

Inventory of Soil Resources of Mon District, Nagaland State Using Remote Sensing and GIS Techniques

ABSTRACT

1.	Survey Area	:	Mon District, Nagaland
2.	Geographical Extent	:	Between 23°35'20" to 24°44'17" North Latitude and 94°32'28" to 95°25'16" East Longitude
3.	Agro Climatic Region	:	Eastern Himalayan Region-II
4.	Total Area of the District	:	1,78,600 ha.
5.	Kind of Survey	:	Soil Resources Mapping using Remote Sensing Techniques.
6.	Base Map	:	a) IRS – ID Geocoded Satellite Imagery (1: 50000 scale) b) SOI – Toposheet (1:50000 scale)
7.	Scale of Mapping	:	1 : 50,000
8.	Period of Survey	:	January, 2014

Soil Series association mapped and their respective area

Sl. No.	Mapping Symbol	Mapping Unit	Soil Series Association	Total Area (ha)	Area (%)
1	32	ACp3a1	Longnam-Jakhama-Kukidolong	1255	0.70
2	33	ACp3c1	Tuli-II-Tuli-I-Diliapur	4270	2.39
3	34	ACp3d1	Tuli-I-Sirhima basa	21	0.01
4	31	ACq3a1	Jakhama-Sirhimakuki-Toshozu-I	4713	2.64
5	35	ACq3c1	Sirhima basa-Diliapur	5458	3.06
6	28	ALb3a1	Tenyiphe-I-Dhansiripar-Rangapahar	555	0.31
7	29	ALb3c1	Rangapahar-Tenyiphe-II-Chumukedima-I	216	0.12
8	2	SDi4c(a)1	Maromi-Alichen-Merongkong	378	0.21
9	3	SDi4c1	Mongsiyimti-Mopungchukit-Mariama	822	0.46

Sl. No.	Mapping Symbol	Mapping Unit	Soil Series Association	Total Area (ha)	Area (%)
10	24	SDn6(2)a1	Zubza-I-Tuensang-Phesama-I	934	0.52
11	22	SDn6c(a)1	Yisemyong-Unger-Phesama-II	2143	1.20
12	23	SDn6c(a)2	Sutsu-Unger-Chieswema	1320	0.74
13	20	SDn6c1	Longnak-Unger-Tsemenyu	4281	2.40
14	21	SDn6c2	Jhanji-Phesama-I-Longwesungu	7786	4.36
15	21.1	SDn6c3	Jhanji-Phesama-I-Longwesungu	348	0.19
16	18	SDn7(2)a1	Phesama-I-Unger-Tuensang	1114	0.62
17	10	SDn7b1	Changki-Mongsiyimti-Unger	163	0.09
18	16	SDn7c(a)1	Mokokchung-Unger	13058	7.32
19	17	SDn7c(a)2	Chieswema-Manguzu-Sutsu	6194	3.47
20	11	SDn7c1	Yisemyong-Longnak-Padambo	10979	6.15
21	12	SDn7c2	Zaphumi-Longnak-Unger	25398	14.23
22	12.1	SDn7c3	Vishwema-Chieswema-Zaphumi	1459	0.82
23	13	SDn7c4	Kohima-Unger-Aizeto	193	0.11
24	14	SDn7d1	Unger-Aizeto	883	0.49
25	9	SDn9c(a)1	Khota-Tsemenyu-Chieswema	12790	7.16
26	7	SDn9c(a)2	Chieswema-Paglapahar-Chieswama-I	3360	1.88
27	5	SDn9c1	Changki-Mongsiyimti-Merongkong	23398	13.11
28	6	SDn9c2	Changki-Vishwema-Longsamtang	26040	14.58
29	6.1	SDn9c3	Chieswama-II-Longsamtang-Vishwema	2069	1.16
30	8	SDn9c4	Kagaki-Kohima-Chieswema	4830	2.70
31	8.1	SDn9d1	Kagaki-Kohima-Chieswema	1366	0.76
32	26	SDy5a1	Gwalwa-Thahiku-Zubza-II	704	0.39
33	25	SDy5c1	Gwalwa-Thahiku-Dayapur	3598	2.01
34	37	SDz4a1	Medziphema-Dayapur	176	0.10
35	36	SDz4c1	Dayapur-Gwalwa	2698	1.51
36	38	Habitation		2431	1.36
37	39	River		1199	0.67
			TOTAL	178600	100.00

Area under different erosion classes

Sl. No.	Erosion	Area (ha)	Area (%)
1	None to slight erosion	6523	3.65
2	None to slight to moderate erosion	2048	1.15
3	Moderate erosion	13464	7.54
4	Moderate to severe erosion	68392	38.29
5	Severe erosion	84543	47.34
6	Misc.	3630	2.03
	TOTAL	178600	100.00

Area under different slope classes

Sl. No.	Slope Classes	Area (ha)	Area (%)
1	Very gently to gently slope	16488	9.23
2	Gently to moderately slope	4074	2.28
3	Moderately to strongly slope	4302	2.41
4	Strongly to moderately steep slope	16812	9.41
5	Moderately steep to steep slope	59441	33.28
6	Very steep to extremely steep slope	73853	41.35
7	Misc.	3630	2.03
	TOTAL	178600	100.00

Area under different landscape and physiography classes

Sl. No	Landscape	Physiography	Area (ha)	Area (%)
1	Alluvium	Alluvial plains	771	0.43
2	Alluvium Colluvium	Broad hill valleys	10171	5.69
		Narrow hill valleys	5546	3.11
3	Sandstone	Plateau plains / hill tops/ mesa	1200	0.67
		Rolling upland	4302	2.41
		Undulating uplands	2874	1.61
		Undifferentiated hills side slopes	150106	84.05
4		Misc.	3630	2.03
		TOTAL	178600	100.00

Salient Features:

- ❖ Alluvium, Alluvium – Colluvium and Sandstone are the three major landscape found in Mon district.
- ❖ Total 51 nos of soil series have been mapped in the three major landscape of Mon district.
- ❖ About 66.33% of the area falls under forest followed by 21.97% of the total area under Jhum land.
- ❖ Soils of the district, falls under seven physiographic classes of which majority of the area comes under undifferentiated hill side slopes followed by broad hill valleys.
- ❖ About 73853 ha (41.35%) of survey area having very steep to extremely steep slope range followed by moderately steep to steep slope range 59441 ha (33.28%).
- ❖ About 53.29% area of the district area is under deep soils followed by very deep soils (32.89%)
- ❖ Majority of the area suffers from severe (47.34%) and moderate to severe erosion hazard (38.29%).
- ❖ Nearly 41.44% of total surveyed area comes under Land Capability Class VI and is not suitable for cultivation, suitable for pasture and forestry with minor limitations where as 41.46% area comes under Land Capability Class VII and is not suitable for cultivation but suitable for pasture and forestry with major limitations as well as for wild life preservation, recreation etc.
- ❖ Soils of the area are taxonomically classified into four orders i.e. Alfisols, Entisols Inceptisols and Ultisols.
- ❖ Nearly 76.92% of total surveyed area comes under Soil Irrigability Class C-D with severe to very severe soil limitations for sustained use under irrigation.
- ❖ Nearly 74.20% of total surveyed area comes under Land Irrigability Class 6 and is not suitable for sustained use under irrigation.
- ❖ Cultivation on steep hill slopes and marginal lands should be restricted. Terraced cultivation or cultivation with proper soil and water conservation measures is highly recommended to mitigate high run-off water and soil erosion.
- ❖ Plantation crops may be taken in abandoned Jhum land with proper soil water conservation measures.

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resources mapping of Mon district, Nagaland providing information on the geographical setting of the district, such as location, extent, physiography, relief, drainage, climate, geology, natural vegetation, agriculture, land use and soils.

The report contains other information on Interpretative grouping of soils (Chapter 7) such as land capability classes; land irrigability classes, soil suitability grouping and hydrological grouping, the crops suitability, horticulture development, forest, forage and grassland development; water harvesting, water storage and water management are also essential for soil and land resource management. The genesis and classification of the soils are also discussed in **Chapter 5**.

Mon district of Nagaland state is spread over an area of 1, 78,600 ha. The district is covered by seven SOI topographical sheets on the scale of 1: 50,000 which are used as base material along with satellite imageries.

Each soil mapping unit is marked by mapping unit i.e. ALb3a1 (Alluvium; alluvial plain; 1-5% slope; agriculture land use; Soil Series Association, describing - Tenyiphe-I as dominant series in association with Dhansiripar and Rangapahar series). Each soil association is restricted to a maximum of three soil series

For the use of the soil resource report, first locate the area of your 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, help to locate the area of interest on the map. For the detailed information on soil mapping unit in respect of soil series of the area of interest, its extent, present and proposed land uses, reference may be made to **Chapter 4, Appendix I and II**.

The mapping unit used in soil mapping represents the five levels of mapping i.e. ALb3a1 may be referred as follows:

AL	-	Alluvium	-	Landscape
b	-	Alluvium plain	-	Physiography
3	-	1-5 %	-	Slope class
a	-	Agriculture land	-	Land use
1	-	Association of Soil series with erosion and management soil unit.		

Any comment and suggestion on the report would be welcome. For any further enquiry / or clarification, correspondence or personal contact may be established, with the

The Chief Soil Survey Officer
Soil and Land Use Survey of India,
IARI Buildings, Pusa,
New Delhi – 110012.
Email- csso-slusi@nic.in.
Ph. – 011- 25841263

Or

The Soil Survey Officer
Soil and Land Use Survey of India,
Baishnabghata-Patuli Township,
Block-E, Kolkata, Pin-700094.
Email - ssokolkata-slusi@nic.in.
Ph. - 033-24301425/1581

WEBSITE: <http://slusi.dacnet.nic.in>