

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

ABSTRACT

1.	Survey Area	:	Nadia District, West Bengal
2.	Geographical Extent	:	88°09' E to 88°48' E Longitudes and 22°53' N to 24°11' N Latitudes
3.	Agro Climatic Region	:	Lower Gangetic Plain (Zone no. III as per planning commission)
4.	Total area	:	392700 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	:	March to April, 2010

9. Soil Series association mapped and their respective area

Sl. No.	Mapping Unit	Soil Association	Total Area (ha)	Area (%)
1	ALb1a1	Bangania-Sonadanga-Banagram	97398	24.80
2	ALk1d1	Nadia-Krishnanagar-Begunia	25279	6.44
3	ALn2a1	Mayakul-Begunia-Shaktigarh	37859	9.65
4	ALb3a1	Shaktigarh-Sonadanga-Hanskhali	162513	41.39
5	ALb3c1	Shaktigarh-Jagpur-Bahadurpur	588	0.14
6	ALe3b1	Srirampur-Nilnagar	534	0.13
7	ALf3a1	Taranagar-Krishnanagar	2646	0.67
8	ALg3e1	Mayapur-Udayachandpur	1209	0.30
9	ALb2b1	Shaktigarh-Sonadanga	2745	0.70
10	ALb3b1	Shaktigarh-Sonadanga	44428	11.32
11	W.B.	Waterbodies	7000	1.80
12	TANK		73	0.01
13	H.S.	Settlements	4725	1.20
14	RIVER		5703	1.45
		Grand Total	392700	100

10. Area under different erosion classes

Sl. No.	Erosion Classes	Area(ha)	%
1	None to slight erosion	325695	82.93
2	Moderate erosion	48295	12.30
3.	Moderate to severe erosion	1209	0.31
4	Misc.	17501	4.46
	Total	392700	100.00

11. Area under different slope classes

Sl. No.	Slope Classes	Area(ha)	%
1	Level to Nearly level slope	122677	31.24
2	Nearly level to very gently slope	40604	10.34
3	Very gently slope	162513	41.38
4	Very gently slope to gently slope	49405	12.58
5.	Misc.	17501	4.46
	Total	392700	100

Salient Features:

❖ Total 16 nos soil series have been mapped in Nadia district under fluvial landscape, out of which 78.35% under Alluvial plain, 9.64% under flood plain & 6.44% under marshy land.

❖ 76.50 % area of the district are cultivated followed by plantation (12.15%), open scrub (6.44%), waste land (0.30%) and forest land(0.15%).

❖ Soils of the district has almost none to slight(82.93%) erosion followed by moderate(12.30%)erosion and marginal area are moderate to severe erosion(0.31%).

❖ Soils of the districts fall in four slope classes

● Level to nearly level slope	122677ha	31.24%
● Nearly level to very gently slope	40604ha	10.34%
● Very gently slope	162513ha	41.38%
● Very gently to gently slope	49405ha	12.58%

❖ Soils under different Land Capability classes

● II	135257 ha	34.44%
● II-III	165693ha	42.19%
● III	742249 ha	18.91%

- ❖ Land capability class wise data reveals that the survey area has good potential for Agriculture and Horticulture.
- ❖ Soils of the area are taxonomically classified into three orders i.e. Alfisol, Inceptisols and Entisols. All the sixteen soils series identified in the area are further classified into 5 sub-orders and great groups, 12 subgroups and 16 families.
- ❖ Soils are slightly acidic to neutral in reaction and low to medium in fertility needs recommended doses of balanced fertilizer in addition of organic manure.
- ❖ Soils of alluvial and flood plain have good potential of wide variety of crops.

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resources mapping of Nadia 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 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**. Nadia district of West Bengal is spread over an area of 392700 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 Bangania as dominant series in association with Sonadanga and Banagram 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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