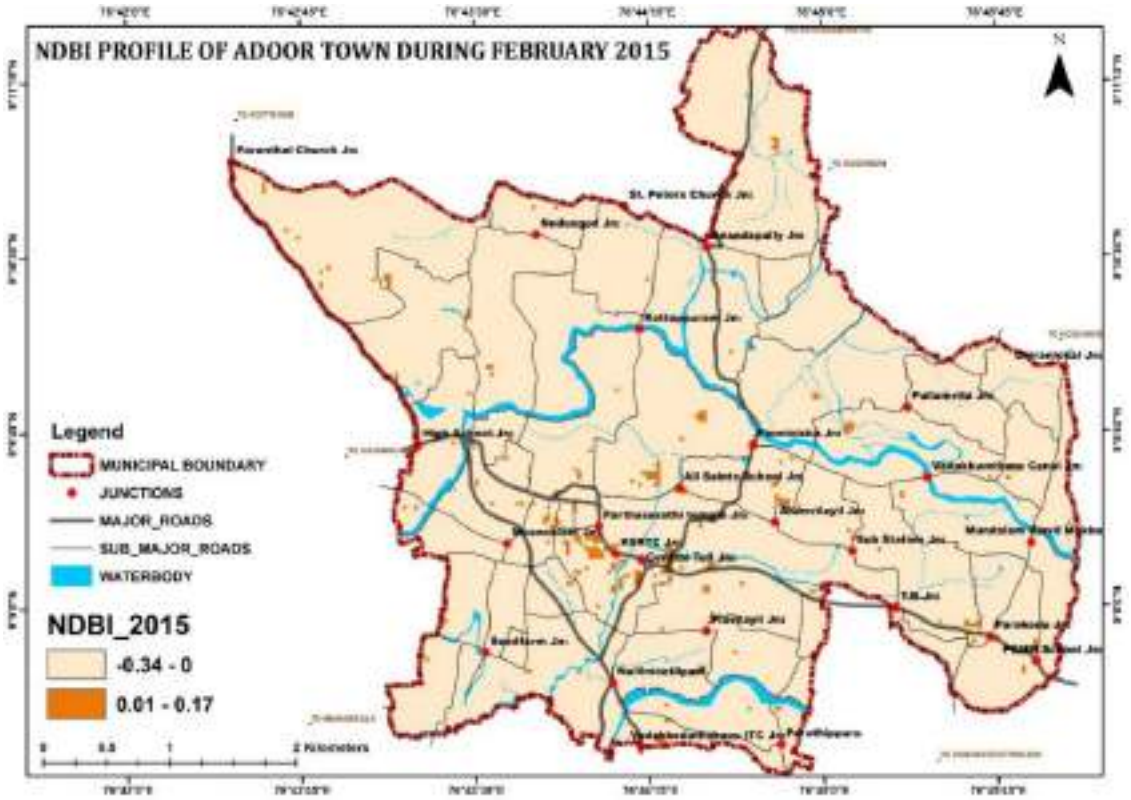


Figure 5.15 NDBI profile of Adoor town during February 2015

Source: Satellite data

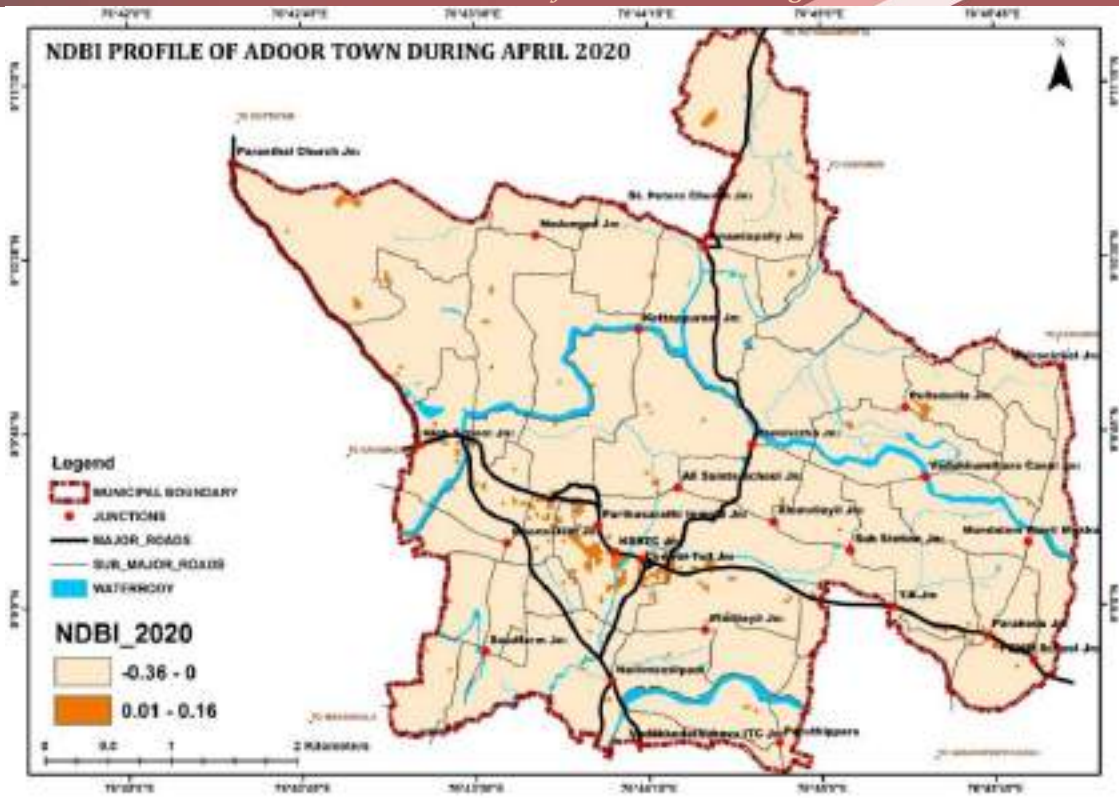


Figure 5.16 NDBI profile of Adoor town during April 2020

Source: Satellite data



Figure 5.17 NDBI profile of Adoor town during March 2024

Source: Satellite data

NDBI profile of Adoor town during the years 2015, 2020, and 2024 is shown in the Figures 5.15, 5.16 and 5.17. A consistent increase in built-up areas was observed over the study period. As impervious surfaces expand, they trap and retain heat, contributing significantly to the Urban Heat Island (UHI) effect. The most significant trend in the built-up area category shows a sharp increase from 2015 to 2024. While there is already a noticeable rise in built-up area in 2020, the increase in 2024 is significantly higher, indicating rapid urban expansion in recent years. The drastic jump suggests large-scale land conversion, potentially due to population growth, infrastructure projects, or industrial development.

5.3.3.1.8 Land Use and Land Cover (LULC) Changes (2015-2024)

LULC transformations play a crucial role in modifying the urban thermal profile. Analysis using true-colour satellite images from Google Earth revealed the following changes in LULC patterns between 2015 (Figure 5.18) and 2024 (Figure 5.19), directly affecting temperature dynamics.

- Decline in Mixed Tree Cover: Mixed tree cover decreased by 1.98 sq. km which resulted in reduced cooling effects from vegetation, leading to an overall increase in LST.
- Decline in Fallow Paddy Fields: Fallow paddy fields declined by 0.76 sq. km, indicating a shift in land use patterns.

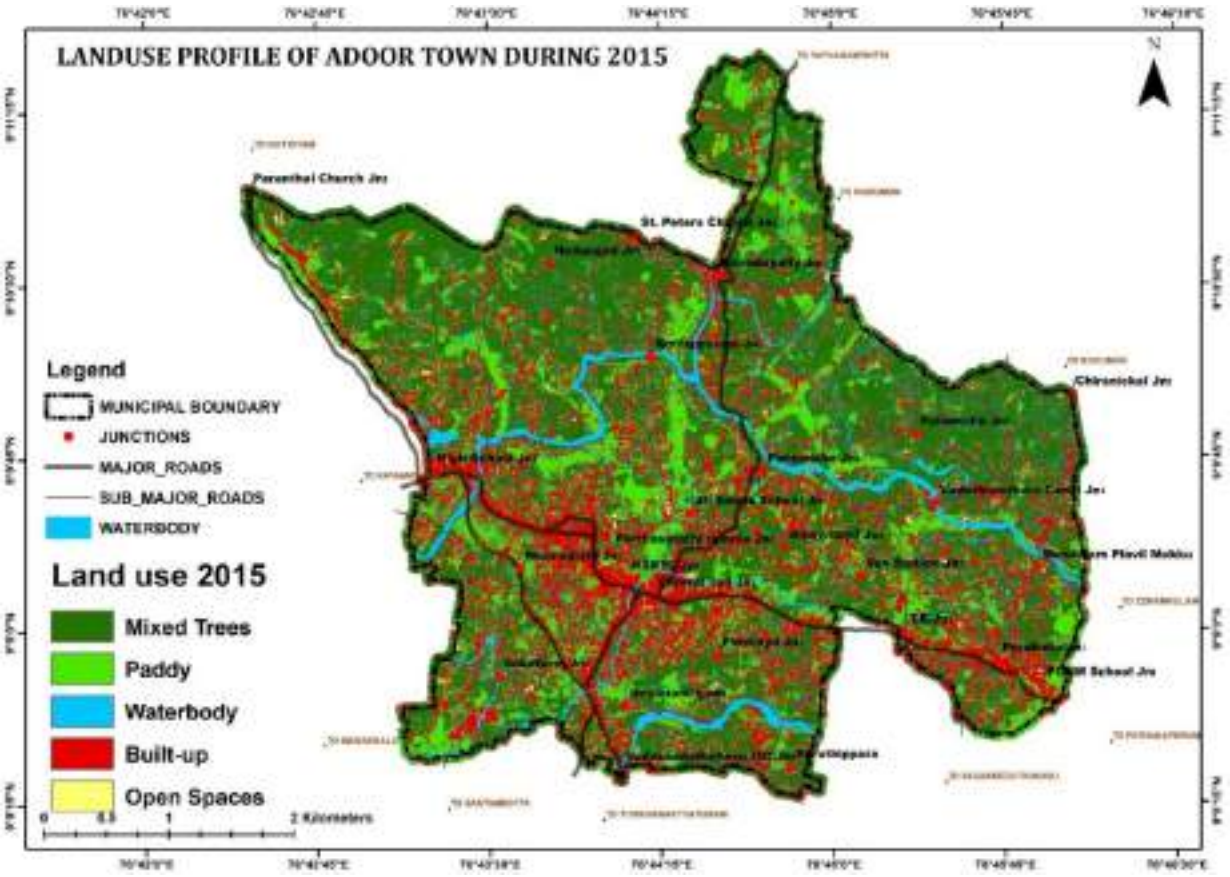


Figure 5.18 Land Use and Land Cover profile of Adoor town during 2015

Source: Satellite data



Figure.5.19 Land Use and Land Cover profile of Adoor town during 2024

Source: Satellite data

- Expansion of Built-up Areas: Built-up area increased by 0.14 sq. km, reinforcing the upward trend in urban expansion and heat accumulation.
- Increase in Open spaces: The 1.8 sq. km increase in open ground and sand spaces contributes to higher temperatures due to low albedo, reduced reflectivity and increased heat absorption, leading to higher LST.

These findings strongly support the conclusion that changes in LULC have intensified the Urban Heat Island effect in Adoor town between 2015 and 2024. The diminishing natural landscapes, particularly the decline in vegetative cover and water-retaining areas, has intensified heat retention in the town, exacerbating the Urban Heat Island (UHI) effect. This highlights urgent need for sustainable urban planning strategies. Implementing measures such as green infrastructure, urban forestry initiatives, and climate-sensitive land use policies can play a crucial role in curbing rising temperatures and enhancing town's resilience to environmental challenges.

5.3.3.1.9 Urban Heat Island (UHI) Effect

The Urban Heat Island (UHI) effect is a phenomenon in urban areas, where land surface temperatures (LST) tend to be higher than the surrounding rural or less developed regions. The above findings of the study highlight a clear trend of rising temperature in Adoor town (Figure 5.20),

primarily caused by vegetation loss, shifts in land use, and the expansion of built-up areas. To tackle this challenge, the UHI effect in the town was mapped and regions were categorised based on temperature deviations. Furthermore, to prioritize interventions, Urban Heat Hotspots (UHS) were identified. UHS are areas experiencing the highest thermal stress, which are crucial targets for focused mitigation strategies. To analyze UHI effects in Adoor town in 2024, UHI zones were computed based on the LST data using the following equation:

$$\text{UHI zones} = \text{LST} > \text{LST}_{\text{Mean}} + 0.5 \times \text{LST}_{\text{SD}}$$

$$\text{Non UHI zones} = 0 < \text{LST} \leq \text{LST}_{\text{Mean}} + 0.5 \times \text{LST}_{\text{SD}}$$

Where UHI = Urban Heat Island; LST = Land Surface Temperature; LST mean = Mean of LST; LST SD = Standard Deviation of LST.

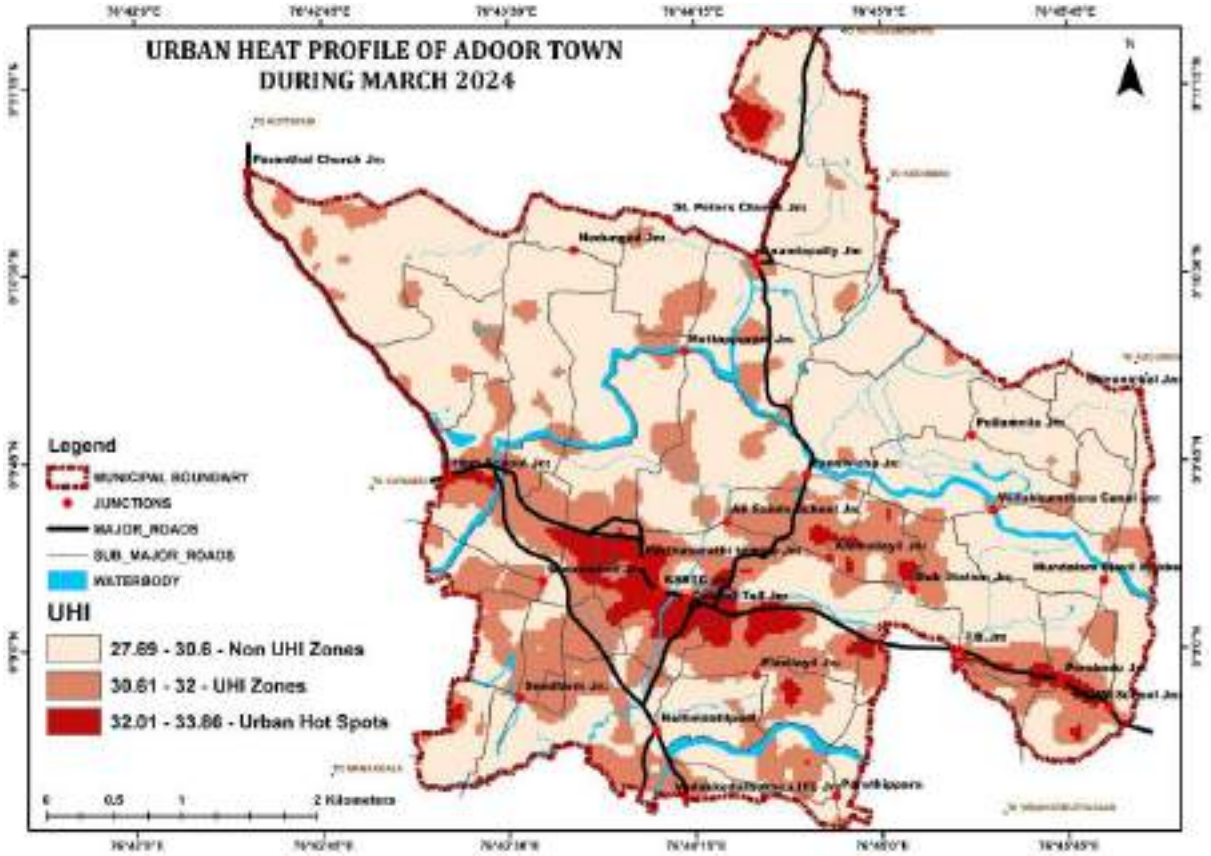


Figure.5.20 Urban Heat profile of Adoor town during March 2024

5.3.3.1.10 Urban Heat Island (UHI) Zones

The study identifies UHI zones as areas with surface temperatures ranging from 30.61°C to 32°C, covering an area of 6.34 sq. km and non-UHI zones as areas where LST values range from 27.69°C to 30.6°C, spanning 14.4 sq. km.

5.3.3.1.11 Urban Heat Hotspots (UHS)

Urban Heat Hotspots (UHS) represent areas of extreme heat stress, identified through advanced computational methods. In Adoor town, an area of 0.94 sq. km has been identified as UHS, (Figure 5.21) representing localized areas where temperature levels significantly exceed the surrounding environment, making them high-priority areas for intervention. To identify areas experiencing heat stress, UHS have been derived using the following equation:

$$UHS = LST > LST_{Mean} + 2 \times LST_{SD}$$

Two primary types of UHS were identified:

1. Dense Built-Up Areas: These regions exhibit high population density, extensive road networks, and minimal vegetation, contributing to excessive heat retention.
2. Bare Earth Regions: Open lands, and cleared agricultural fields were also identified as heat-prone zones. These areas lack significant vegetation cover, exacerbating surface temperature rise.

Some of the detailed views of hot spots are provided in Figure 5.22. A deeper analysis of these areas offers valuable insights into regions facing the highest levels of heat stress, aiding in targeted mitigation measures.



Figure 5.21 Urban Hot Spot areas in the Adoor town

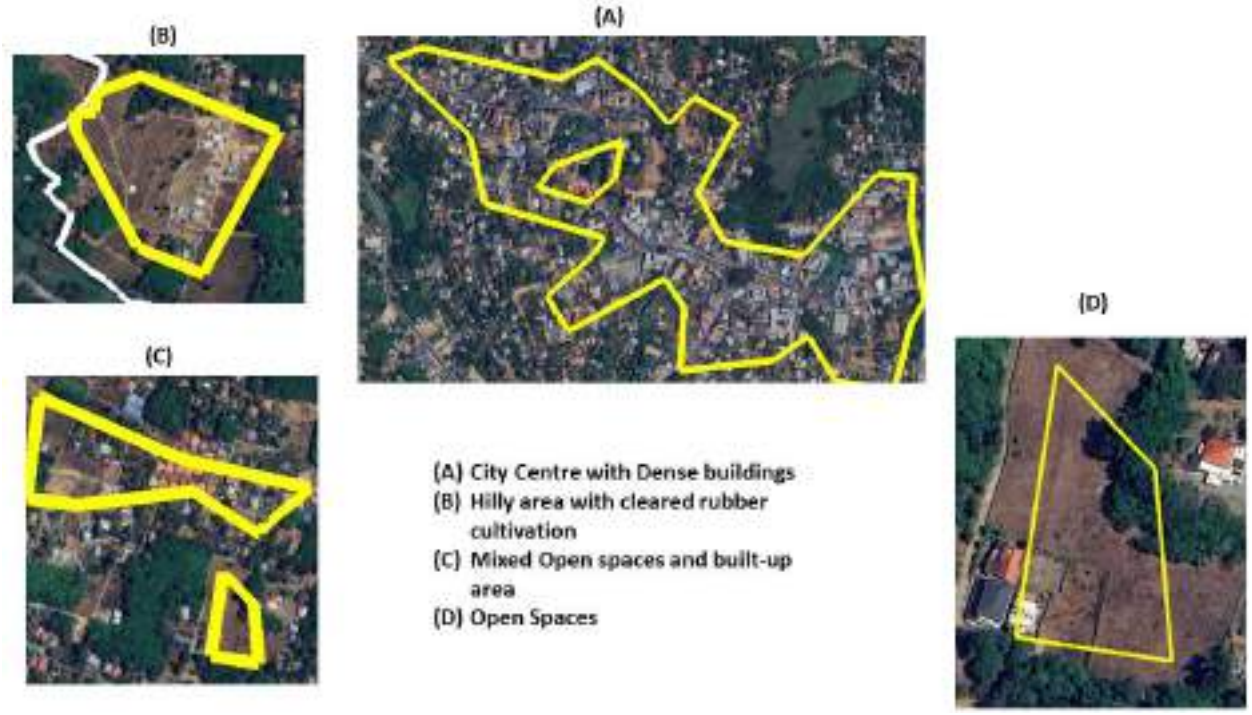


Figure 5.22 Some of the detailed views of urban heat hotspots of Adoor town

A) Dense Built-up Areas (Concrete, Asphalt, Infrastructure)

- Urban Heat Island Effect: Dense built-up areas are major contributors to urban hotspots due to their high thermal mass and low reflectivity.
- Reduced Green Cover: Limited vegetation decreases the cooling effects of evapotranspiration.
- Heat Retention: Materials like concrete and asphalt absorb heat throughout the day and release it slowly at night, prolonging elevated temperatures.
- Anthropogenic Heat: Human activities, such as vehicular emissions, air conditioning, and industrial operations, further intensify heat build-up.

B) & D) Open Area (Barren Land, Non-Vegetated Spaces)

- Direct Solar Exposure: Open areas without vegetation absorb and retain heat, increasing surface temperatures.
- Low Shading Effect: The absence of trees or built structures allows for unfiltered solar radiation, enhancing heat accumulation.
- Wind Influence: While open areas may have better air circulation, in the absence of greenery, they still contribute to localized heating.

C) Combination of Open Areas & Built Spaces

- Heat Amplification: Open areas with sparse vegetation combined with built-up surfaces create mixed heating patterns, intensifying localized temperature variations.

- Fragmented Green Spaces: If green spaces are scattered or insufficient, cooling effects are minimal, and heat hotspots remain dominant.
- Complex Microclimates: Depending on the ratio of open land to built-up areas, localized temperature variations can range from moderate to extreme, influencing urban thermal comfort.

5.3.4 Drought

Drought is supplementary to summers with high temperature. The drought mentioned and felt in the area of concern is mainly hydrological drought which is a deficit in available water for drinking and irrigation purposes.

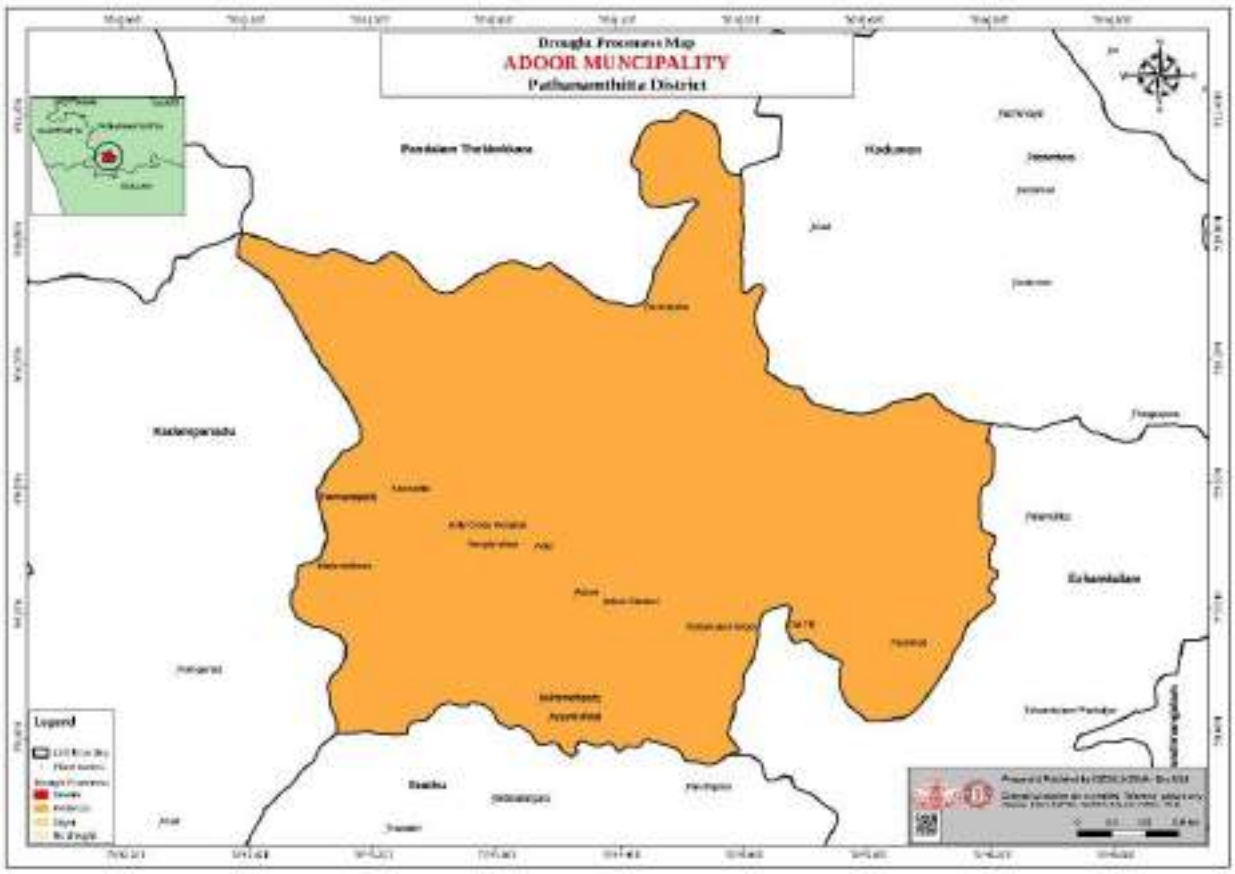


Figure.5.23 Drought prone areas in Adoor town extracted from DM Plan

5.3.5 Major Hazard events in the past and their impacts

The flood of 2018 literally did not affect Adoor town. Whereas in 2021, localised flooding occurred in the banks of the '*Pallikkal Thodu*' near to the town centre. This was said to be caused due to a landslip in the upstream of Achankovil river and the obstructions in the drainage canal. Affected land use and depth of inundation during the 2021 flood event are shown in Table 5.6, 5.7, 5.8 respectively.

Table 5.6 Land use breakup of inundated area

Total Land Use (Ha)							
Dry Agriculture	**Built up**	**Forest**	**Mixed use**	**Paddy Converted**	**Paddy & Wetlands**	**Roads**	**Water body**
0.25	0.00	0.00	0.00	0.00	1.29	0.00	0.00

Table 5.7 Land use breakup and depth of inundation

Depth of inundation	Dry Agriculture	Built up	Forest	Mixed use	Paddy Converted	Paddy & Wetland	Roads	Water body
0 to 3.00m	0.25	0.00	0.00	0.00	0.00	0.29	0.00	0.00
3.00m to 6.00m	0.00	0.00	0.00	0.00	0.00	1	0.00	0.00
Above 6.00m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table.5.8 Developable land – Classification into safe zones and risk zones

Local Body	% of inundation	Inundation of developed land	% of total Agriculture area affected	Population density	Damage to building
Adoor	0.09	0.00	0.02	1.55	1

5.4 Mitigation measures undertaken based on past events

5.4.1 Disaster Management Plan of Adoor town

The DM Plan of Adoor town was prepared in 2022 by the Municipality itself as part of the '*Nammal Namukkai*' programme under Government of Kerala, aimed at bringing stakeholders together for building a resilient Kerala. Technical support to the Municipality for the preparation of the DM plan was provided by KILA. The DM Plan focuses on preparedness. It consists of seven chapters. The first chapter is General Information, which explains the history and geographical peculiarities of the town. It also explains the wards, demography, economy, major livelihood options, infrastructure, residential areas, water bodies etc. The next chapter is about hazard identification and analysis in the town. Heat related disasters, Flood, Landslide, Lightning etc. are said to be threats in the town followed by human-wildlife conflict. However, it is also mentioned that there is no prior history of any major incidences of notified disasters in the area. This chapter also discusses the impact of climate change in disasters, environment and livelihood of people. The details of vulnerable population with gender wise numbers, list of critical infrastructure in hazard prone area and susceptibility maps of various hazards are also provided in this chapter.

The next chapter deals with the disaster response. List and details of ERTs, EWDS, volunteers, shelter management team, first aid team etc. are provided. Fourth chapter provides the

preparedness, mitigation measures and capacity building measures undertaken. It points out the drought mitigation measures and the community awareness programs carried out in the area. A number of location specific mitigation activities are listed in this chapter out of which relevant points can be incorporated as proposals in the master plan. Fifth chapter provides the data regarding resources such as human resources, heavy machinery, communication devices, waste disposal centres, medical shops etc. Next chapter lists out the climate specific disaster risk reduction proposals at the local level. A number of proposals which can be generally classified into bank stabilization, bund construction, disaster management awareness programs etc. Relevant proposals from the list may be incorporated in the master plan.

The link to the Local Disaster Management Plan of Adoor Town is provided. https://dmp.kila.ac.in/mnt/assets/dmp.kila.ac.in/maps/Pathanamthitta/1183-Adoor_MUN/Disaster_Management_Plan_Document_2019.pdf

5.4.2 Initiatives taken by nodal departments for hazard resilience in Adoor Town

Adoor Municipality has formulated a disaster management plan in line with Kerala State Disaster Management Authority guidelines, focusing on community participation and decentralized governance. Ward-level volunteers form the core of the system, supporting early warning, evacuation, and first aid, in coordination with local authorities. A trained disaster management team ensures effective coordination through a clear communication network and defined responsibilities. Regular awareness campaigns promote preparedness and resilience, making the system inclusive, resourceful and responsive to emergencies.

The District Disaster Management Authority (DDMA) coordinates preparedness and response measures, including hazard mapping, mock drills, early warning systems, and community awareness programmes. The Kerala State Electricity Board (KSEB) have implemented preventive steps such as installing lightning arresters, ensuring proper earthing of transformers, and conducting rapid restoration works during outages. The Irrigation Department undertakes canal desilting, widening and deepening of natural drains, side protection works, and maintenance of drainage networks to improve water flow and reduce urban flooding. The Agriculture Department promotes flood-resilient crops, soil conservation measures, and crop insurance schemes to support farmers.

5.5 Climate change impacts

To address the challenges due to climate change, the Department of Environment and Climate Change, Government of Kerala prepared the Kerala State Action Plan on Climate Change, 2022 (KSAPCC). It emphasizes the importance of mitigation measures such as reducing greenhouse gas emissions and promoting renewable energy, as well as adaptation strategies such as strengthening infrastructure, enhancing disaster preparedness, conserving natural resources, and promoting

climate-resilient agriculture and livelihoods. Collaboration between government agencies, communities, civil society organizations, and other stakeholders is crucial for implementing these measures effectively and building resilience to the impacts of climate change in the long term.

The KSDMA has made projections in regard to climatic variables such as maximum temperature, minimum temperature and precipitation over near term, medium term and long term for all local bodies in the state based on RCP 8.5 scenario. The deviation from historical long term average for these parameters in Adoor town is provided in the table below.

Table 5.9 Climate Change projections for Adoor town (RCP 8.5 Scenario)

Climate variables	Seasonal deviation from daily average in near term (2021-2040)				Seasonal deviation from daily average in medium term (2041-2060)				Seasonal deviation from daily average in long term (2061-2099)			
	JF	MAM	JJAS	OND	JF	MAM	JJAS	OND	JF	MAM	JJAS	OND
Maximum temperature (°C)	1.2	0.9	0.7	1.1	1.6	1.6	1.6	1.6	2.5	3.1	3.1	2.7
Minimum temperature (°C)	0.8	0.9	0.9	1.1	1.7	1.6	1.4	1.7	3.3	3.1	2.5	2.9
Precipitation (mm/day)	0	-0.3	1.1	0.1	0	0.2	2.3	0.9	0	0.9	4	2.5

*JF – January- February *MAM- March-April-May *JJASS – June-July-August- September *OND- October-November-December

As per the downscaled climate data, deviations in precipitation during south-west monsoon can possibly create extreme rainfall events leading to floods and landslides. Increase in temperatures and precipitation during summers indicates the possibility of drought also. This can also lead to increase in number of heat related stress diseases.The potential deviation of climatic variables from historical long term average can create disasters and they can lead to various impacts. The table below shows such impacts of climate change.

Table 5.10 Potential Effects and Impacts of Climate Change

Climate Change Variables	Change in variables	Climate Change effects	Climate Change impacts
Temperature	Increase	Longer period of droughts	Decline in crop production
		Warmer days and nights	Heat related stresses on health
Seasonal rainfall	Increase	Frequent flooding	Damage to agriculture, livelihood etc.
	Decrease	Drought	Decline in water supply, crop production etc.
Climate extremes	Increase in extreme rainfall events	Potential changes in frequency and severity of	

		flooding events	
		Potential changes in frequency of rain induced landslide events	

5.5.1 Impact of Climate change in key sectors

Climate change has profound impacts across various sectors:

Agriculture: Altered weather patterns, such as increased temperatures and changing precipitation, can reduce crop yields and affect food security. Extreme weather events like droughts and floods can destroy crops and disrupt planting and harvesting schedules.

Health: Rising temperatures can lead to heat-related illnesses and exacerbate respiratory conditions due to increased air pollution. The spread of diseases may also change, with vectors like mosquitoes expanding their range and introducing diseases like malaria and dengue fever to new regions.

Water Resources: Changes in precipitation patterns and increased evaporation rates can lead to water shortages and reduced water quality. Glacial melt and altered river flows can impact water availability for drinking, irrigation, and hydroelectric power.

Infrastructure: Extreme weather events such as hurricanes, floods, and heat waves can damage infrastructure, leading to costly repairs and disruptions. Sea-level rise threatens coastal infrastructure, including roads, bridges, and buildings, with increased flooding and erosion.

Table.5.11 Climate Change effects and potential impacts in various sectors

Sector	Climate Variables	Change in variables	Climate Change effects	Climate Change impacts
Health	Temperature	Increase	Hotter days	• Heat related stress among vulnerable population
	Rainfall	Increase	Flooding	• Increase in vector borne diseases
Agriculture	Temperature	Increase	Drought	• Increased demand for irrigation • Disruption of cropping cycle • Decrease in product quality
	Rainfall	• Too little rain • Too much rain • Early onset of monsoon • Late onset of monsoon	• Drought • Flooding • Rain induced landslides	• Wilting of crops • Decrease in crop yields • Reduction in farmer's income • Increased risk of pest outbreak
Water Resources	Rainfall	Decreases	Drought	• Increased competition for Water • Changes in water quality
	Extreme	More events	Flooding	• Changes in water quality

	rainfall			
Infrastructure	Extreme rainfall	More events	• Flooding • Rain induced landslides	• Damages to roads, bridges, public buildings etc.

5.6 Existing disaster response system

Adoor municipality has developed a comprehensive disaster response framework that emphasizes community participation and efficient local governance. The Disaster Management Plan of Adoor aligns with the guidelines of the Kerala State Disaster Management Authority, incorporating hazard analysis, resource mapping, and institutional frameworks. A critical component of this system is the network of ward-level volunteers who play a key role in disseminating early warnings, assisting in evacuation, and providing first aid during emergencies. These volunteers work closely with local authorities, ensuring that preparedness measures reach all sections of the community.

The Municipality employs a decentralized approach to disaster management, ensuring resources and facilities are accessible across all wards. Key locations, such as primary health centres and schools, are identified to serve as treatment hubs and emergency shelters. Collaboration with private and public institutions enhances the resource base, including ambulances, rescue units, and medical supplies, which are vital during crisis situations. This integration of infrastructure and resources strengthens the municipality's capacity to respond effectively to disasters.

Coordination and communication are integral to Adoor's disaster response system. The disaster management team comprises trained personnel, including medical staff, rescue teams, and logistics coordinators, who operate within a well-defined communication network. Responsibilities are clearly assigned to officials and ward-level coordinators, facilitating swift action during emergencies. Public awareness campaigns are regularly conducted to educate residents on disaster risks and preparedness measures, fostering a culture of resilience within the community.

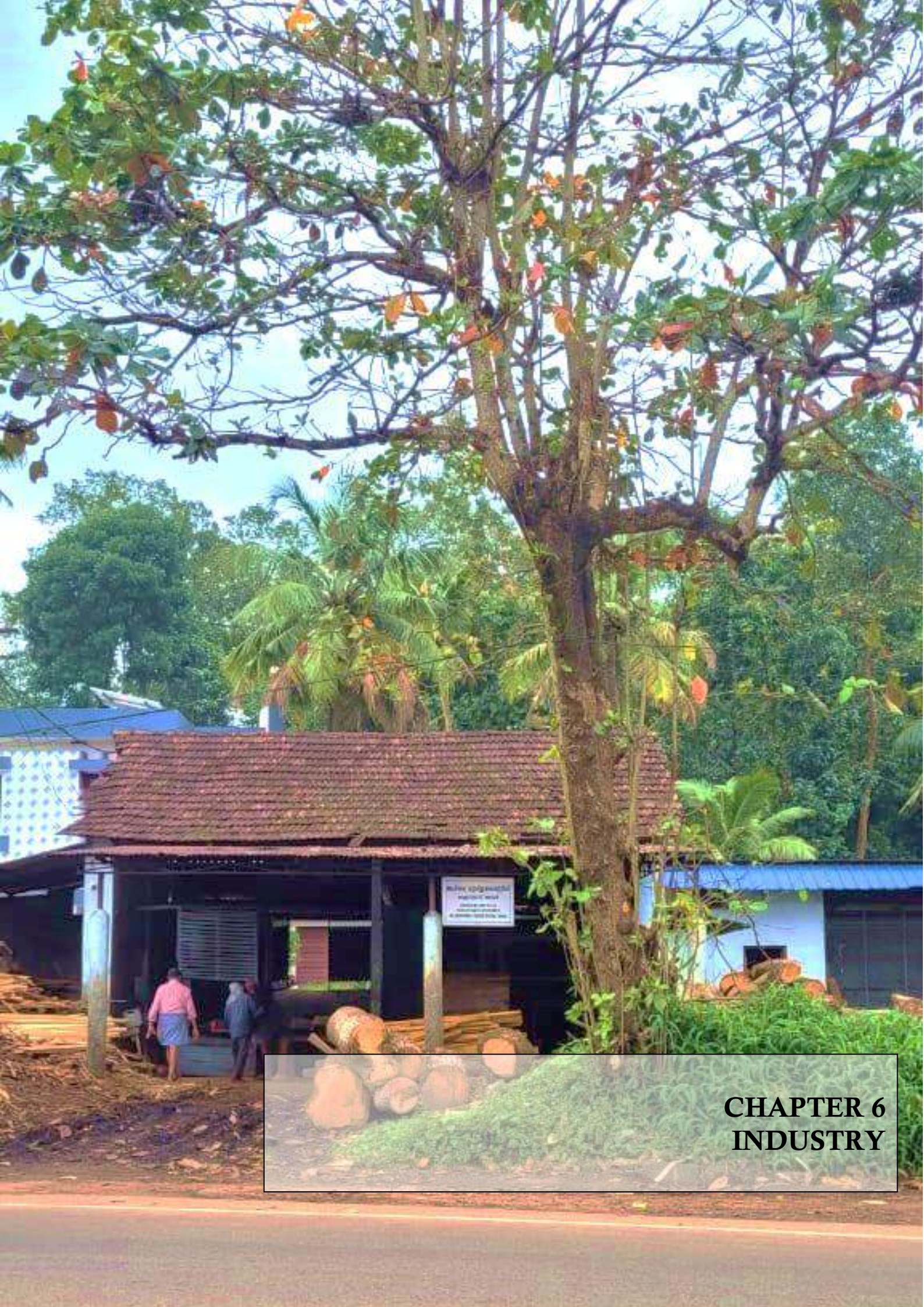
5.7 Inference

Adoor town, though less susceptible to major hazards like floods and landslides, faces several environmental risks that require urgent attention. The most significant threats include heat-related disasters, such as heat strokes and sunburn, which are exacerbated by rising temperatures due to climate change. The town also experiences moderate drought conditions from February to May, leading to water scarcity that affects drinking and irrigation needs. The study highlights the significant impact of urbanization on the Urban Heat Island effect in Adoor Town. The increase in Land Surface Temperature (LST) is closely linked to reductions in vegetation cover and expansions in built-up areas, as indicated by NDVI and NDBI trends. Urban Heat Hotspots (UHS) were found

in densely populated areas and barren lands, confirming that infrastructural growth and land use changes contribute significantly to temperature rise.

Lightning strikes pose another recurring hazard, especially during the pre-monsoon and monsoon seasons, with certain vulnerable groups, such as farmers and outdoor workers, at higher risk. While flooding incidents have been minimal in the past, localized flooding near the *Pallikkal Thodu* in 2021 indicates a growing concern due to changing climatic conditions and extreme weather events.

Climate change further intensifies these hazards by altering temperature and precipitation patterns, leading to prolonged droughts, more frequent heatwaves, and extreme rainfall events that increase flood risks. The projected increase in maximum and minimum temperatures, alongside erratic rainfall patterns, threatens agriculture, water availability, and public health. Infrastructure is also at risk, as heavy rains can cause damage to roads, bridges, and buildings. Addressing these challenges requires a robust mitigation strategy, including effective heat action plans, water conservation initiatives, improved lightning protection measures, and climate-resilient infrastructure. Additionally, enhancing community awareness and disaster preparedness efforts will be crucial to minimizing the impact of these hazards and ensuring long-term resilience for Adoor town.



CHAPTER 6
INDUSTRY

6.1 Introduction

In this chapter the present scenario of Industrial sector of the town is discussed. Large or medium type of industrial units are absent in the town and the industrial sector is limited to few industries in the category of MSME. The mini-industrial estate of Industrial department located at Vadakkedathukavu- Parakode is the major industrial establishment in the town. Other small units are scattered in different part of the town. As per the land use analysis 4.10 hectares of land which is just 0.20 % of total town area is coming under industrial land use. As per the census 1981, 1991 2001 and 2011 the number of workers in House Hold industrial sector are 187, 227, 222 and 175 respectively. This indicates that the number of workers in the industrial sector has not increased over time, reflecting stagnancy in the sector.

6.2 Existing Industrial Base

Pathanamthitta district is generally considered as industrially backward. Large /Medium scale industries are limited in the district. As per District Industries Centre Pathanamthitta, 10940 MSME industrial units registered in 2017 with total Investment of 95961 lakhs and generated 55815 employment opportunities in the district. There are two enterprises working under public sector in the district (Table 6.1). Both the units are located in Thiruvalla region at a distance of around 34.8 km from Adoor town.

Table 6.1 Public sector undertakings in Pathanamthitta district

Name of Enterprise	Product	Value of P&M (Rs in Crore)	Employees (Nos)
Travancore Chemicals & Sugars Ltd.	Beverages	135.00	68
Traco Cable Company Ltd.	Cable	300.00	120

Source: Industrial Potential Survey 2017-18, District Industries Centre Pathanamthitta

6.2.1 Manufacturing Industries

As per the DIC records, the manufacturing industries in the area can be grouped into 17 broad categories. These include Agro Food, Beverage, Meat and Fish Products and Processing; Automobile Service and Repair; Building Materials, Construction, Architecture, and Structural Designing; Electrical and Electronics Products and Services; Information Technology and Mobile Hardware, Cable TV, and Internet services, Garments and Textiles, Tailoring, Boutique, Apparel Designing, and Ornaments; General and Precision Engineering (such as steel and iron fabrication); Glass Products; Handloom, Coir, and Handicraft Items; and Organic and Chemical Fertilizers, Paper Products, and Personal Care Products and Services including Cosmetics, Wellness, Gymnasium, Martial Arts, and Yoga, Plastic Products, Rubber Products, Video and Photo Processing, Media and Entertainment, Event Management, Printing and Publishing, Desktop Publishing (DTP), and Wood Products. Additional groups are Other Manufacturing Activities,

Other Service Activities. There are a total of 166 manufacturing units in the Town. As shown in Figure 6.1, 96% of these units are proprietary concerns. Only 1% belongs to self-help groups and cooperative societies, while 2% are partnership firms. Furthermore, as illustrated in Figure 6.2, 99% of the manufacturing units are classified as micro industries.

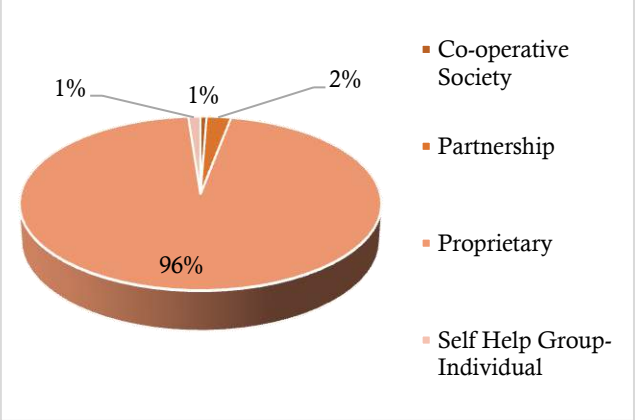


Figure 6.1 Type of Organizations in Manufacturing Industry

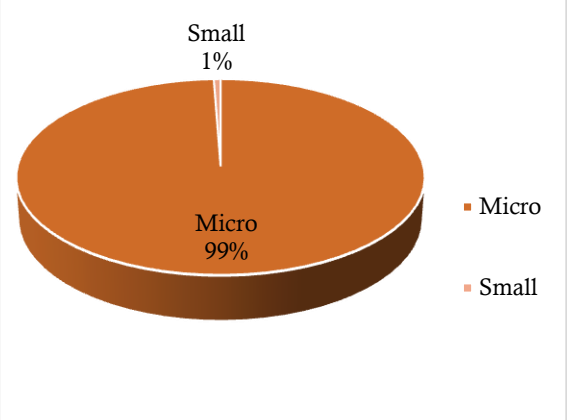


Figure 6.2 Type of Manufacturing Industries

Source: DIC,2024

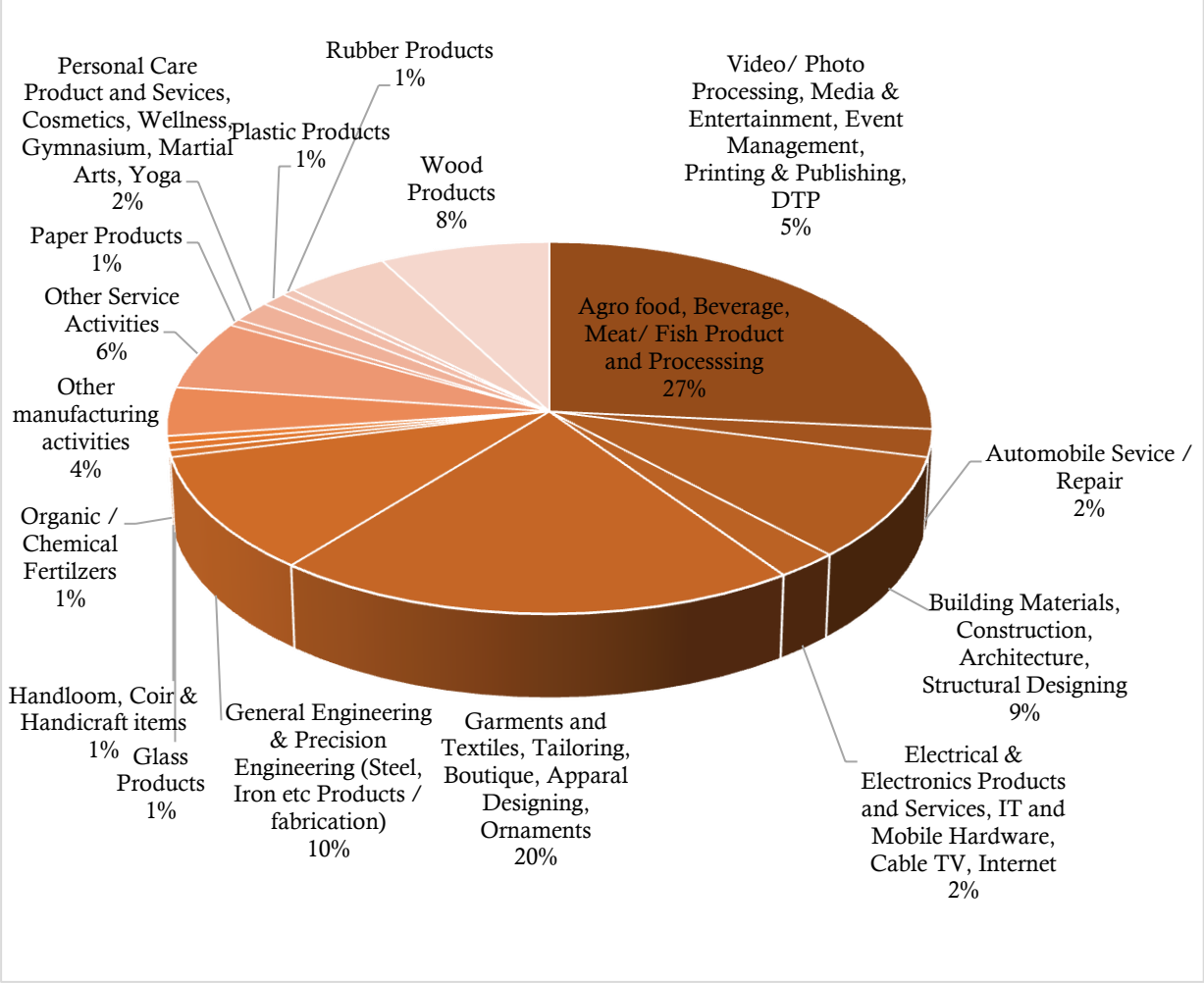


Figure 6.3 Number of Manufacturing Industries in Adoor

Source: DIC,2024

The number of industries in each category of the manufacturing sector is shown in Figure 6.3. The Agro Food, Beverage, Meat and Fish Products and Processing industry has the highest count, with 44 units. This is followed by the Garments and Textiles sector with 34 units, and the General Engineering and Fabrication sector with 17 units. Details of manufacturing industries are given in Annexure 6.1.



Figure 6.4 Industries in Adoor town

6.2.2 Service Industries

As per the DIC records, the service industry in the area can be categorized into nine sectors. These include a diverse range of services such as agro food, beverage, meat and fish products and processing; automobile service and repair; and electrical and electronic products and services, Information technology and mobile hardware, cable TV, and internet services; garments and textiles, tailoring, boutique, apparel designing, and ornaments; and emerging sectors such as information technology, artificial intelligence, robotics, and business process management (BPM), Knowledge services, training and coaching centers, and other general service activities, personal care products and services such as cosmetics, wellness, gymnasiums, martial arts, and yoga, the media and entertainment sector is represented through video and photo processing, event management, printing and publishing, and desktop publishing (DTP).

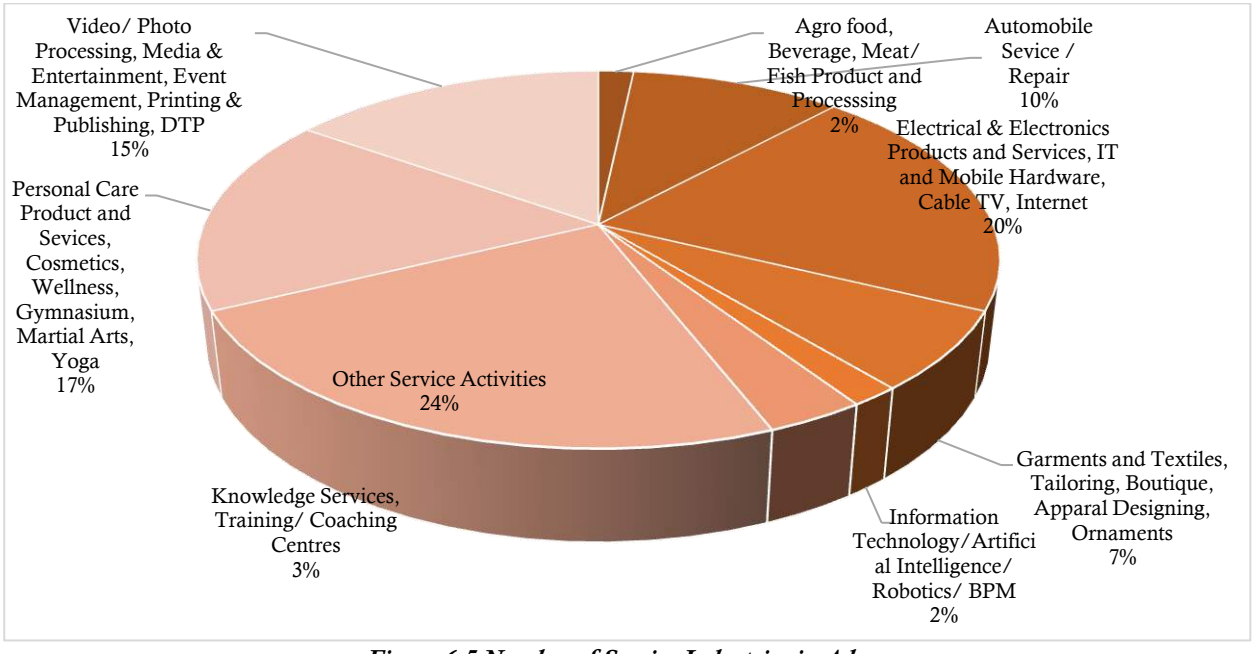


Figure 6.5 Number of Service Industries in Adoor

Source: DIC,2024

There are a total of 59 industries operating in the service sector. The distribution of these industries across various sectors is shown in Figure 6.5. The highest number of industries is in the Mobile Hardware and Cable TV sector, with 12 units. This is followed by the Cosmetics and Wellness sector, which comprises 10 units, and the Media and Entertainment sector, which ranks third in terms of industry count. As shown in Figure 6.6, 97% of the service industries are proprietary establishments, while the remaining 3% are public sector undertakings.

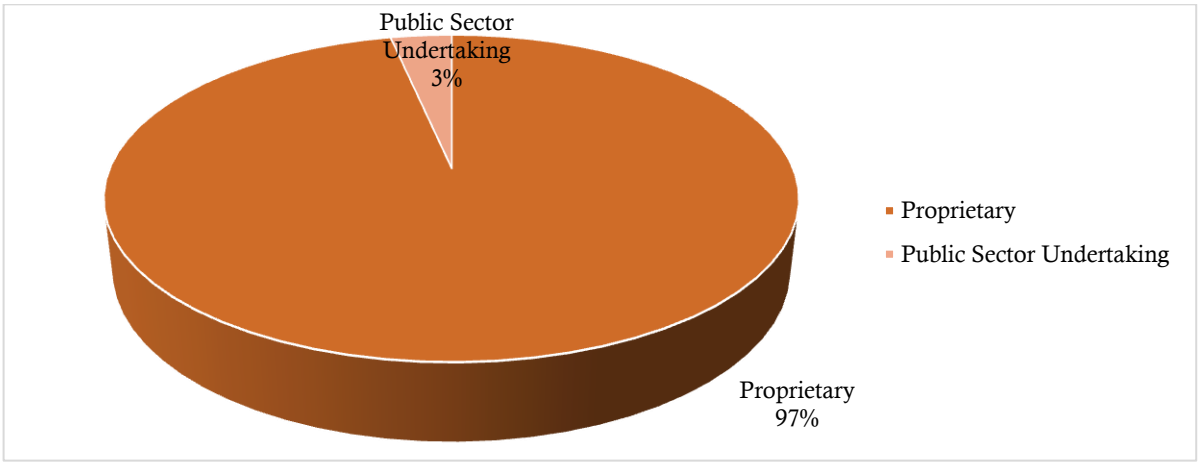


Figure 6.6 Type of Organizations in Service Industry

Source: DIC,2024

The percentage of employees working in each category of the service sector is shown in Figure 6.7. The highest number of employees is engaged in the "Other Service Activities" category, which includes services such as microlabs, dry cleaning, and similar operations. This is followed by the Automobile Service and Repair sector, which also accounts for a significant portion of employment in the service industry. Details of Service industries are given in Annexure 6.2.

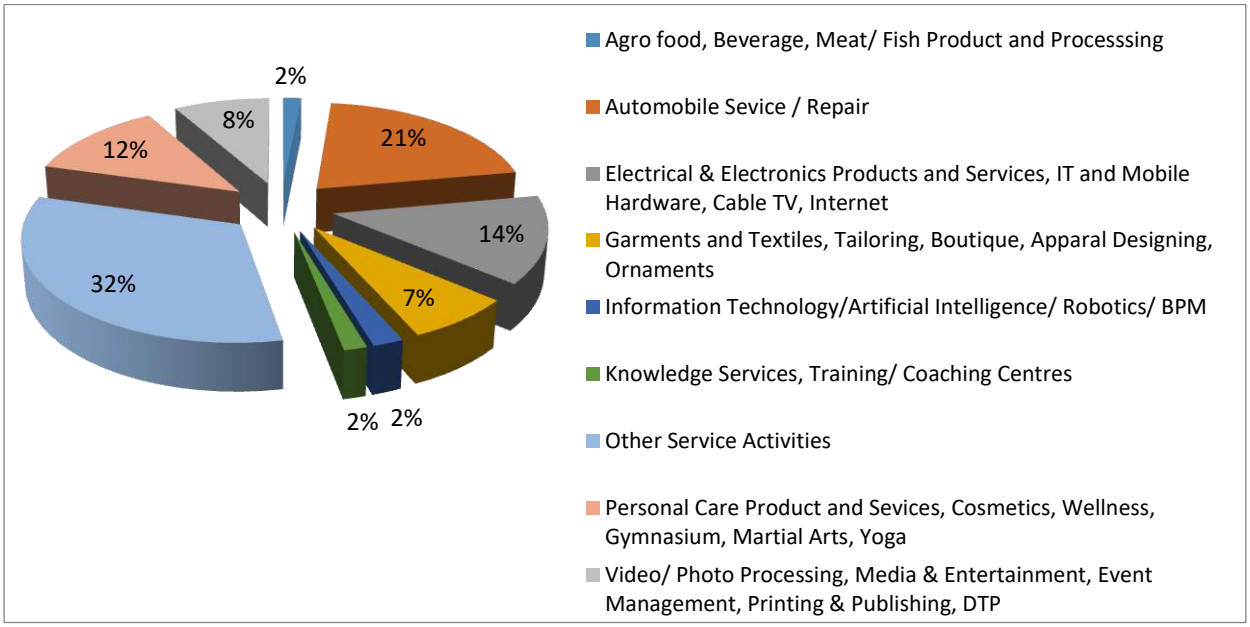


Figure 6.7 Percentage of employs working in each category in service sector

Source: DIC,2024

6.3 M.S.M.E units

The number of registered industrial units in the category of MSME shows an increasing trend over the years. From just 143 units in 1997, the number has increased to 905 units in 2019. The temporal variation in number of MSME units is shown in Figure 6.8. Different category of MSME units and their number is shown in Table 6.2.

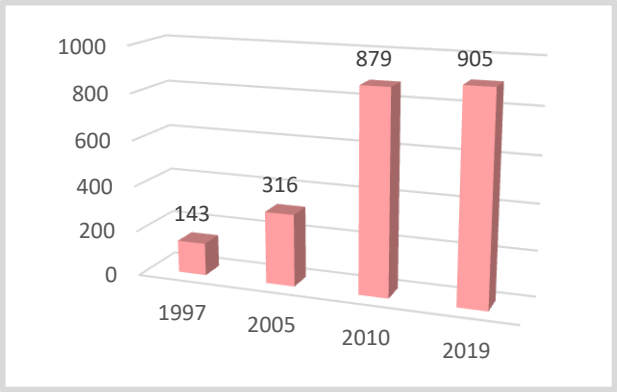


Figure 6.8 Growth in number of M.S.M.E

Table 6.2 Details of MSME units functioning in Adoor Town

Engineering	Electronics	Building Materials	IT Based	Bricks Tiles	Chemical based	Agriculture based	Food Processing	Rubber Based	Cement Based	Plastic Based	Forest Based	Textile Based	Others
53	19	14	8	32	18	36	43	3	16	2	14	174	473

6.4 Mini Industrial Estate

The Mini Industrial Estate owned by Industries Department is the only organized Industrial area within the town limit. It is located in the south west part of the town by the side of Vadakkedathukavu- Parakode Road near Mini Junction. The industrial Estate is functioning in an area of 1 Acre of land. Sheds for 10 units are available in the estate but only three units are occupied now. Tiles, hollow bricks and glue etc. are the products of these units. Since this region is prone to lightning, future expansions should incorporate enhanced protective measures to mitigate lightning-related risks.

6.5 Traditional Industries

In Adoor town Bamboo bags and mats are manufactured by traditional industrial units. Earlier a Sub Depot of Kerala Bamboo Corporation was functioning at Kottamugal for issuing the raw materials. But it is not functioning now in Adoor Town.

6.6 Spatial Distribution

The industrial land use are limited in town and are distributed in different parts of town. The spatial distribution of Industrial landuse is shown in Figure 6.9. The industrial landuse is concentrated in

Pothradu, Adoor Central, Ayyappanpara wards. The Concentration of Industrial landuse in town is shown in Figure 6.10.



Figure 6.9 Spatial Distribution of Industrial Land Use

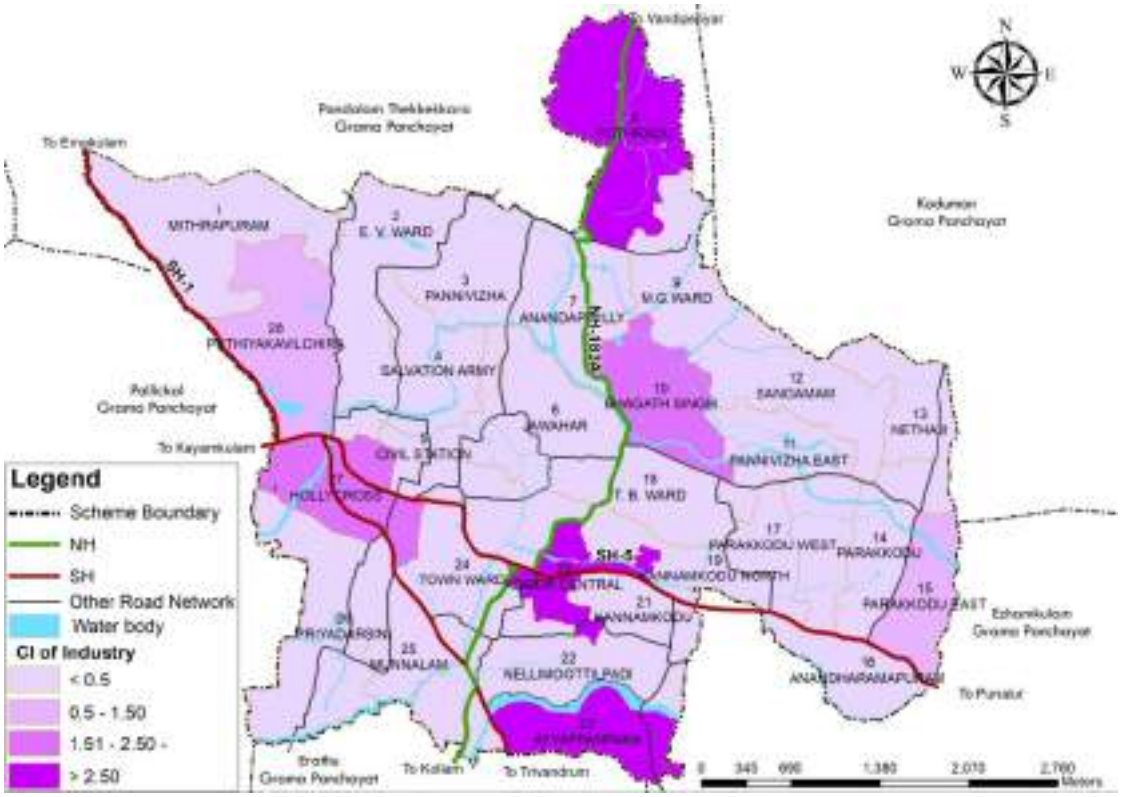


Figure 6.10 Concentration of Industrial Land Use

6.7 Kinfra Food Processing Park, Adoor

KINFRA Food processing park, Adoor is located in adjacent Enadimangalam Grama Panchayat at a distance of 10 km away from Adoor town. The park is functioning in 85 acres of land and 60% area of the park is earmarked for food processing units and the remaining 40% for general industries. The park is meant for all categories, ie. Micro, Small and Medium industries. Once it is fully developed it will definitely help the economic growth of Adoor region.

6.8 Raw Materials

Agro based raw materials are available of in the region, which can be utilized as industrial raw material. Latex which is a major industrial raw material is available in plenty in the town and its hinter land. Granite and clay are the other raw minerals available in the influence region.

6.9 Effect of Hazard risk in Industrial Sector

There are no damages or losses reported in Industrial sector in town due to any natural hazards.

6.10 Problems and potentials

There is no large scale industry presently functioning in the planning area or in the immediate surrounding area. There are no industrial estates /SIDCO/ Kinfra/ Inkel/ Ksidc/ startups/ Incubation centres/ others in the municipality. The major hurdle faced by the industrial sector is the non-availability of infrastructure for industrial purposes at reasonable rates, lack of skilled labours and absence of standardization and marketing infrastructure. Lack of raw materials, decline in Traditional industries, are also major threats. Even though lot of funds from financial banks are available for starting industries, there is little scope for infrastructure like Development Area (DA) /Development Plot(DP) / Mini Industrial Estate(MIE) facilities. Major portion of the Town is coming under residential area and marshy areas which are hindrances for starting new units. Migration of educated youth is another problem.

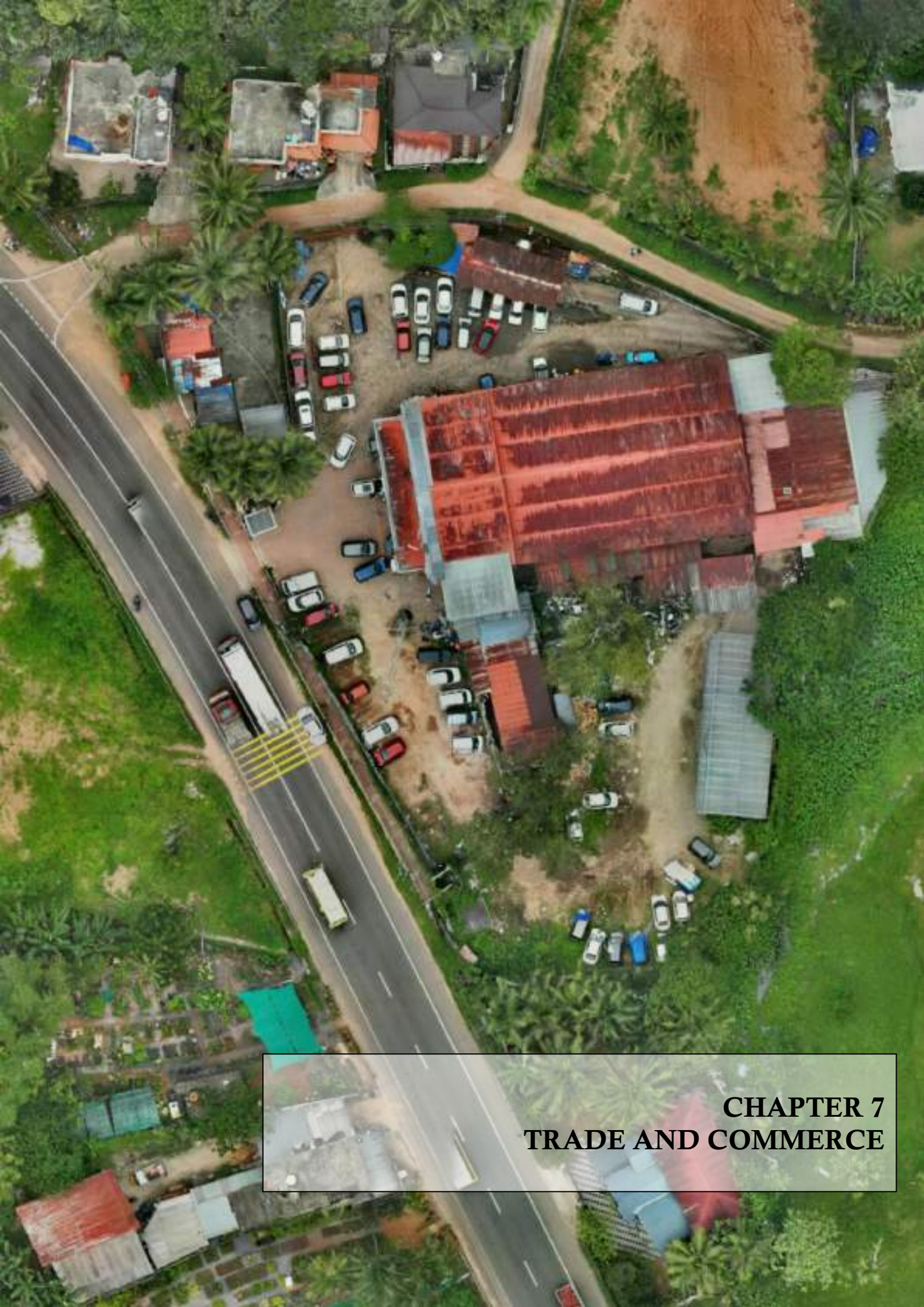
There are a large number of commercial banks in both private and public sector with huge amount of deposits in the Town. NRI/NRK population is very high in this area. Literacy rate is also very high. There are highly educated youth with IT and other engineering qualifications. Fruits, industrial wood, minerals like granite, M sand etc are abundantly available from the adjoining areas. The border areas of the Town, being low-density regions, are suitable for establishing mini industrial estates. Utilizing the neighbourhood unit like Kudumbasree, there is ample scope for starting nano household units in sectors like tailoring, food processing etc.

Even though in this area there are no tourist or pilgrim places, it has become the hub for both tourism and pilgrim activities, making it an ideal location for starting hospitality and service oriented units. Catering, beauty parlors, and tailoring are emerging sectors in the area, offering new economic opportunities and employment prospects for local entrepreneurs. Acquiring suitable land for

industrial purpose is essential for growth of industrial sector. Although land is available in the town, some areas remain unused due to topographical constraints. These lands can be strategically utilized for developing industrial units. Additionally, there is significant potential for exporting units, as a major share of the population consists of NRIs, creating demand for locally produced goods in international markets.

6.11 Inference

There are no major industries in the town. Traditional industries in the town are in declining stage. Adoor does not have a specialization in any particular category of industries. Availability of land and comparatively low population density provide potential for industrial development. Agro based raw materials and building materials like granite are available in the region, which can be utilized as industrial raw material. Presence of KINFRA Park in the neighboring Enadimangalam Grama Panchayat paves the way for establishing ancillary units in the region. Better connectivity with other parts of the state and neighboring states is another advantage.



CHAPTER 7
TRADE AND COMMERCE

7.1 Introduction

Adoor town was developed as a market centre. The trade and commerce activity of Adoor is linked with Parakode Market. Anantharamapuram Market at Parakode was a major centre for trade and commerce of erstwhile Travancore. This market was established by Raja Kesavadasan, the Divan of Travancore. The prosperous period of this market was the end of the 18th century and the beginning of 19th century. The market has trade links even with centers in Tamil Nadu like Senkotta, Kadayanallur, Tenkasi, Madhurai.

Agriculture produces, hill products, spices and even elephants were traded in this market. Once the area of this market was about 19 Acres, but in the later stage its area has been reduced to 9.35 Acres due to encroachments. Parakode cattle market is one of the biggest cattle markets in south Kerala and functioned on third Friday of every month of Malayalam Era. Large number of cattle, goats, buffaloes were brought from many places in Tamil Nadu and Kerala and marketed along with local livestock. Now the importance of the market has diminished due to establishment of other markets in the neighboring area.

7.2 Present Scenario

The total land under commercial use of Adoor Town is 0.37 sq km, which is 1.82% of the total town area. A comparative study with similar adjacent towns in the region has been made and the percentage share of commercial area to the total area of the towns Pathanamthitta, Thiruvalla, Pandalam, Chengannur and Changanassery. It shows that Adoor is in second place after Changanassery as far as the percentage of commercial land use is concerned and it shows the commercial importance of the Town. An analysis regarding the temporal variation of commercial land use of Adoor town has been made. The percentage of commercial land was 1.50% of total area in 2010 and has increased to 1.53% in 2019. The area under commercial land use has increased by 17% in nine years. In addition to Parakode, Commercial development had also taken place in other parts of the town. Trade and Commerce is one of the major economic bases of the town.

7.3 Important Centres, Commercial Node, Hierarchy of Nodes

Adoor Town has a mix of traditional markets and modern commercial hubs that serve as the main centers of trade and shopping. The mini-industrial estate at Vadakkedathukavu–Parakode and the Parakode Market remain significant for traditional commerce, while other shopping complex and malls and commercial shops provide modern retail facilities. Three more nodes were developed with centers at Central toll junction, Municipal bus stand and KSRTC bus stand. Now the in between spaces of these nodes are also developed with Commercial activities. A corridor development is visible along M.C.Road and K.P.Road from High School Junction to Parakode.a commercial space

is developed along the two sides of bypass. Spatial Distributions of Commercial Centers are shows in Figure 7.1.

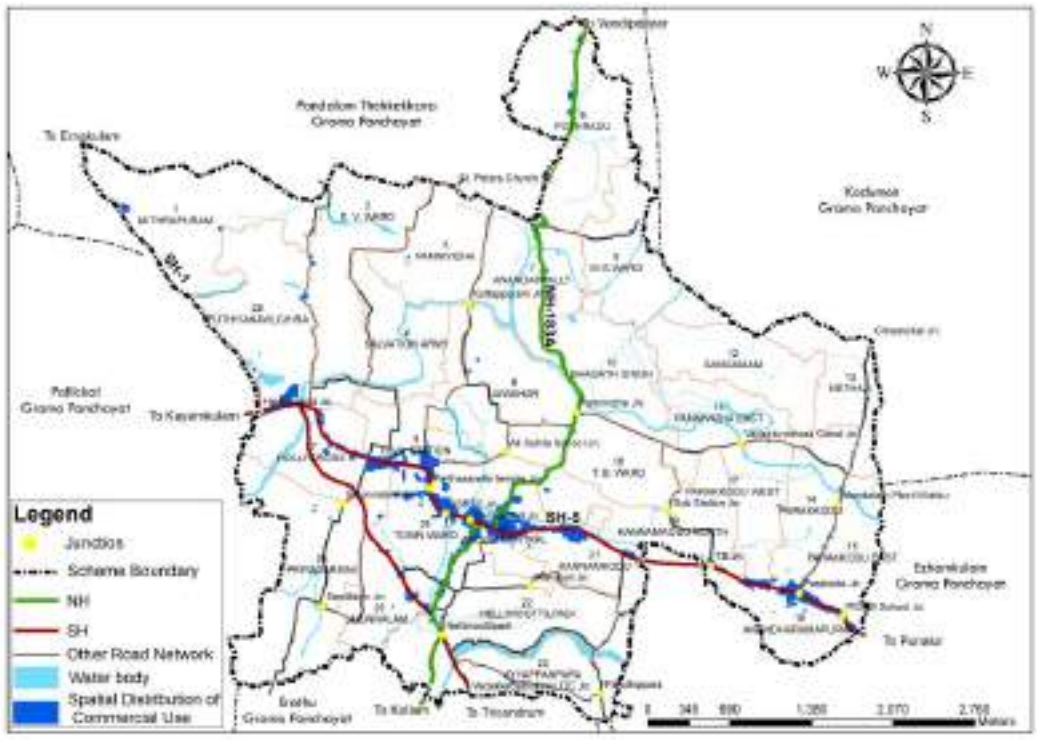


Figure 7.1 Spatial Distribution Commercial Land Use

7.3.1 Commercial Nodes & Hierarchy of Nodes

A detailed survey regarding the commercial nodes in the town has been conducted by the department. Based on the preliminary survey, 11 commercial nodes (Figure 7.2) in the town have been identified for the detailed study. The facilities at various nodes has been generally grouped into Retail shops, Whole sale shops, Commercial offices, Small scale industries, Other facilities and Higher order facilities. The number of shops / units of different categories coming under these general groups were counted. For comparison total scores for each node were calculated after assigning weightage to each facility. Based on the above analysis the existing hierarchy of nodes has been arrived at as given below. (Figure 7.3)

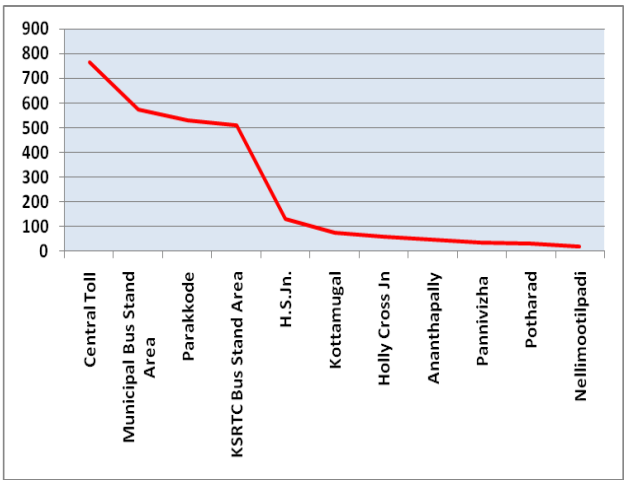


Figure 7.2 Identification of hierarchy of nodes

Source: Commercial Survey 2019

- *First order – Central Toll*
- *Second order - Private Bus stand, KSRTC Bus Stand, Parakode*

- *Third order– High School .Junction, Kottamugal, Holly Cross Junction, Ananthapally, Pannivizha, Potharad, Nellimootilpadi*

Higher order nodes are formed along M.C.Road and K.P.Road between High School Junction and Parakode Junction. With the expansion of nodes the space between nodes were reduced considerably and it appears like corridor development.

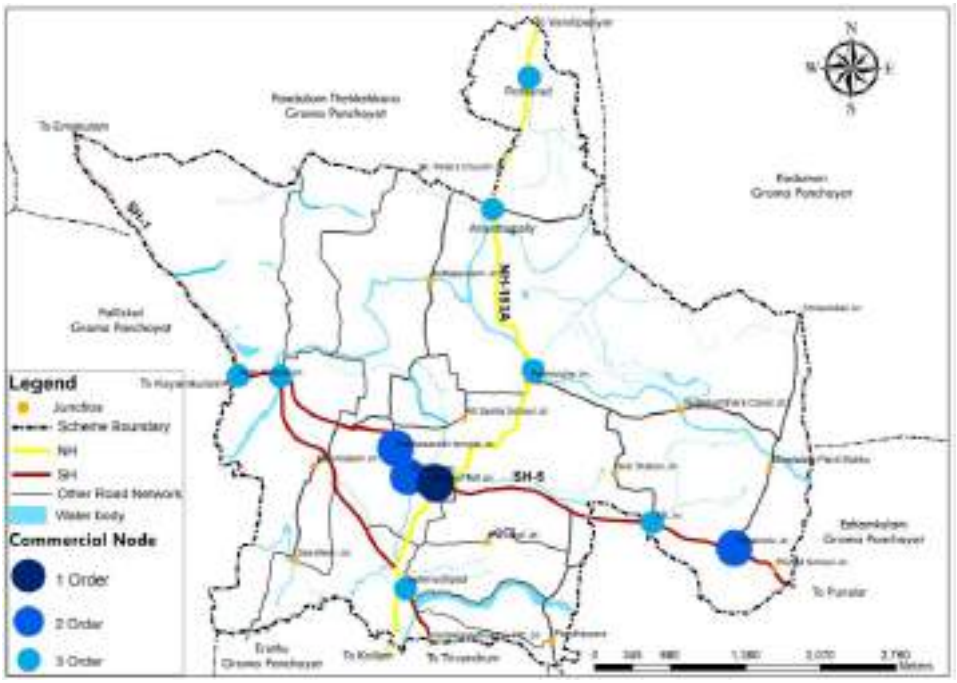


Figure 7.3 Hierarchy of Nodes in town

Source: Land use survey 2023

7.4 Street Vendors/Informal sector

Hawkers and vendors have long been a common feature of sidewalks and markets of urban centers. Hawkers contribute substantially in meeting the needs of the community. They indirectly support the local artisans and poorer sections of the community, by making available commodities at a comparatively cheaper rate. Even though their activities can be justified socially, it is conflicting with the management of traffic and pedestrian movement on street and in many cases affects the environmental quality. Even though in a small scale, the informal sector activity is there in Adoor Town also. There is no organized space for hawkers in the town and they are mainly utilizing road margins. Vendors are concentrated in Central Area, Parakode Market, Pannivizha, Mariya Hospital Junction, Adoor Market, KSRTC Junction, Parthasaradhi Junction, Government Hospital/ Private bus stand, By pass road, K.P.Road, Nellimoottilpadi Junction and Holly Cross Junction/ Fire Station. Details of informal sector activity ie, type of activity, number of units and number of workers etc. of Adoor town is given in Annexure 7.1.

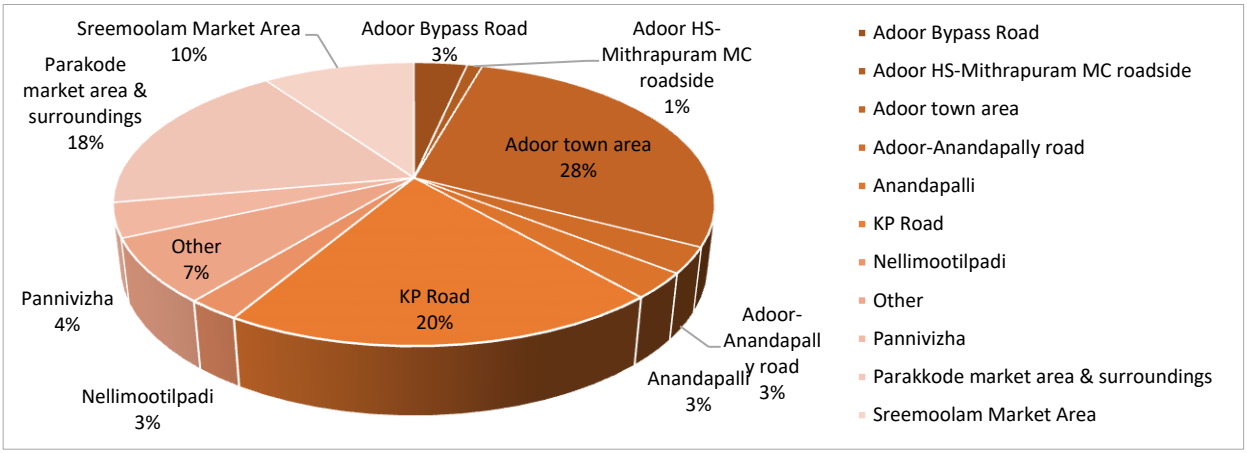


Figure 7.4 Distribution of Street Vendors

Source: Municipal records

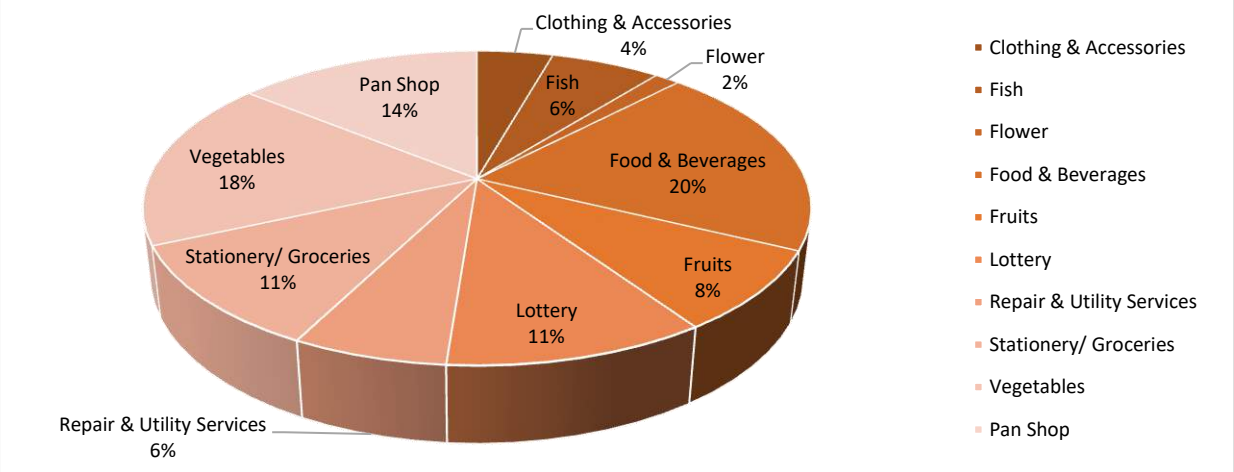


Figure 7.5 Commodities sold by the vendors

Source: Municipal records

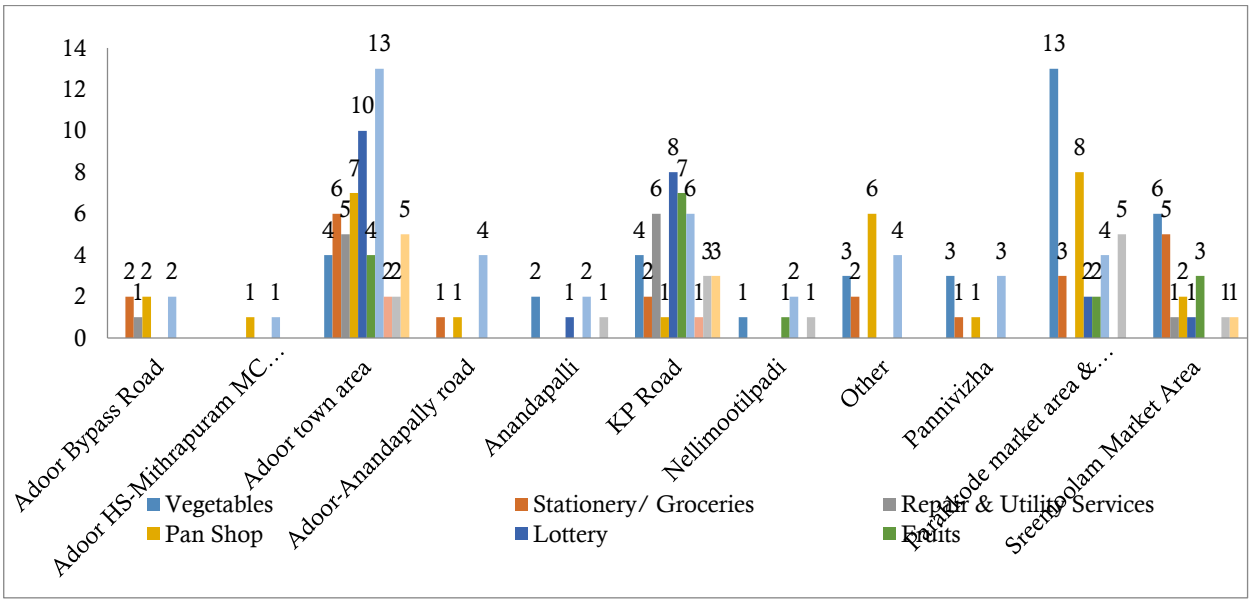


Figure 7.6 Commodity Wise distribution of Street Vendors

Source: Municipal records

Street vending in Adoor exhibits a concentrated spatial pattern, with the majority of vendors located in four principal areas: Adoor town centre (28%), the KP Road corridor (20%), the Parakode market area (18%), and the Sreemoolam market (10%), as illustrated in Figure 7.4. The vending commodities in Adoor encompass a range of categories, including clothing and accessories, fish, flowers, food and beverages, fruits, lottery, repair and utility services, stationery/groceries, vegetables, and pan shops. The predominant commodities traded include food and beverages (20%), vegetables (18%), stationery and groceries (11%), and lottery tickets (11%) as shown in Figure 7.5.



Figure 7.7 Spatial Distribution of Street Vending Activities

Source: Municipal records

Municipal records indicate a total of 205 registered vending units within Adoor Town, with their distribution visualized in Figures 7.6. The spatial distribution, typology of these commodities, and the associated vending patterns and commercial dynamics across the urban landscape are illustrated in Figure 7.7. The precise locations of individual vendors have been mapped in Figures 7.8, 7.9, and 7.10, providing a comprehensive spatial representation of vendor concentration and dispersion across the town.



Figure 7.8 Detailed spatial representation of vendors-Sector 1

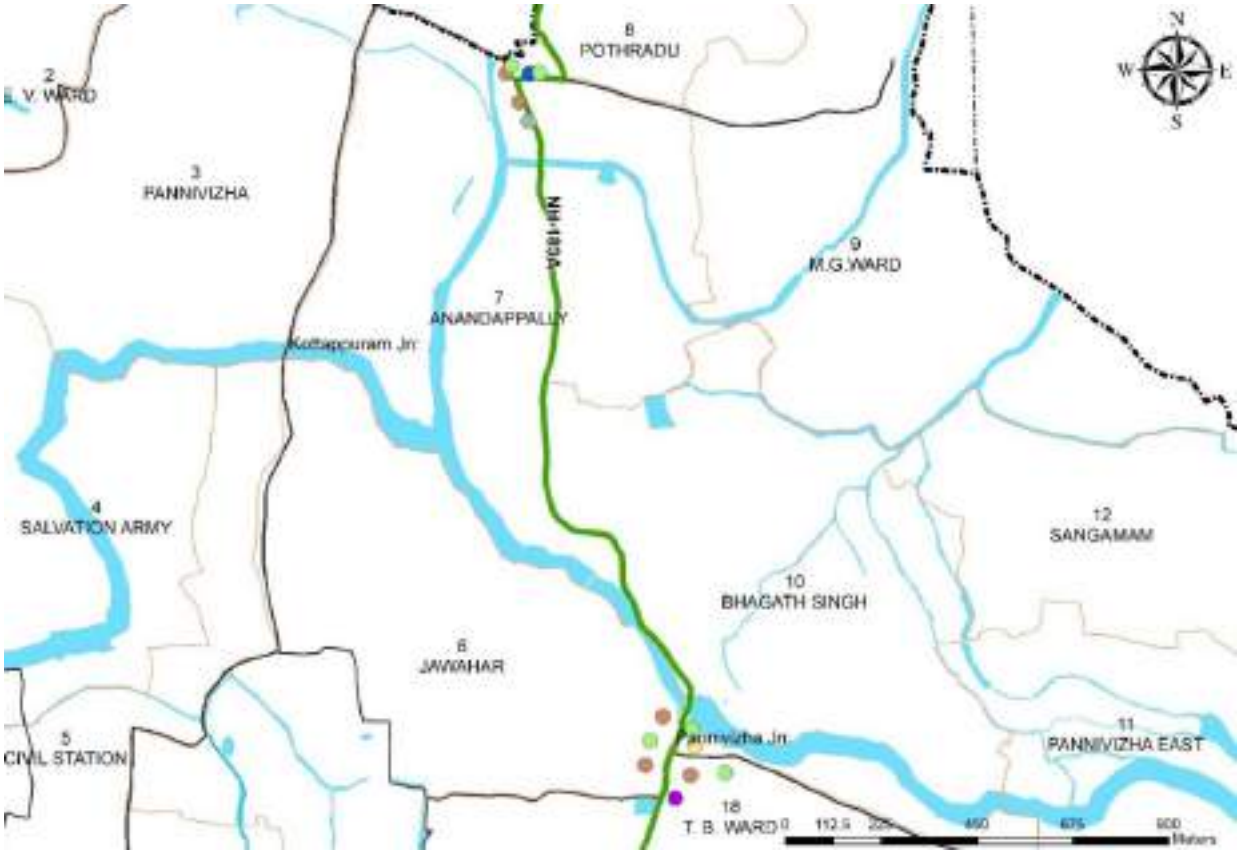


Figure 7.9 Detailed spatial representation of vendors-Sector 2

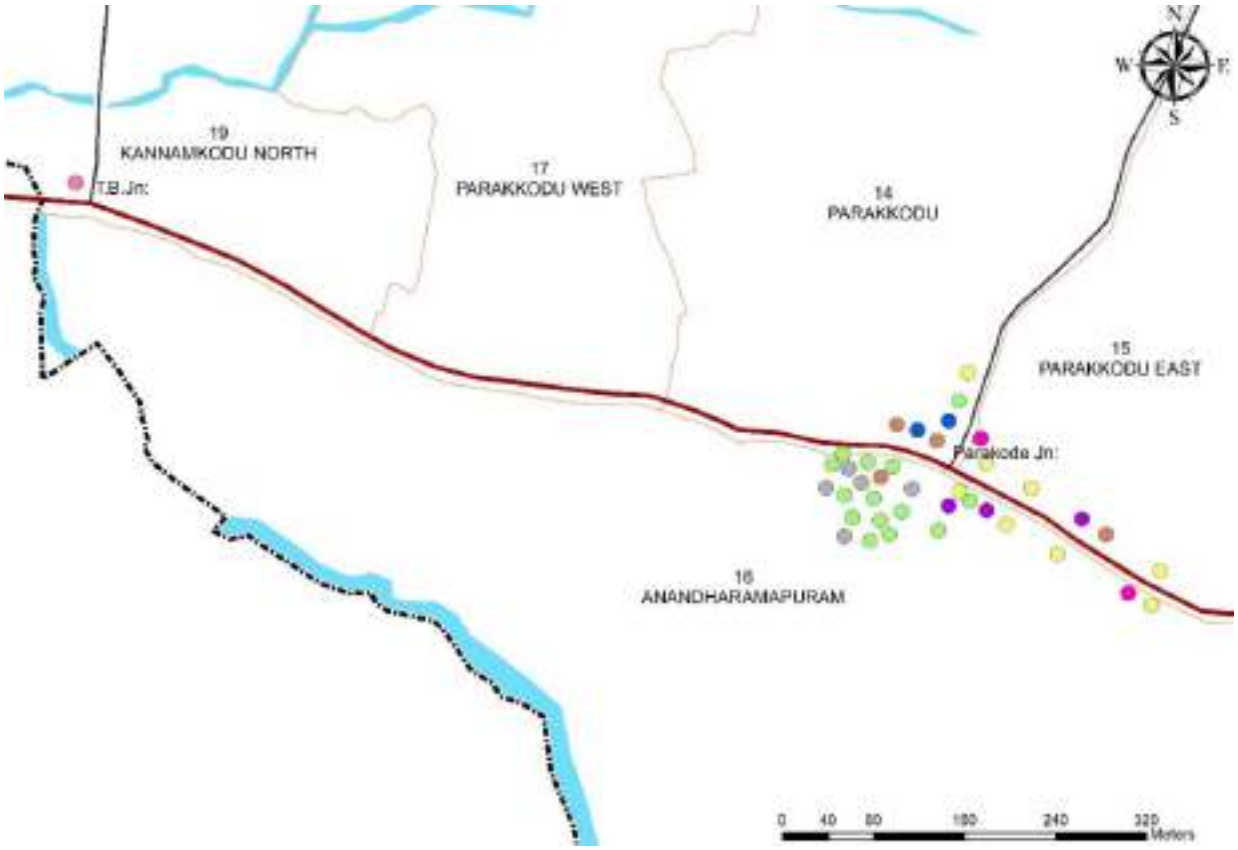


Figure 7.10 Detailed spatial representation of vendors-Sector 3

7.5 Wholesale, Retail Trade, Markets

Details of commercial establishments, busines establishments, hotels and restaurants of the town is shown in Table 7.1

Table 7.1 Commercial establishments of the town

Wholesale & Retail		Business establishment		Restaurants and Hotels		Others	
No.of shops	No.of employees	No.of units	No.of employees	No.of units	No.of employees	No.of units	No.of employees
842	2164	73	206	120	580	18	7

Source: Commercial survey 2019

The Anantharamapuram located in the Parakode area and Sree Moolam Markets in Adoor, are among the oldest and most prominent marketplaces of Central Travancore. Established during the Travancore kingdom period, including the economic reforms under Maharaja Sree Moolam Thirunal, these markets grew into major trading hubs where agricultural produce, spices, cattle, fish, and other goods were exchanged, attracting traders from nearby regions. Historical records note Anantharamapuram Market as the second largest in Travancore, highlighting its economic

significance. Both markets provided structured platforms for farmers and small traders, marking a shift from scattered trading practices to organized commerce. Over time, they became vital centers of daily trade, sustaining local livelihoods and shaping Adoor's growth as a key commercial hub, leaving a lasting impact on the town's economic and social development (Sri. G.Kuttan Pillai Parakode Puranam).

At present, the Parakode Anantharamapuram and Sree Moolam Markets continue to function as key commercial hubs in Adoor, primarily catering to the daily needs of the local population with stalls selling vegetables, fruits, fish, meat, and other household essentials. While modern retail formats, supermarkets, and shopping complexes have taken over a portion of the town's commercial activity, reducing the traditional dominance of these markets, they still retain cultural and economic significance. Both markets serve as vital links between rural producers and urban consumers, preserving the traditional marketplace culture and continuing to play an important role in Adoor's local commerce.

In addition to markets, there are shopping complexes in various part of the town. Textiles, electronics goods, stationary, building materials, super markets etc. are functioning in these shopping complexes. Details of major shopping complexes of the town are shown in Table 7.2.

Table 7.2 Major shopping complexes of the town

Sl.No	Name	Ownership of the building	Built up Area (in sq:m)	Goods sold
1	Punthalath Shopping Complex	Private	5000	All Kinds
2	Saroda complex	Private	3000	Textiles, Electicals others
3	KRM Tower	Private	4000	Textiles, Crokery others
4	Mariam Plaza	Private	2500	Bekery, Restaurant
5	Yamuna Complex	Private	4000	Textile, Hotel etc.,
6	Adoor Tower	Private	2000	Various Items
7	Municipal Shopping Complex	Municipality	800	Vegetable, Stationery, Consumable goods
8	Sreemoolam Complex	Minicipality	700	Vegitable, Stationery, Consumable goods
9	Revenue Tower shopping	Kerala State Housing Board	2000	Stationery and other consumable goods

Source: Commercial survey 2019

Three markets are functioning at Adoor - Parakode Anantharamapuram market, Sree moolam Market and Adoor Central market. The Parakode market functions on two days in a week namely

Monday and Thursday. It is a collection centre for agriculture products of Adoor taluk and surrounding area. A number of related godowns, shopping complexes are there in and around Parakode market. Vegetables, provisions, hill products, cattle, cattle feeds, fish are the major commodities transacted at Parakode market. The vegetables and provisions are brought from the states of Tamil Nadu, Karnataka and Andhra Pradesh. This market also provides facilities for transaction of local products like betel, pepper, ginger and yam. Earlier this market was very famous for cattle trading. But now the trade in this sector is limited to trade of goat only. The commodity from this market is mainly distributed to an area of around 15 km radius, which covers areas in Adoor, Mavelikkara and Kottarakkara taluks. The commodities from the local area is distributed to other districts and part of Tamil Nadu

The Sree Moolam Market is located at the centre of town. It is a small market when compared to Parakode Market and functions on every Wednesday and Saturday. The total extent of this market is 0.25 hectare and the trading is done in adjacent roads also. It is mainly a local market for domestic goods. A Municipal Shopping Complex and an open yard are available there for trading. Sree moolam market is located in the CBD of the town. It is a local market for transaction of vegetables and vegetables are brought from the neighboring states of Tamil Nadu and Karnataka. People from an area of 10Km radius around the market are utilizing this market. The scale of transaction of commodities in this market is low when compared with Parakode market.

In Adoor Central market, mainly meat and fish are traded. The Adoor Central Market is located along Pathanamthitta road and the extent of this market is only 5 cents. It is mainly a fish market. It is comparatively new market opened in the year 2000. The required basic infrastructural facilities are not available in this market. The details of commodity movement through the Parakode Market, Sree moolam Market and Adoor Central Market is shown in Tables 7.3.

Table 7.3 Commodity transaction through markets

Name of Market	Location	Area of the Market place (Hect)	Area of influence (Km. Radius)	Periodicities of transaction	Commodities transacted	Places from where commodities are brought to the Market	Places to which goods are sent	Annual income from the Market for the LSGD
Parakode Anantharamapuram Market	Parakode	3.785	8	Two days in a week	Vegitable, fish, meet and spices	Tamilnadu and Local area	Kochi and local Places	329413

Sree moolam Market	Adoor	0.25	5	Two days in a week	Fish, meat and vegitables	Tamilnadu and Local area	Local area	40000
Adoor Central market	Thatta road Central Adoor	0.2	4	Daily	Fish, meat	Tamilnadu and Local area	Local area	35000

Source: Commercial survey 2019

Parakode Anantharamapuram Market is the major market of the town in terms of both number of commodities and the amount of transaction. It provides market for agriculture products from Adoor town and adjacent area. A detail of commodity transaction through Parakode Market is shown in Annexure.7.2. Details of annual income for the Municipality from the markets are shown in Table 7.4.

Table 7.4 Annual income for the Municipality from markets

2014-15	2015-16	2016-17	2017-18	2018-19
44,05,723	43,62,191	45,26,000	47,47,054	52,18,667

Source: Commercial survey 2019

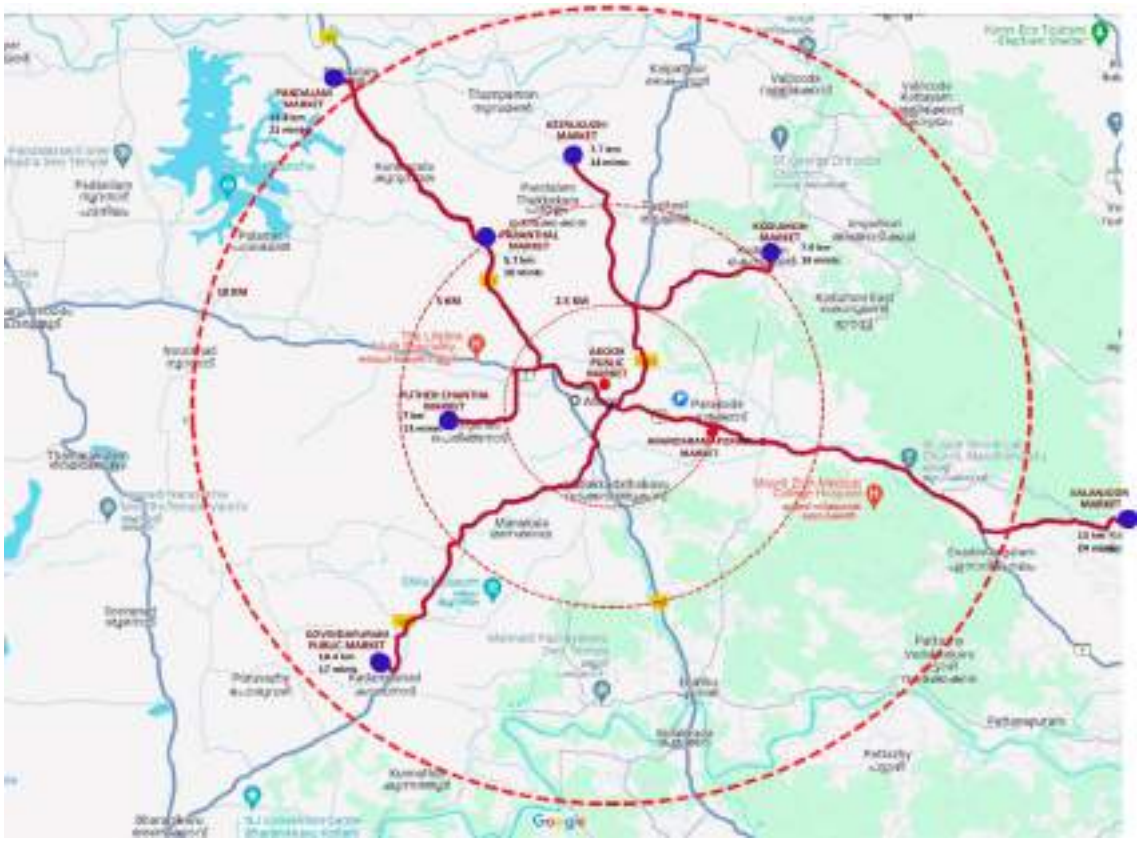


Figure 7.11 Location of Major Markets in Adoor

Markets in Adoor especially Parakode Parakode Anantharamapuram market act as a regional market for the local markets in the surrounding Grama panchayats like Kodumon market,Keerukuzhy market, Pandalam market, Puthenchantha market, Kadambanada market. The large chain of local markets with Parakode market as its centre have more development potentials. The nework of local markets are shown in Figure 7.11.

7.6 Financial institutions

Details of different category of financial institutions functioning in Adoor Municipal area is shown in Table 7.5. 6 branches of various category banks are functioning in the town. Sufficient number of branches are available for the need of the people. The list of banks functioning in the town is given in Annexure.7.3.

Table 7.5 Financial Institutions functioning in Adoor Municipal area

Nationalized Bank	Scheduled Banks	Co-Operative Institutions	Private Financial Institutions	Other Govt Financial Institutions
13	4	10	31	3

7.7 Effect of hazard risk in this sector

Urban flooding due to the improper drainage system in the town affects the commercial establishments in Town centre. Ensuring proper flow of storm water during heavy rains through planned drainage system can resolve above issue.

7.8 Problems and potentials

Many parts of the Parakode Anantharamapuram Market have been encroached, with no fencing or protective measures provided, and the market continues to face severe infrastructural deficiencies such as insufficient stalls or platforms, poor approach roads, lack of drainage and sanitation facilities, and inadequate parking space. Similarly, the Sree Moolam Market and Adoor Central Market also lack basic amenities like platforms, shelters, toilets, drainage, and organized parking areas. The absence of a designated slaughterhouse has further led to unauthorized slaughtering in some parts of the town. These issues highlight the urgent need for renewal and the construction of a modern, well-planned market complex with adequate infrastructure to meet current and future requirements.

7.9 Inference

Parakode Anantharamapuram market was established in 18 th century and Adoor was developed as a market centre. Among the three markets functioning in the town, the Parakode market is the biggest market in terms of Commodity transaction. Central Toll area is the first order node and Parakode, Private Bus stand and KSRTC Bus Stand are second order nodes as per the existing

Hierarchy of commercial nodes. Trade and Commerce can be treated as the major economic base of the town. Parakode market provides opportunity for trading the agriculture products from Adoor and its influence area. Activity of informal sector in small scale is there in the town. Sufficient number of banks is functioning in Adoor town.



CHAPTER 8
TOURISM

8.1 Introduction

Adoor plays a significant and strategic role in the tourist network of Pathanamthitta district due to its cultural, religious and logistical importance. Adoor act as a gateway to the district for travellers from southern parts of Kerala. It acts as a transit town for both domestic and international tourists especially during Sabarimala pilgrimage season. Adoor offers accommodation, eateries and transport facilities that support onward travel to heart of District tourism circuit. Parthasarathy temple attracts pilgrims and cultural tourists. Adoor Gajamela a major elephant festival adds to the cultural tourism appeal.

8.2 Present Scenario

8.2.1 Existing Tourist Circuits

At present tourism sector is not playing a substantial role in the economy of Adoor. Being located in the mid-land region of the state, there are no beaches or backwaters in the town. Major rivers or water bodies are also not present within the town limit.

Adoor is well connected with tourist centres in the neighboring areas. It can be developed as a tourist transit point considering its location in between the network of tourist centres and Pilgrim Centres. Adoor is the transit point of Sabarimala pilgrims from southern part of Kerala and Tamil Nadu. The potential of pilgrim tourism can be exploited and a pilgrim amenity centre can be started at Adoor. Another potential of the town is its locational advantage in the state. Adoor is located in the mid-way between Thiruvananthapuram and Kochi and also between Kayamkulam and Punalur. A number of tourist destinations- Thenmala, Punalur, Gavi, Mannadi, Kollam, Kumarakom, Alappuzha etc., are located in adjacent districts.

8.2.1.1 Gavi

Gavi (132 Km from Adoor) is mainly known for its wildlife. Endangered species including the Nilgiri Tahr and Lion-tailed macaque are often sighted at the outskirts of Gavi. Kerala's very own treasure elephants can be sighted abundantly (Figure 8.1).



Figure 8.1 Gavi

8.2.1.2 Alappuzha



Figure 8.2 Alappuzha

Alappuzha (70Km from Adoor), often referred to as Alleppey, is a picturesque city in the state of Kerala, known for its intricate network of canals, backwaters, beaches, and lagoons. Often dubbed the 'Venice of the East,' Alappuzha is a popular tourist destination, especially famed for its houseboat cruises that offer an immersive experience of Kerala's enchanting backwaters. This coastal city provides a perfect blend of natural beauty, cultural heritage, and serene water-based activities (Figure 8.2).

8.2.1.3 Kumarakom



Figure 8.3 Kumarakom

Kumarakom (75Km from Adoor) is home to a wide variety of flora and fauna. Kumarakom Bird Sanctuary is a noted bird sanctuary where many species of migratory birds visit. The Vembanad Lake, the largest backwater in Kerala, is habitat for many marine and freshwater fish species and it teems with *Karimeen* Poovalan chemeen. The bird sanctuary extends over 14 acres, and came into existence following preservation efforts from the government. It is a major tourist attraction (Figure 8.3).

8.2.1.4 Thenmala



Figure 8.4 Thenmala

Thenmala (Rose Mala) (Figure 8.4 & 8.5), located in the Kollam district of Kerala, is India's first planned eco-tourism destination and a popular spot for nature lovers and adventure seekers. Nestled in the foothills of the Western Ghats, Thenmala offers a unique blend of ecological conservation and tourism, with attractions spread across Culture, Adventure, and Leisure zones. Visitors can enjoy activities such as mountain biking, river crossing, boating in the Shendurney reservoir, and trekking through forest

trails. The site also features a musical dancing fountain, butterfly safari, and an elevated walkway through the forest canopy, providing an immersive experience in the natural landscape. Its proximity to the Shendurney Wildlife Sanctuary adds to the ecological richness of the area, making Thenmala a model for sustainable tourism in India.



Figure 8.5 Rose Mala Kollam

8.2.1.5 Punalur Suspension Bridge



Figure 8.6 Punalur bridge

Punalur Suspension Bridge, locally known as Punalur Thookkupalam, is a historic and picturesque tourist spot located in the Kollam district of Kerala. Built in 1877 by British engineer Albert Henry, it is considered one of the oldest suspension bridges in South India. Spanning the Kallada River, the bridge was originally constructed to prevent wild animals from entering the town while supporting trade and transport during the Travancore era. Made of wood, iron, and stone, it showcases a rare blend of colonial engineering and local craftsmanship. Now restored and open only to pedestrians, the bridge offers scenic views of the river and a gentle swaying experience, especially enchanting during the evening when it is beautifully lit. Surrounded by seating areas and walkways, it has become a peaceful heritage attraction for both locals and tourists. (Figure 8.6).

8.2.2 Number of Tourists

Tourist statistics in the districts of Kerala is shown in Table 8.1. Pathanamthitta ranks 14th among the districts in Kerala in both domestic and foreign tourist arrivals. South Kerala tourism contributes 46.16% of the Kerala tourism sector while Pathanamthitta contributes only 0.18% which is comparatively very low comparing to Thiruvananthapuram, Alappuzha and Kollam. The general trend of tourist arrival has reduced in 2018 due to the Mega flood in Kerala. Even though the share of Pathanamthitta in Kerala Tourism is very less, the number of tourists are increasing year by year. Eventhough there are a large number of tourist destinations in Pathanamthitta district, most of them remain unexplored. The number of domestic tourists arrived Pathanamthitta in 2018 is only 1.2% of

the domestic tourists arrived in Kerala. And the number of foreign tourists arrived Pathanamthitta in 2018 is only 0.18 % of the foreign tourists arrived in Kerala.

Table 8.1 Tourist statistics

Domestic			Foreign			Total		
RANK	Districts	No. of Tourist	RANK	Districts	No. of Tourist	RANK	Districts	No. of Tourist
1	ERNAKULAM	2384552	1	ERNAKULAM	347987	1	ERNAKULAM	2732539
2	TRIVANDRAM	2018136	2	TRIVANDRAM	249731	2	TRIVANDRAM	2267867
3	THRISSUR	1866712	3	ALAPPUZHA	67935	3	THRISSUR	1874966
4	IDUKKI	856295	4	IDUKKI	31987	4	IDUKKI	888282
5	KOZHIKODE	779395	5	KOTTAYAM	26668	5	KOZHIKODE	791535
6	WAYANAD	643722	6	MALAPPURAM	13506	6	WAYANAD	652124
7	KANNUR	571986	7	KOZHIKODE	12140	7	KANNUR	576548
8	MALAPPURAM	415409	8	WAYANAD	8402	8	ALAPPUZHA	429268
9	KOTTAYAM	387847	9	THRISSUR	8243	9	MALAPPURAM	428915
10	PALAKKAD	382007	10	KOLLAM	6416	10	KOTTAYAM	414515
11	ALAPPUZHA	361333	11	KANNUR	3562	11	PALAKKAD	383471
12	KOLLAM	300144	12	KASARAGOD	2633	12	KOLLAM	306559
13	KASARAGOD	207334	13	PALAKKAD	1464	13	KASARAGOD	209967
14	PATHANAMTHITTA	143978	14	PATHANAMTHITTA	1445	14	PATHANAMTHITTA	145423
	Total Arrival	11318850		Total 2018	782118		Total 2018	12100968

8.3 Places of Tourism Potential within town

8.3.1 Parakode Anandaramapuram Market

The Parakode Anantharamapuram market played a pivotal role in the early development of Adoor by transforming it into a major commercial and trading hub of Central Travancore. Established during the Travancore kingdom period, the market attracted traders and farmers from surrounding regions and contributed significantly to the growth of settlements, road networks, and supporting commercial activities around the town. At the time of its inauguration, the first sale was marked by the symbolic sale of an elephant, highlighting the scale and prominence of trading activities. Among the wide variety of goods, the market became especially renowned for the trade of agricultural produce such as paddy, tapioca, banana, and coconut, along with spices like pepper and ginger, while also being widely known for cattle and livestock exchange. Forest produce including arecanut, cashew, and timber further added to its importance. Recognized as the second-largest market in Central Travancore, the Parakode Anantharamapuram market served not only Adoor but also neighboring regions of present-day Pathanamthitta, Kollam, and Alappuzha districts, giving it

strong regional significance and making it a key catalyst in the urban and economic growth of Adoor (Figure 8.7).



Figure 8.7 Parakode Anantharamapuram Market

8.3.2 T.B. hill

The buildings situated at T.B.Hill (2.3 Km from Adoor), popularly known as 'Mushahari Bungalow' (Figure 8.8) was constructed during the British period. In addition to the Bunglaow building, stables, kitchen block etc constructed during that period are also there in the compound. Mahatma Gandhi stayed at the bungalow during his visit to Adoor in 1938, making it a place of important historical value.



Figure 8.8 Mushahari Bungalow

The T.B. hill area, one of the elevated places of the town provide scope for developing tourism related activities (Figure 8.9).About 7.00 Acres of land is available in this area with the Public Works Department.



Figure 8.9 TB Hill view Point

8.3.3 Temples

Ancient temples in and around the town, known for their vibrant festivals, offer valuable opportunities for tourism development in the town. Parthasarathi temple Adoor, Pannivizha temple, Ezhamkulam temple (close to the Municipal boundary), Mannady temple (located in adjacent Kadampanad Grama Panchayat) are the major temples coming under this category. (Figure 8.10). Pannivizha Devi Temple (1.7 Km from Adoor) which was constructed in the earlier period has heritage value. The Pannivizha Pongala is a significant festival celebrated at the Peedikayil Devi Temple.(Figure 8.11).



Figure 8.10 Pannivizha Devi Temple



Figure 8.11 Sree Parthasarathy Temple

The Adoor Gajamela is a grand festival that serves as the highlight of the ten-day annual celebration at the Sree Parthasarathy Temple in Adoor. The Adoor Gajamela is more than just an event; it's a spectacle that attracts thousands of devotees and tourists from all over the world. The festival's highlight is the magnificent elephant pageantry, where nine splendidly adorned tuskers parade through the temple grounds. These elephants, dressed in glittering ornaments, march in unison to the rhythmic beats of traditional drums and the melodic tunes of temple instruments. The sight is nothing short of awe-inspiring, creating an atmosphere of both reverence and festivity.

The Sree Parthasarathy Temple, dedicated to Lord Krishna in his incarnation as Parthasarathy, serves as the perfect backdrop for this grand event. As one of the oldest Krishna temples in Kerala, it holds significant historical and spiritual importance. During the festival, the temple grounds are alive

with various cultural programs that reflect the rich heritage of Kerala. Traditional music and dance performances, including the classical forms of Kathakali and Mohiniyattam, add to the festive spirit, offering visitors a deep dive into the region's artistic traditions. The Kumbha Bharani is the annual festival at the Ezhamkulam Devi Temple (5Km from Adoor). The festival is famous for Garudan Thookkam and Kettukazhcha that take place as part of the festival. (Figure 8.12).

8.3.4 T.K.Madhavan Soudham

The T.K. Madhavan Soudham, located near the Municipal Bus Stand, holds historical significance as its foundation stone was laid by Mahatma Gandhi. (Figure 8.13).



Figure 8.12 Garudan Thookkam



Figure 8.13T K Madavan Soudham

8.3.5 Central toll

The Central toll – the meeting point of M.C Road, Parakode road and Pathanamthitta road is the nerve centre of the town. Earlier this place was a collection point of taxes. This place has witnessed many historical events and visited by Mahatma Gandhi in 1938. A Smruthi Mandapam in this regard is constructed there. (Figure 8.14).



Figure 8.14 Central Toll

8.3.6 Anandapally Maramadi Uthsav



Figure 8.15 Anandapally Maramadi Uthsave

The famous "Anandapally Maramadi Uthsav" related with rich agriculture tradition of the area was conducted in Palissery paddy fields at Anandapally within the town limit. But this festival has not been conducted for the last few years (Figure 8.15). Started in the 1950s in Adoor Puthuveettil Padi Ela, Anandapally Maramadi was held annually after paddy harvest until 2008, following a Supreme Court directive that banned events involving the use of animals. Beyond entertainment, Maramadi carried cultural and agricultural significance, serving as a platform to showcase indigenous farming practices and tools, encouraging youth participation in agriculture and promoting rural tourism.

8.4 Tourism Infrastructure



Figure 8.16 Hotel Aaramam near puthiyakavinchira

Regarding tourism infrastructure, the motel at Puthiyakavinchira, maintained by DTPC is the major facility (Figure 8.16). There are no major star hotels within the town but there are 12 economy hotels (Table 8.2).

Table 8.2 Hotels in Town

Sl. No.	Name	Govt./ Private/ Local body	No. of rooms	No. of persons for whom accommodations available
1	Atlas Residency	Pvt	32	8
2	Dickson Tourist Home	Pvt	16	4
3	Paruvakkal Tourist Home	Pvt	23	7
4	White Portico	Pvt	20	9
5	Marium Plazza	Pvt	7	2
6	Adoor Tourist Home	Pvt	22	6
7	Park Residency	Pvt	20	38
8	Hotel Yamuna	Pvt	17	34

9	Fathima Tourist Home	Pvt	10	20
10	Govt. Rest House, Adoor	Govt	4	8
11	Indraprasta	Pvt	10	20

8.5 Effect of Hazard risk in this sector

The tourism potential areas are located outside of the flood and lightning risk areas. Also, Adoor, with its resilient road network, can efficiently serve as a hub in the regional tourism network.

8.6 Problems and Potentials

Adoor, despite its rich cultural and historical significance, faces several challenges in emerging as a prominent tourism destination. The region suffers from inadequate tourism infrastructure, with only a limited number of quality accommodation facilities. Many heritage structures, including old temples and colonial-era buildings, remain poorly conserved and neglected. Additionally, Adoor lacks visibility in Kerala's mainstream tourism network and has minimal integration with major pilgrimage circuits like Sabarimala and Aranmula. Encroachment and deterioration of wetlands and lack of trained man power are issues faced in the sector. Cultural and pilgrimage tourism can be enhanced by preserving and showcasing its temples, festivals, and traditional practices. The natural landscape is suitable for eco and agri-tourism initiatives, while the peaceful environment supports wellness tourism. Film and art tourism with museum, festivals, film trails etc. and promoting experience based tourism can make Adoor ideal for weekend tourism. With strategic planning and experience-based tourism promotion, Adoor can evolve into an attractive weekend getaway for domestic tourists.

8.7 Inference

Though Adoor town itself has limited intrinsic tourism potential, its strategic location makes it ideal for development as a tourist transit center. Situated along major routes connecting the southern parts of Kerala and Tamil Nadu to Sabarimala, Adoor regularly witnesses large volumes of pilgrim traffic. This flow offers a significant opportunity to tap into pilgrim tourism by creating facilities and services catering to the needs of visitors passing through the town.To leverage this advantage, steps can be taken to enhance the town’s aesthetic appeal through better streetscaping, signage, and preservation of heritage sites. A tourism circuit linking Adoor with nearby attractions such as temples, heritage structures, eco-tourism sites, and cultural destinations can be developed to encourage short visits and overnight stays. Establishing a pilgrim amenity center at Adoor would not only serve Sabarimala pilgrims but also support the town’s growth as a hub for weekend and experience-based tourism.



CHAPTER 9
AGRICULTURE

9.1 Introduction

Agriculture plays a vital role in shaping the socio-economic fabric and land use character of Adoor town. A significant portion of the town's area is still under agricultural use, and the functional profile of Adoor reveals that many of its wards retain a rural or semi-rural character. Agriculture and allied activities not only provide livelihood opportunities for a substantial section of the population but also contribute meaningfully to the local economy. Incorporating the agricultural sector into the Master Plan is essential to ensure the protection, conservation, and sustainable use of farmlands. Planning for agriculture helps safeguard these productive lands from unregulated urban expansion and supports the continuity of agricultural practices for future generations. It also enables the promotion of agriculture-based economic development, such as organic farming, agri-tourism, and value-added processing

9.2 Area under Agriculture

In Adoor town, agriculture plays a pivotal role in land use and the local economy, encompassing approximately 1018.63 hectares, which accounts for 49.15% of the total municipal area. Spatial patterns observed in the land use map reveal that rubber cultivation dominates the agricultural landscape, particularly in the northern and eastern parts of the Town, covering around 734.7 hectares (35.4% of the total land area). This concentration underscores the region's reliance on plantation-based agriculture. Paddy fields, once a hallmark of Adoor's agrarian identity, are primarily located in low-lying areas near streams and canal networks as shown in the map. However, active paddy cultivation has drastically reduced, with only 0.12 hectares remaining under active use out of the 188 hectares (9.0 %) designated for paddy, signaling a clear decline in traditional wetland farming. Other major crops mapped in the area include tapioca, coconut, jackfruit, mango, pepper, sugarcane, and various tuber crops, mostly found in the peripheral and semi-rural wards.

9.3 Major Crops and Production

Agriculture area under different crops and perennial crops are shown in Table 9.1 and 9.2. Major crops, their area of cultivation and productivity of Adoor town is shown in Table 9.3. Rubber is the major crop of the town as far as the area of cultivation concerned, followed by tapioca and banana. Most of the elevated agriculture land is under rubber cultivation. Vegetables, pepper, arecanut, pulses, fruits and fodder are the other crops.

Table 9.1 Agricultural Area under different crops

Crop	Coconut	Arecanut	Pepper	Nutmeg	Cloves	Jack fruit	Mango	Cashew	Tamarind	Other Perennial Crops
Area in Ha	85.89	12.65	31.62	1.06	0.06	66.53	49.74	12.03	4.47	1054.74

Source: EARAS 2015-16

Table 9.2 Area under Perennial Crops (except plantations)

Crop	Paddy			Tapioca	Ginger	Turmeric	Other Tuber Crops	Pulses	Sugar Cane	Betel Leaves	Vegetables	Banana
	Autumn	Winter	Summer									
Area in Ha	0.12	0	0	92.46	4.38	0.73	40.4	18.05	38.1	0.62	13	18.17

Source: EARAS 2015-16

Table 9.3 Area under different crops and its productivity

Crops	Area of cultivation (in Ha)	Productivity
Coconut	100	25 Nuts/1 palm
Tapioca	250	30 Ton/1 Ha
Vegetables	15	12 MT/ 1 Ha
Banana	200	17 MT/ 1 Ha
Rubber	1436	90 MT/ 1 Ha
Pepper	20	250 MT/ 1 Ha
Arecanut	10	6 MT/ 1 Ha
Pulses	3	2.5 MT/ 1 Ha
Fruits	50	3 MT/ 1 Ha
Fodder	1	50 T/ 1 Ha
Paddy	15	3T / 1 Ha

Source: Krishi Bhavan Adoor,2010

9.4 Spatial Distribution

The land use survey was conducted grouping the agriculture land uses into four categories - rubber, paddy, mixed crops and coconut. The total extent of land under agriculture use is 1014.63 hectares and it constitutes 48.95% of the town area. The agriculture land is distributed in all part of the town and not concentrated in a particular area. The split up of agriculture land use is shown in Table 9.4. The spatial distribution of agriculture land use of Adoor Town is shown in Figure 9.1.

Table 9.4 Split up of land under different crops.

Sl.No.	Crops	Area (in Ha)	% of town area	% of Agriculture land
1	Paddy	184	8.8	18
2	Coconut	10.05	0.48	1
3	Mixed crops	85.89	4.1	9
4	Rubber	734.69	35.4	72
TOTAL		**1014.63**	**48.78**	**100.00**

Source: Land use survey 2023.

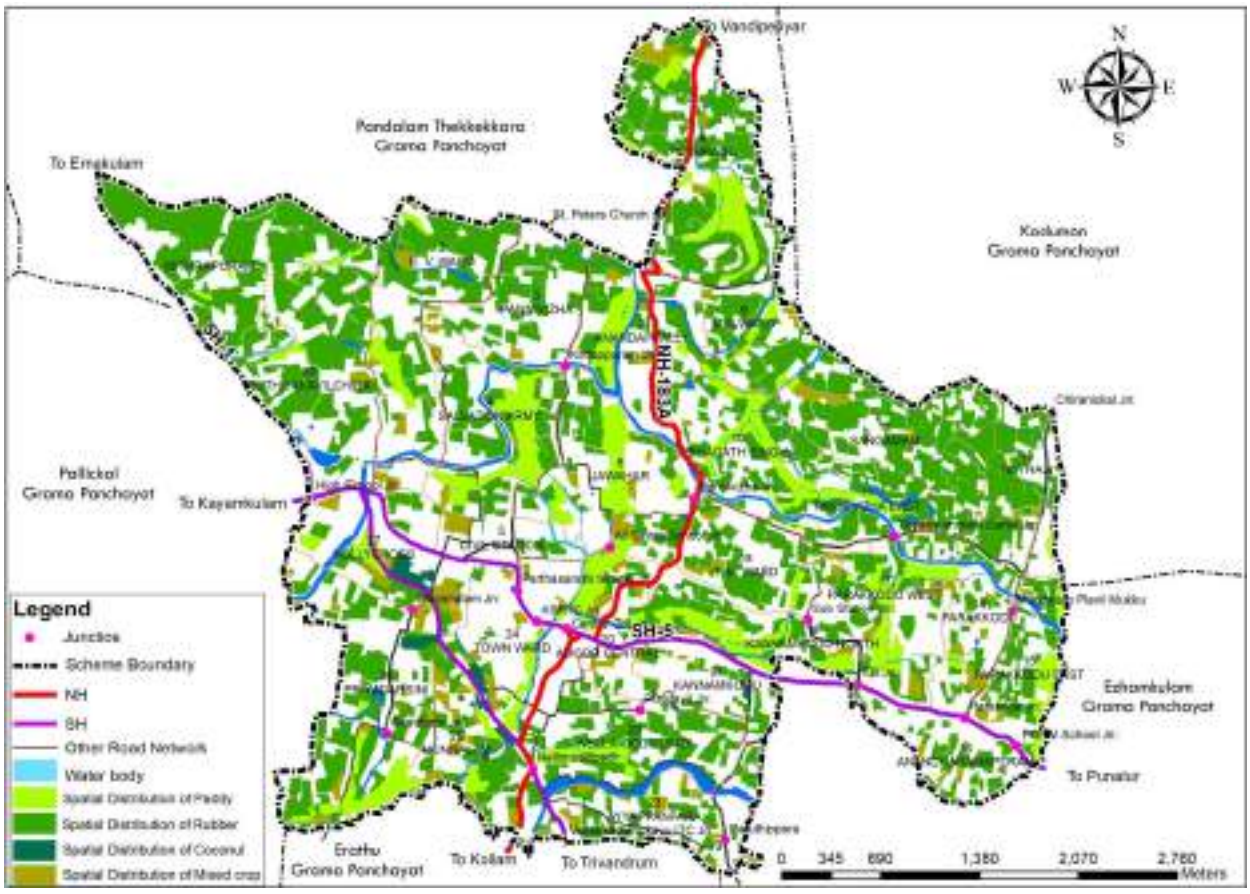


Figure 9.1 Agriculture area of the town

Source: Land use Survey 2023

As per land use survey 2023, Rubber is the major crop of the town and 734.69 hectares of land which is 72 % of agriculture land (35.4 % of the town area). Paddy is coming in second position and 184 hectares of land which is 8.8% of agriculture land and 18% of total town area is coming under this category. Area under mixed crops and coconut are 85.89 hectares (9% of total agriculture land and 4.1% of total town area) and 10.05 hectares (1% of agriculture land and 0.48% of the total town area) respectively. The breakup of Agriculture Land use is shown in Figure 9.2. 82% of agriculture land is dry agriculture land and 18% of the land is wet land.

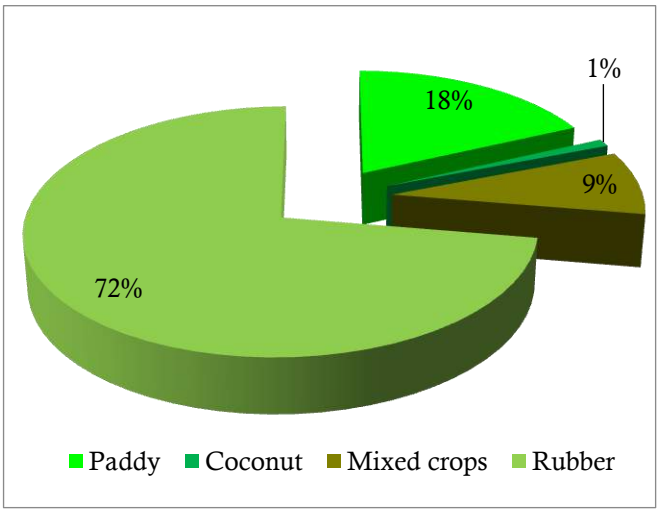


Figure 9.2 Breakup of Agriculture land use

Source: Land use Survey 2023

9.4.1 Concentration of Agriculture Land Use

As mentioned in above, the agriculture area is distributed in all parts of the town. In fact it is mixed with other urban land uses especially the residential area. The higher concentration pattern of Agriculture land use has seen in Mithrapuram (Ward 1) and and Sangamam (Ward 12) Wards and other more details has been discussed in detail in Chapter 4. More concentration of Agriculture land is along the periphery of the town. The concentration pattern of dry and wet agriculture land use is shown in Figure 9.4 and Figure 9.5.



Figure 9.3 Wet Agriculture land



Figure 9.4 Dry Agriculture landuse concentration in Adoor

Source: Land use survey 2023

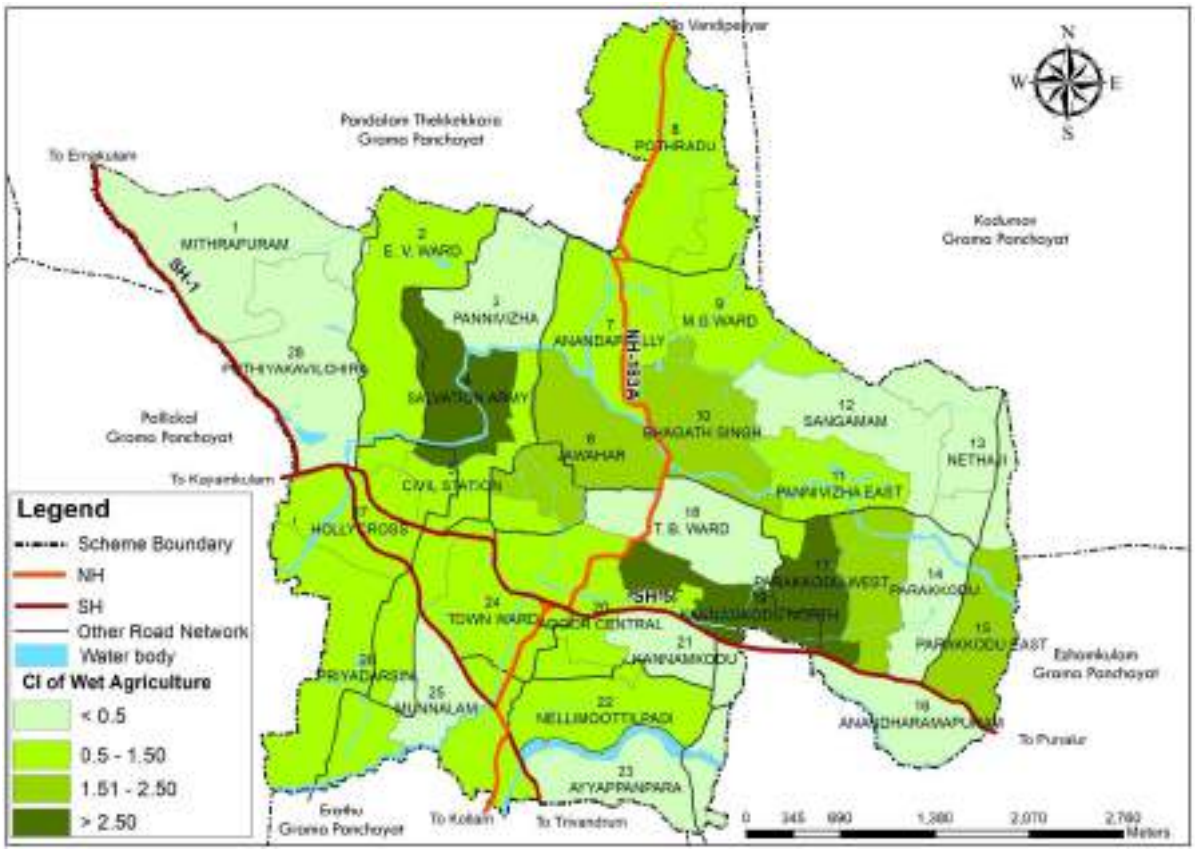


Figure 9.5 Wet Agriculture landuse concentration in Adoor

Source: Land use survey 2023

9.5 Irrigation Facilities

Main canals, branch canals and distributaries of Kallada Irrigation project is passing through Adoor town. Kallada Right Bank Canal from Parakode Mullasserypadi to Malamekkara via-Pannivizha, Karuvatta having a length of 11 kms is passing through the town. Kallada Right Bank sub Canal (Sasthamkotta Branch Canal) (from Kottamugal to Nellimoottilpadi) and Pandalam sub canal (From Pannivizha to anandapally) are the sub canals of the projects passing through the town.



Figure 9.6 Kallada Irrigation Canal



Figure 9.7 Pond

Vallikkode distributary, Ikkad distributary and Peringanad distributary are the distributaries passing through the town. In addition to that there are minor distributaries are there in the town.

Despite this extensive infrastructure, the utilization of irrigation potential remains suboptimal. A significant portion of agricultural lands that were once supported by canal irrigation have been converted to rubber plantations, which require minimal irrigation input.



Figure 9.8 Pallickal river

Furthermore, the lack of a structured cropping calendar, coupled with unpredictable water demand patterns, hampers the efficient management and scheduling of water supply. Encroachments along canal banks and illegal waste disposal into the canals have led to siltation and pollution, further reducing the carrying capacity and health of the canal system. Addressing these issues through land use regulation, awareness-building, and irrigation management reforms is crucial to revitalize traditional agriculture and ensure sustainable water use in Adoor. Arattukulam, Kaithavelilkulam, Valiyakulam, Kallupurathukulam, Pothradkulam, ellyappankulam, Pulikkannankulam, Ayappanparakkulam and Puthiyaveettilpadi kulam are the major ponds in the town. These ponds were acting as 'Thalakkulam', ie ponds at the top end of the fields and were major irrigation source at the earlier period. But with the decline in paddy cultivation these ponds are not maintained properly.

9.6 Marketing Facilities

The Parakode Anantharamapuram Market serves as a key agricultural trading hub for Adoor Town and its surrounding rural hinterlands. It plays a vital role in the aggregation and distribution of local produce such as banana, yam, ginger, betel leaves, and other perishable and non-perishable commodities. Farmers from within the Town and nearby panchayats depend on this market for the sale of their agricultural products, making it central to the local agri-based economy.



Figure 9.9Ananatharamapuram market

9.7 Water Shed development programme

Major part of Adoor town falls in Peringanad water shed. Eighteen out of twenty eight wards of the town is coming under this water shed. E.V Ward, Pannivizha, Salvation Army, Civil Station, Jawahar, Samgamam, Nethaji, Parakode, Parakode East, Anantharamapuram, Parakode West, T.B Bhagam, Kannamkode North, Adoor Central, Kannamkode, Nellimoottilpady, Ayappanpara and Moonnalam wards of the town are coming under Peringanad water shed. Remaining portion of the town is coming under Achenkovil water shed. Water shed of Adoor Town is shown in Figure 9.10. Projects for soil Conservation, construction of new wells, renovation of ponds and wells, trenches for collection of rain water etc are carrying out under the water shed development programme. Promotion of cultivation of plantain, paddy and pepper, distribution of calf etc. are the other activities under this programme.

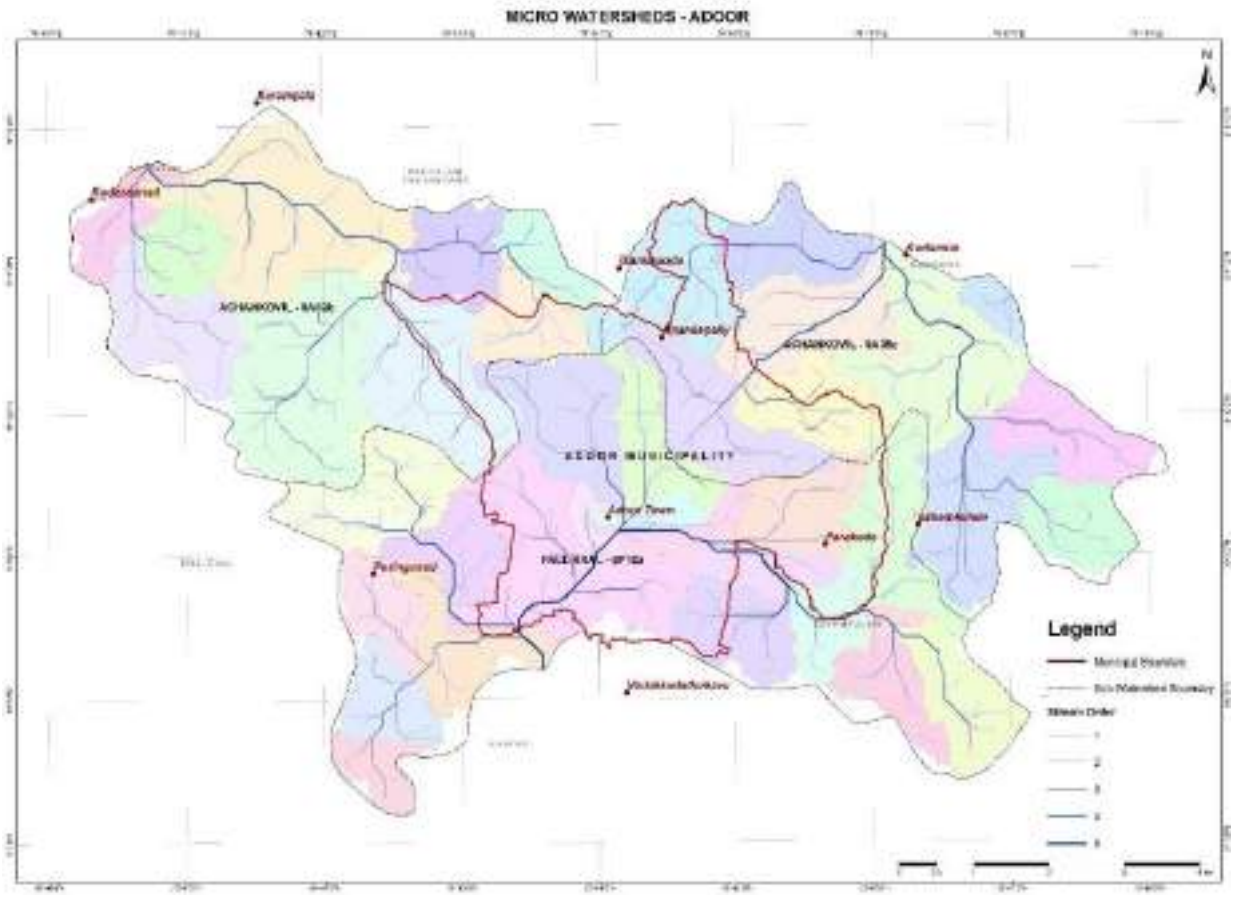


Figure 9.10 Water sheds in Adoor town

9.8 Institutions

A major agricultural institution in Adoor is the State Seed Farm, located in Moonnalam, in the south-western part of the town, away from the urban core. Established in 1960, the farm spans approximately 25 acres and is operated by the Government of Kerala. It plays a key role in the production, storage, and distribution of quality seeds and saplings, supporting crops such as paddy,

banana, vegetables, coconut, and tapioca. The farm contributes significantly to the local agricultural ecosystem by promoting scientific farming practices and seed availability. This office plays a critical role in supporting farmers and agricultural stakeholders in the Municipality. It acts as a hub for implementing government schemes, providing financial and technical assistance, and offering outreach programs.

9.9 Effect of hazard risk in this sector

Loss of agriculture due to floods is not reported as a major issue in the sector. In 2021 Floods 250 numbers of plantain were lost in 1Ha of area affected.

9.10 Problems and potentials

Conventional farming methods are adopted in the area. Labor shortage is the major problem and methods like group farming are not adopted. The mechanization of farming is limited to the usage of tractors and tillers. Many of the landowners are Non Resident Keralities and they are not giving their land for lease for doing agricultural activities by group of farmer's registered in Krishi bhavan. As already mentioned the paddy cultivation is there in very small portion of the existing paddy fields. Major area of paddy fields are remaining vacant marshy area or under cultivation of crops like vegetable, plantain, betel and tapioca. Cultivation of rubber, coconut and arecanut also started in some paddy fields. Conversion of paddy land for constructions and other developments are increasing. During the flood in 2018 all these paddy fields acted as water retention areas thereby protecting town from flooding. Emphasizing the pivotal role played by such fields in mitigating the severity of the flood underscores the necessity to adhere to disaster management standards while converting this land use of the areas. As per the LAPCC reports, unpredictable weather conditions such as heavy rain and drought lead to the destruction of paddy cultivation. The commercial crop rubber is the major cultivation in the dry agriculture area. The rubber cultivation is also declining due to falling rubber prices, rising cost of production and labour shortage.

9.11 Inference

More than half of the town area is under agriculture use. Rubber is the major crop of the town. Nearly three-fourths of the agricultural land in Adoor Town is currently under rubber cultivation, and this trend continues to expand into additional areas, further reducing the extent of traditional food crop cultivation. KIP canals, natural drains and ponds associated with paddy fields are available for irrigation. Major portion of paddy fields are remaining uncultivated or used for cultivation of crops other than paddy. Still, agriculture and allied sector plays major role in the economy of the town and this sector faces significant challenges that need to be addressed to ensure its sustainability and resilience.



CHAPTER 10
ANIMAL HUSBANDRY

10.1 Introduction

Animal Husbandry and Dairy development sector has vital importance in generating additional employment opportunities and supplementing income of families. Mostly peasants and agricultural labourers are engaged in cattle rearing and allied activities. Hence any development in this sector will strengthen the economy of the town. Generally, the Animal Husbandry and Dairy development is a rural oriented activity. In the case of Adoor, 48.38% of total land is coming under Agriculture use. Majority of wards in the Town have rural or semi-rural character. The Socio-Economic survey (2019) reveals that in 27.45% of houses, at least there is one domestic animal (other than dog) and 1.54 % of workers of the town are engaged in live stocks related activities. In this circumstance this sector has importance as far as Adoor town is concerned.

10.2 Number of domestic animals

The main species of livestocks found in Adoor town are Bovines (Cattle and Buffaloes) and Goats . The Figure 10.1 shows the livestock pattern of Adoor town (2019). The cattle constitute 51% of total live stocks population of 2046. The percentage of goats and buffaloes are 47 and 2 percentage respectively. The livestock population is distributed in all wards of the town. The details of livestock population of the town are shown in Table 10.1

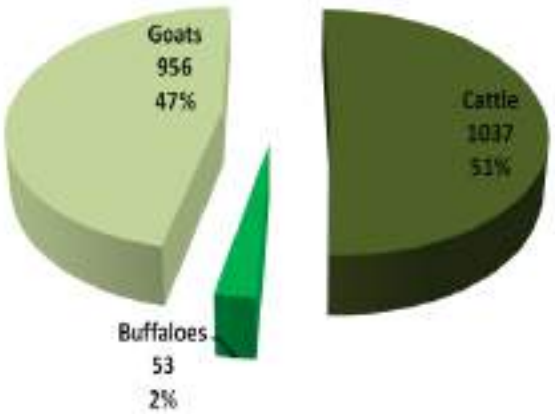


Figure 10.1 Livestock pattern of Adoor Town

Table 10.1 Details of livestock population.

Cattle (Nos.)					Buffaloes (Nos.)			Goats (No.)	Total Live Stock (No.)
Non-Descript		Cross breed		Total					
Male	Female	Male	Female		Male	Female	Total		
0	1	106	930	1037	37	16	53	956	2046

Source: Town Directory 2019

Table 10.2 Temporal variation in number of live stock

Year	Bovines(Cattles and Buffaloes)	Goats
1995	3104	1402
2010	1137	1301
2019	1993	956

Source: Vikasanarekha and Veterinary Policlinic and Town Directory 2019.

The temporal variation (1995 to 2019) of the livestock of Adoor Town is shown in Table 10.2. Even though there is an increase in the number of bovines in 2019, when compared with 2010, there is large scale reduction in number of goats. Adoor Ksheera Vyavasaya Sahakarana Sangham, collect and market milk from Adoor town and surrounding area.

10.3 Institutions

One Veterinary poly clinic and two Intensive Cattle Development Project (ICDP) Sub centers are functioning in Adoor town shows in Table 10.3. A Dairy Extension Service Unit operated by Dairy Development Department is functioning in Parakode Block Panchayat office which includes dairy farm instructors and extension officers providing training, outreach and support to local dairy farmers.

Table 10.3 Veterinary institutions

Sl No	Name	Location	Ward	Phone Number
1	Veterinary Polyclinic, Adoor	Moonnalam	XXVI	04734-223445
2	Veterinary Sub Centre	Anandappally	VII	9496147496
3	Veterinary Sub Centre	Parakode	XIV	9446458240



Figure 10.2 Veterinary Polyclinic Adoor

10.4 Details of Dairy farms, Milk societies etc.

There are four cattle farms and a Dairy cooperative society in town. 176 members are registered in Kerala Dairy Farmers Welfare Fund (KDFWF) and 79 persons are receiving pension in the entire block.




Figure 10.3 Cattle farms in Adoor

10.5 Poultry

The poultry population of Adoor town mainly consists of fowls and its total number is 7041. Details of Poultry outlets of the town is shown in Table 10.4.

Table 10.4Poultry outlets

Sl. No.	Name of Unit	Location	No. of birds sold/day	No. of employees
1	Farm Fresh Chicken	Kottarakara Road	30	3
2	S K Farm Fresh	Parakode Market	40	2
3	Halal Chickens	Parakode Market	30	1
4	God Father Chicken Centre	Near Federal Bank, Parakode	40	3
5	Halal Chicken Centre	Adoor Market	25	1
6	Al-Halal Chicken	Central Adoor	50	1
7	Adoor Chickens	Adoor Market	25	1
8	B J Chicken Centre	Karuvatta	20	1

10.6 Marketing of products

Parakode market holds strong potential to be redeveloped as a regional hub for marketing local products, particularly from the animal husbandry sector. Located along a key transit corridor, it can attract traders and consumers from neighbouring towns and rural areas. With proper infrastructure such as hygienic slaughterhouses and meat stalls, modern dairy and poultry product outlets, cold

storage, and waste management facilities, the market can serve as a reliable platform for farmers and producers to sell directly, ensuring better prices and reduced middlemen. By integrating value-added products through cooperatives, Kudumbashree units, and self-help groups, Parakode market can evolve into a regional centre that not only boosts the animal husbandry sector but also supports local employment and strengthens the rural–urban economic linkages of Adoor region.

10.7 Slaughter House

Presently there are no slaughterhouses in the town. But unauthorized slaughtering is done at places like Adoor, Parakode and Kannamkode areas. A modern slaughterhouse can be established in Parakode market for the entire town area.

10.8 Effect of Hazard Risk in this sector

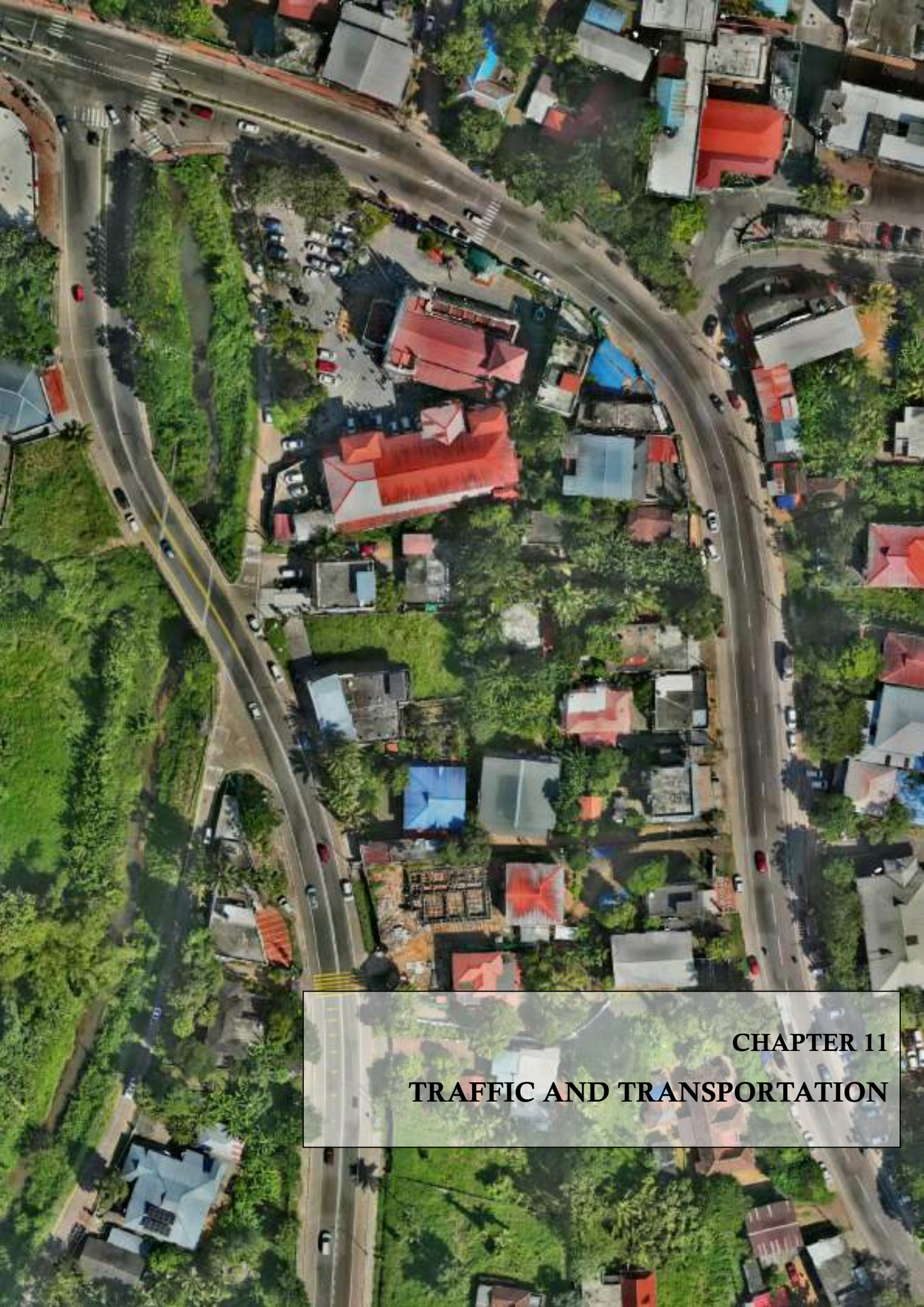
There have been no reported cases of animal death or injury due to natural hazards in the town over the past few years.

10.9 Problems & Potentials

Veterinary facilities are inadequate to fully address disease risks, and declining youth interest in livestock rearing further limits growth. However, the sector holds significant potential due to the strong urban demand for milk, meat, and poultry products. With improved veterinary care, promotion of modern and hygienic dairy and poultry units, and better infrastructure for milk collection and processing, the sector can expand sustainably. There is also scope to integrate livestock rearing with organic waste management and biogas production, while linking with cooperatives, Kudumbashree, and self-help groups can promote value-added products and enhance livelihoods

10.10 Inference

Considering the land use pattern and the large percentage of land under agriculture use, there is ample scope for developing Animal Husbandry sector in the town. Decline in the cultivation of paddy, increase in production cost, non-availability of good cattle breed etc are the major hindrances in growth of the sector. However high demand for milk, egg and meat in town and surrounding area and comparatively good price for product are potentials. Hence this sector can be developed as an income generating economic activity of the town.



CHAPTER 11

TRAFFIC AND TRANSPORTATION

11.1 Introduction- An Overview of Transportation facilities

For the balanced development of an urban centre, planned growth of spatial activities, coupled with provision of adequate infrastructural facilities like transport system, a well-defined hierarchy of road network, drainage, water supply, power supply etc are required. But in most of the cities and towns the available road system is not able to cater to the present traffic. The fast development of socio-economic and commercial activities coupled with inadequate supporting facilities and ever-increasing demand due to centralization of employment centers in C.B.D area caused a perpetual vicious circle of traffic problems.

Among the various urban infrastructure facilities transportation is the one, which shapes the structure and growth of the city. A workable circulation plan ensuring efficient operation of the transportation system facilitates economic growth of the town. With progressive urbanization travel demand in towns has increased tremendously. This is evident from the long delays and traffic congestion observed on urban roads in most of the towns. In order to make the transport system efficient, there is a continuous need to maintain a balance between demand and supply of facilities within the towns and its environs.

As part of preparation of Master Plan for Adoor various studies related to Traffic and Transportation has been conducted. NATPAC Study Report 2011, which was subsequently updated by the District Office in 2019. The transportation system of Adoor town consists of only one mode, ie road ways. No railway or water way is passing through the town. The town is located 19 kms. away from Pathanamthitta, the district headquarters and is well connected to other major centers of the state by a network of PWD roads consisting of Main Central Road (SH-1), Kayamkulam-Punaloor State Highway (SH-5) and National Highway 183 A and other major district roads.

11.2 Roads

11.2.1 Existing Road Network

The road network in Adoor does not follow any specific pattern. The topography of the town is the reason for this. The road network system of the town consists of roads maintained by NH, PWD, and Municipality and Irrigation department. The Existing Road network of the town is shown in Figure 11.1. List of PWD roads providing intra and inter connectivity to adjoining centers is given in Annexure 11.1. The PWD roads consist of State Highways and Major district roads, M.C Road (SH.1), K.P Road (SH.5) and NH 183A are the State and National highways passing through the town. The breakup of PWD roads of the town is given in Table 11.1. The road from Titanium Junction (Kollam) to Vandiperiyar via Adoor and Pathanamthitta has been declared as National Highway (NH-183A) in 2014.

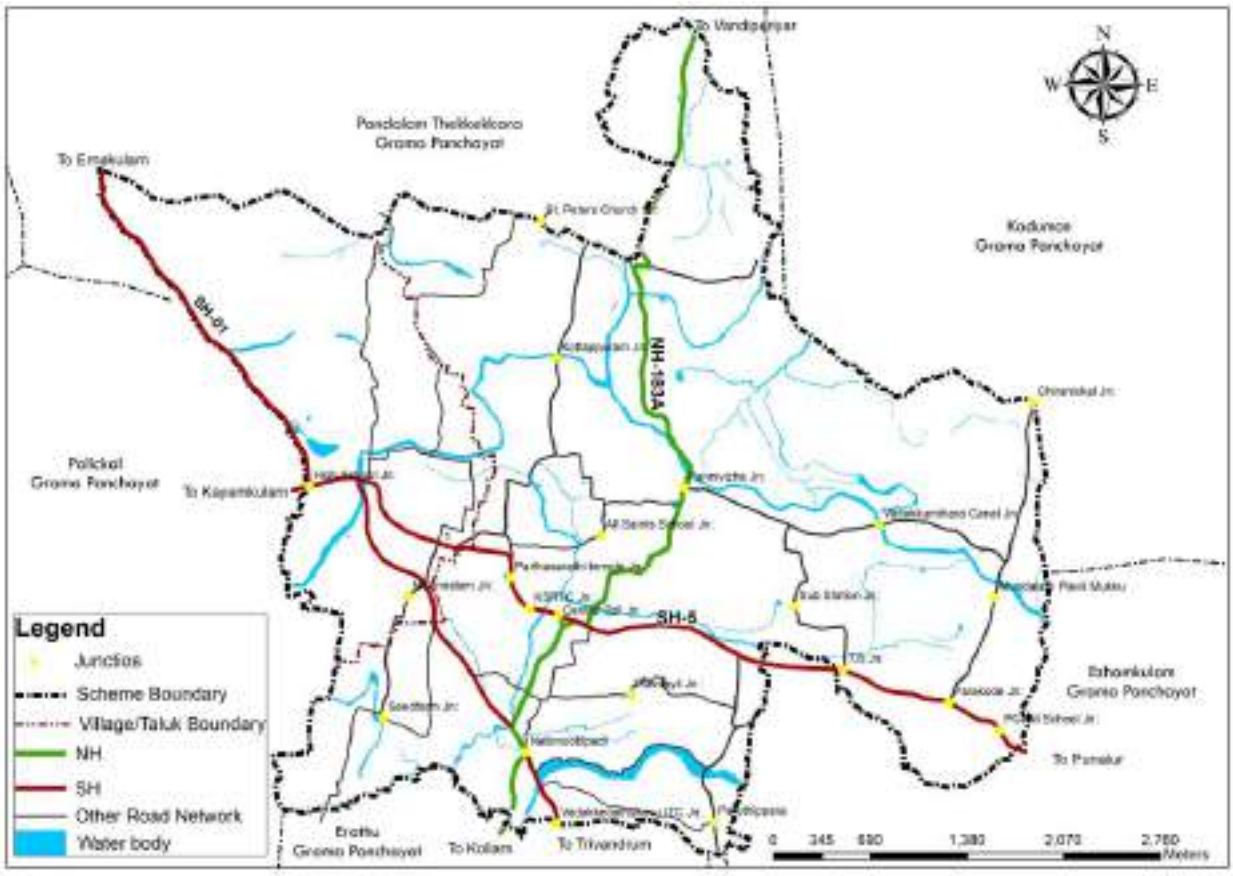


Figure 11.1 Existing Road Network in Adoor Town

In addition to the major roads and sub major roads under PWD, the municipality is also maintaining a network of roads. Details of the road networks maintained by the Adoor Municipality are given in Table 11.2. Another feature of the Adoor town is the road maintained by Irrigation Department. 12.5 kms of Canal roads (KIP) are coming under this category and its details is given in Table 11.3.

Table 11.1 Breakup of PWD Roads

Category of Roads	National Highway	State Highway	Major District Road
Length (in Km)	7.1	11.78	27.40

Source: NATPAC study report

Table 11.2 Municipal Roads in Adoor Municipality

Description	8 m & above	Between 6-8 m	Between 3-6 m	Less than 3 m
No. of roads	**1**	**20**	**298**	**60**
Length of roads (km)	0.167	18.809	811.738	10.107

Source: NATPAC study report

Table 11.3 Canal Roads in Adoor Municipality

Sl No	Description	Length
1	Kallada Right Bank Canal Road (Parakode Mullasserypadi to Malamekkara via Pannivizha- Karuvatta)	11.00 Km
2	Kallada Right Bank Canal (Sasthamkotta Branch) Road (Kottamugal-Nellimoottilpadi)	1.50 Km

Source: NATPAC Study Report

11.2.2 Access to Motorable Roads

Distance to motorable road from the houses has been studied in the Socio Economic Survey-2019. Ward wise distance to motorable roads from houses in different range and percentage of households having distance to motorable road more is than 0.50km. The average distance to motorable roads in the town is 0.56 km and 12.14 percentage of the people in the town has to travel more than 0.50 km to motorable road. The average distance to motorable road is high in Mithrapuram, Salvation Army, M.G.Road, Holly Cross and Nethaji Wards. It indicates the poor road network system in these wards of the town and it is due to non-availability or inadequate width of roads in the residential area of these wards and the people has to walk more distance to reach a motorable road.

11.2.3 Road Inventory Study

An understanding of the extent and quality of road network is very important to formulate plans for the future. A detailed inventory of existing road networks was carried out to obtain information like road length, cross-sections, hierarchical pattern of roads, surface condition, intersections, street furniture, parking area, bus bays etc. The inventory details of major road links within Adoor Municipality are given in Annexure.11.2. The M. C Road has nearly 7.00km length within the town. Carriageway width of this road is 7.50 meter. The road condition is found to be satisfactory. Covered drains are provided on most part of the road length and are found to be in good working condition rather than some minute stretches where the drains are found to be clogged due to the deposition of debris. Intense commercial activities and mixed land use are found all along the road section. The KP Road has a length of 4.20 km within the town. This road has two lane carriageways. The average right of way of this road is found to be 15 meters and the carriageway width varied from 8.00 to 8.50 meters. Major land use along the stretch of the road is commercial. Major traffic generating activities of the town are located along M.C.Road and K.P.Road.

The Adoor - Pathanamthitta road has 5.00 km of road length within the town. This road is having a carriageway width of 5.5 m with an average Right of way of 10.50 m. Number of sharp curves are there along the alignment of this road. Mixed land uses including commercial activities are there in the stretch between Pathanamthitta Road Junction and Ananthapally. The M.C.Road Bye pass which was formed recently under Kerala State Transport project (KSTP) has a right of way of

18.00m and carriage way width of 7.50m. The surface condition of the road is very good. This road is passing through the undeveloped part of the town mainly coconut garden and Environmentally Sensitive area. New Municipal Bus Stand is located on the side of this road. The condition of most of the PWD roads inside the town is found to be satisfactory with bituminous surfacing and paved shoulders. Proper drainage facilities and culverts are required for most of the roads. Most of the Municipal roads are narrow and 90 % of the roads have width in the range of 3.00-6.00 m. The surface condition and drainage of the road is not good. Similarly the surface condition of the Canal roads is very poor due to lack of maintenance

11.2.4 Road Intersections

The town has seven three-arm junctions as shown in Table 11.4, and no five-arm or four-arm junctions are present in the town.

Table 11.4 Road intersections in Adoor town

SL No.	Name of Road	Type of Intersection
1	Central Junction	Three arm
2	Bye Pass Junction	Three arm
3	Chavara Road Junction	Three arm
4	High School Junction	Three arm
5	Pathanamthitta Road Junction	Three arm
6	T.B.Road South	Three arm
7	T.B. Road North	Three arm

11.3 Characteristic Studies of Transportation Network

11.3.1 Traffic Volume Study

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

Composition of traffic in various road links of Adoor town is shown in Table.11.7. On MC road, the average daily traffic volume varied from 10200 PCU observed at Vadakkadathukavu ITC-Sasthamkotta Road Junction section to a maximum of 41384 PCU at Central Junction – Adoor UPS Junction section. On KP Road, a maximum of 29226 PCU was observed at Central junction to Pathanamthitta Road junction stretch and the minimum value 12101 was reported at Parakode junction to Parakode bridge stretch. On other stretches of roads, the average daily traffic volume ranges about 7708 to 14201 PCU.

11.3.1.1 Traffic Volume Survey at Outer Cordon Points

Distribution of vehicles passing through the outer cordon points in Adoor municipality are given in Table 11.5. Maximum daily traffic volume of 530278 PCU was observed at Paranthal church survey point, which includes 262540 PCU of inbound traffic and 267739 PCU of outbound vehicles. Cars constituted the maximum traffic volume followed by two-wheelers and buses. As many as 392575 PCU of vehicles were observed at Vadakkedathukavu ITC survey location. There were 133251 PCU of inbound and 259324 PCU of outbound vehicles at this survey station. Lowest traffic volume of 239611 PCU was observed at Potharad survey point, which includes 119058 PCU of inbound traffic volume and 120552 PCU of outbound traffic volume.

Table 11.5 Distribution of inbound and Outbound Traffic at Outer Cordon Survey Points

Sl.No.	Locations Selected	Total vehicle	Total PCU/Day
1	Sasthamkotta Road Junction.		
i	Towards Adoor	3,610	3,997
ii	Towards Sasthamkotta	3,209	3,501
2	Parakode Bridge		
i	Towards Adoor	4,914	5,465
ii	Towards Pathanapuram	5,259	5,665
3	High School Junction.		
i	Towards Adoor	4,586	5,188
ii	Towards Kayamkulam	3,855	4,362
4	Vadekadathu kavu ITC		
i	Towards Enathu	4,977	4,983
ii	Towards Adoor	5,225	5,217
5	Paranthal church		
i	Towards Adoor	5,490	6,810
ii	Towards Panthalam	5,414	5,729
6	Potharad		
i	Towards Adoor	3,265	3,965
ii	Towards Pathanamthitta	3,188	3,258

Source: NATPAC study report

11.3.1.2 Traffic Volume Survey at Midpoint of Homogeneous Section

For the purpose of carrying out various surveys, major roads in the study area are divided into various homogeneous sections based on road and traffic characteristics. Road and traffic

characteristics were obtained based on reconnaissance survey, review of earlier reports and collection of secondary data. The details of homogeneous sections on major roads in Adoor study area are given in Table 11.6.

Table 11.6 Homogeneous sections on major roads in Adoor

Sl.No	Road Name	Homogeneous Sections	Length (km)
1	M.C Road	1. Vadakkedathu kavu ITC-Sasthamcotta Road Jn. 2. Sasthamcotta Road Jn- Central Jn. 3. Central Jn- TB Road Jn (South) 4. TB Road Jn (South)- TB Road Jn (North) 5. TB Road Jn (North)- HS Jn 6. HS Jn- KP Road Jn. 7. KP Road Jn- Paranthal church	7.00
2	K.P Road	1. Parakode Sakthi Theatre Jn.-Pathanamthitta Road Jn. 2. Pathanamthitta Road Jn- Central Jn 3. M.C Road Jn- Adoor BHS Jn.	4.20
3	Adoor Pathanamthitta Road	1. KP Road Jn.-Anandapalli 2. Anandapalli-Pothrad	5.00
4	Adoor Chavara Road	1. Canan Nagar-Nellimoottilpadi	0.50
5	Parakode- Koduman Road	1. Parakode to Chiranikkal	2.20
6	Parakode Iverkala Road	1. Parakode to Paruthipara	0.70
7	T.B Road	1. T.B Junction to T.B	1.20

Source: NATPAC study report

11.3.1.3 Traffic Volume Survey at Important Intersections

Based on the reconnaissance survey, turning movement surveys at major intersections in the study area were conducted to ascertain the peak hour demands. The surveys were carried out for a period of four to eight hours during morning and evening peak periods depending on the availability of past data Total volume, composition of traffic and turning characteristics were recorded for different types of vehicles. The observed traffic flows were converted to equivalent passenger car units (PCU) by using equivalency factors suggested by IRC. It could be seen that Central Junction witnessed the maximum peak hour traffic flow of 3,129 PCU followed by 2,209 PCU at Pathanamthitta Road Junction.

11.3.1.4 Modal split

The inter town passenger transport in Adoor Municipality is predominantly met by KSRTC buses, private buses, mini buses and a host of personalized vehicles like four wheelers, two wheelers etc. An analysis of the O-D survey data collected from outer cordon survey locations revealed that an estimated 115,876 inter town passenger trips were performed in the study region on a reference day consisting of 48,934 bus passenger trips, 32,726 car passenger trips, 26,091 two wheeler passenger trips. The contributions of the other two modes autorikshaw and mini bus/tempo are comparatively less and it is 7078 and 1048 trips respectively. It could be inferred that public transport had a significant role in meeting the inter town passenger demand and 42.23% of the total passenger trips is made through public transport modes. Figure 11.2 the modal split of inter town passenger traffic in Adoor Municipality.

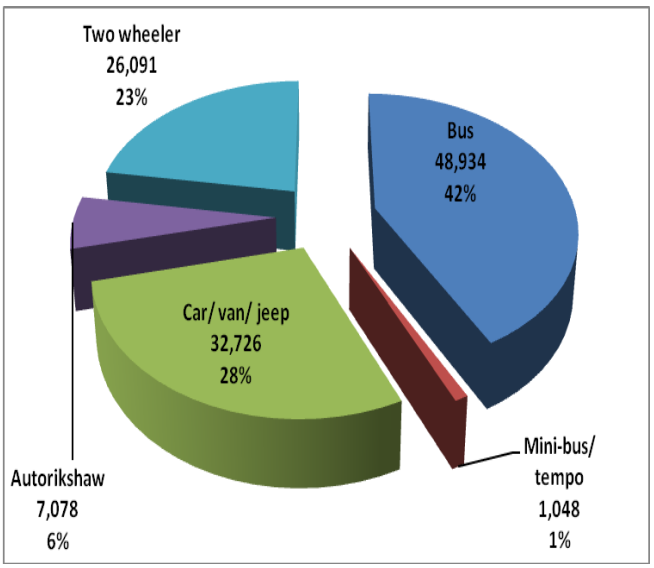


Figure 11-2 Modal Split of inter town Passenger traffic

11.3.2 Traffic Volume/Capacity Study

Capacity utilization of the road stretches was measured by volume-to-capacity ratio (V/C Ratio). It is the ratio of volume of traffic plying on the road stretch to the capacity of the road stretch. For working out the capacity of different road sections, the information compiled during the road inventory survey was compared with the specifications of IRC-106-1990 (Guidelines for capacity on urban roads). While working out the capacities due consideration was given to carriage way width, junctions, parking, lateral clearance, shoulder, surface condition etc.

The traffic volume observed at different road stretches are compared with the capacity of road sections, to calculate the volume-capacity ratio (V/C ratio) of different road sections within the town. The volume capacity ratio of major roads within the Adoor town is given in Table 11.7. It is also shown in Figure 11.3. The volume- capacity ratio is maximum (276) in M.C.Road between Central Junction and Revenue Tower Road Junction (South). From the V/C analysis, the traffic flow on almost 70% of the roads inside the study area is slightly ahead of its capacity, was over utilized to the extent of more than 200% to its carrying capacity.



Figure 11-3 Volume – Capacity ratio in major roads of the town

Source: NATPAC Study Report

Table.11.7 Volume Capacity ratio in major road links

Sl. No.	Road Link	Capacity (PCU/ day)	Volume (PCU/ day)	Volume-capacity ratio
	M.C Road			
1	Vadakkedathukavu ITC-Sasthamcotta Road Junction	15,000	10,200	0.68
2	Sasthamcotta Road Junction-Central Junction	15,000	25,406	1.69
3	Central Junction-Revenue Tower Road Junction (South)	15,000	41,384	2.76
4	Revenue Tower Road Junction (South) - Revenue Tower Road Junction (North)	15,000	14,419	0.96
5	Revenue Tower Road Junction (North) - HS Junction	15,000	17,003	1.13
6	HS Junction-Paranthal chruch	15,000	13,444	0.90
	K.P Road			
7	Central Junction-Pathanamthitta Road Junction	15,000	29,226	1.95

8	Pathanamthitta Road Junction-Parakode	15,000	23,447	1.56
9	Parakode Junction-Parakode Bridge	15,000	12,101	0.81
	Adoor Pattanamthitta Road			
10	Pathanamthitta Road Junction-Anandapalli	15,000	12,179	0.81
11	Anandapalli-Pothrad	15,000	7,677	0.51
	Adoor Chavara Road			
12	Canan Nagar-Nellimoottilpadi	12,000	7,498	0.62
	Revenue Tower Road			
13	Revenue Tower Road Junction (South) - Revenue Tower Road Junction (North)	9,000	14,201	1.58
	Mini Bye Pass Road			
14	Mini Bye pass South Junction -North Junction	15,000	7,708	0.51

Source: NATPAC study report

11.3.3 Speed and Delay Study

This study helps to evaluate congestion, capacity, level of service and the need for improvements in the road network. The speed and delay characteristic of major roads in Adoor town is given in Annexure 11.3. The analysis of the delays and causes of delay has revealed that traffic congestion, intersections, non-standardized bus stops at unscientific locations, presence of slow moving vehicles, parking of vehicles along carriageway and presence of heavy vehicles were the major cause of delay for traffic flow on major roads in Adoor. Major delay of 46 seconds was observed on M.C. Road between Paranthal church- Vadakkedathkavu section due to traffic block at intersection. On MC Road, maximum average journey speed of about 26 km/hr was observed between Paranthal Church to Vadakkedathukavu ITC stretch. This lower speed indicates the necessity of improvement measures. Improper locations of bus stops are found to be the major cause of traffic block. Delays at intersection shall be sorted out by channelizing the traffic flow and adopting proper junction improvement measures.

11.3.4 Parking Survey

The parking demand of vehicles in the town is mainly met by on-street parking. Off-street parking is mainly provided by two private pay and use parking areas located adjacent to KSRTC Bus Station. Parking accumulation and duration survey were carried out at all the major road stretches where the parking accumulation is found to be high. Parking study is done to obtain the peak parking demand and parking duration of various categories of vehicles along these road sections.

Table 11.8 Parking Accumulation at Different Road Sections in Adoor Town

Sl. No.	Road section	Peak parking time (hr)	Type of vehicles						Total (No)	Total (ECS)
			Mini Bus	Car	Pass Auto	Two-Wheeler	Mini Turk	Gods Auto		
1	Pattanamthita Road Junction. (Right)	10.30		5	6	7	1		19	14
2	Pattanamthitta Road Junction. (Left)	11.30		6	2	6	3	2	19	16
3	From KSRTC to Adoor Temple	12.30		16	8	3		1	28	25.6
4	From Temple to Adoor UPS	11.30		10	4	3	1	1	19	17.2
5	Adoor Tourist home to Central Junction.	11.0	1	15		3			19	17.2
6	Pavithra Theature to central Junction.	13		11	5	2		2	20	18.4
7	Revenue Tower road (one way)	16.3		16		3			19	16.6

Source: NATPAC study report

Table 11.8 gives the summary of peak parking accumulation observed on major parking corridors in Adoor. Of the five corridors where parking accumulation survey was conducted, it was found that the road between KSRTC and Adoor Temple had the highest parking accumulation of 28 vehicles parked at 12.30 hours on a normal working day where maximum traffic flow and parking demand occur. Majority of the vehicles parked at most of parking corridors were found to be for short duration of less than 30 minutes. 75 to 90 per cent of the vehicles parked on selected parking corridors were found to be parked for duration less than 30 minutes.

At Revenue Tower Road (one way), about 28% vehicles parked for duration of about one hour. Long duration vehicles constituted only negligible per cent of the total vehicles on most of the stretches. Duration of types of vehicles parked on selected parking corridors of Adoor municipality are given in Annexure 11.4.

11.3.5 Pedestrian Survey

The locations selected for pedestrian survey are Sasthamkotta Road Junction, in front of U.P.S Adoor in M.C Road, Fathima Tourist Home, in front of K.S.R.T.C Bus Station (South side) ,

Apsara Tourist, in front of K.S.R.T.C Bus Station (North side), in front of Private Bus stand at Yamuna Tourist Home, in front of Revenue Tower (one way). Analysis of the pedestrian cross movement at major activity/traffic generation areas revealed that a high volume of pedestrian cross movements occurred in front of KSRTC Stand during the time period between 17.30 and 18.00 hours. Peak hour pedestrian cross movements observed at major locations in Adoor Municipality is given in Table 11.9.

Table 11.9 Peak Hour Pedestrian Movements at major locations

Sl. No.	Name of location	Peak time		No. of pedestrians		
				Up	Down	Total
1	Sasthamkotta Road Junction.(No zebra crossing)	9.00	9.30	22	27	49
2	Infront of U.P.S Adoor in M.C Road	16.30	17.30	25	24	49
3	Fathima Tourist Home	9.00	9.30	178	150	328
4	In front of K.S.R.T.C Bus Station (South side)	18.00	18.30	118	180	298
5	Apsara Tourist Home	8.00	8.30	68	59	127
6	Infront of K.S.R.T.C Bus Station (North side)	17.30	18.00	168	181	349
7	Infront of Private Bus stand at Yamuna Tourist Home	16.30	17.00	86	70	156
8	In front of Revenue Tower (one way)	17.00	17.30	62	27	89

Source: NATPAC study report

11.3.6 O-D Survey of Passenger Trips

A total of 115,876 passenger trips were performed as inter-town trips in the study region on a reference day. The origin destination matrix of inter-town passenger trips is shown in Annexure 11.5. The desire lines of inter-town passenger trips are shown in Figure 11.4. The major traffic generating zone within the town is Zone 4 which comprises of Bhagath Singh, Pannivizha East, Parakode West, T.B. Ward, Nethaji, Para code East, Anantharamapuram wards of Adoor Municipality which covers the CBD area of the town with 31126 trips.

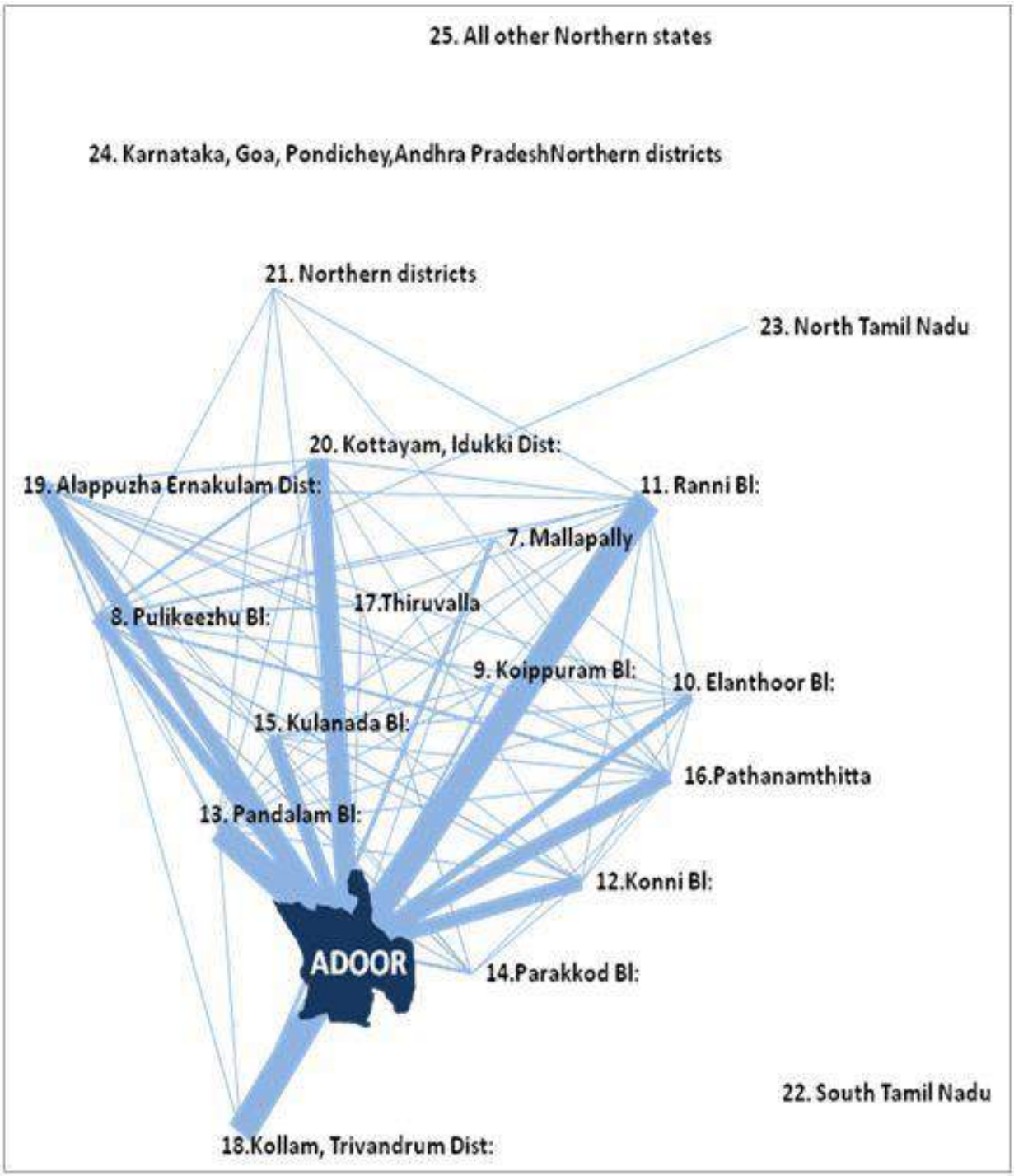


Figure 11.4 Desire line of Inter town passenger traffic

It is followed by 13043 trips in Zone 18 which mainly comprises of passenger trip from southern districts such as Kollam, Thiruvananthapuram etc. Zone 11 comprising Ranni Block (11069 trips), Zone 20 comprising Kottayam and Idukki districts (10107 trips), Zone 1 comprising Bhagath Singh, Pannivizha East, Parakode West, T.B. Ward, Nethaji, Paracode East, Anantharamapuram wards of Adoor Municipality (11069 trips), Zone 13 comprising Pandalam Block (8018 trips), Zone 15 comprising Kulanada Blocks (5312 trips), Zone 17 comprising Thiruvalla (4801 trips) are the other

major traffic generating zones as per the survey. As in the case of trip generation, zone 4 comprising Jawahar, Pambettukulam, Town East, Town and Paranthal wards of Adoor Municipality attracting more number of trips. It is estimated that this zone is attracting 49032 trips. Zone 18, the area comprising Southern districts such as Kollam, Thiruvananthapuram etc. (9494 trips), Zone 13 comprising Pandalam Block (9105 trips), Zone 19 comprising Alappuzha and Ernakulam districts (5769 trips), Zone 8 comprising Pulikeezhu Block (5038 trips) are the other major trip attracting zones. No intra state passenger trip movement found on the matrix analysis.

11.3.6.1 Purpose of Trip

In Adoor Municipality, an estimated 23.62 % of inter- town passenger trips were performed for work or related purpose. An estimated amount of 40.14 % trips were made for personal business purpose. Only 2.95 % of trips were made for shopping purpose. Educational purpose trips were about 5 % of the total passenger trips. Tables 11.10 presents distribution of inter- town passenger trips for different purposes according to mode of travel and purpose of trip.

Table 11.10 Model split of Intercity Daily Passenger Trips

Sl. No.	Purpose of trip	Type of vehicle						
		Bus	Mini-bus	Car	Auto	Two wheeler	Total	Per cent
1	Work	11,557	485	6,938	749	7,638	27,368	23.62
2	Part of work	9,686	138	6,155	1,789	5,168	22,937	19.79
3	Personal business	19,644	202	14,796	2,920	8,956	46,517	40.14
4	Shopping	1,445	185	626	563	602	3,421	2.95
5	Recreation	1,560	-	1,230	392	512	3,693	3.19
6	Social	2,338	29	1,567	575	1,027	5,537	4.78
7	Education	2,388	8	1,139	31	2,089	5,655	4.88
8	Back home	187	-	199	-	57	443	0.38
9	Serve passenger	129	-	77	58	41	305	0.26
10	Medical	-	-	-	-	-	-	-
11	Others	-	-	-	-	-	-	-
Total		48,934	1,048	32,726	7,078	26,091	1,15,876	100

Source: NATPAC study report

11.3.6.2 Occupation of Passengers

The occupational characteristics of passengers were ascertained from the O-D survey. It could seen that person working in the service sector constituted the major segment (about 32 %) of inter - town

travelers, of whom 17.57 % working in private sector, 11.95% in Government sector and 2.37 % are in Business sector. Self employed people including those engaged in own business, professionals, cultivators, casual laborers were about 30 %. Most of them are doing private business. Dependant population like unemployed, housewife, student and retired hands together constitute about 9 % of the total inter- town passengers. Distribution of intercity daily passenger trips according to mode of travel and occupation of trip maker is given in Table 11.11 and the graphical presentation is shown on Figure 11.5

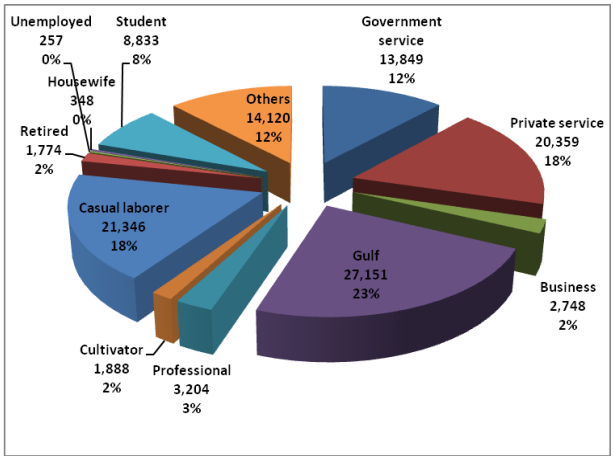


Figure 11.5 Modal Split of Inter- City Daily Passenger Trips According to Occupation

Table 11.11 Intercity Daily Passenger Trips According to Mode of Travel and Occupation

Sl. No.	Occupation of passengers	Type of vehicle						
		Bus	Mini-bus	Car	Auto	Two wheeler	Total	%
1	Government service	5,848	128	3,918	133	3,821	13,849	11.95
2	Private service	8,598	34	4,910	946	5,871	20,359	17.57
3	Business	1,161	-	363	251	974	2,748	2.37
4	Gulf	11,466	371	9,743	1,151	4,421	27,151	23.43
5	Professional	1,353	48	1,184	79	540	3,204	2.76
6	Cultivator	797	4	369	218	499	1,888	1.63
7	Casual laborer	9,014	295	4,725	3,110	4,202	21,346	18.42
8	Retired	749	-	674	58	292	1,774	1.53
9	Unemployed	108	-	106	-	42	257	0.22
10	Housewife	147	-	84	82	35	348	0.30
11	Student	3,730	21	1,005	304	3,772	8,833	7.62
12	Others	5,963	147	5,645	745	1,620	14,120	12.19
	Total	48,934	1,048	32,726	7,078	26,091	115,876	100.00

Source: NATPAC study report

11.3.6.3 Pattern of inter- town passenger trips

The O-D pattern of inter-town passenger traffic revealed that there are 45805 internal - external trips (Study region to outside study region), out of 115,876 inter-town passenger trips. This constituted about 40 percent of total trips. A total of 56165 trips were external – internal trips (outside study region to study region) constituting 48 per cent of the total trips. External – external trips to the tune of 13906 were performed through the study region and they were 12 percent of the total trips.

11.4 Rail Transport

Adoor does not have any railway passing through the town. The nearest Railway Station from Adoor is in Chengannur and it is 23 kms away from Adoor. Certain preliminary surveys have been conducted by the railway authorities for a new railway line through Adoor. But the project is yet to be sanctioned.

11.5 Air Transport

Nearest airport is Thiruvananthapuram International Airport located at a distance of 93 kms from Adoor. Another International Airport, Kochi is 160Km away from the town.

11.6 Characteristics of Goods Traffic

11.6.1 Volume of Goods Vehicles

A maximum number of 6183 goods vehicles passed through outer cordon points selected for the study, comprising 414 MAT, 2564 trucks, 1688 mini-trucks and 1517 goods auto rickshaws. At Sasthamkotta road junction survey point, a total of 910 goods vehicles were observed on a reference day, comprises of 12 MAT, 319 trucks, 285 mini-trucks and 294 goods auto rickshaws. At Parakode Bridge, as many as 17 MAT, 573 trucks, 317 mini-trucks and 242 goods auto rickshaws totaling 1150 goods vehicles passed on the reference day. A minimum number of 759 goods vehicles passed through Vadakkedathukavu ITC survey point comprising of 92 MAT, 182 trucks, 243 mini-trucks and 243 goods auto rickshaws.

11.6.2 Modal Split Of Goods Traffic

A total of 4497 goods vehicles were found to be involved in carrying goods traffic to and from the study region, consisting of 2135 Truck/MAT, 1310 mini-trucks and 1052 goods auto rickshaws. The quantum of goods handled by these goods vehicles was to the tune of 11370 tons. Trucks carried the maximum volume of goods traffic of about 58%, followed by mini-trucks of about 24% and goods auto rickshaws of about 18 %. Modal split of inter- town daily goods traffic (in tons) in Adoor study area is given in Table 11.12.

Table 11.12 Modal Split of Inter-City Daily Goods Traffic (in tons) in Adoor

Sl.No.	Mode of travel	No.of vehicles		Quantity carried	
		No.	Percent	Tons	Percent
1	Truck/MAT	2135	47.46	6,587	57.93
2	Mini Truck	1310	29.13	2,745	24.14
3	Goods Auto rickshaw	1052	23.4	2,039	17.93
Total		4,497	100	11,370	100

Source: NATPAC Study Report

11.6.3 Composition of Goods Carried

Out of the 11517 tons of inter-town goods traffic observed through outer cordon survey stations, maximum volume of 3156 tons movements were observed in the case of earth and gravel which amounted to 27.40 per cent, followed by brick and tiles to the tune of 852 tons (7.39%) and milk and milk products (7.32%) amounted 843 tons. Commodity wise distributions of goods traffic in tons are given in Annexure 11.6.

11.6.4 OD of goods transportation

Total of 2135 trucks trips were observed during 24 hours origin-destination survey in Adoor Municipality. The major traffic generator of goods traffic within the study region was Zone 20 (towards Kottayam and Idukki) area with 1394 tons, and the zone 4 comprising the Jawahar, Pambettukulam, Town East, Town attracting more number of goods traffic (3226 tons). The desire lines of inter-town goods traffic is shown in Figure 11.6.

11.6.5 Pattern of Goods Traffic

The study on goods traffic pattern within the study region vis-a-vis the outside study region revealed that 2328 tons of traffic originated from the study region and 4805 tons of traffic terminated in the study region. Nearly 4237 tons of traffic (37.26%) are of divertible nature, which, are passing through the CBD area of the town.

11.7 Other Infrastructure Facilities

11.7.1 Bus stand

KSRTC is operating more than 62 schedules in different routes from Adoor sub Depot. In addition to that a number of KSRTC buses from other depots are also operating service through Adoor. 132 private buses are also operating services to various destinations. Details are furnished in Table 11.13.

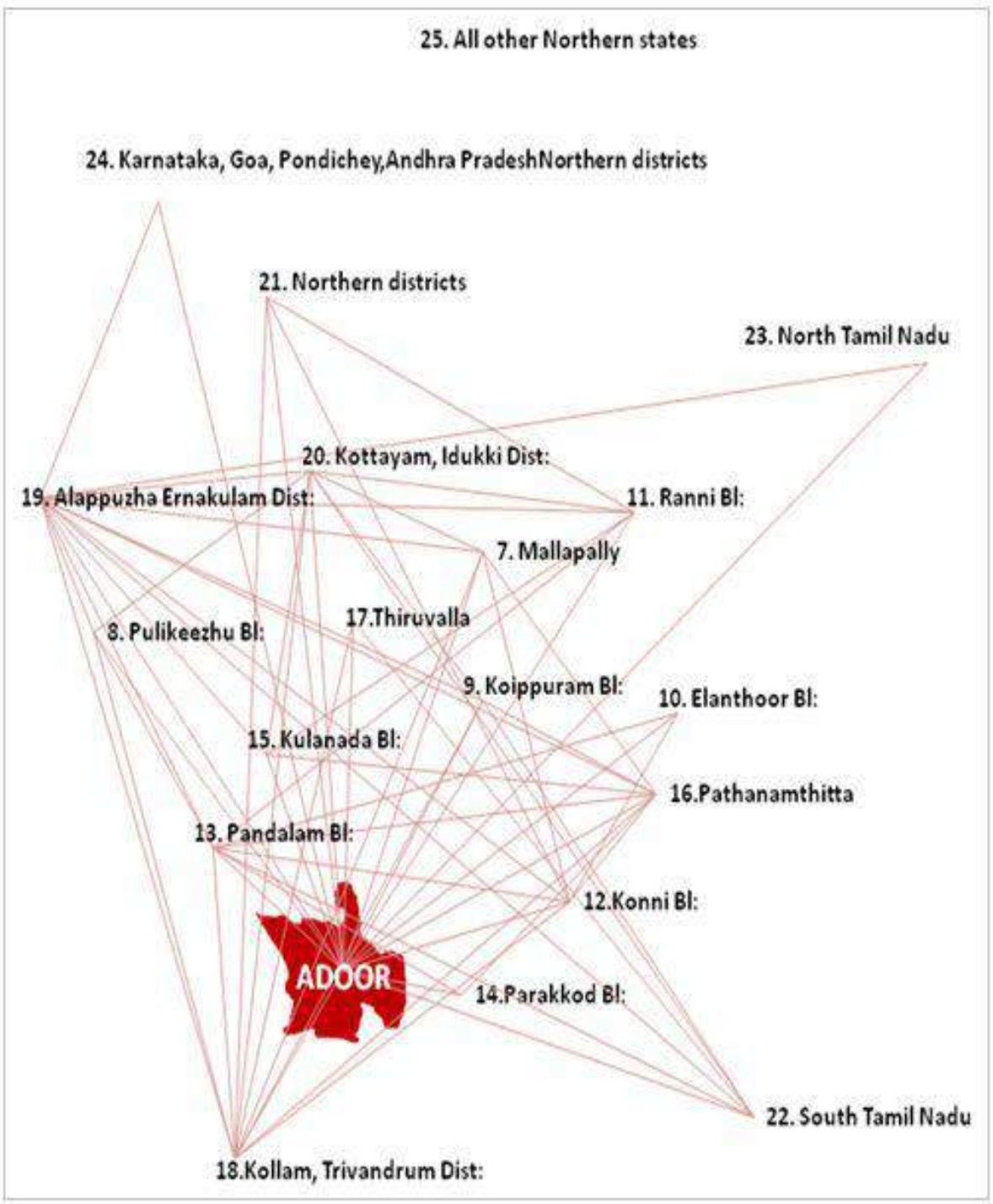


Figure 11.6 Desire line of Inter town goods traffic

Table 11.13 Details of bus services

Sl No	Agency	No of Buses/ Schedules	No of trips per day (single trips)	Average number of passengers per day
1	Private	132	400	40500
2	KSRTC	62	243	39450

Source Town Directory 2019




Figure 11.7 Adoor KSRTC Bus Stand, Private Bus Stand

KSRTC buses are operating from the KSRTC Bus Station located near Central Toll. Poor drainage of the yard is the major problem experiencing there. Also the passenger amenities are inadequate there. The private buses are operating from the area adjacent to the General Hospital and from the bus bay near KSRTC Bus station. No facilities for passengers are available at these places. Another bus stand is there at Parakode near Parakode Market. But this bus stand is not functional now. Municipality has acquired land near M.C.Road Bye pass for construction of a bus stand and operation of Private Buses.

11.7.2 Auto parking (Autorickshaw stands)

Autorickshaw stands are located in different part of the town and except for the stand near KSRTC Bus Station; separate bays are not provided for parking of autorickshaws.

11.7.3 Taxi parking

Five Taxi stands are there in Adoor Municipal area. They are located at Central Toll, near KSRTC Bus Station, near Private Bus Stand, Parakode and Holly Cross Junction. Taxies are parking in the road margin and many of them are in the junction itself and this creates traffic problem to an extent. Absence of a Taxi Stand with necessary facilities is experienced in the town.

11.7.4 Pedestrian facilities

The pedestrian facilities that need to be considered are:

(i) Sidewalks or walkways: Sidewalks and walkways are "pedestrian lanes" that provide people with space to travel within the public right-of-way, that is separated from roadway vehicles. Sidewalks are associated with significant reductions in pedestrian collisions with motor vehicles.

(ii) Marked crosswalks and enhancements: Marked crosswalks indicate optimal or preferred locations for pedestrians to cross and help designate right-of-way for motorists to yield to pedestrians. Crosswalks are often installed at signalized intersections and other selected locations. Marked crosswalks are desirable at some high pedestrian volume locations (often in conjunction with other measures) to guide pedestrians along a preferred walking path. For Adoor Town, cross walk markings are desirable at all arms of the major intersections. Apart from these intersections.

11.7.5 Truck terminals

Adoor is a major market and trade centre. There is no parking place for parking of trucks and goods autrockishaws. Trucks, Mini trucks and goods autorickshaws etc. are mainly parking in Central toll - Parakode Road adjacent to Pathanamthitta road Junction and Near Parakode Market and it creates problems for the free flow of vehicles in these roads. A terminal for parking of goods vehicles shall be provided at Adoor.

11.8 Accident data, accident prone areas

Road accidents can occur in specific areas of a town for various reasons. Some common factors that contribute to accidents in certain areas include Poor Road Conditions, High Traffic Volume, Inadequate Signage and Signals, Pedestrian Activity, Improperly Designed Roads, Inadequate Traffic Management, Weather Conditions and Driver Behaviour. A major contributing factor is the presence of sharp curves along the stretch, combined with the high speed at which vehicles frequently travel. These conditions significantly increase the risk of accidents, particularly during poor weather or low visibility. Immediate measures such as improved signage, speed regulation, and better road engineering are essential to enhance safety.

11.9 Identification of gaps in network

A significant gap in the current transportation infrastructure is the absence of a well-defined Ring Road around the urban area. The development of a Ring Road is essential to divert through-traffic away from the city center, reduce congestion, and improve connectivity between major arterial roads. This would enhance overall traffic efficiency, reduce travel time, and contribute to improved road safety and environmental quality.

11.10 Effect of hazard risk in this sector

As per the NATPAC study report pedestrian and vehicular movement are high at the central junction and surroundings. This area is affected by urban flood during heavy rain season. This may interrupt the pedestrian and vehicular movement for a short period of time. Through proper

mitigation measures this issue can be rectified. The proposals in connection with this are discussed in the corresponding chapters.

11.11 Inference

The configuration of the existing road network within Adoor town does not reflect any regular form, although it resembles more or less like ring and radial type having radial roads connected with partial ring roads. The road inventory shows that majority of roads are with inadequate right of way and carriage way width. The condition of the Municipal roads and Canal roads are poor. Motorable roads are inadequate in residential area and people have to walk more distance to reach motorable roads. The local road network system is needs be improved. Adequate off-street parking area has to be provided in the town. Pedestrian facilities are inadequate and need to be improved. Traffic delays are occurring on the main roads of the town. No organized Taxi stand or Autorickshaw stand exists within the town.

The current Transportation network is inadequate to address the transportation related needs of the town and hence has to be improved through traffic intervention as well as management measures. As much as 115876 passenger trips are made through the town and public transport mode is the major mode of passenger traffic. The Origin and Destination study shows that 12% of passenger traffic and 37.26% of goods traffic are divertible from the town.

The facilities at all bus terminals of the town are inadequate and the existing stands are not utilized fully. A new bus route pattern shall be evolved after the new Municipal bus stand at the M.C.Road Bye pass is made operational. A Rail linkage to the town is necessary for the overall development of the town as well as the region. The current Transportation network is inadequate to address the transportation related needs of the town and hence has to be improved through traffic intervention as well as management measures.



CHAPTER 12
OTHER PHYSICAL INFRASTRACTURE

12.1 Introduction

Physical infrastructure is the essential framework for a town's operation, providing fundamental services like clean water, sanitation, and energy. It directly impacts public health and safety, while also fostering economic activity through efficient transportation and communication networks. Well-planned infrastructure enhances the quality of life by creating accessible public spaces and supporting community interaction. Furthermore, robust infrastructure is vital for sustainable development, promoting environmental protection through responsible resource management and renewable energy integration. It ensures a town's capacity for future growth, economic prosperity, and resilience against challenges.

12.2 Water Supply

12.2.1 Existing water supply system - coverage

Drinking water to Adoor and adjacent Grama Panchayats are provided through the scheme called "Water Supply Scheme to Adoor and adjacent Grama Panchayats". The scheme covers Adoor Municipality, Pallickal, and Ezhamkulam, Enadimangalam and Erath Grama Panchayats of Pathanamthitta district and Pattazhi Grama Panchayat of Kollam District. The source of water is Achankovil River and the intake facilities are located at Kaippattur. The treatment Plant of 12.38 MLD Capacity is located at Chiranickal, 1.00 Km North of Parakode Junction. Aeration, Sedimentation, filtration and chlorination are the treatments done at the treatment plant.The scheme was commissioned in 1994. As per the project report the projected beneficiaries for the scheme for the year 2001 and 2011 are 1,65,920 and 1,92,110 respectively (based on 1991 Population) and the estimated projected water demand for the year 2001 and 2011 were 10.30 MLD and 12.38 MLD respectively . The scheme envisages supply of 40-lpcd water.

The distribution system consists of an overhead Storage Reservoir at Chiranickal with a capacity of 12.40 lakhs liters. In addition to that, there are overhead/ ground level tanks at Chiranickal (2.4 lakhs liters), Kottamugal (4.5 lakhs liters), Pallickal Malamugal (3.00 lakhs liters), Kilikode (0.53 lakhs liters), Kilikode (1.70 lakhs liters), Kunnida (7.00 lakhs liters) and Puthusseribhagom (0.45 lakhs liters) for distribution of water to various parts of the scheme area. Drinking water to various part of Adoor Municipal area is distributed from the tank located at Chiranickal under gravity. The water is distributed through 400 mm (2.74km), 350mm (0.20km), 300mm (2.340km) and 250 mm (1.680 km) A.C and C.I mains and then through 75mm to 140mm PVC distribution line of about 200 Km length.

12.2.2 Water Sources

In the Socio-Economic survey 2019, 93.93% of people reported that well is the major source of water and 25.93% of people reported that water supplied by both well and KWA is the main source of

water. Community well (1.24%), Public bore well (0.14%) is the other sources of water as per the socio-economic survey. There is variation among different wards of town in the usage of water supplied by KWA and Well water. In Town, Adoor Central, M.G.Ward, Parakode East wards the usage of water supplied by KWA is comparatively more. Most of these wards are located in and around CBD.

Distance to source water is also analyzed in the Socio-Economic Survey. For 99.76% of households some kind of water source is available within a distance of 0.50Km. For 0.12% of households drinking water is available within a distance of 0.5-1.0km distance and only for the remaining 0.12%, the distance to source of water is more than 1.00km. Construction of Canals as part of Kallada Irrigation Project through different part of the town has helped in elevating the water tables of the wells in the adjacent areas especially in summer season. The ponds which are available in various part of the town and these ponds can be utilized as an alternate source of water. The supply of protected water in the town is made by Kerala Water Authority. Major portion of the water supplied by KWA is for domestic connection. Supply of water for Industrial purpose is very nominal

12.2.3 Scarcity of water

As per the socio-economic Survey (2019) conducted by Town and Country Planning Department, 75.86% of the households reported that there is no scarcity of water, 13.1% reported that there is scarcity for 1-2 months, 8.83% reported that there is scarcity for 2-3 months, 1.24% reported that there is scarcity for 3-6 months and 0.97% reported that there is scarcity for more than 6 months shows in Figure 12.1. The spatial distribution of scarcity of water is shown in Figure 12.2. The scarcity of water is more in Mithrapuram, Pannivizha, Potharad, T.B.Ward and Puthiyakavilchira wards. Generally in elevated areas the scarcity is more.

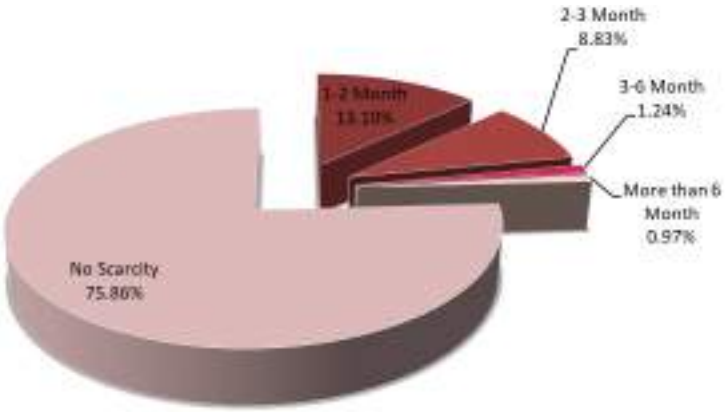


Figure 12.1 Scarcity of Water in Adoor

12.2.4 Effect of hazard risk in this sector

Urban floods and lightning are the major hazards in town and they are not directly affecting the water supply system. There are no reported damages also. Flooding contaminates wells, pipelines and reservoirs with silt, debris, and sewerage, disrupting the quality and safety of drinking water. Lightning strikes can damage pumping machinery, transformers, and overhead power lines that support water distribution, causing sudden breakdowns.

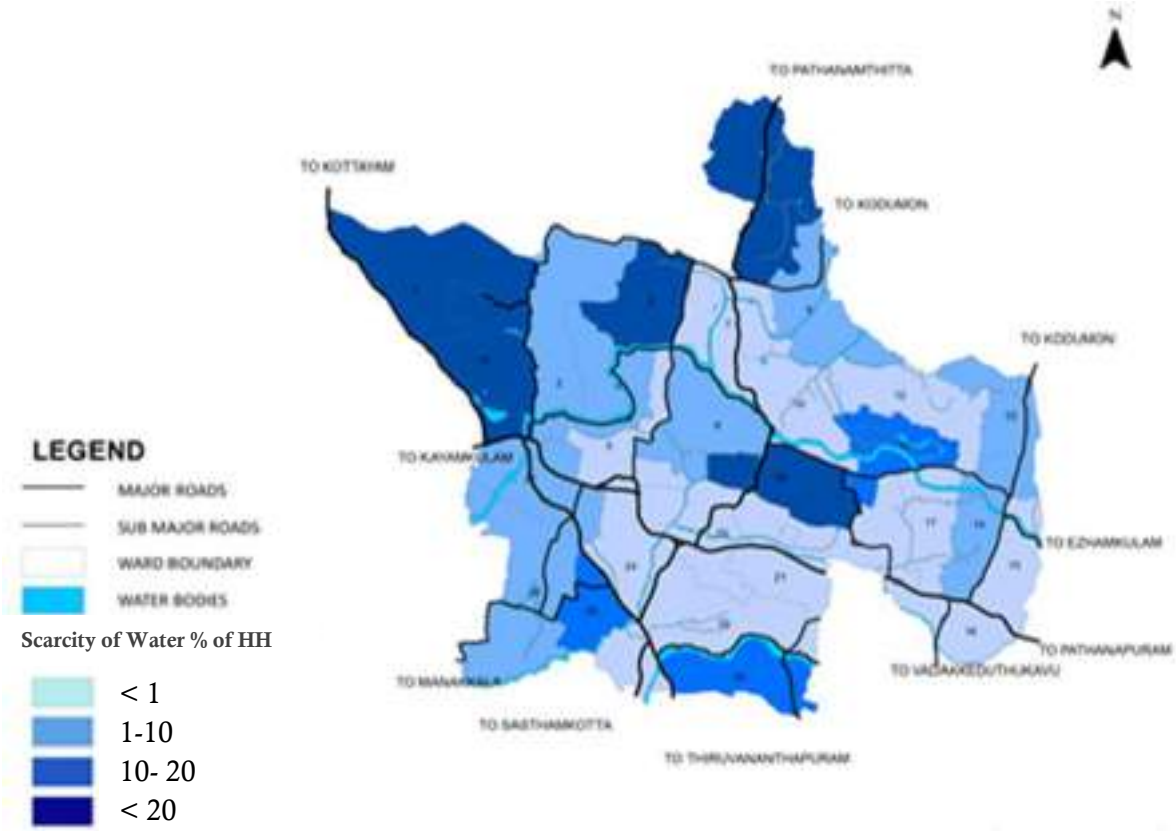


Figure 12.2 Scarcity of Water-Spatial distribution

12.2.5 Problems and Potentials

The water supply system in Adoor town faces problems such as dependence on limited surface and groundwater sources, contamination risks during heavy rains and floods, aging pipelines leading to leakage and loss, and irregular supply in certain wards. Inadequate storage capacity and pressure fluctuations further affect reliability, while power disruptions during lightning and storms often interrupt pumping. At the same time, the sector has significant potential, with scope for expanding supply through augmentation of surface water sources, rainwater harvesting, and rooftop storage. Modernization of pipelines, adoption of smart metering, and establishment of elevated reservoirs can improve efficiency. Community-level awareness, integration with Jal Jeevan Mission initiatives, and opportunities for public–private partnerships provide further scope to develop a resilient and sustainable water supply network for Adoor.

12.2.6 Inference

System for distribution of water to all major habitable area of the town is available. 75.86% of the households reported that there is no scarcity of water (as per Socio-Economic Survey 2019). In the Socio-Economic Survey, majority of the people has the opinion that water is not an issue. Undulating topography is a major hurdle in providing piped water supply. Only 25.93% of households are getting protected water from KWA. For 93.94% of the households, well is the main source of water. Certain areas of the town needed special attention as there is more scarcity of water.

12.3 Drainage

12.3.1 Existing drainage network – Natural and man-made, water logged areas

For the disposal of surface run off, drains are available along the major roads. There are about 3060 m covered drains and about 3740 m of uncovered drains maintained by the Public Works Department. These drains are ultimately leading to natural drains to dispose the excess runoff. Major portion of surface run off is disposed into Pallickalar. The major drainage network of town is shown in Figure 12.3. The natural drains and ponds in the town are listed and mapped in detail in Chapter 19.

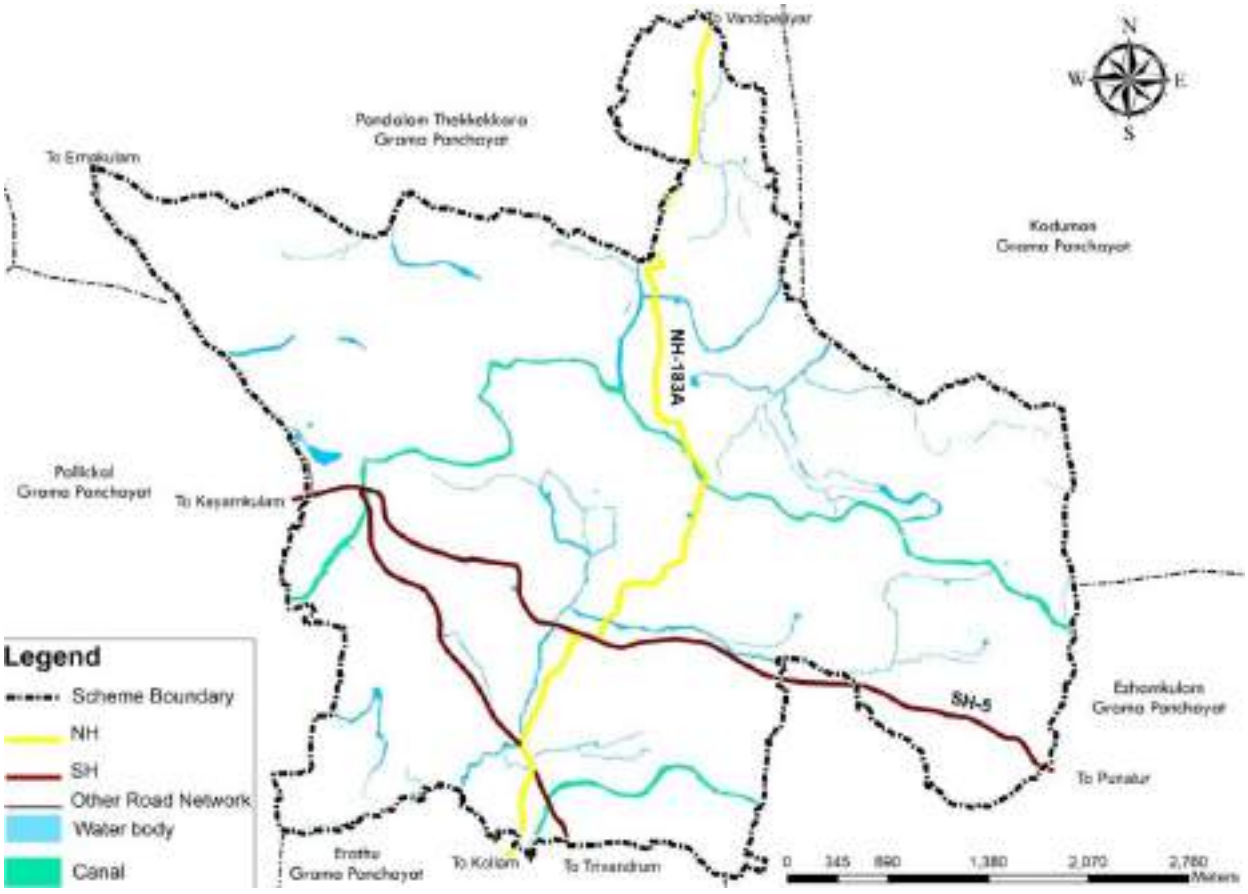


Figure 12.3 Drainage Network in town

A detailed drainage study was conducted in 2020-25 the existing drainage network of the town is mapped and is shown in Figure 12.4.The major food affected areas are highlighted from 2018 flood, especially in the Pallickal River and its tributaries. They need restoration to mitigate flood in during the monsoon season. The existing drains shown in the Figure area currently nonfunctional and need to repair.

12.3.2 Identification of gaps in the network - Analysis of capacity of existing drains, encroachment of natural drains, missing links

Adoor Town does not have a proper drainage network / coverage to adequately address storm water. The existing drainage network comprises of natural channels and man-made storm water

drains. Town has lost several streams due to development and encroachment by individuals. Pallickalaar flows through the water-scarce areas of town and has great development potential. Adoor town has been identified as a vulnerable area for flash flooding, particularly during the monsoon months. This persistent waterlogging hampers mobility, affects commercial activity, and poses health and environmental concerns, highlighting the urgent need for improved stormwater management in the town centre.

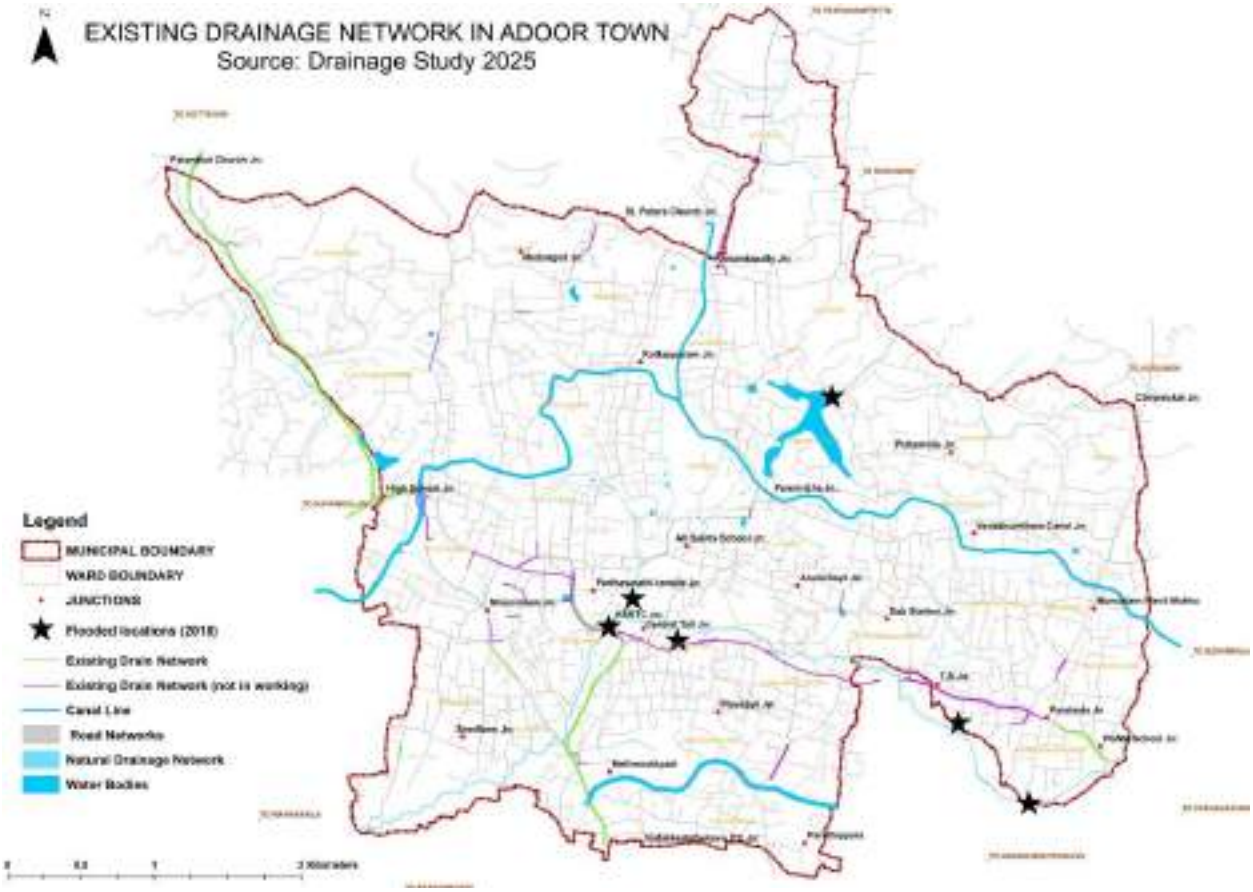


Figure 12.4 Existing Drainage network & Location of Flood

In Adoor Town, canals and streams are primarily relied upon for irrigation. As part of the Kallada Irrigation Project, the main canal branches flow toward Karuvatta and Manakkala areas. Among these, the Vadakkekara Canal flows through the soil of Adoor. The Pallickal River originates from Adoor. This stream, commonly referred to by Adoor residents as "Valiyathodu," passes through multiple wards. The only sources making irrigation possible are these two water bodies. The main issue faced concerning the canals is waste. Since they are owned by the Irrigation Department, cleaning is carried out only occasionally. As a result, the canals and their surroundings have become dumping grounds, overgrown with vegetation. Though several cleaning programs have been organized with the help of MGNREGA workers and locals, the Municipality has limited authority due to ownership resting with the Irrigation Department. It is necessary to identify waste dumping hotspots, install surveillance cameras, and take action against those who dispose of waste illegally.

In line with this, first-phase steps have already been initiated in town areas. The Irrigation Department should be made aware of the importance of timely canal cleaning, and regular maintenance should be ensured.

Regarding streams, along with the inflow of stormwater, soil and silt also accumulate, reducing the natural depth of streams. Without periodic cleaning and deepening, flooding occurs in houses and areas on both sides of the streams. Continuous stormwater flow causes erosion of streambanks, hence protection walls must be built along all streams. In Ward 10, the head pond or "Pottakkulam" and "Valiyakulam" in Perumonday are in a collapsed and sunken state. Urgent maintenance is required to make them usable. In Ward 13, parts of many streams have reportedly been filled in due to the spread of rubber plantations. The lack of streams is causing difficulty even for basic irrigation and drinking water. The land on both sides of the stream is public land, but it is being encroached upon and used for private purposes. This narrows the natural width of the streams and obstructs water flow. In several branches of the Pallickal River, such encroachments have resulted in reduced flow width. These conditions increase the likelihood of flooding during sudden heavy rains. At the start of the Pallickal River, in the outskirts of Adoor, plastic waste dumping has increased, turning the major stream into a waste-carrying channel. These polluted streams must be restored and made to flow smoothly again.

It's likely that the small landslides experienced on nearby hills in 2021 were due to blocked water channels. In Ward 15, to the east of Ezhamkulam LP School, a few people had to be relocated temporarily due to stream overflow. This issue can be resolved by building protective walls along both sides of the stream in the area. In Ward 16, a stream near the start of the Pallickal began flowing with waste after the construction of M Sun Auditorium. Action must be taken, and the stream protected in this area as well. In Anantharamapuram, since the stream is surrounded on three sides by water, overflow causes water to enter the homes of some families near the paddy fields. Constructing protective walls on both sides of the stream is the proper solution. In Ward 6, canal overflow during the opening of the canal has caused minor flooding issues since 2015. Building side embankments is the solution. In Ward 12, the municipal boundary stream at Kanjiravila-Puthurpadi, near Koshakuzhi, lacks protective walls on both sides, causing water to overflow on one side.

Due to lack of protection along roads and sides, urban residents are facing flood-related issues. The only permanent solution is to build protective walls on both sides, which requires municipal intervention. This stream, even used for drinking water in a Grama Panchayat located 10 km away, lies in an unhygienic condition within the municipality — a failure on our part. Therefore, encroachments on both sides must be removed, legal action taken against encroachers, and protective walls built along both sides as a priority. The public land on both sides of the streams

must be acquired by the municipality, planted with large trees, and preserved as a biodiversity zone. The large stream flowing through the urban areas of Adoor — namely the Pallickal River — is in a highly polluted and narrowed state at its origin due to plastic waste and encroachments on both sides. However, just 10 kilometers away, as it passes through other grama panchayats, this same stream flows as a clean water source. Pallickal River, which many people rely on for drinking water in those areas, must be cleaned and protected. This can be implemented with the help of the Ayyankali Employment Guarantee Scheme and members of the Haritha Karma Sena.

12.3.3 Effect of hazard risk in this sector

Urban floods severely affect the drainage system by causing sudden overloading of drains, leading to waterlogging, backflow, and erosion of side drains and culverts. Silt, solid waste, and debris carried by floodwaters often choke the drainage channels, reducing their capacity and resulting in prolonged inundation in low-lying areas. It highlights the vulnerability of the existing drainage network and underline the need for regular desilting, strengthening of channels, and provision of backup power for pumps to ensure effective flood management

12.3.4 Inference

Due to urbanization, many natural streams have been encroached this may disrupting the original hydrological flow. The town faces flash floods, and drainage congestion, particularly during the monsoon season, owing to inadequate capacity, poor maintenance, and lack of integration between natural and engineered systems. To enhance stormwater management and reduce flood risk, it is recommended to widen critical water bodies and natural drainage channels based on their stream order and catchment response. Furthermore, a comprehensive drainage master plan must be prepared that integrates ecological buffers, retention basins, and improved connectivity of the drainage network, while also incorporating climate resilience and urban expansion forecasts.

12.4 Sewerage System

12.4.1 Existing sewerage network

There is no sewerage system for the town. As per the Socio-economic survey conducted by the Town and Country Planning Department (2019) 99.31% of houses have some sort of sanitation system and only 0.69% of houses in the town do not have any sanitation system. In the survey it is also inferred that 54.48% of houses have septic tank, 44.83% of houses have pit latrine. It is represented in Figure12.5 and the analysis

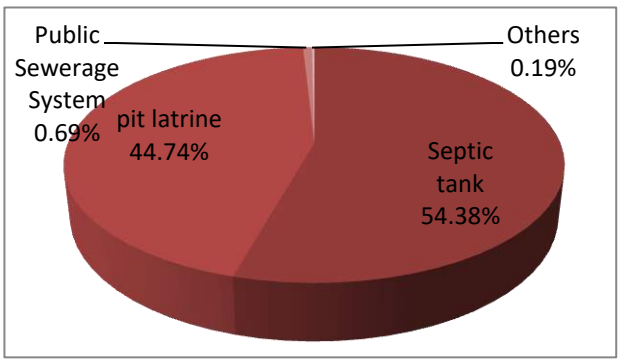


Figure 12.5 Disposal of Sanitary wastes

Source: Socio-economic survey

shows that better Sanitation system is available for the houses in the town. The availability of Public toilet / comfort station is very less in the town and at present only four Public comfort stations – at Parakode Market, KSRTC Stand, near Government Hospital and Private Bus Stand is functioning in the town. More public Comfort Stations are to be provided at different parts of the town shows in Table 12.1.

Table.12.1 Details of Comfort Stations

Sl. No.	Type	Location	Run by	Free/ Charged
1	Public Comfort Station	Parakode	Municipality	Charged
2	Public Comfort Station	KSRTC Adoor	KSRTC	Charged
3	Public Comfort Station	Near Govt.hospital	Municipality	Charged
4	Public Comfort Station	Pvt. Bus stand	Municipality	Charged

Source: Socio-economic survey

12.4.2 Management facilities - Collection, processing, disposal

The existing systems for the liquid waste in the local bodies were done as a primary level surveys. The template format for the identification of the existing systems was send to each municipality and their correspondences were recorded. The analysis suggests that Adoor Town is not having a proper mechanism to address the liquid waste produced in the Municipal area. The existing drainage system of the Municipality is a covered system; meant for the storm water drainage. Presently there is no scientific method of waste disposal available within Adoor Town. Majority of the settlements of the town are depending by on-site individual septic tanks and leach pits for their management of liquid wastes. Also it is worth to note that the municipality does not have a proper FSTP in its administrative limits.

12.4.3 Generation and sources

The quantity of grey water was calculated by the survey of various sources of liquid waste generators in the town and is shown in Table 12.2.

Table.12.2 Grey water Calculation- Adoor Town

Sl. No	Establishments	No. of Establishments	LPCD	Total No. of Seats/ Beds/ Users	Total Water Consumption / Day (Liters)	Quantity of waste water generated/day (Liters)
1	**2**	**3**	**4**	**5**	**6=(4) x(5)**	**7=(6) x 0.75-0.75**
1	Hotel	15	180/Bed	484	87120	65340
2	Restaurants	72	70/seat	1947	136290	102217.5
3	Hospitals with number of beds exceeding 100	2	450/bed	407	183150	137362.5

4	Hospitals with number of beds less than 100	1	340/bed	60	20400	15300
5	Nurse homes	2	135	6	810	607.5
6	Hostels	4	135	302	40770	30577.5
7	Boarding schools and colleges	0	135	0	0	0
8	Day schools and colleges	51	45	15751	708795	531596.25
9	Offices	110	45	1610	72450	54337.5
10	Factories	0	45-30	0	0	0
11	Cinema halls/concert halls /auditoriums	16	15	11141	167115	125336.25
12	Apartments	0	70	0	0	0
13	Any other establishments	227	70	1819	127330	95497.5
	Total				1544230	1158172.5
	Total Quantity of Water Consumed				1158172.5	Liters
	Total quantity of grey water (75% of water consumed in Liters)				1.16	Liters
	Daily quantity of grey water (In MLD)				1.39	**MLD**

12.4.4 Quantity of Septage

The Septage quantification was carried out based on the population of the Municipality. According to the IS Codes (CSE, 2017), Septage Value- Per Capita Per year (Liters) was taken as 120 liters. The yearly Septage generated is thus calculated based on this value and thus daily quantity of septage generated in Adoor is obtained as 11.29 KLD. It is assumed that 50% of this septage would be collected. This is quantity of septage taken for the design of treatment plant.

12.4.5 Treatment Technology

For Adoor Town, the quantity of septage generated to be considered for design purpose is 5.66 KLD. According to the values described in Table12.3, the land required for the demand is taken as 25 cents for the construction of the FSTP. But according to the note given, 25% land area is needed for office space, parking of vehicles and the like functions. The total land required for the proposed FSTP is given in the Table below.

Table 12.3 Calculation of land Requirement for FSTP

Quantity of Septage created (For Calculation)	8.18 KLD
Land area required for FSTP	25 cents
Land for office, parking etc. (@ 25% of area of FSTP)	6.25 Cents
Total required land for the proposed FSTP	**31.25 Cents**

12.4.5.1 Methodology of site selection

The methodology of the site selection for the proposed FSTP and STP has been carried out in a systematic manner starting from the overall demand to the site specific studies. The various interim stages to the site selection are shown in a process chart below Figure 12.6. The site selection for the proposed STP and FSTP were carried out in 7 stages. The quantification of the grey water and Septage were initially calculated based on the population and from the primary data available for the institutions/ establishments in the municipal area. The quantity thus arrived spatially studied over the Municipal area, and a basic zoning was delineated. By studying the parameters such as existing land use, population density, elevation and topography and functional character of the Municipal area, the zones were even sub divided/ joined for the exact positioning of the FSTP/ STP in the given region.

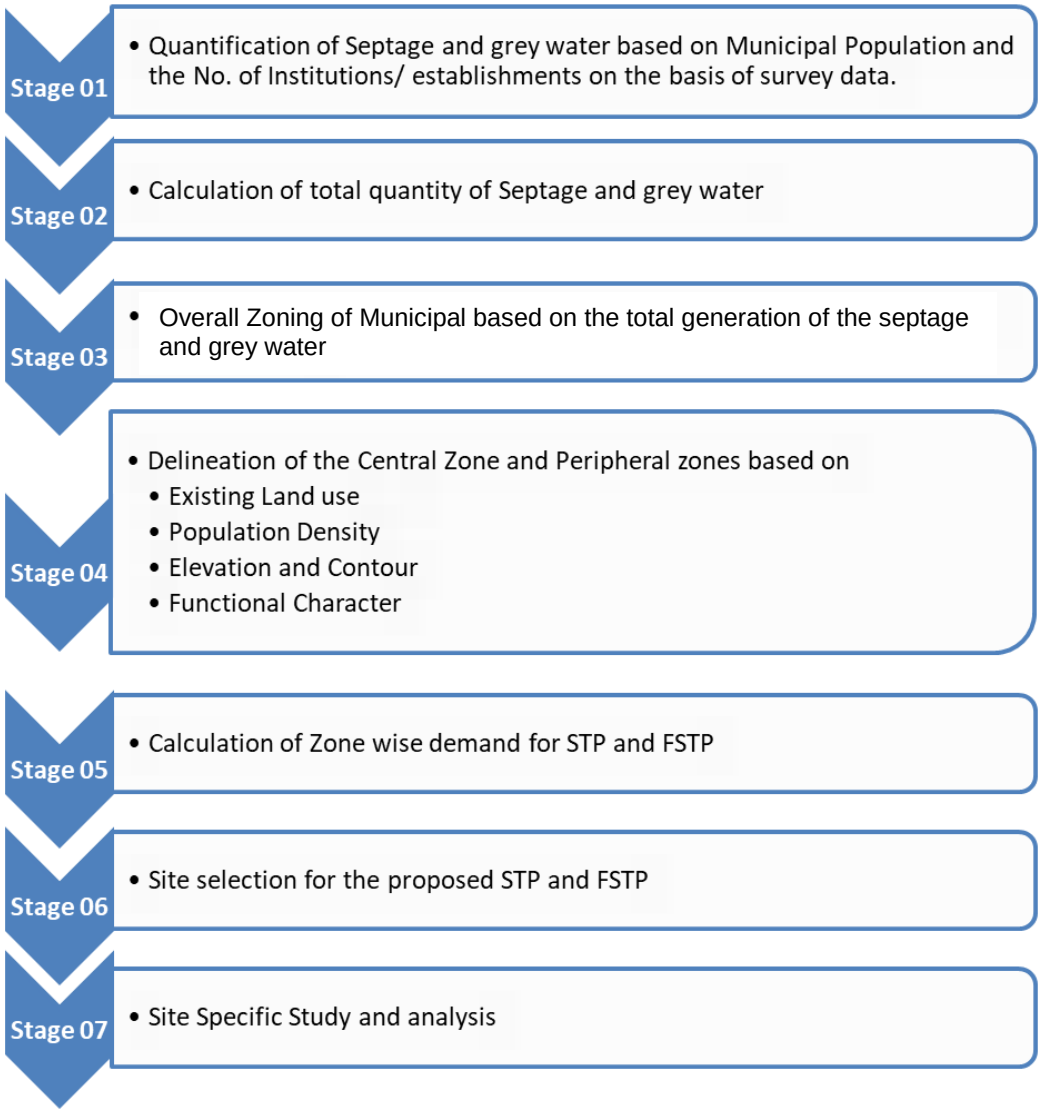


Figure 12.6 Various interim stages of site selection

12.4.5.2 Existing Land use

As per the land use survey 2010, agriculture (both dry and wet), residential, commercial, public and semi- public, industrial, open spaces, transportation and water bodies are the major land use classifications of Adoor Town. The land use pattern of Adoor shows that 50.06% of the town area is coming under Agriculture land. The commercial and other urban activities have taken place along the major travel corridors-M.C. road and K.P road and concentration of non-agriculture activities to an extent is there in this area. The two KIP main canals pass through the town is acting as physical barriers. The residential land uses is scattered all over the town area and mixed with agriculture land uses. The existing land use and its spatial distribution draw a demand of a proper infrastructural system in the North East zone of the town.

12.4.5.3 Population density

The population density of Adoor town as per 2001 census is 1418 persons/sq.km. It is lower than the population density of other two towns in the district, viz Thiruvalla and Pathanamthittawhich have density of 2034 persons / sq. km and 1617persons/sq.Km respectively.In the district scenario also, the population density of Adoor is not high. Certain Grama Panchayats also have population density more than that of Adoor. As seen from the population density, the northern part of the Municipality having higher density is subject to higher demand of the infrastructural systems. Also in the Case of Adoor town, being in the centre of a major transit corridor MC road, the economic activities are also very high. These factors demand for a proper sewerage treatment plant in the municipal limits.

12.4.5.4 Topography and Geology

Topography of Pathanamthitta district consists of three natural divisions, the highland, the midland and the lowland. The highland stretches through the Western Ghats and descends to the midland in the Centre, down to the lowland in the West. Adooris located in the mid land region of Kerala. No major rivers passthrough the town. Pallickal thodu is the major water body passing through the town. About 17 ponds are there in different part of the town.A main canal and a branch canal of Kallada irrigation project are passing through the town.Town has an undulating topography and is mix up of hills and valleys. The hills and valleys are distributed in all part of the town. The height of the town above M.S.Lvaries from 8m to 85m.

12.4.5.5 Functional Character

The functional character is determined based on population distribution, average plot size and land use. As per the regional studies Adoor has rural character. The study shows that, wards with urban and semi urban characters are located along the major travel corridors of the town, M.C.Road and K.P.Road. The study also shows the predominantly rural character of the town. All these factors suggest that, the central zone along the MC road should have a proper sewerage network in order to

address the growth of the town. Provision of FSTP in cllose proximity with the central area will enhance the overall functioning of the town.

12.4.6 Effect of hazard risk in this sector

Flood is the major hazard affecting the sewerage system of the town. Floodwaters can damage or destroy toilets, latrines, and septic tanks, making them inoperable and leading to the release of human waste into the environment. Floodwaters can carry a mix of sewerage and other contaminants into drinking water sources. This makes water unsafe for consumption and increases the risk of waterborne diseases like cholera, dysentery, and typhoid.

12.4.7 Inference

Adoor town does not have a proper sewerage network system to address the liquid waste produced. With no sewerage system, leaving large portions of the population dependent on on-site sanitation systems, which are often poorly maintained. A Sewerage Treatment Plant (STP) and a Faecal Sludge Treatment Plant (FSTP) would provide a long-term solution to the town's liquid waste management challenges. The proposed system of FSTP (Faecal Sludge Treatment Plant) in the Adoor Town will create a permanent solution to the liquid waste management issue of the town. Since the position of the site is near to major activity area, sufficient care must be taken for the proper management of the waste. The sewer suction machines should be carefully connected to the site by proper road network, without affecting the activities of the surrounding settlements. The operation and maintenance of the FSTP is also very crucial in the overall success of the project.

12.5 Solid waste management

12.5.1 Generation and sources

Handling of solid wastes is one of the major problems faced by the urban local bodies. Increase in the volume of urban waste is principally due to increasingly affluent life style, rather than urban growth. The municipal solid waste productions continue to grow both in per capita and over all time. Assuming that 300 gm of solid waste is generated person per day, the present quantum of solid waste generated will be about 8.75 tonnes per day for Adoor. As per the draft solid waste management plan for Adoor Town by SWMP the total quantity of waste generated at household level is 4.88 TPD, in institutional level it is 2.72 TPD and in community level it is 1.77 TPD. The following are the major sources of generation of solid waste in Adoor Town identified for random sampling.

- Individual Households: Dwelling units are the major waste generators of SW. Solid waste comprises of bottles, cans, disposables, food packaging, food scraps, newspapers, magazines, garden moppings, discarded leather, clothes and rubber materials etc.
- Commercial Establishments/Institutions/Hotels: Educational institutions and commercial establishment such as hotels and restaurants, offices, shops, theatres, malls, lodging places

etc. are major source of waste. Commercial waste constitutes of recycling materials which has recycling value.

- Market: Another major contributor of SW is the waste from market yard. The market wastes are ideal for composting.
- Offices and Institutions
- Hospitals and Health Care Institutions
- Town and Community Halls
- Street Sweeping: The waste generated by the daily sweeping of roads, streets, lanes, and by-lanes comprises of various materials.

12.5.2 Quantity of Waste

As per the study, the total quantity of BDW generated at household level is 6.536 TPD and NBDW is 1.742 TPD. At present, institutional level BDW is managed at source to the extent possible and remaining quantity is being transferred to external agencies as pig or cattle feed. Total waste generation of hotels and restaurants in Adoor Town is 0.941 TPD. Total waste generation from Institutions in Adoor Municipality is 0.947 TPD. Total waste generation of commercial institutions in Adoor Town is about 2.518 TPD. As per the study the total quantity of BDW generated at community level is 0.6 TPD and NBDW is 0.2 TPD. E-Waste generated in Adoor Town is found to be 0.27 TPD .Domestic Hazardous waste including batteries, medicine leftovers, pesticides, masks, discarded paint, CFL bulbs, tube lights, broken mercury thermometers, needles and syringes etc. is about 0.27 TPD. Construction and Demolition waste (C&D Waste) generated in Adoor Town is 1.32 TPD.

12.5.3 Existing management facilities - Collection, processing, disposal

The Health wing of the municipality is in charge of collection and disposal of wastes. The collection of wastes by the municipality is confined in public places and only part of the solid waste generated in the municipal area is being collected and disposed by the Municipality. No agency other than Municipality is engaged in collection of solid waste. 1 mini truck lorry is used for collection of wastes and 29 employees engaged in the collection, transportation and disposal process. The regular sweeping areas are Parakode Market and Sree-Moolam market area. Waste collection by the Municipality is limited to parakode East, Anandaramapuram Parakode West, Adoor Central, Town Ward, Holly cross-ward Puthiyakavilchira and Mithrapuram wards.



Figure 12.7 Waste Management Plant

12.5.3.1 Collection coverage

Currently, the Municipality has no proper primary system for collection, transportation, treatment and disposal of biodegradable waste due to the absence of a Centralised Processing Plant. So, source level treatment is promoted. Total number of households in Adoor Town is about 10642, out of which, 5843 households are covered by the HKS members for the collection of NBDW i.e. about 55% households (5843 households) have NBDW collection facility using HKS, as specified under the SWM Rules 2016. Due to the intervention of HKS these households have segregated storage facility for wet, dry and domestic hazardous waste. The volunteers impart repeated awareness for providing proper facilities for segregated storage of waste into three categories, specified under the SWM Rules 2016. The uncollected BDW from household level is being managed at source level using simple traditional methods such as pit composting, feed for cattle rearing, poultry etc. The NBDW part is being stored at source and handing over the same to informal sector/scrap dealers.

12.5.3.2 Collection Field Workers

At present there is a system of house-to-house collection of NBDW through NGO/ SHG/ Private agency/ Haritha Karma Sena on a regular basis as part of Zero Waste Adoor Town. Currently, BDW is not collected from domestic sources. However, BDW is collected from shops in selected wards, which is then taken to aerobic bin facilities. The HKS collects user fee from generators and transports the waste to the mini MCFs or Centralised MCF. Collected NBDW including plastic and E-waste is handed over to agencies including CKCL for co-incineration in cement plants, road tarring, recycling or to local recycling companies. Currently, HKS volunteers spend 14 days of a month collecting the waste (and remaining days in segregating the collected waste) so that each house is visited once a month. The collection time window is from 10 am to 5 pm. 56 Haritha karma sena workers associated with this procedure. A 'Haritha Sahaya Sthapanam'(HSS) is a recent initiative at local body level for organizing collection activity, management support, and ensure coordination to the HKS. The HSS supports the HKS in maintaining fee collection accounts and assist it to ensure participation of all volunteers in primary collection activities.

12.5.3.3 Transfer Stations

At present there is no scientific transfer stations in the Municipality for transferring waste from all wards to the available NBDW processing facilities. The available vehicles are used on need basis for collection and transportation of waste from different places.

12.5.4 Disposal

The waste disposal yard is located at Kaimalappara and 77 cents of land is available here. Windrow composting plant is installed there and 650 kg of bio-degradable waste is processed per day by Aerobic composting method. Thumboormoozhi model aerobic composting plants are installed at

Anandaramapuram Market, Parakode and Private Bus stand, Adoor. 50 kg of bio-degradable waste is processed per day in these units.

In the Socio-Economic Survey (2019) conducted by the Town and Country Planning Department, 99.17% households reported that they are disposing the solid waste in their own compound and 0.14% in Garbage bin. The share of places of disposal is shown in Figure 12.8. Nearly 40% of the residential buildings are situated in plots of area less than 10 cents and 80% of buildings are situated in plots of area less than 25 cents. The problem is more severe in slums and colonies. So the waste collection system has to be extended for collection of wastes from residences as well.

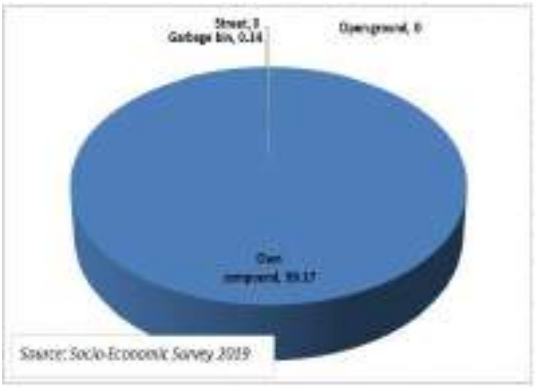


Figure 12.8 Place of disposal of solid waste

As per the draft solid waste management plan for Adoor Town by SWMP in household level 897 pipe compost units,647 biodigester bins and 97 ring compost units are under working condition over a total of 3065 supplied units. In addition, the total number of units planned to be supplied is about 9001. At institutional level no treatment units functioned within the municipality but in community level 12 thumboormuzhi units (23 bins) are under working condition.



Figure 12-9 Pipe Compost Units



Figure 12-10 Biodigester bins



Figure 12-11 Ring compost units



Figure 12-12 Thumboormuzhi units

No system managed by the Municipality is there for collection and disposal of bio-medical wastes from the Hospitals functioning in the town. They are depending on a private agency (IMAGE,

Palakkad) for collection and disposal of bio-medical waste. The Municipality generates about 0.28 TPD of inert waste. At present there is no scientific SLF for disposal of inerts.

12.5.5 Management of other waste

Other waste types in the town, apart from biodegradable and non-biodegradable waste, include sanitary waste, medical waste, domestic hazardous waste, e-waste, construction and demolition waste, inert and ceramic waste, and non-recyclable waste.

12.5.5.1 Slaughterhouse and Chicken Stalls

There is no authorized slaughterhouse operating in Adoor Municipal Area. At present there is no facility for collection, treatment and disposal of waste from chicken stalls. Solid waste generated from such sources contribute to the waste generated from markets and commercial establishments. Slaughterhouse waste is not coming with the city level solid waste as it is not included in the Solid Waste Management Rules 2016 and required onsite storage treatment and disposal facility is to be established in the slaughterhouse compound as it is considered as a special waste. As a state level initiative, district level rendering plants for treatment and disposal of chicken waste and slaughterhouse waste has been established. Rendering plants are operating in all most districts except Thiruvananthapuram, Alappuzha and Idukki district. The ULB can take action for directing the private chicken stalls and slaughterhouse to nearby available rendering plant waste as the responsibility of managing the waste from those institutions/establishments are vested with waste generators. The Rendering Plant of 5 TPD capacity for recovery of resources from chicken waste, established and operated by a private agency (Green Tech Solutions and Innovations, Payyanellur, Adoor, Pathanamthitta) is being utilized for chicken waste collection and treatment generated in Pathanamthitta district including Adoor Municipality.

12.5.5.2 Sanitary Waste

Sanitary waste generated from households and institutions, comprising of sanitary pad, diapers (for children and adults) is about 0.26 TPD (about 2% of the total as per the quantification and characterisation study) in Adoor Municipal Area. As per the SWM Rule 2016, producers/manufacturers of above-mentioned consumable items are required to collect back the used material. Sanitary waste needs to be collected from its sources and a management system is required to be developed as part of this SWM Plan. Sanitary waste if not collected can result in unscientific burning or dumping on land or water bodies.

12.5.5.3 Domestic Hazardous Waste

Domestic Hazardous waste including batteries, medicine leftovers, pesticides, masks, discarded paint, CFL bulbs, tube lights, broken mercury thermometers, needles and syringes etc. is about 0.27 TPD (About 2% of total waste according to quantification and characterisation study). Segregated storage of domestic hazardous waste and primary collection, transportation and scientific disposal/treatment facility is required to be provided as per the provisions of the relevant Rules. The

proposed regional sanitary landfill facility under KSWMP will have a secured landfill for scientific disposal of domestic hazardous waste. Transportation of the same to the proposed regional facility can be done periodically for ensuring scientific disposal of domestic hazardous waste. This plan is targeting for achieving the above-mentioned goal

12.5.5.4 E-Waste

E-Waste generated in Adoor Municipality is found to be 0.27 TPD (2% of the total waste generated as per the CPCB norms). E-waste is the class of waste from electronic and electrical devices. E-waste is the discards of electronic and electrical devices DVDs, music systems, TVs, telephones, mobile phones, computers, vacuum cleaners, refrigerators, air conditioners, and all other household electrical equipment come under E-waste/ E- scrap/ waste electrical and electronic equipment (WEEE). Some E-waste items contain lead, mercury, cadmium, and brominated flame retardants which are harmful to life and environment. So, it is important to ensure proper disposal of such waste. As E-waste does not fall under the purview of Solid Waste Management Rules, 2016, it is not dealt with separately in this plan. It is proposed to provide facilities to store E-waste at the Material Collection Facilities (MCFs)/ Material Recovery Facilities (MRFs)

12.5.5.5 Construction and Demolition Waste

Construction and Demolition waste (C&D Waste) generated in Adoor Municipality is 1.32 TPD (10% of Total waste generated as per G.O.(Ms)No.168/2022/LSGD issued by the Local Self Government Department, GoK). Construction waste is that resulting from the construction of roads and buildings. Demolition waste is generated during pulling down of old buildings and structures. It is common in the new urban landscape of old cities and includes huge quantities of concrete debris, wood, sand, boxes, plastics and the like. C&D Waste Management Rule, 2016 is a separate legislation for managing construction and demolition waste.

12.5.5.6 Rejects, Inerts and Ceramic Waste

It is found that the term 'Rejects' are the fraction of wastes that are soiled, Multi Layered Plastics (MLPs), ceramics and non-recyclable materials of some calorific value. Inert that cannot be recycled or recovered is not addressed by the ULB, as there is no sanitary landfill. As per the characterisation study, the contribution of inert waste is 2.15 % which is 0.28 TPD.

12.5.6 Inference

The solid waste treatment plant at Kaimalappara is functioning effectively and it can be upgraded to a regional plant. Considering future demand, new Thumboormozhi units and expansion of MCF are necessary. Regional treatment facilities are more suitable for treatments of rejects and municipality should take initiative to identify land for regional treatment facilities. Preparation of a solid waste management plan for the town also help to manage the overall solid waste of the town in structured manner.

12.6 Energy

12.6.1 Energy consumption: sector wise break up

The category wise connection and consumption details of Electrical division of Adoor is discussed here. Distribution is done by dividing the town in two zones-A zone and B zone. The Connection details and consumption details is shown in Table 12.4 and Table 12.5.

Table 12.4 Electricity connection details

Zone	No. Of Connections					
	Domestic	Industrial	Commercial	Agriculture	Others	Total
Total	17021	229	5041	102	196	22581

Source: KSEB

Table 12.5 Electricity Consumption (in MKWH) details

Zone	Electricity Consumption (in MKWH)					
	Domestic	Industrial	Commercial	Agriculture	Others	TOTAL
Total	3775244	163711	1634787	13165	103992	5690899

Source: KSEB

12.6.2 Electricity – Distribution network, Low voltage areas, Frequent power disruption areas

Electric power to Adoor town is distributed through Adoor 66 KV Sub-Station (upgradation process initiated for 110 Kv sub-station) located at T.B.Hill 2 Nos 10 MVA and 7.5 MVA Transformers are installed in the Sub-Station and the present load is 17.5 MVA. Distribution of power from the Sub Station to the different part of the town is through eleven feeders. Considering the new connection and for improving the voltage, the capacity of the Sub Station has to be increased or new Sub Station shall be constructed in the town or adjacent area. The distribution of power in town is under the control of Electrical division, it consists of Adoor subdivision and Ezhamkulam sub division. Adoor sub division comprises of 4 sections Adoor, Pallickal, Kaipattoor and Pandalam Thekkekkara . Major Portion of Adoor Municipality and adjacent Pallickal, Kadampanad, and Erath Grama Panchayats is coming under Adoor Section. Distribution in the Parakode area of Adoor Municipality is under the control of Ezhamkulam sub

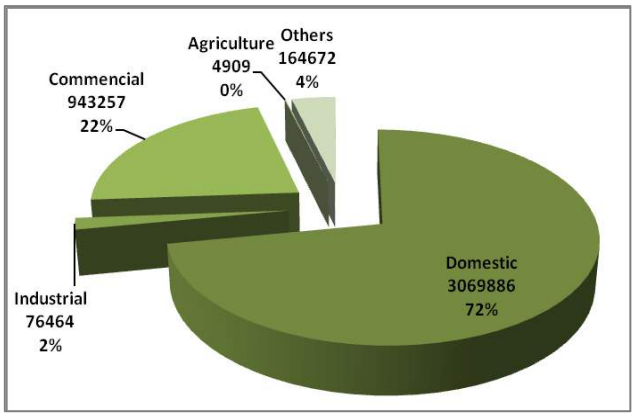


Figure 12.13 Category wise consumption of electricity

division. More percentage of electric power (in terms of connection and consumption) is used for domestic purpose. Consumption for Industrial and Agriculture purpose is very less. It indicates low level of industrialization of the Town. There are 1958 number of street lights installed at different part of the town. Absence of Separate Street main is the major hurdle in providing the street lights in certain part of the town. As per the Socio-economic survey conducted in 2019, 97.80% of houses of the town are electrified.

12.6.3 Bio-mass & energy from non-conventional sources

The Socio Economic survey revealed that 99.51% of houses in the town are using conventional sources of energy and the use of non-conventional sources of energy is very nominal (0.49%) shows in Figure 12.14.

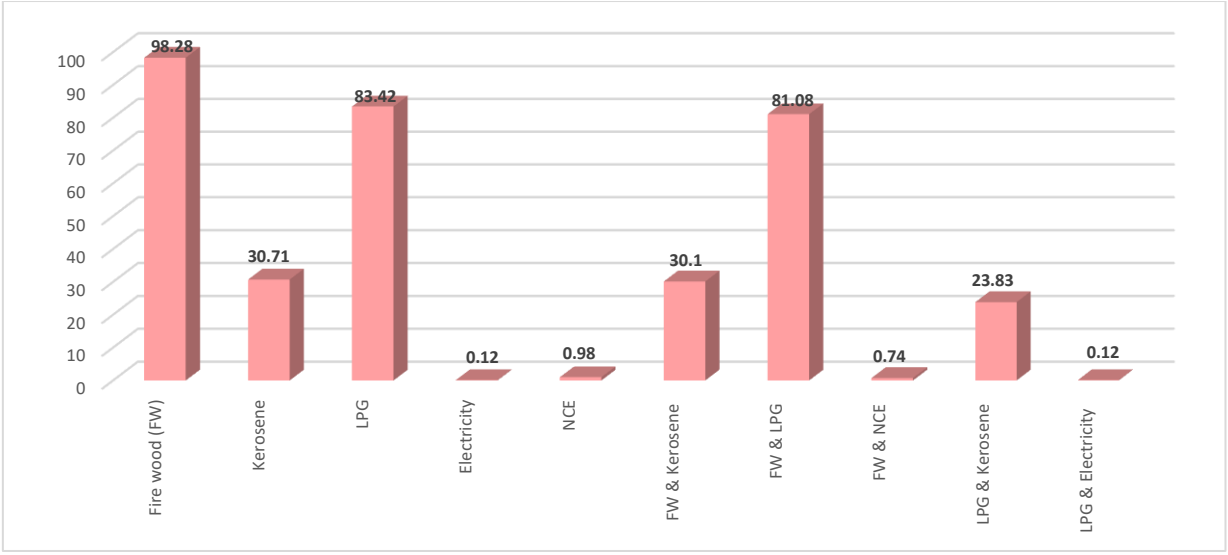


Figure 12-14 Percentage of households using different category of fuels

12.6.4 Energy efficiency – Initiatives

Most of the houses are electrified. Now importance shall be given for improving the quality of supply and other mode of energy sources. 66.34% of the electric power is consumed for domestic purpose and 28.73% for commercial purpose.(Socio Economic Survey 2010) Consumption of power in Industrial sector is very nominal. Solar photovoltaic array (SPVA) systems are good other power supply sources. The Kerala State Electricity Board has introduced a new solar subsidy programme for residents of the state with 40% in solar subsidy in Kerala for rooftop solar panels under this programme. (Only 1% of the domestic connections have registered this facility. (Number of registered consumers in Adoor Division till 2023: 155 domestic 10 commercial and other).

12.6.5 Effect of hazard risk in this sector

Considering the risk assessment, lightning is predominant disaster in the south east part of the municipality. So the SPV power plant should be provided with lightning and over voltage protection. The source of over voltage can be lightning or other atmospheric disturbance. The lightning conductors shall be made as per applicable Indian Standards in order to protect the entire

array yard from lightning stroke. The design and specification shall conform to IS/IEC 62305, "Protection against lightning"\ govern all lightning protection-related practices of a PV system. As per the guidelines specified by ANERT through publication named "Technical Specifications of on Grid Solar Power Plant". In addition, lightning arresters should be placed at area prone to lighting as per the concurrence from electrical inspectorate. All these suggestions are evolved from the focus meeting conducted as per the part of preparing risk informed master plan. As per LAPCC report heat wave is a major aspect need to give more importance in the coming years. As per the hazard indicators heat wave comes under high risk category. Its mitigation and preventive measures are discussed in the corresponding chapter.

12.6.6 Problems and potentials

Majority of the houses in Adoor are electrified. The use of nonconventional sources of energy is very low and needs to be enhanced. A new solar subsidy programme has been introduced by the Kerala State Electricity Board for residents of the state. People can receive up to 40% in solar subsidy in Kerala for rooftop solar panels under this programme (Number of registered consumers in Adoor Division till 2023: 155 domestic 10 commercial and other). In the local level analysis it is identified that absence of street lights in certain parts of the town and separate line for providing street light is an issue.

12.6.7 Inference

Low voltage is not a problem in the town, but frequent power supply interruption is a problem. Absence of separate street light line is creating problems in the functioning of streetlights. Most of the houses are electrified. Now importance shall be given for improving the quality of supply and other sources of energy like Solar photovoltaic array (SPVA) systems. Considering the risk assessment, south-east part of the municipality is prone to lighting. So proper mitigation measures should be taken while developing this area. Still firewood is a major domestic fuel in the town. It may be due to its availability.



CHAPTER 13
EDUCATION

13.1 Introduction

The education sector is crucial for a town's development as it attracts residents and businesses, creates a skilled workforce, stimulates the economy, fosters innovation and entrepreneurship, enhances social and cultural life, increases property values, reduces crime rates, and improves the overall quality of life. Education facilities were available in Adoor, even when it was part of Travancore Kingdom. The Malayalam school established in 1914 during the period of Sree Moolam Thirunal is the present Adoor Government U.P.School. It is the oldest school in Adoor Municipal area. Anandapally L.P.School (1926), Parakode Welfare L.P School (1926), Parakode N.S.U.P.S (1936), Parakode P.G.M.G.H.S (1942) are the schools established in Adoor in earlier stage.

Another educational institution to be mentioned is Adoor Government High School, which was established in 1921. In 1961, the school was bifurcated into two separate schools - Adoor Boy's High School and Adoor Girl's High School. But these schools are located in adjacent Pallickal Grama Panchayat, just at the boundary of the Municipality. The literacy rate of Adoor town as per 2011 census is 96.31%. The literacy rate of Pathanamthitta district and Kerala state are 96.93% and 93.91%. The literacy rate of the town is slightly less than district and higher than the state literacy rate. Comparing with district urban literacy rates, the literacy rate of Adoor town is slightly lower than the district urban literacy rate of Pathanamthitta (urban) 96.90 %. There is enough number of educational institutions in the town.



Figure 13.1 Govt. UPS, Adoor



Figure 13.2 Govt. HS, Adoor

13.2 Existing facilities - Type and Number of Educational institutions, Standard of Education, Facilities within institutions

The details of schools in the town, i.e. number of students , number of teachers, syllabus (up to HS), Category like Government, aided, unaided, unrecognized etc, facilities available, medium of instruction, established year etc. are given in Annexure.13.1 & 13.2. There are 25 schools (including L.P.Schools) functioning in Adoor town limit. Adoor Government Boy's High School and Adoor

Government Girl's High School are situated near town boundary, Adoor Kendriya Vidyalaya is located just beyond the municipal boundary, but in Pallickal Grama Panchayath also serve the students from Adoor town. The number of schools in various categories is shown in Table 13.1.

Table 13.1 Number of schools in various categories

Category	L.P. School	U.P. School	High School	Higher Secondary Schools
No. of schools	11	6	4	2

Source: Town Directory 2019

Regarding the ownership of schools, all schools in Higher Secondary and High School level in municipal limit are functioning in private sector. But in the case of U.P schools, 5 schools are functioning in private sector, 1 school is in Government sector. In the case of L.P School, seven schools are functioning in government and four schools are in private sector. This shows the predominance of private sector in the school education of Adoor town. In High school and Higher secondary section there is no Government institutions and hence students have to depend either aided or unaided institutions. But in primary section (both L.P. School and U.P. School) the situation is comparatively better. The number of students studying in Government school and Government aided school is more than number of students in unaided school.

Out of 23 schools functioning in the town 20 schools are following Kerala state syllabus, three schools are following CBSE syllabus and in one school ICSE syllabus is following. The availability of institutions, particularly the distance to different categories of schools, has been analyzed. As per the Socio-Economic survey of 2019, the average distances to LP School, primary school, UP School and High school are 1.04 km, 1.08km, 1.15km and 1.32km respectively. It is represented in Figure 13.3.

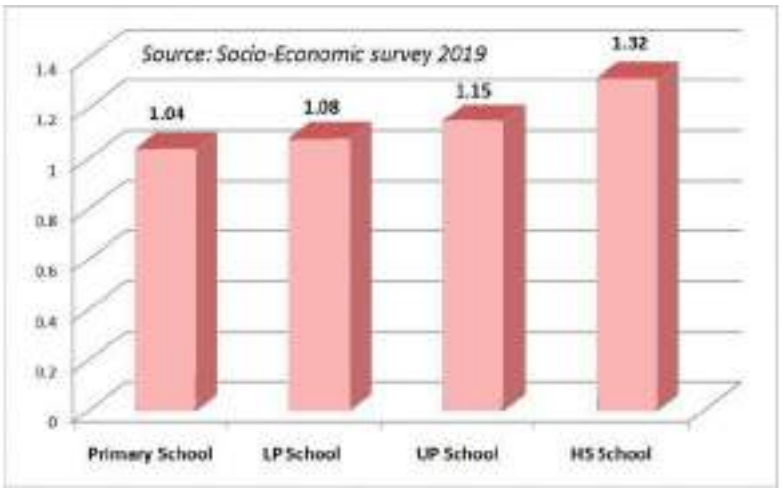


Figure 13.3 Average distance to schools

The distance to various categories of schools is compared with certain standards. The adopted standards based on studies related to preparation of IDDP and LDPs in Kollam district, are the preprimary school, primary schools upper primary schools and high schools shall be available within a distance of 0.50, 0.50, 1.00 and 3.00Km respectively.

As per Socio economic survey 2019, the percentage of population having distance to different category of schools greater than the standard is shown in Figure 13.4. The figure shows that in the case of primary schools, upper primary schools, the travel distance is more for a major percentage of students. Even though there are sufficient number of schools in the town there is concentration in certain part of the town. The spatial distribution of schools in Adoor is shown in Figure 13.5.

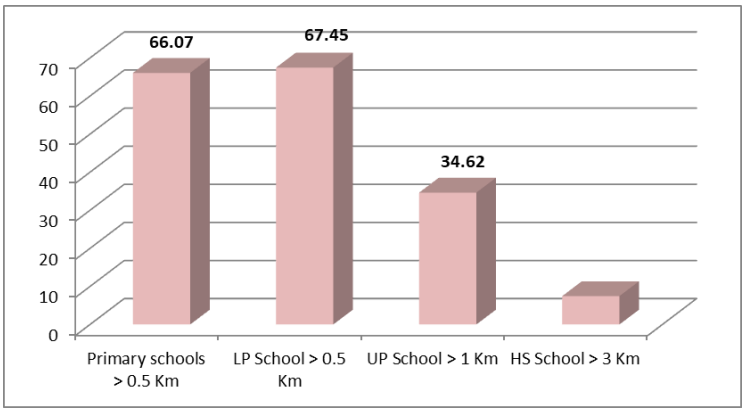


Figure 13.4 Distance to school-comparison with standards

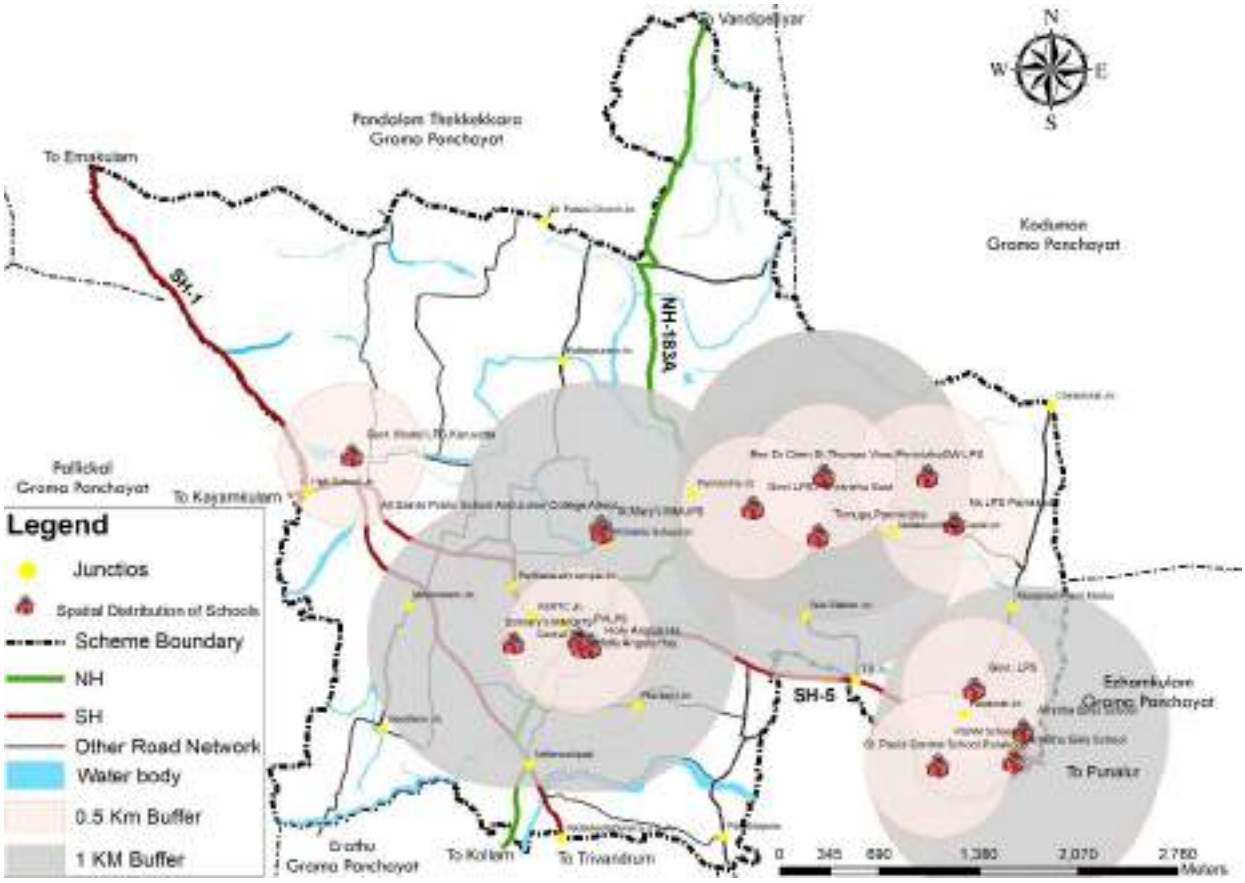


Figure 13.5 Spatial Distribution of Schools in town

13.3 General Education – Status

The general education status is assessed based on literacy rate, number of educational institutions per 1 lakh population and educational status. The educational status of the town is assessed by comparing the percentage qualification of the people. It is shown in Figure13.6. 24.48% of people

have only Primary Education, 32.33% of people have high school education and 13.93% of people have Pre-degree qualification. The remaining 28.28% possess degree or higher qualification.

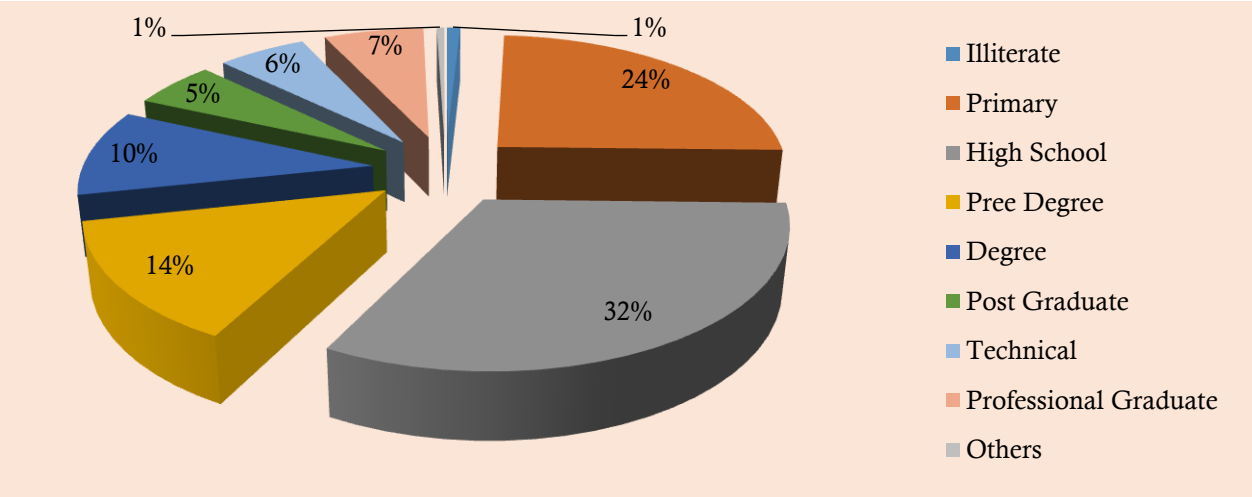


Figure 13.6 Educational status of the town

Source: Socio Economic Survey 2019

Also, Adoor has comparatively high literacy rate than all other grama pachayats except Thumpamon, Pandalam Thekkekkara and Pandalam Municipality. The educational qualification of the people is also high. It indicates the high educational status of the town. The Literacy rate comparison with surrounding Gramapanchayats is shown in Figure 13.7.

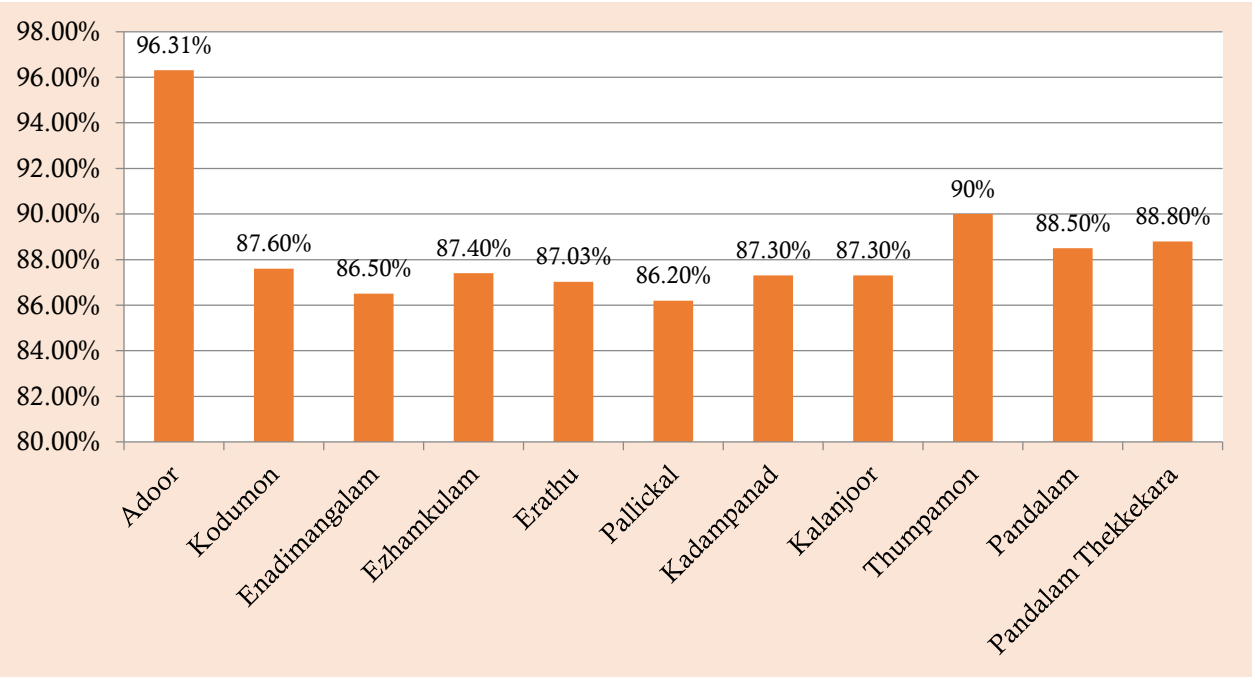


Figure 13.7 Literacy rate comparison with surrounding Gramapanchayats

Source: Census 2011

13.4 Higher and professional education- status

St.Cyrils Arts and Science Colleges, Adoor is located at Kilivayal in adjacent Erath Grama Panchayat and a few kilometers away from the town. But there are three Teachers Training Institutes within the town. They are Parakode P.G.M Teachers Training institutes, H.H.Marthoma Mathew II Training College, Adoor and Viswabharathi Pre-primary teacher training institute. But recently a few self-financing institutes have also started in Adoor. Christian College, near Temple Junction Adoor offering courses in B Com and M Com courses.

University Institute of Technology, Adoor is situated near High School Junction. BCA, BSc Computer science, BBA are the courses offered at University Institute of Technology. College of Applied Science, Adoor is located near General Hospital and offers courses in BSc computer science, BSc electronics, PGDCA and MSc Computer Science. The details of these institutions are furnished in Table 13.2. IHRD College of Engineering, Adoor which is functioning at Manakkala on the outskirts of Adoor town offers Engineering degree in various branches. All of the above three institutions are in public sector and Self Financing Institutions.



Figure 13.8 University Institute of Technology, Adoor

Table 13.2 Technical Institutions offering degree sources

Sl. No	Name of College	Sector	Students	Teachers	Non-teaching	Courses offered	Area (Ha)
1	University Institute of Technology, High School Junction,Adoor	Public	280	16	6	BBA & Bsc Computer Sceince,	0.324
2	College of Applied Science, General Hospital Junction,Adoor	Public	1000	44	20	BSc Computer Sceince, MSc computer Science, BBA, BCA, Mcom with CA, MSc	1.257

In addition to the above Technical institutions, the Government Poly Technic College is functioning at Manakkala in adjacent Erath Grama Panchayat. Two Technical Institutions (ITCs) in private sector is functioning in Adoor Municipal limit and one institution is functioning at the Municipal boundary (Vadakkedathukavu). Details of other technical institutions is shown in Table 13.3. Holy cross school of nursing is another professional institution functioning in the town. It is an institution

in private sector conducting courses in General nursing and midwifery. Details of other technical institutions is shown in Table 13.4 In technical education sector sufficient numbers of institutions are functioning in the town limit and the outskirts. But supporting facilities like library facilities, sports and recreational facilities, hostel facilities etc are inadequate in the town. The spatial distribution of higher educational institutions are given in Figure 13.9.

Table 13.3 Other professional institutions

Sl. No.	Name of College	Students	Teachers	Non-teaching staff	Courses offered
1	Holly Cross college of Nursing, High school Junction	154	17	8	BSc. Nursing

Table 13.4 Other Technical Institutions

Sl. No.	Institution	Location	Courses / Trades of study	No. of students	No. of teachers	No. of Non-teaching staff
1	Talent Accademy	Opp. Govt. Hospital	GITD-Fashion Designing	10	1	1
2	In House Aviation Training Academy	Opp. Govt. Hospital	IATA, Airport operation, Travel and Tourism	30	1	1
3	School Of Computers	Near Market. Adoor	Computer Engineering	5	1	1
4	Bharat Private ITI	Central Junction.	Sanitary Inspector course	42	2	2
5	Tejas Academy	Central Junction.	MOH, DHA,	10	2	2
6	Istrox Acadmy	Central Junction.	Net. JAVA, PHP	8	2	1
7	Computer Centre Of India	Near KSRTC	PGDCA, DCA	38	2	1
8	CAD POINT Training Centre	Near KSRTC	Autocad, 3D Max, REVIT	20	3	1
9	Blits Academy	Near KSRTC	QA/QC, MEP,HVAC	10	3	3
10	CADD Centtre	Near KSRTC	Autocad, 3D Max, REVIT	30	5	3
11	C-Dit CEP IT Kid	Revenue Tower	C Dit Computer Courses	60	6	1
12	Omkar IT Academy	Revenue Tower	IT Based Courses	25	2	0
13	HRD Centre for Profession	Revenue Tower	DPA, Tally, Computer	50	2	1
14	Pinwise Institute	Revenue Tower	CA, CMA	30	5	2
15	Omkar Institute of Technology	Revenue Tower	Welding, Quality Control	5	2	1
16	Sindu ITI	High School Junction	D. Civil, Electical, Fitter	150	7	2
17	International Technical Institute	Near Pvt. Bus Stand	Electrical, AC Refrigeration, Welding, Auto Mobile	54	7	1

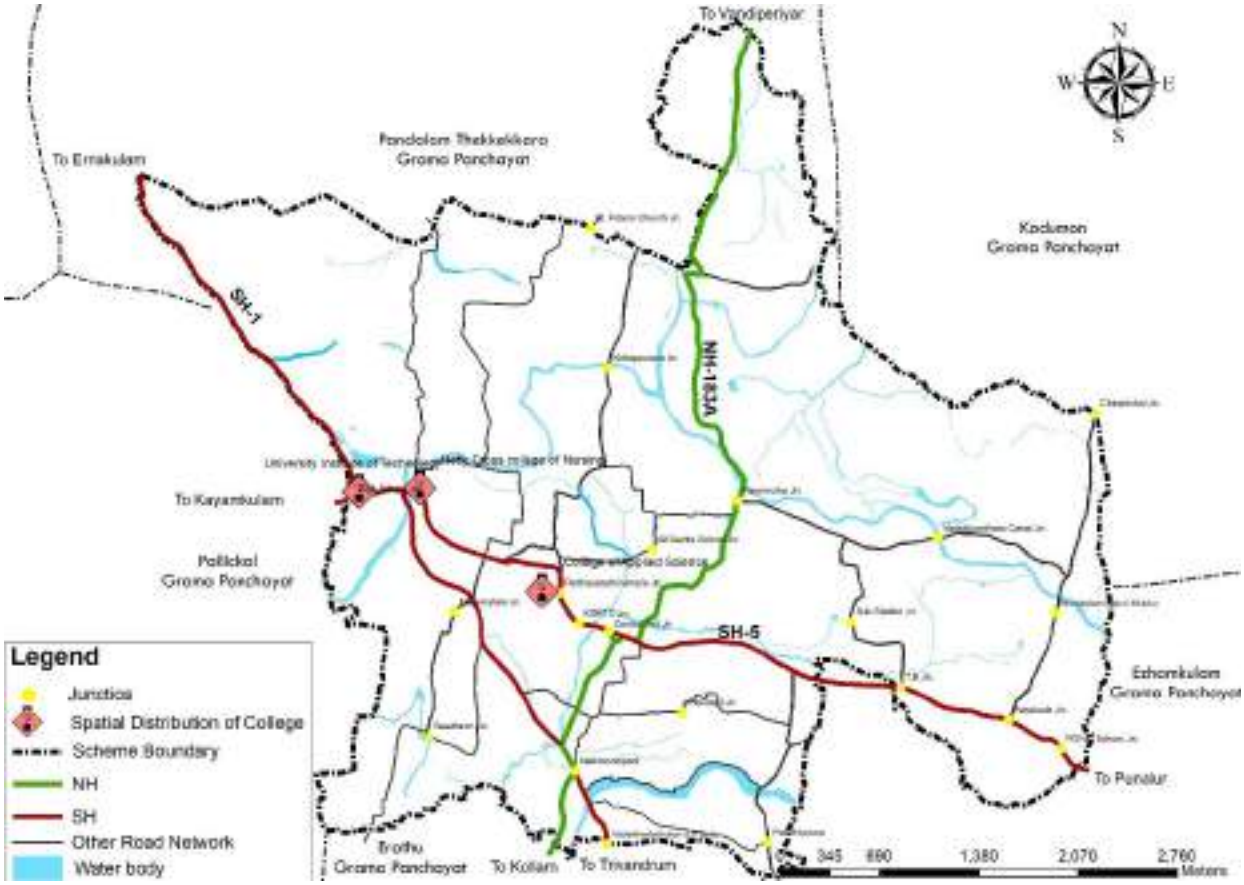


Figure 13.9 Spatial Distribution of Higher Education institutions in town

13.5 Effect of hazard risk in this sector

None of the Educational institutions in the town are situated in any hazard prone areas. Any damages or losses are also not reported from any of the institutions because of flood,lightning or other such issues. But the educational institutions in the town were all acted as relief camps and regional distribution centres for the entire taluk and even for the Kuttanad region during the major floods in Kerala.

13.6 Problems and potentials

There is Infrastructure gaps in public educational institutions such as modern classrooms, labs,libraries and ICT facilities. Also there is inadequate integration of skill training and career oriented courses at the school and college level. Accessibility issues are there from the rural areas of Adoor especially beyond municipal boundary. College level education often lacks alignment with current industry trends and emerging sectors. Also peer pressure, lack of supervision and poor awareness leads to rising drug use among school children and adolescents. Lack of advanced and globally competitive academic options also increase the trend of emigration of students abroad for better educational and job prospects. Presence of reputed institutions are there in an around

Adoor.There is scope for digital integration in education such as e learning,smart classrooms and blended learning models. Also there is scope for research and innovation Hubs, Integration of tourism and culture to education.

13.7 Inference

The town has high literacy rate and Educational standards. The land and infrastructure available can be utilized for starting new generation educational institutions. More number of students are studying in Government or Aided school when compared with unaided schools. But Government educational institutions in High School and Higher Secondary Levels need to be introduced. Majority of students are following State syllabus. Infrastructural facilities and educational standards in Government and aided schools are comparatively less and this attracts more people to the unaided schools. Average travel distance to the schools in primary level and upper primary level is higher than standards. In Higher Education sector, certain new generation Colleges are established within the Municipal limit and in the outskirts of the town recently for catering the needs of the town and surrounding area. Considering the availability of a number of higher education institutions in the town and surrounding area Adoor can be developed as a center of education for the region.



CHAPTER 14
HEALTH

14.1 Introduction

Integrating health into city planning is vital for creating thriving urban environments. This involves building robust public health infrastructure, promoting preventive healthcare through active lifestyles and healthy choices, ensuring equitable access to services for all, mitigating environmental hazards, prioritizing mental well-being, and safeguarding occupational health. Investing in these areas boosts economic productivity, enhances social well-being, improves quality of life, promotes sustainability, and reduces the burden on healthcare systems, ultimately leading to healthier, more resilient cities. In this chapter Health Institutions under the existing three systems of medicine ie, Allopathy, Ayurveda and Homeopathy functioning in the town are studied. The existing status of medical facilities, spatial distribution of medical facilities, major diseases reported in the town etc. are also discussed in the subsequent sections.

14.2 Existing facilities - Type and Number of Health care institutions

14.2.1 Allopathic System of Medicine

The institutions in Allopathic system are functioning both in government and private sector. General Hospital, Adoor is the major medical institution of the town in public sector and all other hospitals are functioning in private sector. The facilities in the hospitals like number of beds, number of doctors etc. are given in Annexure 14.1. The Adoor General hospital is the major medical institution in Government sector functioning in the town and serving the people of Adoor taluk and adjacent taluk. The hospital was established in 1887 and elevated as a community health center in 1989 and as a General hospital in 2010. Total bed strength of the hospital is 151 and 5 beds are reserved for pilgrims during Sabarimala Season. Orthopaedics, Dermatology, Respiratory Infection, Casuality Unit, Dental Unit, Post-partum unit General Medicine, Surgery, Gynaecology, Anaesthesia, Paediatrics, Ophthalmology and ENT are the departments presently functioning in the General Hospital, Adoor. For higher order facilities, people have to depend the medical institutions at Thiruvalla, Kottayam or Thiruvananthapuram.



Figure 14.1 General Hospital , Adoor



Figure 14.2 IHRD compound

A major expansion of the General Hospital, Adoor has been completed recently. Construction of a six-storied building has been completed and the bed strength is increased to 300. Further extension is proposed to the land behind the general hospital (IHRD land) and IHRD is proposed to be shifted to KIP office land (Presently KIP quarters space). Holy Cross Hospital and Mariya Hospital with bed strength of 107 and 60 respectively are the major institutions in the private sector. Numbers of doctors in these institutions are 20 and 14 respectively. In addition to the above, dispensaries, clinics and dental clinics are also functioning in the town. All these dispensaries and clinics are functioning in private sector and services of about 20 doctors are available there. In addition to the above there are 6 Family welfare sub-centers in the town

14.2.2 Ayurvedic System of Medicine

Anandappally Ayurveda dispensary is the only government institution in this system of medicine and service of one doctor is available here. In addition to that there are 6 Ayurvedic dispensaries in private sector functioning at different parts of the town and services of about 8 doctors are available here. An Ayurvedic medicine manufacturing unit in private sector is also functioning in the town. Details of institutions in Ayurvedic system of medicine is given in Annexure 14.2.

14.2.3 Homeopathic System of Medicine

In Homoeopathic system of medicine dispensaries including one dispensary in government sector are functioning at different parts of the town and service of 6 doctors are available in these dispensaries. No higher order facilities are available in this system of medicine. Details of institutions in Homoeopathic System of medicine are given in Annexure 14.3.

14.2.4 Spatial Distribution of Medical Facilities

Distances to a Medical facility and hospital have been assessed in the Socio- Economic Survey conducted in 2019. In the survey, it is found that the average distance to a medical facility is 1.47km and a hospital is 1.92km. The distance to the hospital is further analyzed by assessing the percentage of households with travel distance more than 5.00km. It is found that for 98.76% of households has hospital facility within 5.00km distance and only 1.24% have to travel more than 5.00km for hospital facility. The spatial distribution of hospitals in town is shown in Figure14.3.

14.3 Epidemics

In the Socio Economic Survey conducted in the year 2019 as part of preparation of Master Plan, details regarding major diseases occurred in the town during the past five years have been collected. Chikungunya was reported as the major disease of the town during the last five years. Chicken Pox, Dengue, Hepatitis are the other major diseases reported. 9 death cases were reported due to Covid-19 in 2020 in town.

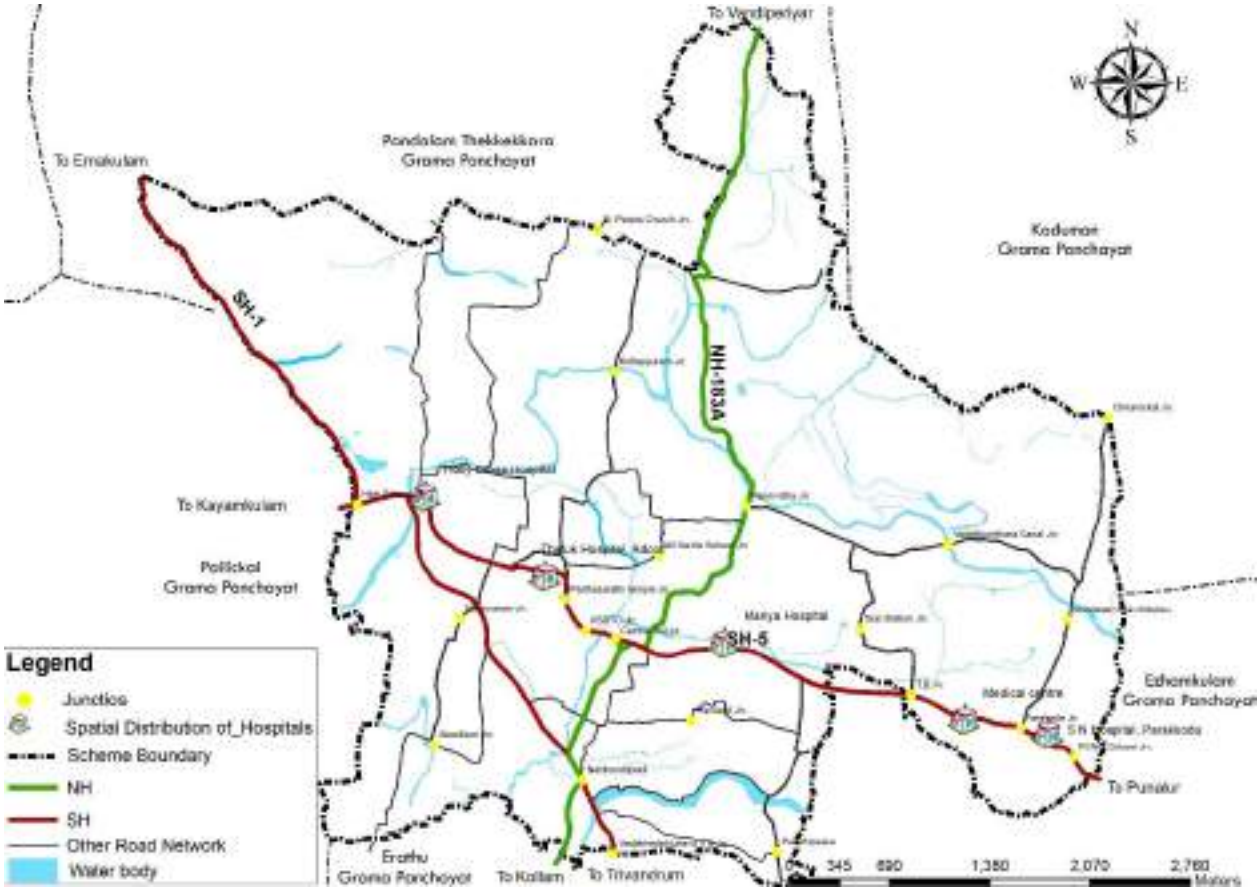


Figure 14.3 Spatial Distribution of Hospitals in town

14.4 Effect of Hazard Risk in this Sector

The health sector institutions and hospitals are all situated in low risk areas and none of them are affected from flood, lightning or other such hazards. But the hospitals in Adoor acted as major centres of health care during the past floods in Kerala during 2018 and 2021. People from surrounding panchayat areas as well as upper Kuttanad region which were all flooded during mega floods depended on Adoor for such facilities since Adoor was not affected and there was better and safe connectivity to Adoor.

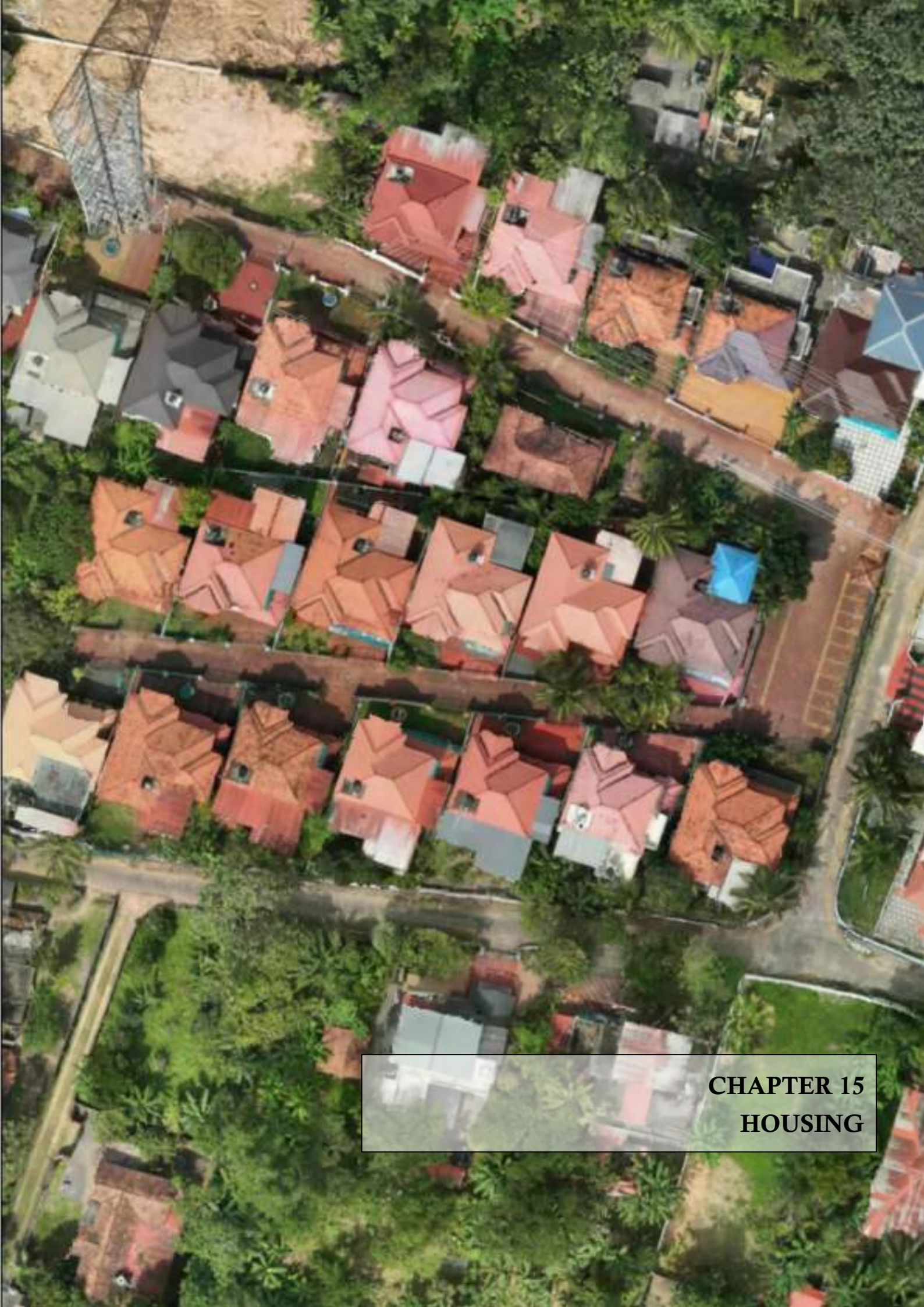
14.5 Problems and potentials

Inadequate infrastructure in public hospitals and PHCs, shortage of medical personnel, poor emergency services lead to overdependence on private sector. Rising life style diseases and lack of mental health care are also issues in the sector. An integrated elderly care system with comprehensive geriatric care and home based medical support is necessary. Existing infrastructure in public hospitals can be upgraded to provide more specialized care particularly in maternal and child health. Adoor has the potential to integrate Ayurveda and wellness tourism with mainstream health care for preventive and curative treatments. Schools, colleges and PHCs can include counseling and mental health campaigns. Also there is scope for digital health initiatives and community health participation through Kudumbasree. As per planning standards, a General Hospital is intended to

serve a population of 2.5 lakh. Since Adoor Town has a population of 29,171, the existing General Hospital is adequate to meet the town's healthcare needs. However, it requires up-gradation in physical infrastructure, modern medical equipment, and service quality to provide better healthcare facilities to the people.

14.6 Inference

The General Hospital, Adoor is the major Medical Institution in the town in terms of number of patients and availability of departments. In addition to this, hospitals in private sector provide necessary medical facilities. Sufficient bed strength as per standards is available at the hospital in the town but many essential departments are not available. Upgradation of Adoor Hospital with trauma care unit is essential. In Ayurvedic system of medicine and Homeopathic system of medicine, Hospitals with IP facilities have to be established. The town has faced significant public health challenges over the past five years, with Chikungunya as the most prevalent disease, indicating the need for improved health and sanitation measures.



CHAPTER 15
HOUSING

15.1 Introduction

Housing is one of the basic needs of human being and it is important next to food and clothing. Normally the quality of housing reflects the quality of living. A well-planned housing sector is fundamental to a city's success. It ensures residents have access to safe, affordable, and adequate shelter, which directly impacts their health, well-being, and economic stability. Strategic housing planning prevents overcrowding, homelessness, and the development of Nagar, while fostering social equity and community cohesion. When compared to other towns in the neighboring areas, the Adoor Town is experiencing comparatively high population growth rate and hence the assessment of housing is very important as far as Adoor Municipality is concerned.

15.2 Housing Status

The number of households and number of houses available from 1971 onwards is shown in Table 15.1. The analysis shows that the deficiency of house is high in the town and measures are to be taken to provide houses to houseless people.

Table 15.1 Variation in number of houses and households

Sl: No	Year	Number of houses	Number of households
1	1971	3898	3964
2	1981	4569	4706
3	1991	5733	5770
4	2001	6868	7544
5	2011	8870	7911
6	2023	10921	9994

Source: Census reports, Panchayath level statistics, Municipal office

15.2.1 Nagar and other sub-standard housing

Like any other urban centers, Adoor is also experiencing the problem of squatter dwelling. There are 20 Nagar in Adoor as per report "Urban Slums in Kerala 1995-1996" prepared by the Town and Country Planning Department. As per the primary survey conducted in 2011, 34 Nagar were identified and detailed study has been conducted about these Nagar. Colonies with at least ten houses are only included in the study. The location of these is shown in the Figure 15.1. The general details of the Nagar are given in Annexure 15.1.

Total number of persons living in the Nagar area is 2169 (1034 male and 1135 female). The residential density of these Nagar is varying from 102 persons per hectare to 315 persons per hectare. The density of population is high in Zakir Hussain Colony (319 persons per hectare), Parankimavila

colony (315 persons per hectare), Palammuruppel Harijan Colony(309 persons per hectare) and Cherukunnel Colony (272 persons per hectare).

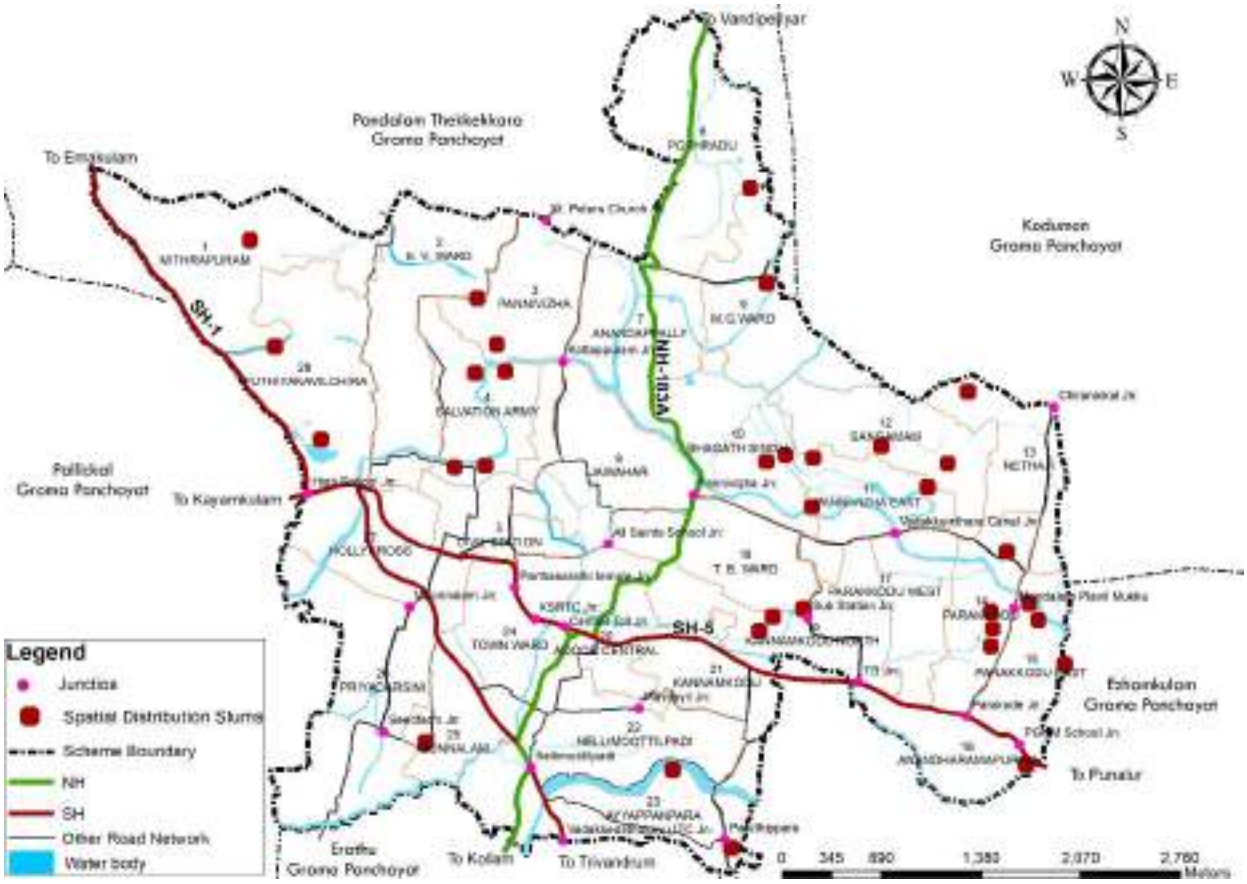


Figure 15.1 Location of Nagars in Adoor town

In 29 Nagar the ownership of the land is with Nagar dwellers and the remaining 5 Nagar are located in puramboke land. Vilayil Colony, Paris Colony, Plavilathara Colony, Kakottukuzhy Colony, Peedikayil Colony are located in puramboke land. Residents of these colonies are facing threat of eviction (291 persons of 91 families) and there is an urgent need to rehabilitate these families.



Gandhi Nagar Colony

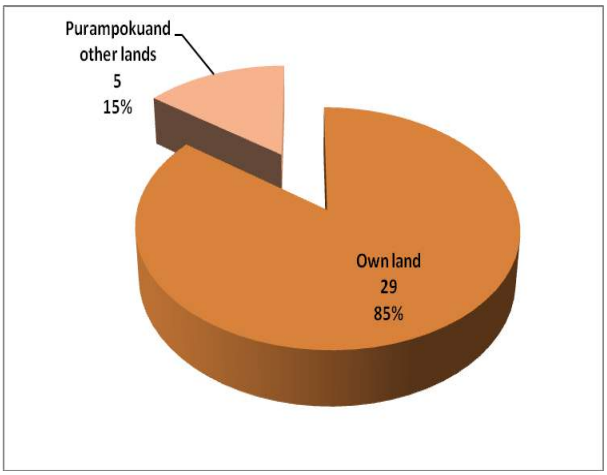


Figure 15.2 Ownership of land

The Age of Nagar is shown in Table 15.2 and it shows that the Nagar in the town are generally old and majority of Nagar are more than 50 years old. Formation of new Nagar are not taking place now.

Table 15.2 Age of Nagar

Age	29 and less	30-39	40-49	50-59	60 and above
No. of Nagar	6	2	7	15	4

Source: Nagar survey 2011

The conditions of approach roads to the Nagar are comparatively good. The approach roads to 23 Nagar are black toped, 8 Nagar are metalled and only 3 Nagar have mud road as approach road. The approach roads to Kakottukuzhy Colony, Chakkanattu Kandathil Bhagam Colony and Mundumuruppel Colony are mud roads. The condition of the internal road is not good. No internal roads are there in 11 Nagar. Internal road are in poor condition in 14 Nagar and only 9 Nagar have good internal roads. The Nagar are not included in the solid waste collection network of the Municipality. No dust bin or other facilities are provided at Nagar for collection of garbage. The garbage is disposed in some open space, street or in own compound. Proper drainage facilities are provided in two Nagar only. Poor drainage condition is there in remaining 32 Nagar. Four Nagar ie, Udaya Nagar Colony, Chakkanattu Kandathil Bhagam Colony and Payikkathara Colony are affected by flood. Street lights are provided in 23 Nagar and but it is not provided in the remaining 11 Nagar. Efforts are to be made for providing street lights in those Nagar. Access to education, health care and public transportation is good and these facilities are available within reasonable distance. Improvement programs have already been implemented in 28 Nagar and are currently ongoing in one more.

No improvement programs have been carried out in 5 Nagar ie in Paris Colony, Plavilathara Colony, Kakottukuzhy Colony, Peedikayil Colony and Zakkir Hussain Colony. The first four Nagar are located on puramboke land. NGOs are involved in most of the Nagar. The year in which, the households are residing in the locality is shown in Figure 15.3. A large number of households were settled in the Nagar before 1970. Since then, there has been a gradual decline in new household settlements, with only a few families moving into the Nagar area

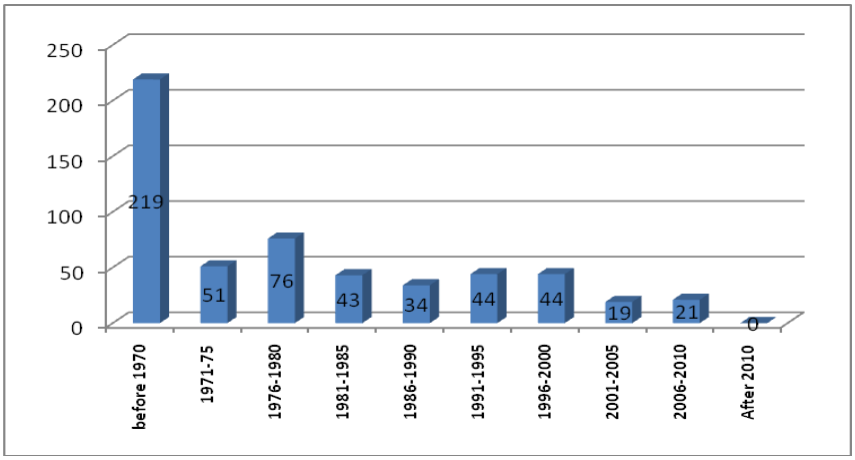


Figure 15.3 Settlement in Nagar area

in recent years. Out of 551 households living in the Nagar areas 544 households were living in their own building and only 7 households were living in rented buildings. In 32 Nagar the dwelling units are detached type and in remaining 2 Nagar, it is row type buildings.

Majority of houses in the Nagar area is used for residential purpose only. Only 11 buildings in the Nagar area is under mixed use of residential and commercial. The availability of sanitary facilities is shown in Figure 15.5. Individual toilets are available for 449 households and common toilets are used by 5 households. 97 households have no type of sanitary facilities. 85.84% of houses were electrified and only 14.16% of houses of the Nagar are not electrified.

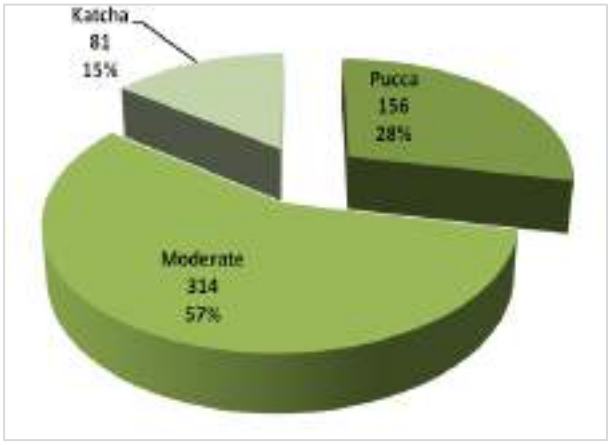


Figure 15.4 structural conditions of houses

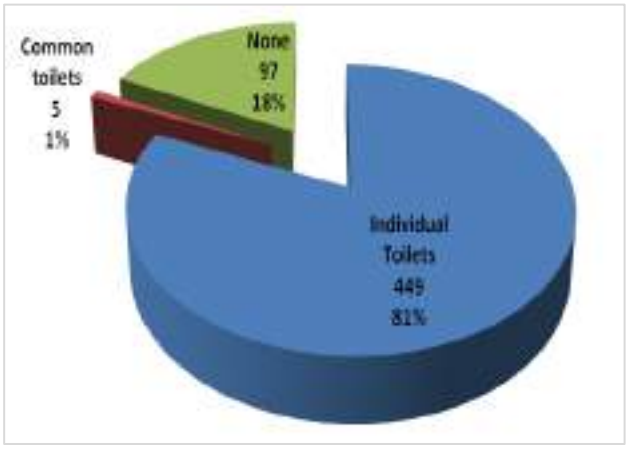


Figure 15.5 Availability of Sanitary facilities

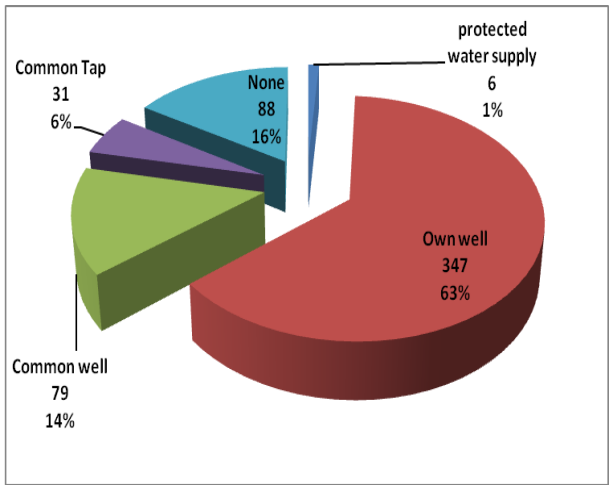


Figure 15.6 Source of water

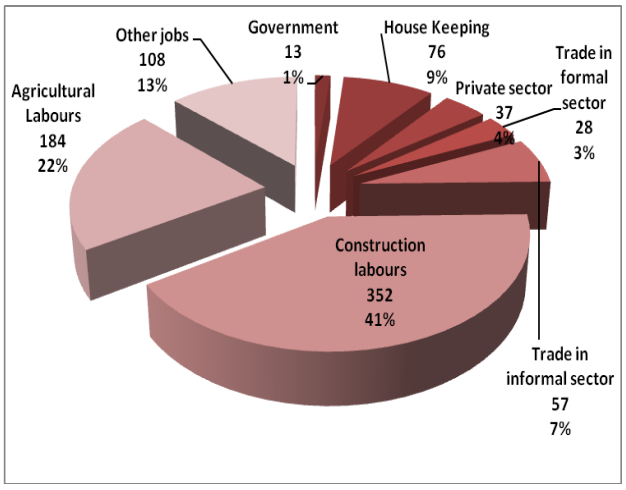


Figure 15.7 Employment details of Nagar dwellers

Source: Nagar Survey 2010

For 63% of households, well is the source of water and common well is the source of 14% households. Public tap is the source of water for 6.00% of households and only 1% of households have individual water connection. It is represented in Figure 15.6. The employment details of Nagar dwellers are shown in Figure 15.7. Major share of workers (41%) are engaged in construction field. 22% of workers are agriculture labours, 9% workers are engaged in housekeeping and 7% of workers are engaged in trade in informal sector. In the survey study regarding the sector in which the

workers are engaged is also conducted. Private sector (94%), trade in formal sector (3%), government sector (1%) are the major sector of employment of the Nagar dwellers.

15.3 Housing Schemes

Under LIFE mission 215 applications were received from landless and houseless families of the Municipal area. 23 houses were already completed under LIFE mission so far to those who have own land. As per the latest reports (2023 February) 72 applications under LIFE mission are need to be processed.

15.4 Spatial distribution

Adoor town has scattered homestead type of residential development and residential areas are scattered in all parts of the town. The density of population and the concentration pattern of residential areas are already discussed in paragraph 2.4 and 4.3.1 respectively. The concentration pattern of residential area shows that the residential areas of the town are concentrated around the two commercial nodes of the town ie, The Central Toll and surroundings and Parakode and there is gradual reduction towards the outer area of the town. Details regarding the size of plots and ownership of plots have been collected in the Socio Economic survey 2019. The average size of residential plots in Adoor Municipality is 18.21 cents. The percentage of plot in different range of plot size is shown in Figure 15.8. Major percentage plot falls in the size range of 11-25 cents and followed by the size range of 6-10 cents. It indicates that the average plot size of the Municipality is comparatively high.

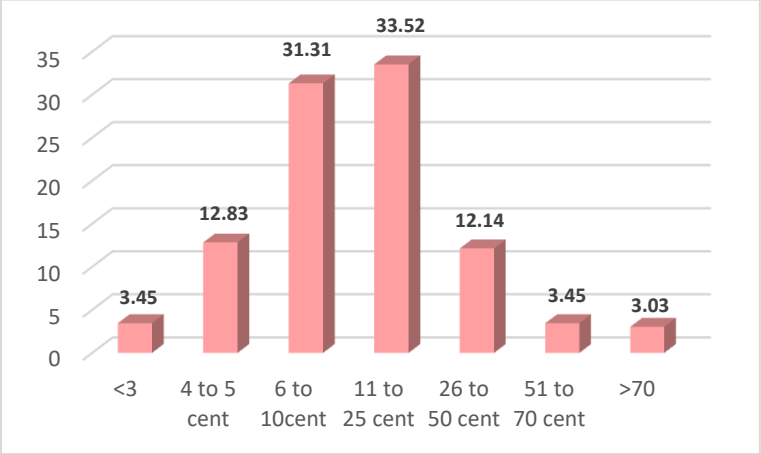


Figure 15.8 Percentage of plot in different range of plot size.

Source: SE Survey 2019

In the Town, the average plot size varies from 8.08 cents in ward 14 (Parakode) to 32.40 cents in ward 10 (Bhagath singh). The ward wise average plot size of Adoor Town is shown in Figure 15.9. There is no specific pattern regarding distribution of wards with different average plot size in the town. In the Socio Economic Survey (2019) it is revealed that majority of households in the town, i.e. 99% have their own land, 1% of household have lease land. It is shown in Figure 15.10. As per the Socio-Economic Survey conducted by LSGD Planning Department in 2019, the average plinth area of the building is 123.01sq.m and average floor area is 136.14 sq.m. The percentage of houses in different range of plinth area is shown in Figure 15.11. More houses (32.83%) have plinth area in

the range of 150-250 sq.m. followed by houses 31.72% in the range of 75-150 sq.m. plinth area. It indicates that the houses in Adoor municipality have comparatively bigger size.

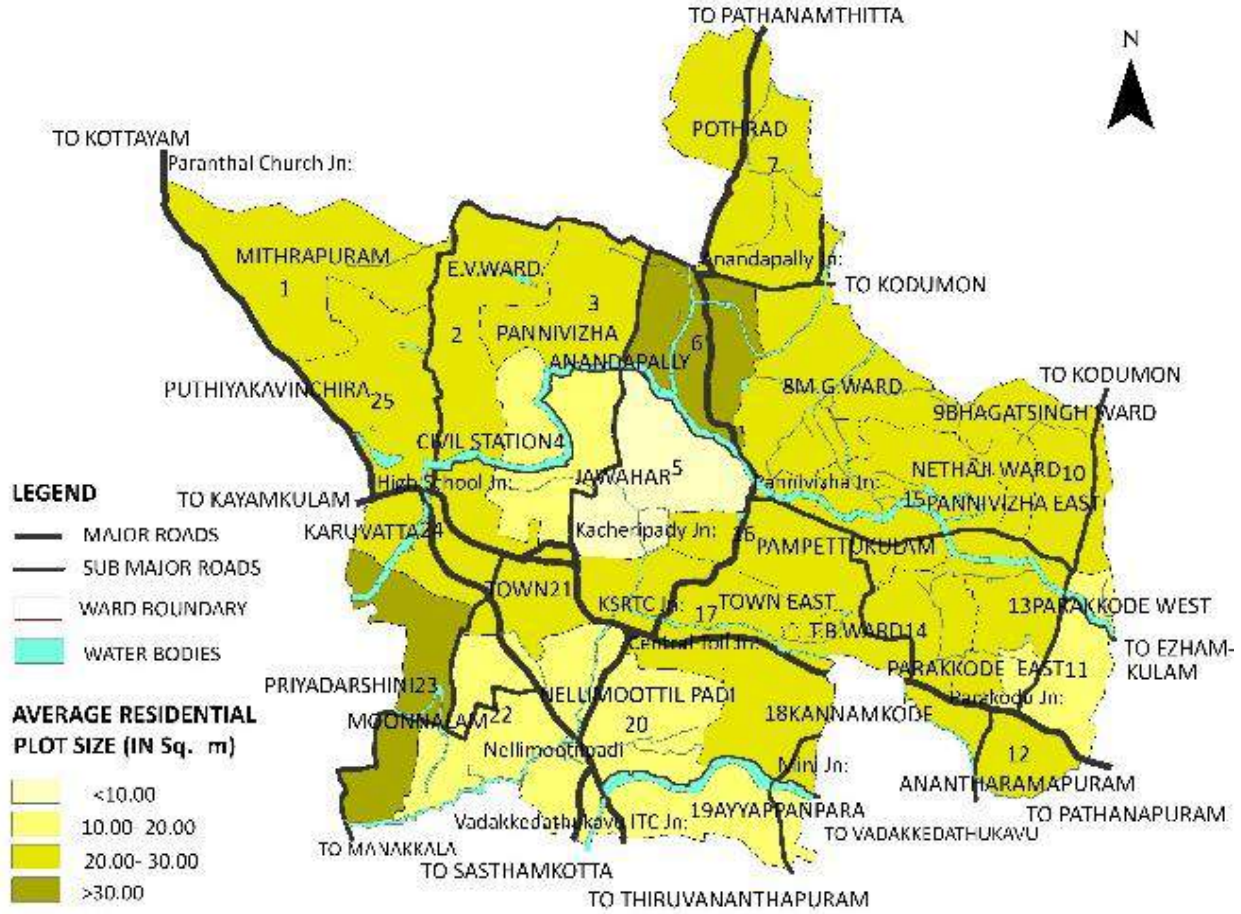


Figure 15.9 Ward wise average plot size

Source: SE Survey 2019

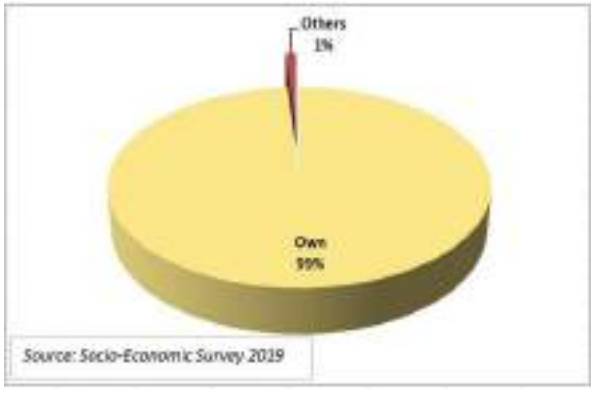


Figure 15.10 Ownership of plot

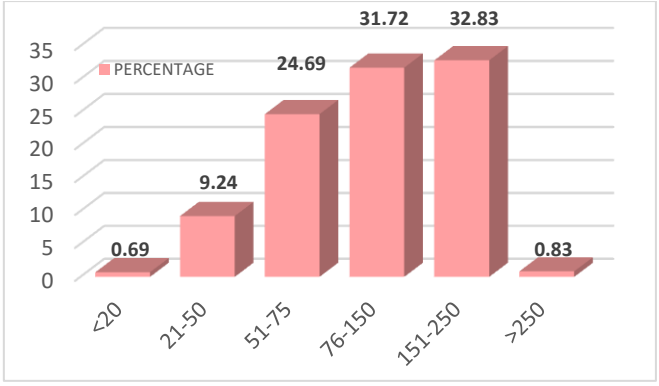


Figure 15.11 Plinth area of building

Source: SE Survey 2019

The structural condition of houses shows that 73% of houses are pucca building, 26% of buildings are moderate buildings and 1% of buildings are Kutcha buildings. It is represented in Figure 15.12. Distribution of houses with different types of floor material, different types of walls and different

types of roof as shown Figures 15.13, 15.14 and 15.15 respectively. It indicates the better structural condition of houses in Adoor Town. From the figure 15.13 it can be found that 90.48% of houses are with ordinary tiles and 8.00% of houses are with Mosaic and Marble tiles and only 1.52% of houses are with other flooring materials. From the Figure 15.15, it can be observed 88.28% of houses are with good quality wall materials i.e, Brick plastered and 4.14% of houses with brick wall and only remaining percentage is with other inferior type wall materials like earth blocks etc. From the Figure 15.14, it can be observed that 73 % of houses are with concrete roof, 27% of houses are with moderate quality roofing materials like tin sheet, asbestos sheet and tiled roof.

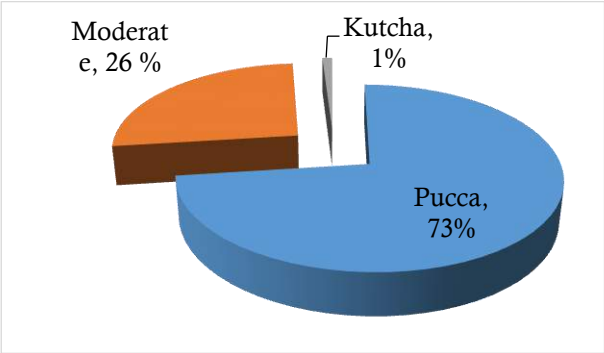


Figure 15.12 Structural conditions of houses

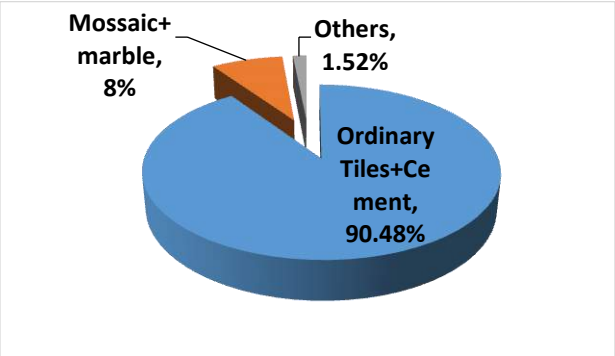


Figure 15.13 Materials used for floor

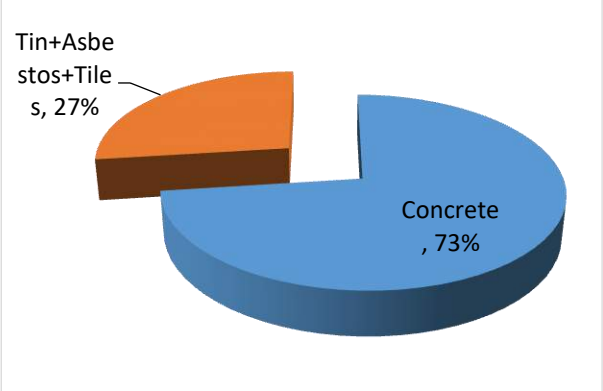


Figure 15.14 Materials used for roof

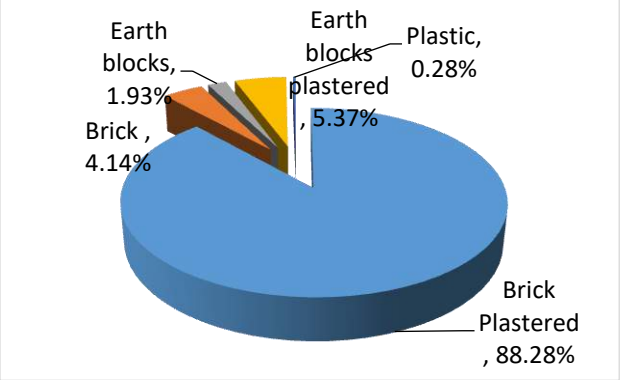


Figure 15.15 Materials used for wall

Source: SE Survey 2019

15.4.1 Availability of services

The average distance in kilometer (As per the Socio-Economic survey 2019) from houses to facilities like motorable roads, bus stops, schools, Post offices, health facilities, hospitals, ration shops, play grounds etc. are shown in Figure 15.16 The Socio-Economic survey data is also analyzed by comparing the distance to various facilities with certain standard. The ward wise average distance to various services and comparison with adopted standards is shown in Annexure 15.2. The percentage of households having opinion their distance to the facilities are exceeding the adopted standard is given in the Table 15.3. The analysis shows that, compared to the adopted standards, facilities such as motorable roads, high schools, post offices, health centers, ration shops, and playgrounds are

located close to residential areas. However, residents need to travel longer distances to access bus stops and certain schools.

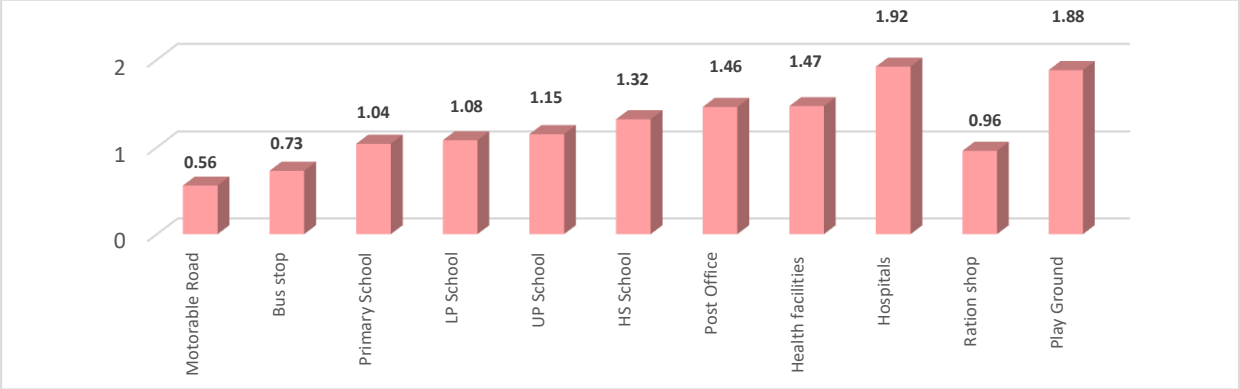


Figure 15.16 Average distance to various services

Source: SE Survey 2019

Table 15.3 Distance to facilities and comparison with standards

Sl. No	Facilities and standard	% of people with the opinion that distance to facilities are higher than standard
1	Distance to motorable road greater than 0.5 km	12.14
2	Distance to bus stop greater than 0.5 km	46.62
3	Distance to Pre-Primary school greater than 0.5 km	66.07
4	Distance to LP school greater than 0.5 km	67.45
5	Distance to UP school greater than 1 km	34.62
6	Distance to HS school greater than 3 km	7.45
7	Distance to Post Office is greater than 3 km	11.45
8	Distance to Health greater than 5 km	0.14
9	Distance to Hospital greater than 5 km	1.24
10	Distance to Ration shop greater than 5 km	0
11	Distance to Play Ground greater than 5 km	1.24

Source: SE Survey 2019

15.4.2 High Rise Residential Buildings

As per the details from Residential Flats Survey conducted by Town and Country Planning Department in 2020, Adoor town have only one Residential flat with more than 4 floors in ward 25.

15.5 Effect of hazard risk in this sector

Damages on housing sector due to flood or lightning is negligible in Adoor town. There were no cases of housing damagaes reported in Adoor even in mega flood 2018. But 11 houses were partially

damaged in the Flood occurred in 2021 November. Damages to electrical appliances are reported from wards in lightning prone areas during heavy thunderstorms.

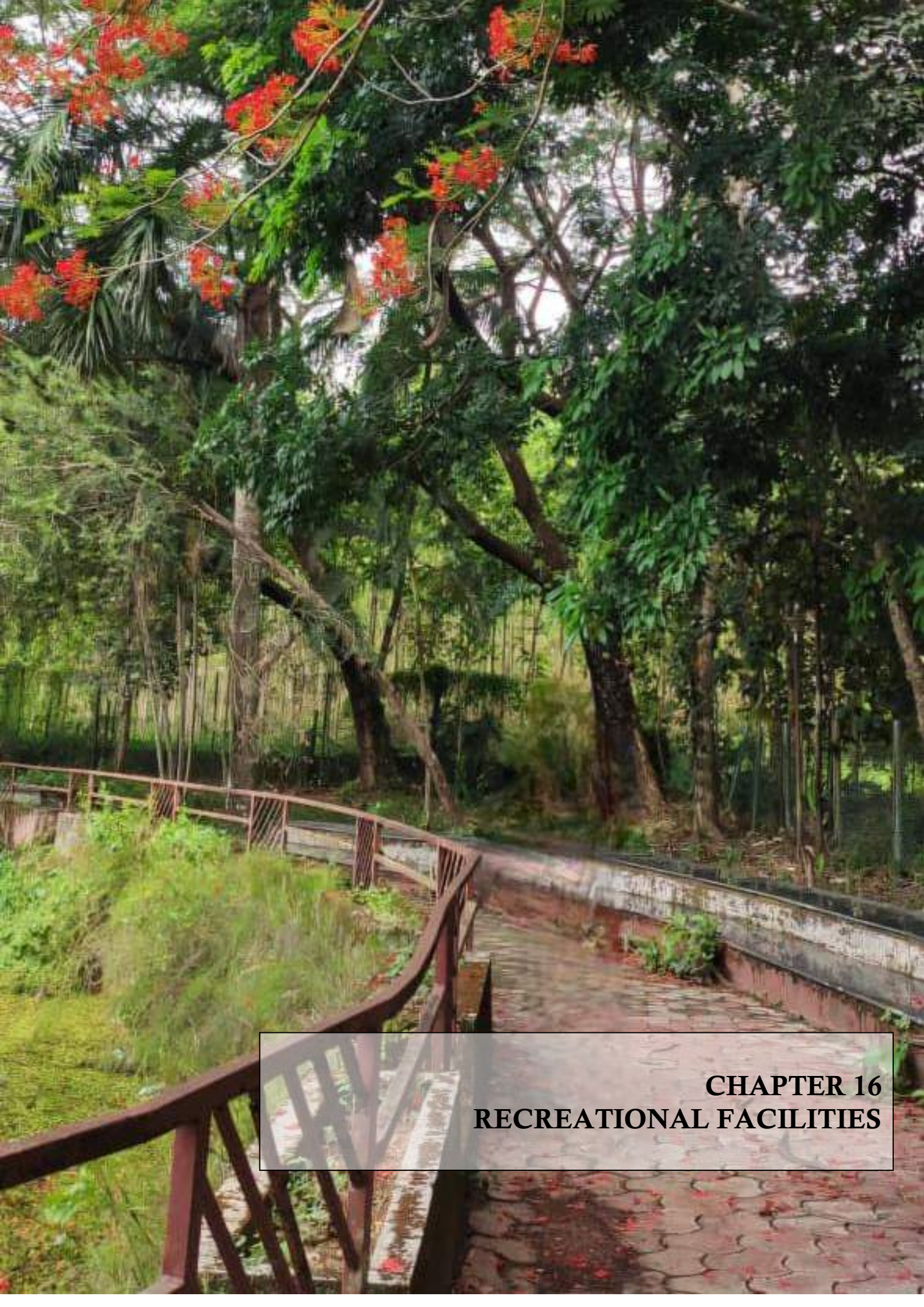
15.6 Problems and potentials

Fragmented and scattered residential development without planning has lead to inefficient landuse. Many residential areas lack adequate infrastructure. The cost of providing infrastructure is also high due to the uncontrolled development sprawl even with encroachment of paddy fields and wetland. This sprawl also reduces ecological buffers and increase flood vulnerability. Lack of affordable housing, compact residential development including high rise residential flats and aged housing stock without maintenance are also issues in the town.

There is potential for highrise developments in residential sector beacause of its location importance, proximity to facilities including transportation, lower risk of natural hazards like flood, landslide etc. There is also scope for community oriented housing,redevelopment of underutilized land,upgradation of substandarad housing in urban core areas,integration of green building practices and planned residential zones.

15.7 Inference

The concentration pattern of residential area shows that the residential area of the town is concentrated around the two commercial nodes of the town-The Central Toll and surroundings and Parakode area and there is gradual reduction towards the outer area of the town. The town experiences significant housing shortage. The houses in Adoor Municipality have comparatively large size and better structural and sanitary condition. The collection of solid wastes from the residential area is very poor and majority of people dispose the garbage in their own premises. When compared to adopted standards most of the services are available at reasonable distance from the residential areas. The scheme for providing houses to all families is in progress under LIFE Mission.



CHAPTER 16
RECREATIONAL FACILITIES

16.1 Introduction

Recreational spaces and facilities are vital components of a healthy and vibrant city, contributing significantly to the well-being of its residents. They provide essential outlets for physical activity, combating sedentary lifestyles and promoting overall fitness. Parks, playgrounds, and sports fields foster social interaction and community building, reducing isolation and strengthening social bonds. Access to green spaces offers psychological benefits, reducing stress, improving mental health, and providing a sense of connection with nature. Furthermore, recreational areas enhance a city's livability, attracting residents and businesses, and boosting property values. They also provide spaces for cultural events, festivals, and community gatherings, enriching the city's cultural landscape. In essence, recreational spaces are not just amenities; they are investments in the physical, mental, and social health of a city's population. In this chapter, the availability and present condition of recreational facilities in town, facilities for sports, religious and cultural activities in town etc. are discussed.

16.2 Existing Facilities

The town offers only limited recreational facilities, and those available are on a relatively small scale and unevenly distributed. Shortage of dedicated sports grounds and lack of modern recreational amenities highlight the need for comprehensive assessment and planning. The total land use coming under Park and Open Space in the town is 2.85 hectares, which is 0.14% of total town area. Puthiyakavilchira tourist centre managed by the District Tourism Promotion Council is the main recreational centre of the town. The major attraction of this spot is the chira (lake). There is potential for boating in the lake. Only restaurant facility is now available. A park is partially developed and it is not being used at present.



Figure 16.1 Puthiyakavilchira



Figure 16.2 Green Valley park

Another recreation facility is in private sector - Green Valley, located at Parakode, which provide recreational facilities for children and facilities for conducting small functions like birthday celebrations etc.

The central toll – the meeting point of M.C Road, KP road and Pathanamthitta road is the nerve centre of the town. Earlier, this place was used for collection of tax. This place has witnessed many historical events and visited by Mahatma Gandhi in 1934. A Smrithi Mandapam in this regard is constructed here. A small park with playing equipment for children is functioning there. This park is not maintained properly and renewal of this park is necessary. Fourteen clubs are functioning in different part of the town.



Figure 16.3 Central Toll

16.2.1 Play Grounds

There is no stadium or open grounds in the town for sports activities or conducting fares. Facilities like open air theatre or swimming pools are also not available in the town. Municipality has acquired 3.95 acres of land near All Saints School adjacent to Sreemoolam Market – Vaidyarupadi Road for Municipal Stadium. But the land is not developed so far. Proper access and Drainage facilities are to be ensured before the construction of the stadium since the nature of the land is environmentally sensitive. Playgrounds are available with most of the schools in the town. Inadequate Park and Open space for recreation is also experienced in the town.

16.2.2 Theatres and auditoria

Four cinema theatres are functioning at different parts of the town catering the people of the town and neighboring Grama Panchayats. There are 10 large, medium and small auditorium or community halls, functioning in the town. Details of auditoriums are available in Table 16.1 Samskarika Nilayams / Community Halls owned by the municipality are functioning at Moonnalam, Potharad and Parakode.

Table 16.1 Town Halls, Auditorium, and other public halls

Sl. No.	Name	Location	Builtup area (Sq.m)	Plot area (Sq.m)	Seating Capacity	Year of construction	Ownership
1	Geetham Auditorium	Near General Hospital	1396	2832	2000	1996	Private
2	Meledathu Auditorium	Near Fire Station	790	1619	700	2002	Private
3	St.Mary,s Orthodox Churh Auditorium	Karuvatta	465	4047	700	2008	Private
4	YMCA Auditorium	Kannamkodu	186	200	200	1974	Private
5	Green Vally	Parakode	2044	3500	2900	2003	Private
6	St. Thomas Orthodox Church Parish Hall	Kannamkodu	929	1800	650	1990	Private
7	Lal Residency	Central Toll	200	400	200	2000	Private
8	Panamthundil Auditoruim	Kannamkodu	600	3453	700	1996	Private
9	Marthoma Youth Centre	Aramana Junction.	65	1200	650	1996	Private
10	Mar Aphrem Jacobite Church Auditorium	Parakode	1214	2000	500	1990	Private

Source: Town Directory 2019

16.2.3 Town Hall

A town hall with modern facilities is needed in the town. Currently there is no town hall for the town.

16.2.4 Reading room and Library

Five libraries and readings rooms are functioning at different part of the municipality and details are furnished in Table 16.2.

Table 16.2 Public Libraries and Reading Rooms

Sl. No.	Name and Description	Location	Rented or own buildings	Year of start	No.of books available	No.of members
1	Sree Chithira Tirunal Kireeda-dharana Grandahasala	Near Market	Rent	1915	15237	1188
2	E V Smaraka Grandhasala	Karuvatta	Own	1946	24988	2972
3	Adoor Municipal Public Library	Municippal Office	Own	1982	13478	1118
4	Santhosh Vayanasala	Pannivizha	Own	1973	10175	204
5	V K S Library & Reading room	Konnamamkara	Own	*	1671	121

Source: Town Directory 2019

16.2.5 Other facilities

A large number of religious centers like Parthasarathi temple and Pannivizha temple , Sacred Heart church , Kannamkode Orthodox church etc are functioning in the town. Kannamcode Juma Ath mosque, which are old and very famous. Various festivals are conducted in association with these religious centers. Anandappally Maramadi festival was conducted on August 15 every year earlier. But this festival is not conducted now.



Figure 16.4 Anandappally Maramadi festival

Adoor is the land of many famous personalities. E.V. Krishna Pillai, Adoor Gopalakrishnan, Adoor Bhasi, Adoor Bhavani who have made significant contributions to literature, cinema, and performing arts. Despite this rich cultural legacy, the town does not currently have a cultural centre or institution that showcases, promotes, or nurtures its heritage and creative pursuits. Establishing such a facility would not only honour the town's distinguished personalities but also provide a dedicated space for cultural exchange, talent development, and community engagement.

16.3 Effect of Hazard risk in this sector

The recreation areas in town are out of the flood and lightning risk areas. Also town being resilient to natural hazards compared to other surrounding towns, Adoor can serve as a regional level recreation centre.

16.4 Problems and Potentials

There are limited number of public parks, playgrounds and open recreational areas in town. Existing recreational spaces are poorly maintained and remain encroached. Poor accessibility, limited facilities for all age groups like youth, children,elderly,women or differnently abled etc.,absence of riverfront or natural green spaces, lack of venues for conducting gatherings,events,local art and culture promotion etc. are major problems in town. But these all can be effectively addressed through strategic utilization of town's untapped potentials. Idle government lands can be transformed to multifunctional spaces, natural features like waterbodies and wetlands can be integrated to recreation planning, development of accessible walkways and inclusive public spaces and involving local stakeholders in maintenance.

16.5 Inference

Only lower-order recreational facilities are currently available in the town. Hence there is a need to enhance these amenities to cater to both the local population and the wider influence area. To address this, the development of a stadium for sports, an open ground for public events, and a town hall for hosting fairs and cultural programs is essential. In addition, small playgrounds at the neighborhood level should be provided to meet the recreational needs of children and residents. A cultural centre is also required to promote local arts and activities, to honour the town's distinguished personalities and for cultural exchange and community engagement. Furthermore, considering the town's rich socio-cultural history, establishing a museum would help preserve and showcase its heritage.



CHAPTER 17
OTHER CIVIC AMENITIES

17.1 Introduction

In order to make a city more liveable with improved quality of life, enhanced public health, sustainable economic growth civic amenities such as Police Station, Fuel Station, Crematoria/ Burial grounds, Communication facilities, Public Toilets, Fire Station etc. are highly essential. The availability of these amenities in Adoor town in analysed in this chapter.

17.2 Existing Facilities

17.2.1 Police Station

Office of the Deputy Superintendent of Police, Office of Circle Inspector of Police (SHO), and Police control room are functioning in Adoor. All these three offices are functioning in a compound adjacent to Revenue tower. In the Local level, analysis there was demand for a police out post at Parakode.



Figure 17.1 Adoor SHO

17.2.2 Fuel Station



Figure 17.2 petrol pump

Adoor town is well served by multiple fuel stations operated by major oil companies such as Indian oil,Bharat Petroleum,Hindustan Petroleum and Reliance strategically located along the major highways.Their distribution across key entry and transit points of the town supports regional connectivety,facilitate freight movement and caters to the growing demand. Strengthening these facilities through modernization, provision of EV Charging stations and inregration with logistics hubs can enhance Adoor's role as a transit and trade centre. Palazhi filling station, Indian oils Pratheesh fuels, Royal fuels,Reliance petrol pump,Indian oil,Hindustan petroleum are the major 7 petrol pumps in the town.

17.2.3 Crematoria and Burial grounds

Town accommodates a number of burial grounds managed by religious institutions and community groups catering to the needs of different faiths and social groups. There are six burial grounds in town. All burial grounds are private, and there is one crematorium proposal under the ownership of municipality.

17.2.4 Public Toilets and Comfort stations

The availability of Public toilet / comfort station is very less in the town and at present only four Public comfort stations – at Parakode Market, KSRTC Stand, near Government Hospital and Private Bus Stand is functioning in the town. More public Comfort Stations are to be provided at different parts of the town.

Table 17.1Details of Comfort Stations

Sl. No.	Type	Location	Run by	Free/ Charged
1	Public Comfort Station	Parakode	Municipality	Charged
2	Public Comfort Station	KSRTC Adoor	KSRTC	Charged
3	Public Comfort Station	Near Govt.hospital	Local body	Charged
4	Public Comfort Station	Pvt. Bus stand	Municipality	Charged

17.2.5 Fire Station

The main objective of the fire and rescue service is to protect the people and their properties from fire and other calamities, which include both natural and incidental. Office of the Fire and Rescue Service in Adoor is functioning in a rented building in M.C.Road near Holy Cross junction. 1.80 acres of land of Kallada Irrigation Project land near Pannivizha Temple Junction was handed over to the Fire Force Department for construction of Fire Station building. The Building is under construction.



Figure 17.3 Fire and Rescue office

17.3 Effect of hazard risk in this sector

There are no damages or losses reported in civic amenities in town due to any natural hazards. The institutions are all situated in low risk areas and none of them are affected from flood, lightning or other such hazards. The buildings in lightning prone areas can be protected with lightening arresters.

17.4 Problems and potentials

Civic amenities form the backbone of public services, but they face several challenges. The police and fire stations are constrained by outdated infrastructure, space limitations and inadequate parking or vehicle movement areas, affecting response time in emergencies. Fire station is functioning in rented building. Fuel stations, though reasonably distributed, need modernization, traffic management around entry/exit points, and future-ready facilities such as EV charging. Crematoria and burial grounds face problems of limited land, out dated technology, lack of green buffers and public resistance due to nuisance and environmental concerns. Public toilets, though provided in select locations, are insufficient in number, poorly maintained, and not always accessible to women, children, and differently abled users.

At the same time, these amenities present strong potential for improvement. The police and fire stations can be modernized with smart surveillance, own building, disaster-response facilities and better locational integration with the transport network. Fuel stations can evolve into integrated service hubs with charging stations, convenience outlets, and logistics support, strengthening Adoor's role as a transit centre. Crematoria can be upgraded with eco-friendly systems, landscaped buffers and dignified facilities, while provision of additional land can address long-term needs. Public toilets can be scaled up through modern designs, gender inclusivity and digital monitoring and public-private partnership models. With strategic planning and investment, these civic amenities can be transformed into efficient, sustainable and citizen-friendly infrastructure for the town.

17.5 Inference

The assessment of civic amenities in Adoor reveals that while the town is equipped with essential facilities such as police and fire stations, fuel outlets, crematoria and burial grounds, public toilets etc. many of these are functioning with spatial, infrastructural and service limitations. Issues such as inadequate land, outdated technology, lack of maintenance, and insufficient coverage reduce their efficiency and accessibility, particularly in times of hazard events like flash floods and lightning. However, the analysis also highlights significant potential: modernisation of safety and emergency services, integration of eco-friendly and inclusive infrastructure, provision of new land for future needs, and adoption of smart systems for operation and monitoring. Strengthening these amenities through strategic upgrades, equitable distribution, and climate-resilient planning will ensure that Adoor evolves into a safe, sustainable and citizen-friendly urban centre, capable of supporting its growing population and regional role.



CHAPTER 18

SPECIAL CONCERN AREAS

18.1 Introduction

Understanding the specific needs of vulnerable populations like the elderly, economically and socially backward individuals, and children is paramount in city planning. Tailoring infrastructure, services, and policies to address their unique challenges ensures equitable access to resources and opportunities. Ignoring these demographics leads to social exclusion, increased inequality, and a diminished quality of life for a significant portion of the population, hindering the city's overall development and well-being. This chapter contain the analysis of the present status of weaker section of the society namely women, children, old aged people and scheduled cast people. The safety aspects of the town are also discussed in the chapter.

18.2 Social Backwardness & Poverty

18.2.1 BPL Index

As per Panchayat level statistics 2011, the BPL population of Adoor town is 1510 number.

18.2.2 SC/ST Population

The Scheduled cast population of Adoor town as per 2011 census is 3621 (male-1764, female-1856) and it is 12.41% of total population. The total number of Scheduled Tribe population in the town is only 38 (13 male and 26 female). A Pre-Metric hostel for S.C students is functioning at Kottappuram. There is no other major institutions for Scheduled caste in the town.

18.2.3 General Condition of SC/ST Population

In the local analysis, the major suggestion related to this sector was for improvement of housing condition, improvement of infrastructural facilities of S.C Colonies and programs for improving the educational standards and job opportunities for them.

18.2.4 SC/ST settlements

Total of 499 SC/ST houses located in Adoor town. More number of houses located in vilayil area. Ward wise number of SC/ ST colonies in Adoor town shows in Annexure 15.1.

18.3 Poverty Alleviation Programmes

Table 18.1 shows the number of kudumbasree units working in the wards of Adoor town.total of 146 number of kudumbasree units are there. Parakode west have 11 number of kudumbasree units.

Table 18.1 kudumbasree Units

Ward Name	No
Adoor Central	5
Anandhapally	4
Anandharampuram	4
Ayyappanpara	10
Bhagath Singh	4

Civil Station	1
E V Ward	8
Holy Cross	2
Jawahar	2
Kannakodu	3
Kannamkodu North	0
M G Ward	6
Mithrapuram	9
Munnalam	6
Nellimoottilpadi	7
Nethaji	1
Pannivizha	9
Pannivizha East	5
Parakode	5
Parakode East	7
Parakode West	11
Pothradu	5
Priyadarshini	7
Puthiyakavilchira	7
Salvashion Army	4
Sangamam	8
T B Ward	3
Town Ward	3
Totals	**146**

Source; Department of Economics & Statistics, Kerala

18.4 Social Security & Welfare, Women and Child Development

18.4.1 Social Welfare Programmes and Infrastructure

As per 2011 census, out of total population of 29,171 the number of female in the town is 14,980, which is 51.35% of total population.. No institution for the welfare of women is functioning in the town. But there are a few working women's hostels functioning in the town. In the local level analysis the major proposals suggested in this sector includes, programme for self-employment of women like SSI units under Kudumbasree, ensure the safety of women, old age homes etc.

18.4.2 Status of Anganwadis

Population in the age group of 0 to 15 is considered Child group. As per the socio economic survey 2019, 18.15 % male population and 15.95% of female population are in the child group. Anganwadis are the grass root level delivery point of social welfare activities. 24 Anganwadis are functioning in the Municipality and out of these, 10 are functioning in own buildings, 11 are functioning in rented building and three Anganwadis are functioning without rent. New buildings are to be constructed for those Anganwadis functioning in rental buildings. Well is source of 20 Anganwadies and water connection is not available for 4 Anganwadies. Electric connection is availablefor 6 Anganwadis and no electric connection is available for the remaining 18

Anganwadies. Gas Connection is available for only 16 Anganwadies. Details of the Anganwadies in the town is given in Annexure 18.1. Salvation Army Child Development Society run by Territorial Commanders Salvation Army is the orphanage functioning in Adoor Municipal Area

18.5 Old Aged People

The people above 60 years are considered as the old age people. As per the socio-economic survey 2019, 21.18% of male population and 22.62% of female population is coming under this group. Brother Horthunathus Memorial Old age Home, Karuvatta, run by Sisters of Charity of St.Johns of God is the old age home functioning in Adoor. In the local level analysis major suggestion in this sector are construction of old age homes and providing necessary medical facilities for old age people.

18.6 Differently abled

Facilities for differently abled people are limitted in the town like disabled friendly footpaths, ramps, lifts in public buildings, public toilets etc. One buds school is situated in ward 26 priyadharshini. More facilities for empowerment of differently abled population are required.

18.7 Effect of hazard risk in this sector

Hazard risks such as lightning and flash floods have a disproportionate impact on vulnerable groups in Adoor. Women and children may face higher safety risks during lightning events in public spaces and while accessing schools, markets, or health centres, as well as mobility challenges during flash flood situations due to poor street lighting and footpaths. Differently abled and elderly populations are particularly at risk during urban floods as they depend on accessible transport, barrier-free infrastructure, and timely assistance, which are often inadequate. Addressing these concerns requires hazard-resilient infrastructure such as lightning arrestors in public buildings, safe shelters, inclusive disaster management plans, barrier-free evacuation facilities, strengthened drainage near vulnerable settlements, and community-based awareness programs that ensure the safety and dignity of all sections of society.

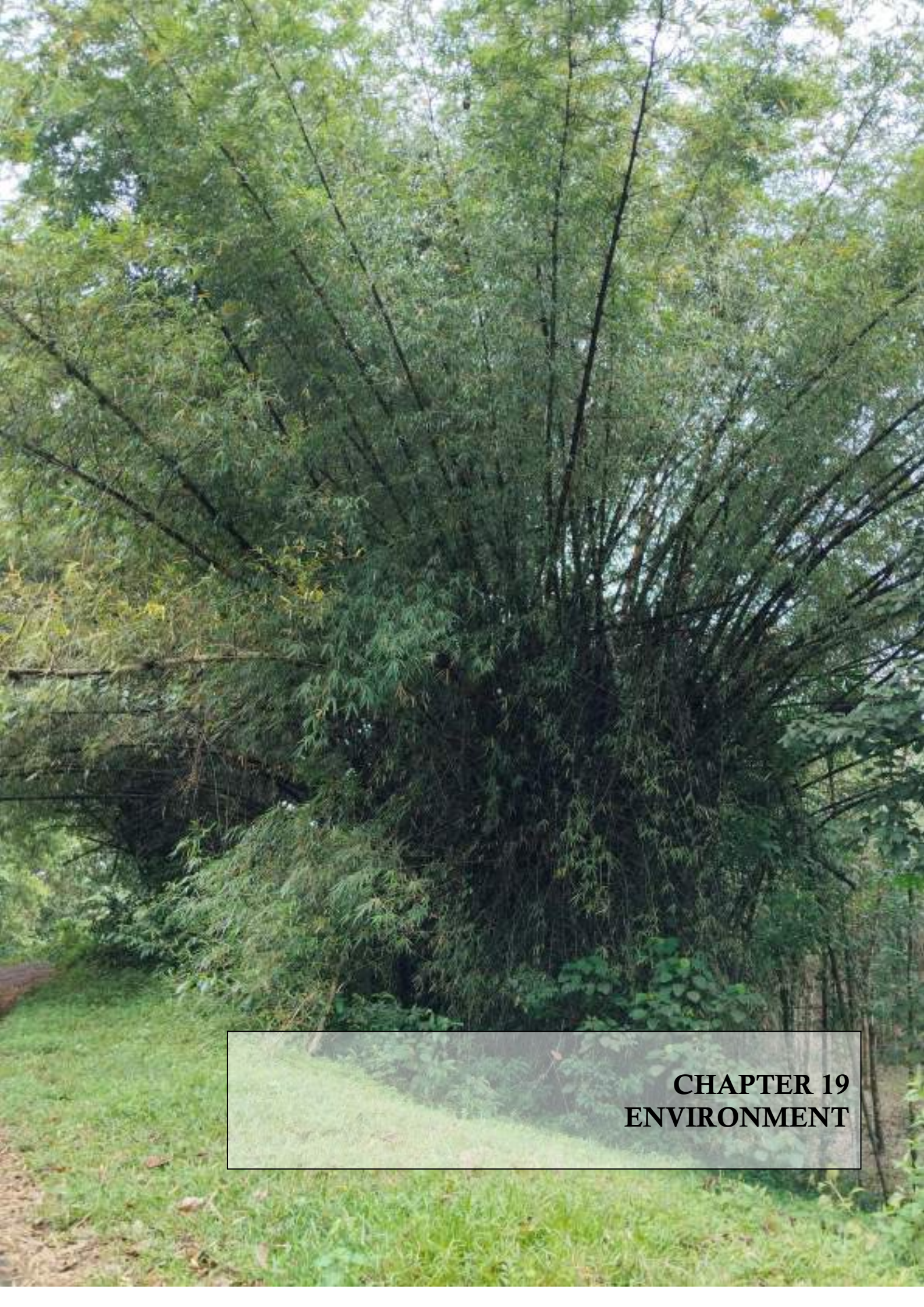
18.8 Problems& potentials

In Adoor, special concern groups such as women, children, differently abled persons, the elderly, and SC/ST nagars face a range of challenges linked to civic amenities and social infrastructure. Women encounter limited gender-friendly public toilets, inadequate lighting in streets and transport hubs, and insufficient safety features in public spaces. Children lack well-equipped playgrounds, child-friendly libraries, and safe pedestrian infrastructure around schools. Differently abled persons face barriers in accessing public buildings, transport, and toilets due to the absence of universal design standards. The elderly require more age-friendly health facilities, resting spaces, and social interaction centres. These concerns also point to significant potential: inclusive urban design,

improved social infrastructure, equitable distribution of services, and community-based development can ensure that vulnerable groups in Adoor are provided with dignity, accessibility, and equal opportunities in the town's growth.

18.9 Inference

Adoor town, while having some existing social welfare structures, demonstrates a clear need for targeted interventions to address the specific vulnerabilities of its SC/ST populations, women, children, and elderly residents. The analysis highlights gaps in infrastructure, institutional support, and essential services, emphasizing the importance of inclusive urban planning that prioritizes the well-being of all its citizens. The Anganwadi situation shows a need for major infrastructure investment. The high percentage of elderly residents shows that the town needs to prepare for aging population.



CHAPTER 19
ENVIRONMENT

19.1 Introduction

Adoor town is endowed with a unique blend of natural and semi natural environmental resources that contribute to its ecological balance, climate resilience and liveability. The town's landscape is marked by a network of small rivers, streams, ponds and wetlands that support biodiversity and groundwater recharge. Tree lined roads, agricultural belts and open spaces not only enhance the aesthetic appeal but also serve as vital green lungs. These environmental assets if conserved and integrated to planning have the potential to improve recreational opportunities strengthen disaster resilience and support sustainable economic activities. The environmental assets in town such as wetlands, water bodies etc. are shown in Figure 19.1 and 19.2.



Figure 19.1 Environmental assets in Adoor town

Urbanization leads to many environmental problems of varying extent that varies from town to town. Commercial activities, population explosion, vehicular growth, conversion of green and open areas, inadequate waste disposal etc. are leading to many environmental problems. Increased interaction between residing population and natural resources, due to economic developments leads to environmental issues. The urban environmental problems are threats to human well-being, resulting from human-induced damage to the physical environment, originating in urban areas. It includes:

- Localized environmental health problems such as inadequate household water and sanitation and indoor air pollution.

- Town level environmental problems such as air pollution, inadequate waste management and pollution of water bodies.
- Degradation of natural areas.
- Infrastructure deficit.
- Urban Flood.



Figure 19.2 Environmental assets in Adoor town

19.2 Present Scenario

19.2.1 Water Pollution

Pallickal River is the major natural water body passing through Adoor town. In addition to that about 12.50 km. of canals of Kallada Irrigation Project is passing through the town. These water bodies are being polluted by disposal of wastes, especially solid wastes including waste from vegetable, fish and meat markets. In addition to that there are around 20 ponds in different part of the town. But with reduction in paddy cultivation, many of these ponds are deteriorated due to lack of maintenance.



Figure 19.3Polluted water in Pallickal River

19.2.2 Land Pollution

General land pollution is primarily caused by improper waste disposal, including the illegal dumping of solid waste and the discharge of untreated sewage into the Pallikkal River Puramboke land. This leads to soil and water contamination posing risk to public health and environment.

19.2.3 Air Pollution

The industrial development of Adoor is limited to few small scale industrial units. No large scale or medium scale industrial units are functioning in the town. There is not much pollution from industrial units.

19.2.4 Noise Pollution

There is no major industry in the town producing noise pollution. The important source of noise pollution is motor vehicles. Such pollution is experienced during day and night in two major travel corridors - M.C.Road and K.P.Road.

19.3 Ecologically Sensitive & Fragile Areas

19.3.1 Paddy Fields



Figure 19.4 Paddy cultivation in Moonnalam Farm

The paddy fields, in addition to its agriculture importance, are also acting as a collection basin of rainwater and in turn, recharging the ground water resources. This act as a protective barrier against flash floods. There is drastic reduction in the area of paddy fields in Adoor town. The total area of paddy field was 341 Ha in 1990, which reduced to 170.20 Ha in 2010 and reduced further to 163.93 ha in 2019. The paddy fields are being converted for various urban activities like construction of buildings, roads etc. So the conversion of paddy fields is another environmental problem. So the conversions need to be strictly regulated considering the aspect of disaster effects in the municipality especially flash floods.



Figure 19.5 Paddy field

19.3.2 Surface Water Sources

19.3.2.1 Ponds

Total 20 ponds are situated in Adoor town which are vital to the local ecosystem and culture. They serve as a source of fresh water and a haven for various aquatic lives, reflecting the town's natural beauty and tranquil environment. Most of the ponds are associated with temples and are well maintained. Parthasarathy temple pond has historical importance and heritage value. Pannivizha Valiyakulam has recreation potential also.

Table 19.1 Ponds

Name or Location	WARD
Near Anandapally jaihind junction	7
Near Anandapally crusher unit	7
Near Pannivizha junction	8
Pambettukulam	18
Valiyakulam	9
Ilayappankulam	8
Pulikannanchira	19
Mulloorkulangara temple pond	14
Parthasarathy temple pond	24
Kaimalaparakulam	3
Vazhuvelilkulam	17
Right side of temple in Pannivizha temple	10
Near Pothradu junction	8
Ilayappan temple pond	14
Karuvattapond	27
Chaverupond	6
Pond near Indus tower	28
Pond near St.Jude school	2
Kaithavelil pond	3
Puthiyakavilchira	28

19.3.2.2 Drains

Adoor's natural drainage is managed by the Pallickal River that runs through the central area, effectively channeling surface runoff and rain water. This system also includes various smaller rivulets crucial for preventing water logging and localized flooding. About 19 natural drains are present in Adoor town. The town's topography naturally directs water toward major outlets. However, encroachments and waste disposal obstruct these natural channels leading to the Central

Troll Junction and the KSRTC Junction. The maintenance and protection of these drains are essential for flood mitigation and environmental preservation.

Table 19.2 Drains

Name	Ward
Puthuvakkal elathodu	4,5,6
Paris shavakottathodu	5
Kokkattupadielathodu	6
Kallumpurathu elathodu	7
Kottathodu	8
Kanjiravelilthodu	9
Aruvalathdam puthoorpadithodu	12
Vazhottu payikaduchirathodu	14
Mullathanathu elakaithodu	19
Changepanakaithodu	19
Mathirampalli elathodu	15
Arukalilkshethramthodu	16
Vadatharapadivaliyathodu	25
Seed farmthodu	25
Vinodubhavanum aganavadithodu	17
Aavelitharthodu	27
Karuvatta elathodu	27
Kavumkottuthodu	28
Pallikal valiyathodu , adoor	5,24,25,26

19.3.3 Sacred Groves

Several sacred groves are present within the municipality. Sacred groves are patches of forest that are traditionally preserved by local communities, to maintain biodiversity and serve as a place of worship. This will also help in the preservation of natural habitats; act as a pure air production space.

19.4 Conservation Efforts

In Adoor Municipality, canals and streams are mainly relied upon for irrigation. As part of the Kallada Irrigation Project, the main canal branches flow towards the Karuvatta and Manakkala regions. Among these, the Vadakke Kara canal flows through the soil of Adoor. The Pallikkal River originates from Adoor. The Pallickal river, commonly referred to by the people of Adoor as "Valiyathodu", flows through several wards. The availability of these two water sources alone makes irrigation for agriculture possible.



Figure 19.6 Kaavu near Parakode

The main issue related to the canals is waste accumulation. Since they are under the ownership of the Irrigation Department, cleaning is done only occasionally. As a result, plants are grown canals and their surroundings are increasingly becoming sites for waste dumping. Although cleaning activities have been organized several times with the help of MGNREGA workers and local residents, due to the ownership lying with the Irrigation Department, there are limitations to the actions that the municipality can take.

Regarding the streams, the flow of runoff water into them causes soil and silt to accumulate, which in turn reduces their natural depth. Since the streams are not cleaned at proper intervals to increase their depth, this often leads to flooding in the houses and areas on both sides of the streams. Continuous flow of runoff water also causes erosion of the stream banks. Therefore, all streams must be protected by constructing retaining walls. In Ward 10, at Perumandeyathu, both Thalakkulam (also known as Pottakkulam) and Valiyakulam are in a state of collapse and deterioration. These should be repaired and made usable as soon as possible.

In Ward 13, due to the spread of rubber plantations, parts of many streams have reportedly been filled in. The lack of streams alone is causing difficulties for both small-scale irrigation and drinking water availability. The land on either side of the streams is public land (puramboke). However, it is

being encroached upon and used for private purposes. As a result, the natural width of the streams is narrowing, and this obstructs water flow.

The main stream flowing through the urban areas of Adoor, known as the Pallickal River, is currently in a highly polluted state due to plastic waste and has significantly narrowed due to encroachments on both sides. However, just 10 kilometers away, as it flows through other grama panchayat, this same river serves as a source of clean water. In many branches of the Pallikkal river, the natural width has been lost and the streams now flow in a constricted manner. In such circumstances, sudden heavy rainfall increases the chances of flooding. Since the Pallickal River is relied upon by people in certain areas for drinking water, it is essential that it be cleaned and properly protected.

Adoor's agricultural culture is very well known. Paddy cultivation in Adoor traditionally begins in the month of Makaram (January–February). The "Maramadi" festival held in the month of Medam (April–May), along with associated agricultural fairs and other farm-related entertainments—especially the *Manal Kandam* (a marketplace for seeds, ploughs, yokes, and cattle) held at Ambi in Adoor—are all celebrations tied to farming that have been taking place in the region for centuries.

However, due to urbanization, rising labour costs, and lack of a proper market, paddy cultivation has drastically declined over the past 20 years and is now limited to a few token plots. Changes in climate and the increasing menace of wild boars have worsened the situation further. Following the ban on *Jallikattu*, the famous *Maramadi* festival has also faced difficulties in being conducted. Adoor Municipality has a total of 10 registered Padasekhara Samitis, of which only 2 are currently active and conducting paddy cultivation jointly.

19.5 Effect of hazard risk in this sector

Even though, for a limited period, urban flooding is experiencing in certain part of the town due to lack of availability of drains and blocking of natural drains. Measures are required for protection of wetlands and Paddy field, natural drains and periodic maintenance of road side drains. And proper linkages should be developed to the nearest drain (river,thodu) in order to avoid the water logging.

19.6 Problems and potentials

Wetlands are not conserved or maintained properly, especially with bunds and side canals. Rivers and canals in the town are facing issues related to pollution from plastic and other waste materials deteriorating the quality of water and also causing hindrance to the natural drainage which results in urban flooding. Encroachment along the Pallickal river edge narrowing the effective width of water body is also a problem. This highlights the need for synchronized cultivation following the Njattuvela Calendar, which helps optimize productivity.

The presence of the Pallikkal River and the KIP Canal within the town should be considered as potential assets from both environmental and agricultural perspectives. The town also contains sacred groves, which are highly bio diverse and therefore need to be conserved to address climate change related challenges. Ensure proper irrigation infrastructure before restarting cultivation. It may take up to 3 years to reach profitability after initial losses. Though steps are being taken by the municipality and Krishi Bhavan, the active participation of the local population is essential for implementation and long-term sustainability. The uncultivated wetlands/paddy field can be utilized for recreation facilities.

19.7 Inference

The town is experiencing various environmental issues, but in different magnitude. Priority has to be given for protection of environmentally sensitive areas and water bodies. These environmental assets if conserved and integrated to planning have the potential to improve recreational opportunities strengthen disaster resilience and support sustainable economic activities. Since Adoor is a growing town the environmental issues need to be addressed at this stage itself and planned growth of the town has to be ensured.



CHAPTER 20
CULTURE & HERITAGE

20.1 Introduction

Changes accompanying urban growth causes the destruction of distinctive and meaningful built and natural elements, eradicating the physical expression of former indigenous ways of life that are very much part of the settlement culture. Since the architecture is a long-term and large-scale physical witness to the past, future generations will continue to refer to it as a reflection of the spirit of the historic culture. During the recent decades, the rehabilitation and regeneration of historic centers has been increasingly recognized as an efficient tool for urban development synthesizing cultural values with economic opportunities. Maintaining and enhancing historic buildings and historic areas can be economically rewarding, and in long term, increase the value of private and public property.

20.2 Culture

20.2.1 Religious institutions and Festivals, Custom, Ethnic groups

20.2.1.1 Sree Parthasarathy Temple

Sree Parthasarathy Temple, dedicated to Lord Krishna in his incarnation as Parthasarathy, is one of the oldest Krishna Temples in Kerala and hence holds significant historical and spiritual importance. The temple is situated near the KSRTC bus station in Adoor, making it easily accessible for visitors. The temple showcases traditional Kerala-style architecture, featuring intricate wooden carvings, sloping tiled roofs, and spacious courtyards. The temple hosts a vibrant ten-day annual festival, drawing devotees from across Kerala, with the highlight being the Gajamela, where nine adorned elephants participate in a grand procession. During the festival, the temple grounds are alive with various cultural programs that reflect the rich heritage of Kerala. Traditional music and dance performances, including the classical forms of Kathakali and Mohiniyattam, add to the festive spirit, offering visitors a deep dive into the region's artistic traditions.



Figure 20.1 Sree Parthasarathy Temple

The Ashtami Rohini festival, celebrating the birth anniversary of Lord Krishna, is fervently observed with various folk art forms and dances performed during the festivities, including Parichamuttukali, Mayoora Nritham, Ammankudam, and Velakali, adding to the cultural richness of the celebrations.

20.2.1.2 Adoor Gajamela

The Adoor Gajamela is a grand festival that serves as the highlight of the ten-day annual celebration at the Sree Parthasarathy Temple in Adoor. The Adoor Gajamela is more than just an event; it's a spectacle that attracts thousands of devotees and tourists from all over the world. The festival's highlight is the magnificent elephant pageantry, where nine splendidly adorned tuskers parade through the temple grounds. These elephants, dressed in glittering ornaments, march in unison to the rhythmic beats of traditional drums and the melodic tunes of temple instruments. The sight is nothing short of awe-inspiring, creating an atmosphere of both reverence and festivity.



Figure 20.2 Adoor Gajamela

20.2.1.3 Pannivizha Devi Temple

Pannivizha Devi Temple (1.7 Km from Adoor) which was constructed in the earlier period has heritage value. The Pannivizha Pongala is a significant festival celebrated at the Peedikayil Devi Temple.





Figure 20.3 Pannivizha Devi Temple

20.2.1.4 Garudan Thookkam

The Kumbha Bharani is the annual festival at the Ezhamkulam Devi Temple (5Km from Adoor). The festival is famous for Garudan Thookkam and Kettukazhcha that take place as part of the festival.



Figure 20.4 Garudan Thookkam

20.2.1.5 Anandapally Maramadi Uthsav

The famous "Anandapally Maramadi Uthsav" related with rich agriculture tradition of the area was conducted in Palissery paddy fields at Anandapally within the town limit. Major Religious institutions and Festivals, Customs and rituals having cultural importance are shown in Figure 20.7.



Figure 20.5 Anandapally Maramadi Uthsav

20.3 Heritage

20.3.1 Important heritage sites and buildings

20.3.1.1 Parakode Anantharamapuram Market

Parkkode Anantharamapuram Market, which was established during the end of 18th century by Raja Kesavadasan, was an important market of erstwhile Travancore Kingdom. This market has major role in the history of development of the town. But no structure of ancient period.



Figure 20.6 Parakode Anantharamapuram Market

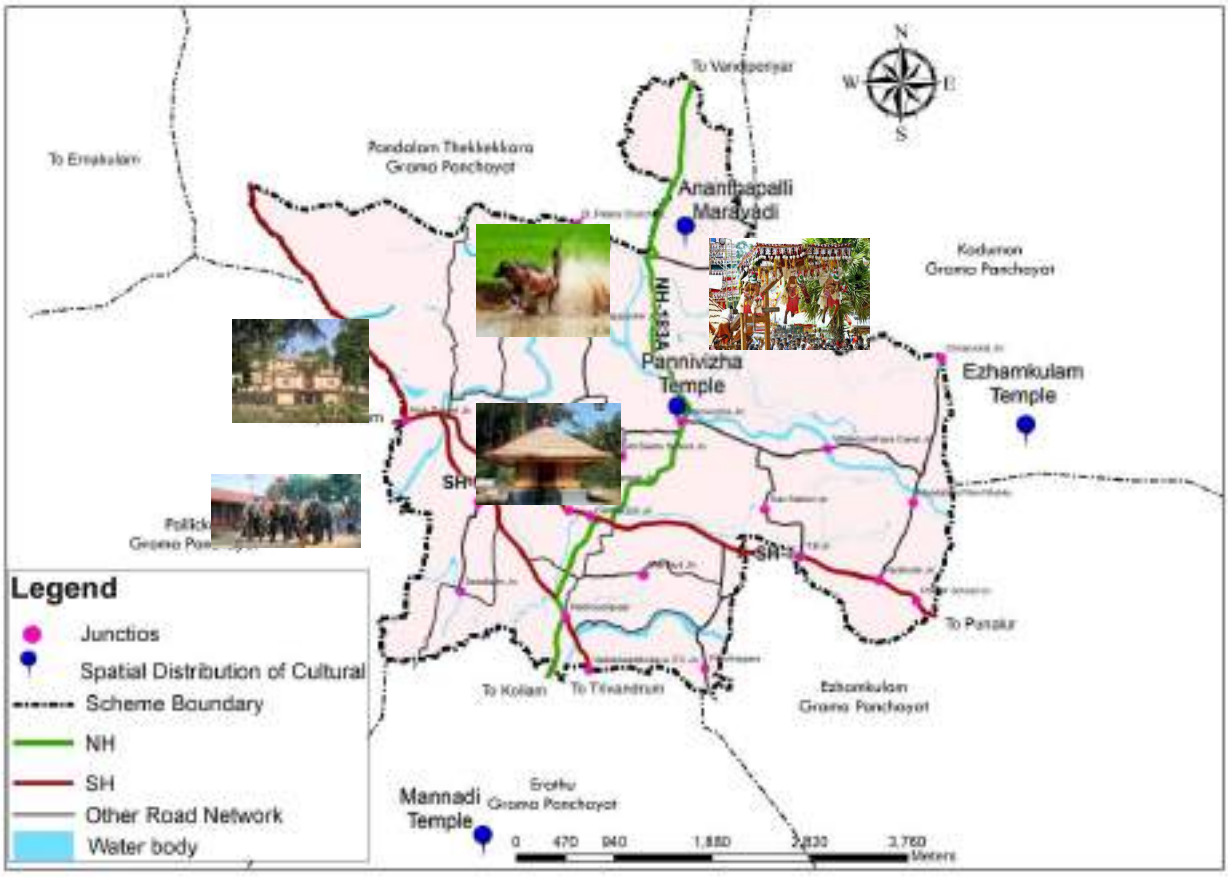


Figure 20.7 Religious Institutions, Festivals and Rituals of Cultural importance

20.3.1.2 Musavari Bungalow



Figure 20.8 Mushavari Bungalow

The buildings situated at T.B.Hill, popularly known as 'Musavari Bungalow' was constructed

during the British period. In addition to the Bunglaow building, stables, kitchen block etc constructed during that period are also there in the compound. Mahatma Gandhi stayed in this bungalow during his visit in Adoor in 1938.

20.3.1.3 TK Madhavan Soudham

The T.K.Madhavan Soudham situated near the Municipal Bus Stand is placed in history as the foundation stone of this building was laid by Mahatma Gandhi. A Smruthi Mandapam in this regard is constructed there.



Figure 20.9 T K Madhavan Soudham

20.3.1.4 The Central toll

The meeting point of M.C Road, Parakode road and Pathanamthitta road is the nerve centre of the town. Earlier this place was a collection point of taxes. This place has witnessed many historical events and visited by Mahatma Gandhi in 1938.





Figure 20.10 Central Toll

20.3.1.5 Parthasarathi Temple pond

According to local legend, During early years, Marthanda Varma was fleeing from enemies, particularly the Ettuveetil Pillamar, powerful feudal lords who opposed his rise to power. While passing through Adoor, the king is said to have sought refuge at a prominent Nair household (the name of the family is sometimes preserved in oral tradition but may vary by source). The family allegedly refused to shelter him, fearing retaliation from the king's enemies. This act was considered

a serious breach of dharma (duty to offer protection to those in danger), especially toward a Kshatriya (warrior/royal class). After ascending to the throne and securing his power, Marthanda Varma returned to the region. In anger and divine authority, he cursed the family that denied him refuge, declaring that their household would sink into the earth and be replaced by water. It is said that soon after, the house collapsed or disappeared, and in its place, a pond (kulam) emerged, which later became associated with the Parthasarathi Temple. The pond was thereafter seen as both sacred and symbolic, representing divine justice, royal authority, and the integration of myth into place.

This story is a classic example of how myth and history intertwine in Kerala's temple lore. It reflects the morality tales often linked to Travancore kings, where loyalty, dharma, and divine sanction are emphasized. The pond, then, is not just a water body but a mythic monument—a reminder of local identity, royal history, and cultural memory.



Figure 20.11 Temple pond

20.3.1.6 Adoor Govt UP School



Figure 20.12 Adoor Govt UP school

The Government Upper Primary School, Adoor (Adoor Govt. UP School) was established in 1914 as Adoor Malayalam School. It was one of the first schools to open in Adoor and played a significant role in the town's educational development. Adoor itself was a major town in Central Travancore, known for its Hindu and Christian communities, and it was never directly under British rule.

20.3.1.7 Kadambanad St.Marys Orthodox church

Kadampanad St. Mary's Orthodox Church, also known as St. Thomas Orthodox Cathedral, is an ancient church (AD 325) located in Kadampanad, 9km from Adoor.It is a significant place of worship for Christians and is part of the Adoor Kadampanad Orthodox Diocese within the Malankara Orthodox Syrian Church. The church is dedicated to St. Thomas and is a part of the larger Malankara Orthodox Syrian Church.



Figure.20.13 Kadambanad St.Marys Orthodox Church

20.3.1.8 Velu Thampi Dalawa Memorial and Museum,Mannadi

Velu Thampi Dalawa (Velayudhan Chempakaraman Thampi) (1765–1809) was the Dalawa or Prime Minister of the Indian kingdom of Travancore between 1802 and 1809 during the reign of His Highness Maharajah Bala Rama Varma Kulasekhara Perumal. He is best known for being one of the earliest individuals to rebel against the British East India Company's supremacy in India. He had committed suicide at Mannadi Temple, to avoid capture by the British.[2] Thus Mannadi has taken its place in history. The Velu Thampi Dalawa Museum constructed in Mannadi, where the true legend committed suicide, reveals the true picture of the ancient Travancore culture. The ancient travancore culture, the coins and household equipments used then are showcased there. Important Heritage sites and buildings are shown in Figure 20.15.



Figure 20.14 Velu Thampi Dalawa Memorial and Museum

20.4 Present condition

Presently there are no efforts for protection of any of the historical buildings Parakode market is partially demolished for renovation purposes and redevelopment have not started yet leaving the site in state of uncertainty. Musahari bungalow, the ancient building is not protected and currently it is functioning as Kerala PWD Buildings' office building. The Anandappally maramadi ulsavam was

stopped for last few years and conversion of paddy fields were happened. But now from 2023 the festival is restarted.

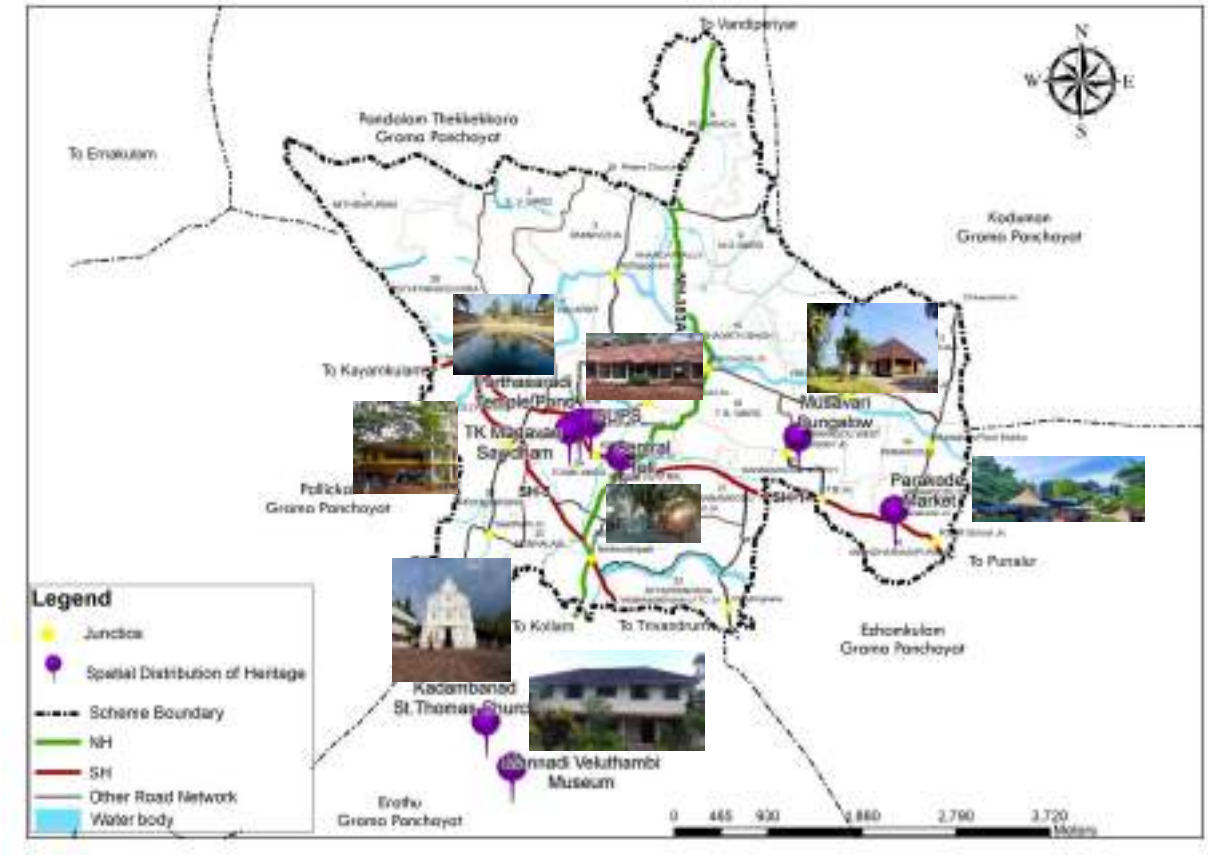


Figure 20. 15 Important Heritage sites and buildings in Adoor Town

20.5 Conservation Efforts – adaptive reuse

Musahari bungalow, the historical building which is not being protected and now used as the PWD office can be preserved keeping its identity and can be re used as Tourist bungalow. Similarly nonfunctioning traditional homes and ancestral buildings can be reused as cultural centres, cafes or homestays.

20.6 Effect of hazard risk in this sector

The heritage and cultural assets are not located in flood prone areas. There are no damages reported in those areas due to flooding. But being lightning is prominent in these areas, heritage structures which are to be protected can be ensured with lightning arresters.

20.7 Problems and potentials

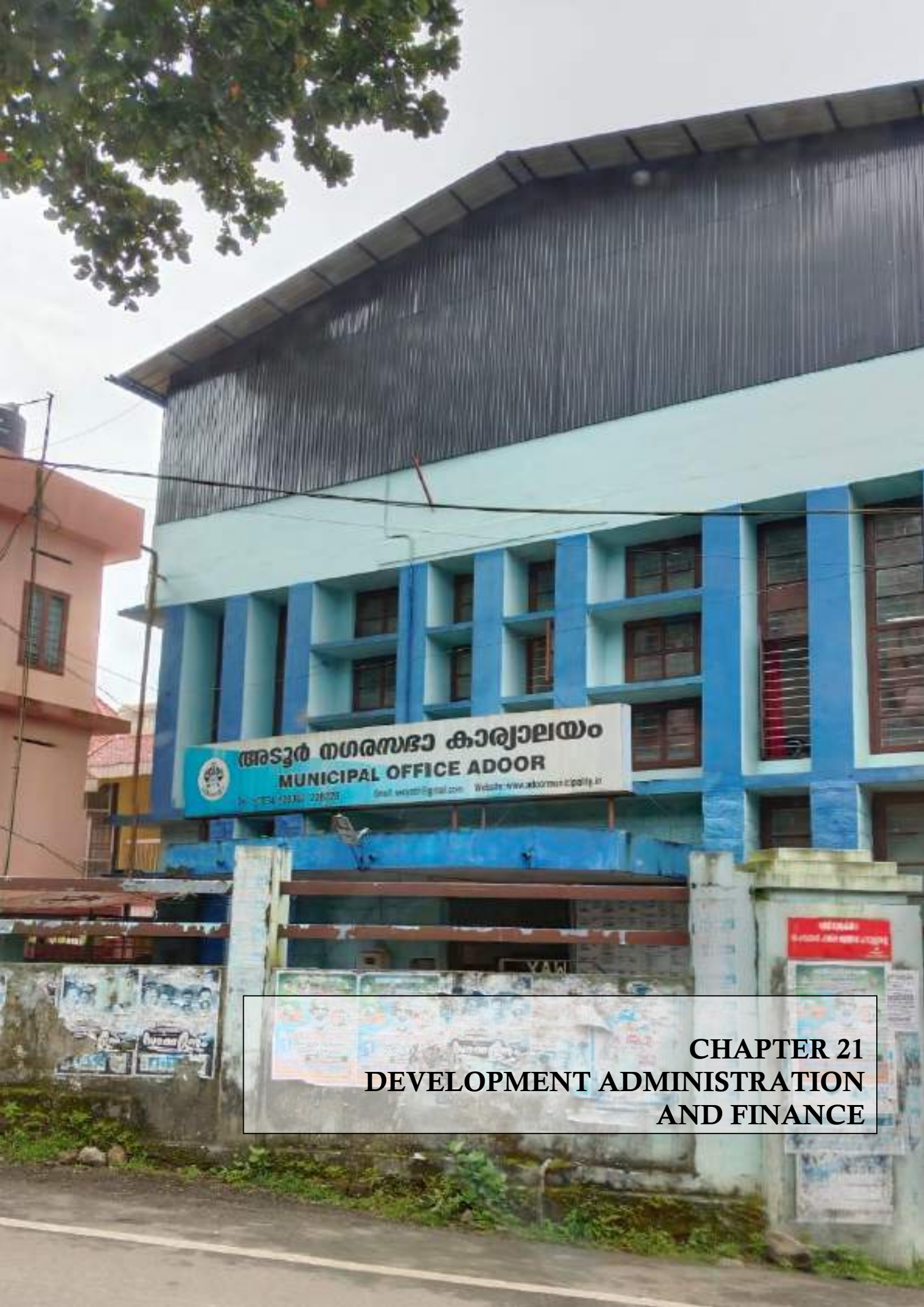
The heritage buildings and cultural attributes of Adoor reflect a rich historical legacy. But they have not received attention for preservation and face challenges due to neglect and modernization. Beyond prominent sites, many heritage structures in Adoor including traditional homes and

religious buildings lack formal protection. Factors such as urban development pressures and limited awareness contribute to their gradual deterioration.

Detailed surveys to catalog heritage buildings, assessing their historical and architectural significance can be undertaken and local community can be engaged in preservation efforts through awareness campaign in partnership with expertise in heritage conservation. Integrating heritage conservation with Heritage and cultural tourism can generate employment opportunities, entrepreneurship opportunities, revitalization of local craft and cuisine and thereby boost local economy.

20.8 Inference

Buildings/precincts of heritage importance are very limited in the town. Ancient temples, well known for festivals offers potential for heritage and cultural tourism development in the town. Parthasarathi temple Adoor, Pannivizha temple, Ezhamkulam temple (close to the municipal boundary), Mannady temple (located in adjacent Kadampanad Grama Panchayat) are the major temples coming under this category. But the historic and cultural buildings as well as rituals can be protected and can be integrated with Heritage,Cultural and Pilgrim tourism thereby enhancing local economic development and employment opportunities.



CHAPTER 21
DEVELOPMENT ADMINISTRATION AND FINANCE

21.1 Introduction

The role of different departments involved in the development activities of Adoor Municipality is discussed in this chapter. The Municipality plays a significant role in the town's development. In addition to the Municipality, Public Works Department, Kerala water Authority, Kerala State Electricity Board, Agriculture Department etc. are the other key departments contributing to this effort. In addition to outlining the functions and financial status of the Municipality, the chapter also covers the details of other public offices operating in the town, providing a comprehensive understanding of Adoor Municipality's development landscape.

21.2 Development Administration

The historical adoption of 74th Constitutional Amendment Act by the Central Government in 1992 has paved the way for local bodies to function independently. This amendment made elections to urban local governments mandatory and facilitated greater devolution of administrative and financial powers. This chapter aims to discuss the existing system of governance in Adoor Municipality.

21.2.1 The Elected Council

The elected council consists of 28 members, which includes 14 women members. The Chairperson who is the head of the council has been elected from the elected members of the council. The Vice-chairperson, to assist the chairperson and also to discharge the duties of chairperson in absence is also elected by the members of the municipal council. There are six standing committees, i.e., for finance, public works, development, health, welfare and education, arts, sports & culture to assist the municipal council in respective fields. Each standing committee consists of five members. The vice-chairperson is the chairman of the finance standing committee and the members of the council will elect the chairpersons of other standing committees.

21.2.2 Administrative Structure of the Municipality

The Municipal Secretary is the executive head of the Municipality and he is supported by the following Organization Structure of the Municipality.

i. General Administration section
ii. Revenue section
iii. Engineering section
iv. Town Planning section
v. Public health section and
vi. Peoples planning section.



Figure 21.1 Municipality Building

21.2.3 General Administration Section

The General Administration section is headed by the Junior Superintendent and consists of three sub-divisions i.e. Establishment, Accounts and other General matters.

21.2.4 Revenue Section

Revenue section is headed by the Revenue Inspector. The section deals with the revenue of the Municipality.

21.2.5 Engineering Section

The Engineering section is headed by Municipal Engineer in the cadre of Assistant Engineer and is assisted by Public works overseers. This section is responsible for the project planning, execution and maintenance of basic services and other infrastructure within the town.

21.2.6 Town Planning Section

The Town planning section is headed by the Municipal Engineer and assisted by Public work Overseers. This section looks after the implementation of the master plans and other town planning schemes, approval of building plan and layout plans, detection of unauthorized construction, eviction of encroachments etc.

21.2.7 Public Health Section

This section is headed by the Public health officer Grade I. This section attends works like collection and disposal of solid wastes, cleaning of drains and work related to public health.

21.2.8 People's Planning section

This section co-ordinates the plan formulation under decentralized planning process. Annual plans and five-year plans for the Municipality are being prepared under decentralized planning process.

21.2.9 Functions of the Municipal Council

Adoor Municipality is the major agency implementing development works in Adoor. The development works under the responsibility of Adoor Municipal Council includes, construction of Municipal roads and their maintenance, public health - primary health centre, community health centre, solid waste management, construction of public market and their maintenance, public cremation ground and its construction procedures, open spaces, parks and their construction works, providing infrastructure in slums, protection of common ponds, and maintenance of the institutions transferred to the Municipal Council such as schools, hospitals and other institutions.

21.3 Municipal Finance

The 74th Constitution Amendment Act of 1992 paved the way for devolution of financial and administrative powers to urban local bodies in a large way. By this amendment the financial

position of the urban local bodies improved and a sizeable share of the total plan fund of the State Government has devolved to the local bodies for plan implementation. The financial position of the Municipality is discussed in the subsequent paragraphs.

21.3.1 Receipts of Municipality

The receipts of the Municipality have been grouped into three categories i.e. revenue, capital and debt. The receipts under revenue includes income from taxes, income from other laws, income from the municipal properties, municipal fees, grant in aid from Government, grant in aid from Government for the maintenance of assets transferred from Government etc. The receipts under capital includes Government grants, Government loans, income from municipal institutions, income from deposits, endowment grant for implementing the programs of the departments transferred to the Municipality, Government grant for decentralized planning etc. The receipts under debt includes deposits, provident fund, pension fund, return from advances, sinking funds, library cess, surcharges, sale tax, income tax, labour welfare fund etc. The Table 21.1 presents an abstract of total receipts in the above three heads from the financial year 2014- 2015 onwards. It shows a steady increase in revenue from all the three heads, i.e revenue, capital and debt.

Table 21.1Abstract of Municipal Income

Item	2014-15	2015-16	2016-17	2017-18
Tax Revenue	22680292	22587269	26523756	25466137
Rental Income from Municipal Properties	8231800	8984871	10582083	9529067
Fees and User charges	2682370	3019780	3340925	4061424
Sale and Hire charges	574692	258683	131935	123021
Revenue grants, Contribution & Subsidies	82735615	73425860	62141813	138303763
Income from Investments	2100	21336	2100	2100
Interest earned	323441	428648	447239	490840
Other Income	15528	0	555265	0
Assigned revenues and compensation	0	0	3996	0
Total income	117245838	108726447	103729112	177976352

Source: Municipal Office, Adoor

21.3.2 Expenditure of the Municipality

Like the receipts, the expenditure of the Municipality is also classified into three accounts revenue account, capital account and debts account. The expenditure under revenue account includes the expenditure for administration and tax collection, public works, town planning, education, water supply and drainage, public health, street light, maintenance of municipal properties, grant for

maintenance of transferred assets etc.The expenditure under capital account includes expenditure for management, public works, education, water supply and drainage, public health, street lighting, endowments, deposits, poverty eradication programs, expenditure for the programs implemented through the departments transferred to the Municipality, programs under decentralized planning etc.

The expenditure under debt account include the expenditure for the repayment of deposits, repayment of cash deposits, pensions, re-payment of advances, library cess, sale tax, income tax, payment of welfare funds etc. An abstract of the total expenditure of the Municipality under the above three heads is presented in the Table 21.2.

Table 21.2Abstract of Municipal Expenditure

Item	2014-15	2015-16	2016-17	2017-18
Establishment Expense	22722451	27595649	34558104	38146329
Administative Expenses	3518640	3353180	9168115	9110785
Operations and Maintenance	1298835	6282832	5625339	8298864
Interest and Finance charges	2226	9934	5893	9053
Programme Expenses	29705963	18249311	19441467	33839413
Decentralised Plan Programme-Service sector	4214362	4222483	5378663	13013484
Decentralised Plan Programme-Infra stucture sector	21912634	41490561	5485735	40061369
Decentralised Plan Programme-Projects not included in sector division	1747827	1209000	1879898	3984908
Revenue grants, Contribution & Subsidies	3073556	883226	0	17500
Depreciation	1005465	0	0	3366166
Total Expenditure	89201959	103296176	81543214	149847871

Source: Municipal Office, Adoor

The receipts of the Municipality has been grouped and described as in Table 21.3. Total Income of Adoor Municipality is largely contributed by Tax Revenues, Revenue Grants accounting for more than 80% of the total revenue income during the recent years. Tax revenue of Adoor Municipality has been increasing year by year (Figure 21.2). Total expenditure is mainly incurred towards statutory functions, Decentralized Plan programs and Revenue expenditure non-Plan (Figure 21.3). Gross surplus has exhibited a gradual upward trend in recent years, as illustrated in Figure 21.4.

Table 21.3 Income and Expenditure of Municipality (in rupees)

Sl. No	**Financial Year**	**2021-22**	**2022-23**	**2023-24**
	Income			
1	Own Fund			
	Tax Revenue	4,57,71,270	4,74,69,552	5,08,85,051

	Non Tax Revenue	1,87,47,906	1,82,05,722	2,62,84,920
2	General Purpose Fund	1,57,40,000	1,43,90,000	1,32,49,800
3	Other Grants(Plan)	5,75,13,539	5,74,39,409	6,48,94,051
4	Other Grants(Non Plan)	5,85,06,220	4,50,74,678	4,35,12,875
5	Capital Income- Loans	4200000	0	1,01,01,426
6	Capital Income other than loans	1,01,66,517	51,98,860	2,05,24,095
	Total Income	**21,06,45,452**	**18,77,78,221**	**22,94,52,218**
	Expenditure			
1	Revenue Expenditure			
	Statutory functions	7,69,89,406	7,46,00,057	8,74,38,487
	Plan	8,49,96,558	5,98,48,345	6,28,79,406
	Non Plan	5,85,06,220	4,32,84,778	4,35,12,875
2	Capital Expenditure			
	Loan Repayment	21,60,001	14,40,002	2491200
	Other than loan repayment	1,02,60,322	1,04,22,234	2,56,48,163
	Total Expenditure	**23,29,12,507**	**18,95,95,416**	**22,19,70,131**
	Gross surplus/Deficit of income over expenditure	**-2,22,67,055**	**-18,17,195**	**74,82,087**

Source: Budget 2021 to 2024 Adoor Municipality.

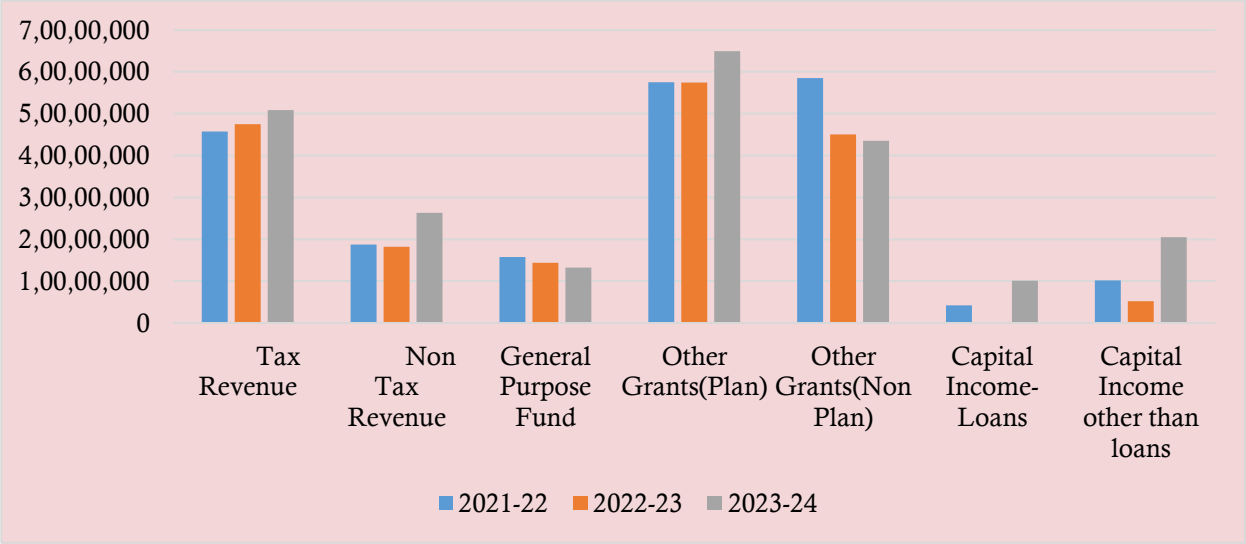


Figure 21.2 Income structure of Adoor Municipality (in rupees)

Source: Budget 2021 to 2024 Adoor Municipality.

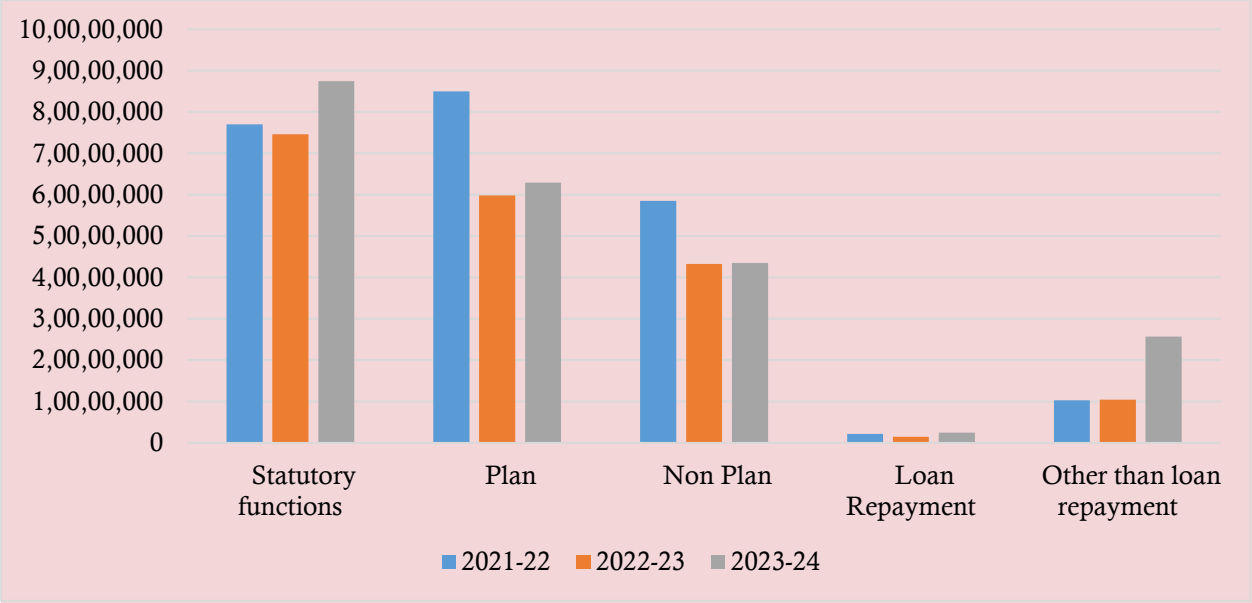


Figure 21.3 Expendicture structure of Adoor Municipality (in rupees)

Source: Budget 2021 to 2024 Adoor Municipality.



Figure 21.4 Comparison of Income, Expenditure and Gross surplus

Source: Budget 2021 to 2024 Adoor Municipality.

21.4 Existing Sources of Funds

The main source of income of Adoor Municipality is municipal taxes, fees for various services, income from properties, government grant (plan fund), deposits and cess. As mentioned earlier, the total income for the financial year 2017-2018 was Rs.17,79,76,352 and the total expenditure was Rs.14,98,47,871. But only a small share of the total income is available for capital improvement program and it is inadequate to provide infrastructural facilities and services in par with demand.

In addition to the above, various programs including infrastructure development projects are being implemented through various State Government Departments and under various centrally sponsored schemes. Procuring funds for implementation of urban master plans and services delivery system from alternate sources shall be thought of.

21.5 Governance

The office building now available for Adoor Municipality does not have sufficient space for efficient functioning. The present building was constructed in 1965, when it was a Grama Panchayat. Lack of space is affecting the day to day functioning of the office. Adequate space and facilities for public are not available. A new building complex with modern facilities considering the next 50 years' demand is required.

The computerization of the Municipal office with network facilities has been completed. Collection of taxes and other revenues, issue of certificates, accounting etc. are computerized. A Janasevanakendram is functioning at the Municipal Office for providing various services to the people. But the front office is not yet functioning in the Municipality.

21.6 Other Departments

Kerala Water Authority is dealing the distribution of drinking water in Municipal area. Office of the Assistant Executive Engineer is functioning at Adoor. The Electricity distribution system is maintained by the Kerala State Electricity Board. The Electrical Major Sections functioning at Adoor and Ezhamkulam are in charge of distribution of electricity. The Kerala State Public Works Department (Roads) is in charge of construction and maintenance of roads other than those roads owned by the Municipal Council. The Kerala State Public Works Department (Buildings) is constructing major buildings.

21.7 Public Offices Functioning in the Town

Adoor is the headquarters of Revenue sub division from the beginning of 19th century. It was the Headquarters of Kunnathoor taluk of erstwhile Kollam district. Adoor became Headquarters of Adoor taluk of Pathanamthitta district in 1982 and now headquarters of Adoor taluk and Adoor revenue division. Headquarters of Parakode block is also situated in Adoor municipality (Parakode). All taluk level offices are functioning in Adoor.

There are 54 State Government offices and 4 Central Government offices functioning in the town. 26 offices are functioning in own building and 32 offices are functioning in rented buildings. Nearly half of the Government offices are functioning in rented building. Even though the Revenue Tower, Adoor was constructed for accommodating Government offices, a number of rooms are remaining vacant due to high rent. A mini Civil Station and a staff quarters is needed for the town.

21.8 Disaster Risk Management

The primary responsibility for rescue, relief and rehabilitation measures for Disaster risk management rest with the respective State Governments. The Central Government supplements the efforts of the states by providing financial and logistic support. The Chief Secretary of the state heads a state level committee which is in overall charge of the relief operations in the state. The district administration is the focal point for implementation of all governmental plans and activities. The administration of relief is the responsibility of the Collector/District Magistrate who exercises coordinating and supervising powers over all departments at the district level. Urban local bodies play a crucial role in disaster management by implementing early warning systems, coordinating relief distribution, providing shelter for affected individuals, and ensuring medical assistance. Municipalities should undertake investments in resilient infrastructure, especially in areas and sectors that are prioritized in the master plans. These could cover sectors like drainage, solid waste management, sanitation, other environmental infrastructure, etc.

21.8.1 District Disaster Management Authority (DDMA)

District Disaster Management Authority, is an institution constituted as per the National Disaster Management Act, 2005 at the District level to ensure effective management and response to any disaster. The District Collector is the Chairperson and the President, District Panchayath, is the Co-Chairperson, of the DDMA. The DDMA establishes a proper chain of command system for planning, coordinating and implementing schemes for effective management of disasters and organize the activities of all agencies responsible for disaster management in the District. DDMA has the authority to make any necessary institutional arrangements, assign responsibilities and modify any existing administrative mechanism or procedure to effectively accomplish the specified objectives pertinent to an incident. Preparation of District Disaster Management Plan is one of the major functions of DDMA.

21.8.2 Nodal Departments for Various Hazards

Table 21.4 Nodal department for varoius hazards in the District

Type of Hazard	Nodal Department
Hydro-meteorological & geological disasters	Revenue & Disaster Management
Road & rail accidents	Home
Chemical, biological, radiological & nuclear disasters	Health & Family Welfare
Industrial accidents	Factories & Boilers Dept., Dept. of Industries
Pest attacks	Agriculture

Dam break	Water resources
Building collapse	Public Works
Forest Fire	Forests
Air accidents	Airport

Source: District Disaster Management Plan 2015, Pathanamthitta

21.8.3 Financial Assistance

As per the National Disaster Management Act, 2005, various financial provisions are available at District level for implementation of the plan.

21.8.3.1 Funds Available At National and State Level

The Calamity Relief Funds which was in operation till March 2010 to meet the expenditure for providing immediate relief was merged in to State Disaster Response Fund on the recommendation of 13th Finance Commission. The fund is maintained in the public account of the state for providing immediate relief. The State Government will also claim on the National Disaster Response Fund (previously NCCF) through memorandums for central assistance for relief and rehabilitation in the event of any calamity of a larger proportion.

21.8.3.2 Funds in 13th Finance Commission

Government have sanctioned Rs.16,00,000 (sixteen lakhs only) for the procurement of essential equipment for strengthening/setting up of the emergency operations centre functioning in the Pathanamthitta district, capacity building in the administrative machinery for better handling of disaster response.

21.9 Programs/Schemes

In the beginning of the twelfth Five-Year Plan some changes were made by government in the Plan guidelines, mainly in sectoral ceilings and project appraisal. In case of infrastructure sector, the mandatory ceiling was fixed at 45 per cent in Grama Panchayats and Block Panchayats, 55 per cent in Municipalities and Corporations and 50 per cent in District Panchayats under general sector outlay. In addition, mandatory minimum allocation of 20 per cent under productive sector, minimum allocation of 10 per cent for sanitation, 10 per cent of the development fund was mandatorily earmarked for Women Component Plan and 5 per cent to children, old age, differently abled, palliative care and other vulnerable groups.

21.9.1 Annual Plan Scheme

Decentralised planning by LSGIs introduced in the State from 1997-98 with devolution of 35 to 40 per cent of State Plan funds envisaged identification of local development problems, prioritisation

and formulation of plans and their implementation with people's participation. Section 175 of the Kerala Panchayat Raj Act (KP Act) 1994 and section 51 of the Kerala Municipality Act (KM Act) 1994 provide that the three tier Panchayats, Municipalities and Corporations are to prepare every year a Development Plan for the succeeding year and submit to the District Planning Committee (DPC) for approval. The Grama/Ward Sabhas decide the priorities in planning and select beneficiaries for beneficiary oriented schemes.

Local Self Government Institutions are provided Plan Allocation in two different streams. They are;

I. Plan Allocation for Centrally Sponsored Schemes and State Sponsored Schemes

II. Plan Allocation for Local Development (Development Fund)

The guidelines for Centrally Sponsored Schemes are formulated by the Central Government and for State Sponsored Scheme, the State Government. The role of the LSGIs under this stream is to act only as an agency for executing the scheme after deciding the location or beneficiaries of the scheme. For Development Fund stream, the LSGIs have full freedom in formulating and implementing schemes after deciding their priority subject to a general overall framework. Basic minimum needs in terms of housing, sanitation, water supply, power connection and physical connectivity of an Urban Local body is addressed through this.

21.9.2 Members of Parliament Local Area Development Scheme (MPLADS)

Under the scheme, each MP has the choice to suggest to the District Collector for works to the tune of Rs.5 Crores per annum to be taken up in his/her constituency. The Rajya Sabha Members of Parliament can recommend works in one or more districts in the State from where he/she has been elected. The Ministry has issued the guidelines on MPLADS Scheme including implementation and monitoring of the scheme.

21.9.3 MLA- Legislative Assembly Constituency Asset Development Fund (LACADF)

This scheme aims at creating durable assets for which each MLA will be allocated 5 Crore during a particular financial year for undertaking capital works in his/her constituency so as to improve infrastructural facilities in all the Assembly Constituencies. Asset means fixed assets for long term uses like buildings, roads, bridges, water supply, sanitation, irrigation, infrastructure, machinery and equipment and fixtures of permanent nature that forms part of infrastructure facilities of Government essential for imparting effective service to the citizens. Major works of the choice of the MLA concerned will be taken up subject to the condition that the cost of works proposed during a year shall not exceed 5 Crore. The LAC-ADF Scheme aims at the upliftment of infrastructure facilities under various Legislative Constituencies by creating durable physical infrastructure of capital nature.

21.9.4 MLA- Special Development Fund (SDF)

A Special Development Fund (SDF) is being allotted to the Members of Legislative Assembly of the State at the rate of Rs.25 lakhs per MLA per year.

21.9.5 Kerala Local Government Service Delivery Project (KLGSDP))

The objective of the Kerala Local Government and Service Delivery Project for India is to enhance and strengthen the institutional capacity of the local government system in Kerala to deliver services and undertake basic administrative and governance functions more effectively and in a sustainable manner. The project will have four components. Component one will provide Gram Panchayats (GPs) and Municipalities with additional discretionary funds to provide increased resources for expanded local investment for the creation, maintenance and operation of capital assets in a manner which incentivizes the strengthening of their institutional capacity. Component two will provide capacity-building inputs to strengthen and supplement the existing systems and human resource of Municipalities and GPs to enhance their institutional performance. Component three will strengthen the system of performance monitoring of GPs and Municipalities in Kerala. Component four will support project management. The Project will benefit 941 Grama Panchayats (GPs) and 87 Municipalities in the State. Investments made by the GPs and Municipalities will indirectly benefit the entire population of the State outside the six City Corporation areas.

21.9.6 AMRUT (Atal Mission for Rejuvenation and Urban Transformation))

AMRUT is a Centrally Sponsored Scheme under Ministry of Urban Development, Government of India. Purpose of AMRUT is to create infrastructure to provide basic services and to build amenities to households. This will improve the quality of life of all, especially the poor and the disadvantaged. The infrastructure should lead to provision of better services to people. Mission components are water supply, sewerage facilities, septage management, storm water drains to reduce flooding, Pedestrian, non-motorized and public transport facilities, parking spaces and enhancing amenity value of cities by creating and upgrading green spaces, parks and recreation centers especially for children.

21.10 Inference

Adoor municipality has a major role in providing various infrastructure facilities and civic amenities to the people. It is a third-grade municipality and the present staff pattern is inadequate considering the responsibilities, powers and assets transferred to the Municipality. The total receipt of the Municipality is showing an increasing trend but it is inadequate to meet the demands. The present Municipal office building is not at all adequate for its smooth functioning and also for providing better service to the people. All taluk level offices are functioning at Adoor town and nearly half of them are functioning in rented building and a new building is needed for those offices, which are functioning in rented buildings.



CHAPTER 22
COMMUNITY INVOLVEMENT

22.1 Introduction

The real purport of Article 243-W of The constitution (74th Amendment) Act, 1992 which defines the powers, authority and responsibilities of Municipalities (urban local bodies), has not been appreciated in most states in India. Little effort has been made to involve the general public in the planning process or in the setting of plan priorities. The Kerala model of people's campaign for decentralized planning aims to resolve this issue.

The importance of people's participation in master plan preparation cannot be overstated. In urban and regional planning, involving the community and stakeholders in the planning process is crucial for several reasons:

- Inclusive Decision-Making: Including the perspectives and concerns of the people who will be affected by the master plan ensures that decisions are -made with a broader range of inputs. This helps in crafting more inclusive, fair, and equitable plans.
- Local Knowledge: The people living and working in an area possess invaluable local knowledge. They understand the nuances of their neighbourhoods, including social, economic, and environmental aspects. Their insights can help in identifying potential issues and opportunities that might not be apparent to planners working from a distance.
- Community Ownership: When people are actively engaged in the planning process, they are more likely to feel a sense of ownership and responsibility for the resulting plan. This can lead to increased support and cooperation in implementing the plan over time.
- Improved Plan Quality: Multiple perspectives and ideas lead to a more comprehensive and well-rounded master plan. The collective intelligence of a community can lead to innovative solutions and a plan that better addresses the needs and desires of the population.
- Transparency and Trust: Involving the community in the planning process promotes transparency and trust between the government, planners, and the public. It helps to dispel suspicions and build confidence in the planning process.
- Legitimacy and Compliance: Plans developed with significant community input are more likely to be perceived as legitimate and are therefore more likely to be followed and implemented. This reduces the risk of resistance or legal challenges to the plan.
- Social Cohesion: Engaging the public can foster a sense of unity and cooperation among community members. When people feel that their voices have been heard and their concerns addressed, it can lead to stronger social bonds and a more cohesive community.

- Environmental Sustainability: Involving the public in master planning can lead to more sustainable decisions. Community members are often acutely aware of local environmental issues and can contribute ideas for minimizing the environmental impact of development.
- Social and Cultural Considerations: Communities have unique cultural and social aspects that should be taken into account in the master plan. This includes preserving cultural heritage, ensuring accessibility for all members of the community, and addressing social inequalities.
- Adaptability: Communities change over time, and a master plan should be adaptable to evolving needs and circumstances. Ongoing community participation can help in monitoring and adjusting the plan as necessary.

Thus, people's participation in master plan preparation is not just a desirable aspect of urban and regional planning; it is a fundamental requirement for creating effective, responsive, and sustainable plans that benefit everyone in the community. Planning processes that actively involve the public are more likely to lead to successful and well-accepted outcomes.

The Kerala Town and Country Planning Act, 2016 has made public participation an integral component of the master planning process. Even from the stage of intention notification to the finalisation of the master plan, citizen engagement plays a vital role, ensuring that the needs and concerns of the community are duly considered. As per section 34(1) of the Kerala Town and Country Planning Act 2016, the Master Plan shall be prepared through a participatory process. Ensuring public participation in the process of preparation of Master Plan is entrusted with the Local Self Government Institution as per Section 16(6) of the Kerala Town and Country Planning (Formulation and Sanctioning of Master Plan) Rules.

The process of preparation of Master Plan for Adoor Municipality involved extensive stakeholder engagements and consultations to ensure that the development needs and concerns of the stakeholders are adequately addressed. These include training programmes, focus group discussions, development seminar, on Preparation of Risk Informed Master Plans etc. Discussions on development needs and identification of issues within the planning area were supported by LSGD Planning with various stakeholders and general public and proposals were presented in development seminar under the leadership of Municipal Council. These consultations ensured that the Master Plan is inclusive, participatory, and responsive to the needs and aspirations of the stakeholders.

22.2 Development Seminars

A Public Seminar was held on 17.02.2024 at SNDP Hall, Adoor, as part of the Master Plan preparation process. This event was hosted by the Municipality and LSGD Planning wing presented the draft Master Plan at the development seminar. Municipal Chairperson, Vice chairman,

Municipal Secretary, Council Members, Standing Committee Members, Working Group Members, Various department officials, Municipality staffs and the General Public participated in the seminar. The presentation of the draft Master Plan was an opportunity to share the vision for the municipality's future development and gather feedback from stakeholders. The event was a significant one to make sure peoples' participation and engagement in the master plan preparation. The Master Plan seminar received excellent feedback from the public.



Figure 22.1 Development Seminar

22.3 Stakeholder Consultations

Thorough involvement of the elected representatives of the local government was ensured through various meetings organized in the Municipality. Throughout the Master Plan preparation process, many meetings and workshops were conducted with working group members at various stages, such as data collection, local-level analysis, envisioning, and detailing, to ensure collaborative and inclusive planning.




Figure 22.2 Discussions and Presentations in Municipal Council




Figure 22.3 Discussions with Chairperson






Figure 22.4 Discussion with line department officials

The representatives from relevant departments were also part of these meetings, seminars and workshops, besides the one-to-one discussions conducted with them. Every possible elected representatives, social activists, historians, academicians, architects, urban designers, scientists, people who have expertise in different sectors etc. were consulted during the preparation of the Plan,

organisations of the citizens, engineers, developers, investors, etc. keenly participated in the process and made their valuable contributions. Besides, extensive publicity was given by the press and other media and discussions were generated on their own platforms, all of which added substantial value to the Master plan.

22.4 Working Group Meeting

First Working Group Meeting was convened on 19.04.2023 at Block Resource Centre, Adoor as part of the Master Plan preparation process. This meeting brought together a diverse group of stakeholders including local government representatives, officials from Adoor Municipality, representatives from various government departments etc. The Working Group Meetings played a crucial in interdepartmental coordination, collaboration, and information sharing among the stakeholders.



Figure 22.5 Working Group Meetings

22.5 Focus Group Discussions

As part of preparation of RIMP for Adoor town, several focus group discussions were conducted with respective stakeholders and experts. These discussions helped in identifying the problems faced in various sectors, possible solution and the future development potential of the town.

22.5.1 FGD on Disaster Management

A meeting in connection with the risk-informed master plan was conducted on 30.09.2023 at Municipal Office, Adoor on Disaster Management. Officials from various departments including District Disaster management Authority, Revenue, KSEB, Electrical Inspectrate, Local Information Desk (LID) &Engineering Wing (EW), Fire Force, Police, KWA and other experts attended the meeting. The major discussion topic was impact of lightning and urban flood in Adoor and the possible mitigation measures. Valuable suggestions were generated from the meeting.



Figure 22.6 Focus group Discussion of Lightning and Urban Flood

22.5.2 FGD onTransportation

A focus group discussion on the transportation sector was convened in Adoor on 29.06.2024 with the participation of officials from the PWD Roads Department, National Highways Authority of India (NHAI), and Kerala Infrastructure Investment Fund Board (KIIFB). The session highlighted the present status of the road network, bottlenecks in connectivity, and the scope for improvement through coordinated interventions. Key issues such as traffic congestion, junction improvements, highway development, safety measures, and financing mechanisms were deliberated in detail. The discussion also emphasized the need for integrated planning to strengthen regional connectivity and support the future growth of Adoor. Details of the Focus Group Discussions held on 30.09.2023 at Municipal Office.



Figure 22.7 Focus Group Discussion with respect to Transportation sector

22.5.3 FGD On Women, Elderly and Children

A focus group discussion with women, elderly, and children was conducted on 17th January 2025 at the Parakode Library Hall in Adoor Town. The session aimed to understand the specific needs, challenges, and aspirations of this group in relation to urban development.



Figure 22.8 Focus Group Meeting with women, elderly and children

concerns regarding safety, accessibility, recreation facilities, healthcare support, and inclusive public spaces. The discussion also brought forward suggestions to create child-friendly environments, elderly-friendly amenities, and opportunities for women's participation in social and economic activities

22.6 Capacity Building Programmes for the Preparation of Risk Informed Master Plans

As part of Adoor town's Risk-Informed Master Plan preparation, detailed training programs were conducted by Kerala Institution of Local Administration (KILA)to make aware the various stakeholders the importance of RIMP and to sensitise them on their roles and responsibilities in the master plan preparation process. Before the training, a Training Need Assessment (TNA) was done to identify knowledge gaps. The TNA informed the development of a tailored training programme, consisting of three modules (Module 1 for Elected Representatives, Module 2 for Line Department officials and Module 3 for Municipal Engineers and LSGD Planning officials who are directly involved in the master plan preparation process) with eight structured sessions each. The modules focused on master plan fundamentals, risk assessment, and disaster risk reduction, specifically designed for elected representatives. A pilot training was held on October 27-28, 2023,at KILA Thrissur which provided valuable inputs for revising the training content.



Figure 22.9 Module 1 Training Programs held at KILA, Thrissur



Figure 22.10 Module 2 Training Programmes held at KILA, Thrissur



Figure 22.11 Module 3 Training Programmes held at KILA, Thrissur

Based on this feedback, four batches of Module 1 trainings were conducted on December 6-7, 2023, December 20-21, 2023, January 5-6, 2024 and January 11-12, 2024. Elected representatives from

Adoor Municipality actively participated in both the Pilot and Module 1 training sessions, making them highly effective. Following the success of Module 1, Module 2 trainings were conducted on January 22-23, 2024, and January 24-25, 2024. These sessions were attended by officials from line departments. Module 3 trainings took place on February 19-20, 2024, and were also well-received by participants from the Municipality and LSGD Planning. The active participation of officials from relevant departments and agencies contributed to the effectiveness of both Module 2 and Module 3 trainings.

22.7 Surveys, Site visits & Public Interaction

As part of the Adoor Master Plan preparation process, a series of comprehensive surveys were carried out to assess the existing conditions and future requirements of the town. Land use survey was undertaken to map the present distribution of residential, commercial, institutional, industrial, agricultural, and open space areas. Transportation survey was conducted to analyze the existing traffic flow, road hierarchy, junction conditions, parking demand, and public transport facilities. The findings highlighted the major bottlenecks in mobility, areas prone to congestion, and opportunities to enhance connectivity through improved infrastructure and integrated transport planning.



Figure 22.12 Land use survey

Socio-economic survey captured the demographic profile, employment structure, income levels, housing conditions, and access to civic amenities. This data helped in understanding the living conditions of residents, identifying vulnerable groups, and projecting future demand for social infrastructure. In addition, a LiDAR survey was carried out to generate high-resolution

topographical data for accurate mapping and identification of natural features, flood-prone areas, and elevation variations. Complementing this, a risk assessment survey evaluated the vulnerability of Adoor to natural and man-made hazards, with specific attention to floods, lightning, and urban heat island effects.



Figure 22.13 Lidar Survey





Figure 22.14 Public Interactions

Apart from technical assessments, public interactions and field visits were organized to make the planning process participatory. Focus group discussions were held with diverse community groups ensuring that their needs and aspirations were directly incorporated into the planning framework. Field observations across different wards further validated the survey findings and revealed on-ground realities that required targeted interventions.

Special attention was given to household-level discussions in lightning-prone areas, where residents shared their experiences, concerns, and suggestions for preventive measures and safety infrastructure. Together, these surveys, discussions, and participatory exercises form a comprehensive knowledge base for the Master Plan, ensuring that it is both scientifically robust and socially inclusive, addressing present challenges while paving the way for a resilient and sustainable future for Adoor.



Figure 22.15 Risk assessment survey

22.8 Expert Level Meetings and Reviews

A meeting had been conducted on 08.02.2024 at Kodumon, a nearby panchayat, as a part of the progress assessment of the Resilient Kerala Program for Results by the World Bank, the KfW (Development Bank Germany) and the AFD (Agence Française de Développement France). The event reviewed the activities of Risk Informed Master Plan preparation in the context of other Disbursement Linked Indicators. Elected representatives including Adoor Municipal Chairperson and Vice-chairperson, officials from various departments and stakeholders attended the meeting and shared their knowledge and concerns about the local context. The participants learned from each other's experience and gained a deeper understanding on resilience building against natural disasters.



Figure 22.16 Meeting with World Bank AFD and KFW



Figure 22.17 World Bank review meeting



Figure 22.18 CTP Planning review meeting

Throughout the process, periodic reviews were conducted by the World Bank, the Chief Town Planner (Planning), and the Rebuild Kerala Initiative (RKI), DLI 4 PIU to monitor progress, provide technical guidance, and ensure that the Master Plan preparation adhered to both international best practices and state-level policy directions. These reviews strengthened the transparency and accountability of the planning process, while also enriching it with expert insights.



Figure 22.19 DLI4PIU Review meetings

Also master plan discussions were held with District Collector, experts from CEREMA university France etc.



Figure 22.20 Meeting with District Collector



Figure 22.21 Meeting with District Collector

An expert level discussion on the draft master plan was conducted on 02/08/2025 at PWD Rest House Adoor. Adoor municipal Chairperson, Special committee members,Chief Town Planner(planning) and officials, DLI4PIU representatives, Pathanamthitta LSGD Planning office, Municipal secretary and engineer along with supporting staff were present in the meeting. Joint site visits are also conducted in proposal areas.



Figure 22.22 Expert level meeting

22.9 Inference

The Master Plan preparation process commences with a resolution passed by the Municipal Council. After that, the Master Plan preparation activities commence with the formation of a Special Committee and Working Groups to guide and support the planning process. They play a crucial role in various phases of the Master Plan's preparation process. The representatives of the people are

encouraged to share their opinions and contribute to the planning process, ensuring that the Master Plan reflects the needs and aspirations of the community.

The Master Plan is designed to maximise the utilisation of land and resources to benefit the community. To achieve this, consultations with local communities play a crucial role in the Master Plan preparation process. Community engagement fosters a stronger relationship between Local Self Governments and the community. It encourages better decision-making by incorporating diverse perspectives and insights. It also provides a platform for people to share their views and concerns, promoting transparency and accountability. By engaging with local communities, the Master Plan preparation process becomes more inclusive, responsive, and effective in addressing the needs of all stakeholders.

The Risk-Informed Master Plan involves a comprehensive research process, analysing various disaster scenarios within the municipal area. The research findings are shared with expert groups from various departments through meetings, facilitating a thorough understanding and evaluation. The information is then shared with the public through a seminar, fostering community involvement in the Master Plan preparation process. The final report is prepared, and additional opportunities for public input are provided. This inclusive approach effectively fosters transparency and encourages active community participation throughout the Master Plan preparation process.



CHAPTER 23
SUMMARY AND FINDINGS

23.1 Introduction

Studies and Analysis at the Settlement and Regional levels relating to various Sectors have been presented in the first part (Chapters 1 to 22) of this report. The findings from the first part are summarized in this chapter

23.2 Summary and Findings

23.2.1 Adoor in the District Context

Adoor is one of the four Municipalities of Pathanamthitta district. It is the headquarters of Adoor taluk and located in the south west corner of the district. In the regional setting study, Adoor has been identified as a second order settlement in the existing hierarchy of settlements. In the District urbanization report of Pathanamthitta (2011) prepared by the Town and Country Planning Department, Adoor is proposed as a second order settlement of Pathanamthitta district. In the District scenario, the Functional Character of the town is Rural. Agriculture, Animal Husbandry and Small-Scale Industries have potential for development in the town.

The town is located in the Central Travancore Region and mid-way between Thiruvananthapuram and Kottayam in the M-C Road (SH.1). It is also located midway between the coastal town of Kayamkulam and the hill town of Punaloor in K-P Road (SH.5) which is another major State Highway. The town is well connected to major centres of the state by road way. Historically the town was developed as a Market centre with the establishment of Parakkode Anantharamapuram market. Trade and commerce is still one of the major activities of the town. Adoor is also an administrative centre and is the headquarters of Adoor revenue division. All taluk level and a few district level offices function at Adoor. Topographically the town has an undulating terrain with hills and valleys. The elevation above MSL varies from 8m to 85m. Areas in the town with higher elevations are mostly Agriculture land (dry cultivation). Major Urban developments have taken place along the valleys. Valiyathodu (Pallickkalar) is the major natural water body passing through the town.

23.2.2 Regional Setting

As per the District Urbanization Report of Pathanamthitta (2011), Adoor is proposed as a second order settlement of Pathanamthitta district along with Pandalam, Mallappally, Ranni and Konni. In the district scenario, the functional character of the town is Rural. Thiruvananthapuram – Angamali M-C Road (SH.1), Kayamkulam - Pathanapuram road (SH.5), National Highway (NH) 183A are suggested as major roads and Adoor-Konni road is suggested as sub-major road. The town is well connected to the major centres of the State by National Highway, State Highways and other district roads. Based on the Urban profile, the functional character and the land use concentration of the town and its surrounding Grama Panchayats, the Planning Area is delineated as Adoor Municiplal

area and the influence area as Adoor Taluk. Pandalam municipality and 9 Grama Panchayats – Pandalam Thekkekara, Thumpamon, Enadimangalam, Erath, Ezhamkulam, Kadambanad, Kalanjor, Kodumon and Pallikkal comes under the influence area and the total extent of the influence area is 327.16 sq.km and total population as per 2011 census is 3,02,936. The floating population to the town is estimated as 50,000. The population density of the influence region is comparatively high. The economy of the region is agriculture oriented. The agro based products are the major resource of the region and the level of industrialization is very low. Grama Panchayats in the region are more or less equally developed as far as the lower order facilities are concerned.

23.2.3 Land use

The existing land use of the town shows that Agriculture land use accounts for 49.15% of the town's total area, indicating that almost half of the town is dedicated to agricultural purposes. Total developed area of the town is 45.20 Residential use is the second-largest land use category, occupying 33.95% of the town's total area which indicates that residential areas c.over a significant portion of the town.

Major urban activities of the town like commercial establishments, public buildings etc. are concentrated in the central part of the town and along M.C. Road and K.P. Road. Surrounding the central part of the town are high-density residential areas. There is a specific pattern in land use activity and there is distinction between agriculture and non-agriculture land use to an extent. The central part of the town is characterized by a concentration of non-agricultural activities and agricultural activities are largely confined to the periphery of the town.

23.2.4 Hazard Profile and Climate Change

Despite being relatively safe from major hazards like floods and landslides, Adoor Municipality is vulnerable to several environmental risks that demand immediate attention. The key threats include heat-related illnesses, drought, water scarcity, lightning strikes, and localized flooding, which are likely to be exacerbated by climate change. Effective heat action plans, water conservation initiatives, improved lightning protection measures, climate-resilient infrastructure, enhanced community awareness and disaster preparedness efforts are required to minimise the impact of environmental hazards and to ensure long-term resilience.

23.2.5 Population

The population of Adoor town as per 2011 census was 29,171. Adoor has second position in population growth rate among the four urban centres of the district. It is mainly due to the establishment of a number of new institutions in the town and surrounding areas. But the density of population of Adoor Municipality is low. The gross population density of different wards in the Municipality varies from 768 to 2779 persons per Sq.km. The age sex pyramid of the town is a

regression pyramid with there are fewer children and more old people and the population is likely to decrease in future. The population growth rate of the town is declining.

23.2.6 Employment

The work participation rate of Adoor town is lower than that of the district and other urban centers of the district as well as surrounding grama panchayats. The work participation rate also declining till 2001 and 2001-2011 it showed an increasing trend. The growth rate of workers is less than population growth rate from 1961-2001. However, during 2001-2011 it started increasing by 10 times. The occupational structure shows that more percentage of workers belong to the other workers category. There is gradual reduction in the number of workers engaged in agriculture and related activity and there is corresponding increase in other workers category. The agricultural sector workers are concentrated in the peripheral area of the town and non-agriculture workers are concentrated in the central part of the town. The analysis shows that in production sector, the agriculture sector shows a declining trend and the industrial sector not recording any growth. The only sector, which shows growth, is service sector. Traditional sectors like agriculture and allied activities have declined in direct employment but still support the local economy directly. Overall, Adoor's employment profile refects a shift from agriculture to service and trade based livelihoods, with growing opportunities in infrastructure, education, healthcare and small scale enterprises.

23.2.7 Agriculture

More than half of the town area is under agriculture use. Rubber is the major crop of the town. Three fourth of agriculture land is currently under rubber cultivation and rubber cultivation is spreading to more and more areas. KIP canals, natural drains and ponds associated with paddy fields are available for irrigation. Major portion of paddy fields are remaining uncultivated or used for cultivation of crops other than paddy. Still, agriculture and allied sector plays major role in the economy of the town.

23.2.8 Animal husbandry and Fisheries

Considering the land use pattern and the large percentage of land under agriculture use, there is ample scope for developing Animal Husbandry sector in the town. Decline in the cultivation of paddy, increase in production cost, non-availability of good cattle breed etc are the major hindrances in growth of the sector. However high demand for milk, egg and meat in town and surrounding area and comparatively good price for product are potentials. Hence this sector can be developed as an income generating economic activity of the town.

Not being a coastal LSGI, Fishing sector has no scope at Adoor town. Possibility of utilising existing ponds in the town for fish farming may be explored.

23.2.9 Industry

In Industrial sector, Adoor is not specialized for any particular type of industry. Only industries in the category of MSME are there in the town and 66% of them are in service sector. Considering the raw materials available in the town and the influence region of the town, there is scope for developing Agro based industries and building materials units. The presence of KINFRA Park is an advantage for industrialization of the region. Industrial areas that are prone to lightning strikes should incorporate additional safety measures and precautions during future expansions to ensure safety.

23.2.10 Tourism, Culture & Heritage

There are no major tourist spots within the town. But Adoor is well connected with tourist centres in the neighbouring areas. It can be developed as a tourist transit point considering its location in between the network of tourist centres and pilgrim centres. There are very few buildings with heritage value within the town. These heritage structures offer opportunities for adaptive reuse.

23.2.11 Trade & Commerce

The study on commercial activity of the town shows that there are four major commercial nodes in the town - Parakkode, Central Toll Junction, KSRTC Bus Station Area and Private Bus Stand Area. High School Junction., Kottamugal, Holy Cross Junction and Anandappally are the other nodes with significant commercial activities. Three markets are functioning in the town, Parakkode Market, Sreemoolam Market and Central Toll Market. Parakkode and Sreemoolam markets have regional importance. There are 61 branches of Nationalised, Scheduled, Commercial and other banks and other financial institution facilities in the town. Trade and commerce is one of the major activities of the town. People from the whole influence area depends on Adoor town for higher order commercial facilities.

23.2.12 Traffic & transportation

The width of 97% of roads are in between 3.00m and 6.00m. Maximum traffic volume of 41,384 PCU is observed in between KSRTC and TB Junction and the v/c ratio at this stretch is 2.76. For most of the sections of M.C. Road and K.P. Road, the v/c ratio is greater than 1. Parking demand is mainly met by on-street parking. Public transport is the major mode for passenger trips (42.23% in 2011). Total divertible Passenger and Goods traffic are 12% and 37% respectively. The pedestrian facilities are inadequate. The availability of public transport facilities at the interior area of the town need to be improved. The facilities at the KSRTC Bus Station is inadequate and no terminal for Private buses is available in the town. A new bus route pattern shall be evolved after the new Municipal bus stand at the M.C. Road By pass is made operational. A Rail linkage to the town is desirable for the overall development of the town as well as the region.

23.2.13 Water supply

Undulating topography is the major hurdle in providing piped water supply. Only 25.93% of households are getting protected water from KWA. For 93.94% of the households, well is the main source of water. Certain areas of the town need special attention as there is more scarcity of water. Areas with high altitude can be served with local water supply schemes.

23.2.14 Drainage and Sewerage Systems

Due to urbanization, many natural streams have been encroached upon disrupting the original hydrological flow. The town faces flash floods, and drainage congestion, particularly during the monsoon season, owing to inadequate capacity, poor maintenance, and lack of integration between natural and engineered systems. To enhance stormwater management and reduce flood risk, it is recommended to widen critical water bodies and natural drainage channels based on their stream order and catchment response. Furthermore, a comprehensive drainage master plan must be prepared that integrates ecological buffers, retention basins, and improved connectivity of the drainage network, while also incorporating climate resilience and urban expansion forecasts.

Adoor town does not have a proper sewerage network system to address the liquid waste produced. With no sewerage system, leaving large portions of the population dependent on on-site sanitation systems, which are often poorly maintained. A Sewage Treatment Plant (STP) and a Faecal Sludge Treatment Plant (FSTP) would provide a long-term solution to the town's liquid waste management challenges.

23.2.15 Solid waste disposal

The solid waste treatment plant at Kaimalappara is functioning effectively and it can be upgraded to a regional plant. Considering future demand, new Thumboormozhi units and expansion of MCF are necessary. Regional treatment facilities are more suitable for treatments of rejects and municipality should take initiative to identify land for regional treatment facilities. Preparation of a solid waste management plan for the town also help to manage the overall solid waste of the town in structured manner.

23.2.16 Energy

In power sector, conventional source of energy is mainly used. 66.34% of the electric power is consumed for domestic purpose and 28.73% for commercial purpose. Consumption of power in industrial sector is very nominal. Low voltage is not a problem in the town whereas, frequent power supply interruption is a problem. Absence of separate streetlight line is creating problems in the functioning of streetlights. 97.8% of the houses are electrified. Now importance shall be given for improving the quality of supply and other sources of energy like Solar photovoltaic array (SPVA) systems. Only 1% of the domestic connections are now using solar system also. As per the risk

assessment, south-east part of the municipality is prone to lighting. So proper mitigation measures should be taken while developing this area. Still, firewood is a major domestic fuel in the town. It may be due to its availability.

23.2.17 Education

The level of education is high in Adoor town. While considering the Government, Aided and unaided schools, sufficient number of institutions are available for school education. The private sector educational institutions have major role in school education especially in the H.S and HSS level. Basic facilities are available in most of the schools. Travel distance to the schools in primary level is higher than the standards. In higher education sector, adequate number of institutions are available in the town and surrounding areas. New generation colleges have come up within and in the surrounding areas of the town recently.

23.2.18 Health

Sufficient bed strength as per standards is available at the hospital in the town but many essential specialised departments are not available. For higher order facilities people depend on institutions in other towns. General Hospital, Adoor is the major Medical Institution in the town in terms of number of patients and availability of departments. As Adoor town is located at the intersection of the major state highways, upgradation of Adoor Hospital with trauma care units is essential. Hospitals with IP facilities in Indian system of medicine and Homoeopathic system of medicine are lacking in the town.

23.2.19 Housing

Most of the people of the town are living in their own houses. The houses in Adoor town have comparatively large size and better structural and sanitary condition. The collection of solid wastes from the residential area is very poor and majority of people dispose garbage in their own premises. When compared to adopted standards most of the services are available at reasonable distance from the residential areas. The scheme for providing houses to all families is in progress under LIFE Mission.

23.2.20 Recreation Facilities

Only lower order recreational facilities are available in the town. Being a regional centre, the recreational facilities in the town have to be improved considering the town and its influence area. Stadium, open ground, fair ground, town hall etc. are also needed. Small play grounds/ tot lots/ parks at neighborhood level are also needed. A cultural centre is also needed in the town.

23.2.21 Special Concern Areas

For the welfare of weaker section of the town more facilities are to be provided. In the changed social structure, more attention is needed for the welfare of old age people. Projects have to be

evolved for the economic development of women, children, differently abled, transgender, Scheduled Castes and Scheduled Tribes.

23.2.22 Environment

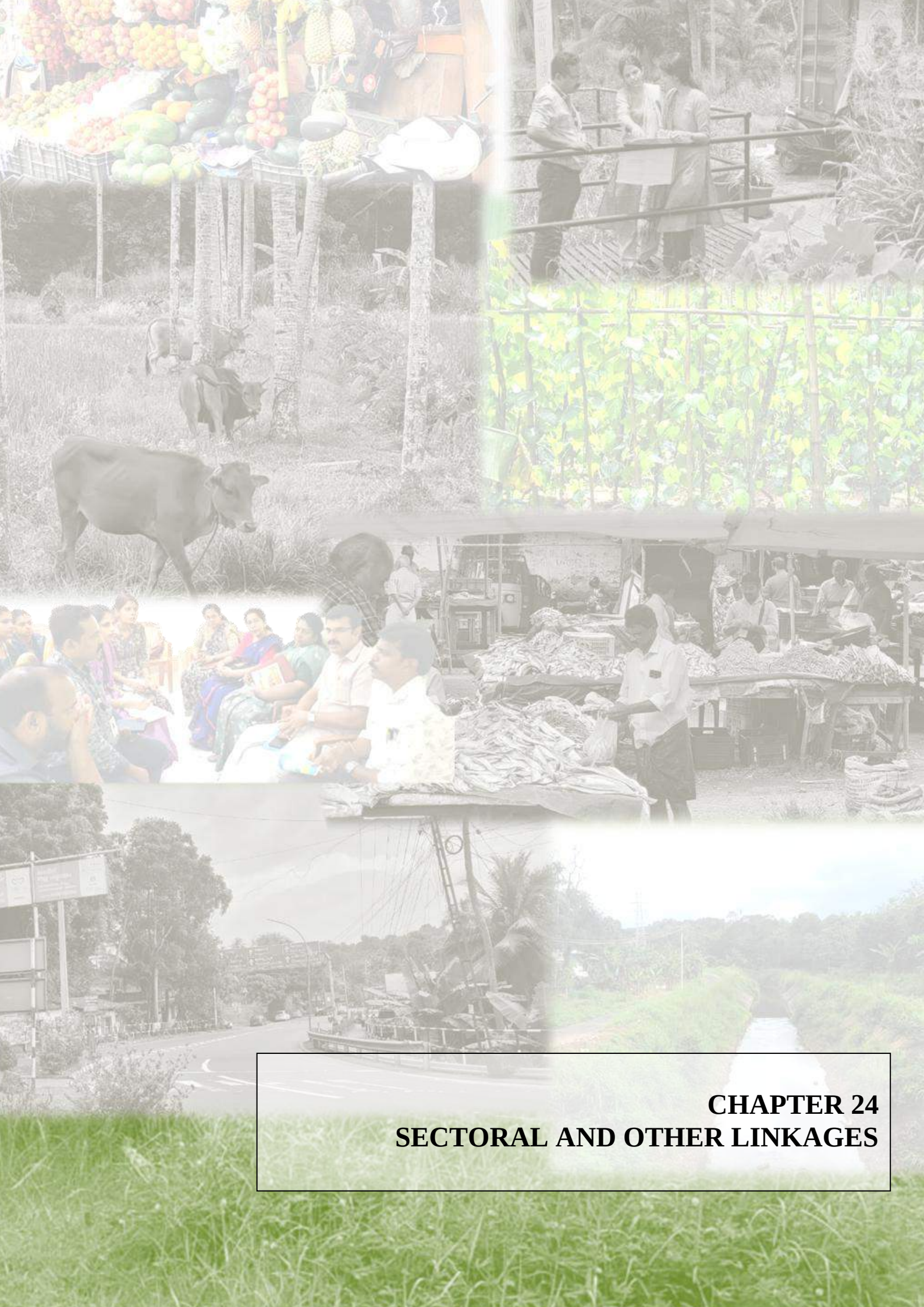
The town is experiencing various environmental issues, but in different magnitude. Priority has to be given for protection of environmentally sensitive areas and waste disposal. Since Adoor is a growing town, the environmental issues need to be addressed at this stage itself and planned growth of the town has to be ensured.These environmental assets if conserved and integrated to planning have the potential to improve recreational opportunities, strengthen disaster resilience and support sustainable economic activities.

23.2.23 Other Civic Amenities

Many of the civic amenities are functioning with spatial, infrastructural and service limitations. Issues such as inadequate land, outdated technology, lack of maintenance, and insufficient coverage reduce their efficiency and accessibility, particularly in times of hazard events like flash floods and lightning. However, modernisation of safety and emergency services, integration of eco-friendly and inclusive infrastructure, provision of new land for future needs, and adoption of smart systems for operation and monitoring are identified potentials.. Strengthening these amenities through strategic upgrades, equitable distribution, and climate-resilient planning will ensure that Adoor evolves into a safe, sustainable and citizen-friendly urban centre, capable of supporting its growing population and regional role.

23.2.24 Development Administration and finance

Adoor is a second-grade municipality and the present staff pattern is inadequate considering the powers, responsibilities and assets transferred to the Municipality. The main sources of income of Adoor Municipality are municipal taxes, fees for various services, income from properties, government grant (plan fund), deposits and cess. The total receipt of the Municipality is showing an increasing trend but it is inadequate to meet the demands. The income of Adoor Municipality is lowest among the Municipalities of the district. The present Municipal office building is not at all adequate for its smooth functioning and also for providing better service to the people.



CHAPTER 24
SECTORAL AND OTHER LINKAGES

24.1 Intersectoral Linkages

Spatial / settlement and sector wise analysis of the town has been made in the previous chapters and different planning issues are identified. Significant relations emerging out of cross-sectional analysis of various sectors and linkages among them are included in this paragraph.

24.1.1 Primary Sector - Effect on Commerce, Industries, Transportation, Tourism, Environment and Special Concern Areas

The Primary sector in Adoor, comprising mainly agriculture and animal husbandry, has a significant impact on various aspects of the town, as agriculture is the predominant land use. The Parakode market is a regional market and it provides facilities for trading of the agricultural and other products of the town and surrounding area. Connecting farmers to markets can increase their income and encourage agricultural production.

Agro based products are one among the resources mainly available in the town and its influence areas. Utilizing agro-based raw materials to establish industries like food processing adds value to agricultural products, increasing their market value and generating revenue. This, in turn, creates employment opportunities and drives economic growth, contributing to the overall development of the region. Transportation plays a vital role in supporting agricultural productivity, market access, and economic growth. Possibility of developing Farm tourism in consultation with local communities can be explored, ensuring that benefits are shared equitably. Farm tourism can be a great way to diversify agricultural income thereby promoting development.

The agricultural activities and the environment of the town are mutually related. It is noted that a major portion of the paddy fields are remaining uncultivated or used for cultivation of crops other than paddy. The conversion of paddy lands for other purposes reduces the capacity of paddy lands to collect storm water. Thus, the natural storm water management system is disrupted, leading to increased flood risk and decreased water quality. Similarly, some uncultivated low-lying areas are left waterlogged with contaminated water, posing health risks to the community. But these wetlands serve as a natural flood barrier, protecting the town from potential flood threats. Interventions to enhance agricultural productivity and food security and to empower women through agricultural opportunities can be explored. The agriculture and animal husbandry are closely linked. The extent of agriculture land is comparatively high in the town. This abundance of agricultural land supports and promotes animal husbandry as a viable and profitable economic activity.

24.1.2 Industries and Commerce - Effect on Transportation, Tourism, Environment and Special Concern Areas

Adoor town's industrial sector is currently limited to a few MSME industries, but it has potential for growth, particularly in agro-based industries and start-ups. To support this growth, the town needs

to develop new markets, roads, and other infrastructure facilities. As industries, trade and commerce activities expand, there will be an increased demand for parking facilities, and transportation services, creating new business opportunities and jobs, ultimately driving economic development in the area.

Being a transit hub for the tourists as well as the pilgrims, possibility of developing facilities and services such as restaurants, shops, and restrooms, specifically catering to tourists and pilgrims, need to be explored. The town needs to adopt sustainable practices in all sectors of economy to minimize the negative impacts on the environment and local communities and to ensure long-term viability. Industrial establishments and markets can generate substantial amount of waste, including food waste, packaging materials, and other non-biodegradable waste. Ensuring proper waste disposal is crucial for protecting the environment and public health.

Establishment of Agro-based industrial units and market access to sell the products can be a great way to empower women, as well as socially and economically weaker sections. Hawkers and street vendors contribute significantly to the local economy, generating employment and stimulating economic activity. Although hawkers and vendors play a vital social role, their activities often obstruct pedestrian paths, and harm the environment. By providing a designated area for hawkers and vendors to sell their goods, the town can be kept organised and clutter-free.

24.1.3 Transportation - Effect on Tourism and Environment

Transportation and tourism are closely intertwined, as the quality and accessibility of transportation infrastructure can significantly impact the tourism experience. Even though potential tourist destinations are not available within the town, a number of tourist places are located in the adjacent districts. The town's central location provides easy access to the surrounding attractions. Adoor is the transit point of Sabarimala pilgrims from southern part of Kerala and Tamil Nadu. Hence, the town can also benefit from pilgrim tourism, making it an ideal hub for tourists.

The transportation sector has a significant impact on the environment. Substantial amount of greenhouse gases, contributing to climate change, are being released by the transportation sector. Additionally, transportation infrastructure development, such as road construction, can lead to habitat destruction, fragmentation, and loss of biodiversity. Air pollution from vehicles also negatively affects human health and environmental quality.

24.2 Linkage between Settlement Characteristics and Sectoral Developments

The settlement pattern and provision of infrastructure facilities are related to some extent. The wards in the North West and North East parts of the town are with very low residential density and the

settlements are scattered. Providing infrastructure facilities like roads, water supply, and sanitation in these areas is very expensive due to the low density and scattered nature of the settlements.

The topography and land use of the town are closely linked. The northern parts of the town are characterized by elevated terrain and steeper slopes, primarily used for dry cultivation and marked by low residential density. The construction of KIP Main canals through the town has physically divided the town into two parts affecting the accessibility to certain areas. A larger proportion of the town's developed areas are concentrated on the southern side of the canal, in contrast to the northern side.

24.2.1 Effect of Population Growth on Various Development Sectors

Population growth has a profound influence on various development sectors. Sectors such as water supply, electricity, housing, transportation, education, and healthcare are directly affected, as they experience increased demand and consumption. The town's population growth has minimal impact on the tourism sector, as there are no local tourist attractions.

24.2.2 Effect of Population Growth on Land use Changes and Environment

The population growth rate has a significant impact on land use changes and the environment. Unlike most towns, where the population growth rate is typically lower than that of surrounding rural areas, Adoor's growth rate is similar to that of its surrounding Grama Panchayats. It is observed that the high population growth rate is recorded due to the establishment of new institutions in higher education sector within the town and its surrounding areas. The availability of sufficient land within the town limits has enabled the development of new residential areas, further contributing to the growth. Additionally, a floating population of students and workers adds to the town's population growth rate. The needs of the floating population must be addressed to create a more inclusive and sustainable environment.

24.2.3 Industrial Sector - Effect on Environment, Land Use and Employment

Adoor's industrial sector is characterized by a lack of specialisation in a specific type of industry. Diversification of industrial activities by promoting IT establishments, apparel units, start-up spots etc. can lead to a more robust economy, increased employment opportunities, and a vibrant business environment in Adoor. But the growth of industries in the town may have negative environmental impacts, including increased air, water, and noise pollution, strain on natural resources like water and energy, and the need for effective waste management systems to handle industrial waste. These issues need to be addressed to ensure sustainable industrial growth in the town.

The development of new industries and infrastructure in Adoor may lead to significant changes in land use patterns. The development of new industries may lead to the conversion of agricultural land

for industrial use, potentially affecting the town's agricultural productivity and food security, as well as increasing urbanisation and land fragmentation, harming the environment. By carefully selecting the types of industries allowed in residential and commercial areas, Adoor can promote employment creation while protecting the environment and maintaining the quality of life for its residents.

To promote employment creation, MSMEs need to be encouraged in Adoor. The expansion of industries may lead to an increased demand for skilled workers. The growth of start-ups and agro-based industries may create opportunities for entrepreneurs and small business owners, contributing to the town's economic diversification and growth. Overall, the growth of Adoor's industrial sector has the potential to drive economic development and employment growth in the town, but it also requires careful planning and management to mitigate the potential environmental and land use impacts.

24.2.4 Effect of Various Sectors on Employment

Adoor's employment generation is closely tied to its economic sectors. The town's favorable conditions, including availability of land for agriculture and industry, irrigation facilities, and high prices for agricultural products, make farming a viable option and create employment opportunities in agriculture. Additionally, the establishment of KINFRA Industrial Park at Elamannoor will lead to the growth of ancillary industrial units, generating employment opportunities in the region. Furthermore, elevation of Adoor town as a second order settlement will lead to the development of the service sector, resulting in increased employment opportunities. As a result, Adoor's economy is expected to diversify, leading to an increase in employment opportunities across agriculture, industry, and services.

24.2.5 Changes in Traffic and Transportation Needs due to Growth in Various Sectors

As different sectors of the economy grow, they create new demands on transportation infrastructure. An efficient road network is crucial to support the town's growth, connecting key activities like residential areas, industries, commercial centres, and public facilities. Careful planning is required to ensure that transportation infrastructure keeps pace with the growing needs of the community.

As trade and commerce grow, they generate more traffic within the city. To mitigate this, it is essential to decentralize development focused on local consumption, spreading it out across the city rather than concentrating it in the town center. This approach can help reduce intra-city traffic and alleviate congestion, ultimately contributing to a more livable and efficient urban environment. Public transportation in the town's interior areas needs to be enhanced by expanding bus routes, increasing frequency, or introducing other modes of public transport.

24.2.6 Changes in Traffic and Transportation Needs Due to Changes in Land Use

Changes in land use patterns significantly impact traffic and transportation needs, driven by population growth and economic factors. In Adoor town, the concentration of traffic-attracting land uses, such as major government offices, hospitals, markets, and bus stands, are located in the central part of the town. This leads to high traffic volume in the roads at the central part of the town. Despite the construction of a bypass, most inbound traffic still enters the town centre, leaving the bypass underutilized. This necessitates shifting certain activities from the central part of the town. However, land use patterns need to be optimized to reduce travel distances and promote mixed-use development. Zoning regulations and density considerations should enable balanced growth with transportation capacity.

24.2.7 Spatial Distribution of Trade & Commerce - Effect on Real Property Values and Equitable Housing Policies

The spatial distribution of trade and commerce activities significantly impacts land value in a town. Areas with high accessibility and visibility, such as those near transportation hubs, tend to have higher land values. Provision of micro industrial units in residential and commercial areas can have a profound impact on land values.

24.2.8 Inclusive growth in various sectors

The last two five-year plans have focused on inclusiveness, leading to significant progress in creating awareness and institution building for faster, sustainable, and more inclusive growth. Inclusiveness encompasses various dimensions, including livability, poverty alleviation, access to healthcare, education, and basic amenities. Key components of inclusive growth include adequate and affordable housing.

Inclusive growth can be promoted through policies and initiatives in various sectors. Recognizing street vendors as legitimate entrepreneurs, allowing micro enterprises in residential and commercial zones, and providing facilities for the economic development of marginalized groups enhance inclusivity. Additionally, improving traffic and transportation infrastructure, such as widening collector roads to enhance public transportation facilities and providing road connectivity to remote habitations and ensuring safe passage for pedestrians, also contributes to inclusive growth.

24.2.9 Energy Efficiency and Land Use

Energy efficiency and land use are closely linked. The way land is used and developed significantly impacts energy consumption and efficiency. The benefits of energy saved by land use planning measures are of long term and hence need careful consideration. Compact and mixed-use developments reduce lengthy commutes, resulting in lower energy consumption and greenhouse gas

emissions. This approach also conserves energy in sectors like water supply and electricity. Furthermore, adopting sustainable land use measures can mitigate the urban heat island effect, decreasing energy consumption by reducing the demand for air conditioning and ventilation. Sustainable land use planning practices prioritizing density, walkability, and resource efficiency can enhance energy efficiency and promote long-term benefits.



CHAPTER 25
SPATIAL STRACTURE

25.1 Existing Spatial Structure

The existing spatial structure of the town has been determined by analysing the geographical aspects of the area, activity based on land use, environmentally sensitive areas, functional character, spatial distribution of population, road network, commercial nodes etc.

25.1.1 Geography of the area

The development activity of an area is decided by the geography of the area. The slope of an area is an indicator of the geography of the area. The likely activity that may come in an area is based on the slope of the particular area. Figure 25.1 shows the slope map of Adoor town. The slope of the town varies from 0^0 to 23^0. 64.71 % of town area has slope between 0^0 and 5^0. So sufficient land is available for development purpose. Mithrapuram, E.V. Ward, M.G. Ward, Bhagath Singh Ward and Pannivizha East Wards have more area with steep slope.

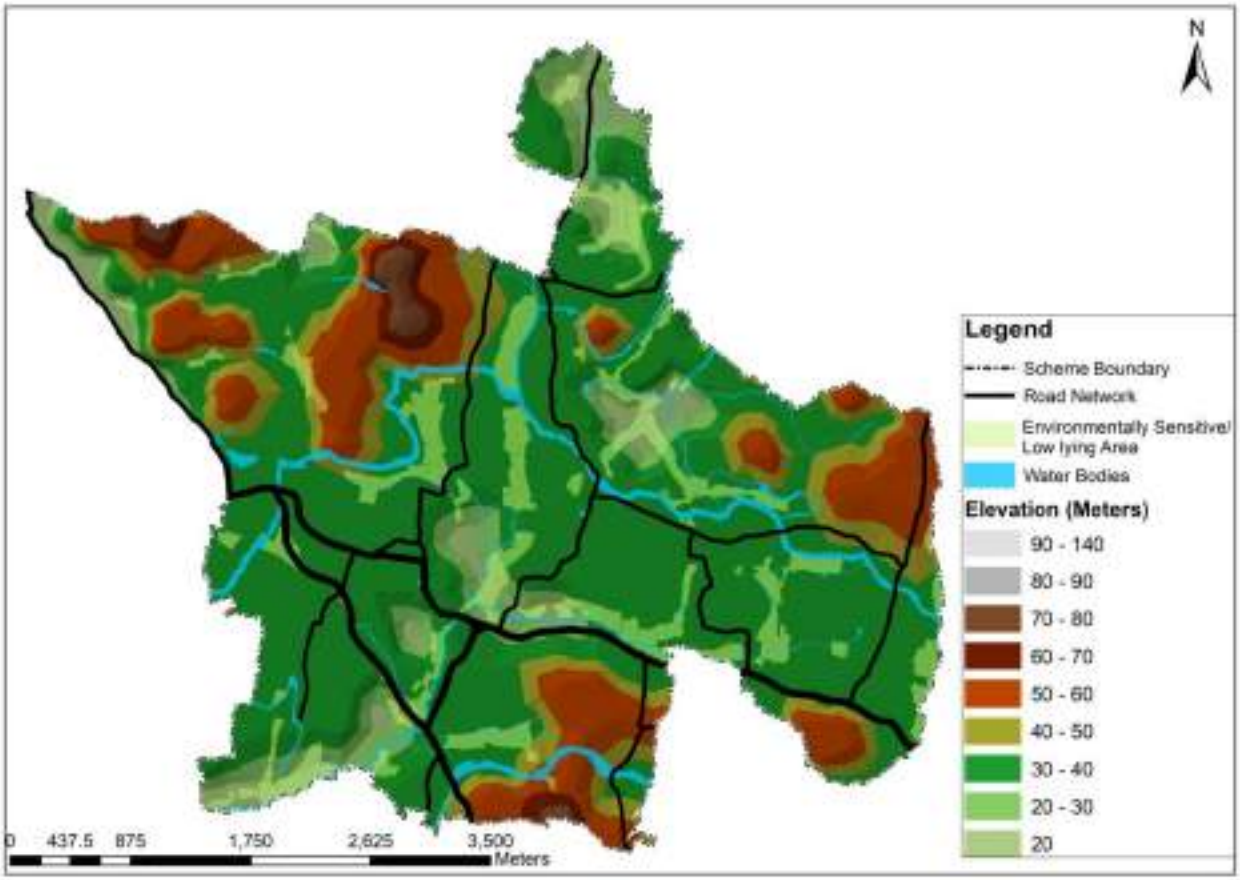


Figure 25.1 Slope of different parts of the town

25.1.2 Functional Character

The functional character of a town is classified into rural, semi-rural, semi-urban and urban based on the land use, population distribution and average plot size within the settlement. The wards in the Municipality are studied in detail with respect to various aspects like total area under each land use category, concentration pattern of population, percentage of workers engaged in non-agricultural

pursuit and average plot size in the residential/agricultural mix use category. The functional character of wards of Adoor town is shown in Figure 25.2. Only six wards of the town, i.e., Civil Station, Parakode, Anantharamapuram, Parakode west, Adoor Central and Ayappanpara has urban character. Nine wards have semi-urban character, two wards has semi-rural character and the remaining eleven wards have rural character.

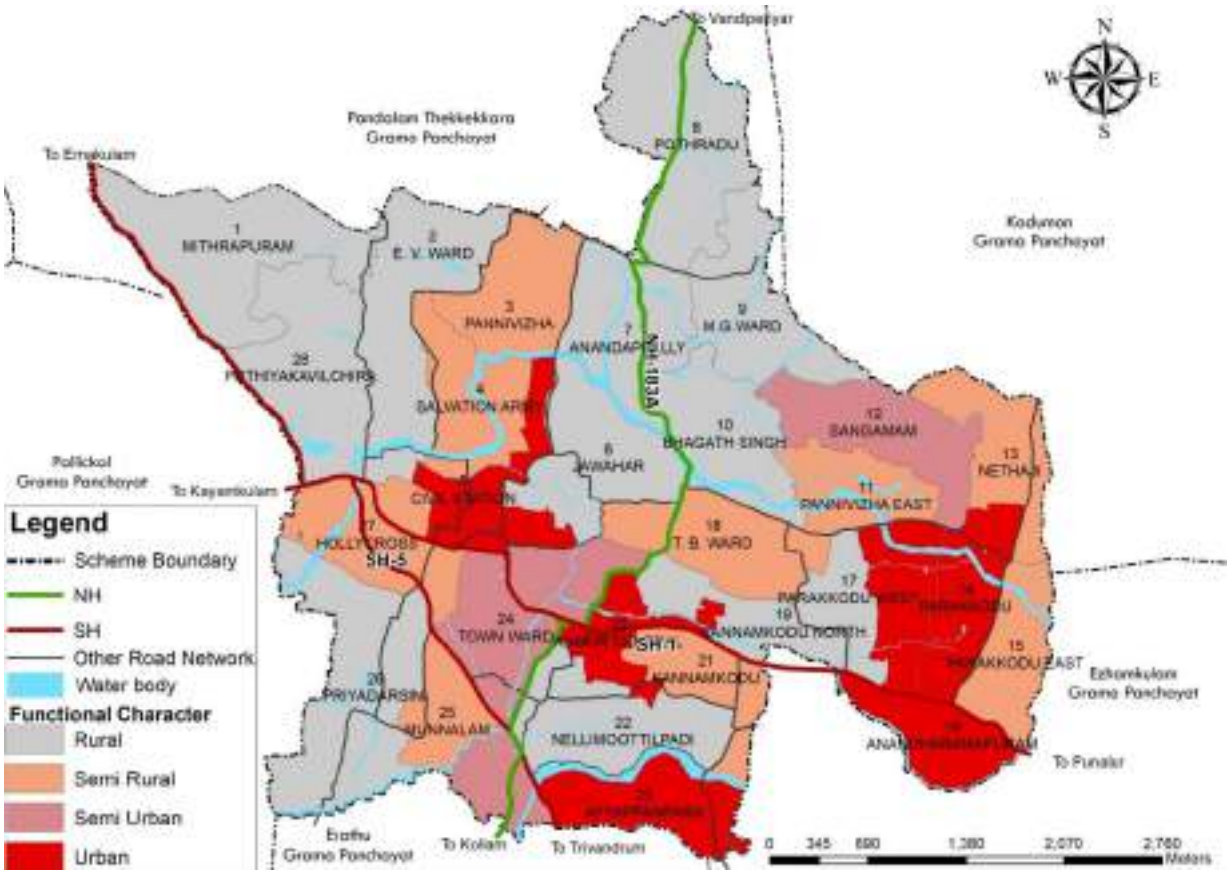


Figure 25.2 Functional Character

25.1.3 Population Distribution

The population of Adoor as per 2011 census is 29,171. The population density of different wards of Adoor is shown in Figure 25.3. The concentration of people is more towards central area. Peripheral areas are having lower population density.

25.1.4 Activity Pattern

The activity pattern of Adoor town is shown in Figure 25.4. The agricultural activities are concentrated in the northern peripheral wards of the town, i.e., Mithrapuram, Potharad, M.G Ward, Bhagath Singh Ward, Sangamam, Nethaji, Munnalam, Salvation Army and Pannivizha East Wards. Commercial activities are concentrated in wards along M.C. Road and K.P. Road and it has concentration in Parakode East, Anantharamapuram, Town, Adoor Central and Holly Cross wards. Public use is concentrated in Civil station, Kannamkode and Priyadarsini wards. Residential area is concentrated in the remaining 11 wards.

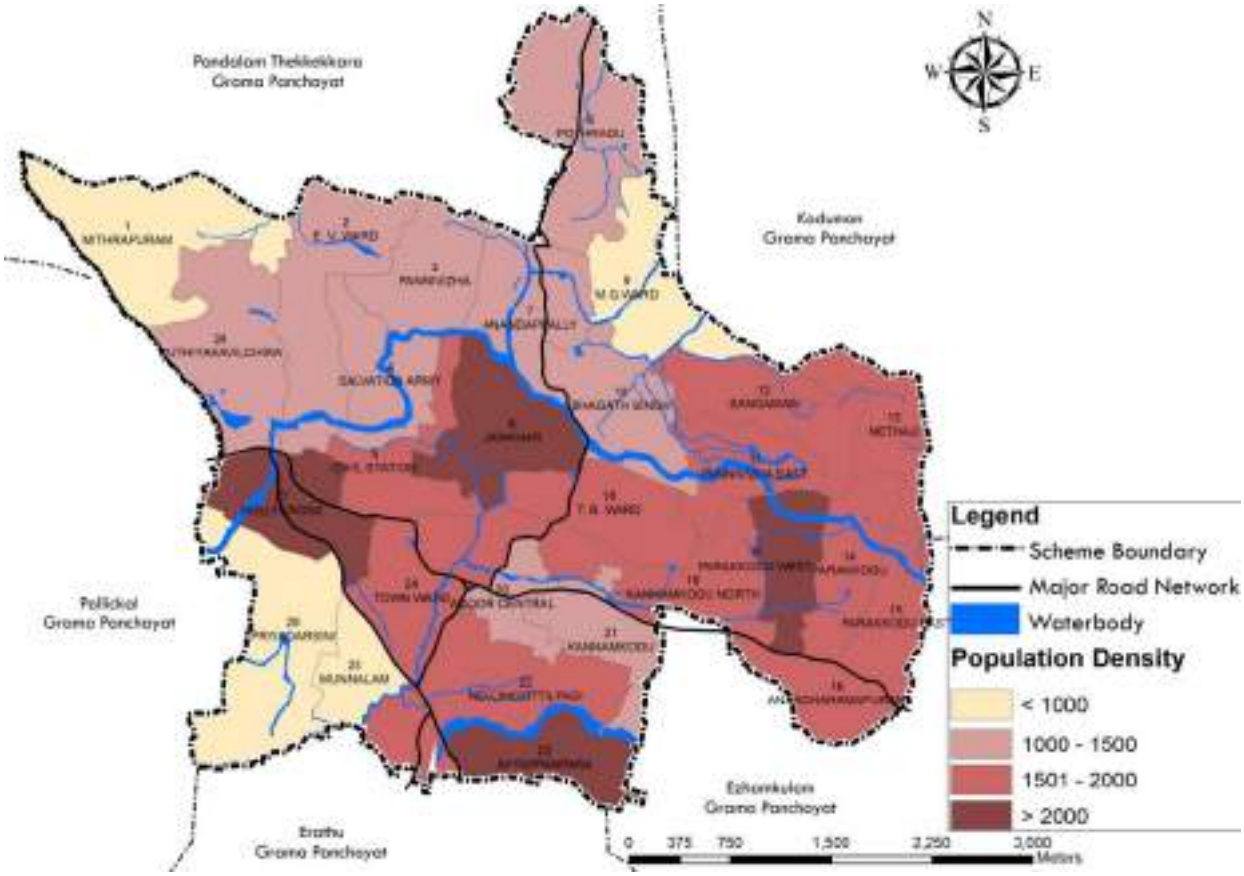


Figure 25.3 Population distribution

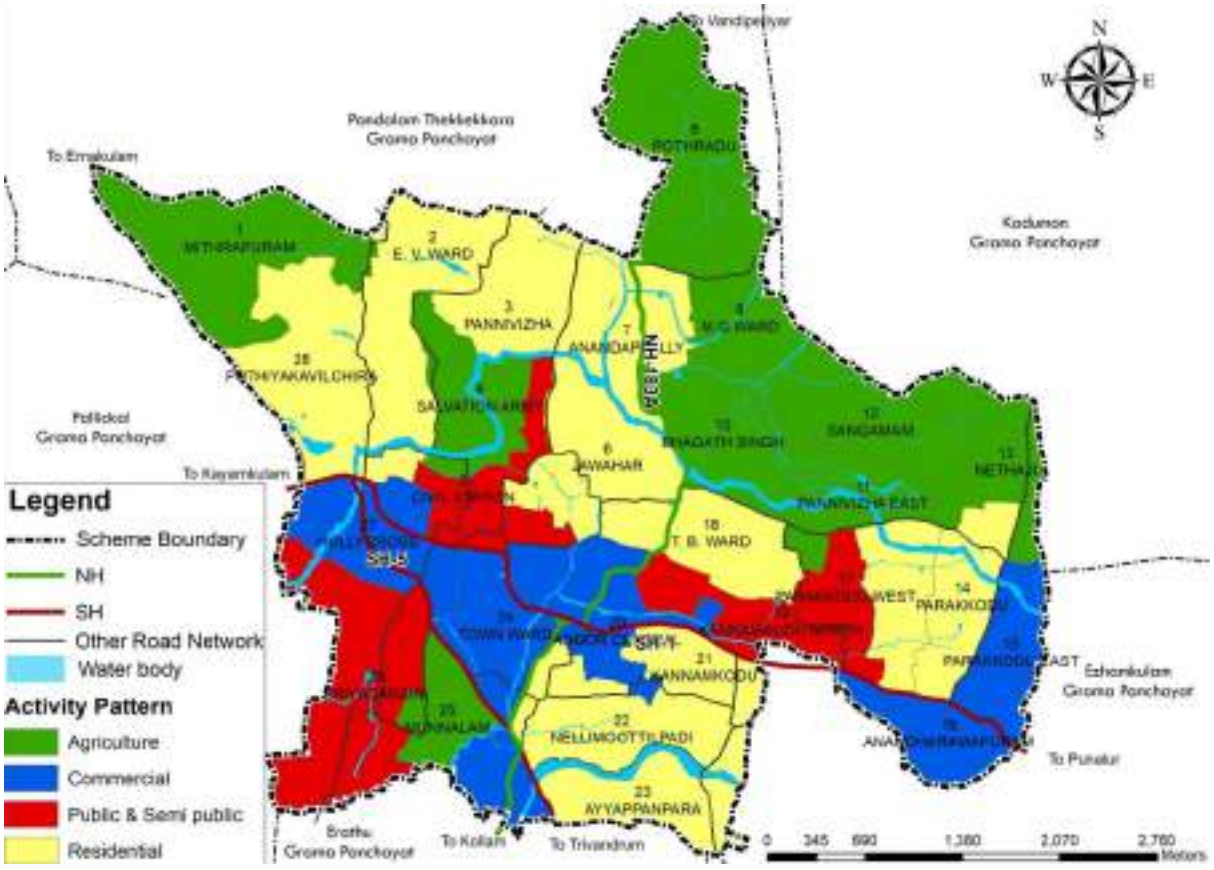


Figure 25.4 Activity Pattern

25.1.5 Environmentally Sensitive Areas

The environmentally sensitive areas of Adoor Municipality mainly consist of paddy fields, along with a few natural drains and sacred groves. These areas are distributed across almost all wards of the municipality. The environmentally sensitive area of Adoor Municipality is shown in Figure 25.3.

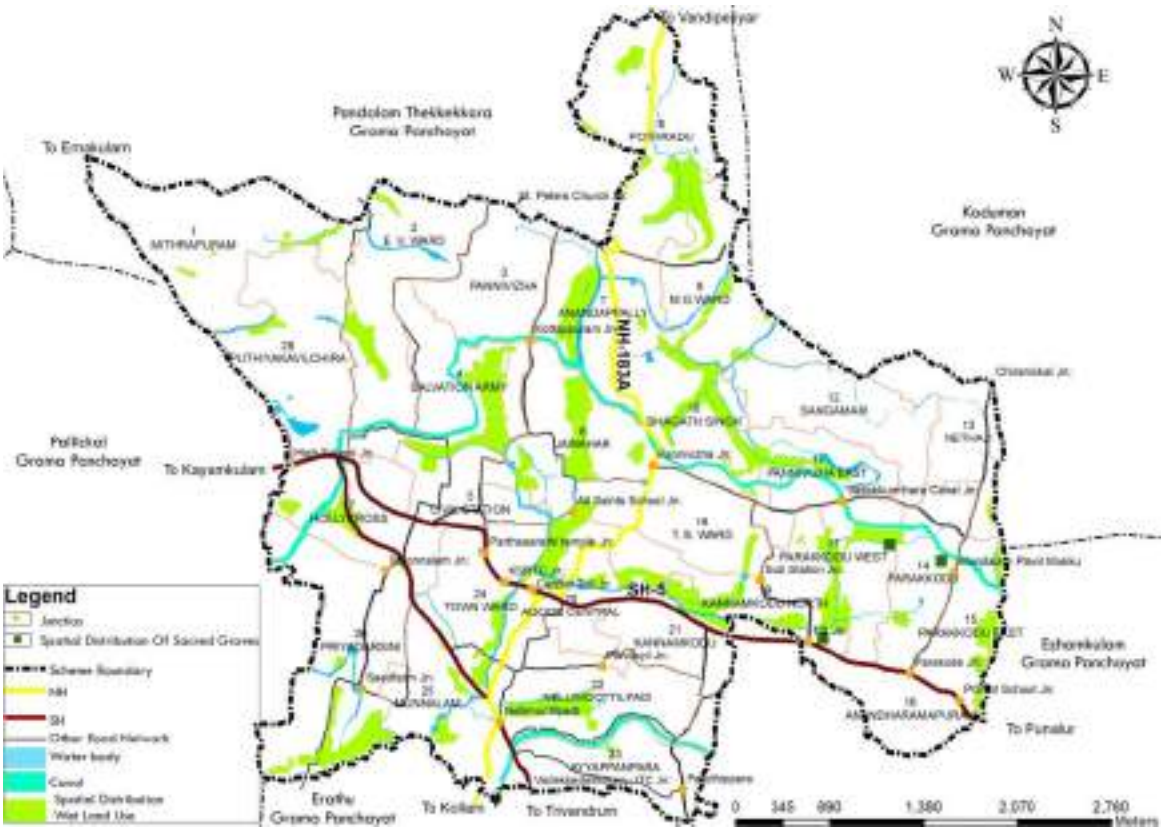


Figure 25.5 Environmentally Sensitive Areas

25.1.6 Urban Flood and Lightning Prone Areas

The flood and lightning prone areas of Adoor as per District Disaster Management Authority's data and primary data collection and are shown in Figure 25.6 and 25.7 respectively.



Figure 25.6 Flood prone areas

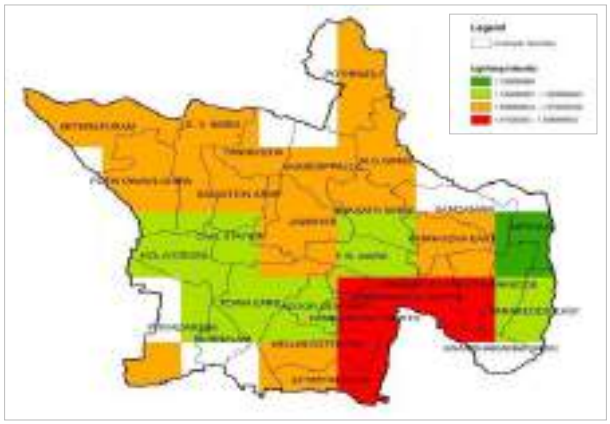


Figure 25.7 Lightning prone areas

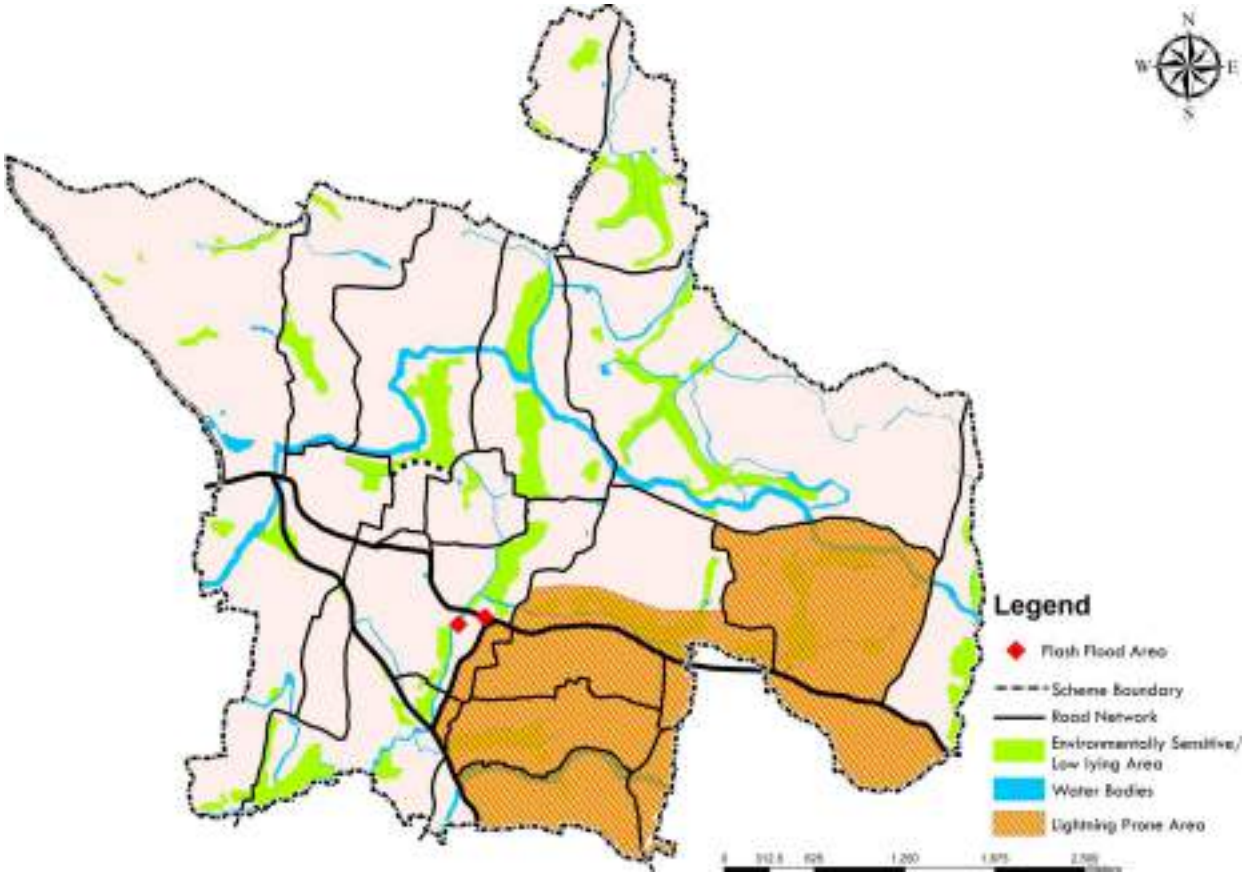


Figure 25.8 Lightning Prone Areas

25.1.7 Connectivity Pattern

Adoor town has good road connectivity. The existing road network of the town is shown in Figure 25.9. M.C. Road, K.P. Road, Pathanamthitta Road, Sasthamkotta Road are the major roads passing through the town. The major non – agriculture activities of the town are concentrated along these roads.

25.1.8 Existing Hierarchy of Nodes

Nodes are identified on all important intersections of roads where there is a concentration of commercial activity. Higher order nodes were formed along M.C. Road and K.P. Road between High school and Parakode Junction. With the expansion of nodes, the space between nodes especially Central Toll, K.S.R.T.C and Private Bus stand are reduced considerably and it is becoming the C.B.D of the town. The hierarchy of nodes of the town is shown in Figure 25.10.

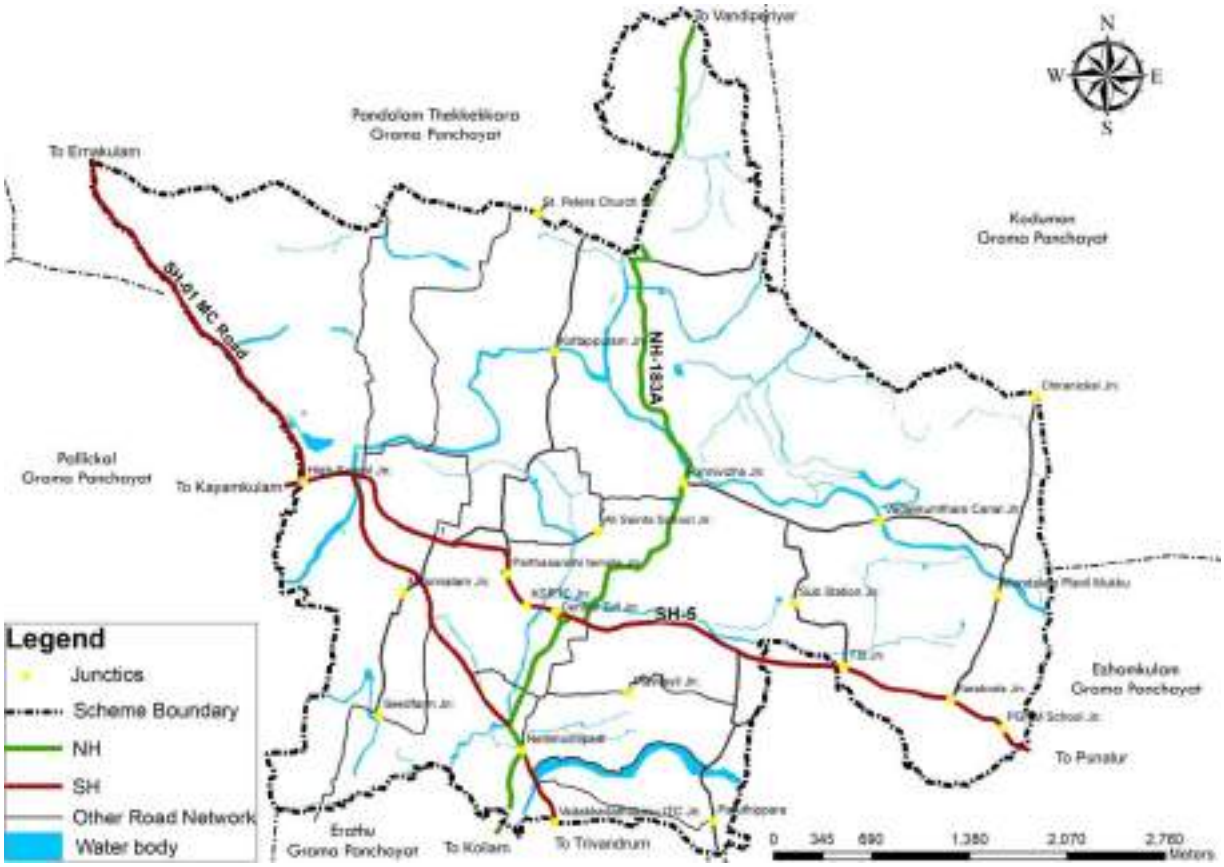


Figure 25.9 Existing Road Network

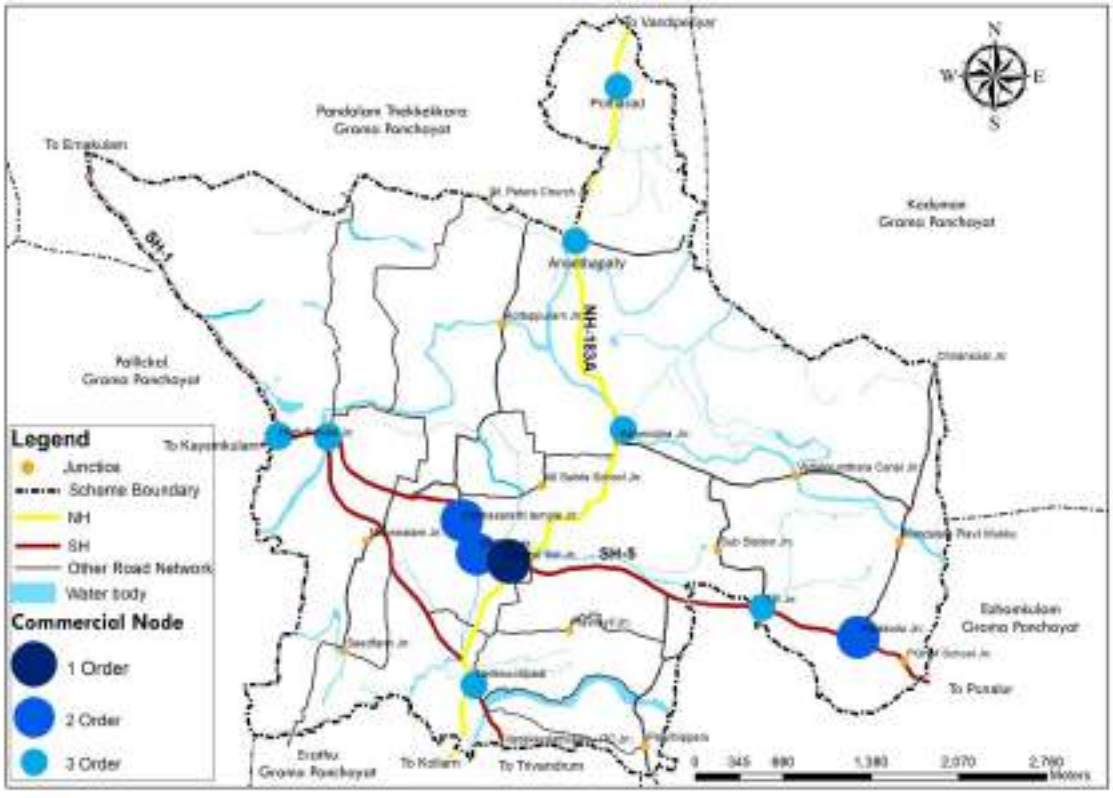


Figure 25.10 Existing Hierarchy of Commercial Nodes

25.1.9 Existing Spatial Structure

The spatial structure for the town is evolved by integrating the factors mentioned above. i.e., Geographical aspects, land use concentration pattern, environmentally sensitive areas, functional characteristics, population distribution, existing road network, hierarchy of nodes and flood prone and lightning areas. The methodology adopted for arriving existing spatial structure is shown in Figure 25.11.

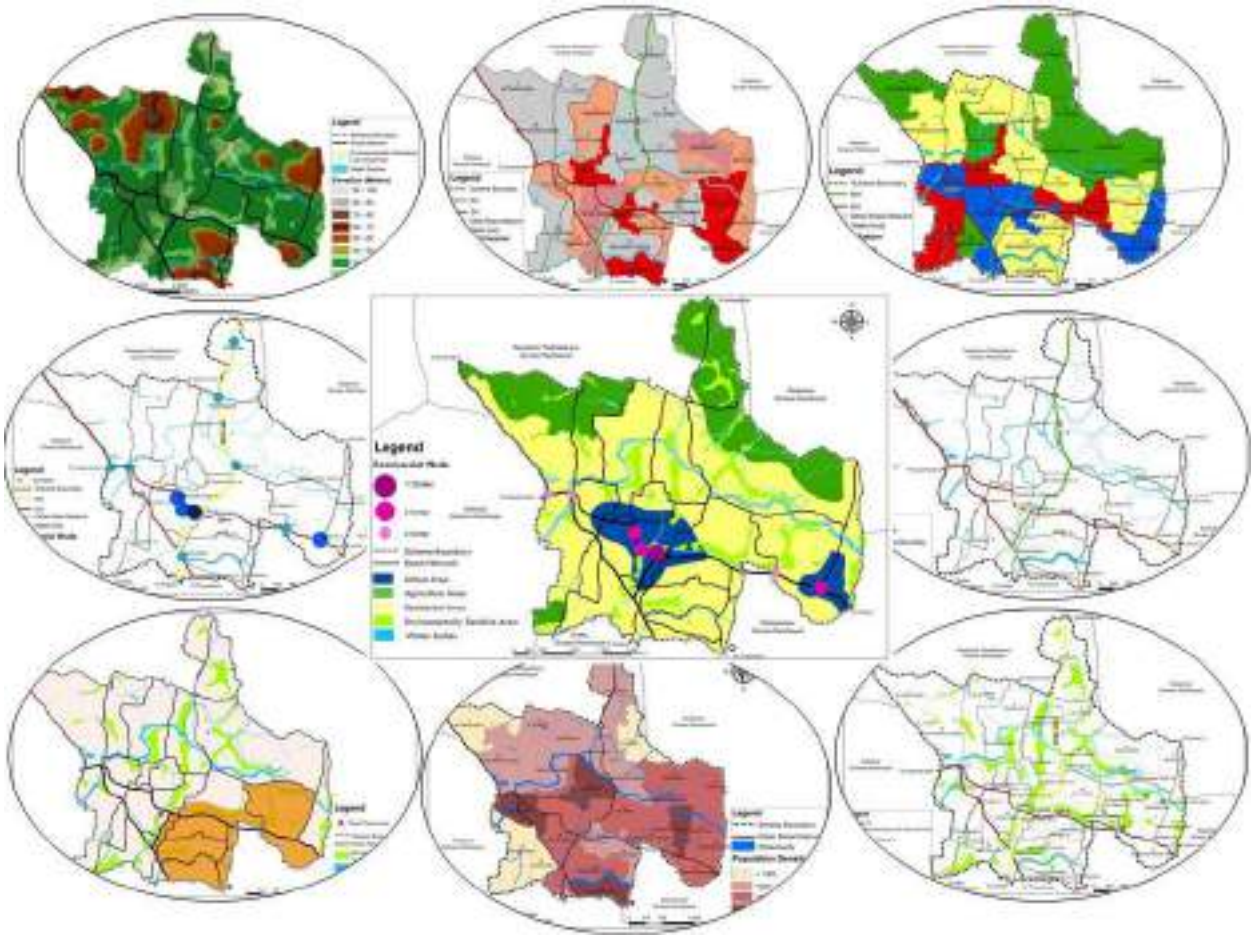


Figure 25.11 Existing Spatial Structure formulation

The existing spatial structure of Adoor, as depicted in Figure 25.12, reveals a distinct urban character along M.C. Road and K.P. Road. The central core is a hub of commercial activity, hosting various public and semi-public institutions. Environmentally sensitive areas are dispersed throughout the town. The surrounding areas are primarily residential, with a mix of housing and mixed crop cultivation. These areas have been designated as Residential with homestead cultivation.

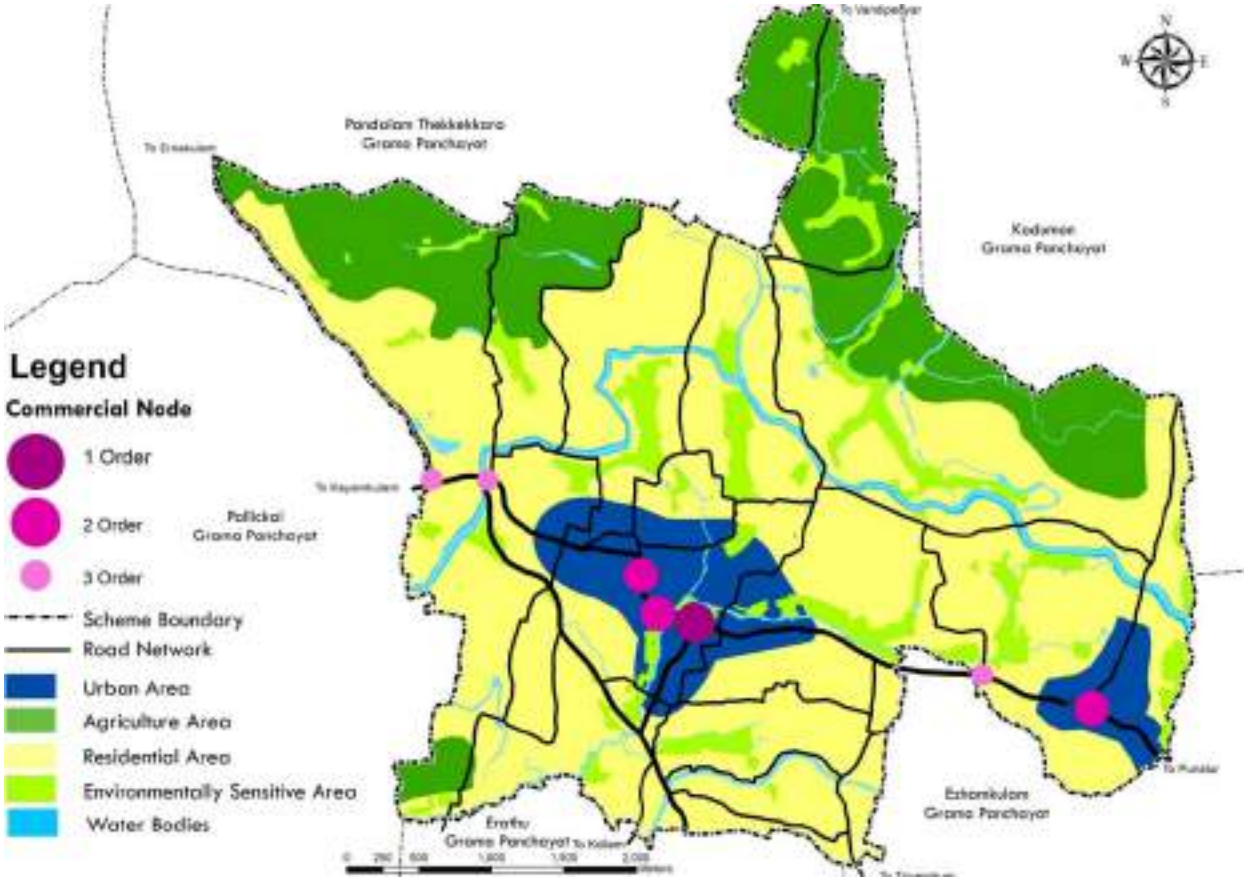


Figure 25.12 Existing Spatial Structure of Adoor Town

25.2 Projection

25.2.1 Population Projection

Population projection is generally carried out by analyzing past growth trends and assuming that a similar pattern will persist in the future. Using Census figures as the base data, the present population is projected to the target years. Since the master plan is prepared for a 20-year horizon, projections are made up to the year 2045. Accordingly, the projected population for the years 2021, 2031, 2041, and 2045 has been estimated on the assumption that the town will continue to follow its historical growth trend. The methods used for projecting population are Arithmetical Increase Method, Geometrical Increase Method and Incremental Increase Method.

25.2.1.1 Arithmetical Increase Method

Table 25-1 Arithmetic Increase Method

Year	Population	Increase in population	Projected Population Calculation	Projected Population
1981	24995			
1991	26639	1644		
2001	28952	2313		
2011	29171	219		
	Total	4176		

	Average	1392		
2021			29176 + (1392x1)	30563
2031			29176 + (1392x2)	31955
2041			29176 + (1392x3)	33347
2045			29176 + (1392x3.4)	33904

25.2.1.2 Geometrical Increase Method

Table 25-2 Geometrical Increase Method

Year	Population	Increase in population	Growth Rate	Projected Population Calculation	Projected Population
1981	24995				
1991	26639	1644	0.066		
2001	28952	2313	0.087		
2011	29171	219	0.008		
	Total	4176	0.160		
	Average	1392	0.053		
2021				$29176 + (1+ 053)^{1}$	30728
2031				$29176 + (1+ 053)^{2}$	32369
2041				$29176 + (1+ 053)^{3}$	34097
2045				$29176 + (1+ 053)^{3.4}$	34814

25.2.1.3 Incremental Increase Method

Table 25-3 Incremental Increase Method

Year	Population	Increase in population	Decadal Incremental Increase	Projected Population Calculation	Projected Population
1981	24995				
1991	26639	1644			
2001	28952	2313	669		
2011	29171	219	-2094		
	Total	4176	-1425		
	Average	1392	-712.5		
2021				29176 + (1x1392)+ (1x2/2x (-712.5)	29851
2031				29176 + (2x1392)+ (2x3/2x (-712.5)	29851
2041				29176 + (3x1392)+ (3x4/2x (-712.5)	29072
2045				29176 + (3.4x1392)+ (3.4x4.4/2x (-712.5)	28574

25.2.2 Projected Population of Adoor Town

Based on the population projection exercise, both the Arithmetic and Geometric methods indicate a steady increase in the population of Adoor town, whereas the Incremental Increase method shows a declining trend owing to the low growth observed between 2001 and 2011. Since the actual future population is expected neither to follow a purely linear increase nor a constant percentage growth, the average of the Arithmetic and Geometric projections is considered as the realistic estimate for

Adoor town. This approach balances the conservative nature of the Arithmetic method with the higher growth assumptions of the Geometric method, thereby providing a more reliable design population for the planning horizon up to 2045.

Table 25-4 Projected Population of Adoor Town

Year	Projected Population (Average of Arithmetic method & Geometric method
2021	30728
2031	32369
2041	34097
2045	34814

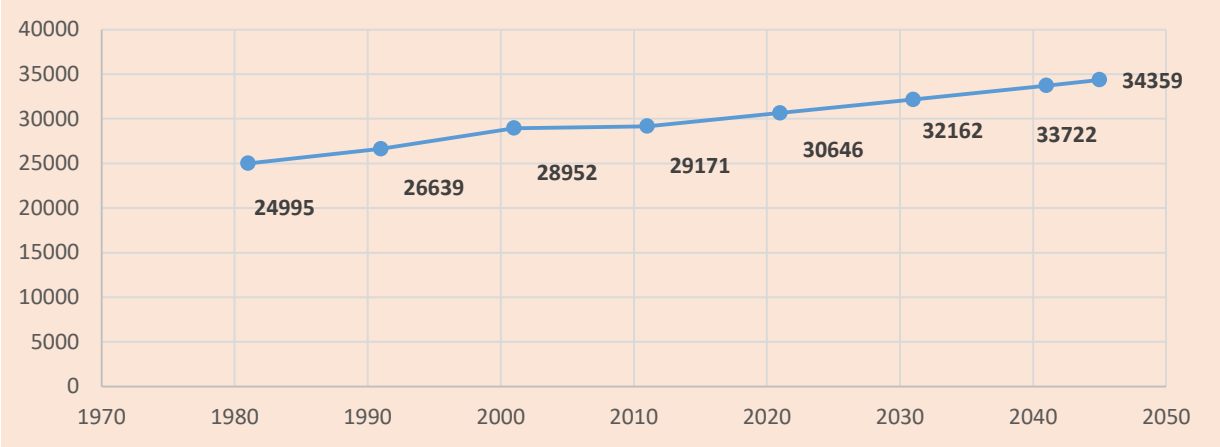


Figure 25.13 Projected Population of Adoor Town by the Year 2045

25.2.3 Workforce Projection

Adoor being developed as a market town, the predominant activity of the town is tertiary activity and 83.46% of workers are engaged in 'other workers' category. Nearly 48.86% of the land of the town is under agriculture land use and 13.99% of workers are engaged in primary sector activities. Hence, there is scope for developing agriculture activity, particularly homestead cultivation and allied activities. Only 2.55% of workers are engaged in secondary sector activities.

The Work Force Participation Rate (WPR) of Adoor town has shown fluctuations over the past decades (32.44 in 1962, 27.02 in 1971, 26.75 in 1981, 29.94 in 1991, 26.38 in 2001 and 28.59 in 2011), with a notable increase during 2001–2011. So Recent-Decade Momentum method that shows the latest positive trend (2001–2011) is used for the projection of WPR. Based on this approach, the WPR is expected to rise from 28.59% in 2011 to 30.80% in 2021, 33.01% in 2031, 35.22% in 2041, and reach 36.10% by 2045. This indicates a steady upward trend, suggesting that the town's future economic activities will generate greater workforce participation, thereby strengthening its socio-economic base.

Table 25-5 Projected Workforce Participation of Adoor Town

Base Year (2011) WPR	28.59%
Per Year WPR point (2001 to 2011)	(28.59- 26.38)/10 =0.221
Projection for 2021	28.59+0.221×10=30.80%
Projection for 2031	28.59+0.221×20=33.01%
Projection for 2041	28.59+0.221×30=35.22%
Projection for 2045	28.59+0.221×34=36.10%

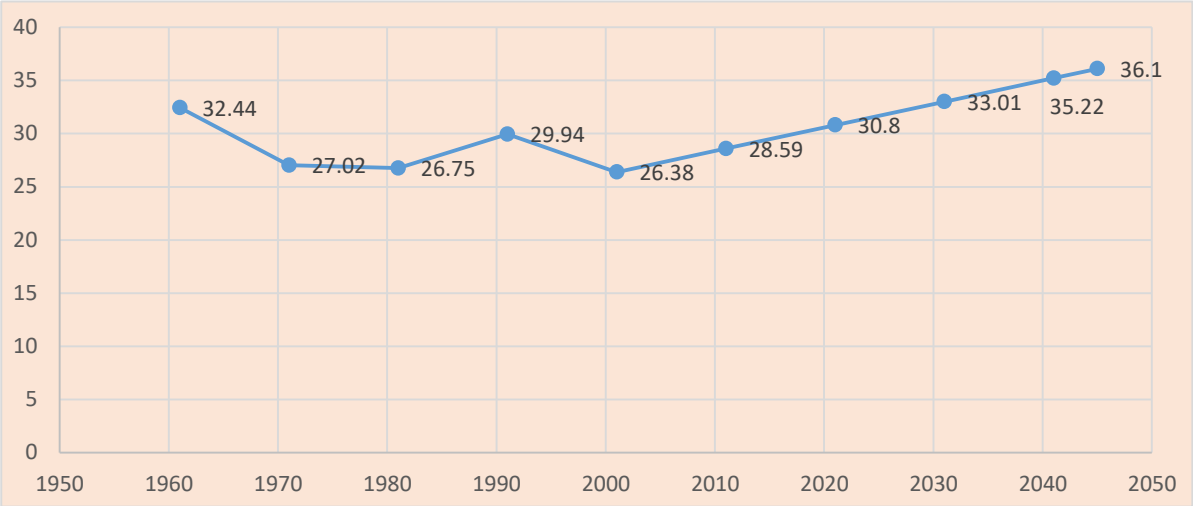


Figure 25.14 Projected Workforce Participation of Adoor Town

25.3 SWOT Analysis

Strengths

- Strategic location: Act as a regional transit hub connecting Pathanamthitta, Kollam, Alappuzha districts.(coastal towns and High ranges)
- Gateway to Sabarimala
- Direct road links(NH,SH) major towns inside and outside state
- Commercial and service centre for surrounding villages
- Compact urban form: small size of town makes infrastructure development more efficient
- Presence of key institutions
- Cultural identity: Rich in heritage,temples,festivals
- Natural resources: Waterbodies, wetlands,green areas, sacred groves
- Heavy footfall and floating population
- Ample land parcels for parking, logistic centres

Weaknesses

- Poor recreational infrastructure
- Traffic congestion and inadequate road width
- Unregulated development
- Insufficient drainage and flood management
- Heavy dependence on private vehicles
- Lack of urban green spaces
- Lacks other modes of transport: rail and waterways

Opportunities

- Scope for green blue infrastructure(stream rejuvenation, urban greening, walkable networks)
- Tourism & Recreation development(cultural circuits,eco tourism,event spaces)
- Inclusive planning for more livable town
- Affordable housing projects
- Scope for mixed use development
- Regional level distribution centre during floods
- Feeder town for eastern areas
- Storage & distribution point for retail/online trade
- Transit and accommodation node in tourism network.(Affordable accommodations,transport interchanges,parking and food courts)
- Scope for logistic hub,eco friendly warehousing zones,ev charging zones
- Hinterland connectivity to Vizhinjam port

Threats

- Climate vulnerability Risk from flash floods,lightning and heat stress
- Urban sprawl
- Land acquisition challenges due to high land value

25.4 Development issues

Adoor town is facing multiple development issues that require urgent attention for sustainable urban growth. The road network remains narrow and congested with inadequate pedestrian facilities, parking, and traffic management, while public transport connectivity and terminals are insufficient. Drainage channels are poorly maintained, causing frequent waterlogging and flash floods during heavy rains. The town also suffers from seasonal water shortages, limited piped supply, and lack of modern sewage treatment, with wastewater often flowing into drains. Solid waste management remains a challenge due to the absence of scientific processing plants, leading to open dumping and pollution. Environmental concerns are evident in the filling of wetlands, encroachments along canals, and loss of green spaces and recreational areas. The economy of Adoor, though supported by trade and animal husbandry, is constrained by congested market areas and lack of organized industrial clusters. Social infrastructure such as health and educational institutions need modernization, and inclusive amenities for women, children, senior citizens, and the differently abled are limited. Housing expansion is unplanned, with inadequate facilities for urban poor and migrant workers. Civic amenities like fire and police stations, crematoriums, and public toilets require better upkeep, while fuel stations create bottlenecks due to poor access design. Added to these are disaster risks from flash floods, lightning, and rising urban heat, making resilience planning crucial for the town's future.

25.5 Inference

The spatial structure of Adoor is a blend of urban, residential, and environmentally sensitive areas. The town's core area is commercially developed, while residential areas with homestead cultivation surround it. Agriculture activities are concentrated in the peripheral wards of the town. The scattered environmentally sensitive areas require careful planning and management to ensure sustainable development and preservation of the town's natural resources. Adoor town, functioning as a major commercial and service centre in Pathanamthitta district, is presently constrained by issues such as traffic congestion, inadequate drainage, seasonal water shortage, poor solid waste management, and limited recreational and social infrastructure. Rapid but unplanned urban growth, encroachment of wetlands, and lack of modern civic amenities further challenge its sustainable development. At the same time, Adoor has significant potential for growth owing to its central location, strong trade links, presence of educational and health institutions, and scope for expanding markets in agriculture and animal husbandry. With planned interventions focusing on improved infrastructure, environmental conservation, inclusive facilities, and organized economic spaces, Adoor can evolve into a vibrant regional hub offering better quality of life and enhanced opportunities for its residents.

PART II



CHAPTER 26
DEVELOPMENT VISION

26.1. Introduction

The findings from the analysis have been instrumental in shaping the development vision for Adoor. Historically established as a market center—anchored by the Parakode market—Adoor continues to function as one of the region's major trading hubs. With trade and commerce playing a central role in the town's economy, Adoor is well-positioned to evolve as a vibrant market town. According to the District Urbanization Report for Pathanamthitta (2011), Adoor is identified as a second-order settlement, underscoring its administrative significance. The town also holds the status of both Taluk Headquarters and Revenue Divisional Headquarters. These factors reinforce the need to develop Adoor as a key administrative center and a prominent second-order settlement within the district.

"Adoor 2045 – The Connected and Inclusive Hub for Commerce and Transit"

26.2. Vision Statement

The vision statement for Adoor town includes several key components that reflect the town's aspirations and the strategic priorities for its future

"To transform Adoor into a connected and inclusive hub for commerce and transit by 2045 — strengthening its role as a regional trade and commerce hub, enhancing its administrative significance as a second-order settlement, ensuring integrated infrastructure development, promoting economic growth through agriculture and commerce, facilitating vehicular and goods movement through an intermediary transit resting hub, promoting nightlife to support a 24-hour economy, and safeguarding its rich environmental heritage for future generations."

26.3. Goals and Objectives

Trade and commerce and agriculture have been identified as the notable economic activities of the town. Optimum utilization of resources and development of economy of the town is to be ensured. Even though Adoor is a taluk headquarters the town is lacking many infrastructure facilities and integrated development of infrastructure facilities has to be ensured. Environmental conservation is another urgent need of the town to protect it from natural disasters and environmentally sensitive areas like paddy fields, natural drains, sacred groves etc are to be protected / conserved. Thus the development goals set are summarized as follows.

26.3.1 Goals

GOAL 1: Strengthen Adoor's Role as a Regional Commercial and Transit Hub

GOAL 2: Enhance Economic Growth through Agriculture, Commerce, and Small Industries

GOAL 3: Ensure Integrated and Inclusive Infrastructure Development

GOAL 4: Promote Sustainable Urban Development and Environmental Risk Resilience

GOAL 5: Improve Quality of Life through Livability and Urban Vibrancy

GOAL 6: Establish Adoor as a Model Second-Order Settlement in the Region

26.3.2 Objectives

The optimum utilization of potentials and resources can create new economic base for Adoor. This can ultimately improve the quality of life of the people. Development based on available potentials and resources is the action towards achieving the development goal. The development objectives for Adoor town are summarized below.



Strengthen Adoor's Role as a Regional Commercial and Transit Hub

In connection with the first goal the objectives set are

- Develop and promote Adoor as a regional center for trade, logistics, and public services.
- Create dedicated zones for administrative, institutional, and commercial functions.
- Upgrade and expand administrative infrastructure including municipal, revenue, and judicial offices.
- Establish an Intermediate Transit Resting Hub to support goods movement and workforce mobility.



Enhance Economic Growth through Agriculture, Commerce and Small Industries

In connection with the second goal, the objectives set are

- Promote agro-based industries and farmer-producer companies.
- Modernize local markets and integrate digital commerce platforms.
- Support MSMEs through industrial clusters, common facilities, and financing assistance.
- Develop logistics parks and godowns to aid agricultural trade and exports.



Ensure Integrated and Inclusive Infrastructure Development

In connection with the third goal, the objectives set are

- Expand and modernize physical infrastructure (roads, water supply, power, waste management).
- Strengthen digital and smart infrastructure to support e-governance and startups.
- Improve connectivity with surrounding growth centers and economic corridors.
- Develop accessible, inclusive public spaces and amenities.

Goal 04

Promote Sustainable Urban development and Environmental resilience

In connection with the fourth goal, the objectives set are

- Implement sustainable land use planning based on ecological sensitivity.
- Preserve green belts, wetlands, and open spaces; implement natural drainage systems.
- Promote renewable energy use and energy-efficient buildings.
- Integrate disaster risk reduction and climate adaptation in urban planning.

Goal 05

Improve Quality of Life through Livability and Urban Vibrancy

In connection with the fifth goal, the objectives set are

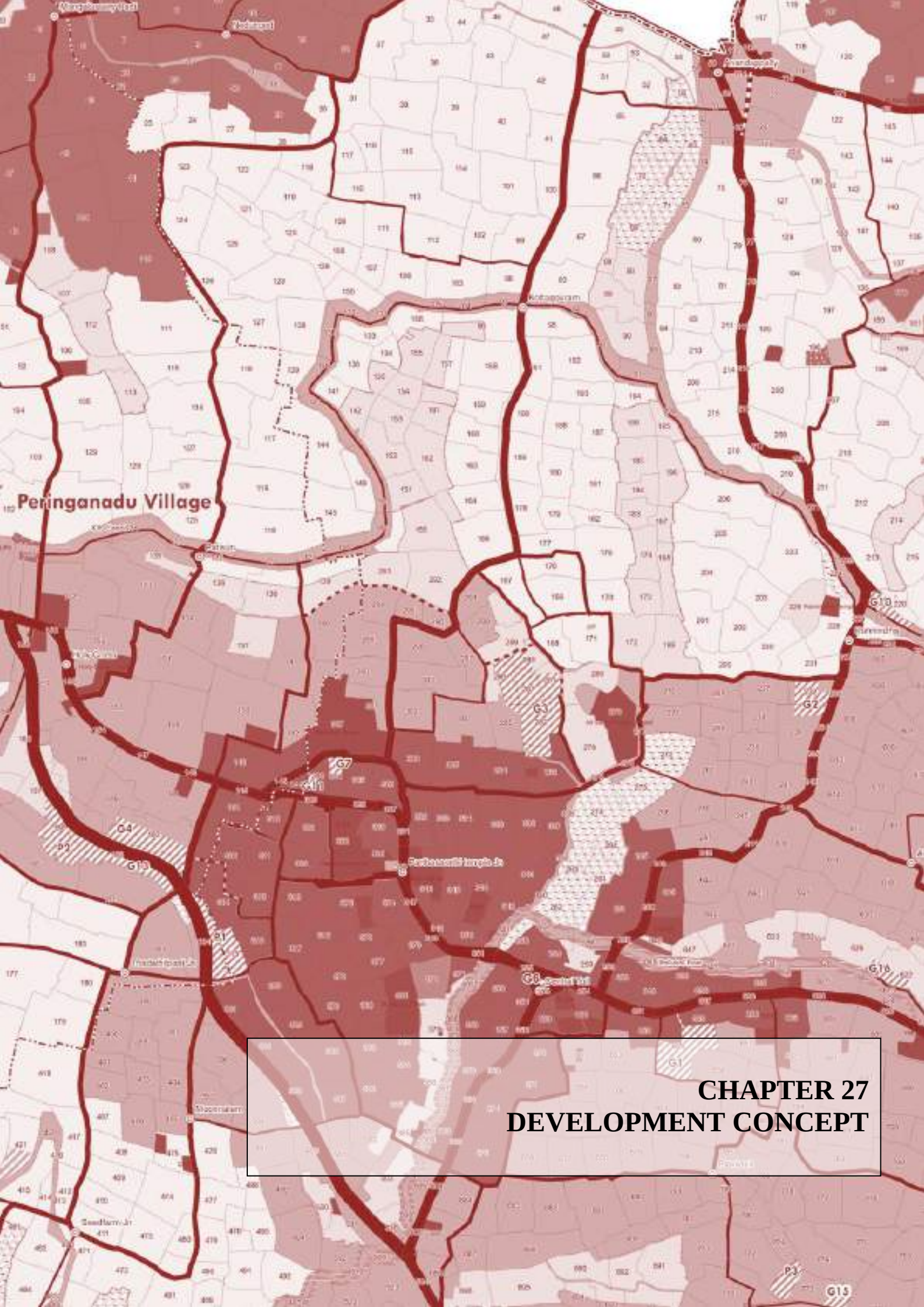
- Promote mixed-use development and walkable neighborhoods.
- Develop cultural corridors, nightlife districts, and entertainment zones.
- Enhance healthcare, education, and recreation facilities.
- Promote community-based initiatives and local heritage conservation.

Goal 06

Establish Adoor as a Model Second-Order Settlement in the Region

In connection with the sixth goal, the objectives set are

- Align development with State Spatial Strategy and local-level master planning.
- Foster inter- LSGI coordination
- Set benchmarks for participatory governance and smart urban management.
- Attract regional investment through branding and policy incentives.



CHAPTER 27
DEVELOPMENT CONCEPT

27.1 Formulation of Spatial Development Concept

The spatial structure is evolved by a range of interrelated factors, including the area's environmental and topographical features, proposed population distribution, connectivity plan and road network, and the hierarchy of proposed nodes. It also considers hazard, vulnerability, and risk assessments; the spatial distribution of existing development; environmentally sensitive areas; and designated activity zones such as residential, recreational, heritage, economic development, environmental conservation, mixed-use areas and public amenities. Together, these components guide the formulation of "Adoor 2045 – Inclusive Hub for Commerce and Transit".

27.1.1 Transit hub and connectivity

Adoor holds strategic connectivity through major road networks including M.C Road (SH.1), K.P Road (SH.5), and the Titanium Junction–Vandiperiyar Road (NH-183A), making it a key transit point in the region. However, the M.C Road and K.P Road corridors within the town center have limited carriageway widths, causing congestion. While the newly developed bypass road offers some relief, the absence of planning controls is leading to unregulated growth, which could undermine its long-term effectiveness. To address this, a ring road is proposed around Adoor to divert through-traffic away from the core area, thereby reducing congestion and enabling better traffic flow. The bypass corridor, still in its developmental phase, holds potential for structured urban growth. Here, uniform urban design elements such as coordinated signage, building elevation materials, and color schemes can establish a distinctive identity for the area.

In connection with this, transit hubs are proposed along major transport corridors to serve long-distance travelers. These hubs will be integrated with public transport networks and offer facilities such as paid parking, shaded rest areas, and refreshments, promoting modal interchange and user comfort. Within the town center, adequate paid parking facilities should be introduced in integration with other urban projects to eliminate roadside parking and create space for pedestrian paths and improved carriageways. The proposal also emphasizes the need to promote public transport by strengthening connectivity, last-mile access, and walkability to ensure that the town remains accessible, inclusive, and efficient. This approach not only improves transit and urban function but also reinforces Adoor's role as a sustainable and well-connected regional hub.

The proposed developments and the projected population distribution are critical factors in determining the road network of the area. The road network is shaped by projected traffic volumes derived from traffic and transportation studies, as well as recommendations from the District Urbanization Report. The conceptual layout of the town's road network is illustrated in Figure 27.1.

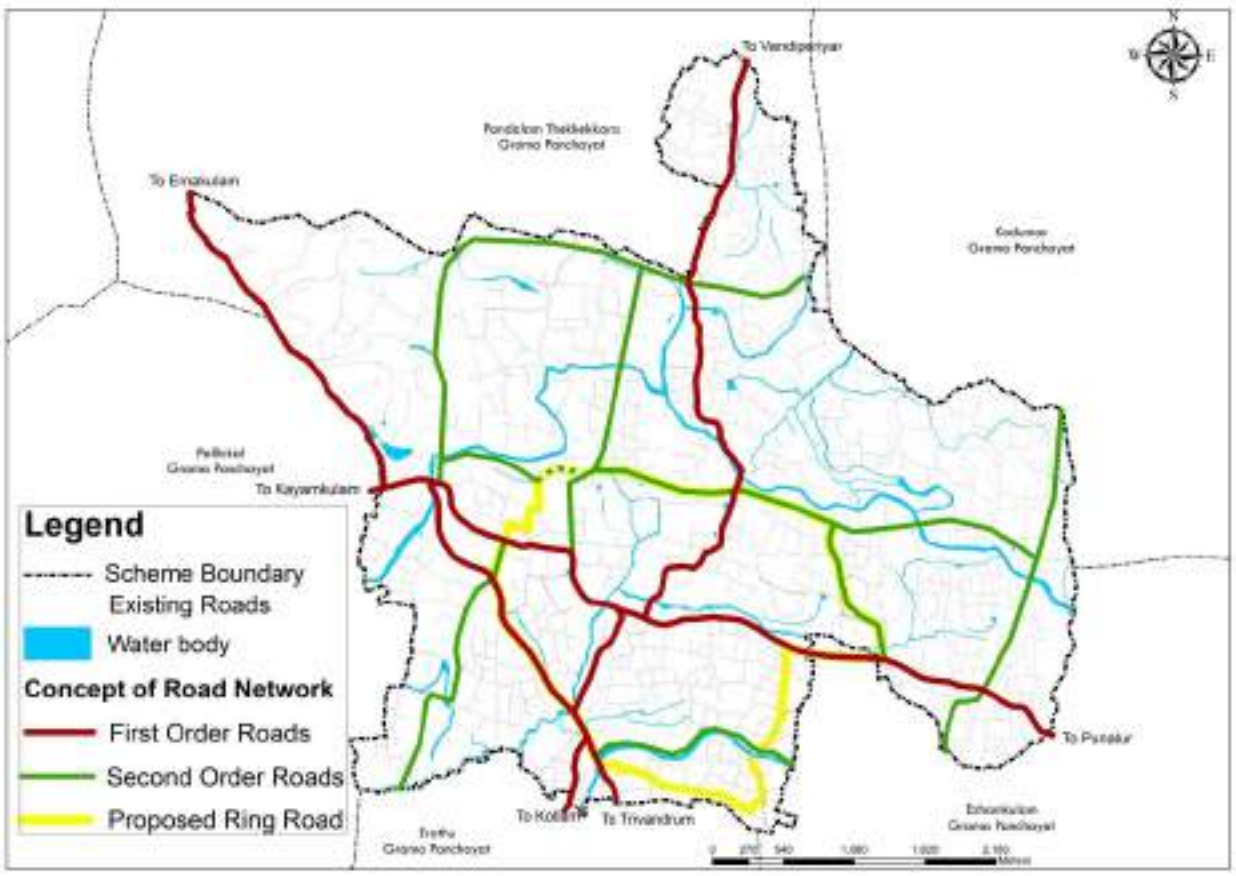


Figure 27.1 Concept of proposed road network

27.1.2 Activity Zones

In Adoor town, the agriculture activities and urban activities are spatially separated. The agriculture dominant areas are located in the peripheral areas of the town. The commercial dominant activities are concentrated along the two major travel corridors MC Road and KP road of the town. Even though the settlements are there in all part of the town, more concentration is there in the area around the central core of Commercial and Public activities.

27.1.3 Environment and Topography

The development potential of an area is significantly influenced by its geographical characteristics, particularly its topography. The slope of the land plays a critical role in determining the suitability of various land uses. The slope ranges from 0° to 23°, with approximately 13% of the town area being level and about 70% having a moderate slope between 2° and 6°. Wards such as Mithrapuram, E.V. Ward, M.G. Ward, Bhagath Singh Ward, and Pannivizha Ward exhibit relatively steeper slopes. These areas are less suitable for intense urban development and are more appropriate for non-urban uses such as agriculture and related activities

27.1.4 Proposed Population Distribution

The spatial distribution of the projected population has been guided by the existing settlement pattern, availability of infrastructure, and potential for future development. Nearly one-third of the

town's population is projected to remain concentrated in the present wards itself. These wards are characterized by higher residential densities, better transportation connectivity, and proximity to key public institutions and services. The proposed distribution strategy shall reinforce this core while also promoting balanced growth by directing a portion of the future population toward identified growth corridors and underutilized peripheral areas, in alignment with the development vision and infrastructure capacity.

27.1.5 Proposed Hierarchy of Nodes

An assessment of the existing hierarchy of urban nodes identifies Central Toll Junction, Municipal Bus Stand Area, Parakode, and the KSRTC Bus Stand Area as the locations with the highest functional significance. Among these, Parakode is designated as a Second order Node while the remaining three are proposed as First-Order Nodes, forming the primary urban activity centers of the town due to their strategic location and development potential. To support balanced urban growth, additional areas including High School Junction, Kottamugal, Ananthapally, and Pannivizha are proposed as Second-Order Nodes, serving as local-level service and commercial hubs. Further, recognizing the strategic opportunity presented by the MC Road Bypass, a new urban hub is proposed in its vicinity to decentralize development pressure from the core and enhance regional connectivity. The proposed hierarchy and distribution of urban nodes are illustrated in Figure 27.2.

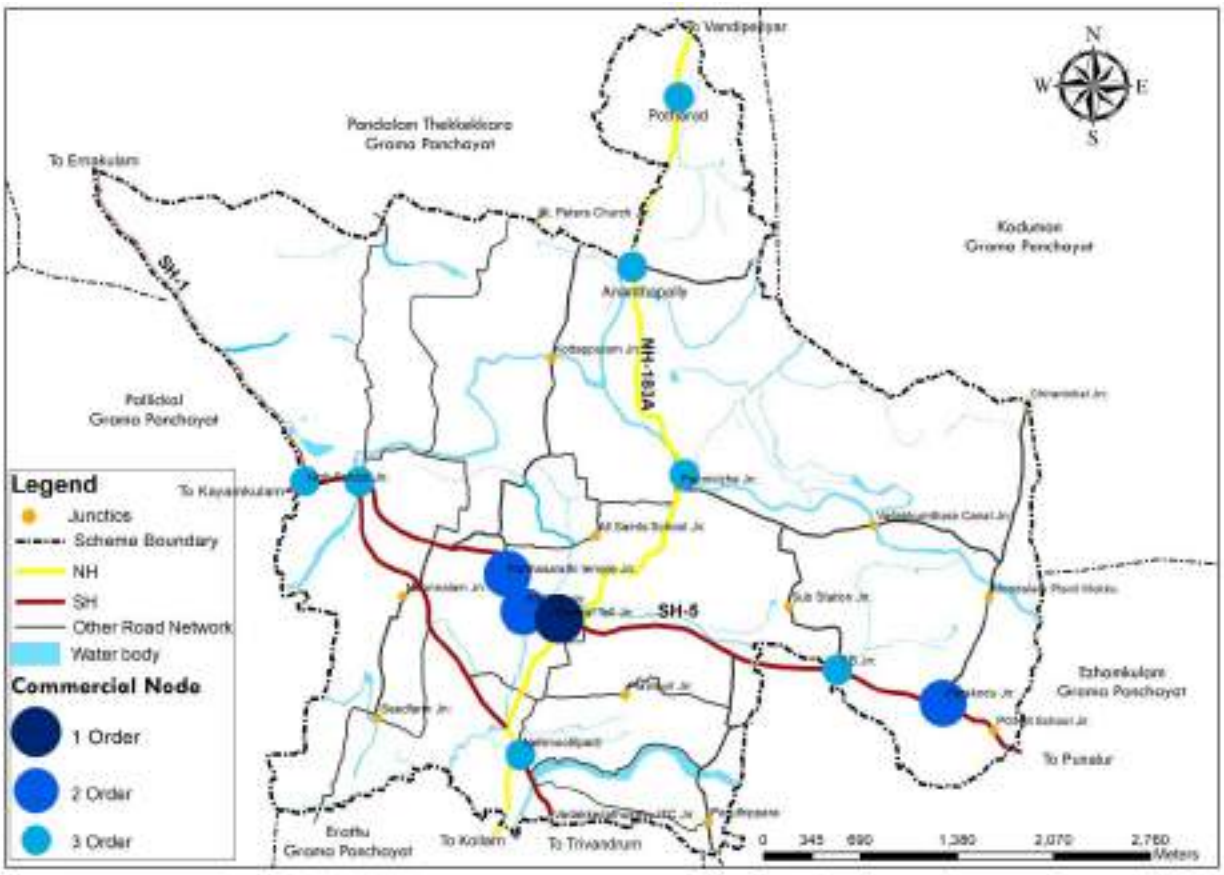


Figure 27.2 Proposed hierarchy of nodes

27.1.6 Environmentally Sensitive Area

Adoor town contains several environmentally sensitive areas, including paddy fields, natural drains, and sacred groves, spread across most wards (Figure 27.3). These areas play a vital role in flood mitigation, biodiversity preservation, and ecological balance. These zones will be protected through zoning regulations, buffer zones, and integration into green corridors, ensuring that urban expansion does not compromise environmental sustainability.

27.1.7 Hazard, Vulnerability and Risk

Adoor played a significant role as a rehabilitation center during the 2018 floods, demonstrating its capacity to support surrounding regions in times of crisis. Building on this experience, Adoor holds strong potential to function as a regional rehabilitation hub through the strengthening of institutional frameworks and infrastructure. As part of hazard risk assessment, Urban flood and lightning-prone areas within the municipality have been identified and are illustrated in Figures 27.3. Addressing lightning risk requires both institutional preparedness and the incorporation of building regulation to vulnerable zones. To mitigate Urban flood risks, a drainage management plan has been proposed, ensuring improved stormwater flow and reduced waterlogging. Hazard-prone zones serve as a vital basis for guiding development regulations, promoting risk-sensitive land use, and informing effective disaster mitigation strategies.

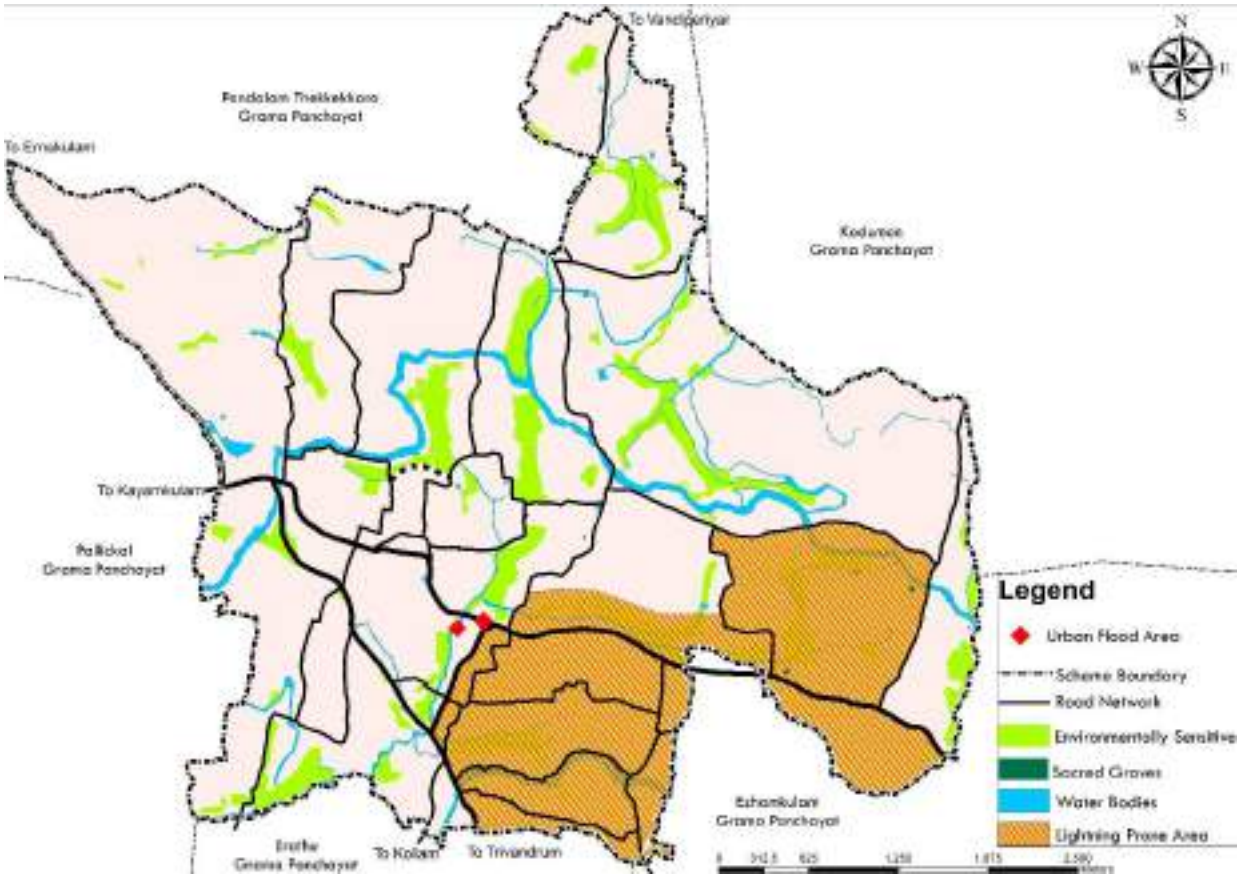


Figure 27.3 Environmentally Sensitive areas, Sacred Groves, Urban Flood areas and Lightning prone areas

27.1.8 Suggested Spatial Structure

The spatial structure of Adoor town has been evolved by integrating multiple parameters such as natural terrain, environmental sensitivity, existing land use, population distribution, transportation infrastructure, and hazard vulnerability. These factors collectively guide the future development pattern in a balanced, inclusive, and resilient manner. The Methodology for proposed spatial structure is illustrated in Figure 27.4

As part of improving regional connectivity and supporting long-distance travel, transit hubs are proposed along major transport corridors. These hubs will be integrated with public transport networks and offer essential amenities such as paid parking, shaded rest areas, and refreshments, encouraging modal interchange and enhancing commuter comfort. Within the town center, the introduction of adequate paid parking facilities in coordination with other urban improvement projects is essential to eliminate roadside parking. This will help reclaim street space for pedestrian pathways, enhance carriageway width, and contribute to better traffic flow. The plan also emphasizes the promotion of public transport by strengthening connectivity, last-mile access, and walkability, ensuring that Adoor remains accessible, inclusive, and efficient. This integrated approach not only improves mobility but also reinforces Adoor's role as a sustainable and well-connected regional hub.

Mithrapuram, E.V. Ward, M.G. Ward, Bhagath Singh Ward, and Pannivizha Ward have significant areas of steep terrain, making them more suitable for agriculture-dominant activities rather than high-density urban development. In addition, agricultural practices are currently concentrated in Mithrapuram, Puthiyakavinchira, E.V. Ward, Potharad, M.G. Ward, Bhagath Singh Ward, Priyadarsini, and Moonnalam Wards. These areas are proposed to be retained and supported as agricultural zones, safeguarding local livelihoods and regional food security. Also, Agriculture tourism activities can be proposed in these agro-active areas.

Adoor Municipality also includes a range of environmentally sensitive areas, primarily comprising paddy fields, natural drainage channels, and wetlands which are found across most wards. These areas are to be protected from conversion and retained in their natural form to preserve ecological integrity. Furthermore, flood-prone and lightning-prone zones—identified in Figure 27.3—have been incorporated into the spatial structuring to ensure risk-sensitive development. Hazard-prone zones will guide development restrictions and support the implementation of disaster mitigation strategies, including improved drainage planning and building regulations for lightning-prone areas.

Commercial and public activities are primarily concentrated along M.C. Road (SH 1) and K.P. Road (SH 5), particularly within Karuvatta, Town, Adoor Central, Civil Station, Jawahar, T.B, Parakkode, Anantharamapuram, and Parakkode East Wards. These areas function as higher-order commercial nodes due to the presence of markets, public and private offices, and transport

terminals. They are expected to continue serving as focal points of commerce and institutional activity.

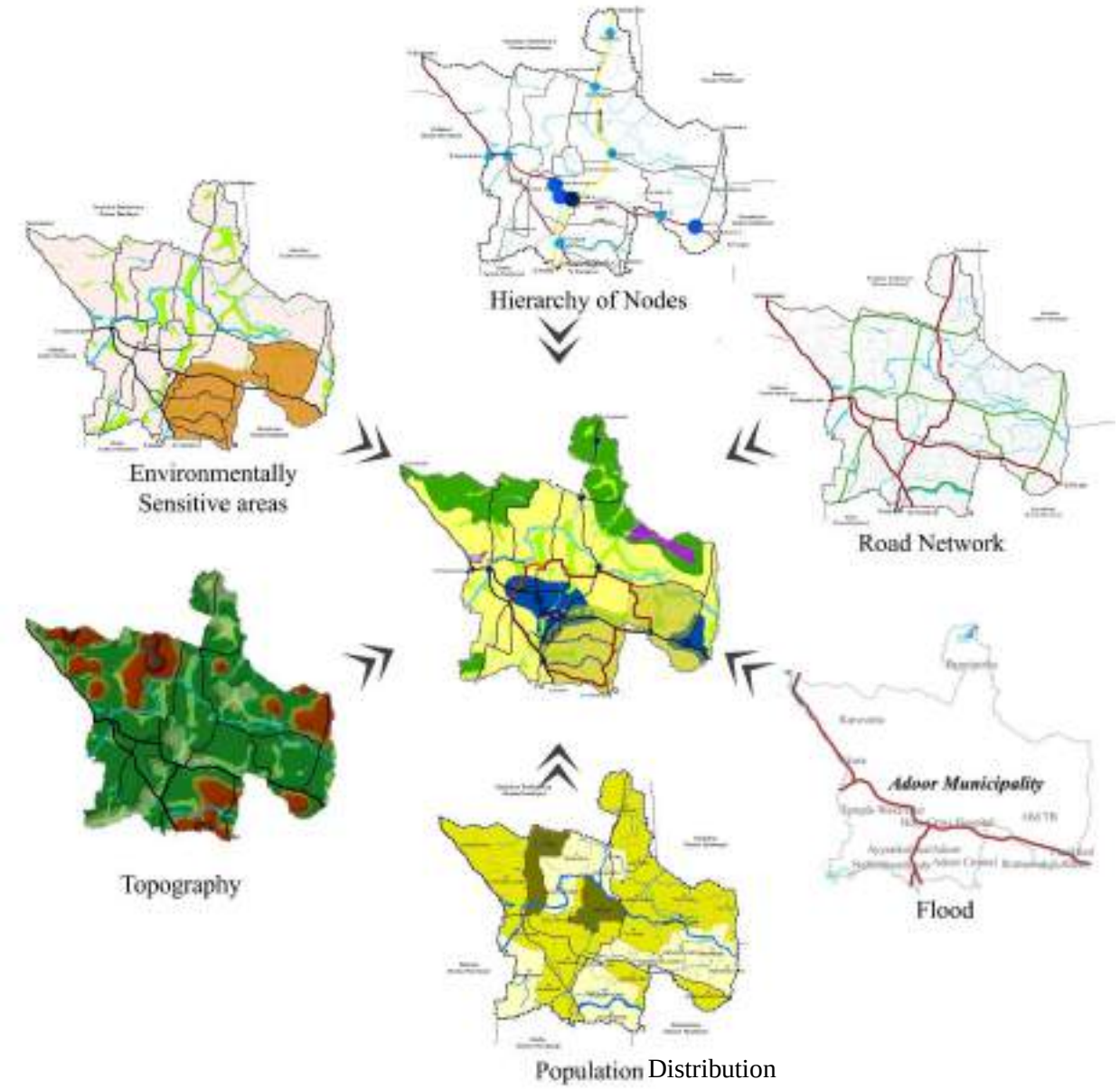


Figure 27.4 Methodology- Proposed Spatial Structure

To decongest the town center, the spatial structure includes proposals for upgrading selected roads to higher-order classifications and introducing new link roads. The M.C. Road Bypass has opened up extensive vacant and underutilized land, which is emerging as a new activity hub recently. Meanwhile, areas with high population concentration will be retained as residential zones, with improvements in infrastructure and services to support healthy urban living. Overall, the proposed spatial structure integrates environmental conservation, economic development, hazard mitigation, and mobility planning, offering a robust framework to guide the sustainable growth of Adoor. The final spatial arrangement is illustrated in Figure 27.5.

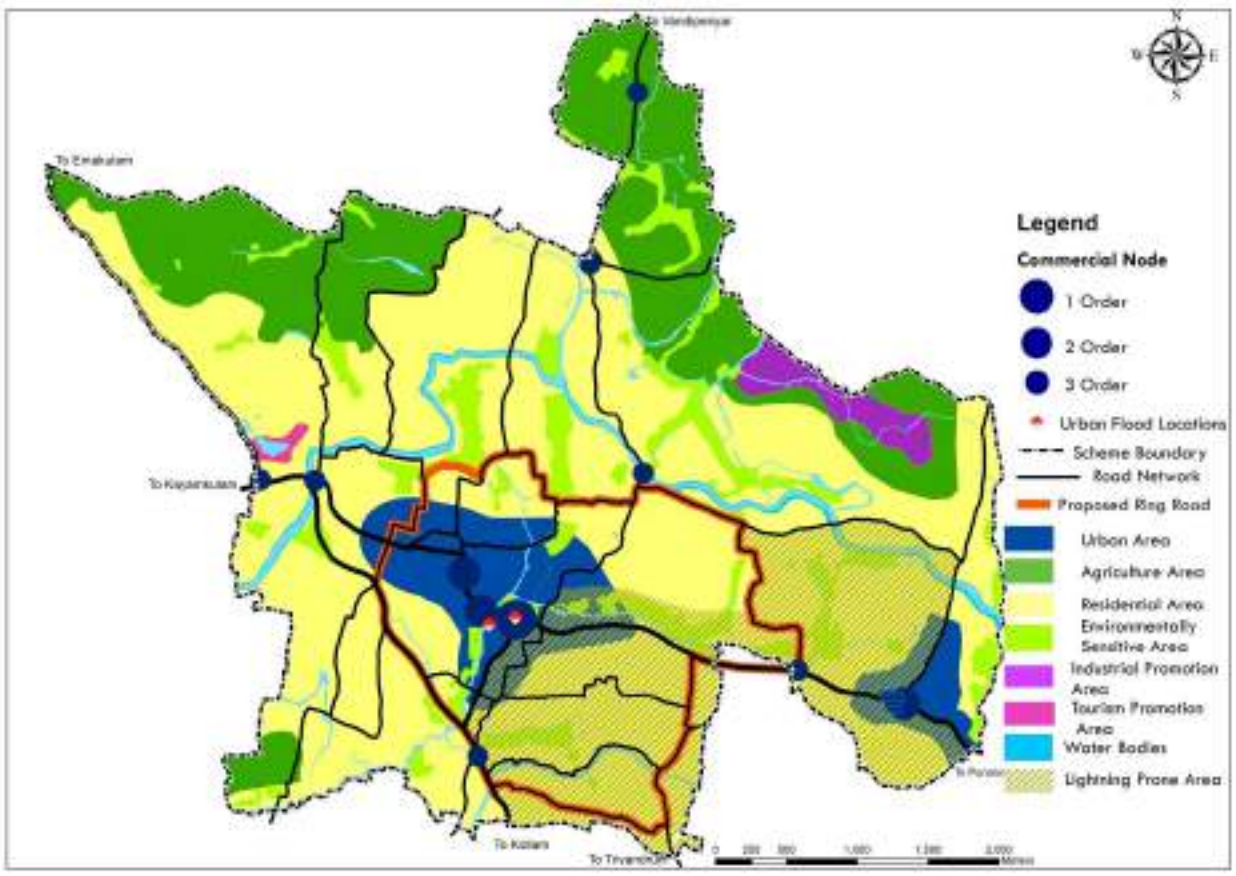


Figure 27.5 Proposed Spatial Structure

27.2 Development Concept for the Town

The development concept for Adoor town has been developed by integrating the proposed spatial structure with critical socio-economic and environmental factors that influence the town's urban growth. Additionally, ancillary sectors such as the Small-Scale Industrial (SSI) sector have also been considered due to their role in supporting employment and local economic development. The interrelationship among these sectors, and their impact on the urban structure, forms the foundation for the development concept. The development strategy for Adoor follows a multi-nodal spatial structure, promoting a balanced and equitable distribution of services and infrastructure. The following are the major components of the development concept:

27.2.1 Strengthening Trading Networks, Market Linkages and Transit resting hubs

The town's economy is significantly shaped by its role as a trading center for surrounding rural and semi-urban areas. In this context, the development concept proposes the strengthening of the trading network by establishing strategic linkages between existing market areas and peripheral settlements. This involves infrastructure improvements aimed at enhancing the efficient movement, storage, and distribution of goods, as well as the integration of local supply chains to support resource-based trade and entrepreneurship.

To further reinforce commercial activity shopping destinations, vending zones, market renovation, etc. are proposed along key transport corridors, particularly along the bypass. These destinations will be supported by designated commercial pockets and walkable shopping streets, enhancing accessibility and visibility to both local residents and through-traffic. The spatial arrangement of these nodes is intended to facilitate the aggregation and showcasing of diverse commodities available within the municipal area, while promoting the creation of commercially vibrant public spaces.

In addition, the development concept integrates the provision of transit hubs at key junctions along major transport corridors. These hubs are designed to serve long-distance travelers and transport operators, offering facilities such as shaded rest areas, paid parking, refreshment kiosks, and basic amenities. By integrating these hubs with nearby commercial zones and public transport networks, they also function as points of modal interchange, encouraging economic activity and creating additional footfall for nearby market areas.

27.2.2 Expansion of Central core

To accommodate the increasing demand for urban services and facilitate administrative and economic functions, the existing Central core is proposed to be expanded. This commercial zone is expected to support the functioning of the core area while enabling spatial and functional continuity.

27.2.3 Mixed Land Use and Higher Residential Densities

To ensure sustainable urban growth, the promotion of mixed land use and higher residential densities are promoted in strategically identified areas. Mixed-use zones will enable the co-location of compatible uses such as residential, commercial, and institutional functions, thereby reducing the need for travel, promoting compact growth, and enabling cost-effective service delivery. In low-density residential areas, provisions are made for the inclusion of small-scale industrial units that are environmentally compatible, contributing to decentralized employment opportunities while preserving the character of residential neighborhoods.

27.2.4 Decentralized Commercial Sub-Centers

To address congestion in the core town area and ensure equitable service distribution, decentralized commercial sub-centers are proposed in residential clusters with high population concentration as shown in Figure 27.6 and Figure 27.7. These sub-centers are envisaged to accommodate community-level services, local retail outlets, and weekly markets, thereby reducing pressure on the congested town center. A new vending zone and food street is proposed along the MC Road Bypass to serve as a regional destination for specialized goods and services, enhancing access for users travelling through the bypass.

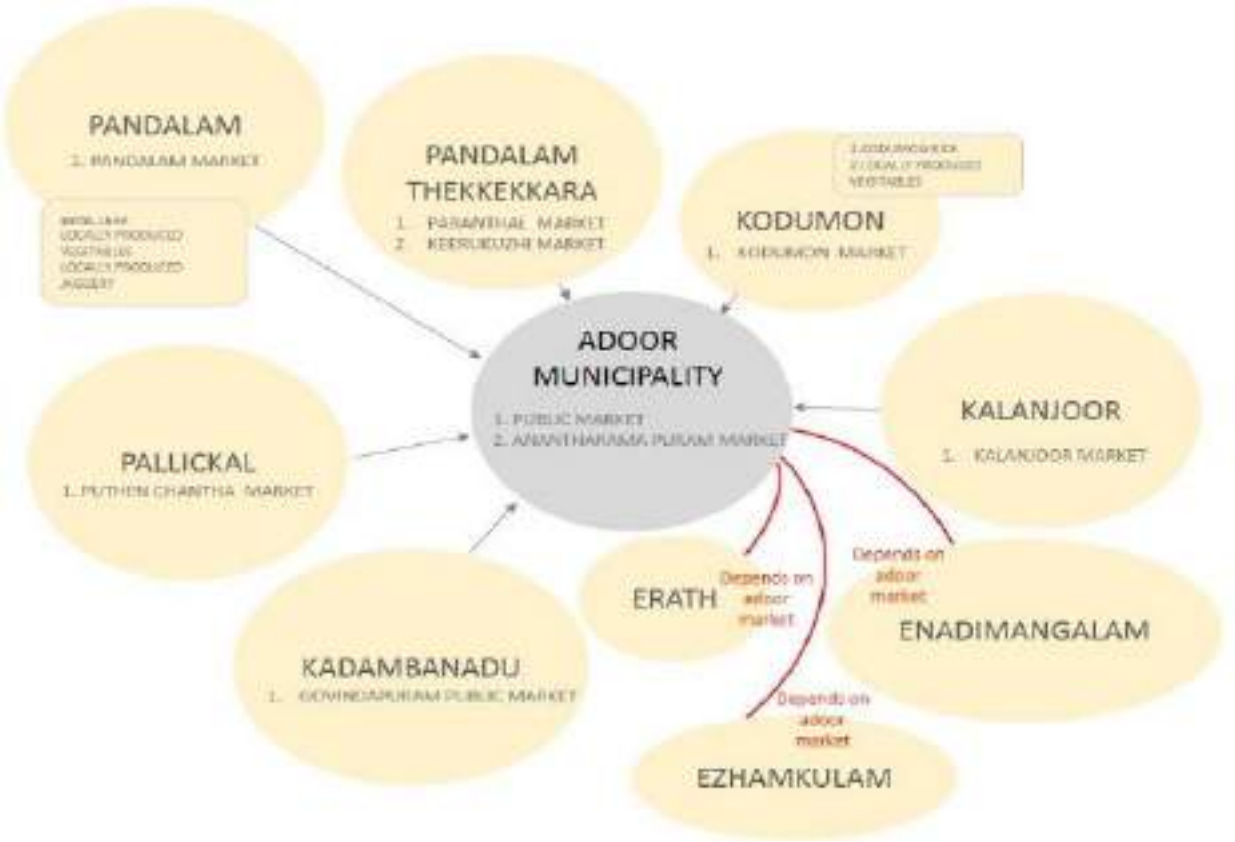


Figure 27.6 Commercial Sub-Centers

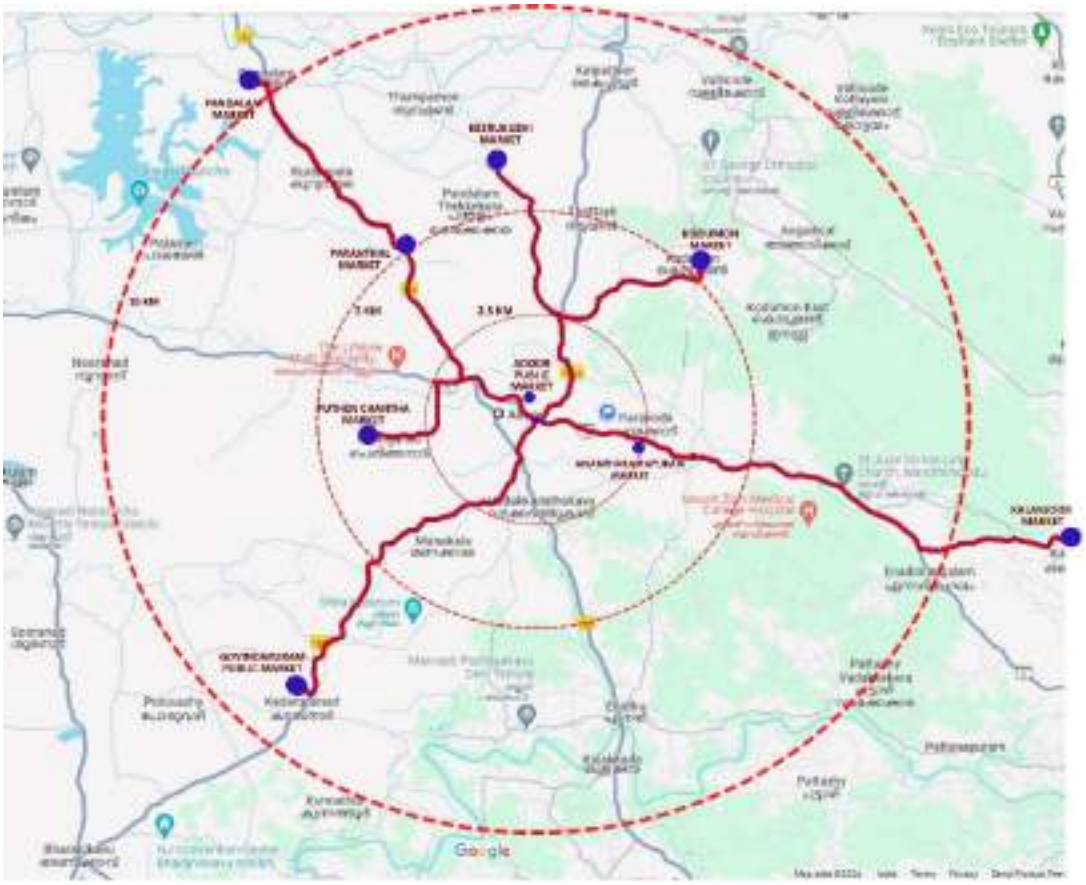


Figure 27.7 Market locations

In addition, the Parakode area is identified as a commercial node and is proposed for expansion, based on its existing commercial significance and development potential. Other areas including High School Junction, Anandapally, Kottamugal, and Pannivizha are designated as second-order nodes to address the localized needs of the surrounding population. The Markets in Adoor town act as a trade centre connecting the regional local markets. The local made agriculture produces from regional markets can be collected at large scale for value addition and exporting.

27.2.5 Promotion of Startups and Small-Scale Industries

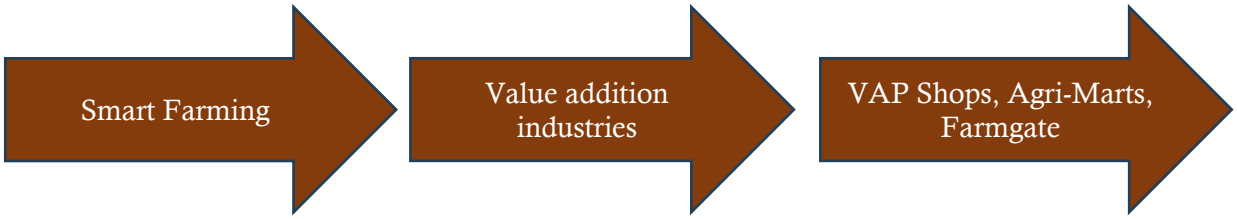
For the establishment of innovation-driven enterprises, large land parcels, which are available for future growth have been earmarked for Industrial promotion, IT-based establishments, startup incubators, Value-Added Product Shops and small-scale apparel parks. The promotion of such enterprises will diversify the town's economic base and create opportunities for youth employment and technology-driven development. Supporting infrastructure such as shared workspaces, digital connectivity, and logistics facilities need to be provided to foster a conducive environment for entrepreneurship and small business growth.

27.2.6 Tourism and Leisure Development

Tourism has been identified as a potential growth sector for Adoor. The development concept proposes the establishment of regional tourism centers at T.B. Hill and Puthiyakavilchira along with an aquatic center at Pambettukulam to promote water-based recreation and leisure. In addition, initiatives such as farm tourism, agrarian parks, and agro-sports are envisaged to integrate agriculture with tourism, while canal-based tourism and the beautification of the Pallickal River will enhance eco-recreational experiences and strengthen landscape value. A cultural centre is also proposed as a hub for performing arts, crafts, and heritage activities. Collectively, these interventions aim to diversify tourism, generate livelihood opportunities, and establish Adoor as a sustainable cultural and eco-tourism destination. A pilgrim tourism circuit can also be proposed with Adoor as the major transit hub.

27.2.7 Promotion of Urban and Peri-Urban Agriculture

Agriculture remains an important land use in Adoor, especially in the north-western and north-eastern parts of the Town. The development concept emphasizes the protection and enhancement of these agricultural areas, recognizing their role in local food production, ecological balance, and flood resilience. Integrated urban agriculture strategies are proposed, including homestead cultivation, community farming, and promotion of peri-urban agricultural belts. These initiatives will increase resilience, reduce the ecological footprint of the town, and promote food security.



27.2.8 Provision of Recreational and Open Spaces

Priority is accorded to the systematic provision of open spaces and local recreational facilities, encompassing Neighbourhood Parks, Happiness Park, Butterfly Park, Community Parks, and related amenities, to enhance the quality of urban life. The concept includes a range of community-level amenities such as parks, playgrounds, outdoor gyms, walking and jogging paths, and spaces for urban farming and leisure activities. These recreational spaces are planned to be equitably distributed across the town to improve the overall quality of life, promote health and well-being, and provide inclusive spaces for all age groups.

27.2.9 Conservation of Environmentally Sensitive Areas and Heritage Precincts

Conservation of environmentally sensitive areas and heritage precincts is an integral part of the development concept. Efforts will be directed towards preserving existing water bodies, wetlands, green patches, and heritage buildings that define the environmental and cultural character of Adoor. Specific conservation zones are delineated, and appropriate development control regulations are introduced to ensure their protection and integration into the urban landscape.

27.2.10 Disaster Risk Reduction and Resilience Building

Comprehensive disaster risk reduction strategies will focus on the identification of hazard-prone zones, preparation of risk assessment maps, and integration of structural and non-structural mitigation measures with planning and design processes. Infrastructure interventions such as multipurpose evacuation shelters, early warning systems, and robust emergency response mechanisms shall be established to strengthen preparedness and enhance resilience. In addition, spatial and nature-based solutions, including urban green spaces, wetlands and sponge parks, detention and retention basins, ponds, butterfly parks, waterbody widening, and green strips will be incorporated to mitigate risks and provide ecological co-benefits.

27.2.11 Development Concept

The concept aspires to create a balanced and resilient urban form, where distinct functional areas are integrated seamlessly to support sustainable growth. The central region is identified as the primary commercial hub, while the peripheral areas are preserved for agricultural activities, ensuring the protection of productive land and ecological balance. Mixed-use zones are prioritized to enhance urban efficiency and livability, while designated areas for industrial development, tourism

promotion, and value addition centers are integrated to strengthen the economic base, support local enterprises, and enhance regional competitiveness. The Development Concept is shown in Figure 27.8.

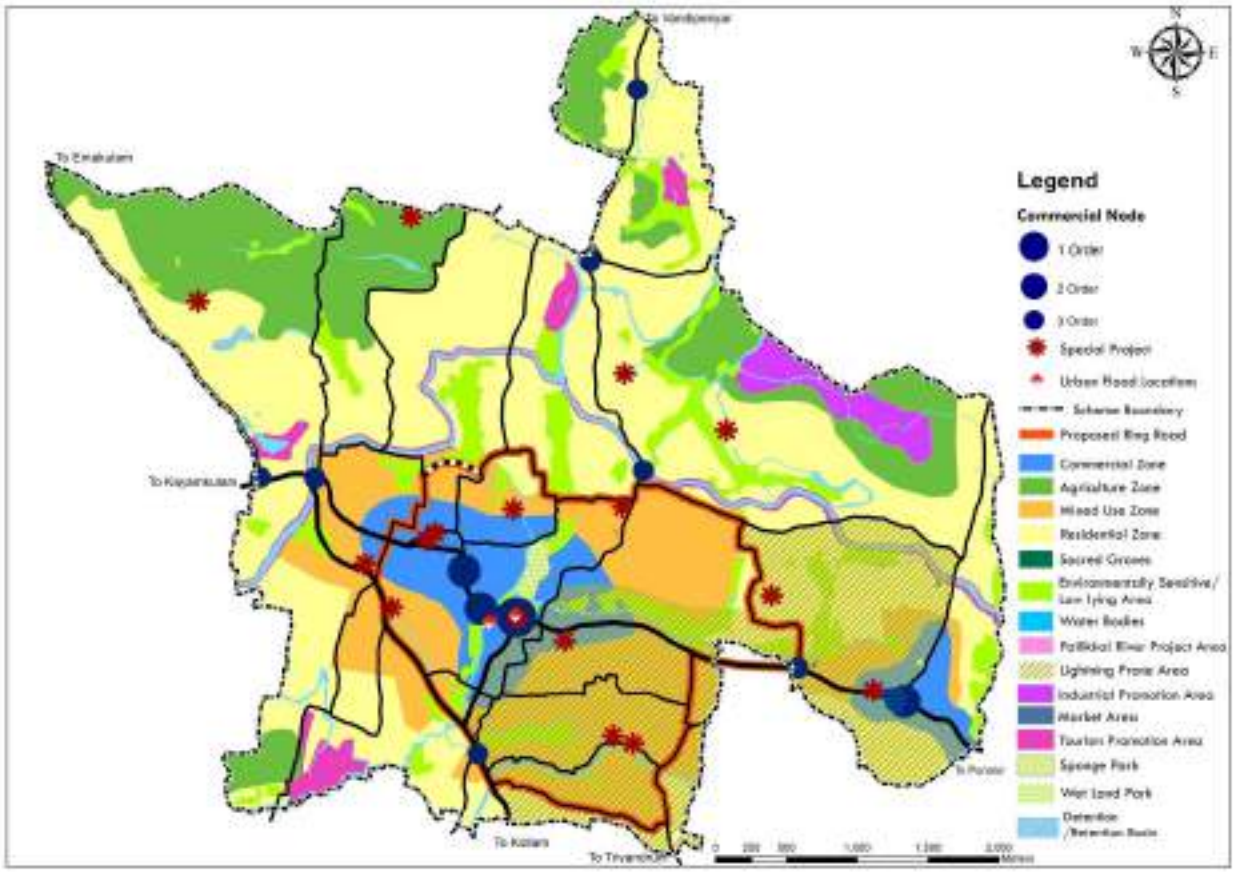


Figure 27.8 Development Concept for Adoor Town



CHAPTER 28
GENERAL POLICIES AND STRATEGIES

28.1 Introduction

This chapter outlines the general and sectoral development policies and strategies formulated based on the findings and conclusions of the sectoral studies presented in Part I of the Master Plan. The strategies aim to guide the implementation of the development concept over a 20-year horizon. The policies focus on promoting balanced urban growth, environmental sustainability, economic development, and improved quality of life for residents and the regional population served by Adoor town

28.2 General Development Policy

The general development policies guiding the future growth of Adoor are summarized as follows:

- Promote Adoor as a Regional Market Centre: Recognize trade and commerce as key economic drivers by strengthening its role as a central market hub, especially for locally produced agricultural goods and value-added products.
- Strengthen the Agricultural Base: Encourage intensive cultivation and integrated agriculture-animal husbandry practices with a focus on self-sufficiency in vegetables, milk, eggs, and meat. Promote smart farming techniques including precision agriculture and use of digital technology.
- Encourage the establishment of small-scale and cottage industries that leverage locally available resources—particularly agro-based products—to produce value-added goods and enhance employment opportunities. In parallel, promote the development of information technology (IT) establishments, startup incubators, apparel manufacturing units, and other Small Scale Industrial (SSI) ventures to diversify the town's economic base and attract young entrepreneurs.
- Promote Transit-Oriented Development: Establish Transit Resting Hubs at key nodes and corridors to cater to long-distance travelers, pilgrims, and tourists. These hubs shall be integrated with the transport network and equipped with rest areas, paid parking, and basic amenities.
- Position Adoor as an Administrative and Secondary Urban Centre: Provide necessary infrastructure and institutional facilities to support Adoor's role as a second-order town in the district urban hierarchy.
- Enhance Quality of Life and Infrastructure: Provide quality healthcare, education, housing, potable water, power, civic amenities, and effective transportation systems for residents.
- Ensure Environmental Sustainability: Preserve environmentally sensitive zones, water bodies, wetlands, and paddy fields. Promote sustainable development aligned with climate resilience and disaster risk mitigation.

28.3 Sectoral Development Policies And Strategies

The sector-wise policies and strategies for the key sectors identified in the development of Adoor town are outlined below.

28.3.1 Trade and Commerce

Policy:

Promote Adoor as a regional trade and commercial centre by strengthening market infrastructure and supporting retail and informal sectors, with special emphasis on locally produced and value-added products.

Strategies:

- Restructure Parakkode and Sreemoolam markets to meet modern standards.
- Decentralize commercial areas with adequate infrastructure like multi-level parking, drainage, and waste disposal.
- Provide organized spaces for the informal sector with required amenities.
- Develop special market zones for value-added products and agricultural goods.
- Encourage public-private partnerships in establishing new commercial complexes, special markets and commercial destinations.

28.3.2 Industry

Policy:

Establish industrial units focused on the value addition of locally available resources, particularly agro-based and traditional products. Encourage the diversification of industrial activities by promoting Information Technology (IT) establishments, apparel manufacturing units, startup hubs, and other emerging sectors to create a balanced and resilient economic base for the town

Strategies:

- Promote processing units for rubber, jackfruit, and other agro-products.
- Support establishment of IT and startup ecosystems.
- Encourage environmentally sustainable production units for building materials by utilizing locally available granite without causing ecological harm.
- Promote subsidiary units for industries operating within the KINFRA Industrial Park, encourage the establishment of small-scale IT and startup ventures, and ensure the provision of essential infrastructure such as roads and telecommunication facilities to support industrial growth.
- Provide marketing infrastructure for value-added goods.
- Support industries for marginalized groups and social collectives like Kudumbashree.

- Develop the Chiranickal Industrial Promotion Zone with comprehensive facilities, including renewable energy, water supply, and appropriate land regulations, to promote industrial activity while regulating other land uses and maintaining buffer zones.

28.3.3 Heritage and Tourism

Policy:

Develop Adoor as a transit tourism hub and preserve its cultural and architectural heritage.

Strategies:

- Create a regional tourist circuit with Adoor as a key transit point.
- Enhance amenities for tourists and Sabarimala pilgrims.
- Conserve heritage structures and sacred precincts.
- Develop promotional materials and digital tourism information points.

28.3.4 Agriculture

Policy:

Strengthen agricultural activities through promotion of sustainable practices and smart farming technologies.

Strategies:

- Encourage urban and homestead cultivation.
- Utilize KIP irrigation for intensive cropping.
- Promote organic farming and use of bio-fertilizers.
- Develop smart farming initiatives using IoT, sensors, and mobile apps.
- Ensure market linkage for agricultural produce and value-added goods.
- Protect ponds, rivers and small drains for irrigation and flood mitigation.
- Maintain and protect existing paddy fields by promoting paddy cultivation with improved techniques to increase yield, while preserving them as natural flood mitigation and groundwater recharge areas.

28.3.5 Animal Husbandry

Policy:

Promote integrated livestock farming to achieve self-sufficiency in milk, meat and egg production, in coordination with agricultural activities

Strategies:

- Establish scientifically managed dairy, poultry, and goat farms.
- Provide veterinary clinics, slaughterhouses, and implement animal welfare programs.
- Strengthen the integration of animal husbandry with agricultural practices.

28.3.6 Housing

Policy:

Ensure inclusive and affordable housing for all economic classes, including slum improvement.

Strategies:

- Designate sufficient residential zones in land use plan.
- Upgrade housing conditions in colonies under various development programs.
- Provide basic infrastructure in residential areas, including quality roads, street lighting, recreational facilities, and drainage systems
- Promote high-density residential developments to ensure efficient service delivery and reduce urban sprawl.

28.3.7 Water Supply

Policy:

Provide a continuous supply of safe drinking water meeting prescribed quality standards to all households, commercial establishments, and industries, with enhanced coverage of the protected water supply system.

Strategies:

- Extend pipeline networks and replace damaged fittings.
- Provide water distribution systems in elevated areas.
- Promote rainwater harvesting and groundwater recharge.
- Conserve ponds and wetlands for water source sustainability.

28.3.8 Transportation

Policy:

Develop an integrated and efficient transport system that meets the town's traffic needs, connects key activity nodes, supports modal shift, and incorporates proposals from the district road network, while promoting transit-oriented development and sustainable mobility

Strategies:

- Establish a well-defined hierarchical road network and create new road links to divert and decongest traffic in the central area.
- Develop terminal facilities and transit resting hubs integrated with major transport nodes.
- Provide adequate parking facilities, including multi-level car parking (MLCP) systems, particularly integrated with new developments in the town centre.
- Create safe, well-designed pedestrian infrastructure and enhance last-mile connectivity.

28.3.9 Energy

Policy:

Ensure uninterrupted, high-quality power supply for all consumers, promote the adoption of renewable energy, and maintain an efficient and sustainable public lighting system.

Strategies:

- Upgrade and modernize power distribution infrastructure to ensure reliability and quality
- Provide energy-efficient street lighting throughout the town.
- Promote renewable energy solutions such as rooftop solar and energy-efficient technologies.
- Implement lightning protection measures, including installation of lightning arresters in buildings located in high-risk zones

28.3.10 Waste Management and Drainage

Policy:

Achieve sustainable, decentralized waste management and ensure effective drainage systems to maintain a clean, hygienic environment and prevent flooding.

Strategies:

- Strengthen waste collection systems with additional workforce, vehicles, and equipment, and extend coverage to all areas with active community participation.
- Expand and improve waste processing facilities, including the dumping yard, and establish more Thumboormoozhi model plants across the town.
- Promote composting and bio-fertilizer production units to reduce landfill dependency.
- Provide additional public comfort stations at strategic locations.
- Maintain and upgrade roadside and natural drains to ensure unobstructed stormwater flow and prevent flash flooding.

28.3.11 Education

Policy:

Enhance educational infrastructure and promote diversification in courses to transform Adoor into an academic hub.

Strategies:

- Upgrade infrastructure in government and aided educational institutions.
- Modernize institutions with smart classrooms, language laboratories, and advanced learning facilities.
- Utilize available land and resources for establishing new institutions and specialized courses.
- Promote higher education institutions offering diversified and industry-relevant programs.

- Develop support facilities including hostels, libraries, sports complexes, and career development programmes.

28.3.12 Health

Policy:

Provide universal access to high-quality, inclusive healthcare by integrating modern and traditional medical systems, with a strong emphasis on preventive care to enhance the overall health status of the Town and its surrounding areas

Strategies:

- Upgrade Adoor General Hospital to super-specialty level with advanced equipment and comprehensive departmental facilities.
- Strengthen and expand infrastructure for Ayurveda and Homoeopathy alongside Allopathy.
- Establish specialised facilities for geriatric care, support for differently-abled children, counselling, and de-addiction services.
- Implement continuous preventive healthcare and community health awareness programmes.

28.3.13 Civic Amenities and Recreation

Policy:

Ensure the provision of high-quality civic amenities and recreational infrastructure to create a livable, inclusive, and vibrant urban environment

Strategies:

- Beautify the Pallickal River and its surroundings as a public attraction and ecological asset.
- Develop and maintain parks, open spaces, and recreational areas at accessible locations.
- Construct the town stadium and upgrade sports facilities.
- Modernize and expand library facilities with digital and user-friendly features.
- Construct and upgrade crematoriums in compliance with environmental standards.
- Upgrade civic amenities by relocating them to strategic locations on own lands and modernizing existing facilities.

28.3.14 Environment

Policy:

Promote eco-sensitive planning and environmental conservation.

Strategies:

- Conserve wetlands, water bodies, sacred groves and heritage landscapes.
- Implement effective solid waste management and pollution control measures.

- Develop green infrastructure and promote urban forestry.
- Enhance town aesthetics through planned streetscapes, organized open spaces, and other urban design interventions

28.3.15 Special concern Area

Policy:

Promote inclusive, safe, healthy, and accessible urban development in Adoor by addressing the specific needs of older adults, marginalised communities, women, and children, thereby ensuring their full participation in the social, economic, and cultural life of the town.

Strategies:

- Promote mixed-use zoning to ensure essential services, shops, recreational areas, healthcare facilities, and wellness centres are within walking distance or accessible by public transport.
- Provide barrier-free pedestrian infrastructure, including wide, well-maintained sidewalks, ramps, unobstructed pathways, shaded walking routes, and accessible public restrooms.
- Develop age-friendly and child-friendly public spaces with shaded seating, safe play areas, cultural and sports facilities, sensory gardens, and intergenerational community centres.
- Enhance safety in public spaces and transport through adequate lighting, surveillance, gender-sensitive infrastructure, secure public toilets, and clear wayfinding.
- Implement affordable and in-situ housing programmes for BPL and marginalised families, coupled with climate-resilient design in residential and public areas.
- Facilitate livelihood enhancement through skill development, vocational training, job linkages, and promotion of women-led enterprises and self-help groups, supported by market access, credit facilities, and digital literacy.
- Ensure equitable access to basic services such as clean water, sanitation, electricity, healthcare, and education in under-served areas, alongside targeted social protection schemes for vulnerable households.
- Strengthen educational support systems through improved school and early childhood infrastructure, scholarships, mentorship, after-school programmes, and digital learning resources.
- Provide comprehensive healthcare services, including paediatric and reproductive care, mental health support, nutrition programmes, and home-based health services for older adults.
- Promote awareness and community engagement on issues of safety, rights, entitlements, anti-discrimination, child protection, and violence prevention through schools, community workshops, and partnerships with civil society.

- Ensure active participation of priority groups—including women, children, older adults, and marginalised communities—in governance, planning, and civic decision-making processes.

28.3.16 Development Administration and Municipal Finance

Policy:

Ensure effective, transparent, and participatory urban governance by adopting sound municipal finance and institutional practices that strengthen service delivery, optimise resource management, and support sustainable and resilient town development.

Strategies:

- Promote active citizen participation in decision-making to ensure policies and projects reflect community needs and priorities.
- Enforce ethical governance standards to maintain transparency, accountability, and public trust in municipal administration
- Enhance the institutional capacity of local governments for efficient service delivery and effective management of urban challenges.
- Conduct periodic evaluations of policies and programmes, enabling evidence-based adjustments based on performance data and community feedback.
- Implement land value capture and other innovative financing mechanisms to fund infrastructure by reinvesting gains from increased property values.
- Prepare long-term financial plans and multi-year budgets aligned with strategic development goals.
- Foster public–private partnerships to mobilise funding and technical expertise for urban development projects.
- Adopt digital governance platforms for streamlined service delivery, online payments, and interactive citizen engagement
- Prioritise green infrastructure such as parks, green roofs, and permeable pavements to enhance resilience and improve urban quality.
- Improve energy efficiency in municipal buildings through targeted retrofits and sustainable design measures

28.3.17 Disaster Management and Climate Resilience

Policy:

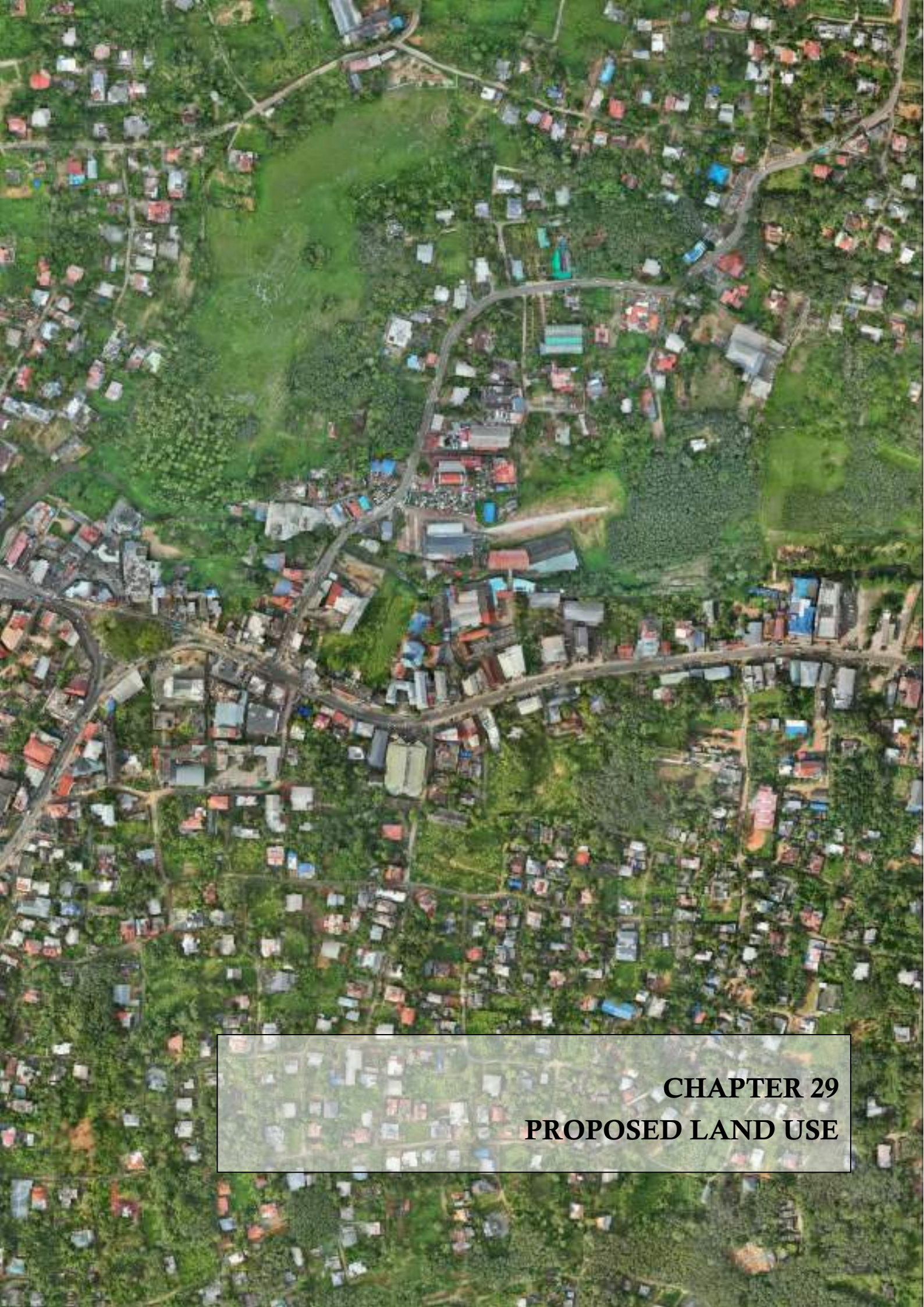
Enhance disaster preparedness and climate resilience through integrated planning, conservation of natural systems, and development of adaptive infrastructure.

Strategies:

- Maintain natural drainage networks in accordance with the Room for the River concept.

- Conserve paddy fields and wetlands as natural retention areas for flood mitigation and groundwater recharge.
- Provide drain widths as per stream order and stream density to ensure effective stormwater management.
- Develop designated water recharge zones in drought-prone areas.
- Implement comprehensive mitigation measures to reduce disaster impacts.
- Strengthen institutional infrastructure to function as multi-purpose facilities and rehabilitation centres during disasters.

PART III



CHAPTER 29
PROPOSED LAND USE

29.1 Introduction

Land use plays a major role in the process of evolving better environment for the town. Better management and distribution of activities in the town will reduce many problems relating to traffic and provision of service. Adoor is expected to be a trade centre and service town. The land use plan for 2045 is proposed in tune with the policies and strategies mentioned in previous chapters, considering the current land development trends, projected requirements, hazard profile of the town, and the evolved development concept.

29.2 Proposed Land Use

The Adoor municipal area has been divided into the following land use zones as per the proposed land use plan. The categories of land use zones proposed are:

1. Residential Use Zone
2. Commercial Use Zone
3. Mixed Use Zone
4. Public & Semipublic Use Zone
5. Industrial Promotion Zone
6. Traffic & Transportation Use Zone
7. Recreational Builtup Zone
8. Recreational Open Space Zone
9. Dry Agricultural Use Zone
10. Environmentally Sensitive Zone
11. Sacred Groves
12. Detention/Retention Basin
13. Canal Bank Beautification
14. Proposed Green Strip (3,5 &10 Meter)
15. Existing Waterbody
16. Special Zone (In Government/ Municipal Owned Land)
17. Special Zone (In Privately Owned Land)

The proposed Land Use Map and break up of land use in Adoor town is shown in Figure 30.1 and 30.2. It is also presented in the Table 30.1.

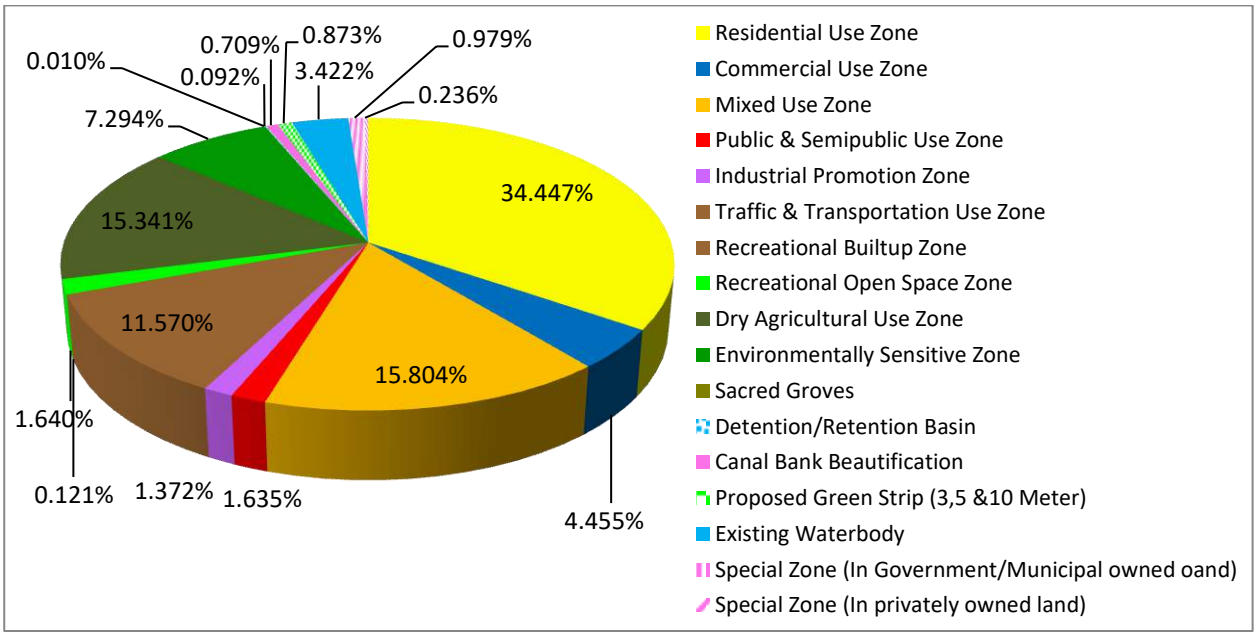


Figure 29.1 Proposed Land use Break up

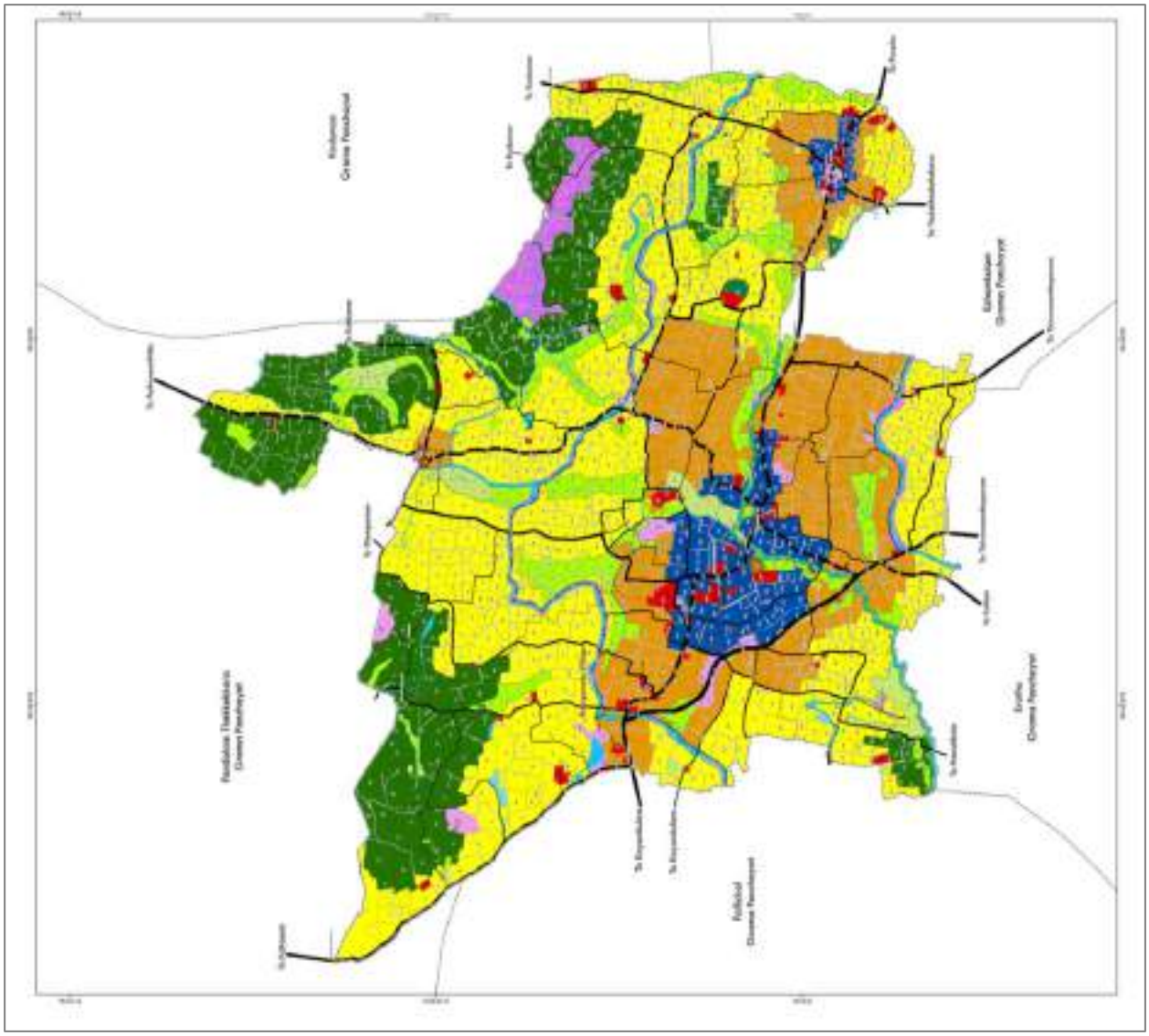


Figure 29.2 Proposed Landuse for Adoor town - 2045

Table 29.1 Proposed Land use Break up

Sl No	Land Use	Area (Sq.Km)	Percentage (%)
1	Residential Use Zone	7.141	34.45
2	Commercial Use Zone	0.924	4.46
3	Mixed Use Zone	3.276	15.80
4	Public & Semipublic Use Zone	0.339	1.64
5	Industrial Promotion Zone	0.284	1.37
6	Traffic & Transportation Use Zone	2.399	11.57
7	Recreational Built up Zone	0.025	0.12
8	Recreational Open Space Zone	0.34	1.64
9	Dry Agricultural Use Zone	3.180	15.34
10	Environmentally Sensitive Zone	1.512	7.29
11	Sacred Groves	0.002	0.01
12	Detention/Retention Basin	0.019	0.09
13	Canal Bank Beautification	0.147	0.71
14	Proposed Green Strip (3,5 &10 Meter)	0.181	0.87
15	Existing Waterbody	0.709	3.42
16	Special Zone (In Government/Municipal owned oand)	0.203	0.98
17	Special Zone (In privately owned land)	0.049	0.24
	Total	20.73	100

29.2.1 Residential Use Zone

The residential zone is designated in the area outside the central commercial core and mixed-use zone, but within the peripheral agricultural belt. The area mainly consists of residents with homestead cultivation land, providing a smooth transition between the high-density urban functions of the core and the extensive agricultural uses at the periphery. The total land use area under Residential use zone is 7.141 sq.km and it constitutes 34.45% of town area.

29.2.2 Commercial Use Zone

The commercial area is zoned in the central core of the town, promoting compact and dense development that strengthens the role of the core as the primary hub of trade and services. This strategy not only ensures accessibility from all parts of the town but also helps in preventing urban sprawl by avoiding scattered commercial growth into peripheral residential and agricultural areas. The total land use area under Commercial use zone is 0.924 sq.km and it constitutes 4.46% of town area.

29.2.3 Mixed Use Zone

The area located between the central commercial core of the town and the peripheral residential zones, including the stretch towards Parakode, is designated as a mixed-use zone. This zoning encourages a balanced blend of residential, commercial, and institutional activities, acting as a transition belt that supports compact development, improves accessibility, and reduces pressure on

both the core and the periphery. The total land use area under Mixed use zone is 3.276 sq.km and it constitutes 15.80% of town area.

29.2.4 Public & Semipublic Use Zone

The Public and Semi-Public use zone is proposed in accordance with the distribution of existing public institutions and facilities. This zone accommodates a wide range of essential functions such as educational institutions, health care facilities, government offices, religious and cultural institutions, and other community services. By consolidating such uses within a defined zone, the plan ensures efficient land allocation, better accessibility, and equitable distribution of civic amenities across the town. Strengthening and expanding these areas will improve service delivery, reduce travel distances for residents, and enhance the overall quality of life. The total land use area under Public & Semi Public use zone is 0.339 sq.km and it constitutes 1.64% of town area.

29.2.5 Industrial Promotion Zone

An area has been reserved for industrial promotion near Chiranickal, identified as suitable for accommodating new industrial uses. At present, this area is less populated, which minimizes conflicts with residential activities and makes it appropriate for future industrial development. The site also has the advantage of basic facilities such as water supply and access roads, which support the feasibility of establishing industrial units. The proposed industrial zone aims to attract small and medium-scale industries, generate local employment, and diversify the town's economic base while ensuring that adequate infrastructure and environmental safeguards are integrated into the development. The total land use area under Proposed Industrial Promotion zone is 0.284 sq.km and it constitutes 1.37% of town area.

29.2.6 Traffic & Transportation Use Zone

The area reserved for Traffic and Transportation use includes the road network, bus bays, parking areas, bus stands, and related facilities. These provisions ensure smooth mobility and connectivity within the town. The existing road system provides good coverage across the settlement, facilitating accessibility to commercial, residential and institutional zones. Strengthening this zone with modern transport facilities, improved parking management, and integrated public transport systems will enhance efficiency, reduce congestion, and support sustainable urban mobility. The total land use area under Traffic & Transportation use zone is 2.399 sq.km and it constitutes 11.57% of town area.

29.2.7 Recreational Built up Zone

The Recreational Built-up Zone is designated to accommodate key recreational projects such as T B Hill View Park, Happiness Park and Valiyakulam Waterfront Wellness Park. These facilities provide diverse opportunities for leisure, wellness, and community engagement, ranging from scenic enjoyment and family recreation to health-oriented open spaces. Concentrating such developments within a defined recreational zone ensures systematic growth of cultural and leisure infrastructure,

strengthens the town's identity as a livable urban centre, and enhances the quality of life for residents and visitors alike. The total land use area under Recreational Built up zone is 0.025 sq.km and it constitutes 0.12% of town area.

29.2.8 Recreational Open Space Zone

The Recreational Open Space Zone is proposed to include a wide range of green and nature-based recreational facilities such as the Sponge Park, Wetland Park, Agri-Sports and Farm Tourism Promotion Zone, Agri-Experience Tourism Area, Neighbourhood Parks, Butterfly Park, and Blossom Garden. These open spaces not only provide opportunities for leisure, eco-tourism, and community recreation but also play a vital role in enhancing environmental sustainability. By integrating wetlands, farmlands, and natural landscapes into recreation, the zone helps in urban cooling, flood mitigation, biodiversity conservation, and promotion of healthy lifestyles. Together, these facilities create a resilient and vibrant urban ecosystem that strengthens the town's identity as a green and livable destination. The total land use area under Recreational Open Space zone is 0.340 sq.km and it constitutes 1.64% of town area.

29.2.9 Dry Agricultural Use Zone

The area reserved for Dry Agricultural use is located in the peripheral parts of the town, predominantly in the northern region, where topographical variations make it more suitable for such cultivation. This zone safeguards traditional agricultural practices, promotes crop diversity, and ensures that the natural terrain is put to sustainable use without intensive urban conversion. Reserving these lands for dry agriculture also acts as a buffer against unplanned urban expansion, helping to maintain ecological balance while supporting the livelihoods of local farming communities.The total land use area under Dry Agricultural use zone is 3.180 sq.km and it constitutes 15.34% of town area.

29.2.10 Environmentally Sensitive Zone

Adoor is endowed with abundant wetlands and water bodies including streams, ponds, and low-lying lands which collectively form a critical natural drainage network. This system plays a vital role in Flood mitigation during monsoons, Groundwater recharge and drought resilience, Sustaining biodiversity and traditional livelihoods. These ecosystems function as the ecological backbone of the town, and they are zoned as Environmentally Sensitive Zone for their conservation, protection and restoration which is essential for climate adaptation and long-term sustainability. The total land use area under Environmentally Sensitive zone is 1.512 sq.km and it constitutes 7.29% of town area.

29.2.11 Sacred Groves

It is proposed to identify, preserve, and regenerate traditional sacred groves (locally known as kavus), which are vital for biodiversity conservation, cultural heritage, and ecological stability. The

total land use area under Sacred The total land use area under Sacred Groves is 0.002sq.km and it constitutes 0.010% of town area.

29.2.12 Detention/Retention Basin

Detention Basins are proposed to hold runoff temporarily during heavy rains and to slowly release it downstream to prevent flooding. And Retention Basins are proposed to hold water permanently like a pond, and to provide capacity to absorb extra storm water during rains. These ensure water quality improvement, groundwater recharge and also have aesthetic and ecological benefits. The total land use area. The total land use area under Detention/Retention Basin is 0.019 sq.km and it constitutes 0.09% of town area.

29.2.13 Canal Bank Beautification

The KIP canal bank under the jurisdiction of the Irrigation Department is proposed to be developed through canal bank beautification and the promotion of canal-based tourism activities. This initiative aims to enhance the aesthetic value of the waterway, provide recreational spaces for residents, and create opportunities for eco-tourism. Walkways, seating areas, landscaping, and allied facilities can transform the canal corridor into a vibrant public realm, while regulated boating and cultural activities along the canal can boost the local economy and promote sustainable tourism. The total land use area under Canal Bank beautification is 0.147 sq.km and it constitutes 0.71% of town area.

29.2.14 Proposed Green Strip (3,5 &10 meter)

A green strip is proposed along the sides of waterbodies and wetlands to safeguard these sensitive ecosystems and prevent encroachments. The width of the green strip varies depending on the ecological sensitivity and context—3 metres, 5 metres, or 10 metres—ensuring flexibility while maintaining effective protection. These strips will function both as ecological buffers and as public open spaces, where non-built recreational activities such as walking trails, cycling tracks, seating, birdwatching, and nature interpretation can be incorporated. This approach enhances flood resilience, improves the visual quality of the townscape, and provides residents with sustainable recreation opportunities closely integrated with natural assets. The total land use area under Proposed Green Strip is 0.181 sq.km and it constitutes 0.87% of town area.

29.2.15 Existing Waterbody

The existing waterbodies including the river, natural drains, ponds, and associated channels, are reserved as an ‘Existing Waterbody.’ This ensures their protection from encroachment and unregulated development while recognizing their ecological and hydrological significance. These waterbodies play a vital role in groundwater recharge, flood moderation, biodiversity support, and micro-climate regulation. Conserving them as a distinct zone safeguards the town’s natural assets and provides opportunities for integrating eco-friendly recreational activities and waterfront

beautification projects. The total land use area under Existing waterbody is 0.709 sq.km and it constitutes 3.42% of town area.

29.3 Special Zone

29.3.1 Special Zone (In Government/Municipal owned land)

This zone include Special Zones proposed in government/ local body owned Land and are specifically demarcated for certain projects, details of which are given in chapter 31 sector wise proposals. Table 29.2 gives the details of Special Zone (In Government/Municipal Owned Land) in Adoor town. The total land use area under Special Zone (In Government/Municipal Owned Land) is 0.203sq.km and it constitutes 0.98% of town area.

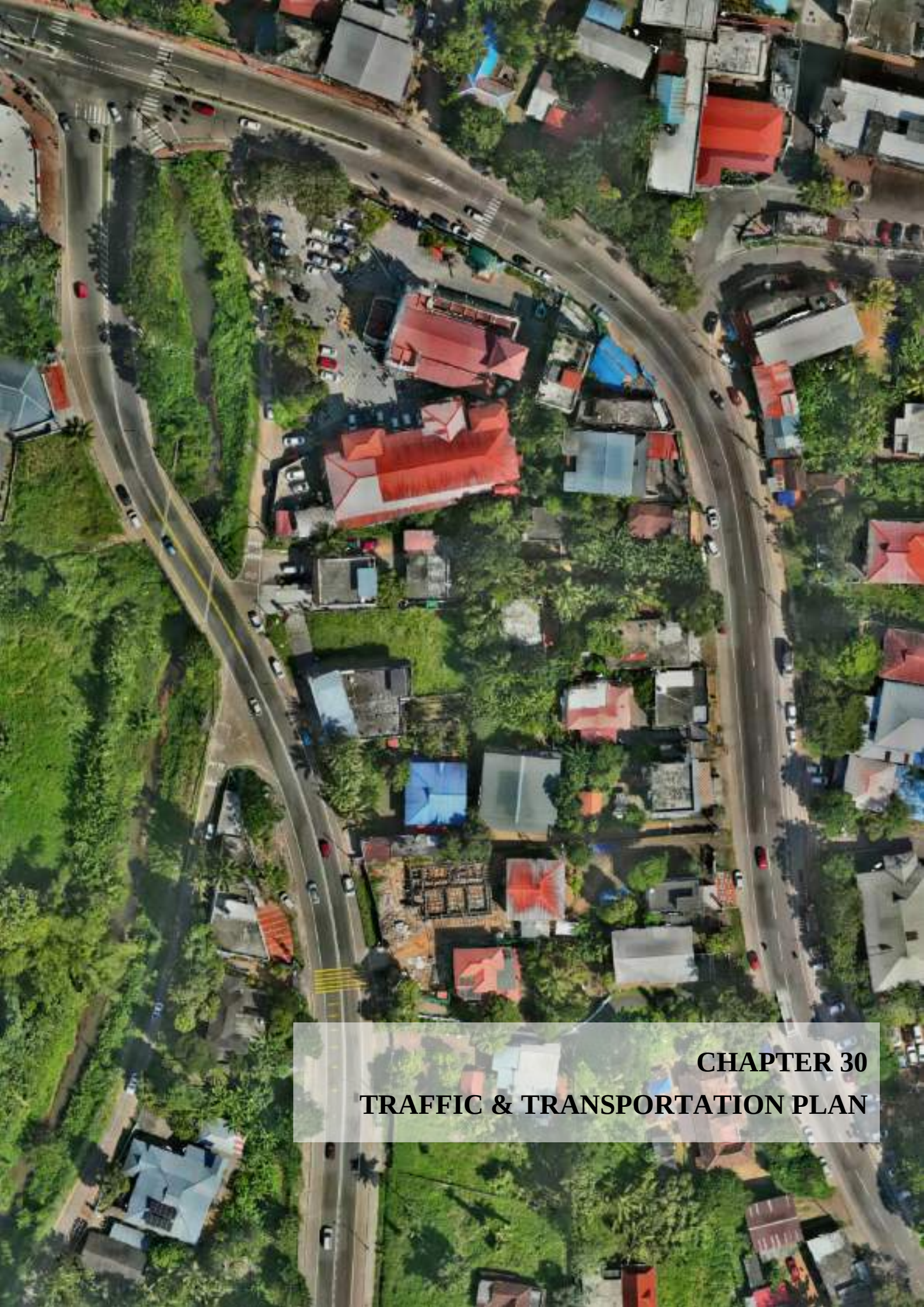
29.3.2 Special Zone (In privately owned land)

This zone include Special Zones proposed in Privately Owned Land and are specifically demarcated for certain projects, details of which are given in chapter 31 sector wise proposals. Table 29.2 gives the details of Special Zone (In Privately Owned Land) in Adoor town. The total land use area under Special Zone (In Privately Owned Land) is 0.049sq.km and it constitutes 0.24% of town area.

Table 29.2 Details of proposed Special Zone (In Privately Owned Land) in Adoor town

Sl No	Code	Special Zone	Area (Sq.Km)	Percentage (%) of Town Area
Special Zone (In Government/ Municipal owned land)				
1	G1	Proposed Innovation Hub	0.0002	
2	G2	Aquatic Complex & Cultural Centre	0.0092	
3	G3	Municipal Stadium & Sports Complex	0.0361	
4	G4	Municipal Office Complex & Municipal Bus Stand	0.0177	
5	G5	Revitalization of Parakode Market	0.0151	
6	G6	Gandhi Park Rennovation	0.0014	
7	G7	Municipal Town Hall & Parking Plaza	0.0022	
8	G8	Transit - Resting Hub	0.0121	
9	G9	Integrated Waste Treatment Plant	0.0341	
10	G10	Proposed Fire & Rescue Station	0.0044	
11	G11	Shopping Complex & She Lodge	0.0011	
12	G12	Crematorium & Bio-park	0.0388	
13	G13	Proposed Highway Travel Plaza	0.0121	
14	G14	Proposed Agrarian Park & Experience Centre	0.0088	
15	G15	Proposed Empowerment Centre	0.0033	

16	G16	Fitlife Centre with Leisure Hub	0.0044	
17	G17	Civic Arcade	0.0020	
		Total	**0.203**	**0.98**
Special Zone (In privately owned land)				
18	P1	Urban Hangout Hub	0.0138	
19	P2	Trade & Expo Pavilion	0.0120	
20	P3	Proposed Turf	0.0048	
21	P4	Proposed Women Skill Development Centre	0.0039	
22	P5	Transit-Resting Hub Extension Area	0.0145	
		Total	**0.049**	**0.24**
TOTAL			**0.252**	**1.22**



CHAPTER 30
TRAFFIC & TRANSPORTATION PLAN

30.1 Introduction

The traffic and transportation plan for Adoor town is designed to address the growing challenges of mobility, accessibility and road safety while supporting the town's future development needs. As Adoor continues to expand as a regional transportation center, its road network faces increasing pressure from rising vehicular traffic, limited pedestrian and cycling infrastructure, and inadequate public transport facilities. The plan emphasizes creating a balanced, multimodal transportation system that integrates road improvements, junction redesigns, dedicated pedestrian and cycle paths, parking management and provisions for an improved public transport system. By focusing on sustainable and inclusive mobility, the proposed interventions aim to reduce congestion, improve connectivity to surrounding regions, ensure road safety and enhance overall travel experience for residents, commuters and visitors. This plan also seeks to align transportation infrastructure with broader goals of economic development, environmental protection and improved urban functionality for Adoor town.

30.2 Proposed Road Network

The existing road network in Adoor Town, though functional, is unable to adequately handle the growing traffic demand. Narrow carriageways, poor pavement conditions and encroachments contribute to congestion, especially along the roads connecting major places like Adoor, Parakode, Karuvatta, Anandapalli and Pannivizha. The proposed road network plan focuses on upgrading and improving internal connectivity of town through widening and strengthening of major link roads, developing new road connections to ease bottlenecks and provide alternate routes. These interventions aim to improve overall traffic circulation, reduce travel time and enhance accessibility to key activity centers such as commercial centers, municipal office, markets, bus terminals, institutional areas. The existing road network of the town is not following any particular pattern due to topographical reasons. But it closely resembles radial pattern. A hierarchical system of road network is proposed for the town as shown in map 30.1. Five categories of roads ie, First order, (30 m & 24 m Right of Way width), Second order roads (18 m Right of Way width), Third order roads (12 m & 10 m Right of Way width), Fourth order roads (7 m Right of Way width), Fifth order roads (below 7 m Right of Way width). Most of these roads are formed by widening the existing roads and a few new roads are also proposed for decongesting the town center and opening more land for various urban activities. List of proposed road widths in the town is mentioned in the Table 30.1.

Table 30.1 Proposed road network of Adoor Town

Sl. No	Name of Road	Proposed width (m)	Code in Map (MP/ 02/II)
First Order Roads			
1	MC Road Bypass	30	RD 01

1	Main Central(MC) Road (SH 01)	24	RD 02
2	Kayamkulam-Punalur (KP) Road (SH 05)	24	RD 03
4	National Highway 183A	24	RD 04
Second Order Roads			
1	Anandappally- Kodumon Road	18	RD 05
2	MG Road	18	RD 06
3	Revenue Tower Road	18	RD 07
4	New Municipal Office/Bus stand Road	18	RD 08
5	Pannivizha-Parakode Road	18	RD 09
6	Parakode-Kodumon Road	18	RD 10
7	Kadampanad-Enath-Ezhamkulam Road	18	RD 11
8	Kottamugal-Vadakkedathukavu Road	18	RD 12
9	Anandappally-Thumpamon road	18	RD 13
10	Pandikkudi-Kottamugal Road via TB	18	RD 14
Third Order Roads			
1	Moonnalam-Manakkala Road	12	RD 15
2	Thadathil -Manakkala Road	12	RD 16
3	Holycross- Mangalasseripadi Road	12	RD 17
4	Ayyappanpara Temple Road	12	RD 18
5	Pannivizha-TB Road	12	RD 19
6	Pambettukulam-Sree Moolam Market Road	12	RD 20
7	Holycross-Kaimalappara Road via Paris Junction	12	RD 21
8	Nellimootilpadi-Adoor Road	10	RD 22
9	Holy Angels School Road	10	RD 23
10	Adoor-Kannamkode Road	10	RD 24
11	Thottathilpadi-HS Junction Road	10	RD 25
12	Thadathilpadi-Karuvatta Road	10	RD 26
13	Stadium Road	10	RD 27
14	Pannivizha-Valiyakulam Road	10	RD 28
15	Adoor-Konnamankara Road	10	RD 29
16	Bible College Road	10	RD 30
17	Road connecting MG Road and Market Road	10	RD 31
Fourth Order Roads			
1	Kannamkode Road	7	RD 33
2	AR Padi Road	7	RD 34
3	Seed Farm Road	7	RD 35
4	Moonnalam-Peringanad Road	7	RD 36
5	Puthenchantha-Mangalasserippadi Road	7	RD 37

6	Access Road to Waste Treatment Plant	7	RD 38
7	EV Vayanassala- Mithrapuram Road	7	RD 39
8	Creamatorium access road	7	RD 40
9	EV Vayanassala- Puthiyakavilchira Road	7	RD 41
10	Pandikkudi-Parakode Road via Edathinal Devi Temple	7	RD 42
11	Avaruvelil Temple Road	7	RD 43
12	Amrita School-Parakode Block Road	7	RD 44
13	Pannivizha-Chiranickal Road via GWLPS	7	RD 45
14	Valiyakulam-Attakulam Road	7	RD 46
15	Valiyakulam-Ampazhavayalthara Road	7	RD 47
16	Valiyakulam-Anandappally Road	7	RD 48
17	Canal Roads	7	RD 49
18	PHC-Chiranickal Road via Pullampallil junction	7	RD 50
19	NSLPS-Ammommakavu Road	7	RD 51
20	Anandappally-Pathisseripadi Road	7	RD 52
21	Kottappuram-Puthenchantha Road	7	RD 53
22	Parthasarathy Road	7	RD 54
23	MMT Road	7	RD 55
24	Konnamankara East Link Road	7	RD 56
25	Parakode North-Chiranickal GWLPS Road	7	RD 57
26	Ambazhavayalthara-Karimbannur Road	7	RD 58
27	Stadium Road	7	RD 59
28	Kencos Road	7	RD 60
29	Access Road to Transit Resting Hub via KSEB	7	RD 61
30	Moonnalam LPS Road	7	RD 62
31	Fish market Road	7	RD 63
32	Pannivizha LPS-Aluvila Road	7	RD 64
33	Pannivizha-All Saints School Road	7	RD 65
34	TB Access Road	7	RD 66
35	Parakode market road	7	RD 67
36	Stadium Access Road from MG Road	7	RD 68
37	New Municipal office access road	7	RD 69
38	Adoor Club Road	7	RD 70
39	Access road to proposed Turf	7	RD 71
Proposed New Roads			
1	National Highway 183A (Link road)	24	RD 72
2	Stadium Road	10	RD 27
3	Road connecting MG Road and Bible College Road	10	RD 32

4	New Municipal office access road	7	RD 69

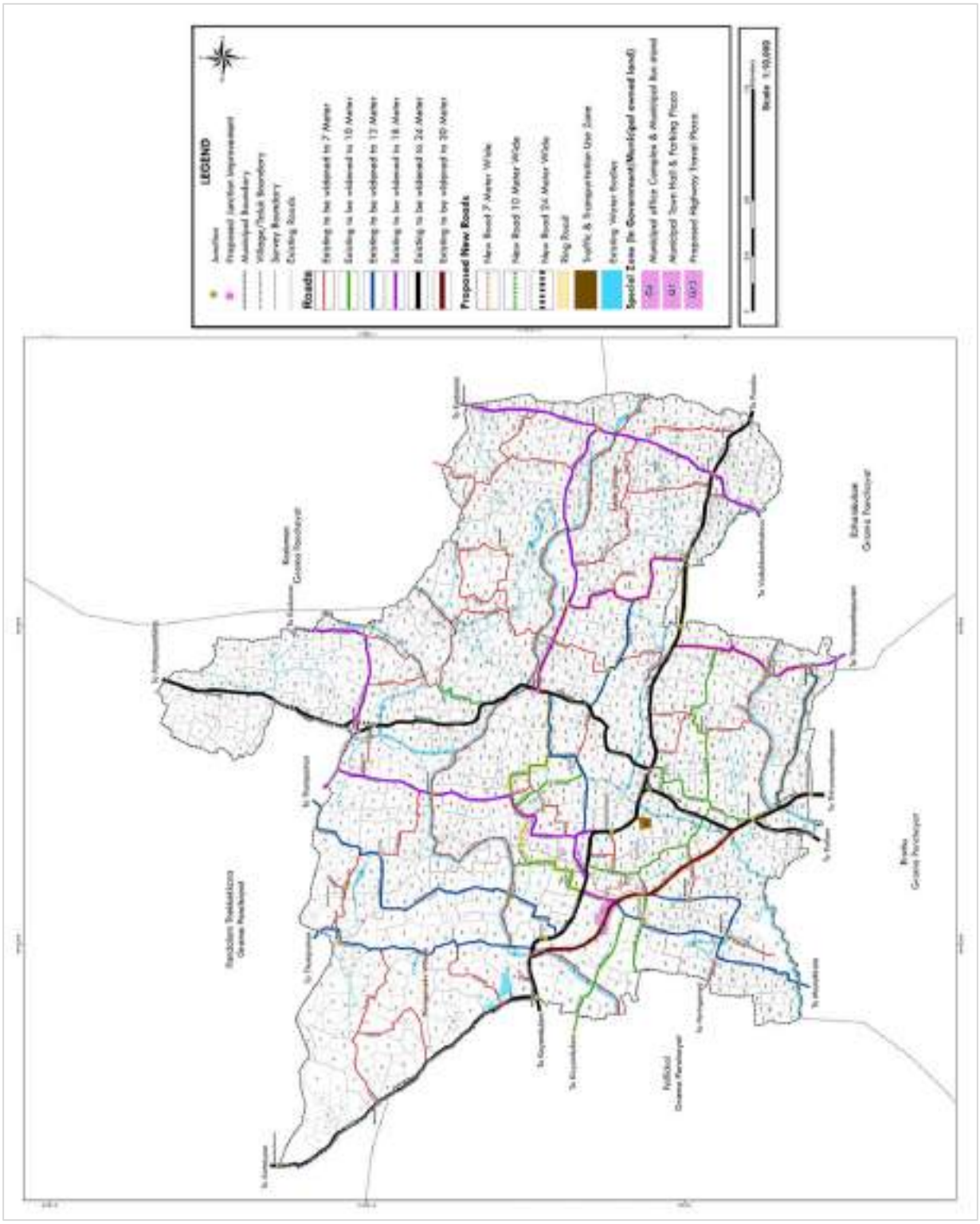


Figure 30.1 Proposed Transportation plan of Adoor town

The first and second order roads are proposed to serve as the principal network to handle through traffic while carrying the bulk of intra-urban movement. Complementing this, third-order roads are introduced to strengthen overall connectivity by linking higher-order roads with forth order roads, thereby improving accessibility and supporting the development of rural and peri-urban areas within the town. Fifth-order roads, with widths less than 7 meters, primarily function as local streets or access roads within residential neighborhoods. They are not intended for through traffic and mainly provide direct access to homes, community spaces, and small-scale facilities. These roads generally carry low traffic volumes and have minimal impact on the overall road network. Therefore, roads of this category are not listed in Table 30.1 unless they require specific attention due to their inclusion in a broader development context or location of sectoral project.

30.3 Proposed Cross Section Details

The proposed road network for Adoor town has been classified into five hierarchical categories based on their function, traffic volume and required right-of-way (ROW). To ensure safe and efficient mobility for vehicles, pedestrians and non-motorized transport, typical cross-section standards are suggested for each category. These sections integrate carriageways, pedestrian pathways, cycle tracks, landscaping and storm water drainage in a balanced manner, thereby enhancing both functionality and vehicular movement.

30.3.1 Design of 30 m wide Bypass road

To address growing traffic congestion and improve regional connectivity, bypass road is proposed as 30m width. This bypass will help divert through-traffic, particularly heavy vehicles, away from the town center, thereby easing congestion on internal roads and improving overall traffic flow. The 30-meter-wide Adoor bypass road is planned with a well-structured cross-section to ensure efficiency and sustainability (Figure 30.2).



Figure 30.2 Design of 30 m wide bypass road

It consists of a four-lane carriageway to accommodate smooth traffic flow, a tree-lined median that enhances aesthetics and provides environmental benefits and a 5-meter-wide service road & cycle track. In addition, footpaths on both sides with foot over bridge (at Private Bus Stand) are included to promote pedestrian safety and encourage non-motorized movement. The design also integrates a dedicated drainage system and utility ducts, ensuring long-term durability, resilience against flooding, and provision for future utility requirements.

30.3.2 Design of 24 m wide road

First-order roads form the backbone of the town's transport network, designed to accommodate heavy through traffic and regional connectivity. The cross-section (Figure 30.3) includes four lane carriageway separated by a median, provision for cycle tracks, pedestrian footpaths with barrier free design, service lanes, tree cover for shades and underground utility ducts. On street parking is not allowed. These roads designed for heavy traffic volume and ensure uninterrupted movement for long-distance commuters while promoting safe multi-modal integration.



Figure 30.3 Design of 24 m wide road

30.3.3 Design of 18 m wide road

Second-order roads act as sub-arterials, linking the major arterials with third order roads. With a cross-section of 18 m (Figure 30.4), these roads generally include two-lane carriageways with two side on street parking, dedicated pedestrian footpaths with barrier free design, tree cover for shades and underground utility ducts. These roads balance mobility and accessibility, serving institutional, residential, and commercial zones within the town.

30.3.4 Design of 12 m wide road

Third-order roads designed (Figure 30.5) to channel traffic from neighborhoods and institutions onto higher-order roads. The cross-section provides for a two-lane carriageway with moderate widths, lined

with pedestrian pathways and tree planting strips. These roads enhance intra-town connectivity and support the smooth flow of mixed traffic.

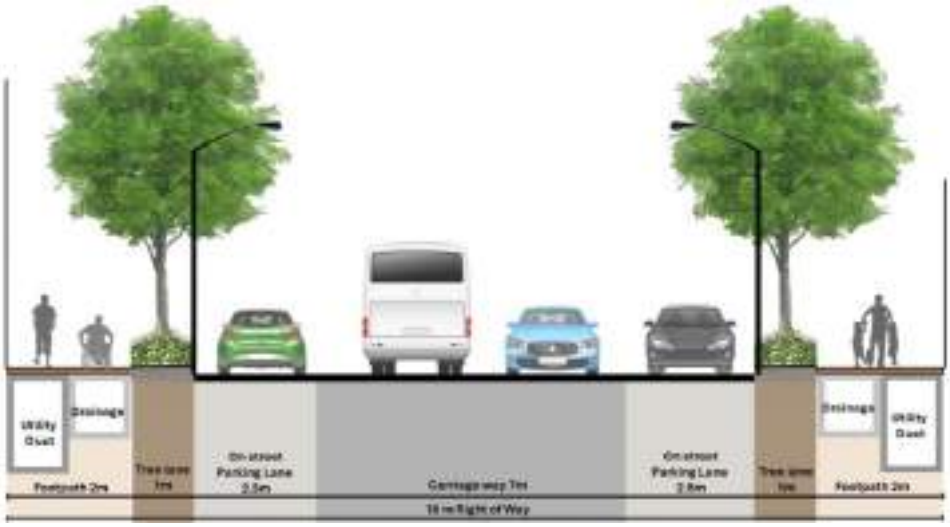


Figure 30.4 Design of 18 m wide road



Figure 30.5 Design of 12 m wide road

30.3.5 Design of 10 m & 7 m wide road

Fourth- & Fifth order roads (Figure 30.6) function as local streets that prioritize community-level accessibility. The 10 m right-of-way accommodates a two-lane carriageway with pedestrian-friendly footpaths on either side. These streets are intended for lower traffic volumes and integrate features like shaded walkways, sitting spaces, and safe pedestrian crossings, encouraging walkability within residential neighborhoods. With a 7 m cross-section, they provide a wide single-way carriageway and pedestrian pathways. These are not meant for through traffic but are critical for last-mile connectivity. Their design emphasizes accessibility and safety over speed, ensuring comfortable local circulation.

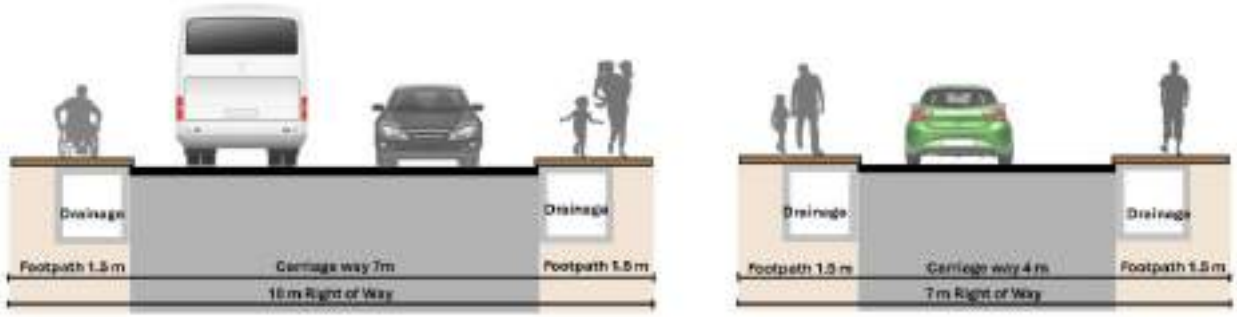


Figure 30.6 Design of 10 m and 7 m wide road

30.4 Ring Road

A Ring Road is proposed in Adoor town to improve traffic circulation, reduce congestion in the core areas, and enhance connectivity between different activity nodes. The road stretches comes under proposed ring road is mentioned in Table 30.2. This network will function as a major mobility corridor, enabling smoother through traffic movement while decongesting the central areas and strengthening linkages to residential, commercial, and institutional zones. The proposal also facilitates better access to regional highways, supports planned urban growth, and provides opportunities for future infrastructure integration such as public transport, pedestrian facilities, and cycle tracks, making it a critical component of the town's transportation framework. The ring road is planned by integrating existing road stretches with strategically identified new link roads, thereby creating a continuous loop around the town (Figure 30.7). The cross section design of ring road is mentioned in Figures 30.2 to 30.7 based on the proposed Right of Way. Small stretch of SH5 in Ezhamkulam Grama Panchayat is also included in the ring road in the South Eastern part of the town.

Table 30.2 Proposed ring road stretches of the town

Sl. No	Name of Road	Proposed width (m)	Code in Map (MP/ 02/II)
1	New Municipal Office/Bus stand Road	18	RD 08
2	Bible College Road	10	RD 30
3	Road connecting MG Road and Bible College Road	10	RD 32
4	MG Road	18	RD 06
5	Road connecting MG Road and Market Road	10	RD 31
6	Pambettukulam-Sree Moolam Market Road	12	RD 20
7	Pannivizha-Parakode Road	18	RD 09
8	Pandikkudi-Kottamugal Road via TB	18	RD 14
9	Kayamkulam-Punalur (KP) Road (SH 05)	24	RD 03
10	Kottamugal-Vadakkedathukavu Road	18	RD 12
11	Ayyappanpara Temple Road	12	RD 18
12	Main Central(MC) Road (SH 01)	24	RD 02
13	MC Road Bypass	30	RD 01

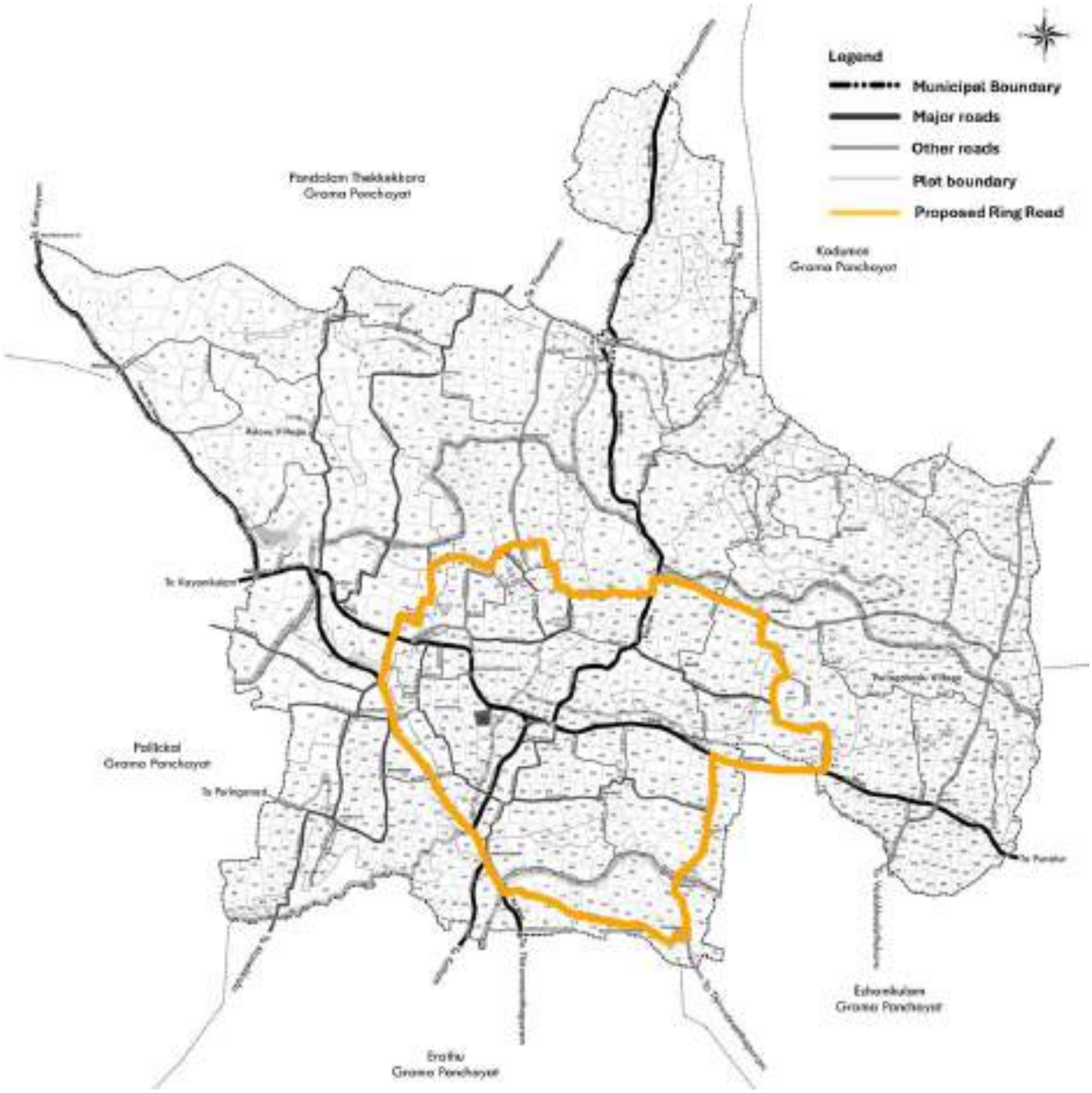


Figure 30.7 Proposed ring road

30.5 Intersection Improvement

Junction improvement in Adoor town is proposed due to the increasing traffic congestion and safety concerns at major intersections. The town is witnessing a steady rise in vehicular movement as it serves as a regional connectivity hub for transportation activities. However, most junctions are poorly channelized, lack pedestrian facilities and often face bottlenecks during peak hours, leading to delays and unsafe conditions for road users. Improper turning lanes, inadequate signage and the absence of modern traffic management measures further worsen the situation. Improving junctions will not only ease traffic flow but also enhance pedestrian safety, reduce accident risks, minimize travel delays and create a more efficient urban transportation environment.

30.5.1 Adoor (Pathanamthitta Road) Junction

Adoor Junction (Figure 30.8) is one of the most critical three arm intersections in the town, formed by the meeting of NH 183A and SH 5 (with proposed width of 24m). Being the main entry and exit point for regional traffic and located near Gandhi Park round about.



Figure 30.8 Adoor (Pathanamthitta Road) Junction

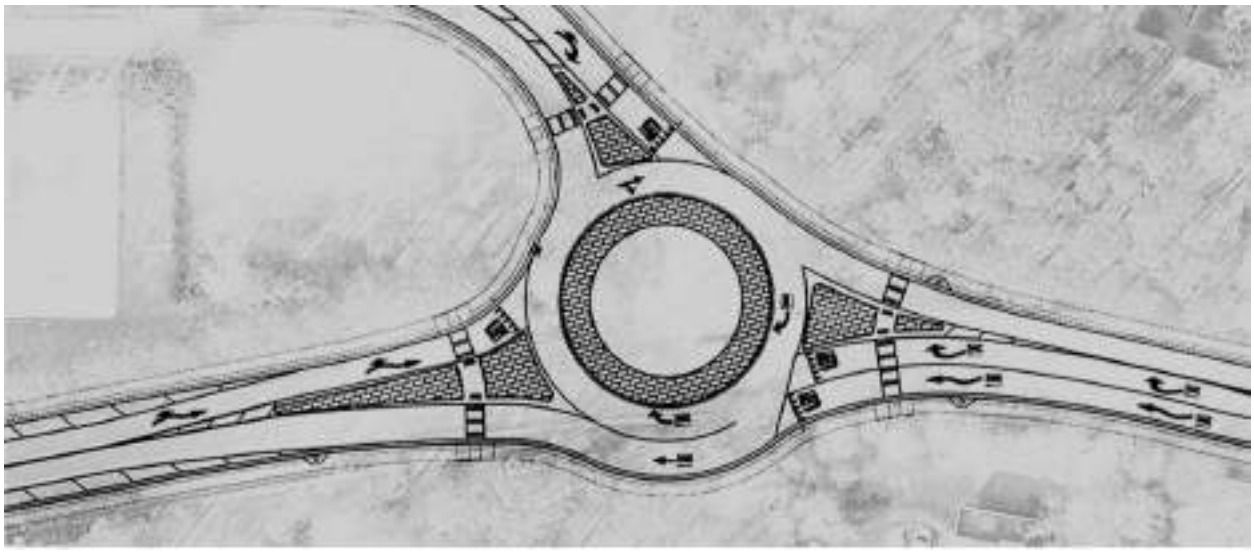


Figure 30.9 Conceptual intersection design at Adoor junction

A model of intersection design at Adoor junction is shown in the Figure 30.9. The following are the suggested design changes in Adoor Junction improvement.

1. Geometric Redesign – Widening of approach roads and channelization of lanes to provide dedicated turning lanes, ensuring smoother movement of vehicles.
2. Rotary Junction –a compact roundabout will be introduced to regulate traffic effectively.

3. Pedestrian Facilities – Provision of zebra crossings, pedestrian refuge islands, and footpaths along the arms of the junction for safe pedestrian movement.
4. Street Lighting & Signage – Installation of high-mast lights, advance direction signage, and road markings to improve night visibility and safety.
5. Public Transport Integration – Dedicated bus bays to reduce conflicts caused by random bus halts on the carriageway.
6. Landscape & Aesthetic Improvements – Junction beautification with street furniture, greenery and urban design elements to make the space both functional and visually appealing.

30.5.2 Parakode Junction

Parakode Junction is a high-activity four-arm node where SH-5 with proposed 24 m width intersects with Kodumon Road with proposed 18 m width. The adjacent market intensifies pedestrian flows, short-stay parking, vendor activity and frequent stopping of small vehicles, increasing conflict points and congestion. The improvement aims to enhance traffic capacity and circulation, improve pedestrian safety and accessibility, integrate public transport and market needs and upgrade urban design and drainage.



Figure 30.10 Conceptual intersection design at Parakode junction

Key strategies for Parakode junction improvement include introducing a roundabout to replace traditional signalized intersections, enabling smoother traffic flow and reducing accident risks. Pedestrian-friendly features such as marked crosswalks, refuge islands, and signals improve safety for walkers and cyclists, while slip lanes facilitate turning movements without disrupting through traffic. Modern real-time monitoring systems with cameras and sensors help manage congestion and ensure quick response to incidents. Adequate street lighting enhances nighttime safety, and the removal of physical obstructions ensures clear sightlines, improving overall visibility and reducing conflicts.

Together, these measures create safer, more efficient, and accessible junction for all road users. A model of intersection design at Parakode junction is shown in the Figure 30.10.

30.5.3 Pannivizha Junction

Pannivizha Junction is another three arm node where NH 183A with proposed 24 m width intersects with Parakode Road with proposed 18 m width. The design features proposed for Adoor Junction improvement, illustrated in Figure 30.9, are also proposed for the improvement of Pannivizha Junction.

30.5.4 Anandapalli Junction

The existing Anathapalli junction along NH183A is characterized by a zig-zag alignment with sharp curves and deviations (Figure 30.11), leading to traffic safety concerns and reduced efficiency in vehicular movement. To address this, a new road alignment is proposed to straighten the corridor, thereby removing the hazardous curves. As part of this realignment, a new Y-junction and two three arm roundabouts are formed. National Highway Authority of India may conduct study at this junction for proper junction improvement plan.



Figure 30.11 Proposed alignment for NH 183A link road at Anandaplli Junction

30.5.5 Minor Junctions

All other & minor junctions, both existing and those created through proposed developments, must adopt common junction improvement measures to ensure safety, efficiency, and aesthetics. Key elements include designing proper turning radii for smooth vehicle movement, providing safe pedestrian crossings with islands or signalized lanes and introducing dedicated turn lanes to ease congestion. Effective drainage and storm water management are essential to prevent waterlogging, while landscaping and green spaces enhance the environment and urban appeal. Additionally,

incorporating public art can improve the visual character of intersections. Overall, well-designed junctions not only improve traffic flow and safety but also contribute positively to the town's urban aesthetics.

30.6 Public Transportation

Public transportation plays a key role in shaping urban functionality by ensuring efficient land use, promoting sustainability, reducing reliance on private vehicles, boosting economic activity and supporting social interaction. In Adoor town, the public transport network is limited to bus services, operated by both private operators and the KSRTC. While KSRTC buses primarily handle long-distance travel, private buses mainly serve local routes within and around the town. Each operates from separate location, catering to their respective passenger needs. The following are the proposals in public transportation sector of the town and location of proposed projects are shown in map mentioned in Figure 30.1.

30.6.1 Renovation of KSRTC Bus Stand

The KSRTC Bus Stand at Adoor is one of the most important transport hubs in the region, catering to both intra-district and inter-district connectivity. However, the existing infrastructure at bus stand has deteriorated over the years and does not meet the present-day functional, safety and comfort requirements. A comprehensive renovation is necessary to enhance passenger experience, improve operational efficiency, and create a modern transit hub that reflects the growing urban character of Adoor. The proposed components and of Renovation of KSRTC Bus Stand project is mentioned in Table 30.3.

Table 30.3 Proposed components & its measures of renovation of KSRTC Bus Stand project

Components	Measures
Improved Entry and Exit Facilities	1. Widening and re-alignment of entry and exit points to ensure smooth movement of buses and private vehicles. 2. Digital signboards for guiding vehicles and passengers.
Internal Roadway Improvements	1. Tarring/resurfacing of the bus stand premises to ensure durability and smoother bus movements. 2. Proper storm-water drainage system to prevent waterlogging during monsoon. 3. Clear lane markings and directional signage for bus bays and parking.
Building Renovation & Layout Improvement	1. Redesigning the terminal building layout to enhance visibility from surrounding, ticket counters, waiting halls, and passenger amenities. 2. Relocation of kiosks and shops in an organized manner to avoid obstruction of pedestrian circulation. 3. Modern façade treatment with improved ventilation and lighting.

Landscaping & Beautification	1. Green buffers and tree plantation along the boundary. 2. Garden pockets with seating to enhance aesthetics. 3. Decorative lighting and shaded pedestrian areas.
Passenger Amenities	1. Comfortable seating arrangements with adequate shade and ventilation. 2. Modernized waiting hall with drinking water facilities. 3. Separate restrooms for men, women, and differently abled. 4. LED display boards showing bus timings and routes.
Safety & Accessibility Features	1. Barrier-free access for differently abled persons, including ramps and tactile paving. 2. CCTV surveillance and improved lighting for safety. 3. Fire safety measures as per standards
Additional Features	1. Dedicated auto/taxi bay and short-term parking area for private vehicles. 2. EV charging stations to promote green mobility. 3. Rainwater harvesting and solar panels for sustainable operations.

30.6.2 New Municipal Bus Stand Terminal

Adoor town currently lacks a dedicated bus stand for private buses. At present, private buses halt on the roadside in front of the KSRTC Bus Stand, leading to traffic congestion, unsafe boarding/alighting conditions and disruption of smooth traffic flow. Establishing a separate Municipal Bus Stand will not only streamline public transportation but also reduce congestion near the KSRTC terminal, enhance commuter safety and improve urban mobility within the town. The new municipal bus stand is proposed in bypass road near proposed new municipal office complex. (Figure 30.12).



Figure 30.12 Location of new municipal bus stand

Proposed Components of the Municipal Bus Stand are Bus Bays, Parking Area, Entry/Exit Points, Internal Roadways, Waiting Hall, Toilets & Drinking Water, Shaded Platforms, LED Information Boards, Shops & Kiosks, Advertisement Spaces, Barrier-Free Design, CCTV Surveillance, Emergency Response, Street Lighting, Rainwater Harvesting, Solar Energy, Green Buffer Zone and Maintenance Yard. The municipal council has designated this project as a priority initiative. Therefore the details

of this project including details of project components, need, aim & objective, project cost, implementation mechanism etc. are detailed in chapter 33.

30.6.3 Highway Travel plaza

For long-distance journeys, drivers and passengers require facilities to rest, eat, and refresh themselves. A highway travel plaza serves as a convenient and safe stopover point, allowing travellers to take breaks, reduce fatigue, and ensure safer driving. It also supports short halts where people can refuel, grab a quick meal, or stretch, helping maintain smooth traffic flow and minimizing the need for detours into nearby towns. A Highway Travel Plaza is proposed along Adoor bypass opposite to proposed municipal bus stand and municipal office complex, recognizing the essential need for integrated facilities during long-distance travel. This plaza will offer a combination of food courts, rest areas, fueling stations, and various amenities, making it a convenient stop for travelers. The location of proposed highway travel plaza is shown in Figure 30.13.



Figure 30.13 Location of proposed highway travel plaza

30.6.4 Truck terminal at Parakode

In order to address the growing challenges of goods transportation and congestion in Adoor town, a dedicated Truck Terminal is proposed at Parakode market area. At present, the absence of a proper facility forces heavy vehicles to park along the roadside and within the town center, leading to traffic bottlenecks, safety issues and inconvenience to pedestrians. The proposed terminal will provide organized parking, loading and unloading platforms, storage and cold storage facilities, as well as rest and service amenities for drivers. By integrating closely with the wholesale and agricultural market activities of Parakode, the terminal will streamline goods movement, reduce pressure on town roads and enhance the efficiency of trade operations. This project is expected to strengthen Adoor's role as a regional commercial hub while ensuring safer, more sustainable urban mobility. The design for the major market portion is prepared by KIIFB. Truck Terminal is part of that project design.



Figure 30.14 Location of Proposed Truck Terminal at Parakode Market Area

30.7 Parking Spaces

Parking facilities form an essential part of urban infrastructure as they influence traffic circulation, economic activity and the overall quality of life in a town. According to KMBR regulations, buildings above a specified floor area are required to provide parking within their own premises to support their functioning. Nevertheless, with the continuous expansion of commercial and institutional activities, additional dedicated parking spaces are necessary. The master plan therefore proposes two categories of parking: on-street and off-street (plot-based) (Figure 30.15).

Considering the proposed land use, road width, and urban functionality, on-street parking is permitted on 18 m wide roads. Off-street or plot-based parking refers to facilities located on private or public plots, separate from the street, which can be managed either by public authorities or private operators. The master plan emphasizes the need for plot-level or off-street parking facilities to support major public and commercial developments in the town. Accordingly, dedicated parking spaces are proposed as integral components of proposed projects such as the Town Hall & Parking Plaza, Parakode Market and Trade & Expo Pavilion.

These proposed projects will not only cater to the parking demand generated by the respective projects but will also help ease pressure on nearby streets by accommodating vehicles within designated plots. Integrating parking with such large-scale developments ensures better accessibility, improved traffic management, and enhanced user convenience, thereby contributing to the overall efficiency of the urban transport system. Component wise details of these projects are mentioned in sector wise proposal in chapter 31. The municipal council has designated Town Hall & Parking Plaza and Parakode Market projects as priority initiatives. Therefore the details of these projects including need,

aim & objective, project components, project cost, implementation mechanism etc. are detailed in chapter 33. Figure 30.15 illustrates the proposed parking plan for Adoor town.

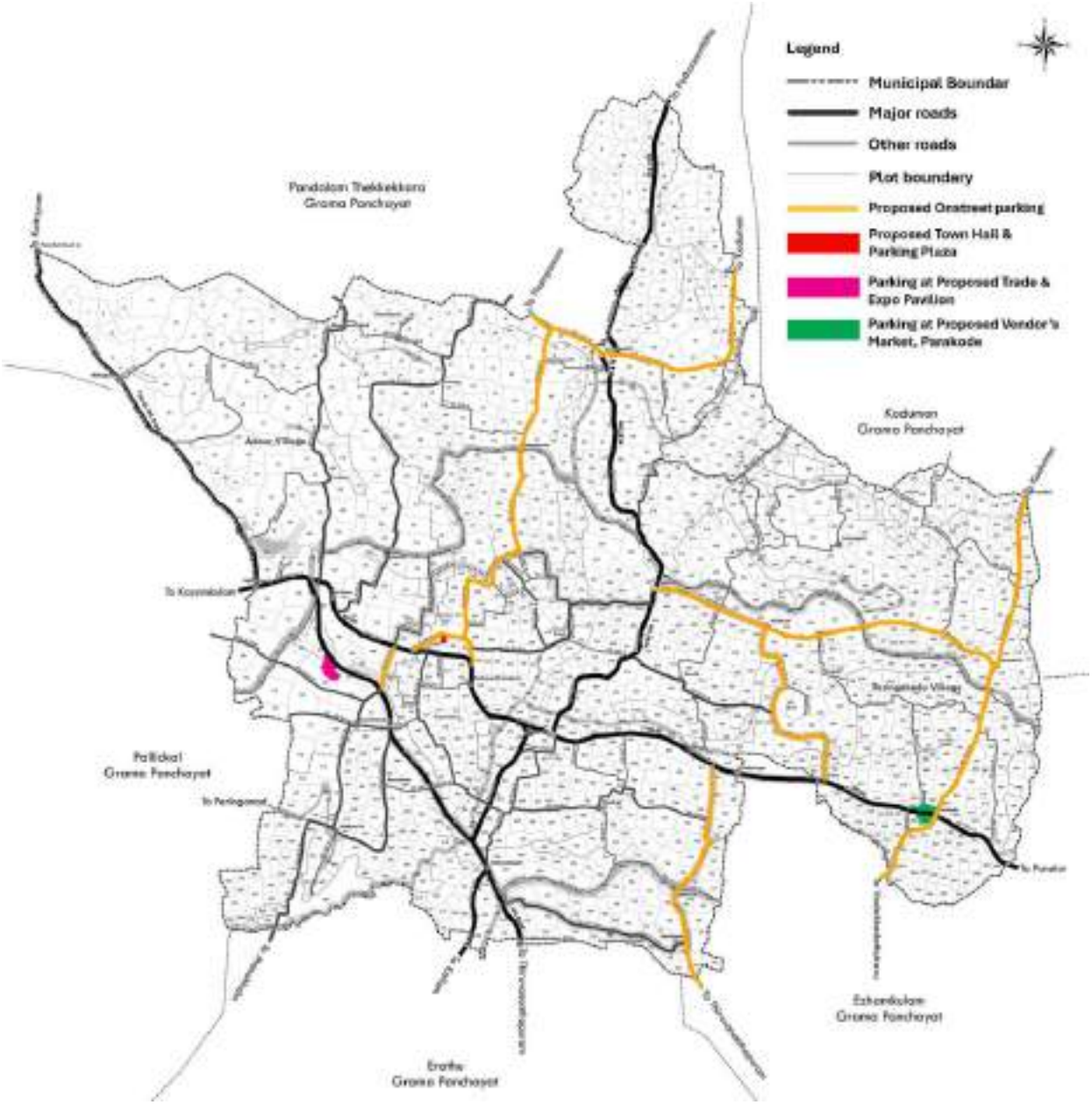


Figure 30.15 Proposed Parking Plan of Adoor Town

30.8 Non-Motorized Transport (NMT)

At present, Adoor town lacks dedicated facilities for non-motorized transport (NMT), making walking and cycling unsafe and inconvenient despite their importance for short-distance trips, first and last-mile connectivity, and inclusive urban mobility. To promote sustainable, safe, and people-friendly movement, the master plan proposes two core components of NMT infrastructure: pedestrian facilities and the cycling facilities.

30.8.1 Pedestrian Infrastructure

The pedestrian infrastructure of the Non-Motorized Transport includes:

1. Footpaths/Sidewalks: Continuous, well-paved, and barrier-free footpaths on both sides of major roads, with a minimum clear width of 1.5–2 m, depending on pedestrian volume.
2. Safe Crossings: Provision of zebra crossings, pedestrian signals, raised crossings near schools and hospitals, and refuge islands on wider roads.
3. Universal Accessibility: Ramps, tactile paving, and dropped kerbs to support elderly persons and differently abled.
4. Streetscaping & Amenities: Benches, shade trees, signage, and street lighting to improve comfort and safety.
5. Pedestrian Zones: Create walkable streets in core commercial stretches and encourage shopping and social interaction.

Proper and wider road side pedestrian walkways with barrier free design is proposed in all road with width of 30m, 24m, 18m, 12m, 10m and 7m in the town.

30.8.2 Cycling Infrastructure

Dedicated cycle lanes separate from motor vehicle lanes improve safety and efficiency for cyclists. Currently town has no dedicated cycle lane. Dedicated cycle lanes are proposed along major roads of the town (NH 183A, SH5 & Bypass) to ensure safe and continuous connectivity for cyclists. Design feature of cycle lane is mentioned in the road cross section details of this chapter. The proposed cycle lane route of the town is shows in Figure 30.16.

30.9 Bus Stop & Auto Taxi Stand

It is proposed to transform the existing bus stops into smart and modern facilities that improve commuter convenience while enhancing the overall urban image of the town. By incorporating digital advertisement display systems, the municipality can also create an additional revenue stream, ensuring financial sustainability. The upgrading process can be undertaken directly by the municipality using its own funds or through alternative models such as Public-Private Partnership (PPP) or Corporate Social Responsibility (CSR) funding.

The following key components are recommended for integration into the redesigned bus stops:

1. Digital Information Systems: Real-time digital displays providing bus arrival times, delays, and schedules to reduce uncertainty and help passengers plan their trips more efficiently.
2. Universal Accessibility: Inclusive features such as wheelchair ramps, tactile paving, and Braille signage to ensure convenience for differently abled persons, senior citizens, and families with children.

3. Revenue Generation: Installation of LED advertising panels that can generate income to support urban transport services and community projects, thereby reducing the financial load on local bodies.
4. Safety and Security: Adequate lighting, CCTV surveillance, and emergency call points to enhance passenger safety, particularly during nighttime.
5. Emergency Communication: The ability to broadcast real-time alerts and emergency notifications such as weather warnings, evacuation instructions, or other town-wide advisories.

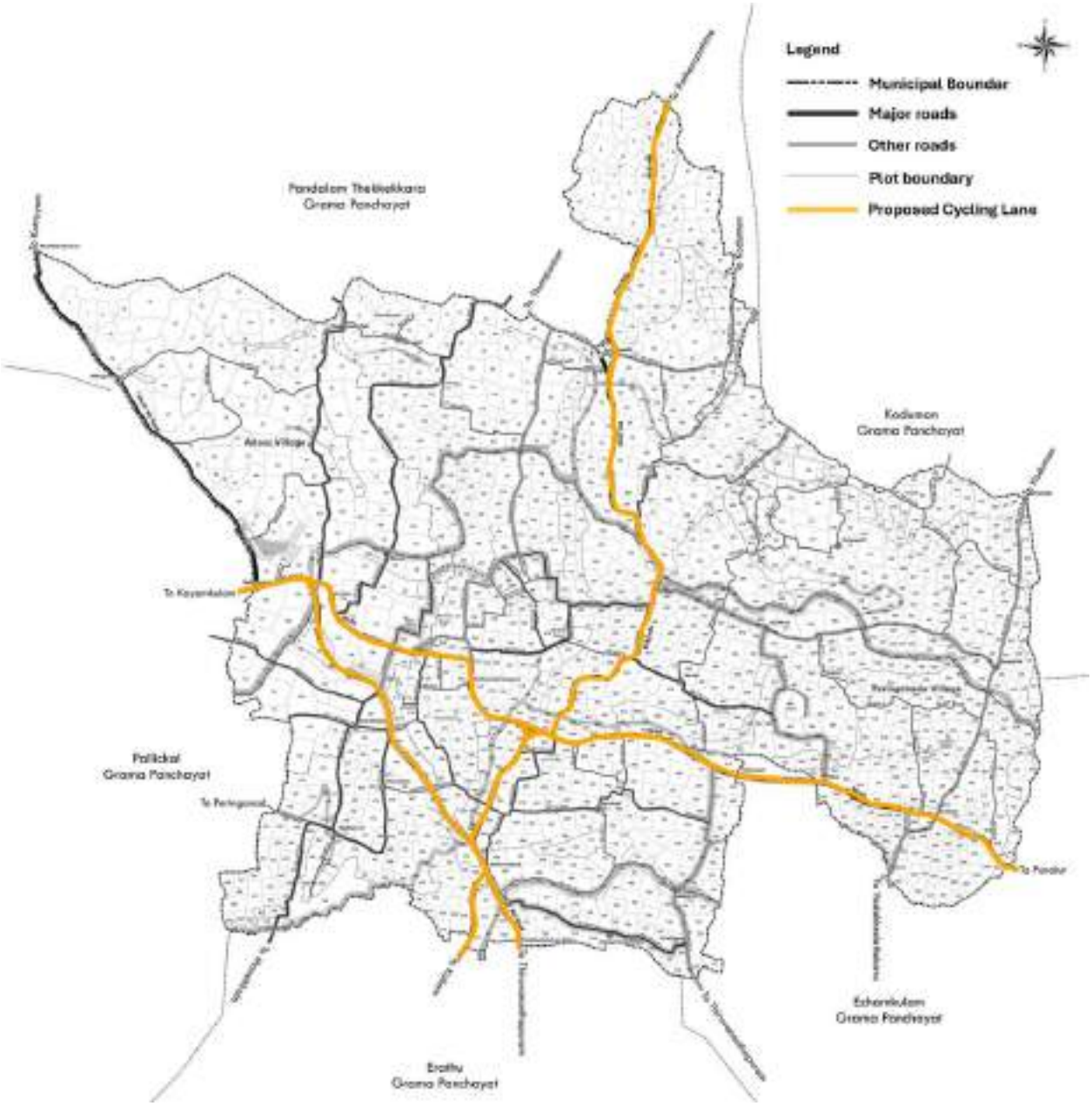


Figure 30.16 Proposed Cycling Lane in Adoor town

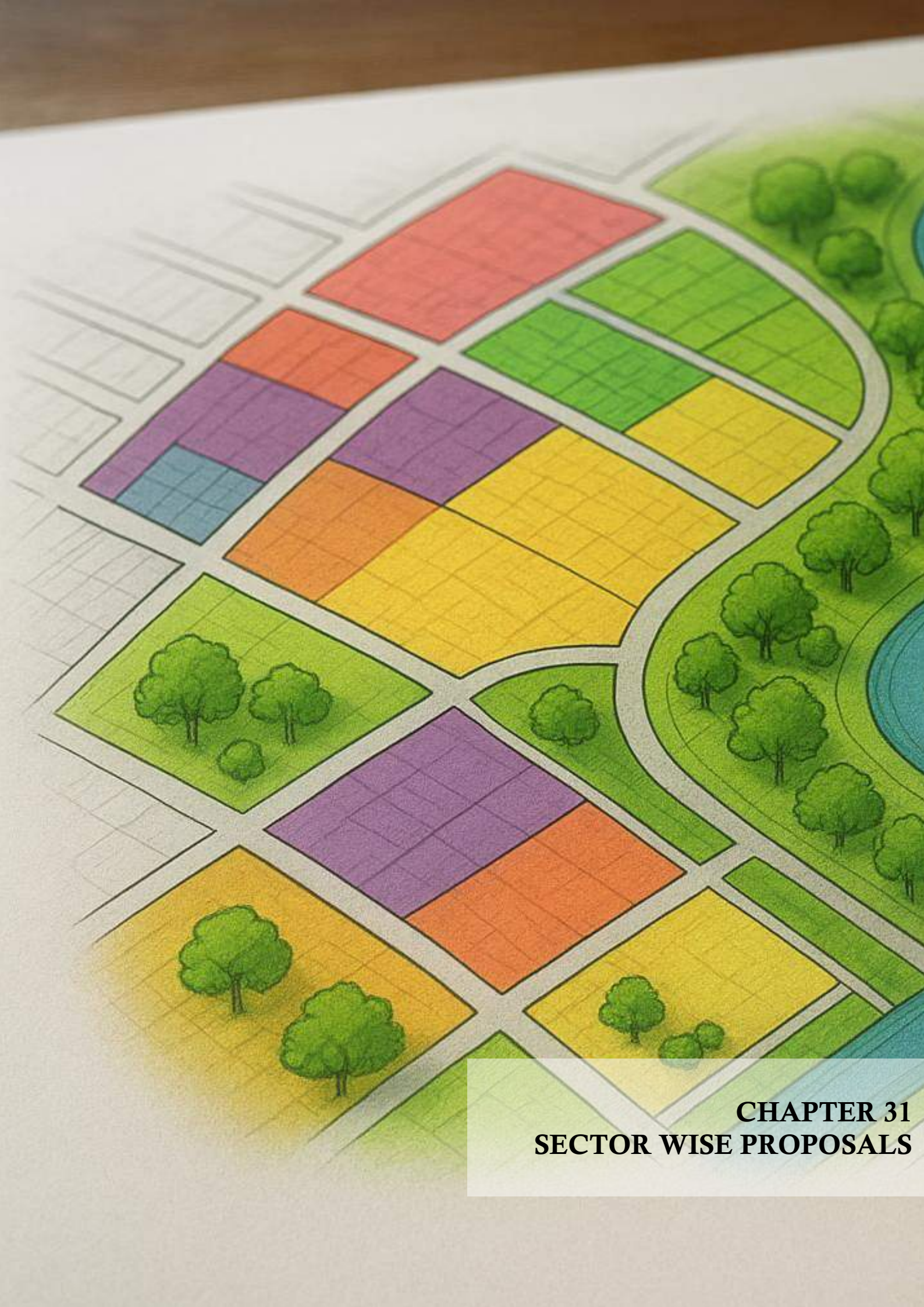
In addition, the bus stop designs will be aligned with the aesthetic character and urban design of Adoor town. Through the integration of landscaping, artistic elements, or sleek minimalist structures, these modernized bus stops will not only serve a functional purpose but also contribute to the town's visual appeal, making public spaces more attractive and vibrant. Auto-rickshaws and taxis currently use on-street spaces with limited space and unorganized, causing congestion, safety concerns, and disruption of traffic flow. To address this, it is proposed to provide dedicated auto/taxi stands with adequate parking capacity, organized waiting areas with markings & sign boards and shelters such as canopies to improve comfort for drivers and passengers. These stands will reduce roadside clutter, enhance pedestrian safety, and improve the overall efficiency and accessibility of urban transport.

30.10 Railway Connectivity

Adoor town currently lacks a direct railway connection, which limits its regional connectivity. However, the town holds significant potential for rail integration due to its proximity to three important railway corridors: the Kollam–Kayamkulam stretch in the west, the Kollam–Punalur line in the south, and the proposed Sabari rail in the northeast. Establishing a new railway link from any of these corridors that connect Adoor town would greatly enhance accessibility, improve passenger and freight movement and strengthen the town's role as a regional hub. The feasibility and practicality of developing such a rail route should be studied in detail to assess alignment options, economic viability, and long-term benefits for the town and its surrounding region. However, considering the high investment and time required, it is also suggesting that in the immediate and medium term, feeder services through alternate modes such as buses, mini-buses, and shared shuttles linking Adoor to nearby major railway stations be developed. Such feeder systems will ensure seamless integration with the regional railway network, providing the residents of Adoor with improved access to rail transport in the short and medium term, even before the direct railway connectivity materializes. This dual approach balances long-term aspirations with practical mobility solutions and enhances regional accessibility.

30.11 Inference

The transportation plan for Adoor is designed with flexibility, allowing for adjustments in response to future development projects and regional connectivity projects which enhance development of Adoor town. It seeks to remain aligned with emerging regional infrastructure initiatives such as new highways, proposed railway extensions and potential Sabari airport road linkages, ensuring smooth integration with the town's mobility framework. This adaptability will support long-term growth, improve accessibility and strengthen Adoor's role within the wider regional context.



CHAPTER 31
SECTOR WISE PROPOSALS

31.1 Background

The sector-wise proposal chapter outlines targeted development interventions across key functional areas of Adoor, designed to operationalize the spatial plan, vision, development concept and policy strategies of the Master Plan. It details spatial-level projects and sector-specific recommendations that address the diverse needs of the town, ensuring balanced, inclusive and sustainable growth.

This chapter serves as a strategic link between the high-level objectives established in earlier sections and the actionable implementation measures required to achieve them. The proposals have been formulated through a multi-stage process that integrated the development concept with active public participation, technical expertise and compliance with relevant policies and statutory provisions. Risk factors relevant to each sector have been considered in the proposals to enhance resilience and sustainability. Disaster Risk reduction-specific proposals are detailed in Chapter 32 & Traffic and Transportation proposals are detailed in Chapter 30. All proposals outlined in this chapter have been formulated not only to meet the requirements of Adoor Municipality but also to cater to the needs of the surrounding Grama Panchayaths falling within the planning area of the town.

31.2 Trade and Commerce

Adoor evolved as a market town, with trade and commerce constituting one of its principal economic activities. In alignment with the Master Plan's goal of positioning Adoor as a commercial hub of regional significance, it is proposed to address and resolve the existing issues in the Central Business District (Central Toll and its surroundings) and to further strengthen its commercial functions. Additionally, the Parakode area is proposed to be developed as a commercial node, enhancing the town's overall economic network.

31.2.1 Revitalization of Parakode Market

The proposal aims to transform the existing Parakode Market into a modern, well-organized commercial market, leveraging the availability of approximately 9.5 acres of land and strategic road connectivity. The proposal envisions its transformation into a modern, integrated market and logistics hub, enhancing traditional trade while incorporating e-commerce-driven supply chains. The proposal aims to reconstruct the market into a modern, well-ventilated facility with semi-open spaces and organised layouts, improving buyer experience while retaining the local shopping culture. Location and model sketches of the proposal is shown in Figure 31.1.

Plot Area	Ownership	Survey Details
0.0151 sq. km	Government	881(p), 882(p), 883(p), 925(p), 926(p)

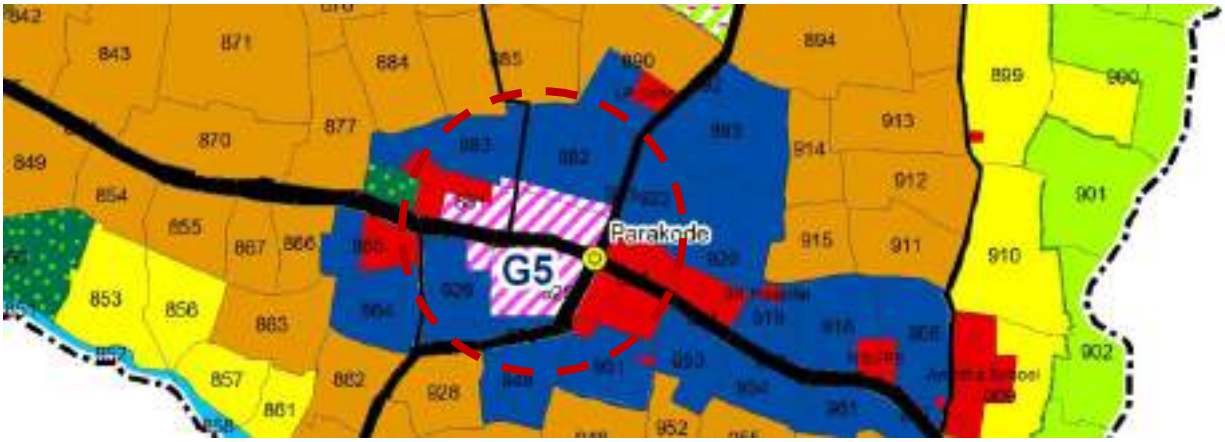






Figure 31.1 Location, Existing condition and Model sketches of Revitalization of Parakode Market

Key Components:

- Market Building:
- Shopping complex: Development of a planned, well-organised shopping complex with defined zones for wholesale, retail, seasonal vendors, and e-commerce logistics.
- Storage Facilities: Provision of dedicated storage, warehousing, e-commerce godown, and last-mile distribution network facilities.
- Vendor's market: The proposed vendor market at Parakode is designed as a universally accessible, open, and inclusive urban space that pays tribute to the area's cultural memory with an elephant statue, marking the site's legacy as the old Elephant Market. The transparent open design ensures visual connectivity, making the space more inviting and welcoming.
- Parking Facilities
- Truck Terminal
- Loading–unloading bays and ample parking for customers, vendors, and logistics vehicles.
- Modern Slaughter House
- Waste management systems: Installation of modern drainage, stormwater management, and scientific solid waste management systems.
- Public amenities: Including restrooms, drinking water facilities, resting spaces, energy-efficient lighting, and security systems.

The main Market complex is proposed to be developed by KIIFB with above components. The market portion in the northern side of KP road is proposed to be developed as a vendors market with stalls, ambient parking facilities, facilities for Food Street & Food truck bay etc.

The Municipal Council has identified this as a priority project. Therefore, the details of the project- including Project components, need, aim and objectives, project cost components and implementation mechanism etc., are detailed in Chapter 33.

31.2.2 Trade & Expo Pavilion

The proposal envisions the development of a dedicated Trade and Fair Area along the Bypass Road to host exhibitions, trade shows, cultural fairs, and commercial events. This facility will enhance Adoor's role as a regional center for business promotion, tourism, and cultural exchange. Also Adoor has a strong legacy in art, literature, and cultural activities, being home to traditional art forms and renowned film festivals. The town currently lacks adequate cultural and recreational infrastructure to support its growing population and its role as a regional cultural hub. Establishing a dedicated center with museum to enhance the cultural identity of Adoor is also be included as part of this project. Location and model sketches of the proposal is shown in Figure 31.2.

The site strategically being located with direct access from the Bypass Road can serve the transit population also. Multipurpose pavilions, open grounds for trade exhibitions, fairs, and cultural events

and supporting infrastructure is proposed along with on-site parking for visitors, vendors, and event logistics. The Cultural Museum with facilities for theatre, performing arts, exhibition halls, library, modern audio-visual infrastructure to host national and international cultural events.

Plot Area	Ownership	Survey Details
0.0120 sq.km	Private	186(p)









Figure 31.2 Location, Existing condition and Model sketches of Trade & Expo Pavilion

31.2.3 Urban Hangout Hub

A high-end shopping mall alongside the Adoor bypass is essential to meet the growing commercial and recreational needs of the town and its surrounding region. The bypass, with better connectivity and large developable land parcels, provides an ideal location to accommodate such a facility without

adding pressure to the congested town centre. A modern mall here can serve as a regional lifestyle hub, offering branded retail outlets, multiplex, food courts, and leisure spaces, reducing the need for residents to travel to distant cities for such experiences. It will not only boost the local economy and generate employment but also promote tourism and enhance the quality of life for youth and families. With several restaurants and eateries already developed along the bypass, a shopping mall will complement this emerging commercial corridor and strengthen Adoor's position as a regional growth centre by catalyzing further planned development and increasing land value. Location and model sketches of the proposal is shown in Figure 31.3.

Plot Area	Ownership	Survey Details
0.0138 sq.km	Private	194(p), 315(p)







Figure 31.3 Location, Existing condition and Model sketches of Urban Hangout Hub

31.2.4 Shopping Complex and She Lodge

With the municipal office shifting to a new facility along the bypass road, the existing municipal building offers an opportunity for adaptive reuse. The proposal aims to renovate the structure to green building standards, ensuring structural integrity, and convert it into a mixed-use facility with commercial spaces and a dedicated "She Lodge" to promote women-friendly urban infrastructure.



Figure 31.4 Location, Existing condition and Model sketches of Shopping Complex and She Lodge

The proposal include renovation of the existing municipal building to meet green building and structural safety standards, Basement-level parking facility for visitors, shoppers, and lodge residents. Lower floors can be developed as a shopping complex with organized retail spaces. Upper floors to be converted into a secure, well-equipped "She Lodge" providing safe accommodation for women. Provision of energy-efficient lighting, rainwater harvesting, and waste management systems should also be ensured. Location and model sketches of the proposal is shown in Figure 31.4.

Plot Area	Ownership	Survey Details
.0011 sq.km	Government	308(p)

31.2.5 Vending Zone and Food Street

Street vending and small-scale food businesses form an integral part of Adoor's local economy and cultural identity. The series of restaurants along the Adoor Bypass road already serves as a food hub of the entire district and the floating population also. Therefore this proposal seeks to establish organized vending zones and food streets along the service roads proposed on both sides of the Bypass ensuring inclusive opportunities for vulnerable groups while promoting local products and culinary tourism. Parking facilities and travel plaza are also proposed along the bypass to cater the food street. The proposal may include designated vending zones and dedicated spaces for selling value-added products from local industries, agricultural produce, and handicrafts. Supporting infrastructure including seating areas, lighting, waste bins, and water supply can also included with well-planned food street sections having hygienic cooking and serving facilities.

31.2.6 Civic Arcade

A Commercial shopping complex with Public Gathering Space is proposed in an open space near Parakode market enough to function as a community gathering space and is intended to create civic spaces that are inviting and safe; foster a sense of community and place; and improve the quality of life for all residents in the locality. Seating arrangements, gathering spaces, and activity areas encourages people to connect and interact. The location, model sketch of public gathering space are shown in Figure 31.5.



Figure 31.5 Location, Existing condition and Model sketches of Civic Arcade

Plot Area	Ownership	Survey Details
0.0020 sq.km	Government	881(p)

31.3 Industry

Adoor currently has no major industrial units, with the existing industrial base limited to a few small-scale enterprises. However, the region has significant potential due to the abundance of agricultural produce, availability of raw materials for construction and proximity to the KINFRA Park in the neighboring Enadimangalam Grama Panchayat. The proposed interventions aim to leverage these advantages to promote small-scale, value-added, and technology-driven industries, fostering local employment and economic diversification.

31.3.1 Small Industrial units

To harness the availability of local agricultural produce such as jackfruit & coconut and raw materials for construction, the proposal focuses on establishing small industrial units for value addition and processing. These will be complemented by units producing granite products and ancillary industries supporting KINFRA Park operations.

31.3.2 Innovation Hub

To encourage innovation and entrepreneurship, a Startup hub is proposed near Adoor Pathanamthitta road junction beside SH 05. This facility will accommodate IT/software units and other small-scale industries. Co-working spaces, plug-and-play facilities for startups, High-speed internet, shared business support services, dedicated incubation and mentoring programs



Figure 31.6 Location, Existing condition and Model sketches ofInnovation Hub

are proposed in the hub. Location and model sketches of the proposal is shown in Figure 31.6

.Plot Area	Ownership	Survey Details
0.0002 sq.km	Government	654(p), 655(p)

31.4 Tourism and Heritage

Tourism potential within Adoor town is limited; however, its strategic location offers scope for creating supporting facilities that can enhance the visitor experience and promote local heritage. The proposals aim to develop eco-friendly leisure and cultural infrastructure, improve recreational opportunities for residents, and attract short-stay tourists from surrounding regions.

31.4.1 Transit Resting Hub

Puthiyakavinchira, covering approximately 5 acres, is a valuable natural and community asset within Adoor. The area has potential to be transformed into an integrated recreational and eco-friendly public space, enhancing both environmental quality and social well-being.

Key Components:

- Ecological renovation of the lake with desilting and water quality improvement.
- Development of walking/jogging tracks around the lake.
- Installation of children's play equipment and shaded seating areas.
- Introduction of safe boating facilities.
- Construction of a mini convention centre for cultural, community, and small-scale commercial events.
- Landscaping with native plants to support biodiversity.

The Municipal Council has identified this as a priority project. Therefore, the details of the project-including Project components, need, aim and objectives, project cost components and implementation mechanism etc., are detailed in Chapter 33. The Location, proposed conceptual images are shown in Figure 31.7

Plot Area	Ownership	Survey Details
0.026 sq.km	Government & Private	94(p), 95(p), 102(p)

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Figure 31.7 Location, Existing condition and Model sketches of Transit Resting Hub

31.4.2 Aquatic Complex & Cultural Centre

Pambettukulam Pond, located along the Adoor–Pathanamthitta road, is a significant water body with potential for both ecological enhancement and recreational use. The proposed development aims to rejuvenate the pond and transform the area into a vibrant aquatic and leisure hub.

Key Components:

- Renovation and ecological protection of the pond through desilting and water quality improvement.
- Establishment of a well-equipped aquatic centre with a swimming training facility.
- Creation of kiosks for local snacks and refreshments.
- Development of recreational areas including landscaped seating zones.
- Designated fish feeding areas for educational and leisure purposes.
- Construction of service areas, modern toilet facilities, and adequate parking. Location and model sketches of the proposal is shown in Figure 31.8.

Plot Area	Ownership	Survey Details
0.0092 sq.km	Government	232(p), 236(p)

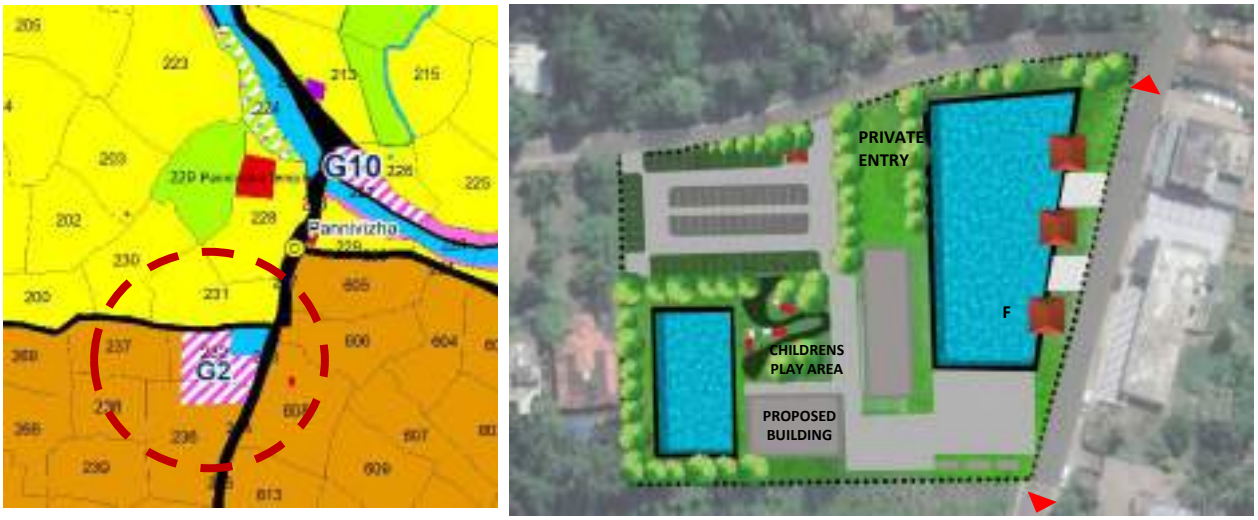


Figure 31.8 Location, Existing location and Model sketches of Aquatic complex and Cultural Centre

31.4.3 TB Hill View Park

Hosai Bungalow, located at T.B. Hill, is a heritage structure of significant architectural and cultural value. The site offers panoramic views of the surrounding landscape and has potential to be developed as a unique heritage-based excursion destination.

Key Components:

- Conservation and restoration of Hosai Bungalow in accordance with heritage preservation guidelines.
- Establishment of an excursion centre with picnic facilities for visiting groups.

- Construction of a viewing tower equipped with a telescope for scenic observation.
- Development of a restaurant serving local cuisine.
- Provision of adequate parking facilities.
- Installation of children's play and entertainment areas.

Location and model sketches of the proposal is shown in Figure 31.9.

Plot Area	Ownership	Survey Details
0.0174 sq.km	Government	569(p)

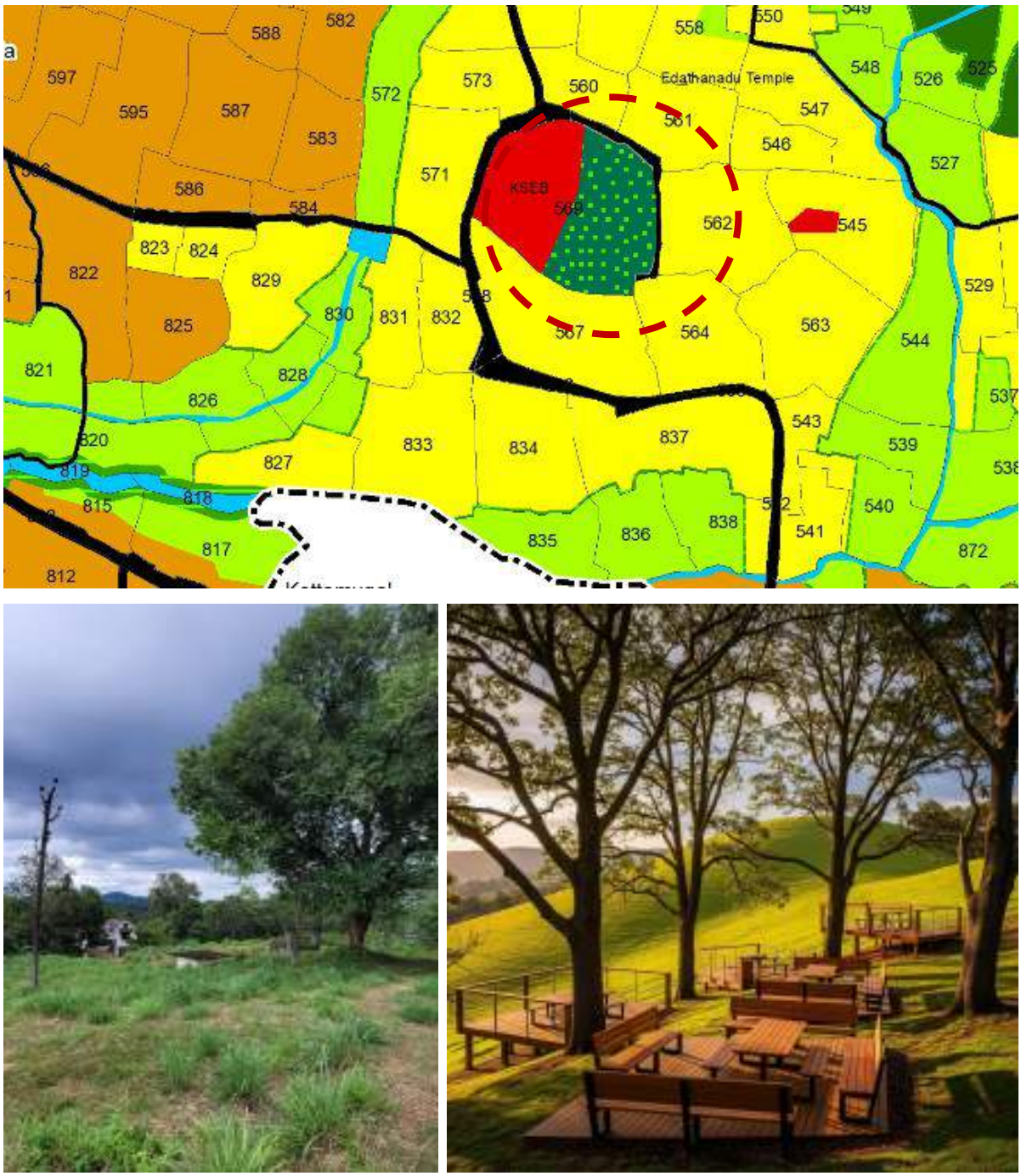


Figure 31.9 Location, Existing condition and Model sketches ofTB Hill View Park

31.4.4 Tourism Circuit

Adoor's central location within the region offers strategic connectivity to several prominent tourist destinations such as Thenmala, Punalur, Gavi, Aranmula, Mannadi, Kollam, Kumarakom and Alappuzha. Leveraging this advantage, a regional tourism circuit is proposed to promote Adoor as a gateway hub, enhancing tourism flows and economic opportunities.

31.4.5 Pilgrim Tourism Circuit

Adoor has an important place in the tourism circuit of the District, owing to its strategic location and cultural-religious significance. The town lies on the transit route to Sabarimala, one of the most renowned pilgrim centres in South India, attracting millions of devotees annually. In addition, Pandalam, associated with Lord Ayyappa's legend, is a major spiritual destination situated close to Adoor. The region is also dotted with several historically important churches and temples, such as St. George Orthodox Valiya Pally, Chennathu Temple, and the Kannamkode Church, which holds a unique place in Christian history as one of the early centres associated with the translation of the Bible into Malayalam, marking it as a landmark in Kerala's spiritual and literary heritage.

By developing an integrated pilgrim tourism circuit linking Adoor with Sabarimala, Pandalam, Kannamkode Church, other prominent churches, and temple sites, the town can become a hub for pilgrim facilitation, offering amenities like pilgrim rest centres, cultural interpretation hubs, transport facilities, and heritage walks. This circuit would not only improve the spiritual experience of devotees but also promote cultural and heritage tourism, generate livelihood opportunities, and strengthen Adoor's position as a gateway to faith-based tourism in the District

31.4.6 Conservation of Heritage Buildings and Adaptive Reuse

The proposal include conservation of important heritage buildings in Adoor, such as the old Court, DYSP Office, Hosai Bungalow, UP School, and TK Madhavan Soudham, through adaptive reuse



Figure 31.10 Heritage Buildings for Adaptive Reuse

strategies. These structures, which reflect the town's cultural, historical, and architectural legacy, will be preserved and repurposed for contemporary functions like cultural centres, museums, libraries, community spaces, or creative hubs. This approach not only safeguards their heritage value but also integrates them into the urban fabric, ensuring their continued relevance, promoting tourism, and strengthening Adoor's identity as a town that respects its past while planning for the future. Buildings are shown in Figure 31.10.

31.4.7 Canal Bank Beautification

The KIP canal bank beautification in Adoor is a vital proposal to enhance the town's environmental quality and unlock its untapped tourism potential. The canal, which passes through prime areas, presently remains underutilized and in parts poorly maintained, despite its historic and ecological significance. Beautification with walkways, seating spaces, greenery, lighting and recreational amenities can transform the canal banks into an attractive waterfront, offering residents a much-needed open space for leisure and act as a health ring for morning walks. By integrating cultural elements, food kiosks, and boating or cycling facilities, the area can evolve into a vibrant tourism



Figure 31.11 Location, Existing condition and Model sketches of Canal Bank Beautification

destination, drawing visitors while simultaneously improving the town's image and land value. Such a project would also contribute to ecological conservation, flood management, and sustainable urban development in Adoor. Location and model sketches of the proposal is shown in Figure 31.11.

31.4.8 Agri Sports & Farm Tourism promotion Zone

The vast paddy fields of Anandappally, once famous for the traditional Maramadi (bull race), hold immense scope for developing into an Agro Sports and Farm Tourism Zone. These lands, with their cultural legacy and rural charm, can be conserved and repurposed for sustainable tourism activities such as agro-sports demonstrations, farm-based adventure games, ox-cart rides, and seasonal paddy cultivation experiences for visitors. As part of this initiative, a park themed on Maramadi is also proposed, showcasing sculptures, exhibits, and interactive spaces that highlight the cultural significance of the bull race while offering recreation facilities for families and youth. In line with

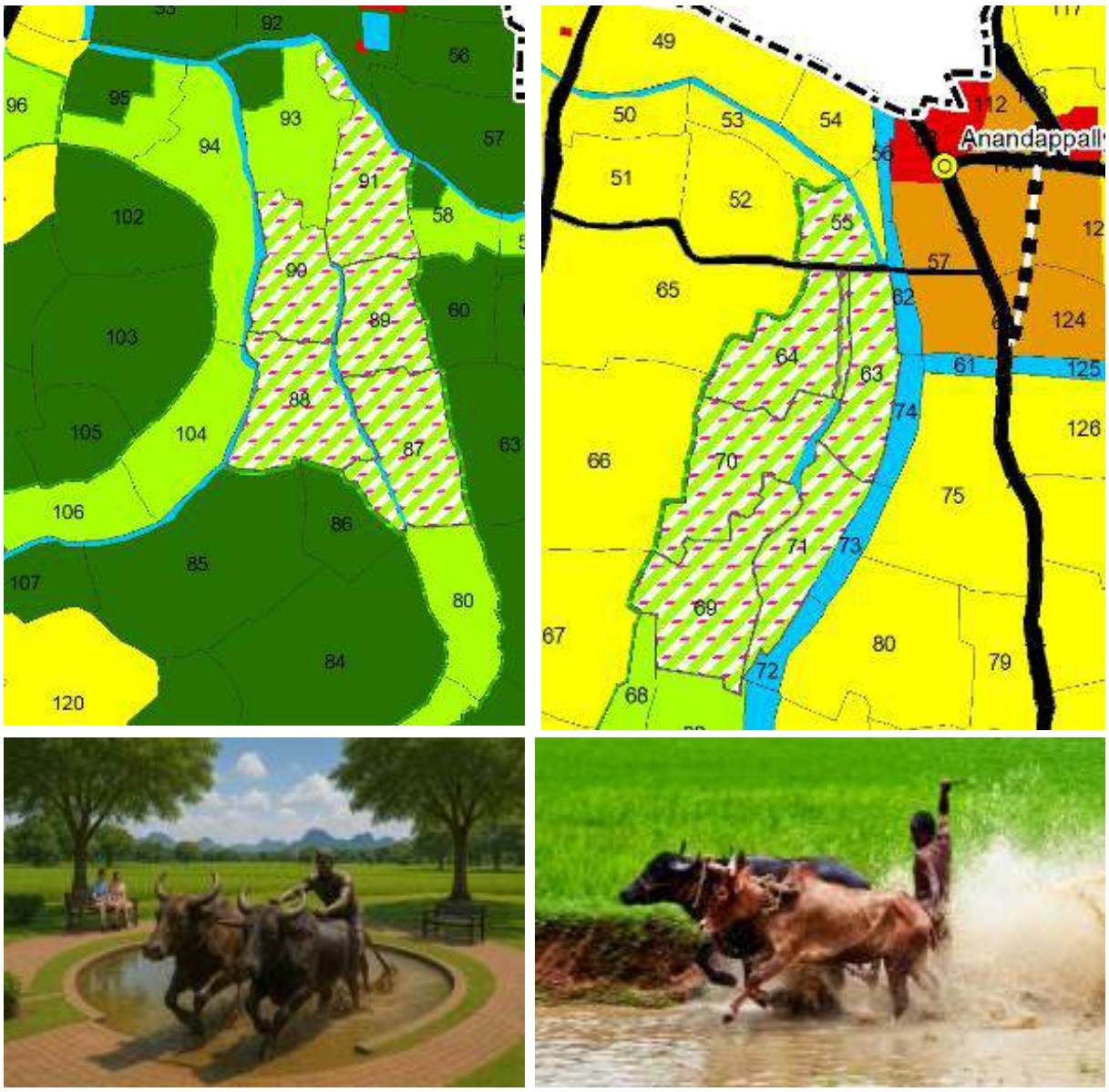


Figure 31.12 Location, Existing condition and Model sketches of Agrarian Sports& Farm Tourism Zone

Local interaction, the revival of the traditional Maramadi is proposed, ensuring that this cultural

heritage event becomes a central attraction of the zone. By creating spaces for festivals, open-air fairs, and cultural showcases, the area can revive its traditional identity while adapting it to modern recreational demands. Such an initiative would not only preserve the heritage of Maramadi but also provide farmers with supplementary income, attract tourists to Adoor, and promote environmental conservation by safeguarding the paddy fields as open green lungs for the town. This zone can thus emerge as a unique blend of heritage, agriculture, and recreation, strengthening the rural-urban linkages of the region. Location and model sketches of the proposal is shown in Figure 31.12.

Plot Area	Ownership	Survey Details
.12 sq.km	Private	55(p), 63(p), 64(p), 69(p), 70(p), 71(p), 87(p), 88(p), 89(p), 90(p), 91(p)

31.5 Recreation

31.5.1 Neighbourhood Parks

Proposal for the development of neighborhood parks across Adoor to ensure accessible green and recreational spaces within residential areas. These parks will be small to medium-sized open spaces designed to serve the daily leisure and fitness needs of local communities, especially children, elderly, and families. Equipped with features such as walking tracks, play areas, benches, landscaped gardens, and shaded seating, they will offer safe and inclusive environments for social interaction and relaxation. In addition to enhancing the quality of life, neighbourhood parks will help improve microclimate, reduce pollution, and strengthen the sense of community. By distributing such parks across different colonies and residential clusters, Adoor can ensure equitable access to green infrastructure and create a healthier, more livable urban environment. Location and model sketches of the proposal is shown in Figure 31.13.

Plot Area	Ownership	Survey Details
.0041sq.km	Government	28(p), 168(p), 746(p), 748(p)



Figure 31.13 Location and Model sketches of Neighbourhood Parks

31.5.2 Butterfly Park

Proposal for the development of a Butterfly Park near the Adoor bypass, creating a unique ecological and recreational landmark that will also be visible to passengers traveling along the corridor. Designed with host plants, nectar gardens, and landscaped greenery, the park will provide a natural habitat for diverse butterfly species while serving as a learning and leisure space for students, families, and nature lovers. A central pond with a fountain will enhance the park's aesthetic appeal, offering a refreshing ambience and attracting both butterflies and visitors. Beyond its role as a tourism and educational attraction, the Butterfly Park will also contribute to reducing the urban heat island effect, improving air quality, and adding ecological balance within the urban fabric. With walking trails, seating spaces, and interpretive displays, the park will serve as a scenic gateway feature for Adoor, strengthening its environmental resilience and urban identity. Location and model sketches of the proposal is shown in Figure 31.14.

Plot Area	Ownership	Survey Details
.0026 sq.km	Private	194(p)

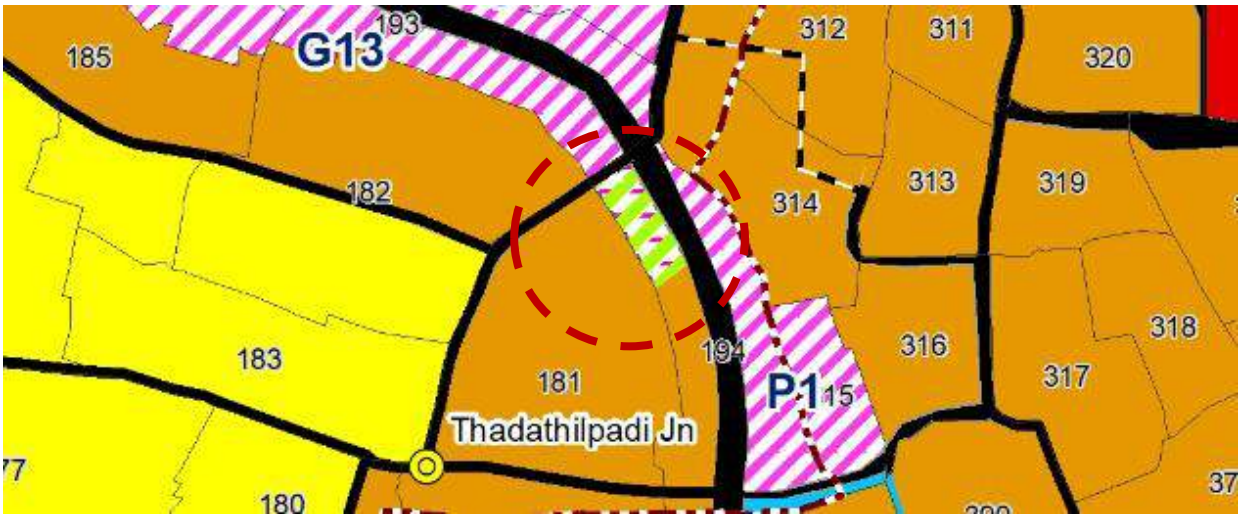


Figure 31.14 Location of Butterfly Park

31.5.3 Happiness Park

To enhance recreational opportunities and promote well-being, a Happiness Park is proposed on the irrigation land near the KIP canal. Designed as a multi-purpose open space, the park will provide a healthy and inclusive environment for relaxation, fitness, and community interaction. The park will feature a children's play area with safe and engaging equipment, an open-air gym to encourage fitness among all age groups, and a cafeteria offering light refreshments in a family-friendly atmosphere. Comfortable seating areas, shaded lawns, and landscaped walkways will make the park a welcoming retreat for residents. Dedicated multi-use spaces will also be created to host small community gatherings, cultural programs, and recreational activities. By combining leisure, fitness, and social interaction, the Happiness Park will not only improve the quality of life for residents but also serve as

a model of healthy urban living in Adoor. Its location near the KIP canal further adds to the charm, creating a green lung that enhances the town's resilience and recreational landscape. Location and model sketches of the proposal is shown in Figure 31.15.

Plot Area	Ownership	Survey Details
.0028 sq.km	Government	100(p)

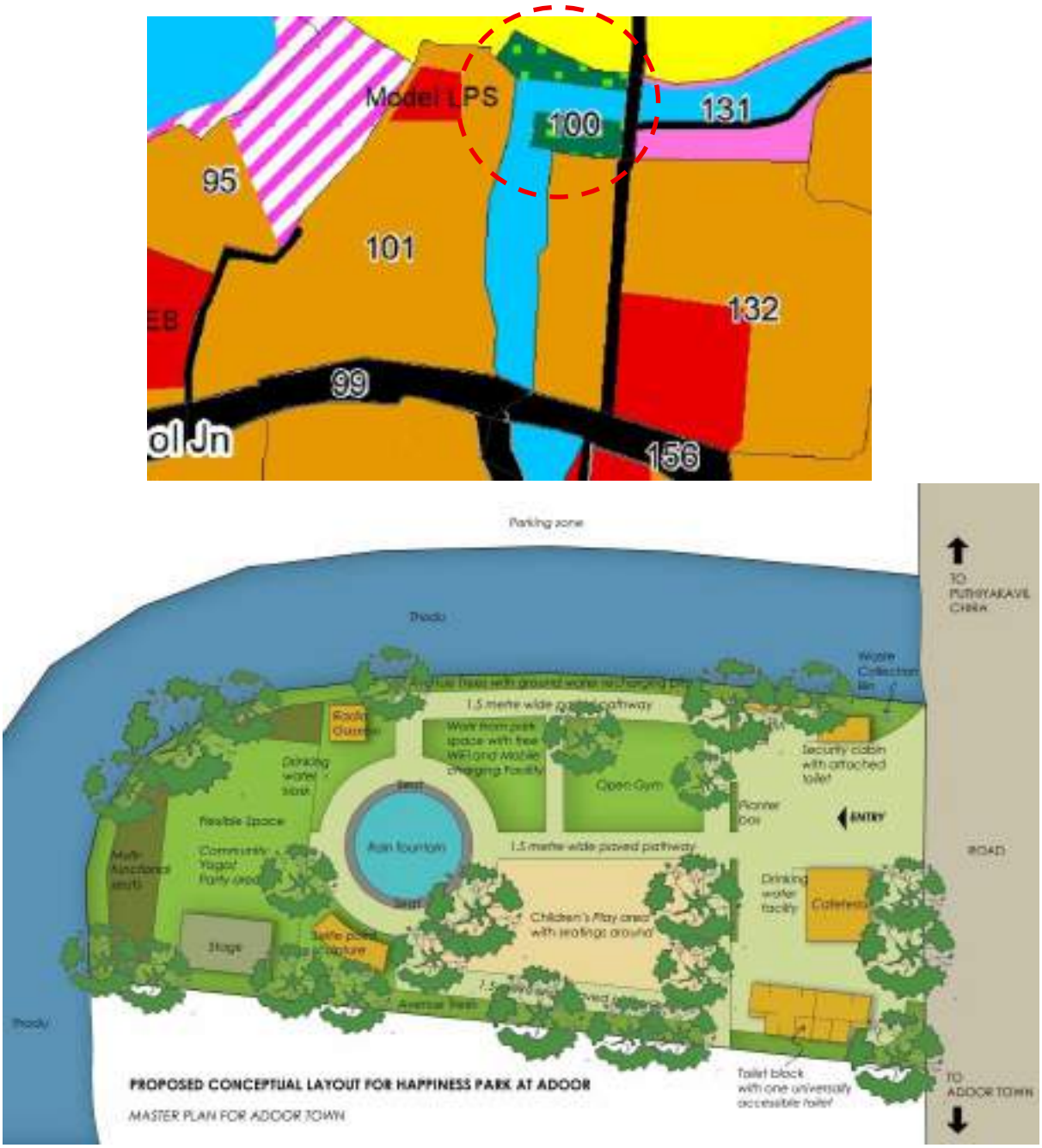


Figure 31.15 Location and Model sketches of Happiness Park

31.5.4 Playgrounds



Figure 31.16 Existing condition of Playgrounds

The master plan emphasizes the retention and protection of existing playgrounds and open spaces in Adoor as vital components of sustainable urban development. These spaces act as the town's green lungs, providing recreational opportunities, supporting biodiversity, and improving the overall environmental quality. Retained parks will be upgraded with better landscaping, seating, play equipment, and walking tracks to make them more user-friendly and inclusive for all age groups. Open spaces, including wetlands, canal banks, and paddy fields, will also be conserved and integrated into the urban fabric as ecological and recreational assets. By retaining and enhancing these green areas, Adoor can reduce the urban heat island effect, improve resilience against climate impacts, and ensure a healthy and vibrant living environment for its residents. Location and model sketches of the proposal is shown in Figure 31.16.

31.5.5 Gandhi Park Renovation

The Municipal Council has identified this as a priority project. Therefore, the details of the project- including Project components, need, aim and objectives, project cost components and implementation mechanism etc., are detailed in Chapter 33. The Location, proposed conceptual images are shown in Figure 31.17.

Plot Area	Ownership	Survey Details
.0014 sq.km	Government	355(p)

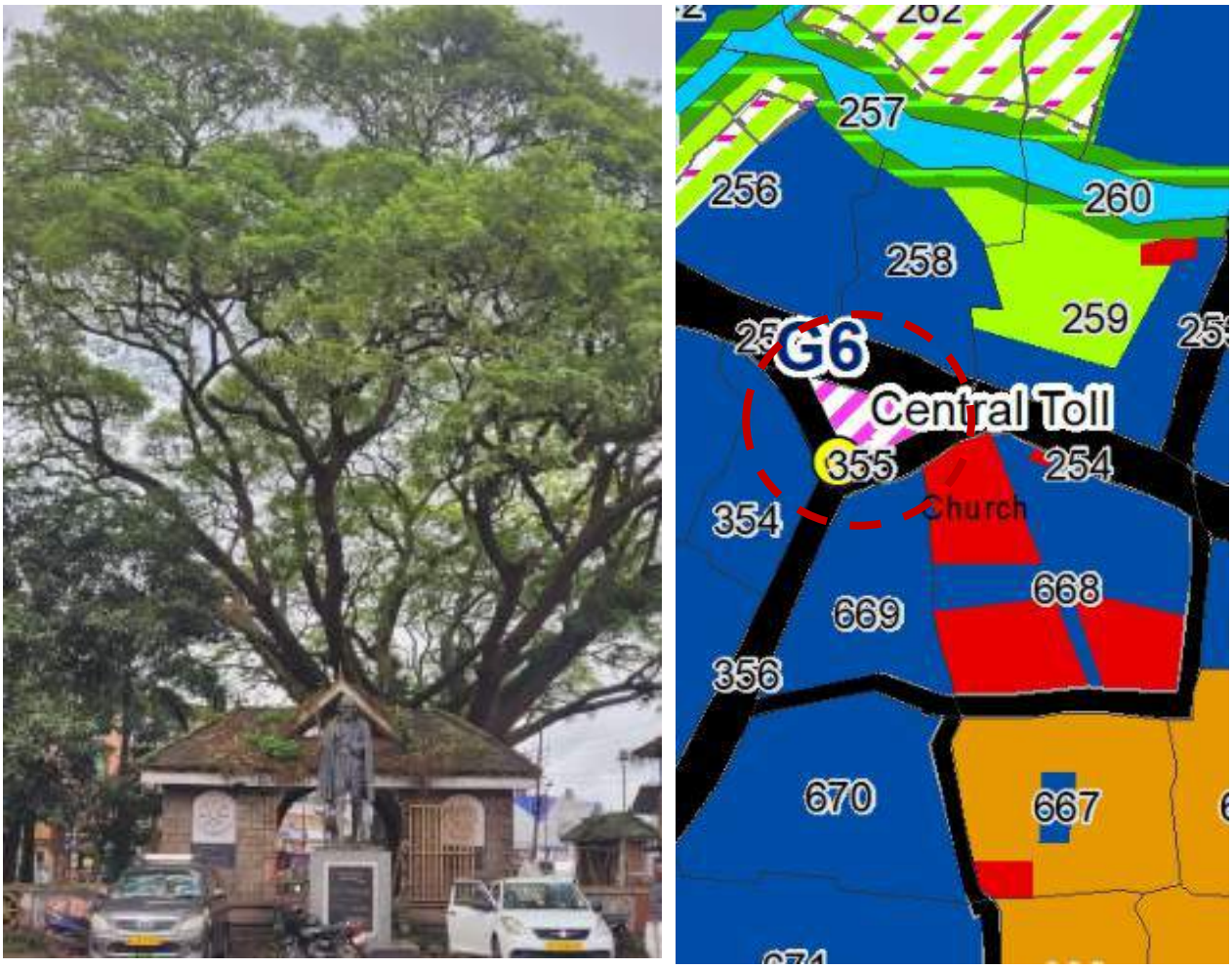


Figure 31.17 Location, Existing condition of Gandhi Park

31.5.6 Proposed Turf

Proposal to develop a modern turf ground in the irrigation land near the KIP canal. The site, with its open setting and accessibility, offers a suitable location for creating a recreational and sporting facility without disturbing the canal alignment. The turf will cater to football, cricket practice nets, and other youth-oriented sporting activities, providing a much-needed open-air fitness and leisure space for the town. The project will be designed with eco-friendly features, ensuring that canal water flow and irrigation functions remain unaffected. The location also enhances visibility and accessibility, making it an attractive hub for local tournaments, evening recreation, and community gatherings, thereby promoting sports culture and healthy lifestyles in Adoor. Location and model sketches of the proposal is shown in Figure 31.18.

Plot Area	Ownership	Survey Details
.0048 sq.km	Private	773(p)

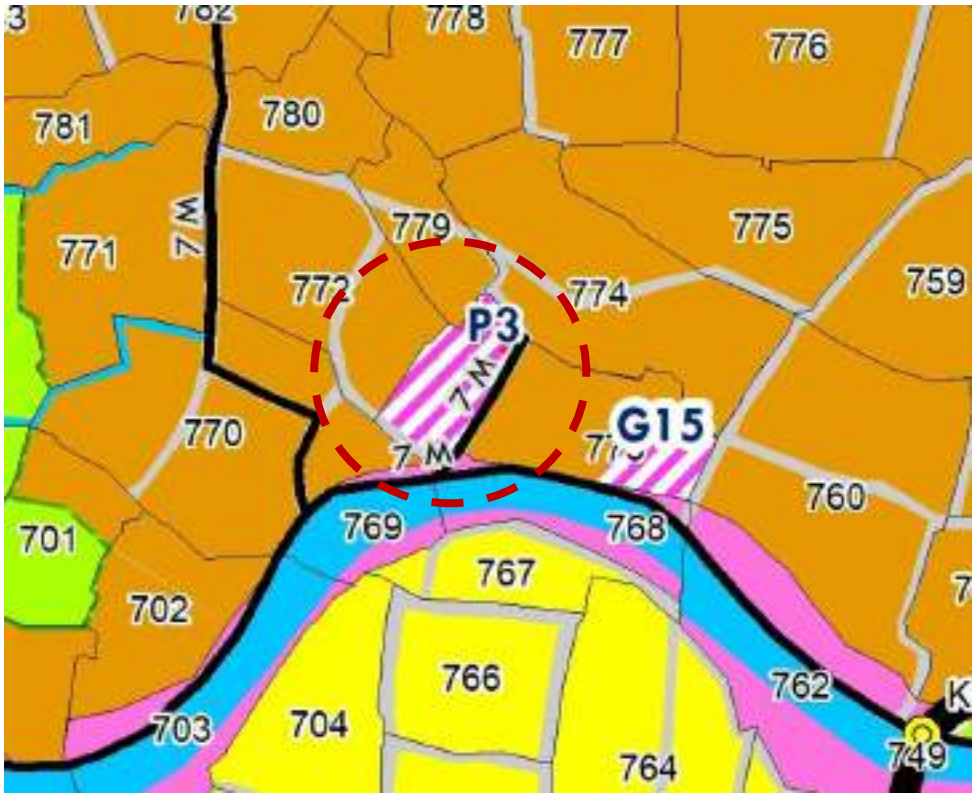






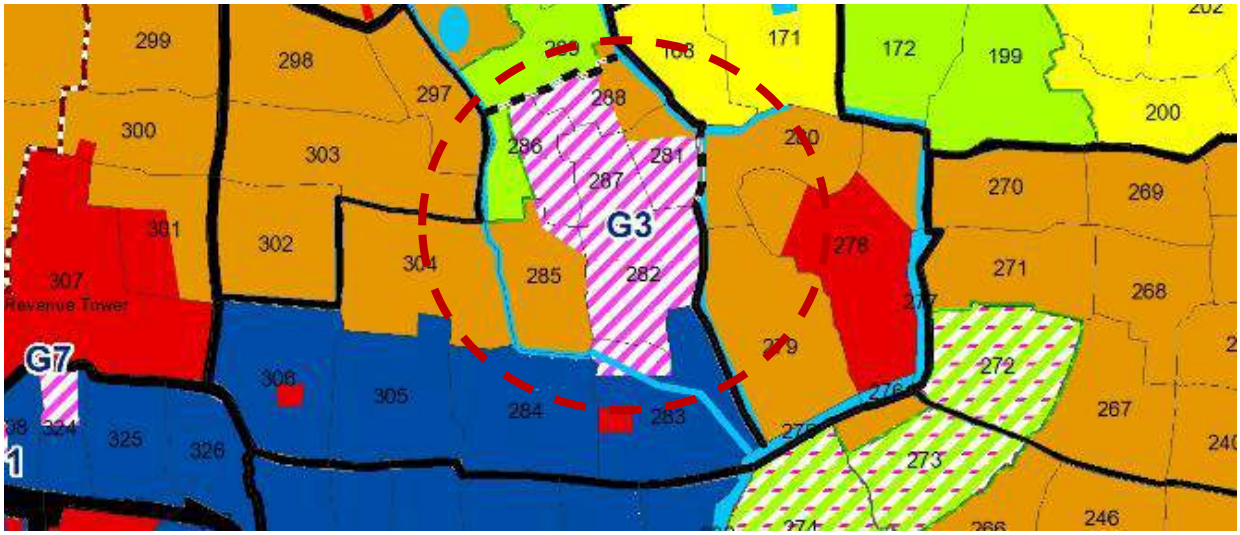




Figure 31.18 Location and Model sketches of Proposed Turf

31.5.7 Municipal Stadium & Sports Complex

Sports infrastructure plays a crucial role in promoting physical fitness, nurturing talent, and creating community-level recreational opportunities. Adoor requires modern and resilient stadium facilities to meet the needs of its growing population and to support regional-level sporting events. Therefore a Municipal Stadium is proposed in the town centre with sufficient access facilities. To complement the proposed stadium facilities, a modern sports complex that can cater to multiple indoor and outdoor sporting needs is also proposed. Such a facility will serve as a hub for physical fitness, recreation, and professional training, addressing the needs of youth, athletes, and the general community. Location and model sketches of the proposal is shown in Figure 31.19.



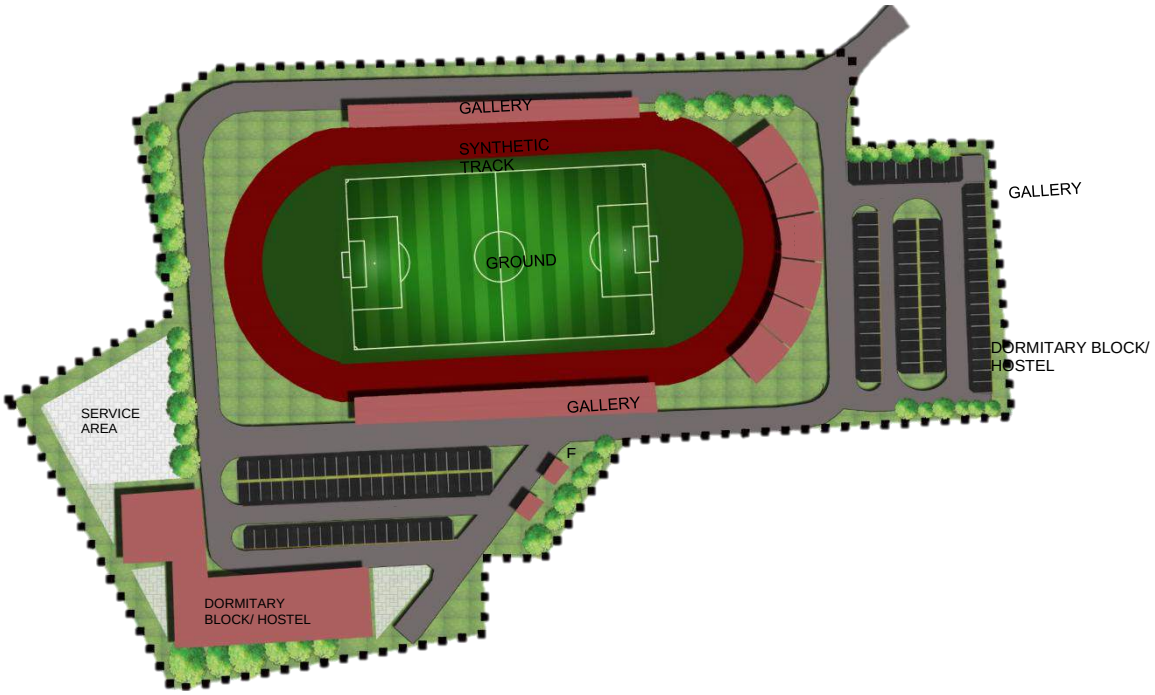


Figure 31.19 Location, Existing condition and Model sketches of Municipal Stadium & Sports Complex

The Municipal Council has identified this as a priority project. Therefore, the details of the project- including Project components, need, aim and objectives, project cost components and implementation mechanism etc., are detailed in Chapter 33.

Plot Area	Ownership	Survey Details
.0361 sq.km	Government	281(p), 282(p), 283(p), 285(p), 286(p), 287(p), 288(p)

31.5.8 Fit Life Centre with Leisure Hub

The Fit Life with Leisure Hub is proposed as a modern recreational and fitness centre that brings together facilities for physical wellness, indoor sports, and leisure activities under one roof. It will feature a fully equipped gym, yoga and meditation halls, aerobics and dance studios, and multipurpose indoor courts for games like badminton, basketball, and volleyball. In addition, the hub will provide spaces for indoor games, a kids' activity zone, hobby corners, and a healthy food café, making it a family-friendly destination. Designed as both a fitness and social engagement space, the hub will host workshops, wellness programs, and cultural events, thereby encouraging community participation. By offering safe, all-weather sports courts and diverse recreation facilities, the Fit Life with Leisure Hub



Figure 31.20 Location, Existing condition and Model sketches of Fitlife Centre with Leisure Hub

will promote healthier lifestyles, youth engagement, and inclusive leisure opportunities, while enhancing the overall recreational infrastructure of the town. Location and model sketches of the proposal is shown in Figure 31.20.

Plot Area	Ownership	Survey Details
.0044 sq.km	Government	622(p), 629(p)

31.5.9 Board Game centers

Recreational options in Adoor are currently limited, particularly for youth and working populations seeking affordable indoor leisure activities. Board game centres can provide interactive, community-oriented spaces that promote social engagement, mental well-being, and cultural vibrancy within the town. The proposal includes establishment of board game centres in small shop spaces or underutilized commercial areas, Provision of facilities for traditional Indian games (e.g., Pallankuzhi, Chess, Carrom) alongside popular international board games, Creation of a safe and inclusive environment for families, students, and youth, Integration with cafeteria/refreshment zones to encourage longer stays and interaction.

31.5.10 Town Gateway

A symbolic town gateway is proposed at the entry point of Adoor Municipality to create a strong sense of identity and place. The gateway will serve both as a landmark and as a welcoming feature, reflecting the cultural, historical, and urban significance of Adoor. The proposal include Architecturally designed gateway structure at the main entry point of the municipality, Incorporation of local cultural motifs, heritage elements, and modern design, Landscaped surroundings with lighting to enhance its visual prominence at day and night, Provision for signage and town branding, including digital boards for information and updates.

31.5.11 Sponge Park

To address the challenges of recurrent flooding and rising urban temperatures, a Sponge Park is proposed in the wetland area near Adoor town centre. The concept of a sponge park is based on nature-based solutions, where wetlands are conserved and enhanced to absorb excess rainwater, recharge groundwater, and act as a natural buffer against urban floods.The proposed park will include rain gardens, bioswales, permeable pathways, and vegetated basins designed to capture stormwater and gradually release it back into the ecosystem. Native wetland vegetation will be restored to strengthen biodiversity and improve ecological balance. At the same time, carefully designed boardwalks, viewing decks, and seating areas will allow residents and visitors to enjoy the beauty of the wetland without disturbing its natural character.

In addition to flood protection, the sponge park will help mitigate the urban heat island effect by providing a large green and water-based cooling zone in the heart of the town. Educational signage

and awareness programmes can further highlight its role in climate resilience, turning the park into a living classroom on sustainable urban design. Thus, the Sponge Park will serve as both a protective ecological barrier and a recreational open space, making Adoor more resilient, livable, and environmentally conscious.

The Municipal Council has identified this as a priority project. Therefore, the details of the project- including Project components, need, aim and objectives, project cost components and implementation mechanism etc., are detailed in Chapter 33. The Location, proposed conceptual images are shown in Figure 31.21.

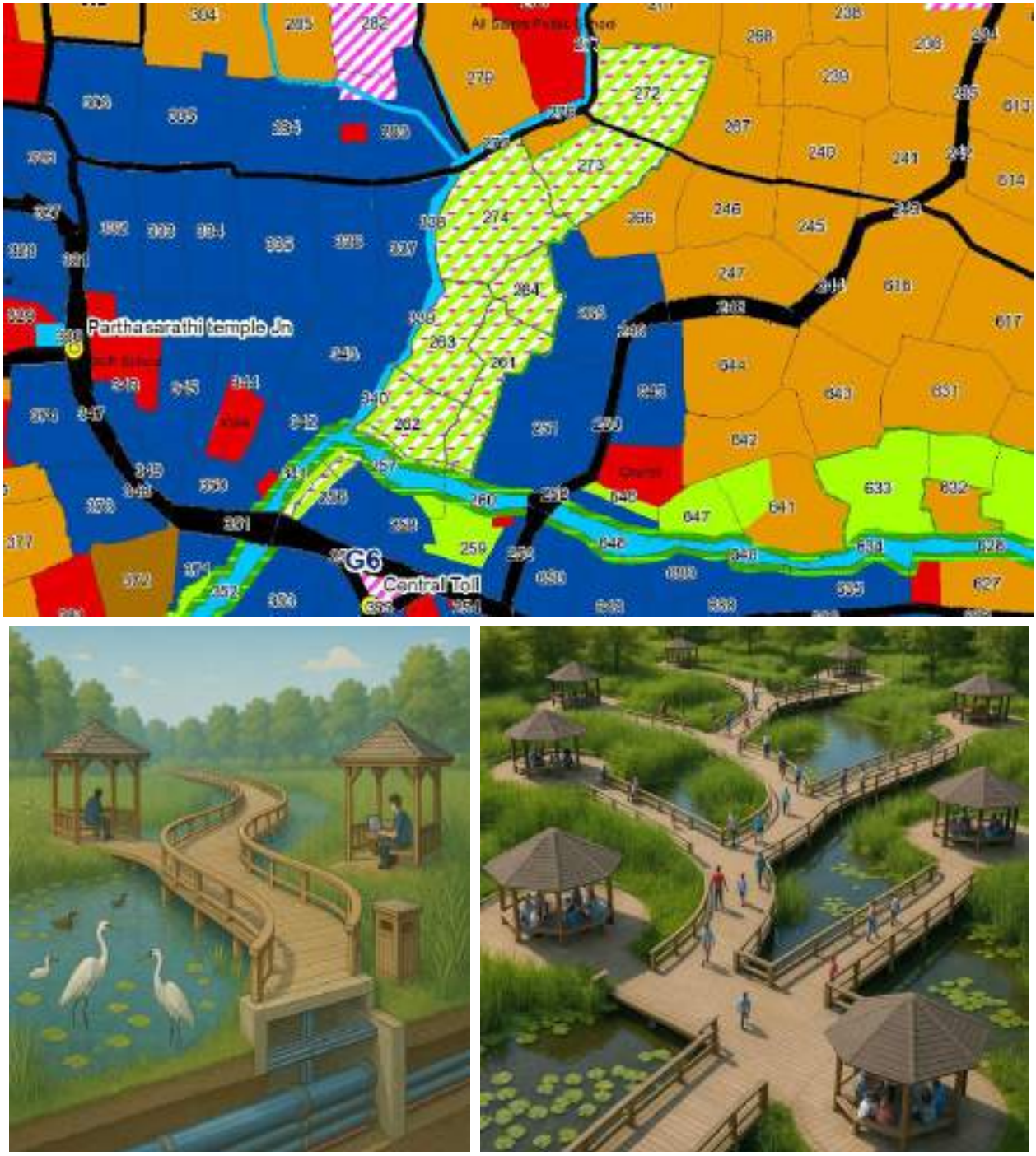


Figure 31.21 Location and Model sketches of Sponge Park

Plot Area	Ownership	Survey Details
.097 sq.km	Private	256(p), 261(p), 262(p), 263(p), 264(p), 272(p), 273(p), 274(p), 392(p), 393(p)

31.5.12 Blossom Garden

To enrich the town's green spaces and provide a vibrant recreational destination, the Master Plan proposes the development of a Blossom Garden. The garden will be designed as a colourful landscape showcasing a wide variety of flowering plants, ornamental shrubs, and seasonal blooms, creating a visually enchanting space for residents and visitors. Key features will include flower trails, thematic garden sections, pergola-covered walkways, seating courts, and water features that highlight the beauty of blossoms throughout the year. Special attractions such as a butterfly corner, photo points, and a small floral exhibition area will enhance the visitor experience.

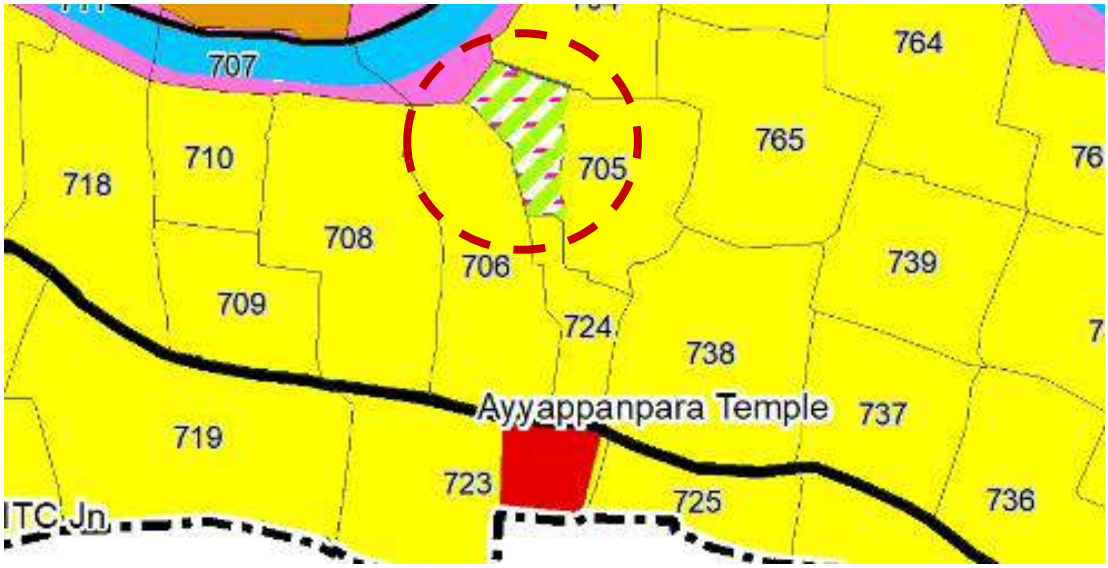


Figure 31.22 Location of Blossom Garden

The Blossom Garden will not only serve as a recreational and aesthetic landmark but also as an educational and ecological space, where awareness on native plant species, pollinators, and sustainable landscaping practices can be promoted. Seasonal flower shows and community gardening programs may also be hosted to engage the public. As a green lung within the urban fabric, the Blossom Garden will reduce urban heat, improve air quality, and offer a serene retreat—making it a symbol of beauty, wellness, and sustainability in Adoor. Location of the proposal is shown in Figure 31.22.

Plot Area	Ownership	Survey Details
.0044 sq.km	Private	705(p)

31.5.13 Wetland Park

A Wetland Park is proposed in the Parakode area, making use of the region's natural wetland ecosystem as both a protective and recreational landscape. The park will be designed to conserve the ecological value of the wetlands while creating a safe and attractive public space for the community.



Figure 31.23 Location, Existing condition and Model sketches of Wetland Park

Key features include nature trails, boardwalks, bird-watching decks, and eco-learning zones that allow visitors to experience the wetland environment without disturbing its sensitive habitats. Native vegetation and aquatic plants will be restored to improve biodiversity and water quality, while interpretive signage will help spread awareness on the importance of wetland conservation.

The Wetland Park will also serve as a climate-resilient buffer, absorbing excess stormwater during heavy rains, reducing the risk of local flooding, and helping regulate micro-climatic conditions. Limited leis ure amenities such as seating areas, shaded pavilions, and small gathering spaces will be incorporated carefully to encourage community use without compromising ecological integrity. By blending conservation with recreation, the Parakode Wetland Park will emerge as a signature ecological landmark for Adoor region, showcasing how natural assets can be protected while simultaneously enriching community life. Location and model sketches of the proposal is shown in Figure 31.23.

Plot Area	Ownership	Survey Details
.0034 sq.km	Private	891(p)

31.6 Agriculture

Agriculture plays a vital role in Adoor's ecological balance, food security, and local economy, with nearly half of the town's land classified under agricultural use and supported by existing irrigation facilities. As identified in the Pathanamthitta District Urbanization Report, Agriculture, Animal Husbandry, and Small-Scale Industries are the primary activities with scope for further strengthening. However, large tracts of paddy fields remain vacant or are converted for alternative crops such as vegetables, plantain, tapioca, and betel. Conserving these paddy fields is crucial for maintaining groundwater recharge, flood mitigation, and environmental stability.

To address these challenges, the proposed land use zoning has categorized agricultural areas into environmentally sensitive areas/ paddy fields, wet agriculture areas and dry agriculture areas. This classification ensures protection of ecologically significant lands while promoting sustainable cultivation practices. Along with conservation, emphasis is placed on crop diversification, integration of modern agri-tech methods, and value addition opportunities, thereby aligning agriculture with urban growth and providing sustainable livelihood support for the local population.

31.6.1 Protection of Irrigation Canals

The Kallada Irrigation Project, with its main canal, branch canals, and distributaries, passes through Adoor town and plays a significant role in supporting agricultural activities. However, poor maintenance, leakage, and improper distribution have hindered its efficiency, leading to water scarcity in some areas and waterlogging in others. Strengthening the irrigation network is essential to ensure sustainable agriculture and optimal land use. Maintenance and desilting of main and branch canals, Lining and repair of canals to prevent leakages, Construction of regulated outlets and drains for equitable water distribution, Provision of access facilities for farmers to utilize irrigation water effectively and Integration of small-scale water conservation structures like check dams and recharge pits are included in the project.

31.6.2 Agriculture Labour Bank

The agricultural sector in Adoor is constrained by the declining availability of agricultural labour, which has adversely affected cultivation and productivity. To address this challenge, an Agriculture Labour Bank is proposed as an institutional mechanism to systematically register, organize, and mobilize agricultural workers to meet cultivation demands in the town.

Creation of a database/register of available agricultural labourers at the municipal level, Establishment of a labour supply mechanism that connects farmers with registered labourers on demand, Development of a transparent system for allocation, payment, and monitoring, Capacity-building and skill-development programs for agricultural workers to adapt to modern farming techniques are components of the proposal.

31.6.3 Cultivators Group / Group Farming and Implements bank

The decline in individual farming practices and the growing challenges of high input costs, labour shortages, and fragmented landholdings necessitate collective approaches to agriculture in Adoor. To revive and strengthen the agricultural sector, the promotion of cultivators' groups and group farming initiatives, supported by an Agricultural Implements Bank, is proposed. This will also help to make better use of uncultivated lands and bring more people, especially women, back into farming. Proposal includes Formation of cultivators' groups and promotion of group farming practices, Establishment of an Implements Bank for providing farm machinery and tools on a rental basis, Leasing of uncultivated and neglected lands to organized cultivator groups for productive use, Active involvement of women through municipal programs aimed at reintroducing them to traditional agricultural practices, Capacity-building and training sessions for cultivator groups on modern and sustainable farming techniques etc.

31.6.4 Bio-fertilizer Plant

The promotion of organic farming and sustainable waste management is a key strategy for strengthening agriculture in Adoor. By encouraging the use of bio-fertilizers, the town aims to reduce dependency on chemical inputs, improve soil fertility, and integrate waste-to-resource practices. Establishing bio-fertilizer plants at both household and centralized levels will contribute to agricultural productivity and environmental sustainability. Installation of Mini Bio-fertilizer Plants in individual households for treating degradable waste and producing biogas and organic manure, Establishment of a Centralized Bio-fertilizer Plant at the existing municipal dumping yard to process organic waste collected from public spaces, Provision of government subsidies and municipal support to promote household-level adoption and Integration of the bio-fertilizer production system with organic farming initiatives and awareness campaigns are proposed as a part of it.

31.6.5 Floriculture

Floriculture is emerging as a promising agricultural activity in Adoor, supported by favorable climatic conditions, irrigation facilities, and increasing local demand for flowers for cultural, religious, and social functions. Promoting floriculture can diversify agricultural activities, enhance farmer income, and create new avenues for women and youth participation in agriculture. The proposal includes cultivation of flowers such as jasmine, marigold, tuberose, and orchids, considering local demand patterns, Utilization of available irrigation facilities to ensure year-round production,Promotion of protected cultivation methods such as polyhouses and shade nets for high-value flowers, Establishment of floriculture clusters and nurseries with technical and financial support and encouragement of women self-help groups (SHGs) and youth collectives to take up floriculture as a livelihood option.

31.6.6 Vegetable Cultivation

Vegetable cultivation plays a vital role in enhancing local food security and reducing dependency on external markets. Adoor has suitable agro-climatic conditions and irrigation facilities that can be effectively utilized to expand vegetable farming. Promoting this sector will help achieve partial self-sufficiency in commonly used vegetables while improving nutritional security for residents.

Proposal includes Expansion of vegetable cultivation to underutilized and fallow lands, Promotion of high-yielding and disease-resistant vegetable varieties, Encouragement of homestead cultivation and terrace gardens within urban households, Formation of vegetable farmers' groups and supply cooperatives,Establishment of cold storage and collection centers for reducing post-harvest losses and awareness campaigns and technical training for farmers and households.

31.6.7 Value addition of Agro based products

Value addition of agricultural products is essential for enhancing farmers' income, reducing post-harvest losses, and creating local employment opportunities. Adoor, with its strong agricultural base and access to raw materials from its hinterland, has significant potential to establish agro-based value addition units, thereby strengthening the town's agro-economy.

Establishment of small and medium-scale units for processing and packaging of agro-products (vegetables, fruits, spices, tapioca, plantain, betel, etc.), Promotion of products such as chips, pickles, curry powders, flour, dried vegetables, and ready-to-cook packs, Cold storage and warehousing facilities for raw materials and processed goods, Branding and marketing support for Adoor-based agro-products through cooperative societies and digital platforms and Capacity-building and entrepreneurship development programs for farmers, women's self-help groups, and youth are components of the proposal.

31.6.8 Cultivation in Canal Puramboke land

The Kallada Irrigation Project (KIP) canal system in Adoor has a considerable extent of canal-side puramboke land lying unutilized. At present, many stretches are under encroachment, leading to both environmental degradation and the loss of productive land. These canal banks present an opportunity to be productively utilized for cultivation, thereby supporting food security and environmental sustainability. Proposal include Identification and demarcation of canal puramboke land suitable for cultivation, Development of community-based cultivation schemes, involving farmers' groups, Kudumbashree units, and youth collectives, Introduction of crops suitable for canal-side cultivation such as vegetables, fodder, and medicinal plants etc.

31.6.9 Soil Conservation measures

Adoor town exhibits undulating topography with varied soil conditions, making certain areas prone to erosion, land degradation, and reduced agricultural productivity. Soil conservation is essential not only for sustaining agricultural activities but also for maintaining ecological balance and preventing

flood and drought-related risks.Implementation of watershed-based soil and water conservation measures.

31.6.10 Water shed Development

The Peringanad Watershed Development Scheme plays a critical role in ensuring sustainable management of land and water resources in Adoor. With the town's natural drainage network and wetlands under increasing pressure from urbanization, watershed-based interventions are essential to conserve paddy lands, improve groundwater recharge, and mitigate flood risks.

Conservation and rejuvenation of natural drains, streams, and wetlands, Ensuring unobstructed flow of water through drains and canals, Maintaining sufficient drain width as per stream order and stream density, Integrated management of paddy lands and wetlands for flood control, biodiversity conservation, and groundwater recharge and Strengthening watershed-based land and water resource management practices are components of the proposal.

31.6.11 Establish Weather Station

Given the increasing variability of climate and its impact on agriculture, water resources, and urban living, establishing a local weather station within Adoor municipality is crucial. This facility will support timely prediction of climate changes and enhance resilience in planning and agricultural practices.

31.6.12 Proposed Agrarian Park & Experience Centre

It is proposed to establish an Agrarian Park and Experience Centre in the Moonnalam area, utilizing the land of the State Seed Farm and the adjoining wetlands. This initiative aims to conserve the unique agrarian landscape while promoting sustainable farming practices, eco-tourism, and community recreation.

The State Seed Farm, with its agricultural heritage, will serve as the core of the project, showcasing traditional and modern farming methods, seed preservation techniques, and demonstration plots. The adjoining wetlands will be protected and integrated into the park design, offering spaces for paddy cultivation, fish farming, bird watching, and environmental education.

The Experience Centre will provide interactive learning opportunities such as hands-on participation in sowing, harvesting, organic farming, and value-added product making. Visitors, especially students and tourists, can engage in guided farm trails, seasonal festivals, and workshops on agro-based industries.

Along with agrarian activities, the park will feature eco-friendly amenities like walkways, viewing decks, rest areas, and interpretation centres, ensuring that the natural wetland ecology is conserved. This initiative will not only safeguard the agricultural and ecological character of Moonnalam but also

Plot Area	Ownership	Survey Details
.0088sq.km	Government	460(p), 461(p),468(p), 463(p), 466(p)

promote it as a green hub for education, tourism, and community recreation. Location and model sketches of the proposal is shown in Figure 31.24.

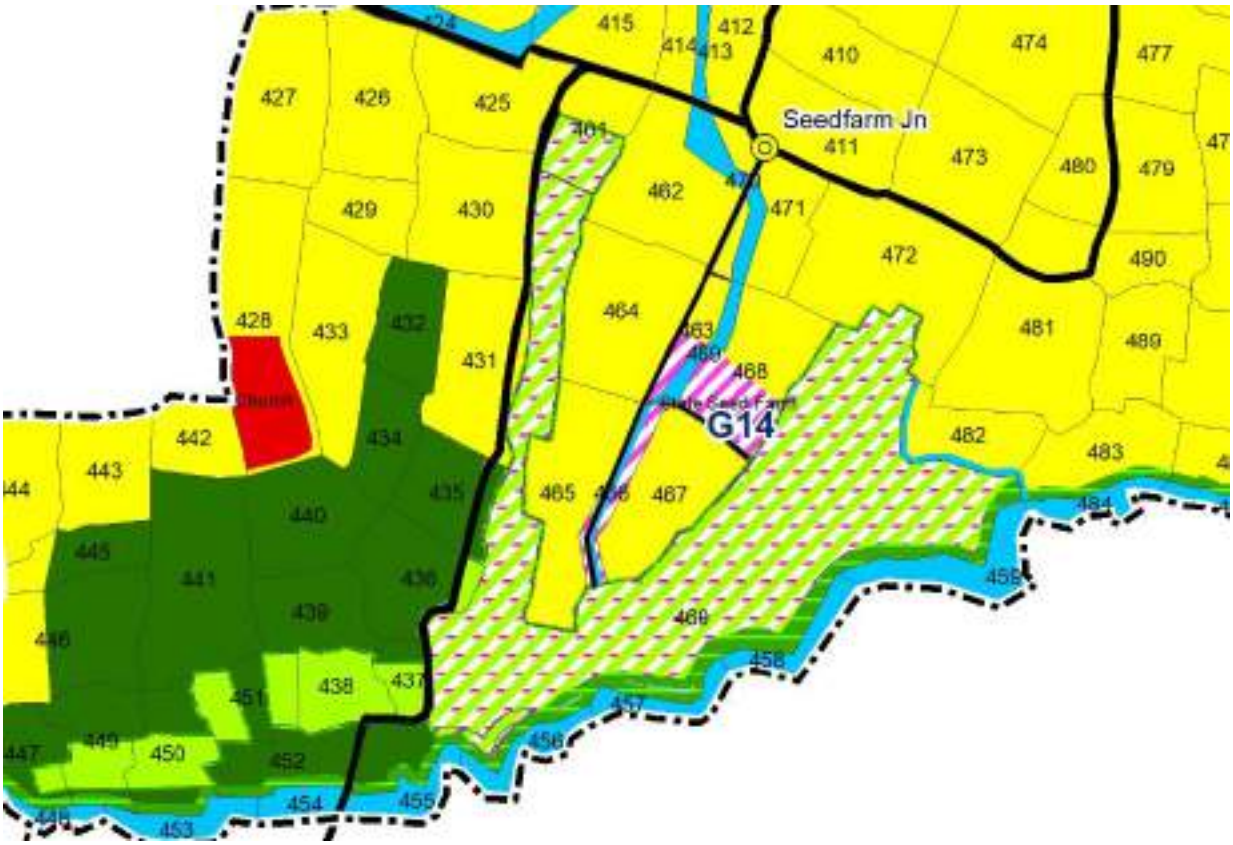


Figure 31.24 Location, Existing condition and Model sketches of Proposed Agrarian Park & Experience centre

31.6.13 Agro Farms

To enhance agricultural productivity and introduce innovative cultivation practices, the promotion of urban farming and conventional agro farms is proposed, particularly along the Pallickal river basin and its adjoining areas. These locations provide fertile soil and irrigation support, making them

suitable for diverse crop cultivation and modern farming techniques. Establishment of model agro farms along the Pallickal river side areas, Promotion of urban farming practices such as rooftop farming, vertical gardens, and hydroponics within the town, Introduction of new cultivation techniques including precision farming, drip irrigation, and organic practices, Integration of agro-



Figure 31.25 Agro Farm

processing and farm-to-market linkages to ensure value addition and better income for farmers are components of the proposal. Model sketches of the proposal is shown in Figure 31.25.

31.7 Animal Husbandry

The animal husbandry sector plays a crucial role in ensuring nutritional security, livelihood generation, and diversification of the local economy. In Adoor, animal husbandry activities are closely interlinked with agriculture, as both sectors complement each other in terms of resource use, waste recycling, and income generation. The areas identified as suitable for agricultural activity are also conducive for livestock-based initiatives. A coordinated and centralized approach is essential to enhance the production of milk, meat, and eggs in a sustainable and profitable manner, while ensuring integration with modern technologies and eco-friendly practices

31.7.1 New Dairy Farms

Given the availability of agricultural land and the semi-rural character of parts of Adoor, the development of small-scale dairy farms is a viable strategy to enhance local milk production and provide livelihood opportunities. Establishing decentralized dairy units will also support integrated farming practices, ensuring better utilization of agricultural by-products and strengthening the rural economy. Establishment of small-scale dairy farms with 10–25 cows per unit, Provision of cattle sheds, feed storage, and basic veterinary care facilities, Training and capacity building for farmers in modern dairy management practices, Integration with fodder cultivation and use of agricultural by-products, Linking with milk collection, processing, and distribution networks etc. can be done as part of the proposal.

31.7.2 Poultry farm / Broiler farm

To meet the growing demand for eggs and meat within Adoor, the establishment of small-scale poultry and broiler farms is proposed. With the town's mix of urban and agricultural land uses, localized poultry units can provide affordable protein sources, improve food security, and create additional livelihood opportunities for small farmers. Establishment of small poultry farms with 75–100 hens per unit and integration with local markets can be established through collection and distribution networks.

31.7.3 Modern Slaughter House

At present, Adoor lacks a designated slaughterhouse facility, leading to unauthorized and unhygienic slaughtering practices. To ensure food safety, environmental protection, and public health, the establishment of a modern slaughterhouse is proposed at Parakode within market area with provision of hygienic slaughtering, meat processing, and storage facilities along with waste treatment and disposal systems, including effluent treatment and solid waste management.

31.7.4 Marketing of products

The animal husbandry sector in Adoor produces poultry, eggs, milk, and other livestock products, but the absence of structured marketing facilities reduces profitability for farmers and leads to dependency on middlemen. To strengthen this sector, dedicated marketing outlets are proposed, integrated with town markets, other proposals like Trade & Expo Pavilion,Vending zones etc. ensuring accessibility for both producers and consumers.

31.7.5 Fish Farming

Given the proximity of Adoor to the Pallickal River and the availability of water resources, fish farming offers significant potential for diversifying the animal husbandry sector. Fish farming can enhance local food security, generate additional income for farmers, and promote sustainable use of water bodies. Capacity-building and training programs can also be organized for farmers in modern fish farming techniques.

31.8 Housing

The housing stock in Adoor Municipality is generally in good structural condition, reflecting steady residential development over the years. However, certain pockets of the town remain under developed and lack adequate infrastructure, services, and quality housing. These disparities require targeted interventions to ensure inclusive growth and balanced urban development. The housing sector proposals are therefore focused on upgrading underdeveloped areas, improving housing quality, and providing affordable, sustainable, and climate-resilient housing options for all sections of society.

31.8.1 Improvement of Infrastructure facilities in Nagars

Approches for improving facilities in Nagars are essential for ensuring inclusice development, social equity and better living standards. Lack of proper connectivity restricts the mobility of residents, limits access to basic services, and adversely affects their overall quality of life. These proposals aim to improve basic infrastructure transform nagars into self-sufficient and sustainable neighborhoods.

Key Components

- Upgradation and widening of existing approach roads to colonies.
- Provision of proper surfacing, side drains, and street lighting.
- Connectivity improvement to nearby public facilities such as schools, health centers, and markets.
- Development of pedestrian pathways and barrier-free access for elderly and differently-abled persons.
- Adoption of eco-friendly solutions such as recharge pits and bio-drainage where feasible.
- Extension of municipal water supply pipelines to underserved colonies.
- Installation of overhead storage tanks and ground-level reservoirs for better distribution.
- Provision of community-level water kiosks and taps in high-density colonies.

- Rainwater harvesting and recharge wells to supplement drinking water supply.
- Replacement of old, leaking pipelines to reduce water loss.
- Ensuring water quality through regular testing and treatment.
- Installation of energy-efficient LED streetlights along main and internal roads of colonies.
- Provision of smart street lighting systems with automatic timers and motion sensors where feasible.

31.9 Water Supply

The provision of adequate and safe water supply is a fundamental requirement for sustaining urban growth and improving the quality of life in Adoor Municipality. The projected population of the town for the year 2041 is 32,750, and the estimated water demand for the horizon year is 4.91 MLD. This projection has been prepared considering both piped water supply and the continued reliance on local resources such as wells. Ensuring equitable distribution, strengthening infrastructure, and adopting sustainable practices are essential to meet the future water requirements of the town.

31.9.1 Augmentation scheme

To meet the rising water demand of Adoor Municipality, augmentation of the existing water supply scheme is essential. The scheme focuses on upgrading and expanding the existing system to ensure a reliable and sustainable water supply.

31.9.2 Isolated distribution of elevated area (Mini schemes)

Certain elevated areas within Adoor Municipality face difficulty in receiving adequate water supply under the current centralized distribution system. To overcome this challenge, mini-schemes with localized storage and distribution are proposed to ensure equitable service coverage. The proposal include establishment of separate distribution tanks at key elevated locations: Mithrapuram, Kaimalappara, Chiranikkal, Ayyappanpara and Kannamkode, dedicated pipelines and pumping systems to feed these tanks, localized distribution networks to supply nearby households efficiently and provision for integration with the main water supply scheme for backup.

31.9.3 Replacement of damaged pipe lines

The existing water supply distribution network in Adoor has sections of pipelines that are old, damaged, and prone to leakage. These issues result in significant water loss, reduced efficiency, and irregular supply to households. To ensure reliable service and minimize wastage, replacement of damaged pipelines is essential. It include identification and mapping of damaged and leaking sections of the distribution network, phased replacement with durable, high-quality pipes suitable for long-term use, upgradation of ancillary infrastructure such as valves and junctions and integration of leak-detection and monitoring systems for future maintenance.

31.9.4 Public Wells

Public wells continue to play an important role in supplementing the municipal water supply system in Adoor, especially during summer months and in areas with intermittent piped water supply. Regular maintenance and protection of these wells are essential to ensure safe and reliable access to water for the community. Proposal include identification and listing of all existing public wells within the municipality,regular cleaning, de-silting, and chlorination of wells, Construction of protective covers, parapet walls, and proper drainage around wells to prevent contamination and installation of hand pumps or motorized pumps where feasible to improve accessibility.

31.9.5 Extension of Pipe lines

Certain areas within Adoor Municipality still remain uncovered by the existing water supply network, resulting in inequitable access to drinking water. To achieve universal coverage and strengthen service delivery, the extension of pipelines to uncovered areas is proposed.

The project include identification of households and colonies presently outside the supply network, laying of new pipelines to extend the existing distribution system, integration with augmentation and small scheme projects to ensure adequate pressure and flow and provision of house service connections in newly covered areas.

31.9.6 Protection of Natural Water Sources

Wells, ponds, and natural drains remain critical supplementary sources of water for the residents of Adoor, particularly during peak demand or service interruptions. However, these sources are under threat due to pollution, encroachments, and lack of proper maintenance. Protecting and conserving these natural water sources is essential for ensuring water security and ecological balance. The proposal include protection and maintenance of public wells, ponds, and natural drains within the municipal area, desilting, cleaning, and periodic chlorination of wells and ponds, Prevention of encroachments and illegal waste disposal in water bodies, Creation of buffer zones and green belts around ponds and drains, Awareness programs to promote community stewardship of natural water resources etc.

Adoor town has 17 ponds locally known as *Thalakkulam* and a network of connected canals that once served as vital sources of irrigation water. With the decline in agricultural activities, many of these ponds and drains have deteriorated, reducing their functional and ecological value. Reviving and protecting these traditional water bodies is crucial both for agricultural rejuvenation and for maintaining the town's environmental balance.

Restoration and desilting of ponds and canals, Construction of protective retaining walls along ponds and drains, Ensuring continuity and interlinking of drains for effective water flow, Development of recharge mechanisms for groundwater replenishment and Integration of pond rejuvenation with recreational and ecological functions can be adopted.

31.9.7 Rain Water Harvesting

Adoor town faces increasing water demand due to urban growth, while natural water availability is limited. Water harvesting is a sustainable method to augment local water resources, recharge groundwater, and reduce dependence on centralized supply systems. Adoption of water harvesting practices will enhance resilience to water scarcity and seasonal fluctuations. The proposal include Mandatory rainwater harvesting systems in new residential, commercial, and institutional buildings, Construction of community-level rainwater harvesting structures such as recharge pits, percolation tanks, and check dams, Retrofitting existing public buildings with rooftop harvesting systems, Promotion of household-level rainwater harvesting through subsidies or incentives and awareness and training programs on water harvesting methods for residents and builders.

31.9.8 Renovation of Kerala Water Authority Office Building

The Kerala Water Authority (KWA) plays a pivotal role in planning, implementing, and maintaining water supply schemes in Adoor town. The existing office infrastructure, however, is inadequate to support the growing administrative and technical demands associated with future projects. Upgrading the KWA office is essential to enhance institutional efficiency and service delivery. The proposal include Renovation and modernization of the existing KWA office in Adoor, Provision of updated technical facilities, digital monitoring systems, and GIS-based management tools, Establishment of a public service desk for efficient grievance redressal, Enhancement of staff capacity through training and skill development.

31.10 Energy

Energy is a critical component for the sustainable growth and functioning of Adoor town. With the projected urban expansion, rising population, and increasing economic activities, the demand for reliable and efficient power supply will continue to grow. Ensuring uninterrupted electricity, promoting renewable energy adoption, and improving energy efficiency are essential to support residential, commercial, and industrial needs. The proposals in the energy sector are designed to strengthen infrastructure, modernize distribution systems, and encourage sustainable practices, thereby enhancing resilience and reducing dependency on conventional energy sources.

31.10.1 Improvement of Power distribution

To meet the growing energy demand of Adoor town, it is essential to improve the power distribution network. Strengthening the existing infrastructure through additional capacity and modernized systems will ensure reliable and uninterrupted electricity supply for residential, commercial, and industrial consumers. It include installation of new transformers to enhance load capacity, laying of new 11 KV lines to improve coverage and reduce transmission losses, upgradation of existing distribution lines and related infrastructure etc.

31.10.2 Street Lighting

Efficient and well-planned street lighting is critical for improving safety, accessibility, and the overall urban environment. Adoor town requires modernized street lighting systems, especially in the Central Business District (CBD) and key intersections, to enhance visibility, reduce accidents, and improve the quality of public spaces.

The proposal include installation of high mast lights in the CBD and major road intersections, replacement of outdated lighting systems with sodium vapor lamps or energy-efficient alternatives, provision of separate dedicated streetlight mains to ensure uninterrupted lighting services etc.

31.10.3 Non-Conventional Energy

With increasing urbanization and rising energy demand, Adoor Municipality must transition towards sustainable energy systems. Adoption of non-conventional energy sources such as solar, biogas, and other renewable technologies, along with energy conservation practices, will ensure long-term energy security, reduce carbon footprint, and promote environmentally responsible urban growth. The proposal include promotion of solar energy through rooftop solar installations on public buildings, institutions, and residential houses, development of biogas plants for waste-to-energy conversion, particularly in markets, slaughterhouses, and large residential colonies, encouragement of energy-efficient green buildings in new developments, adoption of LED-based street lighting and energy-efficient appliances, integration of decentralized renewable energy systems in urban infrastructure.

31.11 Waste Management

31.11.1 Integrated Waste Treatment Plant

As per KSWMP, in town, the land with existing windrow compost plant and RRF is proposed to utilise for establishing the sub-projects such as modernisation of existing windrow compost plant, establishment of OWC, vehicle parking and washing facility, temporary storage facility for inerts, establishment of sanitary waste incinerator and green belt development around the facility. The Centralised facility is proposed with OWC Plant, MCF, Sanitary Waste Incinerator, Vehicle Parking and Washing Area, Storage area for Rejects . Facilities proposed for establishment are waste reception area, storage space, pre-processing, processing, slurry management, waste water treatment, compost management, vehicle parking, vehicle washing, green belt development etc.

In the Kaimalappara integrated solid waste processing facility, there is an existing windrow compost plant of 2 TPD capacity and RRF with capacity 2 TPD. The land identified meets the requirement of KSPCB norms related to red category of industries/ facilities. Location of identified land for establishing integrated centralised solid waste processing facility is given in Figure 31.26.

Plot Area	Ownership	Survey Details
.0341 sq.km	Government	10(p), 11(p), 12(p), 13(p)



Figure 31.26 Location, Existing condition and Model sketches of Integrated Waste Treatment Plant
Source: KSWMP

31.11.2 Biogas Plant

Household-level biogas plants present a sustainable solution for managing biodegradable waste while simultaneously producing clean energy for domestic use. Promoting biogas generation at the household level will reduce waste sent to dumping yards and support renewable energy adoption in Adoor. The proposal include promotion of household biogas plants with differential subsidies based on income levels, utilization of kitchen and organic waste as input for biogas generation, integration of biogas production with household energy needs, reducing dependency on conventional fuel, eduction of organic waste reaching municipal dumping yards etc.

31.11.3 Roadside Drains

Effective storm water drainage is essential to prevent waterlogging, flooding, and deterioration of road infrastructure in Adoor, particularly in the Central Business District (CBD) area where traffic density and commercial activities are high. Provision and maintenance of roadside drains will significantly improve urban hygiene, road safety, and resilience to heavy rainfall events. Construction of roadside drains along all major roads in the CBD area, Regular maintenance and cleaning to ensure unobstructed flow, Integration of roadside drains with natural drainage channels and major outfalls, Use of covered drains in busy pedestrian zones for safety and accessibility are components of the proposal.

31.11.4 Periodic Cleaning of Natural drains

Natural drains and other watercourses play a crucial role in the stormwater management system of Adoor. Over the years, these drains have been encroached upon, blocked, and polluted by indiscriminate disposal of solid and liquid wastes, leading to reduced carrying capacity and localized flooding. Restoring and protecting these natural drains is essential for sustainable waste and water management.Cleaning and desilting of natural drains, Removal of blockages and encroachments,Construction of protection works (retaining walls, fencing, or barriers) to prevent further waste disposal, Community awareness and enforcement measures to ensure long-term protection are components of the proposal.

31.11.5 Public Comfort Stations / E-Toilets

Adequate public sanitation facilities are an essential component of urban infrastructure, contributing to improved hygiene, public health, and overall quality of life. Currently, the availability of such facilities in Adoor is limited and does not adequately meet the needs of residents, visitors, and floating populations in high-traffic areas. The proposal include Establishment of new public comfort stations and modern e-toilets at key locations: Parakkod, Revenue Tower, Sree Moolam Market, High School Junction, and Central Toll Area,Provision of gender-segregated units, disabled-friendly access, and round-the-clock availability, Adoption of automated e-toilet systems with minimal water consumption and efficient waste treatment etc.

31.11.6 Awareness Programme

Public awareness and behavioral change are critical for the success of any waste management initiative. Without community participation, infrastructure and systems alone cannot ensure a clean and sustainable urban environment. It is proposed to conduct health, hygiene, and environmental awareness programmes across all wards, organize workshops, campaigns, and street plays focusing on waste segregation, reduction of plastic use, and responsible disposal,develop educational materials

for schools, residents' associations, and markets, encourage community-led monitoring of cleanliness and waste management practices etc.

31.12 Education

Adoor town is well served with educational institutions ranging from high schools and higher secondary schools to professional colleges, polytechnic, ITI/ITC, and arts and science colleges, ensuring access to education at all levels. As per planning standards, these facilities adequately support the current population and provide opportunities for higher learning and skill development. However, to meet the future needs of a growing population and to strengthen the quality and inclusiveness of education, specific projects and interventions are proposed under this sector.

31.12.1 Improvement of Infrastructural facilities and modernization of Government and aided schools

Government and aided schools form the backbone of Adoor's educational system, providing accessible and affordable education to a large section of the population. Many of these institutions face challenges due to outdated infrastructure and lack of modern facilities, which limits the quality of learning and overall student development. The proposal include construction of new school buildings and classrooms, development of playgrounds and recreational areas, provision of essential amenities such as toilets, safe drinking water, and vehicles for student transport, establishment of modern learning infrastructure including computer labs, language labs, and internet connectivity, modernization of facilities in 18 identified government and aided schools etc.

31.12.2 Utilization of surplus land and buildings

Several educational institutions in Adoor town possess surplus land and underutilized buildings that remain idle or are not effectively integrated into the current academic framework. Proper utilization of these resources can significantly expand the town's educational capacity and support the introduction of new-generation courses aligned with emerging career demands. The proposal include identification and mapping of surplus land and unutilized buildings in existing institutions,allocation of these spaces for setting up new institutions or academic blocks, introduction of new-generation and skill-oriented courses (IT, design, applied sciences, health care, etc.), shared use of infrastructure among multiple institutions to avoid duplication and improve efficiency etc.

31.12.3 Educational Complex

To strengthen Adoor's role as a regional educational hub, the development of an integrated Educational Complex is proposed within the Adoor UPS Compound. The complex is envisioned as a shared learning and training center that will cater to students, teachers, and the wider community by offering modern academic and cultural facilities. The proposal include Establishment of cluster classrooms to accommodate joint learning programs across multiple institutions, Provision of facilities for refresher courses, teacher training, and continuing education programs, Development of a School

Theatre Complex to encourage cultural activities, educational performances, and interactive learning, Shared infrastructure for digital learning, seminars, and workshops etc.

31.12.4 Dental College

To diversify and strengthen higher education opportunities in Adoor, the establishment of a Dental College is proposed. This institution will not only enhance access to professional education but also contribute to improved healthcare services in the region. The proposal include Establishment of a full-fledged Dental College with academic, clinical, and research facilities, Development of supporting infrastructure including lecture halls, laboratories, hostels, and library, Provision of a teaching dental hospital with modern equipment for clinical practice, Integration of community dental care programs for local residents etc.

31.12.5 Students Centre

To support the academic, social, and personal development of students in Adoor and nearby areas, a Students Centre is proposed. This facility will serve as a hub for student welfare, academic enrichment, and cultural interaction, complementing existing higher education institutions. The proposal include Construction of a central facility with hostel accommodation for students from surrounding regions, Establishment of a modern library and digital learning resources, Provision of a career development centre offering guidance, training, and placement support,Spaces for cultural, recreational, and co-curricular activities to promote holistic growth etc.

31.13 Health

Adoor town functions as a key health service center for both its own population and the wider Adoor Taluk. The town hosts a range of health facilities that broadly meet planning standards; however, improvements in infrastructure, accessibility, and specialized care are essential to meet the future health demands of a growing urban population. The sectoral proposals focus on strengthening existing health institutions, expanding specialized facilities, and ensuring equitable access to affordable healthcare for all residents.

31.13.1 Up gradation of General Hospital

The General Hospital at Adoor plays a central role in providing medical care for both the town and the surrounding taluk. However, the growing population and rising health demands call for advanced facilities and specialized healthcare services beyond its current capacity. The proposal include Upgradation of the existing General Hospital into a Super Specialty Hospital, Establishment of specialized departments and diagnostic units, Provision of modern equipment and technology-enabled facilities, Development of trauma care units and emergency response facilities, Improved infrastructure including wards, operation theatres, and patient amenities etc.

31.13.2 Emergency Medical services

As the population of Adoor grows, the need for prompt and efficient emergency medical services becomes critical, especially for vulnerable groups such as the elderly. The existing healthcare facilities lack a dedicated, fully equipped emergency service to address urgent medical needs. The proposal include Establishment of a dedicated emergency medical service unit within the town, Provision of fully equipped ambulances with life-support systems, Priority medical response protocols for aged and vulnerable populations, Setting up a 24x7 emergency helpline integrated with hospitals, Training of paramedical staff for quick response and specialized emergency care etc.

31.13.3 Ayurveda Hospital

Adoor has a rich tradition of Ayurveda and Indian systems of medicine, but the existing facilities are limited to a dispensary with inadequate infrastructure. Upgrading it into a full-fledged Ayurveda Hospital will strengthen traditional healthcare services and provide alternative and complementary treatment options for the community. The proposal include Upgradation of the existing Ayurveda dispensary to a hospital,Establishment of specialty treatment units such as Panchakarma, rejuvenation therapies, and lifestyle disease management, Provision of in-patient wards, outpatient consultation, and pharmacy, Development of herbal gardens to support treatment and research, Integration of health tourism potential with wellness packages etc.

31.13.4 Homeopathic Hospital

Homeopathy has a strong acceptance among the local population as a cost-effective, non-invasive, and holistic healthcare system. However, the present facilities are limited. Establishing a full-fledged Homeopathic Hospital will strengthen healthcare diversity in Adoor and ensure wider treatment choices for residents. The proposal include Establishment of a dedicated Homeopathic Hospital with OPD and IPD facilities, Provision of specialty clinics for chronic ailments such as allergies, arthritis, skin diseases, and respiratory disorders, Development of diagnostic and pharmacy facilities specific to homeopathic medicine, Integration of health awareness programs promoting preventive and lifestyle care, Collaboration with existing allopathic and Ayurveda institutions to provide holistic, multi-system care.

31.13.5 Health Tourism

Adoor, with its favorable climatic conditions, cultural heritage, and existing healthcare institutions, holds significant potential to emerge as a hub for health and wellness tourism. By integrating modern healthcare facilities with traditional systems of medicine such as Ayurveda and Homeopathy, the town can attract both domestic and international visitors seeking holistic healthcare and rejuvenation. The proposal include Development of Ayurveda and wellness centers with accommodation and therapeutic facilities, Integration of modern medical care with traditional therapies to promote holistic treatment, Establishment of wellness resorts and yoga/meditation centers, Promotion of eco-friendly

health tourism packages in collaboration with tourism agencies, Branding Adoor as a regional health and wellness destination.

31.14 Civic Amenities

Civic amenities play a vital role in enhancing the quality of urban life by providing spaces and services that support social interaction, recreation, cultural activities, and community well-being. In Adoor, the availability of recreational and civic facilities is currently inadequate compared to its role as an urban centre and a second-order settlement within the district. Strengthening civic infrastructure is essential to meet the growing population's needs and to ensure inclusive, livable, and vibrant urban environments.

The proposals in this sector focus on developing modern civic facilities, improving recreational spaces, and establishing community-oriented infrastructure to create a balanced and sustainable urban experience.

31.14.1 Municipal Town Hall & Parking Plaza

The development of a new Town Hall is essential to cater to the cultural, civic, and social needs of Adoor. Strategically located opposite to the Revenue Tower, the proposed Town Hall will serve as a

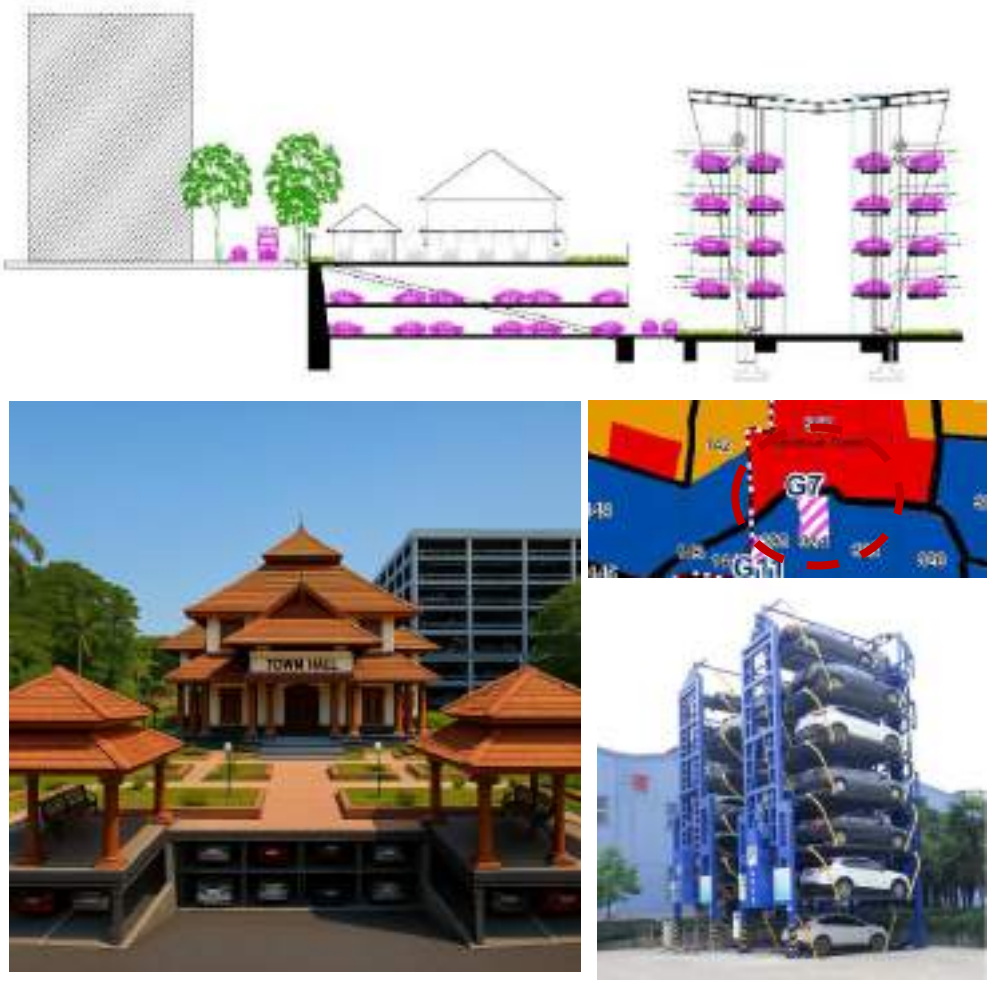


Figure 31.27 Location and Model sketches of Municipal Town hall and Parking plaza

hub for public gatherings, municipal functions, and cultural programs while ensuring efficient land utilization and urban integration.

Key Components

- New Town Hall building with the top floor dedicated for the Town Hall.
- Multi-level car parking facility at the rear side, accessible from adjoining link roads.
- Basement parking provision utilizing the natural contours of the site.
- Public amenities including take-a-break zones, shaded resting areas, and landscaped open spaces.
- Integration of modern infrastructure such as ICT-enabled facilities, advanced lighting, and acoustic systems.

The Municipal Council has identified this as a priority project. Therefore, the details of the project- including Project components, need, aim and objectives, project cost components and implementation mechanism etc., are detailed in Chapter 33. The Location, proposed conceptual images are shown in Figure 31.27.

Plot Area	Ownership	Survey Details
.002 sq.km	Government	324(p)

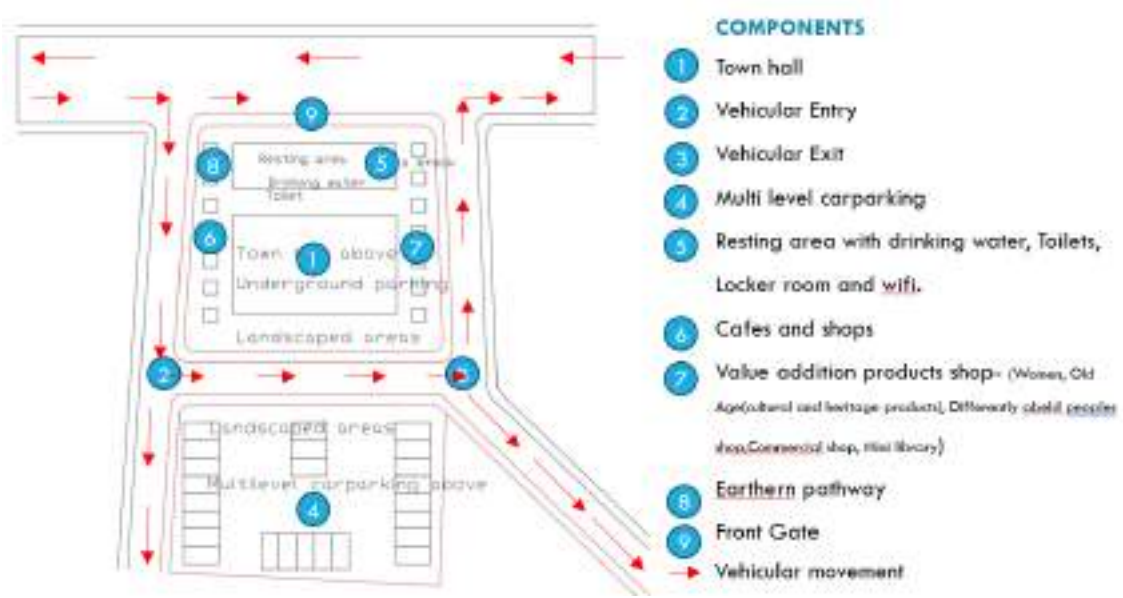


Figure 31.28 Layout of Municipal Town hall and Parking plaza

31.14.2 Crematorium & Bio Park

A dignified and well-planned crematorium is a critical civic amenity that ensures proper waste-free and respectful disposal of mortal remains. Presently, Adoor lacks a modern facility that complies with environmental and urban standards, creating the need for a dedicated crematorium as per the Master Plan.

Key Components

- Construction of a **modern crematorium** at a suitable site identified in conformity with zoning regulations.
- Provision of both **traditional and electric/eco-friendly cremation systems**.
- Supporting infrastructure including waiting areas, prayer halls, restrooms, and parking facilities.
- Landscaping and green buffers around the crematorium to reduce visual and environmental impact.
- Waste management and smoke-control systems to minimize pollution.

The Municipal Council has identified this as a priority project. Therefore, the details of the project-including Project components, need, aim and objectives, project cost components and implementation



Figure 31.29 Location and Model sketches of Crematorium & Bio Park

mechanism etc., are detailed in Chapter 33. The Location, proposed conceptual images are shown in Figure 31.29.

Plot Area	Ownership	Survey Details
.038 sq.km	Government	62(p)

31.14.3 Proposed Fire & Rescue Station

Fire safety is a critical component of urban resilience and public safety. Adoor town requires a well-equipped fire station to ensure timely response to fire accidents, disasters, and emergencies. Land for establishing a fire force station has already been acquired at Pannivizha, making it feasible to develop this essential civic facility.

Key Components

- Construction of a modern fire station building at Pannivizha.
- Provisions for parking fire engines, rescue vehicles, and modern fire-fighting equipment.
- Adequate water storage, communication systems, and emergency response infrastructure.
- Training and deployment of sufficient fire personnel.

Plot Area	Ownership	Survey Details
.0044 sq.km	Government	227(p)



Figure 31.30 Location, Existing condition and Model sketches of Proposed Fire &

The Municipal Council has identified this as a priority project. Therefore, the details of the project- including Project components, need, aim and objectives, project cost components and implementation mechanism etc., are detailed in Chapter 33. The Location, proposed conceptual images are shown in Figure 31.30.

31.14.4 Police Aid Post

Ensuring safety and security is an essential aspect of urban living. With growing population and commercial activity in Parakode, the need for immediate law enforcement presence is critical to address emergencies and maintain public order. Therefore of a Police Aid Post is proposed at Parakode with basic facilities for police personnel, including communication systems and mobility support in integration with the main police station for coordination and quick response.

31.15 Environment

The environment of Adoor is characterized by paddy fields, water bodies, sacred groves, and other ecologically sensitive areas that provide critical ecological, hydrological, and cultural functions. These areas act as natural buffers for flood management, groundwater recharge, biodiversity conservation, and preservation of cultural heritage. Recognizing their importance, the Master Plan incorporates strict zoning regulations and targeted interventions to ensure their protection, sustainable management, and integration with climate resilience and eco-restoration initiatives.

31.15.1 Rejuvenation, Restoration and Beautification of Pallickal River

Pallickalar, a vital natural drainage channel passing through the central area of Adoor town, plays a significant role in stormwater management and ecological balance. However, indiscriminate disposal of solid and liquid waste has led to pollution, reduced carrying capacity, and interruption in its natural flow. Protecting and rejuvenating Pallickalar is essential to ensure water quality, flood mitigation, and environmental sustainability.

Key Components

- Prevention of waste dumping into Pallickal Thodu through strict enforcement and monitoring.
- Construction of proper wastewater diversion and treatment systems to reduce pollution load.
- Strengthening of embankments and desilting at regular intervals.
- Maintaining continuity of flow by removing obstructions and encroachments.
- Development of buffer zones with greenery along the thodu to improve water retention and ecological health.

The Municipal Council has identified this as a priority project. Therefore, the details of the project- including Project components, need, aim and objectives, project cost components and implementation mechanism etc., are detailed in Chapter 33. The Location, proposed conceptual images are shown in Figure 31.31.



Figure 31.31 Model Sketches of Rejuvenation and Restoration of Pallickal river

31.15.2 Valiyakulam Waterfront Wellness Park

The development of a Waterfront Wellness Park around the Valiyakulam pond in Adoor, transforming the area into a vibrant public open space that blends recreation, ecology, and community well-being. The project aims to rejuvenate the pond and its surroundings by improving water quality, strengthening embankments, and conserving the wetland ecosystem. Landscaped walkways, cycling and jogging tracks, meditation decks, and shaded seating areas are planned along the waterfront to encourage a healthy lifestyle. Wellness-oriented facilities such as open-air yoga zones, herbal gardens, reflexology paths, and fitness corners will be incorporated, making the park a unique urban retreat. In addition, a children's play area, interactive water features, and cultural spaces for small gatherings are envisioned to ensure inclusivity and community participation. Native tree planting and butterfly



Figure 31.32 Location, Existing condition and Model sketches of Valiyakulam Waterfront wellness park

gardens will enhance biodiversity, while carefully designed lighting and seating will provide safety

and comfort. The Wellness Park will not only serve as a leisure and fitness destination but also contribute to climate resilience by reducing urban heat, recharging groundwater, and preserving the pond as a natural buffer against flooding. Located close to the heart of the town, the Valiyakulam waterfront will emerge as a signature green space for Adoor—linking ecology, health, and recreation. Location and model sketches of the proposal is shown in Figure 31.32.

Plot Area	Ownership	Survey Details
.0027sq.km	Government & Private	196(p)

31.15.3 Protection of Sacred Groves

Sacred groves in Adoor represent unique ecological and cultural landscapes that combine biodiversity with tradition and community faith. They act as vital green lungs, supporting rare plant species, groundwater recharge, and micro-climate regulation, while also serving as spaces of spiritual and cultural identity. The Master Plan proposes their strict protection through mapping, legal safeguards against encroachment, and eco-restoration with native species. Community stewardship, temple committee involvement, and awareness programs will be encouraged to ensure their continued vitality. By integrating sacred groves into the town's green infrastructure, Adoor can preserve these living ecological sanctuaries as symbols of resilience, heritage, and sustainability.

31.15.4 Green Strip

To safeguard the ecological integrity of water bodies and wetlands, creation of continuous green buffer strips are proposed along their banks. These protective green belts will serve as ecological transition zones, preventing encroachment, filtering runoff, and strengthening the natural edges of water bodies.The green strips will be planted with native trees, shrubs, and grasses that stabilize soil, enhance groundwater recharge, and support local biodiversity. Walking and cycling trails with minimal interventions may be incorporated in selected stretches to promote eco-recreation, without disturbing the sensitive wetland ecology. Interpretative signage, bird perches, and small resting nodes can further increase community awareness and appreciation of these landscapes.This initiative will not only preserve wetlands as natural sponges against floods but also mitigate urban heat, improve air quality, and provide accessible open spaces for the people of Adoor. By formally designating and maintaining these green buffers, the municipality can ensure long-term protection of its vital water ecosystems while simultaneously enhancing the town's resilience and livability.

31.16 Special Concern Areas

Special concern areas address the needs of vulnerable groups, including children, women, the elderly, differently-abled persons, and economically weaker sections, while also ensuring overall public safety and security. The proposals under this sector aim to promote inclusivity, social equity, and resilience by providing dedicated facilities, welfare measures, and supportive infrastructure for their well-being.

31.16.1 Proposed Empowerment Centre

The growing number of aged persons, disabled children, and differently-abled individuals in Adoor highlights the need for dedicated care facilities. Currently, institutional support is limited, leading to challenges in accessibility, specialized care, and social inclusion. Establishing centers dedicated to their wellbeing will ensure inclusive healthcare and social support for vulnerable groups. Location and model sketches of the proposal is shown in Figure 31.33.

Key Components

- Establishment of day-care and residential facilities for elderly persons.
- Specialized therapy and rehabilitation units for physically and mentally challenged individuals.
- Provision of counseling, physiotherapy, and occupational therapy services.
- Skill development and vocational training for disabled persons to encourage self-reliance and employability.
- Recreational and cultural activities to promote **social integration and mental wellbeing**.



Figure 31.33 Location, Existing condition and Model sketches of Empowerment Centre

The Empowerment Centre is envisioned not as an isolated facility, but as part of an inclusive urban environment. Its programs and activities will be strategically linked with proposals in the Recreation sector - such as Neighbourhood Parks, Butterfly Park, Happiness Park, Playgrounds, Gandhi Park Renovation, Proposed Turf, Stadium and Sports Complex, Fit Life Centre with Leisure Hub, and Board Game Centres. These recreational spaces will provide opportunities for therapeutic engagement, social interaction, fitness and leisure for the elderly and differently-abled, thereby integrating health, wellness and recreation into a holistic framework of community development.

Plot Area	Ownership	Survey Details
.0033sq.km	Government	773(p)

31.16.2 Community halls

Community halls play an important role in strengthening social interaction, conducting welfare activities, and hosting community events. Currently, Adoor town has only two community halls, which are insufficient to meet the growing needs of its residents.

Key Components

- Construction of four additional community halls in identified locations.
- Provision of basic infrastructure such as seating, sanitation facilities, and multipurpose spaces.
- Ensuring accessibility for differently-abled persons.

31.16.3 Own building for Anganawadies

Anganwadis are the backbone of early childhood care, nutrition, and pre-primary education in the town. Currently, 14 Anganwadis are operating in rented buildings, lacking adequate space and facilities. Establishing dedicated buildings will improve service delivery and ensure a child-friendly learning environment.

Key Components

- Construction of new purpose-built Anganwadi centers for 14 units.
- Provision of child-friendly infrastructure including classrooms, play areas, toilets, and kitchens.
- Ensuring safe drinking water and hygiene facilities.
- Space for health check-ups and community-level nutrition programs.

31.16.4 Equipment to all Anganawadies

Quality early childhood education requires not only proper buildings but also modern play and learning equipment. Currently, most Anganwadis lack adequate resources to ensure holistic child development. Provision of equipment will enhance both the learning environment and the health of children.

Key Components

- Supply of modern indoor and outdoor play equipment.
- Educational tools such as puzzles, charts, activity kits, and storybooks.
- Child-sized furniture for safe and comfortable seating.
- Basic kitchen equipment for nutrition and mid-day meal programs.

31.16.5 Women Development

Women play a vital role in the socio-economic development of the town. Strengthening women's participation in livelihood activities through skill development, entrepreneurship, and collective action is essential for inclusive growth.

Key Components

- Establishment of small-scale industrial units in all wards.
- Involvement of Kudumbashree or similar women's collectives in managing units.
- Training programs for capacity building, skill enhancement, and entrepreneurship.
- Creation of a centralized market facility for product display and sales.

31.16.6 Proposed Women Skill Development Centre

To promote inclusive growth and empower women through education, training, and employment opportunities, establishment of a Women Skill Development Centre is proposed.

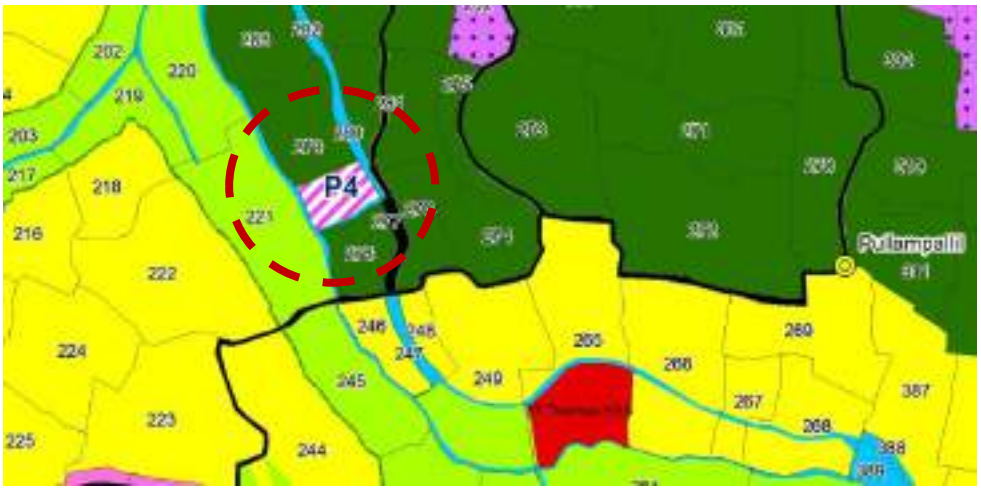






Figure 31.34 Location, Existing condition and Model sketches of Women skill development

The centre will function as a dedicated hub for capacity building, entrepreneurship development, and livelihood enhancement for women of different age groups and socio-economic backgrounds. Training programs will focus on both traditional and modern skills—ranging from tailoring, handicrafts, food processing, and wellness services to digital literacy, IT-enabled services, e-commerce, and start-up incubation.

Special emphasis will be given to supporting women from marginalized sections, ensuring their access to resources, mentoring, and market linkages. The facility will also house a common production-cum-display centre, enabling women entrepreneurs to showcase and sell their products locally and through online platforms. Child-care support, counseling services, and tie-ups with financial institutions will further strengthen the initiative. By creating a safe, supportive, and resourceful environment, the Women Skill Development Centre will not only enhance economic independence but also contribute to the social empowerment and leadership of women in Adoor. Location and model sketches of the proposal is shown in Figure 31.34.

Plot Area	Ownership	Survey Details
.0039 sq.km	Private	279(p)

31.16.7 Child Care Centre

Child care facilities are essential to support working parents and ensure the healthy development, safety, and early education of children. Establishing dedicated child care centers in the town will improve family welfare and social wellbeing.

Key Components

- Establishment of a modern child care center with safe and hygienic infrastructure.
- Provision of trained caregivers and early childhood educators.
- Facilities including play area, nutrition support, medical check-up space, and learning materials.
- Flexible timings to support working parents, especially women in employment.

31.16.8 SC/ST Development

Special initiatives are required for the socio-economic upliftment of Scheduled Castes and Scheduled Tribes (SC/ST) communities in Adoor. Focused interventions in education, skill development, and entrepreneurship will help in enhancing their employability and economic independence.

Key Components

- Training programmes for personality development to prepare candidates for competitive examinations, tests, and interviews.
- Skill-oriented training for servicing of mobile phones, computers, umbrellas, food processing, and similar activities.
- Subsidies and financial support for establishing small-scale industrial units.

- Special coaching and career guidance programs.

31.17 Governance

Governance plays a pivotal role in ensuring effective urban management and sustainable town development. In Adoor, the existing municipal office, constructed in 1960, has become inadequate to meet the present-day functional requirements and the growing demand for public services. To deliver citizen-centric services efficiently and strengthen institutional performance, upgrading the municipal office infrastructure is essential. Additionally, nearly half of the taluk-level offices continue to function in rented buildings, which limits service quality, accessibility, and inter-departmental coordination. Strengthening governance infrastructure and institutional capacity is therefore crucial to improve efficiency, transparency, and responsiveness in urban administration.

31.17.1 Municipal Office Complex

The existing municipal office in Adoor town centre is facing severe limitations due to inadequate space, increasing functional requirements, and the growing problem of traffic congestion in the core area. To address these challenges and to improve administrative efficiency, it is proposed to establish a new Municipal Office Complex near the Adoor bypass. The proposed facility will be designed as a modern, eco-friendly civic centre, equipped with sufficient office space, public service counters, meeting halls, and digital service facilities to cater to the evolving needs of citizens. Relocating the office to the bypass area will ease pressure on the congested town centre while ensuring accessibility for residents across the municipality.

In conjunction with the municipal office, an Integrated Municipal Bus Stand is also proposed within the same campus, creating a multi-functional civic hub. This will streamline public transport, reduce traffic bottlenecks in the central area, and improve connectivity to regional destinations. Ancillary facilities such as parking, green open spaces, and public amenities will be incorporated to enhance user convenience. This combined civic and transport node is envisioned not just as an administrative centre, but as a landmark institution of Adoor's future growth, aligning governance, mobility, and urban development in a single, efficient, and people-friendly space

Key Components:

- Administrative offices for municipal departments
- Conference halls and citizen service counters
- Digital governance and ICT-enabled infrastructure
- Parking facilities and open spaces
- Disaster-resilient building design

31.17.2 Detailed Town Planning (DTP) Scheme Proposals

Detailed Town Planning Schemes (DTPS) or Local Area Plans are essential tools to translate the Masterplan into implementable projects at the micro level. These schemes enable systematic development of growth nodes and commercial hubs while ensuring organized land use, infrastructure provision, and urban design improvements. Therefore, Preparation of DTP Schemes/Local Area Plans are proposed for Bypass Road, Parakode Market area, Central Toll Junction, High School Junction and Revenue Tower and surroundings. The DTP schemes can ensure,

- Reorganization of land use to promote mixed-use development and efficient utilization of land.
- Integration of road widening, pedestrian pathways, parking facilities, and public transport nodes.
- Provision of urban design elements such as open spaces, landscaping, and heritage-sensitive development controls.
- Inclusion of utility corridors for water supply, drainage, electricity, communication lines, and waste management systems.



CHAPTER 32
DISASTER RISK REDUCTION, MITIGATION & CLIMATE ADAPTATION

32.1 Introduction

Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) are critical components of Adoor Municipality's resilience strategy. Given the increasing frequency and intensity of hazards such as heatwaves, droughts, lightning, and localized flooding, it is essential to implement proactive measures to minimize risks and ensure long-term sustainability. This chapter outlines the strategies and interventions required to enhance disaster resilience, including non-structural and structural measures, as well as targeted proposals for vulnerability reduction and climate adaptation.

32.2 DRR & Climate Change Adaptation Strategies, Actions and Projects

Adoor Municipality's approach to DRR includes a combination of non-structural and structural measures aimed at reducing hazard vulnerability and improving community preparedness (Figure 32.1). The following strategies align with the Municipality's Disaster Management Plan and Kerala State Disaster Management Authority's (KSDMA) guidelines.



Figure 32.1 Proposed disaster risk reduction strategies of Adoor Town

Structural interventions designed to mitigate physical risks and enhance long-term resilience. Complementing these are non-structural strategies strengthen institutional capacity and community readiness. Collectively, these measures establish the foundation of a resilient and sustainable urban environment, aligned with the broader goals of climate adaptation and disaster risk reduction.

32.2.1 Non-Structural Measures

Non-structural measures focus on policy, awareness and capacity-building initiatives to strengthen community preparedness and reduce disaster risks. Key initiatives are shown in Figure 32.2



Figure 32.2 Proposed non- structural measures for risk reduction in Adoor Town

32.2.1.1 Public Awareness and Education

Conducting regular disaster awareness programmes, workshops, and mock drills for schools, businesses, and community groups. Since flood and landslide are not a big threat in Adoor, emphasis should be given to lightning awareness and use of surge protectors in households to prevent equipment damage. Inadequate or improper Solid Waste Management would contribute to urban flooding. The importance and need for maintaining surface drainage channels and drains should be an integral component of disaster awareness programmes.

To be implemented in coordination with Adoor Municipality, District Disaster Management Authority, Educational institutions and Local community organizations.

32.2.1.2 Early Warning Systems (EWS) & Preparedness

Strengthening meteorological data collection and communication networks to provide timely warnings for heatwaves, lightning, and potential floods. The SDMA through DDMA will be issuing early warnings and necessary guidelines for preparedness. The municipality shall establish a systematic approach to ensure the dissemination of these contents to the last line. To enhance the town's readiness, seven key interventions are proposed as shown in Figure 32.3.



Figure 32.3 Proposed interventions in development of early warning and preparedness

Effective coordination between Adoor Municipality, District Disaster Management Authority, Police, Fire & Rescue Services and Local community organizations shall be ensured for implementation.

32.2.1.2.1 Preparedness Measures

Preparedness measures form a critical part of Disaster Risk Reduction (DRR) by ensuring communities, households, and institutions are equipped to respond effectively before, during and after disaster events. These measures emphasize awareness, capacity-building, systematic

readiness to reduce risks and enhance resilience. Preparedness measures are an integral part of Disaster Risk Reduction (DRR), designed to strengthen the resilience and ensure timely coordinated action before, during and after disaster events.

Table 32.1 Preparedness measures

Phase	Community Level	Household Level
Before an Event (Mitigation & Preparedness Phase)	• Establish community-based early warning systems using mobile alerts, sirens, social media and local networks. • Conduct regular drills, evacuation simulations and first-aid training. • Pre-position essential relief materials at safe and accessible locations.	• Maintain emergency kits with food, water, medicines, flashlights and important documents. • Prepare evacuation plans and ensure all family members are aware of their roles.
During an Event (Response Phase)	• Activate trained emergency response teams. • Coordinate safe evacuation to designated shelters. • Manage relief camps with food, water, sanitation, medical care and psychosocial support. • Provide real-time communication on evacuation routes and hazard updates.	• Follow evacuation protocols and move to designated shelters. • Adopt precautionary measures during heatwaves (hydration, indoor safety, cooling methods).
After an Event (Recovery Phase)	• Conduct rapid damage and needs assessment. • Distribute relief supplies and provide psychosocial support. • Initiate community restoration of infrastructure. • Carry out post-disaster drills and evaluations to improve future preparedness.	• Inspect homes for damage and hazards. • Access counselling and social support services. • Rebuild using disaster-resilient materials and updated building codes, availing government relief schemes where applicable.

Implementation to be carried out through coordinated efforts of Adoor Municipality, District Disaster Management Authority, Police and Fire & Rescue Services, Educational institutions, and community-based organizations.

32.2.1.2.2 Emergency Response team

In line with the directives of the Local Self Government Department, Adoor Municipality has constituted ward-level Emergency Response Teams (ERTs) as an integral component of its disaster preparedness framework. Functioning under the guidance of the Municipal Disaster Management Cell, these teams are entrusted with tasks such as dissemination of early warnings, coordination of evacuation, provision of rescue and medical support, and management of relief and shelter operations. To enhance the municipality's disaster risk reduction capacity, regular training, capacity-building initiatives, mock drills, and the strengthening of rapid response mechanisms shall be undertaken.

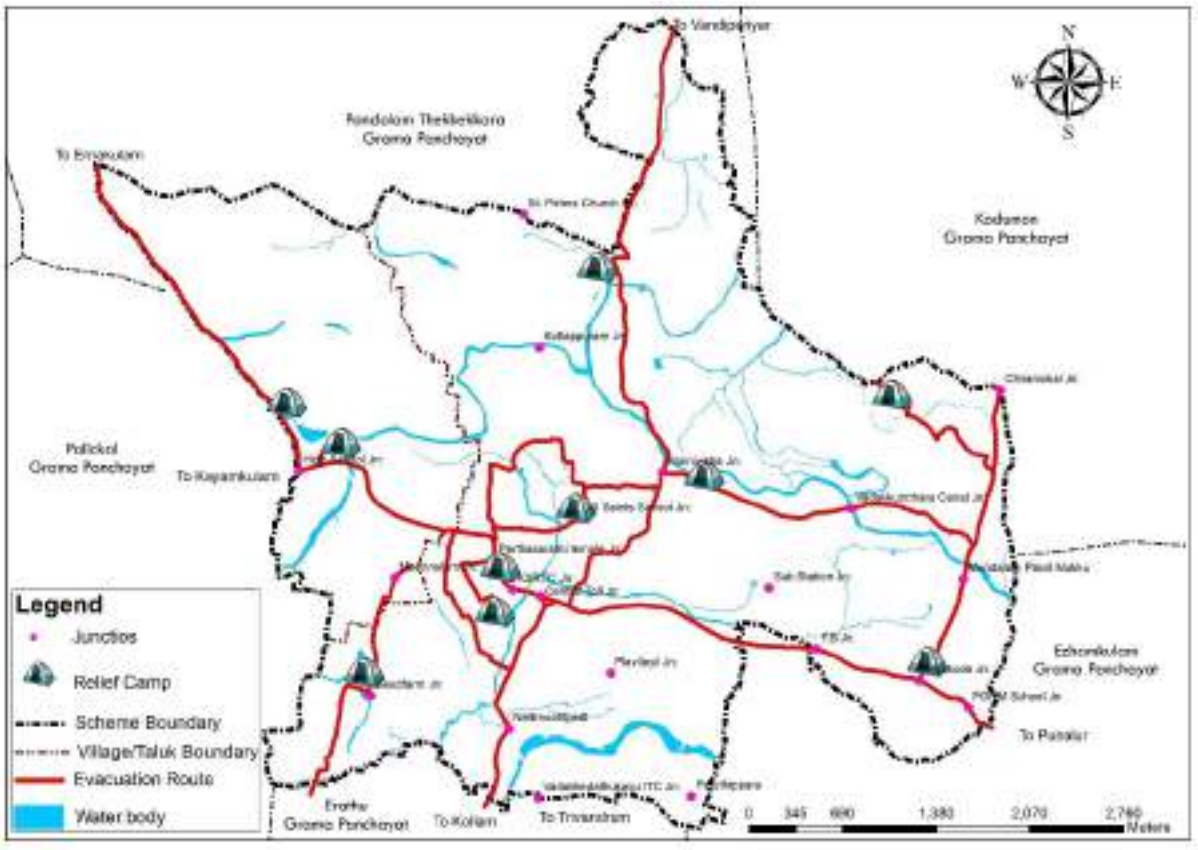


Figure 32.4 Evacuation Routes and Relief camp

32.2.1.2.2.1 Relief Camps

Relief camps are integral to disaster management, providing temporary shelter and essential services such as food, water, sanitation, medical care, and psychosocial support. In Adoor, safe

and accessible elevated sites have been pre-identified for their rapid conversion into functional shelters. The locations are detailed in Table 32.2 and mapped in Figure 32.4

Table 32.2 Relief Camps

Sl.No.	Name of the institution and location	Rooms available	Number of people that can be accommodated
1	Town UPS Adoor	30	100
2	Govt. L. P. S. Munnalam	10	50
3	Govt. L. P. S. Karuwatta	10	50
4	Chiranikkal Welfare School	10	50
5	Govt. L. P. S. Parakode	10	50
6	Govt. L. P. S. Pannivizha East	8	40
7	Govt. L. P. S. Pannivizha, Anandapally	9	45
8	Marthoma Youth Center, Karuwatta	20	300
9	St. Mary's M.M.G. H. S. S.	20	100
10	All Saints Public School, Adoor	25	250

32.2.1.2.2.2 Mass gathering venues

Community halls, auditoriums, large school campuses, religious institutions, and sports grounds shall function as designated mass gathering venues for disaster management, supporting relief distribution, health services, grievance redressal, information dissemination and temporary logistical operations. These venues, strategically located near major roads, helipads, storage facilities and hazard-prone areas, shall be integrated into the town's emergency response system with defined roles and protocols. Their planning and use shall incorporate essential standards including sanitation and safe water supply, power backup, universal accessibility, structural and fire safety, ventilation and waste management, secure storage for relief materials and clear evacuation routes. The identified relief camps shown in Figure 32.4 may be converted into such venues as required.

32.2.1.2.2.3 Safe Parking Zones

Safe parking zones are designated areas on elevated, non-flood-prone sites to safeguard vehicles during prolonged flooding and ensure post-disaster mobility. Identified locations such as school

grounds, stadium premises, and open public lands are temporarily repurposed during emergencies. These zones shall be clearly marked, maintained, and integrated into the town's emergency communication system to facilitate orderly relocation of vehicles. The identified relief camps shown in Figure 32.4 may be converted into such venues as required.

32.2.1.2.2.4 Livestock Shelters

Livestock shelters are planned in elevated and accessible locations, preferably near relief camps or agricultural support centers, to protect animals during floods or landslides. These shelters shall be equipped with temporary enclosures, feed storage, clean water, and veterinary support. Community awareness and training on livestock evacuation are integral to preparedness measures. Certain identified safe parking areas may also be repurposed as livestock shelters during emergencies. The identified relief camps shown in Figure 32.4 may be converted into such venues as required.

32.2.1.2.2.5 Evacuation routes

Evacuation routes are critical for ensuring safe and organized movement from high-risk zones to designated shelters during hazard events. These routes connect vulnerable wards, low-lying flood-prone areas, landslide-prone slopes, and densely populated pockets to relief camps, higher grounds, open spaces and public buildings. The proposed evacuation routes are mapped and shown in Figure 32.4

32.2.1.3 Community-Based Disaster Risk Management (CBDRM)

Establishing ward-level volunteer teams trained in first aid, search and rescue and emergency response. The existing CBDRM measures must be strengthened and updated periodically. Yearly review and capacity building activities must be carried out with the inputs of DDMA.

32.2.1.4 Land Use Planning and Zoning Regulations

Enforcing construction guidelines and restricting development in hazard prone and ecologically sensitive areas.

32.2.1.5 Climate-Smart Agriculture Initiatives

Promoting drought-resistant crops and sustainable irrigation techniques to ensure food security amid changing climate pattern. This should be done in association with the Department of Agriculture.

These non-structural measures are essential for reducing disaster risks and enhancing community resilience, particularly in vulnerable communities. By combining these measures with structural measures, communities can develop a comprehensive approach to DRR.

32.2.2 Structural Measures

Structural measures for Disaster Risk Reduction (DRR) comprise physical infrastructure and engineering interventions aimed at reducing the exposure and vulnerability of the built environment to natural and human-induced hazards. These measures are designed to control, resist, or withstand the adverse impacts of disasters while safeguarding lives, property, and critical infrastructure. In the context of Adoor Town, structural interventions include the development of stormwater drainage and flood control systems, strengthening and retrofitting of public buildings and lifeline infrastructure, slope stabilization in vulnerable areas, construction of retaining walls and embankments, promotion of disaster-resilient housing, urban greening for heat island mitigation, and provision of fire safety and emergency access infrastructure. Collectively, these interventions enhance the town's capacity to cope with disaster risks and support long-term resilience. The proposed structural measures are illustrated in Figure 32.5

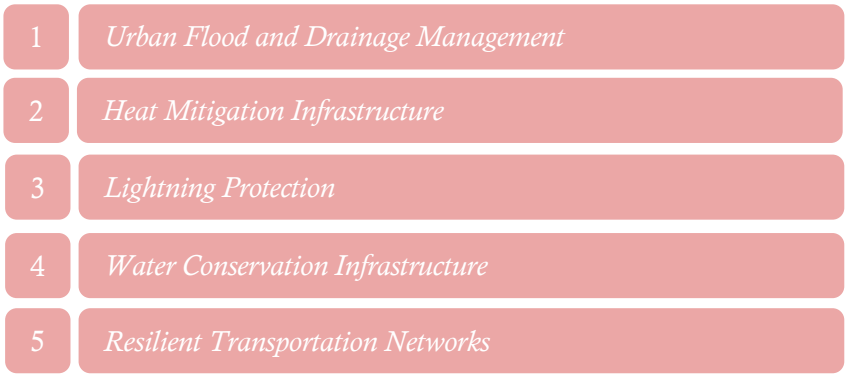


Figure 32.5 Proposed key structural measures for Disaster risk reduction in Adoor Town

32.2.2.1 Urban Flood and Drainage Management

Some key structural measures that can be adopted include upgrading stormwater drainage systems, regular cleaning and maintenance of drainage lines, desilting canals, and constructing embankments along flood-prone areas like Pallikkal Thodu etc. as provided in the Drainage Management Plan for Adoor (2025).

32.2.2.2 Heat Mitigation Infrastructure

Implementing green cover enhancement through various measures, including planting and maintaining trees in urban areas, implementing green roofs on buildings, creating and maintaining urban parks, and rejuvenating water bodies by restoring and maintaining existing ponds and rivers, restoring and maintaining urban wetlands, and creating and maintaining urban water features, such as fountains and ponds. Additionally, other urban cooling strategies can be employed, including implementing cool pavement, such as reflective or permeable pavements, to reduce the urban heat island effect.

Community engagement and participation are essential for the successful implementation and maintenance of heat mitigation infrastructure. Regular monitoring and evaluation of heat mitigation infrastructure are necessary to ensure its effectiveness and identify areas for improvement.

The study on urban heat island effect in Adoor town has identified specific hotspots within the Municipality. Figure 32.6 shows the Urban Heat Island hotspots identified in Adoor Municipality. To effectively mitigate the effects of heat islands, the following targeted proposals are recommended for these identified hotspots.

• *Location A and C:* Location A is the city center with dense buildings and location C is mixed open spaces and built-up areas. It is evident that, in these areas, the built-up area is high and the tree cover is negligible. Increasing tree cover wherever possible can reduce UHI effect. In case of limited space, built up area may be used as heat sinks. Heat absorption in built up areas can be done by

1. Green roofs – Act as heat sinks.
2. Solar energy production – Acts as heat sinks and produces green energy. Explore the possibility of both these methods in public as well as private buildings.

• *Location B:* It is a clear-felled rubber plantation. A previously vegetated area now in a fallow phase. If rubber cultivation or any other cultivation is resumed, green cover will be reinstated and UHI effect will be reduced considerably.

• *Location D:* This is an open space. Any proposal will depend on whether the space is open round

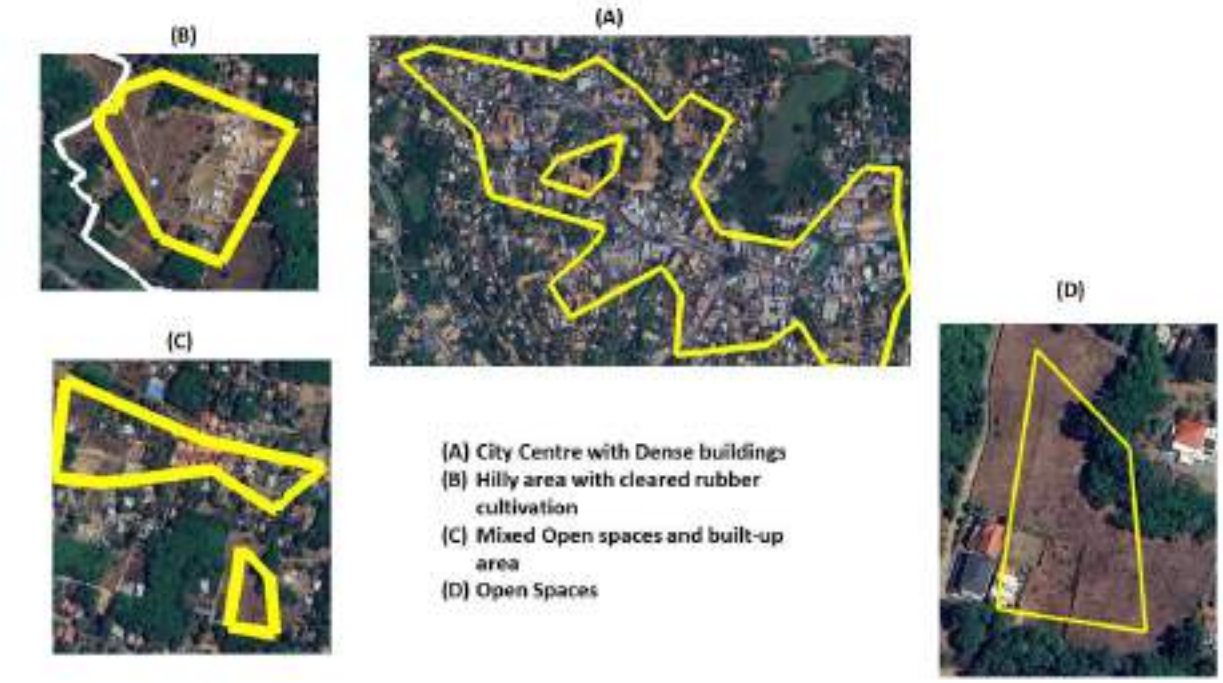


Figure 32.6 Urban Heat Island hotspots identified in Adoor Municipality

the calendar. Appropriate measures such as greening, water-based cooling etc. can be provided considering the ownership and land use.

32.2.2.3 Lightning Protection

Lightning protection is a vital component of disaster risk reduction, ensuring the safety of people, property, and essential infrastructure from lightning strikes. The protection shall be achieved through the installation of lightning arresters in vulnerable structures such as public buildings, schools, high-rise structures, heritage sites, and designated mass gathering venues. Open spaces and frequently used public areas shall also be equipped with appropriate safety provisions to minimise exposure risks.

Public buildings located within lightning-prone zones identified in the land use plan shall be prioritised for immediate protection, while all new constructions in such zones shall mandatorily adopt lightning protection measures in accordance with the building codes and safety standards. These measures shall be supported by regular inspection and maintenance protocols to ensure continued functionality.

In addition, lightning protection shall be complemented with public awareness initiatives. Warnings, alerts, community education on safe practices, and targeted awareness programmes in schools and public institutions shall be implemented to reduce vulnerability and strengthen preparedness.

32.2.2.4 Water Conservation Infrastructure:

Water conservation infrastructure is critical for ensuring sustainable water management and building resilience against drought and seasonal scarcity in Adoor Town. Key measures include the integration of rainwater harvesting systems in public, institutional, commercial, and residential buildings; development of groundwater recharge structures such as recharge pits, percolation tanks, and wells; and creation of reservoirs, ponds, and community storage tanks to secure water during dry periods. Water-sensitive urban design approaches, including permeable surfaces, infiltration zones, and bio-swales, shall be adopted to reduce surface runoff and enhance percolation, while the restoration of ponds, canals, and wetlands will serve as both ecological buffers and water storage assets. In addition, efficient water use infrastructure such as dual plumbing, greywater reuse, and low-flow fixtures shall be promoted in new developments. Collectively, these measures will strengthen the town's capacity to conserve water, reduce vulnerability to drought, and ensure long-term sustainability of water resources.

32.2.2.5 Resilient Transportation Networks

Theses are critical for ensuring the continuity of emergency response services and maintaining economic activity during extreme weather events. Strengthening roads, bridges, and culverts is

essential for building resilient transportation networks that can withstand extreme weather events and ensure continuity of emergency response services.

32.2.3 Proposals for Vulnerability Reduction

Proposals for vulnerability reduction aim to address the social, economic, and environmental factors that contribute to the vulnerability of populations to climate change. Reducing vulnerability involves a mix of policy interventions and targeted projects to safeguard high-risk communities. Key proposals are shown in Figure 32.7



Figure 32.7 Proposals for Vulnerability Reduction

32.2.3.1 Protection of Vulnerable Populations

Protection of vulnerable populations is a key component of disaster risk reduction, with special attention to groups such as the elderly, children, and outdoor workers who are more exposed to heat stress and lightning hazards. Targeted programmes shall be implemented to safeguard these groups through shaded rest areas, cooling centres, awareness campaigns, and timely early warning alerts, along with protective infrastructure in public spaces and institutions. Slums and high-density residential areas, which are more susceptible due to inadequate living conditions, shall be prioritised for such interventions. These measures shall be supported by strengthened public health infrastructure, including mobile health units, first-aid centres, and emergency response facilities, to ensure timely medical assistance and reduce disaster-related health risks. Collectively, these actions will improve resilience, equity, and safety for the most vulnerable sections of Adoor's population.

32.2.3.2 Affordable Climate-Resilient Housing

Affordable climate-resilient housing is a critical aspect of adapting to the impacts of climate change. Incentivizing heat-resistant building designs in new housing projects can help reduce the vulnerability of communities to extreme weather events. The idea of constructing green buildings with energy self-sufficiency must be promoted. So as to reduce energy consumption, greenhouse gas emissions, and operating costs, while improving occupant health, productivity, and comfort.

Laurie Baker's projects, which utilised cost-effective construction techniques, natural ventilation, passive solar design and locally available materials stand as enduring models of sustainable architecture. Drawing from these best practices, housing development in Adoor shall integrate

sustainability, affordability, and resilience to strengthen long-term climate adaptation, disaster risk reduction, and quality of life for all residents.

32.2.3.3 Safe Shelter Development

This involves designating and retrofitting emergency shelters to accommodate displaced populations during disasters. This includes assessing existing structures, renovating and upgrading them, and designating new shelters with safety, accessibility, and capacity in mind.

32.2.4 Proposals for Climate Change Adaptation

Adoor Municipality, in coordination with specialized agencies, the District Disaster Management Authority (DDMA), and relevant Government departments, shall adopt forward-looking climate change adaptation strategies aimed at mitigating long-term risks and enhancing the town's resilience. These measures are intended to safeguard natural resources, strengthen ecological systems, and ensure socio-economic sustainability in the face of changing climate conditions. Key adaptation measures are shown in Figure 32.8



Figure 32.8 Proposals for Climate Change Adaptation

32.2.4.1 Integrated Water Resource Management

Adopt a comprehensive water management approach through watershed conservation, rainwater harvesting, and regulated groundwater extraction. Initiatives will focus on preventing water scarcity, enhancing water security, and ensuring equitable distribution of water resources for domestic, agricultural, and industrial uses.

32.2.4.2 Resilient Ecosystem Management

Promote large-scale afforestation, urban greening, and biodiversity conservation programs while protecting existing wetlands, riverbanks, and natural drainage systems. Efforts will also prioritize the restoration of degraded landscapes to strengthen natural disaster buffers and improve the ecological balance of the municipality.

32.2.4.3 Renewable Energy Adoption

Encourage the transition to clean energy by promoting rooftop solar installations, decentralized energy systems, and energy-efficient public infrastructure. These interventions aim to reduce

dependency on fossil fuels, lower carbon emissions, and contribute to long-term energy security and climate mitigation goals.

32.2.4.4 Climate-Resilient Livelihoods

Support vulnerable communities, particularly those dependent on climate-sensitive sectors such as agriculture and fisheries, through skill development, capacity building, and alternative income-generating opportunities. Special emphasis will be given to promoting sustainable farming practices, value addition in local products, and diversification of livelihoods to reduce climate-related vulnerabilities.

32.2.5 Spatial proposals for Climate change adaptation and Vulnerability reduction

The spatial proposals have been formulated to integrate climate change adaptation, ecological restoration and community resilience within the built environment. These proposals are not isolated interventions but interconnected systems that contribute to disaster risk reduction and sustainable development. Spatial projects provide targeted interventions for flood control, urban cooling, biodiversity conservation, and livelihood diversification. Land use zoning embeds resilience into the long-term structure of Adoor by safeguarding fragile landscapes and regulating development. Together, these proposals strengthen long-term climate resilience and enhance the quality of life in Adoor Town.

32.2.5.1 Spatial Projects for Climate Change Adaptation and Vulnerability Reduction

The spatial projects mitigate risks of heat, flooding, drought, and ecological loss. They integrate ecological preservation, hazard mitigation, and sustainable development into the town's fabric. Key areas of focus include reducing the Urban Heat Island effect, conserving sensitive landscapes, and promoting adaptive reuse.

32.2.5.1.1 Aquatic Complex and Cultural Center

Functions as a flood-mitigating and water-sensitive infrastructure, managing stormwater while providing safe recreational and cultural spaces. By integrating water-sensitive urban design, it reduces local flood risks and prevents waterlogging during heavy rainfall. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.9



Figure 32.9 Aquatic Complex and Cultural Center

32.2.5.1.2 Transit Resting Hub

Acts as a climate-adaptive shelter for commuters exposed to heat waves and extreme weather. By reducing heat stress, it safeguards vulnerable populations and ensures continuity of mobility during adverse climatic events. The Municipal Council has identified this as a priority project. Therefore, the details of the project-including project components, need, aim and objectives, project cost components and implementation mechanism etc., are detailed in Chapter 33. The Location is shown in Figure 32.10



Figure 32.10 Transit Resting Hub

32.2.5.1.3 Crematorium and Bio-Park

Provides a low-emission cremation facility with integrated green cover. The bio-park reduces air pollution, absorbs excess heat and acts as an urban green lung that enhances resilience against heatwaves and poor air quality. The Municipal Council has identified this as a priority project. Therefore, the details of the project-including Project components, need, aim and objectives, project cost components and implementation mechanism etc., are detailed in Chapter 33. The Location is shown in Figure 32.11



Figure 32.11 Crematorium and Bio-Park

32.2.5.1.4 Agrarian Park and Experience Center

Preserves farmland as a natural buffer against urban sprawl, supporting food security during disruptions. Along with agrarian activities, the park will feature eco-friendly amenities like walkways, viewing decks, rest areas, and interpretation centres, ensuring that the natural wetland ecology is conserved Climate-smart farming practices enhance drought resilience, while community awareness builds capacity for long-term adaptation. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.12



Figure 32.12 Agrarian Park and Experience Center

32.2.5.1.5 TB Hill View Park

Stabilizes hill slopes through eco-park development, preventing erosion, landslides, and runoff hazards during monsoon events. At the same time, it promotes eco-tourism, ensuring sustainable use of fragile terrains. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.13



Figure 32.13 TB Hill View Park

32.2.5.1.6 Happiness Park

To enhance recreational opportunities and promote well-being, a Happiness Park is proposed on the irrigation land near the KIP canal. Designed as a multi-purpose open space, the park will provide a healthy and inclusive environment for relaxation, fitness, and community interaction. Provides shaded, green open spaces that reduce the Urban Heat Island (UHI) effect. By mitigating heat stress, it lowers health risks during heat waves and improve s overall community resilience. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.14

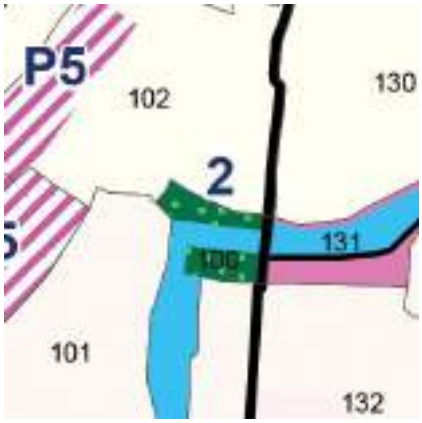


Figure 32.14 Happiness Park

32.2.5.1.7 Valiyakulam Waterfront Wellness Park

The development of a Waterfront Wellness Park around the Valiyakulam pond in Adoor, transforming the area into a vibrant public open space that blends recreation, eco logy, and community well-being. Restores the waterfront to function as a multi-purpose flood buffer, enhancing groundwater recharge and absorbing excess rainfall. Its wellness-oriented facilities combine public safety with community health benefits. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.15



Figure 32.15 Valiyakulam Waterfront Wellness Park

32.2.5.1.8 Sponge Park

The proposed park will include rain gardens, bioswales, permeable pathways, and vegetated basins designed to capture stormwater and gradually release it back into the ecosystem. Native wetland vegetation will be restored to strengthen biodiversity and improve ecological balance. At the same time, carefully designed boardwalks, viewing decks, and seating areas will allow residents and visitors to enjoy the beauty of the wetland without disturbing its natural ch aracter.Acts as a nature-based solution for stormwater management, absorbing and storing excess rainwater. It directly reduces the risk of urban flooding while replenishing aquifers. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.16



Figure 32.16 Sponge Park

32.2.5.1.9 Wetland Park

A Wetland Park is proposed in the Parakode area, making use of the region's natural wetland ecosystem as both a protective and recreational landscape. The park will be designed to conserve the ecological value of the wetlands while creating a safe and attractive public space for the community. Conserves wetlands as natural flood retention zones that regulate stormwater flows, protect biodiversity, and stabilize microclimates. This reduces disaster risks linked to both flooding and drought. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.17



Figure 32.17 Wetland Park

32.2.5.1.10 Agri Sports and Farm Tourism Promotion Zone

The vast paddy fields of Anandappally, once famous for the traditional Maramadi (bull race), hold immense scope for developing into an Agro Sports and Farm Tourism Zone. These lands, with their cultural legacy and rural charm, can be conserved and repurposed for sustainable tourism activities such as agro-sports demonstrations, farm-based adventure games, ox-cart rides, and seasonal paddy cultivation experiences for visitors. Strengthens agrarian



Figure 32.18 Agri-Sports and Farm Tourism Promotion Zone

livelihoods while diversifying the economy to reduce vulnerability during climate-related disruptions. By promoting traditional activities as tourism assets, it creates resilience through livelihood diversification. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.18

32.2.5.1.11 Agri Experience Tourism Area



Figure 32.19 Agri Experience Tourism Area

It is proposed to establish an Experience Centre in the Moonnalam area, utilizing the land of the State Seed Farm's adjoining wetlands. This initiative aims to conserve the unique agrarian landscape while promoting sustainable farming practices, eco-tourism, and community recreation. Builds community awareness and adaptive capacity by connecting visitors with sustainable farming practices and ecological restoration. It promotes food security and ecological resilience. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.19

32.2.5.1.12 Neighborhood Park



Figure 32.21 Neighborhood Park

These parks designed to serve the daily leisure and fitness needs of local communities, es pecially children, elderly, and families. Equipped with features such as walking tracks, play areas, benches, landscaped gardens, and shaded seating, they will offer safe and inclusive environments for social interaction and relaxation. Provides localized safe assembly and open relief spaces during disasters, while functioning as heat mitigation zones during normal conditions. They also strengthen social networks, which are vital for recovery after disaster events. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.20



Figure 32.20 Butterfly Park

32.2.5.1.13 Butterfly Park

Proposal for the development of a Butterfly Park near the Adoor bypass, creating a unique ecological and recreational landmark that will also be visible to passengers traveling along the corridor. Acts as a biodiversity

reserve, maintaining pollination systems critical for food security. Its educational role fosters community participation in conservation and disaster preparedness. It will also contribute to reducing the urban heat island effect, improving air quality, and adding ecological balance within the urban fabric. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.21

32.2.5.1.14 Blossom Garden

The garden will be designed as a colourful landscape showcasing a wide variety of flowering plants, ornamental shrubs, and seasonal blooms, creating a visually enchanting space for residents and visitors. Improves urban cooling capacity through dense native plantations and flowering species. This reduces heat-related disaster risks and enhances mental well-being in post-disaster recovery phases. The specific details and layout of the project elaborated in the Chapter 31 Sectoral Proposals. The Location is shown in Figure 32.9

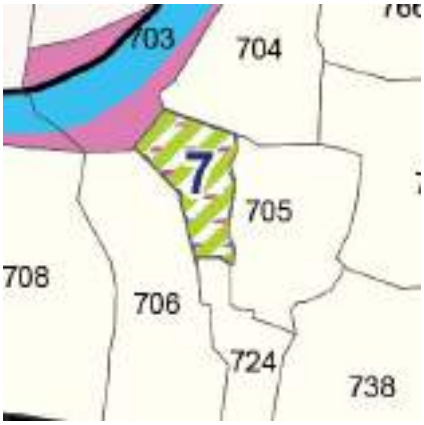


Figure 32.22 Blossom Garden

32.2.5.1.15 Preparation of Drainage Plan

A detailed Drainage study was conducted for Adoor Town and a Proposed Drainage network Plan outlined in Figure 32.23 for Adoor Town. Drainage outfall lines and outfall points are proposed for the Town. The outfalls are proposed mainly towards existing environmentally sensitive areas and drains to prevent waterlogging in other areas.



Figure 32.23 Drainage Plan

32.2.5.2 Land Use Zones for Climate Change Adaptation and Vulnerability Reduction

The designated land use zones serve as a strategic planning framework to integrate climate-responsive functions into the vulnerable landscapes of Adoor. Land use zoning determines where and how development can occur, ensuring that hazard-prone areas are protected, natural buffers are preserved and adaptive land uses are promoted. By demarcating and regulating these zones, it can be ensured that the urban expansion does not compromise ecological stability.

32.2.5.2.1 Environmentally Sensitive Zone

Adoor is endowed with abundant wetlands and water bodies including streams, ponds, and low-lying lands which collectively form a critical natural drainage network. This system plays a vital role in Flood mitigation during monsoons, Groundwater recharge and drought resilience, Sustaining biodiversity and traditional livelihoods



Figure 32.24 Environmentally Sensitive Zone

This zone includes fragile landscapes. Development will be strictly regulated to prevent landslides, flooding and ecological degradation. Conservation-oriented uses like eco-parks, biodiversity reserves, controlled recreations, etc. are encouraged, enabling these areas to serve as natural disaster buffers for the town. The specific provisions are detailed in Chapter 29: Proposed Land Use, and an indicative location of the environmentally sensitive zone is illustrated in Figure 32.24

32.2.5.2.2 Sacred Groves

Traditional sacred groves will be protected and revitalized as micro-reserves of biodiversity and cultural heritage. They act as carbon sinks, groundwater recharge points and temperature regulators, while sustaining indigenous flora and fauna. Their preservation enhances ecosystem resilience and strengthens community-level adaptation to climate variability. The specific provisions are detailed in Chapter 29: Proposed Land Use, and an indicative location of the Sacred Grove location is illustrated in Figure 32.25

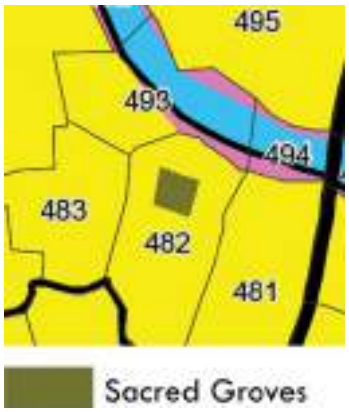


Figure 32.25 Sacred Groves

32.2.5.2.3 Detention and Retention Basins

Strategically located stormwater detention and retention basins will capture excess rainfall, thereby reduce urban flooding risks and enhance groundwater recharge. Designed as multi-

functional landscapes, they will integrate with recreational and ecological spaces, functioning as both critical infrastructure and community assets. The specific provisions are detailed in Chapter 29: Proposed Land Use, and the Detention and an indicative location of Retention basin is illustrated in Figure 32.26



Figure 32.26 Detention and Retention Basins

32.2.5.2.4 Canal Bank Beautification

The KIP canal bank under the jurisdiction of the Irrigation Department is proposed to be developed through canal bank beautification and the promotion of canal-based tourism activities. Canal banks will undergo ecological restoration and beautification using native vegetation, pedestrian pathways, and water-sensitive landscaping. This reduces erosion, encroachment and pollution, while improving water quality and enhancing the town's aesthetic and recreational environment. Canal corridors also function as climate-adaptive linear greenways. The specific provisions are detailed in Chapter 29: Proposed Land Use, and an indicative location of the Canal Bank Beautification location is illustrated in Figure 32.27



Figure 32.27 Canal Bank Beautification

32.2.5.2.5 Green Strips

A green strip is proposed along the sides of waterbodies and wetlands to safeguard these sensitive ecosystems and prevent encroachments. The width of the green strip varies depending on the ecological sensitivity and context—3 metres, 5 metres, or 10 metres—ensuring flexibility while maintaining effective protection. These strips reduce the Urban Heat Island effect, improve air quality, and serve as biodiversity connectors within the urban fabric. In times of disaster, they also act as safe open spaces and ecological buffers. The specific provisions are detailed in Chapter 29: Proposed Land Use and an indicative location of Green Strip is illustrated in Figure 32.28



Figure 32.28 Green Strip

32.2.5.2.6 Waterbodies

The existing waterbodies including the river, natural drains, ponds, and associated channels, are reserved as an 'Existing Waterbody.' This ensures their protection from encroachment and unregulated development while recognizing their ecological and hydrological significance. It will be conserved and rejuvenated as key elements of the town's climate adaptation framework.

Interventions include desilting, embankment strengthening, wastewater treatment and integration with green–blue infrastructure. These waterbodies function as flood storage zones and drought buffers, ensuring water security and disaster resilience. The specific provisions are detailed in Chapter 29: Proposed Land Use and an indicative location of Waterbody is illustrated in Figure 32.29



Figure 32.29 Waterbody

32.2.5.2.7 Agricultural Use Zone

The area reserved for Dry Agricultural use is located in the peripheral parts of the town, predominantly in the northern region, where topographical variations make it more suitable for such cultivation. Agricultural lands will be safeguarded as multi-functional landscapes that provide foo d security, preserve open spaces, and sustain climate-resilient livelihoods. Promotion of organic farming, sustainable cultivation and agro-tourism will reduce ecological vulnerability, diversify rural incomes, and maintain the town's socio-ecological safety net. The specific provisions are detailed in Chapter 29: Proposed Land Use and an indicative location of Agriculture Use Zone is illustrated in Figure 32.30



Figure 32.30 Agricultural Use Zone

32.3 Recommendations for Lightning Prone Areas

The local Disaster Management Plan for Adoor identifies some wards in the town as Lightning prone. The occurrence of thunderstorm and lightning can't be impeded. However, their harmful effects can be minimized through a number of measures.

The guidelines of NDMA and the Kerala State Lightning Action Plan (2022), suggest preventive and mitigation measures for vulnerable buildings in a lighnitng prone area. Details may be seen at https://sdma.kerala.gov.in/wp-content/uploads/2022/05/Kerala_State_LAP_final2022.pdf. More technical information on the subject is available in IS/ IEC 62305.

For the risk reduction from lightning, vulnerable buildings and critical infrastructure shall be subjected to vulnerability assessment. Protection measures could be decided only afterassing the risk of being struck and the potential damage it could cause. A lightning protective system engineer shall undertake such an assessment and propose protective measures.

Following are the recommendations for **lightning prone areas**:

a) All buildings shall have Surge Protection System

b) Following category of buildings shall have adequate Lightning Protection System/ Lightning Shield.

- Where large numbers of people congregate
- Buildings offering essential public services
- Buildings that are located in areas which lightning strokes are prevalent.
- Tall structures and isolated buildings
- Critical infrastructure such as Hospitals and Water treatment plants.
- Heritage buildings and precincts.

The best protective measure is creating public awareness. Refere to the KSDMA published Lightning Awareness brochure for details https://sdma.kerala.gov.in/wp-content/uploads/2018/11/2.Lightning.pdf

32.4 Inference

Adoor Municipality's Disaster Risk Reduction and Climate Change Adaptation framework emphasizes proactive risk mitigation, community engagement, and sustainable infrastructure development. By adopting these strategies, the municipality can build resilience against climate-related hazards and ensure the safety, well-being, and sustainability of its residents for the future.

The mitigation strategies formulated for disaster risk reduction in Adoor are designed with regional relevance, enabling their application not only within the municipal limits but also across surrounding local bodies. By fostering inter-municipal coordination and resource sharing, these measures can contribute to a more integrated and resilient regional framework, ensuring collective preparedness and adaptive capacity against risks.



CHAPTER 33
PRIORITY ACTION PLAN

33.1 Introduction

The Priority Action Plan provides a structured framework of proposed projects/interventions mentioned in chapters 30, 31,& 32 into actionable projects over a defined planning horizon of 20 years. It defines the implementation strategy, outlines the project phasing and highlights priority initiatives, while also detailing the core components of these key projects to facilitate the development of detailed project reports (DPR).

33.2 Implementation Strategy & Project Phasing

Recognizing the need for urban context of town, efficient resource allocations, institutional coordination and manageable execution, the proposed projects/interventions are phased across four stages to ensure steady progress while adapting to evolving urban needs. Each phase is designed to build upon the progress of the previous one, ensuring continuity, scalability, and responsiveness to emerging challenges.

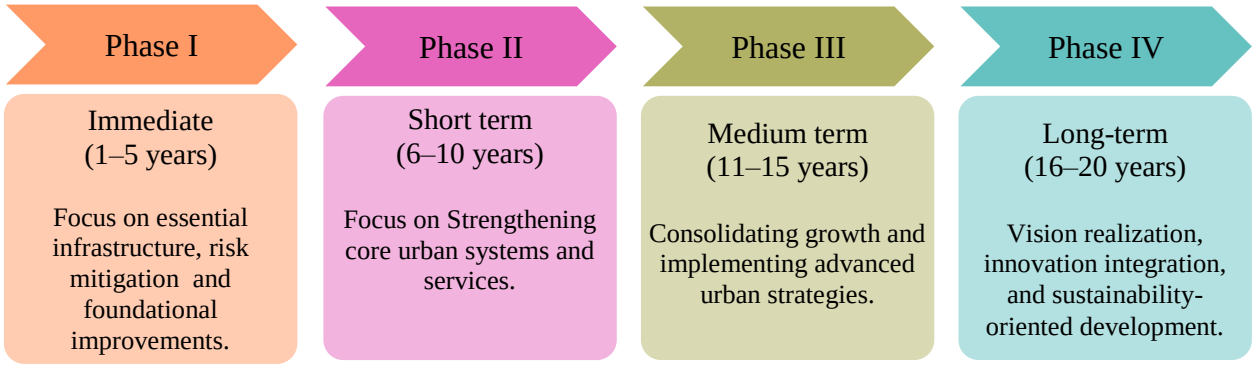


Figure 33.1 Projects Implementation Strategy

The implementation mechanism along with the approximate cost (Project finance/ Fiscal requirement) for each project identified in each phase is presented in Table 33.1 to provide a clear and actionable roadmap.

Table 33.1 Phasing of project

Phase I (Years 1–5)				
Sl. No	Project Name	Sector	Implementation Agencies	Cost Estimate (In Crore)
1	Revitalization of Parakode Market	Trade & Commerce	Municipality	8.0
2	Vending Zone & Food Street	Trade & Commerce	Municipality	3.1
3	Shopping Complex & She Lodge	Trade & Commerce, Special Concerned Areas	Municipality, Social Justice & Women and Child Department	2.0

4	Innovation Hub	Industry	Municipality / Industries Department	10.5
5	Transit Resting Hub	Tourism, Hazard Mitigation & Climate Change	Municipality / Tourism Department	8.0
6	Beautification of Pallickal Riverbank	Tourism, Hazard Mitigation & Climate Change	Municipality/Tourism Department	18.0
7	Pilgrim Tourism Circuit	Tourism& Heritage	Municipality / Tourism Department / Private entrepreneurs	2.5
8	Conservation of Heritage Buildings	Tourism & Heritage	Municipality, Archeological Department	1.5
9	Protection of Irrigation Canals	Agriculture	Revenue & Agriculture Department, Municipality	2.0
10	Value addition of Agro based projects	Agriculture	Agriculture Department, Municipality, Private entrepreneurs	2.0
11	Cultivation in Canal Puramboke land	Agriculture	Agriculture Department, Municipality	0.35
12	Soil Conservation measures	Agriculture	Agriculture Department, Municipality	0.50
13	Establishment of Weather Station	Agriculture	Agriculture Department, Municipality	0.50
14	Modern Slaughter House	Animal Husbandry	Municipality, Animal Husbandry Department,	1.0
15	Pathanamthitta Road Junction Improvement	Transportation	Public Works Department	0.45
16	Pannivizha Junction Improvement	Transportation	Public Works Department	0.18
17	Ananandapally Junction Improvement	Transportation	Public Works Department	0.23
18	New Municipal Bus Stand	Transportation	Municipality	6.15
19	Renovation of KSRTC Bus Station	Transportation	KSRTC	1.0
20	Isolated distribution in elevated area (4 areas)	Water Supply	Kerala Water Authority	2.0
21	Replacement of damaged pipe lines	Water Supply	Kerala Water Authority	1.0
22	Extension of Pipe lines	Water Supply	Municipality, Kerala Water Authority	1.0
23	Street Lighting	Energy	Kerala State Electricity Board, Municipality	1.0
24	Non-Conventional Energy Projects	Energy	Municipality	1.0

25	100% Solid Waste Collection Coverage	Waste Management	Municipality	1.0
26	Awareness Program	Waste Management	Municipality	0.10
27	Biogas Plant	Waste Management	Municipality	0.25
28	Drainage Master Plan	Drainage & Hazard Mitigation & Climate Change	Municipality	1.0
29	Improvement of Infrastructural facilities and modernization of 18 government and aided schools	Education	Municipality, Education Department	4.50
30	Up-gradation of General Hospital	Health	Municipality, Health Department	2.00
31	Turf	Recreation	Municipality	2.50
32	Stadium and Sports Complex	Recreation	Municipality	14.0
33	Gandhi Park Renovation	Recreation	Municipality	1.8
34	Crematorium & Bio Park	Other Civic Amenities, Hazard Mitigation & Climate Change	Municipality	3.5
35	Fire & Rescue Station	Other Civic Amenities	Fire & Rescue Department	4.0
36	Happiness Park	Special Concerned Areas, Recreation, Hazard Mitigation & Climate Change	Municipality	1.0
37	Child Care Centre	Special Concerned Areas	Municipality, women & Child Development	0.50
38	SC / ST Development - Training programs	Special Concerned Areas	Municipality, SC/ST Department	0.25
39	Valiyakulam Waterfront Wellness Park	Environment, Special Concerned Areas, Hazard Mitigation & Climate Change	Municipality	1.0
40	Wetland Park	Hazard Mitigation & Climate Change	KSDMA & Municipality	5
41	Protection of natural water sources	Environment, Hazard Mitigation & Climate Change	Municipality	1.0
42	Protection of ponds and widening of Waterbodies	Environment, Hazard Mitigation & Climate Change	Municipality/ Irrigation Department	1.0

43	Rejuvenation & Restoration of Pallickal River	Environment, Hazard Mitigation & Climate Change	Irrigation Department	12.00

Phase II (Years 6–10)				
Sl. No	Project Name	Sector	Implementation Agencies	Cost Estimate (In Crore)
1	Civic Arcade	Trade & Commerce, Recreation, Hazard Mitigation & Climate Change	Municipality	50.0
2	Urban Hangout Hub	Trade & Commerce, Recreation	Municipality	1.5
3	Industrial Promotion Zone	Industry	Municipality / Industries Department	20.0
4	TB Hill View Park	Tourism, Hazard Mitigation & Climate Change	Municipality / Tourism Department	1.0
5	Canal Bank Beautification	Tourism, Recreation	Municipality	1.0
6	Tourism Circuit	Tourism& Heritage	Municipality / Tourism Department / Private entrepreneurs	2.5
7	Agro farm	Agriculture	Agriculture Department, Municipality	1.0
8	Floriculture	Agriculture	Agriculture Department, Municipality	0.50
9	Vegetable Cultivation	Agriculture	Agriculture Department, Municipality Private entrepreneurs	0.50
10	Bus Stop Upgradation	Transportation	Municipality	0.25
11	Pedestrian overhead path Ways (7Numbers)	Transportation	Municipality	3.5
12	Rain Water Harvesting	Water Supply, Hazard Mitigation & Climate Change	Municipality	0.50
13	Improvement of Power distribution	Energy	Kerala State Electricity Board	5.0
14	Integrated Waste Treatment plant	Waste Management	Municipality, KSWMP	2.0
15	Educational Complex	Education	Education Department	10.0

16	Ayurveda Hospital	Health	Health (Indian System of Medicine) Department	1.00
17	Health Tourism	Health	KTDC, Health (Ayurveda Medicine) Department, Municipality	1.00
18	Fit Life Centre with Leisure Hub	Recreation	Municipality	1.75
19	Town Hall & Parking Plaza	Other Civic Amenities	Municipality	10.0
20	Women Skill Development-Centre	Special Concerned Areas	Municipality, Social Justice & Women and Child Department	1.0
21	Police Aid Post at Parakode	Other Civic Amenities, Special Concerned Areas	Home Department	0.50
22	Protection of sacred groves.	Environment, Hazard Mitigation & Climate Change	Municipality	0.10
23	Municipal Office Complex	Governance	Municipality	6.25

Phase III (Years 11–15)				
Sl. No	Project Name	Sector	Implementation Agencies	Cost Estimate (In Crore)
1	Trade & Expo Pavilion	Trade & Commerce	Municipality	7.7
2	Aquatic Complex & Cultural Centre	Tourism, Hazard Mitigation & Climate Change	Municipality / Tourism Department	3.5
3	Agrarian Park & Experience Centre	Agriculture, Hazard Mitigation & Climate Change	Agriculture Department, Municipality	4.0
4	Agriculture Labour Bank	Agriculture	Agriculture Department, Municipality	1.0
5	Ring Road	Transportation	Municipality	3.5
6	Highway Travel Plaza	Transportation	Municipality	1.0
7	Renovation of KWA office	Water Supply	Kerala Water Authority	0.50
8	Public Comfort Stations / E-Toilets (5 nos)	Waste Management	Municipality	1.5
9	Dental College	Education	Municipality, Education Department	5.00
10	Homeopathic Hospital	Health	Health (Homeopathic Medicine) Department	1.00

11	Playground	Recreation	Municipality	2.50
12	Butterfly Park	Recreation	Municipality	1.0
13	Blossom Garden	Recreation	Municipality	1.0
14	Empowerment Centre	Special Concerned Areas	Municipality, Social Justice & Women and Child Department	1.25
15	Sponge Park	Hazard & Climate Change	KSDMA & Municipality	3

Phase IV (Years 16–20)				
Sl. No	Project Name	Sector	Implementation Agencies	Cost Estimate (In Crore)
1	Agri Sports and Farm Tourism Promotion Zone	Tourism, Agriculture, Hazard Mitigation & Climate Change	Agriculture Department, Municipality	2.5
2	Water Shed Development	Agriculture	Agriculture Department, Municipality	1.0
3	Bio-fertilizer Plant	Agriculture	Agriculture Department, Municipality	1.0
4	Truck Terminal	Transportation	Municipality	1.0
5	Augmentation scheme	Water Supply	Kerala Water Authority	5.0
6	Utilization of surplus land for buildings/other facilities	Education	Municipality, Higher Education Department, Revenue Department	5.0
7	Students Centre	Education	Municipality	2.50
8	Neighborhood Park	Recreation, Hazard Mitigation & Climate Change	Municipality	1.0
9	Town gateway	Recreation	Municipality	0.50
10	Board Game centers	Recreation	Municipality	1.0
11	Own building for Anganvadies (14 nos)	Special Concerned Areas	Municipality, Social Justice & Women and Child Department	0.56
12	Detention/Retention Basin	Hazard & Climate Change	KSDMA & Municipality	2.7

33.3 Identification of Priority Projects

Priority projects refer to specific urban development initiatives (Table 33.2) selected from the phased sectoral proposals that are of immediate importance to the community, with a focus on strengthening infrastructure, enhancing public services, and improving overall quality of life. The nature of these projects is shaped by the unique challenges and aspirations of the town, including economic growth, environmental sustainability, and social equity. Their identification is based on a combination of technical studies, insights from public consultations and seminars, and an understanding of the town's urban context. The final selection is carried out by the municipal council, following deliberations and site inspections undertaken by the Master Plan Committee.

Table 33.2 Priority Projects of Adoor Town

Sl. No	Project Name	Sector
1	Transit Resting Hub	Trade & Commerce, Recreation Tourism, Hazard Mitigation & Climate Change
2	Rejuvenation, Restoration & Beautification of Pallickal River	Hazard Mitigation & Climate change adaptation, Tourism & Recreation, Environment
3	Gandhi Park Renovation	Recreation, Civic amenities, Hazard Mitigation & Climate Change
4	Municipal Stadium & Sports Complex	Recreation
5	Municipal Office Complex & Municipal Bus Stand	Governance , Transportation and Trade & Commerce
6	Revitalization of Parakode Market	Trade & Commerce
7	Municipal Town Hall & Parking Plaza	Other Civic Amenities, Transportation
8	Proposed Fire & Rescue Station	Other Civic Amenities
9	Crematorium & Bio Park	Other Civic Amenities, Recreation
10	Preparation of Drainage Plan	Hazard Mitigation & Climate change adaptation, Drainage
11	Sponge Park	Hazard Mitigation & Climate change adaptation, Recreation

33.4 Details of Priority Projects

This section offers a comprehensive overview of the selected priority projects within the town. It outlines key project information such as a brief description, project location, land ownership details, major components, responsible implementing agencies, proposed implementation mechanisms, estimated costs, and project duration. This information is designed to support the development of Detailed Project Reports (DPRs) and serve as a quick reference for authorities to effectively prioritize initiatives.

33.4.1 Transit Resting Hub

33.4.1.1 Project brief

Need for the Project

Adoor town serves as a key transit node in the regional road transport network, witnessing a high volume of daily commuters and intercity travelers. However, the town currently lacks adequate transit-oriented infrastructure to cater to the needs of travelers, especially facilities for rest, refreshment and parking. With increasing mobility and urbanization, there is a pressing need to establish a well-equipped transit resting hub to improve commuter experience, reduce road fatigue, support last-mile connectivity.

Aim

To transform Adoor into a regional transit hub by developing a sustainable, inclusive, and multifunctional Transit Resting Hub that offers modern amenities for travelers while supporting local entrepreneurship, environmental enhancement, and cultural promotion.

Project Objectives

1. Provide safe, clean, and accessible resting and accommodation facilities for travelers.
2. Improve parking infrastructure with multilevel car parking.
3. Promote local products and social inclusion through dedicated commercial spaces for women, elderly, differently-abled, and SHGs.
4. Enhance tourist appeal with landscaped zones, pedal boating, selfie points, and eco-friendly pathways.
5. Integrate waste management and smart infrastructure for sustainability.
6. Utilize available land resources while conserving the natural waterbody.



Figure 33.2 Existing Condition of proposed Transit Resting Hub Project Area



Figure 33.3 Existing condition of proposed Transit Resting Hub project area

33.4.1.2 Location & Ownership

The Transit Resting Hub project is proposed at a location approximately 200 meters from High School Junction in Adoor, where the MC Road and KP Road, two major State Highways, intersect. (Figure 33.4).



Figure 33.4 Location of Proposed Transit Resting Hub project

Project Area : 0.0121
Land Ownership : Tourism Department & Private
Survey Numbers: 94 (p)

33.4.1.3 Project Components

1. Multi-level car parking
2. Accommodation
3. Resting area with drinking water, Toilets, Locker room and Wi-Fi
4. Cafes and shops, Mini auditorium and Waste collection units
5. Pedal Boating
6. Landscaped area
7. Selfie points
8. Value addition products shop- (Women, Old Age (cultural and heritage products), Differently abled people shop, Commercial shop, Mini library)
9. Earthen pathway
10. Front Gate
11. Designated Vehicular Entry



Figure 33.5 Proposed Transit Resting Hub project – Conceptual design

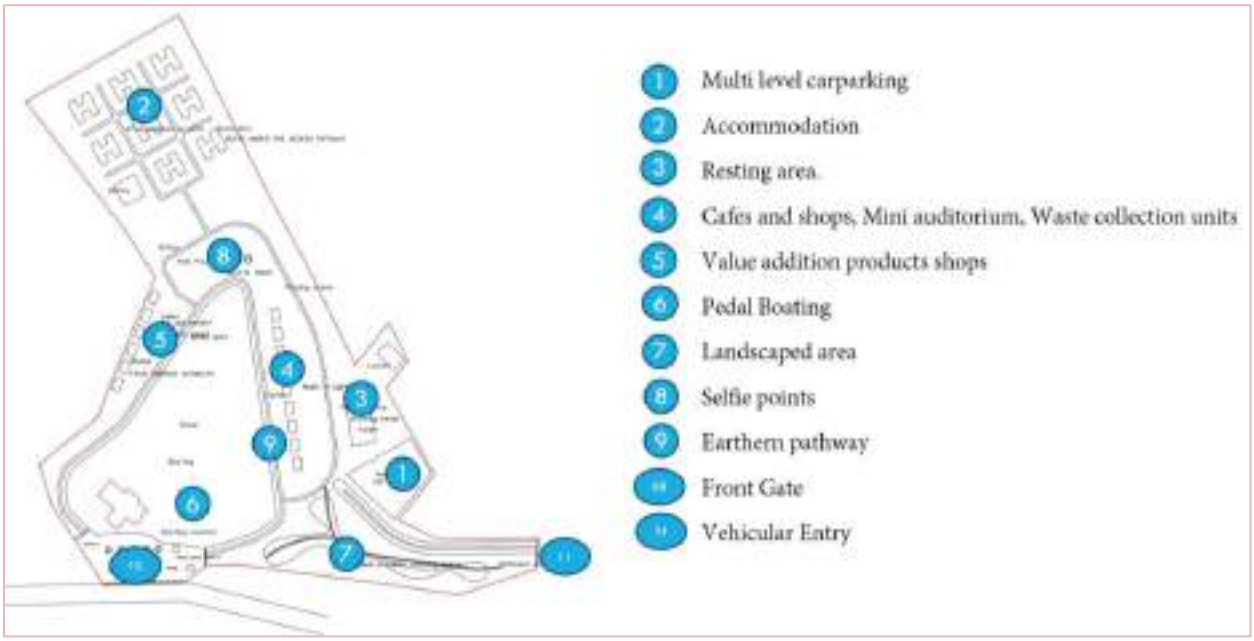


Figure 33.6 Proposed Transit Resting Hub project design – Concept plan

33.4.1.4 Responsible Agencies

Role	Agencies likely to be involved
Nodal Agency	Municipality
Technical Support	Tourism Department, LSGD Planning
Execution	Accredited Landscape Contractors / NGOs, Kudumbashree or local SHGs for maintenance
Possible Funding Options	Central/ State Scheme, Plan Fund, Tourism Development Projects Fund, KIIFB, CSR

33.4.1.5 Suggested Implementation Mechanism

The implementation of the Transit Resting Hub project is proposed through a convergent and phased development approach, integrating resources from government schemes, private investments, and community-based organizations. Core infrastructure such as parking, accommodation, and basic amenities can be undertaken by the local government with support from Central-State-level urban development programs like AMRUT or KSUDP. Commercial elements such as cafes, shops, and value addition product stalls can be developed under a Public-Private Partnership (PPP) model, ensuring both investment efficiency and operational sustainability. Involvement of Kudumbashree units, SHGs, and NGOs is encouraged for managing specific spaces dedicated to women, elderly, and differently-abled entrepreneurs, promoting inclusive economic growth. Eco-sensitive components like earthen pathways and waterfront landscaping must follow environmentally sustainable design guidelines. A phased execution beginning with essential transit infrastructure followed by cultural, commercial, and recreational additions will ensure timely delivery and minimize disruptions.

33.4.1.6 Other Issues to be addressed

Several critical issues must be addressed to ensure the successful implementation of the Transit Resting Hub project. As certain components of the project are proposed on private land, municipality must initiate and complete land acquisition processes within a seven-year timeframe to avoid delays in implementation. Given that parts of the project site fall within wetland areas, the construction must adopt environmentally sensitive design approaches, minimizing ecological disruption and preserving the natural waterbody. Additionally, waste management systems must be monitored efficiently to handle the increased footfall and maintain hygiene standards. As part of enhancing overall accessibility and safety, junction improvement is also proposed at the High School Junction, which serves as a critical node for traffic movement in the area. These interventions are essential to ensure the long-term sustainability, inclusivity, and effectiveness of the project.

33.4.1.7 Project Cost & Period

Sl. No.	Component	Approx. Cost* (Cr)
1	Multilevel Car Parking Facility	2.00
2	Accommodation Units (Dormitories/Rooms)	1.50
3	Resting Area (seating, drinking water, toilets, locker room, Wi-Fi)	0.50
4	Cafes and Shops	0.80
5	Mini Auditorium	0.75
6	Waste Collection and Management Units	0.25
7	Value Addition Shops (Women, Elderly, Differently-abled, Cultural)	0.60
8	Mini Library	0.15
9	Pedal Boating Facility (with safety gear)	0.30
10	Landscaped Area + Earthen Pathways	0.50
11	Selfie Points + Viewing Decks	0.20
12	Front Gate + Signage	0.15
13	Vehicular Entry / Exit Management	0.30

Note: cost calculations are only approximate figures.

Total Estimated Cost: ₹7 crore – ₹8 crore. The priority of the project is coming under 1st phase. The approximate estimated project period will be 3 years.

33.4.2 Rejuvenation, Restoration & Beautification of Pallickal River

33.4.2.1 Project brief

Need for the Project

The Pallickal River plays a vital role in managing the urban floodwaters of Adoor town, acting as the primary natural drainage channel during heavy rains. Over the years, the river has faced

encroachments, pollution, sedimentation, and ecological degradation, severely affecting its flow capacity and flood-mitigating function. With increased urbanization, the frequency and intensity of waterlogging and flash floods in low-lying areas have risen. Therefore, a focused and scientifically guided rejuvenation of Pallickal River is urgently required to restore its hydrological function, ecological health, and capacity to buffer urban floods. At the same time, Adoor faces a shortage of accessible green open spaces and quality recreational areas, with much of the riverbank lying underutilized and prone to littering and neglect.

Addressing these challenges requires a comprehensive river restoration and beautification initiative, which would restore the river's hydrological function and ecological health while also transforming its banks into a vibrant, eco-friendly, and people-oriented public realm. Such an integrated approach will strengthen urban flood resilience, enhance environmental sustainability, and provide much-needed spaces for recreation, tourism, and social interaction, thereby improving overall functionality of Adoor town.

Aim

To rejuvenate & restore the Pallickal River as a resilient urban water system by restoring its natural flow, ecological integrity, and flood-carrying capacity and develop the Pallickal Riverbank into a sustainable, inclusive, and attractive urban green and recreational corridor that serves as both a community space and a tourism asset.

Project Objectives

1. Enhance the flood management capacity of the river through desilting, widening and clearing of obstructions.
2. Prevent future encroachments and ensure regulated buffer zones along the river.
3. Create continuous landscaped pedestrian-friendly riverfronts with seating, shade, and green buffers.
4. Integrate recreational facilities such as walking tracks, cycling paths, children's play zones, and cultural event spaces.
5. Enhance the visual appeal of the riverbanks through thematic landscaping, lighting, and art installations.
6. Support eco-tourism and local economy through designated spaces for handicraft stalls, food kiosks, and cultural performances.
7. Ensure sustainable tourism development without disturbing the natural river ecosystem



Figure 33.7 Pallickal River existing condition

33.4.2.2 Location & Ownership

Pallickal River is located towards the South West side of Adoor town flows from east to west direction through town center (Figure 33.8).

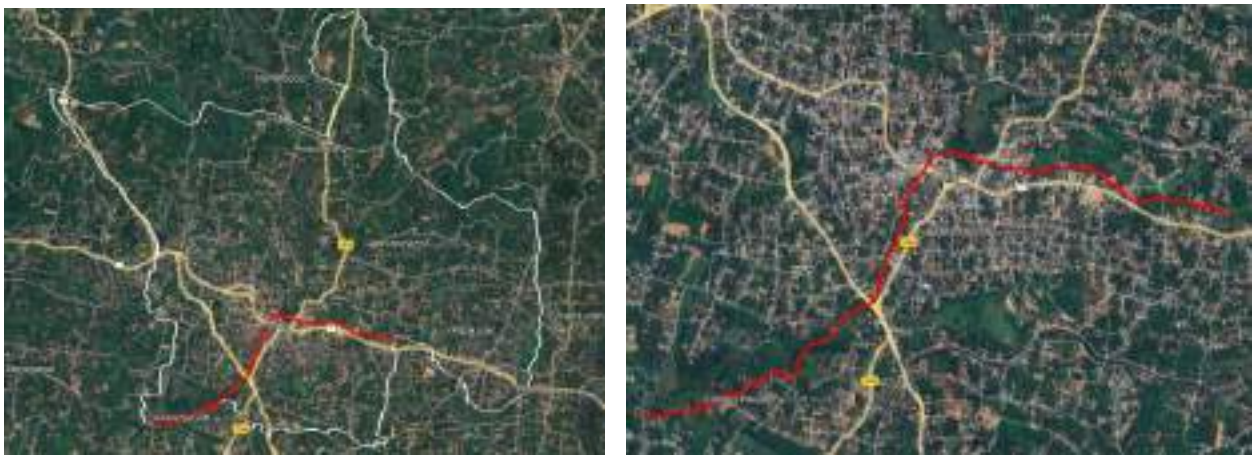


Figure 33.8 Location of Pallckal River

Project Area for rejuvenation & restoration : Length around 4.5 km, Average width 10m
Land Ownership : Government
Survey Numbers: 455,814, 819,818, 341 ,648, 640,634, 628,623,260,257,363,352,508,513,509, 504,367,368,369,493,487,485,484,459,458,457,456,454,453,448,814

The Beautification of Pallickal Riverbank project is proposed at various eight locations of entire Pallickal River stretch with in the town on the both side of the Riverbank. (Figure 33.9).



Figure 33.9 Location of Beautification of Pallickal Riverbank Project.

Beautification Project Area : .0794sq.km
Land Ownership : Irrigation Department, Municipality & Private
Survey Numbers: 181(p), 251(p), 253(p), 256(p), 259(p), 261(p), 262(p), 342(p), 343(p), 350(p), 353(p), 358(p), 359(p), 363(p), 365(p), 366(p), 370(p), 371(p), 433(p), 440(p), 447(p), 449(p), 450(p), 452(p), 460(p), 483(p), 486(p), 488(p), 492(p), 494(p), 503(p), 505(p), 510(p), 511(p), 512(p), 514(p), 515(p), 522(p), 523(p), 622(p), 624(p), 627(p), 629(p), 632(p), 633(p), 635(p), 639(p), 641(p), 646(p), 647(p), 649(p), 650(p), 817(p), 820(p), 825(p), 827(p)

33.4.2.3 Project Components

For Rejuvenation & Restoration of Pallickal River,

1. Undertake cleaning of existing waste, along with desilting and deepening at various sections.
2. Construction of Side wall protection and Weirs to raise water levels at upstream and regulate flow.
3. Carry out a detailed survey to demarcate the Pallickal River alignment, followed by land acquisition for connecting missing links and eviction of any encroachments.
4. Restore missing links to establish continuous connectivity.

For Beautification of Pallickal Riverbank, The town's north-eastern parts exhibit an urban character, while the south-western parts have a semi-rural character. In the north-eastern regions, the projects aim to provide conveniences that address the urban population's requirements. Five locations are identified for urban population which are connected by roads in the north-eastern parts, making them easily accessible. These projects include community facilities, sports facilities, office complexes,

commercial complexes, multiplexes, cycle tracks, and recreational spaces. All these five points are connected through walkable roads to improve the walkability in the town area. In the south-western parts, the projects focus on providing amenities that cater to the semi-rural population's preferences. These include modern agricultural spaces, fish farming spaces, farm houses, and recreational facilities. Component wise proposed conceptual design of each section is mentioned below.



Figure 33.10 Beautification of Pallickal Riverbank Project – Location 1- Conceptual Design.



Figure 33.11 Beautification of Pallickal Riverbank Project – Location 2- Conceptual Design.



Figure 33.12 Beautification of Pallickal Riverbank Project – Location 3- Conceptual Design.



Figure 33.13 Beautification of Pallickal Riverbank Project – Location 4- Conceptual Design.



Figure 33.14 Beautification of Pallickal Riverbank Project – Location 5- Conceptual Design.



Figure 33.15 Beautification of Pallickal Riverbank Project – Location 6- Conceptual Design.



Figure 33.16 Beautification of Pallickal Riverbank Project – Location 7- Conceptual Design.

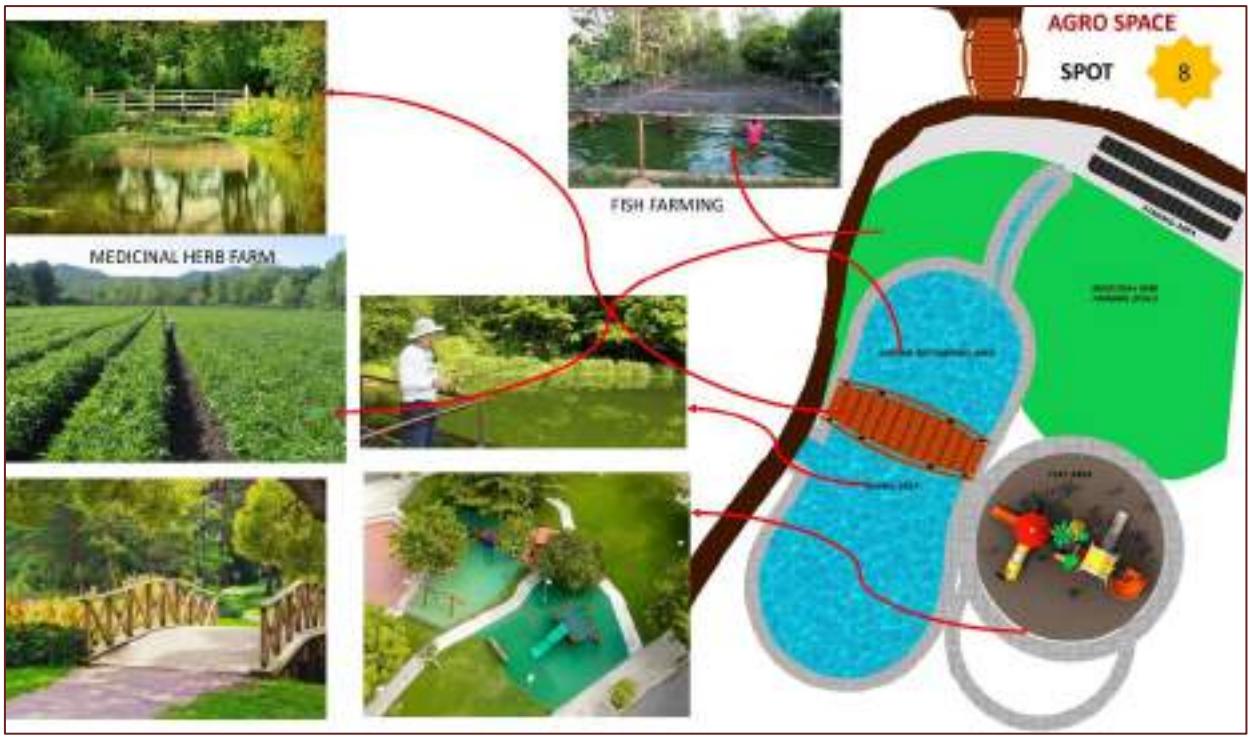


Figure 33.17 Beautification of Pallickal Riverbank Project – Location 8- Conceptual Design.

33.4.2.4 Responsible Agencies

Role	Agencies likely to be involved
Rejuvenation & Restoration	
Preparation of detailed Plan and implementation	Municipal Engineering Section/ Irrigation Department
Monitoring the project	Municipality
Detailed survey and proper delineation of the canal	Land Revenue department & Survey Department
Possible Funding Options	State Govt., World Bank
Beautification of Pallickal Riverbank	
Project Initiator	Municipality
DPR & Technical Support	Municipality / Department of Tourism
Infrastructure Development	PWD, LSGD, Irrigation Department
Eco-tourism Activities	DTPC, Kerala Tourism Development Corporation (KTDC)
River Health & Environment	Pollution Control Board
Agriculture & Fisheries Linkage	Department of Agriculture, Fisheries Department
Possible Funding Options	Municipality, Schemes of Ministry of Tourism, Plan Funds, CSR, PPP

33.4.2.5 Suggested Implementation Mechanism

The main agencies involved in the implementation of Rejuvenation & Restoration project are Irrigation Department, Engineering section of Adoor Municipality, Land Revenue department and Survey Department. The project shall be implemented through a phased and collaborative approach, starting with a scientific survey and hydrological assessment of the river. Initial phases will focus on desilting, clearing, and realignment where necessary to restore natural flow. Convergence with AMRUT, Haritha Kerala, and SDMA programs will be explored for funding. Community engagement will be integral, with awareness drives and community monitoring systems for waste control and river watch. The project must adhere to environmental clearance norms and wetland conservation guidelines issued by state and central agencies.

Beautification of Pallickal Riverbank project will be implemented through phased development, starting with cleaning, stabilization, and landscaping of the riverbanks. The Tourism Department and Municipality can jointly undertake infrastructure works, with support from state schemes and KIIFB funding. Public-private partnerships can be explored for operating recreational facilities, kiosks, and tourism activities. The north-eastern nodes will focus on high-density urban needs and can be implemented with PPP models for commercial and sports complexes. The south-western nodes will focus on rural economy–oriented activities such as farming and aquaculture, with funding support from agriculture and fisheries schemes. All nodes will be linked by walkable roads and cycle tracks, with streetscaping and safety measures. A river corridor plan will guide the uniformity of design and connectivity. Community engagement will be central for maintenance, involving resident

associations, schools, and NGOs. All works must adhere to environmentally sensitive design principles, ensuring minimal disturbance to the river's hydrology and ecology.

33.4.2.6 Other Issues to be Addressed

Several challenges must be managed during the project execution of Rejuvenation & Restoration. These include removal of encroachments along the riverbanks, which will require legal intervention and public consultations. Proper solid waste management and sewage diversion mechanisms must be put in place to prevent re-pollution after rejuvenation. Ensuring coordination among multiple departments and consistent funding over the multi-year execution period will also be crucial for the project's success. Key issues of Beautification of Pallickal Riverbank project include land ownership along the riverbanks, which may require negotiations or acquisitions for continuous public access. As the river is part of an urban flood management system, design interventions must not obstruct natural drainage. Strict waste management protocols should be implemented to prevent littering. Seasonal variations in river water levels must be considered while designing seating, pathways, and tourism facilities. Additionally, coordination between multiple departments is necessary to avoid overlap with flood control or rejuvenation projects.

33.4.2.7 Project Cost & Period

Sl.No.	Component	Approx. Cost* (Cr)
Rejuvenation & Restoration		
1	Detailed land survey to delineate the River stretch and boundary, DPR Preparation	0.50
2	Desilting, Riverbed Deepening and Widening	3.0
3	Removal of Obstructions / Encroachments	1.0
4	Construction of Retaining Walls	2.50
5	Restoration of missing links	1.0
6	Construction of Culvert, Weirs	2.50
Beautification of Pallickal Riverbank		
North-Eastern Urban-Focused Nodes		
1	Community Facilities & Event Spaces	1.50
2	Modern Agricultural Demonstration Spaces	0.80
3	Sports Facilities & Grounds	2.00
4	Commercial Complexes & Multiplexes	3.0
5	Cycle Tracks & Recreational Spaces	1.2
South-Western Rural-Focused Nodes		
6	Agricultural Spaces & Kiosks	1.0
7	Fish Farming Facilities	0.80
8	Farmhouses & Rural Leisure Areas	1.2
Common Connectivity & Beautification Works		
9	Walkable Roads Linking All Nodes	2.00
10	Landscaping & Riverbank Beautification	1.50
11	Lighting, Street Furniture & Signage	0.70

Note: cost calculations are only approximate figures.

Total Estimated Cost for Rejuvenation & Restoration Project: ₹10.5 crore – ₹12 crore. The priority of the project is coming under 1st phase. The approximate estimated project period will be 3 years.

Total Estimated Cost for Beautification of Pallickal Riverbank: ₹16 crore – ₹18 crore. The priority of the project is coming under 1st phase. The approximate estimated project period will be 3 years.

33.4.3 Gandhi Park Renovation

33.4.3.1 Project brief

Need for the Project

Gandhi Park is one of the few open green spaces in Adoor town, located in Adoor junction surrounded by major roads NH 183A & SH5. Currently, the park does not serve its full potential as a recreational, ecological, and cultural asset. With rapid urbanization, lack of public open spaces, poor pedestrian infrastructure and increasing traffic congestion, the renovation of Gandhi Park becomes essential to provide accessible public green space for residents, enhance urban liveability and identity, reduce heat island effect and improve environmental quality and act as a safe recreational and community gathering space

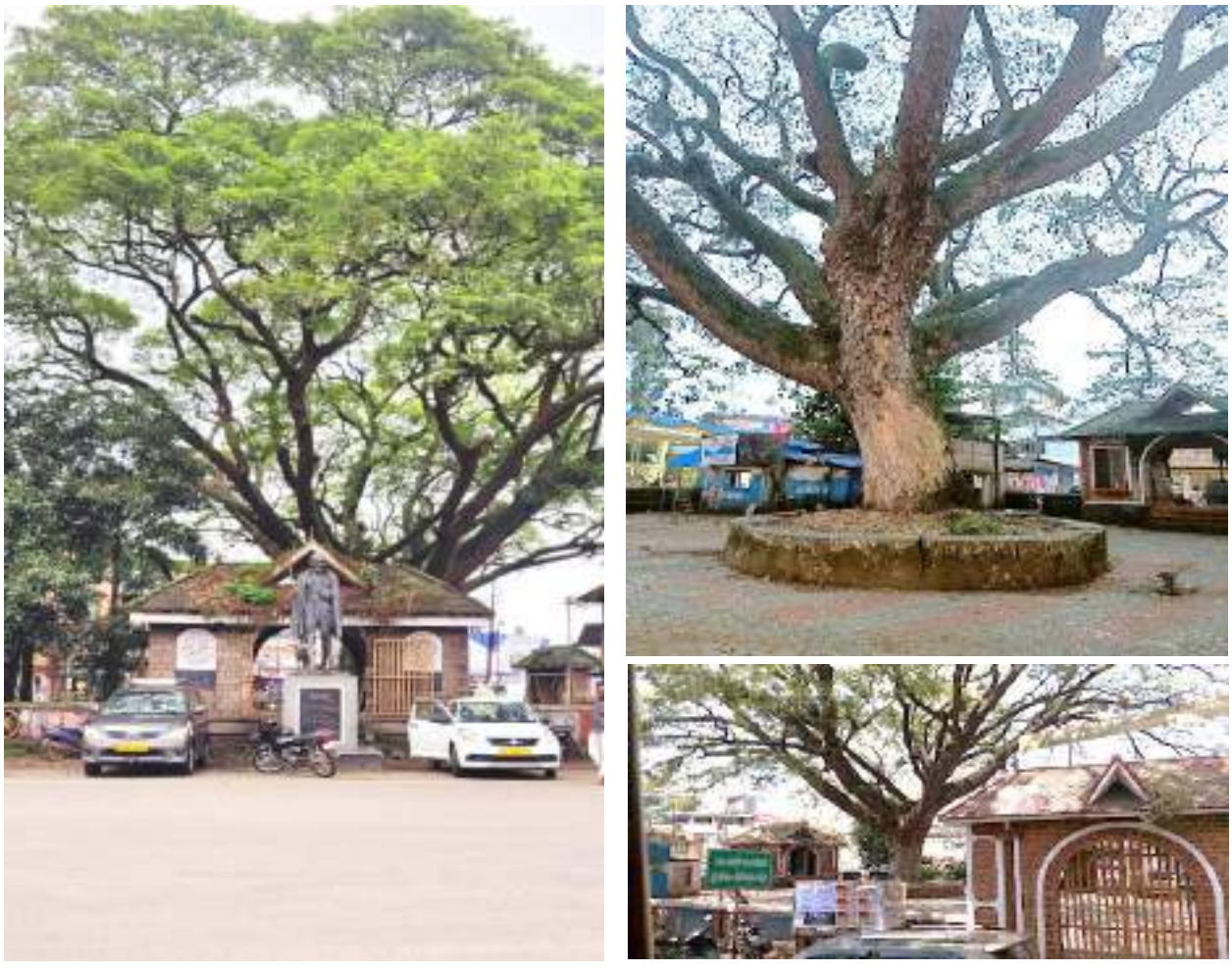


Figure 33.18 Existing Condition- Gandhi Park

Aim

To redevelop Gandhi Park into a sustainable and inclusive urban open space that integrates ecology, recreation, cultural identity and accessibility, thereby supporting the recreational functionality of town.

Project Objectives

1. Improve the aesthetic quality and green cover of Gandhi Park.
2. Provide inclusive facilities for children, elderly and differently-abled persons.
3. Integrate eco-friendly features such as rainwater harvesting, permeable pavements, and green buffers.
4. Enhance safety, visibility, and connectivity with surrounding road networks.
5. Develop the park as a multi-use public space for recreation, cultural activities, and community engagement

33.4.3.2 Location & Ownership

Gandhi Park located in Adoor junction surrounded by major roads NH 183A & SH5 (Figure 33.19).

Project Area : 0.0014 Sq.Km
Land Ownership : Municipality
Survey Numbers: 355(p)



Figure 33.19 Location of Gandhi Park Renovation Project.

33.4.3.3 Project Components

1. Lawn development, native tree plantation, shaded seating areas.
2. Vertical gardens/green walls along road-facing boundaries.
3. Rainwater harvesting system and bio-drains.
4. Children's play zone with safe equipment.
5. Open-air yoga/fitness space.

6. Barrier-free design with ramps, tactile paving, and resting spots.
7. Special seating for elderly and differently-abled.
8. Information boards on town history.
9. Lighting and solar lamps.
10. CCTV surveillance and clear pedestrian crossings.
11. Transparent fencing to ensure visibility from roads.
12. Drinking water kiosks.
13. Public toilets (eco-san/ bio-toilets).
14. Smart benches with charging points.

33.4.3.4 Responsible Agencies

Role	Agencies likely to be involved
Project Initiator	Municipality
DPR & Technical Support	Municipality / LSGD Planning
Infrastructure Development	PWD, LSGD Engineering wing
Possible Funding Options	Municipality, Schemes of Ministry of Tourism, Plan Funds, CSR, PPP

33.4.3.5 Suggested Implementation Mechanism

The renovation of Gandhi Park may be implemented through a coordinated approach led by the Adoor Municipality with technical support from the Local Self Government Department (LSGD) Planning and specialized urban design consultants. Funding can be sourced from state plan funds and centrally sponsored schemes such as AMRUT 2.0, while additional contributions can be mobilized through Corporate Social Responsibility (CSR) partnerships and public–private participation. To ensure long-term sustainability, the project should include a structured operation and maintenance mechanism, wherein the Municipality partners with Kudumbasree for routine upkeep. A phased implementation approach—starting with critical infrastructure, followed by landscape and recreational enhancements—will ensure visible outcomes and community acceptance within a short timeframe.

33.4.3.6 Other Issues to be Addressed

While implementing the project, certain cross-cutting concerns must be addressed to ensure the effectiveness of the park as a public asset. Road safety interventions, including pedestrian crossings and traffic calming measures, are essential given the park's location amidst busy junctions. Noise and air pollution from surrounding vehicular movement should be mitigated through the introduction of green buffers and sound-absorbing vegetation. Waste management inside the park needs to be strengthened with segregated bins, on-site composting, and regular collection systems. Furthermore, clear protocols for surveillance, lighting, and accessibility for differently-abled persons must be integrated to make the space inclusive and safe.

33.4.3.7 Project Cost & Period

Sl. No.	Component	Approx. Cost* (Cr)
	North-Eastern Urban-Focused Nodes	
1	Landscaping & Green Infrastructure	0.40
2	Recreational Facilities (play area, track)	0.35
3	Accessibility & Inclusivity Features	0.15
4	Cultural & Community Spaces	0.20
5	Safety & Surveillance (lighting, CCTV)	0.18
6	Rainwater Harvesting & Drainage Integration	0.10
11	Amenities (toilets, kiosks, smart benches)	0.22

Note: cost calculations are only approximate figures.

Total Estimated Cost: ₹1.6 crore – ₹1.8 crore. The priority of the project is coming under 1st phase. The approximate estimated project period will be 3 years.

33.4.4 Municipal Stadium & Sports Complex

33.4.4.1 Project brief

Need for the Project

Adoor Town lacks a modern, multi-sport facility that can meet the growing demand for physical health, recreational and competitive sports activities. Existing sports infrastructure is inadequate to host district or state-level events, provide year-round training, or meet the recreational standards recommended for urban populations. With increasing youth participation in sports, school competitions, and fitness activities, there is a need for a state-of-the-art stadium and sports complex. This facility will not only enhance the quality of sports training and recreation but will also serve as a venue for cultural events, thereby improving the overall urban functionality of Adoor town.

Aim

To develop a modern, inclusive, and sustainable municipal stadium and sports complex that supports competitive sports, community recreation, and allied facilities in line with sports infrastructure standards.

Project Objectives

1. Provide synthetic track and upgraded ground facilities for athletics and field sports.
2. Construct a spectator gallery with solar rooftop systems to promote renewable energy use.
3. Establish administrative and sports management offices for smooth functioning of the complex.
4. Build a multipurpose gym to cater to various indoor sports and fitness training.
5. Provide dormitory/hostel accommodations for athletes, coaches, and event participants.

6. Facilitate community access for recreational activities alongside professional sports training.
7. Promote sports tourism by hosting district, state, and national level events.

33.4.4.2 Location & Ownership

Municipal Stadium & Sports complex project is envisaged to implement at the open land near veterinary polyclinic. (Figure 33.20). The site is Greenfield land.

Project Area : 0.0361 sq.km
Land Ownership : Municipality
Survey Numbers: 281 (p), 282,283(p), 285(p), 286(p), 287&288(p)



Figure 33.20 Location of proposed Municipal Stadium & Sports complex project



Figure 33.21 Existing site condition – Proposed Municipal Stadium & Sports Complex

33.4.4.3 Project Components

1. Synthetic Track
2. Ground
3. Gallery
4. Dormitory /Hostel Facilities

5. Parking Facilities
6. Office Building with commercial space
7. Kiosks
8. Separate Parking facilities for athletes.





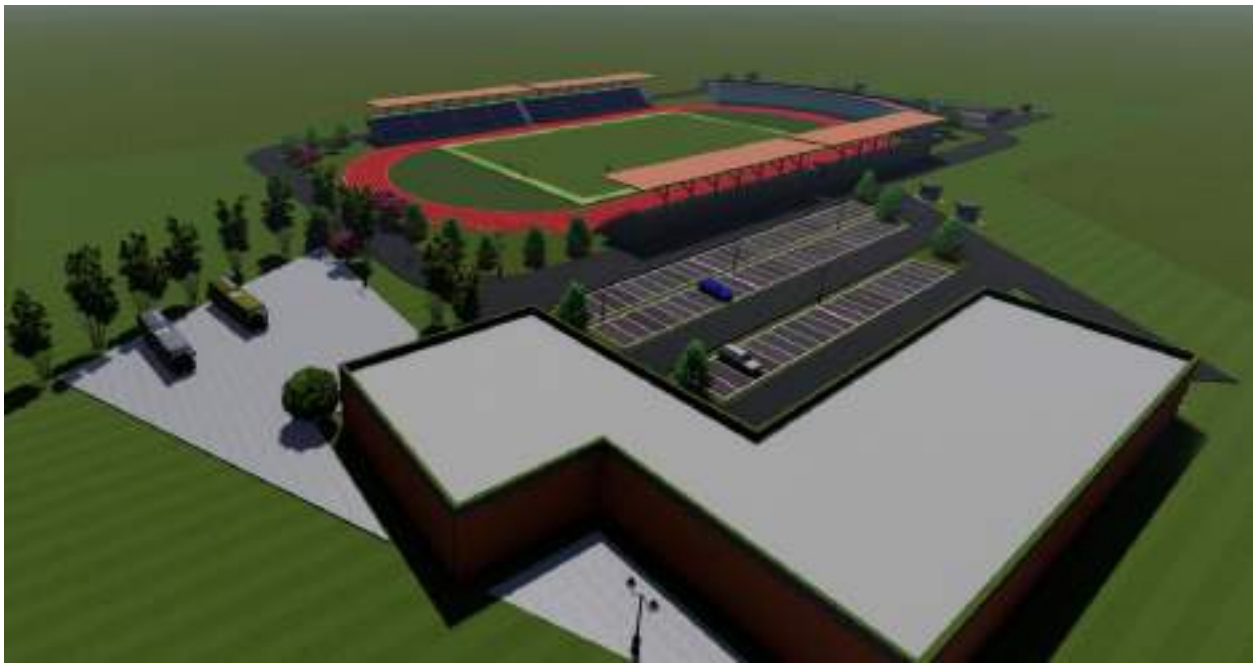


Figure 33.22 Proposed Municipal Stadium & Sports Complex project design

33.4.4.4 Responsible Agencies

Role	Agencies likely to be involved
Nodal Agency	Municipality
Technical Support	Kerala State Sports Council, LSGD Planning
Execution	LSGD, Department of Sports & Youth Affairs
Possible Funding Options	Central/ State Scheme, Plan Fund, KIFB, State Sports Development Schemes, CSR Contributions

33.4.4.5 Suggested Implementation Mechanism

The project will be implemented in phases to ensure functionality at every stage. Phase 1 will focus on core infrastructure including the ground, synthetic track, and basic amenities. Phase 2 will involve construction of the gallery, gym, and office spaces, while Phase 3 will complete dormitories, renewable energy systems, and landscaping. The Municipality will coordinate with the Kerala State Sports Council for technical guidance and standards. A PPP model or CSR partnerships can be explored for operational aspects like the gym or hostel. The complex will be maintained by a dedicated management committee with representatives from the municipality, sports council, and local sports associations.

33.4.4.6 Other Issues to be addressed

Since the proposed site is a Greenfield plot, careful attention must be given to site preparation, grading, and soil stabilization to ensure long-term structural stability. Adequate storm water drainage systems

must be incorporated to prevent waterlogging during rain, along with rainwater harvesting to promote sustainable water use. Integration of sustainable urban drainage systems (SUDS), including bio-swales and pervious surfaces in parking areas, will reduce surface runoff. The project should comply with IGBC Green Building guidelines for energy and water efficiency, with the proposed solar rooftop system forming part of the renewable energy strategy. The design should ensure universal accessibility for differently-abled users, and include proper emergency access routes for safety during events. A noise and light pollution management plan should be prepared to minimize impact on surrounding areas, especially during night-time events. Finally, operations and maintenance strategy must be developed in advance, including a sustainable funding mechanism to avoid deterioration of the facilities over time.

33.4.4.7 Project Cost & Period

Sl. No.	Component	Approx. Cost* (Cr)
1	Site Preparation & Earthwork (Greenfield)	1.00
2	Synthetic Track (400m) with Markings	3.00
3	Sports Ground Development	1.50
4	Gallery with Solar Rooftop	2.50
5	Main Office & Administration Block	1.00
6	Multipurpose Gym & Indoor Sports Hall	2.00
7	Dormitories / Hostel Accommodation	1.50
8	Landscaping, Green Buffer & Walkways	0.50
9	Utilities & Support Infrastructure (Water, Sanitation, Power)	0.50
10	Parking & Internal Access Roads	0.50

Note: cost calculations are only approximate figures.

Total Estimated Cost: ₹13 crore – ₹14crore. The priority of the project is coming under 1st phase. The approximate estimated project period will be 3 years.

33.4.5 Municipal Office Complex & Municipal Bus Stand

33.4.5.1 Project brief

Need for the Project

Adoor town currently operates from an old municipal office building that lacks modern infrastructure, adequate space and public-friendly facilities. Additionally, the town does not have a dedicated bus stand for private buses, resulting in traffic congestion, inefficient public transport operations, and inadequate passenger amenities. This project addresses these deficiencies by constructing a modern municipal office complex integrated with a private bus terminal, while repurposing the old municipal office into a She Lodge to support women's welfare and safe accommodation. The project also

includes commercial spaces to generate revenue, landscaped public areas to improve urban aesthetics, and adequate parking to reduce on-street parking issues.

Aim

To develop an integrated municipal office and private bus stand facility that enhances administrative efficiency, improves public transportation, and provides vibrant community spaces

Project Objectives

1. Provide a modern, efficient and accessible municipal office space for better service delivery.
2. Establish a well-planned private bus stand with adequate passenger amenities.
3. Generate municipal revenue through integrated commercial spaces.
4. Create landscaped and public activity spaces for social interaction and tourism appeal.
5. Reduce congestion by providing organized parking facilities.
6. Promote gender-friendly infrastructure by converting the old municipal office into a She Lodge.

33.4.5.2 Location & Ownership

Project Area : 0.0177 sq.km
Land Ownership : Municipality
Survey Numbers: 192 (p), 193(p)]

33.4.5.3 Project Components

1. Municipal Office Complex – Administrative offices, meeting halls, public service counters, IT-enabled workspaces.
2. Private Bus Stand – Bus bays, passenger waiting areas, ticket counters, toilets, information boards.
3. Commercial Space – Retail shops, office rentals, food courts for revenue generation.
4. Landscaping & Public Activity Space – Open plazas, shaded seating areas, fountains, green belts.
5. Parking Facilities – Dedicated parking for buses, autos, taxis, and private vehicles.
6. Utility Infrastructure – Solar rooftop, rainwater harvesting, waste management system.

33.4.5.4 Responsible Agencies

Role	Agencies likely to be involved
Nodal Agency	Municipality
Technical Support	PWD,LSGD Engineering wing, LSGD Planning
Execution	Municipality
Possible Funding Options	Central/ State Scheme, Plan Fund, KIFB, CSR Contributions

33.4.5.5 Suggested Implementation Mechanism

The project will be implemented in a phased manner to ensure smooth execution and minimal disruption to municipal functions. Phase 1 will involve the preparation of a Detailed Project Report (DPR), feasibility study, stakeholder consultations, and land survey. Phase 2 will cover the tendering process and selection of experienced contractors. Phase 3 will focus on the construction of the new municipal office complex and private bus stand, along with the development of utility infrastructure. In Phase 4, landscaping, commercial space fit-outs, installation of IT systems, and integration of sustainable features such as solar rooftops and rainwater harvesting will be completed. Phase 5 will include testing, commissioning, and the official relocation of municipal operations.

33.4.5.6 Other Issues to be addressed

The project must ensure universal accessibility by incorporating barrier-free design for differently-abled individuals and elderly users. Adequate traffic integration measures should be planned to avoid congestion around the bus stand, with proper signage and road safety features. Sustainable practices such as renewable energy integration, rainwater harvesting, and energy-efficient lighting must be prioritized. Security measures, including CCTV surveillance and adequate night lighting, should be incorporated. A long-term operations and maintenance framework needs to be established for the bus stand and commercial areas. Local entrepreneurs and vendors should be given opportunities within the commercial spaces to promote local economic growth. Public awareness programs must be conducted to familiarize residents with new traffic circulation patterns and available facilities before project commissioning.

33.4.5.7 Project Cost & Period

Sl. No.	Component	Approx. Cost* (Cr)
1	Land Development & Site Preparation	1.00
2	Municipal Office Complex Building	4.50
3	Private Bus Stand (bays, waiting area, amenities)	3.00
4	Commercial Spaces (shops, food court, offices)	1.50
5	Landscaping & Public Activity Spaces	0.60
6	Parking Infrastructure	0.80
7	Utility Systems (solar rooftop, RWH, waste mgmt.)	0.40
8	Conversion of Old Office to She Lodge	0.50
9	IT Infrastructure, CCTV, Digital Boards	0.30

Note: cost calculations are only approximate figures.

Total Estimated Cost: ₹12.5 crore – ₹13crore. The priority of the project is coming under 1st phase. The approximate estimated project period will be 3 years.

33.4.6 Revitalization of Parakode Market

33.4.6.1 Project brief

Need for the Project

The existing Parakode Market is in a deteriorated condition with inadequate vendor facilities, encroachments, poor approach road conditions, lack of sanitation, drainage and parking space. The absence of fencing and protective measures has made the area vulnerable to further encroachments. With growing demand for hygienic, accessible, and sustainable markets, urgent renewal is required to modernize the infrastructure, enhance vendor livelihoods, improve user experience, and promote sustainable urban development in Adoor town.

Aim

To revitalize Parakode Market into a modern, well-equipped, and sustainable vendor market that caters to both economic activity and community needs while improving accessibility, sanitation, and environmental sustainability.



Figure 33.23 Parakode Market – Existing Condition

Project Objectives

1. To provide adequate, hygienic and accessible vendor stalls for all market participants.
2. To create safe pedestrian-friendly and vehicle-friendly circulation in and around the market.
3. To enhance the user experience through comfortable public amenities and social interaction spaces.
4. To incorporate sustainable waste management and water conservation systems.
5. To improve connectivity to the market through upgraded approach roads and adequate parking.

33.4.6.2 Location & Ownership

Project Area : 0.0151 sq.km
Land Ownership : Municipality
Survey Numbers: 881 (p), 882 (p),883(p), 925(p) & 926(p)



Figure 33.24 Location of Parakode market

33.4.6.3 Project Components

The design for the major market portion is prepared by KIIFB. Truck Terminal, Slaughter House etc. are part of that project design. The Part II of the market is designed as Vendor's Market in this project with following components.

1. 71 vendor shops with seamless access from main roads, ensuring smooth circulation.
2. A wide pedestrian-friendly footpath with shade trees and stone benches along the main road edge, creating a calm and comfortable retail promenade.
3. Public interaction zones and a food truck street that activate the space socially and economically.
4. A baby care and feeding room, universally accessible toilet, and separate pay-and-use toilets for men and women ensure comfort for all user groups.

5. Biogas plant for managing biodegradable waste and a waste sorting unit, promoting sustainability.
6. A rainwater and graywater catchment pond to aid flood control and water conservation.
7. Green cover with trees and plants improves the microclimate and enhances the urban environment.
8. Parking space for 50 cars and 76 two-wheelers accommodates the market's footfall.



Figure 33.25 Vendor's Market -Parakode- proposed design

33.4.6.4 Suggested Implementation Mechanism

The project will be implemented in multiple phases. Phase 1 will include detailed surveys, preparation of the Detailed Project Report (DPR), and stakeholder consultations with vendors and the public. Phase 2 will involve clearance of encroachments, fencing of the site, and upgradation of approach roads. Phase 3 will focus on construction of vendor stalls, public amenities, pedestrian walkways, parking, and landscaping. Phase 4 will integrate sustainable systems such as the biogas plant, waste sorting unit, and rainwater harvesting pond. Phase 5 will involve testing, commissioning, and allocation of stalls to vendors through a transparent system, followed by ongoing monitoring and maintenance.

33.4.6.5 Responsible Agencies

Role	Agencies likely to be involved
Nodal Agency	Municipality

Technical Support	Municipal Engineering Section/ PWD & LSGD Planning
Execution	Municipal Engineering Section/ PWD
Possible Funding Options	Municipality, State Govt., CSR, PPP

33.4.6.6 Other Issues to be addressed

Vendor relocation during construction must be planned to avoid livelihood disruptions. Adequate fencing and boundary demarcation must be completed to prevent future encroachments. Waste management systems must be operated by trained personnel with periodic maintenance. Approach road improvements must integrate drainage solutions to prevent waterlogging. Adequate lighting and CCTV surveillance should be installed for safety. Public awareness campaigns should promote hygiene, waste segregation, and proper use of facilities. Vendor associations should be engaged in long-term O&M planning to ensure sustainability.

33.4.6.7 Project Cost & Period

Sl. No.	Component	Approx. Cost* (Cr)
1	Vendor Shops	250.00
2	Pedestrian-Friendly Footpath with Shade Trees & Benches	80.00
3	Public Interaction Zones & Food Truck Street	60.00
4	Baby Care & Feeding Room	15.00
5	Universally Accessible & Pay-and-Use Toilets	30.00
6	Biogas Plant & Waste Sorting Unit	40.00
7	Rainwater & Greywater Catchment Pond	35.00
8	Green Cover Plantation & Landscaping	25.00
9	Parking Facility (50 Cars, 76 Two-Wheelers)	65.00
10	Site Fencing & Boundary Wall	45.00
11	Approach Road Upgradation & Drainage	75.00

Note: cost calculations are only approximate figures.

Total Estimated Cost: ₹ 7.5 crore – 8 crore. The priority of the project is coming under 1st phase. The approximate estimated project period will be 3 years.

33.4.7 Municipal Town Hall & Parking Plaza

33.4.7.1 Project brief

Need for the Project

Adoor Town currently faces a shortage of multi-purpose civic infrastructure that can serve as a hub for cultural events, community gatherings, tourist amenities, and modern parking facilities. Visitors and commuters lack adequate resting areas with basic amenities, while vehicle parking congestion in the town centre remains a persistent problem. This project aims to address these gaps by creating a

multifunctional facility that combines a town hall, modern parking, resting amenities, and commercial activity in a single integrated space.

Aim

To develop a multi-functional civic complex that provides a state-of-the-art town hall, modern parking infrastructure, resting facilities, and dedicated spaces for cultural and commercial activities.

Project Objectives

1. To create a civic hub for cultural, social, and community events.
2. To provide safe, well-organized, and sufficient parking facilities to ease traffic congestion.
3. To offer modern resting facilities for visitors, commuters, and tourists.
4. To promote local culture, heritage, and entrepreneurship through dedicated commercial spaces.
5. To ensure universal accessibility and integration of green design features.

33.4.7.2 Location & Ownership

Project Area : 0.0022 sq.km
Land Ownership : Municipality
Survey Numbers: 324 (p)]



Figure 33.26 Location of proposed Municipal Town hall project

33.4.7.3 Project Components

6. Town Hall – Multipurpose hall for cultural programs, meetings, and public events.
7. Vehicular Entry & Exit – Well-defined circulation with separate entry and exit points for smooth traffic flow.
8. Multi-Level Car Parking – Adequate space for cars and two-wheelers with structured design.
9. Resting Area – Equipped with drinking water, toilets, locker room, and free Wi-Fi.
10. Cafes & Shops – Commercial spaces for food and beverages.
11. Value Addition Products Shop – Spaces for women entrepreneurs, elderly artisans, differently-abled individuals, heritage product sellers, and a small commercial shop.
12. Mini Library – A reading and knowledge-sharing space.
13. Earthen Pathway – Natural pathways enhancing pedestrian movement and aesthetics.
14. Front Gate – Attractive, functional, and secure entry structure.

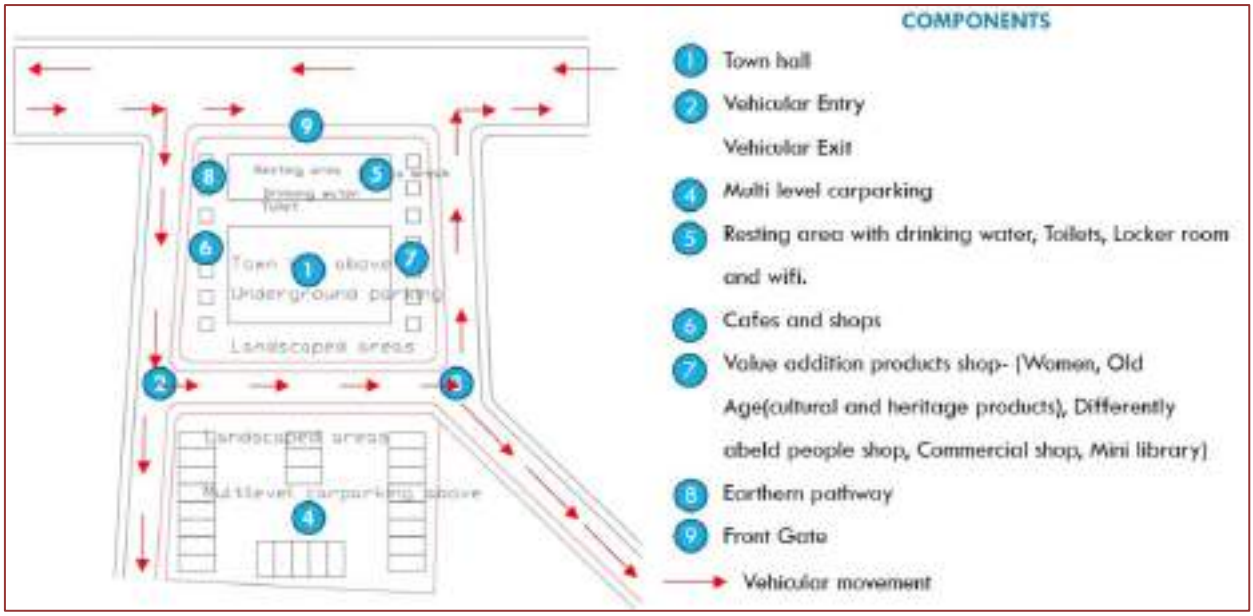






Figure 33.27 Municipal Town Hall- Conceptual Design

33.4.7.4 Responsible Agencies

Role	Agencies likely to be involved
Nodal Agency	Municipality
Technical Support	LSGD Planning, PWD
Execution	PWD/ LSGD Engineering Wing
Possible Funding Options	State Government, Plan Fund, PPP, CSR

33.4.7.5 Suggested Implementation Mechanism

The project should follow a Design–Build–Operate–Maintain (DBOM) approach to ensure efficient delivery and sustainability. The project will be implemented in phases: Phase 1 will be Site clearance, boundary setting, and utility relocation. Phase 2 includes construction of multi-level parking structure, vehicular access points, and resting areas. Phase 3 will be development of the town hall and commercial spaces, including value addition product shops. Phase 4 includes landscaping, earthen pathways, and installation of public amenities and Phase 5 will be commissioning, vendor allocation, and launching cultural/tourism promotion activities. The use of prefabricated structures for certain components can reduce construction time. Parking management and commercial space leasing can be outsourced to professional agencies to ensure revenue generation for O&M.

33.4.7.6 Other Issues to be Addressed

Parking fee structure must be transparent to ensure accessibility without discouraging use. Safety measures, including CCTV surveillance and fire safety systems, must be integrated. Universal accessibility features (ramps, tactile paving, accessible toilets) must be provided. Coordination with traffic police is essential to manage vehicular movement around the site. Promotion of the value addition shops as a local tourism attraction is needed to ensure economic viability. Energy efficiency

measures, such as solar lighting and rainwater harvesting, should be incorporated. Clear maintenance responsibilities must be assigned to avoid facility deterioration.

33.4.7.7 Project Cost & Period

Sl. No.	Component	Approx. Cost* (Cr)
1	Town Hall	3.00
2	Vehicular Entry	2.00
3	Vehicular Exit	0.20
4	Multi-Level Car Parking	2.50
5	Resting Area with Drinking Water, Toilets, Locker Room & Wi-Fi	0.50
6	Cafes & Shops	0.40
7	Value Addition Products Shop (Women, Elderly, Differently-Abled, Heritage)	0.35
8	Mini Library	0.15
9	Earthen Pathway	0.10

Note: cost calculations are only approximate figures.

Total Estimated Cost: ₹ 9.3 crore – 10 crore. The priority of the project is coming under 2nd phase. The approximate estimated project period will be 3 years.

33.4.8 Proposed Fire & Rescue Station

33.4.8.1 Project brief

Need for the Project

Currently, the Fire and Rescue Services in Adoor town operate from a rented building that lacks adequate space, facilities, and modern infrastructure to meet emergency response standards. This severely affects the operational efficiency, storage of equipment, vehicle movement, and response time. Relocating the station to its own dedicated land will allow for proper planning, safe housing of vehicles and equipment, and the integration of modern fire safety infrastructure. A purpose-built facility will also enhance coordination during fire emergencies, floods, road accidents, and disaster management operations in the town.

Aim

To establish a fully equipped, modern, and strategically located Fire and Rescue Station in Adoor to improve emergency preparedness, reduce response times, and enhance the safety and resilience of the community.

Project Objectives

1. Provide adequate space for fire & rescue vehicles and specialized equipment.
2. Enhance the working environment and facilities for fire and rescue personnel.
3. Reduce emergency response time through strategic location and efficient access roads.

4. Integrate modern technology and safety systems into the station design.
5. Ensure the facility also functions as a disaster management hub for the region.

33.4.8.2 Location & Ownership

Project Area : 0.0044 sq.km
Land Ownership : Municipality
Survey Numbers: 227 (p)

33.4.8.3 Project Components

1. Main Station Building – Vehicle bays, equipment storage, offices, and control room.
2. Training & Drill Area – Open yard for drills, simulations, and staff physical training.
3. Watch Tower – For monitoring and training purposes.
4. Dormitory & Staff Amenities – Rest areas, kitchen, and sanitary facilities.
5. Workshop & Maintenance Area – For repair and upkeep of vehicles/equipment.
6. Water Storage & Pumping System – For training and firefighting readiness.
7. Access Roads & Parking – For smooth movement of fire tenders and support vehicles.
8. Solar Rooftop System – To ensure partial energy self-sufficiency.
9. Green Landscaping & Perimeter Security – Fencing, lighting, and landscaping for safety and aesthetics.



Figure 33.28 Proposed Fire & Rescue Station – Conceptual Design

33.4.8.4 Responsible Agencies

Role	Agencies likely to be involved
Nodal Agency	Fire & Rescue Services Department
Technical Support	PWD
Execution	Fire & Rescue Services Department
Possible Funding Options	State Government, MLA Fund

33.4.8.5 Suggested Implementation Mechanism

Phase 1 – Detailed Project Report (DPR): Preparation of site plan, design, and cost estimation by PWD in consultation with Fire & Rescue Services.

Phase 2 – Land Development & Civil Works: Land leveling, foundation works, and construction of main building and supporting infrastructure.

Phase 3 – Equipment & Facility Setup: Installation of control room systems, furniture, solar panels, and firefighting equipment storage systems.

Phase 4 – Testing & Commissioning: Operational readiness checks, staff orientation, and safety audits before official inauguration.

33.4.8.6 Project Cost & Period

Sl. No.	Component	Approx. Cost* (Cr)
1	Land Development & Site Preparation	0. 50
2	Main Building Construction (vehicle bays, control room, offices)	1.50
3	Dormitories & Amenities Block	0. 40
4	Workshop & Maintenance Area	0.20
5	Water Storage & Pumping System	0.40
6	Watch Tower & Training Yard	0.25
7	Solar Rooftop Installation	0.12
8	Access Roads, Parking, & Landscaping	0.25
9	Furniture, Control Room Equipment & IT Systems	0.20

Note: cost calculations are only approximate figures.

Total Estimated Cost: ₹ 3.8crore – 4 crore. The priority of the project is coming under 1st phase. The approximate estimated project period will be 3 years.

33.4.9 Crematorium & Bio-Park

33.4.9.1 Project brief

Need for the Project

Adoor town currently faces challenges in providing modern and eco-friendly cremation facilities, resulting in reliance on outdated systems that often create environmental and social concerns. At the same time, there is a scarcity of green recreational spaces that integrate ecological values with community well-being. Establishing a combined crematorium and bio-park in a single site not only

addresses the need for dignified and sustainable cremation facilities but also optimizes land use by introducing a green, community-oriented space. This project will serve dual purposes: fulfilling a critical urban utility requirement and enhancing environmental sustainability in line with spatial planning.

Aim

To develop a sustainable, environmentally responsible crematorium integrated with a bio-park, thereby combining essential urban services with ecological restoration and community recreational space.

Project Objectives

1. To provide modern, scientific, and pollution-controlled cremation facilities.
2. To integrate green spaces that promote biodiversity, recreation, and community well-being.
3. To demonstrate sustainable land use by co-locating essential services with ecological functions.
4. To create awareness among the public about environmental conservation and sustainable practices.
5. To ensure inclusivity, accessibility, and long-term maintenance through participatory governance.

33.4.9.2 Location & Ownership

Project Area : 0.0388 sq.km
Land Ownership : Municipality
Survey Numbers: 62

33.4.9.3 Project Components

Crematorium Facilities

- Modern LPG/electric cremation units with pollution control devices.
- Waiting halls, prayer/ritual areas, water facilities, and sanitary amenities.
- Cold storage facilities for bodies.
- Dedicated parking and pedestrian-friendly access.

Bio-Park Development

- Landscaped gardens, walking trails, meditation spaces, and seating areas.
- Native tree plantation for biodiversity and carbon sequestration.
- A thematic ecological learning zone with interpretation boards.
- Rainwater harvesting ponds and percolation pits for groundwater recharge.
- Segregated waste collection points and composting units.

Supporting Infrastructure

- Renewable energy integration (solar lighting).
- CCTV surveillance and smart lighting for safety.
- Boundary wall, signage, and wayfinding systems.
- Accessibility features for elderly and differently-abled persons.



Figure 33.29 Proposed Crematorium & Bio Park project- Conceptual Design

33.4.9.4 Responsible Agencies

Role	Agencies likely to be involved
Nodal Agency	Municipality
Technical Support	LSGD Planning, Agriculture Department
Execution	Municipality
Collaborators	Engineering consultants, Academic institutions (IIT, NIT CET), and NGOs working in bio parks.

Possible Funding Options	Plan Fund, State & Central Schemes, World Bank & Other similar agencies, PPP, CSR

33.4.9.5 Suggested Implementation Mechanism

The project can be implemented in a phased approach, starting with crematorium development as a priority utility, followed by phased bio-park creation. Funding may be mobilized through a mix of municipal budget allocations, state and central scheme grants, CSR contributions, and public–private partnerships. For long-term sustainability, an Operation & Maintenance (O&M) model with shared responsibility between the Municipality and community-based organizations should be established.

33.4.9.6 Other Issues to be addressed

While the project addresses both essential service delivery and ecological enhancement, certain issues require careful attention during planning and implementation. Social sensitivity is critical, as crematoriums are often emotionally and culturally sensitive spaces; adequate landscape buffers, visual screening, and zoning within the site should ensure privacy and respect for rituals. Environmental safeguards such as emission monitoring, proper ash disposal, and integration of green buffers are necessary to reduce ecological impacts. Traffic management around the site must be planned to avoid congestion and ensure safe access for both crematorium and bio-park users. Cultural acceptance and inclusivity should be ensured by engaging local religious and community leaders in the decision-making process. Safety and security, through proper lighting, CCTV coverage, and maintenance protocols, must be prioritized to enhance user confidence.

33.4.9.7 Project Cost & Period

Sl. No.	Component	Approx. Cost* (Cr)
1	Crematorium Units (LPG/Electric, 2 Nos.)	1.20
2	Crematorium Support Facilities (halls, sanitation, storage)	0.60
3	Parking & Access Infrastructure	0.25
4	Bio-Park Landscaping & Tree Plantation	0.50
5	Walking Trails, Seating, Meditation Spaces	0.30
6	Rainwater Harvesting & Waste Management	0.20
7	Renewable Energy Integration (Solar lights)	0.15
8	Security, Fencing & Surveillance	0.20
9	Signage, Interpretation & Cultural Elements	0.10

Note: cost calculations are only approximate figures.

Total Estimated Cost: ₹ 3.4crore – 3.5crore. The priority of the project is coming under 1st phase. The approximate estimated project period will be 3 years.

33.4.10 Preparation of Drainage Master Plan

33.4.10.1 Project brief

Need for the Project

Adoor town experiences frequent waterlogging and localized flooding during the monsoon due to inadequate storm water drainage, encroachments along natural water channels, and poor integration of existing drains. The absence of a comprehensive drainage master plan has resulted in ad-hoc interventions that fail to address the root causes of flooding. A scientifically prepared drainage master plan is essential to enhance flood resilience, protect public health and guide sustainable urban development.

Aim

To develop a scientifically driven and integrated drainage master plan that effectively manages storm water, mitigates flooding risks and supports environmentally sensitive urban growth.

Project Objectives

1. Assess the existing drainage network, natural streams, and topography to identify gaps and bottlenecks.
2. Propose a holistic drainage system incorporating sustainable urban drainage solutions.
3. Reduce flood risks and enhance the town's resilience to climate change impacts.
4. Integrate drainage planning with land use, transportation, and environmental conservation.
5. Provide a phased investment plan for implementing proposed drainage improvements.

33.4.10.2 Project Components

1. Base Mapping & GIS Survey – Mapping existing drains, channels, and flood-prone areas.
2. Hydrological & Hydraulic Analysis – Flow accumulation studies, rainfall-runoff modeling, and capacity assessment.
3. Drainage Network Design – Sizing of drains, culverts, and cross-drainage works.
4. Integration with Natural Water Bodies – Restoration and conservation measures for streams and wetlands.
5. Environmental Considerations – Incorporation of green infrastructure such as bioswales, retention ponds, and vegetated buffers.
6. Phased Implementation Strategy – Prioritization of critical works and investment planning.
7. Stakeholder Consultation – Engagement with residents, municipal officials, and technical experts.

33.4.10.3 Responsible Agencies

Role	Agencies likely to be involved
Nodal Agency	Municipality
Technical Support	LSGD Planning, Irrigation Department
Execution	Municipality
Collaborators	Engineering consultants, Academic institutions (IIT, NIT CET), and NGOs working in water management.
Possible Funding Options	Plan Fund, District Disaster Mitigation Fund, World Bank & Other similar agencies

33.4.10.4 Suggested Implementation Mechanism

The project will begin with Phase 1 – DPR preparation involving detailed topographic surveys, hydrological studies, and public consultations. Phase 2 will focus on preparing the drainage master plan integrating grey and green infrastructure solutions. Phase 3 will prioritize project phasing, cost estimation, and integration into municipal budgeting and development programs. The plan should be reviewed periodically to accommodate climate change impacts and urban growth.

33.4.10.5 Other Issues to be addressed

The preparation of the drainage master plan must include a clear Terms of Reference (ToR) outlining the scope of work, deliverables, and technical standards to be followed. Tendering should be carried out transparently to select an experienced and technically qualified agency with proven expertise in urban drainage planning and flood management. Advanced drone surveys may be used to capture high-resolution topographic data, identify bottlenecks and map existing drainage channels accurately, reducing the need for extensive manual surveys. A formal work handover process must be ensured, with periodic progress reviews and technical vetting by the municipality. The project should be completed within a defined time frame of 8–12 months, considering monsoon constraints and the need for detailed field surveys. Strong local support is essential for smooth execution, particularly in providing access for surveys, sharing historical flood data, and facilitating community consultations. Coordination between municipal engineering teams, revenue authorities and local residents will be crucial to ensure accuracy, acceptance, and timely completion of the drainage master plan.

33.4.10.6 Project Cost & Period

Total Estimated Cost: ₹ 1crore. The priority of the project is coming under 1st phase. The approximate estimated project period will be 3 years.

33.4.11 Sponge Park

33.4.11.1 Project brief

Need for the Project

Adoor Town faces periodic urban flooding due to inadequate storm water infiltration and excessive surface runoff from built-up areas. Climate change and urban expansion have reduced natural percolation zones, increasing the risk of flash floods and waterlogging. A Sponge Park will function as a multifunctional green-blue infrastructure solution—capturing, filtering, and reusing stormwater while offering recreational and ecological benefits.

Aim

To create a sustainable urban landscape that enhances water retention and infiltration, and provides a multifunctional public open space for recreation, biodiversity, and flood mitigation.

Project Objectives

1. Stormwater Management – Reduce surface runoff and mitigate urban flooding through natural infiltration systems.
2. Ecological Restoration – Enhance biodiversity with native plants and water habitats.
3. Public Health & Recreation – Provide safe, accessible, and engaging public spaces.
4. Climate Resilience – Improve microclimate, reduce heat island effects, and strengthen urban environmental sustainability.

33.4.11.2 Location & Ownership

Project Area : .097 sq.km
Land Ownership : Private
Survey Numbers: 256(p), 261(p), 262(p), 263(p), 264(p), 272(p), 273(p), 274(p), 392(p), 393(p)



Figure 33.30 Location of proposed Sponge Park



Figure 33.31 Existing site condition – proposed Sponge park

33.4.11.3 Project Components

1. Rain Gardens & Bioswales – Shallow landscaped depressions that collect and filter stormwater runoff, planted with native wetland vegetation.
2. Stilt Pathways– Stilt walkways to allow rainwater flow.
3. Retention Ponds – Designed basins that temporarily store excess rainwater, slowly releasing it into the ground or drainage systems.
4. Native Landscaping – Indigenous plant species that require minimal maintenance, support biodiversity, and withstand local climatic conditions.
5. Urban Furniture – Benches, pergolas, lighting, trash bins, and signage to enhance usability and safety.





Figure 33.32 Proposed Sponge park project conceptual design

33.4.11.4 Responsible Agencies

Role	Agencies likely to be involved
Nodal Agency	Municipality
Planning & Design	LSGD Planning
Execution	LSGD Engineering Wing, NGOs in water or urban ecology
Possible Funding Options	AMRUT 2.0 (Green Infrastructure), KIIFB, Plan Fund, District Disaster Mitigation Fund, CSR (climate resilience or water sector)

33.4.11.5 Suggested Implementation Mechanism

The implementation of the Sponge Park project will be carried out in a phased manner to ensure efficiency, community participation, and long-term sustainability. The first phase will focus on preparing a comprehensive Detailed Project Report (DPR) incorporating site surveys, hydrological studies, design finalization, and stakeholder consultations. The second phase will involve site preparation, including excavation, formation of rain gardens, construction of bioswales, and development of pathways to facilitate natural water infiltration. The third phase will cover planting native vegetation, installing urban furniture, lighting, and other amenities, along with launching public engagement and awareness programs to encourage responsible use and stewardship of the park. Continuous coordination between the implementing agencies, technical experts, and the community will be ensured throughout the project lifecycle to achieve the intended environmental and social benefits.

33.4.11.6 Other Issues to be addressed

Local communities should be sensitized about the ecological functions and responsible usage of sponge parks. Regular maintenance activities—such as de-silting of swales, weeding, replanting native species, and waste management—should be included in the budget and entrusted to trained staff. Clear

demarcation and active management are essential to prevent encroachment, waste dumping, or unauthorized activities.

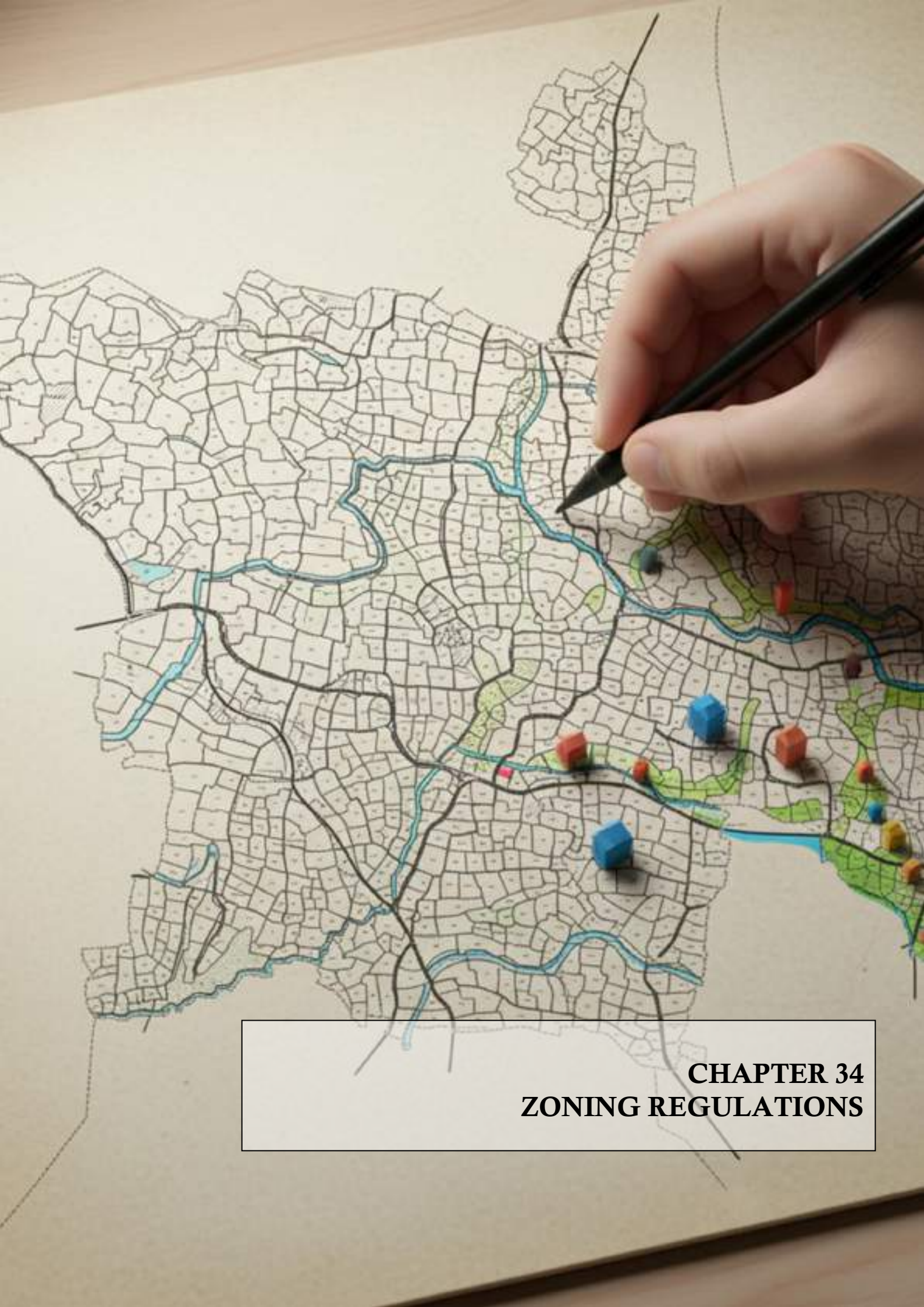
33.4.11.7 Project Cost & Period

Sl. No.	Component	Approx. Cost* (Cr)
1	Rain Gardens & Bioswales	0.80
2	Stilt Pathways & Viewing decks	0.40
3	Retention Ponds	0.60
4	Native Landscaping	0.25
5	Urban Furniture & Lighting	0.20
6	Signage & Interpretation Panels	0.05

Note: cost calculations are only approximate figures.

Total Estimated Cost: ₹2.3crore – ₹ 3crore. The priority of the project is coming under 3rd phase. The approximate estimated project period will be 3 years.

PART IV



CHAPTER 34
ZONING REGULATIONS

34.1 General Guide Lines

1) All future developments/ constructions shall be in conformity with the provisions of the Master Plan for Adoor Town and the Kerala Municipality Building Rules in force, unless otherwise specified in these regulations or in any Detailed Town Planning Scheme in force.
2) For the implementation and enforcement of the proposals envisaged in this Master Plan, Adoor Municipal area has been zoned under various categories as shown below.

Proposed Land Use

1. Residential Use Zone
2. Commercial Use Zone
3. Mixed Use Zone
4. Public & Semipublic Use Zone
5. Industrial Promotion Zone
6. Traffic & Transportation Use Zone
7. Recreational Built up Zone
8. Recreational Open Space Zone
9. Dry Agricultural Use Zone
10. Environmentally Sensitive Zone
11. Sacred Groves
12. Detention/Retention Basin
13. Canal Bank Beautification
14. Proposed Green Strip (3,5,10 Meter)
15. Existing Water body

Special Zones

16. Special Zone (In Government/ Municipal owned land)
17. Special Zone (In Privately owned land)

Details regarding the nature of uses 'Permitted', uses 'Restricted' in each zone are given in Table 34.1. These regulations shall be enforced in conjunction with other specific provisions if any elsewhere in the Master Plan.

3) 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, Adoor Municipality (herein after 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 examined based on their performance characteristics and special locational factors. Such cases which come under this category are classified as 'Uses Restricted 1' and 'Uses Restricted 2'.

a) Uses **Restricted- 1** Category deals with the restricted uses that may be permitted by the Secretary, Adoor Municipality with the concurrence of the Town Planner of the District Office of the Local Self Government Department (Planning), Pathanamthitta. (herein after referred to as Town Planner).

b) Uses **Restricted- 2** Category deals with the restricted uses that may be permitted by the Secretary, Adoor Municipality with the concurrence of the Chief Town Planner concerned of the Local Self Government Department (Planning).

4) **"Uses prohibited"** are various objectionable uses in each zone which shall not be permitted under normal circumstances. All uses which does not come under 'Uses Permitted' or 'Uses Restricted' will be considered as 'Uses prohibited'.

5) Any use not specified either in the 'uses permitted' or 'uses restricted 1' or 'uses restricted 2' category of a particular use zone but which is of a similar nature to any use 'permitted' or 'restricted 1' or 'uses restricted 2' in that particular use zone, may be permitted by the Secretary with the concurrence of the Town Planner.

6) Zoning regulations are not intended to prohibit existing uses that have been lawfully established prior to the enforcement of these regulations, unless otherwise specifically mentioned in this Master Plan. Zoning Regulations are essentially intended to help the competent authority in taking decision regarding granting or refusal of permits for land development and construction of buildings/structures.

7) If any portion of a zone is put to a 'Use Prohibited' as stated in Para 4, before coming into operation of this Master Plan, such use shall be termed as non-conforming use. A non-conforming use may be allowed to continue in its existing location and essential repairs and maintenance for the structure may be permitted by the Secretary, provided that the said use creates no adverse environmental influence in the zone. Addition, alteration or reconstruction, if found necessary as part of any mitigation measures may be permitted for such uses by the Secretary with the concurrence of the Town Planner. The total built up area of such non-conforming use shall not exceed 1.5 times the existing built-up area.

8) Existing areas and structures of archaeological importance and religious uses may be permitted to continue in all the zones and shall be treated as permitted uses.

9) Subject to the zoning regulations of the respective use zones, more than one use may be combined in a building/ plot, provided that the area of individual uses shall be limited to that prescribed for each such use in the zoning regulations of the respective zone.

10) Provisions under the Disaster Management Act 2005 and Environment Protection Act 1986 and any other applicable statutes as amended from time to time will prevail over the respective provisions of this Master Plan unless otherwise specified in the Master plan.

11) Silence Zone, as prescribed by the Noise Pollution (Regulation and Control) Rules, 2000 as amended from time to time, shall be applicable to such areas under this Master Plan.

12) Regulation of constructions and land developments on the sides of new roads / roads proposed for widening as per the Master plan shall be governed by the distance from the centerline of the existing road unless otherwise specified in the Master Plan or Detailed Town Planning Scheme in force or any Detailed Road Alignment approved by the Government. If widening on one side of any stretch of the road is constrained due to the physical barriers such as Water body, or any protected archaeological monuments/sites, the whole road widening required in that stretch shall be towards the other side. Constructions of retaining wall, compound wall, fence and gate may be permitted within the area reserved for road widening if the implementation of such road widening has not been initiated by concerned agency.
13) In the event of change in alignment of new road proposal in the Master Plan, after the commencement of land acquisition of the new alignment, the land parcels in stretches excluded from the original alignment may be changed to adjacent suitable land use zone with the concurrence of the Town Planner. This provision is applicable only to new road development proposals and not to widening proposal.
14) Operational constructions as defined in section 2(w) of Kerala Town & Country Planning Act 2016 shall be treated as permitted use in the Master Plan Area.
15) The Government shall have the power to issue clarifications in respect of technical Interpretations, if any, required on any of the provisions of the Master Plan in consultation with the Chief Town Planner concerned of the Local Self Government Department (Planning).
16) Expansion/modification of existing Public and Semi Public Institutions and their incidental uses to adjacent plots shall be treated as permitted use irrespective of the zone in which such adjacent plot lies, except in 'Existing Water body', 'Environmentally Sensitive Zone', 'Detention / Retention Basin', 'Sacred Groves', 'Recreational Open space Zone', 'Proposed Green Strip (3,5,10 Meter)','Existing roads to be widened', and 'Proposed New Roads' and the development regulations imposed by such Zoning.
17) Disaster mitigation projects by competent authorities shall be treated as permitted uses in all zones and agricultural uses may be permitted in all the zones.
18) Transmission / telecommunication towers, wireless stations, ATMs, water tanks, public utility buildings/structures, Electric charging stations for vehicles shall be treated as permitted uses in all zones except in land zoned as 'Existing Water body', 'Environmentally Sensitive Zone', 'Detention / Retention Basin', 'Sacred Groves', 'Recreational Open space Zone', 'Proposed Green Strip (3,5,10 Meter)'.
19) Local/ State/ Central Government or Public Sector Offices & Establishments, Projects of Central/ State Government, Local Self Government Institutions, Public Sector Undertakings and other Government Institutions may be permitted with concurrence of the Town Planner in all zones, except in 'Existing Water body' , 'Environmentally Sensitive Zone', and 'Recreational Open Space Zone', irrespective of the zoning regulations, if such uses are not included in the

permitted uses or uses restricted 1 or uses restricted 2 as per the zoning regulations applicable.

20) In land up to depth of 100 m, on either side of the road, having an existing or proposed width of 12 m or more (as per the Master Plan for Adoor Town-2045), uses permitted under Commercial Use Zone, Public & Semi-public Use Zone and Mixed Use Zone may be also permitted by Municipal Secretary in Residential use zone and Dry Agricultural Use Zone if not allowed otherwise by these zoning regulations. Provided that if a plot of land extends beyond this boundary, uses permitted as above may be provided for the entire plot.

21) In land up to depth of 250 m, on either side of the road, having an existing or proposed width of 18 m or more (as per the Master Plan for Adoor Town-2045), uses permitted under Commercial Use Zone, Public & Semi-public Use Zone and Mixed Use zone may be also permitted by Municipal Secretary in Residential Use zone and Dry Agricultural Use Zone if not allowed otherwise by these zoning regulations. Provided that if a plot of land extends beyond this boundary, uses permitted as above may be provided for the entire plot.

22) In case of uncertainty in identifying the alignment and boundary of water body, Thodu, River, Existing public road, and in the absence of survey boundaries for the same in the Proposed Land Use Map, it shall be referred to the actual position on ground as well as revenue records and decision taken by the Secretary in this regard shall be final.

23) If different land use zones fall within a single plot, all uses permitted as per zoning regulations of such land use zones may be permitted by the Secretary in the plot. If application submitted includes any of the restricted uses, the Secretary shall issue permit with the concurrence of the Town Planner/Chief Town Planner concerned as the case may be. However, for the part of the plot which comes under 'Existing Water Body', 'Environmentally Sensitive Zone', 'Detention / Retention Basin', 'Sacred Groves' and 'Recreational Open Space Zone', this provision shall not be applicable.

24) If public activities ceased or do not exists in a private land marked as public & Semipublic use zone, uses permitted/restricted in the surrounding land use zone as per the proposed land use map may be allowed in the plot with the concurrence of the Town Planner, if no records are available with the Municipality regarding any proposals for acquiring the particular land for any public use at the time of application of building construction or land development.

25) Survey detail as provided in the Master Plan is obtained from the Department of Survey and Land Records. During the preparation of the plan, Litho maps (cadastral survey) are compiled and geo-referenced by standard procedure. However, the survey number details, survey boundary and areas as available in the revenue records shall be final.

26) Every building should be provided with an appropriate technique such as Pipe composting/ Biogas plants/ vermicomposting etc. for processing organic waste at the source itself. Proper drawings should be supplemented with the building permit applications.

27) Solid Waste Management Unit, Sewage/ Septage Treatment Plant, Material Collection Facility

(MCF), Resource Recovery Facilities (RRFs) and Waste water Treatment Plant shall be treated as permitted uses in all zones except in 'Existing Water body', 'Environmentally Sensitive Zone', 'Detention / Retention Basin', 'Sacred Groves' and 'Recreational Open Space Zone' unless otherwise specified anywhere in the Master Plan.

28) No constructions other than side protection, drain covers and essential protection works are permitted in water bodies in the Master Plan. Also, no constructions obstructing the flow of water course are permitted in the Master Plan Area.

29) All existing ponds shall be preserved considering its infiltration characteristics, ground water recharging, environmental significance and aesthetic value.

30) No construction/land development shall obstruct/ reduce storm water drainage capacity in the area.

31) Large scale development projects in an area of 1 hectare or more, exceeding an investment of Rs.100 Crores, which provide direct employment (after commissioning of the project) to the tune of not less than 500 may be permitted in all zones except in 'Existing Water body', 'Environmentally Sensitive Zone', 'Detention / Retention Basin', 'Sacred Groves', 'Proposed Green Strip (3,5,10 Meter)', and 'Recreational Open Space Zone' if not included in the permitted uses or restricted uses as per zoning regulation applicable. In such cases, the recommendation of a committee with constitution as below shall be obtained, subject to satisfying the procedures laid out here under and the Secretary shall comply the same while issuing permit.

Also, adequate provision shall be made for supporting infrastructure such as water supply, sewerage, solid waste management, power supply etc. Separate systems for management of solid waste and sewage shall be provided and maintained by the developer at his cost. The project shall be completed within a period of 5 years or as suggested by the Committee.

Procedure to be followed

a) The developer shall submit the project report, detailing the demand, feasibility and Environment Impact Assessment aspect of the project, together with the approval, if necessary, obtained from the Ministry of Environment and Forests, Government of India to the Convener of the committee and the convener shall make all arrangements for convening meeting of the committee at the earliest and the committee shall consider and dispose of the application within a period of one month from the date of receipt of the same.

b) The constitution of the committee shall be as given under:

i. Principal Secretary/ Secretary to Government,
Local Self Government Department - Chairperson

ii. The Director, Local Self Government Department (Urban) - Member

iii. The Chief Town Planner, Local Self Government Department (Planning) -Convener

iv. Town Planner - Member

v. Secretary, Adoor Municipality - Member

c) The Convener shall fix the venue, date and time of the meeting in consultation with chairperson and shall be responsible for safe custody of records and communications thereof.

d) The meeting shall be presided over by the Chairperson or in his absence by a member to be authorised by him.

e) The quorum of the meeting shall be majority of the total number of members of the committee for the project.

f) The developer shall also produce before the committee, all required clearances from the State and Central Government agencies concerned.

34.2 Zone Wise Land Use Regulations

Table 34-1 Zone Wise Land Use Regulations

Sl. No	Uses Permitted	Uses Restricted 1	Uses Restricted 2
1	**Residential Use Zone**		
(a)	All Residential buildings including single or multifamily dwelling units, Residential Flats & Apartments, Residential quarters, Lodging houses, Orphanages/Old Age Homes, Night Shelter, Hostels & Boarding Houses, Places of Worship, Crematorium, Seminaries/ Convents / Ashram/ Mutt/Madrassa. Educational institutions essentially serving the needs of residential community such as Day Care, Crèche, Nursery Schools, Kindergartens and schools offering general education (up to Higher Secondary School level), Technical schools. Health institutions essentially serving the needs of residential community such as dispensaries, clinics (Out Patient), Diagnostic Centres, Rehabilitation centres, pain and palliative, Dialysis units etc. having a Built-up area limited up to 200m2 Community facilities such as Community Halls, Auditorium/ Wedding halls/ Convention centre /Recreational Clubs, Social Welfare Centres, Gymnasium /Yoga Centers/ Sports Centers, Indoor Court, Swimming Pool, Libraries, Reading Room etc. having a Built-up area limited up to 200m2.	Fuel Filling Stations Cremation Ground/ Crematorium, Burial Ground/ Common Vault.	

	Information Technology or Information Technology Enabled Service Building/ uses and their Ancillary Buildings - Built-up area limited up to 200m2. Shops, Professional Offices, Commercial Offices, Banks & other Financial Institutions, Restaurants, Hotel, Canteen etc. having Built-up area limited Up to 200m2. Utility Installations and Civic Amenities essentially serving the needs of residential community such as Post office, Police station, Telephone exchange, Fire station, Tot lots, parks, Play grounds, Water treatment plants Plant Nurseries, Pump House, Smoke House, Fish farms, Dairy & Dairy Farm, Poultry Farm, Zoological and Botanical Gardens / Bird Sanctuary, Camping Site, Wells and Irrigation Ponds incidental to residential community needs. Cottage Industries, House hold industries, Service Industries of non-nuisance Nature (See Annexure 34.1), Automobile workshops and service centre - Built-up area limited Up to 100m2. Turf Courts, Open Air Theatre, Outdoor Court, Open stage , Amphitheatre		
(b)	**Provided that the access road has an existing or proposed width of 7 m minimum**		
	Hospitals / Auditorium/ Wedding Halls/ Community halls/ Convention centre, Exhibition Centers and Art Gallery-Built-up area **all up to 500 m2.** Cottage Industries, House hold industries, Service Industries of non-nuisance Nature (See Annexure 34.1), Automobile workshops and service centre with	Higher Educational Institution	

	Built-up area **limited up to 200m^2**. Shops, Godowns/weighbridges/ Stacking Yards / Storage of Non-Hazardous materials, Professional offices, Hotels, banks & other financial institutions, Restaurants - Built-up area **limited up to** 500 Sq.m		
(c)	**Provided that the access road has an existing or proposed width of 10 m minimum**		
	Auditorium / Wedding Halls / Community halls /Convention centre Exhibition Centers and Art Gallery Shops, Godowns/weighbridges/ Stacking Yards / Storage of Non-Hazardous materials, Professional offices, Hospital, Hotels, banks & other financial institutions, Restaurants - Built-up area **limited up to 1000** Sq.m Cottage Industries, Service Industries of non-nuisance Nature (See Annexure 34.1), Automobile workshops and service centre - Built-up area **limited to 500m^2**.	IT/ ITES parks	
2	**Commercial Use Zone**		
(a)	All Commercial Shops, Commercial establishment, Show Rooms, Shopping Complexes, Shopping Malls, Super or Hyper Markets, Commercial Offices, Professional Offices & Establishments, Banking and Financial Institutions, Business Houses, Restaurants etc,. Single family residential buildings, Residential flats/Apartments. Lodge & Lodging Houses and Special Residential, Dormitories, Hotels, Canteen, Hostel, Boarding Houses, Tourist Resorts.	Fuel Filling Station Places of Worship Hospitals, Clinics, Health centers, diagnostic centres, pain and palliative center –Built up area up to **500 Sq.m.**	Multiplex Complex

	Educational Institutions, Training centers Built-up area **limited to 200m^2**. Day care, Creche, Nursery/ Kindergarten, Expansion of existing educational institutions. Hospitals, Clinics, Health centers, diagnostic centres, pain and palliative center, Medical Lab, Dispensaries Nursing Home, Palliative Care Centres -Built-up area **limited to 200m^2**. Social Welfare Institution, Library & Reading Rooms, Clubs, Turf and Cultural Institutions - Built-up area **limited to 200m^2**. Auditorium/ Wedding halls/convention centres, Theatres, Movie halls, Parks & Open Spaces, Stadiums & Exhibition Grounds, Gymnasium / Yoga Centers / Sports Centers & Indoor Games. Cottage industries, automobile workshops, automobile service stations, cold storage, service industries of non- nuisance nature (See Annexure- 34.1), weigh bridges, printing press, IT hardware / electronic industries - Built-up area **limited up to 200m^2**. Parking Buildings, Mechanised Parking, Parking Plazas etc., Public Utility areas &buildings, Plant Nursery, storage of agricultural produces and seeds, Fair Grounds, Markets, Park, Playgrounds, Open-air Theatre	Higher Educational Institutions, Training centers Built-up area **limited to 500m^2**. Sewage / Solid Waste Treatment plants, Modern Slaughter Houses, Modern Meat Processing Unit Cottage industries, automobile workshops, automobile service stations, cold storage, service industries of non- nuisance nature (See Annexure- 34.2), weigh bridges, printing press, IT hardware / electronic industries - Built-up area **limited to 500m^2**. .	
(b)	**Provided that the access road has an Existing or Proposed width of 10 m Minimum**		
	Cottage industries, automobile workshops, automobile service stations, cold	Outdoor games stadium	

	storage, service industries of non- nuisance nature (See Annexure - 34.1), weigh bridges, printing press, IT hardware / electronic industries - Built-up area **limited up to 1000m^2**. Hospitals, Clinics, Health centers, diagnostic centres, pain and palliative center –Built up area up to **1000 Sq.m.**	Transport terminals, Truck terminal	
3	**Mixed Use Zone**		
(a)	All Uses permitted in Residential Use Zone and Commercial Use Zone	All Uses Restricted-I in Residential Use Zone and Commercial Use Zone.	All Uses Restricted-2 in Residential Use Zone and Commercial Use Zone.
(b)	Multispecialty Hospitals, Higher Educational Institutions. Cottage industries, automobile workshops, automobile service stations, cold storage, service industries of non- nuisance nature (See Annexure- 34.1), weigh bridges, printing press, IT hardware / electronic industries	IT/ ITES parks	
(c)	**Provided that the access road has an Existing or Proposed width of 7m Minimum**		
	Marble and Granite Storage Centres, Industrial Estates & Industrial Parks Godowns/Warehouses/Storage of non-hazardous material, stacking yards, weigh bridge.	LPG distribution centres (excluding bottling plants and bulk storage) the Built-up area limited up to 200 m2. Bus Terminals, Truck Terminals	

4	**Public & Semi-public Use Zone**		
(a)	Local/State/Central Government/Public Sector Offices and Other Related Public Buildings, Additions and alterations to the existing authorised buildings including addition of new blocks without altering the use. Residential Building/Quarters/other buildings incidental to public and semi-public use Zone Dharmashala, Ashram, Mutt, Seminaries, Convents, Hostels Educational institutions (including professional education/collegiate education /higher education institutions) Day Care, Crèche, Nursery Schools, Kindergartens, Secondary/Higher Secondary Schools, Higher education and professional educational institutions, Training Centres, library and reading rooms, social welfare centres, museum, swimming pools, Auditorium, Open stage, Exhibition centres and art gallery, convention centres, indoor/ outdoor games stadium. Clinics, diagnostic centres and hospitals. Public Utility Areas and Buildings Government Offices/ Public Buildings/Utility Installations and Civic Amenities essentially serving the needs of residential community such as post office, police station, telephone exchange, fire station, tot lots, parks, play grounds, water treatment plants, and electric substations. Shops, Restaurants, Canteens, hotels – Built-up area **limited up to 200 sq.m.** Parking plazas, auto rickshaw/ taxi/jeep stands. Auditorium / wedding halls / community halls incidental to public and semi-public uses. Tot	Cremation Ground / Crematorium, Burial Ground, Common Vault. Slaughter house	

	lots/parks/playgrounds, open air theatre, camping sites. Places of worship and Religious buildings Solid waste management units, Water Treatment Plant, Sewage / Septage Treatment Plant		
5	**Industrial Promotion Zone**		
(a)	All industries other than obnoxious and nuisance type industries (see Annexure-34.1), Automobile Workshops & Automobile Service Stations, Spray Painting Workshops, Saw Mills, Timber Yard, Plywood, 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/ITES software units. Godowns/Warehouses/Storage of non-hazardous material, stacking yards, weighs bridge. Marble and Granite Storage Centres, Industrial Estates & Industrial Parks Dairy and Dairy Farms, Dairy related Industries, Poultry Farms, Piggery Farm, Smoke House. Dry Cleaning Plants, Power Plants, Sub Stations Residential uses incidental to the Industrial Use including Hostels, Dormitories etc. Any other buildings essentially incidental to Industrial use. Tot lots, Parks and Play Grounds attached to incidental residential use. Single family residential buildings, Shops, Professional Offices, Commercial	Cremation Ground / Crematorium, Burial Ground, Common Vault. Obnoxious and nuisance type industries (See Annexure- 34.2), Storage of Explosives and Fire Works, Gas Godowns, Crusher Units. Fuel Filling Stations. Dharmashala, Ashram, Seminaries Mutt, Madrasa, Places of worship.	

	Offices, Banks & other Financial Institutions, Restaurants, Canteen, Hotels, Libraries, Reading Rooms etc.- Built-up area **limited up to 200 sq.m** Education, Health institutions essentially serving the needs of 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- Built-up area **limited to 300 m2.** Other Public Utility Areas and Public Buildings. Parking yards, Parking plazas, Parking lots, mechanised Parking. Solid waste management units, Water Treatment Plant, Sewage / Septage Treatment Plant, Slaughter House	Truck Terminal Crusher unit, stone crushing, stone carving, Hot Mixing Plant	
6	**Traffic & Transportation Use Zone**		
(a)	Transport terminals including constructions that form an integral or essential part of the terminal. Any remunerative uses attached to the transport terminals as value capture mechanism such as commercial buildings, malls, retails shops, hotels, restaurants, canteens, convention halls, movie halls, lodges and dormitories, Quarters, Office Spaces, Educational Training centers, Professional, Medical Lab, Clinics &Diagnostic Centers, Dispensaries, Neigh shelter, Health Club, IT Parks, Commercial Establishments, Library & Reading rooms, Club, Nurseries/ Day Care and Crèche/ Anganwadis, Coaching Centres etc. Solid waste management units, Water Treatment Plant, Parking yards, Parking	Fuel Filling Stations Sewage Treatment Plant	

	plazas, Public Utility Areas and Buildings, Weigh Bridge, Automobile Service Station.		
7	**Recreational Built Up Zone**		
(a)	Tot Lots, Park, Play Grounds, Walk ways, recreational spaces, etc. Open air Auditorium, Open Stage, Garden , Landscaping, Statue, Yoga centers and meditation lawns, Open Gym, Amphitheater Planned Green space, Walk ways, Watch tower, Children's play area Museum, Exhibition Centres , Art Gallery, Planetarium, Open-air Theatre, Cultural centres, Cultural training centres, performing art theatres ,Tourist Home Street Furniture, Vending kiosk, Information Kiosk, Comfort station. Outdoor gym & fitness stations, Botanical & herbal garden (Ayurvedic / medicinal plants) Butterfly & bird habitat zones Any incidental uses may be permitted with the main use.		
8	**Recreational Open Space Zone**		
	Tot Lots, Park, Play Grounds, Eco Walk ways , Landscaping, Bamboo Park, Butterfly Park, Pond Sponge Parks – Walk ways on pier, Garden/ / Planned Garden Eco-tourism Infrastructure facilities, Pump house, Detention/Retention basin, Watch Tower, Swimming Pools, Fish Spa, Zoological and Botanical Garden, Bird statuary. Hooking platform, Selfie point, Bridge, Lotus Pond Fish Landings, and Floating bridges. Storage shed for horticulture on stilts, wetland awareness and conservation		

	centres made of sustainable materials and designed on stilts. Traditional Agrarian Sports Arena, Water-Based Sports, Children's Agri-Play Zone, Agro-Adventure Park, Farm Stay Cottages / Eco-Lodges, Demonstration Farms, Interactive Crop Cultivation Areas And any non-built incidental use to main use without changing the character of the zone. Nectar Plants Garden, Butterfly Breeding / Rearing Station, Walkways and Trails, Resting and Observation Zones Seasonal Garden, Rotating plantings etc. Urban Forests / Mini Forests, Parks and Open Green Spaces, Native Plantation Garden. Biodiversity Parks or Eco-Islands, Buffer Zones / Green Buffers, Tree Preservation Areas, Recreational Forest Zones, Organic Garden or Herbal Garden Plots, Carbon Sequestration Zones, Gazebos, watchtowers, Man-made mini-forests, eco-toilets, or information kiosks made from sustainable materials without changing the character of the zone.		
9	**Dry Agricultural Use Zone**		
(a)	Agriculture, Horticulture and fodder cultivation, Pastures, Grazing ground, and other types of cultivation including social forestry and its Ancillary Buildings. Dairy/Piggery Farms, Fish farms, Seed farms, Poultry farms, Plant Nursery, pump house, wells and irrigation ponds. Tot Lots/Parks/Play Grounds, Zoological and Botanical Gardens / Bird Sanctuary, Camping Site Single Family Residential Buildings, Residential flats/ Apartments up to 3	Cremation ground/ crematorium, burial ground, common vault. Fuel Filling Stations	

	stories, Residential quarters, Lodges ,Hostels, Orphanages, Night shelters, old age homes, Retirement homes, Dharmasala, Ashrams, Mutts, madrasa, Seminaries, Convent. Day Care and Crèche, Anganwadi, Nursery / Kindergarten, Educational Institution up to higher secondary. Clinics (Outpatient) and diagnostic centres, Hospitals – Built-up Area limited up to 1000 m2. Place of worship, Auditorium/Communality hall/Convention Center, Library and Reading Rooms, Godowns/ Stacking yards/ warehouses/Storage – non-hazardous. Shops, professional offices, commercial offices and establishments, banking and financial institutions, Gymnasium, Yoga Centres, restaurants, canteens- Built-up area **limited up to500 m2.** Public Utility areas &buildings such as Police Post/Police Station, Post and Telegraph office, Fire Post / Fire station, Telephone Exchange, and wireless Stations. Cottage Industries, Agro-based industries, House hold industries, plywood industries, Brick industries, Service Industries of non-nuisance Nature (See Annexure 34.1), Automobile workshops and service centre, Weigh Bridge, Bio gas plant, composting plant, Slaughter house		

(b)	**Provided that the access road has an existing or proposed width of 7 m minimum**		
	Hospitals , Health Centres and Higher Educational Institutions Shops, professional offices, commercial offices and establishments, banking and financial institutions, Gymnasium, Yoga Centres, restaurants, canteens. Marble and Granite Storage Centres, Industrial Estates & Industrial Parks Home stays, Resorts.	Saw Mills and Timber yard Industrial park Storage of explosive and fireworks, Gas godowns, Dumping yard, Sewage treatment plant, Solid waste treatment plant. Truck terminal. Crusher unit, stone crushing, stone carving, Hot Mixing unit	Multiplex Complex
10	**Environmentally Sensitive Zone**		
(a)	Paddy cultivation/ Agriculture/ Horticulture/ floriculture/ Fodder cultivation, Fish Farms/ Seed Farms/ Wells and Irrigation Ponds without any building construction, Pump House. Sponge park, wetland park, Detention/Retention pond. Addition, alteration or reconstruction of existing authorised buildings with total built up area not exceeding 1.5 times the existing built up area.	Minor Public Utility areas & Public utility buildings which will not affect the character of the area Non-built Recreational projects.	
11	**Sacred Groves**		
(a)	Planting of saplings, afforestation and maintenance activities for the sacred groves		
12	**Detention /Retention Basin**		
(a)	Water-holding basins, Side protection walls, wet agriculture, aquaculture,	Water based non built	

	Pisciculture, Pond, Fish Farms/ Seed Farms/ Pump House/ Wells and Irrigation Ponds, Water Treatment Plant without any building construction incidental to main use without changing the character of the zone.	Recreational activities. Addition, alteration or reconstruction of existing authorised buildings with total built up area not exceeding 1.5 times the existing built up area	
13	**Canal Bank Beautification**		
(a)	Eco tourism Infrastructure, Eco-walk way, Open library, water landing, hooking platform, pump house, side protection walls, fish farm, Parking, Bridge, and any incidental to main use without changing the character of the zone. Bio-fencing & Grass Slopes, Floating / Vertical Gardens, Pedestrian Promenade / Walkways, Cycle Tracks & Jogging Paths, Open-Air Plazas, Children's Play Areas, Open Gym, Street Furniture,		
14	**Proposed Green Strip (3,5,10 Meter)** A' Proposed Green Strip' of 10 Meter width on either sides of Pallickal River with in the Town, 'Proposed Green Strip' of 5 Meter width along the boundary of 'Recreational Open Space Zone' in Survey Numbers 52(p),53(p),58(p),60(p),63(p),65(p),66(p), 67(p),85(p) & 86(p) of Adoor Village and 'Proposed Green Strip' of 3 Meter width along the boundary of 'Environmentally Sensitive Zone' and 'Recreational Open Space Zone' as in Proposed Land Use Map 2045 (MP/02/I).		
(a)	Agriculture/ Horticulture/ vegetable/ fodder cultivation, Vending on wheels, Eco walk way, Hooking platform, wooden view in deck, Fish farms, River Training Works , Shops on wheels Fish Landings, Water treatment facilities, Park, Tree house, Play Grounds,	Addition, alteration or reconstruction of existing authorized buildings with total built up area not exceeding 1.5	

	Swimming Pools, Zoological and Botanical Garden. Wooden walk ways on stilts, wooden viewing platforms, Fish Spa, floating bridges. Open library, Children's park, Park/Playground, Fair ground, Turf, First aid stations, water landing, Pump house, / Wells & Irrigation Ponds, Side protection walls Horticulture/ Fodder Cultivation/ Pastures/ Grazing Grounds/ Seed farms and protective works. Bamboo park, Open Gym And any incidental Uses without changing the character of the zone.	times the existing built up area Minor public utility areas	
15	**Existing Water Body**		
(a)	Restoration and rejuvenation of water bodies. Bridges, side protection walls, bathing ghats, floating jetty based on community level requirements. Fishing and allied activities undertaken by local communities.		
III	**Special Zones**		
	SPECIAL ZONES: Developments in this zone may be permitted by Secretary of Adoor Municipality. The proposals which are marked as G1, G2, and G3etc... are proposed in government/ local body owned land. Municipality shall take initiation to get the project implemented by the respective department through proper intervention and if required, take necessary steps for transferring the ownership of such lands to the local body or concerned department/agencies implementing the project. Proposals which are marked as P1, P2, and P3 etc... are proposed in privately owned lands. Initiation of land acquisition for special zones shall be started within a period of 7 years from the date of sanctioning of this 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 Town Planner concerned.		

16	**Proposed Innovation Hub [Adoor Village, Survey No 654(p), 655(p)]**			
	G1	IT/ITES software units, Information technology Enabled Service Building /ITES buildings and information technology/, Professional Offices, Commercial Offices, Banks & other Financial Institutions Research Institutions and their Ancillary Buildings Auditorium/ Wedding halls/ convention center, Community halls, Gymnasium /Yoga Centers / Sports Centers , Start-up hub Parking Yard, Parking Building, Mechanised Parking, Parking Plaza. Turf, Park & Open space, Swimming Pools, Playground, Open stages, Green houses Museum, Exhibition Centers and Art Gallery, Open-air Theatre, Amusement Parks, Stadium ,Fair Ground, Tot Lots/Parks/ Community facilities such as recreational clubs, Reading Rooms, libraries etc. Any incidental uses may be permitted with the main use.		
17		**Aquatic Complex & Cultural Centre [Adoor Village, Survey No 232 (p), 236 (p)]**		
	G2	Multipurpose Auditorium / Theater, Art Galleries & Exhibition Halls, Library & Digital Resource Centre, Workshops & Studio Spaces, Heritage Museum / Cultural Pavilion, Amphitheatre, Conference & Seminar Halls, Cultural Incubation Hub, Souvenir Shops, Retail shops and any other incidental uses to the main use		

18	**Municipal Stadium & Sports Complex [Adoor Village, Survey No 281 (p), 282(p),283(p), 285(p), 286(p), 287&288(p)]**			
	G3	Stadium, Jogging track, sports complex, Clock Room, Locker Room Facility, Training centers, LED Board , Parking lots ,Parking Yard All Indoor and Outdoor sports and games infrastructure facilities including Hostels, dormitories, boarding houses, swimming pools, Gymnasium/ Yoga Centers/ Open Gym, assembly halls, auditoriums, Library, Reading rooms and all other such incidental uses Parking lot/ multi-level car parking, Parking plaza. Any incidental uses may be permitted with the main use.	De-centralised waste treatment Plant	
19	**Municipal Office Complex & Municipal Bus Stand [Peringanadu Village, Survey No 192 (p), 193(p)]**			
	G4	Municipal Office Complex, Municipal Shopping Complex and all other construction/land development essential for the development/ improvement of Municipal Office Complex. All buildings and uses connected with Transportation and Communication such as Transport Terminals/ Bus Terminals/ Truck Terminals and Ancillary Structures Bus parking area with all incidental uses such as repairing shops, Restrooms, commercial establishments, cafeterias, Restaurant, Information centers, Travel plaza, Parking plaza, Travel Agencies, Online Ticket booking centers, Ticket counter, Auto Taxi, EV Charging Station. Public Utility Areas Any remunerative uses attached to the transport terminals as value		

		capture mechanism such as commercial buildings, malls, retail shops, hotels, Nurseries/ Day Care and Crèche/ Anganwadis, Coaching Centres, office spaces, Community Halls, Recreation club, auditorium, Mall, Movie halls, Exhibition halls, convention halls, Art galleries, Museums, Gymnasiums, Library, Reading rooms, Lodging and dormitories, visiting lounges, One day home or "She" lodge for ladies, Quarters, Educational Training centers Offices, Professional Offices , Medical Lab, Clinics &Diagnostic Centers, Dispensaries, Commercial Establishments, Library & Reading rooms, Club, Nurseries/ Day Care and Crèche/ Anganwadis, Night Shelters, Health Club, Retails shops etc.		
20	**Revitalization of Parakode Market [Adoor Village, Survey No 881 (p), 882 (p),883(p), 925(p) & 926(p)]**			
	G5	All commercial shops, Vending shops, Loading and unloading platforms Any construction/land development essential for the development/ improvement of Modern Municipal Market. Expansion or modernization of existing market and its ancillary uses Such as Modern Slaughter house, Modern Meat processing unit, Cold storage, Ice plant etc. Storage building including processing, repairing, Godowns/weighbridges/ Stacking Yards / Storage of Non-Hazardous materials, warehouses, transit sheds, handling & stacking of risk free objects/products.	Transport terminals, Truck terminal	

		Mechanised parking, Parking yard, Public Utility Areas and Public Utility Buildings. Solid waste treatment plants including MCF, RRF, Shredding units, Composting units, Segregations units.		
21	**G6**	**Gandhi Park Renovation[Adoor Village, Survey No 355(p)]**		
		Open air Auditorium, Open Stage, Open Gym, Parks & Open Spaces, Landscaping, Statue, Tot lots, Street Furniture, Vending kiosk, Information Kiosk and other Incidental uses which will not affect the character of the area. Any incidental uses may be permitted with the main use.		
22	**Municipal Town Hall and Parking Plaza [Adoor Village, Survey No 324 (p)]**			
	G7	Auditorium/ Wedding halls/ convention center, Community halls, Gymnasium /Yoga Centers / Sports Centers , Start-up hub Parking Yard, Parking Building, Multilevel Parking, Mechanised Parking, Parking Plaza. Municipal Shopping Complex, Retail shops, Offices and all other construction/land development essential for the development/ improvement of Municipal Town Hall and Parking Plaza		
23	**Transit - Resting Hub [Peringanadu Village, Survey No 94 (p)**			
	G8	Hotels, Restrooms, Commercial establishments, Cafeterias, Restaurant, Fuel Filling Station Lodging and dormitories, night shelters, Visiting lounges, Automobile Workshops & Automobile Service Stations, Library, Reading rooms, Open Gym, Parks & Open Spaces, Garden, and Landscaping.		

		Parking yard, Multi-level car parking, Mechanized parking, Parking buildings/ parking plazas, Information kiosk, Electric Vehicle Charging Station, Vehicle repairing shops		
24	**Integrated Waste Treatment Plant [Adoor Village, Survey No 10 (p), 11(p),12 & 13(p)]**			
	G9	Solid waste treatment plant and Buildings/structures incidental to it. Sewage Treatment Plant and its incidental uses along with beautification works like gardening etc. Parking yard, Multi-level parking, Mechanized parking etc.,		
25	**Proposed Fire & Rescue Station [Adoor Village, Survey No 227 (p)]**			
	G 10	Fire & Rescue Station and its incidental buildings/uses.		
26	**Shopping Complex & She Lodge [Adoor Village, Survey No 308 (p)]**			
	G 11	All shops including shopping complexes, shopping malls, movie halls, restaurants, hotels, Lodges dormitories, Rest House, Rest Rooms, Hostels, Health club, One day home or "She" lodge for ladies Markets. Professional offices, commercial offices & establishments, banking and financial institutions, ATM, IT software units, Movie halls. Parking yard, Multi-level car parking, Mechanized parking, Parking buildings/ parking plazas/ building used exclusively for parking of vehicles, Information kiosk, Electric Vehicle Charging Station Auto / Taxi stands, Public Utility Areas and Public Utility Buildings or Establishments Any incidental uses which may be permitted with the main use.		

27	**Crematorium & Bio-park [Peringanadu Village, Survey No 62]**			
	G 12	Gas crematorium and its incidental uses Sipline , Bio Park, Garden, Land Scalping , Botanical Garden , Parking Plaza and Yard , Prayer Hall		
28	**Proposed Highway Travel Plaza [Peringanadu Village, Survey No 193 (p)]**			
	G 13	Vehicle repairing shops, Restrooms, Commercial establishments, Cafeterias, Restaurant, Lodging and dormitories, night shelters, Visiting lounges, Automobile Workshops & Automobile Service Stations, Library, Reading rooms, Open Gym, Parks & Open Spaces, Garden, Landscaping. Parking yard, Multi-level car parking, Mechanized parking, Parking buildings/ parking plazas, Information kiosk, Electric Vehicle Charging Station.	Fuel Filling Station	
29	**Proposed Agrarian Park & Experience Centre [Adoor Village, Survey No 463 (p),466(p), 468(p)]**			
	G 14	Seed farm and Associated office building, Farm tourism experience centers, Pond, Selfie points, Tree house, Yoga center, meditation center etc., Agri Knowledge Center & Museum, Agro-Processing Demonstration Units, Farm Produce Market / Souvenir Shops, Gazebo, Visitor Orientation Center, Open-Air Amphitheatre, Tot Lots/Parks/, Open-air Theatre, Zoological, and Botanical Gardens/Bird Sanctuary, Camping Site, Exhibition Centers & Art Gallery, recreational clubs. garden, eco-tourism infrastructure facilities,		

		Green houses, Plant nursery, Pump House, water storage and treatment plants, children's play area, ancillary and supporting uses related to tourism. Tourism information centre, comfort station ,Clock rooms Any remunerative uses attached to the Proposed Agrarian Park & Experience Centre as value capture mechanism such as Retail outlet, and all other incidental uses to the main use.		
30	**Proposed Empowerment Centre[Adoor Village, Survey No 773(p)]**			
	G 15	Empowerment center, Gymnasiums & health clubs, Yoga and pilates studios, Wellness Center, Therapy Center, Cultural Center, Open Stage, Skill development Center, Rehabilitation Center. Old age care center, Old age friendly park, Old age homes etc.		
31	**Fitlife Centre with Leisure Hub [Adoor Village, Survey No 622(p), 629(p)]**			
	G 16	All Indoor and Outdoor Courts, Swimming pools, Gymnasium / Yoga Centers / Open Gym, assembly halls, auditoriums, Library, Reading rooms and any such incidental uses without changing the character of the zone. Entertainment Venues, Free Wi-Fi Zones, jogging tracks,Exhibition halls, Open air theatre, Artesian emporium, Indoor stadium, Swimming pools, Comfort station etc. And any incidental uses to the main use		

32	**Proposed Civic Arcade [Adoor Village, Survey No 881 (p)]**			
	G 17	Open air Auditorium, Open Stage, Open Gym, Parks & Open Spaces, Exhibition Grounds, Garden, Landscaping, Statue, Tot lots, Street Furniture, Vending kiosk, Information Kiosk. All Commercial Shops, Commercial establishment, Shopping Complexes, Shopping Malls, Super or Hyper Markets, Commercial Offices, Professional Offices & Establishments, Banking and Financial Institutions, Business Houses, Restaurants etc,. Social Welfare Institution, Library & Reading Rooms, Clubs and Cultural Institutions. Any incidental uses may be permitted with the main use.		
33	**Urban Hangout Hub [Peringanadu Village Survey No 194 (p), Adoor Village Survey No 315 (p)]**			
	P1	All Commercial Shops, Commercial establishment, Show Rooms, Shopping Complexes, Shopping Malls, Super or Hyper Markets, Commercial Offices, Professional Offices & Establishments, Banking and Financial Institutions, Business Houses, Restaurants etc,. Social Welfare Institution, Library & Reading Rooms, Clubs, Turf and Cultural Institutions. Auditorium/ Wedding halls/convention centres, Theatres, Movie halls, Parks & Open Spaces, Stadiums & Exhibition Grounds, Gymnasium / Yoga Centers / Sports Centers & Indoor Games. Any incidental uses may be permitted with the main use.		Multiplex Complex

34	**Trade & Expo Pavilion [Peringanadu Village, Survey No 186 (p)]**			
	P2	Exhibition Halls, Museum, Product Display Zones, Presentation Theatres, LED Board , Open air Auditorium, Open Stage, Fair Ground, Parks & Open Spaces, Exhibition Grounds, Garden, Landscaping, and Tot lots, Street Furniture, Vending kiosk, Information Kiosk, Comfort station. Parking yard, Multi-level parking, Mechanized parking, Parking buildings/ parking plazas, Electric Vehicle Charging Station. Any incidental uses may be permitted with the main use.		
35	**Proposed Turf [Adoor Village, Survey No 773 (p)]**			
	P3	Social Welfare Institution, Library & Reading Rooms, Clubs, Turf and Cultural Institutions Turf, Park & Open space, Swimming Pools, Playground, Open stages, Green houses Open Air theatre, open grounds, Wellness centers, Holistic centers, Yoga centre, Health club, Indoor Courts, Turf, Tot lots/Parks other recreational facilities, Gymnaseum, Health Centre, Counselling centers, Community hall, Open library, Children‟s park, Park/Playground, Fair ground, Turf, First aid stations, water		
36	**Proposed Women Skill Development Centre [Adoor Village, Survey No 279 (p)]**			
	P4	Empowerment center, Gymnasiums & health clubs, Yoga and pilates studios, Wellness Center, Therapy Center, Cultural Center, Open		

		Stage, Skill development Center, Training Center, Rehabilitation Center.		
37	**Transit-Resting Hub Extension Area [Peringanadu Village, Survey No 95(p),102(p)]**			
	P5	Vehicle repairing shops, Restrooms, Commercial establishments, Cafeterias, Restaurant, Lodging and dormitories, night shelters, Visiting lounges, Automobile Workshops & Automobile Service Stations, Library, Reading rooms, Open Gym, Parks & Open Spaces, Garden, Landscaping. Parking yard, Multi-level car parking, Mechanized parking, Parking buildings/ parking plazas, Information kiosk, Electric Vehicle Charging Station.	Fuel Filling Station	

ANNEXURE 4.1

WARD WISE LAND USE BREAKUP

Ward	Land use									
	Residential	Commercial	Industrial	Public	Public (Except religious)	Agricultural	Total Park & Open Space	Total Transportation	Transportation -Bus terminal	Water bodies
1	2	3	4	5	6	7	8	9	10	11
Mithrapuram	0.3479	0.0055	0.0055	0.0020	0.0011	0.9330	0.0105	0.0885	0.0000	0.0040
E.V. Ward	0.4276	0.0007	0.0000	0.0099	0.0099	0.6342	0.0072	0.0562	0.0000	0.0467
Pannivizha	0.2988	0.0003	0.0000	0.0003	0.0003	0.2889	0.0181	0.0472	0.0000	0.0021
Civil Station	0.0707	0.0000	0.0000	0.0086	0.0059	0.4600	0.0038	0.0270	0.0000	0.0747
Javahar	0.3811	0.0044	0.0000	0.0202	0.0182	0.4864	0.1095	0.0755	0.0000	0.0151
Anandapally	0.2534	0.0040	0.0031	0.0081	0.0039	0.2998	0.0449	0.0649	0.0000	0.0799
Potharad	0.3642	0.0135	0.0073	0.0119	0.0049	0.9218	0.0457	0.0926	0.0000	0.0264
M.G. Ward	0.3330	0.0002	0.0005	0.0017	0.0017	0.6769	0.0235	0.0674	0.0000	0.0758
Bhagatsingh Ward	0.1562	0.0002	0.0000	0.0082	0.0071	0.6391	0.0019	0.0449	0.0000	0.0111
Nethagi Ward	0.2191	0.0010	0.0000	0.0117	0.0072	0.2968	0.0000	0.0340	0.0000	0.0014
Parakode East	0.1476	0.0231	0.0001	0.0104	0.0048	0.2918	0.0002	0.0247	0.0000	0.0163
Anantharamapuram	0.1819	0.0268	0.0000	0.0251	0.0146	0.1490	0.0163	0.0636	0.0000	0.0190
Parakode West	0.3759	0.0112	0.0003	0.0123	0.0100	0.2675	0.0016	0.0635	0.0000	0.0548
T.B Ward	0.1557	0.0027	0.0000	0.0336	0.0336	0.1723	0.0140	0.0280	0.0000	0.0124
Pannivizha East	0.1993	0.0000	0.0000	0.0161	0.0161	0.4450	0.0144	0.0536	0.0000	0.0809
Pampettu Kulam	0.2466	0.0012	0.0005	0.0040	0.0040	0.3298	0.0364	0.0537	0.0000	0.0143
Town East	0.2020	0.0838	0.0000	0.0308	0.0199	0.3954	0.0024	0.0647	0.0000	0.0255
Kannamkode	0.2394	0.0074	0.0058	0.0097	0.0097	0.2313	0.0115	0.0627	0.0000	0.0000
Ayyappan Para	0.3254	0.0011	0.0106	0.0126	0.0070	0.3004	0.0148	0.0841	0.0000	0.1100
Nellimoottil Padi	0.4646	0.0357	0.0000	0.0199	0.0199	0.4867	0.0283	0.0152	0.0000	0.0271
Town	0.2379	0.0610	0.0000	0.0416	0.0375	0.0847	0.0000	0.0644	0.0106	0.0012
Moonnalam	0.2810	0.0019	0.0000	0.0101	0.0091	0.3988	0.0171	0.0683	0.0000	0.0475
Priyadarshini	0.3229	0.0010	0.0000	0.0088	0.0003	0.5271	0.0062	0.0417	0.0000	0.0462
Karuvatta	0.3539	0.0194	0.0035	0.0545	0.0467	0.2758	0.0120	0.0755	0.0000	0.0325
Puthiyakavilchira	0.2828	0.0059	0.0000	0.0256	0.0106	0.3832	0.0208	0.0685	0.0000	0.0212

Source : Land Use Survey 2010

ANNEXURE 6.1

DETAILS OF MANUFACTURING INDUSTRIES

Sector	Type of Organization	Unit Category	Total Employ
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	12
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	4
Handloom, Coir & Handicraft items	Proprietary	Micro	1
Automobile Sevice / Repair	Proprietary	Micro	2
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	3
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	4
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	3
Other manufacturing activities	Proprietary	Micro	2
Personal Care Product and Sevices, Cosmetics, Wellness, Gymnasium, Martial Arts, Yoga	Proprietary	Micro	5
Electrical & Electronics Products and Services, IT and Mobile Hardware, Cable TV, Internet	Proprietary	Micro	2
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2
Personal Care Product and Sevices, Cosmetics, Wellness, Gymnasium, Martial Arts, Yoga	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	6
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	4
Other Service Activities	Proprietary	Micro	3
Other Service Activities	Proprietary	Micro	3
Video/ Photo Processing, Media & Entertainment, Event Management, Printing & Publishing, DTP	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	1
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	1
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	4
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Small	6
Wood Products	Proprietary	Micro	5
Wood Products	Proprietary	Micro	4
Wood Products	Proprietary	Micro	2
Wood Products	Proprietary	Micro	3
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2

Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	5
Other manufacturing activities	Proprietary	Micro	11
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	3
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	3
Other Service Activities	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	4
Wood Products	Proprietary	Micro	3
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	1
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	4
Wood Products	Partnership	Micro	6
Electrical & Electronics Products and Services, IT and Mobile Hardware, Cable TV, Internet	Proprietary	Micro	2
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	3
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	3
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	5
Automobile Sevice / Repair	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	7
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Self Help Group-Individual	Micro	8
Video/ Photo Processing, Media & Entertainment, Event Management, Printing & Publishing, DTP	Proprietary	Micro	8
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	6
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	6
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	6
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	4
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	2
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	2
Wood Products	Proprietary	Micro	4
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	4
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	4
General Engineering & Precision Engineering (Steel, Iron	Proprietary	Micro	2

etc Products / fabrication)			
Other manufacturing activities	Proprietary	Micro	4
Plastic Products	Partnership	Micro	3
Other manufacturing activities	Proprietary	Micro	4
Other Service Activities	Proprietary	Micro	2
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	4
Other Service Activities	Proprietary	Micro	5
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	2
Automobile Sevice / Repair	Proprietary	Micro	2
Paper Products	Proprietary	Micro	3
Other manufacturing activities	Proprietary	Micro	3
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Other manufacturing activities	Proprietary	Micro	2
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	7
Other Service Activities	Proprietary	Micro	5
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	1
Other Service Activities	Proprietary	Micro	1
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	3
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	5
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	5
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	3
Other manufacturing activities	Proprietary	Micro	1
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	5
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	6
Automobile Sevice / Repair	Proprietary	Micro	4
Electrical & Electronics Products and Services, IT and Mobile Hardware, Cable TV, Internet	Proprietary	Micro	1
Other Service Activities	Partnership	Micro	5
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	5
Wood Products	Proprietary	Micro	2
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	1
Video/ Photo Processing, Media & Entertainment, Event Management, Printing & Publishing, DTP	Proprietary	Micro	3
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	6
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	7

Video/ Photo Processing, Media & Entertainment, Event Management, Printing & Publishing, DTP	Proprietary	Micro	4
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	5
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	7
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	1
Plastic Products	Proprietary	Micro	2
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	3
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	3
Wood Products	Proprietary	Micro	2
Wood Products	Proprietary	Micro	4
Video/ Photo Processing, Media & Entertainment, Event Management, Printing & Publishing, DTP	Proprietary	Micro	3
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	3
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	4
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Wood Products	Proprietary	Micro	2
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	6
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	4
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	2
Other Service Activities	Proprietary	Micro	2
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	3
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	3
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	3
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2
Video/ Photo Processing, Media & Entertainment, Event Management, Printing & Publishing, DTP	Proprietary	Micro	2
Electrical & Electronics Products and Services, IT and Mobile Hardware, Cable TV, Internet	Proprietary	Micro	1
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	3
Personal Care Product and Sevices, Cosmetics, Wellness, Gymnasium, Martial Arts, Yoga	Co-operative Society	Micro	3

Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	3
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	2
Glass Products	Proprietary	Micro	5
Video/ Photo Processing, Media & Entertainment, Event Management, Printing & Publishing, DTP	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Wood Products	Proprietary	Micro	4
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2
Other Service Activities	Proprietary	Micro	4
Video/ Photo Processing, Media & Entertainment, Event Management, Printing & Publishing, DTP	Proprietary	Micro	3
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	4
Agro food, Beverage, Meat/ Fish Product and Processsing	Self Help Group-Individual	Micro	5
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	4
General Engineering & Precision Engineering (Steel, Iron etc Products / fabrication)	Proprietary	Micro	3
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	8
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Organic / Chemical Fertilzers	Partnership	Micro	5
Rubber Products	Proprietary	Micro	3
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	5
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	4
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	5
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	4
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	1
Wood Products	Proprietary	Micro	6
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	4
Garments and Textiles, Tailoring, Boutique, Apparal Designing, Ornaments	Proprietary	Micro	2
Building Materials, Construction, Architecture, Structural Designing	Proprietary	Micro	3
Agro food, Beverage, Meat/ Fish Product and Processsing	Proprietary	Micro	2
Total			570

Source : DIC, 2024

ANNEXURE 6.2
DETAILS OF SERVICE INDUSTRIES

Sl. No	Type of Organization	Unit Category	Item	Total Employ
1	Proprietary	Micro	Dtp Photostat,	2
2	Proprietary	Micro	Printing Flex Offset,	3
3	Proprietary	Micro	Photostat Printing Lamination,	1
4	Proprietary	Micro	Mobile Sales And Service,	1
5	Public Sector Undertaking	Micro	Muncipality,	20
6	Proprietary	Micro	Service Station,	10
7	Proprietary	Micro	Tailoring Stiching,	2
8	Proprietary	Micro	Beautyparlour ,	2
9	Proprietary	Micro	Dtp Photostat,	1
10	Proprietary	Micro	Dry Cleaning,	1
11	Proprietary	Micro	Stationary,,	1
12	Proprietary	Micro	Laboratory ,	3
13	Proprietary	Micro	Medical Shop,	2
14	Proprietary	Micro	Laboratory,	6
15	Proprietary	Micro	Driving School,	1
16	Public Sector Undertaking	Micro	Industries Service,	6
17	Proprietary	Micro	Pet Shop,	1
18	Proprietary	Micro	Pet Shop,	1
19	Proprietary	Micro	Electrical Items,	2
20	Proprietary	Micro	Mobile Accessories ,	2
21	Proprietary	Micro	Stationary,	1
22	Proprietary	Micro	Electric Works,	1
23	Proprietary	Micro	Clinic ,	2
24	Proprietary	Micro	Car Dealers,	9
25	Proprietary	Micro	Mobile Services,	2
26	Proprietary	Micro	Beautyparlour ,	1
27	Proprietary	Micro	Beautyparlour ,	3
28	Proprietary	Micro	Beautyparlour ,	4
29	Proprietary	Micro	Garments ,	3
30	Proprietary	Micro	Enterprises ,	2
31	Proprietary	Micro	Beautyparlour ,	2
32	Proprietary	Micro	Garments ,	3
33	Proprietary	Micro	Garments ,	6
34	Proprietary	Micro	Beautyparlour ,	4
35	Proprietary	Micro	Hair Cutting,	2
36	Proprietary	Micro	Tyres,	7
37	Proprietary	Micro	Mobile Services,	2
38	Proprietary	Micro	Auto Spares,	8
39	Proprietary	Micro	Mobile Services ,	2
40	Proprietary	Micro	Internet Services ,	3
41	Proprietary	Micro	Coolbar,	3

42	Proprietary	Micro	Mobile,	2
43	Proprietary	Micro	Auto Mobile,	3
44	Proprietary	Micro	Saloon,	2
45	Proprietary	Micro	Electricals,	1
46	Proprietary	Micro	Digital Studio,	1
47	Proprietary	Micro	Mobile Sales And Service,	1
48	Proprietary	Micro	Diagnostics Lab,	14
49	Proprietary	Micro	Mobile Services ,	2
50	Proprietary	Micro	Systems Computer,	10
51	Proprietary	Micro	Beauty Parlour ,	1
52	Proprietary	Micro	Dtp Print,	3
53	Proprietary	Micro	Photostat Dtp,	2
54	Proprietary	Micro	Computer Maintenance ,	4
55	Proprietary	Micro	Automobile Service,	3
56	Proprietary	Micro	Studio,	1
57	Proprietary	Micro	Beauty Saloon,	3
58	Proprietary	Micro	Costumes Making,	2
59	Proprietary	Micro	Mobile Sales And Service,	1

Source : DIC 2024

ANNEXURE 7.1

DETAILS OF INFORMAL SECTOR ACTIVITY IN ADOOR TOWN

Sl.No.	Ward Number	Gender	Age	Name of Place/Road/Locality	Nature of Items being sold	Nature of Items being sold – (Others)
1	014	Female	55	Parakode	Food Items	Others
2	014	Female	65	Parakode	Others	Betel Leaves
3	014	Male	32	Parakode	Others	Lottery
4	014	Female	71	Parakode	Others	Betel Leaves& Lemon Juice
5	014	Male	45	Parakode Junction	Others	Egg , Lemon Juice Etc.
6	011	Male	50	Pannivizha Theppumpara Road	Others	Vegetables
7	011	Female	47	Kallikkottupadi	Others	Vegetables
8	015	Male	63	Parakode Chiranikkal Road	Others	Vegetables
9	015	Male	73	Parakode Ezhamkulam Canal Road	Others	Madakkada
10	014	Female	65	Parakode Vetta Chantha	Food Items	Teashop
11	014	Male	62	Parakode Vetta Chantha	Others	Murukkan Kada
12	015	Male	38	Kp Road	Others	Fish
13	007	Male	54	Anandapalli Junction	Food Items	Others
14	016	Male	56	Kp Road	Others	Fish
15	005	Male	44	Mc Road	Food Items	Others
16	015	Male	29	Parakode Hs Junction	Others	Fish
17	007	Male	54	Anandapalli Junction	Food Items	Fish
18	024	Male	57	Near Sm Textiles	Others	Lottery
19	024	Male	62	Market Road	Others	Chappal
20	010	Male	61	Ambalaveli Jn	Food Items	Stationary
21	009	Female	40	Attakulam Jn	Food Items	Tea Snac
22	009	Male	50	Anandapalli Junction	Food Items	Tea Snac

23	008	Male	62	Pothradu Chira	Food Items	Tea Vegitable
24	008	Female	34	Pothradu	Food Items	Lemon Juce,Candy
25	007	Male	51	Anandapalli Junction	Others	Vegetables
26	007	Male	54	Chembolil Jn	Food Items	Tea,Snac
27	007	Male	47	Thatta,Road	Food Items	Tapioacca
28	007	Female	70	Pannivizha Canal Road	Others	Murukkan Kada
29	006	Male		Kaithakkara	Others	Murukkan Kada
30	006	Female	59	Kaithakkara	Others	Murukkan Kada
31	024	Male	29	Central Toal Adoor	Food Items	Fish
32	016	Male	65	Parakode	Food Items	Vegetables
33	016	Female	64	Parakode	Others	Lottery,Betel Leaves
34	016	Male	44	Parakode	Food Items	Vegetables
35	016	Female	55	Parakode	Others	Lottery
36	020	Female	55	Kannamkode	Food Items	Tea ,Snac
37	020	Male	48	Kannamkode	Food Items	Lemon Juce
38	016	Female	48	K P Road	Others	Lottery
39	016	Male	45	Parakode	Food Items	Vegetables
40	020	Female	64	Kannamkode	Others	Murukkan Kada
41	020	Male	39	Kannamkode	Food Items	Chips
42	024	Male	53	K P Road	Others	Umbrella,Chalppal Repairing
43	024	Female	49	K P Road	Clothes	Others
44	024	Female	33	K P Road	Others	Umbrella,Chalppal Repairing
45	024	Male	51	K P Road	Others	Lottery & Murukkan Kada
46	024	Male	52	K P Road Near Gh	Clothes	Others
47	024	Male	55	Kp Road Adoor Town	Others	Chappal Reparing
48	024	Male	54	Kp Road Adoor Town	Others	Lottery
49	024	Male	69	M C Road	Others	Murukan Kada
50	024	Male	32	K P Road	Others	Lottery
51	022	Male	72	M C Road	Food Items	Fruits

52	024	Male	52	K P Road	Food Items	Fruits
53	024	Male	50	K P Road	Others	Lottery
54	024	Male	47	M C Road	Clothes	
55	024	Male	67	M C Road	Mechanical Goods	Fancy Items And Mask
56	024	Male	60	M C Road	Clothes	Others
57	024	Female	49	Opposite Dayana Hotel	Others	Lottery
58	024	Female	50	Market Road	Others	Lemon,Betel Leaves
59	024	Female	46	Parthasarathy Road	Others	Murukan Kada
60	024	Female	50	M C Road	Others	Lottery
61	024	Male	60	M C Road	Others	Murukan Kada
62	024	Female	60	M C Road	Others	Murukan Kada
63	024	Male	60	Market Road	Others	Lemon
64	024	Female	48	Private Bustand Cumfurt Station	Mechanical Goods	Lottery
65	024	Male	38	Near Parthasarathy Temple	Food Items	Vegetables
66	024	Male	48	Near Govt.Hospital	Food Items	Tea Snac
67	021	Male	49	Pwd Rest House	Food Items	Fruits
68	024	Male	49	Near Sm Textiles	Mechanical Goods	Lotterry Chappal Repairing
69	024	Male	64	Near Adoor Tourist Home	Food Items	Tea Lottery
70	023	Male	57	Near Arapura Church	Food Items	Tea Snac
71	024	Male	46	Nellimootilpadi Ayyappanpara Road	Food Items	Tea Snac
72	022	Female	49	Near Nellimootilpadi Police Aid Post	Food Items	Tea Snac
73	024	Male	58	Near Pvt Bustand	Others	Lottery
74	024	Female	57	Near Parthasarathy Temple	Others	Flower Shop
75	024	Male	59	K P Road Adoor	Others	Chappal Reparing
76	024	Male	52	Near Parthasarathy Temple	Others	Lottery
77	024	Female	34	K P Road	Others	Chappal Reparing
78	024	Male	70	Old Janatha Hospital	Others	Lottery

79	024	Male	46	Near Parthasarathy Temple	Others	Candy,Lemon
80	024	Female	67	Near Market Road	Clothes	Others
81	024	Male	55	Near Parthasarathy Temple	Others	Fancy Items And Mask
82	001	Male	71	Mithrapuram	Others	Murukan Kada
83	001	Female	65	Lakshyamveedu Kolani	Others	Murukkan Kada
84	001	Male	29	Mithrapuram	Food Items	Tea Snacks
85	002	Male	47	Ev Ward	Others	Betel Leaves,Lemon Juice,Banana Etc
86	003	Male	44	Kaimalappra	Others	Betel Leaves
87	003	Female	59	Puthanchantha	Others	Stationary
88	024	Male	64	Market Road	Others	Vegetables
89	024	Male	68	One Way Road Near Market	Clothes	Others
90	024	Male	63	Opposite Of Town Up S	Others	Footwears,Umbrella
91	024	Male	55	Kp Road	Select Item	Cobbler
92	024	Male	52	Near Parthasarathy Temple	Others	Cobbler
93	024	Male	40	Near Parthasarathy Temple	Others	Cobbler
94	022	Male	45	Nellimootilpadi	Others	Vegetables&Fruits
95	022	Male	65	Nellimoottilpadi	Others	Dry Fish
96	024	Female	50	Near Parthasarathy Temple	Others	Chappal Reparing
97	024	Female	47	Market Road	Food Items	Lemon
98	024	Female		Market Road	Others	Masala Kada
99	024	Male	54	Nera Upajilla Office Adoor	Others	Lotion
100	004	Female	68	Ootimukku	Others	Murukan Kada
101	004	Male	62	Ootimukku	Others	Murukan Kada
102	005	Female	48	Municipality	Others	Foam Filling
103	005	Male	38	Near General Hospital Adoor	Others	Thailam
104	005	Female	52	One Way Road Opposite Geetham Auditorium	Others	Murukan Kada
105	005	Male	59	Near Govt.Hospital	Food Items	Fruits

106	005	Male	50	Opposite Court Near One Way	Food Items	Tea,Snac
107	005	Male	60	One Way Road	Food Items	Tea,Snac
108	005	Male	47	K P Road ,Sivil Station	Others	Flower Shop
109	005	Male	57	Market Road	Others	Lottery
110	005	Male	49	Oneway Road Opposite Court	Food Items	Tea
111	005	Male	51	Opposite Sreemoolam Market	Others	Knife Sale
112	005	Male	43	Civil Station Near Market	Others	Knife Sale
113	005	Female	42	Revenue Tower	Others	Lottery
114	027	Male	52	By Pass Road	Food Items	Thattukada
115	027	Male	56	K P Road	Food Items	Fruits
116	027	Male	47	K P Road	Food Items	Tea& Snac
117	027	Male	31	K P Road	Food Items	Vegitable
118	027	Male	36	K P Road	Food Items	Vegitable
119	027	Male	40	K P Road	Food Items	Fruits
120	027	Male	42	K P Road	Others	Lottery
121	027	Male	30	K P Road	Food Items	Fruits
122	027	Male	36	K P Road	Clothes	
123	027	Male	46	M C Road	Others	Lottery
124	027	Male	50	M C Road	Food Items	Tea Snac
125	027	Female	51	M C Road	Food Items	Tea Snac
126	027	Female	53	M C Road	Others	Lottery
127	026	Male	67	Thadathil Padi	Food Items	Tea,Snac
128	027	Male	65	K P Road	Food Items	Tea,Snac
129	026	Female	64	M C Road	Food Items	Tea,Snac
130	025	Male	40	By Pass Road	Others	Tyre Puncture Work
131	025	Female	55	By Pass Road	Food Items	Lemon Juce,Murukan Kada
132	025	Male	52	By Pass Road	Food Items	Tea,Snac
133	027	Male	41	K P Road	Food Items	Fruits
134	027	Female	53	M C Road	Food Items	Tea,Snac

135	027	Female	47	K P Road	Food Items	Fruits
136	027	Male	56	K P Road	Others	Lottery
137	027	Male	39	K P Road	Food Items	Bakery,Tea
138	027	Male	43	K P Road	Others	Daily Used Meterials
139	024	Male	49	K P Road	Others	Murukan Kada
140	024	Male	55	Market Road	Food Items	Lemon
141	024	Male	55	Market Road	Mechanical Goods	Betel Leaves,
142	024	Female	50	Market Road	Food Items	Vegitable
143	024	Female	63	M C Road	Others	Grocery Items
144	016	Male	37	Parakode Market	Food Items	Fish
145	015	Female	56	Parakode Chiranikkal Road	Food Items	Vegitable
146	016	Male	63	Parakode Market	Food Items	Vegetables
147	020	Female	40	K P Road	Food Items	Tea,Snac
148	016	Male	61	Parakode Market	Food Items	Fish
149	020	Male	52	K P Road	Food Items	Lemon Juce
150	020	Male	42	K P Road	Food Items	Tea,Snac
151	017	Male	44	K P Road	Food Items	Vegitable
152	016	Female	61	Parakode	Food Items	Vegitable
153	016	Male	60	Parakode	Food Items	Tappiocca
154	016	Female	56	Parakode	Food Items	Vegetables
155	016	Male	69	Parakode	Food Items	Tappiocca
156	016	Male	55	Parakode	Others	Murukan Kada
157	017	Male	46	Parakode	Food Items	Vegetables
158	009	Male	63	Kanjiraveli Jn	Food Items	Vegetables
159	007	Male	71	Pannivizha, Valiyakulam	Food Items	Cool Drinks & Fruits
160	009	Female	45	Pannivizha, Valiyakulam	Food Items	Vegetables
161	009	Male	65	Pannivizha	Food Items	Vegetables
162	008	Male	54	Pannivizha Kanjiravelil	Food Items	Appam,Porotta, Unniappam,Vada Etc….
163	016	Male	36	Parakode	Food Items	Vegitable

164	017	Male	55	Parakode	Food Items	Vegitable
165	016	Male	59	Parakode	Food Items	Tea,Snac
166	016	Male	60	Parakode	Food Items	Vegitable
167	017	Male	47	Parakode	Food Items	Fruits
168	005	Male	57	Sreemoolam Market Road	Others	Knife Sale
169	005	Male	43	Market Road	Others	Net
170	020	Male	45	Near Mariya Hospital	Others	Lottery,Murukan Kada
171	005	Male	47	Market	Food Items	Vegetables
172	024	Male	69	Near K S R T C Jn	Others	Murukan Kada
173	024	Female	53	Near Beverages	Others	Murukan Kada
174	024	Male	50	Near K S R T C Jn	Food Items	Vegetables,Fruits
175	020	Male	35	Near Malabar Gold	Others	Pot
176	024	Male	67	Near Sm Textiles	Clothes	Others
177	016	Male	39	Opposite Sbi	Food Items	Vegetables
178	005	Male	57	Near Mr Textiles	Food Items	Fruits
179	021	Female	53	Near Bhima Gold	Food Items	Tea Shop
180	005	Female	45	Market	Food Items	Vegetables
181	005	Male	68	Market	Food Items	Fish
182	005	Male	60	Market	Food Items	Vegetables
183	005	Male	52	Opposite Universal Mobile Shop	Food Items	Vegetables
184	007	Female	51	Pannivizha Temple	Food Items	Tea,Snac
185	016	Male	63	Market	Food Items	Spices
186	020	Male	46	Central Toal Adoor	Food Items	Fish Sale
187	009	Male	43	Pannivizha	Food Items	Tappiocca,Cocunut
188	025	Male	46	Bypass Road	Food Items	Coconut Sale
189	024	Male	56	Near K S R T C Jn	Food Items	Peanut Fry
190	005	Female	52	Market,Adoor&Para kode	Food Items	Pappadam
191	016	Female	62	Parakode Stand	Others	Murukkan Kada
192	027	Female	49	Bypass Road	Food Items	Tendor Cocunut Sale

193	024	Male	48	Near K S R T C Jn	Food Items	Fruits
194	021	Male	41	Opposie Pwd Office	Food Items	Fish Sale
195	016	Female	42	Parakode Market	Food Items	Fish Sale
196	006	Male	52	Anandappally	Others	Lottery
197	016	Male	47	Parakode Market	Food Items	Vegetables
198	016	Male	61	Parakode Market	Food Items	Fish Sale
199	021	Male	36	Opposite Pwd Office	Food Items	Vegetables
200	016	Female	85	Parakode	Others	Murukan Kada
201	007	Male	48	Anandappally	Food Items	Vegetables,Fruits
202	022	Male	30	Nellimootilpadi	Food Items	Fruits
203	016	Male	59	Parakode Bus Stand	Food Items	Lemon,Mango
204	016	Male	59	Market	Food Items	Vegetables
205	024	Male	50	Adoor	Clothes	Others

Source : Municipal Records

ANNEXURE 7.2

DETAILS OF COMMODITY TRANSACTION THROUGH PARAKODE MARKET

Sl.No	Commodities	Average Quantity	Price	Arrived from	Distributed to
1	Vegetables	450 tonnes/week	12000000	Tamilnadu, Karnadaka, Maharashtra	Centres with in 20 km radius
2	Banana	80 tonnes/week	1600000	Vayanadu, Tamilnadu	Centres with in 20 km radius
3	Rice	210 tonnes/week	6720000	Andra Pradesh, Kaladi	Centres with in 20 km radius
4	Sugar	50 tonnes/week	1600000	Tamilnadu, Karnadaka	Centres with in 20 km radius
5	Pulses	35 tonnes/week	3500000	Andra Pradesh, Tamilnadu	Centres with in 20 km radius
6	Betal	10000 bundles/week	400000	Local areas with in 15km	Inside Kerala & Tamilnadu
7	Pepper	10 tonnes/week	4500000	Local areas	Ernakulam
8	Ginger	10 tonnes/week	350000	Local and vayanadu	Inside Kerala & Tamilnadu
9	Arecanut	70 bags/week	126000	Local areas	Kozhikode
10	Yan	30 tonnes/week	600000	Local areas	Inside Kerala & Tamilnadu
11	Cattle Feed	90 tonnes/week	2250000	Various factories	Centres with in 20 km radius
12	Poulty/Goat Feed	25 tonnes/week	625000	Tamilnadu, Kerala	Centres with in 20 km radius

Source : Commercial Survey, 2019

ANNEXURE 7.3

THE LIST OF BANKS FUNCTIONING IN THE TOWN

Sl:No	Name of the bank	Location
1	IOB, Adoor	Central toll and surroundings
2	Milk society (Co-Operative society)	Central toll and surroundings
3	Federal Bank	Central toll and surroundings
4	Cathalic syrian bank	Central toll and surroundings
5	Central Bank of India	Central toll and surroundings
6	Union bank	Central toll and surroundings
7	Adoor Co- Operative urban bank	Central toll and surroundings
8	South Indian bank	Central toll and surroundings
9	Dhanalaksmi Bank	Central toll and surroundings
10	Insurance agents co-operative society	K.S.R.C. Stand and surroundings
11	Canara bank	K.S.R.C. Stand and surroundings
12	Agriculture Co-operative society	Private Bus stand and surroundings
13	Agriculture rural development bank	Private Bus stand and surroundings
14	State Bank of Travancore	K.S.R.C. Stand and surroundings
15	KSFE	K.S.R.C. Stand and surroundings
16	Pathanamthitta district Co-operative bank, Adoor	K.S.R.C. Stand and surroundings
17	HDFC Bank	K.S.R.C. Stand and surroundings
18	Indus Ind bank	K.S.R.C. Stand and surroundings
19	Government employees co-operative bank	Private Bus stand and surroundings
20	South Malabar gramin bank	Private Bus stand and surroundings
21	Bank of Baroda	Private Bus stand and surroundings
22	State bank of India	Private Bus stand and surroundings
23	ICICI Bank	Private Bus stand and surroundings
24	Corporation bank	Private Bus stand and surroundings
25	Federal bank ATM	Private Bus stand and surroundings
26	Sasthamkotta Coperative agriculture credit Bank	Central toll and surroundings
27	Syndicate Bank	central Toll and surroundings
28	state Bank of Travancore	Holicross junction
29	Union Bank ATM	High school junction, Municipality
30	Indian Bank	High school junction,Panchayath
31	State Bank of Travancore and ATM	Parakode
32	Federal Bank	Parakode
33	Parakode Service co-operative bank	Parakode
34	Parakode Service Co-operative Socity	Parakode
35	Pannivizha Service co-operative bank	Pannivizha

Source : Primary Survey 2011

ANNEXURE 11.1

LIST OF PWD ROADS IN ADOOR MUNICIPALITY

Sl. No.	Road Name	Length (Km)
1	M.C Road (Paranthal Palli to Vadakkedathukavu I.T.C)	7.00
2	K.P Road (Adoor Central to Parakode Sakthi Theatre & Adoor B.H.S Padi to M.C Road)	4.20
3	Adoor Sabarimala Road (Adoor to Pothrad) NH 183A	5.00
4	Chavara Adoor Road (Canan Nagar to Nellimoottilpadi) NH 183A	0.50
5	Parakode - Koduman Road (Parakode to Chiranikkal)	2.20
6	Parakode Iverkala Road (Parakode to Paruthipara)	0.70
7	T.B Road (T.B Junction to T.B)	1.20
8	Adoor Theppupara Road (Pannivizha Temple to Parakode Muzhangodi Junction)	4.00
9	Kottamukal Vadakkadathu kavu Road (Kottamukal Jn to Paruthipara)	1.50
10	M.G Road (R.D.O. Office to Anandapalli Thumpamon Road)	3.00
11	Civil Station Road to Temple Road (Ring Road)	0.75
12	Thadathil Manakkala Road (Yamuna Jn via Thadathil Padivazhi to Municipal boundary)	2.00
13	Adoor Munnalam Mannakkala Road (Konnayil padi to Cheruvallipalam)	2.50
14	E.V Road (Karuvatta to Thatta)	2.20
15	Ananthapalli -Thumpaman Road (Anandapalli to Muncipal limit)	0.35
16	Anandapalli Kodumon Road (Ananthapalli to Iyecadu)	2.00

Source: Traffic and Transportation Plan for 23 Towns in Kerala State- Adoor Town, Report January 2011 of NATPAC

ANNEXURE 11.2

INVENTORY DETAILS OF MAJOR ROADS

Sl. No.									
Chainage					ADOOR - PATHANAMTHITTA	0/0 to 0/50	ADOOR - CHAVARA ROAD		
Length (Km)	0.50		5.00	1.00	1.00	1.00	1.00	1.00	1.00
Type of Road	MDR			SH	SH	SH	SH	SH	SH
Width (m)	7.00	CW		5.50	5.50	5.50	5.50	5.50	5.50
	12.50	ROW		10.50	10.50	10.50	10.50	11.00	10.00
Median (m)	Nil			Nil	Nil	Nil	Nil	Nil	Nil
Footpath (m)	Nil	L		Nil	Nil	Nil	Nil	Nil	Nil
	Nil	R		Nil	Nil	Nil	Nil	Nil	Nil
Shoulder (m)	1.5 earth	L		2.5 earth	2.5 concrete	2.5 earth	2 earth	2.5 earth	2 earth
	1.5 earth	R		2 concrete	2.5 earth	2 earth	2 earth	2 earth	2 earth
Bus stops	1			1	2	2	2	2	3
Adjoining land use	Residencial	L		Residencial	Residencial	Residencial	Residencial	Agriculture	Mixed
	Residencial	R		Residencial	Residencial	Residencial	Residencial	Residence	Residence
Drain type and condition	Nil	L		Nil	Nil	Nil	Nil	Nil	Nil
	Nil	R		Nil	Nil	Nil	Nil	Nil	Nil
Junctions and controls	Nil			One 3 arm	Nil	Nil	Nil	One 3 arm	Nil
Surface type and condition	BT, fair			BT, fair	BT, fair	BT, fair	BT, fair	BT, fair	BT, fair
CD structures	Nil			1 bridge	1 culvert	Nil	Nil	Nil	2 culverts

3	2	1	VI	1	V	2	1	IV	2	1	III
0/200 to 0/300	0/100 to 0/200	0/0 to 0/100	KAYAMKULAM-PATHANAPURAM	0/0 to 0/70	PARRAKKOD-IVERKALA	0/100 to 0/220	0/0 to 0/100	PARAKODE-CHIRANIKKAL	0/100 to 0/200	0/0 to 0/100	ANANTHAPALLI-KODUMAN ROAD
1.00	1.00	1.00	4.20	0.70	0.70	1.20	1.00	2.20	1.00	1.00	2.00
S.H	S.H	S.H		MDR		M DR	M DR		MDR	MDR	
8.50	8.50	8.50		5.50		4.50	4.50		4.00	4.00	
14.00	14.00	15.50		8.50		8.50	8.50		7.50	8.00	
Nil	Nil	Nil		Nil		Nil	Nil		Nil	Nil	
2.50	2.50	2.50		Nil		Nil	Nil		Nil	Nil	
3.50	3.50	3.50		Nil		Nil	Nil		Nil	Nil	
2.5 earth	2 earth	Nil		Nil		2 earth	2 earth		2 earth	2.5 earth	
2 earth	2 earth	Nil		1.5 earth		2 earth	2 earth		1.5 earth	2 earth	
2	1	1		1		1	3		2	1	
Residencial	Residencial	Common		Mixed		Mixed	Residence+ Agriculture		Agriculture	Residencial	
Residencial	Residencial	Common		Mixed		Mixed	Residence+ Agriculture		Residence	Residencial	
Earthern	Concrete	Nil		Nil		Nil	Nil		Nil	Nil	
Nil	Concrete	Nil		Concrete		Nil	Nil		Nil	Nil	
One 3 arm	Nil	One 3 arm		One 4 arm		Nil	Two staggerd 4 arm		Nil	Nil	
BT, fair	BT, fair	BT, fair		BT, fair		BT, poor	BT, fair		BT, fair	BT, fair	
1 culvert	1 bridge	Nil		1culvert		Nil	Canal		1 culvert	Nil	

2	1	IX	3	2	1	VIII	1	VII	5	4
0/100 to 0/200	0/0 to 0/100	M.C ROAD, PARANTHAL - VADAKKEDATHUKAVU ITC	0/200 to 0/300	0/100 to 0/200	0/0 to 0/100	R.D.O OFFICE - ANANDAP ALLI	0/0 to 0/120	REVENUE TOWER ROAD	0/400 TO 0/420	0/300 to 0/400
1.00	1.00	7.00	1.00	1.00	1.00	3.00	1.20	1.20	0.20	1.00
S.H	S.H		MDR	MDR	MDR		MDR		S.H	S.H
7.50	7.50		6.00	5.00	5.00		7.00		8.00	8.00
23.00	23.00		10.00	8.00	8.00		10.00		14.00	14.00
Nil	Nil		Nil	Nil	Nil		Nil		Nil	Nil
Nil	Nil		Nil	Nil	Nil		Nil		2.50	2.50
Nil	Nil		Nil	Nil	Nil		Nil		3.50	3.50
2.5 BT	2.5 BT		1.5 earth	1.5 earth	1.5 earth		Nil		2 earth	Nil
2.5 BT	2.5 BT		2.5 earth	1.5 earth	1.5 earth		Nil		2 earth	2.5 earth
	2		1	2	1		1		4	2
Residence+ Agriculture	Residencial		Residence+ Agriculture	Residence+ Agriculture	Residencial		Common		Common	Common
Residence+ Agriculture	Residencial		Residence+ Agriculture	Residence+ Agriculture	Residencial		Common		Other	Common
Concrete, partly	Nil		Nil	Nil	Nil		Nil		Nil	Nil
Concrete, partly	Concrete		Nil	Nil	Nil		Nil		Nil	Nil
Nil	Nil		Nil	Nil	Nil		Two 3 arm		One 3 arm	One 3 arm
BT, fair	BT, fair		BT, fair	BT, fair	BT, fair		BT, fair		BT, fair	BT, fair
1 culvert	1 culvert		Nil	1 culvert, 1 bridge	Nil		Nil		Nil	Nil

2	1	X	7	6	5	4	3
0/100 to 0/200	0/0 to 0/100	MINI BYE PASS SOUTH	0/600 to 0/700	0/500 to 0/600	0/400 to 0/500	0/300 to 0/400	0/200 to 0/300
1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00
S H Bye pass	S H Bye pass		S.H	S.H	S.H	S.H	S.H
7.50	7.50		7.50	7.50	7.50	7.50	7.50
18.00	18.00		22.00	22.00	15.00	18.00	20.00
Nil	Nil		Nil	Nil	Nil	Nil	Nil
Nil	Nil		Nil	Nil	Nil	Nil	Nil
Nil	Nil		Nil	Nil	Nil	Nil	Nil
2.5 BT	2.5 BT		2.5 BT	2.5 BT	2 earth	2.5 earth	2.5 BT
2.5 BT	2 BT		2.5 BT	2.5 BT	2 earth	2.5 earth	2.5 BT
				1	1		3
Agriculture	Agriculture		Common+ Residence	Common	Common	Common	Common
Agriculture	Agriculture		Common+ Residence	Common			Common
Nil	Nil		Concrete	Concrete, closed	Nil	Nil	Concrete, partly
Nil	Nil		Nil	Concrete, closed	Nil	Nil	Nil
Nil	One 4 arm		One 3 arm	Two 3 arm	Nil	Nil	Two 3 arm
BT, fair	BT, fair		BT, fair	BT, fair			BT, fair
1 bridge	1 bridge, 1culvert		1 culvert	1 bridge	Nil	Nil	Nil

Source: Traffic and Transportation Plan for 23 Towns in Kerala State- Adoor Town, Report January 2011 of NATPAC

ANNEXURE 11.3
SPEED AND DELAY CHARACTERISTICS OF MAJOR ROADS

Sl. No.	Chainage	Length (m)	Average journey time (sec)	Delay (Sec)	Delay cause	Speed (km/ Hr)	
						With delay	Without delay
I	Kayamkulam -Patthanapuram						
	Central jn. - Parakode bridge	3,300.00					
a	0/1300	1,300.00	154	2	Slow vehicle	30.39	30.79
b	0/2000	700.00	229	36	Congestion	11.00	13.06
c	0/2800	800.00	342	9	Slow vehicle	8.42	8.65
d	0/3000	200.00	372	18	Slow vehicle	1.94	2.03
e	0/3300	300.00	424	10	Congestion	2.55	2.61
II	Adoor -Pathanamthitta road						
	Pothanadu - Pathanamthitta jn.	5,100.00					
a	0/1700	1,700.00	140	8	Slow vehicle	43.71	46.36
b	0/1900	200.00	158	32	Intersection &Slow vehicle	4.56	5.71
c	0/2100	200	208	3	Slow vehicle &Intersection	3.46	3.51
d	0/4300	2200	463	5	Slow vehicle (heavy)	17.11	17.29
e	0/5100	800	582	8	Congestion &Intersection	4.95	5.02
III	M.C Road						
	Paranthal church-Vadakkedathu kavu ITC	3,400.00					
a	0/500	500.00	44	9	Intersection	40.91	51.43
b	0/1300	800.00	123	46	Slow vehicle & Intersection	23.41	37.40
c	0/2000	700	208	10	Congestion	12.12	12.73
d	0/2400	400	265	12	Congestion	5.43	5.69
e	0/2700	300	306	11	Bus stop at improper location	3.53	3.66
f	0/3400	700	390	7	Bus stop	6.46	6.58

Source: Traffic and Transportation Plan for 23 Towns in Kerala State- Adoor Town, Report January 2011 of NATPAC

ANNEXURE 11.4
PARKING DURATION OF VEHICLES AT MAJOR PARKING AREA

Sl. No.	Vehicle type	Duration(minitues)						Total	
		<30	30-60	60-90	90-120	120-150	150-180	>180	
	1.Pattanamthitta Road Jn. (Right)								
1	Bus	0	0	0	0	0	0	0	0
2	Mini-bus	2	0	0	0	0	0	0	2
3	Car	50	0	0	0	0	0	0	50
4	Passenger auto	34	0	0	0	0	0	0	34
5	Two wheeler	84	0	0	0	0	0	0	84
6	Truck	0	0	0	0	0	0	0	0
7	Mini truck	7	0	0	0	0	0	0	7
8	Goods auto	18	0	0	0	0	0	0	18
	Total	195	0	0	0	0	0	0	195
	Percentage	100	0	0	0	0	0	0	100
	2.Pattanamthitta Road Jn. (Left)								
1	Bus	0	0	0	0	0	0	0	0
2	Mini-bus	0	0	0	0	0	0	0	0
3	Car	63	0	0	0	0	0	0	63
4	Passenger auto	28	0	0	0	0	0	0	28
5	Two wheeler	76	0	0	0	0	0	0	76
6	Truck	0	0	0	0	0	0	0	0
7	Mini truck	21	0	0	0	0	0	0	21
8	Goods auto	17	0	0	0	0	0	0	17
	Total	205	0	0	0	0	0	0	205
	Percentage	100	0	0	0	0	0	0	100
	3.From KSRTC to Adoor Temple								
1	Bus	1	0	0	0	0	0	0	1
2	Mini-bus	0	0	0	0	0	0	0	0
3	Car	132	0	0	0	0	0	0	132
4	Passenger auto	42	0	0	0	0	0	0	42
5	Two wheeler	43	0	0	0	0	0	0	43
6	Truck	0	0	0	0	0	0	0	0
7	Mini truck	0	0	0	0	0	0	0	0
8	Goods auto	13	0	0	0	0	0	0	13
	Total	231	0	0	0	0	0	0	231
	Percentage	100	0	0	0	0	0	0	100
	4.From Adoor Temple to Adoor UPS								
1	Bus	1	0	0	0	0	0	0	1
2	Mini-bus	0	0	0	0	0	0	0	0
3	Car	84	0	0	0	0	0	0	84

4	Passenger auto	50	0	0	0	0	0	0	50
5	Two wheeler	54	0	0	0	0	0	0	54
6	Truck	0	0	0	0	0	0	0	0
7	Mini truck	5	0	0	0	0	0	0	5
8	Goods auto	7	0	0	0	0	0	0	7
	Total	201	0	0	0	0	0	0	201
	Percentage	100	0	0	0	0	0	0	100
	5. Adoor Tourist home to Central Jn.								
1	Bus	4	0	0	0	0	0	14.25	4
2	Mini-bus	5	0	0	0	0	0	0	5
3	Car	60	0	2	2	1	1	1	67
4	Passenger auto	7	0	0	0	0	0	0	7
5	Two wheeler	53	4	1	1	0	0	0	59
6	Truck	0	0	0	0	0	0	0	0
7	Mini truck	5	0	0	0	0	0	0	5
8	Goods auto	2	0	0	0	0	0	0	2
	Total	136	4	3	3	1	1	1	149
	Percentage	91.28	2.68	2.01	2.01	0.67	0.67	0.67	100
	6. Pavithra Theature to central jn.								
1	Bus	0	0	0	0	0	0	0	0
2	Mini-bus	2	0	0	0	0	0	0	2
3	Car	83	0	0	0	0	0	0	83
4	Passenger auto	17	0	0	0	0	0	0	17
5	Two wheeler	53	0	0	0	0	0	0	53
6	Truck	1	0	0	0	0	0	0	1
7	Mini truck	3	0	0	0	0	0	0	3
8	Goods auto	4	0	0	0	0	0	0	4
	Total	163	0	0	0	0	0	0	163
	Percentage	100	0	0	0	0	0	0	100
	7. T B Road One way								
1	Bus	0	0	0	0	0	0	0	0
2	Mini-bus	0	0	0	0	0	0	0	0
3	Car	0	0	0	0	0	0	0	0
4	Passenger auto	13	10	2	5	1	0	3	34
5	Two wheeler	0	0	0	0	0	0	0	0
6	Truck	7	3	2	2	0	0	0	14
7	Mini truck	0	0	0	0	0	0	0	0
8	Goods auto	0	0	0	0	0	0	0	0
	Total	20	13	4	7	1	0	3	48
	Percentage	41.67	27.08	8.33	14.58	2.08	0	6.25	100

Source: Traffic and Transportation Plan for 23 Towns in Kerala State- Adoor Town, Report January 2011 of NATPAC

ANNEXURE 11.5
ORIGIN - DESTINATION MATRIX OF INTERCITY DAILY PASSENGER TRIPS

Origin	Destination																									Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
1	0	0	0	0	0	0	871	1921	37	919	1049	344	1334	68	418	587	605	698	605	405	0	0	0	0	0	9861
2	0	0	0	0	0	0	133	79	0	267	0	37	561	373	266	75	0	571	223	0	0	0	0	0	0	2585
3	0	0	0	0	0	0	0	0	0	0	0	437	0	95	0	25	0	190	0	91	0	0	0	0	0	839
4	0	0	0	0	0	0	805	2049	341	2181	2811	2263	4776	329	2131	3271	0	5004	3493	1674	0	0	0	0	0	31126
5	0	0	0	0	0	0	0	107	0	0	0	0	642	33	0	0	0	140	0	0	0	0	0	0	0	922
6	0	0	0	0	0	0	0	0	0	112	0	0	188	0	105	0	0	0	0	68	0	0	0	0	0	473
7	0	120	0	411	0	0	0	0	0	33	4	0	25	0	0	160	0	117	0	0	0	0	0	0	0	871
8	739	0	0	1442	0	0	22	0	0	20	72	0	138	22	116	49	50	0	137	76	0	0	0	0	0	2883
9	460	37	0	349	0	0	0	0	0	0	0	0	27	0	27	17	0	0	72	0	0	0	0	0	0	987
10	285	0	90	1511	74	0	0	6	0	0	0	33	63	0	20	118	0	152	33	0	0	0	0	0	0	2385
11	187	0	0	9825	147	0	37	0	4	267	0	0	315	0	17	42	0	80	131	0	17	0	0	0	0	11069
12	436	102	562	2388	0	0	0	84	0	0	5	0	162	47	17	75	0	50	93	0	0	0	0	0	0	4020
13	260	60	356	5592	0	0	405	83	53	155	124	45	0	0	98	154	0	498	76	48	11	0	0	0	0	8018
14	60	0	0	333	0	0	0	25	0	0	0	0	23	0	39	112	0	0	33	8	0	0	0	0	0	633
15	371	79	0	4042	352	0	0	58	0	78	12	0	42	0	0	219	0	77	35	9	0	0	0	0	0	5372

Total	25	24	23	22	21	20	19	18	17	16
4688	0	0	0	0	0	431	385	985	0	90
559	0	0	0	0	0	0	13	0	0	148
1073	0	0	0	0	0	0	65	0	0	0
49032	0	0	0	0	308	8768	3590	7055	145	3275
765	0	0	0	0	0	0	0	175	0	18
48	0	0	0	0	0	0	48	0	0	0
2518	0	0	0	0	0	0	0	117	0	128
5038	0	0	0	0	0	21	89	499	0	18
453	0	0	0	0	0	0	0	18	0	0
4319	0	0	0	0	0	0	13	182	26	66
4310	0	0	0	0	0	42	101	61	10	17
3371	0	0	0	0	0	26	107	24	0	56
9105	0	0	0	0	0	23	0	606	0	180
993	0	0	0	0	0	0	0	27	0	0
3571	0	0	0	0	0	0	0	70	0	249
6307	0	0	0	0	0	23	37	1342	0	0
1120	0	0	0	0	0	0	25	439	0	0
9494	0	0	0	0	32	700	612	0	137	436
5769	0	0	0	0	0	72	0	662	0	106
3223	0	0	0	0	0	0	137	707	0	0
45	0	0	0	0	0	0	0	0	0	17
0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	75	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
115876	0	0	0	0	340	10107	5221	13043	319	4801

Source: Traffic and Transportation Plan for 23 Towns in Kerala State- Adoor Town, Report January 2011 of NATPAC

ANNEXURE 11.6
DISTRIBUTION OF INTERCITY GOODS TRAFFIC IN TONNES ACCORDING CAMMODITIES CARRIED

Sl. No.	Name of commodity		Vehicle type			Total
			Truck/MAT	Mini Truck	Goods Auto	
	Empty		0	0	0	-
1	Foods grains	Wheat	46.49	16.51	0	63
2		Rice & paddy	208.97	0	75.62	285
3		Grains & pulses	10.27	22.47	0	33
4		Other food grains	19.6	48.16	187.63	255
5	Agricultural products	Fruits & vegetables	500.78	117.08	85.14	703
6		Milk & milk products	303.47	457.93	81.51	843
7		Coconut & copra	0	0	41.59	42
8		Meat	0	13.08	0	13
9		Fish	76.9	51.83	0	129
10		Eggs	8.18	0	0	8
11		Spices including rubber	2.7	13.27	0	16
12		Tea & coffee	0	13.55	0	14
13		Sugar	241.62	0	0	242
14		Bakery items	34.55	4.91	0	39
15		Bewerages & toddy	0	0	0	-
16		Soda & drinks	54.47	64.6	0	119
17		Provisions	0	6.04	0	6
18		Hay	0	0	0	-
19		Cattle feed	0	0	0	-
20	Construction materials	Cement	235.56	206.42	24.26	466
21		Quick lime (Kakka)	0	0	0	-
22		Earth & gravel	2677.71	130.98	347.13	3,156
23		Sand & clay	475.12	43.96	7.28	526
24		Brick & tiles	224.2	558.67	68.78	852
25		Granite & rubbles	56.72	0	0	57
26	Construction materials	Sanitary wares	17.79	24.97	0	43
27		Asbestos sheets	0	0	0	-

28		Paints & varnish	26.02	0	0	26
29		Timber	0	58.98	0	59
30		Firewood	23.29	24.57	0	48
31		Bamboo & wood	289.21	136.77	278.96	705
32		Furniture	16.37	16.17	78.57	111
33	Industrial goods	Steel machinery	4.73	0	0	5
34		Iron & steel	439.35	63.17	0	503
35		Aluminium	0	0	0	-
36		Electrical goods	35.45	0	0	35
37		Tyres & tubes	14.18	0	0	14
38		Spare parts	0	0	0	-
39		Chemicals & Drugs	0	0	0	-
40		Medicines	1.13	24.03	0	25
41		Fertilisers	30.68	4.83	0	36
42		Soap	29.99	17.2	68.68	116
43		Rubber & plastic goods	277.27	108.25	10.11	396
44		Glass	0	10.02	0	10
45		Leather goods	0	0	0	-
46		Ready-made garments	33.83	0	9.27	43
47		Stationery & paper	20.8	0	0	21
48		Coir & coir products	36.24	55.42	0	92
49	Petroleum products	Motor spirit (Petrol)	0	0	0	-
50		Kerosene	0	0	207.95	208
51		LPG	0	406.19	177.97	584
52		Other POL products	23.88	7.37	0	31
53	Miscellaneous	Empty bags, tins & battles	0	0	0	-
54		Parcel	62.26	0	0	62
55		Ice	0.91	0	0	1
56		Miscellaneous	164.81	18.33	295.96	479
		Total	6725.48	2745.75	2046.41	11517.64

Source: Traffic and Transportation Plan for 23 Towns in Kerala State- Adoor Town, Report January 2011 of NATPAC

ANNEXURE 13.1
DETAILS OF SCHOOL OF ADOOR MUNICIPALITY

Sl. No.	Name of School	Number of Teachers									
		Pre Primary		Primary		High School		HSS		VHSS	
1	Rev. Dr. C.T.E.M.St. THOMAS V.H.S.S.		2		1		7			1	9
2	ST. MARY'S MAHILA MANDIRAM GIRLS							3	10		
3	ALL SAINTS PUBLIC SCHOOL, ADOOR		6		20	2	8	3	3		
4	HOLY ANGELS E.M.H.S.S , ADOOR		7	3	33		21	1	11		
5	P.G.M. BOYS HIGH SCHOOL, PARAKODE			2	11	4	16				
6	P.G.M. GIRLS HIGH SCHOOL,PARAKODE				9	3	19				
7	ST. MARY'S M.M.G.H.S,					2	18				
8	N.S.U.P.S., PARAKODE P.O.,			1	9						
9	ST. MARY'S M.M.U.P. SCHOOL,			4	22						
10	T.K.M.V. U.P.S. PANNIVIZHA				1	4					
11	GOVT. U.P.SCHOOL, ADOOR			1	3						
12	ST. JUDE SCHOOL, KARUVATTA, ADOOR		3	2	7						
13	TRAVANCORE INTERNATIONAL SCHOOL		5		7						
14	GOVT. L.P.S. PARAKODE P.O.			1	3						
15	GOVT. L.P.S. PANNIVIZHA		2	2	4						
16	ST. MARY'S CONVENT E.M. SCHOOL		5	1	9						
17	GOVT. L.P.S. MOONNALAM				4						
18	R.S.M. PRE PRIMARY AND PRIMARY SCHOOL	1,2a		4		5					
19	P.V.L.P. SCHOOL					7					
20	GOVT. W.L.P.SCHOOL, PARAKODE				4						
21	N.S.I. L.P.SCHOOL, PARAKODE				5						
22	GOVT. L.P.SCHOOL, PANNIVIZHA EAST				4						
23	GOVT. L.P.SCHOOL, ADOOR		1	2	6						
24	GOVT. MODEL L.P. SCHOOL, KARUVATTA				5						
25	MERRY LAND MONTESSORI SCHOOL		4								
26	ST. KURIAKOSE NURSERY SCHOOL,		3								

Source : Primary Survey 2010

ANNEXURE 13.2
FACILITIES AVAILABLE AT SCHOOLS

Sl. No.	Name of the School	Play ground	Separate Toilet for girl students	Computer lab	Internet	Water availability	Source of water	Connected by a road of width of 3m.	Medium (English/Malayalam or both)	Transportation facilities			Year of Establishment
										Bus	Van	Jeep	
1	St. Jude School, Karuvatta, Adoor	Yes	Yes	Yes	Yes	Yes	Ordinary Well	Yes	English	Nil	3	Nil	2004
2	Travancore International School,	Yes	Yes	Yes	Yes	Yes	Borewell	Yes	English	3	Nil	Nil	
3	P.G.M. Boys High School, Parakode	Yes	Na	Yes	Yes	Yes	Well	Yes	English And Malayalam	Nil	2	Nil	1942
4	P.G.M. Girls High School,Parakode,	Yes	Yes	Yes	Yes	Yes	Well	Yes	English And Malayalam	2	Nil	Nil	1979
5	N.S.U.P.S., Parakode P.O.,	Yes	Yes	Yes	No	Yes	Well, Pipeline	Yes	Malayalam	Nil	Nil	Nil	1936
6	Govt. L.P.S. Parakode P.O.	Yes	Yes	Yes	No	Yes	Well	Yes	Malayalam	Nil	Nil	Nil	
7	Govt. L.P.S. Pannivizha,	Yes	Yes	Yes	No	Yes	Well	Yes	Malayalam	Nil	Nil	Nil	1919
8	St. Mary's M.M.U.P. School,	Yes	Yes	Yes	No	Yes	Well, Pipeline	Yes	English And Malayalam	Nil	Nil	Nil	1976
9	St. Mary's Convent E.M. School,	Yes	Yes	Yes	No	Yes	Well	Yes	English	Na	Na	Na	1980
10	St. Mary's Mahila Mandiram Girls	Yes	Yes	No	Yes	Yes	Well	Yes	English	Nil	Nil	Nil	2004
11	St. Mary's M.M.G.H.S,	Yes	Yes	Yes	Yes	Yes	Well	Yes	English And Malayalam	Nil	Nil	Nil	1962
12	Govt. L.P.S. Moonnalam	Yes	Yes	Yes	No	Yes	Well	Yes	Malayalam	Nil	Nil	Nil	1948
13	R.S.M. Pre Primary And Primary School,	Yes	Yes	Yes	No	Yes	Well	Yes	English	Nil	Nil	Nil	
14	P.V.L.P. School	Yes	Yes	Yes	No	Yes	Well,Pipeline	Yes	Malayalam	Nil	Nil	Nil	1927
15	T.K.M.V. U.P.S. Pannivizha	Yes	Yes	No	No	Yes	Well	Yes	Malayalam	Nil	Nil	Nil	1962
16	Rev. Dr. C.T.E.M.St. Thomas V.H.S.S.	Yes	Yes	Yes	Yes	Yes	Well	Yes	Malayalam	1	Nil	Nil	1983

17	St. Kuriakose Nursery School,	No	Yes	No	No	Yes	Well, Pipeline	Yes	English	Nil	Nil	Nil	2005
18	Govt. W.L.P.School, Parakode	No	Yes	No	No	Yes	Well	Yes	Malayalam	Nil	Nil	Nil	
19	N.S.I. L.P.School, Parakode	No	Yes	No	No	Yes	Well	Yes	Malayalam	Nil	Nil	Nil	
20	Govt. L.P.School, Pannivizha East	No	Yes	No	No	Yes	Well	Yes	Malayalam	Nil	Nil	Nil	1947
21	All Saints Public School, Adoor	Yes	Yes	Yes	Yes	Yes	Well	Yes	English	4	Nil	Nil	2002
22	Holy Angels E.M.H.S.S , Adoor	Yes	Yes	Yes	Yes	Yes	Well, Pipeline	Yes	English	7	Nil	Nil	1964
23	Govt. L.P.School, Adoor	Yes	Yes	Yes	No	Yes	Pipeline	Yes	Malayalam	Nil	Nil	Nil	1917
24	Govt. Model L.P. School, Karuvatta,	No	Yes	No	No	Yes	Well, Pipeline	Yes	Malayalam	Nil	Nil	Nil	1947
25	Merry Land Montessori Play School	Yes	Yes	No	No	Yes	Well	Yes	English	1	1	Nil	2008
26	Govt. U.P.School, Adoor	Yes	Yes	Yes	No	Yes	Well, Pipeline	Yes	Kerala	Nil	Nil	Nil	1917

Source : Primary Survey 2010

ANNEXURE 14.1
INSTITUTIOINS IN ALLOPATHIC SYSTEM OF MEDICINE

Sl. No.	Hospital	Sector	Number of doctors	Number of beds	Departments
1	General Hospital, Adoor	Government	22	151 (expansion is in progress and proposed bed strength is 300)	Orthopedics, Dermatology, Respiratory Infection, Causality Unit, Dental Unit, Post partum unit, General Medicine, Surgery, Gynecology, Anesthesia, Pediatrics, Ophthalmology, ENT
2	Holly Cross Hospital, Adoor	Private	20	200	General medicine, Pediatrics, General surgery, Gynecology, Orthopedics, Anesthesia, Cardiology, ENT, Skin, Radiology, Psychology, Gastrologer, Pulmourology, Ophthalmology
3	Mariya Hospital , Adoor	Private	14	70	General medicine, Gynecology, Orthopedics, Pediatrics, , ENT, Skin, Anesthesia, Radio diagNosis
4	S.N. Hospital, Parakode	Private	1	6	Pediatrics
5	Janatha Hospital, Adoor	Private	2	6	General practice

Source : Primary Survey 2010

ANNEXURE 14.2
INSTITUTIONS IN AYURVEDIC SYSTEM OF MEDICINE

Sl. No.	Name of Hospital	Location	Category*	Number of Beds	Number of Doctors	Govt/Private/ Co-Operative Society
1	Pankaja Kasthuri Ayurvedic Hospita& Panchakarma Hospital	Near Ymca, K.P. Road, Adoor	Hospital	10	3	Private
2	Dr J Thankamma, Oushadhi Agency	11/126,Parakode	Dispensary	0	2	Private
3	Dr. RH Nair Memorial Clinic(Oushadhi)	KSRTC	Dispensary	0	1	Private
4	Nagarjuna	KSRTC	Dispensary	0	1	Private
5	Janatha Medical	Private Busstand	Dispensary	0	1	Private
6	Kottackal Arya Vaidyasala	Private Busstand	Dispensary	0	1	Private
7	Ashtavaidya	Near Geetham Auditorium	Dispensary	0	1	Private
8	Indra Ayurvedics	High School Junction	Dispensary	0	1	Private
9	Punarjani	Byepass Junction	Dispensary	0	1	Private
10	Veni Ayurvedic Hospital And Punchakarma Centre	Near Revenue Tower	Dispensary	0	1	Private

Source : Primary Survey 2010

ANNEXURE 14.3

INSTITUTIONS IN HOMEOPATHIC SYSTEM OF MEDICINE

Sl. No.	Name of Hospital	Location	category	Number of beds	Number of doctors	Govt/Pvt/Cooperative society
1	Kumars Homeo clinic	Firestation	Op only		1	Private
2	Chaithanya Homeo clinic	Near private busstand	Op only		1	Private
3	Sree Ayyappans Homeo Hospital	Opp. Govt. Hospital	Op only		2	Private
4	Bhadra Homeo Hospital	Opp. Karikkineth	Op only		1	Private
5	St. Marys Homeopathic	Opp.KSRTC	Op only		1	Private
6	JJ Homeo clinic	Parakode	Op only		1	Private

Source : Primary Survey 2010

ANNEXURE 15.1
GENERAL DETAILS OF NAGARS

Sl.No		1	2	3
Name of the slum		Ambedkar Nagar Laksham Veedu Colony	Kumpilumvila Colony	Mannathumvila Colony
Location		Pannivizha, Puthenchanda	Oottymukku,Kotappuram	Puthenchanda,Pannivizha
Ward No and village		3,Adoor	4,Adoor	3,Adoor
Approved slum or Not		Yes	No	No
SC/ST slum or Not		No	SC	No
Ownership of land	Own land	*	*	*
	Purampoku land			
	Others			
Total area of slum in hectare		0.51	0.61	0.51
Residential density		219.42	177.91	158.14
Total number of houses		26	23	20
Age of the Slum (in years)		30 Yrs	30 Yrs	55 Yrs
Approach road	Black topped	*		
	Metalled		*	*
	Mud road			
Internal Roads	Good		*	
	Poor	*		
	No road			*
Collection of garbages	Dust bin			
	Some open space			
	Street		*	
	Other areas	*		*

8	7	6	5	4
Kakottukuzhy Colony	Gandhi Nagar Laksham Veedu Colony	Plavilathara Colony(Canal Purampokku)	Paris (Canal Purampokku)	Vilayil Colony
Mithrapuram	Mithrapuram,Adoor	Karuvatta	Karuvatta	Oottymukku,Pannivizha West
1,Adoor	1,Adoor	2,Adoor	4,Adoor	4,Adoor
No	Yes	No	No	Yes
SC	No	No	No	SC
	*			
*		*	*	
				*
0.28	0.81	0.16	0.30	0.91
134.14	132.20	####	####	137.28
11	29	12	22	36
35 Yrs	40 Yrs	30 Yrs	30 Yrs	40 Yrs
	*	*	*	
				*
*				
		*	*	
	*			*
*				
		*	*	
*	*			*

14	13	12	11	10	9
Jawahar Laksham Veedu	Puthussery Colony	Kureekkattu Colony	Kurikkethuvila Colony	Zakir Hussain Colony	Palisserry Colony
Kavanal Junction,Parakode	Puthussery Bhagom	Pannivizha	Kannamkodu	Kannamkodu	Palisseril Bhagom, Anandappally
14,Adoor	20,Adoor	20,Adoor	19,Adoor	19,Adoor	8,Adoor
Yes	Yes	No	No	Yes	Yes
No	SC	No	SC	No	SC
*	*	*	*	*	*
0.30	0.32	0.40	0.40	0.40	0.49
#####	213.12	128.49	168.03	318.75	102.96
16	16	13	16	25	10
40 Yrs	60 Yrs	27 Yrs	50 Yrs	38 Yrs	50 Yrs
*	*		*	*	*
		*			
				*	
*		*	*		
	*				*
				*	
*			*		*
	*	*			

19	18	17	16	15
Peedikayil (PWD Purampokku)	Thondalil Colony	Chakkanattu Kandathil Bhagom Colony	Udaya Nagar Colony (Chakkanattu)	Chiranickal Municipal Colony
Parakode Market	Parakode	Chakkanattu Bhagom	Kandathil Chakkanattu Bhagom	Chiranickal,Adoor
16,Adoor	15,Adoor	15,Adoor	15,Adoor	13,Adoor
No	Yes	No	No	Yes
No	No	No	No	No
	*	*	*	*
*				
0.10	0.40	0.24	0.24	0.61
####	####	131.78	218.27	143.32
10	22	10	12	24
70 Yrs	70 Yrs	15 Yrs	60 Yrs	50 Yrs
*	*		*	*
		*		
*				
	*		*	*
		*		
	*	*	*	
*				
				*

24	23	22	21	20
Thadathil Colony	Mundumuruppel Colony	Udayon Muruppu Colony	Attakulathu Harijan Colony	Chettiyanmukal Colony
Sangamam Junction, Pannivizha	Pannivizha	Arukalathadam , Pannivizha	Kochuvilayil Padi, Anandappally	E.V.Junction
12, Adoor	12,Adoor	12,Adoor	9,Adoor	28,Adoor
Yes	No	Yes	Yes	Yes
SC	SC	No	SC	No
*	*	*	*	*
0.24	0.20	0.20	0.28	0.26
181.20	247.10	192.74	162.38	186.27
13	10	11	12	12
40Yrs	50 Yrs	40 Yrs	55 Yrs	50 Yrs
*			*	*
		*		
	*			
*				*
			*	
	*	*		
	*			*
*		*	*	

30	29	28	27	26	25
Poriyakkodu Colony	Vazhottu Colony	Varyathu Vadakkekkara	Charuvila Colony	Parankimavila Colony	Paruythiyil Colony
Parakode West	Vazhottu, Parakode North	Pannivizha, Adoor	KarimpanNoor, Pannivizha	KarimpanNoor, Pannivizha	Pannivizha
17, Adoor	14, Adoor	11, Adoor	11, Adoor	11, Adoor	11,Adoor
Yes	Yes	No	Yes	Yes	No
No	No	No	SC	SC	No
*	*	*	*	*	*
0.20	0.28	0.24	0.18	0.16	0.51
197.68	169.44	205.91	####	315.05	173.96
11	13	12	11	11	23
50 Yrs	50 Yrs	40 Yrs	50Yrs	50 Yrs	40Yrs
*	*	*	*	*	*
	*				*
*				*	
		*	*		
*	*	*	*	*	*

31	32	33	34
Payikkattuthara Colony	CherukunNil	Charuvila Colony	Palamuruppel Indiraji Colony
Parakode West	Moonnalam	Sub Station,Parakode	Pothradu,Anandappally
17, Adoor	25, Adoor	18, Adoor	8, Adoor
No	Yes	Yes	Yes
No	SC	SC	No
*	*	*	*
0.36	0.20	0.28	0.16
178.46	271.81	#####	#####
16	14	18	11
50 Yrs	50 Yrs	50 Yrs	50 Yrs
		*	
*	*		*
	*		*
*		*	
		*	
*	*		*

Source : Socio EcoNomic Survey, 2019

ANNEXURE 15.2

ACCESS TO FACILITIES IN NAGARS

Sl:No	Name of the slum	Frequency of collection by Municipality				Drainage of waste water		Street lighting		Flood		Access to educational facilities	Access to health facilitlies	Access to public transport facilities
		Daily	Twice in a week	Once in a week	No collection	Good	Poor	Yes	No	Not affecting	Affecting			
1	Ambedkar Nagar Laksham Veedu Colony				*		*	*		*		4km	4km	0.5km
2	Kumpilumvila Colony				*		*	*		*		2km	2km	0.5km
3	mannathumvila Colony				*		*		*	*		3km	5km	2km
4	Vilayil Colony				*		*	*		*		3km	3km	3km
5	Paris (Canal Purampokku)				*		*		*	*		1km	1km	0.2km
6	Plavilathara Colony(Canal Purampokku)				*		*		*	*		1km	1km	0.2km
7	Gandhi Nagar Laksham Veedu Colony				*		*	*		*		3km	5km	1km
8	Kakottukuzhy Colony				*		*		*	*		2km	4km	1km
9	Palisserry Colony				*		*	*		*		2km	5km	1km
10	Zakir Hussain Colony				*		*		*	*		1km	3km	1.5km
11	Kurikkethuvila Colony				*		*	*		*		1km	2km	2km
12	Kureekkattu Colony				*		*	*		*		2km	1km	0.5km
13	Puthussery Colony				*		*		*	*		1km	1km	0.5km
14	Jawahar Laksham Veedu				*		*		*	*		1km	2km	0.3km
15	Chiranickal Municipal Colony				*		*	*		*		1km	3km	0.3km
16	Udaya Nagar Colony (Chakkanattu)				*		*	*			*	1km	2km	1km
17	Chakkanattu Kandathil Bhagom Colony				*		*	*			*	1km	2km	0.05km
18	Thondalil Colony				*		*	*			*	1km	4km	1km
19	Peedikayil (PWD Purampokku)			*		*		*		*		0.2km	0.2km	Bus - near

20	Chettiyanmukal Colony				*		*	*		*		1km	1km	1km
21	Attakulathu Harijan Colony				*		*	*		*		2.5km	3km	0.5km
22	Udayon Muruppu Colony				*		*	*		*		4km	4km	2km
23	Mundumuruppel Colony				*		*		*	*		4km	4 km	2 km
24	Thadathil Colony				*		*	*		*		1km	3km	2km
25	Paruythiyil Colony				*	*		*		*		0.2km	4 km	1km
26	Parankimavila Colony				*		*	*		*		0.5km	4 km	0.1km
27	Charuvila Colony				*		*	*		*		0.5km	4 km	0.25km
28	Varyathu vadakkekkara				*		*	*		*		0.2km	4 km	1 km
29	Vazhottu colony				*		*	*		*		0.5km	0.5km	0.5km
30	Poriyakkodu Colony				*		*		*	*		1 km	1 km	1 km
31	Payikkattuthara colony				*		*		*		*	1 km	1 km	1 km
32	CherukunNil				*		*	*		*		2 km	3 km	1 km
33	Charuvila Colony				*		*	*		*		1 km	1 km	1 km
34	Palamuruppel Indiraji Colony				*		*		*	*		1.5 km	3 km	2 km

Source : Socio EcoNomic Survey, 2019

ANNEXURE 18.1
LIST OF ANGANWADIS

Sl No.	Location of Anganwadi	Wards served.
1	Mithrapuram/Karuvatta	I
2	Plavilathara	II
3	Anandhappally	III, V
4	Katcheri Ward	IV
5	Municipality	VI, XIX
6	Pothrad	VII
7	M.G. Ward	VIII
8	Bhagath Singh	IX
9	Nethaji	X
10	Canal Junction	XI
11	Jawahar Nagar,Parakode	XII,XIII
12	Ambalathara	XIV
13	T.B. Junction	XV
14	Pannivizha	XV,XVII,XVI
15	Pannivizha Perayil	XVI
16	Kannamkode	XVIII
17	Ayyappan Para/Kannamcode	XIX
18	Munnalam	XXII
19	Karuvatta	XXIV

Source: ICDS Office. Parakode Block

ANNEXURE 34.1
LISTOF NON-OBNOXIOUS AND NON-NUISANCE TYPE OF SERVICE OR LIGHT INDUSTRIES PERMISSIBLE IN VARIOUS ZONES.

1	Aerated water and fruit beverages
2	Aluminium utensils from aluminium circles by pressing only (dry mechanical operations)
3	Apparel Making
4	Assembly of air coolers /conditioners, repairing and servicing
5	Assembly of bicycles, baby carriage and other small Non-motorized vehicles
6	Atta – Chakkies, Flour mill, Oil mill
7	Automobile servicing (excluding repair)
8	Ayurvedic and homeopathic medicines (without boiler), Ayurvedic Medicinal Formulations
9	Bailing (hydraulic press) of waste papers
10	Bakery/confectionery/sweets products (with production capacity <1tpd (with gas or electrical oven)
11	Bamboo and cane products.
12	Bi-axially oriented PP film along with metalizing operations
13	Bio fertilizer and bio-pesticides without using iNorganic chemicals
14	Biomass briquettes (sun drying) without using toxic hazardous wastes
15	Biscuits trays etc. from rolled PVC sheet (using automatic vacuum forming machines)
16	Blending and packing of tea
17	Blending of melamine resins & different powder, additives by physical mixing
18	Block making of printing without foundry (excluding wooden block making)
19	Bodybuilding of motor vehicles
20	Brass and bell metal utensils manufacturing from circles(dry mechanical operation without re-rolling facility
21	Cardboard or corrugated box and paper products (excluding paper or pulp manufacturing and without using boilers)
22	Carpentry & wooden furniture manufacturing (excluding saw mill) with the help of electrical (motorized) machines such as electrical wood planner, steel saw cutting circular blade, etc.
23	Carpet weaving

24	Carrying and preservation of fruits and production of jam, jelly etc.
25	Cement products (without using asbestos / boiler / steam curing) like pipe, pillar, jafri, well ring, block/tiles etc. (should be done in closed covered shed to control fugitive emissions)
26	Ceramic colour manufacturing by mixing & blending only (Not using boiler and waste water recycling process)
27	Chalk making from plaster of Paris (only casting without boilers etc. (sun drying / electrical oven)
28	Charging and repairing of batteries
29	Chilling plant and ice making without using ammonia
30	CO_2 recovery
31	Coir (Without bleaching/dyeing)
32	Coke briquetting (sun drying)
33	Cold Storage
34	Compressed oxygen gas from crude liquid oxygen (without use of any solvents and by maintaining pressure & temperature only for separation of other gases)
35	Concrete batching plants
36	Copper, brass and metal utensils
37	Cotton and silk printing
38	Cotton Spinning. Weaving, ginning, clearing, pressing etc.
39	Cotton weaving in handloom & power looms.
40	Cutting, sizing and polishing of marble stone
41	Dal Mills
42	Decoration of ceramic cups and plates by electric furnace
43	Diesel pump repairing and servicing (complete mechanical dry process)
44	Digital printing on PVC clothes
45	Distilled water (without boiler) with electricity as source of heat
46	Domestic electrical appliances.
47	Electric lamp (bulb) and CFL manufacturing by assembling only
48	Electrical and electronic item assembling (completely dry process)
49	Electroplating, tinplating, welding etc.

50	Embroidery and lace manufacturing.
51	Emery powder (fine dust of sand) manufacturing
52	Engineering and fabrication units (dry process without any heat treatment / metal surface finishing operations / painting)
53	Engineering workshop and general fabrication works (Without any chemical Treatment)
54	Facility of handling, storage and transportation of food grains in bulk
55	Flavored betel nuts production/ grinding (completely dry mechanical operations)
56	Fly ash bricks/ block manufacturing
57	Fly ash export, transport & disposal facilities
58	Foam bed, latex threads
59	Footwear (Rubber and PVC)
60	Fountain pen manufacturing by assembling only
61	Furniture making
62	Garment making / Tailoring.
63	Gas operated baby boiler
64	Glass ampules and vials making from glass tubes
65	Glass putty and sealant (by mixing with machine only)
66	Glass, ceramic, earthen potteries, tile and tile manufacturing using electrical kiln or Not involving fossil fuel kiln
67	Glue from starch (physical mixing) with gas / electrically operated oven/boiler
68	Gold and silver smithy (purification with acid smelting operation and sulphuric acid polishing operation) (using less or equal to 1 litre of sulphuric acid/ nitric acid per month)
69	Ground nut decorticating
70	Handloom/ carpet weaving (without dying and bleaching operation)
71	Heat treatment with any of the new techNology like ultrasound probe , induction hardening , ionization beam, gas carburizing etc.
72	Ice cream or ice making
73	Insulation and other coated papers (excluding paper or pipe manufacturing)
74	Ivory, carving and ivory works
75	Jobbing and machining

76	Laundry, dry cleaning and dyeing
77	Leather cutting and stitching (more than 10machine and using motor)
78	Leather foot wear and leather products (excluding tanning and hide processing except cottage scale)
79	Light engineering
80	Lubricating oil, greases or petroleum based products (only blending at Normal temperature)
81	Making of paper boxes, bags, envelopes etc.
82	Manufacture and assembling of umbrellas and production of spare parts of umbrellas.
83	Manufacture and repair of musical instruments
84	Manufacture and repairing of brass and bell metal products
85	Manufacture and repairing of electric fans.
86	Manufacture of "aval" (Beaten rice) appam.
87	Manufacture of agarbathi and other cosmetics.
88	Manufacture of agricultural implements, screws etc.(blacksmith and foundry)
89	Manufacture of Beverages
90	Manufacture of byproduct from No biodegradable waste
91	Manufacture of cement products such as well-kerbs, tube, closets etc.
92	Manufacture of chinaware's and crockery.
93	Manufacture of clay models
94	Manufacture of Cotton thread, rope twine etc.
95	Manufacture of electric meters, production of electric and allied products, repairing and servicing of electrical appliances.
96	Manufacture of electrical machinery and repairing of electric motors armature winding etc.
97	Manufacture of glass and glass products
98	Manufacture of hydrogenated oil
99	Manufacture of iron and steel furniture.
100	Manufacture of Jewelry
101	Manufacture of jute products including repairing of gunny bags.

102	Manufacture of large containers and chinaware.
103	Manufacture of lemongrass oil, candles etc.
104	Manufacture of miscellaneous wooden articles such as sticks, sandals, rules etc.
105	Manufacture of paperboard and paper hand.
106	Manufacture of quilts and mattresses.
107	Manufacture of rubber gloves.
108	Manufacture of Rubber products such as rubber sheets, nipples, rubber shoes including smoke-rubber.
109	Manufacture of sewing machine parts and assembling and repairing of sewing machine.
110	Manufacture of small machine tools and machine parts.
111	Manufacture of soaps involving process without generation of trade effluents (Saponification of fats and fatty acids only)
112	Manufacture of sports goods, balloons etc.
113	Manufacture of stone images and stone wares
114	Manufacture of structural stone goods, stone crushing, stone carving, stone dressing, etc.
115	Manufacture of structural wooden goods such as doors, beams etc.
116	Manufacture of syrup.
117	Manufacture of tin cars and copper vessels.
118	Manufacture of Tobacco products.
119	Manufacture of wood and wooden products
120	Manufacture of wooden furniture and fixtures.
121	Manufacture of wooden industrial goods
122	Manufacture of wooden utensils, photo frames, toys, etc., and photo framing.
123	Manufacturing of coir items from coconut husks
124	Manufacturing of formulated synthetic detergent products
125	Manufacturing of medical instruments
126	Manufacturing of metal caps containers etc.
127	Manufacturing of optical lenses (using electrical furnace)

128	Manufacturing of pasted veneers using gas fired boiler or thermic fluid heater and by sun drying
129	Manufacturing of shoe brush and wire brush
130	Medical oxygen
131	Mineral stack yard / Railway sidings
132	Mineralsed water
133	Miscellaneous printing works including type cutting, book binding
134	Oil and gas transportation pipe line
135	Oil ginning/expelling
136	Oil mill Ghani and extraction (No hydrogenation/refining)
137	Oil mills (vegetables)
138	Optical frames
139	Organic and iNorganic nutrients (by physical mixing)
140	Organic manure (manual mixing)
141	Packing materials manufacturing from Non-asbestos fiber, vegetable fiber yarn
142	Packing of powdered milk
143	Padlocks
144	Paint (by mixing process only)
145	Paper Pins and U Clips
146	Phenyl/ toilet cleaner formulation and bottling
147	Polythene and plastic processed products manufacturing (virgin plastic)
148	Poultry, Hatchery and Piggery
149	Pressure testing units
150	Printing and publishing of books, newspapers and periodicals.
151	Printing of cotton textiles
152	Printing press
153	Processing and preservation of cashew nuts

154	Processing of Cardamom, ginger, pepper etc.
155	Processing, grinding, packing and distribution of coffee and tea
156	Production of Dairy Products
157	Production of rice, flour etc., by hand pounding.
158	Production of vinegar.
159	Puffed rice (muri) (using gas or electrical heating system)
160	Pulverization of bamboo and scrap wood
161	Radio and T.V. servicing and repairing.
162	Ready mix cement concrete
163	Repairing of electric motors and generators (dry mechanical process)
164	Repairing of photographic equipment, spectacles etc.
165	Repairing of watches and clocks
166	Reprocessing of waste cotton
167	Rolling mill (gas fired) and cold rolling mill
168	Rope plastic &cotton
169	Rubber goods industry (with
170	Rubberized coir mattresses
171	Sanitary fittings and other similar industries
172	Sawing and planning of wood
173	Scientific and mathematical instrument manufacturing apparatus manufacturing unit
174	Scrap Sorting
175	Seasoning of wood in steam heated chamber
176	Slaughtering preservation of meat, fish and cleaning fish
177	Small foundries
178	Solar module Non-conventional energy apparatus manufacturing unit
179	Solar power generation through solar photovoltaic cell, wind power and mini hydel power (less than 25 MW)

180	Spice grinding
181	Steel furniture without spray painting
182	Steeping and processing of grains
183	Tamarind powder manufacturing
184	Tissue culturing
185	Toy making
186	Tyres and tube retreating (without boilers)
187	Vulcanizing and repairing of tyres and tubes
188	Watch, pen and spectacles repairing
189	Water Softening and demineralization plants
190	Weaving of silk by Handloom
191	Wooden electrical accessories
192	woolen hosiers making (Dry process only without any dying / washing operation)

ANNEXURE 34.2
LIST OF OBNOXIOUS OR NUISANCE INDUSTRIES SUBJECT TO OBJECTIONABLE ODOURS, FUMES, EFFLUENTS OR PROCESSORS TO BE LOCATED IN HAZARDOUS ZONE

I	Manufacture of Food Stuff:
1	Slaughtering, preservation of meat and fish and canning of fish.
II	Manufacture of Beverages:
2	Production of distilled spirits, wines, liquor, etc., from alcoholic malt, fruits and malts in distillery and brewery.
3	Production of country liquor and indigeNous liquor such as toddy, liquor form mahua, palm juice.
III	Manufacture of Textiles:
4	Dyeing and bleaching of cotton
IV	Manufacture of Wood and Wooden Products:
5	Sawing and planning of wood.
6	Wood seasoning and creosoting
7	Manufacture of veneer and plywood.
8	Paper, pulp and straw board.
V	Manufacture of Leather and Leather Products:
9	Currying, tanning and finishing of hides and skins and preparation of finished leather.
VI	Manufacture of rubber, petroleum and coal products:
10	Manufacture of tyres and tubes.
11	Manufacture of Industrial and synthetic rubber.
12	Reclamation of rubber.
13	Production of petroleum, kerosene and other petroleum products in refineries.
14	Production of chemicals and chemical products.
VII	Manufacture of chemicals and chemical products:
15	Manufacture of basic industrial chemicals such as acids, alkali and their salts Not elsewhere specified (especially sulphurous, sulphuric, nitric, hydrochloric acids, etc.) ammonia, chorine and bleaching powder manufactures.
16	Manufacture of dYes, paint, colours and varnishes, printing ink.

17	Manufacture of fertilizers (Especially from organic materials).
18	Manufacture of disinfectants and insecticides.
19	Manufacture of ammunition, explosive and fireworks.
20	Manufacture of matches.
VIII	Manufacture of Non-metallic mineral products other than petroleum and coal:
21	Manufacture of cement and cement products
22	Manufacture of Lime.
23	Manufacture of Plaster of Paris.
IX	Manufacture of basic metals and their products:
25	Manufacture of iron and steel including smelting, refining, rolling and conversion into basic forms.
26	Manufacture including smelting, refining, etc., or Nonferrous metals and alloys in basic forms.
27	Manufacture of Armaments.
X	Manufacture of machinery (other than transport) and electrical equipment:
28	Manufacture of all kinds of battery.
XI	Miscellaneous items Not covered above:
29	Incineration, reduction or dumping of offal, dead animals' garbage or refuse.
30	Manufacture of gelatin and glue.
31	Fat, tallow, grease or lard refining of manufacture.
32	Bone meal, bone grist and bone powder.
33	Manufacture of cashew nut shell oil.
34	Other similar types of nuisance industries.

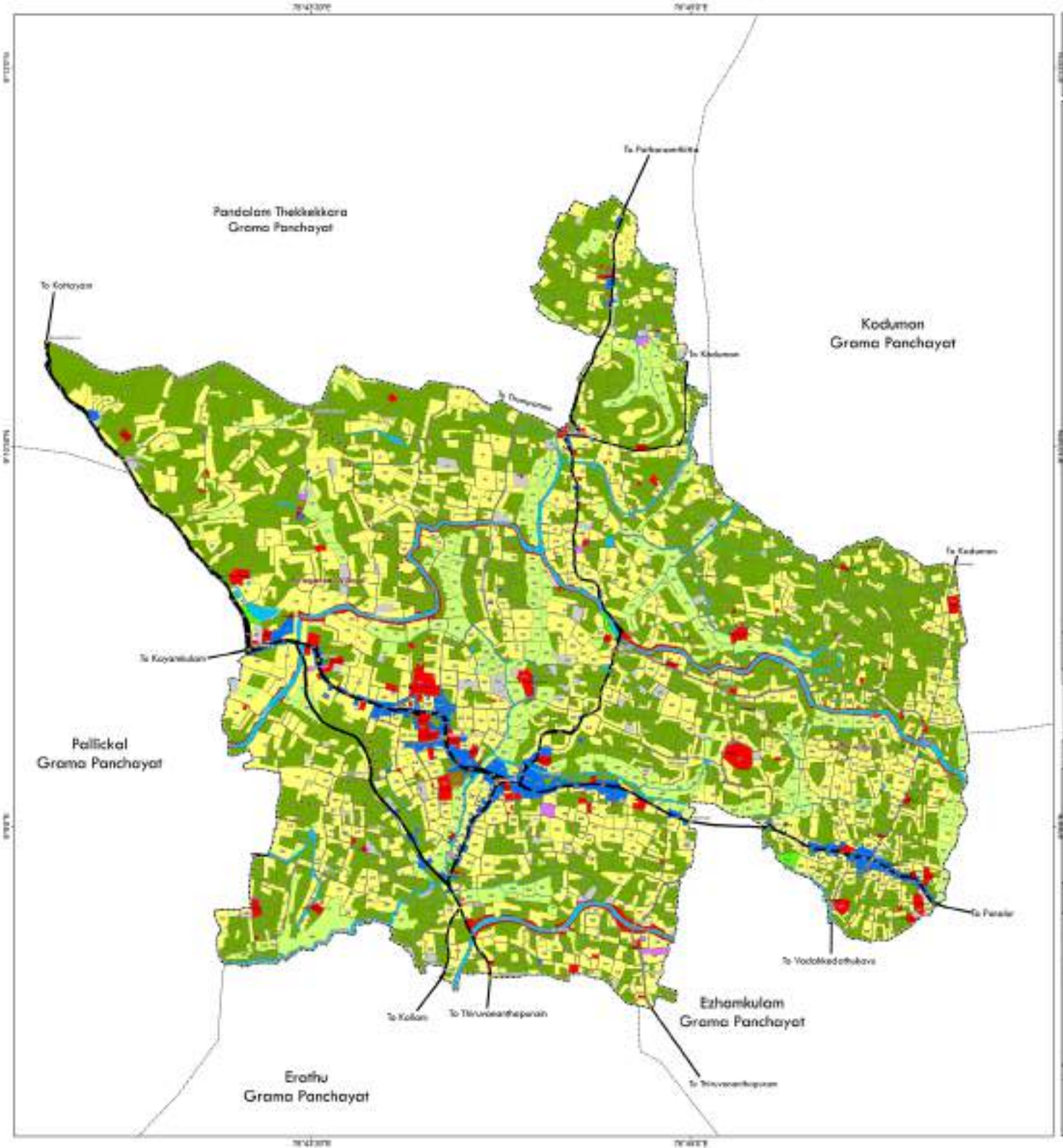
MASTER PLAN FOR ADOOR TOWN
EXISTING LAND USE MAP 2023 (MP/01)











Legend

- Junction
- Municipal Boundary
- Village/Taluk Boundary
- Survey Boundary
- Major Road Network
- Other Roads
- Residential Use
- Commercial Use
- Public & Semi-Public Use
- Industrial Use
- Traffic & Transportation Use
- Park & Open Space
- Environmentally Sensitive Area
- Dry Agriculture Use
- Sacred Groves
- Vacant/Rocky Area
- Water body

ADOOR MUNICIPALITY

CHAIRPERSON SECRETARY

OFFICE OF THE DISTRICT TOWN PLANNER
LSGD PLANNING, PATHANAMTHITTA

Draftsman

Assistant Town Planner

Deputy Town Planner Town Planner

OFFICE OF THE CHIEF TOWN PLANNER
LSGD PLANNING, THIRUVANANTHAPURAM

Assistant Town Planner

Deputy Town Planner

Town Planner

Senior Town Planner Chief Town Planner (Planning)

LOCAL SELF GOVERNMENT DEPARTMENT

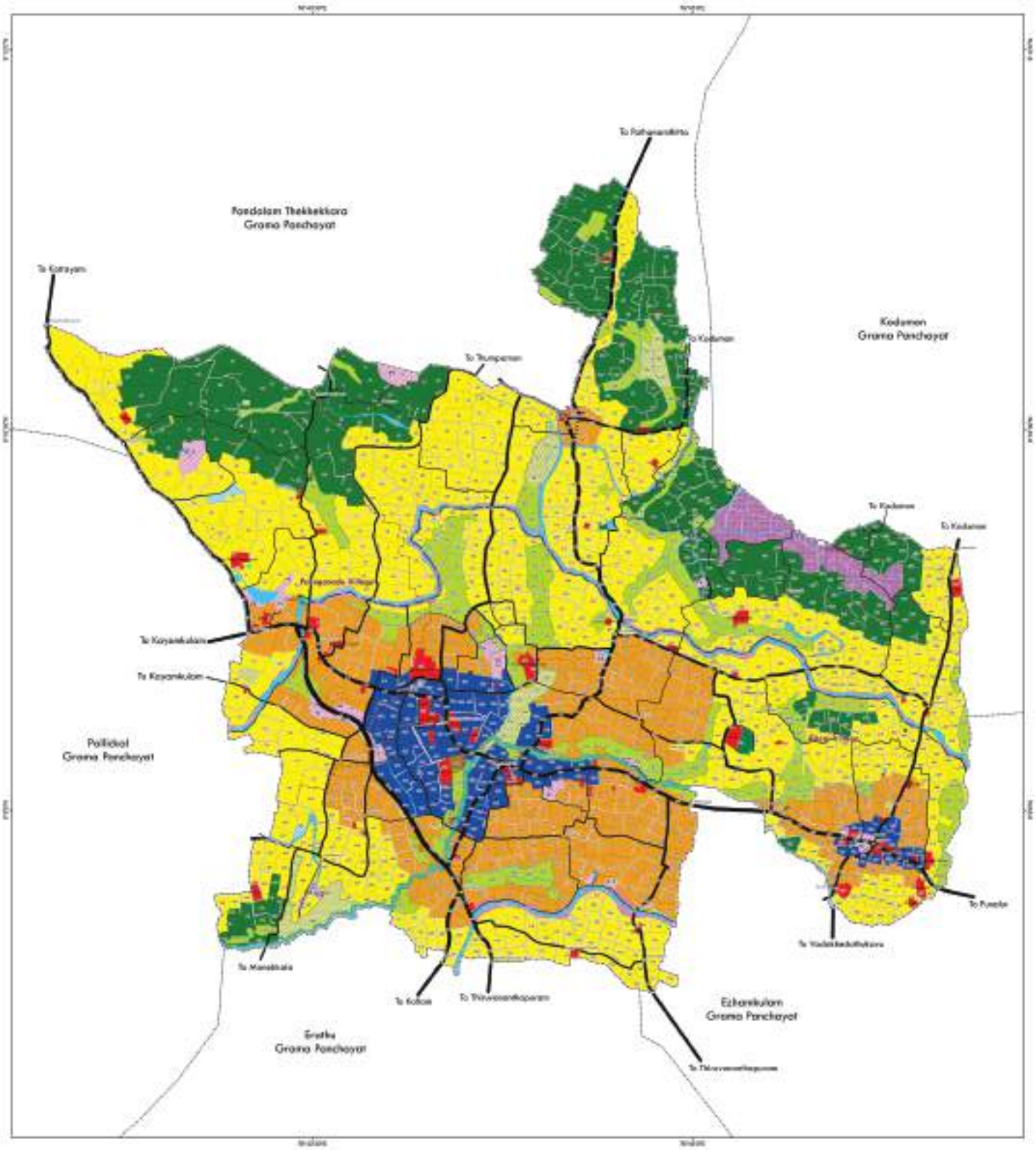
PRINCIPAL SECRETARY TO GOVERNMENT











MASTER PLAN FOR ADOOR TOWN
PROPOSED LAND USE MAP 2045
MP/02/I

LEGEND

Junction
Municipal Boundary
Village/Taluk Boundary
Survey Boundary
Existing Roads

Roads

Existing to be widened to 7 Meter
Existing to be widened to 10 Meter
Existing to be widened to 12 Meter
Existing to be widened to 18 Meter
Existing to be widened to 24 Meter
Existing to be widened to 30 Meter

Proposed New Roads

New Road 7 Meter Wide
New Road 10 Meter Wide
New Road 24 Meter Wide

Proposed Land Use

Residential Use Zone
Commercial Use Zone
Mixed Use Zone
Public & Semipublic Use Zone
Industrial Promotion Zone
Traffic & Transportation Use Zone
Recreational Ballfield Zone
Recreational Open Space Zone
Dry Agricultural Use Zone
Environmentally Sensitive Zone
Sacred Groves
Detention/Retention Basin
Canal Bank Beautification
Proposed Green Strip (7.5 & 10 Meter)
Existing Waterbody

Special Zone

Special Zone (In Government/Waqf/pvt owned land)
Special Zone (In privately owned land)

Scale 1:10,000

ADOOR MUNICIPALITY

CHAIRPERSON SECRETARY

OFFICE OF THE DISTRICT TOWN PLANNER
USGD PLANNING, PATHANAMTHITTA

Draftsman

Assistant Town Planner

Deputy Town Planner Town Planner

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Town Planner

Senior Town Planner Chief Town Planner (Planning)

LOCAL SELF GOVERNMENT DEPARTMENT

PRINCIPAL SECRETARY TO GOVERNMENT

INDIA



KERALA

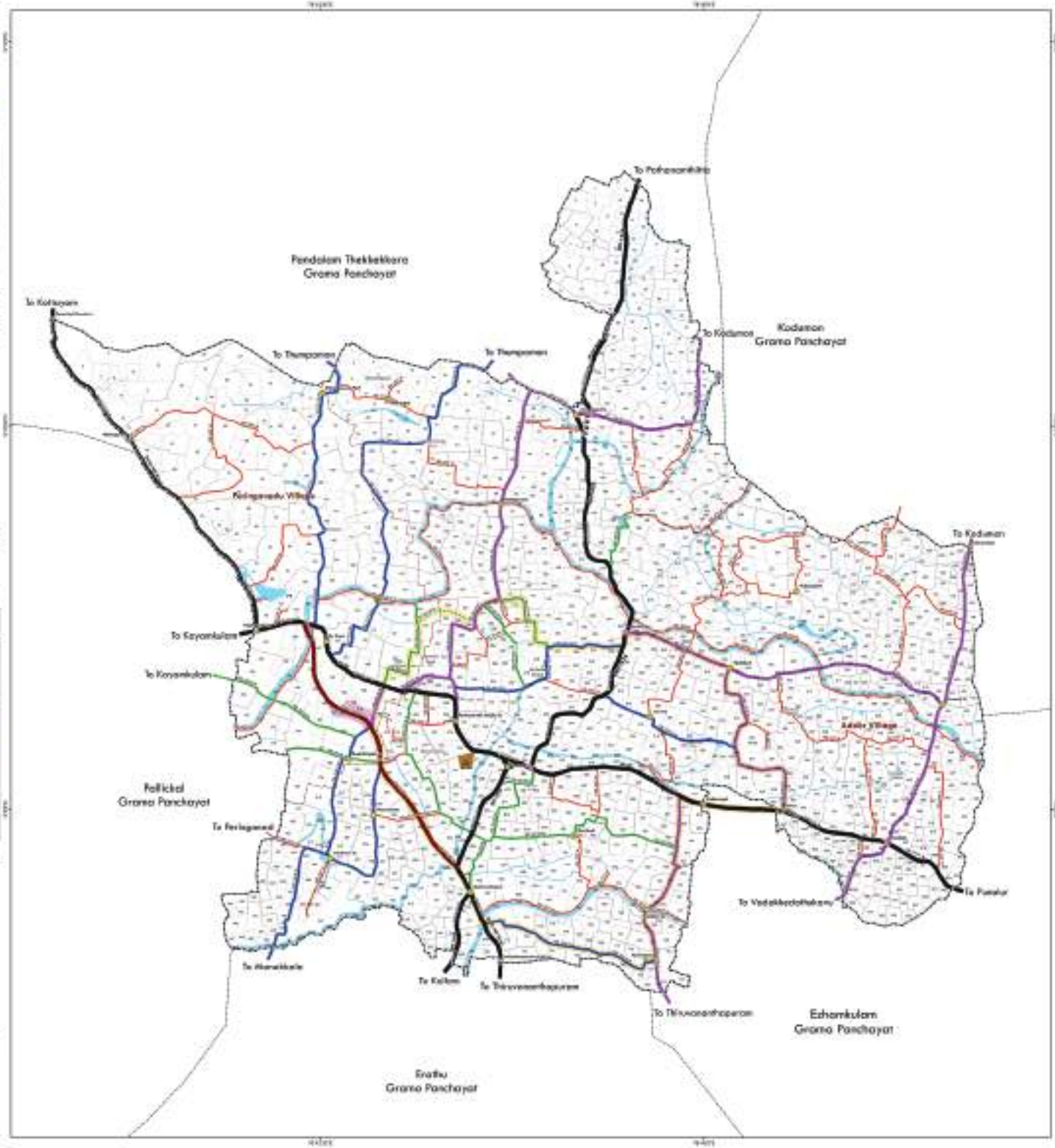


PATHANAMTHITTA DISTRICT



ADOOR TOWN





MASTER PLAN FOR ADOOR TOWN

PROPOSED TRANSPORTATION NETWORK 2045
MP/02/II

LEGEND

- Junction
- Proposed Junction Improvement
- Municipal Boundary
- Village/Taluk Boundary
- Survey Boundary
- Existing Roads

Roads

- Existing to be widened to 7 Meter
- Existing to be widened to 10 Meter
- Existing to be widened to 12 Meter
- Existing to be widened to 18 Meter
- Existing to be widened to 24 Meter
- Existing to be widened to 30 Meter

Proposed New Roads

- New Road 7 Meter Wide
- New Road 10 Meter Wide
- New Road 24 Meter Wide
- Ring Road
- Traffic & Transportation Use Zone
- Existing Water Bodies

Special Zone (In Government/Municipal owned land)

- G2 Municipal office Complex & Municipal Bus stand
- G7 Municipal Town Hall & Parking Place
- G10 Proposed Highway Travel Plaza

ADOOR MUNICIPALITY

CHAIRPERSON SECRETARY

OFFICE OF THE DISTRICT TOWN PLANNER
LSGD PLANNING, ADOOR

Draftsman

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Town Planner

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LOCAL SELF GOVERNMENT DEPARTMENT

PRINCIPAL SECRETARY TO GOVERNMENT



GOVERNMENT OF KERALA