

## सारांश/ABSTRACT

1. **सर्वेक्षित क्षेत्र /Surveyed Area** : 2 सी 6 बी1 से 8 और 2 सी 6 सी 1 से 4 तक ऊपरी यमुना के 2 सी 6 जलप्रकल्प क्षेत्र के 2 सी 6 बी और 2 सी 6 सी उप जलप्रकल्प क्षेत्र, उत्तर प्रदेश राज्य के जिला- बागपत, गौतमबुद्धनगर, गाजियाबाद, मेरठ, मुजफ्फरनगर, सहारनपुर, राज्य- हरियाणा के यमुनानगर, करनाल, पानीपत और फरीदाबाद जिले, उत्तराखंड राज्य के देहरादून और हरिद्वार जिले, हिमाचल राज्य का सिरमौर जिला और दिल्ली के सूक्ष्मजलग्रहण क्षेत्रों की प्राथमिकता के लिए त्वरित टोही सर्वेक्षण की सूची/  
Rapid Reconnaissance Survey for Prioritization of Microwatersheds in 2C6B1 to 8, 2C6C1 to 4 Watersheds of Upper Yamuna (2C6B and 2C6C) Subcatchments of 2C6 Catchment, Districts- Baghpat, Gautambudh Nagar, Ghaziabad, Meerut, Muzaffarnagar, Saharanpur of Uttar Pradesh State; Yamuna Nagar, Karnal, Panipat, Faridabad of Haryana State; Dehradun, Haridwar of Uttarakhand State; Sirmaur of Himachal Pradesh State; Delhi U/T
2. **भौगोलिक स्थिति /Location** : 30° 25' 27" to 28° 16' 3" उत्तरी अक्षांश/North Latitude  
77° 05' 34" to 77° 53' 1" पूर्वी देशान्तर/East Longitude
3. **कुल मानचित्र क्षेत्र/Total Area: Surveyed** : 102874 ha
4. **सर्वेक्षण के प्रकार/Kind of: Survey** : त्वरित टोही सर्वेक्षण /Rapid Reconnaissance Survey
5. **सर्वेक्षण की अवधि/Period of: Survey** : 2009 to 2010 and 2011 to 2012
6. **कृषि जलवायु क्षेत्र/Agro: climatic zone** : ऊपरी गंगा के मैदान(जॉन-5)और पहाड़ी क्षेत्र(जॉन-8)/Upper Gangetic Plains (Zone 5) and Hills Region (Zone 8)
7. **प्रयुक्त आधार मानचित्र /Base: Maps** : भारतीय सर्वेक्षण विभाग के नक्शे/Survey of India Toposheets on 1:50,000 scale
8. **जलीयविभाजन/Hydrological : division** :

2	क्षेत्र/Region
2C	घाटी/Basin
2C6	जलप्रकल्प क्षेत्र/ Catchment t
2C6B and C....	उप जलप्रकल्प क्षेत्र/ Subcatchments
2C6B1 and C1	जलग्रहण क्षेत्र/ Watershed
2C6B1a and C1a...	उपजलग्रहण क्षेत्र/ Subwatersheds
2C5A1a1, 2 ...	सूक्ष्मजलग्रहण क्षेत्र/ Microwatersheds

9. विभिन्न अफवाह संभावित मानचित्र इकाइयों का क्षेत्रीय विस्तार/

Areal Extent of Different Runoff Potential Mapping Units (RPMUs):-

S. No.	RPMU	Runoff Potential Value	Area (ha)	Area (%)
1	AL01	60.00	504	0.05
2	AL02	59.00	454	0.04
4	AL03	56.00	7462	0.73
5	AL04	59.00	288	0.03
6	AL05	59.00	459	0.04
7	AL06	56.00	18823	1.84
8	AL07	58.00	541882	52.87
9	AL08	59.00	49269	4.81
10	AL09	54.00	9631	0.94
11	AL10	63.00	6251	0.61
12	AL11	58.00	29449	2.87
13	AL12	54.00	3572	0.35
14	AL13	56.00	58965	5.75
15	AL14	59.00	4244	0.41
16	AL15	57.00	18906	1.84
17	AL16	57.00	4409	0.43
18	AL17	55.00	93630	9.14
19	AL18	56.00	44819	4.37
20	AL19	56.00	3036	0.3
21	AL20	61.00	156	0.02
22	CM01	59.00	91	0.01
23	CM02	69.00	10763	1.05
24	CM03	71.00	9815	0.96
25	CM04	68.00	1295	0.13
26	HB	0	77806	7.59
27	River	0	27667	2.7
28	WB	0	1228	0.12
<b>Grand Total</b>			<b>1024874</b>	<b>100</b>

**10. मृदा अपरदन/Soil Erosion Hazards:-**

<b>Erosion</b>	<b>Area (ha)</b>	<b>Area (%)</b>	<b>East Delhi</b>	<b>North Delhi</b>	<b>North East Delhi</b>	<b>North West Delhi</b>	<b>South Delhi</b>	<b>Dehradun</b>	<b>Haridwar</b>	<b>Gautambudh Nagar</b>	<b>Ghaziabad</b>	<b>Meerut</b>	<b>Muzaffarnagar</b>	<b>Saharanpur</b>	<b>Faridabad</b>	<b>Karnal</b>	<b>Panipat</b>	<b>Sonipat</b>	<b>Yamuna Nagar</b>	<b>Sirmaur</b>
<b>None to slight water erosion</b>	40325	3.93	-	5	58	-	-	-	5578	3550	1339	1191	4997	20852	-	-	-	-	-	-
<b>Slight to moderate water erosion</b>	733676	71.59	315	613	729	29	262	-	20617	41657	36510	36875	228510	254259	1815	347	714	64	2478	-
<b>Moderate water erosion</b>	136470	13.32	-	98	-	35	-	112	3067	8156	4186	8352	52212	48955	231	481	119	447	288	-
<b>Moderate to severe water erosion</b>	7702	0.75	-	-	-	-	-	165	-	-	-	-	2622	4275	-	-	357	-	175	-
<b>Misc.</b>	106701	10.41	5669	364	4156	80	307	74	697	18056	20521	3337	12580	23050	644	951	761	618	4008	32
<b>Grand Total</b>	<b>1024874</b>	<b>100</b>	<b>5984</b>	<b>1080</b>	<b>4943</b>	<b>144</b>	<b>569</b>	<b>351</b>	<b>29959</b>	<b>71419</b>	<b>62556</b>	<b>49755</b>	<b>300921</b>	<b>351391</b>	<b>2690</b>	<b>1779</b>	<b>1951</b>	<b>1129</b>	<b>6949</b>	<b>32</b>

11. विभिन्न प्राथमिकता वर्ग के अंतर्गत सूक्ष्मजलग्रहण क्षेत्रों का जिले के अनुसार विभाजन/District wise distribution of Microwatersheds under different priority categories

राज्य/State	जिला/District	प्राथमिकता वर्ग/Priority Category	सूक्ष्मजलग्रहणक्षेत्रों की सं./Number of Microwatersheds	क्षेत्र/Area (ha)	
<b>DELHI</b>	East Delhi	Low	4	1787	
		Very Low	10	4197	
	<b>Total</b>			<b>5984</b>	
	North Delhi	Low	5	989	
		Very Low	2	91	
	<b>Total</b>			<b>1080</b>	
	North East Delhi	Low	6	2419	
		Very Low	7	2524	
	<b>Total</b>			<b>4943</b>	
	North West Delhi	Low	2	144	
		<b>Total</b>			<b>144</b>
	South Delhi	Low	3	569	
		<b>Total</b>			<b>569</b>
	<b>DELHI Total</b>				<b>12720</b>
	<b>HARYANA</b>	Faridabad	Low	9	2690
<b>Total</b>			<b>2690</b>		
Karnal		Low	11	1675	
		Very Low	1	104	
<b>Total</b>			<b>1779</b>		
Panipat		Low	9	1905	
		Very Low	1	46	
<b>Total</b>			<b>1951</b>		
Sonipat		Low	6	683	
		Very Low	4	446	
<b>Total</b>			<b>1129</b>		
Yamunanagar		High	3	86	
		Low	14	6347	
		Medium	1	2	
		Very Low	4	514	
<b>Total</b>			<b>6949</b>		
<b>HARYANA Total</b>				<b>14498</b>	
<b>HIMACHAL PRADESH</b>	Sirmaur	High	1	32	
		<b>Total</b>			<b>32</b>
<b>HIMACHAL PRADESH Total</b>				<b>32</b>	

<b>UTTAR PRADESH</b>	Baghpat	Low	157	123630
		Very Low	8	7642
		<b>Total</b>		<b>131272</b>
	Gautam Budhnagar	Low	71	52618
		Very Low	24	18801
		<b>Total</b>		<b>71419</b>
	GHAZIABAD	Low	62	51194
		Very Low	19	11362
		<b>Total</b>		<b>62556</b>
	Meerut	Low	61	48642
		Very Low	1	1113
		<b>Total</b>		<b>49755</b>
	Muzaffarnagar	Low	366	298089
		Very Low	5	2832
		<b>Total</b>		<b>300921</b>
	Saharanpur	High	23	13875
		Low	330	268374
		Medium	7	5883
		Very High	10	6409
		Very Low	61	56850
		<b>Total</b>		<b>351391</b>
<b>UTTAR PRADESH Total</b>				<b>784884</b>
<b>UTTARAKHAND</b>	Dehradun	High	1	351
		<b>Total</b>		<b>351</b>
	Haridwar	Low	49	29297
		Very Low	1	662
		<b>Total</b>		<b>29959</b>
<b>UTTARAKHAND Total</b>				<b>30310</b>
<b>Grand Total</b>				<b>1024874</b>

12. सूक्ष्म जलग्रहण क्षेत्रों की प्राथमिकता के आधार पर राज्यानुसार विस्तार/ Statewise status of priority of microwatersheds

State	Status	Priority Category	No. of Micro watershed	Area (ha)
DELHI	F	Low	4	3480
		Very Low	3	2668
	Total		7	6148
	P	Low	7	2428
		Very Low	9	4144
	Total		16	6572
Total			23	12720
HARYANA	P	High	3	86
		Low	48	13300
		Medium	1	2
		Very Low	9	1110
	Total		61	14498
Total			61	14498
HIMACHAL PRADESH	P	High	1	32
Total		1	32	
Total			1	32
UTTAR PRADESH	F	High	19	11839
		Low	779	727990
		Medium	6	5306
		Very High	10	6409
		Very Low	85	78269
	Total		899	829813
	P	High	4	2036
		Low	214	114557
		Medium	1	577
		Very Low	32	20331
Total		251	137501	
Total			1150	967314
UTTARAKHAND	F	Low	24	20619
		Very Low	1	662
	Total		25	21281
	P	High	1	351
		Low	25	8678
	Total		26	9029
Total			51	30310
<b>Grand Total</b>			<b>1286</b>	<b>1024874</b>

\*Note: F = State fully covered under microwatershed

P = State partially covered under microwatershed

### 13. विभिन्न प्राथमिकता वर्गों के अंतर्गत क्षेत्र का वर्गीकरण/ Distribution of Area under Different Priority Categories

S. No.	Priority Category	No. of Microwatersheds	Area (ha)	Area (%)
1.	Very High (above 70)	10	6409	0.63
2.	High (66-70)	23	14344	1.40
3.	Medium (61-65)	7	5885	0.57
4.	Low (56-60)	953	891052	86.94
5.	Very Low (55 & below)	113	107184	10.46
<b>Grand Total</b>		<b>1106</b>	<b>1024874</b>	<b>100.00</b>

#### 13. मुख्य बिन्दु/Salient Features:

- ⇒ चित्रण एवं संहिताकरण, उपचार क्षेत्र (मृदा एवं जल संरक्षण उद्देश्यों के लिए) का व्यावहारिक आकार, विशिष्ट क्षेत्रीय सीमा एवं अद्वितीय राष्ट्रीय कोड के क्रम में रखते हुये 'सूक्ष्मजलग्रहण क्षेत्र' स्तर तक किया जाता है /Delineation and codification is done up to microwatershed level in order to have viable size of the treatment area (for soil & water conservation purposes) having distinct spatial extent and unique national code.
- ⇒ कुल 1106 सूक्ष्मजलग्रहण क्षेत्रों में से, 33 बहुत उच्च और उच्च श्रेणी के अंतर्गत आते हैं/Out of the total 1106 surveyed microwatersheds, 33 falls under very high and high category.
- ⇒ 10 सूक्ष्मजलग्रहण क्षेत्र बहुत उच्च प्राथमिकता वाले 6409 हेक्टेयर (0.63%) क्षेत्र के साथ और 14344 हेक्टेयर (1.40 %) क्षेत्र के साथ 23 सूक्ष्मजलग्रहण क्षेत्र उच्च प्राथमिकता वाले श्रेणियों में आते हैं, जिसमें तुरंत समुचित रूप से "मृदा एवं जल संरक्षण" के लिए ध्यान देने की आवश्यकता है/ 10 microwatersheds falls under very high priority with 6409 ha (0.63 %) and 23 microwatersheds with 14344 ha (1.40%) comes under high priority categories, requires immediate attention for proper soil and water conservation.
- ⇒ लगभग 733676 हेक्टेयर क्षेत्र (71.59 %) 'अल्प से मध्यम जल अपरदन' और 40325 हेक्टेयर क्षेत्र (3.93%) 'क्षरण रहित या साधारण पानी के क्षरण' के अन्तर्गत आता है। लगभग 136470 हेक्टेयर क्षेत्र (13.32%) 'मध्यम जल अपरदन' और केवल 7702 हेक्टेयर क्षेत्र (0.75%) 'मध्यम से गंभीर जल अपरदन' की श्रेणी के अंतर्गत आता है /About 733676 ha area (71.59 %) is under slight to moderate water erosion and 40325 ha (3.93 %) is under none to slight water erosion. About 136470 ha area (13.32 %) is prone to moderate water erosion and only 7702 ha (0.75 %) is prone to moderate to severe water erosion.
- ⇒ सर्वेक्षण क्षेत्र में बारह विभिन्न प्रकार की 'भौगोलिक दृष्टि' पहचानी गयी हैं जैसे जलोढ़ के मैदान, विच्छेदित धारा बैंक, बाढ़ के मैदान, पहाड़ी की चोटी, पहाड़ी के ढलान, पुराने पानी के चैनल, पीडमोंट प्लान, निचली भूमि मैदान, ऊपरी भूमि मैदान, प्वाइंट बार कॉम्प्लेक्स, नदी छतों और धारा बैंक। अधिकतम क्षेत्र (62.10%) जलोढ़ मैदानों के अंतर्गत कवर किया गया जिसके बाद बाढ़ के मैदान (13.97%) थे/ Twelve different physiography identified in the surveyed area as alluvial plains, dissected stream banks, flood plain, hill tops, hill side slopes, paleo channels, piedmont plains, plain low lands, plain uplands, point bar complex, river terraces and stream banks. Maximum area (62.10%) covered under alluvial plains followed by flood plain (13.97%).

## HOW TO USE SOIL SURVEY REPORT

The report embodies the results of Rapid Reconnaissance Survey conducted for identification and delineation of priority microwatersheds of 2C6B1 to 8, 2C6C1 to 4 watersheds of Lower Yamuna FPR (2C6B and 2C6C) Subcatchments falling in six districts of Uttar Pradesh i.e. Muzaffarnagar, Saharanpur, Baghpat, Meerut, Ghaziabad, Gautam Budh Nagar; four districts of Haryana State i.e. Yamuna Nagar, Karnal, Panipat, Faridabad; two districts of Uttarakhand State i.e. Dehradun, Haridwar; one district of Himachal Pradesh State i.e. Sirmour and Delhi UT covering an area of 1024860 ha spread over 2276 microwatersheds. The priorities are fixed on the basis of Runoff Potential Index (RPI). Higher the values of Runoff Potential Index suggest higher priority and vice versa. The concerned maps on the scale of 1:50,000 are appended with the report. It also furnishes information on general characteristics of the area such as, location and extent, physiography, relief, drainage, geology, climate, present landuse, natural vegetation, water supply and soils of the area.

In the map, each microwatershed is marked by a symbol like 2C6B1a1 etc. where '2' stands for water resource region, '2C' indicates basin, '2C6' for catchment, '2C6B' for subcatchment, '2C6B1' for watershed, '2C6B1a' for subwatershed and '2C6B1a1' for microwatershed. Within each microwatershed, the Runoff Potential Mapping Units (RPMUs) are demarcated according and symbolized by capital English alphabets, based on geological origin of the land 'AL' stands for Alluvium and their further subdivisions are made on the basis of land and soil characteristics. Each unit connotes a set of physiography, slope, landuse, soil characteristics such as soil depth, colour, texture, severity of erosion and management practices. Mapping units are assigned with respective runoff potential weightage value the priority categorisation of microwatersheds have been done hazard as very high, high, medium, low and very low priority areas according to runoff potential index value.

The mapping legends furnished in the **Table-4** and differentiating characteristics of each mapping units represented in **Table-5**.

The details of computation made for determining district wise runoff potential index of various microwatersheds are furnished in Annexure-I and the information of relative priority of microwatersheds in descending order of grading are furnished in Annexure-II.

Microwatersheds categorized under very high and high priority are selected for treatment of degraded lands under these microwatersheds under FPR scheme. Both treatable

and non-treatable lands are occupied by each priority (very high and high category) microwatersheds. 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 some microwatersheds.

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

**Chief Soil Survey Officer**  
**Soil & Land Use Survey of India**  
**I.A.R.I. Campus**  
**New Delhi - 110012**  
*Tel. No. - 011-25843811, 25841263, 25849486*  
*Fax No. - 011-25843811*  
*e-mail: csso-slusi@nic.in*

*or*

**Sr. Soil Survey Officer**  
**Soil & Land Use Survey of India**  
**C-4, Sector - 1, NOIDA**  
**Gautam Budha Nagar (U. P.) - 201301**  
*Tel. No. - 0120-2442694, 2544804*  
*Fax No. - 0120-2442694*  
*e-mail: ssonoida-slusi@nic.in*  
**Website: <http://slusi.dacnet.nic.in>**