

# Inventory of Soil & Land Resource of Panchmahal District, Gujarat Using Remote Sensing and GIS Techniques

## ABSTRACT

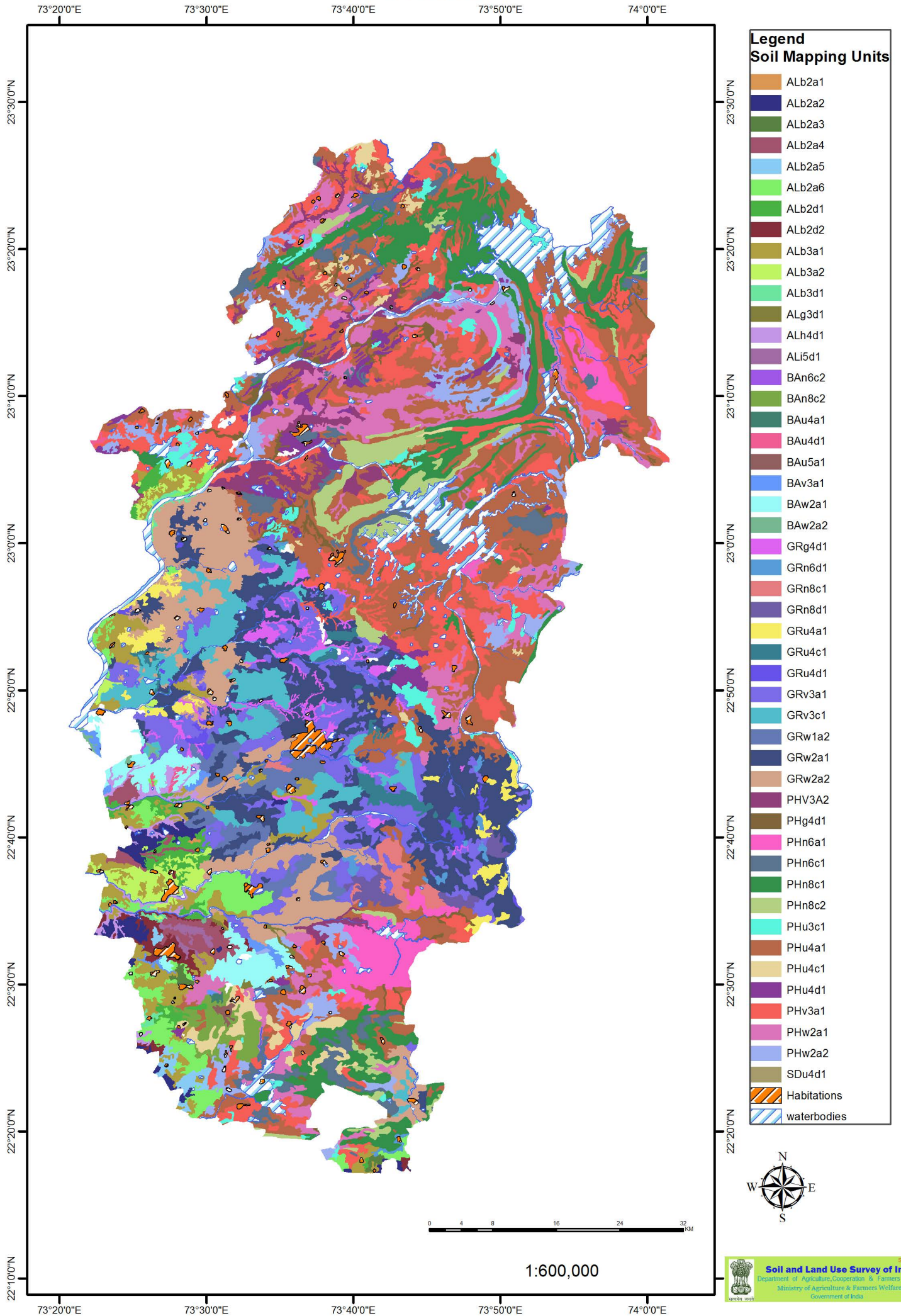
1.	<b>Survey Area</b>	Panchmahal district, Gujarat
2.	<b>Geographical Extent</b>	71°51' to 73°86' East Longitude 20°49' to 22°8' North Latitude
3.	<b>Agro Climate Region</b>	XIII- Gujarat plain and hills
4.	<b>Total area of the district</b>	5,77,450 ha.
5.	<b>Kind of Survey</b>	Soil Resource Mapping using remote sensing techniques and GIS techniques
6.	<b>Base map</b>	(a) IRS-ID Geo-coded Satellite Imagery (1:50,000 Scale ) ( b) SOI –Toposheet ( 1:50,000 scale )
7.	<b>Scale of mapping</b>	1: 50,000
8.	<b>Period of survey</b>	Feb, 2009

### 9. Soil Series association mapped and their respective area.

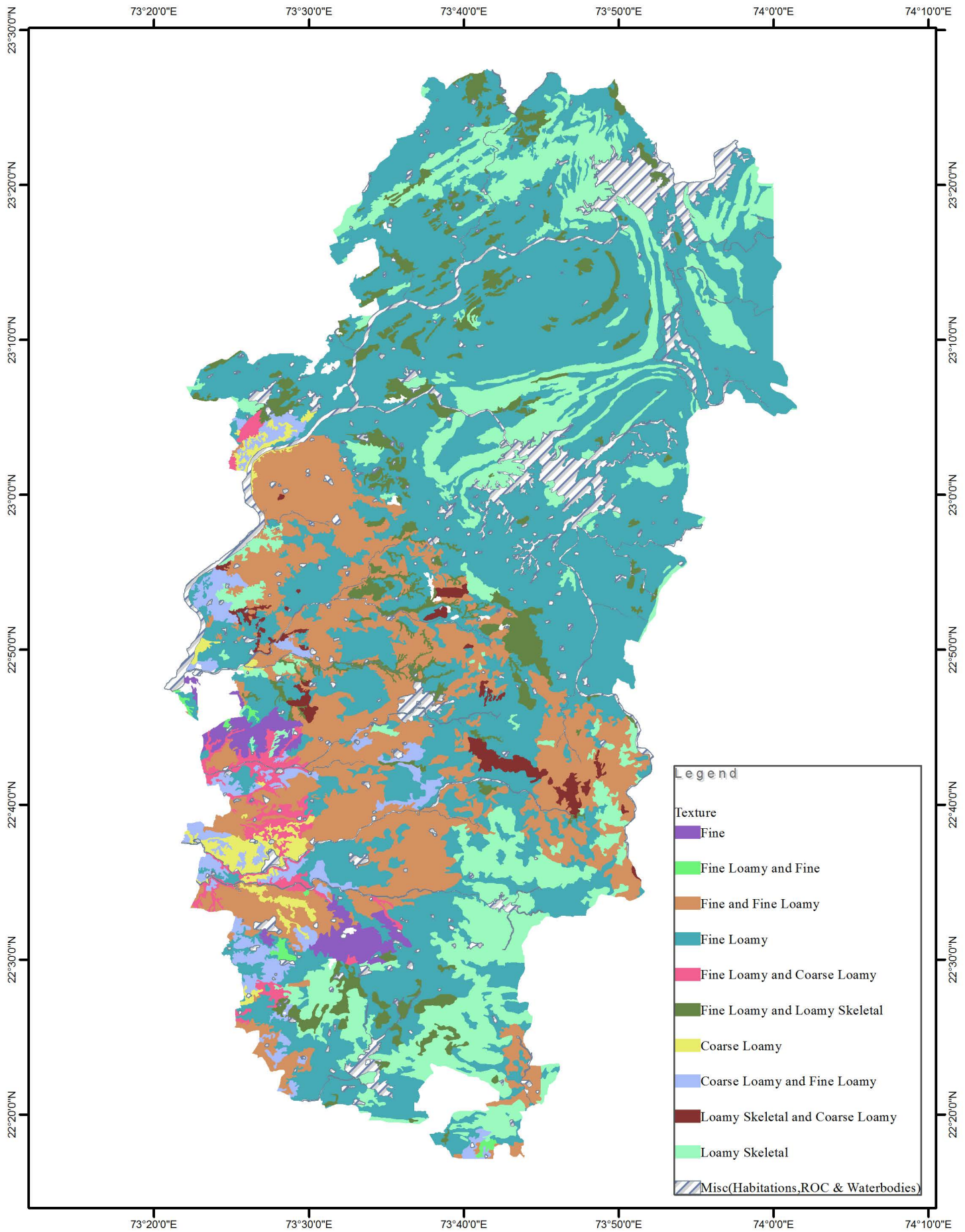
<b>Mapping Unit</b>	<b>Mapping Symbol</b>	<b>Soil Association</b>	<b>Area (ha)</b>	<b>Area (%)</b>
ALb2a1	A01	Sajod-Latipura-Thasra	66.43	0.01
ALb2a2	A02	Sajod-Varnol	3866.64	0.67
ALb2a3	A03	Varnol-Sajod	640.35	0.11
ALb2a4	A04	Sajod-Varnol- Latipura	3929.65	0.68
ALb2d1	A05	Sajod- Thasra- Kawa	246.13	0.04
ALb2d2	A06	Sajod-Kawa	2552.26	0.44
ALg3d1	A07	Varnol-Rumalpura	462.94	0.08
ALb2a5	A08	Sajod- Latipura	1610.24	0.28
ALh4d1	A09	Mulad-Rumalpura	3215.16	0.56
ALi5d1	A10	Derol-Rumalpura	894.56	0.15
ALb2a6	A11	Latipura- Rumalpura -Thasra	9518.18	1.65
ALb3a1	A12	Bariya- Latipura	15036.74	2.60
ALb3a2	A13	Borsad- Bariya	4868.05	0.84
ALb3d1	A14	Borsad- Bariya	950.20	0.16
ALb2a7	A15	Varnol-Thasra	4733.18	0.82
BAn8c1	B02	Kuri- Dungara	3778.47	0.65
BAn6c1	B05	Kavachiya- Dungara	44.90	0.01
BAu5a1	B07	Jambar- Singlvan	348.74	0.06
BAu4a1	B08	Jambar- Singlvan	163.10	0.03
BAu4d1	B09	Singlvan -Jambar	441.51	0.08

BAv3a1	B10	Chandravan-Kadaba	1451.25	0.25
BAw2a1	B11	Sagbara-Chandeliya	7494.61	1.30
BAw2a2	B12	Chandeliya- Sagbara	378.78	0.07
BAg4d1	B13	Kadba - Chandeliya	371.78	0.06
GRn8c1	G01	Dhanpur- Dungarwat	2958.75	0.51
GRn8d1	G02	Dungarwat t-Dhanpur	2886.71	0.50
GRn6d1	G04	Dhanpur Dungarwat -	801.50	0.14
GRn6c1	G05	Dungarwat-Dhanpur	489.60	0.08
GRu4c1	G06	Od-Panwad-Surkheda	3531.40	0.61
GRu4d1	G07	Panwad-Surkheda	2211.45	0.38
GRu4a1	G08	Surkheda-Dhamodi	4959.66	0.86
GRv3a1	G09	Od-Bardoli	28717.94	4.97
GRw2a1	G10	Chisadiya-Jhoj	43095.02	7.46
GRg4d1	G11	Od- Surkheda	5989.15	1.04
GRv3c1	G12	Od- Bordoli	18477.33	3.20
GRw2a2	G13	Chisadiya- Jhoj	30657.14	5.31
GRw1a2	G14	Chisadiya- Jhoj	8533.91	1.48
LSu3a1	LS07	Prachi	48.85	0.01
PHn8c1	PH03	Phulpur- Punakota	32811.94	5.68
PHn8c2	PH04	Punakota - Phulpur	12869.79	2.23
PHn6c1	PH05	Punakota-Phulpur	13824.98	2.39
PHn6a1	PH06	Punakota - Phulpur	11865.0	2.05
PHu4d1	PH07	Sudhiya-Lakhanpur	9146.01	1.58
PHu4c1	PH08	Dabhda-Sudhiya	6874.30	1.19
PHu4a1	PH09	Lakhanpur-Dabhda	95869.59	16.60
PHu3c1	PH10	Dabhda-Sudhiya	8467.34	1.47
PHv3a1	PH11	Liliamba-Wakota	54186.78	9.38
PHw2a1	PH12	Wakota- Chamariya	32473.70	5.62
PHw2a2	PH13	Chamariya-Wakota	17824.85	3.09
PHg4d1	PH14	Lakhanpur- Liliamba	6396.46	1.11
PHv3a2	PH15	Chamariya-Salampur	11150.01	1.93
SDu4d1	S02	Chametha-Godham	170.44	0.03
	F	Habitation, road and railway	1366.29	0.24
	G	Water body	6010.87	1.04
	ROC	Rock out crop	35061.57	6.07
	Sq	Stone quarry	57.90	0.01
	SW	Stony waste	599.92	0.10
<b>Total</b>			<b>577450.00</b>	<b>100</b>

# SOIL MAP



# Distribution of Textural Classes



**Legend**

Texture

- Fine
- Fine Loamy and Fine
- Fine and Fine Loamy
- Fine Loamy
- Fine Loamy and Coarse Loamy
- Fine Loamy and Loamy Skeletal
- Coarse Loamy
- Coarse Loamy and Fine Loamy
- Loamy Skeletal and Coarse Loamy
- Loamy Skeletal
- Misc(Habitations, ROC & Waterbodies)



1:600,000



## 10. Salient Features:

- There are thirty-nine soil series have been mapped in Panchmahal district of Gujarat.
- Soils of Panchmahal district are shallow 16872.94 ha of 2.92 %, shallow to moderately 107762.22 ha of 18.66 %, moderately deep 95918.44 ha of 16.61 %, moderately deep to deep 55042.73 ha of 9.53 %, deep to very deep 73581.62 ha. of 12.74 %, very deep 185175.3 ha of 32.07% and miscellaneous 43096 ha of 7.46% of total area.
- Physiography of Panchmahal district having mainly eight physiographic units as hill side slope 82332.66 ha. of 14.65% pediments as 132232.29 ha. Of 22.89%, upper pediplains as a 113983.0 ha. of 19.73 %, lower pediplains as 140458.48 ha. of 24.60 %, alluvium plains as 48018.01 ha. of 8.31 %, stream bank as 13220.0 ha. of 2.2 %, dissected stream banks as 3215.0 ha. of 0.55% and ravenous lands as 894.56 ha. of 0.15% of total area.
- Soils of Panchmahal district falls in six slope classes as nearly level to very gently sloping as 178771.05 ha. of 30.95%, very gently to gentle sloping as 139340.0 ha. of 24.13%, gently to moderate sloping as 124034.41 of 21.47%, moderate to strong sloping as 1243.30 ha. of 0.21%, strong to steep sloping as 27025.0 ha. of 4.68% and steep to very steep sloping as 43096.55 ha. of 7.46% of total area.
- Land cover classes of Panchmahal district are as cultivated land 393488.31 ha. of 68.14 %, forest land as 107015.51 ha. of 18.52%, open scrub as 33849.54 ha. of 5.88% and miscellaneous land as 43096 ha. of 7.46% of total area.
- Soils of Panchmahal district fall under different erosion classes as none to slight erosion as 17248.08 ha. of 29.88%, slight to moderate erosion as 134013.44 of 23.21%, Severe erosion as 227850.93 of 39.45% and miscellaneous lands area 43096.55 ha. of 7.46% of total area.
- Soils of Panchmahal district under different land capability classes falls class II area 184727.44 of 31.9, class III area 112474.89 of 19.6%, IV-VI area 133022.28 ha. of 23.6%, forest area of 104128.80 ha. of 18.0% and miscellaneous lands area of 430096.55 ha. of 7.5% of total area.
- Around 39.45% total cultivated area of district suffering from severe erosion hazard and area under slight erosion covers 29.88% of district areas 25.21% area under district suffering from slight to moderate erosion hazard.
- Around 23.6% of district categorized under land capability classes IV-VI having very severe limitation to farming there are other option to carry out agro forestry, silviculture where as 30% of land categories in class to and 19.6% land under class III suitable of agro horticulture system.

Soils of the area are taxonomically classified in to four orders that are Alfisols, Entisols, Inceptisols and Vertisols. All the thirty nine soils series identified in the area are further classified in to 7 suborders, 7 great groups 12 sub groups and 18 families.

## HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the soil resource mapping of Panchmahal district of Gujarat providing information on the geographical setting of the district, such as location, extent, physiography, relief, drainage, climate, geology, natural vegetation, agriculture, land use & soils.

The report contains other information on interpretative grouping of soils such as land capability classes; land irritability classes, soil suitability grouping and hydrological grouping and also recommendation for crops, horticulture development, forest, forage and grasslands development, water harvesting, water storage and water management that are essential for soil land resource management. The genesis and classification of the soils are also discussed in chapter-5.

Panchmahal district of Gujarat is spread over an area 577450.0 ha. The district is covered by ten 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. ALb2a1 (Alluvium, alluvial plain; 0-3% slope; agriculture land use; soil series association, describing Sajod – as dominant series in association with Latipura & Thasra series). Each soil association is restricted to maximum of three soil series.

For the use of the soil resource mapping report, first locate the area of your 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 follow:

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 Survey officer,**

**Soil & Land Use Survey of India**

**IARI Buildings, Pusa,**

**New Delhi – 110012**

**Email – [csso-slusi@nic.in](mailto:csso-slusi@nic.in).**

**Website: - [slusi.dacnet.nic.in](http://slusi.dacnet.nic.in)**

**Ph -01125841263**

**Soil & Land Use Survey of India**

**Behind Godavari Flats, Vasna**

**Ahmedabad centre**

**Pin -380007**