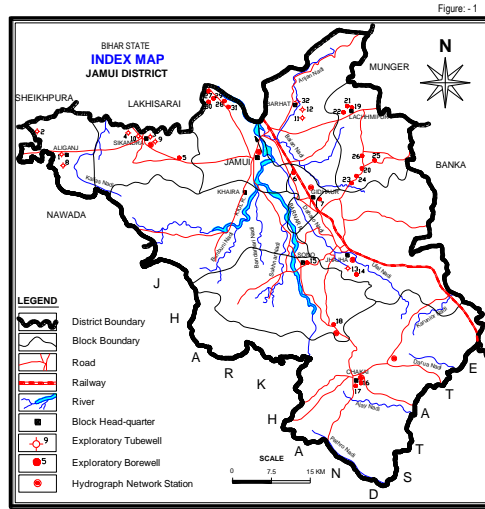




# भूजल सूचना पुस्तिका

## जमुई जिला, बिहार

### Ground Water Information Booklet Jamui District, Bihar State



केन्द्रीय भूमिजल बोर्ड

जल संसाधन मंत्रालय

(भारत सरकार)

मध्य-पूर्वी क्षेत्र

पटना

Central Ground Water Board

Ministry of Water Resources

(Govt. of India)

Mid-Eastern Region

Patna

सितंबर 2013

September 2013

Prepared By

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Sh. S. S. Purty, Scientist – 'B'

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**GROUNDWATER INFORMATION BOOKLET  
JAMUI DISTRICT**

***DISTRICT AT A GLANCE***

Sl. No.	Items	Statistics
<b>1.</b>	<b>GENERAL INFORMATION</b>	
	<b>I. Geographical Area (Sq. Km.)</b>	3098 sq.km
	<b>II. Administrative Divisions</b>	
	<b>No. of Panchayats/Villages</b>	153/1506
	<b>Number of Block</b>	10
	<b>III. Population (As per 2011 Census)</b>	Rural: 145333 Urban: 1615072
	<b>IV. Average Annual Rainfall (mm)</b>	1107
<b>2</b>	<b>GEOMORPHOLOGY</b>	
	<b>Major Physiographic Units</b>	Rocky upland, plateau / pediplain and alluvial plain
	<b>Major Drainages</b>	Kiul River
<b>3</b>	<b>LAND USE</b>	
	<b>i) Forest Area</b>	928.55 sq.km
	<b>j) Net Area Sown</b>	399.72 sq.km
	<b>k) Total Cropped Area</b>	499.65 sq. km
<b>4</b>	<b>MAJOR SOIL TYPES</b>	alfisols and ultisols
<b>5</b>	<b>PRINCIPAL CROPS</b>	Rice, Wheat, Maize & Sugarcane
<b>6</b>	<b>IRRIGATION BY DIFFERENT SOURCES</b>	
	<b>Dugwells</b>	8620 (during 2001)
	<b>Tubewells/Borewells (STW)</b>	3962 (during 2001)
	<b>Tanks/ponds</b>	19
	<b>Canals</b>	18
	<b>Other Sources</b>	-
	<b>Net Irrigated Area</b>	28.9 ('000 ha)
	<b>Gross Irrigated Area</b>	38.0 ('000 ha)

<b>7</b>	<b>NUMBER OF GROUND WATER MONITERING WELLS OF CGWB (2011)</b>	
	<b>No. of Dugwells</b>	08
	<b>No. of Piezometers</b>	Nil
<b>8</b>	<b>PREDOMINANT GEOLOGICAL FORMATIONS</b>	Alluvium, Granite gneisses, Quarzite
<b>9</b>	<b>HYDROGEOLOGY</b>	
	<b>Major water bearing formations</b>	Unconsolidated sand and weathered and fracture zones in hard rocks
	<b>Pre-monsoon Depth to water level during 2011</b>	5.87 – 14.2 m bgl
	<b>Post-monsoon Depth to water level during 2011</b>	2.84 – 11.25 m bgl
	<b>Long term water level trend in last 10 yrs(2002 – 2011) in m/yr</b>	No significant decline
<b>10</b>	<b>GROUND WATER EXPLORATION BY CGWB (As on 31-03-2013)</b>	
	<b>No. of well drilled (EW,OW, PZ, SH, Total)</b>	EW-39, OW-29
	<b>Depth Range (m)</b>	12-76 ( Granular),44-179 ( Fracture)
	<b>Discharge (m<sup>3</sup>/hr)</b>	1.8-21
	<b>Storativity (s)</b>	4.2 X 10 <sup>-3</sup> to 3.7 X 10 <sup>-4</sup>
	<b>Transmissivity (m<sup>2</sup>/day)</b>	13-914
<b>11</b>	<b>GROUND WATER QUALITY</b>	
	<b>Presence of Chemical constituents more than the permissible limit (e.g.EC, F, As, F)</b>	EC and F
	<b>Type of Water</b>	Potable
<b>12</b>	<b>DYNAMIC GROUND WATER RESOURCES (as on 31<sup>st</sup> March 2009) in mcm.</b>	
	<b>Annual Replenishible Ground Water Resources</b>	398.26
	<b>Net Annual Ground Water Draft</b>	150.41
	<b>Projected Demand for Domestic and Industrial Uses up to 2025</b>	53.29
	<b>Stage of Ground Water Development</b>	37.8%

<b>13</b>	<b>AWARENESS AND TRAINING ACTIVITY</b>	
	<b>One day Mass Awareness Programme Organized</b>	One no on “Rain Water Harvesting & Ground Water
	<b>Date</b>	28.03.2007
	<b>Place</b>	Gandhi Town Hall at Jamui Town
	<b>No. of Participants</b>	Over six hundred
<b>14</b>	<b>GROUND WATER CONTROL AND REGULATION</b>	
	<b>No. of OE Blocks</b>	Nil
	<b>No. of Critical Blocks</b>	Nil
	<b>No. of Blocks Notified</b>	Nil
<b>15</b>	<b>MAJOR GROUND WATER PROBLEMS AND ISSUES</b>	High Fluoride Concentration

## 1.0 INTRODUCTION

### 1.1 Location, Area and Administrative Details

The Jamui was separated from Munger district as a district on 21 February 1991. Jamui district is one of the thirty-eight districts of Bihar state. Jamui town is the administrative headquarters of this district. The area of the district is 3098 km<sup>2</sup>. It lies between 24<sup>0</sup>23'15" and 25<sup>0</sup>08'30" North Latitude and 85<sup>0</sup>49'30" and 86<sup>0</sup>38'00" East Longitude, and fall on Survey of India Degree Sheet No. 72/ G, H, K and L.

The district is bounded in the north by Sheikhpura, Lakhisarai and Munger district, in the west by Nawada district, in the east by Banka district and in the south by Jharkhand state boundary. The Administrative units of the district are given in the table 1.

*Table 1 : Administrative Unit*

SN	Administrative Unit	No.
1	No. of Police District	1
2	No. of Sub-Divisions	1
3	No of Police Subdivisions	2
4	No. of Blocks	10
5	No. of Circles	10
6	No. of Police Stations	12
7	No. of Panchayats	153
8	No. of Villages	1528

Source:- <http://jamui.bih.nic.in/index.html>

The district comprises 10 administrative blocks, namely Jamui, Khaira, Gidhour, Jhajha, Sono, Chakai, Barhat, Laxmipur, Sikandra, Aliganj. Jamui township is the headquarters of the district. As per 2011 Census the total population of the district is 1756078 out of which male population is 914368 and female population is 841710. The decadal growth rate (2011) of population over last decade is 25.54%. The population density of the district is 567 person/ km<sup>2</sup>. With regards to Sex Ratio in Jamui district, it stood at 927 per 1000 male and the literacy rate is 62.12%. Total literate in Jamui District were 858,588.

At present the district is the part of Munger Commissionery having one subdivision and 10 revenue block. Block-wise No. of panchayat and village is as below: -

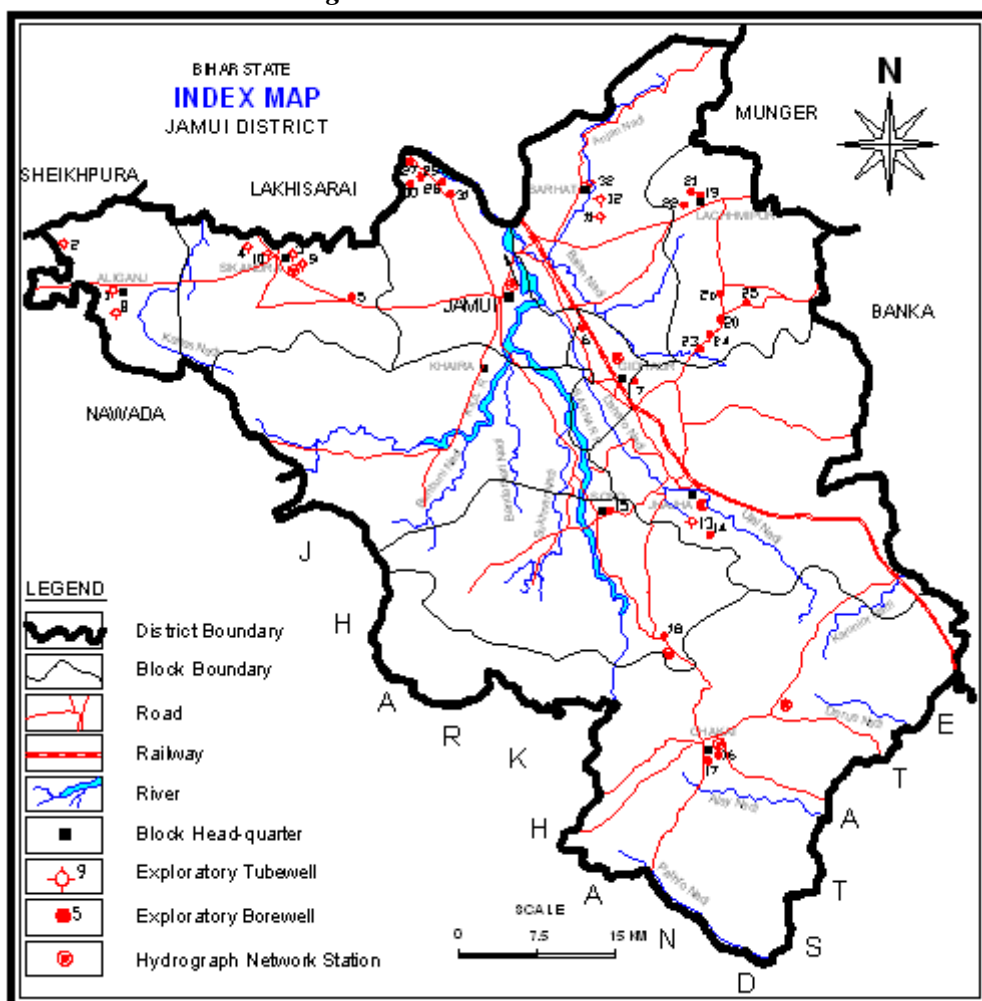


**Table 2 : Block-wise No. of Panchayat and Village**

Sub division	Block	No. Of Panchayat	No. Of Village
Jamui	Jamui	12	081
	Khaira	22	120
	Sikandra	14	068
	I. Aliganj	13	069
	Laxmipur	13	082
	Gidhaur	08	020
	Barahat	09	043
	Sono	19	250
	Chakai	23	600
	Jhajha	20	197
	Total		153

<http://jamui.bih.nic.in>

**Figure 1: Administrative details**



## 1.2 Basin/Sub-Basin and Drainage

Jamui district forms a part of Phalgu-Kiul sub-basin of Ganga Basin. Catchments of Kiul and Barnar rivers form a major part of the district. The dominant drainage pattern is dendritic and radial in the hilly and plateau regions, while in the plains it is parallel to sub-parallel. There is a

linear drainage divide along the outer fringe of Chakai plateau. Ajay, Pathro and Darua rivers flow towards east, while Kiul, Barnar, Ulal, Nakti and Nagi rivers flow towards north. Rivers are generally ephemeral in nature except the Kiul river, which has meager discharge during lean periods. Kiul river also carries a huge amount of sand- the main source of building material in the region.

### 1.3 Land Use, Agriculture and Irrigation Practices

Land utilisation of the district during 2009-10 is as follows:

**Table 3 : Land Utilisation in Jamui District**

Forest Area		1	92855	
Land put to Non-agricultural use	Land Area		2	38972
	Water	Perennial	3	2188
		Temporary	4	2845
		Total (2, 3, & 4)	5	44005
Barren Unculturable Area		6	28567	
Permanent Pastures & Grazing Land		7	1664	
Land under Misc. Tree crops & Groves not included in net area sown		8	2080	
Culturable Waste Land		9	10309	
Fallow Land	Other Fallow Land		10	16127
	Current Fallow Land		11	69710
	Total		12	85837
Total Non-Agricultural Land		13	265317	
Net Sown Area		14	39972	
Total Cropped Area		15	49965	
Area Sown more than once		16	9993	

Source: <http://krishi.bih.nic.in>  
Unit in ham

The economy of the district is agrarian in nature. The agricultural activities are largely confined to Kharif cultivation. As per the data of the Govt. of Bihar the Rice and Maize are the main Kharif crops cultivated by utilising the area of 73000 ha and 6300 ha respectively. The main Rabi crops are wheat, maize, Lentil, Mustard, Linseed etc. The Maize cultivated in about 22000 ha area. The total average (2004 to 2008) production of the major crops of the district is as under:

**Table 4: Total Average Production of Major Crops**

Crops	Rice	Wheat	Maize	Sugarcane	Mango	Banana	Guava	Lemon	Potato
<b>Production</b> (‘000 t)	160.6	33.8	25.4	102.7	9.792	8.637	1.995	1.251	2.6
<b>Productivity</b> (kg/ha)	2200	1500	2500	34000	9525	20963	9027	-	4000

<http://agricoop.nic.in>

The groundwater is the main source of irrigation. About 78.32% of the total irrigated area is irrigated by dugwells and borewells whereas only 2.88 % is irrigated by Canal & Tanks.

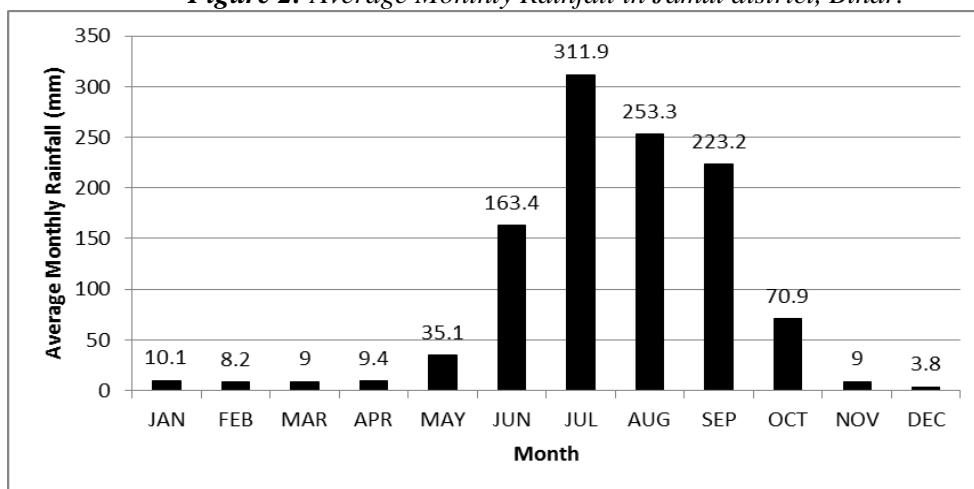
### 1.5 Studies/Activities carried by CGWB

The Central Ground Water Board has carried out hydrogeological surveys followed by ground water exploration in alluvial and hard rock formations of the district. A total of 39 exploratory wells have been drilled in Jamui district out of which 31 tube wells drilled in marginal alluvium and only 8 bore wells in hard rocks. There are 08 National Hydrograph Network Station (Monitoring Wells) representing phreatic aquifer are being monitored four times a year since 1975. Chemical quality of ground water of phreatic aquifer is monitored in the month of May every year. Studies have been carried out for geogenic contamination of ground water with fluoride. Ground water resource has been estimated for the district (GEC-1997, norm) as on 31<sup>st</sup> March 2009.

## 2.0 CLIMATE AND RAINFALL

The average annual rainfall of district is 1107.3 mm. About 80% of the rainfall is received during June to September by south-west monsoon. The climate of Jamui district represents a transition between dry and extreme climates of the northern India and warm and humid of West Bengal. In the summer season the diurnal temperature rises up to 42<sup>o</sup>C, while in winter season it drops to as low as 2<sup>o</sup>C.

*Figure 2: Average Monthly Rainfall in Jamui district, Bihar.*



(<http://data.gov.in>)

## 3.0 GEOMORPHOLOGY AND SOIL

### 3.1 Geomorphology

The district has a diverse geomorphology ranging from hills to flood plains. The major geomorphic units are rocky upland, plateau / pediplain and alluvial plain.

There are three major hilly tracts, namely, a) the hills of Batia-Jhajha area having strike in east-west direction lying in the northern fringe of Chakai plateau, b) the Gidheshwar hills in the western part of the district and c) the Kharagpur hills lying in north-eastern part of the district. Attaining a height of 475 m amsl in Barhat block.

Plateau representing oldest table land in the area is Chakai plateau. The pediplains having rolling topography has relief up to 300 m amsl. It extends from Batia to the south of Kharagpur hills and comprises residual soil overlain by mixture of sheet wash deposits.

Alluvial plain is represented by Jamui terrace. It is made up of sediments derived from the denudation of Chakai plateau and Kharagpur hill. The thickness of alluvium in the northern part is about 80 m, while in southern part it reduces to 10 m. Other landforms such as escarpment, inselberg, valley fills are also present.

### **3.2 Soil**

The district consists mainly of alfisols and ultisols types of soils formed under different lithological and pedogenic conditions. The alfisols are developed mainly on the marginal alluvial area in the northern fringe of hard rock terrain. It occurs mainly in Jamui, Sikandra and Aliganj blocks. The soil in these blocks are called alluvial soil composed of clay, sand and gravel. The lower horizon is highly ferruginized. A variant of alfisols soil is red sandy soil occurring mainly in plateau and hilly regions. These soils have poor fertility and are suitable for high land crops.

The ultisols occur mainly in Sono and Lakhimpur blocks. It contains argillic horizons and has low base status. Red and yellow soils occur in southern and eastern parts of Jamui town, while light brown to red yellow soil occur in the south of Jamui town in small patches.

## **4.0 GROUND WATER SCENARIO**

### **4.1 Water Bearing Formations**

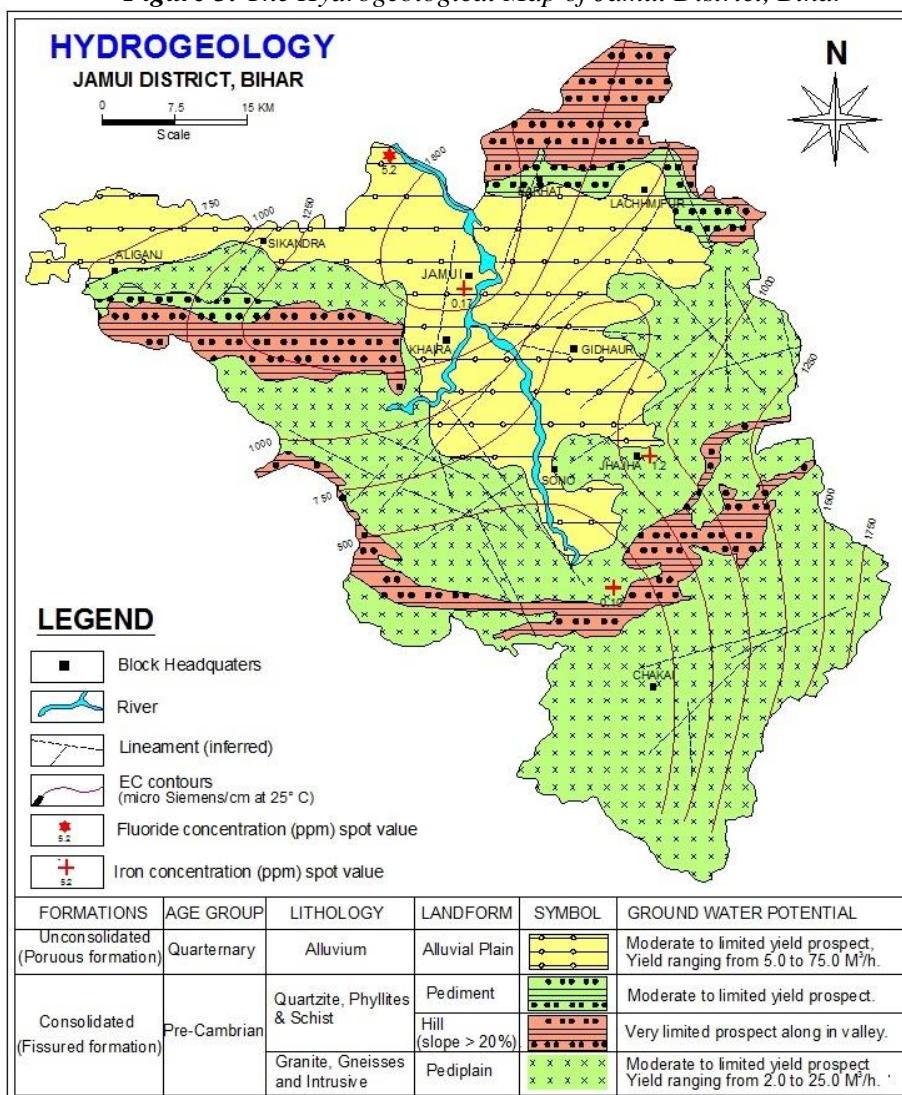
Hydrogeologically, the district can be divided into two parts (a) hard rock/ fissured formation (b) unconsolidated / porous formation (Figure 5).

**(a) The hard rock / fissured formation:** It comprises granite gneisses, quartzite and phyllites, while granite gneisses belong to Chotanagpur Gneissic Complex, quartzite and phyllites belong to Kharagpur Formation. The secondary porosities developed by means of weathering and / or fracturing. These are main repository of ground water in hard rock. In general these rocks form poor aquifers. The exploratory drilling data of this area reveal three to four sets of fractures/ joints occurs at different depths up to 200m bgl. Identification of groundwater potential area has been done based on study of lineaments picked up from satellite imageries. The zones of lineaments are potential areas for ground water exploration and recharge. Weathered residuum, saprolite zone and

fractures within 15-35m bgl depths constitute shallow aquifer in the hard rocks. In Jamui district 41 bore wells have been drilled in hard rock area to a maximum depth of 200m bgl at Mahadeo-Simaria village of Sikandra block. Depth of bore wells in these formations ranges from 60 to 200 m bgl. Ground water occurs under semi-confined condition in hard rock and discharge ranges from 1 to 10 lit. per second with drawdown of 12-18 m.

**(b) Porous formation:** The Quaternary alluvium constitutes this hydrogeological unit. The alluvial tract is confined to the Jamui terrace with sediment thickness ranging from 10 to 70 m. The variation in thickness of the alluvium is due to uneven bed-rock topography. Alluvium comprises clay, silt and sand. The occurrence of colluvial sediments is very common especially along foothills. Aquifers in this formation are in unconfined to semi-confined conditions. CGWB has drilled 16 tube wells in this formation. Maximum thickness of 70 m has been encountered in Arha village, Aliganj block. Drilling depth of tube wells ranges from 40 to 70 m bgl. and the discharge varies from 5 to 20 lps.

**Figure 3: The Hydrogeological Map of Jamui District, Bihar**



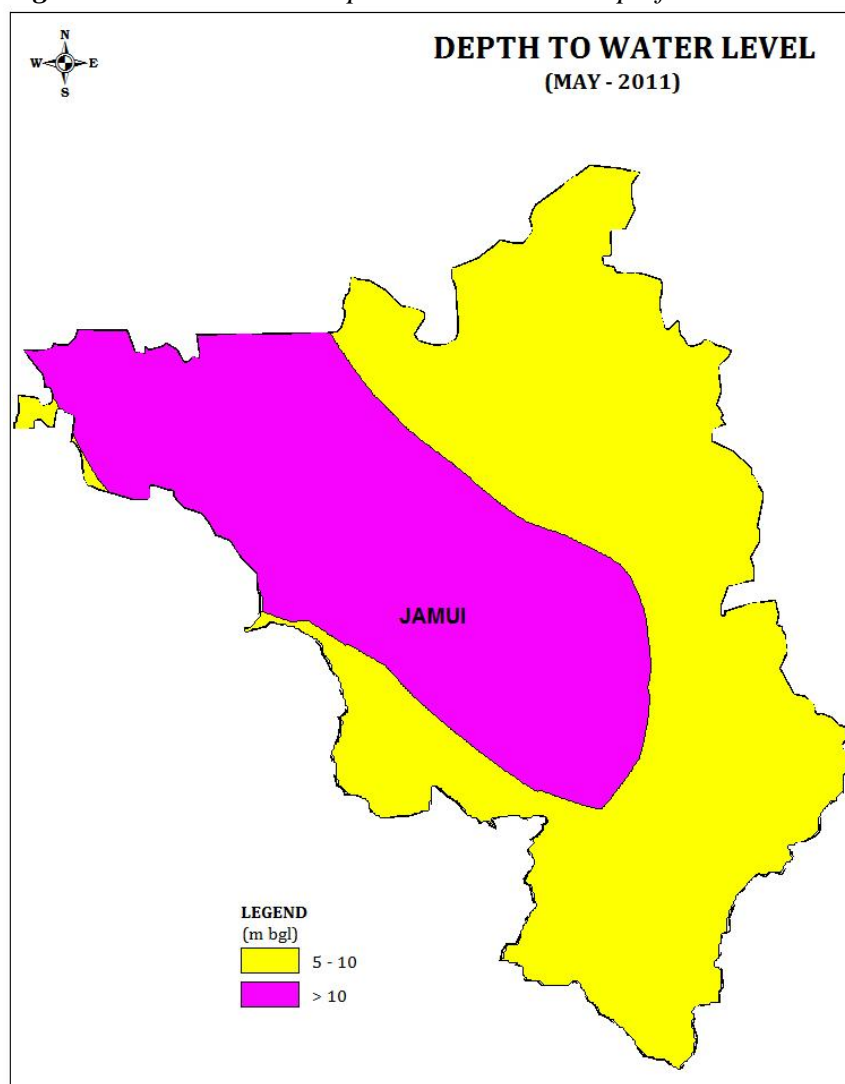
## 4.2 Depth to Water Level

Depth to water level in Jamui district during pre-monsoon period (May 2011) varied from 5.87 to 14.20 m bgl, (Decadal mean is 5.70 to 12.83 m bgl) whereas, during the post-monsoon period (Nov. 2011) it was ranged from 2.84 to 11.85 (Decadal mean is (3.39 to 11.09 m bgl). Comparatively the groundwater level of marginal alluvium is deeper than the water level of hard rock area. Fig 4 & 5 depicts the depth to water level scenario in Jamui district.

During the pre-monsoon period, major part of the district has shown the water level in the range of 2-5 m bgl. however in an elongated area of the western part of district the water level is observed more than 10 m bgl. But during post-monsoon period, in the major part of the district the water level remains in the segment of 2-5 m bgl. and a small patch in the almost central part of the district has shown water level more than 10 m bgl. The remaining part in the district is in the range of 5-10 m bgl.

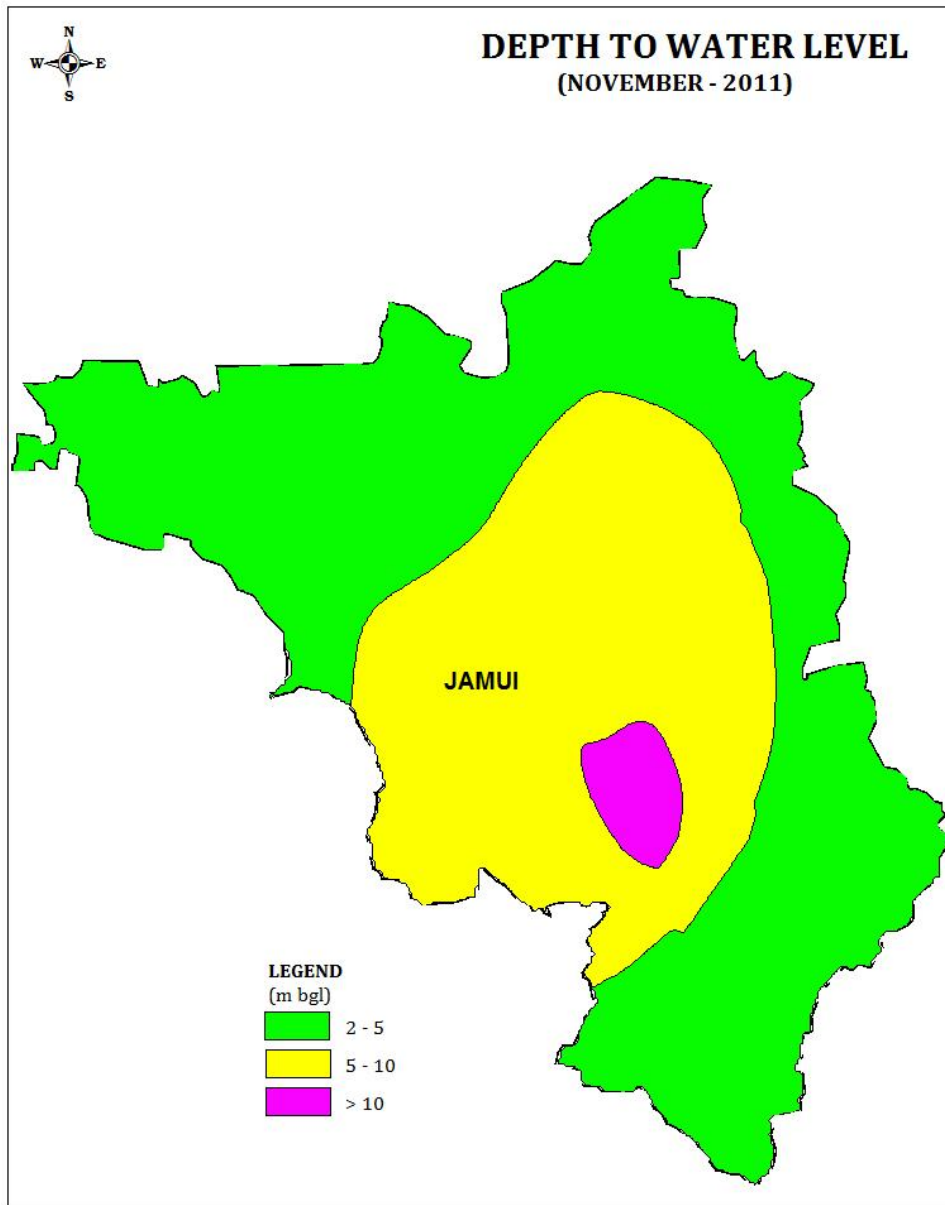
The average water table elevation ranges from 80 to 310 m above mean sea level.

**Figure 4:** Pre-monsoon depth to water level map of Jamui district.





*Figure 5 : Post-monsoon depth to water level map of Jamui district.*



### 4.3 Ground Water Quality

Chemical analysis (May-2011) of phreatic aquifer reveals pH value varying from 8.15-8.69 and EC from 390 to 1760 micro Seimens/cm. As per the concentration of chemical constituents given in Table 5, the ground water is by and large suitable for drinking and irrigation purposes. In some villages of Jamui and Lachhmipur block, viz., Nabinagar and Majhwe, higher concentration of fluoride above the permissible limit (1.5 ppm) has been observed. Fluoride concentration in Majhwe village has been detected in the fractures at a depth of 172.40 m bgl in granite rock. At some places in phreatic aquifers also the fluoride concentration is above the permissible limit. The fluoride contaminated water should be treated before its use for drinking purposes.

**Table 5: Ground Water Quality in Jamui District.**

Chemical constituents	Administrative Blocks							Drinking Water Standard (BIS)	
	Batia	Chakai	Gidhaur	Jamui	Jhajha	Sikandra	Batia	Acceptable limit	Undesirable effect outside the acceptable Limit
EC ( $\mu\text{S}$ @25°C)	390	490	478	1213	707	1760	390	<i>For irrigation</i> * Excellent < 250 Good 250 – 750 Medium 750 – 2,250 Bad 2,250 – 4,000 Very bad > 4,000	
pH	8.31	8.18	8.16	8.24	8.15	8.69	8.31	6.5-8.5	Beyond this range the water will affect the mucous membrane and/or water supply system
CO <sub>3</sub> <sup>2-</sup> (mg/l)	ND	ND	ND	ND	ND	ND	ND	-	-
HCO <sub>3</sub> <sup>-</sup>	146	128	201	165	293	378	146	-	-
Cl <sup>-</sup> (mg/l)	21	53	35	210	64	301	21	250	Beyond this limit taste corrosion and palatability are affected.
Ca <sup>2+</sup> (mg/l)	32	42	42	38	42	20	32	75	Encrustation in water supply structure and adverse effects on domestic use
Mg <sup>2+</sup> (mg/l)	16	21	16	36	19	64	16	30	Encrustation in water supply structure and adverse effects on domestic use.
TH (mg/l)	145	190	170	245	185	315	145	200	Encrustation in water supply structure and adverse effects on domestic use.
Na <sup>+</sup> (mg/l)	8	14	28	125	64	225	8	-	-
K <sup>+</sup> (mg/l)	1.3	0.8	0.6	4.3	1.6	1.8	1.3	-	-

Drinking Water Standard: <http://bis.org.in>

\*<http://www.nih.ernet.in>

#### 4.4 Ground Water Resources

The Ground Water Resource has been The block-wise ground water resource is given in Table 6. The net annual replenishable ground water resource as on 31<sup>st</sup> March 2009 works out to be 39826 ham. The gross annual draft for all uses stands at 15041 ha.m. The average stage of ground water development for the district is 37.8%. The stage of ground water development is highest in Jhajha (66.8%) and lowest in Aliganj (14.3%). The stage of ground water development in all the blocks is within 70%, and there is no long-term decline in water levels recorded in the blocks. Thus, all the blocks are under safe category. The stage of ground water development is depicted in Fig 6

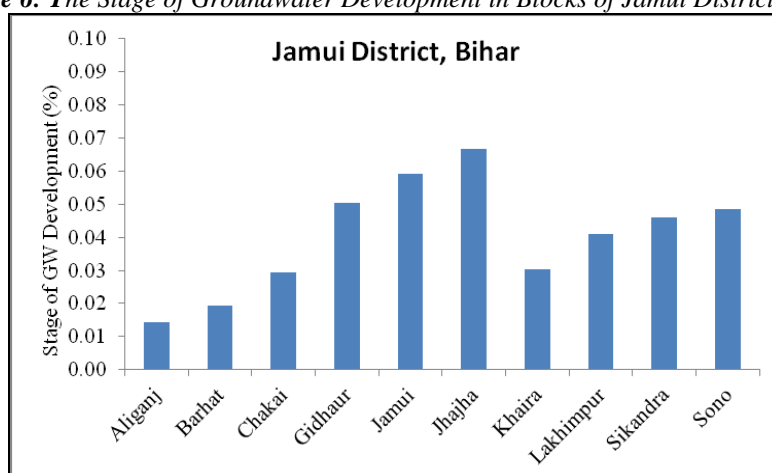


**Table 6: Net Groundwater Availability (ham) and Stage of Groundwater Development in Jamui District, Bihar**  
(As On 31<sup>st</sup> March 2009).

Sl No	Assessment unit/District	Recharge from Rainfall during monsoon season	Recharge from other sources during monsoon season	Recharge from Rainfall during non-monsoon season	Recharge from other sources during non-monsoon season	Total Annual Ground Water Recharge 3+4+5+6	Natural Discharge during non-monsoon	Net Annual Ground Water Availability (7-8)
1	2	3	4	5	6	7	8	9
1	Aliganj	3615	370	814	89	4889	489	4400
2	Barhat	1281	635	362	106	2384	119	2265
3	Chakai	4215	1648	1201	381	7444	372	7072
4	Gidhaur	1007	247	335	106	1695	85	1610
5	Jamui	2800	673	630	299	4402	440	3961
6	Jhajha	1733	939	585	281	3538	354	3184
7	Khaira	6602	1213	1487	395	9696	970	8727
8	Lakhimpur	1175	462	291	121	2049	102	1947
9	Sikandra	2136	557	481	193	3368	337	3031
10	Sono	2072	955	523	270	3821	191	3630
	<b>Total</b>	<b>26636</b>	<b>7699</b>	<b>6709</b>	<b>2242</b>	<b>43285</b>	<b>3459</b>	<b>39826</b>

SN	Assessment Unit/Block	Net Annual Ground water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross Ground water Draft for Domestic and Industrial Water Supply	Existing Gross Ground Water Draft For all Uses (11+12)	Allocation for Domestic and Industrial Requirement supply upto year 2025	Net Ground Water Availability for future irrigation development (10-11-14)	Stage of Ground Water Development (12/10)*100 (%)
1	2	9	10	11	12	13	14	15
1	Aliganj	4400	423	207	630	356	3621	14.3
2	Barhat	2265	304	136	440	234	1727	19.4
3	Chakai	7072	1742	342	2084	588	4741	29.5
4	Gidhaur	1610	701	111	812	191	718	50.4
5	Jamui	3961	2013	337	2350	603	1346	59.3
6	Jhajha	3184	1566	561	2127	696	921	66.8
7	Khaira	8727	2317	323	2640	557	5853	30.3
8	Lakhimpur	1947	620	181	800	311	1016	41.1
9	Sikandra	3031	1175	224	1399	385	1471	46.1
10	Sono	3630	1452	307	1759	529	1648	48.5
	<b>Total</b>	<b>39826</b>	<b>12312</b>	<b>2728</b>	<b>15041</b>	<b>5329</b>	<b>23063</b>	<b>37.8</b>

**Figure 6: The Stage of Groundwater Development in Blocks of Jamui District, Bihar.**



## 5.0 GROUND WATER MANAGEMENT STRATEGY

### 5.1 Ground Water Development

As per the resource evaluation (31<sup>st</sup> march 2009) the average utilisation of ground water in the district is 37.8% only, which means none of the blocks in the district comes under semi-critical/critical or over exploited category hence there is a scope for groundwater development.

### 5.2 Design and Construction of Tube Wells

The occurrence and movement of ground water is governed by geology and geomorphology. An attempt has been made to summarize block wise information on suitable well type, depths, discharge and suitable drilling method (Table. 7).

*Table 7 :Block-wise Data on Suitable Well Type, Design and Suitable Pump for Jamui District.*

S.No	Block Name	Suitable Well type	Expected Discharge (lpm)	Recomm- ended depth (m)	Diameter of well	Suitable Drilling method	Type of pump	Success rate
1.	Aliganj	Tube well	100-500	40-70	6 inch	Rotary	Submersible	Moderate
		Bore well	60-100	100-150	4 inch	DTH	Submersible	Moderate to poor
2.	Barhat	Tube well	100-500	30-50	6 inch	Rotary	Submersible	Good
		Bore well	100-300	100-150	4 inch	DTH	Submersible	Moderate to poor
3.	Chakai	Dug well	60-100	10-15	2.5-3.5 m	Manual	Centrifugal	Good
		Bore well	100-300	100-150	4 inch	DTH	Submersible	Moderate to poor
4.	Gidhaur	Dug well	60-100	10-15	2.5-3.5 m	Manual	Centrifugal	Moderate
		Tube well	100-200	20-30	4 inch	Rotary	Submersible	Good
		Bore well	100-300	100-150	4 inch	DTH	Submersible	Moderate to poor
5.	Jamui	Dug well	60-100	10-15	2.5-3.5 m	Manual	Centrifugal	Moderate
		Tube well	100-200	20-30	4 inch	Rotary	Submersible	Good
		Bore well	100-300	100-150	4 inch	DTH	Submersible	Moderate to poor

### 5.3 Water Conservation and Artificial Recharge

Though there is an overall availability of ground water, the location of a prospective site is difficult in hard rock terrain. As such at some places shortage of water is observed. In these areas water conservation techniques could be used. The district receives average annual rainfall of 1107 mm, but most of the rain water goes as runoff. Construction of water conservation structures will help to arrest runoff, recharge the aquifer and retain the soil moisture. Contour bunding, check dam, gully plug, and percolation tank are suitable structures in the hard rock areas, while recharge shaft and percolation tank are suitable structures in unconsolidated formation.

## **6.0 GROUND WATER RELATED ISSUES AND RELATED PROBLEMS**

The major part of the district being occupied by hard rock, most of the rain water goes as runoff without recharging the aquifers of this area which leads to water scarcity in non-monsoon lean period. In general, the chemical quality of ground water is potable and suitable for irrigation purposes. Fluoride contamination has been found in some villages. People affected with fluorosis are present in Majhwe and Nabinagar villages. In these villages potable water should be supplied either from adjacent villages or through setting up of defluorination plant for treatment of contaminated water.

## **7.0 MASS AWARENESS AND TRAINING PROGRAMME**

Mass Awareness Programme (MAP) on “Rain Water Harvesting & Ground Water Recharge” was organized on 28<sup>th</sup> March 2007 at the Gandhi Town hall in Jamui town. The Chief Guest of the programme was Hon’ble Minister of State for Water Resources, Govt. of India, Sh. Jai Prakash Narayan Yadav. Shri B.M. Jha, Member (SAM) CGWB, graced the occasion as Guest of Honour. In the programme, problems related to water and need of artificial recharge of ground water in the district were highlighted. There were over six hundred participants from various government organizations, NGO, school students and local residents of Jamui town.

## **8.0 AREA NOTIFIED BY CENTRAL GROUND WATER AUTHORITY/ STATE GROUND WATER AUTHORITY**

Since all blocks of the district come under safe category from groundwater development point of view, no area is notified either by Central Ground Water Authority or State Ground Water Authority till date.

## **9.0 RECOMMENDATIONS**

1. Ground water exploration has been done by CGWB (4 EW, 6 OW) in fluoride affected areas of Jamui district indicate that all the potential fractures down to a depth of 172 m is contaminated by fluoride. The weathered zone tapped by the dug wells within 5 -15 m depths is also affected by fluoride contamination.
2. Community based fluoride removal plant can tackle the fluoride menace. There are numbers of fluoride removal techniques. Nalgounda technique is simple and effective.

3. The stage of ground water development of the district is only 37.8% which indicates that there is a large scope for further ground water development however the artificial recharge including rainwater harvesting should be taken to augment the ground water reserve.
4. Suitable structure for artificial recharge in the area under porous formation are recharge shaft and percolation tank.
5. Suitable structures for artificial recharge in hard rock areas are contour bunding, check dam, gully plug, and percolation tank.
6. The districts headquarter Jamui to be taken up under artificial recharge of ground water, keeping in view of rapid increase in ground water draft. Roof top rain water harvesting to be taken up to recharge the aquifer in Jamui urban area.

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