

Inventory of Soil Resources of Murshidabad District, West Bengal Using Remote Sensing and GIS Techniques

ABSTRACT

| | | | |
|----|----------------------|---|--|
| 1. | Survey Area | : | Murshidabad District, West Bengal |
| 2. | Geographical Extent | : | 87°49'09" to 88°44' E Longitudes and 23°43'30" to 24°52'N Latitudes |
| 3. | Kind of Survey | : | Soil Resources Mapping using remote sensing techniques. |
| 4. | Total area | : | 531611 ha. |
| 5. | Agro Climatic Region | : | Lower Gangetic Plain (Zone no. III as per planning commission) |
| 6. | Base map | : | a) IRS – ID Geocoded Satellite Imagery (1: 50000 scale) b) SOI –toposheet (1:50000 scale) |
| 7. | Period of Survey | : | February to March, 2011 |

9. Soil Series association mapped and their respective area

| Sl. No. | Mapping Symbol | Mapping Unit | Soil Association | Total Area (ha) | Area (%) |
|---------|----------------|--------------|-----------------------------|-----------------|--------------|
| 1 | 01 | ALb1a1 | Siyapara-Fatepur-Lalgola | 18229 | 3.43 |
| 2 | 02 | ALb1a2 | Ranagram-Fatepur | 32513 | 6.12 |
| 3 | 03 | ALb2 a1 | Rajdharpara-Daltanpura | 209179 | 39.35 |
| 4 | 04 | ALb2a2 | Kumradhar-Bhakuria-Siyapara | 60894 | 11.45 |
| 5 | 05 | ALb2a3 | Hariharpur-Kumradhar-Choa | 61217 | 11.52 |
| 6 | 06 | ALb3a1 | Lalgola-Fatepur | 59700 | 11.23 |
| 7 | 07 | ALb2b1 | Choa-Lalbag | 19471 | 3.66 |
| 8 | 08 | ALb3b1 | Choa-Bhutadomga-Lalbag | 5277 | 0.99 |
| 9 | 09 | ALb3c1 | Gopgram-Bhutadomga | 186 | 0.03 |
| 10 | 10 | ALe2a1 | Ranagram-Gokarna-Choa | 1891 | 0.36 |
| 11 | 11 | ALf3a1 | Bholadanga-Muktinagar | 2117 | 0.40 |
| 12 | 12 | ALg3a1 | Muktinagar-Islampur | 3892 | 0.73 |
| 13 | 13 | ALk1e1 | Bholadanga-Godhaipur | 10694 | 2.01 |
| 14 | 94 | S.B. | | 8597 | 1.62 |
| 15 | 95 | W.B. | | 7631 | 1.44 |
| 16 | 96 | TANK | | 174 | 0.03 |
| 17 | 98 | H.S. | | 10503 | 1.98 |
| 18 | 99 | RIVER | | 19446 | 3.66 |
| | | | Grand Total | 531611 | 100.0 |

10. Area under different erosion classes

| Erosion classes | Area(ha) | % |
|----------------------------|---------------|---------------|
| None to slight erosion | 394843 | 74.27 |
| Slight to moderate erosion | 1891 | 0.36 |
| Moderate erosion | 88340 | 16.62 |
| Moderate to severe erosion | 186 | 0.03 |
| Misc. | 46351 | 8.72 |
| Total | 531611 | 100.00 |

11. Area under different slope classes

| Slope Classes | Area(ha) | % |
|-----------------------------------|---------------|---------------|
| Level to nearly level slope | 61436 | 11.56 |
| Nearly level to very gently slope | 270073 | 50.80 |
| Very gently slope | 82579 | 15.53 |
| Very gently to gently slope | 71172 | 13.39 |
| Misc. | 46351 | 8.72 |
| Total | 531611 | 100.00 |

Salient Features:

- ❖ Total 18 nos soil series have been mapped in Murshidabad district.
- ❖ 84.58 % area of the district are cultivated followed by plantation (4.66%), barren lands (2.01%) and forest land(0.03%).
- ❖ Soils of the district has almost none to slight erosion(74.27%) followed by moderate erosion (16.62%) and marginal area are moderate to severe erosion(0.03%).
- ❖ Alluvial plains (87.78%) is the major physiography of the district followed by marshy land (2.01%)
- ❖ Soils of the district falls in four slope classes
 - Level to nearly level slope 61436 ha 11.56%
 - Nearly level to very gently slope 270073 ha 50.80%
 - Very gently slope 82579 ha 15.53%
 - Very gently to gently slope 71172 ha 13.39%
- ❖ Soils are slightly acidic to neutral in reaction and low to medium in fertility needs recommended doses of balanced Fertilizer in addition suitable agronomic practices for sustained increase in agriculture production.
- ❖ Good land with minor limitations and suitable for cultivation i.e LCC II covers the maximum area 384149 ha (72.26%) followed by II-III (15.98%), IV(2.01%), III(0.99%) and III-IV(0.03%). These lands are suitable for the adoption of crop based farming system.
- ❖ Soils of the area are taxonomically classified into three orders i.e. Alfisols, Inceptisols and Entisols. All the 18 soils series identified in the area are further classified into 6 sub-orders, 7 great groups, 13 subgroups and 18 families.

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the Soil Resources mapping of Murshidabad district, West Bengal 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 **Chapter5**.

Murshidabad district of West Bengal is spread over an area of 531611 ha. The district is covered by twelve SOI topographical sheets on the scale of 1: 50,000 which are used as base material along with satellite imageries.

Each soil mapping unit is marked by mapping unit i.e. ALb1a1 (Alluvium; alluvial plain; 0-3 % slope; agriculture land use; Soil Series Association, describing Siyapara as dominant series in association with Fatepur and Lalgola 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 |
| 1 | - | 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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