

Abstract

1. **Surveyed Area** : 4G1F Subcatchment of Mahanadi Basin, districts Balangir, Bargarh, Kalahandi, Nuapada and Sonapur of Odisha State.
2. **Location** : 82° 23' 00" to 83° 55' 32" **East Longitude**
20° 08' 20" to 20° 54' 25" **North Latitude**
3. **Total Area** : **8,00,144 ha**
4. **Agro-climatic 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, 2008 to June, 2009
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 – ‘4G1F
 - e) Watersheds –‘4G1F1 to A9
 - f) Subwatersheds – 4G1F1a, 4G1F1b,..... to
 - g) Microwatersheds – 4G1F1a1, 4G1F1a2.....

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

Sl.No	RPMU	Runoff Potential Value	Area (ha)	Area %
1	A01	57	4353	0.54
2	A05	69	243	0.03
3	S02	76	36827	4.60
4	S03	78	73927	9.24
5	S04	71	46630	5.83
6	S05	66	9040	1.13
7	S06	57	99935	12.49
8	S07	57	32218	4.03
9	S08	56	48240	6.03
10	S10	84	2999	0.37
11	S11	94	2528	0.32
12	S12	59	3216	0.40
13	S13	63	8449	1.06
14	S14	59	63049	7.88
15	S15	58	231729	28.96
16	S18	57	110337	13.79
	H		11498	1.44
	R		13473	1.68
	Roc		109	0.01
	T		1344	0.17
	Grand Total		800144	100

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

EIMU	Balangir	Bargarh	Kalahandi	Nuapada	Sonapur	Total Area (ha)	Area (%)
A01	3142		102	286	823	4353	0.54
A05				19	224	243	0.03
S02	26104	15	47	9348	1313	36827	4.60
S03	28541	900		44217	269	73927	9.24
S04	33357	43	125	8502	4603	46630	5.83
S05	8383			545	112	9040	1.13
S06	87182	245		7867	4641	99935	12.49
S07	13012			35	19171	32218	4.03
S08	38592			480	9168	48240	6.03
S10	1709			742	548	2999	0.37
S11	1640		0	888		2528	0.32
S12	2366				850	3216	0.40
S13	6397		1223	594	235	8449	1.06
S14	43095		2962	15195	1797	63049	7.88
S15	186664	7	107	43585	1366	231729	28.96
S18	87273	193	5	20401	2465	110337	13.79
H	8663		80	2451	304	11498	1.44
R	9153		276	1587	2457	13473	1.68
Roc	109					109	0.01
T	671			667	6	1344	0.17
Total	586053	1403	4927	157409	50352	800144	100

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

S. No.	Erosion	Balangir	Bargarh	Kalahandi	Nuapada	Sonapur	Total Area (ha)	Area (%)
1	None to slight erosion	138877	193	5	20916	30804	190795	23.85
2	Slight to Moderate erosion	130277	245	2962	23062	6438	162984	20.37
3	Moderate erosion	192172	7	209	43871	3039	239298	29.91
4	Moderate to Severe erosion	43321	900	1223	45356	616	91416	11.42
5	Severe erosion	59461	58	172	17850	5916	83457	10.43
6	Severe to Very severe erosion				19	224	243	0.03
7	Very severe erosion	3349			1630	548	5527	0.69
	H	8663		80	2451	304	11498	1.44
	R	9153		276	1587	2457	13473	1.68
	Roc	109					109	0.01
	T	671			667	6	1344	0.17
	Total	586053	1403	4927	157409	50352	800144	100

12. Priority Categorization

S. No.	Priority Category	No. of Microwatersheds	Area (ha)	Area %
1.	Very high (above 70)	58	57866	7.23
2.	High (66 – 70)	56	61147	7.64
3.	Medium (61-65)	193	225601	28.2
4.	Low (56-60)	422	455530	56.93
	Grand Total	729	800144	100

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

Sl. No.	Priority Category	4G1									Total Area	Area%
		F1	F2	F3	F4	F5	F6	F7	F8	F9		
1.	Very high (above 70)	3891		7020	5548	535		1093	8111	31668	57866	7.2
2.	High (66 – 70)	4575	4904	2502	5149	2143	2213	3757	14595	21309	61147	7.6
3.	Medium (61-65)	16688	12730	27085	18148	36909	15270	20877	43507	34387	225601	28.2
4.	Low (56-60)	56398	39137	64782	56757	87058	44518	58433	26698	21749	455530	56.9
	Total	81552	56771	101389	85602	126645	62001	84160	92911	109113	800144	100

14. Salient Features of the Area:

- The survey area consists of 729 microwatersheds covering 800144 ha. The survey area has 58 and 56 microwatersheds under the category of very high and high priority respectively, covering total area of 119013 ha (14.8%). 193 microwatersheds covering 225601 ha (28.2%) are categorized under medium priority category. An area of 455530 ha (56.9%) covered by 422 microwatersheds are coming under low priority category.
- Severe, severe to very severe and very severely eroded lands altogether occupy 89227 ha (10.95%) and it needs proper soil conservation practices. The area under moderate erosion and moderate to severe erosion category occupies 330714 ha (37.5%). Balangir and Nuapada districts have maximum area under this category. The area having under slight to moderate erosion is 168984 ha (20.37%) and an area of 190795 ha (23.85%) does not have problem of soil erosion.
- Under Very high and high priority category comprises 7.23% and 7.64% respectively of total area. Total area of very high and high category are distributed in all the microwatershed but 4G1F9 has maximum area 52977 ha.
- Balangir and Nuapada district has maximum area of very high and high priority.

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 4G1F1-9 watersheds of 4G1F 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 4G1F 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 (4G1F1-9) 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. 4G1F1a, 4G1F1b, 4G1F1c etc. and microwatersheds are codified by affixing Arabic numerals with subwatersheds code, 4G1F1a1, 4G1F1b1, 4G1F1c1 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 19 & 20. 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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