

GROUND WATER BROCHURE OF CHANDAULI DISTRICT, U.P.

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CHANDAULI DISTRICT AT GLANCE

1. GENERAL INFORMATION

i. Geographical Area (Sq. Km.)	:	2541
ii. Administrative Divisions	:	
Number of Tehsils		3
Number of Blocks		9
Number of Villages		1637
iii. Population (as on 2011 census)	:	
Male		1017905
Female		934851
Total		1952756
iv. Average Annual Rainfall (mm)	:	1019.00

2. GEOMORPHOLOGY

Major Physiographic Units	:	(i) Northern Alluvial Plain (ii) Southern Hilly Region
Major Drainages	:	River Ganga, River Karamnasa, Chandraprabha

3. LAND USE (Ha.)

a) Forest area	:	77400
b) Net sown area	:	133147
c) Area sown more than once	:	88720
d) Gross area sown	:	221867

4. MAJOR SOIL TYPES

:	(i) Alluvial
:	(ii) Residual
:	c. Bhur or sand

5. AREA UNDER PRINCIPAL CROPS (Ha.)

Jayad	:	350
Kharif	:	121371
Rabi	:	115733

6. IRRIGATION BY DIFFERENT SOURCES (Areas and Number of Structures) Ha.

Dugwells	:	-
Tubewells Govt.	:	246
Tubewells Pvt.	:	15341
Ponds	:	-
Canals	:	534 Km.

	Other sources	:	-
	% of Net area Irrigated to net area sown	:	96.5%
7.	NUMBER OF GROUND WATER MONITORING WELLS OF CGWB (As on 31-3-2012)	:	9
	No. of Dugwells	:	9
	No. of Piezometers	:	-
8.	PREDOMINANT GEOLOGICAL FORMATIONS	:	Alluvium, Vindhyan quartzite and sandstone
9.	HYDROGEOLOGY		
	Major water bearing formation	:	
	Pre-monsoon Depth to water level during 2012	:	1.42 – 14.24 mbgl
	Post-monsoon Depth to water level during 2012	:	0.81 - 13.23 mbgl
	Long term water level trend in 10 years (2003-2012) in m/yr	:	
	Premonsoon		Rise 0.0486 (in three wells) Fall 0.2184 (in six wells)
	Postmonsoon		Rise 0.0891 (in three wells) Fall 0.0903 (in six wells)
10.	GROUND WATER EXPLORATION BY CGWB (As on 31-3-2012)		
	No of wells drilled (EW, OW, PZ, SH, Total)	:	23, 0, 0, 0, 0 = 23
	Depth range (m)	:	70.00 – 274.00
	Discharge (litres per second)	:	60 – 2403
	Storativity (S)	:	-
	Transmissivity (m ² /day)	:	-
11.	GROUND WATER QUALITY		
	Electrical Conductivity	:	413 – 1380 µs/cm
	TH as CuCO ₃ (mg/l)	:	220 – 555
	Fluoride (mg/l)	:	0.11 – 0.74
	Nitrate (mg/l)	:	5.83 – 33.58
	As contents and Trace metals such as Cu, Fe, Zn, Na, Pb, Cr are within the limit of BIS		
12.	DYNAMIC GROUND WATER RESOURCES (HAM) as on 31-3-09		
	Net Annual Ground Water Availability	:	70660.86
	Gross Annual Ground Water Draft	:	19577.47

	Net Ground Water Availability for Irrigation	:	45035.43
	Stage of Ground Water Development	:	33.45%
	Allocation for Domestic and Industrial Requirement	:	6047.95
13.	AWARENESS AND TRAINING ACTIVITY	:	Nil
14.	EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING	:	Nil
15.	GROUND WATER CONTROL AND REGULATION	:	Nos. of Blocks notified – Nil
16.	MAJOR GROUND WATER PROBLEMS AND ISSUES	:	Water scarcity and drought prone area.

GROUND WATER BROCHURE OF CHANDAULI DISTRICT, U.P.

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1.0 INTRODUCTION

Chandauli district covers an area of 2541 sq.km. and forms a part of the Ganga Basin and lies in the doab of the river Ganga and Karam Nasha. Earlier it was a part of Varanasi district. The district lies between latitude 24⁰44'30" N and longitude 83⁰01'30" to 83⁰30'00" E. As per the census of 2011 the population of the district is 1952756.

The hydrogeological survey work carried out by CGWB is available in three reports, "Geology and ground water potential of Varanasi district, U.P." by B.D. Pathak (1967), "Hydrogeology and Ground Water Potentials of Varanasi district, U.P." by V.N. Dube and V.K. Sehgal (1984) and "Hydrogeological Frame Work and Ground Water Resource Potential, Varanasi district, U.P." by P.S. Chauhan (1997-98). The Ground water exploration was carried out in a later phase in this area and a number of exploratory bore wells have been converted into production wells.

The drainage in the district is controlled by the river Ganga which is flowing roughly south-west to north-east in the beginning then WNW to SES in the later phase, and forms boundary with Ghazipur district. One of the major tributary of river Ganga is Karam-nasha River which flows from SW to NE and forming boundary with the Bihar state. Chandra Prabha is another tributary which flows in the central part of the area.

2.0 CLIMATE & RAINFALL

The average annual rainfall is 1069.6 mm. The climate is sub humid and it resembles that of the eastern districts of UP being moist and relaxing except in the

cold and summer season. About 90% of rainfall takes place from June to September. During monsoon surplus water is available for deep percolation to ground water.

There is a meteorological observatory at Varanasi, the records of which may be taken as representative meteorological condition. May is the hottest month with the mean daily maximum temperature at 41.5⁰C, mean daily minimum temperature at 26⁰C and maximum temperature in this period may sometimes be high at 47⁰C. With the onset of the monsoon temp begin to drop and night temperature continues to be high. January is the coldest month with mean daily maximum temperature at about 23⁰C and mean daily minimum temperature about 9.7⁰C. The mean monthly maximum temperature is 32.2⁰C and means monthly minimum temperature is 19.9⁰C.

During the cold season and first half of the hot season the air is very dry. The mean monthly morning relative humidity is 66% and means monthly evening relative humidity is 50%.

Winds are generally high throughout the year, the mean wind velocity is 5.5 kmph. The potential evapotranspiration is 1608.9 mm.

3.0 GEOMORPHOLOGY AND SOIL TYPES

The geomorphology plays an important role on the ground water regime. The relief, slope, depth of soil types and assemblage of different land forms hold significantly on the occurrence and movement of ground water. The soils were classified in two broad groups, alluvial and residual, representing the different stages of soil development resulting from a sub-humid to a humid climate and the physical and chemical weathering of the soils. The alluvial group comprising the northern part of the district and the southern part possesses soils developed insites from the Vindhyan roads. Both the types are inherently and genetically different in nature. Agriculturally also, they behave differently, the alluvial soils being very productive and the soils of the Vindhyan system supporting only sparse cultivation. Thus the following types of soils have been recognised in the district.

(a) *Alluvial Group (Ganga Sand):*

The Ganga flood plain within its high and abrupt bank consists of a stretch of sand generally sterile of producing nothing beyond grasses used for thatching but occasionally covered with a rich and fertile deposit left behind by annual floods. Ganga sand is brown to greyish brown in colour and needs heavy organic manuring. Inferior cereals like Bajra, Barley, and Sugarcane do well in this type of soil.

(b) *Varanasi Type-II (Dhankar):*

This type of soil is found in patches in Chandauli and Chakia. The soil is clayey and grey to dark in colour and have a high percentage of soluble salts and at places are mixed with kankar. The low land soil needs light irrigation and is suitable for the cultivation of Paddy, Barley, Pea, Sugarcane and Barseam.

(c) *Karail:*

This type of soil is found in a long narrow belt roughly parallel to Karam-nasa river. The soils bear a great resemblance to the black colour mar or Kabar soils of Bundelkhand region or the Black cotton soils of Central India. They cannot be used for agricultural purposes.

(d) *Varanasi Type 3-A:*

This is found in Chakia for a short distance along the rivers Chandra Prabha and Karam-nasa. The soil is loamy sand, yellow to brown in colour and require frequent but light irrigation being well suited for the cultivation of Barley, early Paddy, Barseem and Sugarcane.

(e) *Varanasi Type- A:*

This is found in the Vindhyan Upland which comprises the greater part of tehsil Chakia. The soil has the texture of sandy loam, is brown to reddish brown in colour. Inferior Millets, Til, Oilseeds, Barley and Gram are the usual crops grown in these soils.

(f) *Varanasi Type-V:*

This is found in the Vindhyan low land in the western and south-western parts of Chakia Tehsil. The soil is loam to clayey loam is blackish in colour and possesses

some particles of kankar. It requires light irrigation and is good for growing Paddy, Pea and Oilseeds.

4.0 GROUND WATER SCENARIO

The district Chandauli is mainly underlain by Gangetic alluvium in the northern part, the deposition of which commenced from the Pleistocene period after the final upheaval of the Himalayas. It consists of interbedded layers of sand, silt and clay, which are associated at places with kankar.

The Vindhyan rocks which occur in the southern part of the district, consists of Quartzite and Sandstones belonging to the Dhandraul and Scarp-Sandstone stages. The mineral products that are commonly found in the district are Reh, Kankar and Pottery earth.

Following is the generalised Geological sequence of the district.

Geology of the District Allahabad

Age	Formation	Lithology
Upper Pleistocene to Recent	Newer Alluvium	Unconsolidated sand, silt and clays.
Middle to upper Pleistocene	Older Alluvium	Fairly consolidated clay with kankar, sand, fine to medium with some gravel.
Upper Vindhyan	Kaimur sandstone and quartzite	Sandstones, grey to white, buff, Arkosic with capping of Laterites and Bauxite.

MODE OF OCCURRENCE OF GROUND WATER:

Ground water occurs in both, the Kaimur sandstone and unconsolidated alluvial sediments in the district.

In the Kaimur sandstone, the occurrence and movement of ground water are controlled by the size, depth, spacing and degree of Joints, Bedding, Fractures and Fissures. The availability of ground water in a well depends upon encountering the number of Fractures, joints etc. and the extent of weathering in them. Generally the ground water occurs under water table condition.

In the unconsolidated alluvial sediments ground water occurs in the pore spaces in the zone of saturation. The ground water in the unconsolidated deposits of the older alluvium in the area comprises of two bodies, (i) a shallow ground water body which occurs principally in clay and kankar beds of back swamp deposits and (ii) deep or main ground water body which occurs in thick sands of the meander belt deposits. These two water bodies are hydraulically distinct. The back swamp deposits are thick but are likely to be interconnected when they are comparatively thin. The shallow ground water in back swamp deposits is generally confined and its static water level is only few metres bgl. It supplies water to the dugwells. The deep ground water body in meander belt deposits is considered to be hydraulically continuous and is confined in nature. It supplies water to the tube wells for irrigation, industrial and domestic uses.

DEPTH TO WATER LEVEL:

Depth to water level data collected from ground water monitoring wells in May 2012 and November 2012 have been utilized to prepare depth to water level contour maps for pre-monsoon (Plate- II) and Post-monsoon (Plate-III) period.

Table-I

WATER LEVEL FLUCTUATION (PRE AND POST) FOR THE SELECTED YEAR 2012

State : Uttar Pradesh

District: Chandauli

Sl. No.	Well Name	Pre-Monsoon (mbgl)	Post-monsoon (mbgl)	Fluctuation
1	Buburi	10.66	4.77	5.89
2	Chahania	4.49	3.29	1.20
3	Chakia	6.01	3.18	2.83
4	Chandauli	3.47	1.52	1.95
5	Dhanapur	4.09	2.68	1.41
6	Kamalpur	8.77	3.60	5.17
7	Marupur xing	14.24	13.23	1.01
8	Mugal Sarai	1.42	0.81	0.61
9	Sakal diha	6.26	1.82	4.44

A perusal of the table and depth to water level contour map for the period May 2012 reveal that water level varies from 1.42 mbgl as seen in Mugal Sarai to 14.24 mbgl at Maruppur xing.

A perusal of the table and depth to water level contour map for the period November 2012 reveal that water level varies from 0.81 mbgl in Mugal Sarai to 13.23 mbgl in Marupur xing.

SEASONAL FLUCTUATION:

The fluctuation in water level varies from 0.61m to 5.89m. The maximum fluctuation is observed at Baburi (Block-Chandauli)

LONG TERM WATER LEVEL TREND:

The long term water level trend from year 2003-2012 is given in table-1. During pre-monsoon period rising trend of water level was observed at Dhanapur, Chaharia and Mugal Sarai monitoring stations. Whereas during post-monsoon period rising trend was observed at the same monitoring stations. Annual rising trend was also observed at Dhanapur, Chaharia and Mugal Sarai monitoring stations. Declining trend was observed at rest six monitoring stations during pre-monsoon period. Post-monsoon period and annual also.

Ground Water Exploration and Aquifer Parameters

In total 23 exploratory wells were drilled in Chandauli district. Out of these 23 wells, 11 wells were drilled in northern part of the district in alluvial area and rest 12 wells were drilled in Hard rock area in southern part of the district.

Drilled depth of exploratory wells drilled in alluvial area ranges from 70.00 mbgl to 274.60 mbgl. Static water level ranges from 3.73 mbgl to 13.12 mbgl. Their discharge ranges from 500 lpm to 3525 lpm with drawdown ranges between 4.46 to 22.00 m. The value of Transmissivity (T) was found 6196 m²/day at Vyas Nagar exploratory well. The salient features of the exploratory wells are given in Table II.

Drilled depth of exploratory wells drilled in hard rock area ranges from 78.00 mbgl to 160 mbgl. Static water level ranges from 0.68 to 10.21 mbgl. Their discharge ranges from 30 lpm to 240.3 lpm. The salient features of the exploratory wells are given in table-II.

GROUND WATER RESOURCE:

Precipitation is the main source of ground water recharge in the district. The quantity of recharge depends upon the intensity and duration of rainfall, nature and texture of soil, vegetation cover, fractures, joints and fissure pattern in hard rock areas and land use pattern of the area.

The other source which replenish the ground water are as under:

1. Seepage from canal systems.
2. Return flow from applied irrigation
3. Sub-surface inflow from adjoining areas.
4. Influent recharge from the river system.

The Dynamic Ground Water Resource of the district are given in Table-II. All the 9 blocks of the district falls under the safe category. The overall stage of ground water development in the district is 33.45%.

Table-III

DYNAMIC GROUND WATER RESOURCES OF CHANDAULI DISTRICT,

U.P.

(As on 31.03.2009)

Sl. No.	Assessment Units Blocks/ District	Net annual ground water availability (in ham)	Existing gross ground water draft for all uses (5+7)	Net ground water availability for future irrigation development (4-5-9)	Stage of ground water development (in %) (8/4)×100	Category
1	2	3	4	5	6	7
1	Barahani	13246.22	2858.00	9678.18	24.64	Safe
2	Chahania	8064.95	3104.50	4135.51	44.27	Safe
3	Chakia	3674.30	2690.50	291.23	83.85	Safe
4	Chandauli	10529.70	3695.50	5935.14	39.46	Safe
5	Dhanapur	9938.72	3404.00	5606.75	39.37	Safe
6	Naugarh	3515.45	1372.75	1200.97	54.91	Safe
7	Niyamatabad	7864.58	1076.50	5040.84	22.22	Safe
8	Sakatdiha	10254.89	672.35	8291.00	12.59	Safe
9	Shahabganj	3572.06	343.37	2544.05	19.17	Safe
	Total	70660.86	19577.47	45035.43	33.45	

STATUS OF GROUND WATER DEVELOPMENT (BLOCK-WISE):

The status of ground water development (block-wise) is given in Table-II.

The block-wise proposal of ground water development for irrigation purpose in the district is given in Table-III. The categorization of blocks is presented in Plate-IV.

Table-III

BLOCK WISE PROPSAL OF GROUND WATERL DEVELOPER FOR IRRIGATION PURPOSE IN CHANDAULI DISTRICT, UP

Sl. No.	Block	Net ground water availability for future irrigation development (ham)	Ground water availability for irrigation (85% of col 3) (ham)	Ground Water proposed to be utilized for irrigational development (70% of col 4) (ham)	Proposed Structures		Additional irrigation may be created (ha) (average depth of irrigation water adopted 0.50 m) (col 5/0.50)
					No. of State tubewells (taking 50% of col 5, unit draft 12.8 ham)	Private tube wells with pumping sets (taking 50% of col 5, unit draft 1.8 ham)	
1	2	3	4	5	6	7	8
1	Barahani	13246.22	11259.29	7881.50	308	2189	15763.00
2	Chahania	8064.95	6855.21	4798.65	187	1333	9597.30
3	Chakia	3674.360	3123.15	2186.20	85	607	4372.40
4	Chandauli	10529.70	8950.24	6265.16	245	1740	12530.32
5	Dhanapur	9938.72	8447.91	5913.37	231	1643	11826.78
6	Naugarh	3515.45	2988.13	2091.69	82	581	4183.38
7	Niyamatbad	7864.58	6684.89	4679.42	183	1300	9358.84
8	Sakaldiha	10254.89	8316.66	6101.66	238	1695	12203.32
9	Shahabganj	3572.06	3036.25	2125.37	83	590	4250.74
		70660.87	60061.73	42043.22	1642	11678	84086.44

GROUND WATER QUALITY:

Ground water in phreatic aquifers in general, is colourless, odourless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone ranges from 390 to 1420 $\mu\text{S}/\text{cm}$ at 25°C has been observed in 50% of the samples analysed.

It is observed that the ground water is suitable for drinking, domestic and agricultural uses in respect of all the constituents. Arsenic content has been found within the limit of 10 microgram/litre in ground water of the area.

5.0 GROUND WATER MANAGEMENT STRATEGY

Ground Water Development:

Ground water development should take place in those blocks only where the stage of ground water development falls under safe category (Table II). Since all the blocks in Chandauli district falls under safe category hence there is lot of scope for ground water development in the district.

Water Conservation and Artificial Recharge:

In the areas where depth to water level is more than 8.00 mbgl during pre-monsoon period and during post-monsoon period depth to water level is more than 5.00 mbgl and there is declining trend, there is need to adopt techniques of water conservation and Artificial recharge.

In such urban areas, roof top rain water harvesting should be made mandatory for all government buildings, schools etc. Recharge pits, shafts and trenches of suitable design are ideal structure for rain water harvesting in such area. As the southern part of the district is hard rock terrain, following techniques are suitable for water conservation.

- a. Construction of Percolation tanks
- b. Construction of check dams
- c. Construction of Gabbion structures and
- d. Construction of sub-surface dykes.

Central Ground Water Board provides free technical guidance for implementation of roof top rain water harvesting schemes and conservation of water schemes.

6.0 GROUND WATER RELATED ISSUES AND PROBLEMS

As such there is no such water related issue in northern parts of the district except deep water levels adjacent to river Ganga. During post-monsoon period shallow water levels around Mugal Sarai area is a matter of concern. In fact annual rising trend is observed in Dhanapur, Chahania and Mugal Sarai blocks and more emphasis should be given to extraction of water from ground, in these blocks. In southern hilly areas of the district where ground water is available in fractures, joints and cracks etc. there is need of extensive geo-physical surveys to locate the suitable sites for ground water extraction structures.

7.0 AWARENESS & TRAINING ACTIVITY

Mass Awareness Programme (MAP) and Water Management Training Programme (WMTP) by CGWB:

Central Ground Water Board has not conducted any Mass Awareness Programme and Water Management Training Programme in the district.

Participation in Exhibition, Mela, Fair etc: Nil

Presentation and lecture delivered in Public Forum/Radio/T.V. Institute of repute/Grass root Association/NGO/Academic Institution etc.: Nil

8.0 AREA NOTIFIED BY CGWA/SGWA

Nil

9.0 RECOMMENDATIONS

- i. Further development of ground water in Barahani, Chakia, Chandauli, Niyamtabad and Sakaldiha blocks should be done judiciously and through proper management, as these blocks showing declining trend.
- ii. In other blocks where the ground water levels are more or less stable or showing rising trend to a limited extent, the ground water can systematically be developed to boost the agriculture economy of the district.
- iii. In urban areas where depth to water levels is more than 8.00 mbgl during pre-monsoon period and more than 5.00 mbgl during post-monsoon period, there is need to adopt techniques of water conservation and Artificial recharge.
- iv. To minimise the over stress on phreatic aquifer, it is advisable to plan heavy duty water supply tube wells for future uses by exploiting the ground water from the deeper aquifer.
- v. Excessive use of fertilizers by the formers should be discouraged particularly in blocks showing high Nitrate concentration.

TREND OF WATER LEVEL - ALL
From Year 2003 to 2012

State : Uttar Pradesh

District : Chandauli

Sl. No.	Location	Pre Monsoon			Post Monsoon			Annual		
		<i>Data Points</i>	<i>Rise (m/year)</i>	<i>Fall (m/year)</i>	<i>Data (Points)</i>	<i>Rise (m/year)</i>	<i>Fall (m/yea)</i>	<i>Data Points</i>	<i>Rise (m/year)</i>	<i>Fall (m/year)</i>
38	Chandauli	10		0.0274	10		0.0815	42		0.0262
39	Naubatpur	0			0			1		
40	Naugarh	3			5			20		
41	Amna	2			2			7		
42	Dhanpur	10	0.0049		10	0.0057		38	0.0089	
43	Sakaldiha	10		0.1576	10		0.0150	40		0.0134
44	Kamalpur	10		0.2989	10		0.0021	40		0.1303
45	Chahania	9	0.1040		10	0.1790		37	0.1772	
46	Mugal Sarai	10	0.0370		10	0.0827		40	0.0156	
47	Marufpur xing	8		0.4341	8		0.3323	31		0.4840
48	Chakia	10		0.0552	10		0.0133	40		0.0154
49	Baburi	9		0.3376	8		0.0980	37		0.0931
50	Chandra Prabha	2			5			14		

Table-II

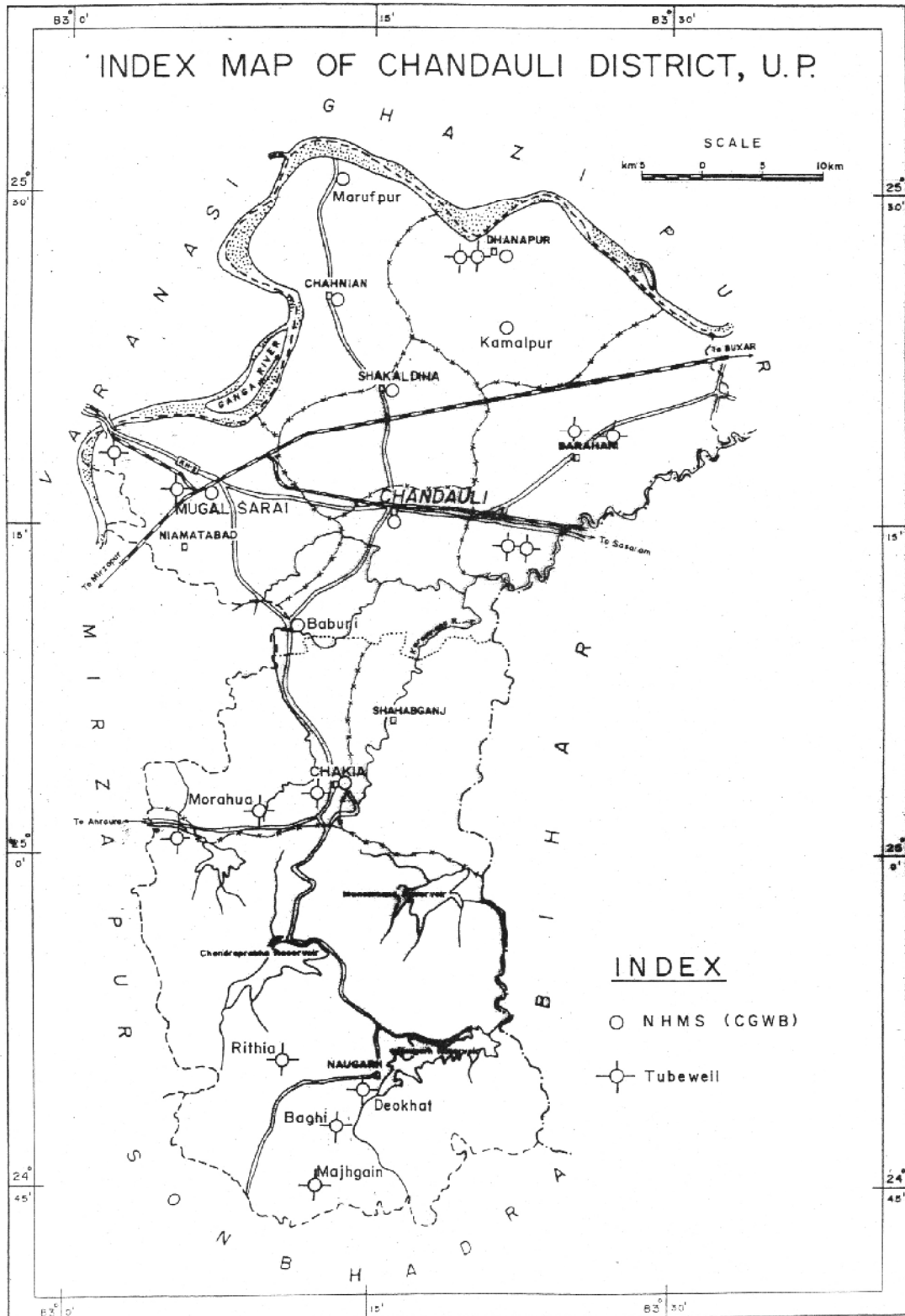
CHANDAULI (ALLUVIAL AREA)

Sl. No.	Location	Type of Well	Year of construction	Depth drilled (mbgl)	Well constructed (mbgl)	Depth of well / overburden	Zone tapped / Fracture zone	Static water level (mbgl)	Discharge (lpm)	Drawdown (m)	Transmissivity (T) m ² /day	Storativity (S)	Lithology
1	Barahani	EW	2004-05	200.12				6.7	3478	9.31			Alluvium
2	Muhammadpur	EW		200.50			135-155	8.38	2994	5.97			Alluvium
3	Muhammadpur (For sp. yield)	EW		179.00			45-69						Alluvium
4	Vyas Nagar	EW	2004-05	200.30			96-120	13.12	3525	4.46	6196		Alluvium
5	Amra	EW	2005-06	198.00			98-110	8.78					Alluvium
6	Ayawati	EW		200.50			114-130	5.10	3046	8.85			Alluvium
7	Hingutagarh	EW		200.50			107-123	10.45	3240	7.29			Alluvium
8	Hingutagarh	EW		70.00			55-67						Alluvium
9	Sikandarpur	EW		94.80			70-78	3.73	500	22.00			Alluvium
10	Bhurkura	EW	2006-07	137.00			74-81	7.98					Alluvium
11	Alinagar	EW	1997-98	274.60									Alluvium

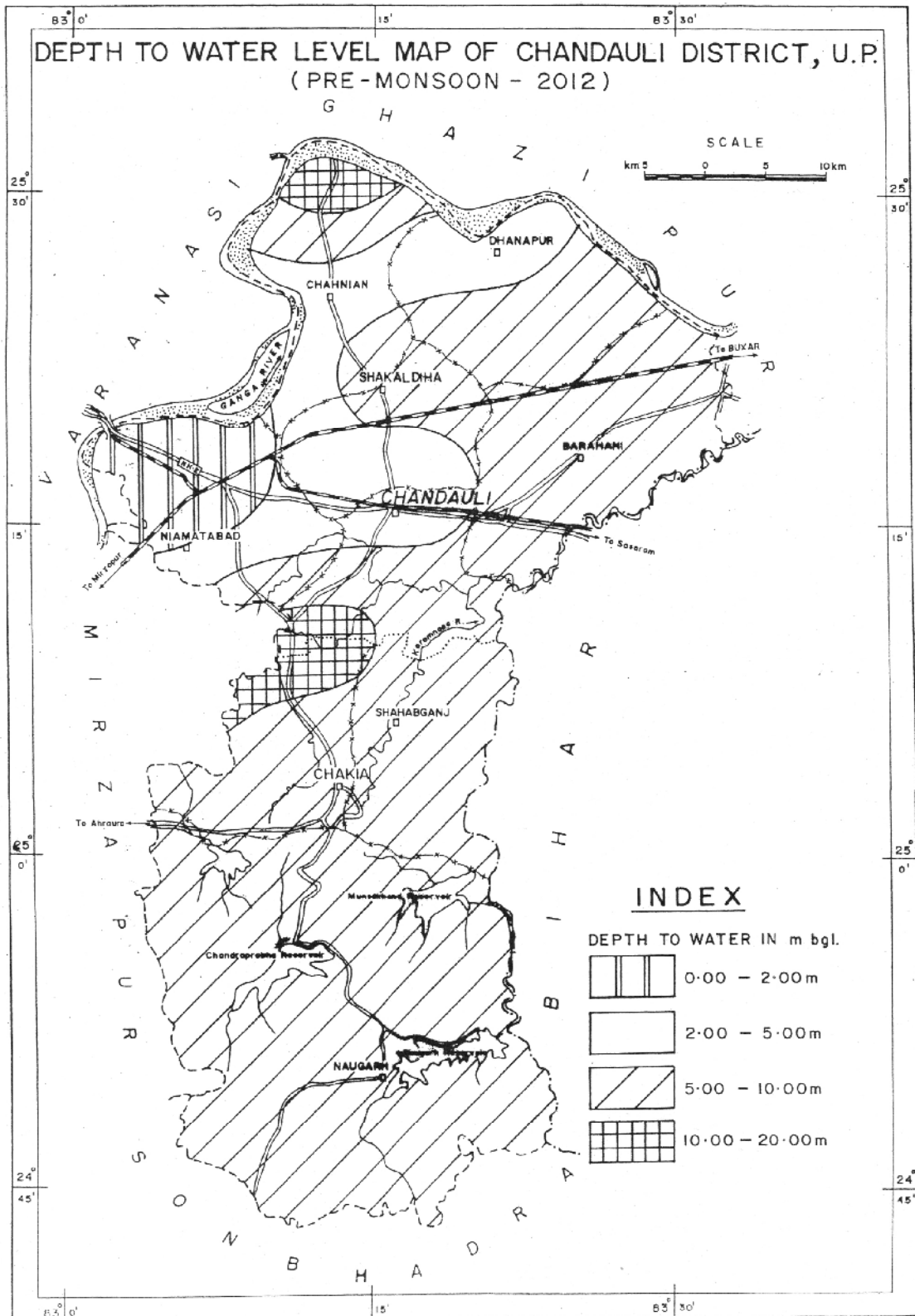
CHANDAULI (HARD ROCK TERRAIN)

Sl. No.	Location	Type of Well	Year of construction	Depth drilled (mbgl)	Well constructed (mbgl)	Depth of well / overburden	Zone tapped / Fracture zone	Static water level (mbgl)	Discharge (lpm)	Drawdown (m)	Transmissivity (T) m ² /day	Storativity (S)	Lithology
1	Baghi 24°49'50" 83°15'30"	EW		127.00	127.00		14.00, 26.00, 32.00, 49.00, 63.00, 126.00, 42.00, 45.00	5.50	612				Vidhyan Sst.
2	Deokhat 25°50'45" 83°15'40"	EW		130.00	130.00			0.68	772				Vidhyan Sst.
3	Majhgain 24°18'50" 83°11'10"	EW		181.90	181.90			8.00	60				Vidhyan Sst.
4	Murahua 25°01'00" 83°08'45"	EW		117.35	117.35		102.00, 105.00	10.21	2403				Vidhyan Sst.
5	Piprahi 24°46'15" 83°08'50"	EW		114.25	114.25		77.00, 93.00	8.75	600				Vidhyan Sst.
6	Rithiu 24°40'10" 83°13'15"	EW		112.25	112.25		72.00, 78.00, 99.00, 102.00	7.50	772				Vidhyan Sst.
7	Muzaffarpur	EW	2007-08	147.85	147.85	26.58	30.00, 84.00	5.87	840				Vidhyan Sst.
8	Ragunathpur	EW	2007-08	84.00	84.00	7.80	24.00, 84.00	8.94	900				Vidhyan Sst.
9	Chakia	EW	2007-08	78.00	78.00	17.35	76.00, 78.00	1.08	960				Vidhyan Sst.

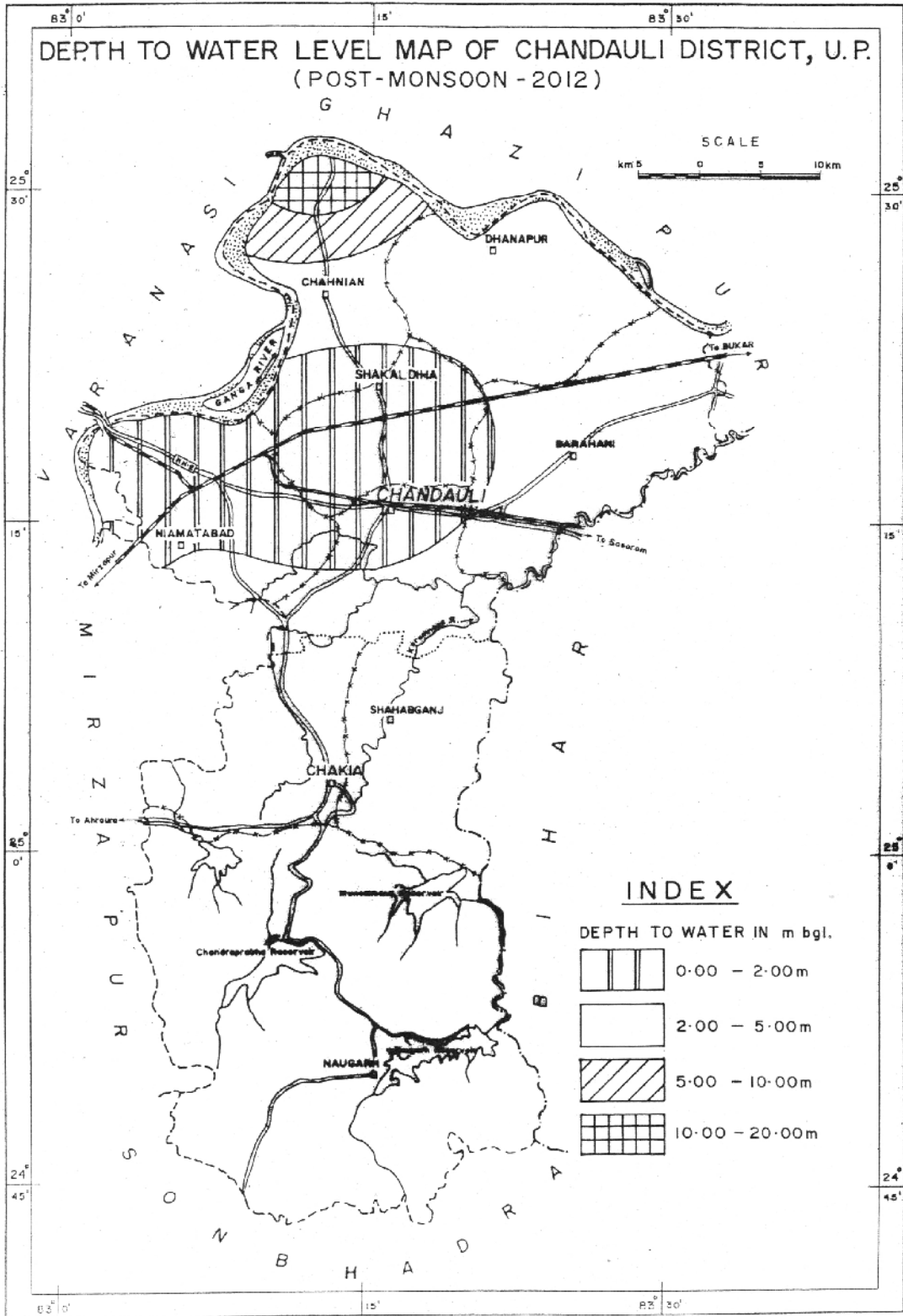
Sl. No.	Location	Type of Well	Year of construction	Depth drilled (mbgl)	Well constructed (mbgl)	Depth of well / overburden	Zone tapped / Fracture zone	Static water level (mbgl)	Discharge (lpm)	Drawdown (m)	Transmissivity (T) m ² /day	Storativity (S)	Lithology
10	Hetampur	EW	2007-08	102.00	102.00	17.40	99.00, 102.00	5.72	1320				Vidhyan Sst.
11	Hinauti Daxini	EW	2007-08	154.88	154.88	11.00	88.00, 99.00	3.44	30				Vidhyan Sst.
12	Hinot Ghat	EW	2007-08	160.00	160.00	0.50	102.00, 105.00, 156.00	29.00	156				Vidhyan Sst.



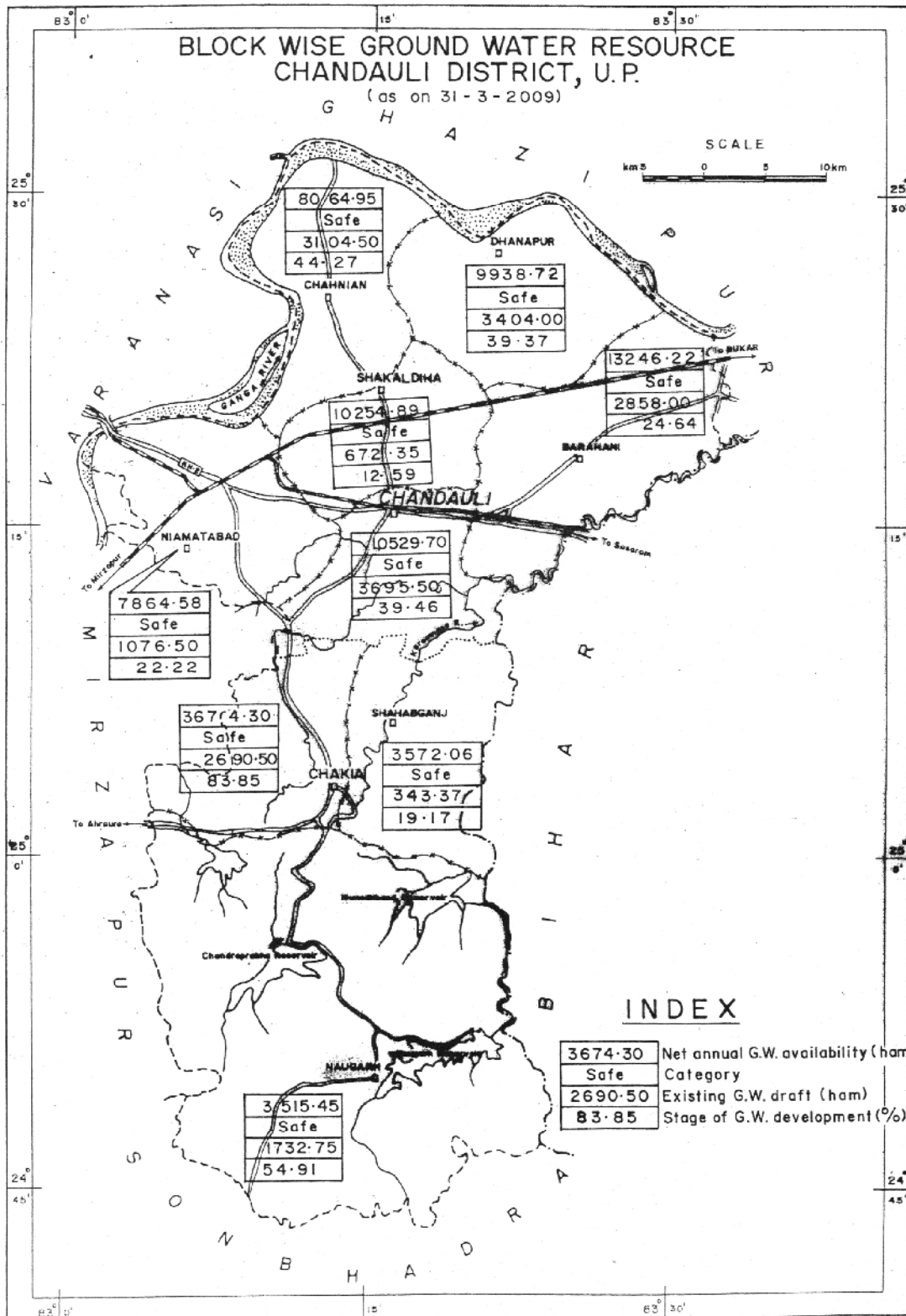
CGWB, N.R., (RAKESH), Drg. No. 4978/14



CGWB, NR, (RAKESH), Drg. No. 4979/14



CGWB, NR, (RAKESH), Drg.No. 4980/14



CGWB, NR, (RAKESH), Drg. No. 4981/14