

Prioritisation of Micro-watersheds of 3A1F1-9 Watersheds of Brahmaputra Basin Districts Kokrajhar, Goalpara, Dhubri, Chirang, Bongaigaon of Assam and Jalpaiguri and Cooch Behar of West Bengal using Remote Sensing Techniques

ABSTRACT

1.	Survey Area	:	<i>Goalpara, Dhubri, Chirang, Bongaigaon of Assam and Jalpaiguri and Cooch Behar of West Bengal</i>
2.	Geographical Extent	:	<i>25⁰ 47' to 26⁰ 54' N Latitudes 89⁰ 44' to 90⁰ 35' E Longitudes</i>
3.	Agro Climatic Region	:	<i>Eastern Himalayan Region II (as per planning commission 1989)</i>
4.	Total area of the district	:	<i>599423. ha.</i>
5.	Type of Survey	:	<i>Rapid Reconnaissance Survey using Remote Sensing Techniques</i>
6.	Base map	:	<i>a) IRS – ID Geocoded Satellite Imagery (1: 50,000 scale) b) SOI –toposheet (1:50,000 scale)</i>
7.	Scale of Mapping	:	<i>1 : 50000</i>
8.	Period of Survey	:	<i>November 2010 to December 2010</i>

9. Areal Extent of different Runoff Potential Mapping Units

Sl. No.	RPMU	Runoff Potential Value	Area (ha)	Area (%)
1	AC01	55	47909	7.99
3	AC03	56	1658	0.28
5	AC04	56	3750	0.63
6	AC05	56	4356	0.73
7	AC06	57	16910	2.82
9	AC08	58	3799	0.63
10	AL01	57	51197	8.54

11	AL02	57	29819	4.97
12	AL03	59	313	0.05
13	AL04	57	10543	1.76
14	AL05	57	7244	1.21
16	AL07	58	11060	1.85
17	AL08	57	1074	0.18
18	AL09	56	17243	2.88
19	AL10	56	33465	5.58
20	AL11	56	114877	19.16
21	AL12	58	5463	0.91
22	AL13	62	1642	0.27
23	AL14	59	1378	0.23
24	AL15	56	6083	1.01
25	AL16	60	74904	12.50
26	AL17	56	2324	0.39
27	AL18	59	50498	8.42
28	AL19	65	16664	2.78
29	AL20	71	15539	2.59
30	AL21	71	818	0.14
31	AL22	65	4463	0.74
32	AL23	64	8026	1.34
33	GN01	62	12	0.00
34	GN02	80	3796	0.63
35	GN03	84	2220	0.37
36	GN04	66	1794	0.30
38	GN06	65	436	0.07
39	GN07	71	144	0.02
40	GN08	63	462	0.08
41	GN09	60	986	0.16
43	SD01	66	703	0.12
44	SB	0	20	0.00

45	ROC	0	91	0.02
46	WB	0	3691	0.62
47	HS	0	7468	1.25
48	RI	0	34581	5.77
Grand Total			599423	100.00

10. Hydrological Divisions

Water Resource Region (3)

Basin (3A)

Catchment (3A1)

Subcatchment (3A1F)

Watersheds (3A1F 1, 2,)

Subwatersheds (3A1F 1a,.b, .c.....,)

Microwatersheds (3A1F1a1..., 3A1F2a1, ...)

11. Area Under Different soil erosion Classes

Erosion Classes	Bongaigaon	Chirang	Dhubri	Kokrajhar	Goalpara	Jalpaiguri	Cooch Behar	Area (ha)	%
None to slight erosion	12610	23043	82453	107919	630	11755	7225	245635	40.98
Slight erosion	0	13072	1804	57276	0	4841	32	77025	12.85
Slight to Moderate erosion	294	826	0	4858	27	845	0	6850	1.14
Moderate erosion	10220	13128	36678	94183	5375	8893	2261	170738	28.48
Moderate to Severe erosion	4698	1217	3986	25359	0	1262	445	36967	6.17
Severe erosion	1249	539	2207	12016	0	346	0	16357	2.73
Misc.	4380	3503	14518	12030	7045	3229	1146	45851	7.65
Total	33451	55328	141646	313641	13077	31171	11109	599423	100

12. Area under different Priority Categories

Sl. No.	Priority Category	No. of Microwatersheds	Area (ha)	Area (%)
1	Very High	2	1943	0.32
2	High	11	10456	1.74
3	Medium	60	60077	10.02
4	Low	469	494385	82.48
5	Very Low	29	32562	5.43
	Total	571	5,99,423	100

Salient Features:

- ❖ *3AIF1-9 sub catchment has been subdivided into 571 microwatersheds following the delineation and codification method outlined in Watershed Atlas of India (1:1 M scale), 2012.*
- ❖ *Out of 599423 hectares of surveyed area, 1943 ha. (0.32%) covered by 2 microwatersheds only have been categorized under very high priority and 10456 ha. (1.74%) covered by 11 microwatersheds have been categorized under high priority area which needs immediate attention for suitable soil-water conservation measures under Integrated Watershed Development Programme.*
- ❖ *In Assam, about 1943 ha. area of Bongaigaon district is under very high priority and about 5680 ha. of Bongaigaon district comes under high priority followed by 3347 ha. of Kokrajhar district which needs immediate attention for soil and water conservation measures.*
- ❖ *Among the watersheds, 3AIF8 watershed is more vulnerable followed by 3AIF3 and 3AIF7 watershed which needs immediate attention for soil water conservation measures.*
- ❖ *About 27417 ha (4.57%) area of the survey area is unmanaged, 14131ha (2.36%) area is unmanaged to poorly managed and 20406ha. (3.4%) area is poorly managed.*
- ❖ *Severely eroded lands occupy 16357 ha. (2.73%) while moderately to severely eroded land cover 36967 ha (6.17%) and moderate eroded land 170738 (28.48%) that also needs proper soil-water conservation practices under Integrated Watershed Development Planning.*

HOW TO USE SOIL SURVEY REPORT

This report on Prioritisation of Micro-watersheds of 3A1F1-9 Watersheds of Brahmaputra Basin Districts Kokrajhar, Goalpara, Dhubri, Chirang, Bongaigaon of Assam and Jalpaiguri and Cooch Behar districts of West Bengal using Remote Sensing Techniques aims at identifying the microwatersheds which are relatively more prone to flooding and seasonal water logging and need the flood control measures. Further, it furnishes information on general characteristics of the catchments with particular reference to their location and extent, physiography, relief and drainage, geology, climate, land use and soils of the area also.

*The subcatchment is 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 9 watersheds (3A1F1-9) of WAI which are subdivided into 87 subwatersheds and finally into 571 microwatersheds. Subwatersheds are codified by suffixing small case English alphabets with the watershed code e.g. 3A1F1a, 3A1F1b etc and microwatersheds are codified by affixing Arabic numerical with the subwatershed code, e.g., 3A1F1a1, 3A1F1b1 etc. Within a microwatershed, Runoff Potential Mapping Units (RPMUs) are demarcated and symbolized with alphanumeric codes viz. AL01, AL02, AC01, AC02, GN01, GN02 etc. The Runoff Potential Mapping Units (RPMU) is established by visual interpretation of False Color Composites (FCC) of IRS-P6 LISS-III followed by field verification. The RPMUs represent the landscape, physiography, slope, soil characteristics, existing soil conservation status, land use and severity of erosion of each mapping unit. These Runoff Potential mapping units are described in the **Table 6** on 'Legend to Runoff Potential Mapping Units'. Each of these units is assigned its runoff potential (RP) value which indicates the potential runoff from the microwatershed. Differentiating morphological characteristics of the Run-off Potential Mapping Units have been depicted in the **Table 7**.*

*Based on Run-off Potential (RP) value and the extent of RPMU in a microwatershed, the Runoff Potential Index (RPI) values of all microwatersheds are computed which is given in the **ANNEXURE-I**. The relative priorities are assigned based upon the Runoff Potential Index (RPI) of the microwatersheds. Higher the value of Runoff Potential Index (RPI) indicates higher priority whereas the lower value indicates lower priority. The list of microwatersheds under different priority categories are given in **ANNEXURE-II**.*

Microwatersheds categorized under very high and high priority are to be selected for management of flood prone area under FPR Scheme. Both treatable and non-treatable lands are occupied by each priority (very high or high category) microwatershed. The ratio of treatable and non-treatable lands in a priority microwatershed varies with the kind, degree and extent of the degraded lands occupied by the same microwatershed.

Each map sheets on 1:50,000 scale depicting the drainage network, hydrological units, runoff potential mapping units and administrative boundaries are appended with this report.

For any further clarification, information or comments contact may be made to:

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