

**INVENTORY OF SOIL RESOURCES OF KOZHIKODE DISTRICT,
KERALA USING REMOTE SENSING TECHNIQUES & GIS**

1.	Survey Area	Kozhikode District, Kerala State
2.	Geographical Extent	75° 32' 30" and 76° 09' 10" East longitude, 11° 07' 05" and 11° 47' 55" North latitude
3.	Agro-climatic Region	Southern Plateau and Hill region (X)
4.	Total Area	2, 35,029 ha.
5.	Kind of Survey	Soil Resource Mapping using Remote Sensing Technique & GIS
6.	Base Maps	i) Survey of India Toposheets (Scale 1:50,000) vide toposheet No. 49M09, 10,11,12,13,14,15 & 16 58A02 & 03 (ii) Geology Map (Scale 1:2,50,000) of Geological Survey of India (iii) Satellite Imagery (Scale 1:50,000) of LISS-III (IRS-1-D)
7.	Scale of Mapping	1:50,000
8.	Period of Survey	February 2016 to March 2016

A. Mapping unit wise soil association and their extent

Sl. No.	Mapping unit	Association	Area (ha)	Area (%)
1.	CAI2b1	Iringal-Ayinnakkod	4412	1.88
2.	LAv3b1	Purameri-Nadapuram	21599	9.19
3.	LAu4b1	Cherode-Bhumivattukkal	15189	6.46
4.	LAn6b1	Memunda-Valayam	5040	2.14
5.	ALb2a1	Pannangod-Nanminda	1056	0.45
6.	GNw2a1	Tiruvallur-Chellanur	21629	9.2
7.	GNv3b1	Mavayi-Pallangod	21180	9.01
8.	GNu4b1	Kallanod-Valiyeri	23047	9.81
9.	GNn6b1	Nittur-Perambra-Maramchadi	28322	12.05
10.	GNn8b1	Chermala-Kuttiyadi	45207	19.23
11.	GNn8c1	Kuttali-Annakampoil	17693	7.53
12.	ROC		1978	0.84
13.	Habitation		22083	9.4
14.	Waterbodies		6594	2.81
Total			235029	100

B. Distribution of area under different Landscape/Geology

Sl. No.	Landscape	Area (ha)	Area (%)
1.	Alluvium	1056	0.45
2.	Coastal Alluvium	4412	1.88
3.	Gneiss	157078	66.83
4.	Laterite	41828	17.80
5.	ROC	1978	0.84
6.	Habitation	22083	9.4
7.	Waterbodies	6594	2.81
Total		235029	100.00

C. Distribution of area under different Physiography

Sl. No.	Physiography	Area (ha)	Area%
1.	Alluvial plains	1056	0.45
2.	Coastal Alluvial Plains	4412	1.88
3.	Lower pediplains	21629	9.20
4.	Upper pediplains	42779	18.20
5.	Pediments	38236	16.27
6.	Undifferentiated hills side slope	96262	40.96
7.	ROC	1978	0.84

Sl. No.	Physiography	Area (ha)	Area%
8.	Habitation	22083	9.4
9.	Waterbodies	6594	2.81
	Total	235029	100.00

D. Distribution of area under different Depth Classes

Sl. No.	Depth classes	Depth (cm)	Area (ha)	Area (%)
1.	Deep (d4)	50-100	17693	7.53
2.	Very deep (d5)	>100	186681	79.43
3.	ROC		1978	0.84
4.	Habitation		22083	9.4
5.	Waterbodies		6594	2.81
	Total		235029	100.00

E. Distribution of area under different Slope Classes

Sl. No.	Slope Classes	Slope (%)	Area (ha)	Area (%)
1.	Nearly level to very gently slope (AB)	0-3	27097	11.53
2.	Very gently to gently slope (BC)	1-5	42779	18.2
3.	Gently to Moderate slope (CD)	3-10	38236	16.27
4.	Strong slope to Moderate steep slope (EF)	10-25	33362	14.19
5.	Steep to Very Steep slope (GH)	25-50	62900	26.76
6.	ROC		1978	0.84
7.	Habitation		22083	9.4
8.	Waterbodies		6594	2.81
	Total		235029	100

F. Distributions of area under different Erosion Classes

Sl. No.	Erosion	Erosion class code	Area (ha)	Area (%)
1.	None to slight water erosion	e1	1056	0.45
2.	Slight to Moderate erosion	e1-e2	68820	29.28
3.	Moderate to Severe erosion	e2-e3	134498	57.23
4.	ROC		1978	0.84
5.	Habitation		22083	9.4
6.	Waterbodies		6594	2.81
	Total		235029	100.00

G. Distributions of area under different Management Classes

Sl. No.	Management	Area (ha)	Area%
1.	Poorly managed(PB)	26011	11.07
2.	Poorly managed (PB) to Moderately managed (MB)	155678	66.24
3.	Moderately managed (MB) to Well managed (WB)	22685	9.65
4.	ROC	1978	0.84
5.	Habitation	22083	9.4
6.	Waterbodies	6594	2.81
	Total	235029	100.00

H. Distribution of mapping units under different Land Capability Classes

S. No.	Land Capability Class	Mapping Units	Area (ha)	Area (%)
1	II	ALb2a1, GNw2a1	22685	9.65
2	III	LAv3b1, GNv3b1, GNu4b1	65826	28.01
3	III-IV	LAu4b1	15189	6.46
4	IV	LAn6b1, GNn6b1	37774	16.07
5	VII	GNn8b1	45207	19.23
11	Forest	GNn8c1	17693	7.53
12	Rock Out Crop		1978	0.84
13	Habitation		22083	9.4
14	Water bodies		6594	2.81
	Grand Total		235029	100.00

I. Distribution of mapping units under different Soil Irrigability classes

S. No.	Soil Irrigability Class	Mapping Units	Area (ha)	Area (%)
1	B	ALb2a1, GNw2a1	22685	9.65
2	B-C	GNu4b1	23047	9.81
3	C	LAv3b1, LAn6b1, GNv3b1, GNn6b1, GNn8b1	121348	51.63
4	C-D	LAu4b1	15189	6.46
5	D	CAI2b1	4412	1.88
6	Forest	GNn8c1	17693	7.53
7	Rock Out Crop		1978	0.84
8	Habitation		22083	9.4
9	Water bodies		6594	2.81
	Grand Total		235029	100.00

J. Distribution of mapping units under different Land Irrigability classes

S. No.	Land Irrigability Class	Mapping Units	Area (ha)	Area (%)
1.	2	ALb2a1, GNw2a1	22685	9.65
2.	3	LAv3b1, GNv3b1	42779	18.2

S. No.	Land Irrigability Class	Mapping Units	Area (ha)	Area (%)
3.	3-4	LAu4b1, GNu4b1	38236	16.27
4.	4	LAn6b1, GNn6b1, CAI2b1	37774	16.07
5.	6	GNn8b1	45207	19.23
6.	Forest	GNn8c1	17693	7.53
7.	Rock Out Crop		1978	0.84
8.	Habitation		22083	9.4
9.	Water bodies		6594	2.81
Grand Total			235029	100.00

K. Distribution of mapping units of the area under different hydrological soil grouping classes

S. No.	Hydrologic Soil Grouping	Mapping Units	Area (ha)	Area (%)
1	A	CAI2b1	4412	1.88
2	B	ALb2a1	1056	0.45
3	C	LAv3b1, LAu4b1, GNw2a1,GNv3b1, GNu4b1	102644	43.67
4	D	LAn6b1, GNn6b1, GNn8b1	78569	33.43
5	Forest	GNn8c1	17693	7.53
6	Rock Out Crop		1978	0.84
7	Habitation		22083	9.4
8	Water bodies		6594	2.81
Grand Total			235029	100.00

Salient Features

1. Most of the area in Kozhikode district comes under Gneiss 157078 ha (66.83 %) followed by laterite 41828 ha (17.80%), Coastal Alluvium 4412 ha (1.88%) and Alluvium 1056 ha (0.45%) as shown in the table.B.
2. In slope classes steep to very steep class covers majority area of 62900 ha (26.76%) of the total area Very gently to gently slope and gently to moderately slope occupied of 42779 ha (18.20%) and 38236 ha (16.27%). Moderately steep slope of 33362 ha (14.19%) and nearly level to very gently slope 27097 (11.53%)as shown in the table.E.
3. Most of the soils of the area are coming under very deep 186681 ha (79.42%) category followed by deep soils 17693 ha (7.53%) as shown in the table.D.
4. Maximum of the district area is coming under Plantation 163996 ha (69.78%) category followed by Agriculture 22685 (9.65%) and 17693 ha (7.53%) area is covered under Forest land.

5. Majority of the soils in the district are Moderate to Severe erosion 134498 ha (57.23%) and Slight to Moderate erosion 68820 ha (29.28%). None to slight water erosion covers an area of 1056 ha (0.45%), as shown in the table. F.
6. Majority of the area in the district is coming under Poorly managed (PB) to Moderately managed (MB) with an area of 155678 ha (66.24%) and Poorly managed(PB) 26011 (11.07%) followed by Moderately managed (MB) to Well managed (WB) 22685 ha (9.65%) area of total surveyed area, as shown in the table. G.
7. Kozhikode district divided into three soil taxonomical orders, four sub-orders, seven great groups, 11 sub-groups and 16 families.
8. Kozhikde majority of area under Land Capability class III 65826 ha (28.01%) followed by class VII covers 45207 (19.23%), class IV covers 37774 ha (16.07%), class II covers 22685 ha (9.65%), Forest covers 17693 ha (7.53%) and class III-IV covers 15189 ha (6.46%), as shown in table no. H.

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resource Mapping of Kozhikode district of Kerala and furnishes information on the geographical setting of the state vis-à-vis location, extent, physiography, relief, drainage, climate, geology, natural vegetation, agriculture, land use and soils.

The report contains information on interpretative grouping of soils and land resources which includes land capability classification providing suggestive management related guidelines; soil suitability groupings and crop recommendations which in turn provides a scientific database for horticulture, forest, forage and grassland development; water harvesting, water storage and water management. The soils of the area have also been differentiated as per soil characteristics based on Soil Taxonomy (USDA) to enable the users for scientific land use planning.

Kozhikode District spreads over an area of 2,35,029 ha and for administrative purposes, the district is divided into two revenue divisions and five taluks. The state is covered by nine Survey of India toposheets on 1:50,000 scale and the same have been used as reference maps for the survey. Satellite data (LISS-III Imagery) has been used for image interpretation and soil mapping. In the report each soil mapping unit is marked by a symbol i.e. ALb2a1 (Alluvium Geology; Alluvial plain, 1-3 % slope; agriculture land use; soil series association, which means the area has dominance of Allanturutti, series in association with Thitta series). Each soil association is restricted to a maximum of three soil series found within concerned soil mapping unit.

For the use of the soil resource report, first user needs to locate the area of interest on the map and note down the soil mapping units. Permanent features such as road, stream, lakes and village habitation etc. shown on the map will help user to locate the area of interest on the map. For the detailed information on soil mapping unit in respect of soil series in the area of interest, its extent, present and proposed land uses reference may be made to chapter-4, 5 and Appendix-I.

The symbols used in the soil mapping unit represents the five levels of mapping i.e. ALb2a1 may be referred as follows:

AL	Alluvium	:	Landscape
b	Alluvial plains	:	Physiography
2	1-3 % Slope	:	Slope classes
a	Agriculture	:	Land use
1	Soil series association		

Any comments and/or suggestions on the report are welcome. For any additional information and clarification, further correspondence or personal contact may be established with:

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