

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

ABSTRACT

1.	Survey Area	:	Kishanganj District, Bihar
2.	Geographical Extent	:	25°55' N to 26°33' N latitude and 87°36'E to 88°18' 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	:	1,88,400ha.
6.	Agro Climatic Zone	:	Middle Gangetic Plain Region (IV) (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

Mapping Symbol	Mapping Unit	Soil Association	Area (ha)	Area (%)
01	ALn1a1	Khakai-Rahariya-Denga	8,028	4.26
02	ALg2a2	Supalnar-Yhangia	3,778	2.01
03	ALn2a2	Jadiya-Nirmali-Norhei	55,994	29.72
05	ALn2a1	Amourna-Chhapra	47,115	25.01
06	ALn1a3	Khuskibag-Harchandpur-Baisi	71	0.04
07	ALn1a2	Parpetti-Supalnar-Birna	16,208	8.6
08	ALk1a1	Belabagan-Gulabbagan	4,010	2.13
09	ALn1a4	Supalnar-Dobha-Surigaon	200	0.11
10	ALb2b1	Bhelaguri-Lodhabari	686	0.36
11	ALn2a3	Purnia-Parara	1,438	0.76
12	ALf2a1	Koshidhar-Champabati	2,069	1.1
14	ALb2a1	Shapetia-Deramari-Khiradaha	2312	1.23
16	ALg2a1	Koshidhar-Champabati	4,223	2.24

Mapping Symbol	Mapping Unit	Soil Association	Area (ha)	Area (%)
17	ALd2a1	Charaiya-Yhangia	1,343	0.71
18	ALe2a2	Uchla-Danraha	658	0.35
19	ALe2a1	Bangra-Danraha	262	0.14
20	ALb2a2	Nuniatari-Shapetia-Deramari	11,744	6.23
8888	Sand Bar		4,133	2.19
9797	Water Body		412	0.22
9898	Habitation		12,407	6.59
9999	River		11,309	6
		TOTAL	1,88,400	100

9. Area under different Erosion classes

Sl. No	Erosion Classes	Area(ha)	Area (%)
1.	None to slight erosion	92,226	48.95
2.	Slight to moderate erosion	63,690	33.81
3.	Moderate erosion	4223	2.24
4.	Misc.	28,261	15.00
	Total	1,88,400	100

10. Area under different Slope classes

Sl. No	Slope Classes	Area (ha)	Area (%)
1.	Nearly level slope	28,517	15.14
2.	Nearly level to very gently slope	1,31,622	69.86
3.	Misc.	28,261	15.00
	Total	1,88,400	100

11. Salient Features:

- ❖ Total 33 soil series have been identified and mapped in Kishanganj district of Bihar state.
- ❖ More than 84.64% area of the district are cultivated (82.51% area comes under multiple crop cultivation whereas 2.13% area under single crop cultivation) followed by plantation (0.36%).
- ❖ Soils of the district are highly suitable for variety of crops and horticulture crops like Rice, Wheat, Maize, Pulses, oilseeds, Sugarcane, Potato, Jute, Banana.
- ❖ 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 (74.41%) followed by slight to moderate erosion (10.59%).
- ❖ Flood plain (68.50%) is the major physiography of the district followed by alluvial plains (7.82%), stream bank (4.25%), muddy land (2.13%), paleo channel (1.10%), pointbar complex (0.71%) & Levees (0.49%).
- ❖ Soils of the district fall in two slope classes. Out of which 69.86% area is comes under very gently slope class followed by Nearly level slope class (0.87%).
- ❖ Land suitable for cultivation, good lands with minor limitations i.e. LCC II-III covers the maximum area 1,16,177 ha. (61.67 %) followed by moderately good to good land with limitations, good lands and fairly good lands with occasional cultivation i.e. LCC II (11.10%), III (2.62%) and IV (0.71%) respectively.
- ❖ Soils of the area are taxonomically classified into three orders i.e. Alfisols, Entisols and Inceptisols. All the identified 33 soils series in the area are further classified into 9 sub-orders, 11 great groups, 19 subgroups and 27 families.

HOW TO USE SOIL RESOURCE MAPPING REPORT

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

Kishanganj district of Bihar is spread over an area of 1,88,400 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. ALn2a1 (Alluvium; flood plain; 1-3 % slope; agriculture land use; Soil Series Association, describing Amourna as dominant series in association with Chhapra 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

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