

Inventory of Soil Resources of Chirang District, Assam Using Remote Sensing and GIS Techniques

ABSTRACT

1.	Survey Area	:	Chirang Districts, Assam
2.	Geographical Extent	:	26° 33' to 26° 54' N Latitudes 90° 21' 0" to 90° 56' E Longitudes
3.	Agro Climatic Region	:	Eastern Himalayan Region (as per planning commission 1989)
4.	Total area of the district	:	1,92,300 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	:	November 2010 to December 2010

9. Soil Series Association Mapped and their Respective Area:

Mapping Symbol	Mapping Unit	Soil- Association			Total Area (ha)	Area (%)
01	ACx4c1	Athiabari	Chirang		9,118	4.74
02	ACx3c1	Chirang	Athiabari		4,318	2.25
04	ACx2c1	Ripu	Athiabari		22,559	11.73
06	ACx2a1	Bardangi	Shampaguri		8,008	4.16
08	ACx2f1	Shampaguri	Bardangi		2,246	1.17
11	ALb2a1	Sudipara	Kasikotra		21,049	10.95
13	ALg2d1	Pathiagaon	Khagrabari		9,794	5.09
13/1	ALn2d1	khagrabari	Pathiagaon		1,503	0.78
13/2	ALd2d1	Pathiagaon	Mahuliapara		37	0.02
13/3	ALd2c1	Pathiagaon	Mahuliapara		89	0.05
14	ALb3c1	Khuti	Kokrajar		10,744	5.59

15	ALb3c2	Domota	Khagrabari	Pathiagaon	1,067	0.55
17	ALb3b1	Chaibari	Kokrajhar		3,055	1.59
18	ALb2a2	Barjhoragaon	Bishmura	Tilapara	15,025	7.81
18/1	ALb2d1	Sonapuri	Dhanpur		467	0.24
19	ALb2a3	Dhanpur	Bathanbil	Singimari	9,618	5.00
19/1	ALb2a4	Sonapuri	Athiabaridomata	Panbari	8,493	4.42
20	ALb3b2	Pakherriguri	Lauripara		25,078	13.04
20/1	ALb2a5	Goragaon	Bishmuri		5,321	2.77
21	ALg3a1	Amlaiguri	Bansbari		5,96	0.31
22	ALf1a1	Bansbari	Amlaiguri		3,19	0.17
25	ALn2a1	Dubri	Panbari		9,65	0.50
25/1	ALn2a2	Panbari	Dubachuri		1,54	0.08
25/2	ALd2a1	Pathiagaon	Khagrabari		1,77	0.09
33	SDn7c1	Kherkhreria	Kherkhreria		84	0.04
5/1	ACx2c(a)1	Athiabari	Shampaguri	Ripu	14,992	7.80
9898	Habitation	Misc.			2,724	1.42
9999	River	Misc.			14,700	7.64
Total					1,92,300	100.00

10. Physiography Wise distribution of Soils:

Sl. No	Landscape	Physiography	Area(ha)	Area (%)
1.	Alluvium	Alluvial plains	99,917	51.96
		Flood plains	2,622	1.36
		Paleo channels	3,19	0.17
		Point bar complex	3,03	0.16
		Stream banks	10,390	5.40
2.	Alluvium - Colluvium	Piedmont plains	61,241	31.85
3.	Sandstone	Undifferentiated hills side slope	84	0.04
4.	Misc.		17,424	9.06
Total			1,92,300	100.00

11. Mapping units Wise Land Capability Classification and their Respective Area:

Land Capability Classes		Mapping Unit	Area (ha)	Area (%)
Classes	Description			
II :	Land Suitable For Cultivation, Good Land With Minor Limitations	ACx2c(a)1 ,ACx2c1 ,ALb2a1, ALb2a2 ,ALb2a3, ALb2a4, ALb2a5, ALf1a1, ALn2a1, ALn2a2,	98,495	51.22
III :	Land Suitable For Cultivation, Moderately Good Land With Major Limitations	ACx3c1, ACx4c1, ALb3b1, ALb3b2, ALb3c1, ALb3c2, ALd2a1, ALb2d1,ALg2d1	63,818	33.19
II-III :	Land Suitable For Cultivation, Moderately Good To Good Land With Moderate Limitations	ACx2a1, ACx2f1, ALg2d1, ALn2d1 , ALg3a1	12,353	6.42
IV :	Land Suitable For Cultivation, Fairly Good Land With Occasional Cultivation And Major Limitations	ALd2c1,ALd2d1	1,26	0.07
VII :	Land Not Suitable For Cultivation, Suitable For Pasture And Forestry With Major Limitations	SDn7c1	84	0.04
Misc.			17,424	9.06
Total			1,92,300	100.00

12. Area Under Different Erosion Classes:

Sl. No	Erosion	Area(ha)	Area(%)
1.	None to slight water erosion	99509	51.75
2.	Slight to moderate erosion	8493	4.42
3.	Moderate water erosion	53877	28.02
4.	Moderate to severe erosion	12997	6.76
5.	Misc.	17424	9.06
Total		192300	100.00

13. Area Under Different Slope Classes

Sl. No	Slope Classes	Area (ha)	Area (%)
1.	Nearly level	3,19	0.17
2.	Nearly level to very gently sloping	1,20,497	62.66
3.	Very gently sloping to gently sloping	44,858	23.33
4.	Gently sloping to moderately sloping	9,118	4.74
5.	Moderately steep to steep	84	0.04
6.	Misc.	17,424	9.06
Total		1,92,300	100.00

14. Depth Wise Area of Soils:

Sl. No	Depth	Area(ha)	Area%
1.	Deep	10,338	5.38
2.	Deep to very deep	37,551	19.53
3.	Very deep	1,26,987	66.04
4.	Misc.	17,424	9.06
Total		1,92,300	100.00

Salient Features:

- ❖ Three types of landscape i.e. Alluvium, Alluvium-colluvium, and Sand stone are found in Chirang district of Assam.
- ❖ Total 32 nos. soil series have been identified and mapped in Chirang districts.
- ❖ In Chirang district of Assam 69725 ha (36.26 %) area are under cultivation followed by Forest land 62971 (32.75%), Plantation 28133 ha (14.63%), Open scrub 11801 (6.14%), Built-up area 2246ha (1.17%) and Misc. land 17424 ha (9.06%).
- ❖ About 120497 ha (62.66%) of survey area having slope range 0-3% i.e plain land, suitable for intensive agriculture system.
- ❖ About 99509 ha (51.75%) area having none to slight erosion hazard and only 53877 ha (28.02%) suffer from Moderate water erosion & 12997 ha (6.76%) moderate to severe erosion needs urgent attention for soil conservation measures.
- ❖ Nearly 51.22 % of total surveyed area comes under capability Class II has good potential for Agriculture/Horticulture development on sustainable basis where as 6.42% area comes under Class II- III & 33.19% comes underclass III which is moderately good land with major limitation for Agriculture propose.
- ❖ Soils of the area are taxonomically classified into four orders i.e. Alfisols, Entisols, Inceptisols and Ultisols. All the thirty two soils series identified in the area are further classified into 8 Sub-Orders, 12 Great-groups, 22 sub-groups and 29 families and 32 soil series.

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resources mapping of Chirang district, Assam 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 such as land capability classes; land irrigability classes, soil suitability grouping and hydrological grouping and also recommendation for crops; horticulture development; forest, forage and grassland development; water harvesting, water storage and water management that are essential for soil and land resource management. The genesis and classification of the soils are also discussed in **Chapter 5**.

Chirang district of Assam is spread over an area of 192300 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 LISS III.

Each soil mapping unit is marked by mapping unit i.e ALb2a1 (Alluvium; alluvial plain; 0-3 % slope; agriculture land use; Soil Series Association, describing Sudipara as dominant series in association with Kosikotra 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. ALb1a1 may be referred as follows:

AL	-	Alluvium	-	Landscape
b	-	Alluvium plain	-	Physiography
2	-	0-3 %	-	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

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