

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

ABSTRACT

1.	Survey Area	:	Dhubri Districts, Assam
2.	Geographical Extent	:	25 ^o 29' to 26 ^o 23' N Latitudes 89 ^o 42' to 90 ^o 29' E Longitudes
3.	Agro Climatic Region	:	Eastern Himalayan Region (as per planning commission 1989)
4.	Total area of the district	:	2,17,600 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			Area (ha)	Area (%)
02	ACx3c1	Chirang	Athiabari		316	0.15
04	ACx2c1	Ripu	Athiabari		279	0.13
06	ACx2a1	Bardangi	Shampaguri		3,117	1.43
11	ALb2a1	Sudipara	Kasikotra		7,771	3.57
13	ALg2d1	Pathiagaon	Khagrabari		805	0.37
13/1	ALn2d1	khagrabari	Pathiagaon		4,383	2.01
13/2	ALd2d1	Pathiagaon	Mahuliapara		22,864	10.51
14	ALb3c1	Khuti	Dhubri		554	0.25
15	ALb3c2	Domata	Khagrabari	Pathiagaon	3,655	1.68
17	ALb3b1	Chaibari	Dhubri		1502	0.69

18	ALb2a2	Barjhoraon	Bishmura	Tilapara	12,928	5.94
18/1	ALb2d1	Sonapuri	Dhanpur		3	0.00
19	ALb2a3	Dhanpur	Bathanbil	Singimari	8,047	3.70
19/1	ALb2a4	Sonapuri	Athiabaridomata	Panbari	3,675	1.69
20	ALb3b2	Pakherriguri	Lauripara		18,270	8.40
20/1	ALb2a5	Goragaon	Bishmuri	Bhuwan Nagar	1,902	0.87
21	ALg3a1	Amlaiguri	Bansbari		3,270	1.50
22	ALf1a1	Bansbari	Amlaiguri		37	0.02
23	ALk1a1	Goragaon	Tilapara		4,933	2.27
25	ALn2a1	Dubri	Panbari		57,940	26.63
25/1	ALn2a2	Panbari	Dubachuri		24,731	11.37
25/2	ALd2a1	Pathiagaon	Khagrabari		8,427	3.87
27	GNn8c1	Bilashipara	Nalbari		583	0.27
28	GNn7c1	Bilashipara	Nalbari		119	0.05
29	GNn6c1	Bilashipara	Bishnajhora		37	0.02
30	GNr6c1	Bilashipara	Nalbari		86	0.04
31	GNr5c1	Bishnajhora	Bilashipara		1,565	0.72
9797	Water Bodies	Misc.			2,046	0.94
9898	Habitation	Misc.			2,816	1.29
9999	River	Misc.			20,939	9.62
Total					2,17,600	100.00

10. Distribution of Area Under Different Landscape and Physiography

Sl. No	Landscape	Physiography	Area(ha)	Area (%)
1.	Alluvium	Alluvial plains	58,307	26.80
		Flood plains	87,054	40.01
		Marshy lands	4,933	2.27
		Paleo channels	37	0.02
		Point bar complex	31,291	14.38
		Stream banks	4,075	1.87
2.	Alluvium - Colluvium	Piedmont plains	3,712	1.71
3.	Gneiss	Hillocks/hummocks/ subdued hill	1,651	0.76
		Undifferentiated hills side slope	739	0.34
4.	Misc.		25,801	11.86
Total			2,17,600	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	ACx2c1, ALb2a2, ALb2a1 ALb2a3, ALb2a4, ALb2a5, ALb2d1, ALf1a1, ALk1a1, ALn2a1, ALn2a2	12,2246	56.18
III	Land Suitable For Cultivation, Moderately Good Land With Major Limitations	ACx3c1, ALb3b1, ALb3b2, ALb3c1, ALb3c2, ALd2a1, ALg3a1,	35,994	16.54
II-III	Land Suitable For Cultivation, Moderately Good to Good Land With Moderate Limitations	ACx2a1, ALg2d1, ALn2d1,	8,305	3.82
IV	Land Suitable For Cultivation, Fairly Good Land With Occasional Cultivation And Major Limitations	ALd2d1	22,864	10.51
VI	Land Not Suitable For Cultivation, Suitable For Pasture And Forestry With Minor Limitations.	GNn6c1, GNr5c1, GNr6c1	1,688	0.78
VII :	Land Not Suitable For Cultivation, Suitable For Pasture And Forestry With Major Limitations	GNn7c1, GNn8c1	702	0.32
Misc.			25,801	11.86
Total			2,17,600	100.00

12. Area Under Different Erosion Classes

Sl. No	Erosion	Area(ha)	Area (%)
1	None to slight erosion	1,23,503	56.76
2	Slight to moderate erosion	3,675	1.69
3	Moderate r erosion	29,644	13.62
4	Moderate to severe erosion	34,977	16.07
5	Misc.	25,801	11.86
Total		2,17,600	100.00

13. Area under different slope classes

Sl. No	Slope Classes	Area(ha)	Area(%)
1	Nearly level	4,970	2.28
2	Nearly level to very gently sloping	1,56,872	72.09
3	Very gently sloping to gently sloping	27,567	12.67
4	Moderately sloping to strongly sloping	1,565	0.72
5	Moderately steep to steep	119	0.05
6	Strongly sloping to moderately steep	123	0.06
7	Steep to very steep	583	0.27
8	Misc	25,801	11.86
Total		2,17,600	100.00

14. Depth wise Area of Soils:

Sl. No	Depth	Area(ha)	Area%
1	Deep	3,117	1.43
2	Deep to very deep	2,669	1.23
3	Very deep	1,86,013	85.48
4	Misc	25,801	11.86
Total		2,17,600	100.00

Salient Features:

- ❖ Three types of landscape i.e. Alluvium, Alluvium-colluvium and Gneiss found in Dhubri district of Assam.
- ❖ Total 35 nos. of soil series have been identified and mapped in Dhubri districts.
- ❖ About 136778 ha (62.86%) area are under cultivation followed by Open scrub 28055 (12.89%), Plantation 19772 ha (9.09%), Forest land 7194 (3.31%), and Misc. land 25801 ha (11.86%).
- ❖ About 123503 ha (56.76%) area having none to slight erosion hazard and only 3675 ha (1.69%) suffer from slight to moderate soil erosion and 34977 ha (16.07%) area affected from moderate to severe soil erosion needs urgent attention for soil conservation measures.
- ❖ Nearly 56.18% of total surveyed area comes under capability Class II having good potential for Agriculture/Horticulture development on sustainable basis where as 3.82% area comes under Class II- III & 16.54% comes underclass III which is moderately good land with major limitation for Agriculture propose.
- ❖ Soils of the area are taxonomically classified into three orders i.e. Entisols, Inceptisols and Ultisols. All the thirty five soil series identified in the area are further classified into 7 Sub-orders, 11 Great groups, 22 Subgroups and 31 Families.
- ❖ Nearly about 186013(85.48%) area are under very deep soils having good potential for wide variety of crop needs assured irrigation with suitable agronomic practices for sustained agriculture production.

HOW TO USE SOIL RESOURCE MAPPING REPORT

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

Dhubri district of Assam is spread over an area of 217600 ha. The district is covered by twelve 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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