

# **Report on Prioritization of Microwatersheds of 4G1B1-7 Watersheds in 4G1B Subcatchment of Mahanadi Basin (Non RVP/FPR), Districts Angul, Cuttack, Dhenkanal, Jagatsinghpur and Kendrapara of Odisha State.**

## **Abstract**

- 1. Surveyed Area** : 4G1B Subcatchment of Mahanadi Basin, districts Angul, Cuttack, Dhenkanal, Jagatsinghpur and Kendrapara of Odisha State.
- 2. Location** : 84° 21' 04" to 86° 51' 54" **East Longitude**  
20° 17' 50" to 20° 59' 05" **North Latitude**
- 3. Total Area** : **4,25,128 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, 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 – ‘4G1B’  
e) Watersheds –‘4G1B1 to B7’  
f) Subwatersheds – 4G1B1a, 4G1B1b,..... to  
g) Microwatersheds – 4G1B1a1, 4G1B1a2.....

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

Sl. No	RPMU	Runoff Potential Value	Area (ha)	Area %
1	A01	57	4221	1.0
2	A02	56	130299	30.7
3	A03	57	40381	9.5
4	A04	55	4051	1.0
5	A05	69	4698	1.1
6	A06	60	494	0.1
7	A07	57	1877	0.4
8	A08	53	467	0.1
9	A09	53	3207	0.8
10	L01	69	3779	0.9
11	L02	62	2936	0.7
12	L03	58	1460	0.3
13	L05	60	31	0.0
14	L06	66	4824	1.1
10	SD01	74	1151	0.3
11	SD02	76	16799	4.0
12	SD03	78	68041	16.0
13	SD04	71	11632	2.7
14	SD05	66	1301	0.3
15	SD06	57	36777	8.7
16	SD07	57	61140	14.4
17	SD08	56	10134	2.4
18	SD09	71	699	0.2
19	SD10	84	316	0.1
20	SD11	94	139	0.0
21	SD12	59	45	0.0
22	G01	82	30	0.0
	<b>Subtotal</b>			<b>410929</b>
	Misc.			14199
	<b>Grand Total</b>			<b>425128</b>

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

RPMU	Angul	Cuttack	Dhenkanal	Jagatsinghpur	Kendrapara	Total Area (ha)	% area
A01	951	2339	640	105	186	4221	1.0
A02		9573	24430	5577	90719	130299	30.7
A03		846	15019	2788	21728	40381	9.5
A04		250	185	323	3293	4051	1.0
A05		30	1261	1173	2234	4698	1.1
A06			60		434	494	0.1
A07		93			1784	1877	0.4
A08			40		427	467	0.1
A09					3207	3207	0.8
L01		2832	947			3779	0.9
L02		2340	596			2936	0.7
L03		1074	386			1460	0.3
L05		31				31	0.0
L06		4179	645			4824	1.1
SD01	76	1075				1151	0.3
SD02	11434	3775	1590			16799	4.0
SD03	41608	21121	5312			68041	16.0
SD04	5397	4558	1677			11632	2.7
SD05	207	889	205			1301	0.3
SD06	13694	14490	7601		992	36777	8.7
SD07	26759	27146	7220		15	61140	14.4
SD08	2814	6260	1060			10134	2.4
SD09	370		20		309	699	0.2
SD10		316				316	0.1
SD11		42	7		90	139	0.0
SD12	45					45	0.0
G02			30			30	0.0
<b>Subtotal</b>	<b>103355</b>	<b>103259</b>	<b>68931</b>	<b>9966</b>	<b>125418</b>	<b>410929</b>	<b>96.7</b>
Misc.	1644	5916	1595	1037	4007	14199	3.3
<b>Grand Total</b>	<b>104999</b>	<b>109175</b>	<b>70526</b>	<b>11003</b>	<b>129425</b>	<b>425128</b>	<b>100.0</b>

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

S. No.	Erosion	Angul	Cuttack	Dhenkanal	Jagatsinghpur	Kendrapara	Total Area (ha)	Area %
1	None to slight erosion	29573	43825	47769	8365	116096	245628	57.8
2	Slight to moderate	13694	15595	7987	-	992	38268	9.0
3	Moderate erosion	996	2682	825	428	5263	10194	2.4
4	Moderate to Severe erosion	41815	31361	7765	-	434	81375	19.1
5	Severe erosion	17201	8333	3317	-	309	29160	6.9
6	Severe to very severe erosion	76	1105	1261	1173	2234	5849	1.4
7	Very Severe erosion		358	7	-	90	455	0.1
	Misc.	1644	5916	1595	1037	4007	14199	3.3
	<b>Total</b>	<b>104999</b>	<b>109175</b>	<b>70526</b>	<b>11003</b>	<b>129425</b>	<b>425128</b>	100.0

## 12. Priority Categorization

S. No.	Priority Category	No. of Microwatersheds	Area (ha)	Area %
1.	Very high (above 70)	99	57171	<b>13.5</b>
2.	High (66 – 70)	90	56241	<b>13.2</b>
3.	Medium (61-65)	105	63986	<b>15.0</b>
4.	Low (56-60)	336	242199	<b>57.0</b>
5.	Very Low (55 & Below)	10	5531	<b>1.3</b>
	<b>Grand Total</b>	<b>640</b>	<b>425128</b>	<b>100.0</b>

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

Sl. No.	Priority Category	Watersheds							Total Area	Area %
		4G1B1	4G1B2	4G1B3	4G1B4	4G1B5	4G1B6	4G1B7		
1.	Very high (above 70)	-	-	-	4805	11507	24091	16768	57171	13.5
2.	High (66 – 70)	444	-	777	9405	8652	14146	22817	56241	13.2
3.	Medium (61-65)	-	559	3567	20880	12115	6420	20445	63986	15.0
4.	Low (56-60)	67617	39035	62346	32455	25013	1980	13753	242199	57.0
5.	Very Low (55 & Below)	974	-	4557	-	-	-	-	5531	1.3
	<b>Total</b>	69035	39594	71247	67545	57287	46637	73783	425128	100.0

### 14. Salient Features of the Area:

- The survey area consists of 640 microwatersheds covering 425128 ha. The survey area has 99 and 90 microwatersheds under the category of very high and high priority respectively, covering total area of 113412 ha (26.7%). 105 microwatersheds covering 63986 ha are categorized under medium priority category. An area of 242199 ha (57.0%) covered by 336 microwatersheds are coming under low priority category and remaining 10 microwatersheds covering an area of 5531 ha ( 1.3%) is under very low priority category.
- Very severe, severe and severe to very severely eroded lands altogether occupy 35464 ha (8.4%) and it needs proper soil conservation practices. The area under moderate erosion and moderate to severe erosion category occupies 91569 ha (21.5%). Angul and Cuttack districts have maximum area under this category. Kendrapara district has area of 2234 ha under severe to very severe erosion hazard. The maximum area of 245628 ha (57.7%) does not have problem of soil erosion.
- Very high and high priority category comprises 13.5% and 13.2% respectively of total area. 4G1B6 and 4G1B7 watersheds have maximum area (38237 ha and 38585 ha respectively) under very high and high priority category.
- Angul district has maximum area of very high and high priority followed by the Cuttack and Dhenkanal.

## 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 4G1B1-7 watersheds of 4G1B 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 4G1B 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 in September, 1990. The surveyed area comprises seven watersheds (4G1B1-7) which are subdivided into 105 Subwatersheds and finally into 640 microwatersheds. Subwatersheds are codified by suffixing small case English alphabets with the watershed code e.g. 4G1B1a, 4G1B1b, 4G1B1c etc. and microwatersheds are codified by affixing Arabic numerals with subwatersheds code, 4G1B1a1, 4G1B1b1, 4G1B1c1 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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