

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

## ABSTRACT

1.	Survey Area	:	North Dinajpur District, West Bengal
2.	Geographical Extent	:	25°11' N to 26°49' N Latitude and 87°49' E to 90°00' E Longitude
3.	Agro Climatic Region	:	Lower Gangetic Plain (Zone no. III as per planning commission)
4.	Total area of the district	:	318166 ha.
5.	Kind of Survey	:	Soil Resources Mapping using remote sensing techniques.
6.	Base map	:	a) IRS – ID Geocoded Satellite Imagery (LISS-III) (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	16924	5.32
2.	ALb2a1	Hemtabad-Kaludanga-Dumaria	55097	17.32
3.	ALb2a2	Mirwal - Lakhimpur	37826	11.89
4.	ALb2a3	Mehadipur-Gunjaria	41108	12.92
5.	ALb2a4	Karmanpur-Gunjaria- Lakhimpur	59230	18.62
6.	ALb2a5	Dangapara-Namania	20708	6.51
7.	ALb2a6	Mehadipur-Thakurnagar	14860	4.67
8.	ALb2b1	Itahar-Marnai	2842	0.89

Sl. No.	Mapping Unit	Soil Series Association	Total Area (ha)	Area (%)
9.	ALb2b2	Sarat - Thakurnagar	18986	0.01
10.	ALc2a1	Balupur-Kanchankaich	4602	1.45
11.	ALe3b1	Marnai - Balupur	3166	1.00
12.	ALg3a1	Sitalpur -Hemtabad-Karmanpur	9952	3.13
13.	Habitation		27688	8.70
14.	River		942	0.30
15.	Tank		313	0.10
16.	Waterbodies / Bills		3922	1.23
		<b>Grand Total</b>	<b>318166</b>	<b>100.00</b>

#### 10. Area under different erosion classes

Sl. No.	Erosion	Area(ha)	%
1.	None to slight erosion	250355	78.68
2.	Slight to moderate erosion	21828	6.86
3.	Moderate erosion	3166	1.00
4.	Moderate to severe erosion	9952	3.13
5.	Misc.	32865	10.33
	<b>Total</b>	<b>318166</b>	<b>100.0</b>

#### 11. Area under different slope classes

Sl. No.	Slope Classes	Area (ha)	Area %
1.	Nearly level slope	16924	5.32
2.	Nearly level to very gently slope	231671	72.81
3.	Very gently to gently slope	36706	11.54
4.	Misc.	32865	10.33
	<b>Total</b>	<b>318166</b>	<b>100.0</b>

### **Salient Features:**

- ❖ Total 20 nos. soil series have been mapped in North Dinajpur district on alluvium landscape.
- ❖ Major part of district i.e. 81.81% area covered by agriculture land use.
- ❖ Soils of the district, falls under four major physiography

<b>Physiography</b>	<b>Area(ha)</b>	<b>%</b>
Alluvial plain	267581	84.1
Channel beds	4602	1.45
Levies	3166	1.00
Stream banks	9952	3.13
Misc.	32865	10.33
<b>Total</b>	<b>318166</b>	<b>100.0</b>

- ❖ About 231671ha (72.817%) of survey area having slope range 0-3%, i.e. plain land, suitable for intensive agriculture system.
- ❖ About 78.68% area having none to slight erosion hazard, 6.86% suffered from slight to moderate erosion followed by 3.13% of the total area suffers from moderate to severe erosion.
- ❖ Nearly 77.24% of total surveyed area comes under capability Class II. has good potential for Agriculture/Horticulture development on sustainable basis followed by 7.41% area comes under III, moderately good land with major limitations and 4.12% area comes under III to IV land, moderate good to fairly good land with occasional cultivation.
- ❖ 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 balanced 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 North 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**.

North Dinajpur district of West Bengal is spread over an area of 318166 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.

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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