

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

ABSTRACT

1.	Survey Area	:	Malda district, West Bengal
2.	Geographical Extent	:	87°45'50"E to 88°28'10" E Longitudes and 24°40'20" N to 25°32'08"N Latitudes
3.	Kind of Survey	:	Soil Resources Mapping using remote sensing techniques.
4.	Period of Survey	:	May to June, 2011
5.	Total area	:	3,73,300 ha.
6.	Agro Climatic Region	:	Lower Gangetic Plain (Zone no. III as per planning commission)
7.	Base map used	:	a) IRS – ID Geocoded Satellite Imagery (1:50000 scale) b) SOI –toposheet (1:50000 scale)

8. Soil Series association mapped and their respective area

Sl. No.	Mapping Symbol	Mapping Unit	Soil Association	Area (ha)	Area (%)
1.	01	ALb2a1	Kaliachak-Srirampur-Popra	69621	18.65
2.	02	ALb2a2	Madhupur-Jagdishpur-Mehadipur	5328	1.43
3.	03	ALb2a3	Lakhimpur-Kulgupara-Phulbari	30397	8.14
4.	04	ALb2a4	Kaliachak-Jagdishpur	45948	12.31
5.	05	ALb2a5	Jagdishpur-Arapur	14173	3.80
6.	06	ALb2b1	Arapur-English Bazar	53938	14.45
7.	07	ALb2c1	English Bazar-Arapur-Gazol	399	0.11
8.	08	ALb3b1	Arapur-English Bazar-Balarampur	18017	4.82
9.	09	ALd2d1	Maheshpur-Manikchak	4688	1.25
10.	10	ALf3a1	Balupur-Popra	2566	0.69
11.	11	ALg3a1	Debipur-Balupur	1036	0.28
12.	12	ALk2d1	Popra- Srirampur	8548	2.29
13.	13	ALn2a1	Manikchak-Maheshpur	35162	9.42
14.	14	ALn2a2	Debipur-Manikchak-Mehadipur	45718	12.25
15.	15	ALn2a3	Maheshpur-Debipur-Kaliachak	10089	2.70
16.	88	Sand bar		2619	0.70
17.	95	Tank		260	0.07
18.	96	Water Bodies		7740	2.07
19.	98	Settlement		2872	0.77
20.	99	River		14181	3.80
			Grand Total	3,73,300	100.00

9. Area under different erosion classes

Sl. No.	Erosion classes	Area (ha)	Area (%)
1	None to slight erosion	151294	40.53
2	Slight to moderate erosion	113362	30.37
3	Moderate erosion	79936	21.41
4	Moderate to severe erosion	1036	0.28
5	Misc.	27672	7.41
	Total	3,73,300	100.00

10. Area under different slope classes

Sl. No	Slope Classes	Area (ha)	Area (%)
1	Nearly level to very gently slope	324009	86.80
2	Very gently to gently slope	21619	5.79
3	Misc.	27672	7.41
	Total	3,73,300	100.00

Salient Features:

- ❖ Total 17 nos soil series have been mapped in Malda district under five physiographic sub-divisions in alluvial landscapes and flood plain landscape.
- ❖ 69.66 % area of the district is cultivated followed by plantation (Mango & etc.) 19.27% and grass land (3.55%) and forest plantation (0.11%).
- ❖ The cropping intensity can be increased by ensuring irrigation and balance fertilizer and manures with improved agronomic package and practices.
- ❖ Major soil erosion of the district is none to slight erosion (40.53%) followed by slight to moderate erosion (30.37%), moderate erosion (21.41%) and marginal area are moderate to severe erosion (0.28%). There is bank cutting soil erosion along the river Ganga and its tributaries.
- ❖ Soils of the district falls only in two slope classes

Slope Class	Area (ha)	Area (%)
Nearly level to very gently slope	324009 h	86.80%
Very gently to gently slope	21619 ha	5.79%

- ❖ Good land with minor limitations and suitable for cultivation i.e LCC II covers the maximum area 151294 ha (40.53%) followed by III (38.84%) and II-III (13.22%). This shows that soils of Malda district having potential for variety of crops and horticultural practices.
- ❖ Soils of the area are taxonomically classified into three orders i.e. Alfisols, Inceptisols and Entisols. All the 17 soils series identified in the area are further classified into 6 sub-orders, 7 great groups, 13 sub-groups and 17 families.
- ❖ Soils are 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 agricultural productions.

HOW TO USE SOIL RESOURCE MAPPING REPORT

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

Malda district of West Bengal is spread over an area of 37300 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. ALb2a1 (Alluvium; alluvial plain; 0-3 % slope; agriculture land use; Soil Series Association, describing Kaliachak as dominant series in association with Srirampur and Popra 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:

<i>AL</i>	-	<i>Alluvium</i>	-	<i>Landscape</i>
<i>b</i>	-	<i>Alluvium plain</i>	-	<i>Physiography</i>
<i>2</i>	-	<i>0-3 %</i>	-	<i>Slope class</i>
<i>a</i>	-	<i>Agriculture land</i>	-	<i>Land use</i>
<i>1</i>	-	<i>Association of Soil series with erosion and management soil unit.</i>		

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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