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

ABSTRACT

1.	Survey Area	:	Tuensang District, Nagaland State
2.	Geographical Extent	:	Between 94˚33' 54" and 95˚11' 10" East Longitude and 25˚35' 10" and 26˚47' 46" North Latitude
3.	Agro Climatic Region	:	Eastern Himalayan Region-II
4.	Total area of the district	:	4,22,800 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 – Toposheets (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	Area (ha)	Area (%)
1	32	ACp3a1	Longnam-Jakhama-Kukidolong	2951	0.70
2	33	ACp3c1	Tuli-II-Tuli-I-Diliapur	1285	0.30
3	34	ACp3d1	Tuli-I-Sirhima basa	133	0.03
4	31	ACq3a1	Jakhama-Sirhimakuki-Toshozu-I	213	0.05
5	35	ACq3c1	Sirhima basa-Diliapur	330	0.08
6	2	SDi4c(a)1	Maromi-Alichen-Merongkong	426	0.10
7	3	SDi4c1	Mongsiyimti-Mopungchukit-Mariama	2159	0.51
8	22	SDn6c(a)1	Yisemyong-Unger-Phesama-II	816	0.19
9	23	SDn6c(a)2	Sutsu-Unger-Chieswema	601	0.14
10	20	SDn6c1	Longnak-Unger-Tsemenyu	329	0.08

Sl. No.	Mapping Symbol	Mapping Unit	Soil Series Association	Area (ha)	Area (%)
11	21	SDn6c2	Jhanji-Phesama-I-Longwesungu	1374	0.32
12	18	SDn7(2)a1	Phesama-I-Unger-Tuensang	66	0.02
13	16	SDn7c(a)1	Mokokchung-Unger	7049	1.67
14	17	SDn7c(a)2	Chieswema-Manguzu-Sutsu	5480	1.30
15	11	SDn7c1	Yisemyong-Longnak-Padambo	7096	1.68
16	12	SDn7c2	Zaphumi-Longnak-Unger	21835	5.16
17	12.1	SDn7c3	Vishwema-Chieswema-Zaphumi	268	0.06
18	9	SDn9c(a)1	Khota-Tsemenyu-Chieswema	42497	10.05
19	7	SDn9c(a)2	Chieswema-Paglapahar-Chieswama-I	46536	11.01
20	5	SDn9c1	Changki-Mongsiyimti-Merongkong	66002	15.61
21	6	SDn9c2	Changki-Vishwema-Longsamtang	196337	46.44
22	6.1	SDn9c3	Chieswama-II-Longsamtang-Vishwema	8176	1.93
23	8	SDn9c4	Kagaki-Kohima-Chieswema	6386	1.51
24	25	SDy5c1	Gwalwa-Thahiku-Dayapur	117	0.03
25	36	SDz4c1	Dayapur-Gwalwa	126	0.03
26	38	Habitation		3896	0.92
27	39	River		316	0.07
TOTAL				**422800**	**100.00**

Area under different erosion classes

Sl. No.	Erosion	Area (ha)	Area (%)
1	None to slight erosion	3164	0.75
2	None to slight to moderate erosion	66	0.02
3	Moderate erosion	3900	0.92
4	Moderate to severe erosion	95938	22.69
5	Severe erosion	315520	74.63
	Misc.	4212	1.00
	TOTAL	**422800**	**100.00**

Area under different slope classes

Sl. No.	Slope Classes	Area (ha)	Area (%)
1	Very gently to gently slope	4912	1.16
2	Gently to moderately slope	2711	0.64
3	Moderately to strongly slope	117	0.03
4	Strongly to moderately steep slope	11296	2.67
5	Moderately steep to steep slope	41794	9.89
6	Very steep to extremely steep slope	357758	84.62
7	Misc.	4212	1.00
8	**TOTAL**	**422800**	**100.00**

Area under different landscape and physiography classes

Sl. No	Landscape	Physiography	Area(ha)	Area (%)
1	**Alluvium Colluvium**	Broad hill valleys	543	0.13
		Narrow hill valleys	4369	1.03
2	**Sandstone**	Rolling upland	117	0.03
		Undulating uplands	126	0.03
		Plateau plains / hill tops / mesa	2585	0.61
		Undifferentiated hills side slope	410848	97.17
3		Misc.	4212	1.00
		TOTAL	**422800**	**100.00**

Salient Features:

- ❖ Alluvium – Colluvium and Sandstone are the two major landscape found in Tuensang district.
- ❖ Total 42 nos of soil series have been mapped in Tuensang district.
- ❖ About 72.24% of the area falls under Forest.
- ❖Soils of the district, falls under six physiographic classes of which majority of the area falls under undifferentiated hill side slopes.
- ❖ About 3,57,758 ha (84.62%) of survey area having very steep to extremely steep slope range followed by moderately steep to steep slope range (9.89%).
- ❖ About 80.45% area of the district area is under deep soils followed by moderately deep soils (13.50%)
- ❖ Majority of the area suffers from severe erosion (74.63%) followed by moderate to severe erosion hazard (22.69%).
- ❖ Nearly 86.55% of total surveyed area comes under capability Class VII and is not suitable for cultivation but suitable for pasture and forestry with major limitations .
- ❖ Soils of the area are taxonomically classified into three orders i.e. Entisols, Inceptisols and Ultisols.
- ❖ Nearly 96.82% of total surveyed area comes under Soil Irrigability Class C- D and have severe to very severe soil limitations for sustained use under irrigation.
- ❖ Nearly 96.42% of total surveyed area comes under Land Irrigability Class 6, Lands 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 Tuensang 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**.

Tuensang district of Nagaland state is spread over an area of 4,22,800 ha. The district is covered by fifteen 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**, A**ppendix 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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