

Abstract

1. **Surveyed Area** : 4G1G Subcatchment of Mahanadi Basin, districts Balangir, Kalahandi, Nabrangpur and Nuapada of Odisha State and districts Bastar and Raipur of Chattisgarh State..
2. **Location** : 82° 03' 37" to 83° 16' 48" **East Longitude**
19° 16' 06" to 20° 20' 12" **North Latitude**
3. **Total Area** : **8,18,145 ha**
4. **Agroclimatic Region** : VII (Eastern Plateau and hills) as per planning Commission Classification
5. **Type of Survey** : Rapid Reconnaissance Survey for Prioritization of Microwatersheds.
6. **Period of Survey** : December, 2010 to June, 2012
7. **Base Material used** : Survey of India Topographical maps on 1:50,000 scale.
8. **Hydrological Sub-division** :
 - a) Region – ‘4’ All Drainage flowing into Bay of Bengal except those 2 & 3
 - b) Basin - ‘4G’ (Mahanadi Basin)
 - c) Catchment – ‘4G1’
 - d) Sub-Catchment – ‘4G1G
 - e) Watersheds –‘4G1G1 to G9
 - f) Subwatersheds – 4G1G1a, 4G1G1b,..... to
 - g) Microwatersheds – 4G1G1a1, 4G1G1a2.....

9. Extent of Area (ha) under Different Runoff Potential Mapping Units (RPMU).

Sl. No	RPMU	Runoff Potential Value	Area (ha)	Area (%)
1	A01	57	2340	0.29
2	G03	62	1654	0.20
3	G08	56	545	0.07
4	G12	56	1328	0.16
5	G16	56	1128	0.14
6	G17	58	6989	0.85
7	S01	74	689	0.08
8	S02	76	45371	5.55
9	S03	78	147521	18.03
10	S04	71	77305	9.45
11	S05	66	6961	0.85
12	S06	57	135273	16.53
13	S07	57	57537	7.03
14	S08	56	57769	7.06
15	S09	71	2688	0.33
16	S10	84	28271	3.46
17	S11	94	17468	2.14
18	S12	59	219	0.03
19	S13	63	4931	0.60
20	S14	59	24811	3.03
21	S15	58	11087	1.36
22	S16	56	148074	18.10
23	S17	56	12550	1.53
24	S18	57	9309	1.14
	H-Habitation		7550	0.92
	R-River		8314	1.02
	T-Tank		463	0.06
	Grand total		818145	100.00

10. Districtwise Distribution of Area (ha) under Different Runoff Potential Mapping Units (RPMU).

S. No.	EIMU	Balangir	Bastar	Kala handi	Nab rangpur	Nua pada	Raipur	Total Area	Area (%)
1	A01			1213		1127		2340	0.29
2	G03					1505	149	1654	0.2
3	G08			545				545	0.07
4	G12					1156	172	1328	0.16
5	G16			1127		1		1128	0.14
6	G17			5526		1463		6989	0.85
7	S01			660			29	689	0.08
8	S02	126		23291	16914	820	4220	45371	5.55
9	S03	1340		79726	16009	19732	30714	147521	18.03
10	S04	73		49370	10703	10340	6819	77305	9.45
11	S05			4952	2002		7	6961	0.85
12	S06	41	74	27248	58796	10353	38761	135273	16.53
13	S07	38	31	11157	21587	10261	14463	57537	7.03
14	S08			38333	3919	7230	8287	57769	7.06
15	S09			1949		167	572	2688	0.33
16	S10			419	12559	2752	12541	28271	3.46
17	S11			4590	71	4916	7891	17468	2.14
18	S12			219				219	0.03
19	S13			184		4747		4931	0.6
20	S14			24811				24811	3.03
21	S15	367		2995	1707	6018		11087	1.36
22	S16			117079	6913	2825	21257	148074	18.1
23	S17			4595		7886	69	12550	1.53
24	S18	1066		948		6358	937	9309	1.14
H-Habitation				3597	1735	1361	857	7550	0.92
R-River				5067	675	1182	1390	8314	1.02
T-Tank				463				463	0.06
Total		3051	105	410064	153590	102200	149135	818145	100

11. Districtwise Distribution of Area (ha) under Different Soil Erosion Hazard.

S. No.	Erosion	Balangir	Bastar	Kalahandi	Nabarangpur	Nuapada	Raipur	Total Area	Area (%)
1	None to slight erosion	1104	31	173784	32419	35717	45185	288240	35.23
2	Slight to Moderate erosion	41	74	52059	58796	10353	38761	160084	19.57
3	Moderate erosion	367		9953	1707	10113	149	22289	2.72
4	Moderate to Severe erosion	1340		84862	18011	24479	30721	159413	19.48
5	Severe erosion	199		74610	27617	11327	11611	125364	15.32
6	Severe to Very severe erosion			660			29	689	0.08
7	Very severe erosion			5009	12630	7668	20432	45739	5.59
	Habitation			3597	1735	1361	857	7550	0.92
	River			5067	675	1182	1390	8314	1.02
	Tank			463				463	0.06
	Total	3051	105	410064	153590	102200	149135	818145	100

12. Priority Categorization

S. No.	Priority Category	No. of Microwatersheds	Area (ha)	Area (%)
1.	Very high (above 70)	296	213846	26.14
2.	High (66 – 70)	159	124888	15.26
3.	Medium (61-65)	197	164388	20.09
4.	Low (56-60)	365	315023	38.50
	Grand Total	1017	818145	100

13. Watershedwise Distribution of Area (ha) under Different Priority Categories

Sl. No.	Priority Category	4G1									Total Area	Area (%)
		G1	G2	G3	G4	G5	G6	G7	G8	G9		
1.	Very high (above 70)	41613	9644	40144	22254	14016	15726	5557	55357	9535	213846	26.14
2.	High (66 – 70)	24773	4504	17950	18059	7220	11312	11292	18071	11707	124888	15.26
3.	Medium (61-65)	31044	13378	13081	29401	11327	12132	20932	24951	8142	164388	20.09
4.	Low (56-60)	27206	47014	24673	70265	25572	58537	18104	32736	10916	315023	38.5
	Total	124636	74540	95848	139979	58135	97707	55885	131115	40300	818145	100

14. Salient Features of the Area:

- The survey area consists of 1017 microwatersheds covering 818145 ha. The survey area has 296 and 159 microwatersheds under the category of very high and high priority respectively, covering total area of 338734 ha (41.4%). 197 microwatersheds covering 164388 ha (20.09) are categorized under medium priority category. An area of 315023 ha (38.50%) covered by 365 microwatersheds are coming under low priority category.
- Severe, severe to very severe and very severely eroded lands altogether occupy 171792 ha (20.99%) and it needs proper soil conservation practices. The area under moderate erosion and moderate to severe erosion category occupies 181702 ha (22.2%). Kalahandi, Nabrangpur and Raipur districts have maximum area under this category. The area having under slight to moderate erosion is 160084 ha (19.57%) and an area of 288240 ha (35.23%) does not have problem of soil erosion.
- Under Very high and high priority category comprises 26.14% and 15.26% respectively of total area. Total area of very high and high category are distributed in all the microwatershed but 4G1G8, 4G1G1 and 4G1G3 has maximum area 197908 ha.
- Kalahandi, Nabrangpur, Nuapda and Raipur district has maximum area of very high and high priority.
- Landuse wise classification of survey area comprises 384461 ha 47% area under forest, 331409 ha 40.51% area under agriculture and 84294 ha, 10.3% area is under open scrub lands.

How to use Soil Survey Report

The report embodies the results of the Priority delineation survey conducted for identification and delineation of priority microwatersheds of 4G1G1-9 watersheds of 4G1G subcatchment of Mahanadi Basin in Odisha. The report explores valuable information about land and soil characteristics of the watersheds. The main objective of the survey is to identify microwatersheds which generate comparatively high runoff towards the lower catchment. Maps showing the demarcation of priority microwatersheds in 4G1G subcatchment in the scale of 1: 50,000 are appended with the report.

The catchments of Centrally Sponsored Scheme are delineated and codified following the codification system of Watershed Atlas of India (WAI) published by Soil & Land Use Survey of India. The surveyed area comprises nine watersheds (4G1G1-9) which are subdivided into 125 Subwatersheds and finally into 834 microwatersheds. Subwatersheds are codified by suffixing small case English alphabets with the watershed code e.g. 4G1G1a, 4G1G1b, 4G1G1c etc. and microwatersheds are codified by affixing Arabic numerals with subwatersheds code, 4G1G1a1, 4G1G1b1, 4G1G1c1 etc. Different Runoff Potential Mapping Units (RPMUs) are identified and denoted by capital English alphabets coined from parent material of this area such as 'A' for alluvium. The mapping unit connotes a set of soil and land attributes namely, physiography, slope, soil characteristics, land use/land cover, erosion hazards and conservation practices. The description of mapping units with their Runoff Potential values is presented in Table 5. The differentiating characteristics of each mapping units are furnished in Table 6.

The details of computation of Runoff Potential Index are given in Annexure - I which list the microwatersheds in systematic order of codification with relative priority. Microwatersheds with their area under different priority categories are summarized in Annexure-II. In the Annexure-II microwatersheds have been arranged in descending order according to their priority rating i.e. very high, high, medium, low and very low categories. Watershedwise and Districtwise grading of microwatersheds under different priority categories are presented in Table 18 & 19. In addition to select priority microwatersheds for soil and water conservation programme, the data contained in mapping legend can also be used for characterization of any part of catchment with respect to slope gradient, broad soil groups, present land use, surface condition, erosion and problems as well. Details of microwatershedwise computation of RPI values and the districtwise priority categorization are furnished in Annexure I & II.

For further clarification and explanation, communication may be made to:

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