ABSTRACT

1.	**Survey Area**	**Kollam District, Kerala State, India**
2.	**Geographical Extent**	76^{o} 29' 30" and 77^{o} 15' 49" East Longitudes 08^{0} 45' 32" and 09^{0} 08' 17" North Latitudes
3.	**Agro-climatic Region**	Agro-climatic Zone-XII (West Coast Plains & Ghat Region)
4.	**Total Geographical Area**	2,47,467 hectare
5.	**Type of Survey**	Soil Resource Mapping (SRM) using Remote Sensing and GIS Techniques
6.	**Base Maps**	(i) Survey of India Toposheets (scale 1:50,000) 58C/08, 58C/12, 58C/16, 58D/09, 58D/13, 58G/04 and 58H/01, 58H/05 (ii) Geology Map (scale 1:2,50,000) of Geological Survey of India (iii) Satellite Imagery (scale 1:50,000) , LISS-III (IRS-ID)
7.	**Scale of Mapping**	1:50,000
8.	**Period of Survey**	December 2016 to January, 2017

A. Mapping unit wise soil association and their extent

Sl. No.	Mapping Unit	Series Association	Area (ha)	Area (%)
1.	CAl2a1	Chittumoola- Paravur	12185	4.92
2.	CAl2b1	Paravur- Chittumoola	15633	6.32
3.	GNn6b1	Chunda-Thalavoor	35846	14.49
4.	GNn6c1	Onthupacha-Chunda	7801	3.15
5.	GNn8b1	Kumarakudy-Kalurutti	17747	7.17
6.	GNn8b2	Perumkulam-Thamaraikudi	252	0.1
7.	GNn8c1	Ullatukadavu-Pukulanji	62457	25.24
8.	GNp2a1	Cheradhanur-Peringodu	13199	5.33
9.	GNu4b1	Puyapalli-Ayirakuzhi	13942	5.63
10.	GNu4c1	Puvanatamodu-Puyapalli	189	0.08
11.	GNv3b1	Sadanandapuram-Niraikod	1215	0.49
12.	GNw2a1	Maniyar-Chungatara	12167	4.92
13.	LAn6b1	Miyanur-Kadambanadu	7625	3.08
14.	LAu4b1	Puravazhy-Kunnattur	10308	4.17
15.	LAv3b1	Chooranadu-Chattanur	9820	3.97
16.	Misc.		27081	10.94
	Total		**247467**	**100**

B. Distribution of area under different Landscape/Geology classes

Sl. No.	Geology	Area (ha)	Area (%)
1.	Coastal Alluvium (CA)	27818	11.24
2.	Gneiss (GN)	164815	66.6
3.	Laterite (LA)	27753	11.22
4.	Misc.	27081	10.94
	Total	**247467**	**100**

C. Distribution of area under different Physiography

Sl. No.	Physiography	Area (ha)	Area (%)
1.	Coastal Alluvial Plains (l)	27818	11.24
2.	Lower pediplains (w)	12167	4.92
3.	Narrow hill valleys (p)	13199	5.33
4.	Pediments (u)	24439	9.88
5.	Undifferentiated hills side slope (n)	131728	53.23
6.	Upper pediplains (v)	11035	4.46
7.	Misc.	27081	10.94
	Total	**247467**	**100**

D. Distribution of area under different Depth classes

Sl. No.	Depth	Depth (cm)	Area (ha)	Area
1.	Deep to very deep (d4-d5)	50 - 100	80390	32.49
2.	Shallow to moderate deep (d2-d3))	10-50	252	0.10
3.	Very deep (d5)	>100	139744	56.47
4.	Misc.		27081	10.94
	Total		**247467**	**100.00**

E. Distribution of area under different Slope classes

Sl. No.	Slope Classes	Slope (%)	Area (ha)	Area (%)
1.	Gently to moderately slope	0-3	24439	9.88
2.	Nearly level to very gently slope	1-5	53184	21.49
3.	Steep to very steep slope	3-10	80456	32.51
4.	Strongly to moderately steep slope	10-25	51272	20.72
5.	Very gently to gently slope	25-50	11035	4.46
6.	Misc.		27081	10.94
	Total		**247467**	**100.00**

F. Distribution of area under different Erosion classes

Sl. No.	Erosion Class	Erosion classes	Area (ha)	Area (%)
1.	e1	Slight water erosion	53184	21.49
2.	e1-e2	Slight to Moderate erosion	25166	10.17
3.	e2	Moderate water erosion	88191	35.64
4.	e2-e3	Moderate to Severe erosion	53845	21.76
5.	Misc.		27081	10.94
	Total		**247467**	**100**

G. Distribution of area under different Management classes

Sl. No.	Management codes	Management classes	Area	Area (%)
1.	M3	Moderately managed (MB)	88191	35.64
2.	M3-M4	Moderately managed (MB) to Well managed(WB)	25166	10.17
3.	M2-M3	Poorly managed (PB) to Moderately managed (MB)	53845	21.76
4.	M4	Well managed (WB)	53184	21.49
5.	Misc.		27081	10.94
	Total		**247467**	**100**

H. Distribution of mapping units under different Land Capability Classes

Sl. No.	Land Capability Class	Description	Area (ha)	Area (%)
1.	II	Good lands with minor limitations	25366	10.25
2.	II-III	Good lands with minor limitations to moderately good lands with minor limitations	35285	14.26
3.	III-IV	Moderately good lands with minor limitations to fairly suitable arable lands	27818	11.24
4.	IV	Fairly suitable arable lands	43471	17.57
5.	VII	Suitable for pasture and forestry with major limitations	17999	7.27
6.	Forest		70447	28.47
7.	Misc.		27081	10.94
		Total	**247467**	**100**

I. Distribution of mapping units under different Soil Irrigability classes:

Sl. No.	Soil Irrigability Class	Mapping Units	Area (ha)	Area (%)
1.	A-B	None to slight limitations for sustained use under irrigation to moderate soil limitations for sustained use under irrigation	25366	10.25
2.	B-C	Moderate soil limitations for sustained use under irrigation to severe soil limitations for sustained use under irrigation	11035	4.46
3.	C	Severe soil limitations for sustained use under irrigation	24250	9.80
4.	C-D	Severe soil limitations for sustained use under irrigation to very severe soil limitations for sustained use under irrigation	71289	28.81
5.	D	Very severe soil limitations for sustained use under irrigation	17999	7.27

6.	Forest		70447	28.47
7.	Misc.		27081	10.94
		Total	**247467**	**100**

J. Distribution of mapping units under different Land Irrigability classes

Sl. No.	Land Irrigability Class	Mapping Units	Area (ha)	Area (%)
1.	2	Land that have moderate limitations for sustained use under irrigation	25366	10.25
2.	2-3	Land that have moderate limitations for sustained use under irrigation to land that have severe limitations for sustained use under irrigation	1215	0.49
3.	3	Land that have severe limitations for sustained use under irrigation	34070	13.77
4.	3-4	Land that are marginal for sustained use under irrigation because of very severe limitaion	27818	11.24
5.	6	Land not suitable for sustained use under irrigation	61470	24.84
6.	Forest		70447	28.47
7.	Misc.		27081	10.94
		Total	**247467**	**100**

K. Distribution of mapping units under different Hydrologic Soil Groupings

Sl. No.	Hydrologic Soil Grouping	Description	Area (ha)	Area (%)
1.	A	Low run-off potential	27818	11.24
2.	B	Moderately lower run-off potential	25366	10.25
3.	B-C	Moderately lower run-off potential to moderately high run-off potential	21343	8.62
4.	C	Moderately high run-off potential	13942	5.63
5.	C-D	Moderately high run-off potential to high run-off potential	43471	17.57
6.	D	High run-off potential	17999	7.27
7.	Forest		70447	28.47
8.	Misc.		27081	10.94
		Total	**247467**	**100**

SALIENT FEATURES

- ❖ The land capability class (LCC) falls under five classes in which LCC class IV accounting 17.57 per cent of the total area followed by class II-III, class III-IV, class II and class VII which account 14.26, 11.24, 10.25 and 7.27 per cent, respectively of total surveyed area. Forest area occupied 28.47 % of the survey area.
- ❖ Nearly 28.81 per cent comes under Soil Irrigability class C-D (severe soil limitations for sustained use under irrigation to very severe soil limitations for sustained use under irrigation) followed by class A-B (severe soil limitations for sustained use under irrigation to very severe soil limitations for sustained use under irrigation), C and D classes accounting 10.25 per cent, 9.8 and 7.27 per cent of the total per cent area, respectively.
- ❖ Majority of the area comprising an area of 24.84 per cent comes under land irrigability class 6 followed by land irrigability class 3, 3-4, 2 and 2-3 which account 13.77, 11.24, 10.25 and 0.49 per cent of the total survey area, respectively.
- ❖ Nearly 17.57 per cent area comes under hydrological soil grouping C-D followed by class A, B, B-C, D and C classes accounting 11.24, 10.25, 8.62, 7.27 per cent and 5.63 per cent, respectively of the total surveyed area.
- ❖ Fifteen mapping units have been established in the survey area, of which, GNn8c1 unit occupies maximum area of 25.24 per cent followed by GNn6b1 unit (14.49%).
- ❖ Most of the area in Kollam district comes under Gneiss 164815 ha (66.60%) followed by Coastal Alluvium 27818 ha (11.24 %) and Laterite 27753 ha (11.22%) of the total surveyed area.
- ❖ Undifferentiated hill side slopes 131728 ha (53.23%) followed by coastal alluvial plains 27818 ha (11.24%), pediments 24439 ha (9.88%), narrow hill valleys 13199 ha (5.33%), lower pediplains 2167 ha (4.92%) and upper pediplain 11035 ha (4.46%) of surveyed area.
- ❖ Most of the soils of the area are coming under very deep soils 139744 ha (56.47%) followed by deep to very deep soil 80390 ha (32.49%) and shallow to moderately deep 252 ha (0.10%).
- ❖ An area of 80456 ha (32.51%) of Kollam district comes under steep to very steep slopes followed by nearly level to very gently slope of 53184 ha (21.49%) while an area of 24439 ha (9.88%) comes under gently to moderately slope.
- ❖ Major area comes under moderate water erosion 88191 ha (35.64%) and moderate to severe erosion 53845 ha (21.76%). None to slight water erosion occupies 53184 ha (21.49%) followed by slight to moderate erosion 25166 ha (10.17%) of the total area.

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resource Mapping of Kollam district of Kerala, state 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 nature and kind of soil resources with its extent on landscape and interpretative grouping of soils and land resources which includes land capability classification that helps to prepare scientific land use plan for agriculture, horticulture, forestry, grassland development and providing suggestive management guidelines for crop suitability and crop recommendations. 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.

Kollam District which spreads over an area of 2,47,467 hectare have its district headquarters at Kollam. The district has six taluks, namely Pathanapuram, Kunnathur, Kottarakkara, Karunagapally, Punalur and Kollam and 104 villages. Survey of India Toposheets on 1:50,000 scale and the same have been used as reference maps for the survey. Satellite data (NRSC Imagery) has been used for image interpretation and soil mapping. In the report each soil mapping unit is marked by a symbol which represent the five levels of generalization as features within mapping units viz.

Geology (parent material)	LA	-	Laterite
Physiography	v	-	Upper pediplains
Slope	3	-	1-5 % Slope
Land use	b	-	Plantation
Soils	1	-	Association of soil 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 3.7, 4 and Appendix-I and II.

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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