

**Prioritisation of Micro-watersheds of 3B3C1-4 Watershed (Bhagdoi Catchment) of Brahmaputra Basin, Golaghat, Jorhat and Sibsagar districts of Assam and Mokokchung, Tuensang and Wokha districts of Nagaland using Remote Sensing Technique**

**ABSTRACT**

<b>1.</b>	<b>Survey Area</b>	:	<i>3B3C1-4 Watershed of Brahmaputra Basin, Golaghat, Jorhat and Sibsagar districts of Assam and Mokokchung, Tuensang and Wokha districts of Nagaland</i>
<b>2.</b>	<b>Location</b>	:	<i>93<sup>0</sup> 49 ' to 94<sup>0</sup> 44'30" E Longitude and 26<sup>0</sup> 16'30" 26<sup>0</sup> 56'30"N Latitude</i>
<b>3.</b>	<b>Total Mapped Area</b>	:	<i>470619 ha</i>
<b>4.</b>	<b>Agro-climatic Region</b>	:	<i>Eastern Himalayan Region (II) as per Planning Commission(1989)</i>
<b>5.</b>	<b>Type of Survey</b>	:	<i>Rapid Reconnaissance Survey using Remote Sensing Technique</i>
<b>6.</b>	<b>Period of Survey</b>	:	<i>December 2005</i>
<b>7.</b>	<b>Base Material Used</b>	:	<i>Survey of India Toposheets (1:50,000) and IRS-P6 LISS-III Precision Geo-coded FCC(3, 2, &amp; 1) Satellite Imagery (1:50,000)</i>

**8. Areal Extent of different Runoff Potential Mapping Units**

<b>Sl.No.</b>	<b>RPMU</b>	<b>Runoff Potential Value</b>	<b>Area (ha)</b>	<b>Area (%)</b>
1	AC01	62	1556	0.33
2	AC02	64	1084	0.23
3	AC03	60	4409	0.94
4	AC04	56	1101	0.23
5	AC05	55	237	0.05
6	AC06	57	112	0.02
7	AL01	56	16890	3.59
8	AL02	56	41235	8.76
9	AL03	59	59054	12.55
10	AL04	54	55666	11.83
11	AL05	58	56404	11.99
12	AL06	60	1851	0.39
13	AL07	57	3227	0.69
14	AL08	54	3680	0.78
15	AL09	58	25510	5.42

16	SD01	71	393	0.08
17	SD02	61	1228	0.26
18	SD03	62	107	0.02
20	SD05	90	1895	0.40
22	SD07	85	52833	11.23
23	SD08	85	1118	0.24
24	SD09	84	6567	1.40
25	SD10	70	2271	0.48
26	SD11	93	4858	1.03
27	SD12	88	7350	1.56
29	SD14	81	12459	2.65
30	SD15	76	473	0.10
31	SD16	73	4482	0.95
32	SD17	63	12600	2.68
33	SD18	76	4242	0.90
34	SD20	76	1368	0.29
35	SD21	66	4513	0.96
36	SD22	75	1476	0.31
37	SD24	64	12583	2.67
38	SD25	61	4713	1.00
39	SD26	76	2115	0.45
40	SD28	63	185	0.04
41	SD30	58	9245	1.96
42	SD31	69	260	0.06
43	Settlement	0	8849	1.88
44	River	0	36587	7.77
45	Airport	0	314	0.07
46	Waterlogging	0	3519	0.75
		<b>Grand Total</b>	<b>470619</b>	<b>100</b>

9. **Hydrological Divisions :**
- Water Resource Region (3)*
  - Basin (3B)*
  - Catchment (3B3)*
  - Subcatchment (3B3C)*
  - Watersheds (3B3C 1, 2, .....)*
  - Subwatersheds (3B3C 3a, b, .c.....,)*
  - Microwatersheds (3B3C3a1..., 3B3C4a1,)*

**10. Area under different Soil Erosion classes:**

Erosion	Assam			Nagaland			Total area (ha)	Area (%)
	Golaghat	Jorhat	Sibsagar	Mokokchung	Tuensang	Wokha		
None to slight erosion	14609	27477	4585	5262		3677	55610	11.82
Slight to Moderate erosion	30277	43481	3721	7923	52	2011	87465	18.58
Moderate erosion	51388	99520	5944	19458	225	11226	187761	39.9
Moderate to Severe erosion	9	4068	100	53919	1193	15996	75285	16
Severe erosion		151	54	13847	558	619	15229	3.24
Miscellaneous	18820	27605	488	2098		258	49269	10.46
<b>Total</b>	<b>115103</b>	<b>202302</b>	<b>14892</b>	<b>102507</b>	<b>2028</b>	<b>33787</b>	<b>470619</b>	<b>100</b>

**11. Area under different Priority Categories**

Sl.No.	Priority Category	No.of Microwatersheds	Area (ha.)	Area (%)
1	Very High (above 70)	140	113067	24.03
2	High (66-70)	27	22988	4.88
3	Medium (61-65)	46	37162	7.9
4	Low (56-60)	289	274437	58.31
5	Very Low (55 & below)	21	22965	4.88
	<b>Grand Total</b>	<b>523</b>	<b>470619</b>	<b>100</b>

**12. District and State wise Priority Categorization:**

Priority Category	Assam			Nagaland			Total Area (ha)	Area (%)
	Golaghat	Jorhat	Sibsagar	Mokokchung	Tuensang	Wokha		
Very High (above 70)	376	4744	781	88201	2028	16937	113067	24.03
High (66-70)	558	3768	99	10970		7593	22988	4.88
Medium (61-65)	773	24437	541	3336		8075	37162	7.90
Low (56-60)	97690	162094	13471			1182	274437	58.31
Very Low (55 & below)	15706	7259					22965	4.88
<b>Grand Total</b>	<b>115103</b>	<b>202302</b>	<b>14892</b>	<b>102507</b>	<b>2028</b>	<b>33787</b>	<b>470619</b>	<b>100.00</b>

### **13. Salient Features:**

❖ *3B3C sub-catchment has been subdivided into 523 microwatersheds following the delineation and codification method outlined in Watershed Atlas of India (1:1 M scale), 2012.*

❖ *Out of 470619 hectares surveyed area, 113067 ha. (24.03%) covered by 140 micro-watersheds have been categorized under very high priority and 22988 ha. (4.88%) covered by 27 micro-watersheds have been categorized under high priority area which need immediate attention for suitable soil water conservation measures under integrated watershed development programme.*

❖ *In Nagaland, 107166 ha (22.77% of the whole survey area) comes under very high priority area whereas 5901 ha (1.25% of total survey area) is in Assam state. Accordingly, 18563ha & 4425ha areas have been demarcated under high priority category in Nagaland and Assam respectively. The very high and high priority area needs immediate soil-water conservation measures to check the runoff from hilly terrain vis-à-vis control regular flood in the lower catchment.*

❖ *In Mokokchung district, 88201 ha(18.74%) & 10970 ha(2.33%) followed by Wokha district 16937ha(3.59%) & 7593ha(1.61%), Jorhat district, 4744ha(1.0%) & 3768ha(0.80%), Tuensang district 2028ha(0.43%), no high priority areas, Sibsagar district 781ha(0.16%) & 99 ha(0.021%) and in Golaghat district 376 ha(0.07%) & 558ha(0.11%) are identified as very high & high priority category respectively.*

❖ *About 84441 ha (17.94%) area of the survey area is unmanaged, 7743ha (1.65%) area is unmanaged to poorly managed and 35224ha (7.48%) area is poorly managed.*

❖ *Severely eroded lands occupy 15229 ha (3.24%) while moderately to severely eroded land cover 75285 ha (16%) and moderate eroded land 187761(39.9%) that also need proper soil- water conservation practices under Integrated Watershed Development Planning.*

## ***HOW TO USE SOIL SURVEY REPORT***

This report on Demarcation of Priority Micro-watersheds of 3B3C1-4 Watershed of Brahmaputra Basin, Golaghat, Jorhat and Sibsagar districts of Assam and Mokokchung, Tuensang and Wokha districts of Nagaland aims at identifying the micro-watersheds which are relatively susceptible to severe water erosion due to land degradation problems. 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 sub-catchment is delineated and codified following the codification system of Watershed Atlas of India, 2012 (WAI) published by Soil & Land Use Survey of India in 2012. The surveyed area comprises 4 watersheds (3B3C1-4) of WAI which are subdivided into 71 subwatersheds and finally into 523 microwatersheds. Subwatersheds are codified by suffixing small case English alphabets with the watershed code e.g. 3B3C1a, 3B3C2c etc and microwatersheds are codified by affixing Arabic numerical with the subwatershed code, e.g., 3B3C1a1, 3B3C2c4 etc. Within a microwatershed, Runoff Potential Mapping Units (RPMUs) are demarcated and symbolized with alphanumeric codes viz. AL01, AL02, SD01, 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 10** on 'Legend to Runoff Potential Mapping Units'. Each of these units is assigned its runoff potential (RP) value which indicates the susceptibility for soil erosion (soil detachment) and transportation of detached materials from the microwatershed. Differentiating morphological characteristics of the Run-off Potential Mapping Units have been presented in the **Table 11**.

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 where as the lower value indicates lower priority. The list of microwatersheds under different priority categories is given in **ANNEXURE-II**.

Microwatersheds categorized under very high and high priority are selected for treatment of degraded lands of these microwatersheds 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. Building, New Delhi 110012  
Telefax-011-258-43811/1263  
E-mail:[csso-slusi@nic.in](mailto:csso-slusi@nic.in)  
Website: <http://slusi.dacnet.nic.in>***

***Or***

***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)***