GROUND WATER INFORMATION BROCHURE
BASTI DISTRICT, U.P.

CONTENTS

PLATES :

BASTI DISTRICT- AT A GLANCE

1.	GENERAL INFORMATION		
	Geographical Area (Sq km)	:	2688
	Administrative Divisions (As on 2011-12) Number of Tehsils/Blocks Number of Panchayat/Villages	 : :	 04/14 1047/3348
	Population (As on 2011 Census)	:	2461056
	Average Annual Rainfall (mm)	:	1166
2.	GEOMORPHOLOGY		
	Major physiographic units	:	Upland plains, Gently undulating slope . Older & Younger alluvium
	Major Drainages	:	Ghaghra,Manorma, Kuwana
3.	LAND USE (Sq Km) (As on 2010 –11)		
	Forest area	:	43.59
	Net area sown	:	2090.17
	Gross area sown	:	2865.24
4.	MAJOR SOIL TYPES	:	Clay, sand and loam
5.	Area under principal crops (Sq Km) (As on 2010 –11)	:	2339.25
6.	IRRIGATION BY DIFFERENT SOURCES (Number of structures/Area (Sq Km))		
	Dugwells/Government Tube wells & Pumpsets (Electric/ Diesel)	:	78356/1335.96
	Tanks/ponds	:	98.86
	Canals	:	66 Km/2.87
	Other sources	:	NA/2.25
	Net Irrigated area	:	1439.94
	Gross irrigated area	:	2174.36
7.	NUMBERS OF GROUND WATER MONITORING WELLS OF CGWB (As on 31-3-2013) No of Dug Wells No of Piezometers	 : :	 10 Nil
8.	PREDOMINANT GEOLOGICAL FORMATIONS	:	Alluvium
9.	HYDROGEOLOGY		
	Major Water bearing formation Pre-monsoon Depth to water level (m. bgl) during 2012)	: :	Sand and Gravel 2.75(Kalwari)–5.67 (Basti)

	Post-monsoon Depth to water level (m. bgl) during 2012)	:	1.92 (Rudauli) – 4.57 (Basti)
	Long term water level trend in 10 yrs(2003-2012) in m/yr	:	Pre-Monsoon: Rise 0.002 – 0.22 Fall 0.0 - 0.049 Post- Monsoon Rise 0.01 – 0.08 Fall 0.004 - 0.08
10	GROUND WATER EXPLORATION BY CGWB (As on 31-3-2012)		No exploratory Tubewell has been constructed till date by CGWB
	No of wells drilled (EW, PZ, SH)	:	
	Depth Range of EW's (mbgl)	:	
	Discharge (lps)	:	
	Storativity (S)	:	
	Transmissivity (m^2/day)		
11.	GROUND WATER QUALITY		
	Presence of Chemical constituents more than permissible limit (e.g. EC, Cl, F, No3)	:	Arsenic reported from six blocks of the district
12.	DYNAMIC GROUND WATER RESOURCES (As on 31/3/2009) (Ham)		
	Annual Replenishable Ground Water Resources	:	94123.63
	Gross Annual Ground Water Draft	:	70996.19
	Projected Demand for Domestic industrial Uses upto 2033	:	7391.76
	Stage of Ground Water Development	:	75.43 %
13.	AWARENESS AND TRAINING ACTIVITY		
	Mass Awareness Programmes organized	:	Nil
	Water Management Training Programme organized	:	Nil
14.	EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING	:	
	Projects completed by CGWB (No & Amount spent)	:	Nil
	Projects under technical guidance of CGWB (Numbers)	:	NIl
15.	GROUND WATER CONTROL AND REGULATION		
	Number Of OE Blocks	:	Nil
	No of Critical Blocks	:	Nil
	No of blocks notified	:	Nil
16.	MAJOR GROUND WATER PROBLEMS AND ISSUES	:	Arsenic reported at some places.

1.0. INTRODUCTION

Basti district forms a part of Central Ganga Plain of Uttar Pradesh,and lies in the doab of Ghaghra and Rapti. It covers an area of 2688 sq.km. The district lies between the parallels of 26° 23' and 27° 30' North and Latitude and 82° 17' and 83° 20' East longitude. Its maximum length from north to south is about 75 km. and breadth from east to west about 70km. The district lies between newly created district Sant Kabir Nagar on the east and Gonda on the west. On the south, the Ghaghra river separates it from the Faizabad and newly created district named Ambedkar Nagar. While on the North it is bounded by district Sidharth Nagar. Administratively, the district is divided into 4 tehsils and 14 developmental blocks. Detail of administration of the district has been given in Table – 1.

Table 1 Area and Population of the Basti District

BLOCK	TEHSIL	BLOCK AREA(SQ. KM)	POPULATION
1. PARASRAMPUR		212.41	155439
2. GAUR		239.46	170733
3. HARRAIYA	**BASTI**	231.05	141531
4. VIKRAM JOT		300.23	118800
5. KAPTAN GANJ	**HARRAIYA**	235.05	135769
6. RAM NAGAR		234.80	142962
7. SALTAUA GOPALPUR		216.90	159169
8. RUDHAULI	**BHANPUR**	115.87	128987
9. SAOONGHAT		190.61	139082
10. BASTI SADAR		190.83	190856
11. BANKATI	**RUDHAULI**	185.81	156236
12. BAHADURPUR		229.10	143726
13. KUDRAHA		136.10	117289
14. DUBAULIYA		136.32	57357
TOTAL RURAL		2604.47	1957936
TOTAL URBAN		83.53	126878
TOTAL DISTRICT		2688.00	2084814

1.1 Drainage:

The district has two main river systems namely, the Ghaghra and Rapti, both of which ultimately form a part of the great Gangetic system. The other streams of the district are the Kuwana, its tributaries are, the Rawai, the Manwar and the Katnehia, and the Ami is a tributary of Rapti. River Ghaghra is formed by the combined waters of Kauriyala, Girwa, Chauka and other streams, which have their origin in the mountains of Kumaun and Nepal. The Ghaghra forms the southern boundary of the district. The river flows continually shifting channel within a broad sandy bed. During the rains it carries immense volume of water, but in dry weather it shrinks to small dimensions. The river has a constant tendency to change its course during the floods, and in this manner large tracts of land from time to time are shifted either to the northern or southern banks, rendering the total area of the district subject to incessant variation. Many point bar deposits are present within the course of river, locally known as *Deyara*. In monsson season Ghaghra river cross its bank and submerged adjoining area. Manwar or Kuwana are tributaries of Ghaghra river in the district.

1.2 Irrigation:

The irrigation facilities have been developed to a considerable extent in the whole of the district. The means of irrigation consist of canals, lift irrigation, well, tubewells, tanks and lakes besides minor irrigation works. For larger part of the district, groundwater serves as the assured source of supplemental irrigation. During the year 2010-11, about 92.7% of the net sown area was irrigated through groundwater resources. Blockwise status of the irrigation by different sources is given in Table 2

Table-2 Blockwise area (hect.) irrigated by different sources - Basti district (March 2011)

Block	Canals	Tubewell		Wells	Ponds	Others	Total Irrigated Area	Net Area Sown	% of Irrigated Area
		Public	Private						
1. Parasrampur	0	855	5986	3368	1350	16	11575	14194	81.55
2. Gaur	0	738	6836	3428	0	16	11018	18561	59.36
3. Harraiya	0	601	9352	3440	560	16	13969	16380	85.28
4. Vikram Jot	0	445	8583	3428	0	16	12472	18555	67.22
5. Kaptan Ganj	0	956	2536	3352	898	16	7758	10349	74.96
6. Ram Nagar	147	1487	2924	3302	562	16	8438	16487	51.18
7. Saltaua Gopalpur	0	993	5381	3429	559	16	10378	16806	61.75
8. Rudhauli	140	562	2640	3310	1127	16	7795	10646	73.22
9. Saoonghat	0	818	5305	3432	561	16	10132	16465	61.54
10. Basti Sadar	0	1528	3648	3458	901	16	9551	13898	68.72
11. Bankati	0	1208	7234	3511	557	16	12526	14761	84.86
12. Bahadurpur	0	446	6236	3413	556	16	10667	16801	63.49
13. Kudraha	0	585	4194	3538	1129	16	9462	13202	71.67
14. Dubauliya	0	368	2637	3439	1126	17	7587	11011	68.90
Total Rural	287	11590	73492	47848	9886	225	143328	208116	68.87
Total Urban	0	0	666	0	0	0	666	901	73.92
Total District	287	11590	74158	47848	9886	225	143994	209017	68.89

The total irrigated area by different sources is 143994 ha. While ratio of net irrigated area to the net sown area is 68.89%.Northern part of the district is mainly under canal irrigation . area under irrigation is highest in Harriya Block.

1.3 Previous works

Sri A.V. Singh, Scientist 'B' carried out reappraisal Hydrogeological Surveys during the year 1991-92 and1992 - 93. A report on Hydrogeology and Ground Water Potential of Basti district was compiled by Dr. A N. Lal Scientist –C in 2001-2002.

2. CLIMATE AND RAINFALL

The climate of the district is more equable than the adjoining districts to the south. The year may be divided into four seasons. The winter season, from mid-November to February is followed by the summer season lasting till about the middle of June. The period from mid-June to the end of September constitutes the south-west monsoon season. October to mid-November is the post monsoon or transition period. During the winter seasons the mean minimum temperature is about 9 degree Celsius and means maximum is 23 degree Celsius while during the summer seasons the minimum is about 25 degree Celsius and mean maximum is about 44 degree Celsius. During south-west monsoon and the post monsoon seasons the relative humidity is high, being above 70 percent. Thereafter the humidity decreases and in the summer air is very dry. Winds are in general very light with a slight increase in force in the late summer and monsoon seasons. The average annual wind velocity in the district ranges from 2 to 7.1 km/hrs.

The average annual rainfall in the district is 1169.8 mm. Maximum rainfall occurs during the monsoon period i.e. June to September having 87% of annual rainfall. July is the wettest month having the normal rainfall of 341.50 mm followed by August with normal rainfall of 311 mm.

3.0 GEOMORPHOLOGY & SOIL TYPE

3.1 Physiography, Geomorphologic features and Landforms

The district, inspite of its apparent uniformity of aspect, it divided topographically into several distinct tract namely, the low valley of the Ghaghra in the south, extending from that river to its tributary, the Kuwana; the central upland, between the latter river and the rapti; and the low and ill-drained paddy belt between the Rapti and the Nepal boundary.The altitude of the Basti district ranges between76 to 92 m amsl.

The district can be almost divided into two identifiable units, the upland plains underlain by Older Alluvium and the lowland plains underlain by Newer Alluvium. Younger alluvial plain is found along the Ghaghra river and it is flat to sloping slightly undulated terrain. It is produced by extensive deposits of alluvium and usually occur adjacent to flood plains and consist of various fluvial land forms which include back swamp, oxbow lake, old meander, meander scar, paleochannel and point bar. It mainly comprises of younger unconsolidated alluvial materials of varying lithology. In the younger alluvial plain area the ground water table is very shallow and ground water yield prospects are excellent. Older alluvial plain is similar to younger alluvial plain but are formed at the earlier stage of depositional regimes comprising of unconsolidated sediments, hence occurring comparatively far from the present flood plains of the river. Groundwater prospects are good to very good.

3.2 Soil Characteristics

The soils of the district consist broadly of "*Matiyar*" or clay, "*Dumat*" or loam. The hard clay soil or *Matiyar* is ideal for rice cultivation and very fertile. The *Dumat* or loam is also fertile soil, ideal for cultivation of various types of crops. This is the reason for high crop yields in the district. In the southern tahsil of Harriya and Basti the prevailing form of soil is loam, while in the north the area of clay approximates a extend to that of loam. The main variety of soils in the district are the loamy of dumat, the clayey or matiyar and the sandy soil is found along the high banks of river Ghaghra. Soils of the district are generally calcareous and similar to the alluvial soils. As regards of fertility, the district Basti is grouped under the medium category

4.0. GROUND WATER SCENARIO

4.1 Hydrogeology:

4.1.1 Water Bearing formations

Ground water occurs in the pore spaces of unconsolidated alluvial material in the zone of saturation. The near surface, clay kankar and sand beds support mainly open wells where ground water occurs under water table conditions. Kankar occurring at shallow depths, also yield sufficient water. Most of shallow tubewells tap water only from kankar and sandy horizons. The shallow aquifers occur under unconfined conditions, while deeper aquifers occur under semiconfined to confined state of disposition. The confining layers are impermeable clay beds.

Aquifer geometry

Alluvial tract of Basti district is underlain by sands of various grades, gravels, silt and clay. The actual thickness of the sediments is not known as CGWB has not carried out exploration in Basti district and the deepest well constructed by state government is only down to depth of 134.12 m bgl. However exploratory well have been constructed by CGWB in adjoining district Siddharthnagar upto a depth of 310 m bgl. The result of exploratory drillings indicates that the aquifers vary great deal in extent, both vertically as well as laterally. The southern part of the district is characterized by thicker aquifers, where sand and gravel predominate over clays. The northern part comprises of thinner granular zones and lenses of sand of varying lateral extent, dominated by thick clay. Broadly, a two (2) tier aquifer system can be inferred in the area down to depth of 300 mbgl. The sticky and yellowish clay marks the boundary between these aquifers at 114 m bgl.Ground water in the topmost aquifer occurs under phreatic or water table conditions while in intermediate and deeper aquifer it occur under semi confined to confined condition.

4.1.2 Depth To Water Level:

As per depth to water level data of ground water monitoring stations of Basti district of year 2012, pre monsoon water level varies from 2.75 mbgl (Kalwari) to 5.67 mbgl (Basti) .In Post monsoon period depth to water level varies from 1.92 mbgl (Rudauli) to 4.57 mbgl (Basti). Annual water level fluctuation (2012) varies from 0.13 to 3.19 meters. The perusal of the pre - monsoon depth to water level map reveals that depth to water level in the central part is deep, having water level in the ranges of 5 – 6 mbgl whereas in the rest of the district shallower water levels(2-5 mbgl) are observed .

4.1.3 Long Term Water Level Trend

Long term water level behavior of the ground water regime has been studied from the water level data of the ground water level monitoring stations (NHS) of CGWB. All of NHS wells except Rudauli shows falling trend during pre-monsoon and post-monsoon. The highest annual decline in the water levels is was observed at Basti 0.092 m/year.

4.1.4 Aquifer with yield, well and aquifer details

No exploratory well has been constructed by CGWB in Basti district under its ground water exploration programme.Based on the details of Tubewell constructed by state government ,the discharge ranges between 2208 and 2889 lpm while that of private Tubewell ranges between 300 to 500 lpm. The drawdown and other parameter are not known.

4.2 Ground Water resources

Ground water is the most dependable source of irrigation as wells as domestic and industrial water supply, due to its assured and timely supply low Cost structures. In Basti district, ground water resources cover about 90 % of the net irrigated area, and its demand is increasing regularly with growing population and other developmental activities. As per report on Dynamic Ground Water Resources of Utter Pradesh as on 31.03.2009 annual ground water availability of the district is 94123.63 ham .The Grass ground water draft for all uses is 70996.19 ham .The average stage of ground water development for the district is 75.43%. As per the estimates worked out, all blocks are under safe category.

TABLE-3 DYNAMIC GROUND WATER RESOURCES,(2009), BASTI DISTRICT ,U.P

Sl. No.	Assessment Units - Blocks	Annual Ground Water Recharge (in ham)	Net Annual Ground Water Availability (in ham)	Existing Gross Ground Water Draft For All Uses (in ham)	Net Ground Water Availability For Future Irrigation Development (in ham)	Stage of Ground Water Development (in %)	Category of Block
1	2	3	4	5	6	7	8
1	BAHADURPUR	8468.51	7621.66	5504.07	2063.50	72.22	SAFE
2	BANKATI	7729	6956.10	6220.71	424.09	89.43	SAFE
3	BASTI SADAR	7458.11	6712.30	5637.63	672.62	83.99	SAFE
4	DUBAULIYA	4609.07	4378.62	3278.19	999.44	74.87	SAFE
5	GAUR	8117.98	7306.18	6380.1	520.06	87.32	SAFE
6	HARRAIYA	7752.77	6977.49	6044.71	781.57	86.63	SAFE
7	KAPTANGANJ	7712.31	6941.08	5447.8	1399.45	78.49	SAFE
8	KUDRAHA	5863.14	5276.83	4388.4	736.65	83.16	SAFE
9	PARASRAMPUR	7253.29	6527.96	5579.57	538.74	85.47	SAFE
10	RAMNAGAR	7650.75	6885.68	3998.28	2761.99	58.07	SAFE
11	RUDAULI	5639.76	5357.77	3800.24	1450.54	70.93	SAFE
12	SALTAUA	8522.52	8096.39	4904.91	2953.58	60.58	SAFE
13	SAUNGHAT	7342.33	6608.10	4634.61	1966.59	70.14	SAFE
14	VIKRAMJOT	9419.42	8477.48	5176.97	3297.55	61.07	SAFE
	TOTAL	**103538.96**	**94123.63**	**70996.19**	**20566.36**	**75.43**	

4.3 GROUND WATER QUALITY

Ground water in the phereatic aquifer in general is colourless, odourless and slightly alkaline in nature. Specific Conductance (EC), which is a measure of total dissolved solids, indicates the ground water in the district is fresh and the EC values range from 303 to 1040 µ

mhos/cm at 25^{o}C .The arsenic value in the district has been found from nd to 0.004mg/l. Fluoride is ranges from 0.0 to 0.84 mg/l within the range of permissible limit.

CGWB analyzed 14 samples for arsenic contamination in ground water from the district. However, Uttar Pradesh Jal Nigam carried out sampling in six blocks of district, most of them lying along Ghaghara River where probability of occurrence of arsenic in ground water is more. Jal Nigam analyzed total of 3104 water samples , of which 12 samples have more than 50 ppb As in ground water. Most affected blocks are Bahadurpur, Parasrampur, Captainganj and Kudaraha. Detail of result is given in following table.

Table – 4 Status of Arsenic Contamination in Ground Water in Basti District.

		Concentration of Arsenic in Ground Water(ppb)				
District	**HPs tested**	**Not Detected**	**Upto 10**	**10 - 40**	**40- 50**	**Above 50**
Bahadurpur	**521**	**422**	**10**	**15**	**5**	**10**
Vikramjot	**636**	**570**	**48**	**7**	**9**	**2**
Paras Rampur	**517**	**286**	**147**	**84**	**0**	**0**
Harraiya	**542**	**188**	**38**	**22**	**0**	**0**
Kaptanganj	**566**	**383**	**45**	**61**	**3**	**0**
Kudaraha	**322**	**178**	**88**	**26**	**0**	**0**
Total	**3104**	**2027**	**376**	**215**	**17**	**12**

4.4 STATUS OF GROUND WATER DEVELOPMENT

In Basti district ground water extraction is done mainly through Private and State tubewells and borings with Pumpsets. The ground water development in the district ranges between 58.07% (Ramnagar block) and 89.43 (Bankati block) through various structures. In all blocks of the district ground water development takes place through dug wells, bore wells and State tubewells. The relevant details are given below.

S.No.	Type of structure	Number	Depth range (mbgl)	Yield (lpm)
1.	Dug wells	44	5.50-30.50	50-100
2.	State tubewells	535	80-134.12	2000-3200
3.	Borewells	76142	20-60	120-300

The wells generally meet out the domestic requirements. Irrigation is by far the main consumer of water- resources. There are 77392 diesel pump sets used in bore wells for irrigation. Maximum number of pump sets is in Harriya block i.e. 8300. State tubewell constructed by State Tube well division for irrigation.

Table 4 Blockwise status of sources of irrigation in district / block (31st march 2011)

Block	Canal length (km)	Govt. tube well (No.)	Perma-nent wells (No.)	Pumpsets				Ground pumpset (No.)
				Electricity Run (No.)	Diesel Run (No.)	Other (No.)	Total (No.)	
1. Parasrampur	**0**	**41**	**5**	**23**	**5833**	**12**	**5868**	**1**
2. Gaur	**0**	**36**	**2**	**21**	**6393**	**0**	**6414**	**0**
3. Harraiya	**0**	**28**	**3**	**25**	**8300**	**5**	**8330**	**1**
4. Vikram Jot	**0**	**19**	**2**	**24**	**7469**	**0**	**7493**	**1**
5. Kaptan Ganj	**0**	**45**	**0**	**27**	**3782**	**8**	**3817**	**0**
6. Ram Nagar	**26**	**73**	**2**	**30**	**4082**	**5**	**4117**	**1**
7. Saltaua Gopalpur	**0**	**47**	**2**	**26**	**5568**	**5**	**5599**	**1**
8. Rudhauli	**17**	**25**	**3**	**35**	**4255**	**10**	**4300**	**0**
9. Saoonghat	**0**	**38**	**3**	**25**	**5542**	**5**	**5572**	**0**
10. Basti Sadar	**10**	**74**	**4**	**33**	**4586**	**8**	**4627**	**0**
11. Bankati	**0**	**60**	**6**	**27**	**6635**	**5**	**6667**	**1**
12. Bahadurpur	**13**	**21**	**2**	**25**	**5941**	**5**	**5971**	**1**
13. Kudraha	**0**	**26**	**7**	**26**	**4820**	**10**	**4856**	**0**
14. Dubauliya	**0**	**15**	**3**	**25**	**3726**	**10**	**3761**	**0**
Total Rural	**66**	**548**	**44**	**372**	**76932**	**88**	**77392**	**7**
Total District	**66**	**548**	**44**	**372**	**76932**	**88**	**77392**	**7**

Drinking water tube-wells have been constructed in town area and villages for providing water through pipeline scheme. In rural area India Mark II Hand pumps have also been constructed for drinking water that benefited population of the district. Depth of these hand pumps varies from 25-50 m. Centrifugal pumps is commonly used for lifting water from shallow tubewell while submersible pump is used in deep well for high lift of water.

5.0GROUND WATER MANAGEMENT STRATEGY

5.1 Ground water development

The stage of ground water development in the district is 75.43 %.Ground water development in all blocks is above 60%. Less ground water developmenthas been observed in Kudraha and Ramnager block. Depth to water level is shallow in most part of the district, shallow tubewell (upto depth of 35 m), constructed by hand boring sets, is suitable to mitout the domestic irrigation requirement. Rotary (direct/Reverse)is suitable for construction of shallow tubewell. Deep tubewell is constructed through direct rotary method. The well assembly for moderately deep tubewells may have 40-50 m housing, tapping 30 to 40 m of granular zone. Since fine sand are encountered in granular zones, it is advised that slot size is between 0.75 to 1.00 mm. To increase the life and discharge of well, after lowering of well assembly tube well should be developed initially by air compressor followed by turbine pump till water is sand free.

5.2 Water conservation structure & artificial recharge

In Basti district, depth to water levels are within 5m bgl , artificial recharge is not required. CGWB has not constructed any recharge structure in the district.

6.0 GROUND WATER RELATED ISSUE AND PROBLEMS

6.1 Water Quality Problem (Geogenic)

On an average ground water quality of the district is good for drinking, irrigational and industrial uses. Few places in the district like Kalwari, Jagdishpur have arsenic concentration about 40ppb.Geomorpholgical and lithological condition of the district suggest that arsenic may be found at more places in the district. A detail study is required to identified arsenic affected area. Arsenic may be found in water owing to its mobilisation through arsenic-rich rocks. Concentrations of arsenic in fresh water vary in magnitude depending on the source of arsenic as well as local geo-chemical environment. Under natural conditions, the elevated concentrations of arsenic are generally found in the ground waters in flood plain and paleo-channels area.

6.2 Water Logging

Presently no part of the district is under water logging condition. Only small area of Bahadurpur Block prone to water logging. But a judicious conjunctive use is required in the area to avoid water logging condition as depth to water level in the district is in general about 3.0 m bgl.

6.3 Drilling problems

None.

6.4 Risk to natural disaster

NA

7.0 AWARENESS AND TRAINING AVTIVITY

No programme/activity has been organized in the block so far.

8.0 AREA NOTIFIED BY CGWA/SGWA

None

9.0 RECOMMENDATIONS

Following recommendations have been made to sort out ground water problems related to groundwater development, and ground water generated diseases.

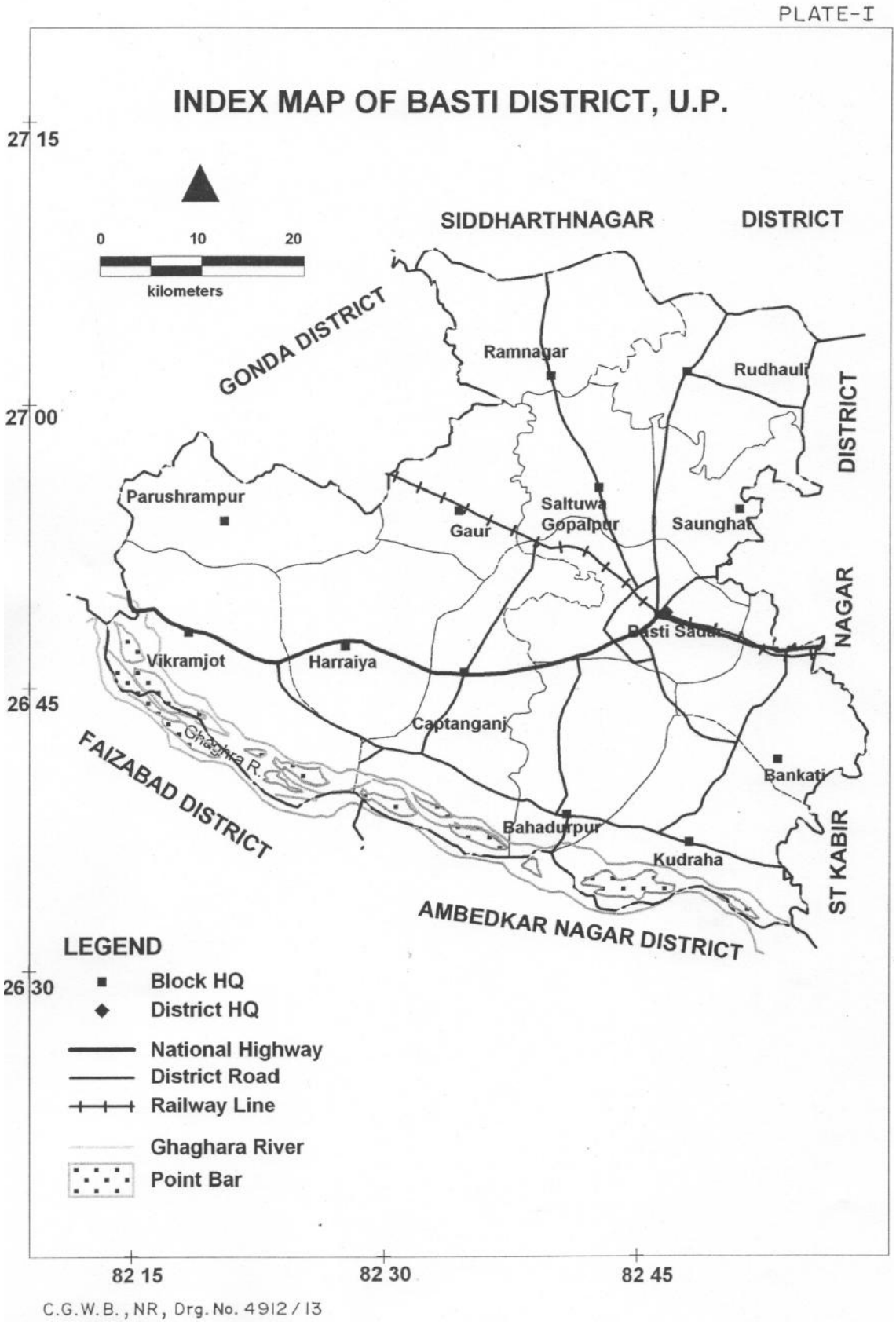
1) Judicious conjunctive use is required in the area to avoid water logging condition as depth to water level in the district is in general about 3.0 m bgl.

2) The problem of Arsenic pollution in ground water in Basti district is not in alarming stage. It is advised that the villages where Arsenic concentration is above the maximum permissible limit defined by BIS (IS 10500 – 91) should be identified. Arsenic field-testing kit could prove to a very useful instrument to commence the detailed investigations in these areas.

3) Only those hand pumps should be allow to use which have arsenic concentration below permissible limit. Jal Nigam should demarcate those hand pumps yielding water with higher Arsenic concentration with red paint. These markings would indicate that these pumps are not fit to be used for catering to human or livestock needs. Alternative sources of ground water may be identified and recommended for use.

4) The most important aspect of any pollution study is *not to scare but make people aware*. It is imperative to make people aware of the groundwater structures having high concentration of arsenic. The objective is to educate them – to use and/or avoid groundwater structures according to arsenic content in water. Mass awareness programmes should be organized in Arsenic affected area.

PLATE-I


INDEX MAP OF BASTI DISTRICT, U.P.
27 15
27 00
26 45
26 30
82 15
82 30
82 45
0
10
20
kilometers
SIDDHARTHNAGAR DISTRICT
GONDA DISTRICT
Ramnagar
Rudhauli
DISTRICT
Parushrampur
Gaur
Saltuwa Gopalpur
Saunghat
Basti Sadar
NAGAR
Vikramjot
Harraiya
Captanganj
Ghaghra R.
FAIZABAD DISTRICT
Bankati
Bahadurpur
Kudraha
ST KABIR
AMBEDKAR NAGAR DISTRICT
LEGEND
Block HQ
District HQ
National Highway
District Road
Railway Line
Ghaghara River
Point Bar
C.G.W.B., NR, Drg. No. 4912/13

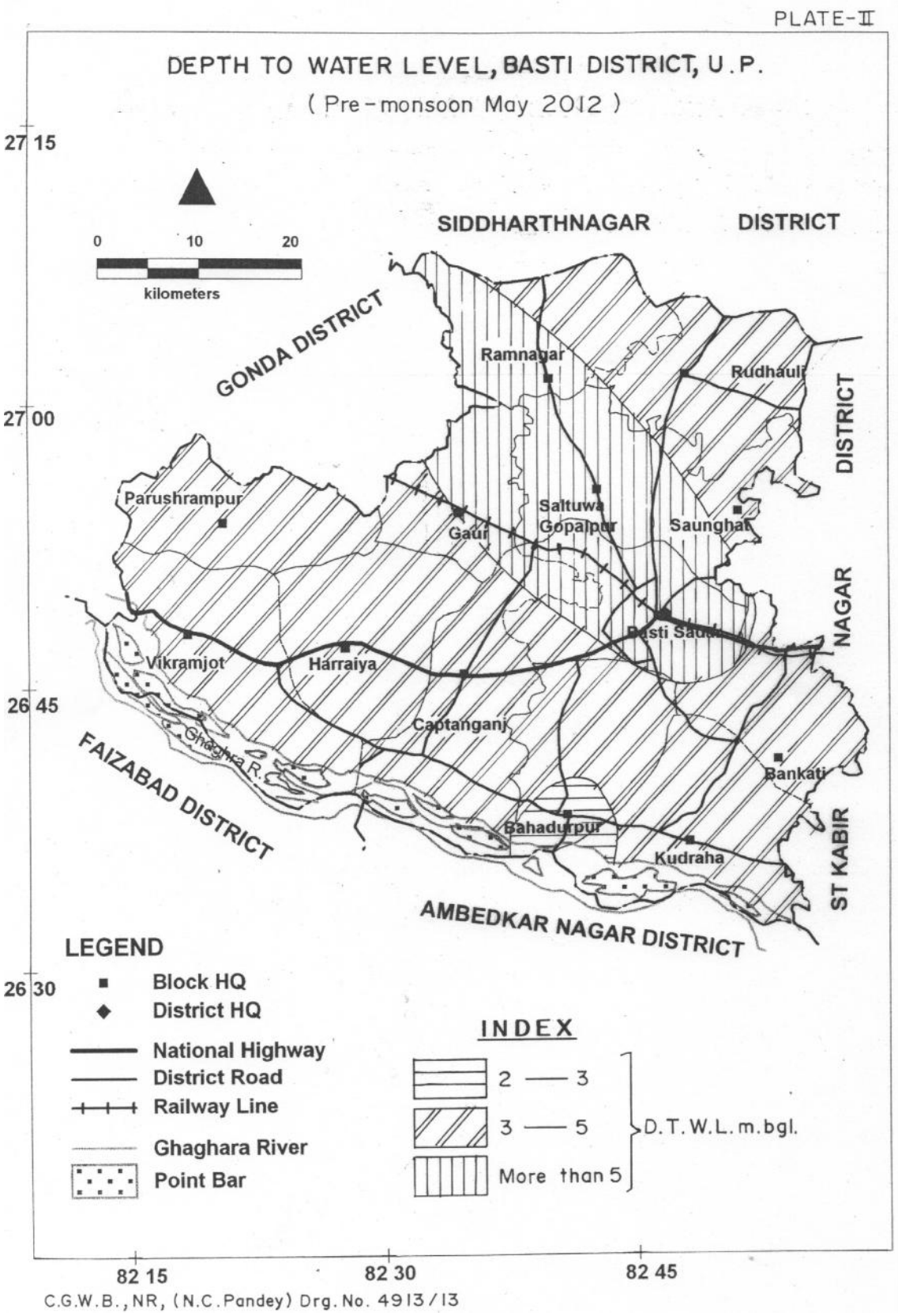


PLATE-II
DEPTH TO WATER LEVEL, BASTI DISTRICT, U.P.
(Pre-monsoon May 2012)
27 15
27 00
26 45
26 30
0 10 20
kilometers
SIDDHARTHNAGAR DISTRICT
GONDA DISTRICT
Ramnagar
Rudhauli
Parushrampur
Saltuwa Gopalpur
Gaur
Saunghat
Basti
Vikramjot
Harraiya
Captanganj
Ghaghra R.
FAIZABAD DISTRICT
Bankati
Bahadurpur
Kudraha
AMBEDKAR NAGAR DISTRICT
ST KABIR NAGAR DISTRICT
LEGEND
Block HQ
District HQ
National Highway
District Road
Railway Line
Ghaghara River
Point Bar
INDEX
2 — 3
3 — 5
More than 5
D.T.W.L. m.bgl.
82 15
82 30
82 45
C.G.W.B., NR, (N.C. Pandey) Drg. No. 4913/13

PLATE-III

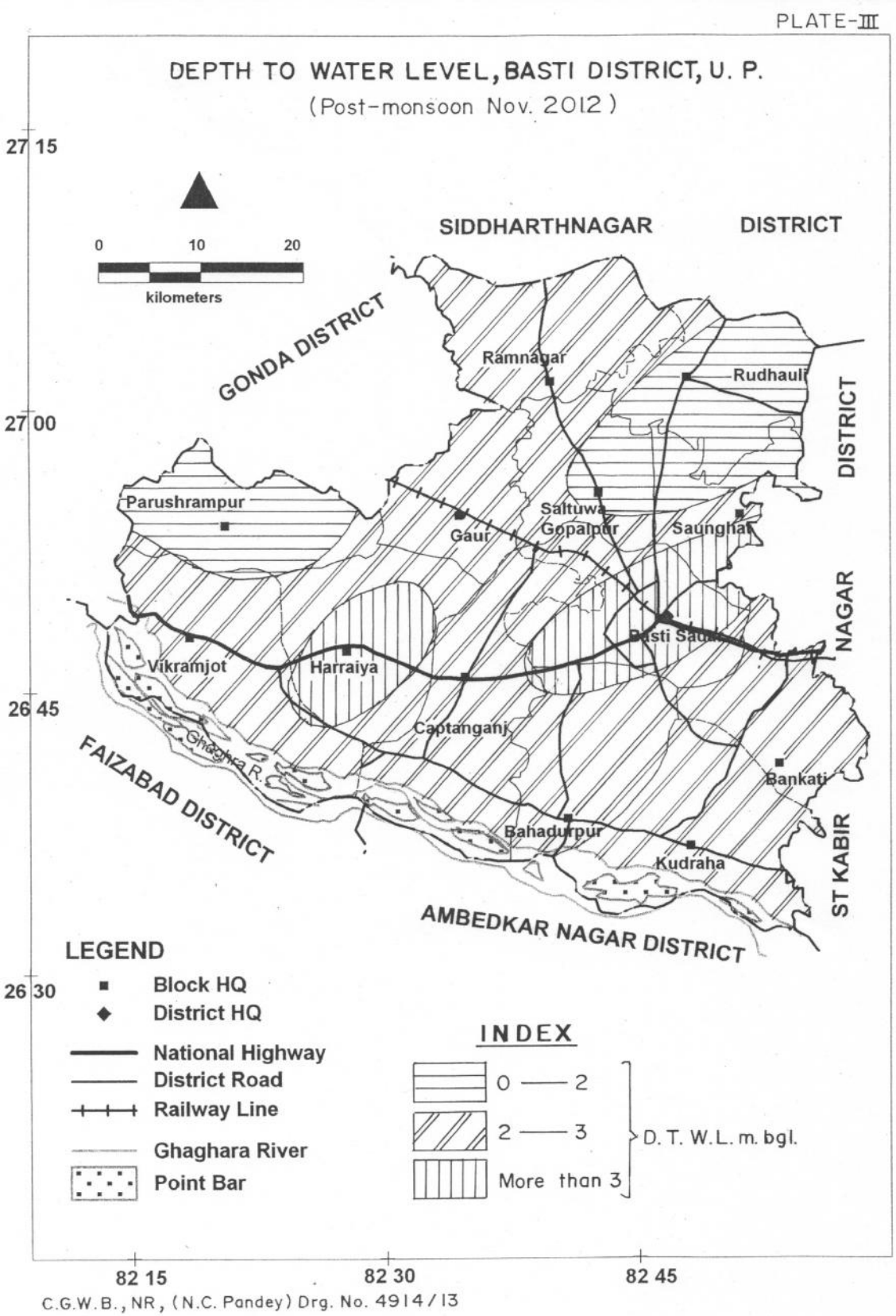
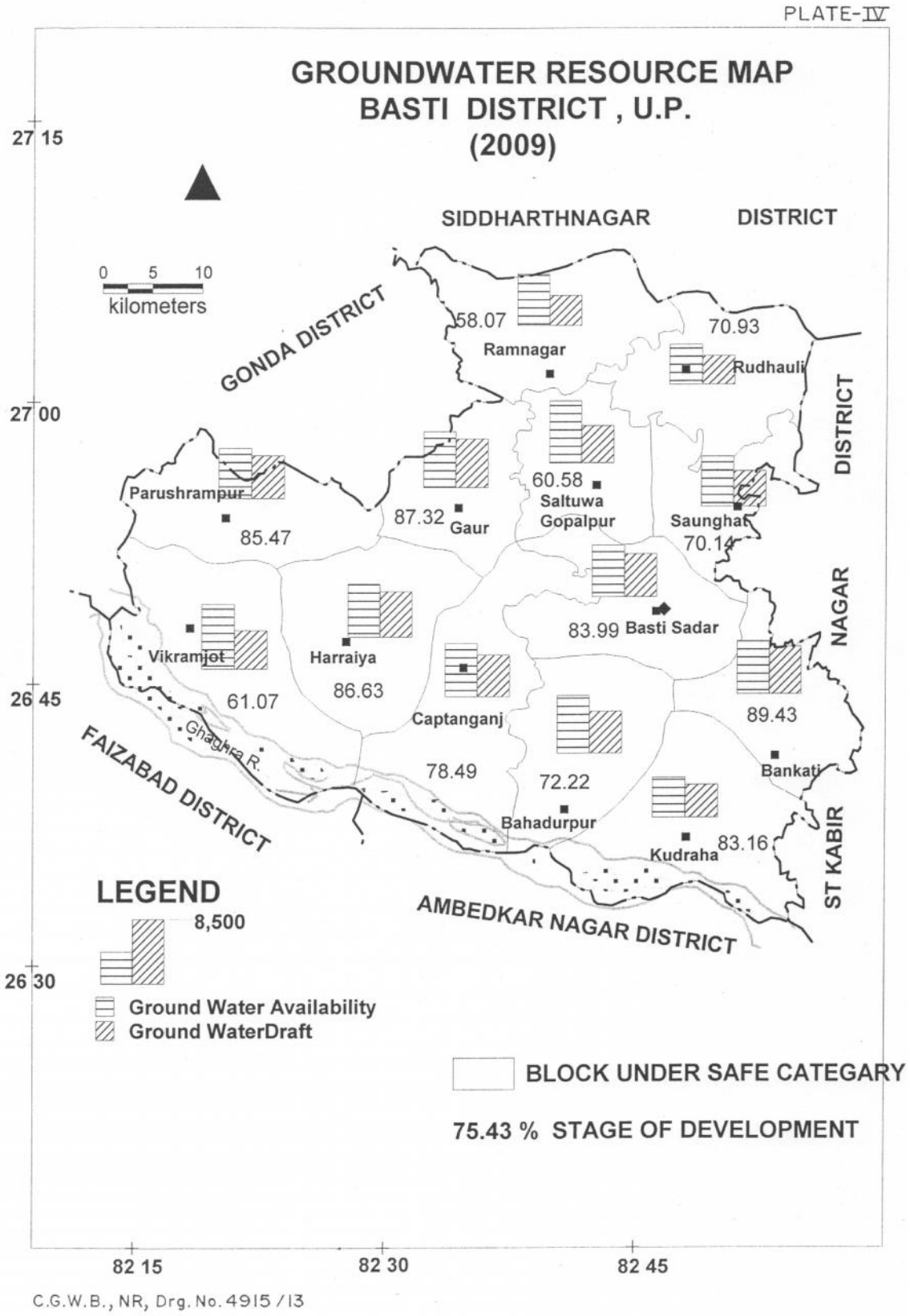
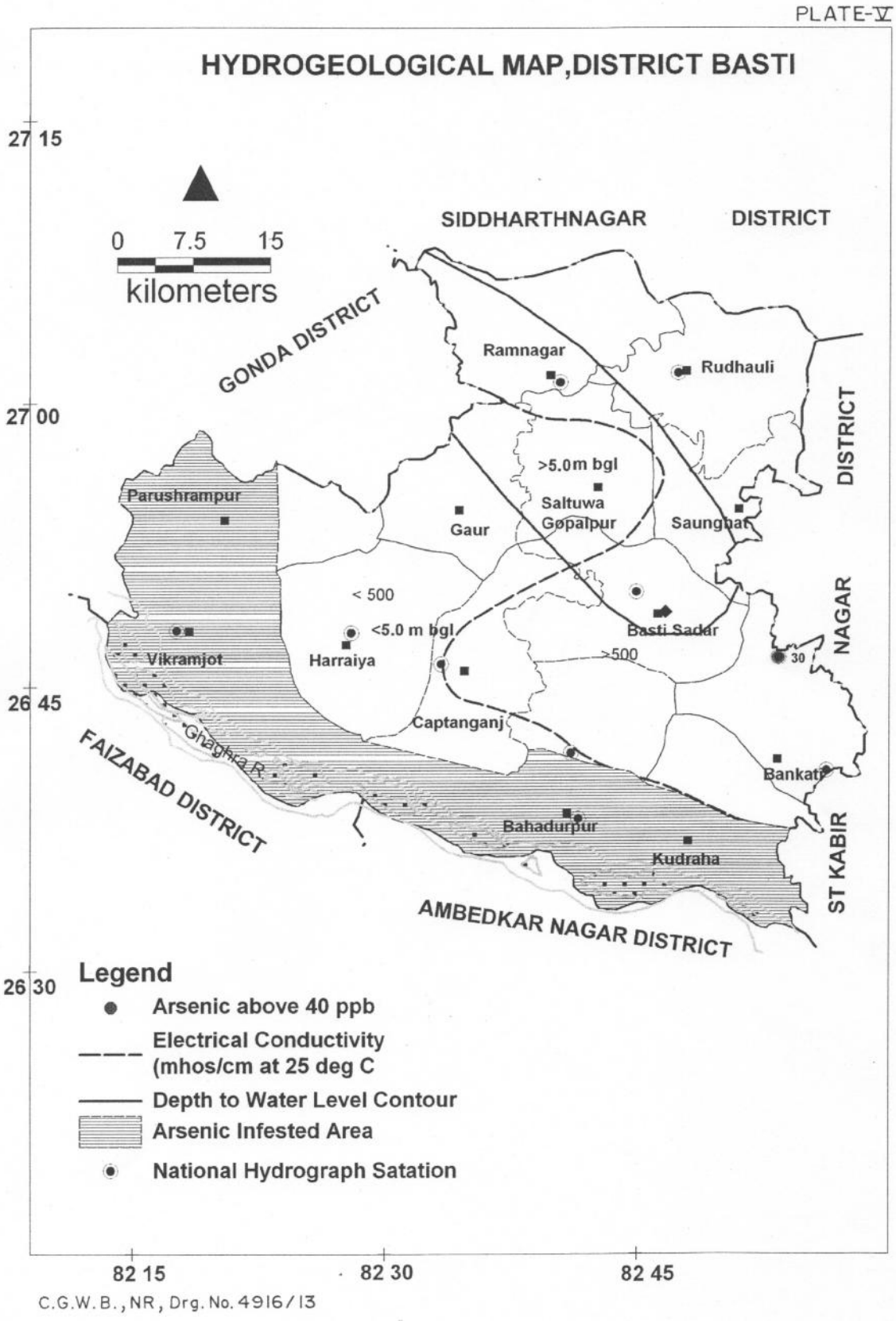

DEPTH TO WATER LEVEL, BASTI DISTRICT, U. P.
(Post-monsoon Nov. 2012)
27 15
27 00
26 45
26 30
0 10 20
kilometers
SIDDHARTHNAGAR DISTRICT
GONDA DISTRICT
Ramnagar
Rudhauli
DISTRICT
Parushrampur
Gaur
Saltuwa Gopalpur
Saunghat
Basti
NAGAR
Vikramjot
Harraiya
Captanganj
Ghaghra R.
FAIZABAD DISTRICT
Bankati
Bahadurpur
Kudraha
ST KABIR
AMBEDKAR NAGAR DISTRICT
LEGEND
Block HQ
District HQ
National Highway
District Road
Railway Line
Ghaghara River
Point Bar
INDEX
0 — 2
2 — 3
More than 3
D. T. W.L. m. bgl.
82 15
82 30
82 45
C.G.W.B., NR, (N.C. Pandey) Drg. No. 4914/13

PLATE-IV



C.G.W.B., NR, Drg. No. 4915 /13

PLATE-V


HYDROGEOLOGICAL MAP,DISTRICT BASTI
27 15
27 00
26 45
26 30
82 15
82 30
82 45
0 7.5 15
kilometers
SIDDHARTHNAGAR DISTRICT
GONDA DISTRICT
FAIZABAD DISTRICT
AMBEDKAR NAGAR DISTRICT
SANT KABIR NAGAR DISTRICT
Ramnagar
Rudhauli
Parushrampur
Gaur
Saltuwa Gopalpur
Saungpur
Basti Sadar
Harraiya
Vikramjot
Captanganj
Bankati
Bahadurpur
Kudraha
Ghaghra R.
>5.0m bgl
<5.0 m bgl
< 500
>500
30
Legend
Arsenic above 40 ppb
Electrical Conductivity (mhos/cm at 25 deg C
Depth to Water Level Contour
Arsenic Infested Area
National Hydrograph Satation
C.G.W.B., NR, Drg. No. 4916/13