DISTRICT URBANISATION REPORT

WAYANAD

< CONTENTS > PREFACE >>

DEPARTMENT OF TOWN AND COUNTRY PLANNING - GOVERNMENT OF KERALA

JANUARY 2011

PREFACE

Planning is a prerequisite for effective development. Development becomes comprehensive when growth centres are identified considering physical, social and economic variables of an area in an integrated manner. This indicates that planning of villages and towns are to be complementary. Second Administrative Reforms Commission (ARC) while interpreting the article 243 ZD of the Constitution of India states as follows. "This, in other words, means that the development needs of the rural and urban areas should be dealt with in an integrated manner and, therefore, the district plan, which is a plan for a large area consisting of villages and towns, should take into account such factors as 'spatial planning', sharing of 'physical and natural resources', integrated development of infrastructure' and 'environmental conservation'. All these are important, because the relationship between villages and towns is complementary. One needs the other. Many functions that the towns perform as seats of industry, trade and business and as providers of various services, including higher education, specialized health care services, communication etc have an impact on the development and welfare of rural people. Similarly, the **orderly growth of the urban centre** is dependent on the kind of organic linkage it establishes with its rural hinterland". Therefore a move of harmonizing urban and rural centres of an area can be said as a move of planned urbanisation of the area.

In this context, it is relevant to mention the 74th Amendment Act of the Constitution of India, which mandated the District Planning Committee to prepare a **draft development plan** for the district. As per Article 243 ZD of the Constitution, the District Planning Committee (DPC) shall consolidate Panchayat/Municipality Plans in the district and prepare draft development plan for the district as a whole. The Constitution also specifies that while preparing draft development plan due regard shall be given to matters of common interest between panchayats and municipalities including spatial planning, sharing of water and other physical and natural resources, the integrated development of infrastructure and environmental conservation. In this respect, the district of Kollam has conducted an important experiment of preparation of an Integrated District Development Plan (IDDP) for the district. Through preparation of IDDP, the District Planning Committee of Kollam has become the first ever DPC in the country to own a District Development Plan as envisaged by the Constitution. This path-breaking venture has become a model in participatory district planning in a spatial platform. The Plan was released during the international conference on district planning held at Kollam in August 2009. The Plan is now sanctioned by Government of Kerala. As per G.O (Rt) 354/04/LSGD dated 01.02.07, the State Government have extended the project to the remaining districts in the state and the districts of Alappuzha, Thrissur, Idukki, Palakkad and Wayanad were selected for extending the project in the first phase. However, even in these districts, preparation of IDDP is yet to be completed.

Preparation of such a plan will surely need decisions and commitment at various levels due to the multiplicity of agencies involved and the vast spectrum of aspects to be addressed. However, delay in planning shall not affect development. Hence a step by step approach may be adopted in planning. Therefore, the Department of Town and Country Planning evolved a sequence of plan preparation at district level, involving District Urbanisation Report (DUR), District Spatial Plan (DSP) and Integrated District Development Plan (IDDP).

The District Urbanisation Report defines the future spatial structure of a district, which is formulated by integrating hierarchy and activity pattern of urban and rural settlements and the connectivity between them. The spatial structure of a district will act as a frame for the orderly development of urban centres and their rural hinterland subsequently leading to a planned urbanisation.

The District Spatial Plan is a synergistic form of the District Urbanisation Report, since as a plan it is congruent to a single unified physical design for the district through setting development goals and objectives and formulating the development concept of the district. DSP will frame the general policies and strategies and streamline directions of development of the district. The Development Directives of DSP is carved in the spatial platform through the synthesis of findings of the analysis over the spatial structure based on secondary sources of data. But it lacks the resource studies as co-ordination of various agencies remain as an uphill task.

The Integrated District Development Plan can be termed as the highest echelon of this series and manifest all features of the draft district development plan as envisaged in Article 243ZD of the Constitution of India. Democratisation of planning and translation of sectoral policies into spatial plans are the paramount qualities of IDDP as against DSP. IDDP comprises of two components; a Perspective Plan for 15-20 years and an Execution Plan for 5 years.

As said earlier, IDDP for Kollam District is already prepared under the leadership of the District Planning Committee, Kollam with the involvement of all the Local Governments in the district and Special Technical Advisory Committee for IDDP. The Department of Town and Country Planning gave technical support for Plan preparation besides coordinating the entire process in the role of nodal agency.

Now, the Department has prepared District Spatial Plans for the districts of Thrissur and Palakkad and District Urbanisation Reports for the districts of Thiruvananthapuram, Pathanamthitta, Alappuzha, Kottayam, Ernakulam, Idukki, Malappuram, Kozhikkode, Wayanad, Kannur and Kasaragod. The District Urbanisation Report for Wayanad is one among the series.

I take this opportunity to appreciate the officials of the Wayanad District Office of the Department, headed by Sri.G.Sasikumar in the preparation of this document. The State Project Cell for LDP-IDDP-SPP played anchor role in this regard, right from conceptualisation to shaping the end product. The toolkits and customised computer applications developed by the State Project Cell has enabled the district offices to accomplish the task in a time bound manner. I also appreciate the consistent efforts of Sri. Jacob Easow, Senior Town Planner, Smt.Ushakumari.P.R, Town Planner, Sri. Baiju.K, Deputy Town Planner and other officials of the State Project Cell. I also appreciate the officials of the circle headed by Sri. G. Mohanan Senior Town Planner for their efforts in vetting and finalising the District Urbanisation Report for Wayanad.

This is a first step on the ladder leading to the **draft development plan** for the district as laid down in the Constitution. It is hoped that the district of Wayanad will further extend the District Urbanisation Report into Integrated District Development Plan for the district.

Certainly, the District Urbanisation Report for Wayanad will provide a framework for development as well as future planning of the district.

Thiruvananthapuram
11-02-2011

Eapen Varughese
Chief Town Planner

< CONTENTS >

ACKNOWLEDGEMENT

For planned development in Kerala, especially for the rural-urban continuum, an integrated approach towards regional development is very essential. A decentralised approach in this regard has extended to all the Districts of Kerala. The study of urbanisation for Wayanad District is the initial footstep for regional development plan in the District . The study was indeed an enriching experience and was conducted by analysing the past and present population, employment, land use, functional character, urban profile and road network of the District. The output of the study will help to frame the urban centres of the District in a systematic and planned manner for regional development.

I articulate my sincere thanks to **Sri. Eapen Varughese,** Chief Town Planner for giving this opportunity and providing necessary facilities for the completion of this work.The methodology adopted for the study was based on the guidelines received from State Project Cell, Thiruvananthapuram. I express my deep sense of gratitude to **Sri. Jacob Easow**, Senior Town Planner, **Smt.Ushakumari.P.R**, Town Planner, **Sri. Baiju.K**, Deputy Town Planner and other officials of the State Project Cell for their systematic guidance, valuable advice and constant encouragement throughout this work.I eloquent my earnest thanks to **Sri. G.Mohanan**, Senior Town Planner of Chief Town Planners Office, and other officials of the circle for their encouragement to complete this project. I am also indebted to all line departments and local governments for providing necessary help at the time of data collection.

Finally, I sincerely appreciate all the officials in District Town and Country Planning Office,Wayanad, especially **Sri.P.Ravikumar,** Deputy Town Planner, **Sri. Rijesh.N.M,** Assistant Town Planner and **Sri. T.N.Chandrabose**, Surveyor (Hr Gr), for their earnest effort for the successful completion of the study.

G Sasikumar,
Town Planner,
Wayanad.

Kalpetta,
02 - 02 - 2011.

<< BACK < CONTENTS > NEXT >>

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ANNEXES

Chapter-1
INTRODUCTION

The urban areas are generators of economic momentum. But all urban areas do not have the same economic capabilities. The economic potential of an urban area may depend on a number of factors like geographic location, availability of economic infrastructure, regional linkages, and propensities for accepting further investments and creating spread effects. Urbanisation is the outcome of large scale industrialization of urban areas and migration of people from rural areas in search of employment in various sectors. Urbanisation is also being caused due to the flow of people from various parts of the state for better social and cultural facilities available in urban centers. In Kerala situation, the development of tertiary sector is the main cause of urbanisation. It is not the outcome of accelerated industrialization as seen in Tamil Nadu, Maharashtra, Andhra Pradesh and Karnataka.

As per the 2001 census, the total population of Wayanad district is 780619 of which 751007 are rural. The census figures indicate that only 3.79 % of the total population is urban whereas the figure for the state is 26%. Unlike the other parts of the country the Urbanisation in Kerala state is not limited to the designated cities and towns. Barring a few grama panchayats in the hilly tracts and a few isolated areas here and there, the entire state depicts the picture of an urban rural continuum. This necessitates the study of urbanisation over a period and the trend of urbanisation for the next twenty years.

Wayanad District is agrarian in nature and located at high land region. This limits the intensity of urbanization in this area. According to 2001 census, this district has only one urban area. But the urbanisation trend is now slowly coming to Wayanad district also. This district acts as a link between Malabar region and some parts of central region to Mysore region of Karnataka State and Ooty area of Tamilnadu State. And now a day, Wayanad district is identified as one major tourism destination in South India. While analyzing the occupational structure, a trend in decrease in the percentage of agricultural labours is visible. In the other side, the labour force in secondary and tertiary sector is increasing. From all these things, it can be inferred that, urbanisation potential of Wayanad district is increasing.

The main problems seen in every developed area are the results of unplanned urban development. Urbanisation in Wayanad district was in its infant state in few years back. But now it attains the speed of growth, and like every developed area, it grows is in an unplanned manner. Hence for controlling the urbanisation and planning it in an excellent manner, identification of current and future urban areas is essential. The urban potentials of all areas to be identified and a plan should be prepared for its sustainable development. District Urbanisation Report is an attempt to identify the urbanisation trend of areas in the district and their future visualization.

Chapter –2
PROFILE OF THE DISTRICT

Wayand District - The Green Paradise, (E.Long 75° 47' 23" and 76° 26' 40" and N.Lat 11° 30' 08" and 11° 58' 40"; area of 2132km^2) in Malabar is one of the border districts of Kerala, fringing the Mysore plateau to the north east and contiguous with the Nilgris of TamilNadu. It was formed on November 1, 1980 merging North and South Wayanad regions of Kozhikode and Kannur districts.

Wayanad, in the south west edge of the Peninsular shield of India, is distinctly marked by the western ghats where ground elevations above mean sea level range between 700-2100 m., whereby it is totally contained within the Highland region (Elevation>=750 m) of the state. To its west and north west are districts of Kozhikode and Kannur, while Malappuram district forms the southern perimeter. The district comprises of four blocks, namely Kalpetta, Sulthan Bathery, Mananthavady and Panamaram with 25 grama panchayats. Its head quarter is located at

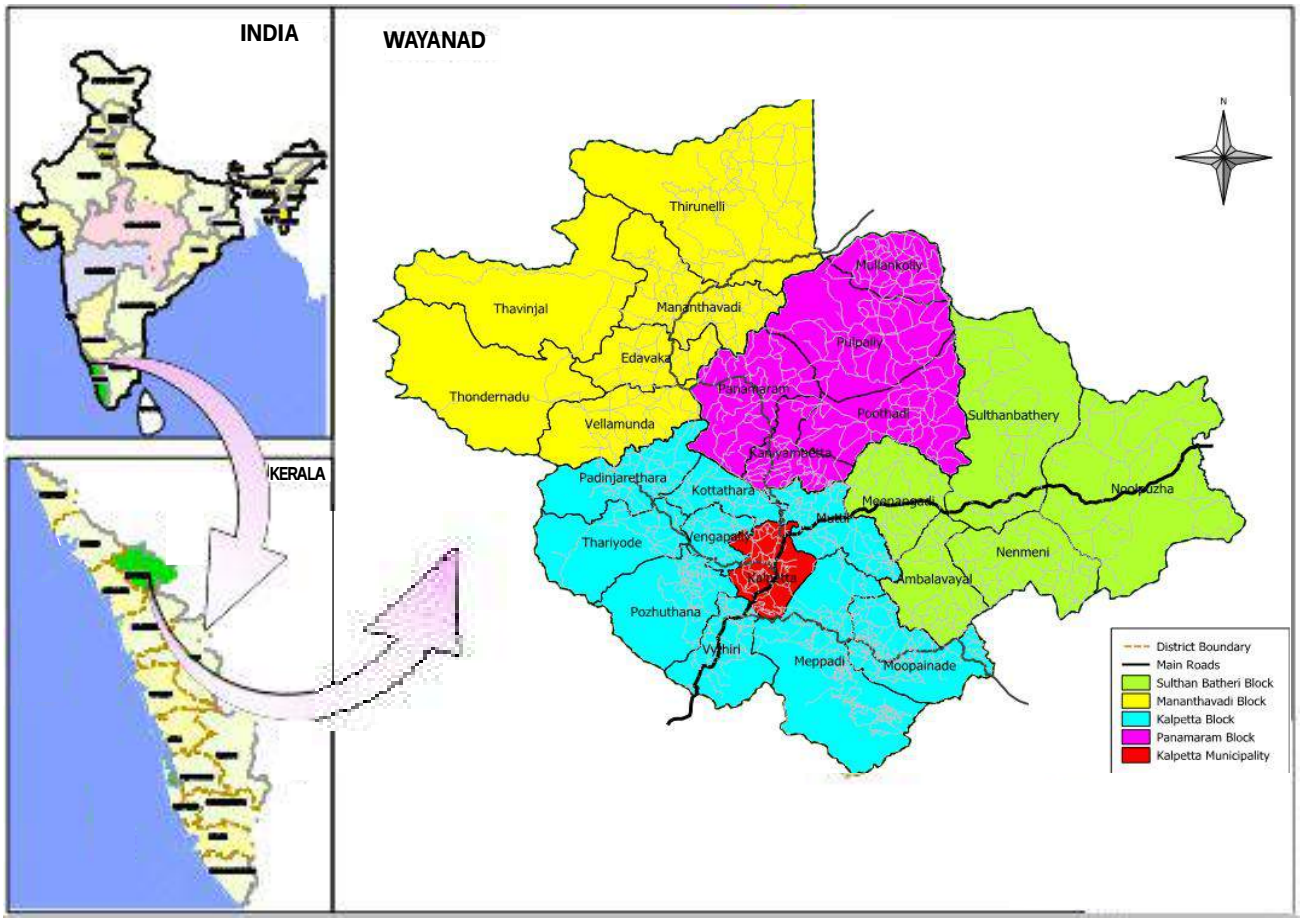


Fig 2.1 Location map of Wayanad District

Kalpetta, the only municipality and there are 48 villages in three thaluks namely Vythiry, Sultan Bathery and Mananthavady. The land of Wayanad is rich in its cultural tradition and heritage. There is a considerable share of forest land in this district and it accommodates a variety of tourist destinations of the state. Wayanad is the home land of the majority of the tribal population of the state.

2.1 ADMINISTRATIVE DIVISIONS

The District has three taluks; Sulthan Bathery, Mananthavady and Vythiri (figure 2.2). The villages coming under each taluk is given in Annexe -1. The name of the taluk and taluk head quarters are shown in the table 2.1. The District has four development blocks (Panamaram, the fourth one came on October 2010), and one municipality. The name of the blocks, block head quarters and block wise distribution of the population is shown in the table 2.2. Name of grama panchayats and their area is given in table 2.3. among these panchayats, noolpuzha (242.97 SqKm) is the biggest one and vengapally (21.16 SqKm) is the smallest one. The spatial distribution of the development block panchayats are shown in fig 2.3

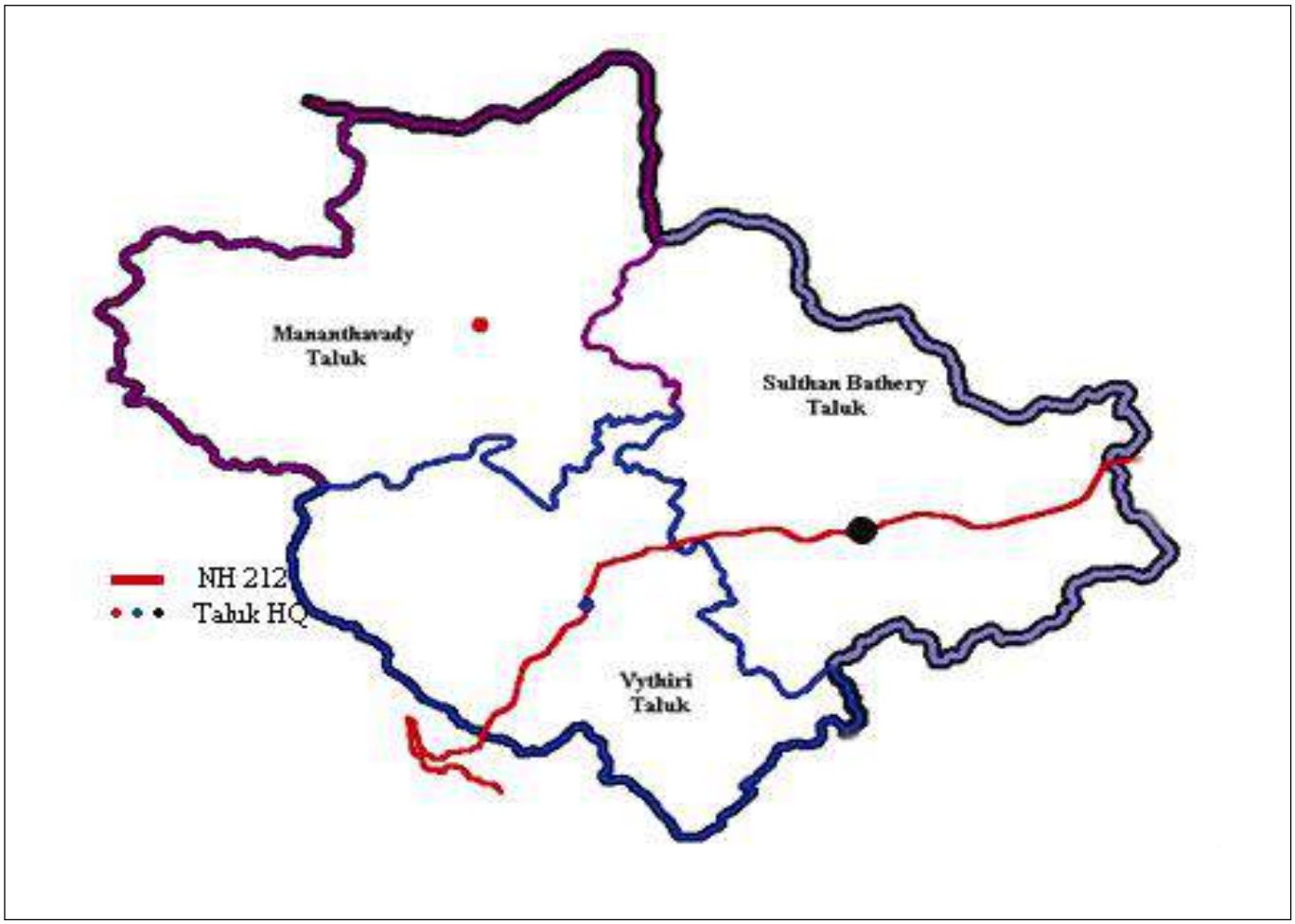


Fig 2.2 Taluks in Wayanad District

Table 2.1 Taluks in Wayanad District

Name of Taluk	Taluk Head Quarters
Sulthan Bathery	Sulthan Bathery
Mananthavady	Mananthavady
Vythiri	Vythiri

Table 2.2 Block Panchayat Details

Sl No	Name of Block Panchayat	Population 2001	Area (SqKm)	Block Head Quarters	Name of the Grama Panchayat where Block HQ situated
1	Mananthavady	201619	666.51	Mananthavady	Mananthavady
2	Sulthan Bathery	178751	529.74	Sulthan Bathery	Sulthan Bathery
3	Kalpetta	194700	584.9	Kalpetta	Kalpetta
4	Panamaram	175937	350.86	Panamaram	Panamaram

Fig 2.3 Grama Panchayats and Kalpetta municipality with block boundary

Table 2.3 Grama Panchayat/Municipality Details

No	Block Panchayat/ Municipality	Grama Panchayat name	Area (Sq Km)
1	Kalpetta Muncipality		40.46
2	Mananthavadi Block	Mananthavady	80.1
3		Vellamunda	64.54
4		Thirunelly	201.16
5		Thondarnad	131.15
6		Edavaka	47.26
7		Thavinchal	142.3
8	Sulthan Batheri Block	Meenangadi	53.52
9		Nenmeni	69.38
10		Ambalavayal	60.65
11		Sulthan Bathery	103.22
12		Noolpuzha	242.97
13	Kalpetta Block	Kottathara	31.75
14		Vengappally	21.16
15		Vythiry	47.84
16		Muttil	47.38
17		Pozhuthana	71.3
18		Thariyode	71.17
19		Padinharathara	55.18
20		Meppady	125.95
21		Muppainad	72.7
22	Panamaram Block	Panamaram	80.9
23		Poothady	82.88
24		Mullamkolly	71.58
25		Pulpally	77.7
26		Kaniyampetta	37.8
	Total		**2132**

2.2 AREA AND POPULATION

Total area of Wayanad district is 2132 SqKm. As per the 2001 census, the total population of the district is 780619 of which 751007 are rural. The census figures indicate that only 3.79 % of the total population is urban whereas the figure for the state is 26%. Wayanad district stands first in the case of tribal *(Adivasi)* population among other districts in the state. However it has a large settler population. There are people from almost all parts of Kerala were migrated to this fertile land. Wayanad has a small jain community consisting of Gowders who came from Karnataka. Almost all sections of Christianity are well represented. One fourth population of Wayanad is constituted by Christians. Muslims constitute another one fourth population and rest of the population belongs to Hindus.

2.3 PHYSIOGRAPHY

Wayanad, in the south west edge of the Peninsular shield of India, is distinctly marked by the Western Ghats where ground elevations above mean sea level range between 700-2100 m., whereby it is totally contained within the Highland region (Elevation>=750 m) of the state. Gross geometry or map view of distribution of arable land in Wayanad is similar to a north west - south east trending shallow-oval bowl with a truncated south east edge. Inhere, Manathavady and Pulpally are along the northern perimeter, whereas Sultan Batheri falls to the eastern edge. Vythiry is due south of Mananthavady in the southern border while Kalpetta is closer to the former but to north east.

Yet, based on degree of dissection and distribution of relief features, physiographic divisions, like rugged highland (1400-2100 m), moderately rugged highland (1000-1400 m) and less rugged highland (700-1000 m) have been identified.

a. Rugged highland, covering the hill tracts of the west, northwest and southwest, is characteristically made of lofty knobs, ridges and intervening relatively narrow valleys with steeper valley walls and valley floors. But for the patches of grass cover on the summits and immediate flanks, most of this tract is covered by very dense forest.

b. Moderately rugged highland is marked by isolated hills and ridges to the east. Ridges to the southeast marks state border between Kerala and Tamil Nadu. Dominant average slope is of the order of 30%.

c. Less rugged highland. This dominant terrain element of Wayanad (area = 63%), is chiefly made of a more or less rolling topography with hills and ridges of moderately steep walls or flanks (slope <30%) and nearly convex summits bordering relatively flat and wide or occasionally narrow valley floors.

Another remarkable aspect of Wayanad terrain is the wide and nearly flat, inter-ridge or inter-mountain valleys, covered with a soil cover of variable thickness, resulting from accumulation of sediment shed by the bordering hills and ridges. Uniquely, such and other valley floors have been landscaped and terraced to form patches ideal for cultivating rice paddy or similar crops. Certainly some valley floors in the upper reaches are typically erosional.

2.4 PHYSICAL FEATURES

Natural Sub-Divisions:

The district lies at an altitude of 700m to 2100m above mean sea level. With rugged terrain, hills are relatively lower in the middle of the district, while, northern, western and southern areas have high hills with wild and mountainous appearance. The eastern area is flatter and open. The evergreen forest on the slopes and the deep valleys of the east abounds bamboo forests while the hills and dales of the south and west are areas of cultivation.

Due to peculiar terrain, there are east-flowing and west flowing rivers in the district. The low hills are full of plantations like tea, coffee, pepper and cardamom, while the valleys have predominance of paddy fields.

Climate:

The district has a salubrious climate. The mean average rainfall in this district is 2322mm. Lakkidi, Vythiri and Meppadi are the high rainfall areas in Wayanad. Annual rain falls in these high rainfall areas ranges from 3000 to 4000 mm. High velocity winds are common during the south-west monsoon and dry winds blow in March-April. High altitude regions experience severe cold.

Generally the year is classified in four seasons, namely, cold whether (December – February), hot whether (March – May), Southwest monsoon (June – September) and Northeast monsoon (October – November).

Mountains:

Banasura Peak

Placed on the southern tip of the Decan plateau, Wayanad's prime glory is the majestic Western Ghats with lofty ridges interspersed with magnificent forests, tangled jungles and deep valleys. In the center of the district, hills are lower in height, while the northern area has high hills and they give a wild and mountainous appearance. Some the major peaks are Vellarimala, Banasura, Brahmagiri, Chembra etc ranging from 1500 to 2100 m height.

Rivers:

Kabani River, one of the three east flowing rivers of Kerala, is an important tributary of the river Cauvary. Kabani and its tributaries constitute a powerful river system in the landscape of Wayanad. The existing water body network of Wayanad District is shown in Figure 2.4.

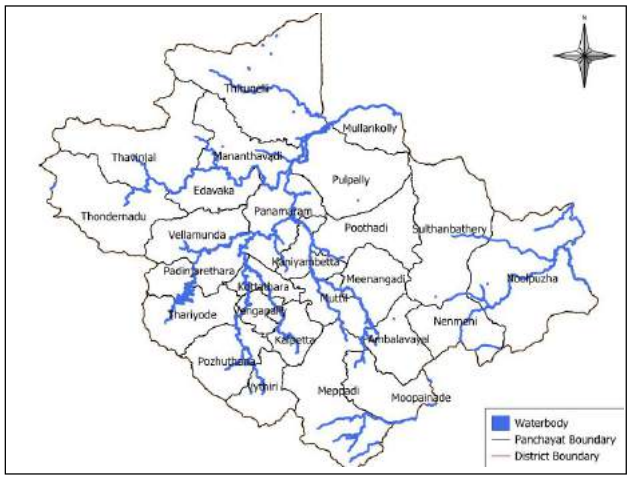


Fig 2.4 Existing Waterbody network

Lakes & Backwaters:

The famous Pookot Lake, the only lake of its kind of the district is situated in Kunnathidavaka village, half way between Lakkidi and Vythiri on a loop road. This perennial lake has an extension of 5.23 hectares. There are no backwaters in the district.

Pookot Lake

Lithology

Rock types noticed in Wayanad are supracrustal gneisses and charnockites of Archaean age; basic and acidic intrusives of proterozoic age; laterite of sub-recent age and recent alluviam. A detailed geological succession, along with relative ages and lithologies are indicated in Table 2.4.

Table 2.4 Geological succession, Wayanad District

Age	Activity	Lithology
Post Archaean	Dyke activity & Cataclasite	Dolerite,
		Myloblastic
		Fissible mica gneiss
Proterozoic to Paleozoic	Retrogression Acid intrusives	Garnet-biotite gneiss
		Pegmatite,Granite,
		Granite neiss
	Basic intrusives	Gabbro
		Diorite
Archaean	Charnokitisation Migmatisation	Charnockite
		Migmatite gneiss (II)
	Wayanad supracrustals	Quartz-sericite schist
		Garnet-sillimanite-kyanite gneiss
		Fuschite quartzite
		Magnetite quartzite
		schist
		Pyroxene granulite/amphiboloite
	Basement gneiss	Migmatitic gneiss (I) fissile

(Source: GSI, 1992)

Ground Water Regimen or Hydrogeology

Weathered and fractured crystalline rocks and alluvial formations in Wayanad are chief abodes of ground water. On the one hand, weathered zone has Ground water dominantly occurring under phreatic conditions and the latter is developed both for domestic and agricultural uses by means of conventional domestic wells of variable diameters. Over burden or thickness of the weathered zone is highly variable but controlled only by structure and lithological make up of basement rocks. The weathered zone is exceptionally thick (range = 20-30 m.) in areas of gneissic basement of central and eastern. But northern and southern tracts underlain by charnockites, supracrustals, basic dykes and granite register a relatively lower thickness of 15-25 m. for weathered zone. Potential (unconfined and confined) aquifers do occur in the fractured rock formations and is exploited by bore-wells.

2.5 SOCIO ECONOMIC ASPECTS

Wayanad is basically agrarian, with plantation economy playing a major role. Of the total 2132 Sq.Km the district has around 40% forest area and around 50% agriculture and plantation area. The district is characterized by perennial plantation crops and spices with coffee forming the main agriculture crop. Coffee is cultivated 66973 hectares. Coffee in the district shares 33.65 per cent of the total cropped area in the district and 78 per cent of the coffee area in the state. Other Major crops are pepper, Coconut , Rubber , Areca nut , Cardamom and ginger . Pepper is grown along with coffee in the north eastern parts of the district, especially in Pulpally and Mullankolly. Paddy, once the major crop of the District, is now cultivated in 12988 H and only a single crop is harvested. Much of the paddy

field of the district is being converted for banana cultivation. Ginger cultivation in Wayanad has also substantially increased in recent times and paddy fields are increasingly being converted for ginger cultivation.

The district does not have any significant industry. Wayanad is a backward area in the industrial map of Kerala and there is no major industrial unit in the district worth mentioning except a few factories for processing tea and coffee. Though there are high potential for the processing of local agriculture produces, there is no significant processing units in the district.

Animal husbandry is another major area contributes to the economy of wayanad. Dairy is a subsidiary economic activity for a significant section of the population of the district. Kerala Agriculture University has set up a veterinary college in Lakkidi.

Literacy Rate:

The average literacy rate of the district is 82.73% in 1991, comparatively lower than state average of 90.86%. According to 2001 senses, the literacy rate of district is 85.25% and that of Kalpetta municipality is 76.92%.

Share of Workers:

The work force participation ratio (WPR) in Kerala has increased from 34.75% to 35.93% from 1991 to 2001. The WPR of the district is reported to the 39.53% in 2001. There is no significant variation in WPR among the blocks.

Table 2.5 Work force participation

Year	Population	No. of workers	Main workers	WPR
1981	553348	212186	185894	38.35
1991	672128	260514	227453	38.76
2001	780619	308613	219789	39.53

Source: Census Data 2001

Per Capita Income (PCI):

Per Capita Income is the income of person in a population. PCI is often used to measure a country's standard of living. Per capital income means income of each Indian, assuming national income is evenly divided among the country's population.

The per capita income in real terms (at 1999-2000 prices) during 2008-09 is estimated to attain a level of Rs.25,494 as compared to the Quick Estimates for the year 2007- 08 of Rs.24,295. The growth rate in per capita income is estimated at 4.9 per cent during 2008-09. The per capita income at current prices during 2008-09 is estimated to attain a level of Rs.37,490 as compared to the Quick Estimates for the year 2007-08 of Rs.33,283, showing a rise of 12.6 per cent. The per capita state income at constant (1999-2000) prices increased from 33372 in 2007-08 to Rs.35457 in 2007-08, registering a growth rate of 6.25 percent. At current prices the per capita state income during 2008-09 is Rs.49316 as against Rs.43104 during 2007-08, recording a growth rate of 14.41 percent in 2008-09. The per capita state income is higher than the per capita national income.

District wise distribution of Gross State Domestic Product at factor cost at current prices shows that Ernakulam District continues to have the highest income of Rs.27474.62 crore in 2008-09 as against Rs.20782.48 crore in 2007-08 registering a growth rate of 14.81% . At constant (1999-2000) prices it comes to Rs.19940.60 crore during 2008-09 compared to Rs.16338.99 crore during 2007-08. Thiruvananthapuram District stands second with an income of Rs.20745.07 crore in 2008-09 at current prices followed by Thrissur (Rs.18483.03 crore), Kozhikode (Rs.16761.85 crore), Malappuram (Rs.14728.60 crore) and Palakkad (Rs.14579.11 crore). The lowest income of Rs.3554.59 crore was recorded in Wayanad District at current prices during 2008-09 preceded by Idukki (Rs.6352.92 crore). Wayanad contributes around 1.8% of states GDP.

The analysis of district wise per capita income shows that Ernakulam district stands first with the per capita income of Rs.59970 at constant (1999-2000) prices in 2008-09 as against Rs.56060 in 2007-08. Kottayam District has the second largest per capita income of Rs.46362 in 2008-09 at constant prices followed by Thiruvananthapuram (Rs.43247), Thrissur (Rs.42316), and Pathanamthitta (Rs.42166). The lowest per capita income was recorded in Malappuram District (Rs.25291) in 2008-09 at constant prices preceded by Wayanad (Rs.28047). The per capita income of all the districts is shown in the table 2.6.

Table 2.6 District-wise Distribution of per capita income

Sl No	District	2007-08 (P) Rs.	Rank	2008-09 (Q) Rs.	Rank	Growth Rate(%) 2008-09
1	2	3	4	5	6	7
1	Thiruvananthapuram	40700	3	43247	3	6.26
2	Kollam	34593	10	36698	10	6.09
3	Pathanamthitta	39597	5	42166	5	6.49
4	Alappuzha	37606	6	40089	6	6.60
5	Kottayam	43722	2	46362	2	6.04
6	Idukki	35548	9	37374	9	5.14
7	Ernakulam	56060	1	59970	1	6.97
8	Thrissur	39658	4	42316	4	6.70
9	Palakkad	34541	11	36487	11	5.63
10	Malappuram	24067	14	25291	14	5.09
11	Kozhikode	36488	7	38798	7	6.33
12	Wayanad	26847	13	28047	13	4.47
13	Kannur	36321	8	38634	8	6.37
14	Kasaragod	32310	12	34006	12	5.25
	STATE	**37507**		**39815**		**6.15**

Source: Department of Economics and Statistics

P - Provisional.
Q - Quick.

Tourism

Tourism plays a major role in the economic aspects of Wayanad district. The Government of Kerala has identified Wayanad as a Tourism District and tourism is an emerging sector in Wayanad. The scenic beauty and rich heritage sites of Wayanad offer several opportunities for tourism expansion in the district. Almost all area of this green paradise is tourist attracting place. The major tourist activity centers in Wayanad are:

Banasura Sagar Dam

This is the second largest earth dam in India. The topography here is such that many islands will be formed in the upstream of the dam when the dam is full. These islands with the background of the Banasura hill will provide a hypnotizing sight to tourists.

Chembra Peak

The hills, rocks and valleys, which contribute to the very unique character of Wayanad, provide a lot of adventure tourism. Trekking to the Chembra peak is a risky mountaineering endeavour. Chembra peak, the highest hill in Wayanad, is near Meppady town. Trekking to the top of the peak takes almost a day. Tourists can

Chembra Peak

also stay one or two days at the top of the peak takes in temporary camps. District Tourism Promotion Council provides guides, sleeping bags, canvases, huts and trekking implements on hire. The scenic beauty of Wayanad, which is visible from the top of Chembra, is very exhilarating.

Edakkal Cave

This location of breath-taking beauty is three kilometers from Ambalavayal which is 25 kms from Kalpetta. The Edakkal cave in the Ambukuthy Mountain is not a cave in the real sense. As state in the India Antiquary and quoted in the District Gazetter, Kozhikode, it is only a 'cleft about 96 ft long and 22 ft wide in the rock'. It is fissure made by a corner of rock splitting off from the main body due to some natural causes. The depth of both the cleft and the fissure is 30 ft. What makes it a cave to the ordinary observer is the fact that in the other portion of the large cleft, an enormous rock, weighing several tons, has fallen forming a roof over a large part of it. The rock wall contains some interesting carvings, which represent human and animal figures and objects of human use and symbols. These carvings speak of a highly civilized people of pre – historic era and inspire the archaeologists and historians to rewrite the history of Wayanad and Kerala as a whole.

Kuruva Island

The Kuruva Island, 950 acres of evergreen forest on the tributaries of east following river Kabani, is an ideal picnic spot, far away from the disturbance of city

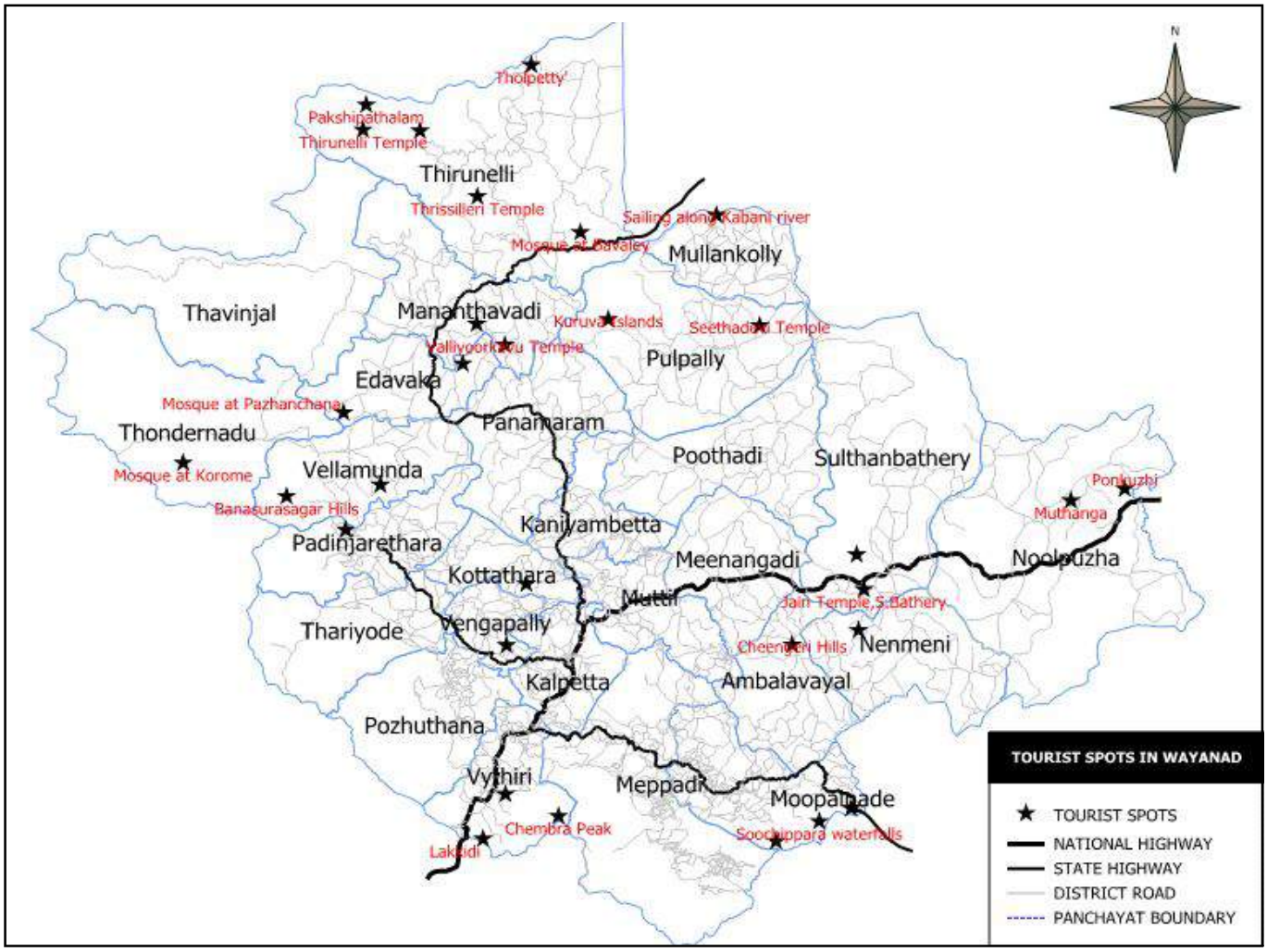


Fig 2.5 Major Tourist Destinations.

life. The island is uninhabited. Rare species of birds, orchids and herbs are the sovereigns of this supernal kingdom. It is 17 kms east of Mananthavady and 40 kms north west of Sulthan Bathery.

Lakkidi

One of the highest locations in Wayanad, Lakkidi also commands picturesque scenery. It is about 58 kms north east of Kozhikode and five kms south of Vythiri. Lakkidi, the gateway of Wayanad, lies at an elevation of 700m above mean sea level. The lofty mountain peaks, the gurging stream, luxuriant vegetation and the bird's eye view of the deep valley on the south, with its winding roads, are breath taking. The 12 kms long journey from Adivaram to Lakkidi through ghats road with nine hairpin bends amidst thick forests, is fascinating experience.

Muthanga Wild Life Sanctury

Muthanga, which is 16 kms east of Sulthan Bathery, is located very near to the Karnataka border. Wild forests covering an area of 345 sq.kms from the Muthanga Wild Life Sanctuary, the biggest abode of wild animals in Malabar. Elephant, spotted deer, bison, tiger, cheetah, wild bear etc are found in this sanctuary. The Forest Department has facilities for providing elephant rides to the tourists here.

Pakshipathalam

Pakshipathalam in the Brahmagiri hills at Thirunelly is a challenging tourists spot for any adventure seeking tourist. To reach Pakshipathalam, seventeen Kms have to be covered through wild forest. The deep rock caves, formed among the thick blocks of rocks at the northern top end of the Brahmagiri, are the abode of various birds and wild beasts. Special permissions have to be obtained from Forest Department to go to Pakshipathalam. District Tourism Promotion Council arranges vehicles, guides, camping equipmens etc to the tourist, on hire.

Pazhassi Tourist Resort

Pazhassi Tourist Resort at Mananthavady is a good picnic center in north Wayanad. There is a good aquarium here. Coin – operated toys for children and boating facilities for tourists are available here. Pazhassi Raja, the Lion of Kerala, who organized guerilla type warfare against British East India Company, was cremated here in 1805.

Pookot Lake

It is a natural fresh water lake, brimmed with ever- green mountains. The weather here is salacious; the scenic beauty, hypnotizing and the nature, unspoiled. Pookot Lake tourist resort in Vythiri is the sought after tourist spot of Wayanad. There is an aquarium and a green house here. Boating facilities also are available. Spices and handicraft items are also arranged for sale at Pookot. The lake has an area of 8.5H and the maximum water depth is 6.5 m. This is located at 3 Km south of Vythiri.

Soochippara Waterfall

The waterfalls at Soochippara near Meppadi are really a tresure of nature, yet to be discovered. The streches of waterfalls ranging at places from 100 to 300 feet height are a treat to the eyes. The pool below provides for water rafting, swimming, bathing etc. The tree top huts at Soochippara give a unique view of the valleys of the Western Ghats.

2.6 INFERENCE

Wayanad district is agrarian in nature and located at high land region. This limits the urbanisation in the district. According to 2001 census, the total population of Wayanad district is 780619 and of this, 751007 are rural. Plantation plays a major role in the economic base of the district. Besides, tourism and animal husbandry also have important role.

Chapter –3
HISTORY AND REGIONAL LINKAGES

3.1 HISTORICAL BACKGROUND

Comprising an area of 2132 Sq.kms, Wayanad has a powerful history. Countless evidences about New Stone Age civilization can be seen on the hills of Wayanad. The two caves of Ampukuthimala located between Sulthan bathery and Ambalavayal, with pictures painted on their walls and pictorial writings speak volumes of the bygone era and civilization.

Recorded history of this district is available from the 18th century. In ancient times, this land was ruled by the Rajas of the Veda tribe. In later days, Wayanad came under the rule of the Pazhassi Rajas of Kottayam royal dynasty. When Hyder Ali became the ruler of Mysore, he invaded Wayanad and brought it under his way. In the days of Tippu, Wayanad was restored to the Kottayam royal dynasty. But Tipu handed over the entire Malabar region to the British, after the sreerangapattanam truce, he made with them. This was followed by fierce and internecine encounters between the British and Kerala Varma Pazhassi Raja of Kottayam. When the Raja was driven to the wilderness of Wayanad, he organized the war, like people's militia with the help of Kurichye tribals and engaged the British in several guerrilla type encounters. In the end, the British could get only the dead body of the Raja, who killed himself somewhere in the interior of the forest.

Thus Wayanad fell into the hands of British and with it came a new turn in the history of this area. The British authorities opened up the plateau for cultivation of tea and other cash crops. Roads were laid across the dangerous slopes of Wayanad, from Kozhikode and Thalassery. These roads were extended to the cities of Mysore and Ooty through Gudalur. Through the roads poured in settlers from all parts of Kerala and the virgin forest lands proved a veritable goldmine with incredible yields of cash crops.

When the state of Kerala came into being in November 1956, Wayanad was part of Kannur district. Later, south Wayanad was added to Kozhikode district. In order to fulfill the aspirations of the people of Wayanad for development, north Wayanad and south Wayanad were carved out and joined together to form the present district of Wayanad.

3.2 REGIONAL LINKAGES

Wayand District (E.Long 75° 47' 23" and 76° 26' 40" and N.Lat 11° 30' 08" and 11° 58' 40"; area of 2132km^2) is bounded by Kodagu district of Karnataka on the north, Nilgiri district of Tamilnadu and Mysore district of Karnataka on the east, Malappuram district on the south and Kozhikode and Kannur districts on the west. Wayanad is the only district in Kerala, which shares its boundary with two other states, namely Karnataka and Tamilnadu.

The major urban center near to the district is Kozhikode which is about 75 km west of Kalpetta, the head quarters of Wayanad. For all the higher order facilities, the district depends mainly on Kozhikode. The famous tourist centers of South India viz Ooty and Mysore are equidistant of about 120 km from the district head quarters.

Fig 3.1 Location and Regional Linkages

3.3 CONNECTIVITY

Wayanad is connected to Mysore and Coorg districts in Karnataka, the Nilgiris in Tamil Nadu, Kannur, Kozhikode and Malappuram Districts in Kerala by road. Mananthavady-Tolpetti road, Mananthavady-Baveli road and Sultan Battery – Mysore Road (NH 212) connect the district to Karnataka. It is connected to the Nilgiri District in Tamil Nadu by Sultan Batheri - Ayyankolli – Gudallur road and Vythiri-Vaduvachal-Gudallur road. The three roads which connect with Kozhikode and Kannur districts of Kerala are Baveli-Tellicherry road via Peria ghat, Kozhikode road via Tamarasseri ghat (NH 212) and Mananthavady-Kuttiadi Road. Railway or Airway facility is not available in this district. The nearest railway station is at Kozhikode, 75 kms west of the district headquarters Kalpetta. The district has a good network of village roads.

NH 212 is the main road connecting Kozhikode and Mysore through Wayanad. This is the major goods and passenger corridor in this district. Karnataka Government Banned the traffic through Bandipur

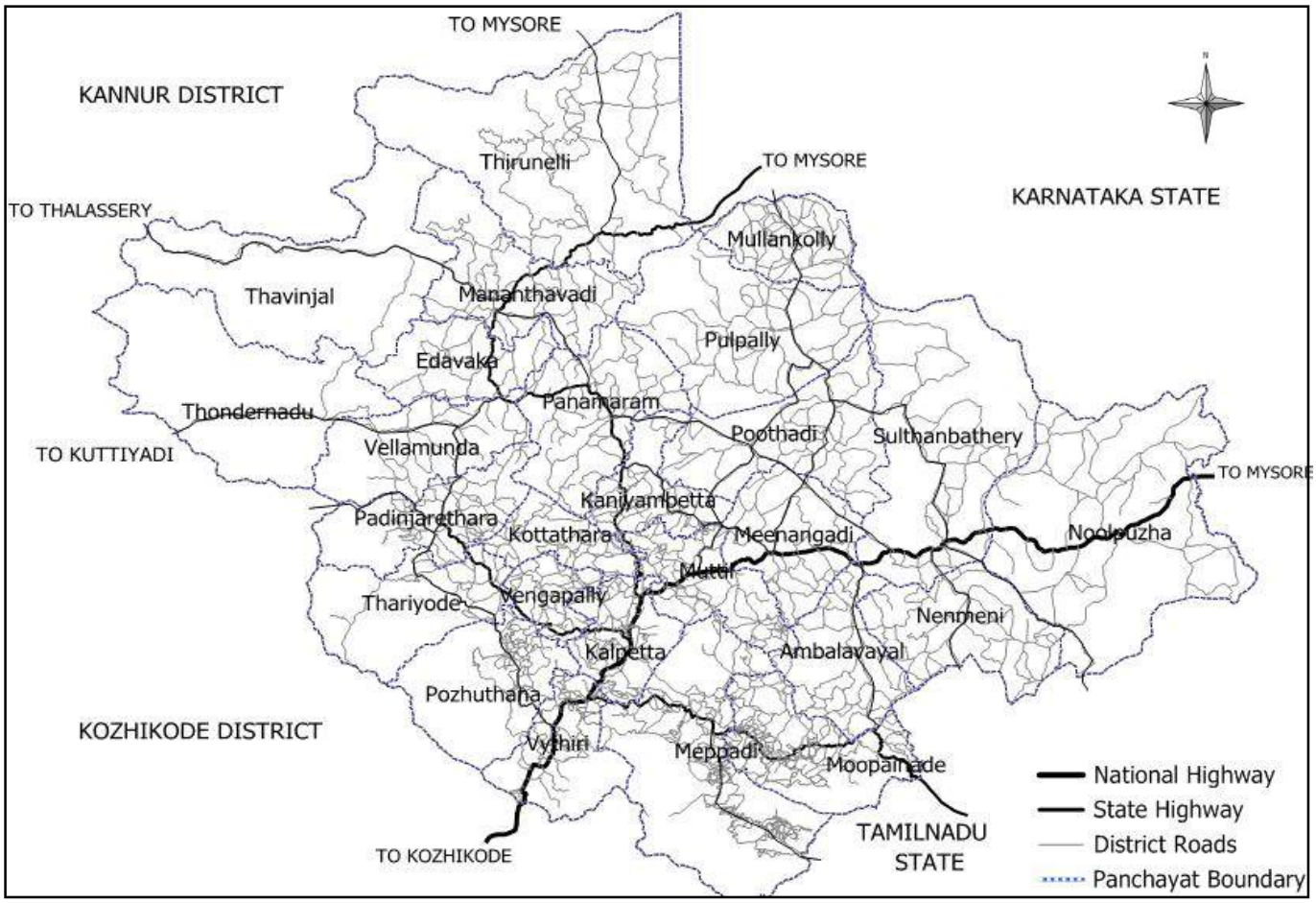


Fig 3.2 Road Network of District

National Park in this route from 9pm to 6am. The alternate route for this route is Kalpetta-Kainatty-Panamaram-Mananthavadi-Tholpetti-Kutta-Gonikoppai-hunsur-Mysore. Average width of carriageway of this alternate road is 5.5 meter and the surface condition is poor. This will cause traffic congestion in the route when all vehicles from NH 212 are diverted to this new route at night. Lack of widening and road up-gradation works for this alternate route will cause poor connectivity (Regional Linkage) between Wayanad and Mysore region.

3.4 INFERENCE

Wayanad is the only district in kerala, which shares its boundary with two states (Karnataka and Tamil Nadu). Wayanad District is connected to other parts of the State and the Country only by roads. The nearest airport of the district is the International airport at Kozhikode at a distance of 90 km from the district headquarters, Kalpetta. The lack of rail and air facility makes the inter district and intra district/state movements of the passenger and goods uncomfortable.

Chapter –4
POPULATION

4.1 POPULATION SIZE

According to 2001 Census, the population of Wayanad district is 7,80619 of which male population is 3,91,273 and female is 3,89,346. The population of Scheduled Tribes is 1,36,002 and that of Scheduled caste is 33,364. Population of Literates in this district is 5,76,735 of which 3,03,579 belong to Males and 2,73,156 belong to females. The grama panchayat/municipality wise population breakup is shown in the table 4.1 below.

Table 4.1 Local Government wise Population distribution (2001)

Name of Block Panchayat / Municipality	Name of Grama Panchayat	Population				
		Total	Male	Female	SC	ST
Kalpetta muncipality		29612	14849	14763	2263	3128
Mananthavadi Block	**Mananthavady**	45477	22858	22619	1644	6819
	Vellamunda	36415	18359	18056	683	5720
	Thirunelly	27450	13552	13898	553	11178
	Thondarnad	22455	11316	11139	518	4374
	Edavaka	31168	15859	15309	517	4910
	Thavinchal	38654	19333	19321	1559	6790
Sulthan Batheri Block	**Meenangadi**	32067	16176	15891	1039	7099
	Nenmeni	44096	21825	22271	2079	7086
	Ambalavayal	34345	17110	17235	1086	4775
	Sulthan Bathery	42059	21179	20880	1710	4894
	Noolpuzha	26184	13265	12919	661	10228
Kalpetta Block	**Kottathara**	16636	8271	8365	489	4600
	Vengappally	11072	5452	5620	287	2661
	Vythiry	17820	8835	8985	2971	875
	Muttil	31227	15535	15692	1069	4562
	Pozhuthana	17397	8502	8895	1199	3266
	Thariyode	11843	5932	5911	216	2649
	Padinharathara	24823	12318	12505	1718	2647
	Meppady	39849	19813	20036	3837	3516
	Muppainad	24033	11903	12130	1512	988
Panamaram Block	**Panamaram**	42922	21769	21153	963	10056
	Poothady	39687	19905	19782	992	7262
	Mullankolly	29519	15177	14342	1716	2741
	Pulpally	34293	17425	16868	1317	7143
	Kaniyampetta	29516	14755	14761	766	6035
Total		**780619**	**391273**	**389346**	**33364**	**136002**

Source: Census Data 2001

4.2 GROWTH OF POPULATION

The district had a population of 672128 persons in 1991 census. During the last 10 year, 108491 persons were added to the district. Decadal growth rate of population was 21.47% during 1981 -1991 and for 1991-2001, it was 16.14%

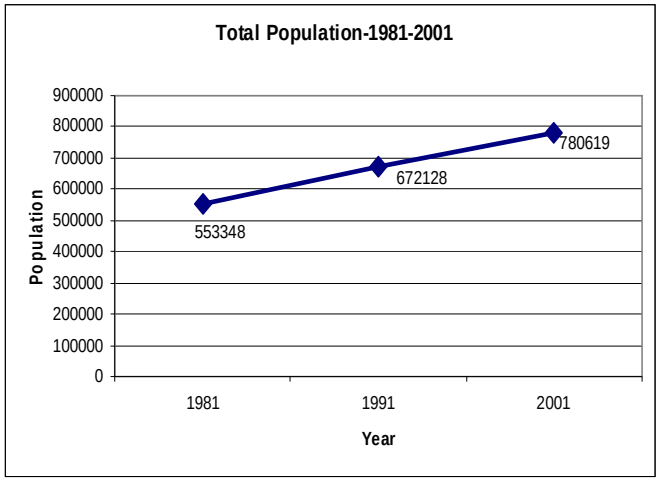


Fig 4.1 Population growth in Wayanad (1981-2001).

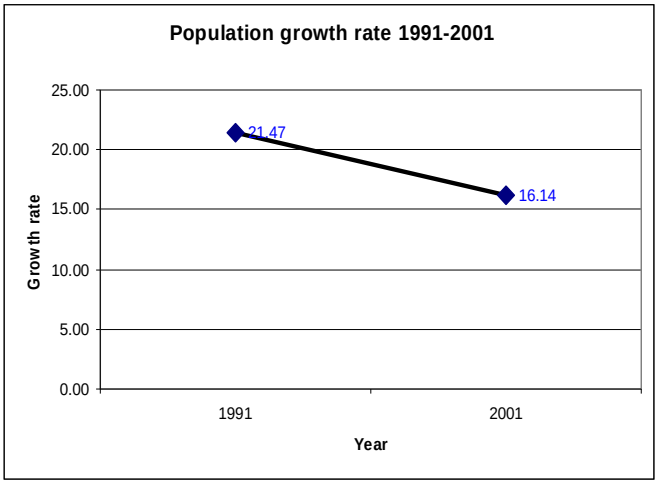


Fig 4.3 Decadal growth in Wayanad.

Comparison of Population Growth

When looking at the figure 4.5, it is seen that, Wayanad district shows high growth rate of population compared to state average. According to 2001 census, state average growth rate is 9.43, where as it is 16.14 for Wayanad district. When comparing the population growth rate with surrounding districts, Wayanad district comes in the second place, followed by Malappuram District. Kozhikode and Kannur Districts shows very less population growth rate compared to Wayanad district.

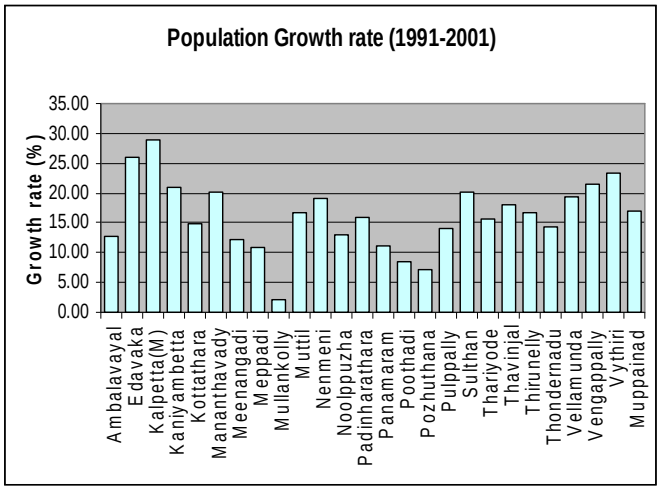


Fig 4.2 LSG wise Population Growth rate.

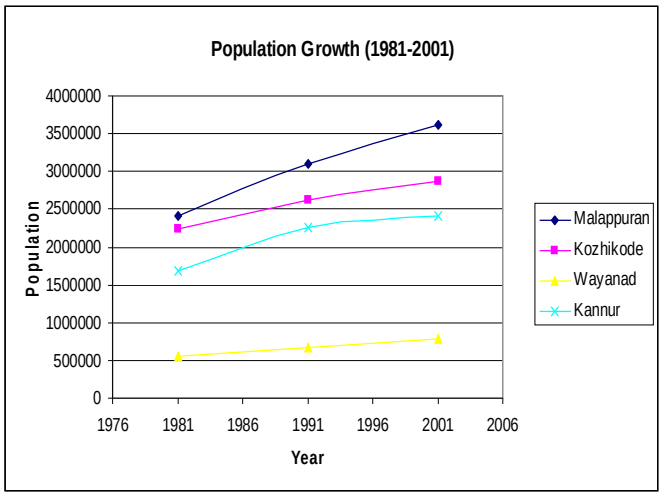


Fig 4.4 Population Growth-Comparison with Surrounding Districts

LSG wise population growth rate for year 1991-2001 is shown in the figure 4.3. Kalpatta, Edavaka, Vythiri and Vengapally show higher growth rates. The value growth rate is more than 20% for these LSGs. Mullankolly situate at the last place. Pozhuthana and poothadi also shows very small growth rates.

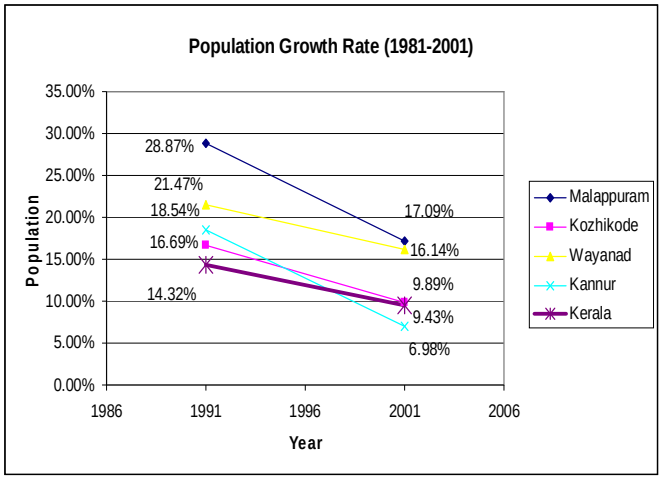


Fig 4.5 Population Growth Rate - Comparison with Surrounding Districts and State

4.3 POPULATION DENSITY

In the 1901 census, the population density of Wayanad area was 35 persons per Sq Km. it reaches above 100 in 1961 and in 2001 it raises above 650 in few panchayats and in Kalpetta Municipality. Population density of Wayanad is 366 persons/SqKm. The distribution of population density is shown in fig 4.6.

Wayanad is a district almost surrounded by forest. Hence the population concentration pattern of the district shows unique character compared to other districts in the state. Population is highly concentrated at the centre portion of district (Shown in the red circle in the fig4.6 below). The density shows gradual decrease from centre to edges. From the figure, it can be seen that population density of most of the boundary panchayats are less than 400 persons per Sq.Km. One exception is Nenmeni panchayat, mainly due to the lack of vast forest area. This peculiar nature of population concentration pattern (minimum at boundary area and maximum at central area as shown in figure 4.7 and 4.8) limited the developments towards the edges of the district, and this nature has to be continued in future planning for the protection of reserve forest and the natural resources of Wayanad district. Local body wise population density is given in table 4.2 and figure 4.9.

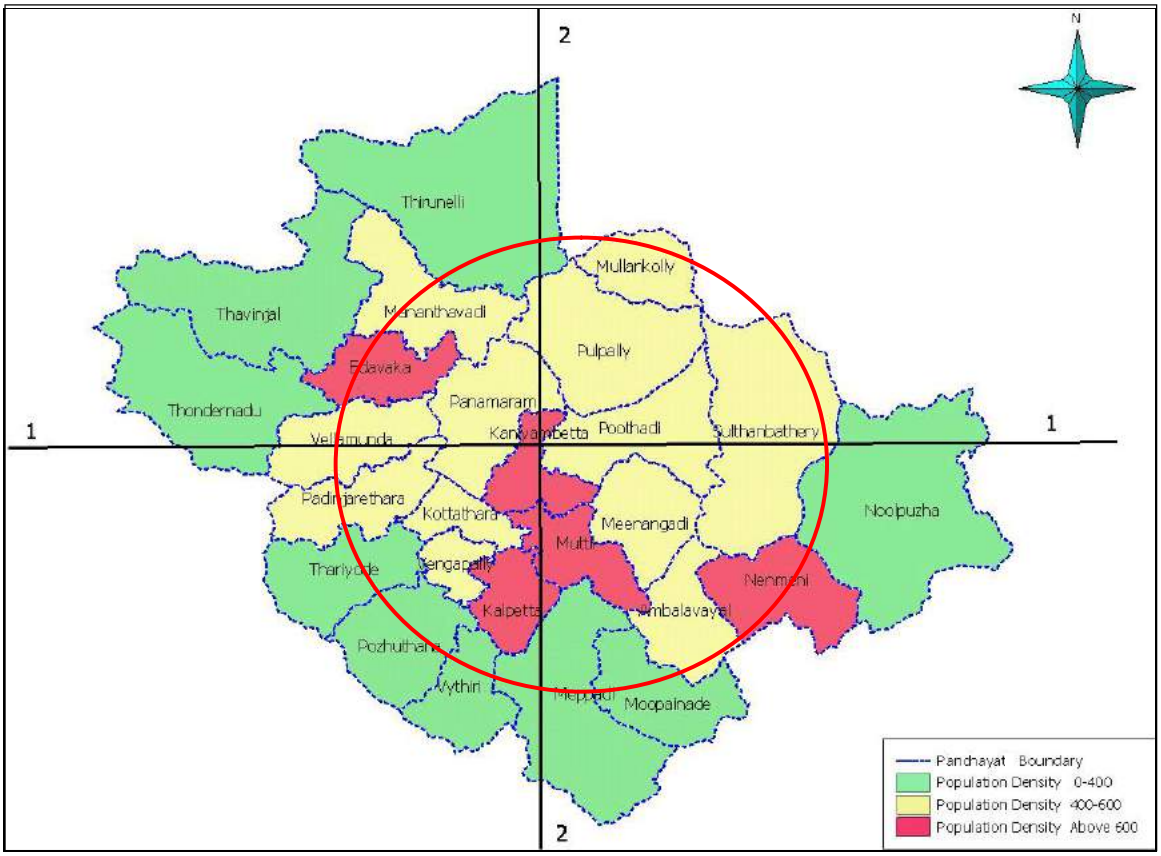


Fig 4.6 Population Density Map.

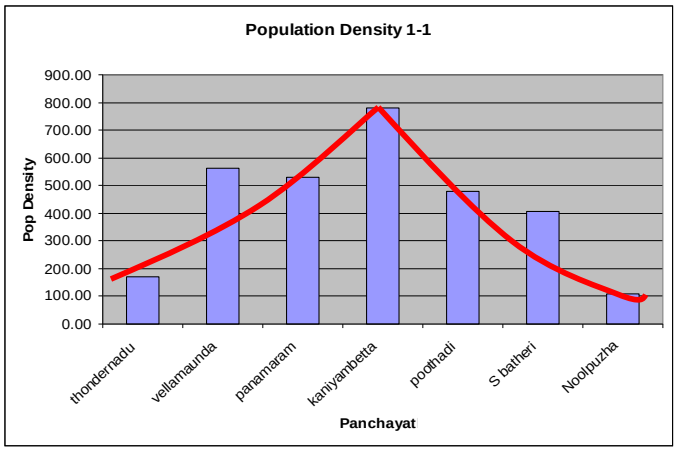


Fig 4.7Population density along 1-1.

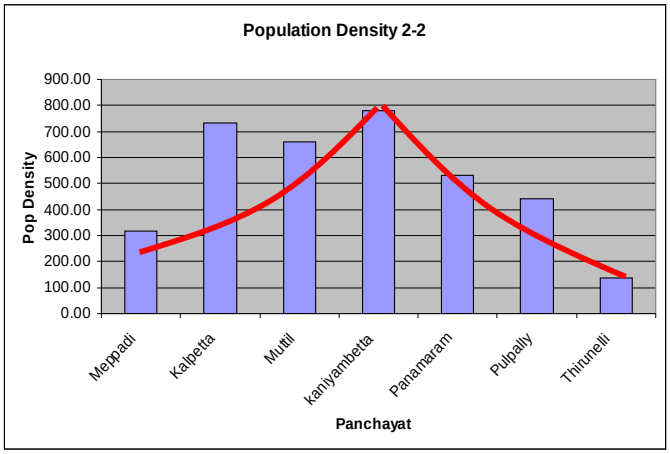


Fig 4.8 Population density along 2-2

Table 4.2 Local Government wise Population density (2001)

No	Local Body Name	Population density-2001 (Persons/ SqKm)
1	Kalpetta muncipality	732
2	Ambalavayal	566
3	Edavaka	660
4	Kaniyampetta	781
5	Kottathara	524
6	Mananthavady	568
7	Meenangadi	599
8	Meppady	316
9	Mullankolly	412
10	Muppainad	331
11	Muttil	659
12	Nenmeni	636
13	Noolpuzha	108
14	Padinharathara	450
15	Panamaram	531
16	Poothady	479
17	Pozhuthana	244
18	Pulpally	441
19	Sulthan Bathery	407
20	Thariyode	166
21	Thavinchal	272
22	Thirunelly	136
23	Thondarnad	171
24	Vellamunda	564
25	Vengappally	523
26	Vythiri	372

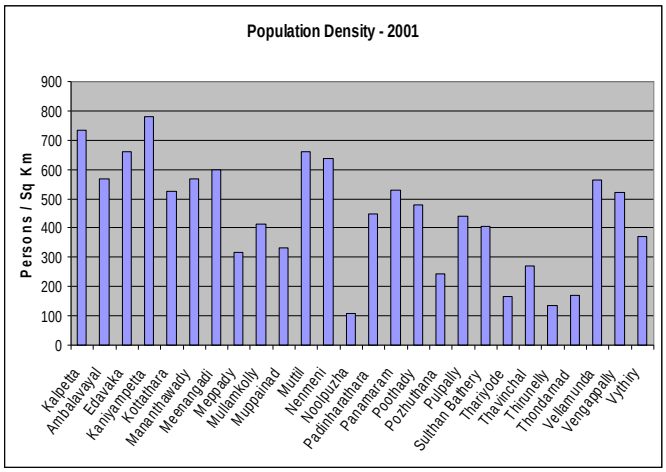


Fig 4.9 Local government wise Population Density (2001).

Population Density - Rural Urban composition

The population density at rural area is 359 persons per SqKm where as that at urban area is 732

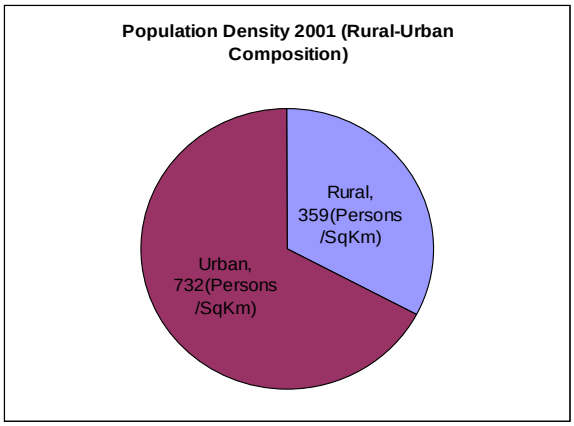


Fig 4.10 Population density – Rural Urban Composition

persons per SqKm. The rural urban composition of population density is given in figure 4.10. The variation of population density of Wayanad district for the last three decades is given in the figure 4.11.

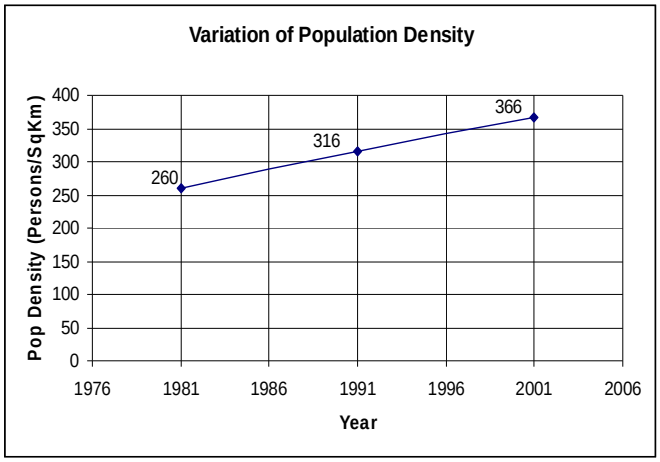


Fig 4.11 Variation of population density (1981 – 2001)

4.4 SEX RATIO

Sex ratio is the number of females per 1000 male. Females outnumber males in all censuses in Kerala from 1901. The topographical and geophysical characters of Wayanad district is widely differ from general trend in Kerala. Sex ratio is also not exempted from this. At Wayanad, sex ratio is in favour of males in all previous censuses. Sex ratio of all districts in Kerala state according to 2001 census are given in table 4.3 and local body wise sex ratio of Wayanad district is given in table 4.4. Highest sex ratio is at Pozhuthana panchayat. Thirunelli and Vengapalli grama panchayats also have higher sex ratio. Mullankolli grama panchayat shows lowest sex ratio in the district. Edavaka, Panamaram and Noolpuzha grama panchayats are also having lower sex ratios.

Table 4.3 Sex ratio – Kerala state (2001)

Rank in 2001	District	Sex-Ratio (Number of Females per 1000 Males)		Rank in 1991
		2001	1991	
1	Pathanamthitta	1094	1062	2
2	Thrissur	1092	1085	1
3	Kannur	1090	1049	6
4	Alappuzha	1079	1051	5
5	Kollam	1070	1035	8
6	Palakkad	1068	1061	3
7	Malappuram	1063	1053	4
8	Thiruvananthapura	1058	1036	7
9	Kozhikode	1058	1027	9
10	Kasaragod	1047	1026	10
11	Kottayam	1025	1003	11
12	Ernakulam	1017	1000	12
13	Wayanad	995	966	14
14	Idukki	993	975	13

Source: Census Data 2001

Table 4.4 Local Government wise Sex ratio (2001)

No	Name of Local Body	Sex ratio
1	Kalpetta	994
2	Ambalavayal	1007
3	Edavaka	965
4	Kaniyampetta	1000
5	Kottathara	1011
6	Mananthawady	990
7	Meenangadi	982
8	Meppady	1011
9	Mullankolly	945
10	Muppainad	1019
11	Muttil	1010
12	Nenmeni	1020
13	Noolpuzha	974
14	Padinharathara	1015
15	Panamaram	972
16	Poothady	994
17	Pozhuthana	1046
18	Pulpally	968
19	Sulthan Bathery	986
20	Thariyode	996
21	Thavinchal	999
22	Thirunelly	1026
23	Thondarnad	984
24	Vellamunda	983
25	Vengappally	1031
26	Vythiri	1017

Source: Census Data 2001

4.5 POPULATION CONCENTRATION PATTERN

Population of Wayanad district is mainly concentrated at its central grama panchayats. The concentration of population in the boundary grama panchayats are very less, mainly because of the forest and plantation land use domination. The population concentration pattern of Wayanad district is shown in figure 4.12.

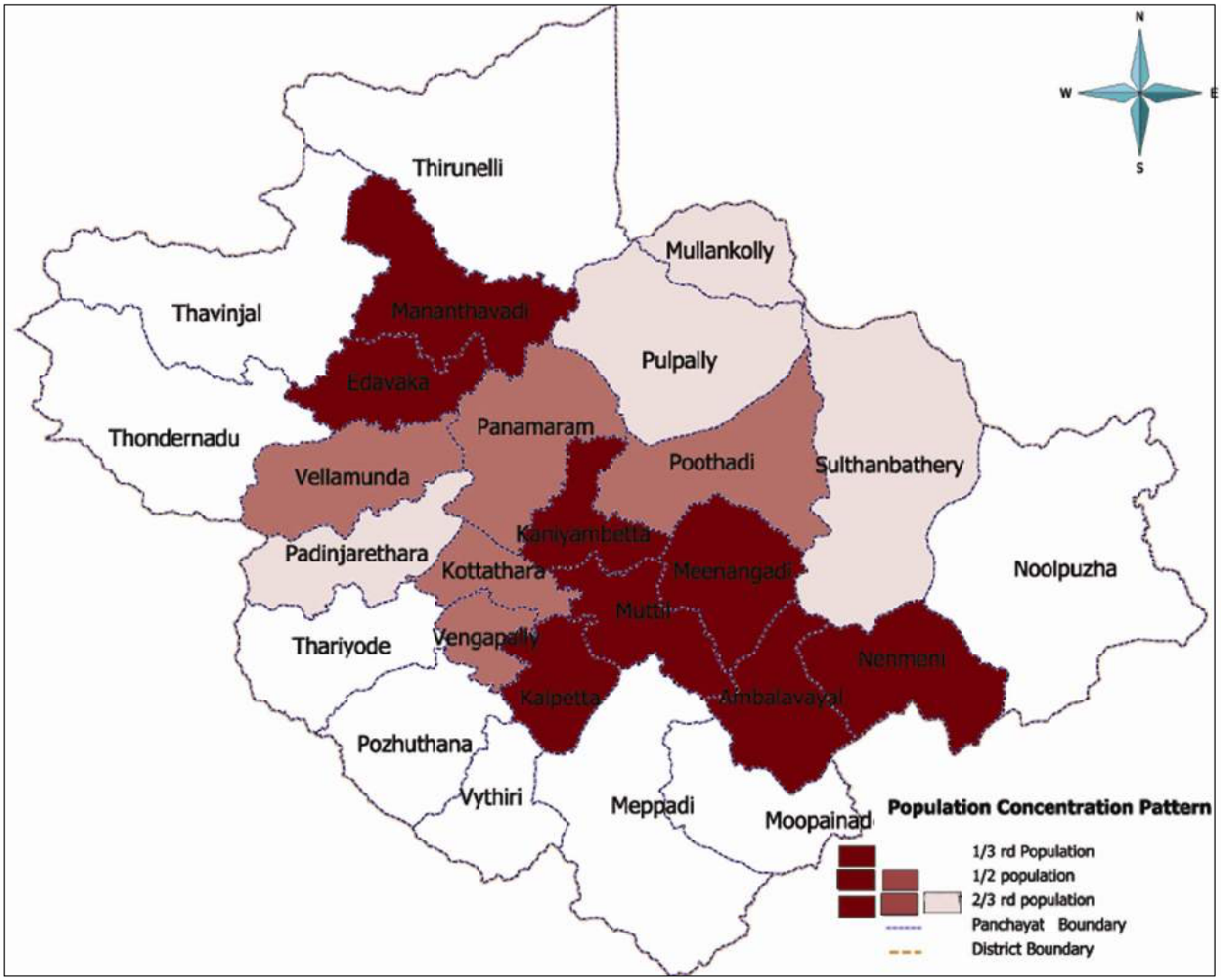


Fig 4.12 Population Concentration Pattern

Eight LSGs constitute one third population of this district. Out of this 8, six are located at south east area. Two third population of this district scattered in 17 LSGs. The remaining 9 LSGs constitute only one third population. All the LSGs coming under last one third concentration group are boarder grama panchayats. This is mainly due to the high forest land use concentration in these boundary grama panchayats.

4.6 MIGRATION DETAILS

One important facet of study on population is the study of migration arising out of various social, cultural, economic or political reasons. For a large country like India, the complexity of movement of population in different parts of the country helps in understanding the dynamics of the society. At this crucial juncture in economic development in our

Table 4.5 Migration details of Kerala state

Sl No	District	Return Emigrants	Emigrants	Non Resident Keralites	Out Migrants
1	Thiruvananthapuram	161441	189361	88918	46909
2	Kollam	85236	146892	73556	73225
3	Pathanamthitta	25534	53936	87764	100905
4	Alapuzha	60630	114020	72462	99073
5	Kottayam	28571	75610	118921	33606
6	Idukki	8436	1989	60771	6702
7	Ernakulam	61063	142785	105522	81108
8	Thrissur	104391	170308	150770	80582
9	Palakkad	51521	89655	126970	100130
10	Malappuram	143419	336251	15991	27205
11	Kozhikode	56845	158430	40544	41761
12	Wayanad	9127	15409	41866	6403
13	Kannur	53957	254453	56220	115349
14	Kasaragod	36132	98803	11781	57469
	Kerala	**886303**	**1847902**	**1052056**	**870427**

Source Kerala Migration Survey 2007

country, study on migration assumes special importance.

A person is considered as migrant by place of birth if the place in which he is enumerated during the census is other than his place of birth. As a person could have migrated a number of times during his lifetime, migration by place of birth would not give a correct picture of the migration taking place currently. A person, on the other hand, is considered as migrant by place of last residence, if the place in which he is enumerated during the census is other than his place of immediate last residence. By capturing the latest of the migrations in cases where persons have migrated more than once, this concept would give a better picture of current migration scenario. At the time of enumeration in census, a person could have moved from another village or town in the same district, or from another district of the state, or another state in India or even from another country. Census provides migration data on all these migration streams by both the concepts to understand the dynamics in the movement of population and the broad reasons behind.

It is seen from census 2001 data that, out of the 97.5 million internal migrants in the country, 53.3 million (54.7 %) moved within rural areas. About 20.6 million persons (21.1% of the total migrants) moved from rural areas to urban areas during the last decade. On the other hand, 6.2 million persons (6.4%) moved from urban areas to rural areas. The number of migrants who moved from one town to another during the last decade is 14.4 million, i.e., about 14.7 per cent of the total migrants. In case of about 3 per cent of the migrants the rural-urban status of the place from which they moved could not be determined.

According to kerala migration survey 2007, total emigrants to Wayanad is 15409 and total return emigrants is 9127. Total out migrants from Wayanad district is 6403 persons (0.74% of State average). Wayanad is the district with least number of outmigrants in Kerala state. But when looking the number of emigrants, District stands at 13th place. The number of non resident Keralites in Wayanad district is 41866 persons.

4.7 POPULATION PROJECTION (TREND BASED)

The Population parameter serves as the base in all the development endeavors. One of the objectives of all sorts of planning is providing maximum good for the maximum number of people. Estimate of future population are therefore required by planners to analyze the magnified image of the consequences and current trends and differentials. This chapter includes the projection of District population for 2021. Different methods for population projection are Arithmetic Increase method, Geometrical Increase method, Incremental increase method, Decreasing Rate Method, Graphical Methods, Logistical curve method, and Apportionment method.

From the above list of projections, it can be seen that the most suitable methods of population projection for Wayanad district is decreasing rate method. While considering the present condition of the district, there is no extra ordinary change in death rate, birth rate and

migration rate. Hence the Apportionment method is also suitable for Wayanad district. For the current analysis, Decreasing rate method and Apportionment method are considered and the average of those two is taken as the future population of Wayanad district for further analysis.

Decreasing rate method

The population growth rate of 2011 & 2021 are calculated assuming that the same percentage of decrease in population growth prevails as that of 2001 for the succeeding two decades. Based on the population growth rate calculated, the population of the District is projected for 2011 and 2021 and the same is shown in table 4.6.

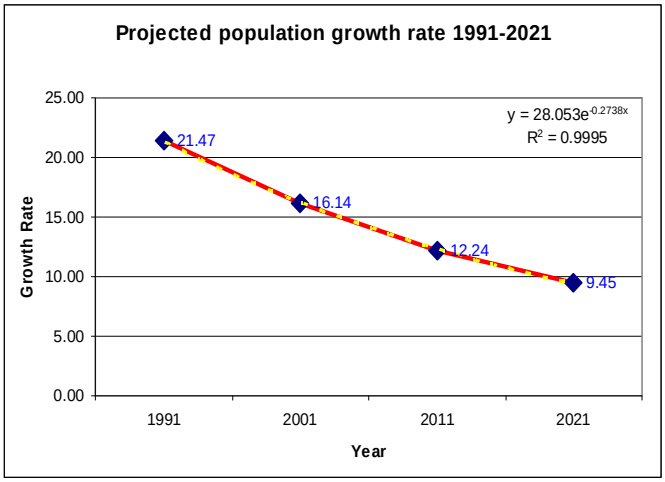


Fig 4.13 Population projection (1991-2021)

Table 4.6 Projected District Population – Decreasing rate method

Year	Population	Growth rate	Percentage Decrease in Growth rate
1981	553348		
1991	672128	21.47	
2001	780619	16.14	24.80
2011	875369	12.24	24.80
2021	955265	9.45	24.80

Apportionment method:

In the apportionment method the ratio of the District population to the State population has been found out and the same is projected to the next two decades assuming the change in the ratio during 2001 - 2011 and 2011-2021 is same the value as that during 1991-2001.In order to find out the projected population in 2011 and 2021, the projected population of the State during the same years are needed. The projected population of the District based on the apportionment method is shown in table 4.7

Table 4.7 Projected District Population – Apportionment method

Year	Kerala State Population	Wayanad Population	Ratio of District Pop to State Pop	Change in ratio
	X	y	y/x	
1971	21347375			
1981	25453680	553348	0.0217	
1991	29098518	672128	0.0231	0.00136
2001	31841374	780619	0.0245	0.00142
2011	33817196	876994	0.0259	0.00142
2021	35198589	962713	0.0274	0.00142

The projected total population by the two methods differs slightly. The average of these two is taken as the population for further analysis. This is shown in table 4.8

Table 4.8 Final Projected Population figures of the District

Year	Total population as per decrease rate method	Total population as per apportionment method	Average population figures
2011	875369	876994	876181
2021	955265	962713	958989

So it can be concluded that the total population of Wayanad District will be 876181 and 958989 on 2011 and 2021 respectively.

4.8 INFERENCE

Population in this border world of greener part of Kerala is basically agrarian with the majority of the working population of the district is involved with

agriculture, either as cultivators or agriculture labourers. Census of India 2001 reveals that 47.3 % of the total work force of the district is involved with agriculture while the figure for Kerala is 22.8%. The population density of the District, 366 persons per sq.km, is very much lesser than the state average (819 persons per sq.km). From above analysis, it is revealed that population is mainly concentrated at the central area of the district. Border areas of the district are highly concentrated with forest area and hence population concentration is very less. At these areas density is less than 200 persons per Sq km.

Chapter –5
OCCUPATIONAL STRUCTURE

5.1 WORK FORCE OF THE DISTRICT

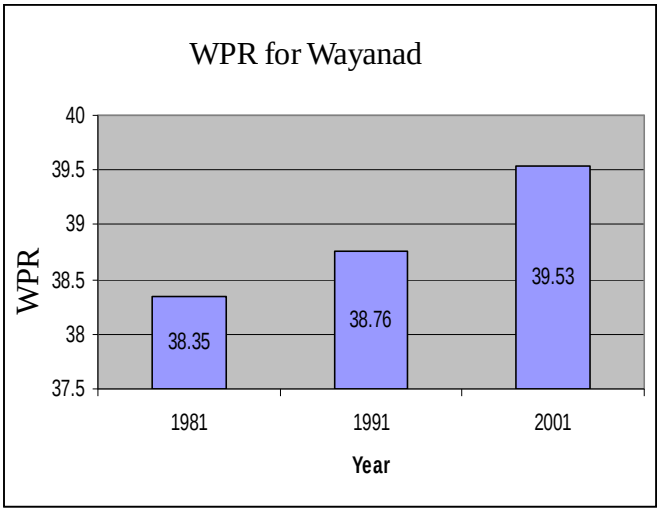
The work force participation ratio of Wayanad district is more than the state average. As per 2001 census, the WPR of Kerala state is 35.93, where as that of the district is 39.53%. There is no significant variation in WPR among the blocks. It can note from the figure 5.1 that, the WPR of Wayanad district shows gradual increase in each decades.

The graph of total and main workers (Fig 5.2) shows that, though the total workers are gradually increasing over last three decades (from 1981 to 2001), the number of main workers shows decreasing trend in between 1991 and 2001 indicating a dim picture about the current economic base of the District. Even though the number of the total workers of the district show increase in figures during 1991-2001, the growth rate of the workers during this period (growth rate is 6.7%) is below the growth rate of the total population (Growth rate of total population is 7.38%) of the same period. This indicates that the opportunity of working is not increasing in proportion to the growth of population. This may be due to the shrinking economic base of the district.

Table 5.1 Work force participation

Year	Population	No. of workers	Main workers	WPR
1981	553348	212186	185894	38.35
1991	672128	260514	227453	38.76
2001	780619	308613	219789	39.53

Source: Census Data 2001



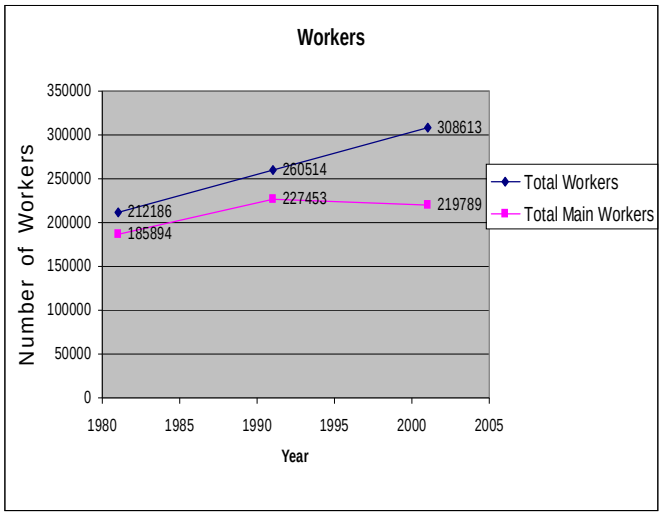


Fig 5.2 Total and main workers (1981-2001)

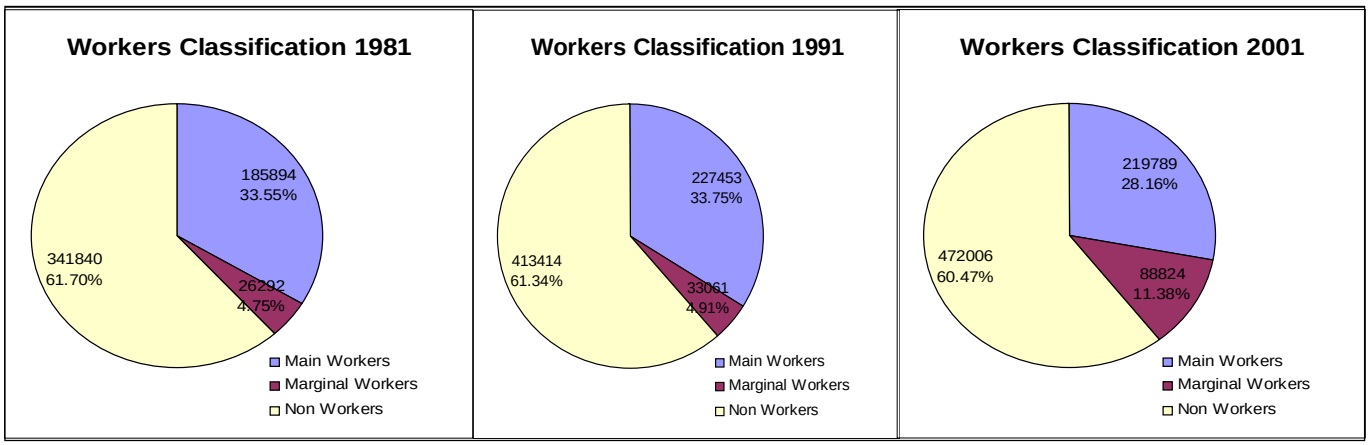


Fig 5.3 Number of Workers (1981-2001)

Table 5.2 Number of workers from 1981 – 2001

Workers Classification	1981	1991	2001
Main Workers	185894	227453	219789
Marginal Workers	26292	33061	88824
Non Workers	341840	413414	472006

Source: Census Data 2001

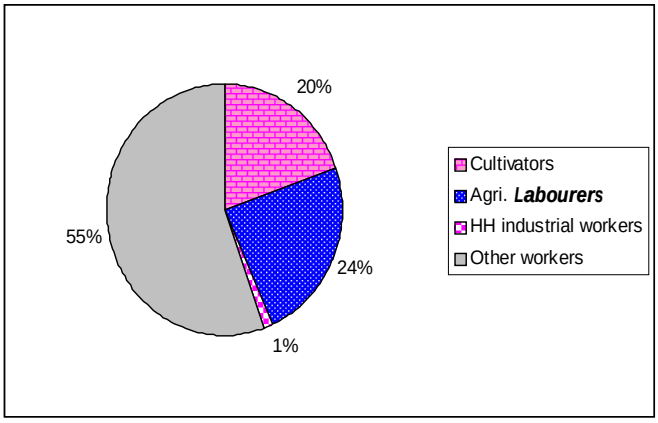


Fig 5.4 Occupational structure (2001)

5.2 OCCUPATIONAL STRUCTURE

As per the census 2001, the main workers are classified in to four categories viz. cultivators, agricultural labourers, household industrial workers and other workers. The other workers category mainly includes the primary sector workers like workers engaged in mining, animal husbandry and plantation workers.

Table 5.3 Workers Classifications (Four Fold)- District

Cultivators	Agri. labourers	HH industrial workers	Other workers
43186	52076	2557	121970

The cultivators and agricultural labourers constitute 44 % of the total main workers whereas major share of the main workers (55%) belongs to the other workers category (See fig 5.4). As mentioned earlier other workers category will include some of the primary workers like plantation workers, workers engaged in mining and animal husbandry.

5.3 OCCUPATIONAL STRUCTURE - VARIATION IN URBAN AND RURAL AREA

The table 5.3 shows the four-fold category of workers in the urban and rural area of the District. The same values are depicted in pie in figure 5.4

Fig 5.5 shows that the cultivators and agricultural

Table 5.4 Workers Classification – Urban and Rural area

	Cultivators	Agricultural labourers	HH industrial workers	Other workers	Total
Urban	2793	341	159	8785	12078
Rural	40393	51735	2398	113185	207711

Table 5.5 Variation of the number of different category of workers

Year	Cultivators	Agricultural labourors	HH industrial workers	Other workers
1981	39502	73262	1963	71167
1991	40729	74813	1084	111911
2001	43186	52076	2557	121970

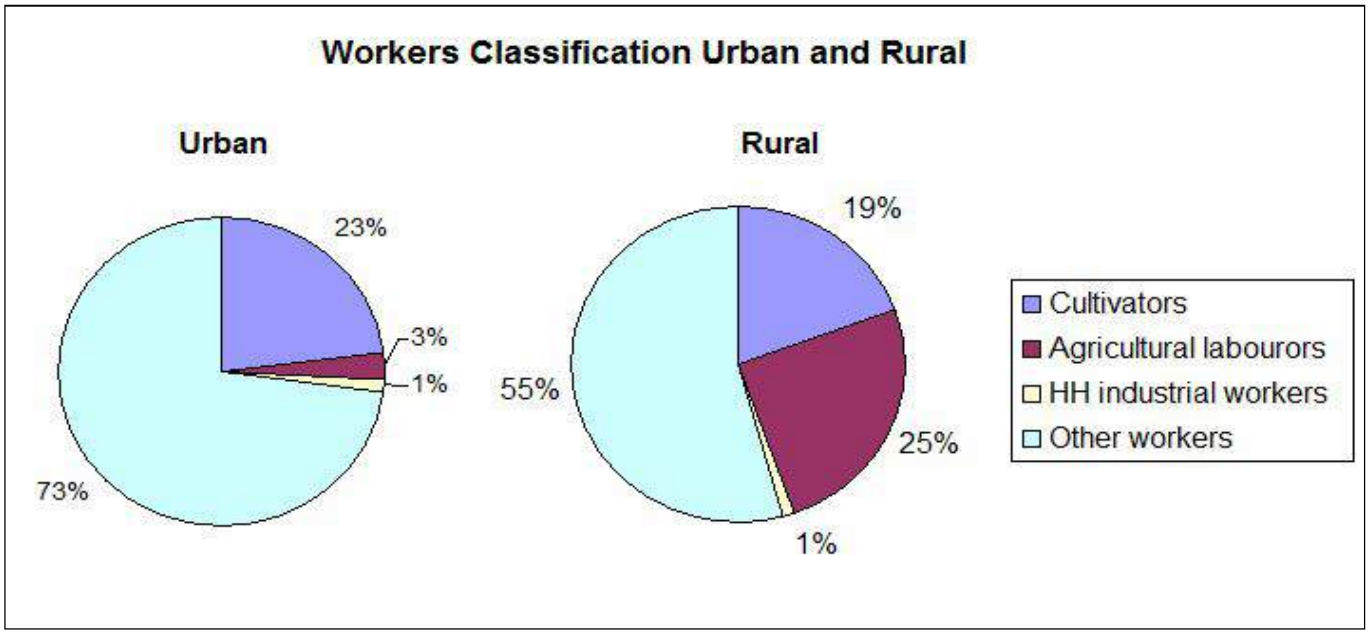


Fig 5.5 Occupational structure: Urban V/s Rural (2001)

labourers share are 26% and 44% in urban area and rural area respectively. The household industrial workers share is the same at 1% in both the urban and rural areas. This indicates that as far as the workers classification is considered, all most all the workers (73%) in urban area depends on the tertiary sector for their lively hood. Household industrial sector share in both urban and rural area is a very low of 2% of the total main workers.

5.4 OCCUPATIONAL STRUCTURE – TEMPORAL VARIATION

The fig 5.6 and table 5.5 shows the variation of the number of different category of workers in the urban area from 1981 to 2001. There is significant increase in the category of other workers during this period; meanwhile the category of workers in agricultural labourers is in the decline during the same period.

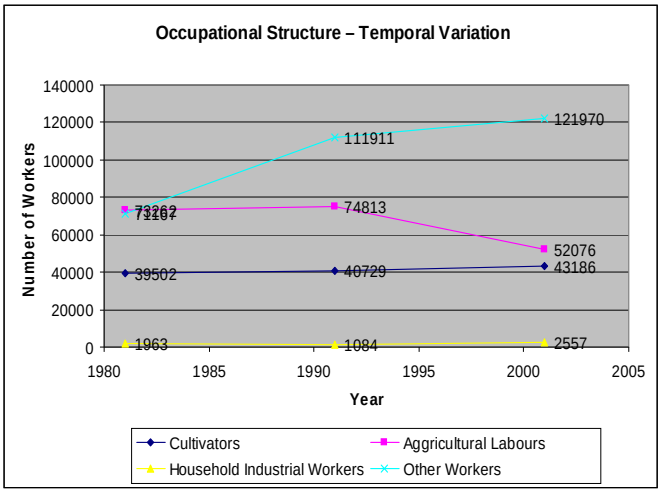


Fig 5.6 Occupational structure: Temporal variation

5.5 OCCUPATIONAL STRUCTURE – ESTIMATION OF NINE FOLD CLASSIFICATION OF 2001

Table 5.6 Nine fold classification of workers

Block Panchayat/ Municipality Name	LSG name	9 fold classification of workers as per 2001 census								
		Cultivators	Agr lbrs	Livestock, Forestry, Fishing, Hunting, Plantation, Orchards, and allied activites	Mining and Quarring	Manufacturing, Processing Serviciing and repairs in Household industries	Manufacturing, Processing, servicing and repairs in other than household industries	Trade and commerce	Transport , storage and Communic-ations	Other Services
Kalpetta muncipality		208	341	4404	213	120	793	2502	827	2669
Mananthavadi	Mananthavady	2582	3422	1741	161	296	1302	3440	1210	3976
	Vellamunda	1964	2724	2410	71	74	477	2157	468	2383
	Thirunelly	801	1832	5420	197	188	372	1346	529	1649
	Thondarnad	1781	1365	1856	32	107	511	978	325	1502
	Edavaka	2331	2368	1719	37	75	655	2100	546	2568
	Thavinchal	3485	2759	3239	11	120	1352	1454	513	1939
Sulthan Batheri	Meenangadi	1746	1921	4388	33	125	710	1733	532	2129
	Nenmeni	2616	3358	6821	87	45	547	1252	584	1921
	Ambalavayal	2126	3089	3826	687	43	407	1121	497	2184
	Sulthan Bathery	1482	2233	3013	32	232	1108	3139	1093	3406
	Noolpuzha	1935	2684	3287	27	14	408	898	474	1493
Kalpetta	Kottathara	1413	1438	1458	12	28	531	659	165	865
	Vengappally	435	762	1634	10	30	136	548	185	780
	Vythiry	148	107	3737	22	0	385	713	323	1503
	Muttil	1291	1659	2617	323	69	830	1705	632	2378
	Pozhuthana	211	334	4783	6	0	248	326	143	762
	Thariyode	506	628	364	206	99	240	703	300	1453
	Padinharathara	1189	1346	2276	42	97	615	1157	341	1866
	Meppady	985	862	9849	34	24	866	1119	429	1886
	Muppainad	527	763	5512	20	15	493	637	243	1073
Panamaram	Panamaram	2854	3286	2611	51	552	737	2923	778	3087
	Poothady	2544	3032	7336	31	96	342	1011	351	1649
	Mullankolly	3294	3530	4279	66	17	111	390	120	465
	Pulpally	3362	4725	4290	27	60	211	787	195	858
	Kaniyampetta	1400	1508	3109	49	87	611	1710	535	1957
Total		**43216**	**52076**	**95979**	**2487**	**2613**	**14998**	**36508**	**12338**	**48401**

5.6 SPATIAL DISTRIBUTION OF THE MAJOR CLASSES OF WORKERS

All local bodies in the district contain all classes of workers. But each local body will have major concentration of any one class of workers. This can be identified by comparing the number of different classes of workers in the LSGs with the total number of workers in that local body. For identifying the major class of worker in the LSGs compared to the District, a measure is created, namely Concentration index.

$$\text{Concentration Index of a particular class of worker in a Local Body} = \frac{\text{(Number of that class of worker in a Local Body) / (Total Number of workers in the Local Body)}}{\text{(Number of that class of worker in the District)/ (Total Number of workers in the District)}}$$

Concentration index (CI) of four classes of workers were analysed in this section. The value of WCI of a particular class of worker, if greater than one, indicates that the class of worker under consideration is relatively more concentrated in that local body, than other local bodies in the district. Concentration Index of different classes of workers is given in the table 5.7.

Cultivators show very high concentration index in Thavinjal, thondernadu, Mullankolli and Kottathara grama panchayats. CI of cultivators is more than one in 13 grama panchayats (Fig 5.7).

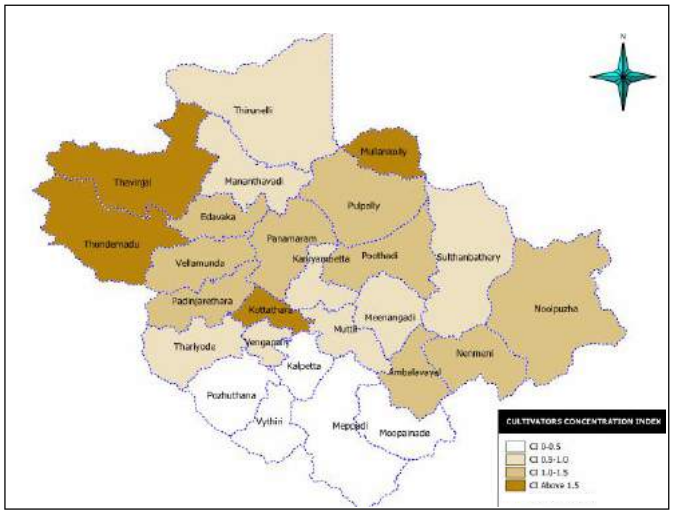


Fig 5.7 Cultivators Concentration Index

Agricultural Labourers show very high concentration index in Mullankolli and Pulpally grama panchayats. CI of cultivators is more than one in 15 grama panchayats(Fig 5.8).

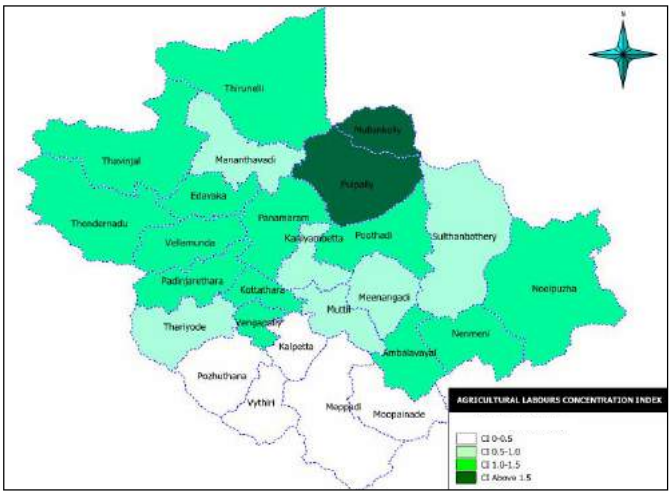


Fig 5.8 Agricultural labourers Concentration Index

Industrial Labourers show very high concentration index in Padinjarethara, Muttil and Sulthan Batheri grama panchayat. CI of Industrial Labourers is more than one in 13 grama panchayats (Fig 5.9).

Other Workers show very high concentration index in Kalpetta Municipality, meppadi, Vythiri and Pozhuthana grama panchayats. The interesting thing is that, all these four local bodies are situated at the eastern end of wayanad district and all these four shares theirs boundaries. CI of Other Workers is more than one in 13 grama panchayats (Fig 5.10).

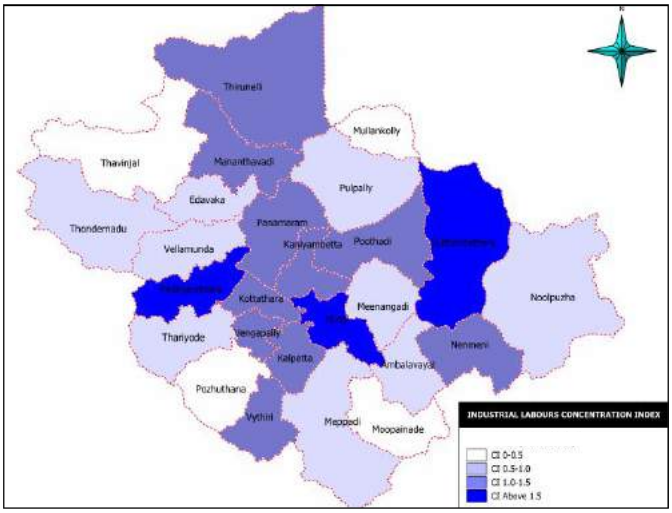


Fig 5.9 Industrial labourers Concentration Index

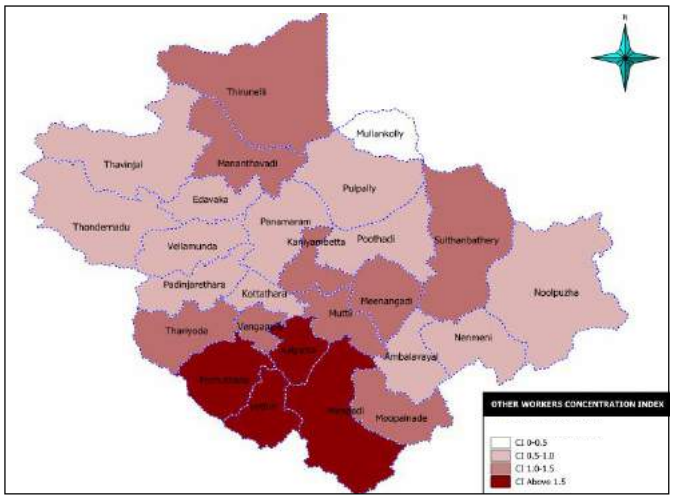


Fig 5.10 Other workers Concentration Index

5.7 ACTIVITY PATTERN BASED ON OCCUPATIONAL STRUCTURE OF WORKERS

The main activity in a local body can be determined with the help of the Workers CI. The value of WCI of a particular worker type, if greater than one, indicates that the work type under consideration is relatively more concentrated in that local body, than other local bodies in the district. Based on the workers concentration index, it can be inferred that, cultivators and agricultural labourers are scattered in most of the grama panchayats, except Kalpetta Municipality, Vythiri, Pozhuthana, Meppadi and Muppainadu. If each grama

Table 5.7 Concentration Index of Workers (WCI)

Sl No	Name of Local Body	Workers Concentration Index			
		Cultivators	Agricultural Labours	Industrial Workers	Other Workers
1	Ambalavayal	1.05	1.27	0.87	0.87
2	Edavaka	1.37	1.16	0.98	0.8
3	Kalpetta(M)	0.11	0.15	1.44	1.67
4	Kaniyambetta	0.96	0.86	1.49	1.07
5	Kottathara	1.52	1.29	1.01	0.69
6	Mananthavady	0.87	0.97	1.18	1.06
7	Meenangadi	0.98	0.9	0.96	1.05
8	Meppadi	0.42	0.31	0.54	1.51
9	Mullankolly	1.83	1.64	0.44	0.44
10	Muttil	0.82	0.88	1.54	1.1
11	Nenmeni	1.03	1.11	1.04	0.94
12	Noolppuzha	1.28	1.48	0.74	0.7
13	Padinharathara	1.09	1.03	1.84	0.94
14	Panamaram	1.25	1.21	1.17	0.82
15	Poothadi	1.26	1.25	1.3	0.79
16	Pozhuthana	0.22	0.3	0.38	1.59
17	Pulppally	1.47	1.72	0.79	0.53
18	Sulthan Bathery	0.75	0.79	1.71	1.16
19	Thariyode	0.85	0.88	0.57	1.11
20	Thavinjal	1.52	1.01	0.43	0.82
21	Thirunelly	0.58	1.1	1.27	1.1
22	Thondernadu	1.56	1	0.62	0.81
23	Vellamunda	1.14	1.32	0.5	0.83
24	Vengappally	0.75	1.1	1.17	1.04
25	Vythiri	0.16	0.1	1.46	1.68
26	Muppainad	0.38	0.45	0.49	1.47

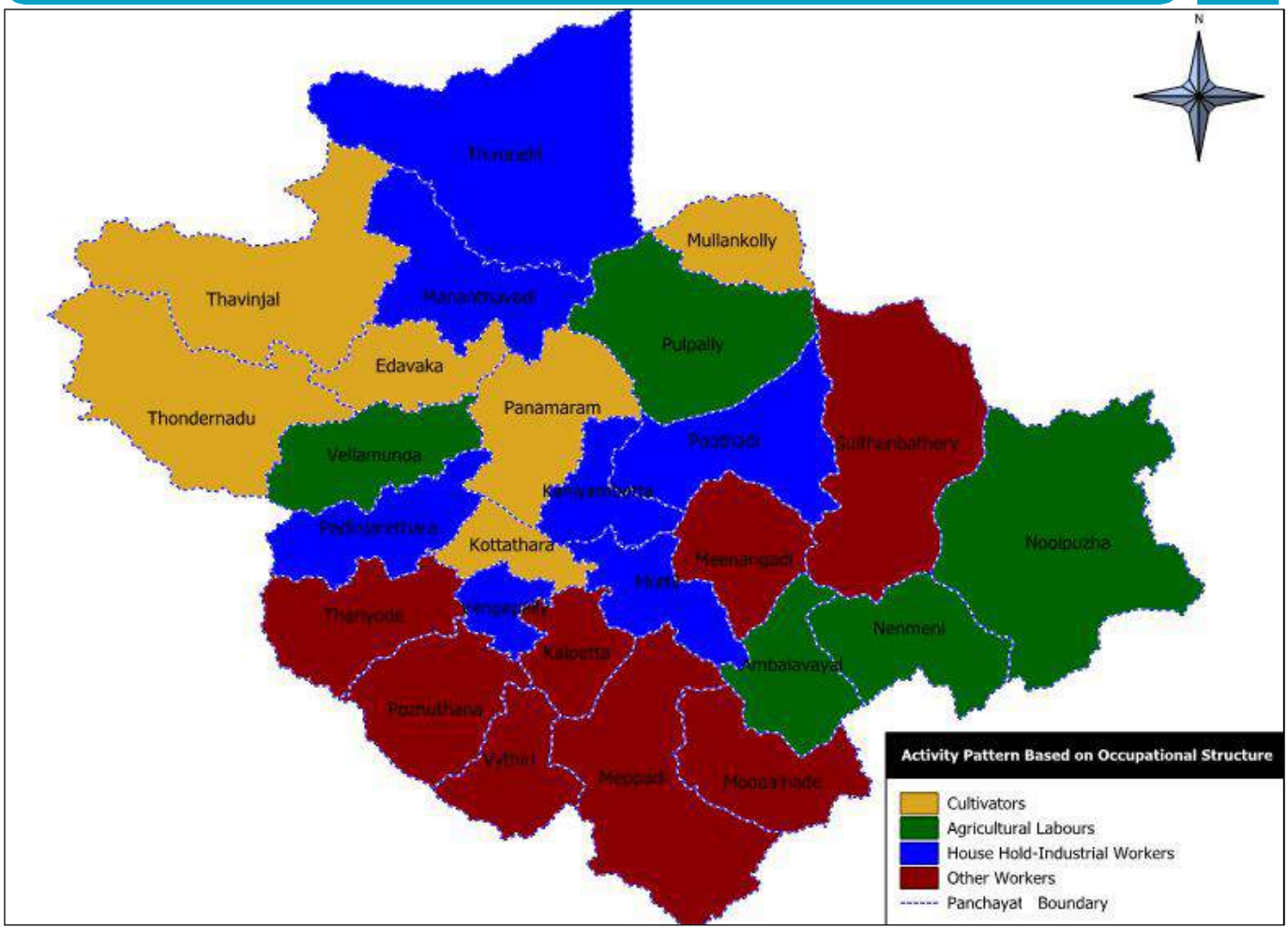


Figure 5.11 Activity pattern based on occupational structure

panchayat shows CI greater than one only for one occupational structure, then it will be possible to group all the grama panchayats in to four classes. But here lot of grama panchayats shows concentration index higher than one for different category of workers. Hence the activity of grama panchayat is taken as the activity for which it got highest concentration index (CI) among four CIs. The activity pattern of grama panchayats derived based on occupational structure is shown in the figure 5.11.

5.8 INFERENCE

The backbone of any economy of a region is the production sector. The analysis of the occupational structure of the District shows a very alarming situation about the economic base of the district. The production sector including the agriculture and plantation sector shows declining trend in the district. One reason for decrease in the number of primary sector workers may be the mechanization in agricultural sector. But still this sector shows frightening decrease. The only sector, which shows growth, is the service sector. More than 50% of the urban population depends on the service sector for their lively hood. It is observed that rural area of the district is also slowly withdrawing from the primary sector and started depending more on the service sector. In this District production sectors are in alarming level, peoples avoided this sector due to this price declining of the hill products, paddy etc., the farmers are becoming poor and poor people are going to poorest. So the back bone of this District in suffering stage, the government and non-governmental agencies should also provide necessary aids and uplift the stage of production sector.

Chapter –6
LAND USE

6.1 LAND USE PATTERN OF KERALA STATE

Kerala is endowed with a combination of distinct altitudinal variations resulting from the rise of the land mass from 5 meters below sea level in the west to the soaring of 2695 meters in the east within the short span of 120 km. The small expanse of land with an area of 38,863 km^2 has a base length of 560 km along the coast and width ranging from 11 km to 124 km. Physiographically, the terrain has three natural regions namely, lowlands, midland, highlands. Geologically, Kerala is occupied by four major rock formations namely, crystalline rocks of Precambrian age, sedimentary rocks of Tertiary confined to Neogene period , laterites capping the crystalline and sedimentary rocks and recent and sub recent sediments forming the low-lying areas and river valleys. The percentage of different land uses in state is shown in the figure 6.1.

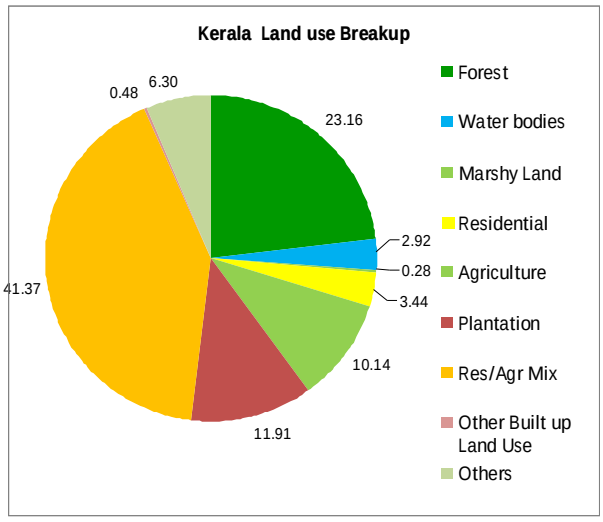


Fig 6.1 Land Use breakup of Kerala State

Wayanad district is coming under the extreme end category of state. Its altitude varies from 700m to 2100m and hence it is completely coming under the highland region.

6.2 LAND USE BREAK UP OF THE DISTRICT

The total area of Wayanad district is 2132 Sq Km. Land use map of Wayanad District shown in figure 6.2.The breakup of land use area of the district to its total area is shown in table 6.1 and figure 6.3. From this it can easily inferred that, the main land use categories in the district are forest and plantation. Figures 6.4, 6.5 and 6.6 shows agricultural, forest and built up land use areas in the district.

Table 6.1 Land Use breakup Wayanad District

Sl No	LAND USE	Area (Sq Km)	Percentage
1	Forest	837.00	39.26
2	Water bodies	11.90	0.56
3	Marshy Land / Kole Land	0.00	0.00
4	Residential	14.90	0.70
5	Agriculture	233.20	10.94
6	Plantation	831.90	39.02
7	Res/Agr Mix	136.20	6.39
8	Other Built up	4.70	0.22
9	Others	62.00	2.91
	Total	**2132.00**	**100.00**

As the district located completely at the highland region, its climate and land use pattern shows significant difference from all other districts of Kerala. Most of the border Grama Panchayats in this district is

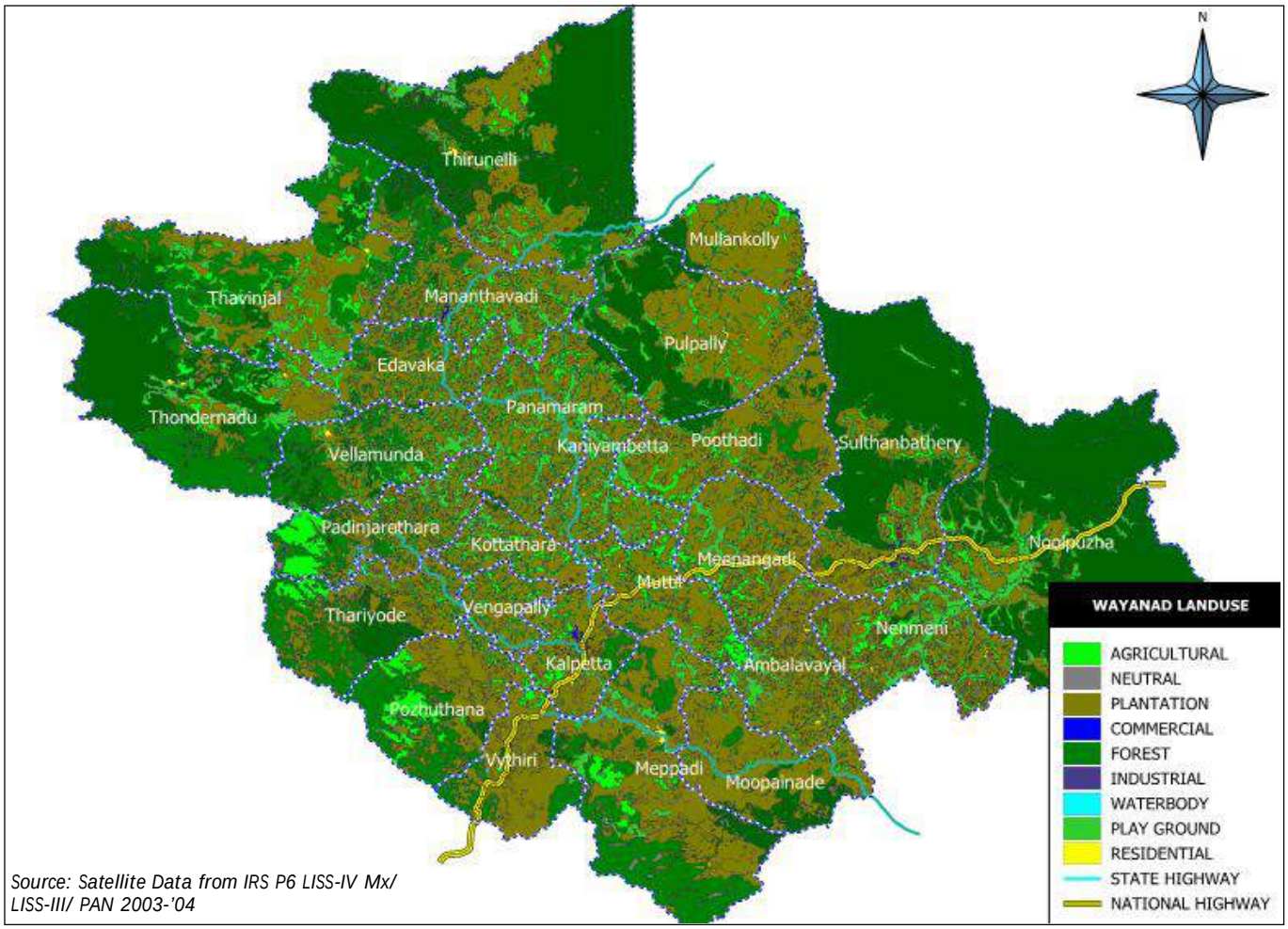


Fig 6.2 Combination of all land uses-Wayanad District

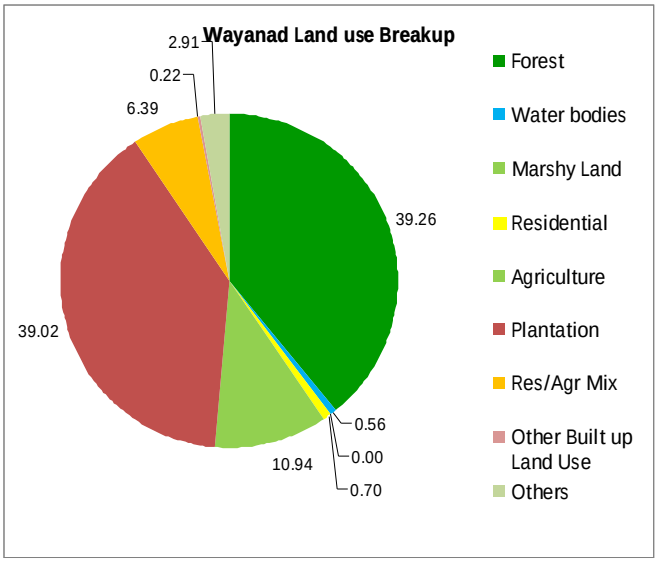
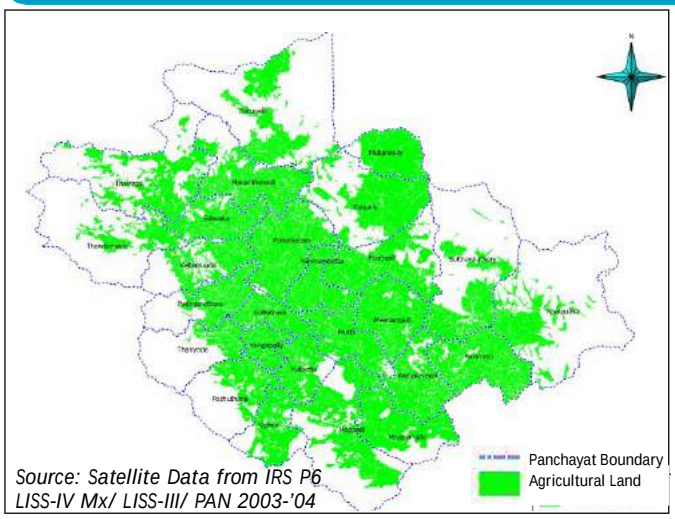


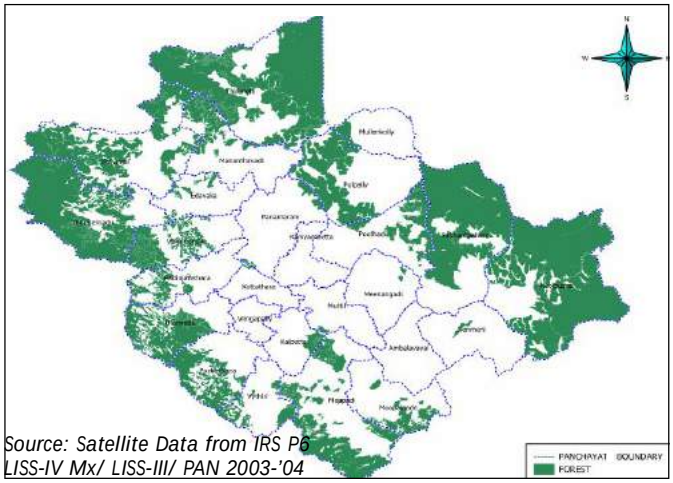
Fig 6.3 Land Use breakup Wayanad District

holding large extent of forest area (Fig 6.5). Lion share of land area other than forest area is used for plantations and agricultural activity (Fig 6.4). All other activities of the district are taking place in the remaining small areas (Fig 6.6). Industrial development is very low and commercial development is ribbon type along the major roads in this district. The major portion of total land area of the district is coming under three major categories, viz forest land (39.26), plantation land (39.02) and agricultural land (10.94). ie, 90 percentage of Wayanad land use is composed of forest and primary activity. It clearly shows that, Wayanad is an agrarian district with large forest area.



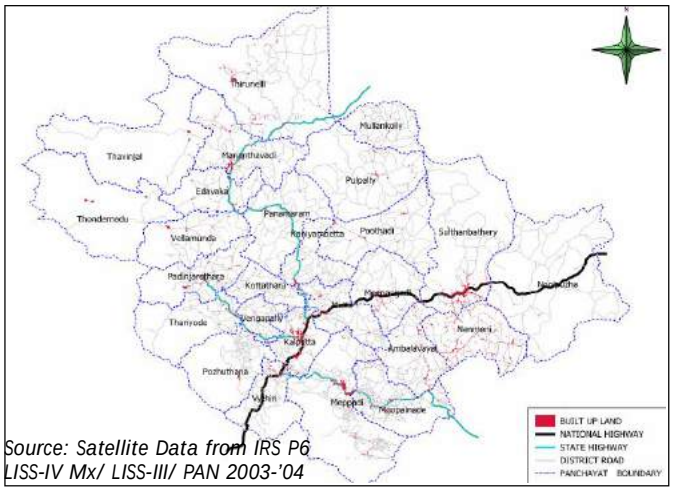
Source: Satellite Data from IRS P6 LISS-IV Mx/ LISS-III/ PAN 2003-'04

Fig 6.4 Agricultural Land use



Source: Satellite Data from IRS P6 LISS-IV Mx/ LISS-III/ PAN 2003-'04

Fig 6.5 Forest Land use



Source: Satellite Data from IRS P6 LISS-IV Mx/ LISS-III/ PAN 2003-'04

Fig 6.6 Built-up Land use

6.3 REGIONAL LAND USE STUDY

Table 6.2 shows the comparison of land use with surrounding Districts of Wayanad. When compared to the land use pattern of near by districts, as expected, Wayanad District shows remarkable variations in the percentage of plantation land use, Residential Agricultural Mix land use and forest land use. Around 80% of Wayanad land use is constituted by forest and plantation, where as in the case of surrounding districts, the combination of these two together coming below 25 percentage only.

Table 6.2 Land use Comparison – Surrounding districts and State

Sl No	LAND USE	Malappuram	Kozhikode	Wayanad	Kannur	Kerala
1	Forest	18.11	18.68	39.26	14.69	23.18
2	Water bodie	1.61	2.54	0.56	2.69	2.92
3	Marshy Land / Kole Land	0.33	0.18	0	0	0.28
4	Residential	0.51	3.42	0.7	7.38	3.45
5	Agriculture	7.10	5.44	10.94	22.44	10.17
6	Plantation	3.89	0.29	39.02	0.03	10.01
7	Res/Agr Mix	60.79	63.98	6.39	44.56	41.38
8	Other Built up	0.56	0.19	0.22	0.02	0.48
9	Others	7.10	5.29	2.91	8.19	8.13
	Total	100	100	100	100	100

Forest Land use

The land use which gives a unique identity to Wayanad from other surrounding districts is forest land use. Unlike other districts, here forest land scattered in most of the grama panchayats. It can be seen from figure 6.5 that, the only local bodies which are not having forest land inside them are Meenangadi grama panchayat, Kaniyambetta grama panchayat and Vengapalli grama panchayat. From the comparison chart (Fig. 6.7), it is clear that, around 40% of Wayanad land is forest, where as other surrounding districts have less than 20% and the state has 23.18%. From chart(Fig. 6.8) it can infer that around 10% of Kerala forest land is contributed by Wayanad district.

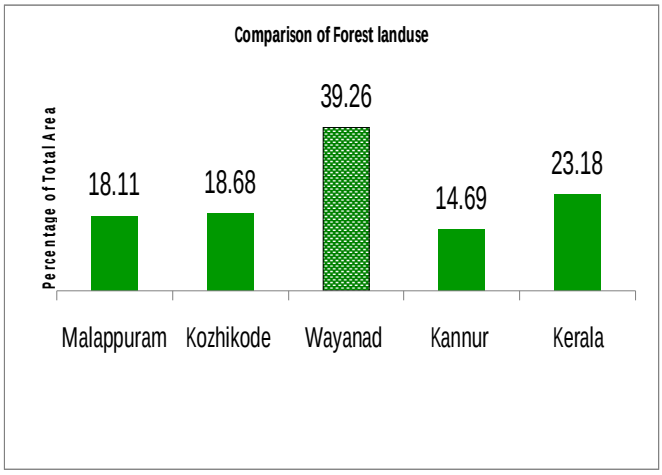


Fig 6.7 Comparison of Forest Land use - Surrounding districts and State

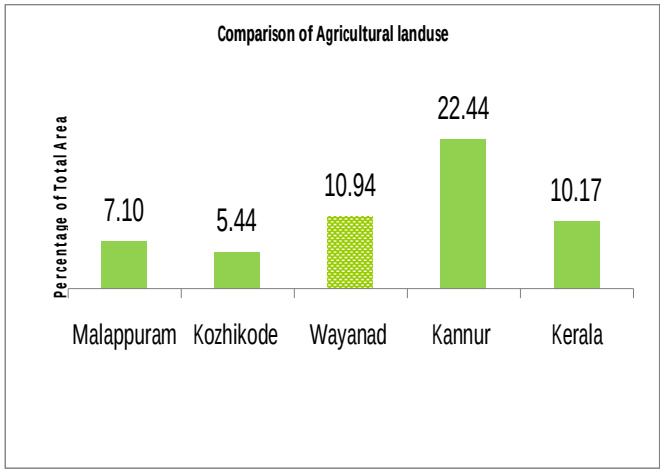


Fig 6.9 Comparison of Agricultural Land use - Surrounding districts and State

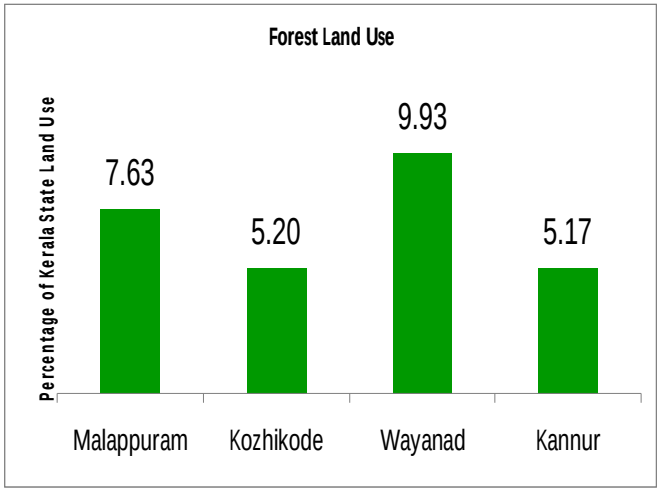


Fig 6.8 Forest Land use – Percentage of Kerala State.

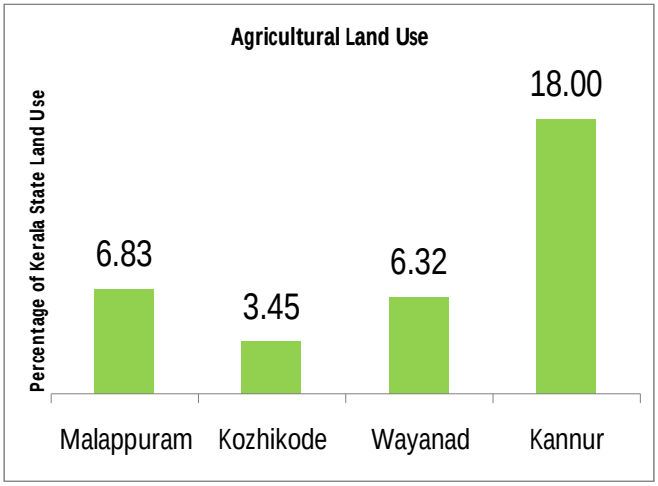


Fig 6.10 Agricultural Land use – Percentage of Kerala State.

Agricultural Land use

Agriculture and plantation are the main pillars of Wayanad economy. When compared to plantation, agricultural land use area is less. It is only 10.94%. But it is almost same as state average. When compared to surrounding districts, Wayanad comes in second place with 6.32%. Kannur district comes in the first place wit 18.00%. Wayanad is account for 6.3% of Kerala agricultural land.

Plantation Land use

Main primary activity in Wayanad is plantation. From the figure 6.11, it can see that, 39.02% of Wayanad land area is plantation land use. Wayanad stands at the first place in plantation land use when compared with surrounding districts. Its plantation land area is very high compared to state average of 10.01%. Around 20.0% of state plantation land use is contributed by Wayanad district.

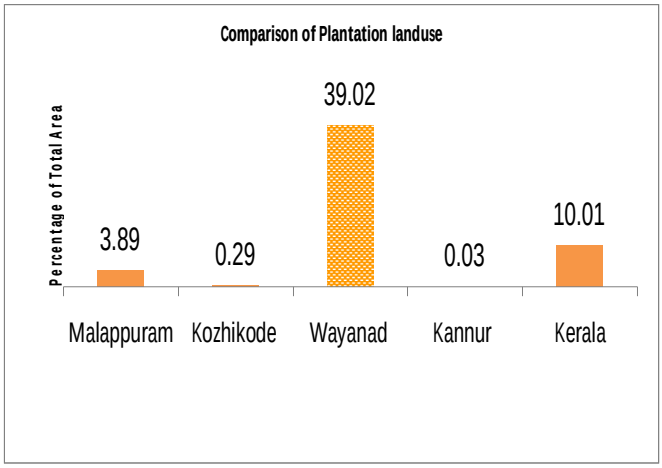


Fig 6.11 Comparison of Plantation Land use - Surrounding districts and State

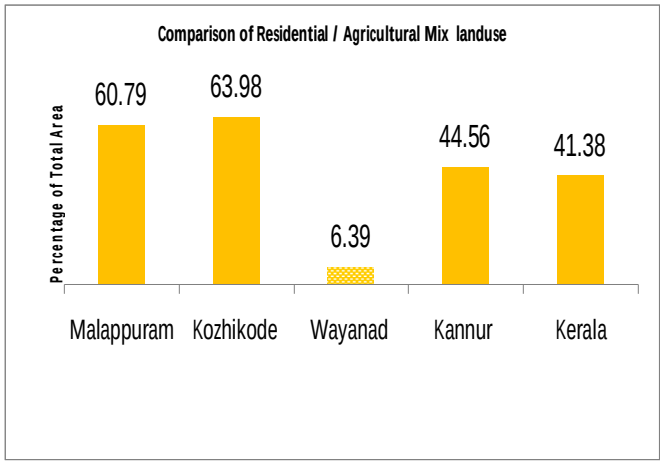


Fig 6.13 Comparison of Residential Agricultural Mix Land use - Surrounding districts and State

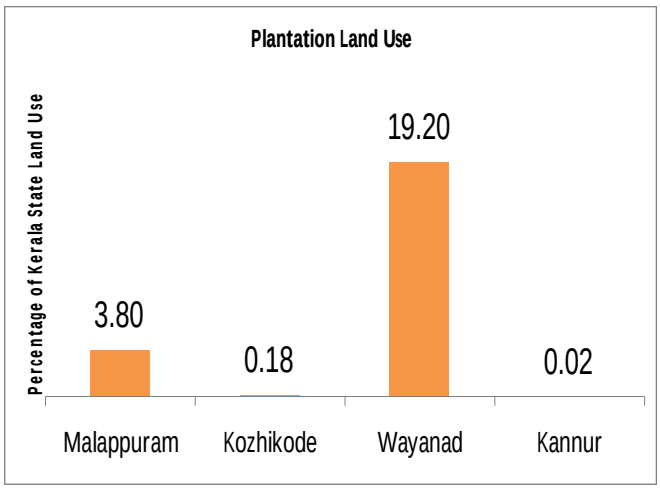


Fig 6.12 Plantation Land use – Percentage of Kerala State.

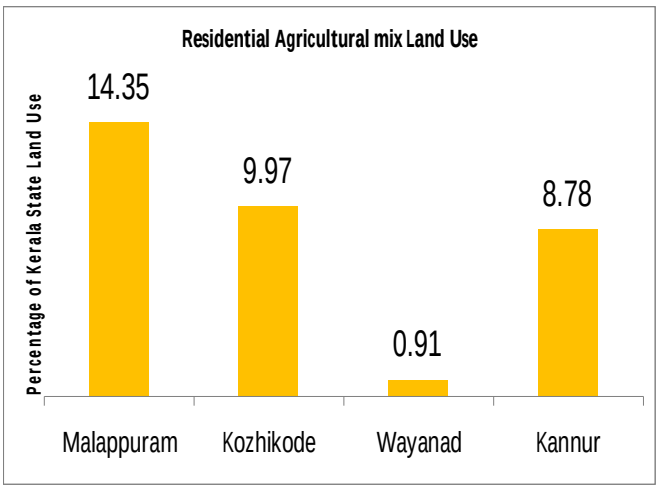


Fig 6.14 Residential Agricultural Mix Land use – Percentage of Kerala State.

Residential Agricultural Mix Land use

Around 42% of Kerala state land use is residential agricultural mix. Wayanad land use is mainly composed of forest and plantation. Hence here percentage of residential agricultural mix land use is very less and is only 6.39%. When comparing with the surrounding districts, Wayanad comes in last place and it only contributing 0.91% of state share. First place is occupied by Kozhikode district with 63.98 percentage. Malappuram and Kannur districts occupies the second and third places respectively.

Residential Land use

Percentage of residential land use area of Wayanad district is 0.70%. It comes in third place when comparing with surrounding districts. 1.19% of Kerala residential land use is in Wayanad district. Lots of peoples in wayanad are holders of large extent of land. Their houses will be in that large area, which is surrounded by their agricultural activities. This is one of the main reason of small percentage of residential land use in Wayanad. Less population density is also a main reason.

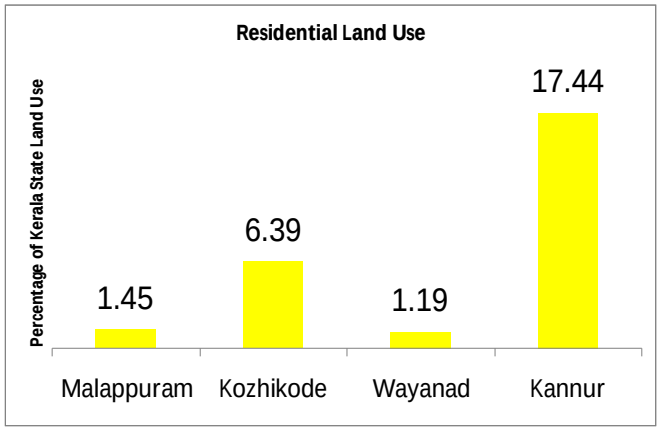


Fig 6.15 Residential Land use – Percentage of Kerala State.

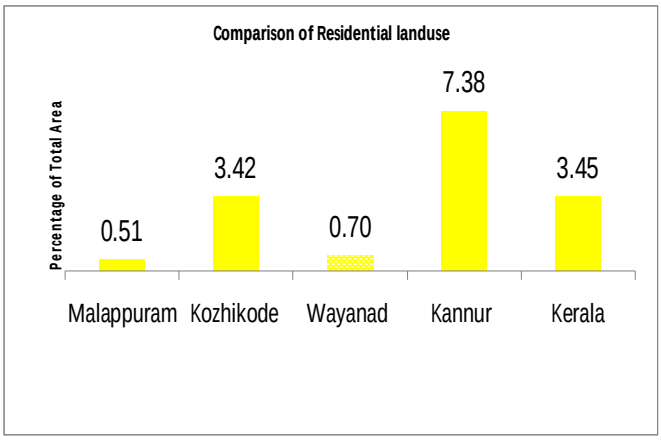


Fig 6.16 Comparison of Residential Land use - Surrounding districts and State

Other Built Up Land use

Average other built up land percentage of Kerala state is 0.48. Wayanad contributes 2.65 percentage of this land use with a district share of 0.22%.

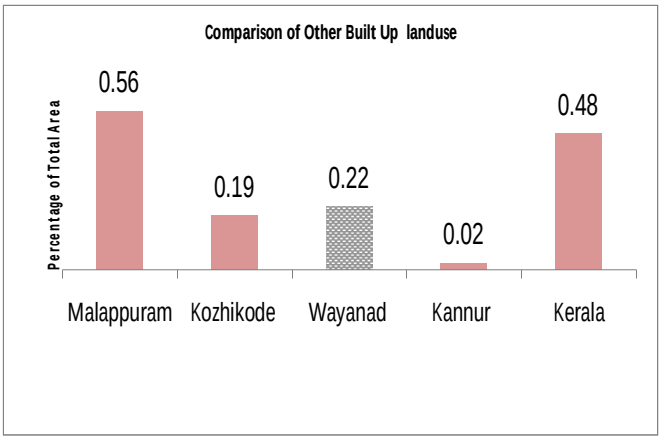


Fig 6.17 Comparison of Other Built up Land use - Surrounding districts and State

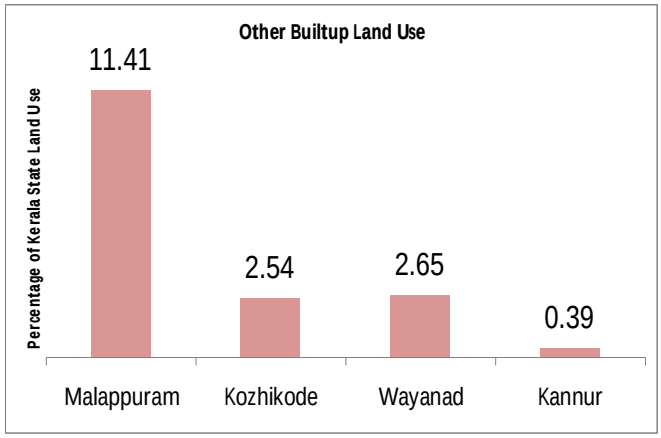


Fig 6.18 Other Built up Land use – Percentage of Kerala State.

Water Body

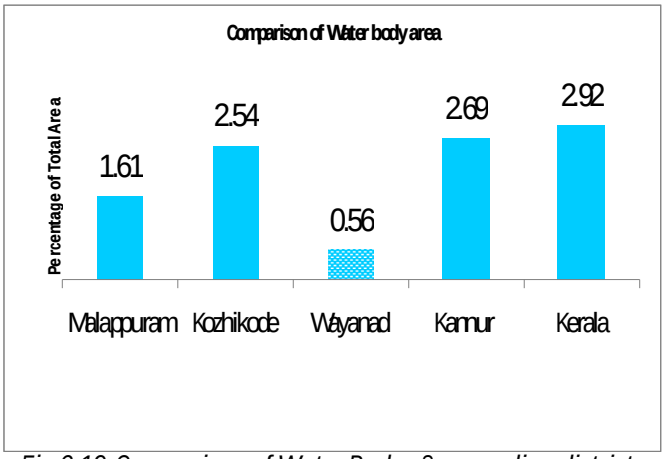


Fig 6.19 Comparison of Water Body - Surrounding districts and State

Water body area of Wayanad is 0.56% of its total area. Average water body concentration of Kerala state is 2.92%. Wayanad's percentage is very less compared to state average. It stands at last place when compared to surrounding districts. 1.13% of States water body area is constituted by Wayanad.

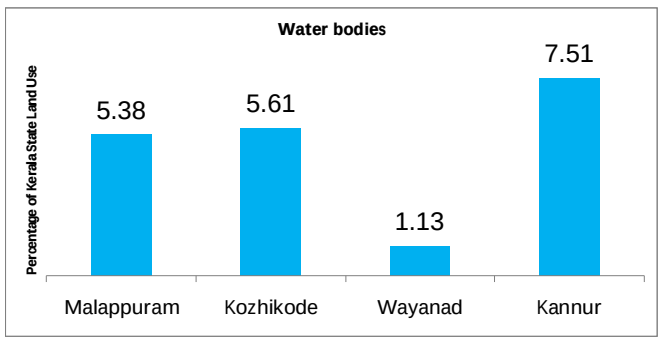


Fig 6.20 Water body – Percentage of Kerala State

Marshy Land

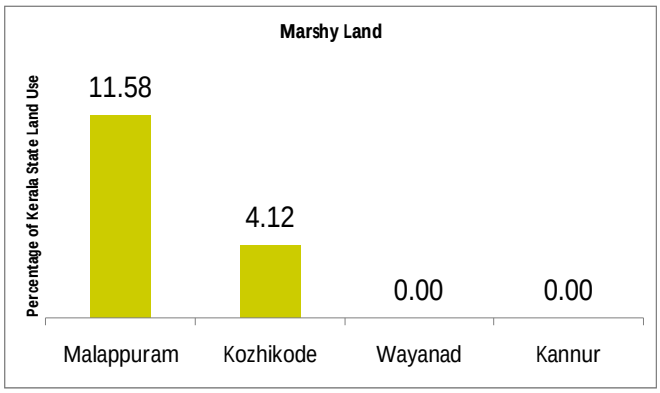


Fig 6.21 Marshy Land use – Percentage of Kerala State.

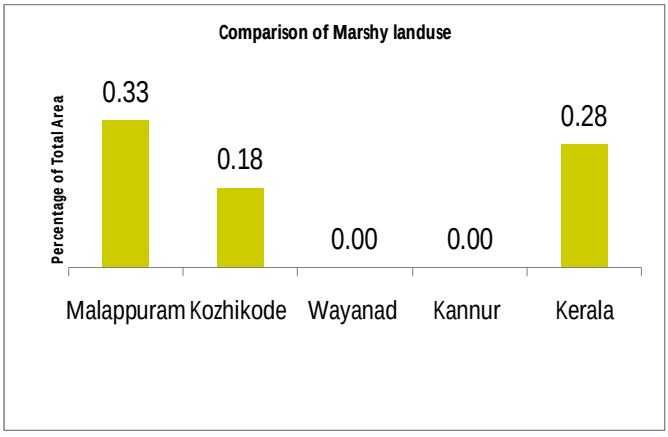


Fig 6.22 Comparison of Marshy Land - Surrounding districts and State

Marshy land percentage of Kerala state is only 0.28%. There is no marshy land in Wayanad. When looking at surrounding districts, Malappuram shows highest percentage of marshy land area. Like Wayanad, Kannur District is also not having Marshy land.

6.4 CONCENTRATION PATTERN OF LAND USES

The concentration pattern of a land use gives an idea about where that particular land use is concentrated within the District. The concentration pattern of a land use can be ascertained by the concentration index of that land use which is calculated as follows. To determine the LCI, land uses in the district are categorised in to nine, namely, Forest Land, Plantation Land, Agricultural Land, Residential Agricultural Mix Land, Residential Land, Other Built Up Land, Marshy Land, Water Body And Others,

Concentration Index of a particular land use (LCI)	=	(Area of that land use in a Local Body) / (Total area of the Local Body) / (Area of that land use in the District)/ (Total area of the District)

LSGs with Concentration Index greater than one indicates that the land use under consideration is concentrated more than the other LSGs in the district

The detailed study of different kinds of land uses concentration is done in the following paragraphs. Since Wayanad is an agrarian district, the agricultural and plantation land uses were split up and studied more. The other build up land use is the main indicator of urban area and hence it is also studied well. Split study of residential agricultural mix land use is also conducted. Since no marshy land is present in the district analysis of marshy land use is omitted.

Forest Land use

Around 40% area of Wayanad is forest land. It constitutes around 10% of Kerala forest land. From the figure, it can say that, forest land use is dominated in most of the boundary grama panchayats. Both Western Ghat forest area at south side and Muthanga wild life sanctuary at east side are the main causes for forest land use domination in this boundary grama panchayats of this District. The analysis of forest LCI maps gives that, the forest land is highly dominated in Sulthan Batheri, Noolpuzha, Thondernadu and Thirunelli Panchayats. Forest land domination at Ambalavayal, Meppadi, Thavinjal, Vellamunda and Thariyode Panchayats are also high compared to remaining Panchayats. 9 Panchayats out of 25 LSGs in this district are shows forest activity domination.

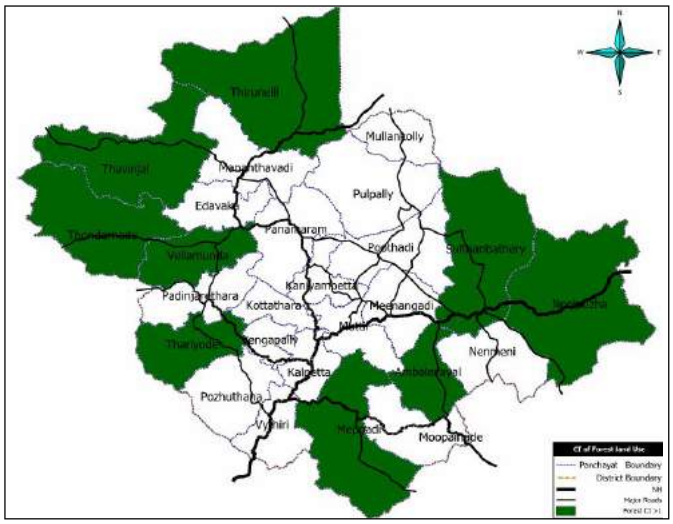


Fig 6.23 Forest Land use Concentration Index >1

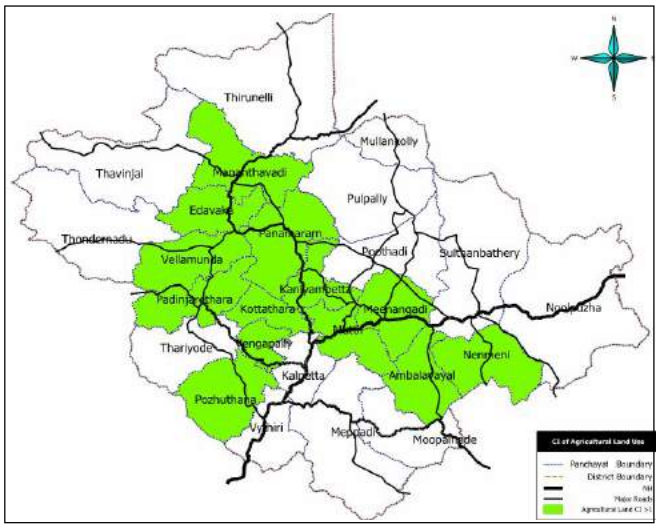


Fig 6.25 Agricultural Land use Concentration Index >1

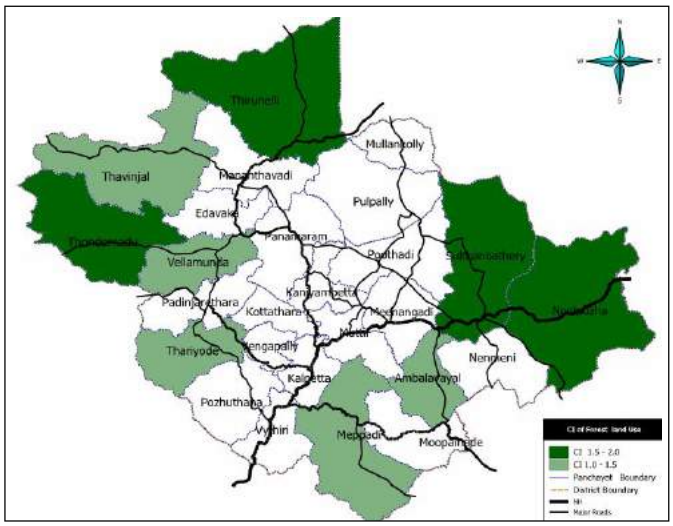


Fig 6.24 Forest Land use Concentration Index

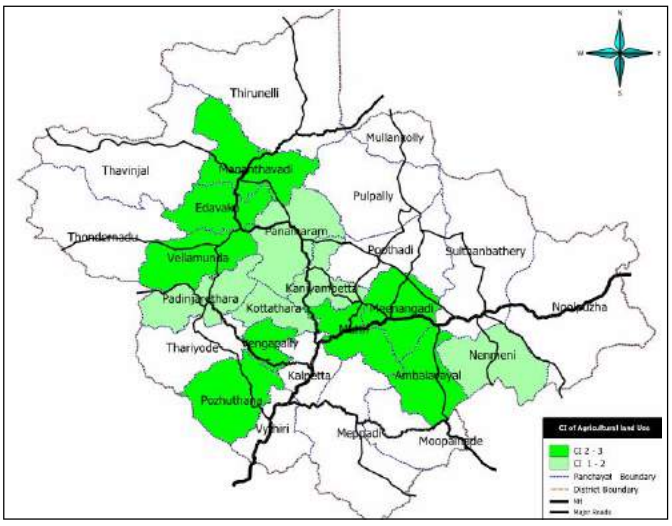


Fig 6.26 Agricultural Land use Concentration Index

Agricultural Land use

The economy of Wayanad is agricultural based. Hence study of agricultural land use is very much necessary. The analysis of agricultural CI revealed that, 13 grama panchayats are having ALCI>1. This indicates that one of the dominated land use type in these 13 Panchayats is Agriculture. Agriculture activity is highly dominated in Pozhuthana, Vengappally, Muttil, Ambalavayal, Meenangadi, Vellamunda, Edavaka and Mananthavadi grama panchayats.

As per NREDB land use classification, agricultural land use is classified in to 6 categories, say 1. Cashew/ orange/pepper/pine apple, 2. Viruppu (1st Crop)/ Mundakan, 3. Land without scrub, 4. Double Crop/Triple crop, 5. Agriculture farm and 6. Agriculture farm (Orchads)/Mixed trees. Lat two categories, Agriculture farm and Agriculture farm (Orchads)/Mixed trees are not present in Wayanad district. The first category is only present in *Thondernadu grama panchayat*. The remaining three types show their concentration in

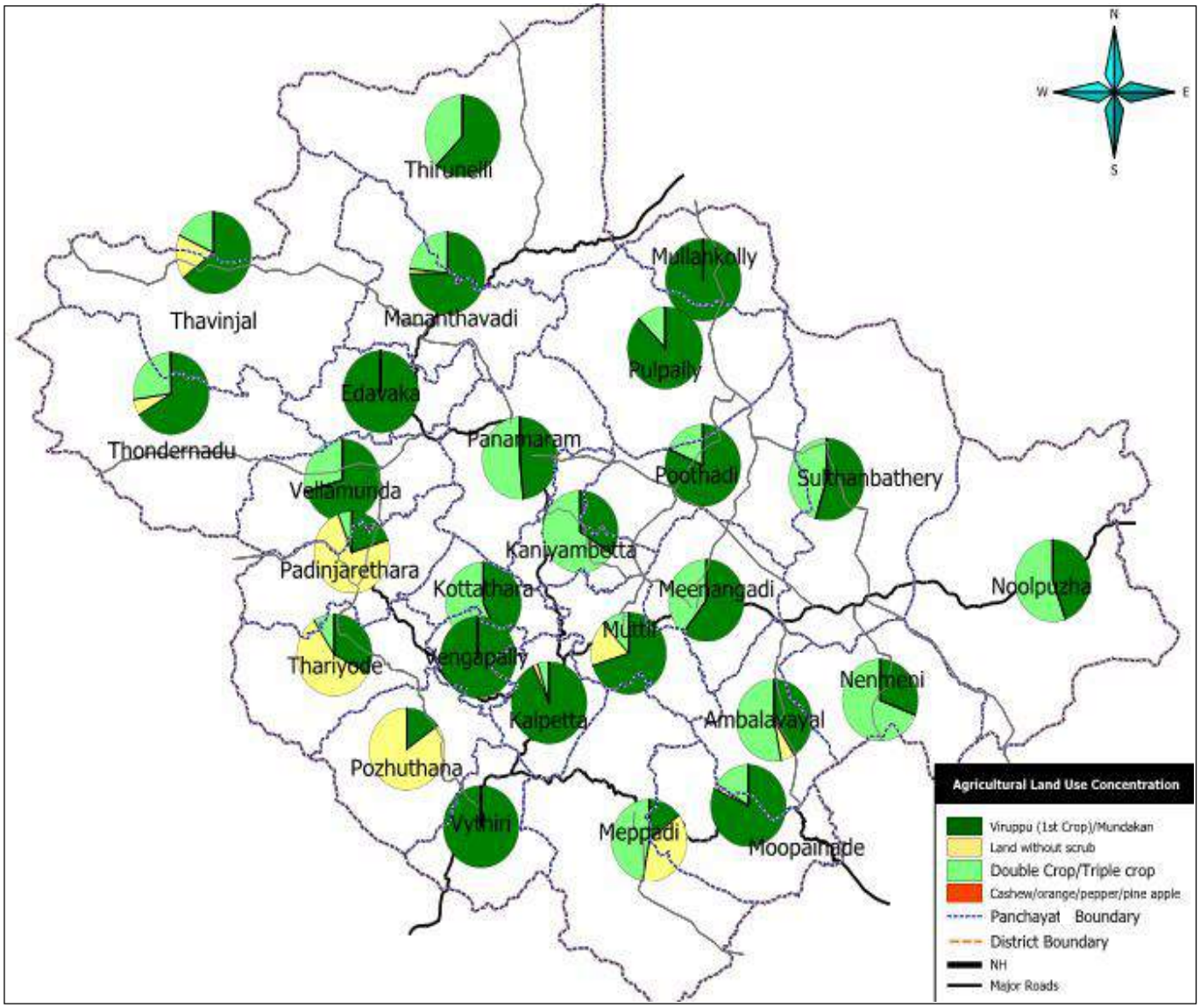


Fig 6.27 Agricultural Land use concentration (Crop wise)

different grama panchayats and the detailed concentration analysis of these types is given below. The concentration of different agricultural crops at each grama panchayats is shown in the figure 6.27. Virippu (Ist crop) Mundakan is highly present in most of the grama panchayats. Double Crop/ Triple Crop are also shows high density. Concentration Index of Viruppu (1st Crop)/Mundakan is more than one in fifteen local bodies out of twenty six in Wayanad district.

Concentration index of Land without scrub is more than one in six grama panchayats.

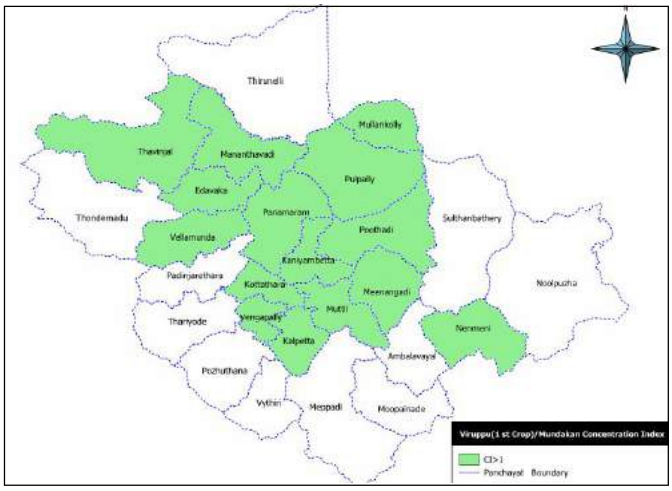


Fig 6.28 Viruppu (1st Crop)/Mundakan

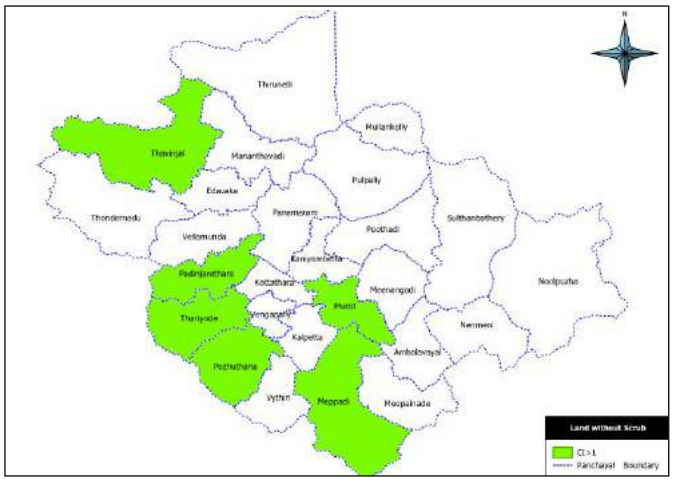


Fig 6.29 Land without scrub

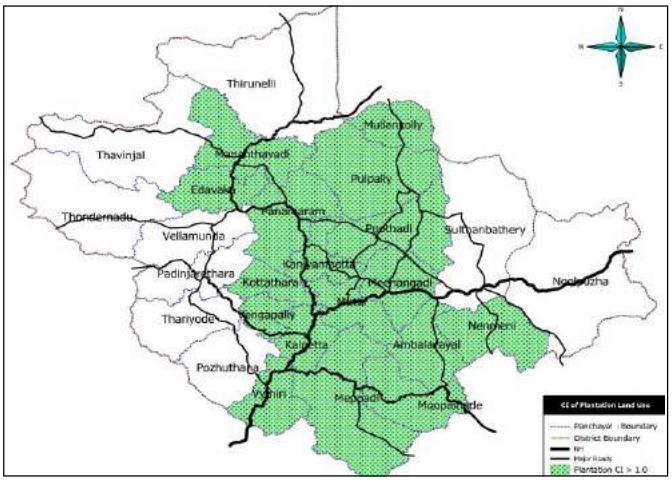


Fig 6.31 Plantation Land use Concentration Index >1

Double crop / triple crop shows high concentration index in eight grama panchayats.

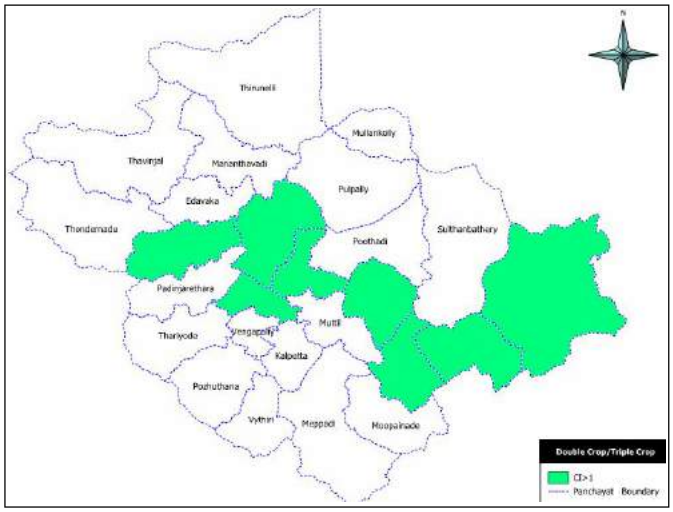


Fig 6.30 Double Crop/Triple crop

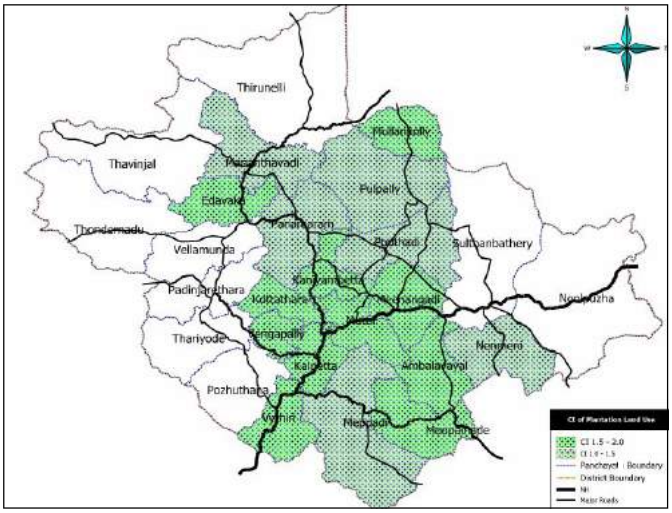


Fig 6.32 Plantation Land use Concentration Index

Plantation Land use

Plantation is one of the major land use type in Wayanad district. It covers around 40% area of the district. Plantations of Wayanad constitute around 20% area of Kerala Plantation land use. Almost all of the LSGs in this district contain plantation land use. 17 LSGs out of 26 LSGs in this district shows plantation land use domination. The plantation land use is dominated in the central grama panchayats of the district, especially at Kottathara, Vengappally, Kalpetta, Muttil, Kaniyambetta, Meenangadi, Ambalavayal, Muppainadu, Vythiri, Edavaka and Mullankolli.

The major types classified under plantation land use are 1.Rubber (R.F), 2.Tea/Cofee/cardomom/ Eucalptus,3.Tea&Eucalyptus,4.Tea(R.F)/Coffee(RF)/ Cardamom(RF), 5.Teak, 6.Teak & Softwood (R.F), 7.Teak (R.F)/Cashew (RF), 8.Eucalyptus (R.F)/ Eucalyptus and soft wood (RF)/Soft wood (silver oak), 9.Oil Palm, 10.Oil Palm (R.F) and 11.Dense mixed forest mainly rubber. In these, items 1, 3, 7, 9, 10 and 11 are not present in Wayanad district. Detailed analyses of remaining items were carried out.

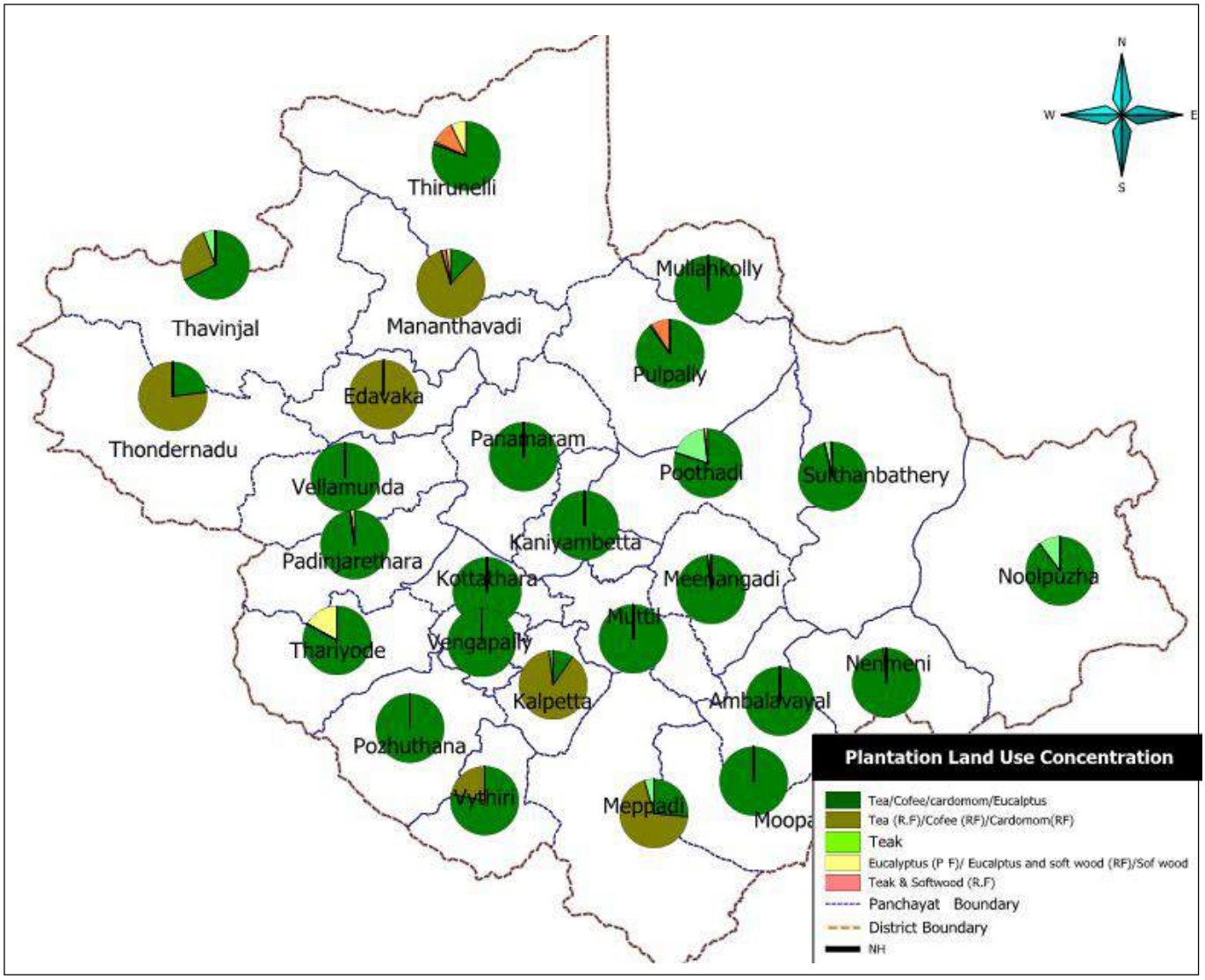


Fig 6.33 Plantation Land use Concentration

The group in plantation category which shows high concentration in Wayanad is Tea/ Coffee/ Cadomom/Eucaliptus. Edavaka grama panchayat, Thondernadu grama panchayat, Mananthavadi grama panchayat and Meppadi grama panchayat shows high concentration of former type in reserve forest area.

Concentration index of Tea/coffee/cardamom/ eucalyptus class is more than one in Five grama panchayats. From fig 6.35 it is clear that, the concentration index of this type in reserve forest is also have high value in this same five grama panchayats.

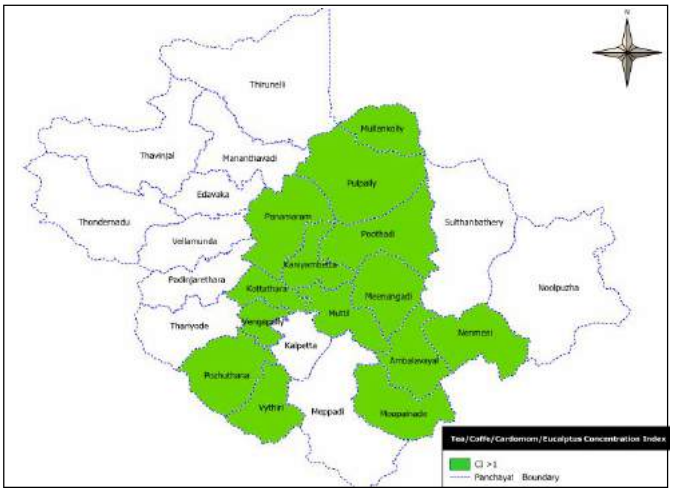


Fig 6.34 Tea/Cofee/cardomom/Eucalptus

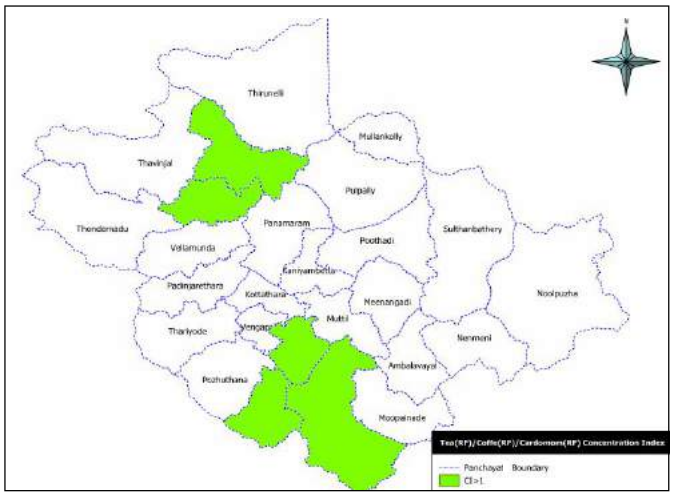


Fig 6.35 Tea (R.F)/Cofee (RF)/Cardomom(RF)

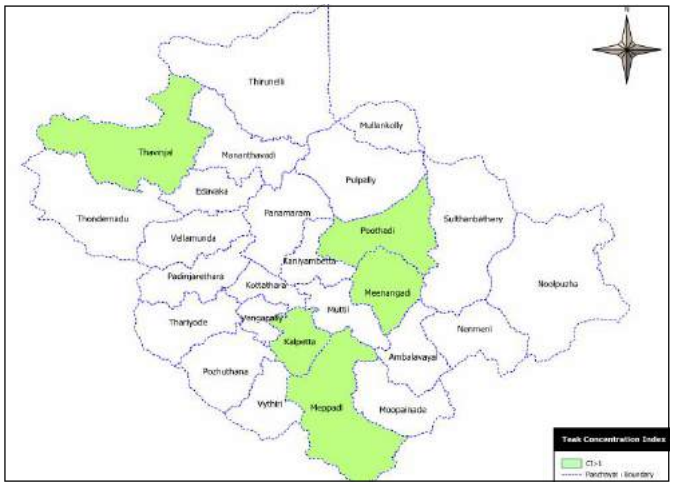


Fig 6.36 Teak

Concentration index of teak plantation is high in Kalpetta, Meppadi, Meenangadi, Poothadi and Thavinjal grama panchayats.

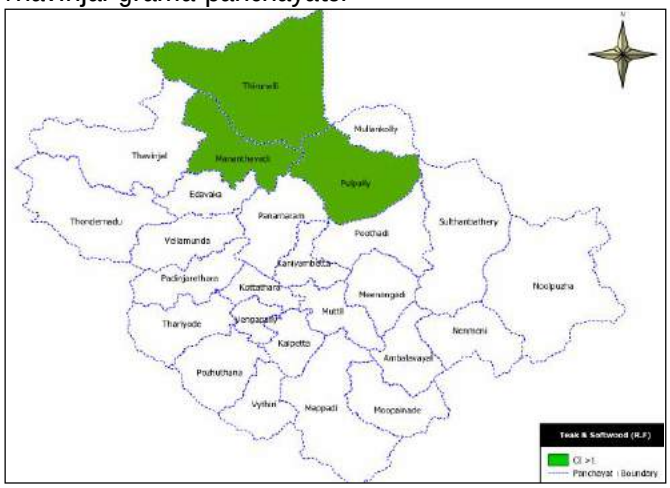


Fig 6.37 Teak & Softwood (R.F)

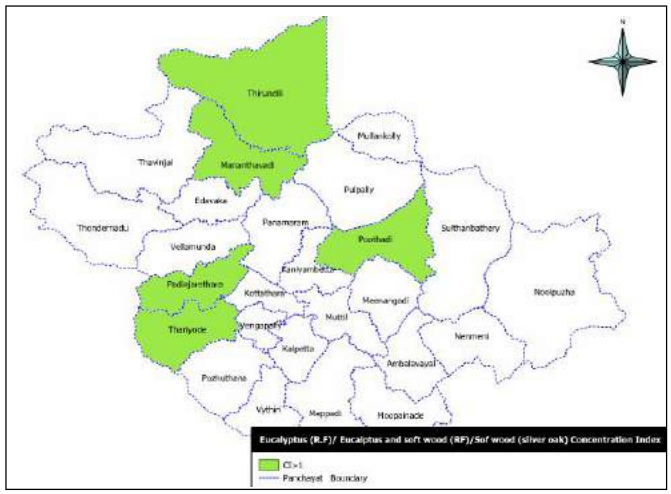


Fig 6.38 Eucalyptus (R.F)/ Eucalptus and soft wood (RF)/Sof wood (silver oak)

Teak and softwood type shows high concentration index in three grama panchayats, say Pulpally, Mananthavadi and Thirunelli. These three are connected panchayats.

Eucalyptus (R.F)/ Eucalptus and soft wood (RF)/ Sof wood (silver oak) type shows more concentration index in five grama panchayats.

Residential Agricultural Mix Land use

Resi/Agri mixed land use consists of land use categories of Arecanut, Banana, Banana & Tapioca, Coconut/coconut & arecanut/cocconut & tapioca, Coconut dominant mixed crop, Current fallow, Mixed Crop, Rubber, Mixed and Tapioca as per the land use data of NREDB. Resi / Agri land use is concentrated in the 8 Panchayats of the district, most of them located at the central areas of the district. The panchayats having higher concentration index of Resi/Agri mix land use is shown in Figure 6.39. Panchayat wise concentration of different types of crops coming under the residential agricultural mix category is shown in the figure 6.41.

As per NREDB land use classification, Residential Agricultural Mix land use is classified in to 9 categories; say 1.Arecanut, 2.Banana, 3.Banana & Tapioca, 4.Coconut/coconut&arecanut/cocconut&tapioca, 5.Coconut dominant mixed crop, 6.Current fallow, 7.Mixed Crop, 8.Rubber and 9.Tapioca. In this, items 3,4,5 and 9 are not present in Wayanad district. Detailed analysis of remaining items are carried out.

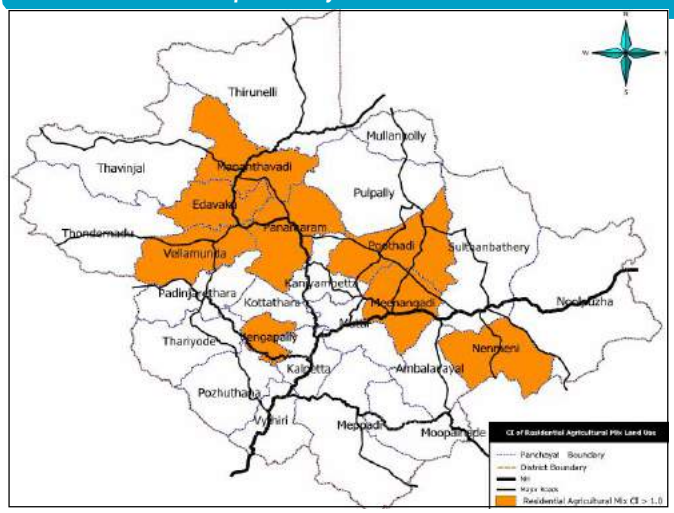


Fig 6.39 Residential Agricultural Mix Land use Concentration Index >1

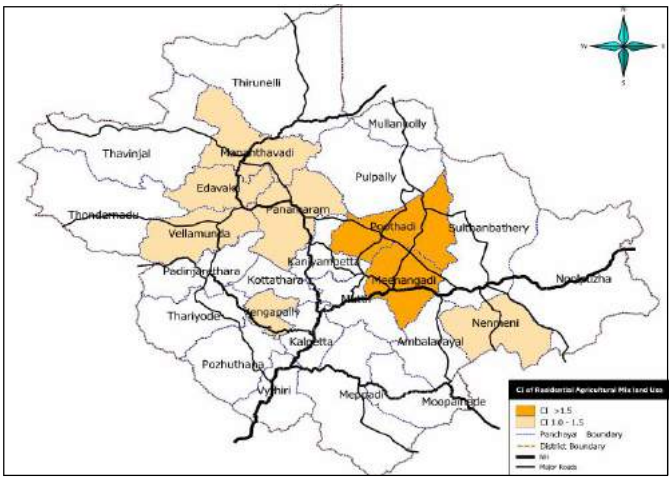


Fig 6.40 Residential Agricultural Mix Land use Concentration Index

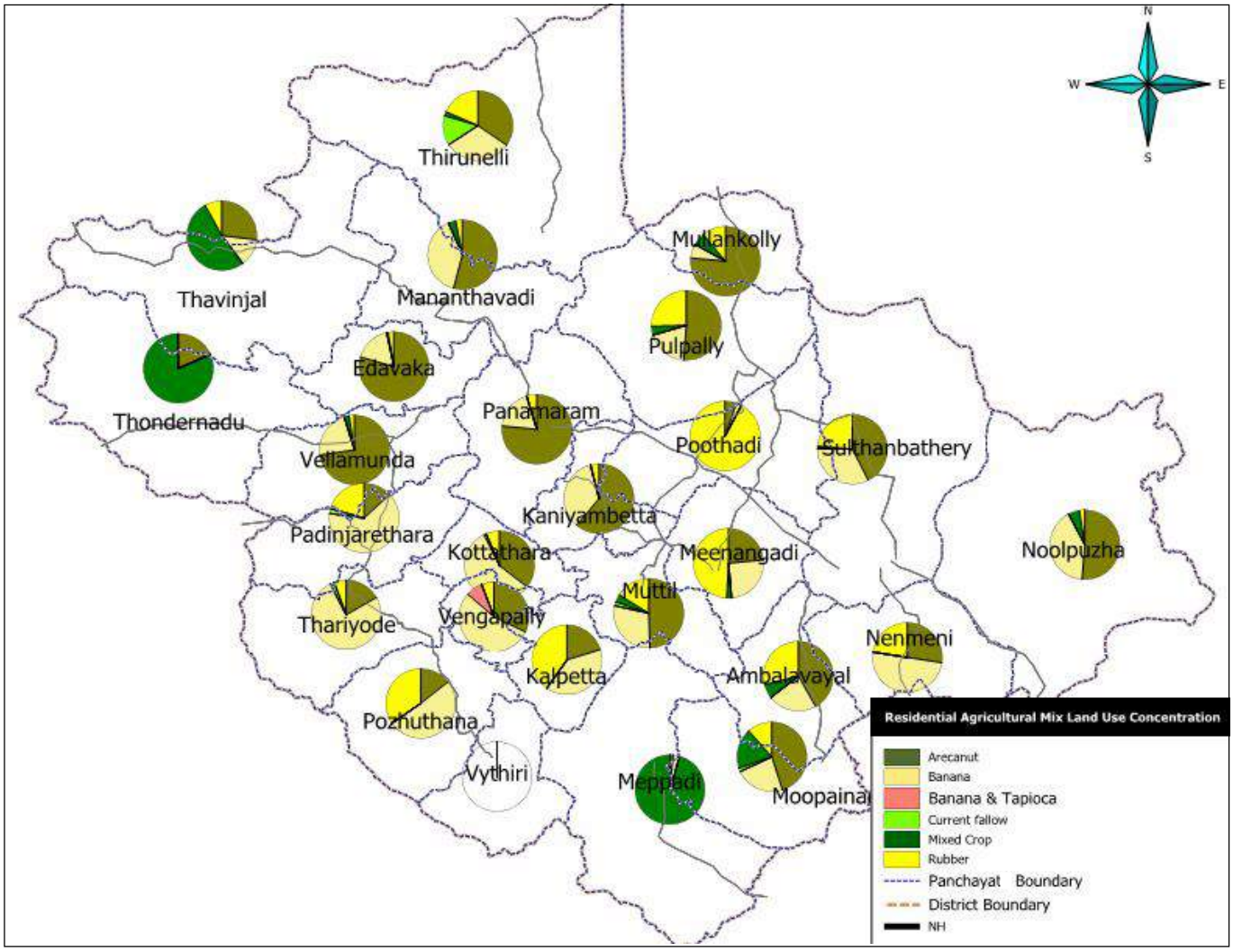


Fig 6.41 Panchayat wise concentration of Residential agricultural mix land use.

Detailed analysis of concentration of different categories of residential agricultural mix land use is done and concentration index for each categories were found. Analysis of Aricanut revealed that, there is fourteen Panchayats with Arecanut CI greater than one. Banana also shows CI greater than one in fourteen Panchayats. The interesting thing is that, most of the panchayats with higher Arecanut CI shows higher CI for Banana also.

Banana and Tapioca class have high concentration index in Vythiri, Vengapalli and Kottathara Panchayats. Current fallow CI is greater than one in five Panchayats.

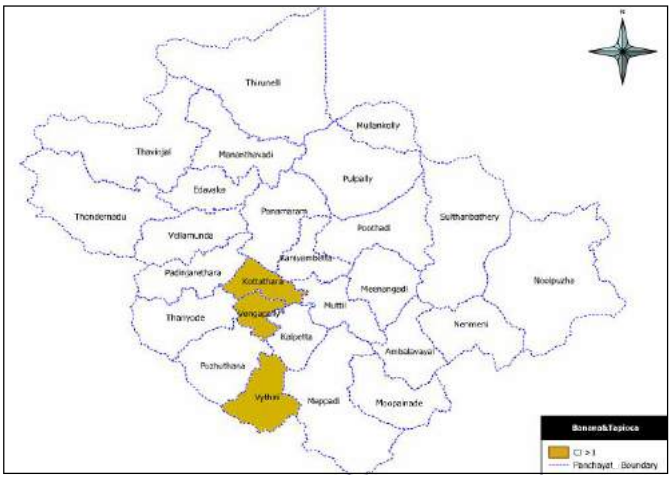


Fig 6.44 Banana & Tapioca

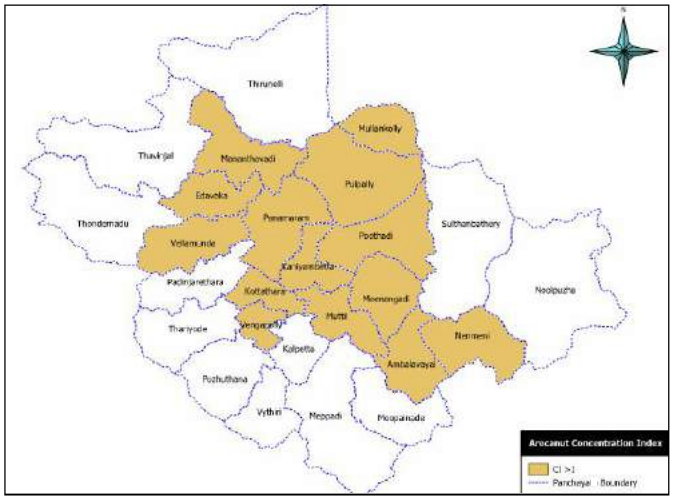


Fig 6.42 Arecanut

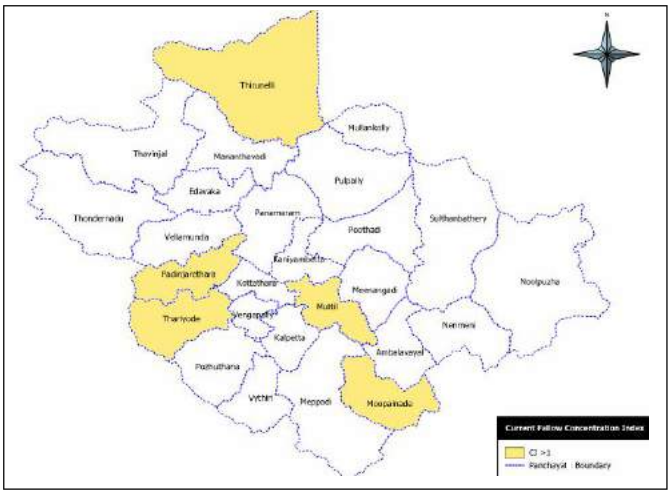


Fig 6.45 Current fallow

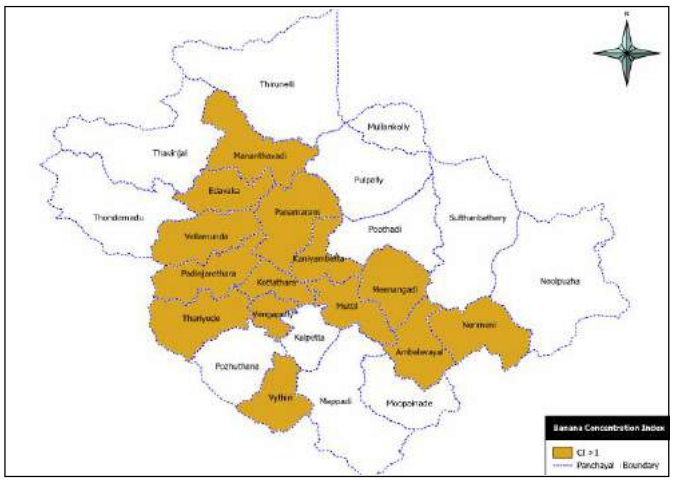


Fig 6.43 Banana

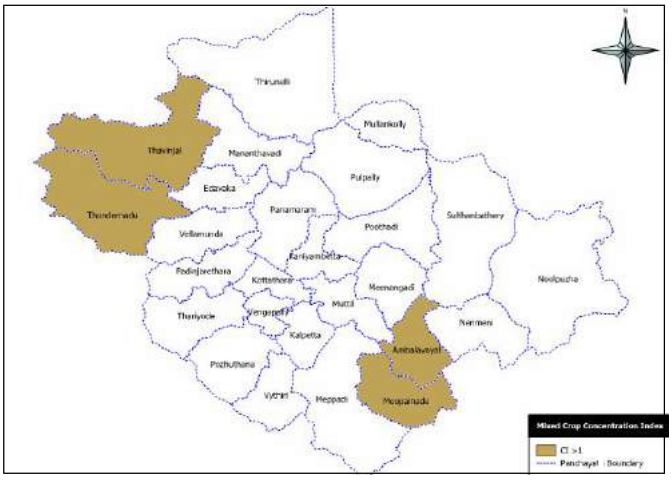


Fig 6.46 Mixed Crop

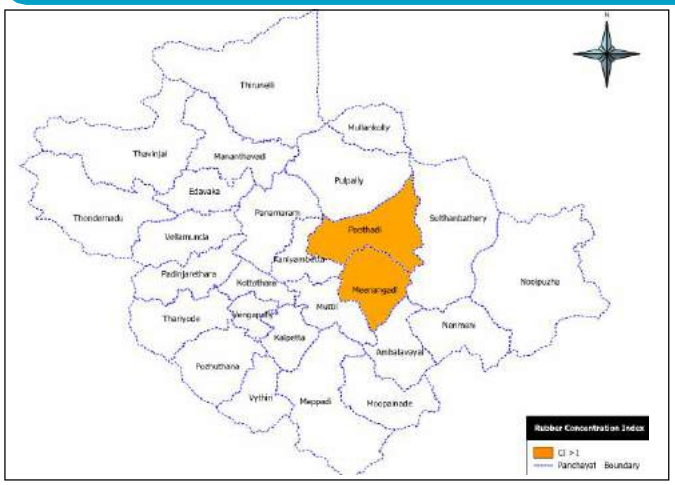


Fig 6.47 Rubber

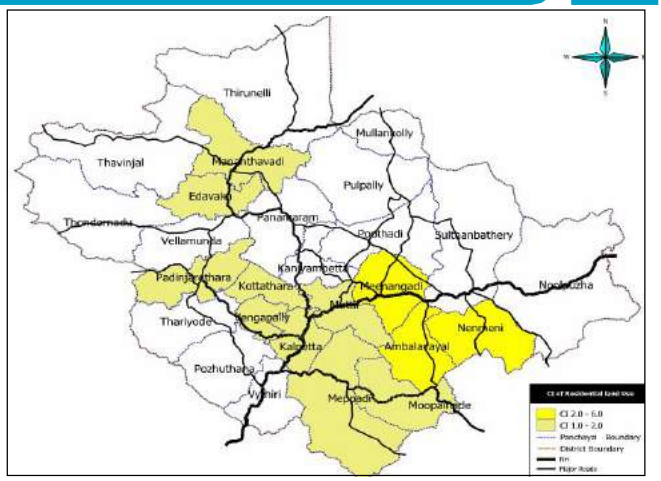


Fig 6.49 Residential Land use Concentration Index

Mixed crop class has higher CI than one in four panchayats. CI analysis of Rubber reveled that it is highly concentrated in Meenangadi and Poothadi grama panchayats.

Residential Land use

The LSGs having residential land use concentration more than one is shown in the figure 6.48. The residential land use is mainly concentrated in the southern sides of the district. In Meenangadi, Nenmeni and Ambalavayal panchayats, RLCI is very high. Less forest land concentration and high residential and agricultural mix land concentration are the main reason for residential concentration in these grama panchayats.

Other Built Up Land use

Other built up land use concentration is one measure for urban nature of local body. The local bodies with high other built up land use concentration index are Kalpetta municipality and Vythiri, Muttil, Muppainadu, Pozhuthana, Sulthan Batheri and Mananthavadi grama panchayats. From field observations, it is clear that most of these LSG s are comparatively urbanized. The interesting thing which can be noted from this concentration index is that, NH or SH passes through all the local bodies, which have other built up land use concentration index more than one. This is a solid evidence for ribben developed towns in Wayanad district

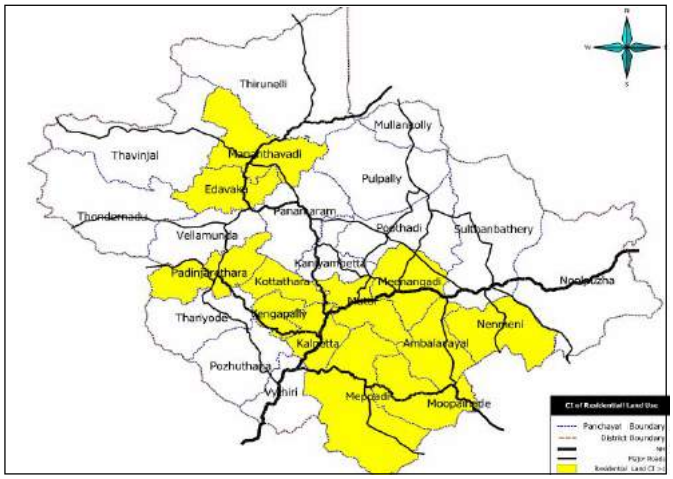


Fig 6.48 Residential Land use Concentration Index >1

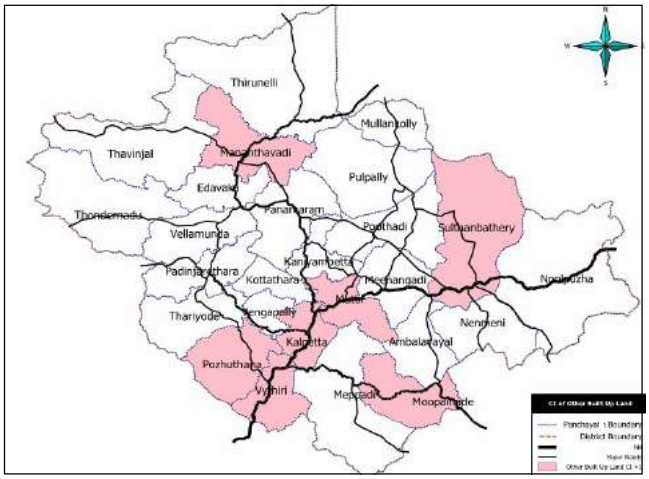


Fig 6.50 Other Built Up Land use Concentration Index >1

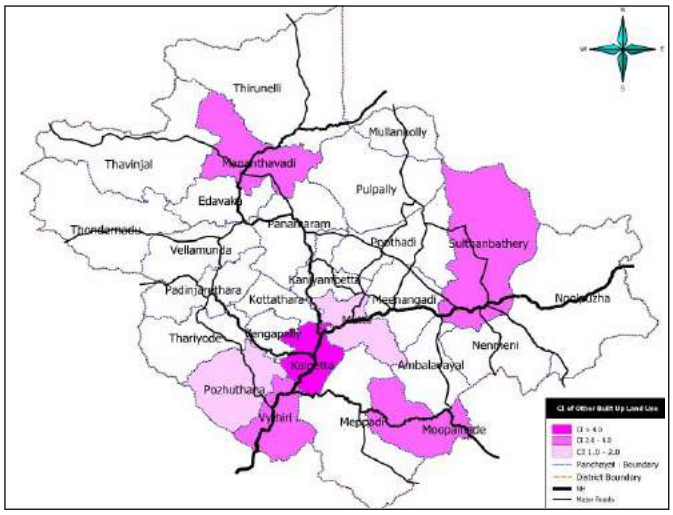


Fig 6.51 Other Built Up Land use Concentration Index

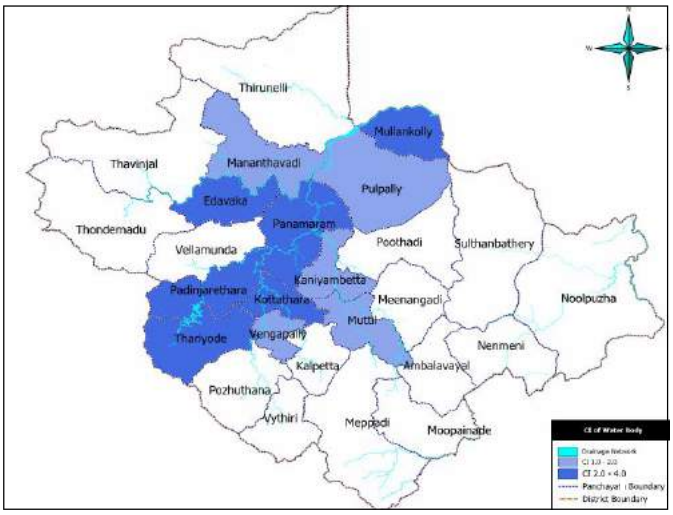


Fig 6.53 Water Body Concentration Index

Water Body

The LSG s having Water body concentration more than one is shown in the figure 6.52. The water bodies are mainly concentrated in the central portion of the district. There are eleven grama panchayats showing higher water body concentration index.

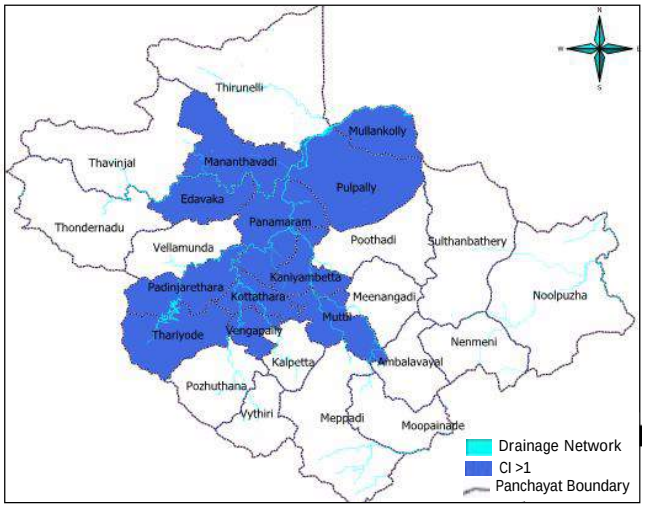


Fig 6.52 Water Body Concentration Index >1

6.5 ACTIVITY ZONES BASED LAND USE CONCENTRATION PATTERN

The main activity in a local body can be determined with the help of the land use concentration index. The value of land use concentration index of a particular land use, if greater than one, indicates that the land use under consideration is relatively more concentrated in that local body, than other local bodies in the district. The LSGs are categorized as Urban, Rural or Neutral based on the land use CI value of the respective category. The land use types considered for each class is listed under the corresponding heads in the table 6.3.

The land use types in each local body is classified under these three categories and found out the total area of each type, say Rural, Urban and Neutral. The map showing the concentration of land use is shown in Figure 6.54.

Table 6.3 Land use types considered under Urban, Rural and neutral Classes

Neutral Land Use	Urban Land Use	Rural Land Use
Dense Mixed Forest	Beaches	Cashew/orange/pepper/pine apple
Dense Mixed Forest (R.F)/Forest Blank	Commercial	Rubber (R.F)
Dense mixed forest mainly bamboo	Harbour / Port	Tea/Cofee/cardomom/Eucalptus
Dense mixed forest mainly bamboo & teak (R.F)	Industrial /Industrial Park	Tea & Eucalyptus
Dense mixed forest mainly bamboo (R.F)	Mining / Industrial waste land	Tea (R.F)/Cofee (RF)/Cardomom(RF)
Dense mixed forest mainly teak or cashew	Mixed Built-up/Mixed Built-up converted	Teak
Bamboo (R.F)	Residential	Teak & Softwood (R.F)
Barren Rocky/ Stone waste/ sheet rock	Residential (Converted from Paddy)	Teak (R.F)/Cashew (RF)
Barren Rocky/ Stone waste/ sheet rock(RF)	Airport	Viruppu (1st Crop)/Mundakan
Coastal Sand	Playground	Eucalyptus (R.F)/ Eucalptus and soft wood (RF)/Sof wood
Land with scrub	Dam wall	Land without scrub
Open mixed forest/Open mixed forest (RF)	Educational Instituions	Oil Palm
Open mixed forest mainly teak/Open mixed forest		Oil Palm (R.F)
Perennial		Double Crop/Triple crop
Reservoir/Canal		Dense mixed forest maily rubber
Reservoir Bed/River bed/River island		Agriculture farm
Sands/ riverine/Flood plain		Agriculture farm (Orchads)/Mixed trees
Scrub forest		
Temporarily (marshy land)/Marshy		
Water Bodies/Back waters		
Under utilized / degraded notified forest		
Dense Grassland/Degraded grass land		
Degraded grass land (RF)		

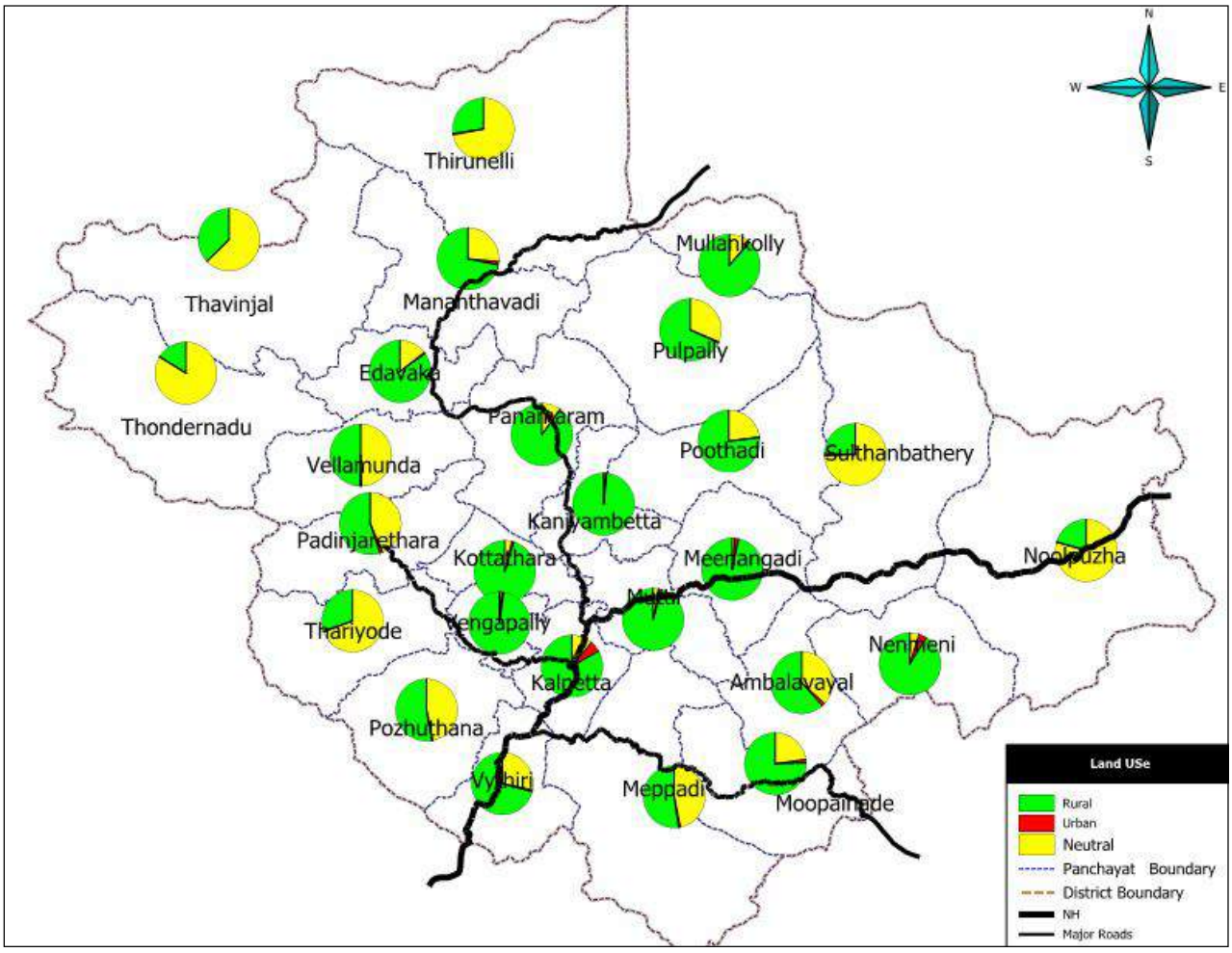


Fig 6.54 Urban Rural and Neutral Land Use Concentration

LSGs are categorized in to three classes based on the LCI value greater than one. If the urban LCI is greater than one, the LSGI is classified as urban. If the Rural LCI is greater than one, it is classified as rural and if Neutral LCI is greater than one, it is classified as Neutral local body. The figures 6.55, 6.56 and 6.57 shows the Panchayats of urban, rural and neutral concentration index greater than unity.

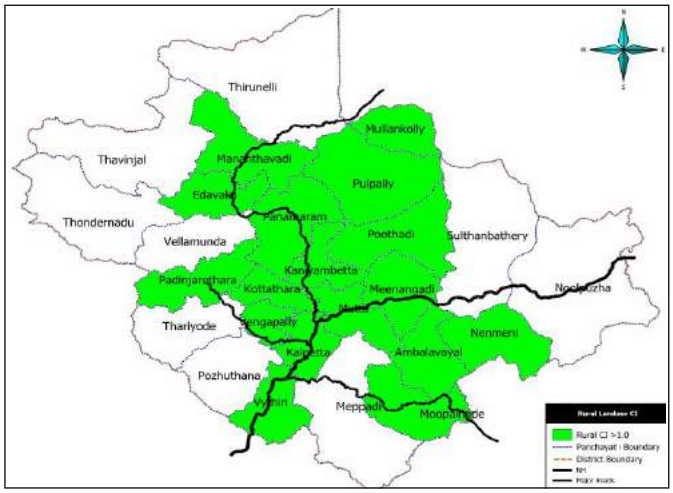


Fig 6.55 LSGs Having Rural Land Use Concentration Index>1

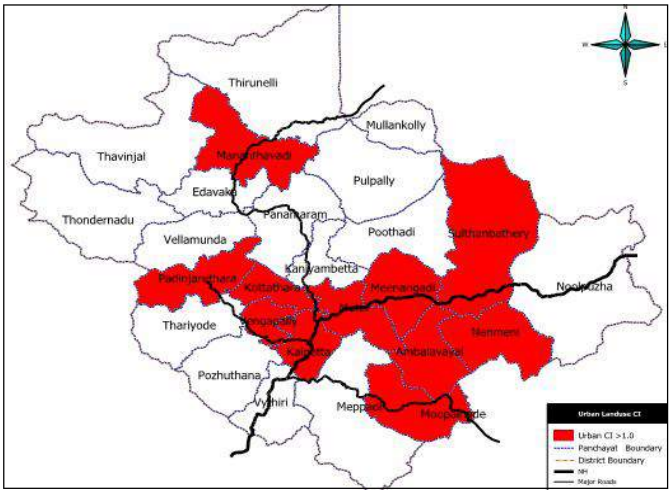


Fig 6.56 LSGs Having Urban Land Use Concentration Index>1

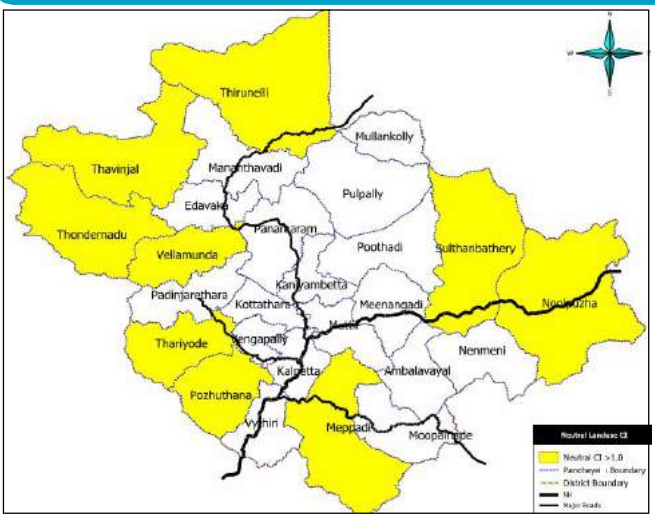


Fig 6.57 LSGs Having Neutral Land Use Concentration Index>1

The remarkable point noticed from the above figures is that, the Panchayats like Ambalavayal, Mananthavadi, Meenangadi, Nenmeni, Muppainadu etc coming under both urban and rural categories. Similarly, Sulthan Batheri Panchayat shows Urban and Neutral character together. This is because of the special geographic condition of Wayanad district. Most of the Panchayats in this district are comprised of different land uses (Agricultural, plantation, forest, commercial and residential) together.

Since most of the Panchayats shows two land use types together, it will be very difficult to classify the Panchayats to three categories only based on land use type. Hence with the help of local reconnaissance studies and based on the land use concentration index, the Panchayats were grouped. The activity zones based on this is shown in table 6.4 and figure 6.58. Here ten local bodies came under rural class, eight under both urban and neutral class.

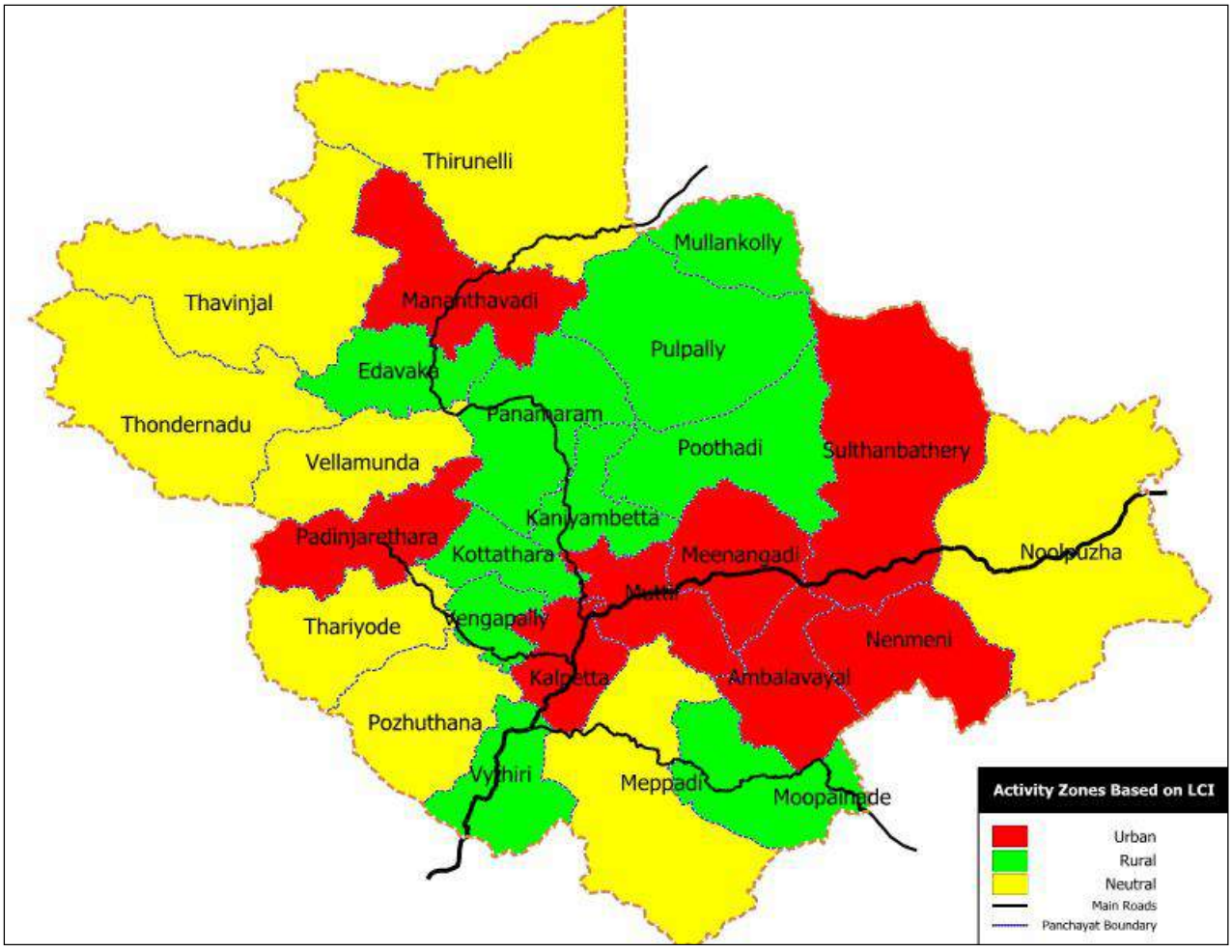


Fig 6.58 Activity Classification of LSGs

Table 6.4 Activity classification of LSGs based on Land use Concentration Index

Rural	Urban	Neutral
Kaniyambetta	Kalpetta	Noolpuzha
Kottathara	Nenmeni	Thondarnadu
Vengapalli	Ambalavayal	Thirunelli
Panamaram	Sulthan Batheri	Pozhuthana
Edavaka	Meenangadi	Thariyode
Pulpally	Mananthavadi	Thavinjal
Poothadi	Muttil	Vellamunda
Muppainad	Padinjarethara	Meppadi
Vythiri		
Mullankolli		

6.6 INFERENCE

From the details in this chapter, it can conclude that, panchayats in Wayanad district shows different nature simultaneously. It will show urban nature with a large concentration of forest land inside it, or urban with agricultural and plantation domination. Also it can be noted that, this district shows remarkable variation in its land use distribution while comparing with adjacent districts. Since Wayanad is a district with agriculture, plantation and forest domination, only few panchayats shows urban nature. Based on the land use concentration index it can be inferred that the agricultural and built-up land is scattered throughout the district and its peripheral area is concentrated with forest land.

Chapter –7
FUNCTIONAL CHARACTER OF SETTLEMENTS

The function of a settlement is the major activity within the settlement, be it agricultural and allied activity (pucca rural) or secondary sector and tertiary sector activities (pucca urban activities) or a combination of the two (semi urban or semi rural).

7.1 CHARACTER OF SETTLEMENTS

The land use pattern existing in Kerala shows that there are only a few areas in the State which are pucca urban or pucca rural. In between the pucca urban or pucca rural area, large chunks of land ('in between land') with mixed land use character where in a combination of residential and agricultural land use. This peculiar character of the land use makes it difficult to classify a local body or as either urban or pucca rural. The pucca urban or rural area is only a minor share of the total area; the remaining area being mixed lan use areas. Hence the character of the mixed land use area determines the total character of the area. This mixed land use area is to be again classified in order to ascertain the character of the character of the land use of an area. The procedure of the same is explained in Annexe 4.

Average plot size of the **mixed land use** is taken as the criterion for classifying the mixed land use area because in most of the cases this determines type of activity to be introduced there and consequently the character of the mixed land use area.

If the average plot size (total area/ number of houses) in the mixed land use area is such that one can earn reasonable income from agricultural activity alone (without considering the present status of land use), it

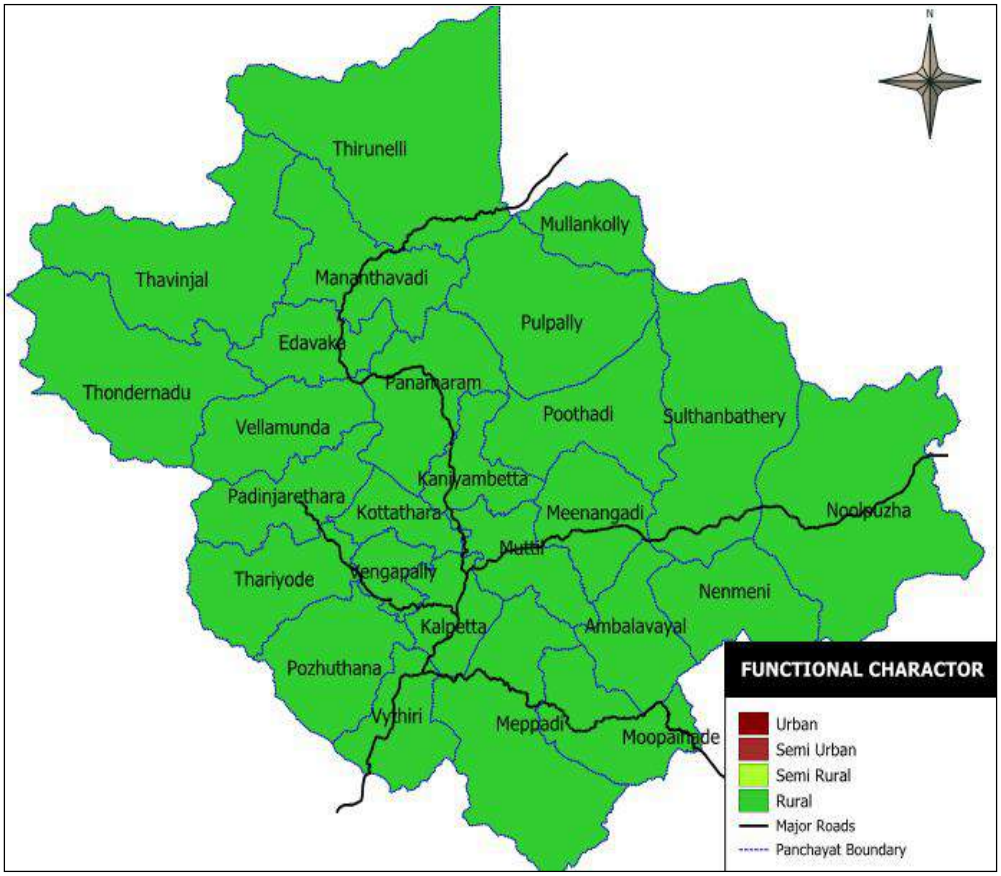


Fig 7.1 Functional Character of settlement

can be classified as a rural area.

If the averaage plot size is such that a family can earn their livelihood only partially from the agricultural activity, it can be termed as semi urban or semi rural area. The share between the agricultural and non agricultural activity determines whether it is a semi urban or semi rural area. If the plot size is such that a family has to earn major share of their livelihood from rural activity but has to resort to some urban activity also to fill the gap (in the earnings) it can be termed as semi rural area. A reversed situation indicates a semi urban area.

Those plot size with an extent, which is not at all sufficient for any agriculture activity of namesake, can be treated as urban area.

From the above explanation it can be concluded that the mixed land use area can be classified as rural area, urban area, semi urban area and semi - rural area based on the average plot size.

The analysis is conducted for wayanad district using the district land use (supplied by NREDB). The functional charactor obtained as rural for all the local bodies in the district and is shown in fig 7.1

7.2 INFERENCE

Wayanad district is composed of local bodies with rural nature. The main activity taking place in this district is agriculture and plantation. According to 2001 census, primary labourers are shifting to other sectors. This changes the rural nature of Panchayats. But still at the local bodies in this district show rural character. There is only one census urban area in the district, the Kalpetta Municipality, where all its administrative setup is concentrated. **Analysis for functional character revealed that all the LSGs in Wayanad districts show Rural Character.**

Chapter –8
HIERARCHY OF SETTLEMENTS

8.1 EXISTING HIERARCHY OF SETTLEMENT

Cumulative Functional Index (CFI) method is used to find out the hierarchy of settlement. The CFI of a settlement is assessed based on the number and presence of the following types of facilities in the settlement.

- Educational facilities
- Health Facilities
- Market
- Facilities in Agriculture and allied sector
- Physical infrastructure facilities
- Transportation facilities

The weightage of each of these facilities in the District is calculated and total of this weightage is taken as the CFI Value of Panchayats. CFI index calculated based on this is given in the Annexe - 5. CFI is plotted against the number of settlements to find out the hierarchy of settlement in the District. The graph, so obtained is shown in figure 8.1.

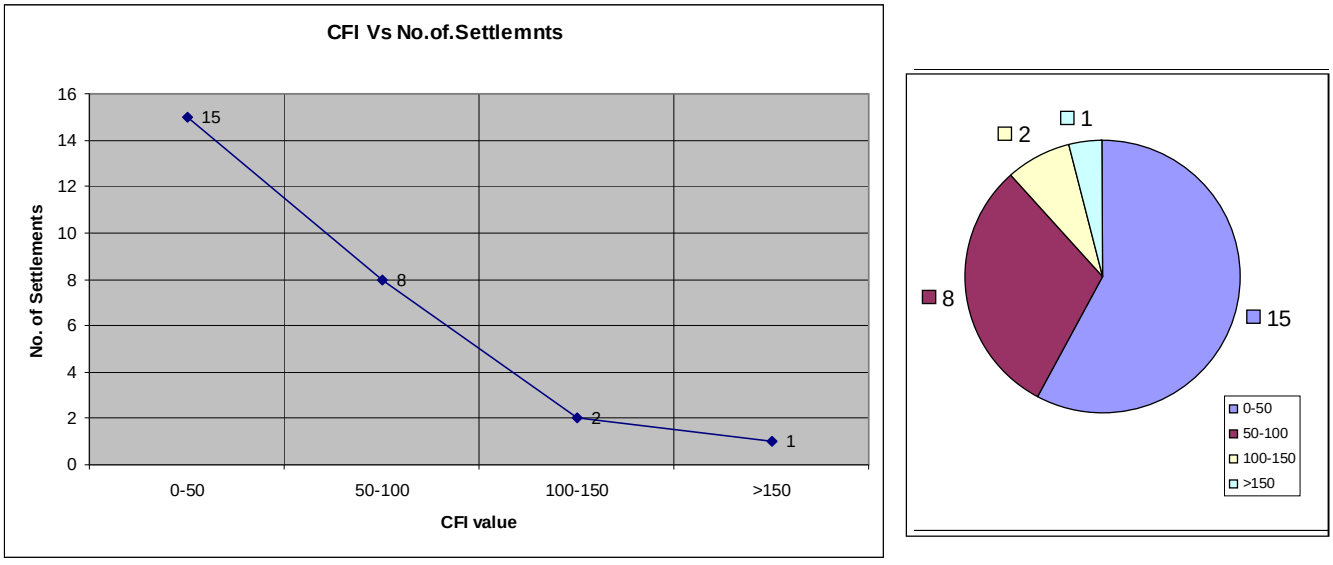


Fig 8.1 CFI Vs Frequency graph

Table 8.1 CFI based Hierarchy and Number of settlements

Sl No	CFI Range	Hierarchy	No of Local body
1	Above 150	1	1
2	100-150	2	2
3	50- 100	3	8
4	0 -50	4	15

Looking at the above table (8.1), it can be seen that there is only one first order settlement (Kalpetta Municipality) in the district. The head quarters of Wayanad district is at Kalpetta municipality, and it is the only municipality in this district. It is acting as a major economic and commercial centre in this district. Most of the major activities are concentrated here.

The Sulthan Batheri and Mananthavadi Panchayats are coming under second order with CFI s of 141.71and 145.88 respectively. These two are another major activity centers in this district. The existing hierarchy of the settlements in Wayanad district can summarize as below.

Ist Order Settlement

Kalpetta Municipality

IInd order settlement

Sulthan Bathery

Mananthavady

IIIrd and IVth order settlement

All remaining panchayats (See Annexe-6)

The spatial distribution of existing first, second and third order settlements is shown in the fig 8.2.

It can be noted from the spatial distribution of existing settlements that,

a) All the third order panchayats shares their boundary with existing higher order settlements.

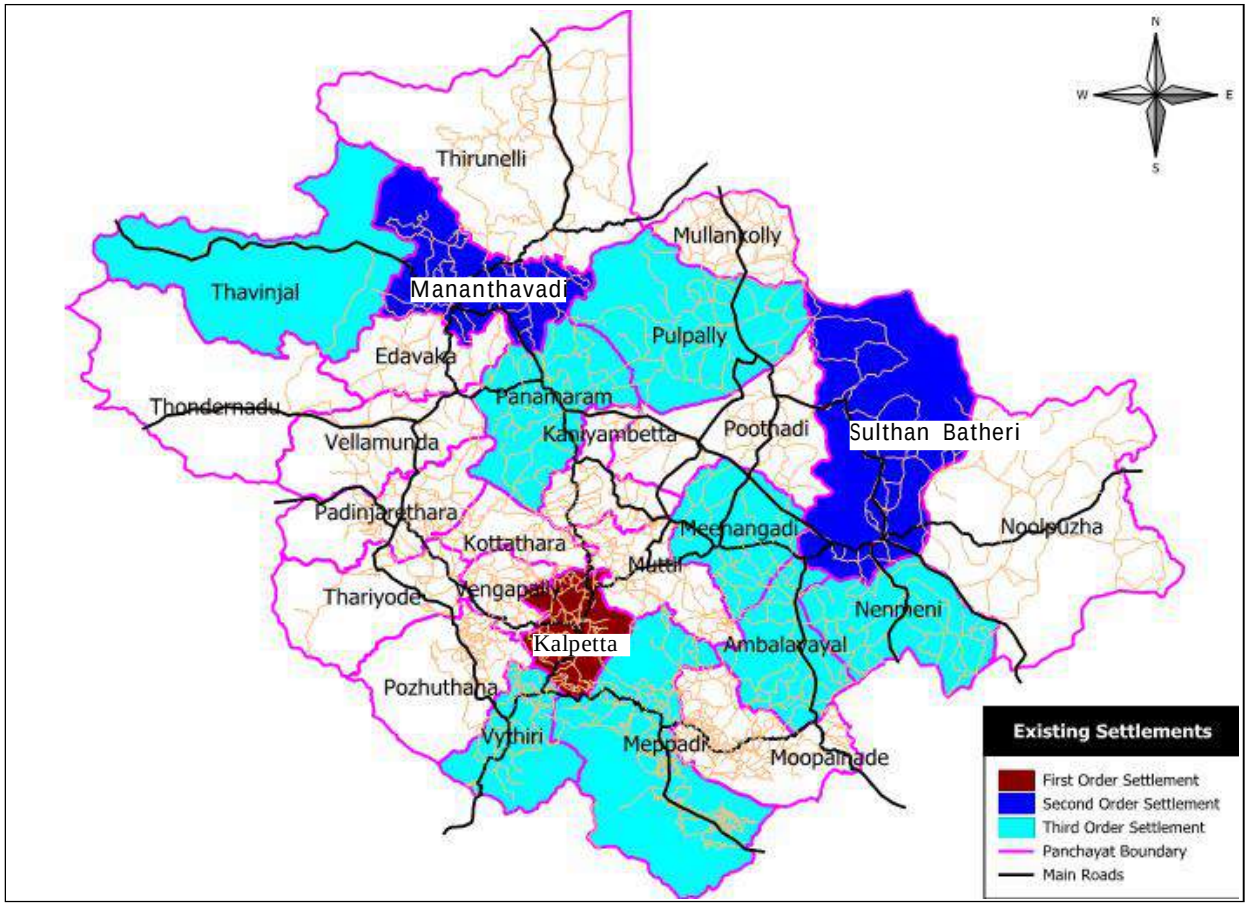


Fig 8.2 Existing first, second and third order settlements

b) Some areas in the districts have not getting service from these third order settlements and

c) The panchayats with CFI value in between 100 and 200 are considered as third order in most of the panchayats in other districts of Kerala.

Hence in the case of Wayanad , the development should not be followed by the existing hierarchy of settlements. For sustainable development, a new hierarchy should be proposed considering the centrality, connectivity, development potential and administrative status of settlements along with CFI values.

8.2 SUGGESTED HIERARCHY OF SETTLEMENTS

Crystallor's central place theory is used for finding out the proposed hierarchy of settlements. Some criteria like Centrality, Existing hierarchy, Connectivity, population Distribution and Administrative status were analysed for obtaining the future hierarchy. The major steps in the procedure are

1. Identification of gap area in the district where services are not reaching from existing higher order settlements.
2. Identification of higher order settlement at gap area
3. Identification of the service area of existing and proposed higher order settlements and check whether any area is not served.
4. If so, repeat the procedure.
5. Identification of third order settlements.

Identification of Gap

For the analysis purpose first marked the first and second order settlements in the district map (based on existing hierarchy). Divided the entire district into four segments and checked whether any segment within the district is not served by a second order settlement.

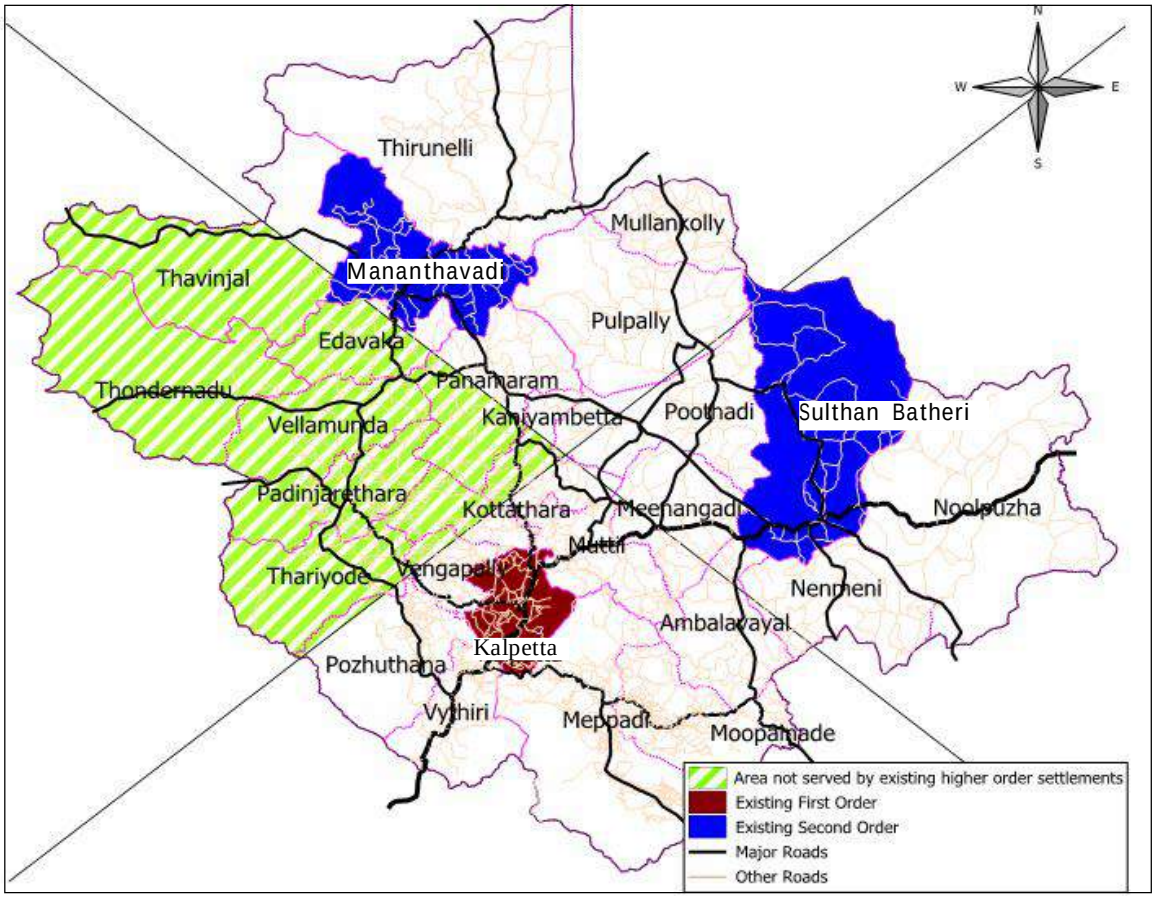


Fig 8.3 Identification of gap area

Here from the figure 8.3 it can be seen that the west side of the district is not served by any of the existing second order settlement (the hatched area).

Identification of higher order settlement at gap area

Second stage is the identification of a higher order settlement at gap area. Here 6 settlements are present in the gap area. From this one has to be proposed as a higher order. The criteria for selecting this are Centrality, Existing hierarchy, Connectivity, population Distribution and Administrative status. Vellamunda and padinjarethara shows high centrality character. Thavinjal and Edavaka show higher CFI Values. Thariyode and padinjarethara have SH connectivity. All these panchayats have almost same population distribution and administrative status. When analyzing these findings, it can be seen that, Padinjarethara panchayat is having higher centrality and connectivity. Moreover, Banasura sagar dam which is a part of Kuttiyadi hydro electric augmentation scheme is present in this panchayat. This gives higher tourism potential for this panchayat than others. Hence Padinjarethara can be proposed as a higher order settlement. Padinjarethara panchayat is classified as a higher order panchayat in the western area of Wayanad district. Next stage is the identification of its order. Following points to be noted while the estimation of order of Padinjarethara.

1. Padinjarethara is an agricultural settlement and located near to Western Ghats, the identified Heritage area.
2. The forest land density inside Padinjarethara and its surrounding Panchayats is very high.
3. Padinjarethara is serving nearly one lakh popu lation, where as the remaining second order settlements serves around three lakh popula tion by the year 2021.

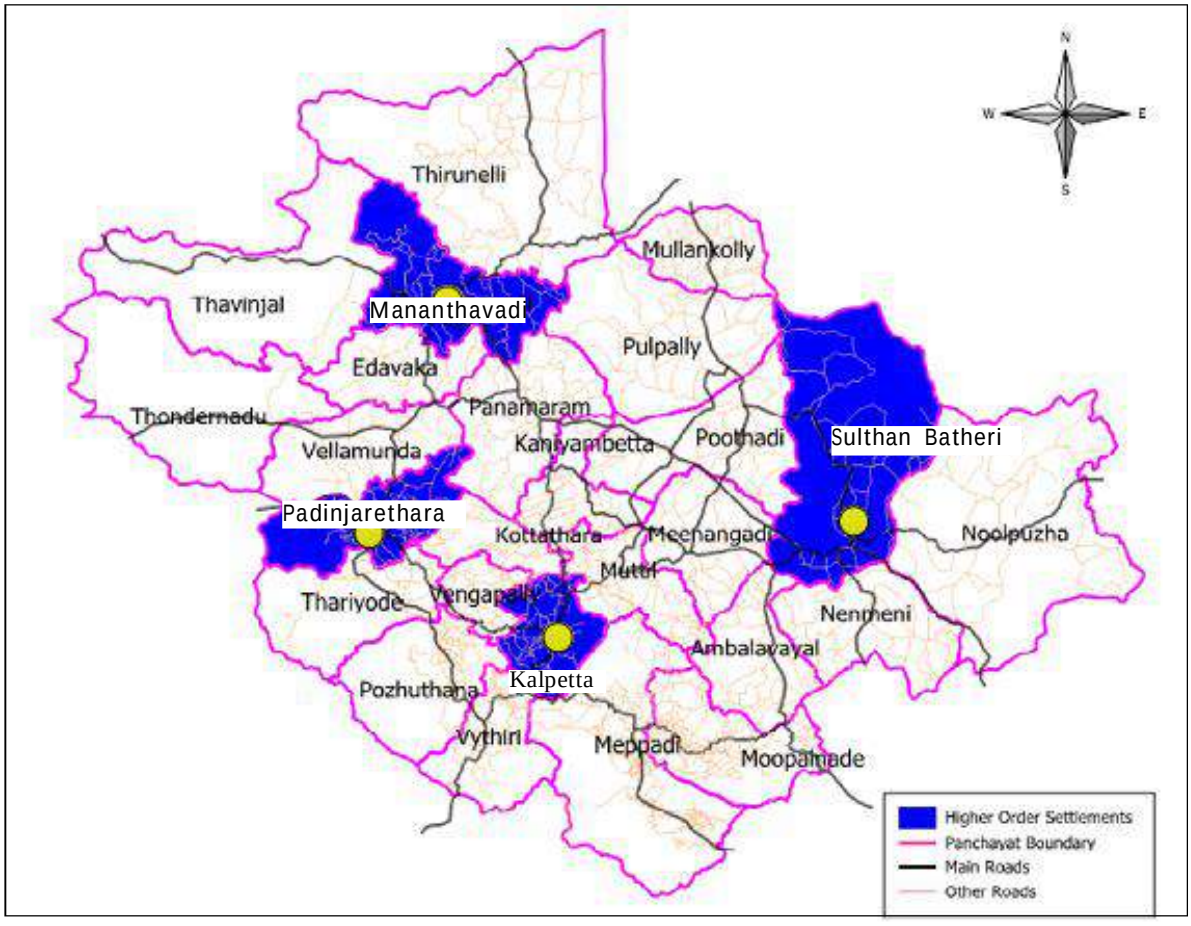


Fig 8.4 Existing and proposed higher order settlements

4. The service settlements of Padinjarethara are forest land use dominated Panchayats.

5. The travel distance from the service settle ments of Padinjarethara to Mananthavadi/ Kalpetta (Existing Higher Order Settlements) is around 25 Km.

From the above reasons, it can conclude that, Padinjarethara is not having the potential for developing as a second order settlement and there is not much need of a second order settlement in the forest dominated western area. Hence in the final proposed hierarchy, Padinjarethara can be considered as a third order settlement instead of second order.

Identification of the service area of higher order settlements.

For further analysis, (existing and new) higher order settlements were plotted. The service area of the higher order settlements to be demarcated (Here Crystallors theory is applied). For this purpose, estimated the population to be served by a higher order settlement. There are four higher order settlements and hence population to be served is 25% of total population of the district. Next is the estimation of area of the service area of hexagon. The equation used for estimating the area is,

Area of service area of Hexagon in shape =	(Population to be served by one higher order settlement) / (Average population density in the zone).

For estimating the average population density of zones, perpendicular bisectors to the line joining the higher order settlements were done. Four zones were delineated by joining these perpendicular bisectors (Fig 8.5). The panchayats coming under each zone were

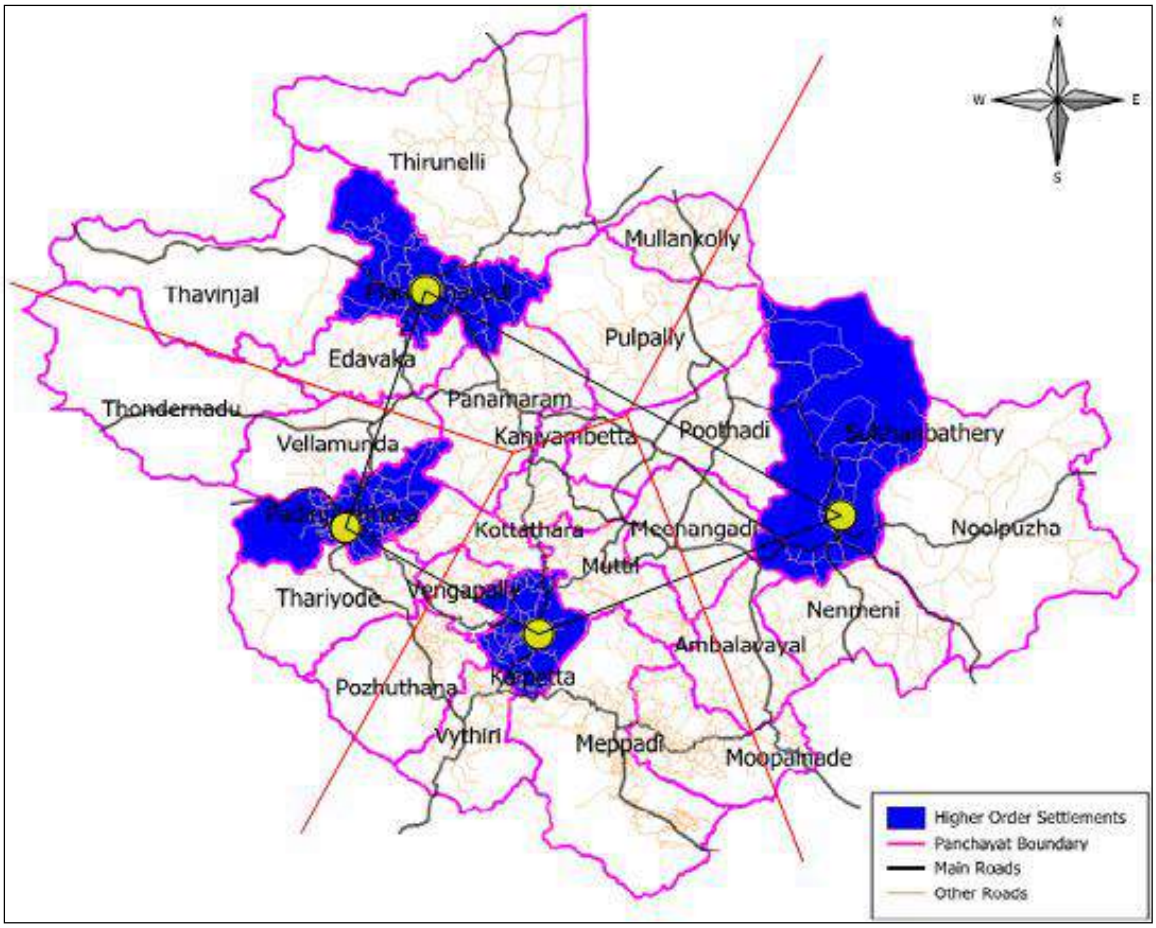


Fig 8.5 Identification of Service zones of higher order settlements.

identified and average population density of these was calculated. The service population in each zone is shown in the table 8.2.

area due to low population density. From this area, sides of the hexagons were calculated and the hexagons were placed on the map (Figure 8.6).

Table 8.2 Second order settlements, its service area & service population

Second Order settlements	No:	Service settlements	Service Population		Total service Population	
			2001	2021	2001	2021
	1	KALPETTA	29612	36378		
	2	MEPPADI	39849	48954		
	3	MUPPAINADU	24033	29524		
	4	VYTHIRI	17820	21892		
	5	POZHUTHANA	17397	21372		
	6	KOTTATHARA	16636	20437		
	7	VENGAPPALLY	11072	13602		
	8	MUTTIL	31227	38362		
KALPETTA	9	KANIYAMBETTA	29516	36260	217,162	266,781
	1	SULTHAN BATHERI	42059	51669		
	3	NENMENI	44096	54172		
	4	POOTHADI	39687	48755		
	5	NOOLPUZHA	26184	32167		
	6	MEENANGADI	32067	39394		
	7	PULPALLY	34293	42129		
SULTAN BATHERI	8	AMBALAVAYAL	34345	42193	252,731	310,479
	1	MANANTHAVADI	45477	55868		
	2	PANAMARAM	42922	52730		
	3	EDAVAKA	31168	38290		
	4	TAVINJAL	38654	47486		
	5	THIRUNELLI	27450	33722		
MANANTHAVADY	6	MULLANKOLLI	29519	36264	215,190	264,360
	1	VELLAMUNDA	36415	44736		
	2	THARIYODE	11843	14549		
	3	THONDERNADU	22455	27586		
PADINJARETHARA	4	PADINJARETHARA	24823	30495	95,536	117,366

Service areas of hexagons were calculated using this average population density.

The areas obtained for each zones are

1. Zone 1 (Mananthavadi area) :452.40 SqKm
2. Zone 2 (Sulthan Batheri area) : 418.92 SqKm
3. Zone 3 (Kalpetta area) :391.85 SqKm
4. Zone 4 (Padinjarethara area) :577.51 SqKm

Here zone 3 have smaller service area due to high population density and Zone 4 have higher service

Small adjustments were done on these hexagons. The final service areas are shown in figure 8.7.

From figure 8.7, it can be concluded that, whole Wayanad district is getting service from these higher order settlements. But for availing these services a person from the boundary region of the hexagonal service area has to be traveled around 14 Km. The desired distance for availing a higher order facility is 6 to 8 Km. Hence for making available the facilities in a distance of 6 to 8 Km, few third order settlements should be identified in between the higher order settlements.

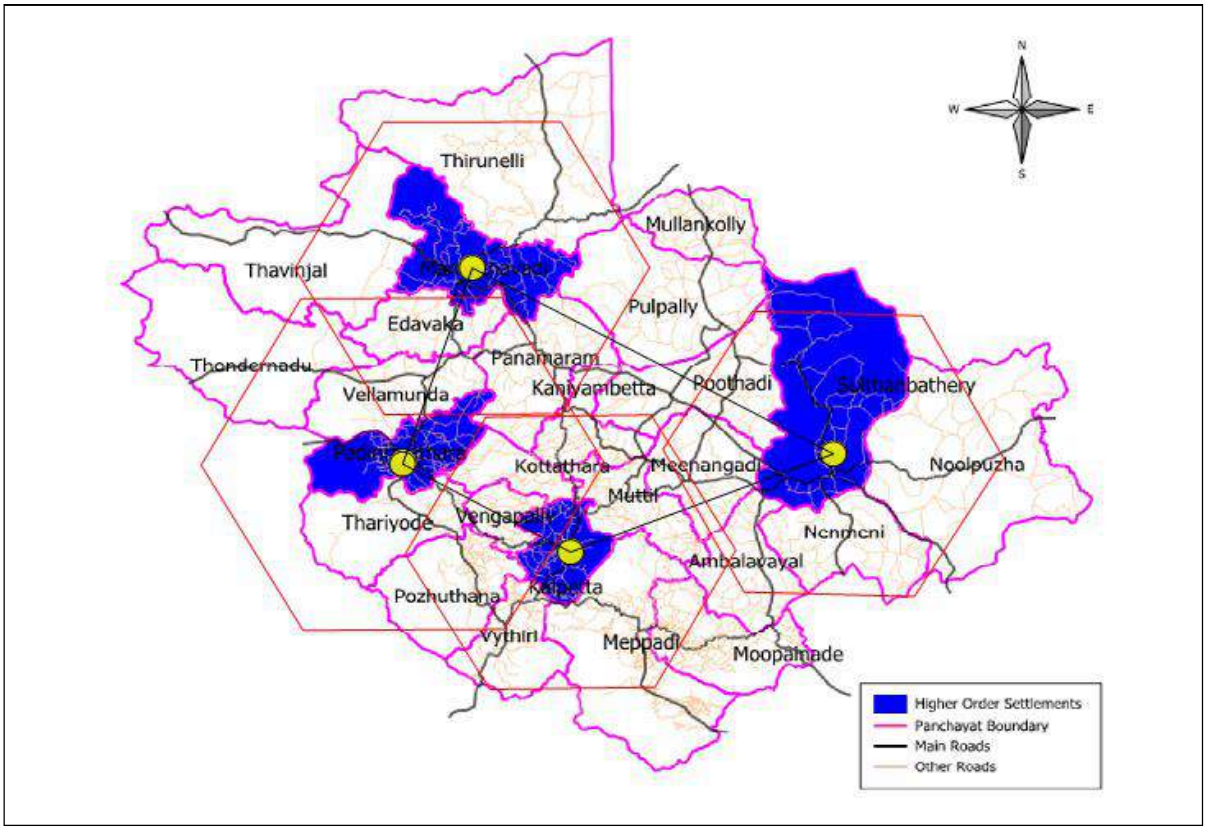


Fig 8.6 Service area of higher order settlements.

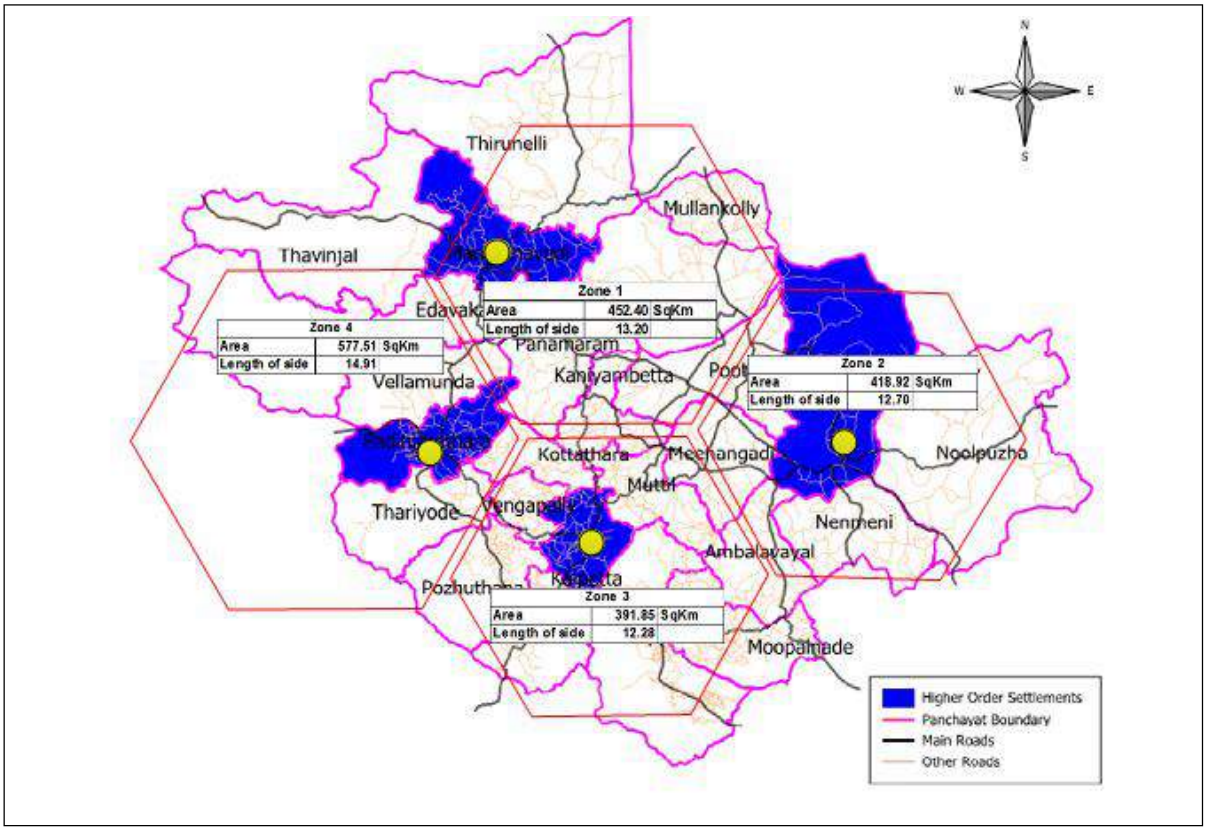


Fig 8.7 Adjusted Service area of higher order settlements.

Identification of third order settlements.

At the time of identification of third order settlements, the higher order settlements can also be considered as third order settlements with smaller service area. So here existing and proposed higher order settlements were considered as third order settlements with 8Km sized service area. While plotting these hexagons (Fig 8.8), few gaps were identified.

Five local bodies were selected at this gap area for acting as third order based on centrality, connectivity and existing hierarchy. The identified five local bodies are

1. Panamaram: Block head quarters. Hill highway towards Mysore passing through it. Having ex cellent development potential
2. Pulpally: Panchayat with agricultural domina tion. But shows higher growth in commercial and tertiary sector than adjacent Mullankolly and Poothadi panchayats.
3. Meenangadi: shows greater growth potential. Having good connectivity to most of the major local bodies in Wayanad district. NH 212 Pass ing through this panchayat.
4. Meppadi: Grama panchayat dominated with agricultural and plantation land use. SH to Ooty is passing through it. Chances of developing as an educational hub of the district, because of the proposals of Engineering and Medical colleges.
5. Thavinjal: Agricultural and forest land use. Shows higher growth potential than adjacent Thondernadu and Edavaka panchayats. The only Govt. Engineering College in Wayanad District is functioning at this grama panchayat.

The radius of hexagonal service area is taken as 6 Km for the identified third order settlements. The spatial distribution of the third order settlements and their service area are shown in figure 8.9.

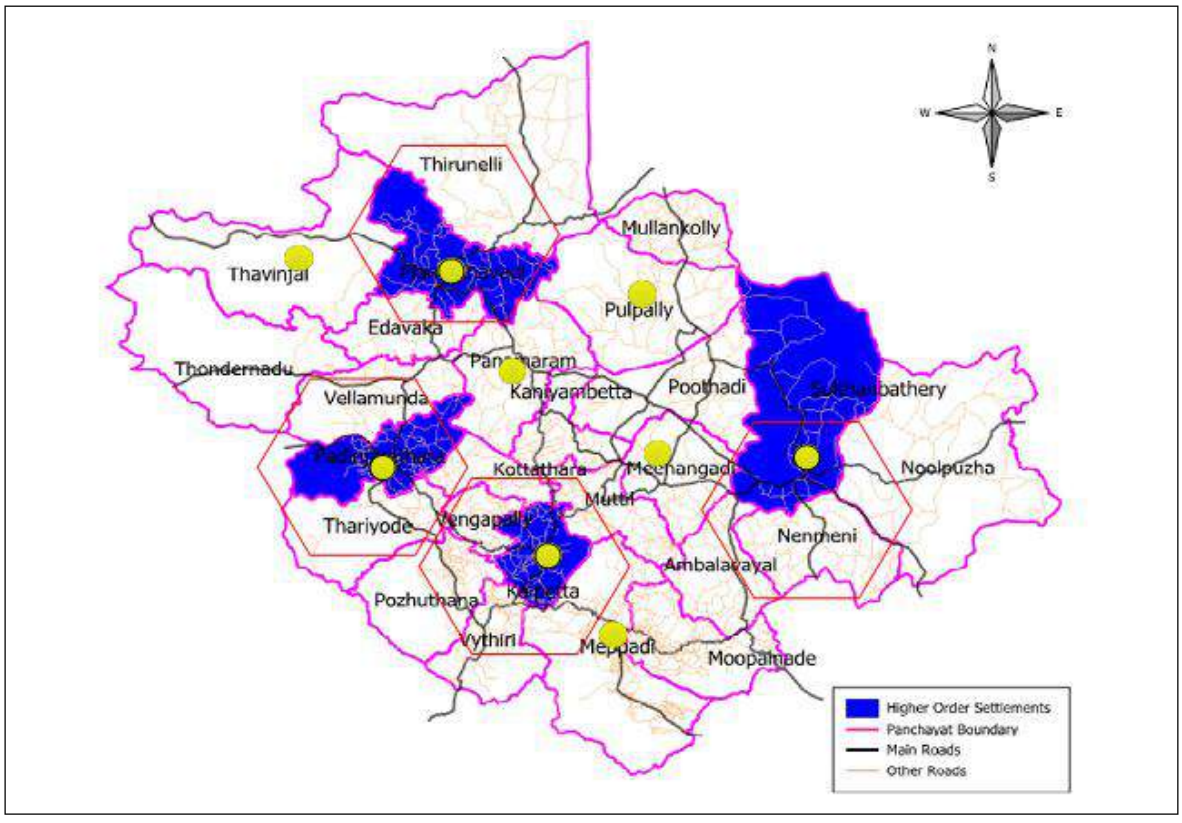


Fig 8.8 Identification of Third order settlements.

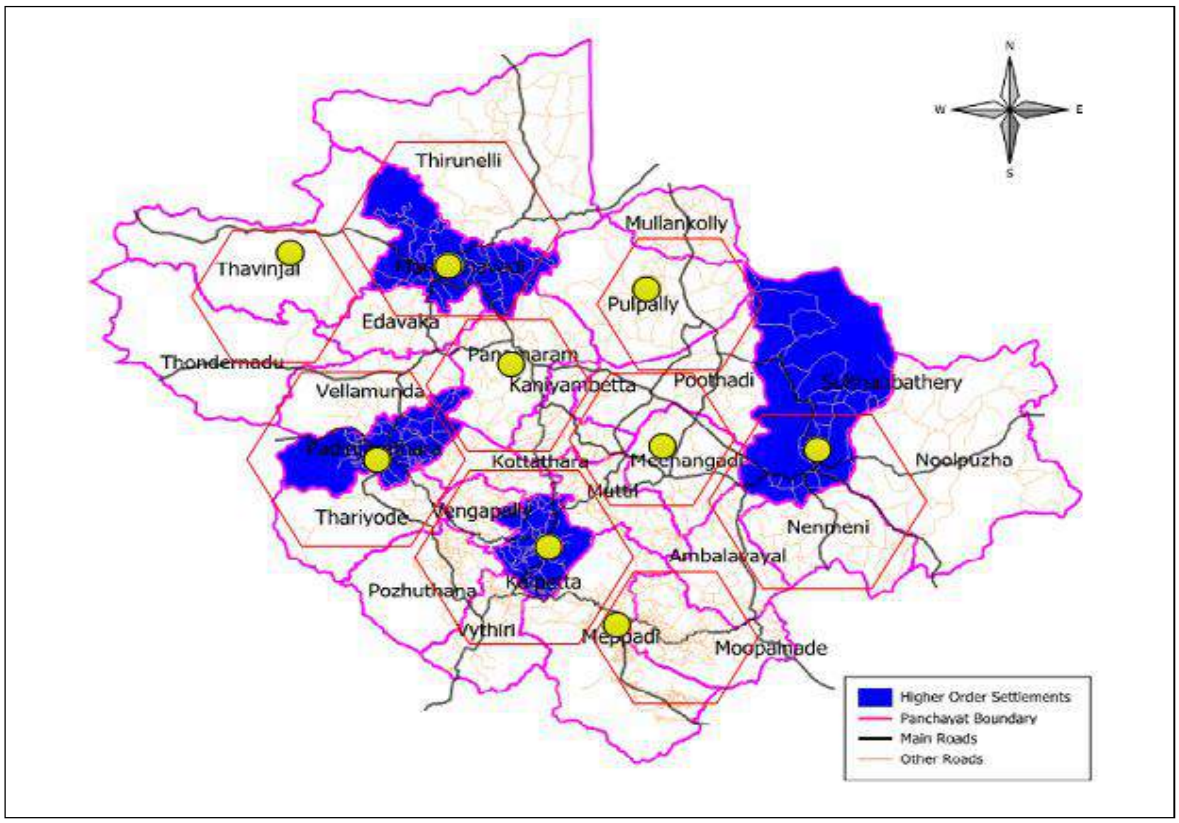


Fig 8.9 Adjusted Third order settlements.

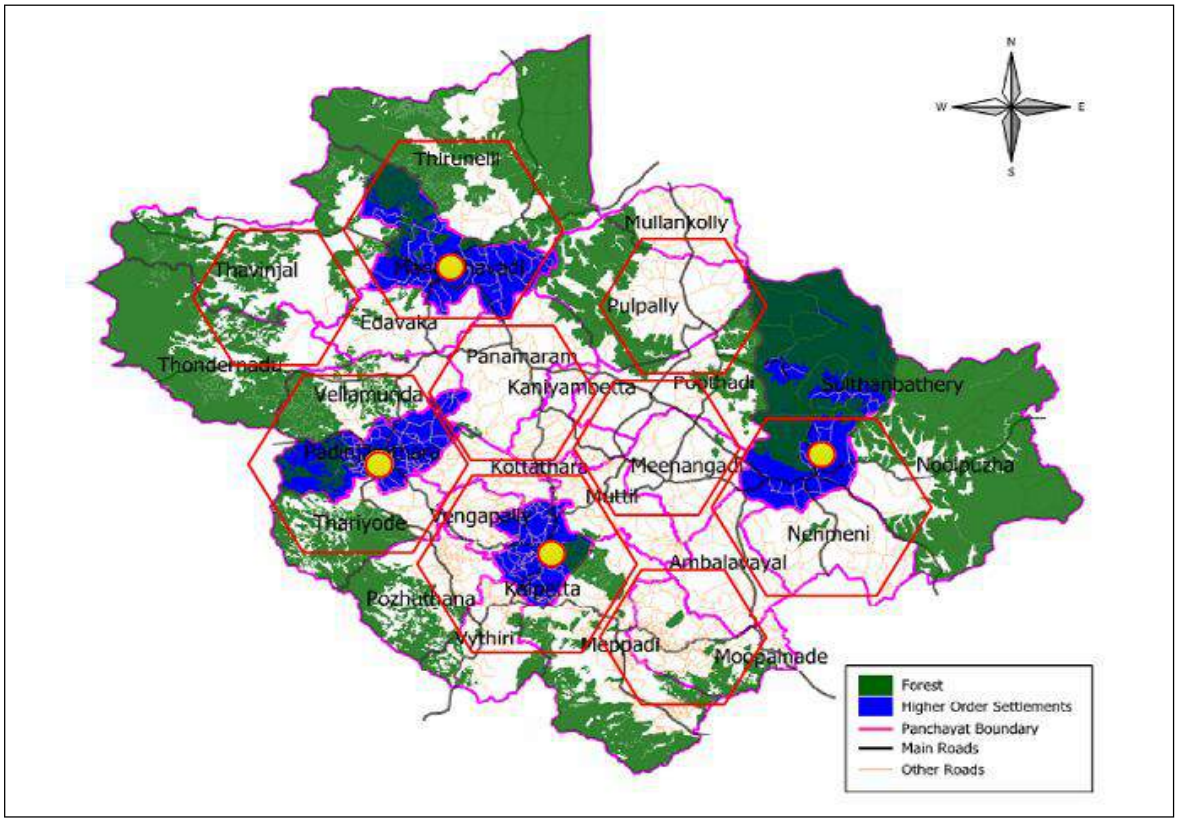


Fig 8.10 Final Third order settlements with forest land use

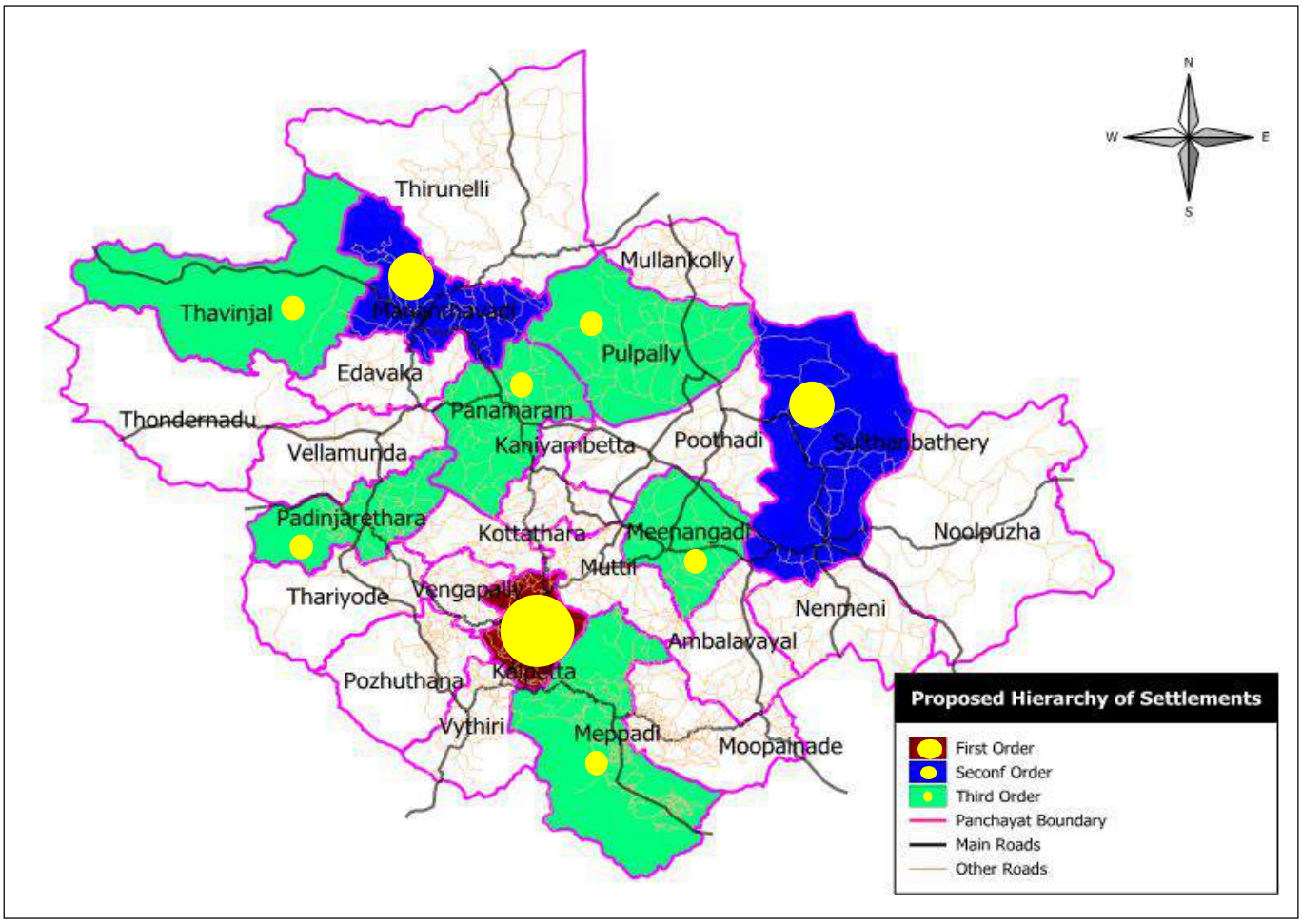


Fig 8.11 Suggested Hierarchies of Settlements.

When looking at the figure of final third order settlements and their service area (Fig 8.9), still few areas look un-served. The un-served areas are major portions of Sulthan Batheri grama panchayat and Noolpuzha grama panchayats, portions of Thirunelli grama panchayat, Mullankolli grama panchayat, Meppadi grama panchayat, Thondernadu grama Panchayat, etc. But all these areas are forest land dominated area. It can be seen from figure 8.10 that the whole area of Wayanad is served from proposed third order settlements except the forest areas. The proposed hierarchy of settlements is show in figure 8.11. Here one first order , two second order and six third order settlements were proposed.

8.3 INFERENCE

CFI analysis revealed that, Wayanad district is having one first order settlement and two second order settlement. All remaining panchayats have CFI Values less than 100. This is solid evidence of rural nature and poor urbanisation of Wayanad district. As per the proposed hierarchy of settlements, there is one first order settlement, two second order settlements and six third order settlements. The character wise analysis of these higher order settlements shows that, the first and second order settlements shows urban nature. Most of the third order settlements are with semi rural character and in near future, they will attain semi urban character.

Chapter – 9
URBAN PROFILE

9.1. TREND OF URBANIZATION – KERALA

At the turn of the 20th century, Kerala had a population of 63.96 lakhs, of which 59.42 lakhs were in its rural areas (source census 2001, p 17). This constituted 92.89 percent of the total population of the state. At the end of the 20th century the total population in Kerala has increased to 3.18 crores (31838619) of which rural population is 2.35 crores (table).This means that the rural population constitutes about 74 % of the total population on 2001.

There is an increase of about 400% in the total population of Kerala within a century. During this period rural population has increased by 300 %. Rural population content in Kerala has declined from 92.89% to 74% of the total population within a century. This is an indication on the trend of urbanization in Kerala that has happened in a century.

There is a steady decline in the population growth rate over the last three decades. Population growth rate was 19.24% in 1981 and it reduced to 9.42% in 2001. During the period 1981-91 population of 36.45 lakhs were added to the previous decades population, whereas during the period 1991-2001, population of only 27.4 lakhs were added. The growth rate of urban population of Kerala over the last three decades shows that it is in a transition phase. Over the last two decades (1971-81 and 1981-91) growth rate in urban population was on the rise, 37.64% in 1981 and 60.97% in 1991. But the urban population growth rate has drastically declined to 7.64% in 2001 with a decrease of 87.5% over the preceding decadal urban population growth rate. At the same time the growth rate in total population has decreased from 14.32 % to 9.42% only with a decrease rate of 34.2%.

Table 9.1 Trends in urbanization of Kerala - 1981-2001

Year	Total population	Total urban population	Percentage of urban population	Growth rate of total population	Growth rate in urban population
1981	25453680	4771275	18.74	19.24	37.64
1991	29098518	7680294	26.39	14.32	60.97
2001	31838619	8267135	25.97	9.42	7.64

9.2. URBAN AREAS IN THE DISTRICT

There is one designated urban area in the district, Kalpetta municipality by virtue of it being the district headquarters of Wayanad. Kalpetta was declared a municipal area only in 1990. From the various analysis it can be seen that, of the other panchayats in the district, Mananthavady and Sulthan Bathery are developing at a faster rate by virtue of their locational aspects. There are junctions of major traffic corridors and have got comparatively higher potential for future development. They serve as collection and distribution centers. Because of their locational aspect, they serve as the service center for the surrounding panchayats. Kalpetta is the administratic headquarters of the district. It also acts as the service center of surrounding panchayats. The census urban areas of Wayanad District is shown in the figure 9.1

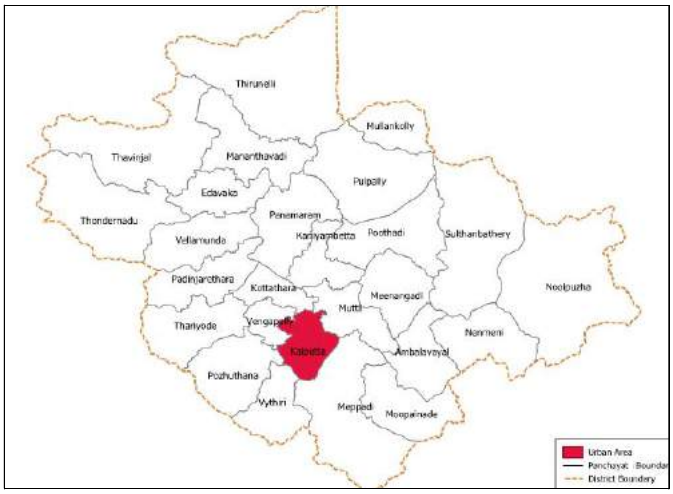


Fig 9.1 Urban area in the District.

9.3. URBAN POPULATION CONTENT (EXISTING)

The process of urbanization of an area can be assessed in relation to its urban population content. The urban population content of Kerala state is 26%, whereas that of the District is 3.8%. On comparing the urban content of all the 14 Districts of the State, it can be seen from the table 9.2 that Wayanad District is positioned in the 14th rank. Though the district account for 2.31% of total population of the state, it constitute only 0.3% of total urban population. This indicates the lesser degree of urbanization in the district. The urban area of the district is 1.6% of the state urban area and 0.3% of the state urban population live in this area. This explains the lesser density of urban area in the district compared to that of the state and also shows that the process of urbanization is rather slow in Wayanad District.

9.4. GROWTH RATE OF URBAN POPULATION

District is least urbanized in Kerala state with only 3.41% of the population living in. There is only one urban area ie., Kalpetta Municipality but as per out field observation there are many nodes like Mananthavady, Sulthan Bathery, Meenangady, Meppadi, Vythiri enjoys more as an urban status area. Especially Sulthan Bathery and Mananthavady, which are much bigger than Kalpetta urban area and functionally, are more urbanized than Kalpetta town. figure 9.2 shows the decadal variation in the urban population of Wayanad District from 1991 to 2001 with male and female shares.

Table 9.2District wise percentage of urban population

District	Population 2001				Urban Content Rank 2001
	Urban	Rural	Total	% Urban	
Kannur	1212898	1196058	2408956	50.3	1
Ernakulam	1477085	1628713	3105798	47.6	2
Kozhikode	1101157	1777974	2879131	38.2	3
Thiruvananthapuram	1091661	2142695	3234356	33.8	4
Alappuzha	621457	1487703	2109160	29.5	5
Thrissur	839433	2134799	2974232	28.2	6
Kasargod	233700	970378	1204078	19.4	7
Kollam	465978	2119230	2585208	18	8
Kottayam	299808	1653838	1953646	15.3	9
Palakkad	356575	2260907	2617482	13.6	10
Pathanamthitta	123798	1110218	1234016	10	11
Malappuram	356170	3269301	3625471	9.8	12
Idukki	57593	1071628	1129221	5.1	13
Wayanad	29612	751007	780619	3.8	14

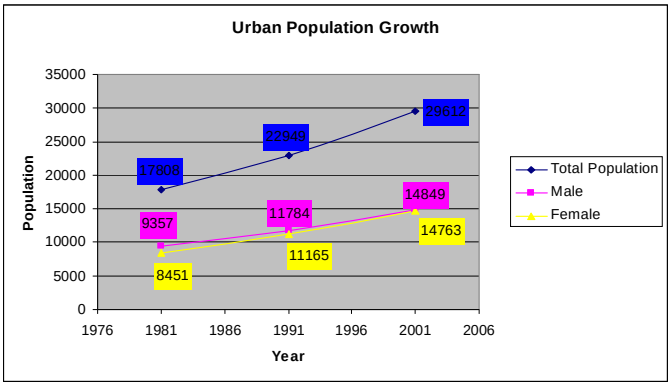


Fig 9.2 Urban Population Growth.

9.5. URBAN SETTLEMENTS – FROM 1971 TO 2001

The district consists of four blocks and a municipality. There are 25 grama panchayats in the district of which 14 are special grade Panchayat. The only statutory urban area is Kalpetta, the district headquarters. There are 49 villages in the three taluks of the district.

Table 9.3 Urban settlements in different period of time

Census year	Total number of Urban area	Municipal corporation	Municipal Towns	Urban out growth	Total Urban area (sq km)
1981	0	0	0		
1991	1	nil	1	22949	40.74
2001	1	nil	1	29612	40.74

9.6. FUTURE URBANIZATION PROFILE OF THE DISTRICT

The analysis of the occupational structure of the District shows that the production sectors- i.e., the agriculture and industrial sector, shows declining trend in the district. The only sector, which shows growth, is the service sector. More than 50% of the total urban population depends on the service sector for their lively hood. It is observed that rural area of the district is also slowly withdrawing from the primary sector and started depending more on the service sector. Because of this shift in the occupational structure some of the rural areas will be having more than 75% of the male workers in the non-agricultural category in the near future and hence will fall in the category of census urban. Hence there may be significant increase in the urban populations well as in the extent of urban areas of the District in the future, though the urban populations content of the existing urban areas show a narrow increasing trend. In the following paragraphs, the future urban local bodies are delineated based on the three fold census classification as per census 2001, and the result are further iterated with the factors like impact of proposed urban development projects, grade of the local bodies and hierarchy of settlements.

Census Urban Areas

In 2001 census the workers are classified into four fold categories namely Cultivators, Agricultural labourers, House Hold industrial workers and other workers. From this it is not possible to sort non agricultural workers. Hence nine fold classifications of workers in 1991 with correction (i.e. contribution of marginal workers also added) is taken and it is projected to 2001 and to 2021. Percentage of non agricultural male workers in the year 2021 varies from 10% to 67% in different Panchayats of this district, but is less than 75%. Hence there is no census urban local body in this district in the year 2021 also.

Grade of local bodies.

The grading of local bodies is given comparing their physical and economical development. So here in the absence of direct data to assess the physical and economic development, the grade of Panchayat can be taken as a proxy indicator to measure the physical and economic development of the local body. There are 14 special grade Panchayats in this district (Fig 9.3).

1. Ambalavayal
2. Mananthavadi
3. Meenangadi
4. Meppadi
5. Mullankolli
6. Muppainad
7. Muttil

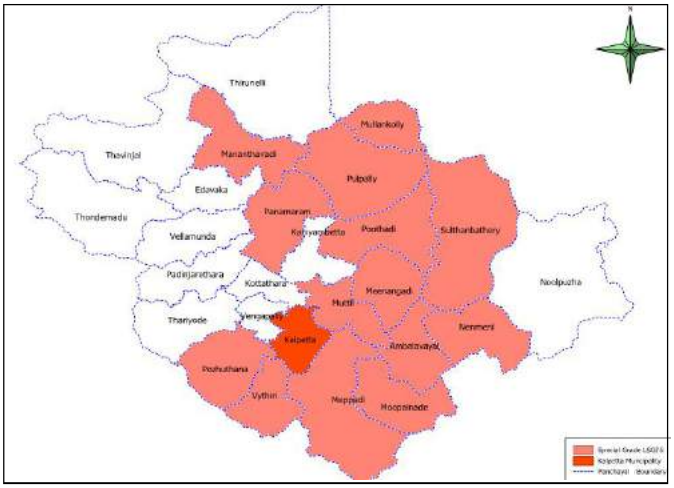


Fig 9.3 Special grade local bodies

Cumulative Functional Index

Here the criteria of cumulative functional index above 50 are considered. There are 11 local bodies in the district having CFI >50.

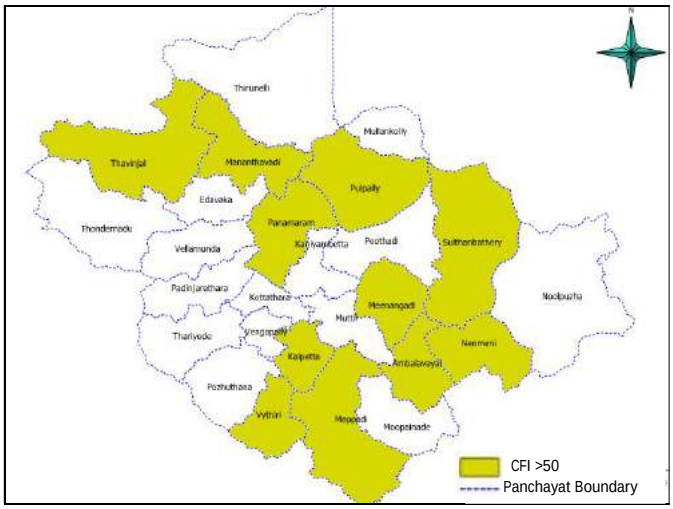


Fig 9.4 Local bodies having CFI>50

1. Meppadi
2. Thavinchal
3. Panamaram
4. Nenmeni
5. Ambalavayal
6. Pulpally
7. Vythiry
8. Meenangadi
9. Sulthan Bathery
10. Kalpetta Muncipality
11. Manthavady

Proposed Hierarchy of Settlements

Out of the total 26 local bodies, one first order local body, two second order local bodies and 6 third order local bodies are included.

First Order

1. Kalpetta Municipality

Second Order

1. Sulthan Batheri
2. Mananthavadi

Third order

1. Panamaram
2. Pulpally
3. Meenangadi
4. Meppadi
5. Padinjarethara
6. Thavinjal

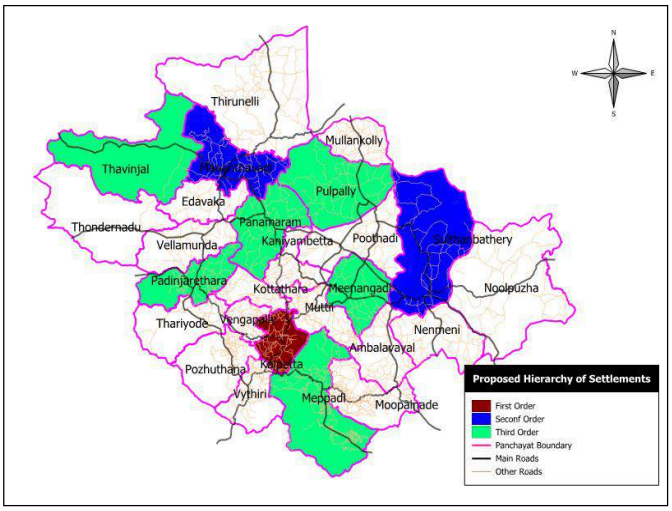


Fig 9.5 Proposed hierarchy of settlements

Local bodies with CFI>50, and special grade Panchayats having hierarchy of first second or third order together are considered as future urban local bodies. There are 9 local bodies satisfying all these conditions.

1. Kalpetta Municipality
2. Mananthavadi
3. Sulthan Bathery
4. Panamaram
5. Meenangadi
6. Meppadi
7. Pulpally

Before finalizing the future urban local bodies of the District, the upcoming development Project in various Panchayats and their impact are also to be studied.

Perspective in urban development.

There are lots of committed and ongoing projects in Wayanad. The details of the projects and their location are given in the table 9.4

Table 9.4 Committed and ongoing projects

Sl. No	Name of Local body	Name of Project	Remarks
1	Mananthavady	1. Central School	Only proposal- land acquisition initiated
		1. Kannur University Campus	Ongoing
2	Edavaka	2. Kalan College of Arts and Science	Ongoing
3	Meenangadi	1. HRD Applied Science College Mylampadi	Ongoing
		2. Panchayat Stadium	Construction nearing completion
		3. District Cricket Stadium	Construction ongoing
		4. Bio diversity Park	Ongoing
4	Meppadi	1. Continental College of Engineering	-Private Institution
		2. Industrial School	-TVS Group of Companies
		3. MIMS Hospital Unit	-Only Proposal Stage
		4. Uravu, Mandad	-Handicraft items using Bamboo
		5. Medical College	Private Institution, at proposal stage
5	Muttil	1. Food Park	Land acquisition Completed
		2. Bus Stand	Work started
6	Nenmeni	1. Brahmagiri meat processing unit	Work ongoing. Intended to produce, process and export meat products
		2 Womens ITI	Ongoing
		3. Fruit and Vegetable Market	- Building construction completed. Intended to produce, process and export fruits and vegetables with aid of European Economic counsil.
7	Padincharathara	Banasura Tourism Project	By utilizing the Earthen Dam and its ayacut area initiated by KSEB and DTPC.
8	Poothadi	Drinking water project at Athirattukunnu	Ongoing
9	Pulppally	Archery Institute at Kolarattukunnu	Ongoing
		Arts and Science college	Committed
10	Thondernadu	Mini Industrial Estate	Ongoing
11	Vellamunda	Bus Stand	Ongoing
12	Ambalavayal	1. Kaduvakkuzhi Tourism Project	Only proposal(Foundation stone laid) In connection to Edakkal Caves in Wayanad
		2. Edakkal Caves	Heritage Tourism spot. (Centrally protected Heritage Precinct)
13	Vythiri	Veterinary University	Recently Announced by the Government.
14	Kalpetta Muncipality	1. Bus Stand	Ongoing
		2. Drinking water project under UIDSSMT	Ongoing
		3. Milma Plant	Chilling production of Milk and Milk products.
		4. KINFRA Industrial Park	Ongoing
		5. Govt. Hospital at Kainatty	Ongoing
		6. District Stadium at Maravayal	Ongoing

Out of 14 local bodies described in the table 9.4, five were already admitted as future urban based on the former analysis. Major projects are attracted to these settlements, and this strengthening the former analysis results. When looking at the remaining 9 Panchayats in the above table, Muttil and Vythiri Panchayats shows chance for becoming urban. The location of thes panchayats are also plays important role. NH 212 is passing through these panchayats and these two shares their boundary with Kalpetta municipality, the only first order settlement in this District. Hence it can be concluded that, there will be nine future urban local bodies in the district (Fig 9.6).

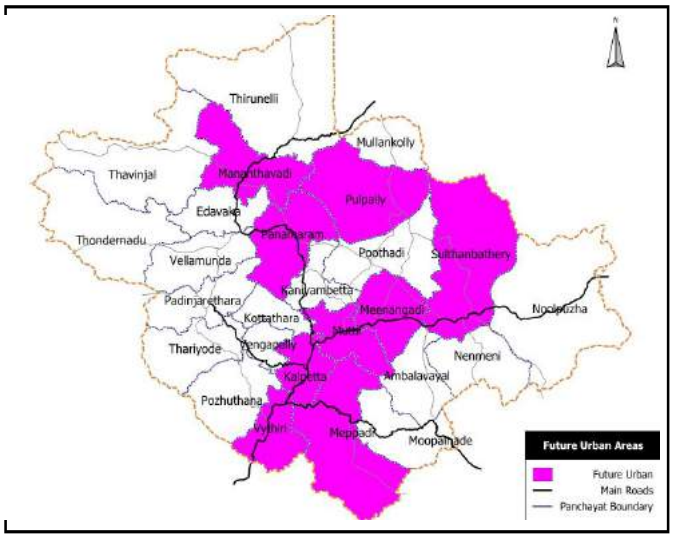


Fig 9.6 Future Urban Areas.

9.7. URBAN PROFILE

The above analysis revealed that, there will be 8 more urban LSGs in the district by the end of 2021. In this, some local bodies are expected to attain the urban character in next decades (2011). The growth rate of population density and present condition of the local body can be taken as deciding criteria by how fast it attains urban nature. It is assumed that, LSGs showing good development potential and having average growth rate of population density more than 20% may attain urban status in 2011 and the remaining local bodies will becomes urban by 2021.This is shown in Table 9.5 and figure 9.7.

Table 9.5 Urban Phasing

Attain Urban Status in	
Year 2011	Year 2021
1. Mananthavady	1. Vythiri
2. Sulthan Bathery	2. Meenangadi
	3. Meppadi
	4. Muttil
	5. Pulpally
	6. Panamaram

It is projected that there will be 10 urban local bodies by 2021, in place of the present 1 urban local body. This increase in the number of urban local bodies

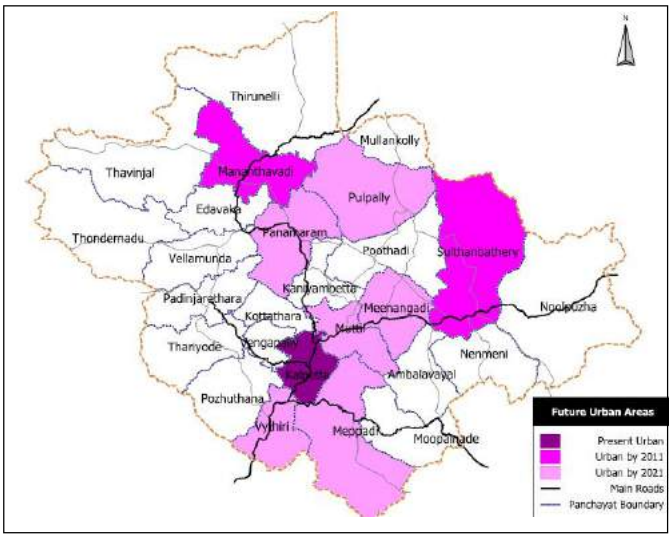


Fig 9.7 Future Urban Profile.

is mainly because of the change in the occupational structure. The Spatial distribution of the 10 local bodies shows that most of these are located along the National Highway and State Highway. The Kalpetta Muncipality act as a nucleus of the urbanization of the District, from which the urban character spreads to the nearby local bodies. The Kalpetta Muncipality and surrounding local bodies will form an urban agglomeration in future.

From the figure 9.8, it can be noted that, the forest land is encroaching the future urban areas. Hence it can conclude that, **Wayanad will urbanise as urban towns instead of urban grama panchayats or urban municipalities**.

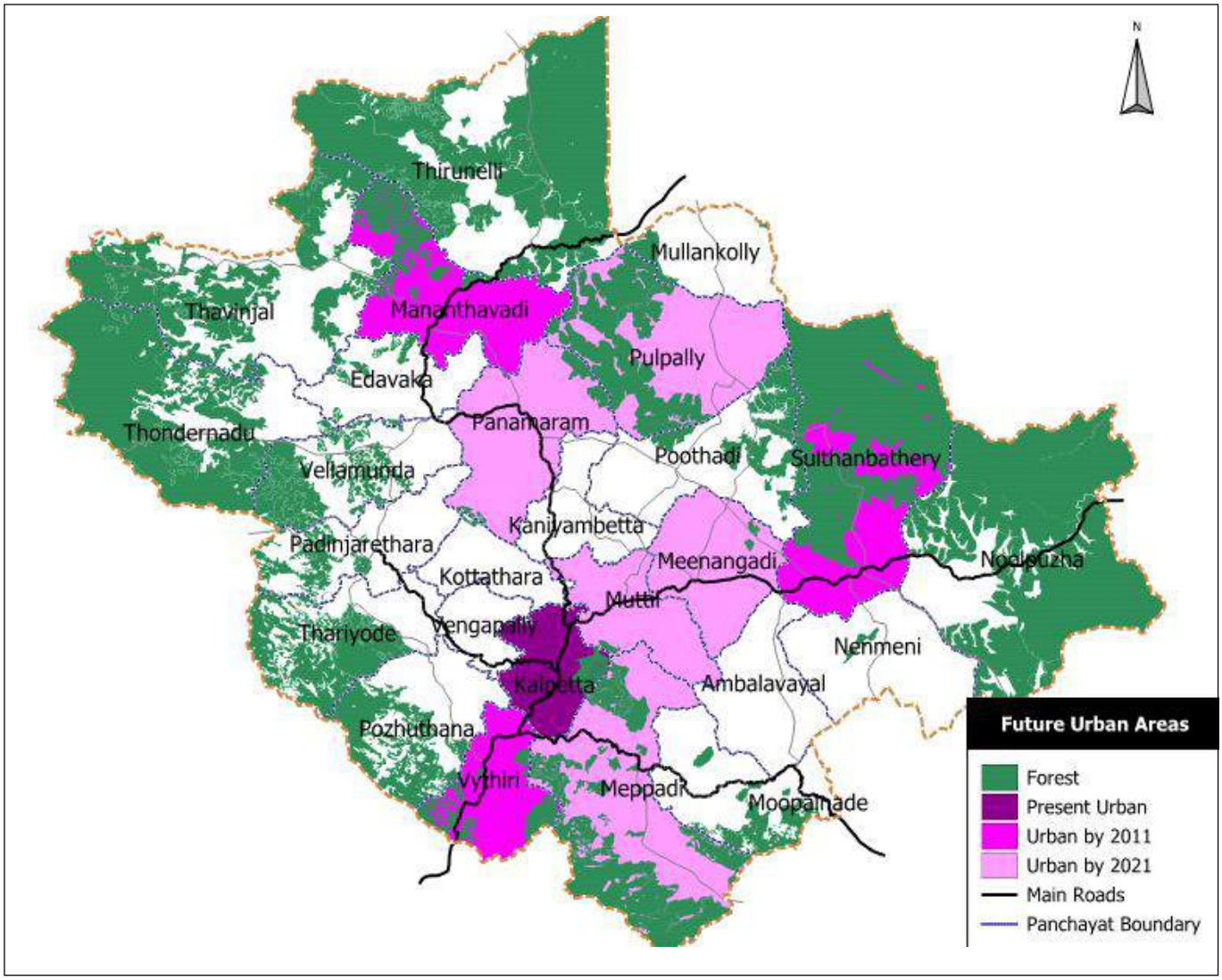


Fig 9.8 Future Urban Profile with forest land.

9.8. INFERENCE

Wayanad is the agricultural District; these agricultural activities concentrated at the rural Region. The people of this district utilized the urban centre for purchasing and selling their commodities. So they do not migrate and settle in this Region. But now the shifting of workers from agricultural to other activities is very high in this district, and this changes the nature of LSG s from pucca rural to semi urban and urban. This may be the main reason for the future 10 number of local bodies in the district by the year 2021 from present single urban local body. While analysing the activity and land use concentrations, it can inferred that ***Wayanad will urbanise as urban towns*** instead of urban panchayats or urban municipalities.

Chapter –10
ACTIVITY PATTERN

The economic activity of a local body in Kerala State will be primary (Agriculture and Plantations) secondary (Industries), tertiary (Service Activities) or a combination of these. In the case of Wayanad district, primary activity is dominant in most of the Panchayats and secondary activity is nominal. The Activity Pattern of a local body is related to a variety of parameters such as the existing population, net population density, growth rate of population in previous decades, distribution of population, occupation structure, expected population and occupation structure in the Plan period, availability of various facilities, existing hierarchy of nodes, connectivity through various modes, locational importance, administrative status, proposed hierarchy of settlements and future urban status, existing land use, impact of ongoing, committed and proposed major developmental projects etc. all these parameters can be grouped under three heads, the land use pattern, Urban Profile, and the Functional Character.

10.1. DESCRIPTION OF LAND USE CONCENTRATION PATTERN

The concentration of land use in a particular local body approximately gives its activity type. If the major share of land use is agriculture and cultivation, the local body is a primary activity area. If the area is filled with industries, it will be coming under secondary activity concentrated area. But from the chapter 5, it is noted that, Most of the grama panchayats are composed of different land uses (Agricultural, plantation, forest, commercial and residential) together. This is evident of the scattered nature of land use. Still 8 urban LSGs were traced from the district. The 8 LSGs categorized as Urban based on land use concentration are Muttil, Meenangadi, Ambalavayal, Nenmeni, Sulthan Batheri, Mananthavadi and Padinjarethara grama panchayats and Kalpetta Municipality. These are shown in red color in the figure 10.1.

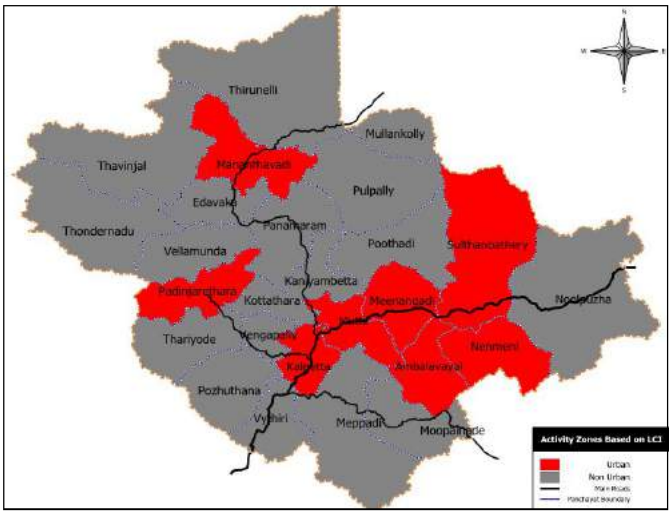


Fig 10.1 Urban LSGs based on land use

10.2. DESCRIPTION OF FUTURE URBAN PROFILE

The Urban Profile of the local body, ie., whether the local body is Urban or Non-Urban in nature, is derived based on the hierarchy of local body based on the availability of facilities, administrative status, urban status, demographic trends, distribution of population, occupation structure, locational significance, regional linkages etc. The future Urban Profile is identified in chapter 9 and the Panchayats showing urban nature are shown in figure 10.2

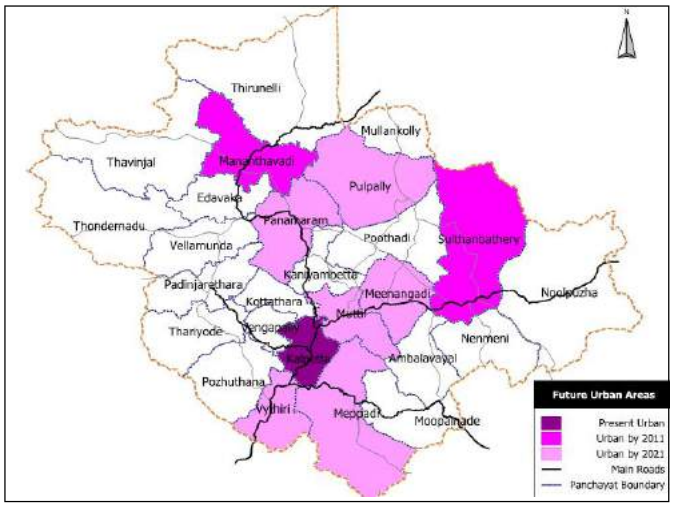


Fig 10.2 Future Urban Profile

10.3.DESCRIPTION OF FUNCTIONAL CLASSIFICATION

The Functional Character of the local body can be Pucca Rural Pucca Urban or a Combination of Both. It is identified in chapter 7. All local bodies in this district shows pucca rural character. The map showing functional character of settlements is given below (Fig 10.3).

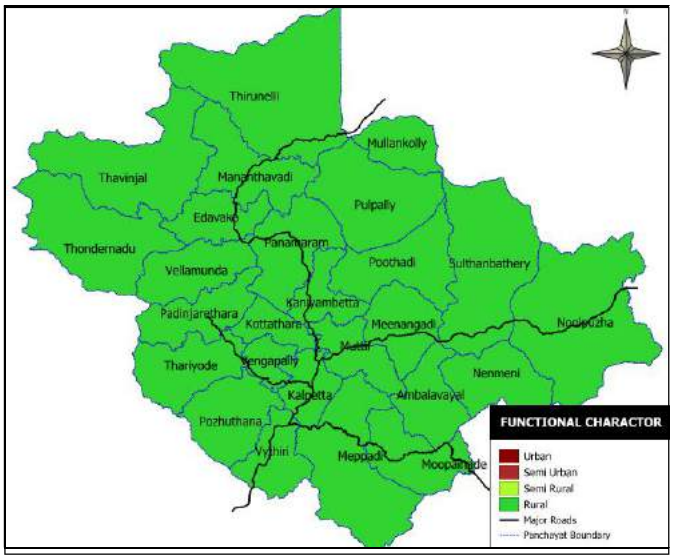


Fig 10.3 Functional Classification of LSGs

10.4. DETERMINATION OF ACTIVITY PATTERN

The activity pattern can be identified by clubbing together the results obtained from the analysis of the land use concentration pattern, Functional classification of local body and the urban profile of the district. Those local bodies with urban profile, land use classification and functional character as urban taken as local body having urban activity.

Table 10.1. Measures for Identifying Activity Pattern.

Activity	Measures		
	Urban Profile	Land Use	Function
Primary	Non urban	Rural	Rural / Semi Rural
Secondary	Urban / Non Urban	Urban	Semi Urban / Urban
Urban	Urban	Urban	Urban

While analyzing these factors, it is clear that, there is no urban local body in this district. But when considering the district head quarter position of Kalpetta municipality and its high pucca urban land use share, it can be considered as a local body having urban activity. Activity based classification of Local bodies is given in the table below.

Table 10.2 Activity Pattern of local Government .

Urban Activity	Primary Activity	Secondary & Tertiary Activity
Kalpetta	Ambalavayal	Mananthavadi
	Edavaka	Meenangadi
	Kaniyambetta	Meppadi
	Kottathara	Muppainad
	Mullankolli	Muttil
	Poothadi	Nenmeni
	Pulpally	Sulthan Batheri
	Vellamunda	
	Vengapalli	
	Panamaram	

From table 10.4, it can inferred that, one settlement shows urban activity, and eight shows Secondary and tertiary activity. Remaining are primary activity and forest land use concentrated area. But, Panamaram Grama Panchayat, which is obtained as a primary activity concentrated area, is now block head quarters and hence its development potential shows a drastic increase.

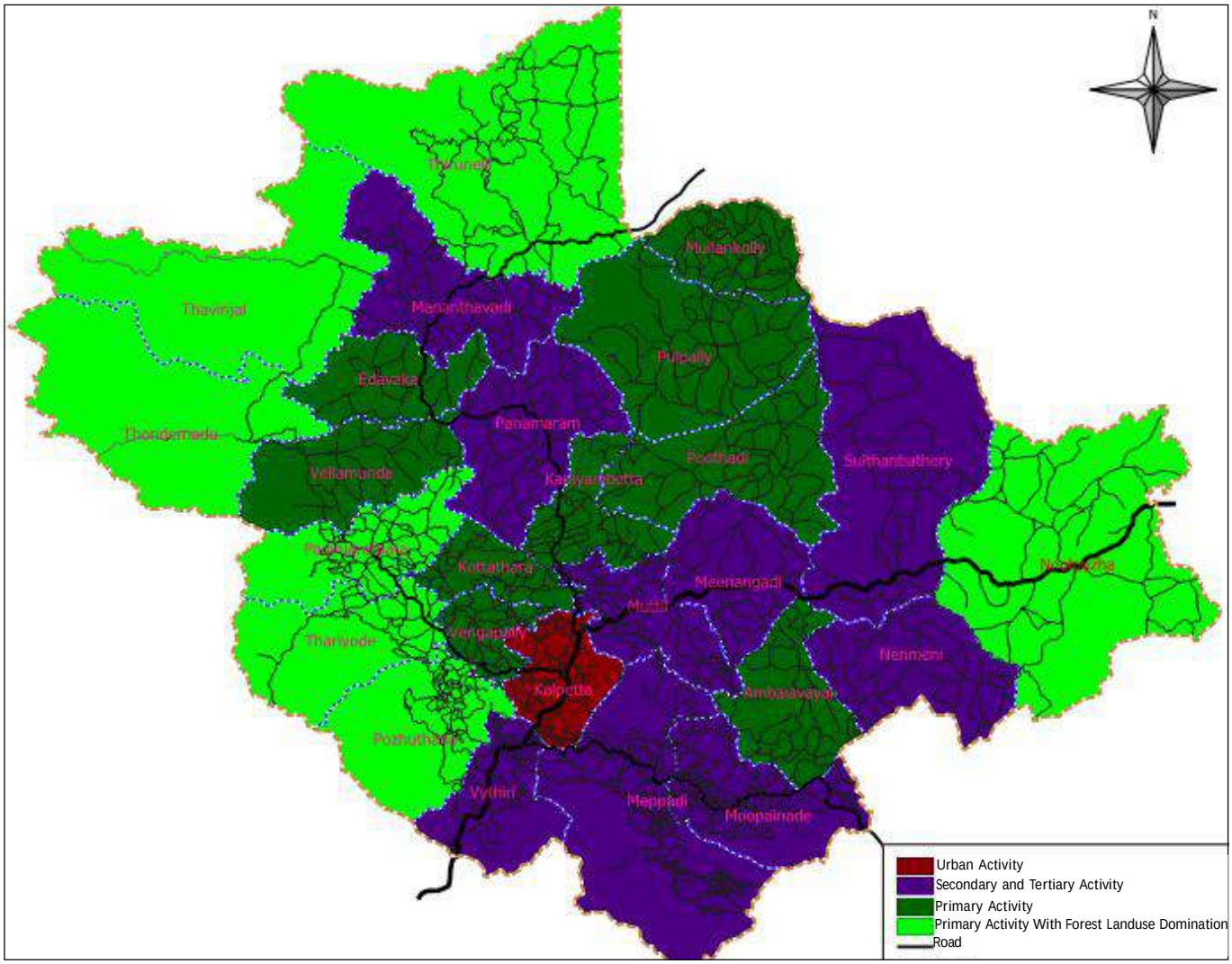


Fig 10.4 Activity Pattern of the District.

Hence in future, Panamaram grama panchayat has to be upgraded as an urban area. Similerly, Vythiri grama panchayat shows both primary and urban activity together. Vythiri is an entry Panchayat to district and a Taluk Head quarters. NH 212 passing through it. Hence in very next future, it will change to urban activity area. The activity pattern of Wayanad district after considering these findings is shown in the figure 10.4.

10.5. INFERENCE

Since Wayanad is an agricultural district with only ribbon development, the major urban activity areas are the settlements along NH and SH. NH 212 passing through 6 local bodies and 5 of them are showing domination in secondary and tertiary activity. Most of the Panchayats, which are not connected with NH or SH shows Agricultural and Forest nature.

Chapter –11
CONNECTIVITY

11.1. INTRODUCTION

The efficiency of the transportation system is an indicator of development. Roads are important channels of movement of people, and the development of the road network in any settlement is the physical manifestation of the extent and direction of the mobility of the people to satisfy their requirement in day-to-day activities, for work, recreation and living.

11.2. ROAD NETWORK

The road network is the most important mode of transportation in the district, connecting almost all-important nodes. The district is served with fairly good network of roads comprising, national highway, state highway, major district roads and other roads. National highway 212 passes through the district connecting important districts Kozhikode on western side and Mysore on the eastern side.

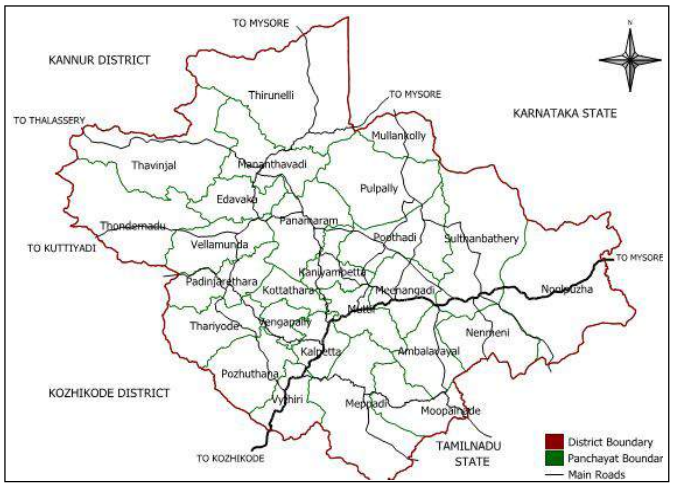


Fig 11.1 Main roads in District

The NH 212 is one of the most important catalysts of economic development in the district. It acts as a vehicular artery of the district. The important Regional Linkages include Mysore – Kozhikode and Kozhikode – Vythiri – Gudallur. Besides, two other networks connecting with districts of Kerala are in Bavely Thalassery Road via Periya (that linking Kannur district) and Gudallur Calicut Road via Thamarassery (that linking it to Calicut and Gudallur).

Main roads in the district are:

NATIONAL HIGHWAYS

1. Calicut – Mysore Road (NH 212)

STATE HIGHWAYS

1. Chundale- Meppadi - Ootty Road
2. Kalpetta – Varambetta Road

HILL HIGHWAYS (PROPOSEL STAGE)

1. Boy's Town – Mananthavady – Tharuvana – Padinjarathara – Poozhithode Road
2. Mananthavady – Panamaram – Kalpetta – Meppadi – Chooralmala – Arunapuzha Road

MAJOR DISTRICT ROADS

1. Thalassery – Bhaveli Road
2. Kattikulam – Tholpetty Road
3. Begur – Thirunelly Road
4. Mananthavady – Kandothuvayal Road
5. Beenachi – Panamaram Road

6. Sulthan Bathery – Pulpally – Perikkalloor Road
7. Pulpally – Payyampilly – Mananthavady Road
8. Mananthavady – Kaithakkal Road
9. Mananthavady – Pakkramthalam Road
10. Periya – Korome Road
11. Kamblakkad – Pallikkunnu – Anchukunnu Road
12. Kaniyambetta – Meenangadi Road
13. Kakkavayal – Kariambadi – Kenichira Road
14. Sulthan Bathery – Noolpuzha Road
15. Pazhoor – Cheeral Road
16. Madakkara – Thazhathoor – Cheeral Road
17. Sulthan Bathery – Malavayal – Ambukuthi – Ambalavayal Road
18. Ambalavayal – Chulliyode Road
19. Vaduvanchal – Kolagappara Road
20. Kumberi – Ambalavayal Road
21. Muttil – Meppadi Road
22. Pozhuthana – Vengappally Road
23. Vythiri – Pozhuthana – Kavummannam Road

11.3. CONCENTRATION PATTERN OF ROADS

Since roads are the only mode of transport, they act as major lifeline of the district and are extremely relevant in case of Wayanad. As explained earlier, there is only one National Highway (NH 212) from west to east. Its carriageway (C/W) varies between 7 to 12 m (See table11.1).

The NH constitutes around 2.0% of the total road length. SH constitutes 3.2% of the total road length of the district. Major District Road (MDR) and ODR account for 74.03% of the total road length in the district. Last in hierarchy are village roads, which account for 18.5% of the total road length of the district.

Wayanad district has an organized public transport system and private bus operators to play as stage carriage services on inter-district and intra district routs. Jeeps are the common modes of transport for both goods and passenger movement in the rural areas. Jeeps provide services for inter – block as well as intra – block movement, they cater to service between 10 to15 kms. Auto rickshaws serve the purpose of movement for intra Panchayat settlements and play only within a distance of 5 to 10 kms.

Table 11.1 Hierarchy of Roads in Wayanad District

Sl No	Road Type	Length (Km)	Percentage (%)	Carriage way width (m)
1	National Highway	60.2	1.84	7 to 14
2	State Highway	103.6	3.17	6 to 8
3	District Roads	2416	74.03	7 to 8
4	Village Roads	605.9	18.57	4.5 to 5.5
5	Other Roads	77.9	2.39	3.5 to 4.0

Road density

From table 11.2 of road density, it can be inferred that, the LSGs with high NH & SH density are relatively developed ones. Road density of Wayanad is around 3.75 Km/1000 Population, which is high compared to National average of 2.6 Km/1000 populations. But in Kerala contest it is relatively low compared to the 4.7 Km/1000 populations. Road density of most of the Panchayats is above 1Km/SqKm, where India's average road density is around 1Km/SqKm. The Panchayats with density less than one are Panchayats having forest land use domination.

Nodes

The agglomeration of activity area around one or more road junctions which act as commercial centre of a local body is termed as a node. While considering agriculture, plantation and forest dominating Wayanad district, chances of having large number of nodes within each local body is very less. In most cases, the nodes are the area where an LSGs head quarters located. The major nodes in the district and the roads creating these nodes are given in the annexe 7

Table 11.2 Local Government wise Road density

Grama Panchayat / Municipality	NH & SH Density (Km/SqKm)
Kalpetta	0.58
Vythiri	0.27
Muppainad	0.23
Vengappally	0.23
Muttil	0.19
Meenangadi	0.16
Panamaram	0.14
Kaniyambetta	0.14
Edavaka	0.10
Sulthan Batheri	0.09
Mananthavady	0.09
Meppadi	0.09
Thariyode	0.07
Noolppuzha	0.07
Thirunelly	0.06
Padinjarathara	0.05
Kottathara	0.03
Vellamunda	0.02
Ambalavayal	0.02
Pozhuthana	0.02
Mullankolly	0.00
Nenmeni	0.00
Poothadi	0.00
Pulppally	0.00
Thavinjal	0.00
Thondernadu	0.00

Grama Panchayat / Municipality	District & Village Roads Density (Km/SqKm)
Vengappally	2.85
Kaniyambetta	2.50
Muppainad	2.48
Kalpetta	2.45
Muttil	2.41
Kottathara	2.37
Padinjarathara	2.11
Mananthavady	2.05
Pulppally	1.90
Meppadi	1.87
Meenangadi	1.84
Nenmeni	1.82
Vythiri	1.82
Ambalavayal	1.69
Pozhuthana	1.64
Poothadi	1.58
Edavaka	1.54
Panamaram	1.54
Mullankolly	1.33
Sulthan Batheri	1.29
Vellamunda	1.17
Thariyode	1.12
Thirunelly	0.99
Thavinjal	0.64
Noolppuzha	0.61
Thondernadu	0.39

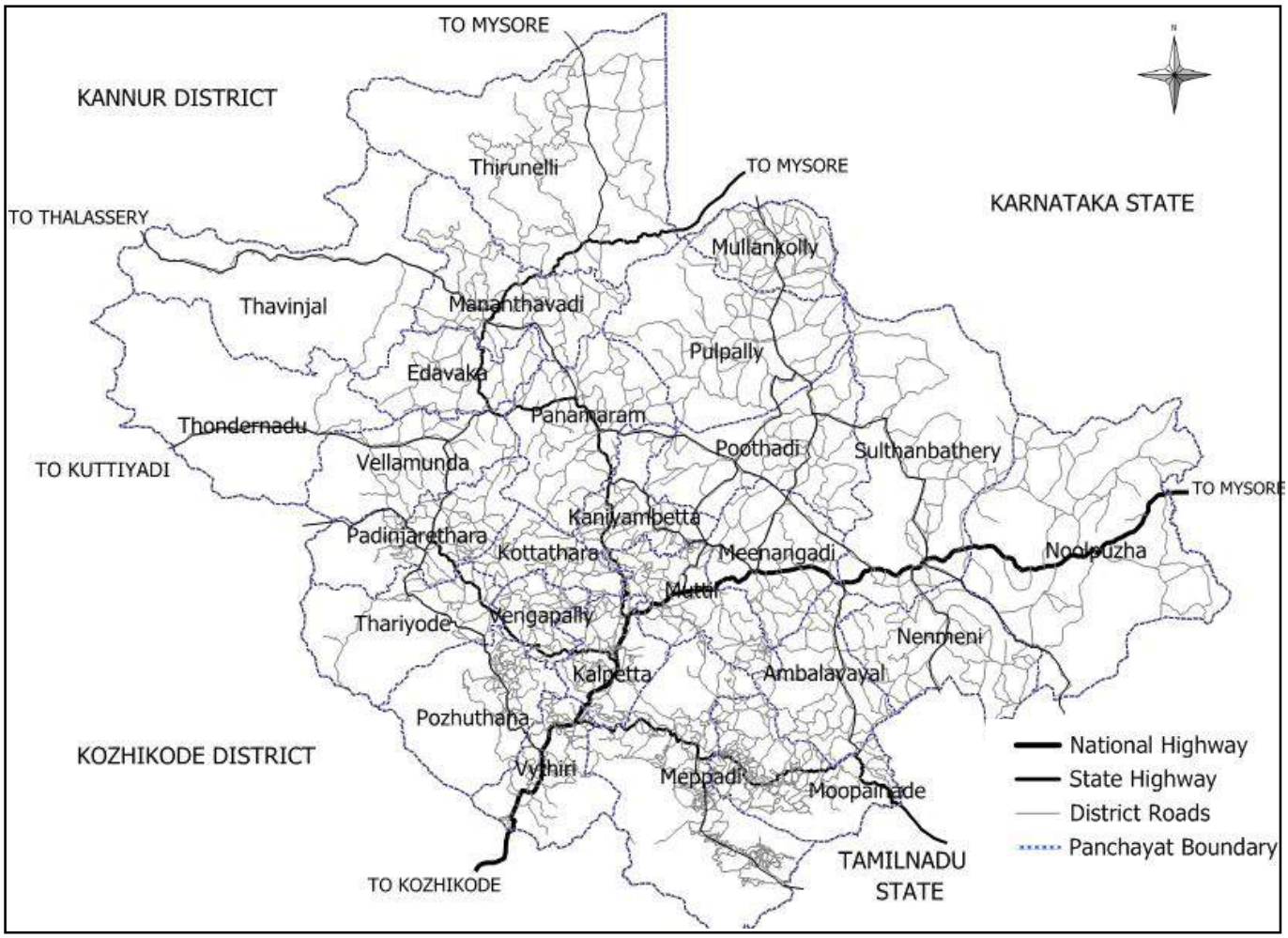


Fig 11.2 Road Network of District

11.4. RAIL NETWORK

At present there is no railway line in the district. Other than Idukki, Wayanad is the only district in the state without railway connectivity. However railway lines extend upto Nilambur from Shornur and Nanjangaud from Mysore. Meppadi – Nilambur rail when materializes will go a long way in improving the accessibility of Wayanad. Nilambur – Vythiri – Thalassery railway line in another important proposal, which will have much greater impact on the development of the region. The financial viability and technical feasibility are to be analyzed. At present the people of the district find Kozhikode as the nearest railway station. Development of railway line should boost regional development.

Airport is also not present in Wayanad district. The nearest airport is Calicut International airport, which is around 100 Km from Kalpetta, the district head quarters. The proposed airport at Moorkanparambu (Kannur District) will be a gift for Wayanad too, since it is located very near to the North West boarder of Wayanad.

11.5. FUTURE ROAD NETWORK

Wayanad acts as a connection area between Karnataka/Tamilnad to Malabar area and central area of Kerala state. NH 212 is a major goods/ passenger corridor. Volume counts on NH 212 reveled that the number of two axial and multi axial trucks is very high compared to the vehicle registration in the district. It is

because of the inter state and inter district movements through it. This large number of goods vehicles creates congestion in major towns in the district and the insufficient carriage way width makes the condition worst. All this necessitates the widening of NH 212 and bypasses for it in major towns.

Night journey through NH 212 is banned and hence the traffic uses Kainatti-panamaram-mananthavadi-kutta road instead of it at the night times. This decreases the level of service of this road drastically. Hence the widening of this route is as necessary as that of NH 212.

From the figure 11.2, it can be noted that, Wayanad district is well connected with MDR, ODR, and VR network except at boundary regions. Most of the boundary area of this district is filled with forest and hence the requirement of well connectivity is less in this area. But these entire Major, Other and Village roads are suffering with lack of sufficient carriage way width, good driving condition, and surface condition. Most of the roads are victims of unplanned development. Hence a major road Maintenance/Upgradation is necessary for this district. Major emphasis should give for the following roads.

1. District has three main urban centers, namely Kalpetta, Mananthavadi and Sulthan Batheri. The link between these three settlements should be streangthened.
2. Nenmeni, Ambalavayal and Meppadi are Panchayats showing good development potential. A connection between NH 212 and these Panchayats are very much essential for their further growth.
3. Padinjarethara Panchayat is connected with Kalpetta and NH 212 through SH. This connection should be extended to Mananthavadi Panchayat through Vellamunda and Edavaka.
4. Panamaram – Tharuvana- Kuttiyadi Road
5. Mananthavadi – Iritty Road
6. Meppadi Chooral Mala Road
7. Roads to Gudallor from NH 212 through Ambalavayal, Nenmeni and Noolpuzha.
8. Meenangadi – Irulam – Pulpally – Mullankolli (to Bhairakuppa) road

Yet Wayanad having well road network, few missing links are present (Fig 12.3).

1. Link between Panamaram-Vellamunda-Kuttiyadi Road and Mananthavadi-Thondernadu-Iritty Road (1)
2. Link for bypassing Mananthavadi Town for Kalpetta Tholpetti Mysore Passengers (2)

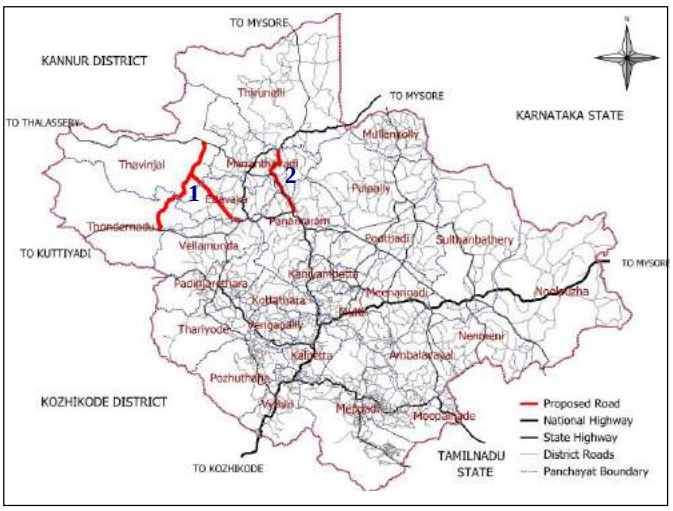


Fig 11. 3 Future Road Network of District

11.6. INFERENCE

It can be concluded that Wayanad district is well connected to other parts of the State by road. The total population of this district fully depends on road net work, because of unavailability of other modes of transport. ODRs and Village roads acts as connecting link between the rural and urban areas. These are widely used for traffic movements inside the district, but are in worst conditions. So the Tourism and other development activities were in blocked condition. Change in this poor condition of roads will improve the economic aspects of the District. Moreover, for reaching the district, road is the only way. Introduction of rail way faces lots of problems due to the high altitude of the district. Currently there are no chances for an airport for Wayanad district. The only air way facility is the air

strip present in Sulthan Batheri Panchayat. Wayanad is now identified as a major tourism spot in the world. Lack of airport, Railway and good quality connecting roads resists the flow of National and International tourists. Wayanad economy is resting on its agricultural and tourism basis. Hence for strong future economic basis, good road network and few more airstrips are necessary for this district.

Chapter – 12
SPATIAL STRUCTURE

The spatial structure of the district can be obtained by overlaying the map of activity pattern, hierarchy of settlements and connectivity. This gives the spatial structure of the district in the present scenario. Taking into account the future prospects the existing spatial structure can be modified.

12.1. HIERARCHY OF SETTLEMENT

As per the proposed hierarchy of settlements, there is one first order settlement, two second order settlements and nine third order settlements in the District. First order settlement and second order settlements show urban nature. Most of the third order settlements are with semi rural character and the remaining order settlements are pucca rural. There are fourteen rural settlements in this district out of twenty six local bodies.

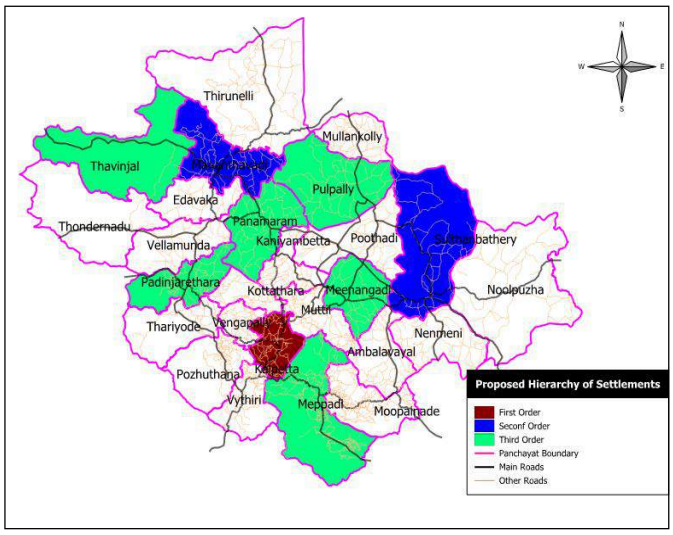


Fig 12.1 Suggested Hierarchy of Settlements.

12.2. ACTIVITY PATTERN

The major activity in Wayanad is agricultural including plantation. Concentrated forest land around the boundary regions limits urban as well as agricultural activities in these areas. When doing internal comparison (Between the Local bodies in Wayanad) 10 local bodies shows growth trend towards urban. When comparing to other urban areas in the state, all of these urban areas, except Kalpetta, Mananthavadi And Sulthan Batheri can only termed as semi urban.

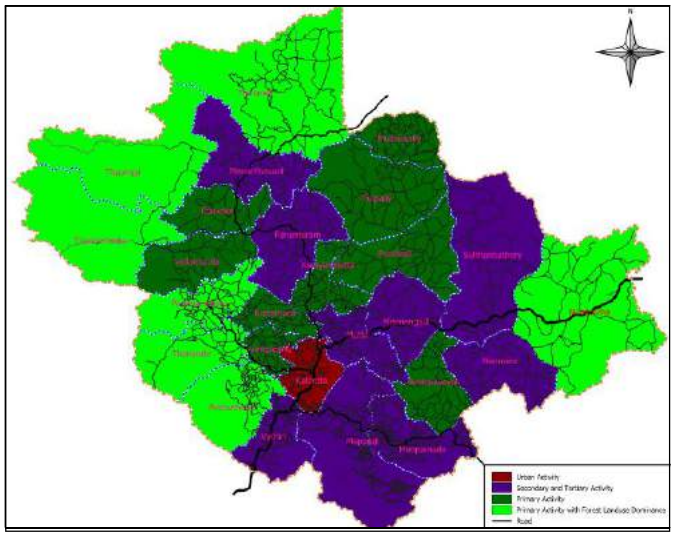


Fig 12.2 Activity Pattern of the District.

12.3. CONNECTIVITY

Wayanad is well connected with roads with a well developed road network composed of NH, SH, district roads and village roads. The major problem is the poor surface conditions of most of the roads and insufficient carriage way width. Once these two problems solved,

the only thing to be done is provision of some

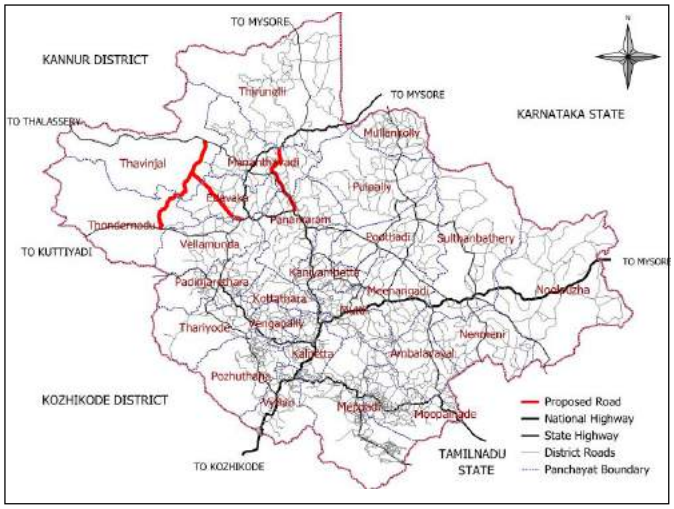


Fig 12. 3 Future Road Network of District

missing links. When looking at the connectivity map, it can conclude that the ***settlements are well connected with poor roads***.

12.4. SPATIAL STRUCTURE

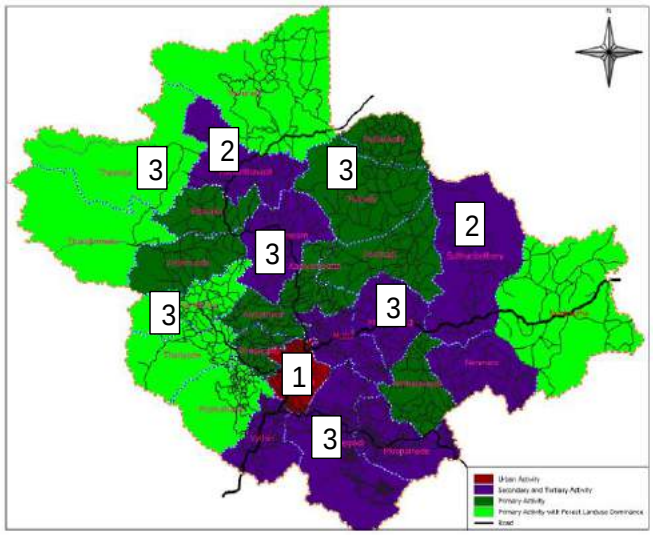


Fig 12.4 Spatial Structure.

The spatial structure of the district can be obtained by overlaying the map of activity pattern, hierarchy of settlements and connectivity. This gives

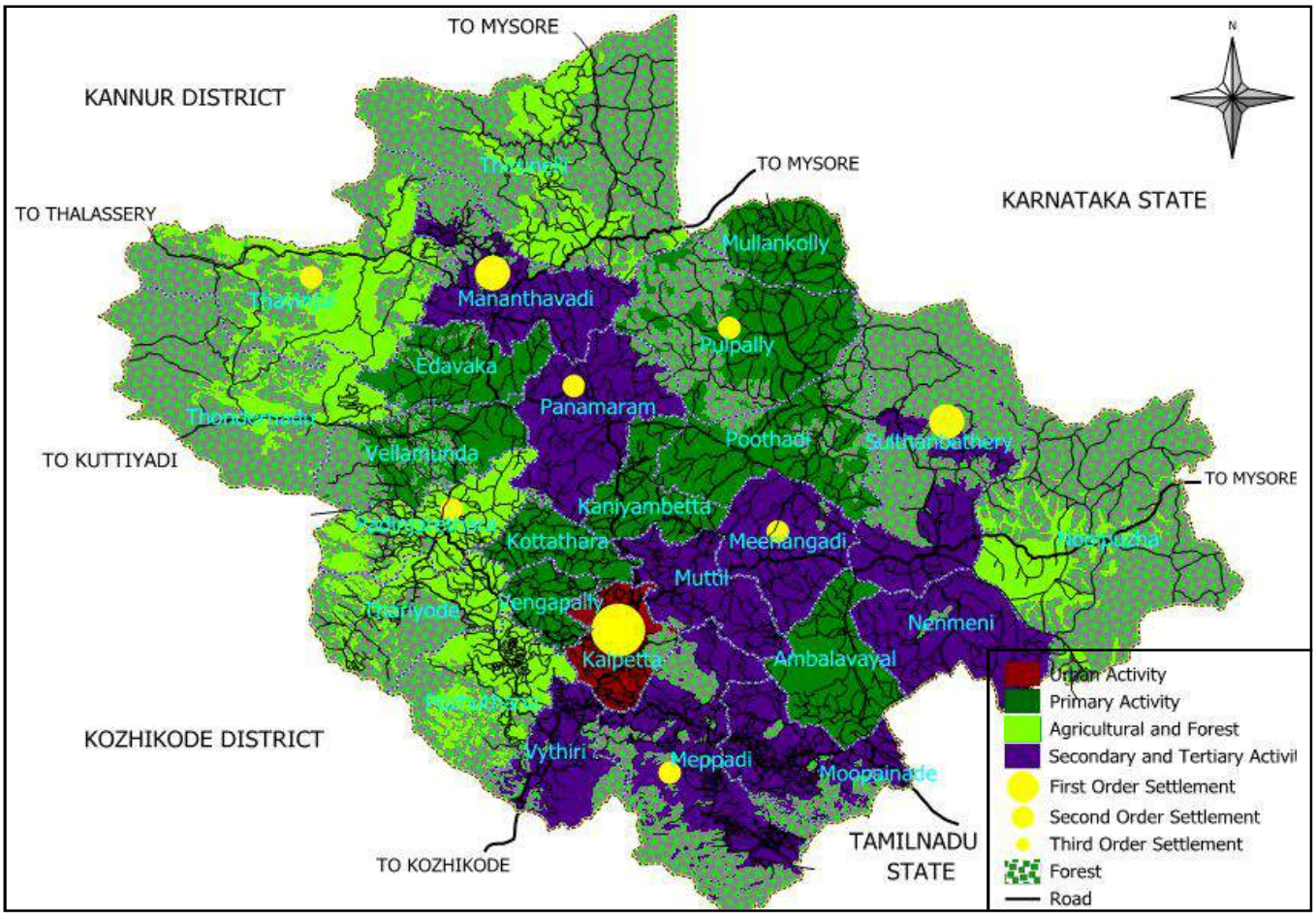


Fig 12.5 Future Spatial Structure of Wayanad.

the spatial structure of the district in the present scenario. The overlaid map is given below (Fig 12.4), where the numbers 1, 2 and 3 represents the order of settlements based on Hierarchy.

Higher concentration of forest land and agricultural and environment tourism based economy holds this district in rural and semi rural character. Since there are no major industrial or commercial development proposals, which changes the face of district, Wayanad will continue the present spatial structure.

The forest land and agricultural land should get consideration while identifying the future spatial structure. Activities in Wayanad are scattered everywhere. So people need not go to the specific pouches for satisfying their needs. Hence chances for future specific activity nodes are less. So the future special structure will be as similar of present if some major projects are not attracted to the district. But considering the geographical and environmental conditions of Wayanad, the projects which introduced should be non-polluting and eco-friendly ones. So the chances are for educational facilities (International Open University, Professional college, etc), IT Parks, Value added centers for hill products (Food Park, Spices Processing Unit, etc), etc. All these can located anywhere in the district and hence the change in spatial structure because of the introduction of these cannot be predicted. Hence the changes in the activity pattern will be very minor. Proposed spatial structure of the district for the year 2021 is shown in Figure 12.5.

12.5. INFERENCE

The major activity in Wayanad district is agricultural. Forest land use is concentrated on boundary panchayats. Urban activity is marginal and is concentrated on few nodes. Wayanad is best example of ribbon development and hence the identified urban areas holding lion share of NH and SH. The major developments are concentrated in the first order settlement (Kalpetta Municipality) and second order settlements (Mananthavadi and Sulthan Batheri). The settlements are well connected by transportation network.

Chapter –13
SUMMARY OF FINDINGS

Wayand District - The Green Paradise, is the only district in Kerala, which share its boundary with two states, say Tamilnadu and Karnataka. The main connection between Mysore region of Karnataka and Malabar region of Kerala is through this district (NH 212). These things give a good growth opportunity in the case of both commercial and industrial fields for Wayanad. But in actual, Wayanad is a pure agriculture district with large extent of forest land.

The geographical location and socio economic characters hold this district in rural nature. District is only having ribbon developments along its major roads. Around 50% of land is used for agricultural and plantation activities and around 40% is forest land. All the development activities take place in the remaining 10% land. This 10% is account for water body and waste land also. Hence the real built up land is very less in the case of Wayanad district.

From the lack of built up land, it can be assumed that the density of population and employment as well as urban areas will be less in this District. Statistics shows the same. The population density of Wayanad is only 366 persons per SqKm, which is very less compared other districts of Kerala. The population density of most of the boundary grama panchayats is less than 200 persons per SqKm. this is mainly because of higher concentration of forest land use in boundary grama panchayats. The population density distribution shows an interesting variation in Wayanad district. The density is very less at boundary panchayats and it increases gradually towards centre. The employment density is also less. When looking to the census urban aspects, it can be seen that, no census urban area is present in the district except Kalpetta Municipality. Kalpetta got its urban status only because of its District headquarters position. It is found that there is no census urban areas in the district in the year 2021 based on the analysis done with projected population and employment for the year 2021. Instead of this urban panchayats and municipalities, few nodes are highly developed and hence the urban areas in wayanad can termed as urban towns. It can be concluded that, Wayanad is basically agrarian with non urban character.

Good connectivity, strong economy and high growth potential are the major things required for urbanisation of any area. Wayanad is having all these things. It is having good road network with NH, SH and MDR, strong agricultural based economy and excellent tourism potential. But most of the roads are suffering with poor surface condition and lack of sufficient carriage way width. Changes in climate, shifting from basic crop patterns and changes in the fertility of soil due to high quantity use of pesticides reduced the profit from agriculture. Hence labourers were shifted from agriculture to secondary and tertiary sectors. The tourism is heritage and scenic based. Hence the rate of change from rural to urban nature will be very slow in Wayanad still it have all the required inputs.

The analysis of settlements revealed that, there will be three urban local bodies in the year 2011 and six more by the end of 2021. In future, one first order, two second order and six third order settlements

will be present.

Most of the border areas of Wayanad are concentrated with forest and especially the western area coming under the heritage zone with Western Ghats. The future economy of Wayanad will be standing on agriculture and tourism. For promoting these, environment should be protected. Hence urban activities should be channelised. All the forest area should be kept away from urban. Since most of the Panchayats are having forest and agricultural area, the third and fourth order settlements should be developed with basic amenities. The first and second order settlements should be developed highly and all the remaining settlements should connect with these with the help of good road network.

Since there is no rail or air connectivity in the district except helipad at Sulthan Batheri panchayat, care should be given for introducing rail network and air strip in this district.

The spatial structure of Wayanad district shows that, primary activity is scattered all over the district and giving a rural or semi rural nature for it. Surrounded forest land and lack of rail, air and water way facilities for regional linkage to other areas are also the reason for semi rural nature of the district. Kalpetta municipality and its surrounding areas along with the two second order settlements, viz Mananthavadi grama panchayat and Sulthan Batheri grama panchayat shows urban / semi urban nature with higher secondary and tertiary activity concentration.

ANNEXE 1

VILLAGES UNDER TALUKS

No	Villages Under		
	Vythiri Taluk	Sulthan Bathery Taluk	Mananthavady Taluk
1	Kunnathidavaka	Ambalavayal	Mananthavady
2	Achooranam	Cheeral	Payyampally
3	Chundel	Kidanganad	Panamaram
4	Kavumannam	Kuppadi	Nallornadu
5	Thariyode	Nenmeni	Porunnanoor
6	Kottathara	Noolpuzha	Anjukunnu
7	Kuppadithara	Thomattuchal	Cherukattoor
8	Padinharathara	Bathery	Thrissileri
9	Pozhuthana	Irulam	Thirunelli
10	Vengapally	Krishnagiri	Periya
11	Kalpetta	Nadavayal	Kanhirankode
12	Kaniyambetta	Padichira	Thondernadu
13	Kottapadi	Poothady	Vellamunda
14	Muppainadu	Pulpally	Edavaka
15	Muttil North	Purakkadi	Valad
16	Muttil South		Thavinhal
17	Thrikkaippatta		
18	Velerimala		

ANNEXE 2

WORKERS CONCENTRATION INDEX

Sl No	Name of Local Body	Workers Concentration Index			
		Cultivators	Agricultural Labourers	Industrial Workers	Other Workers
1	Ambalavayal	1.05	1.27	0.87	0.87
2	Edavaka	1.37	1.16	0.98	0.8
3	Kalpetta(M)	0.11	0.15	1.44	1.67
4	Kaniyambetta	0.96	0.86	1.49	1.07
5	Kottathara	1.52	1.29	1.01	0.69
6	Mananthavady	0.87	0.97	1.18	1.06
7	Meenangadi	0.98	0.9	0.96	1.05
8	Meppadi	0.42	0.31	0.54	1.51
9	Mullankolly	1.83	1.64	0.44	0.44
10	Muttil	0.82	0.88	1.54	1.1
11	Nenmeni	1.03	1.11	1.04	0.94
12	Noolppuzha	1.28	1.48	0.74	0.7
13	Padinharathara	1.09	1.03	1.84	0.94
14	Panamaram	1.25	1.21	1.17	0.82
15	Poothadi	1.26	1.25	1.3	0.79
16	Pozhuthana	0.22	0.3	0.38	1.59
17	Pulppally	1.47	1.72	0.79	0.53
18	Sulthan Bathery	0.75	0.79	1.71	1.16
19	Thariyode	0.85	0.88	0.57	1.11
20	Thavinjal	1.52	1.01	0.43	0.82
21	Thirunelly	0.58	1.1	1.27	1.1
22	Thondernadu	1.56	1	0.62	0.81
23	Vellamunda	1.14	1.32	0.5	0.83
24	Vengappally	0.75	1.1	1.17	1.04
25	Vythiri	0.16	0.1	1.46	1.68
26	Muppainad	0.38	0.45	0.49	1.47

ANNEXE 3

LAND USE CONCENTRATION INDEX

Sl.No	Name of Local body	Land Use Concentration Index								
		Forest	Water bodies	Marshy Land	Residential	Agriculture	Plantation	Res/Agr Mix	Other Built-up land use	Others
1	Kalpetta muncipality	0.22	0.94	0	1.49	0.97	1.73	0.45	19.94	0.4
2	Ambalavayal	1.04	0.09	0	3.13	1.13	1.76	0.91	0.08	2.59
3	Edavaka	0.21	2.03	0	1.02	1.49	1.51	1.25	0.04	1.16
4	Kaniyampetta	0	1.35	0	0.99	2.72	1.54	0.85	0	0
5	Kottathara	0.03	2.78	0	1.23	2.38	1.54	0.94	0.29	0.29
6	Mananthavady	0.55	1.87	0	1.43	1.07	1.31	1.23	2.5	0.67
7	Meenangadi	0	0.28	0	2.24	1.41	1.75	1.61	0.07	0.36
8	Meppady	1.01	0.87	0	1.23	0.58	1.13	0.04	0	1.74
9	Muppainad	0.42	0.5	0	1.16	0.29	1.74	0.39	3.94	1.54
10	Mullankolly	0.21	2.9	0	0.87	0.8	1.85	0.82	0	0
11	Muttil	0.03	1.64	0	1.71	1.93	1.68	0.93	1.29	0.15
12	Nenmeni	0.04	0.19	0	5.42	2.12	1.49	1.16	0	0.89
13	Noolpuzha	1.89	0.75	0	0.1	0.98	0.22	0.42	0	0
14	Padinharathara	0.69	3.84	0	1.45	2.22	0.67	0.59	0.28	4.17
15	Panamaram	0.19	2.56	0	0.32	2.07	1.47	1.18	0	0.06
16	Poothady	0.55	0.15	0	0.56	0.98	1.49	8.07	0	0.02
17	Pozhuthana	0.95	0.73	0	0.19	1.17	0.95	0.28	1.36	2.28
18	Pulpally	0.71	1.89	0	0.73	0.87	1.36	0.7	0	0
19	Sulthan Bathery	1.76	0.24	0	0.86	0.49	0.45	0.51	2.4	0.01
20	Thariyode	1.32	2.29	0	0.48	0.58	0.47	0.3	0.7	5.55
21	Thavinchal	1.32	0.65	0	0.2	0.89	0.63	0.73	0	1.93
22	Thirunelly	1.77	0.7	0	0.83	0.45	0.5	0.23	0.14	0.21
23	Thondarnad	1.88	0.35	0	0.24	0.66	0.2	0.35	0	1.74
24	Vellamunda	1.05	0.73	0	0.87	1.31	0.76	1.26	0	0.8
25	Vengappally	0	1.95	0	1.09	1.38	1.86	1.08	0.59	0
26	Vythiri	0.54	0.42	0	0.51	0.2	1.7	0	2.52	2.04

ANNEXE 4

PROCEDURE FOR FUNCTIONAL CLASSIFICATION OF AN AREA

Classification of an area (ward or local body or district) into urban, semi urban, semi rural and rural.

In the Kerala context a ward or a local body will be having either pucca urban area, pucca rural area or mixed (Residential cum agricultural) use area in separate or in its combination. And also the mixed land use area can be further classified into- Urban, semi urban, semi rural and rural as noted above. When the total area of a ward or local body is concerned,the predominance of any of the four (urban land use, rural land use, semi urban or semi rural) determines the character of the area. Fig 3: Classification of an area- Methodology.

While this condition always acceptable, certain other conditions, from the practical point of view, are also incorporated for classification of an area.

The conditions are elaborated below:

The character of an area can be termed as urban.

1. If the pucca urban land use (not taking in to account the classification of mixed land use) is more than or equal to 25% of the total area, then the ara can be termed as an urban area. (The analysis of the land use of various urban local bodies & the share of various land uses of an urban area as specified in the UDPFI guide lines shows that an urban area is having a residential land use (commercial, industrial, public & semi public etc. This is actually the residential land use attached to the urban land use. So if the pucca urban land use is 25% then by adding the residential share of 25% the total urban land use share becomes 50%)
2. The urban land use (Taking in to account the classification of mixed land use) percentage of 50% of the total area of a region can be taken as the lower limit to term it as an urban area.

The character of an area can be termed as rural,

1. If the pucca rural land use share is more than 50% it is a rural area.
2. If the rural land use (taking into account, both pucca rural land use and the classification of mixed land use) share is greater than or equal to 50% of the total area.

The character of an area can be termed as Semi urban,

1. If the mixed land use atea is classified as semi urban and the sum of urban land use share and semi urban residential land use is greater than or equal to 50% of the total area.

The character of an area can be termed as rural,

1. If the mixed land use area is classified as semi rural area and the sum of rural land use share and semi rural- mixed land use is greater than is greater than or equal to 50% of the total area.
2. If the pucca rural land use share is at least 1/3rd of the total area and the mixed land use is not urban or semi urban, then also the area can be termed as semi rural area (this condition is included after practical verification).

ANNEXE 5

CFI VALUES OF SETTLEMENTS

No.	Name of Local body	CFI Value
1	Kalpetta Muncipality	154.54
2	Manthavady	145.88
3	Sulthan Bathery	141.71
4	Meenangadi	70.73
5	Vythiri	61.37
6	Pulpally	61.33
7	Ambalavayal	59.71
8	Nenmeni	59.54
9	Panamaram	59.11
10	Thavinchal	56.73
11	Meppadi	56.56
12	Edavaka	46.07
13	Poothady	42.52
14	Vellamunda	40.93
15	Thirunelly	36.75
16	Muttil	35.14
17	Kaniyampetta	32.01
18	Padincharathara	31.3
19	Noolpuzha	29.37
20	Muppainad	27.86
21	Kottathara	25.23
22	Mullankolly	25.09
23	Thariyode	24.17
24	Thondarnad	20.92
25	Pozhuthana	20.44
26	Vengappally	15.74

ANNEXE 6

ORDER OF SETTLEMENT

No:	Ist Order	IInd Order	IIIrd Order	IV th order
1	Kalpetta Muncipality	Mananthavady	Meenangadi	Edavaka
2		Sulthan Bathery	Vythiri	Poothady
3			Pulpally	Vellamunda
4			Ambalavayal	Thirunelly
5			Nenmeni	Muttil
6			Panamaram	Kaniyampetta
7			Thavinchal	Padincharathara
8			Meppadi	Noolpuzha
9				Muppainad
10				Kottathara
11				Mullankolly
12				Thariyode
13				Thondarnad
14				Pozhuthana
15				Vengappally

ANNEXE 7

NODES

Node	Road I	Road II
Kaniyaram	Mananthavady-Thalassery	Kaniyaram-Pilakkav
Thalappuzha	Mananthavady-Thalassery	Thalappuzha-Valad
Boys Town	Mananthavady- Thalassery	BoysTown-Palchuram-Iritty
Chettappalam	Mananthavady-Bavaly-Mysore (SH)	Chettappalam Valliyoorkkav Road
Ondayangadi	Mananthavady-Bavaly-Mysore (SH)	Ondayangadi-Thrissileri
Kartikkulam	Mananthavady-Bavaly-Mysore (SH)	1. Kartikkulam-Tholppetty
		2. Kartikkulam- Thirunelly
4th Mile	Kalpetta-Mananthavady-Kartikkulam-Bavaly (SH)	4th Mile- Tharuvana- Kuttiyadi.
Panamaram	Kalpetta-Mananthavady-Kartikkulam-Bavaly (SH)	1. Panamaram-Nadavayal-Pulppally
		2. Panamaram-Nadavayal- Kenichira-S.Batheri
Kaniyambetta	Kozhikode- Mananthavady (SH)	Kaniyambetta-Varadur-Meenangadi
Pachilakkad	Kozhikode- Mananthavady (SH)	Pachilakkad- Varadur- Meenangadi
Kambalakkad	Kozhikode- Mananthavady (SH)	Kambalakkad-Pallikkunnu – Venniyod
Vythiri	NH 212	Vythiri-Pozhuthana-Padinharathara
Chudale	NH 212	Kozhikkod-Ootty Road
Kappumkolly	Kozhikkod-Ootty Road	Meppadi-Kalpetta Road
Meppadi	Kozhikode- Ootty Road	Meppadi- Chooralmala Road
Vaduvanchal	Kozhikode- Ootty Road	Kolagappara-Bathery
Kalpetta Traffic	NH 212	1. Bypass Road
		2. Meppadi Road
Kainatty	Kozhikode-Mysore (NH 212)	Kozhikkode-Mananthavady
Muttil	Kozhikode-Mysore	Muttil- Trikkaipaptta
Kakkavayal	NH 212	Karappuzha road
Meenangadi	NH 212	1. Meenangadi-Varadur-Kaniyambetta-Panamaram
		2. Meenangadi-Moonnanakkuzhi-Kenichira-Pulppally
Kolagappara	NH 212	Ambalavayal- Vaduvanchal
Beenachi	NH 212	Beenachi-CC-Panamaram-Manantahvady
Sulthan Batheri	NH 212	1. Chulliyode-Thalur
		2. Cheeral-Pattavayal
		3. Batheri-Pulppally