

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

## ABSTRACT

1.	<b>Survey Area</b>	:	Bankura district, West Bengal
2.	<b>Geographical Extent</b>	:	22° 38' N to 23° 38' N latitude and 86° 36' E to 87° 46' E longitude
3.	<b>Kind of Survey</b>	:	Soil Resource Mapping using remote sensing and GIS techniques.
4.	<b>Period of Survey</b>	:	November, 2009 to January, 2010
5.	<b>Total area</b>	:	688200 ha.
6.	<b>Agro Climatic Region</b>	:	Lower Gangetic Plain ( Zone no. III as per planning commission)
7.	<b>Base map used</b>	:	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)	%
1	01	ALb2a1	Jamboni-Murakata-Dasdighi	25557	3.71
2	02	ALb2a2	Murakata-Kumardanga-Jamboni	66720	9.69
3	03	ALb3a1	Kumardanga-Bikrampur	1152	0.17
4	04	ALb3b1	Bikrampur-Kumardanga	24660	3.58
5	06, 07	ALe3a1	Gamirda-Dangmejia	7239	1.05
6	08	ALg2a1	Bhangbandh-Misrisol-Deuli	6882	1.00
7	12	ALd3a1	Gamirda-Dangmejia	669	0.10
8	13	ALe3c1	Dangmejia-Gamirda	160	0.02
9	21	LAv3a1	Balguma-Kanchanpur-Bishnupur	3108	0.45
10	22	LAv3a2	Dubrakan-Balibil-Puabagan	13803	2.01
11	23	LAv3b1	Balguma-Kanchanpur	28288	4.11
12	24	LAv3b2	Bankura-Dhanda-Dhandua	4776	0.69
13	25	LAv3c1	Dhanda-Nutangram-Madarbani	51522	7.49
14	26	LAv3c2	Nutangram-Madarbani-Dhanda	14278	2.07
15	27	LAv3c3	Bishunpur-Kanchanpur-Balguma	20090	2.92
16	28	LAv2a1	Dubrakan-Asude-Balibil	61284	8.90
17	29	LAW2a1	Katul-Asude	46691	6.78

18	31	LAv3d1	Balguma-Kanchanpur-Dhanda	3239	0.47
19	32	LAv2a2	Balibil-Dubrakan-Puabagan	15069	2.19
20	40	GGn8c1	Khudadihi-Lohardangi-Mejea	496	0.07
21	41	GGn6c1	Mejea-Saltora	436	0.06
22	42	GGr4c1	Pabra-Saltora	253	0.04
23	44	GGv3a1	Beldanga-Bagdiha	3995	0.58
24	45	GGv2a1	Uganpathar-Brajrajpur	85274	12.39
25	46, 47	GGv3b1	Sukribasa-Bagdiha-Champasol	23111	3.36
26	48	GGv3c1	Champasol-Sukribasa-Gangajalghati	9136	1.33
27	49	GGv3c2	Gangajalghati-Pabra	7468	1.09
28	50	GGw2a1	Khatwa-Indpur-Brajrajpur	30123	4.38
29	52	GGv3d1	Sukribasa-Champasol	3661	0.53
30	61	SDn8c1	Rangapada-Brindinath	499	0.07
31	62	SDn6c1	Ituri-Rangapada-Brindinath	372	0.05
32	63	SDv3a1	Paharpur-Dhangager	1470	0.21
33	64	SDv3b1	Dhangager-Paharpur	1446	0.21
34	66	SDv3c1	Paharpur-Dhangager	655	0.10
35	67	SDr4c1	Keshidanga-Lalpur	540	0.08
36	72	SDw2a1	Jobacob-Hadmedhaura-Laikdanga	4040	0.59
37	73	SDv2a1	Gopalpur-Jarukha-Banara	9246	1.34
38	81	SCn7c1	Thakurdanga-Keshidanga	1561	0.23
39	82	SCn6c1	Keshidanga-Thakurdanga-Lalpur	7280	1.06
40	83, 83.1	SCr4c1	Keshidanga-Lalpur	5508	0.80
41	84	SCv3a1	Holdupur-Chinturi	1534	0.22
42	86	SCv3b1	Raghunathpur-Holdupur	5989	0.87
43	87	SCv3c1	Holdupur-Sidpur	7733	1.12
44	89	SCv2a1	Chinturi-Boro	23614	3.43
45	90	SCw2a1	Chandro-Boro	20465	2.97
46		Canal		522	0.08
47		Habitation		7649	1.11
48		River		22223	3.23
49		Tank		750	0.11
50		Waterbody		5964	0.87
				<b>688200</b>	<b>100.00</b>

## 9. Area under different erosion classes

Sl. No.	Erosion classes	Area(ha)	%
1	None to slight erosion	403038	58.56
2	Slight to moderate erosion	31899	4.64
3	Moderate erosion	130801	19.01
4	Moderate to severe erosion	82798	12.03
5	Severe erosion	2556	0.37
6	Misc.	37108	5.39
	<b>Total</b>	<b>688200</b>	<b>100.00</b>

## 10. Area under different slope classes

Sl. No	Slope Classes	Area(ha)	%
1	Nearly level slope	23614	3.43
2	Nearly level to very gently slope	371351	53.96
3	Very gently slope	669	0.10
4	Very gently to gently slope	238513	34.66
5	Gently to moderately slope	6301	0.92
6	Strongly to moderately steep slope	8088	1.18
7	Moderately steep to steep slope	1561	0.23
8	Steep to very steep slope	995	0.14
9	Misc.	37108	5.39
	<b>Total</b>	<b>688200</b>	<b>100.00</b>

## 11. Salient Features:

- ❖ Total 57 soil series have been identified and mapped in five landscape of Bankura district.
- ❖ About (62.18%) area of the district are cultivated land followed by forest land (18.60%) plantation (12.83%) and scrub land (1.05%) (0.59).
- ❖ Soil of the district are highly suitable for variety of crops and horticulture crops like Rice, Wheat, Maize, Pulses, oilseeds, Sugarcane, Potato, Jute, Banana, Coconut, Areca nut, Orange, Pineapple.
- ❖ The cropping intensity can be increased by ensuring irrigation and balance fertilizer and manures.

- ❖ Major soil erosion of the district is none to slight erosion (58.56%) followed by moderate erosion(19.01%), moderate to severe erosion(12.03%), slight to moderate erosion (4.64) and severe erosion only (0.37%).
  
- ❖ Uper and lower pedi plain (38.27%) and (34.55%) are the major physiography of the district followed by alluvial plain (17.16%), hill side slope(2.35%), levees (1.08%) and others.
  
- ❖ Soils of the district fall in seven slope classes. Out of which 53.96% area are nearly level to very gently slope followed by very gently to gently slope(34.66%), nearly level slope(3.43%),strongly to moderately steep slope(1.18%), gently to moderately slope(0.92%) , moderately steep to steep slope(0.23%), steep to very steep (0.14%), gently slope (0.10%) and moderately to strongly slope(0.05%).
  
- ❖ Land suitable for cultivation, good land with minor limitations i.e LCC II covers the maximum area 317077ha(46.07%) followed by LCC II-III (14.29%), III (9.98%) and III-IV (5.69%).
  
- ❖ Soils of the area are taxonomically classified into three orders i.e. Alfisols, Inceptisols, Entisols. All the 57 soils series identified in the area are further classified into 8 sub-orders, 10 great groups, 20 subgroups and 42families.

## HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resources Mapping of Bankura 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 8) such as land capability classes, land irrigability classes, soil suitability grouping, hydrological grouping and also recommendation for crops; horticulture development; forest, forage and grassland development; water harvesting, water storage and management that are essential for soil and land resource management. The genesis and classification of the soils are also discussed in **Chapter 5**.

Bankura district of West Bengal is spread over an area of 688200ha. The district is covered by twenty one 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 Jamboni as dominant series in association with Murakata and Dasdighi 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. ALb2a1 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 / clarification, correspondence or personal contact may be established, with the

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