

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

ABSTRACT

1.	Survey Area	:	Purnia district, Bihar State
2.	Geographical Extent	:	25°43' N to 26°12' N latitude and 86°99' E to 87°86' 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	:	3,22,900 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	ALg2a1	Yhangia-Koshidhar	1142	0.35
2	02	ALg2a2	Supalnagar-Champabati	7534	2.33
3	03	ALe2a1	Bangra-Danraha	9675	3.00
4	04	ALd2a1	Charaiya-Yhangia	2216	0.69
5	05	ALn1a1	Parasmani-Rampur-Bisantha	16965	5.25
6	06	ALn1a2	Khuskibag-Harchandpur-Baisi	44297	13.72
7	07	ALn1a3	Supalnagar-Dobha-Surigaon	50481	15.63
8	08	ALn2a1	Purnia-Parara	52745	16.33
9	09	ALn2a2	Jalalgarh-Sikindarpur	72819	22.55
10	10	ALn2b1	Kasba-Banbagh	3836	1.19
11	11	ALf1a1	Marocha-Bhelai	3478	1.08
12	13	ALn2a3	Purnia-Sikindarpur-Tinpani	5929	1.84

SL. No.	Mapping Symbol	Mapping Unit	Soil Association	Area (ha)	Area (%)
13	14	ALn2a4	Nababganj	34	0.01
14	15	ALk1a1	Belabagan-Gulabbagan	11785	3.65
15	8888	Sandbar		251	0.08
16	9797	Waterbody		2213	0.69
17	9898	Habitation		33403	10.34
18	9999	River		4097	1.27
Grand Total				3,22,900	100.00

9. Area under different erosion classes

Sl. No.	Erosion classes	Area(ha)	Area (%)
1.	None to slight erosion	2,58,533	80.07
2.	Slight to moderate erosion	9,675	3.00
3.	Moderate erosion	14,728	4.56
4.	Misc.	39,964	12.38
Total		3,22,900	100

10. Area under different slope classes

Sl. No	Slope Classes	Area(ha)	Area (%)
1.	Level to nearly level slope	1,27,006	39.33
2.	Nearly level to very Gently slope	1,55,930	48.29
3.	Misc.	39,964	12.38
Total		3,22,900	100

11. Salient Features:

- ❖ Total 27 soil series have been identified and mapped in Purnia district.
- ❖ More than 86.43% area of the district are cultivated (85.74% area comes under multiple crop cultivation whereas 0.69% area under single crop cultivation) followed by plantation (1.19%).
- ❖ 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 (80.87%) followed by slight to moderate erosion (3.0%) and moderate erosion (4.56%).
- ❖ Flood plain (76.51%) is the major physiography of the district followed by Marshy land (3.65%), Levees (3.0%), Stream bank (2.69%), Paleo channel (1.08%), Pointbar complex (0.69%) and.
- ❖ Soils of the district fall in two slope classes. Out of which 48.29 % area is comes under nearly level to very gentle slope followed by nearly level slope (39.33%).
- ❖ Land suitable for cultivation, good land with minor limitations i.e. LCC II covers the maximum area 182236 ha. followed by Land suitable for cultivation, moderately good to good land with limitations i.e. LCC II- III (30.50%) and Land suitable for cultivation, moderately good land with major limitations i.e. LCC III (0.69%).
- ❖ Soils of the area are taxonomically classified into three orders i.e. Alfisols, Entisols and Inceptisols. All the identified 27 soils series in the area are further classified into 7 sub-orders, 10 great groups, 16 subgroups and 20 families.

HOW TO USE SOIL RESOURCE MAPPING REPORT

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

Purnia district of Bihar is spread over an area of 3,22,900 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; 0-3 % slope; agriculture land use; Soil Series Association, describing Purnia as dominant series in association with Parara and 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

**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>