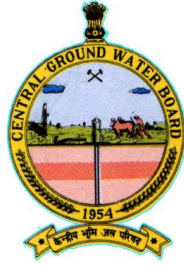


# DISTRICT GROUND WATER INFORMATION BOOKLET



## BETUL DISTRICT MADHYA PRADESH



**Ministry of Water Resources  
Central Ground Water Board  
North Central Region  
Government of India**

2013

## BETUL DISTRICT AT A GLANCE

S.No	ITEMS	Statistics	
1.	<b>GENERAL INFORMATION</b>		
S.No	ITEMS	Statistics	
1.	<b>GENERAL INFORMATION</b>		
	i) Geographical area ( In Sq. km)	10043	
	ii) Administrative Divisions (As on 2013 ) Number of Tehsil/ Block , Number of Panchayat /Villages	8/10, 553/1409	
	iii) Population (As per Census 2011)	15,75,247	
	iv) Normal Rainfall (mm)	1129.6	
2,	<b>GEOMORPHOLOGY</b>		
	i) Major Physiographic Units	i. Satpura plateau in the Tawa and Morand valleys ii. Satpura plateau in the central and southern iii.Tapi valley	
	ii) Major Drainage	i. Tawa, Morand, Machna and Bhangi of Narmada Basin ii. Wardha and Bel of Wardha basin iii.Tapi, Maru and Tapi of Tapi basin	
3.	<b>LAND USE (sq km)</b>		
	i) Forest area	3967	
	ii) Net area sown:	4046	
	iii) Cultivable area:	4040	
4.	<b>MAJOR SOIL TYPES</b>	Black cotton	
5.	<b>AREA UNDER PRINCIPAL CROPS</b>	Wheat, Rice. Jowar, Maize Sugarcane etc.	
6.	<b>IRRIGATION BY DIFFERENT SOURCES</b>	<b>Number of Structures</b>	<b>Area in Sq km</b>
	Dug wells	53150	716
	Tube wells/Bore wells	3427	126
	Tanks/Ponds	15	2
	Canals	92	189
	Other Sources	-	126
	Net Irrigated Area	-	1159
7.	<b>NUMBER OF GROUND WATER MONITORING WELLS OF CGWB (As on 31.3.2013)</b> No. of Dug Wells / No. of Piezometers	23 / 07	
8	<b>PREDOMINANT GEOLOGICAL FORMATIONS</b>	Deccan Trap Lava Flows, Lameta beds, Upper and Lower Gondwanas and Archaeans	

9	<b>HYDROGEOLOGY</b> Major Water Bearing Formation  <b>Pre-monsoon</b> Depth to water level during 2012 <b>Post-monsoon</b> Depth to water level during 2012  Long Term water level trend in 10 years (2001-2010) in m/yr	Weathered & Fractured basalt Weathered & Fractured sandstone Weathered / Fractured granite, gneiss, amphibolites  2.0 – 16.40  0.51 9.75  Fall Pre 0.02-0.1 Rise 0.02-0.09
10.	<b>GROUND WATER EXPLORATION BY CGWB (As on 31-03-2013)</b>	
	No of wells drilled EW, OW, PZ, SH, Total) Depth Range (m) Discharge (litres per second) Storativity (S) Transmissivity (m <sup>2</sup> /day)	<b>EW-55 PZ-08 Ow-29</b> 10-300, 0.75-20 lps, 1-3 lps 4.7x10 <sup>-4</sup> to 6.5x10 <sup>-5</sup> 1 .8-442.8 m <sup>2</sup> /day
11.	<b>GROUND WATER QUALITY</b> Presence of Chemical constituents more than permissible limit (eg EC, F, As, Fe) Type of Water	EC- 262-1670, Nitrate- 1.3-156, Fluoride - .09-.9 in phreatic aquifer
12	<b>DYNAMIC GROUND WATER RESOURCES (2009) In MCM</b>	
	Net Ground Water Availability Gross Annual Ground Water Draft Projected Demand for Domestic and Industrial Uses up to 2033 Stage of Ground Water Development	1139.70 536.22  46.38 47 %
13.	<b>AWARENESS AND TRAINING ACTIVITY</b>	
	Mass Awareness Programs organized 03 Date: Place: No. of Participants  Water Management Training Programmes Organized No: Date: Place: No. of Participants	19.09.05, 12.9.06 07.10.06. <b>Betul, Sasundra, Athner</b> 50 150 170 14: 09.05 & 06.10.06 :(Betul) <b>Pathakheda</b> 60 to 70
14	<b>EFFORTS OF ARTIFICIAL RECHARGE &amp; RAINWATER HARVESTING</b>	
	Projects under technical guidance of CGWB (Numbers)	01 , Central Sector scheme in Bel watershed in Amla block and dug well recharge
15.	<b>GROUND WATER CONTROL AND REGULATION</b>	
	Categorization of blocks	All block under Safe category
16	<b>MAJOR GROUND WATER PROBLEMS AND ISSUES</b>	Depleting ground water level

## 1.0 Introduction

The Betul district is one of the marginally located districts of state Madhya Pradesh, covering an area of 10059.48 Sq. km. It lies between north latitude 21<sup>0</sup> 22' and 22<sup>0</sup> 24' and east longitude 77<sup>0</sup> 04' and 78<sup>0</sup> 33' 00'' falling in survey of India toposheet no. 55 FJ\ Fig.-1. The district is bounded by Chhindwara district in the east Khandwa in the west Hoshangabad in the north and Maharashtra state in the south. The district is approachable by rail and road. The Betul headquarters is located at falls on the Nagpur Itarsi section of Delhi-Chennai main line and national highway no. 69.

The district is divided into 8 Tehsils and Ten blocks the district is predominantly a rural district there are 1343 villages. The total population of the district of as as per 2001 census. The details of administrative units are given in table- 1.

**Table – 1 : Administrative Divisions, District Betul M.P. (Census-2001)**

S. No.	Blocks	Area in Sq. Km	No. Of villages	No. of Gram Panchayat	Population	Increase in 10 year in %	S.C. Population	S.T. Population
1	Betul	1150	188	77	240160	22.37	22192	64567
2	Chicholi	494	80	34	73861	25.44	4030	46472
3	Ghoradongri	1300	162	56	225307	21.41	32079	82874
4	Bhiansdehi	1257	132	50	116761	15.42	10188	62648
5	Athner	853	100	45	92869	13.51	6948	41770
6	Bhimpur	1150	151	54	122313	28.48	4663	103603
7	Shahpur	505	125	40	95909	22.30	7679	61770
8	Multai	1081	132	69	143933	9.06	15599	14639
9	P Patan	1133	120	65	122462	9.86	19154	31023
10	Amla	1120	153	68	161600	14.79	25072	40541

The classification of the total area of the district inflects the extent of development of agriculture activities in the district and also represents the potential aestivation of the area. The area different land use and their percentage to the reported area of the district for the year 2006 is given in table-2.

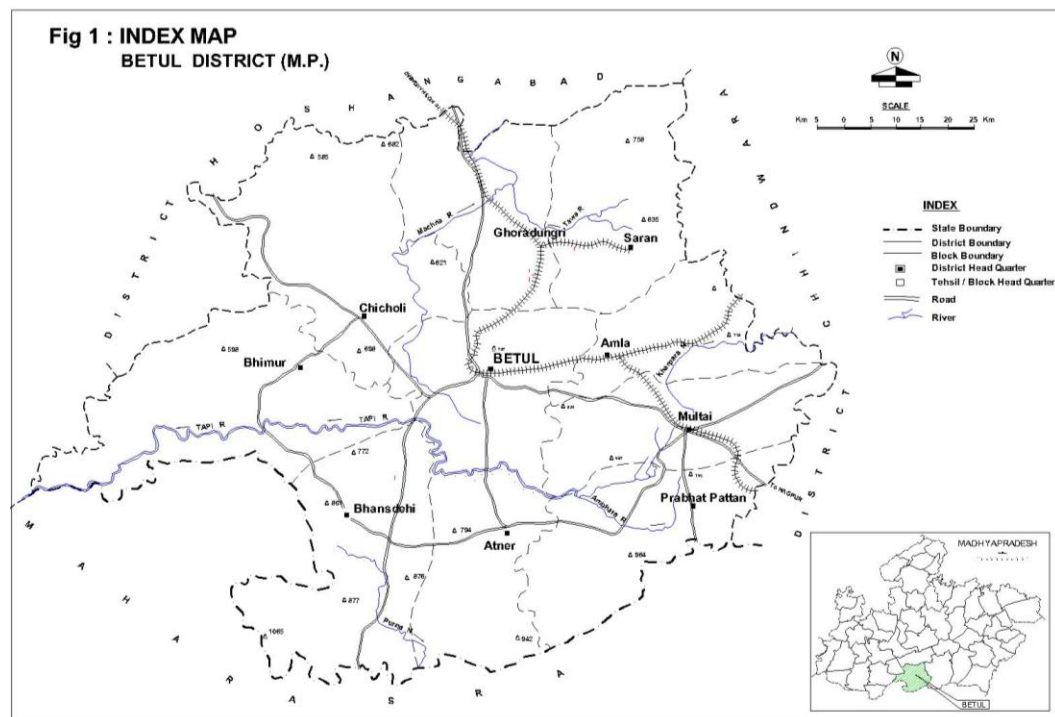
**Table No. 2 : Land use Patter of Betul District**

S. No.	Type	Area is Sq. km
1	Forest	3967
2	Land not available for agriculture	259
3	Other non agriculture land	467
4	Cultivable area	4040
5	Total sown area	4046
6	Area sown more than once	1565

The agriculture activity in Betul district is mainly depended on the monsoon. At present source of irrigated in the district are dug well, tube well and porty from canal.

### Central Ground Water Board and Activities

- Systematic hydrogeological geological survey were conducted by Shri A. B. Deshmukh and Seraj Khan in 1987-88.
- Reappraisal hydrogeological survey were conducted by Shri A K Budhaliya, D. K. Ra and S. K. Verma during AAP 1995-96.
- Under the World Bank assisted hydrology project five number of piezometer have been constructed for water level and quality monitoring.
- Under ground water exploratory programme 55 No. exploratory wells at different location have been constructed.
- Under demonstrative project, artificial recharge structures have been constructed in Bel watershed in Amla block.
- Technical guidance provided in Artificial recharge through dug well scheme in Amla block



## **2.0 Rainfall & Climate**

The climate of Betul is characterized by a hot summer and general dryness except rainfall during the south- west monsoon season. The year can be divided into four seasons. The cold season, December to February is followed by hot season from March to about first week of June is the summer season. The period from the middle June to September is the south-west monsoon season. May is the hottest month of the year with average temperature of 39.3°C. The minimum during the December is 10.3°C. The normal annual mean maximum and minimum temperature is 30.7°C and 17.9°C respectively.

The south-west monsoon starts from middle of June and lasts till end of September. October and middle of November constitute the post monsoon or retreating monsoon season. The normal annual rainfall of Betul district is 1129.6 mm. About 86.6% of annual rainfall is received during monsoon season. Only 13.4% of annual rainfall takes place between October to May.

The humidity comes down lowest in April. It varies between 31% to 91% at different time in different seasons. The wind velocity is high during the monsoon period as compared to pre and post monsoon. The wind velocity is higher in June around 8.5Km/hr and lowest is 3.8 km/hr in November.

## **3.0 Physiography and soil**

The district has four district physiographic division viz (i) Satpura plateau in Tawa and Morand valleys (ii) The Satpura plateau in central and (iii) southern part of the district (iv) and Tapti valley. The whole district lies on Satpura plateau at an elevation of 365 m above mean sea level. The general elevation is about 609m at Kilendeo form the highest peak in the northern and central parts of the district. Tawa valleys lies at on elevation of 396m amsl between peaks of Kilandeo and Bhogwargar, the general scope of the valley is towards the north west.

The country is mainly undertaking with presence of few residual hills and is inter sector by large number of stream joining Taw the high land mass of the district sub sides into the fringing ravenous country of Wardha and tributaries of the Kanhan. The went of Khamla is highest point 1137 m amsl in the entire country and forms the part of Gwagarh hills.

The drainage of the district is diverted in all direction from the eastern high mass of Satpura plateau. The northern and central part of the district drains into the Narmada in the north through Tawa, Machna Morand and the Bhange. The Tapti bengh basically consequent river and flowing to the west drain water of the western and southern central part of the Purna, Mam and Wadha occupy small areas of their drainage in the southern part of the district.

In the district, there are five types of soils namely kali soil, Morand soil, Matbarra soils, Bardi soil Sihar and retard soils. The southern central and eastern part of the district is covered by black cotton soil.

## 4.0 Ground Water Scenario

### 4.1 Hydrogeology

Betul district is underlain by various geological formations, forming different types of the aquifer in the area. Main geological units of the area are, Archaean, Gondwana Lameta, Deccan traps, Laterite and soils. Occurrence and movement of ground water in hard rocks is mainly controlled by secondary porosity through joints and fractures primary porosity in Gondwana sandstone and vesicular basalts. In Deccan traps play an important role in ground water movement ground water is general occurs under unconfined and semi confined to confined conditions. Hydrogeology of Betul district is shown in Fig.2

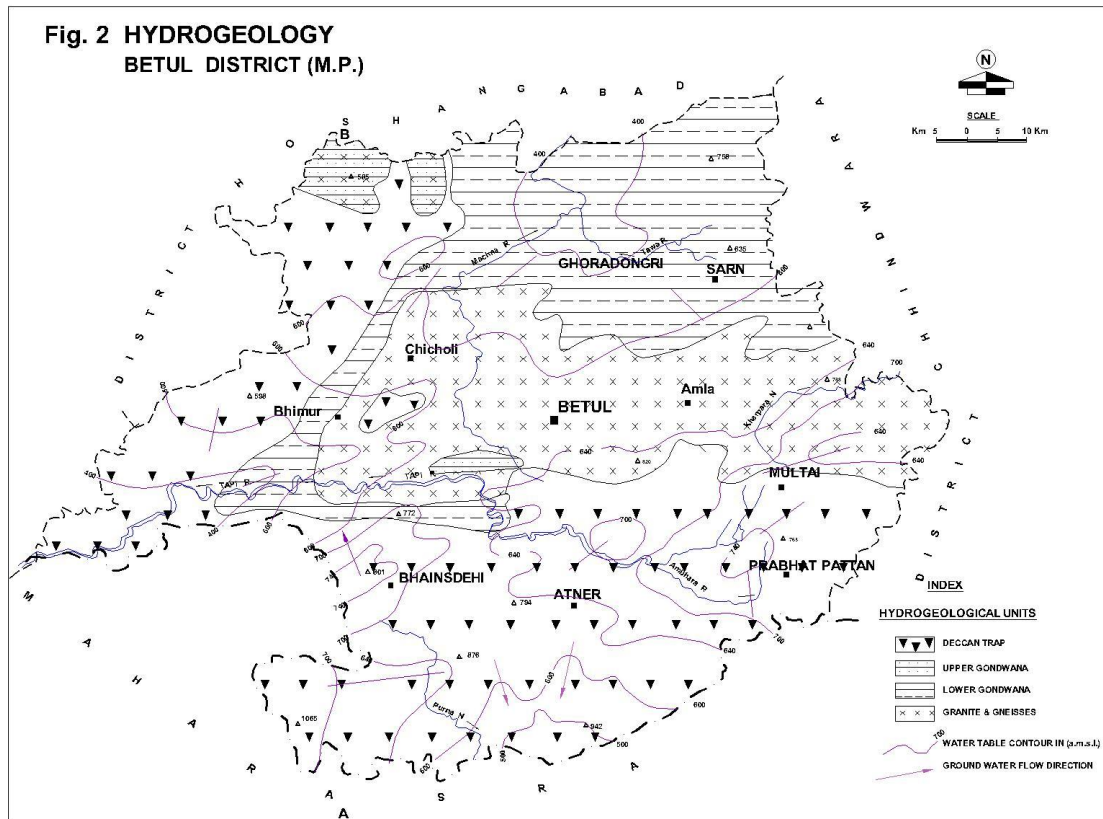
The occurrence and movement of ground water is different geological formations is described below:

#### **Archaeans**

The crystalline metamorphic and igneous rocks covers approximately 20% of the total district area. The igneous rocks are intensive granite and pegmatite veins intending the metamorphic rocks. Quartz pegmatite views are common features and occurs as broad dykes and thin strings. The ground basins are conterminous with surface drainage sub basin thus ground water flow system are of local types where end system has its recharge area at topographic low. The Archaeans are mainly occupying the Betul, Chichab, Multai and Amla blocks. These rocks do not have primary porosity and hydraulic conductivity. The weathered part of the crystalline rocks are called saprolite, which is of particular interest from the point of view of storage zone for ground water and as an aquifer for open well and shallow tube wells. The thickness of this zones in the entire district area ranges from 2.5 to 30.00 m. in this formation, aquifers also occurs where bed rock and quartz pegmatite intensive vein are jointed and fractures. The yield depends upon saturated thickness of the weathered mantle and fracture pattern of the rocks. The open wells that exist in this formation range in depth of 8.00-20.00 mbgl generally the column of water available during pre monsoon season varies from 2.00 – 4.00 m. The general yield potential of Archaean formation less than 180 lpm. However at places the yield potential in deeper aquifer are found to the tune of 600 lpm. The specific capacity ranges between 54 to 162.69 lpm/m/min and permeability ranges from 9.57 to 29.83 m<sup>2</sup>/day in shallow aquifers.

#### **Gondwana**

The Gondwana rocks are comprising succession of sand stone, shales with seams of coal lying over the metamorphic rocks of crystalline Archaean system with a district unconformity. The beds of Gondwana rocks are distributed in patches and lie in a liner trends coinciding almost with the present river valleys. There rocks show considerable



faulting. The Talchir beds consisting of sandstone and green clays with boulders contain plant fossils. They are bounded by faults. To the west and north west of Betul, there are outcrops of Gondwana rocks which separate decant traps from Archaean rocks. The Barkar of the Gondwana group contains coal seams. In the Gondwana system, mostly groundwater structures tap sandstone and argillaceous shales and rarely clays. The groundwater structure in the Barkar series ranges in depth from 5-16.30 mbgl, whereas in the Talchir series the depth of dug wells ranges from 8-14 mbgl. These rocks are occupying Ghoradongri, Shahpur and part of Bhimpura blocks. The yield potential of Gondwana ranges from 100 lpm to 300 lpm tapping semi-confined and unconfined aquifers.

### Deccan Traps

Deccan traps comprising various types of basaltic lava flows and most extensive rocks in the district. These rocks occupy Betul, Multai, Bhimpura, Chicholi, Bhainsdehi, Atner and Prabhak Pattan blocks. The base of the flow consists of porous layers of earthy basalt which pass rapidly into the main body of flow consisting of great thickness of hard basalt. Generally the Deccan trap in the area occurs in the form of fractures, weathered and vesicular basalts. The groundwater structure occurring in the fractures of basalt taps the groundwater resource between the depth range 6 to 14.00 mbgl. In the weathered basalt the depth of groundwater structures varies from 4.15 – 10-20 mbgl, while in the vesicular type of flows the depth of groundwater structures ranges from 3 to 20-00 mbgl. The yield of the shallow aquifer in this formation ranges between 60 to 300 lpm.



## **DEPTH TO WATER LEVELS**

### **Pre Monsoon (May, 2012)**

Central ground water board has been carrying out water level monitoring through ground water monitoring wells since last two decades. The water levels of these monitoring wells are being monitored from time to time during the month Jan, May, August and November. A hydrogeological map (Fig-2) of Betul district has been prepared on the basis of available data. To study ground water regime of the area, pre monsoon and post monsoon depth to water level maps of the district has been prepared. The central part of the district is highly undulating and forested. In this area there are few wells available for monitoring of water level pre monsoon (May 2012) in general depth to water level in the district, ranges between 2 m at Sarni to 16.4 m bgl at Chicholi. In major part of the district, depth to water level ranges between 4 to 8 mbgl recorded in most of the blocks (fig. -3) depth to water level ranges more 12 m has been recorded at Kapasia Masod and Jogli.

### **Post Monsoon (November 2012)**

During post monsoon season of year 2012 depth to water level varies from 0.51 mbgl at Jhallar to 9.75 mbgl at Bhainsdehi in basalt terrain (fig.4). Shallow water level less than 5 mbgl are observed in most part of the district. However depth to water level more than 5 mbgl are observed at Kolgaon, Chincholi, Sasudra Ghatpiparia, Bhainsdehi, and Masod in the south western and southern part of the district.

### **Water level fluctuation between pre and post monsoon season 2012**

In the entire Betul district, rise in water between pre and post monsoon season have been recorded. Rise in water level ranges from 0.17 m at Sarni in South eastern part of the district to 13.05 m at Jhallar in southern part of the district. Rise in water level less than 2 m is observed at Multai Bhainsdehi, Masod. Water level rise between 2 and 4 m is recorded at Ghatpiparia, Nimpani and Chiraptra in eastern and western part the district. Rise in water level more than 4 m is reported in the remaining monitoring wells.

### **Ground Water Level Trend May 2001 to May 2010.**

Analysis of ground water level data of pre monsoon period indicate that these is declining water trend in Amla, Bainsdehi, Multai and Prabhat pattan blocks. In general 0.020 to 0.1 m/year water level declines have been observed in the district however these is also rise in water level between 0.027 m to 0.09 m have been recorded in the Betul and Ghoradongri blocks.

Fig.3

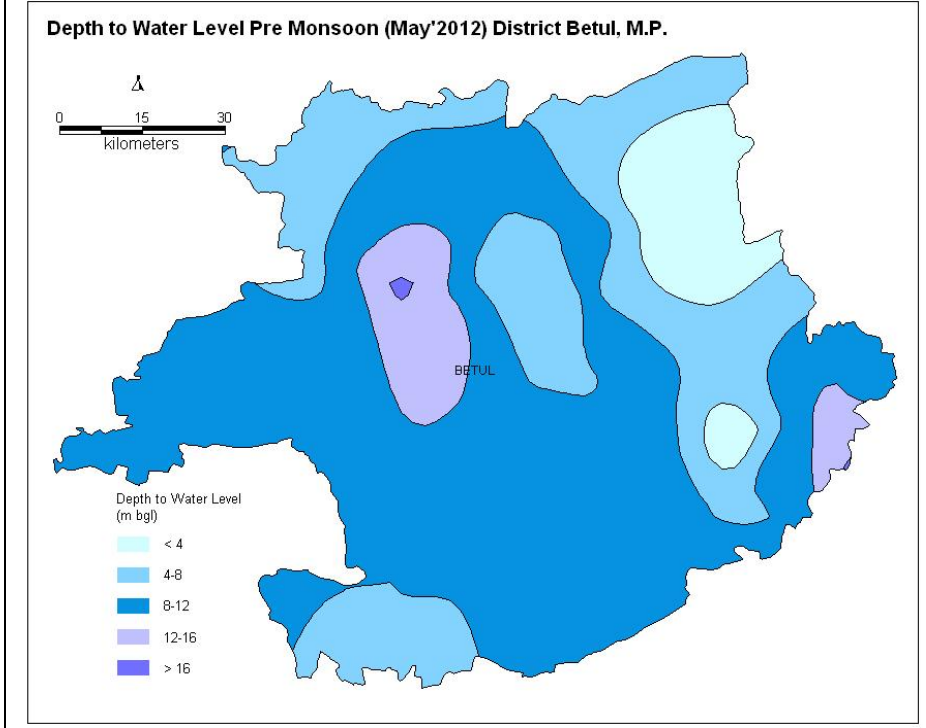
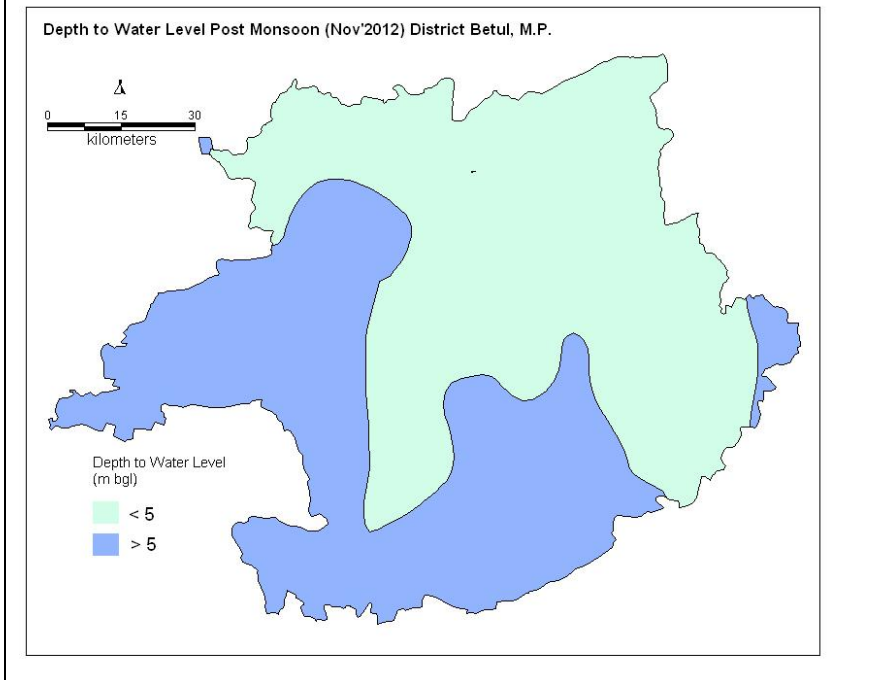


Fig.4



## Aquifer parameters

CGWB has drilled 55 exploratory wells in the district hydrogeological data of exploratory wells in the district. The yield of Archaean varies from 0.5 to 16.00 and drawdown ranges between 4.20 to 45 m. The yield of Deccan trap in the district vary from 0.75 to 14.0 lps and drawdown was observed between 2.83 to 25.5 in the yield of Gondwana ranges between 0.40 to 1.80 lps. The transmissivity values ranges between 3.16 to 553.35 m<sup>2</sup>/day and storability is between 4.7 x 10<sup>-4</sup> to 6.25 x 10<sup>-5</sup>.

## 4.2 Ground Water Resources

Ground Water Resources estimation of Betul district has been computed for the base year 2009 on block wise basis. Except Non Command area of Betul block falling in semi critical category, entire district are falling under safe category. Except Betul blocks falling in both non command and command area, entire district is falling under non command area. Higher stage of development is computed on 72% for Non Command area of Betul block and lowest is computed as 19 % Ghioradongri block.

As per ground water resources estimation figures, net ground water availability in Betul district is 113970 ham and ground water draft for all user is 53622 ham making stage of ground water development 47% as whole for district after making all allocation for future domestic and industrial supply for next 25 years, balance available ground water for future irrigation would be 59227 ham at 50% stage of ground water development safe limit in Betul district. Blockwise ground water resource estimation data of Betul district is given in table 3 .

**Table-3: Ground Water Resources of Betul district**

District/ Assessment Unit	Sub-unit Command/ Non- Command/	Net Annual Ground water Availability (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, and industrial requirement supply to next 25 year (2033) (ham)	Net Ground water Availability for future irrigation d development (ham)	Stage of Ground water developme nt (%)	Category
<b>Betul</b>									
Amla	Command								
	Non-Command	12461	7813	404	8218	572	<b>4075</b>	<b>66</b>	<b>Safe</b>
	Block Total	<b>12461</b>	<b>7813</b>	<b>404</b>	<b>8218</b>	<b>572</b>	<b>4075</b>	<b>66</b>	
Athner	Command								
	Non-Command	6870	3786	223	4009	308	2776	58	<b>Safe</b>
	Block Total	<b>6870</b>	<b>3786</b>	<b>223</b>	<b>4009</b>	<b>308</b>	<b>2776</b>	<b>58</b>	<b>Safe</b>
Betul	Command	784	166	56	222	64	554	28	<b>Safe</b>
	Non-Command	13458	9384	370	9754	440	3635	72	<b>Safe</b>
	Block Total	<b>14243</b>	<b>9550</b>	<b>426</b>	<b>9976</b>	<b>504</b>	<b>4189</b>	<b>70</b>	<b>Safe</b>
Bhainsdehi	Command								
	Non-Command	12468	3482	285	3767	409	8577	30	<b>Safe</b>

	Block Total	<b>12468</b>	<b>3482</b>	<b>285</b>	<b>3767</b>	<b>409</b>	<b>8577</b>	<b>30</b>	<b>Safe</b>
Bhimpur	Command						<b>0</b>		
	Non-Command	9902	1630	426	2056	612	7661	21	<b>Safe</b>
	Block Total	<b>9902</b>	<b>1630</b>	<b>426</b>	<b>2056</b>	<b>612</b>	<b>7661</b>	<b>21</b>	<b>Safe</b>
Chincholi	Command								
	Non-Command	4258	2101	212	2312	341	1816	54	<b>Safe</b>
	Block Total	<b>4258</b>	<b>2101</b>	<b>212</b>	<b>2312</b>	<b>341</b>	<b>1816</b>	<b>54</b>	<b>Safe</b>
Ghoradongri	Command								
	Non-Command	15747	2456	572	3028	700	12591	19	<b>Safe</b>
	Block Total	<b>15747</b>	<b>2456</b>	<b>572</b>	<b>3028</b>	<b>700</b>	<b>12591</b>	<b>19</b>	<b>Safe</b>
Multai	Command								
	Non-Command	15589	10454	336	10790	424	4710	69	<b>Safe</b>
	Block Total	<b>15589</b>	<b>10454</b>	<b>336</b>	<b>10790</b>	<b>424</b>	<b>4710</b>	<b>69</b>	<b>Safe</b>
P. Pattan	Command								
	Non-Command	16539	7211	287	7498	361	8968	45	<b>Safe</b>
	Block Total	<b>16539</b>	<b>7211</b>	<b>287</b>	<b>7498</b>	<b>361</b>	<b>8968</b>	<b>45</b>	<b>Safe</b>
Shahpur	Command								
	Non-Command	5894	1623	345	1968	407	3864	33	<b>Safe</b>
	Block Total	<b>5894</b>	<b>1623</b>	<b>345</b>	<b>1968</b>	<b>407</b>	<b>3864</b>	<b>33</b>	<b>Safe</b>
	<b>District Total</b>	<b>113970</b>	<b>50105</b>	<b>3516</b>	<b>53622</b>	<b>4638</b>	<b>59227</b>	<b>47</b>	<b>Safe</b>

### 4.3 Ground Water Quality

The groundwater samples are being collected from each monitoring wells during the month of May every year. The quality of ground water in district is being described by the analysis of groundwater samples from 23 ground water monitoring wells. The analysis of water samples for year 2012 indicate that. The electrical conductivity (EC) values were found in the range of 262 and 16700 us/cm at 25°C. The nitrate in ground water of Betul district is varying between 1.3-156 mg/l Nitrate more than 100 mg/l was found in only one village namely Nimpani (145 mg/l) The higher concentration of NO<sub>3</sub> may be due to excessive use of fertilizer and localized pollution.

## 5.0 Ground Water Management Strategy

Ground Water Resources estimation of Betul district has been computed for the base year 2011 on block wise basis. Except Non Command area of Betul block falling in semi critical category, entire district are falling under safe category.. Except Betul blocks falling in both non command and command area, entire district is falling under non command area. Higher stage of development is computed on 72% for Betul block and Lowest is computed as 21 % Ghoradongri block.

### Rainwater Conservation and Artificial Recharge

## Artificial Recharge to Ground Water (Demonstrative Project) in Bel watershed of Amla Block

The central ground water board, under the central sector scheme, has been extending technical and financial support to the state government for implementing rain water harvesting and artificial recharge structures in Betul district. The project on artificial recharge to ground water in Bel- watershed in Amla block is completed which was implemented by Public Health Engg. Department, Govt. of M.P. While working for the project of Artificial recharge to ground water in Bel water shed is found that the optimum monsoon runoff is to tune of 281.0 MCM is considered as surplus monsoon runoff. The total requirement of water is worked out 149 MCM. 65 structures were completed (Fig 5).

**Location:** Bel watershed, Amla and Multai blocks, Betul district.

**Structures), Check dams (23), Desilting of tanks with Recharge shaft (2), Desilting of tanks (1) Piezometers ( 40)**

**Sanctioned amount : Rs. 65.265 lakhs**

**Implementing Agency: Public Health Engineering Department, Govt. of M.P.**

**Amount of water likely to be harnessed : 339.11 TCM (in one year Estimated)**

**Impact:** The total estimated volume of water retained after first monsoon in above structures, is about 299.3 TCM and initial observations taken so far show water level rise ranging between 0.16 and 4.06 m in pre monsoon period (2007, pre monsoon to 2008,pre monsoon).

Like wise the priority should be given in Multai, Athner, Prabhat pattan and Betul blocks for constructed of artificial recharge structures to check the declining trend of water level in these blocks.

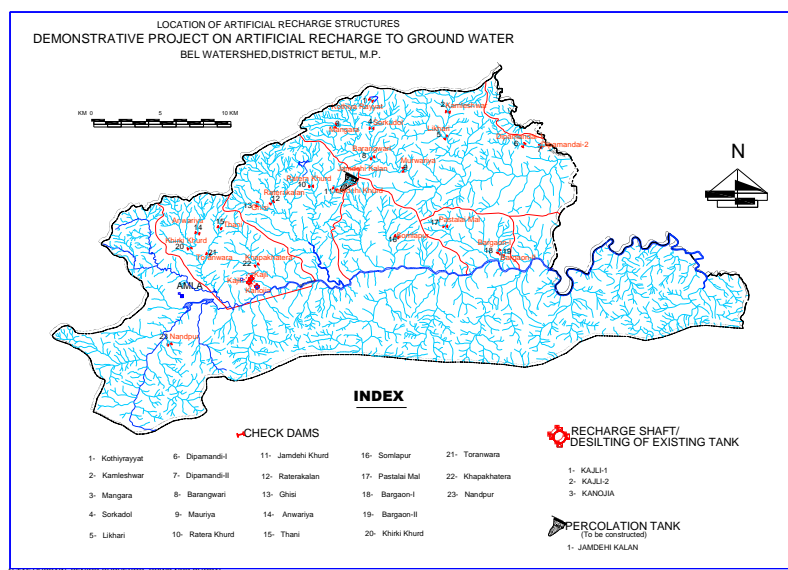


Fig. 5 Location map of Bel watershed with AR structures

### Artificial Recharge to ground water through Dug Wells

A scheme on “Artificial Recharge to ground water through Dug Wells” was being implemented in the state of Madhya Pradesh in 48 Over-exploited/Critical/Semi-critical Blocks. The scheme envisages the construction of a recharge structure, connected to a dug well in the field of farmers. About 3,60,088 dug wells belonging to Marginal, small and other farmers will be recharged at a unit cost of Rs. 4,800.00. Ministry of Water Resources will subsidize the entire amount of Rs. 4,800.00 to marginal and small farmers while in other cases 50% subsidy will be given. Panchayati Raj & Rural Development Department, Government of Madhya Pradesh is the nodal department for implementation of the scheme. The subsidy amount will be transferred to the bank accounts of the beneficiaries by NABARD through the Lead Banks of the respective districts. Status of schemes till November 2012 is given in table 4.

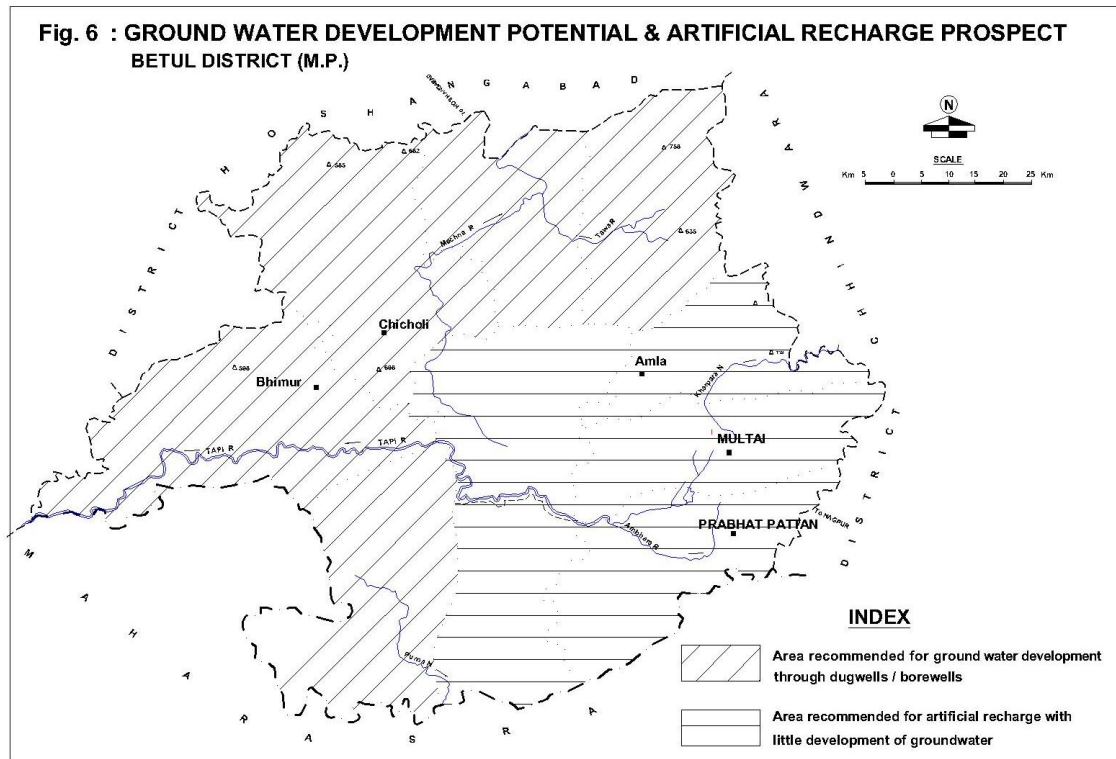
S. No .	District	Target as per the CCA	No. of beneficiaries identified	No. of bank account newly opened	No. of the beneficiaries approved by SLSC	No. of Beneficiaries/ Structure list provided/ forwarded to NABARD by the state Nodal Dept.	Funds released by NABARD to number of beneficiaries / Subsidy Amount (in lakh)	No. of beneficiaries received subsidy in their account	No. of beneficiaries received subsidy in their account
1	2	3	4	5	6	7	8	9	10
2	Betul	8657	1970	2834	1970	2834/3242	2834/150.073	2854	1351

As per ground water resources estimation of Betul district for the year 2011 the available ground water resources and gross ground water draft are 59159 ham and 59159 ham respectively, making state of ground water development 52 % as whole for the district. All blocks fall under safe category. The decadal water level trend analysis reveals mixed trend of water level during pre and post monsoon season. After making the allocation for future domestic and industrial supply up to 25 years, balance available at 50% stage of ground water development under safe limit of Betul district. The area recommended for future development is given in fig. 6. Dug wells are feasible in all geological formation however tube wells are feasible in Gondwana. However tube wells are feasible in Gondwana and Deccan traps at appropriate locations. DTH rigs are to be deployed in the district and at places combination rigs may be deployed.

## 6.0 Ground Water Related Issues and Problem

Long term water level trend analysis shows mixed results. Depletion of ground water levels is observed during pre and post monsoon season in ground water monitoring well in Athner Multai and Prabhat pattan and Amla block. The stage of development of ground water in Multai and Athner blocks are advancing from safe to semi critical categories due to fast agricultural development in these blocks. The drilling problems in Athner and Bhaindehi blocks are observed due to presence of three to four inter trapping beds encountered in the basaltic lavas flows. In Betul blocks, Lameta beds of sedimentary origin is encountered below 120 m which creates the drilling problem as below this depth rotary rig is not operative.

Since there is thermal plant station at Sarni, the possibilities of ground water pollution in the area due to fly ash may occur in future.



## 7.0 Awareness and Training Activities

### 7.1 Mass Awareness Programme (MAP) and Water Management Training Programme (WMTP) By CGWB

Three mass awareness programme have been organized by CGWB in Betul district one MAP was organized on 19.9.05 at Jaywanti Hoskar college, Betul which was attended by PHED officers, Nagar Palika officers, NGO's and other citizens. The second MAP was organized by CGWB at Sasundra, High school Betul and more than 150 student and Panchayat Karmis participated this programme on 12.09.06. The third MAP was organized on 7.10.06 at pump honour hose of Athner, district Betul more than 170 villages Panchayat Karmis and NGO participated in this programme. Two water management training programmes were organized by CGWB, The first WMTP was held on 17.09.05 at Pathakheda, WCL auditorium 60 Participated from western coal field officers were trained in this programme. The second WMTP was organized at Utsav hotel, Betul on 6.10.06 for the officer and official of PHED and Nagar Palika. 70 Participants attended this training programme.

### 7.2 Participants in Exhibition, Mela etc.

CGWB has not taken any participation in exhibition, Mela and fair etc. in Betul district.

- 7.3 Presentation, Lectures delivered in Public forum Radio/TV etc.**  
CGWB has not done such activities in Betul district.

## **8.0 Area Notified by CGWA / SGWA**

In Betul district, no area is notified by CGWA / SGWA.

## **9.0 Recommendations**

- a. In Amla, Multai, Athner and Prabhat Pattan blocks, average water levels are deep decadal fluctuation and long term trend are showing a decline in water level and balance of ground water is left limited. The population and progress coupled with poor aquifer are responsible for the critical situation. Thus special attention is to be taken while developing the ground water resource in these blocks. At large scale artificial recharge practices are to be adopted which one shown in fig.
- b. In Amla, Betul and Multia blocks, sugarcane and soyabean crops are being grown in the area. The sugarcane is high intensive water crop. Change in cropping pattern is another measure which will relieve the situation.
- c. In Ghoradongri, Shahpur, Chicholi Bhanpur and Bhainsdeh blocks, the stage of ground water is low, falling in safe category which provide ample scope for ground water development for irrigation by increasing the numbers of dug wells and tube wells at 50% stage of ground water of a development stage.
- d. Drilling problem Athner, Bhainsdehi and Betul blocks are reported where inter-trappean and infratrappen are encountered at variable depth so proper drilling technique is to be adopted in hard and soft rocks and proper well assembly is to be designed in basalts rocks.
- e. Conjunctive use of surface and ground water is recommended in the area.
- f. Ground water pollution studies are suggested around Sarni thermal power station.
- g. Impact of coal mining studies on ground water level and also suggested in the Ghordongri and Shahpur blocks where coal mining activities are going on.
- h. Roof Top Rain Water harvesting at all block head quarters is suggested.