

## GENERAL INFORMATION

Wayanad District came into existence on 1<sup>st</sup> November, 1980 as the 12<sup>th</sup> District of Kerala consisting of Mananthavady, Sulthanbathery and Vythiri Taluks. The name Wayanad is derived from “Vayal Nadu” which means the land of paddy fields. It is a picturesque plateau situated at a height between 700 meters and 2100 meters above the mean sea level nested among the mountains of the Western Ghats on the Eastern portion of North Kerala and on the sides of Tamil Nadu and Karnataka States. The District was carved out from the then Kozhikode and Kannur Districts. About 885.92.sq.km of area is under forest. The culture of Wayanad is mainly tribal oriented. Though considered as backward, this District is perhaps one of the biggest foreign exchange earners of the State, with its production of cash crops like pepper, cardamom, coffee, tea, spices and other condiments.

The district stands 1<sup>st</sup> in pepper cultivation and coffee plantation in the state. It has no railway line and no sea coast. The total area of the district is 2131 sq.km i.e., 5.48 km percent of the total geographical area of the State.

There is only one Revenue division named Mananthavady in the district. It consists of 3 Taluks and 49 Revenue villages. Kalpetta Municipality is the only statutory town in the district. The district has 4 development blocks viz, (1) Mananthavady (2) Kalpetta (3) Sulthanbathery, and (4) Panamaram comprising of 25 panchayats.

Wayanad consist of 2 Sub Micro regions viz, (1) Wayanad Forested Hills and (2) Wayanad plateau. It lies between the north latitudes 11° 27' and 11°58'35" and the east longitudes' 75°47'50" and 76°26'35". The district is bounded on the north by Kodagu District of Karnataka State on the east by Mysore district of Karnataka State and Nilagiri District of Tamil Nadu, on the west by Quilandy and Vadakara Taluks of Kozhikode District and Thalasseri Taluk of Kannur District. The total area of the district is 2131 sq.km i.e., 5.48 percent of total geographical area of the State. The urban area is only 40.74 sq .km. Wayanad District rank's the 12<sup>th</sup> among the Districts in area.

Wayanad offers a panorama of undulating hills and dales. The Vavumala (Camel Hill or Camel's Hump) is the highest peak (2339 m) in the district. Other mountain Peaks which deserve special mention are the Vellarimala (2245m), the Banasuramala (2061m), the Elambilerimala (1839 m), the Brahmagirimala (1608 m), the Kunelippandimala (1607m), the Thariotemala (1553 m) and Muthumala (1374m). The Periya Ghat is an important pass into the Wayanad plateau.

Edakkal caves, Pakshipathalam (endowed with various birds and wild animals), Pookottu Lake (fresh water), and Banasurasagar Dam are in Wayanad District.

The main river of the district is Kabani river, one of the East flowing rivers of Kerala. The three tributaries of Kabani river are Panamaram, Mananthavady and Thirunelli. The total drainage area of the Kabani river in the district is 1974 sq.km. The other important rivers are Mahe and the Chaliyar. The Mahe river or Mayyazhipuzha originates from the western slopes of the dense forests of Mananthavady taluk. The Chaliyar or Beypore river originates from the Elembileri Hills of Sulthanbathery Taluk.

## **HISTORY**

Wayanad has a history dating back to at least 10 centuries before Christ. Historians are of view that human life existed in these parts around that time. The early history of the District is obscure. Some evidences about the New Stone Age Civilization can be seen on the Hills of Wayanad. The pictorial writings and painted pictures on the walls of Edakkal Caves, which is a cleft about 96 feet long and 22 feet wide, located on Ambukuthi Mountains, 3 km. away from Ambalavayal, and Megalithic Burial Sites discovered about 7 km. West of Edakkalamala and also at Chingeri in Ambalavayal Village throw some light about these bygone days. According to Fawcett, the carvings of human and animal figures on the rock walls are the work of Kurumbar. One of the rock inscriptions in Sanskrit on the walls of Edakkal Caves reveals that Sri.Vishnuvarman was the earliest of eight kings of the Kudumriya Family. Ptolemy had mentioned that the limits of Kerala extended over the Western Ghats which included portions of the Mysore Plateau which is now known as Wayanad. Sangam Works reveal that Karkanad comprising of Wayanad-Gudallur Area including part of Coorg formed part of the Kingdom of Ezhimala. Some Ancient Tamil Works throw light on the early history of the District. It is said that during the 5<sup>th</sup> century AD, Nannan, an illustrious king of Poozhinad had to take refuge in the Wayanad hills when he was defeated by Cheras and he was killed in the famous Battle of Vakaiperumthurai.

The history of the District in the early Christian era is not clear. In the 9<sup>th</sup> century, the Second Chera Empire came into power in Kerala under Kulasekhara Varma (800-820 AD). The two inscriptions discovered from Thirunelly Temple which regulate the Temple dues bear the name of Bhaskara Ravi-Varma-I (962-1019AD) and Bhaskara Ravi Varma –II (979-1021 AD) of the second Chera Empire. A reference had been made about the Kingdom of Eli (land of Kolathiris) in the Writings of Marcopolo who visited Kerala in the 13<sup>th</sup> century. The extent of the Kingdom of Kolathiris quoted from the Malabar Quarterly Review by Shri.K.P.Padmanabha

Menon in his "A History of Kerala" is as follows: "The Kingdom of Kolathiri Raja extended from Kasargod in the North to Korapuzha in the south. The Eastern boundary was Kudakumala and the Western the Sea". The Kolathiri Dominion emerged into independent principalities viz., Kadathanad, Randathra or Poyand, Kottayam, Nileswaram, etc., under separate royal chieftains due to the outcome of internal dissensions. The origin of Kottayam Royal Family is lost in obscurity. It has been stated that the Raja of Kottayam setup a semi-independent principality of his own at the expense of Kolathiris. In the 10<sup>th</sup> century AD, the region comprised of east while Taluks of Kottayam, Wayanad and Gudallur was called Puraikizhar Family into two branches viz., Elder (Muthukur) and Younger (Elamkur) in the beginning of the 11<sup>th</sup> century. In 17<sup>th</sup> century Kottayam was the Capital of Puraikizhanad (Puranattukara) Rajas. It was divided into three branches viz., Eastern, Western and Southern under separate dignitaries known as Mootha Elaya and Munnarkur Rajas. The Kottayam Rajas extended their influence up to the border of Coorg. By the end of the 17<sup>th</sup> century, they shared the area of Thalasseri Taluk with the Iruvazhinad Nambiar and were in possession of North Wayanad and the small Village of Thamarassery which formed the Eastern portion of the present Vadakara, Quilandy and Kozhikode Taluks.

The circumstances under which the mountainous region of Wayanad came under the control of Kottayam Rajas are not clear. The traditional history of Wayanad as given by Logan, however throws some interesting light on the subject.

Wayanad is an abode of hill tribes like the Kurumans, Kurichiyas, Panias, etc., which was formerly inhabited by wild hunters ruled over by a line of Vedar Rajas. The history of acquisition of Wayanad by Kottayam Rajas is an interesting one. While Vedar Raja was ruling over Wayanad, Kumbala Raja, a person of Kshatriya Caste came to Wayanad on a pilgrimage to the Vishnu Shrine at Thirunelly. He was taken prisoner and carried before the Vedar Raja who insisted on his marrying one of his daughters before he could be released. Being a Kshatriya, Kumbala Raja did not consent to marry into the Vedar Tribe. But the Vedar Raja was relentless and Kumbala Raja agreed to marry on condition that the ceremony should be carried out in accordance with Kshatriya customs. That was allowed and as the preparation for the marriage was going on, the imprisoned Raja communicated with the Kshatriya Rajas of Kottayam and Kurumbranad and those Rajas with their forces appeared on the wedding day. The Vedar Raja was besieged in his fort. The fort was taken and the Vedar Raja and most of their people were killed. The intended bride of Kumbala Raja was given in marriage to a member of the Nambiar Caste and Wayanad was entrusted to him. The allied Rajas decided to divide Wayanad so as to avoid disputes. They set out in different directions and agreed to make the place where they should meet, the boundary of their respective spheres of influence. This plan failed due to the difficulties arising from the topography of the area. Kottayam

Raja generously gave up all his claims to the Kurumbanad Rajas on one condition that the latter should come to his help when necessity arose in future. In course of time, Wayanad was divided among his followers. The Padri Rock Halfway between Sulthanbathery and Meenangadi became the boundary mark between the two possessions. Subsequently the Kottayam and Kurumbranad families fell out. Kottayam Raja had to face trouble from the Rajas of Coorg.

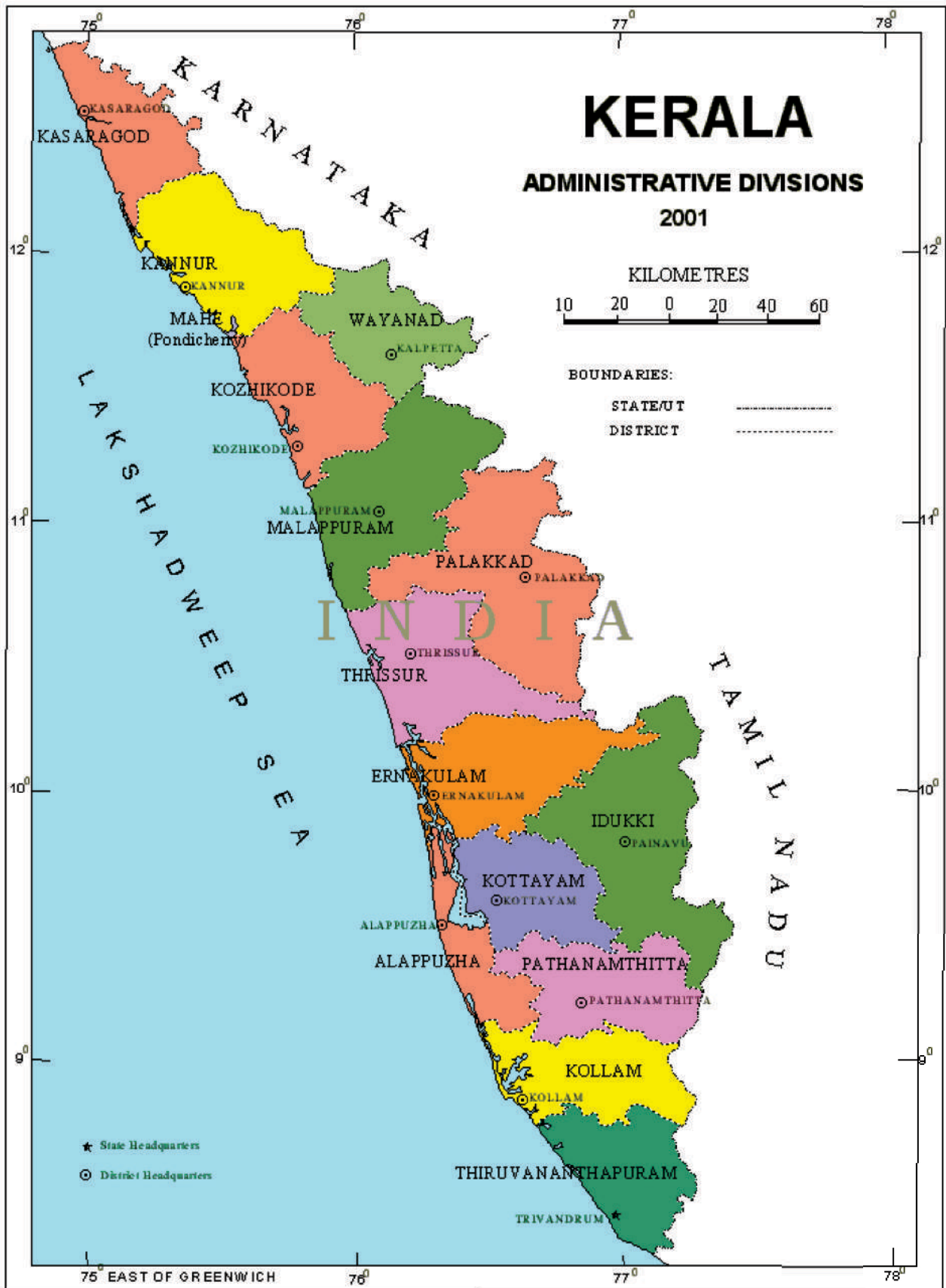
Though the Portuguese and the Dutch had strong foothold in Malabar Area, being an interior tract their territorial claims had little impact on Wayanad. The Mysorean Conquest was the most important episode in the political history of North Kerala in the second half of the 18<sup>th</sup> century. The distracted political conditions in North Kerala, the rivalry between native princes and the chieftains and the political intrigues of foreign powers for a firm footing, were the important factors which paved way for Mysorean Invasion. In 1776, Hyder Ali, the Ruler of Mysore, invaded North Kerala and seized the Palace of Chirakkal by the assistance of Ali Raja. In 1774 Hyder conquered the Territories of Kottayam and Kurumbranad and proceeded to Calicut. While Calicut was occupied by Mysorean Army, Zamorin sent his family members to Ponnani and committed self immolation. Madanna, an experienced Revenue Officer, was appointed as the Civil Governor of Malabar with the Headquarters at Calicut. After the departure of Hyder, the civil population rose in revolt against Mysore Rule. The Ancient Rajas, except Chirakkal, were reinstated in 1768. The conflict ended with the withdrawal of Mysorean Army on condition of paying annual tribute. But the Rajas failed to pay the annual tribute. After the conquest of Coorg in 1773, hyder;s Forces under Syed Sahib and Srinivas Rao descended on Malabar through Wayanad. The Malabar Chiefs yielded without difficulty and Srinivas Rao became the Governor. The conflict between the British and Hyder's Troops ended with the capture of Calicut by Major Abington. The Mysorean Army was wiped out of the Mysorean Garrison and Mysorean Authority was restricted to Palakkad only. Hyder Ali died on the 7<sup>th</sup> December 1782 and Tippu ascended the throne. Tippu's conquests are significant in the history of Malabar. In 1784 Tippu visited Malabar with a large army through Wayanad but he had to return due to monsoon. Again he came to Malabar through the same route in February 1788 to enforce his unpopular policies. Immediately after the Treaties of Srirangapattanam, in February and March 1792 the whole of Malabar except Wayanad was ceded to the British. In 1799 on the fall of Srirangapattanam Wayanad was ceded to the Company as part of their share on Western Coast. The close of the 18<sup>th</sup> century witnessed a serious revolt against the British Supremacy by Kerala Varma pazhassi Raja of Padinjare Kovilakom of Kottayam Family who was a great patriot and a towering personality of Kerala. Wayanad was intertwined in the freedom struggle of Pazhassi Raja. Pazhassi Raja had been a tower of strength to the British against Tippu. After the expulsion of Tippu, the Company showed scant respect for

the Raja. The British declared that Malabar Rulers were the subjects of the East India Company and Pazhassi Raja objected to this. The joint Commissioner of the Company gave Kurumbranad Raja the authority to levy revenue from the former principality of Kottayam. This action infuriated Pazhassi Raja and he persuaded the people to resist paying revenue to the company. Ultimately the company had to come to a temporary agreement with Kerala Varma Raja in December, 1793 on condition that the revenue would not be levied for one year from the temple lands and that one fifth of the total revenue would be given to the ruler of Kottayam as his right to the property. The Company ultimately did not agree to this condition and Kottayam was handed over to Kurumbranad Raja on lease. In 1794 the lease was renewed for another five years. The Raja disregarded the orders of the company and levied taxes from the territory. The Company ordered the arrest of Pazhassi Raja. As the Raja had advance information of the British move he escaped with his family and found shelter in the wild forest of Wayanad and organized the Kurichiya Tribe into a sort of people's militia. In 1797, the British Forces under Col. Dow ascended Thamarassery Pass and marched through Wayanad as far as Periya. Another Troop under Lt.Mealey also ascended on Wayanad for seizing the Raja. These forces were defeated by the Valiant Soldiers of Pazhassi Raja. This led the Company to make reconciliation with the Raja as a matter of political expediency. Accordingly, Pazhassi Raja was granted a pension of Rs.8,000 per annum. The agreement with Kurumbranad Raja was cancelled.

In 1799, Pazhassi Raja, supported by the Chieftains of Malabar wanted the British to concede his right of ownership on Wayanad. While the Raja was engaged in the elaborate preparation for fight, the British sent a large force under Arthur Wellesly who constructed roads for the movement of Troops and blocked the flow of food products to the Pazhassi Troops. In 1801, Col. Stevenson entered Wayanad and occupied all the places of strategic importance. Kannavath Sankaran Nambiar and other foremost leaders of the revolt were captured and hanged. In 1802, Maj. Macleode issued a proclamation prohibiting the carrying of weapons in Wayanad. But in October, 1802, the Pazhassi Troops headed by Thalackal Chandu and Edachenna Kunjan Nair with the native forces captured Panamaram Fort and the whole detachment was massacred. The Pazhassi Troops held control over all the important passes and they blocked all the passages of the British Troops from Mysore. The flow of British Troops to strengthen the posts at Mananthavady, Lakkidi-Kottah and Periya made Pazhassi Raja to withdraw his Troops from Wayanad to the hills and jungles. By utilizing the discontentment of the natives, Pazhassi Troops came out of the Wayanad Jungles and became active. In early 1804, Thomas Harvey Baber was appointed as the Sub Collector of Tellicherry. His strategies changed the situation in favour of the British and Pazhassi forces were forced to withdraw into the jungles. On June 1804, the British Government issued a proclamation confiscating the properties

and estate of Pazhassi Raja, to members of his family and nine lieutenants and rewards were offered for the capture of the above twelve leaders of the revolt. The anti British Merchants of Mysore helped Pazhassi Troops with rice and other articles. But the British cut of all contacts on all sides and Pazhassi Troops were forced to take relief in the interior forest. The British forces succeeded in surrounding Pazhassi Raja on November 30, 1805. Pazhassi Raja attained martyrdom. His followers were killed or captured. The Raja's dead body kept in a palanquin was taken to Mananthavady and was cremated with all the customary honors. Sardar K.M. Panicker wrote about Pazhassi Raja "he was the great Kerala patriot who sacrificed his all for the freedom of his people and refused till the last to bent his knee to the foreigners" The revolt in Wayanad did not come to an end .In April 1812, Kurichiyars and Kurumbras rose in the revolt as a protest against the Government's decision to collect land revenue in the money instead of kind. They captured the British Garrisons but they could not resist for long and peace was soon restored. The descendants of Kurichiyars who assisted Pazhassi raja in several battles are still expert archers and their excellence in archery has been exhibited recently in various centers. There were organised struggle in a nominal way in Wayanad district later on in connection with national struggle for freedom with the involvement of Malabar unit of Indian national congress formed in 1910.there were also waves of national struggle in Wayanad in repercussion of Kerala Pradesh convention held in 1928 in Payyannur. Mahatma Gandhi also visited Kalpetta (puliarmala) on the 14 January 1934 as part of national struggle for freedom. With the involvement of adivasis, the movement against untouchability was strengthened by various prominent leaders.

The capture of Wayanad by the British marked a new turn in the history of this area. The British Authorities opened up the plateau for cultivation of tea and other cash crops .Communication was established by linking Wayanad to Kozhikode and Thalasseri by constructing roads across the dangerous slopes of Wayanad .These roads were extended to the cities of Mysore and Ooty through Gadalur. People from other district started settling down in Wayanad and at present it has become rich area with an abundance of cash crops.



Based upon Survey of India map with the permission of the Surveyor General of India. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

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## KERALA AT A GLANCE

Location : North Latitude between 8° - 18' and 12° - 48'  
East Longitude between 74° - 52' and 77° - 22'

Area : 38863 sq. km.  
Forests : 11309.4172 sq. km.  
Wetlands : 1941 sq. Km

Percentage of area to the  
area of Indian Union : 1.18

Length of Coastal Line : 580 km  
Highest Peak : Anamudi : 2694 metres  
Longest River : Periyar : 244 km

### Rivers

West flowing : 41 Nos  
East flowing : 3 Nos

### Administration

Districts : 14 Nos  
Taluks : 63 Nos  
Revenue Villages : 1478 Nos  
Grama Panchayats : 978 Nos  
Corporations : 5 Nos  
Municipalities : 60 Nos

Community Development Blocks : 152 Nos  
Average Annual Rainfall : 2900 mm  
Cultivated Area (million hectares) : 2.292 mh  
Per capita land : 0.13 ha.  
Per capita cultivated land : 0.10 ha.  
Per capita production food grain : 37 kg/annum

### Members in State Legislature

Elected : 140 Nos  
Nominated : 1 No

### Members of Parliament

Lok Sabha : 20 Nos  
Rajya Sabha : 9 Nos.

Table 1.1

Population	1991 Census	2001 Census	2011 Census
Total population (lakhs)	290.99	318.41	333.88
Male population (lakhs)	142.89	154.69	160.21
Female population (lakhs)	148.10	163.73	173.66
Density per sq. km.	749	819	859
Sex ratio (Females per 1000 males):	1036	1058	1084
Literacy (per cent)	89.81	90.86	93.91
Male Literacy	93.62	94.24	96.02
Female Literacy	86.17	87.72	91.98
Rural population (lakhs)	214.18	235.75	
Urban population (lakhs)	76.80	82.67	
Growth of population (per cent)	13.88	9.43	4.86
Life Expectancy (years)	68	-	
Infant mortality (per 1000)	22	16*	
Birth Rate (per 1000)	19.8	18.3	

Source:- Census Report 2001, Govt. of India

## WAYANAD AT A GLANCE

Table 1.2

### ADMINISTRATIVE SET UP

Sl. No.	Particulars	Wayanad	State
1	No. of Revenue Divisions	1	21
2	No. of Taluks	3	63
3	No. of Revenue Villages	49	1,478
4	No. of Municipalities	1	60
5	No. of Municipality Wards	28	2,216
6	No. of Block Panchayat	4	152
7	No. of Block Panchayat Wards	57	2,095
8	No. of Grama Panchayat	25	978
9	No. of Grama Panchayat Wards	459	16,680
10	No. of Assembly Constituencies	3	140
11	No. of Parliament Constituencies	1	20
12	No. of District Panchayat Wards	16	332

Table 1.3

### GEOGRAPHICAL PARTICULARS

1	Total Areas( Sq. Km)	2,131	38,863
	Wet Area(hect)	24,731	4,62,797
	Dry Area(hect)	1,00,869	22,73,603
2	Forest Area(hect)	78,787	10,81,509
3	Length of Coastal Line(in KMs)	Nil	590

Table 1.4

### AGRICULTURE

Sl.No.	Land Utilization pattern(in Ha)	Wayanad	State
1	Total Geographical Area	2,12,560	38,85,497
2	Forest Area	78,787	10,81,509
3	Land put to non agricultural use	273	4,30,084
4	Barren& uncultivable Land		28,891
5	Permanent pastures and other grazing land	52	292
6	Land under misc. tree crops	489	10,193
7	Cultivable Waste	1,032	70,092
8	Fallow other than current fallow	391	40,917
9	Current fallow	1,598	68,634
10	Net area sown	1,17,384	21,54,885
11	Area sown more than once	87,643	8,41,408
12	Total cropped area	2,05,027	29,96,293

Source:- Agricultural Statistics, DES

Table 1.5

**ANIMAL HUSBANDRY AND FISHERIES**

Sl. No.	Livestock population	Wayanad	State
1	Cattle	1,03,809	21,22,453
2	Buffaloes	3,934	64,618
3	Goats	43,019	12,13,173
4	Pigs	3,684	76,452
5	Sheep	36	3,631
6	Duck	7,765	
7	Milk production (in 1000Ltr.)	21,709	

Table 1.6

**INDUSTRIES**

Sl. No.	Category	Wayanad	State
1	Number of Factories	33	18,239
2	Number of SSI Units registered		2,80,584
3	units	2,335	5,305
4	Number of Handloom Co-operative Societies	4	758
5	Number of Coir societies		647
6	Number of Women SSI Units		51,871
7	Number of SC/ ST SSI Units	179	10,770

Table 1.7

**COMMUNICATION**

Sl. No.	Category	Wayanad	State
1	Total numbers of post offices	166	5,083
a)	Number of Head Post office	1	51
b)	Number of Sub office	18	1,464
c)	Number of branch office	144	3,042
d)	Number of ED Sub office	3	526

Table 1.8

## HEALTH

Sl. No.	Institutions	Wayanad	State
1	General Hospitals		6
2	Women & Children Hospital		5
3	District Hospital	1	11
4	Taluk HQ Hospital	1	40
5	Government Hospitals [Allopathic]	3	53
6	Primary Health Centers	25	931
7	Govt. Dispensary/ Rural dispensary	7	25
8	Mobiles Dispensary / Units	5	13
9	Police Hospital		5
10	Leprosy control unit/ Hospitals		21
11	TB Centre/ Clinic	1	18
12	Mental Health centers		3
13	Numbers of Ayurvedic institutions	66	
14	Numbers of Ayurvedic dispensaries	27	
15	Numbers of Homoeopathic hospitals	72	

Table 1.9

## EDUCATION

Sl. No.	Institutions	Wayanad	State
1	Lower primary Schools	150	6,817
2	Upper Primary Schools	75	3,037
3	High schools	68	2,790
4	Higher Secondary Schools	38	1,610
5	Vocational Higher Secondary Schools	7	375
6	Technical Higher Secondary Schools	0	25
7	Teachers Training Institute	5	202
8	Schools for physically handicapped		43
9	Kendriya Vidyalaya	1	32
10	Navodaya Vidyalaya	1	14
11	CBSE School	11	483
12	ICSE School	1	78
13	ITI	1	32
14	Veterinary College	1	2
15	Arts & Science Colleges		
16	Polytechnic Colleges		
17	Engineering Colleges	1	84
18	Polytechnic Colleges	2	52

Table 1.10

### DRINKING WATER FACILITIES

Sl. No.	Particulars	Wayanad	State
1	Number of public wells	1,990	
2	Number of public tanks/ ponds	484	
3	Number of public taps	4,400	1,83,231
4	Number of tube wells	233	
5	No of connections	6,695	97,73,224

Table 1.11

### MINOR IRRIGATION AYACUT AREA UNDER MINOR IRRIGATION SCHEMES ACCORDING TO PROJECT CLASS (IN HECT)

Particulars	Proposed Area		Achieved area	
	Wayanad	State	Wayanad	State
Well	2543	8645	316	2439
Tube Well	29	1607	29	1195
Pond	1525	52025	444	33255
Lift Irrigation	2445	134374	840	80292
Side Protection Wall	2611	97123	434	60108
Minor Dam	4505	174494	1620	69930
Others	1694	133998	879	72489
<b>Total</b>	<b>15352</b>	<b>623162</b>	<b>4562</b>	<b>330853</b>

Table 1.12

### AYACUT AREA UNDER MINOR IRRIGATION SCHEMES ACCORDING TO PROJECT CLASS (in Ha)

Class	Proposed area		Achieved area	
	Wayanad	State	Wayanad	State
Class 1	1298	36611	578	19596
Class 11	7831	226339	2203	99064
IPD Yelah	495	359440	112	23409
Lift Irrigation	2445	134374	840	80292
Community Irrigation	269	19217	103	10744
Others	3013	149785	727	86603
<b>Total</b>	<b>15351</b>	<b>946662</b>	<b>4563</b>	<b>330853</b>



0 1.25 2.5 5 7.5 10 Kilometers

1 : 350,000

### ADMINISTRATIVE BOUNDARY WAYANAD DISTRICT

#### Blocks

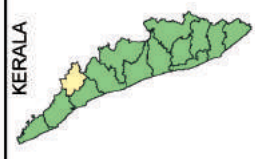
- KALPETTA BLOCK
- MANANTHAVADI BLOCK
- PANAMARAM BLOCK
- SULTHAN BETHERY BLOCK

#### Municipality

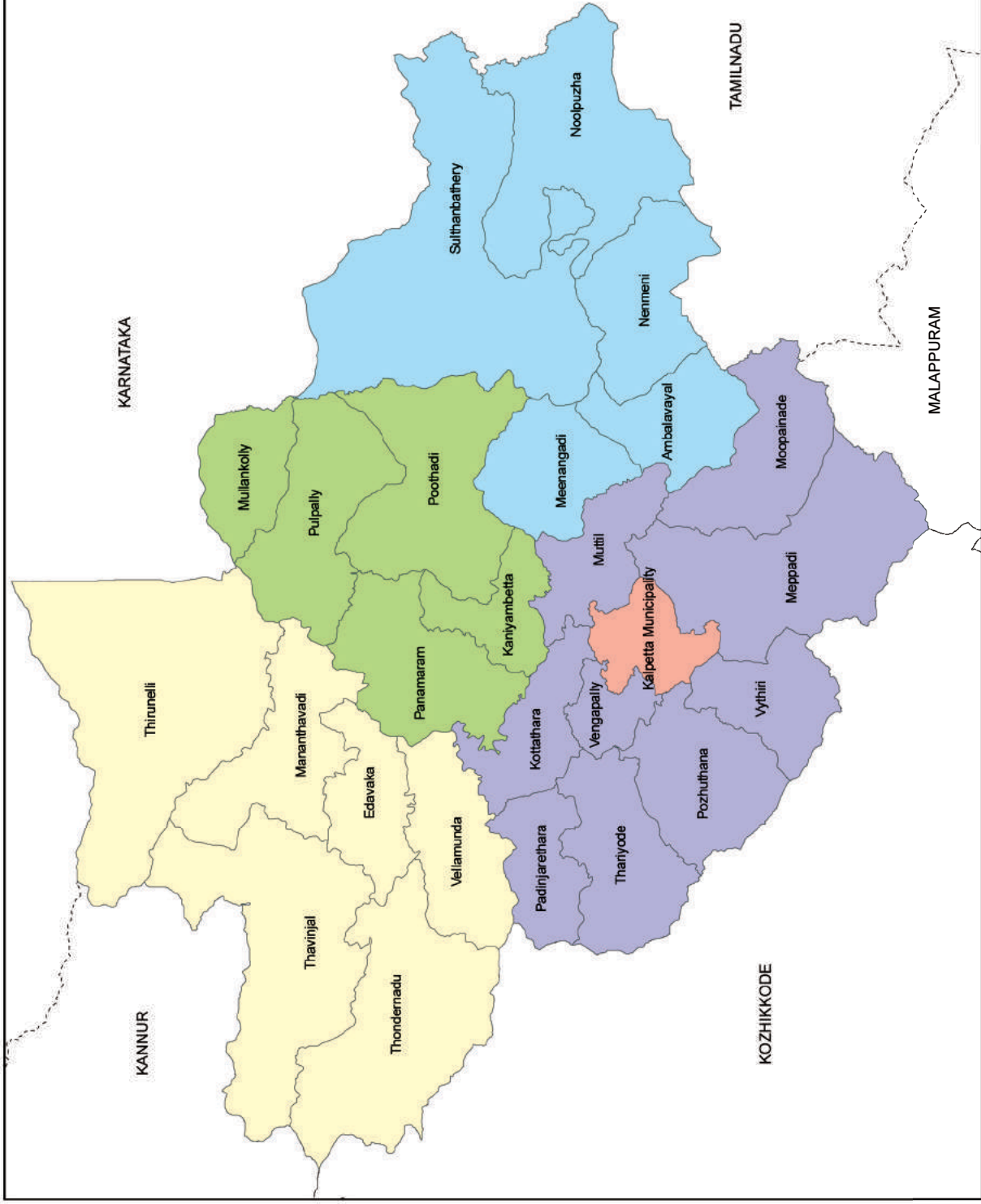
- KALPETTA MUNICIPALITY

KERALA

WAYANAD



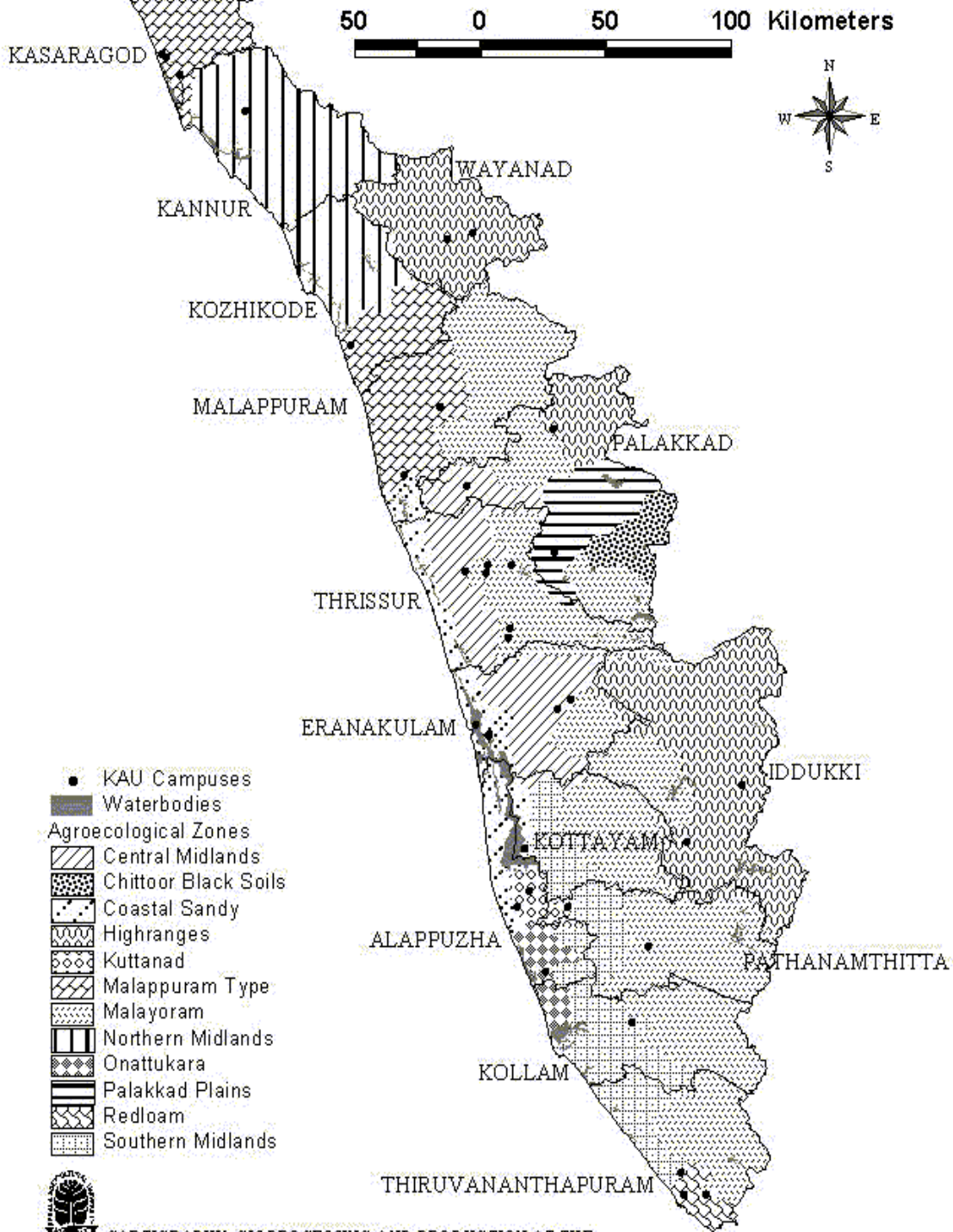
Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33







# Agroecological Zones of Kerala



CARTOGRAPHY, GIS PROCESSING AND PRODUCTION AT THE  
CENTRE FOR LAND RESOURCES RESEARCH AND MANAGEMENT, KAU P.O., THIRUVANANTHAPURAM - 680 656

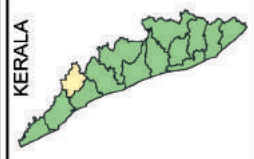




**LEGISLATIVE ASSEMBLY  
CONSTITUENCY  
WAYANAD DISTRICT**

**LEGISLATIVE ASSEMBLY  
CONSTITUENCY**

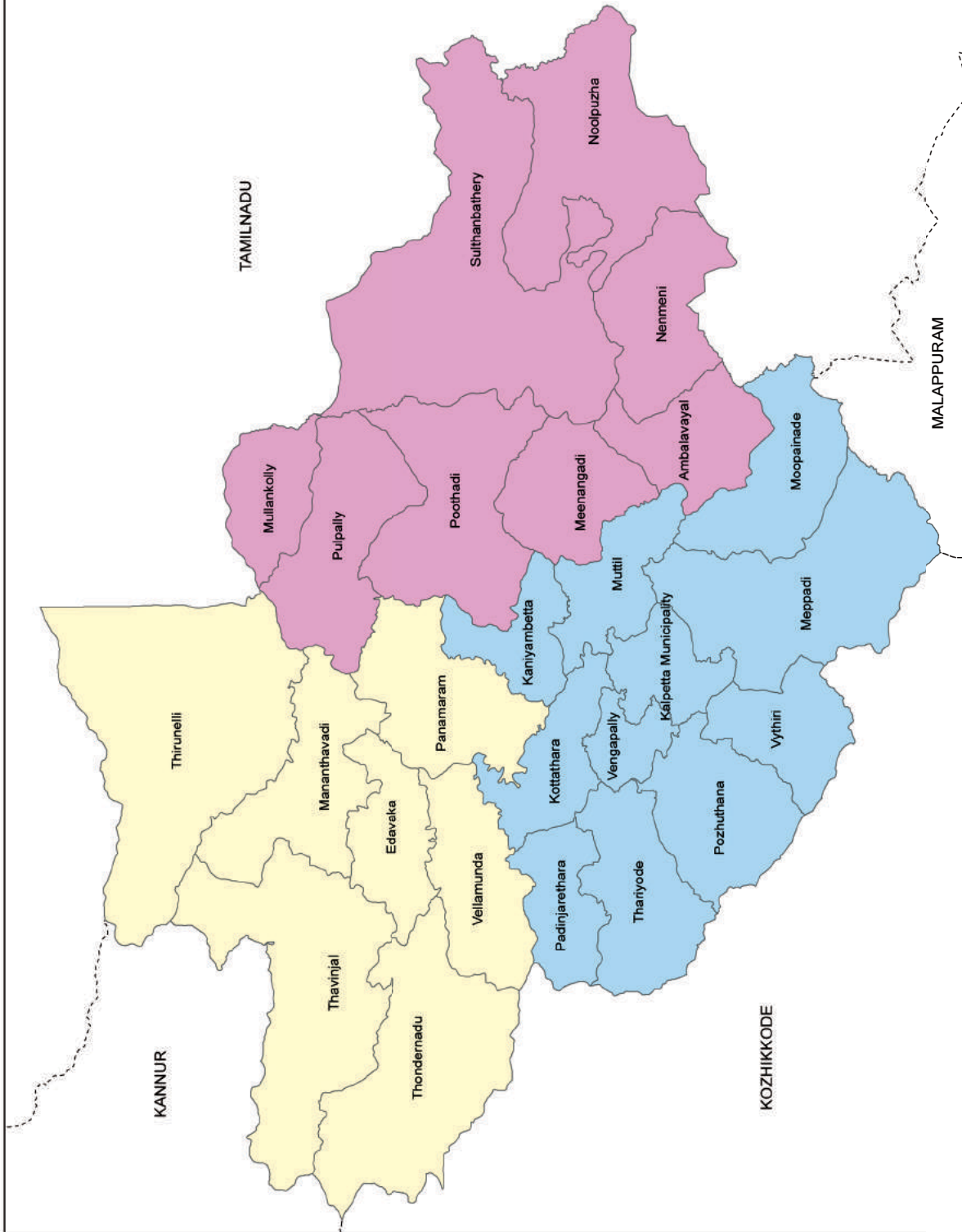
- KALPETTA
- MANANTHAVADI
- SULTHANBATHERY



WAYANAD



Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33





## DEMOGRAPHY

### INDIA'S POPULATION CENSUS 2011

Table:- 4.1

Current Population of India in 2011	1,210,193,422 (1.21 billion)
Total Male Population in India	623,700,000 (623.7 million)
Total Female Population in India	586,500,000 (586.5 million)
Sex Ratio	940 females per 1,000 males
<b>Age structure</b>	
0 to 25 years	50% of India's current population
Currently, there are about 51 births in India in a minute.	
India's Population in 2001	1.02 billion
Population of India in 1947	350 million

### KEY FINDINGS OF THE CENSUS

- Population grows to 1.21 billion
- 181 million people added during 2001-11
- Growth declines to 17.64% from 21.15% during 1991-2001
- There are 623.7 million males and 586.5 million females
- India accounts for 17.5% of the world's population, China 19.4%
- First decade (with exception of 1911-1921) which saw addition of lesser people than the previous decade.
- Child sex ratio — 914 females against 1,000 males — lowest since independence
- Overall sex ratio rises by seven points — 940 females per 1,000 males
- Literacy rate goes up from 64.83% to 74.04%
- 74% people aged seven and above are literate
- 82.14% male literacy, 65.46% female literacy
- In 2001, male literacy was 75.26%, female literacy was 53.67%
- Delhi (11,297 people per square km) has the highest population density, followed by Chandigarh (9,252)
- Uttar Pradesh is the most populous state with 199 million people while Lakshadweep is the least populated at 64,429

Source:- Census Report- 2011



Table:- 4.2

## CENSUS OF INDIA 2011-PROVISIONAL POPULATION TOTALS INDIA, KERALA STATE AND DISTRICTS

India/State/ District	Area in sq.km.	Total Population			Population in age group 0-6			Number of Literates			Literacy rate (in Percentage)			Percentage decadal growth rate of population	Sex Ratio (Number of Females per 1000 Males)	Sex Ratio 0-6 populati on
		Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
INDIA	3,166,285	1,21,01,93,422	62,37,24,248	586,469,174	158,789,287	82,952,135	7,58,37,152	778,454,120	44,42,03,762	33,42,50,358	74.04	82.14	65.46	17.64	940	914
KERALA	38,863	33,387,677	1,60,21,290	1,73,66,387	33,22,247	16,95,935	16,26,312	2,82,34,227	1,37,55,888	1,44,78,339	93.91	96.02	91.98	4.86	1084	959
Kasaragod	1,992	13,02,600	6,26,617	6,75,983	1,49,280	76,149	73,131	10,36,289	5,17,031	5,19,258	89.95	93.93	86.13	8.18	1079	960
Kannur	2,966	25,25,637	11,84,012	13,41,625	2,65,276	1,35,189	1,30,087	21,56,575	10,22,972	11,33,603	95.41	97.54	93.57	4.84	1133	962
Wayanad	2,131	8,16,558	4,01,314	4,15,244	89,720	45,776	43,944	6,49,186	3,30,093	3,19,093	89.32	92.84	85.94	4.6	1035	960
Kozhikode	2,344	30,89,543	14,73,028	16,16,515	3,23,511	1,64,800	1,58,711	26,34,493	12,76,384	13,58,109	95.24	97.57	93.16	7.31	1097	963
Malappuram	3,550	41,10,956	19,61,014	21,49,942	5,52,771	2,81,958	2,70,813	33,28,658	16,08,229	17,20,429	93.55	95.78	91.55	13.39	1096	960
Palakkad	4,480	28,10,892	13,60,067	14,50,825	2,88,366	1,46,947	1,41,419	22,32,190	11,19,360	11,12,830	88.49	92.27	84.99	7.39	1067	962
Thrissur	3,032	31,10,327	14,74,665	16,35,562	2,89,126	1,48,428	1,40,698	26,89,229	12,86,141	14,03,088	95.32	96.98	93.85	4.58	1109	948
Ernakulam	3,068	32,79,860	16,17,602	16,62,258	2,89,281	1,48,047	1,41,234	28,61,509	14,27,572	14,33,937	95.68	97.14	94.27	5.6	1028	954
Idukki	4,358	11,07,453	5,51,944	5,55,509	1,00,107	51,132	48,975	9,28,774	4,74,988	4,53,786	92.2	94.84	89.59	1.93	1006	958
Kottayam	2,208	19,79,384	9,70,140	10,09,244	1,68,563	86,113	82,450	17,45,694	8,59,038	8,86,656	96.4	97.14	95.67	1.32	1040	957
Alappuzha	1,414	21,21,943	10,10,252	11,11,691	1,86,022	95,565	90,466	18,63,558	8,95,476	9,68,082	96.26	97.9	94.8	0.61	1100	947
Pathanamthitta	2,637	11,95,537	5,61,620	6,33,917	91,501	46,582	44,919	10,70,120	5,03,171	5,66,949	96.93	97.7	96.26	3.12	1129	964
Kollam	2,491	26,29,703	12,44,815	13,84,888	2,38,062	1,21,484	1,16,581	22,42,757	10,76,509	11,66,248	93.77	95.83	91.95	1.72	1113	960
Thiruvananthi puram	2,192	33,07,284	15,84,200	17,23,084	2,90,661	1,47,777	1,42,884	27,95,195	13,58,924	14,36,271	92.66	94.6	90.89	2.25	1088	967

Source:- Census Report - 2011





**CENSUS OF INDIA 2011-PROVISIONAL POPULATION TOTALS- RURAL AND URBAN DISTRIBUTION (INDIA, KERALA, DISTRICTS)**

INDIA/ STATE/ DISTRICT	Total / Rural/ Urban	Population			Percentage of decadal growth 2001-2011	Percentage of child population in the age-group 0-4			Literacy Rate			Sex ratio of total population	Sex ratio of child population in the age-group 0-6	Percent share of urban population
		Persons	Males <sup>#</sup>	Females		Persons	Males <sup>#</sup>	Females	Persons	Males <sup>#</sup>	Females			
1	T	3	4	5	6	7	8	9	10	11	12	13	14	15
INDIA	T	1,21,01,93,422	62,37,24,248	58,64,69,174	17.64	13,12	13,30	12,93	74,04	82,14	65,46	940	914	31.16
	R	83,30,87,662	42,79,17,052	40,51,70,610	17.19	14,11	14,32	13,90	68,91	78,57	58,75	947	919	
	U	37,71,05,760	19,58,07,196	18,12,98,564	18.12	10,93	11,07	10,78	84,98	89,67	79,92	926	902	25.96
KERALA	T	3,33,87,677	1,60,21,290	1,73,66,387	4.86	9,96	10,59	9,36	93,91	96,02	91,98	1084	959	47.72
	R	1,74,55,506	84,03,706	90,51,800	-25.96	10,01	10,61	9,45	94,92	95,29	90,74	1077	960	
	U	1,59,32,171	76,17,584	83,14,587	92.72	9,88	10,56	9,27	94,99	96,83	93,33	1091	958	
Kasaragod District	T	13,02,600	6,26,617	6,75,983	8.18	11,46	12,15	10,82	89,85	93,93	86,13	1079	960	38.78
	R	7,97,424	3,87,324	4,10,100	-17.82	11,07	11,61	10,56	88,71	93,11	84,51	1059	964	
	U	5,05,176	2,39,293	2,65,883	116.18	12,07	13,03	11,21	91,67	95,27	88,49	1111	956	
Kannur District	T	25,25,637	11,94,012	13,41,625	4.84	10,50	11,42	9,70	95,41	97,54	93,57	1133	962	65.05
	R	8,82,745	4,26,243	4,56,502	-26.20	10,46	11,07	9,89	93,88	96,50	91,48	1071	956	
	U	16,42,892	7,57,769	8,85,123	35.45	10,53	11,61	9,60	96,23	98,12	94,54	1168	965	
Wayanad District	T	8,16,588	4,01,314	4,15,244	4.60	10,99	11,40	10,58	89,32	92,84	85,94	1035	960	3.87
	R	7,84,981	3,95,922	3,99,059	4.52	10,99	11,41	10,59	89,22	92,77	85,82	1034	960	
	U	31,577	15,392	16,185	6.64	11,03	11,58	10,52	91,63	94,56	88,87	1052	955	
Kozhikode District	T	30,89,543	14,73,028	16,16,515	7.31	10,47	11,19	9,82	95,24	97,57	93,16	1097	963	67.15
	R	20,74,765	9,87,374	10,87,404	88.42	10,26	10,97	9,61	95,47	97,64	93,52	1101	964	
	U	10,14,778	4,85,654	5,29,111	-42.93	10,91	11,63	10,25	94,79	97,42	92,41	1089	961	
Malappuram District	T	41,10,956	19,51,014	21,49,942	13.39	13,45	14,38	12,60	93,55	95,78	91,55	1096	960	44.19
	R	22,94,473	10,95,465	11,98,008	-28.82	13,40	14,31	12,56	92,67	94,97	90,61	1095	961	
	U	18,16,483	8,55,549	9,50,934	410.00	13,51	14,47	12,64	94,66	96,81	92,74	1099	959	
Palakkad District	T	26,10,892	13,80,067	14,50,825	7.39	10,26	10,80	9,75	88,49	92,27	84,99	1067	962	24.09
	R	21,33,699	10,31,940	11,01,759	-5.63	10,39	10,94	9,88	87,23	91,27	83,49	1068	964	
	U	6,77,193	3,28,127	3,49,066	89.92	9,84	10,37	9,34	92,45	95,41	89,70	1064	958	
Thrissur District	T	31,10,327	14,74,665	16,35,662	4.58	9,30	10,07	8,60	95,32	96,98	93,85	1109	948	67.19
	R	10,20,537	4,85,875	5,34,662	-52.20	9,43	10,13	8,79	93,99	96,09	92,11	1100	955	
	U	20,89,790	9,88,790	11,01,000	148.95	9,23	10,03	8,51	95,97	97,41	94,70	1113	944	
Ernakulam District	T	32,79,860	16,17,602	16,62,258	5.60	8,82	9,15	8,50	95,68	97,14	94,27	1028	954	66.07
	R	10,47,296	5,18,040	5,29,258	-35.70	8,44	8,74	8,16	94,34	95,96	92,76	1022	954	
	U	22,32,564	10,99,562	11,33,002	51.15	9,00	9,35	8,65	96,32	97,70	94,98	1030	954	
Idukki District	T	11,07,453	5,51,944	5,55,509	-1.93	9,04	9,26	8,82	92,20	94,84	89,59	1006	958	4.70
	R	10,55,428	5,28,420	5,29,008	-1.51	9,02	9,24	8,80	92,03	94,73	89,34	1005	957	
	U	52,025	25,524	26,501	-8.67	9,49	9,83	9,16	95,74	97,10	94,45	1038	968	
Kottayam District	T	19,79,384	9,70,140	10,09,244	1.32	8,52	8,88	8,17	96,40	97,17	95,67	1040	957	28.58
	R	14,13,773	6,94,308	7,19,465	-14.52	8,56	8,91	8,23	97,17	97,97	96,40	1036	957	
	U	5,65,611	2,75,832	2,89,779	88.66	8,41	8,80	8,03	94,49	95,16	93,86	1051	958	
Alappuzha District	T	21,21,943	10,10,252	11,11,691	0.61	8,77	9,46	8,14	96,26	97,90	94,80	1100	947	54.06
	R	9,74,916	4,92,571	5,12,345	-34.47	9,08	9,82	8,42	96,72	98,24	95,38	1106	950	
	U	11,47,027	5,47,681	5,99,346	84.57	8,50	9,16	7,90	95,87	97,62	94,30	1094	944	
Pathanamthitta District	T	11,95,537	5,61,620	6,33,917	-3.12	7,65	8,29	7,09	96,93	97,70	96,26	1129	964	11.00
	R	10,64,076	4,99,745	5,64,331	-4.16	7,65	8,29	7,08	96,87	97,64	96,19	1129	964	
	U	1,31,461	61,875	69,586	6.19	7,70	8,32	7,15	97,42	98,15	96,79	1125	967	
Kollam District	T	26,26,703	12,44,815	13,81,888	1.72	9,05	9,76	8,42	92,77	95,82	91,05	1112	960	45.11
	R	14,43,363	6,78,969	7,64,394	-31.89	9,02	9,78	8,35	94,10	95,15	92,30	1126	961	
	U	11,86,340	5,65,846	6,20,494	154.59	9,09	9,73	8,50	93,38	95,46	91,52	1097	958	
Thiruvananthapuram District	T	33,07,284	15,84,200	17,23,084	2.25	8,79	9,33	8,29	92,68	94,60	90,89	1088	967	53.80
	R	15,28,030	7,25,230	8,02,800	-28.69	9,15	9,82	8,55	91,98	94,27	89,95	1107	963	
	U	17,79,254	8,58,970	9,20,284	62.99	8,48	8,91	8,07	93,24	94,89	91,71	1071	970	

# Males include both males and others

**ADMINISTRATIVE UNITS-KERALA**

	2001		2011	
	No. of Districts	14	14	63
No. of Sub-Districts (Talukas)		63		83
No. of Towns		159		520
No. of Villages		1,384		1,018
Percentage of urban population		25.96		47.72

**NUMBER OF TOWNS AND URBAN POPULATION IN KERALA**

Census Year	No. of towns	Urban population
1901	21	4,54,489
1911	27	5,24,661
1921	44	6,80,900
1931	53	9,16,330
1941	62	11,95,550
1951	94	18,25,832
1961	92	25,54,141
1971	88	34,66,449
1981	106	47,71,275
1991	197	76,80,294
2001	159	82,66,925
2011	520	1,59,32,171

**GROWTH IN NO. OF TOWNS (KERALA)**

Towns	2001	2011	% Growth (Rounded to next digit)
STs	60	59	-2%
CTs	99	461	366%
Total	159	520	227%



## Some Concepts and Definitions

### **What is census?**

Population census is the total process of collecting, compiling, analyzing or otherwise disseminating demographic, economic and social data pertaining, at a specific time, to all persons in a country or a well defined part of a country. As such, the census provides a snapshot of the country's population and housing at a given point of time.

### **Classification of Area:**

For Census purposes total geographical area is broadly classified into Rural and Urban.

**Urban:** Constituents of urban areas are Statutory Towns, Census Towns and Outgrowths.

**Statutory Town (ST):** All places with a municipality, corporation, cantonment board or notified town area committee etc. No. of STs in Kerala: 59\*

**Census Town (CT):** Places that satisfy the following criteria are termed as Census Towns (CTs). (a) A minimum population of 5000 (b) At least 75% of the male main working population engaged in non-agricultural pursuits (c) A density of population of at least 400 per sq.km No. of CTs in Kerala: 461\*

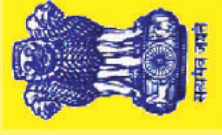
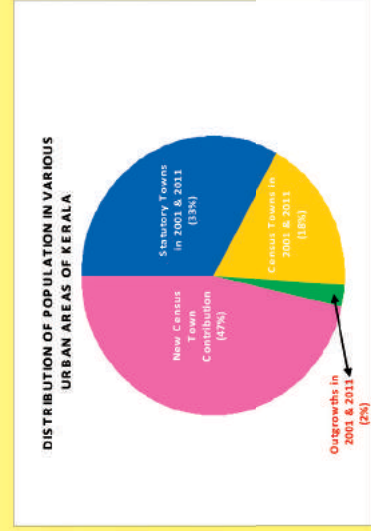
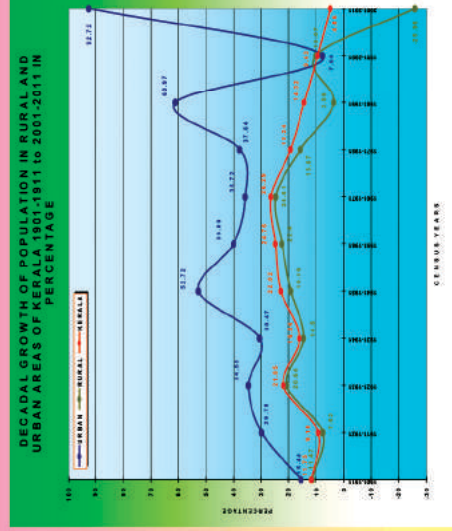
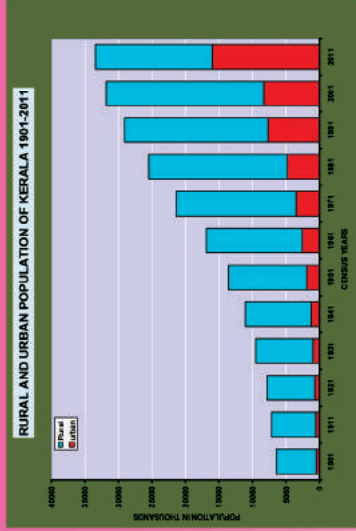
**Out Growth (OG):** Out Growth should be a viable unit such as a village or part of a village contiguous to a statutory town and possess the urban features in terms of infrastructure and amenities such as pucca roads, electricity, taps, drainage system, education institutions, post offices, medical facilities, banks, etc. Examples of OGs are Railway colonies, University campuses, Port areas, that may come up near a city or statutory towns outside its statutory limits but within the revenue limit of a village or villages contiguous to the town or city.

No. of OGs in Kerala: 16\*

**Urban Agglomeration (UA):** It is a continuous urban spread constituting a town and its adjoining urban outgrowths (OGs) or two or more physically contiguous towns together and any adjoining urban out-growths of such towns. No. of UAs in Kerala: 19\*

**Rural:** All areas other than urban are rural. The basic unit for rural areas is the revenue village. No. of Villages in Kerala: 1018\*

\* All administrative units are as on 31.12.2009, the date of freezing of administrative boundaries for Census.



## **CENSUS OF INDIA 2011**

### **SUMMARY OF PROVISIONAL POPULATION FIGURES KERALA**

#### RURAL – URBAN DISTRIBUTION

**Census of India, 2011 is the second Census of the 21<sup>st</sup> century and 7<sup>th</sup> Census after Independence. The provisional results of 2011 show that Population of Kerala as on 1<sup>st</sup> March 2011 is 3,33,87,677 with 1,74,55,506 in Rural and 1,59,32,171 in Urban.**



**Our Census, Our Future**

**Directorate of Census Operations, Kerala  
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## METEOROLOGY

Table: 5.1

### RAIN FALL DISTRIBUTION OF WAYANAD

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Actual	Normal	Deviation
<b>1997</b>	19	6	47	59	151	504	876	572	170	268	196	53	2921	3622	-701
State Average (Total/14)	3	4	37	62	133	562	942	521	290	283	285	92	3213	3052	161
<b>1998</b>	2	0	30	69	92	616	769	287	214	199	117	43	2438	3622	-1184
State Average (Total/14)	8	1	11	65	171	725	601	365	516	439	129	84	3115	3052	63
<b>1999</b>	0	10	14.4	53	252	336	758	302	64	392	38	0	2219.4	3622	-1402.6
State Average (Total/14)	2	24	22	124	459	614	657	250	86	545	71	5	2859	3052	-193
<b>2000</b>	14	14	0	118	58	608	378	626	256	122	44	112	2350	3408	-1058
State Average (Total/14)	14	68	23	99	130	649	336	580	249	216	81	70	2515	2919	-404
<b>2001</b>	1	49	15	99	144	409	523	329	140	166	104	1	1980	3409	-1429
State Average (Total/14)	20	29	7	113	247	709	587	348	231	320	178	11	2800	2929	-129
<b>2002</b>	25	5	40	129	148	406	279	476	76	298	216	0	2098	3409	-1311
State Average (Total/14)	7	10	35	117	341	491	319	435	94	519	148	2	2518	2929	-411

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Actual	Normal	Deviation
<b>2003</b>	1	17	73	151	92	413	476	278	67	286	57	4	1915	3410	-1495
State Average (Total/14)	1	50	71	139	93	571	530	345	94	396	82	10	2380	2948	-568
<b>2004</b>	2	4	29	149	405	791	306	540	145	164	73	0	2608	3411	-803
State Average (Total/14)	3	8	38	114	622	665	373	405	197	327	119	2	2877	3092	-215
<b>2005</b>	56	3	24	164	104	507	1178	451	349	288	71	8	3203	3409	-206
State Average (Total/14)	21	6	27	225	136	628	789	274	400	249	194	62	3011	3091	-80
<b>2006</b>	10	0	67	65	482	443	691	382	315	133	118.9	0	2707	3408.9	-702
State Average (Total/14)	10	1	75	71	525	574	551	388	475	380	219	2	3271	3091	180
<b>2007</b>	0	10	1	125	114	501	1147	591	385	173	29.1	8	3083	3408.9	-326
State Average (Total/14)	0	7	8	152	210	729	953	492	534	357	101	11	3554	3091	463
<b>2008</b>	NA	19.2	166.3	89.4	102.0	312.5	416.7	413.8	159.3	450.7	11.8	0.7	NA	NA	NA
State Average (Total/14)	0.8	29.7	215.9	103.7	78.5	477.9	508.6	347.8	343.9	354.2	56.8	16.1	NA	NA	NA
<b>2009</b>	NA	NA	5.2	47.1	123.9	309.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
State Average (Total/14)	3.2	1.3	9.7	67.8	190.4	433.5	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source:- Agricultural Statistics, DES

Table:- 5.2

**DETAILS OF RAIN FALL RECORDED IN THE RAIN GAUGE DURING 2007-2008(mm)**

Sl. No.	Division / Centre	April	May	June	July	August	Sep	October	Nov	Dec	Jan	February	March
1	Thenmala	159.85	291.80	311.45	452.66	261.45	302.75	316.25	112.20	52.55	-	113.80	173.45
2	Achencoil	4.00	10.00	13.50	13.00	11.00	15.00	10.00	9.50	-	2.00	10.00	6.50
3	Konni	378.00	236.00	587.00	778.00	308.00	467.70	595.40	198.00	16.20	-	97.00	163.40
4	Munnar	13.86	6.00	66.62	105.50	66.32	53.42	49.78	18.37	6.87	-	3.78	20.83
5	Thrissur	5.77	17.19	75.73	120.30	48.02	53.31	35.47	5.14	1.33	-	3.10	14.12
6	Vazhachal	166.96	359.30	776.67	1,521.04	763.23	726.38	348.37	174.75	24.40	-	51.00	104.30
7	Chalakkudy	6.12	14.45	51.44	97.19	48.63	50.29	43.42	5.38	2.22	-	2.61	24.84
8	Malayattoor	164.07	194.44	608.16	859.44	373.84	519.90	416.34	252.77	56.41	13.99	13.11	174.44
9	Palakkad	3.91	2.01	28.51	21.97	19.34	15.48	19.76	3.23	2.49	0.61	2.02	0.96
10	Mannarkkad	156.00	275.00	736.00	1,100.00	553.00	556.00	329.00	111.00	16.00	-	27.00	286.00
11	Nilambur North	2.23	8.03	23.03	46.12	20.72	19.02	4.83	0.28	0.25	-	0.51	4.09
12	Kannur	74.80	74.00	388.85	568.50	325.15	319.75	71.80	107.40	30.00	-	-	1,907.85
13	Wildlife Division, Thiruvananthapuram	96.00	510.00	362.00	353.00	389.00	498.00	517.00	377.00	158.00	45.00	84.00	35.00
14	Periyar East, Thekkady	111.83	250.41	261.02	335.16	223.06	347.24	545.44	269.21	29.32	23.99	5.65	7.21
15	Eravikulam, Munnar	-	106.50	66.05	59.00	92.00	103.90	144.90	43.20	95.02	51.00	-	111.02
16	Periyar West Peerumadu	49.30	608.10	315.51	1,367.50	872.30	1,324.80	1,137.40	476.15	51.40	15.00	54.30	254.00
17	Silent Valley	169.98	308.80	1,693.55	2,402.98	1,378.08	1,000.78	412.55	63.53	16.27	9.00	47.20	186.80
18	Aralam	-	116.00	980.00	1,075.00	670.00	520.00	230.00	110.00	37.00	-	-	-
19	Wildlife Wayanad	165.35	84.53	312.90	636.75	426.31	299.54	144.54	59.50	15.00	25.00	29.34	182.34
20	Sendurney	-	-	-	-	-	-	-	-	-	-	-	-
21	Parambikulam	155.00	260.00	684.00	785.00	621.00	520.00	446.00	24.00	113	24	-	102

Source:- Agricultural Statistics, DES

Table:- 5.3

**MONTHLY MEAN MINIMUM-MAXIMUM TEMPERATURE (<sup>0</sup> C) for the year 2007**

Stations	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
TVPM City	21.8	33.0	22.4	33.1	24.1	34.1	25.3	33.8	25.2	32.8	24	31.2	23.5	30.2	23.9	30.7	23.7	30.7	23.4	31.2	23.0	32.0	22.7	32.2
Kozhikode City	22.8	33.1	23.7	33.1	25.9	33.7	26.3	34.7	25.7	33.2	24.6	30.4	24	29.1	23.7	29.4	24.0	30.0	24.1	31.4	23.3	32.7	23.4	32.8
Vellankkara	22.0	32.5	22.2	34.2	24.4	36.0	25.0	35.7	24.7	32.7	23.5	30.0	22.9	28.4	22.9	29.0	23.0	29.4	22.5	30.5	21.6	31.7	22.6	36.6
Alappuzha	21.6	31.8	22.5	31.7	24.9	32.5	24.5	32.8	25	32.3	23	29.2	22	28.4	22.4	29.1	22.9	30.0	22.9	30.9	22.7	31.4	22.1	32.1
Thiruvananthapuram AP	22.4	31.3	22.9	31.5	24.9	32.5	25.6	33.0	25.6	32.3	23.9	30.7	23.4	29.7	24.1	30.0	23.9	30.2	23.7	30.2	23.4	30.9	22.9	31.3
Kannur	20.6	33.5	21.5	34.3	24.3	34.9	25.2	35.7	25	34.2	23.2	30.4	22.5	29.7	22.4	29.9	22.9	30.5	22.8	31.8	21.7	33.9	22.8	33.4
Punalur	19.9	35.2	20.5	36.0	22.4	38.0	24.3	36.1	24.3	34.7	23.2	31.9	22.8	29.7	23.1	31.6	23.0	31.3	23.1	30.5	22.3	31.7	21.8	31.0
Kozhikode AP	21.8	33.0	22.5	33.0	25.0	33.9	25.2	34.3	25	32.9	23.6	29.7	22.7	28.1	22.7	29.0	22.8	29.2	22.8	30.9	22.3	32.9	22.0	33.0
Kottayam	21.3	33.7	21.9	33.8	24.4	34.7	24.1	33.9	24.4	32.6	23.4	30.2	22.7	28.7	23.1	30.0	23.1	30.0	22.7	31.0	22.5	31.9	21.7	32.4
Palakkad	21.8	32.1	21.9	34.2	24.5	38.4	Data not available																	
Kochi	22.5	32.3	23.4	32.3	25.9	33.0	25.6	33.4	25.5	32.4	23.8	30.2	23.1	29.3	23.6	29.5	23.5	29.7	23.5	31.3	23.3	31.3	23.1	31.8

Source: Farm Guide



## GEOLOGY & GEOMORPHOLOGY

Wayanad district was formed on 1<sup>st</sup> November 1980. It occupies the first place in urban work participation rate (40.79 %) in the state. The district stands the 1<sup>st</sup> in pepper cultivation and coffee plantation in the state. It has no railway line and seacoast. The total area of the district is 2131 sq. km, ie 5.48 % of the total geographic area of the State.

The main river of the district is Kabani river, one of the East flowing rivers of Kerala. The three tributaries of Kabani river are Panamaram, Mananthavady and Thirunelly. The total drainage of the Kabani river in the district is 1974 sq. km. The other important rivers are Mahe and Chaliyar. The Mahe river or Mayyazhipuzha originates from the Western slopes of the dense forests of Mananthavady Taluk. The Chaliyar Or Beypore river originates from the Elembileri Hills of Sulthan Batheri Taluk.

The district can be broadly divided into four geological domains viz (1) The Peninsular Gneissic Complex in the North and central part, (2) The Migmatite Complex in the south-central part, (3) The Charnockite group in the south and (4) The Wayanad group in the North.

Wayanad group of Supracrustal rocks include Garnet-Sillimanite – Biotite gneiss with or without graphite, Kyanite-fuchsite-muscovite-quartz schist, Hornblende-biotite schist and gneiss ± garnet, Amphibolite bands, quartz sericite schist/quartz mica schist and meta ultra mafites, representing upper amphibolite to lower granulite facies metamorphism. These rocks are found as linear bands in the north. The main member of the group namely garnet-sillimanite-biotite gneiss ± graphite occurs as large bodies north of Kabani river. Peninsular gneissic complex, represented by hornblende-biotite gneiss and pink granite gneiss, occupies a major part of the district. Charnockite group of comprises charnockite forming the Hilly Terrain in the south and south east. Pyroxene granite and banded magnetite quartzite occur as narrow band within Charnockite. Migmatite complex is represented by biotite-hornblende gneiss, occurring over a large area in the south-central part. The other member of this group, namely garnetiferous quartzite ± sillimanite occurs as narrow bands within charnockites. Migmatite complex is represented by biotite – hornblende gneiss occurring over a large area in the south central part. The other member of this group, namely garnetiferous quartzite ± sillimanite occurs as narrow bands within older charnockites. In the east, large bodies of intrusive pink granite occur near Kalpetta and Sulthan Bathery. Pegmatite veins are also associated with granites. Dolerite and gabbro are intrusive with older rocks. Large lenticular bodies of gabbro \ anorthosites occur north east of Mananthavady and a large body of diorite occurs near the northern boundary of the district.

Gold, steatite and Molybdenite are some of the known economic minerals reported from the district. Gold occurs on the Quartz veins of Wayanad plateau in Devala-Pandalur – Meppadi – Vythir- Mananthavadi and Thavangal. Steatite grade talc bands have been delineated around Sulthan Bathery. The Ambalavayal granite contains Molybdenum.

Archean type of rock occur in the district, they comprised mainly of Dharwar rocks, charnockite gneiss Charnokite and clopset granite. Dharwar formations represented by Garnetiferous uruginous quartzites, mica and talc schists are found exposed in

south eastern region of Wayanad, While Champion gneiss are located in south and south eastern portion of Wayanad.

### **Mineral Resources**

Basic dykes of probable Cuddiapah age are detected in southern region of Wayanad. In respect of economic minerals, quartz reef, containing minute quantities of gold occur in the district.

## **GEOMORPHOLOGY**

Two distinct physiographic units are discernible in the district viz a western hilly region with high ranges (western ghats and an eastern denuded plateau) and the Wayanad plateau. The attitude vary from 700 – 2061m above MSL. Banasuramala located in Vythiri Taluk has the highest peak. The Plateau slopes towards east. The plateau is bordered on the west by structural – denudational hills whereas in the east by isolated structural hills. In contrast to the southern Kerala and unique to the Wayanad district, the major river systems flow to the east with the Kabani river being the major east flowing river

The district may be divided into 3 physiographic zones. Wayanad plateau, central Sahyadri Highland and mountaneous regions of central sahyadri as per soil survey organization.

On the basis of topographic features the area can be divided into different physiographic zones like high ranges with rugged moderate topography, Intermountain valley and flood plains.

High ranges with rugged topography include hill ranges in the west, north west and south western part of Wayand district and elevation ranges from 1400 to 2100 above MSL .This area is occupied by dense mixed jungles and having rugged topography with steps slopes and narrow valleys.

Hill – ranges along the eastern part and isolated hills come under high ranges with moderately rugged topography. The altitudes of physiographic zones range between 1000 and 1400 c.m a.m.s.l with moderate slope.

Intermountain valleys are the valleys between the high ranges. These areas are occupied by colluvium formed by depositional processes .Erosional intermontane valleys are also seen. The flood plains with apperent alluvial thickness of more than 10m are quite common and form productive aquifers.

The land form units identified in Wayanad are alluvial plains, valley fill, flood plains, valley fill, linear ridge hill crust, sloping terrains, rocky slope and hilly terrain. The flood plain and valley fill are the major fluvial land forms where as moderately sloping lorrain, highly sloping terrain, rocky slope, linear ridge and will crust are major denudational land form units. Flood plains are relatively smooth valley floors adjacent to and formed by rivers, which are subject to overflow. There is no lithological control over land use in the area. Land form units with highest slopes (90) identified in these area in scrap face.

Table:- 6.1

**GEOLOGY DETAILS**

BLOCK	PANCHAYAT	ROCK_TYPE	AREA (Ha.)
<b>Kalpetta Municipality</b>		Charnockite group of rocks	431.86
		Penisular Gneissic Complex	3128.08
			<b>3559.95</b>
<b>Kalpetta</b>	Kaniyambetta	Charnockite group of rocks	838.32
		Metabasic and Ultra basic rocks	2.62
Penisular Gneissic Complex		2909.08	
			<b>3750.02</b>
	Kottathara	Charnockite group of rocks	1.14
		High grade metasedimentary rocks	94.43
		Metabasic and Ultra basic rocks	59.74
		Migmatite Complex	414.29
		Penisular Gneissic Complex	4121.60
			<b>4691.19</b>
	Meppadi	Charnockite group of rocks	9775.56
		High grade metasedimentary rocks	42.42
		Migmatite Complex	415.58
		Penisular Gneissic Complex	3133.39
			<b>13366.96</b>
	Moopainade	Charnockite group of rocks	794.75
		High grade metasedimentary rocks	4.71
		Metabasic and Ultra basic rocks	63.82
		Migmatite Complex	9.35
		Penisular Gneissic Complex	6196.43
			<b>7069.06</b>
	Muttil	Charnockite group of rocks	221.86
		Penisular Gneissic Complex	4498.15
			<b>4720.01</b>
	Padinjarethara	Charnockite group of rocks	2442.25
		Migmatite Complex	1213.30
		Penisular Gneissic Complex	387.98
			<b>4043.54</b>

BLOCK	PANCHAYAT	ROCK_TYPE	AREA (Ha.)	
<b>Mananthavadi</b>	Pozhuthana	Charnockite group of rocks	2366.49	
		High grade metasedimentary rocks	22.97	
		Migmatite Complex	4095.78	
		Penisular Gneissic Complex	615.39	
			<b>7100.63</b>	
	Thariyode	Charnockite group of rocks	885.32	
		Migmatite Complex	6099.12	
		Penisular Gneissic Complex	7.04	
			<b>6991.48</b>	
	Vengapally	Charnockite group of rocks	208.96	
		Migmatite Complex	101.18	
		Penisular Gneissic Complex	1854.52	
			<b>2164.67</b>	
	Vythiri	Basic Rocks	36.69	
		Charnockite group of rocks	4214.93	
		Migmatite Complex	564.41	
		Penisular Gneissic Complex	53.74	
			<b>4869.77</b>	
			<b>58767.33</b>	
	Edavaka	High grade metasedimentary rocks	249.54	
		Penisular Gneissic Complex	4476.29	
			<b>4725.83</b>	
	Mananthavadi	Basic Rocks	86.57	
		High grade metasedimentary rocks	1943.25	
		Metabasic and Ultra basic rocks	23.47	
		Penisular Gneissic Complex	5891.26	
			<b>7944.55</b>	
Panamaram	Basic Rocks	8.95		
	Charnockite group of rocks	28.25		
	High grade metasedimentary rocks	31.66		
	Metabasic and Ultra basic rocks	3.95		
	Penisular Gneissic Complex	7905.66		
		<b>7978.47</b>		

BLOCK	PANCHAYAT	ROCK_TYPE	AREA (Ha.)
Sulthanbathery	Thavinjal	High grade metasedimentary rocks	1247.62
		Penisular Gneissic Complex	13034.28
			<b>14281.90</b>
	Thirunelli	Alkaline rocks	5164.30
		Basic Rocks	3375.57
		High grade metasedimentary rocks	6982.41
		Metabasic and Ultra basic rocks	0.45
		Penisular Gneissic Complex	4620.71
			<b>20143.44</b>
	Thondernadu	Charnockite group of rocks	7074.82
		Penisular Gneissic Complex	6031.27
			<b>13106.09</b>
	Vellamunda	Charnockite group of rocks	1509.35
		Metabasic and Ultra basic rocks	306.84
		Penisular Gneissic Complex	4605.43
			<b>6421.62</b>
			<b>74601.89</b>
	Ambalavayal	Charnockite group of rocks	55.53
		Metabasic and Ultra basic rocks	71.87
		Penisular Gneissic Complex	5212.72
			<b>5340.12</b>
Meenangadi	Charnockite group of rocks	825.89	
	Metabasic and Ultra basic rocks	40.56	
	Penisular Gneissic Complex	4900.86	
		<b>5767.31</b>	

BLOCK	PANCHAYAT	ROCK_TYPE	AREA (Ha.)
	Mullankolly	Basic Rocks	1427.21
		High grade metasedimentary rocks	219.46
		Penisular Gneissic Complex	2626.11
			<b>4272.78</b>
	Nenmeni	Penisular Gneissic Complex	6872.61
		<b>6872.61</b>	
	Noolpuzha	Charnockite group of rocks	1328.69
		Pegmatite/Aplite/Quartz vein	15.71
		Penisular Gneissic Complex	10994.67
		<b>12339.07</b>	
	Poothadi	Charnockite group of rocks	44.85
		High grade metasedimentary rocks	2.55
		Metabasic and Ultra basic rocks	237.10
		Penisular Gneissic Complex	10434.22
		<b>10718.72</b>	
	Pulpally	Basic Rocks	863.65
		Metabasic and Ultra basic rocks	96.44
		Penisular Gneissic Complex	7415.44
		<b>8375.53</b>	
	Sulthanbathery	Charnockite group of rocks	1058.26
		High grade metasedimentary rocks	716.98
		Metabasic and Ultra basic rocks	29.35
		Pegmatite/ Aplite/ Quartz vein	173.87
		Penisular Gneissic Complex	20439.71
		<b>22418.17</b>	
		<b>76104.30</b>	
		<b>District Total</b>	<b>213100.00</b>

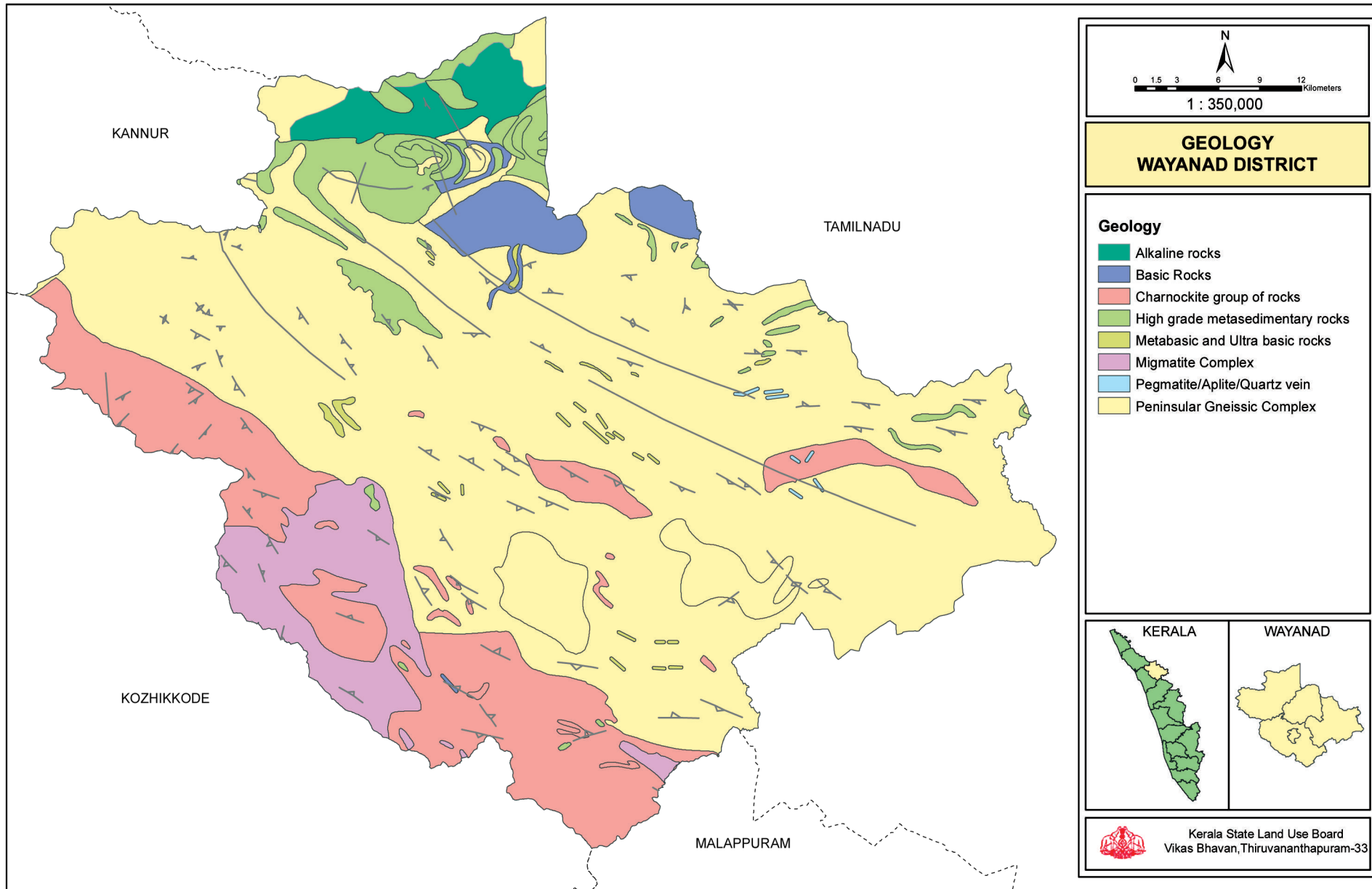






Table 6.2

**GEOMORPHOLOGY DETAILS**

BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha.)
<b>Kalpetta Municipality</b>		Denudational Hills	72.09
		Denudational Structural Hills	562.07
		Piedmont Zone	2304.05
		Upper Plateau (Lateritic)- Dissected	201.48
		Valley	165.30
		Valley Fill	254.95
			<b>3559.95</b>
<b>Kalpetta</b>	Kaniyambetta	Piedmont Zone	186.75
		Residual Mount(Upper Plateau)	69.39
		Upper Plateau (Lateritic)- Dissected	2210.44
		Valley Fill	1283.43
		<b>3750.02</b>	
	Kottathara	Denudational Hills	374.28
		Piedmont Zone	1063.37
		Residual Hill	35.57
		Residual Mount(Upper Plateau)	131.91
		Upper Plateau (Lateritic)- Dissected	1691.37
		Valley	2.30
		Valley Fill	1304.53
		Water Body	87.87
		<b>4691.19</b>	
	Meppadi	Denudational Structural Hills	10238.64
		Piedmont Zone	2567.91
		Rock Exposure	25.35
		Upper Plateau (Lateritic)- Dissected	69.56
		Valley	296.13
		Valley Fill	148.08
		Water Body	21.30
			<b>13366.96</b>
	Moopainade	Channel bar(Flood Plain)	2.05
		Denudational Structural Hills	1322.99
		Piedmont Zone	4960.88
		Residual Hill	61.96
		Residual Mount(Upper Plateau)	19.85
		Upper Plateau (Lateritic)- Dissected	185.14
Valley		129.31	
Valley Fill		381.63	
Water Body	5.24		
	<b>7069.06</b>		

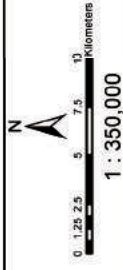
BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha.)
	Muttil	Denudational Hills	8.23
		Denudational Structural Hills	311.17
		Piedmont Zone	960.24
		Residual Mount(Upper Plateau)	187.11
		Upper Plateau (Lateritic)- Dissected	2127.14
		Valley Fill	1126.13
			<b>4720.01</b>
	Padinjarethara	Residual Mount(Pediment)	101.79
		Denudational Structural Hills	1641.20
		Linear ridge(Piedmont Zone)	0.73
		Piedmont Zone	1744.92
		Residual Mount(Upper Plateau)	1.36
		Upper Plateau (Lateritic)- Dissected	166.25
		Valley Fill	362.91
		Water Body	24.37
			<b>4043.54</b>
	Pozhuthana	Denudational Structural Hills	5014.71
		Piedmont Zone	1805.41
		Residual Hill	48.08
		Rock Exposure	13.09
		Valley Fill	186.98
		Water Body	32.35
			<b>7100.63</b>
	Thariyode	Residual Mount(Pediment)	103.90
		Denudational Structural Hills	4420.91
		Linear ridge(Piedmont Zone)	54.21
		Piedmont Zone	1662.05
		Residual Mount(Upper Plateau)	57.03
		Rock Exposure	3.61
		Upper Plateau (Lateritic)- Dissected	330.28
		Valley Fill	331.61
		Water Body	27.88
		<b>6991.48</b>	
	Vengapally	Residual Mount(Pediment)	10.58
		Denudational Hills	33.26
		Piedmont Zone	757.94
		Residual Mount(Upper Plateau)	25.26
		Upper Plateau (Lateritic)- Dissected	825.91
		Valley	116.73
		Valley Fill	366.96
		Water Body	28.02
		<b>2164.67</b>	

BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha.)
Mananthavadi	Vythiri	Denudational Structural Hills	2504.99
		Piedmont Zone	2049.37
		Residual Hill	166.61
		Rock Exposure	7.86
		Valley	132.09
		Water Body	8.86
			<b>4869.77</b>
	Edavaka	Linear Ridge (Upper Plateau)	74.49
		Piedmont Zone	0.47
		Residual Mount(Upper Plateau)	179.59
		Upper Plateau (Lateritic)- Dissected	3510.60
		Valley Fill	889.63
		Water Body	71.04
			<b>4725.83</b>
	Mananthavadi	Residual Mount(Pediment)	181.03
		Channel bar(Flood Plain)	0.31
		Denudational Structural Hills	1411.71
		Linear Ridge (Upper Plateau)	59.82
		Linear ridge(Piedmont Zone)	63.58
		Piedmont Zone	2206.50
		Point bar(Flood Plain)	4.45
		Residual Mount(Upper Plateau)	65.66
		Rock Exposure	0.70
		Upper Plateau (Lateritic)- Dissected	2707.54
		Valley	76.00
		Valley Fill	1067.35
		Water Body	99.89
			<b>7944.55</b>
	Panamaram	Denudational Hills	268.98
		Linear Ridge (Upper Plateau)	70.69
		Piedmont Zone	1704.44
		Point bar(Flood Plain)	3.89
		Residual Hill	49.02
		Residual Mount(Upper Plateau)	343.02
		Upper Plateau (Lateritic)- Dissected	3220.25
		Valley	40.72
Valley Fill		2116.03	
Water Body		161.43	
		<b>7978.47</b>	

BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha.)
	Thavinjal	Residual Mount(Pediment)	438.34
		Denudational Structural Hills	6613.72
		Linear ridge(Piedmont Zone)	24.93
		Piedmont Zone	5069.90
		Residual Mount(Upper Plateau)	72.70
		Upper Plateau (Lateritic)- Dissected	879.55
		Valley Fill	1126.80
		Water Body	55.97
		<b>14281.90</b>	
	Thirunelli	Residual Mount(Pediment)	127.47
		Channel bar(Flood Plain)	8.38
		Denudational Structural Hills	8095.31
		Piedmont Zone	9630.84
		Point bar(Flood Plain)	0.84
		Residual Hill	770.40
		Stabilized channel bar (Flood Plain)	3.64
		Valley Fill	1356.90
		Water Body	149.66
	<b>20143.44</b>		
	Thondernadu	Residual Mount(Pediment)	95.32
		Denudational Structural Hills	8034.61
		Linear ridge(Piedmont Zone)	50.98
		Piedmont Zone	2335.59
		Residual Mount(Upper Plateau)	136.82
		Rock Exposure	3.39
		Upper Plateau (Lateritic)- Dissected	1923.79
		Valley Fill	501.40
		Water Body	24.20
	<b>13106.09</b>		
	Vellamunda	Denudational Structural Hills	1654.11
		Piedmont Zone	749.03
		Residual Mount(Upper Plateau)	41.00
		Rock Exposure	2.65
		Upper Plateau (Lateritic)- Dissected	2656.89
		Valley Fill	1286.06
		Water Body	31.88
<b>6421.62</b>			
<b>74601.89</b>			

BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha.)
Sulthanbathery	Ambalavayal	Piedmont Zone	4293.23
		Residual Hill	126.47
		Structural Hills	234.25
		Valley	222.18
		Valley Fill	464.01
			<b>5340.12</b>
	Meenangadi	Piedmont Zone	2049.32
		Residual Hill	112.92
		Rock Exposure	2.65
		Upper Plateau (Lateritic)- Dissected	2528.02
		Valley	206.78
		Valley Fill	867.62
		<b>5767.31</b>	
	Mullankolly	Residual Mount(Pediment)	11.12
		Channel bar(Flood Plain)	2.01
		Denudational Hills	519.14
		Piedmont Zone	2875.13
		Point bar(Flood Plain)	11.13
		Residual Hill	55.66
		Valley	185.60
		Valley Fill	510.47
		Water Body	102.52
		<b>4272.78</b>	
	Nenmeni	Denudational Hills	40.85
		Piedmont Zone	4443.69
		Residual Hill	42.99
		Structural Hills	615.23
		Valley Fill	1727.95
		Water Body	1.90
		<b>6872.61</b>	
	Noolpuzha	Denudational Hills	5792.23
		Piedmont Zone	4997.21
		Residual Hill	12.64
		Valley Fill	1501.70
		Water Body	35.30
		<b>12339.07</b>	

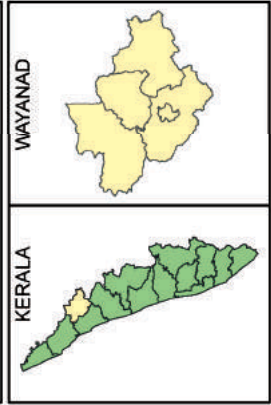
BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha.)
	Poothadi	Residual Mount(Pediment)	95.43
		Denudational Hills	2978.29
		Piedmont Zone	4070.85
		Residual Hill	12.58
		Residual Mount(Upper Plateau)	47.53
		Upper Plateau (Lateritic)- Dissected	2126.14
		Valley	332.39
		Valley Fill	1055.50
			<b>10718.72</b>
	Pulpally	Residual Mount(Pediment)	42.53
		Channel bar(Flood Plain)	29.18
		Channel Island (Flood Plain)	154.11
		Denudational Hills	1527.55
		Piedmont Zone	5470.31
		Point bar(Flood Plain)	2.03
		Residual Hill	8.81
		Upper Plateau (Lateritic)- Dissected	1.21
		Valley	701.46
		Valley Fill	305.98
		Water Body	132.36
			<b>8375.53</b>
		Sulthanbathery	Residual Mount(Pediment)
	Denudational Hills		7153.11
	Piedmont Zone		13075.20
	Residual Hill		58.98
	Valley		309.41
	Valley Fill		1715.77
	Water Body		46.81
		<b>22418.17</b>	
		<b>76104.30</b>	
		<b>213100.00</b>	



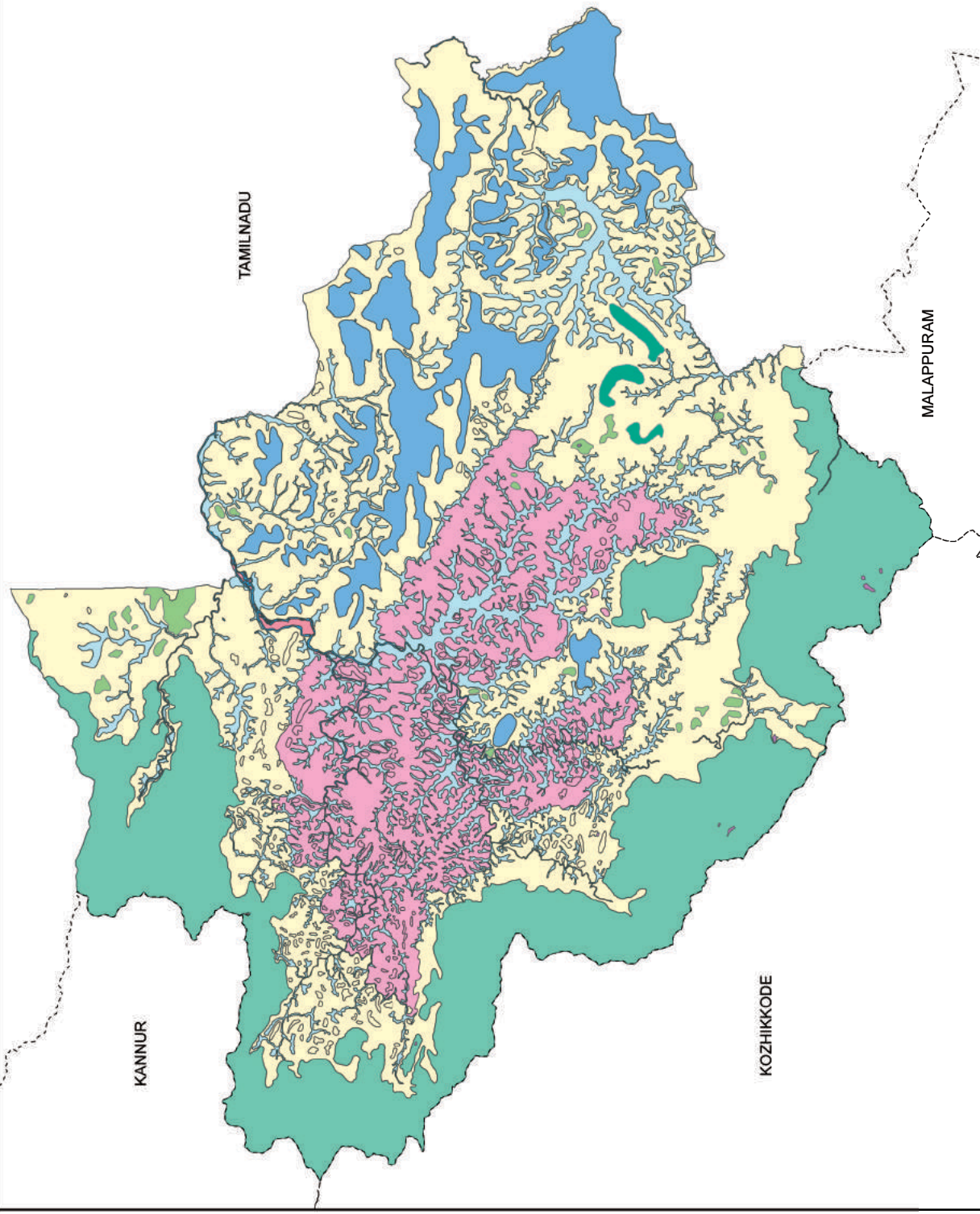
**GEOMORPHOLOGY  
WAYANAD DISTRICT**

**Geomorphology Level 1**

- Denudational Hills
- Denudational Structural Hills
- Flood Plain
- Pediplain
- Piedmont Zone
- Plateau
- Residual Hill
- Rock Exposure
- Structural Hills
- Water Body



Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33







## **PHYSIOGRAPHY**

Topographically the district is in the high land region forming part of the Western Ghats. Located at higher altitude, the district is a plateau in the mountainous region with height ranging from 700 to 2061 metres above the sea level. Baanasuramalai located in Vythiri taluk on the western border of the district is the highest peak. From the highest altitude on the western border of the district the plateau of Wayanad gradually slopes down eastwards. Further eastward from Mananthavady it becomes a rolling land with broad valleys of paddy fields and sloping mounds of plantation crops. The name "Wayanad" is derived from the expression "Wayalnadu" which means, "land of field". With the extensive paddy fields and plantation hill locks in between, Wayanad offers a panoramic view.

In contrast to other parts of the State, the rivers of Wayanad are flowing to the east. The Kabani river system of Wayanad with about 1600 sq. km of drainage area is the perennial source of water to the river Cauvery. Panamaram rivulet originating from Lakkidi and Mananthavady rivulet originating from Tondarmudi joins to form the river Kabani, which is part of Cauveri basin.

Table:- 7.1

**NATURAL REGIONS OF WAYANAD- VILLAGE WISE AREA**

District/Taluk/Village	Low land	Mid land	High land (Ha)
<b>WAYANAD DISTRICT</b>			
<b>1. Sulthan's batteri Taluk</b>			
1. Pulpally	-	-	12600
2. Poothadi	-	-	10616
3. Kidanganad	-	-	17520
4. Noolpuzha	-	-	12550
5. Nenmeni	-	-	6938
6. Sulthan's batteri	-	-	4549
7. Purakkadi	-	-	5352
8. Ambalavayal	-	-	6065
<b>Total</b>	-	-	<b>76190</b>
<b>2. Vythiri Taluk</b>			
1. Kaniyampetta	-	-	-
2. Kottathara	-	-	3175
3. Kuppadihara	-	-	1556
4. Padinjarethara	-	-	3962
5. Thariyode	-	-	7117
6. Vengappally	-	-	2116
7. Kalpetta	-	-	3414
8. Mutil	-	-	4738
9. Muppainad	-	-	11390
10. Kottapadi	-	-	8475
11. Kunnathedavaka	-	-	4784
12. Achooranam	-	-	7130
<b>Total</b>	-	-	<b>57857</b>
<b>3. Mananthavadi Taluk</b>			
1. Periya	-	-	6225
2. Thavinhal	-	-	8005
3. Thirunelli	-	-	20116
4. Vemom	-	-	8010
5. Edavaka	-	-	2517
6. Thandaranad	-	-	13115
7. Vellamunda	-	-	3583
8. Porunnanore	-	-	2871
9. Nallurnad	-	-	2209
10. Kuppathode	-	-	5052
11. Anchukunnu	-	-	3038
<b>Total</b>	-	-	<b>74741</b>



0 1.25 2.5 5 7.5 10  
Kilometers

1 : 350,000

### PHYSIOGRAPHY WAYANAD DISTRICT

### Physiography

- High land
- Midland

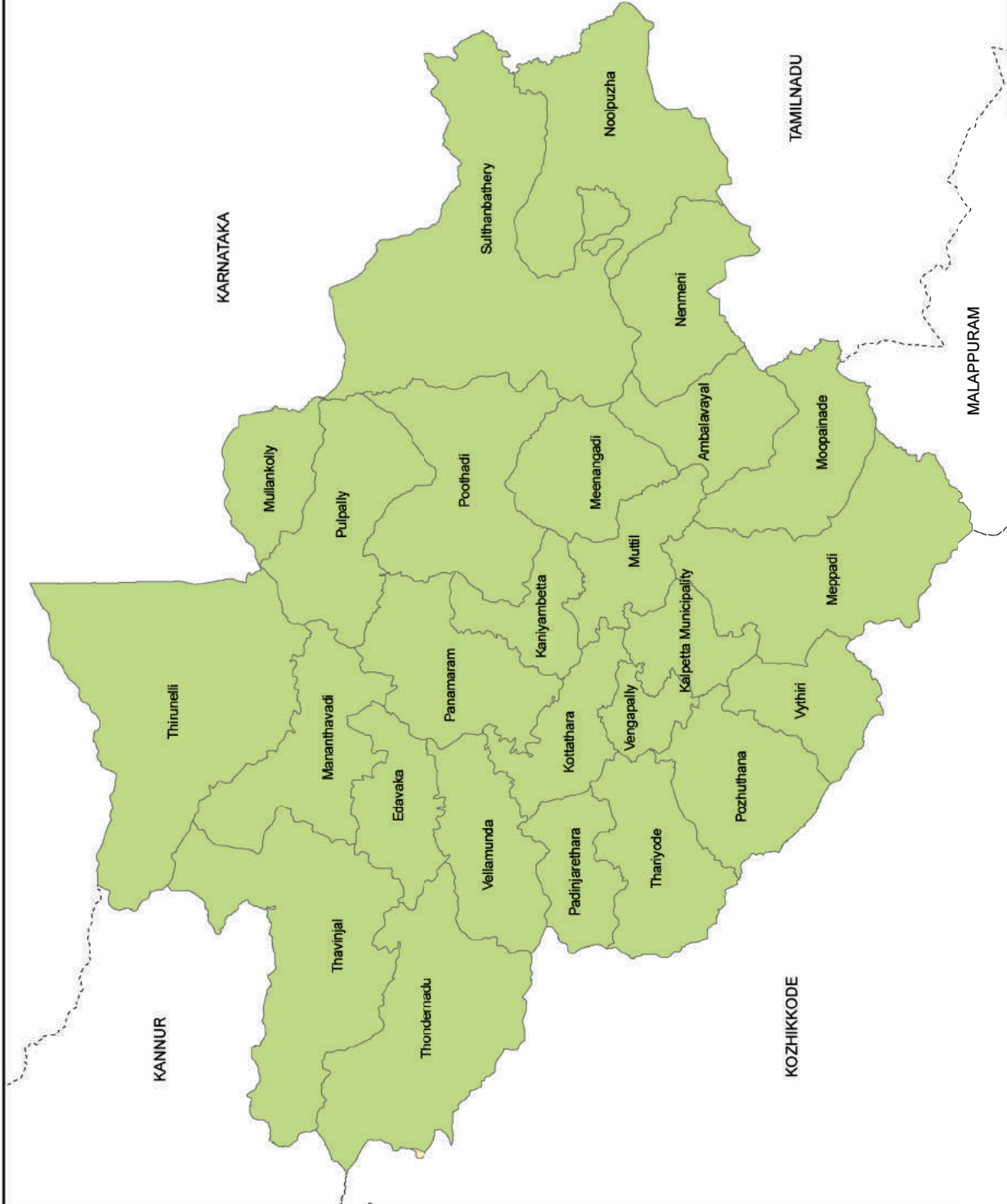


WAYANAD

KERALA



Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33





## SOILS

Soil is the basic natural resources that support all life on earth's surface. Its thickness varies from a few centimeters to a few meters on earth's surface, but it takes millions of years for its formation. Knowledge of soils is fundamental to well being of the present generation and the prosperity to come.

Soil is one of the major resources of land which determines the use potential. Soil information furnished is from the National Bureau of soil survey and Land use planning (NBSS &LUP) under Indian council of Agricultural Research (ICAR), Regional Centre, Bengaluru and State Soil Survey Organisation. The National Bureau of soil survey and land use planning has classified the soils of Kerala into 38 soil units in association of two soils and numbered them serially from K01 to K38 based on characteristics like soil texture, surface gravelliness, soil reaction, slope, soil erosion, depth of water table, drainage etc. The details of soils units in Wayanad district is furnished in below.

The soils of the Wayanad plateau includes poorly drained alluvial soils having sandy loam to sandy clay loam texture to well drained soils developed from gneissic materials having clay loam to clay texture. The soils in the central Sahyadri highlands Physiographic region have well to excessively drained soils developed from gneissic rock. The texture ranges from clay loam to clay texture with varying ranges of gravel content. The soils of the Mountainous region are very deep excessively drained forest soils developed from gneissic material with clay loam texture

1) Loamy soil:-Major part of the district

2) Laterite soil:-Valleys in the middle portion of the district.

They are formed by the Weathering of acidic rocks under alternate wet and dry tropical conditions and are generally developed in regions of heavy rainfall and high Temperature Porous and well drained , their capacity for retaining water and fertilisers is somewhat poor. Laterite soils are usually of low fertility. Those found in the hills are gritty and shallow land deficient in essential plant foods. Those which occur in the plains are deeper and of finer texture containing fair quantity of organic matter but very deficient in phosphate, potash and lime. Though laterite soils are of

low natural fertility they respond well to cultivation and judicious application of fertilisers.

These soils mainly occur in the midlands at elevation 20 to 100 above M.S. L as a strip between the coastal belt and hilly midup land. All these laterite soils are acidic with low water holding capacity, soil erosion and reduced effectively soil volume. The laterite soil is generally suitable for most of the dry land crops. It is mainly cultivated with coconut, arecanut banana, tapioca, vegetables, yams, pepper, pineapple, fruit tree etc.

Table: 8.1

#### **SOIL TYPES IN WAYANAD (OLD LOCAL TERMINOLOGY)**

<b>Type of Soil</b>	<b>Details of location</b>
Laterite soil	Major part of the district
Loamy soil	Valleys in the middle portion of the district

Table:- 8.2

**LEGEND FOR THE SOIL MAPS OF DISTRICTS IN KERALA**

<b>S1. No.</b>	<b>Map symbol</b>	<b>Depth</b>	<b>Texture</b>	<b>Slope</b>	<b>Drainage</b>
1	K 01	vd	s	vg	mw
2	K02	vd	s	vg	e
3	K03	vd	c	vg	vp
4	K04	vd	c	vg	vp
5	K05	vd	c	vg	i
6	K06	vd	l	vg	mw
7	K07	vd	gc	g	w
8	K08	vd	c	vg	mw
9	K09	vd	gc	ms	w
10	K10	vd	gc	g	w
11	K11	vd	gc	g	w
12	K12	vd	gc	g	w
13	K13	d	gc	g	w
14	K14	ms	gl	g	w
15	K15	vd	l	vg	p
16	K16	vd	l	vg	i
17	K17	vd	l	vg	mw
18	K18	vd	c	g	w
19	K19	vd	c	m	w
20	K20	d	gc	s	e
21	K21	md	gc	m	e
22	K22	vd	c	g	w
23	K23	ms	gc	vg	w
24	K24	d	gl	ms	w
25	K25	vd	gc	m	w
26	K26	vd	c	ms	w
27	K27	vd	l	g	w
28	K28	md	gl	g	w
29	K29	vd	l	g	w
30	K30	vd	c	m	w
31	K31	vd	gl	s	w
32	K32	d	l	g	w
33	K33	d	gc	rn	w
34	K34	vd	l	vg	i
35	K35	d	gc	m	w
36	K36	vd	c	ms	w
37	K37	vd	c	m	w
38	K38	vd	c	ms	w

Depth		
1	d	deep
2	vd	very deep
3	md	moderately deep
4	ms	moderately shallow

Slope		
1	g	gentle
2	vg	very gentle
3	m	moderate
4	s	steep
5	ms	moderately Steep

Texture		
1	s	sandy
2	gc	gravelly clay
3	c	clay
4	l	loam
5	gl	gravelly loam

Drainage		
1	mw	moderately well drained
2	w	well
3	e	excessive
4	i	imperfectly
5	vp	very poor
6	p	poor



Table:- 8.3

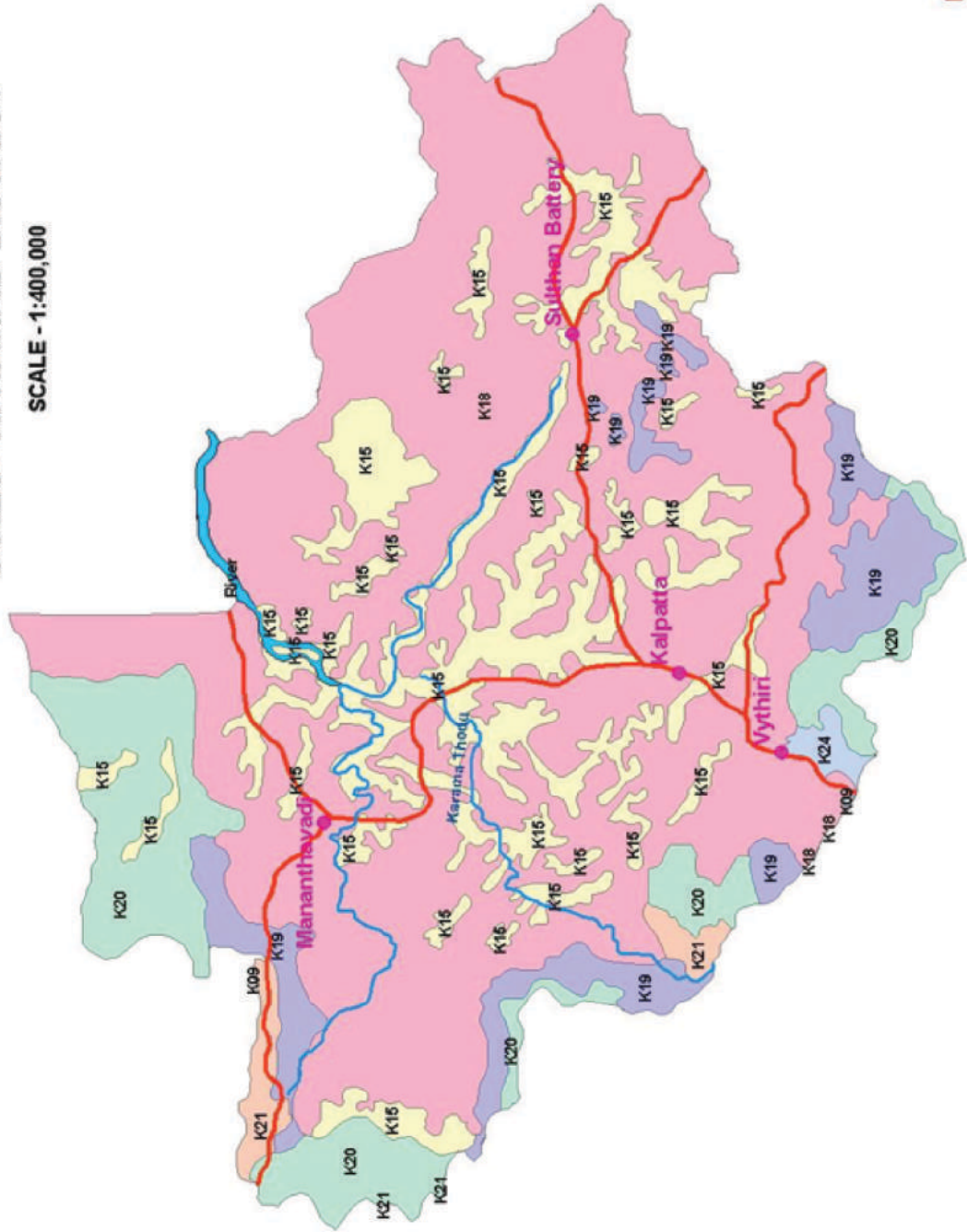
**SOILS OF WAYANAD DISTRICT (COMPREHENSIVE LEGEND)**

Soil Mapping Units	Description Major Soil	Classification	
		Major soils	Inclusions
K-09	Very deep, moderately well drained gravelly clay soils with moderate surface gravelliest on moderately sloping latrine mounds, with moderate erosion; associated with deep, well drained and gravelly clays soils on gently slopes.	Clayey- skeletal, Kaolin Oxic Humitropepts clayey- skeletal, Kalinitic, Ustic Haplohumults	Clayey- skeletal, kaolinitic, Ustic Kandihumults Fine – loamy, mixed ,Typic Kandiustults
K-15	Very deep ,poorly drained , loamy soils with moderately shallow water table in very gently sloping vallys of Wayanad Plateau, with slight erosion; associated with very deep ,imperfectly drained , clayey soils with moderately shallow water table on nearly level lands.	Fine-loamy, mixed, Aeric Tropaquepts Fine,mixed,Aeric, Tropaquepts	Fine – loamy, mixed, Typic Ustropepts Fine mixed , Typic Ustropepts
K-18	Very deep well drained, clayey soils on gently sloping lands of Wayanad Plateau, with moderate erision; associated with very deep, well drained, clayey soils.	Clayey, mixed Ustic Clayey, mixed,Ustic Haplohumults	Clayey- Skeptical, mixed Ustic Palehumults, Clayey - Skeletal, Kaolintic,Kanhaplic haplustults
K-19	Very deep , well drained, clayey soils on moderately sloping high hills with thin vegetarians, with moderate erosion; associated with rock outcrops.	Clay ,mixed, Ustic Palehumults Rock land	Fine –loamy, mixed, Ustic,Humitropepts Fine- loamy, mixed, Ustic Palehumults

Soil Mapping Units	Description Major Soil	Classification	
		Major soils	Inclusions
K-20	Deep, somewhat excessively drained, gravelly clay soils with, moderate surface gravelliness on steeply sloping high hills with thick vegetarian, with moderate erosion ; associated with very deep, well drained, clayey soils on gently slopes	Clayey- skeletal, mixed, Ustic Haplohumults Clayey, mixed, Ustic Palehumults	Rock land , Fine, mixed , Ustic- Humitropepts
K-21	Moderately deep, somewhat excessively, drained gravelly clay soils with coherent material at 75 to 100 cm on moderately sloping medium hills with thick vegetation, with moderate erosion; associated with moderate erosion; associated with moderately shallow, somewhat excessively drained gravelly clay soils with moderately clay soils with moderate surface gravelliness and coherent material at 50 to 75 cm on very steep slopes, severely eroded	Clayey- skeletal, mixed, Ustic Haplohumults Clayey- Skeletal, Kaolinitic, Typic Kanhaplustults	Rock land Fine, mixed, Ustic Humitropepts
K-24	Deep well drained, gravelly loam soils with ironstone layer at 100 to 150 cm on moderately steeply sloping medium hills with thin vegetation with moderate erosion :associated with rock outcrops	Fine – loamy, mixed, Ustic Haplohumults Rock land	Clayey, mixed, Ustic Palehumults Clayey- Skeletal, mixed, Ustic Haplohumults

# SOILS- WAYANAD DISTRICT

SCALE - 1:400,000



Legend	
•	Major places
—	Road
—+—	Railway
Light Blue	K08
Yellow	K15
Pink	K18
Light Purple	K19
Light Green	K20
Light Orange	K21
Light Blue-Grey	K24
Blue	River



## **WATER RESOURCES**

In most developing countries, agriculture is the dominant user of water, accounting for more than 85% of all water use. Agriculture water use raises significant issues for water resources management like issues dealing with water scarcity, competing demands from other sectors, irrigation service delivery and system management, water use efficiencies are so forth. The primary objective in coming years will be to balance water supply and demand among users to ensure adequate water for agriculture and sustainable irrigation system management while satisfying other needs. Investments in irrigation are changing globally in response to changes in environment and experience with previous projects. In the 1970's and 1980's investment typically involved large irrigation and drainage projects with considerable infrastructure development. In the 1990's investment often supported system rehabilitation and management and more recently to small irrigation schemes. Increased water scarcity has shifted the focus from exploitation of water resources and building infrastructure to improvement of water use efficiency.

The basic premise of water resource management is that river basins are best managed and developed as an integrated whole. This is always legally and politically complex due to the challenges of allocation between users and uses. In many cases the need of river infrastructure such as weirs, dykes, regulators and other storage structures are primary drivers for adopting institutional solutions. The investment in storage structures is essential to optimize water use as well as to address the growing number of water conflicts. The surface irrigation consists of major chunk of irrigation infrastructure in the state. There are 18 dams in the state intended for irrigation. Out of this, 13 storages and 5 are barrages.

### **Live storage capacities of irrigation Reservoirs**

The live storage position of the reservoirs during the beginning and end of the monsoon period during 2008 to 2010 are given in the following table.

Table:-9.1

(Mm<sup>3</sup>)

Sl. No	Item	2008	2009	2010
1	Storage at the beginning of the Monsoon	452	392	531
2	Storage at the end of the Monsoon	1156	1180	1213
3	Increase due to Monsoon	704	788	682
4	Average for 10 years			
	(I) at the beginning of the monsoon	405	429	410
	(ii) at the end of the monsoon	1110	1096	1097
	(iii) increase in monsoon storage	705	667	688

Source: Economic Review, 2010

## RIVERS IN WAYANAD

### THE KABINI RIVER:

It has its origin in the Western Ghats falling in the north and south Wayanad Taluks. It is fed by four important tributaries, the Panamaram, the Mananthavady, the Babaji and the Noolpuzha. The total drainage area of the Kabini river basin up to the border where the river crosses the State boundary is 2070 sq.km of which an extent of 1920sq.km. is within Kerala.

Source: Rivers in Kerala, P W D

# RIVERS OF KERALA



## Legend



-  STATE BOUNDARY
-  RIVER/ WATERBODY





Table: 9.2

**GROUND WATER DUG WELL STATISTICS- WAYANAD**

Sl. No.	SITE_NAME	DATE_TIME	WATER_LEVEL (m bgl)
1	Ambalavayal	Apr/10	9.2
2	Appapara	Apr/10	4.87
3	Chenad	Apr/10	14.8
4	Kartikulam	Apr/10	7.45
5	Kavumandam	Apr/10	5.95
6	Lakkidi	Apr/10	1.55
7	Meppady	Apr/10	17.85
8	Minangadi	Apr/10	6.96
9	Neykatti	Apr/10	5.25
10	Noolpuzha	Apr/10	3.13
11	Panamaram	Apr/10	3.55
12	Periya	Apr/10	2.3
13	Pozhutana	Apr/10	6.65
14	Pulpally	Apr/10	3.9
15	Talapoya	Apr/10	1.65
16	Taruvana	Apr/10	10.4
17	Thirunelly	Apr/10	5.9
18	Vaduvanchal	Apr/10	9.15
19	Valatt	Apr/10	10.2
20	Vayittiri	Apr/10	8.2
21	Vaduvanchal	Apr/11	9.07
22	Kamblakat	Apr/11	18.02
23	Vayittiri	Apr/11	7.92
24	Minangadi	Apr/11	6.47

Sl. No.	SITE_NAME	DATE_TIME	WATER_LEVEL (m bgl)
25	Noolpuzha	Apr/11	2.49
26	Pulpally	Apr/11	3.16
27	Perikallur	Apr/11	12.84
28	Neykatti	Apr/11	4.98
29	Ambalavayal	Apr/11	9
30	Cheyymbam	Apr/11	2.02
31	Chenad	Apr/11	14.92
32	Taruvana	Apr/11	11.01
33	Kartikulam	Apr/11	4.21
34	Thirunelli	Apr/11	7.5
35	Appapara	Apr/11	2.98
36	Kavumandam	Apr/11	5.84
37	Pozhutana	Apr/11	6.42
38	Padinjarattara	Apr/11	8.8
39	Meppady	Apr/11	17.52
40	Lakkidi	Apr/11	1.42
41	Talapoya	Apr/11	1.65
42	Periya	Apr/11	5.33
43	Vellamunda	Apr/11	5.45
44	Mannanthody	Apr/11	8.25
45	Koroth	Apr/11	2.91
46	Panamaram	Apr/11	3
47	Kellur	Apr/11	7.61
48	Valatt	Apr/11	9.11

Source:- Central Ground Water Department

Table :- 9.3

**GROUND WATER STATISTICS- WAYANAD**

SITE NAME	SAMPLING TIME	pH	EC	Na	K	Ca	Mg	HCO <sub>3</sub>	CO <sub>3</sub>	Cl	NITRATE
Ambalavayal	Apr/08	7.31	164			9.6	1.96			18	17
Appapara	Apr/08	8.31	123			9.6	3.42			5.7	2.6
Chenad	Apr/08	8.58	176			18	5.61			13	0.71
Cheyyambam	Apr/08		423			14	20.68			67	20
Kalpetta	Apr/08	8.35	500			27	6.48			54	23
Kamblakat	Apr/08	8.12	144			9.6	3.42			8.5	19
Kartikulam	Apr/08		177			11	1.59			16	17
Kavumandam	Apr/08	8.15	106			7.2	1.95			8.5	8.7
Kellur	Apr/08	8.05	320			17	4.76			47	41
Koroth	Apr/08	7.95	86			8.8	1.47			7.1	3.8
Lakkidi	Apr/08		59			4	0.98			4.3	1.6
Mannanthody	Apr/08	8.77	470			23	7.44			52	40
Meppady	Apr/08	8.05	141			7.2	3.41			20	17
Minangadi	Apr/08		316			16	6.34			44	35
Muthunga	Apr/08	8.64	260			14	3.66			27	3.8

SITE NAME	SAMPLING TIME	pH	EC	Na	K	Ca	Mg	HCO <sub>3</sub>	CO <sub>3</sub>	Cl	NITRATE
Neykatti	Apr/08	8.63	401			32	7.33			57	15
Noolpuzha	Apr/08	8.35	122			7.2	5.36			5.7	1.9
Padinjarattara	Apr/08	8	157			12	3.9			11	19
Panamaram	Apr/08		143			8	1.47			18	2.3
Perikallur	Apr/08		370			29	0.89			62	22
Periya	Apr/08	6.97	36			2.4	0.98			5.7	1.3
Pozhutana	Apr/08	7.73	112			7.2	1.95			9.9	0.56
Pulpally	Apr/08	8.8	526			18	30.41			68	2.5
Talapoya	Apr/08	7.75	90			7.2	1.95			14	4
Taruvana	Apr/08	6.22	93			4	2.44			21	10
Thirunelly	Apr/08	7.5	56			4.8	0.98			5.7	2.5
Vaduvanchal	Apr/08	7.44	186			13	3.78			24	52
Valatt	Apr/08	8.1	91			13	2.33			4.3	4.6
Vayittiri	Apr/08	7.86	171			11	3.54			17	12
Vellamunda	Apr/08	7.7	58			2.4	1.46			4.3	1

Source:- Central Ground Water Department





0 1.25 2.5 5 7.5 10  
kilometers

1 : 350,000

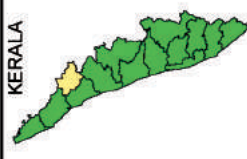
### WATER RESOURCE WAYANAD DISTRICT

#### WATER RESOURCE

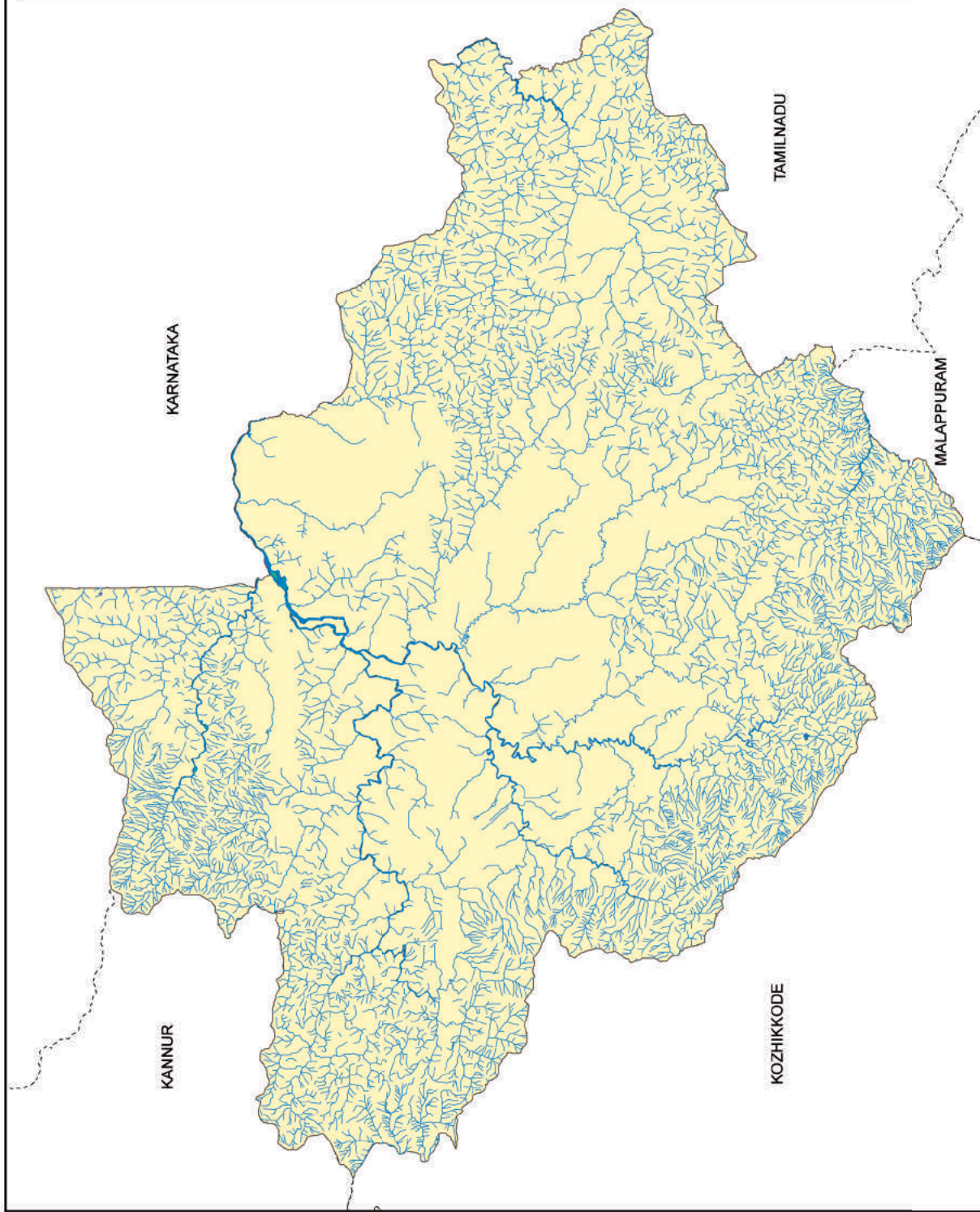
- DRAIN
- OPEN AREA
- RIVER
- RIVER ISLAND
- RIVER ROCK
- RIVER SAND
- WATERBODY DRY
- WATERBODY WET

KERALA

WAYANAD



Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33





## MINERALS

Table:- 10.1

### INVENTORY OF THE MINERAL RESOURCES OF THE STATE

Name of Mineral	Location	Est. reserves (in Million Tonnes)	Remarks
Mineral Sand	Chavara-Kayamkulam Sector, Kollam Dist. North of Kayamkulam Pozhi-Thottappalli, Alappuzha Dist.	127.00* 17.00	Total Heavy mineral Estimated Reserve
<b>Gold</b> Primary Gold	Maruda, Nilambur, Malappuram Dist., Kappil, Nilambur, Malappuram Dist., Pattumala, Attapady, Kottathara, Palakkad Dist.	0.55 0.0613 0.08 0.0067	4 g/t 4.1 g/t 12.98 g/t 14.99 g/t
Placer Gold	Punnapuzha and Chaliyarpuzha, Nilambur, Malappuram Dist.	30 m cu.m. 2.5 m cu.m	0.07 g/m <sup>3</sup> 0.1 g/m <sup>3</sup>
Iron ore	Kozhikode & Malappuram Dists.	84.00	Magnetite Oxidised: 39.0 MMT Unoxidised 45.0 MMT Fe 32.0 - 41.0%
Bauxite	Kannur & Kasargod Dists. Kollam & Thiruvananthapuram Dists.	10.16 2.65*	Metallurgical grade 5.2 MMT
Graphite	Thiruvananthapuram, Kollam, Kottayam & Ernakulam Dists.	2.81	5% to 25 % Fixed Carbon
China Clay	Thiruvananthapuram, Kollam, Kannur & Kasargod Dists.	172.00	Probable : 80 Possible : 92

Name of Mineral	Location	Est. reserves in Million Tonnes)	Remarks
Ball Clay	Thiruvananthapuram, Kollam, Kannur & Kasargod Dists.	5.67	Inferred Reserve
Fire Clay	Kollam, Alappuzha, Ernakulam, Thrissur & Kannur Dists.	11.50	Inferred Reserve
Silica Sand	Cherthala, Alappuzha Dists.	28.40	Mineable Resources Glass Sands - High SiO <sub>2</sub> Recently assessed
Lignite	Madayi, Kannur Dist., Nileswaram, Kadamkottumala & Kayyur, Kasargod Dist.	5.60 2.50 1.00 0.55	
Limestone	Pandarathu, Walayar, Palakkad Dist.	24.00	15-20 % only available now
Lime Shell	Vembanad lake & adjacent areas Alappuzha & Kottayam Dists. Coastal tracts of Kannur, Kasaragod Dist. & Estuaries of Periyar and Kadalundi puzha Kozhikode Dist.	4.05*	Chemical grade
Magnesite	Salayoor, Mulli, Palakkad Dist.	0.037*	
Talc/Steatite	Kozhikode & Kannur Dists.	7.94	Inferred Reserve

Source:- State Mining & Geology Department



Table: 10.2

**NUMBER OF MINING LEASES IN THE DISTRICTS OF KERALA AS ON 31.3.2004**

Sl. No	Name of Mineral	TVM	Kollam	Pathanam-thitta	Alappuzha	Kottayam	Idukki	Ernakulam	Thrissur	Palakkad	Malappuram	Kozhikode	Wayanad	Kannur	Kasaragod	Total
1	Bauxite		3													3
2	China Clay	34	5											2	1	42
3	China Clay, Ball Clay, Fire Clay		1													1
4	Limeshell				6	2										8
5	Limestone								1							1
6	Graphite	1														1
7	Mineral Sands		3													3
8	Silica Sands				21											21
9	Quartz												4			4
10	Laterite													1		1
	<b>Total</b>	<b>35</b>	<b>12</b>		<b>27</b>	<b>2</b>				<b>1</b>			<b>4</b>	<b>3</b>	<b>1</b>	<b>85</b>

Source:- State Mining & Geology Department

Table: 10.3

**Number of Quarrying Permits in force as on 31.3.2004**

Sl. No.	District	Granite Building Stone	Laterite	Brick Clay	River Sand	Ordinary Sand	Lime Shell	Total
1	Thiruvananthapuram	81	2			2		85
2	Kollam	94		17		2		113
3	Alappuzha			8	13		4	25
4	Pathanamthitta	113	2	6		3		124
5	Kottayam	77	6	1		193		277
6	Idukki	93				7		100
7	Ernakulam	92	2	41	6			141
8	Thrissur	36	8		7			51
9	Palakkad	167	14	1		6		188
10	Malappuram	317						317
11	Kozhikode	88	25	3		1		117
12	Kannur	106	139		1			246
13	Wayanad	108		33		7		148
14	Kasargod	81	137		6	35		259
	<b>Total</b>	<b>1453</b>	<b>335</b>	<b>110</b>	<b>33</b>	<b>256</b>	<b>4</b>	<b>2191</b>

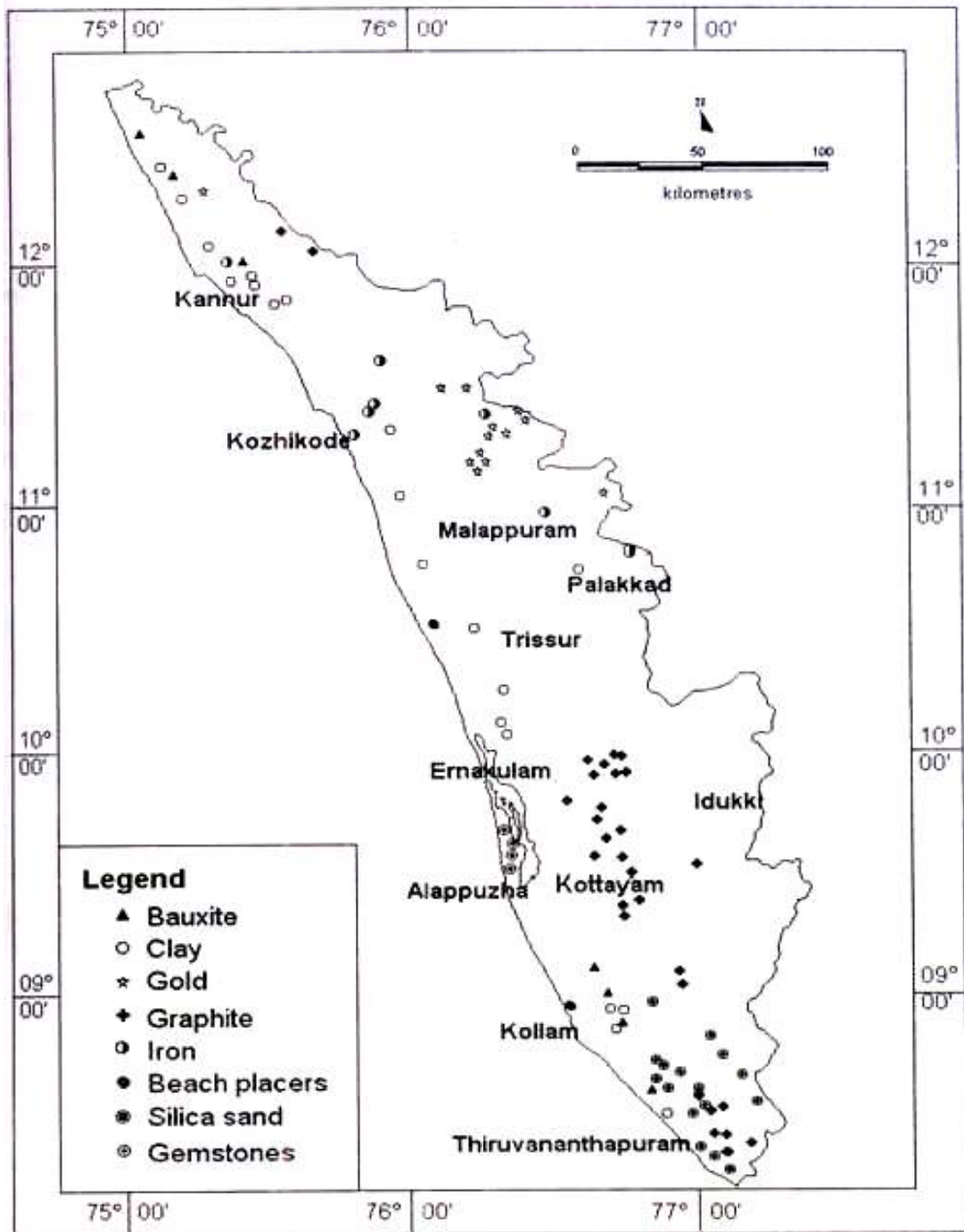
Table:- 10.4

**Quarrying Leases for 2003-2004 as on 31.3.2004**

Sl. No.	District	Granite Building Stone	Limeshell	Seashell	Granite Dimensi on Stone	Brick Clay	Total
1	Thiruvananthapuram	55			35		90
2	Kollam	3					3
3	Alappuzha		1	1			2
4	Pathanamthitta	31					31
5	Kottayam	28	1				29
6	Idukki	13					13
7	Ernakulam	38					38
8	Thrissur	24					24
9	Palakkad	17			2		19
10	Malappuram	26					26
11	Kozhikode	35					35
12	Kannur	14					14
13	Wayanad	6					6
14	Kasargod	1					1
	<b>Total</b>	<b>291</b>	<b>2</b>	<b>1</b>	<b>37</b>		<b>331</b>

Source:- State Mining &amp; Geology Department

### Mineral reserves (2000-01)



Mineral map of Kerala (After Dept. of Mining and Geology, 2005)

Source: [www.Kerenvis.nic.in](http://www.Kerenvis.nic.in)



## **LAND USE**

The spatial information on land use/land cover and their pattern of change is essential for planning, utilization and management of the country's land resources. Land use/land cover inventories are assuming increasing importance in various resource sectors like agriculture planning, settlement and cadastral surveys, environmental studies and operational planning based on agro-climatic zones. Information on land use/ land cover permits a better understanding of the land utilization aspects on cropping pattern, fallow land, forest and grazing land, wasteland, surface water bodies etc., which is very vital for developmental planning. Further the draft outline of the National land Use Policy having strongly re-iterated the main thrust and strategy on "Optimum Land Use Planning" for sustained efforts and economic returns, an up to date information on the nature, distribution and extent of land use/land cover will be of great relevance. Space remote sensing with its wider scope, rapid and repetitive coverage capabilities, can provide highly reliable and accurate estimate on the various resources.

Realising its importance, land use mapping on 1:250,000 scale was envisaged for the entire country using satellite data by Department of Space in 1986 as a part of Remote Sensing Application Mission Project. The study enabled to arrive at a Nationwide Land use/Land cover classification system.

Subsequently, the Government of Kerala felt the need for having an upto date information for the whole State on agriculture and other land use categories and their estimate for agro-climate zone planning in 1:50,000 scale. The work undertaken by the Board, involves preparation of land use maps on 1:50,000 scale for 14 districts through digital techniques.

The Kerala State Land Use Board was entrusted with the task of preparing the Land use/land cover maps of State, by interpretation of satellite imagery. Standard False Colour Composite (FCC) generated on 1:12,500 scale of IRS (LISS-IV) was interpreted for identification of different Land use/Land cover classes, based on the image characteristics like tone, size, shape, pattern, texture, location, association etc. by developing a detailed interpretation key for each district.

Multi-date imagery was essentially interpreted to identify and map the details of crop land in Viruppu and Mundakan seasons the area under double crop, fallow lands and for better boundary delineation of boundaries of the other land use/land cover classes. Ancillary data like topographical maps and other thematic maps of the district was also used for the interpretation.

### **METHODOLOGY**

The methodology is essentially digital interpretation of IRS-1C (LISS - IV) geo-coded image (FCC) for identification of different categories of land use/land cover using standard visual image interpretation techniques which is based on interpretation elements such as tone, texture, shape, size, etc. supplemented by the local knowledge of the interpreter. Other ancillary data like topographical maps and any other available information will be used for identification and mapping of land

use/ land cover. The interpreted details are to be verified on the ground in order to rectify the doubtful areas, and based on the ground verification, the wasteland boundaries (interpreted details) are to be finalized.

The geographical area under different land use/land cover categories was then computed and expressed as simple percentage to the total geographical area of each district.

### **Land Use/Land Cover Categories and their Spatial Distribution**

Land use/land cover: Land use refers to man's activities and the various use which are carried on land. Land cover refers to, "natural vegetation, water bodies, rock/soil, artificial cover and others resulting due to land transformations".

A brief description of the major land use/land cover categories observed in the different districts of the State and their spatial distribution is given below:

#### **i) Built up Land**

It is defined as an area of human habitation developed due to non-agricultural use and that which has a cover of buildings, transport, communication, utilities in association with water, vegetation and vacant lands. A total area of 19.88 Sq.km. which represent .933 % of total Geographical Area falls under this category.

#### **ii) Agricultural land**

It is defined as the land primarily used for farming and for production of food, fibre, other commercial and horticultural crops. It includes land under crops (irrigated and unirrigated), fallow land and plantation area under agricultural tree crops planted adopting certain agricultural management techniques. A total area of 1102.69 Sq.km. which represent 51.77 % of total Geographical Area falls under this category.

#### **iii) Forest**

It is an area (within the notified forest boundary) bearing an association predominantly of trees and other vegetation types capable of producing timber and other forest produce. This category includes Evergreen/Semi-evergreen and Deciduous forests, degraded forests where the vegetative (crown) density is less than 20% of the canopy cover, forest blanks described as openings amidst forests without any tree cover and forest plantations of trees of forestry importance and raised on notified forest lands. A total area of 860.28 Sq.km. which represent 40.39% of total Geographical Area falls under this category.

#### **iv) Wetlands**

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water table. For the purposes of this classification, wetlands must have one or more of the following three attributes 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil;

and 3) the substrate is nonsoil and is saturated with water or covered by shallow water level at some time during the growing season of each year.

#### v) Waste lands

It is described as degraded land which can be brought under vegetative cover with reasonable efforts and which is currently under utilized and land which is deteriorating due to lack of appropriate water and soil management or on account of natural causes. The two major classes in the category are; a) Land with or without scrub which occupy higher topography like uplands or high grounds with or without scrub, generally prone to degradation or erosion and b) barren rocky/ stony waste/ sheet rock area which are rock exposures of varying lithology and devoid of soil cover and vegetation. They occur amidst hill forests as opening or scattered as isolated exposures or loose fragments of boulders or as sheet rocks on plateau and plains.

#### vi) Water bodies

It is an area of improduced water, area in extent and often with a regulated flow of water,. It includes manmade reservoirs/lakes/tanks/canals, besides natural lakes, rivers/streams and creeks.

The district wise area under land use/land cover categories in the State identified and mapped is furnished in Table separately.

Table showing land use/ land cover of Wayanad district

#### LAND USE / LAND COVER CATEGORIES

Sl. No.	Category	Area (Sq.Km)	Percentage
1	Built up land (urban) - industrial	0.09	0
2	Built up land (urban) - commercial	2.46	0.12
3	Built up land (rural) - residential	14.63	0.69
4	Built up land (rural) - mixed builtup	2.7	0.13
5	Paddy - viruppu	133.25	6.26
6	Paddy - viruppu + mundakan	80.64	3.79
7	Paddy reclaimed arecanut	40.35	1.89
8	Paddy reclaimed mixed crop	1.86	0.09
9	Paddy reclaimed banana	25.96	1.22
10	Paddy reclaimed banana +tapioca	0.15	0.01
11	Paddy reclaimed residential	0.77	0.04
12	Paddy - fallow	0.58	0.03
13	Tea	76.96	3.61
14	Coffee	722.06	33.9

15	Rubber	13.32	0.63
16	Mixed crop	6.1	0.29
17	Pepper	0.05	0
18	Tapioca	0.64	0.03
19	Semi evergreen/Evergreen - Dense mixed forest	255.33	11.99
20	Semi evergreen/Evergreen - Dense mixed forest (Reserve Forest)	268.72	12.62
21	Semi evergreen/Evergreen - Dense mixed forest mainly bamboo	24.17	1.13
22	Semi evergreen/Evergreen - Dense mixed forest mainly bamboo (Reserve Forest)	101.44	4.76
23	Semi evergreen/Evergreen - Open mixed forest	20.48	0.96
24	Semi evergreen/Evergreen - Scrub forest	20.13	0.95
25	Deciduous - Dense mixed forest mainly bamboo + teak	67.84	3.19
26	Deciduous - Dense mixed forest mainly teak	7.07	0.33
27	Deciduous - Dense mixed forest mainly teak (Reserve Forest)	56.09	2.63
28	Deciduous - Scrub forest	0.54	0.03
29	Forest blank	0.48	0.02
30	Forest plantation - Teak	19.32	0.91
31	Forest plantation - Teak (Reserve Forest)	10.03	0.47
32	Forest plantation - Eucalyptus (Reserve Forest)	4.89	0.23
33	Forest plantation - Soft wood	3.75	0.18
34	Grassland	6.77	0.32
35	Grassland - degraded	1.28	0.06
36	Land with scrub	60.74	2.85
37	Land without scrub	27.34	1.28
38	Mining/Industrial wastelands	0.03	0
39	Barren rocky/sheet rock area	3.43	0.16
40	Degraded land under plantation crop (Coffee)	27.97	1.31
41	Degraded land under plantation crop (Tea)	1.98	0.09
42	Degraded land under plantation crop (Rubber)	0.52	0.02
43	Under utilised/degraded notified forest	4.61	0.22
44	Sands - riverine	0.34	0.02
45	Water bodies	11.88	0.56
	<b>Total</b>	<b>2129.74</b>	<b>100</b>



**PANCHAYATH RESOURCE MAPPING (PRM)**

**KALPETTA BLOCK - LAND USE (Area in Ha.)**

Table:- 11.1

Sl. No.	Land Use	Kottathara	Vengapally	Vythiri	Meppadi	Moopaindau	Muttill	Padinjarath ara	Pozhuthana	Thariyode
1	Built up land	3.25	7.41	20.41	8.80	24.68	81.16	18.41	16.93	0.32
2	Paddy - Virippu	175.20	163.27	14.47	119.95	15.84	240.06	276.24	3.04	40.72
3	Paddy - Mundakan	42.43	4.89		99.12	1.87	3.04	41.65		
4	Paddy - Puncha	64.44	2.97			2.55	21.23	55.60	3.99	2.02
5	Paddy - Virippu + Mundakan	27.29			1.50	9.55		33.68		
6	Paddy - Mundakan + Puncha	5.14	4.52							
7	Paddy - Virippu + Puncha	43.82					125.95			
8	Paddy + Arecanut					3.55	28.22	30.40		
9	Paddy + Banana					13.43	16.02			
10	Paddy land converted to Coconut					0.86	3.37	5.35	0.46	
11	Paddy land converted to Arecanut	54.99	34.17	14.04	73.08	137.21	140.71	127.02	45.70	23.82
12	Paddy land converted to Banana	187.03	143.14	17.59	45.53	301.82	179.35	259.89	147.31	78.24
13	Paddy land converted to Arecanut + Banana	46.49	122.65	2.38	14.47	36.09	135.74	48.38	49.35	21.81
14	Paddy land converted to Mixed Crops	11.30	23.75	59.36	120.59	68.54	151.63	23.91	13.23	18.02
15	Paddy land converted to Coconut + Arecanut				1.89	8.12	10.19	5.46		
16	Paddy land converted to Arecanut + Tuber Crops						32.06			
17	Paddy land converted to Coconut + Banana			2.48	6.70				1.11	
18	Paddy land converted to Arecanut + Coffee				3.32					

Sl. No.	Land Use	Kottathara	Vengapally	Vythiri	Meppadi	Moopaindau	Muttill	Padinjarathara	Pozhuthana	Thariyode
19	Paddy land converted to Arecanut + Rubber				2.01					
20	Paddy land converted to Coffee + Rubber				5.04					
21	Paddy land converted to Rubber				10.74	45.70	2.61			1.44
22	Paddy land converted to Tapioca	9.12		1.19				2.18		2.59
23	Paddy land converted to Banana + Tapioca	22.51		1.54						
24	Paddy land converted to Vegetables	2.98				8.63	34.90	5.50		
25	Paddy land converted to Cardamom	13.79				3.15				
26	Paddy land converted to Arecanut + Cardamom					23.92				
27	Banana	114.52		7.72	3.86	10.81	26.63	125.66	44.95	48.77
28	Banana + Tapioca				1.64					
29	Tuber Crops						6.74			
30	Ginger				3.56					
31	Cardamom	15.69		0.71	460.29	37.07	4.14			
32	Cardamom + Tea				8.02					
33	Cardamom + Rubber				21.67					
34	Coconut	8.31			224.45	5.20	17.65	22.22		10.93
35	Coconut + Arecanut		8.84	3.72	39.43	1.04	44.07			2.26
36	Coconut + Rubber						2.21			
37	Coconut + Banana	1.89		2.04	6.25					

Sl. No.	Land Use	Kottathara	Vengapally	Vythiri	Meppadi	Moopaindau	Muttill	Padinjarath ara	Pozhuthana	Thariyode
38	Arecanut	86.52	63.47	5.49	37.27	108.77	69.32	58.34	11.39	40.97
39	Arecanut + Banana	23.07	19.86		5.23	5.63	32.21		2.21	14.92
40	Arecanut + Vanilla						3.21			
41	Rubber + Banana				1.22					
42	Rubber + Arecanut				8.73					
43	Mixed Crops	1271.08	433.79	642.46	1446.58	344.28	656.76	1668.77	112.19	744.64
44	Mixed Trees	17.77	9.62	144.01	841.51	12.38	202.57	250.08	158.45	59.42
45	Teak							2.91		
46	Cashew							8.12		
47	Rubber	171.80	41.73	3.87	17.34		50.28	154.90	331.40	74.77
48	Rubber + Vanilla						1.40			
49	Tea			525.28	1667.06	870.40			608.98	
50	Coffee	195.96	948.68	671.93	1074.61	1717.63	1093.44	239.73	1248.37	333.42
51	Coffee + Tea			13.61		141.86			118.61	
52	Coffee + Rubber	175.59	21.88	94.60	512.93	607.78	220.80	3.32	41.63	68.26
53	Coffee + Coconut	9.67	2.04				8.48			12.73
54	Coffee + Arecanut	6.87	66.21	19.81	24.39	35.52	78.41	5.18	43.63	50.08
55	Coffee + Banana					5.29				
56	Coffee + Mixed Crops		1.72				170.78	33.46		32.66

Sl. No.	Land Use	Kottathara	Vengapally	Vythiri	Meppadi	Moopaindau	Muttill	Padinjarath ara	Pozhuthana	Thariyode
57	Coffee + Ginger	155.45	11.04	215.08		90.21	178.00		102.03	18.60
58	Coffee + Mixed Crops		4.26			15.25	1.52			
59	Coffee + Tuber Crops								216.17	
60	Coffee + Vanilla						2.62			
61	Play Ground	2.10								
62	Waste Land	31.59	4.37	120.91	392.50	239.67	19.48	21.27	1188.63	1.78
63	Cultivable Waste Land	19.69	13.4	34.76		49.88	1.55	18.20	7.44	13.39
64	Granite Quarry				0.72					
65	Rock Exposures			1.85			1.21			0.61
66	Forest			2179.33	5320.38	1764.20		1782.30	2513.66	4880.24
67	Open Ground			13.45	5.28					
68	Marshy land			1.77		5.77		22.42		
69	Water Source	43.39	18.96	79.05	83.78	12.27	75.13	88.14	83.22	12.68
70	Dam Land							79.47		
71	Project Area						279.18			472.27
	<b>Total</b>	<b>3060.74</b>	<b>2176.64</b>	<b>4914.91</b>	<b>12721.44</b>	<b>6786.42</b>	<b>4454.03</b>	<b>5518.16</b>	<b>7114.08</b>	<b>7082.38</b>

Table:- 11.2

## MANANTHAVADY BLOCK- LAND USE (Area in Ha.)

Sl. No.	Land Use	Edevaka	Mananthavady	Tavinjal	Thiruinelli	Thondernadu	Vellamunda
1	Builtup land	17.88	146.81	30.66	6.83	32.93	9.02
2	Paddy - Virippu	224.93	393.71	326.45	798.96	177.55	628.03
3	Paddy - Mundakan	7.51	112.21	12.88	101.34	2.12	3.03
4	Paddy - Puncha		118.09	44.02	29.20	3.93	
5	Paddy - Virippu + Mundakan	45.99	65.82	2.79	0.93	175.76	13.74
6	Paddy - Mundakan + Puncha		2.24	1.08	33.78		
7	Paddy - Virippu + Puncha	181.77	116.58	27.51		61.05	92.80
8	Paddy + Arecanut		14.52				
9	Paddy + Banana		23.55			1.68	
10	Paddy land converted to Coconut	2.96	5.23	0.69	6.87		0.29
11	Paddy land converted to Arecanut	253.14	161.08	85.71	61.29	25.69	137.11
12	Paddy land converted to Banana	143.72	338.16	519.87	45.50	214.63	372.58
13	Paddy land converted to Arecanut + Banana		1.43			4.04	2.72
14	Paddy land converted to Coconut + Arecanut	10.53	10.54			5.54	15.06
15	Paddy land converted to Arecanut + Banana	34.33	76.83	92.67			184.89
16	Paddy land converted to Arecanut + Rubber		3.79				
17	Paddy land converted to Arecanut + Pepper		1.61				
18	Paddy land converted to Mixed Crops	145.69	88.67	222.36	161.95	15.33	141.81
19	Paddy land converted to Vanilla		1.58				

Sl. No	Land Use	Ecdavaka	Mananthavady	Tavinjal	Thiruinelli	Thondernadu	Vellamunda
20	Paddy land converted to Tapioca	0.26	8.90		6.17	1.58	
21	Paddy land converted to Arecanut + Ginger	4.12					
22	Paddy land converted to Banana + Rubber		1.69				
23	Paddy land converted to Banana + Pepper		1.99				
24	Paddy land converted to Banana + Ginger		4.14				4.73
25	Paddy land converted to Banana + Tuber Crops		1.42				
26	Paddy land converted to Ginger	1.65	2.56		40.74	0.87	0.73
27	Paddy land converted to Pepper				8.01		
28	Paddy land converted to Builtup land		1.14		0.59		
29	Paddy land converted to Banana + Tapioca			0.79		43.61	
30	Tuber Crops	2.37	23.89				1.69
31	Vanila	3.08	8.41				
32	Vegetables		6.34				
33	Coconut	16.97	57.43	27.07	4.51		23.57
34	Arecanut	37.82	142.57	89.71	52.64	50.54	19.54
35	Banana	31.02	75.00	15.32	15.78	4.23	6.11
36	Pepper	357.51	139.45	41.69	16.69	36.10	189.78
37	Ginger	5.45	18.08		8.00		2.98
38	Ginger + Pepper						4.13
39	Ginger + Tuber Crops		131.59				
40	Banana + Tuber Crops			2.11			

Sl. No	Land Use	Ecdavaka	Mananthavady	Tavinjal	Thiruinelli	Thondernadu	Vellamunda
41	Banana + Pepper		1.10				
42	Coconut + Arecanut		20.86			0.81	0.56
43	Coconut + Pepper		14.16				6.91
44	Coconut + Ginger		8.06				
45	Coconut + Rubber		8.17				
46	Coconut + Vanilla		1.68				
47	Arecanut + Rubber		2.29				
48	Arecanut + Pepper		6.79				11.42
49	Arecanut + Ginger		5.36				
50	Arecanut + Banana		37.33	0.82			2.51
51	Rubber + Arecanut		8.63				
52	Mixed Crops	1495.99	1015.22	3293.97	923.25	700.32	1747.07
53	Mixed Trees		274.39	78.32	8.38	209.43	100.54
54	Cardamom			27.23	2.25		16.77
55	Cardamom + Ginger			27.31			
56	Cardamom + Pepper	1.58		141.84			
57	Cashew	28.88	36.36	65.01		20.85	
58	Rubber	156.03	257.13	179.50	48.61	50.90	59.13
59	Rubber + Ginger		5.17				
60	Rubber + Pepper		15.01	6.56		2.22	10.41
61	Rubber + Coconut						4.34

Sl. No	Land Use	Ecdavaka	Mananthavady	Tavinjal	Thiruinelli	Thondernadu	Vellamunda
62	Rubber + Tea		3.31	38.61			
63	Tea	1.43	693.81	1227.24		111.98	7.48
64	Pepper + Tea			21.35			
65	Coffee	1219.75	934.78	501.00	1990.42	227.97	358.70
66	Coffee + Pepper		464.19	169.60	155.07	221.32	888.86
67	Coffee + Coconut		14.90				4.08
68	Coffee + Mixed Crops				2.67		
69	Coffee + Tuber Crops		1.10	2.50			3.87
70	Coffee + Mixed Trees		20.77				31.49
71	Coffee + Rubber	16.97	77.60	8.00	9.39		9.98
72	Coffee + Tea		11.76	11.20		1.76	
73	Coffee + Banana		3.05				
74	Coffee + Arecanut	3.05	17.71				
75	Marshy land		2.79			6.46	
76	Rock Exposures		1.98				
77	Granite Quarry			4.03			
78	Waste Land	26.46	101.34	373.97	17.78	34.68	43.30
79	Cultivable Waste Land	12.15	29.47	13.05	8.68		23.13
80	Open Ground	39.39	119.26	607.48		6.52	61.67
81	Forest		777.03	2953.75	15114.90	9547.80	1032.13
82	Water Bodies	120.28	126.41	83.29	87.78	36.78	92.33
	<b>Total</b>	<b>4650.00</b>	<b>7426.00</b>	<b>11379.00</b>	<b>19769.00</b>	<b>12037.00</b>	<b>6371.00</b>



Table:- 11.3

**SULTHANBATHERY BLOCK - LAND USE (Area in Ha.)**

Sl. No.	Land Use	Ambalavayal	Sulthan Bathery	Meenangadi	Nenmeni	Noolpuzha
1	Built up land	16.89	96.15	34.62	7.11	Data not Available
2	Paddy - Virippu	1.94	779.87	622.51	1018.03	
3	Paddy - Mundakan	166.77	27.35	131.56	60.26	
4	Paddy - Puncha	50.17	26.33	12.80	121.44	
5	Paddy - Virippu + Mundakan	7.53	56.66		0.57	
6	Paddy - Mundakan + Puncha	65.61	1.51	41.76		
7	Paddy - Virippu + Puncha	62.70		14.68		
8	Paddy + Arecanut		1.64			
9	Paddy + Banana	22.49		7.70		
10	Paddy land converted to Coconut		13.79	24.12	26.27	
11	Paddy land converted to Arecanut	430.40	54.03	99.67	114.70	
12	Paddy land converted to Banana	258.50	63.60	26.00	98.71	
13	Paddy land converted to Coconut + Arecanut	16.12		11.20	10.94	
14	Paddy land converted to Arecanut + Banana	37.52	2.34	40.59	10.12	
15	Paddy land converted to Mixed Crops	118.06	127.93	128.09	250.31	
16	Paddy land converted to Tapioca	4.57		1.14	16.03	
17	Paddy land converted to Tuber Crops		8.68			
18	Paddy land converted to Rubber	94.89		9.89	160.58	
19	Paddy land converted to Pepper		5.08	66.37	28.27	

Sl. No.	Land Use	Ambalavayal	Sulthan Bathery	Meenangadi	Nenmeni	Noolpuzha
20	Paddy land converted to Banana + Tapioca	3.39			1.88	Data not Available
21	Paddy land converted to Ginger	10.81	5.93	3.81	30.87	
22	Paddy land converted to Builtup land		28.13	0.64	39.86	
23	Paddy land converted to Banana + Ginger	4.62		8.94		
24	Paddy land converted to Arecanut + Ginger	4.93				
25	Paddy land converted to Arecanut + Rubber				2.70	
26	Paddy land converted to Coconut + Banana			5.70	2.03	
27	Vegetables/Tuber Crops					
28	Tuber Crops	1.80	0.57		22.74	
29	Vanila		3.00	6.10		
30	Coconut	37.45	15.78	30.45	51.25	
31	Arecanut	146.29	165.27	112.73	93.39	
32	Banana	31.81	88.21	19.67	62.59	
33	Ginger	1.65	89.77	4.16	38.30	
34	Pepper		22.34			
35	Ginger + Vanila			0.96		
36	Coconut + Arecanut	36.21	2.97	146.31	47.90	
37	Coconut + Ginger		3.84			
38	Coconut + Banana	2.15		2.31	7.03	
39	Coconut + Rubber	1.29				

Sl. No.	Land Use	Ambalavayal	Sulthan Bathery	Meenangadi	Nenmeni	Noolpuzha
40	Coconut + Vanila	4.02				Data not Available
41	Arecanut + Vegetables			1.59		
42	Arecanut + Ginger		3.46		2.24	
43	Arecanut + Banana	2.45		12.04	3.93	
44	Banana + Ginger		2.56		6.57	
45	Banana + Vegetables				2.89	
46	Mixed Crops	928.40	1123.61	1738.04	1578.06	
47	Mixed Trees	227.58	226.11	118.61	832.73	
48	Cardamom	2.61				
49	Rubber	115.54	58.75	105.21	143.60	
50	Teak	62.34	41.75	76.41		
51	Rubber + Mixed Crops	7.81		23.72		
52	Rubber + Teak	2.96		2.49		
53	Rubber + Arecanut			19.72		
54	Tea				468.72	
55	Coffee	2239.45	1724.66	1286.51	563.94	
56	Coffee + Ginger		24.14			
57	Coffee + Coconut	8.61		11.04	7.46	
58	Coffee + Mixed Trees	17.40	6.10	17.36	69.23	
59	Coffee + Rubber	15.62	184.56	15.82	256.66	

Sl. No.	Land Use	Ambalavayal	Sulthan Bathery	Meenangadi	Nenmeni	Noolpuzha
60	Coffee + Arecanut	47.88	5.61	27.47	12.71	Data not Available
61	Coffee + Banana		2.25		3.41	
62	Coffee + Tea				24.04	
63	Eucalyptus	26.42				
64	Marshy land	9.16		21.34		
65	Granite Quarry	477.54		1.53	24.03	
66	Project Area	36.22				
67	Waste Land	293.04	19.62	41.64	180.80	
68	Cultivable Waste Land	14.35	3.94	27.04	14.41	
69	Forest	4.13	16279.72	98.65	370.12	
70	Water Source	22.28	66.85	57.35	27.30	
	<b>Total</b>	<b>6202.00</b>	<b>21464.46</b>	<b>5318.06</b>	<b>6917.00</b>	

Table:- 11.4

**PANAMARAM BLOCK - LAND USE (Area in ha.)**

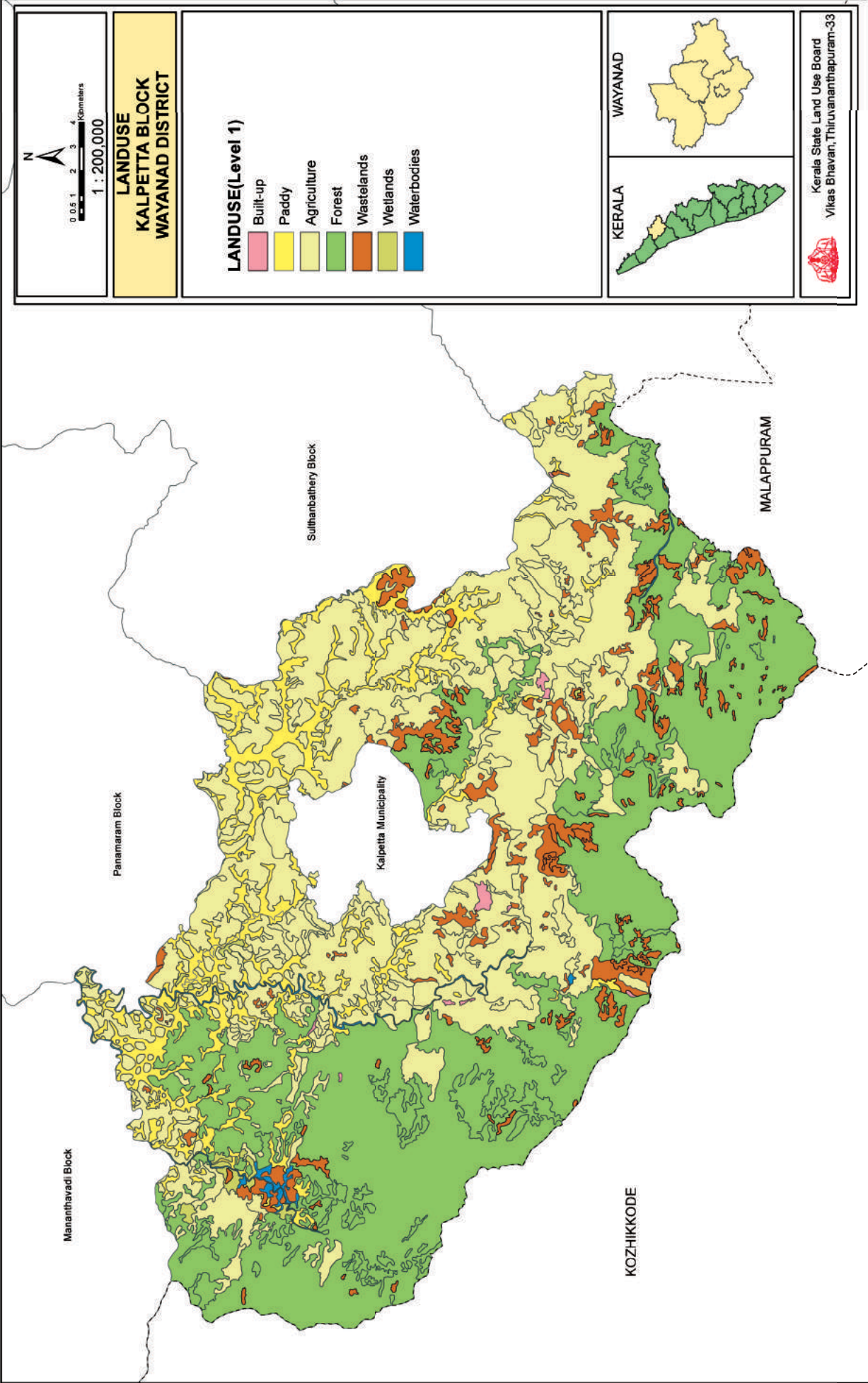
Sl. No	Land Use	Mullankolly	Poothadi	Pulpalli	Kaniyampe tta	Panamara m
1	Built up land	3.95	12.38	10.32	43.41	30.87
2	Paddy - Virippu	142.44	445.08	407.70	530.77	422.72
3	Paddy - Mundakan	106.17	400.22	16.97	12.23	11.25
4	Paddy - Puncha	3.15	24.84	7.58	0.45	42.77
5	Paddy - Virippu + Mundakan	66.66	1.42	2.50	154.33	19.02
6	Paddy - Mundakan + Puncha	11.22		9.45		
7	Paddy - Virippu + Mundakan + Puncha	6.68				
8	Paddy - Virippu + Puncha		11.83			980.60
9	Paddy + Arecanut				18.90	46.52
10	Paddy + Banana				8.83	1.31
11	Paddy land converted to Coconut	38.91	0.96	21.74	3.73	24.56
12	Paddy land converted to Arecanut	149.23	72.28	66.58	164.61	265.25
13	Paddy land converted to Banana	15.42	31.63	8.78	125.20	136.35
14	Paddy land converted to Coconut + Arecanut	91.47		7.64	7.84	64.10
15	Paddy land converted to Arecanut + Banana	4.28	1.47	2.87	54.03	50.14
16	Paddy land converted to Mixed Crops	125.32	150.20	135.29	156.77	310.44
17	Paddy land converted to Tapioca	4.99	4.18			7.35
18	Paddy land converted to Tuber Crops					5.72
19	Paddy land converted to Pepper	17.21				
20	Paddy land converted to Banana + Tapioca				16.41	3.32
21	Paddy land converted to Ginger			64.69		12.32
22	Paddy land converted to Builtup land	4.50	7.38	5.93		
23	Paddy land converted to Banana + Ginger	3.65		6.58		3.00

Sl. No	Land Use	Mullankolly	Poothadi	Pulpalli	Kaniyampe tta	Panamara m
24	Paddy land converted to Coconut + Ginger					0.89
25	Paddy land converted to Arecanut + Ginger	49.11		35.38		1.90
26	Paddy land converted to Arecanut + Tapioca					19.56
27	Paddy land converted to Arecanut + Rubber					
28	Paddy land converted to Coconut + Banana	3.55				1.59
29	Paddy land converted to Banana + Vegetables					1.40
30	Paddy land converted to Arecanut + Vegetables					3.37
31	Paddy land converted to Vegetables				6.44	3.88
32	Vegetables/Tuber Crops		21.49	12.66		
33	Tuber Crops					3.89
34	Vegetables	1.41				9.55
35	Vanila	22.29	1.50	4.92		
36	Coconut	72.12	35.78	8.33	9.65	48.58
37	Arecanut	8.97	85.90		79.77	113.02
38	Banana	5.62	4.52	29.33	109.90	45.74
39	Ginger	21.29	14.64	38.20		33.94
40	Pepper	1143.09	29.31	168.48		47.47
41	Ginger + Vanila					
42	Ginger + Pepper	30.92		17.41		
43	Coconut + Arecanut	6.79	20.91	7.54	17.20	18.68
44	Coconut + Ginger			4.82		
45	Coconut + Banana			9.69		
46	Coconut + Rubber	1.54				
47	Coconut + Mixed Trees				4.51	

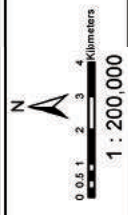
Sl. No	Land Use	Mullankolly	Poothadi	Pulpalli	Kaniyampe tta	Panamaram
48	Coconut + Cardamom				1.04	
49	Coconut + Pepper	14.43	1.56			
50	Arecanut + Vegetables			3.62		
51	Arecanut + Ginger			0.91		
52	Arecanut + Banana		9.52	8.94	66.51	6.66
53	Arecanut + Pepper	9.68	3.64			3.51
54	Banana + Cardamom				8.33	
55	Banana + Ginger		5.81			8.99
56	Mixed Crops	1674.90	2798.13	3043.07	763.11	1566.98
57	Mixed Trees	65.12	915.52	284.35	153.01	370.15
58	Cardamom		7.85		2.62	
59	Rubber	193.17	221.74	118.98	76.71	186.99
60	Teak	5.40				
61	Rubber + Peper	110.04		12.03		19.31
62	Rubber + Mixed Trees				8.48	
63	Rubber + Arecanut			3.21		
64	Coffee	124.60	517.05	96.05	759.02	1482.31
65	Coffee + Pepper	390.26	35.42	74.26		827.65
66	Coffee + Ginger		8.35	5.94	110.30	7.37
67	Coffee + Coconut		12.66	2.60	9.59	1.65
68	Coffee + Mixed Crops		87.02		78.65	
69	Coffee + Mixed Trees	5.02	8.71	2.85		38.98
70	Coffee + Rubber	12.88	3.16		53.38	84.47
71	Coffee + Arecanut	5.26	188.62	3.65	35.27	51.06

<b>Sl. No</b>	<b>Land Use</b>	<b>Mullankolly</b>	<b>Poothadi</b>	<b>Pulpalli</b>	<b>Kaniyampe tta</b>	<b>Panamara m</b>
72	Coffee + Banana		21.85		1.47	7.74
73	Coffee + Vanila			1.50		
74	Coffee + Cardamom		9.81			
75	Marshy land		0.42		1.66	
76	Granite Quarry	1.86	1.46			2.81
77	Waste Land	54.73	28.82	33.59	7.95	45.95
78	Cultivable Waste Land	1.06	9.29	23.83	4.91	19.60
79	Open Ground	16.31		99.95		669.30
80	Forest	207.01	3367.11	3135.25		
81	Water Source	175.80	69.46	225.05	47.24	
82	Cemetry				1.43	236.69
	<b>Total</b>	<b>5229.00</b>	<b>9710.90</b>	<b>8291.00</b>	<b>3715.66</b>	<b>8429.00</b>





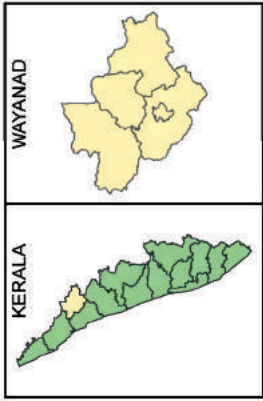




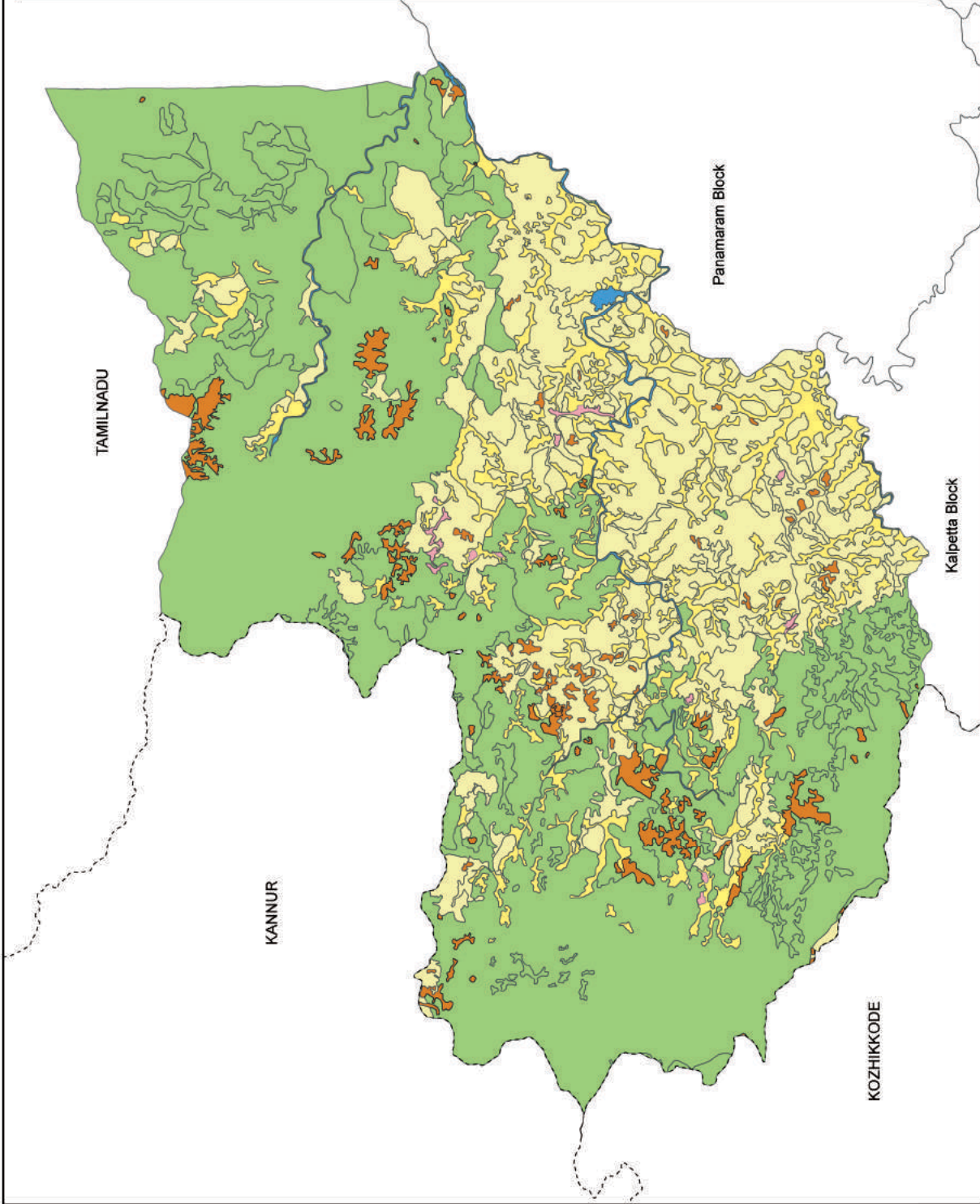
**LANDUSE  
MANANTHAVADI BLOCK  
WAYANAD DISTRICT**

**LANDUSE(Level 1)**

- Built-up
- Paddy
- Agriculture
- Forest
- Wastelands
- Wetlands
- Waterbodies



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





0.489 1.6 2.7 3.6 Kilometers

1 : 175,000

**LANDUSE  
SULTHANBATHERY BLOCK  
WAYANAD DISTRICT**

**LANDUSE (Level 1)**

-  Built-up
-  Paddy
-  Agriculture
-  Forest
-  Wastelands
-  Wetlands
-  Waterbodies



KERALA

WAYANAD



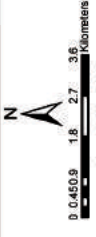
Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33

TAMILNADU

Panamaram Block

Kaipetta Block

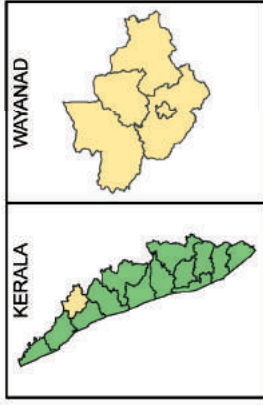




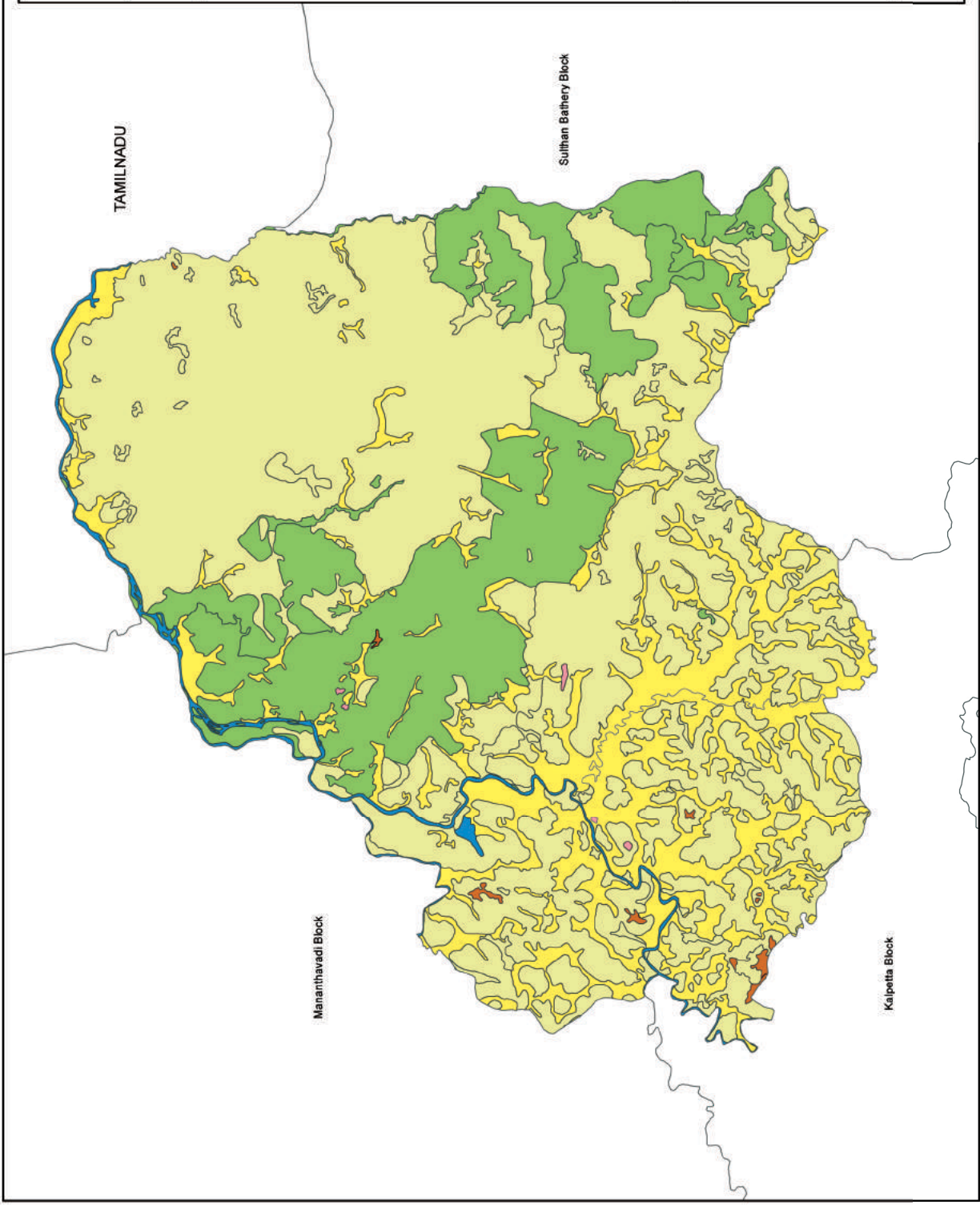
**LANDUSE  
PANAMARAM BLOCK  
WAYANAD DISTRICT**

**LANDUSE(Level 1)**

- Built-up
- Paddy
- Agriculture
- Forest
- Wastelands
- Wetlands
- Waterbodies

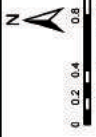


Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33









1 : 50,000

**LANDUSE  
KALPETTA MUNICIPALITY  
WAYANAD DISTRICT**

**LANDUSE(Level 1)**

- Built-up
- Paddy
- Agriculture
- Forest
- Wastelands
- Wetlands
- Waterbodies

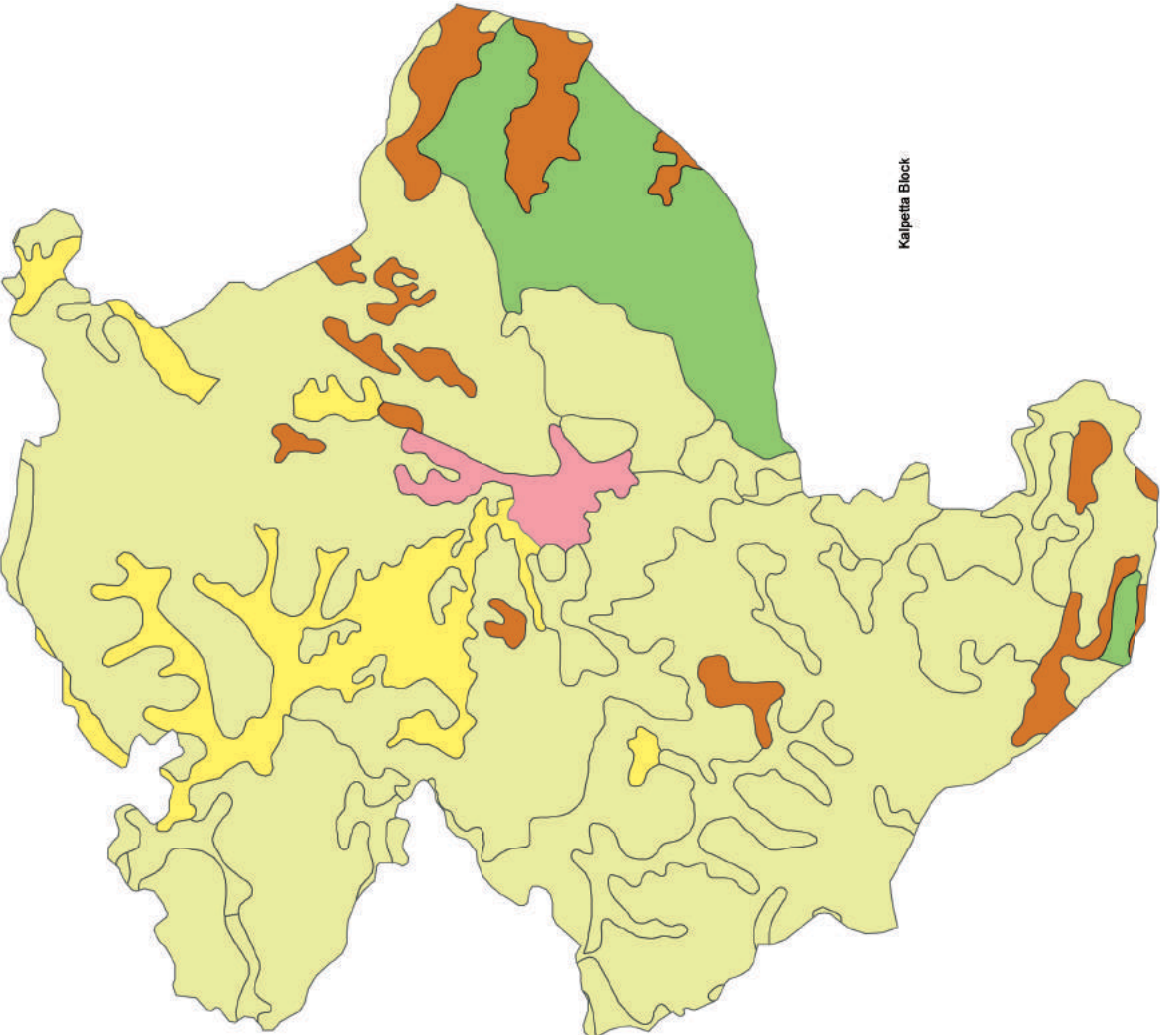


WAYANAD

KERALA



Kerala State Land Use Board  
Vikas Dhavan, Thiruvananthapuram-33



Kalpetta Block



## BIO DIVERSITY

The 2010 International year of Bio-diversity (IYB), is a special year declared by the United Nations to help raise awareness of the importance of Bio-diversity all over the world. It is an opportunity to stress the importance of biodiversity for our well-being, reflects on our achievements to safeguard biodiversity and encourage a redoubling of our efforts to reduce the rate of biodiversity loss. The 2010 IYB is promoting some important messages. **First**, Humans are part of nature's rich diversity and have the power to protect or destroy. **Second**, biodiversity is essential for sustaining the living networks and systems that provide us all with health, wealth, food, fuel and vital services our lives depend on. **Third**, human activity is causing the diversity of life on earth to be lost at a greatly accelerated rate, but we can prevent this loss. Fourth, we have made some achievements to safeguard biodiversity but we need to do much more and we must act urgently. Throughout 2010 UNEP's IYB website will also feature interesting segments such as biodiversity theme of the week, examples of successful community action in biodiversity conservation and other intriguing biodiversity related components. In connection with the International year of biodiversity 2010, Kerala State Biodiversity Board has taken up several programmes.

Much of Kerala's notable biodiversity is concentrated and protected in Western Ghats. Almost a fourth of India's 10,000 plant species are found in the state. Among the almost 4,000 flowering plant species (1,272 of which are endemic to Kerala and 159 threatened) are 900 species of medicinal plants. Its 9,400 km<sup>2</sup> of forests include tropical wet evergreen and semi-evergreen forests (lower and middle elevations-3,470 km<sup>2</sup>), tropical moist and dry deciduous forests (mid-elevations - 4,100 km<sup>2</sup> and 100 km<sup>2</sup>, respectively), and montane subtropical and temperate (*shola*) forests (highest elevations—100 km<sup>2</sup>). Altogether, 24% of Kerala is forested. Two of the world's Ramsar convention listed wetland lake- sasthanmotta and the Vembanad-Kol wetlands-are in Kerala, as well as 1455.4 km<sup>2</sup> of the vast Nilgiri Biosphere Reserve. The following table depicted the biodiversity statistics in Kerala.

Table:- 12.1

**PLANT DIVERSITY**

Flowering Plants	4000
Grass species	350
Bamboo species	15
Reeds species	9
Orchid species	214
Gymnosperms	4
Ferns and Fern allies	200
Liverworts	200
Algae	231
Fungi	1044
Lichens	800

Table:- 12.2

**ANIMAL DIVERSITY**

Large and medium sized mammals	48
General Birds species	475
Water Birds	101
Reptiles General	60
Lizard (endemic)species	30
Snake (endemic)species	57
Amphibia(endemic)species	87
Fresh water fish(endemic)species	84
Butterflies	313

## FOREST

Kerala has a total recorded forest cover of 11309.42 sq. km which is 29.09% of the total land area of the State. This is greater than the national coverage of 19.50%. The 11309.42 sq.km of forest cover includes 9157.10 sq. km reserve forests; 214.31 sq. km proposed reserve and 1754.18 sq.km vested forest. Of the recorded forest area, the effective (actual) forest area in Kerala is only 9400 sq.km. Forests of Kerala are broadly classified into 5 major categories. They are:

Table:-13.1

Sl. No.	Forest Type	Area (lakh ha.)
1	Tropical Wet Evergreen Forest	3.480
2	Tropical Moist Deciduous Forests	4.100
3	Tropical Dry Deciduous Forests	0.094
4	Mountain Sub Tropical Forests	0.188
5	Plantations	1.538
<b>Total</b>		<b>9.400</b>

Much of the forest cover of Kerala is spread over the Western Ghats. The Western Ghats represents one of the world's 18 hot spots of bio-diversity and is considered to be a repository of endemic, rare and endangered flora and fauna. There are 28 vegetation types in the state, but the existence of most is doubtful. 51% of the total forest cover is in the southern districts and the remaining 49 percent is in the central and northern regions. Idukki and Pathanamthitta districts have the largest area under forest cover. Alappuzha is the only district without any area under forest cover.

Over the past years the state government had taken a number of steps towards the conservation of forest and wildlife. The state government banned clear felling of natural forest in 1983. With the aid of various organizations, including the World Bank, the government has implemented various programmes for the afforestation of degraded forests. These include Community afforestation, compensatory afforestation and general forestry programmes.

Three Forest Divisions fall in Wayanad District, namely, North Wayanad, South Wayanad and Wayanad Wildlife Division. In North Wayanad Division there is a total of 215.48sq.km of forest area as on 31-3-2000 which includes 133.90sq.km. Reserve forest and 66.52 sq. km of Vested Forests. 15.06sq.km of area proposed for Reserve forest is also considered. 325.89sq.km forest area comes under South Wayanad Forest Division. It includes 67.52sq.km of reserve forest and 251.91 sq.km of vested forest. 6.46 sq.km of area proposed for reserve forest in South Wayanad Forest Division is also included. In Wayanad Wildlife Sanctuary, 344.55sq.km of area is included. The Three Forest Divisions together constitutes 885.92sq.km of forest area which includes the proposed area for reserve forest. The Taluk wise area figures of forest collected from the Tahasildars and presented in the village directory show that Sulthanbathery Taluk constitutes 336.30 sq.km of forest area, followed by Mananthavady Taluk with 292.90 sq.km. The Forest area in Vythiri Taluk is 182.49 sq.km. In short the forest area of the district is about more than forty percent of the total area of the District.

Forest fall under three categories: (i) Plateau Deciduous, (ii) Tropical Evergreen, (iii) Tropical Semi Evergreen. The most common is Plateau Deciduous found at about 700-1000 meters above the mean sea level, mostly located on the Eastern side of the District on the Begur and Chedleth Ranges in an area of high precipitation. This area has Valuable belt of Teak Forests. The Tropical Evergreen Forests found at the height of 900 meters and above are mainly concentrated in the lady smith Reserve Forest in Chedleth Range, Semi-Evergreen Forests are also found there. Teak is abundantly grown here. Other tress found here are Karimaruthu, Venteak, Bajal, Jal, Kadamba, Bamboo, Screw Pine, etc. The Trees of wild type are preserved here to give shade for coffee plantations and for giving support to pepper. Most of the thick forest areas are replaced by coffee, tea or cardamom plantations.

Table: 13.2

**RANGEWISE AREA OF FORESTS AS ON 31.03.2009 IN  
WAYANAD**

<b>Division/Range</b>	<b>Area (Sq.km)</b>	<b>TOTAL</b>
<b>Wayanad North</b>		
Begoor	104.16	214.93
Periya	84.73	
Mananthavady	26.04	
<b>Wayanad South</b>		
Kalpetta	130.11	347.66
Meppady	133.01	
Chethalayam	84.54	

Table:- 13.3

**DISTRICTWISE FOREST AREA BY LEGAL STATUS AS ON  
31.03.2009(SQ.KM)**

<b>Division</b>	<b>Reserve Forest/Proposed Forest</b>	<b>Vested Forest</b>	<b>Total</b>
Wayanad North	149.08	65.85	214.94
Wayanad South	72.98	274.68	347.66
Wayanad (WL)	344.44		344.44
<b>Total</b>	<b>566.51</b>	<b>340.53</b>	<b>907.044</b>

Source:- Forest Statistics, Forest & Wild Life Dept.

Table: 13.4

## DIVISION/SPECIES WISE DISTRIBUTION OF PLANTATION AREA (HA) AS ON 31.03.2009

Divisions	Teak	Teak and Softwood	Accacia Mangium	Accacia Auriculiformis	Eucalyptus	Cane	Bamboo	Rosewood	Mahagani	Sandalwood	Other Hardwood	Reeds	Cinnamon	Pepper	Medical Plants	Gravelia Robusta	Pine
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
NORTHERN CIRCLE																	
Wayanad (S)	2330.1	69.9		296	671	60	170					10		30	26.14	110	
Wayanad(N)	488.36	997.03		436.7	411	166	146							30	220.8		
Divisions	Albezzia	Anjili	Kambakom	Elavu	Rubber	Balsa	Wattle	Matti	Cashew	Agave	Alnus	Sesbania	Casuarinaq	Misc	Mangroves	Fruit Bearing	Grand Total
1	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
NORTHERN CIRCLE																	
Wayanad (S)																	3773
Wayanad(N)														1368			2895

Source:Forest Statistics,Forest and Wild life Department



Table: 13.5

## FOREST COVER IN WAYAND

Geographic Area	Forest Cover				Percent to GA
	Very Dense	Moderate Dense	Open Forest	Total	
2131	140	1347	288	1775	83.29

Table:- 13.6

## ECO-TOURISM LOCATIONS UNDER FOREST DEPARTMENT IN WAYANAD

District	Eco-Tourism location
Wayanad	Pakkom karuva
	Muthanga
	Meenmuti
	Banasurasagar
	Thirunelly-Pakshipathalam
	Tholpetty
	Chembra Peak
	Soochippara

Source:Forest Statistics,Forest and Wild life Department

Table:- 13.7

## PARTICIPATORY FOREST MANAGEMENT (PFM)

The State has adopted Participatory Forest Management (PFM) as a Strategy for conservation of bio-diversity and for the improvement of livelihood of forest dependent people by forming partnership institutions at grass root level since 1998. The institutions in territorial forest divisions are called Vana Samrakshana samithies (VSS). Those in sanctuaries and national parks are called Eco- Development Committees (EDC). During the year 2008-09 there were 388 number of VSS'c and 189 number of EDC'c. List of the names of Vss of Kerala Forest Department in wayanad district under the management of Forest Development Agencies (FDA) are depicted in the following table.

Name of VSS	Type (Fringe/Tribal)	No. of family			Total	Mgnt. Area (ha)	Range
		SC	ST	Others			
1	2	3	4	5	6	7	8
<b>NORTHERN CIRLCLE</b>							
<b>North Wayanad FDA</b>				<b>North Wayanad Division</b>			
Papanasini	Fringe	2	34	74	110	300	Begur
Kalinidi	Fringe	0	139	0	139	1000	Begur
Sreesayalam	Fringe	0	161	0	161	750	Begur
Haritha	Fringe	0	333	0	333	600	Begur
Panchatheertham	Fringe	0	80	0	80	2000	Begur
Plamoola	Fringe	0	0	0	0	194	Begur
Makkimala	Fringe	0	90	0	90	850	Begur
Pilakkavu	Fringe	9	17	185	211	258	Begur
Chalil	Fringe	1	39	144	184	200	Mananthavady
Mangalawery	Fringe	0	75	75	150	200	Mananthavady
Pannippadu	Fringe	0	101	79	180	250	Mananthavady
Perincherimala	Fringe	0	60	63	123	200	Mananthavady
Peria	Fringe	0	60	0	60	3000	Peria
Kunhome	Fringe	0	95	0	95	3000	Peria
Kappattumala	Fringe	0	19	38	57	275	Peria
Churuli	Fringe	0	45	0	45	280	Peria
Pookkottu-Chapparam	Fringe	0	36	115	151	300	Peria

Name of VSS	Type (Fringe/Tribal)	No. of family			Total	Mgnt. Area (ha)	Range
		SC	ST	Others			
1	2	3	4	5	6	7	8
<b>NORTHERN CIRLCLE</b>							
<b>South Wayanad FDA</b>				<b>South Wayanad Division</b>			
Kunduwady	Fringe	0	252	0	252	171	Chedalath
Uthayakkara	Fringe	0	612	535	1147	300	Chedalath
Vattathani	Fringe	5	51	335	391	150	Chedalath
Kelamangalam	Fringe	0	23	132	155	150	Chedalath
Chekadi	Fringe	1	204	98	303	135	Chedalath
Naikuppa	Fringe	0	67	143	210	200	Chedalath
Ayanimala	Fringe	0	15	102	117	200	Chedalath
Pakkamkuruva	Fringe	0	92	45	137		Chedalath
Aranamala	Fringe	0	142	0	142	211	Meppadi
Palchuram	Fringe	0	117	53	170	153	Meppadi
Karukamthodu	Fringe	0	153	0	153	900	Kalpetta
Parathodu	Fringe	15	109	424	548	280	Kalpetta
Thariyodu 8th Mile	Fringe	16	365	883	1264	300	Kalpetta
Varambetta	Fringe	0	50	358	408	280	Kalpetta

Source: Forest Statistics, Forests and Wild life Department

Table:- 13.8

**DETAILS OF DIVISION WISE ECO DEVELOPMENT COMMITTEES  
(EDC)**

<b>Sl. No.</b>	<b>Name of EDC</b>	<b>Reg.No.</b>	<b>Management Area</b>	<b>Range</b>
1	Puthur, Man animal conflict Mitigation EDC	01/01/02	4 km fencing	Noolpuzha section\Muthanga
2	Kundur Man animal conflict Mitigation EDC	02/01/02	3 km fencing	Noolpuzha section\Muthanga
3	Karassery, Man animal conflict Mitigation EDC	03/01/02	4 km fencing	Kallur section\Sulthan Bathery
4	Kattandoe, Man animal conflict Mitigation EDC	04/01/02	5 km fencing	Kallur section\Sulthan Bathery
5	Muthanga Tourist Guide EDC	05/01/02	Tourist zone in Muthanga Range	Muthanga
6	Tholpetty Tourist Guide EDC	06/01/02	1 km fencing	Tholpetty
7	Vandikkadavu Man animal conflict Mitigation EDC	01/01/05	2 km fencing	Vandikkadavu section\Kurichiat
8	Kannampuzha Man animal conflict Mitigation EDC	02/01/05	1 km fencing	Vandikkadavu section\Kurichiat
9	Amarakuni Man animal conflict Mitigation EDC	03/01/05	4th mile to Pazhery 4.5km	Vandikkadavu section\Kurichiat
10	Pazhery, Man animal conflict Mitigation EDC	04/01/05	300 Ha	Vandikkadavu section\Kurichiat
11	Chettiyalakoor fire protection EDC	07/01/02	300 Ha	Muthanga
12	Kundur fire protection EDC	08/01/02	300 Ha	Muthanga
13	Putur fire protection EDC	09/01/02	200 Ha	Muthanga
14	Pulithookky fire protection EDC	10/01/02	300 Ha	Muthanga
15	Thoottamoola fire protection EDC	11/01/02	300 Ha	Muthanga
16	Anacamp fire Protection EDC	12/01/02	300 Ha	Muthanga
17	Thakarappady fire Protection EDC	13/01/02	300 Ha	Muthanga
18	Ponkuzhi Kattunaika fire protection EDC	14/01/02	600 Ha	Sulthan Bathery
19	Rampally Atathue Manmadanmoola fire protection EDC	15/01/02	650 Ha	Sulthan Bathery

Sl. No.	Name of EDC	Reg.No.	Management Area	Range
20	Pilakkavu 1st and 2nd fire protection EDC	16/01/02	800 Ha	Sulthan Bathery
21	Kurichiat fire protection EDC	17/01/02	650 Ha	Kurichiat
22	Karipoor fire protection EDC	18/01/02	650 Ha	Kurichiat
23	Pokilamalam fire protection EDC	19/01/02	350 Ha	Kurichiat
24	Pullumala fire protection EDC	20/01/02	350 Ha	Kurichiat
25	Manalmoola fire protection EDC	21/01/02	300 Ha	Kurichiat
26	Thenkuzhuy fire protection EDC	22/01/02	300 Ha	Kurichiat
27	Poovanchi fire protection EDC	23/01/02	300 Ha	Kurichiat
28	Kommenchery fire protection EDC	24/01/02	300 Ha	Kurichiat
29	Amma Vayal fire protection EDC	25/01/02	300 Ha	Kurichiat
30	Thirulkunu fire protection EDC	26/01/02	500 Ha	Tholpetty
31	Neduthana fire protection EDC	27/01/02	800 Ha	Tholpetty
32	Bavali fire protection EDC	28/01/02	1000 Ha	Tholpetty
33	Dasnakatta fire protection EDC	29/01/02	1000 Ha	Tholpetty

Table:- 13.9

### TRIBAL SETTLEMENTS

Sl No	Particulars	Wayanad Dist.		Kerala
		Wayanad South	Wayanad North	
1	No. of divisions	1	1	31
2	No. of Settlements	84	13	723
3	Area (ha)	2321.05	38.91	21531.996
4	No. of Tribal families possessing land	1243	110	20713
5	No. of landless tribal families	502	60	2193
6	No. of non- tribal families possessing land in settlement	71	-	4486

Source:Forest Statistics,Forests and Wild life Department









## AGRICULTURE

Agriculture plays a crucial role in the Kerala economy. When compared to other States, the per-capita availability of cultivable land is low in Kerala. Stabilization and augmentation of productivity assume critical importance, given the limited scope for increasing area under cultivation of various crops. Increase in production would be possible mainly from improvements in productivity through the use of location specific technology and modernization of agriculture. An integrated mixed cropping pattern is practiced in the State by majority of the farmers considering the land holding size. The trends in agricultural income in Kerala during the last six years is shown in Table 1. The provisional estimate for 2009-10 indicated an increase of 0.25 per cent in growth over 2008-09.

**Table 14.1: Trends in Agricultural Income in Kerala**

<b>Trends in Agricultural Income in Kerala</b>					
<b>(Base 2004-05)</b>					
<b>Sl. No.</b>	<b>Year</b>	<b>Agricultural Income (` in crores)</b>	<b>Rate of change over previous year</b>	<b>Agriculture and Allied Sectors (` in crores)</b>	<b>Share of Agriculture and Allied Sectors in GSDP</b>
1	2004-05	16980.51		20843.21	17.48
2	2005-06	18041.97	6.25	21882.16	16.67
3	2006-07	16567.85	-8.17	20507.67	14.48
4	2007-08	16196.60	-2.24	20255.14	13.15
5	2008-09**	16641.70	2.75	20779.74	12.58
6	2009-10*	16683.91	0.25	20927.91	11.54

\* Provisional \*\* Quick  
Source: Directorate of Economics and Statistics

Agriculture is the principal occupation of the people in the Wayanad District. Hence Wayanad district in the real sense of the term in an Agricultural District. The district is suitable for all varieties of cultivation. The most important crops which are cultivated in the District are pepper and paddy. The high altitude district is characterized by the cultivation of perennial plantation crops and spices. 26% of pepper, 54% of ginger, 75% of coffee, 17% of tea and 5% of cardamom produced in the state are from the Wayanad district which forms 5.5% of the total area of the state. The major plantation crops are coffee, Tea, Pepper, Cardamom and Rubber.

### AGRICULTURAL INSTITUTIONS

The Agricultural Research Station at Ambalavayal established in 1945 carries out research to develop agricultural practice suited to the climate of the district and to improve quality of the agricultural produces. The station concentrates on research on

spices, tropical and sub-tropical fruits, vegetables, especially winter season vegetables and hill paddy. A Krishi Vijnan Kendra with the objective of dissemination of latest technologies to the farmers is also attached to this station. Recently plant Bio-Technology centre started functioning here for large scale production of tissue culture plants of high value crops. The nursery of the station has a large collection of roses and other ornamental plants. This Research institutes produces and distributes quality seeds and good planting materials to the farmers. There is an Agricultural Extension scheme at Chingeri.

Table:- 14.2

### PANCHAYAT WISE GEOGRAPHICAL AREA

Name of Panchayath	Area	Agricultural Area		Forest Area	Plantation Area
		Dry Land	Wet Land		
Mananthavady	96.11	54.5	13.54	14.14	13.93
vellamunda	64.46	44.3	14.16	6	0
Thirunelly	216.75	35.83	12.53	152.3	16.09
Thondernadu	137.02	44.5	8.77	77.34	6.41
Edavaka	47.77	37.05	10.72	0	0
Thavinchal	93.34	42.56	6.01	31.71	13.06
Panamaram	80.94	52.59	22.47	5.88	0
<b>TOTAL</b>	<b>736.39</b>	<b>311.33</b>	<b>88.2</b>	<b>287.37</b>	<b>49.49</b>
Meenangadi	56.56	40.83	11.49	1.82	2.42
Nenmeni	74.41	47.66	20.71	1.07	4.97
Ambalavayal	62.8	50.85	9.85	0	2.1
Poothadi	83.86	52.55	12.26	17.98	1.07
Noolpuzha	283.83	19.83	17.61	246.39	0
Mullankolly	71.99	47.59	3.2	21.2	0
Pulpally	78.23	42.65	8.15	27.43	0
Sulthan Bathery	65.46	36.67	9.45	17.1	2.24
<b>TOTAL</b>	<b>777.14</b>	<b>338.63</b>	<b>92.72</b>	<b>332.99</b>	<b>12.8</b>
Kottathara	33.96	23.88	8.92	0.14	1.72
Vengapally	21.39	16.29	5.1	0	0
Vythiri	57.13	34.53	0.86	12.14	9.6
Muttill	48.95	34.38	11.37	0.92	2.28
Pozhuthana	94.58	40.97	3.31	26.22	24.08
Thariyode	70.14	26.79	3.52	39.83	0
Padinjarathara	55.42	30.83	10.42	13.74	0.43
Meppadi	154.64	68.86	5.64	55.04	25.1
Kaniyampetta	20.82	12.25	8.57	0	0
Mooppainad	77.45	40.37	4.36	17.68	15.04
<b>TOTAL</b>	<b>634.48</b>	<b>329.15</b>	<b>61.37</b>	<b>165.71</b>	<b>78.25</b>
Kalpetta(M)	43.42	29.58	5.01	6.27	2.56
<b>District Total</b>	<b>2191.43</b>	<b>1008.69</b>	<b>247.3</b>	<b>792.34</b>	<b>143.1</b>

Table:- 14.3

**CLASSIFICATION OF DATA ON THE BASIS OF LAND UTILISATION**

<b>YEAR</b>	<b>Total geographic area</b>	<b>Forest</b>	<b>Land put to non agricultural use</b>	<b>Barren and uncultivable land</b>	<b>Permanent pastures and other grazing land</b>	<b>Land under miscellaneous tree crops</b>	<b>Cultivable waste</b>	<b>Fallow other than current fallow</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>2009-2010</b>	212966	78787	9381	206	2	79	1209	370
<b>2008-2009</b>	212966	78787	12276	195	6	77	926	428
<b>2007-2008</b>	212966	78787	11673	247	6	148	1054	449

<b>YEAR</b>	<b>Current fallow</b>	<b>Marshy Land</b>	<b>Still Water</b>	<b>Water logged Area</b>	<b>Social Forestry</b>	<b>Net Area Sown</b>	<b>Area sown more than once</b>	<b>Total Cropped Area</b>
<b>1</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>
<b>2009-2010</b>	1647	1	4055	14	33	117182	60182	177364
<b>2008-2009</b>	936	1	4055	14	27	115238	75045	190283
<b>2007-2008</b>	1054	1	4055	13	25	115454	84614	200068

Source: Agricultural Statistics, DES

Table:- 14.4

**DISTRICT WISE AREA OF CROPS**

YEAR	Paddy								Pulses including Tur				Total food grains
	Autumn	Winter	Summer	Total	Jower	Ragi	Other Cereals	Total cereals/ millets	Autumn	Winter	Summer	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
2009-2010	0	10576	2419	12995	16	0		13011	0	1	222	223	13234
2008-2009	0	9850	2896	12746	6	3	1	12756	0	3	364	367	13123
2007-2008	0	9413	2995	12408	9	1	1	12419	1	0	349	350	12769

YEAR	Sugar Crops			Spices and Condiments									
	Sugar Cane	Palmyrah	Total	Pepper	Ginger	Turmeric	Cardamom	Arecanut	Tamarind	Vanilla	Cloves	Nutmeg	Cinnamon
1	15	16	17	18	19	20	21	22	23	24	25	26	27
2009-2010	7	96	103	16571	2446	189	4106	10862	132	120	24	49	20
2008-2009	7	14	121	20825	4166	232	4106	11734	131	199	30	61	23
2007-2008	1	120	121	25542	4604	270	4106	12213	142	244	37	60	23

Table:- 14.4 Continue.....

YEAR	Spices and Condiments		Grand Total	Fresh Fruits								Dry Fruits	Total Fruits
	Garlic	Total		Jack	Mango	Banana	Plantain	Pineapple	Pappaya	Other fresh fruits	Total	Cashew	
<b>1</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>	<b>32</b>	<b>33</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>
<b>2009-2010</b>	0	34519	34622	7481	3818	8318	1311	35	351	760	22074	706	<b>22780</b>
<b>2008-2009</b>		41507	41628	7480	3976	10859	1723	54	410	440	24942	969	<b>25911</b>
<b>2007-2008</b>	0	47241	47362	8198	4337	12123	1805	55	408	470	27396	1133	<b>28529</b>

YEAR	Tapioca				Tubers					Total
	Autumn	Winter	Summer	Total	Elephant Foot Yam	Colocasia	Yam (Kachil)	Sweet Potato	Other Tubers	
<b>1</b>	<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	<b>45</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>
<b>2009-2010</b>	225	491	982	<b>1698</b>	1553	411	61	9	9	<b>2043</b>
<b>2008-2009</b>	305	393	1597	<b>2295</b>	2994	617	67	12	5	<b>3695</b>
<b>2007-2008</b>	376	495	2197	<b>3068</b>	3411	611	63	16	5	<b>4106</b>

Table:- 14.4 Continue.....

YEAR	Vegetables												Total	Total Food Crops
	Drum stick	Amarant hus	Bitter Gourd	Snake Gourd	Ladies Finger	Brinjal	Green Chillies	Little Gourd (koyal)	Ash Gourd (Kumbalam)	Pumpkin	Cucumber	Other Vegetables		
1	51	52	53	54	55	56	57	58	59	60	61	62	63	64
2009-2010	380	56	212	4	8	24	49	14	75	171	32	479	1504	75881
2008-2009	615	101	210	6	9	29	64	12	88	195	44	661	2034	88686
2007-2008	622	62	201	3	13	19	60	8	84	186	40	563	1861	97695

Non Food Crops																
YEAR	Oil Seeds					Fibre Drugs and Narcotics					Plantation Crops					Grand Total
	Groundnut	Sesamum	Coconut	Others	Total	Cotton	Betel Leaves	Tobacco	Lemon Grass	Total	Tea	Coffee	Rubber	Cocoa	Total	
1	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
2009-2010	0	5	10200	42	10247	0	2	0	114	116	6343	67366	9723	184	83616	93979
2008-2009			11016	13	11029		2	97	99	6309	67366	9315	143	83133	94261	94261
2007-2008		1	12292	13	12306		1		112	113	6213	67345	8890	147	82595	95014

YEAR	Non Food Crops						Total Cropped Area
	Fodder Grass	Green Manure Crops	Other Crops and trees	Medicinal Plants	Total	Total non food crops	
1	81	82	83	84	85	86	87
2009-2010	564	862	6058	20	7504	101483	177364
2008-2009	681	706	5934	15	7336	101597	190283
2007-2008	636	787	5925	11	7359	102373	200068

Table:- 14.5

**BLOCK WISE AREA UNDER CROPS 2008-2009**

(Area in Ha)

Sl. No.	Block	Paddy			Sugar cane	Pepper	Ginger	Turmeric	Arecanut	Nutmeg	Jack
		Autumn	Winter	Summer							
1	2	3	4	5	6	7	8	9	10	11	12
1	Vythiri		1763.18	408.41	0.98	3524.23	602.01	57.71	3738	10.79	1775.25
2	Mananthavady		3445.35	1105.09	5.48	6884.71	826.14	85.71	3025	30.24	2072.38
3	Sulthan Bathery		4631.02	1380.12	0.16	10320.07	2732.9	87.91	4549	17.87	3439.04
	Municipality		10.8	2.46	0.03	95.83	4.95	0.96	423	2.09	193.34
	<b>District Total</b>		<b>9850.35</b>	<b>2896.08</b>	<b>6.65</b>	<b>20824.84</b>	<b>4166</b>	<b>232.29</b>	<b>11734</b>	<b>60.99</b>	<b>7480.01</b>

Sl. No.	Block	Banana	Plantain	Pineapple	Pappaya	Cashew	Tapioca	Drumstick	Sesamum	Coconut	Betel Leaves	Cocoa
1	2	13	14	15	16	17	18	19	20	21	22	23
1	Vythiri	4030.92	410.82	13.09	110.11	45.5	557.22	45.28		2409.27	0.12	38.76
2	Mananthavady	3905.49	469.32	27.73	116.13	843.51	854.87	92.96	0.46	2990.82	1.47	38.54
3	Sulthan Bathery	2726.48	819.98	13.1	175.31	79.5	869.5	460.4		5388.43		60.41
	Municipality	196.12	22.9	0.08	8.45	0.49	13.41	16.35		227.29	0.13	5.3
	<b>District Total</b>	<b>10859.01</b>	<b>1723.02</b>	<b>54</b>	<b>410</b>	<b>969</b>	<b>2295</b>	<b>614.99</b>	<b>0.46</b>	<b>11015.8</b>	<b>1.72</b>	<b>143.01</b>

Source: Agricultural Statistics, DES

Table:- 14.6

**BLOCK WISE AREA UNDER CROPS 2009-2010**

Area in Ha

Sl. No.	Block	Paddy			Sugarcane	Pepper	Ginger	Turmeric	Arecanut	Nutmeg	Jack
		Autumn	Winter	Summer							
1	2	3	4	5	6	7	8	9	10	11	12
1	Vythiri		1944.71	425.68	2.7	2900.8	366.56	39.95	3765.21	12.81	1981.4
2	Mananthavady		3689.33	708.59	1.84	566.37	474.36	58.51	2654.24	17.49	2328.4
3	Sulthan Bathery		4914.08	1279.2	2.35	7985.6	1588.8	90.57	4239.52	17.5	3038.4
	Municipality		28.48	5.99	0.16	20.3	15.64	0.34	202.87	1.04	166.08
	<b>District Total</b>		<b>10576.6</b>	<b>2419.46</b>	<b>7.05</b>	<b>16571</b>	<b>2445.4</b>	<b>189.37</b>	<b>10861.8</b>	<b>48.84</b>	<b>7481.2</b>

Sl. No.	Block	Banana	Plantain	Pineapple	Pappaya	Cashew	Tapioca	Drumstick	Sesamum	Coconut	Betel Leaves	Cocoa
1	2	13	14	15	16	17	18	19	20	21	22	23
1	Vythiri	2594.06	281.63	12.13	95.93	38.09	401.74	67.43	0	2823.20	0.48	55.14
2	Mananthavady	3627.48	408.19	9.99	100.11	590.53	542.08	65.90	0	2864.60	0.99	37.03
3	Sulthan Bathery	2083.23	607.32	12.15	147.64	76.24	746.90	236.20	5.38	4359.30	0.39	90.77
	Municipality	12.94	13.93	0.44	7.22	1.02	7.20	10.60	0	153.27		0.93
	<b>District Total</b>	<b>8317.71</b>	<b>1311.07</b>	<b>34.71</b>	<b>350.9</b>	<b>705.88</b>	<b>1697.9</b>	<b>380.13</b>	<b>5.38</b>	<b>10200.37</b>	<b>1.86</b>	<b>183.87</b>



Table:- 14.7

**PRODUCTION OF IMPORTANT CROPS**

YEAR	Rice				Jower	Ragi	Other Cereals	Sugar cane (canegur)	Black Pepper	Green Chillies	Pulses including Tur	Cured Ginger	Ground nut
	Autumn	Winter	Summer	Total									
1	2	3	4	5	6	7	8	9	10	11	12	13	14
2009-2010	0	26338	6819	33157	9			0	4497	72	169		
2008-2009		25707	8154	33861	3	2	1		4526	64	279	19713	508
2007-2008		23473	8606	32079	5	1	1	3	4060	60	266	17054	561

YEAR	Arecanut	Tamari nd	Mango	Jack (Nos in million nuts)	Banana	Other Plantain	Pine apple	Tapioca	Sweet Potato	Papp aya	Drum stick	Sesa mum	Coconut (million nuts)
1	15	16	17	18	19	20	21	22	23	24	25	26	27
2009-2010	5385	258	12524	23	71627	7487	118	80618	106	3240	136	0	46
2008-2009	5518	256	13041	15	65238	10679	229	94828	141	2597	253	1	38
2007-2008	4627	278	14226	23	90427	10984	192	95540	188	2721	294	0	45

YEAR	Cotton (No.of bales of 170kg each)	Nutmeg	Tobacco	Tea	Coffee	Rubber	Cocoa	Processed Cardamom	Raw cashew nuts	Betel leaves	Clove (dry)	Garlic
1	28	29	30	31	32	33	34	35	36	37	38	39
2009-2010		11		9366	49950	8400	67	366	494	116	3	
2008-2009		8		10731	47510	8600	15	362	318	33	3	
2007-2008		14			40240	8085	30	324	534	26	4	

Table:- 14.8

**BLOCK WISE PRODUCTION OF IMPORTANT CROPS 2008-2009**

Production in Tonnes

Sl. No.	Block	Rice			Canegur	Black pepper	Cured Ginger	Cured Turmeric	Arecanut	Jack (Million Nos.)	Banana	Other Plantain
		Autumn	Winter	Summer								
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Vythiri	0	4393.63	1080.17		297.46	2109.44	120.67	2138.83	3.44	27914.3	2982.14
2	Mananthavady	0	9117.29	2694.5		1569.22	4967.58	171.33	1449.98	5.38	20035.3	2345.66
3	Sulthan Battery	0	12169.6	4373.64		2657.38	12619.68	213.97	1819.19	5.76	16279.8	4973.18
	Municipality	0	26.43	5.45		1.77	16.60	1.67	109.95	0.42	1008.34	377.85
<b>District Total</b>		<b>0</b>	<b>25707</b>	<b>8153.76</b>		<b>4525.85</b>	<b>19713.31</b>	<b>507.65</b>	<b>5517.96</b>	<b>15.01</b>	<b>65237.8</b>	<b>10678.83</b>

Sl. No.	Block	Pineapple	Tapioca	Pappaya	Drumstick	Sesamum	Coconut (Million nuts)	Nutmeg	Cocoa	Raw cashew	Betel Leaves
1	2	14	15	16	17	18	19	20	21	22	23
1	Vythiri	48.70	21606.2	405.53	5.93		7.99	2.57	6.07	11.06	26.38
2	Mananthavady	137.04	43983.1	593.07	46.85	0.63	6.97	4.83	4.40	273.82	6.85
3	Sulthan Bathery	43.30	28584.8	1562.71	197.97		20.99	0.60	3.90	32.91	
	Municipality	0.22	653.73	36.014	1.766		1.67		0.62		
<b>District Total</b>		<b>229.28</b>	<b>94827.8</b>	<b>2597.34</b>	<b>252.52</b>	<b>0.63</b>	<b>37.63</b>	<b>8.02</b>	<b>15.00</b>	<b>317.80</b>	<b>33.24</b>

Table:- 14.9

**BLOCK WISE PRODUCTION OF IMPORTANT CROPS 2009-2010**

(Production in Tonnes)

Sl. No.	Block	Rice				Canegur	Black pepper	Cured Ginger
		Autumn	Winter	Summer	Total			
1	2	3	4	5	6	7	8	9
1	Vythiri	0	5144.06	1038.14	<b>6182.20</b>		521.23	1605.16
2	Mananthavady	0	8403.71	1869.65	<b>10273.37</b>		1718.5	3545.84
3	Sulthan Bathery	0	12744.69	3891.89	<b>16636.58</b>		2255.90	13212.54
	Municipality	0	45.43	19.61	<b>65.04</b>		1.84	75.27
<b>District Total</b>		<b>0</b>	<b>26337.91</b>	<b>6819.3</b>	<b>33157.21</b>	<b>0</b>	<b>4497.48</b>	<b>18438.82</b>

Sl. No.	Block	Cured Turmeric	Arecanut	Jack (Million Nos.)	Banana	Other Plantain	Pineapple	Tapioca	Pappaya
1	2	10	11	12	13	14	15	16	17
1	Vythiri	95.68	1662.48	3.79	19502.6	1543.33	42.819	15821.32	543.82
2	Mananthavady	185.12	1868.63	4.45	34108.05	2414.44	34.86	23323.24	689.35
3	Sulthan Battery	390.26	1723.69	14.41	17914.96	3456.86	38.32	41313.28	1935.41
	Municipality	0.92	130.27	0.17	100.92	71.87	1.67	157.5	71.63
<b>District Total</b>		<b>671.99</b>	<b>5385.08</b>	<b>22.83</b>	<b>71626.53</b>	<b>7486.52</b>	<b>11.67</b>	<b>80618.34</b>	<b>3240.22</b>

Sl. No.	Block	Drumstick	Sesamum	Coconut (Million nuts)	Nutmeg	Cocoa	Raw cashew	Betel Leaves
1	2	18	19	20	21	22	23	24
1	Vythiri	15.57		11.30	3.75	15.82	7.83	87.84
2	Mananthavady	22.07		12.19	3.49	5.56	431.70	12.87
3	Sulthan Bathery	96.84		21.79	3.5	45.54	54.85	15.6
	Municipality	1.88		0.95	0	0.34		0
<b>District Total</b>		<b>136.38</b>		<b>46.24</b>	<b>10.75</b>	<b>67.28</b>	<b>494.39</b>	<b>116.31</b>

Table:- 14.10

**ESTIMATED AREA AND PRODUCTION OF RICE (WINTER)**

(Area in hectares and Production in Tonnes)

YEAR	High Yielding						Local Varieties						Total	
	Irrigated		Un irrigated		Total		Irrigated		Un irrigated		Total		Area	Production
	Area	Production	Area	Production	Area	Production	Area	Production	Area	Production	Area	Production		
<b>2009-2010</b>	7660.9	19959.22	614.33	1683.41	8275.2	21642.63	1469.2	2711.30	832.18	1983.98	2301.39	4695.28	10577	26337.92
<b>2008-2009</b>	6565	17859	1413	3663	7978	21522	955	2203	917	1982	1872	4185	9850	25707
<b>2007-2008</b>	5562	14469	2138	5362	7700	19831	852	1723	861	1919	1713	3642	9413	23473

Table:- 14.11

**ESTIMATED AREA AND PRODUCTION OF RICE (SUMMER)**

(Area in hectares and Production in Tonnes)

YEAR	High Yielding						Local Varieties						Total	
	Irrigated		Un irrigated		Total		Irrigated		Un irrigated		Total		Area	Production
	Area	Production	Area	Production	Area	Production	Area	Production	Area	Production	Area	Production		
<b>2009-2010</b>	2395.9	6749.66	22.27	67.59	2418.2	6817.25	1.29	2.04			25.55	15.72	108.19	156.61
<b>2008-2009</b>	2780	7881	4	5	2784	7886	112	268			112	268	2896	8154
<b>2007-2008</b>	2968	8579			2968	8579	27	27			27	27	2995	8606

Source: Agricultural Statistics, DES

Table:- 14.12

**THE FINAL ESTIMATION OF YIELD AND PRODUCTION OF RICE (YEAR WISE)****Season: Winter**

Year	No of Experiments		Estimated yield in Tonnes/ Ha (Rice)	Area in 1000 Ha	Average Yield (kg/Ha) Rice	Estimated Production of Rice in 1000 tons	Bund Correction Factor (if any) applied	Sampling error for Av.Yield	%of sampling Error
	Planned	Analysed							
<b>2009-2010</b>	274	274	2.49	10.57	2490	26.33	Not Applied	65.86	2.64
<b>2008-2009</b>	274	274	2.61	9.8	2610	25.70		80.96	3.10
<b>2007-2008</b>	274	274	2.49	9.41	2494	23.47		77.28	3.0

Table:- 14.13

**FINAL RESULT OF CROP ESTIMATION SURVEY ON DRIAGE RESULTS**

Year	No of Driage Exp:		Total of Plot Yield Before Driage(gms)	Total of Plot Yield After Driage (gms)	Driage rate applied for estimating Yield
<b>2009-2010</b>	9	9	2250	2066	0.918
<b>2008-2009</b>	9	9	2250	2090	0.929

Source: Agricultural Statistics, DES

Table:- 14.14

**AREA,MEAN YIELD AND PRODUCTION OF RICE FOR HIGH YIELDING VARITIES OF PADDY****Season-Winter**

YEAR	Irrigated					Un Irrigated					Total				
	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes
<b>2009-2010</b>	200	2605	7660.88	81.66	19959.2	7	2740	614.33	316.88	1683.42	207	2615	8275.21	79.17	21642.63
<b>2008-2009</b>	186	2720	6564.8	103.72	17858.8	29	2592	1413.1	239.37	3663.33	215	0	7977.92	95.30	21522.13

Table:- 14.15

**AREA, MEAN YIELD AND PRODUCTION OF RICE FOR LOCAL VARITIES OF PADDY****Season-Winter**

YEAR	Irrigated					Un Irrigated					Total				
	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes
<b>2009-2010</b>	62	1845	1469.21	112.48	2711.3	5	2384	832.18	203.48	1983.98	67	2040	2301.39	102.81	4695.28
<b>2008-2009</b>	44	2307	955.07	153.61	2203.09	15	2162	916.67	208.2	1981.7	59	2236	1871.74	128.61	4184.79

Source: Agricultural Statistics, DES

Table:- 14.16

**AREA,MEAN YIELD AND PRODUCTION OF RICE FOR ALL VARITIES OF PADDY****Season-Winter**

YEAR	HIGH YIELDING VARIETY					LOCAL VARIETY					TOTAL				
	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes
<b>2009-2010</b>	207	2615	8275.21	79.18	21642.6	67	2040	2301.39	102.83	4695.29	274	2490	10577	65.87	26337.92
<b>2008-2009</b>	215	2698	7977.92	95.31	21522.1	59	2236	1871.74	128.61	4184.79	274	2610	9850	80.97	25706.92

Table:- 14.17

**AREA, MEAN YIELD AND PRODUCTION OF RICE FOR ALL VARITIES OF PADDY****Season-Winter**

YEAR	IRRIGATED					UN IRRIGATED					TOTAL				
	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes
<b>2009-2010</b>	262	2483	9130.09	70.88	22670.5	12	2535	1446.51	178.37	3667.4	274	2490	10577	65.87	26337.92
<b>2008-2009</b>	230	2668	7519.87	90.55	20061.9	44	2423	2329.79	166.72	5645.03	274	2610	9850	80.97	25706.92

Source: Agricultural Statistics, DES

Table:- 14.18

**AREA,MEAN YIELD AND PRODUCTION OF RICE FOR HIGH YIELDING VARITIES OF PADDY  
Season-Summer**

YEAR	IRRIGATED					UN IRRIGATED					TOTAL				
	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes
<b>2009-2010</b>	262	2817	2395.9	80.14	6749.66	6	3035	22.27	427.53	67.59	268	2819	2418.17	79.50	6817.26
<b>2008-2009</b>	255	2834	2780.4	97.01	7880.99	1	1267	4.05	0	5.13	256	2832	2784.44	96.87	7886.13

Table:- 14.19

**AREA, MEAN YIELD AND PRODUCTION OF RICE FOR LOCAL VARITIES OF PADDY  
Season-Summer**

YEAR	IRRIGATED					UN IRRIGATED					TOTAL				
	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes
<b>2009-2010</b>	2	1584	1.29	972.04	2.043	0			0		2	1584	1.29	972.05	2.043
<b>2008-2009</b>	18	2391	111.94	196.57	267.63	0			0		18	2391	111.94	196.58	267.63

Source: Agricultural Statistics, DES



Table:- 14.20

**AREA, MEAN YIELD AND PRODUCTION OF RICE FOR ALL VARIETIES OF PADDY**  
**Season-Summer**

YEAR	IRRIGATED					UN IRRIGATED					TOTAL				
	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean Yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes	No of Experiments	Mean yield (kg/Ha) Rice	Area (Ha)	Sampling Error	Production of Rice in Tonnes
<b>2009-2010</b>	2	1584	1.29	972.05	2.04	0			0		2	1584	1.29	972.04	2.043
<b>2008-2009</b>	273	2817	2892.33	93.56	8148.62	1	1267	4.05	0	5.13	274	2815	2896.4	93.43	8153.8

Table:- 14.21

**CROP ESTIMATION SURVEYS-AUXILIARY INFORMATION**  
**PERCENTAGE OF AREA UNDER DIFFERENT AGRICULTURAL PRACTICES- A STATEMENT**  
**Season-Summer**

YEAR	Seeds Used(No of Exp)			Chemically Manured (%)	Other Manured (%)	Both Chemical and other Manured	Not Manured	Treated with pesticides	Pesticides not used
	Total	Improved	Local						
<b>2009-2010</b>	270	268	2	85.56	65.19	53.7	3.7	35.19	64.81
<b>2008-2009</b>	274	256	18	89.42	65.33	56.57	1.82	34.67	65.33

Source: Agricultural Statistics, DES

Table:- 14.22

**Block/Panchayat/Municipality wise Sex Wise Marginal Workers  
Population, Marginal Cultivators Population & Marginal Agricultural  
Labourers Population**

Block/ Panchayat/ Municipality	Marginal Workers			Marginal Cultivators			Marginal Agricultural Labourers		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>Kalpetta Block</b>	<b>24086</b>	<b>14603</b>	<b>9483</b>	<b>1557</b>	<b>1030</b>	<b>527</b>	<b>9838</b>	<b>5796</b>	<b>4042</b>
Pozhuthana	2054	1409	645	207	158	49	517	382	135
Vythiri	2294	1443	851	21	16	5	298	203	95
Meppady	4247	2550	1697	186	101	85	1016	576	440
Muttill	3558	2218	1340	263	151	112	1438	823	615
Kaniambetta	3563	2229	1334	161	94	67	2263	1424	839
Kottathara	1866	1111	755	179	133	46	1056	591	465
Padinharethara	3427	1984	1443	315	207	108	2211	1225	986
Thariyode	1485	807	678	74	56	18	518	275	243
Vengappally	1592	852	740	151	114	37	521	297	224
<b>Sulthanbathery Block</b>	<b>32202</b>	<b>17774</b>	<b>14428</b>	<b>3509</b>	<b>1821</b>	<b>1688</b>	<b>17718</b>	<b>9716</b>	<b>8002</b>
Ambalavayal	3754	2015	1739	404	255	149	1922	1035	887
Nenmeni	4455	2390	2065	279	144	135	2567	1293	1274
Noolpuzha	3566	1901	1665	539	257	282	2101	1042	1059
Mullenkolly	3185	1715	1470	739	373	366	1958	1066	892
Pulpalli	2943	1575	1368	433	151	282	1922	1070	852
Poothadi	6187	3373	2814	493	340	153	3120	1801	1319
Meenangadi	4331	2463	1868	409	168	241	2091	1196	895
Sulthanbathery	3781	2342	1439	213	133	80	2037	1213	824
<b>Mananthavady Block</b>	<b>29951</b>	<b>16521</b>	<b>13430</b>	<b>3479</b>	<b>1652</b>	<b>1827</b>	<b>13976</b>	<b>7870</b>	<b>6106</b>
Thondernad	2677	1528	1149	532	202	330	1221	736	485
Vellamunda	4000	2253	1747	497	261	236	2034	1187	847
Edavaka	3800	1803	1997	820	290	530	2012	1062	950
Panamaram	5381	2980	2401	548	277	271	2888	1582	1306
Mananthavady	3175	1771	1404	410	213	197	1216	673	543
Thirunelly	5320	2826	2494	208	146	62	2601	1376	1225
Thavinhal	3398	2034	1364	408	234	174	1616	984	632
Muppainad	2200	1326	874	56	29	27	388	270	118
<b>Total (Rural)</b>	<b>86239</b>	<b>48898</b>	<b>37341</b>	<b>8545</b>	<b>4503</b>	<b>4042</b>	<b>41532</b>	<b>23382</b>	<b>18150</b>
<b>Municipality / Corporation</b>									
Kalpetta (M)	2585	1371	1214	20	7	13	531	317	214
<b>Total (Urban)</b>	<b>2585</b>	<b>1371</b>	<b>1214</b>	<b>20</b>	<b>7</b>	<b>13</b>	<b>531</b>	<b>317</b>	<b>214</b>
<b>District Total</b>	<b>88824</b>	<b>50269</b>	<b>38555</b>	<b>8565</b>	<b>4510</b>	<b>4055</b>	<b>42063</b>	<b>23699</b>	<b>18364</b>

Source:- Panchayath level Statistics, 2006, DES.

Table:- 14.23

**Block/ Panchayat/ Municipality wise Sex Wise number of Marginal Workers Population, Marginal Cultivators Population & Marginal Agricultural Labourers Population**

Block/ Panchayath/ Municipality	Marginal Household Industry			Marginal Other workers			Non Workers		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>Kalpetta Block</b>	<b>294</b>	<b>162</b>	<b>132</b>	<b>12397</b>	<b>7615</b>	<b>4782</b>	<b>123391</b>	<b>45767</b>	<b>77624</b>
Pozhuthana	45	25	20	1285	844	441	10584	4204	6380
Vythiri	16	12	4	1959	1212	747	10883	4170	6713
Meppady	24	16	8	3021	1857	1164	23795	9362	14433
Muttill	49	29	20	1808	1215	593	19724	7238	12486
Kaniambetta	44	21	23	1095	690	405	18549	6630	11919
Kottathara	9	2	7	622	385	237	10066	3520	6546
Padinharethara	59	31	28	842	521	321	15893	5641	10252
Thariyode	25	14	11	868	462	406	7344	2602	4742
Vengappally	23	12	11	897	429	468	6553	2400	4153
<b>Sulthanbathery Block</b>	<b>328</b>	<b>140</b>	<b>188</b>	<b>10647</b>	<b>6097</b>	<b>4550</b>	<b>167586</b>	<b>60012</b>	<b>107574</b>
Ambalavayal	50	27	23	1378	698	680	20365	7329	13036
Nenmeni	61	8	53	1548	945	603	26865	9554	17311
Noolpuzha	17	7	10	909	595	314	14964	5482	9482
Mullenkolly	21	15	6	467	261	206	17247	6161	11086
Pulpalli	5	1	4	583	353	230	19779	7022	12757
Poothadi	86	44	42	2488	1188	1300	23296	8472	14824
Meenangadi	31	21	10	1800	1078	722	18750	6765	11985
Sulthanbathery	57	17	40	1474	979	495	26320	9227	17093
<b>Mananthavady Block</b>	<b>389</b>	<b>149</b>	<b>240</b>	<b>12107</b>	<b>6850</b>	<b>5257</b>	<b>163495</b>	<b>60735</b>	<b>102760</b>
Thondernad	51	32	19	873	558	315	13998	5181	8817
Vellamunda	89	11	78	1380	794	586	23688	8760	14928
Edavaka	31	8	23	937	443	494	18768	7257	11511
Panamaram	61	30	31	1884	1091	793	26044	9676	16368
Mananthavady	68	32	36	1481	853	628	27348	10097	17251
Thirunelly	40	21	19	2471	1283	1188	15116	5767	9349
Thavinhal	37	13	24	1337	803	534	23782	8371	15411
Muppainad	12	2	10	1744	1025	719	14751	5626	9125
<b>Total (Rural)</b>	<b>1011</b>	<b>451</b>	<b>560</b>	<b>35151</b>	<b>20562</b>	<b>14589</b>	<b>454472</b>	<b>166514</b>	<b>287958</b>
<b>Municipality/ Corporation</b>									
Kalpetta (M)	32	10	22	2002	1037	965	17534	6364	11170
<b>Total (Urban)</b>	<b>32</b>	<b>10</b>	<b>22</b>	<b>2002</b>	<b>1037</b>	<b>965</b>	<b>17534</b>	<b>6364</b>	<b>11170</b>
<b>District Total</b>	<b>1043</b>	<b>461</b>	<b>582</b>	<b>37153</b>	<b>21599</b>	<b>15554</b>	<b>472006</b>	<b>172878</b>	<b>299128</b>

Table:- 14.24

**Block/Panchayat/Municipality wise Sex Wise Institutional Population & Houseless Population**

Block/ Panchayat/ Municipality	Institutional Population			Houseless Population		
	Total	Male	Female	Total	Male	Female
<b>Kalpetta Block</b>	<b>2056</b>	<b>1021</b>	<b>1035</b>	<b>85</b>	<b>47</b>	<b>38</b>
Pozhuthana	22	15	7	0	0	0
Vythiri	599	356	243	6	2	4
Meppady	268	156	112	31	17	14
Muttil	780	394	386	24	13	11
Kaniambetta	72	37	35	0	0	0
Kottathara	20	10	10	0	0	0
Padinharethara	160	5	155	17	10	7
Thariyode	105	18	87	2	2	0
Vengappally	30	30	0	5	3	2
<b>Sulthanbathery Block</b>	<b>2189</b>	<b>989</b>	<b>1200</b>	<b>308</b>	<b>233</b>	<b>75</b>
Ambalavayal	176	78	98	2	2	0
Nenmeni	157	39	118	50	28	22
Noolpuzha	372	200	172	17	10	7
Mullenkolly	164	78	86	7	6	1
Pulpalli	190	80	110	31	26	5
Poothadi	239	86	153	18	8	10
Meenangadi	211	160	51	59	50	9
Sulthanbathery	680	268	412	124	103	21
<b>Mananthavady Block</b>	<b>3254</b>	<b>1676</b>	<b>1578</b>	<b>272</b>	<b>144</b>	<b>128</b>
Thondernad	250	160	90	11	6	5
Vellamunda	220	138	82	2	2	0
Edavaka	814	505	309	5	4	1
Panamaram	329	177	152	17	14	3
Mananthavady	873	317	556	70	36	34
Thirunelly	279	133	146	12	7	5
Thavinhal	235	135	100	16	5	11
Muppainad	254	111	143	139	70	69
<b>Total (Rural)</b>	<b>7499</b>	<b>3686</b>	<b>3813</b>	<b>665</b>	<b>424</b>	<b>241</b>
<b>Municipality/ Corporation</b>						
Kalpetta (M)						
<b>Total (Urban)</b>						
<b>District Total</b>	<b>7499</b>	<b>3686</b>	<b>3813</b>	<b>665</b>	<b>424</b>	<b>241</b>

## SEED RATE FOR IMPORTANT CROPS OF KERALA

1. Rice	Transplanting	-	60-85kg/ha
	Broadcasting	-	80-100kg/ha
	Dibbling	-	80-90kg/ha
2. Maize		-	20kg/ha
3. Ragi	Direct sown	-	5kg/ha
	Transplanted crop	-	4-5kg/ha
4. Sorghum		-	12-15kg/ha
5. Black gram	Pure crop	-	20kg/ha
	Mixed crop	-	6kg/ha
6. Cowpea			
1. For vegetable type			
a. Bush		-	20-25kg/ha
b. Trailing		-	4-5kg/ha
2. For grain and dual purpose			
a. Broadcasting		-	60-65kg/ha
b. Dibbling		-	50-60kg/ha
7. Green gram			
	Pure crop	-	20-25kg/ha
	Mixed crop	-	6kg/ha
8. Green pea		-	60kg/ha
9. Horse gram		-	25-30kg/ha
10. Red gram			
	Pure crop	-	15-20kg/ha
	Mixed crop	-	6-7kg/ha
11. Amorphophallus		-	9-12tonnes/ha
12. Colocasia		-	800-1200kg/ha
13. Greater yam (Kachi)		-	3000-3700kg/ha
14. Lesser yam (Nanakizhangu)		-	1800-2700kg/ha
15. Sweet potato		-	80kg tubers/ha
16. Tapioca		-	2000 stems/ha
17. Rubber		-	450-500plants/ha
18. Ground nut			
	Pure crop	-	100kg kernels/ha
	Inter crop in coconut	-	80kg kernel/ha
	Inter crop in Tapioca	-	40-50kg kernel/ha
19. Sesame		-	4-5kg/ha
20. Mango ginger		-	1500kg/ha
21. Ginger		-	1500kg/ha
22. Turmeric		-	2000-2500kg/ha
23. Betel vine		-	<b>20000to25000cuttings/ha</b>
24. Okra		-	7-8.5kg/ha
25. Bitter gourd		-	5-6kg/ha
26. Coleus		-	75-100kg/tubers/ha
27. Snake gourd		-	3-4kg/ha

28. Cucumber	-	0.5-0.75kg/ha
29. Watermelon	-	1-1.5kg/ha
30. Bottle gourd	-	3-4kg/ha
31. Pumpkin	-	1-1.5kg/ha
32. Ash gourd	-	0.75-1kg/ha
33. Brinjal	-	370-500g/ha
34. Chilli	-	1kg/ha
35. Tomato	-	400g/ha
36. Cabbage	-	500-750g/ha
37. Cauliflower	-	600-750g/ha
38. Carrot	-	5-6kg/ha
39. Beetroot	-	7-8kg/ha
40. Radish	-	7-8kg/ha
41. Potato	-	1000-2000kg seed tuber/ha
42. Garlic	-	500kg of cloves/ha
43. Winged bean	-	15-20kg/ha
44. Cluster bean	-	10-12kg/ha
45. Clove bean	-	6-7kg/ha
46. Smooth gourd	-	2.5-3kg/ha
47. Ridge gourd	-	2.5-3kg/ha
48. Bell pepper	-	400-600g/ha

### CONVERSION RATES BETWEEN RAW MATERIALS AND PROCESSED PRODUCTS

Paddy	Rice	Cleaned 2/3 by weight of paddy
Groundnut	Kernels to nuts in shell	70 percent
	Oil to nuts in shell	28 percent
	Oil to Kernels crushed	40 percent
	Cake to Kernels crushed	60 percent
Sesamum	Oil to seeds crushed	40 percent
	Cake to seeds crushed	60 percent
Coconut	Copra to nuts	6,773 nuts gives one tone of copra (average), presently it is 7250-7500 nuts due to mite attack
	Cake to copra	38 percent
Pepper	Green to dry	21-39 percent by weight
Sugarcane	Gur from cane	10 percent
	Crystal sugar from gur	62.4 percent
	Crystal sugar from cane	9.9 percent
	Molasses from cane	3.5 percent
Cashew	Cashew Kernel	25 percent of nuts
Arecanut	Husked Champan to unhusked	35 percent by weight
Supari	(Processed tender nut to Unhusked champan)	12 percent
	Starch	28-30 percent on the weight of fresh tubers

Turmeric	Cured to raw (Dry 17-25% of the raw stuff)	16-20 percent of the weight
Ginger	Dry Ginger	21-30 percent by weight
Cocoa	Pod to wet beans	40 percent by weight
	Wet beans to dried beans	35-40 percent by weight
Coffee	Robusta-Berried to clean coffee	4.5 to 3.6:1
	Wet beans to dried beans	5.0 to 3.3:1
Cardamom	Green to dry	25-35 percent
Oil Palm	Palm Oil	20% by weight of Bunch
Soyabean seed	Oil to soyabean seed crushed	18 percent
	Meal to soyabean seed crushed	73 percent
	Hull from soyabean seed crushed	8 percent
Neem seed	Oil to kernel crushed	45-50 percent
	Cake to kernel crushed	50-55 percent

### CONVERSION FACTORS FOR COCONUT

- A. Number of Coconuts to a tonne of Copra:
- |              |   |
|--------------|---|
| Kerala       | 6,250 to 6,850 (at present it is 7250-7500 nuts due to mite attack) |
| Andrapradesh | 8,820   |
| Tamilnadu    | 7,000   |
| Laccadives   | 12,000  |
- B. Copra yield from coconut in different months in Kerala at 6% moisture level/1000 nuts
- |           |       |
|-----------|-------|
| January   | 163kg |
| February  | 181kg |
| March     | 178kg |
| April     | 176kg |
| May       | 179kg |
| June      | 165kg |
| July      | 152kg |
| August    | 139kg |
| September | 147kg |
| October   | 148kg |
| November  | 155kg |
| December  | 158kg |
- C. Nuts to shell, Coconut water etc.
- |           |                             |
|-----------|-----------------------------|
| 1000 nuts | 114kg shell                 |
| 1000 nuts | 100 litres of coconut water |
| 1000 nuts | 35kg of charcoal            |
- D. Coconut Oil from Copra
- |           |        |
|-----------|--------|
| Chekkus   | 58-60% |
| Rotories  | 62-63% |
| Expellers | 63-65% |
- E. Ball copra from coconut (per 1000 nuts)
- |  |                    |
|--|--------------------|
|  | 1.5tonne (grade 1) |
|  | 1.3tonne (average) |
- F. Dessicated coconut (per 1000 nuts)
- |  |               |
|--|---------------|
|  | 1 tonne of DC |
|--|---------------|

G. Cake yield as percentage of copra crushed			
		38%	
		36%	
		34%	
H. Coconut to Fibre (per 1000 nuts)			
	81.8kg – kerala		
	68.3kg – Andhrapradesh		
	90.0kg – Tamilnadu		
	81.9kg – Karnataka		
	56.9kg - Others		
I. Composition of Coconut (Husked)			
	Shell	27.9% (23.5 to32.8)	
	Kernel	55.2% (48.2 to 62.0)	
	Water	17.0% (8.2 to 25.1)	
J. Composition of Standard Copra			
	Moisture	6%	
	Oil	68 to 71%	
	Free Fatty Acids	2%	
Composition	Kernel	Copra%	Cake%
Moisture	46.3	5.8	10.7
Protein	4.1	8.9	19.1
Fat	37.3	67.0	11.1
Carbohydrates	7.9	12.4	40.9
Crude Fibre	3.4	4.1	14.1
Ash	1.0	1.8	4.1
K. Fatty Acid Composition of Coconut Oil			
	Saturated Fatty Acids	Un-Saturated Fatty Acids	
	Lauric Acid	Palmitoleic Acid	
	Caprylic Acid	Oleic Acid	
	Myristic Acid	Linoleic Acid	
	Straric Acid	Arachidonic Acid	
	Arachidic Acid		
L. Coir pith per 10000 husk		2 tonnes	
M. Charcoal yield from shell (per 3 tonnes of shell)		1 tonne	
N. Processed coconut cream/1000 coconut		200kg cream	
O. Coconut Vinegar (per 100 litres coconut water)		110 litre vinegar	

Source:- Farm Guide.



## **PLANTATION CROPS**

Plantation crops in general are either export oriented or import substituting and therefore assume special significance from the national point of view. It is estimated that nearly 14 lakh families are dependent on the plantation sector for livelihood. Each of the four plantation crops of South India has its distinct characteristics and economics problems. Consequent to the removal of quantitative restrictions on import, plantation crops in general are facing the threat of low quality imports.

Kerala has a substantial share in the four plantation crops of rubber, tea, coffee and cardamom. These four crops together occupy 6.89 lakh ha, accounting for 31.58 percent of the net cropped area in the state and 43 percent of the area under these crops in the country. Kerala's share in the national production of rubber is 91 percent, cardamom 75 percent, coffee 22 percent during the year 2008-09.

### **RUBBER**

India is the fourth largest producer of natural rubber with a share of eight percent in the world after Thailand, Indonesia and Malaysia. The production of natural rubber in the country was 8.31 lakh MT in 2009-10, registering a 3.8 percent decline compared to the previous year. India is at the same time the second largest consumer of natural rubber after China. A 34 percent decline in the consumption of USA was recorded in 2009 over 2008 while consumption in China and India increased by 17.70 percent and 2.70 percent respectively.

Kerala accounts for 78 percent of the area under rubber in the country. The coverage under the crops in 2009-10 was 5.25 lakh ha, higher by 7933 ha. Over the previous year. The production of natural rubber in Kerala during the year was 7.45 lakh tones indicating a 4.85 percent decline over the previous year. The increasing trend in productivity continued during 2008-09. It was 1190 kg. per ha in 1998-99, which rose to 1514 kg. during 2008-09. However it declined slightly to 1419 Kg/ha in 2009-10. In terms of tapping area, productivity recorded was 1867 kg. per ha during the year 2008-09 which declined to 1784 Kg/ha in 2009-10.

Even though the domestic prices of natural rubber were more or less comparable to international prices during 2007-08, (Appendix 4.17) the industrial sector still resorts to imports in bulk quantities. The total quantity imported was 86394

MT which slightly declined to 77616 MT in 2008-09. The import increased to 176756 MT in 2009-10.

The higher prices in the international market are reflected in the domestic market also. The average of RSS 4 in the domestic market at Kottayam was Rs. 144.98 per kg. in 2009-10. The international price of RSS3, equivalent of RSS 4 of India, was Rs. 111.13 in the corresponding period. The price of RSS 4 in Kottayam reached Rs. 137.82 during August 2008 and then declined to Rs. 64.88 in October 2008 and further increased to Rs. 108.98 in October 2009 and Rs. 149.48 in March 2010. The share of Rubber in Wayanad is 0.63%

## **COFFEE**

The area under coffee in Kerala was 0.85 lakh ha out of 3.99 lakh ha. In the country during 2009-10, which works out to 21 percent. The share of Kerala in production is 20.5 percent during 2009-10. Major variety grown in Kerala is Robusta with a share of 95 percent in planted area. Production of coffee during the year was only 0.59 lakh MT against 2.90 lakh MT for the country. Productivity of the crop in terms of bearing area in Kerala (705 kg/ha) is lower than the national level of 826 kg/ha. Area under coffee registered substantial increase during the last two decades with an annual growth rate of over 2 per cent. The increase in production recorded during the period was much higher and registered an annual average growth rate of nearly nine percent. Coffee provides opportunities for livelihood to nearly one lakh families including agricultural labourers. In Kerala, coffee is also one of the small holder plantation crops with nearly 76,000 holding coming under the category with an average size of 1.1 ha. Consumption of coffee has remained more or less static at around 55,000 tonnes for the past one and half decades till 1999 and then slightly improved to 70,000 tonnes in 2003, and further to 1 lakhs tones in 2009.

Coffee is a highly export dependent crop and more than 80 percent of domestic production is exported. The unit value realization has declined drastically from Rs. 95.37 per kg. in 1997-98 to Rs.106.08 per kg. in 2009-10. The quantity of coffee exported from India declined in 2009-10 to 2.04 lakh tones from 2.18 lakh tones in 2007-2008 and slightly improved in 2008-09.

To mitigate the problems of coffee growers arising from the low prices of coffee, a series of steps have been taken including the restructuring of loans and

interest relief to coffee growers ( a subsidy of 5 percent for small growers and 3 percent for large growers is available for working capital). Rainfall insurance as a risk management support for coffee growers in collaboration with AIC is also implemented. Government of India has approved in June 2010 the coffee debt relief package 2010 for the debt ridden small coffee growers with a total financial implication of Rs. 241.33 crore. It is in the early stage of implantation. The share of Coffee in Wayanad is 33.9%.

## **TEA**

Against the total area 5.11 lakh ha under tea in the country Kerala accounts for only 0.37 lakh ha. In respect of production the share of Kerala is 6.6 percent in 2007. Tea plantations owned by big companies employ a labour force of over 84,000 in the organized sector. There is fluctuation in production and it ranged from 64.8 M. kgs. In 1995 - 96, reaching to 69.1 M kgs. In 2000-01 which declined to 56 M kgs. In 2007 and improved to 57.81 M Kg in 2009.

Imports increased from 13.4 M. Kg. in 2000 to 20.28 M kg. in 2009. However during 2003 the import declined substantially to 9.8 M. kgs. The maximum quantity of tea was imported from Nepal (31 percent). Followed by Vietnam (25 percent) and Indonesia (11 Percent). The unit value of imported tea was the lowest from Vietnam (Rs. 53/kg) while the average being Rs. 62/kg. The disturbing fact is that most of the countries to India at low prices.

The average price of tea in 2007-08 was 67.3 per Kg which increased to Rs. 110.30 in 2008-09 and declined slightly to Rs. 107.81 in 2009-10.

Productivity of Tea in India is much lower than that in Vietnam. The organic tea production is a major shift in this sector. (eg. Darjeeling tea). In Kerala coverage under organic tea could be increased.

Government of India has setup a special purpose Tea Fund for funding replantation and rejuvenation aimed at improving the age profile of tea plantation with an estimated outlay of Rs. 567.10 crores during Eleventh Five Year Plan. The estimated area to be taken up for replantation/rejuvenation during the period would be 85044 ha in the country. The share of Tea in Wayanad is 3.61%

## **CARDAMOM**

Productivity which was more or less stagnant around 50 kg./ha. In the 1980s has improved to the level of around 203 kg. per ha by 2001 and increased slightly to 206 kg./ha. In 2008-09 and declined to 188 Kg./ha in 2009-10. The share of Kerala in production at the all India level increased from 28 percent in 1992-93 to 56 percent in 2008-2009. While area under Cardamom in the country has declined from 0.97 lakh ha to 0.73 lakh ha. In the period, in Kerala it has come down from 65,000 ha to 41593 ha. On the export front cardamom has been facing competition from Guatemala although the quality of Guatemala cardamom is inferior. The country could tide over the challenge by expanding domestic market through market promotion. The average price during 2000-01 was Rs. 570 Per kg. which is declined to Rs. 463.14 in 2007-08 and improved to Rs. 506.44 in 2008-09 and Rs. 800.08 in 2009-10. The Indian export of cardamom has increased by 27.8 percent in 2009-10 to reach 1975 MT. The unit price of exported Cardamom increased steadily to Rs. 838 per kg. in 2009-10 from Rs. 630 per kg. in 2008-09. However the market for cardamom is largely domestic as could be seen from the declining share of exports and the share of exports is only 5 percent of the production.

Source: Economic Review

Table: 15.1

**RUBBER STATISTICS**

Type- wise Production & Consumption of NR & SR	August 2011	August 2010	April 2011 to August 2011	April 2010 to August 2010	April 2010 to March 2011	Percentage increase (+) / decrease (-) of (3) & (4) (4)
	(1)	(2)	(3)	(4)	(5)	(6)
<b>PRODUCTION</b>						
<b>Natural Rubber (NR)</b>						
Ribbed Smoked Sheet (RSS)	51365	53035	222330	213515	618960	
Solid Block Rubber	9740	9535	42840	40795	117830	
Latex Concentrates (drc)	6115	5690	28130	26210	76065	
Others	3980	4240	17900	17230	49095	
<b>Total</b>	<b>71200</b>	<b>72500</b>	<b>311200</b>	<b>297750</b>	<b>861950</b>	<b>4.5</b>
<b>Synthetic Rubber (SR)</b>						
Styrene Butadiene (SBR)	1515	1524	7848	7062	19994	
Poly Butadiene (BR)	6670	6325	32700	32345	75905	
Others	1206	918	5781	4504	14441	
<b>Total</b>	<b>9391</b>	<b>8767</b>	<b>46329</b>	<b>43911</b>	<b>110340</b>	<b>5.5</b>
<b>Total NR &amp; SR</b>	<b>80591</b>	<b>81267</b>	<b>357529</b>	<b>341661</b>	<b>972290</b>	<b>4.6</b>
<b>CONSUMPTION</b>						
<b>Natural Rubber (NR)</b>						
Ribbed Smoked Sheet (RSS)	44965	45190	254165	247165	607455	
Solid Block Rubber	22720	25580	103485	97360	235130	
Latex Concentrates (drc)	6210	6310	31290	32305	77380	
Others	2295	2420	11675	11720	27750	
<b>Total</b>	<b>76190</b>	<b>79500</b>	<b>400615</b>	<b>388550</b>	<b>947715</b>	<b>3.1</b>

Type- wise Production & Consumption of NR & SR	August 2011	August 2010	April 2011 to August 2011	April 2010 to August 2010	April 2010 to March 2011	Percentage increase (+)/decrease (-) of (3) & (4)
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Synthetic Rubber (SR)</b>						
Styrene Butadiene (SBR)	14605	14535	76760	69435	174855	
Poly Butadiene (BR)	9830	10330	55205	48585	125305	
Others	9200	9355	47600	49125	111670	
Total	33635	34220	179565	167145	411830	7.4
Out of which Auto Tyre Manufactures	23530	25092	130877	118803	298414	10.2
<b>Total NR &amp; SR</b>	<b>109825</b>	<b>113720</b>	<b>580180</b>	<b>555695</b>	<b>1359545</b>	<b>4.4</b>
Out of which Auto Tyre Manufactures	70776	74450	394225	363033	896037	8.6

Table: 15.2

<b>(Metric Tonnes)</b>					
Production Consumption and stock of RR	August 2011	August 2010	April 2011 to August 2011	April 2010 to August 2010	April 2010 to March 2011
<b>Reclaimed Rubber (RR)</b>					
Production	8590	8540	41620	39670	99960
Consumption	8385	8480	41300	40160	100290
Out of which Auto Tyre Manufactures	3676	3406	17235	16032	40511
Stock with Manufactures (end of month/ year)	5270	4790			

Source:-Rubber Board

## ANIMAL HUSBANDRY SECTOR

The Animal Husbandry Sector plays an important role in strengthening the economy of the state, especially rural economy. It provides self employment opportunities to unemployed and underemployed rural poor. The majority of the live stock Population in the state is concentrated in rural areas. The progress in livestock will directly reflect a more balanced development in rural economy and upliftment of weaker sections of the society. A large manpower is also involved in livestock eating and related activities. About 57% of world cattle population is in India.

The main objective of the sector is to strengthening the livestock population of the state in terms of both quantity and quality and convert the state into a disease controlled zone by controlling/eradicating animal diseases. Prevention of disease includes control of contagious diseases by systematic vaccination. According to 2003 live stock census the cattle production of the state was 2,122 out of which 1,735 were crossbred. In Wayanad, the total cattle production was 1,03,694 of which 86,956 were crossbred. The population of the Buffaloes and Goats in the district were 3678 and 206 respectively, contribution of about 5% of Buffaloes and approximately 5% of Goats with respect to state live stock population of Buffaloes and Goats. The poultry population in the state was 12,216 of which Wayanad contributes about 2% in this sector.

Table: 16.1

	Cattles			Buffaloes	Sheep	Goats	Pigs		
	Indigenous	Crossbred	Total				Cross bred	Indigenous	Total
<b>Wayanad</b>	16738	86956	103694	3678	206	41921	3400	284	3684
<b>State</b>	387182	1735271	2122453	64618	3631	1213173	50945	25507	76452

Source: Report on integrated sample survey, A H D

Table:-16.2

Statement of Outbreaks,Attacks,Deaths etc.due to contagious diseases and number of animals protected/vaccinated during the year 2007-2008

Foot and Mouth				Anthrax				Black Quarter				H.S			
Out break	Attack	Death	Protecte d/Vaccin ated	Out break	Attack	Death	Protect ed/Vacc inated	Out break	Attack	Death	Protect ed/Vacc inated	Out break	Attack	Death	Protect ed/Vacc inated
4	43	3	9220	0	0	0	689	0	0	0	75	0	0	0	5822

Canine Distemper				Parvo Virus				Ranikhet				Fowl Pox			
Out break	Attack	Death	Protect ed/Vacc inated	Out break	Attack	Death	Protect ed/Vacc inated	Out break	Attack	Death	Protect ed/Vacc inated	Out break	Attack	Death	Protect ed/Vacc inated
0	0	0	61	0	0	0	63	0	0	0	167714	0	0	0	3417

Infectious Bursal Disease				Duck Plague				Others				Total			
Out break	Attack	Death	Protect ed/Vacc inated	Out break	Attack	Death	Protect ed/Vacc inated	Out break	Attack	Death	Protect ed/Vacc inated	Out break	Attack	Death	Protect ed/Vacc inated
0	0	0	4200	0	0	0	95	0	0	0	8165	4	43	3	282521

Source:Animal husbandry Statistics,AHD



Table:-16.3

Number of Cases treated under important  
categories of diseases in various Departmental  
institutions during 2007-2008

Mastitis	Bovine	2543
	Goat	385
	Others	1
Abortion	Bovine	342
	Goat	256
	Others	2
Worm Infections	Bovine	34173
	Goat	12871
	Others	4576
Coccidiosis	Bovine	1887
	Goat	341
	Others	2090
Babesiosis	Bovine	711
	Goat	53
	Others	0
Other diseases	Bovine	53017
	Goat	19069
	Others	21745
Total	Bovine	92673
	Goat	32975
	Others	28414
<b>Total Number of Animals Treated</b>		<b>154062</b>

Source:Animal husbandry Statistics

Table:-16.4

## Anti rabies Vaccinations done in the District during 2007-2008

Prophy lactic in dogs	Post Exposure vaccinations					Number of deaths due to rabies				
	Cattle	Buffalo	Goat	Canine	Other Animal	Cattle	Buffalo	Goat	Canine	Other Animals
7237	169	0	198	370	17	2	1	0	3	0

Table:-16.5

Dairy Co-operative Societies in the district as on  
31-3-2008

Primary Societies	55
Regional Unions	0
Total	55
Anand Mode (APCOS)	53
Traditional	2
<b>Total</b>	<b>55</b>

Table:-16.6

Broiler production and Distribution in private  
sector for the year 2007-2008 in Wayanad  
District

Total No of chicken sold	Total Meat Production
100110	427470

Table:-16.7

## Estimated poultry meat Production (in MT)

Meat Production	
Wayanad	378
State	15482

Source:Animal husbandry Statistics

Table:-16.8

## Estimated Meat Production -Categorywise(authorised sector only)in MT during 2007-2008

Cattle			Buffalo			Goat and sheep			Pig			Total Meat Production
Adult	Young	Total	Adult	Young	Total	Adult	Young	Total	Adult	Young	Total	
546	42	589	663	28	691	106	7	112	37	140	177	1569

Table:-16.9

## Estimated Number of Animals slaughtered Categorywise (authorised sector only) 2007-2008 (in Nos)

Cattle			Buffalo			Goat and sheep			Pig		
Adult	Young	Total	Adult	Young	Total	Adult	Young	Total	Adult	Young	Total
9020	2493	11513	10665	1775	12440	11393	1221	12614	1002	3050	4061

Table:-16.10

## NUMBER OF SLAUGHTER HOUSES AND MEAT PRODUCTION

District	No. of slaughter houses				Meat Production (MT)
	Authorised	Unauthorised	Temporary	Total	
Wayanad	1	39	25	65	2256
State	154	1997	1714	3865	102027

Source:Animal husbandry Statistics

Table:-16.11

## KERALA XVIII QUINQUENNIAL CENSUS 2007 CATTLE (EXOTIC AND CROSSBRED) MALE

	Under 1 year	1 to 2 and half years	Total	Used for Breeding	Used for Agriculture only	Used for Bullock cart	Others	Total	Total Males
Rural	2879	1839	4718	149	476	99	170	894	5612
Urban	38	3	41	0	4	0	1	5	46

Table:-16.12

## CATTLE (EXOTIC AND CROSSBRED) FEMALE

District	Under 1 year	1 to 2 and half years	Total	Females over 2 and half years					Total Females	Total Exotic and Crossbred Cattles
				In milk	Dry	Not yet Calved	Above 10 years	Total		
Wayanad	11907	13992	25899	19293	8020	1288	807	29408	55307	60965
Rural	11690	13601	25291	18702	7957	1285	767	28711	54002	59614
Urban	217	391	608	591	63	3	40	697	1305	1351

Table:-16.13

XVIII QUINQENNIAL CENSUS 2007  
TOTAL LIVESTOCK

District	Cattle	Buffaloes	Sheep	Goats	Pigs	Other livestock	Total
Wayanad	65459	2880	190	75375	2196	6	146106
Rural	64102	2774	19	74447	2062	6	143581
Urban	1357	106	0	928	134	0	2525

Source: Report on Eighteenth Quinquennial, Dept of Animal Husbandry

Table:-16.14

## STATEMENT SHOWING THE DISTRIBUTION OF LIVESTOCK IN WAYANAD DISTRICT (1996 TO 2007)

Livestock Number				Percentage Distribution			
1996	2000	2003	2007	1996	2000	2003	2007
259539	153851	153043	146106	4.65	3.58	4.4	4.07

Table:-16.15

## LIVE STOCK AND POULTRY-CATTLE INDIGENOUS-MALE

District	Under 1 year	1 to 3 years	Total	Male over 3 years					Total Males
				Used for Breeding	Used for Agriculture only	Used for Bullock cart	Others	Total	
Wayanad	360	330	690	18	280	55	35	388	1078
Rural	360	327	687	18	280	55	35	388	1075
Urban	0	3	3	0	0	0	0	0	3

Table:-16.16

## LIVE STOCK AND POULTRY-CATTLE INDIGENOUS-FEMALE

District	Under 1 year	1 to 3 years	Total	Female over 3 years					Total Females	Total indigenous Cattle	Total Cattle
				In milk	Dry	Not yet Calved	Above 10 years	Total			
Wayanad	798	830	1628	996	623	108	61	1788	3416	4494	65459
Rural	797	829	1626	995	623	108	61	1787	3413	4488	64102
Urban	1	1	2	1	0	0	0	1	3	6	1357

Source: Report on 18th Quinquennial , Dept of Animal Husbandry

Table:-16.17

## LIVE STOCK AND POULTRY-BUFFALOES-MALE

District	Under 1 year	1 to 3 years	Total	Male over 3 years					Total Males
				Used for Breeding	Used for Agriculture & Breeding	Used for Bullock cart	Others	Total	
Wayanad	382	520	<b>902</b>	58	492	32	126	708	<b>1610</b>
Rural	356	499	<b>855</b>	58	492	32	126	708	<b>1563</b>
Urban	26	21	<b>47</b>	0	0	0	0	0	<b>47</b>

Table:-16.18

## LIVE STOCK AND POULTRY-BUFFALOES-FEMALE

District	Under 1 year	1 to 3 years	Total	Buffaloe Female over 3 years					Total Females	Total Cattle
				In milk	Dry	Not yet Calved	Above 10 years	Total		
Wayanad	350	257	<b>607</b>	453	119	54	37	<b>663</b>	<b>1270</b>	<b>2880</b>
Rural	334	249	<b>583</b>	426	111	54	37	<b>628</b>	<b>1211</b>	<b>2774</b>
Urban	16	8	<b>24</b>	27	8	0	0	<b>35</b>	<b>59</b>	<b>106</b>

Table:-16.19

## LIVE STOCK-SHEEP

District	Male			Female			Total sheep
	Under 6 months	6 months and above	Total	Under 6 months	6 months and above	Total	
Wayanad	42	47	<b>89</b>	46	55	101	<b>190</b>
Rural	42	47	<b>89</b>	46	55	101	<b>190</b>
Urban	0	0	<b>0</b>	0	0	0	<b>0</b>

Source:Report on 18th Quinquennial ,Dept of Animal Husbandry

Table:-16.20

## LIVE STOCK AND POULTRY-GOATS

District	Male			Female			Total	Total Goats	
	Under 1 year	1 year and above	Total	Under 1 year	1 year and above				
					In milk	Dry			Not calved
Wayanad	10869	6331	17200	21303	23728	11791	1353	58175	75375
Rural	10733	6523	16986	20988	23446	11681	1346	57461	74447
Urban	136	78	214	315	282	110	7	714	928

Table:-16.21

## LIVE STOCK-HORSES

District	Males				Females			Total Horses
	Below 3 years	3 years and above			Below 3 years	3 years and above	Total	
		Used for Cart	Used for sport	Total				
Wayanad	1	0	3	4	1	1	2	6
Rural	1	0	3	4	1	1	2	6
Urban	0	0	0	0	0	0	0	0

Table:-16.22

## LIVE STOCK AND POULTRY PIGS-EXOTIC CROSSBRED

District	Male			Female			Total Exotic pigs
	Below 6 months	6 months and above	Total	6 months and above	Below 6 months	Total	
Wayanad	395	475	870	446	523	969	1839
Rural	367	454	821	427	476	903	1724
Urban	28	21	49	19	47	66	115

Source:Report on 18th Quinquennial ,Dept of Animal Husbandry

Table:-16.23

## LIVE STOCK AND POULTRY-PIGS-INDIGENOUS

District	Male			Female			Total indigenous pigs	Total pigs
	Below 6 months	6 months and above	Total	Below 6 months	6 months and above	Total		
Wayanad	76	117	193	50	114	164	357	2196
Rural	76	98	174	50	114	164	338	2062
Urban	0	19	19	0	0	0	19	134

Table:-16.24

## LIVESTOCK AND POULTRY-FOWLS

District	Cocks			Hens			Total
	Improved	Desi	Total	Improved	Desi	Total	
Wayanad	13475	43142	56617	38402	205318	243720	300337
Rural	13286	41497	54783	35572	20026	235598	290381
Urban	189	1645	1834	2830	5292	8122	9956

Table:-16.25

## LIVESTOCK-ELEPHANT

District	Male	Female	Total
Wayanad	9	5	14
Rural	9	5	14
Urban	0	0	0

Source:Report on 18th Quinquennial, Dept of Animal Husbandry



Table:-16.26

**LIVESTOCKS-RABBITS**

District	Male	Female	Total
<b>Wayanad</b>	1343	1922	<b>3265</b>
<b>Rural</b>	1335	1908	<b>3243</b>
<b>Urban</b>	8	14	<b>22</b>

Table:-16.27

**LIVESTOCKS-DOGS**

District	Male	Female	Total
<b>Wayanad</b>	22058	9566	<b>31624</b>
<b>Rural</b>	21909	9445	<b>31354</b>
<b>Urban</b>	149	121	<b>270</b>

Table:-16.28

**LIVESTOCK AND POULTRY  
FOWLS**

District	Desi	Improved	Total
<b>Wayanad</b>	302902	66523	<b>369425</b>
<b>Rural</b>	294660	62260	<b>356920</b>
<b>Urban</b>	<b>8242</b>	<b>4263</b>	<b>12505</b>

Table:-16.29

**FOWLS  
CHICKEN BELOW 5 MONTHS**

District	For Eggs			For Meat			Total
<b>Wayanad</b>	11411	51243	62654	3235	3199	6434	<b>369425</b>
<b>Rural</b>	11389	49942	61331	2013	3195	5208	<b>356920</b>
<b>Urban</b>	22	1301	1323	1222	4	1226	<b>12505</b>

Source:Report on 18th Quinquennial,Dept of Animal Husbandry

Table:-16.30

LIVESTOCK AND POULTRY  
DUCKS

District	Drakes			Ducks		
	Improved	Desi	Total	Improved	Desi	Total
Wayanad	1357	1710	3067	1155	2415	<b>3570</b>
Rural	1218	1684	2902	990	2329	<b>3319</b>
Urban	139	26	165	165	86	<b>251</b>

Table:-16.31

LIVESTOCK AND POULTRY  
DUCKS  
DUCKLING BELOW 6 MONTHS

District	For Eggs			For Meat			Total Ducks
	Improved	Desi	Total	Improved	Desi	Total	
Wayanad	897	928	1825	230	313	543	<b>9005</b>
Rural	872	875	1747	214	313	527	<b>8495</b>
Urban	25	53	78	16	0	16	<b>510</b>

Table:-16.32

NUMBER AND PERCENTAGE DISTRIBUTION OF INDIGENOUS AND CROSSBRED CATTLE IN 2007 AND THE PREVIOUS YEAR

District	2000			2003			2007		
	Indigenous	Crossbred	% distribution of CB	Indigenous	Crossbred	% distribution of CB	Indigenous	Crossbred	% distribution of CB
Wayanad	16761	89632	84.25	16738	86956	76.06	4494	60965	93.1

Source:Report on 18th Quinquennial,Dept of Animal Husbandry

Table:-16.33

**VARIATION OF INDIGENOUS AND CROSSBRED CATTLE OVER 2003 CENSUS**

District	2003			2007			% Variation over 2003 census		
	Indigenous	Crossbred	Total	Indigenous	Crossbred	Total	Indigenous	Crossbred	Total
Wayanad	16738	86956	103694	4494	60965	65459	-73.15	-29.89	36.87
State	387183	1735274	2122457	118872	1621245	1740117	-69.3	-6.75	18.01

Table:-16.34

**CONCENTRATION OF CATTLE POPULATION IN THE RURAL AND URBAN AREA OF THE STATE  
ACCORDING TO 2007 CENSUS**

District	Number			% Rural-urban distribution		% Districtwise distribution		
	Rural	Urban	Total	Rural	Urban	Rural	Urban	Total
Wayanad	64102	1357	65459	97.93	2.72	4.9	2.27	4.75
State	1640961	99156	1740117	94.3	5.7	100	100	100

Table:-16.35

**SEXWISE DISTRIBUTION OF CATTLE IN THE WAYANAD DISTRICT AS PER 2007 CENSUS**

District	Number			Percentage of sex distribution of cattle				
	Male	Female	Total	Districtwise			Sexwise	
Wayanad	6736	58723	65459	4.12	3.72	3.76	10.29	89.71

Source:Report on 18th Quinquennial,Dept of Animal Husbandry

Table:-16.36

**CONCENTRATION OF BUFFALOES IN RURAL AND URBAN AREAS IN WAYANAD DISTRICT ACCORDING TO 2007 CENSUS**

District	Number			%of Rural Urban Distribution		% of districtwise distribution		
	Rural	Urban	Total	Rural	Urban	Rural	Urban	Total
<b>Wayanad</b>	2774	106	2880	96.32	3.68	5.12	2.69	4.95

Table:-16.37

**DENSITY OF LIVESTOCK AND POULTRY POPULATION DURING 2007**

District	Area in sq.km	Cattle		Buffaloes		Goats		Total livestock		Total Poultry	
		Population	Density per sq.km	Population	Density per sq.km	Population	Density per sq.km	Population	Density per sq.km	Population	Density per sq.km
<b>Wayanad</b>	2131	65459	30.72	2880	1.35	75375	35.37	146106	68.56	383723	180.07

Table:-16.38

**NUMBER AND PERCENTAGE DISTRIBUTION OF POULTRY, FOWLS AND DUCKS IN THE WAYANAD DISTRICT ACCORDING TO 2007 CENSUS**

District	Fowls		Ducks		Others		Total Poultry	
	Number	%	Number	%	Number	%	Number	%
<b>Wayanad</b>	369425	3.13	9005	1.04	5293	1.3	383723	2.93

Source: Report on 18th Quinquennial, Dept of Animal Husbandry

Table:-16.39

**COMPARATIVE STATEMENT OF DISTRIBUTION AND VARIATION  
OF GOATS IN DIFFERENT DISTRICTS**

District	2003		2007		% Variation over the previous year
	Number	%	Number	%	Number
<b>Wayanad</b>	41921	3.46	75375	4.36	79.8

Table:-16.40

**COMPARATIVE STATEMENT OF DISTRIBUTION AND VARIATION  
OF PIGS IN DIFFERENT DISTRICTS**

District	2003		2007		% Variation over the previous year
	Number	%	Number	%	Number
<b>Wayanad</b>	3684	4.82	2196	3.72	-40.32

Table:-16.41

**DENSITY OF POULTRY, FOWLS AND DUCKS AS PER 2007 CENSUS**

Area in sq.km	Fowls		Ducks		Total Poultry	
	Number	Density in Sq.km	Number	Density in Sq.km	Number	Density in Sq.km
2131	369425	173.36	9005	4.23	383723	180.07

Source: Report on 18th Quinquennial, Dept of Animal Husbandry



## **FISHERIES**

Fisheries form one of the most important sectors of Kerala's economy. Kerala is a coastal state and is bordered on the west by the marine flora and fauna rich Arabian Sea. The coastline of the state runs to a length of about 590km. The territorial limits of the state is about 22 kms from the sea shore and the total area covered by the sea that falls within this territory comes up to around 13,000 square kilometres. This is the area in which the marine fishermen of the state are allowed to venture. The shallow seabed surrounding the state of Kerala comes to around 3919 square kilometres. This is the most fertile region of the Arabian Sea as far as fisheries are concerned. The potential of the state in terms of marine fisheries is believed to be about 5.17 lakh tones. Not only do the fisheries contribute to about 3 percent of the economy of Kerala they also earn the state a great deal of foreign exchange and goodwill. The fisheries of the state are famous all over the world and are exported to Europe and America among other parts of the globe. At present the state of Kerala produces about 6 lakh tones of marine fishes every year.

Geographically, inland fisheries have great scope in the state. An inimitable feature of the state is the occurrence of 49 interconnected backwaters which have an area of 46129 ha. Besides there are estuaries, backwaters, brackish water area pokkali and prawn filtration fields and private shrimp farms. All these bodies of water provide rich sources of inland fish production.

The Wayanad district is insignificant in the field of marine fishing due to absence of coastal area. Inland fishing has immense scope in Wayanad. There are 275 fisherman engaged in inland fishing during 1990-2000. According to a survey there are 983 pounds in the district with a total area of 6734.75 cents. An aqua culture Extension-cum-Training center has been set up in the district for giving scientific training to fish farmers and also to conduct research to produce fingerlings on a scientific basis. The programme of "Janakeeya Matsya Krishi" has been introduced during the 9<sup>th</sup> plan. It envisages optimal utilization of the inland water resources with people's participation. JMK is an integrated programme consisting of fresh water and brackish water seed rearing, setting up of hatcheries etc.

Table:- 17.1

## FRESH WATER RESOURCES IN WAYANAD DISTRICT

Year	Panchayat Ponds		Holy Ponds and Streams		Village Ponds and other Water Holds		Irrigation Tanks	
	No	Area (Ha)	No	Area(Ha)	No	Area(Ha)	No	Area (Ha)
2009	28	5.16	5	2.08	22	10.66	61	5.44
2008	28	5.16	5	2.08	22	10.66	61	5.44

Table:- 17.2

## CHECK DAMS IN WAYANAD DISTRICT

Year	Name of the Check Dam	Area in Hect	Location		Type of construction	Ownership
			Block	Panchayat		
2009	Anappara Check Dam	0.76	Kalpetta	Kottathara	Concrete	Panchayat
	Mutil Check Dam	0.5	Kalpetta	Kottathara	Concrete	Panchayat
	Karimam	0.4	Kalpetta	Kottathara	Concrete	Panchayat
	Kattancherry	0.75	Kalpetta	Kottathara	Concrete	Panchayat
	Vellithodu	0.5	Kalpetta	Vythiri	Concrete	Panchayat
	<b>TOTAL</b>	<b>2.91</b>				

Year	Name of the Check Dam	Area in Hect	Location		Type of construction	Ownership
			Block	Panchayat		
2008	Anappara Check Dam	0.76	Kalpetta	Kottathara	Concrete	Panchayat
	Mutil Check Dam	0.5	Kalpetta	Kottathara	Concrete	Panchayat
	Karimam	0.4	Kalpetta	Kottathara	Concrete	Panchayat
	Kattancherry	0.75	Kalpetta	Kottathara	Concrete	Panchayat
	Vellithodu	0.5	Kalpetta	Vythiri	Concrete	Panchayat
	<b>TOTAL</b>	<b>2.91</b>				

Source: Fisheries Statistics, Dept of Fisheries



Table:- 17.3

**DISTRIBUTION OF FISHERMEN POPULATION IN  
WAYANAD**

2005-2006				2006-2007			
Male	Female	Children	Total	Male	Female	Children	Total
94	101	97	292	95	102	98	295

2007-2008				2008-2009 (Estimated)			
Male	Female	Children	Total	Male	Female	Children	Total
97	104	101	302	110	118	114	342

Table:- 17.4

**WORKING OF FFDA IN WAYANAD**

Year	No. of members during the year	Total Area Surveyed (Ha)	Area brought under fish culture (Ha)	No. of beneficiaries	Distribution of fish Seed (No)	Harvested area (Ha)	Harvested Quantity (in tonne)	No. of farmers trained
2008-2009	170	83.17	49	715	245074	41	142.5	313
2007-2008	0	18.24	27.11	869	231815	21	105	353
2006-2007	2	24.68	21.89	254	240975			79

Table:- 17.5

**LIST OF FISHING VILLAGES (INLAND) AND  
INLAND FISHERMEN POPULATION**

Name of village	Fishermen Population			
	2005-2006	2006-2007	2007-2008	2008-2009
Vythiri	292	295	302	342

Source: Fisheries Statistics, Dept of Fisheries

Table:- 17.6

**PERCENTAGE OF ACTIVE FISHERMEN TO THE FISHERMEN POPULATION (INLAND)**

2005-2006			2006-2007			2007-2008			2008-2009		
Total Number of Fishermen	Total Number of Active Fishermen	Percentage of Active Fishermen	Total Number of Fishermen	Total Number of Active Fishermen	Percentage of Active Fishermen	Total Number of Fishermen	Total Number of Active Fishermen	Percentage of Active Fishermen	Total Number of Fishermen	Total Number of Active Fishermen	Percentage of Active Fishermen
292	0	0	295	0	0	302	0	0	342	0	0

Table:- 17.7

**DETAILS OF FISH/SHRIMP/PRAWN SEED FARMS AND HATCHERIES  
IN WAYANAD**

Number of Seed farms/Hatcheries			Seed Production capacity (in lakhs)		
Fish	Shrimp	Scampi	Total		
			Fish	Shrimp	Scampi
1	0	0	1	0	0
			Total		

Source: Fisheries Statistics, Dept of Fisheries

Table:- 17.8

**DISTRICT WISE SPECIES WISE INLAND FISH LANDINGS IN  
WAYANAD**

<b>2006-2007</b>		<b>2007-2008</b>	
Name of Fish	Number	Name of Fish	Number
Prawn	0	Prawn	0
Etroplus	0	Etroplus	0
Murrels	9	Murrels	9
Mulletts	0	Mulletts	0
Cat Fish	8	Cat Fish	8
Jew fish	0	Jew fish	0
Tilapia	40	Tilapia	41
Labeo fimbriatus	0	Labeo fimbriatus	0
Barbus	0	Barbus	0
Mrigal	10	Mrigal	10
Crabs	40	Crabs	40
Common Carps	71	Common Carps	72
Catla	69	Catla	70
Gourami	0	Gourami	0
Chamos	0	Chamos	0
Eels	0	Eels	0
Labeo Rohitha	54	Labeo Rohitha	55
Mussel	0	Mussel	
Edible Oyster		Edible Oyster	
Miscellaneous	0	Miscellaneous	0
<b>TOTAL</b>	<b>301</b>	<b>TOTAL</b>	<b>305</b>

Source: Fisheries Statistics, Dept of Fisheries

Table:- 17.9

**DISTRICT WISE SPECIES WISE VALUES OF INLAND FISHES IN  
WAYANAD (VALUE RS IN 000'S)**

<b>2006-2007</b>		<b>2007-2008</b>	
<b>Name of Fish</b>	<b>Number</b>	<b>Name of Fish</b>	<b>Number</b>
Prawn	0	Prawn	0
Etroplus	0	Etroplus	0
Murrels	423	Murrels	450
Mulletts	0	Mulletts	0
Cat Fish	368	Cat Fish	376
Jew fish	0	Jew fish	0
Tilapia	1360	Tilapia	1435
Labeo fimbriatus	0	Labeo fimbriatus	0
Barbus	0	Barbus	0
Mrigal	410	Mrigal	420
Crabs	12200	Crabs	12200
Common Carps	3195	Common Carps	3240
Catla	3036	Catla	3150
Gourami	0	Gourami	0
Chamos	0	Chamos	0
Eels	0	Eels	0
Labeo Rohitha	2376	Labeo Rohitha	2475
Miscellaneous	0	Mussel	0
<b>TOTAL</b>	<b>23368</b>	Edible Oyster	0
		Miscellaneous	0
		<b>TOTAL</b>	<b>23746</b>

Source: Fisheries Statistics, Dept of Fisheries

Table:- 17.10

**CONTRIBUTION OF FISHING TO NDP ESTIMATES AT  
CURRENT PRICES**

<b>2005-2006 (base year 2004-05)</b>	<b>Wayanad</b>	<b>2005-2006 (base year 1999-2000)</b>	<b>Wayanad</b>
Net Domestic Product * (Rs.in lakhs)	267678	Net Domestic Product * (Rs.in lakhs)	215975
Fishing* (Rs. In lakhs)	96	Fishing* (Rs. In lakhs)	12
Percentage of fishing to Net Domestic Product	0.04	Percentage of fishing to Net Domestic Product	0.006
Population (In' 0000)*	839	Population (In' 0000)*	817
Per Capita income(In Rs.)*	31904	Per Capita income(In Rs.)*	26435
Contribution of Fishing to percapita income	12.76	Contribution of Fishing to percapita income	1.59

Table:- 17.11

**CONTRIBUTION OF FISHING TO NDP ESTIMATES AT CURRENT  
PRICES**

<b>2006-2007(base year 2004-05)</b>	<b>Wayanad</b>	<b>2006-2007(base year 1999-2000)</b>	<b>Wayanad</b>
Net Domestic Product * (Rs.in lakhs)	277389	Net Domestic Product * (Rs.in lakhs)	244046
Fishing* (Rs. In lakhs)	101	Fishing* (Rs. In lakhs)	17
Percentage of fishing to Net Domestic Product	0.04	Percentage of fishing to Net Domestic Product	0.007
Population (In' 0000)*	850	Population (In' 0000)*	839
Per Capita income (In Rs.)*	32634	Per Capita income(In Rs.)*	29088
Contribution of Fishing to percapita income	13.05	Contribution of Fishing to percapita income	2.04

Source: Fisheries Statistics, Dept of Fisheries



## **WETLAND**

Wetland is an area of ground that is saturated with water either permanently or seasonally. Wetlands are categorized by their characteristic vegetation, which is adapted to these unique soil conditions. The water found in wetland can be saltwater, fresh water, or brackish, wetlands include swamps marshes and bogs flood plains shallow ponds and littoral zone of large water bodies.

Wetlands are found on every continent except Antarctica. The main functions of wetlands are as water purification systems flood control, shoreline stability and as reservoirs of biodiversity. Wetlands may be converted to agriculture or development or constructed as a water management tool as in the recent developing field of water sensitive urban design.

The study of wetlands has recently been termed as 'paludology' in some publications. Wetlands also are known internationally as inland water or coastal / marine ecosystems. Environmental degradation is more prominent within wetland systems than any other ecosystem on Earth.

Wetlands have been categorized both biomes and ecosystem. A patch of land that develops pools of water after a rain storm would not be considered as a 'wetland' though the land is wet. Wetlands have unique characteristics. They are generally distinguished from other water bodies or landforms based on their water level and on the types of plants that thrive within their specifically wetlands are characterized as having a water table that stands at or near the land surface either permanently or seasonally for a large enough period each year to support aquatic plants.

Wetlands have also been described as ecotones, providing a transition between dry land and waterbodies Mitsch and Gosselink write that wetlands exist the interface between truly terrestrial ecosystem and aquatic systems making them inherently different from each other, yet highly dependent on both.

Wetlands vary widely due to local and regional differences in topography, hydrology, vegetation and other factors including human interference. Wetlands can be divided into two main classes, tidal and non-tidal areas.

Wetland hydrology is associated with the spatial and temporal dispersion, flow, and physio chemical attributes of surface and ground water in its reservoirs. Based on hydrology wetlands can be categorized as riverine (associated with streams) lacustrine (associated with lakes and reservoirs) and palustrine(isolated). Salinity has a very strong influence on wetland water chemistry. In non-riverine wetlands natural salinity is regulated by interaction between ground and surface water, which may be influenced by human activity.

Carbon is the major nutrient cycled within wetlands. Most nutrients such as carbon, sulphur, phosphorus and nitrogen are found within the soil of wetlands. The biota of a wetland system includes its vegetation zones and structure as well as animal population and distribution which are highly dependent of an water chemistry. The chemistry of water flowing into wetlands depends on the source of water and the geological material in which it flows through as well as the nutrients discharged from organic matter in the soils and plants at higher elevation as the slope wetlands.

There are four main groups of hydrophytes that found in wetland systems. Submerged water plants - found completely underwater, floating water plants usually small although it may take up a large surface area in wetland systems, emergent water plants seen above the surface of water but whose roots are completely submerged.

Fish are more dependent on wetland ecosystems than any other type of habitat. Frogs are the most crucial amphibian species in wetland systems.

Temperature varies greatly depending on the location of the wetland. Rainfall also varies according its location.

Wetland reservoirs are very rich in our country which exhibit significant ecological diversity because of variability in climatic conditions and topography.

Though small in size Kerala is land of affluent in water sources. 44 rivers drain the land, of which 41 are west flowing and 3 are east flowing. Apart from these 44 rivers their tributaries and a countless number of streams and rivulets crisscross the land making it green and fertile and also serve as inland waterways.

Besides these rivers Kerala are bestowed with a number of lakes and backwater lagoon which add to the beauty of the land. The important wetlands of Kerala are Ashtamudi Lake, Vembanadu Lake and Sasthankotta Lake. In the state of Kerala 1762 wetlands have been delineated. In addition, 2592, wetlands smaller than 2.25 ha have also been identified. Total wetlands area estimated to 160590 ha. The major wetland types are River/ stream(65162 ha) Lagoons(38442 ha) Reservoirs(26167 ha) and waterlogged (20305 ha). Analysis of wetland status in terms of open water and aquatic vegetation showed that around 88 and 83% of wetland area is under open water category during post monsoon and pre monsoon respectively. Aquatic vegetation (floating/ emergent) occupies around 8 and 6 % of wetland area during post and pre monsoon respectively.

“Wetlands are lands transitional between terrestrial and an aquatic system where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must have one or more of the three attributes: (i) at least periodically, the land supports predominantly hydrophytes; (ii) the substrate is non soil and is saturated with



water or covered by shallow water at some time during the growing season of each year”.

This definition, given by Cowardin et al. (1979), is widely accepted by wetland scientists of the United States and is also used in India (Mitsch and Gosselink, 1989). Wetlands include the swamps, bogs, marshes, mires, fens and other wet ecosystems found throughout the world under different names.

The Asian Wetland Bureau (1991) broadly defines the wetlands of South and West Asia as: “Estuaries and deltas, salt marshes, mangroves and mudflats, coastal lagoons, freshwater lakes and marshes, oasis, salt marshes, seasonal flood plain wetlands, swamp forests, rivers and streams, man-managed systems such as rice fields, fish ponds and reservoir”.

Another simple definition is that the wetlands are areas where, for part of the year at least, water stands naturally from 2.5 cm to around 300 cm.

The wetlands can be broadly classified into inland fresh and saline as well as coastal fresh and saline areas. The coastal wetland ecosystems are often classified as tidal salt marshes, tidal freshwater marshes and mangrove wetlands; the inland wetland ecosystems, as inland fresh water marshes, peatlands, deepwater swamps and riparian wetlands. Examples of artificial wetlands are those of wild-life sanctuaries of Bharathpur and Kaziranga in India and the extensive man-managed rice fields in different parts of Asia.

The wetlands are among the most important ecosystems of the Earth. On a short-time scale, wetlands are useful as sources, sinks and transformers of a multitude of chemical, biological and genetic materials. They have been found to cleanse polluted waters, prevent floods, protect shorelines and recharge groundwater aquifers; further more wetlands provide unique habitats for a wide variety of flora and fauna. In a long-time scale, the swampy environment of the carboniferous Period produced and preserved many of the fossil fuels on which we depend now. Some scientists have rightly called the wetlands as ‘nature’s kidneys’ because of the natural functions they perform.

There is a case to be made for wetland science as a unique multidiscipline, with support in ecology, chemistry, hydrology and engineering. Wetland management, as the applied side of wetlands science, also requires an understanding of the scientific aspects of wetlands, balanced with legal, institutional, and economic realities, to ensure protection of these valuable ecosystems (Mitsch and Gosselink, 1989).

Wetlands are the most productive life-supports system in the world and are of immense socio-economic and ecological importance to mankind. The management of these wetlands has become the most important concern of mankind today. The paddy

wetlands are a potential source for the food security of the state. The area of these wetlands is shrinking at an alarming rate due to the shift from rice to cash crops and non-agricultural use. Scientific Management coupled with socioeconomic considerations will provide an effective tool to the planner for recognizing wetlands as one of the prime life-sustaining ecosystems. To save this unique inter-tidal ecosystem from being endangered its conservation and management as well as in river basin management policies/programmes.

## WETLANDS OF WAYANAD

The district stands on the southern top of the Deccan plateau and its chief glory is the majestic rugged terrain of the Western Ghats, with lofty ridges interspersed with dense forest, tangled jungles and deep valleys. Quite a large area of the district is covered by forest but the continued and indiscriminate exploitation of the natural resources point towards an imminent environmental crisis. The Kabani river one of the three east flowing rivers of Kerala, is an important tributary of Kaveri river.

The wetland area estimated in 3886 ha which include 36 small wetlands (<2.25 ha). The major wetland types are River/ stream, tanks/ ponds and lagoons. Analyze of wetlands status in terms of open water and aquatic vegetation showed that around 92 and 84 % of wetland area is under open water category during post monsoon and pre monsoon respectively. Aquatic vegetation (floating/ emergent) occupies around 9 and 4 % of wetland area during post and pre monsoon respectively.

## THE LAND OF PADDY LANDS

The etymology of the word Wayanad is Vayal (Paddy) Naad (Land) ie., land of paddy fields. The landscape of Wayanad is distinct because of its deep valleys, leading to a multitude of climatically and ecologically situation.

Agriculture is the main stake of the district economy and rich cash crop plantations of pepper, cardamom, coffee, tea, spices have made Wayanad one of the biggest foreign exchange earners in Kerala. Paddy used to be the dominant crop in the area, some varieties with medical and dietician value, but its area of cultivation has reduced very much. The trend of turning multi functional paddy field into monoculture banana plantations has economic, cultural and ecological consequences. The extent of the loss of agro biodiversity is accelerating and accompanied by diminishing food security. With the intrusion of people from the plains into this region resulted in the shift to high intensive cash crop agriculture that has simplified the heterogeneity of the landscape to a significant extent resulting in the loss of its flora and fauna.

The rice farming system brought about changes in agricultural practices in Wayanad and there are interdependencies between social organization of labour and

agro ecological conditions. While integrated home gardens with high biological diversity are still maintained in every farm, the Kuruichiyars convert paddy fields to commercial banana plantations and at the same time abandon elaborate water storage systems. Both of these changes threaten the ecology of the rice farming system, food security and employment opportunities, especially for the community of landless labourers of the Paniyas.

Most of the paddy fields in Wayanad district are reclaimed and the remaining fields are under the threat of conversion. Paddy cultivation is diminishing and the rate of conversion is invariably high during the recent years. Nearly fifty percent of the paddy fields are converted in the district. The rate of conversion is maximum in Vythiri taluk followed by Mananthavady and Sulthan Bathery. One of the major reason is the introduction of the banana cultivation in the district. Paddy cultivation being a labour intensive crop is faced with shortage of labour and high labour charges.

The banana and vegetables introduced in the district is much more profitable when compared to cultivating paddy and this encouraged the farmers for a shift from paddy to banana and vegetables. The financial and technical support for fruits and vegetables by the State government also made this change much easier. The areas adjacent to roads and canals are more converted. Earlier the cultivation in the paddy fields were a community effort and locally generated farm yard manure was utilised. Now commercialisation and with the introduction of modern agricultural practices like use of chemical fertilizers, pesticides and weedicides have totally changed operationalisation and have reduced the co-operation between farmers considerably. The development activities like the roads, footpath and land filling damaged the natural drainage system.

The land use change analysis of the district clearly reveals the pattern and extent of the changes. The comparative analysis of land use changes in the paddy fields are given below:

(Area in hectares)

<b>Name of panchayat</b>	<b>Total paddy area</b>	<b>Present paddy area</b>	<b>Paddy area converted</b>	<b>Percentage of paddy area converted</b>
Kottathara	706.53	358.32	348.21	49.28
Vengappally	499.36	175.65	323.71	64.82
Vythiri	113.1	14.47	98.63	87.21
Muttill	1125.08	434.52	690.56	61.38
Pozhuthana	264.19	7.03	257.16	97.34
Thariyodu	188.66	42.74	145.92	77.35
Padinjarethara	915.26	437.57	477.69	52.19

Meppadi	501.93	220.57	281.36	56.06
Kaniyambatta	1260.54	725.51	535.03	42.44
Muppainadu	680.83	46.79	634.04	93.13
<b>Kalpetta Block</b>	<b>6255.48</b>	<b>2463.17</b>	<b>3792.31</b>	<b>60.62</b>
Meenangadi	1257.17	831.01	426.16	33.90
Nenmeni	1993.57	1200.30	793.27	39.79
Ambalavayal	1361.02	377.21	983.81	72.28
Poothadi	1151.49	883.39	268.10	23.28
Sulthan Bathery	1202.87	893.36	309.51	25.73
Noolpuzha	1396.91	1143.77	253.14	18.12
Mullankolly	843.96	336.32	507.64	60.15
Pulppally	798.98	443.50	355.48	44.49
<b>Sulthan Bathery Block</b>	<b>10005.97</b>	<b>6108.86</b>	<b>3897.11</b>	<b>38.95</b>
Mananthavady	1558.27	846.72	711.55	45.66
Vellamunda	1597.52	737.60	859.92	53.83
Thirunelly	1295.33	964.21	331.12	25.56
Thondarnadu	733.38	422.09	311.29	42.45
Edavaka	1056.6	460.20	596.40	56.45
Thavinjal	1336.82	414.73	922.09	68.98
Panamaram	2439.33	1524.19	915.14	37.52
<b>Mananthavady Block</b>	<b>10017.25</b>	<b>5369.74</b>	<b>4647.51</b>	<b>46.40</b>
<b>Kalpetta Municipality</b>	<b>479.16</b>	<b>35.26</b>	<b>443.90</b>	<b>92.64</b>
<b>Total</b>	<b>26757.06</b>	<b>13977.03</b>	<b>12780.03</b>	<b>47.76</b>

The rate of paddy conversion is maximum in Vythiri taluk (60.62 percent) followed by Mananthavady (46.40 percent) and Sulthan Bathery (38.95 percent). Of the 25 panchayats in the districts, the rate of conversion is less than 25 percent in two panchayats viz Poothadi and Noolpuzha: 25 to 50 percent in 10 panchayats, viz Kottathara, Kaniyampetta (Vythiri taluk), Meenangadi, Nenmeni, Sulthan Batheri, Pulpally (Sulthan Batheri taluk), Mananthavady, Thirunelli, Thondernadu and Panamaram (Mananthavady taluk): 50 to 75 percent in 9 panchayats viz Vengapalli, Muttil, Padinjarethara, Meppadi (Vythiri taluk), Amabalavayan, Mullankolly (Sulthan bathery taluk), Vellamunda, Edavaka and Thavinjal (Mananthavady taluk): more than 75 percent in 4 panchayats viz Vythiri, Pozhuthana, Thariyodu and Muppainadu (Vythiri taluk). In Kalpetta municipality 92.64 percent of the paddy fields has been converted to non paddy area.

Table:- 18.1

## WETLAND DETAILS

BLOCK	PANCHAYAT	CATEGORY	AREA (Ha.)		
<b>Kalpetta Municipality</b>		OTHER AREA	3112.91		
		Paddy - viruppu	364.50		
		Paddy - viruppu + mundakan	19.43		
		Paddy converted to arecanut	21.36		
		Paddy converted to banana	41.74		
			<b>3559.95</b>		
		<b>Kalpetta</b>	Kaniyambetta	OTHER AREA	2392.01
				Paddy - viruppu	395.82
				Paddy - viruppu + mundakan	760.35
				Paddy converted to arecanut	128.48
Paddy converted to banana	73.36				
	<b>3750.02</b>				
Kottathara	OTHER AREA		3152.44		
	Paddy - viruppu		542.10		
	Paddy - viruppu + mundakan		722.90		
	Paddy converted to arecanut		103.36		
	Paddy converted to banana	167.17			
	Paddy converted to banana and tapioca	3.21			
	<b>4691.19</b>				
Meppadi	OTHER AREA	12824.87			
	Paddy - viruppu	126.58			
	Paddy - viruppu + mundakan	414.05			
	Paddy converted to arecanut	0.47			
	Paddy converted to banana	0.98			
	<b>13366.96</b>				

BLOCK	PANCHAYAT	CATEGORY	AREA (Ha.)
	Moopainade	OTHER AREA	6677.96
		Paddy - viruppu	192.98
		Paddy - viruppu + mundakan	38.04
		Paddy converted to arecanut	83.11
		Paddy converted to banana	42.32
		Paddy converted to mixed crop	34.66
			<b>7069.06</b>
	Muttil	OTHER AREA	3636.70
		Paddy - viruppu	721.93
		Paddy - viruppu + mundakan	122.81
		Paddy converted to arecanut	143.92
		Paddy converted to banana	84.01
		Paddy converted to mixed crop	10.64
			<b>4720.01</b>
	Padinjarethara	OTHER AREA	3656.50
		Paddy - viruppu	204.57
		Paddy - viruppu + mundakan	59.98
		Paddy converted to arecanut	20.91
		Paddy converted to banana	101.57
			<b>4043.54</b>
	Pozhuthana	OTHER AREA	6871.18
		Paddy - viruppu	143.91
		Paddy converted to arecanut	18.75
		Paddy converted to banana	66.78
			<b>7100.63</b>
	Thariyode	OTHER AREA	6672.02
		Paddy - viruppu	149.32
Paddy - viruppu + mundakan		41.94	
Paddy converted to arecanut		23.15	
Paddy converted to banana		105.05	
		<b>6991.48</b>	

BLOCK	PANCHAYAT	CATEGORY	AREA (Ha.)
Mananthavadi	Vengapally	OTHER AREA	1680.98
		Paddy - viruppu	336.84
		Paddy - viruppu + mundakan	0.46
		Paddy converted to arecanut	49.93
		Paddy converted to banana	84.24
		Paddy converted to banana and tapioca	12.22
			<b>2164.67</b>
	Vythiri	OTHER AREA	4756.95
		Paddy - viruppu	112.83
			<b>4869.77</b>
			<b>58767.33</b>
	Edavaka	OTHER AREA	3547.55
		Paddy - viruppu	796.66
		Paddy - viruppu + mundakan	0.63
		Paddy converted to arecanut	311.44
		Paddy converted to banana	67.67
		Paddy converted to mixed crop	1.89
			<b>4725.83</b>
	Mananthavadi	OTHER AREA	6379.60
		Paddy - viruppu	715.59
		Paddy - viruppu + mundakan	223.66
		Paddy converted to arecanut	349.92
		Paddy converted to banana	253.61
		Paddy converted to mixed crop	22.16
		<b>7944.55</b>	
	Panamaram	OTHER AREA	5514.33
		Paddy - viruppu	907.44
Paddy - viruppu + mundakan		962.76	
Paddy converted to arecanut		476.94	
Paddy converted to banana		117.01	
	<b>7978.47</b>		

BLOCK	PANCHAYAT	CATEGORY	AREA (Ha.)
	Thavinjal	OTHER AREA	12816.32
		Paddy - viruppu	932.88
		Paddy - viruppu + mundakan	259.17
		Paddy converted to arecanut	184.77
		Paddy converted to banana	88.76
			<b>14281.90</b>
	Thirunelli	OTHER AREA	18907.38
		Paddy - viruppu	644.10
		Paddy - viruppu + mundakan	391.73
		Paddy converted to arecanut	105.34
		Paddy converted to banana	94.88
			<b>20143.44</b>
	Thondernadu	OTHER AREA	12123.39
		Paddy - viruppu	652.01
		Paddy - viruppu + mundakan	265.01
		Paddy converted to arecanut	55.07
		Paddy converted to banana	2.05
		Paddy converted to mixed crop	8.55
			<b>13106.09</b>
	Vellamunda	OTHER AREA	4949.08
		Paddy - viruppu	671.69
		Paddy - viruppu + mundakan	280.29
		Paddy converted to arecanut	387.71
		Paddy converted to banana	120.72
		Paddy converted to mixed crop	12.13
			<b>6421.62</b>
			<b>74601.89</b>



BLOCK	PANCHAYAT	CATEGORY	AREA (Ha.)
Sulthanbathery	Ambalavayal	OTHER AREA	4469.29
		Paddy - viruppu	280.77
		Paddy - viruppu + mundakan	361.01
		Paddy converted to arecanut	134.96
		Paddy converted to banana	73.02
		Paddy converted to mixed crop	21.07
			<b>5340.12</b>
	Meenangadi	OTHER AREA	4534.14
		Paddy - viruppu	557.57
		Paddy - viruppu + mundakan	364.08
		Paddy converted to arecanut	143.69
		Paddy converted to banana	154.40
		Paddy converted to mixed crop	13.42
		<b>5767.31</b>	
	Mullankolly	OTHER AREA	3679.79
		Paddy - viruppu	386.48
		Paddy converted to arecanut	177.45
		Paddy converted to banana	15.24
		Paddy converted to mixed crop	13.82
		<b>4272.78</b>	
	Nenmeni	OTHER AREA	4816.97
		Paddy - viruppu	509.69
		Paddy - viruppu + mundakan	1137.82
		Paddy converted to arecanut	144.40
		Paddy converted to banana	263.31
		Paddy converted to mixed crop	0.41
		<b>6872.61</b>	

BLOCK	PANCHAYAT	CATEGORY	AREA (Ha.)
	Noolpuzha	OTHER AREA	10651.79
		Paddy - viruppu	606.72
		Paddy - viruppu + mundakan	756.09
		Paddy converted to arecanut	173.84
		Paddy converted to banana	138.76
		Paddy converted to mixed crop	11.87
			<b>12339.07</b>
	Poothadi	OTHER AREA	9081.36
		Paddy - viruppu	966.37
		Paddy - viruppu + mundakan	218.89
		Paddy converted to arecanut	302.77
		Paddy converted to banana	137.04
		Paddy converted to mixed crop	12.29
			<b>10718.72</b>
	Pulpally	OTHER AREA	7257.71
		Paddy - viruppu	725.93
		Paddy - viruppu + mundakan	102.05
		Paddy converted to arecanut	198.88
		Paddy converted to banana	74.79
		Paddy converted to mixed crop	16.17
			<b>8375.53</b>
	Sulthan Bathery	OTHER AREA	20644.77
		Paddy - viruppu	681.57
		Paddy - viruppu + mundakan	561.90
		Paddy converted to arecanut	294.99
		Paddy converted to banana	228.14
		Paddy converted to mixed crop	6.80
			<b>22418.17</b>
			<b>76104.31</b>
		<b>District Total</b>	<b>213100.00</b>

Table: 18.2

**WETLAND (Abstract )**

BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha)
<b>Kalpetta Municipality</b>		Denudational Hills	72.09
		Denudational Structural Hills	562.07
		Piedmont Zone	2304.05
		Upper Plateau (Lateritic)- Dissected Valley	201.48
			165.30
		Valley Fill	254.95
			<b>3559.95</b>
<b>Kalpetta</b>	Kaniyambetta	Piedmont Zone	186.75
		Residual Mount(Upper Plateau)	69.39
		Upper Plateau (Lateritic)- Dissected Valley Fill	2210.44
			1283.43
		<b>3750.02</b>	
	Kottathara	Denudational Hills	374.28
		Piedmont Zone	1063.37
		Residual Hill	35.57
		Residual Mount(Upper Plateau)	131.91
		Upper Plateau (Lateritic)- Dissected Valley	1691.37
			2.30
		Valley Fill	1304.53
		Water Body	87.87
		<b>4691.19</b>	
	Meppadi	Denudational Structural Hills	10238.64
		Piedmont Zone	2567.91
		Rock Exposure	25.35
		Upper Plateau (Lateritic)- Dissected Valley	69.56
			296.13
		Valley Fill	148.08
		Water Body	21.30
			<b>13366.96</b>
	Moopainade	Channel bar(Flood Plain)	2.05
		Denudational Structural Hills	1322.99
		Piedmont Zone	4960.88
		Residual Hill	61.96
		Residual Mount(Upper Plateau)	19.85
		Upper Plateau (Lateritic)- Dissected Valley	185.14
		129.31	
Valley Fill		381.63	
Water Body	5.24		
	<b>7069.06</b>		

BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha)
	Muttill	Denudational Hills	8.23
		Denudational Structural Hills	311.17
		Piedmont Zone	960.24
		Residual Mount(Upper Plateau)	187.11
		Upper Plateau (Lateritic)- Dissected	2127.14
		Valley Fill	1126.13
			<b>4720.01</b>
	Padinjarethara	Residual Mount(Pediment)	101.79
		Denudational Structural Hills	1641.20
		Linear ridge(Piedmont Zone)	0.73
		Piedmont Zone	1744.92
		Residual Mount(Upper Plateau)	1.36
		Upper Plateau (Lateritic)- Dissected	166.25
		Valley Fill	362.91
		Water Body	24.37
			<b>4043.54</b>
	Pozhuthana	Denudational Structural Hills	5014.71
		Piedmont Zone	1805.41
		Residual Hill	48.08
		Rock Exposure	13.09
		Valley Fill	186.98
		Water Body	32.35
			<b>7100.63</b>
	Thariyode	Residual Mount(Pediment)	103.90
		Denudational Structural Hills	4420.91
		Linear ridge(Piedmont Zone)	54.21
		Piedmont Zone	1662.05
		Residual Mount(Upper Plateau)	57.03
		Rock Exposure	3.61
		Upper Plateau (Lateritic)- Dissected	330.28
		Valley Fill	331.61
		Water Body	27.88
			<b>6991.48</b>
	Vengapally	Residual Mount(Pediment)	10.58
		Denudational Hills	33.26
		Piedmont Zone	757.94
		Residual Mount(Upper Plateau)	25.26
		Upper Plateau (Lateritic)- Dissected	825.91
		Valley	116.73
		Valley Fill	366.96
		Water Body	28.02
			<b>2164.67</b>

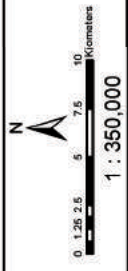
BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha)
Mananthavadi	Vythiri	Denudational Structural Hills	2504.99
		Piedmont Zone	2049.37
		Residual Hill	166.61
		Rock Exposure	7.86
		Valley	132.09
		Water Body	8.86
			<b>4869.77</b>
	Edavaka	Linear Ridge (Upper Plateau)	74.49
		Piedmont Zone	0.47
		Residual Mount(Upper Plateau)	179.59
		Upper Plateau (Lateritic)- Dissected	3510.61
		Valley Fill	889.63
		Water Body	71.04
			<b>4725.83</b>
	Mananthavadi	Residual Mount(Pediment)	181.03
		Channel bar(Flood Plain)	0.31
		Denudational Structural Hills	1411.71
		Linear Ridge (Upper Plateau)	59.82
		Linear ridge(Piedmont Zone)	63.58
		Piedmont Zone	2206.50
		Point bar(Flood Plain)	4.45
		Residual Mount(Upper Plateau)	65.66
		Rock Exposure	0.70
		Upper Plateau (Lateritic)- Dissected	2707.54
		Valley	76.00
		Valley Fill	1067.35
		Water Body	99.89
			<b>7944.55</b>
	Panamaram	Denudational Hills	268.98
		Linear Ridge (Upper Plateau)	70.69
		Piedmont Zone	1704.44
		Point bar(Flood Plain)	3.89
		Residual Hill	49.02
		Residual Mount(Upper Plateau)	343.02
		Upper Plateau (Lateritic)- Dissected	3220.25
		Valley	40.72
		Valley Fill	2116.03
		Water Body	161.43
		<b>7978.47</b>	

BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha)
	Thavinjal	Residual Mount(Pediment)	438.34
		Denudational Structural Hills	6613.72
		Linear ridge(Piedmont Zone)	24.93
		Piedmont Zone	5069.90
		Residual Mount(Upper Plateau)	72.70
		Upper Plateau (Lateritic)- Dissected	879.55
		Valley Fill	1126.80
		Water Body	55.97
			<b>14281.90</b>
	Thirunelli	Residual Mount(Pediment)	127.47
		Channel bar(Flood Plain)	8.38
		Denudational Structural Hills	8095.31
		Piedmont Zone	9630.84
		Point bar(Flood Plain)	0.84
		Residual Hill	770.40
		Stabilized channel bar (Flood Plain)	3.64
		Valley Fill	1356.90
		Water Body	149.66
		<b>20143.44</b>	
	Thondernadu	Residual Mount(Pediment)	95.32
		Denudational Structural Hills	8034.61
		Linear ridge(Piedmont Zone)	50.98
		Piedmont Zone	2335.59
		Residual Mount(Upper Plateau)	136.82
		Rock Exposure	3.39
		Upper Plateau (Lateritic)- Dissected	1923.79
		Valley Fill	501.40
		Water Body	24.20
		<b>13106.09</b>	
	Vellamunda	Denudational Structural Hills	1654.11
		Piedmont Zone	749.03
		Residual Mount(Upper Plateau)	41.00
		Rock Exposure	2.65
		Upper Plateau (Lateritic)- Dissected	2656.89
		Valley Fill	1286.06
		Water Body	31.88
		<b>6421.62</b>	
		<b>74601.89</b>	

BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha)
Sulthanbathery	Ambalavayal	Piedmont Zone	4293.23
		Residual Hill	126.47
		Structural Hills	234.25
		Valley	222.18
		Valley Fill	464.01
			<b>5340.12</b>
	Meenangadi	Piedmont Zone	2049.32
		Residual Hill	112.92
		Rock Exposure	2.65
		Upper Plateau (Lateritic)- Dissected	2528.02
		Valley	206.78
		Valley Fill	867.62
		<b>5767.31</b>	
	Mullankolly	Residual Mount(Pediment)	11.12
		Channel bar(Flood Plain)	2.01
		Denudational Hills	519.14
		Piedmont Zone	2875.13
		Point bar(Flood Plain)	11.13
		Residual Hill	55.66
		Valley	185.60
		Valley Fill	510.47
		Water Body	102.52
			<b>4272.78</b>
	Nenmeni	Denudational Hills	40.85
		Piedmont Zone	4443.69
		Residual Hill	42.99
		Structural Hills	615.23
		Valley Fill	1727.95
		Water Body	1.90
		<b>6872.61</b>	
	Noolpuzha	Denudational Hills	5792.23
		Piedmont Zone	4997.21
		Residual Hill	12.64
		Valley Fill	1501.70
		Water Body	35.30
		<b>12339.07</b>	

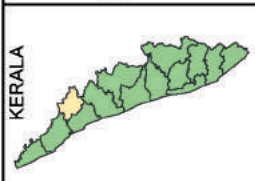
BLOCK	PANCHAYAT	DISCR_L3	AREA (Ha)
	Poothadi	Residual Mount(Pediment)	95.43
		Denudational Hills	2978.29
		Piedmont Zone	4070.85
		Residual Hill	12.58
		Residual Mount(Upper Plateau)	47.53
		Upper Plateau (Lateritic)- Dissected	2126.15
		Valley	332.39
		Valley Fill	1055.50
			<b>10718.72</b>
	Pulpally	Residual Mount(Pediment)	42.53
		Channel bar(Flood Plain)	29.18
		Channel Island (Flood Plain)	154.11
		Denudational Hills	1527.55
		Piedmont Zone	5470.31
		Point bar(Flood Plain)	2.03
		Residual Hill	8.81
		Upper Plateau (Lateritic)- Dissected	1.21
		Valley	701.46
		Valley Fill	305.98
		Water Body	132.36
			<b>8375.53</b>
	Sulthanbathery	Residual Mount(Pediment)	58.89
		Denudational Hills	7153.11
		Piedmont Zone	13075.20
		Residual Hill	58.98
		Valley	309.41
		Valley Fill	1715.77
		Water Body	46.81
			<b>22418.17</b>
			<b>76104.30</b>
			<b>213100.00</b>



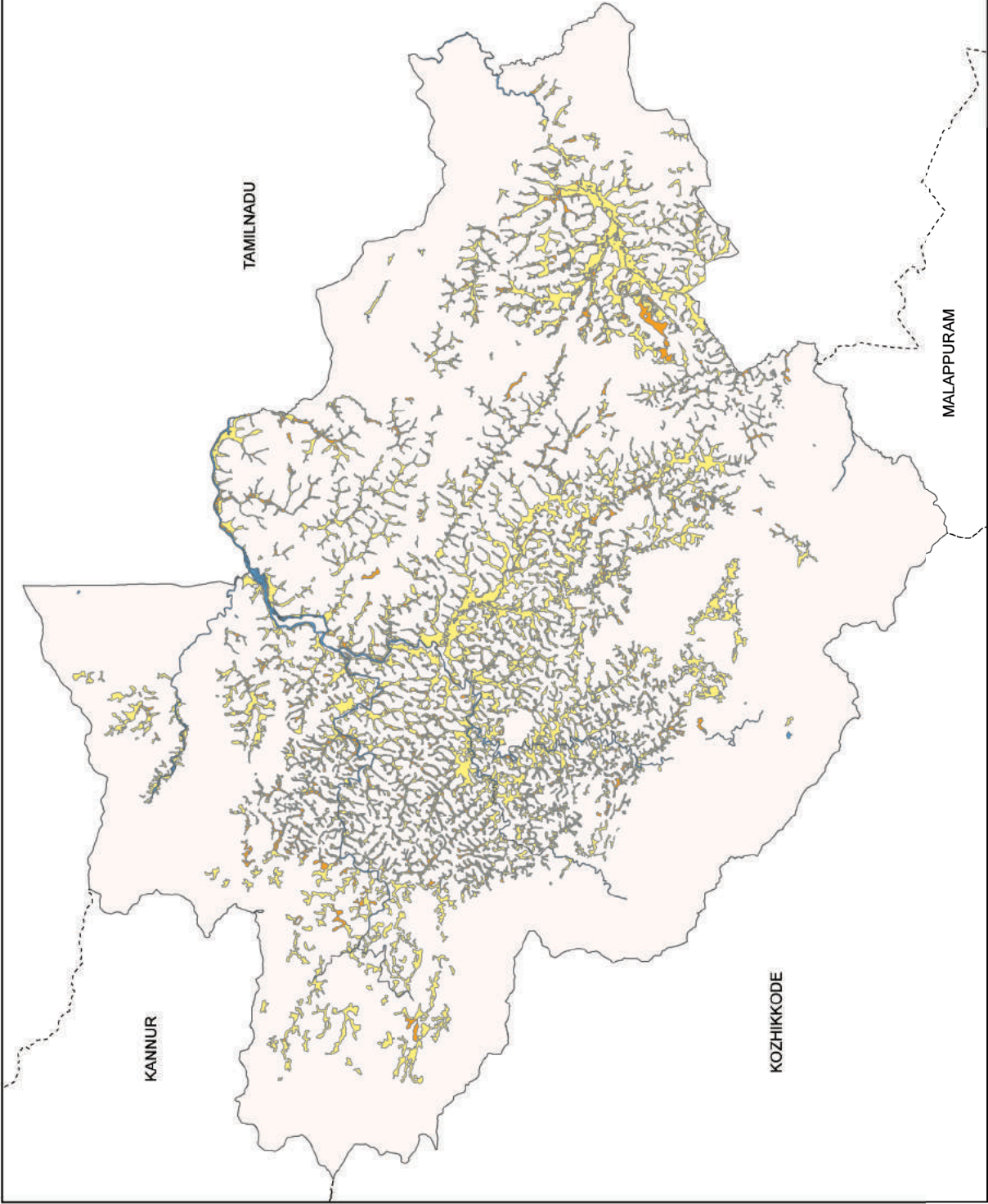


**WETLAND  
WAYANAD DISTRICT**

- WETLAND**
- Paddy
  - Paddy converted to agriculture land
  - Other landuse
  - Waterbody



Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33





## **WASTELANDS**

Land is one of the most important critical resources which determine the success of development planning of any region. Promoting optimum land use is an essential purpose in achieving the planned goals of economic efficiency and ecological activity. Identification of prime and unique lands for agriculture and prevention of its misuse, assume utmost importance for food, security and self-reliance. It is therefore imperative that for sustainable development, effort should be made to ensure that the available land in the state is put to wise and optimum use.

### **Wasteland defined**

Wasteland is defined as "degraded land which can be brought under vegetative cover with reasonable effort, and which is currently under utilized and land which is deteriorating for lack of appropriate water and soil management or on account of natural causes." Wastelands can result from inherent/imposed disabilities such as by location, environment, chemical and physical properties of the soil or financial or management constraints. These lands could fall under Government occupation, private occupation or forest lands. 13 categories of wasteland have been standardized and State and Central Government departments are using the same.

### **Wasteland classification**

The wasteland categories standardized by National Remote Sensing Centre, Hyderabad for Kerala for this proejt is as follows:

- 01 Land with dense scrub
- 02 Land with open scrub
- 03 Waterlogged - permanent
- 04 Waterlogged - seasonal
- 05 Scrub dominated forest
- 06 Degraded pastures/grazing land
- 07 Sands - riverine
- 08 Coastal sands
- 09 Mining wastelands
- 10 Barren rocky area

## **Data base**

Under wasteland mapping, four types of data are used. They are Satellite data, Topographic maps, Legacy data and Ground data.

## **Satellite data**

The IRS P6 LISS III geometrically corrected data within the framework of NNRMS specified standards form the primary input for updating of wastelands. Multi-temporal data sets are used for the updation of wastelands in a pursuit to achieve improved classification accuracies. The geo-coded scene covers an area of 27 x 27 km covering approximately 729 sq. km.

## **Topographic maps**

Survey of India topographical maps on 1:50000 scale in digital form will be used as a base layer for mapping and planning groundtruth collection. The digital topomap layer contains administrative boundaries (international, state, district, tehsil, village and forest management boundary), major roads, railway, drainage, settlements etc.

## **Legacy data**

The wasteland layer generated earlier using the 2003 remotesensing data will form the primary legacy layer. The other layers such as landuse/landcover and biodiversity data generated on different scales will be used as a reference while updating wasteland categories.

## **Ground data**

Ground truth or ground investigation forms are important and integral part of the interpretation methodology of remotely sensed data. Ground data is attributed to collection, verification and measurement of information about the different surface features on earth, which are responsible for the occurrence of specific spectral reflectance behavioral patterns. Ground truth is dependent upon the extent of doubtful areas, the sampling procedure adopted during field traverses, the terrain conditions, classification accuracy requirements etc. However, good quality satellite data (more contrast and cloud free), interpretation skill/experience and knowledge of the study area can minimize ground truth collection.

## **Methodology**

The methodology is essentially digital interpretation of Multi – season IRS-P6 (LISS - III) geo-coded image (FCC) for identification of different categories of wasteland using standard visual image interpretation techniques which is based on interpretation elements such as tone, texture, shape, size, etc. supplemented by the local knowledge of the interpreter. Other ancillary data like topographical maps and any other available information will be used for identification and mapping of wastelands. The interpreted details are to be verified on the ground in order to rectify the doubtful areas, and based on the ground verification, the wasteland boundaries (interpreted details) are to be finalized

## **Procedure**

Preparing the data is a primary requirement before undertaking image interpretation and subsequent analysis. Preparation of datasets involves the following steps.

### **Step 1 - Geo - rectification**

Satellite data which is available in a raster form need to be geo-referenced to a map coordinate system so as to generate spatial information to be used subsequently in a GIS environment. The process of geo-rectification involve assigning a coordinate system and transforming the raster image to input coordinate system which enables viewing, querying, and analyzing the geographic data. Images of different points of time are often acquired from sensors / platforms with varying geometry. Hence such images need to be referenced to a common projection system. The ETM +data which is available in UTM projection with wgs84 datum as a reference image is used for rectification of IRS LISS III 2005 - 2006 data using image to image registration algorithm.

### **Step 2 - Tile preparation for image interpretation**

In conformity with the National Spatial Frame work defined for NNRMS standards the entire state is divided to tile scheme (consisting of 15 minutes x 15 minutes) for interpretation, edge matching, quality assurance and final map preparation. For the ease of interpretation these tiles will be further divided in to grids of 5'x5'.

### **Step 3 - Image preparation**

Consistency in the image handling requires a thorough pre-processing of satellite data for inter and intra image alignments in terms of geometry and radiometry. Image data in Geo Tiff format may be imported using suitable format converters (National spatial framework projection parameter from NNRMS standards) and care to be taken to maintain the geo referencing scheme.

### **Step 4 - Image enhancements**

In order to improve the classification accuracy image enhancement methods are used. It is essential for improving the image contrast and allows the best possible delineation of wastelands by fine tuning the contrast.

### **Image interpretation**

Image interpretation is defined as “the art of examining the images for the purpose of identifying objects or surface features and judging their significance”. Interpretation key was prepared on the basis of image characteristics like tone, texture, shape, size, pattern, location and association that generally play a very important role for identification of various objects. Wasteland vector data of year 2003 is used as a template for updating the wasteland vector polygons by overlying it on to 2005-2006 satellite data.

### **Analyzing wasteland dynamics**

For analyzing wasteland dynamics, overlay operation is done in between Interpreted vector for current year (2005-2006) and the wasteland vectors for the year 2003.

### **Ground data collection and verification**

Ground truth / field verification is an important component in wasteland mapping and its validation exercise. It is very helpful in improving the classification accuracy of various wasteland categories.

### **Computation of statistics**

The district wise area statistics of different wasteland categories is generated.

Out of the different categories of wasteland classified by National Remote Sensing Agency, the following seven categories have been identified in the district. The different categories identified and mapped in the State are as follows.

**Scrubland:** - This is a land which is generally prone to deterioration due to erosion. Such land occupies relatively high topographic locations. Scrublands are associated with moderate slopes in plains and foot hills and are generally surrounded by agricultural lands.

On the basis of presence of vegetation cover scrublands are classified into two sub-classes.

**1. Land with dense scrub:** - These areas possess shallow and skeletal soils, at times chemically degraded, extremes of slopes, severely eroded and land subjected to excessive aridity with scrub dominating the landscape. These are having a tendency for intermixing with cropped areas.

**2. Land with open scrub:** - This is a land which is generally prone to deterioration due to erosion and having no scrub cover. Such lands possess sparse vegetation or devoid of scrub and have a thin soil cover.

**3. Waterlogged / marshy land:** - Waterlogged land is that land where the water is at/or near the surface for the most part of the year. Marsh is a land, which gets permanently or periodically inundated by water and is characterized by hydrophytic vegetation, which includes water hyacinth and reeds.

Depending on the duration of water logging seasonality, two sub classes are delineated.

**a. Waterlogged – permanent :-** These are waterlogged areas where the waterlogging conditions prevail during most part of the year. These areas are mostly located in low-lying areas.

**b. Waterlogged – seasonal :-** Seasonally waterlogged areas are those where the waterlogging condition prevail usually during the monsoon period. These lands are mostly located in plain areas associated with the drainage congestion.

**4. Scrub dominated forest:** - Land, as notified under the Forest Act and those lands with various types of forest cover, in which vegetative cover is less than 20 per

cent are classified as degraded land. These areas are generally confined to the fringe areas of notified forests.

**5. Degraded pastures/grazing land :-** All those grazing lands in non-forest areas, whether or not they are permanent pastures or meadows, which have become degraded due to lack of proper soil conservation and drainage measures, fall under this category.

**6. Mining wastelands:** - Lands where mining operations bring about the deterioration of land are the mining wastelands. The industrial wastelands are lands which have deteriorated on account of large scale industrial effluent discharge.

**7. Barren rocky area:** - The rock exposures of varying lithology often barren and devoid of soil cover and vegetation. They occur amidst hill-forests as openings or as isolated exposures on plateau and plains. Barren rocky areas occur on steep isolated hillocks / hill slopes, crests, plateau and eroded plains associated with barren and exposed rocky / stony wastes, lateritic outcrops, mining and quarrying sites.

#### **Brief description on the spatial distribution, physical condition of wastelands**

Area and percentage to total of each category of waste land.

<b>Sl. No.</b>	<b>Wasteland Categories</b>	<b>Area in sq.km</b>	<b>% to total geographical area</b>	<b>% to total wastelands</b>
1	Land with Dense Scrub	42.61	2.00	45.51
2	Land with Open Scrub	25.44	1.19	27.17
3	Waterlogged - Seasonal	0.24	0.01	0.25
4	Scrub dominated forest	14.19	0.67	15.16
5	Degraded pastures / grazing land	8.27	0.39	8.84
6	Mining wastelands	0.38	0.02	0.41
7	Barren rocky area	2.49	0.12	2.66
	<b>Total</b>	<b>93.61</b>	<b>4.39</b>	<b>100.00</b>

Interpretation of satellite imageries show that 4.39 percent area of Wayanad district remains unused or under utilised due to various reasons.

- 1. Land with scrub:-** Land with dense and open constitutes the major wasteland category in the district constituting 82.68 percent of the total wastelands and it covers to 3.19 percent of the district area. The majority of



the area is distributed in Vythiri taluk (3490.10 ha) followed by Mananthavady and Sulthan Bathery. Majority of the area is distributed in Pandinjarathara (897.39 ha), Thariyode (859.55 ha), Pozuthana (597.43 ha), Kottappady (459.46 ha), Thrikkepatta (266.25 ha), Vellamunda (481.72 ha), Thavinjal (301.63 ha), Periya (210.38 ha), Thondernadu (507.95 ha), Kunnethidavaka (148.65 ha), Mananthavady (115.14 ha), Kanjirangad (196.15 ha) and Ambalavayal (118.19 ha). These patches may be either lying waste or having poor crop growth due to soil limitation is revealed during the ground truth studies. Lack of adequate irrigation facilities added with poor management could be the main reason for the under utilisation of these lands.

2. **Scrub dominated forest:-** This is the second major category of wasteland identified and mapped in the district. It occurs as an area 14.19 sq. km. representing 0.67 percent of the total geographical area and 15.16 percent of the total wastelands occurring in the district. The forest of Wayanad district includes notified forests, private forests and vested forests, of which only the notified forests, private forests and vested forests, of which only the notified forests possess territorial boundaries. The other categories do not have any demarcation in the ground as well as in the concerned toposheets. But the under-utilised or degraded forests identified in all the above forestlands are marked with appropriate symbol and accounted accordingly. This degraded forest area may or may not be within the notified forest boundary as seen in Survey of India toposheets. This category is identified in all the three taluks and falls in ten panchayats. The village having the maximum area is Thirunelli (199.24 ha) followed by Periya (98.58 ha), Thondernadu (79.59 ha), Thrissileri (78.35 ha), Mananthavady (48.74 ha) and Thariyode (48.53 ha). The remaining area falls in Pozuthana, Achooranam, Nenmeni and Ambalavayal villages. Selective ground truth verification revealed that these areas are either forest grasslands, failed forest plantations or private forests under dispute regarding the ownership. Excluding some rocky patches and bouldered areas, these degraded areas have moderately deep to deep soils, which can support plant growth.

## **Suggestions and solutions for reclamation**

Out of the total wastelands of 9361 hectares mapped in the district, land with dense/open scrub accounts over 6805 hectares representing 82.68 percent of the total wastelands ie.3.19 percent of the total geographical area of the district.

The land dense or open scrubs occurring mostly in the midland region are agricultural lands (private holdings). Reasons for these lands lying waste are 1) Lack of cultivable soil due to occurrence of hard laterite outcrop, (2) shallow depth of soil (3) Lack of interest due to poor return and (4) Higher investment required. Detailed on the spot study has to be conducted to find out the exact reasons for each plot lying waste or underutilised and reclamation/development plan chalked out and implemented with a long term perspective. Cultivators are also to be persuaded by providing the required financial assistance for meeting the initial development cost. Some of the areas can be used for silvipasture with drought resistant varieties. Afforestation or greening of the degraded forest lands are to be taken with public participation. Catchments of reservoirs that are seen devoid of vegetation have to be compulsorily afforested with utmost importance for preventing soil loss and to check silting up of the reservoirs.

The elevation, climate as well as the soil type of Wayanad district make the vacant lands suitable for coffee and tea cultivation. Necessary proposals for raising coffee or tea plantation are to be formulated after detailed study, considering the suitability, adaptability and local acceptability. All the degraded forestlands are to be developed to hold perennial vegetal cover in order to check further deterioration and to make better use of the potentialities.

The steep sloping land with little or no soil, seldom allow plant growth. This area should be left undisturbed, permitting whatever little vegetation to come up.

Table:- 19.1

**DISTRIBUTION OF WASTELANDS – VILLAGE WISE - WAYANAD**

Sl. No	Name of Village	Land with scrub	Under utilized	Degraded pastures	Deg.land plantation	Mining	Barren rocky	Steep sloping	Total
<b>VYTHIRI</b>									
1	Padinjarethara	897.39					3.84		<b>901.23</b>
2	Thariyode	859.55	48.53					37.89	<b>945.97</b>
3	Pozhuthana	597.43	1.96				14.82		<b>614.21</b>
4	Kunnathidavaka	148.65			7.48				<b>156.13</b>
5	Choondal	31.66							<b>31.66</b>
6	Achooranam	68.05	0.48		10.21				<b>78.74</b>
7	Kavumandam								
8	Kuppadithara								
9	Kottathara	19.92							<b>19.92</b>
10	Vengappathy								
11	Kalpetta	57.05			53.2		1.59		<b>111.84</b>
12	Kottappady	459.46		73.37	9.49		52.65		<b>594.97</b>
13	Vellarimala	22.06		65.95	48.29		78.86		<b>215.16</b>
14	Moopainade	52.79					5.18		<b>57.97</b>
15	Thrikkaipatta	266.25							<b>266.25</b>
16	Mutil South	9.84							<b>11.73</b>
17	Multi North								
18	Kaniyambetta								
	<b>Total</b>	<b>3490.1</b>	<b>50.97</b>	<b>139.3</b>	<b>128.67</b>	<b>0</b>	<b>156.9</b>	<b>37.89</b>	<b>4005.8</b>
<b>MANANTHAVADY</b>									
1	Thirunelli	8.96			189.03				<b>1049.17</b>
2	Thrissileri	82.9	78.35						<b>161.25</b>
3	Mananthavady	115.14	48.74						<b>163.88</b>
4	Payyampalli								
5	Nallornad								
6	Cherukattor								
7	Panamaram								
8	Anchukunnu	26							<b>26</b>
9	Prunnannoor								
10	Vellamuda	481.72					2.42		<b>484.14</b>
11	Edavaka								

Sl. No	Name of Village	Land with scrub	Under utilized	Degraded pastures	Deg.land plantation	Mining	Barren rocky	Steep sloping	Total
12	Kanjirangad	196.15					9.82		<b>205.97</b>
13	Valad	64.97							<b>64.97</b>
14	Thavinjal	301.63							<b>301.63</b>
15	Periya	210.38	98.58						<b>308.96</b>
16	Thondernadu	507.95	79.59				2.07		<b>589.61</b>
	<b>Total</b>	<b>1995.8</b>	<b>305.26</b>		<b>189.03</b>		<b>14.31</b>		<b>3355.6</b>
<b>SULTHANBATHERY</b>									
1	Pulpally								
2	Padichira								
3	Kidangad								
4	Kuppadi								
5	Noolpuzha								
6	Cheeral								
7	Nenmeni	96.87	6.61				12.24	150.04	<b>265.76</b>
8	Thomattuchal								
9	Ambalvayal	118.39	16.04			29.49	24.69		<b>188.61</b>
10	Sulthanbathery								
11	Krishnagri						44.88		<b>44.88</b>
12	Purakkudi	26.47							<b>26.7</b>
	<b>Total</b>	<b>241.73</b>	<b>22.65</b>	<b>0</b>	<b>0</b>	<b>29.49</b>	<b>81.81</b>	<b>150.04</b>	<b>525.95</b>



**WASTLAND  
WAYANAD DISTRICT**

- WASTLAND**
- Barren Rocky Area
  - Land with Dense Scrub
  - Land with Open Scrub
  - Miscellaneous polygon
  - Scrub Dominated Forest
  - Waterlogged - Seasonal

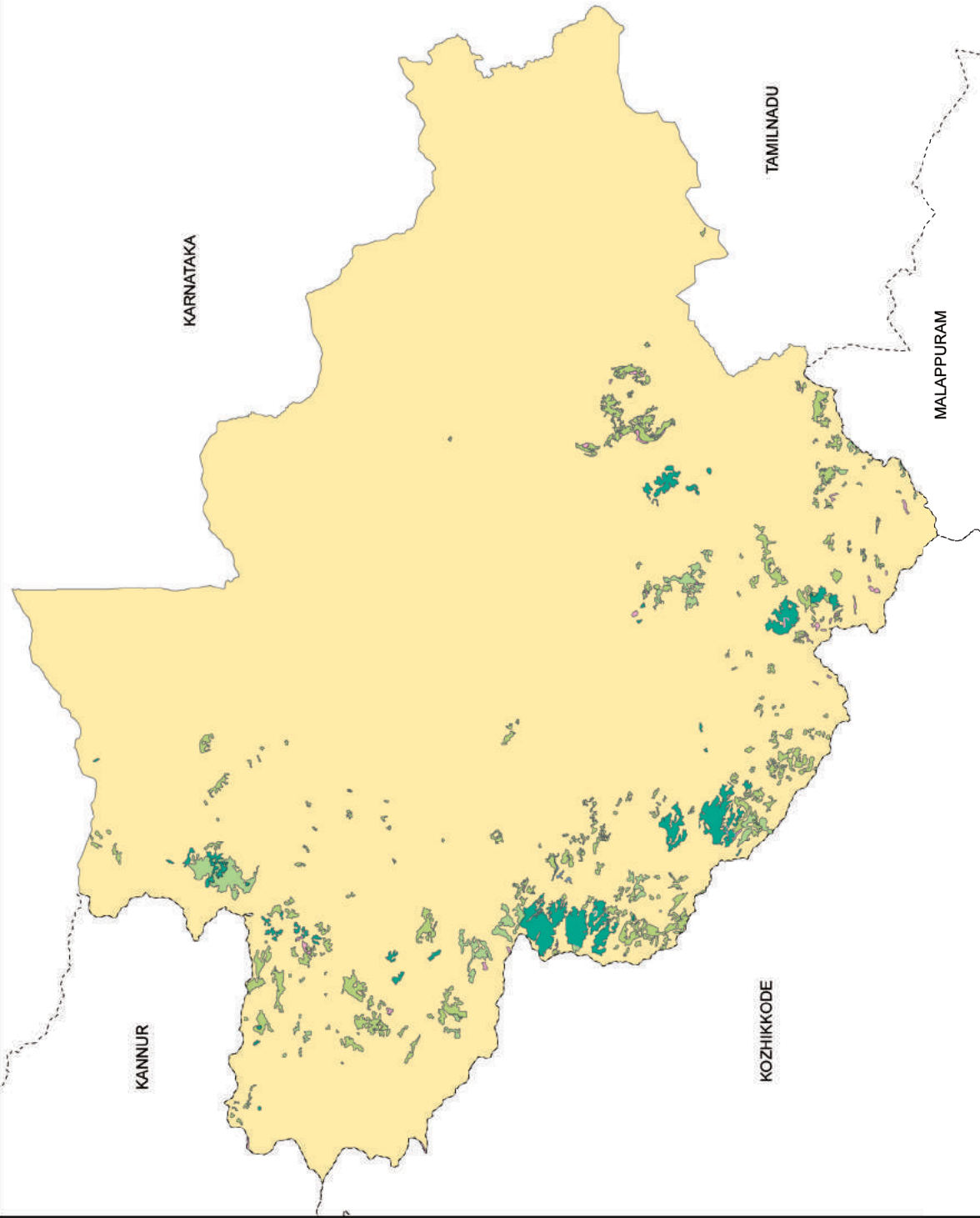


WAYANAD

KERALA



Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33



KARNATAKA

TAMILNADU

MALAPPURAM

KANNUR

KOZHIKODE



## **WATERSHED**

Watershed development and management is an integration of technology within the natural boundary of a drainage area for optimum development of land, water and plant resources to meet the basic minimum needs of the people in a sustained manner. The poor in the rural areas who are struggling for survival cannot be expected to pay heed to the conservation strategy unless their daily needs of food, fiber and fuel are met with. A still more urgent need is for assured and full employment for all. Integrated watershed development and management is not only the most effective solutions to many of the problems mentioned above, but also effective solution to many other common problems like drought, floods etc. It includes the integration of many scattered programs of soil conservation, afforestation, minor irrigation, crop production, tree plantation, fodder development and other development activities into a well prepared micro watershed project based on study of climate, land, water & plant resources on the one hand and man, animal resources on the other, offers hope for bringing about sustained natural resources development. It also provides solution to many environmental problems like soil erosion, siltation, improper land use, lowering ground water table etc. Once these are solved the overall productivity, income of the family and employment opportunity in the villages could be increased and thereby the living conditions of the rural population can be enhanced.

The rain water after absorbed by the soil, flows as runoff in small gullies, rivulets and joins the stream and form river system. This represents a natural drainage system. The river basin at macro level and watershed /sub watershed at microlevel represent the Natural Drainage System.

A watershed is an area from which runoff, resulting from precipitation flows past a single point into a large stream, river, lake or an ocean. In other words a

watershed is that area in which all the precipitation converges and drains past a particular point. The term watershed, catchment area of drainage basin can be used interchangeably. A watershed may be only a few hectares as in the case of small ponds, or hundreds of square kilometers as in the case of rivers or big reservoirs. For convenience watershed are classified in terms of size into: Basins, Catchments, Sub catchments, Watershed, Sub watershed, Mini & Micro watersheds. Each watershed is an independent hydrological unit; any modification of the land use in the watershed will be reflected on the water as well as in the sediment yield of the watershed.

The watershed can be demarcated from the topo sheet. But for a small (micro) watershed a detailed topographical survey has to be made and a contour map may have to be prepared. The ridge points are marked and the area below the ridge line is known as the watershed area. This contour map can be imposed with the village map. In case of small watershed, it could be demarcated by walking over the ridge point.

Watershed has become an acceptable unit of planning for optimum use and conservation of soil and water resources. A watershed is hydrological units which produce water as an end product by interaction of rainfall and watershed factor.



Table:20.1

## WATERSHED

Sl. No.	WSCODE	Area (ha)	Sl. No.	WSCODE	Area (ha)
1	24C31d	5.47	37	24C9r	0.04
2	24C34a	0.00	38	24C9s	6.22
3	24C35a	6.53	39	27k10a	206.05
4	24C35b	282.01	40	27k11a	196.49
5	24C35c	571.41	41	27K12a	740.13
6	24C35d	186.79	42	27K13a	627.79
7	24C36a	408.20	43	27K14a	500.67
8	24C37a	529.35	44	27K14b	276.69
9	24C37b	718.60	45	27K14c	452.93
10	24C37c	671.04	46	27K14d	346.41
11	24C37d	310.35	47	27K14e	545.28
12	24C37e	318.70	48	27K14f	394.92
13	24C37f	276.98	49	27K14g	841.50
14	24C37g	890.50	50	27K14h	295.74
15	24C37h	275.71	51	27K14i	1083.54
16	24C38a	173.00	52	27K14j	213.49
17	24C38b	824.04	53	27K14k	510.66
18	24C38c	243.47	54	27K14l	405.46
19	24C38d	838.39	55	27K14m	548.92
20	24C38e	614.88	56	27K14n	902.06
21	24C38f	359.69	57	27K14o	490.37
22	24C38g	239.89	58	27K14p	994.39
23	24C39a	439.16	59	27K14q	376.55
24	24C40a	1144.08	60	27K14r	308.41
25	24C41a	248.58	61	27K14s	393.17
26	24C42a	824.44	62	27K14t	694.68
27	24C42b	534.92	63	27K15a	580.35
28	24C42c	575.48	64	27K15aa	700.94
29	24C42d	1904.20	65	27K15ab	984.20
30	24C42e	592.84	66	27K15ac	210.05
31	24C42f	0.19	67	27K15ad	1215.08
32	24C7q	14.99	68	27K15ae	1153.34
33	24C7r	11.56	69	27K15af	806.15
34	24C7s	0.04	70	27K15b	1170.73
35	24C9j	1.36	71	27K15c	1318.79
36	24C9k	9.21	72	27K15d	811.25

<b>Sl. No.</b>	<b>WSCODE</b>	<b>Area (ha)</b>	<b>Sl. No.</b>	<b>WSCODE</b>	<b>Area (ha)</b>
73	27K15e	304.12	111	27K1a	1479.17
74	27K15f	361.35	112	27K1aa	1038.68
75	27K15g	826.14	113	27K1ab	2220.07
76	27K15h	1282.08	114	27K1ac	370.39
77	27K15i	375.05	115	27K1ad	466.66
78	27K15j	237.43	116	27K1ae	539.15
79	27K15k	857.62	117	27K1af	389.76
80	27K15l	938.70	118	27K1ag	508.42
81	27K15m	615.69	119	27K1ah	1464.55
82	27K15n	901.30	120	27K1ai	798.69
83	27K15o	982.99	121	27K1aj	789.93
84	27K15p	817.25	122	27K1ak	711.85
85	27K15q	1300.33	123	27K1al	905.90
86	27K15r	376.12	124	27K1am	551.56
87	27K15s	1241.06	125	27K1an	1631.61
88	27K15t	1188.95	126	27K1ao	578.16
89	27K15u	2006.94	127	27K1ap	1140.86
90	27K15v	546.14	128	27K1b	358.27
91	27K15w	312.82	129	27K1c	1009.82
92	27K15x	509.51	130	27K1d	1042.73
93	27K15y	897.57	131	27K1e	546.32
94	27K15z	834.06	132	27K1f	601.71
95	27K16a	1762.08	133	27K1g	524.15
96	27K17a	769.73	134	27K1h	455.65
97	27K18a	834.63	135	27K1i	395.15
98	27K18b	593.05	136	27K1j	554.33
99	27K18c	526.41	137	27K1k	453.46
100	27K18d	1143.70	138	27K1l	353.68
101	27K18e	251.86	139	27K1m	546.02
102	27K18f	686.19	140	27K1n	1000.21
103	27K18g	1439.95	141	27K1o	295.76
104	27K18h	1269.01	142	27K1p	563.31
105	27K18i	1029.73	143	27K1q	576.23
106	27K18j	341.29	144	27K1r	472.83
107	27K18k	360.42	145	27K1s	400.85
108	27K18l	482.07	146	27K1t	385.16
109	27K18m	742.10	147	27K1u	710.06
110	27K19a	753.63	148	27K1v	523.69

<b>Sl. No.</b>	<b>WSCODE</b>	<b>Area (ha)</b>	<b>Sl. No.</b>	<b>WSCODE</b>	<b>Area (ha)</b>
149	27K1w	1052.28	187	27K32b	590.55
150	27K1x	600.89	188	27K32c	886.98
151	27K1y	961.05	189	27K32d	348.10
152	27K1z	546.80	190	27K32e	1089.75
153	27K20a	469.93	191	27K32f	381.17
154	27K21a	918.52	192	27K32g	292.26
155	27K22a	619.91	193	27K32h	967.10
156	27K22b	488.37	194	27K32i	497.75
157	27K22c	163.85	195	27K32j	246.12
158	27K23a	332.63	196	27K32k	773.61
159	27K24a	310.19	197	27K32l	1003.15
160	27K24b	385.09	198	27K32m	388.73
161	27K24c	229.35	199	27K32n	963.96
162	27K24d	976.38	200	27K32o	861.50
163	27K24e	816.59	201	27K32p	632.16
164	27K24f	548.34	202	27K32q	909.25
165	27K24g	363.60	203	27K32r	224.90
166	27K24h	288.04	204	27K32s	601.14
167	27K25a	206.75	205	27K32t	696.26
168	27K25b	647.06	206	27K32u	1397.55
169	27K25c	284.96	207	27K32v	959.99
170	27K25d	227.45	208	27K33a	374.30
171	27K26a	312.93	209	27K34a	498.84
172	27K26b	263.38	210	27K35a	690.69
173	27K26c	634.64	211	27K36a	523.13
174	27K26d	443.91	212	27K36aa	402.97
175	27K26e	290.88	213	27K36ab	759.69
176	27K27a	620.91	214	27K36ac	712.60
177	27K27b	566.10	215	27K36ad	508.17
178	27K27c	469.58	216	27K36ae	588.98
179	27K28a	1272.56	217	27K36af	481.08
180	27K29a	401.91	218	27K36ag	296.19
181	27K29b	653.82	219	27K36ah	261.64
182	27K29c	918.23	220	27K36ai	538.46
183	27K2a	483.80	221	27K36aj	397.89
184	27K30a	578.91	222	27K36ak	896.96
185	27K31a	691.63	223	27K36al	173.74
186	27K32a	788.23	224	27K36am	706.82

<b>Sl. No.</b>	<b>WSCODE</b>	<b>Area (ha)</b>	<b>Sl. No.</b>	<b>WSCODE</b>	<b>Area (ha)</b>
225	27K36an	329.47	263	27K37a	255.04
226	27K36ao	416.44	264	27K37b	427.03
227	27K36ap	543.65	265	27K37c	503.78
228	27K36aq	367.18	266	27K38a	1281.38
229	27K36ar	697.11	267	27K39a	226.97
230	27K36as	431.79	268	27K3a	1999.67
231	27K36at	2016.07	269	27K3b	486.62
232	27K36au	336.98	270	27K3c	1905.89
233	27K36av	306.18	271	27K3d	603.01
234	27K36aw	1571.93	272	27K3e	1131.26
235	27K36ax	1454.65	273	27K3f	685.58
236	27K36ay	452.26	274	27K3g	1752.95
237	27K36az	539.44	275	27K3h	424.04
238	27K36b	822.03	276	27K40a	326.15
239	27K36c	528.71	277	27K40aa	489.20
240	27K36d	1333.47	278	27K40ab	574.39
241	27K36e	507.08	279	27K40ac	566.92
242	27K36f	399.74	280	27K40ad	276.33
243	27K36g	952.15	281	27K40ae	1020.38
244	27K36h	998.76	282	27K40af	307.09
245	27K36i	803.92	283	27K40ag	267.87
246	27K36j	659.97	284	27K40b	256.30
247	27K36k	911.13	285	27K40c	212.90
248	27K36l	703.49	286	27K40d	403.71
249	27K36m	467.76	287	27K40e	496.42
250	27K36n	754.16	288	27K40f	681.09
251	27K36o	538.97	289	27K40g	868.87
252	27K36p	832.87	290	27K40h	534.80
253	27K36q	1000.90	291	27K40i	670.39
254	27K36r	545.01	292	27K40j	479.79
255	27K36s	917.88	293	27K40k	752.52
256	27K36t	700.60	294	27K40l	673.47
257	27K36u	437.18	295	27K40m	1235.65
258	27K36v	674.15	296	27K40n	948.33
259	27K36w	413.65	297	27K40o	478.78
260	27K36x	685.47	298	27K40p	438.01
261	27K36y	743.88	299	27K40q	381.26
262	27K36z	1817.97	300	27K40r	452.29

Sl. No.	WSCODE	Area (ha)	Sl. No.	WSCODE	Area (ha)
301	27K40s	363.11	339	29M16b	21.37
302	27K40t	485.16	340	29M17b	3.99
303	27K40u	486.17	341	29M17c	523.92
304	27K40v	842.64	342	29M17d	462.63
305	27K40w	500.26	343	29M17e	792.79
306	27K40x	392.89	344	29M17g	9.34
307	27K40y	307.98	345	29M17h	264.23
308	27K40z	616.58	346	29M17i	335.75
309	27K41a	98.16	347	29M17j	468.35
310	27K42a	957.28	348	29M17k	97.04
311	27K4a	1112.62	349	31A23a	28.63
312	27K5a	590.68	350	32V31g	20.56
313	27K5b	554.23	351	32V34g	13.29
314	27K5c	483.25	352	32V41b	33.49
315	27K5d	529.95	353	32V41c	8.79
316	27K5e	509.60	354	32V41d	19.57
317	27K5f	739.64	355	32V42a	154.15
318	27K5g	390.42	356	32V42b	289.98
319	27K5h	432.69	357	32V42c	418.03
320	27K5i	704.49	358	32V42d	724.86
321	27K6a	390.14	359	32V42e	35.15
322	27K7a	523.41	360	32V43a	10.42
323	27K8a	418.60	361	32V44a	6.75
324	27K9a	233.72	362	32V45a	0.17
325	27K9b	581.72	363	32V53e	14.50
326	27K9c	764.60		<b>District Total</b>	<b>213100.00</b>
327	27K9d	223.72			
328	27K9e	273.85			
329	28K13f	13.55			
330	28K13g	7.03			
331	28K13h	23.34			
332	28K16d	16.59			
333	28K16e	1.09			
334	28K16h	13.72			
335	28K18d	682.78			
336	28K25a	0.36			
337	28K26a	67.73			
338	28K27c	91.13			





0 1.25 2.5 5 7.5 10  
Kilometers

1 : 350,000

### WATERSHED WAYANAD DISTRICT

#### WATERSHED

- CHALIYAR
- KABANI
- KUTTIYADI
- MAHE
- VALAPATTANAM

KERALA

WAYANAD



Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33

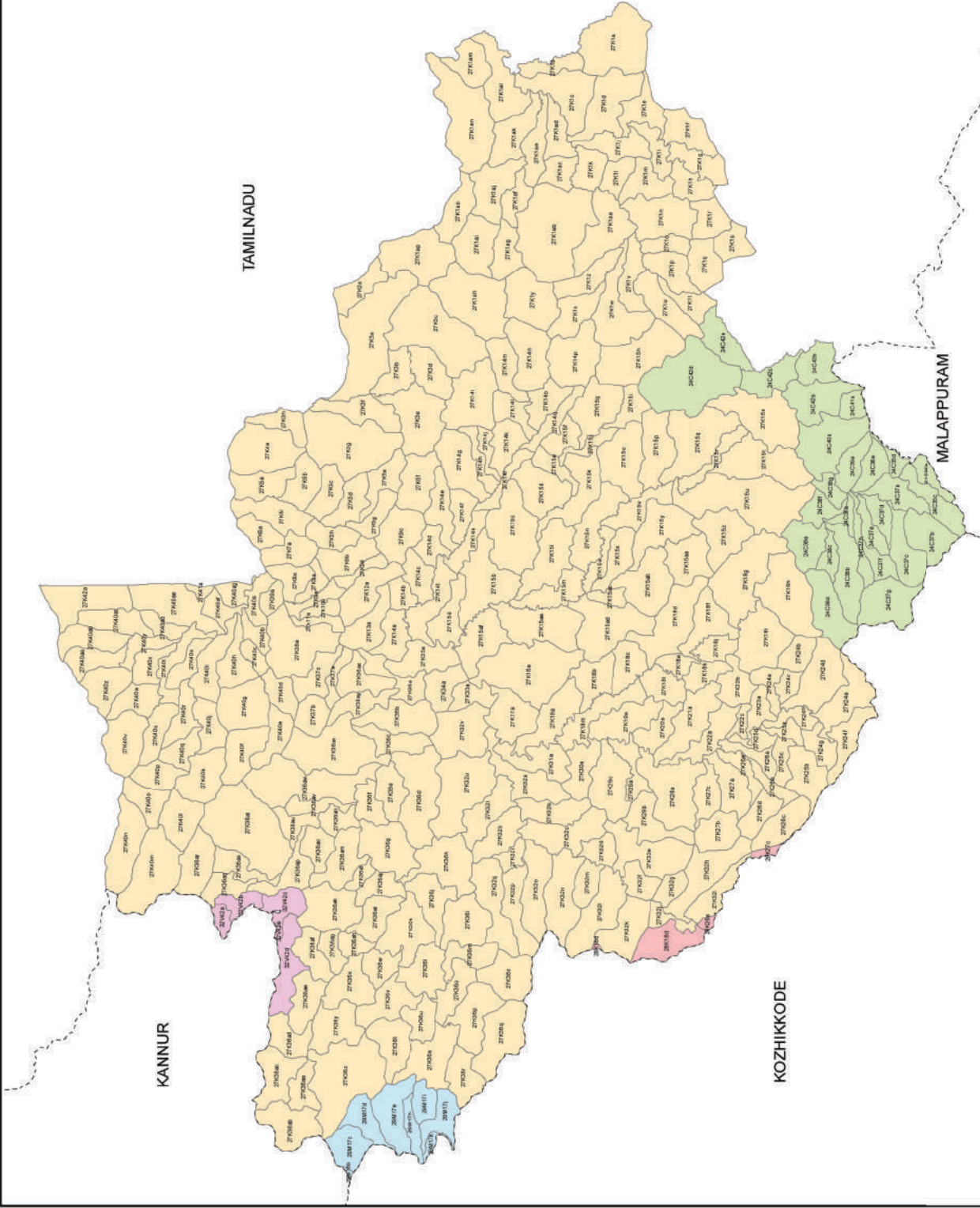






Table:- 21.1

**IRRIGATION**  
**NET AREA IRRIGATED (SOURCE WISE)**

Sl. No.	Source	(In Ha.)							
		2004-05	2005-06	2006-07	2007-08	2008-09	2009-10		
1	2	3	4	5	6	7	8		
1	Government Canals	101397	104669	98664	88318	95956	94813		
2	Private Canals	4729	4965	4300	4324	6318	2656		
3	Tanks	43983	45062	42064	41580	39752	40851		
4	Wells	108445	110000	114477	131002	133312	125892		
5	Other Sources	134802	135227	125900	122321	123915	122118		
6	Total	393356	399923	385405	387545	399253	386330		
7	Area irrigated more than once in a year		918341						
8	Gross irrigated area	455391	464765	475231	455310	458238	454783		
9	Net area irrigated to net area Sown (%)	18	19	17.52	18.41	18.86	16.34		
10	Gross irrigated area to gross cropped area (%)	15	15	16.29	16.44	16.96	17.04		
11	Irrigated area under paddy to total irrigated area	40	38	45	40	37	37		

Table:- 21.2

## GROSS AREA UNDER IRRIGATION (CROP WISE)

YEAR	Area in Hectares											
	Paddy	Tubers	Vegetables	coconut	Arecanut	Cloves	Nutmeg	Other spices and condiments	Banana	Betel Leaves	Sugar cane	Other Crops
2009-2010	11528	0	805	105	332	0	0	63	4880	0	1	44
2008-2009	10412		1068	110	158			6	5313			16
2007-2008	9409	7	640	145	246	2	2	28	6768			31

Table:- 21.3

## NET AREA IRRIGATED (SOURCE-WISE)-2008-2009

Government canal	Private canal	Government Tanks	Private Tanks	Government Wells	Private Wells	Minor Irrigation	Other Sources	Tube Wells	Total
221	767	45	185	4	156	687	10123	1	12189

Source:- Minor Irrigation Census



### **SPILL WAY**

Crest level	:	767.00 m
Length of spillway	:	56.38 m

### **RIVER SLUICE**

Size of sluice	:	2m & Circular
Level at C/L	:	+ 750.75 m

### **CANAL SYSTEM**

Length of main canal	:	2.730 Km
Length of Padinjathara Branch canal:	:	8.273 Km
Length of Venniyode Branch Canal	:	5.490 Km
Take off level of main canal	:	+ 760.075

### **AYACUT DETAILS**

Total Ayacut (net)	:	2800 ha
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## **KARAPUZHA IRRIGATION PROJECT**

Karapuzha Project is the first Irrigation Project taken up in Wayanad district. Wayanad with an average elevation of 780 m above sea level, lying on the eastern slope of Western Ghats is inhabited by several Hill tribes and settlers from different parts of the state. With a view to irrigate more and more area under paddy cultivation to overcome the deficiency in food grain production, a few major Irrigation Projects have been investigated in Wayanad area, out of which Karapuzha project was taken up for execution during the fifth Five Year Plan.

### **BASIC INFORMATION**

Ayacut Area in ha - Net 5221 ha Gross 8721 ha.

### **SALIENT FEATURES**

### **HYDROLOGY**

Catchment area	:	62 Sq. Km.
Average annual rainfall	:	2452 mm
Mean annual run off	:	83.44 Mm <sup>3</sup>
Minimum dry weather flow	:	0.85 M3/Sec.
Bed level of river at dam site	:	+738.00 M
FRL/MWL	:	+763.00 M

Top level of dam	:	+766.00 M
Gross storage capacity	:	76.5 Mm <sup>3</sup>
Dead storage (at +748.60M)	:	4.5 Mm <sup>3</sup>
Live storage	:	72 Mm <sup>3</sup>

#### **DAM**

Height of dam above bed level	:	28 M
Length at top	:	625 M
Width at top	:	7 M

#### **SPILLWAY**

Crest level	:	+757.00
Length	:	35 M

#### **CANAL SYSTEM**

L.B. Main canal	-	16.74 KM length.
R.B. Main canal	-	8.805 KM length.

### **KARAPUZHA IRRIGATION PROJECT**

Karapuzha Project is the first project for irrigation taken up in the Wayanad District of Kerala. The project is to construct an earthen dam with concrete spillway in Right bank at Vazhavatta across Karapuzha stream and the saddle dam at Pakkam, Cherupette and Cheengeri to create a reservoir of 76.50 Mm<sup>3</sup> storage capacities.

The original estimate of the project was Rs. 7.60 crores in 1979 and the estimate as per the 2008 schedule of rates in Rs. 498 crores. The cumulative expenditure up to March 2010 is Rs. 275.14 crores. Major components under head works viz., (i) Earth dam and saddle dam and (ii) Spillway are already completed. Work of stilling Basin and Energy Dissipating Chamber connection structure of RBC from diversion chamber is in progress. Raising of roads completed to the extent of 90 per cent. As regards Left Bank canal, it is in the nearly completion stage (99%). Seventy five per cent of the work in respect of Padinjareveedu Branch canal of LBC is completed, investigation of Thondippally Branch and Kuttoor Branch of Left bank canal is completed for which land acquisition is in process. Investigation of all Distributaries of LBC is completed and land acquisition is in progress except Pallikkunnu Distributary. As regards the Right Bank canal, it is completed only with the exception of the connection structure of length 24.28 m. The work of one

distributary is completed and the investigations for other distributaries are completed and land acquisition proposals were submitted. The progress of of implementation of the project is very slow. More proactive steps are required to complete the project in the drought affected district.

Source : Irrigation Department

## MINOR IRRIGATION

Kerala has a wide network of rivers and rivulets and springs spread over the entire cropped area. Minor Irrigation sector received considerable attention from Seventh Plan onwards and got a considerable boost during the Ninth Plan period consequent to the enhanced flow of funds from the grant in aid of the local bodies as well as special support received from the external agencies like European Economic Community, Dutch Government and assistance under RIDF of NABARD. With introduction of decentralized planning, all minor irrigation works (having cultivable command area up to 2000 ha.) were vested with the Panchayat Raj Institutions (PRIs). But by the enactment of new Act 'Kerala Irrigation and Water Management Act 2003' the definition of minor irrigation has been changed and works benefiting an area less than 15 ha. only come under the category of minor irrigation and are vested with PRIs. All other works having cultivable command area greater than 15ha. have been taken over by the Water Resources Department as medium irrigation. The major works implemented under surface water are minor irrigation Class-I, II and Lift irrigation schemes. Construction of check dam, Vented cross bars, weirs, tanks etc are the various works executed under minor irrigation Class-I & II.

The cumulative physical achievement of Minor irrigation up to Xth Five year plan was 235957 ha. (net). Minor irrigation has been given a considerable thrust during Eleventh Plan. About 24 per cent of the outlay in Irrigation sector is proposed for the development of Minor Irrigation. The details of physical achievement during the first two years of Eleventh Plan are shown in the table.

Table: 21.4

### Physical Achievement of Minor Irrigation (Surface Water)

(Net area in Ha.)

Sl. No.	Name of Schemes	2007-08	2008-09
1	MI Class I	2217.00	1474.81
2	MI Class II	711.00	1522.93
3	Lift Irrigatoin works	712.00	173.75
4	Repairs to MI structure	40.00	0.00
5	MI Class I- NABARD	1802.00	2032.90
6	MI Class II- NABARD	1285.00	3015.90
7	Lift Irrigation- NABARD	53.00	88.62
	<b>Total</b>	<b>6820.00</b>	<b>8308.91</b>

The minor irrigation has always been a thrust area for NABARD not only in terms of providing increased refinance but also by introducing various developmental initiatives and financial incentives. The RIDF I, II and III have been closed on December 2002, RIDF IV by March 2005, RIDF V by June 2006 RIDF VI by September 2007, RIDF VII by December 2008. RIDF VIII by September 2008 and its reimbursement claim was closed by 31.12.2008. The RIDF X closed by December 2009 and its reimbursement claim by 31.03.2010.

Table: 21.5

**DETAILS OF COMPLETED PROJECTS UNDER DIFFERENT TRENCHES OF RIDF**

Sl. No	RIDF Trenches	No. of Schemes completed
1	RIDF I	59
2	RIDF II	115
3	RIDF III	91
4	RIDF IV	66
5	RIDF V	122
6	RIDF VI	81
7	RIDF VII	39
8	RIDF VIII	43
9	RIDF IX	20
10	RIDF X	12
11	RIDF XI	135
12	RIDF XIII	176
13	RIDF XIV	8
	<b>Total</b>	<b>967</b>

**MINOR IRRIGATION CENSUS – WAYANAD (2000-2001)**

Table: 21.6

**CONSTRUCTION OF DUGWELLS OVER THE YEARS**

Up to 1993-94	During 1994-95	During 1995-96	During 1996-97	During 1997 -98	During 1998 -99	During 1999 -2000	During 2000 - 2001	Total
332	71	51	71	58	28	39	37	687

Table: 21.7

**CULTURABLE COMMAND AREA AND POTENTIAL CREATED THROUGH DUGWELLS**

Culturable Command Area	Irrigation Potential created				
	Kharif	Rabi	Perennial	others	Total
958	565	500	346	63	1474



Table: 21.8

**DUGWELLS IN THE COMMAND OF MAJOR/MEDIUM PROJECT AND  
SUPPLEMENTARY IRRIGATION**

Location of Dugwells (Nos)			Supplementary Irrigation (Ha)				
Inside Command	Outside Command	Total	Kharif	Rabi	Perennial	Others	Total
0	687	687	0	0	0	0	0

Table: 21.9

**DISTRIBUTION OF SURFACE FLOW SCHEMES ACCORDING TO THE FARMERS  
HOLDING SIZE**

Marginal (0-1 ha)	Small (1 - 2 ha)	Medium (2 - 10 ha)	Big (> 10 ha)	Total
22	3	49	21	115

Table: 21.10

**CULTURABLE COMMAND AREA AND POTENTIAL CREATED THROUGH SURFACE  
FLOW SCHEMES**

Culturable Command Area	Irrigation Potential created				
	Kharif	Rabi	Perennial	Others	Total
5193	4680	3691	354	3719	12444

Table: 21.11

**POTENTIAL UTILISED THROUGH SURFACE FLOW SCHEMES**

Kharif	Rabi	Perennial	Others	Total
3150	2098	298	2676	8222

Table: 21.12

**SURFACE FLOW SCHEMES IN THE COMMAND OF MAJOR/ MEDIUM PROJECT AND  
SUPPLEMENTARY IRRIGATION**

Location of Schemes (Nos.)		Augmentation	Total	Supplementary Irrigation (Ha)				
Inside Command	Outside Command			Kharif	Rabi	Perennial	Others	Total
1	517	0	518	0	0	0	0	0

Table: 21.13

**SURFACE FLOW SCHEMES- POTENTIAL CREATED AND UTILISED THROUGH TANKS**

Tanks (nos.)	Irrigation Potential Created				Total	Irrigation Potential utilised				Total
	Kharif	Rabi	Perennial	Others		Kharif	Rabi	Perennial	Others	
206	1358	1008	261	1262	3889	910	566	211	926	2613

Table: 21.14

**DISTRIBUTION OF SURFACE FLOW SCHEMES IN USE ACCORDING TO UTILISATION OF POTENTIAL CREATED**

No Constraints in Utilisation	Constraints in utilisation					Total
	Non filling-up of storage	Siltation of Storage	Break down of channel	Other reason	Total	
317	18	8	5	26	57	374

Table: 21.15

**DISTRIBUTION OF SURFACE FLOW SCHEMES (PERMANENT DIVERSION) IN USE AND THEIR POTENTIAL CREATED/ UTILISED ACCORDING TO PRIVATE AND PUBLIC**

No. in use			Potential Created (Ha)			Potential Utilised (Ha)		
Public	Private	Total	Public	Private	Total	Public	Private	Total
125	11	136	3585	155	3740	3244	154	3398

Table: 21.16

**DISTRIBUTION OF SURFACE FLOW SCHEMES (WATER CONSERVATION-CUM GROUND WATER RECHARGE) IN USE AND THEIR POTENTIAL CREATED/ UTILISED ACCORDING TO PRIVATE AND PUBLIC**

No. in use			Potential Created (Ha)			Potential Utilised (Ha)		
Public	Private	Total	Public	Private	Total	Public	Private	Total
25	4	29	377	44	421	365	44	409

Table: 21.17

**DISTRIBUTION OF SURFACE LIFT SCHEMES ACCORDING TO AVERAGE PUMPING HOURS**

According to average pumping hours during peak season						
0 - 4 hrs	4-8 hrs	8-12 hrs	12-16 hrs	16-20 hrs	20-24 hrs	Total
740	265	0	7	1	0	1013

Table: 21.18

**CULTURABLE COMMAND AREA AND POTENTIAL CREATED THROUGH SURFACE LIFT SCHEMES**

Cultivable Command Area	Irrigation Potential created				
	Kharif	Rabi	Perennial	Others	Total
6150	3522	3289	2112	810	9733

Table: 21.19

**SURFACE LIFT SCHEMES IN THE COMMAND OF MAJOR/ MEDIUM PROJECT AND SUPPLEMENTARY IRRIGATION**

Location of Schemes (Nos.)			Supplementary Irrigation (Ha)				
Inside Command	Outside Command	Total	Kharif	Rabi	Perennial	Others	Total
0	1013	1013	0	0	0	0	0

Table: 21.20

**DISTRIBUTION OF SURFACE LIFT SCHEMES (ON RIVER) IN USE AND THEIR POTENTIAL CREATED/ UTILISED ACCORDING TO PUBLIC AND PRIVATE**

No. in use			Potential Created (Ha)			Potential Utilised (Ha)		
Public	Private	Total	Public	Private	Total	Public	Private	Total
58	383	441	2472	2387	4859	2256	2162	4418

Table: 21.21

**DISTRIBUTION OF SURFACE LIFT SCHEMES (ON STREAM) IN USE AND THEIR POTENTIAL CREATED/ UTILISED ACCORDING TO PUBLIC AND PRIVATE**

No. in use			Potential Created (Ha)			Potential Utilised (Ha)		
Public	Private	Total	Public	Private	Total	Public	Private	Total
17	340	357	425	2173	2598	355	2043	2398

Table: 21.22

**DISTRIBUTION OF SURFACE LIFT SCHEMES (ON DRAIN/ CANAL) IN USE AND THEIR POTENTIAL CREATED/ UTILISED ACCORDING TO PUBLIC AND PRIVATE**

No. in use			Potential Created (Ha)			Potential Utilised (Ha)		
Public	Private	Total	Public	Private	Total	Public	Private	Total
1	11	12	8	35	43	8	24	32

Table: 21.23

**DISTRIBUTION OF SURFACE LIFT SCHEMES (ON TANK/ POND) IN USE AND THEIR POTENTIAL CREATED/ UTILISED ACCORDING TO PUBLIC AND PRIVATE**

No. in use			Potential Created (Ha)			Potential Utilised (Ha)		
Public	Private	Total	Public	Private	Total	Public	Private	Total
12	133	145	409	817	1226	409	753	1162

Table: 21.24

**AGRICULTURE LAND AND ITS USE**

Graphical Area	Cultivable Area	Net Area Shown	Net Area Irrigated through			
			Maj/ Med Scheme	Ground Water	Surface Water	Total
212439	122137	112409	0	1398	16152	17550

Table: 21.25

**MINOR IRRIGATION SCHEMES AT A GLANCE**

No. of Blocks	No. of Villages	Number of Schemes							Total
		Ground Water				Surface Water			
		Dugwell	Shallow	Deep	Total	S. Flow	S. Lift	Total	
4	26	687	0	0	687	518	1013	1531	2218

Table: 21.26

**IRRIGATION POTENTIAL CREATED /UTILISED THROUGH GROUND WATER SCHEMES IN USE**

DUG WELLS			SHALLOW TUBEWELLS		
No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised
674	1444	1179	0	0	0

DEEP TUBEWELLS			TOTAL		
No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised
0	0	0	674	1444	1179

Table: 21.27

**IRRIGATION POTENTIAL CREATED/ UTILISED THROUGH SURFACE FLOW SCHEMES IN USE**

TANKS			OTHER STORAGES			PERMANENT DIVERSIONS		
No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised
1	2	3	4	5	6	7	8	9
152	2822	2613	46	1926	1535	136	3740	3398

TEMPORARY DIVERSIONS			WATER CONSERVATION CUM GROUND WATER RECHARGE			TOTAL		
No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised
10	11	12	13	14	15	16	17	18
11	270	266	29	422	410	374	9180	8222

Table: 21.28

**IRRIGATION POTENTIAL CREATED/ UTILISED THROUGH SURFACE WATER SCHEMES IN USE**

SURFACE FLOW			SURFACE LIFT			TOTAL		
No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised
374	9180	8222	955	8725	8011	1329	17905	16233

Table: 21.29

**IRRIGATION POTENTIAL CREATED/ UTILISED THROUGH SURFACE LIFT SCHEMES IN USE**

ON RIVER			ON STREAM			ON DRAIN/ CANAL		
No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised
1	2	3	4	5	6	7	8	9
441	4859	4418	357	2598	2398	12	43	32

ON TANK/ POND			TOTAL		
No. in use	Potential Created	Potential utilised	No. in use	Potential Created	Potential utilised
10	11	12	16	17	18
145	1226	1162	955	8726	8010

Table: 21.30

**GROUND WATER SCHEMES NOT IN USE AND POTENTIAL LOST**

DUG WELLS			SHALLOW TUBEWELLS			DEEP TUBEWELLS			TOTAL		
No. not in use	CCA	Potential Lost	No. not in use	CCA	Potential Lost	No. not in use	CCA	Potential Lost	No. not in use	CCA	Potential Lost
13	23	29	0	0	0	0	0	0	13	23	29

Table: 21.31

**SURFACE FLOW SCHEMES NOT IN USE AND POTENTIAL LOST**

TANKS			OTHER STORAGES			PERMANENT DIVERSIONS		
No. not in use	CCA	Potential Lost	No. not in use	CCA	Potential Lost	No. not in use	CCA	Potential Lost
1	2	3	4	5	6	7	8	9
54	488	1068	21	103	188	65	883	1950

TEMPORARY DIVERSIONS			WATER CONSERVATION CUM GROUND WATER RECHARGE			TOTAL		
No. not in use	CCA	Potential Lost	No. not in use	CCA	Potential Lost	No. not in use	CCA	Potential Lost
10	11	12	13	14	15	16	17	18
2	38	44	2	7	14	144	1519	3264

Table: 21.32

**SURFACE LIFT SCHEMES NOT IN USE AND POTENTIAL LOST**

ON RIVER			ON STREAM			ON DRAIN/ CANAL		
No. not in use	CCA	Potential Lost	No. not in use	CCA	Potential Lost	No. not in use	CCA	Potential Lost
1	2	3	4	5	6	7	8	9
16	323	410	13	205	397	0	0	0

ON TANK/ POND			TOTAL		
No. not in use	CCA	Potential Lost	No. not in use	CCA	Potential Lost
10	11	12	16	17	18
29	115	202	58	643	1009

Table: 21.33

**CROP WISE AREA IRRIGATED BY GROUND WATER SCHEMES**

DUG WELLS					SHALLOW TUBEWELLS				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
1	2	3	4	5	6	7	8	9	10
529	286	312	53	1180	0	0	0	0	0

DEEP TUBEWELLS					TOTAL				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
11	12	13	14	15	16	17	18	19	20
0	0	0	0	0	529	286	312	53	1180

Table: 21.34

**CROP WISE AREA IRRIGATED BY SURFACE FLOW SCHEMES**

TANKS					OTHER STORAGES				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
1	2	3	4	5	6	7	8	9	10
910	566	211	926	2613	636	413	0	485	1534

PERMANENT DIVERSIONS					TEMPORARY DIVERSIONS				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
11	12	13	14	15	16	17	18	19	20
1305	874	87	1132	3398	146	105	0	15	266

WATER CONSERVATION CUM GROUND WATER RECHARGE					TOTAL				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
11	12	13	14	15	16	17	18	19	20
153	140	0	116	409	3150	2098	298	2674	8220

Table: 21.35

**CROP WISE AREA IRRIGATED BY SURFACE WATER MINOR IRRIGATION SCHEMES**

SURFACE FLOW					SURFACE LIFT				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
1	2	3	4	5	6	7	8	9	10
3150	2098	298	2676	8222	3271	2693	1577	470	8011

TOTAL				
Karif	Rabi	Perennial	Other	Total
11	12	13	14	15
6421	4791	1875	3146	16233

Table: 21.36

**CROP WISE AREA IRRIGATED BY MINOR IRRIGATION SCHEMES**

GROUND WATER					SURFACE WATER				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
1	2	3	4	5	6	7	8	9	10
529	286	312	53	1180	6421	4791	1875	3146	16233

TOTAL				
Karif	Rabi	Perennial	Other	Total
11	12	13	14	15
6950	5077	2187	3199	17413

Table: 21.37

**CROP WISE AREA IRRIGATED BY GROUND WATER SCHEMES AS SUPPLEMENTARY SOURCE OF IRRIGATION**

DUG WELLS					SHALLOW TUBEWELLS				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0

DEEP TUBEWELLS					TOTAL				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
11	12	13	14	15	16	17	18	19	20
0	0	0	0	0	0	0	0	0	0

Table: 21.38

**CROP WISE AREA IRRIGATED BY SURFACE FLOW SCHEMES AS SUPPLEMENTARY SOURCE OF IRRIGATION**

TANKS					OTHER STORAGES				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0

PERMANENT DIVERSIONS					TEMPORARY DIVERSIONS				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
11	12	13	14	15	16	17	18	19	20
0	0	0	0	0	0	0	0	0	0

WATER CONSERVATION CUM GROUND WATER RECHARGE					TOTAL				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
21	22	23	24	25	26	27	28	29	30
0	0	0	0	0	0	0	0	0	0



Table: 21.39

**CROP WISE AREA IRRIGATED BY SURFACE LIFT SCHEMES AS SUPPLEMENTARY SOURCE OF IRRIGATION**

ON RIVER					ON STREAM				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0

ON DRAIN/ CANAL					ON TANK/ POND				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
11	12	13	14	15	16	17	18	19	20
0	0	0	0	0	0	0	0	0	0

TOTAL				
Karif	Rabi	Perennial	Other	Total
26	27	28	29	30
0	0	0	0	0

Table: 21.40

**CROP WISE AREA IRRIGATED BY SURFACE WATER SCHEMES AS SUPPLEMENTARY SOURCE OF IRRIGATION**

SURFACE FLOW					SURFACE LIFT				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0

TOTAL				
Karif	Rabi	Perennial	Other	Total
11	12	13	14	15
0	0	0	0	0

Table: 21.41

**CROP WISE AREA IRRIGATED BY MINOR IRRIGATION SCHEMES AS SUPPLEMENTARY SOURCE OF IRRIGATION**

GROUND WATER					SURFACE WATER				
Karif	Rabi	Perennial	Other	Total	Karif	Rabi	Perennial	Other	Total
1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0

TOTAL				
Karif	Rabi	Perennial	Other	Total
11	12	13	14	15
0	0	0	0	0

Table: 21.42

**ELECTRICAL/ DIESEL PUMPS USED IN MINOR IRRIGATION SCHEMES**

ELECTRICAL PUMPS							
Dugwell	Shallow Tubewell	Deep Tubewell	Lift on River	Lift on Stream	Lift on Drain/ Canal	Lift on Tank/ Pond	Total
1	2	3	4	5	6	7	8
467	0	0	251	228	6	109	1061

DIESEL PUMPS							
Dug well	Shallow Tube well	Deep Tube well	Lift on River	Lift on Stream	Lift on Drain/ Canal	Lift on Tank/ Pond	Total
9	10	11	12	13	14	15	16
155	0	0	203	141	5	65	569

TOTAL							
Dug well	Shallow Tube well	Deep Tube well	Lift on River	Lift on Stream	Lift on Drain/ Canal	Lift on Tank/ Pond	Total
17	18	19	20	21	22	23	24
622	0	0	454	369	11	174	1630

Source:- Minor Irrigation Census, Irrigation Dept.

## POWER

### DETAILS OF POWER GENERATION IN KERALA

Table: 22.1

#### 1. KSEB HYDRO

Sl. No.	Name of Station	Power( in Mega Watts)	Energy (in Million Units)
1	Pallivasal	37.50	284.00
2	Sengulam	48.00	182.00
3	Poringalkuthu	32.00	170.00
4	Neriamangalam	52.50	251.60
5	Panniyar	30.00	148.00
6	Sabarigiri	325.00	1338.00
7	Sholayar	54.00	233.00
8	Kuttiady	75.00	248.00
9	Idukki	780.00	2398.00
10	Idamalayar	75.00	320.00
11	Kallada	15.00	65.00
12	Peppara	3.00	11.50
13	Lower Periyar	180.00	493.00
14	Mattupetty	2.00	6.40
15	Poringal left bank extension	16.00	74.00
16	Kakkad	50.00	262.00
17	Kuttiadi extension scheme	50.00	75.00
18	Malampuzha shep	2.50	5.60
19	Chembukadavu - I	2.70	6.24
20	Chembukadavu - II	3.75	9.66
21	Urumi - I	3.71	9.53
22	Urumi - II	2.40	6.10
23	Malankara	10.50	65.00
24	Lower Meenmutty	3.50	7.00
25	Neriamangalam extension	25.00	58.00

## 2. DIVERSION/AUGMENTATION SCHEMES

1	Vazhikadavu		24.00
2	Panniar Augmentation		10.00
3	Narakakkanam (To Idukki)		7.00
4	Poringal (To Idamalayar)		60.00
5	Azhutha		57.00
6	Vadakkepuzha		12.00
7	Kuttiadi Augmentation		223.00

## 3. CAPTIVE HYDRO

1	Maniar	12.00	37.00
2	Kuthungal	21.00	79.00

## 4. KSEB DIESEL

1	Brahmapuram	106.60	535.00
2	KDPP Kozhikode	128.00	896.00

## 5. CENTRAL PUBLIC SECTOR - THERMAL

1	Kayamkulam (N.T.P.C)	359.58	2094.00
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## 6. THERMAL IPPs

1	B.S.E.S Kerala Power Limited Kochi (IPP)	157.00	1099.00
2	KPC Kasargod (IPP)	20.44	140.00

## 7. WIND ENERGY (KSEB)

1	Wind Farm, Kanjikode	2.03	5.00
2	Ramakkalmedu (private sector)	10.50	20.24
3	Agali (private sector)	6.00	12.01

## MISCELLANEOUS

### Industries

In Wayanad most of the industries are located in Kalpetta Municipality, Sulthan Battery, Meenangadi and Mananthavady Grama Panchayats. 79 industrial Co-operative societies are registered in the district, out of it 41 come under the category of SC/ST and 12 are of Women Enterprises. There are 803 agro based industries, 1649 garment based units, 757 engineering units and 144 building material units in the district. In addition to the above about 1017 small scale industries in various sectors including Photostat, leather bag, rexin products, biofertilizers etc. The district industries centre function at Muttill Taluk industries offices are functioning in vythiri and Mananthavady Taluks. A 851 wing has started functioning at Sulthanbattery branch of Canara Bank. In Sultan Battery 9 mini industrial estate having 14 sheds in functioning under the control of SIDCO. A raw material unit is also operating there. Land has been purchased to start industrial estate in Edavaka, Mananthavady, Kariyambetta and Poothady under the project of district panchayat. Construction work is in progress at chundela for and industrial park by KINFRA. In Wayanad district so far 4370 small scale industrial units have been registered. Of these 1829 are in SulthanBattery Block, 1332 in Kalpetta Block and the remaining 1219 are in Mananthavady Block.

Table:- 23.1  
**NUMBER OF MOTOR VEHICLES HAVING VALID REGISTRATION AS ON 31.03.2010**

Goods	Buses			Four Wheelers			Three Wheelers			Tractors/ Trailers			Total
	Three wheeler and above	Stage carriage	Contract carriage	Motor Car	Motor Cab	Jeep	Autorick shaw	Motor Cycle	Tractor	Tiller	Trailer	Other	
3607	1839	562	1248	8854	3159	3874	7987	30797	140	257	102	2069	64495

Table:- 23.2  
**GROWTH OF MOTOR VEHICLES IN KERALA AND THEIR INDEX (BASE 2001=100)**

Motor Vehicles (Nos)	2000-01		2001-02		2002-03		2003-04		2004-05		2005-06		2006-07	
	Index	Motor Vehicles (Nos)	Index	Motor Vehicles (Nos)	Index	Motor Vehicles (Nos)	Index	Motor Vehicles (Nos)	Index	Motor Vehicles (Nos)	Index	Motor Vehicles (Nos)	Index	Motor Vehicles (Nos)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
30405	100	31427	103.4	33479	110.1	36358	119.6	40425	133	46556	153.1	53957	177.5	

Motor Vehicles (Nos)	2007-08		2008-09		2009-10	
	Index	Motor Vehicles (Nos)	Index	Motor Vehicles (Nos)	Index	Motor Vehicles (Nos)
15	16	17	18	19	20	
52171	171.6	56242	185	64495	212.1	

Table:- 23.3

**NEWLY REGISTERED VEHICLES FOR THE  
YEAR 2009-10 (Provisional)**

<b>Transport Vehicles</b>	<b>Wayanad</b>
Multi Axiled/ Articulated Vehicles	4
Trucks/ Lorries	25
Four Wheelers	0
Three Wheelers	211
<b>Total</b>	<b>240</b>
Stage Carriages	30
Contract Carriages	21
P.S.V.S	1
Other Buses EIV	13
<b>Total Buses</b>	<b>65</b>
Motor Cabs	109
Maxi Cabs	53
Other Taxis	1
<b>Total Taxi</b>	<b>163</b>
LMV Passenger 3 Wheeler	915
4-6 Seaters	0
M Cycle on Hire	0
<b>Total</b>	<b>915</b>
Other TVs	17
Total TVS	1394
Scooter	621
Mopeds	463
Motor Cycle	3741
<b>Total</b>	<b>4825</b>
Cars	7871
Jeeps	418
Omni Buses	79
Tractors	16
Trailors	102
Other Vehicles	12
<b>Total</b>	<b>8498</b>
<b>Total NTVS</b>	<b>13323</b>
<b>Grand Total</b>	<b>14717</b>

Table:- 23.4

## KSRTC OPERATIONS STATISTICS DURING 2009-10

Unit	No. of Buses held as on 31.03.10	No. of Schedules as on 31.03.10	No. of routes as on 31.03.10	Routes distance (Kms)	Gross Kms (in lakhs)	Effective Kms operated (in lakhs)	Passengers carried (in lakhs)	Average carrying capacity per bus
<b>Wayanad</b>								
Kalpetta	56	51	47	2726	64.83	59.64	104.35	60
Mananthavady	65	60	49	3234	74.4	67.59	148.23	60
Sulthanbathery	88	75	37	4033	96.66	92.14	157.83	60

Table:- 23.5

## KSRTC OPERATIONS STATISTICS DURING 2009-10

Unit	No. of Buses held daily	Average Kms Run per day per bus	Average Route length (Kms)	Earning per Vehicle on road per day (in Rs.)	Earning per Km of buses operated (in ps.)
<b>Wayanad</b>					
Kalpetta	56	355	58	7243	2042
Mananthavady	66	319	66	7559	2368
Sulthanbathery	85	366	109	7629	2088

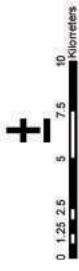


Table:- 23.6

## FARE STRUCTURE OF KSRTC DURING 2010

<b>Sl. No</b>	<b>Type of Service</b>	<b>Basic fare per KM (paise)</b>	<b>Minimum fare (paise)</b>
1	City	55.00	4.00
2	Ordinary	55.00	4.00
3	City Fast Passenger	57.00	5.00
4	Fair Passenger	57.00	5.00
5	Super Fast	60.00	10.00
6	Suppeer Express	65.00	15.00
7	Super Delux Service	75.00	20.00
8	A/C Air Bus	90.00	30.00
9	High tech (Volvo)	110.00	30.00





**TRANSPORT NETWORK  
WAYANAD DISTRICT**

- Road Type**
- OTHER ROADS
  - DISTRICT ROAD
  - STATE HIGHWAY
  - NATIONAL HIGHWAY



WAYANAD

KERALA



Kerala State Land Use Board  
Vikas Bhavan, Thiruvananthapuram-33

