

# DISTRICT AT A GLANCE



**BALAGHAT DISTRICT**  
MADHYA PRADESH



***Ministry of Water Resources***

***Central Ground Water Board***

**North Central Region**

**BHOPAL**

**2013**

## BALAGHAT DISTRICT PROFILE

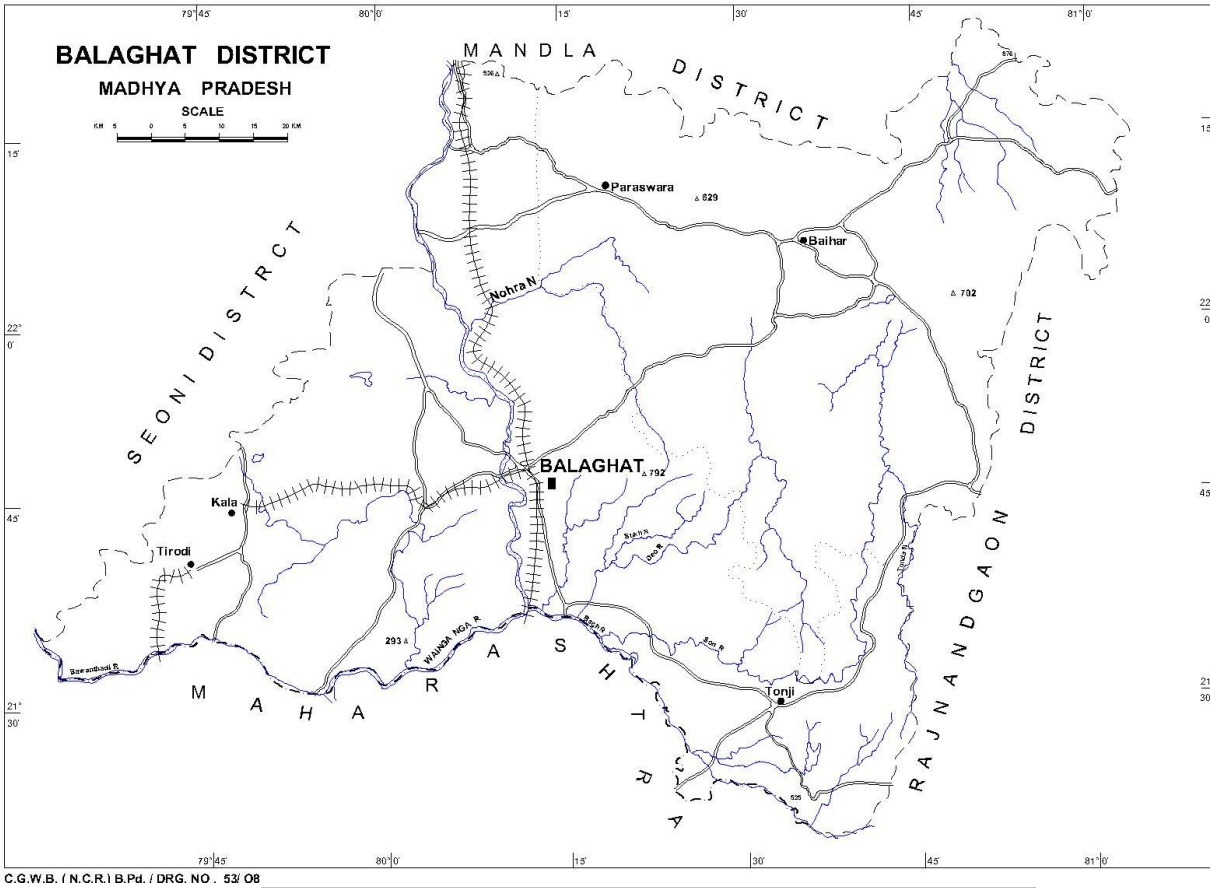
S.No	ITEMS	STATISTICS
<b>1</b>	General Information	
	i) Geographical Area (Sq.Km)	99229
	ii) Administrative Divisions ( as on year 2013 ) Number of Tehsil / Block Number of Villages	10/10 1400
	iii) Population (Census 2011 )	17,01,156
	iv) Normal Rainfall ( mm )	1390.3
<b>2</b>	<b><u>GEOMORPHOLOGY</u></b>	
	Major Physiographic Units	1.Maikal Satpura mountains 2.Undulating Plains
	Major Drainage	Wain ganga, Bagh, Banjar, Shisire, Sod
<b>3</b>	<b>Land Use ( Sq. Km. )</b> i) Forest area : ii) Net sown area : iii) Cultivable area :	505 2732 3025
<b>4</b>	<b><u>Major Soil Types</u></b>	Black Cotton, Sandy-Loamy and Lateritic
<b>5</b>	<b>Area under principle crops</b>	Paddy,Wheat, Maize Gram, sugarcane
<b>6</b>	<b><u>IRRIGATION BY DIFFERENT SOURCES</u></b>	
	<b><u>Structures</u></b>	<b><u>No</u></b> <b><u>Area</u></b> <b>( Sq. Km.)</b>
	Dug wells	1895    226
	Tube wells/ Bore wells	52      2
	Tanks/ ponds	2391    291
	Canals	101     841
	Other Sources	33      55
	Net Irrigated Area.	1247
	Gross Irrigated Area	1415
<b>7</b>	<b>Number of Ground Water Monitoring Wells of CGWB ( As on 31-03-2013 )</b>	
	No. of Dug Wells	40
	No. of piezometers	08
<b>8</b>	<b>PREDOMINANT GEOLOGICAL FORMATIONS</b>	Archaeans, Gondwanas, Lameta Beds and Basalts.
<b>9</b>	<b><u>HYDROGEOLOGY</u></b>	

	Major water bearing formation  ( Pre-monsoon DWL during 2012) ( post-monsoon DWL during 2012 ) Long term water level trend in10 yrs ( 2003-2012)	Archaeans, Basalt and Alluvium  1.65-12.65 0.80-8.50 0.01 to -0.1( Rise ) +0.2 to -0.1(fall)
<b>10</b>	<b>GROUND WATER EXPLORATION BY CGWB ( as on 31.03.2013 )</b>	
	No of wells drilled ( EW, OW, PZ, SH, Total )	09 PZ
	Depth Range ( m )	30-60
	Discharge ( litres per second )	0.24-12.21
<b>11</b>	<b>GROUND WATER QUALITY</b>	
	Presence of Chemical constituents more than permissible limit ( EC, F,AS, Fe etc. )	EC-207-3570, Nitrate-4-337 Fluoride – 0.01-1.36 in phreatic aquifer
<b>12</b>	<b>DYNAMIC GROUND WATER RESOURCES ( 2009) in MCM</b>	
	Net Ground Water Availability	912.28
	Gross Annual Ground Water Draft	136.61
	Projected demand for Domestic and Industrial Uses up to next 25 Years (2035)	41.44
	Stage of Ground Water Development	40.31%
<b>!3</b>	<b>EFFORTS OF ARTIFICIAL RECHARGE &amp; RAIN WATER HARVESTING</b>	
	Projects completed by CGWB	Nil
	Projects under technical guidance of CGWB	Nil
<b>14</b>	<b>GROUND WATER CONTROL AND REGULATION</b>	
	Number of OE Blocks	All blocks are under Safe category
	Number of Critical Blocks	
	Number of Notified Blocks	

## INTRODUCTION

The Balaghat District lies in the Southern part of Madhya Pradesh state between the parallels of latitude 21°30' to 22°30' and 80°00' to 81°00' East Longitude falling in Survey of India toposheets Nos. 64B,C, 55N and 55O. It is bounded by the district Mandla in North, Rajnandgaon & Durg districts in the East and south, and Seoni district in the west.

The District is divided into 10 Tehsils and 10 Blocks. There are 1400 Villages (Table-1).



**Table – 1: Administrative Divisions, District SEONI, (M.P).**

S.No.	Block	Area Sq.Km
1.	Baihar	1291.60
2.	Balaghat	1222.19
3.	Birsa	1415.43
4.	katangi	697.79
5.	Khairlangi	487.88
6.	Kirnapur	810.40
7.	Lalburra	715.92
8.	Langi	871.26
9.	Paraswada	1240.50
10.	waraseoni	476.03

## SOILS

The district is broadly covered by three types of soils. Black cotton soils, Sandy loam & lateritic soil

## DRAINAGE

Wain ganga, Bagh, Banjar, Shisire, Sod,tumnar along with their tributaries form wainganga & narmada river basins.The pattern of drainage on the whole is dendritic.

## IRRIGATION

The main source of irrigation in the district are canals and dug wells while the tube wells and ponds contributes about 20%. Table-2

Table-2: Irrigation and net irrigated area. (SqKms).							
Canals		T/W		D/W		Ponds	
Nos.	Irrigated area	Nos.	Area	Nos.	Area	Nos.	Area
101	841	52	2	1895	226	2391	291

## CROPPING PATTERN

The principal crops grown in the district are Paddy, Wheat, sugarcane, Maize, Jowar, pulses & oil –seeds.

## CGWB ACTIVITIES

The area has been covered under systematic hydrogeological surveys by Central Ground Water Board, NCR Bhopal (M.P).

The area was covered under Ground Water Management studies in the year 1998-99 (RHS) by S/Shri.S.K.Juneja, Scientist ‘C’,

## 2.0 CLIMATE AND RAINFALL

The Climate of Balaghat District, M.P.is sub- tropical characterized by a hot summer and general dryness except during the southwest 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 the middle of June. The period from the middle of June to September is the southwest monsoon. October and November form the post monsoon or transition period.

The normal annual rainfall of Balaghat district is 1294.5 mm. Seoni District received maximum rainfall during southwest monsoon period i.e. June to September. Thus, surplus water for ground water recharge is available only during the southwest monsoon period.

The normal maximum temperature recorded during the month of May is 43° C and minimum during the month of December is 8°C. The normal annual means maximum and minimum temperatures of Seoni district are 32°C & 8°C respectively.

During the southwest monsoon season the relative humidity ranges between 70-75%. In the rest of the year it is drier. The driest part of the year is the summer season, when relative humidity is less 34%. 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 7.7 km/hr observed during the month of June and minimum 3.9 km/hr during the month of December.

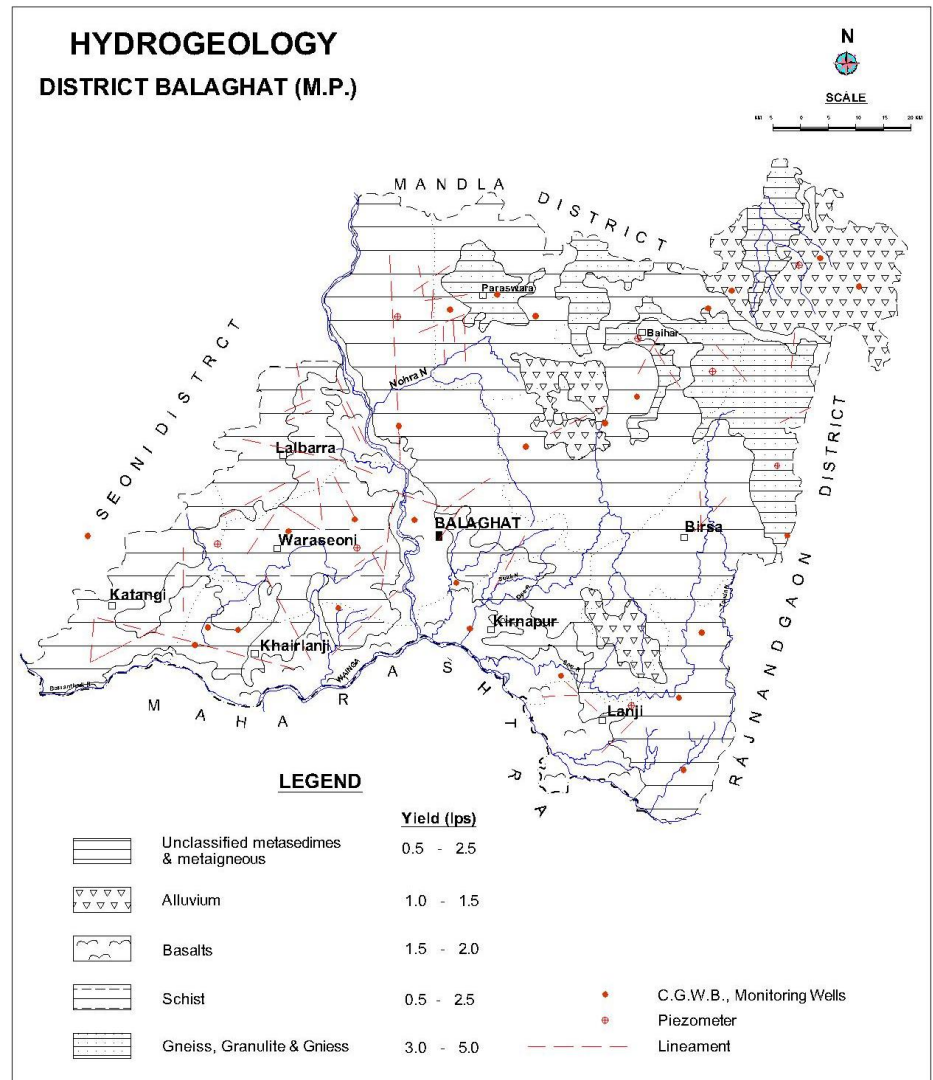
## 4.0 GEOMORPHOLOGY AND SOIL TYPES

Geomorphologically the district comprises of Alluvial plains, intermonnate valleys, denudational hills,pediplains & Pediment structural hills.

## 4.0 GROUND WATER SCENARIO

### 4.1 HYDROGEOLOGY

The occurrence and movement of ground water in hard rock areas is widely controlled by the secondary porosity present in them like joints, fractures, weathering etc. The district is mainly occupied by Archean rocks, Dharwars, Basaltic lava flows & alluvium. The weathering of Archean rocks ranges from 0.50 mbgl to 10.00 mbgl. The weaker zones in Deccan traps are also developed at the contacts of two consecutive lava flows, which facilitate downward movement of ground water. In Vesicular basalts the voids provide more space for the accumulation of ground water.



The water bearing properties of these formations varied widely depending upon their lithological properties and structural control.

### WATER BEARING FORMATIONS

The Ground Water occurs under water table and semi confined to confined conditions in all formations of the area. Topographic depressions, nature and extent of weathering, presence of joints and fractures play an important role in the occurrence and movement of ground water.

The area occupied by Archean rocks is mostly undulating. The ground water in these rocks occurs under unconfined conditions, which is widely controlled by the weathering of the rocks, presence of joints, fracture and lineament in them.

The area occupied by Deccan trappean rocks, where ground water occurs under phreatic conditions in the weaker zones of weathered, vesicular, fractured and jointed parts of the flows. The sheet joints, basal parts of flows and inter-connection of joints and fractures controls the horizontal as well as vertical movement of ground water. The plateau like topography plays an important role in occurrence and movement of ground water.

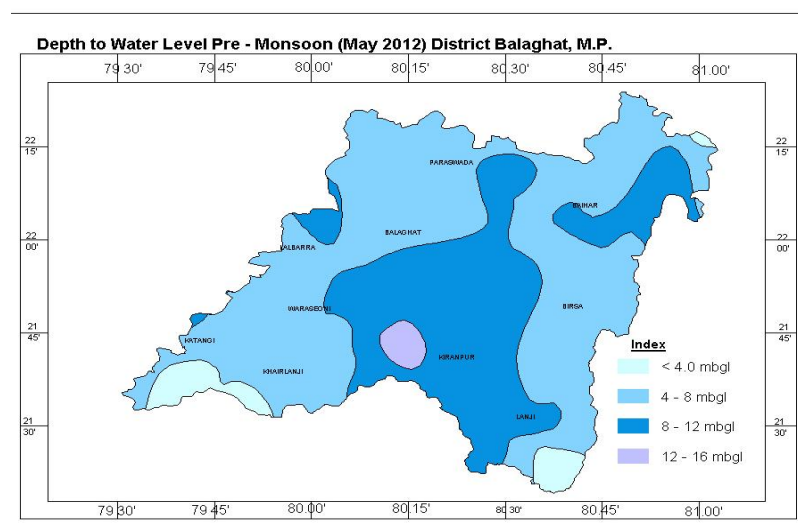
Under semi-confined conditions the ground water occurs at the contacts of two flows and at the contact of trappean rocks with Archean basement.

### 4.3 Ground Water Levels

Variation of ground water levels in a area is an important component of Hydrological cycle because of its is a physical reflection of aquifer system. As the change in ground water level is directly related to ground water balance and its continuous records provide direct information of sub surface geo environmental changes due to withdrawal of ground water. To monitor the seasonal & annual fluctuation, change in quantity and quality of ground water, CGWB has established. Ground water monitoring wells and piezometers in entire Shajapur district. The monitoring of ground water levels in these wells is being carried out by CGWB during the month of May, August, November and January. To study ground water regime of the area pre monsoon and post monsoon maps of the Balaghat district has been prepared .

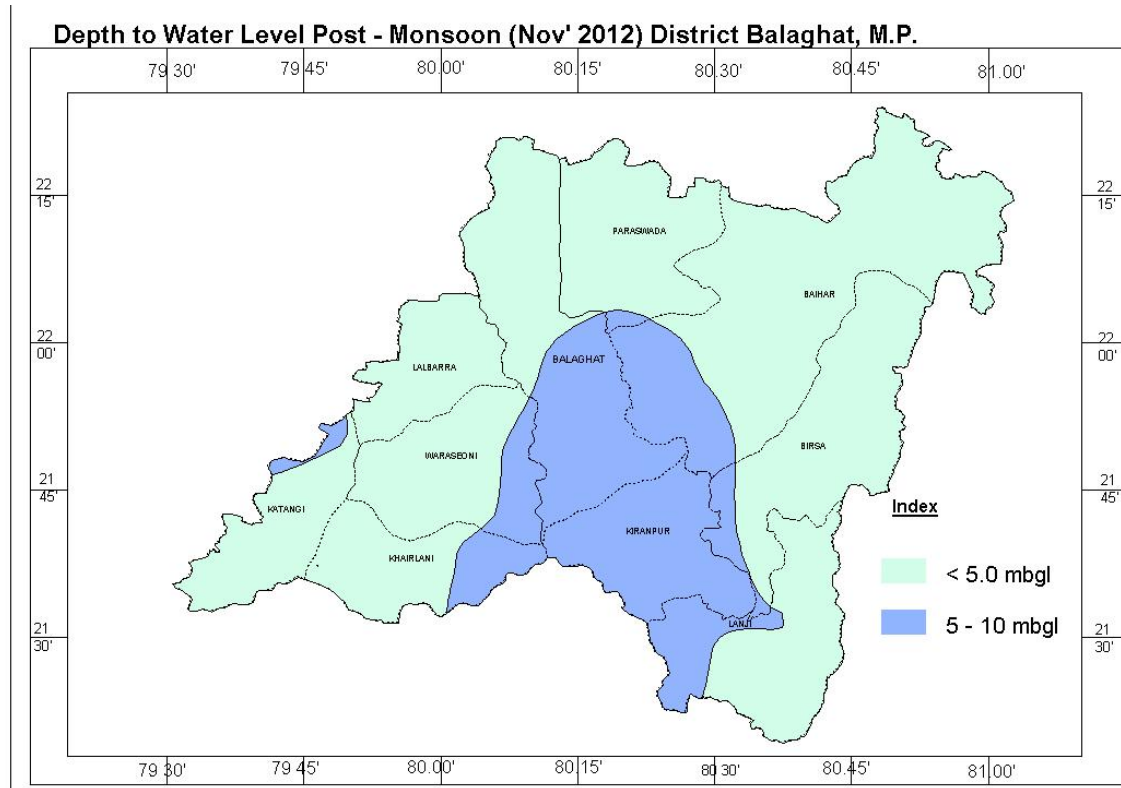
#### 4.3.1. Pre Monsoon (May 2012.)

In pre monsoon period, May 2012,depth to water level ranges between 1.65mbgl to 12.65 mbgl. The most part of the district have water level in the range of 4.0 to 8.0 m bgl during the pre monsoon water level.



#### 4.3.2. Post Monsoon (November 2012)

During Post monsoon period November 2012 ,the water level ranges from 0.80 m bgl to 8.50 mbgl. It is observed that in most part of the district the water level lies within 5.00 mbgl. During post monsoon period water level between 5-10m occurs in south- central part Of the district.



#### 4.3.4. Ground Water Level Trend (2003 -2012)

Analysis of ground water level trend indicate that there is declining trend in water level between 0.02 to 0.1 m/year & rising trend ranges between 0.01-0.1m/year in different parts of the district.

#### AQUIFER GEOMETRY

The Ground Water occurs in shallow aquifers under unconfined to semi-confined conditions in Deccan trap areas whereas in granitic and Archean formations it is restricted to unconfined conditions.

The Ground Water in deeper levels occurs under semi-confined to confined conditions. The discharge of tube wells varies from 0.5 lps to 12.2 lps. The extent of aquifer restricted to their regional extends. The recharge of the deeper aquifer takes place through deep joints, fractures and contact zones, whereas the shallow aquifer recharges through weathered portion of the formation.

#### OCCURRENCE, MOVEMENT AND DISTRIBUTION OF GROUND WATER

The Ground Water occurs under water table conditions in the area. Topographic depressions, nature and extent of weathering, presence of fractures and joints play an important role in the occurrence and movement of ground Water in Archean formations, whereas in trappean rocks the thickness and percentage of vesicularity present in them play an important role in the occurrence of ground water.



## 4.2 GROUND WATER RESOURCES

The entire district falling under safe category of Ground water development (both command and non command area). The existing stage of Ground water development is 15% (2009). The net annual ground water availability in Balaghat district is 912.48 MCM and total draft is 136.61 MCM. The net annual ground water available in the district for future irrigation is 770.83 MCM.

### GROUND WATER RESOURCE POTENTIAL OF BALAGHAT DISTRICT, M.P. (As on March,2009)

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} (%)
<b>Balaghat</b>								
Baiher	Command							
	Non-Command	11958	146	402	548	545	11267	5
	Block Total	<b>11958</b>	<b>146</b>	<b>402</b>	<b>548</b>	<b>545</b>	<b>11267</b>	<b>5</b>
Balaghat	Command	1377	120	31	150	32	1225	11
	Non-Command	9853	1502	301	1803	337	8015	18
	Block Total	<b>11230</b>	<b>1622</b>	<b>332</b>	<b>1953</b>	<b>368</b>	<b>9240</b>	<b>17</b>
Birsa	Command							
	Non-Command	12374	95	274	369	466	11813	3
	Block Total	<b>12374</b>	<b>95</b>	<b>274</b>	<b>369</b>	<b>466</b>	<b>11813</b>	<b>3</b>
Katangi	Command	1003	199	39	238	43	761	24
	Non-Command	6641	1935	295	2230	358	4347	34
	Block Total	<b>7644</b>	<b>2134</b>	<b>333</b>	<b>2467</b>	<b>402</b>	<b>5108</b>	<b>32</b>
Khairilangi	Command	642	120	39	159	42	479	25
	Non-Command	4673	956	263	1219	291	3426	26
	Block Total	<b>5315</b>	<b>1076</b>	<b>302</b>	<b>1378</b>	<b>333</b>	<b>3906</b>	<b>26</b>
Kirnapur	Command						0	
	Non-Command	7375	1553	358	1910	435	5387	26
	Block Total	<b>7375</b>	<b>1553</b>	<b>358</b>	<b>1910</b>	<b>435</b>	<b>5387</b>	<b>26</b>
Lalburra	Command	2660	524	113	637	139	1997	24
	Non-Command	6384	887	212	1099	279	5219	17
	Block Total	<b>9044</b>	<b>1411</b>	<b>325</b>	<b>1735</b>	<b>417</b>	<b>7216</b>	<b>19</b>
Langi	Command	1620	128	70	197	78	1415	12
	Non-Command	8708	709	306	1015	373	7627	12
	Block Total	<b>10329</b>	<b>837</b>	<b>375</b>	<b>1212</b>	<b>451</b>	<b>9041</b>	<b>12</b>
Paraswada	Command							
	Non-Command	10908	93	197	289	247	10568	3
	Block Total	<b>10908</b>	<b>93</b>	<b>197</b>	<b>289</b>	<b>252</b>	<b>10563</b>	<b>3</b>
Waraseoni	Command	1727	338	125	463	125	1264	27
	Non-Command	3345	829	206	1035	237	2279	31
	Block Total	<b>5072</b>	<b>1167</b>	<b>331</b>	<b>1498</b>	<b>362</b>	<b>3543</b>	<b>30</b>
	<b>District Total</b>	<b>91248</b>	<b>10133</b>	<b>3228</b>	<b>13361</b>	<b>4031</b>	<b>77083</b>	<b>15</b>

### **4.3 GROUND WATER QUALITY OF SEONI DISTRICT**

Groundwater quality in Balagat district is assessed annually by CGWB on the basis of samples collected from 40 number of hydrograph stations in the district. On the basis of examination of data for the year 2011, the water quality range are as follows.

EC-207-3570  $\mu\text{S}/\text{cm}.$ , Nitrate-4-337ppm Fluoride – 0.01-1.36 ppm in phreatic aquifer.

## **5.0 GROUND WATER MANAGEMENT STRATEGY**

### **5.1 GROUND WATER DEVELOPMENT**

The entire district is falling under 'Safe' category of ground water development. The ground water development in the district as a whole is about 14%. In general geology, climatologic and pedalogical parameters governs the ground water development in the district. Construction of dug-wells & tubewells are recommended.