

DISTRICT BROCHURE OF JYOTIBA PHULEY NAGAR, U.P.

(A.A.P.: 2012-2013)

By

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DISTRICT AT A GLANCE (JYOTIBA PHULEY NAGAR)

1. GENERAL INFORMATION

i. Geographical Area (Sq. Km.)	:	2249
ii. Administrative Divisions (as on 2005-2006)	:	
Number of Tehsil/Block	:	3/6
Number of Panchayat/Villages	:	940
iii. Population (as on 2001 census)	:	14,99,000
iv. Average Annual Rainfall (mm)	:	967.3

2. GEOMORPHOLOGY

Major Physiographic Units	:	Younger and Older Alluvium
Major Drainages	:	Ganga

3. LAND USE (Hectare)

a) Forest area	:	21340
b) Net area sown	:	315000
c) Cultivable area	:	266000

4. MAJOR SOIL TYPES

: Domat, Matiyar and Sandy Loam

5. AREA UNDER PRINCIPAL CROPS (as on 2005-2006)

: Wheat, Rice, Sugar Cane & Mentha

6. IRRIGATION BY DIFFERENT SOURCES

(Areas and Number of Structures) (ha)

Tubewells/Borewells :
(Govt. T/W-224, Electric T/W-1911, Diesel T/W-59540, Deep T/W - 122)

Canals : 58 Km

Other Sources : -

Net Irrigated Area : 116000 ha

Gross Irrigated Area : 234000 ha

7. NUMBER OF GROUND WATER MONITORING WELLS OF CGWB (As on 31-7-2008)

No. of Dugwells : Nil

No. of Piezometers (CGWB) : 2

Govt. Tubewells : 277

Private Tubewells : 35837

	Other Sources	: 59761
8.	PREDOMINANT GEOLOGICAL FORMATIONS	: Alluvium comprising of mainly sand, Silt, Clay & Kankar
9.	HYDROGEOLOGY	
	Major water bearing formation	: Sand
	(Pre-monsoon Depth to water level during 2012)	: 4.90 to 13.11
	(Post-monsoon Depth to water level during 2012)	: 3.77 to 14.05
10.	GROUND WATER EXPLORATION BY CGWB (As on 31-3-2009)	
	No of wells drilled (EW, OW, PZ, SH, Total)	: EW-2, PZ-4, Total-6
	Depth range (m)	: 50 mbgl
	Discharge (litres per second)	: 400 lpm (Approx. 7 lps)
11.	GROUND WATER QUALITY	
	Presence of Chemical constituents more than permissible limit (e.g. EC, F, As, Fe)	: EC ranges 315 to 1030 μ mhos/cm at 25 ⁰ C
	Type of water	: -
12.	DYNAMIC GROUND WATER RESOURCES (2009)-in HAM	
	Annual Replenishable Ground Water Resources	: 60522.68 Ham
	Net Annual Ground Water Draft for All Uses	: 64458.98 Ham
	Projected Demand for Domestic and Industrial Uses upto 2025	: 3031.74 Ham
	Stage of Ground Water Development	: 106.50%
13.	AWARENESS AND TRAINING ACTIVITY	
	Mass Awareness Programmes organized	: Nil
	Date	:
	Place	:
	No. of participants	:
	Water Management Training Programme organized	: Nil
	Date	:
	Place	:
	No. of participants	:
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 : 5
- No. of Critical Blocks : 1
- No. of Blocks Notified : Nil
- No. of Safe Block : Nil
- 16. MAJOR GROUND WATER PROBLEMS AND ISSUES :** There is no canal network in the district therefore, district is dependent on ground water for irrigation, industrial and domestic use, water level is declining year by year

Data source - (I) Statistical Diary, U.P.
 (II) Internet
 (III) C.G.W.B. Reports etc.

DISTRICT BROCHURE OF JYOTIBA PHULEY NAGAR, U.P.

(A.A.P.: 2012-2013)

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1.0 INTRODUCTION

Jyotiba Phuley Nagar district lies in the west of Moradabad district, south of Bijnor district, north of Budaun district and east of Ghaziabad & Bulandshahar district. The district came into being on 24th April 1997, in the memory of famous social reformer Sant Mahatma Jyotiba Phuley by combining Amroha, Dhanaura and Hasanpur tehsils of Moradabad district, U.P. whose head office is situated in the ancient city Amroha.

The district consists of 1133 villages, 3 tehsils, 6 blocks. Its geographical area is 2249 Sq. Km. and lies between 28^o24'00" and 28^o06'00" north latitude, and 78^o03'00" and 78^o43'00" east longitude and falls on survey of 2" dia Toposheet No. 53L. The headquarter of the district i.e. Amroha is located in the eastern segment of the area. The district in the north is bounded by Bijnor, in the east by Moradabad and in the south by Badaun district. Ganga being its western boundary separated the district from Ghaziabad and Bulandshahar. Geologically the area falls in the Ganga basin. The area is drained by Ganga, Soht and Bagar river.

Irrigation in major part of the district is carried out by means of minor irrigation structures, such as tubewells, ponds etc. There is no canal system prevailing in the area.

Central Ground Water Board carried out systematic hydrogeological surveys on the area (1982-83, 1983-84) by Shri Akhtar Jamal, E.R.J. Rao and Dr. A.N. Lal. Reappraisal hydrogeological surveys was undertaken by Shri R.C. Verma & R.K. Rajput in the year 1986-87. C.G.W.B. under exploration programme has drilled two exploratory tubewells at Amroha & Gajraula and five piezometers for the measurement of water level.

2.0 RAINFALL & CLIMATE

The district falls in the subtropical region and the climate is classified as tropical to subtropical type. The climate is characterised by a hot summer and biting cold, winter is associated with general dryness, except during the southwest monsoon where humidity is high. The rainy season extends from end of June to September or mid of October. Extreme temperature are recorded during winter & summer months. The mean daily maximum temperature is about 40⁰C and the mean daily minimum temperature is about 25⁰C during May and June. The mean monthly maximum relative humidity in the morning and evening is 84% to 74% respectively and is varies from 21% to 84%.

A study of rainfall data from six rain gauge stations around the district, the annual mean rainfall is 1046 mm at Amroha. Amroha received highest rainfall in 1990 (1813.0 mm) which is 1.76 times more than normal. Whereas lowest was in 1987 (492.1 mm) which is 1.84 times less than normal. The Hasanpur highest rainfall was recorded in 1975 (1404 mm) which is 1.59 time more than normal, whereas lowest was in 1987 (402.4 mm) which is 2.19 times less than normal annual rainfall.

3.0 GEOMORPHOLOGY & SOIL TYPES

The district has almost monotonous plain with no distinct features except some sand ridges, river valleys and shallow depressions. The maximum and minimum height from sea level are 182.00 mamsl to 208.00 mamsl.

Geomorphologically, the district can be divided in to two broad geomorphologic units namely younger and older alluvium.

YOUNGER ALLUVIUM:

The area occupied by younger alluvium in the district can be delineated all along in the flood plains of Ganga. The flood plain can be further differentiated in to two geomorphic units:

1. Newer flood plain
2. Older flood plain

1. Newer Flood Plain:

The newer flood plain occupies along the river channel and its adjacent area of terrace which are subjected to periodic flooding. These are consists of sand, silt and silty sand with minor clays and form the flood plain of river. Over all, this is narrow zone along the river channel and gets flood regularly during rainy season.

2. Older Flood Plain:

The older flood plain of river Ganga can be delineated over a few kilometers, locally it is known as Khader. Adjacent to river Ganga, the order flood plain is more conspicuous and wide in the eastern side as compared to western side. The zone is characterised by the presence of fluvial land forms such as meander scars, cut off meanders and paleochannels etc. The sediments are fine grained sand and silt with thin clay horizons. The zone can be separated from older alluvium by the presence of natural levees, sand dunes has occurs in the Dhanaura, Bacchrawa and Hasanpur area of the district.

OLDER ALLUVIUM:

It occupies the entire upland or interfluvial area occurring between the major drainage. The soils are silty, clayey and sandy in varying proportions. The older alluvium can be differentiated into the following geomorphic units:

1. Area of Sand Dunes / Sandy Tract:

These occur close to old flood plain of Ganga in the district, extending all along from north to south, having a chain of sand dunes and sand ridges. This unit is characterised by the absence of drainage ways, indication of high permeability.

2. Central Upland Plain or Interfluve Area:

This unit occupies the central part as well as eastern part of the district, and is characterised by presence of well entrenched drainage ways namely, Gangan Ban and Soat. The soils are clayey, but at places sandy soils are also met with.

SOILS:

The soils of the district can be classified into two major groups based on its texture & composition characteristics.

1. Khader and low land soil
2. Upland or Bangar soil

1. Khader and Low Land Soil:

This type of soil is found in low lying land and along the river courses like Ganga & sot. These soils are characterised by generally ash grey to brownish grey on the surface and their texture is some time silty loamy and some time sandy. The clay contents are low.

2. Upland or Bangar Soil:

These soils occur in upland tract of older alluvium. The soil profile is generally mature, showing good development and alleviation of clay. It can be subgrouped depending upon its topography, occurrence and textural nature into sandy soil, clayey soils and loamy soil.

4.0 GROUND WATER SCENARIO

4.1 HYDROGEOLOGY:

Occurrence of Ground Water:

Jyotiba Phuley Nagar underlain by unconsolidated sediments of quaternary age comprising sand, silt, clay along with occasional kankar. The ground water occurs in the granular sediments within the zone of saturation under water table conditions in the shallow aquifer and in deeper aquifer below 150 m depth, occurs under semiconfined to confined conditions.

Sub Surface Geological Configuration (Aquifer System):

On regional scale a single aquifer group extending down to 180 mbgl is existing. The exploratory drilling done by CGWB in the district and adjacent district

(Moradabad) down to a depth of 450 mbgl indicate that the first aquifer group may extend down to 215 mbgl below 215 m a thick clay bed is existing. The change in the sediment facies occur in depth range of 388-400 mbgl and sediments may belong to one system. The sediments below 400 m may belong to different depositional environment. The aquifer system behave as unconfined to semi confined depending upon the presence of clay beds. The aquifer materials are fine to medium grained & get coarser with depth. Also gravel is encountered at few places. The presence of clay beds of variable thickness are dominantly confined to areas close to major drainage system namely Ganga.

Depth to Water Level:

Data collected from National Hydrograph Stations of CGWB and monitoring stations of U.P. Govt. have been utilised for the preparation of depth to water level map, pre (May) and post monsoon (Nov) for the year 2012. The blockwise water level pre and post monsoon, fluctuation is given below:

Table-1

Blocks	Hydrograph Station	Water Level mbgl (May'12)	Water Level mbgl (Nov'12)	Fluctuation (m)
Amroha	Amroha	11.48	11.94	-0.46
Joya	Joya	11.83	12.74	-0.91
Dhanaura	Dhanaura	10.18	9.96	+0.22
Gajraula	Gajraula	10.62	11.27	-0.65
	Jogipur	12.87	12.59	+0.28
	Jalalpur Kalan	13.41	14.05	-0.64
Hasanpur	Hasanpur	12.60	12.75	-0.15
	Bawan Kheri	14.10	-	-
	Bagadpur	11.80	12.05	-0.25
Gangeswari	Daurala	5.44	5.40	+0.04
	Daryal	4.90	3.77	+1.13

As per Table No. 1, the water table in the entire district during the premonsoon (May 2012) varies from 4.90 mbgl at village Daryal (Gangeswari block) to 13.41 mbgl at village Jalalpur Kalan (Gajraula block). During the postmonsoon (Nov 2012), It varies from 3.77 mbgl to 14.05 mbgl. The water level is less than 5.00 m has been recorded in the Gangeswari block only it is due to younger deposits and falls in the

flood plain of Ganga (Khader or low lying area). The fluctuation in water level in the blocks of J.P. Nagar is negative except Gangeswari & Dhanaura block their water level fluctuation is positive i.e. rising trend has been recorded.

Hydrogeological Characteristics of Aquifer System:

A single aquifer system has been deciphered in the district down to 180.00m. The system at places is separated or divided into a number of aquifers by the intercalation clays. The system behave as an unconfined to confined depending upon the disposition of clays. The water table of the state tubewells varies from 5 to 12mbgl. General depth of tubewells ranges from 50 to 110 mbgl. The cumulative screened length varies from 20 to 30 m down to the depth of tubewell. The average yield varies from 1445 to 3000 lpm for drawdown ranging from 1.85 to 8.70 m. The specific capacity of the tubewell varies from 183 to 1129 lit/min/m. The summarised hydrogeological data of tubewell (blockwise) is given below:

Table-2

Sl. No.	Block	Depth range of tubewell (m)	Thickness range of Granular Zone	Yield range (lpm)	Range of specific capacity/lit/min
1.	Amroha	57-102	27-33	1850-2850	315-592
2.	Chajlet	57-85	NA	NA	NA
3.	Dhanaura	47-80	20-28	2028-3059	183-524
4.	Gajraula	55-109	14-39	1900-3041	233-593
5.	Gangeswari	73-101	26-50	2749-3000	-
6.	Hasanpur	85-115	34-50	1753-3093	465-1129
7.	Joya	53-101	30-43	2357-2677	502-618

4.2 GROUND WATER RESOURCES:

Jyotiba Phuley Nagar district being close to Himalaya has appreciable water resources to be utilised for its agricultural needs. Ground water due to its assured and timely, availability has now become the most dependable source for irrigation but its overexploitation affects adversely its regime. For a better ground water management, it is necessary to have a constant vigil on its overall reserve and status of utilisation. The blockwise ground water recharge, its present withdrawal and available balance for future utilisation as on 31.3.2009 is given below:

Table-3

GROUND WATER RESOURCE POTENTIAL OF JYOTIBA PHULEY NAGAR, U.P.

(As on 31st March 2009)

Sl. No.	Assessment Units Blocks	Net Ground Water Availability (annual) (ham)	Existing Gross Ground Water Draft for Irrigation (ham)	Existing gross ground water draft for domestic & industrial water supply (ham)	Existing gross ground water draft for all uses (ham)	Provision for domestic & industrial requirement supply for 2025 (ham)	Net Ground Water Availability for Future Irrigation Development (ham)	Stage of Ground Water Development (%)	Category
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
1	Amroha	8947.62	9066.68	508.56	9575.24	508.56	0.00	107.02	Over Exploited
2.	Dhanaura	12891.08	11716.90	433.71	12150.60	587.07	587.11	94.26	Critical
3.	Gangeswari	12581.66	12422.02	438.51	12860.53	438.51	0.00	102.22	Over Exploited
4.	Gajraula	8778.28	10391.00	396.22	10787.22	396.22	0.00	122.89	Over Exploited
5.	Hasanpur	9123.95	9731.24	445.43	10176.67	455.43	0.00	111.54	Over Exploited
6.	Joya	8200.10	8252.76	655.95	8908.71	655.95	0.00	108.64	Over Exploited
	Total	60522.68	61580.60	2878.38	64458.98	3031.74	587.11	106.56	

Table-4

**BLOCKWISE PROPOSAL OF GROUND WATER DEVELOPMENT FOR IRRIGATION PURPOSE IN
JYOTIBA PHULEY NAGAR DISTRICT, U.P.**

S. No.	Blocks	Net G.W. availability for future irrigation development (ham)	G.W. Available for irrigation (ham) 85% of Col 3	G.W. proposed to be utilised for development (ham) 70% of Col 4	Proposed Structure		Additional Irrigation potential may be created (ha.) (Average depth of irrigation water adopted 0.50 m) (Col. 5/0.50)
					<i>No. of state tubewells (taking 50% of Col. 5 unit draft 12.8 ham)</i>	<i>Private tubewell borings with pumping sets (taking 50% of col. 5 unit draft 1.8 ham)</i>	
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
1.	Amroha	0.00	-	-	-	-	-
2.	Dhanaura	587.11	499.04	349	13	96	698
3.	Gajraula	0.00	-	-	-	-	-
4.	Gangeswari	0.00	-	-	-	-	-
5.	Hasanpur	0.00	-	-	-	-	-
6.	Joya	0.00	-	-	-	-	-

As per above Table-3 the situation of ground water in the district is alarming. The Amroha, Gajraula, Gangeswari, Hasanpur & Joya blocks are categorised as Over Exploited, due to more than 100% development of ground water. The Dhanaura block is falling in Critical stage. District is required water sharing and artificial recharge schemes to be implemented.

4.3 STATUS OF GROUND WATER DEVELOPMENT:

In the Jyotiba Phuley Nagar district 60522.68 ham ground water is available as per dynamic ground water resources data as on 31.03.2009. In the district presently no any canal network system is prevailing and all the requirements of water depends on the ground water for the irrigation / domestic / industrial uses. As per Table-4 the blockwise proposal of ground water development for irrigation purpose only Dhanaura block having possibilities of further ground water development.

Table-5

GROUND WATER SITUATION : 2012-13 JYOTIBA PHULEY NAGAR DISTRICT

Area	Wells Feasible	Rigs Suitable	Depth of Well (m)	Discharge (lpm)	Suitable Artificial Recharge Structures*
Soft Rock Aquifer (Entire District)	Dugwells / Handpumps	Manual / Hand boring set	20 – 40	50 – 100	Recharge Shaft, Recharge Pit, Abandoned Handpumps / Tubewells, Rooftop Rain Water Harvesting Structures in urban areas and in the Gajraula, Gangeswari, Hasanpur & Joya blocks.
	Shallow Tubewell	Rotary Rigs (Direct / Reverse)	50 – 100	1000 – 2000	
	Deep Tubewell	Rotary (Direct)	100 300**	2000 – 3000	
Net Annual Ground Water Availability				605.23 MCM/yr	
Gross Annual Draft				644.59 MCM/yr	
Stage of Ground Water Development				106%	
Name of Blocks showing intensive ground water development				Over Exploited – Gajraula, Gangeswari & Hasanpur	

* Applicable in alluvial area where depth to water level is >8 mbgl with declining trend in both pre and postmonsoon.

** Depth limited due to salinity problem.

4.4 GROUND WATER QUALITY:

Ground water in phreatic aquifer (upto 100-150m) in general it is colorless, odorless in nature, the specific electric conductance cm at 25⁰C. The ranges of chemical constituents in the ground water is given below:

Table-6

Sl. No.	Chemical Constituents	Range
1.	pH	7.40 – 8.20
2.	Calcium (mg/l)	32.00 – 92.00
3.	Magnesium (mg/l)	10.00 – 440.00
4.	Fluoride (mg/l)	00.01 – 00.27
5.	Carbonate (mg/l)	not determined
6.	Arsenic (mg/l)	not determined
7.	Bicarbonate (mg/l)	220.00 – 256.00
8.	Chloride (mg/l)	11.00 – 241.00
9.	Sulphate (mg/l)	12.00 – 120.00
10.	Nitrate (mg/l)	1.00 – 37.00
11.	Potassium (mg/l)	4.00 – 12.00
12.	Sodium (mg/l)	17.00 – 15.80
13.	Total Hardness (mg/l)	120.00 – 440.00
14.	EC at 25 ⁰ C	425.00 – 1310.00

It is observed that the ground water is suitable for drinking, domestic, industrial and irrigation uses in all respect.

5.0 GROUND WATER MANAGEMENT STRATEGY

5.1 GROUND WATER DEVELOPMENT:

The flood plains of Ganga (younger alluvium) is more suitable for extraction of ground water due to seasonal recharge through flood. The rotary / manual hand boring set is generally used in the alluvial area and down to 80 – 100 m deep tubewells are fully successful for irrigation & domestic use. While deeper tubewell more than 150 to 200 m may be utilised for industrial use, especially for Gajraula industrial area.

5.2 WATER CONSERVATION & ARTIFICIAL RECHARGE:

For the over exploited urban area the rain water harvesting structures should be mandatory in the Govt./ Private buildings.

6.0 GROUND WATER RELATED ISSUES AND PROBLEMS

The water logged area in the district is confined along the river Ganga due to seasonal flood. The declining trend of ground water has been observed in all the blocks due to absence of surface irrigation and below average rainfall in the previous years. There is no quality problem in the entire district.

7.0 AWARENESS & TRAINING ACTIVITY

7.1 MASS AWARENESS PROGRAMME (MAP) & WATER MANAGEMENT TRAINING PROGRAMME (WMTP) BY CGWB:

Nil.

7.2 PARTICIPATION IN EXHIBITION, MELA, FAIR ETC.:

Nil.

7.3 PRESENTATION & LECTURES DELIVERED IN PUBLIC FORUM / RADIO / TV / INSTITUTION OF REPUTE / GROSS ROOTS ASSOCIATION / NGO / ACADEMIC INSTITUTION ETC.:

Time to time broadcast by T.V. and Radio through national programme.

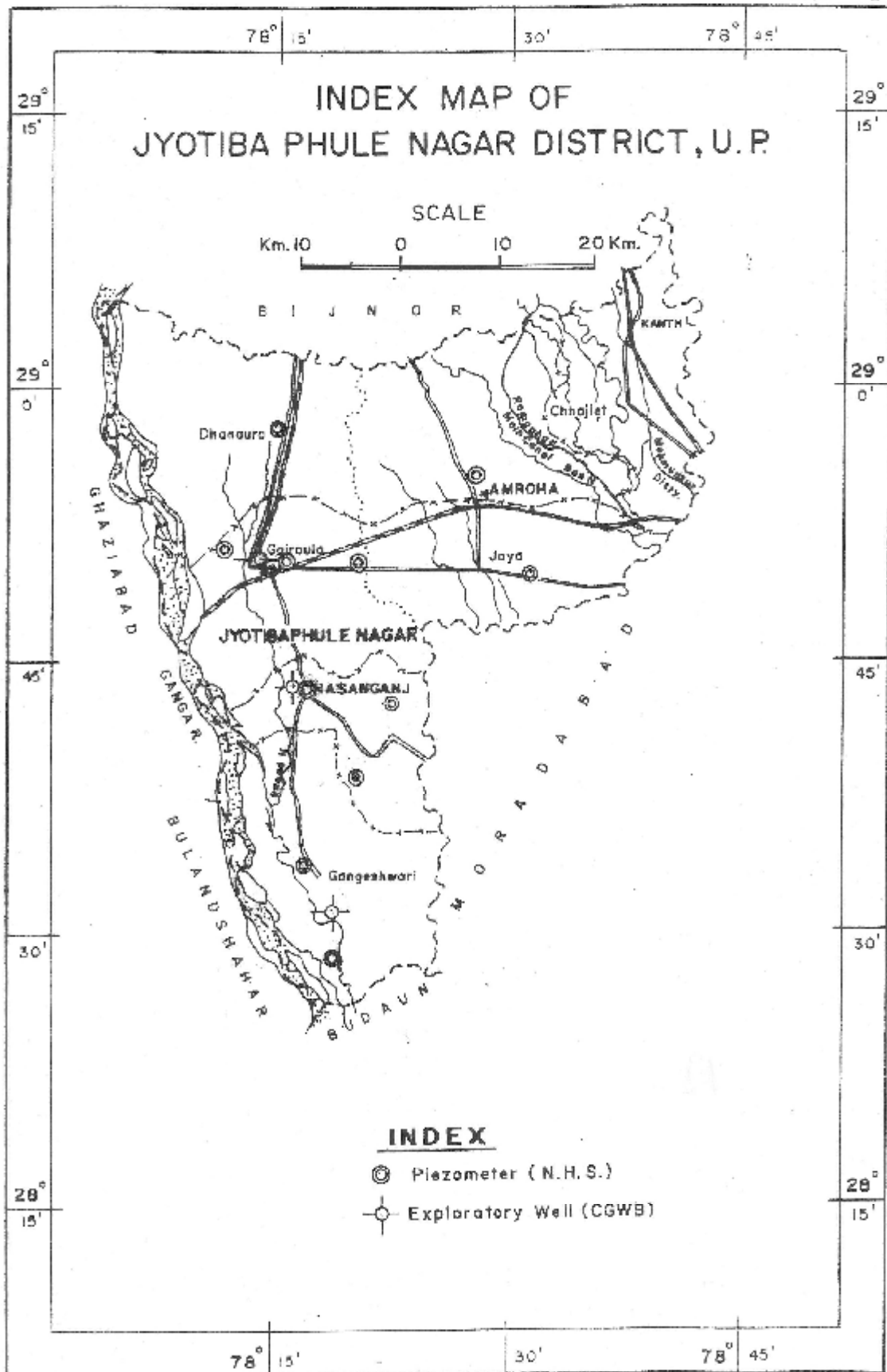
8.0 AREA NOTIFIED BY CGWA/SGWA

Nil.

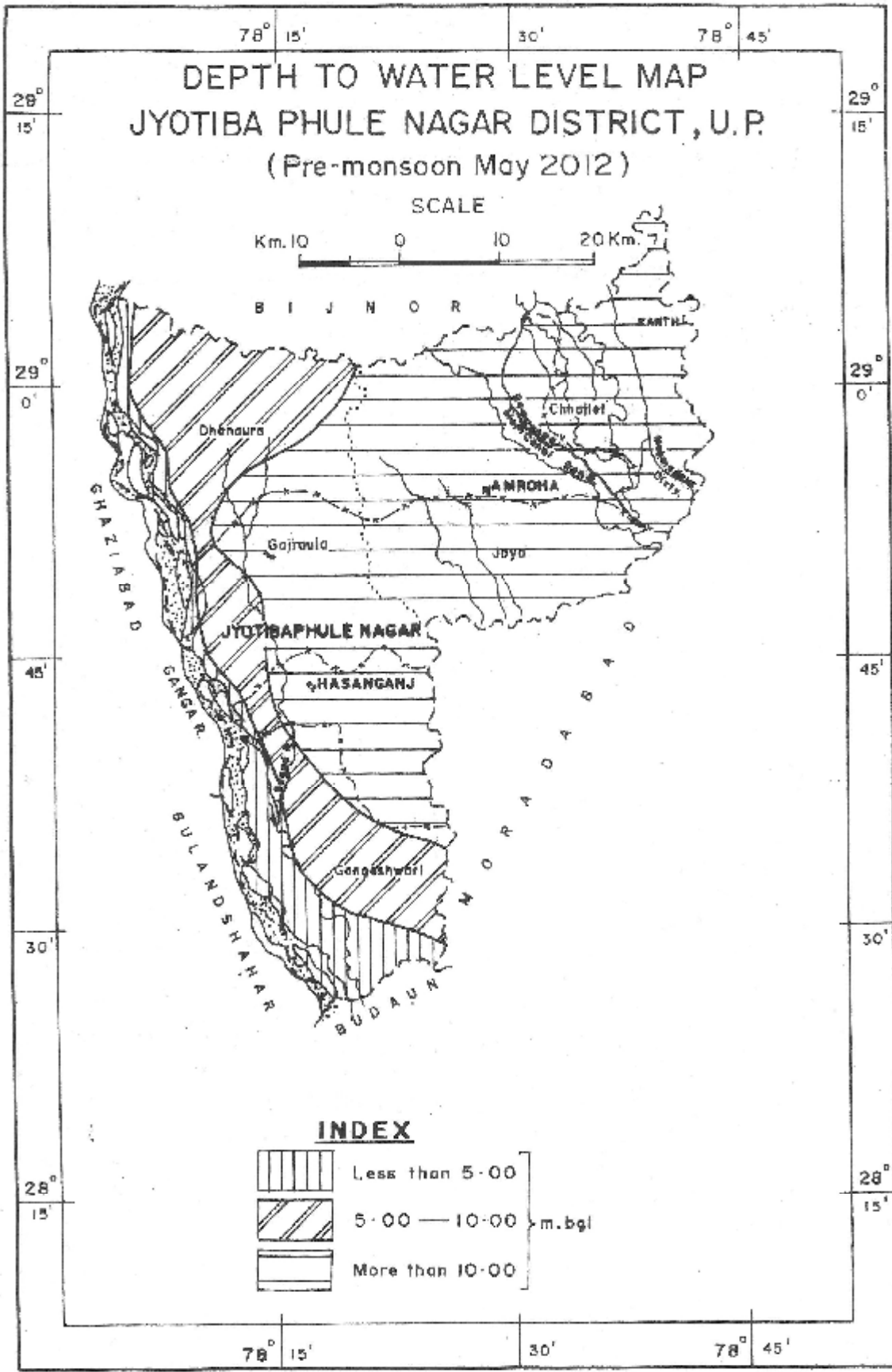
9.0 RECOMMENDATIONS

Based on the foregoing, the following recommendations are made:

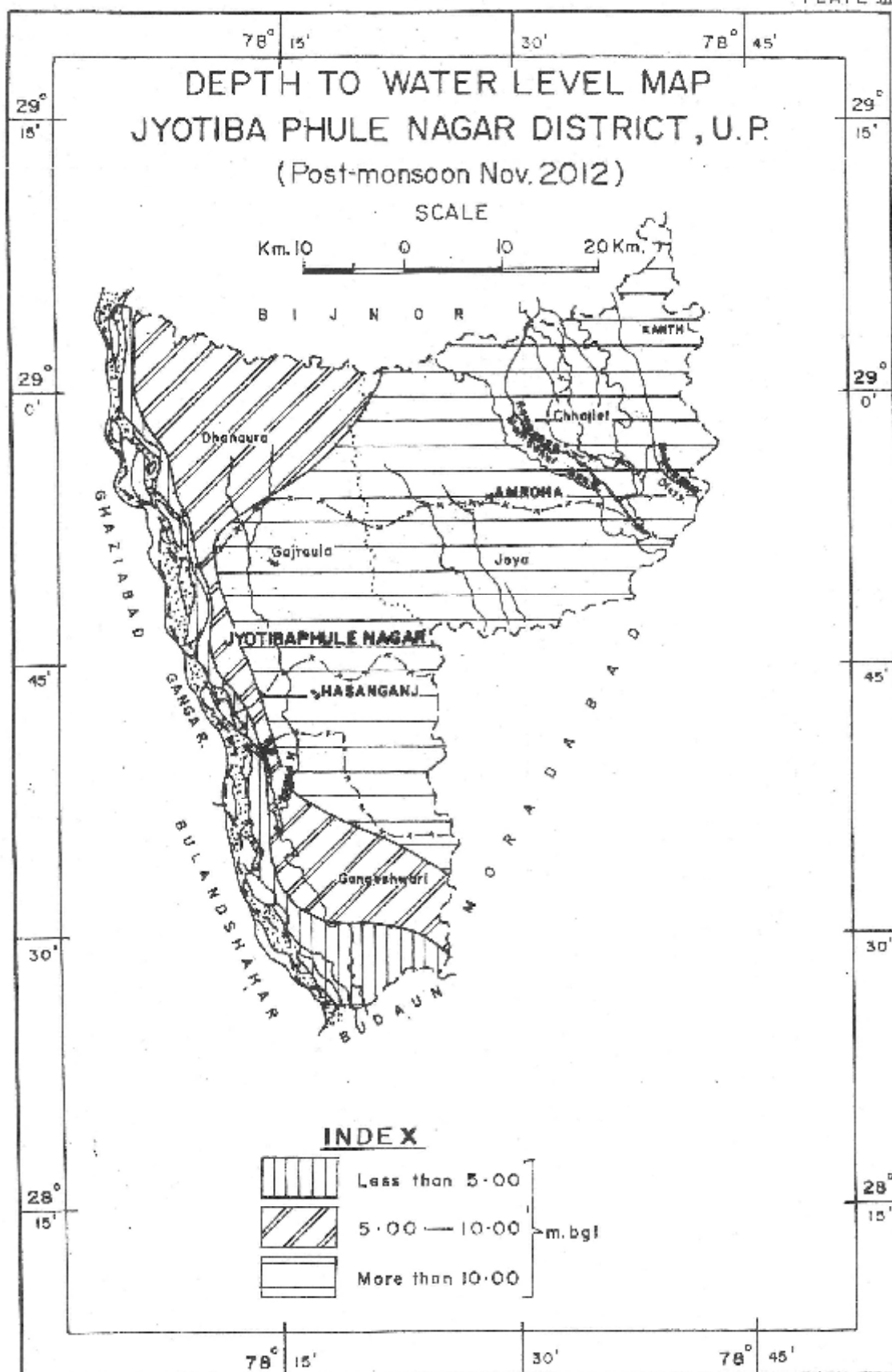
- (1) It is imperative to control declining trend by conjunctive use of the surface water resources for irrigation through canals as well exploring deeper ground water aquifer system.
- (2) The dugwells are being used for dumping all sort of refuse causing pollution of ground water. It is suggested that these wells may be closed by back filling and the piezometers in the phreatic aquifer say down to 30 m to 40 m may be installed at proper locations so that water levels may be monitored regularly in the district.
- (3) The water conservation practices should be utilised. Sprinkler irrigation should be encouraged and subsidy on this should be provided especially in O.E. blocks.
- (4) The exploration of deeper aquifers below 180 m should be undertaken immediately in a systematic manner and exploitation of aquifer within the depth of 180 metres should be discouraged in the district, since there is ample scope of development at greater depth.
- (5) The central part of the district where the water level is more than 6.00 metres should be recharged artificially by using the check earthen dam across the river Sot and its minor tributaries.
- (6) Rooftop rain water harvesting has to be encouraged specially in urban areas to augment ground water recharge.



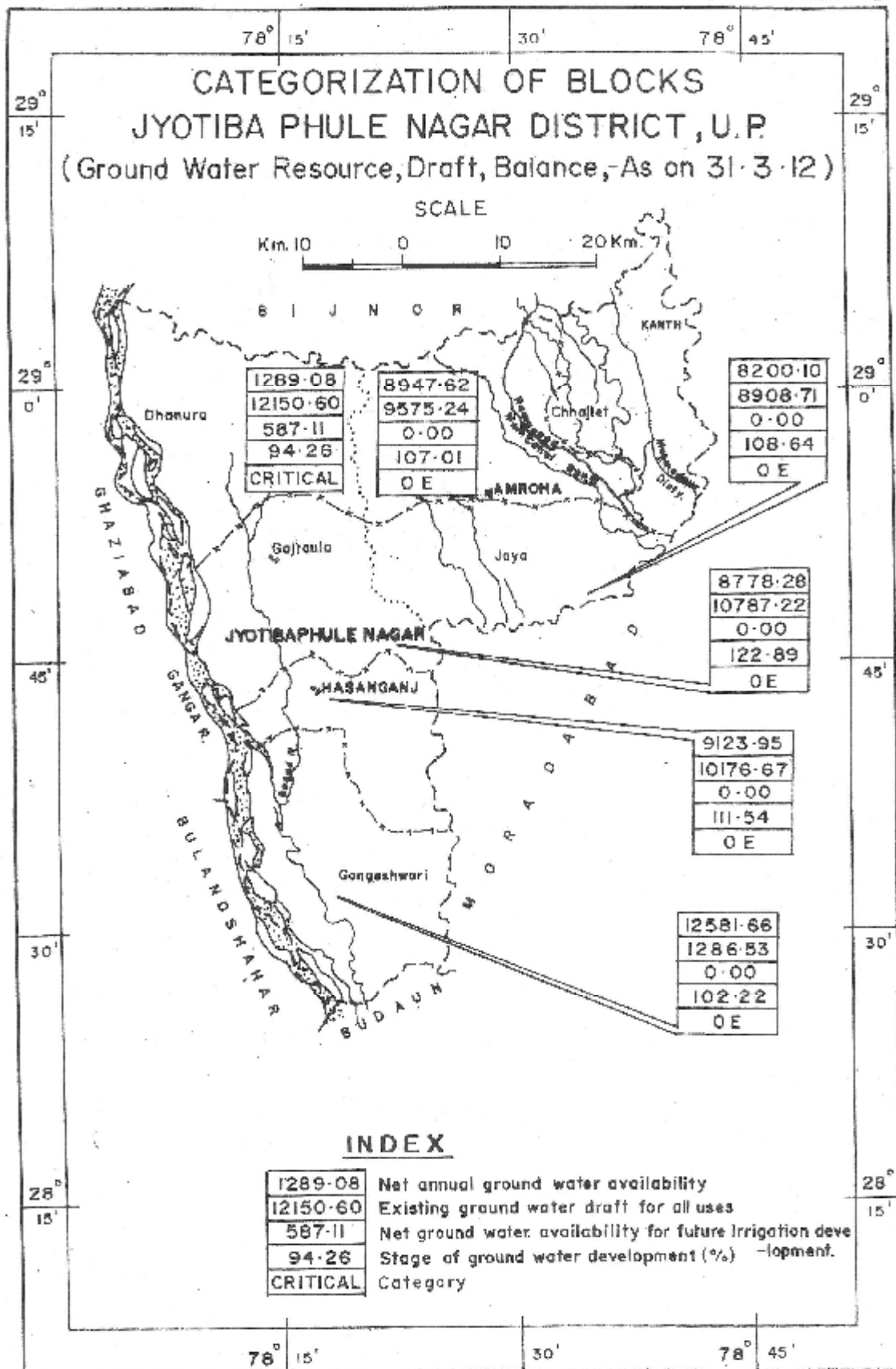
CGWB, N.R. (N. Chandral) Drg. No. 2519/06, (N.C. Pandey) Drg. No. 4773/13



CGWB, NR (N. Chandra) Drg. No. 2519/08, (N.C. Pandey) Drg. No. 4774/13



CGWB, NR (N. Chandra) Drg. No. 2519/08, (N.C. Pandey) Drg. No. 4775/13



CGW9, NR (N.Chandra) Drg. No. 2519/08, (N.C.Pandey) Drg. No. 4776/13