Inventory of Soil Resources of Dahod District, Gujarat Using Remote Sensing and GIS Techniques

ABSTRACT

1.	Survey Area	Dahod district, Gujarat
2.	Geographical Extent	73°15' to 74°30'- East Longitude. 20°30' to 23°30'- North Latitude.
3.	Agro Climate Region	Semi-Arid - Gujarat plain and hills.
4.	Total area of the district	3,88,067 ha.
5.	Kind of Survey	Soil Resource Mapping using Remote Sensing Techniques.
6.	Base map	(a) IRS-ID Geo-coded Satellite Imagery (1:50,000 Scale) (b) SOI –Toposheet (1:50,000 scale)
7.	Scale of mapping	1:50,000
8.	Period of survey	Dec, 2008

9. Soil Series association mapped and their respective area.

S. No	Mapping unit	Mapping symbol	Soil Association	Area (ha)	Area %
1	BAn8c1	B02	Dungra-Kavachiya	1116	0.29
2	BAn8d1	B03	Kavachiya-Dungra	1057	0.27
3	BAn6c1	B04	Kavachiya-Dungra	133	0.03
4	BAn6c2	B05	Dungra-Kavachiya	5270	1.36
5	BAn6a1	B06	Kavachiya-Dungra	1913	0.49
6	BAu5a1	B07	Singalvan-Jambar	9848	2.54
7	BAu4a1	B08	Jambar-Singalvan	7998	2.06
8	BAu4d1	B09	Jambar-Singalvan	7618	1.96
9	BAv3a1	B10	Chandravan-Kadaba	9502	2.45
10	BAw2a1	B11	Sagbara-Chandeliya	7487	1.93
11	BAw2a2	B12	Chandeliya-Sagbara	3964	1.02
12	BAg4d1	B13	Kadaba-Chandeliya	473	0.12
13	BAu5a2	B14	Singalvan-Jambar	954	0.25
14	GRn8c1	G01	Dhanpur-Dungarwant	3977	1.02
15	GRn8d1	G02	Dhanpur-Dungarwant	8307	2.14
16	GRn6d1	G04	Dhanpur-Dungarwant	498	0.13
17	GRn6c1	G05	Dhanpur-Dungarwant	1614	0.42
18	GRu4c1	G06	Surkheda-Od	3002	0.77
19	GRu4d1	G07	Surkheda-Panvad	2047	0.53
20	GRu4a1	G08	Surkheda-Dhamodi	10427	2.69
21	GRv3a1	G09	Od-Bardoli	5416	1.40
22	GRw2a1	G10	Chisadiya-Jhoj	9537	2.46
23	GRg4d1	G11	Od-Surkheda	807	0.21
24	GRv3c1	G12	Od-Bardoli	157	0.04
25	LSu4d1	LS01	Manikaya-Chhayan	3002	0.77
26	LSu4a1	LS02	Manikaya	7426	1.91
27	LSu3d1	LS03	Chhayan-Manikaya	2580	0.66

28	LSv3a1	LS04	Prachi	7689	1.98
29	LSw2a1	LS05	Vaniya-Pawadi	1777	0.46
30	PHi3c1	PH01	Khajuri	1092	0.28
31	PHi3a1	PH02	Khajuri	259	0.07
32	PHn8c1	PH03	Punakota-Phulpur	15523	4.00
33	PHn8c1	PH04	Punakota-Phulpur	6866	1.77
34	PHn6c1	PH05	Punakota-Phulpur	17166	4.42
35	PHn6a1	PH06	Punakota-Phulpur	1503	0.39
36	PHu4d1	PH07	Sudhiya-Lakhanpur	11116	2.86
37	PHu4c1	PH08	Dabhda-Sudhiya	7097	1.83
38	PHu4a1	PH09	Dabhda-Lakhanpur	70613	18.20
39	PHu3c1	PH10	Dabhda-Sudhiya	14546	3.75
40	PHv3a1	PH11	Liliamba-Wakota	52166	13.44
41	PHw2a1	PH12	Wakota-Chamariya	32513	8.38
42	PHw2a2	PH13	Chamariya-Wakota	3378	0.87
43	PHg4d1	PH14	Lakhanpur-Liliamba	13136	3.38
44	PHv3a2	PH15	Chamariya-Salampur	4791	1.23
45	f	F		1583	0.41
46	g	G		9123	2.35
Total				**388067**	**100.00**

Soil under different physiography classes

Physiography	**Area (ha)**	**Area %**
Plateau plains / hill tops / mesa	1351	0.35
Undifferentiated hills side slope	64943	16.73
Narrow mountain valleys	14416	3.71
Pediments	158274	40.79
Upper pediplains	79721	20.54
Lower pediplains	58656	15.11
Misc.	10706	2.76
Total	**388067**	**100.00**

Soils of the district fall in six slope classes

Slope Classes	**Area(ha)**	**Area %**
Nearly level to very gently	58656	15.11
Very gently to gently	98198	25.30
Gently to moderately	144762	37.30
Moderately to strongly	10802	2.78
Strongly to moderately steep	28097	7.24
Steep to very steep	36846	9.49
Misc.	10706	2.76
Total	**388067**	**100.00**

Soils under different depth classes

Depth	Area(ha)	Area %
Shallow	73738	19.00
Shallow to moderately deep	148783	38.34
Moderately deep	9040	2.33
Moderately deep to deep	28211	7.27
Deep to very deep	80195	20.67
Very deep	35891	9.25
Misc.	12209	3.15
Total	**388067**	**100.00**

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

Land use	Area(ha)	Area %
Agriculture	249161	64.21
Open scrub	50641	13.05
Forest	77559	19.99
Misc.	10706	2.76
Total	**388067**	**100.00**

Soils under different erosion classes

Erosion	Area (ha)	Area %
None to slight water erosion	49119	12.66
Slight to Moderate erosion	14328	3.69
Moderate water erosion	91393	23.55
Moderate to Severe erosion	12560	3.24
Severe water erosion	209961	54.10
Misc.	10706	2.76
Total	**388067**	**100.00**

Soils under different Land capability classes

Land capability class	Area (ha)	Area (%)
II	115613	29.79
III	29878	7.70
III-IV	7689	1.98
IV	134436	34.64
VI	13278	3.42
F	76467	19.70
Misc.	10706	2.76
Total	**388067**	**100.00**

10. Salient Features:

- Total 34 soil series have been mapped in Dahod district of Gujarat. The soils have been classified into 4 orders, five sub orders, five great group, 11 subgroups and 21 family classes.

- Shallow to moderately deep soils cover maximum area covering, 1,48,783 ha (38.34%), followed by deep to very deep soils 80,195 ha (20.67%), shallow soils 73,738 ha (19.00%) and very deep soils 35,891 (9.25%).

- Soils of Dahod district, suffered from severe water erosion comprising 2,09,961 ha (54.10%) followed by moderate to severe erosion 1,03,953 ha (26.79%), none to slight erosion 49,119 ha (12.66%) and Slight to Moderate erosion 14,328 ha (3.69%).

- About 1,344,36 ha (34.64%) area is grouped under marginal lands with land capability class IV, where as good land with minor limitations comprises 1,15,613 ha (29.79%), lands with major limitations classed under III and III-IV cover 37,567 ha, lands suited for pasture covers 13,278 ha (3.42%) and are grouped under class VI and forest lands covers 76,467 ha (19.70%)

HOW TO USE SOIL RESOURCE MAPPING REPORT

This report embodies the results of the soil resource mapping of Dahod 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.

Dahod district of Gujarat is spread over an area of 3,88,067 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. BAn8d1 (Basalt, Hillside slope; 25-50% slope; Open scrub land use; soil series Association, describing Kavachiya - as dominant series in association with Dungra 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:

BA	- Basalt	- Landscape
n	- Hill side slope	- Physiography
8	- 25-50 %	- Slope class
d	- Open scrub	- 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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