

# INVENTORY OF SOIL RESOURCES OF PATHANAMTHITTA DISTRICT, KERALA USING REMOTE SENSING TECHNIQUES & GIS

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<b>1. Survey Area</b>	Pathanamthitta District, Kerala State
<b>2. Geographical Extent</b>	76 <sup>0</sup> 28'35" and 77 <sup>0</sup> 17'03" East longitude, 9 <sup>0</sup> 4'8" and 9 <sup>0</sup> 29'29" North latitude
<b>3. Agro-climatic Region</b>	Southern Plateau and Hill region (X)
<b>4. Total Area</b>	2, 65,766 ha.
<b>5. Kind of Survey</b>	Soil Resource Mapping using Remote Sensing Technique & GIS
<b>6. Base Maps</b>	i) Survey of India Toposheets (Scale 1:50,000) vide toposheet No. 58C07,11,12,15 & 16 58G03,04,07 &08 (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)
<b>7. Scale of Mapping</b>	1:50,000
<b>8. Period of Survey</b>	March & April 2017

**A. Mapping unit wise Soil association and their extent:**

Sl.No	Mapping Unit	Series Association	Area	% area
1	ALb2a1	Allanturutti-Thatta	29352	11.06
2	CKn6b1	Omalur-Malantadam	19457	7.32
3	CKn6c1	Kattachira-Vallamala-Vallikunnu	6035	2.27
4	CKn8b1	Kottayam-Kizhakkupuram-Nirathupara	36681	13.80
5	CKn8c1	Alunkal-Ranni-Sabarimala	122157	45.96
6	CKp3b1	Aruvapallam-Vaypur	3826	1.44
7	CKq2a1	Vallikod-Puramattom	3354	1.27
8	CKu4b1	Edakulam-Konni	3000	1.13
9	CKu4c1	Vallamala-Kodapanna	397	0.15
10	CKv3b1	Mallesri-Kotakulam	1669	0.63
11	LAn6b1	Mezhuvveli-Parakkod	10151	3.82
12	LAu4b1	Kumbazha-Paranthala	13439	5.06
13	LAv3b1	Mudiyur-Vadakumbagam-Elanthoor	8868	3.34
14	e	ROC	2180	0.82
15	f	Habitations	591	0.23
16	g	Water bodies	4609	1.70
<b>Total</b>			<b>265766</b>	<b>100.0</b>

**B. 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	32706	12.30
2.	Very gently to gently slope (BC)	1-5	14363	5.41
3.	Gently to Moderate slope (CD)	3-10	16836	6.34
4.	Strong slope to Moderate steep slope (EF)	10-25	35643	13.41
5.	Steep to Very Steep slope (GH)	25-50	158838	59.76
6.	Misc. (Habitations, ROC & Waterbodies)		7380	2.78
<b>Total</b>			<b>265766</b>	<b>100</b>

**C. Distribution of area under different depth classes.**

Sl. No.	Depth classes	Depth (cm)	Area (ha)	Area (%)
1.	Deep (d4)	50-100	10151	3.82
2.	Deep to very deep (d4-d5)	>50	201166	75.69
3.	Very deep (d5)	>100	47069	17.71
4.	Misc. (Habitations, ROC & Waterbodies)		7380	2.77
<b>Total</b>			<b>265766</b>	<b>100.00</b>

#### D. Distribution of area under different erosion classes.

Sl. No.	Erosion	Erosion class code	Area (ha)	Area (%)
1.	None to slight water erosion	e1	41574	15.64
2.	Slight to Moderate erosion	e1-e2	5495	2.07
4.	Moderate water erosion	e2	171636	64.59
3.	Moderate to Severe erosion	e2-e3	39681	14.93
4.	Misc. (Habitations, ROC & Waterbodies)		7380	2.77
<b>Total</b>			<b>265766</b>	<b>100.00</b>

#### E. Distribution of area under different management classes

SI No.	Management	Area (ha)	Area%
1	Poorly managed (PB) to Moderately managed (MB)	39681	14.93
2	Moderately managed (MB)	171636	64.59
3	Moderately managed (MB) to Well managed (WB)	5495	2.07
4	Well managed (WB)	41574	15.64
5	Misc (Habitations, ROC & Waterbodies)	7380	2.78
<b>Total</b>		<b>265766</b>	<b>100.00</b>

#### F. Distribution of area under different landuse classes

Sl. No.	Land use	Land use code	Area (ha)	Area (%)
1.	Agriculture	a	32706	12.30
2.	Plantation	b	97091	36.54
3.	Forest	c	128589	48.38
4.	Misc. (Habitations, ROC & Waterbodies)		7380	2.77
<b>Total</b>			<b>265766</b>	<b>100.00</b>

#### Salient Features

1. Most of the area in Pathanamthitta district comes under Charnokite 196576 ha (73.97 %) followed by laterite 32458 ha (12.21%) and Alluvium 29352 ha (11.04%) as shown in the table.1.
2. In slope classes steep to very steep class covers majority area of 158838ha (59.77%) of the total area, strongly to moderately steep slopes occupies an area of 35643ha (13.41%), 12.31 percentage of area comes under nearly level to very gently slope and 5.4 percentage of area under very gently to gently slope class as shown in the table.11.

3. Most of the soils are coming under deep to very deep covering of 201166 ha(75.69%) followed by very deep soils with an area of 47069 ha (17.71%) as shown in the table.12.
4. Maximum of the district area is coming under Forest 128589 ha (48.38%) followed by Plantation 97091ha (36.54%). Only 32706 ha (12.30%) area is covered under agriculture land as shown in the table.13.
5. Majority of the soils in the district are prone to moderate erosion 171636 ha (64.59%) and moderate to severe erosion 39681 ha (14.93%), as shown in the table.14.
6. Majority of the area in the district is coming under Moderately managed with an area of 171636 ha (64.59%) followed by well managed area 41574 ha (15.64%), poorly to moderately managed area is having 39681 ha (14.93%) of the total area and moderate to ell managed area occupies 5495 ha (2.07%), as shown in the table.15.
7. Pathanamthitta district divided into four soil taxonomical orders, five sub-orders, ten great groups, 13 sub-groups and 21 families, as shown in table no.7.
8. Pathanamthitta majority of area under forest 128589 ha (48.38%), Land Capability class under II-III cover 47,069ha (17.71%), VI-VII covers 36681h (13.80%), Land Capability class IV covers 22457 ha (8.46%), III-IV covers 13439 ha (5.06%) and VI covers 10151 ha (3.82%), as shown in table no. 16

## HOW TO USE SOIL RESOURCE MAPPING REPORT

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This report embodies the results of the Soil Resource Mapping of Pathanamthitta 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.

Pathanamthitta District spreads over an area of 2,65,766 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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