

Inventory of Soil Resources of South Dinajpur District, West Bengal Using Remote Sensing and GIS Techniques

ABSTRACT

1.	Survey Area	:	South Dinajpur District, West Bengal
2.	Geographical Extent	:	89°0'30"E to 88°47' 0"E Longitudes and 25°10'55"N to 25°13'0" N Latitudes
3.	Agro Climatic Region	:	Lower Gangetic Plain (Zone no. III as per planning commission)
4.	Total area of the district	:	221176 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	:	December 2011 to January 2012

9. Soil Series association mapped and their respective area

Sl. No.	Mapping Unit	Soil Series Association	Total Area (ha)	Area (%)
1	ALb1a1	Kuchna-Giasil-Ghughu danga	6386	2.89
2	ALb2a1	Hemtabad-Kaludanga-Dumaria	46090	20.84
3	ALb2a2	Gazol- Lakhimpur	23233	10.50
4	ALb2a3	Mehadipur-Thakurbari-Gunjaria	37577	16.99
5	ALb2a4	Karmanpur-Gunjaria-Lakhimpur	26774	12.11
6	ALb2a5	Dangapara-Namania	28765	13.01
7	ALb2a6	Mehadipur -Thakurnagar	12415	5.61

Sl. No.	Mapping Unit	Soil Series Association	Total Area (ha)	Area (%)
8	ALb2b1	Itahar-Marnai	687	0.31
9	ALb2b2	Sarat- Thakurnagar	14	0.01
10	ALc2a1	Balupur-Kanchankaich	1307	0.59
11	ALe3b1	Marnai- Balupur	1368	0.62
12	ALg3a1	Hemtabad-Karmanpur-Sitalpur	5949	2.69
13	Habitation		28526	12.90
14	River		1446	0.65
15	Tank		509	0.23
16	Waterbodies/ Bill		130	0.06
		Grand Total	221176	100.00

10. Area under different erosion classes

Sl. No.	Erosion	Area(ha)	%
1.	None to slight erosion	182547	82.53
2.	Slight to moderate erosion	701	0.32
3.	Moderate erosion	1368	0.62
4.	Moderate to severe erosion	5949	2.69
5.	Misc.	30611	13.84
	Total	221176	100.00

11. Area under different slope classes

Sl. No.	Slope Classes	Area (ha)	Area %
1	Nearly level slope	6386	2.89
2	Nearly level to very gently slope	175541	79.37
3	Very gently to gently slope	8638	3.91
4	Misc.	30611	13.84
	Total	221176	100.00

Salient Features:

- ❖ Total 21 nos. soil series have been mapped in South Dinajpur district on alluvium landscape.
- ❖ About 85.22% of the area falls under Agriculture.
- ❖ Soils of the district, falls under four major physiography

Physiography	Area(ha)	%
Alluvial plain	181941	82.26
Channel beds	1307	0.59
Levies	1368	0.62
Stream banks	5949	2.69
Misc.	30611	13.84
Total	221176	100.0

- ❖ About 175541ha (79.37%) of survey area is having slope range of 0-3%, i.e. plain land, suitable for intensive agriculture system.
- ❖ About 82.53% area having none to slight erosion hazard followed by 2.69% suffered from moderate to severe erosion needs immediate soil-water conservation measures.
- ❖ Nearly 81.94% of total surveyed area comes under capability Class II has good potential for Agriculture / Horticulture development on sustainable basis followed 2.69% of the total area comes under capability class III-IV has moderately to fairly good land with major limitations.
- ❖ Soils of the area are taxonomically classified into three orders i.e. Alfisols, Entisols and Inceptisols. All the twenty one soil series identified in the area are further classified into 9 sub-orders, 11 great groups, 17 subgroups and 21 families.
- ❖ Soils are acidic to neutral in nature and low to medium in fertility status needs recommended doses of fertilizer 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 South Dinajpur 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 (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**.

South Dinajpur district of West Bengal is spread over an area of 221176 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. ALb1a1 (Alluvium; alluvial plain; 0-3 % slope; agriculture land use; Soil Series Association, describing - Kuchna as dominant series in association with Giasil and Ghughu danga 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
1	-	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 the

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