



Rivers, Lakes, Ponds and Wetlands of Kerala

October 2017

**Kerala Forest Research Institute
Kerala State Biodiversity Board**

RIVER BASINS

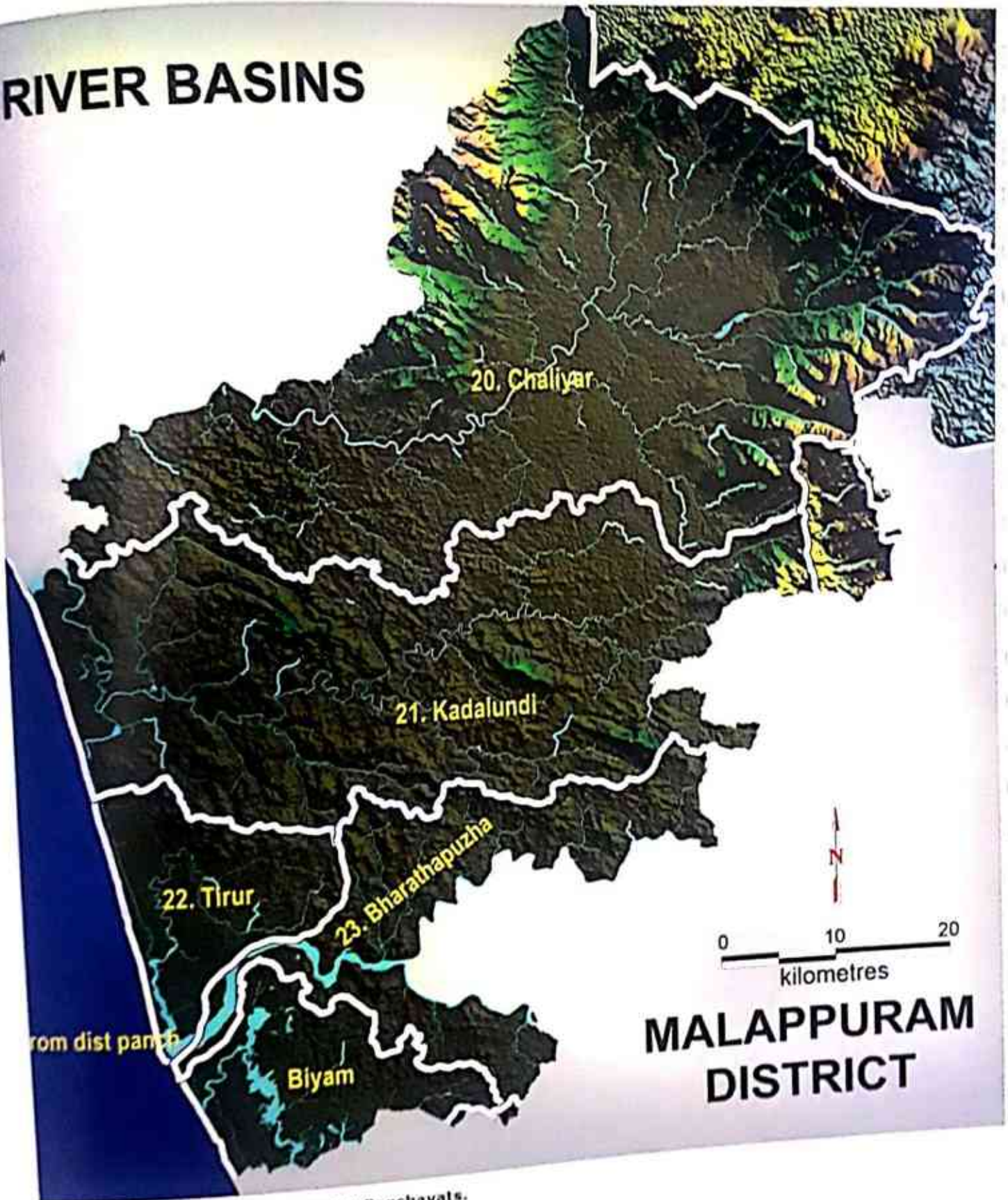


Fig. 14-nn Malappuram District: Panchayats.

KOZHIKODE DISTRICT

INTRODUCTION

The district has three distinct regions - sandy coastal belt, rocky highlands formed by the hilly portion of the Western Ghats and lateritic midland. Of the total area of 2344 km², the sandy coastal belt is 362.85 km², lateritic midlands 1343.50 km² and rocky highlands 637.65 km².

Puzha are the two main rivers. The south eastern portion is drained by Chaliyar. There are two dams across Kuttyyadi River for power generation.

RIVER BASINS

Mahe Basin

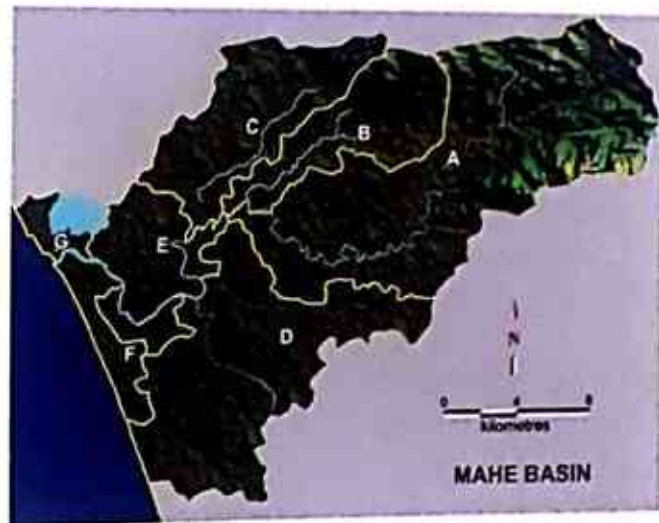


Fig. 11-02 Mahe Basin

Sub basins A, B, D and F fall within Kozhikode District, C and E are in Kannur District. Land use in the basin is dry land cultivation, paddy fields, forest and built-up areas. Vadakara Block is fully inside this basin. Thunerri Block also fall fully inside this basin. Naripatta, Kunnummal and Nadapuram Panchayats of Kunnummal Block is also inside this basin.

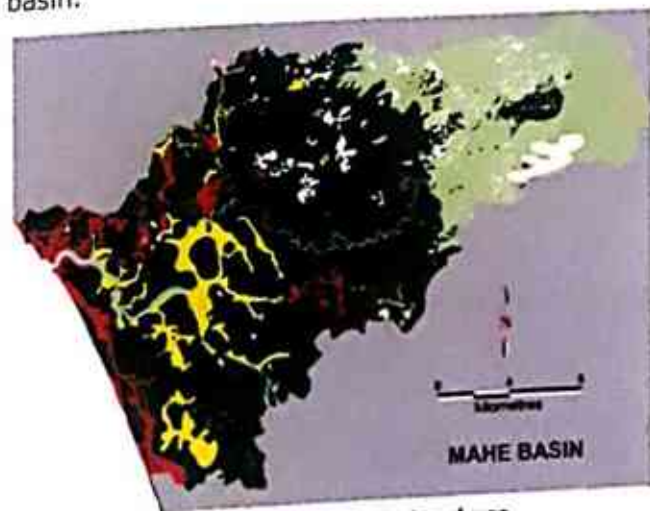


Fig. 11-04 Mahe Basin: Land use



Fig. 11-01 Kozhikode District

The district has a coastal length about 80 kms. Kozhikode District is situated on the south-west coast of India. The district is bounded on the north by Kannur District, on the east by Wayanad District, on the South by Malappuram District and on the West by the Arabian Sea.

It is situated between North latitudes 11°08' and 11°50' and East longitudes 75°30' and 76°08'. The highland region accounts for 26.80 per cent and the lowland region 15.55 per cent of the total area of the district. Dry land crops is the major land use in Kozhikkode District. It is much higher than the State average. Forest area is nearly 20%, but less than state average. Wetlands are less than state average. Rubber cultivation is also less than state average.

Geographically, the district has coastal areas, midlands and highlands. Korappuzha and Kuttyyadi

Kuttiadi Basin

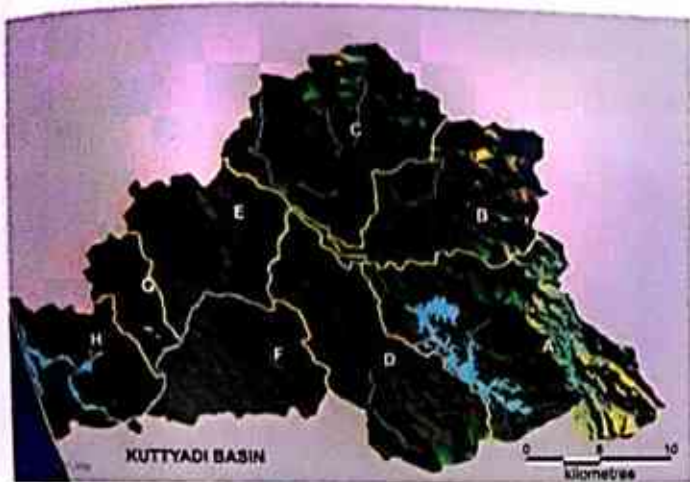


Fig. 11-03 Kuttiadi Basin

Kuttiadi River has its origin from Narikota ranges on the western slopes of the Wayanad Hills. The Kuttiadi River flows through Vadakara, Quilandi and Kozhikkode taluks. The river is also known as Murat River. The major tributaries of the river are Onipuzha, Thottilpalam Puzha Kadiyangad Puzha, Thevannathil Puzha and Madappalli Puzha. The river joins Arabian Sea at Kottakkal, 7 km. south of Vadakara. The Kuttiadi River has a length of 74 km and has an area of 583 km². This river nourishes locations like Oorakkudi, Kuttyadi, Thiruvallor, Muyippoth, Maniyoor and Karuvanchery during its course.



Fig. 11- 05 Kuttiadi estuary

Now the name of Kuttiadi is connected with the hydro-electric project in Kuttiadi River basin. It also serves as an irrigation project. Peruvannamuzhi reservoir also serves water for the famous Japan government aided Drinking Water Project. Long tunnels runs from here for the purpose of providing drinking water to secluded villages of Kozhikode District.

The Kakkayam dam comes as part of the Kuttiyadi Hydro Electric Project and is located at a height of about 750 m above sea level. The pen stock runs down from the dam site and goes through various tunnels and hills to the Kuttiyadi tall race power house at Kakkayam. Water coming out of this power house joins a river and is utilized for Peruvannamoozhi Irrigation Project.

Kuttiadi River basin is divided in to 8 sub basins. There are 6 chiras and two ponds in this basin. Thacharu vayal water body in this basin has an area of 14.81 ha, Puthenchira has an area of 14.81 ha, Eranhipuzha is 8.89 ha, Cherandathur chira has area of 3.77 ha, Pathiyarakkara chira is 1.25 ha and Viyamchira is 5.3 ha. Blocks extend beyond basins and description at panchayat level is more appropriate.

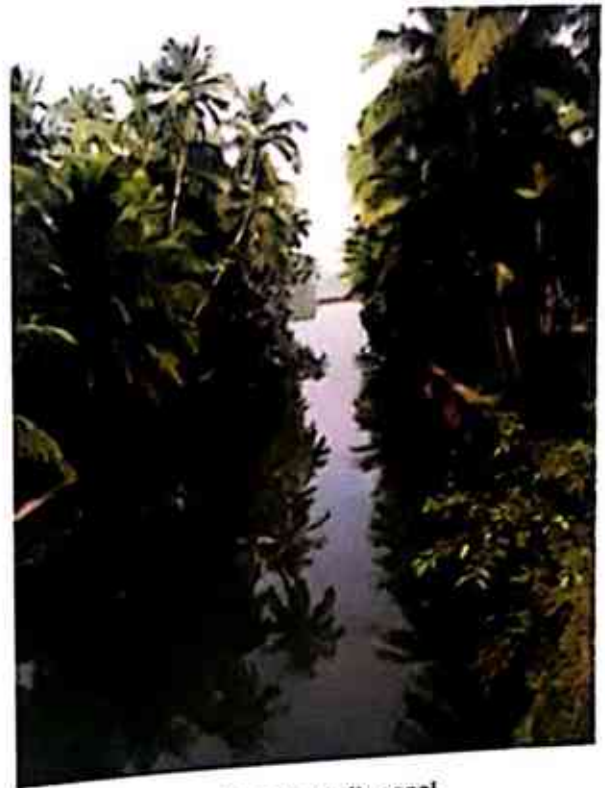


Fig. 11-06 Cannolly canal

Sub basin A: There are two dams in this sub basin, Peruvannamuzhi and Kakkayam. They are on tributaries of Kuttiadi River. The area is mostly forested with few inhabited areas near the dams. Forest has non wooded patches. Chakkittapara and Koorachund Panchayats come in this sub basin.

Sub basin B: Upper reaches of this sub basin is forested. Forest has non wooded regions. Lower

areas have mixed dry land cultivation. Two tributaries of Kuttiadi River, Kadanthara Puzha and Niduvai Puzha drain this area. Panchayats are Kavilumpara, Maruthomkara and Chankaroth.

Sub basin C: Upper reaches are steep hills. A tributary of Kuttiadi River from this sub basin join the main river at Kuttiadi. Upper reaches are forested; other areas have mixed dry land cultivation and small amount of rubber. There are built-up areas along main roads. Panchayats are Kavilumpara, Maruthompara and Kayyakodi.

Sub basin D: Kadiyangad Puzha, a tributary joins the main river at Puravur, Kallur area. Land use is mainly mixed dry land cultivation. There are built-up areas. Panchayats are Kayanna, Koothali, Chankaroth and parts of Perambra.

Sub basin E: Few small streams from this basin join the main river which is called as Gulika Puzha in this region. Land use is mainly mixed dry land cultivation. There are built-up areas and rubber cultivation. Panchayats are Thiruvallur, Purameri, Kuttiyadi, Velom and Ayancheri.



Fig. 11-07 Kuttiyadi Basin: Luse



Sub basin F: Consist of few streams on the southern side flowing to the main river. Land use is mainly mixed dry land cultivation. There are built-up areas, waste lands and water bodies. Panchayats are Cheruvannur and Perambra.

Sub basin G: Main feature is the Badakara - Mahe canal. Land use is mainly mixed dry land cultivation. There are few water bodies. Panchayat is Thiruvallur.

Sub basin H: Local bodies are Vadakara Municipality, Payyoli and Maniyur. First two are coastal areas. Kuttiyadi River, lake and estuary are inside this sub basin. Land use is mainly mixed dry land cultivation and built-up areas.

Korapuzha Basin

Korapuzha is formed by the confluence of the Agala Puzha and Panur Puzha. While Agala Puzha is more or less a backwater, Panur Puzha originates from Arikkan kunnu. Korapuzha empties into the Arabian Sea at Elattur. The total length of Korapuzha is 40 km and the area of its basin is 624 km².

The river connects all important industrial towns lying in the coastal areas such as Vadakara, Kozhikode, Kallayi and Beypore.



Fig. 11-08 Korapuzha Basin

Agala Puzha, literally meaning broad river, in Calicut District may also be considered as a kayal. This backwater extends to a north-south distance of 25.6 km, parallel to the sea up to its merger with the Elattur River close to its mouth. No significant rivers drain into it. Nearly all drainage from the hills is intercepted by the main stream and tributaries of the Korapuzha. It would seem as if the Korapuzha had at one time found its way to the sea by this outlet instead by the channel. The man-made Payyoli canal of about 1.6 km in length connects Agala Puzha to Korapuzha.

KSLUB (2000) divides the basin into 29 micro water sheds. We have grouped the watersheds into 7 sub basins, A to G.

Sub basin A: Kora Puzha and its continuation, Chittari Puzha are the rivers in this basin. Region consists of low hills, except at the north-east corner where the steep hills are forested. Land use is mainly mixed dry land cultivation with traces of built-up areas and waste lands. Panchayats in this sub basin are Panangad, Kottur, Naduvannur and Arikkulam.

Sub basin B: Panur Puzha is a tributary of Korapuzha originating in the northern part, flowing south wards and then westwards to join the main river. In the extreme northern part there is forest and rubber cultivation. Remaining areas are mixed dry land crops. There is small amount of waste land and built-up areas. The panchayats are Thamarassery, Kizhakkoth, Kuruvattur and Kakkodi.

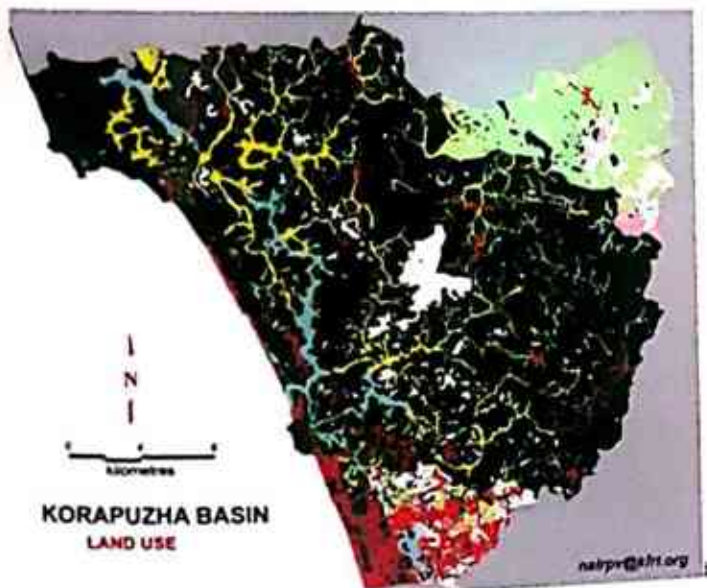


Fig. 11-09 Korapuzha Basin: Land use

Crops	Rubber	Paddy	Water
Built-up	Forest	Waste	Pantn.

Sub basin C: Ramallur Thodu and an unnamed stream flow directly into Korapuzha. Land use is mixed dry land crops with small amount of waste land and built-up areas. Panchayats in the sub basin include Namanda, Kakkur, Chelannur and Balussery.

Sub basin D: This sub basin consists of the Agalapuzha Lake and land surrounding it. The railway line and national highway pass through this. Land use is mixed dry land crops, waste land and built-up areas. Coastal panchayats are Thikkodi, Modadi, and Chengottu Kavu. Koyilandy Municipality also comes in this group. Keezhayur

and Thuravur are Panchayats on the northern side of the lake.

Sub basin E and F: These are coastal sub basins. Panchayats are Chengottukavu, Chemanchery, Atholl, Thalakulathur, Elathur and Kozhikkode Corporation. Kozhikkode Corporation has mostly built-up areas; other local bodies have mostly dry land cultivation.

Kallayi Basin



Fig. 11-10 Kallayi Basin: Sub basins

Kallayi River has its origin at Cherukulathur in Kozhikkode District. Winding through many villages of thick settlements like Cherukulathoor, Kovoor, Olavanna and Malava, the river empties into the Arabian Sea near Kallayi.



Fig. 11-11 Kallayi river, floating of timber

Though small in size, the Kallai River is one of the most important rivers in the entire state from commercial point of view. Kallayi town, a main

centre of timber trade, is situated on its banks. It is connected to the Chaliyar on the south by a man-made canal. The river is of 22 km long.

Being a small basin, nine water sheds marked by KSLUB (2000) is retained. Overall land use is dry land cultivation and built-up areas. Northern part of the basin is occupied by Kozhikkode Corporation. Southern side consists of parts of Beypore, Cheruvannur, Olavanna, Peruvana and Peruvayal Panchayats.

Sarovaram Bio Park: Sarovaram Bio Park is an eco-friendly development near the city of Kozhikkode, situated adjacent to Connolly Canal. The project has been developed with an eco-friendly theme and is located in an ecosystem consisting of wetlands and mangrove forests containing bird habitats.

Chaliyar (Beypore River) originates from Ilambalari (Elembalai) hills in Gudalur of Nilgiris District (in Tamil Nadu). The length of the river is 169 km. This river has a total drainage area of 2,923 km², of which 2,535 km² is in Kerala and the rest in Tamil Nadu. The river flows through Wayanad, Malappuram and Kozhikkode districts. Chaliyar River joins Arabian Sea near Beypore. The mouth of the river has been converted into a minor fishing harbour. Chaliyar River flows through Nilambur, Mambad, Edavanna, Areecode and Vazhakkad in Malappuram District and Feroke in Kozhikkode District, before it joins the Arabian Sea near Beypore.

Important tributaries of Chaliyar are Chalipuzha, Punnapuzha, Pandiyar, Karimpuzha, Vadapurampuzha, Iringipuzha and Iruthullypuzha. The three main tributaries of this river unite a few kilometres near Nilambur. The eastern tributary, Karimpuzha arises below Mukurti peak and drains the densely wooded valley between Gulikal hill and Nilgiri and Makurti peaks. The middle one, the Punnapuzha drains the Ocheterlong valley and the south-east of the Marappanmadi of the Nilgiri-Wayanad area and passes over the ridge of the Ghats. Chaliyar leaps down from the crest of the Wayanad hills in a magnificent waterfall near the Chalad pass and drains the valley east of the Vavumala. The three streams reinforced by many large feeders unite in the heart of the famous teak plantations in the middle of the Nilambur valley. The Kavanakallu regulator cum bridge is constructed across the Chaliyar River, 13 km away from Kondotty Hill.

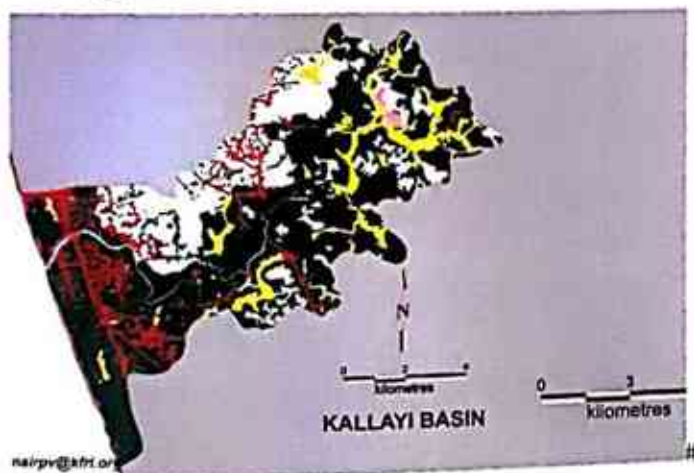
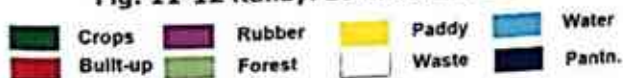


Fig. 11-12 Kallayi Basin: Land use



Chaliyar basin

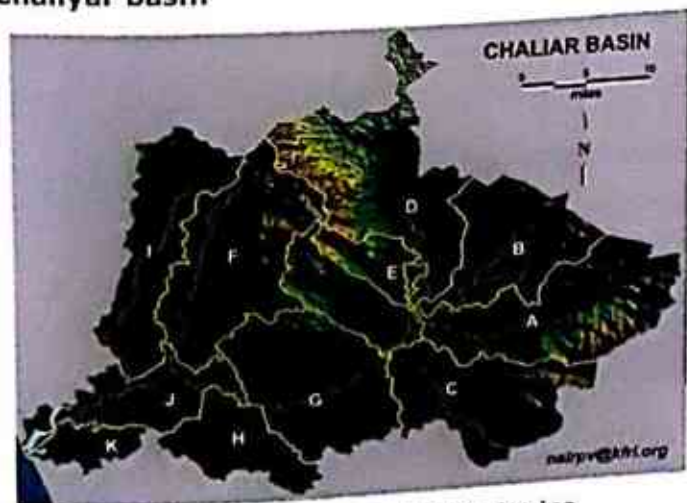


Fig. 11-13 Chaliyar Basin: Sub basins

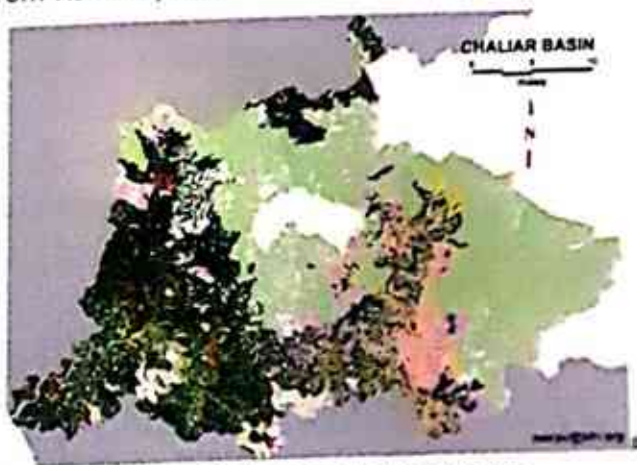
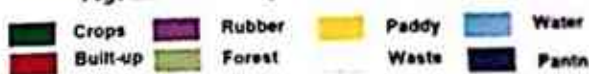


Fig. 11-14 Chaliyar Basin: Land use



Most of this basin falls in the Kozhikode district. Two of the sub basins, F and I fall in Kozhikkode District and are described below.

Sub basin F: Block Koduvally. Panchayats: Thiruvampady, Koodaranhi, Karasseri, Mukkam. Munda Puzha joins Iruvani Puzha and joins Chaliar at Puzhur. Land use is forests in the upper reaches, dry land cultivation and rubber below.

Sub basin I : Blocks are Koduvally and Kunnamangalam. Sub basin I is mostly plain areas falling in Koduvally and Kunnamangalam blocks in Malappuram District. The sub basin is drained by Charu Puzha which joins Chaliyar downstream. Land use is mixed dry land cultivation and paddy fields in the plains, rubber cultivation and forest are the land use in the upper reaches.

BLOCKS AND PANCHAYATS

There are 12 blocks in Kozhikode District. Arabian Sea is on the western side and hill ranges of the Western Ghats are on the eastern side. There are extensive set of temple ponds and irrigation tanks in the district. The blocks are described below.



Fig. 11-15 Kozhikode District, Block Panchayats

Vadakara Block and Vadakara Municipality (MCP)

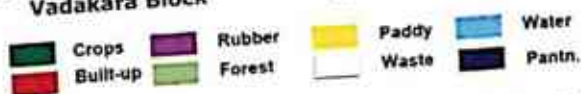
Vadakara is the northern most block in Kozhikode District. There are four panchayats and one municipality in this group. Murat River flows in the southern portion of Vadakara MCP. Mahe River flows through the north and eastern boundary of Azhiyur Panchayat and northern boundary of Eramala Panchayat. A tributary of Mahe River flows through the eastern boundary of Eramala Panchayat. Topo does not show any ponds.



Fig. 11-16 Panchayats in Vadakara Block



Fig. 11-17 Block: Vadakara - Land use



Mixed crop cultivation and built-up areas are the land use. Records do not show any ponds in the area. All local bodies except Eramala have sea on the western side. The northern portions of this block fall in sub basins E and F of Mahe River.

Tuneri Block

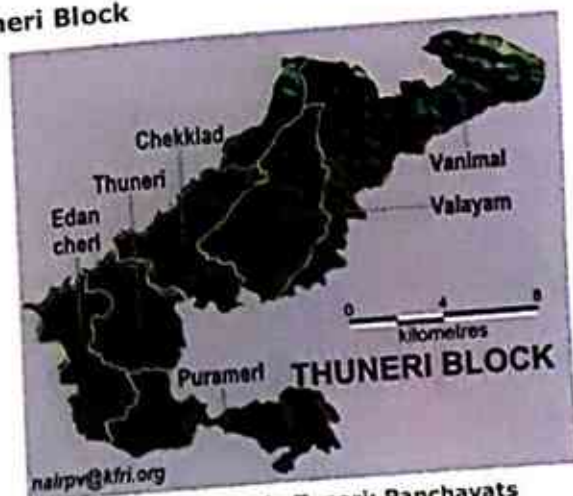


Fig. 11-18 Block: Tuneri: Panchayats

There are six panchayats. Mahe River makes western boundary to Edanchery Panchayat and it flows between Chekkiad and Thuneri Panchayats. Mahe River is boundary for Valayam in the south-west and Vanimal in the south-east side. Tributaries of Mahe River spread through the block. Topo does not show any ponds.

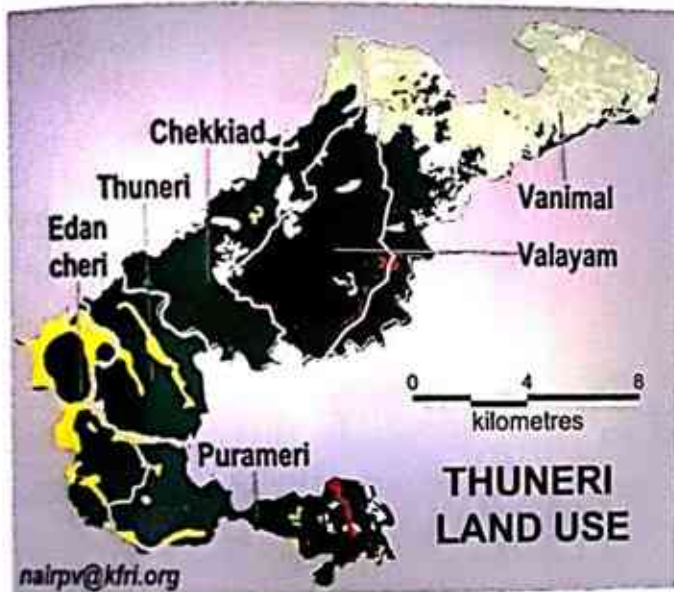
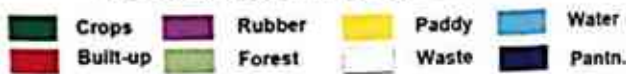


Fig. 11-19 Block: Tuneri, land use



Vanimal, Chekiad and Valayam panchayats fall in the Mahe basin. In fact the water divide pass along these panchayats. The eastern portion is forested hilly areas.

Some areas in the northern portions of Chekkiad, Valayam and Vanimal panchayats are hilly and forested. Block has mainly mixed crop cultivation, some areas in Valayam and Vanimal Panchayats have Rubber cultivation.

Kunnummal Block



Fig. 11-20 Block: Kunnummal

There are eight panchayats. Gulika Puzha lies in the southern boundary of the block. Tributaries of Kuttiadi River spread through Kayakkodi, Kavilumpara and Maruthomkara panchayats.



Fig. 11-21 Block: Kunnummal Land use



Mahe River comes in the northern boundary of the block. Kavudi Puzha lies in the northern portion of Narippatta Panchayat. Topo does not show any ponds. Much of the areas in Kavilumpara Panchayat are forested. Some areas in Narippatta and Maruthomkara panchayats are also forested. Dry land cultivation is the predominant land use. Some areas in Velam and Kavilumpara are under rubber. Teak plantations are also present. Hill tops have barren areas. Water bodies are few; there is paddy cultivation in Kuttiyadi and Velom Panchayats. Narippatta and Nadapuram panchayats come in Mahe basin. The rest of the panchayats come in Kuttiadi basin. Kavilumpara, Kayakkodi and Kunnummal are in sub basin 28K/C. In general, ponds are few, Pan fish (1992) reports few of them. Land use in Kuttiadi panchayat show as much as 18.6% area under paddy fields.

Table 11-01 Kunnummal Block: Water bodies

Panchayat	W Body %	Paddy %	Topo	NREDB	Pan fish
Kavilumpara	0.00	0.00			3
Kayyakodi	0.15	0.03			1
Kunnummal	0.00	1.20			4
Kuttiadi	0.00	18.67			4
Maruthomkara	0.00	2.34			1
Nadapuram	0.00	0.00			3
Narippatta	0.00	0.00			1
Velom	0.98	6.38		1	2

Thodannur Block

There are four panchayats. Murat River comes in the south-east and south-West boundaries of Maniyur Panchayat. Kotta Puzha comes in the eastern boundary of Thiruvallur Panchayat. Vadakara-Mahe canal comes inside this block. Topo shows large water body associated with Murat River in Maniyur Panchayat. Topo shows three large ponds near Vellukara in Thiruvallur Panchayat. Topo shows a small pond near Padiyirakkara in Maniyur Panchayat. There is a tank also in Maniyur Panchayat near Cherandattur. Land use is mixed crop cultivation, some area in Maniyur Panchayat is under rubber. Mostly plain areas, there is no sea coast for any of the panchayats.

The main Kuttiyadi River flows along the southern boundary of Maniyur and Thiruvallur panchayats. Streams from these panchayats flow south to join the river. There appears to be a link with the Mahe basin 29M/D. This is the Badagara-Mahe canal; it passes along a series of paddy fields. Renovation of four kilometres of the 17.61 km canal started in 2013. The 36 m wide canal is to have road and foot path on either side. Second stage would be 10 km. This is based on central waterway standards. Action has been initiated for two out of 10 bridges needed in the scheme. Land use in Ayanchery Panchayat shows as much as 50% area under paddy fields.

Table 11-02 Ponds in Thodannur Block

Panchayat	W Body%	Paddy %	Topo	NREDB	Pan fish
Ayancheri	0.00	49.81			3
Manniyur	2.00	3.11	2	1	
Thiruvallur	1.42	11.87	3	2	
Villiappally	0.01	0.00		1	2

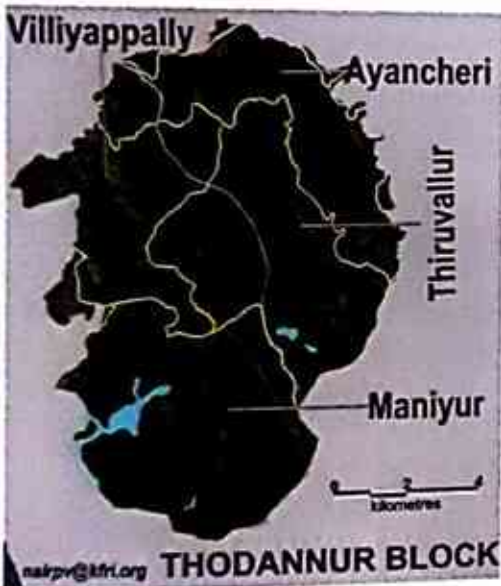


Fig. 11-22 Block: Thodannur.

Melady Block

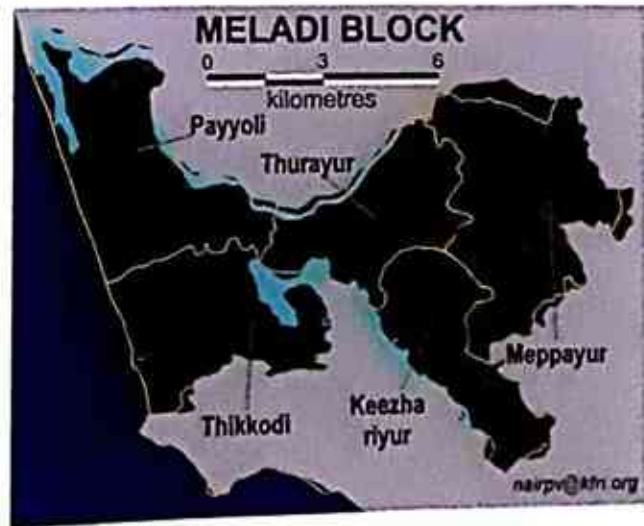


Fig. 11-24 Melady Block: Panchayats

There are five panchayats. Agala Puzha and Murat Puzha flows through this block. Murat River joins with Arabian Sea at Payyoli Panchayat. Agala Puzha spreads through Thikkodi, Thurayur and Keezhariyoor Panchayats. There is a large water body near Porku Mala in Meppayur Panchayat. Topo does not show any other ponds. Main land use is dry land cultivation. Some areas are under rubber in Meppayur and Thurayur Panchayats.

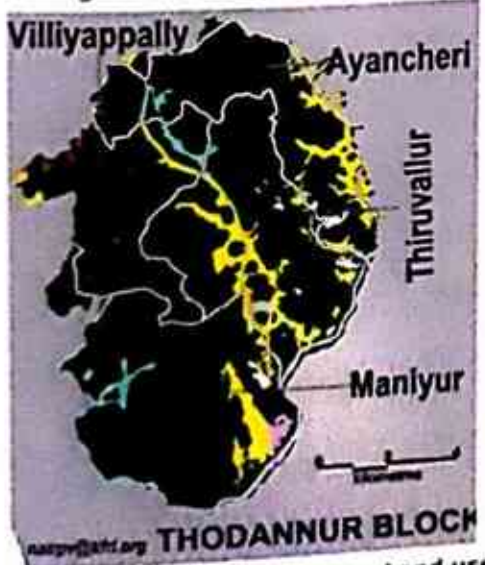


Fig. 11-23 Block: Thodannur - Land use

- Crops
- Rubber
- Paddy
- Waste
- Water
- Built-up
- Forest
- Pantn.

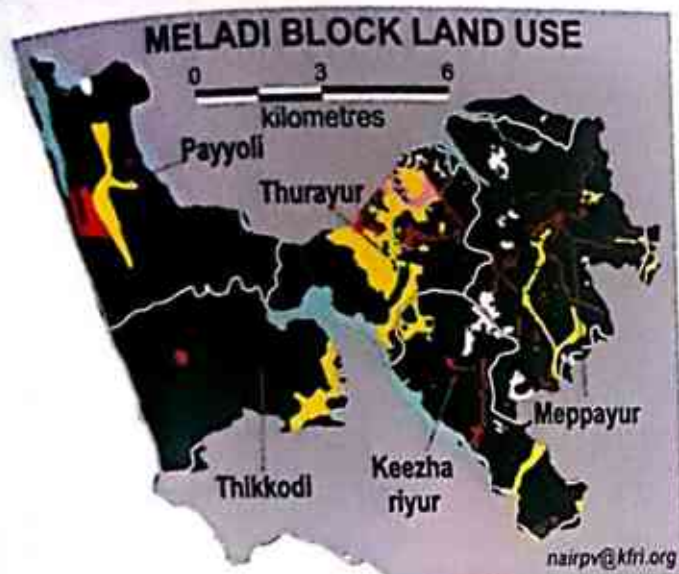


Fig. 11-25 Meladi Block: Land use

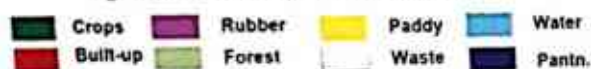


Table 11-03 Ponds in Meladi Block

Panchayat	W Body%	Paddy%	Topo	NREDB	Pan fish
Keezhayur	0.13	0.00			
Meppayyur	0.05	1.94		2	
Payyoli	3.77	24.65			4
Thikkodi	0.03	0.00			3

On the whole, this is a water logged block. Topo sheet show more than half the area as paddy fields. But, most of this got converted to dry land. Branches of Kotta Puzha, Korapuzha and Chittari Puzha are intertwined and they make a very vast water body. The outlets to the sea are far away, the direction of water flow would depend on a variety of factors. NREDB (2010) shows much paddy cultivation in Payyoli Panchayat. The watersheds fall in Kuttiyadi and Kora Puzha basins.

Panthalayani Block

There are five panchayats. Kora Puzha and its tributary Chittari Puzha makes boundaries in the south and eastern portion. Anela Puzha, a tributary of Kora Puzha, lies between Koyilandi MCP and Arikkulam Panchayat and makes eastern boundary to Koyilandi MCP and Moodadi Panchayat. Topo shows a water body along the side of Anela Puzha near Kuruvangad in Koyilandi MCP and another near Maruthur in Arikkulam Panchayat.

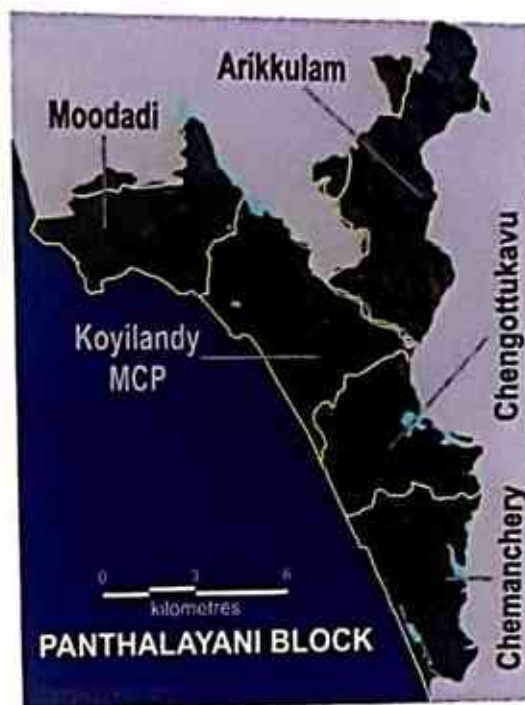


Fig. 11-26 Panthalayani Block: Panchayats

Chemanchery has a large water body near Vengalam. There is a tank near Mannamangalm in Koyilandi MCP. Topo shows a small pond near Muchukunnu in Moodadi Panchayat. There is a small water body near Kadalur in Moodadi Panchayat. Cultivation is of dry land mixed crop type.

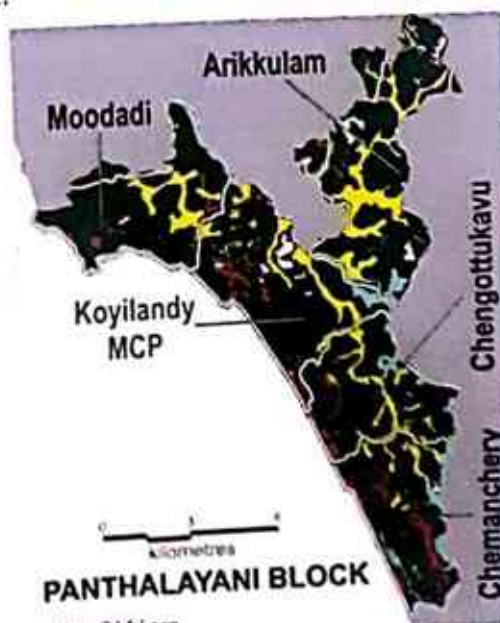


Fig. 11-27 Block: Panthalayani- Land use



Panthalayini is also a coastal block with much water logged, marshy and wet areas. A water body traverses in north south direction. Two panchayats show near 50% area under paddy fields. Land use is mainly dry land crops and built-up areas. Sea is on the western side, there are other water bodies scattered over the block. This is also a low altitude plain area with a large river and water bodies. Lakes of Korapuzha connect with water bodies in north and south.

Table 11-04 Ponds in Panthalayani Block

Panchayat	W Body%	Paddy %	Topo	NREDB	Pan fish
Arikulam	0.63	12.82	2		4
Chemmenchery	0.59	3.40		4	4
Chengottukavu	61.81	5.52		4	2
Koyilandi MCP	1.04	8.35	2	6	2
Moodadi	0.28	43.65	1		

Chelannur Block

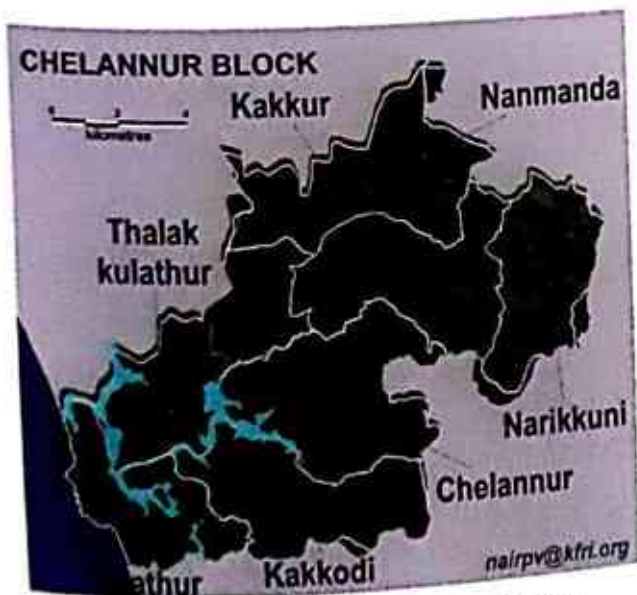


Fig. 11-28 Chelannur Block: Panchayats

There are seven panchayats. Conolly Canal, Akala Puzha and Kora Puzha come inside this block. Western portions are water logged areas. Panur Puzha joins Akala Puzha in Kakkodi Panchayat. Elathur Panchayat has a large water body. Topo does not show any ponds. Dry land cultivation is the land use. Few hill tops are barren.

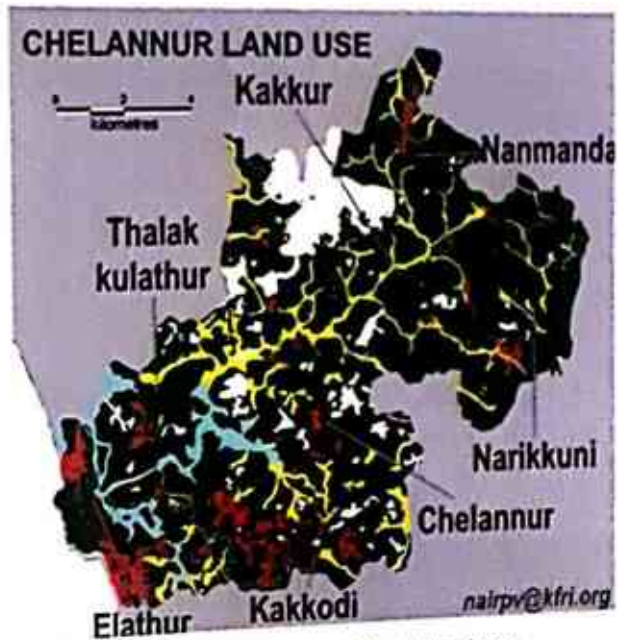


Fig. 11-29 Chelannur Block. Land use



Chelannur Block extends from sea coast to mid land. A large number of streams drain to the water bodies. There is paddy cultivation in these areas. There are bare hill tops in Nanmanda Panchayat. The water bodies end in the block and it is continued south wards as the Connolly canal. All the panchayats in this block are in Korappuzha basin. There are several ponds in the block. Two panchayats have more than 25% under paddy fields.

Table 11-05 Chelannur block: Water bodies

Panchayat	W Body%	Paddy %	Topo	NREDB	Pan fish
Elathur	1.21	7.04	2	3	3
Kakkodi	0.02	39.16		1	
Kakkur	0.00	0.00			5
Nanmanda	0.15	0.49		1	5
Narikkuni	0.0	28.69			5
Thalakkulathoor	0.35	4.26		3	6

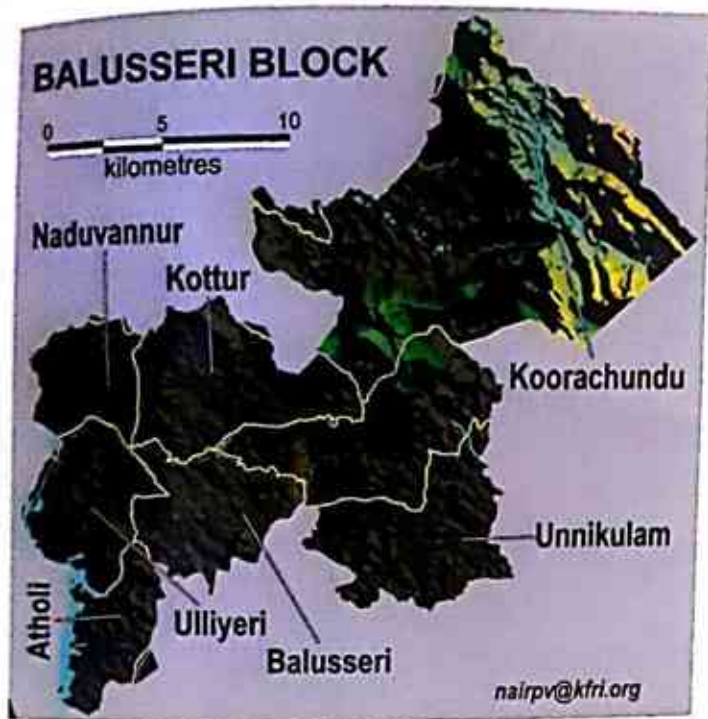


Fig. 11-30 Balusseri Block: Panchayats

This block comes in Kuttiyadi and Korappuzha basins. The eastern Koorachundu Panchayat is hilly, forested, and with many hydro projects. The basin divide is also in this panchayat. The rest of the block is drained by Korapuzha and Panur Puzha. There are paddy fields along the streams.

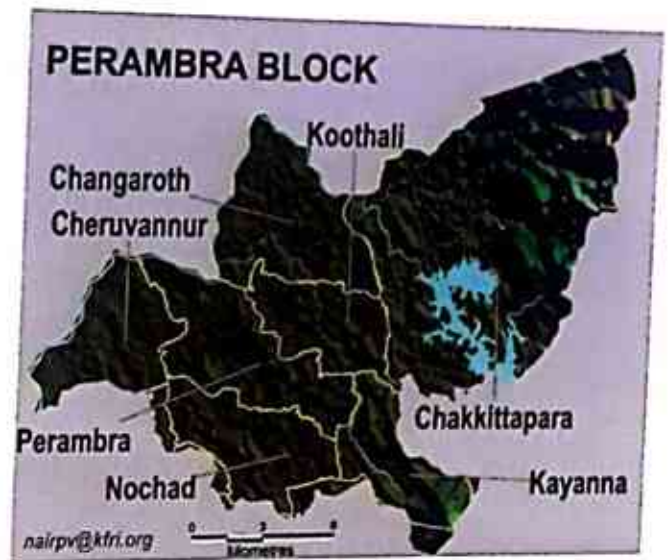


Fig. 11-34 Perambra Block: Panchayats

There are seven panchayats. Gulika Puzha makes boundaries to Cheruvannur, Perambra and Changaroth panchayats. Kuttiadi River and its tributaries, Alampara Thodu, Oni Puzha, Kadanthara Puzha, flow through Chakkittappara Panchayat. Kuttyadi Dam and Peruvannamuzhi Dam are situated in this block.



Fig. 11-31 Balusseri Block: Land use

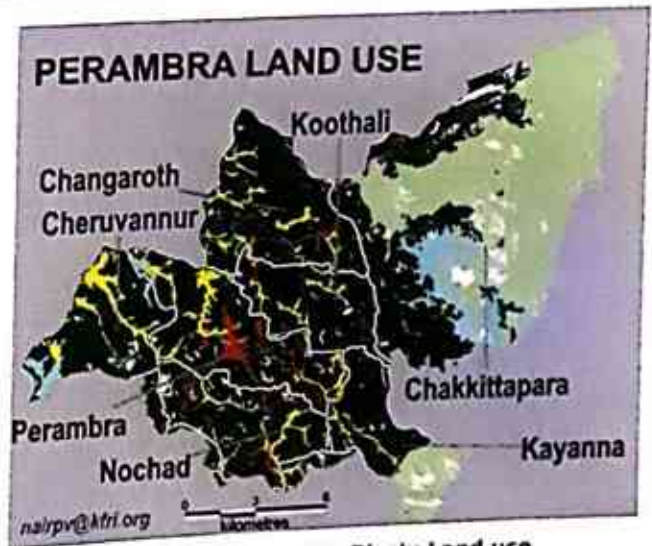
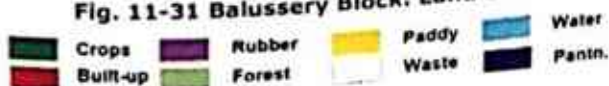


Fig. 11-33 Perambra Block: Land use



Kadiyangad Puzha flows through Changaroth, Koothali and Kayanna panchayats. Topo does not show any ponds in this block. Most of the areas in Chakkittappara Panchayat and some areas in Kayanna Panchayat are forested. Dry land cultivation is the main land use. Chakkittappara Panchayat in Perambra Block has hills and forest.

The Pruvannamuzhy dam also comes inside this. Area is drained by tributaries of Kuttiadi River. There is paddy cultivation along streams. There is much paddy fields in Koothali and Changaroth panchayats.

Table 11-06 Ponds in Perambra Block

Panchayat	W Body%	Paddy %	Topo	NREDB	Pan fish
Chakkittapara	12.42	0.30			
Changaroth	0.00	23.25	2		
Cheruvannoor	0.48	12.58	1		2
Kayanna	0.00	1.94			
Koothali	0.01	31.93		2	2
Nochad	0.10	17.89		4	2
Perambra	0.00	5.4		1	3

Koduvally Block

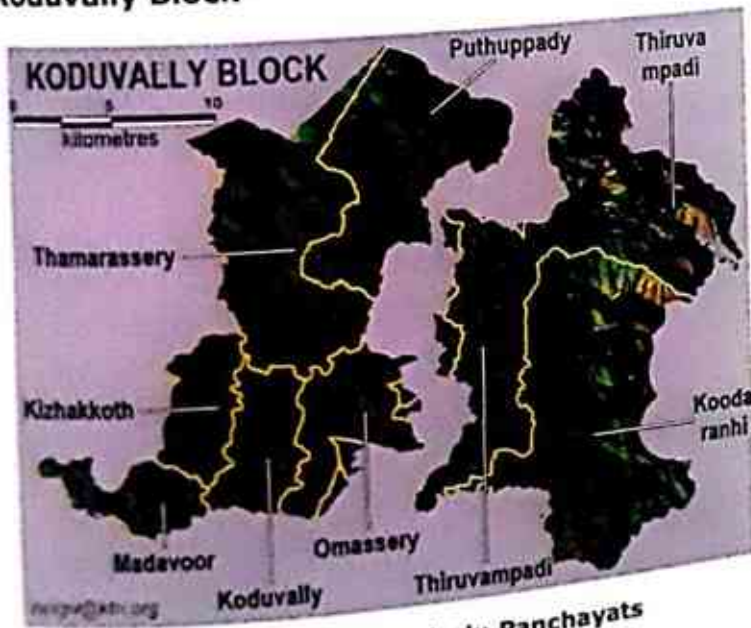


Fig. 11-35 Koduvally Block: Panchayats

There are eight panchayats. Due to some reason, the Kodanchery panchayat got wedged between panchayats, of this block. Thiruvampadi and Koodaranhi, lies right and six panchayats lies left to Kodanchery Panchayat in Kunnamangalam Block. Panur Puzha, Iruvanni Puzha and Cheru Puzha flows through this block. Topo does not show any ponds in this block. Most of the areas in Thamarassery, Puthuppady, Thiruvampadi and Koodarathi Panchayats are forested. Dry land cultivation is the main land use. Some areas are under rubber in Thamarassery, Puthuppady, Thiruvampadi and Koodaranhi Panchayats.

Panchayats in this block is drained by Korappuzha and Chaliar. The water divide is in Puthupady and Thamarasseri pachayats. Land use is mainly forest and mixed dry land cultivation. Small amounts of paddy and built up areas are also there. Most of the hair pin bends in the Calicut-Vythiri highway come in Puthupady Panchayat. Even though Madavoor shows large area under paddy, land use table indicate most of it being converted to coconut plantations.

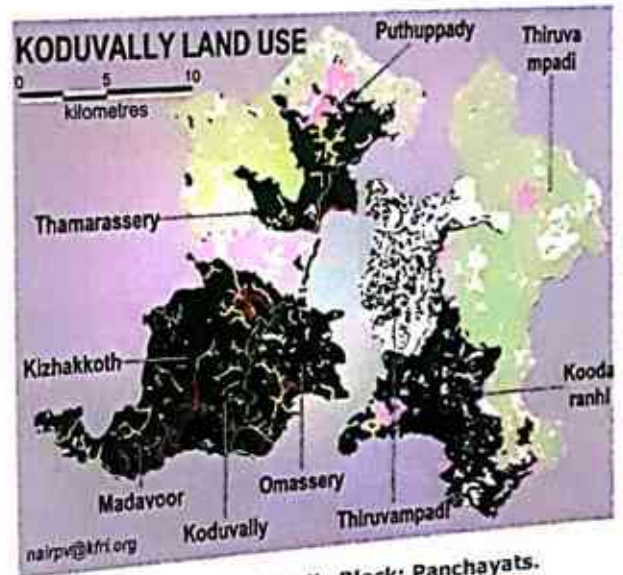


Fig. 11-36 Koduvally Block: Panchayats.

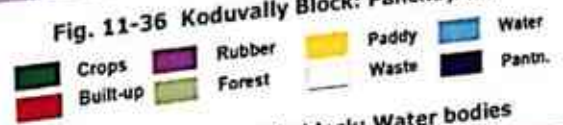


Table 11-07 Koduvally block: Water bodies

Panchayat	W Body %	Paddy %	Topo	NREDB	Pan fish
Kizhakkoth	0.26	16.56			4
Koduvally	0.11	1.43			
Koodaranhi	0.06	0.00			
Madavoor	0.00	47.32			
Omassery	0.04	1.64			
Puthuppady	0.00	5.02			
Thamarasseri	0.00	0.72			
Thiruvampadi	0.03	2.36	1		

Kunnamangalam Block

There are ten panchayats in this block. Beypore River makes boundaries in the southern side and its tributaries Cheru Puzha and Iruvanni Puzha flows through this block. Panur Puzha lies between

Kunnamangalam and Kuruvattur Panchayats. There is a small pond near Nelliparambu in Karassery panchayat. Topo does not show any other ponds in this block.



Fig. 11-37 Kunnamangalam Block: Panchayats

Dry land cultivation is the main land use. Some areas in Peruvayal, Karassery, Mukkom and Kodyathur Panchayats are under rubber. Northern portion of Kodanchery and Eastern portion of Karassery Panchayats are forested.

Paddy fields in Peruvayal, Mukkam and Karuvattor have largely been converted to dry land. Other land use includes built-up areas, barren hill tops and forest.

Table 11-08 Ponds in Kunnamangalam block

Panchayat	W Body%	Paddy %	Topo	NRED B	Par fish
Chathamangalam	0.13	21.41		1	2
Karasseri	0.16	0.76			1
Kodanchery	0.00	3.91			
Kodyathur	3.36	11.03			
Kunnamangalam	0.01	1.53		1	
Karuvattoor	1.02	13.27		1	5
Maruthomkara					1
Mukkam	0.57	17.76			
Peruvayal	0.36	34.67			

Kozhikkode Block and Corporation



Fig. 11-39 Kozhikkode Block: Panchayats

There are six panchayats in Kozhikkode Block. Beypore, Kallayi, Kadalundi rivers and Chaliyam Puzha come inside this block. Kadalundi River flows through the southern boundary of Kadalundi Panchayat. Chaliyam Puzha lies between Kadalundi and Feroke Panchayats and joins with Beypore River. Kadalundi, Feroke and Ramanattukara panchayats lie south of Beypore River and Beypore, Cheruvannur-Nallam and Olavanna Panchayats are in the north. Kallayi River and its tributaries flow through Kozhikkode Corporation and Olavanna

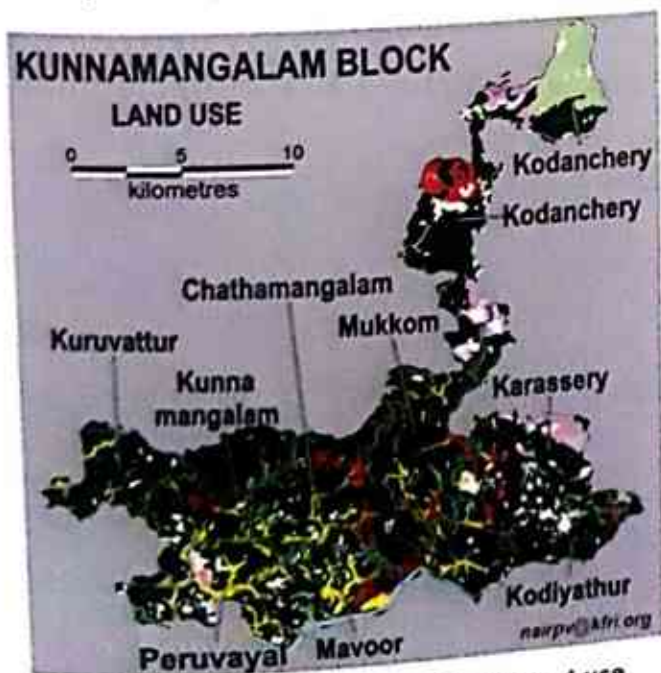


Fig. 11-38 Kunnamangalam Block: Land use



Panchayat. Topo shows one large pond and Conolly Canal in Kozhikkode Corporation near Nadakavu. Topo shows ponds and canals in this block. There is a tank near Karuvantiruthi and a small pond near dispensary in Feroke Panchayat. There are eight tanks and two ponds in the western portion of Kozhikkode Corporation. Mixed crop cultivation is prevalent in all areas. Much built up areas are seen in Kozhikkode Corporation.

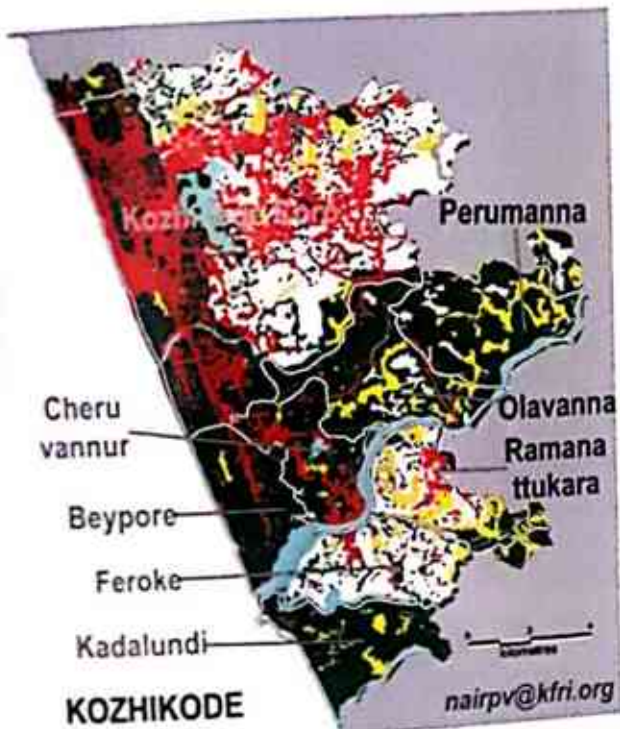


Fig. 11-40 Kozhikkode Block: Land use



The Conolly canal continues north wards to form a water way. There are large water bodies long the canal (Kothu kunnu). Chaliar is a broad river as it enters Kozhikkode. Kallayi basin is also inside Kozhikkode Corporation.

Table 11-09 Kozhikkode block: Water bodies

Panchayat	W Body%	Paddy %	Topo	NREDB	Pan fish
Kozhikkode Corp			14		1
Beypore	0.15	0.00	2	3	2
Cheruvannur	6.48	7.65			
Nadadam				4	
Feroke	0.51	1.60		4	2
Kadalundi	0.98	0.00			3
Olavanna	0.06	10.88		2	
Peruvanna	0.64	36.58		2	4
Ramanattukara	0.68	39.06			

Drinking water for Kozhikkode is obtained from Mananchira.



Fig. 11-41 Mananchira

Other aspects

Land use wise, Calicut District has more forest than state average. Paddy fields are also more in the district. Dry land crops, rubber cultivation and built-up areas are less than state average.

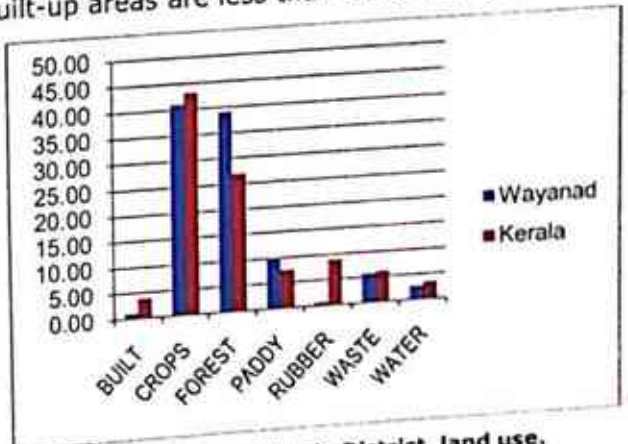


Fig. 11-42 Kozhikkode District, land use.

Quarry ponds are a source of fresh water. Figure illustrates the Injappara quarry pond being developed as a recreation center.



Fig. 11-43 Injappara quarry pond

Many ponds in laterite area show typical terraced construction. The water table being low, such an approach is essential.



Fig. 11-44 Muchukunnu temple pond

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Fig. 11-45 Sarovaram Biological park.

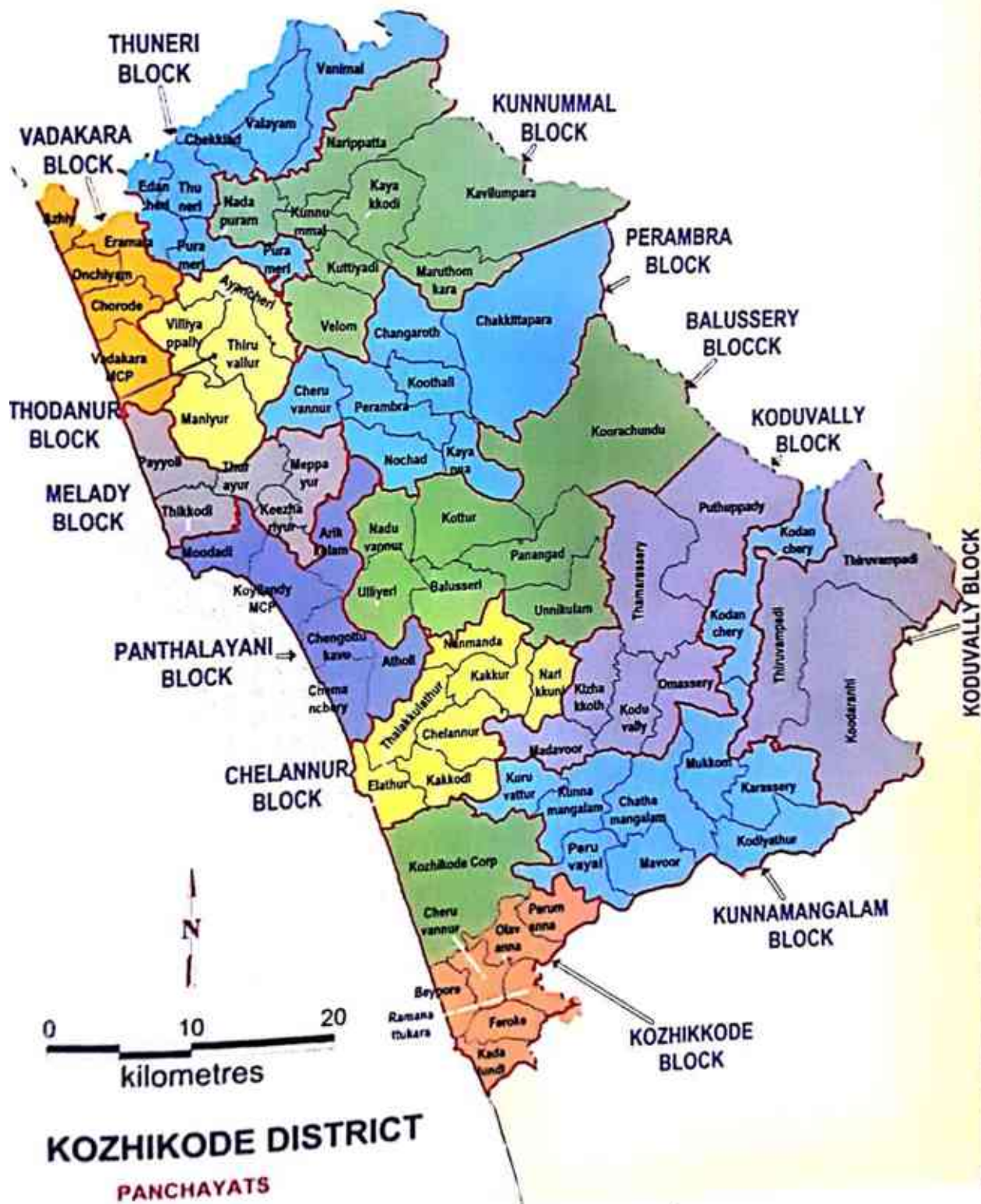


Fig. 11-46 Kozhikode District: Panchayats.

WAYANAD DISTRICT

INTRODUCTION

The total geographical area of Wayanad is 2,126 km². It is bounded on the East by Nilgiris and Mysore District of Tamil Nadu and Karnataka respectively, on the North by Coorg District of Karnataka, on the South by Malappuram and on the West by Kozhikode and Kannur .



Fig. 12-01 Wayanad District: Basins

Placed on the southern tip of the Deccan plateau, its prime glory is the majestic Western Ghats with lofty ridges interspersed with magnificent forests, tangled jungles and deep valleys. In the centre of the district, hills are lower in height, while the northern area has high hills. Some of the major peaks are Vellarimala, Banasura, Brahmagiri, Chembra, etc. ranging from 1,500m to 2,100m height.

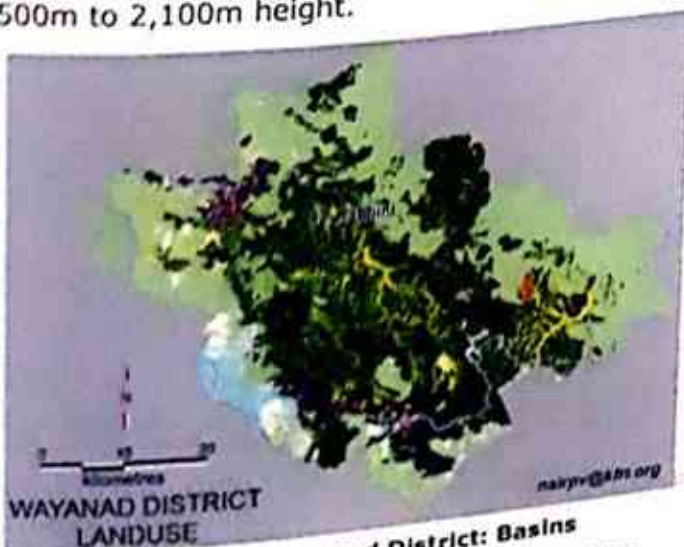
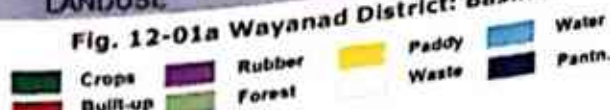


Fig. 12-01a Wayanad District: Basins



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

The altitude of Wayanad varies from 700 to 2100 meters from sea level. The hill ranges of Vythiri Taluk, through which the road from Kozhikode ascends the Wayanad Plateau over mind-boggling bends and ridges, are the highest locations. From the highest altitude of the Western Ghats on the western border of the district, the plateau of Wayanad gradually slopes down eastward. Further from Mananthavady, it becomes a common plain of paddy fields with the swift flowing Kabani coursing through it.



Fig. 12-02 Wayanad vayal

Elsewhere, Wayanad offers a panorama of undulating hills and dales, which are converted into paddy fields. The hills, which might have been thick forests once, are now plantations of coffee, tea or cardamom. There is luxuriant greenery all round. The soil of the Wayanad District is mainly of the forest type. It promotes a lushy luxuriant growth of vegetation.

Wayanad has a salubrious climate. The mean average rainfall in this district is 2,322 mm. Lakkidi, Vythiri and Meppadi are the high rainfall areas in Wayanad. Annual rain fall ranges from 3000 to 4,000 mm. High velocity winds are common during the southwest monsoon and dry winds blow in March-April. High altitude regions experience severe cold. In Wayanad (Ambalavayal) the mean maximum and minimum temperature for

the last five years was 29°C and 18°C respectively).
 The dale, Lakkidi, nestled among the hills of
 Vythiri Taluk has the highest average rainfall in
 Kerala.



Fig. 12-03 Water fall

Kabani Basin

Kabani River, one of the three east-flowing Rivers of Kerala, is an important tributary of the river Cauvery. Kabani and its tributaries constitute a powerful river system in the landscape of Wayanad.

Panamaram rivulet takes its origin from the Perennial Lake called Pookkode Lake. It flows swiftly through mountain gorges joined by other streams and tumbles down into Panamaram valley. Six kilometres further from Panamaram, this river joins the Mananthavady rivulet, originating from the lower regions of the peak 'Thondarmudi'. From this confluence onwards the river is known as Kabani, a mighty, perennial river which after entering Karnataka, joins with the river Cauvery. Almost entire Wayanad is drained by the Kabani River and its tributaries namely Panamaram, Manantha-vady and Thirunelli.

KSLUB (2000) divides the Kabani basin into 40 watersheds. We have grouped them into 6 water sheds 27K/A to F. Each of these sub basins have tributaries arising from hill tops, flowing to the valley in the center to from the Kabani River. The blocks are Mananthavady (sub basin A and B) Kalapetta (C and D) Sultan Bathery (E and F). The features of the sub basins are tabulated below:

Sub basin 27K/A. Panchayts: Thirunelli Panchayat. Thirunelli Hole. Hills up to 1100m are on the western side. Land use is mostly forest, followed by dry land agriculture and paddy fields.

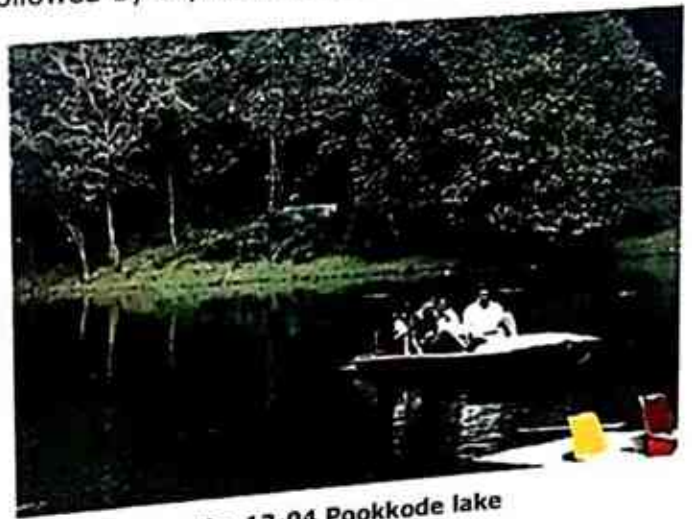


Fig. 12-04 Pookkode lake

Sub basin 27K/B. Panchayts: Tavinjal, Tondernad, Manathavadi and Edavaka. Vellamunda (north part). Sub basin is Mananthavadi River. Hills of about 1000m are on the northern, wester and southern sides. There are two branches Priya Puzha on the north and Tondernad Puzha on the west. Land use in Tondernad and Thavinjal are mostly forest, plantations, dry land crops, paddy and bare lands. Panchayats Mananthavady and Edavaka on the other hand has dry land crops, paddy fields and built-up areas as land use.

Sub basin 27K/C. Panchayts: Vellamunda, Padinjare-thara, Thariod, Pozhuthana, Vythiri, Meppadi, Kapetta MCP, Vengappally, Kottathara and Panamaram. This sub basin also has two branches, Karaman Todu and Pozhuthana Puzha. Hills of about 1000m are on west, south and east sides. The rivulets flow towards the valley on the north. Panchayats on the rim, Vellamunda, Padinarethara, Thariod, Pozhuthana, Vythiri and Meppadi have forest as the main land use. There is a large reservoir in Thariod and Pozhuthan Panchayats. Banasura Sagar dam is in this sub basin.

Sub basin 27K/D. Panchayts: Muppainad, Ambalavayal, Muttill, Meenanangadi, Kaniyambetta, Poothadi (part), Pulapally (part) and Panamaram (part). Sub basin D has only low hills along the periphery. The streams are Korapuzha and Narasi Puzha which join the main river. The main land use is dry land crops and paddy cultivation along the streams. There is forest along the rim of the hills.

Sub basin 27K/E. Panchayats: Sultha Bathery, Nenmeni and Noolpuzha. There is forest in Sulthan Bathery and Noolpuzha panchayats. Noolpuzha and Manjatodu are the streams, they join Muthanga. The combined river flow north into Karnataka as Nugu Hole and join Kabini further downstream. Nenmeni panchayat has dry land crops, paddy fields and built up areas.

Sub basin 27K/F. Panchayats: Mullankolly, Pulpally (part), Sulatan Bathery (part) and Poothady (part). Two streams Kadaman Thodu and Kannegal Hole join the main river near the Kabani reservoir. There are forest in two large patches, separated by a large stretch of dry land cultivation and paddy.

Bhavani basin

Bhavani River originates in Kerala and flows to Tamil Nadu. The basin can be grouped into 10 sub basins.

Sub basin A: Bhavani River originates in the Kunda Plateau at an altitude of about 2200m. The river enters Kerala near Tundukkal Malai and follows a deep valley. Surprisingly there are few settlements in this valley connected by long foot paths to places in Attappadi. Land use is shown as mixed dry land cultivation.

Sub basin B: A small stream, Panchan Thodu joins Bhavani River at Mukkali. There is a small settlement in this sub basin. At Mukkali Bhavani river takes a 90° turn and flows to Eastern side. The divide is so narrow that very little effort is required to change the river course.

Sub basin C: is plains on the left side of Bhavani River as it flows down. Lower portions are inhabited.

Sub basin D: is Varaha Pallam a stream flowing down along a valley and joining Bhavani River near Ranganatha Puram. Lower portions are inhabited.

Sub basin E: is an unnamed stream flowing between Bhavani river and Siruvani River (Sub basin F,G). Lower portions are inhabited.

Sub basin F and G: The Siruvani River. Up stream of this river is Siruvani Dam which supplies drinking water to Coimbatore town. Lower portions are inhabited.

Sub basin H: Karuthottarai Ar that joins Siruvani River near Agali.

Sub basin I: Streams from hills on the eastern side of basin, flowing eventually to Bhavani River.

BLOCKS AND PANCHAYATS

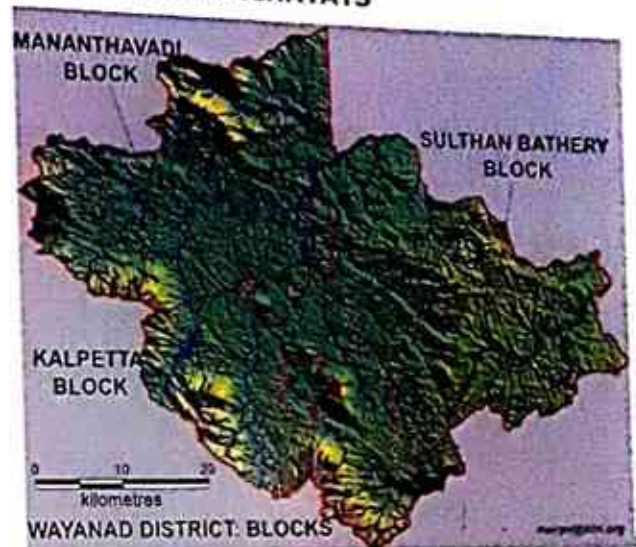


Fig. 12-05 Wayanad District: Block Panchayats

There are three blocks in Wayanad District, Kalpetta, Mananthavady and Sultan Bathery.

Kalpetta Block and Kalpetta MCP

There are ten panchayats in Kalpetta Block. Karaman Thodu, Vyttiri Puzha and Pozhuthana Puzha which are tributaries of Panamaram Puzha come inside the block. Karaman Thodu and its branches spread through Padinjara Thara and Thariyod Panchayats. Pozhuthana Puzha and its tributaries flows through Kottathara, Vengappally, Thariyod, Kalpetta MCP, Pozhuthana, Vyttiri and Meppadi Panchayats. Chali Puzha and Minmutt Puzha come in the South-East portions of the block between Meppady and Muppainad Panchayats. Pukkot Lake situated at Vythiri Panchayat. Cheru Puzha which is a tributary of Venniyottu Puzha flows through Kottathara, Vengappally, Kalpetta MCP and Meppady Panchayats. A tributary of Panamaram Puzha come inside Kaniyambetta, Muttil, Meppady and Muppainad Panchayats.

altitude goes up to 1500m. In the lower reaches of these hills there are extensive tea plantations.



Fig. 12-06 Banasura Sagar.

Topo shows a tank near Vellampadi at Muttill Panchayat. Topo shows two ponds one near Karinkutty and another one near Anerivayal at Kottathara Panchayat. Topo does not show any other ponds in this block. Most of the areas in Padinjaraathara, Thariyod, Pozhuthana, Vythiri, Meppady, Muppainad and some areas of Kalpetta MCP are forested. Dry land cultivation, paddy cultivation are the major land use. There is considerable amount of forests in this block.

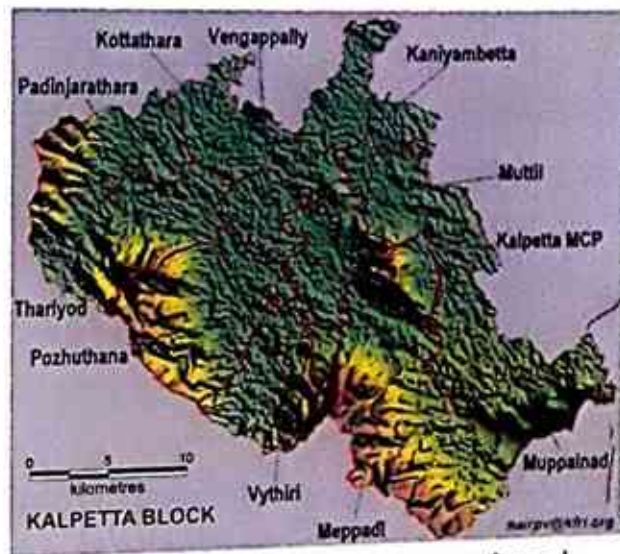


Fig. 12-07 Kalpetta Block: Topography and panchayats

Table 12-01 Kalpetta Block: Water bodies

Panchayat	W Sheds	W Body%	Paddy %	Topo	NRE DB	Pan fish
Kaniyambetta	22B/D	5.90	41.16			2
Kottathara	C	0.00	29.68	2		4
Meppadi	C	0.60	4.35			1
Muppainad	D	0.39	5.28	1		
Muttill	D	0.00	4.85	1		3
Padinjarethara	C	9.87	7.06			4
Pozhuthana	C	0.04	5.01	2		2
Thariyod	C	37.79	1.53	1		1
Vengappally	C	0.00	9.46	2		2
Vythiri	C	0.10	1.34	1		1

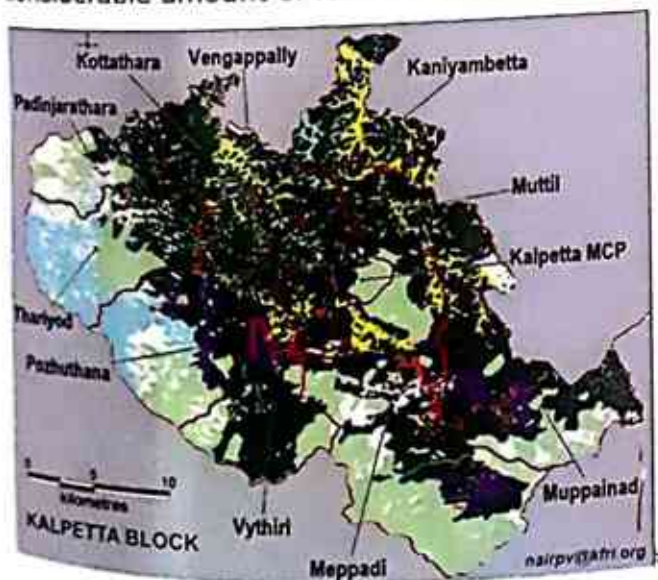
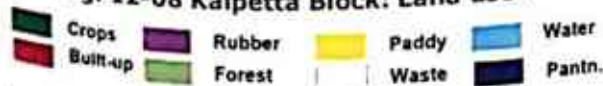


Fig. 12-08 Kalpetta Block: Land use.



Water bodies are comparatively few in Kalpetta block, but paddy cultivation is one of the highest. In Kaniyampet, Kottathara and Vengappally panchayats it is 41.16, 29.68 and 9.46% of land use respectively. Water bodies occupy 37.79% and 9.87 % of total area in Thariyod and Padinjarethara panchayats. This is the waters of the Banasura Sagar Reservoir. In the southern panchayats the

Sulthan Bathery Block



Fig. 12-09 Sulthan Batheri Block: Topography

There are eight panchayats: Noolpuzha inside Nulpuzha and Nenmeni Panchayats. Kabani River flows through the North-West boundary of Mullankolly and Pulppally Panchayats. Manikkadu Puzha comes inside Pulppally and Pooppadi Panchayats. Kadaman Thodu comes inside Mullankolly and Pulppally Panchayats. Kannegal Hole lies in the Eastern boundary of Mullankolly Panchayat. Kannaram Puzha and its tributaries Kurchiyat Puzha and Chedieth Puzha lie in Sulthan Bathery and Eastern boundary of Pulpally and Poothadi Panchayats. Manjat todou flows through Sulthana Bathery Panchayat. Narasi Puzha comes inside Poothadi and Sultan Battery Panchayats. Chundal Puzha comes inside Poothadi and Meenangadi Panchayats. Kara Puzha flows through the Western boundary of Meenangadi and Ambalavayal Panchayats. Thudukutty Ar, which is a tributary of Nul Puzha comes inside Sulthan Bathery Panchayat. Topo does not show any ponds in this block. Most of the areas in Sulthan Bathery and Nul Puzha Panchayats are forested. Some areas in Mullankolly, Pulpally, Poothadi, Meenangady and Nenmeny Panchayats are also forested. Dry land cultivation, paddy cultivation and also rubber is there.

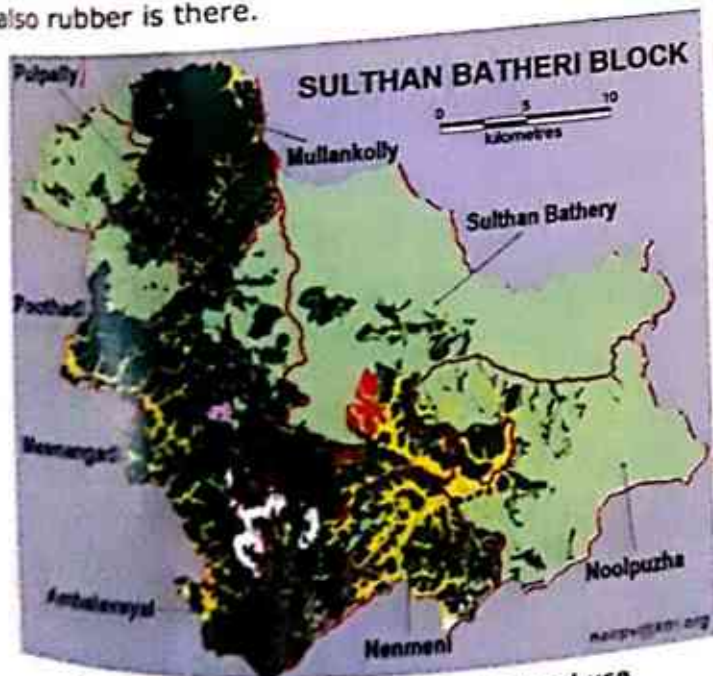


Fig. 12-10 Sulthan Bathery Block: Land use



There is considerable amount of forest in the eastern panchayats, Sulthan Bathery and Noolpuzha. There is a gap in the forest continuity in Mullankolly and Pulpally panchayats. There are not

extensive paddy fields in all the panchayats.

Table 12-02 Sulthan Bathery Block: Water bodies

Panchayat	Water sheds	W Body%	Paddy %	Topo	NREDB	Pan fish
Ambalavayal	22KD	0.02	36.87	1	1	4
Meenangadi	D	0.11	43.55	1	3	2
Mullankolly	F	0.00	28.64			2
Nenmeni	E	0.03	32.33	1		2
Noolpuzha	E	0.65	10.46			3
Poothadi	D,F	0.00	22.84		1	1
Pulpally	D,F	0.03	11.77	1		4
Sulthan bathery	E,F	0.06	6.39	1	2	2
Thirunelli	A	0.38	5.17			1

In Meenangadi and Ambalavayal panchayats it is as high as 43.55 % and 36.87 % of total area. Pookkot lake and Kerala Veterinary University come enroute on th highway leading to Karnataka.

Mananthavady Block

There are seven panchayats. Mananthavady River and Panamaram River, which are tributaries of Kabani, flows through this block. Mananthavady River and its branches come inside Mananthavady, Panamaram, Edavaka, Vellamunda, Thondernad and Thavinjal Panchayats. Panamaram River and its tributaries, Narasi Puzha and Chunadal Puzha, come inside Panamaram Panchayat. Bavali Puzha and its tributaries flow through Thirunelli Panchayat. Topo shows a pond near Kurikkalat in Mananthavady. Topo does not show any other pond in this block.

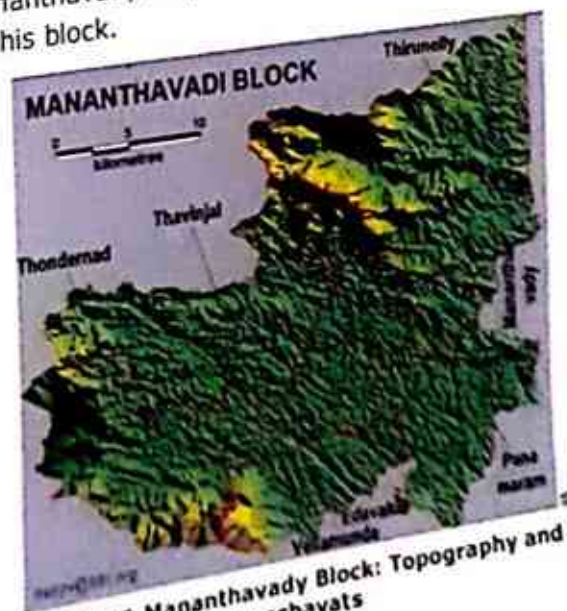


Fig. 12-11 Mananthavady Block: Topography and panchayats

Most of the areas in Thavinjal, Vellamunda, Thirunelli, Thundernad and some areas in Mananthavady and Edavaka are forested. Dry land cultivation and paddy fields are there.

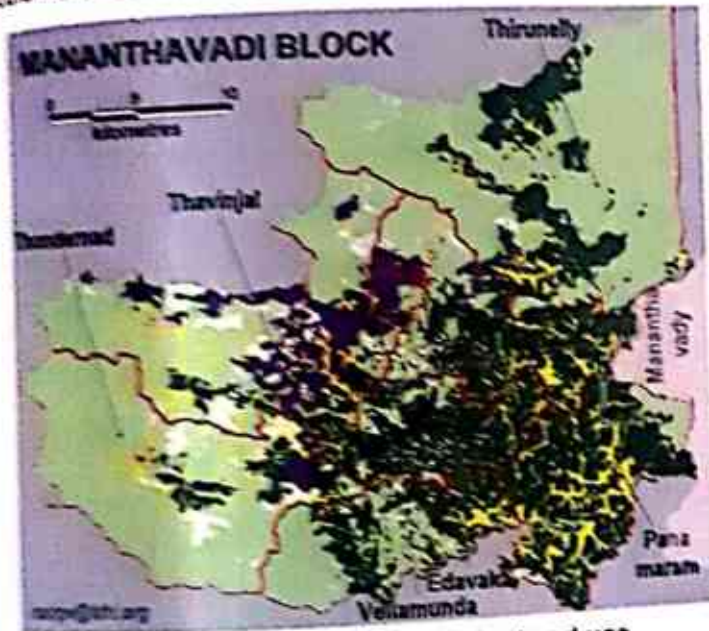


Fig. 12-12 Mananthavady Block: Land use



There is considerable amount of forest in the panchayats on the western rim of the block. Another notable feature is extensive tea plantations in the Thavinjal Panchayat. There is vast area under paddy cultivation. It is as high as 17.25, 16.56 and 10.61% of total area in Vellamunda, Edavaka and Mananthavady panchayats.

Table 12-03 Mananthavady Block: Water bodies

Panchayat	W sheds	W Body%	Paddy %	Topo	NREDB	Pan fish
Edavaka	22K/B	0.00	16.56			1
Mananthavady	B	0.01	10.61	1	2	1
Panamaram	D.C	0.00	8.83	2		4
Thavinjal	B	0.07	9.60		2	1
Thirunelli	A	0.38	5.17	3		1
Thundernad	B	0.00	5.97			2
Vellamunda	B	0.09	17.25			2

Other aspects

Paddy cultivation and forest are more than state average in Wayanad District. Consequently dry land crops and built-up areas are lower than state average. Typical of the state, the Banasurasagar reservoir, created for power generation and irrigation is badly implemented and hardly serves any purpose. The actual missions for this dam is to provide water for Kakkayam dam which was situated in Kozhikode district to produce electricity and also irrigation in wayanad, both missions were not accomplished and currently it's been part of Hydel project. It is India's First Solar Atop Dam.

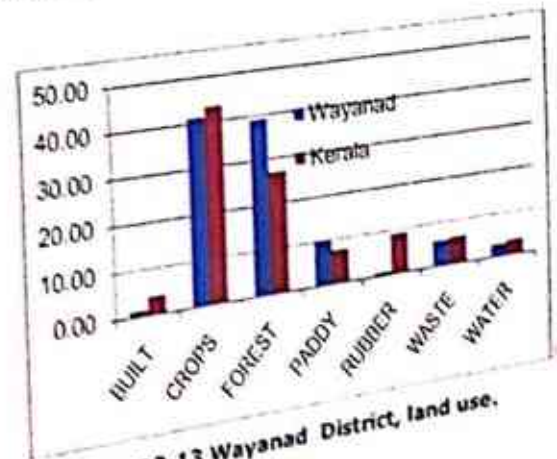


Fig. 12-13 Wayanad District, land use.

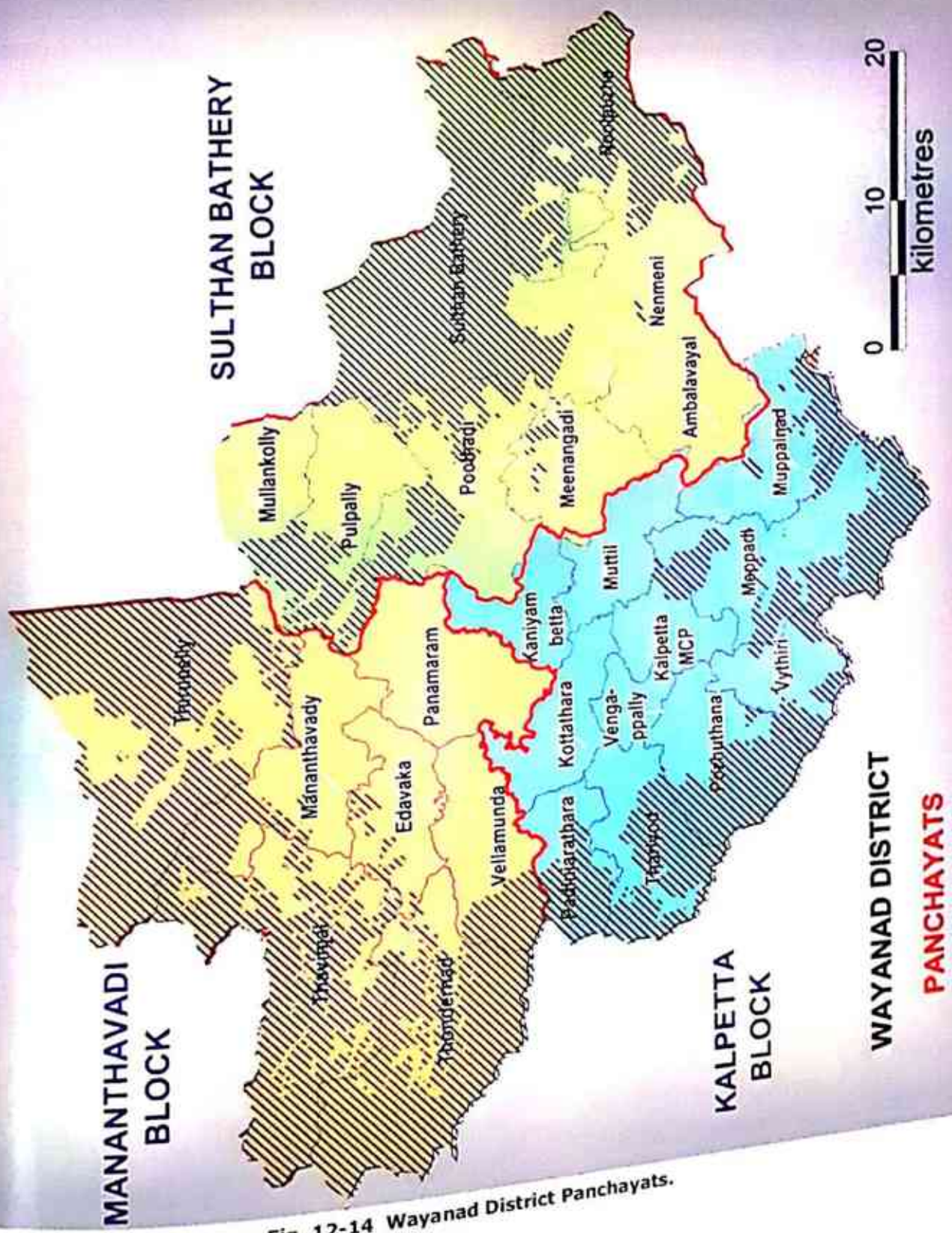


Fig. 12-14 Wayanad District Panchayats.

KOZHIKODE DISTRICT

INTRODUCTION

The district has three distinct regions - sandy coastal belt, rocky highlands formed by the hilly portion of the Western Ghats and lateritic midland. Of the total area of 2344 km², the sandy coastal belt is 362.85 km², lateritic midlands 1343.50 km² and rocky highlands 637.65 km².

Puzha are the two main rivers. The south eastern portion is drained by Chaliyar. There are two dams across Kuttyyadi River for power generation.

RIVER BASINS

Mahe Basin



Fig. 11-02 Mahe Basin

Sub basins A, B, D and F fall within Kozhikode District, C and E are in Kannur District. Land use in the basin is dry land cultivation, paddy fields, forest and built-up areas. Vadakara Block is fully inside this basin. Thunerri Block also fall fully inside this basin. Naripatta, Kunnummal and Nadapuram Panchayats of Kunnummal Block is also inside this basin.

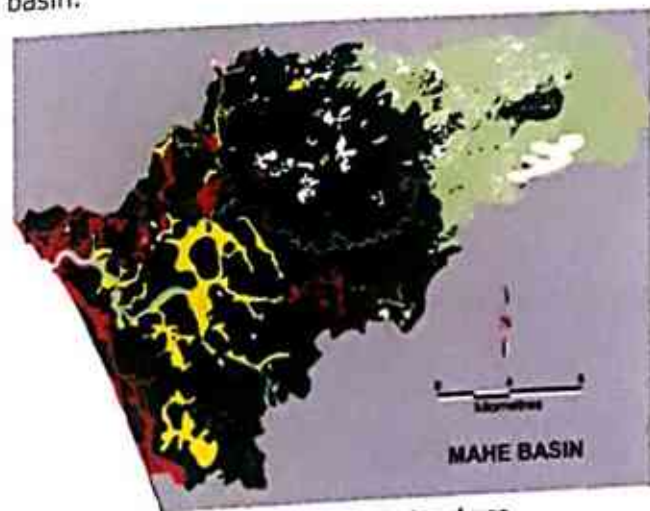


Fig. 11-04 Mahe Basin: Land use



Fig. 11-01 Kozhikod District

The district has a coastal length about 80 kms. Kozhikode District is situated on the south-west coast of India. The district is bounded on the north by Kannur District, on the east by Wayanad District, on the South by Malappuram District and on the West by the Arabian Sea.

It is situated between North latitudes 11°08' and 11°50' and East longitudes 75°30' and 76°08'. The highland region accounts for 26.80 per cent and the lowland region 15.55 per cent of the total area of the district. Dry land crops is the major land use in Kozhikkode District. It is much higher than the State average. Forest area is nearly 20%, but less than state average. Wetlands are less than state average. Rubber cultivation is also less than state average.

Geographically, the district has coastal areas, midlands and highlands. Korappuzha and Kuttyyadi

Kuttiadi Basin

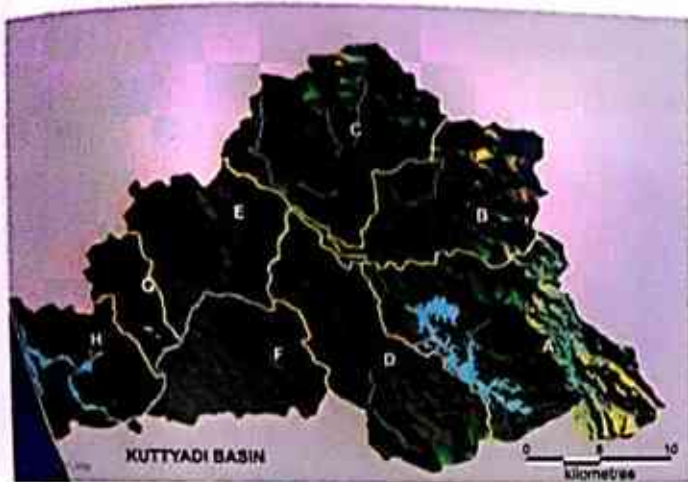


Fig. 11-03 Kuttiadi Basin

Kuttiadi River has its origin from Narikota ranges on the western slopes of the Wayanad Hills. The Kuttiadi River flows through Vadakara, Quilandi and Kozhikkode taluks. The river is also known as Murat River. The major tributaries of the river are Onipuzha, Thottilpalam Puzha Kadiyangad Puzha, Thevannathil Puzha and Madappalli Puzha. The river joins Arabian Sea at Kottakkal, 7 km. south of Vadakara. The Kuttiadi River has a length of 74 km and has an area of 583 km². This river nourishes locations like Oorakkudi, Kuttyadi, Thiruvallor, Muyippoth, Maniyoor and Karuvanchery during its course.



Fig. 11- 05 Kuttiadi estuary

Now the name of Kuttiadi is connected with the hydro-electric project in Kuttiadi River basin. It also serves as an irrigation project. Peruvannamuzhi reservoir also serves water for the famous Japan government aided Drinking Water Project. Long tunnels runs from here for the purpose of providing drinking water to secluded villages of Kozhikode District.

The Kakkayam dam comes as part of the Kuttiyadi Hydro Electric Project and is located at a height of about 750 m above sea level. The pen stock runs down from the dam site and goes through various tunnels and hills to the Kuttiyadi tall race power house at Kakkayam. Water coming out of this power house joins a river and is utilized for Peruvannamoozhi Irrigation Project.

Kuttiadi River basin is divided in to 8 sub basins. There are 6 chiras and two ponds in this basin. Thacharu vayal water body in this basin has an area of 14.81 ha, Puthenchira has an area of 14.81 ha, Eranhipuzha is 8.89 ha, Cherandathur chira has area of 3.77 ha, Pathiyarakkara chira is 1.25 ha and Viyamchira is 5.3 ha. Blocks extend beyond basins and description at panchayat level is more appropriate.



Fig. 11-06 Cannolly canal

Sub basin A: There are two dams in this sub basin, Peruvannamuzhi and Kakkayam. They are on tributaries of Kuttiadi River. The area is mostly forested with few inhabited areas near the dams. Forest has non wooded patches. Chakkittapara and Koorachund Panchayats come in this sub basin.

Sub basin B: Upper reaches of this sub basin is forested. Forest has non wooded regions. Lower

areas have mixed dry land cultivation. Two tributaries of Kuttiadi River, Kadanthara Puzha and Niduvai Puzha drain this area. Panchayats are Kavilumpara, Maruthomkara and Chankaroth.

Sub basin C: Upper reaches are steep hills. A tributary of Kuttiadi River from this sub basin join the main river at Kuttiadi. Upper reaches are forested; other areas have mixed dry land cultivation and small amount of rubber. There are built-up areas along main roads. Panchayats are Kavilumpara, Maruthompara and Kayyakodi.

Sub basin D: Kadiyangad Puzha, a tributary joins the main river at Puravur, Kallur area. Land use is mainly mixed dry land cultivation. There are built-up areas. Panchayats are Kayanna, Koothali, Chankaroth and parts of Perambra.

Sub basin E: Few small streams from this basin join the main river which is called as Gulika Puzha in this region. Land use is mainly mixed dry land cultivation. There are built-up areas and rubber cultivation. Panchayats are Thiruvallur, Purameri, Kuttiyadi, Velom and Ayancheri.

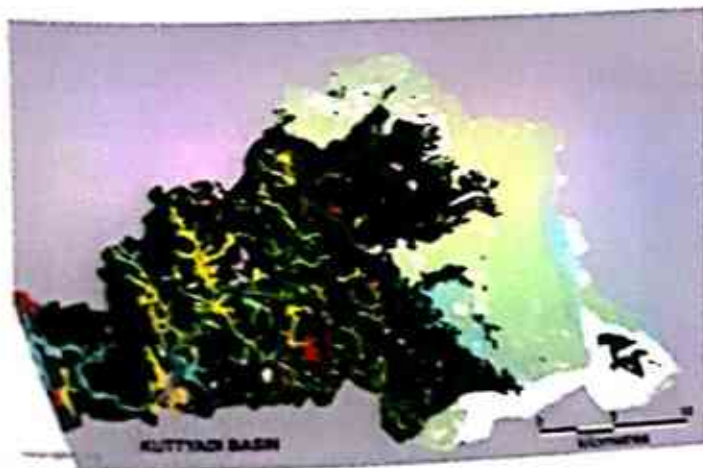
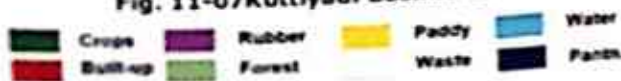


Fig. 11-07 Kuttiyadi Basin: Luse



Sub basin F: Consist of few streams on the southern side flowing to the main river. Land use is mainly mixed dry land cultivation. There are built-up areas, waste lands and water bodies. Panchayats are Cheruvannur and Perambra.

Sub basin G: Main feature is the Badakara - Mahe canal. Land use is mainly mixed dry land cultivation. There are few water bodies. Panchayat is Thiruvallur.

Sub basin H: Local bodies are Vadakara Municipality, Payyoli and Maniyur. First two are coastal areas. Kuttiyadi River, lake and estuary are inside this sub basin. Land use is mainly mixed dry land cultivation and built-up areas.

Korapuzha Basin

Korapuzha is formed by the confluence of the Agala Puzha and Panur Puzha. While Agala Puzha is more or less a backwater, Panur Puzha originates from Arikkan kunnu. Korapuzha empties into the Arabian Sea at Elattur. The total length of Korapuzha is 40 km and the area of its basin is 624 km².

The river connects all important industrial towns lying in the coastal areas such as Vadakara, Kozhikode, Kallayi and Beypore.



Fig. 11-08 Korapuzha Basin

Agala Puzha, literally meaning broad river, in Calicut District may also be considered as a kayal. This backwater extends to a north-south distance of 25.6 km, parallel to the sea up to its merger with the Elattur River close to its mouth. No significant rivers drain into it. Nearly all drainage from the hills is intercepted by the main stream and tributaries of the Korapuzha. It would seem as if the Korapuzha had at one time found its way to the sea by this outlet instead by the channel. The man-made Payyoli canal of about 1.6 km in length connects Agala Puzha to Korapuzha.

KSLUB (2000) divides the basin into 29 micro water sheds. We have grouped the watersheds into 7 sub basins, A to G.

Sub basin A: Kora Puzha and its continuation, Chittari Puzha are the rivers in this basin. Region consists of low hills, except at the north-east corner where the steep hills are forested. Land use is mainly mixed dry land cultivation with traces of built-up areas and waste lands. Panchayats in this sub basin are Panangad, Kottur, Naduvannur and Arikkulam.

Sub basin B: Panur Puzha is a tributary of Korapuzha originating in the northern part, flowing south wards and then westwards to join the main river. In the extreme northern part there is forest and rubber cultivation. Remaining areas are mixed dry land crops. There is small amount of waste land and built-up areas. The panchayats are Thamarassery, Kizhakkoth, Kuruvattur and Kakkodi.

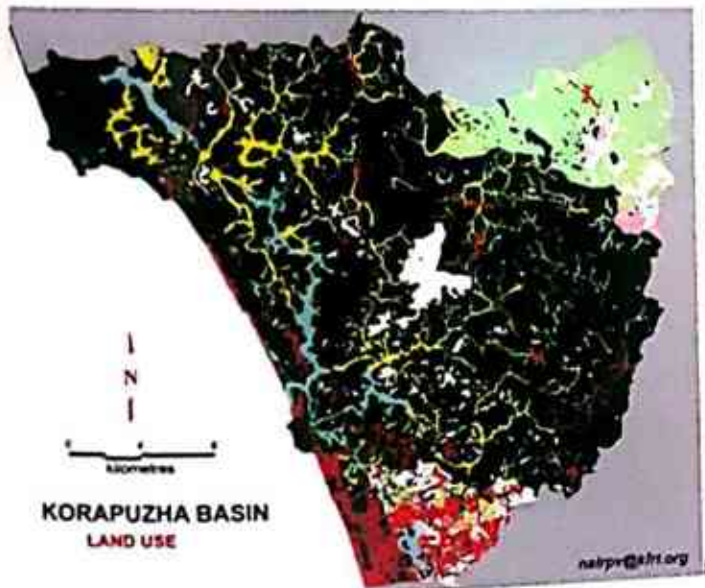


Fig. 11-09 Korapuzha Basin: Land use

Sub basin C: Ramallur Thodu and an unnamed stream flow directly into Korapuzha. Land use is mixed dry land crops with small amount of waste land and built-up areas. Panchayats in the sub basin include Namanda, Kakkur, Chelannur and Balussery.

Sub basin D: This sub basin consists of the Agalapuzha Lake and land surrounding it. The railway line and national highway pass through this. Land use is mixed dry land crops, waste land and built-up areas. Coastal panchayats are Thikkodi, Modadi, and Chengottu Kavv. Koyilandy Municipality also comes in this group. Keezhayur

and Thuravur are Panchayats on the northern side of the lake.

Sub basin E and F: These are coastal sub basins. Panchayats are Chengottukavu, Chemanchery, Atholl, Thalakupathur, Elathur and Kozhikkode Corporation. Kozhikkode Corporation has mostly built-up areas; other local bodies have mostly dry land cultivation.

Kallayi Basin



Fig. 11-10 Kallayi Basin: Sub basins

Kallayi River has its origin at Cherukulathur in Kozhikkode District. Winding through many villages of thick settlements like Cherukulathoor, Kovoor, Olavanna and Malava, the river empties into the Arabian Sea near Kallayi.



Fig. 11-11 Kallayi river, floating of timber

Though small in size, the Kallai River is one of the most important rivers in the entire state from commercial point of view. Kallayi town, a main

centre of timber trade, is situated on its banks. It is connected to the Chaliyar on the south by a man-made canal. The river is of 22 km long.

Being a small basin, nine water sheds marked by KSLUB (2000) is retained. Overall land use is dry land cultivation and built-up areas. Northern part of the basin is occupied by Kozhikkode Corporation. Southern side consists of parts of Beypore, Cheruvannur, Olavanna, Peruvana and Peruvayal Panchayats.

Sarovaram Bio Park: Sarovaram Bio Park is an eco-friendly development near the city of Kozhikkode, situated adjacent to Connolly Canal. The project has been developed with an eco-friendly theme and is located in an ecosystem consisting of wetlands and mangrove forests containing bird habitats.

Chaliyar (Beypore River) originates from Ilambalari (Elembalai) hills in Gudalur of Nilgiris District (in Tamil Nadu). The length of the river is 169 km. This river has a total drainage area of 2,923 km², of which 2,535 km² is in Kerala and the rest in Tamil Nadu. The river flows through Wayanad, Malappuram and Kozhikkode districts. Chaliyar River joins Arabian Sea near Beypore. The mouth of the river has been converted into a minor fishing harbour. Chaliyar River flows through Nilambur, Mambad, Edavanna, Areecode and Vazhakkad in Malappuram District and Feroke in Kozhikkode District, before it joins the Arabian Sea near Beypore.

Important tributaries of Chaliyar are Chalipuzha, Punnapuzha, Pandiyar, Karimpuzha, Vadapurampuzha, Iringipuzha and Iruthullypuzha. The three main tributaries of this river unite a few kilometres near Nilambur. The eastern tributary, Karimpuzha arises below Mukurti peak and drains the densely wooded valley between Gulikal hill and Nilgiri and Makurti peaks. The middle one, the Punnapuzha drains the Ocheterlong valley and the south-east of the Marappanmadi of the Nilgiri-Wayanad area and passes over the ridge of the Ghats. Chaliyar leaps down from the crest of the Wayanad hills in a magnificent waterfall near the Chalad pass and drains the valley east of the Vavumala. The three streams reinforced by many large feeders unite in the heart of the famous teak plantations in the middle of the Nilambur valley. The Kavanakallu regulator cum bridge is constructed across the Chaliyar River, 13 km away from Kondotty Hill.

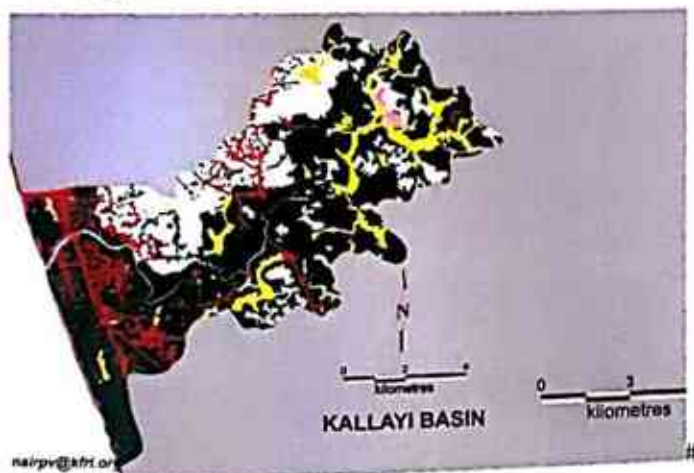
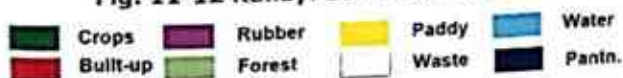


Fig. 11-12 Kallayi Basin: Land use



Chaliyar basin

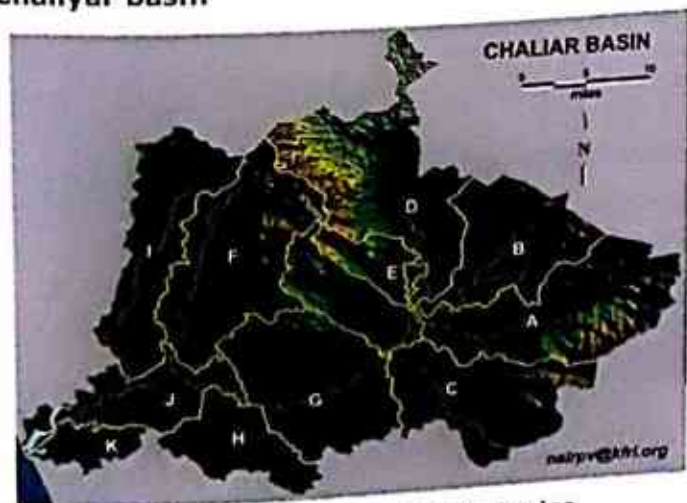


Fig. 11-13 Chaliyar Basin: Sub basins

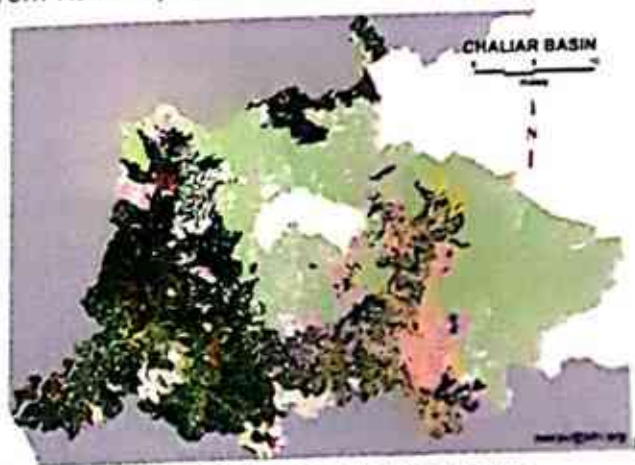
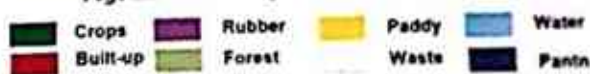


Fig. 11-14 Chaliyar Basin: Land use



Most of this basin falls in the Kozhikode district. Two of the sub basins, F and I fall in Kozhikkode District and are described below.

Sub basin F: Block Koduvally. Panchayats: Thiruvampady, Koodaranhi, Karasseri, Mukkam. Munda Puzha joins Iruvani Puzha and joins Chaliar at Puzhur. Land use is forests in the upper reaches, dry land cultivation and rubber below.

Sub basin I : Blocks are Koduvally and Kunnamangalam. Sub basin I is mostly plain areas falling in Koduvally and Kunnamangalam blocks in Malappuram District. The sub basin is drained by Charu Puzha which joins Chaliyar downstream. Land use is mixed dry land cultivation and paddy fields in the plains, rubber cultivation and forest are the land use in the upper reaches.

BLOCKS AND PANCHAYATS

There are 12 blocks in Kozhikode District. Arabian Sea is on the western side and hill ranges of the Western Ghats are on the eastern side. There are extensive set of temple ponds and irrigation tanks in the district. The blocks are described below.



Fig. 11-15 Kozhikode District, Block Panchayats

Vadakara Block and Vadakara Municipality (MCP)

Vadakara is the northern most block in Kozhikode District. There are four panchayats and one municipality in this group. Murat River flows in the southern portion of Vadakara MCP. Mahe River flows through the north and eastern boundary of Azhiyur Panchayat and northern boundary of Eramala Panchayat. A tributary of Mahe River flows through the eastern boundary of Eramala Panchayat. Topo does not show any ponds.



Fig. 11-16 Panchayats in Vadakara Block



Fig. 11-17 Block: Vadakara - Land use



Mixed crop cultivation and built-up areas are the land use. Records do not show any ponds in the area. All local bodies except Eramala have sea on the western side. The northern portions of this block fall in sub basins E and F of Mahe River.

Tuneri Block

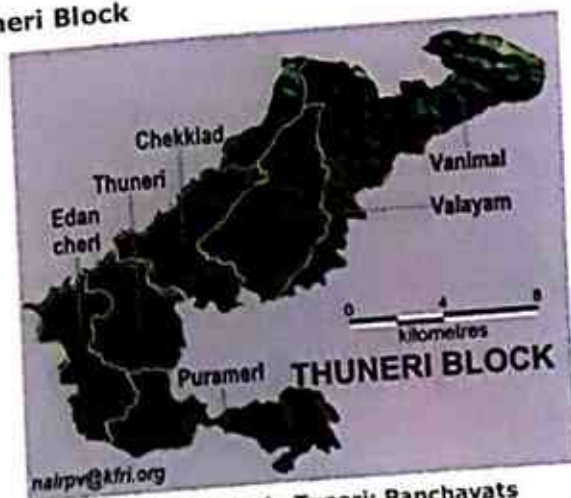


Fig. 11-18 Block: Tuneri: Panchayats

There are six panchayats. Mahe River makes western boundary to Edanchery Panchayat and it flows between Chekkiad and Thuneri Panchayats. Mahe River is boundary for Valayam in the south-west and Vanimal in the south-east side. Tributaries of Mahe River spread through the block. Topo does not show any ponds.

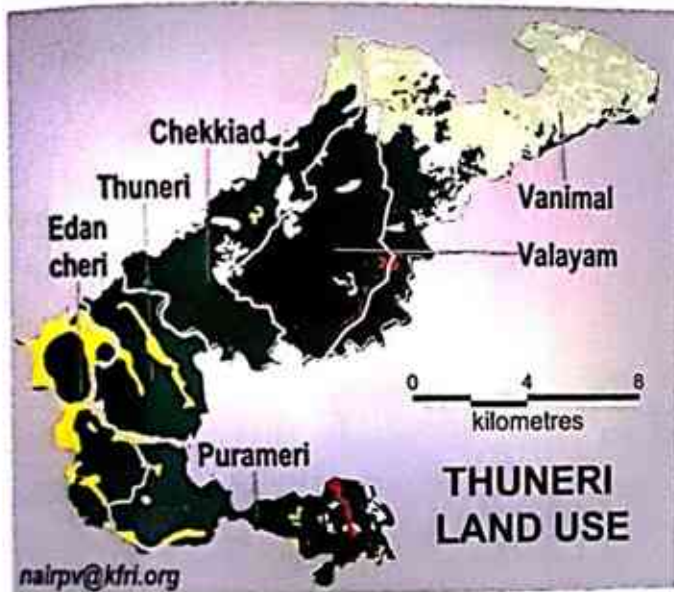
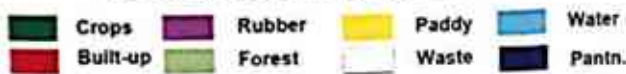


Fig. 11-19 Block: Tuneri, land use



Vanimal, Chekiad and Valayam panchayats fall in the Mahe basin. In fact the water divide pass along these panchayats. The eastern portion is forested hilly areas.

Some areas in the northern portions of Chekkiad, Valayam and Vanimal panchayats are hilly and forested. Block has mainly mixed crop cultivation, some areas in Valayam and Vanimal Panchayats have Rubber cultivation.

Kunnummal Block



Fig. 11-20 Block: Kunnummal

There are eight panchayats. Gulika Puzha lies in the southern boundary of the block. Tributaries of Kuttiadi River spread through Kayakkodi, Kavilumpara and Maruthomkara panchayats.

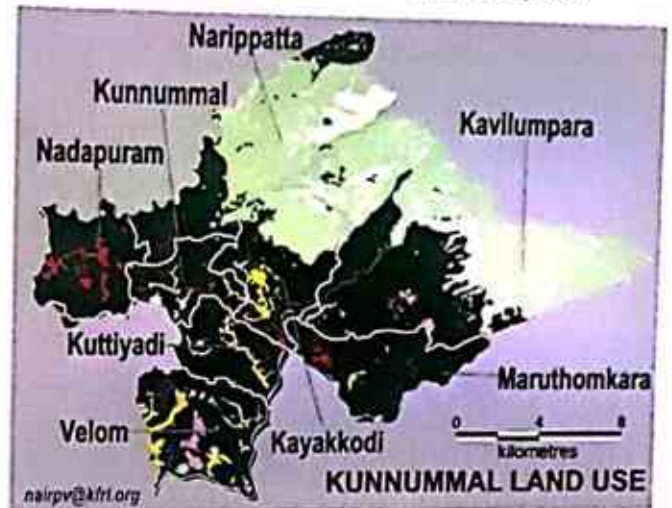


Fig. 11-21 Block: Kunnummal Land use



Mahe River comes in the northern boundary of the block. Kavudi Puzha lies in the northern portion of Narippatta Panchayat. Topo does not show any ponds. Much of the areas in Kavilumpara Panchayat are forested. Some areas in Narippatta and Maruthomkara panchayats are also forested. Dry land cultivation is the predominant land use. Some areas in Velam and Kavilumpara are under rubber. Teak plantations are also present. Hill tops have barren areas. Water bodies are few; there is paddy cultivation in Kuttiyadi and Velom Panchayats. Narippatta and Nadapuram panchayats come in Mahe basin. The rest of the panchayats come in Kuttiyadi basin. Kavilumpara, Kayakkodi and Kunnummal are in sub basin 28K/C. In general, ponds are few, Pan fish (1992) reports few of them. Land use in Kuttiyadi panchayat show as much as 18.6% area under paddy fields.

Table 11-01 Kunnummal Block: Water bodies

Panchayat	W Body %	Paddy %	Topo	NREDB	Pan fish
Kavilumpara	0.00	0.00			3
Kayyakodi	0.15	0.03			1
Kunnummal	0.00	1.20			4
Kuttiyadi	0.00	18.67			4
Maruthomkara	0.00	2.34			1
Nadapuram	0.00	0.00			3
Narippatta	0.00	0.00			1
Velom	0.98	6.38	1		2

Thodannur Block

There are four panchayats. Murat River comes in the south-east and south-West boundaries of Maniyur Panchayat. Kotta Puzha comes in the eastern boundary of Thiruvallur Panchayat. Vadakara-Mahe canal comes inside this block. Topo shows large water body associated with Murat River in Maniyur Panchayat. Topo shows three large ponds near Vellukara in Thiruvallur Panchayat. Topo shows a small pond near Padiyirakkara in Maniyur Panchayat. There is a tank also in Maniyur Panchayat near Cherandattur. Land use is mixed crop cultivation, some area in Maniyur Panchayat is under rubber. Mostly plain areas, there is no sea coast for any of the panchayats.

The main Kuttiyadi River flows along the southern boundary of Maniyur and Thiruvallur panchayats. Streams from these panchayats flow south to join the river. There appears to be a link with the Mahe basin 29M/D. This is the Badagara-Mahe canal; it passes along a series of paddy fields. Renovation of four kilometres of the 17.61 km canal started in 2013. The 36 m wide canal is to have road and foot path on either side. Second stage would be 10 km. This is based on central waterway standards. Action has been initiated for two out of 10 bridges needed in the scheme. Land use in Ayanchery Panchayat shows as much as 50% area under paddy fields.

Table 11-02 Ponds in Thodannur Block

Panchayat	W Body%	Paddy %	Topo	NREDB	Pan fish
Ayancheri	0.00	49.81			3
Manniyur	2.00	3.11	2	1	
Thiruvallur	1.42	11.87	3	2	
Villiappally	0.01	0.00		1	2

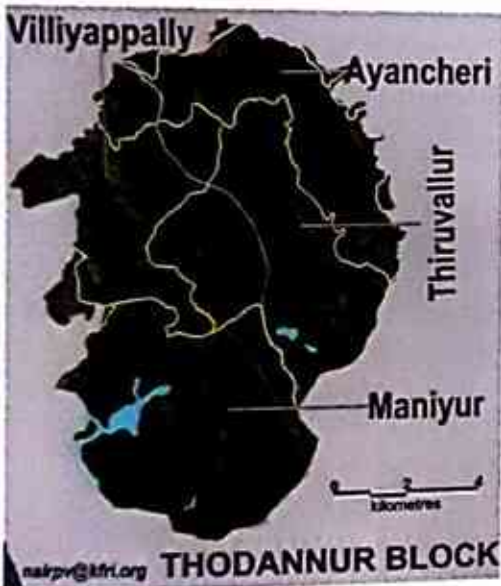


Fig. 11-22 Block: Thodannur.

Melady Block

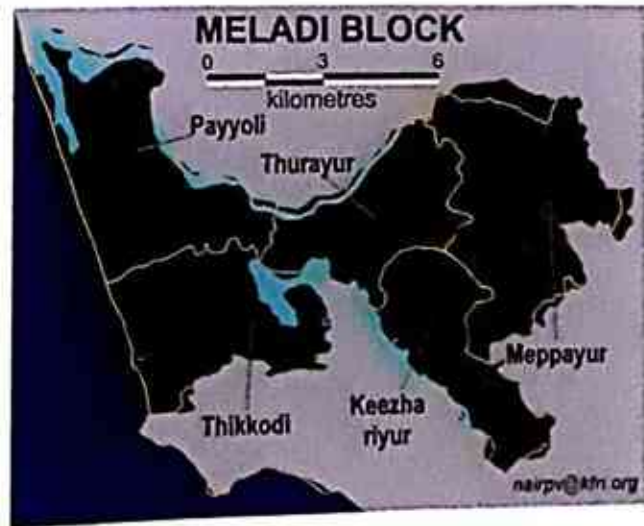


Fig. 11-24 Melady Block: Panchayats

There are five panchayats. Agala Puzha and Murat Puzha flows through this block. Murat River joins with Arabian Sea at Payyoli Panchayat. Agala Puzha spreads through Thikkodi, Thurayur and Keezhariyoor Panchayats. There is a large water body near Porku Mala in Meppayur Panchayat. Topo does not show any other ponds. Main land use is dry land cultivation. Some areas are under rubber in Meppayur and Thurayur Panchayats.

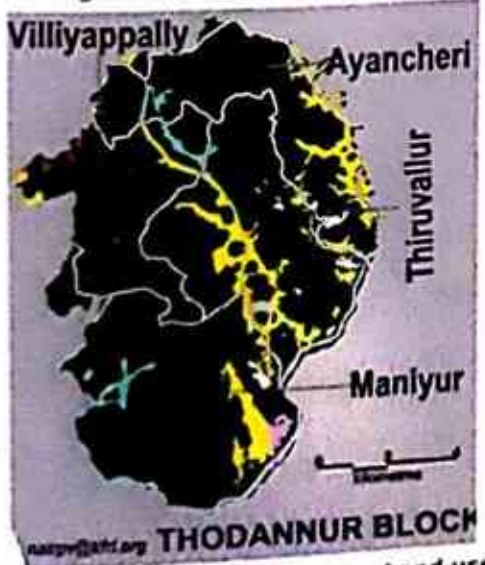


Fig. 11-23 Block: Thodannur - Land use

- Crops
- Rubber
- Paddy
- Waste
- Water
- Built-up
- Forest
- Pantn.

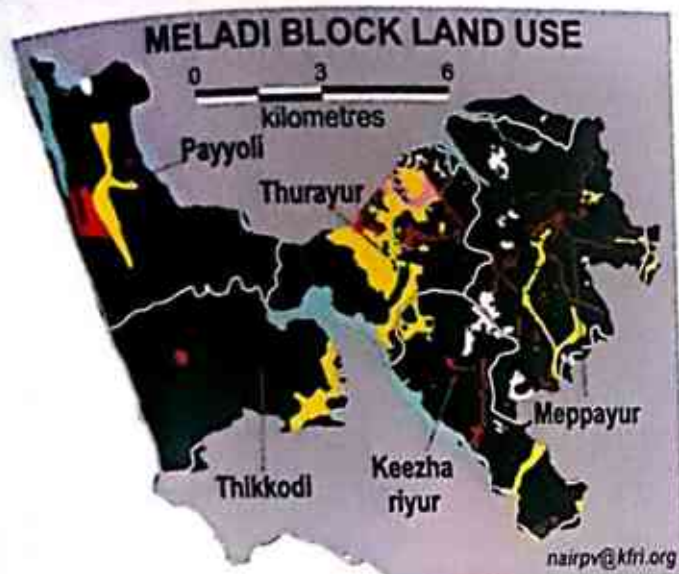


Fig. 11-25 Meladi Block: Land use

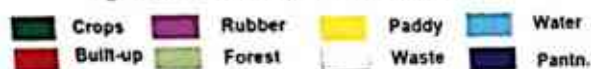


Table 11-03 Ponds in Meladi Block

Panchayat	W Body%	Paddy%	Topo	NREDB	Pan fish
Keezhayur	0.13	0.00			
Meppayyur	0.05	1.94		2	
Payyoli	3.77	24.65			4
Thikkodi	0.03	0.00			3

On the whole, this is a water logged block. Topo sheet show more than half the area as paddy fields. But, most of this got converted to dry land. Branches of Kotta Puzha, Korapuzha and Chittari Puzha are intertwined and they make a very vast water body. The outlets to the sea are far away, the direction of water flow would depend on a variety of factors. NREDB (2010) shows much paddy cultivation in Payyoli Panchayat. The watersheds fall in Kuttiyadi and Kora Puzha basins.

Panthalayani Block

There are five panchayats. Kora Puzha and its tributary Chittari Puzha makes boundaries in the south and eastern portion. Anela Puzha, a tributary of Kora Puzha, lies between Koyilandi MCP and Arikkulam Panchayat and makes eastern boundary to Koyilandi MCP and Moodadi Panchayat. Topo shows a water body along the side of Anela Puzha near Kuruvangad in Koyilandi MCP and another near Maruthur in Arikkulam Panchayat.

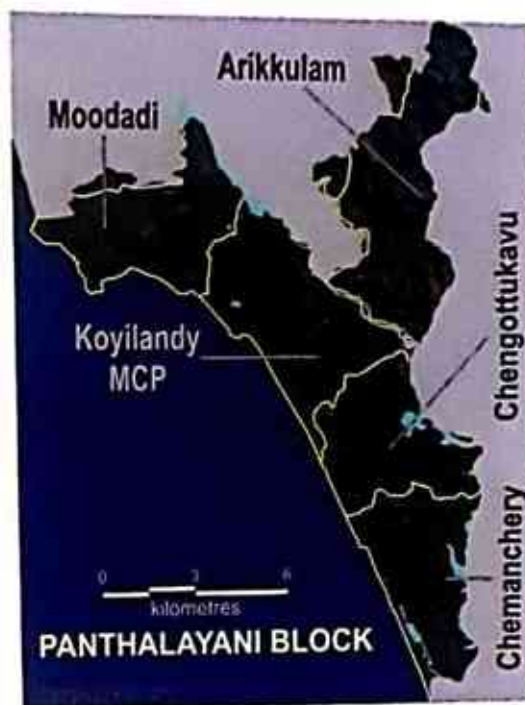


Fig. 11-26 Panthalayani Block: Panchayats

Chemanchery has a large water body near Vengalam. There is a tank near Mannamangalm in Koyilandi MCP. Topo shows a small pond near Muchukunnu in Moodadi Panchayat. There is a small water body near Kadalur in Moodadi Panchayat. Cultivation is of dry land mixed crop type.

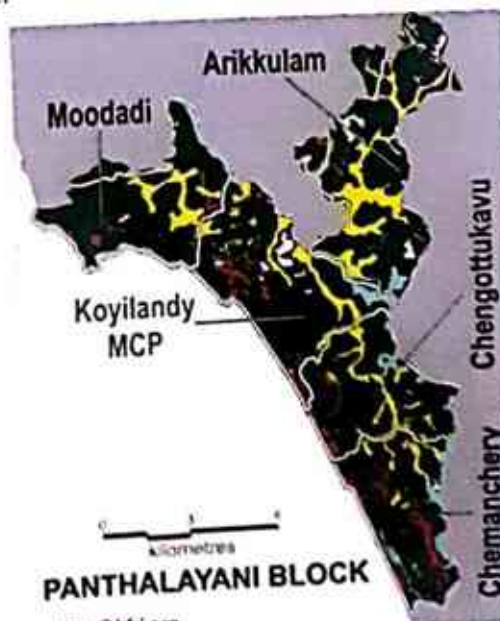


Fig. 11-27 Block: Panthalayani- Land use



Panthalayini is also a coastal block with much water logged, marshy and wet areas. A water body traverses in north south direction. Two panchayats show near 50% area under paddy fields. Land use is mainly dry land crops and built-up areas. Sea is on the western side, there are other water bodies scattered over the block. This is also a low altitude plain area with a large river and water bodies. Lakes of Korapuzha connect with water bodies in north and south.

Table 11-04 Ponds in Panthalayani Block

Panchayat	W Body%	Paddy %	Topo	NREDB	Pan fish
Arikulam	0.63	12.82	2		4
Chemmenchery	0.59	3.40		4	4
Chengottukavu	61.81	5.52		4	2
Koyilandi MCP	1.04	8.35	2	6	2
Moodadi	0.28	43.65	1		

Chelannur Block

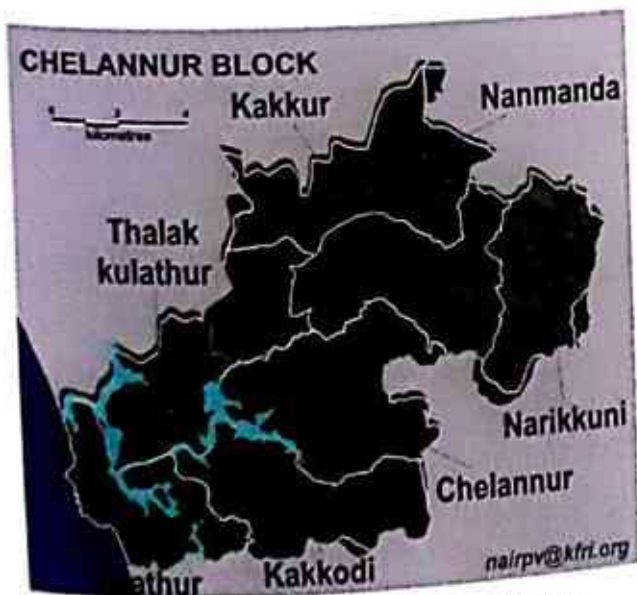


Fig. 11-28 Chelannur Block: Panchayats

There are seven panchayats. Conolly Canal, Akala Puzha and Kora Puzha come inside this block. Western portions are water logged areas. Panur Puzha joins Akala Puzha in Kakkodi Panchayat. Elathur Panchayat has a large water body. Topo does not show any ponds. Dry land cultivation is the land use. Few hill tops are barren.

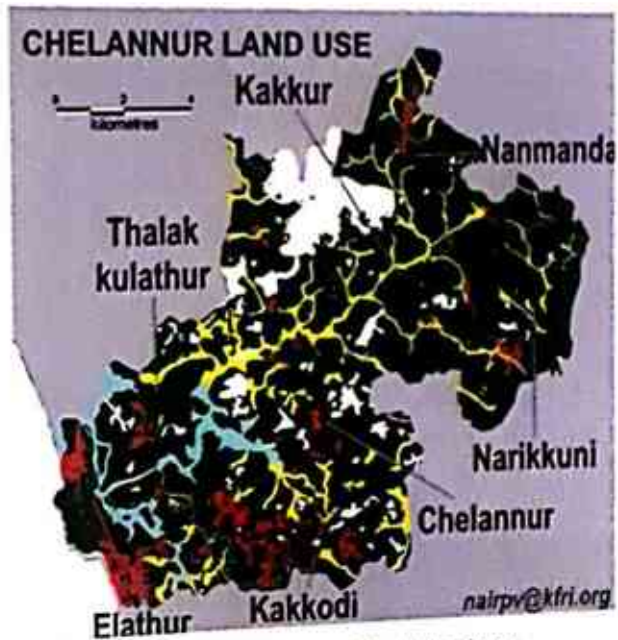


Fig. 11-29 Chelannur Block. Land use



Chelannur Block extends from sea coast to mid land. A large number of streams drain to the water bodies. There is paddy cultivation in these areas. There are bare hill tops in Nanmanda Panchayat. The water bodies end in the block and it is continued south wards as the Connolly canal. All the panchayats in this block are in Korappuzha basin. There are several ponds in the block. Two panchayats have more than 25% under paddy fields.

Table 11-05 Chelannur block: Water bodies

Panchayat	W Body%	Paddy %	Topo	NREDB	Pan fish
Elathur	1.21	7.04	2	3	3
Kakkodi	0.02	39.16		1	
Kakkur	0.00	0.00			5
Nanmanda	0.15	0.49		1	5
Narikkuni	0.0	28.69			5
Thalakkulathoor	0.35	4.26		3	6



Fig. 11-30 Balusseri Block: Panchayats

This block comes in Kuttiyadi and Korappuzha basins. The eastern Koorachundu Panchayat is hilly, forested, and with many hydro projects. The basin divide is also in this panchayat. The rest of the block is drained by Korapuzha and Panur Puzha. There are paddy fields along the streams.



Fig. 11-34 Perambra Block: Panchayats

There are seven panchayats. Gulika Puzha makes boundaries to Cheruvannur, Perambra and Changaroth panchayats. Kuttiadi River and its tributaries, Alampara Thodu, Oni Puzha, Kadanthara Puzha, flow through Chakkittappara Panchayat. Kuttyadi Dam and Peruvannamuzhi Dam are situated in this block.

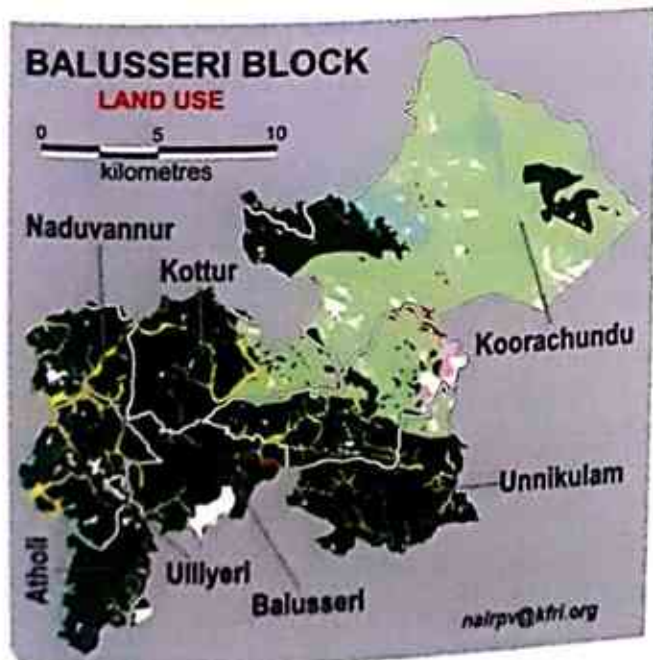


Fig. 11-31 Balusseri Block: Land use

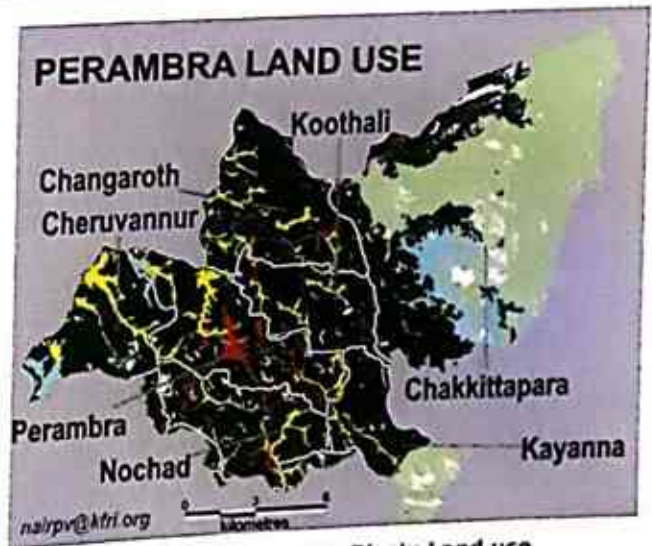


Fig. 11-33 Perambra Block: Land use



Kadiyangad Puzha flows through Changaroth, Koothali and Kayanna panchayats. Topo does not show any ponds in this block. Most of the areas in Chakkittappara Panchayat and some areas in Kayanna Panchayat are forested. Dry land cultivation is the main land use. Chakkittappara Panchayat in Perambra Block has hills and forest.

The Pruvannamuzhy dam also comes inside this. Area is drained by tributaries of Kuttiadi River. There is paddy cultivation along streams. There is much paddy fields in Koothali and Changaroth panchayats.

Table 11-06 Ponds in Perambra Block

Panchayat	W Body%	Paddy%	Topo	NREDB	Pan fish
Chakkittapara	12.42	0.30			
Changaroth	0.00	23.25	2		
Cheruvannoor	0.48	12.58	1		2
Kayanna	0.00	1.94			
Koothali	0.01	31.93		2	2
Nochad	0.10	17.89		4	2
Perambra	0.00	5.4		1	3

Koduvally Block



Fig. 11-35 Koduvally Block: Panchayats

There are eight panchayats. Due to some reason, the Kodanchery panchayat got wedged between panchayats, of this block. Thiruvampadi and Koodaranhi, lies right and six panchayats lies left to Kodanchery Panchayat in Kunnamangalam Block. Panur Puzha, Iruvanni Puzha and Cheru Puzha flows through this block. Topo does not show any ponds in this block. Most of the areas in Thamarassery, Puthuppady, Thiruvampadi and Koodarathi Panchayats are forested. Dry land cultivation is the main land use. Some areas are under rubber in Thamarassery, Puthuppady, Thiruvampadi and Koodaranhi Panchayats.

Panchayats in this block is drained by Korappuzha and Chaliar. The water divide is in Puthupady and Thamarasseri pachayats. Land use is mainly forest and mixed dry land cultivation. Small amounts of paddy and built up areas are also there. Most of the hair pin bends in the Calicut-Vythiri highway come in Puthupady Panchayat. Even though Madavoor shows large area under paddy, land use table indicate most of it being converted to coconut plantations.

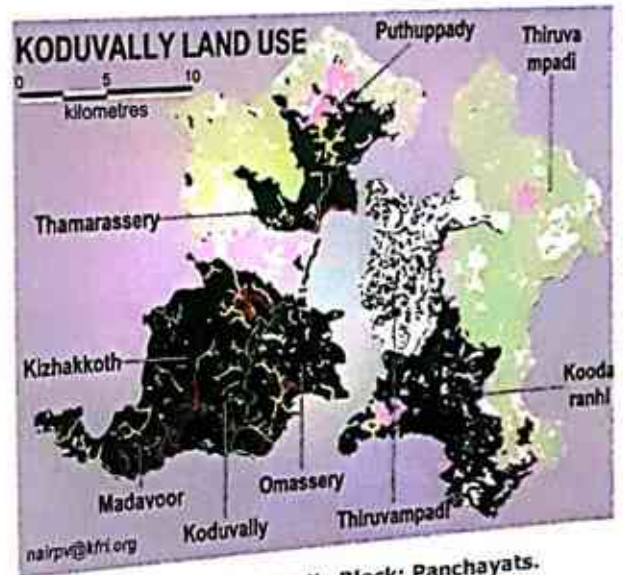


Fig. 11-36 Koduvally Block: Panchayats.

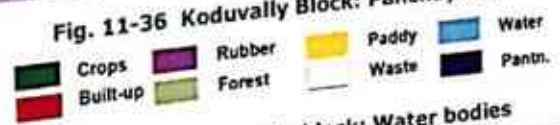


Table 11-07 Koduvally block: Water bodies

Panchayat	W Body %	Paddy %	Topo	NREDB	Pan fish
Kizhakkoth	0.26	16.56			4
Koduvally	0.11	1.43			
Koodaranhi	0.06	0.00			
Madavoor	0.00	47.32			
Omassery	0.04	1.64			
Puthuppady	0.00	5.02			
Thamarasseri	0.00	0.72			
Thiruvampadi	0.03	2.36	1		

Kunnamangalam Block

There are ten panchayats in this block. Beypore River makes boundaries in the southern side and its tributaries Cheru Puzha and Iruvanni Puzha flows through this block. Panur Puzha lies between

Kunnamangalam and Kuruvattur Panchayats. There is a small pond near Nelliparambu in Karassery panchayat. Topo does not show any other ponds in this block.



Fig. 11-37 Kunnamangalam Block: Panchayats

Dry land cultivation is the main land use. Some areas in Peruvayal, Karassery, Mukkom and Kodyathur Panchayats are under rubber. Northern portion of Kodanchery and Eastern portion of Karassery Panchayats are forested.

Paddy fields in Peruvayal, Mukkam and Karuvattor have largely been converted to dry land. Other land use includes built-up areas, barren hill tops and forest.

Table 11-08 Ponds in Kunnamangalam block

Panchayat	W Body%	Paddy %	Topo	NRED B	Pan fish
Chathamangalam	0.13	21.41		1	2
Karasseri	0.16	0.76			1
Kodanchery	0.00	3.91			
Kodyathur	3.36	11.03			
Kunnamangalam	0.01	1.53		1	
Karuvattoor	1.02	13.27		1	5
Maruthomkara					1
Mukkam	0.57	17.76			
Peruvayal	0.36	34.67			

Kozhikkode Block and Corporation



Fig. 11-39 Kozhikkode Block: Panchayats

There are six panchayats in Kozhikkode Block. Beypore, Kallayi, Kadalundi rivers and Chaliyam Puzha come inside this block. Kadalundi River flows through the southern boundary of Kadalundi Panchayat. Chaliyam Puzha lies between Kadalundi and Feroke Panchayats and joins with Beypore River. Kadalundi, Feroke and Ramanattukara panchayats lie south of Beypore River and Beypore, Cheruvannur-Nallam and Olavanna Panchayats are in the north. Kallayi River and its tributaries flow through Kozhikkode Corporation and Olavanna

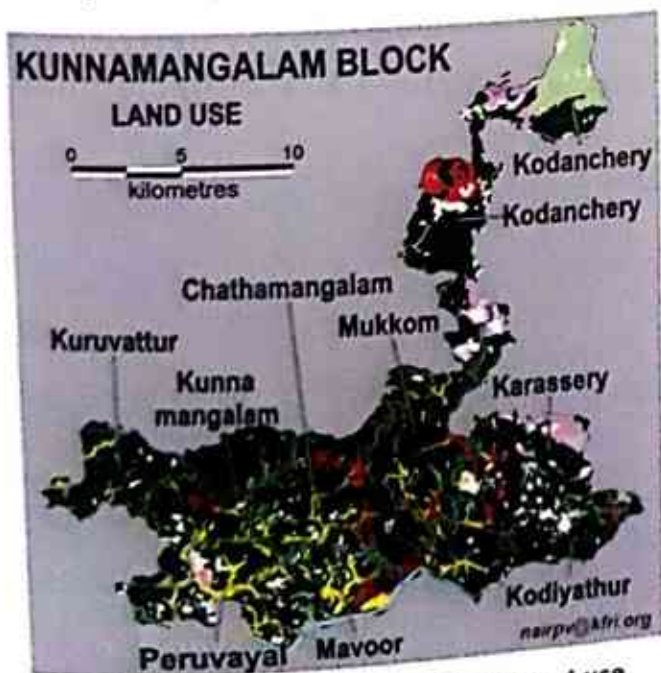


Fig. 11-38 Kunnamangalam Block: Land use



Panchayat. Topo shows one large pond and Conolly Canal in Kozhikkode Corporation near Nadakavu. Topo shows ponds and canals in this block. There is a tank near Karuvantiruthi and a small pond near dispensary in Feroke Panchayat. There are eight tanks and two ponds in the western portion of Kozhikkode Corporation. Mixed crop cultivation is prevalent in all areas. Much built up areas are seen in Kozhikkode Corporation.

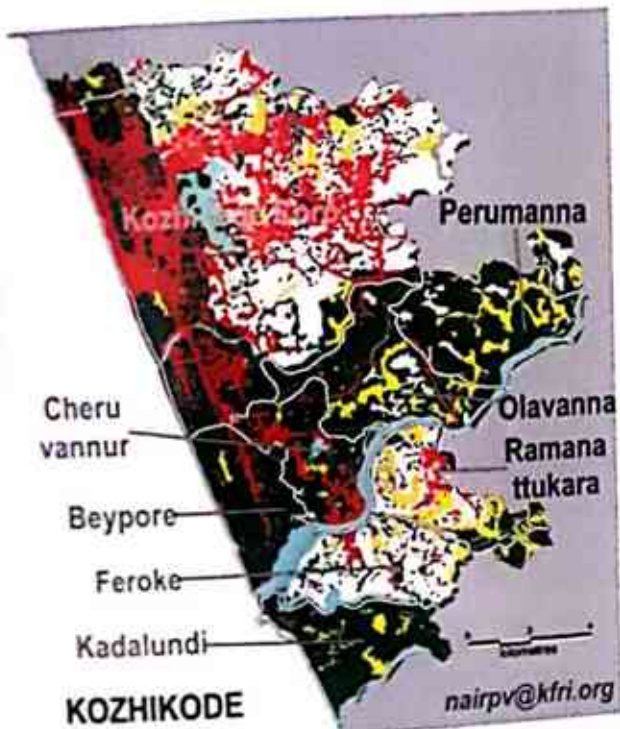


Fig. 11-40 Kozhikkode Block: Land use



The Conolly canal continues north wards to form a water way. There are large water bodies long the canal (Kothu kunnu). Chaliar is a broad river as it enters Kozhikkode. Kallayi basin is also inside Kozhikkode Corporation.

Table 11-09 Kozhikkode block: Water bodies

Panchayat	W Body%	Paddy %	Topo	NREDB	Pan fish
Kozhikkode Corp			14		1
Beypore	0.15	0.00	2	3	2
Cheruvannur	6.48	7.65			
Nadadam				4	
Feroke	0.51	1.60		4	2
Kadalundi	0.98	0.00			3
Olavanna	0.06	10.88		2	
Peruvanna	0.64	36.58		2	4
Ramanattukara	0.68	39.06			

Drinking water for Kozhikkode is obtained from Mananchira.



Fig. 11-41 Mananchira

Other aspects

Land use wise, Calicut District has more forest than state average. Paddy fields are also more in the district. Dry land crops, rubber cultivation and built-up areas are less than state average.

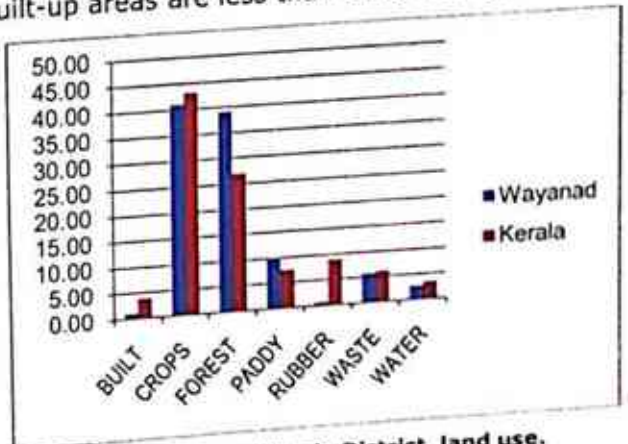


Fig. 11-42 Kozhikkode District, land use.

Quarry ponds are a source of fresh water. Figure illustrates the Injappara quarry pond being developed as a recreation center.



Fig. 11-43 Injappara quarry pond

Many ponds in laterite area show typical terraced construction. The water table being low, such an approach is essential.



Fig. 11-44 Muchukunnu temple pond

#



Fig. 11-45 Sarovaram Biological park.

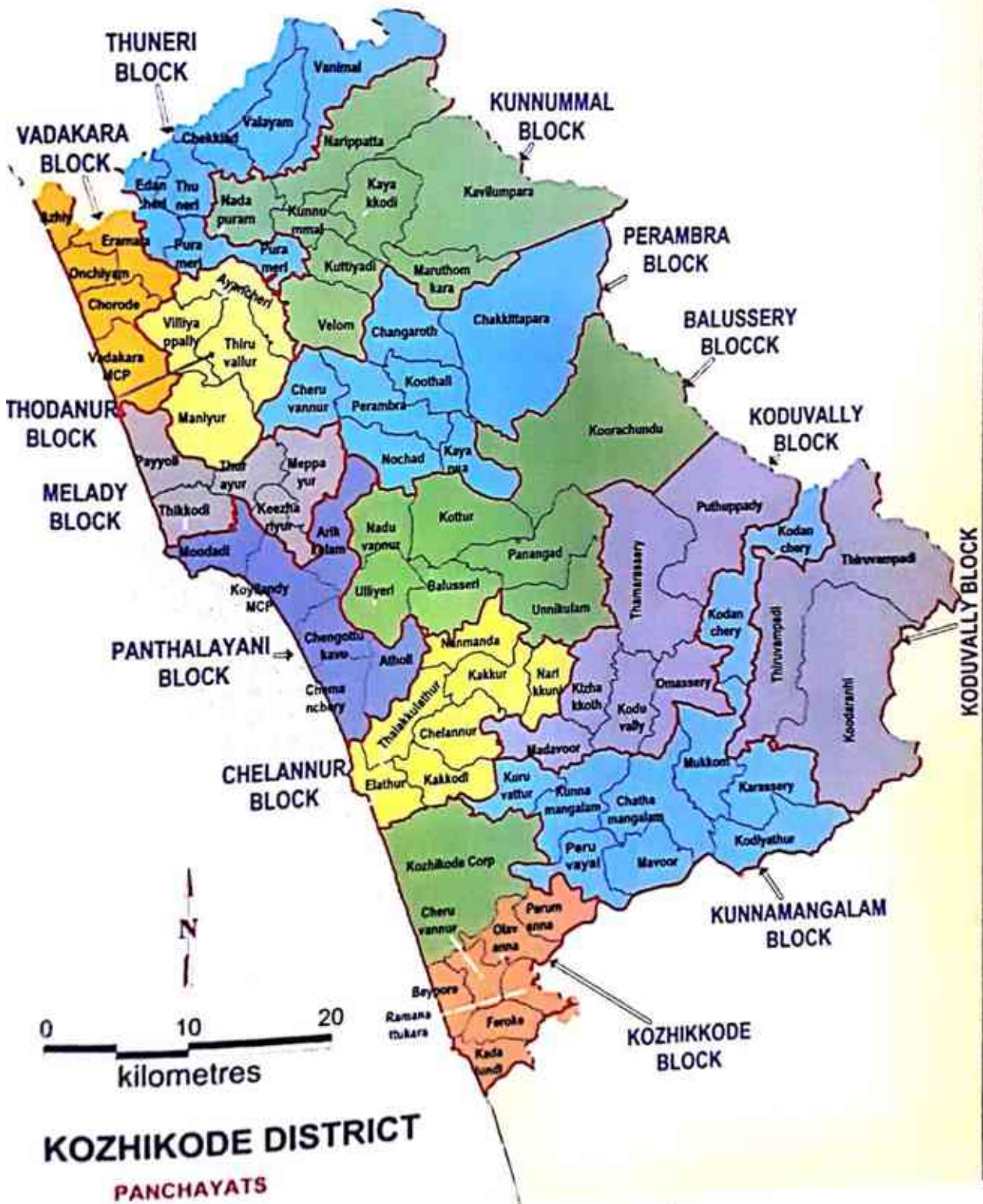


Fig. 11-46 Kozhikode District: Panchayats.

WAYANAD DISTRICT

INTRODUCTION

The total geographical area of Wayanad is 2,126 km². It is bounded on the East by Nilgiris and Mysore District of Tamil Nadu and Karnataka respectively, on the North by Coorg District of Karnataka, on the South by Malappuram and on the West by Kozhikode and Kannur .



Fig. 12-01 Wayanad District: Basins

Placed on the southern tip of the Deccan plateau, its prime glory is the majestic Western Ghats with lofty ridges interspersed with magnificent forests, tangled jungles and deep valleys. In the centre of the district, hills are lower in height, while the northern area has high hills. Some of the major peaks are Vellarimala, Banasura, Brahmagiri, Chembra, etc. ranging from 1,500m to 2,100m height.

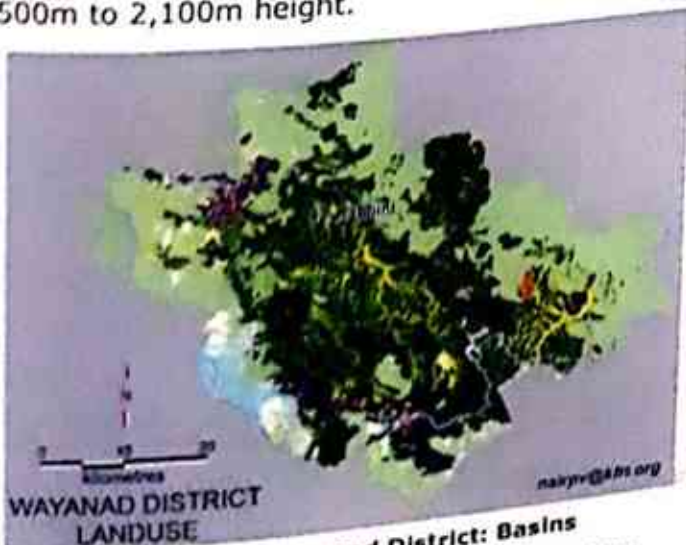
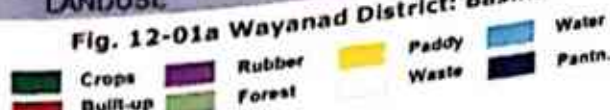


Fig. 12-01a Wayanad District: Basins



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

The altitude of Wayanad varies from 700 to 2100 meters from sea level. The hill ranges of Vythiri Taluk, through which the road from Kozhikode ascends the Wayanad Plateau over mind-boggling bends and ridges, are the highest locations. From the highest altitude of the Western Ghats on the western border of the district, the plateau of Wayanad gradually slopes down eastward. Further from Mananthavady, it becomes a common plain of paddy fields with the swift flowing Kabani coursing through it.



Fig. 12-02 Wayanad vayal

Elsewhere, Wayanad offers a panorama of undulating hills and dales, which are converted into paddy fields. The hills, which might have been thick forests once, are now plantations of coffee, tea or cardamom. There is luxuriant greenery all round. The soil of the Wayanad District is mainly of the forest type. It promotes a lushy luxuriant growth of vegetation.

Wayanad has a salubrious climate. The mean average rainfall in this district is 2,322 mm. Lakkidi, Vythiri and Meppadi are the high rainfall areas in Wayanad. Annual rain fall ranges from 3000 to 4,000 mm. High velocity winds are common during the southwest monsoon and dry winds blow in March-April. High altitude regions experience severe cold. In Wayanad (Ambalavayal) the mean maximum and minimum temperature for

the last five years was 29°C and 18°C respectively).
 The dale, Lakkidi, nestled among the hills of
 Vythiri Taluk has the highest average rainfall in
 Kerala.



Fig. 12-03 Water fall

Kabani Basin

Kabani River, one of the three east-flowing Rivers of Kerala, is an important tributary of the river Cauvery. Kabani and its tributaries constitute a powerful river system in the landscape of Wayanad.

Panamaram rivulet takes its origin from the Perennial Lake called Pookkode Lake. It flows swiftly through mountain gorges joined by other streams and tumbles down into Panamaram valley. Six kilometres further from Panamaram, this river joins the Mananthavady rivulet, originating from the lower regions of the peak 'Thondarmudi'. From this confluence onwards the river is known as Kabani, a mighty, perennial river which after entering Karnataka, joins with the river Cauvery. Almost entire Wayanad is drained by the Kabani River and its tributaries namely Panamaram, Manantha-vady and Thirunelli.

KSLUB (2000) divides the Kabani basin into 40 watersheds. We have grouped them into 6 water sheds 27K/A to F. Each of these sub basins have tributaries arising from hill tops, flowing to the valley in the center to from the Kabani River. The blocks are Mananthavady (sub basin A and B) Kalapetta (C and D) Sultan Bathery (E and F). The features of the sub basins are tabulated below:

Sub basin 27K/A. Panchayts: Thirunelli Panchayat. Thirunelli Hole. Hills up to 1100m are on the western side. Land use is mostly forest, followed by dry land agriculture and paddy fields.

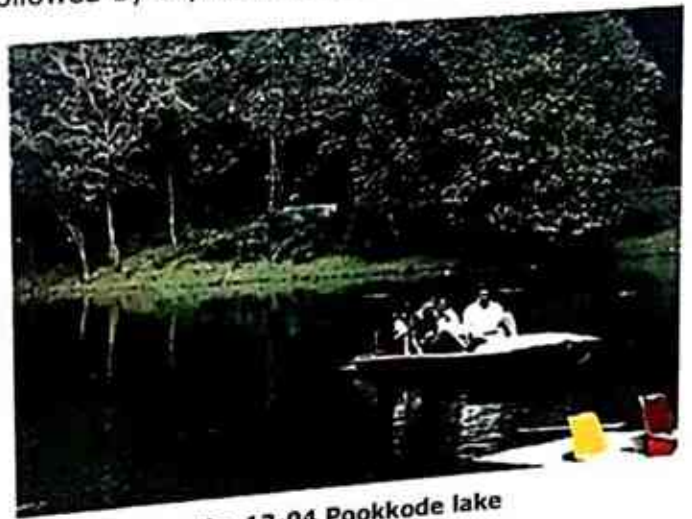


Fig. 12-04 Pookkode lake

Sub basin 27K/B. Panchayts: Tavinjal, Tondernad, Manathavadi and Edavaka. Vellamunda (north part). Sub basin is Mananthavadi River. Hills of about 1000m are on the northern, wester and southern sides. There are two branches Priya Puzha on the north and Tondernad Puzha on the west. Land use in Tondernad and Thavinjal are mostly forest, plantations, dry land crops, paddy and bare lands. Panchayats Mananthavady and Edavaka on the other hand has dry land crops, paddy fields and built-up areas as land use.

Sub basin 27K/C. Panchayts: Vellamunda, Padinjare-thara, Thariod, Pozhuthana, Vythiri, Meppadi, Kapetta MCP, Vengappally, Kottathara and Panamaram. This sub basin also has two branches, Karaman Todu and Pozhuthana Puzha. Hills of about 1000m are on west, south and east sides. The rivulets flow towards the valley on the north. Panchayats on the rim, Vellamunda, Padinarethara, Thariod, Pozhuthana, Vythiri and Meppadi have forest as the main land use. There is a large reservoir in Thariod and Pozhuthan Panchayats. Banasura Sagar dam is in this sub basin.

Sub basin 27K/D. Panchayts: Muppainad, Ambalavayal, Muttill, Meenanangadi, Kaniyambetta, Poothadi (part), Pulapally (part) and Panamaram (part). Sub basin D has only low hills along the periphery. The streams are Korapuzha and Narasi Puzha which join the main river. The main land use is dry land crops and paddy cultivation along the streams. There is forest along the rim of the hills.

Sub basin 27K/E. Panchayats: Sultha Bathery, Nenmeni and Noolpuzha. There is forest in Sulthan Bathery and Nulpuzha panchayats. Noolpuzha and Manjatodu are the streams, they join Muthanga. The combined river flow north into Karnataka as Nugu Hole and join Kabini further downstream. Nenmeni panchayat has dry land crops, paddy fields and built up areas.

Sub basin 27K/F. Panchayats: Mullankolly, Pulpally (part), Sulatan Bathery (part) and Poothady (part). Two streams Kadaman Thodu and Kannegal Hole join the main river near the Kabani reservoir. There are forest in two large patches, separated by a large stretch of dry land cultivation and paddy.

Bhavani basin

Bhavani River originates in Kerala and flows to Tamil Nadu. The basin can be grouped into 10 sub basins.

Sub basin A: Bhavani River originates in the Kunda Plateau at an altitude of about 2200m. The river enters Kerala near Tundukkal Malai and follows a deep valley. Surprisingly there are few settlements in this valley connected by long foot paths to places in Attappadi. Land use is shown as mixed dry land cultivation.

Sub basin B: A small stream, Panchan Thodu joins Bhavani River at Mukkali. There is a small settlement in this sub basin. At Mukkali Bhavani river takes a 90° turn and flows to Eastern side. The divide is so narrow that very little effort is required to change the river course.

Sub basin C: is plains on the left side of Bhavani River as it flows down. Lower portions are inhabited.

Sub basin D: is Varaha Pallam a stream flowing down along a valley and joining Bhavani River near Ranganatha Puram. Lower portions are inhabited.

Sub basin E: is an unnamed stream flowing between Bhavani river and Siruvani River (Sub basin F,G). Lower portions are inhabited.

Sub basin F and G: The Siruvani River. Up stream of this river is Siruvani Dam which supplies drinking water to Coimbatore town. Lower portions are inhabited.

Sub basin H: Karuthottarai Ar that joins Siruvani River near Agali.

Sub basin I: Streams from hills on the eastern side of basin, flowing eventually to Bhavani River.

BLOCKS AND PANCHAYATS

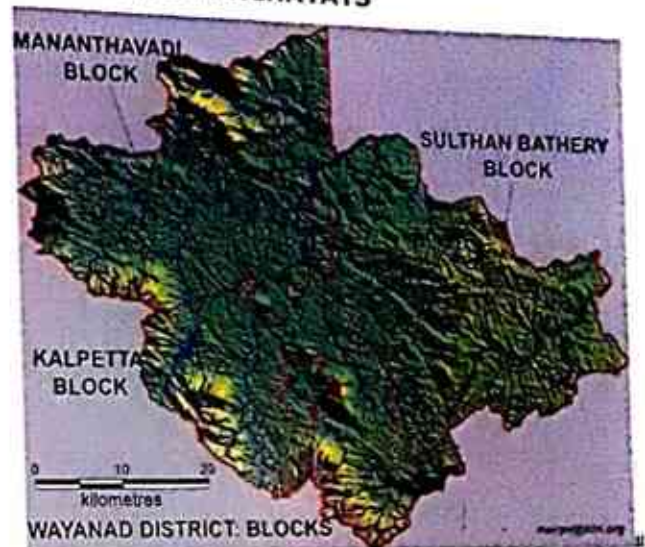


Fig. 12-05 Wayanad District: Block Panchayats

There are three blocks in Wayanad District, Kalpetta, Mananthavady and Sultan Bathery.

Kalpetta Block and Kalpetta MCP

There are ten panchayats in Kalpetta Block. Karaman Thodu, Vyttiri Puzha and Pozhuthana Puzha which are tributaries of Panamaram Puzha come inside the block. Karaman Thodu and its branches spread through Padinjarathara and Thariyod Panchayats. Pozhuthana Puzha and its tributaries flows through Kottathara, Vengappally, Thariyod, Kalpetta MCP, Pozhuthana, Vyttiri and Meppadi Panchayats. Chali Puzha and Minmuttu Puzha come in the South-East portions of the block between Meppady and Muppainad Panchayats. Pukkot Lake situated at Vythiri Panchayat. Cheru Puzha which is a tributary of Venniyottu Puzha flows through Kottathara, Vengappally, Kalpetta MCP and Meppady Panchayats. A tributary of Panamaram Puzha come inside Kaniyambetta, Muttill, Meppady and Muppainad Panchayats.

altitude goes up to 1500m. In the lower reaches of these hills there are extensive tea plantations.



Fig. 12-06 Banasura Sagar.

Topo shows a tank near Vellampadi at Muttil Panchayat. Topo shows two ponds one near Karinkutty and another one near Anerivayal at Kottathara Panchayat. Topo does not show any other ponds in this block. Most of the areas in Padinjarathara, Thariyod, Pozhuthana, Vythiri, Meppady, Muppainad and some areas of Kalpetta MCP are forested. Dry land cultivation, paddy cultivation are the major land use. There is considerable amount of forests in this block.

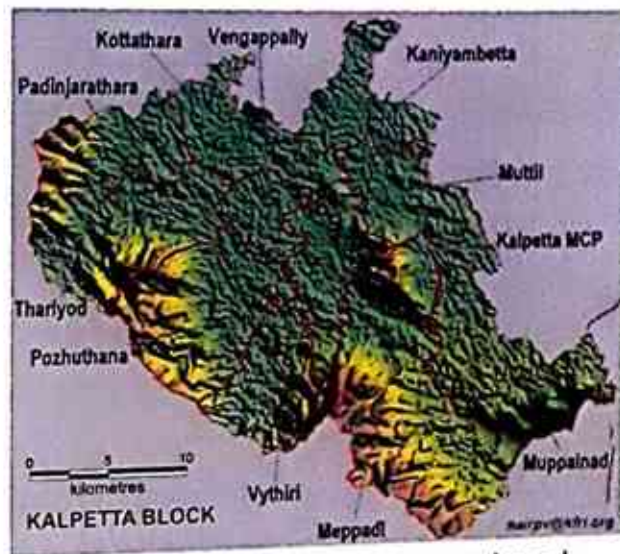


Fig. 12-07 Kalpetta Block: Topography and panchayats

Table 12-01 Kalpetta Block: Water bodies

Panchayat	W Sheds	W Body%	Paddy %	Topo	NRE DB	Pan fish
Kaniyambetta	22B/D	5.90	41.16			2
Kottathara	C	0.00	29.68	2		4
Meppadi	C	0.60	4.35			1
Muppainad	D	0.39	5.28	1		
Muttil	D	0.00	4.85	1		3
Padinjarathara	C	9.87	7.06			4
Pozhuthana	C	0.04	5.01	2		2
Thariyod	C	37.79	1.53	1		1
Vengappally	C	0.00	9.46	2		2
Vythiri	C	0.10	1.34	1		1

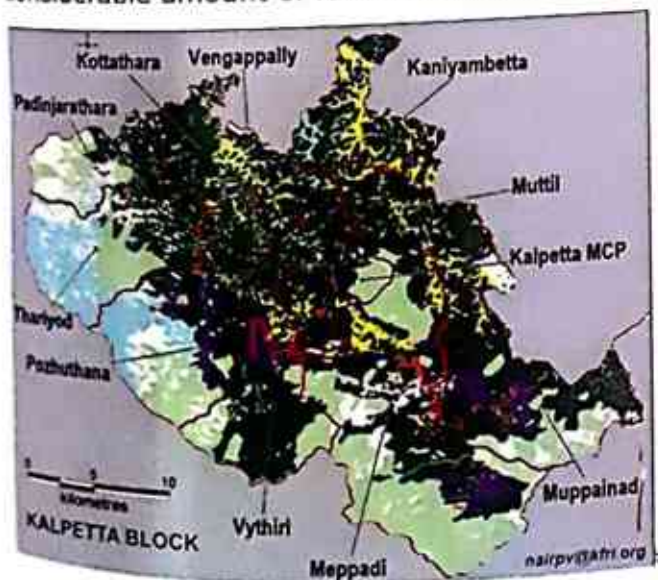


Fig. 12-08 Kalpetta Block: Land use.

Crops
 Rubber
 Paddy
 Water
 Built-up
 Forest
 Waste
 Pantn.

Water bodies are comparatively few in Kalpetta block, but paddy cultivation is one of the highest. In Kaniyampet, Kottathara and Vengappally panchayats it is 41.16, 29.68 and 9.46% of land use respectively. Water bodies occupy 37.79% and 9.87 % of total area in Thariyod and Padinjarathara panchayats. This is the waters of the Banasura Sagar Reservoir. In the southern panchayats the

Sulthan Bathery Block

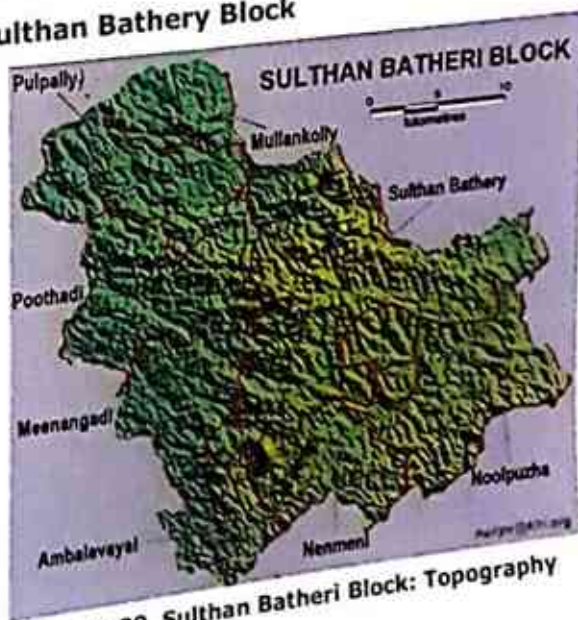


Fig. 12-09 Sulthan Bathery Block: Topography

There are eight panchayats: Noolpuzha inside Nulpuzha and Nenmeni Panchayats. Kabani River flows through the North-West boundary of Mullankolly and Pulppally Panchayats. Manikkadu Puzha comes inside Pulppally and Pooppadi Panchayats. Kadaman Thodu comes inside Mullankolly and Pulppally Panchayats. Kannegal Hole lies in the Eastern boundary of Mullankolly Panchayat. Kannaram Puzha and its tributaries Kurchiyat Puzha and Chedieth Puzha lie in Sulthan Bathery and Eastern boundary of Pulpally and Poothadi Panchayats. Manjat todou flows through Sulthana Bathery Panchayat. Narasi Puzha comes inside Poothadi and Sultan Battery Panchayats. Chundal Puzha comes inside Poothadi and Meenangadi Panchayats. Kara Puzha flows through the Western boundary of Meenangadi and Ambalavayal Panchayats. Thudukutty Ar, which is a tributary of Nul Puzha comes inside Sulthan Bathery Panchayat. Topo does not show any ponds in this block. Most of the areas in Sulthan Bathery and Nul Puzha Panchayats are forested. Some areas in Mullankolly, Pulpally, Poothadi, Meenangady and Nenmeny Panchayats are also forested. Dry land cultivation, paddy cultivation and also rubber is there.

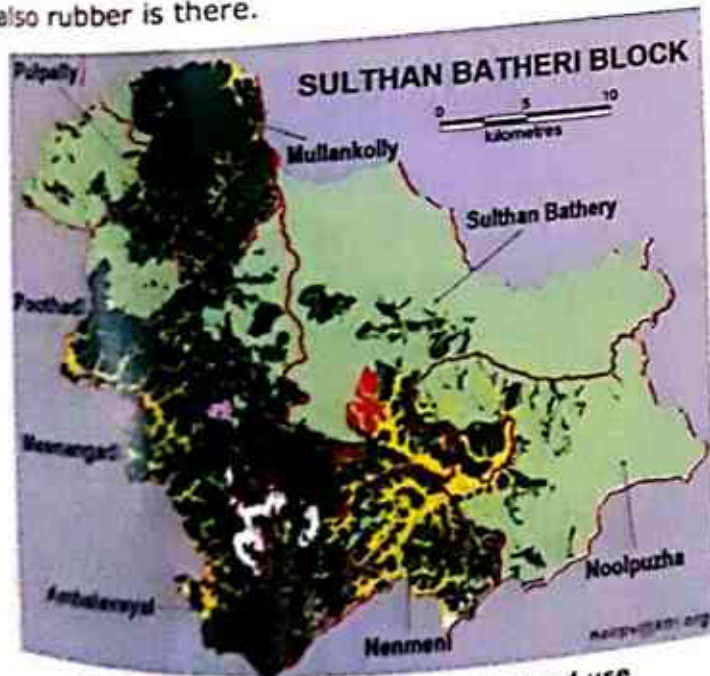
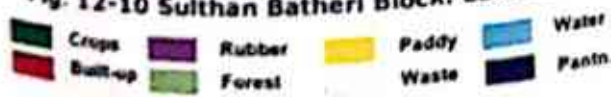


Fig. 12-10 Sulthan Bathery Block: Land use



There is considerable amount of forest in the eastern panchayats, Sulthan Bathery and Noolpuzha. There is a gap in the forest continuity in Mullankolly and Pulpally panchayats. There are not

extensive paddy fields in all the panchayats.

Table 12-02 Sulthan Bathery Block: Water bodies

Panchayat	Water sheds	W Body%	Paddy %	Topo	NREDB	Pan fish
Ambalavayal	22KD	0.02	36.87	1	1	4
Meenangadi	D	0.11	43.55	1	3	2
Mullankolly	F	0.00	28.64			2
Nenmeni	E	0.03	32.33	1		2
Noolpuzha	E	0.65	10.46			3
Poothadi	D,F	0.00	22.84		1	1
Pulpally	D,F	0.03	11.77	1		4
Sulthan bathery	E,F	0.06	6.39	1	2	2
Thirunelli	A	0.38	5.17			1

In Meenangadi and Ambalavayal panchayats it is as high as 43.55 % and 36.87 % of total area. Pookkot lake and Kerala Veterinary University come enroute on th highway leading to Karnataka.

Mananthavady Block

There are seven panchayats. Mananthavady River and Panamaram River, which are tributaries of Kabani, flows through this block. Mananthavady River and its branches come inside Mananthavady, Panamaram, Edavaka, Vellamunda, Thondernad and Thavinjal Panchayats. Panamaram River and its tributaries, Narasi Puzha and Chunadal Puzha, come inside Panamaram Panchayat. Bavali Puzha and its tributaries flow through Thirunelli Panchayat. Topo shows a pond near Kurikkalat in Mananthavady. Topo does not show any other pond in this block.

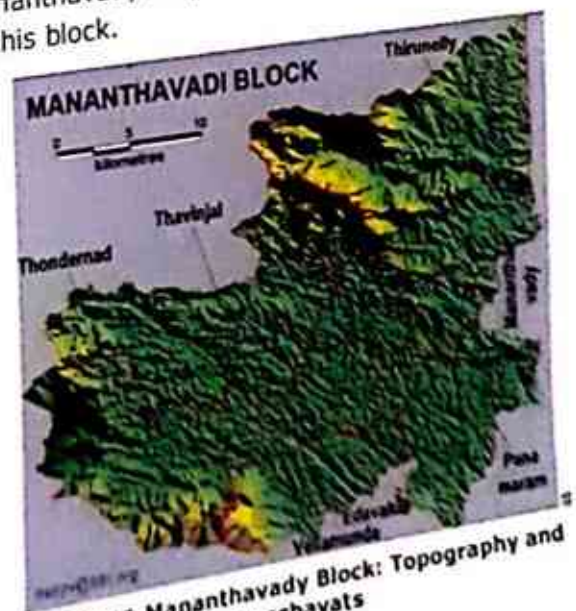


Fig. 12-11 Mananthavady Block: Topography and panchayats

Most of the areas in Thavinjal, Vellamunda, Thirunelli, Thundernad and some areas in Mananthavady and Edavaka are forested. Dry land cultivation and paddy fields are there.

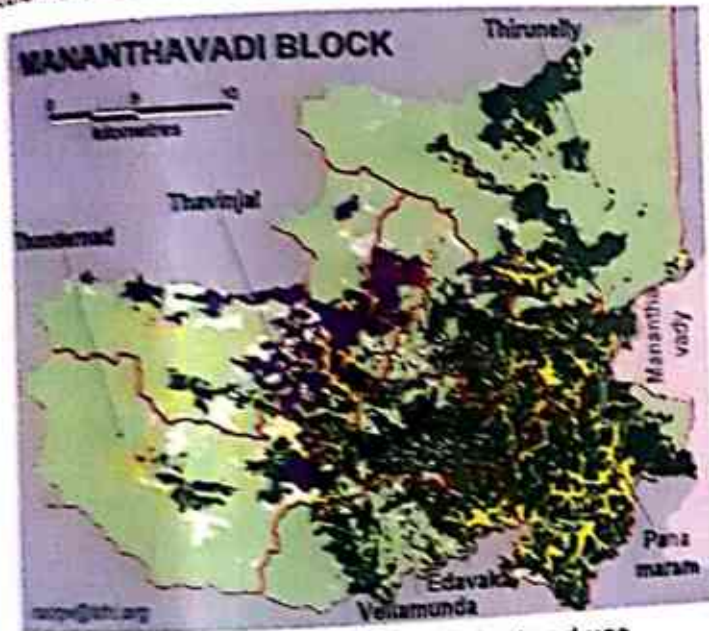


Fig. 12-12 Mananthavady Block: Land use



There is considerable amount of forest in the panchayats on the western rim of the block. Another notable feature is extensive tea plantations in the Thavinjal Panchayat. There is vast area under paddy cultivation. It is as high as 17.25, 16.56 and 10.61% of total area in Vellamunda, Edavaka and Mananthavady panchayats.

Table 12-03 Mananthavady Block: Water bodies

Panchayat	W sheds	W Body%	Paddy %	Topo	NREDB	Partish
Edavaka	22K/B	0.00	16.56			1
Mananthavady	B	0.01	10.61	1	2	1
Panamaram	D.C	0.00	8.83	2		4
Thavinjal	B	0.07	9.60		2	1
Thirunelli	A	0.38	5.17	3		1
Thundernad	B	0.00	5.97			2
Vellamunda	B	0.09	17.25			2

Other aspects

Paddy cultivation and forest are more than state average in Wayanad District. Consequently dry land crops and built-up areas are lower than state average. Typical of the state, the Banasurasagar reservoir, created for power generation and irrigation is badly implemented and hardly serves any purpose. The actual missions for this dam is to provide water for Kakkayam dam which was situated in Kozhikode district to produce electricity and also irrigation in wayanad, both missions were not accomplished and currently it's been part of Hydel project. It is India's First Solar Atop Dam.

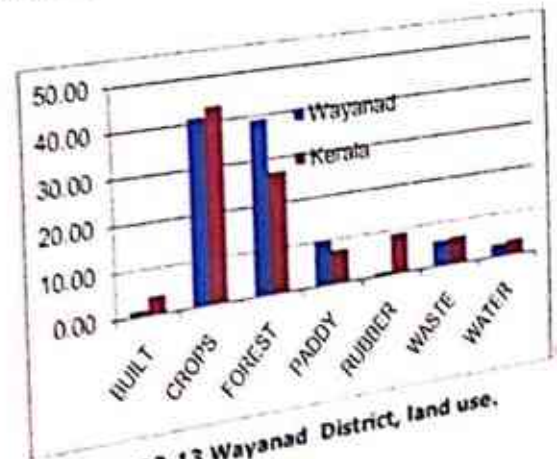


Fig. 12-13 Wayanad District, land use.

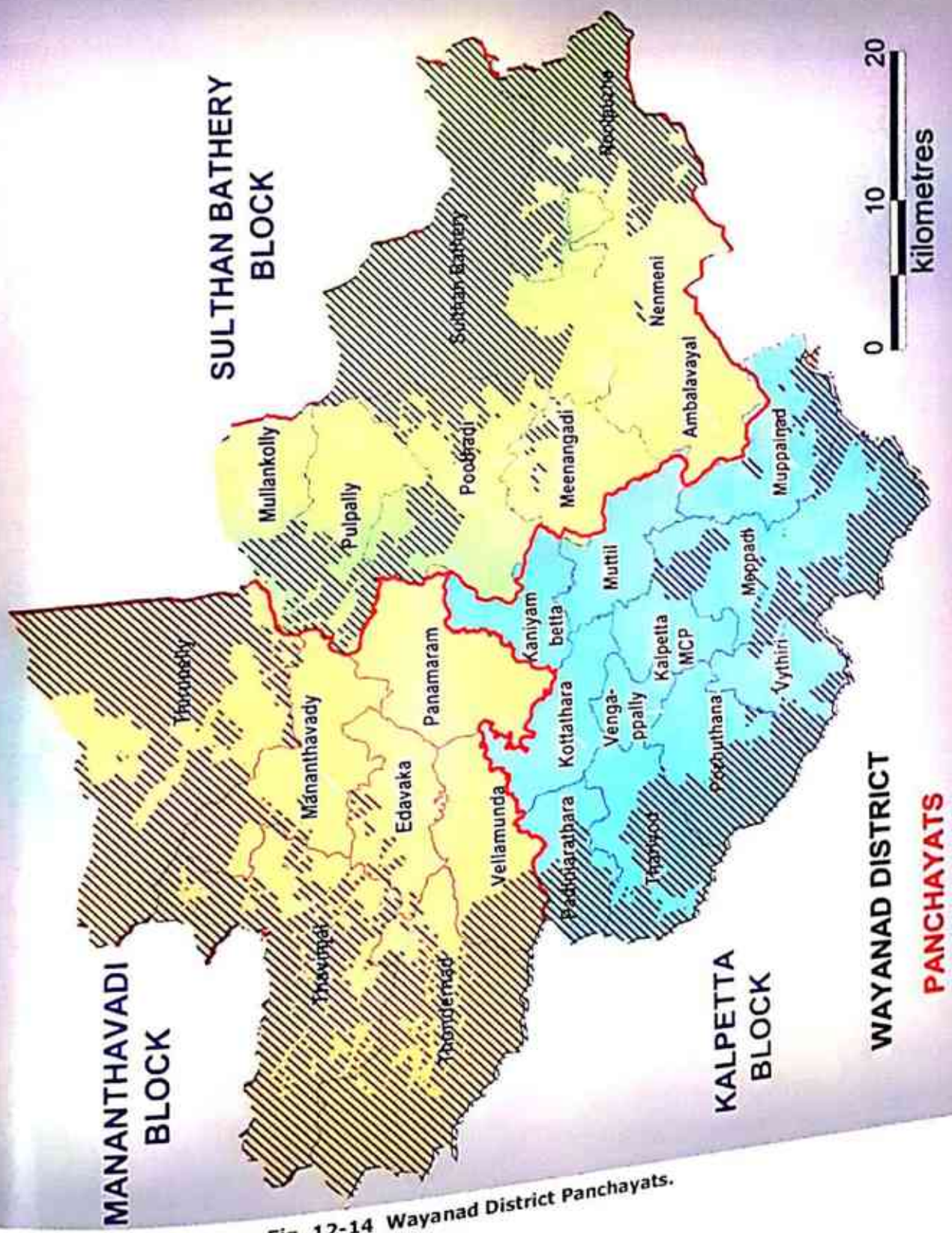


Fig. 12-14 Wayanad District Panchayats.

Introduction

Kannur District is bound by the Western Ghats in the East (Coorg District of Karnataka State), Kozhikkode and Wayanad Districts, in the South, Lakshadweep Sea in the West and Kasargod, the northern-most District of Kerala, in the North. The district can be divided into three geographical regions - highlands, midlands and lowlands.



Fig 13-01 Kannur District: River Basins

The highland region comprises mainly of mountains. This is the area of major plantations like coffee, rubber, tea, cardamom and other spices. Timber trees like teak and rosewood are grown in this region. The midland region, lying between the mountains and the low lands, is made up of undulating hills and valleys. This is an area of intense agricultural activity. The lowland is comparatively narrow and comprises rivers, deltas and sea shore. This is a region of coconut and paddy cultivation.

Kannur District has a humid climate with dry season from March to May. This is followed by the south-west monsoon which, continues till the end of September. October and November form the post-monsoon or retreating monsoon season. The north-east monsoon which follows extends up to the end of February, although the rain generally ceases after December. During the months of April and May, the mean daily maximum temperature is about 35° Celsius. Temperature is low in December and January - about 20° Celsius. The annual

average rainfall is 3438 mm and more than 80 percent of it occurs during the period of South-West monsoon. The rainfall during July is very heavy and the district receives 68 per cent of the annual rainfall during this season.

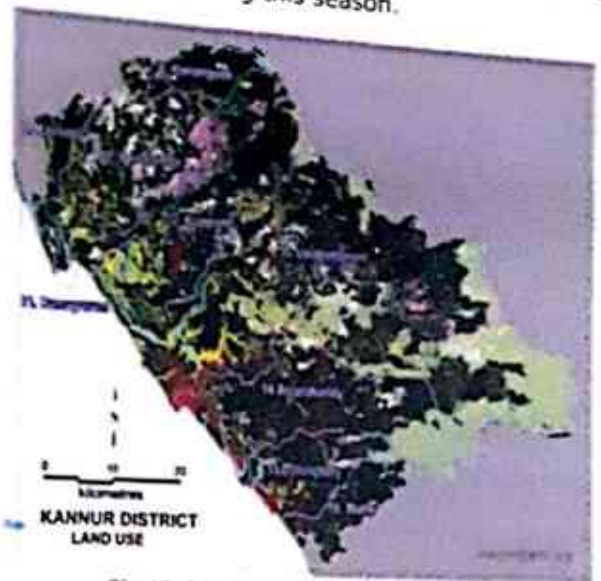


Fig 13-01a Kannur District: Land use

Forest is limited to small patches on the crest line along the state boundary. Patches of teak, bamboo and grasses can be seen. There are large patches of mangrove forests in the estuaries. Human interference has changed the vegetation of the coastal region.

Kannur District is peculiar in many ways. The district is only about 50 km in width from the sea coast to the mountains. There are few disconnected hills along the Karnataka border. Remaining portion is almost fully plain areas. An isolated hill at Ezhimala, near the sea is the exception. The hill has prevented erosion of the land there and had been the seat of many kingdoms in the past. Kannur District had seen change of many rulers. One can see the resurgence of the area after each of these events. Tippu Sultan conquered the area, and the British defeated him. Kannur was the site of many movements associated with the freedom struggle. After independence, several research institutions were started here, so also several industries. Agriculture saw several changes, paddy, tapioca and tobacco and areca nut gaining prominence in different times. Settlers from Travancore reclaimed hilly waste lands. Developments of railway and highway connected

Sub basin: 35P/E, F. Sub basin E (Peruvamba) and F (Manakan Thodu) are two streams that join the main river. This sub basin is also on north-south direction. Panchayats are Peringom - Vayakkara and Erimam - Kottur. Land use in both sub basin are dry land crops, wastelands and rubber. Altitude in sub basin E is from 150-200m where as in sub basin F it is 100-150 m. There are large pepper and rubber plantations as per top-sheet.

Sub basin: 35P/G. Sub basins G and H are on the 4° and last stream flowing in north to south direction to the main river. The stream flows through a deeper valley. The unnamed stream originating in Karippal and Vellora areas at about 150 m is perennial in nature. The lower sub basin H is at around 0-100m elevation Land use in G is dry land crops and waste lands; in H the same is dry land crops, rubber and waste lands. Panchayats are Erimam - Kottoor and Kadannappally - Panappuzha.

Sub basin: 35P/I. Sub basins B and I are on either side of the river, immediately upstream of previous sub basin. This is also the junction of streams coming from up stream. Land use is dry land crops, built-up areas, paddy and wastelands. Payyannur Municipality, Cheruthazham Panchayat and Kadannappalli - Panappuzha are the panchayats. Altitude range from 20m at river bed to 100m at hill tops. Cheravancheri, Chondapura are localities. Hills and valleys are more pronounced, streams from the valleys join the river.

Sub basin: 35P/J. Sub basin 35P/J is the Ezhimala hill. There is water on almost all sides. The hill is about 260m high. Streams flow to the valleys in all directions. The hill is in Ramanthali Panchayat. The hill top is barren, remaining parts are dry land crops. The location is currently occupied by training campus of Indian Navy.

There is much non wooded wastelands and small amount of rubber cultivation in the basin. Built-up areas are near Payyannur. Payyannur, Karippal, Vellora, Kariprakunnu. The railway line and national highway avoids the lakes and is situated about 10 km inland from the coast. The river joins Kavvayi lake and then the sea.



Fig. 13-03 Payyannur subramony temple pond

The Payyannur Subramony temple pond is situated in the Peruvamba basin. The estuary is a centre of fishing activities.



Fig. 13-04 Peruvamba Basin Choottad pozhi

RAMAPURAM BASIN (34R)

Ramapuram River originates in the isolated hillocks in the midlands. Elevation ranges from 10m to 250m. The river is 19 km long. The river joins the sea via a fresh water lake. KSLUB (2000) divides the basin into 14 water sheds. We have grouped them into five sub basins, details of which are tabulated below.

Sub basin: 34R/A. Sub basins 34R/A and E are on the eastern slopes of Ezhimala hill. Streams from sub basin A flow sea wards and join the lake. Small stream from sub basin E flows west and joins the sea. The water divide is at about 250m. Land use is mixed dry land crops (coconut) and bare rocks. The sub basin is located in the Ramanthali Grama Panchayat.

Sub basin: 34R/B. 34R/B falls in Kunjimangalam, Pariyaram and Cheruthazham panchayats. Altitude is about 50m. Land use is dry

land use areas.

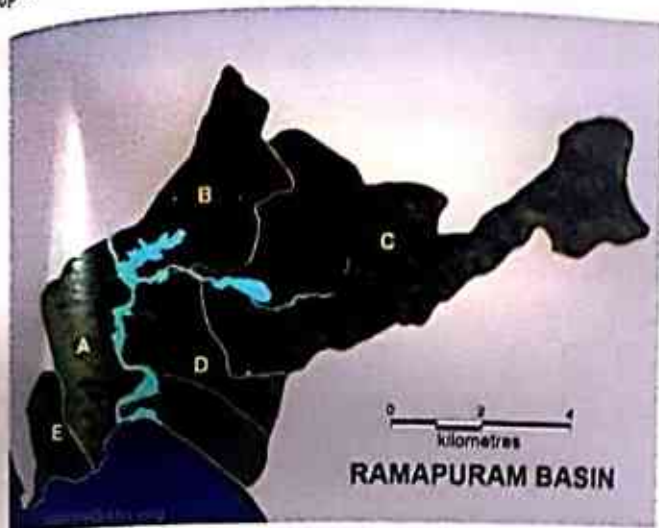


Fig. 13-05 Ramapuram Basin

Sub basin: 34R/C. 34R/C falls in Kunj-mangalam and Cheruthazham panchayats. Altitude is about 50m. Land use is dry land cultivation, paddy fields, bare areas and built-up areas.

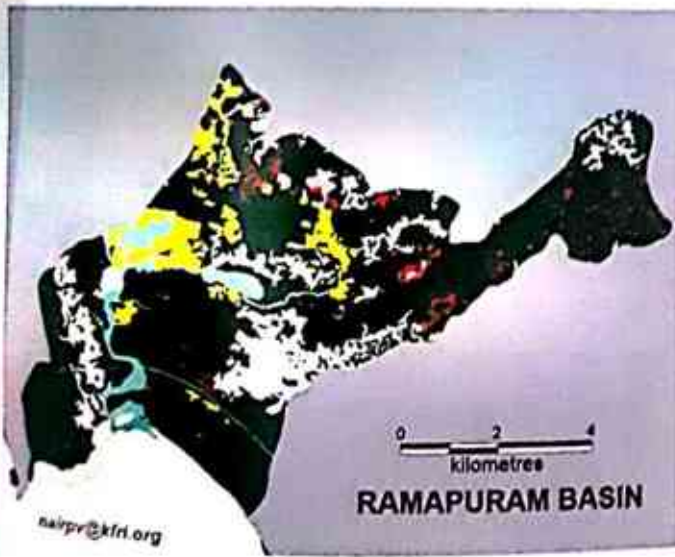
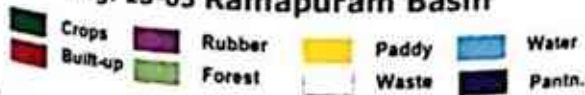


Fig. 13-05 Ramapuram Basin



Sub basin: 34R/D. 34R/D is in Madayi Panchayat. Land use is mostly dry land cultivation. It is coastal area but 3 streams flow parallel to sea and reach the lake. Sultan canal is a man made stream which connects it to southern lakes.

Sub basin: 34R/E. 34R/A and E are on the western slopes of Ezhimala hill. Streams from sub basin A flow sea wards and join the lake. Small stream from E flows west and joins the sea. The

water divide is at about 250m. Land use is mixed dry land crops (coconut) and bare rocks. This sub basin is located in Ramanthali Panchayat.

KUPPAM BASIN (33K)

Kuppam River originates in the hills in Karnataka State at an altitude of 1700m. The river is 82 km long. There are two branches; both join the lake and then the sea. Kuttikkal Puzha is the second tributary. P. Nair (2000) divides the Kuppam Basin, 33K into 11 watersheds. We have grouped them into 8 sub basins, the features of which are tabulated below.

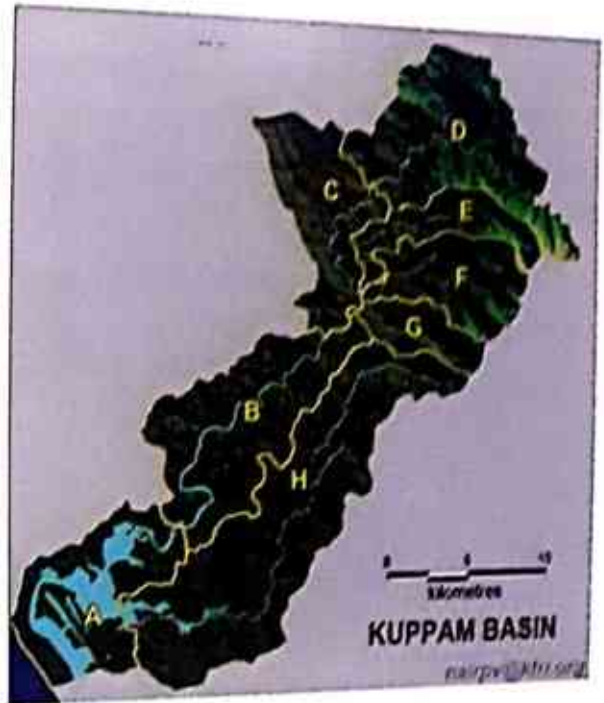


Fig. 13-06 Kuppam Basin

Sub basin: 33K/A. 33K/A. Cherukunnu, Ezhome, Pattvam panchayats. Kuppam River joins the sea. Coastal areas. Northern part of Mattool also. Railway linepass through this sub basin. Well known Location is Madayi. Altitude is less than 20m. Land use mostly paddy fields and coconut groves. Cherukunnu Sri Annapoorneswary temple pond is a large water body of about one hectare.

Sub basin: 33K/B is on either side of the main river, above confluence with lake. Pariyaram Panchayat is downstream and Chapparappadavu Panchayat is upstream. Thalippparambu and Chapparapadavu are nearby towns. Altitude is 20 to 100m. There is paddy cultivation in the lower reaches. Dry land crops, rubber and waste lands

are the land use in elevated areas. Sub basin consists of gently undulating hills.

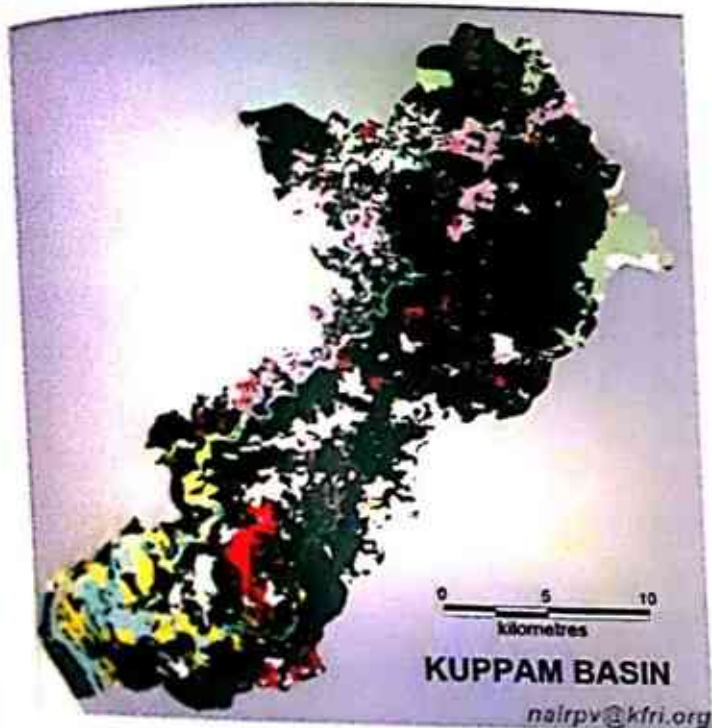


Fig. 13-11 Ramapuram Basin: Land use.

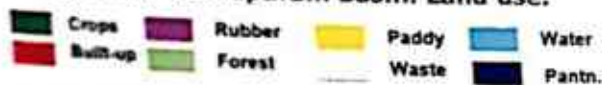


Fig. 13-07 Cherukunnu pond

Sub basin: 33K/C. Sub basin 35K/C is the hilly regions through which the main river flows down. Altitude is 100 to 300m. Small stream Cheriya Thodu joins the river. Main feature of sub basin is extensive rubber plantations. Lower areas have dry land cultivation. There are small amount of waste land also. Alacode is the panchayat.

Sub basin: 33K/D. Very hilly region. Tributaries originate from the valleys. Western region fall in Alacode Panchayat and eastern region falls in Udayagiri Panchayat. Land use is mixed dry land cultivation, rubber and waste lands. Well known

locations Rayaram and Udayagiri. River is called Pattappara Puzha in the upper reaches.

Sub basin: 33K/E. Sub basin 33K/E is the Alakode Thodu which joins the main river. The stream originates in the surrounding hills of about 500m. The river base is at about 100m. Land use is mixed dry land cultivation with patches of rubber. The region comes in Alacode and Udayagiri panchayats.

Sub basin: 33K/F. Sub basin F is also hilly terrain from which Karuvanchal Thodu originates and joins the main river. Kaniyan Chal, Karuvan chal and Velladu are populated areas. Area is mostly dry land cultivation with patches of bare areas on hill tops. The region comes in Alacode Panchayat.

Sub basin: 33K/G. Sub basin 33K/G is an unnamed perennial stream originating in Naduvil - Tirikkal areas. Land use is dry land cultivation, small quantities of rubber, waste lands and built-up areas. Panchayat is Naduvil.

Sub basin: 33K/H. Sub basin 33K/H is Kuttikol Puzha or Varadul Thodu that independently joins the lake. The perennial stream originates in Panniyur area where there is a pepper research station. The stream is called as Padeppangadu Thodu in the upper reaches. Karimbam and Poomangalam are well known localities. Land use is mainly dry land cultivation with small quantities of rubber, waste lands and built-up areas. Panchayats are Karumathur, Thalipparambu Municipality, Kannapuram and Pattuvam Panchayats.

VALAPATTANAM BASIN (32V)

Valapattanam basin is one of the largest in northern Kerala. It has a catchment area of 1877 km² and length of 110 km. The river originates in the Brahmagiri hills along the state border. Annual average stream flow is 4779 Mm³. KSLUB (2000) divides the basin into 92 water sheds. We have grouped them into 22 sub basins. Details of these follow. Chirakkal Chira, more than 5 ha in extent, is famous throughout the area and attracts the attention of tourists from various places. It is part of the Kadalayi temple.

Sub basin: 32V/A. This sub basin is the coastal area surrounding the Valapattanam Lake. The area consists of very low hills, almost plain area. Land use dry land crops, paddy, built-up areas. An independent stream from Kallyssery areas joins the

lake directly. Panchayats are Kalliyasseri, Pappinasseri, Mattool and Azhikkode.



Fig. 13-08 Chirakkal Chira Loc ??

Sub basin: 32V/B. Panchayats are Narath, Chirakkal, Puzhathi, Valapattanam and Papinasseri. Land use is dry land crops, paddy, built-up areas. Kattampally bridge is shown as under construction in Topo sheet. Pallikulam, Large pond is shown in topo sheet. Nearby town is Valapattanam. Railway line and main roads pas through the sub basin. Area is almost plain, altitude range from 40 to 100m.

Sub basin: 32V/C. Panchayat is Chengalal. Land use is dry land crops, built-up areas and waste lands. A perennial stream, Valakkai originates in the hilly areas and joins the river. Well known Location is Chuzhali.

Sub basin: 32V/D. Panchayats are Naduvil, Ervasseri, Payyavoor. Land use is dry land crops, built-up areas, rubber, forest, and waste lands. Well known Location Chemberi. Five perennial streams, Uravamakari Todu, Poliarapai Todu, Arangampara Todu, Chenhalkara Todu, Talapulua Todu originating in the hilly areas flow to the main river. Hills at the top are at about 1200m, the river basin is at about 40m.

Sub basin: 32V/E. Panchayats Eruvasseri, Payyavoor. Land use dry land crops, built-up areas, rubber, forest and waste lands. This sub basin is the perennial Payyavoor stream coming down from a narrow valley. The stream originates in steep hills of about 1000m. The top region of the stream is also called Atumbal Thodu.

Sub basin: 32V/F. Panchayats, Ulickal, Payyavoor. Land use is dry land crops, built-up areas, rubber, forest and waste lands. The sub basin is Parikalam puzha, also known as Chichani

hole in the Karnataka State border areas. The streams flow down along a wide valley.

Sub basin: 32V/G. Panchayats are Sreekandapuram, Malapattom and Chengalal. Land use is dry land crops, built-up areas, rubber, forest and waste lands. Sreekanda Puram puzha flows to the main river.

Sub basin: 32V/H. Panchayats Malapattom, Irikkur, and Chengalal, Keezhur-Chavasseri. Land use is dry land crops, built-up areas, rubber, forest, water bodies and waste lands. This is the main river, Pazhassi dam is in this. Several streams from either side flow into the river.

Sub basin: 32V/I. Panchayats are Payam and Ulickal. Land use is dry land crops and built-up areas. The sub basin, Tan Thodu is a narrow valley, the hills at the top are at about 500m.

Sub basin: 32V/J. Panchayats are Payam, Ayyankunnu. Land use is dry land crops, built-up areas, rubber forest and waste lands. Sub basin 32V/J is the main river. The hills on periphery are up to about 800m. Tributaries are Kaliandrath Thodu, Verappat Thodu, Kandur Puzha, Marenadu Hole, etc. The main river is called as the Charal Puzha.

Sub basin: 32V/K. Panchayat Ayyankunnu. Land use is dry land crops, built-up areas, rubber, forest and waste lands. The stream Kakkat Thodu join the main river as Vem Puzha. Hill ridges are at about 500m. The main river is at about 100m.

Sub basin: 32V/L. Panchayats are Aralam, Ayyankunnu, Muzhakunnu. Land use is dry land crops, built-up areas, rubber, forest and waste lands. Sub basin 32V/L is another large tributary. Uruti Puzha is from the ridge of 500-800m.

Sub basin: 32V/M. Panchayats are Kelakam, Kottiyur, Aralam, Land use mostly forest, dry land crops, built-up areas, forest and waste lands. The tributary Chikani puzha is a large river, the streams of which originate from hills of about 1000m.

Sub basin: 32V/N. Panchayats are Kelakam and Kottiyur. Land use is mostly forest, dry land crops and built-up areas. This sub basin is the Bavali Puzha, with many perennial streams arising from hills at about 500m.

Sub basin: 32V/O. Panchayats are Kanichar, Peravoor and Kolayade. Land use is forest, dry land crops and built-up areas. Kanhira puzha flow into the main river.

Sub basin: 32V/P. Panchayats are Keezhur-Chavassery, Thillankeri and Muzhakkunnu. Land use is forest, dry land crops and built-up areas. Seasonal streams from Muzhal kunnu flow down to the main river.

Sub basin: 32V/Q. Panchayats are Kodali, Malur and Mattannur Municipality. Land use is forest, dry land crops and built-up areas. A seasonal stream flows into the main river. Topo sheet shows paddy cultivation along the stream.

Sub basin: 32V/R. Panchayats are Munderi, Kuttiyattoor, Mayyiland Kolachery. Land use is forest, dry land crops, paddy fields, water bodies and built-up areas. The sub basin is rather marshy area, several perennial streams flow to the Kattakambal water body.

Sub basin: 32V/S. Panchayats are Valapattanam, Pallikunnu.

Land use in the Valapattanam basin is dry land crops and built-up areas. Kannur town is in this area. Topo show large pond beside railway line at Talap. There are tanks near Central Jail, Idachery and few other locations. Large tank at Pallikulan beside railway track is also notable.



Fig. 13-09 Basin Valapattanam

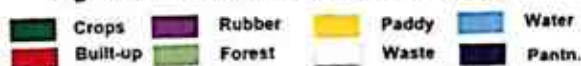
The Pazhassi irrigation project was constructed in 1979 across Valapattanam River in Panchayats Padiyur and Keezhur-Chavasseri. It now serves as a source of drinking water for large part of the district. It was designed to facilitate the second paddy crop. The stored water could not be used as there were breaches in canals in 2012 floods.

Renovation works are in progress, but its utility is to be seen in the context of increasing cost of paddy cultivation. The barrage is on a tributary of Valapattanam River in Chirakkal and Narath panchayat boundaries in sub basin B. Valapattanam River and other rivers join the lake and the lake is known by different names such as Thalipparamba, Valapattanam and Kattampalli in different locations.

Kattampally barrage was constructed four decades ago to reduce salt water inflow to facilitate raising second crop of paddy in the catchment areas. With time, it reduced the soil quality and fisheries wealth and conflicting interests are beginning to question the wisdom of constructing the barrage itself.



Fig. 13-17 Payyannur Block: Land use.



The Pappinisseri mangrove theme park is a controversial eco-tourism project on the banks of Valapattanam River in Kannur. Dharmadom Island is an uninhabited island covered with coconut palms and dense bushes near the confluence of Anjarakandy and Thalassery rivers. It is just 100 metres from the sandy beach of Dharmadom, which is set off from the mainland by rivers that surround it on three sides and the sea on its western side. One can wade to the island at low tide.

The Mangrove trail of Malabar is an eco-tourism venture aimed at spreading awareness about the benefits of the threatened inter-tidal ecosystem and how it nourishes exquisite flora and fauna. The trail is reported to be on the ancestral property of one Mr. Riaz who is committed to preserving and sustaining this precious treasure even though the mangroves lie on prime commercial land holdings

ideal for shrimp farming. The venture employs local people who are tasked with maintaining the trail, lending a hand in conducting the tour and ensuring the conservation of this ecosystem. It has also been instrumental in conducting tours for school children and inculcating in them a sense of ownership for their natural surroundings and kindling the curiosity to explore such ecological wonders.



Fig. 13-10 Kattampalli barrage

ANJARAKANDI BASIN (31A)

Anjarakandi basin has a catchment area of 412 km². It originates in the Kannothe hills on the extreme eastern portion, the remaining portions are low land and midlands. KSLUB (2000) divides the basin into 40 watersheds. We have grouped them into sub basins. Details of these follow.

Sub basin 31A/A. Almost level areas. Railway line and main road. Topo sheet shows paddy cultivation along seasonal streams. Streams drain to sea. Panchayats are Edakkad, Kadambur, Chelora, Elayavoor, Muzhuppi-langad. Land use is dry land crops, built-up areas, paddy, water bodies, waste lands.



Fig. 13-11 Basin Anjarakandi

Sub basin: 31A/B. Almost level areas. Topo sheet shows paddy cultivation along seasonal streams. Panchayats are Chembilod, Peralassery, Kadamboor, Dharmadam and Muzhippilangad, Pinarayi. Land use is dry land crops, built-up areas, paddy, water bodies, waste lands.

Sub basin: 31A/C. Anjarakandi Puzha. Topo sheet shows paddy cultivation along seasonal streams. Panchayats are Anjarakandi, Vengad, Peralasseri, Mangottidam, Koothuparambu Municipality. Land use is dry land crops, built-up areas, paddy, water bodies and waste lands. Well known localities are Kalattumala and Padiriyad. Altitude is 20-100m.

Sub basin: 31A/D. Anjarakandi Puzha. Topo sheet shows paddy cultivation along seasonal streams. Panchayats are Koodali, Keezhallur, Mangattidam, Chittariparambu and Vengad. Land use is dry land crops, built-up areas, paddy, water bodies, forest and waste lands. Populated areas are Kandakunnu and Uruvachal. Altitude is 20-100m.



Fig. 13-17 Payyannur Block: Land use.



Sub basin: 31A/E. Anjarakandi Puzha becomes seasonal Idumba Thodu in this sub basin. Topo sheet shows paddy cultivation along streams. Panchayats are Malur, Kolayade, Chittariparambu and Pattiam. Land use is dry land crops, built-up areas, rubber, water bodies, forest and waste lands. Altitude is 100-200m.

Sub basin: 31A/F. Stream from Kannavam area flows to Main River. Panchayats are Chittariparambu and Pattiam. Land use is forest, dry land crops, waste lands, built-up areas and rubber. Altitude is up to 500m.

The river joins the sea at Thalasseri where it creates a broad estuary.



Fig. 13-12 Vedimad island. Mangrove forest

THALASSERI BASIN(30T)

Thalasseri River originates in the Chennapoyil mala of Kannothe reserve forest and has a catchment area of 158 km². The river is about 20 km in length. KSLUB (2000) divides the area into 18 watersheds. We have grouped them into 3 sub basins.

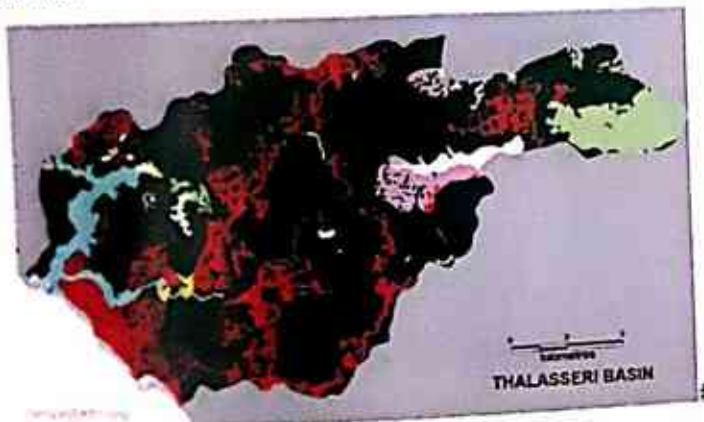
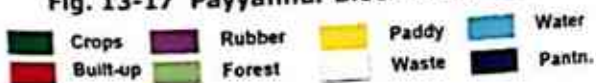


Fig. 13-17 Payyannur Block: Land use.



Sub basin: 30T/A. Almost plain area, surrounded by water on all sides. Panchayats are Dharmadam, Kottayam, Pinarayi, Kathirur, Eranholy and Thalassery MCP. Land use is mixed dry land crops, water bodies and built-up areas. Topo sheet shows paddy along streams.

Sub basin: 30T/B. Gentle hills. Panchayats are Pattiom, Mookeri and Koothuparambu MCP. Land use is mixed dry land crops, water bodies, rubber, forest and built-up areas. Topo sheet shows paddy along streams.

Sub basin: 30T/C. There is a lake through the middle. Sub basin is coastal area. Panchayats are Kathirur, Eranholy, Panniyannur, Thalassery MCP and Mahe. Land use is mixed dry land crops, water

bodies and built-up areas. Topo sheet shows paddy along streams.



Fig. 13-13 Thirthamkara fresh water pond

The two main branches, Dharmadam Puzha and Eranholy Puzha join to form Thalasseri River which joins the sea at Mannoyed, about 3 km north of Thalasseri as a broad estuary..



Fig. 13-14 Ayram thenu valapattanam mangrove

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BLOCKS AND PANCHAYATS

There are eight blocks in Kannur District. Payyannur block is the northern most. Most of the blocks have an elongated shape extending into the ghat region. Nearly half the blocks have sea coast or lakes on the western side. Most of the blocks have one more rivers flowing through them. Plywood industries are located in Kannur (on Valapattanam River, Baliapattam). It is a major cloth weaving centre. Major landmarks are Madayi para Aralam WLS, Kannur University and so on. Kannur is the sixth-most urbanized district in Kerala, with more than 50% of its residents living in urban areas.



Fig. 13-15 Kannur District Blocks

PAYYANNUR BLOCK AND MCP

There are 12 panchayats in Payyannur Block. Mattool, Madayi, Ramathali, Payyannur Municipality, Ezhome and Kunjimangalam Panchayats are water logged areas. Topo shows two small ponds near China Clay Factory in Madayi Panchayat. There is a pond near Porachery Vayal and a small tank near Varankod Ambalam in Cheruthazham Panchayat. Topo shows a large water body, Ramapura Puzha at Cheruthazham Panchayat. Topo shows a small tank near Eripuram at Ezhome Panchayat. Vannatti Puzha and Pazhayangadi Puzha are the main rivers. Chankurl Chal was seen near Kunjimangalam Panchayat. Dry land cultivation, rubber and paddy fields are there.



Fig. 13-16 Block: Payyannur

There are 11 grama panchayats and one municipality in Payyannur block. Details are given below.

Cheruthazham: Sub basins 34R/B, 34R/C. 34R/B falls in Kunjimangalam Panchayat and Cheruthazham Panchayat. Altitude is about 50m. Land use is dry land cultivation, paddy fields and built-up areas. 34R/C falls in Cheruthazham Panchayat. Land use is dry land crops and bare areas.

Erimam-Kuttoor: Sub basins are 35P/G, 35P/H. Sub basins G and H are on the 4th and last stream flowing in north to south direction to the main river. The stream flows through a deeper valley. The unnamed stream originating in Karippal and Vellora areas at about 150 m is perennial in nature. The lower sub basin H is at around 0-100m elevation. Land use in G is dry land crops and waste lands, In H, the same is dry land crops, rubber and waste lands. Panchayats are Erimam - Kuttoor and Kadannappally - Panappuzha.

Ezhome: Sub basin is 33K/A. Kuppam River joins the sea. Panchayat is in coastal areas. Railway line passes through this. Altitude is less than 20m. Land use mostly paddy fields and coconut groves.

Kadannappally-Panappuzha: Sub basins are 35P/B, 35P/G, 35P/H, 35P/I. Sub basins B and I are on either side of the river. This is also the junction of streams coming from up stream. Land

use is dry land crops, built-up areas, paddy and wastelands. Altitude range from 20m at river bed to 100m at hill tops. Cheruvanchen, Chondapura are populated localities. Hills and valleys are more pronounced, streams from the valleys join the river.



Fig. 13-17 Payyannur Block: Land use.



Kankole-Alappadamba: Sub basin is 35P/C. Sub basin C is one of the larger streams flowing to the main river. The seasonal stream, Aravanchal Thodu comes from hilly regions, the altitude of which is up to 100-150m. Land use is dry land crops and waste lands with traces of rubber.

Kunjimangalam: Sub basins are 34R/B and 35P/A. Sub basin 34R/B falls in Kunjimangalam Panchayat and Cheruthazham Panchayat. Altitude is about 50m. Land use is dry land cultivation, paddy fields and built-up areas.

Madayi: Sub basin is 34R/D. Land use is mostly dry land cultivation. It is coastal area but three streams flow parallel to sea and reach the lake.

Mattool: Sub basins are 32V/A and 33K/A. These sub basins are coastal areas surrounding Valapattanam Lake. The area consists of very low hills, almost plain area. Land use is dry land crops, paddy and built-up areas. An independent stream from Kallyssery areas joins the lake directly.

Payyannur MCP: Sub basin is 35P/B. This is also the junction of streams coming from up stream. Land use is dry land crops, built-up areas, paddy and wastelands. Altitude range from 20m at river bed to 100m at hill tops. Cheruvanchen, Chondapura are localities. Hills and valleys are more pronounced, streams from the valleys join the river.

Peringome-Vayakkara: Sub basins are 35P/C, 35P/D, 35P/E, 35P/F. Sub basin C is one of the larger streams flowing to the main river. The seasonal stream, Aravanchal Thodu comes from hilly regions, the altitude of which is up to 100-150m. Land use is dry land crops and waste lands with traces of rubber.

Ramanthali: Sub basins are 34R/A, 34R/E and 35P/J. 34R/A, E are on the eastern slopes of Ezhimala hill. Streams from sub basin A flow sea wards and join the lake. Small stream from E flows west and joins the sea. The water divide is at about 250m. Land use is mixed dry land crops (coconut) and bare rocks.

Table 13-1 Water bodies in Payyannur Block

Panchayat	W Body%	Paddy %	Top e	NRED S	Pan fish	Panchayat
Cheruthazham	0.01	4.5		2	4	11
Eramam-Kuttur	0.20	0.77		1	4	10
Ezhome	0.06	25.02	1	1	5	15
Kadannappally-Panappuzha	0.16	2.97		2	5	15
Kankole-Alappadamba	0.03	4.44		5	2	16
Kangomba ?						1
Kariveilur-Peralam	0.85	1.67		1	4	11
Kunjimangalam	0.08	12.95		5	7	10
Madayi	0.05	1.61	2			24
Mattool	0.26	4.61		1	1	1
Payyannur MCP	11.88	2.00		2	3	
Peringome-Vayakkara	0.05	0.00		1	4	2
Ramanthali	70.2	0.26	1			11

hilly areas flow to the river. Top hills are at about 1200m, the river basin is at about 40m.

Narath: Sub basin is 32V/B. Land use is dry land crops, paddy, built-up areas. Kattampally bridge is shown as under construction in Topo sheet. Pallikulam is a large pond shown in topo sheet. Valapattanam is town in the area. Railway line, main roads pass through the area. Panchayat is almost plain area, altitude range from 40 to 100m.

Papinisseri: Sub basins are 32V/B and 32V/A. Land use dry land crops, paddy and built-up areas.

Pariyaram: Sub basins are 33K/B and 34R/B. Panchayat is on either side of the main river, above confluence with lake. Pariyaram Panchayat is downstream and Chapparappadavu Panchayat is upstream. Thalipparambu, Chapparapadavu nearby towns. Altitude is 20 to 100m. There is paddy cultivation in the lower reaches. Land use is dry land crops, rubber and wastelands in elevated areas. Sub basin consists of gently undulating hills.

Pattuvam: Sub basins are 33K/A and 33K/H. 33K/A. Kuppam River joins the sea. Railway line pass through the area. Nearby location Madayi. Altitude is less than 20m. Land use mostly paddy fields and coconut groves.

Thaliparambu MCP: Sub basin is 33K/H, Kuttikol Puha or Varadul Thodu that independently joins the lake.



Fig. 13-19 Block:Thaliparamba

Udayagiri: Sub basins are 33K/D and 33K/E. Panchayat is in very hilly region. Tributaries originate from the valleys. Land use is mixed dry land cultivation, rubber and waste lands. Well known locations are Rayaram and Udayagiri. River is called Pattappara Puzha in the upper reaches.

Table 13-2 Water bodies in Thalipparambu block

Panchayat	W Body%	Paddy %	Topo	NRED B	Panfish	Panch
Alakode	0.17	0.00		1	2	
Anthoor					3	
Changalal/Chengali	0.00	2.29			2	
Chapparapadavu	0.00	0.30			3	
Cherukunnu	0.73	32.14	1	1	1	
Kallyasseri	0.38	11.54			1	
Kannapuram	0.00	12.88			1	
Kurumathur	0.01	2.10		1	1	
Naduvil	0.00	0.02			1	
Narath	0.00	10.81			1	
Papinasseri	0.28	4.87			1	
Pariyaram	0.00	5.09		1	1	
Pattuvam	0.18	16.19			1	
Thaliparambu MCP				6	3	
Udayagiri	0.12	0.00			1	

IRIKKUR BLOCK

There are ten panchayats. Valapattanam and Kattampally rivers make boundaries to Kolacheri Panchayat. Valapattanam River and its tributaries flow through this block. Topo does not show any ponds in this block. Some areas in Eruvassy and Payyavur panchayat are forested. Dry land cultivation, rubber and paddy fields are the land use. Description of panchayats follows.

Eruvasseri: Sub basin is 32V/E. Land use is dry land crops, built-up areas, rubber, forest and waste lands. This sub basin is the perennial Payyavoor stream coming down from a narrow valley. The stream originates in steep hills, up to about 1000m. The top region of the stream is also called Atumbal Thodu.

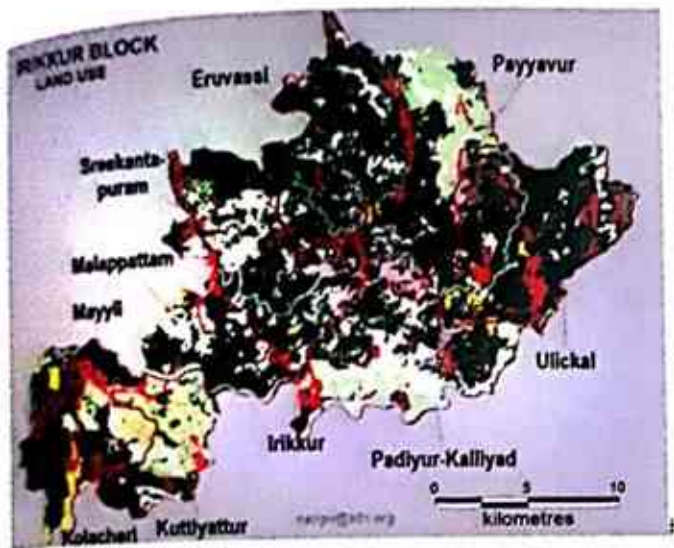


Fig. 13-20 Payyannur Block: Land use.



Kolachery: Sub basin is 32V/R. Land use is forest, dry land crops, paddy fields, water bodies and built-up areas. Partly marshy area, several perennial streams flow to the Kattakambal water body.

Kuttiyattoor: Sub basin is 32V/R. Land use is forest, dry land crops, paddy fields, water bodies and built-up areas. Rather marshy area, several perennial streams flow to the Kattakambal water body.

Eruvasseri: Sub basin is 32V/D. Land use is dry land crops, built-up areas, rubber, forest, and waste lands. Well known location is ation Chemberi. Five perennial streams, Uravamakari Todu, Poliarapai Todu, Arangampara Todu, Chenhalkara Todu, Talapulia Todu originating in the hilly areas flow to the river. Top hills are at about 1200m, the river basin is at about 40m.

Irikkur: Sub basin is 32V/H. Land use is dry land crops, built-up areas, rubber, forest, water body and waste lands. This is the main river, Pazhassi dam is in this. Several streams from either side flow into the river.

Malappattom: Sub basin is 32V/G. Land use is dry land crops, built-up areas, rubber, forest and waste lands. Sreekandapuram puzha flows to the main river.

Malappattom: Sub basin is 32V/H. Land use is dry land crops, built-up areas, rubber, forest, water body and waste lands.

Mayyil: Sub basin is 32V/R. Land use is forest, dry land crops, paddy fields, water bodies and built-up areas.

Payyavoor: Sub basin is 32V/D. Land use is dry land crops, built-up areas, rubber, forest, and waste lands. Notable location is Chemberi. Four perennial streams, Uravamakari Todu, Poliarapai Todu, Arangampara Todu, Chenhalkara Todu, Talapulia Todu originating in the hilly areas flow to the river. Top hills are at about 1200m, the river basin is at about 40m.

Sreekandapuram: Sub basin is 32V/G. Land use is dry land crops, built-up areas, rubber, forest and waste lands. Sreekandapuram puzha flows to the main river.



Fig. 13-21 Block: Irikkur

Table 13-3 Irikkur water bodies

Panchayat	WBody %	Paddy %	Top o	NRE DB	Pan-fish	Panch
Eruvassy	0.00	0.00			3	1
Irikkur	0.00	0.75			3	
Kolachery	0.00	1.74			3	5
Kuttiyattoor	0.14	4.09			3	9
Malappattom	0.17	1.75		1	3	84
Mayyil	0.03	2.39			4	17
Padiyoor-Kalhyad	0.00	1.03			1	5
Payyavoor	0.05	0.64			1	20
Sreekantapuram	0.03	0.65		1	1	

Ulickal: Sub basin is 32V/F. Land use dry land crops, built-up areas, rubber, forest and waste lands. The sub basin is Parikalam puzha, also

known as Chichani Hole in the Karnataka State border areas. The streams flow down along a wide valley.

Ulickal: Sub basin is 32V/I. Land use is dry land crops and built-up areas. The sub basin, Tan Thodu is a narrow valley, the hills at the top are at about 500m.

Iritty Block and Mattannur MCP

There are seven panchayats. Valapatanam, Aralam, Uruti, Bavali and Anjarakandy rivers lie in this block. Topo does not show any ponds. Eastern portions of Ayyankunnu and Aralam panchayats are forested. Land use is dry land cultivation and rubber. Paddy fields are also there. Kannur airport is in this block. Details of panchayats follow.

Aralam: Sub basins are 32V/L and 32V/M. Land use dry land crops, built-up areas, rubber, forest and waste lands. 32V/L is another large tributary, Uruti Puzha, the ridge is from 500-800m.

Ayyankunnu: Sub basins are 32V/J, 32V/K and 32V/L. Land use is dry land crops, built-up areas, rubber, forest and waste lands. 32V/J is the main river, on to which streams join. The hills on periphery are up to about 800m. Tributaries are Kaliandrath Thodu, Verappat Thodu, Kandur Puzha, Marenadu Hole, etc. The main river is called as the Charal Puzha.

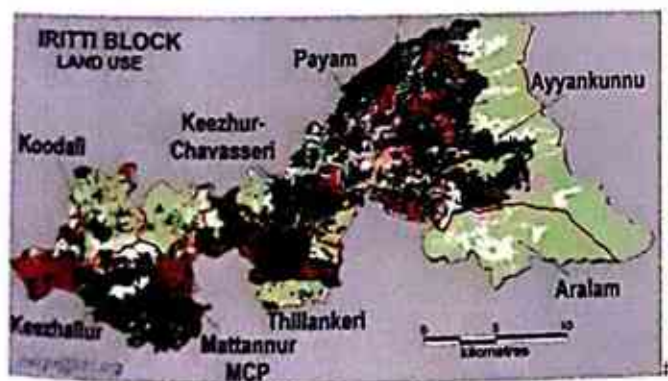


Fig. 13-23 Payyannur Block: Land use.



Keezhallur: Sub basin is 31A/D. Anjarakandi Puzha. Topo sheet shows paddy cultivation along seasonal streams. Land use is dry land crops, built-up areas, paddy, water bodies, forest and waste lands. Well known localities are Kandakunnu and Uruvachal. Altitude is 20-100m.

Keezhur-Chavasseri: Sub basins are 32V/H and 32V/P. Land use is dry land crops, built-up areas, rubber, forest, water body and waste lands. This is the main river, Pazhassi dam is in this. Several streams from either side flow into the river.

Koodali: Sub basin is 31A/D, Anjarakandi Puzha. Topo sheet shows paddy cultivation along seasonal streams. Land use is dry land crops, built-up areas, paddy, water bodies, forest, waste lands. Well known localities are Kandakunnu and Uruvachal. Altitude is 20-100m.

Mattannur MCP: Sub basin is 32V/Q. Land use is forest, dry land crops and built-up areas. Topo sheet shows paddy cultivation along the streams.

Payam: Sub basins are 32V/I and 32V/J. Land use is dry land crops and built-up areas. The sub basin, Tan Thodu is a narrow valley, the hills at the top are at about 500m.

Thillankeri: Sub basins 32V/P. Land use is forest, dry land crops and built-up areas. Seasonal streams from Muzhalkunnu flow down to the main river.



Fig. 13-24 Block: Iritty

Table 13-4 Water bodies in Iritty block

Panchayat	W Body %	Paddy %	Top o	NRE DB	Panfish	Panch
Aralam	0.00	0.00			3	92
Ayyankunnu	0.00	0.08			3	5
Keezhallur	0.00	1.18			4	9
Keezhur-Chavasseri	0.05	1.58			5	8
Koothali	0.00	0.56			1	9
Mattannur MCP					3	
Payam	0.62	4.08			3	9
Thillankeri	0.00	0.00			3	5

PERAVUR BLOCK

There are seven panchayats. Bavali Puzha and Kanhira Puzha flows through this block. Aralam Puzha lies at the northern boundary of Muzhakkunnu Panchayat. Topo does not show any ponds. Most of the area in Kottiyur Panchayat and some areas in Kolayad Panchayat are forested. Dry land cultivation is the main land use.



Fig. 13-26 Block: Peravur

Kanichar: Sub basins are 32V/O, 32V/M and 32V/N. Land use is forest, dry land crops and built-up areas. Kanhira puzha flows into the main river.

Kodal: Sub basin is 32V/Q. Land use is forest, dry land crops and built-up areas. Topo sheet shows paddy cultivation along the streams.

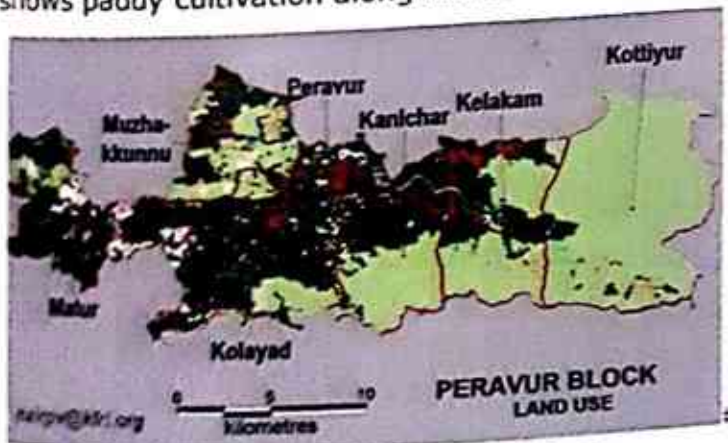


Fig. 13-25 Payyannur Block: Land use.



Kolayade: Sub basins 31A/E, 32V/O. Anjarakandi Puzha becomes seasonal Idumba Thodu. Topo sheet shows paddy cultivation along streams. Land use is dry land crops, built-up areas, rubber, water bodies, forest and waste lands. Altitude is 100-200m.

Kottiyur: Sub basins are 32V/M and 32V/N. Land use is mostly forest, dry land crops, built-up forest and waste lands. The tributary Chikani puzha is a large river, the streams of which originate from hills nearly 1000m.

Malur: Sub basins are 31A/D, 31A/E and 32V/Q. Main river is Anjarakandi Puzha. Topo sheet shows paddy cultivation along seasonal streams. Land use is dry land crops, built-up areas, paddy, water bodies, forest, waste lands. Well known localities are Kandakunnu and Uruvachal. Altitude is 20-100m.

Muzhakkunnu: Sub basins are 32V/P and 32V/L. Land use is forest, dry land crops and built-up areas. Seasonal streams from Muzhal kunnu flow down to the main river.

Peravoor: Sub basin is 32V/O. Land use is forest, dry land crops and built-up areas. Kanhira puzha flows into the main river.

Table 13-5 Water bodies, Peravur Block

Panchayat	W Body%	Paddy%	Topo	NRED B	Panfish	Panch
Kanichar	0.00	0.02			3	163
Kelakam	0.04	0.05			2	67
Kolayade	0.10	0.00		1	4	30
Kottiyoor	0.06	0.00			3	99
Maloor	0.04	0.00			3	20
Muzhakunnu	0.00	0.00			1	9
Peravur	0.00	0.79			3	300

Kannur Block (Edakkad)

There are nine panchayats. Kattampally Puzha lies in the north-west boundary of Chelora, Munderi and Elayavur Panchayats. Anjarakandy Puzha lies in the Eastern boundary of Anjarakandy, Peralassery and Muzhupilangad Panchayat and joins with Arabian Sea. Topo does not show any ponds in this block. Dry land cultivation, built-up areas and paddy fields are the main land use.

Kannur MCP

There are five panchayats in this block. Valapatanam River and Kattampally Puzha makes boundaries in the north-east portion of Azhikkodu, Chirakkal and Puzhathy Panchayats. Topo shows two large tanks, one near Pallikkulam at Valappattanam Panchayat and another near

municipal offices at Kannur MCP. There are two small tanks also seen, one near Pallikkunnu and one near Kannur municipal offices. Built-up areas, dry land cultivation and some paddy fields constitute the land use.

Anjarakandy: Sub basin is 31A/C. Topo sheet shows paddy cultivation along seasonal streams. Land use is dry land crops, built-up areas, paddy, water bodies and waste lands. Populated localities are Kalattumala and Padiriyad. Altitude is 20-100m.



Fig. 13-27 Block: Name

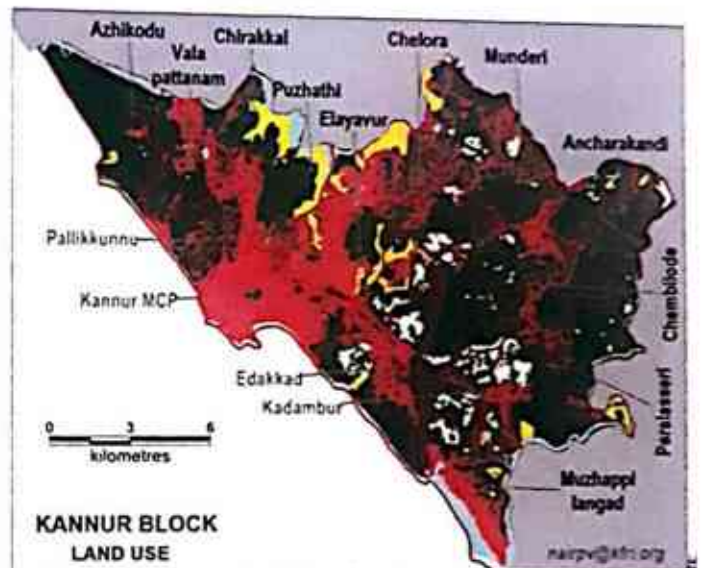
Azhikode: Sub basin is 32V/A. This sub basin is the coastal area surrounding the Valapattanam Lake. The area consists of very low hills, almost plain area. Land use dry land crops, paddy, built-up areas. An independent stream from Kallyssery areas join the lake directly.

Chelora: Sub basins are 31A/A and 32V/R. Almost level areas, railway line and main road pass through this panchayat. Topo sheet shows paddy cultivation along seasonal streams. Streams drain to sea. Land use is dry land crops, built-up areas, paddy, water bodies and waste lands.

Chembilode: Sub basin is 31A/B. Almost level areas. Topo sheet shows paddy cultivation along seasonal streams. Land use is dry land crops, built-up areas, paddy, water bodies and waste lands.

Chirakkal: Sub basin is 32V/B. Land use is dry land crops, paddy and built-up areas. Pallikulam is a large pond shown in topo sheet. Near by town is Valapattanam. Railway line and main roads pass

through the panchayat. Area is almost plain, altitude range from 40 to 100m.



F Fig. 13-28 Payyannur Block: Land use.



Edakkad: Sub basin is 31A/A. Almost level areas, railway line and main roads pass through this panchayat. Topo sheet shows paddy cultivation along seasonal streams. Streams drain to sea. Land use is dry land crops, built-up areas, paddy, water bodies and waste lands.

Elayavoor: Sub basin is 31A/A. Topo sheet shows paddy cultivation along seasonal streams. Streams drain to sea. Land use is dry land crops, built-up areas, paddy, water bodies and waste lands.

Kadamboor: Sub basins are 31A/B and 31A/A. Almost plain areas, topo sheet shows paddy cultivation along seasonal streams. Land use is dry land crops, built-up areas, paddy, water bodies and waste lands.

Munderi: Sub basin is 32V/R. Land use is forest, dry land crops, paddy, water bodies and built-up areas. Rather marshy area, several perennial streams flow to the Kattakambal water body.

Muzhappilangad: Sub basins are 31A/B and 31A/A. Topo sheet shows paddy cultivation along seasonal streams. Land use is dry land crops, built-up areas, paddy, water bodies and waste lands.

Pallikunnu: Sub basin is 32V/S. Land use is dry land crops and built-up areas. Kannur town is in this area. Topo shows large pond beside railway line at Talap. There are tanks near Central Jail, Idachery and few other locations. Large tank at Pallikulam beside railway track is also notable.

Peralasseri: Sub basins are 31A/C and 31A/B. Topo sheet shows paddy cultivation along streams. Land use is dry land crops, built-up areas, paddy, water bodies and waste lands. Kalattumala and Padiniyad are well known places. Altitude is 20-100m.

Puzhathi: Sub basin is 32V/B. Land use dry land crops, paddy and built-up areas. Altitude range from 40 to 100m.

Valapattanam: Sub basins are 32V/B and 32V/S. Land use is dry land crops, paddy and built-up areas. Altitude range from 40 to 100m.

Table 13-6 Water bodies. Kannur Block

Panchayat	WBody %	Paddy %	To po	NRE DB	Pan-fish	Panch
Anjarakandi	0.00	4.79			2	10
Amikode	0.02	0.65		1	3	14
Chelora	0.00	11.43			2	5
Chemilode	0.00	0.00			2	9
Chrakkal	0.00	10.26			2	
Idakkad	0.00	0.00			3	9
Elayavoor	0.00	5.99			3	1
Kadumboor	0.00	0.00			2	45
Munden	0.05	0.00			2	1
Muzhuppiangad	0.00	0.93			2	15
Pallikunnu	0.00	0.00	4		2	1
Peralasseri	36.30	2.17		1	4	67
Puzhathi	0.0	0.87			1	4
Valapattanam	1.62	0.00	1	1	2	12
Kannur MCP	0.07	1.13	1		2	

Thalassery Block and Mcp

(and Mahe Kunuchira. Kottayam chira)

There are nine panchayats in Thalassery Block. Mahe River flows through Peringalam, Karyad, Chokki, Mahe and New Mahe and joins Arabian Sea. Dharmadam, Thalassery MCP, Eranholi and Western portions of Pinarayi Panchayats are water logged areas. Anjarakandi River, Eranholi Puzha and Dharmadam Puzha are inside this block. Topo shows a pond at Kottayam Panchayat. Topo does

not show any other ponds. Dry land cultivation and built-up areas are the land use.



Fig. 13-29 Block: Thalassery

Dharmadam: Sub basins are 31A/B and 30T/A. Almost level areas. Topo sheet shows paddy cultivation along streams. Land use is dry land crops, built-up areas, paddy, water bodies and waste lands.

Eranholi: Sub basins are 30T/A and 30T/C. Almost plain areas. Many areas in panchayat are surrounded by water. Land use is mixed dry land crops, water bodies and built-up areas. Topo sheet shows paddy along streams.

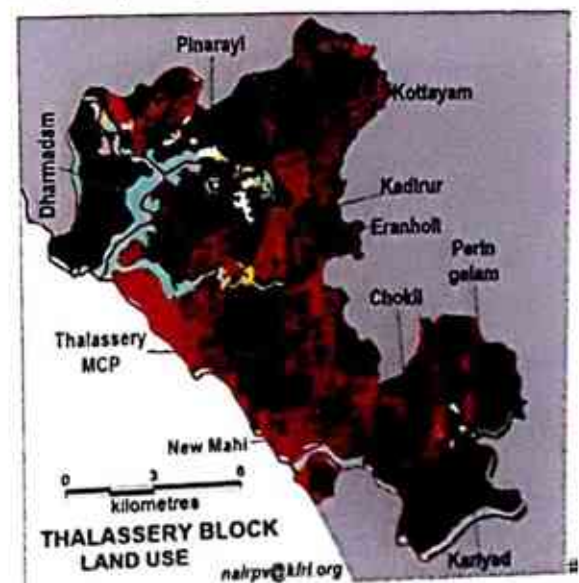
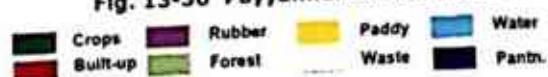


Fig. 13-30 Payyannur Block: Land use.



Kathirur: Sub basins are 30T/A and 30T/C. Almost plain area, surrounded by water. Land use is mixed dry land crops, water bodies and built-up areas. Topo sheet shows paddy along streams.

Pinarayi: Sub basins are 30T/A and 31A/B. Almost plain areas, surrounded by water. Land use is mixed dry land crops, water bodies and built-up areas. Topo sheet shows paddy along streams.

Kottayam: Sub basin is 30T/A. Almost plain areas, surrounded by water on all sides. Land use is mixed dry land crops, water bodies and built-up areas. Topo sheet shows paddy along streams.

Thalassery MCP: Sub basins are 30T/A and 30T/C. Almost plain areas, surrounded by water. Land use is mixed dry land crops, water bodies and built-up areas.

Table 13-7 Thalassery Block. Water bodies

Panchayat	WBody %	Paddy %	Topo	NRE DB	Pan-fish	Panch
Chokki	7.54	0.00			2	3
Dharmadam	0.00	0.00				
Eranholi	0.00	7.40			1	1
Kariad	4.80	0.00			2	21
Kathiroor	0.04	0.00		1	1	5
Kodiyeri					2	3
Kottayam	0.00	0.00	1			15
Pinarayi	0.00	0.00			2	3

KUTHUPARAMBU BLOCK AND MCP

There are nine panchayats in Kuthuparambu Block. Anjarakandi Puzha, Eranholi Puzha and Mahe River come inside this block. Topo shows a tank near Sankaranallur in Managattidam Panchayat. Topo does not show any ponds in this block. Most of the areas in Pattiam Panchayat are forested. Land use is dry land cultivation and built up areas. Some areas are under rubber and paddy.



Fig. 13-31 Block: Kuthuparambu

Chittariparambu: Sub basins are 31A/D, 31A/E and 31A/F. Land use is dry land crops, built-up areas, paddy, water bodies, forest and waste lands. Localities nearby are Kandakunnu and Uruvachal. Altitude is 20-100m.

Koothuparambu MCP: Sub basins are 30T/B and 31A/C. Gentle hills, land use is mixed dry land crops, water bodies, rubber, forest and built-up areas.

Mangattidam: Sub basins are 31A/D and 31A/C. Anjarakandi Puzha. Topo sheet shows paddy cultivation along seasonal streams. Land use is dry land crops, built-up areas, paddy, water bodies, forest and waste lands. Localities nearby are Kandakunnu and Uruvachal. Altitude is 20-100m.

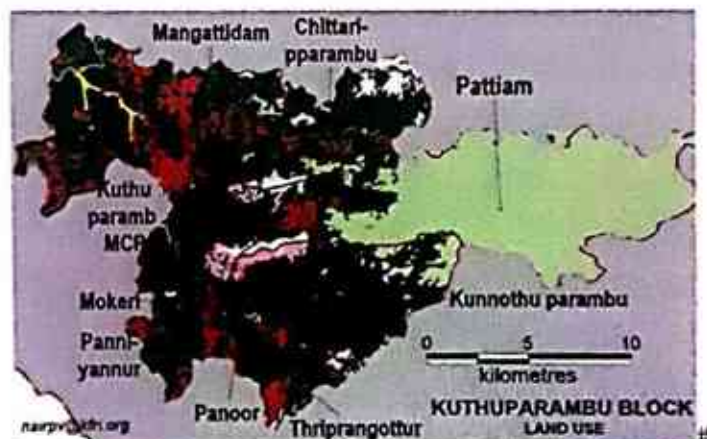


Fig. 13-32 Payyannur Block: Land use.



Mookeri: Sub basin is 30T/B. Gentle hills, land use is mixed dry land crops, water bodies, rubber, forest and built-up areas. Topo sheet shows paddy along streams.

Panniyannur: Sub basin is 30T/C. There is a lake in the middle. Coastal area, land use is mixed dry land crops, water bodies and built-up areas. Topo sheet shows paddy along streams.

Pattiam: Sub basins are 31A/E, 31A/F and 30T/B. Anjarakandi Puzha becomes seasonal Idumba Thodu. Topo sheet shows paddy cultivation along streams. Land use is dry land crops, built-up areas, rubber, water bodies, forest and waste lands. Altitude is 100-200m.

Vengad: Sub basins are 31A/C and 31A/D. Land use is dry land crops, built-up areas, paddy,

water bodies, waste lands. Nearby Localities are Kattumala and Padiriyad. Altitude is 20-100m.

Table 13-8 Kuthuparambu. Water bodies

Panchayat	WBody %	Paddy %	Topo	NRE DB	Pan-fish	Panch
Chittarambu	0.50	0.00			3	7
Konathuparambu	0.00	0.00			3	
Kuthuparambu MCP					4	
Mangattodom	0.03	0.00	1	1	4	
Mookeri	0.00	0.00			3	
Pannyanoor	0.00	0.00			4	3
Pannor	0.00	0.00			5	5
Pattayam	0.00	0.65			3	47
Thripprangottur	2.36	0.00			4	6
Vengad	0.00	3.59			2	

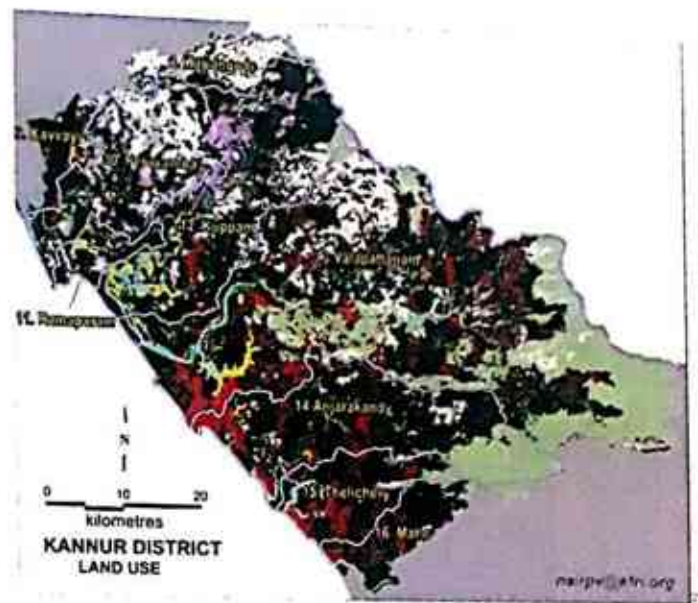
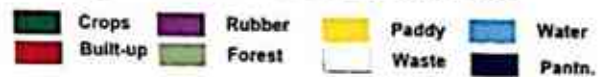


Fig. 13-33 Kannur District, land use



Other aspects

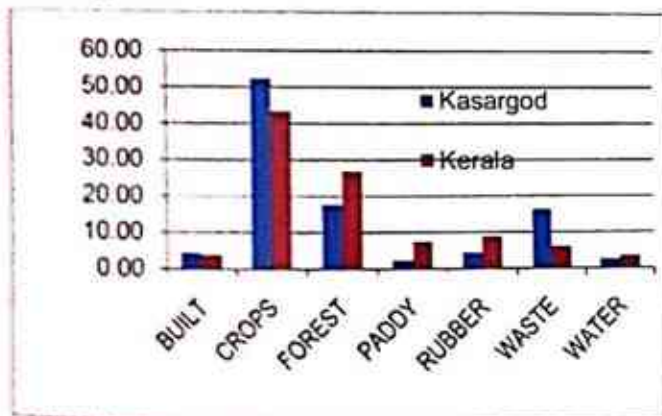


Fig. 13-32 Kasargod District, land use.

In Kannur District, dry land crops top in the land use. It is more than state average also. Forests, paddy and rubber are less than state average. There is more than 15% waste lands, it is higher than state average.

Kannur has been a district with acute drinking water shortage. A Japanese aided water supply scheme has been conceived for supplying water to Pattuvam, Kurumathur, Panniyur, Kuttiyeri, Koovery, Mattul, Kadannappally, Panappuzha, Pariyaram, Ezhome, Kallyasserri, Pappinisserri, Cherukunnu, and Kannapuram villages as well as Taliparamba municipality.

The total capacity envisaged is 90 million litres a day (mld). The source of the project, which estimates 5.29 lakh people in the area as its beneficiaries, is the reservoir of the Pazhassi irrigation project. The other components of the scheme are a treatment plant at Peruvalathparamba at Irikkur, pipelines including pumping main for 11.10 km, transmission line for 82.3 km, and distribution line for 623 km, and 13 reservoirs. The scheme being implemented in four packages. Project engineers say the works of intake and pumping main are almost completed and that the construction of 12 of the 13 reservoirs has been completed. Though there were some snags in the laying of pipes, the work has resumed, they say.

Laying of distribution pipes at Kooveri, Panappuzha, Kadannappally, Pariyaram, Kallyasserri, Pappinisserri, Cherukunnu, Kannapuram, and Mattul is in progress. The work for laying distribution pipes in the remaining areas of Taliparamba, Kurumathur, Panniyur, Kuttiyeri, Ezhome, and Pattuvam has been re-tendered.

In the first phase, distribution pipes will be laid to an extent of 623 km. The pipeline has been already laid for a total length of 166 km, they say. Two mld of water will be supplied to Madayi from the reservoir at Kannon village in Ezhome panchayat though the proposal is not part of the JICA-aided project.

People of Madhav will start getting water from
the system following the partial commissioning of
the project. The demand for water in Athikode
is 10 MGD, Vengalathuram (1) 8 MGD, and
Vengalathuram (2) 4 MGD has also been included in the
work scope of the project once it is fully
commissioned.

The reservoirs as part of the Pattuvam water
supply scheme have been built at Adikumpara,
Kuchichal, Kanjirangad, Koonam, Nadikani,
Madakkadu, Oduvalithattu, Karikkapara,
Karakkundu, Madanthattu, Kallyasser, and
Karakkundu.

KASARGOD DISTRICT

Introduction

Kasargod District is the northern most district of Kerala and is named after Kasargod Town which is the administrative headquarters of the district. More than 60% of the area of the District is dry land cultivation. This includes mixed crop of coconut, plantain, tapioca, etc. Compared to state average, this type of land use is more in Kasargod District. Next comes forest areas, which is less than state average.

lowland, bordering the sea, the midland consisting of the undulating country and the forest, clad highland on the extreme east. There are mainly four types of soils namely, sandy, sandy loam, laterite and hill or forest soil. The sandy and the sandy loam soils exist as a continuous narrow belt all along the Western coast about 20 km in width. Built up areas are higher than state average, wetlands are also less than state average. Like the rest of Kerala, the maximum land use is dry land crops.

Built up area is more than state average, other land uses such as forest, rice cultivation, rubber and wetlands are less than state average. There is considerable waste land in the district formed by laterite mining.



Fig. 14_01-Kasargod District: Topography

There is a continuous mountain range on the eastern side. The district has a coastline of around 29.3 kilometres and a very vast midland. The ghats dominate the topography. The coastline is fringed with low cliffs alternating with stretches of sand. A few kilometres to the interior, the scene changes and transforms into low red laterite hills interspersed with paddy fields and coconut gardens. Based on physical features, the district falls in to three natural divisions. The

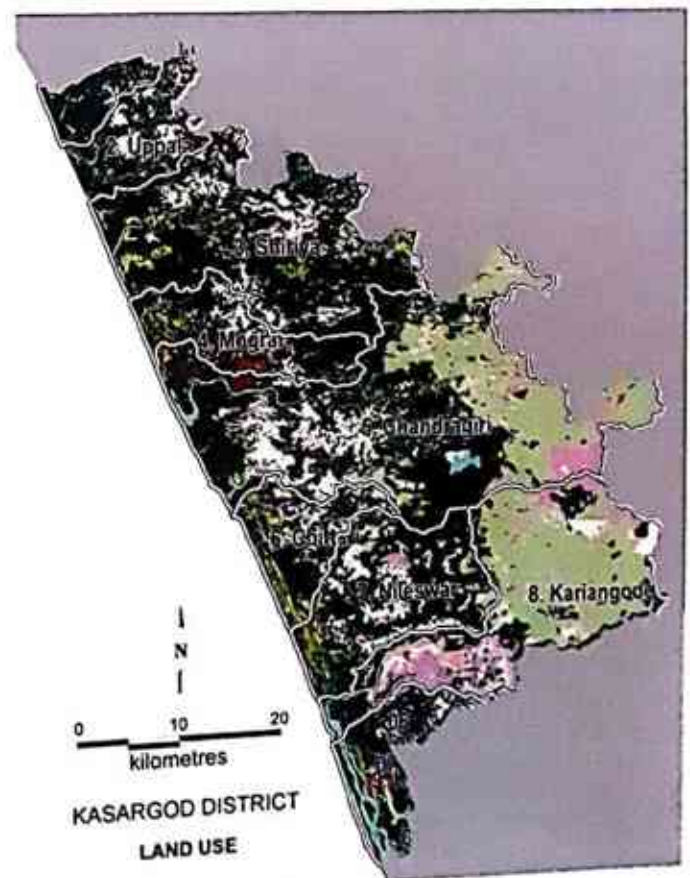


Fig. 14-02 Kasargod District: Land use



RIVER BASINS

There are nine river basins in Kasargod District. They are Manjeswaram, Uppala, Shiriya, Mogral, Chandragiri, Chittari, Neeleswaram, Kariangode and Kavvai.

Manjeswaram basin



Fig. 14_02 Manjeswaram Basin.

Originating from Balepuni hills on the border between Kerala and Karnataka, the Manjeswaram River flows through the villages Vorkadi, Pavuru and Badaje and enters Manjeswaram town. After a 16 km course, this river joins Uppala Kayal. The river has a catchment area of 90 km². The river is seasonal and muddy.

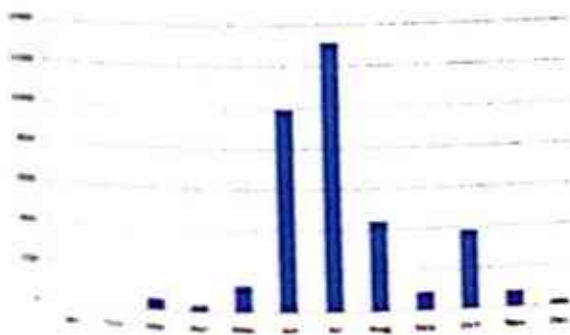


Fig. 14-03 Rain fall in Manjeswaram basin

The basin consists of 8 watersheds, 44MA to 44PH. Kunjatturu thodu is another stream in this basin which empties in to the Uppala kayal. There is a lake in this basin which forms the boundary of Kerala and Karnataka states at Kunjatturu. From the topo-sheets, 4 ponds were identified in this basin. The area of the ponds in this basin ranges from 0.44 ha to 1.16 ha. The largest pond in this

basin has an area of 1.16 ha, remaining three ponds have areas, 0.44, 0.49 and 0.79 ha respectively. One pond is in the Kerala- Karnataka border.

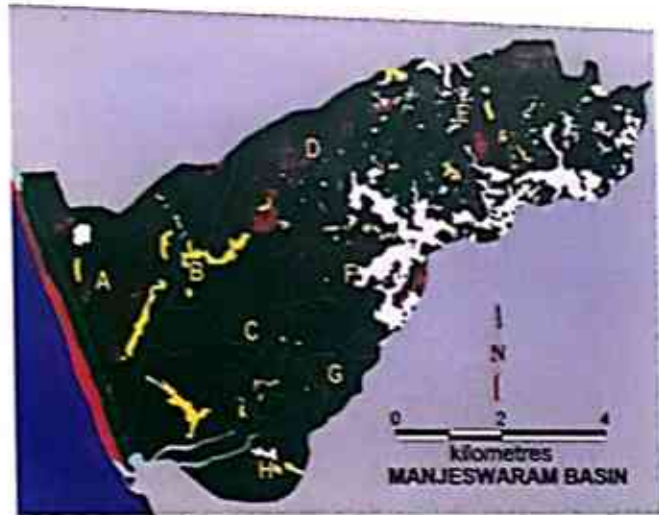


Fig. 14-04 Land use in Manjeswaram basin



River Manjeswar meets the Arabian sea at Manjeswaram estuary between Bengara and Manjeswaram. Once it was a thriving port town and attracted many cultures and people to its beautiful banks. The Arabs, Jains and Konkan Brahmans and Baniyas came and settled in this little cosmopolitan town and made it truly multi-cultural. Many Jain Bastis and temples and old buildings still survive along its old streets. The river mouth is the sight of an ancient dismantled stone temple and is a small fish landing centre now. Land use is mainly mixed dry land cultivation with traces of paddy and built up areas. Hills on the south east part are shown as waste lands.



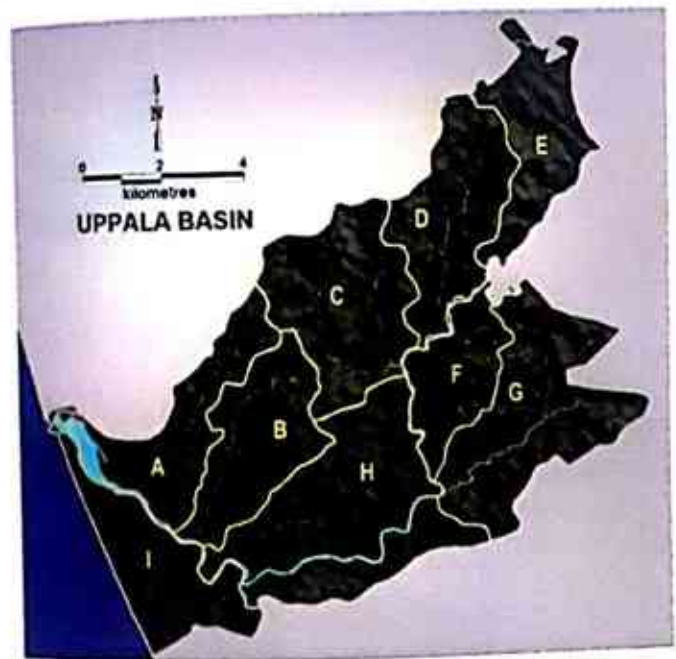
Fig. 14-05 Kunjatturu lake CROP

Manjeswaram River and Uppala River have muddy water in rainy season. Hills come down near the sea. 50 years ago paddy cultivation was

thriving. The hill top, has a temple with a perennial pond.

Uppala Basin

Uppala river is 76 km long. Coastal 3.2 km distance is navigable. Annual yield of water is 309 Mm³. Entire basin falls inside Manjeswaram Block Panchayat. Panchayats falling inside Uppala basin are Meenja fully, Northern portion of Mangalpady and northern portion of Palvalike.



F-06. Uppala River basin

There is no forest in Uppala basin. One reason is that the hills are further away in this region. Uppala River, compared to Manjeswaram River is comparatively larger.



Fig. 14-07 Alla Temple pond

It originates in Karnataka State and is a large river when it enters Kerala. In the northern part of Palvalike Panchayat, a large stream originates and flows south to join Uppala River coming from Karnataka. Uppala River forms the southern

different parts of the Meenja Panchayat drain into Uppala River.



Fig. 14-08 Uppala beach

Topo-sheet shows wet cultivation along rivers and streams. 1:50,000 scale topo-sheets does not show any ponds or tanks. Small streams from north side of Mangalpady drain into Uppala River which is the northern boundary for this Panchayat. The estuary of Uppala River is very broad; there are large islands in it. The railway bridge and road bridge in national high way is in the estuary region. Manjeswaram River also joins the same estuary.



Fig. 14-09 Uppala estuary

KSLUB (2000) divides the basin into 17 water sheds. The basin can be grouped into sub basins 43U/A to 43U/I for description. Each of them contains one or more watersheds. 43U/A is a small unnamed stream originating in Kadambaru areas and joining the Uppala lake. The Aila temple pond in this basin is near the sea and not connected to a major stream. 43U/B is the Madambally Thodu that joins the Uppala River.

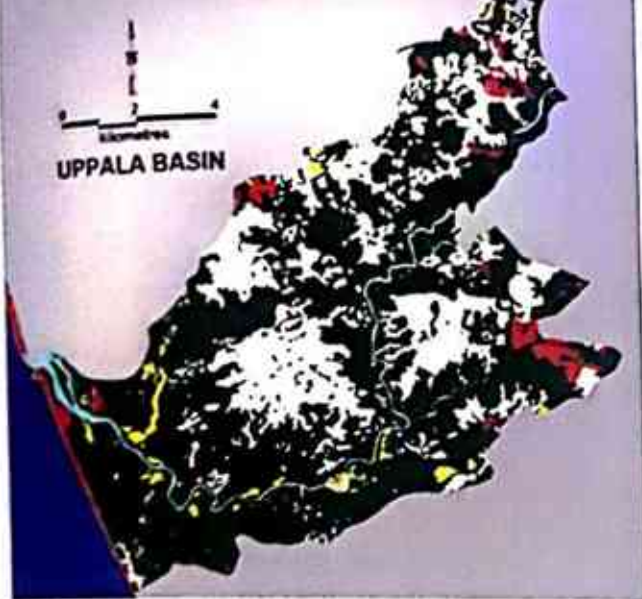


Fig. 14-10 Uppala basin: Land use



There are paddy fields on both sides of these streams. 43U/C to E are streams on the right side of the river. 43U/F are small streams on the left side of the river. 43U/G is Baringala stream which has paddy fields on either side. 43U/H is Kutur Thodu and other streams joining Uppala River on the Right side. 43U/I is small streams flowing to Uppala River on the left side near the lake. Each of these sub basins can be monitored for water quality and for planning sustainable development. Meenja Grama Panchayat is in the Uppala Basin.

Land use is mainly mixed dry land cultivation with traces of paddy and built up areas. Almost all hills on the basin are shown as waste lands.

Shiriya River

Shiriya River is 67 km in length. There are no dams in the river. Place and river names have 'adke' which means areca nut in Kannada, probably indicating extensive areca nut cultivation. Shiriya basin falls almost fully in Manjeswaram Block. There is no forest inside this basin. Shiriya River has two branches, both originate in Karnataka. Panchayats in the basin are Enmakaje, Palavalike, Puthige, Mangal Pady, Kumbadje, Belloor, and Kumbla.

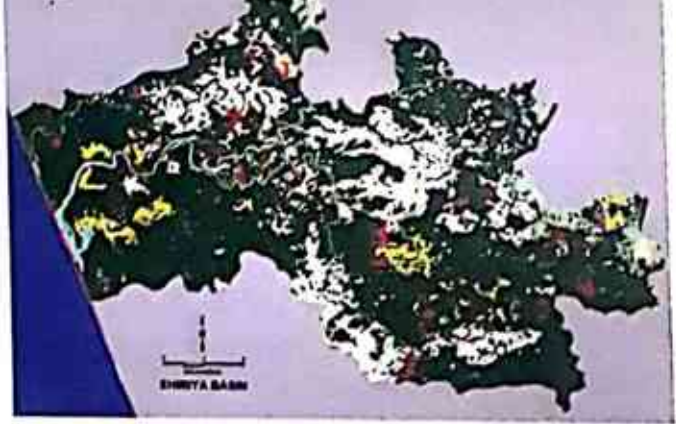
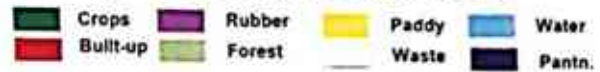


Fig. 14-11 Shiriya basin: Land use



Entadka Hole is a large river as it enters Kerala. Another stream which also originates in Karnataka flows northwards and joins Entadka Hole (first branch). Sante Thodu flowing south joins the main river. Further down, the Venmakaje Thodu joins the main river (Enmakaje Panchayat). The second branch of Shiriya River originates in Karnataka, pass through Badiadka Panchayat and flow through Enmakaje Panchayat to join the first branch in Puthige Panchayat. There are numerous other streams as well. As per topo, wetland cultivation is very limited along these streams. Paiavalike Panchayat is on the right side of the first branch.



Fig. 14-12 Shiriya estuary

Belloor, Magalpady and Kumbadje panchayats fall in the Shiriya basin. Pattadka Hole flow through Puthige Panchayat and join the first arm at its western edge. Few seasonal streams also join the river here. Kumbla Panchayat is on the left side of Shiriya River. There is a seasonal steam flowing through the middle of this panchayat which join a lake and then Shiriya estuary.

Shiriyā is a large basin with 42 KSLUB (2000) watersheds. We have grouped the basin into 12 sub basins. 42S/A is Kaiyaru Thodu on the northern side which joins the sea directly through a small lake. There are paddy fields on either side of it.



Fig. 14-13 Mujungavu temple pond

42S/L is streams on the southern edge that join the lake. Map shows paddy fields in this sub basin. Mangalpady Panchayat is in this area. Hundreds of devotees take holy dip in the temple pond at Mujungavu on festival day. Shiriyā River branches into two after about 10 kms from the lake. Most of this region is navigable. Paivalige and Kumbala Panchayats come in this area.

Sub watersheds 42S/B is on the right side of the river and 42S/K on the left side. Paddy fields are on the decrease as per recent land use map. Kumbala and Puthige panchayats come in this area. Of the two branches, the southern branch is called Adkostala Hole. Sub basins 42S/C, D and E cover the northern branch of the Shiriyā River. There are non wooded waste lands in this area, paddy cultivation is rare, the basin continues into adjoining Karnaka State. Enmakaje is the Gramapanchayat in this area. Adkostala Hole occupies the rest of the basin.

Sub basins 42S/FGHI and J cover this area. The river branches into 7 tributaries and occupies the valleys between the ridges. Main land use in these sub basins are dry land cultivation and waste lands. Grama Panchayats Belloor, Kumbadje, Karadka and Badiadka come in this area.

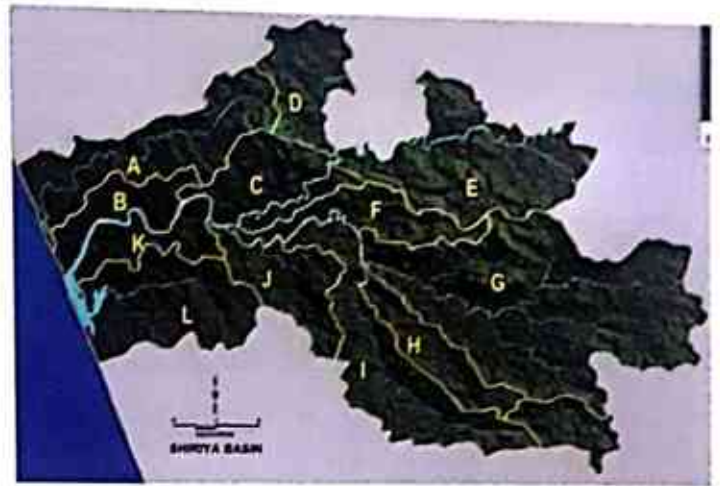


Fig. 14-14 Shiriyā Basin

Mogral River

Mogral River is 34 km in length. Mogral basin falls in two blocks, Manjeswaram and Kasargod. There is no forest inside the basin. Only small parts of Badiadke and Puthige panchayats fall in this basin. The western portion is drained by streams draining to Mogral River. Part of Puthige Panchayat falling inside the basin is drained by streams leading to Mogral River.



Fig. 14-15 Ananhpura temple

Northern parts of Karadka Panchayat are drained by stream leading to Shiriyā River. Southern parts are drained by a stream leading to Mogral River. Mulliyar Panchayat falls in two basins, northern half in Mogral basin and southern half in Payaswini basin. Same is the case with Chengala Panchayat. Similarly Madhur Panchayat falls in Mogral and Payaswinini basins. Most of Mogral Puthur Panchayat drains to Mogral River.

Chandragiri River



Fig. 14-18 Chandragiri Estuary



Fig. 14-19 Chandragiri River

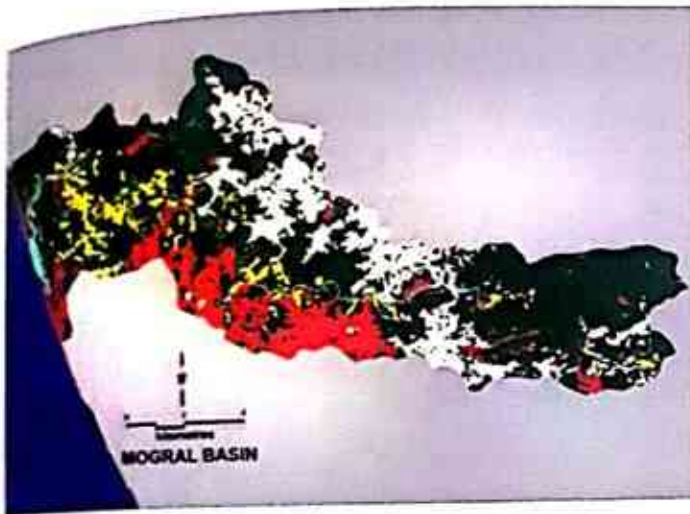


Fig. 14-16 Mogral River basin: Land use



Mogral is a river of the plains and the land use is mainly dry land cultivation. There is much built-up area along the southern edge and waste lands along the northern edge. There are no tributaries and small streams from valleys on either side join the river.

KSLUB (2000) divides the basin into 18 watersheds. Description of these, grouped into six sub basins follow. Sub basin 41M/A is mostly dry land crop area. Sub basins B and C have dry land crop area and waste lands on the hill slopes. Sub basin D, though hilly in nature, is dry land crop area. Sub basin E is almost fully built-up area; sub basin has built-up area, dry land crops and paddy fields.

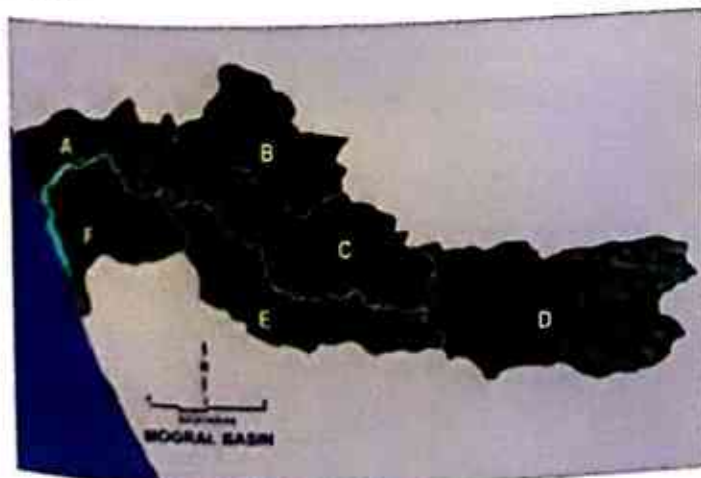


Fig. 14-17 Mogral River basin



Fig. 14-20 Chandragiri River basin

The total length of Chandragiri River is 105 km. It originates from the forested ghat region. This basin falls in two blocks, Kasargod and Kanhangad. Panchayats in Kasargod block are Karadka, Delampady, Bedadka, Chemmanad and Kasargod Municipality. Panchayats in Kanhangad Block are Panathady, Kallar, Kodom Belur, Pullur Periya and Udumbannur. The basin also falls in two forest ranges, Kasargod and Kanhangad. Chandragiri River has two main branches; the northern branch

Chandragiri.

KSLUB (2000) divides the basin into 50 watersheds. We group them into 12 sub basins. Chandragiri River branches into two main branches, after about 10 km from the sea, the northern branch is called Payaswini and the southern branch Chandragiri. Sub basin 40C/A is coastal area with built-up areas and dry land crops as land use. Kasargod Municipality is in this sub basin. This sub basin is drained by the stream Kasargod Hole, which joins the lake directly.

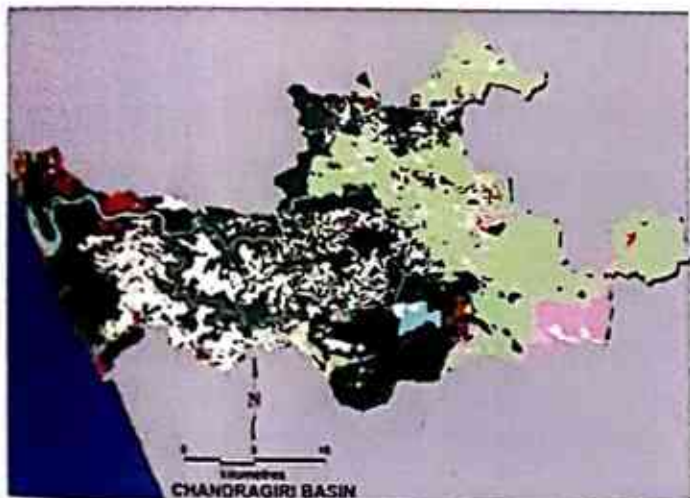


Fig. 14-21 Chandragiri Estuary



Land use is similar in 40C/B, situated on right side of the river. Panchayats Chemmanad and Chengala cover this area. Sub basin 40C/C is on either side of the northern branch of Payaswini River with land use of dry land crops and small amount of non wooded regions. Muliar is the panchayat in this region. Sub basins D and E are the forested hilly areas where the river originates. Panchayats Karadka, Delampady and Kutikkol cover this area. Sub basin F and G are terminal portion of Chandragiri River, the region is forested and falls in the Panathady Panchayat. Sub region H is down stream of this with land use of forest and dry land cultivation. This sub basin falls in Kallar Panchayat. Sub basin I and J are further downstream; the land use is shown predominantly as non wooded waste lands. Area falls in Bedadka Panchayat.

Chittari River



Fig. 14-22 Chittari estuary

Chittari River has a length of 25 km and a basin area of 97 km². It is made of streams Kalnad, Bekal and Chittari. Chittari basin is fully inside Kanhangad Block. Range wise, the basin falls in Kanhangad forest range. Following panchayats come in it fully or partially.

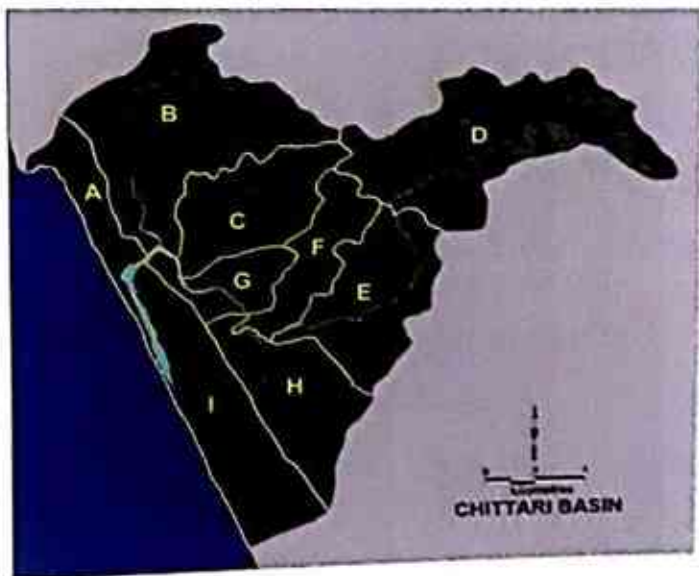


Fig. 14-23 Chittari River

Pullur Periya is a large panchayat. The southern boundary of panchayat and basin coincide. Northern portions are drained by Chandragiri River. Southern parts are drained by Chittari. Pallikare Panchayat is drained by a stream in the northern side of Chittari River. A small belt on the northern side does not fall in the Chittari basin; it is drained by a small stream draining directly to the sea.



Fig. 14-24 Bekal fort @Kasergod.nic.in

Ajanur Panchayat is drained by two streams of Chittari River. Kanhangad MCP: A small northern portion falls inside this basin. Out of this, the eastern portion is drained by one stream of Chittari River, the western portion by a stream leading directly to the sea. The small stream Kalnad rises from Chettiarchal hillocks at an elevation of 91m. Kalnad stream is 8 km. long and joins Kalnad backwaters at 12 km upstream of its outlet to sea. The extent of the basin is 16 km².

down to form a backwater before emptying into Arabian Sea. The river is tidal for about 6km from the mouth. Kottikkulam is a small backwater in this basin with a small stream. This back water has an area of 4.5 hectares.

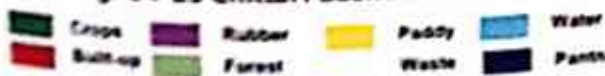


Fig. 14-26 Chittari River

The Chittari basin is divided into 10 sub basins (from 15 water sheds of KSLUB (2000)). Topo does not show any ponds in this basin. The basin consists of dry land crops and waste lands on the eastern side and dry land crops, paddy fields and built-up areas on the western side.



Fig. 14-25 Chittari Basin: Land use



The Bekal River is formed by the joining together of two small streams originating from Kaniyadka and Maladka respectively. Though the river rises at an elevation of 75m, it abruptly drops to 15m in the course of about 3km. The Chittari is formed by a number of rivulets originating from Cherambe, Tayamkulam and Pullur which flow

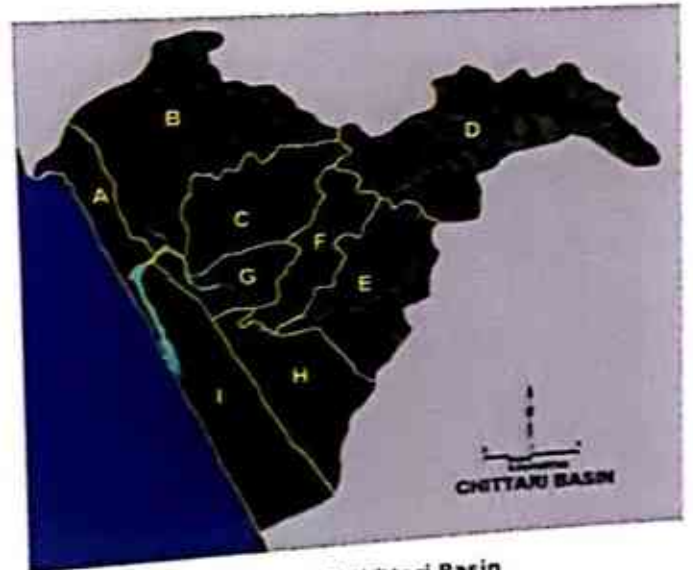


Fig. 14-27 Chittari Basin

Neeleswaram River

The river originates from Kinalur in Hosdurg taluk and it is known as Pallichal Thodu in its initial reaches. Its main tributaries Aryangal Thodu and Balgote Hole join the main river 8 km. downstream of its origin. Other streams which nurture the Neeleswaram River are Anapadi chal, Channakutta chal, Kumbalpalli chal, Valapadi chal, Kelutha chal and Kizhakkamkot chal. It joins the Karingode

river towards its mouth at Kottappuram to the south-west of Nileswaram town. The length of the river is 46 km and a basin area of 190 km².



Fig. 14-28 Neeleswaram River

This basin falls mainly in Kanhangad Block. Southern strip falls in Nileswaram Block. This basin falls in Kanhangad Forest Range. Kodom Belur Panchayat: Northern parts are drained by streams of Chittari. Southern parts are drained by a small stream. Madikai Panchayat is drained by streams of Neeleswaram River. Kanhangad Municipality is drained by Nileswaram River.

The Nileswaram river basin has 11 sub basins. Topo sheet shows a small fresh water lake in this basin namely Thirthamkara, which has an area nearly 4.5ha. This sub basin comes inside Kanhangad MCP. Pallikere, Pullur-Periya dn Ajanur are the Panchayats.



Fig. 14-29 Thirthamkara fresh water pond

Neeleswaram River is 46 km long. Twenty one watersheds of KSLUB (2000) are grouped into 9 sub basins. The river is made of 5 tributaries,

draining hills and valleys on the northern side. Sub basin 38N/A and B are drained by Baigole Hole. Land use here is mixed crops, waste land and paddy cultivation. Panchayat is Madikai. Sub basin 38N/C is a seasonal stream coming from Mindore and Kanjirapoyil areas. There is dry land crops in the valleys, hills on either side are waste land. Madikai Grama Panchayat covers this area. Sub basins D, E and F are streams flowing south from parallel valleys and hills. Valleys have dry land crops and hills have waste lands. There is a patch of rubber cultivation in sub basin D.

Sub basin G is the main river flowing from east to west along a deep valley with mixed crops. Hills on either side have mostly waste lands. Area falls mostly in Kinnaoor -Karinthalam Panchayat. Sub basin H and I are either side of the main river before it joins the sea via Kavvai lake. Land use is mixed crops, paddy fields and built-up areas. Fresh water body Theerthankara pond of 4.5 ha is in Padanakkad Kerala Agricultural College campus. This pond drains into the Neeleswaram River. Kanhangad Municipality and Neeleswaram Panchayat come in this area.

The river has its origin in Padinalkkadu hills in Coorg District in Karnataka. It flows down the steep slopes of the Western Ghats in the initial reaches until the bed level falls to 460m within a distance of 8 km. Its two main tributaries, the Mundroe and the Pandimala hole join at a level of 250m. Another tributary, the Mundroth hole joins the main river at Pullingom at a bed level elevation of 36m. Almost all the main streams in Karingode system flow in a south-westerly direction. After the confluence with the Nileswaram River, the channel gets split into several distributaries before falling into the sea near Thuruthi. The common estuary of the Karingode River and Nileswaram River extend southwards parallel to the coast forming a long stretch of Kavvayi kayal.



Fig. 14-29 Neeleswaram Basin: Land use



Kariangode River

The Kariangode River has a length of 64 km with a catchment area of 561 km². About 132 km² of its catchment lie within Karnataka. This basin falls in Nileswaram Block. Forest Range is Kanhangad.



Fig. 14-29 Kariangode River at Cheruvathoor From Mdakkara bridge

Balal Panchayat is drained by the terminal streams of Karingote River. East Eleri Panchayat is drained by Karingote River. West Eleri Panchayat is drained by Karingote River. This Panchayat contains a small piece of forest as per topo-sheet, Eleri RF. Cherupuzha Panchayat is also drained by streams of Karingote River. There is a water divide in the Panchayat, the southern parts flowing to Kuppam River. Peringom Vayakkara Panchayat: The northern portion flow to Kariangode River. Kayyur Cheemeni Panchayat: Streams flow to Kariangode River. Streams of southern part flow to Kavvayi

river. Cheruvathur Panchayat: streams flow to Kariangode River.

Many streams flow from north and south namely Yenichal, Mulaprapoyilchal (Thirumenchal), Perambatte chal, Malothipuzha and Napechal to the main river at various points. It branches into many small tributaries before it enters into the sea nearby Thuruthi. The common estuary of Kavvayi and Peruvemba rivers open to the sea.

The Kariangode River basin is divided in to eight sub basins. Topo does not show any ponds in this basin. Kariangode River is five streams flowing down from hills on the eastern side. Main river is about 10 km in length joins the Kavvai lake. KSLUB (2000) divides the basin into 44 water sheds. We have grouped the watershed into 14 sub basins for systematic description. Sub basin 37K/A is the right side of the river before it joins the Kavvai Lake. Land use here is dry land crops, small amounts of paddy fields and built-up areas. Area falls mostly in Neeleswaram and Kinnanoor-Karinthalam panchayats. There is baxite mining in this basin.

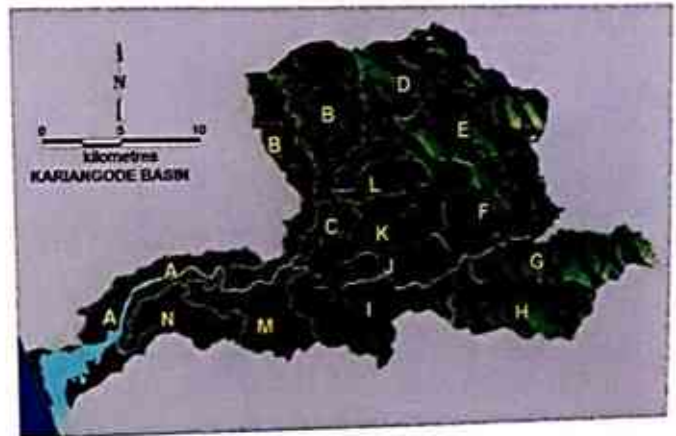


Fig. 14-30 Kariangode River. Sub basins 37K/A to N

Sub basins 37K/M and N are the left side of the river, falling in Cheruvathoor and Kayyur-Cheemeni panchayats. Surprisingly the main land use here is rubber cultivation. Land use in sub basin B, C, D, E, F, J and K, tributaries of Kariangote River is mainly forests and small amounts of rubber cultivation. Tributary at sub basin C, D and E are called Malothi Puzha. These areas fall in Balal, East Eleri, West Eleri and Cherupuzha Panchayats.

Sub basins H and I are on the left side of the main river and the land use in 37K/H is mainly dry land crops (Cherupuzha Panchayat) and 37K/I (Peringom-Vayakkara Panchayat) is mainly waste

lands. Sub basin 37K/J on the other hand is on the right side of the river and main land use is forest. Sub basins 37K/K and L are in East and West Eleri Panchayats, land use is mainly forest. Sub basin 37K/K is on a separate tributary called Perupatte Chal. It joins the main river downstream. 37K/L is the downstream areas of Malothi Puzha.

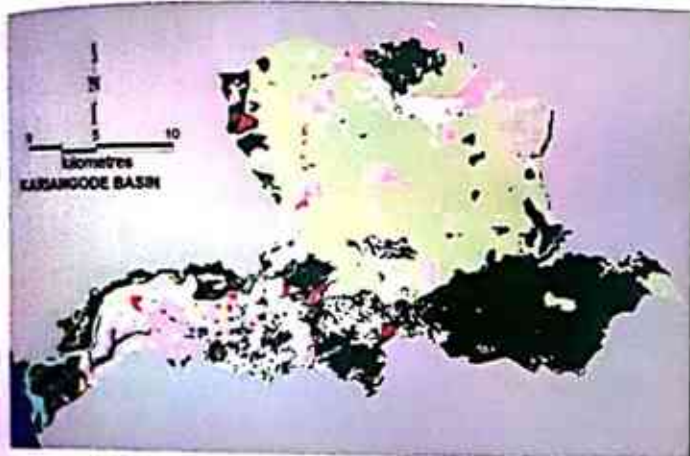
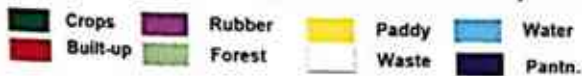


Fig. 14-31 Kariangode River. Sub basins 37K/A to N



Kavvai River

This is a small river which originates in Cheemeni village and flows past Alpadampa and Vadasserri before emptying in to the Kavvayi kayal at Udamanthal. It has a length of 31 km and a catchment area of 143 km². Maniyat thodu and Banati chal are the streams which join this river.



Fig. 14-32 Ramankulam

The Kavvayi kayal extends parallel to the coast for a distance of 21 km with outlets at the mouth of Kariangode and Ezhimala Rivers. Three other rivers Peruvemba, Kavvayi and Ramapuram also drain in to the lake. There are few islets (thuruths) in this kayal, the major ones being Madakkal, Yedalakkad and Vadakkekad. To the south, this kayal is connected to Pazhayangadi-Valapattanam Rivers by

Sultan's canal. There were Mangrove patches in Kavvayi kayal. Topo shows one pond of 0.79 ha area in this basin.



Fig. 14-32 Kavvai River 36K/A to G

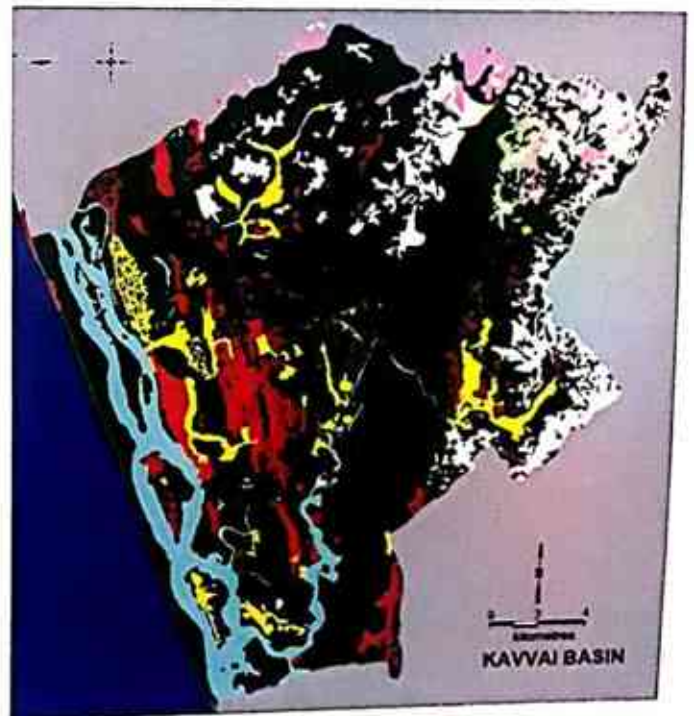


Fig. 14-33 Kavvai River 36K/A to G



Blocks Nileswarm, Payyannur Municipality and Payyannur. Forest ranges are Kanhangad and Thalipparamba. Streams from Kangol Alappadampa Panchayat flow to Kavvayi basin. Pilicode, Padne, Thrikakripur panchayats: Streams flow to Kavvayi basin. Valiya Paramba is a coastal Panchayat. Payyannur Municipality: Northern parts fall in

Kavvayi. Karivellur Peralam Panchayat also drains to Kavvayi basin.

Kavvai basin consists of 5 small streams. Land use is mainly mixed crops. There are waste lands in eastern hilly regions and paddy fields and built-up areas on the western area. Localities Vellur, Payyannur are in this basin.

WATER BODIES IN BLOCKS AND PANCHAYATS



Fig. 14-34 Kasargod District: Blocks

Manjeswaram basin falls inside the Manjeswaram Block. The western portion falls in Manjeswaram Panchayat and eastern portions fall in Vorkady Panchayat. Fifty years ago, Manjeswaram - Vorkady areas are described as one of the most backward areas in Kerala. Railway line was the main means of access at that time which extended up to Mangalore. Unlike other dry land areas of Kerala, Tapioca cultivation was not popular here. Only the valleys were cultivated, with coconut, areca nut and paddy. Plantations of *Casuarina* and cashew reported. NREDB (2000) land use shows waste lands in the eastern hilly regions. There are many temples in the coastal area, which were damaged repeatedly before the British period. A type of feudal system is described with most of the land being in the hands of Brahmin families.

Language spoken is Tulu, a mixture of Malayalam and Kannada. There are four Panchayat blocks and 36 panchayats and two municipalities in the district.

Manjeswaram Block



Fig. 14-35 Manjeswaram Block: Panchayats

There are 11 grama panchayats in Manjeswaram Block. Land use wise, dry crops are in 67% of the area, bare lands 15%, plantations 7% and built-up areas 3.5% (NREDB(2008)). Forests occupy about 4% of the area; water bodies and paddy fields constitute 4.35%. Enmakaje Panchayat in this block was severely damaged by over use of pesticide Endosulphan. Notable localities are Manjeswaram, Uppala and Kumbala on the coast.

Water bodies: Manjeswaram River is the northern most river. Uppala river is south of this. Kaiyaru Thodu is a small stream flowing east to west direction. Southern portions are drained by Shiriya River. Manja nadi, a stream from paddy fields in Karnataka enter this block before ending in the sea.

Panchayat	Water sheds	WB ody %	Pad dy %	To po	NRE DB	Pan-fish	Panc-hayat
Badia dka	42S/B IGH	0.0 3	3.6 6		1	1	6
Bel-loor	42S/G	0.0 4	2.9 8	1	3	2	
En-makaje	42S/E FG	0.7 9	0.2 8		7	1	
Karad ka	40C/D	0.0 6	1.0 3		3	2	2

Panchayat	Water sheds	WB ody %	Pad dy %	To po	NRE DB	Pan-fish	Panc-hayat
Kumbala	42S/K L	0.0 2	12. 91	3	2	1	20
Kumbadje	42S/G	0.0 1	3.7 9		2	2	
Mangal-pady	42S/B	11. 67	3.4			2	15
Man-jesh-wara m	44M/ ABC	11. 30	5.3 9	2			16
Meenja	43U/A BCDEF H	0.0	1.8 2			2	10
Paiv-alike	42S/A DC	0.1 4	0.9 2		4	1	3
Puthige	42S/J, 43U/C	0.0 3	1.1 2	2	2	2	43
Vorkady	44M/ DEF	0.4 1	2.9 5	1		3	23

Mangalpady Grama Panchayat has the Kaiyaru Thodu flowing through the middle and Uppala River as the northern boundary and has Shiriya River as the southern boundary. Large tracts of non wooded areas are seen in satellite image. Both railway line and national highway pass through the panchayat. Sandy beach is quite wide and small boats can be seen on the beach.

lake. Water bodies including paddy fields consist about 4.35 % of the total area only. In the case of tanks and ponds different sources of data is examined. Survey of India topo sheets of 1:50,000 scale show 9 ponds (1.51 ha Enmakaje Panchayat, 3 ponds of 0.3 to 0.5 ha in Kumbala Panchayat, 2 ponds of about 0.5 ha each in Manjeswaram Panchayat, a pond of 0.5 ha and 4.72 ha in Puthige Panchayat, a pond of 1.16 ha in Vorkady Panchayat).

NREDB (2008) lists 22 ponds ranging in area from 0.2 to 2.2 ha in 8 panchayats. This data is based on visual interpretation of 23m satellite images. Panfish (1992) lists 17 ponds ranging in area between 0.2 ha to 2.1 ha. The resource plans or websites of individual panchayats report a much higher number of ponds. Badiadka Panchayat (6), Manje-shwaram (16), Kumbala (20), Mangalpady (15), Meenja (10), Paivallike (3), Puthige (43) and Vorkady (23).

Kasargod Block

There are 9 grama panchayats and Kasargod Municipality coming under this heading. Total area is 411 km². Major land use is plantations (27%), Dry land crops (23%), forest (21%), bare land (19%) and built-up areas (5.6%). Water bodies and paddy fields occupy 2.25% of the block area (NREDB, 2008). There is not much of rubber cultivation, coastal areas have coconut plantations.

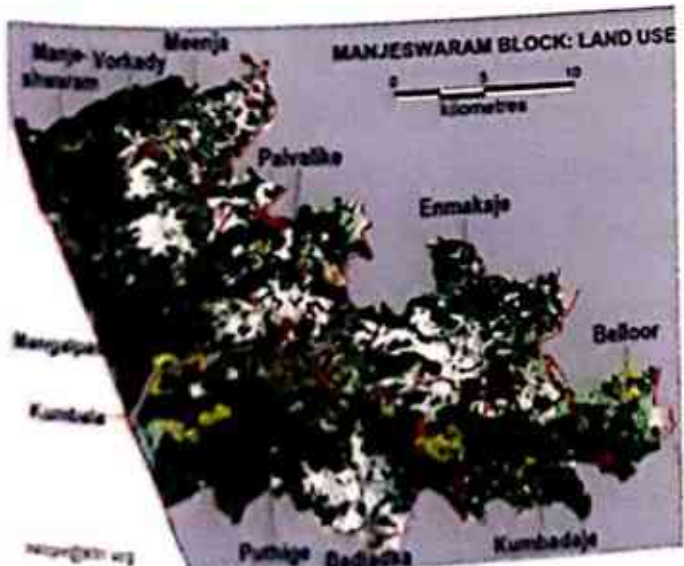


Fig. 14-36 Block: Land use

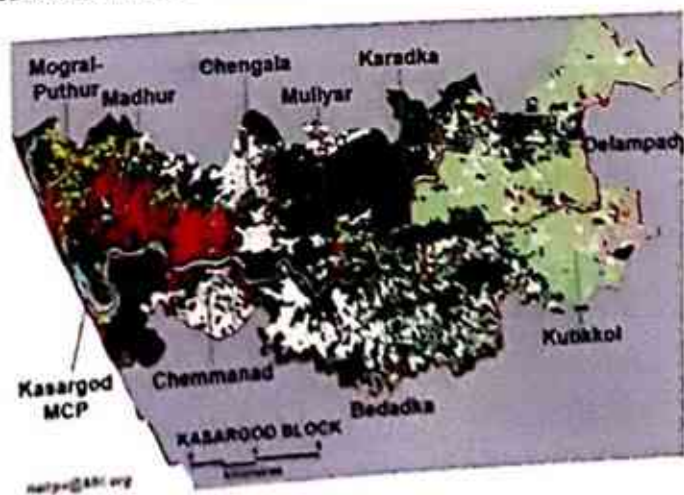


Fig. 14-37 Block: Land use



Water bodies consist of rivers, lakes, ponds and Paddy fields. The block is drained by three rivers, Manjeswaram, Uppala and Shiriya. Rivers enter the

Notable locations are Mogral and Kasargod on the coast. Kasargod region is the main market for agricultural produce and has been converted to

Municipality. At about 10 km from the coast, Chandragiri River divides into two branches. The upper branch is called as Payaswini River. Kasargod has acute drinking water shortage. National Coconut Research Institute was at Kasargod. Bekal fort is on the coast.

Karadka Panchayat has a dumbbell shape, with distinct eastern and western parts. There is a seasonal stream in the eastern portion, which drains into the Payaswini River. The stream in the western portion drains into Shiriya River. Delampady Panchayat is on the left bank of River Payaswini. The river originates in Karnataka, and is already a large river when it enters the Panchayat. Aduru reserve forest is in this panchayat.

Kutikol Panchayat is situated between the two rivers. A road in the middle runs along the water divide. Beddadka Panchayat is situated between the two rivers. A road in the middle runs along the water divide. Chemmanad Panchayat is on the left side, after joining of the two arms of the Shiriya River. There is another short stream in the Panchayat, which joins the sea through an estuary. Railway line and main road pass through this panchayat. Kasargod Municipality is literally inside a fold of the Chandragiri River, for which the river forms the southern boundary.

Panchayat	Watersheds	WBod y%	Paddy %	Topo	NREDB	Panfish	Panchayat
Beddadka	40C /CI	0.00	0.11		1	4	12
Chemmanad	40C /kl	0.82	0.62		2	4	15
Chengala	41M /CE	0.02	3.68		1	1	27
Delampady	40C /DE	0.59	0.99		5		184
Kasargod MCP	40C /AB						1
Kutikol	40C /EF	0.28	0.19		1		20
Madhur	40C /BC E	0.01	4.18	2	1	2	17
Mogral Puthur	41M /F	8.00	14.25		1	2	4
Muliyar	41M /D, 40C /C	0.05	1.09		5	2	9

Status of ponds in Kasargod Block from different sources is given below. Mogral- Puthur and Madhur has considerable amount of water bodies and paddy fields. NREDB (2008), Panfish (1992) and panchayat resource plans report ponds in all the panchayats.

Kanhangad block

This block is also situated in a east-west direction. Chandragiri River forms the northern boundary and short rivers of Mogral and Chittari on the western side. There are nine grama panchayats and Kanhangad Municipality under this heading. Panathady Panchayat has a tongue of land projecting into Karnataka.



Fig. 14-38 Kanjangad Block: Panchayats

The Panchayat is drained by the second arm, Chandragiri River. Panathady reserve forest is in this panchayat. Water divide is the southern boundary of the panchayat. Kallar Panchayat is mostly on the left side of the river. Two streams flowing north wards drain the Panchayat. Water divide is the southern boundary of the panchayat. There is a small patch of forest in this panchayat.

Kodom Belur is a large panchayat, the northern part of which falls in Chandragiri Basin. Pullur Periya also is a large panchayat, the northern part of which falls in Chandragiri Basin. Udumbannur Panchayat is remarkable in that it is drained by a stream that flows directly to the sea. There is an estuary, the railway line pass through a bridge on this. Coastal Ajanur and Pallikere panchayats have considerable amount of water bodies and paddy fields. Topo-sheets, NREDB (2008), Panfish (1992) and panchayat development plans show several ponds in the panchayats.

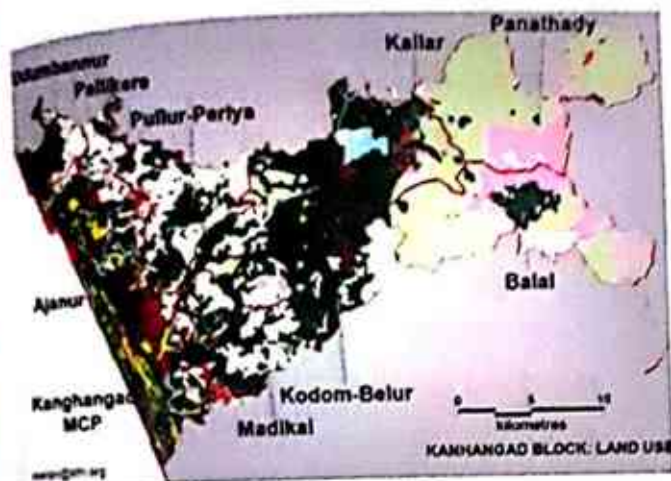


Fig. 14-39 Block: Land use



There are 8 grama panchayats and Kanhangad Municipality under this heading. Chandragiri River forms the northern boundary.

Panchayat	Water sheds	WBod y%	Paddy y%	To po	NR ED B	Pa nfi sh	Panc h
Ajanur	39C/C GFHI	4.68	12.1 7		2	3	10
Balal	37K/B DE	0.00	0.08			4	5
Kallar	40C/H	1.01	0.79				
Kodom _Belur	38N/C DEF,4 OC/I	0.00	1.50			1	11
Madikal	38N/B CG	0.04	2.31	4	2	7	
Pallik- kere	39C/A B	9.92	4.78	1		1	13
Pana- thady	40C/G	0.02	0.06			3	5
Pul- lur_Per iya	39C/D EF	0.07	11.1 5		6	1	1
Udum- bannur	40C/K	0.89	1.70		1	2	29
Kan- hangad MCP	38N/A I			2	8		

There are a few west flowing streams near the coast. Crops include coconut and areca nut. With migration from southern Kerala, tapioca cultivation became prevalent about 50 years ago. Tobacco is cultivated as a second or third crop in paddy fields. A Tobacco Research Centre is also reported. Main localities are Kasargod, Bekal and Hosdurg. NREDB (2008) reports dry land crops (29%), Forest

(20%), Bare land (21%), plantations (15%), Rubber (7%) and water bodies and paddy fields (2.2%).

Neeleswaram Block

There are 10 grama Panchayats in Neeleswaram Block. The block is situated on either side of the Kariangode River. There is an extension of the lake on the west side. As per NREDB (2008), Neeleswaram has forest (28%), dry land crops (23%), Plantations (14%), Rubber (12%), built-up areas (4.4)% and water bodies and paddy fields (8%).



Fig. 14-39 Block: Neeleswaram

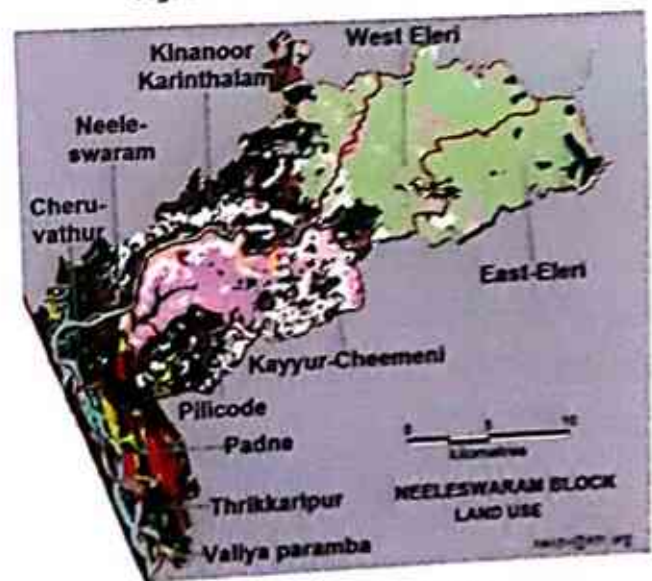


Fig. 14-40 Block: Land use



Thali temple and pond is situated near Neeleswaram. Cheruvathoor and Padanna are well known localities. Cheruvathur railway pond is notable. Panchayats on the western side, Neeleswaram, Padanna, Neeleswaram and Thirankipur have large amounts of water bodies and paddy fields.

Neeleswaram Panchayat has the maximum area of water bodies. Paddy fields are maximum in Padanna and Pilicode panchayats.

Ponds and water bodies

Panchayat	WBody %	Paddy %	To po	NRE DB	Pa nfi sh	Pancha yat
Cheruvathur	0.14	2.82		5	3	1
East Eleri	0.71	0.00			1	9
Kayyur, Cheruvathur	0.01	1.73		2	3	12
Kinnaroo Karinthalam	0.11	0.95			2	10
Neeleswaram	31.81	1.03		6	3	18
Padanna	0.20	23.65	1	8	4	33
Pilicode	0.04	16.44		2	3	53
Thirankipur	1.59	2.51		2	4	22
Valliyapattam	0.37	4.83		3	3	salt
West Eleri	1.09	0.03			1	-

Other aspects

Dry land crops constitute the maximum land use in Kasargod district. This is above state average.

This is followed by forest, which is below state average. Paddy is below state average. So also rubber. The district has large amount of laterite waste lands.

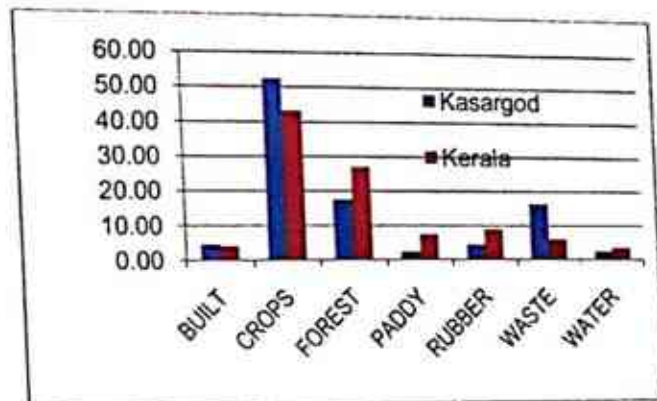


Fig. 14-41 Kasargod District, land use.

Kasargod is a district with many peculiarities. Communication facilities by way of road and rail were rather limited and the region is well connected. Difficulty in raising paddy crops economically has forced trying other land uses. Extensive cashew, areca nut and rubber plantations exist. Overuse of pesticide in cashew plantation has created many issues. Bauxite mining is described as having not much environmental impact.



Fig 14-42 Kasargod Panchayats

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