

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

ABSTRACT

1.	Survey Area	:	Kokrajhar District, Assam
2.	Geographical Extent	:	26 ⁰ 07' 0" to 26 ⁰ 52' 0" E Longitudes 89 ⁰ 50' 0" to 90 ⁰ 26' 0" N Latitudes
3.	Agro Climatic Region	:	Eastern Himalayan Region (as per planning commission 1989)
4.	Total area of the district	:	316544 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 (%)
01	ACx4c1	Athiabari	Chirang	-	1142	0.36
02	ACx3c1	Chirang	Athiabari	-	14487	4.58
04	ACx2c1	Ripu	Athiabari	-	39466	12.47
5/1	ACx2c(a) 1	Athiabari	Shampaguri	Ripu	2194	0.69
06	ACx2a1	Bardangi	Shampaguri	-	1358	0.43
08	ACx2f1	Shampaguri	Bardangi	-	131	0.04
11	ALb2a1	Sudipara	Kasikotra	-	30301	9.57
13	ALg2d1	Pathiagaon	Khagrabari	-	5018	1.59
13/1	ALn2d1	khagrabari	Pathiagaon	-	3502	1.11
13/2	ALd2d1	Pathiagaon	Mahuliapara	-	1875	0.59

Mapping Symbol	Mapping Unit	Soil-Association			Area (ha)	Area (%)
13/3	ALd2c1	Pathiagaon	Mahuliapara	-	229	0.07
14	ALb3c1	Khuti	Kokrajhar	-	46164	14.58
15	ALb3c2	Domota	Khagrabari	Pathiagaon	26206	8.28
17	ALb3b1	Chaibari	Kokrajhar	-	1993	0.63
18	ALb2a2	Barjhora	Bishmura	Tilapara	14494	4.58
18/1	ALb2d1	Sonapuri	Dhanpur		1435	0.45
19	ALb2a3	Dhanpur	Bathanbil	Singimari	26223	8.28
19/1	ALb2a4	Sonapuri	Athiabari domota	Panbari	4626	1.46
20	ALb3b2	Pakherriguri	Lauripara	-	36897	11.66
20/1	ALb2a5	Goragaon	Bishmuri	Bhuwan Nagar	16576	5.24
21	ALg3a1	Amlaiguri	Bansbari	-	2833	0.89
22	ALf1a1	Bansbari	Amlaiguri	-	706	0.22
23	ALk1a1	Goragaon	Tilapara	-	5036	1.59
25	ALn2a1	Dubri	Panbari	-	6648	2.10
25/1	ALn2a2	Panbari	Dubachuri	-	6607	2.09
25/2	ALd2a1	Pathiagaon	Khagrabari	-	37	0.01
27	GNn8c1	Bilashipara	Nalbari	-	1882	0.59
28	GNn7c1	Bilashipara	Nalbari	-	1406	0.44
29	GNn6c1	Bilashipara	Bishnajhora	-	400	0.13
30	GNr6c1	Bilashipara	Nalbari	-	302	0.10
31	GNr5c1	Bishnajhora	Bilashipara	-	614	0.19
33	SDn7c1	Kherkherria	-	-	674	0.21
8888	Sand Bar	Misc.			18	0.01
9494	ROC	Misc.			90	0.03
9797	Water Bodies	Misc.			1540	0.49
9898	Habitation	Misc.			3268	1.03
9999	River	Misc.			10166	3.21
Total					316544	100.00

10. Physiography wise Distribution of Soils

Sl.No	Landscape	Physiography	Area (ha)	Area (%)
1.	Alluvium	Alluvial plains	20,4915	64.7
		Flood plains	16,757	5.3
		Marshy lands	5,036	1.6
		Paleo channels	706	0.2
		Pointbar complex	2,141	0.7
		Stream banks	7,851	2.5
2.	Alluvium - Colluvium	Piedmont plains	58,778	18.6
3.	Gneiss	Hillocks/hummocks/ subdued hill	916	0.3
		Undifferentiated hills side slope	3,688	1.2
4.	Sandstone	Undifferentiated hills side slope	674	0.2
5.	Misc.		15,082	4.8
Total			3,16,544	100

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, ALb2d1, ALf1a1, ALk1a1, ALn2a1, ALn2a2	15,4,312	48.7
III :	Land Suitable For Cultivation, Moderately Good Land With Major Limitations	ACx3c1, ACx4c1, ALb3b1, ALb3b2, ALb3c1, ALb3c2, ALd2a1, ALg3a1	12,9,759	41.0
II-III :	Land Suitable For Cultivation, Moderately Good To Good Land With Moderate Limitations	ACx2a1, ACx2f1, ALg2d1, ALn2d1	10,009	3.2
IV :	Land Suitable For Cultivation, Fairly Good Land With Occasional Cultivation And Major Limitations	ALd2c1,ALd2d1	2,104	0.7

VI :	Land Not Suitable For Cultivation, Suitable For Pasture And Forestry With Minor Limitations.	GNn6c1, GNr5c1,GNr6c1	1,316	0.4
VII :	Land Not Suitable For Cultivation, Suitable For Pasture And Forestry With Major Limitations	GNn7c1, GNn8c1, SDn7c1	3,962	1.3
	Misc.		15,082	4.8
		Total	3,16,544	100.00

12. Area under different Erosion classes

SL. No	Erosion	Area(ha)	Area(%)
1	None to slight water erosion	16,5,037	52.1
2	Slight to moderate erosion	4,626	1.5
3	Moderate water erosion	92,365	29.2
4	Moderate to severe erosion	39,434	12.5
5	Misc.	15,082	4.8
	Total	316544	100.00

13. Area under different Slope classes

Sl. No	Slope Classes	Area(ha)	Area(%)
1	Nearly level	5,742	1.8
2	Nearly level to very gently sloping	1,60,720	50.8
3	Very gently sloping to gently sloping	1,28,580	40.6
4	Gently sloping to moderately sloping	1,142	0.4
5	Moderately sloping to strongly sloping	614	0.2
6	Strongly sloping to moderately steep	702	0.2
7	Moderately steep to steep	2,080	0.7
8	Steep to very steep	1,882	0.6
9	Misc.	15,082	4.8
	Total	3,16,544	100.00

Salient Features:

- ❖ Total 36 nos. of soil series have been identified and mapped in Kokrajhar districts.
- ❖ About 115445ha (36.5 %) area are under cultivation followed by forest land 135166 (42.7%), plantation 38890 ha (12.3%), Open scrub 11830 (3.7%), Built-up area 131ha (0.04%) Misc. land 158082 ha (4.8%)
- ❖ About 165037ha (52.1%) area having none to slight erosion hazard and only 92365ha (29.2%) suffer from Moderate water erosion while 39434 ha (12.5%) suffers from moderate to severe erosion which needs urgent attention for soil conservation measures.
- ❖ Nearly 48.7% of total surveyed area comes under capability Class II. has good potential for Agriculture/Horticulture development on sustainable basis whereas 3.2% area comes under Class II- III & 41.0% comes under class 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 six soils series identified in the area are further classified into 8 sub-orders, 12 great groups, 23 subgroups and 32 families.
- ❖ The data indicate that soil have good potential for agriculture production under assured irrigation system. The health management is key for sustainable agriculture development.

HOW TO USE SOIL RESOURCE MAPPING REPORT

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

Kokrajhar district of Assam is spread over an area of 316544 ha. The district is covered by eleven 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 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. ALb2a1 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 :

**Chief Soil Survey Officer,
Soil and Land Use Survey of
India, IARI Buildings, Pusa,
New Delhi – 110012,
Email- csso-slusi@nic.in.
Ph. - 01125841263**

Or

**Soil Survey Officer,
Soil and Land Use Survey of India,
Baishnabghata-Patuli Township,
Block-E, Kolkata, Pin-700094,
Email - ssokolkata-slusi@nic.in.
Ph. - 033-24301425/1581**

OUR WEBSITE: <http://slusi.dacnet.nic.in>