

Inventory of Rapid Reconnaissance Survey for Prioritisation of Micro-watersheds in 3A3C Sub-Catchment of Kameng Catchment (3A3C3-5 Watersheds) of Brahmaputra Basin (FPR), East Kameng, West Kameng and Lower Subansiri districts of Arunachal Pradesh Using Remote Sensing and GIS Technique

ABSTRACT

1.	Survey Area	:	<i>The Kameng sub-catchment(3A3C) spreads over part of East Kameng, West Kameng and Lower Subansiri districts of Arunachal Pradesh.</i>
2.	Geographical Extent	:	<i>27⁰ 25' to 27⁰ 57' North Latitudes and 92⁰ 26' to 93⁰ 14' East Longitude</i>
3.	Agro Climatic Region	:	<i>Eastern Himalayan Region II (as per planning commission 1989)</i>
4.	Total area of the district	:	<i>272670 ha.</i>
5.	Type of Survey	:	<i>Rapid Reconnaissance Survey using Remote Sensing & GIS Techniques</i>
6.	Base map	:	<i>a) IRS – IC 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>Dec '09 to February, 10 & Nov'10- Dec '10</i>

9. Areal Extent of different Runoff Potential Mapping Units

Sl.No.	RPMU	Runoff Potential Value	Area (ha)	(%)
<i>1</i>	AC01	57	27	0.01
<i>2</i>	AC03	63	373	0.14
<i>3</i>	SS01	60	3176	1.16
<i>4</i>	SS02	66	140	0.05
<i>5</i>	SS03	83	24356	8.93
<i>6</i>	SS04	67	80994	29.70
<i>7</i>	SS06	66	20833	7.64
<i>8</i>	SS07	62	54604	20.03
<i>9</i>	SS08	82	2082	0.76
<i>10</i>	SS09	86	24298	8.91

11	SS10	63	2096	0.77
12	SS11	61	2036	0.75
13	SS12	60	7462	2.74
14	SS13	72	931	0.34
15	SS14	83	5860	2.15
16	SS15	58	48	0.02
17	SS16	59	1957	0.72
18	SS17	67	568	0.21
19	SS18	75	322	0.12
20	HS		406	0.15
21	W		27	0.01
22	RIVER		1048	0.38%
23	SN		38915	14.27%
24	ROC		111	0.04%
		Grand Total	272670	100

10. Hydrological Divisions

Water Resource Region (3)

Basin (3A)

Catchment (3A3)

Subcatchment (3A3C)

Watersheds (3A3C3, 5,)

Subwatersheds (3A3C 3 a, b, c.....)

Microwatersheds (3A3C 3a1..., 3A3C 4a1, ...)

11. Watershedwise distribution of Area (ha) under different Priority Category

Watershed	Very High	High	Medium	Low	Very Low	Area (ha)
3A3C3	38861	35231	42669	686	1070	118517
3A3C4	32112	25705	12554		2612	72983
3A3C5	40158	30114	10121		777	81170
Total	111131	91050	65344	686	4459	272670

12. District wise Priority Categorization

Priority Category	East Kameng	Lower Subansiri	West Kameng	Area (ha)	%
Very High (above 70)	108276	227	2628	111131	40.76
High (66-70)	86041	583	4426	91050	33.39
Medium (61-65)	51502	63	13779	65344	23.96
Low (56-60)	535		151	686	0.25
Very Low (55 & below)	4296	163		4459	1.64
Total	250650	1036	20984	272670	100.00

13. Area under different Priority Categories

Sl. No.	Priority Category	No. of Microwatersheds	Area (ha.)	%
1	Very High (above 70)	145	111131	40.76
2	High (66-70)	121	91050	33.39
3	Medium (61-65)	76	65344	23.96
4	Low (56-60)	1	686	0.25
5	Very Low (55 & below)	7	4459	1.64
	Grand Total	350	272670	100

Salient Features:

- ❖ 3A3C 3-5 watersheds of Kameng catchment have been subdivided into 350 microwatersheds following the delineation and codification method outlined in *Watershed Atlas of India (1:1 M scale)*, 2012.
- ❖ 107090 ha of land (i.e. 39.27 % of the whole area) covered by 140 microwatersheds comes under very high priority area and 95091 ha (34.87%) area covered by 121 microwatersheds under high Priority which needs immediate attention for suitable soil-water conservation measures under *Integrated Watershed Development Programme*.
- ❖ Among the districts, East Kameng district of Arunachal Pradesh is the most affected by runoff water which occupies the very high priority area comprising about 104324 ha, followed by West Kameng (2628 ha) and Lower Subansiri (138ha) respectively. But East Kameng, Lower Subansiri and West Kameng districts of Arunachal Pradesh have 89993ha, 672 ha and 4426 ha area with high priority, which also needs immediate attention for soil and water conservation measures.
- ❖ 3A3C5 watershed is the worst affected by runoff water followed by 3A3C3 and 3A3C4 watersheds which needs immediate attention to check the runoff from upper catchment and immediate measure for flood control under *Integrated Watershed Management Programme*..
- ❖ About 57291 ha (21.01%) area of the survey area is poorly managed.

HOW TO USE SOIL SURVEY REPORT

This report on Prioritisation of Micro-watersheds of 3A3C 3-5 Sub catchment of Kameng catchment, East Kameng, West Kameng and Lower Subansiri districts of Arunachal Pradesh 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 3 watersheds (3A3C3-5) of WAI which are subdivided into 51 subwatersheds and finally into 350 microwatersheds. Subwatersheds are codified by suffixing small case English alphabets with the watershed code e.g. 3A3C3a, 3A3C3b etc and microwatersheds are codified by affixing Arabic numerical with the subwatershed code, e.g., 3A3C3a1, 3A3C3b1 etc. Within a microwatershed, Runoff Potential Mapping Units (RPMUs) are demarcated and symbolized with alphanumeric codes viz. SS01, SS02, AC01, AC02 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 5** 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 6**.*

*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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