

ABSTRACT

1. Surveyed area	Detailed Soil Survey and Land Use Plan in 4D4C5h1, h2, h3, h4, h5, j3, k3, k4, k5, k6, m1, m2, m3, m4, m5, p1, p2, p3, p4, p5, p6, p7, q1, q2, q3, r1, r2, r3, r4, s1, s2, s3, t1, t2, and t3 microwatersheds of 4D4C5 watershed under Tungabhadra (RVP) Catchment Using Remote Sensing and GIS Techniques in Taluk-Channagiri, District-Davanagere; Taluk-Holalkere, District-Chitradurga and Taluk-Tarikere, District-Chikmagalur, Karnataka State
2. Geographical extent	13 ⁰ 52' 21" to 14 ⁰ 10' 36" N Latitude and 75 ⁰ 58' 05" to 76 ⁰ 11' 56" E longitude.
3. Total area surveyed	44,012 ha
4. Kind of survey	Detailed Soil Survey using Remote Sensing Techniques.
5. Period of survey	February, 2013 to March, 2013
6. Base map used	High resolution Satellite Imageries and Enlarged Toposheets on 1:10,000 scale.
7. Toposheet used	48N/16, 48 O/03, 57B/04 and 57C/01.
8. Agro-climatic zone	10 (Southern Plateau and Hill region)

9. Microwatershed wise distribution of area (ha) under different Soil Series

Sl.No.	sMicrowatershed	Arabagatte	Basapura	Harlakatte	Lambanihatti	Madapura	Ramgatta	Tuppadahalli	Misc.	Total Area (ha)	Area (%)
1	4D4C5h1	927	69	500	74	239	157	544	109	2619	5.94
2	4D4C5h2	300	35	409	13	45	58	157	43	1060	2.41
3	4D4C5h3	125	0	37	0	59	10	81	13	325	0.74
4	4D4C5h4	427	77	377	69	98	13	80	34	1175	2.67
5	4D4C5h5	455	12	100	50	12	66	57	29	781	1.77
6	4D4C5j3	204	151	510	42	78	26	48	4	1063	2.42
7	4D4C5k3	216	135	179	21	209	241	28	141	1170	2.66
8	4D4C5k4	680	64	148	38	105	421	19	70	1545	3.51
9	4D4C5k5	63	0	626	393	186	173	0	115	1556	3.54
10	4D4C5k6	64	7	271	506	154	76	66	38	1182	2.69
11	4D4C5m1	403	13	969	37	370	110	62	40	2004	4.55
12	4D4C5m2	272	117	293	39	501	22	0	106	1350	3.07
13	4D4C5m3	201	0	161	3	37	28	30	108	568	1.29
14	4D4C5m4	204	41	579	38	67	53	42	53	1077	2.45
15	4D4C5m5	501	81	387	38	285	57	135	41	1525	3.46
16	4D4C5p1	318	64	634	82	125	38	20	76	1357	3.08
17	4D4C5p2	395	0	442	4	183	38	110	0	1172	2.66
18	4D4C5p3	110	68	450	5	47	122	104	42	948	2.15
19	4D4C5p4	381	117	816	10	75	94	61	82	1636	3.72
20	4D4C5p5	187	44	338	60	91	90	190	94	1094	2.49
21	4D4C5p6	322	189	547	15	53	49	28	84	1287	2.92
22	4D4C5p7	105	14	286	64	16	60	135	20	700	1.59
23	4D4C5q1	760	18	497	39	38	59	61	96	1568	3.56
24	4D4C5q2	177	16	59	1	29	87	136	19	524	1.19
25	4D4C5q3	370	59	627	36	156	155	37	42	1482	3.37
26	4D4C5r1	558	71	323	77	245	159	37	75	1545	3.51
27	4D4C5r2	201	27	127	36	79	15	53	91	629	1.43
28	4D4C5r3	641	88	729	122	165	181	166	45	2137	4.86
29	4D4C5r4	346	79	673	9	62	33	44	15	1261	2.87
30	4D4C5s1	278	123	404	55	164	129	128	85	1366	3.1
31	4D4C5s2	233	7	650	77	98	196	44	52	1357	3.08
32	4D4C5s3	79	73	332	103	98	30	114	99	928	2.11
33	4D4C5t1	321	178	701	80	110	69	115	40	1614	3.67
34	4D4C5t2	146	41	745	73	234	76	24	32	1371	3.12
35	4D4C5t3	249	25	439	106	86	37	39	55	1036	2.35
Total Area (ha)		11219	2103	15365	2415	4599	3228	2995	2088	44012	100
Area (%)		25.49	4.78	34.91	5.49	10.45	7.33	6.8	4.74	100.00	

10. Microwatershed wise distribution of area (ha) under different Land capability units

S.No.	MICRO-WATERSHED	IIIs-1	IIIs-1	IIIs-2	IIIs-3	Ives-1	Ives-2	Ives-3	VIs-1	VIs-2	Misc	Total Area (ha)
1	4D4C5h1	53	678	359	483	316	31	46	187	357	109	2619
2	4D4C5h2	290	141	45	131	240	0	13	34	123	43	1060
3	4D4C5h3	2	39	117	36	37	0	0	45	36	13	325
4	4D4C5h4	105	453	8	273	153	69	0	63	17	34	1175
5	4D4C5h5	7	429	67	93	49	22	28	5	52	29	781
6	4D4C5j3	242	103	88	268	268	17	25	14	34	4	1063
7	4D4C5k3	0	328	129	376	147	0	21	0	28	141	1170
8	4D4C5k4	0	985	116	253	26	38	38	19	0	70	1545
9	4D4C5k5	0	288	11	710	39	224	169	0	0	115	1556
10	4D4C5k6	0	143	36	350	43	18	488	66	0	38	1182
11	4D4C5m1	248	210	218	869	316	19	22	56	6	40	2004
12	4D4C5m2	121	89	137	641	205	25	26	0	0	106	1350
13	4D4C5m3	8	18	34	153	214	0	3	4	26	108	568
14	4D4C5m4	27	160	7	556	194	5	33	0	42	53	1077
15	4D4C5m5	130	424	64	300	381	13	37	30	105	41	1525
16	4D4C5p1	116	156	151	549	190	13	86	20	0	76	1357
17	4D4C5p2	21	352	112	421	152	0	4	0	110	0	1172
18	4D4C5p3	73	41	64	397	222	4	1	54	50	42	948
19	4D4C5p4	460	255	155	358	236	0	29	22	39	82	1636
20	4D4C5p5	174	138	60	168	210	59	1	0	190	94	1094
21	4D4C5p6	47	175	32	534	350	22	15	24	4	84	1287
22	4D4C5p7	56	96	6	240	83	0	64	85	50	20	700
23	4D4C5q1	134	695	61	363	119	25	14	0	61	96	1568
24	4D4C5q2	0	192	0	69	107	0	1	0	136	19	524
25	4D4C5q3	17	297	54	652	347	0	36	10	27	42	1482
26	4D4C5r1	10	405	203	373	360	0	82	0	37	75	1545
27	4D4C5r2	10	160	87	121	71	4	32	0	53	91	629
28	4D4C5r3	216	554	126	595	283	44	108	1	165	45	2137
29	4D4C5r4	205	251	60	468	209	2	7	3	41	15	1261
30	4D4C5s1	35	142	55	440	426	51	4	10	118	85	1366
31	4D4C5s2	343	99	34	351	350	17	67	41	3	52	1357
32	4D4C5s3	74	47	22	267	181	68	56	65	49	99	928
33	4D4C5t1	375	245	52	405	262	64	56	19	96	40	1614
34	4D4C5t2	82	190	18	698	239	0	88	2	22	32	1371
35	4D4C5t3	0	68	22	449	297	20	86	28	11	55	1036
	Total Area (ha)	3681	9046	2810	13410	7322	874	1786	907	2088	2088	44012
	Area (%)	8.36	20.55	6.38	30.47	16.64	1.99	4.06	2.06	4.74	4.74	100.00

11. Micro-watershedwise distribution of area (ha) under different soil depth, slope and erosion classes of surveyed area

Sl.No.	Micro-watershed	Depth Classes			Slope Classes					Erosion Classes		
		d3	d4	d5	B	C	D	E	F	e1	e2	e3
1	4D4C5h1	618	239	1653	1050	842	74	187	357	53	2064	393
2	4D4C5h2	170	45	802	513	334	13	34	123	290	371	356
3	4D4C5h3	81	59	172	64	167	0	45	36	2	203	107
4	4D4C5h4	149	98	894	791	201	69	63	17	105	855	181
5	4D4C5h5	107	12	633	481	164	50	5	52	7	613	132
6	4D4C5j3	90	78	891	528	441	42	14	34	242	522	295
7	4D4C5k3	49	209	771	507	473	21	0	28	0	833	196
8	4D4C5k4	57	105	1313	1171	247	38	19	0	0	1392	83
9	4D4C5k5	393	186	862	914	134	393	0	0	0	1233	208
10	4D4C5k6	572	154	418	414	158	506	66	0	0	547	597
11	4D4C5m1	99	370	1495	1058	807	37	56	6	248	1373	343
12	4D4C5m2	39	501	704	343	862	39	0	0	121	892	231
13	4D4C5m3	33	37	390	176	251	3	4	26	8	209	243
14	4D4C5m4	80	67	877	620	324	38	0	42	27	758	239
15	4D4C5m5	173	285	1026	671	640	38	30	105	130	933	421
16	4D4C5p1	102	125	1054	722	457	82	20	0	116	893	272
17	4D4C5p2	114	183	875	737	321	4	0	110	21	947	204
18	4D4C5p3	109	47	750	300	497	5	54	50	73	600	233
19	4D4C5p4	71	75	1408	967	516	10	22	39	460	848	246

Sl.No.	Micro-watershed	Depth Classes			Slope Classes					Erosion Classes		
		d3	d4	d5	B	C	D	E	F	e1	e2	e3
20	4D4C5p5	250	91	659	344	406	60	0	190	174	469	357
21	4D4C5p6	43	53	1107	666	494	15	24	4	47	771	385
22	4D4C5p7	199	16	465	262	219	64	85	50	56	468	156
23	4D4C5q1	100	38	1334	1124	248	39	0	61	134	1159	179
24	4D4C5q2	137	29	339	195	173	1	0	136	0	271	234
25	4D4C5q3	73	156	1211	759	608	36	10	27	17	1022	401
26	4D4C5r1	114	245	1111	595	761	77	0	37	10	1023	437
27	4D4C5r2	89	79	370	238	211	36	0	53	10	384	144
28	4D4C5r3	288	165	1639	1264	540	122	1	165	216	1492	384
29	4D4C5r4	53	62	1131	847	346	9	3	41	205	822	219
30	4D4C5s1	183	164	934	404	694	55	10	118	35	796	450
31	4D4C5s2	121	98	1086	628	556	77	41	3	343	530	432
32	4D4C5s3	217	98	514	302	310	103	65	49	74	528	227
33	4D4C5t1	195	110	1269	872	507	80	19	96	375	794	405
34	4D4C5t2	97	234	1008	825	417	73	2	22	82	921	336
35	4D4C5t3	145	86	750	483	353	106	28	11	0	575	406
Total Area (ha)		5410	4599	31915	21835	14679	2415	907	2088	3681	28111	10132
Area (%)		12.29	10.45	72.51	49.61	33.35	5.49	2.06	4.74	8.36	63.87	23.02

12. Salient features:-

- a.** Geology of the surveyed area is Gneiss (83.15%) and Alluvium (12.11%).
- b.** An area of 31915 hectares representing 72.51% of the total surveyed area is covered by very deep soils of Arabagatte, Basapura, Harlakatte and Ramgatta series. An area of 4599 ha (10.45 %) of the total area is under deep soils of Madapura series. Moderately deep soils representing 5410 hectares (12.29%) of the total surveyed area is under Lambanihatti and Tuppadahalli series. An area of 2088 hectares is covered by miscellaneous lands, which includes village sites, streams/ river, rock out crop, tanks, etc.
- c.** Out of total surveyed area of 44012 hectares, an area of 21835 hectares (49.61%) is having 1-3% slope, an area of 14679 hectares (33.35%) having 3-5% slope, 2415 hectares (5.49%) having 5-10% slope, 907 hectares (2.06%) having 10-15% slope, and remaining 2088 hectares (4.745%) having 15-25% slope.
- d.** An area of 3681 hectares representing 8.36 % of the total surveyed area is prone for slight and 28111 hectares representing 63.87% is susceptible to moderate erosion. The remaining area of 10132 hectares representing 23.02% is susceptible to severe erosion.
- e.** Majority of the area is under Land Capability Class IIIes-3 (13410 ha, 30.47%), IIIes-1 (9046 ha, 20.55%) and IVes-1 (7322 ha 16.64%).

HOW TO USE SOIL SURVEY REPORT

This report on Detailed Soil Survey and Land Use Plan in in 4D4C5h1, h2, h3, h4, h5, j3, k3, k4, k5, k6, m1, m2, m3, m4, m5, p1, p2, p3, p4, p5, p6, p7, q1, q2, q3, r1, r2, r3, r4, s1, s2, s3, t1, t2, and t3 microwatersheds of 4D4C5 watershed under Tungabhadra (RVP) Catchment in Channagiri Taluk of Davanagere District, Holalkere Taluk of Chitradurga District and Tarikere Taluk of Chikmagalur District, Karnataka Using Remote Sensing Techniques contains detailed information about the soils of the area. This information is for various purposes including development of strategies for sustainable agro-production system development for the area. This report provide information on soil for planning cropping schedules, soil and water management programmes including soil conservation practices. The requisite information for desired locality could be obtained from the report as follows:

First, the user needs to locate the area of interest on soil map appended with this report and note the soil-mapping units enclosed by the soil boundary. This identification is done with the help of permanent features like roads, ponds, streams, village site, revenue survey number of the field, etc.

On the soil map, area covered by a soil-mapping unit is marked by a mapping symbol. Each of the soil-mapping unit refers to a particular kind of soil type and its related properties eg. soil depth, surface texture, slope, erosion, gravelliness, stoniness, rockiness. A soil mapping unit having mapping symbol, A5rB2 indicates:

- a) Abbreviated name of soil series 'A' for Arabagatte
- b) Soil depth '5' for deep soil depth (more than 100 cm.)
- c) Soil texture 'r' for clayey texture
- d) Slope class 'B' for 1-3% slope and
- e) Erosion class '2' for moderate erosion

Detailed information on soil series, profile description and other related soil characteristics is given in **Chapter 4** entitled "Soils of the Area" and in "Description of representative pedons" in **Appendix II**. Soil classification of the soils of the area is done according to the "Soil Taxonomy" (USDA) 2014 and has been provided in **Table 11**.

In **Appendix III** entitled "**Village wise mapping units list in different microwatersheds**" information on the soil mapping units mapped in the area vis a vis , physiographic position, predominant slope, present land use, soil conservation measures adopted and land capability is given.

In **Appendix I**, entitled as “Guide to soil mapping units” multipurpose interpretation of each soil mapping unit is presented. Mapping units mapped in the surveyed area have been listed along with respective description. Furthermore this provides information on area of mapping unit in each microwatershed followed by the interpretation with respect of land capability units, soil and land irrigability classification, paddy soil grouping and hydrological soil groupings. This table readily provides information on soil and land characteristics and their use potential at a glance thus can be very helpful.

In Chapter 7 section 7.1 on land capability classification, two types of problems viz. 1) Inherent problem and 2) improvable problem /correctable problems have been listed for each of the land capability unit mapped along with the recommendations for soil conservation, treatment needs and crop production. These recommendations are brief and suggestive but are adequate for broad level watershed management planning. For specific planning and potential for a particular land use of any site or area of interest the user agencies can use their local experiences and knowledge about the area and may make necessary modifications as warranted. General recommendations for the soil and water conservation have been given in **Chapter.8** “Specific problems and Recommendations”.

For any suggestion, comment, or clarification further correspondence/personal contact may be established with

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