

ABSTRACT

1.	Survey Area	Malappuram District, Kerala State, India
2.	Geographical Extent	75 ° 50' and 76 ° 36' East Longitudes 10° 40' and 11° 32' North Latitudes
3.	Agro-climatic Region	Agro-climatic Zone-XII (West Coast Plains & Ghat Region)
4.	Total Geographical Area	3,55,735 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) 49M/15, 49M/16, 49N/13, 49N/14, 58A/02, 58A/03, 58A/04, 58A/08, 58A/07 , 58A/11,58B/01,58B/02 and 58B/05 (ii) Geology Map (scale 1:2,50,000) of Geological Survey of India (iii) Satellite Imagery (scale 1:50,000) and LISS-III (IRS-ID)
7.	Scale of Mapping	1:50,000
8.	Period of Survey	April, 2018 to May, 2018

A. Mapping unit wise soil association and their area of extent

Sl. No.	Mapping Unit	Series Association	Area (ha)	Area (%)
1.	ALb1a1	Erava-Kaladi-Tekkankatoor	6533	1.84
2.	ALb2a1	Kaladi-Tekkankatoor-Erava	3409	0.96
3.	ALb2b1	Tekkankatoor-Kaladi-Erava	571	0.16
4.	CA11b1	Nirmaruthur-Vakkad	3126	0.88
5.	CA12b1	Vakkad-Nirmaruthur	11658	3.28
6.	CKn6b1	Pukkattumpadam-Chokkad	894	0.25
7.	CKn8b1	Periyapuram-Pandalur	26579	7.47
8.	CKn8c1	Pullangod-Vazhikadavu	66198	18.61
9.	LAn6b1	Valiyagati-Puttur	59319	16.68
10.	LAn6c1	Kariam-Kalkulam	2763	0.78
11.	LAp2a1	Cherukunnu-Vaniambalam	40629	11.42
12.	LAu4b1	Cheriyamundam-Tirurkkad-Olakara	81068	22.79
13.	LAu4c1	Karulai-Karimpuzha	11033	3.10
14.	LAv3b1	Valiyara-Changaramkulam	7331	2.06
15.	LAq2a1	Pattapariyam-Mambad	11100	3.12
16.	LAp2b1	Vaniambalam-Cherukunnu	8048	2.26
17.	HB		610	0.17
18.	ROC		6075	1.71
20.	RIVER		8791	2.47
Total Area			355735	100

B. Distribution of area under different Landscape/Geology classes

Sl. No.	Geology	Area (ha)	Area (%)
1.	Coastal Alluvium (CA)	14784	4.16
2.	Alluvium (AL)	10513	2.96
3.	Charnockite (CK)	93671	26.33
4.	Laterite (LA)	221291	62.20
5.	Misc.	15476	4.35
Total Area		355735	100

C. Distribution of area under different Physiography

Sl. No.	Physiography	Area (ha)	Area (%)
1.	Coastal Alluvial Plains (l)	14784	4.16
2.	Alluvial plains (b)	10513	2.96
3.	Narrow hill valleys (p)	48677	13.68
4.	Broad hill valleys(q)	11100	3.12
5.	Pediments (u)	92101	25.89
6.	Undifferentiated hills side slope (n)	155753	43.78
7.	Upper pediplains (v)	7331	2.06
8.	Misc.	15476	4.35
Total Area		355735	100

D. Distribution of area under different depth classes

Sl. No.	Depth Classes	Depth (cm)	Area (ha)	Area %
1.	Moderately deep to deep (d4-d5)	25-100	81068	22.79
2.	Deep to very deep (d3-d4)	50-100	174117	48.95
3.	Very deep (d5)	>100	85074	23.91
4.	Misc.		15476	4.35
Total Area			355735	100

E. Distribution of area under different slope classes

Sl. No.	Slope Classes	Slope (%)	Area (ha)	Area (%)
1.	Nearly level slope (A)	0-1	9659	2.72
2.	Nearly level to very gently slope (AB)	0-3	75415	21.2
3.	Very gently to gently slope (BC)	1-5	7331	2.06
4.	Gently to moderately slope (CD)	3-10	92101	25.89
5.	Strongly to moderately steep slope (EF)	10-25	62976	17.7
6.	Steep to very steep slope (GH)	25-50	92777	26.08
7.	Misc.		15476	4.35
Total Area			355735	100

F. Distribution of area under different Erosion classes

Sl. No.	Erosion Class code	Erosion classes	Area (ha)	Area (%)
1.	e1	Slight water erosion	6533	1.84
2.	e1-e2	Slight to Moderate erosion	70493	19.82
3.	e2	Moderate water erosion	183239	51.51
4.	e2-e3	Moderate to Severe erosion	79994	22.49
5.	Misc.		15476	4.35
Total Area			355735	100

G. Distribution of area under Land use classes

Sl. No.	Land use	Land use code	Area (ha)	Area (%)
1.	Agriculture	a	61671	17.34
3.	Plantation	b	198594	55.83
2.	Forest	c	79994	22.49
5.	Misc.		15476	4.35
Total Area			355735	100

H. Distribution of area under different management classes

Sl. No.	Management Class codes	Management Classes	Area (ha)	Area (%)
1.	M3	Moderately managed (MB)	175191	49.25
2.	M3-M4	Moderately managed (MB) to Well managed (WB)	78541	22.08
3.	M2-M3	Poorly managed (PB) to Moderately managed (MB)	11033	3.10
4.	M1-M2	Unmanaged(UB) to Poorly managed(PB)	68961	19.39
5.	M4	Well managed (WB)	6533	1.84
6.	Misc.		15476	4.35
Total Area			355735	100

I. Distribution of mapping units under different land capability classes (LCC)

Sl. No.	LCC	Description	Mapping Units	Area (ha)	Area (%)
1.	II-III	Good lands with minor limitations to moderately good lands with minor limitations	LAp2a1, LAv3b1, LAq2a1, LAp2b1	67108	18.86
2.	III-IV	Moderately good lands with minor limitations to fairly suitable arable lands	ALb2a1, ALb2b1, CA11b1, CA12b1, LAu4b1	106365	29.90
3.	IV	Fairly suitable arable lands	CKn6b1, LAn6b1	60213	16.93
4.	VI-VII	Suitable for pasture and forestry with major limitations	CKn8b1	26579	7.47
5.	Forest		CKn8c1, LAn6c1, LAu4c1	79994	22.49
6.	Misc.			15476	4.35
Total Area				355735	100

J. Distribution of mapping units under different soil irrigability classes (SIC)

Sl. No.	SIC	Mapping Units	Area (ha)	Area (%)
1.	B-C	LAp2a1, LAv3b1, LAq2a1, LAp2b1	67108	18.86
2.	C	CKn6b1, CKn8b1, LAn6b1	86792	24.40
3.	C-D	ALb2a1, ALb2b1, CA11b1, CA12b1, LAu4b1	106365	29.90
4.	Forest	CKn8c1, LAn6c1, LAu4c1	79994	22.49
5.	Misc.		15476	4.35
Total Area			355735	100

K. Distribution of mapping units under different land irrigability classes (LIC)

Sl. No.	LIC	Mapping Units	Area (ha)	Area (%)
1.	2-3	LAp2a1, LAv3b1, LAq2a1, LAp2b1	67108	18.86
2.	3-4	ALb2a1, ALb2b1, CA11b1, CA12b1	25297	7.11
3.	4	LAu4b1	81068	22.79
4.	6	CKn6b1, CKn8b1, LAn6b1	86792	24.40
5.	Forest	CKn8c1, LAn6c1, LAu4c1	79994	22.49
6.	Misc.		15476	4.35

Total Area	355735	100
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L. Distribution of mapping units under different hydrologic soil groupings (HSG)

Sl. No.	HSG	Mapping Units	Area (ha)	Area (%)
1.	A-B	CA11b1, CA12b1	14784	4.16
2.	B-C	LAp2a1, LAp2b1	48677	13.68
3.	C	CKn6b1, CKn8b1, LAn6b, LAu4b1 LAv3b1	175191	49.25
4.	C-D	ALb2b, LAq2a1	11671	3.28
5.	D	ALb1a1, ALb2a1	9942	2.79
6.	Forest	CKn8c1, LAn6c1, LAu4c1	79994	22.49
7.	Misc.		15476	4.35
Total Area			355735	100

SALIENT FEATURES

- ❖ The land capability class (LCC) falls under four classes in which LCC class III-IV accounting 29.90 per cent of the total area followed by class II-III, class IV and class VI-VII which account 18.86, 16.93 and 7.47 per cent, respectively of total surveyed area. Forest area occupies 22.49 per cent out of total the surveyed area (Table I).
- ❖ Nearly 29.90 per cent comes under Soil Irrigability class C-D (Severe to Very severe soil limitations for sustained use under irrigation.) followed by class C (Severe soil limitations for sustained use under irrigation) and class B-C (Moderate soil limitations for sustained use under irrigation), accounting 24.40 and 18.86 per cent out of total surveyed area, respectively (Table J).
- ❖ Majority of the area comprising an area of 24.40 per cent comes under land irrigability class 6 followed by land irrigability class 4, 2-3 and 3-4 which account 22.79, 18.86 and 7.11 per cent of the total surveyed area, respectively (Table K).
- ❖ Nearly 49.25 per cent area comes under Hydrological soil grouping C followed by class B-C, A-B, C- D and D classes accounting 13.68, 4.16, 3.28 per cent and 2.79 per cent, respectively of the total surveyed area. Forest accounts for 28.47 per cent of the surveyed area (Table L).
- ❖ Sixteen mapping units have been established in the survey area, of which, LAu4b1 unit occupies maximum area of 22.79 per cent followed by CKn8c1 unit (18.61%). River accounts for 8791 ha (2.47%) followed by Rock 6075 ha (1.71%) and Habitation 610 ha (0.17) of the total surveyed area as depicted in table A.
- ❖ Most of the area in Malappuram district comes under Laterite 221291ha (62.20%) followed by Charnockite 93671 ha (26.33%) Coastal Alluvium 14784 ha (4.16%) and Alluvium 10513 (2.96%) of the total surveyed area (Table B).
- ❖ Undifferentiated hill side slopes cover maximum area of 155753 ha (43.78%) followed by pediments 92101 ha (25.89%), narrow hill valleys 48677 ha (13.68%), coastal alluvial plains 14784 ha (4.165.33%), broad hill valleys 11100 ha (3.12%), alluvial plains 10513 ha (2.96%) and upper pediplain 7331 ha (2.06%) of surveyed area (Table C).
- ❖ Most of the soils of the area are coming under deep to very deep soils 174117 ha (48.95%) followed by very deep soil 85074 ha (23.91%) and moderately deep to deep 81068 ha (22.79%) as depicted in table D.

- ❖ An area of 92777ha (26.08%) of Malappuram district comes under steep to very steep slopes followed by gently to moderately slope of 92101 ha (25.89%) while an area of 75415 ha (21.2%) comes under nearly level to very gently (Table E).
- ❖ Major area comes under moderate water erosion 183239ha (51.51%) and moderate to severe erosion 79994 ha (22.49%). slight to moderate erosion occupies 70493 ha (19.82%) followed by slight water erosion 6533 ha (1.84%) of the total area (Table E).
- ❖ Maximum of the district area is coming under Plantation 198594 ha (55.83%) category followed by Forest 79994 (22.49%) and 61671 ha (17.34%) area is covered under Agriculture land (Table G).
- ❖ Malappuram district divided into five soil taxonomical orders, nine sub-orders, 13 great groups, 15 sub-groups and 22 families.