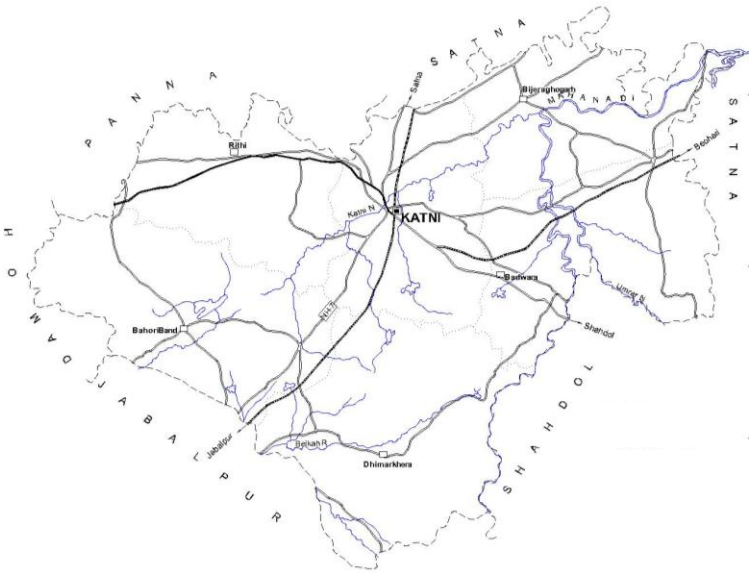
DISTRICT GROUND WATER INFORMATION BOOKLET

KATNI DISTRICT
MADHYA PRADESH



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

BHOPAL
2013

KATNI DISTRICT AT A GLANCE

S.N	ITEMS	Statistics
1	**General Information**	
	i) Geogeaphical area (sq.km) ii) Administrative Divisions Villages iii) Population (As per Census 2011) iv) Average Annual Rainfall (mm)	4504.11 948 1271684 1171.4
2	**Geomorphology**	
	i) Major Physiographic Units ii) Major Drianage – Ganga & Narmada basir	Vindhyan Plateau, Denudation slope Structural hills valleys of Bhitrigarh ranges Chhotimahandi, Katni Ken of Gangabati Belkund & Suharrirors of Narmda barin.
3	**LAND USE (Sq km)**	
	i) Forest Area ii) Net Area Sown iii) Cultivable Area	1000 1927 2459
4	**Major Soil Types**	Palaydlow, reddish brown & blacks oil
5	**Area under Principal Crops**	Paddy, Wheat, Gram etc.
6	**Irrigation by Different Sources**	
	(Areas and Numbers of Structures)	Number Area (Ha)
	Dugwells	11008 301
	Tube Wells / Borewells	921 12
	Tanks / Ponds	2581 7
	Canals	144 128
	Other Sources	1623 151
	Net Irrigated Area	492
	Gross Irrigated Area	592
7.	**Number of Ground Water Monitoring Wells of CGWB (As on 31.03.2013)** No. of Dug Wells No. of Piezometers	 18 01
8	**Predominent Geological Formations**	Mahakoshals (Archaeans) Vindhyans, Gondwans, Lamelas, Deccantaps, Katni form lateriten & allumium.
9	**Hydrology** Major Water Bearing Formation (Pre-monsoon depth to water level during 2006) (Post-monsoon depth to water level during 2006) Long Term Water level trebd in 10 years (1997-2006) in m/yr	 Mahakoshals, Vidhyans, Gondwana, Lamda, Katni & Allumium. 3.30-16.60 (m bgl) 0.20-8.55 (m bgl) +0.02 to – 0.029 (Pre) m/year - 0.03 to – 0.09 (Pre) m/year
10	**Ground Water Exploration by CGWB (As on 31.03.2013)**	
	No. of wells drilled (EW, OW, PZ, SH Total)	16 Ew + OW6+Pz4=26
11.	**Ground Water Quality**	

	(EC,No3, F,)	EC- 60-1075,NO3- 1.2-81,F-0.02-0.87
	Type of Water	C1S1, C2s1 & C3 S1
12	**Dynamic Ground Water Resources (2009) in MCM**	
	Annual Resplenishable Ground Water Resources	345.08
	Net Annual Ground Water Draft	130.00
	Projected Demand for Domestic and Industrial Uses upto 2025	34.40
	Stage of Ground Water Development	45%
13	**Awareness And Training Activity**	
	Mass Awareness Programmes Organised Date Place No. of Participants	Nil
	Water Management Training Programmes Organised Date Place No. of Participants	Nil
14	**Efforts of artificial Recharge & Rain Water 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 Blocks	Nil
	Number of Critical Blocks	Nil
	Number of Blocks Notified	Nil
16	**Major Ground water problems and issues**	Depletion of water levels

1.0 INTRODUCTION

Katni is a newly formed district, situated in the eastern past of Madhya Pradesh. It came into existence by reorganization of Jabalpur districts in the year 2003. It is having 23.0% tribal population of the district. It is famous for its Cement & Lime Stone and & Fireclay industries.

Katni district in surrounded by Satna in north-east, Umariya in the east, Jabalpur & Damoh in the west & Panna in the north. The district lies between north latitude $23^0$59' and $24^0$75' and east longitude $79^0$57' and $80^0$59' falling in the Survey Of India Topo Sheet No. 55M, 63 D, 64 A and 55 N.

The area of the district in 4504 sq. Km. It has been divided into four Tehsil and six blocks (Fig-1). There are 911 villages and four towns in the district.

Details of administrative divisions of the district are given in table – 1

Table – 1 Administrative divisions, Katni district, M.P.

S. N	Tehsil	Block	Area in Sq.Km.	No. of towns
1.	Mudwara	1 Rithi 2. Katni 3. Badwara	490.00 530.08 812.63	3
2.	Vijayraghogarh	4. Vijayraghogarh	668.74	1
3	Bahoriband	5 Bahoriband	933.25	
4	Dhimarkheda	6 Dhimarkheda	784.59	
	Total	**6**	**4504.11**	**4**

Drainage :

Katni district falls under two river basins i.e. Ganga & partly in Narmda basin. About 82% area of the district is drained by the Ganga basin. The Chhoti Mahanadi, Katni & Ken rivers are the major rivers of this basin. Ken river flows towards north and confluences with Yamuna nadi. Katni river flow easterly & confluences with Chhoti Mahanadi near Hantola village of Chhoti Mahanadi takes turn towards east & ultimately confluence with Son river of Ganga basin.

Irrigation :

Irrigation facilities in Katni district are under development stage only 30% of net sown area is irrigated, and rest of the area in rain fed.

Surface water irrigation in the district is in developing stage ground water is the main source of irrigation in the district out of total 594.49 sq.km. area, irrigated land is 320.15 sq.km. is irrigated from ground water sources, which in about 54.57% of total irrigation in the district. There are 921 table wells & 11008 dug wells is the district for irrigation.

CGWB Activities :

Shri M.A. Haseeb carried out systematic by Hydrogeological surveys in the district 1976-78 S/Shri K.M. vishwanath & Sourabh Gupta, Junior Hydrogeologist carried out systematic hydrogelogical surveys in the year 1988-89 & 89-90. S/Shri G.B. Rao & Babu Nair carried out reappraisal hydro geological surveys in the year 1996-1997 & by Shri A.K. Badhauliya, Sr. Hydrogeologist in the year 1997-98. C.G.W.B. under carried out exploration work during the year 1995-99.

2.0 CLIMATE AND RAINFALL

The climate of Katni district M.P. characterized by a summer and general dryness except during the south west monsoon season. The year may divided into four seasons. The cold season, December to February is followed by the hot season from March to about middle of June. The period from the middle of June to September is the south west monsoon season. October and November form the post monsoon or transition period.

The nearest Observatory is Jabalpur. The climatological parameters of Jabalpur is used for analysis of rainfall. The average annual rainfall of Katni District is 1171.4 mm. Katni district received maximum rainfall during south west monsoon period i.e. June to September about 56.9% of the annual rainfall received during monsoon season. Only 13.1% of the annual rainfall takes place between October to May period. Thus surplus water for ground water recharge is available only during the south west monsoon period.

The normal maximum temperature received during the month of May is 42.0^0c and minimum during the month of Dec./January is 9^0C. The normal annual means maximum and minimum temperature of Katni district is 32^0C & 18^0C respectively. During the south west monsoon season the relative humidity generally exceeds 88% (August month). In the rest of the year is driver. The driver part of the year is the summer season, when relative humidity's are less 31% May is the driest month of the year.

The wind velocity is higher during the pre-monsoon period as compared to post monsoon period. The maximum wind velocity 8.2 km/hr observed during the month of June and minimum 2.6 km/hr during the month of December. The average normal annual wind velocity of Katni district is 4.9 km/hr. Normal climatologically parameter of Katni district is given in attached annexure.

Normal Climatological parameters for Katni District.

S. N.	Para meter	Jan	Feb	Mar	April	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Annul
1.	Max. temp. (^{0}C)	26.2	29.4	34.5	39.3	42.0	38.0	31.1	29.8	31.4	32.3	29.9	26. 7	32.6
2.	Minimum temp. (^{0}C)temp	9.7	12.1	16.6	21.9	26.4	26.6	24.2	23.7	23.3	7.92	13.1	9.7	18.9
3.	Relative temp (%)	64	58	43	33	31	59	85	88	82	70	65	70	63
4.	Wind Velocity (Km/hr)	3.2	3.7	4.3	5.0	6.3	8.2	7.2	6.9	5.4	3.5	2.7	2.6	4.9

2.0 GEOMORPHOLOGY AND SOIL TYPES

Geomorphology

Katni district is predominantly hilly & forested. From geo-morphological point of view, the district consists of series of mountains ranger & rivers. It can be divided into three geo-morphological divisions.

1. **Vindhyan plateau**
2. **Denudational slope & older flood plain**
3. **Structural hills & valleys of Bhitrigarh ranges.**

In general, Katni district is characterised by hilly to undulating terrain with altitude ranging between 400 m & 700 m. a mgl. The main high relief features of the area are the Bahnder & Rampur ranger of Vindhyan Platean. Which form the north western boundary of the district. North central part of the districts covered by denudation slope & older flood plain along the Katni river form west to east directory an proterozone works. The Bhitrighash ranger run across the southern part of the district from south west to north east & represented by plateau, hills & valley it consists of metamorphic rock. As per ITC classification system there are three groups of land form (a) Denudation b) Depositional & c) Structural have been identified in the district.

Soils :

Soil of the district may be classified according to their physical property, the crops grown and their position. The low lying area is occupied by pale yellow, reddish brown & block soil.

Pale yellow is occupying alluvium, reddish brown is occupying the upper Bhander sands tones & black soil is occupying the argillaceous sirbushaler. All the agricultures fields are located over shales are covered by medium block soil & it occuping the argillaceous. Sirbu shale All the agriculture field are located over shales are covered by medium black soil it varies in the thickness from place to place from 1 to 4 m. In the north of Katni town the area is occupied by alluvium the thickness of alluvium varies from 20 to 50 m in depth.

4.0 GROUND WATER SCENARIO

Hydrogeology

Katni district is underlain by various geological formations, forming different types of aquifers in the area. Main geological units of the area are, Archaean, Mahakoshals, Vindhayan Super group, Gondwana super group, Lametas, Deccan traps, Katni formation, Laterits and alluvium. Occurrence and movement of ground water in hard rocks is mainly controlled by secondary porosity in Gondwana sand stone & vesicular basalts in Deccan traps play an important role in ground water movement lameta are also forming potential aquifers made up of relatively loose and friable shale & sandstone. Ground water in general occurs under unconfined to semi-confined conditions. The occurrence and movement of ground water in different geological formation is described below.

Mahakoshal group (Archaean);

There rocks consisting of quartzite, shale, slate & marble are hard, compact, recrystalised and have no primary porosity & form poor aquifer : However, limestone at places have solution cavity resulting into very high secondary porosity & permeability can yield 18 lps. water in wells. There formations are found in southern part of the district in Dhimarkheda block the open wells existing in there formations can yield moderate quantity of ground water. The yield depends upon the saturated thickness of weathered mantle overlying the massive rock. The open wells have depth range between 9 to 15 m. bgl. Generally column of water available during pre-monsoon season varies from 2 to 4 m. the general yield potential of Archaean formations in less than 3 lps.

Vindhyans :

There are mostly sandstones and are devoid of primary porosity. However, due to weathering, fracturing & Jointing the top position of formation behave as phreatic aquifer due to development of secondary, porosity. There are poor yielding formation four the ground water point of view both is phreatic & deep aquifer zone. There formations occupied the northern part of the district in form of Kaimur ranger from west to east covering major parts of Rithi, Beharibadn & Bijaraghogarh block. The depth of open wells exists in this formation ranges from 8 to 15 m. bgl. The general yield potential of vindhyans formation is less than 3 lps.

Gondwanas :

There are sedimentary formation and are rich in granular zones forming moderately potential aquifers. Gondwana sand stone. Support both tube wells & dug wells and capable of yielding up to 5 to 16 lps of water for moderate drawdown of 4 to 8 m. There formation are occupying eastern parts of the district in Badwara & Katni blocks & underlain by older alluvium.

Lametabeds :

This group consists of limestone, sand stone & days and lie uncontermably on the older rock formations & are found usually underlying Deccan traps.

There formations occupying southern part of the district in Dhemarkheda block in a narrow strip in the area. There beds are sandy containing chart, Jasper, pebble result being a calcareous grit rather than limestone & having thickness of about 8 to 15 m. and can yield poor to moderate discharge. Maeta gondwana contact can be explored for moderately potential aquifers.

Deccan Traps :

Deccan traps are very limited in the area in parts of Dhimar Kheda block. the weathered, jointed, fractured & vesicular units of basalt form moderately potential aquifer. These formations have highly variable yield, being higher in dug wells ranging from 2 to 7 lps & generally increase with the depth.

Katni formation

These are horizontally disposed sequence belonging to Jabalpur bed of Gondwana super group with thickness varying between 13 to 52 m. It consists of thin veneer of ferruginous sediments and its base is conglomerate/pebbly ferruginous quarts wake with bauxite. This formation is exposed above 380 m.amsl over the entire Katni vally. The

exploratory box wells in this formation have discharge from 3.5 to 7 lps. for 7.50 to 23 m. of draw down.

Laterite :

It is most abundant in block of Katni area & transferred pebbles of these laterites are seam at the base of Katni formation over the Jabalpur beds. This formation has poor to moderate field ranging from 3 to 4 lps.

Alluvium :

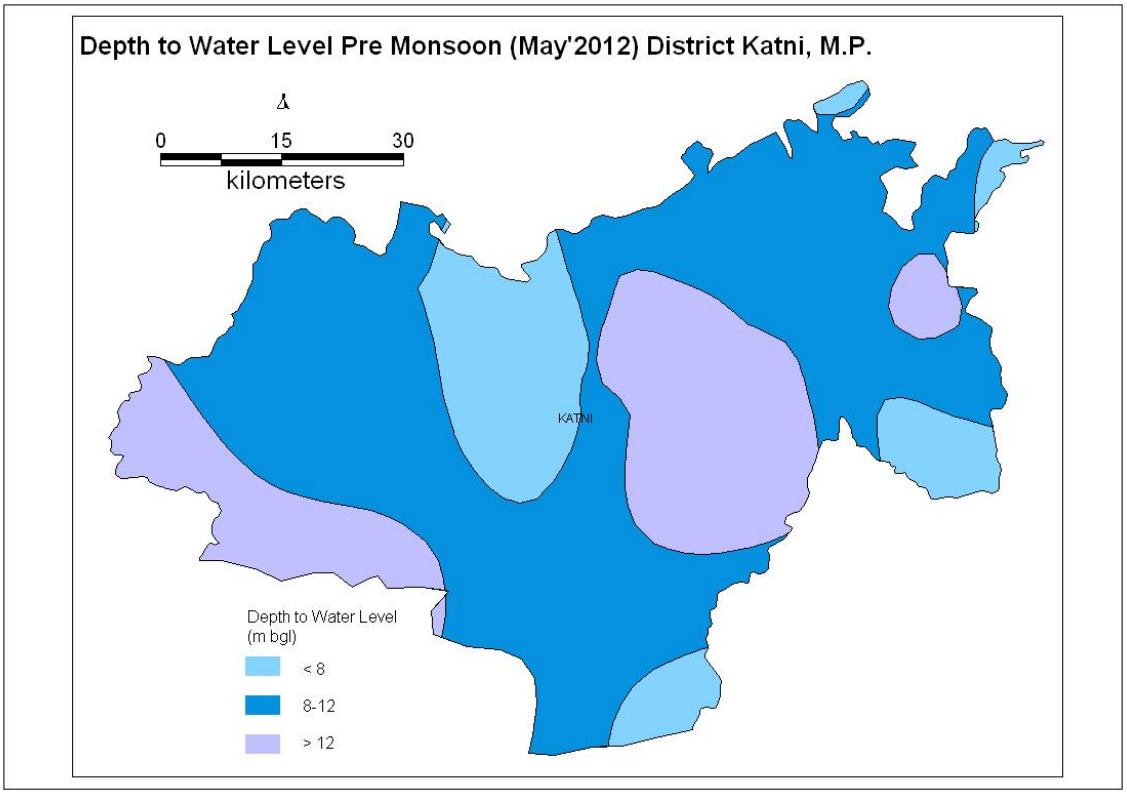
The alluvial deposits are confined mostly along and around the river courses in the Dhmarkheda & Baheriband blocks along Balkund & Suhar rivers. This is about 10 to 12 m. thick & has very good ground water potential zones which can field upto 10 lps of discharge of ground water.

Depth to water level

Control ground board has been carrying out water level monitoring of ground water monitoring wells (GWMW), form last two decades in the district. Water level of these monitoring wells are being monitored four times in a year during the month of January, May, August & November. A hydrogeological map of Katni district has been prepared on the bases of available data. To study ground water regime of the area, pre & post monsoon depth to water level maps of the district has been prepared. Northern part of the district is highly undulating & forested. In this area these are a few ground water monitoring wills for monitoring of water level.

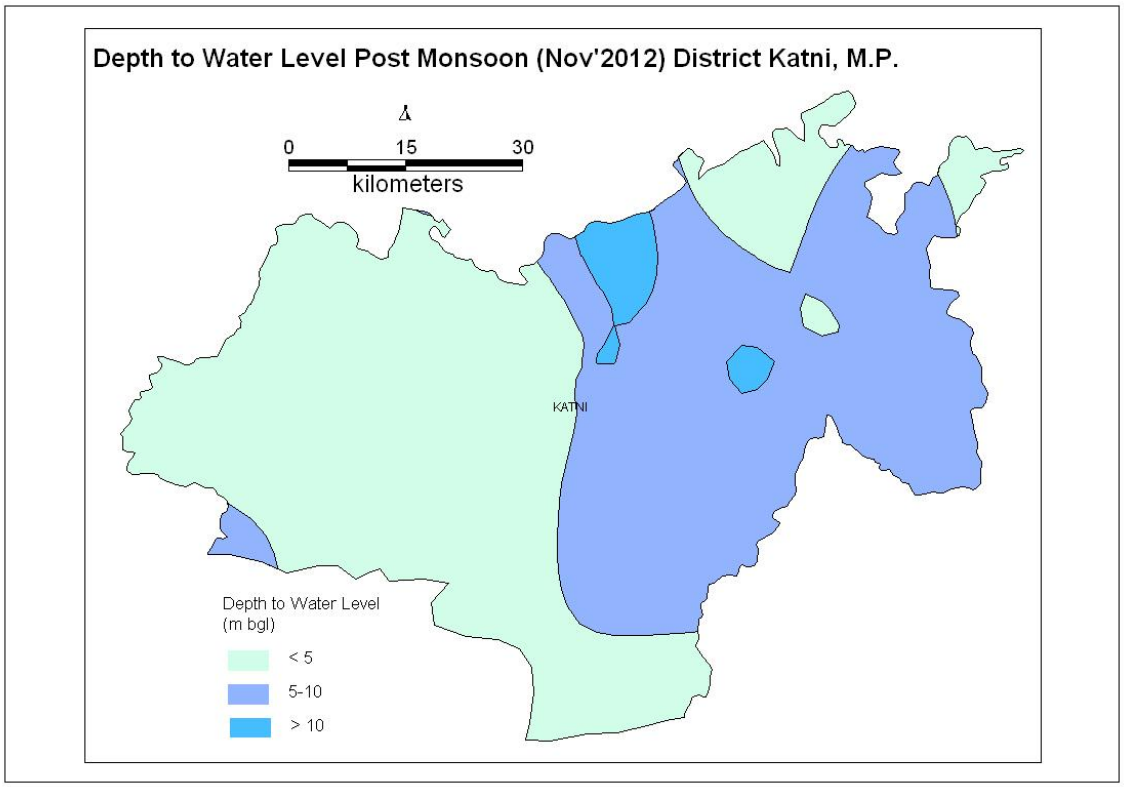
Pre-Monsoon (May 2012)

In general depth to water level in the district, ranges between 3.30 m-16.60m bgl



Post monsoon (November 2012)

. In general depth to water level in the district, ranges between 0.20 m-10.00 m bgl



Long term water level trend in last 10 years (Year 2003 to 2012)

During pre-monsoon period there is rise of 0.02-0.09 m/year and fall of 0.03 -0.09m/year.

Aquifer parameter

CGWB had drilled 13 exploratory wells in the district Hydrogelogical data of exploratory wells is the district is given in Table 4 from the perusal of table 4 reveals that, yield of Gondwana formations vary from 4.7' lps. to 15.71 lps,& draw down ranges between 3.57 m to 8.44 m. the yield of Archean is between 2.66 of 3.0 lps for draw down of 40.85 m. The yield of exploratory wells located in Vindhyaans are showing meager discharger to 5.5 lps at Gulwara.

The Katani formation showing the yeild between 3.5 lps and 14.67 lps for draw down between 21.48 m & 37.64 m. The exploration in cavernous limestone done at Kuan the yield was formed 18 lps for 4 m. draw down only. Aquifer tapping in shale's have poor yield ranging from 1.5 lps to 5.5 lps.

Table 4: Hydrogeological details of CGWB exploratory wells drilled in Katni district

S. No.	Location	Depth Drilled (M)	Zones tapped (m)	Discharge (lps)	W.L.M. bgl	Draw Down (m)	Formation
1.	Dharmapur $23^0$13'45" $80^0$17'55"	81.75	18.00-19.50 22.50-31.00 41.50-53.00 65.50-73.00	2.00	5.72	14.41	Clay Kankar slate
2.	Kolu Barkhera $23^0$13'45" $80^0$17'55"	77.30	52.00-61.00 64.00-67.00 70.00-73.00	3.50	5.32	21.48	Laterite, clay sand, slate
3.	Basari $23^0$13'45" $80^0$17'55"	80.00	36.00-39.00 41.00-43.00 45.00-51.00 56.00-59.00 61.00-63.00	5.25	9.7	8.44	Laterite, sandstone (Gondwana shale)
4.	IG Ward Katni $23^0$13'45" $80^0$17'55"	70.00	34.00-43.00 59.00-65.00	7.00	10.20	7.49	Laterie sandstone (Gondwana clay& limestone)
5.	Khirhani (Pipariya) $23^0$13'45" $80^0$17'55"	70.00	25.00-31.00 37.00-55.00	4.7	15.05	3.57	Clay sand stone (Gondwana)
6.	Bramhanwara (Kailwara) $23^0$13'45" $80^0$17'55"	70.00	50.00-70.00	14.67	6.16	37.64	Clay limestone
7.	Barkhera $23^0$13'45" $80^0$17'55"	183.00	Abandoned	meagre	discharge		
8.	Lakha-Khera $23^0$13'45" $80^0$17'55"	92.8	17.00-30.00 33.00-38.00 52.00-62.00	15.71	12.41	4.05	Sandstone (Gondwana)
9.	Nadawar $23^0$13'45" $80^0$17'55"	95.00	33.00-42.00 51.00-60.00	2.6	9.31	36.37	Alluvium shale
10.	Gulwara $23^0$13'45" $80^0$17'55"	135.2	44.00-75.00 134.00-135.00	5.5	6.37	22.91	Shale's
11.	Devri Hatai $23^0$13'45" $80^0$17'55"	183.00	44.00-48.50 119.00-122.00 146.00-152.5	2.66	51.00	408.85	Shale's
12.	Kuan $23^0$13'45" $80^0$17'55"	59.00	13.70-26.70 37.00-55.00	18.00	6.3	4.00	clay limestone (cavernous)
13.	Kauriya $23^0$13'45" $80^0$17'55"	82.00	35.00-37.00 43.00-44.50	1.50	12.85	19.00	shale's

Ground Water Resources

Katni district is underlain by Vindhyan sandstone, Bijawar Alluvium and Basaltic lava flows of Deccan trap and. Dynamic ground water resources of the district have been estimated for base year -2008/09 on block-wise basis. Out of 4,89,400 ha of geographical area, 4,66,648 ha (95 %) is ground water recharge worthy area and 22,752 ha (5%) is hilly area. There are six number of assessment units (block) in the district which fall under non-command (94 %) and command (6.%) sub units. All the blocks of the district are categorized as safe. Vijairaghogarh block of the district with highest stage of ground water development is computed as 63.3 % in Murwara (Katni). The net ground water availability in the district is 35,5078 ham and ground Water draft for all uses is 15,457 ham, making stage of ground water development 45 % (37 % in 20030/4) as a whole for district. After making allocation for future domestic and industrial supply for next 25 years, balance available ground water for future irrigation would be 18,067 ham.

Table 5 : Block Wise Ground Water Resource Estimation Data & Katni District

Annexure III D - (cont.) ASSESSMENT OF DYNAMIC GROUND WATER RESOURCES OF MADHYA PRADESH
Type of Assessment Unit : Block (As on March, 2009)

S. No.	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 (11+12) (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 Development {(13/10)*100} (%)
	Katni								
	Badwara	Command	1329	126	19	145	45	1159	11
		Non-Command	6393	3051	402	3453	518	2824	54
		Block Total	**7723**	**3177**	**421**	**3598**	**563**	**3983**	**47**
	Bohariband	Command	1300	55	41	96	65	1180	7
		Non-Command	6101	2031	370	2402	587	3483	39
		Block Total	**7402**	**2086**	**411**	**2497**	**652**	**4664**	**34**
	DhimarKhrda	Command							
		Non-Command	4369	951	384	1335	493		31
		Block Total	**4369**	**951**	**384**	**1335**	**493**	**2926**	**31**
	Murwara	Command	1315	136	109	245	177	1002	19
		Non-Command	4384	2523	322	2845	441	1420	65
		Block Total	**5699**	**2659**	**431**	**3090**	**618**	**2422**	**54**
	Rithi	Command	380	27	22	48	33	320	13
		Non-Command	3516	1116	240	1357	387	2013	39
		Block Total	**3895**	**1143**	**262**	**1405**	**420**	**2333**	**36**
	Vijayraghogarh	Command							
		Non-Command	5419	2985	546	3531	694	1740	**65**
		Block Total	**5419**	**2985**	**546**	**3531**	694	**1740**	**65**
		District Total	**34508**	**13000**	**2457**	**15457**	**3440**	**18067**	**45**

Ground water quality of Katni district

Quality of Ground water for Drinking :

Ec,No3 and F value of ground water varies from 60-1075,1.2-81,0.02-0.87 respectively.High nitrate in the village area is appears due to excessive use of fertilizers and agricultural waste. The total hardness of the ground water in the district is under safe limit as per BIS standards.

Quality of water for irrigation

High SAR is not good for irrigation as it leads to Sodium Hazard. Water samples in the district generally fall in C1S1, C2S1 and C3S`1 classes of US Salinity diagram. However ground water in the district general is sage for irrigation but proper drainage system is required where EC is more than 1500 us cm^{-1}.

Geogenic problems:

Fluoride in the district generally below 1.5 mgl-1, however groundwater in the district is safe for drinking. More than 1.5mgl. Fluoride is responsible for bone deformation. No arsenic has been detected in the district.

Status of ground water development

Ground water is main source for drinking of irrigation in the Katni district. About 54.57% of irrigation in the district is from ground water sources through level of irrigation is the district is only 30% there are 910 tube wells and 10696 dug wells for irrigation in the district. There are 13827 electric connections for agriculture purpose. Depth of dug wells in the district ranger from 8 to 18 lps, depending on hydro geological situations is the area. High yielding tube wells are found is the base wells located is Gondwana sandstone and cavernous limestone.

A past from private sources, hand pumps are main source of rural water supply in district and out of 911 villages 854 villages have tube wells/hand pump facility while 98 villages have piped water supply. Water supply of Katni town are form **Katni river.**

5.0 GROUND WATER MANAGEMENT STRATEGY

Ground water development

As per ground water resource estimation of Katni district for the year 2009, the available ground water resources and gross ground water daft's are 345.08 MCM & 130.00 MCM respectively, making stage of ground water development 45% as a whole for district. There is ample scope for future development of ground water resources is the district. All six blocks namely Murwara, Vijayraghogarh, Badwara, Rithi, Bahoriband & Dhimarkheda are falling under safe category. Decadal water level trend analysis reveals mixed trend of water levels during pre & post monsoon seasons. After making allocation for future domestic & industrial supply upto next 25 years, balance available ground water at 50% stage of ground water development safe limits in Katni district would be 180.67 MCM, if 70% of balance available ground water resources is to be developed through dug wells & 30% through tube wells, then at suitable hydro geological locations tentatively 12000 new dug wells & 12000 new tube wells for irrigation can be constructed in the district, considering unit draft of dug wells & tube wells 0.01 & 0.04 MCM respectively. Dug wells are feasible structure for granite area, whereat shallow tube wells are recommended in weathered, jointed Archaeans. Deep tube wells with proper wells assembly are suitable in Gondwana, Katni, Lametas & Alluvial formations. In hard rocks i.e. raniter, Vindhyaur drilling may be taken up with DTH rigs. But in semi -consolidated rocks, ie. Gondwana sandstones Katni formations, Lameta & alluvium the drilling may be done by combination type of rig.

Water conservation and artificial recharge:

Considering hydro geological situation of the area, there is tremendous scope for artificial recharges work especially is ground water depleting areas in all blocks. Plan may be adopted using hill to valley approach is a watershed. At origin of streams structures like gully plugs & contour trenches may be constructed to arrest surface run-off & same water may be useful for soil moisture retention & development of vegetation cover in the area. Gabion structures may be constructed at down stream of this structure, across the stream using local boulders & wire mess to check the velocity of flowing water, & to store water in upstream direction of these structures.

Percolation tanks are most important structure from ground water recharges point of view. These are recommended is second & third order streams on porous & permeable formations. Foundation of there percolation tanks should not rest on hard & compact or on impregnable formation & water should be allowed to seep below streambed to recharge ground water body at sub-surface.

It is quite possible that is due course of time infiltration of water from percolation tanks is reduced due to silt deposition is side the structures.

To over come this problem recharge shafts may be constructed inside percolation tanks to allow continuous seepage of water from the structures to ground water system of the area. Recharge shafts are also have an advantage to hold water is tanks upto required levels for local use.

Recharge shafts can also be constructed is those placer where impervious formations are occurring at surface & at shallow depth porous & permeable rocks are

found, which may accepts water for recharge by constructing recharge shalk inside water bodies of this type of situation, interconnection is made to reach water is underlying porous & permeable formations occurring below impervious formation at shallow depth. Properly designed tube wells also act as recharge shaft, if recharge of water is needed in deeper aquifers overlain by impervious rocks.

Sub surface dykes are water conservation structure constructed at suitable hydro geological sites across the river beds at the end of water shed to check sub surface flow of water along stream beds. Trench is dug down to impervious horigon across the steams & filled with local clay balls over high density polythene, making sub surface parser for flow of water from stream beds.

Dug wells recharge is also applicable in rural areas. In this system water from fields is diverted into recharge well passing through de-siltation chamber & filter media. Filtered water reaches into recharge well through delivery pipe, lowered below water level. at bottom of the well through delivery pipe to avoid checking of aquifer by entry of bubbler.

In the urban areas the roof top rain water harvesting structure should be implemented keeping local hydro geological setup of area in mind the suitable technique should be adopted. Area recommended for ground water development potential & artificial recharge is shown in fig. 6

6.0 GROUND WATER RELATED ISSUES AND PROBLEMS

Long term water level trend analysis shows mixed results. Depletion in ground water levels is observed during both pre post monsoon seasons in ground water level monitoring wells.

Though stage of ground water development of the district is only 45% even though depiction of ground water levels indicates that ground water draft is exceeding the recharge except the diction of ground water levels these is no major ground water related issue & problem in the district.

7.0 AWARENESS AND TRAINING ACTIVITY

1 Mass awareness programme (MAP) & Water management training programme (WMTP) by CGWB.
CGWB has not conducted any MAP & WMTP in Katni district.

2 Paticipation in exhibition, Mela, Fair etc.:
CGWB has not taken any participation in exhibition, Mela & Fair etc. in Katni district.

3 Presentation & lectures delivered in public forum & Radio/T.V. etc.
CGWB has not done any activity in Katni district, under items mentioned above.

8.0 AREAS NOTIFIED BY CGWA/SGWA

In Katni district, no any area is notified by CGWB/SGWA

9.0 RECOMMENDATIONS

The stage of ground water development of Katni district is only 45% which reveals adequate scope for future developments of ground water for irrigation. After making allocation for future domestic & industrial water supply up to next 25 years is the district, balance available ground water at 50% stage of ground water developments safe limit would be 180.67 MCM. If 70% of balance available ground water is to be developed through dug wells & 30% through tube wells/base wells, there tentatively 12000 new dug wells & 1200 new tube wells can be constructed for irrigation.

- Depletion of ground water levels is recorded in ground water monitoring wells therefore a plan for artificial recharge to be prepared so that important natural resource is again used to recharge ground water system through feasible techniques.

- Conjunctive use of surface & ground water is recommended is the area.

  There is high SAR value is some water samples which is not good for irrigation as it leads to sodium hazard however is general ground water is safe for irrigation but proper drainage system is required where EC is more than 1500 Us cm-1 nitrate is the ground water of Katni (119 mgl/l) Saleemabad (211 mg/l) & Barnhi (107 mg/l) GWM wells has been found in excessive than permissible limits. Higher nitrate content in ground water is indicating anthropogenic pothetion in ground water system of the area. Water from these stations should not be used for drinking purpose.

- Roof top rainwater harvesting tripe at should be implemented in urban areas of Katni district.
