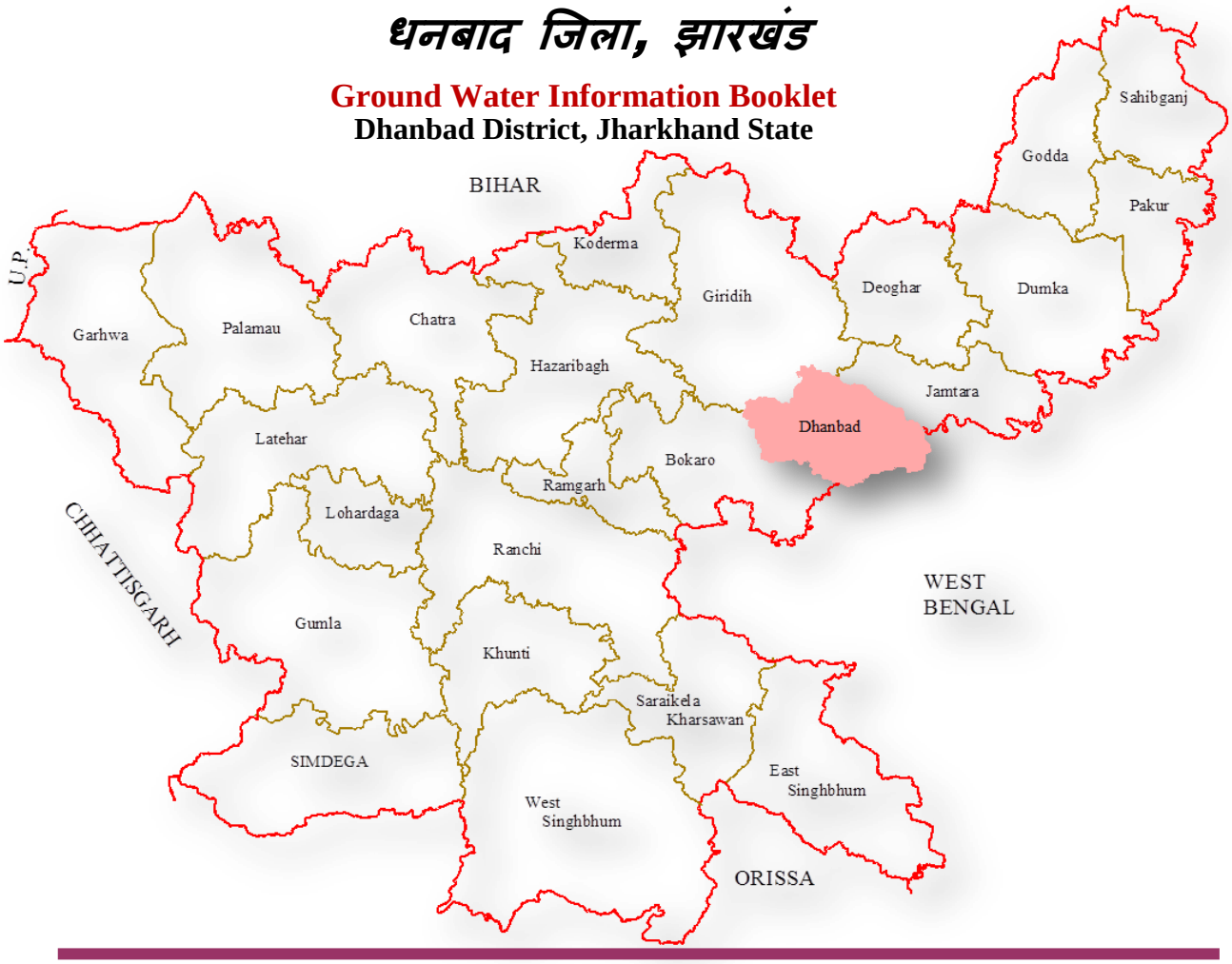
भूजल सूचना पुस्तिका

धनबाद जिला, झारखंड

Ground Water Information Booklet
Dhanbad District, Jharkhand State



केन्द्रीय भूमिजल बोर्ड
जल संसाधन मंत्रालय
(भारत सरकार)
राज्य एकक कार्यालय, राँची
मध्य-पूर्वी क्षेत्र
पटना

Central Ground water Board
Ministry of Water Resources
(Govt. of India)
State Unit Office,Ranchi
Mid-Eastern Region
Patna

सितंबर 2013
September 2013

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Prepared By

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State Unit Office, Ranchi
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1.	GENERAL INFORMATION		
	i) Geographical Area (Sq km.)	2074 Sq. km.	
	Administrative Divisions (As on 2013) Number of Block Number of Panchyat Number of villages	 9 311 1348	
	(ii) Population (As on 2011 Census)-	26,82,662	
	(iii) Average Annual Rainfall (mm)	1241 mm	
2.	GEOMORPHOLOGY		
	Major Physiographic units	Denudational Hills, Dissected Pediplain, Structural Ridges.	
	Major Drainages	Damodar and Barakar	
3.	LAND USE (Sq Km.)		
	a) Forest area:	189.3	
	b) Net area sown:	346.0	
	c) Cultivable area:	403.10	
4.	MAJOR SOIL TYPES	ultisols (red and yellow soils)Alfisols (Red sandy soils) Light textured Slightly Acidic Poor in N & P Fairly rich in K	
5.	AREA UNDER PRINCIPAL CROPS (2011-12)	Pulses-2422 Oil Seeds-4395 Paddy-24135	
6.	IRRIGATION BY DIFFERENT SOURCES (Areas and Number of Structures) (2006-07)	Areas (ha)	Structures
	Dugwell	3255	3255
	Tube wells /Bore wells		102
	Tanks / Ponds	160	261
	Canals	--	--
	Other Sources	1143	565
	Net irrigated area	--	--
	Gross irrigated area	--	--
7.	NUMBERS OF GROUND WATER MONITORING WELLS OF CGWB (As on 31-03-2013) No of Dugwell No. of Piezometers	 9 Nil	
10.	PREDOMINANT GEOLOGICAL	Granite Gneiss & Associated Intrusive	

	FORMATIONS	Gondwanas
11	➢ Major Water bearing formation ➢ (Pre-monsoon Depth to water level during 2012) ➢ (Post-monsoon Depth to water level during 2012)	Granite gneiss, Sandstone 1.29 – 14.60 mbgl 2.00-6.15mbgl
12.	GROUND WATER EXPLORATION BY CGWB (As on 31-03-13)	
	No. of wells drilled (EW, OW, PZ, SH, Total	EW – 7
	Depth Range (m)	38 – 199.1 m bgl
	Discharge (m3/hr))	1 m^3/hr – 12 m^3/hr
	Storativity (S)	--
	Transmissivity (m^2/day)	0.8 – 105
13.	GROUND WATWER QUALITY	Potable
	Presence of Chemical constituents more than permissible limit (e.g. EC, F, As, Fe)	Fluoride above permissible limit in Mahuda locality.
	Type of Water	Calcium Bicarbonate type
14.	DYNAMIC GROUND WATER RESOURCES (2009) in ha-m	
	Annual Replenishable Ground Water Resources	13492
	Gross Ground Water Draft	3807
	Projected Demand for Domestic and Industrial uses up to 2034	5780
	Stage of Ground Water Development	52.17%
15.	AWARENESSS AND TRAINING ACTIVITY	
	Mass Awareness Programmes Organized Date Place No. of Participants	One 2003 Govindpur Block office 110
	Water Management Training Programmes Organized Date Place No. of Participants	 One 2004 CMRI Dhanbad 50
16.	EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING	
	Projects completed by CGWB (No & Amount spent)	Rs 1,74,85,643 sanctioned and spent till March 2013 Rs122.4 lacs spent

	Projects under technical guidance of CGWB	Indian School of Mines,Dhanbad
17	GROUND WATER CONTROL AND REGULATION	
	Number of OE Blocks	1 (Jharia)
	No. of Critical Block	1 (Dhanbad)
	No. of Blocks notified	Nil
18.	MAJOR GROUND WATER PROBLEMS AND ISSUES	1. Sporadic nitrate occurrence at few places and Fluoride value above permissible limit at Mahuda More (2.1ppm) hand pump. 2. Lowering of water table near active colliery mining areas.

GROUND WATER INFORMATION BOOKLET

DHANBAD DISTRICT

1.0 INTRODUCTION

1.1 Administration

Dhanbad district lies in the mid eastern part of Jharkhand state. Giridih bound it in the north, Bokaro in the west, Purulia district in the south and Jamtara district in the east. It is connected through NH-2 and NH-32 from state capital and different district headquarters of the state. The district has total area of 2074 sq. km.and is located between 23^0 26'- 24^0 01' North latitude to 86^0 10'- 86^0 48' East longitude. Area is included in toposheet no 73I/1, 73I/2, 73I/5, 73I/6, 73I/7 73I/9, 73I/10, 73I/13 and 73I/14 of survey of India (1:50000 scale). The Dhanbad district consist of 8 blocks of Dhanbad district namely Baghmara, Baliapur, Dhanbad, Govindpur, Jharia, Nirsa, Topchanchi & Tundi.The district comprises of 9 blocks,157 number of panchayats and 1052 no. of villages. The total population of the Dhanbad district as per the 2011 census is 26,82,662.The density of population is 1300 person per sq. Km. The decadal growth of population is 11.91% (2001-11).

1.2 DRAINAGE

The drainage system of the district is the part of Damodar sub-basin. All the rivers that originate or flow through the district have an easterly or south easterly course. The Damodar is the most important river with an easterly course for about 125 km. streams as Jamunia, Katri, and Pusai are originating from northern hills of Parasnath and Tundi areas. These are flowing from N – S to NNW – SSE and meeting Damodar river. The Barakar river is the most important tributary of the Damodar and their confluence marks the eastern border of the district. It recieves from the west its only tributary, the Khudia, which takes its rise in the extreme west of the district between the parasnath and Tundi ranges.

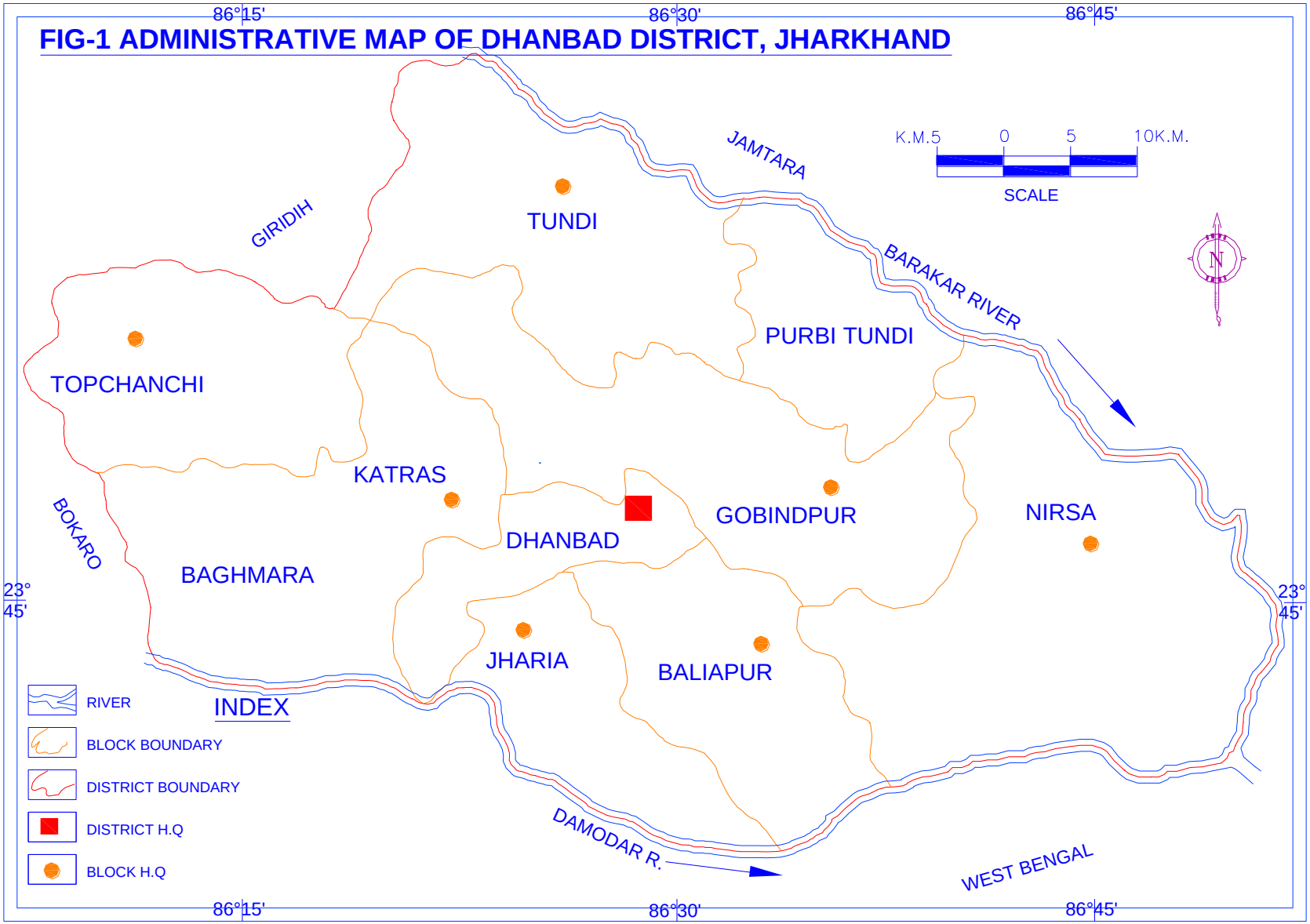
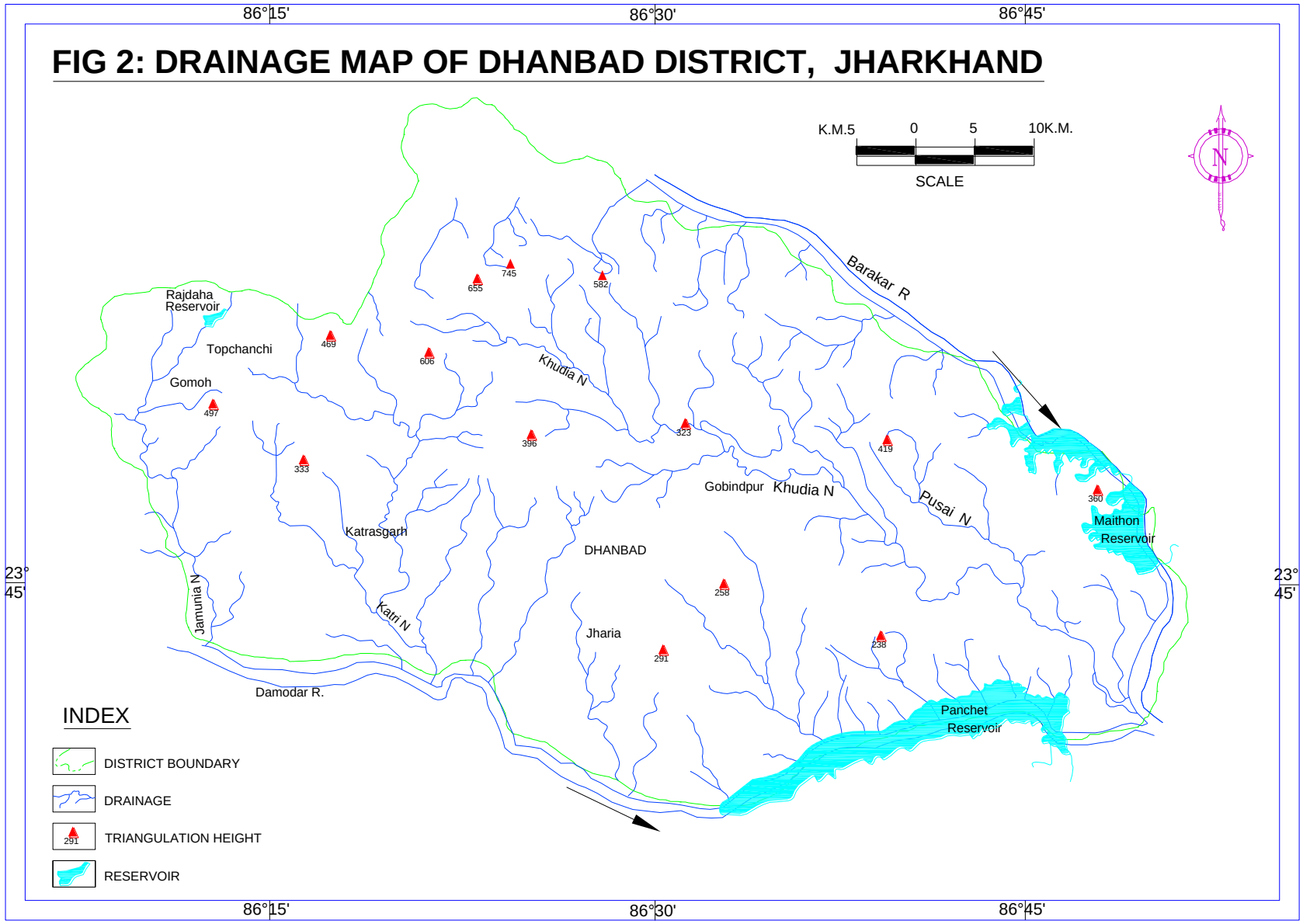


FIG-1 ADMINISTRATIVE MAP OF DHANBAD DISTRICT, JHARKHAND
86°15'
86°30'
86°45'
23° 45'
K.M.5 0 5 10K.M.
SCALE
N
JAMTARA
GIRIDH
TUNDI
BARAKAR RIVER
PURBI TUNDI
TOPCHANCHI
KATRAS
BOKARO
DHANBAD
GOBINDPUR
NIRSA
BAGHMARA
JHARIA
BALIAPUR
INDEX
RIVER
BLOCK BOUNDARY
DISTRICT BOUNDARY
DISTRICT H.Q
BLOCK H.Q
DAMODAR R.
WEST BENGAL

FIG 2: DRAINAGE MAP OF DHANBAD DISTRICT, JHARKHAND



1.3 Land use, irrigation and cropping pattern

Forest cover is spread over 189 sq. km. Area in the district. Land put to non-agricultural use covers 431 sq. km., Barren and uncultivable waste covers 325 sq. km., cultivable wasteland covers 113 sq. km.and current fallow is 392 sq. km. Net area sown is 346 sq. km.Among all the blocks of the district**,** Forest cover is highest in Tundi block. Barren and uncultivable waste is highest in Nirsa followed by Baghmara block. Land put to non- agricultural use is maximum in Nirsa block. Cultivable waste is maximum in Nirsa block. Net area sown is maximum in Govindpur and Tundi blocks.

From the cropping area data, it can be inferred that the unirrigated kharif crops continue to cover 95% of the total cropped area. Rabi irrigated crops cover only 3% of the total cropped area. Summer irrigated crops are only 1%. Rabi crops and summer crops are not popular in the district due to lack of irrigation facilities Total area irrigated in Dhanbad is 270 sq. km. streams sources irrigate about 70 sq. km. area. Irrigation by ponds is covered in 65 sq. km. area. Dug wells cover about 50 sq km. areas. Lift irrigation is done in 31sq. km. area while other sources cover 24 sq. km. area.

1.4 Studies/Activities carried out by C.G.W.B.

The district was geologically mapped by the Geological survey of India who also studied in detail the problem of infiltration of ground Water to the underground coalmines in connection with panchet reservoir studies. Central Ground water Board has carried out systematic hydro geological survey in Dhanbad district during 1984 by S.C. Bhattacharya. Study on Hydrogeology and ground water resources of Dhanbad district was carried out by Mr. I. Banerjee (Senior Hydro geologist), in the year 1987.District report of Dhanbad district was prepared by Mr. K.K. Singh (Scientist D) in the year 1994-95. Mining Hydro geological studies of Jharia block was carried out by M.L. Doja (Sc-C) in the year 2001-02. During AAP 2002-03 seven no of exploratory boreholes were drilled in Dhanbad, Tundi, Baliapur and Gobindpur blocks. During 2005-06, Reappraisal hydro geological survey work was completed in the Dhanbad district and parts of Bokaro district by T.B.N.singh (Sc-B).

2.0 CLIMATE:

Dhanbad district experience sub-tropical climate, which is characterized by hot summer from March to May and well distributed rainfall during southwest monsoon from June to September. Winter season in the area is marked by dry and cold weather with intermittent showers during the month of December to February.

Dhanbad area is climatically different from neighboring regions. The important climatic elements such as temperature, precipitation, pressure, and wind velocity show great variation.

Three broad climatic seasons are found - (1) **the winter season** lasting from November to February. The months of December and January are the coldest. (2) **The summer season** begins from March and lasts till May. During April the wind blows from the west .It remains relatively hot and temperature rises around 40^0C. (3) **The Rainy season**-This season normally begins from the middle of June, when the monsoon winds bring moisture-laden clouds from the Bay of Bengal

2.1 Rainfall-

Dhanbad areas receive more rainfall due to coal dust, which attracts clouds and brings rainfall to the area**.** Rainfall is the principal method of ground water recharge to ground water. Southwest monsoon brings rainfall to this area during the months of June to October mainly. Normal data of the Dhanbad I.M.D. observatory indicates 1306 mm of rainfall.

2.2 Temperature:

Long-term data of temperature shows that temperature decreases progressively after October. The winter season starts from November and lasts till February. January is the coldest month with the mean daily maximum temperature at 30^O C and the mean daily minimum temp. at 14.9^O C.

3.0 Geomorphology & Soils

3.1 Physiography —

The northern part of the study area is covered with hills and thick forest. In general the altitude varies from 133m amsl in Chirkunda to 745m amsl in Parasnath hills. The study area can be divided into two parts.

1) Northwestern hill ranges of Parasnath having parts of Topchanchi, Tundi blocks. These regions have general slope towards south.

2) Areas covered by Damodar and its Tributaries like Barakar. The area comprises of coalfield areas and alluvial tracts.

The main geomorphic features and landforms in the district are as follows.

(1) Alluvial Plains: - These are found near the river tracts and consist of gravels, sands, silt, clay etc.

(2) Structural ridges: - These are linear or arcuate hills showing definite trend lines and covered with thick forests developed over metamorphic rocks. Found in Tundi and northern part of Topchanchi area.

(3) Pediplain (PM):- These are developed over granite gneiss and Meta sediments. High frequencies of lineaments are found. These are found in Govindpur block and parts of Tundi block

(4) PPS (Pediplain): These are developed over sedimentary rocks especially Gondwana formation (Sandstone, Shale, coal). Found in Nirsa, Chirkunda area.

(5) Dissected Pediplain (DPP): Dissected pediplains are developed over Gondwana formations. Found in Jharia, Baghmara and Katras areas.

(6) Denudation hills: - These are developed over metamorphic rocks found as moderately high hills and are mostly barren rocky exposure, found in north eastern/North western parts of the district.

(7) Pediplains are the most important for ground water point of view.

3.2 Soils—

The soils of the district are mostly of the residual type. High temperature and high rainfall have led to the formation of lateritic type of soils from rocks of Archean metamorphic complex exposed in the greater part of the district and also from the lower Gondwana rocks in the west-central and east central parts. Texturally the soils of the district have been classified into four classes---

a. Stony and gravelly soils--- These are low-grade soils having a large admixture of cobbles, pebbles and gravels generally found at the base of the hills.

b. Sandy soils— These types of soils are generally found near the river and streambeds. They contain more than 60 percent sand and poor in plant nutrients. They are also called hungry soils because of heavy manuring required.

c. Loamy soils--- They consist mostly detritus of decomposed rocks and vegetable matter and contain between 30 to 60 percent sand.

d. Clayey soils— These soils are sticky when wet and very hard and difficult to break when dry. They are very fertile but yield in such soils improve with addition of sand, lime, coarse bulky manures etc.

4.0 Ground water scenario

4.1 Hydrogeology:

Groundwater occurs in the area under unconfined condition in the weathered zones at shallow depths in most of the litho units in the Achaeans and almost all the litho units in the Gondwanas. Groundwater occurs under confined to semi-confined condition where the fractures are deep seated and are unconnected with the top weathered zone.

Aquifer geometry-The aquifer geometry for shallow and deeper aquifer has been established through hydro geological studies, exploration, the surface and subsurface geophysical studies in the district covering all geological formations. The aquifer can be divided into two zones – shallow and deeper aquifer.

(i) Shallow aquifer – The shallow aquifers are being taped through dug wells, dug cum bore wells or shallow bore wells drilled to the depth of 60 m. The weathered mantle and shallow fractures constitute the shallow aquifers. The thickness of weathered mantle varies from 5 to 25 mbgl. The well inventory data suggest that the maximum depth of dug well in granite gneiss and Gondwana is 17 m and 25 m respectively. Exploration in granite gneiss indicates that shallow fractures are less productive. Many dug wells and hand pumps get dried up during summer.

Deeper aquifers:

Depths –to-water levels and groundwater conditions:

Groundwater conditions in various litho units are usually described under two broad heads viz.

(i) The porous formations and

(ii) The fissured formations

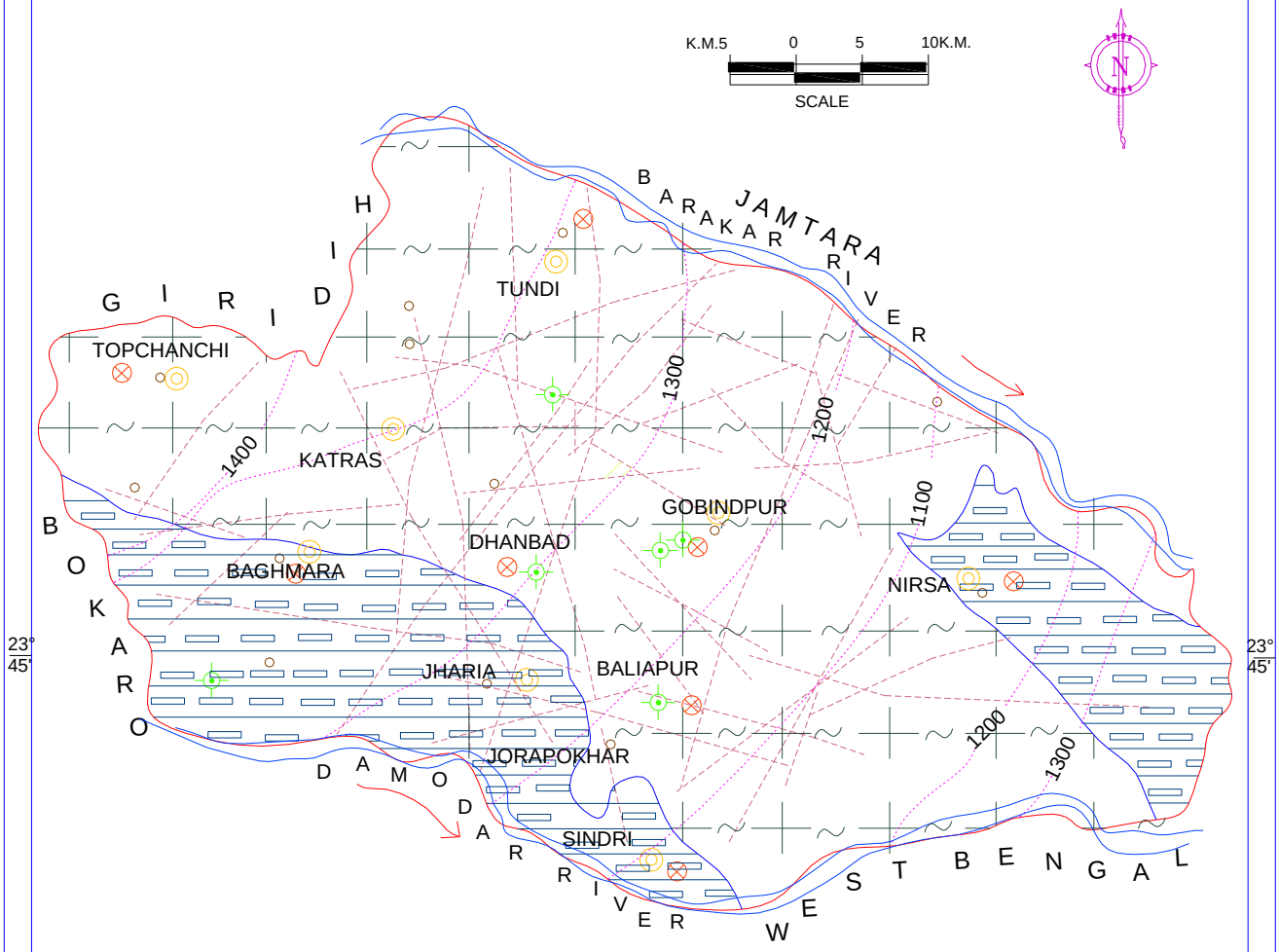
I. **The porous Formations:**

The main members of the porous formations are the Newer and Older alluvium of the Recent and sub-recent age. Recent alluvium is found in very thin veneers in topographic depressions along the Damodar River. Insignificant occurrences may also be noticed along Barakar River and in some major tributaries of these two. They cannot however, be considered as potential aquifers.

II. **The Fissured Formations:**

Achaeans meta-sedimetaries, the granites, intrusive metabasics and the Lower Gondwana sedimentary constitute the productive aquifer. The first three come under consolidated Formation and the last one under semi consolidated Formation.

FIG 3 : HYDROGEOLOGICAL MAP OF DHANBAD DISTRICT, JHARKHAND



I N D E X

LITHOLOGICAL CONDITIONS	HYDROGEOLOGICAL CONDITION	GROUND WATER POTENTIAL
GONDWANAS	(POROUS/FISSURED FORMATION) MODERATELY THICK CONFINED/ UNCONFINED AQUIFERS	LIMITED YIELD PROSPECTS 1-10 m^3/HOUR
GNEISSIC COMPLEX	(FISSURED FORMATION) GROUND WATER RESTRICTED TO WEATHERED RESIDUUM AND FRACTURES ZONE HAVING SECONDARY POROSITY	GOOD YIELD PROSPECTS 1-20 m^3/HOUR
SPRING	NHNS	BOREWELL (DEEP)
LINEAMENT	1300 ISOHYETAL CONTOUR	BOREWELL (SHALLOW)

Pre-monsoon depth to water level

Pre-monsoon depths to water level map of dug wells show water level between 1.29-14.60 mbgl. Topchanchi, Govindpur, Jharia, Katras, Nirsa areas show water level between 8-10 mbgl While Tundi,Rajganj have water level between 6-8 mbgl. Katras areas have deepest water level (14.60mbgl).

Post- monsoon depth to water level- During this period maximum area(Govindpur,Nirsa,Rajganj,Topchanchi,Tundi) have water level between 2.10-3.50 mbgl. And small patches of Mahuda,Sindri Dhanbad, Katras and Topchanchi area have 4-6 mbgl water level

Table 1: Depth to water level of NHNS of Dhanbad district (2012)

Sl No.	Location of Wells	May (2012)	November (2012)
1	Govindpur	3.46	2.30
2	Jharia	1.29	2.10
3	Katras	14.60	6.15
4	Nirsa	3.31	2.00
5	Rajganj	6.92	3.40
6	Sindri	7.59	4.20
7	Topchanchi	7.71	3.90
8	Tundi	6.00	2.50

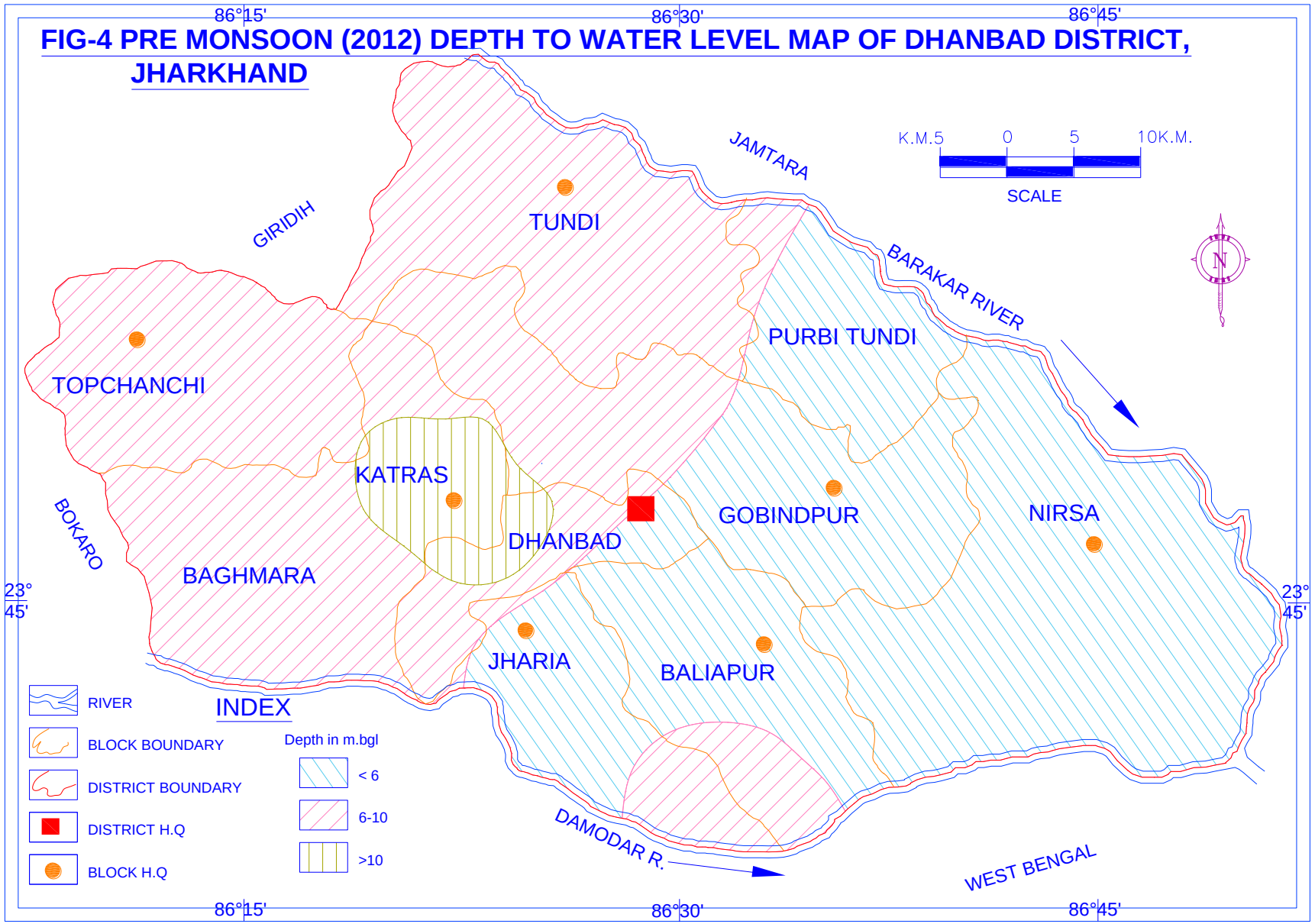
Ground water level fluctuation

The seasonal ground water fluctuation map for dug well data is prepared based on the inventory wells of pre and post monsoon data**.** The map depicts that maximum (about 55 percent) area falls under 2-4m range while 20 percent area comes under 4-6m range and 20 percent area under 6-8 m. range while about 5 percent under 0-2 m range.

Abstraction structures

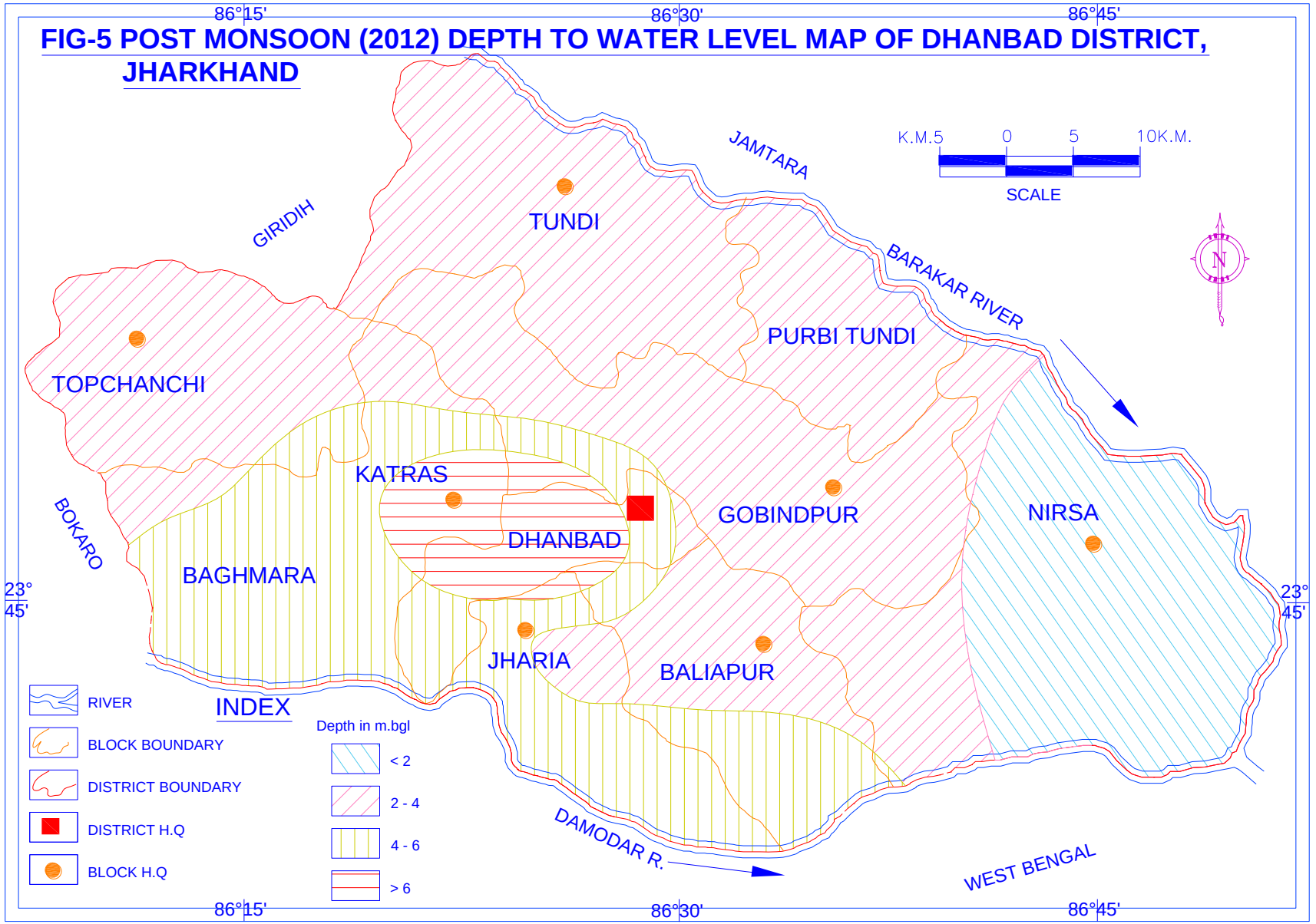
In the Dhanbad district ground water abstraction is mainly through dug wells. These are 5-15m deep tapping the weathered zone and shallow fracture zones. Presently there are more than 20,000 dug wells in the study area. The mode of lifting of water for drinking purpose from dug well is mainly through rope and bucket. Wells fitted with diesel pump set (5 HP) are in use for irrigation. Hand pumps in the district tape water from 30-60mbgl. Total **7766** nos. of hand pumps are functioning in the Dhanbad district.

FIG-4 PRE MONSOON (2012) DEPTH TO WATER LEVEL MAP OF DHANBAD DISTRICT, JHARKHAND



CENTRAL GROUND WATER BOARD, MID EASTERN REGION, PATNA

FIG-5 POST MONSOON (2012) DEPTH TO WATER LEVEL MAP OF DHANBAD DISTRICT, JHARKHAND



4.2 Ground water Resources-

The ground water assessment has been done based on the recommendation of the GEC-1997. The ground water assessment has been carried on block wise basis(2009) and the assessment varies between Jharia (9600ha) and Nirsa (35000ha). Jharia block falls in over-exploited category while Dhanbad block is in critical category. All other six blocks in the district fall in the safe category. The net annual replenishable ground water resources of the district are 134.91 mcm. The gross ground water draft for all uses is 70 mcm and allocation for domestic and Industrial requirement up to year 2034 is 58 mcm. The present stage of ground water development of the district as on 31st march 2009 is 52%. At present maximum ground water development is in Jharia block (105.63%) and Dhanbad sadar block (92%) and minimum ground water development is in Tundi block (42.55%). Details of block wise ground water Resources are given in (**Table 2)**

Table 2: Block wise Ground water Resources of Dhanbad district inHa-m (As on 2009)

Sl No.	Assessment unit	Command/Non-Command/Total	Net Ground Water Availability	Existing Ground Water Draft For Irrigation	Existing Ground Water Draft For Domestic And Industrial Water Supply	Existing Ground Water Draft For All Uses	Allocation For Domestic And Industrial Requirement Supply	Net Ground Water Availability For Future Irrigation	Stage Of Ground Water Development (%)	Categorisation of blocks
1	2	3	4	5	6	7	8	9	10	11
1	Baghmara	23639	1890.38	412.03	582.97	995.0	885.00	593.35	52.63	**safe**
2	Baliapur	12521	1068.07	492.272	178.06	670.3	270.31	305.49	62.76	**safe**
3	Dhanbad	11148	1101.00	52.896	961.72	1014.6	1459.99	-411.89	92.15	**Critical**
4	Gobindpur	24404	2196.55	852.832	333.28	1186.1	505.95	837.77	54.00	**safe**
5	Jharia	11840	786.14	19.024	811.38	830.4	1231.75	-464.64	105.63	**Over-exploited**
6	Nirsa	36501	3225.80	322.944	522.07	845.0	792.55	2110.30	26.20	**safe**
7	Tundi	25145	2125.42	695.072	209.27	904.3	317.70	1112.65	42.55	**safe**
8	Topchanchi	12927	1098.21	384.656	208.37	593.0	316.33	397.23	54.00	**safe**
	Total	**158125**	**13491.57**	**3231.73**	**3807.1**	**7038.8**	**5779.59**	**4480.26**	**52.17**	

Table-3 DETAILS OF CHEMICAL ANALYSIS OF SHALLOW AQUIFER WATER SAMPLES OF NHNS WELLS (2012)

S. NO.	Location	District	Well No.	EC µS/cm at 25ºC	CO3 mg/l	HCO3 mg/l	Cl mg/l	Ca mg/l	Mg mg/l	TH as CaCO3 mg/l	Na mg/l	K mg/l
1	Jharia	Dhanbad	BDD-1	577	0	160	49.6	24	28	175	37	12.1
2	Tundi	Dhanbad	BDD-2	605	0	98	67.4	56	17	210	33	2.2
3	Nirsa	Dhanbad	BDD-3A	1172	0	98	124.1	74	29	305	111	3.2
4	Topchanchi	Dhanbad	BDD 4	1970	0	268	259.0	160	78	720	43	3.2
5	Mahuda	Dhanbad	BDD-7A	973	0	289	67.4	26	68	345	52	8.8
6	Govindpur	Dhanbad	BDD-8A	588	0	277	14.2	34	15	145	48	5.3
7	Rajganj	Dhanbad	BDD-9	1690	0	390	195.0	86	60	460	143	1.2
8	Katras	Dhanbad	BDD-10	1750	0	196	241.1	126	86	670	68	4.8
9	Sindri	Dhanbad	BDD-11	1138	0	329	89.0	64	28	275	108	1.4
10	Dhanbad	Dhanbad	BDD-13	1384	0	234	184.3	58	75	455	62	17.5
11	Baghmara	Dhanbad	BDD-14	677	0	111	70.9	56	19	220	39	1.9

4.3 GROUND WATER QUALITY

Quality of ground water is just as important as its quantity. Dhanbad district is covered by variety of geological formations like Archean gneisses, granites, amphibolites and Gondwana super group of rocks consisting of shales, sand stone etc. Quality of ground water in the study area is monitored regularly by collection of samples annually during pre monsoon (May) from 8 NHNS spread over study area.

CHEMICAL QUALITY

PH: - It is the measure of acidity or alkalinity of ground water. pH of shallow aquifers varies between 7.10 to 8.66

Electrical Conductivity: - It is the measure of conductivity of the water. It varies between 570 to 1900 micro-mhos /cm. at 25^0cfor shallow aquifers

Total Hardness as $CaCO_3$: - Total hardness as CaCO3 value varies between 175 to 720 mg/l in general for shallow aquifers.

Bicarbonates: - Bicarbonates values vary between 98 to 390 mg/l for shallow aquifers.

Chlorides: - Chlorides are important anions of ground water. Its concentration varies between 49.6 mg/l to 249 mg/l.

Calcium: - Calcium is a major cation found in ground water. Its concentration varies between 24 mg/l to 160 mg/l, which is within permissible limit.

Magnesium: - In ground water of Dhanbad and parts of Bokaro district concentration of magnesium varies between 17 to 86 mg/l, which is within permissible limit.

Sodium: - Concentration of Na varies between 33 mg/l to 111 mg/l in general

Potassium: - Potassium concentration is between 1.2 to 17.5 mg/l.

4.4 Status of Ground water development

The ground water is mainly utilized for domestic needs and for irrigation purposes. The ground water abstraction is mainly through dug wells and bore wells. The bore wells are fitted with hand pumps or submersible power pump. The stage of ground water development in the district is 52.17%. The highest stage of development is in Jharia (105.67%) and Dhanbad (94%) blocks and lowest stage of development is in Tundi (%) block. The Gondwana sandstones in general, are known to constitute good aquifers at many places. However, the yield potential of the areas adjoining active mines in the coal belt is poor. With continued dewatering of the active mine-pits, the neighboring wells register gradually lowering of water levels. The active mines often act as groundwater “sinks”. In contrast, the water logged abandoned mines and pits act as potential sources of groundwater.

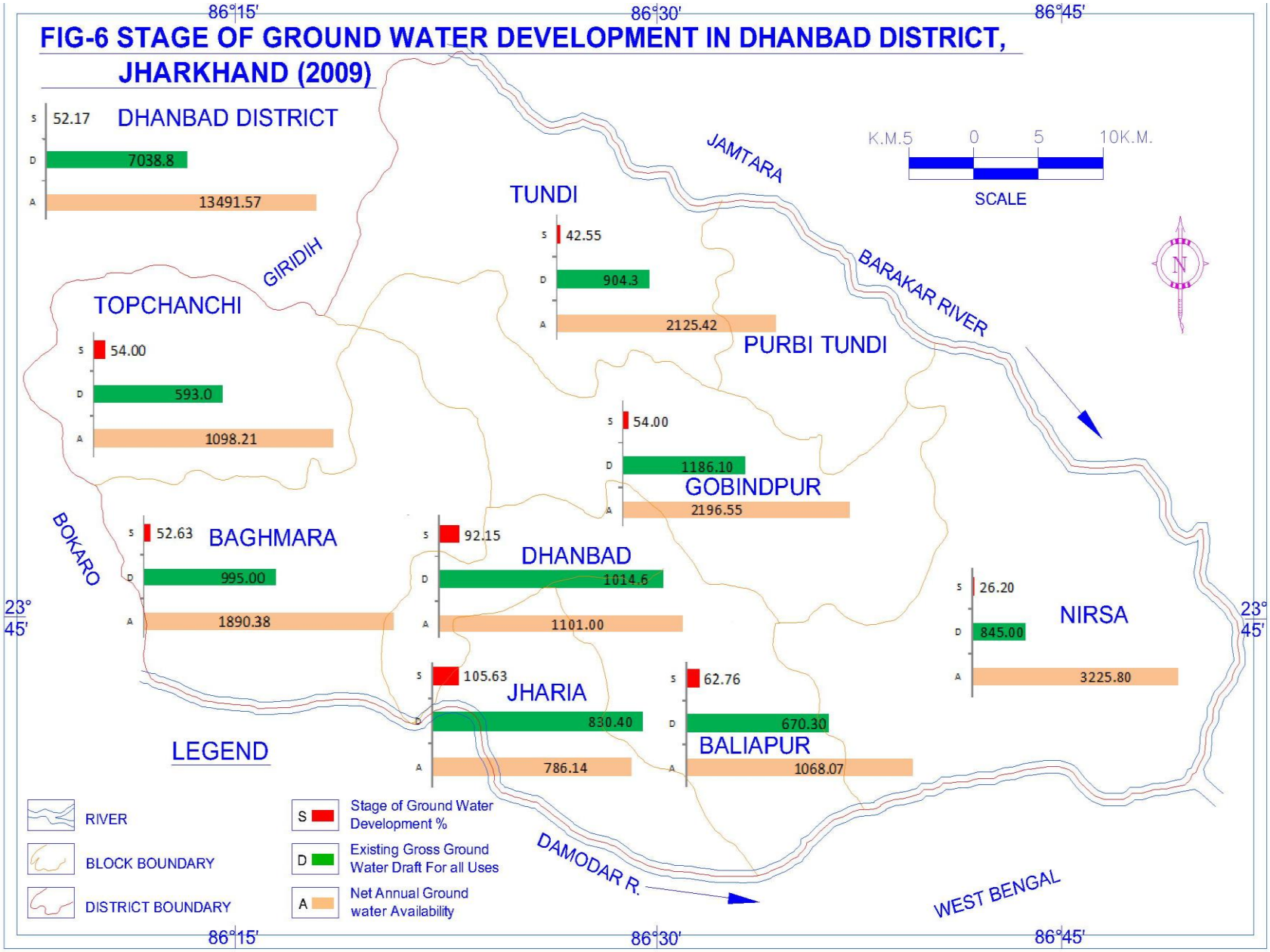


FIG-6 STAGE OF GROUND WATER DEVELOPMENT IN DHANBAD DISTRICT, JHARKHAND (2009)
86°15'
86°30'
86°45'
23° 45'
DHANBAD DISTRICT
S 52.17
D 7038.8
A 13491.57
K.M.5 0 5 10K.M.
SCALE
JAMTARA
GIRIDIH
BARAKAR RIVER
TUNDI
S 42.55
D 904.3
A 2125.42
PURBI TUNDI
TOPCHANCHI
S 54.00
D 593.0
A 1098.21
S 54.00
D 1186.10
A 2196.55
GOBINDPUR
BOKARO
S 52.63
BAGHMARA
D 995.00
A 1890.38
S 92.15
DHANBAD
D 1014.6
A 1101.00
S 26.20
D 845.00
A 3225.80
NIRSA
S 105.63
JHARIA
D 830.40
A 786.14
S 62.76
D 670.30
BALIAPUR
A 1068.07
LEGEND
RIVER
BLOCK BOUNDARY
DISTRICT BOUNDARY
S Stage of Ground Water Development %
D Existing Gross Ground Water Draft For all Uses
A Net Annual Ground water Availability
DAMODAR R.
WEST BENGAL

5.0 Ground water management strategy:

The ground water is mainly utilized for domestic needs and to a limited extent for irrigation and industrial Purposes. The ground water abstraction is mainly through dugwells, bore wells, Dug cum bore wells and filter point wells are also used for ground water abstraction in a very limited area. Ground water potential of the rocks are limited only in secondary porosity. Surface water resources can be utilized for solving the water scarcity. Main problem of water is in Dhanbad urban area comprising of Dhanbad municipal area, jharia area, Jorapokhar, Pathardih, Jamadoba, Bhuli and Katras.Against the demand of 35.18 million gallons per day of water supply is only 17 million gallons per day. There is shortage of 18.18 million gallons per day. In summer season scarcity of water is in alarming proportion. Maithon water supply scheme can be a good substitute for supplying surface water to Dhanbad urban areas.20 million gallons of water per day can be supplied from Maithon dam.

5.1 Areas Suitable for artificial Recharge

Rainwater having in the technique of collection and storage of rainwater at surface or in sub-surface aquifer before it is last as surface runoff. Artificial recharge to ground water is a process by which the ground water reservoir is augmented a rate exceeding that under natural condition of replenishment.

Potential areas

1. Where groundwater levels are declining on regular basis.
2. Where substantial amount of aquifer has been desatureted
3. Where due to rapid urbanization infiltration of rainwater into subsoil has decreased drastically and recharging of ground water has diminished.

Identification of area

The identification of the area suitable for artificial recharge has been done on the basis of depth of mean post- monsoon water level the area where the average water level of last 10 years is more than 7 mbgl in post monsoon period (November) has been considered for artificial recharge. In Dhanbad district Baghmara, Katras, Jharia and Dhanbad urban areas are showing declining trend. So, rainwater harvesting can be a good option for recharging the desaturated aquifer in these areas. In urban areas rainwater available from rooftops of building, pared and unpaved areas go waste. This water can be recharged to aquifer and can be utilized at the time of need.

6.0 Ground water related issues –

In Dhanbad district the consolidated and fractured aquifers constituted by the Archaean metamorphic provide better scope for development of groundwater. A lesser discharge from bore wells in the Gondwana group of rocks might be due to the proximity of active collieries, which register considerable mines seepage.

7.0 Awareness and Training activity

7.1 Mass awareness programme and training activity-

Altogether one mass awareness programme and one Rainwater harvesting training programme was organized in Dhanbad district. One Mass awareness programme was organized at Govindpur block campus during March 2003.One training programme on Rain water harvesting and artificial recharge to Ground water was organized at Central Mining research institute campus, Dhanbad during March 2004.Director, Indian school of Mines, Dhanbad chaired the function. In the function representatives from different Govt. departments, CMRI, CFRI, N.G.O.s and builders participated. Scientists of Central Ground Water Board delivered lectures related to Rainwater harvesting and conservation of ground water.

7.2 Participation in exhibition, Mela .Fair etc NIL

7.3 Presentation & lectures delivered in Public forum / Radio / Television / Institute of repute / grassroot association / NGO / academic institutes---

Central Ground Water Board has organized lectures related to Rain water harvesting in the Indian School of mines, Dhanbad. Lectures were delivered by D.Chakrborty and T.B.N.singh.

8.0 Area notified by CGWA/SGWA

From the ground water point of view, all the blocks of the district are under safe category. So far no blocks have been notified by C.G.W.A.

9.0 Recommendations

1. Topchanchi and Tundi blocks being hilly and undulating the drainage is very intensely developed. The construction of Rain water harvesting structures such as gully plugging, contour bunding, gabion structures, check dams and Percolation tanks would increase the storage in surface which will in turn recharge the ground water around it.

2. In mining operation, huge quantity of water is generated and discharged on surface or in natural water bodies without any productive use. Jharia coalfield area has a large amount of coal deposit and every year a huge quantity of water is discharged from coal mines to the rivers to facilitate safe mining. By conservative estimate BCCL (Bharat Cooking Coal Ltd.) coal mines of Jharia region discharges about **3,40,120 GPM (2.22 Mm^3/day) of wastewater**. This has a visible detrimental effect on the water quality and aquatic lives of the region. Besides, a huge quantity of unused mine water is already available in all the abandoned open cast mines.

3. Baliapur and Govindpur blocks have high density of lineaments. These areas have good potential of ground water so it can be developed with further intensive study.

4. Roof top rainwater harvesting should be adopted in Dhanbad, Jharia, Katras and Baghmara blocks to improve the groundwater scenario.

5. In Baliapur and Govindpur area casing should be placed properly so that caving problem can be avoided.