

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

ABSTRACT

1.	Survey Area	:	Wokha District, Nagaland
2.	Geographical Extent	:	Between 25° 55'16 " and 26° 33 '32 " North Latitude and 93° 57 '18 " and 94° 23 '28 " East Longitude
3.	Agro Climatic Region	:	Eastern Himalayan Region - II
4.	Total area of the district	:	162800 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 : 50000
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	6767	4.16
2	33	ACp3c1	Tuli-II-Tuli-I-Diliapur	1939	1.19
3	31	ACq3a1	Jakhama-Sirhimakuki-Toshozu-I	1703	1.05
4	35	ACq3c1	Sirhima basa-Diliapur	3498	2.15
5	27	ALb2a1	Singrijan-Dimapur-Dhansiripar	245	0.15
6	28	ALb3a1	Tenyiphe-I-Dhansiripar-Rangapahar	1250	0.77
7	29	ALb3c1	Rangapahar-Tenyiphe-II-Chumukedima-I	640	0.39
8	2	SDi4c(a)1	Maromi-Alichen-Merongkong	405	0.25
9	3	SDi4c1	Mongsiyimti-Mopungchukit-Mariama	1127	0.69

Sl. No.	Mapping Symbol	Mapping Unit	Soil Series Association	Total Area (ha)	Area (%)
10	22	SDn6c(a)1	Yisemyong-Unger-Phesama-II	385	0.24
11	23	SDn6c(a)2	Sutsu-Unger-Chieswema	211	0.13
12	20	SDn6c1	Longnak-Unger-Tsemenyu	10067	6.18
13	21	SDn6c2	Jhanji-Phesama-I-Longwesungu	1502	0.92
14	10	SDn7b1	Nerhema-Zunheboto-Chimillan	3573	2.19
15	16	SDn7c(a)1	Mokokchung-Unger	46	0.03
16	17	SDn7c(a)2	Chieswema-Manguzu-Sutsu	3319	2.04
17	11	SDn7c1	Yisemyong-Longnak-Padambo	28138	17.28
18	12	SDn7c2	Zaphumi-Longnak-Unger	19571	12.02
19	9	SDn9c(a)1	Khota-Tsemenyu-Chieswema	3033	1.86
20	7	SDn9c(a)2	Chieswema-Paglapahar-Chieswama-I	5549	3.41
21	5	SDn9c1	Changki-Mongsiyimti-Merongkong	37711	23.16
22	6	SDn9c2	Changki-Vishwema-Longsamtang	25644	15.75
23	8	SDn9c4	Kagaki-Kohima-Chieswema	452	0.28
24	26	SDy5a1	Gwalwa-Thahiku-Zubza-II	149	0.09
25	25	SDy5c1	Gwalwa-Thahiku-Dayapur	1710	1.05
26	38	Habitation		2106	1.29
27	39	River		525	0.32
28	40	Waterbody		1535	0.94
			TOTAL	162800	100.0

Area under different erosion classes

Sl. No.	Erosion	Area (ha)	Area (%)
1	None to slight erosion	9965	6.12
2	Moderate erosion	7204	4.43
3	Moderate to severe erosion	97648	59.98
4	Severe erosion	43817	26.91
5	Misc.	4166	2.56
	TOTAL	162800	100.0

Area under different slope classes

Sl. No.	Slope Classes	Area (ha)	Area(%)
1	Nearly level to very gently slope	245	0.15
2	Very gently to gently slope	15797	9.70
3	Gently to moderately slope	1532	0.94
4	Moderately to strongly slope	1859	1.14
5	Strongly to moderately steep slope	12165	7.47
6	Moderately steep to steep slope	54647	33.57
7	Very steep to extremely steep slope	72389	44.46
8	Misc.	4166	2.56
	TOTAL	162800	100.0

Area under different landscape and physiography

Sl. No	Landscape	Physiography	Area(ha)	Area(%)
1	Alluvium	Alluvial plains	2135	1.31
2	Alluvium Colluvium	Broad hill valleys	5201	3.19
		Narrow hill valleys	8706	5.35
3	Sandstone	Plateau plains / hill tops / mesa	1532	0.94
		Rolling upland	1859	1.14
		Undifferentiated hills side slope	139201	85.50
		Misc.	4166	2.56
		TOTAL	162800	100.00

Salient Features:

- ❖ Alluvium, Alluvium – Colluvium and Sandstone are the three major landscape found in Wokha district.
- ❖ Total 48 nos soil series have been mapped in Wokha district.
- ❖ About 81.08% of the area falls under Forest followed by Jhum/ shifting cultivation (10.12%).
- ❖ Soils of the district, falls under six physiographic classes of which majority of the area falls under undifferentiated hill side slopes followed by narrow hill valleys.
- ❖ About 72389 ha (44.46%) of survey area having very steep to extremely steep slope range followed by moderately steep to steep slope range (33.57%).
- ❖ About 58.03% of the district area is under deep soils followed by very deep soils (37.27%)
- ❖ Majority of the area suffers from moderate to severe (59.98%) and severe erosion hazard (26.91%)
- ❖ Nearly 44.46% of total surveyed area comes under Land Capability Class VII and is not suitable for cultivation but is suitable for pasture and forestry with major limitations where as 33.54% area comes under Land Capability Class VI which 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 79.06% of total surveyed area comes under Soil Irrigability Class C - D, with severe to very severe soil limitations for sustained use under irrigation.
- ❖ Nearly 78.03% of total surveyed area comes under Land Irrigability Class 6 which 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 Wokha 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**.

Wokha district of Nagaland state is spread over an area of 162800 ha. The district is covered by nine 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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