

GENERAL INFORMATION

Malappuram district came into existence on 16th June 1969. District is bounded on the North by Kozhikode district and Vythiri tauk of Wayanad district and on the South by Mannarkkad and Ottappalam taluks of Palakkad district and Thalappalli and Chavakkad taluks of Palakkad district. District covers an area of 355446 ha. consisting 15 block, 7 municipalities and 6 taluks. Being Northern part of Kerala Malappuram falls between 75° to 77° east longitude and 10° to 12° north latitude. Based on physiographic features district falls under five sub micro regions namely Malappuram coast, Malappuram undulating plain, Chaliyar river basin, Nilambur forested hills and Perinthalmanna undulating upland. District has a tropical humid climate with an oppressive summer and plentiful seasonal rainfall. Forest is classified as evergreen and deciduous and covers an area of 723.91 Sq.km. Large forest reserves favourably affect climate and induce more rain in the district. With vast stretches of evergreen forest Malappuram is blessed with natural habitat for variety of plants and animals. Mineral reserves are not abundantly rich except laterite stone. Alluvial, Laterite and Forest loam soils cover the whole area. Main rivers are Chaliyar, Kadalundi, Tirur and Bharathapuzha; Bharathapuzha is the second longest river in the State. Agriculture plays a vital role in the district with a total cropped area of 230288 ha. during 2012-13. District stands 1st position in arecanut, tamarind and mango cultivation. District contributes major part of betel leaves production in the State. Malappuram has long tradition in fishing industry and coastal area extends 70 km. consisting 29 fishing villages. Agricultural allied animal husbandry plays another vital role in the district and total live stock population was 1.05 lakh. during 2010-11. Besides the conventional sources for irrigation like tanks, wells and private canals, district has a major irrigation scheme and lot of minor irrigation schemes. Watershed has become an acceptable unit of planning for optimum use and conservation of soil and water resources. Land use category is

observed in this district are builtup land, forest, water bodies, agriculture land, wasteland and wetland. Major categories of wasteland are barren rocky, land with dense scrub and scrub dominated forest. There are some Prehistoric relics found in some parts of the district particularly Dolmens, Menhirs and Rock-cut caves. With rich natural beauty and historic past district has much tourist attractions.

History

Malappuram district came into existence on 16th June, 1969. Malappuram district is composed of portion of the erstwhile Palakkad and Kozhikode districts. It was carved out of Ernad taluk and portions of Tirur taluk of Kozhikode district and portions of Perinthalmanna and Ponnani taluks of Palakkad district. The ancient history of the places comprising of the district is obscure. However, there are some pre-historic relics found in some parts of the district, particularly Dolmens, Menhirs and Rock-cut caves. In Manjeri town and in Nilambur village, these relics are found. Rock-cut caves are also seen in Irimbiliyam, Puliyakkode, Trikkulam, Urakam, Melmuri, Ponmala, Vallikunnu and Vengara. The ancient archeological relics include the fortified palace of the eastern branch of the Zamorin's family known as Kizhakke Kovilakom. The Zamorins held sway over Malappuram and their chieftain Para Nambi, ruled the area in early days. There are some renowned old temples in the district, which have archeological and architectural values. Of them Thirunavaya Vishnu temple, Triparangode Siva temple, Hanumankavu, Chamravattathu Ayyappankavu, Trikkandiyur Siva temple, Keraladhiswaram Vishnu temple, Vennayur Vishnu temple and Karikkad Subramonia temple are important. During the Sangam period, the district formed part of the Chera Empire. No further details are available about the life and culture of the people either during the Sangam age or in the Post-Sangam age. However, the inscriptional evidence found at the Triparangode temple indicates that Goda Ravi of the Chera Empire had his sway over this region. Similarly

details of the rulers of Ernad, who were the ancestors of later Zamorins, figure in the Jewish copper plates of Bhaskara Ravi Varman (1000 AD) and in the Kottayam copper plates of Veera Raghava Chakravarthy (1225 AD). The later history of the district is interwoven with the history of Zamorin's rule. Zamorin or Samury or Samuthiri originally belonged to Nediyruppu in Ernad taluk of Malappuram district before shifting his seat to Kozhikode. The conquests of Zamorin in the pre-Portuguese period deserve special mention, particularly his conquests over Parappanad and Vettathunadu (Tanur). The war with Valluvakkonathiri ended in establishing Zamorin's superiority and gave him the honour of presiding over the Mamankam, as the 'Rakshapurusha' or protector of Mamankam. By 1400 AD Zamorin acquired hegemony over the entire district. The Portuguese period commences with the arrival of Vasco Da Gama on the Kerala coast in 1498. The Zamorin gave him all facilities for trade; however, the attitude of the Portuguese underwent radical changes resulting in conflicts with the Zamorin. Ponnani (which now forms part of the district) also was an important target of the Portuguese. In 1507 Almeida raided Ponnani and started building a fortress there in 1585. By the close of the 16th century, the Portuguese supremacy in the Malabar Coast started dwindling and it slowly declined giving political advantage to the Dutch. Unmindful of Portuguese opposition, the Zamorin entered into a treaty with the Dutch East India Company on 11th November 1604. This was followed by another treaty in 1608, which confirmed the earlier treaty and the Dutch assured assistance to Zamorin in expelling the Portuguese. By the middle of the 17th century, the Dutch had monopoly of the foreign trade in the Kerala coast except for small English factories at Ponnani and Calicut. The arrival of Captain Keeling at Kozhikode in 1650 and the conclusion of a treaty with the Zamorin paved way for the British supremacy in the region. Though the British had to face stiff resistance in Malabar from the Portuguese, the Dutch and the French, the English in the earlier years mainly concentrated in fostering trade rather than involving themselves in military

exercises. The Mysorean invasions during the period had political overtones in Malabar. During his conquest between 1766-93, Haider Ali marched to Ponnani facing stiff resistance from the local Nairs. Haider Ali adopted severe and primitive means for punishing enemy troops. With headquarters at Manjeri, his troops spread all over the district capturing men, women and children. His draconian measures produced an outward calm in the district though it did not last for long. During 1768-73 Haider was busy with his campaigns against the Mahrattas, but at the end of 1773, he again invaded Malabar through the Thamarasseri pass. In 1778 a rebellion broke out against the authority of Mysorean ruler. The English East India Company encouraged the local rulers and they helped the local people to rise to shake off the Mysorean yoke. The British force under Col. Humberstone had to face the Mysorean army led by Makhdum Ali, which ended in the death of the latter in April 1782. The greater part of his army was also lost. At this juncture, Haider Ali sent his son Tippu Sultan to restore his authority over Malabar. But Tippu could not continue for long in Malabar as his father passed away and he had to inherit his father's throne. In 1788 Tippu Sultan again invaded Kerala with a large army and without facing much resistance he could establish his suzerainty and establish Feroke as his capital. But the signing of the treaty at Serinagapatanam in 1792 resulted in the collapse of the Mysore throne and the large tract of Malabar, which was under the authority of Mysoreans, was ceded to the British. The British Commissioner's effected a political settlement and thereby the rulers of Parappanad and Vettathunad were required to pay their revenues through the Zamorin, who was also temporarily vested the powers to administer justice over all these petty Rajahs. These arrangements also did not last long as the revenues of the district could not be paid by the Zamorin to the British promptly. Under the strict orders of the Governor of Bombay on 5th July 1796, the Commissioners took the direct management of the Zamorin's estates, but on payment of dues they returned the territories to him. However, the rebellion of Manjeri Attan Gurukkal again resulted

in non-payment of revenues by Zamorin and the Company taking this opportunity assumed the control of the districts governed by the Zamorin in October 1798. Thereafter the British Collectors ruled Malabar, which include the present Malappuram district. During the reign of the British also, the peace of the region was often disturbed due to Mappila riots. At the close of the 19th century the situation in the district was almost peaceful. The Indian National Congress was founded in 1885 and many delegates from Kozhikode and Malabar attended the annual sessions of the Congress held at various places in the country. However, no organised political movement took place until the beginning of the 20th century. In 1908, the District Congress Committee was formed in Malabar and many people actively participated in its activities. The first political conference was held at Palakkad in 1916 followed by the conferences at Kozhikode in 1917, Tellicherry in 1918 and at Badagara in 1919. But the most important conference was the Manjeri Political Conference held on 28th April 1920, consequent on the announcement of the Montague Chelmsford Reforms of 1919 which was attended by about 1300 delegates from all parts of Malabar. Sri K.P. Raman Menon on behalf of the extremists moved the main political resolution declaring that India was fit for full self government and the Montague Chelmsford Reforms were quite unsatisfactory and disappointing. Dr. Annie Beasant who was also present at the conference, opposed the resolution but it was passed by a huge majority. Another noteworthy resolution passed at the conference was the demand for tenancy reforms. In a nutshell Manjeri Political Conference was a turning point in the history of the political movement in Kerala. The Non-cooperation and Khilaphat movement had also their repercussions in the district. The Khilaphat committees were set up all over Malabar particularly in the then Ernad and Valluvanad taluks. Several encounters took place between the Mappila rebels and the British troops. These events known as the Malabar Rebellion of 1921, spread to Tirurangadi, Malappuram, Manjeri, Perinthalmanna, Pandikkad, Tirur etc. The official history of the Congress states that upto the 28th

August 1921, the administration in Malappuram, Tirurangadi, Manjeri and Perinthalmanna was almost virtually ended, as these areas fell under the rebel leaders. At the same time, the congress workers were very active in preaching, non-violence and rendering all help to various victims of the disturbances. It is an irony of fate that while the Mappila rebels were being rounded up and punished the Congress leaders who were preaching non-violence were also arrested and sentenced to various terms of imprisonment. Kozhikode district Gazetter States that, at the final phase of the rebellion the Mappilas became desperate and committed acts of forcible conversion, looting of Hindus, arson and murder besides looting and destroying public offices. The rebellion was crushed by hanging or deporting the rebels to the Andaman Islands, besides imprisoning large number of persons. Sri K.P.Kesava Menon who had intimate personal knowledge of the men and women connected with the rebellion has expressed the view quoted from Kozhikode District Gazetteer that "there is no doubt regarding the genesis of the rebellion on 1921. It was born out of police repression. Its chief cause was the excessive violence used by the authorities to suppress the Khilaphat movement, and not any Jenmi-Kudiyar conflict or dispute regarding mosque. When police atrocities became unbearable, they gave up the vow of non-violence and decided to meet violence with violence itself". After the rebellion, the political activity in Malabar came to a standstill till the starting of the Civil Disobedience Movement. The Payyanur Conference in May 1928 was presided over by Pandit Jawaharlal Nehru and it generated great enthusiasm among the masses and gave a fresh impetus to the activities of the Congress in Malabar. Volunteers from this district also participated in the famous Salt Satyagraha on 1930 and may courted arrest. The withdrawal of the Civil Disobedience Movement led to a peculiar political situation in the country. The younger general of the Congress men decided to form a Congress Socialist Party in 1934. This leftist group who subscribed to the community ideology was under the leadership of P. Krishna Pillai and E.M.S Namboodiripad. The rift in the

Congress became very serious at its meeting in Shornur in October 1934. In 1936, elections were held to the Madras Legislature base on the revisions of the Government of India Act, 1935 and all the Congress candidates from Malabar were returned to the provincial legislature. The volunteers of this district also participated in the Quit India Movement of 1942 and many persons were put behind the bars. Of the major political set up in Malabar, the most important was the emergence of Kerala Muslim League as a political party in the district under the leadership of Syed Abdul Rahman Bafaki Thangal, K.M. Seethi Sahib and C.H. Mohammed Koya. It is worthwhile to say here that the population of this district consists mostly Muslims. The people are pious and the background of the people tells the story of an arduous life in the midst of hills, boulders and rocks.

MALAPPURAM AT A GLANCE

Table: 1.1

ADMINISTRATIVE SET UP

Sl. No.	Particulars	Malappuram	Kerala
1	No. of Revenue Divisions	2	21
2	No. of Taluks	6	63
3	No. of Revenue Villages	135	1453
4	No. of Corporations	0	5
5	No. of Corporation Wards	0	359
6	No. of Municipalities	7	60
7	No. of Municipality Wards	278	2216
8	No. of Block Panchayat	15	152
9	No. of Block Panchayat Wards	227	2095
10	No. of Grama Panchayat	100	978
11	No. of Grama Panchayat Wards	1902	16680
12	No. of Assembly Constituencies	16	140
13	No. of Parliament Constituencies	2	20
14	No. of District Panchayat Wards	32	332

Table: 1.2

DEMOGRAPHY

Sl. No.	Particulars	Malappuram	Kerala
1	Total Population	4110956	33387677
2	No. of Literates	3328658	28234227
3	No. of Migrant	292753	1625653

Table: 1.3

GEOGRAPHICAL PARTICULARS

Sl. No.	Area Categorization	Malappuram	Kerala
1	Total Area (Ha)	355446	3886287
2	Forest Area (Ha)	103417	1081509
3	Length of Coastal Line (Kms)	70	590

Table: 1.4

AGRICULTURE

Sl. No.	Land Utilization Pattern	Malappuram	Kerala
1	Total geographical area	355446	3886287
2	Forest area	103417	1081509
3	Land put to non agricultural use	45189	402577
4	Barren & uncultivable land	938	16354
5	Permanent pastures and other grazing land	1	118
6	Land under misc. tree crops	275	2799
7	Cultivable waste	5951	96596
8	Fallow other than current fallow	52268	55835
9	Current fallow	8138	76744
10	Net area sown	179978	2048109
11	Area sown more than once	50310	543625
12	Total cropped area	230288	2591734

Table: 1.5

ANIMAL HUSBANDRY

Sl. No.	Livestock Population	Malappuram	Kerala
1	Cattle	105329	1740117
2	Buffaloes	13532	58145
3	Goats	248403	1729127
4	Pigs	2401	59017
5	Sheep	257	965
6	Ducks	54908	865331
7	Fowls	1423259	11820376

Table: 1.6

FISHERIES

Sl. No.	Particulars	Malappuram	Kerala
1	Length of coastal line	70	590
2	No. of fishing villages		
a)	Marine	23	222
b)	Inland	6	113
3	Fisher folk population		
a)	Marine	77897	771249
b)	Inland	4147	230376

Table: 1.7

INDUSTRIES

Sl. No.	Industrial Units	Malappuram	Kerala
1	Number of Factories		
2	Number of SSI units registered	11508	219444
3	Number of Women SSI units registered	1873	55416
4	Number of Industrial Co-operative Societies Registered	0	9

Table: 1.8

COMMUNICATION

Sl. No.	Communication Divisions	Malappuram	Kerala
1	Total Number of Post Offices	433	5064
a)	Number of Head Office	4	51
b)	Number of Sub Office	98	1455
c)	Number of ED Branch Office	331	3558
2	Total Number of Telephone Exchanges	95	1266

Table: 1.9

HEALTH

Sl. No.	Institutions	Malappuram	Kerala
1	General Hospital	1	16
2	Women & Children Hospital	0	8
3	District Hospital	1	15
4	Taluk Hospital	5	77
5	Primary Health Centre	66	682
6	Leprosy Control Unit/Hospitals	0	3
7	TB Centre/Clinic	2	17
8	Mental Health Centre	0	3
9	Number of Govt. Allopathic Hospitals	124	1281
10	Number of Govt. Ayurvedic Hospitals		
11	Number of Govt. Homoeopathic Hospitals	3	32

Table: 1.10

EDUCATION

Sl. No.	Institutions	Malappuram	Kerala
1	Government Lower Primary Schools	349	2607
2	Government Upper Primary Schools	111	924
3	Government High Schools	86	1089
4	Government Higher Secondary Schools	83	769
5	Government Vocational Higher Secondary Schools	24	261
6	Teachers Training Institute	27	222
7	Kendriya Vidyalaya	1	27
8	Jawahar Navodaya Vidyalaya	1	14
9	CBSE School	71	797
10	ICSE School	2	108
11	Government Engineering Colleges	0	9
12	Government Medical Colleges	0	5
13	Government Polytechnic Colleges	2	49

Table: 1.11

DRINKING WATER FACILITIES

Sl. No.	Water Supply Connections	Malappuram	Kerala
1	Number of Public Canal	3153	85825
2	Number of Public Wells	130	603
3	Number of Public Tanks	337	1777
4	Number of Tube Wells	956	19716
5	Number of Ground water Dug Wells	13510	162826

Table: 1.12

POWER

Sl.No.	Particulars	Kerala
1	No. of Pump sets Energised	524568
2	No. of Streetlight Energised	1202988
3	No. of Transformers	58104

Table: 1.13

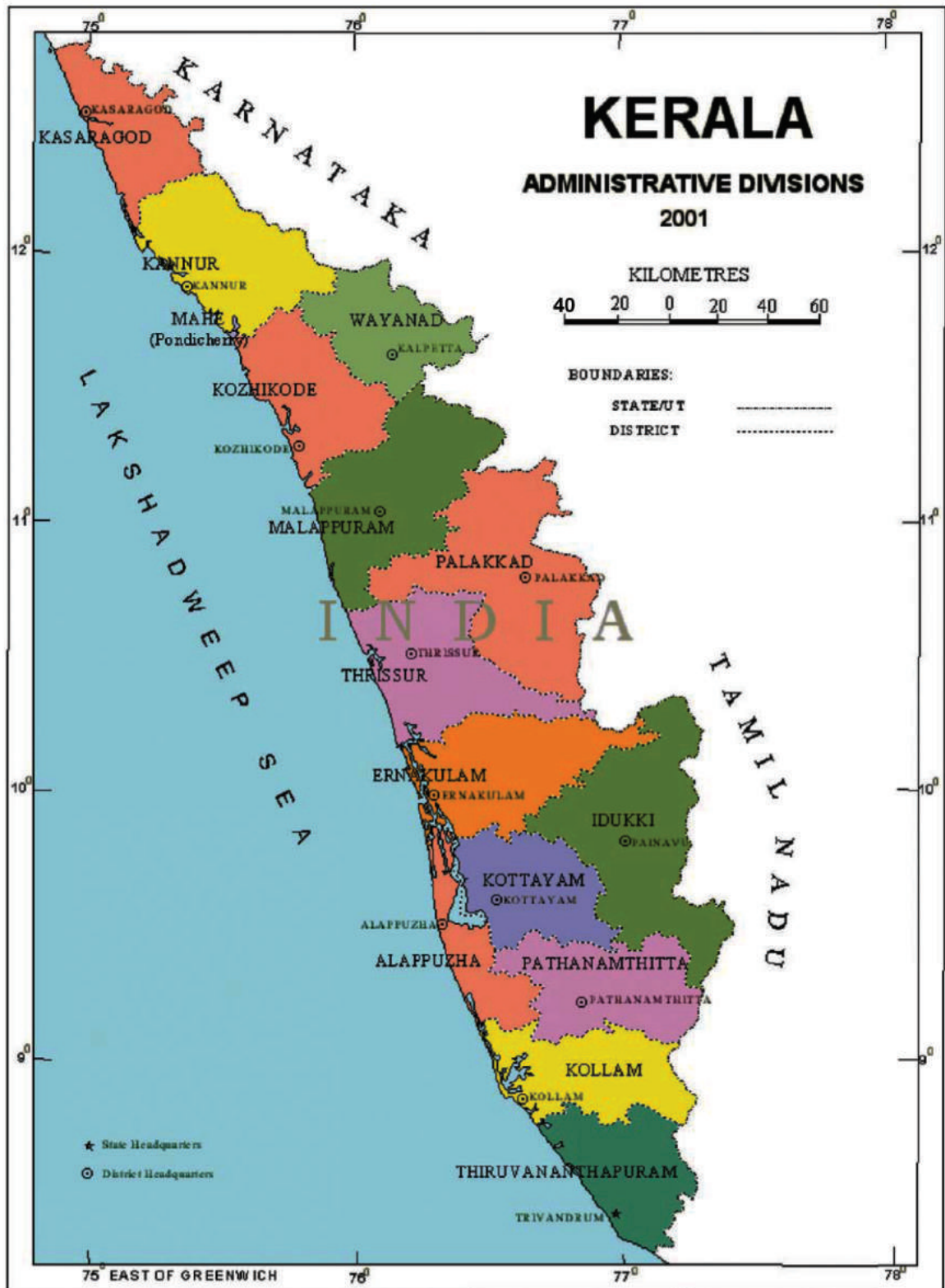
WATER RESOURCES

River	Chaliyar (Beypore)
	Kadalundi
	Tirur
	Bharathapuzha
Back Waters	Puthupponnani
	Ponnani Kayal
	Poorappuzha
	Kadalundi Kayal

Table: 1.14

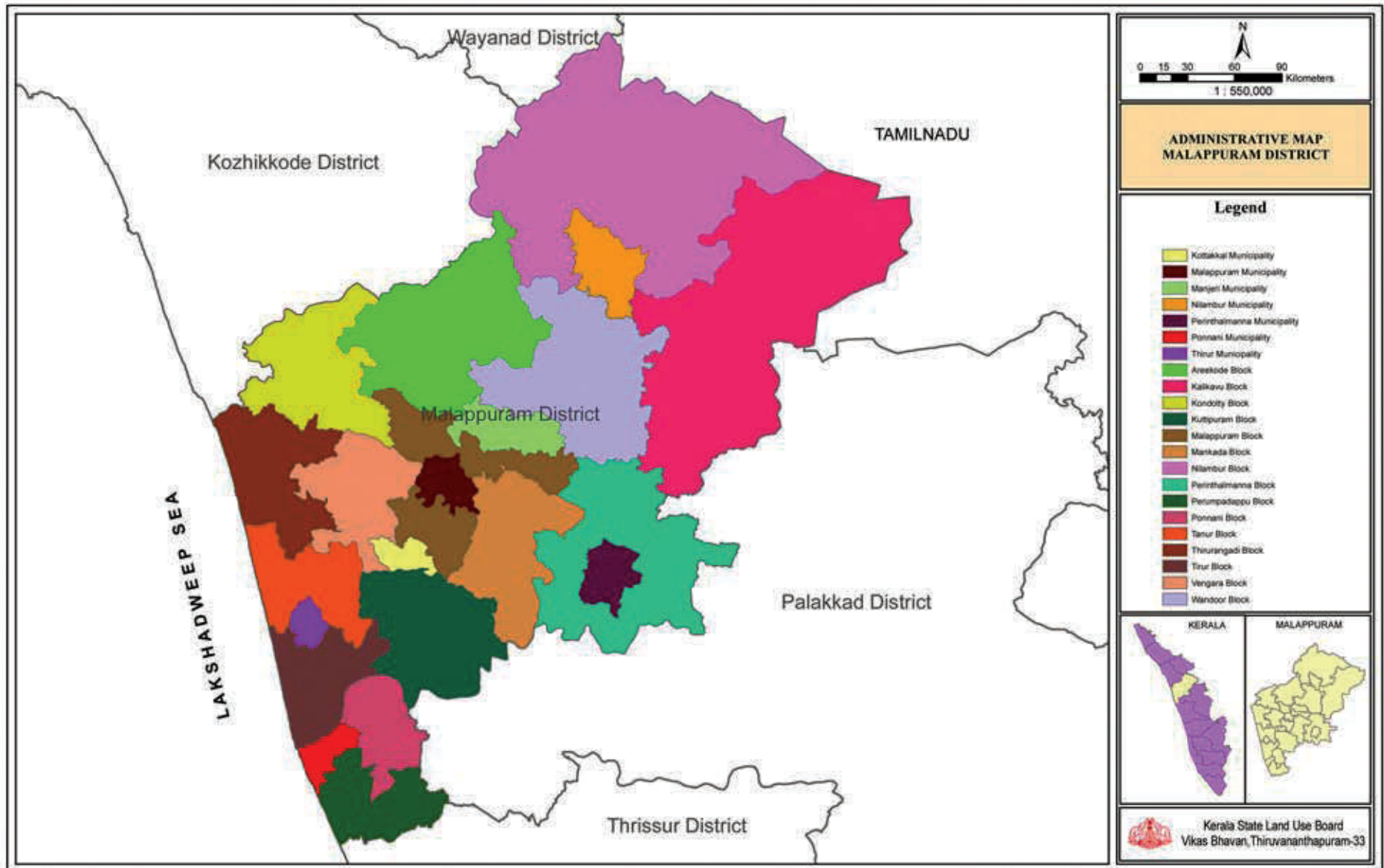
MAJOR TOURIST SPOTS

Sl.No.	Tourist Centre	Focus
1	Kadalundi	Bird sanctuary
2	Padinjarekara	Beach
3	Kodikuthimala	Hill top
4	Valamthode	
5	Adyanpara	Water fall
6	Nilambur	Teak Museum
7	Kottakunnu	Old Fort
8	Biyyam Kayal	Water sport
9	Manjeri	Legendary place
10	Tirur	
11	Tanur	
12	Tirurangadi	



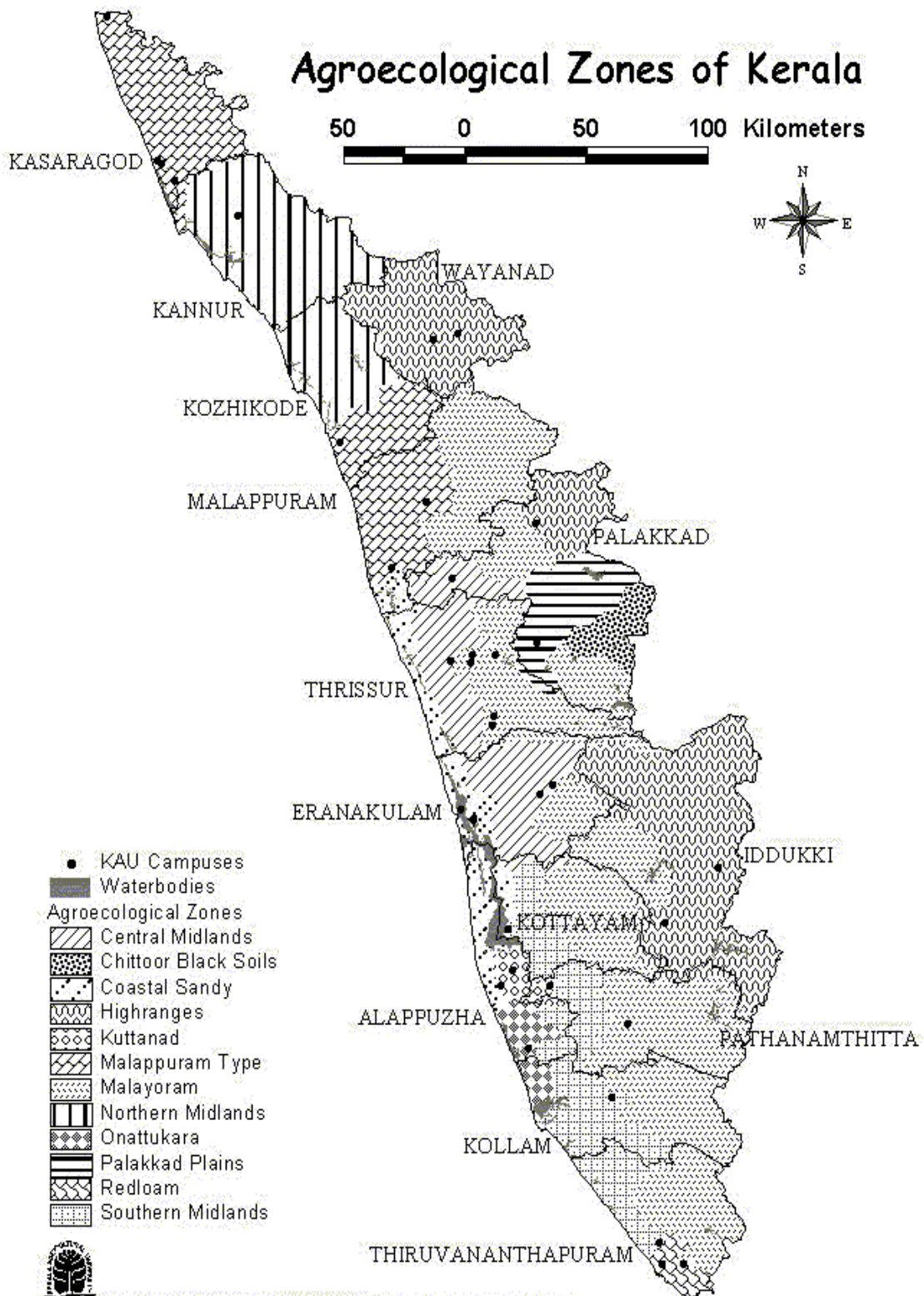
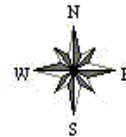
Based upon Survey of India map with the permission of the Surveyor General of India.
The territorial waters of India extend into the sea to a distance of twelve nautical miles
measured from the appropriate base line.

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Agroecological Zones of Kerala

50 0 50 100 Kilometers

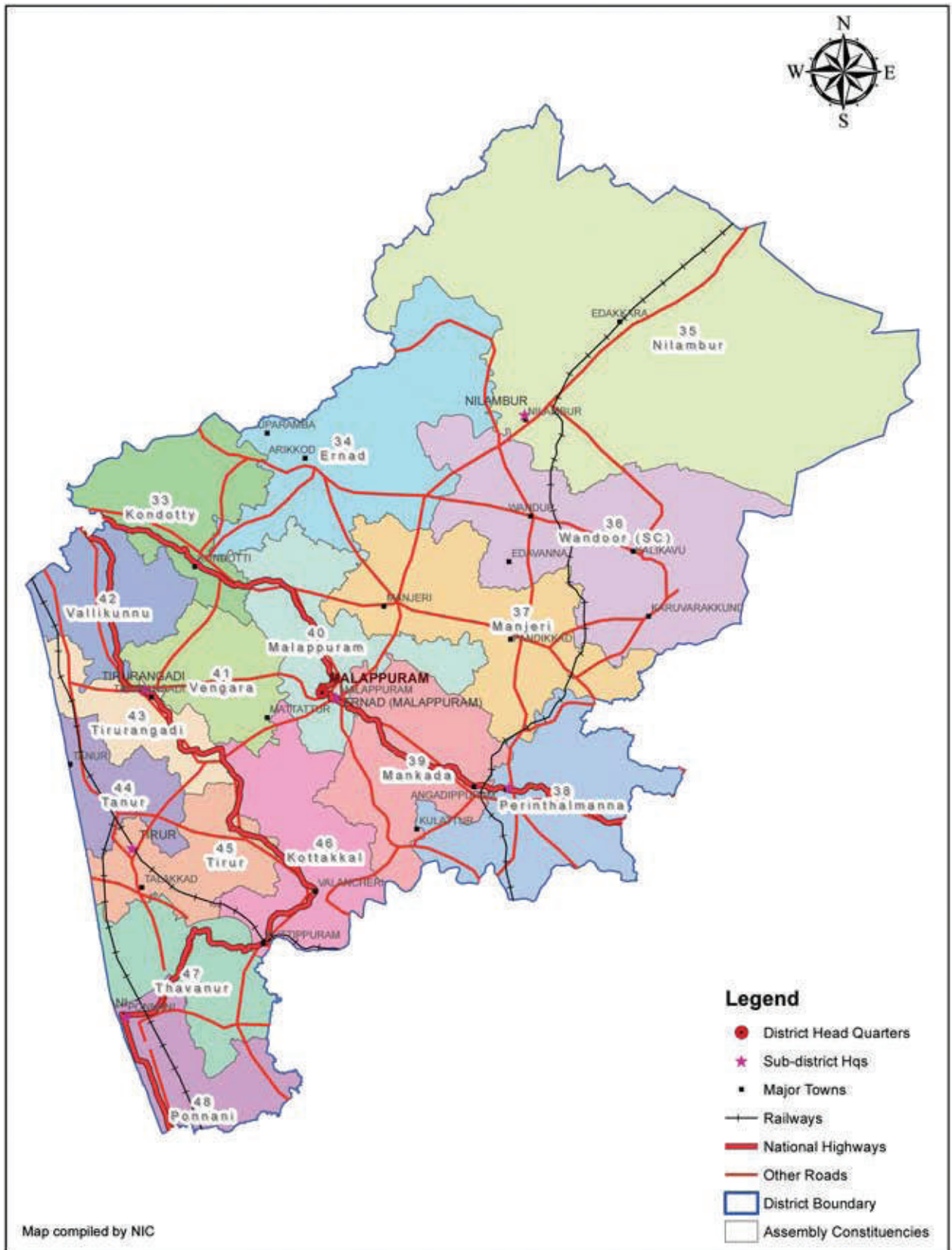


CARTOGRAPHY, GIS PROCESSING AND PRODUCTION AT THE
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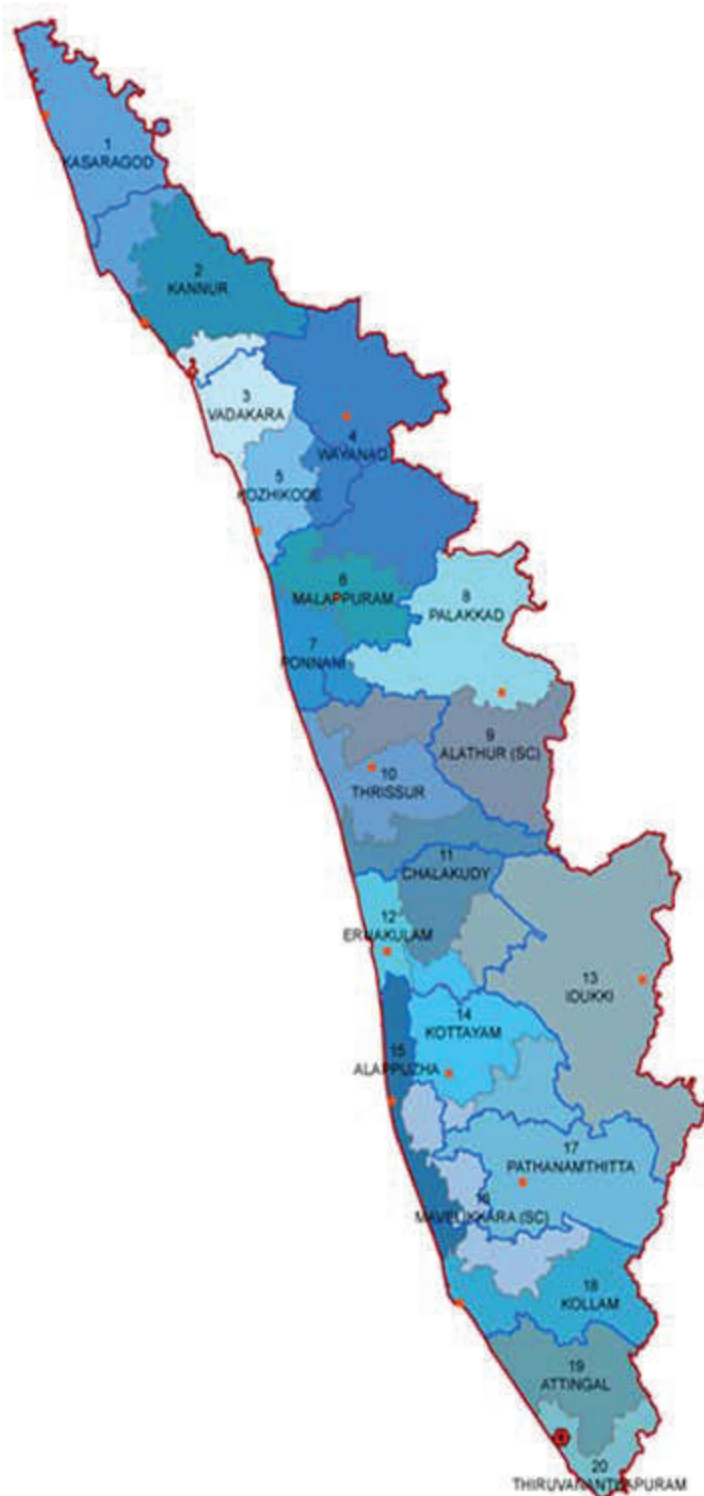
Assembly Constituencies-Post delimitation

State : Kerala

District : Malappuram



Parliamentary Constituencies Kerala



Legend

- State Head Quarter
- District Head Quarters
- State Boundary
- District Boundary

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
Age structure	
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

Table: 4.2

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 (%)	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	174.56
Urban population (lakhs)	78.80	82.67	159.32
Increase of population (%)	13.88	9.43	4.86
Life Expectancy (Years)	68	71	74
Infant Mortality (per 1000)	22	16	12
Birth Rate (per 1000)	19.8	18.3	14.7

Source: Census Report 2011

Table: 4.3

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		
		Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
1	2	3	4	5	6	7	8	9	10	11
INDIA	31,66,28	1,21,01,93,422	62,37,24,248	58,64,69,174	15,87,89,287	8,29,52,135	7,58,37,152	77,84,54,120	444,203,762	334,250,358
KERALA	38,863	3,33,87,677	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
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
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
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
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
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
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
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
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
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
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
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
Pathanam thitta	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
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
Thiruvanan thapuram	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

Table: 4.3 continued.....

India/State/ District	Literacy rate (in Percentage)			Percentage decadal growth rate of population	Sex Ratio (Number of Females per 1000 Males)	Sex Ratio 0-6 population
	Persons	Males	Females	2001-11	2011	2011
1	12	13	14	15	16	17
INDIA	74.04	82.14	65.46	17.64	940	914
KERALA	93.91	96.02	91.98	4.86	1084	959
Kasaragod	89.95	93.93	86.13	8.18	1079	960
Kannur	95.41	97.54	93.57	4.84	1133	962
Wayanad	89.32	92.84	85.94	4.6	1035	960
Kozhikode	95.24	97.57	93.16	7.31	1097	963
Malappuram	93.55	95.78	91.55	13.39	1096	960
Palakkad	88.49	92.27	84.99	7.39	1067	962
Thrissur	95.32	96.98	93.85	4.58	1109	948
Ernakulam	95.68	97.14	94.27	5.6	1028	954
Idukki	92.2	94.84	89.59	1.93	1006	958
Kottayam	96.4	97.14	95.67	1.32	1040	957
Alappuzha	96.26	97.9	94.8	0.61	1100	947
Pathanam thitta	96.93	97.7	96.26	3.12	1129	964
Kollam	93.77	95.83	91.95	1.72	1113	960
Thiruvanan thapuram	92.66	94.6	90.89	2.25	1088	967

Source : Census Report 2011

Table: 4.4

POPULATION - 2011 CENSUS

Sl. No.	Category		Malappuram			Kerala		
			Total	Male	Female	Total	Male	Female
1	Total Population	Total	4112920	1960328	2152592	33406061	16027412	17378649
		Rural	2295709	1095308	1200401	17471135	8408054	9063081
		Urban	1817211	865020	952191	15934926	7619358	8315568
2	Population in the age group 0-6 Years	Total	574041	292132	281909	3472955	1768244	1704711
		Rural	320051	162918	157133	1823664	927888	895776
		Urban	253990	129214	124776	1649291	840356	808935
3	Scheduled Caste Population	Total	308266	151557	156709	3039573	1477808	1561765
		Rural	192270	94367	97903	1818281	883819	934462
		Urban	115996	57190	58806	1221292	593989	627303
4	Scheduled Tribe Population	Total	22990	11272	11718	484839	238203	246636
		Rural	18247	8927	9320	433092	213208	219884
		Urban	18247	2345	2398	51747	24995	26752
5	Literates	Total	3311315	1597404	1713911	28135824	13704903	14430921
		Rural	1838508	888731	949777	14549320	7132430	7416890
		Urban	1472807	708673	764134	13586504	6572473	7014031
6	Illiterates	Total	801605	362924	438681	5270237	2322509	2947728
		Rural	457201	206577	250624	2921815	1275624	1646191
		Urban	344404	156347	188057	2348422	1046885	1301537

Table: 4.4 Continued.....

7	Total Workers	Total	1062424	898157	164267	11619063	8451569	3167494
		Rural	613162	509684	103478	6341957	4507501	1834456
		Urban	449262	388473	60789	5277106	3944068	1333038
	Main Workers							
8	Workers	Total	852047	748431	103616	9329747	7179828	2149919
		Rural	483419	420379	63040	4930191	3743078	1187113
		Urban	368628	328052	40576	4399556	3436750	962806
9	Cultivators	Total	45710	42693	3017	544932	465546	79386
		Rural	34086	31482	2604	481651	410532	71119
		Urban	11624	11211	413	63281	55014	8267
10	Agricultural Labourers	Total	81841	69919	11922	919136	629092	290044
		Rural	61030	50975	10055	760632	510300	250332
		Urban	20811	18944	1867	158504	118792	39712
11	House hold Industry Workers	Total	13450	11295	2155	198281	132111	66170
		Rural	8206	6811	1395	104642	68889	35753
		Urban	5244	4484	760	93639	63222	30417
12	Other Workers	Total	711046	624524	86522	7667398	5953079	1714319
		Rural	380097	331111	48986	3583266	2753357	829909
		Urban	330949	293413	37536	4084132	3199722	884410

Table: 4.4 Continued.....

	Marginal Workers							
13	Workers	Total	210377	149726	60651	2289316	1271741	1017575
		Rural	129743	89305	40438	1411766	764423	647343
		Urban	80634	60421	20213	877550	507318	370232
14	Cultivators	Total	11857	8829	3028	125321	81360	43961
		Rural	9449	6878	2571	105378	68349	37029
		Urban	2408	1951	457	19943	13011	6932
15	Agricultural Labourers	Total	35564	26232	9332	403714	228903	174811
		Rural	26553	19163	7390	322371	179994	142377
		Urban	9011	7069	1942	81343	48909	32434
16	Household Industry Workers	Total	4973	3392	1581	74741	32504	42237
		Rural	3460	2287	1173	46285	20508	25777
		Urban	1513	1105	408	28456	11996	16460
17	Other Workers	Total	157983	111273	46710	1685540	928974	756566
		Rural	90281	60977	29304	937732	495572	442160
		Urban	67702	50296	17406	747808	433402	314406
18	Non Workers	Total	3050496	1062171	1988325	21786998	7575843	14211155
		Rural	1682547	585624	1096923	11129178	3900553	7228625
		Urban	1367949	476547	891402	10657820	3675290	6982530

Source: Panchayat Statistics, 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 0-6			Literacy Rate			Sex ratio of total population	Sex ratio of child population in the age- group 0-6	Percent age share of urban population
		Persons	Males [#]	Females		Persons	Males [#]	Females	Persons	Males [#]	Females			
1	2	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	
KERALA	T	3,33,87,677	1,60,21,290	1,73,66,387	4.88	9.95	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	92.92	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	84.61	1059	964	
	U	5,05,176	2,39,293	2,65,883	116.16	12.07	13.03	11.21	91.67	95.27	88.49	1111	956	
Kannur District	T	25,25,637	11,84,012	13,41,625	4.84	10.50	11.42	9.70	95.41	97.54	93.57	1133	962	65.05
	R	8,62,745	4,26,243	4,36,502	-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	9.80	96.23	98.12	94.64	1168	965	
Wayanad District	T	8,16,558	4,01,314	4,15,244	4.60	10.99	11.41	10.58	89.32	92.84	85.94	1035	960	3.87
	R	7,84,981	3,85,922	3,99,059	4.52	10.99	11.40	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	94.58	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	10,14,765	4,85,654	5,29,111	-42.93	10.91	11.63	10.25	94.79	97.42	92.41	1089	961	
	U	20,74,778	9,87,374	10,87,404	88.42	10.26	10.97	9.61	95.47	97.64	93.52	1101	964	
Malappuram District	T	41,10,956	19,61,014	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	11,99,008	-29.82	13.40	14.31	12.56	92.57	94.97	90.61	1095	961	
	U	18,16,483	8,65,549	9,50,934	410.00	13.51	14.47	12.64	94.66	96.81	92.74	1099	959	
Palakkad District	T	28,10,892	13,60,067	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	68.07
	R	10,47,296	5,18,040	5,29,256	-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	1005	958	4.70
	R	10,55,428	5,28,420	5,27,008	-1.51	9.02	9.24	8.80	92.03	94.73	89.34	1005	957	
	U	52,025	23,524	28,501	-9.67	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	4,62,571	5,12,345	-34.47	9.08	9.82	8.42	96.72	98.24	95.38	1108	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	4,89,745	5,74,331	-4.16	7.65	8.29	7.08	96.87	97.54	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	26,29,703	12,44,815	13,84,888	1.72	9.05	9.76	8.42	93.77	95.83	91.95	1113	960	45.11
	R	14,43,363	6,78,969	7,64,394	-31.89	9.02	9.78	8.35	94.10	96.15	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	92.66	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				
No. of Districts	2001		2011	
	14	14	14	14
No. of Sub-Districts (Talukas)	63		63	
	25.96		47.72	
No. of Towns	159		520	
	1,364		1,058	

NUMBER OF TOWNS AND URBAN POPULATION IN KERALA		
Census Year	No. of towns	Urban population
1901	21	4,54,499
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 *

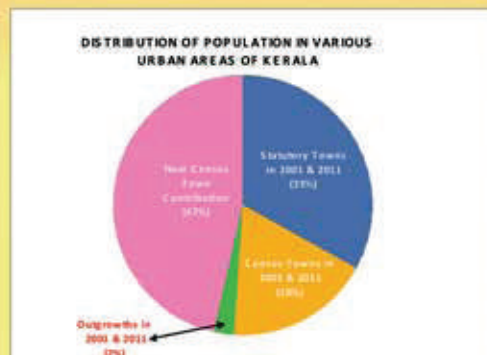
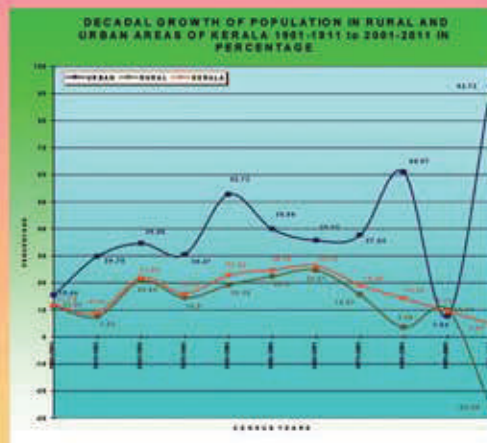
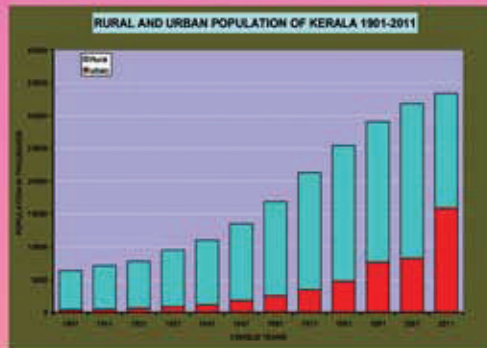
Urban Agglomeration (UA): It is a continuous urban spread constituting a town and its adjoining urban outgrowths (OGs) or two or more physically contiguous towns together and any adjoining urban out-growths of such towns.

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 21st century and 7th Census after Independence. The provisional results of 2011 show that Population of Kerala as on 1st 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

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METEOROLOGY

Meteorology is the interdisciplinary scientific study of the atmosphere. Meteorology, climatology, atmospheric physics and atmospheric chemistry are sub-disciplines of the atmospheric sciences. Meteorology and hydrology compose the interdisciplinary field of hydrometeorology. Interactions between Earth's atmosphere and the oceans are part of coupled ocean-atmosphere studies. Weather information and forecasts are of vital importance to many activities like agriculture, aviation, shipping, fisheries, tourism, defense, industrial projects, water management and disaster mitigation. Kerala's climate condition is divided into four seasons viz Winter, Summer, South-West monsoon and North-East monsoon.

Malappuram district has more or less similar climatic conditions prevalent elsewhere in Kerala. District is consisting of South-West monsoon from June to September, North-East monsoon from October to November, hot season from March to May and cold season from December to February. Temperature decreases by the end of May and district gets benefit of rainfall during South-West and North-East monsoon seasons. Major rainfall contribution is from South-West monsoon followed by North-East monsoon. Normal rainfall of the district is 2793.3 m.m. April is the hottest month and rainfall is heavy particularly in the month of June and July. Climate is generally hot and humid. Range of temperature varies from 20⁰c to 39⁰c. Maximum temperature ranges from 28.9⁰c to 36⁰c and minimum temperature ranges from 23⁰c to 17⁰c. Temperature starts rising from January and reaches the peak in the month of March, April then decreases during the monsoon month and again rising from September onwards.

Table: 5.1

**ACTUAL RAINFALL, NORMAL RAINFALL AND PERCENTAGE OF DEPARTURE
FOR THE YEAR 2013**

Pre-Monsoon Rainfall (March to May)			
District/State	Actual Rainfall (mm)	Normal Rainfall (mm)	Percentage departure
Malappuram	141.5	320.6	-56
Kerala	218.9	379.7	-42

South West Monsoon Rainfall (June to September)			
District/State	Actual Rainfall (mm)	Normal Rainfall (mm)	Percentage departure
Malappuram	2676.5	2060.7	30
Kerala	2570.3	2039.6	26

North East Monsoon Rainfall (October to till 18th December 2013)			
District/State	Actual Rainfall (mm)	Normal Rainfall (mm)	Percentage departure
Malappuram	387.9	446	-13
Kerala	430.7	473	-9

Source: Economic Review 2013

Table: 5.2

RAINFALL DISTRIBUTION OF DISTRICT FOR THE YEAR 2012-13**(Rainfall in mm)**

2012						
District/State	JUL	AUG	SEP	OCT	NOV	DEC
Malappuram	420.3	440.3	203.0	142.0	70.8	8.3
Kerala (Average)	362.5	504.1	239.9	188.1	114.4	9.7

2013						
District/State	JAN	FEB	MAR	APR	MAY	JUN
Malappuram	0.0	7.7	28.2	28.2	104.8	1066.7
Kerala (Average)	3.7	39.1	50	50.2	118.6	1041.1

2012-13			
District/State	Actual	Normal	Departure (%)
Malappuram	2520.3	2835.1	-11.1
Kerala (Average)	2706.4	2936.7	-7.84

Source: Agricultural Statistics, DES

GEOLOGY & GEOMORPHOLOGY

Malappuram district forms a part of Malabar region of Kerala, which is predominantly a land of hills and valleys. It extends from the west coast upto the Tamil Nadu State boundary in the east with a maximum width of about 80 km along E-W. The terrain has a gentle westerly slope from the Western Ghats to the Arabian Sea coast. The district has an area of 3550 sq.km. It is bounded by Kozhikode district in the north, Nilgiri district in the east, Palakkad and Thrissur districts in the south and Lakshadweep Sea in the west.

GEOLOGY

From the exposure pattern of the rock types, the district can be divided into two geological belts: i) charnockite Group of rocks covering a major part and ii) Migmatite Complex towards the east. Wynad Group is represented by small bodies of meta-ultramafites (talc-tremolite schist, talc-pyroxene-garnet schist, banded magnetite quartzite) and high-grade schist and gneiss (hornblende-biotite schist and gneiss $\pm$ garnet with amphibolites band) which extends into Tamil Nadu where it is known as Satyamangalam Group. The rocks of Peninsular Gneissic Complex, represented by granite-gneiss and hornblende-biotite gneiss, form the next younger sequence. They have a very limited distribution near the eastern boundary, extending into the adjacent district where they are known as Bhavani Group. A linear band of granite gneiss NE of Perinthalmanna and a large body of hornblende-biotite gneiss east of Manjeri are the prominent units. Charnockite Group includes charnockite/charnockite gneiss, having the largest areal distribution, followed in decreasing order of abundance by banded magnetite quartzite, pyroxene granulite, amphibolites/hornblende granulite and pyroxenite, which occur as concordant as well as discordant bands, lenses, layers and enclaves both within gneisses of Migmatite Complex. The Migmatite Complex is represented by biotite-hornblende gneiss (hornblende-

biotite gneiss) and quartzofeldspathic gneiss/garnet-biotite gneiss with enclaves of garnet-sillimanite gneiss $\pm$ graphite distributed mostly in the central and northeastern part. Pegmatite and quartz veins constitute the acid intrusive, whereas gabbro and dolerite are the basic intrusives. Near the coast, isolated cappings of Neogene Warkalli sediments comprising grit and clay beds are noticed. Lateritisation is widespread, at places attaining a thickness of more than 10m. Extensive plateaus with laterite 'mesas' are common in the area. Angadipuram (west of Perinthalmanna) the type locality of laterite falls in this district. Quarternary unconsolidated sediments are restricted to the coastal plain. They have been classified into various morphostratigraphic units as Guruvayur Formation (palaeomarine), Periyar Formation (fluvial), Viyyam Formation (fluviomarine) and Kadappuram Formation (marine).

GEOMORPHOLOGY

Malappuram district is also broadly divisible into three physiographic units from west to east as: i) the coastal plain ii) the mid-land region and iii) the high hilly terrain. The coastal plain is 5-10 km wide with a maximum elevation of about 10m towards east. It exhibits depositional landforms of marine, fluvial and fluviomarine origin. Palaeobeach ridges suggestive of marine regression in the Quarternary period are well developed in the coastal tract. The midland region is relatively wide with elevations ranging between 200 m and 300 m. It is a denudational terrain characterized by flat-topped laterite-capped flats, mesas, interfluves, hills, mounds and spurs interspersed by narrow valleys as well as wide alluvial valleys and flood plain. Geomorphological studies in this region have brought out remnants of four palaeo-planation surfaces around 550 m, 350-400 m, 150-230 m and 45-130 m above msl. Of these, the first two surfaces only have accordance of summits with relicts of laterite, whereas the latter two have extensive and plateau-type remnants with thick laterite profile. The hilly region in the east is more than 600 m high. The terrain is characterized by hills and narrow

incised valleys representing structural cum denudational landforms. Some of the highest peaks along the eastern border are ·2554 Makarti peak, ·2476 Nilgiri peak and ·2383 Anginda hill Chaliyar puzha is the major river draining the northern part; Kadalundi puzha drains the central part, while the lower reaches of Ponnani river drain the coastal tract in the south.

GEOLOGY DETAILS

Table: 6.1

AREEKOD BLOCK

(Area in Ha)

[illegible]

Table: 6.2

KALIKAVU BLOCK

(Area in Ha)

[illegible]

Table: 6.3

KONDOTTY BLOCK

(Area in Ha)

[illegible]

Table: 6.4

KUTTIPPURAM BLOCK

(Area in Ha)

[illegible]

Table: 6.5

MALAPPURAM BLOCK

(Area in Ha)

Sl. No.	Rock Type	Anakkayam	Kodur	Morayur	Othukkungal	Ponmala	Pookkottur
1	Basic Rocks	52.99		81.36			81.36
2	Charnockite Group of Rocks	3800.16	1899.17	2331.79	1320.42	1836.23	2049.07
3	High Grade Metasedimentary Rocks						
4	Laterite						
5	Metabasic and Ultra Basic Rocks						
6	Migmatite Complex	730.34	89.47				
7	Pegmatite/Aplite/Quartz Vein						
8	Peninsular Gneissic Complex						
9	Sand and Silt				13.5	328.33	
10	Sandstone and Clay with Lignite Interc						
	Panchayat Total	4583.49	1988.64	2413.15	1333.92	2164.56	2130.43
	Block Total	14614.19					

Table: 6.6

MANKADA BLOCK**(Area in Ha)**

Sl. No.	Rock Type	Kuttilangadi	Kuruva	Mankada	Moorkkanadu	Makkarapparambu	Puzhakkattiri
1	Basic Rocks	147.34		74.68	14.82	91.07	74.88
2	Charnockite Group of Rocks	2298.50	2804.38	2306.68	3255.74	1344	1587.36
3	High Grade Metasedimentary Rocks						
4	Laterite						
5	Metabasic and Ultra Basic Rocks						
6	Migmatite Complex		643.45		250.04	37.6	650.01
7	Pegmatite/Aplite/Quartz Vein						
8	Peninsular Gneissic Complex						
9	Sand and Silt						
10	Sandstone and Clay with Lignite Interc						
	Panchayat Total	2445.84	3447.83	2381.36	3520.60	1472.67	2312.25
	Block Total	15580.55					

Table: 6.7

NILAMBUR BLOCK

(Area in Ha)

Sl. No.	Rock Type	Chaliyar	Chungathara	Edakkara	Muthedam	Pothukallu	Vazhikkadavu
1	Basic Rocks	83.59					
2	Charnockite Group of Rocks	7112.77	7898.94	125.68	1856.57	5636.27	3942.43
3	High Grade Metasedimentary Rocks		55.55		1.05		251.76
4	Laterite	117.51	21.27				467.05
5	Metabasic and Ultra Basic Rocks						72.69
6	Migmatite Complex		48.93			10.48	
7	Pegmatite/Aplite/Quartz Vein			37.85		58.77	
8	Peninsular Gneissic Complex	1080.04	6355.98	3650.15	5287.85	7584.75	9884.52
9	Sand and Silt						
10	Sandstone and Clay with Lignite Interc						
	Panchayat Total	8393.91	14380.67	3813.68	7145.47	13290.27	14618.45
	Block Total	61642.45					

Table: 6.8

PERINTHALMANNA BLOCK

(Area in Ha)

[illegible]

Table: 6.9

PERUMPADAPPU BLOCK**(Area in Ha)**

Sl. No.	Rock Type	Alangode	Marancherry	Nannamukku	Perumpadappu	Veliyancode
1	Basic Rocks					
2	Charnockite Group of Rocks	1086.62	78.11	361.75		
3	High Grade Metasedimentary Rocks					
4	Laterite					
5	Metabasic and Ultra Basic Rocks					
6	Migmatite Complex					
7	Pegmatite/Aplite/Quartz Vein					
8	Peninsular Gneissic Complex					
9	Sand and Silt	1025.23	2201.29	428.66	1285.55	1848.49
10	Sandstone and Clay with Lignite Interc	23.42		931.11	138.13	13.94
	Panchayat Total	2135.27	2279.40	1721.52	1423.68	1862.43
	Block Total	9422.30				

Table: 6.10

PONNANI BLOCK**(Area in Ha)**

Sl. No.	Rock Type	Edappal	Kaladi	Thavanur	Vattomkulam
1	Basic Rocks				
2	Charnockite Group of Rocks	906.63	122.41		1262.90
3	High Grade Metasedimentary Rocks				
4	Laterite				
5	Metabasic and Ultra Basic Rocks				
6	Migmatite Complex				
7	Pegmatite/Aplite/Quartz Vein				
8	Peninsular Gneissic Complex				
9	Sand and Silt	754.86	1431.36	2500.29	954.03
10	Sandstone and Clay with Lignite Interc				
	Panchayat Total	1661.49	1553.77	2500.29	2216.93
	Block Total	7932.48			

Table: 6.11

TANUR BLOCK

(Area in Ha)

[illegible]

Table: 6.12

TIRURANGADI BLOCK

(Area in Ha)

[illegible]

Table: 6.13

TIRUR BLOCK**(Area in Ha)**

Sl. No.	Rock Type	Mangalam	Purathur	Thalakkad	Thirunavaya	Thriprangode	Vettom
1	Basic Rocks						
2	Charnockite Group of Rocks			18.14	767.83		
3	High Grade Metasedimentary Rocks						
4	Laterite						
5	Metabasic and Ultra Basic Rocks						
6	Migmatite Complex						
7	Pegmatite/Aplite/Quartz Vein						
8	Peninsular Gneissic Complex						
9	Sand and Silt	1240.86	1908.28	1607.72	1210.64	1987.09	1645.66
10	Sandstone and Clay with Lignite Interc						
	Panchayat Total	1240.86	1908.28	1625.86	1978.47	1987.09	1645.66
	Block Total	10386.22					

Table: 6.14

VENGARA BLOCK

(Area in Ha)

[illegible]

Table: 6.15

WANDOOR BLOCK

(Area in Ha)

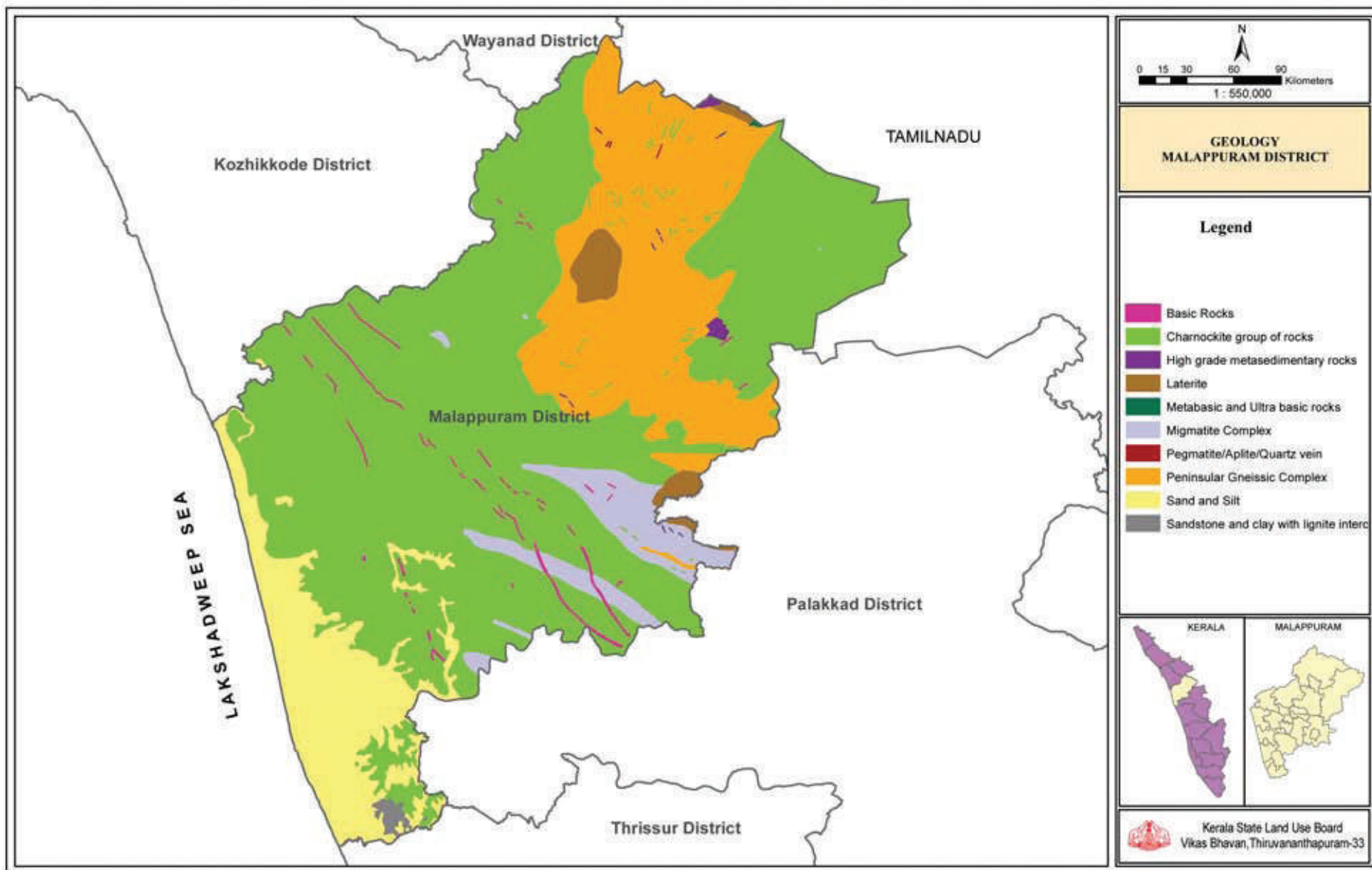
Sl. No.	Rock Type	Mambad	Pandikkad	Porur	Thiruvali	Thrikkalangode	Wandoor
1	Basic Rocks						
2	Charnockite Group of Rocks	1238.31	5114.19	55.98	59.26	4408.13	
3	High Grade Metasedimentary Rocks			20.19		20.36	
4	Laterite	175.18					
5	Metabasic and Ultra Basic Rocks						
6	Migmatite Complex						
7	Pegmatite/Aplite/Quartz Vein						
8	Peninsular Gneissic Complex	2826.63	639.19	3281.03	3169.49	1616.55	3327.22
9	Sand and Silt						
10	Sandstone and Clay with Lignite Interc						
	Panchayat Total	4240.12	5753.38	3357.20	3228.75	6045.04	3327.22
	Block Total	25951.71					

Table: 6.16

MUNICIPALITY

(Area in Ha)

Sl. No.	Rock Type	Malappuram Municipality	Manjeri Municipality	Perinthalmanna Municipality	Ponnani Municipality	Tirur Municipality	Kottakkal Municipality	Nilambur Municipality
1	Basic Rocks	45.16	5.43	269.85			45.50	
2	Charnockite Group of Rocks	3248.2	5249.04	2564.14		142.41	1544.44	114.58
3	High Grade Metasedimentary Rocks							
4	Laterite							3338.76
5	Metabasic and Ultra basic Rocks							
6	Migmatite Complex			948.58				
7	Pegmatite/Aplite/Quartz vein							
8	Peninsular Gneissic Complex							2907.54
9	Sand and Silt				2530.57	1534.82	477.68	
10	Sandstone and Clay with lignite interc							
	Municipality Total	3293.36	5254.47	3782.57	2530.57	1677.23	2067.62	6360.88



AREEKOD BLOCK

(Area in Ha)

[illegible]

Table: 6.18

KALIKAVU BLOCK

(Area in Ha)

[illegible]

Table: 6.19

KONDOTTY BLOCK

(Area in Ha)

[illegible]

Table: 6.20

KUTTIPPURAM BLOCK

(Area in Ha)

[illegible]

Table: 6.21

MALAPPURAM BLOCK

(Area in Ha)

Sl. No.	Rock Type	Anakkayam	Kodur	Morayur	Othukkungal	Ponmala	Pookkottur
1	Beach (Coastal Plain)						
2	Butte						
3	Channel bar (Flood Plain)						
4	Coastal Plain						
5	Denudational Hills						
6	Denudational Structural Hills						
7	Linear ridge (Lower Plateau)	88.5				24.85	
8	Linear ridge (Piedmont Zone)						
9	Lower Plateau (Lateritic) - Dissected	1819.05	1575.40	1574.61	1114.76	1582.92	1678.87
10	Marshy						
11	Mesa				52.23	147.50	
12	Mud Flat (Coastal Plain)						
13	Piedmont Zone	1533.1		94.04			22.70
14	Point Bar (Flood Plain)	7.28					
15	Residual Hill	90.59					
16	Residual Mount	57.6	165.43	149.28		74.18	141.63
17	Residual Mount (Pediment)	82.91					
18	Rock Exposure	8.19		4.08		2.71	
19	Spit (Coastal Plain)						
20	Structural Hills	458.9		314.85			39.98
21	Stabilized channel bar (Flood plain)						
22	Swale (Coastal Plain)						
23	Valley						
24	Valley Fill	327.26	205.37	276.3	120.19	329.25	247.24
25	Waterbody	110.11	42.44		46.74	3.14	
	Panchayat Total	4583.49	1988.64	2413.16	1333.92	2164.55	2130.42
	Block Total	14614.18					

Table: 6.22

MANKADA BLOCK

(Area in Ha)

Sl. No.	Rock Type	Kuttilangadi	Kuruva	Mankada	Moorkkanadu	Makkarapparambu	Puzhakkattiri
1	Beach (Coastal Plain)						
2	Butte						
3	Channel bar (Flood Plain)						
4	Coastal Plain						
5	Denudational Hills						
6	Denudational Structural Hills						
7	Linear ridge (Lower Plateau)		25.11				
8	Linear ridge (Piedmont Zone)						
9	Lower Plateau (Lateritic) - Dissected	1652.24	2587.52	366.41	3022.02	1111.78	1813.95
10	Marshy						
11	Mesa		30.03		92.83		39.14
12	Mud Flat (Coastal Plain)						
13	Piedmont Zone	221.64		967.90		30.71	
14	Point Bar (Flood Plain)				9.56		
15	Residual Hill						
16	Residual Mount	80.97	264.36	27.12	51.17	88.43	99.19
17	Residual Mount (Pediment)	23.08					
18	Rock Exposure	0.12				11.63	
19	Spit (Coastal Plain)						
20	Structural Hills	35.17		823.13			
21	Stabilized channel bar (Flood plain)						
22	Swale (Coastal Plain)						
23	Valley						
24	Valley Fill	367.51	538.96	196.80	333.12	230.13	359.97
25	Waterbody	65.1	1.85		11.89		
	Panchayat Total	2445.83	3447.83	2381.36	3520.59	1472.68	2312.25
	Block Total	15580.54					

Table: 6.23

NILAMBUR BLOCK**(Area in Ha)**

Sl. No.	Rock Type	Chaliyar	Chungathara	Edakkara	Muthedam	Pothukallu	Vazhikkadavu
1	Beach (Coastal Plain)						
2	Butte						
3	Channel bar (Flood Plain)				79.85	5.02	1.91
4	Coastal Plain						
5	Denudational Hills						
6	Denudational Structural Hills	6185.02	7430.55	465.62		10565.94	9616.30
7	Linear ridge (Lower Plateau)						
8	Linear ridge (Piedmont Zone)					29.18	
9	Lower Plateau (Lateritic) - Dissected		2211.21	718.29	3439.29	63.7	15.54
10	Marshy						
11	Mesa						
12	Mud Flat (Coastal Plain)						
13	Piedmont Zone	2016.62	3284.18	1754.57	1834.43	2032.89	3283.28
14	Point Bar (Flood Plain)	1.02					3.43
15	Residual Hill			152.26		6.42	143.22
16	Residual Mount		215.54		274.78		30.90
17	Residual Mount (Pediment)	39.88	51.47	14.99	16.21	17.94	
18	Rock Exposure	117.91	257.03			131.6	
19	Spit (Coastal Plain)						
20	Structural Hills						
21	Stabilized channel bar (Flood plain)						
22	Swale (Coastal Plain)						
23	Valley						
24	Valley Fill		710.39	683.38	1285.33	282.86	1425.64
25	Waterbody	33.46	220.3	24.56	215.58	154.72	98.23
	Panchayat Total	8393.91	14380.67	3813.67	7145.47	13290.27	14618.45
	Block Total	61642.44					

Table: 6.24

PERINTHALMANNA BLOCK

(Area in Ha)

[illegible]

Table: 6.25

PERUMPADAPPU BLOCK**(Area in Ha)**

Sl. No.	Rock Type	Alangode	Marancherry	Nannamukku	Perumpadappu	Veliyancode
1	Beach (Coastal Plain)					
2	Butte					
3	Channel bar (Flood Plain)		39.07		0.79	2.17
4	Coastal Plain	0.62	1217.17	466.88	789.62	1213.63
5	Denudational Hills					
6	Denudational Structural Hills					
7	Linear ridge (Lower Plateau)					
8	Linear ridge (Piedmont Zone)					
9	Lower Plateau (Lateritic) - Dissected	1281.2		515.75	114.33	
10	Marshy					
11	Mesa					
12	Mud Flat (Coastal Plain)	119.59	436.52	376.80	82.83	105.24
13	Piedmont Zone					
14	Point Bar (Flood Plain)					
15	Residual Hill					
16	Residual Mount					
17	Residual Mount (Pediment)					
18	Rock Exposure					
19	Spit (Coastal Plain)					
20	Structural Hills					
21	Stabilized channel bar (Flood plain)					
22	Swale (Coastal Plain)		22.71		71.76	193.24
23	Valley					
24	Valley Fill	733.87		326.62	166.21	
25	Waterbody		563.92	35.47	198.14	348.15
	Panchayat Total	2135.28	2279.39	1721.52	1423.68	1862.43
	Block Total	9422.30				

Table: 6.26

PONNANI BLOCK**(Area in Ha)**

Sl. No.	Rock Type	Edappal	Kaladi	Thavanur	Vattomkulam
1	Beach (Coastal Plain)				
2	Butte				
3	Channel bar (Flood Plain)		2.92	4.57	
4	Coastal Plain	934.66	364.62	719.6	52.15
5	Denudational Hills				
6	Denudational Structural Hills				
7	Linear ridge (Lower Plateau)				
8	Linear ridge (Piedmont Zone)				
9	Lower Plateau (Lateritic) - Dissected	14.65	401.21	560.60	1455.01
10	Marshy				
11	Mesa				
12	Mud Flat (Coastal Plain)	578.46	568.58	764.25	128.23
13	Piedmont Zone				
14	Point Bar (Flood Plain)		52.52	270.98	
15	Residual Hill				
16	Residual Mount		14.74		50.67
17	Residual Mount (Pediment)				
18	Rock Exposure				
19	Spit (Coastal Plain)				
20	Structural Hills				
21	Stabilized channel bar (Flood plain)				
22	Swale (Coastal Plain)				
23	Valley				
24	Valley Fill	0.60	125.26	120.64	530.87
25	Waterbody	133.11	23.91	59.65	
	Panchayat Total	1661.48	1553.76	2500.29	2216.93
	Block Total	7932.46			

Table: 6.27

TANUR BLOCK

(Area in Ha)

[illegible]

Table: 6.28

TIRURANGADI BLOCK

(Area in Ha)

[illegible]

Table: 6.29

TIRUR BLOCK

(Area in Ha)

Sl. No.	Rock Type	Mangalam	Purathur	Thalakkad	Thirunavaya	Thriprangode	Vettom
1	Beach (Coastal Plain)	0.02	0.01				0.01
2	Butte						
3	Channel bar (Flood Plain)		87.13		8.69	0.03	
4	Coastal Plain	738.57	881.5	469.37	319.24	908.32	1044.37
5	Denudational Hills						
6	Denudational Structural Hills						
7	Linear ridge (Lower Plateau)						
8	Linear ridge (Piedmont Zone)						
9	Lower Plateau (Lateritic) - Dissected			413.68	889.99		
10	Marshy						
11	Mesa						
12	Mud Flat (Coastal Plain)	439.59	429.58	264.04	164.16	855.89	344.74
13	Piedmont Zone						
14	Point Bar (Flood Plain)		101.68		95.16	179.81	
15	Residual Hill						
16	Residual Mount						
17	Residual Mount (Pediment)						
18	Rock Exposure						
19	Spit (Coastal Plain)		4.98				
20	Structural Hills						
21	Stabilized channel bar (Flood plain)		14.39				
22	Swale (Coastal Plain)			22.99		9.03	177.12
23	Valley						
24	Valley Fill			416.03	472.6	0.09	
25	Waterbody	62.66	389.00	39.76	28.63	33.92	79.41
	Panchayat Total	1240.84	1908.27	1625.87	1978.47	1987.09	1645.65
	Block Total	10386.19					

Table: 6.30

VENGARA BLOCK

(Area in Ha)

[illegible]

Table: 6.31

WANDOOR BLOCK

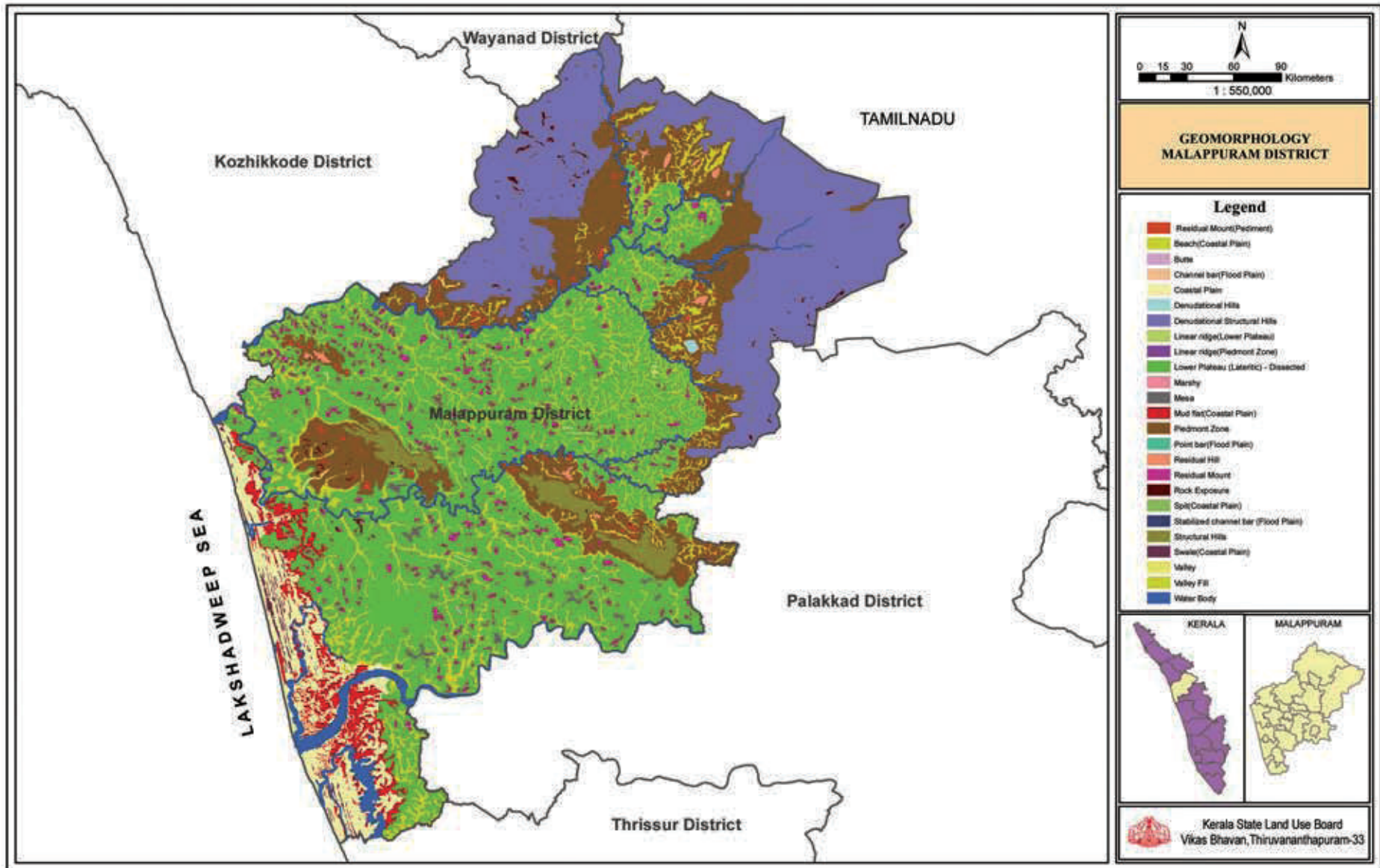
(Area in Ha)

Sl. No.	Rock Type	Mambad	Pandikkad	Porur	Thiruvalli	Thrikkalangode	Wandoor
1	Beach (Coastal Plain)						
2	Butte						
3	Channel bar (Flood Plain)						
4	Coastal Plain						
5	Denudational Hills						
6	Denudational Structural Hills	498.67					
7	Linear ridge (Lower Plateau)		107.87	12.59			14.34
8	Linear ridge (Piedmont Zone)						
9	Lower Plateau (Lateritic) - Dissected	2036.51	4317.06	2572.85	2487.01	4753.24	2165.51
10	Marshy						
11	Mesa						
12	Mud Flat (Coastal Plain)						
13	Piedmont Zone	800.39	0.32				294.78
14	Point Bar (Flood Plain)	45.01					
15	Residual Hill						
16	Residual Mount	49.22	205.92	32.16	91.65	403.47	20.90
17	Residual Mount (Pediment)	38.06					
18	Rock Exposure		1.04	1.14		2.16	
19	Spit (Coastal Plain)						
20	Structural Hills						
21	Stabilized channel bar (Flood plain)						
22	Swale (Coastal Plain)						
23	Valley						0.36
24	Valley Fill	708.81	1082.56	738.47	650.08	886.17	802.41
25	Waterbody	63.44	38.61				28.9
	Panchayat Total	4240.11	5753.38	3357.21	3228.74	6045.04	3327.20
	Block Total	25951.68					

Table: 6.32

MUNICIPALITY

Sl. No.	Rock Type	Malappuram Municipality	Manjeri Municipality	Perinthalmanna Municipality	Ponnani Municipality	Tirur Municipality	Nilambur Municipality	Kottakkal Municipality
1	Beach (Coastal Plain)				0.01			
2	Butte							
3	Channel bar (Flood Plain)				48.75			
4	Coastal Plain				1380.34	1208.55		
5	Denudational Hills							
6	Denudational Structural Hills						118.47	
7	Linear ridge (Lower Plateau)	14.98		47.39				
8	Linear ridge (Piedmont Zone)							
9	Lower Plateau (Lateritic) - Dissected	1786.33	4222.39	2410.76		3.06	2824.16	1709.25
10	Marshy							
11	Mesa			22.17				71.50
12	Mud Flat (Coastal Plain)				690.83	397.78		
13	Piedmont Zone	938.25	0.02	470.46			2095.76	
14	Point Bar (Flood Plain)		1.16		94.79			
15	Residual Hill							
16	Residual Mount	35.05	376.52	191.54			109.66	52.61
17	Residual Mount (Pediment)	9.54					79.98	
18	Rock Exposure		5.30					2.11
19	Spit (Coastal Plain)				2.58			
20	Structural Hills	228.18		233.09				
21	Stabilized channel bar (Flood plain)							
22	Swale (Coastal Plain)				7.17	16.5		
23	Valley							
24	Valley Fill	200.96	639.39	407.16		1.66	942.75	232.15
25	Waterbody	80.07	9.69		306.11	49.67	190.1	
	Municipality Total	3293.36	5254.47	3782.57	2530.58	1677.22	6360.88	2067.62



PHYSIOGRAPHY

Based on physiographic nature, Kerala is divided into three regions namely **highland, midland** and **lowland**. Malappuram district falls under five sub micro regions viz. i) Malappuram coast ii) Malappuram undulating plain iii) Chaliyar river basin iv) Nilambur forested hills v) Perinthalmanna undulating upland. Malappuram coast region falls all along the coastal tract of Malappuram district. This region is drained by the major rivers like Chaliyar, Kadalundi, Ponnani etc. canals and backwaters. This coastal plain slopes towards the west very gently. Maximum height (104 m) is located at Kalpakancherry village of Tirur taluk. Second region Malappuram undulating plain makes its boundaries with Nadapuram-Mavoor undulating plains in the north, the Chaliyar river basin and Perinthalmanna undulating upland in the east, Pattambi undulating plain in the south and Malappuram coast in the west. The Nenmini hill (478 m) at the central part of the region and located at Kannamangalam village of Tirurangadi taluk is the highest spot in the region. Chaliyar river basin falls entirely in Ernad taluk. It makes its boundaries by Nilambur forested hills in the north and east, Perinthalmanna undulating upland in the south and Malappuram undulating plains in the east. This region falls under the middle course of the Chaliyar river. The maximum height (343 m) being at Kalikavu village (31 m) of Nilambur taluk and minimum (50 m) and Eramangalam desam (29 m) of Porur village of Nilambur taluk. Nilambur forested hills region makes its boundaries with Kozhikkode forested hills and Wayanad forested hills in the north, Tamilnadu in

the east, Mannarkkad, Palakkad forested hills in the south and Chaliyar river basin in the west. This region is a part of the Western Ghats. There are many peaks with over 1000 m in height in this region. The minimum height (115 m) is located at Mambad village. Perinthalmanna undulating upland region makes its boundaries with the Chaliyar river basin in the north, Mannarkkad-Palakkad forested hills in the east, Palakkad gap in the south and Malappuram undulating plain in the west. The Kadalundi river drains through this region. Maximum height of the region is 610 m at the Vadakkankara village of Perinthalmanna taluk. The 100 m contour which shows the minimum height runs throughout this region.

Table: 7.1

**NATURAL REGIONS OF MALAPPURAM - DETAILS OF
TALUKS/VILLAGES AND WITH AREA BY REGIONS**

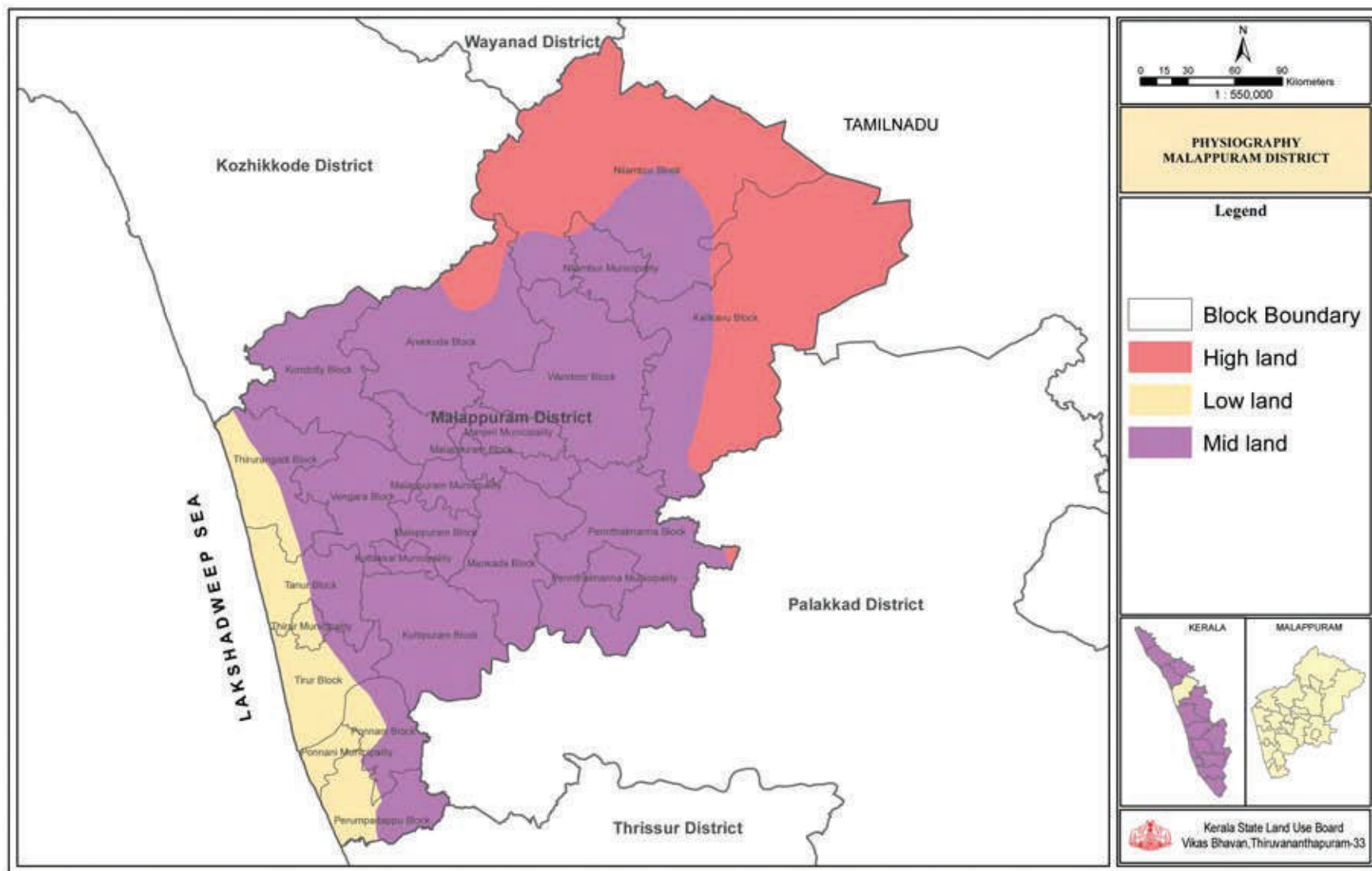
(Area in ha)

Sl.No.	Taluks/Villages	Low land	Mid land	High land
Ernad Taluk				
1	Anakkayam	-	2530.05	-
2	Areekode	-	1702.38	-
3	Chemprasserri	-	1703.92	-
4	Cherukavu	-	1179.2	-
5	Cheekkodu	-	1608.86	-
6	Edavanna	-	2823.82	-
7	Elamkoor	-	2915.34	-
8	Karakunnu	-	1568.54	-
9	Kavanur	-	3128.93	-
10	Keezhuparambu	-	1476.34	-
11	Kondotty	-	1072.76	-
12	Kuzhimanna	-	2272.19	-
13	Malappuram	-	818.54	-
14	Manjeri	-	1317.54	-
15	Melmuri	-	1338.77	-
16	Morayur	-	2413.15	-
17	Muthuvallur	-	2533.70	-
18	Narukara	-	1955.67	-
19	Nediyiruppu	-	2054.26	-
20	Pandalur	-	2053.44	-
21	Pandikkad	-	1757.30	-
22	Perakamanna	-	2295.32	135.90
23	Payyanadu	-	1981.26	-
24	Pookkottur	-	2130.43	-
25	Pulickal	-	2781.09	-
26	Pulpatta	-	3016.56	-
27	Panakkad	-	1136.05	-
28	Thrikkalangode	-	1561.17	-
29	Oorngattiri	-	2376.80	529.56
30	Vazhakkad	-	2517.88	-
31	Vazhayur	-	2346.28	-
32	Vettikkattiri	-	2292.16	-
33	Vettilappara	-	803.80	3785.08

Sl.No.	Taluks/Villages	Low land	Mid land	High land
	Total	-	65463.50	4450.54
Nilambur Taluk				
1	Akambadam	-	2184.09	6879.91
2	Amarambalam	-	3177.06	4564.61
3	Chokkad	-	2292.3	3823.16
4	Chungathara	-	3124.95	4649.77
5	Edakkara	-	4001.24	4771.72
6	Kalikavu	-	1069.79	2719.60
7	Karulai	-	3994.05	25297.32
8	Karuvarakundu	-	513.36	3470.26
9	Kerala Estate	-	200.18	3097.08
10	Karimbalangode	-	1481.26	14252.51
11	Mambad	-	3354.79	-
12	Nilambur	-	2895.13	-
13	Porur	-	3357.20	-
14	Pullippadam	-	5814.79	652.97
15	Thuvvur	-	3077.74	88.16
16	Thiruvalli	-	3228.75	-
17	Vazhikkadavu	-	466.38	13101.78
18	Vellayur	-	2379.29	-
19	Wandoor	-	3327.22	-
	Total	-	49939.57	87368.85
Perinthalmanna Taluk				
1	Anamangad	-	3525.85	-
2	Angadippuram	-	1557.75	-
3	Arakkuparamba	-	1852.54	246.55
4	Edappatta	-	2135.14	417.56
5	Elamkulam	-	2168.16	-
6	Kariavattom	-	1899.37	-
7	Keezhattur	-	1916.22	-
8	Kodur	-	2309.44	-
9	Kuttilangadi	-	2110.66	-
10	Kuruva	-	3127.02	-
11	Kuruvambalam	-	998.95	-
12	Mankada	-	3071.24	-
13	Melattur	-	2672.48	-
14	Moorkkanadu	-	3103.11	-
15	Nenmini	-	2196.78	-

Sl.No.	Taluks/Villages	Low land	Mid land	High land
16	Pathakkara	-	1900.05	-
17	Perinthalmanna	-	1509.26	-
18	Pulamanthole	-	2032.65	-
19	Puzhakkattiri	-	2312.26	-
20	Thazhekkode	-	2424.3	-
21	Vadakkangara	-	1117.97	-
22	Valamboor	-	2197.9	-
23	Vettathur	-	1745.73	-
	Total	-	49884.83	664.11
Ponnani Taluk				
1	Alangode	-	2135.22	-
2	Edappal	830.22	1232.10	-
3	Ezhavathuruthy	1447.7	-	-
4	Kaladi	1179.22	507.45	-
5	Marancherry	2089.62	-	-
6	Nannamukku	61.59	1659.99	-
7	Perumpadappu	906.74	516.94	-
8	Ponnani Nagaram	895.91	-	-
9	Thavanur	878.04	1623.70	-
10	Vattomkulam	2216.93	-	-
11	Veliyancode	1678.11	25.56	-
	Total	12184.08	7700.96	-
Tirur Taluk				
1	Anantavur	-	870.25	-
2	Athavanad	-	1306.1	-
3	Cheriyamundam	-	1167.23	-
4	Edayur	-	2957.01	-
5	Irumbiliyam	-	2403.51	-
6	Kalpakancherry	-	1478.39	-
7	Kattiparuthi	-	2269.32	-
8	Kottakkal	-	2067.63	-
9	Kurumbathur	-	1310.57	-
10	Kuttiapuram	-	1617.55	-
11	Melmuri	-	1744.39	-
12	Mangalam	1240.63	-	-
13	Marakkara	-	1099.09	-
14	Naduvattom	-	1480.86	-
15	Niramaruthur	946.35	-	-

Sl.No.	Taluks/Villages	Low land	Mid land	High land
16	Ozhur	708.53	924.58	-
17	Pariyapuram	1098.61	-	-
18	Perumanna	-	1169.41	-
19	Ponmala	-	2164.57	-
20	Ponmundam	-	884.23	-
21	Purathur	1907.5	-	-
22	Thalakkad	829.19	796.67	-
23	Thanalur	1393.89	228.78	-
24	Thanur	893.29		-
25	Thirunnavaya	215.22	893.00	-
26	Thriprangode	1987.08		-
27	Tirur	611.25	215.13	-
28	Thrikkandiyoor	717.13	133.71	-
29	Valavannur	1520.99	-	-
30	Vettom	1632.63	-	-
	Total	15702.29	29181.98	-
Tirurangadi Taluk				
1	Ariyallur	1187.72	41.73	-
2	Chelambra	-	1575.83	-
3	Kannamangalam	-	2806.32	-
4	Koduvayur	-	1474.52	-
5	Munniyur	493.49	1793.90	-
6	Nannambra	895.51	877.44	-
7	Neduva	1520.68	-	-
8	Othukkungal	-	1734.22	-
9	Pallickal	-	2710.3	-
10	Parappanangadi	808.13	-	-
11	Parappur	-	1564.56	-
12	Peruvallur	-	1967.95	-
13	Thenjippalam	100.25	1603.81	-
14	Thennala	-	2344.35	-
15	Thirurangadi	483.62	1327.70	-
16	Oorakam	-	2033.38	-
17	Vallikkunnu	749.77	485.37	-
18	Vengara	-	1887.26	-
	Total	6239.17	26228.64	-



SOIL

Soil is an important natural resource, through which we get everything directly or indirectly. Its thickness varies from a few centimeters to a few meters on earth's surface, but it takes millions of years for its formation. Formation of soil is formed due to weathering by chemical, mechanical and biological forces. Formation is a very slow process as 21/2 cm of soil is formed in one thousand years. Soil is one of the major resources of land which determines the use of potential. Factors upon which formation of soil depend are (i) the parent rock (ii) topography or relief (soil cover is thin in hilly areas than on the plains) (iii) climate (it is the most important soil forming factor; weathering, i.e. breaking or disintegration of rocks depends upon the elements of climate, i.e. heat (hot/cold), rain, wind, etc.) (iv) vegetation. Soil is the natural body consisting of layers (soil horizons) that are primarily composed of minerals which differ from their parent materials in their texture, structure, consistency, colour, chemical, biological and other characteristics. The result of soil is the end product of the influence of the climate (temperature, precipitation), relief (slope), organisms (flora and fauna), parent materials (original minerals), temperature and time. Kerala State is endowed with wide range of soil types.

Malappuram district covers laterite, alluvial and forest loam soils. These occur in Malappuram plain. The soils in the lowland are moderately well drained coastal alluvial soils with sand to loamy sand texture. The midland soils includes well drained laterite soils, shallow excessively drained laterite soils having petroferric contact and imperfectly drained colluvio-alluvial hydromorphic soils. The soils in the midup land are well drained soils developed from gneissic material. The upland soils are well drained forest soils developed from gneissic material. Stones and boulders are present in subsoil. The texture varies from clay loam to clay texture.

Table: 8.1

SOILS IN MALAPPURAM DISTRICT (COMPREHENSIVE LEGEND)

Soil Mapping Unit	Description Major Soil	Classification	
		Major Soils	Inclusions
K01	Very deep, moderately well drained, sandy soils with moderately shallow water table on very gently sloping subdued sand dunes, with slight erosion:	Mixed, Aquic Ustipsamments	Fine-loamy, Mixed, Typic Dystropepts
	Associated with very deep, moderately well drained, sandy soils.	Mixed Typic Ustipsamments	Coarse-loamy, Mixed Aquic Ustorthents
K02	Very deep, somewhat excessively drained sandy soils with moderately deep water table on very gently sloping beaches, with slight erosion:	Mixed, Typic Ustipsamments	Coarse-loamy, Mixed Aquic Ustorthents
	Associated with very deep, moderately well drained, sandy soils with moderately shallow water table.	Mixed, Aquic Ustipsamments	Fine, Mixed Aeritropaquepts
K03	Very deep, very poorly drained, clayey soils with moderately shallow water table in nearly level broad valleys, with slight erosion:	Fine, Mixed Typic Tropaquepts	Fine, Mixed Typic Sulfaquepts
	Associated with very deep, imperfectly drained clayey soils with moderately deep water table on very gentle slopes.	Fine, Mixed Aeritropaquepts	Fine, Mixed Typic Dystropepts
K05	Very deep, imperfectly drained, clayey soils with shallow water table on level lands with valleys, with slight erosion.	Fine, Mixed Typic Dystropepts	Fine, Mixed Typic Tropaquepts
		Fine, Mixed Aeritropaquepts	Fine-loamy, Mixed Ustic Kanhaplohumults

K07	Very deep, well drained, gravelly clay soils on gently sloping coastal laterites, with moderate erosion:	Clayey-skeletal, Kaolinitic, Typic Kandistults	Loamy- skeletal, Mixed Ustoxic Dystrypepts
	Associated with very deep, well drained, gravelly clay soils with moderate surface gravelliness.	Clayey-skeletal, Kaolinitic, Typic Kanhaplustults	Clayey, Kaolinitic, Typic Kandistults
K08	Very deep, moderately well drained, clayey soils with moderately shallow water table in nearly level narrow valleys, with slight erosion:	Fine Mixed Typic Dystrypepts	Clayey, Kaolinitic, Typic Kanhaplustults
	Associated with very deep, imperfectly drained clayey soils with moderately shallow water table on nearly level land.	Fine Mixed Typic Tropaquepts	Fine Mixed Typic Ustopepts
K09	Very deep, well drained, gravelly clay soils with moderate surface gravelliness on moderately steeply sloping laterite mounts, with moderate erosion:	Clayey-skeletal, Kaolinitic, Oxic Humitropepts	Clay-skeletal, Kaolinitic, Ustic-Kandihumults
	Associated with deep, well drained, gravelly clay soils on gently slopes.	Clay-skeletal, Kaolinitic, Ustic-Haplohumults	Fine-loamy, Mixed Typic Kandihumults
K10	Very deep, well drained, gravelly clay soils on gently sloping midland laterite with valleys of northern Kerala, with moderate erosion:	Clayey, Kaolinitic, Ustic-Kandihumults	Clayey, Kaolinitic, Typic Kanhaplustults
	Associated with deep well drained gravelly clay soils with moderate surface gravelliness and ironstone layer at 100 to 150 cm on nearly level lands, slightly eroded.	Clay-skeletal, Kaolinitic, Typic Kanhaplustults	Clay-skeletal, Kaolinitic, Type Kandistults

K11	Very deep, well drained, gravelly clay soils on gently sloping midland laterites with valleys of central Kerala, with moderate erosion:	Clayey, Kaolinitic, Ustic- Kandihumults	Fine mixed typic Dystropepts
	Associated with deep, well drained, clayey soils with coherent material at 100 to 150 cm on gentle slopes.	Clayey, kaolinitic, Typic Kanhaplustults	Clayey-skeletal kaolinitic, oxic humitropepts
K13	Deep, well drained gravelly clay soils with moderate surface gravellines and ironstone layer at 100 to 150 cm on gently sloping midland laterites, with moderate erosion;	Clayey, kaolinitic, Ustic Haplohumults	Fine Kaolinitic, Petroferric Dystropepts
	Associated with laterite outcrops.	Ironstone	Loamy-skeletal, mixed Ustic Humitropepts
K18	Very deep, well drained, clayey soils on gently sloping lands of Wayanad Plateau, with moderate erosion;	Clayey, mixed Ustic	Clayey-skeletal, mixed, Ustic Palehumults,
	Associated with very deep, well drained, clayey soils.	Clayey, mixed, Ustic Haplohumults	Clayey-skeletal, kaolinitic, Kanhaplic Haplustults
K19	Very deep, welldrained, clayey soils on moderately sloping high hills with thin vegetation, with moderate erosion;	Clayey, mixed, Ustic Palehumults	Fine-loamy,mixed, Ustic Humitropepts
	Associated with rock outcrops.	Rock land	Fine-loamy,mixed, Ustic Palehumults
K20	Deep, some what excessively drained, gravelly clay soils with moderate surface gravellines on steeply sloping high hills with thick vegetation, with moderate erosion;	Clayey-skeletal, mixed Ustic Haplohumults	Rock land
	Associated with very deep, well drained, clayey soils on gentle slopes.	Clayey-mixed Ustic Palehumults	Fine, Mixed Ustic Humitropepts

K22	Very deep, well drained clayey soils on gently sloping low hills with isolated hillocks, with moderate erosion: Associated with deep well drained, gravelly clay soils on moderately steep slopes.	Clayey-mixed Ustic Palehumults Fine, mixed, Ustic Humitropepts	Clayey-skeletal, Mixed Ustic Humitropepts Fine loamy, Mixed Ustic Haplohumults
K23	Moderately shallow, well drained, gravelly clay soils with ironstone layer at 50 to 75 cm on very gently sloping foothills and valleys, with slight erosion; Associated with very deep, well drained, clayey soils on nearly level lands.	Clayey, mixed Ustic Aplohumults Fine, mixed, Typic Dystropepts	Clayey-skeletal, kaolinitic, Petroferric Dystropepts Clayey-skeletal, kaolinitic, Typic Kanhaplustults
K24	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
K26	Very deep, well drained, clayey soils on moderately steeply sloping high hills with thin vegetation, with moderate erosion: Associated with rock outcrops.	Clayey, Mixed, Ustic Palehumults Rock land	Clayey-skeletal, Mixed Typic Ustropepts Fine loamy, Mixed Ustic Haplohumults

K27	Very deep, well drained, loamy soils on gently sloping medium hills with thick vegetation, with moderate erosion: Associated with rock outcrops.	Fine, Mixed Pachic Haplustolls Rock land	Fine, Mixed, Pachic Argiustolls Clayey, Mixed, Ustic Haplohumults
K29	Very deep, well drained, loamy soils on gently sloping uplands with valleys, with moderate erosion: Associated with very deep, well drained, loamy soils on gently slopes	Fine loamy, Mixed, Pachic Argiustolls Fine loamy, Mixed Ustic Humitropepts	Loamy-skeletal, Mixed Pachic Argiustolls Loamy-skeletal mixed Lithic Ustorthents

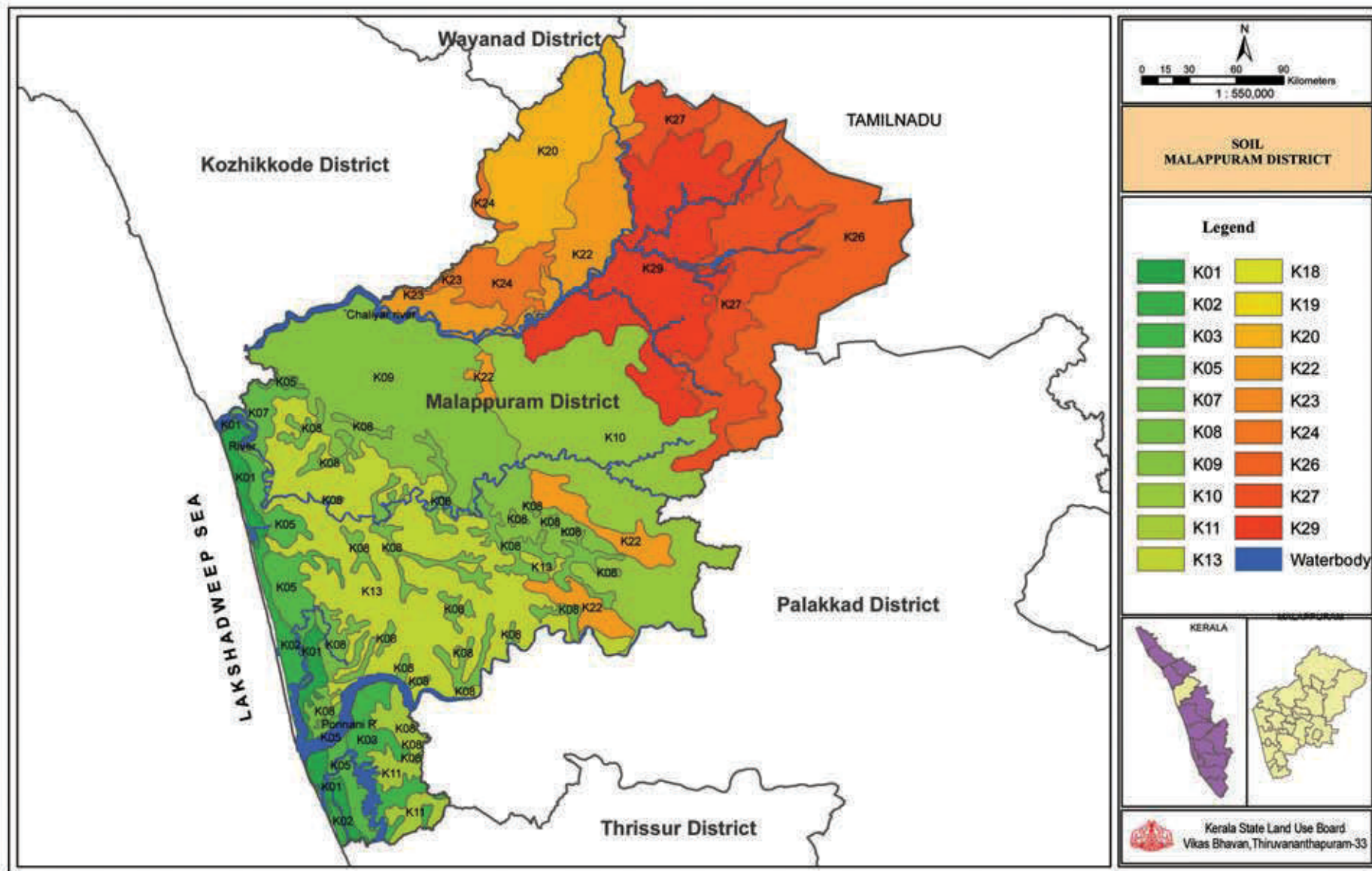
Soils of the Lowland	-	K01, K02, K03, K05, K07
Soils of the Midland	-	K08, K09, K10, K11, K13
Soils of the Central Sahyadri	-	K18, K19, K20, K22, K24, K29
Soils of the Nilgris	-	K26, K27

Table: 8.2

LEGEND FOR THE SOIL MAP OF MALAPPURAM DISTRICT

Sl.No.	Map Symbol	Depth	Texture	Slope	Drainage
1	K01	vd	s	vg	mw
2	K02	vd	s	vg	e
3	K03	vd	c	vg	vp
4	K05	vd	c	vg	l
5	K07	vd	gc	g	w
6	K08	vd	c	vg	mw
7	K09	vd	gc	ms	w
8	K10	vd	gc	g	w
9	K11	vd	gc	g	w
10	K13	d	gc	g	w
11	K18	vd	c	g	w
12	K19	vd	c	m	w
13	K20	d	gc	s	e
14	K22	vd	c	g	w
15	K24	d	gl	ms	w
16	K26	vd	c	ms	w
17	K27	vd	l	g	w
18	K29	vd	l	g	w

Depth		
1	d	deep
2	vd	very deep
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



WATER RESOURCES

In most developing countries, agriculture is the dominant user of water, accounting for more than 85% of all water use. Use of water in agriculture 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 1970's and 1980's investment typically involved large irrigation and drainage projects with considerable infrastructure development. In 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 manages and develops the river basins as an integrated approach. 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, 14 have storages and remaining are barrages.

Table: 9.1

LIVE STORAGE POSITION IN THE IRRIGATION RESERVOIRS

(Million cubic meter)

Sl. No.	Item	2011	2012	2013
1	Storage at the beginning of the Monsoon	525	404	281
2	Storage at the end of the Monsoon	1274	744	1290
3	Increase due to Monsoon	749	340	1009
Live storage position (Average for 10 years)				
i	Storage at the beginning of the Monsoon	431	431	395
ii	Storage at the end of the Monsoon	1133	1117	1186
iii	Increase due to Monsoon	702	686	791

RIVERS

There are 41 west flowing and 3 east flowing rivers, most of them having their source in the Western Ghats and draining into the Arabian Sea. Some of these rivers have a portion of their catchments in the adjoining States of Karnataka and Tamil Nadu. In addition, there are three rivers which also originate from the Western Ghats, but they flow eastwards into the States of Karnataka and Tamil Nadu. The important rivers in the district are the Chaliyar or Beypore, Kadalundi, Purapparamba, Tirur and Bharathapuzha.

Chaliyar or Beypore River

Chaliyar or Beypore river, one of the major river of the State, takes its origin from Elembiler hills of Vythiri taluk of Wayanad district. Its important tributaries are Cherupuzha, Iringapuzha, Kurumbranpuzha, Kanjirappuzha, Karimpuzha, Punnapuzha, Vadapurampuzha and Chaliyar. Main river traverses through Cholanmala estate, Kanthapara, Kurumbanmala, Edakkara, Chungathara,

Amarambalam, Nilambur, Mambad, Oorngattiri and Keezhuparambu of Malappuram district before it empties itself into the sea at Beypore. The rivers are navigable and motor boats can ply from the mouth of the river upto Kuttiyadi. Timber from the forests is extensively floated down to Kallai through this river.

Kadalundi River

Kadalundi river also known as Karimpuzha or Oravanpurampuzha, originates from the silent valley reserve forests at an elevation of 1219m. above the MSL. Olipuzha and Velliyar are its main tributaries and the river drains Karuvarakundu of Nilambur taluk, Pandikkad, Vettikkattiri, Pandalur, Anakkayam, Malappuram, Oorakam villages of Ernad taluk, Edappatta, Melattur, Keezhattur, Koottilangadi and Kodur villages of Perinthalmanna taluk and Othukkungal, Parappur, Vengara, Thenmala, Tirurangadi, Munniyur, Parappanangadi, Ariyallur, Oorakam and Thenhippalam villages of Tirurangadi taluk before it falls into the Lakshadweep sea at Kadalundi.

Tirur River

Originating from Athavanad village of Tirur taluk, the Tirur river flows the south-west upto Thirunavaya and flows upto Elamkulam in the north-western direction. Then it turns to south-west and finally joins the Bharathapuzha to reach the sea near Ponnani. It flows through Ananthavoor, Thirunavaya, Thalakkad, Valavannur, Cheriya mundam, Tirur and Purathur villages.

Bharathapuzha River

Bharathapuzha the second longest river in the State takes its origin from Anamala hills and flows through the district of Coimbatore, Palakkad, Malappuram and Thrissur and joins the Arabian sea near Ponnani town. The important tributaries of the Bharathapuzha are Gayathripuzha, Kannadipuzha, Korayar and Thoothapuzha.

Table: 9.2

BASIC RIVER STATISTICS

Sl. No.	Name of the River	Main Tributaries	Irrigation Projects	Hydro Electric Projects
1	Bharathapuzha	Gayathripuzha Chittoorpuzha Kalpathipuzha Thoothapuzha		Malampuzha
2	Chaliyar	Karimpuzha Kanjirapuzha Cherupuzha		Pandiyar Punnapuzha
3	Kadalundi	Olipuzha Veliar	Nil	Nil
4	Tirur	Vallilapuzha	Nil	Nil

Source: - ER, CGWD, PWD.

RIVERS OF KERALA



Legend

- STATE BOUNDARY
- RIVER/ WATERBODY

Table: 9.3

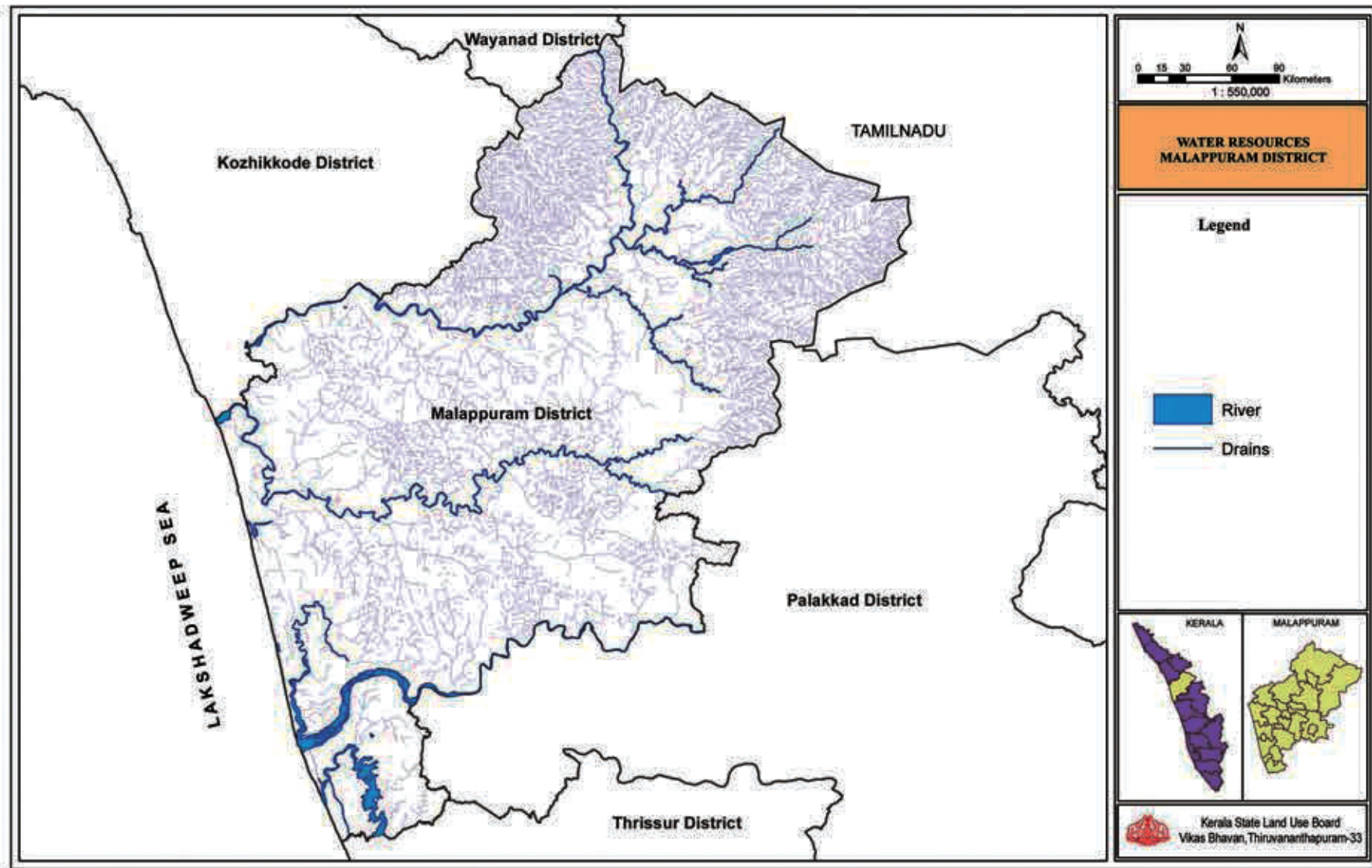
GROUND WATER STATISTICS MALAPPURAM 2008-09

SI. No.	Assessment Unit	Command/ Non-Command/ Total	Recharge from rainfall during monsoon season	Recharge from other sources during monsoon season	Recharge from rainfall during non- monsoon season	Recharge from other sources during non- monsoon season	Total Annual Ground Water Recharge (4+5+6+7)	Provision for Natural Discharges
1	2	3	4	5	6	7	8	9
1	Areekod	Non-Command	4142.46	28.43	609.18	554.00	5334.07	533.41
2	Kondotty	Non-Command	2108.10	28.20	310.01	609.00	3055.31	305.53
3	Kuttippuram	Non-Command	2124.75	29.35	312.46	256.00	2722.56	272.26
4	Malappuram	Non-Command	2775.53	20.59	408.17	440.00	3644.29	364.43
5	Mankada	Non-Command	2847.03	40.31	418.68	730.00	4036.02	403.60
6	Nilambur	Non-Command	5787.79	21.47	851.15	781.00	7441.41	744.14
7	Perinthalmanna	Non-Command	3226.92	23.75	474.55	1120.00	4845.22	484.52
8	Perumpadappu	Non-Command	1822.12	25.65	180.51	165.73	2194.01	109.70
9	Ponnani	Non-Command	1741.88	13.44	170.77	650.00	2576.09	257.61
10	Tanur	Non-Command	2871.65	35.59	367.44	420.00	3694.68	184.73
11	Tirur	Non-Command	2997.17	40.50	358.78	580.00	3976.45	198.82
12	Tirurangadi	Non-Command	1705.98	22.41	231.24	300.00	2259.63	112.98
13	Vengara	Non-Command	2050.00	19.52	301.47	430.00	2800.99	280.10
14	Wandoor	Non-Command	3045.96	20.07	447.94	1044.00	4557.97	455.80
Total (Ha.m)		Non-Command	39247.33	369.28	5442.35	8079.73	53138.69	4707.63
Total (MCM)		Non-Command	392.47	3.69	54.42	80.80	531.39	47.08

Table: 9.3 Continued.....

Sl. No.	Assessment Unit	Net Annual Ground Water Availability (8-9)	Existing Gross Ground Water Draft for irrigation	Existing Gross Water Draft for domestic and industrial water supply	Existing Gross Ground Water Draft for all issues (11+12)	Provision for domestic and industrial requirement supply in 2025	Net Ground Water Availability for future irrigation development (10-11-14)	Stage of Ground water Development (13/10 * 100) (%)
1	2	10	11	12	13	14	15	16
1	Areekod	4800.66	623.73	1741.65	2365.38	2162.98	2013.95	49.27
2	Kondotty	2749.78	622.59	1369.59	1992.18	1700.91	426.28	72.45
3	Kuttippuram	2450.3	634.72	1041.93	1676.65	1293.99	521.59	68.43
4	Malappuram	3279.86	458.44	1443.22	1901.66	1792.35	1029.07	57.98
5	Mankada	3632.42	874.51	1431.27	2305.78	1777.51	980.40	63.48
6	Nilambur	6697.27	516.17	1810.95	2327.12	2249.05	3932.05	34.75
7	Perinthalmanna	4360.7	522.26	1353.78	1876.04	1681.28	2157.16	43.02
8	Perumpadappu	2084.31	548.99	729.65	1278.64	906.16	629.16	61.35
9	Ponnani	2318.48	298.08	1138.12	1436.20	1413.45	606.95	61.95
10	Tanur	3509.95	775.46	1758.46	2533.92	2183.85	550.64	72.19
11	Tirur	3777.63	876.73	1541.34	2418.07	1914.21	986.69	64.01
12	Tirurangadi	2146.65	493.22	1475.04	1968.26	1653.42	0.01	91.69
13	Vengara	2520.89	440.56	1361.27	1801.83	1690.57	389.76	71.48
14	Wandoor	4102.17	480.98	1588.42	2069.40	1972.68	1648.51	50.45
Total (Ha.m)		48431.06	8166.44	19784.69	27951.13	24392.41	15872.21	57.71
Total (MCM)		484.31	81.66	197.85	279.51	243.92	158.72	57.71

Source: Central Ground Water Board



MINERALS

The availability of minerals determines the pace of economic development of a State to a great extent. Minerals are basically natural resources. Kerala State is endowed with a number of occurrences/deposits of minerals such as Heavy Mineral Sands (Ilmenite, Rutile, Zircon, Monazite, Sillimanite), Gold, Iron Ore, Bauxite, Graphite, China Clay, Fire Clay, Tile and Brick Clay, Silica Sand, Lignite, Limestone, Limeshell, Dimension Stone (Granite), Gemstones, Magnesite and Steatite etc. However mining activities on large scale are confined mainly to a few minerals - Heavy Mineral Sands, China Clay and to a lesser extent Limestone/Limeshell, Silica Sand and Granite. In fact, Heavy Mineral Sand and China Clay contribute more than 90% of the total value of mineral production in the State.

Malappuram district is not rich in mineral wealth. Laterite stone is found abundantly in the midland areas. Archean gneiss is most common geological formation of the district. The major economically important mineral is quartz magnetite. This mineral is found at Porur and Vettikuthu hills near Ernad taluk. Quartz gneisses are in common in Nilambur, Edavanna and Pandikkad areas. Garnetiferous quartz is seen near Manjeri, Kondotty and Pandalur. Charnockite rocks occur near Nilambur and hills near Edavanna. Deposits of Iron ore are found in Ernad taluk. Deposits of limeshells are found in the coastal belt mainly in Ponnani and Kadalundi nagar. The coastal sands of Ponnani and Veliyancode contain heavy minerals like Ilmenite and monazite. China clay is plenty in Perinthalmanna, Ponnani taluks and also in Kadalundi river near sea mouth. Ball clay deposits are found in Thekkummuri near Changaramkulam.

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Table: 10.1

INVENTORY OF THE MINERAL RESOURCES OF KERALA

Sl. No.	Name of Minerals	Occurrence	Reserves (Million Tonnes)	Uses
1	Gold	Wayanad, Maruda, Nilambur, Malappuram	0.55	Manufacture of ornaments
2	Iron	Kozhikode (Eleyettimala, Naduvallur Nanminda, Cheruppa, Alampara) Malappuram (Korattimala)	83.04	Iron is useful in building (Bridge, highway, rail road, etc.), transportation (car, train, boats, plane, etc.) tools (knife, machines, etc.)
3	China clay	Thiruvananthapuram, Kollam, Kannur, Kasaragod	172	Ceramics, pottery, paper, textiles, rubber and paints
4	Ball clay	Thiruvananthapuram (Nadayara) Kollam (Kumbalam, <i>Kanjirottussery</i> , Mulavana) Kannur (Pattuvam, Karivalloor, <i>Earipuram</i> , Pazhayangadi)	1.67	Manufacture of Refractory products, Ceramic Granite Tiles, Glazed Tiles, Table Ware & High Tension Electric insulators etc.
5	Fire clay	Kollam (Kundamon, Pallikkal), Alappuzha (Thamarakulam), Ernakulam (Amballoor, Kanjiramattom, Keezhumadu), Thrissur (Poomangalam) Kannur (Pattuvam)	11.55	Manufacture of firebrick and of various accessory utensils, such as crucibles, saggars, retorts and glass pots, used in the metal working industries.

6	Silica	Coastal area of Alappuzha	28.40	Used in ceramics and to make glass with. It can also be used to strengthen iron and steel.
7	Bauxite	Thiruvananthapuram (Mangalapuram, Chilambil, Sasthavattom), Kollam (Poruvazhy, Aadichanalloor) Kannur, Kasaragod	12.5	Manufacture of Aluminium. It is used in cement, chemicals, face makeup, soda cans, dishwashers, siding for houses.
8	Lime shell	Alappuzha, Ernakulam (Vembanad lake), Kottayam, Thrissur (Vadanapally) Kannur (Payyannur, Thrikkaripur)	4.05	Manufacture of a variety of products including white cements.
9	Limestone	Palakkad (Walayar)	24	Manufacture of cement, calcium carbide, Iron & Steel Industry etc.
10	Graphite	Thiruvananthapuram (Veli, Kuttichal), Ernakulam (Vadakode), Kottayam (Chirakadavu)	2.81	Crucible Foundry, Refractory, Paints & Lubricant Industries
11	Lignite	Kannur (Madai), Kasaragod (Nileswaram, Palayi)	9.65	Used as fuel for steam electric power generation in some countries
12	Magnesite	Palakkad (Attapadi)	0.03	Refractory bricks for furnaces

Table: 10.2

NUMBER OF MINERAL QUARRIES (PERMITS ISSUED) DURING 2009-10

Sl. No.	Districts	Name of Mineral						
		Granite building stone	Late rite	Brick clay	Ordinary sand	Sea shell	Lime shell	Total
1	Thiruvananthapuram	158	4	5	4			171
2	Kollam	112	11	7	25			155
3	Pathanamthitta	162	9	8				179
4	Alappuzha		51	4				55
5	Kottayam	274		14	239			527
6	Idukki	172			118			290
7	Ernakulam	294	11	14	2		1	322
8	Thrissur	299	60	82				441
9	Palakkad	142	7		283			432
10	Malappuram	326	489	17				832
11	Kozhikode	336	85	30	20			471
12	Wayanad	151	3	12	4			170
13	Kannur	218	226		37	1		482
14	Kasaragod	172	336		148			656
	Total	2816	1292	193	880	1	1	5183

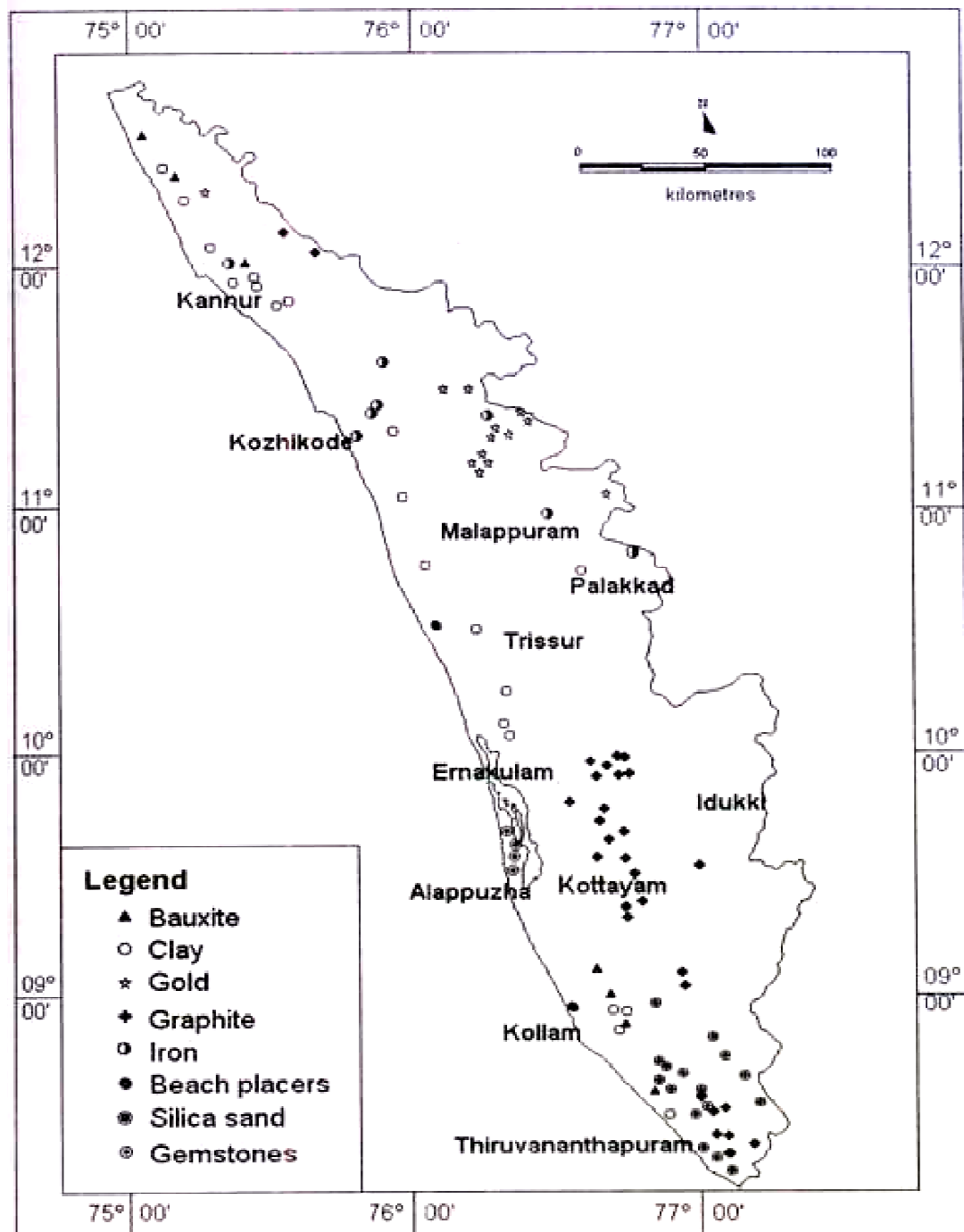
Table: 10.3

**NUMBER OF MINERAL WISE MINING LEASES IN KERALA AS ON
31-03-2010**

Sl. No.	Districts	Name of Mineral									
		Graphite	China clay	Laterite	Iron ore	Quartz	Lime shell	Mineral sand	Lime stone	Silica sand	Quartzite
1	Thiruvananthapuram		30								
2	Kollam		1					3			
3	Pathanamthitta										
4	Alappuzha			1			4			22	
5	Kottayam						2				1
6	Idukki					1					
7	Ernakulam	1									
8	Thrissur										
9	Palakkad								1		
10	Malappuram										
11	Kozhikode				1						
12	Wayanad										
13	Kannur		2	5							
14	Kasaragod		1	1							
	Total	1	34	7	1	1	6	3	1	22	1

Source: Infrastructure Statistics of Kerala 2011, DES

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, 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.

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 Malappuram

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 Malappuram district 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, and communication, utilities in association with water, vegetation and vacant lands. An area 4119 ha accounting for 1.16 per cent of the TGA is estimated under this category.

ii) Agricultural land

It is defined as the land primarily used for farming and for production of food, fibre and 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. This is the major category occupying an area of 235975 ha accounting for 66.45 per cent of the TGA. Of these, the paddy area covers an area of 24863 ha. Nearly 18384 ha of paddy area have been converted to other landuses. The coconut dominant mixed crop which covers an area of 125127 ha is the major land use identified under this category.

iii) Forest

It is an area bearing an association predominantly of trees and other vegetation types capable of producing timber and other forest produce. It includes 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. 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 forest lands. This category accounts for 77556 ha, which is 21.84 per cent of the total geographical area.

iv) 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 three 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 b) underutilized / degraded notified forest – scrub dominated and c) 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. The waste lands occupy an area of 31918 ha accounting for 8.99 percent of the total geographical area.

v) Water bodies

It is an area of impounded 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 water bodies mapped occupy an area of 5550 ha accounting for 1.56 percent of the total area.

Table: 11.1

LAND USE / LAND COVER CATEGORIES- MALAPPURAM

(Area in Sq.Km)

Sl. No.	Category	Area	Percentage
1	Built up land (urban) - industrial	0.21	0.01
2	Built up land (urban) - commercial	21.15	0.6
3	Built up land (urban) - beaches	3.5	0.1
4	Built up land (rural) - residential	16.33	0.46
5	Paddy - viruppu	200.37	5.64
6	Paddy - viruppu + mundakan	48.26	1.36
7	Paddy reclaimed arecanut	88.62	2.5
8	Paddy reclaimed coconut	2.45	0.07
9	Paddy reclaimed rubber	0.42	0.01
10	Paddy reclaimed mixed crop	47.25	1.33
11	Paddy reclaimed banana	43.52	1.23
12	Paddy reclaimed tapioca	0.18	0.01
13	Paddy reclaimed banana + tapioca	0.29	0.01
14	Paddy reclaimed residential	1.11	0.03
15	Rubber	361.34	10.18
16	Coconut	12.57	0.35
17	Arecanut	0.41	0.01
18	Cashew	1.58	0.04
19	Teak	4.53	0.13
20	Mixed crop	292.99	8.25
21	Coconut + Arecanut	1.75	0.05
22	Coconut dominant mixed crop	1251.27	35.24
23	Mixed trees	0.37	0.01
24	Pepper	0.47	0.01

25	Semi evergreen/Evergreen - Dense mixed forest	264.65	7.45
26	Semi evergreen/Evergreen - Dense mixed forest (Reserve Forest)	185.28	5.22
27	Semi evergreen/Evergreen - Dense mixed forest mainly bamboo	156.15	4.4
28	Semi evergreen/Evergreen - Dense mixed forest mainly bamboo (Reserve Forest)	1.03	0.03
29	Deciduous - Dense mixed forest mainly teak (Reserve Forest)	9.39	0.26
30	Deciduous – Open mixed forest	1.42	0.04
31	Deciduous - Scrub forest	4.81	0.14
32	Forest plantation - Teak	1.1	0.03
33	Forest plantation - Teak (Reserve Forest)	110.6	3.11
34	Forest plantation - Eucalyptus	18.95	0.53
35	Forest plantation - Rubber	18.12	0.51
36	Forest plantation – Rubber (Reserve Forest)	0.69	0.02
37	Forest plantation - Cashew	0.39	0.01
38	Grassland	2.98	0.08
39	Land with scrub	159.1	4.48
40	Land without scrub	2.68	0.08
41	Coastal sand	1.24	0.03
42	Mining/Industrial wastelands	0.6	0.02
43	Barren rocky/sheet rock area	27.23	0.77
44	Degraded land under plantation crop (Rubber)	39.16	1.1
45	Waterlogged - permanent	0.07	0
46	Waterlogged - temporary	11.81	0.33
47	Under utilised/degraded notified forest	59.29	1.67
48	Sands/riverine	18	0.51
49	Water bodies	55.5	1.56
	Total	3551.18	100

Table: 11.2

AREEKOD BLOCK

(Area in Ha)

[illegible]

Table: 11.3

KALIKAVU BLOCK

(Area in Ha)

[illegible]

Table: 11.4

KONDOTTY BLOCK

(Area in Ha)

[illegible]

Table: 11.5

KUTTIPPURAM BLOCK

(Area in Ha)

[illegible]

Table: 11.6

MALAPPURAM BLOCK

(Area in Ha)

Sl. No.	Land Use	Anakkayam	Kodur	Morayur	Othukkungal	Ponmala	Pookkottur
1	Agriculture plantation (Arecanut)	29.51				7.67	
2	Agriculture plantation (Banana)						
3	Agriculture plantation (Cashew)	182.54		299.50			500.22
4	Agriculture plantation (Coconut)						
5	Agriculture plantation (Mixed)	2144.07	1075.54	1013.09	776.97	1121.95	1102.30
6	Agriculture plantation (Pepper)						
7	Agriculture plantation (Rubber)	995.22	344.22	81.71	170.38	191.78	24.15
8	Agriculture plantation (Tea)						
9	Barrenrocky/Stonywaste/Sheetrock	15.92					
10	Built-up (Cities/Town/Villages)	75.63	28.51	129.24	19.43	1.18	65.22
11	Cropland (Kharif)						
12	Doublecrop (Kharif+Rabi)	192.82	28.71	186.98	129.84	290.95	168.40
13	Fallow land	81.27		100.42			7.18
14	Forest deciduous (Dense)			9.91			
15	Forest deciduous (scrub/degrade)						
16	Forest evergreen (Dense)						
17	Forest evergreen (Open)						
18	Forest mangroves (Littoral Swamp)						
19	Forest plantations						
20	Grass land						
21	Land with scrub	742.91	469.22	592.30	190.55	545.59	262.96
22	Land without scrub					2.30	
23	Mining/Industrial waste	6.21					
24	River/Waterbodies	110.11	42.44		46.74	3.14	
25	Sandy area	7.28					
26	Wetlands (Waterlogged)						
	Panchayat Total	4583.49	1988.64	2413.15	1333.91	2164.56	2130.43
	Block Total	14614.18					

Table: 11.7

MANKADA BLOCK

(Area in Ha)

Sl. No.	Land Use	Kuttilangadi	Kuruva	Mankada	Moorkkanadu	Makkarapparambu	Puzhakkattiri
1	Agriculture plantation (Arecanut)	140.7	39.87	55.1	30.45	30.02	20.96
2	Agriculture plantation (Banana)						
3	Agriculture plantation (Cashew)	1.36		80.71		247.5	16.04
4	Agriculture plantation (Coconut)						
5	Agriculture plantation (Mixed)	1084.72	1947.14	677.94	2088.4	443.43	1355.8
6	Agriculture plantation (Pepper)						
7	Agriculture plantation (Rubber)	347.38	352.4	616.6	274.72	227.22	81.3
8	Agriculture plantation (Tea)						
9	Barrenrocky/Stonywaste/Sheetrock	3.86		12.31		16.68	
10	Built-up (Cities/Town/Villages)	26.72	24.09	14.60	82.01	48.37	18.76
11	Cropland (Kharif)						
12	Doublecrop (Kharif+Rabi)	315.7	599.79	162.56	482.53	199.43	545.48
13	Fallow land						
14	Forest deciduous (Dense)						
15	Forest deciduous (scrub/degrade)						
16	Forest evergreen (Dense)			254.51			
17	Forest evergreen (Open)						
18	Forest mangroves (Littoral Swamp)						
19	Forest plantations						
20	Grass land						
21	Land with scrub	460.29	383.89	476.18	450.25	209.29	219.14
22	Land without scrub		98.8	30.85	92.46	50.73	54.77
23	Mining/Industrial waste						
24	River/Waterbodies	65.1	1.85		19.45		
25	Sandy area				0.33		
26	Wetlands (Waterlogged)						
	Panchayat Total	2445.83	3447.83	2381.36	3520.60	1472.67	2312.25
	Block Total	15580.54					

Table: 11.8

NILAMBUR BLOCK

(Area in Ha)

Sl. No.	Land Use	Chaliyar	Chungathara	Edakkara	Muthedam	Pothukallu	Vazhikkadavu
1	Agriculture plantation (Areca nut)						
2	Agriculture plantation (Banana)						
3	Agriculture plantation (Cashew)		5.84				
4	Agriculture plantation (Coconut)		48.01				
5	Agriculture plantation (Mixed)	3490.79	3557.47	149.19	1840.93	2.15	78.43
6	Agriculture plantation (Pepper)						
7	Agriculture plantation (Rubber)	733.76	2370.27	888.32	2153.38	971.97	1068.02
8	Agriculture plantation (Tea)						
9	Barren rocky/Stony waste/Sheet rock	422.93	440.45		5.41	146.16	530.55
10	Built-up (Cities/Town/Villages)		2.2		19.84		3.44
11	Cropland (Kharif)						
12	Doublecrop (Kharif+Rabi)	53.62	109.08	84.18	1170.14	13.56	128.48
13	Fallow land						
14	Forest deciduous (Dense)	1580.84	5706.28			7556.23	3200.59
15	Forest deciduous (scrub/degrade)	40.18	15.44			14.68	
16	Forest evergreen (Dense)	4.18	199.9		1551.46		4922.1
17	Forest evergreen (Open)						
18	Forest mangroves (Littoral Swamp)						
19	Forest plantations	94.46	937.45	2561.12	1.74	3996.77	3380.66
20	Grass land		106.87				
21	Land with scrub	1961.39	417.43	106.3	181.52	326.67	1198.88
22	Land without scrub		243.67			102.76	3.73
23	Mining/Industrial waste						
24	River/Waterbodies	10.73	220.3	24.56	215.58	154.72	98.23
25	Sandy area	1.02			5.48	4.59	5.34
26	Wetlands (Waterlogged)						
	Panchayat Total	8393.90	14380.66	3813.67	7145.48	13290.26	14618.45
	Block Total	61642.42					

Table: 11.9

PERINTHALMANNA BLOCK

(Area in Ha)

Sl. No.	Land Use	Alipparambu	Angadipपुरam	Elamkulam	Keezhattur	Melattur	Pulamanthole	Thazhekkode	Vettathur
1	Agriculture plantation (Areca nut)		21.28		48.15		79.63		
2	Agriculture plantation (Banana)		14.00	58.84					
3	Agriculture plantation (Cashew)	47.19	77.84			4.45		100.53	1.42
4	Agriculture plantation (Coconut)							7.52	6.89
5	Agriculture plantation (Mixed)	1143.54	1643.92	1140.6	2974.48	978.14	1603.5	1891.42	2178.93
6	Agriculture plantation (Pepper)								
7	Agriculture plantation (Rubber)	736.03	222.96	319.20	824.73	61.48	103.42	709.31	487.36
8	Agriculture plantation (Tea)								
9	Barren rocky/Stony waste/Sheet rock				63.09				69.39
10	Built-up (Cities/Town/Villages)	131.46	204.72	119.05	54.1		140.17	52.75	0.28
11	Cropland (Kharif)		3.56						
12	Doublecrop (Kharif+Rabi)	597.28	656.55	206.76	561.68	286.34	408.64	432.47	378.64
13	Fallow land				16.17				
14	Forest deciduous (Dense)								
15	Forest deciduous (Open))							2.07	
16	Forest deciduous (scrub/degrade)	420.9						160	
17	Forest evergreen (Dense)				4.04				
18	Forest evergreen (Open)								
19	Forest mangroves (Littoral Swamp)								
20	Forest plantations	12.66						374.33	266.03
21	Grass land								
22	Land with scrub	339.89	907.51	244.08	808.48		103.38	390.73	255.09
23	Land without scrub	22.84	3.30	44.7			113.77	29.01	
24	Mining/Industrial waste				6.76				
25	River/Water bodies	60.15		36.79	86.81	6.59	33.77		1.07
26	Sandy area	8.25		3.79					
27	Wetlands (Waterlogged)						27.83		
	Panchayat Total	3520.19	3755.64	2173.81	5448.49	1337.00	2614.11	4150.14	3645.10
	Block Total				26644.48				

Table: 11.10

PERUMPADAPPU BLOCK

(Area in Ha)

Sl. No.	Land Use	Alangode	Marancherry	Nannamukku	Perumpadappu	Veliyancode
1	Agriculture plantation (Areca nut)					
2	Agriculture plantation (Banana)					
3	Agriculture plantation (Cashew)					
4	Agriculture plantation (Coconut)	47.91	1212.54		611.2	902.98
5	Agriculture plantation (Mixed)	1331.05	163.54	1113.95	344.68	359.72
6	Agriculture plantation (Pepper)					
7	Agriculture plantation (Rubber)	43.35		39.38	69.33	
8	Agriculture plantation (Tea)					
9	Barrenrocky/Stonywaste/Sheetrock					
10	Built-up (Cities/Town/Villages)	208.01	18.63	157.06	28.47	59.55
11	Cropland (Kharif)					
12	Doublecrop (Kharif+Rabi)	374.84	682.87	246.4	304.88	515.06
13	Fallow land					
14	Forest deciduous (Dense)					
15	Forest deciduous (scrub/degrade)	6.28				
16	Forest evergreen (Dense)					
17	Forest evergreen (Open)					
18	Forest mangroves (Littoral Swamp)					
19	Forest plantations					
20	Grass land					
21	Land with scrub	123.84	28.05			
22	Land without scrub					
23	Mining/Industrial waste					
24	River/Waterbodies		1.98	164.73	50.46	12.98
25	Sandy area				14.66	12.14
26	Wetlands (Waterlogged)		171.78			
	Panchayat Total	2135.28	2279.39	1721.52	1423.68	1862.43
	Block Total	9422.30				

Table: 11.11

PONNANI BLOCK**(Area in Ha)**

Sl. No.	Land Use	Edappal	Kaladi	Thavanur	Vattomkulam
1	Agriculture plantation (Arecanut)	21.65	0.23	11.85	
2	Agriculture plantation (Banana)			26.96	
3	Agriculture plantation (Cashew)				
4	Agriculture plantation (Coconut)		166.79	123.67	
5	Agriculture plantation (Mixed)	900.15	629.15	1023.5	1211.47
6	Agriculture plantation (Pepper)				
7	Agriculture plantation (Rubber)		3.16	18.72	23.75
8	Agriculture plantation (Tea)				
9	Barrenrocky/Stonywaste/Sheetrock				13.16
10	Built-up (Cities/Town/Villages)	32.27	71.62	110.82	212.94
11	Cropland (Kharif)				
12	Doublecrop (Kharif+Rabi)	547.44	464.69	756.87	666.57
13	Fallow land				
14	Forest deciduous (Dense)				
15	Forest deciduous (scrub/degrade)				
16	Forest evergreen (Dense)				
17	Forest evergreen (Open)				
18	Forest mangroves (Littoral Swamp)	26.7			
19	Forest plantations				
20	Grass land				
21	Land with scrub		17.08	69.8	85.54
22	Land without scrub				
23	Mining/Industrial waste				
24	River/Waterbodies	6.25	24.62	76.85	3.22
25	Sandy area		56.7	265.39	
26	Wetlands (Waterlogged)	127.03	119.73	15.86	0.29
	Panchayat Total	1661.49	1553.77	2500.29	2216.94
	Block Total	7932.49			

Table: 11.12

TANUR BLOCK

(Area in Ha)

Sl. No.	Land Use	Cheriyamundam	Niramaruthur	Ozhur	Perumannaclari	Ponmundam	Tanur	Thanalur	Valavannur
1	Agriculture plantation (Areca nut)			49.32				32.38	
2	Agriculture plantation (Banana)			30.44			17.14		
3	Agriculture plantation (Cashew)								
4	Agriculture plantation (Coconut)	16.43	427.27				952.47	687.67	
5	Agriculture plantation (Mixed)	852.98	231.84	1147.68	913.91	739.73	685.93	411.44	1168.1
6	Agriculture plantation (Pepper)								
7	Agriculture plantation (Rubber)				23.07				1.73
8	Agriculture plantation (Tea)								
9	Barrenrocky/Stonywaste/Sheetrock				7.72	6.24			6.16
10	Built-up (Cities/Town/Villages)	5.02	10.04	0.25	4.41	15.4	33.16	27.92	13.81
11	Cropland (Kharif)								
12	Doublecrop (Kharif+Rabi)	270.19	167.97	371.3	134.31	112.75	188.8	411.93	306.69
13	Fallow land								
14	Forest deciduous (Dense)								
15	Forest deciduous (scrub/degrade)								
16	Forest evergreen (Dense)								
17	Forest evergreen (Open)								
18	Forest mangroves (Littoral Swamp)						7.68	10.76	
19	Forest plantations								
20	Grass land								
21	Land with scrub	12.23		31.48	85.99	10.12		1.88	24.52
22	Land without scrub								
23	Mining/Industrial waste								
24	River/Waterbodies	10.38							
25	Sandy area		115.31				171.66	40.12	
26	Wetlands (Waterlogged)			2.65					
	Panchayat Total	1167.23	952.43	1633.12	1169.41	884.24	2056.84	1624.10	1521.01
	Block Total				11008.38				

Table: 11.13

TIRURANGADI BLOCK

(Area in Ha)

[illegible]

Table: 11.14

TIRUR BLOCK

(Area in Ha)

Sl. No.	Land Use	Mangalam	Purathur	Thalakkad	Thirunavaya	Thriprangode	Vettom
1	Agriculture plantation (Arecanut)				45.09	5.49	
2	Agriculture plantation (Banana)	71.2	19.01		121.13	14.75	
3	Agriculture plantation (Cashew)			46.55			
4	Agriculture plantation (Coconut)	428.83	284.08	47.94		80.64	942.64
5	Agriculture plantation (Mixed)	430.04	634.5	806	1199.2	997.42	114.57
6	Agriculture plantation (Pepper)						
7	Agriculture plantation (Rubber)				6.45	0.04	
8	Agriculture plantation (Tea)						
9	Barrenrocky/Stonywaste/Sheetrock						
10	Built-up (Cities/Town/Villages)	22.53	133.41	28.58	9.94	47.98	91.63
11	Cropland (Kharif)						
12	Doublecrop (Kharif+Rabi)	128.68	219.23	657.03	387.41	627.77	240.99
13	Fallow land						
14	Forest deciduous (Dense)						
15	Forest deciduous (scrub/degrade)						
16	Forest evergreen (Dense)						
17	Forest evergreen (Open)						
18	Forest mangroves (Littoral Swamp)						62.41
19	Forest plantations						
20	Grass land						
21	Land with scrub	10.37	1.14		30.41		
22	Land without scrub						
23	Mining/Industrial waste						
24	River/Waterbodies	79.83	397.48	39.76	43	101.14	93.91
25	Sandy area	53.75	219.42		90.15	111.87	82.84
26	Wetlands (Waterlogged)	15.62			45.7		16.68
	Panchayat Total	1240.85	1908.27	1625.86	1978.48	1987.1	1645.67
	Block Total	10386.23					

Table: 11.15

VENGARA BLOCK

(Area in Ha)

[illegible]

Table: 11.16

WANDOOR BLOCK**(Area in Ha)**

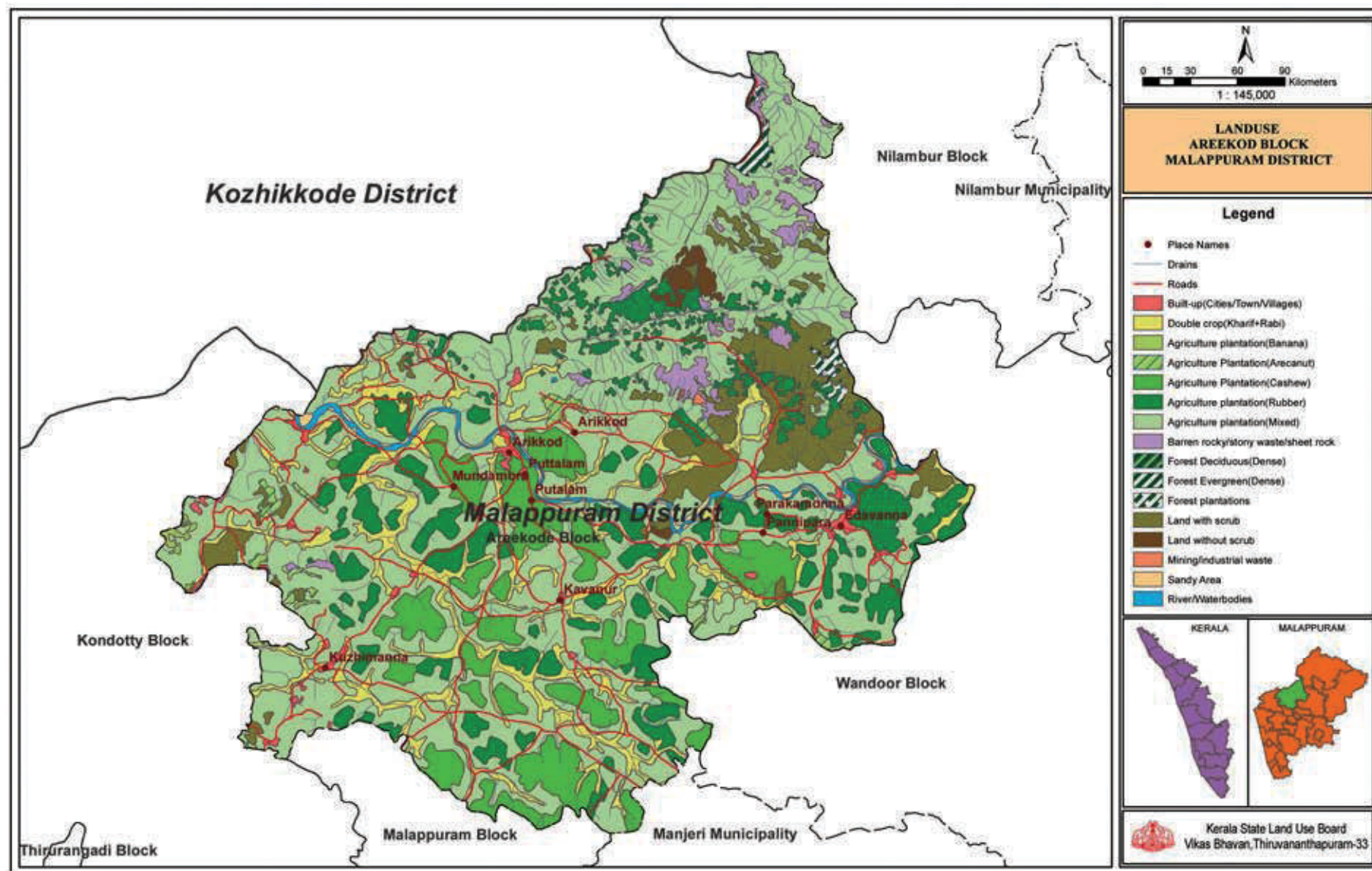
Sl. No.	Land Use	Mambad	Pandikkad	Porur	Thiruvalli	Thrikkalangode	Wandoor
1	Agriculture plantation (Arecanut)				20.81	135.41	25.81
2	Agriculture plantation (Banana)						
3	Agriculture plantation (Cashew)	252.4		68.16	103.61	448.32	100.3
4	Agriculture plantation (Coconut)						
5	Agriculture plantation (Mixed)	1470.56	3781.4	1677.16	1996.7	2271.26	1333.06
6	Agriculture plantation (Pepper)						
7	Agriculture plantation (Rubber)	773.26	1025.75	669.56	565.67	1648.69	987.57
8	Agriculture plantation (Tea)						
9	Barrenrocky/Stonywaste/Sheetrock					9.69	17.4
10	Built-up (Cities/Town/Villages)	33.79	52.48	6.67	23.98	37.66	50.02
11	Cropland (Kharif)				25.97		
12	Doublecrop (Kharif+Rabi)	841.36	665.64	584.52	332.07	588.97	690.69
13	Fallow land		2.48		67.26	49.52	
14	Forest deciduous (Dense)						
15	Forest deciduous (scrub/degrade)						
16	Forest evergreen (Dense)						
17	Forest evergreen (Open)						
18	Forest mangroves (Littoral Swamp)						
19	Forest plantations	132.55					0.53
20	Grass land						
21	Land with scrub	584.66	182.18	351.14	92.69	855.53	92.93
22	Land without scrub						
23	Mining/Industrial waste						
24	River/Waterbodies	106.53	43.44				28.9
25	Sandy area	45.01					
26	Wetlands (Waterlogged)						
	Panchayat Total	4240.12	5753.37	3357.21	3228.76	6045.05	3327.21
	Block Total	25951.72					

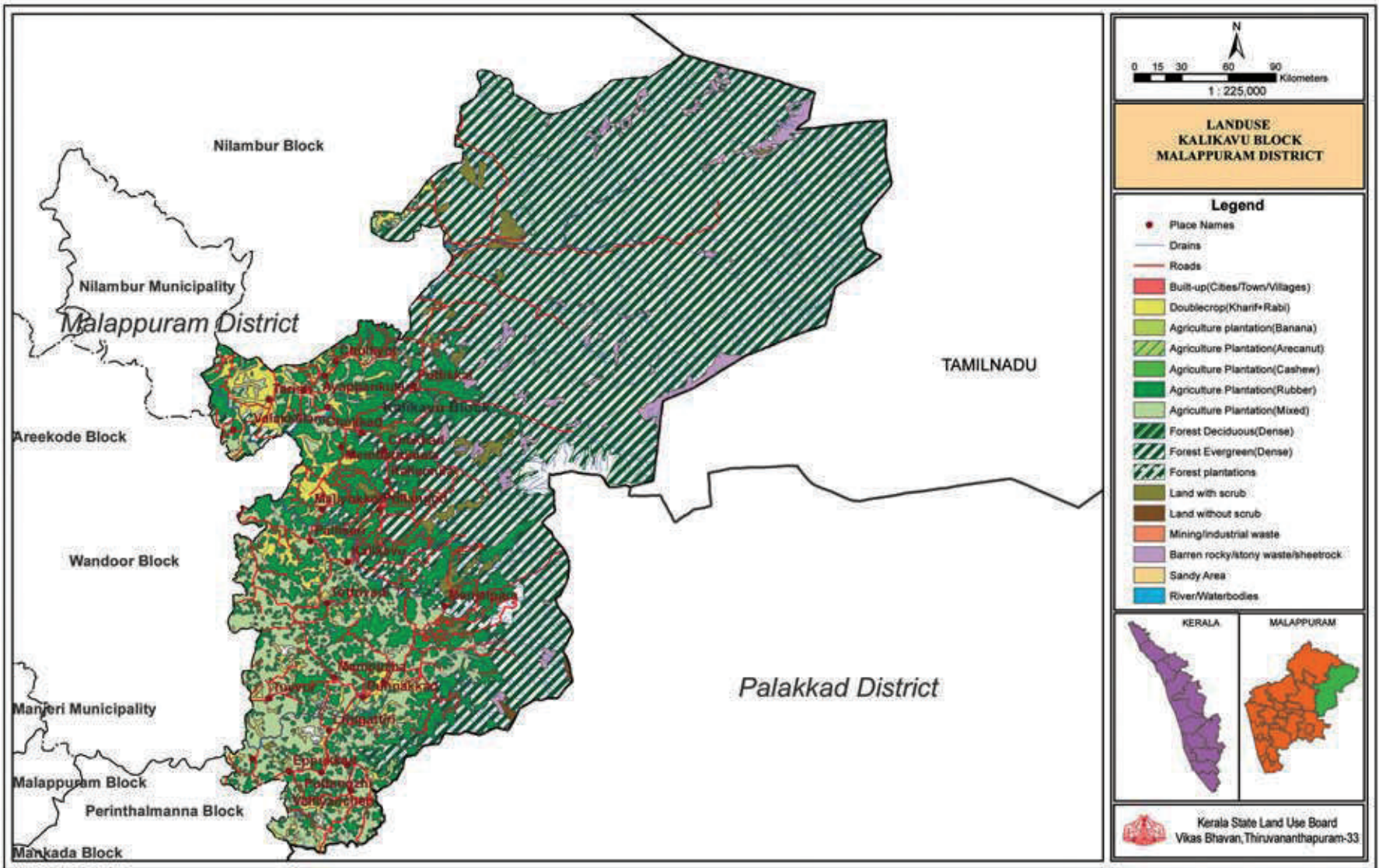
Table: 11.17

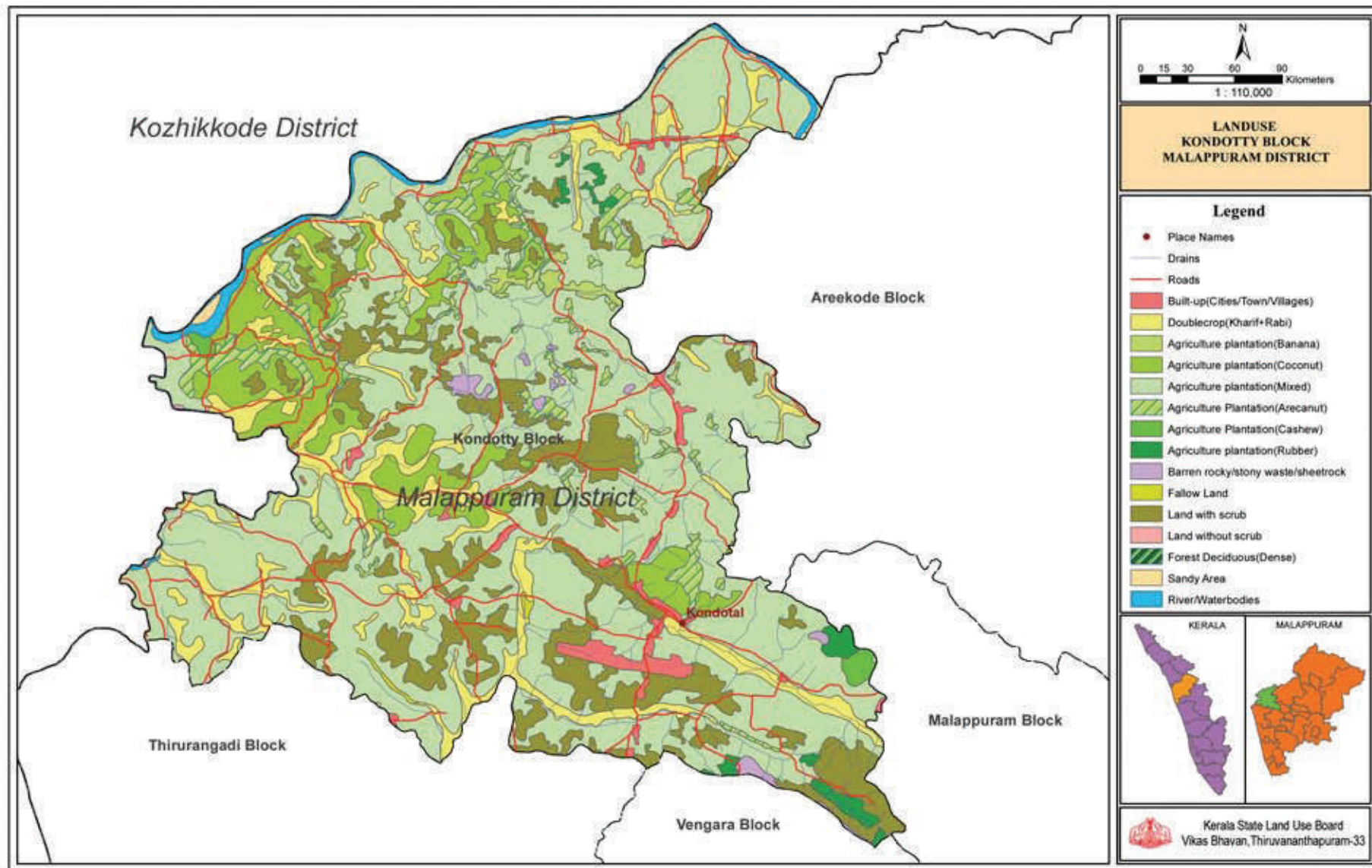
MUNICIPALITY

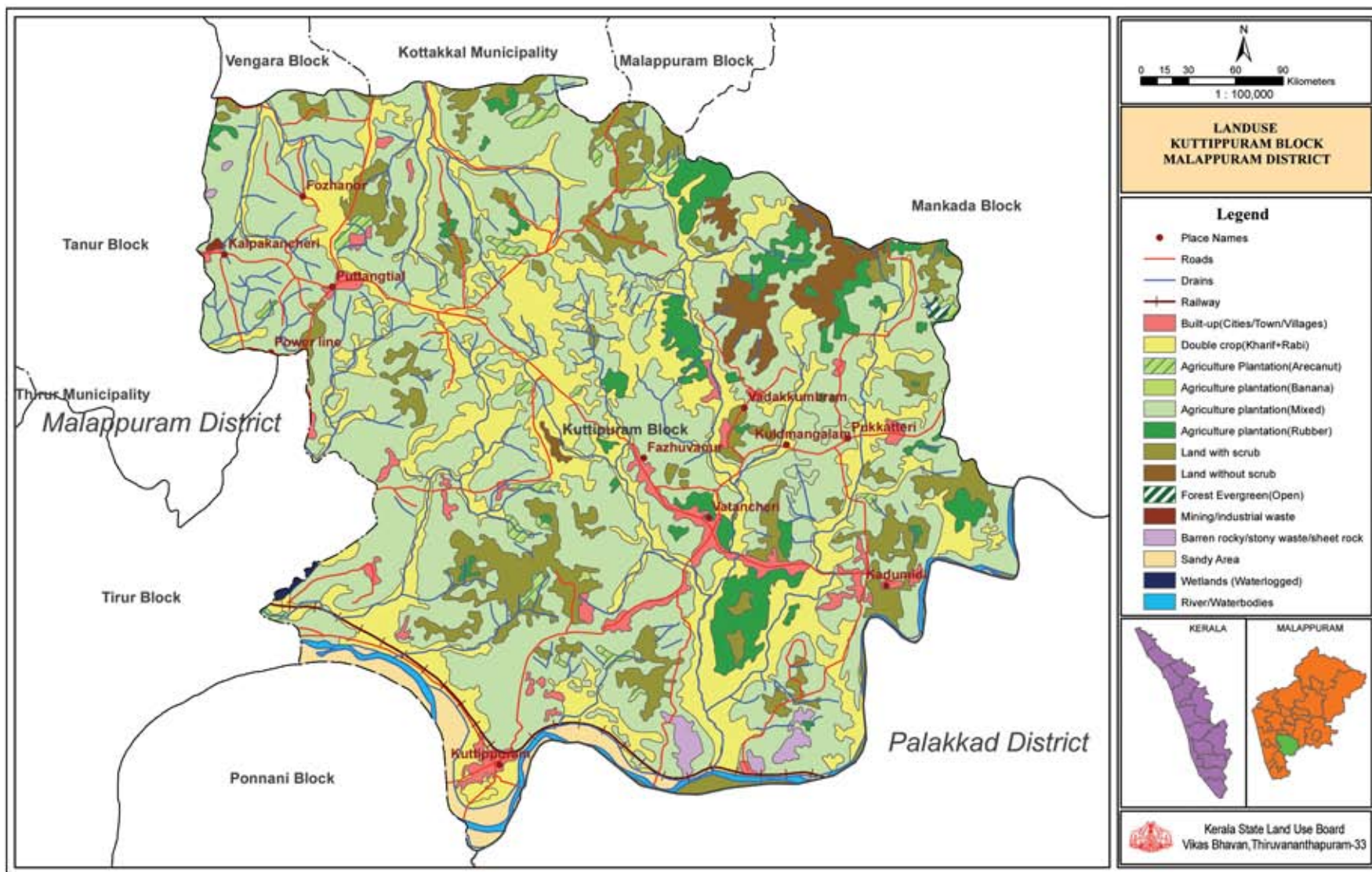
(Area in Ha)

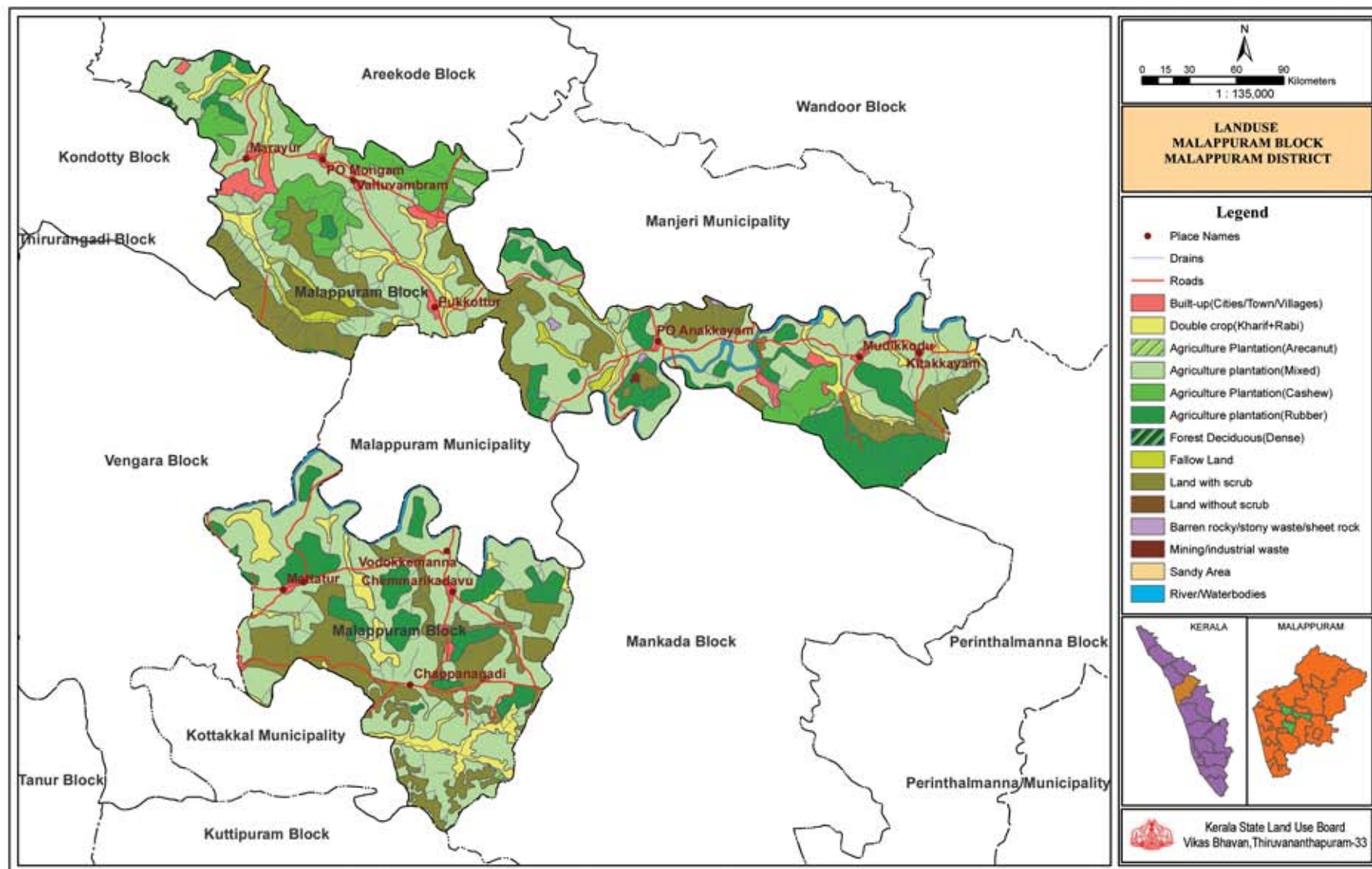
Sl. No.	Land Use	Malappuram Municipality	Manjeri Municipality	Perinthalmanna Municipality	Ponnani Municipality	Tirur Municipality	Nilambur Municipality	Kottakkal Municipality
1	Agriculture plantation (Arecanut)	36.78						5.91
2	Agriculture plantation (Banana)			24.32	52.92			
3	Agriculture plantation (Cashew)	49.19	117.17	12.93		24.97		
4	Agriculture plantation (Coconut)				1386.25	536.4	12.47	
5	Agriculture plantation (Mixed)	1546.24	2754.44	1440.58	70.57	584.4	1414.08	1036.79
6	Agriculture plantation (Pepper)			22.88				
7	Agriculture plantation (Rubber)	438.95	867.13	421.37			1748.66	59.72
8	Agriculture plantation (Tea)							
9	Barrenrocky/Stonywaste/Sheetrock		28.53	9.02			37.64	1.21
10	Built-up (Cities/Town/Villages)	250.55	30.21	275.38	239.69	103.62	76.74	70.48
11	Cropland (Kharif)							
12	Doublecrop (Kharif+Rabi)	151	403.36	751.39	348.57	378.85	1713.31	286.94
13	Fallow land		63.3					
14	Forest deciduous (Dense)						3.67	
15	Forest deciduous (scrub/degrade)			37.94				
16	Forest evergreen (Dense)							
17	Forest evergreen (Open)							
18	Forest mangroves (Littoral Swamp)				24.97			
19	Forest plantations			493.55			74.37	
20	Grass land							
21	Land with scrub	740.57	974.26	274.34	2.55		1100.42	601.29
22	Land without scrub			18.87				
23	Mining/Industrial waste							5.30
24	River/Waterbodies	80.07	14.91		226.92	48.99	179.52	
25	Sandy area		1.16		165.2			
26	Wetlands (Waterlogged)				12.94			
	Municipality Total	3293.35	5254.47	3782.57	2530.58	1677.23	6360.88	2067.64

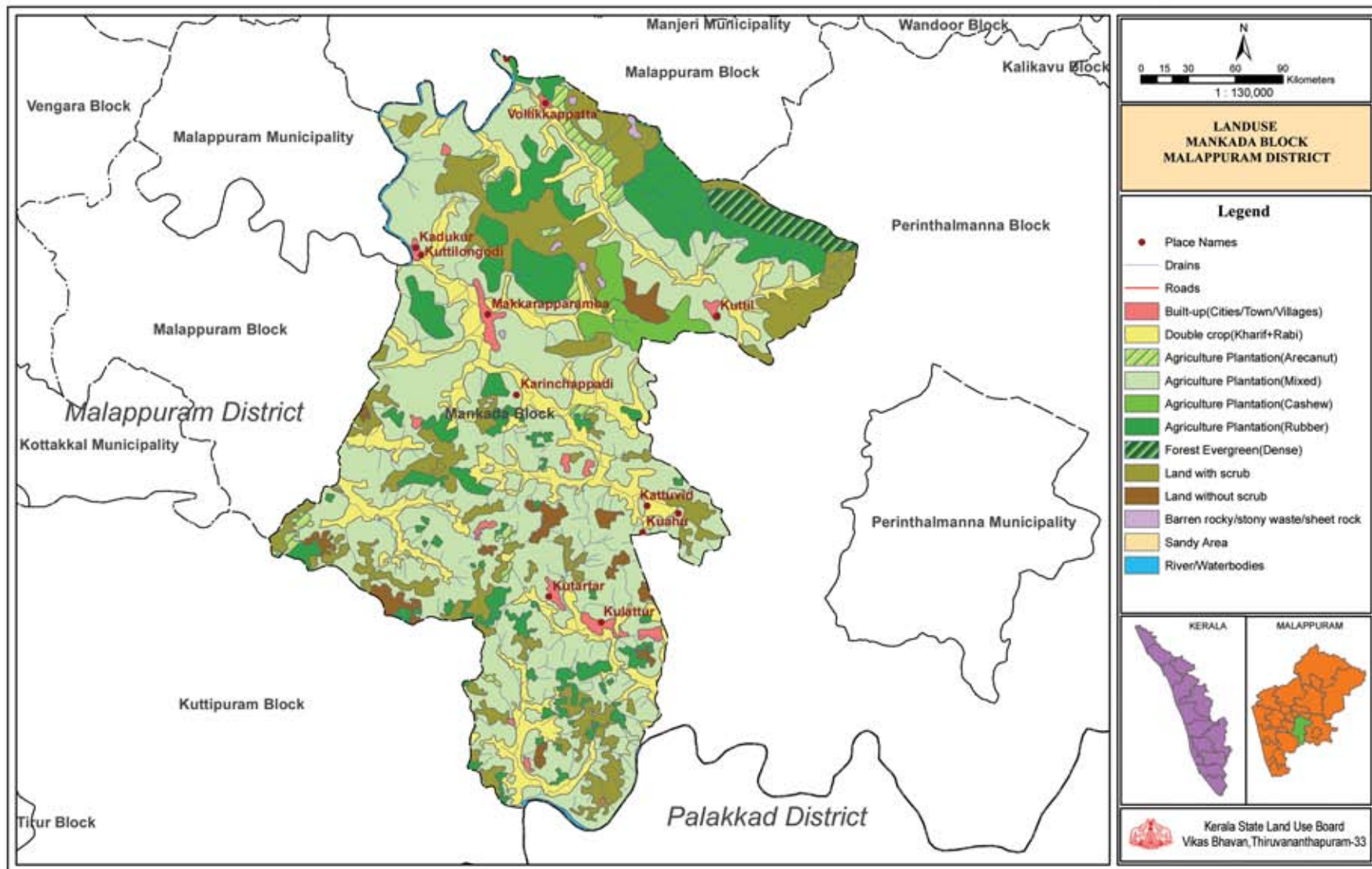


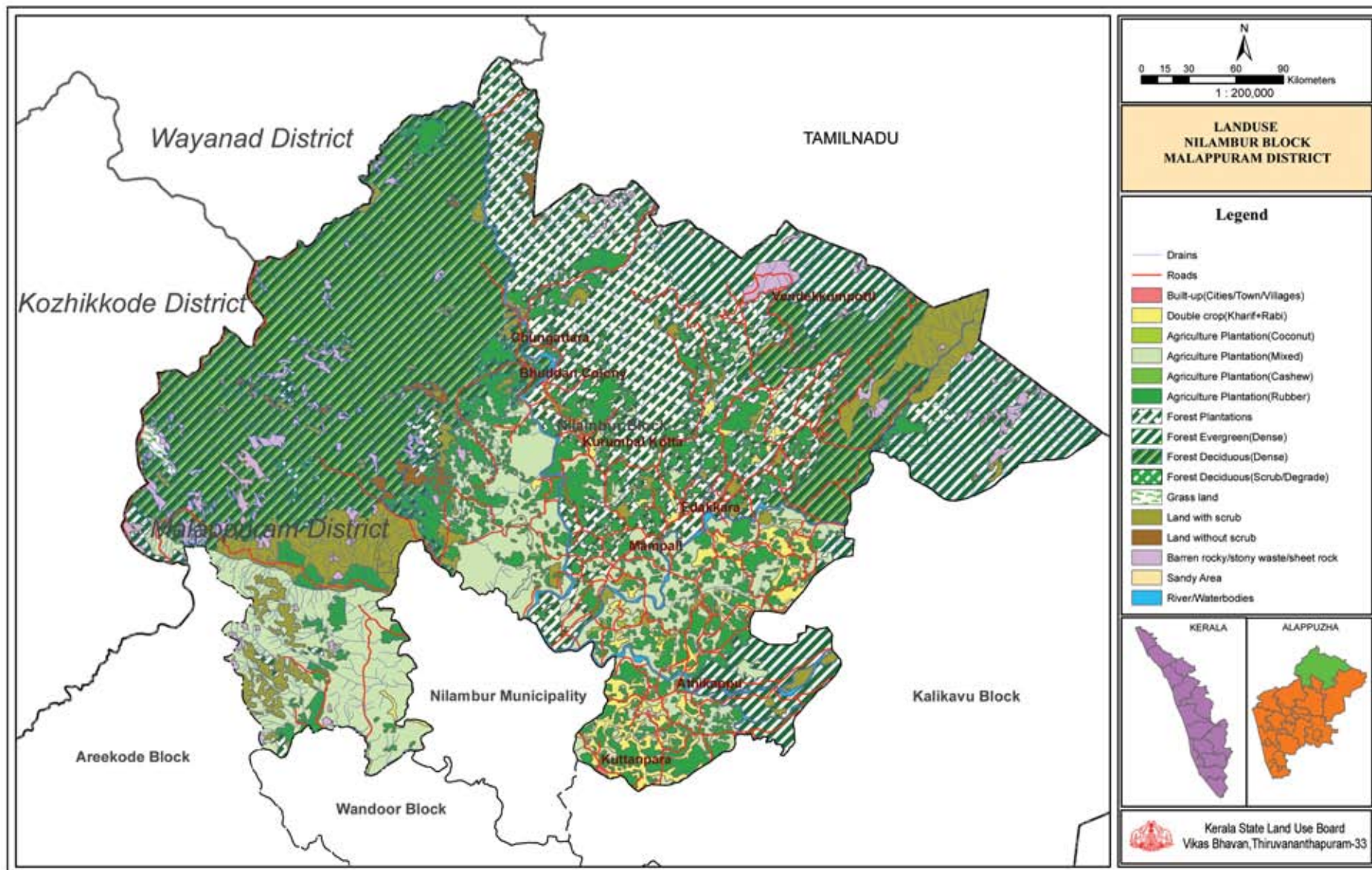


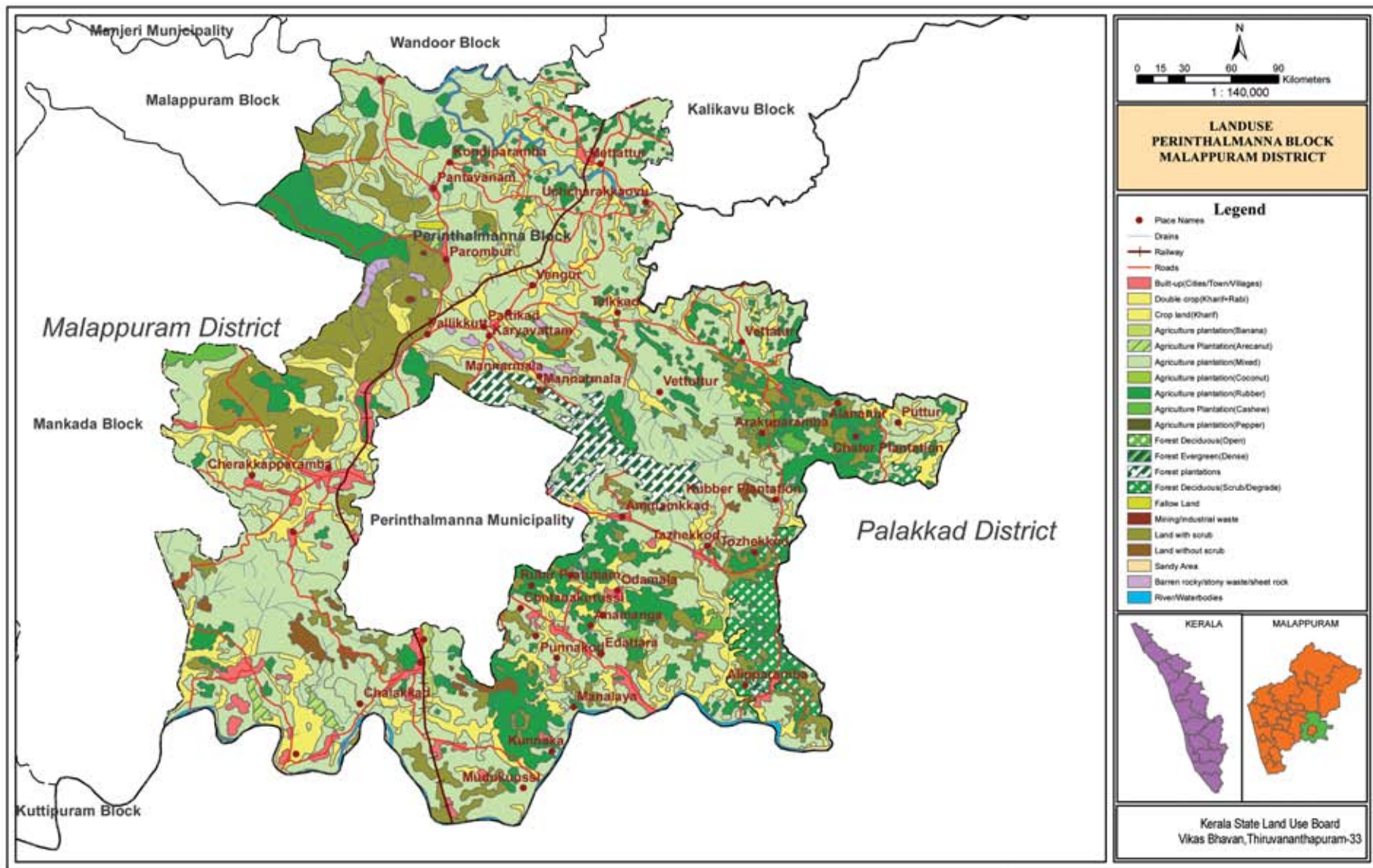


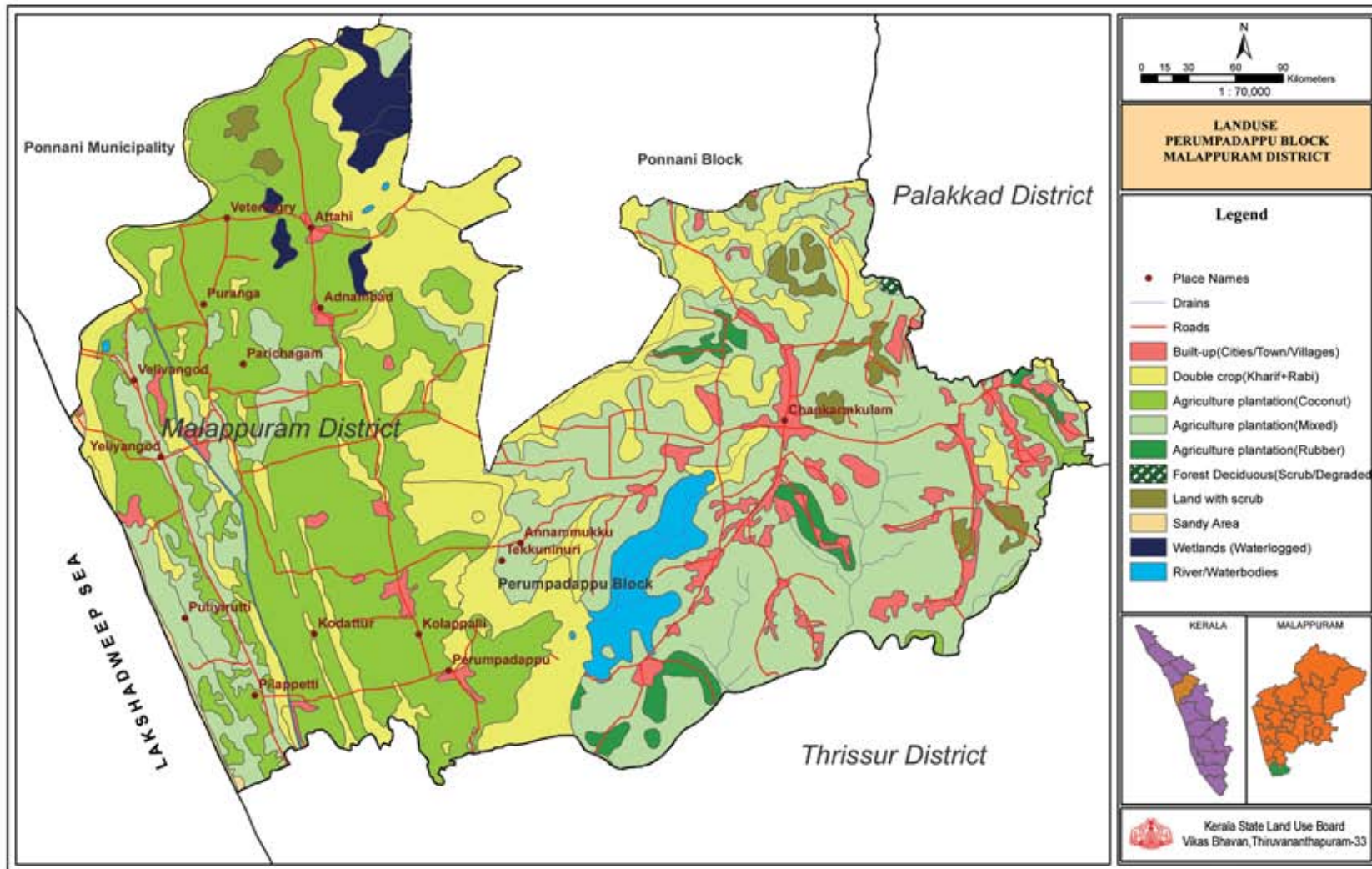


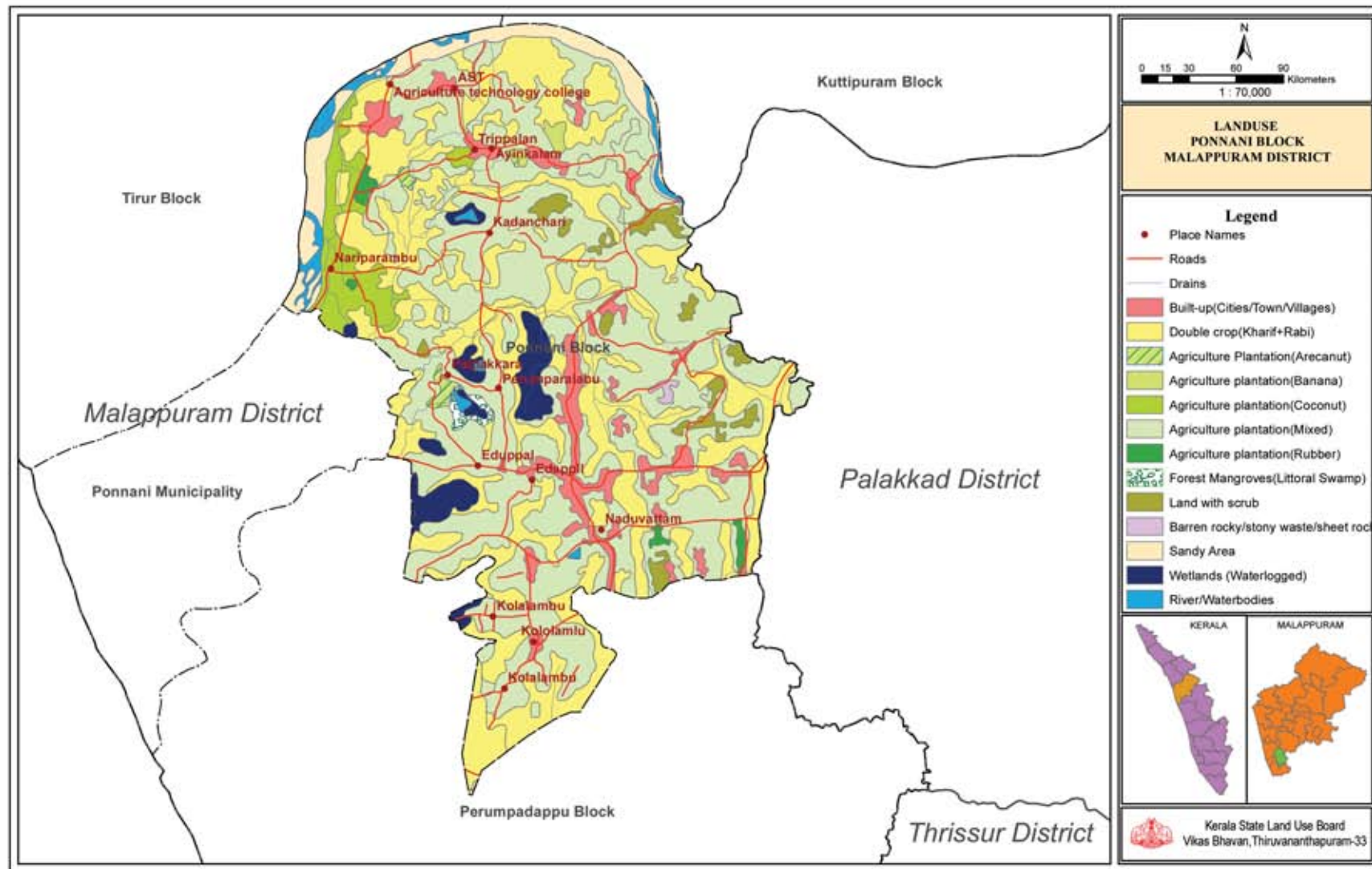


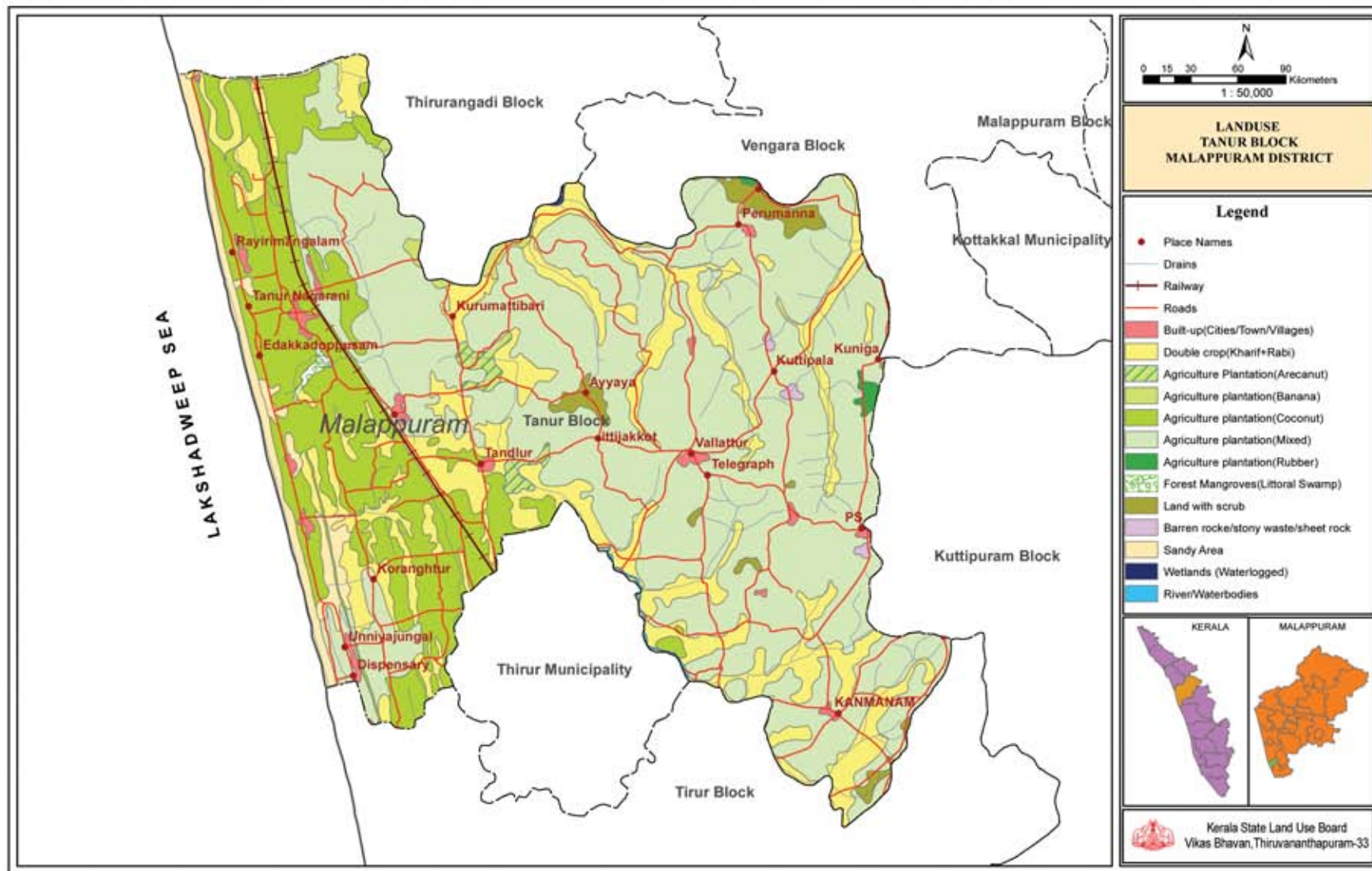


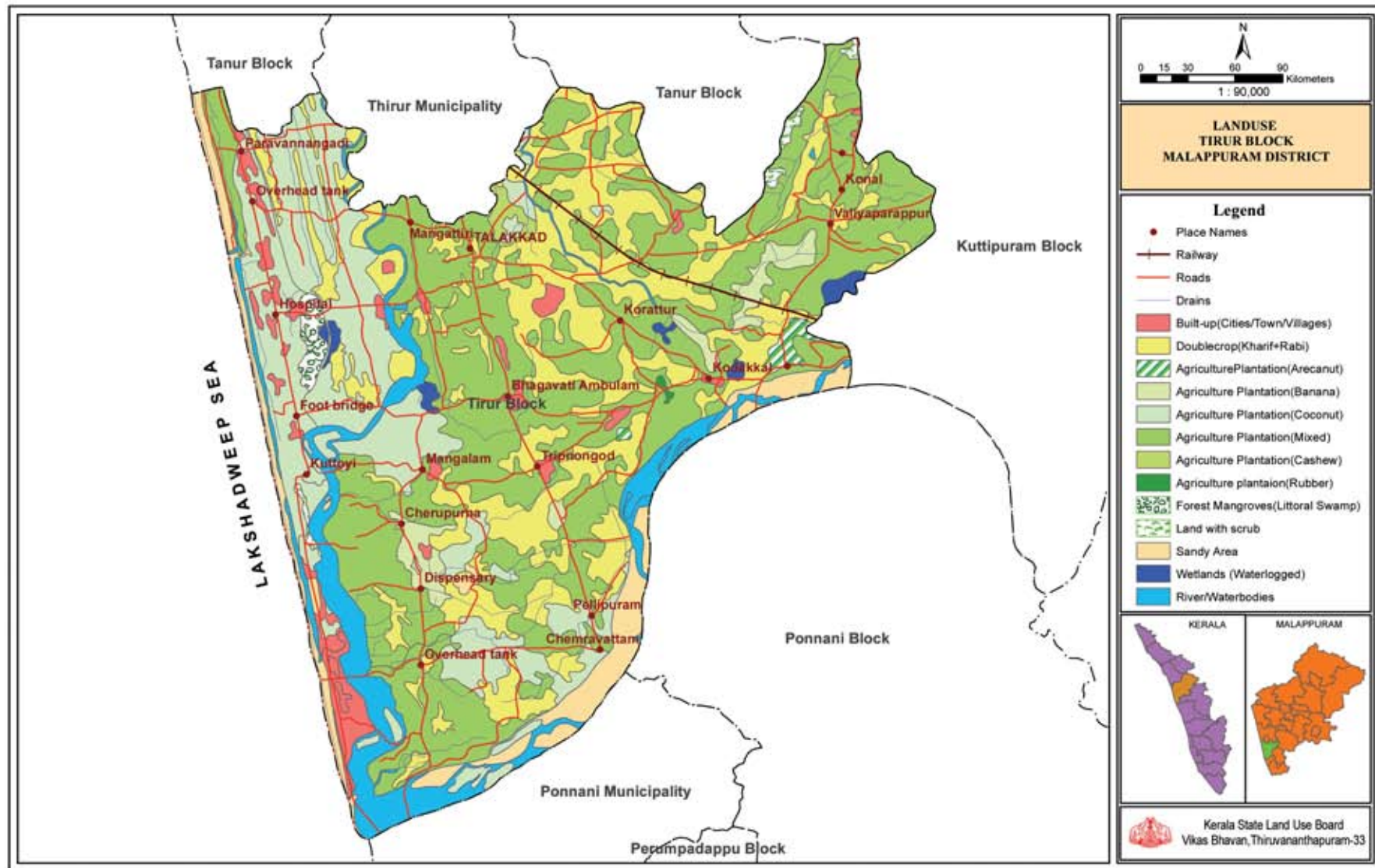


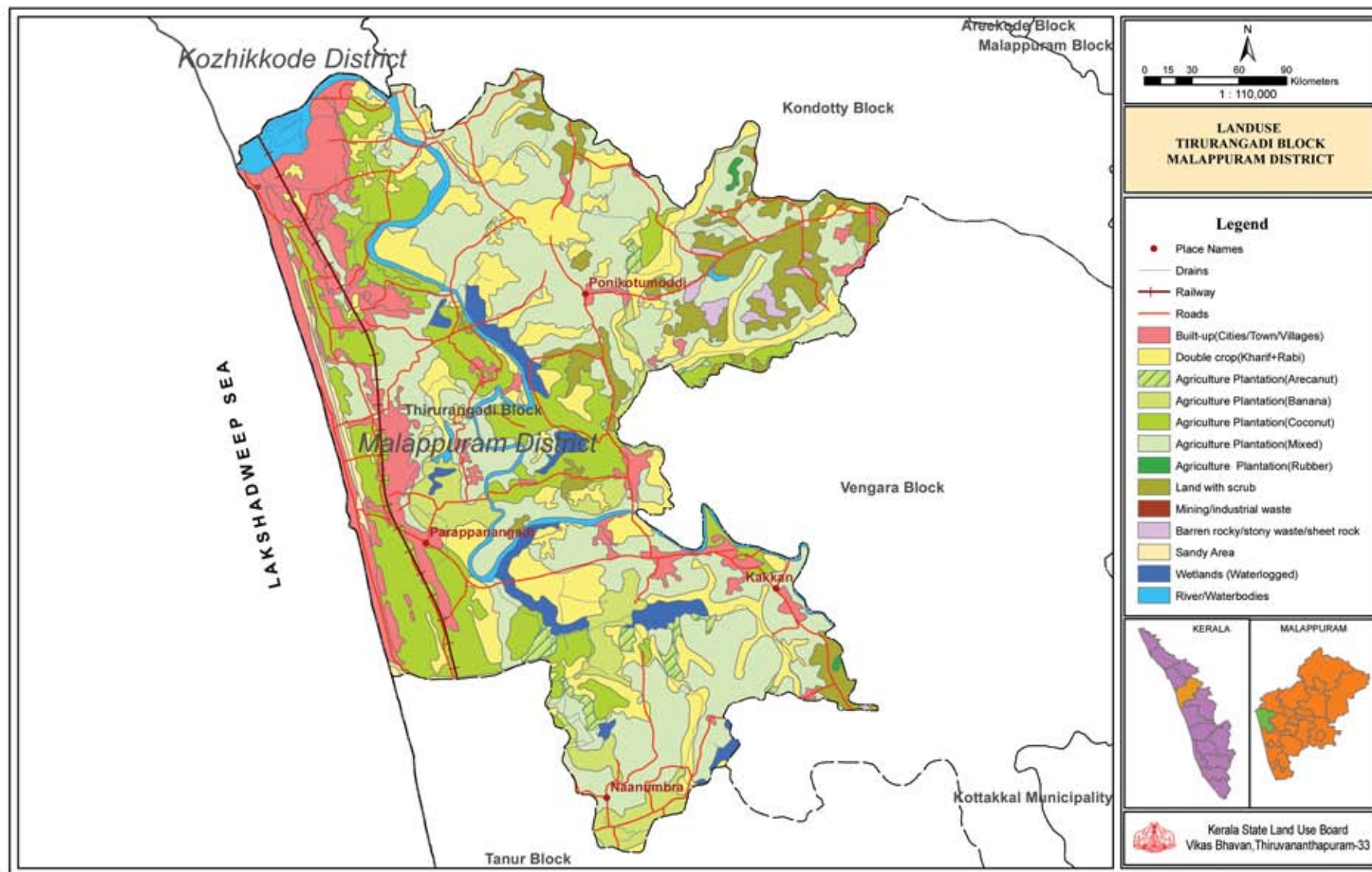


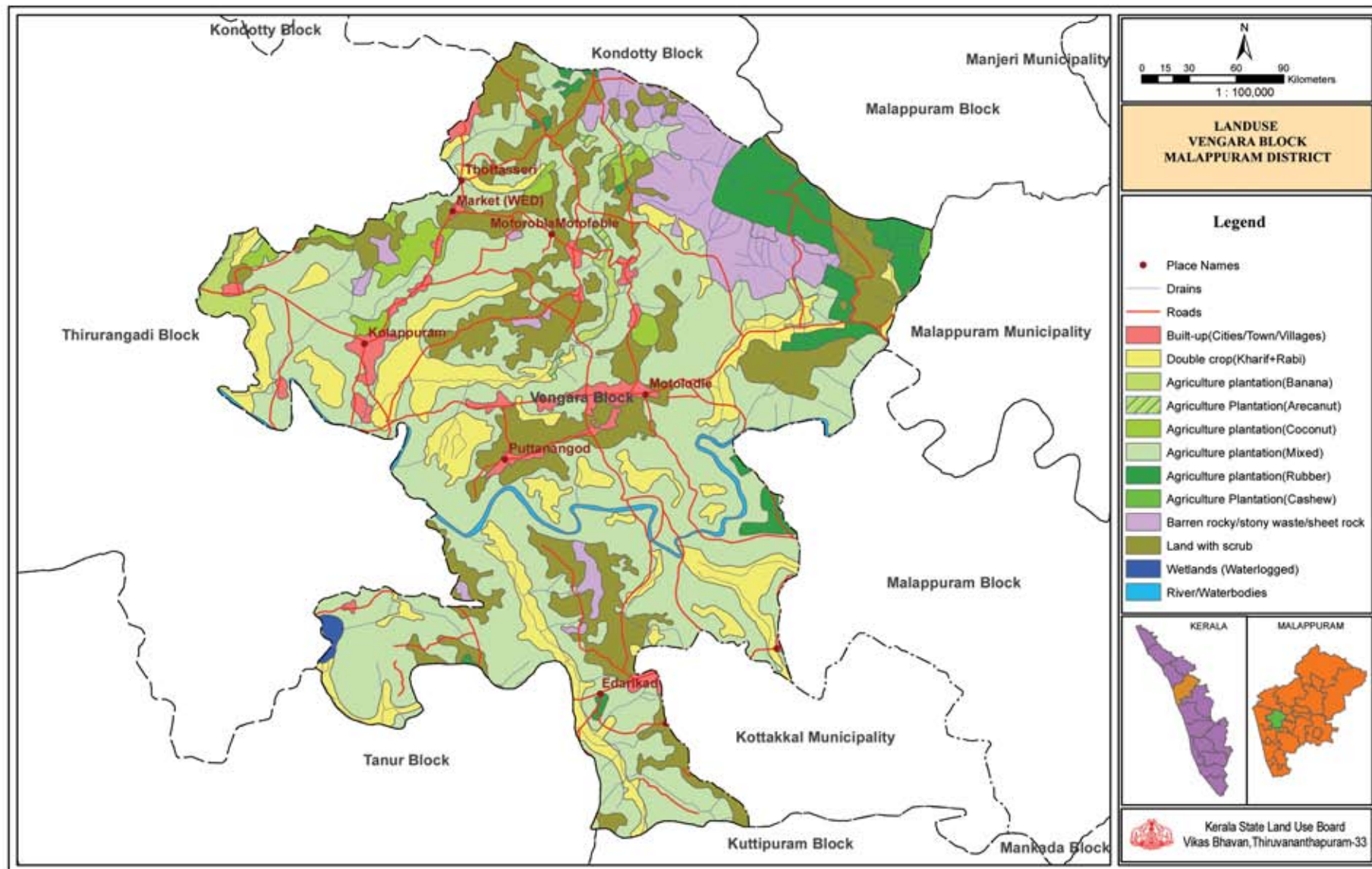


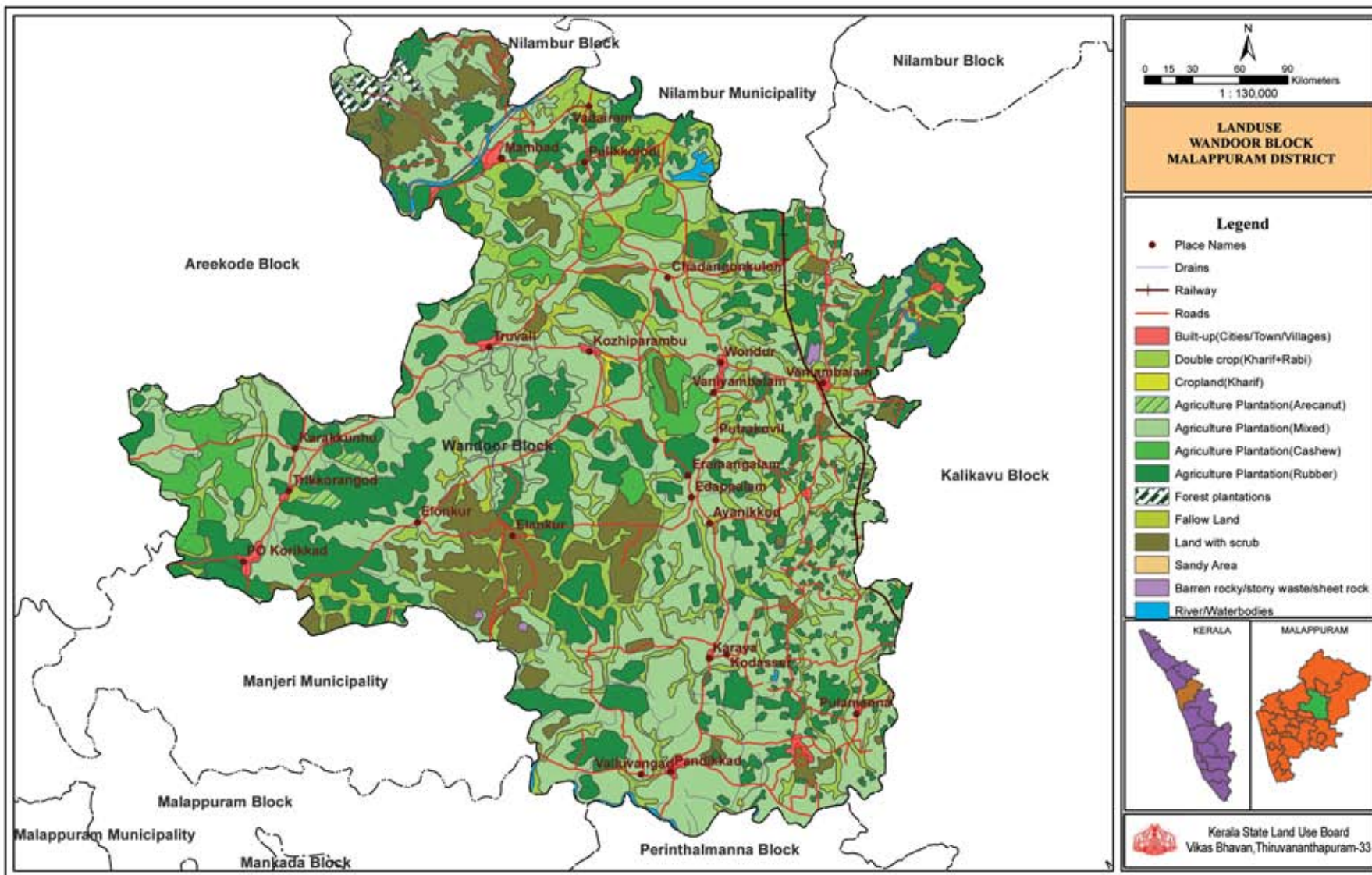


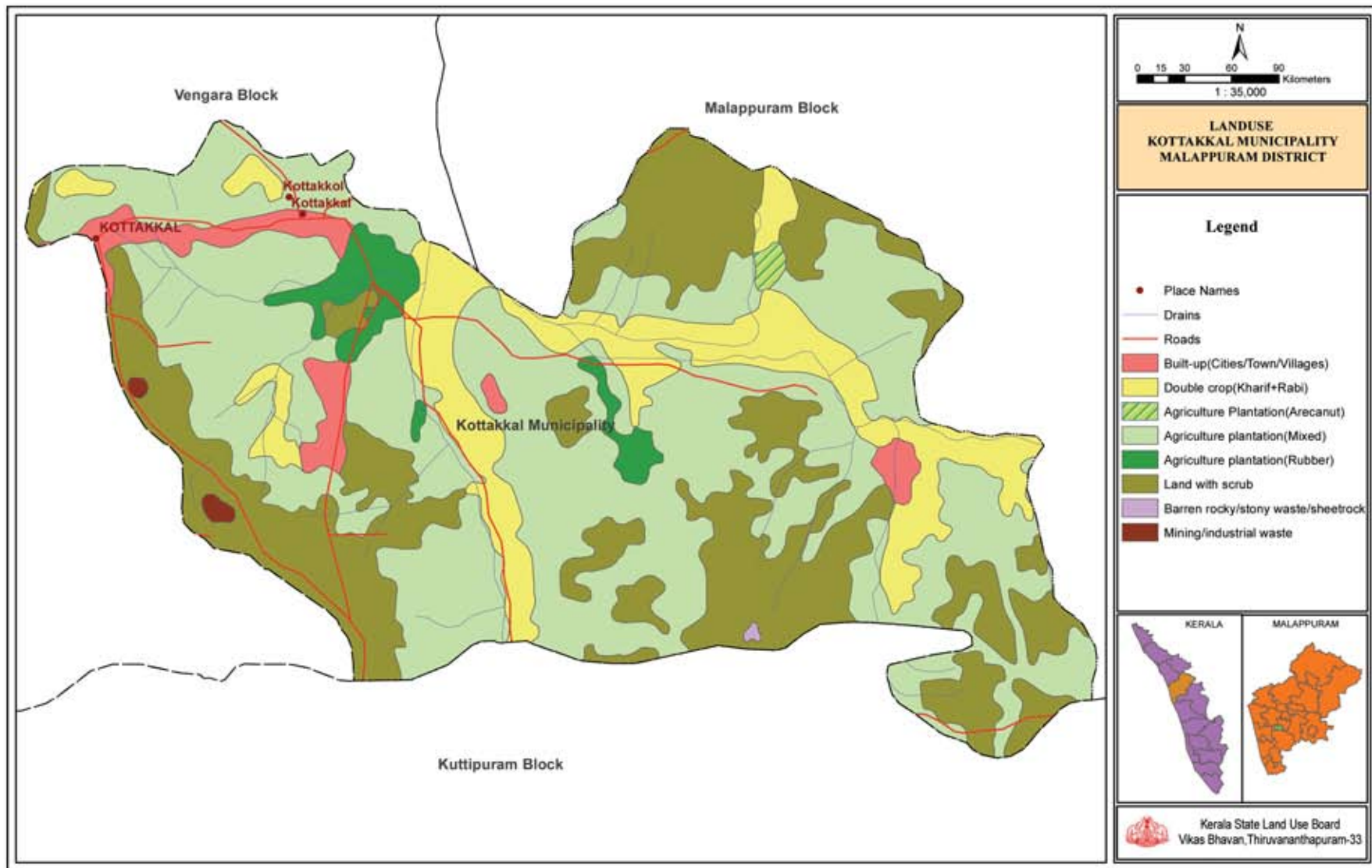


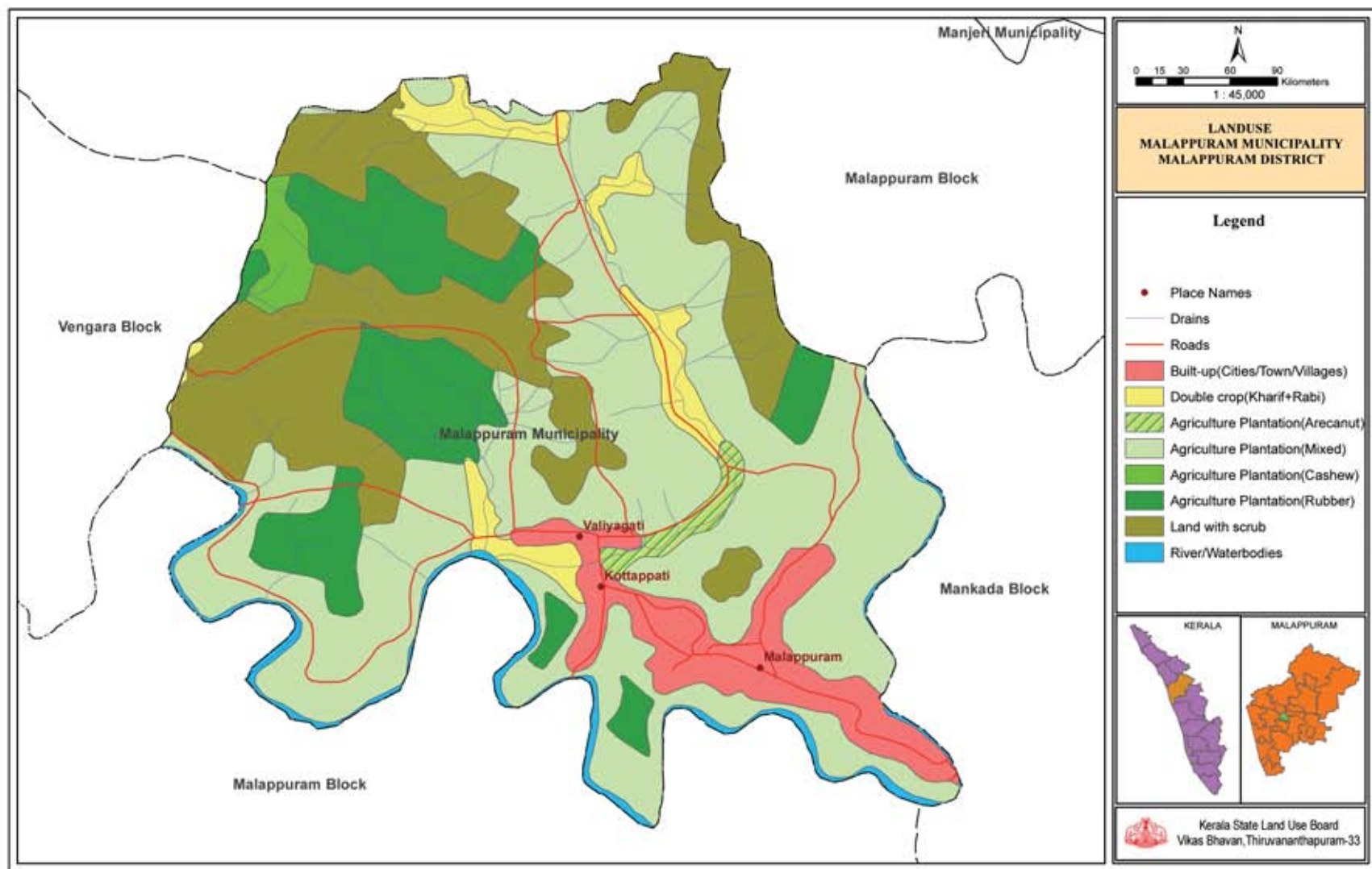


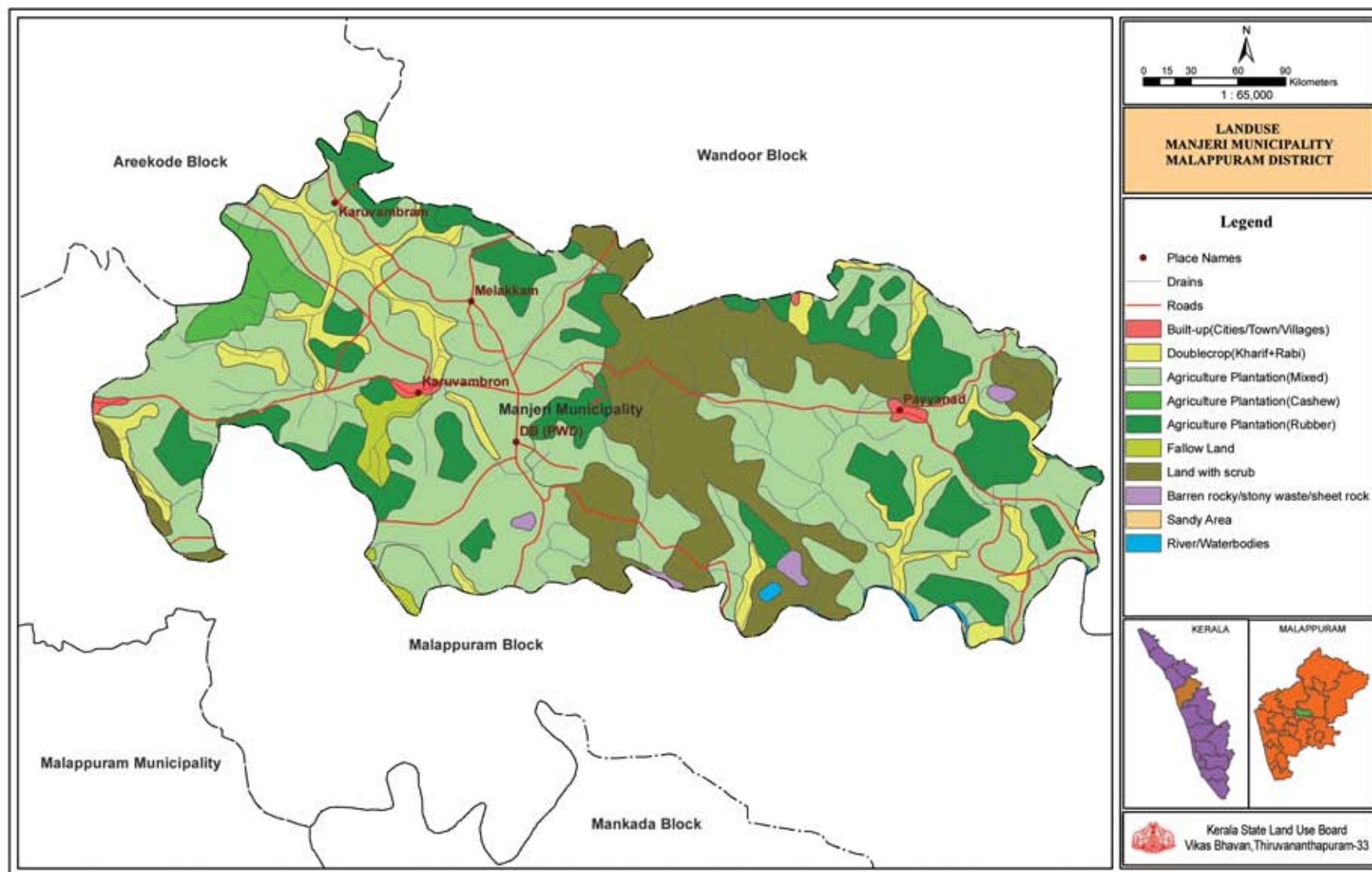


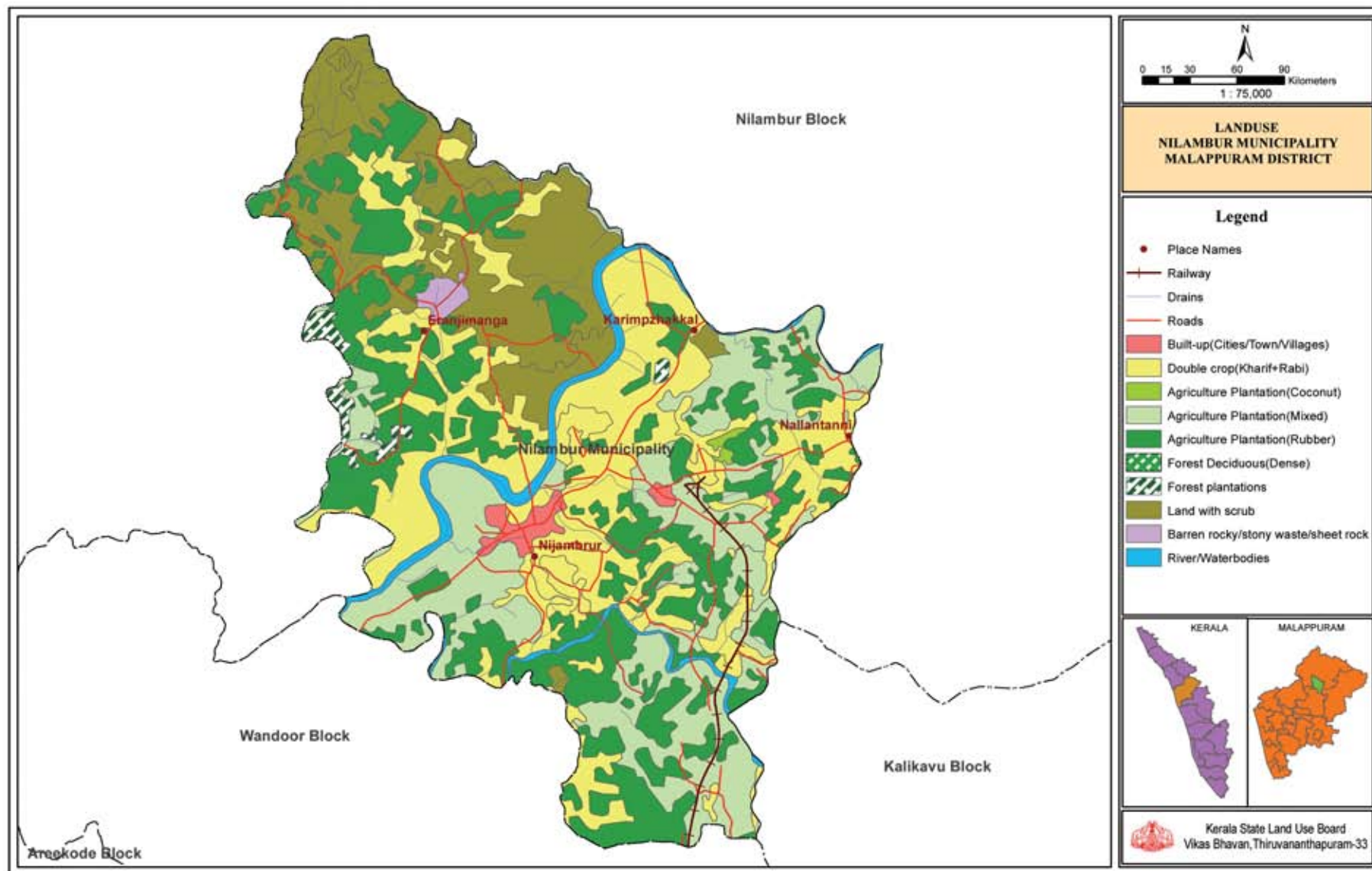


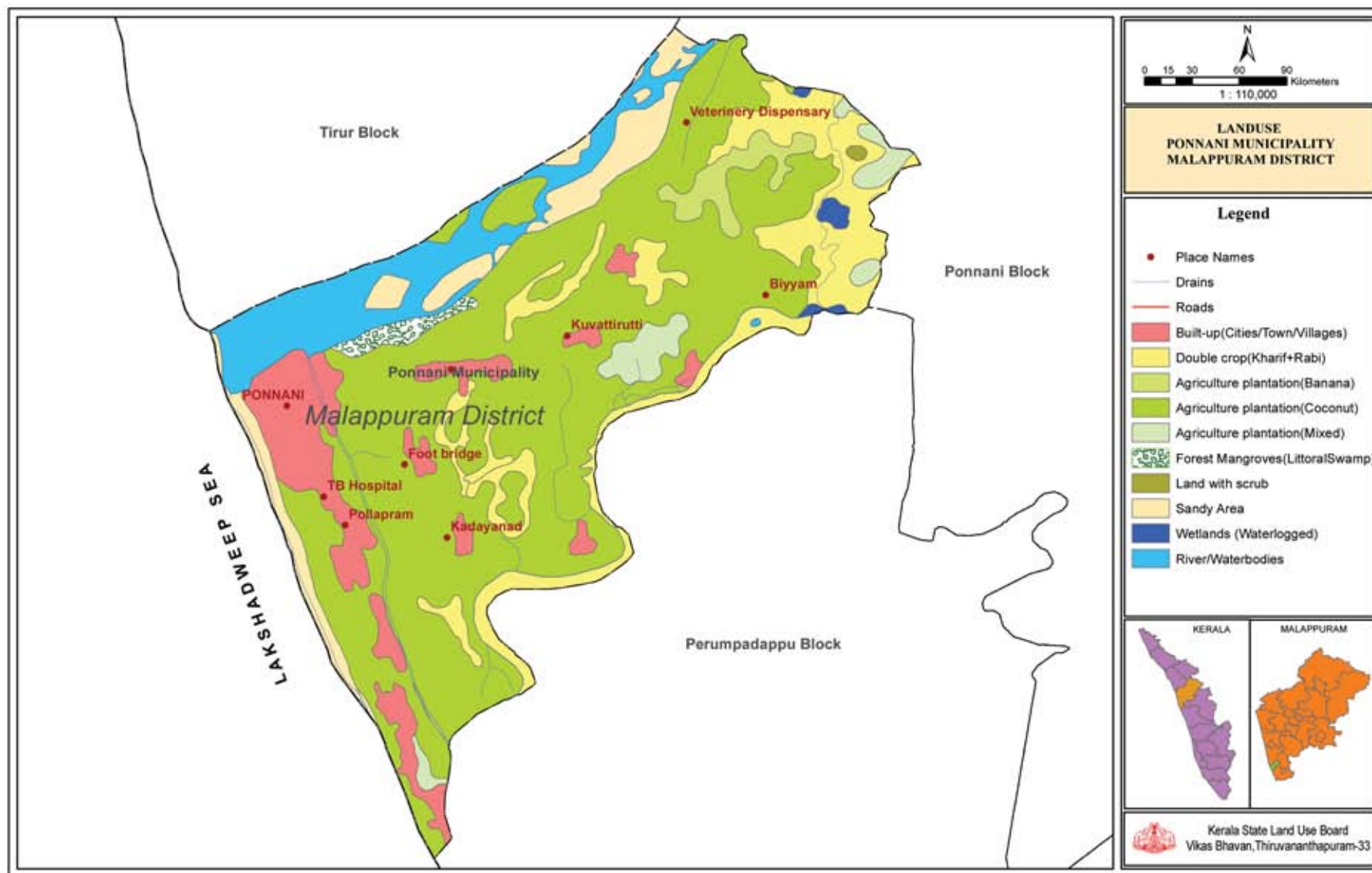


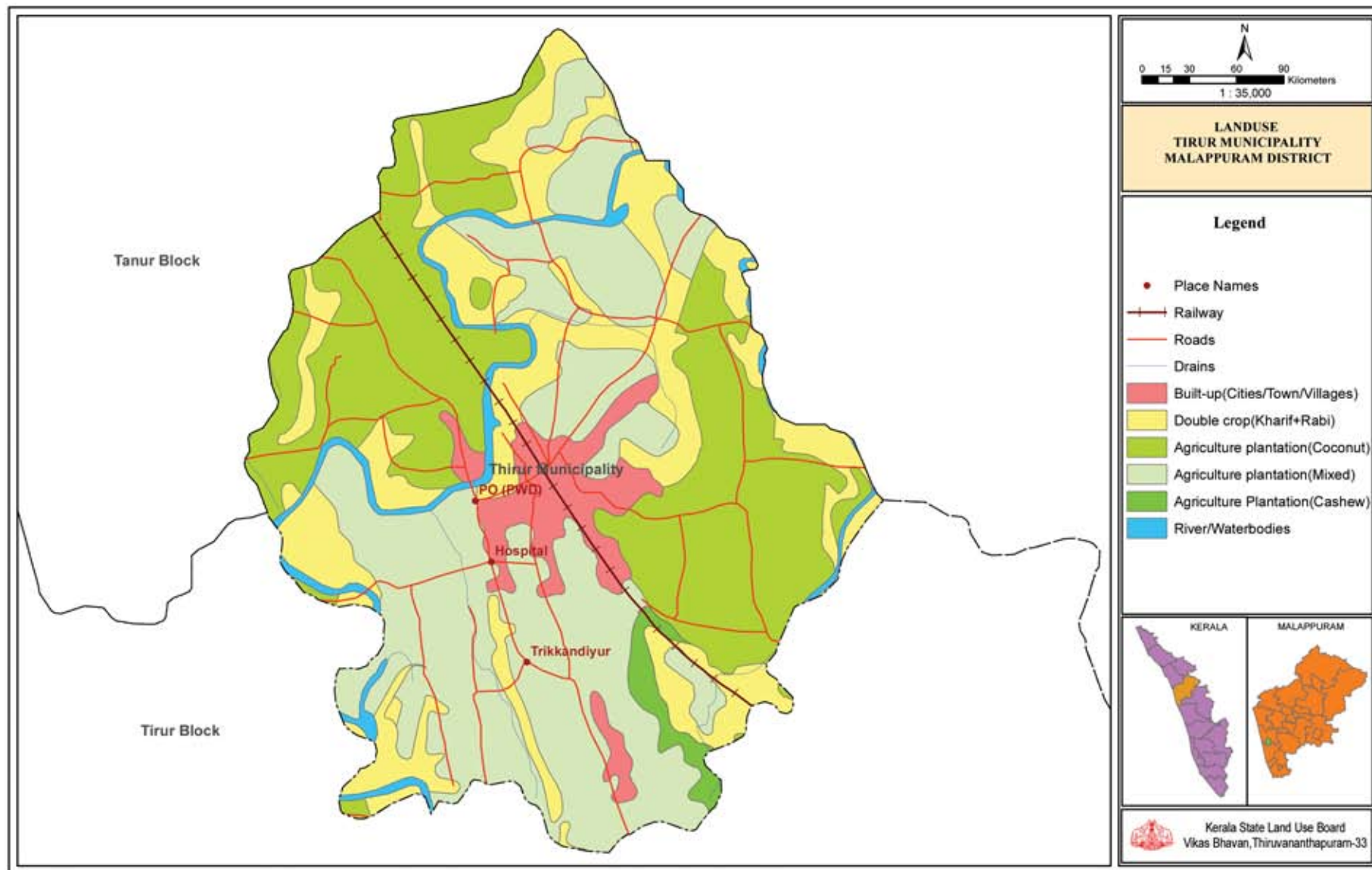












BIODIVERSITY

Biodiversity refers to the variety and variability of life on earth. It is the variety of all living organisms including all species. Biodiversity is expressed at three levels on earth viz., genetic diversity, species diversity and ecosystem diversity. Its direct and indirect services are crucial for the subsistence of life on earth. Biodiversity ensures food, fuel, shelter, medicines and other resources vital for our survival. Most of the crop pests are controlled by a variety of other organisms including insects, birds and fungi which are certainly superior natural pesticides than their chemical equivalents. Genetic diversity is the variety of genetic information contained in all individual plants, animals and micro organisms. Species diversity is the variety species on earth. Species diversity is usually a measure of the number of species and their relative abundances for a given area at a given point in time. Ecosystem diversity is the variety of habitats, biotic communities and ecological processes.

Western Ghats, one of the Biodiversity hot spot is lying along the length of Kerala. Almost a fourth of India's 10,000 plant species are found in the State. Among the 4,000 flowering plant species (1,272 of which are endemic to Kerala and 159 threatened) almost 900 species are of medicinal plants. Its 9,400 km² of forests include tropical wet evergreen and semi-evergreen forests (lower and middle elevations-3,470 km²), tropical moist and dry deciduous forests (mid-elevations-4,100 km² and 100 km² respectively), montane subtropical and temperate (shola) forests (highest elevations-100 km²). Altogether, 29% of Kerala is forested.

Table: 12.1

PLANT DIVERSITY

Sl.No.	Items	Nos.
1	Flowering plants	4000
2	Grass species	350
3	Bamboo species	15
4	Reeds species	9
5	Orchid species	214
6	Gymnosperms	4
7	Ferns and fern allies	200
8	Liverworts	200
9	Algae	231
10	Fungi	1044
11	Lichens	800

Table: 12.2

ANIMAL DIVERSITY

Sl.No.	Items	Nos.
1	Large and medium sized mammals	48
2	Birds species	475
3	Water Birds	101
4	Reptiles Genera	60
5	Lizard (endemic) species	30
6	Snake (endemic) species	57
7	Amphibian (endemic) species	87
8	Fresh water fish (endemic) species	84
9	Butterflies	313

Source: Economic Review

Table: 12.3

**WESTERN GHAT BLOCKS, GRAMA PANCHAYATS OF
MALAPPURAM DISTRICT**

Block	Panchayat
Kondotty	Chelambra
	Cherukavu
	Kondotty
	Nediyirippu
	Pallickal
	Pulickal
	Vazhakkad
	Vazhayur
Wandoor	Edavanna
	Karuvarakundu
	Mambad
	Pandikkad
	Porur
	Thiruvaly
	Thuvvoor
	Thrikkalangode
	Wandoor
Areekod	Areekod
	Cheekkoodu
	Kavanur
	Keezhuparambu
	Kuzhimanna
	Pulpatta
	Oorngattiri
Malappuram	Anakkayam
	Kottakkal
	Morayur
	Oorakam
	Ponmala
	Pookkottur
Nilambur	Vazhikkadavu
	Kalikavu
	Chokkad
	Amarambalam
	Nilambur
	Karulai
	Chungathara
	Edakkara
	Muthedam
	Pothukallu
	Chaliyar

Source: Western Ghat Development Programme

FOREST

Kerala has a total recorded forest cover of 11309.47 Sq.km which is 29.09% of the total geographical area of the State (38863 Sq.km). 11309.47 Sq.km of forest cover includes reserve forest (9176.30 Sq.km), proposed reserve (295.37 Sq.km), vested forest (1837.79 Sq.km). Tropical climate favours forests with rich biodiversity and endemism. Forest is classified as evergreen and deciduous and covers an area of 723.91 Sq.km. Evergreen forest is mainly located in slope of Western ghat and some are also seen along the river banks. Deciduous forest is found in the plain and lower ghat slopes. Major forest area is concentrated in Nilambur, Wandoor blocks and Melattur in Western ghats. Afforestation is also done here. Social forestry division promotes planting of trees outside forest lands for protecting the natural forest.

Table: 13.1

CLASSIFICATION OF FOREST TYPES AS ON 31-03-2012

Sl. No.	Type	Area (km ²)	% of total
1	Tropical Wet Evergreen and Semi Evergreen	3877.44	34.28
2	Tropical Moist Deciduous	3615.98	31.97
3	Tropical Dry Deciduous	391.36	3.46
4	Montane Sub-tropical Temperate sholas	386.42	3.42
5	Plantations	1525.52	13.49
6	Grass Lands	501.08	4.43
7	Others	1011.65	8.95
	Total	11309.47	100.00

Table: 13.2

**CLASSIFICATION OF FOREST AREA ACCORDING TO UTILIZATION AS ON
31-03-2012**

Sl. No.	Mode of Utilisation	Area (km ²)	% of total
1	Dense Forests/Degraded Forest	8952.17	79.16
2	Plantation	1525.52	13.49
3	Area under lease	421.27	3.72
4	Forest land diverted under FCA	410.49	3.63
	Total	11309.47	100.00

Table: 13.3

**DISTRICT WISE FOREST AREA (APPROX) BY LEGAL STATUS AS ON
31-03-2012**

District	Division	Reserve Forest/ Proposed Reserve	Vested Forest + EFL	Total (Km ²)
Malappuram	Nilambur South	267.38	57.88	325.52
	Nilambur South	57.93	340.70	398.63
	Total	325.31	398.58	724.15

Table: 13.4

DISTRICT WISE FOREST AREA AS ON 31-03-2012

Sl. No.	District	Area (Km ²)
1	Thiruvananthapuram	463.83
2	Kollam	840.56
3	Pathanamthitta	1533.79
4	Kottayam	100.84
5	Ernakulam	823.83
6	Idukki	2713.72
7	Thrissur	1022.75
8	Palakkad	1527.35
9	Malappuram	723.91
10	Kozhikode	290.45
11	Wayanad	907.04
12	Kannur	241.45
13	Kasaragod	119.84
	Total	11309.41

Table: 13.5

DISTRICT WISE ECOLOGICALLY FRAGILE LAND (EFL) AREA

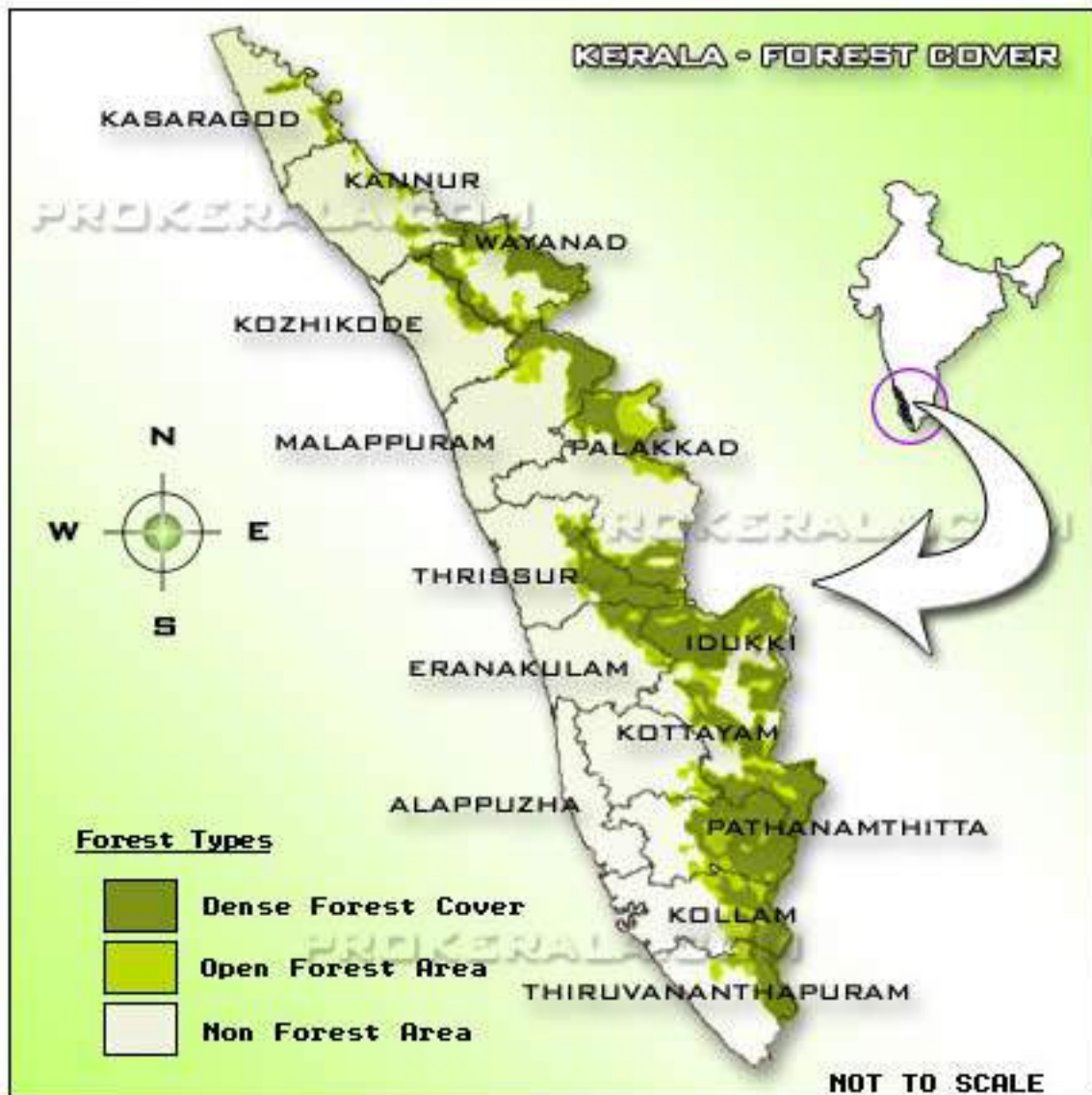
Sl. No.	District	Area (ha)
1	Thiruvananthapuram	881.75
2	Kollam	273.72
3	Idukki	1255.55
4	Thrissur	75.76
5	Palakkad	5212.68
6	Malappuram	1265.12
7	Kozhikode	1531.90
8	Wayanad	2700.27
9	Kannur	779.46
10	Kasaragod	94.88
	Total	14071.12

Table: 13.6

DISTRIBUTION OF FOREST AREA ACCORDING TO LEGAL STATUS**(Km²)**

Reserve Forest	Proposed Reserve	Vested Forest + EFL	Total
9176.30	295.37	1837.79	11309.47
81.14%	2.61	16.25%	100%

Source: Forest Statistics, Forest Department



AGRICULTURE

The agricultural sector is the important sub-sector of the primary sector in Kerala. Agriculture has been a way of life and continues to be the single most important livelihood of the masses. Stabilization and augmentation of productivity assume critical importance, given the limited scope for increasing area under cultivation of various crops. Agricultural crops in the State are broadly classified as food crops and non-food crops. Food crops are cereals & condiments, fresh fruits, vegetables etc. The major non-food crops are rubber, betel leaves, lemon grass etc. Another classification of crops is seasonal crops, annual crops and perennial crops which are based on their life time.

Malappuram district has a unique position in Agricultural sector. Of the total geographical area of 355446 ha, total cropped area covers 230288 ha. Area under paddy cultivation was 23148 ha during 2000-01 period and now it had declined to 6674 ha in 2012-13. Coconut enjoys an important position in the agricultural economy and district stands 2nd position for this cultivation in the State. During 2000-01 period coconut cultivation was 626 million numbers and now it had risen to 1125.17 million numbers in 2012-13 period. Kuttippuram, Kondotty and Perinthalmanna cover the maximum area under coconut cultivation. An important cash crop Arecanut covers an area of 19410.81 ha with a total production of 27126.01 tonnes and stands 1st position in Kerala. Arecanut cultivation is mainly concentrated in Kalikavu, Areekod and Perinthalmanna blocks. Betal leaves and Sesamum are cultivated 94.57 ha and 150.29 ha and stands 1st position in Kerala. Some important fresh crops are also cultivated in this district.

Table: 14.1

CLASSIFICATION OF AREA ON THE BASIS OF LAND UTILISATION**(Area in Ha)**

Year	Total Geographical area	Forest	Land put to non agricultural use	Barren & uncultivable land	Permanent pastures & other grazing land
1	2	3	4	5	6
2012-13	355446	103417	45189	938	1
2011-12	355446	103417	46615	1215	1
2010-11	355446	103417	44439	1240	0

Year	Land under misc. tree crops	Cultivable waste	Fallow other than current fallow	Current fallow	Marshy land
1	7	8	9	10	11
2012-13	275	5951	5268	8138	0
2011-12	389	5595	6647	7363	0
2010-11	384	6041	6275	8982	1

Year	Still water	Water logged area	Social forestry	Net area sown	Area sown more than once	Total cropped area
1	12	13	14	15	16	17
2012-13	6047	64	180	179978	50310	230288
2011-12	6082	64	180	177878	62999	240877
2010-11	6082	64	180	178341	59133	237474

Table: 14.2

BLOCK WISE AREA OF CROPS 2012-13

Sl. No.	Name of Block	Paddy			Tapioca			Drum stick	Amaran thus	Brinjal	Ladies finger
		Autumn	Winter	Summer	Autumn	Winter	Summer				
1	2	3	4	5	6	7	8	9	10	11	12
1	Malappuram	56.56	235.00		43.76	86.86	83.38	122.11	17.49	3.78	7.07
2	Kondotty	27.66	338.91	33.57	64.82	49.85	182.51	133.94	8.93	0.39	6.66
3	Areekod	37.03	216.64	9.19	52.31	74.14	138.62	151.23	12.56	2.36	5.86
4	Wandoor	60.72	210.63		270.23	187.15	317.22	197.71	3.66	1.18	6.60
5	Nilambur	40.02	219.82		48.38	36.43	41.23	106.74	2.34	0.88	2.51
6	Kalikavu	33.47	180.44		213.84	132.05	226.29	117.10	5.46	4.02	5.40
7	Tirur	24.50	307.19	35.64	0.76	6.57	4.72	61.82	1.70	0.78	1.19
8	Tanur	14.87	290.14		4.45	5.29	9.79	86.72	0.62	0.37	0.87
9	Tirurangadi	23.17	220.35	292.64	17.24	40.97	123.65	59.83	4.16	0.57	3.27
10	Vengara	10.70	339.24	27.86	21.70	128.77	149.07	94.91	2.12	0.74	3.77
11	Kuttippuram	27.95	578.42	19.79	15.86	80.80	55.72	168.63	5.13	3.52	3.38
12	Perinthalmanna	48.13	533.95		246.60	225.67	290.83	307.85	12.23	16.98	16.00
13	Mankada	28.80	148.32		385.96	130.81	427.74	139.49	8.60	6.74	12.87
14	Ponnani	23.77	403.82	218.45	2.40	1.51	4.03	53.56	6.31	1.35	1.98
15	Perumpadappu	14.67	227.59	818.20	2.35	2.94	4.36	67.55	3.12	1.82	1.88
	Blocks Total	472.02	4450.46	1455.34	1390.66	1189.81	2059.16	1869.19	94.43	45.48	79.31
	Municipalities	21.25	272.5	2.24	147.79	91.55	130.9	175.68	6.93	7.82	7.63
	District Total	493.27	4722.96	1457.58	1538.45	1281.36	2190.06	2044.87	101.36	53.3	86.94

Table: 14.2 Continued.....

Sl. No.	Name of Block	Bitter gourd	Snake gourd	Little gourd (Koval)	Ash gourd (Kumbalam)	Payar (Achinga)	Pumpkin (Mathan)	Cucumber (Vellari)	Bottle gourd	Green chilli
1	2	13	14	15	16	17	18	19	20	21
1	Malappuram	12.37	8.68	2.55	8.98	95.72	17.36	8.87	10.15	1.36
2	Kondotty	4.45	5.13	1.14	4.21	100.92	13.00	15.90	9.63	3.17
3	Areekod	13.84	3.57	4.95	10.05	96.99	33.50	22.33	9.91	2.92
4	Wandoor	19.04	2.84	3.40	27.10	222.32	58.54	81.93	4.89	1.40
5	Nilambur	5.13	2.65	9.19	9.30	58.06	17.18	4.94	2.02	1.21
6	Kalikavu	7.27	2.36	6.70	20.78	83.76	31.97	9.03	4.33	1.84
7	Tirur	2.12	1.65	0.90	2.60	5.93	8.86	2.49	4.94	0.55
8	Tanur	1.54	1.60	0.26	0.75	21.01	10.77	1.23	5.32	0.25
9	Tirurangadi	6.92	1.59	0.12	4.10	51.44	14.87	9.27	11.40	0.83
10	Vengara	3.70	1.03	0.54	2.04	66.84	13.71	4.29	10.38	0.10
11	Kuttippuram	7.18	4.55	3.05	4.68	24.66	15.24	1.50	4.80	5.96
12	Perinthalmanna	9.74	7.71	6.58	26.31	71.46	18.89	53.16	2.47	2.17
13	Mankada	7.14	4.60	3.10	10.39	56.74	15.39	15.45	4.80	7.46
14	Ponnani	2.43	1.21	0.95	2.65	5.65	4.58	4.33	1.39	5.21
15	Perumpadappu	3.10	1.45	1.47	1.74	7.94	5.07	2.39	0.63	3.93
	Blocks Total	105.97	50.62	44.90	135.68	969.44	278.93	237.11	87.06	38.36
	Municipalities	4.80	19.82	5.3	16.77	79.7	16.13	25.59	4.29	2.31
	District Total	110.77	70.44	50.20	152.45	1049.14	295.06	262.7	91.35	40.67

Table: 14.2 Continued.....

Sl. No.	Name of Block	Potato	Cabbage	Tomato	Cauli flower	Beans	Other vegetables	Elephant foot yam	Colocasia	Yam
1	2	22	23	24	25	26	27	28	29	30
1	Malappuram			0.17	0.05		0.26	18.95	27.48	3.63
2	Kondotty						0.49	22.49	40.46	10.29
3	Areekod						0.44	70.52	76.35	13.56
4	Wandoor						0.03	84.51	88.54	4.57
5	Nilambur							7.56	20.58	8.07
6	Kalikavu							77.70	114.60	4.56
7	Tirur		0.02	0.14			0.32	2.39	5.98	1.05
8	Tanur	0.04	0.05	0.05	0.12	0.03	0.15	2.09	14.92	0.76
9	Tirurangadi			0.29				8.04	20.13	1.49
10	Vengara						0.25	5.17	15.51	2.23
11	Kuttippuram						0.63	4.31	20.62	1.45
12	Perinthalmanna				0.07		1.56	204.85	126.26	2.90
13	Mankada			0.05		0.09	0.90	6.17	14.86	1.27
14	Ponnani		0.07	0.26	0.05		0.75	1.54	6.45	0.78
15	Perumpadappu		0.01	0.40	0.08		0.39	0.79	6.27	0.92
	Blocks Total	0.04	0.15	1.36	0.37	0.12	6.17	517.08	599.01	57.53
	Municipalities			0.12	0.02		0.64	24.07	34.55	5.32
	District Total	0.04	0.15	1.48	0.39	0.12	6.81	541.15	633.56	62.85

Table: 14.2 Continued.....

Sl. No.	Name of Block	Koorka	Sweet potato	Nana kizhangu	Other tubers	Pulses	Ginger	Turmeric	Sesamum	Coconut	Areca nut
1	2	31	32	33	34	35	36	37	38	39	40
1	Malappuram	2.75	6.84	0.06	0.87		3.28	21.91	3.58	7239.48	1369.90
2	Kondotty	3.15	4.88	2.47	2.24		2.19	20.74	5.11	7592.16	986.73
3	Areekod	0.82	5.14	1.08	3.44	0.05	2.80	49.36		7969.01	3320.93
4	Wandoor	0.06	3.52	0.17	7.63		0.46	32.38	0.85	4895.58	2548.45
5	Nilambur	0.32	0.49	0.18	0.38		0.77	11.45		3925.75	720.76
6	Kalikavu	0.20		0.12	0.58		5.09	34.18		4257.74	2128.64
7	Tirur	0.02	1.76	0.02	6.72	0.71	0.04	0.69	4.65	5624.36	207.09
8	Tanur	0.09	2.17	0.08	8.03	0.40	0.43	3.92	15.98	7888.13	459.96
9	Tirurangadi	0.05	4.61	0.34	2.73	3.30	0.92	8.65	8.04	6858.16	389.57
10	Vengara	0.09	11.32	0.04	2.18	7.21	1.68	5.34	15.01	7219.74	658.47
11	Kuttippuram	11.40	7.44	1.47	20.97	0.45	4.40	9.42		10029.90	1018.77
12	Perinthalmanna	4.46	5.41	1.49	7.54		9.06	27.02	6.29	8521.69	1988.86
13	Mankada	1.25	5.47	0.04	0.05	26.60	5.23	10.49	24.91	4412.64	1096.58
14	Ponnani	1.03	2.86	0.02	2.20	30.62	1.08	1.15	8.47	3865.89	542.55
15	Perumpadappu	0.89	0.82	0.12	1.52	0.18	0.58	0.83	1.00	4978.23	653.08
	Blocks Total	26.58	62.73	7.70	67.08	69.52	38.01	237.53	93.89	95278.46	18090.34
	Municipalities	0.63	2.34	0.13	4.88	0.36	3.5	20.89	0.68	7138.19	1320.47
	District Total	27.21	65.07	7.83	71.96	69.88	41.51	258.42	94.57	102416.65	19410.81

Table: 14.2 Continued.....

Sl. No.	Name of Block	Cashew	Pepper	Jack	Mango tree	Tamarind	Clove	Nutmeg	Cocoa	Pappaya	Banana
1	2	41	42	43	44	45	46	47	48	49	50
1	Malappuram	206.04	126.38	375.77	361.83	54.60	0.07	5.42	0.57	79.26	265.54
2	Kondotty	285.81	118.59	905.95	638.37	65.12	0.89	9.40	0.49	130.49	554.81
3	Areekod	354.80	229.46	733.17	613.13	70.68	0.06	12.91	3.89	192.90	635.01
4	Wandoor	332.41	191.52	713.26	637.12	117.63		12.33	0.79	148.25	1199.22
5	Nilambur	473.86	113.75	462.16	443.73	97.97	2.64	19.44	10.24	67.25	183.90
6	Kalikavu	107.82	283.85	414.76	310.75	97.24	0.91	43.26	74.13	110.28	1089.53
7	Tirur	123.11	47.29	196.49	331.76	80.53	0.04	13.33		50.76	14.48
8	Tanur	75.29	86.12	287.97	248.77	33.17	0.19	23.87	0.11	86.38	11.79
9	Tirurangadi	111.52	99.64	308.90	394.78	45.42	0.78	15.37	0.23	99.25	388.81
10	Vengara	182.72	93.88	456.72	434.32	55.87	0.31	12.80	0.03	90.55	296.23
11	Kuttippuram	334.64	243.67	635.15	565.46	161.42	0.02	63.19	0.18	148.04	61.69
12	Perinthalmanna	185.00	233.60	975.81	911.62	298.78	0.30	14.68	0.31	176.73	1714.21
13	Mankada	106.57	268.11	664.20	569.36	54.85		7.00	0.24	79.46	597.87
14	Ponnani	166.95	78.78	259.12	251.91	117.20	0.42	10.40	0.75	54.75	35.84
15	Perumpadappu	95.50	82.43	258.78	288.70	60.17	0.68	16.24	2.07	55.43	3.82
	Blocks Total	3142.04	2297.07	7648.21	7001.61	1410.65	7.31	279.64	94.03	1569.78	7052.75
	Municipalities	205.36	219.99	512.5	488.47	77.89	0.46	12.81	1.65	127.03	476.53
	District Total	3347.40	2517.06	8160.71	7490.08	1488.54	7.77	292.45	95.68	1696.81	7529.28

Table: 14.2 Continued.....

Sl. No.	Name of Block	Betel leaves	Pine apple	Plantain	Sugar cane	Lemon grass	Fodder grass	Green Manure Plants	Teak	Medicinal Plants
1	2	51	52	53	54	55	56	57	58	59
1	Malappuram	4.68	2.89	108.50			8.22	247.58	98.04	0.26
2	Kondotty	12.95	4.54	169.66			0.52	1023.50	155.01	1.89
3	Areekod	1.97	15.68	504.13			4.05	451.22	326.16	5.18
4	Wandoor	0.67	6.64	196.94			8.67	389.02	255.83	1.74
5	Nilambur	0.96	9.45	197.21		0.16	9.55	127.63	150.24	6.86
6	Kalikavu	0.52	27.99	229.94			1.65	271.66	104.23	1.25
7	Tirur	2.78	0.54	125.56			1.59	75.59	4.30	1.79
8	Tanur	36.84	3.27	95.24			0.34	98.13	11.09	2.16
9	Tirurangadi	0.26	6.86	102.54			0.36	118.48	21.54	1.51
10	Vengara	6.34	3.28	113.26	1.11		0.21	192.08	36.91	0.13
11	Kuttippuram	53.49	5.13	226.50			1.61	252.54	68.64	3.71
12	Perinthalmanna	0.12	18.01	298.99		0.90	1.15	553.74	307.08	4.58
13	Mankada	0.69	3.41	198.44				372.73	209.05	1.44
14	Ponnani	0.10	0.97	153.35			0.61	85.35	17.69	7.27
15	Perumpadappu	0.15	0.47	138.76			0.31	62.55	20.19	8.01
	Blocks Total	122.52	109.13	2859.02	1.11	1.06	38.84	4321.80	1786.00	47.78
	Municipalities	27.77	5.45	212.19			7.86	203.29	172.15	5.48
	District Total	150.29	114.58	3071.21	1.11	1.06	46.70	4525.09	1958.15	53.26

Table: 14.3

BLOCK WISE AREA OF CROPS 2011-12**(Area in Ha)**

Sl. No.	Name of Block	Paddy			Tapioca			Drumstick	Amaran thus	Brinjal	Ladies finger
		Autumn	Winter	Summer	Autumn	Winter	Summer				
1	2	3	4	5	6	7	8	9	10	11	12
1	Malappuram	36.84	230.89		76.41	85.41	125.53	109.31	39.46	2.87	7.05
2	Kondotty	20.35	244.90	61.50	97.27	58.07	306.39	144.58	6.63	0.89	8.91
3	Areekod	49.32	307.31	91.74	38.00	74.77	119.74	143.30	8.55	0.93	3.38
4	Wandoor	112.52	220.09	11.44	243.03	283.55	454.53	166.14	6.06	1.64	3.97
5	Nilambur	93.26	270.10	14.92	27.82	58.84	32.26	116.86	2.55	0.45	1.42
6	Kalikavu	112.70	250.22		91.00	56.67	173.68	129.39	4.7	4.57	3.73
7	Tirur	41.68	339.33	15.83	4.01	3.99	2.29	67.24	1.13	0.40	0.8
8	Tanur	17.90	326.86	3.08	5.60	6.99	11.26	77.74	0.95	0.46	0.57
9	Tirurangadi	29.54	246.34	282.19	22.05	25.91	172.25	133.50	6.77	0.23	1.78
10	Vengara	4.87	207.28	27.09	107.32	46.17	120.22	137.33	1.61	0.57	2.26
11	Kuttippuram	36.30	559.34	32.31	25.61	139.2	76.18	154.46	6.31	4.52	3.26
12	Perinthalmanna	77.01	611.71	1.22	271.51	218.81	518.13	295.31	11.74	13.42	14.01
13	Mankada	7.23	242.84		262.88	111.52	388.18	114.19	4.76	5.84	5.33
14	Ponnani	50.46	450.18	134.13	0.91	1.86	4.12	49.90	4.58	1.18	2.23
15	Perumpadappu	38.58	239.97	940.00	2.23	2.91	5.18	43.91	3.82	1.20	1.63
	Blocks Total	728.56	4747.36	1615.45	1275.65	1174.67	2509.94	1883.16	109.62	39.17	60.33
	Municipalities	38.08	393.44	4.63	121.17	79.44	106.73	214.83	11.31	3.65	7.25
	District Total	766.64	5140.8	1620.08	1396.82	1254.11	2616.67	2097.99	120.93	42.82	67.58

Table: 14.3 Continued.....

Sl. No.	Name of Block	Bitter gourd	Snake gourd	Little gourd (Koval)	Ash gourd (Kumbalam)	Payar (Achinga)	Pumpkin (Mathan)	Cucumber (Vellari)	Bottle gourd	Green chilli	Cabbage
1	2	13	14	15	16	17	18	19	20	21	22
1	Malappuram	8.86	13.37	3.24	6.90	68.79	12.08	13.15	6.83	1.29	0.10
2	Kondotty	7.24	4.08	2.12	5.53	91.97	12.15	17.60	10.82	2.31	0.03
3	Areekod	7.85	3.30	1.15	10.65	55.81	26.48	11.22	23.54	1.42	0.10
4	Wandoor	16.92	1.56	2.53	26.96	133.71	46.92	77.10	3.40	1.89	
5	Nilambur	5.17	1.50	8.02	9.55	48.70	12.71	2.71	2.64	0.64	0.20
6	Kalikavu	5.83	1.26	7.06	16.70	54.37	24.97	5.86	1.85	4.05	
7	Tirur	1.49	1.02	0.28	1.90	4.35	7.36	1.94	4.28	0.11	
8	Tanur	2.64	1.92	0.25	0.80	28.32	12.83	2.29	6.65	0.38	0.05
9	Tirurangadi	3.43	2.47	0.35	2.69	41.09	13.93	10.68	6.63	0.73	0.02
10	Vengara	1.57	0.83	0.22	1.67	27.87	9.09	3.86	7.15	0.26	
11	Kuttippuram	7.81	3.72	2.22	3.66	38.76	13.37	3.55	4.14	5.96	
12	Perinthalmanna	15.10	9.73	4.99	25.06	95.22	17.47	31.01	8.90	3.64	
13	Mankada	4.21	5.37	2.31	5.03	47.78	15.34	12.80	2.41	5.32	
14	Ponnani	1.74	0.95	0.97	2.99	3.06	4.71	2.72	0.49	4.99	0.02
15	Perumpadappu	3.17	1.68	1.00	1.65	7.98	5.78	4.38	1.04	3.41	0.08
	Blocks Total	93.03	52.76	36.71	121.74	747.78	235.19	200.87	90.77	36.40	0.60
	Municipalities	8.28	9.75	4.35	13.57	81.46	13.19	19.61	2.00	2.55	0.02
	District Total	101.31	62.51	41.06	135.31	829.24	248.38	220.48	92.77	38.95	0.62

Table: 14.3 Continued...

Sl. No.	Name of Block	Tomato	Cauli flower	Beans	Onion	Other vegetables	Elephant foot yam	Colocasia	Yam	Koorka	Sweet potato
1	2	23	24	25	26	27	28	29	30	31	32
1	Malappuram				0.02	0.07	24.58	34.62	5.77	1.82	6.90
2	Kondotty			0.03		0.69	13.98	41.33	9.23	0.12	6.69
3	Areekod					0.05	36.06	76.59	9.23	0.09	5.32
4	Wandoor	0.05				0.06	91.26	93.43	5.39	0.41	3.05
5	Nilambur						7.32	27.41	9.03	0.53	0.36
6	Kalikavu						72.34	113.61	4.63	0.18	0.18
7	Tirur		0.02		0.02		1.43	5.82	0.22	0.12	1.06
8	Tanur	0.05	0.08			0.08	1.41	15.87	0.30	0.09	2.49
9	Tirurangadi					0.08	3.08	18.91	0.85	0.11	1.82
10	Vengara					0.49	3.64	10.91	0.62	0.54	3.66
11	Kuttippuram	0.03				0.47	4.18	24.53	0.31	8.54	4.84
12	Perinthalmanna					95.73	150.45	62.75	4.80	9.50	5.90
13	Mankada					0.88	31.83	33.73	2.20	10.44	3.81
14	Ponnani	0.12	0.09			0.36	0.76	6.61	0.54	0.69	1.35
15	Perumpadappu	0.41	0.14	0.03		0.10	0.92	6.43	1.02	0.78	0.85
	Blocks Total	0.66	0.33	0.06	0.04	99.06	443.24	572.55	54.14	33.96	48.28
	Municipalities	0.15	0.55	0.02		2.78	23.35	34.57	3.02	0.34	5.67
	District Total	0.81	0.88	0.08	0.04	101.84	466.59	607.12	57.16	34.30	53.95

Table: 14.3 Continued.....

(Area in Ha)											
Sl. No.	Name of Block	Nana kizhangu	Other tubers	Pulses	Ginger	Turmeric	Coconut	Arecanut	Cashew	Pepper	Jack
1	2	33	34	35	36	37	38	39	40	41	42
1	Malappuram	0.14	0.79		3.54	25.21	6586.16	1328.06	322.48	135.30	485.46
2	Kondotty	4.95	1.22		3.08	17.72	9083.36	1331.44	381.48	149.84	1117.57
3	Areekod	1.12	2.24	1.13	4.93	48.73	7430.00	3286.60	378.30	216.20	734.06
4	Wandoor	0.06	1.50		1.98	37.58	5141.28	2436.84	419.11	218.91	622.48
5	Nilambur	0.58	0.20	0.05	2.82	13.32	4281.16	948.97	207.58	104.82	364.29
6	Kalikavu	0.12	1.12		4.78	30.94	4579.83	2325.62	133.11	273.16	461.73
7	Tirur		7.14		0.29	0.38	6529.06	221.49	126.45	56.17	213.04
8	Tanur		5.67	0.35	0.46	4.03	7970.68	617.43	78.96	92.33	304.17
9	Tirurangadi	0.44	3.11		0.68	11.95	8183.75	448.13	140.24	131.36	501.55
10	Vengara	0.29	6.63		1.19	4.12	8125.62	582.96	249.53	122.80	548.17
11	Kuttippuram	0.66	20.57	0.03	4.80	8.02	10659.99	1014.27	338.48	219.19	632.13
12	Perinthalmanna	0.83	6.89	0.33	11.19	39.25	8734.91	1862.26	223.03	287.14	911.85
13	Mankada	0.79	2.67		3.38	17.64	4825.28	998.89	322.22	244.23	474.21
14	Ponnani	0.04	2.06	26.53	1.14	1.01	3896.19	643.36	182.91	80.47	264.70
15	Perumpadappu	0.05	2.16	4.78	0.36	0.63	4909.41	668.05	109.06	88.66	273.56
	Blocks Total	10.07	63.97	33.20	44.62	260.53	100936.68	18714.37	3612.94	2420.58	7908.97
	Municipalities	0.33	1.06	0.28	2.79	21.97	8292.68	1263.48	212.97	169.19	496.14
	District Total	10.40	65.03	33.48	47.41	282.5	109229.36	19977.85	3825.91	2589.77	8405.11

Table: 14.3 Continued.....

Sl. No.	Name of Block	Mango tree	Tamarind	Clove	Nutmeg	Cocoa	Pappaya	Banana	Pine apple	Plantain	Orange
1	2	43	44	45	46	47	48	49	50	51	52
1	Malappuram	430.26	68.93	0.08	7.77	0.37	92.07	269.33	6.52	144.36	0.02
2	Kondotty	886.29	93.22	1.26	7.59	0.65	149.35	464.54	10.69	186.02	
3	Areekod	678.53	111.05		21.88	5.63	207.57	451.77	23.02	380.17	0.13
4	Wandoor	570.32	122.22	0.07	23.30	8.41	120.00	1402.29	16.83	199.57	0.03
5	Nilambur	324.24	112.12	1.46	30.94	17.35	65.69	205.66	9.11	243.98	
6	Kalikavu	393.46	115.66	0.07	35.41	65.07	120.57	1207.76	27.66	230.45	
7	Tirur	424.69	63.57	0.02	11.56	0.35	53.04	5.73	1.98	79.07	0.07
8	Tanur	242.42	33.51	0.44	18.42	0.14	82.19	8.60	5.15	80.47	
9	Tirurangadi	535.51	84.08	0.58	22.50	0.08	168.70	241.83	6.77	126.13	
10	Vengara	554.08	79.65	0.55	13.52	0.03	146.66	183.48	5.41	126.24	
11	Kuttippuram	535.09	137.07	0.07	53.18	0.25	143.04	140.18	4.81	193.43	
12	Perinthalmanna	793.09	249.57	0.03	22.90	0.88	143.64	1523.09	24.49	256.38	
13	Mankada	375.93	167.62	0.26	9.80	0.84	77.43	237.51	5.94	107.36	
14	Ponnani	259.96	122.12	0.79	8.82	0.67	44.21	9.30	1.42	156.61	
15	Perumpadappu	293.68	60.63	1.01	18.03	1.81	47.15	4.04	1.06	139.18	0.01
	Blocks Total	7297.55	1621.02	6.69	305.62	102.53	1661.31	6355.11	150.86	2649.42	0.26
	Municipalities	550.42	121.94	2.79	9.47	1.73	140.70	510.70	4.10	195.61	0.56
	District Total	7847.97	1742.96	9.48	315.09	104.26	1802.01	6865.81	154.96	2845.03	0.82

Table: 14.3 Continued.....

Sl. No.	Name of Block	Sugar cane	Sesamum	Lemon grass	Fodder grass	Green Manure Plants	Vanila	Teak	Medicinal Plants
1	2	53	54	55	56	57	58	59	60
1	Malappuram		1.53		2.54	327.40	0.02	140.67	0.51
2	Kondotty				0.59	772.45		152.49	2.98
3	Areekod				2.35	461.80	0.14	361.01	5.31
4	Wandoor				6.99	411.04	0.38	258.62	1.18
5	Nilambur		1.95	0.15	6.72	114.37	0.18	175.52	0.73
6	Kalikavu				3.84	268.25		120.41	0.41
7	Tirur		15.81		0.87	89.16		4.48	2.35
8	Tanur		15.04		0.44	102.87	0.03	11.25	1.64
9	Tirurangadi		3.10		0.05	138.30		20.54	0.88
10	Vengara		2.06			238.25		35.64	0.65
11	Kuttippuram		4.68		1.80	259.19		58.45	2.40
12	Perinthalmanna		6.95		0.75	571.89	3.76	394.44	13.12
13	Mankada				1.72	502.21	0.34	391.26	3.23
14	Ponnani		41.75		0.52	83.05	0.02	18.78	2.33
15	Perumpadappu	0.02	6.61	0.08	0.91	62.40	0.11	18.03	7.34
	Blocks Total	0.02	99.48	0.23	30.09	4402.63	4.98	2161.59	45.06
	Municipalities	0.07	1.59		7.26	250.14	0.17	226.16	3.48
	District Total	0.09	101.07	0.23	37.35	4652.77	5.15	2387.75	48.54

Table: 14.4

BLOCK WISE PRODUCTION OF CROPS 2012-13

Sl. No.	Name of Block	Rice			Black Pepper	Cured Ginger	Cured Turmeric	Arecanut	Tamarind	Jack (million No.)	Banana
		Autumn	Winter	Summer							
1	2	3	4	5	6	7	8	9	10	11	12
1	Malappuram	143.70	467.99		20.85	5.69	48.42	1727.02	55.34	0.95	2712.60
2	Kondotty	66.42	581.96	69.16	29.41	4.33	38.78	1393.16	35.97	2.30	5646.44
3	Areekod	88.19	468.67	25.14	41.76	6.33	92.30	4856.49	47.95	1.27	5205.30
4	Wandoor	135.33	425.41		46.53	0.92	60.55	2757.77	51.08	1.67	8339.59
5	Nilambur	94.10	391.88	3.68	23.20	1.63	23.35	919.54	66.74	1.30	1273.63
6	Kalikavu	65.81	307.16		59.04	13.99	69.72	5212.83	134.47	1.26	10011.75
7	Tirur	43.21	556.17	107.12	7.42	0.06	1.40	194.68	85.76	0.39	123.95
8	Tanur	26.78	384.61	0.63	14.81	0.75	7.33	522.67	34.61	0.59	88.19
9	Tirurangadi	47.62	338.85	1057.73	22.51	1.84	16.17	500.10	50.52	0.94	3595.24
10	Vengara	13.51	559.77	83.32	14.83	3.46	9.07	754.96	29.80	1.23	2099.70
11	Kuttippuram	56.04	1258.34	86.32	50.68	7.56	16.01	1548.79	188.71	3.27	445.84
12	Perinthalmanna	117.63	1307.07		91.57	13.26	36.74	3208.72	272.84	3.18	13889.71
13	Mankada	60.60	343.34		38.34	7.71	16.05	1520.63	44.83	1.83	4648.30
14	Ponnani	50.42	791.56	852.23	20.79	1.15	0.78	197.54	45.55	0.61	297.84
15	Perumpadappu	24.59	539.42	2823.48	24.07	0.58	0.70	302.11	34.99	0.72	38.29
	Blocks Total	1033.95	8722.20	5108.81	505.81	69.26	437.37	25617.01	1179.16	21.51	58416.37
	Municipalities	39.98	466.05	6.39	36.54	7.67	45.36	1509	59.65	1.25	4084.48
	District Total	1073.93	9188.25	5115.20	542.35	76.93	482.73	27126.01	1238.81	22.76	62500.85

Table: 14.4 Continued.....

Sl. No.	Name of Block	(Production in Tonnes)									
		Plantain	Pineapple	Tapioca	Mango	Sesamum	Coconut (Million No.)	Nutmeg	Cashew	Cocoa	Betel leaves
1	2	13	14	15	16	17	18	19	20	21	22
1	Malappuram	793.24	25.94	5890.35	1839.90	4.65	92.70	2.49	105.28		392.88
2	Kondotty	707.82	15.87	13194.79	3559.55	0.87	89.92	4.49	164.05		568.11
3	Areekod	2744.99	69.36	12060.69	2221.98		81.93	10.71	226.71	2.60	69.69
4	Wandoor	1032.95	29.20	29774.08	1333.49	0.14	47.60	3.19	196.45	0.14	30.48
5	Nilambur	1759.11	55.61	5254.35	2385.49		47.58	5.77	99.51	2.85	32.46
6	Kalikavu	1981.62	230.62	24460.70	2565.86		43.39	22.27	35.36	36.54	22.70
7	Tirur	689.70	3.02	253.05	1151.20	0.61	57.36	8.93	32.13		328.87
8	Tanur	432.67	27.14	353.98	1230.91	2.18	84.71	15.73	28.30		9519.82
9	Tirurangadi	442.35	57.15	4260.07	1304.35	1.71	94.31	7.13	41.37		14.39
10	Vengara	429.36	15.19	8686.66	1094.92	2.76	62.43	9.42	65.59		201.61
11	Kuttippuram	1421.74	28.24	3333.31	2036.22		115.18	52.13	139.88		2592.12
12	Perinthalmanna	2020.57	105.41	26740.55	6281.06	2.98	103.45	7.59	37.92		
13	Mankada	1729.41	8.21	37229.75	3341.00	10.61	45.37	0.39	18.54		17.98
14	Ponnani	1150.28	7.21	150.11	1227.05	2.56	38.35	2.33	27.21		1.31
15	Perumpadappu	988.94	2.55	227.98	1441.76	0.25	47.36	3.47	16.04	1.09	2.95
	Blocks Total	18324.75	680.72	171870.4	33014.74	29.32	1051.64	156.04	1234.34	43.22	13795.37
	Municipalities	1272.74	29.04	13610.48	1552.9	0.1	73.53	7.26	79.08		1044.26
	District Total	19597.49	709.76	185480.9	34567.64	29.42	1125.17	163.30	1313.42	43.22	14839.63

Table: 14.5

BLOCK WISE PRODUCTION OF CROPS 2011-12

Sl. No.	Name of Block	Rice			Black Pepper	Cured Ginger	Cured Turmeric	Arecanut	Tamarind	(Production in Tonnes)	
		Autumn	Winter	Summer						Jack (Million No.)	Banana
1	2	3	4	5	6	7	8	9	10	11	12
1	Malappuram	79.12	494.87		26.92	7.89	52.23	1390.61	100.38	1.23	2431.42
2	Kondotty	42.55	571.39	152.57	30.26	7.05	26.40	1687.49	62.51	3.52	5307.67
3	Areekod	105.68	666.60	269.42	22.48	11.32	98.28	2199.10	76.20	1.16	2648.26
4	Wandoor	269.35	519.89	25.75	36.33	5.05	73.13	1857.90	67.82	1.36	13635.27
5	Nilambur	138.53	566.26	32.45	22.32	7.57	30.03	909.63	40.60	1.24	1924.07
6	Kalikavu	250.73	515.73		31.41	13.32	71.19	4037.92	92.71	1.22	11842.09
7	Tirur	85.53	802.61	43.51	19.66	0.63	0.69	222.32	73.24	0.42	62.94
8	Tanur	38.10	526.23	7.95	27.14	1.09	8.71	902.49	36.77	0.69	57.96
9	Tirurangadi	56.98	511.20	956.80	20.88	1.51	25.95	701.20	56.73	1.28	2039.90
10	Vengara	4.70	459.87	84.40	16.82	2.41	8.86	818.61	46.40	1.72	1984.42
11	Kuttippuram	67.07	1185.96	103.48	81.10	8.86	16.67	1573.37	184.63	1.58	1076.87
12	Perinthalmanna	162.98	1446.10	1.12	66.44	19.13	58.95	2316.21	431.56	2.72	13191.06
13	Mankada	13.93	544.64		45.91	4.04	19.29	1942.64	298.95	1.28	2547.75
14	Ponnani	100.72	942.21	468.29	27.44	1.12	0.98	558.39	67.23	0.62	61.73
15	Perumpadappu	80.07	585.57	3690.02	17.46	0.36	0.75	549.27	50.50	0.49	34.28
	Blocks Total	1496.04	10339.13	5835.76	492.57	91.35	492.11	21667.15	1686.23	20.53	58845.69
	Municipalities	92.57	803.10	9.77	27.17	5.41	40.73	1566.12	103.04	0.77	3119.92
	District Total	1588.61	11142.23	5845.53	519.74	96.76	532.84	23233.27	1789.27	21.30	61965.61

Table: 14.5 Continued.....

Sl. No.	Name of Block	Other Plantain	Pineapple	Tapioca	Pappaya	Sesamum	Coconut (Million No.)	Nutmeg	Cashew	Cocoa	Betel leaves
1	2	13	14	15	16	17	18	19	20	21	22
1	Malappuram	1085.01	36.63	7679.42	438.34	0.27	58.61	1.31	128.67		1072.00
2	Kondotty	958.93	48.93	19334.94	396.97		65.61	1.45	276.19		151.98
3	Areekod	1764.74	118.82	6771.85	1151.59		51.86	8.53	204.66	1.50	29.40
4	Wandoor	1022.79	99.76	38222.08	584.04		42.20	15.65	313.49	3.77	
5	Nilambur	1133.53	209.96	3734.80	199.89	0.24	63.36	10.02	92.99	3.67	27.27
6	Kalikavu	856.58	238.20	14581.25	521.44		40.00	18.23	43.66	35.62	18.76
7	Tirur	458.76	16.73	245.15	246.15	2.47	53.30	7.30	32.75		411.60
8	Tanur	293.23	26.81	475.52	202.10	2.80	74.09	11.36	28.42		7151.64
9	Tirurangadi	494.68	25.82	3699.52	989.08	0.54	65.12	11.83	83.72		18.76
10	Vengara	369.75	31.90	7273.84	624.62	0.72	61.85	6.66	98.06		101.16
11	Kuttippuram	938.13	26.02	4719.30	449.14	0.94	91.75	28.02	107.29		3287.62
12	Perinthalmanna	1438.80	663.36	38762.80	724.95	6.67	101.25	10.03	41.03		330.27
13	Mankada	591.23	36.16	26690.30	311.26		53.85	1.58	50.26	0.14	798.00
14	Ponnani	981.00	14.209	150.71	275.56	17.91	20.13	1.57	43.71	0.24	5.04
15	Perumpadappu	829.09	6.97	168.99	353.29	1.32	38.97	4.77	23.33	0.50	1.44
	Blocks Total	13216.25	1600.27	172510.50	7468.42	33.88	881.95	138.31	1568.23	45.44	13404.94
	Municipalities	1038.84	30.95	12650.47	514.96	0.25	64.76	2.27	56.40		666.44
	District Total	14255.09	1631.22	185160.9	7983.38	34.13	946.71	140.58	1624.63	45.44	14071.38

Table: 14.6

PRODUCTION OF IMPORTANT CROPS**(Production in Tonnes)**

Year	Rice			Black pepper	Green chillies	Pulses	Cured Ginger	Cured Turmeric	Arecanut
	Autumn	Winter	Summer						
1	2	3	4	5	6	7	8	9	10
2012-13	1074	9188	5115	542	38	52	77	483	27126
2011-12	1589	11142	5846	520	36	27	97	533	23233
2010-11	2297	12826	5946	478	47	103	125	486	17291

Year	Tamarind	Mango	Jack (Million Nos.)	Banana	Other plantain	Pineapple	Tapioca	Sweet potato	Pappaya
1	11	12	13	14	15	16	17	18	19
2012-13	1239	34568	23	62501	19598	710	185481	796	7987
2011-12	1789	42040	21	61966	14255	1631	185161	661	7983
2010-11	1666	33319	23	57177	16340	1139	197190	1628	8994

Year	Drumstick	Sesamum	Coconut (Million Nos.)	Nutmeg	Rubber	Cocoa	Processed cardamom	Raw cashew nuts	Betel leaves	Clove (dry)
1	20	21	22	23	24	25	26	27	28	29
2012-13	981	29	1125	163	55605	43	2	1313	14840	1
2011-12	1238	34	947	141	54220	45	2	1625	14071	1
2010-11	1220	76	916	155	50745	54	1	1304	13452	1

Source: Agricultural Statistics

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 (Kachil)		-	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. Sesamum		-	4-5kg/ha
20. Mango ginger		-	1500kg/ha
21. Ginger		-	1500kg/ha
22. Turmeric		-	2000-2500kg/ha
23. Betel vine		-	20000to25000cuttings/ha
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 tonne 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
Tapioca	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)

1.5 tonne (grade 1)
1.3 tonne (average)

F. Desiccated coconut (per 1000 nuts)

1 tonne of DC

G. Cake yield as percentage of copra crushed

Chekkus	38%
Rottories	36%
Expellers	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 to 32.8)
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%

<u>Composition</u>	<u>Kernel (%)</u>	<u>Copra (%)</u>	<u>Cake (%)</u>
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

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 are perennial crops which are grown in larger areas and commercially important. Plantation crops in general are either export oriented or import substituting and therefore assume special significance from the national point of view. Kerala has a substantial share in the four plantation crops of rubber, tea, coffee and cocoa.

Rubber: - Natural Rubber occupies the prime position in Kerala among plantation crops. The total area of rubber cultivation in Malappuram district was 40230 hector and production 55605 tonnes during 2012-13 period.

Tea: - Tea is greater significant to Kerala because of high land productivity relative to other crops, exports earnings and employment in rural and backward areas. Kerala accounts for 6% of area under tea production. District is having no area under tea plantation.

Coffee: - Total area under coffee plantation in Kerala is recorded as 85359 hector and production is 68175 tonnes. District is having no area under coffee plantation.

Cocoa: - Cocoa production was estimated as 13362 tonnes during 2012-13 period, all over Kerala. Total area under cocoa plantation in Malappuram district was reported as 96 hector and a production of 43.25 tonnes during 2012-13 period.

Table: 15.1

RUBBER STATISTICS

(Metric Tonnes)

Type- wise Production & Consumption of NR & SR	December 2013	December 2012	April to Dec 2013	April to Dec 2012	April 2012 to March 2013	Percentage increase (+)/ decrease (-) of (3) & (4)
	1	2	3	4	5	6
PRODUCTION						
Natural Rubber (NR)						
Ribbed Smoked Sheet (RSS)	83925	86115	465895	514230	667225	
Solid Block Rubber	10475	12340	80135	88350	122125	
Latex Concentrates (drc)	7300	8460	49280	53975	73150	
Others	6300	7085	36690	40645	51200	
Total	108000	114000	632000	697200	913700	-9.4
Synthetic Rubber (SR)						
Styrene Butadiene (SBR)	1923	1764	16401	13931	19296	
Poly Butadiene (BR)	7510	6333	59785	58378	77038	
Others	560	781	7873	9230	12358	
Total	9993	8878	84059	81539	108692	3.1
Total NR & SR	117993	122878	716059	778739	1022392	-8.0

CONSUMPTION						
Natural Rubber (NR)						
Ribbed Smoked Sheet (RSS)	42180	46270	422375	439125	578050	
Solid Block Rubber	31280	23210	234680	225960	292210	
Latex Concentrates (drc)	6980	6890	58235	57150	76705	
Others	1940	2050	16110	20245	25740	
Total	82380	78420	731400	742480	972705	-1.5
Out of which Auto Tyre Manufacturers	54498	49210	485659	490142	635539	-0.9
Synthetic Rubber (SR)						
Styrene Butadiene (SBR)	18510	16170	169840	147140	196530	
Poly Butadiene (BR)	13810	12060	117055	110235	145695	
Others	10020	8715	74400	76560	101935	
Total	42340	36945	361295	333935	444160	8.2
Out of which Auto Tyre Manufacturers	30744	26138	259549	244228	323412	6.3
Total NR & SR	124720	115365	1092695	1076415	1416865	1.5
Out of which Auto Tyre Manufacturers	85242	75348	745208	734370	958951	1.5

(Metric Tonnes)

Production Consumption and Stock of RR	December 2013	December 2012	April to Dec 2013	April to Dec 2012	April 2012 to March 2013
	1	2	3	4	5
Reclaimed Rubber (RR)					
Production	11030	9745	92130	87470	115670
Consumption	11125	9670	91475	86870	114595
Out of which Auto Tyre Manufacturers	4453	3650	36870	35025	45879
Stock with Manufacturers (end of month/year)	7810	6680			
IMPORT/EXPORT & STOCK NR & SR					
Import (p)					
Natural Rubber	24307	18366	260133	173441	217364
Synthetic Rubber	27582	26370	280852	251967	329585
Total NR & SR	51889	44736	540985	425408	546949
Export (p)					
Natural Rubber	695	1603	5224	10782	30594

Table: 15.2

RUBBER STOCK AT THE END OF DECEMBER 2013**(Metric tonnes)**

Natural Rubber			
With Growers	98000	Ribbed smoked sheet	177110
With Dealers & Processors	90000	Solid Block Rubber	42625
With Auto Tyre Units	65725	Latex (drc)	19195
With other manufacturing units	18275	Others	33070
Total	272000	Total	272000
Synthetic Rubber			
With Producers	6975		
With Auto Tyre Units	32295	SBR	23650
With other manufacturing units	8785	Others	24405
Total	48055	Total	48055

Table: 15.3

PERFORMANCE OF NATURAL RUBBER 2012-13

Area	758,000 Hectares (3.2% Growth)
Production	913,700 Tonnes (1.1% Growth)
Consumption	972,705 Tonnes
Import	217,364 Tonnes
Export	30,594 Tonnes
Average Market Price for RSS 4 grade	Rs.176.82/kg
Stock at the end of the year	253,000 Tonnes
Number of small holdings	1.25 Million
Number of estates	537
Average yield per hectare	1,813 kg
Customs duty on natural rubber	
Solid form	20% or Rs.20/kg whichever is lower
Latex	70% or Rs.49/kg whichever is lower
Value of Natural rubber imported	Rs.3,887.9 Crore
Value of Natural rubber exported	Rs.468.5 Crore
Value of rubber products imported	Rs.6,206.3 Crore (2011-12)
Value of rubber products exported	Rs.15,532.2 Crore
Income from NR to the growers	Rs.16,150 Crore
Cess on Natural Rubber	Rs.128.28 Crore
Number of licensed dealers	9,533
Number of licensed manufacturers	4,334
Tyre and Non-tyre NR consumption ratio	65:35
NR and SR consumption ratio	69:31
Per capita consumption of elastomer	1.16kg
Tyre industry turnover	Rs.46,000 Crore
Tyre production	122.78 Million Numbers
Value of tyre exports	Rs.4,775 Crore
World production	11.327 Million Tonne (2012)
World consumption	11.005 Million Tonne (2012)
World NR & SR consumption ratio	42:58
International price of RSS 3 grade	Rs.175.76/kg

Source:- Rubber Board

ANIMAL HUSBANDRY

Animal husbandry plays an important role in generating employment and income to the weaker sections of the population. The preservation and the development of cattle wealth and poultry are also significant to the production of major livestock products of nutritional standard and the district is covered by the Integrated Dairy Development Project. As per 1996 animal husbandry report district had cattle population 2.44 lakhs and a poultry population of 2.62 lakhs. Based on 2007 live stock census report cattle population in the district was reported as 1.05 lakh and poultry population of 1.52 lakh.

Table: 16.1

ANTI RABIES VACCINATION DONE IN 2010-11

Prophylactic in dogs	Post Exposure Vaccinations					Number of deaths due to rabies				
	Cattle	Buffalo	Goat	Canine	Other Animals	Cattle	Buffalo	Goat	Canine	Other Animals
4519	49	9	600	239	0	7	0	41	71	9

Table: 16.2

DAIRY CO-OPERATIVE SOCIETIES AS ON 31-03-2011

Primary Societies	246
Regional Unions	0
Total	246
Anand Mode (APCOS)	213
Traditional	33
Total	246

Table: 16.3

**OUTBREAKS, ATTACKS, DEATHS DUE TO CONTAGIOUS DISEASES AND
NUMBER OF ANIMALS PROTECTED/VACCINATED DURING THE YEAR 2010-11**

Foot and Mouth				Anthrax				Black Quarter			
Out Break	Attack	Death	Protected/ Vaccinated	Out Break	Attack	Death	Protected/ Vaccinated	Out Break	Attack	Death	Protected/ Vaccinated
4	53	3	87239	0	0	0	1402	0	0	0	605
Hemorrhagic Septicemia				Canine Distemper				Parvo Virus			
Out Break	Attack	Death	Protected/ Vaccinated	Out Break	Attack	Death	Protected/ Vaccinated	Out Break	Attack	Death	Protected/ Vaccinated
0	0	0	855	2	0	0	162	1	0	0	123
Ranikhet				Fowl Pox				Infectious Bursal Disease			
Out Break	Attack	Death	Protected/ Vaccinated	Out Break	Attack	Death	Protected/ Vaccinated	Out Break	Attack	Death	Protected/ Vaccinated
9	0	0	1184300	2	0	0	64	0	0	0	11
Duck Plague				Others				Total			
Out Break	Attack	Death	Protected/ Vaccinated	Out Break	Attack	Death	Protected/ Vaccinated	Out Break	Attack	Death	Protected/ Vaccinated
0	0	0	39840	0	0	0	3491	18	53	3	1318092

Source: Bulletin 2011, AHD.

FISHERIES

In Kerala fishing industry occupies an important position in its economy. With a coastal line of 590 Km in length, Kerala offers immense possibilities for fishing both marine and inland. The activities covered in this sector are (i) fishing in ocean, coastal, offshore and inland waters for commercial purposes ii) Subsistence fishing in inland waters (iii) Gathering of sea weeds, seashells and other ocean and coastal water products (iv) Fish curing. Malappuram district has seacoast with 70 km length which stretched between Kadalundi Nagaram in the north and Palappetty in the south. District offers enormous and wide natural potentialities for both marine and inland fisheries. Main fishing centers in the district are Ponnani, Kottayi, Parappanangadi and Thanur. High sea fish catching operations with mechanized boats are centered in Ponnani and Parappanangadi. Backwaters, lakes, rivers and tanks are also stocked with much kind of fish. FFDA (Fish Farmers Development Agency) is functioning in this district extends all basic support and assistance for the development of inland fish farming. There are 23 marine and 6 inland fishing villages. Based of 2011-12 report fisher folk population was 82044 with a breakup of 77897 from marine and 4147 from inland. Annual fish production was 27328 MT from marine and 2647 MT from inland during the same year.

Table: 17.1

FRESH WATER RESOURCES IN MALAPPURAM 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	545	38.14	275	15.43	7	2.04	45	6.10
2010	545	38.14	275	15.43	7	2.04	45	6.10

Table: 17.2

DETAILS OF DISTRICT WISE PADASEKHARAMS IN KERALA

Sl. No.	Name of Districts	No. of Panchayats	No. of Padasekharams	Area in	
				Acre	Cent
1	Kollam	17	104	6837	31.5
2	Alappuzha	52	557	68173	67
3	Kottayam	18	206	15810	40
4	Ernakulam	40	257	10432	20
5	Thrissur	10	92	6002	30
6	Palakkad	11	44	1638	16
7	Malappuram	15	85	580	34
8	Kozhikode	3	8	173	
9	Kannur	41	117	3381	69
10	Kasaragod	11	80	2479	78
	Total	218	1550	115505	385.5

Table: 17.3

LIST OF INLAND FISHING VILLAGES IN MALAPPURAM

Sl.No.	Name of Villages
1	Kadavonadu (Ponnani)
2	Gomughom
3	Purathoor
4	Kutturapuzha (Poorapuzha)
5	Palathungal
6	Kadalundipuzha

Table: 17.4

SPECIES WISE INLAND FISH LANDINGS IN MALAPPURAM (QTY in MT)

2008-2009		
Sl. No.	Name of Fish	Quantity
1	Prawn	46
2	Etroplus	21
3	Murrels	58
4	Mullet	66
5	Cat fish	24
6	Jew fish	44
7	Tilapia	120
8	Labeo fimbriatus	0
9	Barbus	25
10	Mrigal	863
11	Crabs	55
12	Common crabs	60
13	Catla	0
14	Gourami	0
15	Chamos	3
16	Eels	0
17	Labeo Rohitha	53
18	Shrimp	0
19	Mussel	281
20	Edible Oyster	0
21	Miscellaneous	23
	Total	1742

2009-2010		
Sl. No.	Name of Fish	Quantity
1	Prawn	47
2	Etroplus	21
3	Murrels	58
4	Mullet	65
5	Cat fish	24
6	Jew fish	44
7	Tilapia	118
8	Labeo fimbriatus	0
9	Barbus	25
10	Mrigal	1083
11	Crabs	68
12	Common crabs	72
13	Catla	0
14	Gourami	0
15	Chamos	3
16	Eels	0
17	Labeo Rohitha	61
18	Shrimp	36
19	Mussel	375
20	Edible Oyster	0
21	Miscellaneous	21
	Total	2121

Source: Inland Fisheries Statistics, Dept of Fisheries

WETLAND

Wetlands play a vital role in maintaining the fragile environmental balance. Wetlands serve as sinks, sources and transformers of innumerable chemical, biological and genetic materials. They offer a unique habitat for a wide variety of flora and fauna as well. Wetlands are lands transitional between terrestrial and aquatic ecosystem where the water table is usually at or near the surface or the land is covered by shallow water. 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. 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.

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.

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 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 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, sulfur, 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 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.

Temperatures vary 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 climate conditions and topography.

Though small in size Kerala is land of affluent in water sources. 44 rivers drain the land of, which are west flowing and 3 flows east. 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 is 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 Sasthamkotta Lake. In the State of Kerala 1762 wetlands have been delineated. Total wetlands area estimated to 160590ha. The major wetland types are River/stream (65162ha) 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.

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.

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.

Table: 18.1

AREEKOD BLOCK

(Area in Ha)

[illegible]

Table: 18.2

KALIKAVU BLOCK

(Area in Ha)

[illegible]

Table: 18.3

KONDOTTY BLOCK

(Area in Ha)

[illegible]

Table: 18.4

KUTTIPPURAM BLOCK

(Area in Ha)

[illegible]

Table: 18.5

MALAPPURAM BLOCK**(Area in Ha)**

Sl. No.	Category	Anakkayam	Kodur	Morayur	Othukkungal	Ponmala	Pookkottur
1	Marshy Land						
2	Mundakan				95.05		
3	Mundakan + Puncha						
4	Other Land Uses	2854.28	1710.21	2090.12	1173.25	1773.07	1765.01
5	Paddy Converted to Arecanut						
6	Paddy Converted to Banana						
7	Paddy Converted to Built up	231.08	43.82	26.88		27.59	23.08
8	Paddy Converted to Built up + Coconut	83.79					
9	Paddy Converted to Built up + Mixed Crops						
10	Paddy Converted to Built up + Mixed Trees	573.78					
11	Paddy Converted to Built up + Rubber						
12	Paddy Converted to Coconut + Arecanut						
13	Paddy Converted to Cashew						
14	Paddy Converted to Coconut	290.23	64.82	247.62	28.24	101.15	35.56
15	Paddy Converted to Cultivable Wasteland				6.08	3.50	
16	Paddy Converted to Mixed Crops	108.03	123.48	2.13		66.79	100.21
17	Paddy Converted to Mixed Trees	76.94		46.40			17.08
18	Paddy Converted to Rubber	62.33					3.83
19	Puncha						
20	River	90.66	13.65		18.75		
21	Virippu						
22	Virippu + Mundakan	212.38	32.64		12.55	192.47	185.67
23	Virippu + Mundakan + Puncha						
24	Water Bodies						
	Panchayat Total	4583.50	1988.62	2413.15	1333.92	2164.57	2130.44
	Block Total	14614.20					

Table: 18.6

MANKADA BLOCK

(Area in Ha)

Sl. No.	Category	Kuttilangadi	Kuruva	Mankada	Moorkkanadu	Makkarapparambu	Puzhakkattiri
1	Marshy Land						
2	Mundakan						
3	Mundakan + Puncha						
4	Other Land Uses	1925.98	2763.93	2111.98	2796.01	1214.38	1770.79
5	Paddy Converted to Arecanut						
6	Paddy Converted to Banana	26.08	30.86		12.59	14.7	17.21
7	Paddy Converted to Built up	33.72	335.55	13.52	22.79	18.43	26.5
8	Paddy Converted to Built up + Coconut						
9	Paddy Converted to Built up + Mixed Crops						
10	Paddy Converted to Built up + Mixed Trees	7.75			32.29		28.91
11	Paddy Converted to Built up + Rubber						
12	Paddy Converted to Coconut + Arecanut						
13	Paddy Converted to Cashew						
14	Paddy Converted to Coconut	45.96	60.07	30.34	5.32	10.86	55.32
15	Paddy Converted to Cultivable Wasteland	5.04					0.34
16	Paddy Converted to Mixed Crops	81.04	100.34	143.11	33.39	15.02	40
17	Paddy Converted to Mixed Trees		2.09		37.08		4.15
18	Paddy Converted to Rubber		5.96		23.71		19.44
19	Puncha						
20	River	38.69	11.42		62.48	5.6	15.77
21	Virippu						
22	Virippu + Mundakan	281.58	137.61	82.41	494.94	193.66	333.66
23	Virippu + Mundakan + Puncha						
24	Water Bodies						0.14
	Panchayat Total	2445.84	3447.83	2381.36	3520.60	1472.65	2312.23
	Block Total	15580.51					

Table: 18.7

NILAMBUR BLOCK

(Area in Ha)

Sl. No.	Category	Chaliyar	Chungathara	Edakkara	Muthedam	Pothukallu	Vazhikkadavu
1	Marshy Land						
2	Mundakan						
3	Mundakan + Puncha						
4	Other Land Uses	8303.26	12436.81	3022.03	5484.99	12973.79	12840.67
5	Paddy Converted to Arecanut						
6	Paddy Converted to Banana		36.52				
7	Paddy Converted to Built up	0.66	235.36	208.85	40.06	82.78	204.32
8	Paddy Converted to Built up + Coconut				5.64		
9	Paddy Converted to Built up + Mixed Crops						
10	Paddy Converted to Built up + Mixed Trees						
11	Paddy Converted to Built up + Rubber						
12	Paddy Converted to Coconut + Arecanut		19.14				
13	Paddy Converted to Cashew						
14	Paddy Converted to Coconut		442.29	341.69	400.11	27.56	916.11
15	Paddy Converted to Cultivable Wasteland		69.24	104.09	310.45	2.53	13.78
16	Paddy Converted to Mixed Crops		229.7	59.63	14.26	15.81	370.55
17	Paddy Converted to Mixed Trees	5.16	20.43	12.44	100.1		75.9
18	Paddy Converted to Rubber	28.76	522.85	3.49	53.68	24.93	66.69
19	Puncha						
20	River	56.08	235.81	43.75	190.62	162.87	117.98
21	Virippu						
22	Virippu + Mundakan		132.53	17.7	545.55		12.44
23	Virippu + Mundakan + Puncha						
24	Water Bodies						
	Panchayat Total	8393.92	14380.68	3813.67	7145.46	13290.27	14618.44
	Block Total	61642.44					

Table: 18.8

PERINTHALMANNA BLOCK

(Area in Ha)

[illegible]

Table: 18.9

PERUMPADAPPU BLOCK

(Area in Ha)

Sl. No.	Category	Alangode	Marancherry	Nannamukku	Perumpadappu	Veliyancode
1	Marshy Land					
2	Mundakan					
3	Mundakan + Puncha					
4	Other Land Uses	1394.89	1235.06	1045.39	970.74	1228.35
5	Paddy Converted to Arecanut					
6	Paddy Converted to Banana		3.89	2.7	0.09	5.79
7	Paddy Converted to Built up	4.31	18.63		3.26	13.62
8	Paddy Converted to Built up + Coconut					
9	Paddy Converted to Built up + Mixed Crops					
10	Paddy Converted to Built up + Mixed Trees					
11	Paddy Converted to Built up + Rubber					
12	Paddy Converted to Coconut + Arecanut					3.76
13	Paddy Converted to Cashew					
14	Paddy Converted to Coconut	17.88	172.51	1.73	38.32	107.2
15	Paddy Converted to Cultivable Wasteland	2.09	2.97	2.02	5.79	34.93
16	Paddy Converted to Mixed Crops	4.05	41.75	4.72	17.67	81.02
17	Paddy Converted to Mixed Trees					
18	Paddy Converted to Rubber					
19	Puncha	447.1	25.15	435.63	186.09	6.9
20	River		567.71	35.66	167.53	346.62
21	Virippu			30.15		
22	Virippu + Mundakan	207.1	84.95	163.55	34.19	34.23
23	Virippu + Mundakan + Puncha	57.85	126.75			
24	Water Bodies					
	Panchayat Total	2135.27	2279.37	1721.55	1423.68	1862.42
	Block Total	9422.29				

Table: 18.10

PONNANI BLOCK**(Area in Ha)**

Sl. No.	Category	Edappal	Kaladi	Thavanur	Vattomkulam
1	Marshy Land				
2	Mundakan		7.97		289.58
3	Mundakan + Puncha				
4	Other Land Uses	931.38	713.54	995.63	1548.25
5	Paddy Converted to Arecanut				
6	Paddy Converted to Banana	3.38	8.44	4.25	
7	Paddy Converted to Built up	15.93	15.95	128.39	8.85
8	Paddy Converted to Built up + Coconut				
9	Paddy Converted to Built up + Mixed Crops				
10	Paddy Converted to Built up + Mixed Trees				
11	Paddy Converted to Built up + Rubber				
12	Paddy Converted to Coconut + Arecanut	3.36		16.28	
13	Paddy Converted to Cashew				
14	Paddy Converted to Coconut	4.59	102.85	313.05	11.39
15	Paddy Converted to Cultivable Wasteland	33.6	172.77	34.02	2.02
16	Paddy Converted to Mixed Crops	74.02	37.5	28.53	13.67
17	Paddy Converted to Mixed Trees				
18	Paddy Converted to Rubber	1.02		13.32	
19	Puncha	358.28			93.81
20	River	129.11	75.16	333.53	
21	Virippu				
22	Virippu + Mundakan	98.78	64.8	92.08	240.51
23	Virippu + Mundakan + Puncha	0.77	319.8	541.27	8.85
24	Water Bodies	7.27	34.96		
	Panchayat Total	1661.49	1553.74	2500.35	2216.93
	Block Total	7932.51			

Table: 18.11

TANUR BLOCK

(Area in Ha)

[illegible]

Table: 18.12

TIRURANGADI BLOCK

(Area in Ha)

[illegible]

Table: 18.13

TIRUR BLOCK**(Area in Ha)**

Sl. No.	Category	Mangalam	Purathur	Thalakkad	Thirunavaya	Thriprangode	Vettom
1	Marshy Land						
2	Mundakan			8.45	16.68	17.34	
3	Mundakan + Puncha						
4	Other Land Uses	784.98	888.22	808.72	1214.04	855.22	1168.27
5	Paddy Converted to Arecanut						1.03
6	Paddy Converted to Banana	13.66	12.41	3.11	26.43		13.27
7	Paddy Converted to Built up	35.32	56.43	96.8	84.5	84.39	29.36
8	Paddy Converted to Built up + Coconut						
9	Paddy Converted to Built up + Mixed Crops						
10	Paddy Converted to Built up + Mixed Trees						
11	Paddy Converted to Built up + Rubber						
12	Paddy Converted to Coconut + Arecanut						21.51
13	Paddy Converted to Cashew						
14	Paddy Converted to Coconut	163.93	140.85	159.21	44.08	150.45	181.3
15	Paddy Converted to Cultivable Wasteland	76.86	194.66		4.63	66.3	20.53
16	Paddy Converted to Mixed Crops	20.31	34.49	130.62	27.24	30.58	80.75
17	Paddy Converted to Mixed Trees						
18	Paddy Converted to Rubber						
19	Puncha	22.66					
20	River	65.5	569.24	39.05	125.17	215.92	81.71
21	Virippu						
22	Virippu + Mundakan	18.99	11.97	379.9	435.71	363.28	46.98
23	Virippu + Mundakan + Puncha	38.53				202.58	
24	Water Bodies	0.11	0.01			1.01	0.96
	Panchayat Total	1240.85	1908.28	1625.86	1978.48	1987.07	1645.67
	Block Total	10386.21					

Table: 18.14

VENGARA BLOCK

(Area in Ha)

[illegible]

Table: 18.15

WANDOOR BLOCK

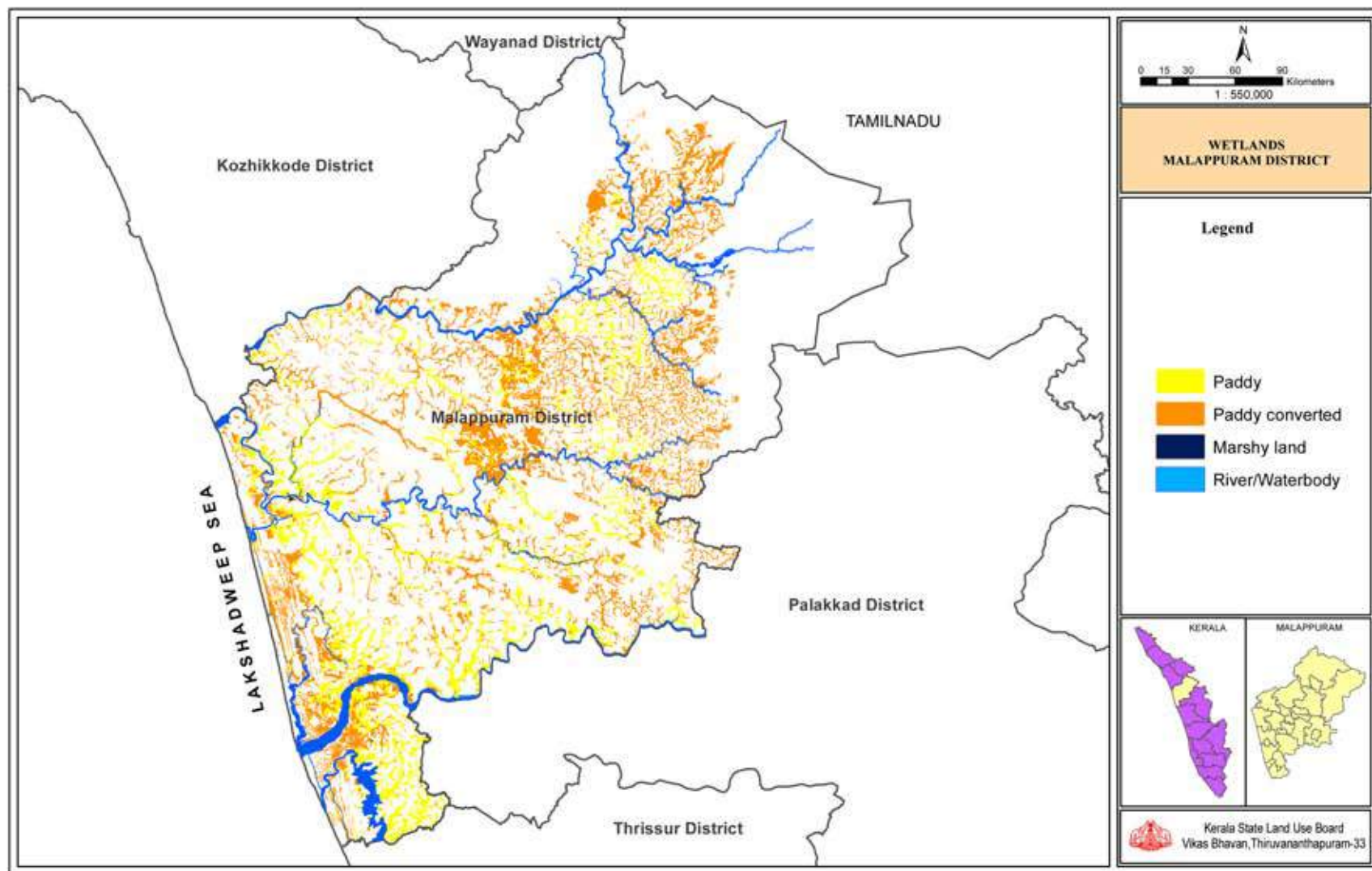
(Area in Ha)

Sl. No.	Category	Mambad	Pandikkad	Porur	Thiruvali	Thrikkalangode	Wandoor
1	Marshy Land						
2	Mundakan			14.4		168.44	
3	Mundakan + Puncha						
4	Other Land Uses	3250.51	4482.97	2438.99	2306.38	3944.47	2345.44
5	Paddy Converted to Arecanut						
6	Paddy Converted to Banana				26.78		8.6
7	Paddy Converted to Built up	88.31	95.68	40.71	22.32	90.59	93.57
8	Paddy Converted to Built up + Coconut						
9	Paddy Converted to Built up + Mixed Crops						
10	Paddy Converted to Built up + Mixed Trees				151.09	968.01	
11	Paddy Converted to Built up + Rubber					52.17	
12	Paddy Converted to Coconut + Arecanut						
13	Paddy Converted to Cashew					56.68	
14	Paddy Converted to Coconut	26.51	127.79	379.63	544.71	215.76	4.83
15	Paddy Converted to Cultivable Wasteland	3.24	16.28	10.15	18.87	5.56	114.59
16	Paddy Converted to Mixed Crops		1.32		2.36	13.97	33.98
17	Paddy Converted to Mixed Trees	149.17	346.98	307.56	42.57	91.1	119.76
18	Paddy Converted to Rubber	189.39	130.38	35.89	23.17	88.87	82.40
19	Puncha						
20	River	84.11	80.46				24.41
21	Virippu						
22	Virippu + Mundakan	448.89	471.53	129.88	90.48	349.42	499.64
23	Virippu + Mundakan + Puncha						
24	Water Bodies						
	Panchayat Total	4240.13	5753.39	3357.21	3228.73	6045.04	3327.22
	Block Total	25951.72					

Table: 18.16

MUNICIPALITY**(Area in Ha)**

Sl. No.	Category	Malappuram Municipality	Manjeri Municipality	Perinthalmanna Municipality	Ponnani Municipality	Tirur Municipality	Nilambur Municipality	Kottakkal Municipality
1	Marshy Land							
2	Mundakan			74.59		2.06		8.01
3	Mundakan + Puncha							
4	Other Land Uses	2984.24	3020.58	2983	1357.88	1218.41	5077.26	1717.04
5	Paddy Converted to Arecanut		19.92		1.96			
6	Paddy Converted to Banana	1.67	20.53	136.97	35.42	51.6		
7	Paddy Converted to Built up	30.43	337.89	146.94	112	121.4	46.86	36.17
8	Paddy Converted to Built up + Coconut		89.29	40.46				
9	Paddy Converted to Built up + Mixed Crops		176.05	46.14				
10	Paddy Converted to Built up + Mixed Trees		831.36					
11	Paddy Converted to Built up + Rubber							
12	Paddy Converted to Coconut + Arecanut							
13	Paddy Converted to Cashew		7.54					
14	Paddy Converted to Coconut	30.25	83.4	18	299.42	89.19	96.63	50.45
15	Paddy Converted to Cultivable Wasteland			11.06	133.97	41.18	97.92	13.50
16	Paddy Converted to Mixed Crops	19.65	135.71	277.51	133.68	58.12	110.52	33.22
17	Paddy Converted to Mixed Trees		330.15				85.27	
18	Paddy Converted to Rubber		23.03	18.57		2.74	255.99	
19	Puncha							
20	River	116.98	53.89		441.94	50.2	187.57	
21	Virippu							
22	Virippu + Mundakan	110.13	125.13	29.34	0.94	40.93	402.87	209.14
23	Virippu + Mundakan + Puncha				13.37			
24	Water Bodies					1.38		0.10
	Municipality Total	3293.35	5254.47	3782.58	2530.58	1677.21	6360.89	2067.63



WASTELAND

Land is a critical natural resource

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 in Kerala

It is a not an exaggeration to say that wasteland exist in Kerala, where the per capita availability of land is only 0.13 hectare and the average size of holding is 0.33 hectare. The studies by National Remote Sensing Agency (1985) using satellite imageries has revealed that cultivable and uncultivable wasteland exists in Kerala, and it amounts to 5.2 percent of the total geographical area. The State Land Use Board made an attempt to estimate the extent of wasteland in the State utilizing the primary data available from the Department of Economics and Statistics; the only source on land utilization statistics in the State (Extent of Wasteland in Kerala State Land Use Board, 1986). This study has shown that 8.15 percent of the geographical area or 11.09 percent of the non-forest area of the State is categorized as wasteland. Though the two figures are from two different methodologies and classifications, the area involved is much significant in the small State like ours, where the density of population and pressure on land are so high.

The National Wasteland Development Board has undertaken the mapping of wasteland in India on 1:50,000 scale during 1987-88. They have identified six districts having maximum area of wastelands, viz, Kasargod, Kannur, Wayanad, Malappuram, Palakkad and Idukki under Wasteland

mapping Project Phase II at national level. Kerala State Land use Board undertook the task of identifying and mapping and completed the project, Later the remaining eight districts, viz. Alapuzha, Ernakulam, Kollam, Kottayam, Kozhikode, Pathanamthitta, Thiruvananthapuram and Thrissur were taken up under the project, Wasteland Mapping Phase V. The study revealed that there is a total area of 1457 sq.km (3.73 percent) under wasteland in the State.

Presently under this project, the updation of the wastelands was done using the LISS III satellite imagery of 2003. The data gathered by this task is presented for the use of various departments/agencies in the State engaged in the programme of reclamation of wastelands in the State.

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 project is as follows:

1. Land with scrub
2. Land without scrub
3. Waterlogged –permanent
4. Waterlogged – seasonal
5. Under utilized/degraded notified forest land - scrub dominated
6. Degraded pastures/grazing land

7. Degraded land under plantation crop
8. Sands (riverine/coastal/desertic) - flood plain
9. Coastal sand
10. Mining/Industrial - Mining
11. Mining/Industrial – Industrial
12. Barren Rocky/Stony waste/Sheet rock
13. Steep slopping area

**Brief description on spatial distribution and physical condition of
wastelands in Malappuram district**

Area and percentage to total of major categories of wasteland in the district are given below:-

Table: 19.1

Sl. No.	Wasteland categories	Area in Ha.	Percentage to total Geographical area (Total area 355446 ha)
1	Barren rocky area	2146.31	0.60
2	Coastal sands	355.33	0.99
3	Land with dense scrub	11636.95	32.73
4	Scrub dominated forest	5696.95	16.02

1. **Barren rocky area:** - This category of wasteland mapped in an area of 2146.31 ha. covering 0.60% of total geographical area of the district. It is mainly distributed in Karulai (521.06 ha.), Amarambalam (254.22 ha.), Chungathara (243.24 ha.) Panchayats.
2. **Coastal sands:** - This category of wasteland identified in an area of 355.33 ha. covering 0.99% of the total geographical area of the district. This is mainly located in Tanur (82.34 ha.), Purathur (68.47 ha.), Vettom (63.46 ha.) Panchayats.

3. **Land with dense scrub:** - This category of wasteland occurs in an area of 11636.95 ha. covering 32.73% of the total geographical area of the district. It is mainly identified in Karulai (521.06 ha.), Chikkode (396.60 ha.) and Pulickal (390.12 ha.) Panchayats.
4. **Scrub dominated forest:** - This category of wasteland mapped an area of 5696.95 ha. covers 16.02% of the total geographical area of the district. Panchayats having maximum area under this category are Chaliyar (1166.93 ha.), Pothukallu (757.16ha.), Oorngattiri (548.48 ha.).

Table:19.2

AREEKOD BLOCK

[illegible]

Table:19.3

PERINTHALMANNA BLOCK

									Area (Ha)
Sl. No.	Category	Alipparambu	Angadippuram	Elamkulam	Keezhattur	Melattur	Pulamanthole	Thazhekkode	Vettathur
1	Barren rocky area		7.69		43.68	0.94			48.95
2	Coastal sands								
3	Land with dense scrub	69.43	51.19	119.32	120.63	28.56	72.01	172.52	71.29
4	Land with open scrub	0.36						4.35	15.24
5	Scrub dominated forest				13.81			216.17	124.55
6	Sands riverine								
	Panchayat Total	69.79	58.88	119.32	178.12	29.50	72.01	393.04	260.03
	Block Total	1180.69							

Table:19.4

KONDOTTY BLOCK

Area (Ha)										
Sl. No.	Category	Chelambra	Cherukavu	Kondotty	Muthuvallur	Nediyiruppu	Pallickal	Pulickal	Vazhakkad	Vazhayur
1	Barren rocky area		71.29		38.58			144.81		
2	Coastal sands									
3	Land with dense scrub	37.78	281.44	86.91	70.88	249.29	380.56	390.12	270.83	168
4	Land with open scrub								3.47	25.61
5	Scrub dominated forest									
6	Sands riverine									
	Panchayat Total	37.78	352.73	86.91	109.46	249.29	380.56	534.93	274.3	193.61
	Block Total	2219.57								

Table:19.5

TANUR BLOCK

[illegible]

Table:19.6

MALAPPURAM BLOCK

Area (Ha)

Sl. No.	Category	Anakkayam	Kodur	Morayur	Othukkungal	Ponmala	Pookkottur
1	Barren rocky area	7.13		3.61			
2	Coastal sands						
3	Land with dense scrub	122.35	132.96	164.63	71.08	121.1	142.67
4	Land with open scrub					19.41	
5	Scrub dominated forest						
6	Sands riverine						
	Panchayat Total	129.48	132.96	168.24	71.08	140.51	142.67
	Block Total	784.94					

Table:19.7

NILAMBUR BLOCK

Area (Ha)

Sl. No.	Category	Chaliyar	Chungathara	Edakkara	Muthedam	Pothukallu	Vazhikkadavu
1	Barren rocky area	145.44	243.24			147.46	20.44
2	Coastal sands						
3	Land with dense scrub	43.92	228.72	78.65	185.6	68.32	20.63
4	Land with open scrub		0.33				
5	Scrub dominated forest	1166.93	897.25		60.24	757.16	315.06
6	Sands riverine						
	Panchayat Total	1356.29	1369.54	78.65	245.84	972.94	356.13
	Block Total	4379.39					

Table:19.8

MANKADA BLOCK

Area (Ha)

Sl. No.	Category	Kuttilangadi	Kuruva	Mankada	Moorkkanadu	Makkarapparambu	Puzhakkattiri
1	Barren rocky area	0.4		10.19		20.34	0.05
2	Coastal sands						
3	Land with dense scrub	131.9	195.92	135.08	151.35	39.78	41.93
4	Land with open scrub		31.76				
5	Scrub dominated forest			77.13			
6	Sands riverine						
	Panchayat Total	132.3	227.68	222.4	151.35	60.12	41.98
	Block Total	835.83					

Table:19.9

WANDOOR BLOCK

Area (Ha)

Sl. No.	Category	Mambad	Pandikkad	Porur	Thiruvalli	Thrikkalangode	Wandoor
1	Barren rocky area	5.52		2.46	36.06		56.14
2	Coastal sands						
3	Land with dense scrub	270.12	98.54	84.85	122.62	146.96	110.59
4	Land with open scrub						
5	Scrub dominated forest	77.54					
6	Sands riverine						
	Panchayat Total	353.18	98.54	87.31	158.68	146.96	166.73
	Block Total	1011.40					

Table: 19.10

KUTTIPPURAM BLOCK

								Area (Ha)
Sl. No.	Category	Athavanad	Edayur	Irimbiliyam	Kalpakancherry	Kuttippuram	Marakkara	Valancherry
1	Barren rocky area						2.82	2.43
2	Coastal sands							
3	Land with dense scrub	189.54	216.47	88.84	80.18	198.17	319.16	198.62
4	Land with open scrub		7.09				36.13	
5	Scrub dominated forest							
6	Sands riverine			38.97		266.90		
	Panchayat Total	189.54	223.56	127.81	80.18	465.07	358.11	201.05
	Block Total	1645.32						

Table:19.11

VENGARA BLOCK

Area (Ha)								
Sl. No.	Category	A.R.Nagar	Edarikkode	Kannamangalam	Parappur	Thennala	Oorakam	Vengara
1	Barren rocky area							
2	Coastal sands							
3	Land with dense scrub	42.41	49.15	304.82	63.05	57.49	251.2	102.45
4	Land with open scrub							
5	Scrub dominated forest							
6	Sands riverine							
	Panchayat Total	42.41	49.15	304.82	63.05	57.49	251.2	102.45
	Block Total	870.57						

Table: 19.12

TIRURANGADI BLOCK

								Area (Ha)
Sl. No.	Category	Munniyur	Nannambra	Parappanangadi	Peruvallur	Thenjippalam	Tirurangadi	Vallikkunnu
1	Barren rocky area							
2	Coastal sands			27.64				
3	Land with dense scrub	113.01	19.51		49.28	93.69	27.02	13.99
4	Land with open scrub							3.05
5	Scrub dominated forest							
6	Sands riverine							
	Panchayat Total	113.01	19.51	27.64	49.28	93.69	27.02	17.04
	Block Total	347.19						

Table: 19.13

KALIKAVU BLOCK[illegible]

Table: 19.14

TIRUR BLOCK

Sl.No.	Category	Area (Ha)					
		Mangalam	Purathur	Thalakkad	Thirunavaya	Thriprangode	Vettom
1	Barren rocky area						
2	Coastal sands	42.99	68.47				63.46
3	Land with dense scrub				13.38		
4	Land with open scrub						
5	Scrub dominated forest						
6	Sands riverine						
	Panchayat Total	42.99	68.47	0.00	13.38	0.00	63.46
	Block Total	188.30					

Table: 19.15

PONNANI BLOCK

Sl.No.	Category	Area (Ha)			
		Edappal	Kaladi	Tavanur	Vattamkulam
1	Barren rocky area				
2	Coastal sands				
3	Land with dense scrub		7.81	31.71	3.65
4	Land with open scrub				1.79
5	Scrub dominated forest				
6	Sands riverine			1.22	
	Panchayat Total	0.00	7.81	32.93	5.44
	Block Total	46.18			

Table: 19.16

PERUMPADAPPU BLOCK

Area (Ha)

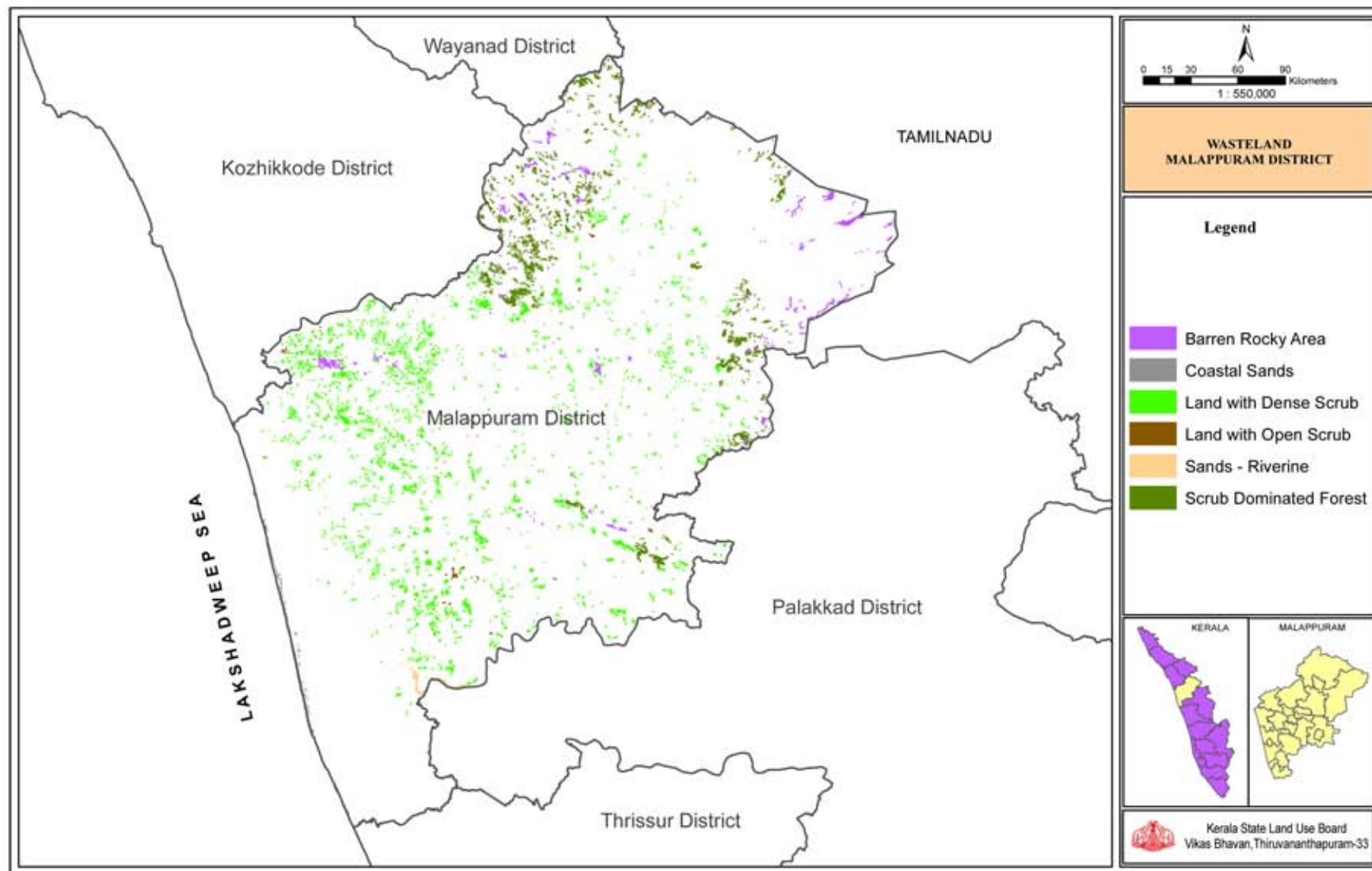
Sl. No.	Category	Alangode	Marancherry	Nannamukku	Perumpadappu	Veliyancode
1	Barren rocky area					
2	Coastal sands				14.87	12.61
3	Land with dense scrub					
4	Land with open scrub					
5	Scrub dominated forest					
6	Sands riverine					
	Panchayat Total	0.00	0.00	0.00	14.87	12.61
	Block Total	27.48				

Table: 19.17

MUNICIPALITY

Area (Ha)

Sl. No.	Category	Malappuram Municipality	Manjeri Municipality	Perinthalmanna Municipality	Ponnani Municipality	Tirur Municipality	Nilambur Municipality	Kottakkal Municipality
1	Barren rocky area		4.99	2.74				3.19
2	Coastal sands							
3	Land with dense scrub	188.85	72.47	136.57			185.16	177.95
4	Land with open scrub	6.00					16.22	
5	Scrub dominated forest			6.1			19.56	
6	Sands riverine							
	Municipality Total	194.85	77.46	145.41	0	0	220.94	181.14



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 DETAILS

Block	Panchayat	WS Code	Area (Ha)
Areekod	Areekod	24C11a	5.80
		24C12a	0.28
		24C12n	1.01
		24C13a	1.44
		24C63a	180.87
		24C64a	357.07
		24C65a	325.01
		24C66a	809.24
		24C66b	4.46
		24C66q	5.25
		24C66r	11.97
		Panchayat Total	1702.38
	Cheekkodu	24C10a	4.24
		24C11a	0.01
		24C65a	0.35
		24C66a	12.89
		24C66o	107.21
		24C66q	541.89
		24C66r	190.28
		24C67a	298.96
		24C68a	43.69
		24C69a	216.68
		24C69b	346.76
		24C69c	516.58
		24C69d	195.20
		24C69e	343.57
		24C69f	1.19
		24C72b	110.31
		24C72c	28.09
		Panchayat Total	2957.90
	Edavanna	24C12j	24.62
		24C12k	38.36
		24C15a	187.27
		24C15b	784.84
		24C15c	179.64
		24C16a	303.96
		24C17a	503.05
		24C18a	14.61
		24C58a	2.89
		24C58f	529.33
		24C59a	1114.40

Block	Panchayat	WS Code	Area (Ha)
		24C60a	482.26
		24C61a	208.59
		24C61b	475.75
		24C61c	52.45
		24C61e	0.34
		24C61f	0.00
	Panchayat Total		4902.35
	Kavanur	24C13a	2.47
		24C14a	3.74
		24C15a	10.52
		24C61a	8.96
		24C61d	77.05
		24C61e	306.56
		24C61f	878.01
		24C62a	214.77
		24C63a	113.39
		24C64a	6.68
		24C66a	6.55
		24C66b	911.06
		24C66c	906.62
		24C66d	32.82
		24C66j	0.02
	Panchayat Total		3479.22
	Keezhuparambu	24C10a	672.03
		24C11a	495.11
		24C12a	248.56
		24C12b	14.19
		24C12m	0.31
		24C12n	1.51
		24C63a	0.08
		24C64a	2.11
		24C65a	1.38
		24C66a	0.05
		24C67a	0.50
		24C68a	0.22
		24C9at	12.17
		24C9au	28.12
	Panchayat Total		1476.34
	Kuzhimanna	23k7h	19.94
		24C66a	10.79
		24C66b	57.58
		24C66c	29.49
		24C66j	0.00
		24C66k	1.72
		24C66l	7.69
		24C66m	333.13
		24C66n	363.98
		24C66o	499.67

Block	Panchayat	WS Code	Area (Ha)
		24C66p	556.49
		24C66q	391.71
	Panchayat Total		2272.19
	Pulpatta	23K16c	3.43
		23K16d	6.18
		24C61e	0.14
		24C66b	3.07
		24C66c	127.30
		24C66d	460.18
		24C66e	53.46
		24C66g	19.07
		24C66h	206.22
		24C66i	363.22
		24C66j	633.05
		24C66k	899.42
		24C66l	187.22
		24C66m	5.12
		24C66p	49.47
	Panchayat Total		3016.54
	Oorngattiri	24C12a	9.42
		24C12b	4.58
		24C12c	7.40
		24C12d	7.86
		24C12e	510.64
		24C12f	421.91
		24C12g	357.39
		24C12h	955.78
		24C12i	770.30
		24C12j	313.47
		24C12k	349.21
		24C12l	500.76
		24C12m	417.34
		24C12n	346.21
		24C13a	752.30
		24C14a	867.54
		24C15a	420.88
		24C15b	6.16
		24C15c	17.21
		24C18a	1.19
		24C19b	20.48
		24C19c	8.17
		24C20e	6.01
		24C20f	345.07
		24C20g	70.90
		24C20k	2.16
		24C61a	0.00
		24C61f	0.22
		24C62a	0.38

Block	Panchayat	WS Code	Area (Ha)
		24C63a	0.86
		24C9al	5.88
	Panchayat Total		7497.66
	Block Total		27304.57
Kalikavu	Amarambalam	24C52ay	444.16
		24C52az	173.88
		24C52ba	1013.50
		24C52bb	533.92
		24C52bc	9.93
		24C52bg	0.00
		24C52bi	1278.04
		24C52bj	704.68
		24C52bk	1547.68
		24C52bm	2.36
		24C52bp	345.86
		24C52br	353.79
		24C56a	42.05
		24C56aa	277.75
		24C56ab	85.84
		24C56b	639.70
		24C56bh	237.24
		24C56bn	1557.08
		24C56bo	416.17
		24C56c	461.14
		24C56d	782.81
		24C56e	315.90
		24C56f	596.25
		24C56g	366.70
		24C56h	2.64
		24C56i	0.00
		24C56j	102.98
		24C56k	2.84
		24C56p	1.97
		24C56q	11.59
		24C56r	1.56
	Panchayat Total		12310.01
	Chokkad	20B4w	32.14
		24C56d	9.28
		24C56e	3.69
		24C56f	13.08
		24C56g	277.38
		24C56h	779.48
		24C56i	249.98
		24C56j	151.25
		24C56k	672.37
		24C56l	687.28
		24C56m	1212.48
		24C56n	273.01

Block	Panchayat	WS Code	Area (Ha)
		24C56o	480.48
		24C56p	479.30
		24C56q	307.05
		24C56r	373.35
		24C56s	111.78
		24C56u	1.45
		24C56z	0.67
	Panchayat Total		6115.50
	Edappatta	23K25a	3.03
		23K26a	3.10
		23K28a	5.71
		23K29a	684.52
		23K30b	214.70
		23K30c	499.02
		23K30e	575.02
		23K30f	563.51
		23K30p	4.08
	Panchayat Total		2552.69
	Kalikavu	20B4w	0.78
		23K23h	790.73
		24C56aa	2.49
		24C56m	172.05
		24C56n	26.51
		24C56o	479.65
		24C56r	13.20
		24C56s	345.35
		24C56t	411.32
		24C56u	1285.77
		24C56v	470.84
		24C56w	550.22
		24C56x	82.85
		24C56y	819.74
		24C56z	717.16
	Panchayat Total		6168.67
	Karulai	24C52aa	666.38
		24C52ab	439.31
		24C52ac	765.33
		24C52ad	1534.22
		24C52ae	232.98
		24C52af	616.66
		24C52ah	4.64
		24C52ai	626.97
		24C52ak	321.12
		24C52al	846.11
		24C52am	1066.59
		24C52an	335.09
		24C52ao	1224.70
		24C52ap	472.15

Block	Panchayat	WS Code	Area (Ha)
		24C52aq	637.65
		24C52ar	824.54
		24C52as	817.86
		24C52at	677.82
		24C52au	1127.96
		24C52av	1066.65
		24C52aw	1884.33
		24C52ax	221.19
		24C52ay	951.49
		24C52az	168.41
		24C52ba	25.89
		24C52bb	487.31
		24C52bc	354.07
		24C52bd	313.26
		24C52bf	102.57
		24C52bg	589.38
		24C52bj	1.42
		24C52bk	10.94
		24C52bl	233.76
		24C52bm	143.63
		24C52s	3.04
		24C52x	1.40
		24C52y	1.38
		24C56bh	27.74
		24C56bn	321.53
		24C56bo	0.96
	Panchayat Total		20148.41
	Karuvarakundu	20B4v	5.31
		20B4w	1.90
		23K26a	21.82
		23K27a	385.34
		23K27b	409.09
		23K27c	654.85
		23K27d	451.80
		23K27e	436.61
		23K27f	1168.72
		23K28a	713.00
		23K29a	263.45
		23K30b	286.10
		23K30c	50.98
		23K30d	18.86
		23K30i	91.32
		24C56v	4.25
		24C56w	1263.84
		24C56x	415.19
		24C56y	638.46
	Panchayat Total		7280.87
	Thuvvoor	23K23h	884.87

Block	Panchayat	WS Code	Area (Ha)
		23K25a	80.87
		23K26a	731.72
		23K27a	2.41
		23K29a	266.00
		24C56u	5.85
		24C56v	2.37
		24C56x	383.14
		24C56y	808.66
	Panchayat Total		3165.90
	Block Total		57742.06
Kondotty	Chelambra	23K2a	166.17
		23K7c	69.60
		24C77a	0.73
		24C78a	14.33
		24C78b	17.19
		24C78c	1.10
		24C78d	366.98
		24C78e	280.83
		24C79a	658.66
	Panchayat Total		1575.61
	Cherukavu	24C72d	34.90
		24C73a	2.85
		24C74a	491.13
		24C75a	246.85
		24C78b	473.07
		24C78c	624.67
	Panchayat Total		1873.47
	Kondotty	23k7f	136.34
		23k7g	402.36
		23K7l	343.49
		23K7m	8.08
		24C66n	182.50
	Panchayat Total		1072.76
	Muthuvalloor	23k7f	3.30
		24C66n	378.92
		24C66o	315.78
		24C69c	219.54
		24C72c	267.12
	Panchayat Total		1184.67
	Nediyiruppu	23k7g	97.85
		23k7h	394.53
		23k7i	227.84
		23K7j	2.19
		23K7k	279.78
		23K7l	253.57
		23K7n	713.73
		23K8c	0.98
		24C66l	60.51

Block	Panchayat	WS Code	Area (Ha)
		24C66m	13.60
		24C66n	9.68
	Panchayat Total		2054.26
	Pallickal	23K7b	0.84
		23K7c	466.80
		23K7d	560.61
		23K7e	222.93
		23k7f	7.30
		23K7l	30.60
		23K7m	332.69
		23K7n	707.44
		23K7o	3.88
		24C78b	0.99
		24C78c	197.47
		24C78d	173.69
		24C79a	5.05
	Panchayat Total		2710.30
	Pulickal	23K7d	10.65
		23K7e	191.88
		23k7f	400.57
		24C66n	89.06
		24C69e	7.98
		24C69f	0.72
		24C70a	0.74
		24C71a	2.18
		24C72a	51.88
		24C72b	491.84
		24C72c	513.10
		24C72d	456.45
		24C73a	4.76
		24C74a	5.44
		24C78c	553.83
	Panchayat Total		2781.09
	Vazhakkad	24C10a	3.72
		24C68a	347.12
		24C69a	373.05
		24C69e	71.65
		24C69f	490.19
		24C6a	0.05
		24C70a	532.17
		24C71a	470.75
		24C72a	194.72
		24C72b	10.00
		24C72d	17.28
		24C7ac	0.04
		24C8a	5.31
		24C9au	1.83
	Panchayat Total		2517.88

Block	Panchayat	WS Code	Area (Ha)
	Vazhayur	24C3a	1.02
		24C4a	26.88
		24C72a	0.83
		24C72d	100.00
		24C73a	591.99
		24C74a	594.30
		24C75a	330.84
		24C78a	6.14
	Panchayat Total		1652.00
	Block Total		17422.04
Kuttippuram	Athavanad	20B1a	0.03
		20B3a	125.34
		21T11b	3.78
		21T13a	42.00
		21T13b	818.82
		21T13c	30.97
		21T13d	328.34
		21T13e	434.57
		21T13f	380.58
		21T13g	96.18
		23K45g	342.13
		23K46b	13.92
	Panchayat Total		2616.67
	Edayur	20B3b	20.47
		20B3c	205.33
		20B3d	616.37
		20B3e	802.19
		20B3f	1294.02
		20B4b	18.16
		20B4d	0.46
	Panchayat Total		2957.01
	Irimbiliyam	20B3a	2.31
		20B3e	150.48
		20B3f	1117.11
		20B48a	6.14
		20B4a	1107.45
		20B4b	15.71
		20B4cc	1.56
		20B4cd	2.23
		20B4ce	0.52
	Panchayat Total		2403.51
	Kalpakancherry	21T11b	435.71
		21T11c	5.23
		21T13a	1.66
		21T13b	0.49
		23K45g	0.77
		23K46b	1024.96
		23K46c	9.58

Block	Panchayat	WS Code	Area (Ha)
	Panchayat Total		1478.39
	Kuttippuram	20B1a	1180.82
		20B2a	748.92
		20B3a	361.71
		20B3e	4.13
		20B3f	3.43
		20B48a	28.42
		20B49a	24.34
		21T13d	331.95
		21T13f	7.82
		21T13g	277.02
		21T13h	129.84
	Panchayat Total		3098.40
	Marakkara	20B3a	142.40
		20B3d	872.47
		21T13e	4.42
		23K45c	0.15
		23K45d	61.81
		23K45e	102.49
		23K45f	1171.04
		23K45g	439.72
		23K45h	24.46
		23K46b	24.51
	Panchayat Total		2843.48
	Valancherry	20B1a	5.47
		20B2a	10.00
		20B3a	1349.23
		20B3b	530.39
		20B3c	0.00
		20B3d	3.69
		20B3e	318.76
		20B3f	15.60
		21T13e	6.66
		21T13f	29.53
	Panchayat Total		2269.32
	Block Total		17666.79
Malappuram	Anakkayam	23K16d	4.60
		23K16e	0.35
		23K16f	1.79
		23K18a	231.87
		23K19a	506.43
		23K20a	818.94
		23K21a	562.46
		23K22a	11.42
		23K23a	2.27
		23K23l	1.70
		23K24a	5.94
		23K32a	191.84

Block	Panchayat	WS Code	Area (Ha)
		23K33a	518.49
		23K34a	1221.03
		23K35a	450.60
		23K36a	30.23
		23K36b	3.30
		23K37a	2.03
		23K38a	0.98
		24C66f	1.10
		24C66g	16.12
	Panchayat Total		4583.49
	Kodur	23K14a	5.72
		23K15a	0.40
		23K16f	7.40
		23K17a	5.09
		23K39m	124.91
		23K40a	209.40
		23K41a	386.85
		23K42a	1223.21
		23K43a	7.15
		23K45c	18.51
	Panchayat Total		1988.63
	Morayur	23K13a	36.57
		23K15a	1.10
		23K16b	0.03
		23K16c	86.26
		23k7i	271.65
		23K7j	681.16
		23K7k	115.31
		23K7n	51.46
		24C66k	127.77
		24C66l	901.82
		24C66m	140.04
	Panchayat Total		2413.15
	Othukkungal	23K12a	16.42
		23K13a	4.39
		23K14a	6.59
		23K43a	282.94
		23K44a	469.95
		23K45a	311.13
		23K45b	242.50
	Panchayat Total		1333.92
	Ponmala	20B3d	4.66
		23K14a	2.36
		23K42a	80.09
		23K43a	710.49
		23K45a	43.86
		23K45b	414.56
		23K45c	786.54

Block	Panchayat	WS Code	Area (Ha)
		23K45d	122.00
	Panchayat Total		2164.57
	Pookkottur	23K16b	258.79
		23K16c	906.01
		23K16d	533.25
		23K16e	295.63
		23K19a	1.90
		23k7i	1.30
		23K7j	75.21
		24C66i	36.11
		24C66k	17.51
		24C66l	4.72
	Panchayat Total		2130.43
	Block Total		14614.20
Kottakkal Municipality		20B3d	0.82
		23K45b	368.67
		23K45d	720.56
		23K45e	195.18
		23K45f	24.39
		23K45h	236.67
		23K45i	485.02
		23K46a	20.53
		23K46b	15.78
	Municipality Total		2067.63
Malappuram Municipality		23K13a	151.39
		23K14a	450.83
		23K15a	588.77
		23K16a	479.71
		23K16b	247.66
		23K16e	214.49
		23K16f	623.71
		23K17a	412.68
		23K18a	102.46
		23K19a	6.70
		23K38a	6.61
		23K39a	0.13
		23K40a	0.72
		23K41a	1.80
		23K42a	0.09
		23K43a	5.03
		23K7j	0.58
	Municipality Total		3293.36
Manjeri Municipality		23K16d	231.10
		23K16e	0.01
		23K20a	432.77
		23K21a	532.92
		23K22a	1240.86
		23K23a	248.96

Block	Panchayat	WS Code	Area (Ha)
		23K23b	402.03
		23K23l	10.15
		23K33a	0.21
		23K34a	0.44
		24C61d	3.65
		24C66d	38.76
		24C66e	368.26
		24C66f	997.54
		24C66g	745.40
		24C66h	1.41
	Municipality Total		5254.47
Mankada	Kuttilangadi	23K17a	2.76
		23K18a	3.29
		23K19a	0.40
		23K20a	3.37
		23K21a	2.99
		23K35a	5.18
		23K36a	355.75
		23K36d	550.86
		23K37a	477.62
		23K38a	521.61
		23K39a	424.26
		23K39b	97.74
		23K39m	0.02
	Panchayat Total		2445.84
	Kuruva	20B3d	75.06
		20B3f	83.15
		20B4d	24.13
		23K17a	1.15
		23K39a	1.72
		23K39b	25.35
		23K39c	10.16
		23K39k	42.84
		23K39l	691.61
		23K39m	547.70
		23K40a	60.89
		23K45c	1884.06
	Panchayat Total		3447.83
	Mankada	23K34a	1.74
		23K35a	9.59
		23K36a	447.59
		23K36b	665.02
		23K36c	1006.19
		23K36d	201.71
		23K39b	9.78
		23K39d	6.67
		23K39e	33.07
	Panchayat Total		2381.36

Block	Panchayat	WS Code	Area (Ha)
	Moorkkanadu	20B3f	17.70
		20B4b	1614.74
		20B4c	234.83
		20B4cc	0.15
		20B4d	1435.80
		20B4e	187.06
		23K39k	23.48
		23K45c	6.84
	Panchayat Total		3520.60
	Makkarapparambu	23K36a	8.53
		23K36b	38.22
		23K36d	296.21
		23K39b	1016.44
		23K39c	106.20
		23K39d	6.63
		23K39l	0.44
	Panchayat Total		1472.67
	Puzhakkattiri	20B4d	24.90
		23K39b	3.00
		23K39c	229.64
		23K39d	340.91
		23K39j	115.49
		23K39k	1505.65
		23K39l	31.80
		23K45c	60.88
	Panchayat Total		2312.26
	Block Total		15580.56
Nilambur	Chaliyar	24C12e	2.31
		24C12i	2.93
		24C12j	0.21
		24C18a	7.50
		24C19a	6.16
		24C19b	460.69
		24C19c	625.19
		24C19d	214.58
		24C19e	540.70
		24C20a	881.53
		24C20b	739.27
		24C20c	333.15
		24C20d	436.79
		24C20e	318.04
		24C20f	116.72
		24C20g	1.71
		24C20i	6.46
		24C20j	20.11
		24C20k	600.91
		24C20l	438.01
		24C20m	1369.06

Block	Panchayat	WS Code	Area (Ha)
		24C20n	595.08
		24C20o	150.79
		24C20p	3.66
		24C20q	7.84
		24C23a	101.01
		24C23b	404.03
		24C23c	6.00
		24C23d	0.88
		24C23e	0.00
		24C23f	2.00
		24C56a	0.00
		24C56ah	0.59
	Panchayat Total		8393.91
	Chungathara	24C20g	488.28
		24C20h	410.25
		24C20i	1151.19
		24C20j	403.65
		24C20k	82.00
		24C20m	1.96
		24C23a	3.16
		24C23b	28.54
		24C23c	1092.46
		24C23d	639.33
		24C23e	422.97
		24C23f	422.47
		24C23g	1068.53
		24C23h	566.23
		24C23i	1305.60
		24C23j	702.56
		24C23k	183.33
		24C24a	526.89
		24C25a	120.03
		24C26a	467.27
		24C27a	9.69
		24C28a	12.04
		24C29a	1.96
		24C29b	292.46
		24C29c	538.36
		24C29d	46.67
		24C31c	18.21
		24C49a	36.22
		24C50a	378.26
		24C51a	280.75
		24C51d	620.35
		24C52a	892.54
		24C52ah	474.21
		24C52ai	557.39
		24C52bq	7.76

Block	Panchayat	WS Code	Area (Ha)
		24C52br	3.74
		24C9aa	40.18
		24C9ai	16.02
		24C9s	26.89
		24C9t	0.27
		24C9u	40.00
	Panchayat Total		14380.67
	Edakkara	24C47d	0.00
		24C48a	4.24
		24C49a	249.20
		24C50a	2.30
		24C51a	596.97
		24C51b	1229.89
		24C51c	313.36
		24C51d	225.21
		24C52a	548.83
		24C52ag	0.01
		24C52ah	7.47
		24C52b	429.39
		24C52c	202.42
		24C52j	1.30
		24C52k	0.70
		24C52r	2.39
	Panchayat Total		3813.68
	Muthedam	24C52a	18.90
		24C52ac	29.81
		24C52ae	10.89
		24C52af	148.52
		24C52ag	1008.18
		24C52ah	1152.14
		24C52ai	989.39
		24C52aj	562.56
		24C52ak	84.24
		24C52b	0.41
		24C52bd	37.88
		24C52be	283.50
		24C52bf	177.57
		24C52bm	223.36
		24C52bp	294.24
		24C52bq	778.50
		24C52br	1176.75
		24C52r	1.58
		24C56a	29.57
		24C56b	135.42
		24C56bo	2.08
	Panchayat Total		7145.47
	Pothukallu	24C23i	0.78
		24C26a	69.85

Block	Panchayat	WS Code	Area (Ha)
		24C27a	694.96
		24C28a	566.96
		24C29a	205.76
		24C29b	52.59
		24C29c	3.80
		24C29d	159.82
		24C29e	280.32
		24C29f	417.71
		24C30a	262.33
		24C31a	399.21
		24C31b	288.20
		24C31c	636.00
		24C31d	581.19
		24C31e	407.79
		24C32a	130.61
		24C32b	644.97
		24C32c	234.90
		24C32d	632.89
		24C33a	527.63
		24C34a	535.05
		24C35a	393.01
		24C35b	251.22
		24C35c	1.89
		24C35d	4.93
		24C40a	0.13
		24C41a	6.05
		24C42a	3.71
		24C42b	2.69
		24C42f	88.59
		24C43a	459.38
		24C44a	377.21
		24C45a	404.42
		24C46a	666.18
		24C47a	332.84
		24C47b	674.63
		24C47c	400.64
		24C47d	330.01
		24C47e	237.37
		24C48a	451.15
		24C49a	423.75
		24C51a	3.18
		24C51b	6.24
		24C52c	1.28
		24C9s	36.48
	Panchayat Total		13290.27
	Vazhikkadavu	24C47c	421.40
		24C47d	0.03
		24C51b	3.50

Block	Panchayat	WS Code	Area (Ha)
		24C52aa	902.34
		24C52ab	4.39
		24C52ac	5.80
		24C52af	1.35
		24C52ag	25.27
		24C52am	0.02
		24C52b	17.12
		24C52c	1495.48
		24C52d	481.70
		24C52e	763.21
		24C52f	199.85
		24C52g	365.38
		24C52h	319.62
		24C52i	502.42
		24C52j	515.34
		24C52k	438.48
		24C52l	624.64
		24C52m	554.19
		24C52n	674.03
		24C52o	358.51
		24C52p	541.70
		24C52q	191.62
		24C52r	1202.00
		24C52s	536.79
		24C52t	465.40
		24C52u	422.40
		24C52v	390.22
		24C52w	176.17
		24C52x	504.87
		24C52y	942.59
		24C52z	570.59
	Panchayat Total		14618.44
	Block Total		61642.10
Nilambur Municipality		24C19e	0.33
		24C20a	4.19
		24C20b	3.82
		24C20c	3.86
		24C20o	209.96
		24C20p	726.94
		24C20q	325.84
		24C21a	470.29
		24C22a	486.12
		24C23a	336.31
		24C23f	9.85
		24C23j	1.29
		24C23k	6.90
		24C52a	2.88
		24C52ai	2.19

Block	Panchayat	WS Code	Area (Ha)
		24C52bq	161.15
		24C52br	752.73
		24C53a	390.98
		24C54a	336.73
		24C55a	299.48
		24C56a	949.79
		24C56ab	516.53
		24C56ac	356.93
		24C56af	1.93
		24C56ag	0.24
		24C56ah	1.37
		24C56b	2.24
	Municipality Total		6360.89
Perinthalmanna	Alipparambu	20B4bu	4.34
		20B4bv	15.56
		20B4bx	47.30
		20B4by	22.56
		20B4g	39.50
		20B4h	6.51
		20B4i	2053.65
		20B4j	941.14
		20B4k	379.53
		20B4l	5.15
		23K39g	4.96
	Panchayat Total		3520.19
	Angadippuram	20B4e	10.93
		20B4g	16.46
		23K36c	33.83
		23K39d	829.88
		23K39e	1271.72
		23K39f	23.49
		23K39i	160.55
		23K39j	1389.09
		23K39k	19.70
	Panchayat Total		3755.65
	Elamkulam	20B4bz	12.16
		20B4ca	7.81
		20B4g	1610.33
		20B4h	537.38
		20B4i	6.13
	Panchayat Total		2173.82
	Keezhattur	23K24a	0.73
		23K25a	21.91
		23K29a	398.74
		23K30a	561.94
		23K30b	373.61
		23K30e	1.68
		23K30q	0.04

Block	Panchayat	WS Code	Area (Ha)
		23K30r	1389.15
		23K30s	498.61
		23K31a	576.13
		23K32a	1184.95
		23K33a	0.81
		23K34a	20.11
		23K36b	5.18
		23K36c	17.08
		23K39e	397.81
	Panchayat Total		5448.49
	Melattur	23K30a	1.88
		23K30b	1.44
		23K30e	0.20
		23K30f	0.31
		23K30p	37.76
		23K30q	287.84
		23K30r	1007.56
	Panchayat Total		1337.00
	Pulamanthole	20B4c	2.67
		20B4cb	20.83
		20B4cc	10.59
		20B4e	1011.63
		20B4f	1158.93
		20B4g	275.50
		23K39j	26.25
		23K39k	107.70
	Panchayat Total		2614.11
	Thazhekkode	20B4i	26.40
		20B4j	1247.45
		20B4l	85.28
		20B4m	465.34
		20B4n	18.39
		23K30l	5.32
		23K30n	1592.02
		23K30q	11.55
		23K39e	2.39
		23K39f	110.16
		23K39g	575.08
		23K39h	10.74
	Panchayat Total		4150.13
	Vettathur	20B4m	2.84
		23K30m	5.57
		23K30n	183.23
		23K30o	367.97
		23K30p	0.00
		23K30q	1658.89
		23K30r	495.55
		23K39e	895.83

Block	Panchayat	WS Code	Area (Ha)
		23K39f	35.22
	Panchayat Total		3645.09
	Block Total		26644.49
Perinthalmanna Municipality		20B4g	1405.80
		20B4i	61.95
		23K39e	10.92
		23K39f	801.07
		23K39g	204.47
		23K39h	360.83
		23K39i	920.62
		23K39j	16.91
	Municipality Total		3782.57
Perumpadappu	Alangode	19K10a	10.75
		19K11a	0.63
		19K12a	0.40
		19K3a	180.64
		19K3b	109.70
		19K3e	15.15
		19K3f	318.17
		19K3g	273.91
		19K4a	3.60
		19K6a	1060.32
		19K7a	153.98
		19K7d	8.02
	Panchayat Total		2135.28
	Marancherry	19K15a	146.41
		19K16a	863.98
		19K17a	677.36
		19K18a	65.33
		19K19a	128.09
		19K1a	9.51
		19K2a	0.04
		19K2c	186.77
		19K3a	201.90
	Panchayat Total		2279.39
	Nannamukku	19K12a	0.76
		19K13a	1.27
		19K3a	10.76
		19K3g	408.18
		19K4a	627.36
		19K5a	206.91
		19K6a	466.29
	Panchayat Total		1721.52
	Perumpadappu	19K13a	0.16
		19K14a	0.66
		19K14d	0.24
		19K15a	320.34
		19K19a	714.41

Block	Panchayat	WS Code	Area (Ha)
		19K3g	1.54
		19K4a	128.08
		19K5a	258.24
	Panchayat Total		1423.68
	Veliyancode	19K15a	355.22
		19K16a	39.13
		19K17a	20.58
		19K18a	510.40
		19K19a	762.62
		19K1a	71.46
		19K3a	1.15
		19K3g	100.06
		19K4a	1.80
	Panchayat Total		1862.43
	Block Total		9422.30
Ponnani	Edappal	19K16a	0.04
		19K2c	697.32
		19K2d	13.58
		19K3a	935.86
		19K3g	14.70
	Panchayat Total		1661.49
	Kaladi	19K2a	111.42
		19K2b	31.90
		19K2c	1044.38
		19K2d	165.82
		20B50a	200.26
	Panchayat Total		1553.77
	Thavanur	19K2a	16.09
		19K2b	1023.94
		19K2c	71.88
		20B1a	1.83
		20B48a	203.87
		20B49a	702.77
		20B50a	479.91
	Panchayat Total		2500.29
	Vattomkulam	19K2b	0.81
		19K2c	706.60
		19K3a	382.37
		19K3b	688.34
		19K3c	274.14
		19K3e	1.30
		20B48a	163.39
	Panchayat Total		2216.93
	Block Total		7932.48
Ponnani Municipality		19K16a	13.19
		19K17a	18.81
		19K18a	28.83
		19K1a	993.65

Block	Panchayat	WS Code	Area (Ha)
		19K2a	195.17
		19K2c	8.67
		19K2d	101.89
		20B50a	1170.37
	Municipality Total		2530.57
Tanur	Cheriyamundam	21T10a	521.93
		21T11a	286.74
		21T11b	89.42
		21T11c	16.49
		21T14a	1.05
		21T15a	14.56
		21T8a	21.20
		21T9a	210.35
		23K46c	0.94
		23K48d	4.56
	Panchayat Total		1167.23
	Niramaruthur	21T2a	569.38
		21T3a	123.30
		21T5a	158.57
		21T6a	101.19
	Panchayat Total		952.44
	Ozhur	21T7a	95.23
		21T8a	533.22
		23K48c	42.02
		23K48d	55.23
		23K48e	302.45
		23K48f	596.83
		23K48h	8.14
	Panchayat Total		1633.11
	Perumannaclari	23K46b	21.48
		23K46c	758.83
		23K48b	18.85
		23K48c	68.73
		23K48d	301.51
	Panchayat Total		1169.41
	Ponmundam	21T10a	1.82
		21T8a	14.32
		21T9a	38.08
		23K46c	32.56
		23K48d	487.08
		23K48e	310.37
	Panchayat Total		884.23
	Tanur	21T6a	35.44
		21T7a	346.48
		23K48f	114.25
		23K48g	372.26
		23K48h	725.11
		23K48i	405.18

Block	Panchayat	WS Code	Area (Ha)
		23K48j	58.13
	Panchayat Total		2056.85
	Thanalur	21T5a	127.60
		21T6a	335.12
		21T7a	407.82
		21T8a	726.14
		21T9a	21.68
		23K48e	5.75
	Panchayat Total		1624.11
	Valavannur	21T10a	2.82
		21T11a	0.36
		21T11b	541.89
		21T11c	593.75
		21T13a	29.18
		23K46b	14.85
		23K46c	338.13
	Panchayat Total		1520.99
	Block Total		11008.36
Tirur Municipality		21T10a	0.22
		21T11a	0.13
		21T11c	1.65
		21T12a	6.21
		21T14a	301.27
		21T15a	545.26
		21T16a	346.07
		21T17a	8.31
		21T4a	20.60
		21T5a	157.03
		21T8a	290.46
	Municipality Total		1677.22
Tirurangadi	Munniyur	23K3a	2.50
		23K47a	2.88
		23K48j	0.51
		23K49a	6.85
		23K4a	486.81
		23K50a	4.21
		23K5a	515.68
		23K6a	667.53
		23K7a	382.11
		23K7b	199.12
		23K7o	7.63
		23K7p	11.17
		23K7q	0.40
	Panchayat Total		2287.39
	Nannambra	23K48a	6.01
		23K48b	169.16
		23K48c	278.00
		23K48e	0.02

Block	Panchayat	WS Code	Area (Ha)
		23K48f	555.81
		23K48g	763.30
		23K48h	0.14
		23K48j	0.51
	Panchayat Total		1772.95
	Parappanangadi	23K48a	7.03
		23K48g	0.80
		23K48i	0.06
		23K48j	516.55
		23K49a	1751.92
		23K5a	0.15
		23K6a	15.23
	Panchayat Total		2291.74
	Peruvallur	23K7a	1.35
		23K7b	2.93
		23K7c	6.34
		23K7d	1.63
		23K7e	2.09
		23K7n	224.03
		23K7o	446.00
		23K7p	1283.58
	Panchayat Total		1967.95
	Thenjippalam	23K2a	36.53
		23K3a	867.91
		23K4a	173.12
		23K50a	4.12
		23K51a	20.50
		23K7b	425.15
		23K7c	132.83
		23K7n	0.30
		23K7o	2.07
		24C79a	41.54
	Panchayat Total		1704.07
	Tirurangadi	23K46c	2.18
		23K46d	194.46
		23K47a	375.60
		23K48a	439.20
		23K48b	776.15
		23K48c	0.48
		23K48j	1.38
		23K6a	5.44
		23K7a	0.53
		23K7q	8.33
		23K8a	0.53
		23K8e	3.67
		23K9a	3.36
	Panchayat Total		1811.31
	Vallikkunnu	23K1a	86.42

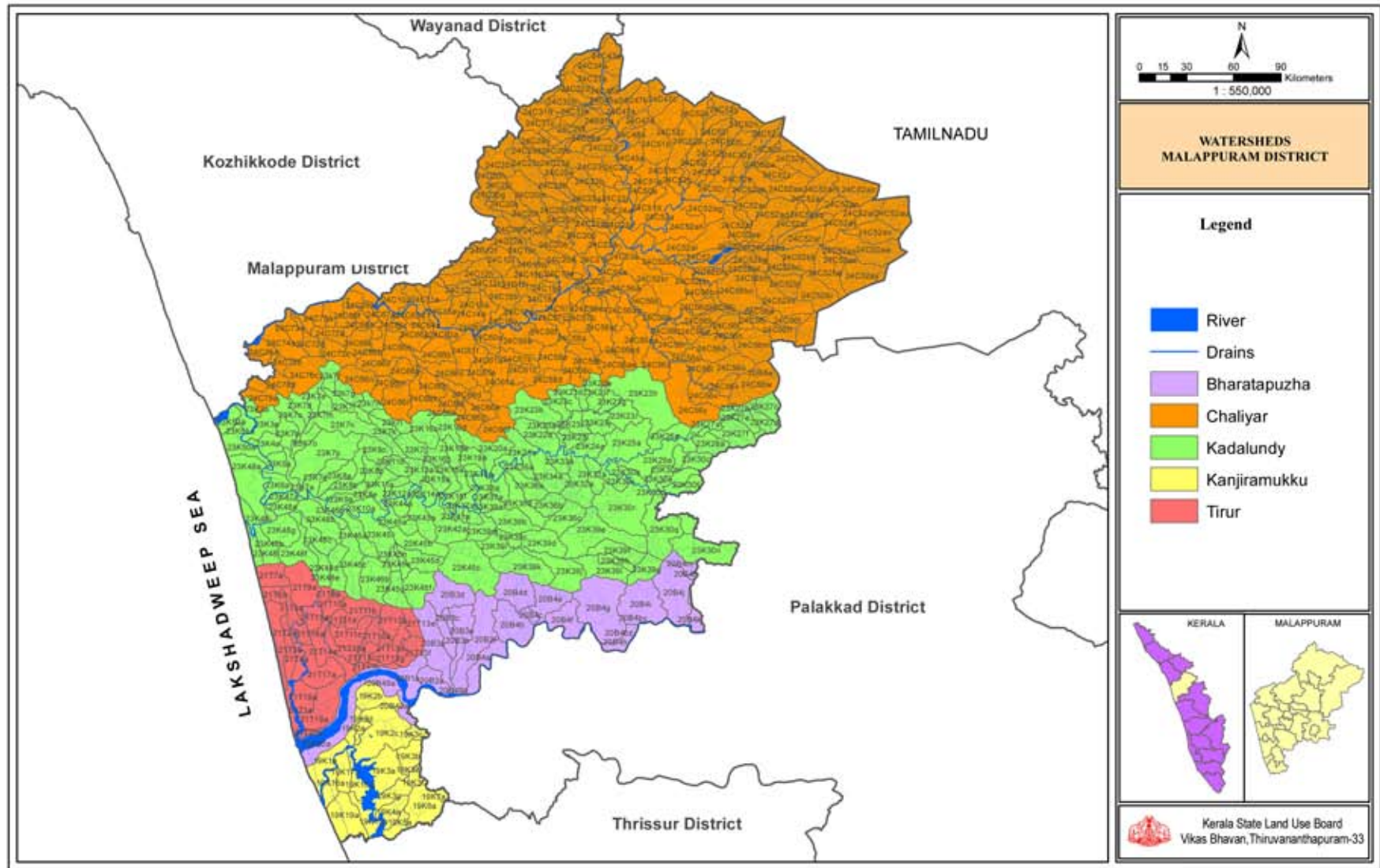
Block	Panchayat	WS Code	Area (Ha)
		23K2a	107.92
		23K3a	4.48
		23K49a	329.31
		23K4a	17.05
		23K50a	1076.58
		23K51a	345.70
		23K52a	493.67
		23K5a	7.53
	Panchayat Total		2468.65
	Block Total		14304.05
Tirur	Mangalam	21T17a	200.25
		21T18a	563.27
		21T19a	201.79
		21T1a	135.24
		21T2a	124.76
		21T3a	14.86
		21T4a	0.69
	Panchayat Total		1240.86
	Purathur	20B50a	430.16
		21T18a	254.92
		21T19a	705.34
		21T1a	346.50
		21T20a	171.35
	Panchayat Total		1908.28
	Thalakkad	21T11a	0.96
		21T11c	428.64
		21T12a	411.36
		21T14a	425.22
		21T16a	13.98
		21T17a	331.34
		21T4a	14.38
	Panchayat Total		1625.86
	Thirunnavaya	20B1a	203.95
		20B49a	7.22
		20B50a	9.54
		21T11b	1.09
		21T11c	7.55
		21T12a	138.04
		21T13a	481.54
		21T13b	3.61
		21T13c	413.22
		21T13d	219.56
		21T13h	165.96
		21T14a	281.29
		21T17a	38.86
		21T19a	7.03
	Panchayat Total		1978.47
	Thriprangode	20B1a	110.97

Block	Panchayat	WS Code	Area (Ha)
		20B50a	191.61
		21T14a	64.45
		21T17a	818.53
		21T18a	18.31
		21T19a	783.22
	Panchayat Total		1987.09
	Vettom	21T16a	11.93
		21T17a	31.21
		21T18a	8.33
		21T1a	0.64
		21T2a	497.22
		21T3a	573.50
		21T4a	516.36
		21T5a	6.49
	Panchayat Total		1645.66
	Block Total		10386.22
Vengara	A.R. Nagar	23K46d	0.01
		23K47a	0.42
		23K7a	7.75
		23K7p	627.72
		23K7q	785.06
		23K8a	53.06
		23K8e	0.50
	Panchayat Total		1474.52
	Edarikkode	23K10a	13.94
		23K45i	71.81
		23K46a	758.46
		23K46b	377.85
		23K46c	58.53
		23K46d	0.91
		23K9a	0.38
	Panchayat Total		1281.87
	Kannamangalam	23K11a	156.11
		23K11b	4.67
		23K7n	92.33
		23K7p	669.93
		23K7q	63.36
		23K8a	177.22
		23K8b	363.59
		23K8c	795.23
		23K8d	459.05
		23K8e	24.85
	Panchayat Total		2806.32
	Parappur	23K10a	619.44
		23K11a	95.66
		23K11c	0.74
		23K12a	1.01
		23K44a	18.35

Block	Panchayat	WS Code	Area (Ha)
		23K45a	364.13
		23K45b	70.60
		23K45d	0.51
		23K45i	689.77
		23K46a	13.80
		23K9a	0.01
	Panchayat Total		1874.03
	Thennala	23K46a	0.60
		23K46c	225.62
		23K46d	142.34
		23K48b	299.75
		23K48c	390.10
		23K48e	0.97
		23K9a	3.10
	Panchayat Total		1062.48
	Oorakam	23K10a	8.34
		23K11a	542.48
		23K11b	469.89
		23K11c	302.12
		23K12a	343.45
		23K13a	314.84
		23K15a	0.15
		23K44a	1.00
		23K7n	114.78
		23K8c	6.66
		23K8d	6.53
		23K8e	13.97
	Panchayat Total		2124.22
	Vengara	23K10a	106.68
		23K11a	73.37
		23K46d	1.64
		23K7q	13.56
		23K8a	447.47
		23K8b	306.38
		23K8e	377.01
		23K9a	561.15
	Panchayat Total		1887.26
	Block Total		12510.70
Wandoor	Mambad	24C12j	0.30
		24C15b	0.50
		24C17a	156.93
		24C18a	723.36
		24C19a	383.83
		24C19b	216.84
		24C19d	1.68
		24C19e	9.69
		24C56a	9.23
		24C56ac	5.29

Block	Panchayat	WS Code	Area (Ha)
		24C56af	408.09
		24C56ag	310.93
		24C56ah	306.31
		24C57a	465.67
		24C57b	636.55
		24C57c	198.75
		24C58a	399.84
		24C58f	6.33
	Panchayat Total		4240.12
	Pandikkad	23K23a	7.97
		23K23b	1.64
		23K23c	9.69
		23K23d	12.94
		23K23e	3.44
		23K23f	8.92
		23K23g	43.81
		23K23h	451.99
		23K23i	862.01
		23K23j	718.10
		23K23k	544.94
		23K23l	432.78
		23K24a	758.79
		23K25a	1880.23
		23K26a	3.33
		23K29a	1.20
		23K31a	6.07
		23K32a	3.71
		23K33a	1.83
	Panchayat Total		5753.38
	Porur	23K23d	190.36
		23K23e	334.10
		23K23f	645.74
		23K23g	425.27
		23K23h	981.04
		23K23j	2.58
		23K23k	0.41
		24C56aa	4.21
		24C56ad	128.52
		24C56ae	287.73
		24C58b	196.81
		24C58c	160.43
	Panchayat Total		3357.20
	Thiruvali	24C56ac	19.47
		24C56ae	4.78
		24C56af	367.49
		24C57b	56.73
		24C58a	559.97
		24C58b	627.85

Block	Panchayat	WS Code	Area (Ha)
		24C58c	306.54
		24C58d	0.38
		24C58e	719.72
		24C58f	286.98
		24C59a	147.90
		24C61b	61.38
		24C61c	69.55
	Panchayat Total		3228.75
	Thrikkalangode	23K23b	987.81
		23K23c	550.74
		23K23d	330.71
		24C58c	143.65
		24C58d	1056.87
		24C58e	165.08
		24C61a	1.07
		24C61b	7.46
		24C61c	638.62
		24C61d	1362.12
		24C61e	555.18
		24C61f	28.80
		24C66c	15.40
		24C66d	119.38
		24C66e	61.71
		24C66f	20.42
	Panchayat Total		6045.05
	Wandoor	24C56aa	658.94
		24C56ab	150.43
		24C56ac	187.26
		24C56ad	792.95
		24C56ae	545.50
		24C56af	330.89
		24C56c	0.00
		24C56q	211.76
		24C56r	239.62
		24C56z	153.77
		24C58a	48.27
		24C58b	7.82
	Panchayat Total		3327.22
	Block Total		25951.72
District Total			355099.65



IRRIGATION

Development patterns, increasing population pressure and the demand for better livelihoods across the globe are contributing to a looming global water crisis. Addressing this crisis will require maintaining a sustainable relationship between water and development, one that balances current needs against the prospects for future generations. Only 3% of the world's water supply is fresh water and two-thirds of that is locked in glacier ice or buried in deep underground aquifers, leaving only 1% readily available for human use.

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 resource 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 objectives 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.

CHAMRAVATTOM MAJOR IRRIGATION PROJECT (ONGOING)

Regulator cum bridge at Chamravattom

The Project, Regulator Cum-Bridge at Chamaravattom across Bharathapuzha envisages the construction of a Regulator cum-bridge across one of the largest rivers in Kerala, Bharathapuzha, at a place locally known as Chamaravattom. The bridge will connect the two banks of the river and the distances between Ponnani and Tirur will be reduced from 38 Km to 18 Km by road resulting in a saving of 20 Km, in communication network. The main and primary aim of the proposal is to evolve a storage, sufficiently enough for irrigating crops for a gross ayacut of 9659 ha.

Basic Information

District	:	Malappuram
Potential area	:	Net 3106 Ha Gross 9659 ha
River	:	Bharathapuzha
Benefited District	:	Malappuram & Thrissur
Year of Starting	:	1999

Salient Features

Location	:	Chamravattom Longitude 75° 57' E Latitude 10° 51' N
Taluks	:	Ponnani and Tirur
District	:	Malappuram
State	:	Kerala
Type	:	Regulator cum bridge
Width of river at regulator site	:	1000m
Length of regulator	:	978.5 m
Number of shutters	:	70 Nos.
Size of shutters	:	12 x 4.50 m
R.L of river bed	:	(+) 1.50m
Proposed FRL of reservoir	:	(+) 6.00 m
Storage capacity	:	24.49 Mm ³
Water spread area	:	868.ha
Maximum flood discharge	:	8496 m ³ /sec.
Maximum annual rainfall	:	4528mm during 1961
Minimum annual rainfall	:	1793 mm during 1966
Mean annual rainfall	:	2721mm
Width of roadway	:	7.50m
R.L of roadway	:	(+) 9.35m

MINOR IRRIGATION CENSUS (2006-07)

Table: 21.1

MINOR IRRIGATION SCHEMES AT A GLANCE

Sl.No.	Name of Block/Mun./Cor.	No. of Villages	Total Number of Schemes							Grand Total (7+10)	No. of Village Schedules
			Ground Water				Surface Water				
			Dugwell	Shallow Tubewell	Deep Tubewell	Total (4+5+6)	S. Flow Scheme	S. Lift Scheme	Total (8+9)		
1	Perumpadappu	5	950	90	0	1040	7	15	22	1062	5
2	Areekod	8	853	1	0	854	56	123	179	1033	8
3	Kondotty	8	1127	9	10	1146	24	40	64	1210	8
4	Kuttippuram	6	1078	7	14	1099	60	4	64	1163	6
5	Malappuram	6	607	12	7	626	65	23	88	714	6
6	Malappuram (M)	1	157	0	0	157	0	19	19	176	1
7	Manjeri (M)	1	207	0	0	207	0	26	26	233	1
8	Mankada	9	1492	23	0	1515	110	128	238	1753	9
9	Nilambur	11	795	1	1	797	54	470	524	1321	11
10	Perinthalmanna	7	869	6	0	875	77	150	227	1102	7
11	Perinthalmanna (M)	1	60	0	0	60	0	0	0	60	1
12	Ponnani	4	364	0	0	364	1	5	6	370	4
13	Ponnani (M)	1	137	43	0	180	1	13	14	194	1
14	Tanur	9	1318	38	0	1356	75	45	120	1476	9
15	Tirur	6	1063	110	6	1179	56	8	64	1243	6
16	Tirurangadi	7	830	7	0	837	4	21	25	862	7
17	Tirur (M)	1	135	0	0	135	1	4	5	140	1
18	Vengara	7	723	0	1	724	90	97	187	911	7
19	Wandoor	9	745	0	0	745	47	135	182	927	9
	District Total	107	13510	347	39	13896	728	1326	2054	15950	107

Table: 21.2

NUMBER OF GROUND WATER SCHEMES AND IRRIGATION POTENTIAL CREATED AND POTENTIAL UTILISED

Sl. No.	Name of Block/Mun./Cor.	Dugwell			Shallow Tubewell			Deep Tubewell			Total Ground Water		
		Nos.	Potential Created	Potential Utilised	Nos.	Potential Created	Potential Utilised	Nos.	Potential Created	Potential Utilised	Nos.	Potential Created	Potential Utilised
1	Perumpadappu	950	435	435	90	29	29	0	0	0	1040	464	464
2	Areekod	853	496	460	1	1	0	0	0	0	854	497	461
3	Kondotty	1127	415	384	9	6	6	10	10	8	1146	431	398
4	Kuttippuram	1078	701	695	7	5	5	14	10	10	1099	716	710
5	Malappuram	607	377	377	12	32	32	7	3	3	626	412	412
6	Malappuram (M)	157	126	126	0	0	0	0	0	0	157	126	126
7	Manjeri (M)	207	50	50	0	0	0	0	0	0	207	50	50
8	Mankada	1492	681	626	23	23	23	0	0	0	1515	704	649
9	Nilambur	795	716	689	1	0	0	1	2	2	797	718	691
10	Perinthalmanna	869	703	668	6	19	12	0	0	0	875	722	687
11	Perinthalmanna (M)	60	43	43	0	0	0	0	0	0	60	43	43
12	Ponnani	364	383	383	0	0	0	0	0	0	364	383	383
13	Ponnani (M)	137	147	147	43	32	32	0	0	0	180	179	179
14	Tanur	1318	519	514	38	28	28	0	0	0	1356	547	542
15	Tirur	1063	506	506	110	56	56	6	5	5	1179	567	567
16	Tirurangadi	830	505	495	7	2	2	0	0	0	837	507	497
17	Tirur (M)	135	92	92	0	0	0	0	0	0	135	92	92
18	Vengara	723	453	442	0	0	0	1	1	1	724	454	443
19	Wandoor	745	436	403	0	0	0	0	0	0	745	436	403
	District Total	13510	7784	7535	347	233	225	39	31	29	13896	8048	7797

Table: 21.3

NUMBER OF SURFACE WATER SCHEMES AND IRRIGATION POTENTIAL CREATED AND POTENTIAL UTILISED

Sl.No.	Name of Block/Mun./Cor.	Surface Flow Schemes			Surface Lift Schemes			Total Surface Water		
		Nos.	Potential Created	Potential Utilised	Nos.	Potential Created	Potential Utilised	Nos.	Potential Created	Potential Utilised
1	Perumpadappu	7	422	422	15	1261	1261	22	1683	1683
2	Areekod	56	433	429	123	1191	787	179	1624	1216
3	Kondotty	24	111	104	40	40	38	64	151	142
4	Kuttippuram	60	2173	2034	4	612	467	64	2785	2501
5	Malappuram	65	1702	1481	23	39	39	88	1741	1520
6	Malappuram (M)	0	0	0	19	14	14	19	14	14
7	Manjeri (M)	0	0	0	26	13	13	26	13	13
8	Mankada	110	2771	2294	128	2349	2115	238	5120	4409
9	Nilambur	54	3059	3059	470	2149	2132	524	5208	5191
10	Perinthalmanna	77	2029	1872	150	1497	1438	227	3526	3310
11	Perinthalmanna (M)	0	0	0	0	0	0	0	0	0
12	Ponnani	1	37	37	5	1132	1132	6	1169	1169
13	Ponnani (M)	1	18	8	13	36	31	14	54	39
14	Tanur	75	590	520	45	91	91	120	681	611
15	Tirur	56	954	916	8	2438	2214	64	3392	3130
16	Tirurangadi	4	40	40	21	1232	1045	25	1272	1085
17	Tirur (M)	1	57	57	4	11	11	5	68	68
18	Vengara	90	1658	1588	97	771	750	187	2429	2338
19	Wandoor	47	973	914	135	1201	1146	182	2174	2060
	District Total	728	17027	15775	1326	16077	14724	2054	33104	30499

Table: 21.4

MINOR IRRIGATION SCHEMES ACCORDING TO SOURCE OF ENERGY

Sl. No.	Name of Block/Mun./Cor.	Ground Water Schemes							Surface Water Schemes (Surface Lift Scheme Only)						
		Electric Pump	Diesel Pump	Wind Mills	Solar Pumps	Manual/ Annual	Others	Total (3to8)	Electric Pump	Diesel Pump	Wind Mills	Solar Pumps	Manual/ Annual	Others	Total (10to15)
1	Perumpadappu	1035	5	0	0	0	0	1040	13	0	0	0	2	0	15
2	Areekod	777	63	1	0	7	6	854	89	28	0	0	1	5	123
3	Kondotty	1134	6	0	0	0	6	1146	26	6	0	0	0	8	40
4	Kuttiapuram	1070	28	1	0	0	0	1099	4	0	0	0	0	0	4
5	Malappuram	604	21	0	0	0	1	626	22	1	0	0	0	0	23
6	Malappuram (M)	1489	24	0	0	0	2	1515	112	0	0	0	15	1	128
7	Manjeri (M)	730	67	0	0	0	0	797	347	123	0	0	0	0	470
8	Mankada	827	12	0	1	35	0	875	137	13	0	0	0	0	150
9	Nilambur	363	1	0	0	0	0	364	5	0	0	0	0	0	5
10	Perinthalmanna	1351	5	0	0	0	0	1356	36	9	0	0	0	0	45
11	Perinthalmanna (M)	1129	48	1	0	0	1	1179	7	1	0	0	0	0	8
12	Ponnani	823	14	0	0	0	0	837	21	0	0	0	0	0	21
13	Ponnani (M)	702	22	0	0	0	0	724	92	3	0	0	0	2	97
14	Tanur	697	45	0	1	0	2	745	70	64	1	0	0	0	135
15	Tirur	139	15	0	0	0	3	157	2	0	0	0	0	17	19
16	Tirurangadi	206	1	0	0	0	0	207	17	9	0	0	0	0	26
17	Tirur (M)	60	0	0	0	0	0	60	0	0	0	0	0	0	0
18	Vengara	176	0	0	0	0	4	180	12	1	0	0	0	0	13
19	Wandoor	133	2	0	0	0	0	135	4	0	0	0	0	0	4
	District Total	13445	379	3	2	42	25	13896	1016	258	1	0	18	33	1326

Table: 21.5

NUMBER OF MINOR IRRIGATION SCHEMES AND IRRIGATION POTENTIAL CREATED AND POTENTIAL UTILISED

Sl.No.	Name of Block/Mun./Cor.	Ground Water Schemes			Surface Water Schemes			Total		
		Nos.	Potential Created	Potential Utilised	Nos.	Potential Created	Potential Utilised	Nos.	Potential Created	Potential Utilised
1	Perumpadappu	1040	464	464	22	1683	1683	1062	2147	2147
2	Areekod	854	496	460	179	1624	1216	1033	2120	1676
3	Kondotty	1146	431	398	64	151	142	1210	582	540
4	Kuttiappuram	1099	717	710	64	2785	2501	1163	3502	3211
5	Malappuram	626	412	412	88	1741	1520	714	2153	1932
6	Malappuram (M)	157	126	126	19	14	14	176	140	140
7	Manjeri (M)	207	50	50	26	13	13	233	63	63
8	Mankada	1515	703	649	238	5121	4409	1753	5824	5058
9	Nilambur	797	719	692	524	5207	5191	1321	5926	5883
10	Perinthalmanna	875	722	681	227	3526	3309	1102	4248	3990
11	Perinthalmanna (M)	60	43	43	0	0	0	60	43	43
12	Ponnani	364	383	383	6	1168	1168	370	1551	1551
13	Ponnani (M)	180	179	179	14	54	39	194	233	218
14	Tanur	1356	548	542	120	681	611	1476	1229	1153
15	Tirur	1179	568	567	64	3392	3130	1243	3960	3697
16	Tirurangadi	837	507	497	25	1272	1085	862	1779	1582
17	Tirur (M)	135	92	92	5	68	68	140	160	160
18	Vengara	724	454	442	187	2429	2339	911	2883	2781
19	Wandoor	745	436	403	182	2174	2060	927	2610	2463
	District Total	13896	8050	7790	2054	33103	30498	15950	41153	38288

Table: 21.6

MINOR IRRIGATION SCHEMES IN TRIBAL & NON TRIBAL VILLAGES

Sl. No.	Name of Block/ Mun./Cor.	Dugwell			Shallow Tubewell			Deep Tubewell			Surface Flow Schemes			Surface Lift Schemes			Total Minor Irrigation Schemes		
		Tribal	Non Tribal	Total	Tribal	Non Tribal	Total	Tribal	Non Tribal	Total	Tribal	Non Tribal	Total	Tribal	Non Tribal	Total	Tribal	Non Tribal	Total
1	Perumpadappu	0	950	950	0	90	90	0	0	0	0	7	7	0	15	15	0	1062	1062
2	Areekod	0	853	853	0	1	1	0	0	0	0	56	56	0	123	123	0	1033	1033
3	Kondotty	0	1127	1127	0	9	9	0	10	10	0	24	24	0	40	40	0	1210	1210
4	Kuttippuram	0	1078	1078	0	7	7	0	14	14	0	60	60	0	4	4	0	1163	1163
5	Malappuram	0	607	607	0	12	12	0	7	7	0	65	65	0	23	23	0	714	714
6	Mankada	0	1492	1492	0	23	23	0	0	0	0	110	110	0	128	128	0	1753	1753
7	Nilambur	0	795	795	0	1	1	0	1	1	0	54	54	0	470	470	0	1321	1321
8	Perinthalmanna	0	869	869	0	6	6	0	0	0	0	77	77	0	150	150	0	1102	1102
9	Ponnani	0	364	364	0	0	0	0	0	0	0	1	1	0	5	5	0	370	370
10	Tanur	0	1318	1318	0	38	38	0	0	0	0	75	75	0	45	45	0	1476	1476
11	Tirur	0	1063	1063	0	110	110	0	6	6	0	56	56	0	8	8	0	1243	1243
12	Tirurangadi	0	830	830	0	7	7	0	0	0	0	4	4	0	21	21	0	862	862
13	Vengara	0	723	723	0	0	0	0	1	1	0	90	90	0	97	97	0	911	911
14	Wandoor	0	745	745	0	0	0	0	0	0	0	47	47	0	135	135	0	927	927
15	Malappuram (M)	0	157	157	0	0	0	0	0	0	0	0	0	0	19	19	0	176	176
16	Manjeri (M)	0	207	207	0	0	0	0	0	0	0	0	0	0	26	26	0	233	233
17	Perinthalmanna (M)	0	60	60	0	0	0	0	0	0	0	0	0	0	0	0	0	60	60
18	Ponnani (M)	0	137	137	0	43	43	0	0	0	0	1	1	0	13	13	0	194	194
19	Tirur (M)	0	135	135	0	0	0	0	0	0	0	1	1	0	4	4	0	140	140
	District Total	0	13510	13510	0	347	347	0	39	39	0	728	728	0	1326	1326	0	15950	15950

Table: 21.7

SEASON WISE AREA IRRIGATED BY MINOR IRRIGATION SCHEMES

Sl. No.	Name of Block/ Mun./Cor.	Area irrigated by Ground water schemes					Area irrigated by Surface water schemes					Area irrigated by Total minor irrigation schemes				
		Kharif	Rabi	Perennial	Others	Total (3 to 7)	Kharif	Rabi	Perennial	Others	Total (8 to 11)	Kharif	Rabi	Perennial	Others	Total (13 to 16)
1	Perumpadappu	48	49	339	28	464	356	1327	0	0	1683	404	1375	339	28	2146
2	Areekod	45	84	277	54	460	373	585	238	21	1217	419	669	514	75	1677
3	Kondotty	124	114	105	55	398	61	59	16	6	142	185	173	120	61	539
4	Kuttippuram	24	24	643	19	710	1425	1075	2	0	2502	1448	1099	645	19	3211
5	Malappuram	44	67	196	105	412	563	546	261	150	1520	606	613	457	255	1931
6	Mankada	90	101	372	86	649	1543	1402	868	596	4409	1633	1503	1241	681	5058
7	Nilambur	157	186	233	116	692	1009	2147	1266	769	5191	1166	2333	1499	885	5883
8	Perinthalmanna	27	148	465	41	681	1043	1090	1011	166	3310	1070	1238	1475	207	3990
9	Ponnani	86	81	156	60	383	610	558	0	0	1168	696	639	156	60	1551
10	Tanur	35	40	384	84	543	275	249	71	16	611	310	289	455	100	1154
11	Tirur	61	42	430	34	567	1206	794	1017	113	3130	1267	836	1447	147	3697
12	Tirurangadi	164	162	154	17	497	441	434	108	101	1084	605	596	262	118	1581
13	Vengara	143	134	114	51	442	1040	776	235	288	2339	1182	911	349	339	2781
14	Wandoor	55	116	194	38	403	254	700	901	205	2060	309	816	1095	242	2462
15	Malappuram (M)	4	3	90	29	126	0	0	12	2	14	4	3	102	31	140
16	Manjeri (M)	21	16	13	0	50	0	0	13	0	13	21	16	26	0	63
17	Perinthalmanna (M)	18	14	7	4	43	0	0	0	0	0	18	14	7	4	43
18	Ponnani (M)	63	63	38	15	179	22	14	3	0	39	85	77	41	15	218
19	Tirur (M)	3	8	81	0	92	32	27	6	3	68	36	35	87	3	161
	District Total	1212	1452	4291	836	7791	10253	11783	6028	2436	30500	11464	13235	10317	3270	38286

Table: 21.8

MINOR IRRIGATION SCHEMES ACCORDING TO WATER LIFTING DEVICES

Sl. No.	Name of Block/Mun./Cor.	Ground Water Schemes						Surface Water Schemes (Surface Lift Schemes only)					
		Submersible Pump	Centrifugal Pump	Turbine	Manual/Annual	Others	Total (3 to 7)	submersible Pump	Centrifugal Pump	Turbine	Manual/Annual	Others	Total (9 to 13)
1	Perumpadappu	94	943	3	0	0	1040	1	12	0	2	0	15
2	Areekod	17	822	0	7	8	854	0	115	0	1	7	123
3	Kondotty	100	1044	0	0	2	1146	11	16	0	0	13	40
4	Kuttiappuram	32	1057	0	0	10	1099	0	4	0	0	0	4
5	Malappuram	158	468	0	0	0	626	17	6	0	0	0	23
6	Mankada	203	1312	0	0	0	1515	7	106	0	15	0	128
7	Nilambur	470	327	0	0	0	797	111	359	0	0	0	470
8	Perinthalmanna	116	723	1	35	0	875	1	149	0	0	0	150
9	Ponnani	0	364	0	0	0	364	1	4	0	0	0	5
10	Tanur	38	1312	3	0	3	1356	0	45	0	0	0	45
11	Tirur	48	1129	1	0	1	1179	0	8	0	0	0	8
12	Tirurangadi	82	744	11	0	0	837	0	20	1	0	0	21
13	Vengara	28	695	1	0	0	724	3	94	0	0	0	97
14	Wandoor	80	664	0	0	1	745	9	125	1	0	0	135
15	Malappuram (M)	1	156	0	0	0	157	1	18	0	0	0	19
16	Manjeri (M)	1	206	0	0	0	207	0	26	0	0	0	26
17	Perinthalmanna (M)	0	60	0	0	0	60	0	0	0	0	0	0
18	Ponnani (M)	1	174	0	0	5	180	0	13	0	0	0	13
19	Tirur (M)	3	131	1	0	0	135	0	4	0	0	0	4
	District Total	1472	12331	21	42	30	13896	162	1124	2	18	20	1326

Table: 21.9

NUMBER OF GROUND WATER SCHEMES AND POTENTIAL UTILISED BY WATER DISTRIBUTION DEVICE

Sl. No.	Name of Block/ Mun./Cor.	Ground Water Schemes According to Water Distribution System															
		Open Water Channel				Underground pipe		Surface pipe		Drip		Sprinkler		Others		Total	
		Lined/Pucca		Unlined/Kuchha		No.	PU	No.	PU	No.	PU	No.	PU	No.	PU	No.	PU
		No.	PU	No.	PU												
1	Perumpadappu	424	214	480	203	2	2	134	45	0	0	0	0	0	0	1040	464
2	Areekod	131	35	162	75	3	2	541	345	0	0	0	0	11	3	848	460
3	Kondotty	408	127	400	185	1	2	320	78	6	3	0	0	11	5	1146	400
4	Kuttippuram	248	110	849	594	0	0	0	0	0	0	2	6	0	0	1099	710
5	Malappuram	42	24	448	284	2	23	134	81	0	0	0	0	0	0	626	412
6	Mankada	90	61	1174	508	2	2	244	76	0	0	4	1	1	0	1515	648
7	Nilambur	460	239	108	291	2	3	220	157	0	0	2	1	5	2	797	693
8	Perinthalmanna	21	10	853	670	0	0	0	0	0	0	1	1	0	0	875	681
9	Ponnani	1	0	329	326	33	48	0	0	0	0	1	9	0	0	364	383
10	Tanur	52	18	1025	418	34	17	216	76	12	6	16	7	1	0	1356	542
11	Tirur	22	10	693	344	102	77	359	134	1	1	2	1	0	0	1179	567
12	Tirurangadi	494	313	253	140	45	27	16	5	1	1	0	0	28	11	837	497
13	Vengara	418	273	304	167	1	0	1	2	0	0	0	0	0	0	724	442
14	Wandoor	154	94	287	180	82	29	220	90	0	0	2	11	0	0	745	404
15	Malappuram (M)	2	0	1	1	1	1	151	123	0	0	0	0	2	0	157	125
16	Manjeri (M)	0	0	1	0	0	0	206	49	0	0	0	0	0	0	207	49
17	Perinthalmanna (M)	0	0	60	43	0	0	0	0	0	0	0	0	0	0	60	43
18	Ponnani (M)	2	1	107	126	0	0	67	47	0	0	2	4	2	1	180	179
19	Tirur (M)	1	1	129	82	5	10	0	0	0	0	0	0	0	0	135	93
	District Total	2970	1530	7663	4637	315	243	2829	1308	20	11	32	41	61	22	13890	7792

Table: 21.10

NUMBER OF SURFACE WATER SCHEMES AND POTENTIAL UTILISED BY WATER DISTRIBUTION DEVICE

Sl. No.	Name of Block/ Mun./Cor.	Surface Water Schemes According to Water Distribution System															
		Open Water Channel				Underground pipe		Surface pipe		Drip		Sprinkler		Others		Total	
		Lined/Pucca		Unlined/Kuchha		No.	PU	No.	PU	No.	PU	No.	PU	No.	PU	No.	PU
		No.	PU	No.	PU												
1	Perumpadappu	1	100	12	1055	0	0	0	0	0	0	0	0	9	527	22	1682
2	Areekod	10	469	58	446	3	2	92	149	1	2	1	1	9	149	174	1218
3	Kondotty	24	82	13	37	0	0	27	23	0	0	0	0	0	0	64	142
4	Kuttippuram	3	450	59	2051	0	0	0	0	0	0	0	0	0	0	62	2501
5	Malappuram	1	30	79	1490	0	0	0	0	0	0	0	0	0	0	80	1520
6	Mankada	26	85	206	4253	2	62	3	4	1	5	0	0	0	0	238	4409
7	Nilambur	90	3585	229	1262	0	0	186	147	0	0	0	0	19	197	524	5191
8	Perinthalmanna	16	14	190	1998	15	1290	0	0	0	0	4	3	1	4	226	3309
9	Ponnani	4	695	2	473	0	0	0	0	0	0	0	0	0	0	6	1168
10	Tanur	8	99	53	442	0	0	10	6	0	0	0	0	45	64	116	611
11	Tirur	8	2402	42	726	0	0	0	0	0	0	0	0	1	3	51	3131
12	Tirurangadi	23	1054	2	31	0	0	0	0	0	0	0	0	0	0	25	1085
13	Vengara	14	796	66	1194	0	0	13	4	0	0	6	199	87	147	186	2340
14	Wandoor	59	1371	89	485	0	0	32	204	0	0	0	0	0	0	180	2060
15	Malappuram (M)	1	1	8	10	0	0	10	3	0	0	0	0	0	0	19	14
16	Manjeri (M)	0	0	12	7	11	6	3	1	0	0	0	0	0	0	26	14
17	Perinthalmanna (M)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	Ponnani (M)	0	0	14	39	0	0	0	0	0	0	0	0	0	0	14	39
19	Tirur (M)	0	0	2	59	3	9	0	0	0	0	0	0	0	0	5	68
	District Total	288	11233	1136	16058	34	1369	376	541	2	7	11	203	171	1091	2018	30502

Table: 21.11

NUMBER OF GROUND WATER SCHEMES AND POTENTIAL UTILISED BY WATER DISTRIBUTION DEVICE

Sl. No.	Name of Block/ Mun./Cor.	Minor Irrigation Schemes According to Water Distribution System															
		Open Water Channel				Underground pipe		Surface pipe		Drip		Sprinkler		Others		Total	
		Lined/Pucca		Unlined/Kuchha		No.	PU	No.	PU	No.	PU	No.	PU	No.	PU	No.	PU
		No.	PU	No.	PU												
1	Perumpadappu	425	314	492	1258	2	2	134	45	0	0	0	0	9	527	1062	2146
2	Areekod	141	504	220	521	6	3	633	494	1	2	1	1	20	152	1022	1677
3	Kondotty	432	208	413	221	1	2	347	101	6	3	0	0	11	5	1210	540
4	Kuttippuram	251	560	908	2645	0	0	0	0	0	0	2	6	0	0	1161	3211
5	Malappuram	43	54	527	1774	2	23	134	81	0	0	0	0	0	0	706	1932
6	Mankada	116	147	1380	4762	4	63	247	80	1	5	4	1	1	0	1753	5058
7	Nilambur	550	3824	337	1552	2	3	406	304	0	0	2	1	24	199	1321	5883
8	Perinthalmanna	37	24	1043	2668	15	1290	0	0	0	0	5	4	1	4	1101	3990
9	Ponnani	5	695	331	799	33	48	0	0	0	0	1	9	0	0	370	1551
10	Tanur	60	118	1078	860	34	17	226	81	12	6	16	7	46	65	1472	1154
11	Tirur	30	2412	735	1070	102	77	359	134	1	1	2	1	1	3	1230	3698
12	Tirurangadi	517	1367	255	171	45	27	16	5	1	1	0	0	28	11	862	1582
13	Vengara	432	1069	370	1361	1	0	14	5	0	0	6	199	87	147	910	2781
14	Wandoor	213	1464	376	665	82	29	252	294	0	0	2	11	0	0	925	2463
15	Malappuram (M)	3	1	9	11	1	1	161	126	0	0	0	0	2	0	176	139
16	Manjeri (M)	0	0	13	7	11	6	209	50	0	0	0	0	0	0	233	63
17	Perinthalmanna (M)	0	0	60	43	0	0	0	0	0	0	0	0	0	0	60	43
18	Ponnani (M)	2	1	121	165	0	0	67	47	0	0	2	4	2	1	194	218
19	Tirur (M)	1	1	131	142	8	19	0	0	0	0	0	0	0	0	140	162
	District Total	3258	12763	8799	20695	349	1610	3205	1847	22	18	43	244	232	1114	15908	38291

Source: Irrigation Department

POWER

Power Sector in Kerala plays a vital role in all developmental activities in Kerala. Obviously power crisis is the prime obstacle to start new initiatives in the industrial field. The need for power is increasing and the production of power should also be increased accordingly. Monsoon is essential to sustain the hydropower base in the State and the shortage in rainfall usually creates power crisis. Kerala received abundant monsoon during the current year and increased the inflow in to KSEB reservoirs; the KSEB could manage the power supply situation with higher quantum of cheaper hydel power. Kerala is one among the very few states in the country where there was no load shedding and power out during 2010-11. KSEB has been responsible for the generation, transmission and supply of electricity in the State, with particular emphasis to provide electricity at affordable cost to the domestic as well as for agricultural purposes. The Board has been passing through a transitional phase of reforms in the electricity sector. The Electricity Act 2003 envisages separate organizations for Transmission and Distribution. Hydel and Thermal Projects, which form the backbone of the power sector of Kerala State, cater to needs of the various industries, which are augmented by the supply from National grids. High rainfall and terrain conditions have endowed the State with a vast potential of hydro-electricity, which is about 6% of India's total hydroelectric potential. The Small Hydro Power (SHP) units have spurred the momentum of development of wind, solar and biomass energy systems, paving the way for integrated renewable energy systems in all potential development blocks/taluks.

Kerala's power sector projections

In the past, the energy demand was presumed to be basis with load factor being used to convert the projected energy demand to peak MW demand. The projected energy demand was worked out by a combination of end use and time

series analysis. This was the methodology used in the Electric Power Surveys (EPS) conducted by CEA in conjunction with the State Electricity Boards.

One of the problems with the above approach has been consistent over projection of peak demand. The annual growth of peak power demand has been assumed to be the order of 7-8% and this has resulted in projections well beyond actual demand realized.

Some of these anomalies have been corrected in the current Electric Power Surveys conducted and the projections for Kerala as continued in the 17th Survey. The figures for Kerala in terms of demand projection in the Draft 17th EPS are given below.

Table: 22.1

17th EPS ESTIMATES FOR 11th PLAN PERIOD

Year	Energy Consumption	Peak Demanded	Annual Load Factor (%)
2006-07	11147	2699	60.75
2007-08	12037	2823	61.54
2008-09	12973	2947	62.34
2009-10	13977	3078	63.14
2010-11	15112	3227	63.94
2011-12	16345	3391	64.74

It is evident from the 17th EPS Draft Report that a number of assumptions made for projections which may result in the actual demand being more than what is projected in the EPS or less. KSEB's own projections taking into account a higher growth rate and a slightly lower load factor projects the following demands for the 11th plan period.

Table: 22.2

Year	Energy Consumption	Peak Demand	Annual Load Factor (%)
2007-08	15217	2856	60.82
2008-09	16096	3004	61.17
2009-10	17025	3159	61.52
2010-11	18077	3335	61.87
2011-12	19230	3528	62.22

Source: EPA Draft Report

Table: 22.3

GROWTH OF KERALA POWER SYSTEM AT A GLANCE 2010-2013

Sl. No.	Particulars/Year	Position as on 11/2013		
		2010-11	2011-12	2012-13
1	Installed capacity - MW	2857.59	2872.79	2881.04
2	Maximum demand (system) - MW	3119	3348	3268
3	Generation per annum - (KSEB own) - MU	7412.59	8350.74	5333.40
4	Import per annum – MU	10512.29	11270.71	12771.64
5	Export per annum - MU	130.24	201.1	0
6	Energy sales within state per annum - MU	14547.90	15980.53	16838.24
7	Percentage of energy losses to energy available for sales	17.99	17.45	16.83
8	Per capita consumption - KWH	519	567	595
9	220 KV lines – CT Kms	2701	2713	2719.55
10	110 KV lines – CT Kms	4004	4005	4044.30
11	66 KV lines – CT Kms	2387	2387	2386.76
12	33 KV lines – CT Kms	1421	1497	1561.63
13	11 KV lines – CT Kms	49232	51392	52971
14	LT lines – CT Kms	266856	270718	273274
15	Step up transformer capacity - MVA	2684	2689	2691
16	No of EHT substations			
A	400 KV	2*	2*	2*
B	220 KV	17	18	18
C	110 KV	128	131	132
D	66 KV	80	80	81
E	33 KV	113	120	128
17	Step down transformer capacity – MVA	16222.10	16556.30	16965.30
18	Distribution transformers			
A	Numbers	58427	62726	65138

B	Capacity - MVA	7320	7674	7940
19	No of villages electrified	1467	1467	1467
20	No of consumers (Lakhs)	101.28	104.58	108.07
21	Connected load - MW	16681.30	17518.42	18539.34
22	No of street lights	1196503	1218610	1257285
23	No of irrigation pumps	446460	455078	466289
24	Total revenue per annum (Lakhs)	641138	797804.89	1165810
25	Revenue from sale of power per annum (Lakhs)	495060	581781.92	722339.35

* Pallipuram 400 KV substation owned by PGCIL

Table: 22.4

ENERGY SOURCE IN KERALA (2010-2013)

Sl. No.	Source of Energy	Installed Capacity (MW)		
		2010-11	2011-12	2012-13
1	Hydel: KSEB	1997.80	2008.80	2010.05
2	Thermal: KSEB	234.60	234.60	234.60
3	Wind: KSEB	2.03	2.03	2.03
4	NTPC	359.58	359.58	359.58
5	Thermal: IPP	188.93	198.93	198.93
6	Hydel: Captive	33.00	33.00	33.00
7	Hydel: IPP	10.00	10.00	10.00
8	Wind: IPP	31.65	32.85	32.85
	Total	2857.59	2879.79	2881.04

Source: Economic Review

Table: 22.5

**ALL INDIA GENERATING INSTALLED ELECTRICITY GENERATION
CAPACITY AS ON 31-03-2011**

Name of State/U.Ts	Hydro	Coal	Diesel	Gas
1	2	3	4	5
Northern Region	13822.75	24232.5	12.99	4134.76
Western Region	7447.5	30995.5	17.48	7903.81
Southern Region	11299.03	19882.5	939.32	4690.78
Eastern Region	3882.12	18747.88	17.2	190
North Eastern Region	1116	60	142.74	787
Islands	0	0	70.02	0
Total (All India)	37567.4	93918.38	1199.75	17706.35

Name of State/U.Ts	Nuclear	RES	Total
1	6	7	8
Northern Region	1620	3165.55	46988.55
Western Region	1840	5357.96	53562.25
Southern Region	1320	9341.67	47473.3
Eastern Region	0	359.64	23196.84
North Eastern Region	0	223.6	2329.34
Islands	0	6.1	76.12
Total (All India)	4780	18454.52	173626.4

Source: Kerala State Electricity Board

MISCELLANEOUS

WATER TRANSPORT

In Kerala there are many water bodies including rivers, lakes, backwaters etc. Backwater is a wonderful gift of nature to the God's Own Country. Water transport provides for those people who reside in waterlogged areas. These waterlogged areas include Alappuzha, Kollam, Kottayam, Ernakulam, Kannur and Kasaragode district. Ashtamudi and Vembanadu lake which completes the network of waterways not only provides natural beauty but inland navigation facilities also. This includes navigable river, backwaters and manmade cross canals. Most of these are in Travancore-Cochin region. Of the 44 rivers in Kerala, the 41 west flowing rivers together with back waters and manmade canals form the integral part of inland navigation system. It is the water bodies that connect the islands and remote villages with the main land. This inland water transport system consists of 1895 kms of waterways. This type of inland water transport has advantages such as pollution free and cheap means of transportation. It is in the inland canals that connect the rivers from one to another. Here we have the west coast canal system which has a length of about 560 kms. The Vembanad lake which has a length of about 83 kms. has cochin in this north and Alappuzha in the southern end.

Table: 23.1

LIST OF BACKWATERS IN MALAPPURAM

Sl.No.	Name of Backwater	Area (ha)
1	Puthupponnani	150.83
2	Ponnani Kayal	757.19
3	Poorappuzha	62.98
4	Kadalundi Kayal	323.56

Table: 23.2

**NEWLY REGISTERED VEHICLES IN MALAPPURAM DISTRICT FOR THE
YEAR 2012-13**

Sl.No.	Classification of Vehicles	Vehicle No.
Transport Vehicles		
1	Multiaxied Articulated Vehicles	0
2	Trucks and Lorries	0
3	Four Wheelers	2572
4	Three Wheelers	59326
Total		61898
5	Stage Carriage	1686
6	Contract Carriage	8610
7	Private Service Vehicles	348
8	Other Buses	910
Total		11554
9	Motor Cabs	622
10	Maxi Cabs/Taxi	0
11	Other Taxis	217
12	LMV 3 Seater	6326
13	LMV 4 to 6 Seater	0
14	Motor Cycle Hire	0
Total		7165
15	Other TVs	0
Total Transport		80617
16	Scooters	0
17	Mopads	0
18	Motor Cycles including above & below 95cc	73825
Total		73825
19	Cars	78346
20	Jeeps	164
21	Omni Buses	3
22	Tractors	60
23	Trailors	213
24	Others	0
Total		78786
Total Non Transport		152611
Grand Total		233228

Table: 23.3

**NUMBER OF MOTOR VEHICLE HAVING VALID REGISTRATION IN
MALAPPURAM DISTRICT AS ON 2013**

Goods Vehicle	Four Wheelers and above	32665
	Three Wheelers including tempos	76847
Buses	Stage carriages	3189
	Contract Carriages/Omni Buses	19364
Four Wheelers	Cars	102604
	Taxis	1200
	Jeeps	9758
Three Wheelers	Autorickshaws	82634
	Motorized Cycle Rickshaws	0
Two Wheelers	Motorized Cycles	0
	Scooter/Motor Cycles	351899
Tractors/Trailors	Tractors/Trailors	1354
	Tillers	724
	Trailors	314
	Others	5639
Grand Total		688191

Table: 23.4

LENGTH OF ROADS MAINTAINED BY PWD (R & B) AS ON 31-03-2012

(in Kms)

District/State	State Highways	Major District Roads	Total
Malappuram	374.76	2301.13	2675.89
State	4341.65	27469.95	31811.60

Source: Infrastructure Statistics of Kerala

Table: 23.5

STANDARDISED LIST OF INSTITUTIONS IN MALAPPURAM DISTRICT

Sl. No.	Institutions	Location	No. of Beds	Health Block
1	CHC	Chungathara	10	CHC Chungathara
2	CHC	Areekod	35	CHC Areekod
3	CHC	Edavanna	36	CHC Edavanna
4	CHC	Mankada	26	CHC Mankada
5	CHC	Puzhakkattiri	20	CHC Mankada
6	CHC	Marancherry (Old)	16	CHC Marancherry
7	CHC	Melattur	22	CHC Melattur
8	CHC	Neduva	34	CHC Neduva
9	CHC	Omannur	24	CHC Omannur
10	CHC	Kottakkal	24	PHC Pookottur
11	CHC	Kuttippuram	22	CHC Kuttippuram
12	CHC	Kondotty	29	CHC Kondotty
13	CHC	Thrikkannapuram	12	CHC Thrikkannapuram
14	CHC	Edappal	30	CHC Thrikkannapuram
15	CHC	Thanur	42	PHC Valavannur
16	CHC	Valavannur	16	PHC Valavannur
17	CHC	Vengara	30	CHC Vengara
18	CHC	Purathur	10	CHC Purathur
19	CHC	Vettom	22	BPHC Vettom
20	CHC	Wandoor	42	CHC Wandoor
21	CHC	Karuvarakundu	24	CHC Wandoor
22	24X7 PHC	Pothukallu	24	CHC Chungathara
23	24X7 PHC	Vazhikkadavu	24	CHC Chungathara
24	24X7 PHC	Kavanur	10	CHC Edavanna
25	24X7 PHC	Pang	24	CHC Mankada
26	24X7 PHC	Palapetti	24	CHC Marancherry
27	24X7 PHC	Thazhekkode	0	CHC Melattur
28	24X7 PHC	Alipparambu	10	CHC Melattur
29	24X7 PHC	Athanikkal	24	CHC Neduva
30	24X7 PHC	Vazhakkad	8	CHC Omannur
31	24X7 PHC	Vazhayur	10	CHC Omannur
32	24X7 PHC	Anakkayam	24	PHC Pookottur
33	24X7 PHC	Edayur	24	CHC Kuttippuram
34	24X7 PHC	Valancherry	16	CHC Kuttippuram

Sl. No.	Institutions	Location	No. of Beds	Health Block
35	24X7 PHC	Pallickal	10	CHC Kondotty
36	24X7 PHC	Thevarkadappuram	10	PHC Valavannur
37	24X7 PHC	Thenjippalam	10	CHC Vengara
38	24X7 PHC	Thirunnavaya	10	BPHC Vettom
39	24X7 PHC	Chokkad	40	CHC Wandoor
40	24X7 PHC	Karulai	10	CHC Chungathara
41	24X7 PHC	Kalikavu	28	CHC Wandoor
42	24X7 PHC	Pandikkad	0	CHC Wandoor
43	PHC	GFD Koottayi	0	PHC Vettom
44	PHC	Amarambalam	0	CHC Chungathara
45	PHC	Chaliyar	0	CHC Chungathara
46	PHC	Edakkara	0	CHC Chungathara
47	PHC	Kurumbalangode	0	CHC Chungathara
48	PHC	Muthedam	0	CHC Chungathara
49	PHC	Chathalloor	0	CHC Edavanna
50	PHC	Thrikkalangode	0	CHC Edavanna
51	PHC	Trippanachi	10	CHC Edavanna
52	PHC	Angadippuram	0	CHC Mankada
53	PHC	Chemmalasseri	0	CHC Mankada
54	PHC	Kodur	0	CHC Mankada
55	PHC	Kuttilangadi	0	CHC Mankada
56	PHC	Makkarapparambu	0	CHC Mankada
57	PHC	Moorkkanadu	10	CHC Mankada
58	PHC	Marancherry (New)	10	CHC Marancherry
59	PHC	Alangode	10	CHC Marancherry
60	PHC	Nannamukku	0	CHC Marancherry
61	PHC	Perumpadappu	0	CHC Marancherry
62	PHC	Veliyancode	0	CHC Marancherry
63	PHC	Edappatta	0	CHC Melattur
64	PHC	Elamkulam	0	CHC Melattur
65	PHC	Keezhattur	10	CHC Melattur
66	PHC	Vettathur	0	CHC Melattur
67	PHC	Kadalundinagaram	6	CHC Neduva
68	PHC	Munniyur	10	CHC Neduva
69	PHC	Nannambra	24	CHC Neduva
70	PHC	Parappanangadi	0	CHC Neduva
71	PHC	Cheekkodu	0	CHC Omannur
72	PHC	Keezhuparambu	0	CHC Omannur
73	PHC	Odakkayam	0	CHC Omannur

Sl. No.	Institutions	Location	No. of Beds	Health Block
74	PHC	Oorngattiri	10	CHC Omannur
75	PHC	Pookkottur	24	PHC Pookkottur
76	PHC	Morayur	0	PHC Pookkottur
77	PHC	Nediyiruppu	0	PHC Pookkottur
78	PHC	Oorakam	0	PHC Pookkottur
79	PHC	Ponmala	10	PHC Pookkottur
80	PHC	Athavanad	0	CHC Kuttippuram
81	PHC	Irimbiliyam	0	CHC Kuttippuram
82	PHC	Marakkara	10	CHC Kuttippuram
83	PHC	Chelembra	0	CHC Kondotty
84	PHC	Cherukavu	0	CHC Kondotty
85	PHC	Kuzhimanna	10	CHC Kondotty
86	PHC	Pulickal	0	CHC Kondotty
87	PHC	Ezhavathuruthy	0	CHC Thrikkannapuram
88	PHC	Vattomkulam	0	CHC Thrikkannapuram
89	PHC	Cheriyamundam	0	PHC Valavannur
90	PHC	Kalpakan cherry	0	PHC Valavannur
91	PHC	Ozhur	10	PHC Valavannur
92	PHC	Ponmundam	0	PHC Valavannur
93	PHC	Thanalur	0	PHC Valavannur
94	PHC	A.R. Nagar	0	CHC Vengara
95	PHC	Edarikkode	10	CHC Vengara
96	PHC	Iringalloor	0	CHC Vengara
97	PHC	Othukkungal	0	CHC Vengara
98	PHC	Thennala	0	CHC Vengara
99	PHC	Kootayi	0	BPHC Vettom
100	PHC	Thalakkad	0	BPHC Vettom
101	PHC	Thriprangode	0	BPHC Vettom
102	PHC	Mambad	10	CHC Wandoor
103	PHC	Porur	0	CHC Wandoor
104	PHC	Thiruvalli	0	CHC Wandoor
105	PHC	Thuvvoor	0	CHC Wandoor

Source: DHS

