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

ABSTRACT

1.	Survey Area	:	Zunheboto District, Nagaland
2.	Geographical Extent	:	Between 25° 45'25 " and 26 ° 17 '02 " North Latitude and 94° 20 '13 " and 94° 42 '58 " East Longitude
3.	Agro Climatic Region	:	Eastern Himalayan Region-II
4.	Total area of the district	:	1,25,500 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 (1:50,000 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	982	0.78
2	33	ACp3c1	Tuli-II-Tuli-I-Diliapur	186	0.15
3	31	ACq3a1	Jakhama-Sirhimakuki-Toshozu-I	11	0.01
4	2	SDi4c(a)1	Maromi-Alichen-Merongkong	253	0.20
5	3	SDi4c1	Mongsiyimti-Mopungchukit-Mariama	1510	1.20
6	22	SDn6c(a)1	Yisemyong-Unger-Phesama-II	59	0.05
7	21	SDn6c2	Jhanji-Phesama-I-Longwesungu	13	0.01
8	18	SDn7(2)a1	Phesama-I-Unger-Tuensang	673	0.54

Sl. No.	Mapping symbol	Mapping Unit	Soil Series Association	Total Area (ha)	Area (%)
9	16	SDn7c(a)1	Mokokchung-Unger	1935	1.54
10	17	SDn7c(a)2	Chieswema-Manguzu-Sutsu	2216	1.77
11	11	SDn7c1	Yisemyong-Longnak-Padambo	3663	2.92
12	12	SDn7c2	Zaphumi-Longnak-Unger	12267	9.77
13	9	SDn9c(a)1	Khota-Tsemenyu-Chieswema	8058	6.42
14	7	SDn9c(a)2	Chieswema-Paglapahar-Chieswama-I	9843	7.84
15	5	SDn9c1	Changki-Mongsiyimti-Merongkong	37592	29.95
16	6	SDn9c2	Changki-Vishwema-Longsamtang	41533	33.09
17	6.1	SDn9c3	Chieswama-II-Longsamtang-Vishwema	1469	1.17
18	8	SDn9c4	Kagaki-Kohima-Chieswema	1014	0.81
19	25	SDy5c1	Gwalwa-Thahiku-Dayapur	13	0.01
20	38	Habitation		2000	1.59
21	39	River		203	0.16
22	40	Water body		7	0.01
			TOTAL	**125500**	**100.0**

Area under different erosion classes

Sl. No.	Erosion	Area (ha)	Area (%)
1	None to slight erosion	993	0.79
2	None to slight to moderate erosion	673	0.54
3	Moderate erosion	1696	1.35
4	Moderate to severe erosion	53788	42.86
5	Severe erosion	66140	52.70
	Misc.	2210	1.76
	TOTAL	**125500**	**100.0**

Area under different slope classes

Sl. No.	Slope Classes	Area (ha)	Area (%)
1	Very gently to gently slope	1179	0.94
2	Gently to moderately slope	1763	1.40
3	Moderately to strongly slope	13	0.01
4	Strongly to moderately steep slope	1541	1.23
5	Moderately steep to steep slope	20754	16.54
6	Very steep to extremely steep slope	98040	78.12
7	Misc.	2210	1.76
	TOTAL	**125500**	**100.0**

Area under different landscape and physiography classes

Sl. No	Landscape	Physiography	Area(ha)	Area (%)
1	**Alluvium Colluvium**	Broad hill valleys	11	0.01
2		Narrow hill valleys	1168	0.93
3	**Sandstone**	Plateau plains / hill tops / mesa	1763	1.40
4		Rolling upland	13	0.01
5		Undifferentiated hills side slope	120335	95.88
		Misc.	2210	1.76
		TOTAL	**125500**	**100.00**

Salient Features:

- ❖ Alluvium – Colluvium and Sandstone are the two major landscape found in Zunheboto district.

- ❖ Total 41 nos soil series have been mapped in Zunheboto district.

- ❖ About 79% of the area falls under Forest.

- ❖Soils of the district falls under five physiographic classes of which majority of the area falls under undifferentiated hill side slopes (95.8%).

- ❖About 98040 ha (78.12%) of survey area having very steep to extremely steep slope range followed by moderately steep to steep slope range (16.54%).

- ❖ About 83.65% of the district area is under deep soils followed by moderately deep soils (8.40%)

- ❖ Majority of the area suffers from severe erosion (52.70%) and moderate to severe erosion (42.86%) hazard.

- ❖ Nearly 79.29% of total surveyed area comes under Land Capability Class VII which is not suitable for cultivation and is suitable for pasture and forestry with major limitations where as 16.0% area comes under Land Capability Class VI and is not suitable for cultivation but is 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 95.30% of total surveyed area comes under Soil Irrigability Class C-D with severe to very severe soil limitations for sustained use under irrigation.

- ❖ Nearly 95.29% of total surveyed area comes under Land Irrigability Class 6 and is not suitable for sustained use under irrigation.

- ❖Cultivation on steep hills may be avoided and terraced cultivation with proper soil and water conservation measures is highly recommended.

- ❖Plantation crops may be taken in abandoned Jhum lands with proper soil water conservation measures.

- ❖ Valley lands can be used for intensive agriculture with taking effective agronomic practices in addition to proper soil and water conservation measures.

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resources Mapping of Zunheboto 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**.

Zunheboto district of Nagaland state is spread over an area of 125500 ha. The district is covered by five 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. ACp3a1 (Alluvium Colluvium; Narrow hill valleys; 1-5% slope; agriculture land use; Soil Series Association, describing - Longnam as dominant series in association with Jakhama and Kukidolong 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. ACp3a1 may be referred as follows:

AC	-	Alluvium Colluvium	-	Landscape
p	-	Narrow hill valleys	-	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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