

Inventory of Soil Resources of Khagaria District, Bihar Using Remote Sensing and GIS Techniques

ABSTRACT

1.	Survey Area	:	Khagaria district, Bihar State
2.	Geographical Extent	:	25°15' N to 25°43' N latitude and 86°17' E to 86°51' E longitude
3.	Kind of Survey	:	Soil Resources Mapping using remote sensing and GIS techniques.
4.	Period of Survey	:	November, 2014 to January, 2015
5.	Total area	:	1,48,600 ha.
6.	Agro Climatic Zone	:	Middle Gangetic Plain Region(IV)(as per planning commission)
7.	Base map used	:	a) IRS – ID Geocoded Satellite Imagery(1 : 50,000 scale) b) SOI –toposheet (1:50,000 scale)

8. Soil Series association mapped and their respective area

Sl. No.	Mapping Symbol	Mapping Unit	Soil Association	Area (ha)	Area (%)
1	01	ALd2d1	Kalyanpur-Charaiya	209	0.14
2	02	ALc2a1	Phultora-Augani	4,445	2.99
3	04	ALe2a1	Ekashi-Bisanpur	4,793	3.23
4	06	ALf2a1	Gobargadda-Saronikala	2,121	1.43
5	07	ALg2a1	Augani-Phultora	2,933	1.97
6	09	ALn1a1	Sarbani-Kaithi	1,733	1.17
7	10	ALn2a1	Kaithi-Meghuna	20,095	13.52
8	11	ALn2a2	Jadiya-Sarbani-Bhawanipur	21,653	14.57
9	12	ALn2a3	Gamariya-Kaurihar-Bhawanipur	24,995	16.82
10	13	ALn2a4	Samaspur-Borna Two-Ashram	2,688	1.81
11	14	ALn2a5	Ketaun-Bhawanipur	17,618	11.86

Sl. No.	Mapping Symbol	Mapping Unit	Soil Association	Area (ha)	Area (%)
12	15	ALb2a 1	Ranisakarpur-Jawahar Nagar	9,003	6.06
13	16	ALn2b1	Khumariya-Baghrauli	3,410	2.29
14	17	ALn1a2	Dobha-Bajnathpur-Surigaon	761	0.51
15	18	ALn2a6	Bhawanipur-Ketaun	15,959	10.74
13	8888	Sandbar		1,247	0.84
14	9797	Waterbody		3,608	2.43
15	9898	Habitation		5,361	3.61
16	9999	River		5,968	4.02
TOTAL				1,48,600	100

9. Area under different erosion classes

Sl. No.	Erosion classes	Area(ha)	Area (%)
1.	None to slight erosion	1,19,338	80.31
2.	Slight to moderate erosion	12,869	8.66
3.	Moderate erosion	209	0.14
4.	Misc.	16,184	10.89
	Total	1,48,600	100

10. Area under different slope classes

Sl. No.	Slope Classes	Area (ha)	Area (%)
1.	Level to nearly level slope	2,494	1.68
2.	Nearly level to very Gently slope	1,29,922	87.43
3.	Misc.	16,184	10.89
	Total	1,48,600	100

11. Salient Features:

- ❖ Total 26 soil series have been identified in the fluvial landscape and mapped in Khagaria district.
- ❖ More than 86.82% area of the district are cultivated (86.68% area comes under multiple crop cultivation whereas 0.14 % area under single crop cultivation) followed by plantation (2.29%). OXBOW
- ❖ Soils of the district are highly suitable for variety of crops and horticulture crops like Rice, Wheat, Maize, Pulses, oilseeds, Sugarcane, Potato, Jute, Banana, etc.
- ❖ The cropping intensity can be increased by ensuring irrigation and balance fertilizer and manures.
- ❖ Major soil erosion of the district are none to slight erosion (80.31%) followed by slight to moderate erosion (8.66%) and moderate erosion (0.14%).
- ❖ Flood plain (73.29 %) is the major physiography of the district followed by Alluvial plain (6.06%), Levees (3.23 %), Channel bed (2.99%), Stream bank (1.97 %) and Oxbow/Paleo channel (1.43%), Pointbar complex (0.14%).
- ❖ Soils of the district fall in two slope classes. Out of which 87.43 % area is comes under nearly level to very gentle slope followed by nearly level slope (1.68 %).
- ❖ Land suitable for cultivation, good land with minor limitations i.e. LCC II covers the maximum area 1,07,284 ha. followed by Land suitable for cultivation, moderately good to good land with limitations i.e. LCC II- III (13.55%) and Land suitable for cultivation, moderately good land with major limitations LCC III (3.37%).
- ❖ Soils of the area are taxonomically classified into two orders i.e. Entisols and Inceptisols. All the identified 26 soils series in the area are further classified into 6 sub-orders, 8 great groups, 14 subgroups and 19 families.

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resources mapping of Khagaria district, Bihar 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**.

Khagaria district of Bihar is spread over an area of 1,48,600 ha. The district is covered by ten SOI topographical sheets on the scale of 1:50,000 which are used as base map along with satellite imageries.

Each soil mapping unit is marked by mapping unit i.e. ALn2a2 (Alluvium; flood plain; 0-3 % slope; agriculture land use; Soil Series Association, describing Sukhasan dominant series in association with Sarbani and Emale 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
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 / or clarification, correspondence or personal contact may be established, with the

**Chief Soil Survey Officer,
Soil and Land Use Survey of
India, IARI Buildings, Pusa,
New Delhi – 110012,
Email-csso-slusi@nic.in.
Ph. - 011-25841263**

**Soil Survey Officer,
Soil and Land Use Survey of India,
Baishnabghata-Patuli Township,
Block-E, Kolkata, Pin-700094,
Email- ssokolkata-slusi@nic.in.
Ph. - 033-24301425/1581**

Or

Our website: <http://www.slusi.dacnet.nic.in>