

Inventory of Soil Resource of Paschim Champaran District, Bihar State using Remote Sensing and GIS Technique.

Abstract

- 1. Surveyed Area** : Paschim Champaran district, Bihar
- 2. Location** : a) Latitude 26°16' to 27°31'N
b) Longitude 83°50' to 85°18'E
- 3. Agroclimatic Region** : Middle Gangetic Plain
(Zone – IV as per planning commission)
- 4. Total Area of the District** : 523730 ha
- 5. Kind of Survey** : Soil Resource Mapping using Remote Sensing and GIS Techniques
- 6. Base Map** : a) IRS-ID Geocoded Satellite Imagery (1:50,000)
b) Survey of India Topographical maps on (1:50,000) scale.
- 7. Scale of Mapping** : 1:50,000
- 8. Period of Survey** : Nov.2014 to Jan. 2015

9. Soil Series Association mapped and their respective area:

Mapping Symbol	Mapping Unit	Soil Series Association	Area (ha)	%
01	ALb1a1	Mathura	10240	1.96
02	ALb1a2	Bishanpura - Sonbarsa	14774	2.82
03	ALb2a1	Chanki - Saidpur	45319	8.65
04	ALb2a2	Magroha,- Jai Manglapur	86508	16.52
05	ALb2a3	Misrauliya - Dhatmatriya	18944	3.62
06	ALb2a4	Ramnagar - Katsikri - Dharmgata	51384	9.81
07	ALb2a5	Jagdishpur - Bhit Bherwa	49622	9.47
08	ALb2b1	Gobariya	10038	1.92
09	ALn2a1	Cherwatola - Bela	16010	3.06
10	ALn2a2	Bagha - Nautan	25672	4.90
11	ALn2a3	Yodapur - Bagha	16340	3.12
12	ALn2d1	Dhana- Bagha-Cherwatola	23749	4.53
13	ALg3a1	Kundalipur - Bela	26048	4.97
14	ALb3c1	Gobariya - Dumri	23857	4.56
15	ALb4c1	Banwari - Jamunia	24776	4.73
16	SDn6c1	Someswar	4589	0.88
17	SDn7c1	Dun - Bhikna Tori	40946	7.82
18	Habitation		5820	1.11
19	River and Water body		27780	5.30
20	Canal		1314	0.25
		Grand Total	523730	100

10. Salient Features:

- ⇒ Total 28 soil series have been mapped in Paschim Champaran district.
- ⇒ Major soils of the districts are very deep (84.64%) which is followed by deep (0.88 %) and shallow to moderately deep soils (7.82%).
- ⇒ Soil of the district mainly fall under two landscape and five physiography.

Landscape	Physiography	Area (ha)	%
Alluvium	Alluvial Plain	335462	64.06
	Flood Plain	81771	15.61
	Stream/River Banks	26048	4.97
Sandstone	Undifferentiated hill side slope	45535	8.7
Miscellaneous		34914	6.66

- ⇒ Soils of the district fall in eight slope classes:

Plain to nearly level sloping	25014 ha	(4.78 %)
Nearly level to very gently sloping	306504 ha	(58.52 %)
Very gently to gently sloping	49905 ha	(9.53%)
Gently to moderately sloping	37082 ha	(7.08%)
Strongly to moderately steep sloping	29365 ha	(5.61%)
Steep to very steep sloping	40946 ha	(7.82%)

⇒ Various land use / land cover classes of the district are as under

➤ Cultivated lands	360861 ha (68.90%)
➤ Forest	94168 ha (17.99%)
➤ Plantation	10038 ha (1.92%)
➤ Open scrub/scrub land	23749 ha (4.53%)

⇒ Soils of the area are taxonomically classified into three orders i.e Alfisols, Entisols and Inceptisols. All the 33 soils series identified in the area are further classified into 5 sub order, 5 great group, 9 sub group and 15 families.

⇒ Soils of the districts have five erosion classes

➤ None to slight erosion:	276791 ha (52.85%)
➤ Slight to moderate erosion:	44689 ha (8.53%)
➤ Moderate erosion:	63260 ha (12.09%)
➤ Moderate to severe erosion:	101595 ha (19.40%)
➤ Severe erosion:	2481 ha (0.47%)

⇒ Soils under different Land Capability classes

➤ II	276791 ha (52.85%)
➤ II-III	54727 ha (10.45%)
➤ III	26048 ha (4.97%)
➤ III-IV	37082 ha (7.08%)
➤ VI	48633 ha (9.29%)
➤ VII	45535 ha (8.7 %)

The data indicate that soils have good potential for agricultural production. The soil health management is key for sustainable agriculture development.

How To Use Soil Resource Mapping Report

This report embodied the results of the Soil Resource Mapping of Paschim Chamaparan 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.

Paschim Chamaparan district of Bihar is spread over an area of 523730 ha. The district is covered by 15 SOI topographical sheets on the scale of 1:50,000 which are used as base material along with satellite imageries.

Each soil mapping units is marked by mapping unit i.e ALb2a1 (Alluvium; alluvial plain; 0-3% slope; agriculture land use; soil series association describing Chanki as dominant series in association with Saidpur 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 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 and 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	-	Alluvial plain	Physiography
2	-	0-3% slope	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 further enquiry / or clarification, correspondence or personal contact may be established with either of the following address:

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