

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

ABSTRACT

| | | | |
|----|----------------------------|---|-----------------------------------------------------------------------------------------------|
| 1. | Survey Area | : | Araria district, Bihar State |
| 2. | Geographical Extent | : | 25°56' N to 26°33' N latitude and 87°23'E to 87°41' 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 | : | 2,83,000ha. |
| 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. | 1 | ALn1a1 | Khakai-Rahariya-Denga | 460 | 0.16 |
| 2. | 2 | ALg2a2 | Supalnagar-Yhangia | 370 | 0.13 |
| 3. | 3 | ALn2a2 | Jadiya-Nirmali-Norhei | 1,20,199 | 42.49 |
| 4. | 5 | ALn2a1 | Amourna-Chhapra | 1,01,324 | 35.81 |
| 5. | 6 | ALn1a3 | Khuskibag-Harchandpur-Baisi | 212 | 0.07 |
| 6. | 7 | ALn1a2 | Parpetti-Supalnagar-Birna | 5,153 | 1.82 |
| 7. | 8 | ALk1a1 | Belabagan-Gulabbagan | 6,794 | 2.40 |
| 8. | 9 | ALn1a4 | Supalnagar -Dobha-Surigaon | 3,369 | 1.19 |
| 9. | 10 | ALb2b1 | Bhelaguri-Lodhabari | 4,557 | 1.61 |
| 10. | 11 | ALn2a3 | Birna-Parara | 1,473 | 0.52 |
| 11. | 12 | ALf2a1 | Champabati r-Koshidha | 1,727 | 0.61 |
| 12. | 13 | ALn2a4 | Jalalgarh-Baisi-Sikindarpur | 13,275 | 4.69 |
| 13. | 14 | ALb2a1 | Shapetia-Deramari-Khiradaha | 2,010 | 0.71 |
| 14. | 16 | ALg2a1 | Koshidhar-Champabati | 766 | 0.27 |

| SL. No. | Mapping Symbol | Mapping Unit | Soil Association | Area (ha) | Area (%) |
|---------|----------------|--------------------|------------------|-----------------|------------|
| 15. | 17 | ALd2a1 | Charaiya-Yhangia | 94 | 0.03 |
| 16. | 8888 | Sand Bar | | 9 | 0.00 |
| 17. | 9797 | Water Body | | 1,361 | 0.48 |
| 18. | 9898 | Habitation | | 15,204 | 5.37 |
| 19. | 9999 | River | | 4,643 | 1.64 |
| | | Grand Total | | 2,83,000 | 100 |

9. Area under different erosion classes

| Sl. No. | Erosion classes | Area(ha) | Area (%) |
|---------|----------------------------|-----------------|------------|
| 1 | None to slight erosion | 254080 | 89.78 |
| 2 | Slight to moderate erosion | 6567 | 2.32 |
| 3 | Moderate erosion | 1136 | 0.40 |
| 4 | Misc. | 21,217 | 7.50 |
| | Total | 2,83,000 | 100 |

10. Area under different slope classes

| Sl. No | Slope Classes | Area(ha) | Area (%) |
|--------|--------------------|-----------------|------------|
| 1 | Nearly level slope | 15988 | 5.65 |
| 2 | Very gently slope | 245795 | 86.85 |
| 3 | Misc. | 21,217 | 7.50 |
| | Total | 2,83,000 | 100 |

11. Salient Features:

- ❖ Total 30 soil series have been identified and mapped in Araria district.
- ❖ More than 90.89% area of the district are cultivated (88.49% area comes under multiple crop cultivation whereas 2.40% area under single crop cultivation) followed by plantation (1.61%).
- ❖ 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 as per soil test data.
- ❖ Major soil erosion of the district is none to slight erosion (89.78%) followed by slight to moderate erosion (2.32%) and moderate erosion (0.40%) only.
- ❖ Flood plain (86.74%) is the major physiography of the district followed by Marshy land (2.40%), Alluvial plains (2.32%), Paleo channel (0.61%), Stream bank (0.40%) and Pointbar complex (0.03%).
- ❖ Soils of the district fall in three slope classes. Out of which 83.70% area is comes under nearly level to very gently slope followed by very gently slope (6.40%) and Level to nearly level slope (2.40%).
- ❖ Land suitable for cultivation, good lands with minor limitations i.e. LCC II covers the maximum area 252032 ha. (89.06 %) followed by moderately good to good land with limitations, good lands and fairly good lands with occasional cultivation i.e. LCC II-III (1.01%), III (2.40) and IV (0.03%) respectively.
- ❖ Soils of the area are taxonomically classified into three orders i.e. Alfisols, Entisols. and Inceptisols All the identified 30 soils series in the area are further classified into 6 sub-orders, 11 great groups, 20 subgroups and 25 families.

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resources mapping of Araria 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 contains 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**.

Araria district of Bihar is spread over an area of 2,83,000 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 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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