

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

## ABSTRACT

<b>1.</b>	Survey Area	:	Mokokchung District, Nagaland
<b>2.</b>	Geographical Extent	:	Between 26°11'91" to 26°45'50" North Latitude and 94°17'35" to 94°45'36" East Longitude
<b>3.</b>	Agro Climatic Region	:	Eastern Himalayan Region-II
<b>4.</b>	Total Area of the District	:	1,61,500 ha.
<b>5.</b>	Kind of Survey	:	Soil Resources Mapping using Remote Sensing Techniques.
<b>6.</b>	Base Map	:	a) IRS – ID Geocoded Satellite Imagery (1: 50000 scale) b) SOI – toposheet (1:50000 scale)
<b>7.</b>	Scale of Mapping	:	1 : 50000
<b>8.</b>	Period of Survey	:	January, 2014

### 9. 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	727	0.5
2	33	ACp3c1	Tuli-II-Tuli-I-Diliapur	2846	1.8
3	31	ACq3a1	Jakhama-Sirhimakuki-Toshozu-I	2170	1.3
4	35	ACq3c1	Sirhima basa-Diliapur	2019	1.3
5	28	ALb3a1	Tenyiphe-I-Dhansiripar-Rangapahar	61	0.0
6	29	ALb3c1	Rangapahar-Tenyiphe-II-Chumukedima-I	79	0.1
7	2	SDi4c(a)1	Maromi-Alichen-Merongkong	306	0.2
8	3	SDi4c1	Mongsiyimti-Mopungchukit-Mariama	210	0.1

Sl. No.	Mapping Symbol	Mapping Unit	Soil Series Association	Total Area (ha)	Area (%)
9	22	SDn6c(a)1	Yisemyong-Unger-Phesama-II	186	0.1
10	23	SDn6c(a)2	Sutsu-Unger-Chieswema	216	0.1
11	20	SDn6c1	Longnak-Unger-Tsemenyu	5784	3.6
12	21	SDn6c2	Jhanji-Phesama-I-Longwesungu	1332	0.8
13	16	SDn7c(a)1	Mokokchung-Unger-Unger	3601	2.2
14	17	SDn7c(a)2	Chieswema-Manguzu-Sutsu	2911	1.8
15	11	SDn7c1	Yisemyong-Longnak-Padambo	20951	13.0
16	12	SDn7c2	Zaphumi-Longnak-Unger	20947	13.0
17	9	SDn9c(a)1	Khota-Tsemenyu-Chieswema	5089	3.2
18	7	SDn9c(a)2	Chieswema-Paglapahar-Chieswama-I	8221	5.1
19	5	SDn9c1	Changki-Mongsiyimti-Merongkong	34445	21.3
20	6	SDn9c2	Changki-Vishwema-Longsamtang	40076	24.8
21	6.1	SDn9c3	Chieswama-II-Longsamtang-Vishwema	169	0.1
22	8	SDn9c4	Kagaki-Kohima-Chieswema	257	0.2
23	26	SDy5a1	Gwalwa-Thahiku-Zubza-II	224	0.1
24	25	SDy5c1	Gwalwa-Thahiku-Dayapur	4698	2.9
25	37	SDz4a1	Medziphema-Dayapur	42	0.0
26	36	SDz4c1	Dayapur-Gwalwa	573	0.4
27	38	Habitation		3073	1.9
28	39	River		263	0.2
29	40	Tank		24	0.1
			<b>TOTAL</b>	<b>161500</b>	<b>100.0</b>

### 10. Area under different erosion classes

Sl. No.	Erosion	Area (ha)	Area (%)
1	None to slight erosion	2958	1.8
2	Moderate erosion	5727	3.5
3	Moderate to severe erosion	87173	54.0
4	Severe erosion	62282	38.6
	Misc.	3360	2.1
	<b>TOTAL</b>	<b>161500</b>	<b>100.0</b>

### 11. Area under different slope classes

Sl. No.	Slope Classes	Area (ha)	Area (%)
1	Very gently to gently slope	7902	4.9
2	Gently to moderately slope	1131	0.7
3	Moderately steep to steep slope	48410	30.0
4	Moderately to strongly slope	4922	3.0
5	Strongly to moderately steep slope	7687	4.8
6	Very steep to extremely steep slope	88088	54.5
7	Misc.	3360	2.1
	<b>TOTAL</b>	<b>161500</b>	<b>100.0</b>

### 12. Area under different landscape and physiography classes:

Sl. No	Landscape	Physiography	Area(ha)	Area(%)
1	<b>Alluvium</b>	Alluvial plains	140	0.1
2	<b>Alluvium Colluvium</b>	Broad hill valleys	4189	2.6
		Narrow hill valleys	3573	2.2
3	<b>Sandstone</b>	Plateau plains / hill tops / mesa	516	0.3
		Rolling upland	4922	3.0
		Undifferentiated hills side slope	144185	89.3
		Undulating uplands	615	0.4
		Misc	3360	2.1
		<b>TOTAL</b>	<b>161500</b>	<b>100.0</b>

### **13. Salient Features:**

- ❖ Alluvium, Alluvium – Colluvium and Sandstone are the three major landscape found in Mokokchung district.
- ❖ Total 48 nos of soil series have been mapped in the three major landscape of Mokokchung district.
- ❖ About 83.1% of the area falls under forest followed by 12.7% 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 rolling uplands.
- ❖ About 88088 ha (54.5%) of survey area having very steep to extremely steep slope range followed by moderately steep to steep slope range (30.0%).
- ❖ About 67.0% area of the district area is under deep soils followed by very deep soils (27.5%)
- ❖ Majority of the area suffers from moderate to severe (54%) and severe erosion hazard (38.6%).
- ❖ Nearly 54.6% of total surveyed area comes under Land Capability Class VII and is not suitable for cultivation but suitable for forestry with major limitations where as 34.6% area comes under Land Capability Class VI and is not suitable for cultivation but suitable for pasture and forestry with minor limitations.
- ❖ Soils of the area are taxonomically classified into four orders i.e. Alfisols, Entisols Inceptisols and Ultisols.
- ❖ Nearly 85.6% of total surveyed area comes under Soil Irrigability Class C-D with severe to very severe soil limitations for sustained use under irrigation.
- ❖ Nearly 84.6% 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 may be avoided. 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 lands with proper soil water conservation measures.

## HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resources mapping of Mokokchung 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**.

Mokokchung district of Nagaland state is spread over an area of 161500 ha. The district is covered by six 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

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