

# **Inventory for Prioritization of Micro-watersheds of 3B2A1-9 Watersheds of Brahmaputra Basin Districts, Marigaon, Karbi Anglong, Kamrup, Darrang and Nagaon districts of Assam and East Khasi, Jaintia, Ribhoi, West Khasi district of Meghalaya using Remote Sensing and GIS Techniques**

## **ABSTRACT**

1. **Survey Area** : *Marigaon, Karbi Anglong, Kamrup, Darrang and Nagaon districts of Assam and East Khasi, Jaintia, Ribhoi, West Khasi district of Meghalaya*
2. **Geographical Extent** : *91<sup>0</sup> 37' to 93<sup>0</sup> 10' E Longitude and 25<sup>0</sup> 25' to 26<sup>0</sup> 37' N Latitude*
3. **Agro Climatic Region** : *Eastern Himalayan Region II (as per planning commission 1989)*
4. **Total area of the district** : **722698 ha.**
5. **Type of Survey** : *Rapid Reconnaissance Survey using Remote Sensing & GIS Techniques*
6. **Base map** : *a) IRS – ID Geocoded Satellite Imagery (1: 50,000 scale)  
b) SOI –toposheet (1:50,000 scale)*
7. **Scale of Mapping** : *1 : 50000*
8. **Period of Survey** : *April'08 to May'08 & Feb, 2010*

## 9. Areal Extent of different Runoff Potential Mapping Units

Sl. No.	RPMU	Runoff Potential Value	Area (ha)	Area (%)
1	AC01	56	12914	1.79
2	AC02	56	13697	1.90
3	AC03	63	864	0.1
4	AC04	58	5145	0.71
5	AC05	56	2324	0.32
6	AL01	56	26085	3.61
7	AL02	57	6009	0.83
8	AL03	57	9328	1.29
9	AL04	55	12460	1.72
10	AL05	57	16122	2.23
11	AL06	56	7802	1.08
12	AL07	56	21731	3.01
13	AL08	56	1616	0.22
14	AL09	54	2794	0.39
15	AL10	57	483	0.07
16	AL11	59	730	0.10
17	AL12	57	6580	0.91
18	AL13	60	16865	2.33
19	AL14	57	21723	3.01
20	AL15	59	846	0.12
21	GG01	63	2325	0.32
22	GG02	61	6284	0.87
23	GG03	68	52300	7.24
24	GG04	79	20983	2.90
25	GG05	85	12041	1.67
26	GG06	90	575	0.08
27	GG07	90	18288	2.53
28	GG08	61	62939	8.71
29	GG09	66	12162	1.68
30	GG10	75	15963	2.21
31	GG11	77	2819	0.39
32	GG12	59	6071	0.84
33	GG13	64	20531	2.84
34	GG14	66	229	0.03
35	GG15	61	33405	4.62
36	GG16	62	10570	1.46
37	GG17	73	8503	1.18
38	GG18	60	27226	3.77
39	GG19	57	25709	3.56

40	GG20	60	9453	1.31
41	GG21	68	4651	0.64
42	GG22	72	2763	0.38
43	GG23	57	899	0.12
44	GG24	70	17705	2.45
45	GG25	65	2453	0.34
46	SD01	60	1457	0.20
47	SD02	66	716	0.10
48	SD03	68	14858	2.06
49	SD04	74	5455	0.75
50	SD05	85	821	0.11
51	SD07	90	2705	0.37
52	SD08	62	12906	1.79
53	SD09	67	4238	0.59
54	SD10	74	1779	0.25
55	SD11	80	1699	0.24
56	SD12	65	9794	1.36
57	SD13	63	17568	2.43
58	SD14	68	2733	0.38
59	SD15	73	3553	0.49
60	SD16	65	20086	2.78
61	SD17	58	7451	1.03
62	SD18	61	3584	0.50
63	SD19	69	451	0.06
64	SD20	72	924	0.13
65	SD21	73	9814	1.36
66	SD22	65	848	0.12
67	HOMESTEAD	0	21867	3.03
68	RIVER	0	3172	0.44
69	WATERBODY	0	11254	1.56
	<b>Grand Total</b>		<b>722698</b>	<b>100</b>

**10. Hydrological Divisions**

*Water Resource Region (3)*

*Basin (3B)*

*Catchment (3B2)*

*Subcatchment (3B2A)*

*Watersheds (3B2A1, 2, .....)*

*Subwatersheds (3B2A 1a,.b, .c.....)*

*Microwatersheds (3B2A1a1)*

**11. Area Under Different soil erosion Classes**

Erosion Classes	Assam					Meghalaya				Area (ha)	%
	Kamrup	Karbi Anglong	Darrang	Marigaon	Nagaon	East Khasi Hills	Jaintia Hills	Ribhoi	West Khasi Hills		
None to slight erosion	24950	24912		20861	47450	1976	278	29188	814	150429	20.81
Slight to Moderate erosion	12009	42523		1269	5102	20757	8039	44099	5959	139757	19.34
Moderate erosion	13708	55576		17329	57542	11179	6701	39313	3669	205017	28.37
Moderate to Severe erosion	1964	28387	79	414	5922	5305	4011	31393	1192	78667	10.89
Severe erosion	2277	44419	4	1073	3015	8916	6056	44868	1907	112535	15.57
Misc.	4964	588	11	3564	19816	4399	475	2399	77	36293	5.02
<b>Total</b>	<b>59872</b>	<b>196405</b>	<b>94</b>	<b>44510</b>	<b>138847</b>	<b>52532</b>	<b>25560</b>	<b>191260</b>	<b>13618</b>	<b>722698</b>	<b>100</b>

## 12. Area under different Priority Categories

Sl.No.	Priority Category	No.of Microwatersheds	Area (ha.)	%
1	Very High (above 70)	148	85799	11.87
2	High (66-70)	263	144036	19.93
3	Medium (61-65)	475	269925	37.35
4	Low (56-60)	364	220664	30.53
5	Very Low (55 & below)	5	2274	0.31
	<b>Grand Total</b>	<b>1255</b>	<b>722698</b>	<b>100</b>

## 13. Watershedwise distribution of Area (ha.) under different Priority Categories

Watershed	Very High	High	Medium	Low	Very Low	Area (ha)
3B2A1	8757	22387	38038	17324		86506
3B2A2	10734	17936	29686	9933		68289
3B2A3	8312	14916	32242	23155	272	78897
3B2A4	5940	10284	24859	21030	462	62575
3B2A5	7741	15685	17325	4124		44875
3B2A6	10364	17311	34509	47550		109734
3B2A7	5393	36346	78922	2637		123298
3B2A8	14134	5879	10089	55232		85334
3B2A9	14424	3292	4255	39679	1540	63190
<b>Total</b>	<b>85799</b>	<b>144036</b>	<b>269925</b>	<b>220664</b>	<b>2274</b>	<b>722698</b>

## 14. Districtwise distribution of area (ha.) Microwatershed under different Priority Categories

Priority Category	Assam					Meghalaya				Area (ha)	%
	Kamrup	Karbi Anglong	Darrang	Marigaon	Nagaon	East Khasi Hills	Jaintia Hills	Ribhoi	West Khasi Hills		
Very High	2765	37590			7935	8503	1756	26628	622	85799	11.87
High	8163	41239	60	799	5075	21022	6615	59534	1529	144036	19.93
Medium	25436	93021	34	6870	11297	21761	17183	87596	6727	269925	37.35
Low	23274	24555		36803	112538	1246	6	17502	4740	220664	30.53
Very Low	234			38	2002					2274	0.31
<b>Total</b>	<b>59872</b>	<b>196405</b>	<b>94</b>	<b>44510</b>	<b>138847</b>	<b>52532</b>	<b>25560</b>	<b>191260</b>	<b>13618</b>	<b>722698</b>	<b>100.00</b>

## **Salient Features:**

- ❖ *3B2A1-9 sub catchment has been subdivided into 1255 microwatersheds following the delineation and codification method outlined in Watershed Atlas of India (1:1 M scale), 2012.*
- ❖ *It is found that only 148 microwatersheds covering 85799 ha ( 11.87%) comes under very high priority and 263 microwatersheds covering 144036 ha ( 19.93%) comes under high priority. Among the districts, Karbi Anglong district of Assam is the most affected by runoff water which occupies 37590 ha area under very high and 41239 ha under high priority followed by Ribhoi district of Meghalaya (which occupies 26628ha ha and 59534 ha area under very high and high priority respectively which needs immediate attention for suitable soil-water conservation measures under Integrated Watershed Development Programme.*
- ❖ *3B2A9 watershed is the worst affected by runoff water as well as flooding as followed by 3B2A8 and 3B2A2 watersheds ( Vide table 13) which needs immediate attention for proper Soil Water Conservation and flood control measures under Integrated Management Programme.*
- ❖ *About 112052 ha (15.5%) area of the survey area is unmanaged, 20086 ha (2.78%) area is unmanaged to poorly managed and 100409ha. (13.9%) area is poorly managed.*
- ❖ *Severely eroded lands occupy 112535 ha. (15.57%) while moderately to severely eroded land cover 78667 ha (10.89%) and moderate eroded land 205017 (28.37%) 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 3B2A1-9 Watersheds of Brahmaputra Basin Districts, Marigaon, Karbi Anglong, Kamrup, Darrang and Nagaon districts of Assam and East Khasi, Jaintia, Ribhoi, West Khasi district of Meghalaya using Remote Sensing and GIS 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 3B2A1-9 of WAI which are subdivided into 168 subwatersheds and finally into 1255 microwatersheds. Subwatersheds are codified by suffixing small case English alphabets with the watershed code e.g. 3B2A1a, 3B2A1b etc and microwatersheds are codified by affixing Arabic numerical with the subwatershed code, e.g., 3A1A1a1, 3A1A1b1 etc. Within a microwatershed, Runoff Potential Mapping Units (RPMUs) are demarcated and symbolized with alphanumeric codes viz. AL01, AL02, AC01, AC02, GG01, GG02, SD01 and SD02 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:*

**Chief Soil Survey Officer**

**Soil and Land Use Survey of India**

**I.A.R.I. Buildings, New Delhi 110012 Or**

**Telefax-011-25843811**

**E-mail: [csso-slusi@nic.in](mailto:csso-slusi@nic.in)**

**Soil Survey Officer**

**Soil and Land Use Survey of India**

**E-Block, B. P. Township,**

**Kolkata-700094**

**Telefax-033-24301425**

**E-mail: [ssokolkata-slusi@nic.in](mailto:ssokolkata-slusi@nic.in)**

**Website: <http://slusi.dacnet.nic.in>**