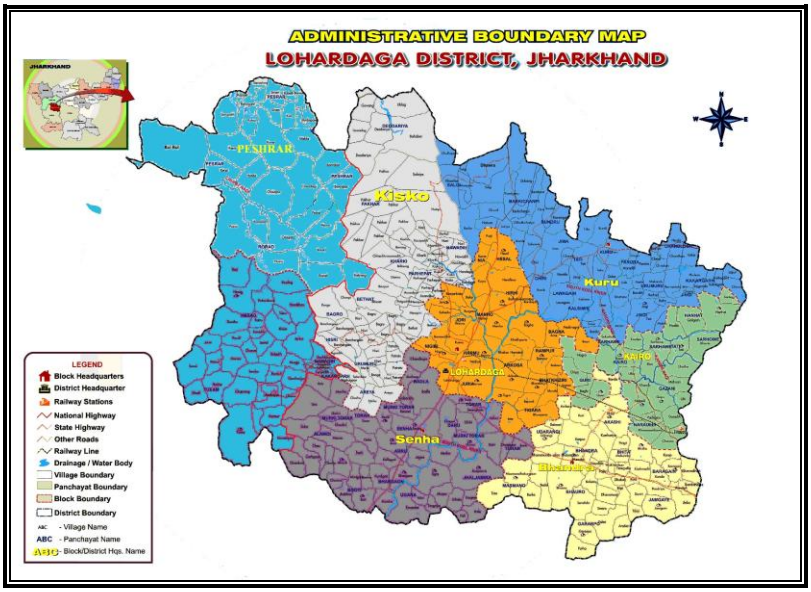
भूजल सूचना पुस्तिका

लोहरदगा ***जिला, झारखंड***

Ground Water Information Booklet

Lohardaga District, Jharkhand State



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

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

सितंबर 2013

September 2013

भूजल सूचना पुस्तिका

लोहरदगा जिला, झारखंड

Ground Water Information Booklet

Lohardaga District, Jharkhand State

Prepared By

रोज अनीता कूजूर

(वैज्ञानिक ग)

Rose Anita Kujur

(Scientist C)

राज्य एकक कार्यालय, राँची

मध्य-पूर्वी क्षेत्र,पटना

State Unit Office, Ranchi

Mid Eastern Region, Patna

GROUND WATER INFORMATION BOOKLET OF LOHARDAGA DISTRICT, JHARKHAND STATE

CONTENTS

List of Table :

List of Figures:

LOHARDAGA – DISTRICT AT A GLANCE

Sl No.	ITEMS	Statistics			
1.	GENERAL INFORMATION				
	i) Geographical Area (Sq km.)	1419 Sq. km.			
	(16) Administrative Divisions (As on -- 2007) Number of Block Number of Panchyat / Villages	7 66/354			
	(ii) Population (As on 2011 Census)- in lakhs	4,61,490			
	(iii) Average Annual Rainfall (mm)	1278 mm			
2.	GEOMORPHOLOGY				
	Major Physiographic units	Hilly and undulating			
	Major Drainages	South Koel			
3.	LAND USE (Sq Km.)				
	a) Forest area:	1591.4			
	b) Net area sown:	2558.5			
	c) Cultivable area:	550.70			
4.	MAJOR SOIL TYPES	Alfisols (older alluvial soil) Light textured Acidic to Neutral very poor fertility.			
5.	AREA UNDER PRINCIPAL CROPS(2011-12)	Crops	Area (HA)	Production (MT)	Productivity (KG/HA)
		Rice	30283	121207	4002
		Wheat	6696	12374	1848
		Pulses	13725	17161	7111
		Oilseeds	7534	6456	3460
		Maize	2977	4233	1422
6.	IRRIGATION BY DIFFERENT SOURCES (Areas and Number of Structures)	Areas (Ha)		Nos.	
	Dugwell	7978		12969	
	Tube wells /Bore wells	0		0	
	Tanks / Ponds	0		0	
	Canals	47		2	
	Other Sources	69		1	
	Net irrigated area	-		-	
	Gross irrigated area	8094		12972	
7.	NUMBERS OF GROUND WATER MONITORING WELLS OF CGWB (As on 31-03-07) No of Dugwell No. of Piezometers	7 -			
10.	PREDOMINANT GEOLOGICAL FORMATIONS	Chottanagpur Granite Gneiss Laterite, Phyllite, Quartzite, Schists.			
11					

	➢ Major Water bearing formation ➢ (Pre-monsoon Depth to water level during 2006) ➢ Post-monsoon Depth to water level during 2006) ➢ Long term water level trend in 10 yrs (1997-2006) in m / yr.	Granite Gneiss 5.85 – 10.00m 1.70 – 5.00m	
		RISE	FALL
		0.0104 – 0.368	0.059 at Rudh
12.	GROUND WATER EXPLORATION BY CGWB (As on 31-03-07)		
	No. of wells drilled (EW, OW, PZ, SH, Total	EW – 11, OW -2	
	Depth Range (m)	23.47– 199.12 mbgl	
	Discharge (m3/hr)	0.02 – 28.8	
	Storativity (S)	----	
	Transmissivity (m^2/day)	----	
13.	GROUND WATWER QUALITY	Good	
	Presence of Chemical constituents more than permissible limit (e.g. EC, F, As, Fe)	EC 116 to 1260 micro mhos/cm at 25^0 C.	
	Type of Water	Ca-Hco_3	
14.	DYNAMIC GROUND WATER RESOURCES (2009) in mcm.		
	Net Annual Ground Water Availability	937593	
	Net Annual Ground Water Draft	3717.75	
	Projected Demand for Domestic and Industrial uses up to 2005	811.89	
	Stage of Ground Water Development	39.65%	
15.	AWARENESSS AND TRAINING ACTIVITY		
	Mass Awareness Programmes Organized Date Place No. of Participants	NIL	
	Water Management Training Programmes Organized Date Place No. of Participants	NIL	
16.	EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING		
	Projects completed by CGWB (No & Amount spent)	NIL	
	Projects under technical guidance of CGWB (Numbers)	NIL	
17	GROUND WATER CONTROL AND		

	REGULATION	
	Number Of OE Blocks	NIL
	No. of Critical Block	NIL
	No. of Blocks notified	NIL
18.	MAJOR GROUND WATER PROBLEMS AND ISSUES	Decline in water level has been observed in some places, Nitrate problem in some dug wells.

Ground Water Information Booklet of Lohardaga District (Jharkhand)

1.0 Introduction

Lohardaga is a tribal dominated district of Jharkhand located in the west-central part of the Jharkhand state. The district is bounded by Latehar district in the north, Ranchi in east and Gumla in south and west. Lohardaga district is spread over 1419 Sq. Km., lying between north latitude $23^0$30' to $23^0$45' and East longitude $84^0$15' to $84^0$50'. It falls in the Survey of India toposheet no. – 73/A.

1.1 ADMINISTRATIVE DIVISION & POPULATION

Lohardaga district came into existence after Ranchi was split into three districts namely Ranchi, Lohardaga and Gumla way back in 1983, with the area of the district is 1491 sq . km and five administrative bocks namely (i) Lohardaga, (ii) Senha, (iii) Kisko, (iv) Bhandra and (v) Kuru. At present It has Seven blocks: Lohardaga, Kuru, Bhandra, Kairo, Kisko, Peshrar and Senha which contains 354 villages spread over **in** 66 Gram Panchayats**.** According to 2011 census, the total population of the district is 4,61,790 constituting 1.40 % of the total population of Jharkhand. The rural and urban population of is 4,04,379 and 57,411 respectively. (Table-1).The rural population constitutes 87.57 % of the total population of the district. Administrative divisions have been shown in figure-1. Graphical representation of population of Lohardaga district is shown in figure-1A.

TABLE – 1 POPULATION OF LOHARDAGA DISTRICT

Sl. No.	Block	Rural population			Urban population		
		Male	Female	Total	Male	Female	Total
1	Lohardaga	34484	34114	68598	29374	28037	57411
2	Senha	35308	34460	69768	-	-	-
3	Kisko	27692	27267	54959	-	-	-
4	Bhandra	28754	28549	57303	-	-	-
5	Kuru	42480	42347	84827	-	-	-
6	Kairo	18773	19094	37867	-	-	-
7	Peshrar	15764	15293	31507	-	-	-

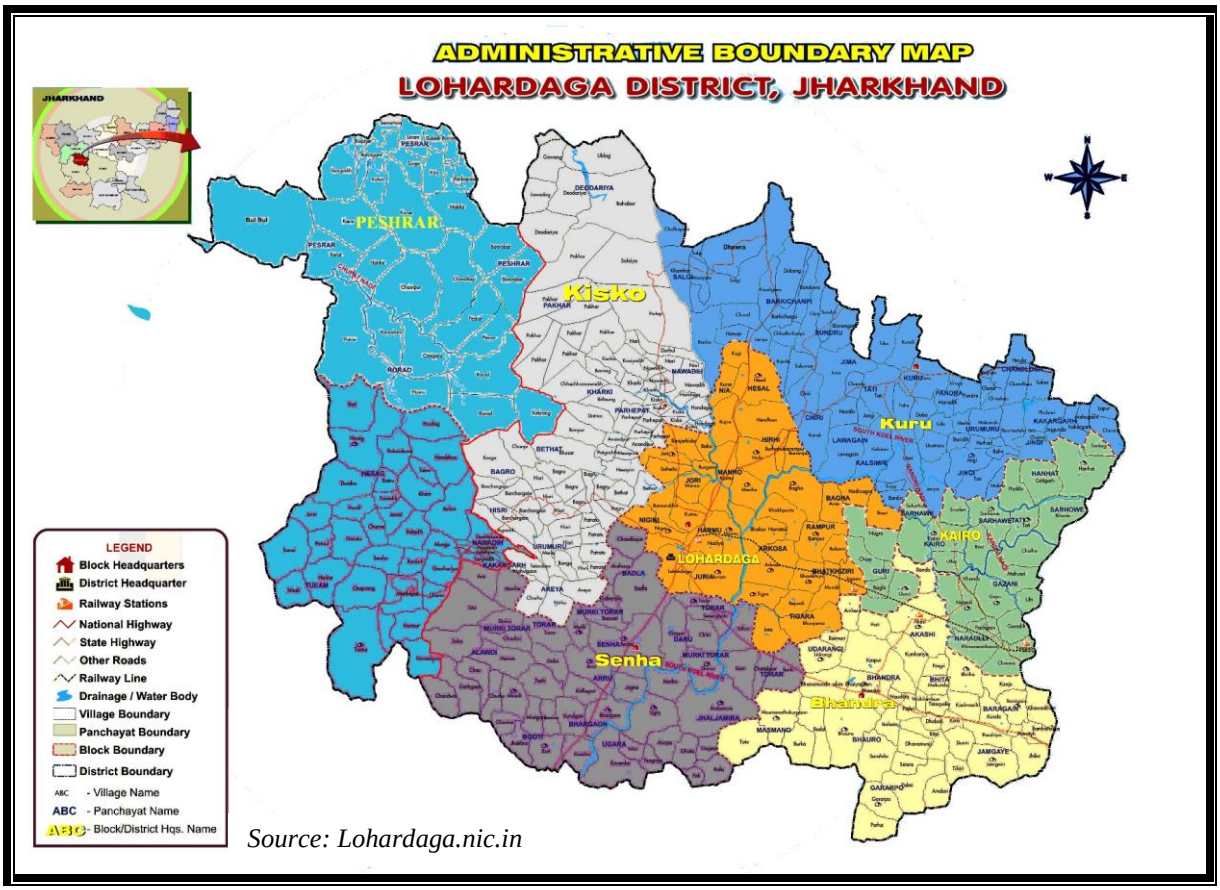
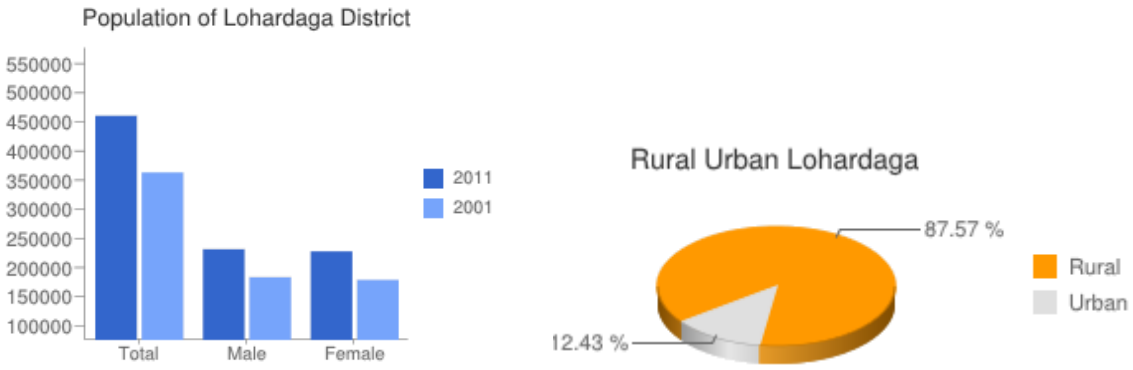


Fig 1: Administrative map of Lohardaga district



Source: Population census 2011

Fig 1A: Graphical representation of population of Lohardaga district

1.1 DRAINAGE

The Lohardaga district covers the south - western part of Chhotanagpur plateau. The range of elevation of the district vary approximately between 610 and 640 m amsl. In plain areas and around 1000 meter in plateau region. The topography of the district is l undulating and rugged.

Lohardaga district is drained by the tributaries of three major river of the state viz. North Koel, South Koel and Damodar. The plateau region in west of Lohardaga town is the major water divide for north and south Koel river. The plateau region of the district is highly dissected by down cutting of the tributaries of these rivers. Drainage of the district have been shown in figure-2. A brief description of the rivers of the district is given below:

(i) South Koel river: This river originates at Piska near Ranchi. It flows in westward direction, draining the northern part of the district. Near Nawatoli. It takes a turn and flows towards south till is leaves Lohardaga and enters into Gumla district.

(ii) Sankh river: This river is the major tributary of South Koel river which rises near Khamer pat at an altitude of 1064 m above msl. It flows southward till it joins the South Koel near Bhasko.

(iii) North Koel river : North Koel river originates from the western part of the plateau regions of the district. In the district it flows in NW direction by dissecting the plateau region.

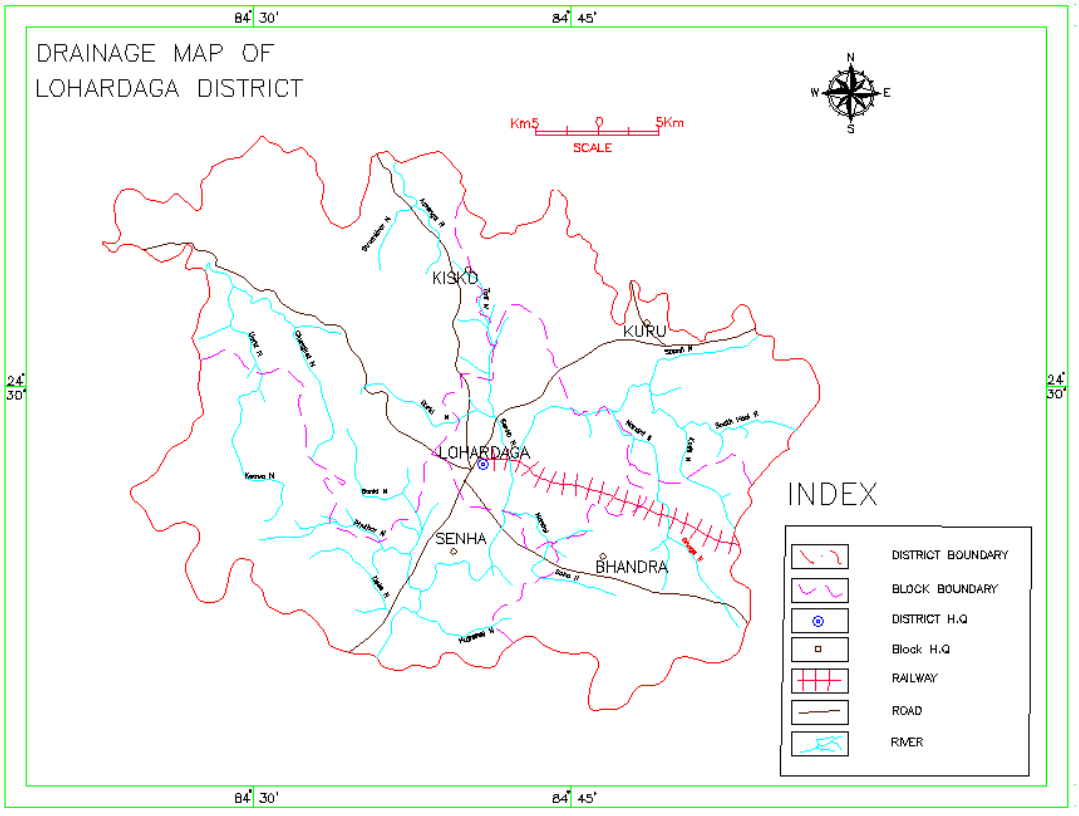


Fig 2: Drainage map of Lohardaga district

1.2 LAND USE

The total geographical area of Lohardaga district is 1491 sq. km. In Lohardaga district only 29% of the total area is the Net area under cultivation, while forest contributes 22% of total geographical area. About 6% of the area is barren and uncultivable land. Area under cultivation more than once is 9356 hectare, which is 6% of total geographical area.

Among the different blocks, Kisko block has got larger forest area (52%) while Bhandra block has the lowest forest area i.e. about 3% of total area. The forest cover is around 32-35% of the total area of the district.

As per net area under cultivation is concerned, the Bhandra block has got largest share, where it covers about 55% of the total area. Kisko block has the lowest agricultural activity, where 16.40% of total area comes under cultivation. The per capita agriculture land is around 0.28 Ha. Net irrigated area is 13.4% of net sown area (0.8% by canals, 7% by wells, 2% by tanks & 3.6% by lift irrigation & others).

The Lohardaga block shows highest area under cultivation more than once. The area under this particular class contributes 14% of total geographical area.

The average cropping intensity for the district is 120%. Highest cropping intensity is found in Lohardaga block i.e. 140% and lowest in Kisko block which is around 105%.

1.3 STUDIES / ACTIVITIES CARRIED OUT BY CGWB

CGWB has established network Hydrograph stations for monitoring of ground water regime behavior and quality of ground water in the district. The Board has also carried out of exploratory drilling to identify the potential fractures in the district and also to know the sub – surface geology, depth and thickness of water bearing formation with their yield and determine the different aquifer parameters. The exploratory wells have been constructed at Balumath, Chandwa, Latehar and Manika. Report on “Hydrogeological framework of Lohardaga District” was prepared during the year-1999.

2.0 CLIMATE & RAINFALL

2.1 CLIMATE

The district experience warm humid climate with three well defined seasons i.e. Summer, Winter and Monsoon. The winters commence from middle November and extend up to middle of March. December is the coldest month. During winter the temperature goes down to 4^0c. Summer starts from middle of March and continues up to middle of June, when the temperature shoots up 42^0c

2.2 RAINFALL

The monsoon sets in by the middle of June and continue till the middle of October. The annual normal rainfall in the district is 1137 mm. 83.5% of total rainfall occurs during the monsoon months only i.e. middle of June to middle of October. The district experiences maximum precipitation in July.(Table-2). The month wise normal rainfall of the Lohardaga district is as follows –

Table-2: Normal rainfall data of Lohardaga district

Sl. No.	Month	Normal Rainfall(in mm)
1	January	17.7
2	February	31.2
3	March	17.3
4	April	23.0
5	May	40.8
7	June	137.3
8	July	305.0
8	August	294.1
9	September	212.8
10	October	44.2
11	November	9.7
12	December	4.3

3.0 GEOMORPHOLOGY AND SOILS

3.1 GEOMORPHOLOGY

Lohardaga district is a part of the Chhotanagpur plateau which is situated in the western part of the plateau. The terrain is highly undulating in nature. The plateaus are covered with laterite having the average thickness of 50m. In some places the laterites are enriched with aluminium and contain huge amount of bauxite. The average elevation of the district vary between 610 to 640masl . The Lohardaga district is divisible into following two physiographic unit .

1. **Plateau region:-** The average height of such plateau is 1000 m above mean sea level. The plateaus are covered with laterite having the average thickness to the tune of 50 m.
2. **Peneplain area.:-** The average altitude of the peneplain area is around 600 mamsl. Residual hills of different altitudes dot the peneplain area.

3.2 SOILS

The farming situation in the district are mainly dependent on soil, topography and fertility of soil in the area. A varient of alfisols soil is a red sandy soil occurring mainly in plateau and hilly regions. These soils have poor fertility and needs more water for crop production. The different types of soil encountered in the district are alluvial soil, grey eroded scrap soil, red calcareous soil, laterite and forest soil.

4.0 GROUND WATER SCENARIO

4.1 HYDROGEOLOGY

The district is underlain by hard rock formations belonging to the Pre-Cambrian period and recent alluvium, confined to the valley part. The geology and the structure of the underlying basement control the occurrence and movement of ground water. No primary porosity is available in the hard rock formation and the ground water occurs in secondary porosity such as joints, fractures and the extent of interconnections within them, facilitates ground water movement.

Ground water occurs within the weathered residuum at favorable locations. The average thickness of the weathered residuum of the district varies from 15 to 20 meter. Besides, the patches of laterite deposits contain copious amount of ground water within its primary porosity in the western part of the district . The valley has been formed mainly by South Koel and its tributaries like Sankh. Ground water also occurs in the unconsolidated sediments deposited by these rivers. The hydrogeology of the area has been presented in figure- 3.

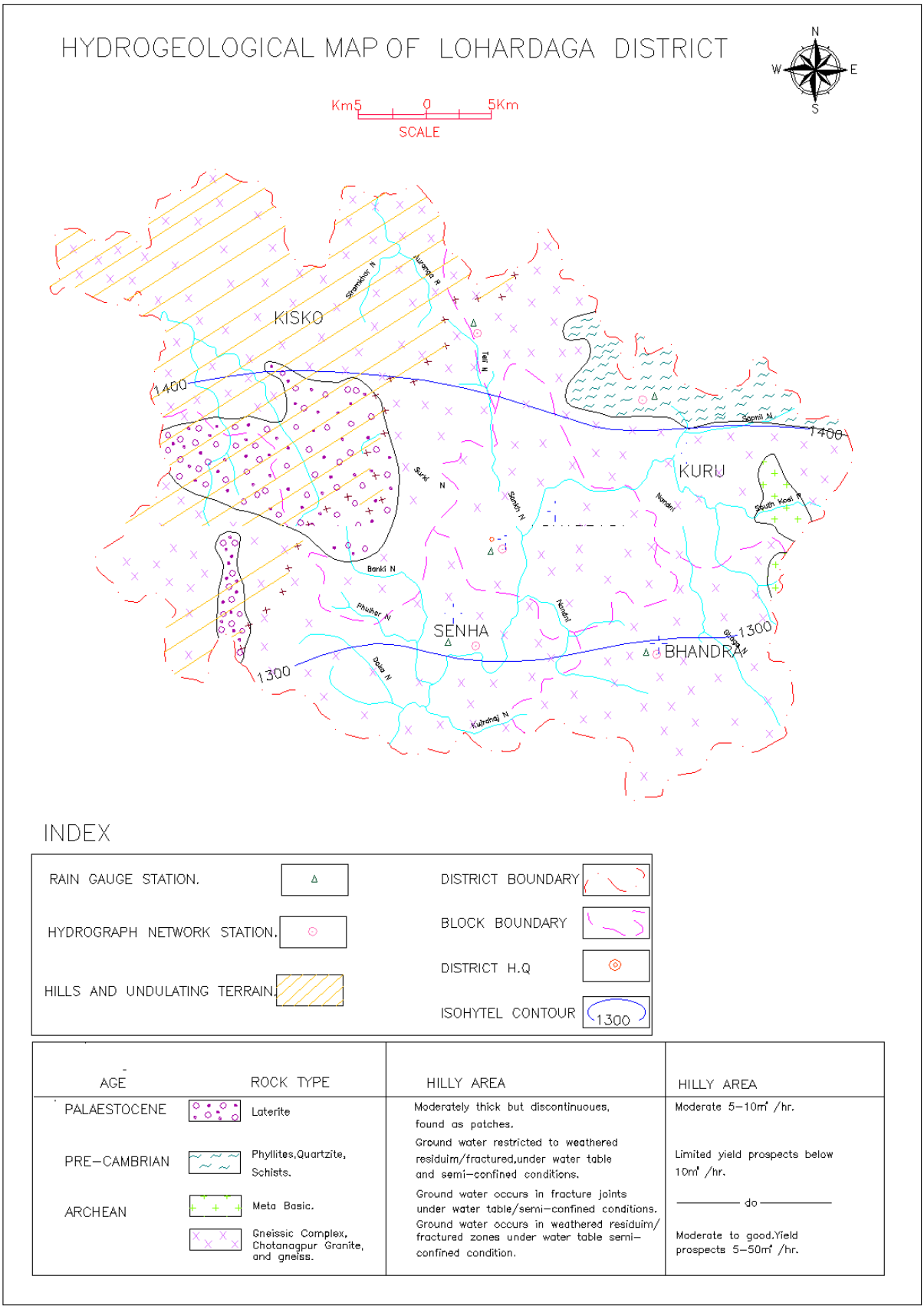


Fig 3: Hydrogeological map of Lohardaga district

4.2 EXPLORATORY WELLS

CGWB has drilled 11 exploratory bore holes and 2 observation bore holes Six exploratory bore wells were drilled by Departmental rigs while five by outsourcing rig. Drilling was done to a depth of about 200 m and 4 fractures have been encountered upto this depth. (Table No.-3).To know the aquifer/fracture potentiality in the area at different places drilling have been done. Drilling was done in Bhandara, Senha, Kuru and Lohardagga districts. Highest yield of bore wells were observed in Lohardagga district.Kujra exploratory well has highest discharge (28.8m^3/hr) while Badla exploratory well has discharge of (23.76 m^3/hr) Thickness of weathered formation in Kujra is 42.42 m while in Badla is 22.57 m. Exploratory wells in Lohardaga district is shown in figure 4.

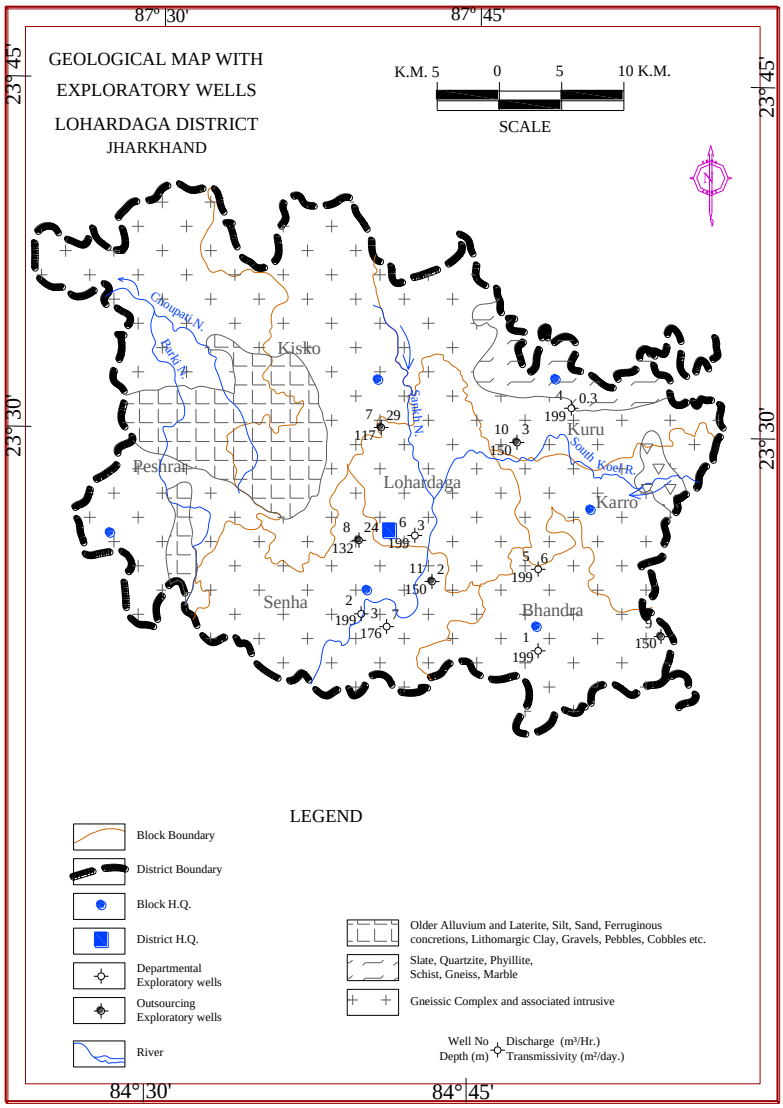


Fig 4: Exploratory wells in Lohardaga district

Table 3: DETAILS OF EXPLORATORY WELLS IN LOHARDAGA DISTRICT

Sl No	Location	Block	Co-ordinate	Depth Drilled	Length of Casing pipe	Granular Zone / fracture Tapped	Static Water level	Discharge	Drawdown	Dia. of assembly	Formation	Year
				mbgl.	m	m	m bgl.	m^3/hr	m	mm		
1	2	3	4	5	6	7	8	9	10	11	12	13
EXPLORATORY WELLS DRILLED BY DEPARTMENTAL RIGS												
1	**BHANDRA EW**	Bhandra	$23^0$21'45'' $84^0$46'45''	199	23.1				Dry		CGG	
2	**SENHA** EW -1	Senha	$23^0$23'00'' $84^0$39'30''	199.12	20.2				Dry		CGG	
3	**SENHA** EW -2	Senha	$23^0$23'05'' $84^0$39'30''	176.26	18.15			7.2			CGG	
4	**KURU EW OW**	Kuru	$23^0$25'25'' $84^0$48'45''	199.12 23.86	33.4			0.29			CGG	
5	**IRGAON EW OW**	Bhandra	$23^0$25'25'' $84^0$46'30''	199.12 27.46	19			6.45			CGG	
6	**AJAY UDAYAN EW**	Lohardagga	$23^0$25'30'' $84^0$41'00''	199.12	13			2.63			CGG	

EXPLORATORY WELLS DRILLED BY OUTSOURCED RIGS												
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
7	**KUJRA** EW	Lohardagga	23^0 30' 30" 84^0 40' 40"	116.85	42.42	33.88-39.50 45.11-50.64 74.97-80.56 92.80-98.56	4.6	28.8	7.1	203	CGG	02/2005
8	**BADLA** EW	Senha	23^0 25' 25" 84^0 39' 40"	132.39	22.57	25-28 85-88	5.6	24	6.1	203	CGG	02/2005
9	**CHATTI** **EW**	Bhandra	23^0 21' 30" 84^0 53' 50"	150	10.4		7.9			203	CGG CGG	02/2005
10	**LAWAGI** EW	Kuru	23^0 29' 40" 84^0 46' 55"	150	11.4	108.78-114.40	5.1	LOW		203	CGG CGG	02/2005
11	**SETHIO** EW	Senha	23^0 23' 40" 84^0 43' 05"	150	13.08	13.82-16.82 22.45-28.05 33.73-35.73	5.3	2.46	20.9	203	CGG	02/2005

CGG;Chhotanagpur granite gneiss

TABLE: 4 DEPTH TO WATER LEVEL OF NHS OF LOHARDAGA DISTRICT DURING THE YEAR OF 2012 – 2013

Sl No.	Location	May '2012(mbgl)	August '2012(mbgl)	November '2012(mbgl)	January '2013 (mbgl)
1	Lohardaga	7.24	2.60	3.60	6.12
2	Kuru	9.70	3.91	5.34	7.26
3	Hinjla	6.20	5.77	3.60	7.20
4	Bhandara	7.67	5.47	5.09	5.87
5	Kisko	13.37	--	--	--
6	Rudh	5.50	6.85	5.85	7.32
7	Senha	8.32	4.73	2.05	4.20

4. 3 DEPTH TO WATER LEVEL

Central Ground Water Board has established network of observation wells for monitoring of groundwater level to know the behavior of ground water regime in the district. There are seven monitoring stations which are monitored every year in January, May, August & November has been shown in figure-3.

During pre-monsoon season the minimum and maximum water level were observed as 5.50 mbgl at Rudh and 13.37 mbgl at Kisko respectively. The water level during the post-monsoon season of the district ranges from 2.60 to 6.85 mbgl. The pre-monsoon and post-monsoon depth to water level has been presented in figure-5 & 6, Table 4.

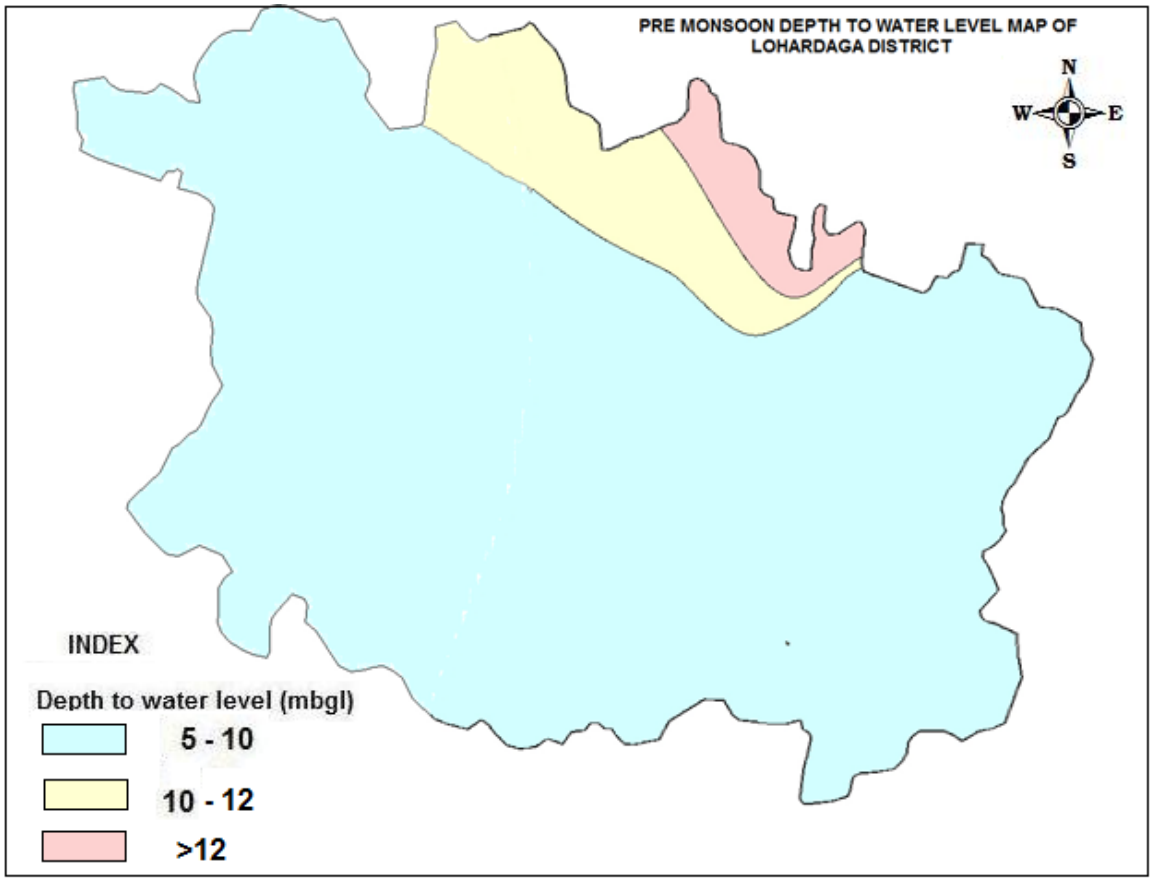


Fig 5: Depth to water level map (May-2012) of Lohardaga district

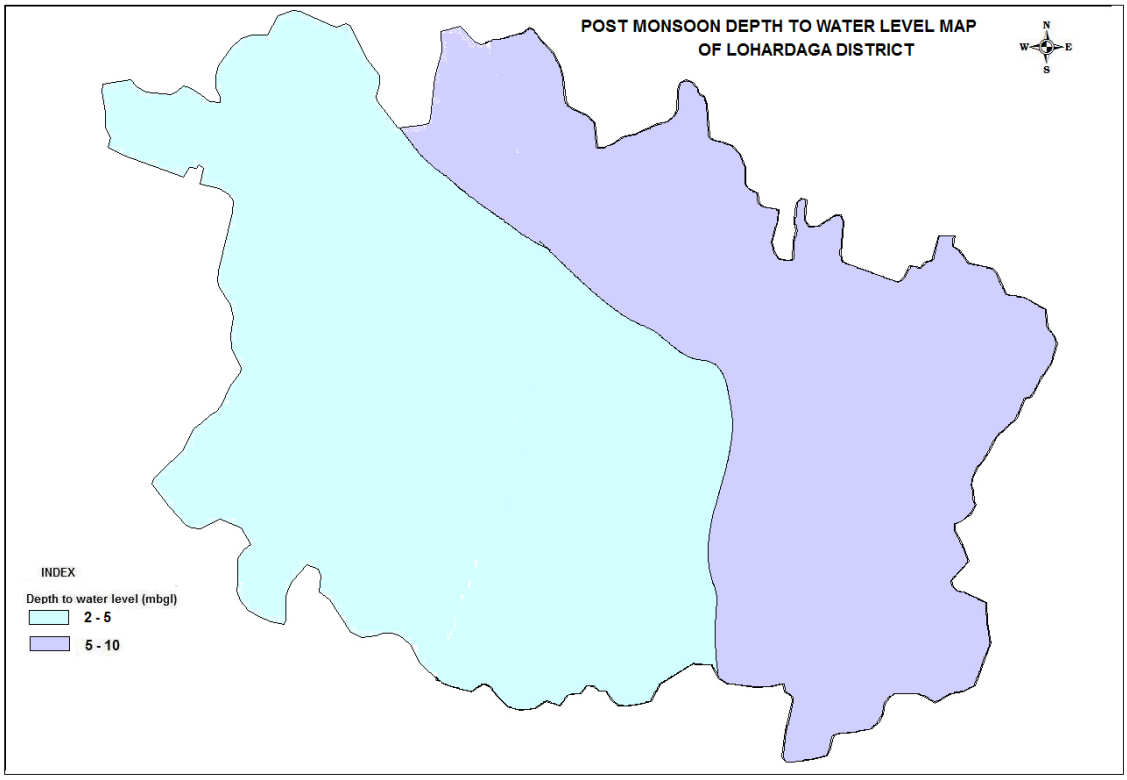


Fig 6: Depth to water level map (November-2012) of Lohardaga district

4.4 WATER LEVEL TREND

The rainfall is only source of recharge to ground water system in the district. The maximum observation wells show the falling trend of water level in the district.. The maximum and minimum fall of water level of the observation wells during pre-monsoon are 0.24 m/year (Hengila) and 0.003 m/yr (Senha) respectively. The maximum and minimum fall of water level of the observation wells during post-monsoon are 0.28 m/year (Kuru) and 0.03 m/yr (Bhandra) respectively. The maximum and minimum fall of water level of the observation wells for all seasons are 0.32 m/year (Hinjla) and 0.14 m/yr (Lohardaga) respectively. The rising and falling trend of water level has been tabulated in the Table 5.

TABLE: 5 RISE AND FALL IN OF WATER LEVEL OF NHS STATIONS OF LOHARDAGA DISTRICT DURING THE LAST DECADE(2003-2012).

Sl No.	Location	Rise (m/yr)	Fall (m/yr)	Rise (m/yr)	Fall (m/yr)	Rise (m/yr)	Fall (m/yr)
		Pre monsoon		Post monsoon		All seasons	
1	Lohardaga	0.002	-	-	0.167	-	0.138
2	Kuru	-	0.148	-	0.281	-	0.206
3	Hinjla	-	0.243	-	0.117	-	0.322
4	Bhandara			-	0.035	-	0.199
5	Rudh	-	0.073	-	0.255	-	0.162
6	Senha	-	0.003	0.034	-	0.036	-

4.5 GROUND WATER RESOURCES

The Ground Water Resource assessment has been carried based on the recommendations of Ground Water Estimation Committee report 1997 (GEC-1997). Block wise ground water resources, gross draft and stage of ground water development have been worked out for the year 2009 for five blocks and presented in **table -6.** The net ground water availability has been assessed to be 9375.93 ham and the existing ground water draft for all uses has been assessed as 3717.75 ham. The net ground availability for future irrigation has been assessed as 5421.14 ham.

The stage of ground water development in Lohardaga district is found to 1be very low. It ranges from 17.69% in Kisko block to 67 % in Lohardaga block with an average of 39.65%. Minimum ground water development is found in Kisko block located in the northern part of the district.

4.6 GROUND WATER QUALITY

To evaluate the quality of ground water , 6 Nos. of water samples have been collected from the district and analyzed in Chemical Laboratory CGWB, MER, Patna. The analyzed results are given in the table-7 The constituents are under permissible limit as per the Indian Standard of Drinking Water (BIS- 10500-91). and hence the ground water is suitable for irrigation as well domestic purpose. The ph value of ground water indicates its

Table-6: ASSESSMENT OF DYNAMIC GROUND WATER RESOURCES OF LOHARDAGA DISTRICT, (2009) (in ham)

Sl. No	Assessment Unit/District	Net Annual Ground water Availability	Existing Gross Ground Water Draft for Irrigation	Existing Gross Ground water Draft for Domestic and Industrial Water Suply	Existing Gross Ground Water Draft For all Uses (10+11)	Allocation for Domestic and Industrial Requirement suply upto next 25 years	Net Ground Water Availability for future irrigation development	Stage of Ground Water Development (%)
DISTRICT: LOHARDAGA								
1	Bhandara	1657.80	745.65	87.45	833.10	131.96	780.19	50.25
2	Kisko	2593.54	354.96	90.97	445.93	137.28	2101.30	17.19
3	Kuru	1848.52	695.77	132.13	827.90	199.39	953.35	44.79
4	Lohardaga	1210.04	683.94	126.83	810.77	191.39	334.72	67.00
5	Senha	2066.04	662.59	137.46	800.05	151.87	1251.58	38.72
	TOTAL	9375.93	3142.90	574.85	3717.75	811.89	5421.14	39.65

TABLE 7: CHEMCAL ANALYSIS RESULTS OF WATER SAMPLES FROM NHS OF LOHARDAGA DISTRICT

Sl.No	District	Location	E.C. micro Siemens/cm at 25^{o} C	pH	CO_3 mg/l	HCO_3 mg/l	Cl mg/l	Ca mg/l	Mg mg/l	TH as $CaCO_3$ mg/l	Na mg/l	K mg/l
1.	LOHARDAGA	Lohardaga	1260	8.79	48	390	160	96	53	460	79	10
2.		Kuru	1098	8.43	12	299	131	64	57	395	43	13
3.		Hinjila	365	8.28	0	177	14	24	7.3	90	38	5.1
4.		Bhandara	116	8.47	18	24	7.1	10	2.4	35	10	1.2
5.		Rudh	207	8.27	ND	48	35	20	2.4	60	17	5.1
6.		Senha bdo	498	8.81	36	134	57	58	9.7	185	25	4.5

alkaline nature. The EC value ranges from 116 to 1260 micro Siemens/cm at 25^0c. The total hardness as $CaCo_3$ varies from 35 to 460 mg/l.

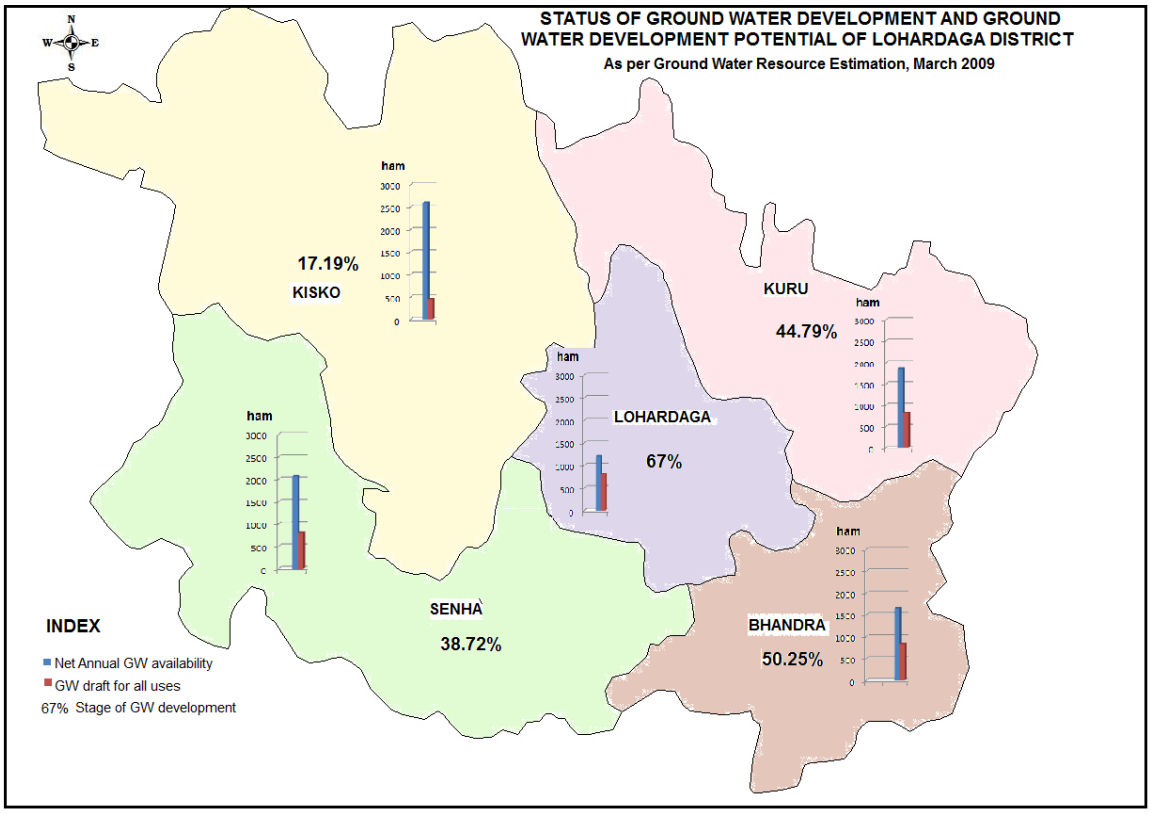


Fig 7: Stage of Ground Water development of Lohardaga district

5.0 GROUND WATER MANAGEMENT STRATEGY

5.1 STATUS OF GROUND WATER DEVELOPMENT

Although ground water development in Lohardaga district is on low scale but almost the entire rural water supply is dependent on ground water. Besides, the role of ground water for irrigation is also increasing day by day. As evident from the stage of ground water development, which ranges from 17.19 % to 67% (Block wise) for the district, there is vast scope for further development of this precious natural resource. The ground water is mainly confined within weathered residuum and in narrow valley fills along the rivers. Besides, CGWB exploration reveals , considerable amount of ground water occurs within the secondary porosity at deeper fracture zones. The joints and fractures are not uniformly distributed, thus locating them is the main requisite for deeper ground water

development. Identification of lineaments from satellite Imageries and subsequent confirmation through resistivity survey can help to a greater extent for ground water development from deeper water bearing zones. The eastern part of the district are not feasible for high yield production well.

Construction of dug cum bore well is also suitable for enhancing the yield of dug wells, which will be cost effective. The ground water development varies in different places depending on the availability of favorable potential zones / aquifer. For the construction of ground water structures, knowledge of the local as well as regional hydrogeological condition of the area is necessary.

5.2 WATER CONSERVATION & ARTIFICIAL RECHARGE

In view of the increasing thrust on development of ground water resources, there is urgent need to augment the depleting ground water resources. It can be augmented through natural recharge as well as artificial recharge. Water conservation is the activity of direct collection of rain water .The conservation of rain water is optimum utilization of the ground water resources. In hydrogeological point of view, rain water conservation is needed for augmenting in ground water and to improve ground water quality. Very high percentage of surface runoff goes to river .There should be a plan to arrest the decline of ground water and ensure sustainable and economic utilization of ground water resources in the district. In the area, undulating topographic setting with hills, rainwater harvesting structures like check dam, gabion structures, percolation tank, contour bunding and trenching may be constructed.

6.0 GROUND WATER RELATED ISSUES AND PROBLEMS

During summer season, the dug wells are dried up. Decline in water level is observed in the district. Nitrate problem has been observed in Lohardaga area.

7.0 AWARENESS AND TRAINING ACTIVITY

7.1 Awareness of Training Activity

No mass awareness programme or water management training programme has been organized in the district till date.

7.2 Participation in Exhibition, Mela, Fair etc.

Nil

7.3 Presentation & Lectures delivered in public forum/Radio/TV/Institute of repute/Grassroots association/NGO/ Academic institutions etc.

Nil

8.0 Areas Notified by CGWB/SGWA

From the ground water point of view, all blocks of the district fall under safe category. So no blocks have been notified by the Authority.

9.0 RECOMMENDATION

1. As the district is predominantly inhabited by small an marginal farmers, dug well and shallow bore well should be given importance for ground water development. They require less capital investment and maintenance cost. Loans and subsidies should be provided to the small and marginal farmers for construction of ground water structure.
2. In the adjoining district under similar geological condition deeper fracture and other secondary porosity have proven their water yielding and storage capacity. More exploratory drilling may be taken up to ascertain deeper ground water potentialities of the district.
3. In the North-western part of the district, roof top rain water harvesting may be adopted to substantiate the existing water supply.
4. In certain patches, the dug wells go dry during the summer. In such places the wells should be deepen so that it taps the entire saturated thickness of weathered residuum.
5. Lineaments should be carefully demarcated and pin pointed by geophysical investigations for construction of bore wells.
6. The springs should be developed and used for local water supply.
7. Rain water harvesting and artificial recharge to ground water schemes may be adopted in Lohardaga and other block headquarters The artificial recharge structure like percolation tank, gully plugging

,subsurface dyke can be constructed to maintain the ground water sustainability.