

Inventory of Soil Resources of Jalpaiguri Districts, West Bengal Using Remote Sensing and GIS Techniques

ABSTRACT

1. **Survey Area** : Jalpaiguri district of West Bengal
2. **Geographical Extent** : 26°15' to 27°0' North latitude
88°24' to 89°53' East longitude
3. **Agro Climatic Region** : Eastern Himalayan Region (II)
4. **Total Area of the district** : **6,22,700 ha.**
5. **Kind of Survey** : Soil resources mapping using remote sensing techniques.
6. **Base map** : a) IRS – P6 Geocoded Satellite Imagery ,
LISS- III(1: 50000 scale)
b) SOI –Toposheet (1:50000 scale)
7. **Scale of Mapping** : 1 : 50000
8. **Period of Survey** : May 2011 to June 2011
9. **Soil Series Association Mapped and their Respective Area**

Mapping Symbol	Mapping Units	Soil –Association			Area(ha.)	Area (%)
1	ALb2a1	Jagijhara	Sakerpara	Singimari	1,01,401	16.28
2	ALb2a2	Khagrabari	Baragharia		5,661	0.91
3	ALb2a3	Beniapara	Sakerpara		8,214	1.32
4	ALb2a4	Koliagram	Bhutnirghat		6,2861	10.09
5	ALn2a1	Nagrakata(1)	Badaganj		1,1093	1.78
6	ALn2a2	Badaganj	Nagrakata(1)		1,4711	2.36
7	ALb2b1	Pachim Magarmari	Khagrabari		6,2511	10.04
8	ALn2d1	Patla Khawa	North Barjora		1,1593	1.86
9	ALk2a1	Uttar Boragari			2,321	0.37
10	ALb3b1	Palashbari	Gayerkata		89,975	14.45

11	ALb3c1	Sonakhali	Apalchand	97,934	15.73
12	ALn3c1	North Barajhar	North Barjora	17,136	2.75
13	ALd3a1	Patla Khawa	North Barjora	336	0.05
14	ALd3c1	North Barjora	Patla Khawa	910	0.15
15	ALd3d1	Patla Khawa	North Barjora	6,469	1.04
16	ALg3a1	Salmari	Dhupguri	6,441	1.03
17	ACx3a1	Taribari	Tulsipara	2,208	0.35
18	ACx3b1	Tulsipara	Lankapara	16,987	2.73
19	ACx3c1	Titi Lankapara	Lankapara	13,975	2.24
20	ACx3d1	Lankapara	Tulsipara	2,915	0.47
21	SCt7b1	Samsing	Nagrakata(2)	1,275	0.20
22	SCi3b1	Nagrakata(2)	Samsing	12,184	1.96
23	SDn7a1	Jaigaon Pahari	Titi	407	0.07
24	SDn7c1	Titi	Jaigaon Pahari	9,921	1.59
25	SDn7c2	Titi	Jaigaon Pahari	1,005	0.16
26	SDn9c1	Titi		5,210	0.84
7777	Water Bodies		Misc.	291	0.05
7878	Sandbar			2,021	0.32
9797	Tank			8	0.02
9898	Habitation			8,548	1.37
9999	River			46,097	7.40
9393	Build up area			81	0.01
Total				6,22,700	100.00

10. Physiography wise distribution of Soils:

Landscape	Physiography	Area (ha)	Area (%)
Alluvium	Alluvial plains	4,28,557	68.82
	Flood plains	54,533	8.76
	Marshy lands	2,321	0.37
	Point bar complex	7,715	1.24
	stream bank	6,441	1.03
Alluvium -Colluvium	Piedmont plains	36,085	5.79
Sandstone	Undifferentiated hills side slope	16,543	2.66
Schist	Mesa side slopes	1,275	0.20
	Mesa Top	12,184	1.96
Misc.		57,046	9.16
Total		6,22,700	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.	ALb2a1,ALb2a2, ALb2a3,ALb2a4, ALb2b1, ALk2a1,	2,42,969	39.02
III :	Land Suitable For Cultivation, Moderately Good Land With Major Limitations.	ACx3a1,ACx3b1, ACx3d1, ALb3b1, ALg3a1,ALn2a1, ALn2a2,ALn2d1, , SCi3b1	1,68,107	26.99
	Forest.	ACx3c1,ALb3c1, ALn3c1	1,29,045	20.72
IV :	Land Suitable For Cultivation, Fairly Good Land With Occasional Cultivation And Major Limitations.	ALd3a1, ALd3d1,	6,805	1.09
	Forest.	ALd3c1	910	0.15
VII :	Land Not Suitable For Cultivation, Suitable For Pasture And Forestry With Major Limitations.	SCt7b1, SDn7a1,	1,682	0.27
	Forest.	SDn7c1, SDn7c2, SDn9c1,	16,136	2.59
		Misc.	57,046	9.16
		Total	6,22,700	100.00

12. Area under different erosion classes

SL. No	Erosion	Area (ha)	Area (%)
1.	None to slight erosion	3,16,707	50.86
2.	Slight to moderate erosion	1,41,972	22.80
3.	Moderate erosion	93,134	14.96
4.	Moderate to severe erosion	9,921	1.59
5.	Severe erosion	3,920	0.63
6.	Misc.	57,046	9.16
Total		6,22,700	100.00

13. Area Under different Slope Classes

Sl. No	Slope Classes	Area(ha)	Area (%)
1.	Nearly level to very gently sloping	2,86,807	46.06
2.	Very gently sloping to gently sloping	2,61,029	41.92
3.	Moderately steep to steep	12,608	2.02
4.	Very steep to extremely steep slope	5,210	0.84
5.	Misc.	57,046	9.16
Total		6,22,700	100.00

14. Depth wise Area of Soils:

SL. No	Depth Classes	Area(ha)	Area (%)
1.	Deep	80,323	12.90
2.	Very deep	4,85,331	77.94
3.	Misc.	57,046	9.16
Total		6,22,700	100.00

Salient Features:

- ❖ Four types of landscape i.e. Alluvium, Alluvium-colluvium, Schist and Sand stone are found in Jalpaiguri district of West Bengal.
- ❖ Total 29 no's soil series have been identified and mapped in Jalpaiguri districts of west Bengal.
- ❖ In Jalpaiguri district of west Bengal 144172 ha (23.15 %) area are under cultivation and rest area followed by Forest land 146498 ha (23.53%), Tea-Garden 102159 ha (16.41%), Plantation 18262 ha (2.93%), Scrub/Scrub Land 2915ha (0.47%), Orchard surrounding by built-up land 62511ha (10.04%), Grass land/Pasture land 18062ha (2.90%). Misc 57046 ha (9.16%).
- ❖ About 286807 ha (46.06%) of survey area having slope range nearly level to very gently sloping (0-3%) i.e. plain land, and about 261029ha (41.92%) very gently sloping to gently sloping area having slope rang 1-5% suitable for intensive agriculture system.
- ❖ About 316707 ha (50.86%) area having none to slight erosion hazard followed by 141972 ha (22.80%) suffer from slight to moderate erosion 93116ha (14.95%), moderate water erosion 93134ha (14.96%) moderate to severe erosion about 9921ha (1.59%) area and about 3920ha(0.63%) suffer from severe erosion needs urgent attention for soil water conservation measures.
- ❖ Soils of the area are taxonomically classified into two orders i.e. Entisols and Inceptisols. All the twenty nine soils series identified in the survey area which is further classified into 6 sub-orders, 9 great groups, 15 subgroups and 23 families.
- ❖ Soil are acidic to neutral in nature and low in fertility state needs recommendation doses of balance fertilizer and suitable agronomy practices in addition to assured irrigation for sustained increase in agriculture production.

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resources mapping of Jalpaiguri district, West Bengal 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**.

Jalpaiguri district of West Bengal is spread over an area of 6,22,700 ha. The district is covered by nineteen 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 Jagijhara as dominant series in association with Sakerpara and Singimari 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 following alternative

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