

GENERAL INFORMATION

Alappuzha district popularly known as “Venice of the East” came into existence on 17th August 1957. District is surrounded by Lakshadweep Sea in the West, Kottayam and Pathanamthitta districts in the East, Kollam district in the South and Ernakulam district in the North. Alappuzha covers an area of 141011 ha. consisting of 12 blocks, 5 municipalities and 6 taluks. Being southern part of Kerala, Alappuzha falls between North latitude 9^o 05’ and 9^o 54’ and East longitude 76^o 17’ 30” and 76^o 40’. Based on physiographic features this area falls under three sub micro regions namely Aleppy coast, Kuttanad low lying plain and Chengannur rolling plain. District has a tropical humid climate with an oppressive summer and plentiful seasonal rainfall. Mineral resources are not immensely rich except beach sand. Sandy, peaty, alluvial and laterite soil cover the whole area. Alappuzha is the only district in Kerala having no area under forest cover. Agriculture plays a vital role in the district with a total cropped area of 104287 ha. during 2012-13. Kuttanad - “rice bowl of Kerala” - constitutes a major part of the district. District is blessed with a network of rivers, backwaters and canals which included in the west coast canal system used as navigation. Main rivers are Manimala, Pamba and Achankovil. Watershed has become an acceptable unit of planning for optimum use and conservation of soil and water resources. This is one of the well developed coastal districts in Kerala State which extends 82 Km consisting 54 fishing villages. Fisheries in Alappuzha district occupy a very important position in industrial sector in Kerala. Land use categories observed in this district are built-up land, agricultural land, wasteland and waterbodies. Major categories of wasteland are land with scrub, sandy area and wetland waterlogged. Wetland has a role in fragile environmental balance. Alappuzha is known as traditional home of coir industry. Alappuzha is rich in beautiful tourist spots and pilgrims centres.

History

Alappuzha district was carved out of erstwhile Kottayam and Kollam (Quilon) districts. It is assumed that the name of Alappuzha was derived by the geographical position and physical features of the place which means the land between the sea and the network of rivers flowing into it. The history of the district in the palaeolithic age is obscure. It is presumed that the coastal taluks of Cherthala, Ambalapuzha and Karthikappally might have been under water and these areas were formed by the accumulation of silt and sand, later than the other parts of the district. Kuttanad taluk was well known even from the early periods of the Sangam age. The early Cheras had their home in Kuttanad taluk and they were called 'Kuttuvans' named after this place. Some archeological antiques like stone inscriptions, historical monuments etc. found in the temples, churches, rock-out caves etc., and literary works like "Unnili Sandesam" give some insight into the ancient period of this district. Christianity had a strong foothold in this district even from the 1st century A.D. The church located at Kokkomangalam or Kokkothamangalam in Cherthala taluk was one of the seven churches founded by St.Thomas, one of the twelve disciples of Jesus Christ. It is generally believed that he landed at Maliankara in Muziris Port, presently known as Cranganore or Kodungallur in 52 A.D and preached Christianity in South India. During 9th to 12th century AD the district flourished in the field of religion and culture under the second Chera Empire. The famous literary work of this period was 'Ascharya Choodamani' a Sanskrit drama written by Sakthibhadra who was a scholar of Chengannur gramam.

During 16th century small principalities like Kayamkulam (presently Karthikappally and Mavelikkara taluks), Purakkad which was often called Ambalappuzha or Chempakasseri (present Ambalappuzha and part of Kuttanad taluk) and Karappuram comprising of two principalities called Moothedath and Iledath (present Cherthala Taluk) emerged into power. In the same period the

Portuguese came into prominence in the political scene of the district. Christianity became popular in all parts of the district and they built several churches of which Churches located at Purakkad and Arthungal are well known. The kingdom of Chempakasseri was at its zenith during the reign of Pooradam Thirunal Devanarayana, a great scholar and a poet who was the author of 'Vedantha Retnamala', a commentary on the first verse of Bhagavat Geetha. It is said that Sreekrishna Swami temple at Ambalappuzha was constructed and the idol of Lord Krishna installed during that time. It is believed that Melpathur Narayana Bhattathiri, Sri Neelakanta Deekshithar and Sri Kumaran Namboothiri were eminent scholars who patronized his court.

In the 17th century the Portuguese power declined and the Dutch had a predominant position in the principalities of this district. It was at that time Maharaja Marthandavarma, the 'Maker of modern Travancore' interfered in the political affairs of those principalities. The annexation of the Kingdoms of Kayamkulam, Ambalappuzha, Thekkumkur, Vadakkumkur and Karappuram to Travancore gave the Dutch a setback from the political scene of the district. Marthandavarma Maharaja had a remarkable role in the internal progress of the district. He gave special attention to the development of Mavelikkara as an administrative as well as a commercial centre. The Krishnapuram palace, which is now a protected monument of the State Archaeology department, was constructed during that period. It was at that time that the great and talented poet Kunjan Nambiar was installed in the court at Trivandrum.

During the reign of Dharmaraja, the district improved by all means. Raja Kesava Das, Diwan of Travancore who was known as the 'Maker of modern Alleppey' made Alappuzha a premier port town of Travancore. He constructed several roads and canals to improve communications and built warehouses. He gave all facilities to merchants and traders from far and near. During the reign of Balaramavarma Maharaja, Velu Thampi Dalava took keen interest in the development of town and port. He brought the whole area of the island

Pathiramanal under coconut cultivation and large tracts under paddy cultivation. The role of Velu Thampi Dalava in the development of Alappuzha is worth mentioning. In the 19th century the district attained progress in all spheres. One of the five subordinate courts opened in the State in connection with the reorganization of the judicial system by Colonel Munro was located at Mavelikkara. The credit of having the first post office and first telegraph office in the erstwhile Travancore State goes to this district. The first modern factory for the manufacture of coir mats and mattings was also established in 1859 at Alappuzha. The town Improvement Committee was set up in 1894.

This district had a prominent role in the freedom struggle of the country. The campaign for the eradication of untouchability was organized much earlier in this district by T.K. Madhavan, a fearless journalist and in 1925 the approach roads to the temples, especially to Ambalappuzha Sree Krishna Swami temple were thrown open to the Hindus of all casts. The district also witnessed the 'Nivarthana' movement which was started as a protest against the constitutional repression of 1932. The first political strike in Kerala was held at Alappuzha in 1938. The historic struggles of Punnapra and Vayalar in 1946 stiffened the attitude of the people against Sir C.P. Ramaswamy Iyer, Diwan of Travancore, which ultimately led to his exit from the political scene of Travancore. After India became independent, a popular Ministry was formed in Travancore on 24th March, 1948 and on 1st July 1949. Travancore and Cochin States were integrated and the position continues till the formation of Kerala State on 1st November 1956 as per the States Reorganization Act 1956. The district came into existence as a separate administrative unit on 1st August 1957.

ALAPPUZHA AT A GLANCE

Table: 1.1

ADMINISTRATIVE SET UP

Sl. No.	Particulars	Alappuzha	Kerala
1	No. of Revenue Divisions	2	21
2	No. of Taluks	6	63
3	No. of Revenue Villages	91	1478
4	No. of Corporations	0	5
5	No. of Corporations Wards	0	359
6	No. of Municipalities	5	60
7	No. of Municipality Wards	186	2216
8	No. of Block Panchayat	12	152
9	No. of Block Panchayat Wards	158	2095
10	No. of Grama Panchayat	73	978
11	No. of Grama Panchayat Wards	1186	16680
12	No. of Assembly Constituencies	9	140
13	No. of Parliament Constituencies	2	20
14	No. of District Panchayat Wards	23	332

Table: 1.2

DEMOGRAPHY

Sl. No.	Particulars	Alappuzha	Kerala
1	Total Population	2121943	33387677
2	No. of Literates	1863558	28234227
3	No. of Migrant	94154	1625653

Table: 1.3

GEOGRAPHICAL PARTICULARS

Sl. No.	Area Categorization	Alappuzha	Kerala
1	Total Area (Ha)	141011	3886287
2	Forest Area (Ha)	0	1081509
3	Length of Coastal Line (Kms)	82	590

Table: 1.4

AGRICULTURE

Sl. No.	Land Utilization Pattern	Alappuzha	Kerala
1	Total geographical area	141011	3886287
2	Forest area	0	1081509
3	Land put to non agricultural use	22522	402577
4	Barren & uncultivable land	23	16354
5	Permanent pastures and other grazing land	1	118
6	Land under misc. tree crops	64	2799
7	Cultivable waste	15680	96596
8	Fallow other than current fallow	1928	55835
9	Current fallow	2898	76744
10	Net area sown	85361	2048109
11	Area sown more than once	18926	543625
12	Total cropped area	104287	2591734

Table: 1.5

ANIMAL HUSBANDRY

Sl. No.	Livestock Population	Alappuzha	Kerala
1	Cattle	78045	1740117
2	Buffaloes	3070	58145
3	Goats	76957	1729127
4	Pigs	585	59017
5	Sheep	0	965
6	Ducks	383023	865331
7	Fowls	696295	11820376

Table: 1.6

FISHERIES

Sl. No.	Particulars	Alappuzha	Kerala
1	Length of coastal line	82	590
2	No. of fishing villages		
a)	Marine	30	222
b)	Inland	24	113
3	Fisher folk population		
a)	Marine	107204	771249
b)	Inland	60590	230376

Table: 1.7

INDUSTRIES

Sl. No.	Industrial Units	Alappuzha	Kerala
1	Number of Factories		
2	Number of SSI units registered	16554	219444
3	Number of Women SSI units registered	5073	55416
4	Number of Industrial Co-operative Societies registered	0	9

Table: 1.8

COMMUNICATION

Sl. No.	Communication Divisions	Alappuzha	Kerala
1	Total Number of Post Offices	124	5064
a)	Number of Head Office	2	51
b)	Number of Sub Office	48	1455
c)	Number of ED Branch Office	74	3558
2	Total Number of Telephone Exchanges	72	1266

Table: 1.9

HEALTH

Sl. No.	Institutions	Alappuzha	Kerala
1	General Hospital	1	16
2	Women & Children Hospital	1	8
3	District Hospital	1	15
4	Taluk Hospital	7	77
5	Primary Health Centre	42	682
6	Leprosy Control Unit/Hospitals	1	3
7	TB Centre/Clinic	2	17
8	Mental Health Centre	0	3
9	Number of Govt. Allopathic Hospitals	90	1281
10	Number of Govt. Ayurvedic Hospitals		5
11	Number of Govt. Homoeopathic Hospitals	3	32

Table: 1.10

EDUCATION

Sl. No.	Institutions	Alappuzha	Kerala
1	Government Lower Primary Schools	201	2607
2	Government Upper Primary Schools	70	924
3	Government High Schools	60	1089
4	Government Higher Secondary Schools	41	769
5	Government Vocational Higher Secondary Schools	14	261
6	Teachers Training Institute	13	222
7	Kendriya Vidyalaya	1	27
8	Jawahar Navodaya Vidyalaya	1	14
9	CBSE School	56	797
10	ICSE School	13	108
11	Government Engineering Colleges	0	9
12	Government Medical Colleges	1	5
13	Government Polytechnic Colleges	1	49

Table: 1.11

DRINKING WATER FACILITIES

Sl. No.	Water Supply Connections	Alappuzha	Kerala
1	Number of Public Canals	577	85825
2	Number of Public Wells	2	603
3	Number of Public Tanks	0	1777
4	Number of Tube Wells	5874	19716
5	Number of Ground water Dug Wells	4660	162826

Table: 1.12

POWER

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

Table: 1.13

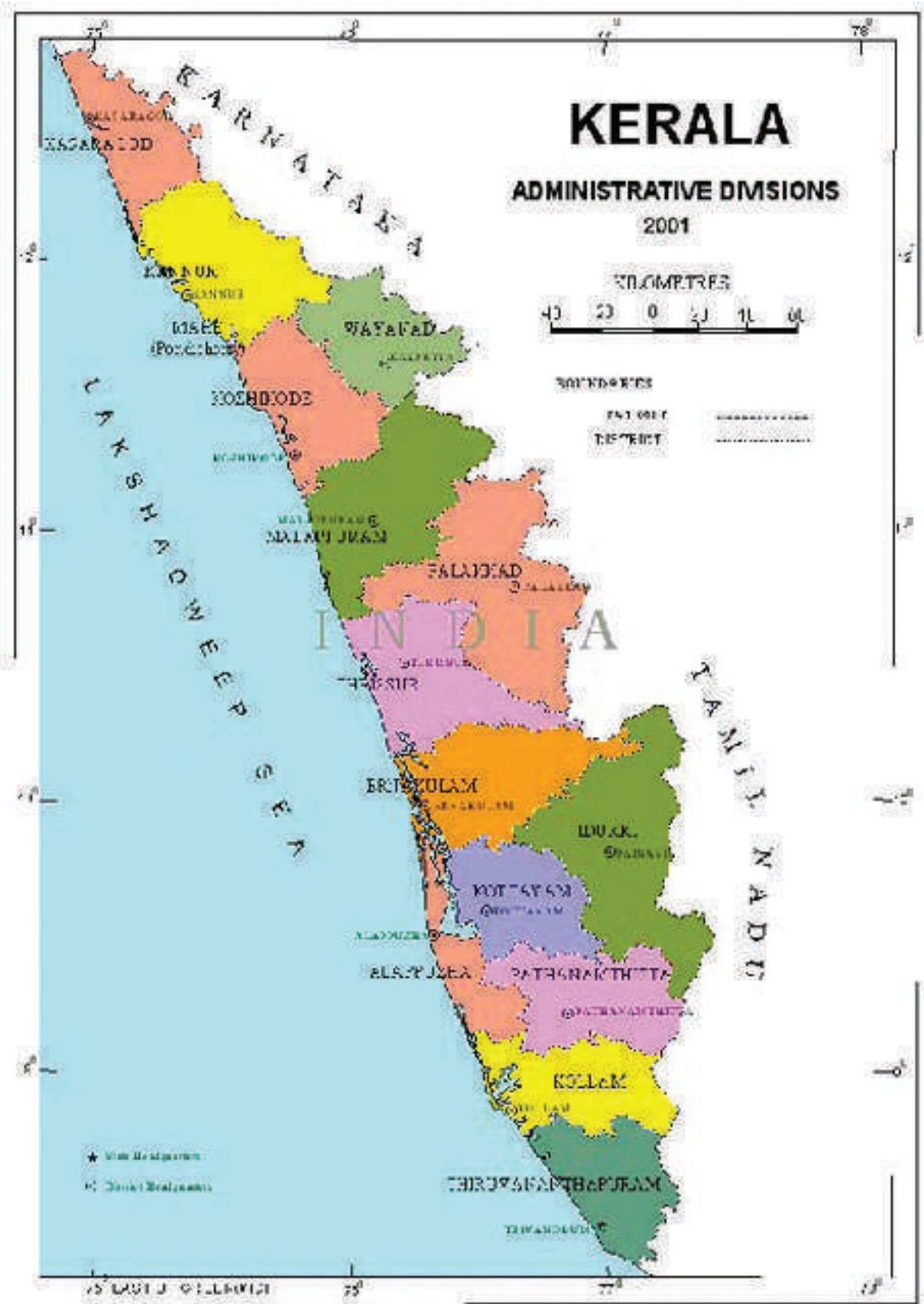
WATER RESOURCES

River	Achankovil
	Manimala
	Pamba
Back Waters	Kuttanad Kayal
	Vembanad Kayal
	Kayamkulam Kayal
	Poomeen Kayal
	Vadakkal Kayal
	Chethi Kayal
	Arthungal Kayal
	Pozhichal Kayal
	Vettakkalchal Kayal

Table: 1.14

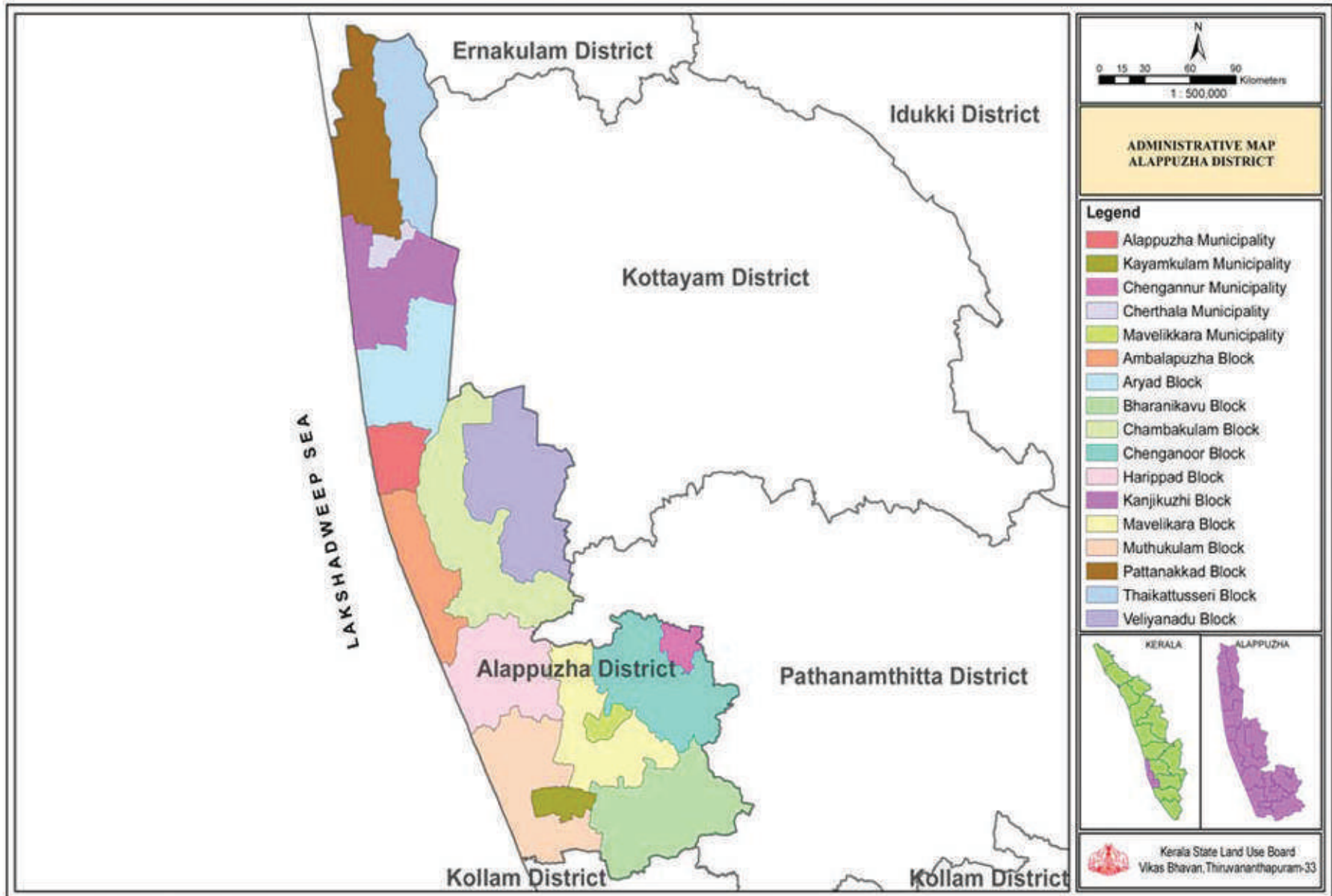
MAJOR TOURIST SPOTS

Sl.No.	Tourist Centre	Focus
1	Kuttanad	Backwater
2	Pathiramanal	Bird Sanctuary
3	Mararikulam	Sandy beach
4	Karumadikuttan	Historical place
5	Arthunkal	Beach
6	Thunjanparambu	Historical place

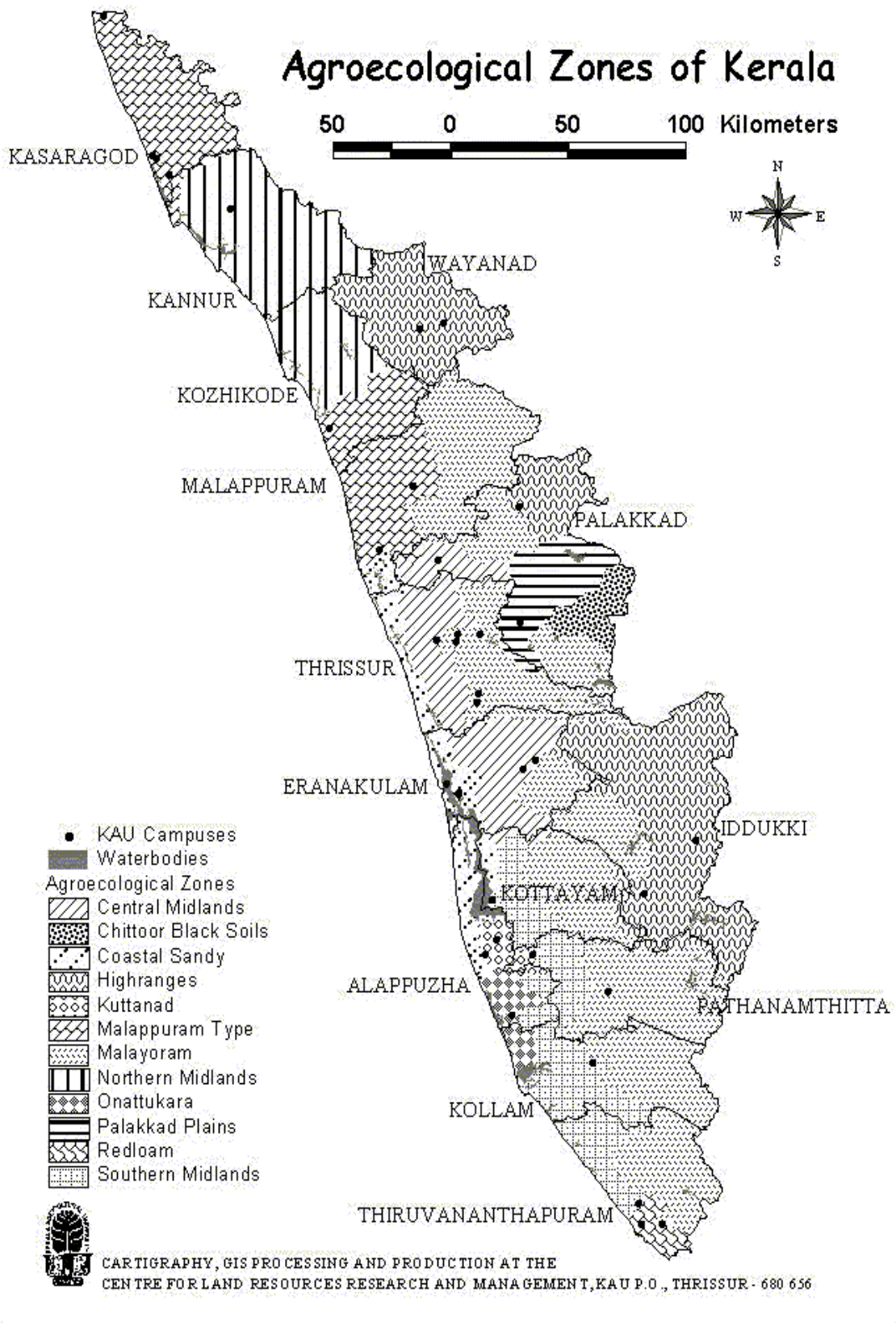


Based on the Survey of India map with the boundaries of the States as of 1st July 2001. The territorial limits of India extend into the sea to a distance of three nautical miles measured from the appropriate low water.

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Agroecological Zones of Kerala

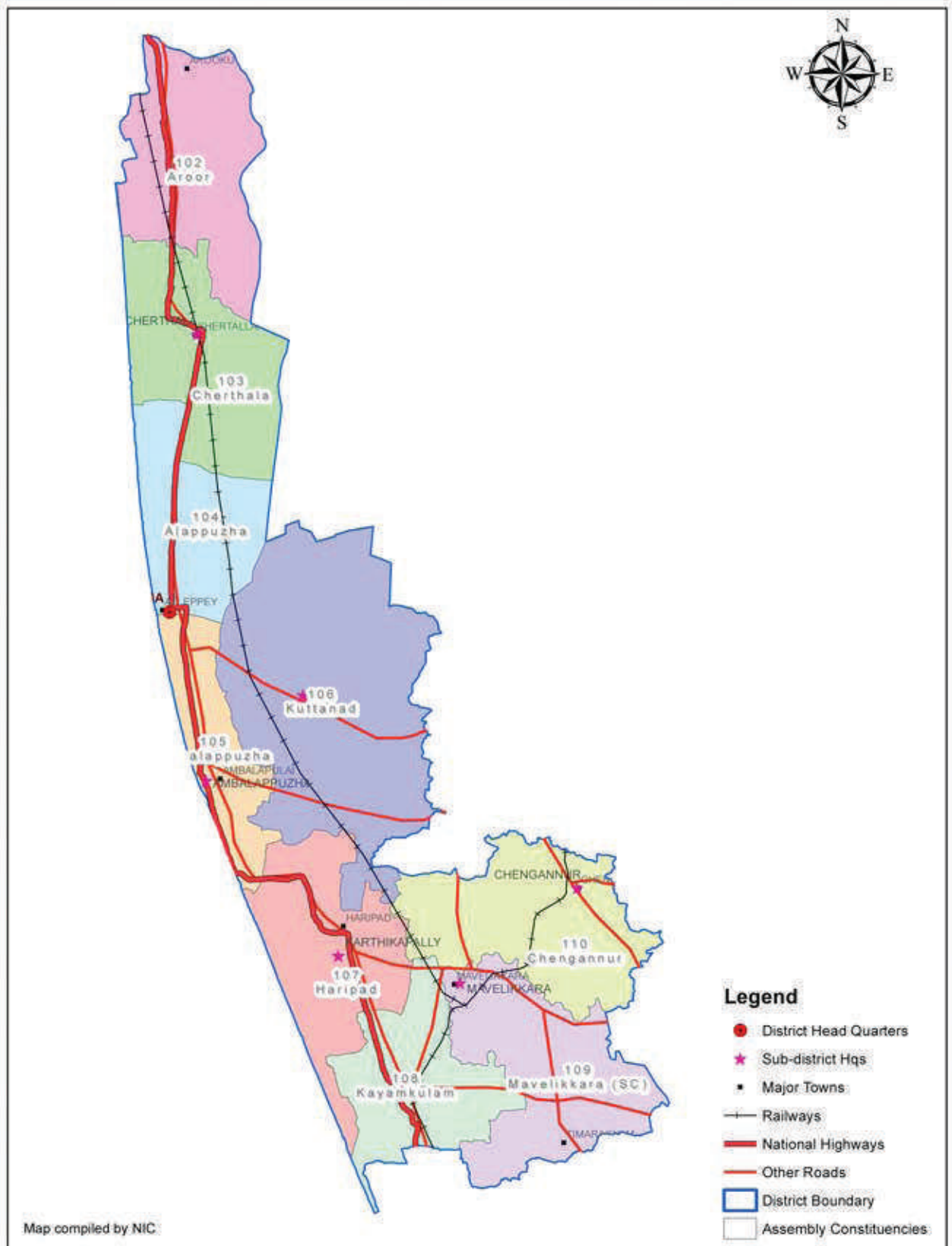


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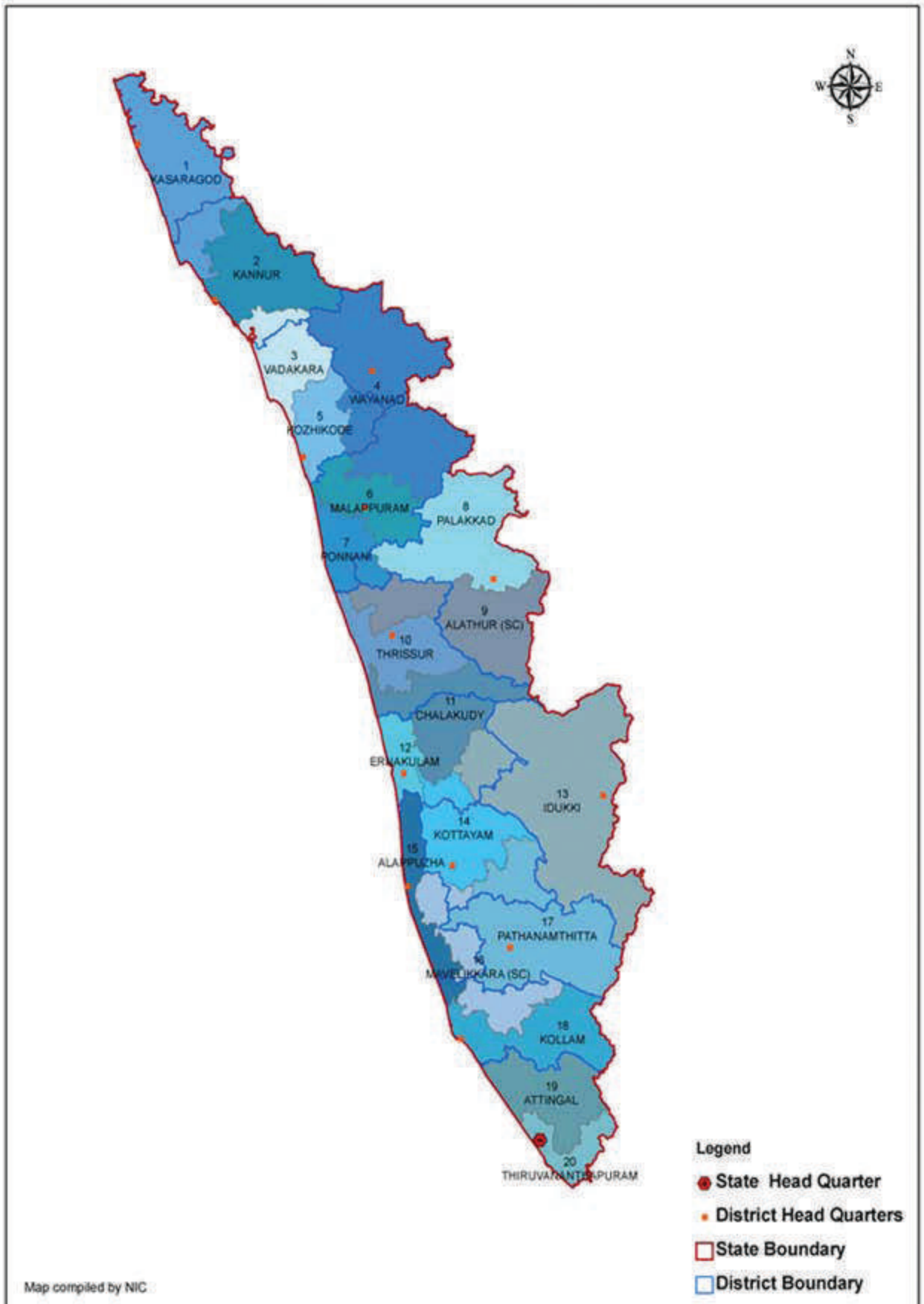
Assembly Constituencies-Post delimitation

State : Kerala

District : Alappuzha



Parliamentary Constituencies Kerala



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	31,66,285	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	Alappuzha			Kerala			
		Total	Male	Female	Total	Male	Female	
1	Total Population	Total	2127789	1013142	1114647	33406061	16027412	17378649
		Rural	979643	464713	514930	17471135	8408054	9063081
		Urban	1148146	548429	599717	15934926	7619358	8315568
2	Population in the age group 0-6 Years	Total	192046	98444	93602	3472955	1768244	1704711
		Rural	89414	45728	43686	1823664	927888	895776
		Urban	102632	52716	49916	1649291	840356	808935
3	Scheduled Caste Population	Total	201211	97183	104028	3039573	1477808	1561765
		Rural	111931	53941	57990	1818281	883819	934462
		Urban	89280	43242	46038	1221292	593989	627303
4	Scheduled Tribe Population	Total	6574	3175	3399	484839	238203	246636
		Rural	2961	1440	1521	433092	213208	219884
		Urban	3613	1735	1878	51747	24995	26752
5	Literates	Total	1852797	890552	962245	28135824	13704903	14430921
		Rural	852470	407413	445057	14549320	7132430	7416890
		Urban	1000327	483139	517188	13586504	6572473	7014031
6	Illiterates	Total	274992	122590	152402	5270237	2322509	2947728
		Rural	127173	57300	69873	2921815	1275624	1646191
		Urban	147819	65290	82529	2348422	1046885	1301537

Table: 4.4 Continued.....

7	Total Workers	Total	804471	536738	267733	11619063	8451569	3167494
		Rural	371442	244185	127257	6341957	4507501	1834456
		Urban	433029	292553	140476	5277106	3944068	1333038
Main Workers								
8	Workers	Total	596387	434391	161996	9329747	7179828	2149919
		Rural	263794	191272	72522	4930191	3743078	1187113
		Urban	332593	243119	89474	4399556	3436750	962806
9	Cultivators	Total	17805	15333	2472	544932	465546	79386
		Rural	14770	12838	1932	481651	410532	71119
		Urban	3035	2495	540	63281	55014	8267
10	Agricultural Labourers	Total	39491	26826	12665	919136	629092	290044
		Rural	29796	19988	9808	760632	510300	250332
		Urban	9695	6838	2857	158504	118792	39712
11	House hold Industry Workers	Total	25155	13265	11890	198281	132111	66170
		Rural	10129	5503	4626	104642	68889	35753
		Urban	15026	7762	7264	93639	63222	30417
12	Other Workers	Total	513936	378967	134969	7667398	5953079	1714319
		Rural	209099	152943	56156	3583266	2753357	829909
		Urban	304837	226024	78813	4084132	3199722	884410

Table: 4.4 Continued.....

		Marginal Workers						
13	Workers	Total	208084	102347	105737	2289316	1271741	1017575
		Rural	107648	52913	54735	1411766	764423	647343
		Urban	100436	49434	51002	877550	507318	370232
14	Cultivators	Total	7432	5346	2086	125321	81360	43961
		Rural	5861	4259	1602	105378	68349	37029
		Urban	1571	1087	484	19943	13011	6932
15	Agricultural Labourers	Total	32215	16091	16124	403714	228903	174811
		Rural	24186	12007	12179	322371	179994	142377
		Urban	8029	4084	3945	81343	48909	32434
16	Household Industry Workers	Total	10710	3476	7234	74741	32504	42237
		Rural	5114	1802	3312	46285	20508	25777
		Urban	5596	1674	3922	28456	11996	16460
17	Other Workers	Total	157727	77434	80293	1685540	928974	756566
		Rural	72487	34845	37642	937732	495572	442160
		Urban	85240	42589	42651	747808	433402	314406
18	Non Workers	Total	1323318	476404	846914	21786998	7575843	14211155
		Rural	608201	220528	387673	11129178	3900553	7228625
		Urban	715117	255876	459241	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	84.88	89.67	79.92	926	902	
KERALA	T	3,33,87,677	1,60,21,290	1,73,66,387	4.86	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	-25.98	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	93.03	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	8,82,745	4,26,243	4,56,502	-26.20	10.46	11.07	9.89	93.88	96.50	91.48	1071	956	
	U	16,42,892	7,57,769	8,85,123	35.45	10.53	11.61	9.60	96.23	98.12	94.64	1168	965	
Wayanad District	T	8,16,588	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	14,73,029	16,16,515	7.31	10.47	11.19	9.82	95.24	97.57	93.16	1097	953	67.15
	R	10,14,785	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	92.67	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	1006	950	4.70
	R	10,55,428	5,26,420	5,29,008	-1.51	9.02	9.24	8.80	92.03	94.73	89.34	1005	957	
	U	52,025	25,524	26,501	-9.67	9.49	9.83	9.16	95.74	97.10	94.45	1038	958	
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	0.01	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	95.72	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	4,99,745	5,64,331	-4.18	7.65	8.29	7.08	96.87	97.64	96.19	1129	964	
	U	1,31,461	61,875	69,586	6.19	7.70	8.32	7.15	97.42	98.15	96.79	1125	967	
Kollam District	T	26,29,703	12,44,815	13,84,888	1.72	9.95	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	9.99	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		Percentage of urban population
	2001	2011	2001	2011	
No. of Sub-Districts (Talukas)	83	83	2001	2011	25.96 47.72
No. of Towns	159	520			
No. of Villages	1,364	1,018			

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*

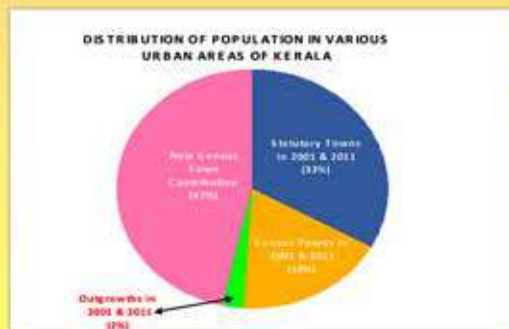
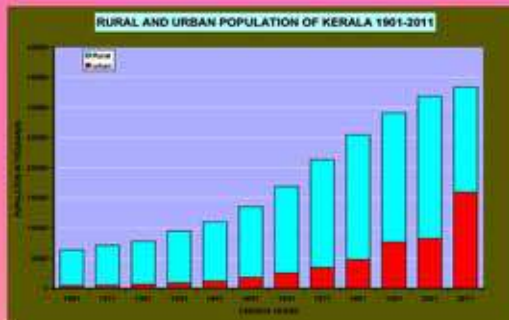
Out Growth (OG): Out Growth should be a viable unit such as a village or part of a village contiguous to a statutory town and possess the urban features in terms of infrastructure and amenities such as pucca roads, electricity, taps, drainage system, education institutions, post offices, medical facilities, 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.



सत्यमेव जयते

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.



2011

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.

Alappuzha has a tropical humid climate with an oppressive summer and plentiful seasonal rainfall. Coastal area has humid climate while there is a moderate climate in its interior. District experiences South-West monsoon from June to September and North-East monsoon from October to November. Generally March, April months are hottest and December, January months are coldest. Temperature decreases by the end of May and district gets benefit of rainfall during South-West, North-East monsoon seasons. Alappuzha receives an average of 2965.4 mm as the normal rainfall. Maximum temperature ranges from 28.8^o c to 32.7^oc whereas minimum from 25.5^oc to 22.6^oc. The average annual maximum temperature is 30.7^oc and average annual minimum temperature is 23.9^oc. Humidity is higher during the monsoon period. All through the year humidity is high during the morning hours.

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
Alappuzha	227.5	477.3	-52
Kerala	218.9	379.7	-42

South West Monsoon Rainfall (June to September)			
District/State	Actual Rainfall (mm)	Normal Rainfall (mm)	Percentage departure
Alappuzha	2113.6	1745.9	21
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
Alappuzha	373.1	560.3	-33
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
Alappuzha	271.5	407.1	195.4	151.0	105.2	5.5
Kerala (Average)	362.5	504.1	239.9	188.1	114.4	9.7

2013						
District/State	JAN	FEB	MAR	APR	MAY	JUN
Alappuzha	51.5	88.4	49.8	40.3	137.4	535.8
Kerala (Average)	3.7	39.1	50	50.2	118.6	1041.1

2012-13			
District/State	ACTUAL	NORMAL	DEPARTURE (%)
Alappuzha	2038.9	2840.5	-28.2
Kerala (Average)	2706.4	2936.7	-7.84

Source: Agricultural Statistics, DES

GEOLOGY & GEOMORPHOLOGY

Alappuzha district, situated in the Southwestern part of the Kerala State bounded by the Lakshadweep sea in the west and Ernakulam, Kottayam and Pathanamthitta districts in the north and west and Kollam district in the south. The district is unique for its wide and lengthy coastal plain. The total area of the district is 1414 sq.km. out of which more than 60% constitute the coastal low land and backwater bodies. District can broadly be divided into two provinces.

1. The coastal plain with Quaternary sediments towards the west.
2. The midland terrain with Precambrian basement rocks and Neogene sediments towards the eastern part.

GEOLOGY

Khondalite is the oldest rock of the area and it includes quartzites which occur as lenticular bodies and garnet-biotite-sillimanite gneiss with or without graphite, confined to the south eastern parts. The charnockite group of rocks including acid and intermediate varieties is found in the northeastern parts. Rocks of the migmatite group represented by biotite gneiss (quartzo feldspathic gneiss) are noticed as small bodies along the eastern margin of the district. Near Chengannur, a massive granite body representing the acid intrusive occurs. Hills in the southern and western parts are capped by Tertiary sedimentary rocks (Warkali Formations). The Kuttanad low land covering an area of approximately 100 Sq.km is reported to have plenty of semicarbonised and partly decayed wood trunks, roots, branches, leaves, etc buried under a thin veneer of black carbonaceous clay. This region is locally known as Karipadams because of the yielding of coal like (carbonized wood) material from the paddy field. The other quaternary sediments include strandline/palaeobeach deposit, fluvial deposits, tidal/mudflat deposit and beach deposit.

GEOMORPHOLOGY

A major part of the district represents coastal plain characterised by landforms of marine, fluvial and fluvio marine origin. The widest part of the coastal plain of Kerala is seen in this district, in the stretch between Ambalappuzha-Thiruvalla, Haripad-Chengannur sections where its width is as much as 35 km. The prominent landforms of this area are the palaeo beach ridges, inter tidal flats, delta and flood plain. Backwaters in the forms of lagoons (kayals), canals and distributory systems of the rivers occupy a considerable part of the coastal plain. Vembanad kayal, Karthikappally kayal, Vayalar kayal and Vatta kayal are some of the prominent back water bodies. In addition to this, there is a conspicuous low lying area which is below the sea level (0.5 to 1m below msl) and is always under water logged condition. This is the Kuttanad area south of Vembanad lake. All these water bodies are brackish during summer. The Thanneermukkom barrage across Vembanad lake and the Thottappally spillway help to a certain extent the incursion of sea water during the high tide. The low land region along the mouth of Pamba and Achankovil rivers has helped to develop a well marked distributory system and formation of delta. Eastern part of the district is characterized by small laterite capped hillocks and narrow valleys representing the midland region.

Table: 6.1

GEOLOGY DETAILS
AMBALAPPUZHA BLOCK

(Area in Ha)

Sl. No.	Rock Type	Ambalappuzha North	Ambalappuzha South	Punnapra North	Punnapra South	Purakkad
1	Alkaline rocks					
2	Charnockite group of rocks					
3	Laterite					
4	Migmatite complex					
5	Sand and silt	836.65	1519.77	822.22	1501.8	2240.76
6	Sandstone and clay with lignite interc					
7	Tank/WB/River					
	Panchayat Total	836.65	1519.77	822.22	1501.8	2240.76
	Block Total	6921.20				

Table: 6.2

KANJIKKUZHI BLOCK

(Area in Ha)

Sl. No.	Rock Type	Cherthala South	Kadakkappalli	Kanjikkuzhi	Mararikulam North	Thanneermukkam
1	Alkaline rocks					
2	Charnockite group of rocks					
3	Laterite					
4	Migmatite complex					
5	Sand and silt	1964.62	946.76	1263.61	1770.06	2421.00
6	Sandstone and clay with lignite interc					
7	Tank/WB/River					1265.02
	Panchayat Total	1964.62	946.76	1263.61	1770.06	3686.02
	Block Total	9631.07				

Table: 6.3

MAVELIKKARA BLOCK

(Area in Ha)

Sl.No.	Rock Type	Chennithala - Thripperrunthura	Chettikku langara	Mannar	Mavelikkara - Thekkekkara	Thazhakkara
1	Alkaline rocks					
2	Charnockite group of rocks					
3	Laterite					
4	Migmatite complex					
5	Sand and silt	2186.68	2171.78	1017.27	1258.52	492.68
6	Sandstone and clay with lignite interc				1050.38	1539.40
7	Tank/WB/River					
	Panchayat Total	2186.68	2171.78	1017.27	2308.90	2032.08
	Block Total	9716.71				

Table:6.4

THAIKKATTUSSERI BLOCK

(Area in Ha)

Sl.No.	Rock Type	Arukkutti	Chennam Pallippuram	Panavalli	Perumbalam	Thaikkattusseri
1	Alkaline rocks					
2	Charnockite group of rocks					
3	Laterite					
4	Migmatite complex					
5	Sand and silt	761.77	1603.97	1354.76	557.09	1238.40
6	Sandstone and clay with lignite interc					
7	Tank/WB/River	549.37	1073.00	586.34	869.05	133.33
	Panchayat Total	1311.14	2676.97	1941.10	1426.14	1371.73
	Block Total	8727.06				

Table:6.5

BHARANIKAVU BLOCK

(Area in Ha)

Sl. No.	Rock Type	Bharanikavu	Chunakkara	Mavelikkara - Thamarakulam	Nooranadu	Palamel	Vallikkunnam
1	Alkaline rocks						
2	Charnockite group of rocks						
3	Laterite						
4	Migmatite complex			0.51	838.53	2115.42	
5	Sand and silt	1736.07	438.36	527.32	161.33	45.72	843.23
6	Sandstone and clay with lignite interc	806.77	1392.77	1415.86	1001.75	509.28	1300.28
7	Tank/WB/River						
	Panchayat Total	2542.84	1831.13	1943.69	2001.61	2670.42	2143.51
	Block Total	13133.20					

Table:6.6

CHAMPAKULAM BLOCK

(Area in Ha)

Sl. No.	Rock Type	Champakulam	Edathwa	Kainakari	Nedumudi	Thakazhi	Thalavadi
1	Alkaline rocks						
2	Charnockite group of rocks						
3	Laterite						
4	Migmatite complex						
5	Sand and silt	2291.72	1765.36	4782.17	2099.58	2526.73	1596.22
6	Sandstone and clay with lignite interc						
7	Tank/WB/River			668.07			
	Panchayat Total	2291.72	1765.36	5450.24	2099.58	2526.73	1596.22
	Block Total	15729.85					

Table:6.7

VELIYANAD BLOCK

(Area in Ha)

Sl. No.	Rock Type	Kavalam	Muttar	Neelamperoor	Pulinkunnu	Ramankari	Veliyanad
1	Alkaline rocks						
2	Charnockite group of rocks						
3	Laterite						
4	Migmatite complex						
5	Sand and silt	2006.20	1063.62	2438.25	2849.27	2403.50	3184.54
6	Sandstone and clay with lignite interc						
7	Tank/WB/River	734.04			158.48		4.39
	Panchayat Total	2740.24	1063.62	2438.25	3007.75	2403.50	3188.93
	Block Total	14842.29					

Table:6.8

ARYADU BLOCK

(Area in Ha)

Sl. No.	Rock Type	Aryadu	Mannancheri	Mararikulam South	Muhamma
1	Alkaline rocks				
2	Charnockite group of rocks				
3	Laterite				
4	Migmatite complex				
5	Sand and silt	548.40	2078.47	1882.31	1110.46
6	Sandstone and clay with lignite interc				
7	Tank/WB/River	853.08	1896.26		1598.24
	Panchayat Total	1401.48	3974.73	1882.31	2708.70
	Block Total	9967.22			

Table:6.9

CHENGANNUR BLOCK

(Area in Ha)

Sl. No.	Rock Type	Ala	Budhanoor	Cheriyyanadu	Mulakuzha	Pandanadu	Puliyur	Thiruvan vandoor	Venmoni
1	Alkaline rocks				8.08	92.43	128.07	148.89	
2	Charnockite group of rocks	741.02			2203		86.6		733.17
3	Laterite							2.04	
4	Migmatite complex								483.52
5	Sand and silt	462.88	2148.72	1298.18		998.82	943.81	695.12	270.85
6	Sandstone and clay with lignite interc			108.46					412.75
7	Tank/WB/River								
	Panchayat Total	1203.90	2148.72	1406.64	2211.08	1091.25	1158.48	846.05	1900.29
	Block Total	11966.41							

Table:6.10

HARIPAD BLOCK

(Area in Ha)

Sl. No.	Rock Type	Cheruthana	Haripad	Karthikappalli	Karuvatta	Kumarapuram	Pallippadu	Thrikkunna ppuzha	Veeyapuram
1	Alkaline rocks								
2	Charnockite group of rocks								
3	Laterite								
4	Migmatite complex								
5	Sand and silt	1435.55	981.20	841.19	1405.15	1473.4	1758.16	1055.84	1379.00
6	Sandstone and clay with lignite interc								
7	Tank/WB/River								
	Panchayat Total	1435.55	981.20	841.19	1405.15	1473.40	1758.16	1055.84	1379.00
	Block Total	10329.46							

Table:6.11

MUTHUKULAM BLOCK

(Area in Ha)

Sl. No.	Rock Type	Arattupuzha	Cheppad	Chingoli	Devikulangara	Kandallur	Krishnapuram	Muthukulam	Pathiyur
1	Alkaline rocks								
2	Charnockite group of rocks								
3	Laterite								
4	Migmatite complex								
5	Sand and silt	2268.90	1290.82	692.12	1509.69	1078.09	1330.03	1269.34	1506.94
6	Sandstone and clay with lignite interc								
7	Tank/WB/River								
	Panchayat Total	2268.90	1290.82	692.12	1509.69	1078.09	1330.03	1269.34	1506.94
	Block Total	10945.93							

Table:6.12

PATTANAKAD BLOCK

(Area in Ha)

Sl. No.	Rock Type	Aroor	Ezhupunna	Kodam thuruthu	Kuthiyathodu	Pattanakad	Thuravoor	Vayalar
1	Alkaline rocks							
2	Charnockite group of rocks							
3	Laterite							
4	Migmatite complex							
5	Sand and silt	1243.42	1504.09	1210.09	961.69	1549.19	1847.62	1446.27
6	Sandstone and clay with lignite interc							
7	Tank/WB/River	169.47						
	Panchayat Total	1412.89	1504.09	1210.09	961.69	1549.19	1847.62	1446.27
	Block Total	9931.84						

Table: 6.13

MUNICIPALITY

(Area in Ha)

Sl. No.	Rock Type	Alappuzha Municipality	Chengannur Municipality	Cherthala Municipality	Kayamkulam Municipality	Mavelikkara Municipality
1	Alkaline rocks		1357.68			
2	Charnockite group of rocks		140.21			
3	Laterite					
4	Migmatite complex					
5	Sand and silt	3452.38		1216.41	1788.88	882.48
6	Sandstone and clay with lignite interc					221.66
7	Tank/WB/River	190.91		9.46		
	Municipality Total	3643.29	1497.89	1225.87	1788.88	1104.14

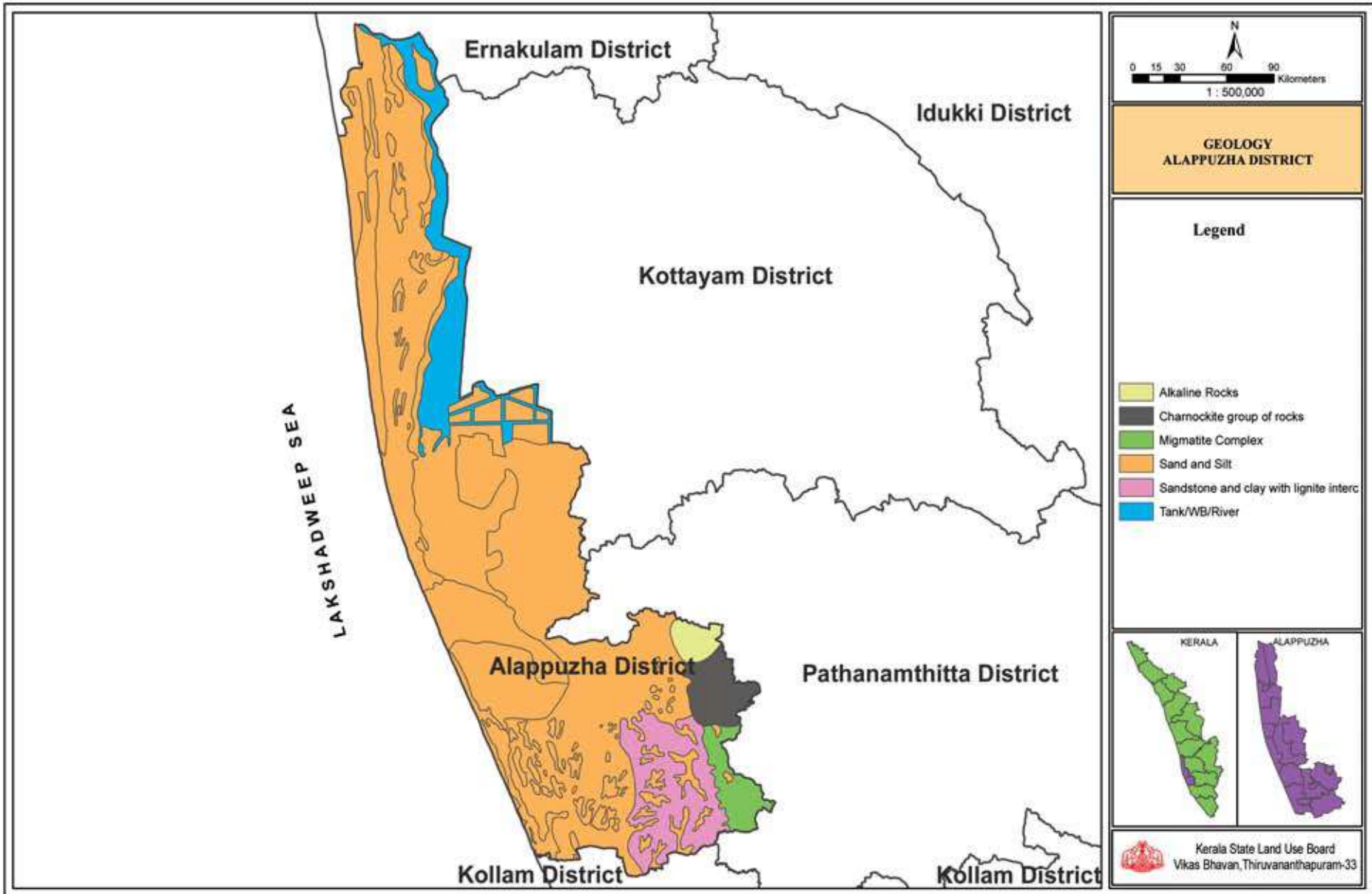


Table: 6.3

MAVELIKKARA BLOCK

(Area in Ha)

Sl.No.	Rock Type	Chennithala - Thripperrunthura	Chettikku langara	Mannar	Mavelikkara - Thekkekkara	Thazhakkara
1	Alkaline rocks					
2	Charnockite group of rocks					
3	Laterite					
4	Migmatite complex					
5	Sand and silt	2186.68	2171.78	1017.27	1258.52	492.68
6	Sandstone and clay with lignite interc				1050.38	1539.40
7	Tank/WB/River					
	Panchayat Total	2186.68	2171.78	1017.27	2308.90	2032.08
	Block Total	9716.71				

Table:6.4

THAIKKATTUSSERI BLOCK

(Area in Ha)

Sl.No.	Rock Type	Arukkutti	Chennam Pallippuram	Panavalli	Perumbalam	Thaikkattusseri
1	Alkaline rocks					
2	Charnockite group of rocks					
3	Laterite					
4	Migmatite complex					
5	Sand and silt	761.77	1603.97	1354.76	557.09	1238.40
6	Sandstone and clay with lignite interc					
7	Tank/WB/River	549.37	1073.00	586.34	869.05	133.33
	Panchayat Total	1311.14	2676.97	1941.10	1426.14	1371.73
	Block Total	8727.06				

Table: 6.14

GEOMORPHOLOGY DETAILS**AMBALAPPUZHA BLOCK**

(Area in Ha)

Sl. No.	Rock Type	Ambalappuzha North	Ambalappuzha South	Punnapra North	Punnapra South	Purakkad
1	Alluvial Plain	490.07	914.05	242.17	609.19	1546.14
2	Beach (Coastal Plain)	0.01	0.00	0.02	0.00	0.38
3	Coastal Plain	327.06	571.53	533.93	800.14	534.55
4	Lower Plateau (Lateritic) - Dissected					
5	Marshy					0.50
6	Mud Flat (Coastal Plain)					
7	Point Bar (Flood Plain)					
8	Residual Mount					
9	Swale (Coastal Plain)	2.00		28.43	42.24	
10	Valley					
11	Valley Fill					
12	Water Body	17.51	34.19	17.66	50.23	159.19
	Panchayat Total	836.65	1519.77	822.21	1501.80	2240.76
	Block Total	6921.19				

Table: 6.15

ARYADU BLOCK

(Area in Ha)

Sl. No.	Rock Type	Aryadu	Mannancheri	Mararikulam South	Muhamma
1	Alluvial Plain	146.43			
2	Beach (Coastal Plain)			0.02	
3	Coastal Plain	408.51	1863.45	1723.09	1177.00
4	Lower Plateau (Lateritic) - Dissected				
5	Marshy				
6	Mud Flat (Coastal Plain)		79.23		13.05
7	Point Bar (Flood Plain)				
8	Residual Mount				
9	Swale (Coastal Plain)	21.21	133.18	144.75	50.20
10	Valley				
11	Valley Fill				
12	Water Body	825.33	1898.87	14.45	1468.45
	Panchayat Total	1401.48	3974.73	1882.31	2708.70
	Block Total	9967.22			

Table: 6.16

BHARANIKAVU BLOCK

(Area in Ha)

Sl. No.	Rock Type	Bharanikavu	Chunakkara	Mavelikkara - Thamarakulam	Nooranadu	Palamel	Vallikkunnam
1	Alluvial Plain						
2	Beach (Coastal Plain)						
3	Coastal Plain	1248.79		1.63			673.18
4	Lower Plateau (Lateritic) - Dissected	483.29	1272.28	1393.57	1336.23	2040.88	902.78
5	Marshy						
6	Mud Flat (Coastal Plain)	645.09	381.65	511.25		76.16	513.29
7	Point Bar (Flood Plain)						
8	Residual Mount				71.97	65.59	
9	Swale (Coastal Plain)	165.66					38.12
10	Valley						
11	Valley Fill		177.20	37.24	539.99	421.43	
12	Water Body				53.42	66.35	16.13
	Panchayat Total	2542.83	1831.13	1943.69	2001.61	2670.41	2143.50
	Block Total	13133.17					

Table: 6.17

CHAMPAKULAM BLOCK

(Area in Ha)

Sl. No.	Rock Type	Champakulam	Edathwa	Kainakari	Nedumudi	Thakazhi	Thalavadi
1	Alluvial Plain	1809.03	1216.11	4357.54	1500.05	1965.93	1110.82
2	Beach (Coastal Plain)						392.08
3	Coastal Plain	320.80	398.47	114.60	396.58	341.30	
4	Lower Plateau (Lateritic) - Dissected						
5	Marshy						
6	Mud Flat (Coastal Plain)						
7	Point Bar (Flood Plain)						
8	Residual Mount						
9	Swale (Coastal Plain)						
10	Valley						
11	Valley Fill						
12	Water Body	161.88	150.78	978.09	202.95	219.50	93.32
	Panchayat Total	2291.71	1765.36	5450.23	2099.58	2526.73	1596.22
	Block Total	15729.83					

Table: 6.18

CHENGANNUR BLOCK

(Area in Ha)

Sl. No.	Rock Type	Ala	Budhanoor	Cheriyannadu	Mulakuzha	Pandanadu	Puliyur	Thiruvannamkudi	Venmani
1	Alluvial Plain					260.69		793.27	
2	Beach (Coastal Plain)					525.41			
3	Coastal Plain	119.89	1932.94	891.31			390.85	1.46	219.51
4	Lower Plateau (Lateritic) - Dissected	762.50	8.36	2.18	1783.77		505.43	24.12	957.70
5	Marshy								
6	Mud Flat (Coastal Plain)	57.92	109.05	376.00		213.91	234.92		347.29
7	Point Bar (Flood Plain)		4.72	3.33			0.14		
8	Residual Mount	22.21			191.46		0.94		14.27
9	Swale (Coastal Plain)								
10	Valley				58.97				43.20
11	Valley Fill	241.37	0.23	99.24	174.43		12.34		222.92
12	Water Body		93.43	34.58	2.46	91.24	13.87	27.21	95.41
	Panchayat Total	1203.89	2148.73	1406.64	2211.09	1091.25	1158.49	846.06	1900.30
	Block Total	11966.45							

Table: 6.19

HARIPAD BLOCK

(Area in Ha)

Sl. No.	Rock Type	Cheruthana	Haripad	Karthika ppalli	Karuvatta	Kumara puram	Pallippadu	Thrikkunna ppuzha	Veeyapuram
1	Alluvial Plain	980.36	475.81		874.30	278.43	935.16		864.74
2	Beach (Coastal Plain)							0.02	
3	Coastal Plain	334.83	477.37	603.90	490.73	1091.33	741.43	852.72	360.98
4	Lower Plateau (Lateritic) - Dissected								
5	Marshy							90.72	
6	Mud Flat (Coastal Plain)		15.86	178.19		84.50	41.88	21.62	
7	Point Bar (Flood Plain)								
8	Residual Mount								
9	Swale (Coastal Plain)								
10	Valley								
11	Valley Fill								
12	Water Body	120.36	12.16	59.09	40.12	19.14	39.69	91.76	153.25
	Panchayat Total	1435.55	981.20	841.18	1405.15	1473.40	1758.16	1056.84	1378.97
	Block Total	10330.45							

Table: 6.20

KANJIKKUZHI BLOCK

(Area in Ha)

Sl. No.	Rock Type	Cherthala South	Kadakkarappalli	Kanjikkuzhi	Mararikulam North	Thanneer mukkam
1	Alluvial Plain					
2	Beach (Coastal Plain)	0.02			0.01	
3	Coastal Plain	1704.86	839.41	1122.86	1575.73	2328.30
4	Lower Plateau (Lateritic) - Dissected					
5	Marshy					
6	Mud Flat (Coastal Plain)		29.67			
7	Point Bar (Flood Plain)					
8	Residual Mount					
9	Swale (Coastal Plain)	241.33	28.23	134.75	180.68	237.63
10	Valley					
11	Valley Fill					
12	Water Body	18.41	49.45	6.00	13.64	1120.09
	Panchayat Total	1964.62	946.76	1263.61	1770.06	3686.02
	Block Total	9631.07				

Table: 6.21

MAVELIKKARA BLOCK

(Area in Ha)

Sl. No.	Rock Type	Chennithala - Thrippерunthura	Chettikkulangara	Mannar	Mavelikkara - Thekkekkara	Thazhakkara
1	Alluvial Plain	980.34	284.58	500.04		
2	Beach (Coastal Plain)					
3	Coastal Plain	1100.63	1440.30	481.87	745.85	
4	Lower Plateau (Lateritic) - Dissected	2.32			884.55	1620.10
5	Marshy					
6	Mud Flat (Coastal Plain)				432.60	62.26
7	Point Bar (Flood Plain)					0.19
8	Residual Mount					
9	Swale (Coastal Plain)		418.06		236.36	
10	Valley					
11	Valley Fill				9.54	346.70
12	Water Body	103.38	28.84	35.36		2.84
	Panchayat Total	2186.67	2171.78	1017.27	2308.90	2032.09
	Block Total	9716.71				

Table: 6.22

MUTHUKULAM BLOCK

(Area in Ha)

Sl. No.	Rock Type	Arattupuzha	Cheppad	Chingoli	Devi kulangara	Kandallur	Krishna puram	Muthukulam	Pathiyur
1	Alluvial Plain		312.12						178.52
2	Beach (Coastal Plain)								
3	Coastal Plain	751.32	639.55	442.27	801.07	609.35	967.74	771.51	961.42
4	Lower Plateau (Lateritic) - Dissected								
5	Marshy								
6	Mud Flat (Coastal Plain)	174.40	192.18	200.90	100.43	250.86	203.26	186.58	14.72
7	Point Bar (Flood Plain)								
8	Residual Mount								
9	Swale (Coastal Plain)	2.38	140.44	48.95	181.98	150.81	153.02	311.25	344.1
10	Valley			0.01					
11	Valley Fill								
12	Water Body	1340.79	6.52		426.21	67.07	6.01		8.18
	Panchayat Total	2268.89	1290.81	692.13	1509.69	1078.09	1330.03	1269.34	1506.94
	Block Total	10945.92							

Table: 6.23

PATTANAKAD BLOCK

(Area in Ha)

SI. No.	Rock Type	Aroor	Ezhupunna	Kodam thuruthu	Kuthiyathodu	Pattanakad	Thuravoor	Vayalar
1	Alluvial Plain							
2	Beach (Coastal Plain)				0.01	0.01		
3	Coastal Plain	821.02	808.22	578.48	634.51	1058.39	927.96	1036.84
4	Lower Plateau (Lateritic) - Dissected							
5	Marshy							
6	Mud Flat (Coastal Plain)	195.02	400.52	429.72	243.30	355.06	629.68	135.58
7	Point Bar (Flood Plain)							
8	Residual Mount							
9	Swale (Coastal Plain)		8.02	21.48	27.00	45.86	84.64	2.96
10	Valley							
11	Valley Fill							
12	Water Body	396.86	287.32	180.41	56.88	89.86	205.34	270.88
	Panchayat Total	1412.90	1504.08	1210.09	961.70	1549.18	1847.62	1446.26
	Block Total	9931.83						

Table: 6.24

THAIKATTUSSERI BLOCK

(Area in Ha)

Sl. No.	Rock Type	Arukkutti	Chennam Pallippuram	Panavalli	Perumbalam	Thaikkattusseri
1	Alluvial Plain					
2	Beach (Coastal Plain)					
3	Coastal Plain	541.50	1343.67	1022.41	461.19	806.86
4	Lower Plateau (Lateritic) - Dissected					
5	Marshy					
6	Mud Flat (Coastal Plain)	129.17	26.76	317.25	77.77	178.01
7	Point Bar (Flood Plain)					
8	Residual Mount					
9	Swale (Coastal Plain)		137.10	16.96	43.88	135.36
10	Valley					
11	Valley Fill					
12	Water Body	640.47	1169.43	584.47	843.30	251.49
	Panchayat Total	1311.14	2676.96	1941.09	1426.14	1371.72
	Block Total	8727.05				

Table: 6.25

VELIYANAD BLOCK

(Area in Ha)

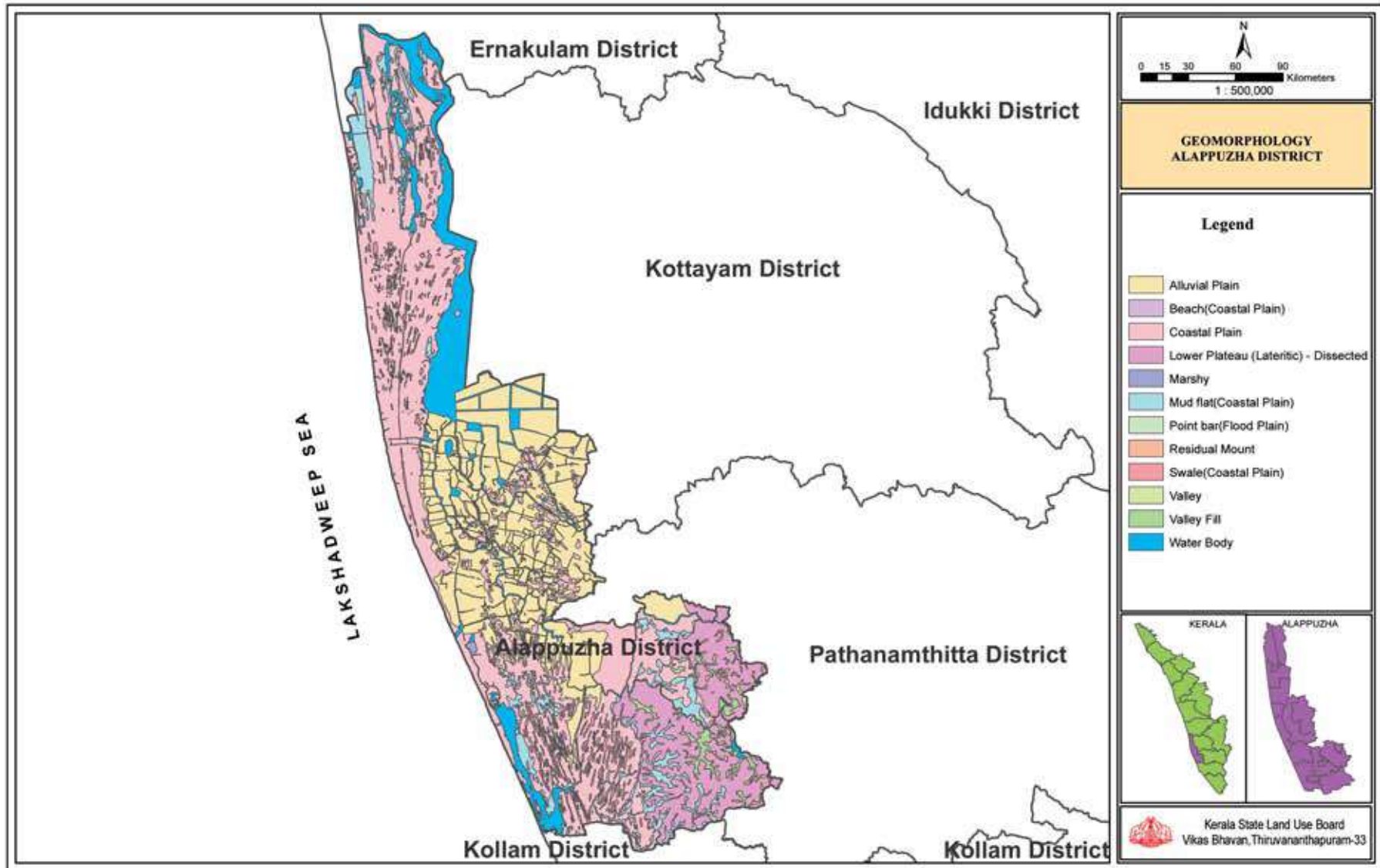
Sl. No.	Rock Type	Kavalam	Muttar	Neelamperoor	Pulinkunnu	Ramankari	Veliyanad
1	Alluvial Plain	2266.30	824.90	2055.87	2291.33	1883.98	2300.23
2	Beach (Coastal Plain)						
3	Coastal Plain	2.57	176.94	216.29	369.94	346.50	705.52
4	Lower Plateau (Lateritic) - Dissected					0.12	
5	Marshy						
6	Mud Flat (Coastal Plain)						
7	Point Bar (Flood Plain)						
8	Residual Mount						
9	Swale (Coastal Plain)						
10	Valley						
11	Valley Fill						
12	Water Body	471.36	61.79	166.09	346.48	172.90	183.17
	Panchayat Total	2740.23	1063.63	2438.25	3007.75	2403.50	3188.92
	Block Total	14842.28					

Table: 6.26

MUNICIPALITY

(Area in Ha)

Sl. No.	Rock Type	Alappuzha Municipality	Chengannur Municipality	Cherthala Municipality	Kayamkulam Municipality	Mavelikkara Municipality
1	Alluvial Plain	842.47	1.90		19.54	
2	Beach (Coastal Plain)	0.07				
3	Coastal Plain	2529.90	157.57	1106.30	1341.00	153.79
4	Lower Plateau (Lateritic) - Dissected		1192.99			807.34
5	Marshy					
6	Mud Flat (Coastal Plain)		25.16		163.94	72.16
7	Point Bar (Flood Plain)		3.20			0.01
8	Residual Mount		28.29			
9	Swale (Coastal Plain)	82.03		91.32	227.16	
10	Valley					
11	Valley Fill		19.30			54.08
12	Water Body	188.82	69.49	28.24	37.24	16.76
	Municipality Total	3643.29	1497.90	1225.86	1788.88	1104.14



PHYSIOGRAPHY

Based on physiographic nature, Kerala is divided into three regions namely **highland**, **midland** and **lowland**. Alappuzha district falls under three sub micro regions viz. Alleppey coast, Kuttanad low lying plain and Chengannur rolling plain. Alleppey coast region falls all along the coast of the district comprising the whole of Cherthala taluk and part of Ambalappuzha, Karthikappally and Mavelikkara taluks. It is a low lying land having marshy areas in some places. Regarding the relief feature of this region, the height of the land is very low even below the sea level in some areas, besides some portion being marshy lands maximum height is recorded at Vallikkunnam village of Mavelikkara taluk (18m). Vegetation also covers this area. Second region Kuttanad low lying plain is a special striking feature of Kerala. This region comprises of the whole of Kuttanad taluk and parts of Ambalappuzha, Chengannur, Mavelikkara and Karthikappally taluks. This region is a basin between the coast and its eastern plain. In many places the height is lower than the sea level. Here maximum height (6m) is recorded at Kunnamangalam village of Mavelikkara taluk. It is the typical example of kole lands and it is highly influenced by the Vembanad lake. Paddy and coconut are the important crops of this region. The main mode of transportation is inland water transport. Chengannur rolling plain region falls in the eastern portion of Alappuzha district comprising parts of Thiruvalla, Mavelikkara and Chengannur taluks. This region is also a plain region having the average height between 80 and 90m. The maximum height of this region (157m) falls in Thottappuzhassery village of Thiruvalla taluk and the minimum height (50m) falls in Kulanada village of Kozhancherry taluk. This region slopes gently towards the west. Coconut is widely cultivated in this region besides sugarcane on the banks of rivers.

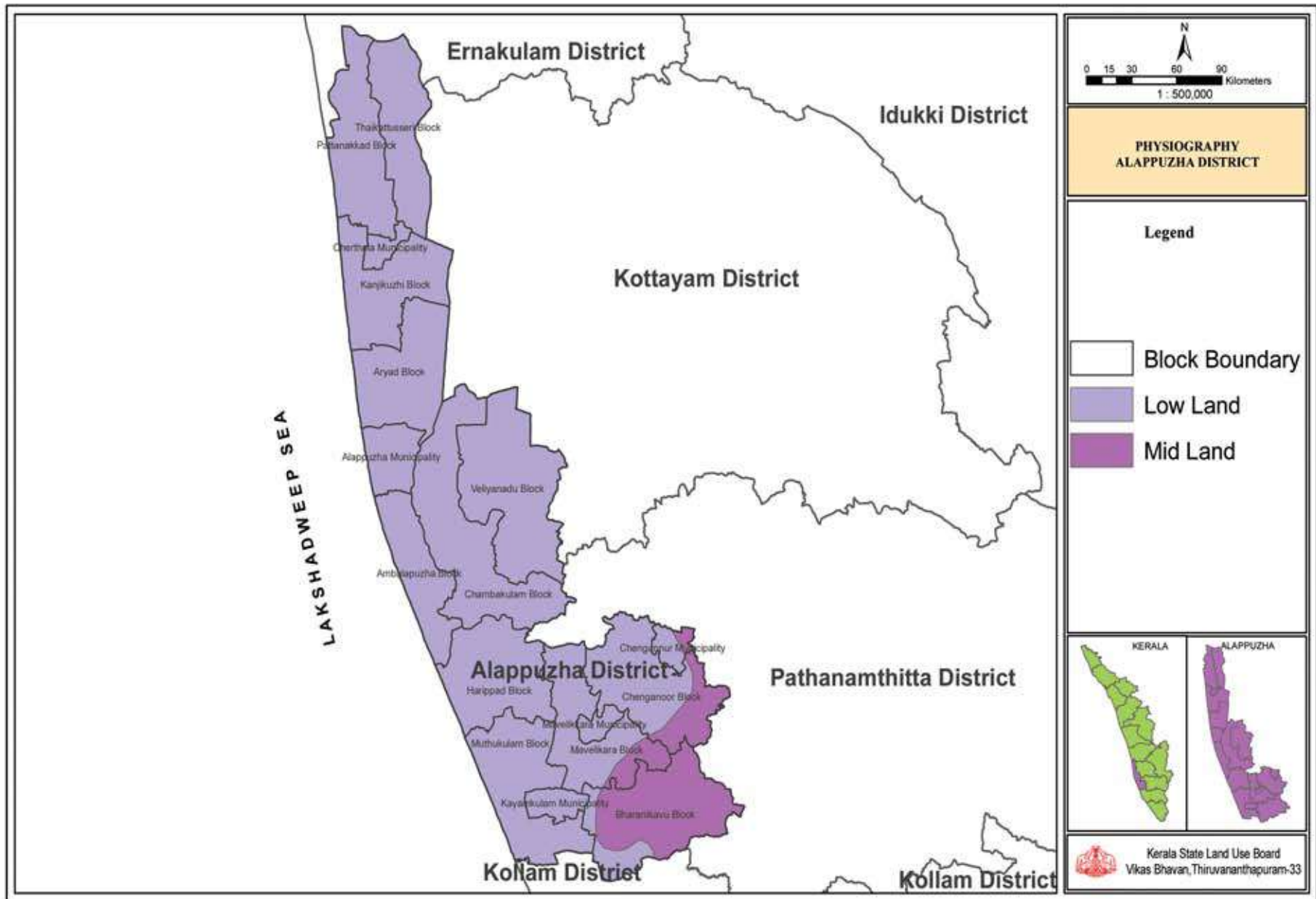
Table: 7.1

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

(Area in ha)				
Sl.No.	Taluks/Villages	Low land	Mid land	High land
Cherthala Taluk				
1	Aroor	2922	-	-
2	Madathilbhagam	2747	-	-
3	Panavalli	1955	-	-
4	Thaikkattusseri	1382	-	-
5	Thuravoor North	2061	-	-
6	Thuravoor South	1918	-	-
7	Vayalar West	2429	-	-
8	Vayalar East (P)	1444	-	-
9	Pallippuram	2553	-	-
10	Kokkothamangalam (P)	1129	-	-
11	Cherthala North (P)	564	-	-
12	Cherthala South (P)	1270	-	-
13	Thanneermukkam North (P)	2391	-	-
14	Thanneermukkam South	2676	-	-
15	Kanjikkuzhi	1286	-	-
16	Mararikulam North	1697	-	-
17	Cherthala (M)	1619	-	-
	Total	32043	-	-
Ambalappuzha Taluk				
1	Maraikulam South	1863	-	-
2	Aryadu North	3750	-	-
3	Pathirappalli	591	-	-
4	Alappuzha (P)	17	-	-
5	Punnapra	2308	-	-
6	Ambalappuzha	2357	-	-
7	Purakkad	2319	-	-
8	Alappuzha Town	4677	-	-
	Total	17882	-	-

Sl.No.	Taluks/Villages	Low land	Mid land	High land
Kuttanad Taluk				
1	Kainakari	4218	-	-
2	Pulinkunnu	2869	-	-
3	Chennamkari	3259	-	-
4	Neelamperoor	990	-	-
5	Veliyanad	1941	-	-
6	Ramankari	1135	-	-
7	Champakkulam	2297	-	-
8	Nedumudi	2022	-	-
9	Thakazhi	2527	-	-
10	Kozhimukku	2711	-	-
11	Muttar	1048	-	-
12	Thalavadi	1576	-	-
	Total	26593	-	-
Chengannur Taluk				
1	Vadakkekkara (P)	-	108	-
2	Mulakuzha	-	2264	-
3	Venmoni	-	1802	-
4	Chengannur (M)	-	1300	-
5	Kurattissery	962	-	-
6	Mannar	793	-	-
7	Chengannur	1292	-	-
8	Pandanadu	1041	-	-
9	Ala	1065	-	-
10	Thiruvanvandoor	901	-	-
11	Puliyur	1168	-	-
12	Cheriyyanadu	1424	-	-
	Total	8646	5474	-
Mavelikkara Taluk				
1	Thrippperumthura	1623	-	-
2	Chennithala (P)	603	-	-
3	Kannamangalam (P)	1261	-	-
4	Peringala	783	-	-
5	Mavelikkara Town	1265	-	-
6	Thekkekkara (P)	-	1982	-
7	Thazhakkara (P)	-	2526	-
8	Nooranadu	-	2128	-

Sl.No.	Taluks/Villages	Low land	Mid land	High land
9	Chunakkara	-	1732	-
10	Bharanikkavu	-	2347	-
11	Vallikkunnam	-	2136	-
12	Thamarakulam	-	2088	-
13	Palamel	-	2560	-
14	Thonnallur	-	3029	-
15	Pandalam South	-	2536	-
	Total	5535	23064	-
Karthikappalli Taluk				
1	Karuvatta	1440	-	-
2	Cheruthana	1425	-	-
3	Veeyapuram	1402	-	-
4	Haripad	956	-	-
5	Kumarapuram	1439	-	-
6	Thrikkunnappuzha	1253	-	-
7	Karthikappalli	873	-	-
8	Pallipadu	1693	-	-
9	Chingoli	724	-	-
10	Arattupuzha	2280	-	-
11	Muthukulam	1158	-	-
12	Cheppad	1267	-	-
13	Pathiyur (P)	1108	-	-
14	Keerikad (P)	520	-	-
15	Kandallur	974	-	-
16	Puthuppalli (P)	829	-	-
17	Kayamkulam (P)	942	-	-
18	Kayamkulam (M)	2179	-	-
	Total	22462	-	-



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.

Alappuzha district covers sandy, peaty, alluvial and laterite soil. Sandy soil covers the western parts of Cherthala, Ambalappuzha, Karthikappally and Mavelikkara taluks. The peaty or kari soils are occurring in small belt of the eastern region of Cherthala and Ambalappuzha taluks and the western region of Kuttanad taluk. Major portion of Chengannur and Mavelikkara taluks are covered by laterite soil and the alluvial soil is occurred in Karthikappally, Chengannur and Mavelikkara taluks.

Table: 8.1

SOILS IN ALAPPUZHA DISTRICT

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: Associated with very deep, moderately well drained, sandy soils.	Mixed, Aquic Ustipsamments Mixed Typic Ustipsamments	Fine-loamy, Mixed, Typic Dystropepts 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: Associated with very deep, moderately well drained, sandy soils with moderately shallow water table.	Mixed, Typic Ustipsamments Mixed, Aquic Ustipsamments	Coarse-loamy, Mixed Aquic Ustorthents Fine, Mixed Aeric Trophaquepts
K04	Very deep, very poorly drained, clayey soils with shallow water table on level submerged lands, swamps and marshes; Associated with very deep, very poorly drained sulphide-rich, saline, clayey soils with very shallow water table.	Fine, Mixed Typic trophaquepts Fine, Mixed Typic Sulfaquents	Fine-loamy, Mixed, Typic Sulfaquents Mixed Aquic Ustipsamments
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 Aeric Trophaquepts	Fine, Mixed Typic Trophaquepts Fine-loamy, Mixed Ustic Kanhaplohumults

K06	Very deep, moderately well drained, loamy soils with moderately deep water table on very gently sloping reclaimed lands, with slight erosion:	Fine-loamy over sandy, mixed fluventic Dystropepts	Fine-loamy, mixed Typic Dystropepts
	Associated with very deep, poorly drained, loamy soils with moderately shallow water table.	Fine-loamy mixed Typic Tropaquepts	Clayey over sandy, mixed, fluventic Dystropepts
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 Dystropepts
	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 Dystropepts	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 Ustropepts
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

K12	Very deep, well drained, gravelly clay soils with moderate surface gravelliness on gently sloping midland laterite with valleys on Southern Kerala, with moderate erosion:	Clayey-skeletal, Kaolinitic, Ustic-Kanhaplohumults	Fine-loamy, Mixed Aquic Ustifluvents
	Associated with very deep, well drained, clayey soils.	Clayey, Kaolinitic, Typic Kandiuults	Clayey-skeletal, Kaolinitic, Typic Kanhaplustults

Soils of the Lowland
Soils of the Midland

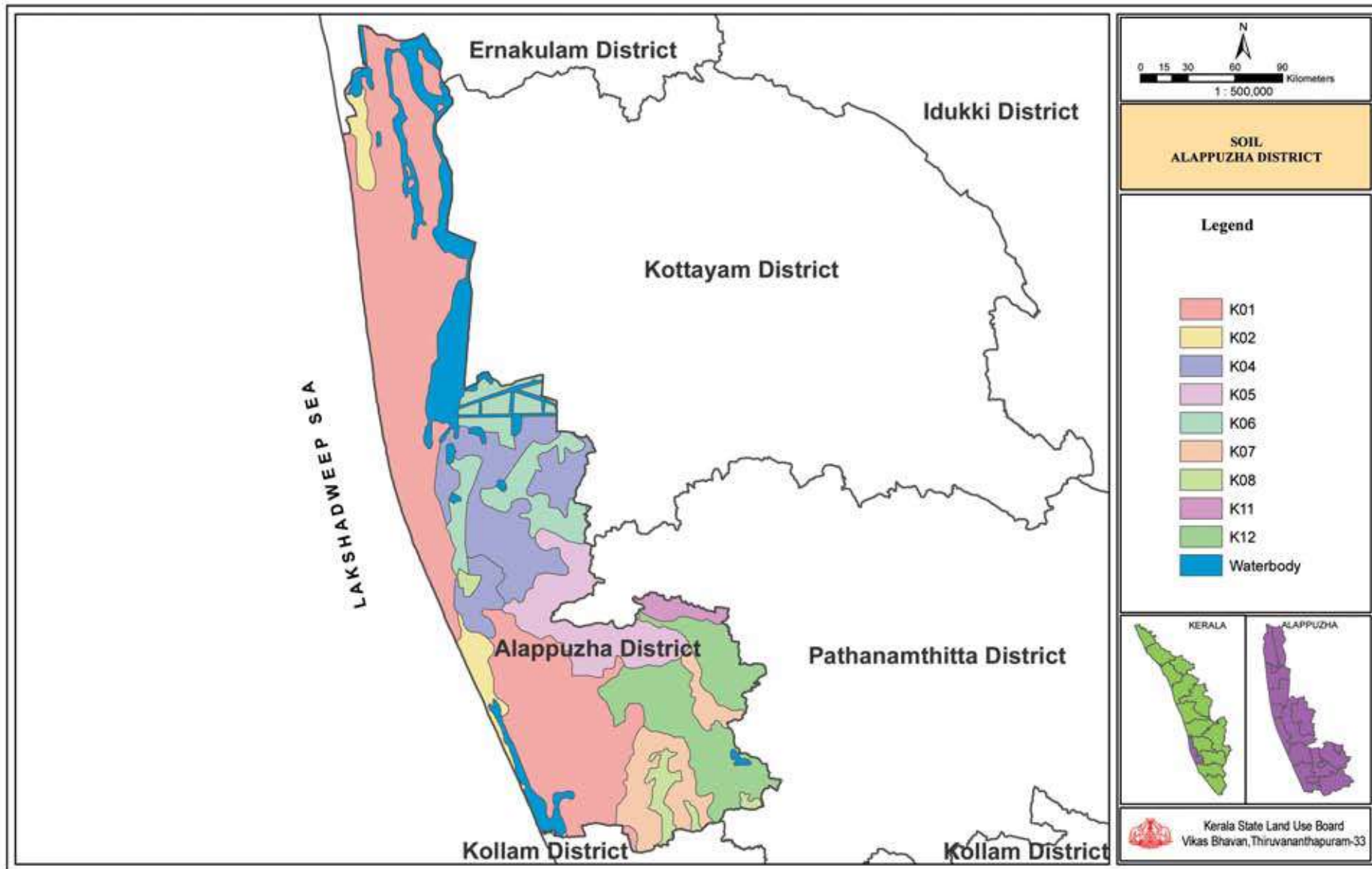
- K01, K02, K04, K05, K06, K07
- K08, K11, K12

Table: 8.2

LEGEND FOR THE SOIL MAP OF ALAPPUZHA DISTRICT

SI.No.	Map Symbol	Depth	Texture	Slope	Drainage
1	K01	vd	s	vg	mw
2	K02	vd	s	vg	e
3	K04	vd	c	vg	vp
4	K05	vd	c	vg	i
5	K06	vd	l	vg	mw
6	K07	vd	gc	g	w
7	K08	vd	c	vg	mw
8	K11	vd	gc	g	w
9	K12	vd	gc	g	w

Depth		
1	vd	very deep
Slope		
1	g	gentle
2	vg	very gentle
Texture		
1	s	sandy
2	gc	gravelly clay
3	c	clay
4	l	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 Manimala, Pamba and Achankovil.

Manimala River

Manimala river originates from Mothavana hills in Kottayam district and enters the district at Thalavadi village in Kuttanad taluk while it passes through Edathwa and Champakulam villages and joins the Pamba river at Muttar.

Pamba River

Pamba which is the third longest river in Kerala State is formed by several streams originating from Peerumade Plateau and nearby region. The main tributaries of the rivers are Pambayar, Kakkiar, Arudaiar, Kakkadar and Kallar.

The river enters the district at Chengannur and flows through Pandanad, Veeyapuram, Thakazhy and Champakulam. At Pandanad, it flows in a South Westery direction upto Muttar where Manimala river joins it. The other branch flows around Parumala and a branch of the Achankovil river joins it. It empties into the Vembanad lake through several branches such as Pallathuruthi Ar, Nedumudi Ar and Muttar.

Achankovil River

Achankovil river originates from Pasukidamettu, Ramakkaltheri and Rishimalai of Kollam district and enters the district at Venmoni. This river is often known as Kulakkada river. It passes through Cheriyanad, Puliyoor and Chengannur villages and enters Mavelikkara taluk at Chennithala. It flows through Pallippad villages and joins the Pamba river at Veeyapuram.

Table: 9.2

BASIC RIVER STATISTICS

Sl. No.	Name of the River	Main Tributaries	Irrigation Projects	Hydro Electric Projects
1	Achankovil	Kallar	Nil	Nil
2	Pamba	Kakkiyar, Kallar Arudaiar, Pambayar, Kakkadar	Pamba	Sabarigiri
3	Manimala	Kokayar Elakkal Thodu	Nil	Nil

Source: - ER, CGWD, PWD.

RIVERS OF KERALA



Legend

- STATE BOUNDARY
- RIVER/ WATERBODY

Table: 9.3

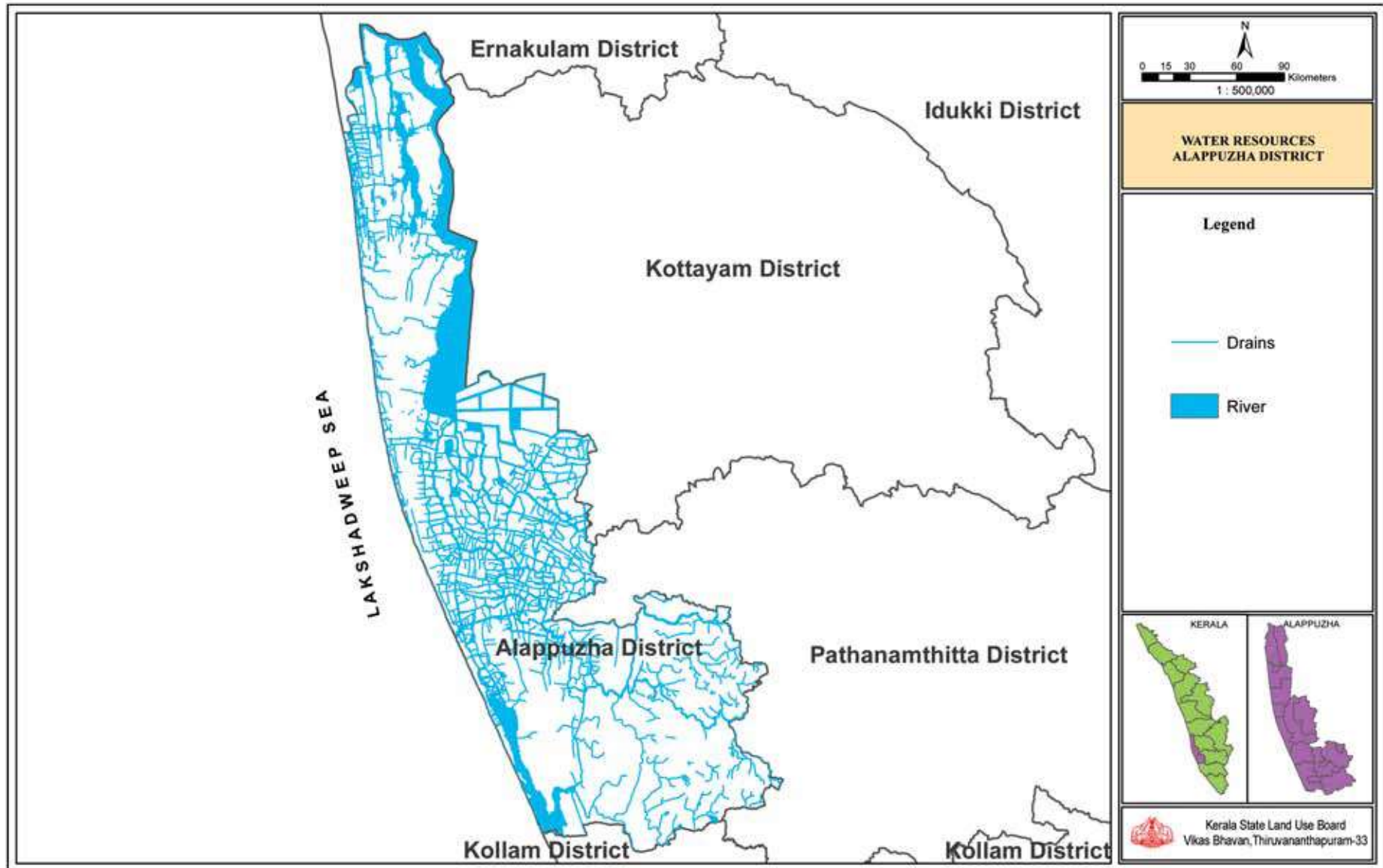
GROUND WATER STATISTICS ALAPPUZHA (2008-09)

Sl. 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	Ambalappuzha	Non-Command	1640.08	0.00	362.41	470.00	2472.49	123.62
2	Aryadu	Non-Command	2085.40	8.53	461.41	230.00	2785.34	139.27
3	Bharanikavu	Non-Command	2731.68	17.08	615.18	2180.00	5543.94	277.20
4	Champakulam	Non-Command	3000.30	0.00	809.15	1003.00	4812.45	481.24
5	Chengannur	Non-Command	3060.88	0.00	788.79	1110.00	4959.67	247.98
6	Haripad	Non-Command	2386.99	22.42	601.69	950.00	3961.10	198.05
7	Kanjikkuzhi	Non-Command	2147.98	0.00	579.28	550.00	3277.26	327.73
8	Mavelikkara	Non-Command	2529.85	6.40	528.31	1990.00	5054.56	252.73
9	Muthukulam	Non-Command	2385.30	9.69	612.84	900.00	3907.83	195.39
10	Pattanakad	Non-Command	2747.13	1.59	571.81	78.00	3398.53	169.93
11	Thaikkattusseri	Non-Command	2761.57	4.05	744.76	230.00	3740.38	374.04
12	Veliyanad	Non-Command	2659.39	0.00	624.41	1178.00	4461.80	223.09
Total (Ha.m)		Non-Command	30136.55	69.76	7300.06	10869.00	48375.35	3010.27
Total (MCM)		Non-Command	301.37	0.70	73.00	108.69	483.75	30.10

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	Ambalappuzha	2348.87	135.26	616.79	752.05	657.21	1556.40	32.02
2	Aryadu	2646.07	211.37	1385.44	1596.81	1496.10	938.60	60.35
3	Bharanikavu	5266.74	399.58	780.68	1180.26	843.04	4024.12	22.41
4	Champakulam	4331.21	58.08	549.36	607.44	593.22	3679.91	14.02
5	Chengannur	4711.69	802.84	937.46	1740.30	1010.72	2898.13	36.94
6	Haripad	3763.05	503.90	768.93	1272.83	657.21	2601.94	33.82
7	Kanjikkuzhi	2949.53	116.26	735.71	851.97	794.48	2038.79	28.88
8	Mavelikkara	4801.83	182.38	832.56	1014.94	898.25	3721.20	21.14
9	Muthukulam	3712.44	249.98	1187.67	1437.65	1176.20	2286.26	38.73
10	Pattanakad	3228.60	97.55	1020.65	1118.20	1028.35	2102.70	34.63
11	Thaikkattusseri	3366.34	113.09	678.67	791.76	731.90	2521.35	23.52
12	Veliyanad	4238.71	121.58	449.06	570.64	484.93	3632.20	13.46
Total (Ha.m)		45365.08	2991.87	9942.98	12934.85	10371.61	32001.60	28.51
Total (MCM)		453.65	29.92	99.43	129.35	103.72	320.02	28.51

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 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.

It is stated that high quality sand deposits occur between Alappuzha and Cherthala which form a stretch of 35km in length along western side of Vembanad Lake. Large quantities of sand are also seen in Pallippuram. Vast deposits of Limeshell occur in the Vembanad Lake covering an area of 15 sq.km. upto a depth of 8m between Pathiramanal and Vaikom. China clay and Ordinary clay occur in several places in this district. Crystalline rocks also obtained from various places.

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.

Sl. No.	Name of Minerals	Occurrence	Reserves (Million Tonnes)	Uses
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						Total
		Granite building stone	Laterite	Brick clay	Ordinary sand	Sea shell	Lime shell	
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

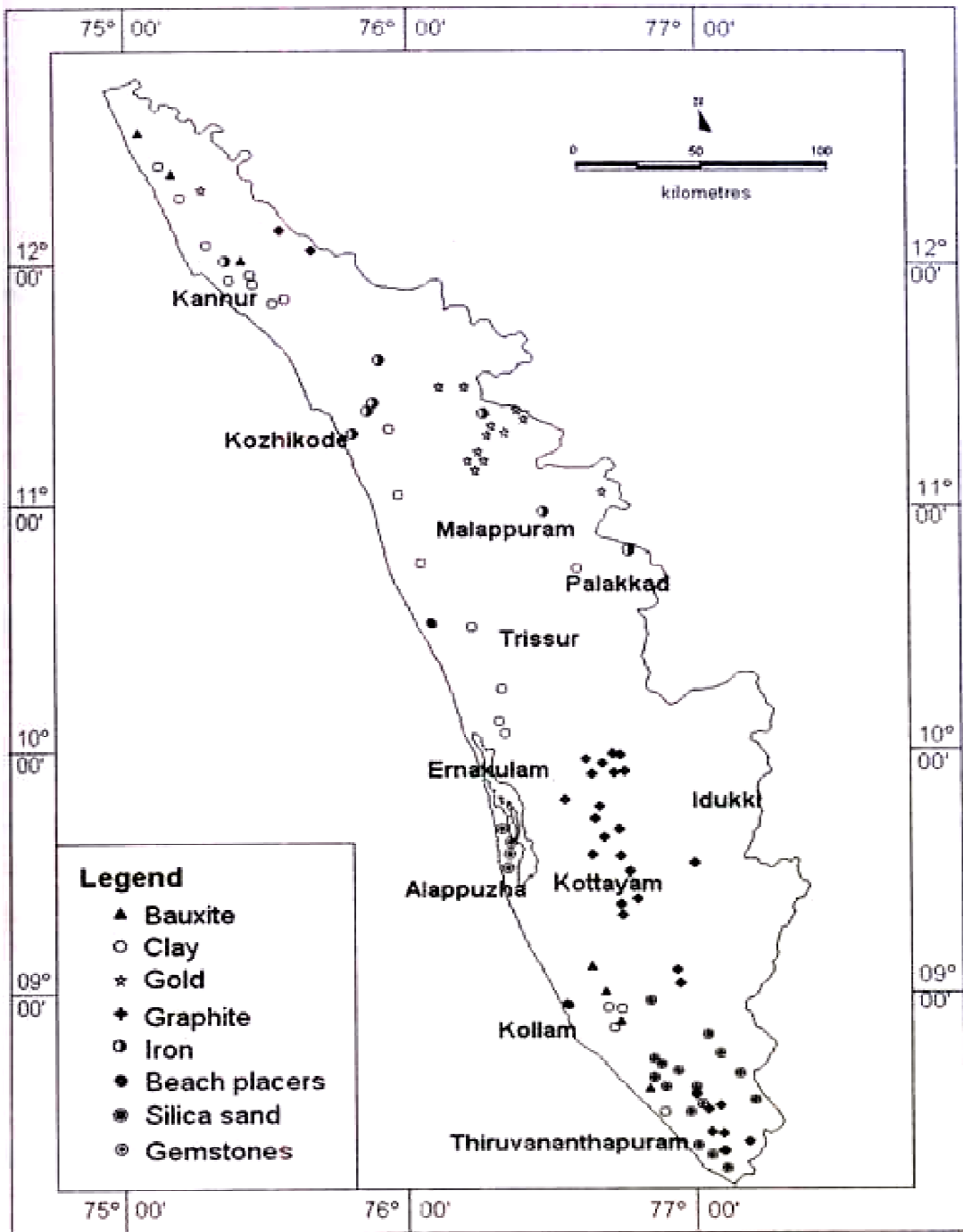
Table: 10.3

**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

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 - Alappuzha

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 Alappuzha 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 1894 ha accounting for 1.34 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, fiber 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 second major category occupying an area of 121762 ha accounting for 86.03 per cent of the TGA. Of these, the paddy area covers an area of 21580 ha. Nearly 3035 ha of paddy area has been converted to other land uses. The coconut dominant mixed crop which covers an area of 53983 ha is the major land use identified under this category.

iii) Waste lands

It is described as degraded land which can be brought under vegetative cover with reasonable efforts and which is currently under utilized and land which is deteriorating due to lack of appropriate water and soil management or on account of natural causes. The two major classes in the category are; **a)** Land with or without scrub which occupy higher topography like uplands or high

grounds with or without scrub, generally prone to degradation or erosion **b)** water logged area. The waste lands occupy an area of 323 ha accounting for 0.23 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 17550 Ha accounting for 12.40 percent of the total area.

The land use/land cover categories identified and mapped in the district is furnished in the table below:

Table: 11.1

LAND USE / LAND COVER CATEGORIES - ALAPPUZHA

(Area in Sq.Km)

Sl.No.	Category	Area	Percentage
1	Built up land (urban) - commercial	8.98	0.63
2	Built up land (urban) - beaches	7.87	0.56
3	Built up land (rural) - residential	2.09	0.15
4	Paddy - viruppu	215.8	15.25
5	Paddy reclaimed coconut	27.1	1.91
6	Paddy reclaimed rubber	0.23	0.02
7	Paddy reclaimed mixed crop	2.02	0.14
8	Paddy reclaimed banana	1	0.07
9	Paddy - fallow	232.27	16.41
10	Rubber	0.79	0.06
11	Coconut	2.51	0.18
12	Mixed crop	195.97	13.85
13	Coconut dominant mixed crop	539.83	38.14
14	Banana	0.1	0.01
15	Land with scrub	0.25	0.02
16	Sands/riverine	0.01	0
17	Waterlogged area	2.97	0.21
18	Water bodies	175.5	12.4
	Total	1415.29	100

Table: 11.2

AMBALAPPUZHA BLOCK**(Area in Ha)**

Sl. No.	Land Use	Ambalappuzha North	Ambalappuzha South	Punnapra North	Punnapra South	Purakkad
1	Acqua + Paddy					
2	Acquaculture					
3	Agriculture plantation (Coconut)	300.16	734.12	445.25	665.75	611.96
4	Agriculture plantation (Mixed)					
5	Agriculture plantation (Rubber)					
6	Barrenrocky/Stonywaste/Sheetrock					
7	Built-up (Cities/Town/Villages)	77.41	68.22	62.65	157.18	16.88
8	Cropland (Kharif)					
9	Doublecrop (Kharif+Rabi)	433.12	682.65	251.7	605.99	1436.12
10	Fallow land					
11	Forest mangroves (Littoral Swamp)					
12	Land with scrub					
13	Land without scrub					
14	Marshy/Swampy					17.38
15	Mining/Industrial waste					
16	River/Waterbodies	17.51	34.19	15.43	47.06	158.41
17	Sandy area	8.45	0.60	47.19	25.81	0.02
18	Wetlands (Waterlogged)					
	Panchayat Total	836.65	1519.78	822.22	1501.79	2240.77
	Block Total	6921.20				

Table: 11.3

ARYADU BLOCK

(Area in Ha)

Sl. No.	Land Use	Aryadu	Mannancheri	Mararikulam South	Muhamma
1	Acqua + Paddy				
2	Acquaculture				
3	Agriculture plantation (Coconut)	342.68	1452.61	1720.37	1110.95
4	Agriculture plantation (Mixed)	43.35	336.00	19.73	38.2
5	Agriculture plantation (Rubber)				
6	Barrenrocky/Stonywaste/Sheetrock				
7	Built-up (Cities/Town/Villages)	51.39	228.76	108.31	53.75
8	Cropland (Kharif)				
9	Doublecrop (Kharif+Rabi)	146.43	86.25	20.94	32.89
10	Fallow land		3.24		
11	Forest mangroves (Littoral Swamp)				
12	Land with scrub				
13	Land without scrub				
14	Marshy/Swampy				
15	Mining/Industrial waste				
16	River/Waterbodies	817.64	1861.18	5.7	1468.45
17	Sandy area		6.7	7.27	4.46
18	Wetlands (Waterlogged)				
	Panchayat Total	1401.49	3974.74	1882.32	2708.70
	Block Total	9967.25			

Table: 11.4

BHARANIKAVU BLOCK

(Area in Ha)

Sl. No.	Land Use	Bharanikavu	Chunakkara	Mavelikkara - Thamarakulam	Nooranadu	Palamel	Vallikkunnam
1	Acqua + Paddy						
2	Acquaculture						
3	Agriculture plantation (Coconut)	1960.87	74.97	80.03	10.87		1149.09
4	Agriculture plantation (Mixed)	59.86	288.41	749.05	504.09	608.13	609.46
5	Agriculture plantation (Rubber)	47.00	1111.08	744.74	1069.13	1666.68	107.77
6	Barrenrocky/Stonywaste/Sheetrock						
7	Built-up (Cities/Town/Villages)	22.08	10.79	15.55	8.21	20.71	
8	Cropland (Kharif)						
9	Doublecrop (Kharif+Rabi)	453.04	345.9	308.51	354.36	296.14	270.01
10	Fallow land						
11	Forest mangroves (Littoral Swamp)						
12	Land with scrub				10.81	0.48	
13	Land without scrub					7.92	
14	Marshy/Swampy						
15	Mining/Industrial waste				3.92		
16	River/Waterbodies			37.24	0.97	0.52	4.15
17	Sandy area						
18	Wetlands (Waterlogged)			8.59	39.26	69.83	3.01
	Panchayat Total	2542.85	1831.15	1943.71	2001.62	2670.41	2143.49
	Block Total	13133.23					

Table: 11.5

CHAMPAKULAM BLOCK

(Area in Ha)

Sl. No.	Land Use	Champakulam	Edathwa	Kainakari	Nedumudi	Thakazhi	Thalavadi
1	Acqua + Paddy						
2	Acquaculture						
3	Agriculture plantation (Coconut)	458.8	386.2	364.93	397.14	524.72	603.72
4	Agriculture plantation (Mixed)		49.05		1.11		32.26
5	Agriculture plantation (Rubber)						
6	Barrenrocky/Stonywaste/Sheetrock						
7	Built-up (Cities/Town/Villages)		14.32				0.78
8	Cropland (Kharif)						
9	Doublecrop (Kharif+Rabi)	1670.89	1156.64	4115.8	1498.38	1782.51	855.36
10	Fallow land						
11	Forest mangroves (Littoral Swamp)						
12	Land with scrub		8.3				7.48
13	Land without scrub						
14	Marshy/Swampy						
15	Mining/Industrial waste						
16	River/Waterbodies	162.03	150.86	969.50	202.95	219.5	96.61
17	Sandy area						
18	Wetlands (Waterlogged)						
	Panchayat Total	2291.72	1765.37	5450.23	2099.58	2526.73	1596.21
	Block Total	15729.84					

Table: 11.6

CHENGANNUR BLOCK

(Area in Ha)

Sl. No.	Land Use	Ala	Budhanoor	Cheriyannadu	Mulakuzha	Pandanadu	Puliyur	Thiruvannamoor	Venmoni
1	Acqua + Paddy								
2	Acquaculture								
3	Agriculture plantation (Coconut)	189.32	1399.19	486.45		573.60	344.16	60.07	20.85
4	Agriculture plantation (Mixed)	276.04	93.43	330.13	1050.98	37.97	361.11	382.97	581.10
5	Agriculture plantation (Rubber)	577.04		256.03	1014.40	5.08	57.96	57.61	856.14
6	Barrenrocky/Stonywaste/Sheetrock						4.38		
7	Built-up (Cities/Town/Villages)	15.43	25.6	43.02	12.78	3.01	4.70	9.43	20.93
8	Cropland (Kharif)								
9	Doublecrop (Kharif+Rabi)	144.59	529.88	247.66	124.42	380.34	371.09	309.43	314.65
10	Fallow land		2.47						2.30
11	Forest mangroves (Littoral Swamp)						1.07		
12	Land with scrub	1.46		5.45					
13	Land without scrub								
14	Marshy/Swampy								
15	Mining/Industrial waste								
16	River/Waterbodies		94.1	34.58	2.46	91.24	13.87	26.55	95.20
17	Sandy area		4.05	3.33			0.14		
18	Wetlands (Waterlogged)	0.02			6.04				9.13
	Panchayat Total	1203.90	2148.72	1406.65	2211.08	1091.24	1158.48	846.06	1900.30
	Block Total	11966.43							

Table: 11.7

HARIPAD BLOCK

(Area in Ha)

Sl. No.	Land Use	Cheruthana	Haripad	Karthika ppalli	Karuvatta	Kumara puram	Pallippadu	Thrikkunna ppuzha	Veeyapuram
1	Acqua + Paddy								
2	Acquaculture								
3	Agriculture plantation (Coconut)	428.50	566.37	728.47	725.52	1318.25	946.76	819.04	372.49
4	Agriculture plantation (Mixed)	0.23		1.79	10.21		5.87	22.34	9.84
5	Agriculture plantation (Rubber)								
6	Barrenrocky/Stonywaste/Sheetrock								
7	Built-up (Cities/Town/Villages)		11.7	1.01		6.72	14.44	4.43	5.23
8	Cropland (Kharif)								
9	Doublecrop (Kharif+Rabi)	843.56	388.77	5.98	522.81	54.46	751.40		836.71
10	Fallow land								
11	Forest mangroves (Littoral Swamp)								
12	Land with scrub	42.90			56.93				0.65
13	Land without scrub								
14	Marshy/Swampy				44.42	0.09		94.25	
15	Mining/Industrial waste								
16	River/Waterbodies	120.36	14.35	59.19	40.12	19.14	39.69	87.57	154.06
17	Sandy area							0.02	
18	Wetlands (Waterlogged)			44.75	5.12	74.74		28.19	
	Panchayat Total	1435.55	981.19	841.19	1405.13	1473.40	1758.16	1055.84	1378.98
	Block Total	10329.44							

Table: 11.8

KANJIKKUZHI BLOCK

(Area in Ha)

Sl. No.	Land Use	Cherthala South	Kadakkarappalli	Kanjikkuzhi	Mararikulam North	Thanneermukkam
1	Acqua + Paddy		0.06			
2	Acquaculture					
3	Agriculture plantation (Coconut)	1700.61	820.63	1165.98	1542.70	2301.48
4	Agriculture plantation (Mixed)	20.71		32.32	75.75	4.09
5	Agriculture plantation (Rubber)					
6	Barrenrocky/Stonywaste/Sheetrock					
7	Built-up (Cities/Town/Villages)	238.95	56.08	44.38	111.13	144.03
8	Cropland (Kharif)					
9	Doublecrop (Kharif+Rabi)		13.62		31.68	105.28
10	Fallow land					
11	Forest mangroves (Littoral Swamp)					
12	Land with scrub					
13	Land without scrub					
14	Marshy/Swampy					
15	Mining/Industrial waste					
16	River/Waterbodies	0.30	54.11		2.16	1127.42
17	Sandy area	4.06		20.94	6.65	3.72
18	Wetlands (Waterlogged)		2.27			
	Panchayat Total	1964.63	946.77	1263.62	1770.07	3686.02
	Block Total			9631.11		

Table: 11.9

MAVELIKKARA BLOCK

(Area in Ha)

Sl. No.	Land Use	Chennithala - Thrippерunthura	Chettikkulangara	Mannar	Mavelikkara - Thekkekkara	Thazhakkara
1	Acqua + Paddy					
2	Acquaculture					
3	Agriculture plantation (Coconut)	1109.04	1732.41	366.34	1324.63	19.02
4	Agriculture plantation (Mixed)	1.43		0.17	17.83	581.15
5	Agriculture plantation (Rubber)				514.61	1048.82
6	Barrenrocky/Stonywaste/Sheetrock					
7	Built-up (Cities/Town/Villages)		2.32	31.45	14.68	25.79
8	Cropland (Kharif)					
9	Doublecrop (Kharif+Rabi)	960.58	393.45	583.95	427.27	354.27
10	Fallow land		12.74		9.11	
11	Forest mangroves (Littoral Swamp)					
12	Land with scrub					
13	Land without scrub					
14	Marshy/Swampy					
15	Mining/Industrial waste					
16	River/Waterbodies	115.63	28.84	35.36	0.77	2.84
17	Sandy area					0.19
18	Wetlands (Waterlogged)		2.02			
	Panchayat Total	2186.68	2171.78	1017.27	2308.90	2032.08
	Block Total	9716.71				

Table: 11.10

MUTHUKULAM BLOCK

(Area in Ha)

Sl. No.	Land Use	Arattupuzha	Cheppad	Chingoli	Devikulangara	Kandallur	Krishnapuram	Muthukulam	Pathiyur
1	Acqua + Paddy								
2	Acquaculture								
3	Agriculture plantation (Coconut)	848.16	899.52	619.27	974.75	884.26	1241.26	1170.37	1279.19
4	Agriculture plantation (Mixed)	29.21		0.16	17.97	46.35		20.14	
5	Agriculture plantation (Rubber)								
6	Barrenrocky/Stonywaste/Sheetrock								
7	Built-up (Cities/Town/Villages)	226.12	75.09	18.41	1.15	4.06	8.81	5.59	35.55
8	Cropland (Kharif)				0.38				
9	Doublecrop (Kharif+Rabi)	4.51	288.55	11.58	67.94		69.47	37.40	149.67
10	Fallow land		19.67		5.75	23.03	4.95	21.08	33.6
11	Forest mangroves (Littoral Swamp)								
12	Land with scrub				12.38				
13	Land without scrub								
14	Marshy/Swampy								
15	Mining/Industrial waste								
16	River/Waterbodies	1108.34	6.99		426.21	67.07	4.49	2.88	8.93
17	Sandy area	0.53							
18	Wetlands (Waterlogged)	52.03	1.00	42.7	3.16	53.30	1.05	11.86	
	Panchayat Total	2268.90	1290.82	692.12	1509.69	1078.07	1330.03	1269.32	1506.94
	Block Total	10945.89							

Table: 11.11

PATTANAKAD BLOCK

(Area in Ha)

Sl. No.	Land Use	Aroor	Ezhupunna	Kodamthuruthu	Kuthiyathodu	Pattanakad	Thuravoor	Vayalar
1	Acqua + Paddy			353.93	230.25	280.59	481.03	
2	Acquaculture	189.42	473.69	104.2				
3	Agriculture plantation (Coconut)	625.10	646.36	489.74	523.26	1058.64	896.89	1126.33
4	Agriculture plantation (Mixed)	1.93		3.58	27.24		0.04	0.31
5	Agriculture plantation (Rubber)							
6	Barrenrocky/Stonywaste/Sheetrock							
7	Built-up (Cities/Town/Villages)	182.30	111.77	53.44	76.90	106.29	25.24	27.10
8	Cropland (Kharif)							
9	Doublecrop (Kharif+Rabi)	13.11		3.50	2.93	8.95	65.81	17.69
10	Fallow land			10.21		5.41		
11	Forest mangroves (Littoral Swamp)							
12	Land with scrub	5.22						2.95
13	Land without scrub							
14	Marshy/Swampy							
15	Mining/Industrial waste							
16	River/Waterbodies	395.35	269.05	180.41	56.88	84.37	199.16	270.88
17	Sandy area	0.47	2.18	11.07	44.23	1.91	141.66	1.01
18	Wetlands (Waterlogged)		1.03			3.02	37.79	
	Panchayat Total	1412.90	1504.08	1210.08	961.69	1549.18	1847.62	1446.27
	Block Total	9931.84						

Table: 11.12

THAIKKATTUSSERI BLOCK

(Area in Ha)

Sl. No.	Land Use	Arukkutti	Chennam pallippuram	Panavalli	Perumbalam	Thaikkattusseri
1	Acqua + Paddy			52.49		91.34
2	Acquaculture	1.18				
3	Agriculture plantation (Coconut)	607.22	996.70	1062.84	517.77	732.18
4	Agriculture plantation (Mixed)		7.91			
5	Agriculture plantation (Rubber)					
6	Barrenrocky/Stonywaste/Sheetrock					
7	Built-up (Cities/Town/Villages)	21.46	194.69	147.63	40.58	197.84
8	Cropland (Kharif)					
9	Doublecrop (Kharif+Rabi)	33.53	20.00	22.28	24.50	40.19
10	Fallow land					
11	Forest mangroves (Littoral Swamp)					
12	Land with scrub	4.32				
13	Land without scrub					
14	Marshy/Swampy					
15	Mining/Industrial waste					
16	River/Waterbodies	640.47	1169.43	585.24	843.30	251.49
17	Sandy area	2.96	266.62	56.07		58.67
18	Wetlands (Waterlogged)		21.63	14.55		
	Panchayat Total	1311.14	2676.98	1941.10	1426.15	1371.71
	Block Total			8727.08		

Table: 11.13

VELIYANAD BLOCK

(Area in Ha)

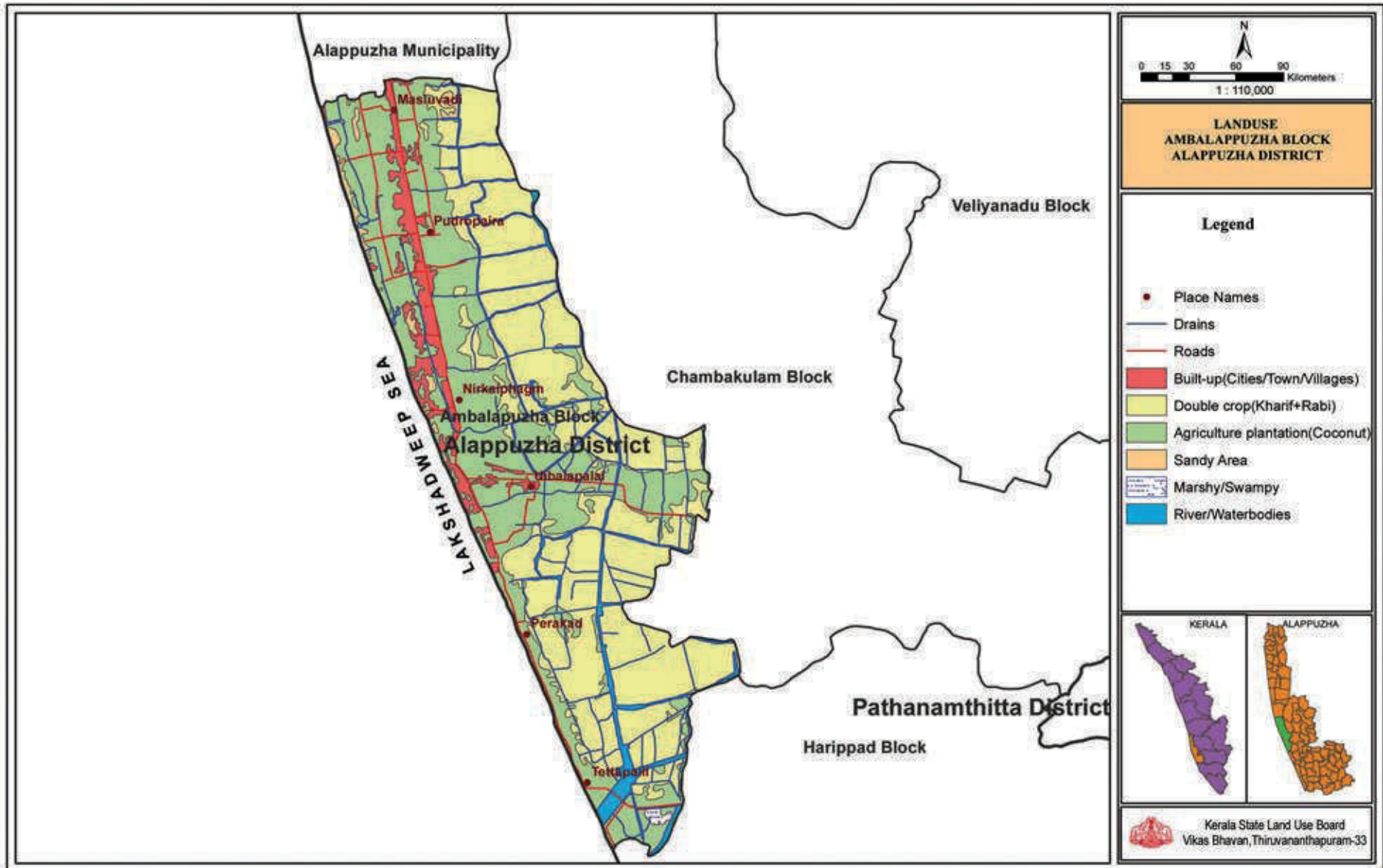
Sl. No.	Land Use	Kavalam	Muttar	Neelamperoor	Pulinkunnu	Ramankari	Veliyanad
1	Acqua + Paddy						
2	Acquaculture						
3	Agriculture plantation (Coconut)	0.70	248.53	493.11	662.57	388.76	716.96
4	Agriculture plantation (Mixed)		3.11	7.97		3.49	
5	Agriculture plantation (Rubber)						
6	Barrenrocky/Stonywaste/Sheetrock						
7	Built-up (Cities/Town/Villages)					4.81	
8	Cropland (Kharif)						
9	Doublecrop (Kharif+Rabi)	2267.96	745.27	1771.45	2006.28	1834.55	2320.25
10	Fallow land						
11	Forest mangroves (Littoral Swamp)						
12	Land with scrub		4.92				
13	Land without scrub						
14	Marshy/Swampy						
15	Mining/Industrial waste						
16	River/Waterbodies	471.58	61.79	165.72	338.90	171.90	151.71
17	Sandy area						
18	Wetlands (Waterlogged)						
	Panchayat Total	2740.24	1063.62	2438.25	3007.75	2403.51	3188.92
	Block Total	14842.29					

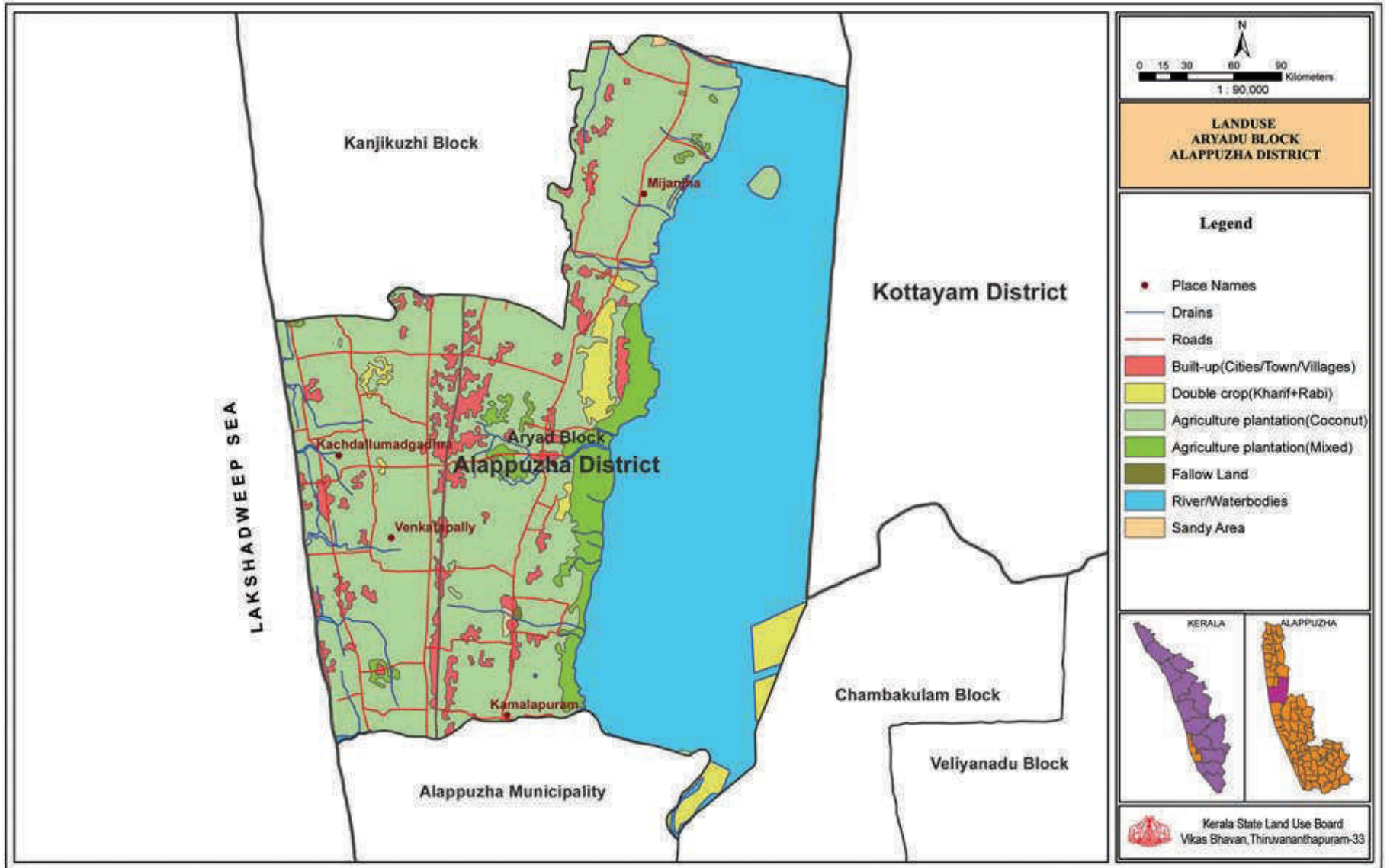
Table: 11.14

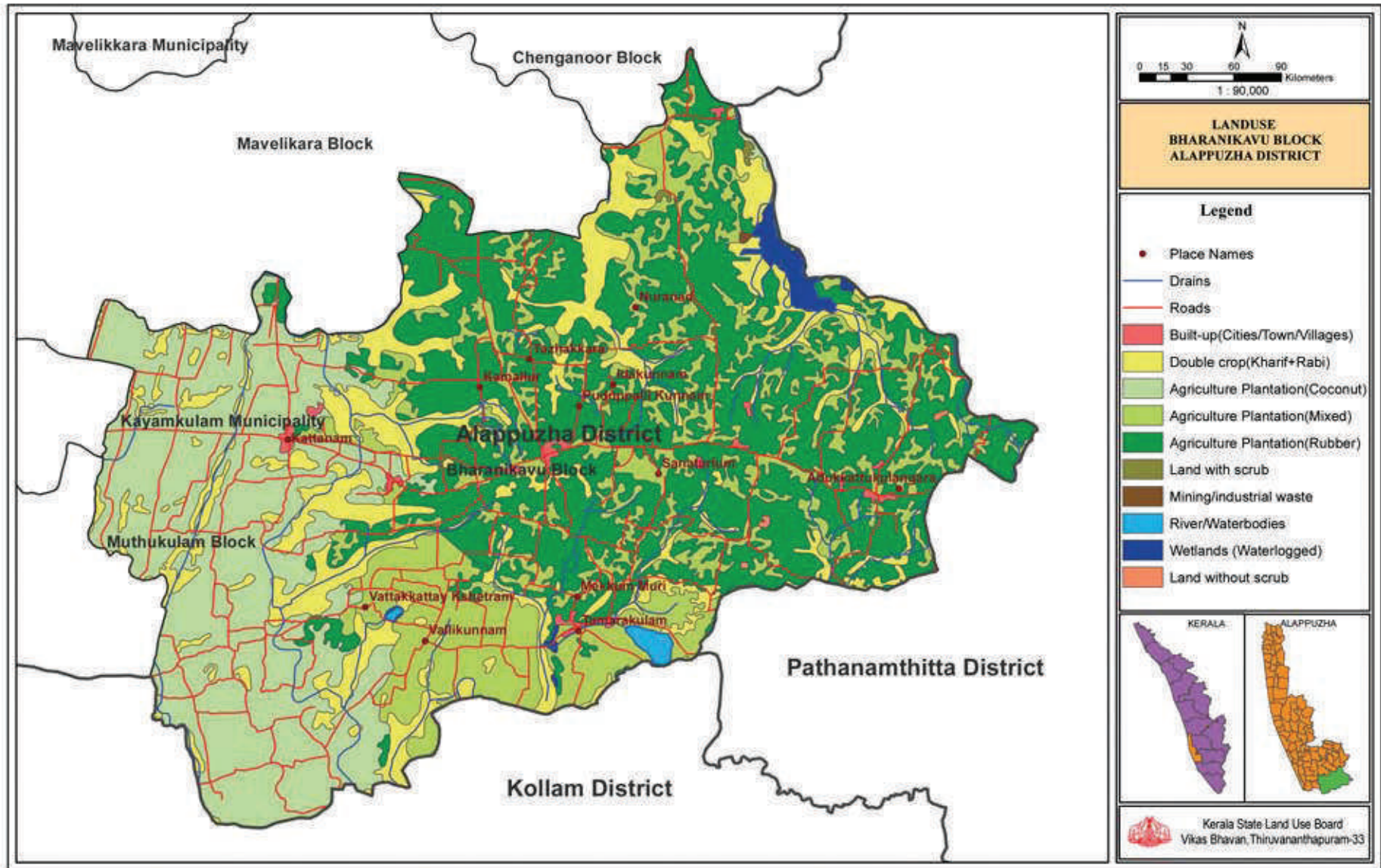
MUNICIPALITY

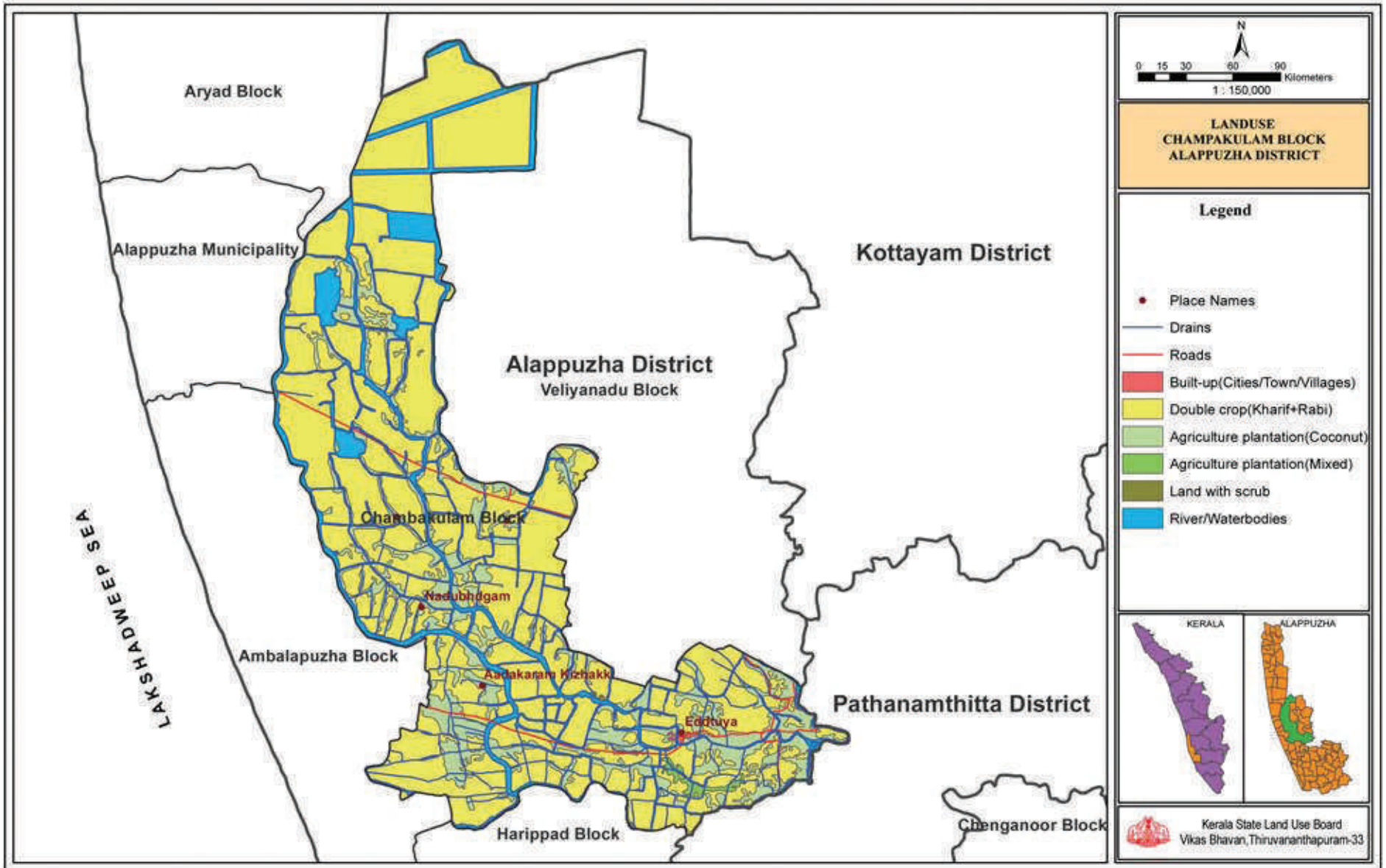
(Area in Ha)

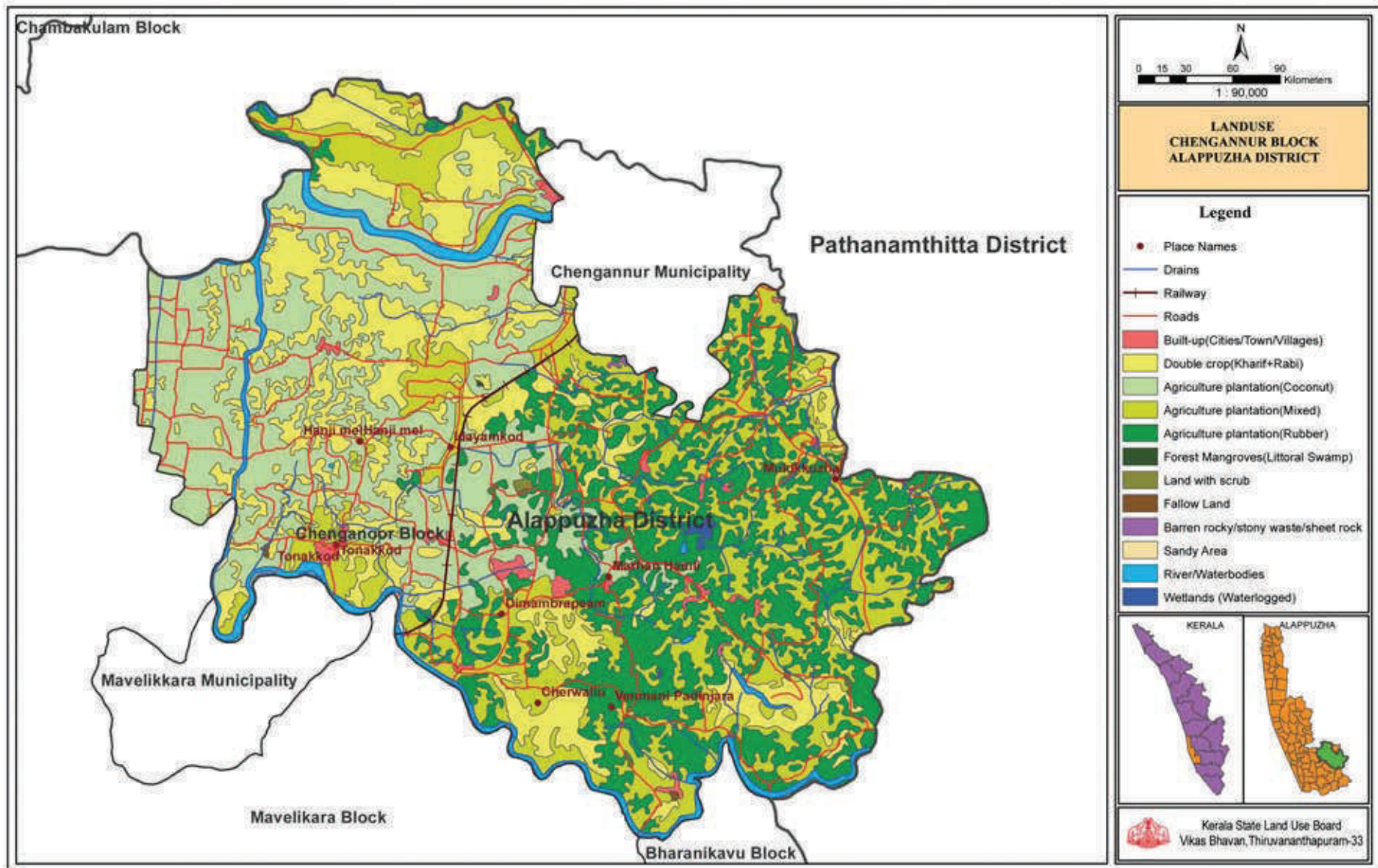
Sl. No.	Land Use	Alappuzha Municipality	Chengannur Municipality	Cherthala Municipality	Kayamkulam Municipality	Mavelikkara Municipality
1	Acqua + Paddy					
2	Acquaculture					
3	Agriculture plantation (Coconut)	1795.33	20.41	1035.06	1587.93	457.09
4	Agriculture plantation (Mixed)		776.38	29.35	5.59	344.20
5	Agriculture plantation (Rubber)		480.76			101.01
6	Barrenrocky/Stonywaste/Sheetrock		18.53			
7	Built-up (Cities/Town/Villages)	787.22	66.83	139.14	35.08	56.99
8	Cropland (Kharif)					
9	Doublecrop (Kharif+Rabi)	875.21	61.29		55.72	113.78
10	Fallow land				15.17	13.61
11	Forest mangroves (Littoral Swamp)					
12	Land with scrub				44.05	
13	Land without scrub		0.98			
14	Marshy/Swampy					
15	Mining/Industrial waste					
16	River/Waterbodies	174.06	69.50	22.31	40.86	17.47
17	Sandy area	11.48	3.19			0.01
18	Wetlands (Waterlogged)				4.48	
	Municipality Total	3643.30	1497.87	1225.86	1788.88	1104.16

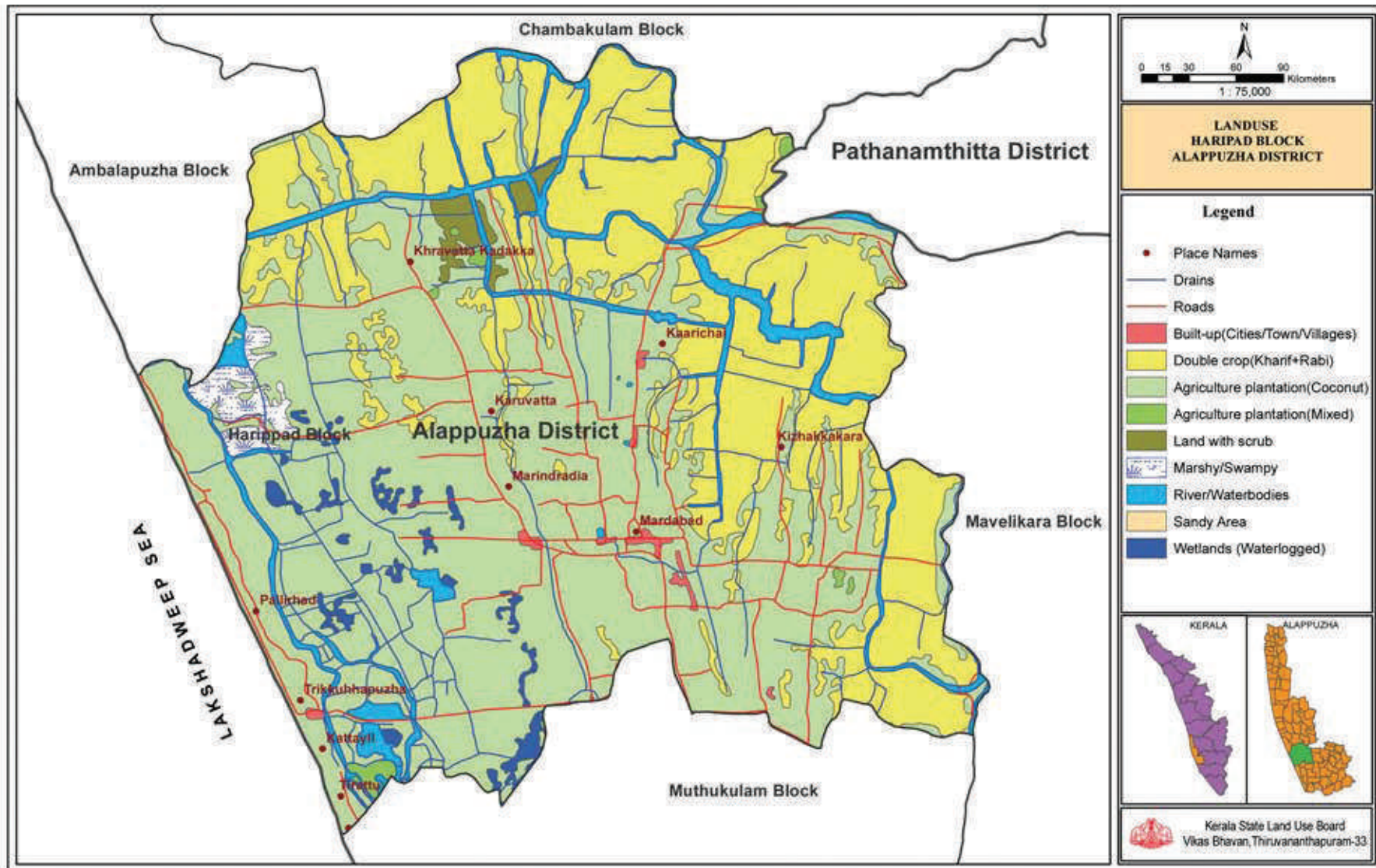


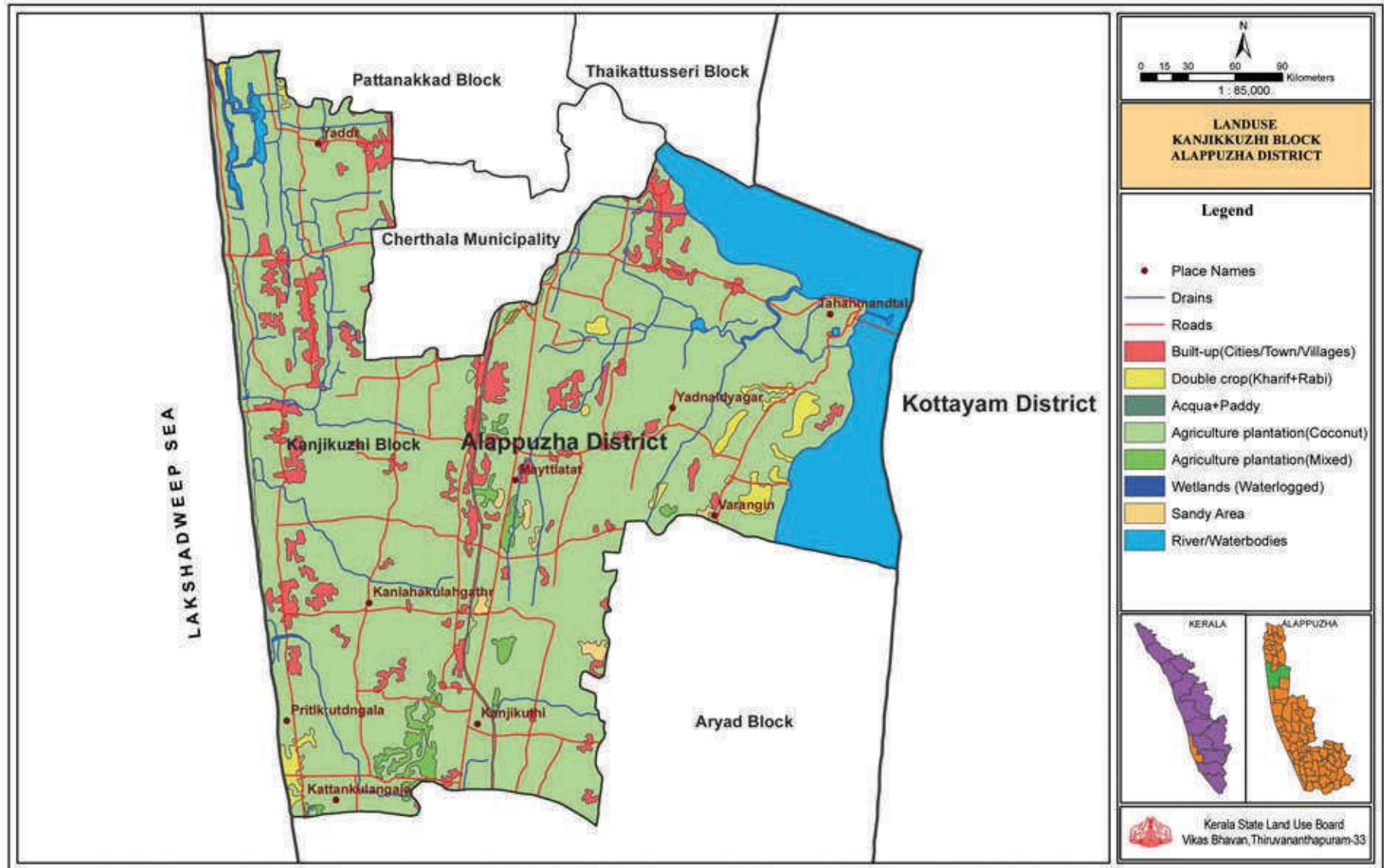


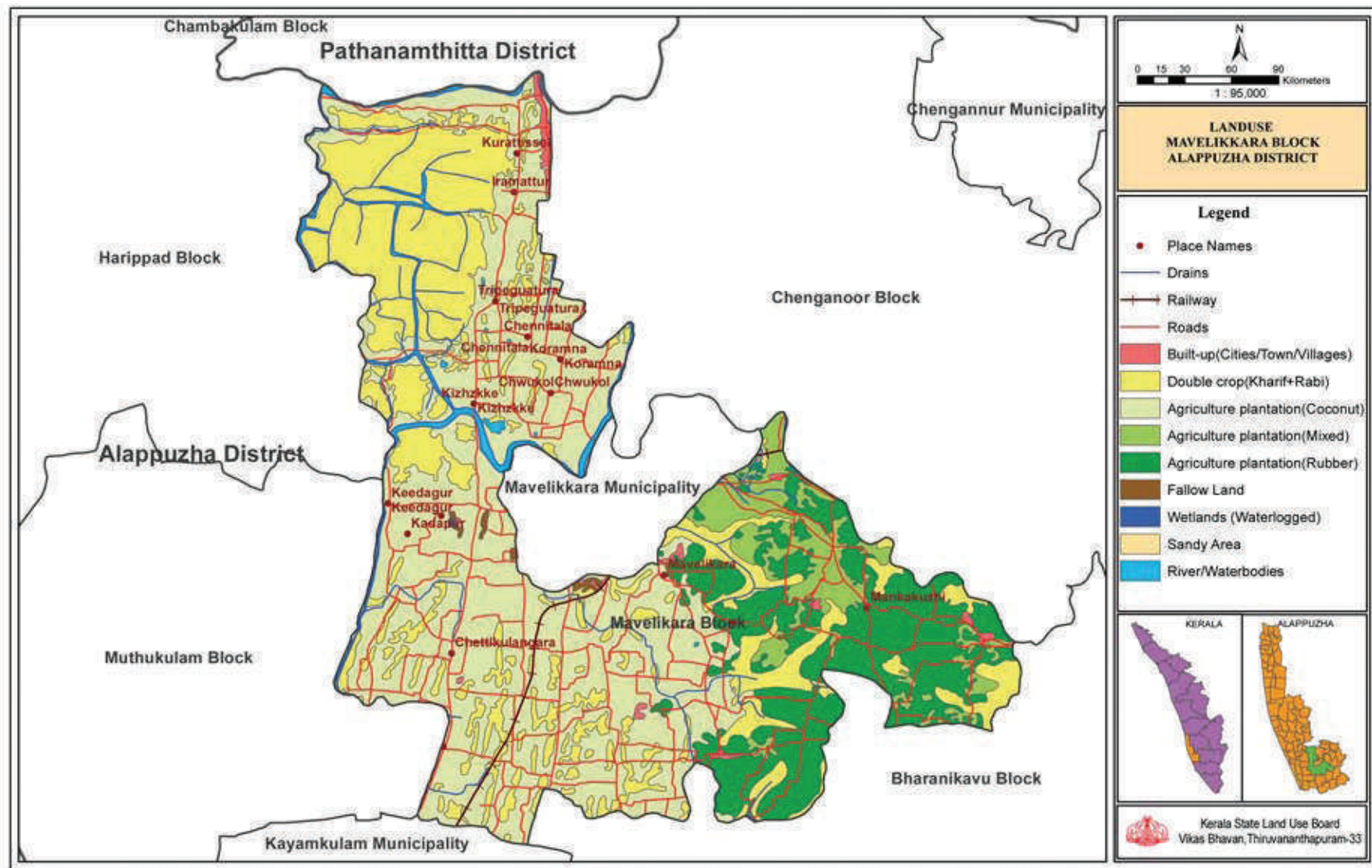


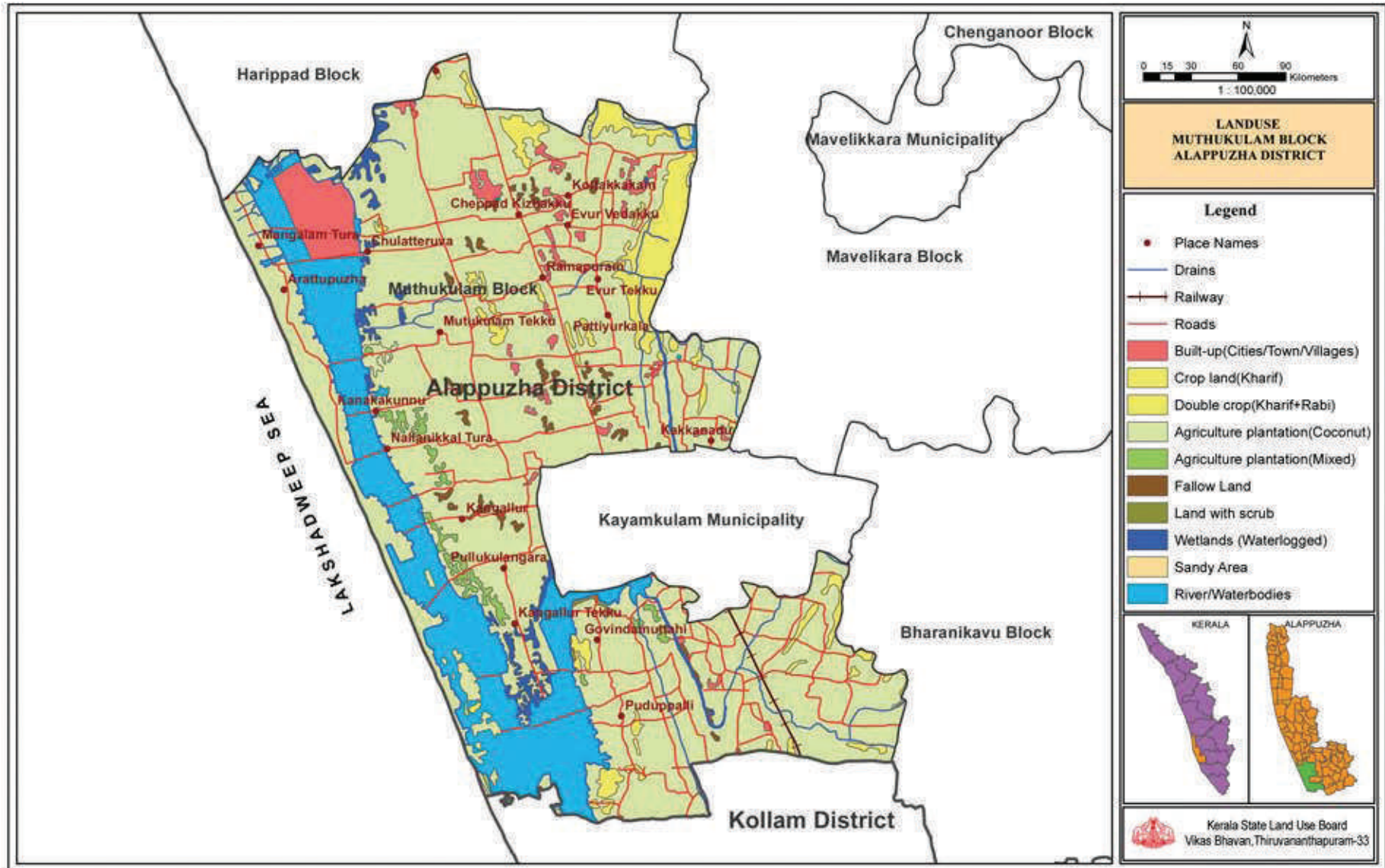


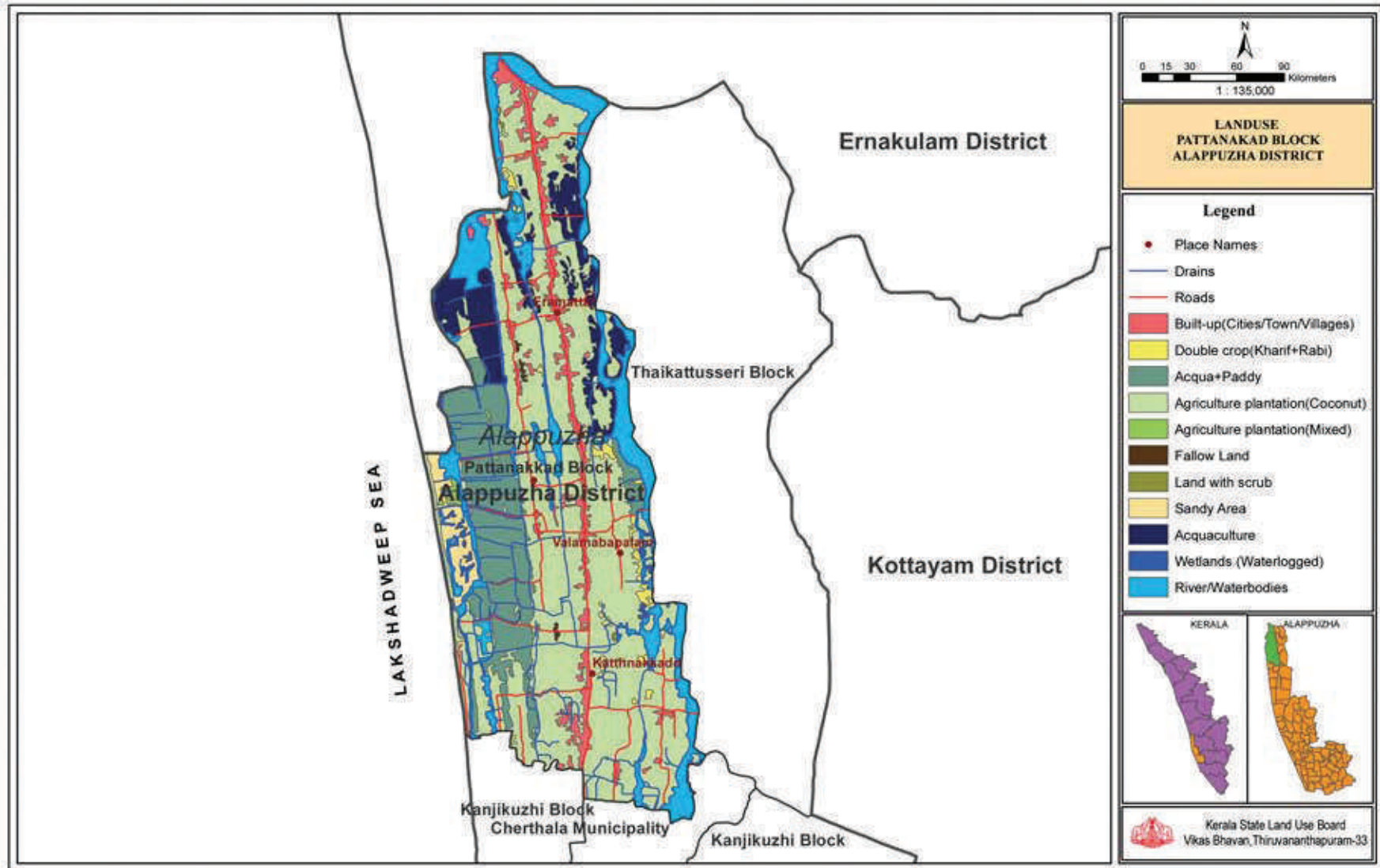


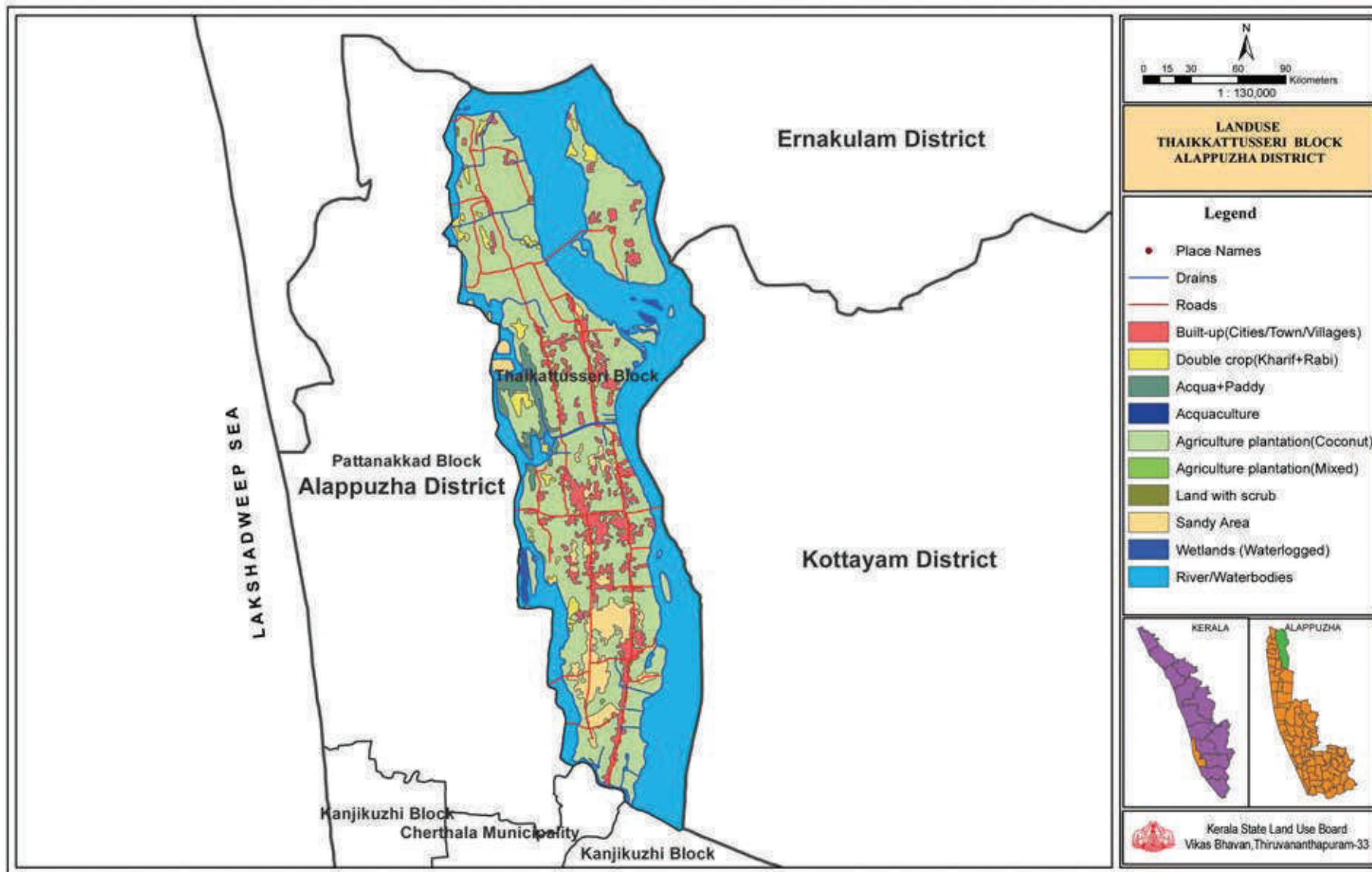


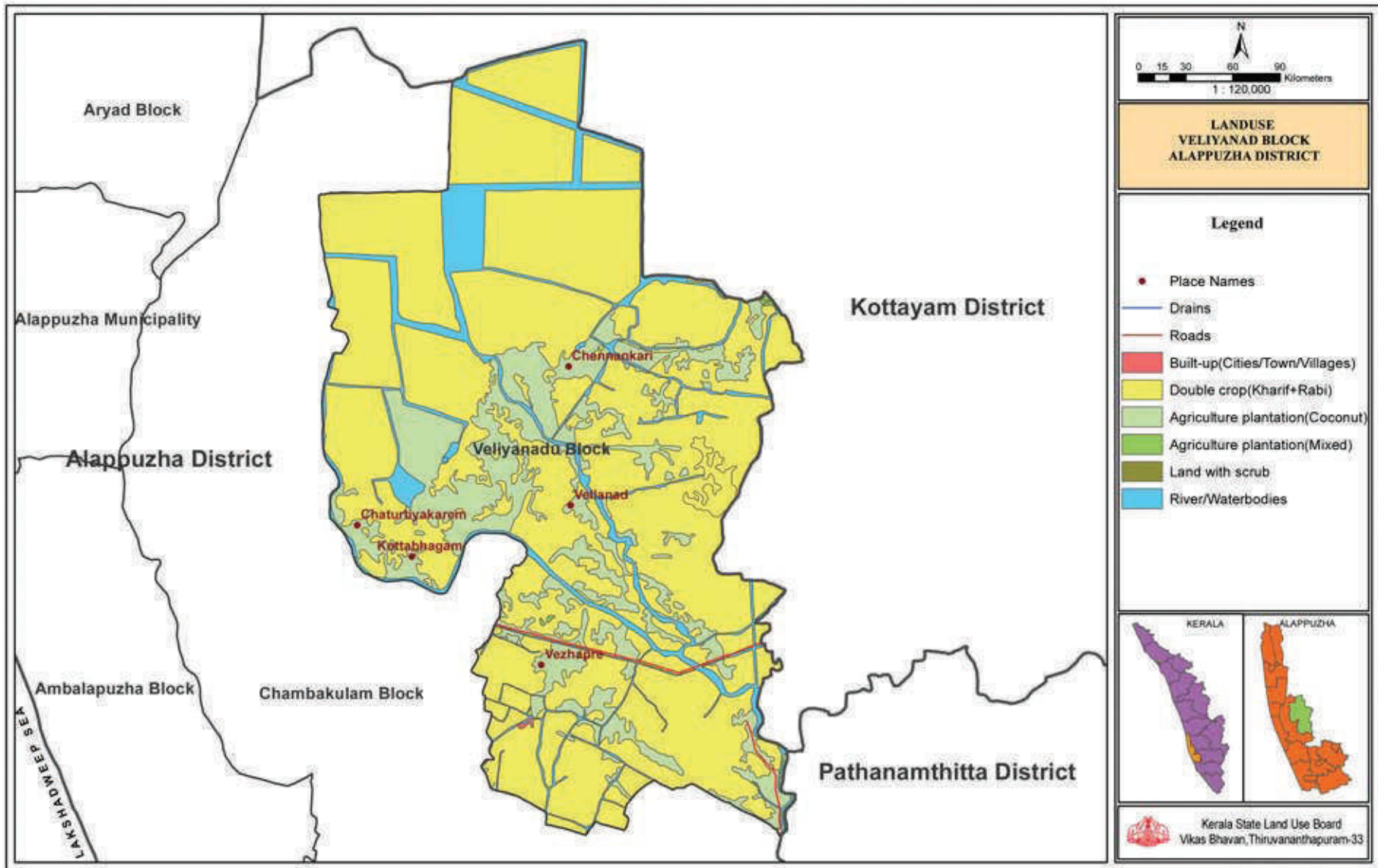


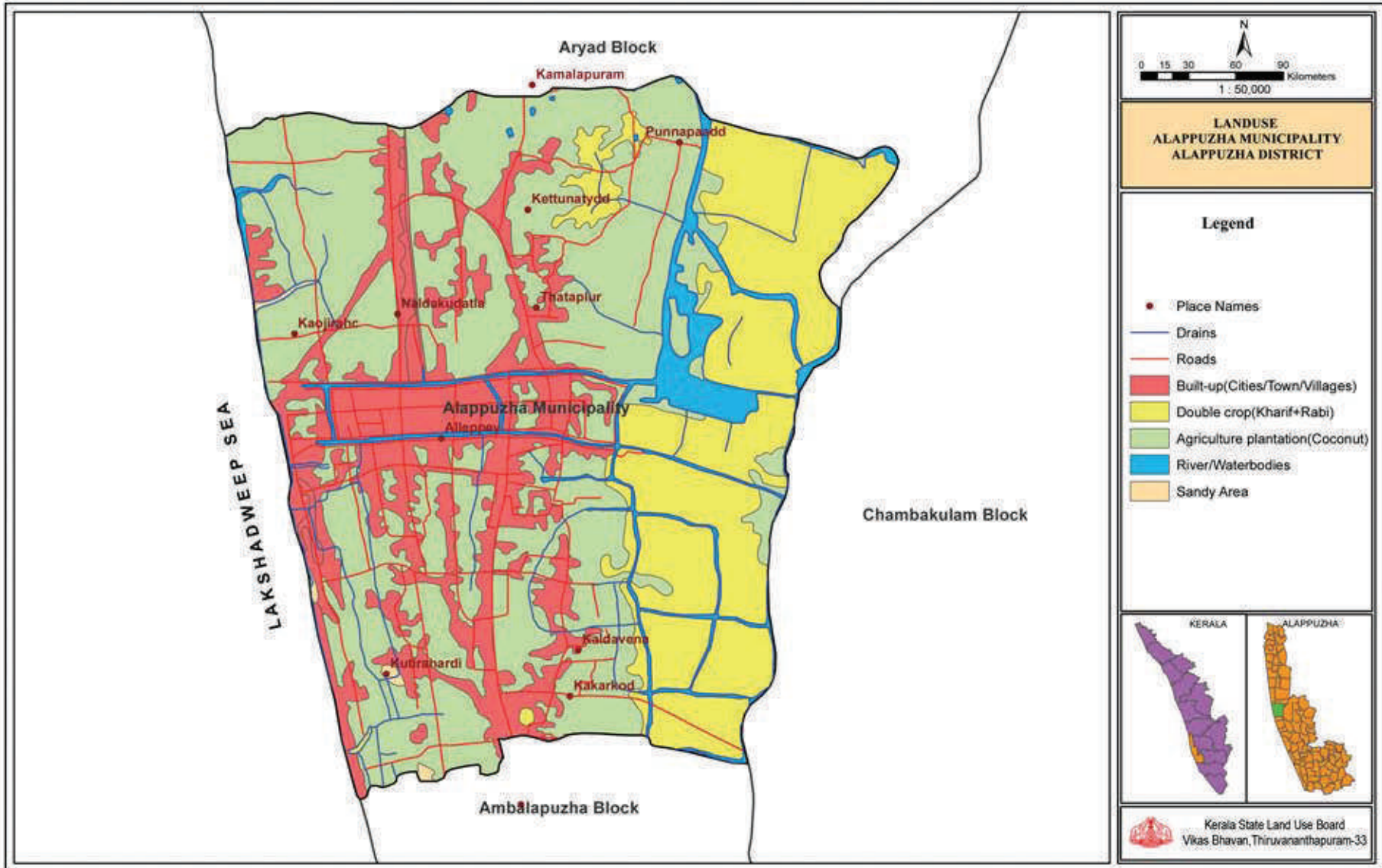


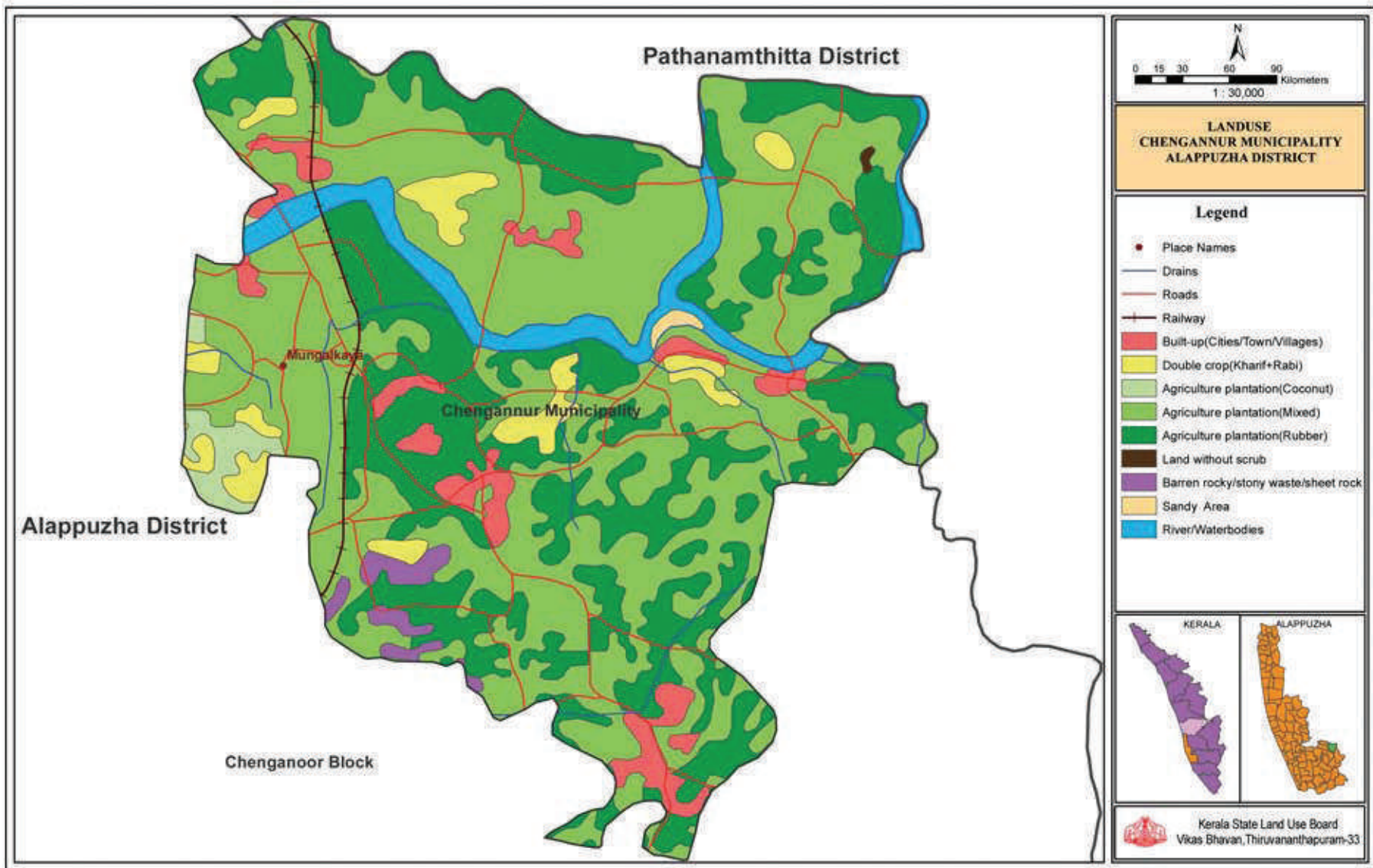


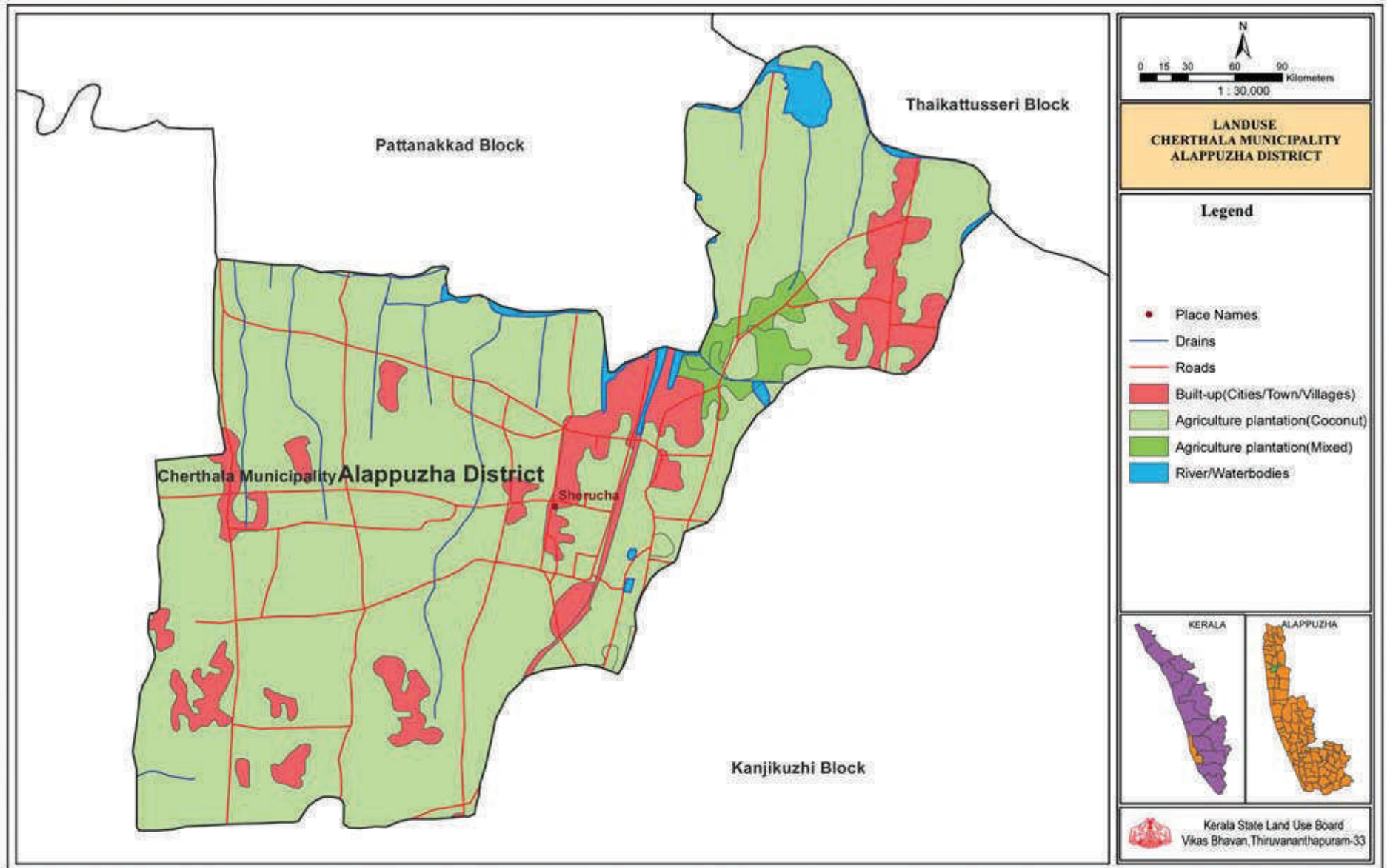


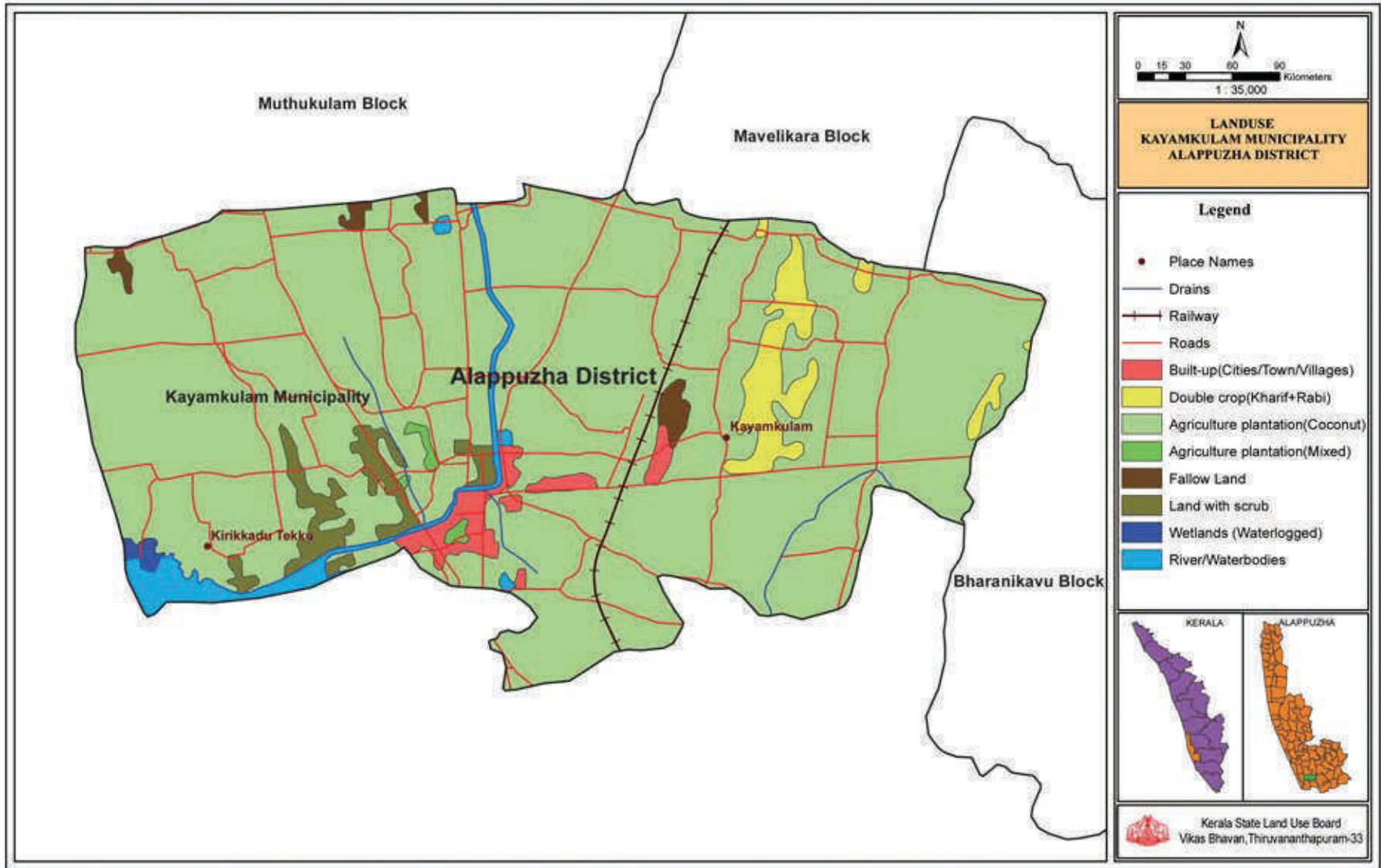


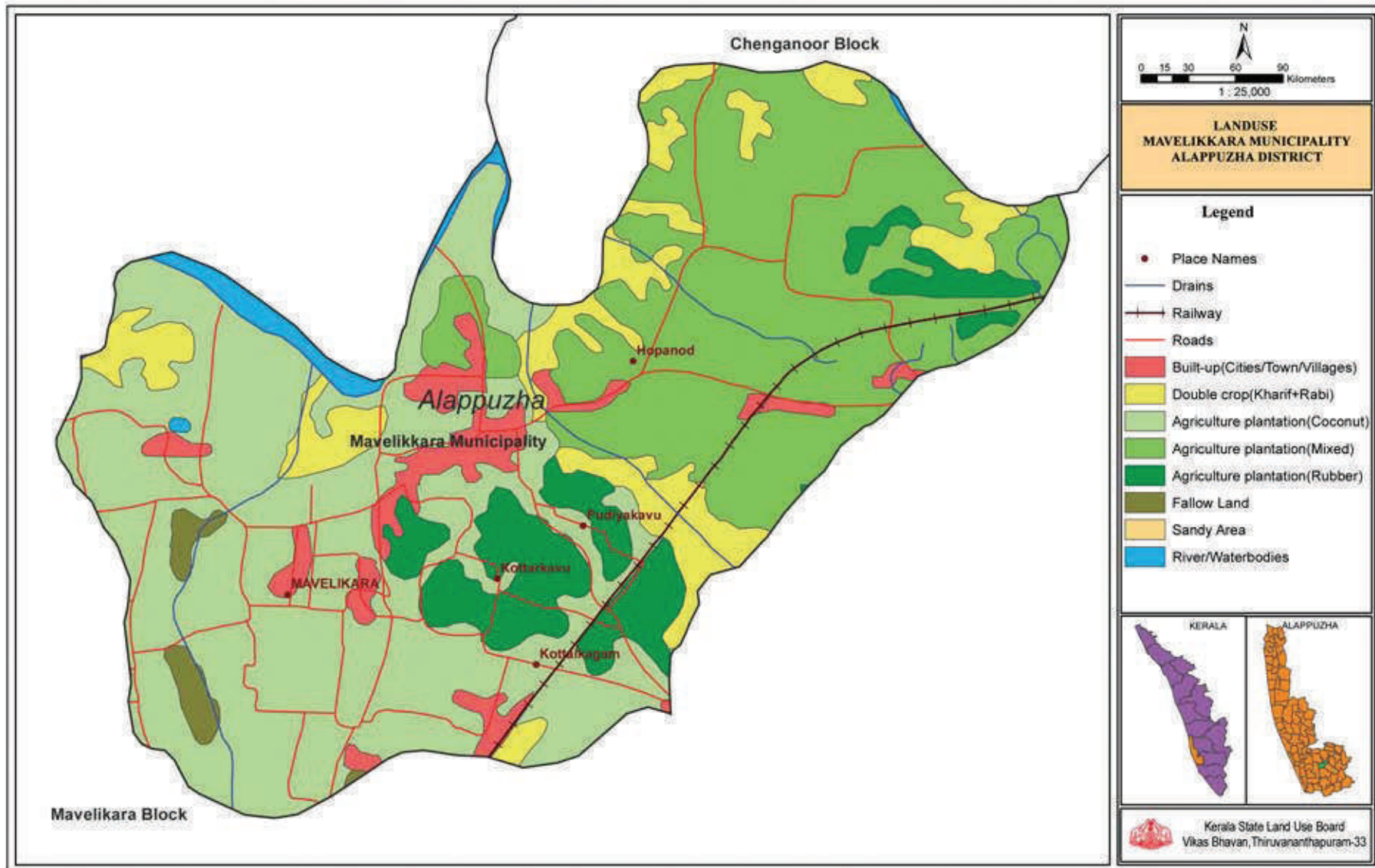












BIODIVERSITY

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 spots is running 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.

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. Alappuzha is the only district in Kerala having no area under forest cover. Eventhough some social forestry activities are functioning in this district (Thottappalli).

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 (km²)	% 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 AS ON 31-03-2012

Sl.No.	District	Area (Km²)
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: 13.4

DISTRICT WISE ECOLOGICALLY FRAGILE LAND

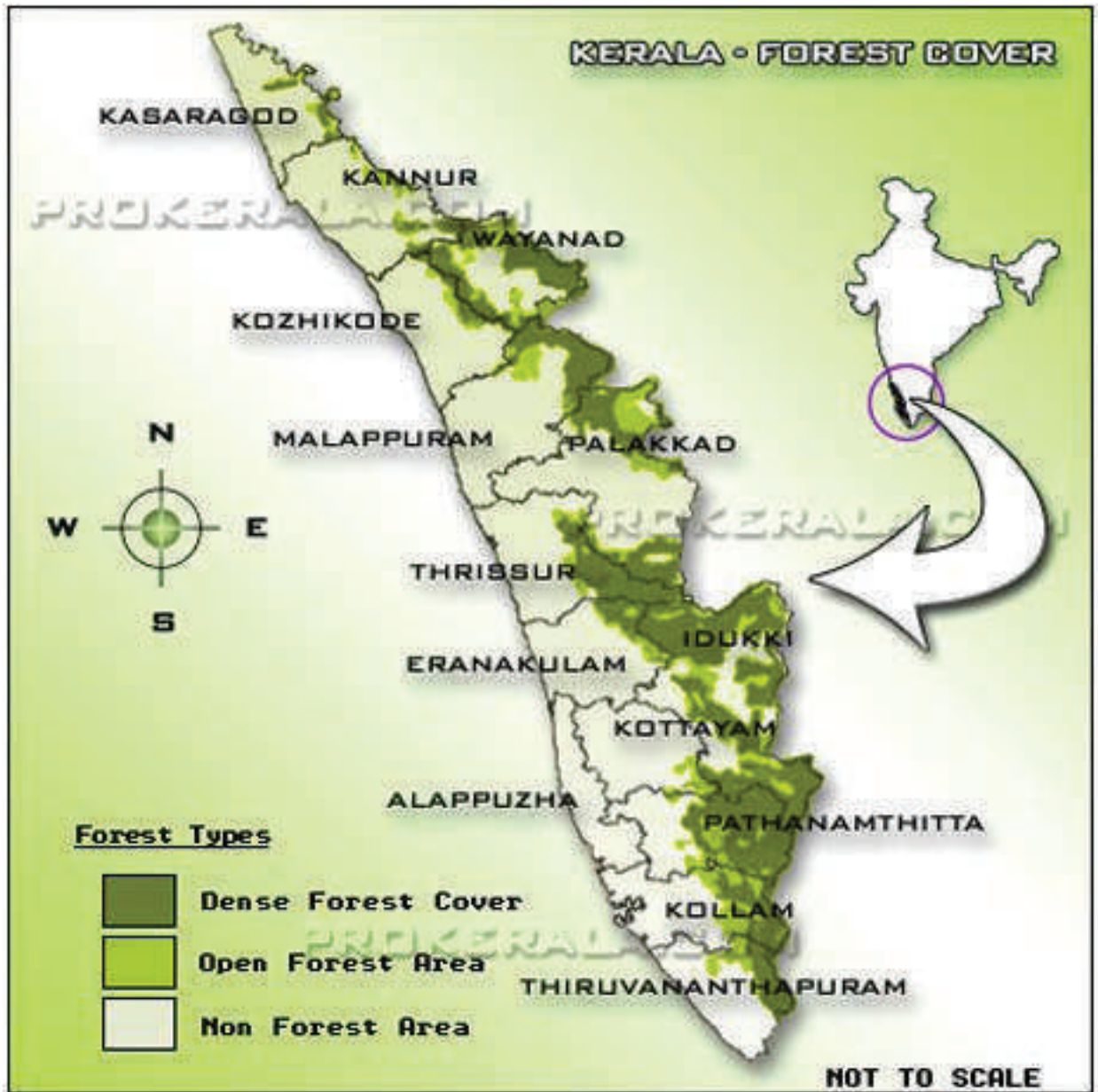
Sl.No.	District	Area (ha)
1	Thiruvananthapuram	881.75
2	Kollam	273.72
3	Idukki	1255.55
4	Thrissur	75.76
5	Palakkad	5212.68
6	Malappuram	1265.12
7	Kozhikode	1531.90
8	Wayanad	2700.27
9	Kannur	779.46
10	Kasaragod	94.88
	Total	14071.12

Table: 13.5

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.

Alappuzha district has predominant position in agricultural sector. Of the total geographical area of 141011 ha. total cropped area covers 104287 ha. Kuttanad is an area of Alappuzha district covered with water ways which is known as “rice bowl of Kerala” has second position in paddy cultivation. Paddy cultivation is also concentrate in Champakulam, Veliyanad and Haripad blocks. The contribution of district towards paddy production was 104593.45 tonnes in the year 2012-13 and area under cultivation was 36194.63 ha. Coconut is another main crop cultivated in Muthukulam, Haripad and Kanjikkuzhi blocks with a total production of 233.47 tonnes. Plantain, another food crop cultivated in different places of the district and production estimated to 10798.87 tonnes. Tapioca, another important crop cultivated mainly in dry land of eastern portion of the district and area under cultivation is 2545.71 ha. Other crops seen in the district are pepper, arecanut, cashew, sesamum etc. Fresh fruits are also grown here.

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	141011	0	22522	23	1
2011-12	141011	0	22278	21	0
2010-11	141011	0	20881	32	39

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	64	15680	1928	2898	33
2011-12	82	15333	2250	3304	37
2010-11	150	12829	3954	3145	33

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	12144	328	29	85361	18926	104287
2011-12	12144	366	37	85159	22230	107389
2010-11	12144	326	33	87445	21044	108489

Table: 14.2

BLOCK WISE AREA OF CROPS 2012-13**(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	Thaikkattusseri	93.23	71.4		2.31	2.97	11.14	18.34	7.13	3.97	1.95
2	Pattanakad	142.72	30.57		3.57	4.44	6.46	10.75	8.56	5.03	4.25
3	Kanjikkuzhi	65.63	45.33		6.37	5.25	13.24	34.93	15.35	11.07	15.57
4	Aryadu	45.65	5.16	39.64	2.01	1.18	10.02	6.05	11.91	3.01	1.84
5	Ambalappuzha	2277.76	100.00	645.35	2.18	3.37	3.56	33.05	5.67	2.32	1.31
6	Veliyanad	334.94	2285.84	7499.86	3.12	4.80	4.02	5.46	5.72	1.07	2.41
7	Champakulam	6777.24	1470.45	6991.84	4.66	1.88	3.88	6.07	6.93	1.38	2.37
8	Chengannur		370.04	503.64	109.39	140.27	311.86	51.52	12.19	9.60	4.43
9	Mavelikkara	0.24	32.79	1562.55	71.65	188.64	181.38	71.74	5.32	11.94	3.29
10	Bharanikavu	0.19	155.26	152.22	76.07	365.24	321.79	89.38	11.54	25.32	12.78
11	Haripad	205.09	525.81	2245.14	42.29	97.75	107.17	36.3	54.86	5.55	4.50
12	Muthukulam	62.79	6.77	89.30	43.77	144.72	142.16	54.31	39.00	7.40	2.99
	Blocks Total	10005.48	5099.42	19729.54	367.39	960.51	1116.68	417.90	184.18	87.66	57.69
	Municipalities	751.99	12.7	595.5	20.68	36.71	43.74	39.39	13.68	5.55	2.89
	District Total	10757.47	5112.12	20325.04	388.07	997.22	1160.42	457.29	197.86	93.21	60.58

Table: 14.2 Continued.....

(Area in Ha)											
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	Potato
1	2	13	14	15	16	17	18	19	20	21	22
1	Thaikkattusseri	6.34	3.62	2.79	3.56	13.70	2.26	2.00	0.05	2.99	
2	Pattanakad	8.03	3.44	4.60	1.87	13.97	2.47	1.63		3.47	0.03
3	Kanjikkuzhi	21.25	17.94	7.87	3.72	40.17	5.78	3.89	0.21	5.41	
4	Aryadu	3.66	2.28	1.35	0.16	12.39	0.24	1.44		2.19	
5	Ambalappuzha	3.92	2.88	2.17	0.21	8.28	0.68	0.72		2.15	
6	Veliyanad	6.22	2.61	3.73	0.47	22.90	0.96	4.50		2.64	
7	Champakulam	9.99	3.73	5.79	0.54	32.45	0.82	7.73		3.45	
8	Chengannur	19.86	29.42	7.24	3.48	53.39	4.37	20.10	0.28	6.83	
9	Mavelikkara	6.41	7.86	8.61	3.10	16.31	2.15	2.76	0.05	9.70	
10	Bharanikavu	27.23	28.90	23.82	2.09	43.85	3.79	7.88		27.00	
11	Haripad	20.08	32.20	23.70	2.09	45.95	1.50	2.33		11.76	
12	Muthukulam	9.24	9.90	18.22	3.71	18.90	3.33	3.12		8.62	
	Blocks Total	142.23	144.77	109.89	25	322.26	28.35	58.1	0.59	86.21	0.03
	Municipalities	3.98	3.22	6.73	0.59	12.25	1.38	1.11		6.22	
	District Total	146.21	147.99	116.62	25.59	334.51	29.73	59.21	0.59	92.43	0.03

Table: 14.2 Continued.....

(Area in Ha)												
Sl. No.	Name of Block	Carrot	Cabbage	Tomato	Cauli flower	Beans	Other vegetables	Elephant foot yam	Colocasia	Yam	Koorka	Sweet potato
1	2	23	24	25	26	27	28	29	30	31	32	33
1	Thaikkattusseri		0.09	0.18	0.08		3.28	5.73	20.62	2.46	0.29	0.42
2	Pattanakad			0.27			10.00	6.45	16.43	4.04		0.25
3	Kanjikkuzhi			0.53			14.40	10.67	22.17	9.22	0.94	0.92
4	Aryadu			0.04			0.84	5.05	12.56	2.96		0.02
5	Ambalappuzha		0.05	0.39	0.09	0.04	0.23	2.66	5.51	1.88		0.02
6	Veliyanad							4.05	2.72	2.03		0.07
7	Champakulam			0.21			0.18	3.31	4.67	1.88		
8	Chengannur						2.40	179.58	204.80	25.27		
9	Mavelikkara			0.06				52.00	47.69	8.88		
10	Bharanikavu							133.26	165.32	46.50		0.07
11	Haripad	0.05	0.24	0.24	0.16			24.32	34.26	9.75		
12	Muthukulam			0.63				41.55	83.61	16.32		0.07
	Blocks Total	0.05	0.38	2.55	0.33	0.04	31.33	468.63	620.36	131.19	1.23	1.84
	Municipalities			0.09			1.01	27.33	41.31	12.55	0.02	0.09
	District Total	0.05	0.38	2.64	0.33	0.04	32.34	495.96	661.67	143.74	1.25	1.93

Table: 14.2 Continued.....

(Area in Ha)										
Sl. No.	Name of Block	Nana kizhangu	Pulses	Ginger	Turmeric	Sesamum	Coconut	Arecanut	Cashew	Pepper
1	2	34	35	36	37	38	39	40	41	42
1	Thaikkattusseri	0.47	1.55	0.12	0.23		2870.05	91.10	193.53	17.14
2	Pattanakad			0.15	0.15		3338.89	161.45	185.35	43.61
3	Kanjikkuzhi	0.21	20.67	0.26	0.29		3894.38	68.33	276.70	38.08
4	Aryadu	0.02	10.68	0.17	0.29	0.15	1417.92	30.22	182.28	9.06
5	Ambalappuzha			0.23	0.28		1177.26	65.93	103.69	23.76
6	Veliyanad			0.78	0.41		1766.16	90.64	0.91	5.32
7	Champakulam			0.36	0.35		1631.52	127.09	6.44	10.90
8	Chengannur	7.51		36.66	7.43		1853.74	86.44	76.81	69.36
9	Mavelikkara	1.46		8.86	3.16	21.34	3331.67	70.68	205.71	51.08
10	Bharanikavu	15.4		28.17	8.88	15.36	2898.86	156.10	212.78	125.49
11	Haripad	2.06		4.86	3.94	9.30	4251.84	142.08	276.68	85.62
12	Muthukulam	2.94	1.92	6.65	6.43	13.90	5295.29	178.52	251.32	123.50
	Blocks Total	30.07	34.82	87.27	31.84	60.05	33727.58	1268.58	1972.2	602.92
	Municipalities	2.28	0.1	2.14	1.16		3258.52	118.1	137.82	35.97
	District Total	32.35	34.92	89.41	33.00	60.05	36986.1	1386.68	2110.02	638.89

Table: 14.2 Continued.....

(Area in Ha)										
Sl. No.	Name of Block	Jack	Mango tree	Tamarind	Clove	Nutmeg	Cocoa	Pappaya	Banana	Betel leaves
1	2	43	44	45	46	47	48	49	50	51
1	Thaikkattusseri	76.00	197.42	26.66		29.75	2.92	36.31	4.77	1.11
2	Pattanakad	169.38	356.20	61.16		17.87	3.06	61.51	4.17	0.49
3	Kanjikkuzhi	82.38	227.91	58.34		11.90	3.57	42.14	11.58	0.83
4	Aryadu	77.52	211.70	18.26		4.72	0.43	42.62	0.26	0.03
5	Ambalappuzha	75.98	196.38	32.24		5.96	0.60	66.92	3.77	0.03
6	Veliyanad	45.30	239.85	16.46	0.99	4.45	13.37	68.70	11.67	
7	Champakulam	79.14	267.17	32.08	0.13	8.96	14.58	36.47	9.77	
8	Chengannur	299.22	256.21	25.93	3.04	85.05	17.93	97.30	344.19	28.69
9	Mavelikkara	213.93	299.99	19.05	0.32	7.53	0.96	85.33	22.67	0.53
10	Bharanikavu	402.32	335.94	29.22	2.11	7.60		134.61	116.86	22.10
11	Haripad	191.37	421.51	40.37	1.62	11.20	2.52	127.38	71.59	0.28
12	Muthukulam	226.50	374.34	17.29	0.37	4.11	0.41	130.44	0.91	0.22
	Blocks Total	1939.04	3384.62	377.06	8.58	199.10	60.35	929.73	602.21	54.31
	Municipalities	259.68	401.04	25.61	0.65	32.5	7.19	79.96	28.98	0.11
	District Total	2198.72	3785.66	402.67	9.23	231.60	67.54	1009.69	631.19	54.42

Table: 14.2 Continued.....

(Area in in Ha)

Sl. No.	Name of Block	Pineapple	Plantain	Sugar cane	Lemon grass	Fodder grass	Green Manure Plants	Teak	Medicinal Plants
1	2	52	53	54	55	56	57	58	59
1	Thaikkattusseri	2.55	95.32			10.01	6.66	21.19	4.70
2	Pattanakad	4.01	147.92			7.20	31.10	42.21	9.50
3	Kanjikkuzhi	1.43	114.59			12.47	8.54	25.20	8.91
4	Aryadu	0.31	63.71			4.08	31.03	21.10	2.07
5	Ambalappuzha	1.04	63.88			1.11	12.62	12.88	3.34
6	Veliyanad	0.74	88.78			0.57	13.59	12.56	4.66
7	Champakulam	0.64	182.96		0.08	0.71	16.12	16.40	8.71
8	Chengannur	13.77	170.18	72.43	0.66	8.62	54.47	123.38	10.14
9	Mavelikkara	10.23	121.49			4.86	35.83	29.50	0.73
10	Bharanikavu	39.21	185.36			13.82	49.57	116.07	4.24
11	Haripad	3.36	254.18	0.31	0.14	2.57	126.82	38.61	3.04
12	Muthukulam	1.39	177.61			3.71	96.75	46.70	3.41
	Blocks Total	78.68	1665.98	72.74	0.88	69.73	483.10	505.80	63.45
	Municipalities	2.79	117.88	0.06		1.9	45.02	86.02	5.9
	District Total	81.47	1783.86	72.80	0.88	71.63	528.12	591.82	69.35

Table: 14.3

BLOCK WISE AREA OF CROPS 2011-12

Sl. No.	Name of Block	Paddy			Tapioca			Drumstick	Amaranthus	Brinjal
		Autumn	Winter	Summer	Autumn	Winter	Summer			
1	2	3	4	5	6	7	8	9	10	11
1	Thaikkattusseri	35.46	27.01		0.97	1.45	6.18	16.38	3.66	2.15
2	Pattanakad	74.78	10.56		1.28	2.92	9.87	8.85	7.79	4.39
3	Kanjikkuzhi	75.60	132.75		4.57	3.16	12.76	46.86	15.47	6.97
4	Aryadu	51.69	5.39	38.46	3.14	0.52	9.64	9.34	10.64	3.46
5	Ambalappuzha	2311.51	168.43	1294.60	0.5	2.16	3.15	25.44	4.43	2.52
6	Veliyanad	594.09	4701.57	4545.05	0.56	6.55	7.09	8.77	8.57	1.30
7	Champakulam	5660.86	2997.99	6055.85	0.59	1.67	4.42	9.99	5.76	2.28
8	Chengannur	0.41	194.23	387.04	122.12	163.12	308.55	64.24	11.53	14.46
9	Mavelikkara	2.77	30.95	1229.55	70.29	182.06	174.61	54.06	7.63	12.71
10	Bharanikavu	4.61	87.18	12.27	72.46	354.93	336.38	88.08	17.87	20.36
11	Haripad	347.56	741.36	2517.85	38.34	61.29	82.31	62.12	40.77	7.31
12	Muthukulam	27.07	5.58	166.02	44.82	112.83	139.06	70.54	39.90	8.47
	Blocks Total	9186.41	9103	16246.69	359.64	892.66	1094.02	464.67	174.02	86.38
	Municipalities	779.62	12.09	923.10	19.4	46.53	38.61	48.57	14.28	3.92
	District Total	9966.03	9115.09	17169.79	379.04	939.19	1132.63	513.24	188.3	90.3

Table: 14.3 Continued.....

(Area in Ha)										
Sl. No.	Name of Block	Ladies finger	Bitter gourd	Snake gourd	Little gourd (Koval)	Ash gourd (Kumbalam)	Payar (Achinga)	Pumpkin (Mathan)	Cucumber (Vellari)	Bottle gourd
1	2	12	13	14	15	16	17	18	19	20
1	Thaikkattusseri	1.44	5.00	1.50	1.34	2.21	8.49	3.33	4.44	
2	Pattanakad	3.97	7.19	3.05	4.39	1.85	10.35	2.38	1.37	
3	Kanjikkuzhi	9.23	16.56	12.78	6.36	3.61	23.27	4.35	4.34	
4	Aryadu	2.37	4.13	2.37	2.11	0.11	12.51	1.31	2.29	
5	Ambalappuzha	1.00	2.61	1.62	1.90	0.08	5.84	0.47	0.44	
6	Veliyanad	5.46	5.87	3.43	5.07	0.78	30.54	0.64	4.47	
7	Champakulam	2.99	12.27	8.30	8.45	0.59	28.71	0.8	1.84	
8	Chengannur	4.24	18.6	34.03	8.87	3.16	64.04	8.09	24.11	2.36
9	Mavelikkara	3.32	7.70	9.78	11.69	6.04	16.83	3.03	2.25	
10	Bharanikavu	14.43	32.11	35.83	23.11	3.81	50.27	5.34	15.85	
11	Haripad	3.84	16.68	13.72	13.73	1.37	27.00	2.37	2.63	
12	Muthukulam	2.63	8.15	8.27	18.27	3.55	18.45	3.14	2.17	
	Blocks Total	54.92	136.87	134.68	105.29	27.16	296.3	35.25	66.2	2.36
	Municipalities	2.59	6.91	6.13	6.52	0.69	20.69	0.85	1.42	
	District Total	57.51	143.78	140.81	111.81	27.85	316.99	36.10	67.62	2.36

Table: 14.3 Continued.....

(Area in Ha)										
Sl. No.	Name of Block	Green chilli	Cabbage	Tomato	Cauli flower	Other vegetables	Elephant foot yam	Colocasia	Yam	Koorka
1	2	21	22	23	24	25	26	27	28	29
1	Thaikkattusseri	1.67	0.06	0.05	0.06	1.44	3.76	14.30	2.66	0.19
2	Pattanakad	3.82	0.03	0.42	0.06	8.47	7.44	15.82	4.86	0.03
3	Kanjikkuzhi	3.89		0.16		8.50	5.73	11.58	4.24	0.64
4	Aryadu	3.11		0.05		0.85	5.44	15.11	3.67	
5	Ambalappuzha	2.01				0.06	1.16	6.06	1.05	
6	Veliyanad	2.19				0.07	4.37	5.56	2.45	
7	Champakulam	4.11		0.09		0.07	2.15	2.82	1.36	
8	Chengannur	5.85	0.03			4.79	180.38	223.29	28.45	
9	Mavelikkara	11.78					40.54	78.24	12.13	0.18
10	Bharanikavu	25.14				0.03	139.09	186.59	68.19	
11	Haripad	9.20		0.10			18.22	33.28	6.17	
12	Muthukulam	9.17		0.19			44.93	72.29	14.63	0.02
	Blocks Total	81.94	0.15	1.06	0.12	24.28	453.21	664.94	149.86	1.06
	Municipalities	6.46				1.11	29.14	47.72	8.90	
	District Total	88.40	0.15	1.06	0.12	25.39	452.35	713.66	158.76	1.06

Table: 14.3 Continued.....

(Area in Ha)										
Sl. No.	Name of Block	Sweet potato	Nana kizhangu	Pulses	Ginger	Turmeric	Coconut	Arecanut	Cashew	Pepper
1	2	30	31	32	33	34	35	36	37	38
1	Thaikkattusseri	0.18	0.18		0.20	0.22	2908.91	85.88	187.15	12.96
2	Pattanakad	0.21	0.12		0.03	0.09	3566.24	215.17	176.63	53.71
3	Kanjikkuzhi	0.26		52.57	0.03	0.03	4017.76	71.83	516.25	37.53
4	Aryadu	0.14	0.10	0.05	0.47	0.38	1995.18	62.01	299.27	16.85
5	Ambalappuzha				0.09	0.12	1112.94	41.56	47.17	18.12
6	Veliyanad	0.09	0.08		0.46	0.44	1936.03	102.14	0.07	4.37.00
7	Champakulam				0.37	0.41	1832.22	167.88	7.64	11.01
8	Chengannur		7.9		46.27	5.29	2060.01	78.56	63.65	74.54
9	Mavelikkara	0.06	5.41		7.79	2.96	3244.57	61.68	190.58	40.95
10	Bharanikavu	1.42	19.68		23.00	3.55	2985.37	156.8	198.69	121.17
11	Haripad		0.59	1.57	5.01	2.64	4308.57	244.21	401.93	112.93
12	Muthukulam		1.90	4.49	6.70	3.30	5364.00	180.17	300.26	158.23
	Blocks Total	2.36	35.96	58.68	90.42	19.43	35331.80	1467.89	2389.29	662.37
	Municipalities		0.73	0.89	3.22	1.17	3224.14	147.54	170.52	62.39
	District Total	2.36	36.69	89.87	93.64	20.60	38555.94	1615.43	2559.81	724.76

Table: 14.3 Continued.....

(Area in Ha)										
Sl. No.	Name of Block	Jack	Mango tree	Tamarind	Clove	Nutmeg	Cocoa	Pappaya	Banana	Pine apple
1	2	39	40	41	42	43	44	45	46	47
1	Thaikkattusseri	65.98	173.66	21.58		17.22	1.77	29.30	3.20	2.08
2	Pattanakad	161.55	296.77	52.69		14.88	2.44	64.46	1.78	4.75
3	Kanjikkuzhi	92.23	173.82	69.15		16.02	7.06	45.28	6.34	3.54
4	Aryadu	121.06	282.53	42.72	0.05	6.75	1.33	61.41	0.95	1.06
5	Ambalappuzha	52.65	161.26	18.57		5.06	2.20	42.78	0.90	1.04
6	Veliyanad	71.21	230.63	20.64	0.66	1.98	10.30	48.61	14.70	0.73
7	Champakulam	145.14	329.95	40.08	0.31	5.85	27.82	59.34	11.37	0.71
8	Chengannur	295.86	257.42	28.53	3.45	79.96	16.86	97.47	269.01	13.88
9	Mavelikkara	202.46	235.87	13.71	0.04	9.07	2.92	80.72	13.44	8.01
10	Bharanikavu	425.84	347.86	32.32	5.31	3.70	0.01	132.62	100.54	34.53
11	Haripad	292.82	701.79	80.85	0.58	8.03	2.10	149.27	10.24	2.17
12	Muthukulam	222.72	298.47	18.93	0.61	6.24	0.27	135.31	3.41	4.36
	Blocks Total	2149.52	3490.03	439.77	11.01	174.76	75.08	946.57	435.88	76.86
	Municipalities	238.36	363.32	28.28	0.33	36.85	5.58	94.47	19.07	3.18
	District Total	2387.88	3853.35	468.05	11.34	211.61	80.66	1041.04	454.95	80.04

Table: 14.3 Continued.....

(Area in Ha)											
Sl. No.	Name of Block	Plantain	Orange	Sugar cane	Sesamum	Lemon grass	Fodder grass	Green Manure Plants	Vanila	Teak	Medicinal Plants
1	2	48	49	50	51	52	53	54	55	56	57
1	Thaikkattusseri	88.48					7.98	9.45	0.05	16.74	4.59
2	Pattanakad	200.47					3.15	14.98	0.09	50.21	9.59
3	Kanjikkuzhi	119.01					13.69	15.64		26.84	11.89
4	Aryadu	104.18					6.91	46.11		28.53	2.22
5	Ambalappuzha	46.10				0.12	3.19	14.76		8.19	1.84
6	Veliyanad	131.82					0.27	14.45		8.11	0.78
7	Champakulam	217.17					0.29	20.94		14.87	3.48
8	Chengannur	181.39		94.73		0.20	6.65	93.39		150.27	10.24
9	Mavelikkara	101.60				0.28	4.50	38.04		44.47	0.40
10	Bharanikavu	210.93			8.17		14.22	63.00		116.84	7.09
11	Haripad	222.78	0.09			0.15	6.48	121.01	0.011	44.64	3.37
12	Muthukulam	127.23		0.16	4.06		8.92	93.85		46.94	4.18
	Blocks Total	1751.16	0.09	94.89	12.23	0.75	76.25	545.62	0.25	556.65	59.67
	Municipalities	158.41		0.04	1.70		2.37	53.44		88.89	5.31
	District Total	1909.57	0.09	94.93	13.93	0.75	78.62	599.06	0.25	645.54	64.98

Table: 14.4

BLOCK WISE PRODUCTION OF CROPS 2012-13**(Production in Tonnes)**

Sl. No.	Name of Block	Rice			Black Pepper	Cured Ginger	Cured Turmeric	Areca nut	Tamarind	Jack (Million No.)	Banana	Plantain
		Autumn	Winter	Summer								
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Thaikkattusseri	158.94	121.83		5.12	0.16	0.19	33.32	10.15	0.14	22.80	431.89
2	Pattanakad	228.77	32.45		6.36	0.15	0.10	35.25	25.97	0.21	13.82	609.57
3	Kanjikkuzhi	95.33	75.09		8.91	0.29	0.44	23.90	18.32	0.12	49.44	500.64
4	Aryadu	43.88	0.83	41.09	1.64	0.18	0.24	8.67	19.72	0.10	1.62	313.89
5	Ambalappuzha	7020.33	181.79	1332.19	4.41	0.18	0.23	13.14	35.57	0.09	26.41	270.78
6	Veliyanad	918.73	6969.83	22764.62	1.27	2.73	0.97	92.49	26.61	0.06	35.68	656.79
7	Champakulam	21003.13	4888.39	19045.22	2.49	0.86		125.72	54.44	0.11	42.17	1809.11
8	Chengannur		1067.52	1633.72	27.32	151.58	25.26	48.98	29.18	2.41	3415.42	1752.85
9	Mavelikkara	0.42	63.10	4340.44	15.42	18.88	5.37	21.18	15.21	0.56	160.92	824.31
10	Bharanikavu	0.46	299.87	272.62	17.94	64.59	16.60	54.41	30.70	1.66	777.35	1618.56
11	Haripad	699.05	1458.36	5931.20	14.72	7.45	4.68	62.91	35.08	0.40	223.74	822.52
12	Muthukulam	104.49	10.18	82.13	34.58	8.87	6.55	129.36	13.62	0.38	5.89	562.66
	Blocks Total	30273.53	15169.24	55443.23	140.18	255.92	60.63	649.33	314.57	6.24	4775.26	10173.57
	Municipalities	2088.79	19.12	1599.40	7.39	5.13	1.87	32.24	24.49	0.7	226.40	625.3
	District Total	32362.32	15188.36	57042.63	147.57	261.05	62.50	681.57	339.06	6.94	5001.66	10798.87

Table: 14.4 Continued.....

(Production in Tonnes)											
Sl. No.	Name of Block	Pineapple	Tapioca	Mango	Sugar cane	Sesamum	Coconut (Million No.)	Nutmeg	Cashew	Cocoa	Betel leaves
1	2	14	15	16	17	18	19	20	21	22	23
1	Thaikkattusseri	7.32	294.78	539.74			19.52	7.85	34.25	1.34	51.20
2	Pattanakad	13.89	229.26	898.33			22.53	5.32	27.61	2.17	28.52
3	Kanjikkuzhi	4.13	566.60	887.25			24.53	3.95	46.20	2.49	34.44
4	Aryadu	0.46	179.98	510.40		0.03	5.78	0.37	28.25	0.12	2.56
5	Ambalappuzha	4.85	179.54	365.26			6.98	0.61	20.84		2.92
6	Veliyanad	4.97	333.32	2263.70			6.68	2.21		11.65	
7	Champakulam	3.88	300.44	3933.01			13.15	4.69	4.54	19.59	
8	Chengannur	71.43	24689.47	1599.77	638.83		19.03	52.30	42.93	49.14	2867.85
9	Mavelikkara	80.32	9587.77	989.06		6.18	13.59	5.01	41.96		24.03
10	Bharanikavu	343.60	20103.11	813.64		3.53	9.24	3.88	42.55		805.76
11	Haripad	13.47	6041.31	1128.38		6.27	24.83	6.67	53.39	2.41	4.58
12	Muthukulam	4.41	6984.98	972.16		6.72	38.40	0.93	59.81		2.76
	Blocks Total	552.73	69490.56	14900.70	638.83	22.73	204.26	93.79	402.33	88.91	3824.62
	Municipalities	16.05	3427.91	1320.51			21.17	11.77	33.75	20.05	3.59
	District Total	568.78	72918.47	16221.21	638.83	22.73	225.43	105.56	436.08	108.96	3828.21

Table: 14.5

BLOCK WISE PRODUCTION OF CROPS 2011-12**(Production in Tonnes)**

Sl. No.	Name of Block	Rice			Canegur	Black Pepper	Cured Ginger	Cured Turmeric	Arecanut	Tamarind	Jack (Million No.)
		Autumn	Winter	Summer							
1	2	3	4	5	6	7	8	9	10	11	12
1	Thaikkattusseri	80.37	57.85			2.20	0.24	0.17	22.95	10.02	0.10
2	Pattanakad	125.60	7.82			8.32			59.77	26.28	0.14
3	Kanjikkuzhi	114.84	236.95			3.15	0.02	0.02	24.76	29.23	0.12
4	Aryadu	124.67	1.92	92.02		3.03	0.72	0.28	24.57	60.09	0.13
5	Ambalappuzha	7658.61	335.07	3780.70		4.24	0.05	0.05	13.91	27.38	0.14
6	Veliyanad	1522.23	16321.22	16357.84		1.30	1.41	0.89	136.16	42.84	0.15
7	Champakulam	17840.93	8713.86	18401.25		1.80	1.18		103.49	73.20	0.26
8	Chengannur	1.03	593.00	1240.14	833.72	20.05	210.99	22.42	45.64	58.81	1.02
9	Mavelikkara	4.02	65.82	3106.85		6.67	16.39	3.55	16.12	26.13	0.49
10	Bharanikavu	0.60	160.30	18.29		17.32	36.93	5.40	44.08	45.63	0.86
11	Haripad	487.33	1788.87	7430.79		19.87	7.48	3.06	64.37	70.94	0.60
12	Muthukulam	47.14	6.57	207.57		38.13	9.84	3.59	52.31	18.85	0.73
	Blocks Total	28007.37	28289.25	50635.45	833.72	126.08	285.25	39.43	608.13	489.40	4.74
	Municipalities	2515.01	11.74	2521.49		10.08	12.99	2.08	51.11	27.81	0.86
	District Total	30522.38	28300.99	53156.94	833.72	136.16	298.24	41.51	659.24	517.21	5.60

Table: 14.5 Continued.....

(Production in Tonnes)												
Sl. No.	Name of Block	Banana	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	23
1	Thaikkattusseri	20.34	443.37	7.58	160.10	104.30		25.05	5.04	45.66	1.41	28.52
2	Pattanakad	9.03	557.30	11.02	199.62	344.60		27.06	4.61	23.66	1.97	11.88
3	Kanjikkuzhi	29.55	460.92	10.00	340.64	296.62		19.09	4.69	100.66	4.03	28.16
4	Aryadu	5.82	443.28	1.96	139.09	148.06		5.86	0.56	41.59	0.36	4.20
5	Ambalappuzha	5.04	222.89	5.43	177.32	175.05		6.58	0.56	5.94	1.85	
6	Veliyanad	123.61	942.51	4.56	367.42	195.31		14.80	2.58		11.505	
7	Champakulam	41.61	1448.95	5.81	162.68	307.32		11.04	1.60	1.29	21.25	
8	Chengannur	2432.16	1576.27	76.72	16802.47	1277.73		19.68	30.94	24.50	51.86	733.75
9	Mavelikkara	97.85	1060.60	42.51	10247.04	551.56		7.18	3.80	32.01		42.42
10	Bharanikavu	584.43	1548.43	243.33	21731.54	704.08	1.98	10.72	1.64	43.51		753.13
11	Haripad	71.29	513.50	10.57	2744.20	1346.56		23.78	2.25	104.10	0.79	
12	Muthukulam	16.09	596.07	16.13	6142.78	1011.17	1.92	30.13	1.16	86.17		10.65
	Blocks Total	3436.82	9814.09	435.62	59214.9	6462.36	3.90	200.97	59.43	509.09	95.02	1612.71
	Municipalities	167.15	838.08	23.61	1861.82	536.64	0.68	18.31	16.49	38.54	7.97	16.60
	District Total	3603.97	10652.17	459.23	61076.72	6999.00	4.58	219.28	75.92	547.63	102.99	1629.31

Table: 14.6

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

Year	Rice			Sugar cane	Canegur	Black pepper	Green chillies	Pulses	Cured Ginger	Cured Turmeric
	Autumn	Winter	Summer							
1	2	3	4	5	6	7	8	9	10	11
2012-2013	32362	15188	57043	639		148	84	30	261	63
2011-2012	30522	28301	53157		834	136	80	57	298	42
2010-2011	23856	9235	58234	475		151	100	45	264	31

Year	Arecanut	Tamarind	Mango	Jack (Million Nos)	Banana	Other plantain	Pineapple	Tapioca	Sweet potato
1	12	13	14	15	16	17	18	19	20
2012-2013	682	339	16221	7	5002	10799	569	72919	21
2011-2012	659	517	20215	6	3604	10652	459	61077	21
2010-2011	769	848	18972	8	5202	13311	502	76992	41

Year	Pappaya	Drumstick	Sesamum	Coconut (Million Nos)	Nutmeg	Rubber	Cocoa	Raw cashew nuts	Betel leaves	Clove (dry)
1	21	22	23	24	25	26	27	28	29	30
2012-2013	9255	277	23	233	106	6885	109	436	3828	1
2011-2012	6999	374	5	219	76	6890	103	548	1629	1
2010-2011	10941	444	6	264	116	6740	147	493	1526	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
Coconut	Cake to seeds crushed	60 percent
	Copra to nuts	6,773 nuts gives one tonne of copra (average), presently it is 7250-7500 nuts due to mite attack
Pepper	Cake to copra	38 percent
	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
Areca nut	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 the district was 4420 hectares and production 6885 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 hectare 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 this district is recorded as 13013 hectares and a production of 13362 tonnes during the same period.

Table: 15.1

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: 15.2

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

Table: 15.3

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

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 development of cattle wealth and poultry are also significant to the production of major live stock product of nutritional standard. Alappuzha is poor in cattle wealth because of the scarcity of green grass, as most of the area is water logged. As per 1987 live stock census, district had cattle population of 2.95 lakhs and poultry population of 12.9 lakhs. Based on 2007 live stock census report district had cattle population of 78045 and poultry population of 1107523.

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
11878	228	6	484	179	1	21	0	5	2	0

Table: 16.2

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

Primary Societies	269
Regional Unions	0
Total	269
Anand Mode (APCOS)	243
Traditional	26
Total	269

Table: 16.3

**OUTBREAKS, ATTACKS, DEATHS ETC. 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
0	1	0	74117	0	0	0	2162	0	0	0	804
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	2077	0	0	0	379	0	0	0	211
Ranikhet				Fowl Pox				Infectious Bursal Disease			
Out Break	Attack	Death	Protected/ Vaccinated	Out Break	Attack	Death	Protected/ Vaccinated	Out Break	Attack	Death	Protected/ Vaccinated
0	0	0	497178	0	0	0	0	0	0	0	1200
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	272585	0	0	0	464961	0	1	0	1315674

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. Fisheries in Alappuzha district occupy a very important position in the industrial sector in Kerala. District has the benefit with the immense wealth of marine and inland fishing. 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. This is one of the well developed coastal district in southern part of Kerala State which extends 82 km consisting 54 fishing villages. This stretched between Pallithode in the north and Valiazheekkal in the south. Vembanad and Kayamkulam backwaters and the network of rivers and canals enrich inland fish farming. Both brackish water fish farming and fresh water fish farming are done in this district. There are 30 marine and 24 inland fishing villages. Based on 2011-12 report annual fish production was 127385 MT from marine and 18284 from inland sector. Fisher folk population was 167794 with a breakup of 107204 from marine and 60590 from inland during same year. Fishermen development welfare co-operative societies are functioning in this district extends all basic support and assistants for the development of inland fish farming.

Table: 17.1

FRESH WATER RESOURCES IN ALAPPUZHA 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	340	322.56	303	44.24	-	-	3	16.18
2010	340	322.56	303	44.24	-	-	3	16.18

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 ALAPPUZHA DISTRICT

Sl.No.	Name of Villages
1	Kayamkulam
2	Kochiyard Jetty
3	Chodatheruvu
4	Payippadu
5	Karuvatta
6	Chenkole
7	Muhamma
8	Thirunellur
9	Panavally
10	Arukutty
11	Perumpalam
12	Aroor
13	Thuravoor (North)
14	Thuravoor (South)
15	Valayar (East)
16	Mannar Sangham
17	Thalavady
18	Noornadu
19	Eraviperoor
20	Marakkattu Ward
21	Ramankary
22	Kavalam
23	Thevarvattom
24	Thanneermukkom

Total: 17.4

**SPECIES WISE INLAND FISH LANDINGS IN ALAPPUZHA
(QTY in MT)**

2008-2009		
Sl. No.	Name of Fish	Quantity
1	Prawn	2220
2	Etroplus	1939
3	Murrels	780
4	Mulletts	1038
5	Cat fish	1057
6	Jew fish	805
7	Tilapia	1884
8	Labeo fimbriatus	255
9	Barbus	47
10	Mrigal	820
11	Crabs	217
12	Common crabs	612
13	Catla	597
14	Gourami	0
15	Chamos	116
16	Eels	15
17	Labeo Rohitha	767
18	Shrimp	0
19	Mussel	13
20	Edible Oyster	87
21	Miscellaneous	758
	Total	14027

2009-2010		
Sl. No.	Name of Fish	Quantity
1	Prawn	2264
2	Etroplus	1934
3	Murrels	786
4	Mulletts	1034
5	Cat fish	1063
6	Jew fish	796
7	Tilapia	1860
8	Labeo fimbriatus	257
9	Barbus	47
10	Mrigal	1030
11	Crabs	270
12	Common crabs	732
13	Catla	795
14	Gourami	0
15	Chamos	117
16	Eels	15
17	Labeo Rohitha	890
18	Shrimp	605
19	Mussel	17
20	Edible Oyster	54
21	Miscellaneous	706
	Total	15272

Source: Inland Fisheries Statistics, Dept of Fisheries

WETLAND

Wetlands play a vital role in maintaining the 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 habitant. 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

AMBALAPPUZHA BLOCK

Area (Ha)

Sl.No.	Category	Ambalappuzha North	Ambalappuzha South	Punnapra North	Punnapra South	Purakkad
1	Mundakan		58.88			760.71
2	Mud flats					
3	Other land use	410.00	785.67	566.25	857.47	675.14
4	Paddy converted to mixed trees					
5	Paddy converted to other crops					
6	Paddy converted to banana					
7	Paddy converted to banana and tapioca					
8	Paddy converted to built up area				6.85	
9	Paddy converted to clay mining					
10	Paddy converted to coconut			10.52	15.36	
11	Paddy converted to mixed crop			6.25	3.1	
12	Paddy converted to rubber					
13	Paddy converted to tapioca					
14	Paddy lands left as cultivable wasteland	17.61	11.94			
15	Punja and prawn culture	95.10				
16	Punja	289.86	625.09	125.00	459.77	419.26
17	Virippu					
18	Virippu and punja			99.41	84.96	
19	Virippu and mundakan			5.42	26.56	211.86
20	Virippu and prawn culture					
21	Water bodies	24.08	38.18	9.36	47.73	173.79
22	Waterlogged area					
	Panchayat Total	836.65	1519.76	822.21	1501.80	2240.76
	Block Total	6921.18				

Table: 18.2

ARYADU BLOCK

Area (Ha)

Sl. No.	Category	Aryadu	Mannancheri	Mararikulam South	Muhamma
1	Mundakan				
2	Mud flats				
3	Other land use	397.36	1741.75	1695.61	1104.02
4	Paddy converted to mixed trees		2.16		
5	Paddy converted to other crops				
6	Paddy converted to banana				
7	Paddy converted to banana and tapioca				
8	Paddy converted to built up area		38.74	12.96	11.80
9	Paddy converted to clay mining				
10	Paddy converted to coconut		12.95	4.88	19.24
11	Paddy converted to mixed crop	5.17	85.70	97.58	42.70
12	Paddy converted to rubber				
13	Paddy converted to tapioca				
14	Paddy lands left as cultivable wasteland	23.84			
15	Punja and prawn culture				
16	Punja	124.82	0.52		
17	Virippu				
18	Virippu and punja				
19	Virippu and mundakan	32.92	182.34	51.65	33.92
20	Virippu and prawn culture				
21	Water bodies	817.37	1910.58	19.62	1497.02
22	Waterlogged area				
	Panchayat Total	1401.48	3974.74	1882.30	2708.70
	Block Total		9967.23		

Table: 18.3

BHARANIKAVU BLOCK

Area (Ha)

Sl. No.	Category	Bharanikavu	Chunakkara	Mavelikkara - Thamarakulam	Nooranadu	Palamel	Vallikkunnam
1	Mundakan			158.30	309.46	318.05	284.98
2	Mud flats						
3	Other land use	1696.11	1315.65	1529.13	1470.39	2181.18	1569.03
4	Paddy converted to mixed trees				7.74	0.09	2.28
5	Paddy converted to other crops						
6	Paddy converted to banana		0.53	10.42	14.68	2.55	
7	Paddy converted to banana and tapioca		17.77				
8	Paddy converted to built up area	22.85	3.40	1.00	3.56	2.71	39.34
9	Paddy converted to clay mining				89.01	110.06	
10	Paddy converted to coconut	214.24	25.57	29.54	8.94	8.07	67.09
11	Paddy converted to mixed crop	94.05	30.14	25.37	4.52	11.38	85.67
12	Paddy converted to rubber			3.54	17.81		4.23
13	Paddy converted to tapioca						4.92
14	Paddy lands left as cultivable wasteland					10.24	
15	Punja and prawn culture						
16	Punja	0.03		0.05	37.76		0.01
17	Virippu						
18	Virippu and punja						
19	Virippu and mundakan	515.55	437.79	150.83	0.68		75.54
20	Virippu and prawn culture						
21	Water bodies		0.29	35.52	37.04	26.08	10.40
22	Waterlogged area						
	Panchayat Total	2542.83	1831.14	1943.70	2001.59	2670.41	2143.49
	Block Total	13133.20					

Table: 18.4

CHAMPAKULAM BLOCK

Area (Ha)

Sl. No.	Category	Champakulam	Edathwa	Kainakari	Nedumudi	Thakazhi	Thalavadi
1	Mundakan						
2	Mud flats						
3	Other land use	518.89	489.27	639.62	671.29	543.61	699.86
4	Paddy converted to mixed trees						
5	Paddy converted to other crops						
6	Paddy converted to banana						
7	Paddy converted to banana and tapioca						
8	Paddy converted to built up area		2.09			1.02	11.84
9	Paddy converted to clay mining						
10	Paddy converted to coconut		18.78	608.02		2.92	24.32
11	Paddy converted to mixed crop						
12	Paddy converted to rubber						
13	Paddy converted to tapioca						
14	Paddy lands left as cultivable wasteland		7.88	63.27			
15	Punja and prawn culture						
16	Punja	1518.54	1089.58	2480.04	571.80	1722.2	726.14
17	Virippu						
18	Virippu and punja	106.23		783.75	681.47		
19	Virippu and mundakan		0.18				
20	Virippu and prawn culture						
21	Water bodies		157.58	875.55	175.02	256.98	134.06
22	Waterlogged area						
	Panchayat Total	2143.66	1765.36	5450.25	2099.58	2526.73	1596.22
	Block Total	15729.86					

Table: 18.5

CHENGANNUR BLOCK

SI. No.	Category	Area (Ha)							
		Ala	Budhanoor	Cheriyannadu	Mulakuzha	Pandanadu	Puliyur	Thiruvannandoor	Venmoni
1	Mundakan	174.91	371.57	151.33	134.45	194.45	381.74	127.96	107.91
2	Mud flats								
3	Other land use	970.21	1380.28	1092.42	1971.71	576.50	681.18	516.74	1410.24
4	Paddy converted to mixed trees								
5	Paddy converted to other crops						6.28		
6	Paddy converted to banana	4.79			11.85		5.51	20.29	
7	Paddy converted to banana and tapioca								
8	Paddy converted to built up area	8.67	6.67		2.82	11.89		5.49	
9	Paddy converted to clay mining	17.02	14.7	7.56	7.94		8.68	4.77	
10	Paddy converted to coconut	1.55	130.27	40.71	0.44	174.33	23.49	25.82	11.89
11	Paddy converted to mixed crop	18.35	19.88	6.37	10.55	18.95	26.48	7.33	6.91
12	Paddy converted to rubber				9.55				
13	Paddy converted to tapioca				2.53	3.98			
14	Paddy lands left as cultivable wasteland	8.41		15.24	38.43	6.86		6.45	
15	Punja and prawn culture								
16	Punja		137.39	43.44	17.50	25.77	5.24	107.56	278.84
17	Virippu								
18	Virippu and punja								
19	Virippu and mundakan		15.58	8.92			5.95		2.14
20	Virippu and prawn culture								
21	Water bodies		72.39	40.64	3.30	78.52	13.93	23.63	82.36
22	Waterlogged area								
	Panchayat Total	1203.91	2148.73	1406.63	2211.07	1091.25	1158.48	846.04	1900.29
	Block Total	11966.40							

Table: 18.6

HARIPAD BLOCK

Sl. No.	Category	Area (Ha)							
		Cheruthana	Haripad	Karthikappalli	Karuvatta	Kumarapuram	Pallippadu	Thrikkunna ppuzha	Veeyapuram
1	Mundakan								
2	Mud flats								
3	Other land use	413.07	483.26	651.64	635.54	1097.66	756.95	966.86	347.91
4	Paddy converted to mixed trees								
5	Paddy converted to other crops								
6	Paddy converted to banana						2.54		
7	Paddy converted to banana and tapioca								
8	Paddy converted to built up area	4.33	10.84	13.14		11.19	10.59		3.26
9	Paddy converted to clay mining								
10	Paddy converted to coconut	27.62	19.19	20.65		23.46	230.82		0.87
11	Paddy converted to mixed crop	10.66	9.24	20.07		25.37	19.45		3.31
12	Paddy converted to rubber								
13	Paddy converted to tapioca								
14	Paddy lands left as cultivable wasteland								
15	Punja and prawn culture								
16	Punja	284.35	0.08	0.18	0.1	0.07			0.01
17	Virippu								
18	Virippu and punja								
19	Virippu and mundakan	578.82	445.26	84.53	709.40	269.87	688.30	14.84	901.81
20	Virippu and prawn culture								
21	Water bodies	116.70	13.33	50.98	60.10	45.78	49.51	73.65	121.82
22	Waterlogged area							0.49	
	Panchayat Total	1435.55	981.20	841.19	1405.14	1473.40	1758.16	1055.84	1378.99
	Block Total	10329.47							

Table: 18.7

KANJIKKUZHI BLOCK

Area (Ha)

Sl. No.	Category	Cherthala South	Kadakkarappalli	Kanjikkuzhi	Mararikulam North	Thanneermukkam
1	Mundakan					
2	Mud flats					
3	Other land use	1788.73	869.96	1050.06	1586.74	2409.47
4	Paddy converted to mixed trees					
5	Paddy converted to other crops					
6	Paddy converted to banana					
7	Paddy converted to banana and tapioca					
8	Paddy converted to built up area	15.24	1.40	23.14	14.38	5.50
9	Paddy converted to clay mining					
10	Paddy converted to coconut			9.13		0.59
11	Paddy converted to mixed crop	79.49	23.98	106.65	137.64	31.63
12	Paddy converted to rubber					
13	Paddy converted to tapioca					
14	Paddy lands left as cultivable wasteland					
15	Punja and prawn culture					
16	Punja				0.04	
17	Virippu		23.54			106.54
18	Virippu and punja					
19	Virippu and mundakan	51.53		68.66	13.88	
20	Virippu and prawn culture					
21	Water bodies	29.62	27.89	5.97	17.39	1132.28
22	Waterlogged area					
	Panchayat Total	1964.61	946.77	1263.61	1770.07	3686.01
	Block Total	9631.07				

Table: 18.8

MAVELIKKARA BLOCK

Area (Ha)

Sl. No.	Category	Chennithala - Thripperunthura	Chettikku langara	Mannar	Mavelikkara - Thekkekkara	Thazhakkara
1	Mundakan	24.36				91.81
2	Mud flats					
3	Other land use	1159.75	1478.71	408.15	1671.28	1505.82
4	Paddy converted to mixed trees				4.93	
5	Paddy converted to other crops					
6	Paddy converted to banana			12.27	12.51	5.29
7	Paddy converted to banana and tapioca					0
8	Paddy converted to built up area		3.89		15.59	1.14
9	Paddy converted to clay mining	6.19				
10	Paddy converted to coconut	8.18	49.41	2.16	62.02	9.44
11	Paddy converted to mixed crop	0.22	10.63		39.47	6.12
12	Paddy converted to rubber				2.33	
13	Paddy converted to tapioca					8.72
14	Paddy lands left as cultivable wasteland		3.01			3.30
15	Punja and prawn culture					
16	Punja	7.43	0.87		0.52	33.96
17	Virippu					
18	Virippu and punja					
19	Virippu and mundakan	881.87	610.86	578.88	500.24	359.46
20	Virippu and prawn culture					
21	Water bodies	98.69	14.4	15.8		7.03
22	Waterlogged area					
	Panchayat Total	2186.69	2171.78	1017.26	2308.89	2032.09
	Block Total	9716.71				

Table: 18.9

MUTHUKULAM BLOCK

Sl. No.	Category	Area (Ha)							
		Arattupuzha	Cheppad	Chingoli	Devikulangara	Kandallur	Krishnapuram	Muthukulam	Pathiyur
1	Mundakan								
2	Mud flats								
3	Other land use	957.33	647.34	475.72	877.34	727.66	1060.03	911.96	989.00
4	Paddy converted to mixed trees			0.79				0.61	
5	Paddy converted to other crops								
6	Paddy converted to banana						0.38		4.34
7	Paddy converted to banana and tapioca								
8	Paddy converted to built up area	0.66	3.52	12.18	9.25	25.54	13.12	31.47	30.45
9	Paddy converted to clay mining								
10	Paddy converted to coconut	2.78	125.82	22.32	70.70	64.13	71.24	70.33	125.21
11	Paddy converted to mixed crop		11.23	40.84	43.25	41.58	62.40	19.40	22.97
12	Paddy converted to rubber								
13	Paddy converted to tapioca				2.06		3.97		
14	Paddy lands left as cultivable wasteland				1.55	2.29			
15	Punja and prawn culture								
16	Punja	0.02	2.41	0.03		0.05	0.01	0.31	1.92
17	Virippu								
18	Virippu and punja								
19	Virippu and mundakan	22.92	480.22	137.23	112.50	170.06	96.56	174.91	321.42
20	Virippu and prawn culture								
21	Water bodies	901.95	20.28	3.01	393.04	46.77	22.32	0.31	11.64
22	Waterlogged area	383.24						60.03	
	Panchayat Total	2268.90	1290.82	692.12	1509.69	1078.08	1330.03	1269.33	1506.95
	Block Total	10945.92							

Table: 18.10

PATTANAKAD BLOCK

Sl. No.	Category	Area (Ha)						
		Aroor	Ezhupunna	Kodamthuruthu	Kuthiyathodu	Pattanakad	Thuravoor	Vayalar
1	Mundakan							
2	Mud flats							
3	Other land use	892.75	745.18	555.41	658.29	1170.91	967.43	1067.91
4	Paddy converted to mixed trees							
5	Paddy converted to other crops							
6	Paddy converted to banana							
7	Paddy converted to banana and tapioca							
8	Paddy converted to built up area	3.46	1.96			3.00	2.25	
9	Paddy converted to clay mining							
10	Paddy converted to coconut					11.30	18.26	
11	Paddy converted to mixed crop		26.12			37.40	8.39	14.36
12	Paddy converted to rubber							
13	Paddy converted to tapioca							
14	Paddy lands left as cultivable wasteland	5.39	7.92	12.05		21.71		
15	Punja and prawn culture							
16	Punja	0.10	0.08	63.98	16.91	0.20	158.41	0.20
17	Virippu				0.77	11.69	62.61	6.15
18	Virippu and punja							
19	Virippu and mundakan							
20	Virippu and prawn culture	214.34	431.32	390.95	252.34	251.73	408.47	134.88
21	Water bodies	296.85	291.51	187.71	33.38	41.24	221.8	222.76
22	Waterlogged area							
	Panchayat Total	1412.89	1504.09	1210.10	961.69	1549.18	1847.62	1446.26
	Block Total	9931.83						

Table: 18.11

THAIKKATTUSSERI BLOCK

Area (Ha)

Sl. No.	Category	Arukkutti	Chennam Pallippuram	Panavalli	Perumbalam	Thaikkattusseri
1	Mundakan					
2	Mud flats					
3	Other land use	565.58	1240.22	1023.43	488.06	713.46
4	Paddy converted to mixed trees					
5	Paddy converted to other crops					
6	Paddy converted to banana					
7	Paddy converted to banana and tapioca					
8	Paddy converted to built up area	3.46	14.73	18.86		44.41
9	Paddy converted to clay mining					
10	Paddy converted to coconut	5.73	1.31	11.02		7.74
11	Paddy converted to mixed crop	23.14	68.65	139.43		143.36
12	Paddy converted to rubber					
13	Paddy converted to tapioca					
14	Paddy lands left as cultivable wasteland	0.30				
15	Punja and prawn culture					
16	Punja	130.20	170.20	141.37	92.02	232.33
17	Virippu					
18	Virippu and punja					
19	Virippu and mundakan					
20	Virippu and prawn culture	0.87				
21	Water bodies	581.85	1181.86	607.01	846.06	230.41
22	Waterlogged area					
	Panchayat Total	1311.13	2676.97	1941.12	1426.14	1371.71
	Block Total			8727.07		

Table: 18.12

VELIYANAD BLOCK

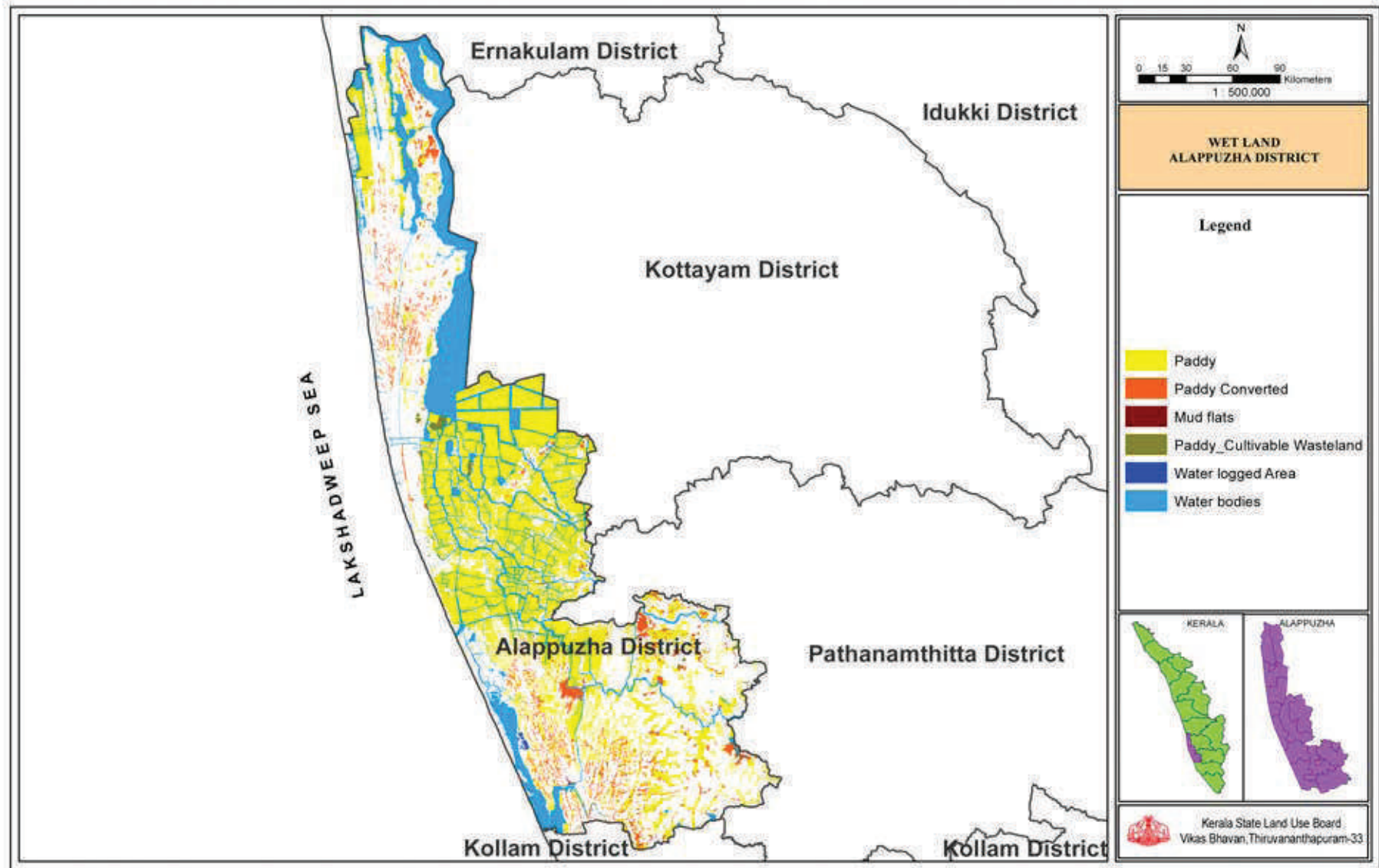
Area (Ha)

Sl. No.	Category	Kavalam	Muttar	Neelamperoor	Pulinkunnu	Ramankari	Veliyanad
1	Mundakan						
2	Mud flats						
3	Other land use	75.31	361.69	514.89	477.34	597.96	801.05
4	Paddy converted to mixed trees						
5	Paddy converted to other crops						
6	Paddy converted to banana						
7	Paddy converted to banana and tapioca						
8	Paddy converted to built up area			29.03	7.46	0.93	
9	Paddy converted to clay mining						
10	Paddy converted to coconut		1.50	25.33	3.51	1.84	23.08
11	Paddy converted to mixed crop			19.74	6.97		8.52
12	Paddy converted to rubber						
13	Paddy converted to tapioca						
14	Paddy lands left as cultivable wasteland						
15	Punja and prawn culture			4.88			
16	Punja	2222.01	629.66	1666.32	2105.48	1663.51	2147.64
17	Virippu						
18	Virippu and punja				77.71		
19	Virippu and mundakan						
20	Virippu and prawn culture						
21	Water bodies	442.91	70.77	178.06	329.29	139.25	208.64
22	Waterlogged area						
	Panchayat Total	2740.23	1063.62	2438.25	3007.76	2403.49	3188.93
	Block Total	14842.28					

Table: 18.13

MUNICIPALITY

Sl. No.	Category	Area (Ha)				
		Alappuzha Municipality	Chengannur Municipality	Cherthala Municipality	Kayamkulam Municipality	Mavelikkara Municipality
1	Mundakan		87.38			
2	Mud flats				15.94	
3	Other land use	2628.7	1244.57	1126.99	1440.99	865.75
4	Paddy converted to mixed trees					
5	Paddy converted to other crops					
6	Paddy converted to banana		20.54			
7	Paddy converted to banana and tapioca					
8	Paddy converted to built up area	11.74	3.84	12.80	38.68	
9	Paddy converted to clay mining		2.86			
10	Paddy converted to coconut	27.37	36.26	8.91	102.74	15.89
11	Paddy converted to mixed crop	6.16	20.85	42.57	53.07	
12	Paddy converted to rubber					
13	Paddy converted to tapioca					
14	Paddy lands left as cultivable wasteland	190.28	2.30		6.97	
15	Punja and prawn culture					
16	Punja	351.34	11.94		0.04	0.01
17	Virippu			5.64		
18	Virippu and punja	256.74				
19	Virippu and mundakan	4.83		2.10	82.78	214.95
20	Virippu and prawn culture					
21	Water bodies	166.13	67.35	26.86	47.68	7.56
22	Waterlogged area					
	Municipality Total	3643.29	1497.89	1225.87	1788.89	1104.16



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 Alappuzha 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 (355446 ha)	Percentage to total Wastelands (1677.52 ha)
1	Barren rocky/Stony waste/Sheet rock	22.91	0.016	1.36
2	Land with scrub	208.31	0.14	12.41
3	Marshy/Swampy	156.14	0.11	9.30
4	Mining/Industrial waste	3.92	0.002	0.23
5	Sandy area	745.64	0.52	44.44
6	Wetlands (Waterlogged)	540.58	0.38	32.22
	Total	1677.52	1.16	100.00

1. Land with scrub:- This category of wasteland mapped in an area of 208.31 ha. covering 0.14% of total geographical area and 12.41 % of total wasteland. It is mostly located in Karuvatta (56.93 ha.), Cheruthana (42.9 ha.) Panchayats and Kayamkulam Municipality (44.05 ha.).

2. Marshy/Swampy:- This category of wasteland occurs in an area of 156.14 ha. covering 0.11% of the total geographical area and 9.30 % of total wasteland. This is distributed in Purakkadu (17.38 ha) and Karuvatta (44.42 ha.) Panchayats.
3. Sandy area:- It is the major wasteland category identified in the district covers an area of 745.64 ha. comes 0.52% of the total geographical area and 44.44 % of the total wasteland. This is mainly distributed in Chennam pallipuram (266.62 ha), Thuravoor (141.66 ha.), Thaikkattusseri (58.67 ha.) and Pallipuram (56.07 ha.) Panchayats.
4. Wetlands (waterlogged):- This is the second major category of wasteland covers an area of 540.58 ha. comes 0.38 % total geographical area and 32.22 % of total wasteland. Panchayat having maximum area under this category are Kumarapuram (74.74 ha.), Palamel (69.83 ha.) and Kandallur (53.3 ha.).

Table: 19.1

AMBALAPPUZHA BLOCK

(Area in Ha)

Sl. No.	Rock Type	Ambalappuzha North	Ambalappuzha South	Punnapra North	Punnapra South	Purakkad
1	Barrenrocky/Stonywaste/Sheetrock					
2	Land with scrub					
3	Marshy/Swampy					17.38
4	Mining/Industrial waste					
5	Sandy area	8.45	0.6	47.19	25.81	0.02
6	Wetlands (Waterlogged)					
	Panchayat Total	8.45	0.6	47.19	25.81	17.4
	Block Total	99.45				

Table: 19.2

KANJIKKUZHI BLOCK

(Area in Ha)

Sl. No.	Rock Type	Cherthala South	Kadakkappalli	Kanjikkuzhi	Mararikulam North	Thanneermukkam
1	Barrenrocky/Stonywaste/Sheetrock					
2	Land with scrub					
3	Marshy/Swampy					
4	Mining/Industrial waste					
5	Sandy area	4.06		20.94	6.65	3.72
6	Wetlands (Waterlogged)		2.27			
	Panchayat Total	4.06	2.27	20.94	6.65	3.72
	Block Total	37.64				

Table: 19.3

MAVELIKKARA BLOCK

(Area in Ha)

Sl.No.	Rock Type	Chennithala - Thrippurunthura	Chettikkulangara	Mannar	Mavelikkara - Thekkekkara	Thazhakkara
1	Barrenrocky/Stonywaste/Sheetrock					
2	Land with scrub					
3	Marshy/Swampy					
4	Mining/Industrial waste					
5	Sandy area					0.19
6	Wetlands (Waterlogged)		2.02			
	Panchayat Total	0	2.02	0	0	0.19
	Block Total			2.21		

Table: 19.4

THAIKKATTUSSERI BLOCK

(Area in Ha)

Sl.No.	Rock Type	Arukkutti	Chennam Pallipuram	Panavalli	Perumbalam	Thaikkattusseri
1	Barrenrocky/Stonywaste/Sheetrock					
2	Land with scrub	4.32				
3	Marshy/Swampy					
4	Mining/Industrial waste					
5	Sandy area	2.96	266.62	56.07		58.67
6	Wetlands (Waterlogged)		21.63	14.55		
	Panchayat Total	7.28	288.25	70.62	0	58.67
	Block Total			424.82		

Table: 19.5

BHARANIKAVU BLOCK

(Area in Ha)

Sl. No.	Rock Type	Bharanikavu	Chunakkara	Mavelikkara - Thamarakulam	Nooranadu	Palamel	Vallikkunnam
1	Barrenrocky/Stonywaste/Sheetrock						
2	Land with scrub				10.81	0.48	
3	Marshy/Swampy						
4	Mining/Industrial waste				3.92		
5	Sandy area						
6	Wetlands (Waterlogged)			8.59	39.26	69.83	3.01
	Panchayat Total	0.00	0.00	8.59	53.99	70.31	3.01
	Block Total	135.90					

Table: 19.6

CHAMPAKULAM BLOCK

(Area in Ha)

Sl. No.	Rock Type	Champakulam	Edathwa	Kainakari	Nedumudi	Thakazhi	Thalavadi
1	Barrenrocky/Stonywaste/Sheetrock						
2	Land with scrub		8.3				7.48
3	Marshy/Swampy						
4	Mining/Industrial waste						
5	Sandy area						
6	Wetlands (Waterlogged)						
	Panchayat Total	0.00	8.30	0.00	0.00	0.00	7.48
	Block Total	15.78					

Table: 19.7

VELIYANAD BLOCK

(Area in Ha)

Sl.No.	Rock Type	Kavalam	Muttar	Neelamperoor	Pulinkunnu	Ramankari	Veliyanad
1	Barrenrocky/Stonywaste/Sheetrock						
2	Land with scrub		4.92				
3	Marshy/Swampy						
4	Mining/Industrial waste						
5	Sandy area						
6	Wetlands (Waterlogged)						
	Panchayat Total	0	4.92	0	0	0	0
	Block Total	4.92					

Table: 19.8

ARYADU BLOCK

(Area in Ha)

Sl.No.	Rock Type	Aryadu	Mannancheri	Mararikulam South	Muhamma
1	Barrenrocky/Stonywaste/Sheetrock				
2	Land with scrub				
3	Marshy/Swampy				
4	Mining/Industrial waste				
5	Sandy area		6.7	7.27	4.46
6	Wetlands (Waterlogged)				
	Panchayat Total	0.00	6.70	7.27	4.46
	Block Total	18.43			

Table: 19.9

CHENGANNUR BLOCK

(Area in Ha)

Sl. No.	Rock Type	Ala	Budhanoor	Cheriyannadu	Mulakuzha	Pandanadu	Puliyur	Thiruvannandoor	Venmoni
1	Barrenrocky/Stonywaste/Sheetrock						4.38		
2	Land with scrub	1.46		5.45					
3	Marshy/Swampy								
4	Mining/Industrial waste								
5	Sandy area		4.05	3.33			0.14		
6	Wetlands (Waterlogged)	0.02			6.04				9.13
	Panchayat Total	1.48	4.05	8.78	6.04	0	4.52	0	9.13
	Block Total	34.00							

Table: 19.10

HARIPAD BLOCK

(Area in Ha)

Sl. No.	Rock Type	Cheruthana	Haripad	Karthikappalli	Karuvatta	Kumarapuram	Pallippadu	Thrikkunnapuzha	Veeyapuram
1	Barrenrocky/Stonywaste/Sheetrock								
2	Land with scrub	42.9			56.93				0.65
3	Marshy/Swampy				44.42	0.09		94.25	
4	Mining/Industrial waste								
5	Sandy area							0.02	
6	Wetlands (Waterlogged)			44.75	5.12	74.74		28.19	
	Panchayat Total	42.90	0.00	44.75	106.47	74.83	0.00	122.46	0.65
	Block Total	392.06							

Table: 19.11

MUTHUKULAM BLOCK

(Area in Ha)

Sl. No.	Rock Type	Arattupuzha	Cheppad	Chingoli	Devikulangara	Kandallur	Krishna puram	Muthukulam	Pathiyur
1	Barrenrocky/Stonywaste/Sheetrock								
2	Land with scrub				12.38				
3	Marshy/Swampy								
4	Mining/Industrial waste								
5	Sandy area	0.53							
6	Wetlands (Waterlogged)	52.03	1.00	42.70	3.16	53.3	1.05	11.86	
	Panchayat Total	52.56	1.00	42.70	3.16	53.30	1.05	11.86	0.00
	Block Total	165.63							

Table: 19.12

PATTANAKAD BLOCK

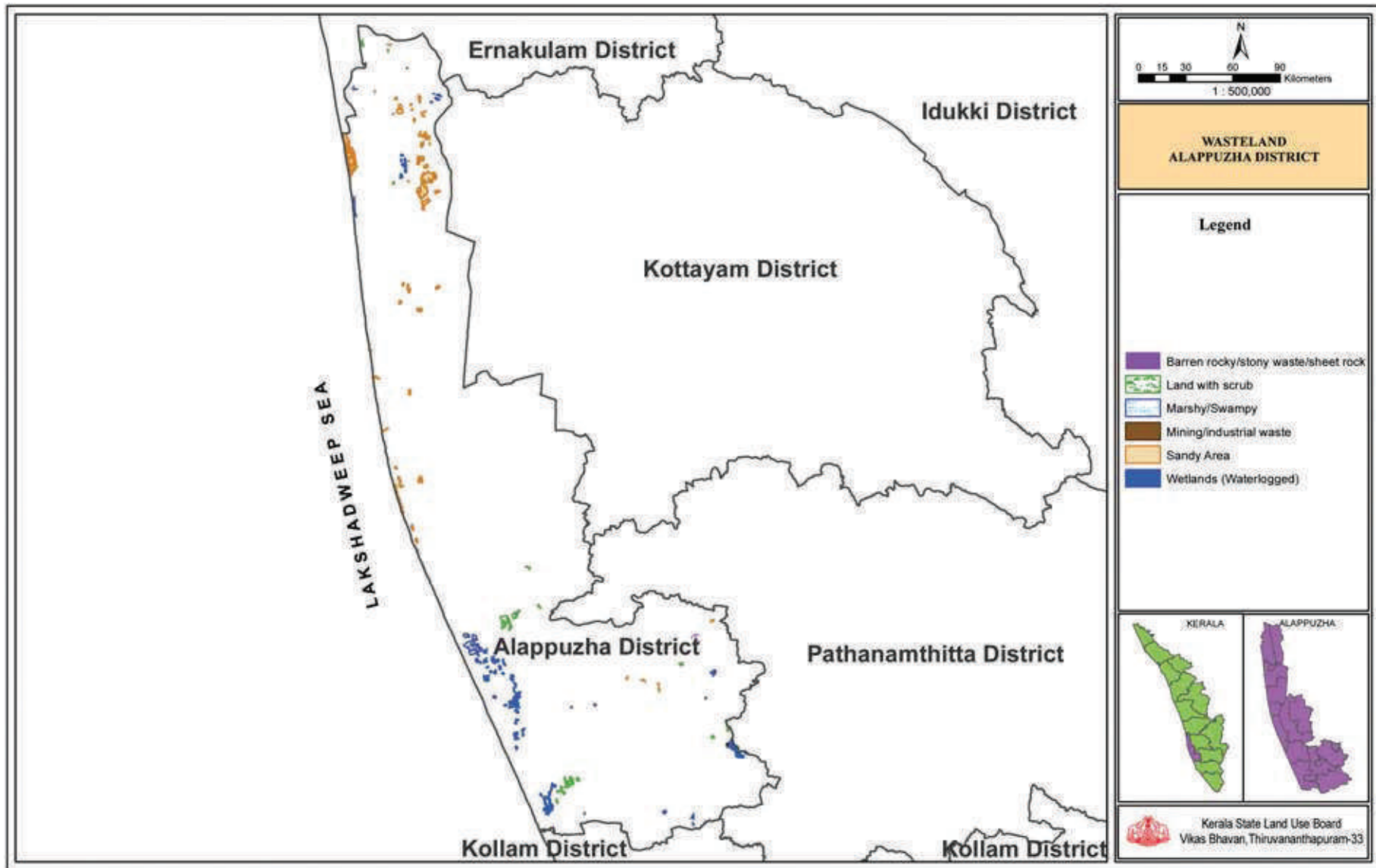
(Area in Ha)

Sl. No.	Rock Type	Aroor	Ezhupunna	Kodamthuruthu	Kuthiyathodu	Pattanakad	Thuravoor	Vayalar
1	Barrenrocky/Stonywaste/Sheetrock							
2	Land with scrub	5.22						2.95
3	Marshy/Swampy							
4	Mining/Industrial waste							
5	Sandy area	0.47	2.18	11.07	44.23	1.91	141.66	1.01
6	Wetlands (Waterlogged)		1.03			3.02	37.79	
	Panchayat Total	5.69	3.21	11.07	44.23	4.93	179.45	3.96
	Block Total	252.54						

Table: 19.13

MUNICIPALITY**(Area in Ha)**

Sl. No.	Rock Type	Alappuzha Municipality	Chengannur Municipality	Cherthala Municipality	Kayamkulam Municipality	Mavelikkara Municipality
1	Barrenrocky/Stonywaste/Sheetrock		18.53			
2	Land with scrub				44.05	
3	Marshy/Swampy					
4	Mining/Industrial waste					
5	Sandy area	11.48	3.19			0.01
6	Wetlands (Waterlogged)				4.48	
	Municipality Total	11.48	21.72	0	48.53	0.01



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)	
Alappuzha Municipality		10P71a	2291.70	
		10P72a	864.93	
		10P73a	443.66	
		13M82a	43.01	
		Municipality Total	3643.29	
Ambalappuzha	Ambalappuzha North	10P70a	836.65	
		Panchayat Total	836.65	
	Ambalappuzha South	10P68a	678.35	
		10P69a	798.34	
		10P70a	43.07	
		Panchayat Total	1519.77	
		Punnapra North	10P71a	822.22
		Panchayat Total	822.22	
		Punnapra South	10P1a	0.00
			10P3a	0.36
		10P70a	1040.28	
		10P71a	461.16	
	Panchayat Total		1501.80	
	Purakkad	10P66a	129.03	
		10P68a	738.78	
		10P69a	1239.79	
		9A1a	51.45	
		9A3a	81.71	
	Panchayat Total		2240.76	
	Block Total		6921.20	
Aryadu	Aryadu	10P71a	59.93	
		10P72a	53.98	
		10P72b	352.09	
		10P73a	13.87	
		11M2a	17.05	
		11M3a	70.28	
		13M82a	834.29	
		Panchayat Total	1401.49	
		Mannancheri	10P72b	1477.89
			10P73a	38.41
		13M82a	1909.09	
		13M83a	442.28	

Block	Panchayat	WS Code	Area(ha)
		13M94a	107.06
	Panchayat Total		3974.74
	Mararikulam South	10P72b	15.58
		10P73a	1459.45
		13M94a	407.27
	Panchayat Total		1882.31
	Muhamma	13M82a	1524.11
		13M83a	544.10
		13M84a	640.49
	Panchayat Total		2708.70
	Block Total		9967.23
Bharanikavu	Bharanikavu	8P5a	24.03
		8P6b	670.01
		9A45b	758.34
		9A46b	1090.45
	Panchayat Total		2542.84
	Chunakkara	8P6b	60.99
		8P7b	5.33
		9A43a	624.34
		9A45b	1140.47
	Panchayat Total		1831.14
	Mavelikkara-Thamarakulam	8P6b	427.00
		8P6c	68.33
		8P7a	86.55
		8P7b	1212.12
		8P7c	147.08
		9A43a	2.62
	Panchayat Total		1943.70
	Nooranadu	8P7b	15.64
		9A42a	57.89
		9A42c	450.06
		9A43a	1478.02
	Panchayat Total		2001.61
	Palamel	8P7b	439.41
		8P8b	691.34
		9A42a	71.34
		9A42b	271.80
		9A42c	1142.43
		9A43a	54.10
	Panchayat Total		2670.41
	Vallikkunnam	8P5a	465.48
		8P6a	169.97
		8P6b	760.56

Block	Panchayat	WS Code	Area(ha)
		8P6c	453.64
		8P7b	123.00
		9A46b	170.85
	Panchayat Total		2143.51
	Block Total		13133.20
Champakulam	Champakulam	10P1a	194.39
		10P2a	0.14
		10P3a	2.63
		10P4a	870.38
		10P5a	97.60
		10P6a	43.85
		11M10a	1.34
		11M1a	13.93
		11M57a	527.30
		11M58a	534.55
		11M9a	5.60
	Panchayat Total		2291.72
	Edathwa	10P4a	0.06
		10P5a	685.07
		10P6a	699.56
		10P7a	0.36
		10P8a	380.31
	Panchayat Total		1765.36
	Kainakari	10P1a	1818.46
		10P2a	1356.72
		10P3a	0.22
		10P71a	33.68
		11M1a	540.63
		11M2a	298.52
		11M3a	500.54
		11M4a	724.22
		11M5a	23.73
		11M9a	45.85
		12M47a	33.73
		13M81a	40.03
		13M82a	33.91
	Panchayat Total		5450.24
	Nedumudi	10P1a	326.49
		10P3a	1701.40
		10P4a	3.73
		10P5a	1.27
		10P68a	23.78
		10P69a	2.17

Block	Panchayat	WS Code	Area(ha)
		10P70a	17.29
		10P71a	23.43
	Panchayat Total		2099.58
	Thakazhi	10P3a	12.48
		10P4a	1.81
		10P5a	953.28
		10P67a	2.56
		10P68a	1555.43
		10P6a	0.06
		10P7a	1.11
	Panchayat Total		2526.73
	Thalavadi	10P6a	877.55
		10P8a	602.43
		11M19a	43.09
		11M56a	73.15
	Panchayat Total		1596.22
	Block Total		15729.84
Chengannur	Ala	10P60b	7.62
		10P61a	190.04
		9A7a	105.79
		9A7b	477.17
		9A7c	423.27
	Panchayat Total		1203.89
	Bhudhanoor	10P61a	677.58
		10P62a	715.91
		10P9a	1.20
		9A44a	59.45
		9A6a	501.10
		9A7a	193.48
	Panchayat Total		2148.72
	Cheriy Nadu	10P61a	3.16
		9A43a	22.08
		9A44a	18.85
		9A7a	94.48
		9A7c	1025.63
		9A8a	242.43
	Panchayat Total		1406.64
	Mulakuzha	10P60a	10.87
		10P60b	912.49
		10P60c	171.76
		10P61a	52.50
		9A7b	392.37
		9A8a	181.26

Block	Panchayat	WS Code	Area(ha)
		9A9a	489.83
	Panchayat Total		2211.08
	Pandanadu	10P10a	0.10
		10P11a	303.44
		10P61a	785.13
		10P9a	2.58
	Panchayat Total		1091.25
	Puliyur	10P61a	786.75
		9A44a	15.46
		9A7a	292.02
		9A7b	33.80
		9A7c	30.46
	Panchayat Total		1158.48
	Thiruvandoor	10P10a	0.60
		10P11a	457.04
		10P12a	127.58
		10P61a	7.36
		11M55a	253.48
	Panchayat Total		846.05
	Venmoni	9A42a	30.45
		9A42c	3.01
		9A43a	68.34
		9A7b	140.18
		9A7c	236.07
		9A8a	1331.05
		9A9a	91.20
	Panchayat Total		1900.29
	Block Total		11966.41
Chengannur Municipality		10P12a	363.84
		10P13a	200.62
		10P60a	7.28
		10P60b	7.47
		10P60c	44.34
		10P61a	853.75
		9A7b	20.59
	Municipality Total		1497.89
Cherthala Municipality		13M84c	5.26
		13M85a	351.57
		13M86a	32.25
		13M91a	564.88
		13M92a	271.91
	Municipality Total		1225.87
Haripad	Cheruthana	10P5a	9.95

Block	Panchayat	WS Code	Area(ha)
		10P64a	262.61
		10P65a	354.91
		10P66a	1.25
		10P67a	351.61
		10P68a	5.01
		10P7a	450.21
	Panchayat Total		1435.55
	Haripad	10P65a	310.10
		9A3a	63.24
		9A4a	607.69
		9A5a	0.16
	Panchayat Total		981.20
	Karthikappalli	9A3a	819.53
		9A4a	21.66
	Panchayat Total		841.19
	Karuvatta	10P64a	0.86
		10P65a	29.05
		10P66a	501.09
		10P68a	411.70
		9A3a	462.45
	Panchayat Total		1405.15
	Kumarapuram	10P65a	143.97
		9A3a	1329.43
	Panchayat Total		1473.40
	Pallippadu	9A46a	0.26
		9A4a	1354.38
		9A5a	403.53
	Panchayat Total		1758.16
	Thrikkunnappuzha	9A1a	499.65
		9A3a	556.20
	Panchayat Total		1055.84
	Veeyapuram	10P5a	10.40
		10P63a	11.93
		10P64a	108.71
		10P65a	58.77
		10P7a	103.39
		10P8a	171.80
		9A4a	401.07
		9A5a	512.91
	Panchayat Total		1378.97
	Block Total		10329.46
Kanjikkuzhi	Cherthala south	13M84b	239.65
		13M85a	38.80

Block	Panchayat	WS Code	Area(ha)
		13M91a	2.52
		13M92a	1159.34
		13M93a	524.31
	Panchayat Total		1964.62
	Kadakkappalli	13M91a	392.68
		13M92a	554.09
	Panchayat Total		946.76
	Kanjikkuzhi	13M83a	610.60
		13M84a	172.13
		13M84b	397.16
		13M94a	83.72
	Panchayat Total		1263.61
	Mararikulam North	13M83a	27.00
		13M84b	49.19
		13M93a	589.33
		13M94a	1104.53
	Panchayat Total		1770.06
	Thanneermukkam	13M80a	0.90
		13M82a	480.23
		13M84a	1247.48
		13M84b	1242.45
		13M84c	464.68
		13M85a	250.28
	Panchayat Total		3686.02
	Block Total		9631.08
Kayamkulam Municipality		9A2a	449.50
		9A46a	570.89
		9A46b	467.62
		9A47a	4.81
		9A4a	296.07
	Municipality Total		1788.88
Mavelikkara	Chennithala-Thrippunthura	10P62a	310.48
		9A44a	13.26
		9A45a	1.26
		9A45c	1.26
		9A46a	29.83
		9A4a	2.60
		9A5a	1491.51
		9A6a	336.48
	Panchayat Total		2186.68
	Chettikulangara	9A45c	20.09
		9A46a	1945.41
		9A46b	185.28

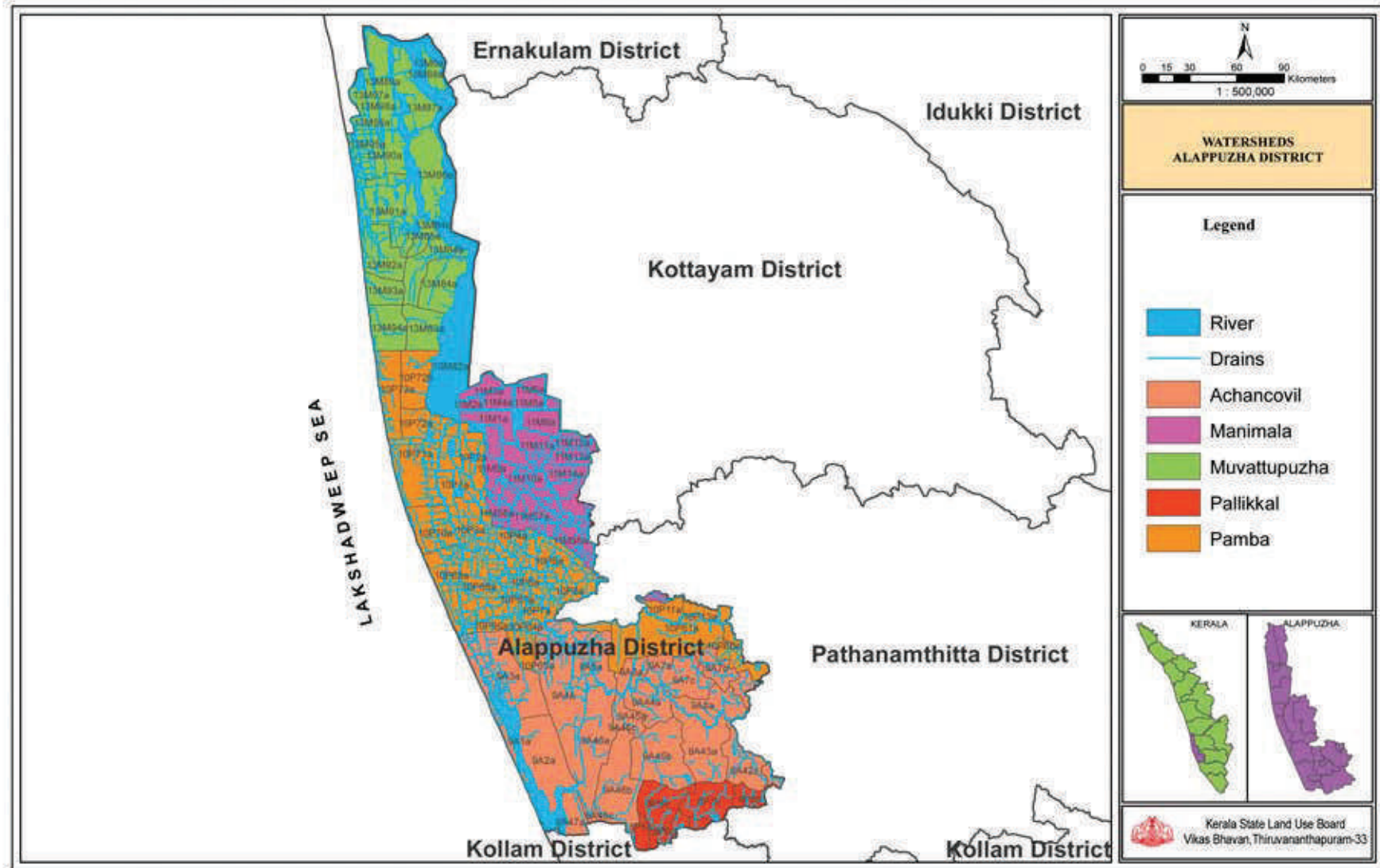
Block	Panchayat	WS Code	Area(ha)
		9A4a	20.74
		9A5a	0.25
	Panchayat Total		2171.78
	Mannar	10P62a	165.94
		10P63a	303.07
		10P8a	3.51
		9A5a	544.75
	Panchayat Total		1017.27
	Mavelikkara-Thekkekkara	9A44a	82.71
		9A45a	308.51
		9A45b	1198.04
		9A45c	226.04
		9A46a	10.37
		9A46b	483.23
	Panchayat Total		2308.90
	Thazhakkara	9A43a	839.35
		9A44a	805.87
		9A45a	23.64
		9A45b	363.22
	Panchayat Total		2032.09
	Block Total		9716.72
Mavelikkara Municipality		9A44a	669.61
		9A45a	250.48
		9A45c	97.56
		9A46a	86.49
	Municipality Total		1104.14
Muthukulam	Arattupuzha	9A1a	1314.95
		9A2a	730.75
		9A3a	223.20
	Panchayat Total		2268.90
	Cheppad	9A2a	96.59
		9A3a	52.70
		9A46a	0.50
		9A4a	1141.02
	Panchayat Total		1290.82
	Chingoli	9A3a	670.78
		9A4a	21.34
	Panchayat Total		692.12
	Devikulangara	9A1a	55.92
		9A2a	102.42
		9A46a	19.19
		9A46c	97.58
		9A47a	1234.58

Block	Panchayat	WS Code	Area(ha)
	Panchayat Total		1509.69
	Kandallur	9A2a	1076.98
		9A47a	1.11
	Panchayat Total		1078.09
	Krishnapuram	9A46a	248.87
		9A46b	967.79
		9A46c	113.38
	Panchayat Total		1330.03
	Muthukulam	9A2a	1188.97
		9A3a	80.37
	Panchayat Total		1269.34
	Pathiyur	9A2a	354.51
		9A46a	382.11
		9A4a	770.32
	Panchayat Total		1506.94
	Block Total		10945.91
Pattanakad	Aroor	13M100a	10.01
		13M101a	0.05
		13M87a	43.37
		13M89a	1319.51
		13M97a	39.95
	Panchayat Total		1412.89
	Ezhupunna	13M87a	38.25
		13M89a	659.34
		13M97a	483.23
		13M98a	323.27
	Panchayat Total		1504.09
	Kodamthuruthu	13M87a	22.36
		13M89a	383.54
		13M90a	93.16
		13M95a	11.51
		13M96a	326.03
		13M97a	286.24
		13M98a	82.65
		13M99a	4.60
	Panchayat Total		1210.09
	Kuthiyathodu	13M89a	0.00
		13M90a	883.79
		13M95a	77.25
		13M96a	0.47
		13M97a	0.18
	Panchayat Total		961.69
	Pattanakad	13M90a	225.47

Block	Panchayat	WS Code	Area(ha)
		13M91a	1323.71
	Panchayat Total		1549.19
	Thuravoor	13M86a	12.36
		13M87a	8.66
		13M90a	1552.01
		13M91a	161.23
		13M95a	113.36
	Panchayat Total		1847.62
	Vayalar	13M85a	40.59
		13M86a	25.44
		13M90a	0.36
		13M91a	1379.88
	Panchayat Total		1446.27
	Block Total		9931.84
Thaikkattusseri	Arookutti	13M87a	966.58
		13M88a	6.69
		13M89a	24.58
		999	313.28
	Panchayat Total		1311.13
	Chennam pallipuram	13M76a	0.46
		13M84c	86.68
		13M86a	2495.63
		13M90a	59.52
		13M91a	34.68
	Panchayat Total		2676.97
	Panavalli	13M25a	4.03
		13M86a	6.76
		13M87a	1884.25
		13M88a	18.98
		999	27.08
	Panchayat Total		1941.10
	Perumbalam	13M87a	1.10
		13M88a	621.03
		999	804.02
	Panchayat Total		1426.14
	Thaikkattusseri	13M25a	1.11
		13M76a	0.98
		13M86a	1113.59
		13M87a	250.33
		13M90a	5.71
	Panchayat Total		1371.72
	Block Total		8727.06
Veliyanad	Kavalam	11M11a	309.62

Block	Panchayat	WS Code	Area(ha)
		11M12a	248.67
		11M1a	80.89
		11M4a	41.36
		11M5a	656.00
		11M6a	346.07
		11M7a	126.08
		11M8a	894.55
		12M41a	0.87
		12M42a	28.94
		12M46a	7.20
	Panchayat Total		2740.24
	Muttar	10P6a	173.76
		11M15a	0.52
		11M17a	2.23
		11M19a	14.17
		11M56a	784.12
		11M57a	88.81
	Panchayat Total		1063.62
	Neelamperoor	11M10a	4.20
		11M11a	287.97
		11M12a	395.05
		11M13a	443.23
		11M14a	1193.33
		11M15a	1.60
		11M16a	95.94
		11M8a	3.90
		12M41a	13.03
	Panchayat Total		2438.25
	Pulinkunnu	11M10a	691.38
		11M11a	18.07
		11M1a	786.39
		11M57a	1.65
		11M58a	4.37
		11M9a	1505.88
	Panchayat Total		3007.75
	Ramankari	10P4a	142.85
		10P6a	797.93
		11M10a	4.60
		11M14a	195.72
		11M15a	56.56
		11M56a	247.70
		11M57a	958.15
	Panchayat Total		2403.50

Block	Panchayat	WS Code	Area(ha)
	Veliyanad	11M10a	1639.91
		11M11a	482.42
		11M12a	0.29
		11M14a	996.94
		11M15a	57.20
		11M57a	11.88
		11M8a	0.19
		11M9a	0.09
	Panchayat Total		3188.92
	Block Total		14842.29
	District Total		141102.32



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 rise 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.

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	Alappuzha (M)	1	80	5	0	85	0	0	0	85	1
2	Ambalappuzha	5	167	171	0	338	0	86	86	424	5
3	Aryadu	3	166	79	0	245	0	47	47	292	3
4	Bharanikavu	6	866	34	0	900	52	10	62	962	6
5	Champakulam	6	93	23	0	116	0	69	69	185	6
6	Chengannur	9	1433	8	0	1441	13	17	30	1471	9
7	Chengannur (M)	1	113	1	0	114	1	1	2	116	1
8	Cherthala (M)	1	22	86	0	108	0	21	21	129	1
9	Haripad	9	469	217	0	686	0	61	61	747	9
10	Kanjikkuzhi	5	233	220	0	453	0	223	223	676	5
11	Kayamkulam (M)	1	80	26	0	106	0	5	5	111	1
12	Mavelikkara	4	434	7	0	441	0	29	29	470	4
13	Mavelikkara (M)	1	37	0	0	37	11	2	13	50	1
14	Muthukulam	7	320	79	0	399	0	86	86	485	7
15	Pattanakad	8	62	285	0	347	0	203	203	550	8
16	Thaikkattusseri	5	85	315	0	400	0	361	361	761	5
17	Veliyanad	6	0	0	0	0	0	56	56	56	6
District Total		78	4660	1556	0	6216	77	1277	1354	7570	78

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	Alappuzha (M)	80	18	18	5	1	1	0	0	0	85	19	19
2	Ambalappuzha	167	31	31	171	40	39	0	0	0	338	71	70
3	Aryadu	166	75	75	79	48	48	0	0	0	245	123	123
4	Bharanikavu	866	350	349	34	25	25	0	0	0	900	375	374
5	Champakulam	93	28	27	23	5	5	0	0	0	116	33	32
6	Chengannur	1433	735	636	8	28	3	0	0	0	1441	763	639
7	Chengannur (M)	113	89	72	1	1	1	0	0	0	114	90	73
8	Cherthala (M)	22	14	14	86	61	61	0	0	0	108	75	75
9	Haripad	469	234	233	217	107	107	0	0	0	686	341	340
10	Kanjikkuzhi	233	53	53	220	60	60	0	0	0	453	113	113
11	Kayamkulam (M)	80	29	29	26	9	9	0	0	0	106	38	38
12	Mavelikkara	434	122	122	7	112	1	0	0	0	441	234	123
13	Mavelikkara (M)	37	39	37	0	0	0	0	0	0	37	39	37
14	Muthukulam	320	135	135	79	31	31	0	0	0	399	166	166
15	Pattanakad	62	18	18	285	98	98	0	0	0	347	116	116
16	Thaikkattusseri	85	71	71	315	103	103	0	0	0	400	174	174
17	Veliyanad	0	0	0	0	0	0	0	0	0	0	0	0
	District Total	4660	2041	1920	1556	729	592	0	0	0	6216	2770	2512

Table:21.3

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 (3 to 8)	Electric Pump	Diesel Pump	Wind Mills	Solar Pumps	Manual/Annual	Others	Total (10 to15)
1	Ambalappuzha	329	0	0	0	9	0	338	72	0	0	0	14	0	86
2	Aryadu	245	0	0	0	0	0	245	44	0	0	0	3	0	47
3	Bharanikavu	591	9	0	0	296	4	900	7	3	0	0	0	0	10
4	Champakulam	100	0	0	0	16	0	116	57	5	0	0	0	7	69
5	Chengannur	1156	9	0	0	251	25	1441	8	2	0	0	2	5	17
6	Haripad	412	0	0	0	274	0	686	34	0	0	0	20	7	61
7	Kanjikkuzhi	453	0	0	0	0	0	453	223	0	0	0	0	0	223
8	Mavelikkara	138	0	0	0	301	2	441	26	0	0	0	3	0	29
9	Muthukulam	323	0	0	0	76	0	399	5	0	0	0	81	0	86
10	Pattanakad	347	0	0	0	0	0	347	196	1	0	0	6	0	203
11	Thaikkattusseri	400	0	0	0	0	0	400	358	3	0	0	0	0	361
12	Veliyanad	0	0	0	0	0	0	0	56	0	0	0	0	0	56
13	Alappuzha (M)	85	0	0	0	0	0	85	0	0	0	0	0	0	0
14	Chengannur (M)	113	0	0	0	1	0	114	1	0	0	0	0	0	1
15	Cherthala (M)	108	0	0	0	0	0	108	21	0	0	0	0	0	21
16	Kayamkulam (M)	99	0	0	0	7	0	106	3	0	0	0	2	0	5
17	Mavelikkara (M)	37	0	0	0	0	0	37	2	0	0	0	0	0	2
	District Total	4936	18	0	0	1231	31	6216	1113	14	0	0	131	19	1277

Table:21.4

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	Alappuzha (M)	0	0	0	0	0	0	0	0	0
2	Ambalappuzha	0	0	0	86	22	22	86	22	22
3	Aryadu	0	0	0	47	24	24	47	24	24
4	Bharanikavu	52	336	312	10	1088	1088	62	1424	1400
5	Champakulam	0	0	0	69	71	71	69	71	71
6	Chengannur	13	250	158	17	863	612	30	1113	770
7	Chengannur (M)	1	45	45	1	68	68	2	113	113
8	Cherthala (M)	0	0	0	21	17	17	21	17	17
9	Haripad	0	0	0	61	50	50	61	50	50
10	Kanjikkuzhi	0	0	0	223	70	70	223	70	70
11	Kayamkulam (M)	0	0	0	5	2	2	5	2	2
12	Mavelikkara	0	0	0	29	998	998	29	998	998
13	Mavelikkara (M)	11	430	412	2	192	192	13	622	604
14	Muthukulam	0	0	0	86	45	45	86	45	45
15	Pattanakad	0	0	0	203	67	67	203	67	67
16	Thaikkattusseri	0	0	0	361	128	128	361	128	128
17	Veliyanad	0	0	0	56	35	35	56	35	35
	District Total	77	1061	927	1277	3740	3489	1354	4801	4416

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	Alappuzha (M)	85	19	19	0	0	0	85	19	19
2	Ambalappuzha	338	71	70	86	22	22	424	93	92
3	Aryadu	245	123	123	47	24	24	292	147	147
4	Bharanikavu	900	375	374	62	1424	1400	962	1799	1774
5	Champakulam	116	34	33	69	71	71	185	105	104
6	Chengannur	1441	763	639	30	1113	770	1471	1876	1409
7	Chengannur (M)	114	89	73	2	113	113	116	202	186
8	Cherthala (M)	108	75	75	21	17	17	129	92	92
9	Haripad	686	341	341	61	50	50	747	391	391
10	Kanjikkuzhi	453	113	113	223	70	70	676	183	183
11	Kayamkulam (M)	106	38	38	5	2	2	111	40	40
12	Mavelikkara	441	234	124	29	998	998	470	1232	1122
13	Mavelikkara (M)	37	39	37	13	604	604	50	643	641
14	Muthukulam	399	166	166	86	45	45	485	211	211
15	Pattanakad	347	116	116	203	67	67	550	183	183
16	Thaikkattusseri	400	173	173	361	128	128	761	301	301
17	Veliyanad	0	0	0	56	35	35	56	35	35
	District Total	6216	2769	2514	1354	4783	4416	7570	7552	6930

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		
		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	Ambalappuzha	0	167	167	0	171	171	0	0	0	0	0	0	0	86	86	0	424	424
2	Aryadu	0	166	166	0	79	79	0	0	0	0	0	0	0	47	47	0	292	292
3	Bharanikavu	0	866	866	0	34	34	0	0	0	0	52	52	0	10	10	0	962	962
4	Champakulam	0	93	93	0	23	23	0	0	0	0	0	0	0	69	69	0	185	185
5	Chengannur	0	1433	1433	0	8	8	0	0	0	0	13	13	0	17	17	0	1471	1471
6	Haripad	0	469	469	0	217	217	0	0	0	0	0	0	0	61	61	0	747	747
7	Kanjikkuzhi	0	233	233	0	220	220	0	0	0	0	0	0	0	223	223	0	676	676
8	Mavelikkara	0	434	434	0	7	7	0	0	0	0	0	0	0	29	29	0	470	470
9	Muthukulam	0	320	320	0	79	79	0	0	0	0	0	0	0	86	86	0	485	485
10	Pattanakad	0	62	62	0	285	285	0	0	0	0	0	0	0	203	203	0	550	550
11	Thaikkattusseri	0	85	85	0	315	315	0	0	0	0	0	0	0	361	361	0	761	761
12	Veliyanad	0	0	0	0	0	0	0	0	0	0	0	0	0	56	56	0	56	56
13	Alappuzha (M)	0	80	80	0	5	5	0	0	0	0	0	0	0	0	0	0	85	85
14	Chengannur (M)	0	113	113	0	1	1	0	0	0	0	1	1	0	1	1	0	116	116
15	Cherthala (M)	0	22	22	0	86	86	0	0	0	0	0	0	0	21	21	0	129	129
16	Kayamkulam (M)	0	80	80	0	26	26	0	0	0	0	0	0	0	5	5	0	111	111
17	Mavelikkara (M)	0	37	37	0	0	0	0	0	0	0	11	11	0	2	2	0	50	50
	District Total	0	4660	4660	0	1556	1556	0	0	0	0	77	77	0	1277	1277	0	7570	7570

Table:21.7

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	Ambalappuzha	0	329	0	9	0	338	0	72	0	14	0	86
2	Aryadu	0	245	0	0	0	245	0	44	0	3	0	47
3	Bharanikavu	9	588	0	296	7	900	0	10	0	0	0	10
4	Champakulam	0	100	0	16	0	116	0	69	0	0	0	69
5	Chengannur	31	1136	0	251	23	1441	2	7	0	2	6	17
6	Haripad	1	411	0	274	0	686	0	41	0	20	0	61
7	Kanjikkuzhi	3	450	0	0	0	453	0	223	0	0	0	223
8	Mavelikkara	0	137	0	301	3	441	0	24	2	3	0	29
9	Muthukulam	0	323	0	76	0	399	0	5	0	81	0	86
10	Pattanakkad	1	345	1	0	0	347	1	196	0	6	0	203
11	Thaikkattusseri	2	398	0	0	0	400	3	357	0	0	1	361
12	Veliyanad	0	0	0	0	0	0	0	56	0	0	0	56
13	Alappuzha (M)	0	85	0	0	0	85	0	0	0	0	0	0
14	Chengannur (M)	0	113	0	1	0	114	1	0	0	0	0	1
15	Cherthala (M)	0	108	0	0	0	108	0	21	0	0	0	21
16	Kayamkulam (M)	0	99	0	7	0	106	0	3	0	2	0	5
17	Mavelikkara (M)	0	37	0	0	0	37	0	2	0	0	0	2
	District Total	47	4904	1	1231	33	6216	7	1130	2	131	7	1277

Table:21.8

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	Ambalappuzha	0	0	0	0	0	0	329	69	0	0	0	0	9	1	338	70
2	Aryadu	0	0	0	0	0	0	245	123	0	0	0	0	0	0	245	123
3	Bharanikavu	0	0	0	0	0	0	598	291	0	0	1	0	297	83	896	374
4	Champakulam	0	0	0	0	0	0	100	31	0	0	0	0	16	2	116	33
5	Chengannur	4	1	419	205	0	0	627	273	54	27	1	1	324	132	1429	639
6	Haripad	0	0	216	112	0	0	346	178	2	4	1	1	121	46	686	341
7	Kanjikuzhi	0	0	1	0	0	0	451	112	0	0	0	0	1	0	453	112
8	Mavelikkara	1	0	282	35	1	0	139	79	0	0	0	0	16	9	439	123
9	Muthukulam	0	0	15	9	0	0	323	138	0	0	0	0	61	19	399	166
10	Pattanakad	0	0	0	0	0	0	347	116	0	0	0	0	0	0	347	116
11	Thaikkattusseri	0	0	1	0	0	0	399	173	0	0	0	0	0	0	400	173
12	Veliyanad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Alappuzha (M)	0	0	0	0	0	0	85	19	0	0	0	0	0	0	85	19
14	Chengannur (M)	0	0	0	0	0	0	114	73	0	0	0	0	0	0	114	73
15	Cherthala (M)	0	0	0	0	0	0	108	75	0	0	0	0	0	0	108	75
16	Kayamkulam (M)	0	0	0	0	0	0	97	37	1	0	0	0	8	1	106	38
17	Mavelikkara (M)	0	0	0	0	0	0	37	37	0	0	0	0	0	0	37	37
	District Total	5	1	934	361	1	0	4345	1824	57	31	3	2	853	293	6198	2512

Table:21.9

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/Kuchh		No.	PU	No.	PU	No.	PU	No.	PU	No.	PU	No.	PU
		No.	PU	No.	PU												
1	Ambalappuzha	0	0	1	0	0	0	72	19	0	0	0	0	13	2	86	22
2	Aryadu	0	0	0	0	0	0	44	24	0	0	0	0	3	0	47	24
3	Bharanikavu	14	1025	18	272	0	0	14	78	0	0	0	0	11	25	57	1400
4	Champakulam	0	0	0	0	0	0	69	71	0	0	0	0	0	0	69	71
5	Chengannur	9	678	3	5	0	0	10	87	0	0	0	0	0	0	22	770
6	Haripad	0	0	5	3	1	1	35	38	0	0	0	0	20	8	61	50
7	Kanjikkuzhi	0	0	0	0	0	0	220	69	0	0	0	0	3	1	223	70
8	Mavelikkara	5	892	0	0	0	0	20	103	0	0	0	0	4	3	29	998
9	Muthukulam	0	0	2	9	0	0	4	1	0	0	0	0	80	34	86	45
10	Pattanakad	0	0	1	0	0	0	196	64	0	0	0	0	6	2	203	67
11	Thaikkattusseri	0	0	0	0	0	0	360	128	0	0	0	0	1	0	361	128
12	Veliyanad	0	0	0	0	0	0	56	35	0	0	0	0	0	0	56	35
13	Alappuzha (M)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Chengannur (M)	1	45	1	68	0	0	17	0	0	0	0	0	0	0	2	113
15	Cherthala (M)	0	0	0	0	0	0	2	17	0	0	0	0	0	0	21	17
16	Kayamkulam (M)	0	0	0	0	0	0	4	2	0	0	0	0	1	0	5	2
17	Mavelikkara (M)	1	90	11	412	0	0	1	102	0	0	0	0	0	0	13	604
	District Total	30	2730	42	769	1	1	1124	838	0	0	0	0	142	75	1341	4416

Table:21.10

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	Ambalappuzha	0	0	1	0	0	0	401	89	0	0	0	0	22	3	424	92
2	Aryadu	0	0	0	0	0	0	289	146	0	0	0	0	3	0	292	146
3	Bharanikavu	14	1025	18	272	0	0	612	369	0	0	1	0	308	108	953	1774
4	Champakulam	0	0	0	0	0	0	169	101	0	0	0	0	16	2	185	103
5	Chengannur	13	679	422	210	0	0	637	360	54	27	1	1	324	132	1451	1409
6	Haripad	0	0	221	116	1	1	381	215	2	4	1	1	141	54	747	391
7	Kanjikkuzhi	0	0	1	0	0	0	671	181	0	0	0	0	4	1	676	182
8	Mavelikkara	6	892	282	35	1	0	159	181	0	0	0	0	20	12	468	1120
9	Muthukulam	0	0	17	18	0	0	327	139	0	0	0	0	141	53	485	210
10	Pattanakad	0	0	1	0	0	0	543	181	0	0	0	0	6	2	550	183
11	Thaikkattusseri	0	0	1	0	0	0	759	301	0	0	0	0	1	0	761	301
12	Veliyanad	0	0	0	0	0	0	56	35	0	0	0	0	0	0	56	35
13	Alappuzha (M)	0	0	0	0	0	0	85	19	0	0	0	0	0	0	85	19
14	Chengannur (M)	1	45	1	68	0	0	114	73	0	0	0	0	0	0	116	186
15	Cherthala (M)	0	0	0	0	0	0	129	92	0	0	0	0	0	0	129	92
16	Kayamkulam (M)	0	0	0	0	0	0	101	39	1	0	0	0	9	1	111	40
17	Mavelikkara (M)	1	90	11	412	0	0	38	139	0	0	0	0	0	0	50	641
	District Total	35	2731	976	1131	2	1	5471	2660	57	31	3	2	995	368	7539	6924

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	2	3	4	5
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 31-03-11**

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. Ashtamudy 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

SI.No.	Name of Backwater	Area (ha)
1	Vembanad Kayal	10661.23
2	Kayamkulam Kayal	1511.75
3	Poomeen Kayal	3.37
4	Vadakkal Kayal	1.46
5	Chethi Kayal	4.11
6	Arthunkal Kayal	5.96
7	Pozhichal Kayal	20.41
8	Vettakkalchal Kayal	27.10

Table: 23.2

NEWLY REGISTERED VEHICLES IN ALAPPUZHA DISTRICT AS ON 2012-13

SI.No.	Classification of Vehicles	Vehicle No.
Transport Vehicles		
1	Multiaxied Articulated Vehicles	3
2	Trucks and Lorries	514
3	Four Wheelers	1517
4	Three Wheelers	538
Total		2572
5	Stage Carriage	461
6	Contract Carriage	212
7	Private Service Vehicles	4
8	Other Buses	73
Total		750
9	Motor Cabs	1184
10	Maxi Cabs/Taxi	0
11	Other Taxis	80
12	LMV 3 Seater	3216
13	LMV 4 to 6 Seater	0
14	Motor Cycle Hire	0
Total		4480
15	Other TVs	0
Total Transport		7802
16	Scoters	752
17	Mopads	1568
18	Motor Cycles including above & below 95cc	49933
Total		52253
19	Cars	9094
20	Jeeps	172
21	Omni Buses	0
22	Tractors	26
23	Trailors	2
24	Others	504
Total		9798
Total Non Transport		62051
Grand Total		69853

Table: 23.3

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

Goods Vehicle	Four Wheelers and above	22752
	Three Wheelers including tempos	11704
Buses	Stage carriages	937
	Contract Carriages/Omni Buses	7134
Four Wheelers	Cars	78103
	Taxis	12968
	Jeeps	716
Three Wheelers	Autorickshaws	23946
	Motorized Cycle Rickshaws	0
Two Wheelers	Motorized Cycles	0
	Scooter/Motor Cycles	370533
Tractors/Trailors	Tractors/Trailors	1074
	Tillers	130
	Trailors	282
	Others	1661
Grand Total		531940

Table: 23.4

LENGTH OF ROADS MAINTAINED BY PWD (R & B) AS ON 31-03-2013

(in Kms)

District/State	State Highways	Major District Roads	Total
Alappuzha	170.84	1303.12	1473.96
State	4341.65	27469.95	31811.60

Source: Infrastructure Statistics of Kerala

Table: 23.5

STANDARDISED LIST OF INSTITUTIONS IN ALAPPUZHA DISTRICT

Sl. No.	Institutions	Location	No. of Beds	Health Block
1	CHC	Thaikkattusseri	52	CHC Arookutti
2	CHC	Champakkulam	51	CHC Chempumpuram
3	CHC	Muhamma	23	CHC Muhamma
4	CHC	Thanneermukkam	24	CHC Muhamma
5	CHC	Ambalappuzha	12	CHC Ambalappuzha
6	CHC	Chunakkara	16	CHC Chunakkara
7	CHC	Kurathikadu	24	CHC Kurathikadu
8	CHC	Muthukulam	24	CHC Muthukulam
9	CHC	Veliyanad	30	CHC Veliyanad
10	CHC	Chempumpuram	12	CHC Chempumpuram
11	CHC	Edathwa	36	CHC Edathwa
12	CHC	Pandanadu	24	CHC Pandanadu
13	CHC	Mannar	24	CHC Mannar
14	CHC	Thrikkunnappuzha	18	CHC Thrikkunnappuzha
15	CHC	Arookutti	28	CHC Arookutti
16	CHC	Perumbalam	26	CHC Perumbalam
17	24X7 PHC	Kalavoor	24	CHC Chettikad
18	24X7 PHC	Cherthala South	0	CHC Muhamma
19	24X7 PHC	Ezhupunna	24	CHC Thuravoor
20	24X7 PHC	Aroor	0	CHC Thuravoor
21	24X7 PHC	Pallithodu	0	CHC Thuravoor
22	24X7 PHC	Vettakkal	18	PHC Vettakkal
23	24X7 PHC	Vallikunnam	24	CHC Chunakkara
24	24X7 PHC	Nooranadu	12	PHC Nooranadu
25	24X7 PHC	Chettikulangara	24	CHC Kurathikadu
26	24X7 PHC	Arattupuzha	24	CHC Muthukulam
27	24X7 PHC	Kandallur	36	CHC Muthukulam
28	24X7 PHC	Thakazhi	8	CHC Chempumpuram
29	24X7 PHC	Cheriyana	24	CHC Mannar
30	24X7 PHC	Karthikapalli	0	CHC Thrikkunnappuzha
31	24X7 PHC	Karuvatta	0	PHC Cheruthana
32	24X7 PHC	Pallippuram	12	PHC Pallippuram
33	24X7 PHC	Vayalar	24	PHC Pallippuram
34	PHC	Aryad	0	CHC Chettikad
35	PHC	Mannanchery	0	CHC Chettikad

Sl. No.	Institutions	Location	No. of Beds	Health Block
36	PHC	Mararikulam North	6	CHC Muhamma
37	PHC	Kanjikkuzhi	0	CHC Muhamma
38	PHC	Vallethodu	0	CHC Thuravoor
39	PHC	Kodamthuruthu	0	CHC Thuravoor
40	PHC	Thuravoor South	0	CHC Thuravoor
41	PHC	Kadakkappalli	0	PHC Vettakkal
42	PHC	Thottappalli	0	PHC Ambalappuzha
43	PHC	Purakkad	0	PHC Ambalappuzha
44	PHC	Punnappa	0	PHC Ambalappuzha
45	PHC	Thamarakulam	0	CHC Chunakkara
46	PHC	Bharanikavu	0	CHC Chunakkara
47	PHC	Palamel	0	PHC Nooranadu
48	PHC	Venmoni	0	PHC Nooranadu
49	PHC	Chennithala	0	CHC Kurathikadu
50	PHC	Thazhakkara	0	CHC Kurathikadu
51	PHC	Pathiyur	0	CHC Muthukulam
52	PHC	Devikulangara	0	CHC Muthukulam
53	PHC	Cheppad	0	CHC Muthukulam
54	PHC	Krishnapuram	0	CHC Muthukulam
55	PHC	Kavalam	0	CHC Veliyanad
56	PHC	Muttar	0	CHC Veliyanad
57	PHC	Ramankari	0	CHC Veliyanad
58	PHC	Neelamperoor	0	CHC Veliyanad
59	PHC	Kuppapuram	0	CHC Chempumpuram
60	PHC	Thalavadi	0	CHC Edathwa
61	PHC	Eramalikkara	0	CHC Pandanadu
62	PHC	Ala	0	CHC Pandanadu
63	PHC	Puliyur	0	CHC Pandanadu
64	PHC	Mulakuzha	0	CHC Pandanadu
65	PHC	Kadampoor	0	CHC Mannar
66	PHC	Budhanoor	0	CHC Mannar
67	PHC	Kumarapuram	0	CHC Thrikkunnappuzha
68	PHC	Chingoli	0	CHC Thrikkunnappuzha
69	PHC	Cheruthana	24	PHC Cheruthana
70	PHC	Haripad	24	PHC Cheruthana
71	PHC	Veeyapuram	0	PHC Cheruthana
72	PHC	Panavalli	0	CHC Arookutti

Source: DHS

