केंद्रीय भूमि जल बोर्ड

जल संसाधन, नदी विकास और गंगा संरक्षण

विभाग, जल शक्ति मंत्रालय

भारत सरकार

Central Ground Water Board

Department of Water Resources, River Development and Ganga Rejuvenation,

Ministry of Jal Shakti

Government of India

AQUIFER MAPPING AND MANAGEMENT OF GROUND WATER RESOURCES

JASHPUR DISTRICT, CHHATTISGARH

उत्तर मध्य छत्तीसगढ़ क्षेत्र, रायपुर

North Central Chhattisgarh Region, Raipur

2020

भारत सरकार

Government of India

जल शक्ति मंत्रालय, जल संसाधन, नदी विकास एवं गंगा संरक्षण बिभाग

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Central Ground Water Board

जशपुर जिला, छत्तीसगढ़ के जलभृत नक्शे एवं भूजल प्रबंधन योजना

Aquifer Maps and Ground Water Management Plan of Jashpur District, Chhattisgarh

केन्द्रीय भूमि जल बोर्ड

उत्तर मध्य छत्तीसगढ़ क्षेत्र

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रायपुर

FOREWORD

Groundwater resources are being developed over years in order to meet domestic, irrigation and industrial requirements. The spatial distribution of availability of ground water resources however, is uneven and is being indiscriminately exploited by various users thereby creating relentless pressure. On the other hand, rapid urbanization, industrialization and land use changes has resulted decline of water levels in many parts of the country.

There is an urgent need for scientific approach for proper management of the available ground water resources for sustainability of this precious natural resource for present and future generation.

Central Ground Water Board has been in the forefront of activities for occurrence, development, and management of this resource through various scientific studies and techniques. Over the last four decades CGWB, NCCR, Raipur has gathered a huge amount of data regarding ground water resources of Chhattisgarh. Based on this experience aquifer mapping of Jashpur district was prepared with the vast amount of data generated and available with North Central Chhattisgarh Region. The report embodies all the features of ground water and related aspects of the study area including physiography, meteorological conditions, hydrology, drainage, geomorphology, geology, hydrogeology, ground water resources, hydrochemistry, geophysics, ground water problems etc.

The report titled "A REPORT ON AQUIFER MAPS AND GROUNDWATER MANAGEMENT PLAN OF JASPUR DISTRICT, CHHATTISGARH" is prepared by Sh Sidhanta Kumar Sahu, Scientist-B under supervision of Sh. A.K.Patre, Scientist-D. I appreciate the concerted efforts put by the author to make it possible to bring the report in its present shape. I hope this report will no doubt be useful and worthy for the benefit of Jashpur district and would be a useful document for academicians, administrators, planners and all the stakeholders in ground water.

Though utmost care has been taken to minimize the errors, some errors may have inadvertently crept in. It is expected that these mistakes will be taken in the proper spirit.

Sh A. K. Biswal
(REGIONAL DIRECTOR (I/C))

Executive summary

Aquifer mapping is a multidisciplinary scientific process wherein a combination of geological, hydrogeological, geophysical, hydrological and quality data is integrated to characterize the quantity, quality and movement of ground water in aquifers. However, due to paradigm shift in focus from development to management of ground water in last one decade, the need for more reliable and comprehensive aquifer maps on larger scale has been felt for equitable and sustainable management of the ground water resources at local scale. Volumetric assessment of ground water and strategies for future development and management are the primary objectives of aquifer mapping.

Under the aquifer mapping Programme, all the development blocks of Jashpur District namely Jashpur, Pathalgaon, Kansabel, Kunkuri, Duldula, Pharsabahar, Bagicha and Manora. were taken up covering an area of 6710 sq. km. It falls in the Survey of India's Degree Sheet No. 64 M (12 & 16), N (6, 9, 10, 11, 13, 14 & 15) and 73 A 4, B (1, 2 & 3) between the Latitude 22° 17'- 23° 15'N and Longitude 83°30' to 84°24'E. Jashpur district is bordered by Surguja and Raigarh Districts of Chhattisgarh on NWW and Southern part. On the northeastern and south-eastern part has common boundaries with Jharkhand and Orissa respectively. The nearest airport to the District is at Ranchi (Jharkhand), about 150 kms away. All-important places within the district are well connected by a network of the state highways and all-other roads.

The total population of the study area as per 2011 Census is 8,40,352 out of which rural population is 7,03,650 & the urban population is only 1,36,702.

The study area experiences sub-tropical climate. The average annual rainfall for the study area is around 1487 mm (Average of the last five years i.e. 2013 to 2017)

Geomorphologically the study area displays Structural Plains, Pediment/Pediplain, Denudational Hills and Valleys with an elevation ranging from 440 to 1116 msl.

The net sown area is 245292 hectares, while double-cropped area is 11759 hectares. Rice is sown in nearly 75% of the net sown area.

The net irrigated area in the study area is 9156 hectares where ground water contribution is 2143 Ha only. Percentage of Area Irrigated by ground water with respect to net irrigated area is 23%. About 90% area with respect to net sown area is dependent on rain only.

Based on the exploratory drilling data generated for the blocks, the existing aquifer systems in the area may be divided into phreatic and semiconfined aquifer. The major aquifers present in the study area are (1) Chotanagpur Granite Geneiss, Discharge varies from negligible to 7.8 lps in fractured granite and 10 to 100 m3/day in weathered granite, having Av. Drawdown of 33 m in fractured granite 25 m in weathered granite and higher yields are obtained where thick weathered zones are associated with bedrock fracturing.

As per 2017 ground water resource calculation stage of ground water development in the study area is only 39.09 %. So, there is scope of utilizing more ground water for future irrigation purpose and other purposes. Additional number of Ground water abstraction structure may be developed for the effective utilization of ground water resources.

The existing demand for irrigation in the area is 11849.74Ham while the same for domestic use is 2055.01 Ham and for industrial field is 40.22 Ham. To meet the future demand for ground water, a total quantity of21530.83ham of ground water is available for future use.

The major ground water issues identified during the survey in the study area are as follows: (i) Drying of Dugwells and handpumps during summer. (ii) Inherent hydrogeological character of aquifer. (iii) Fluoride concentration. (iv) Iron contamination. (v) Nitrate contamination.

In study area because of complex hydrogeological conditions ground availability is scattered. In area where ground water availability is limited surface water may be conserved and utilized. High value of Fluoride and Iron has been reported from several locations. In granitic aquifer system at many places ground water is contaminated with Fluoride because of geogenic reasons. The problem of fluoride contamination in drinking water may be tackled by setting up of small defluorination units in affected villages or alternate source may be identified. Similarly, Iron filter may be used for the villages having high Iron concentration. Regular ground water quality monitoring is also required.

So far as Management strategies are concerned for ground water availability, for effective utilization of Ground water existing draft for irrigation may be coupled with micro irrigation system. Change in irrigation pattern, optimum use of available resource, use of ground water potential created after artificial recharge can lead to groundwater savings and increase in gross cropped area of the district.

Acknowledgement

The author is grateful to Shri G C Pati, Chairman, Central Ground Water Board for giving opportunity for preparation of Aquifer Map and Management Plan of, Jashpur district of Chhattisgarh state. I express my sincere gratitude to Shri. Utpal Gogoi Member (Scientist), CGWB for giving valuable guidance, encouragement and suggestions during the preparation of this report. The author is thankful to Shri A. K. Biswal, Head of the Office, Central Ground Water Board, NCCR, Raipur extending valuable guidance and constant encouragement during the preparation of this report. I am extremely grateful to Sh. A. K. Patre, Scientist-D & OIC NAQUIM, for his continuous guidance and support during preparation of this report. The author is also thankful to Sh Uddeshya Kumar Sc-B and Sh G Sreenath, Sc-B for carrying out ground water exploration in Jaspur district. The author is also thankful to Sh Sujit Sarkar, Sc-B and Sh N Rao Elisela, AGP for the geophysical studies. The author is also thankful to Sh R Dewangan, Sc-B, Smt Kiran Singh Sc-B and Smt Anita Bind, STA for the chemical analysis. The efforts made by Sh. T.S. Chouhan, Draftsman, for digitization of maps are thankfully acknowledged. The author is also thankful to the state agencies for providing the various needful data. The author is thankful to Technical Section, Data Centre, Chemical Section, Report Processing Section and Library of CGWB, NCCR, Raipur for providing the various needful data.

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AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, JASHPUR DISTRICT, CHHATTISGARH

(08 BLOCKS- JASHPUR, PATHALGAON, KANSABEL, KUNKURI, DULDULA, PHARSABAHAR, BAGICHA & MANORA)

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ABBREVIATIONS

a msl	above mean sea level
BDR	Basic Data Report
BW	Borewell
CGWB	Central Ground Water Board
Dia	Diameter
DTW	Depth to Waterlevel
DW	Dugwell
EC	Electrical Conductivity
EW	Exploratory Wells
GS	Gabion structures
GW/ gw	Ground Water
ham	Hectare meter
HP	Handpump (Shallow)
lpcd	litres per capita per day
lpm	litres per minute
lps	liters per second
m	meter
m bgl	meter below ground level
m2/day	Square meter/ day
m3/day	cubic meter/day
MCM/mcm	Million Cubic Meter
NCCR	North Central Chhattisgarh Region
NHNS/ NHS	National Hydrograph Network Stations
OW	Observation Well
PZ	Piezometre
STP	Sewage Treatment Plan
T	Transmissivity
TW	Tubewell

1. INTRODUCTION

1.1 Objective

The groundwater is the most valuable resource for the country. However, due to rapid and uneven development, this resource has come under stress in several parts of the country. Central Ground Water Board (CGWB) is, therefore, involved in hydrogeological investigations for Re-appraisal of ground water regime. CGWB has also carried out ground water exploration in different phases with prime objective of demarcating and identifying the potential aquifers in different terrains for evaluating the aquifer parameters and also for developing them in future. The reports and maps generated from the studies are mostly based on administrative units such as districts and blocks and depict the subsurface disposition of aquifer on regional scale. However, due to paradigm shift in focus from development to management of ground water in last one decade, the need for more reliable and comprehensive aquifer maps on larger scale has been felt for equitable and sustainable management of the ground water resources at local scale.

1.2 Scope of study

The demand for ground water for various types of use is increasing day by day; consequently, indiscriminate development of ground water has taken place and the ground water resource has come under stress in several parts of the country. On the other hand, there are also areas where adequate development of ground water resources has not taken place. These facts underscore the need for micro- level study of the aquifer systems of the country. The water resource managers and planners to develop and implement effective long term as well as short term aquifer management strategies, a host of scientific questions must be answered. These questions can be best answered through a comprehensive process that integrates the available scientific data. Aquifer mapping study thus is a multidisciplinary scientific process wherein a combination of geological, hydrogeological, geophysical, hydrological and quality data is integrated to characterize the quantity, quality and movement of ground water in aquifers. It primarily depends on the existing data that are assembled, analyzed and interpreted from available sources. The data gap analysis carried out helped to generate data from data newly collected through activities such as exploratory drilling, groundwater level monitoring on a regular basis for a considerable period and groundwater quality analysis. These existing as well as generated data were analyzed in ordered to prepare regional hydrogeological, thematic, water quality maps, cross-sections, 2–D and 3-D aquifer disposition maps. The aquifer maps are the maps depicting aquifer disposition, giving lateral

and vertical extension. The maps will also provide information on the quantity and quality. It explains the components of the Aquifer Classification System, outlines the assumptions underlying the map information presented and summarizes the content of an aquifer classification map. The goal is to help the map users understand the strengths and limitations of the information contained on the aquifer classification maps so that they can apply that information appropriately to their particular water and land management needs. The system and maps are designed to be used together and in conjunction with other available information as a screening tool for setting groundwater management priorities. These provide a way of comparing aquifers within a consistent hydrogeological context and prioritizing future actions at various planning levels. The maps may provide some background information for site-specific projects. However, the maps are not to be used for making site-specific decisions. The classification of an aquifer reflects the aquifer as a whole and at a specific time. Groundwater conditions, such as the degree of vulnerability and water quality, may vary locally and over time respectively. This variability in the data sometimes requires subjective decision-making and generalizing of information for an entire aquifer.

1.3 Approach and Methodology

The activities under the aquifer project can be summarized as follows:

i) Data Compilation & Data Gap Analysis: One of the important aspects of the aquifer mapping Programme was the synthesis of the large volume of data already collected during specific studies carried out by the Central Ground Water Board and various other government organizations with a new set of data generated that broadly describe an aquifer system. The data were compiled, analyzed, synthesized and interpreted from available sources. These sources were predominantly non-computerized data that were converted into computer-based GIS data sets. On the basis of these available data, Data Gaps were identified.

ii) Data Generation: It was evident from the data gap that additional data should be generated to fill the data gaps in order to achieve the objective of the aquifer mapping Programme. This was done by multiple activities like exploratory drilling, hydro chemical analysis, use of geophysical techniques as well as detail hydrogeological surveys.

ii) Aquifer map Preparation: On the basis of integration of data generated through various hydrogeological and geophysical studies, aquifers have been delineated and characterized in terms of quality and potential. Various maps have been prepared bringing out the Characterization of Aquifers. These maps may be termed as Aquifer Maps depicting spatial

(lateral and vertical) variation of the aquifers existing within the study area, quality, water level and vulnerability (quality and quantity).

iv) Aquifer Management Plan: Based on the integration of these generated, compiled, analysed and interpreted data, the management plan has been prepared for sustainable development of the aquifer existing in the area.

1.4 Area Details

Under the aquifer mapping Programme, an area comprising of 8 no of development blocks of Jashpur district was taken up covering an area of 6710 sq. km. Jashpur district is situated in the north-eastern corner of Chhattisgarh (Fig.1). On NWW and Southern part it is bordered by Surguja and Raigarh Districts of Chhattisgarh. On the northeastern and south-eastern part has common boundaries with Jharkhand and Orissa respectively. It falls in the Survey of India's Degree Sheet No. 64 M (12 & 16), N (6, 9, 10, 11, 13, 14 & 15) and 73 A 4, B (1, 2 & 3) between the Latitude 22° 17'- 23° 15'N and Longitude 83° 30' to 84° 24'. The nearest airport to the District is at Ranchi (Jharkhand), about 150 kms away. All-important places within the district are well connected by a network of the state highways and all-other roads.

1.4.1 Administrative Division

District includes 08 blocks and It is further divided in 414 gram panchayats and 764 villages. The name of the 8 blocks are given below.

1. Jashpur Block
2. Pathalgaon Block
3. Kansabel Block
4. Kunkuri Block
5. Duldula Block
6. Pharsabahar Block
7. Bagicha Block
8. Manora Block

The administrative map for the study area is given in Figure 1.

Administrative Map

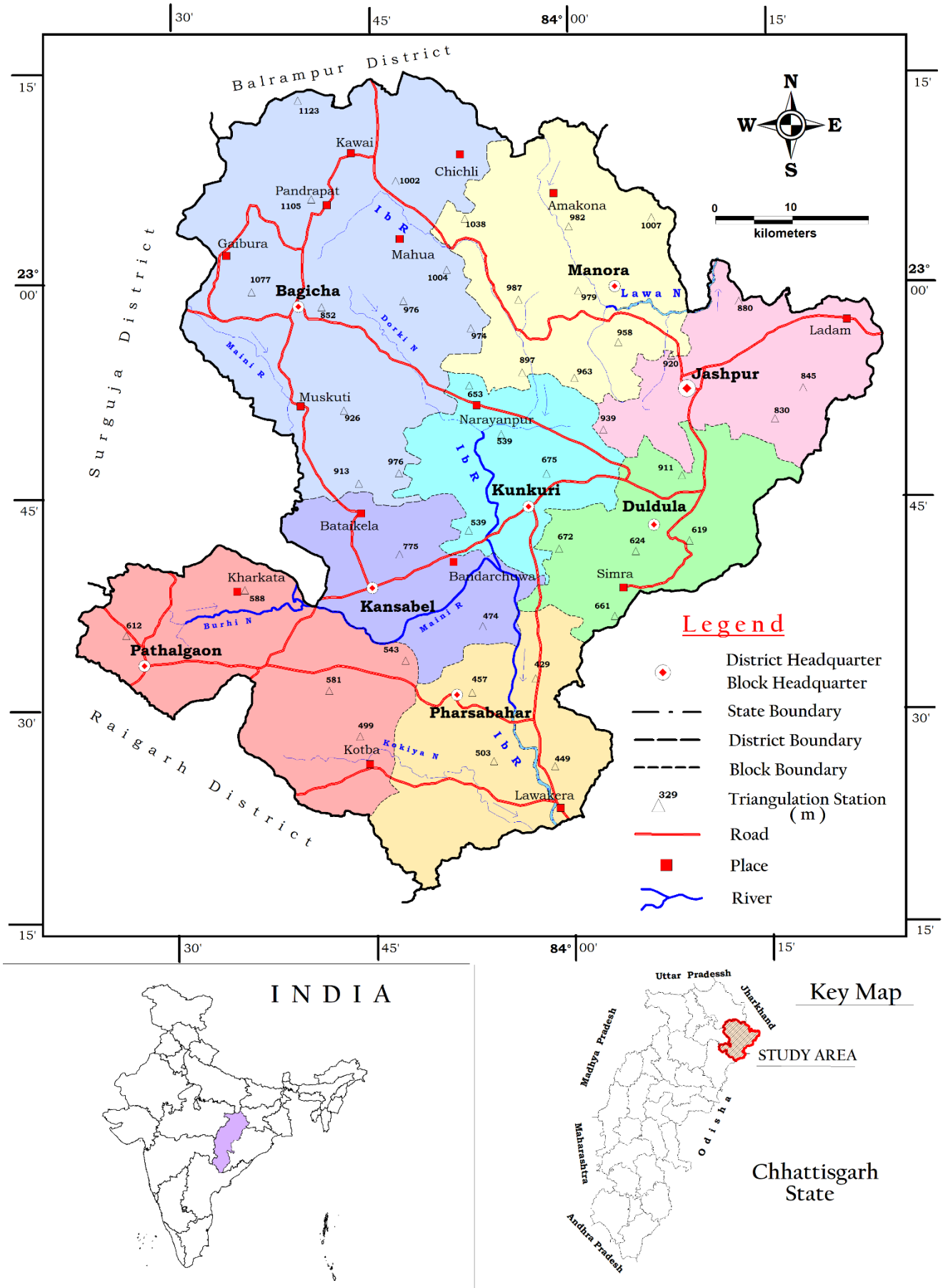


Figure 1 Administrative Map of Jashpur District

1.5 Data Availability, Data Adequacy and Data gap Analysis

Table 1 Data Integration

Districts	Blocks	Existing				Data Generation			
		EW	Chem	VES	WL	EW	Chem	VES	WL
Jashpur	Bagicha	6	12	0	12	0	13	02	20
	Duldula	5	3	04	3	0	12	05	17
	Jashpur	2	8	03	8	0	03	03	05
	Kansabel	9	17	05	17	0	08	03	14
	Kunkuri	14	11	03	11	0	07	06	13
	Manora	1	1	0	1	0	05	0	06
	Pathalgaon	13	10	04	10	04	05	03	08
	Pharsabahar	6	8	0	8	01	04	04	04
TOTAL		**56**	**70**	**19**	**70**	**05**	**57**	**26**	**87**

1.6 Rainfall

The study area receives rainfall mainly from south-west monsoon. It sets in third/fourth week of June and continues till mid-August/September with heaviest showers in the months of July and August and nearly 95% of the annual rainfall is received during this period. The average annual rainfall for the study area is around 1487 mm (Average of the last five years i.e. 2013 to 2018) which is presented below in Figure 2. *Source: IMD. Raipur*

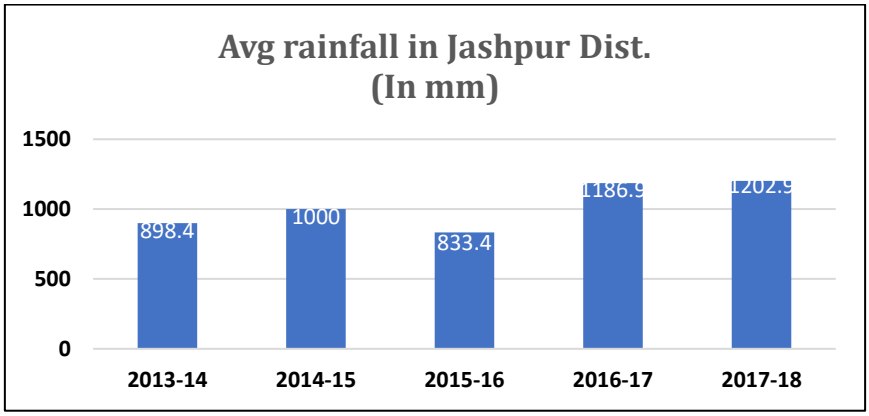


Figure 2 Avg. Rainfall in Jashpur District

1.7 Physiography/Geomorphology

Geomorphologically the study area displays;

- Pediment/Pediplain
- Denudational hills & Valleys on Proterozoic rocks
- High level plateaus with lateritic cover
- Denudational plateau on magmatic and metamorphic rock

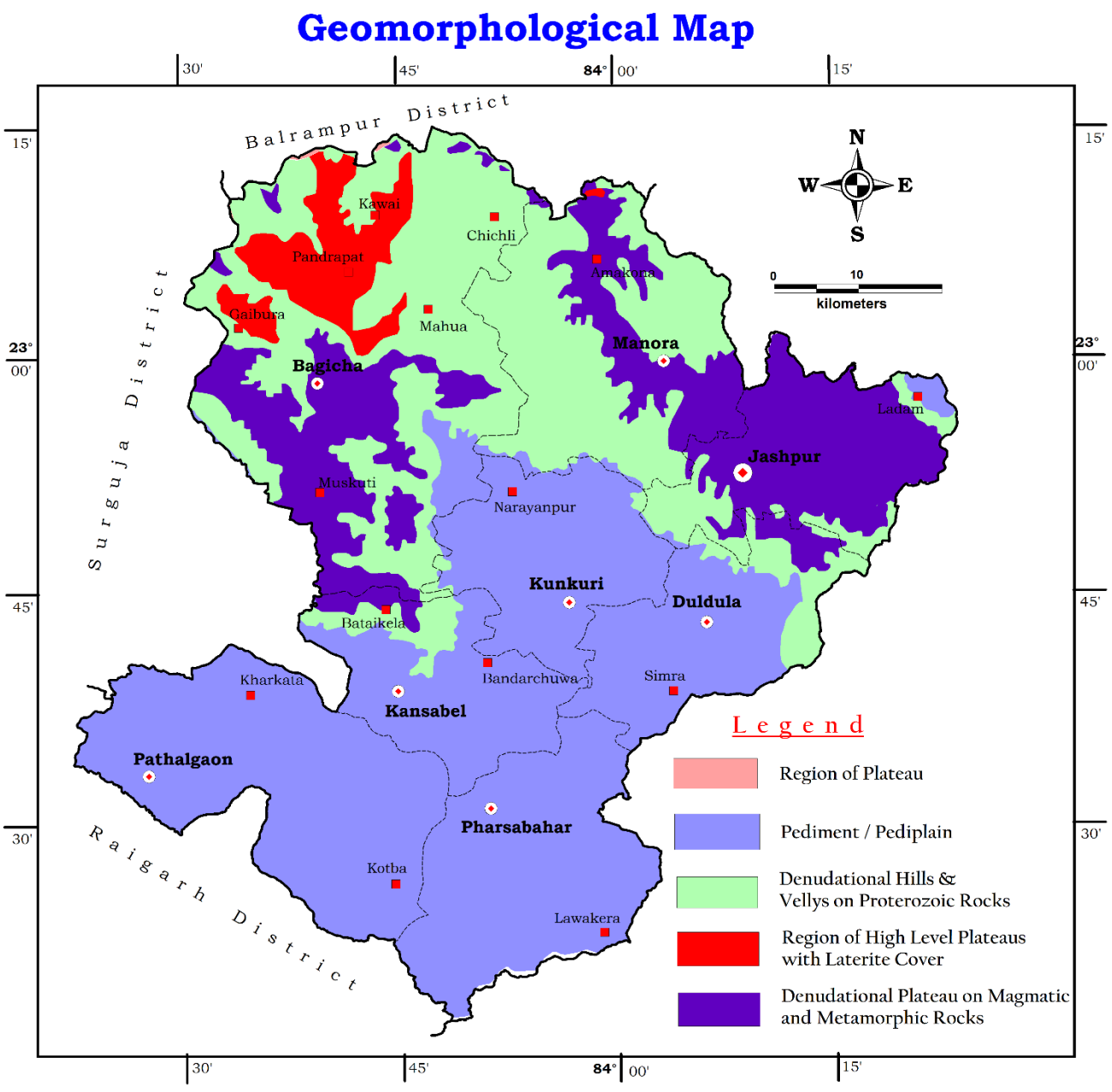


Figure 3 Geomorphology Map of the Study area

All these Geomorphologic structures comes under the physiographic unit belonging to Chotanagpur Granite gneiss area. The North-eastern & Western part of the district is covered by Denudational plateau on magmatic and metamorphic rock. This unit has extensive cris-

crossed fractures and joints. They are having gently sloping erosional surfaces and thin to moderate cover of soil. Along with the above-mentioned geomorphic unit, Pediment/Pediplain is also developed in the district especially in central and Southern part of the study area. The Northern part is covered by Denudational hills & Valleys on Proterozoic rocks and high-level plateaus with lateritic cover. Figure 3 shows the Geomorphology in the study area.

1.8 Land use

There is 56381 ha revenue forest, protected forest and other forest in the district. Area not available for cultivation is 78182 ha. Details are presented in Table no.2. Figure 4 shows the Landuse pattern in the study area.

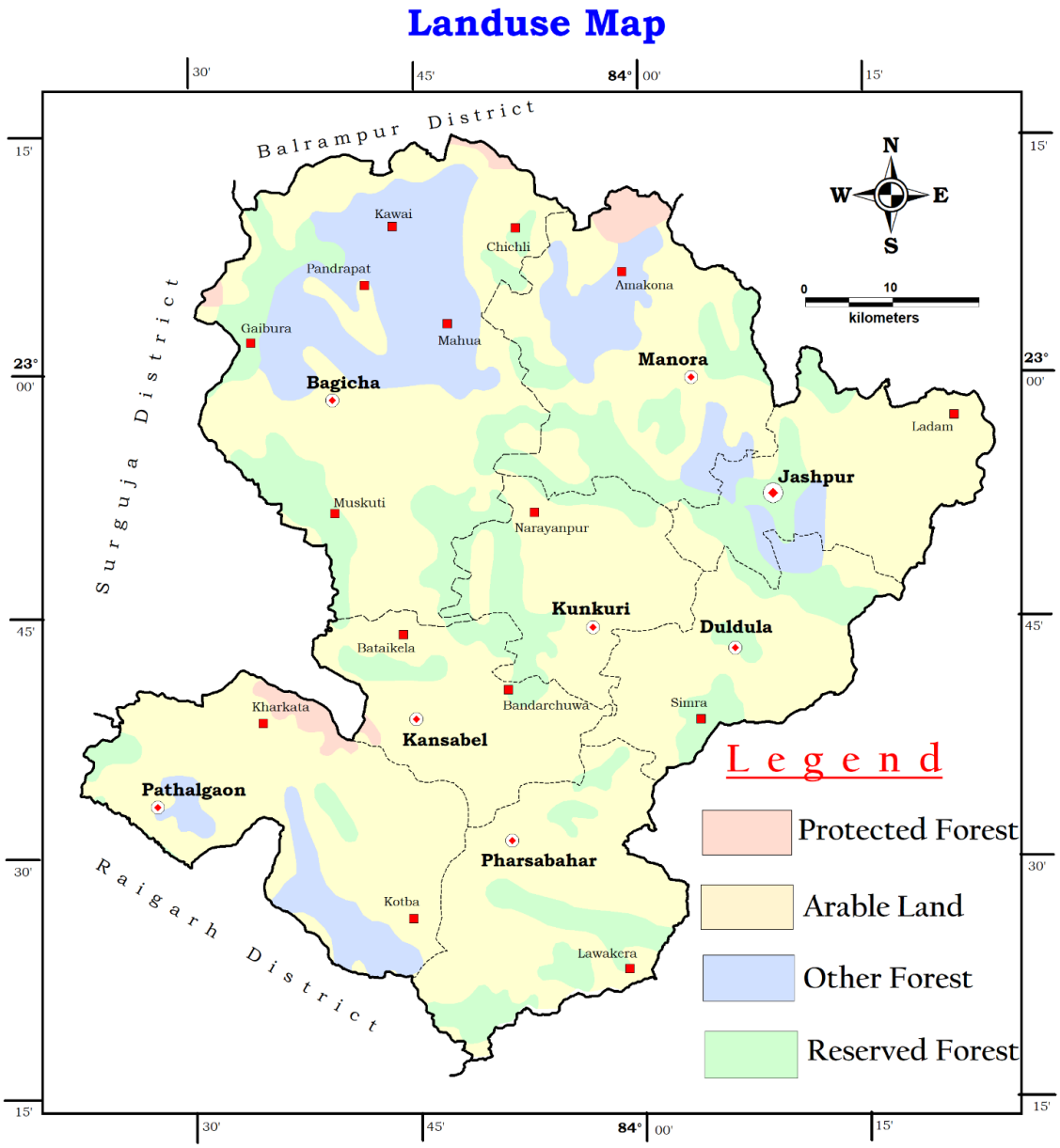


Figure 4 Landuse map of the study area

Table 2 Land use pattern 2017-18 (in ha)

District	Total Geographical Area (In ha)	Revenue forest area (In ha)	Area not available for cultivation (In ha)	Non-agricultural & Fallow land (In ha)	Agricultural Fallow land (In ha)	Net sown area (In ha)	Double cropped area (In ha)	Gross cropped area (In ha)
Jashpur	472163	56381	78182	41715	9270	245292	11759	257051

1.9 Soil

The soils in the district are having wide variations. In all two types of soils are abundant in the study area and are mostly insitu in nature. They are red sandy Alfisols and the medium black Inceptisols i.e. covers the northeren part of the study area. Figure 5 represents the different kind of soil that present in the study area.

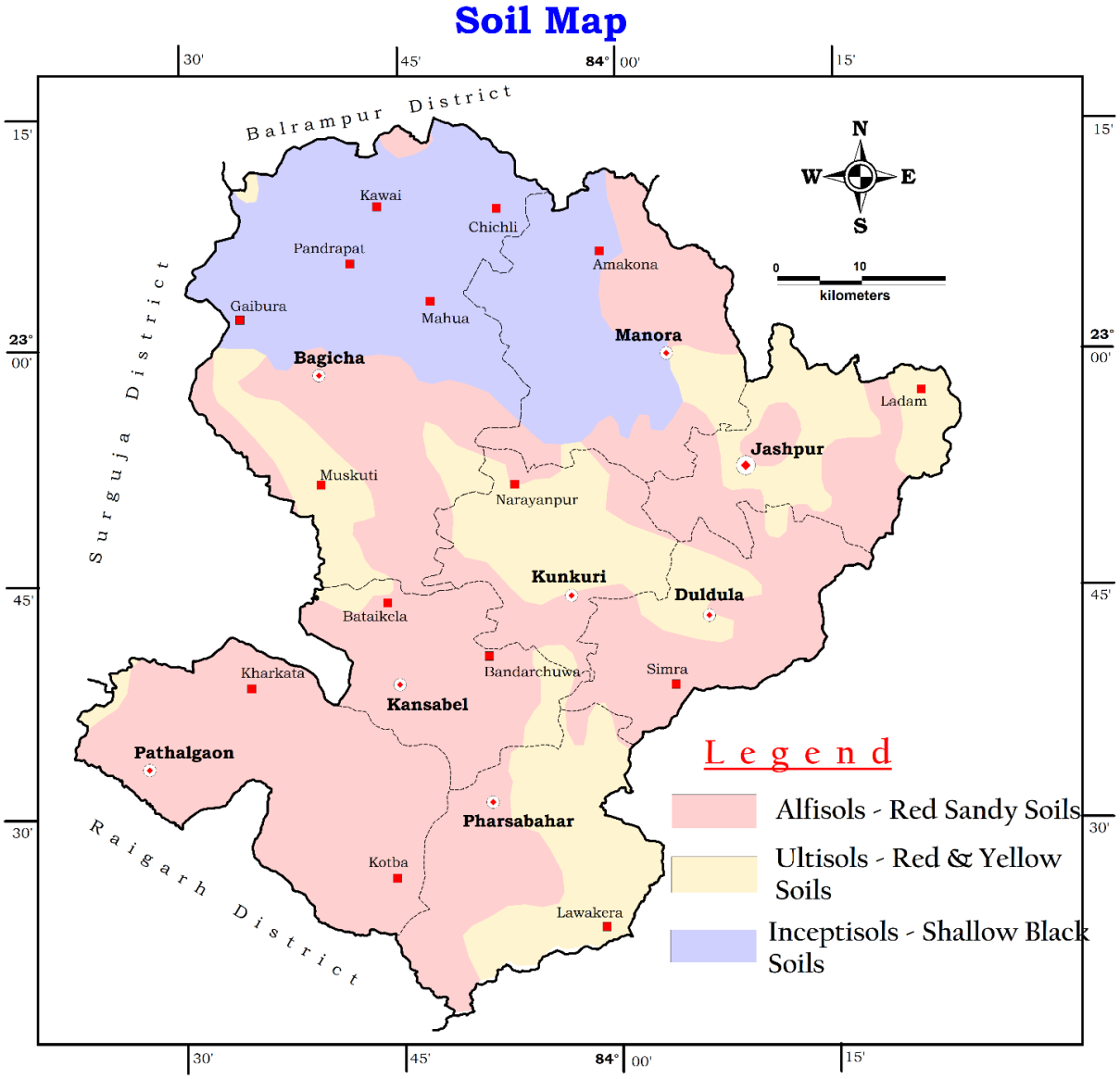


Figure 5 Soil map of the study area

1.10 Hydrology and Drainage

The general slope of the district is towards east. All the rivers of the district flow in eastern direction. Entire district can be divided into 3 major river basins: Mahanadi basin occupies nearly 71% area in the central part, Bramhani basin covers 21% area in the eastern part and Lower Ganges basin covers an area of 8% in the northern part of the district. Major rivers in the Mahanadi basin are Ib and its tributaries such as Dorki, Maini, Kokiya, Utai, Khadung, Burhi etc. In the eastern part, rivers named Girma and Lava Nadi flow in the Brahmani basin. Lower Ganges part is mainly drained by Geor and Kanhar rivers. Drainage pattern is dendritic and is highly irregular, which is reflective of the topography. The drainage density is very high on the western part of the area and is low on the eastern part. The high drainage density indicates higher run off and less infiltration. (Figure 6)

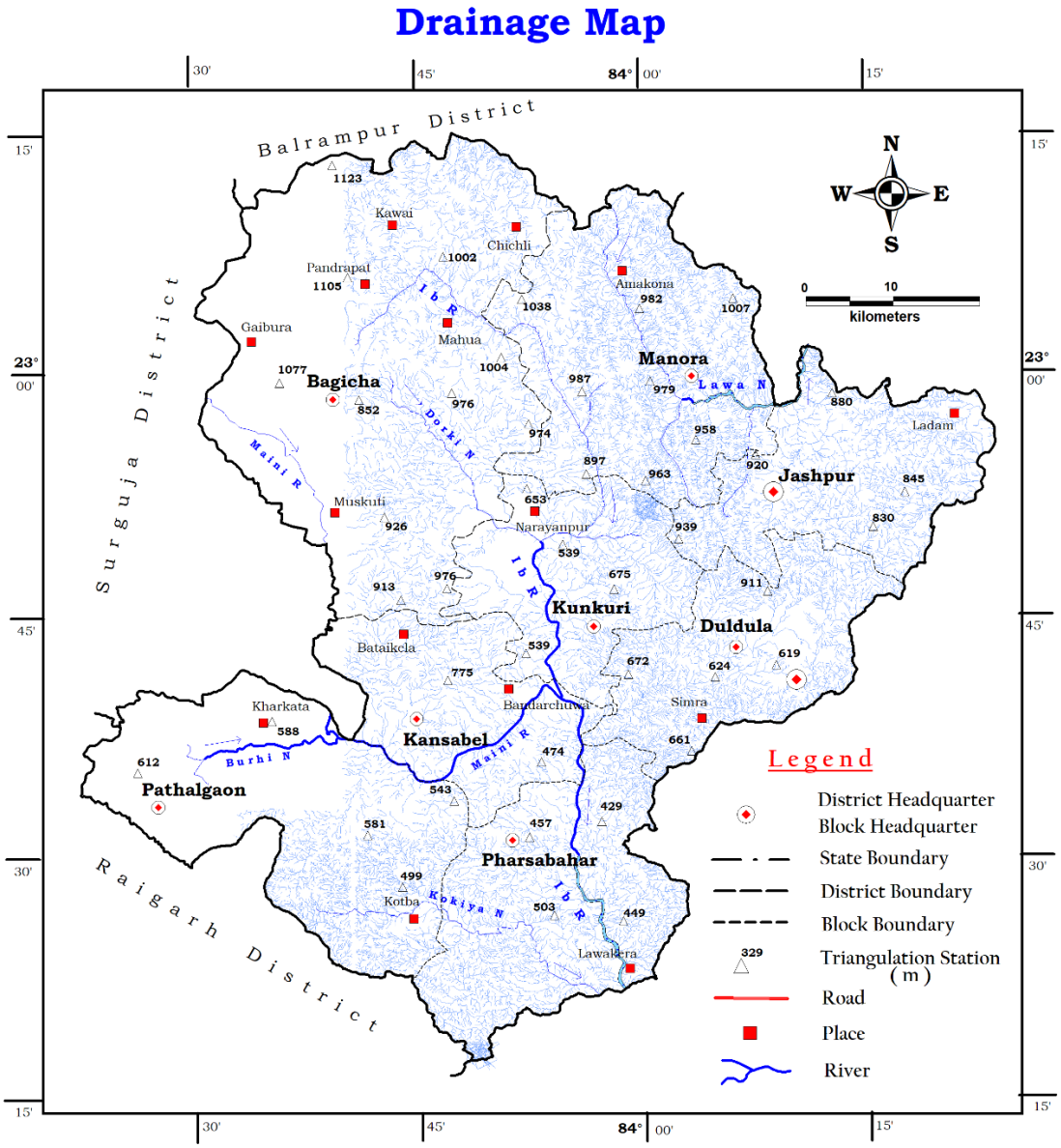


Figure 6 Drainage map of the study area

1.11 Geology

Jashpur district is mainly underlain by hard rock belonging to Precambrian age, part from these alluvium and laterite of Quaternary age occur in very isolated pocket with and limited extension. Hard rock mainly includes Granitic gneiss. Nearly 90% of the area in the district is covered with granitoids, which include granite gneiss, chlorite-biotite gneiss, muscovite granite, granodiorite etc. Remaining area is occupied by Deccan Traps and Lametas. The entire has a thick carapace of laterite. Thickness of laterite cover varies from a few metres to more than 30m (Figure 7).

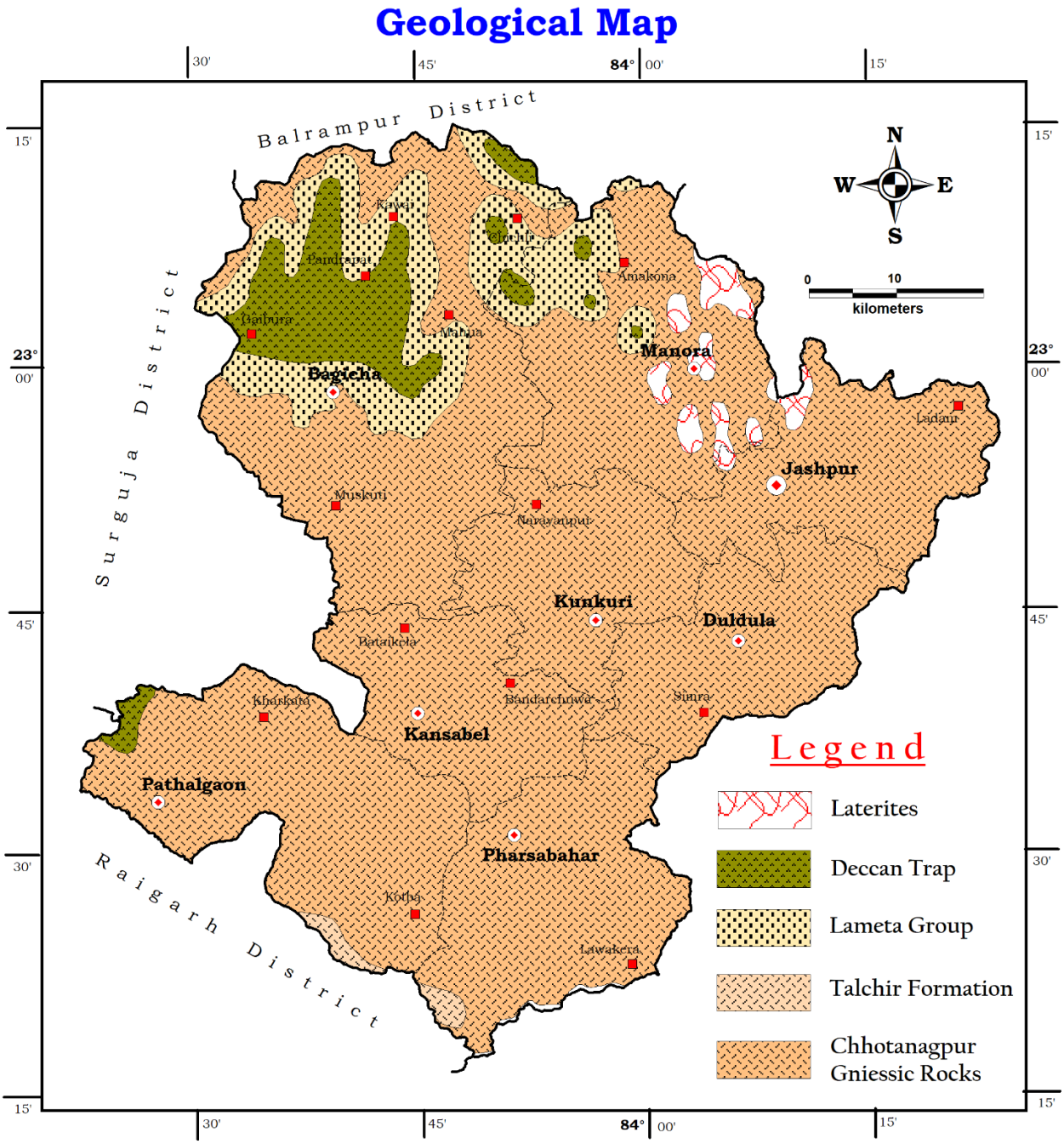


Figure 7 Geological map of the study area

1.12 Agriculture, Irrigation, Cropping Pattern

Agriculture is practiced in the area during Kharif and Rabi season every year. During the Kharif, cultivation is done through rainfall while during the Rabi season, it is done through ground water as well as partly through surface water like canals and other sources. The groundwater abstraction structures are generally Dugwells, Borewells /tubewells. The principal crops are paddy, wheat, vegetables and pulses. In some areas, double cropping is also practiced. The agricultural pattern, cropping pattern and area irrigated data of Jashpur district is given in Table No. 3 (A, B, C).

Table No. 3(A) Cropping pattern (in ha)

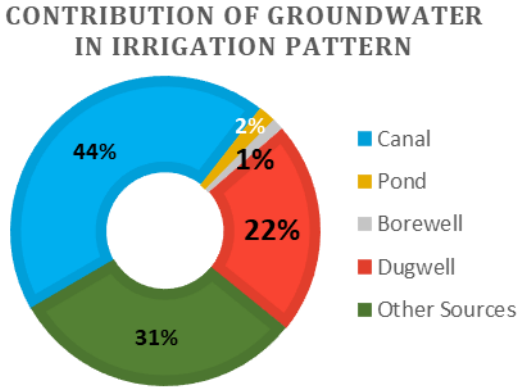
			Cereal									
Kharif	**Rabi**	**Paddy**	**Wheat**	**Jowar & Maize**	**Kodo Kutki**	**Others**	**Pulses**	**Tilhan**	**Fruits Vegetables**	**Reshe**	**Mirch Masala**	**Sugarcane**
244058	12993	183914	907	5528	1811	1442	22553	29777	10184	94	738	103

Table No. 3(B) Area irrigated by various sources (in ha)

No. of canal s (private and Govt.)	**Irrigated area**	**No.of bore wells/ Tube wells**	**Irrigated area**	**No. Of dug wells**	**Irrigated area**	**No. of Ponds**	**Irrigated area**	**Irrigated area by other sources**	**Net Irrigated area**	**% of irrigated area wrt. Net sown area**
53	4014	492	111	14525	2032	652	170	2829	9156	4

Table No. 3(C) Contribution of Groundwater in Irrigation Pattern (in ha)

Area Irrigated through Borewells/Tube wells	**Area Irrigated through Dug wells**	**Area Irrigated through Groundwater**	**Net Area Irrigated through all sources**	**% Groundwater contribution in Irrigation wrt Net Irrigated Area**
111	2032	2143	9156	23



Area Irrigated by groundwater is 2143 ha i.e. 23% (1%-Borewell, 22%-Dugwell) of the total Irrigated area.

2. DATA GENERATION, DATA INTERPRETATION AND DATA INTEGRATION

2.1 Hydrogeological Data

Both in phreatic and fractured condition in general two aquifers exist in the area although both are hydraulically connected. The first shallow unconfined/ phreatic aquifer between 0-20 mbgl and the second semi confined to confined aquifer below 20 mbgl. It has been found that within the second aquifer, there are 2-3 set of aquifers which are not well connected. The different sets of aquifers are of different thickness as well as of varying horizontal extent. The details of exploration are shown in Annexure 3. In the study area, key wells were established during the pre-monsoon period and have been subsequently monitored in the post-monsoon period (Annexure-1). The key wells are distributed throughout the study area (Figure 8) covering all the geological formations.

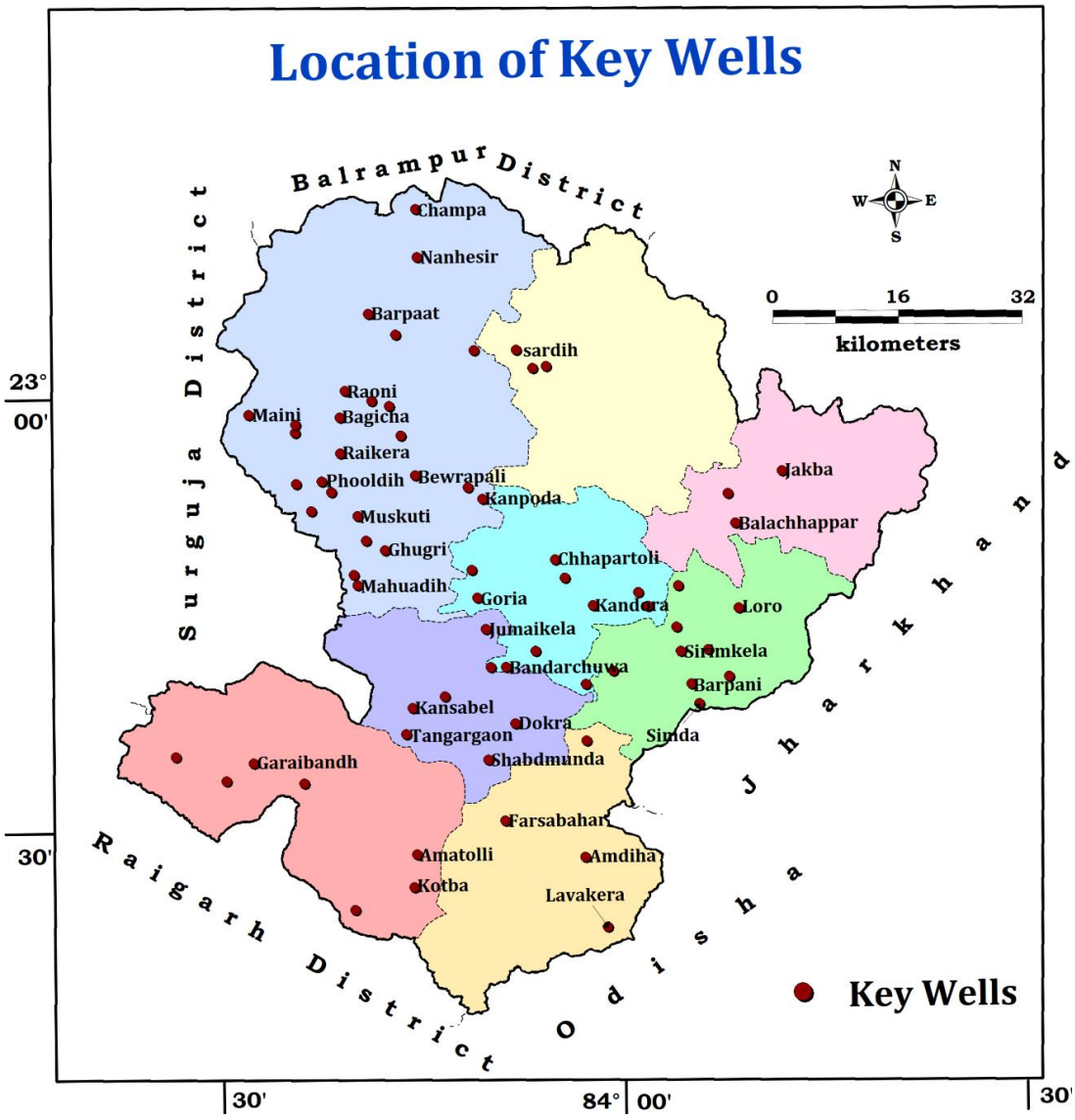


Figure 8 Key Wells of the study area

2.1.1 Water level behavior

Based on the depth to water level periodical monitoring data of the key wells established in the study area, pre-monsoon and post-monsoon depth to water level maps as well as seasonal fluctuation maps have been prepared.

i. Pre- monsoon water level (May 2019):

In the pre-monsoon period, it has been observed that in the study area water level in Phreatic aquifer vary between 3 to 10.95 m bgl with average water level of 6.65m bgl . In deeper semi-confined aquifer, water level varies between 2.56 to 32.3 m bgl with average water level of 12.55 m bgl shown in Table No. 4(A).

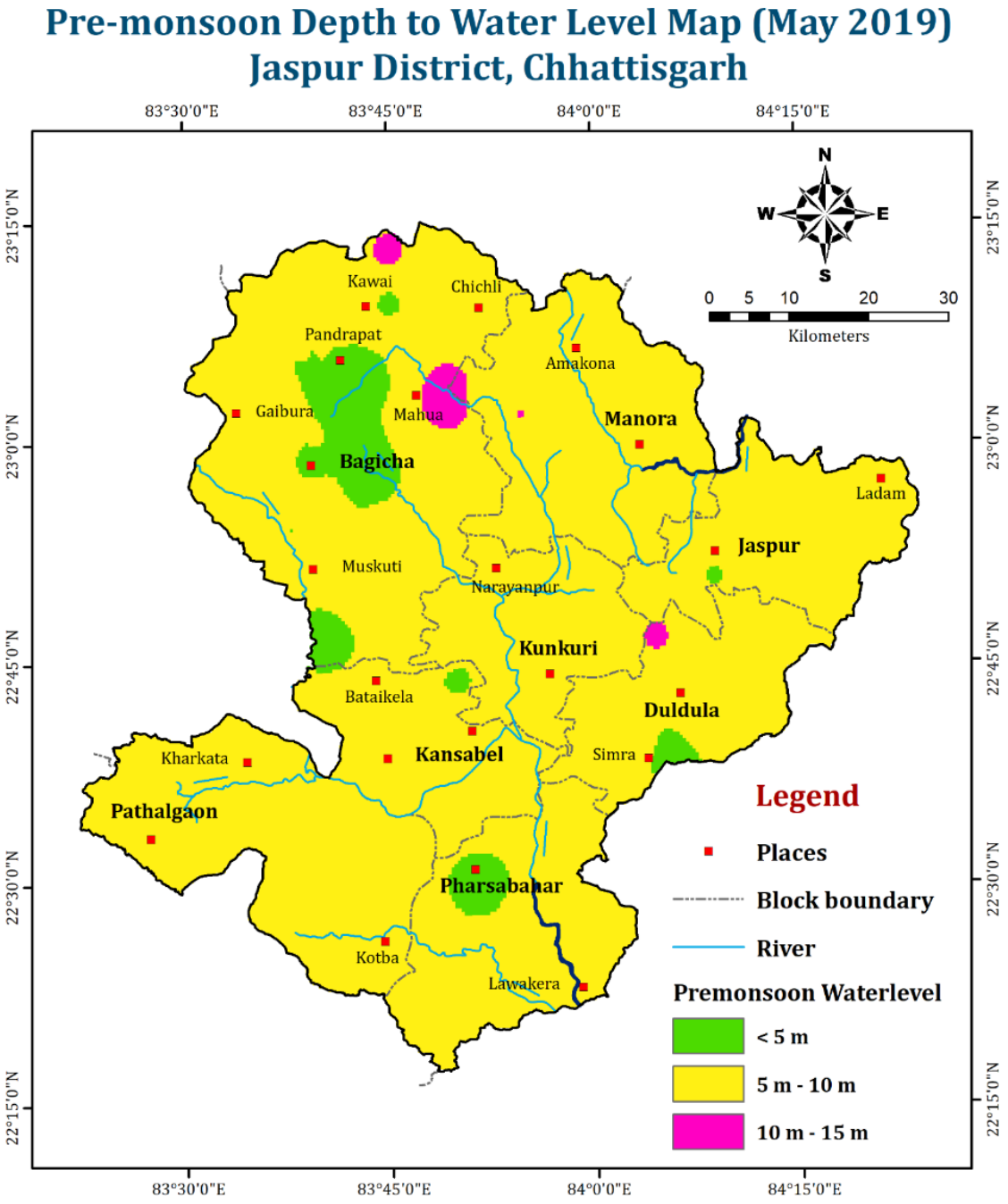


Figure 9 Pre monsoon Water Level Maps of Phreatic Aquifer

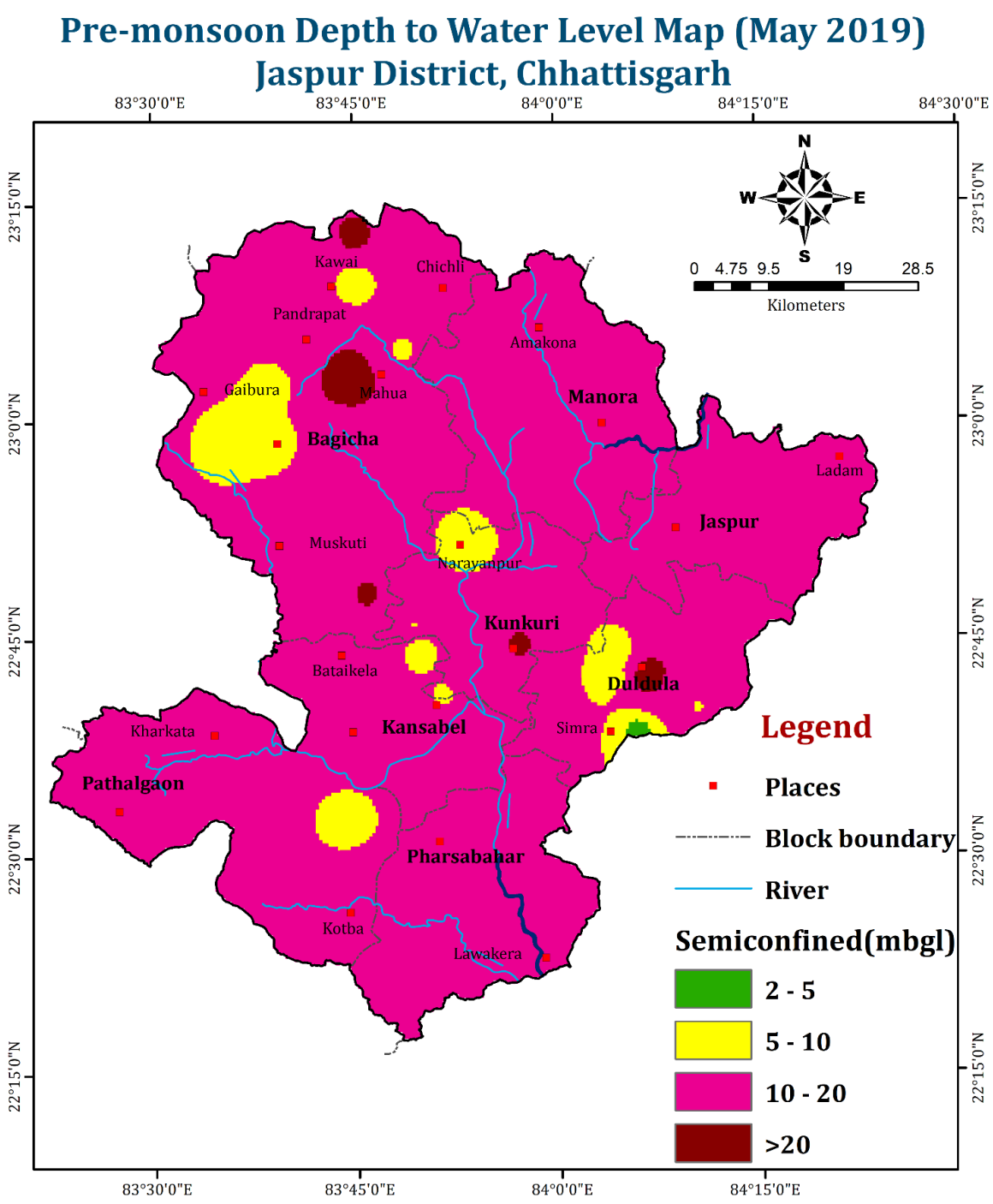


Figure 10 Pre monsoon Water Level Maps of Semi-Confined Aquifer

Table 4(A)- Aquifer wise Depth to Water Level (Pre-monsoon)

District	Aquifer Type	Min	Max	Avg
Jashpur	Phreatic aquifer	3	10.95	6.65
	Semi-confined Aquifer	2.56	32.3	12.55

ii. Post- monsoon water level (Nov 2019):

In the post-monsoon period, it has been observed that in the study area, water level in Phreatic aquifer varies between 0.52 to 9.85 m bgl with average water level of 3.88 m. In deeper semi-confined aquifer, water level varies between 2.5 to 22.43 m bgl with average water level of 7.95 m bgl shown in Table No. 4(B).

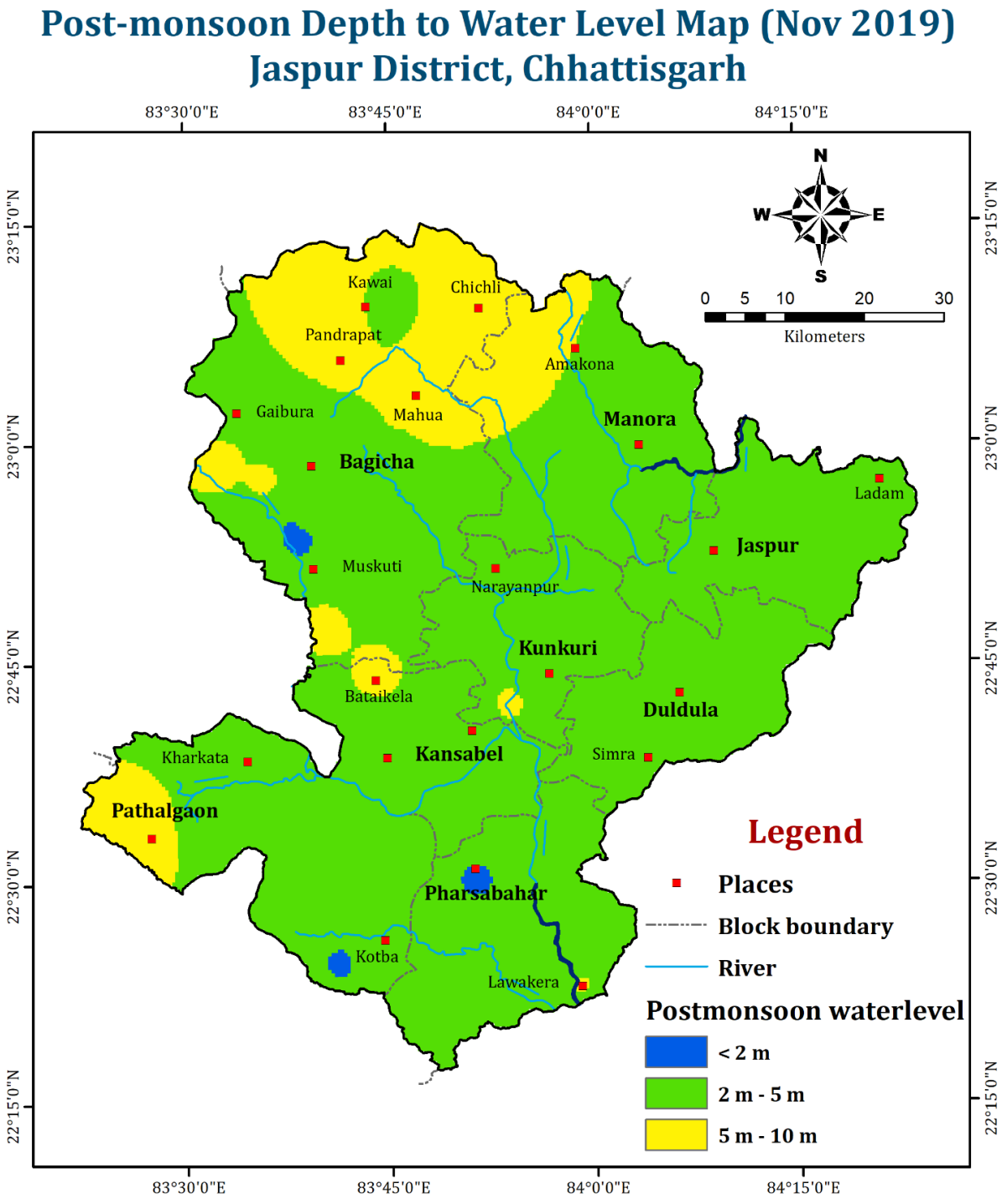


Figure 11 Post monsoon Water Level Map of Phreatic Aquifer

Post-monsoon Depth to Water Level Map (Nov 2019)
Jaspur District, Chhattisgarh

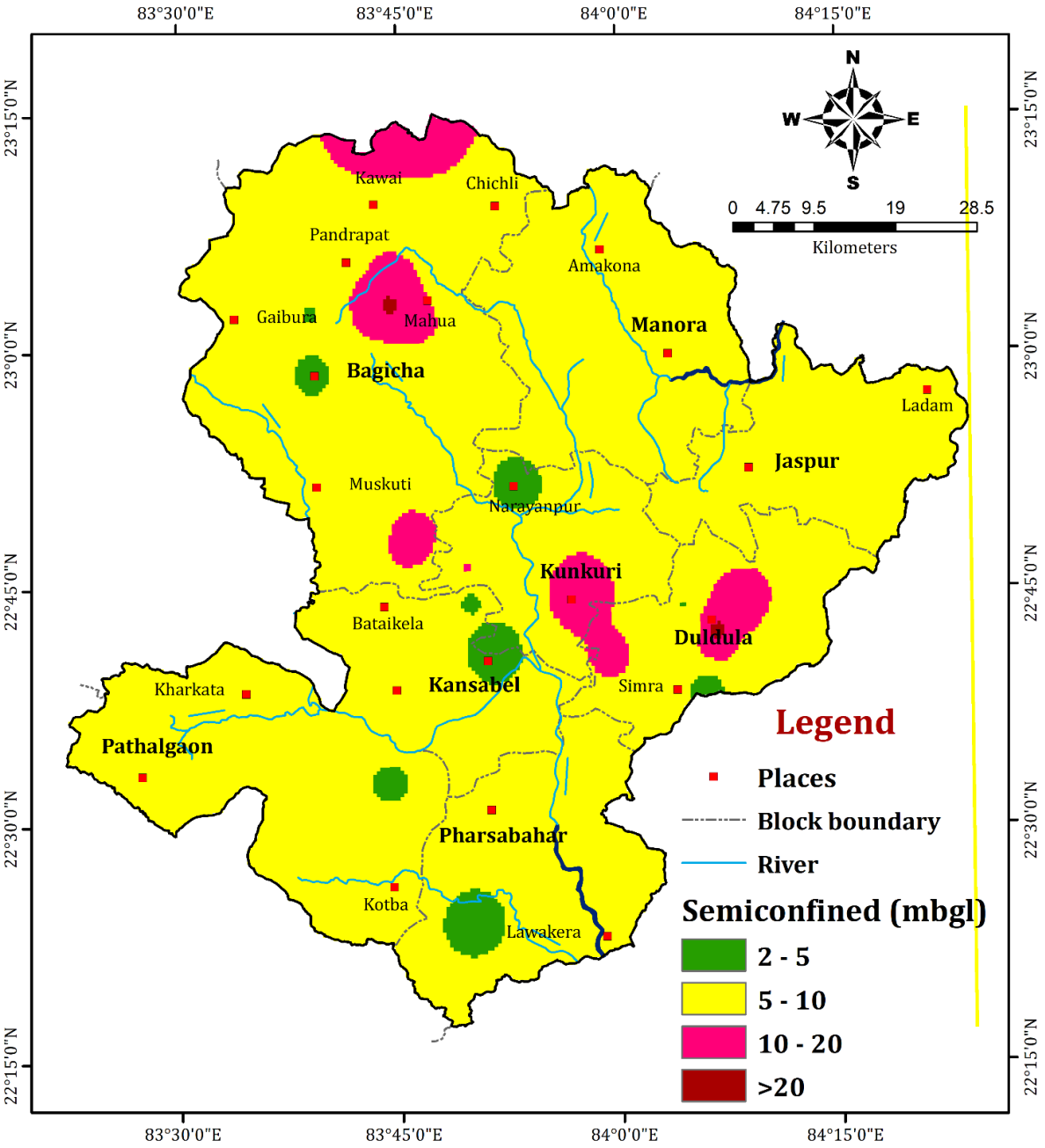


Figure 12 Post monsoon Water Level Maps of Semi-Confined Aquifer

Table No. 4(B)- Aquifer wise Depth to Water Level (Post-monsoon)

District	Aquifer Type	Min	Max	Avg
Jashpur	Phreatic aquifer	0.52	9.85	3.88
	Semi-confined Aquifer	2.5	22.43	7.95

iii.Seasonal water level fluctuation:

The water level fluctuation data indicates that in the study area, water level fluctuation in phreatic aquifer varies from 0.5 to 8.25m with an average fluctuation of 3.25m. Water level fluctuation in semi-confined aquifer varies from 0.02 to 11.2 m with an average fluctuation of 4.60m shown in Table No. 4(C).

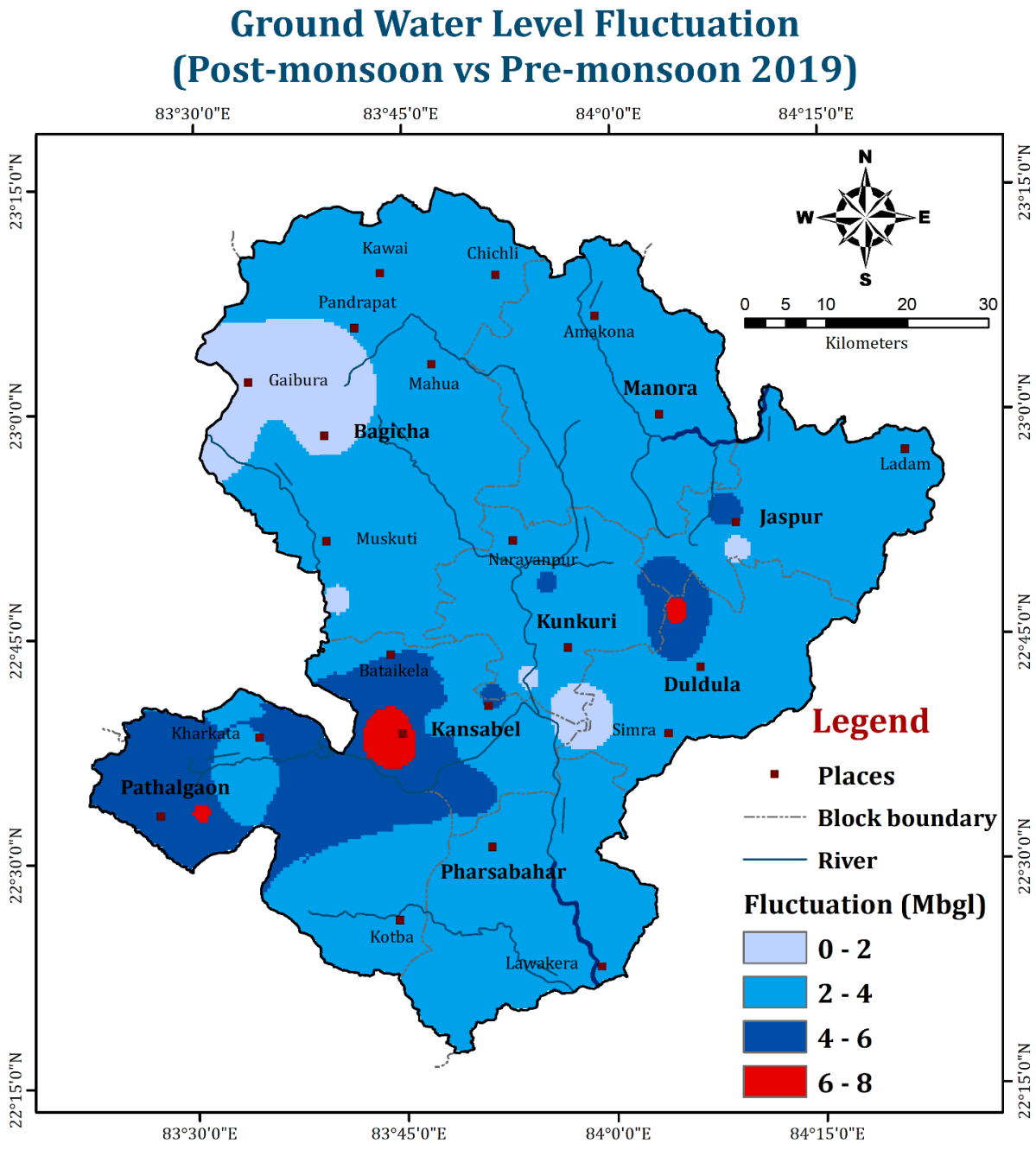


Figure 13 Water level fluctuation of Phreatic aquifer 2018

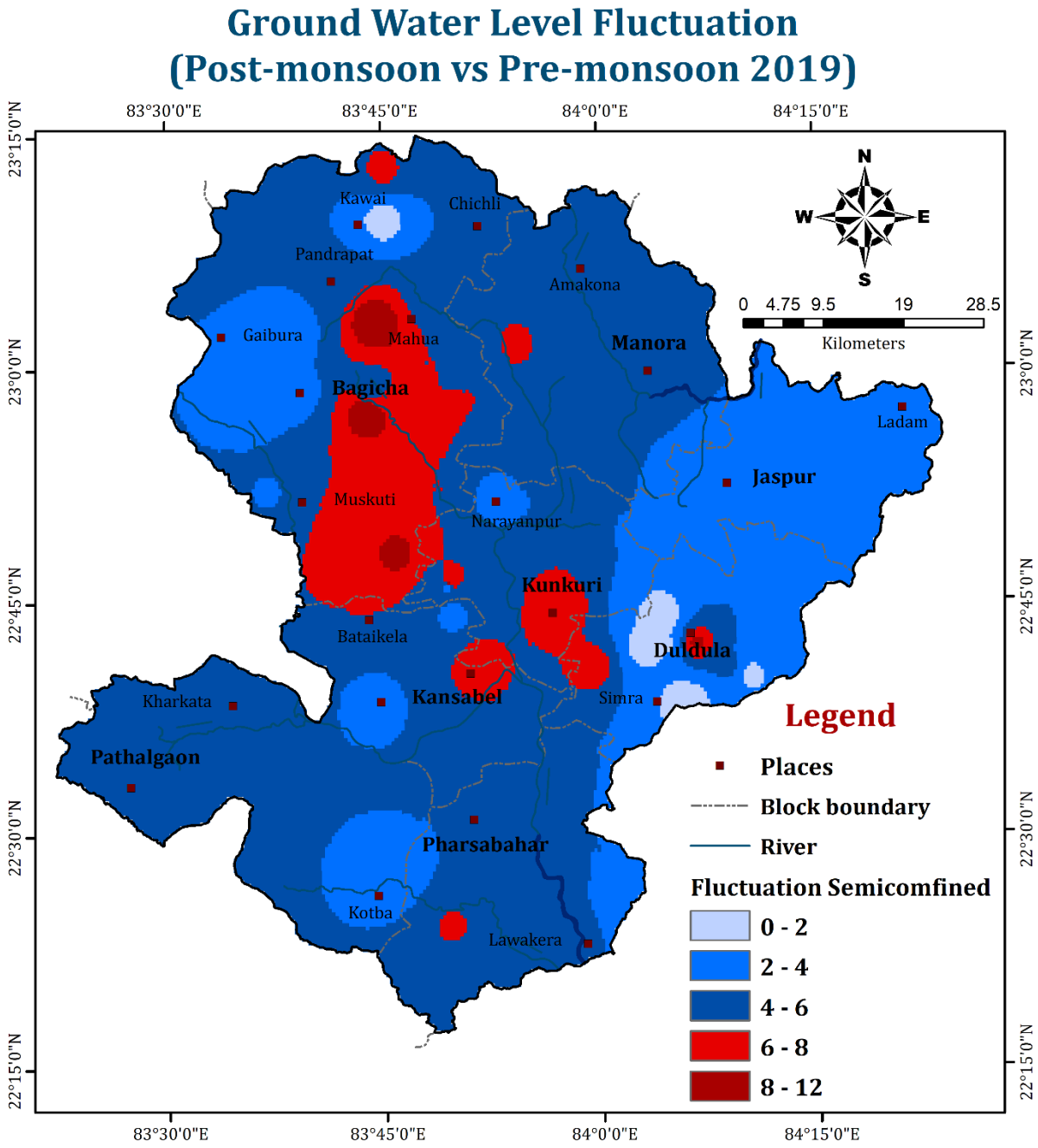


Figure 14 Water level fluctuation of Semiconfined aquifer 2018

Table No. 4(C)- Aquifer wise Depth to Water Level Fluctuation

District	Aquifer Type	Min	Max	Avg
Jashpur	Phreatic aquifer	0.5	8.25	3.25
	Semi-confined Aquifer	0.02	11.2	4.60

3. AQUIFER DEPOSITION AND GROUND WATER RESOURCES

3.1 Aquifer Geometry and Characterization

Based on the exploratory drilling data generated for the blocks (Annexure 3), the existing aquifer systems in the area may be divided into two namely phreatic and deeper fractured aquifer. The major aquifers present in the study area is (1) Chotanagpur Granite Geneiss. Details are represented in Table no. 5.

Table 5 Aquifer Characteristics of Jashpur District

CHARACTERISTICS	**AQUIFER SYSTEM**	
	Fractured Granite	**Weathered Granite**
Major Geological Formation	Chotanagpur Granite Geneiss	Chotanagpur Granite Geneiss.
Major Rock type	Granite Geneiss	Granite Geneiss
Avg Weathered Thickness (m)	-	15.22
Transmissivity (m^2/day)	1 to 112	7 to 45
Average Drawdown (m)	33	25
Discharge	Negligible to 7.8 lps	10 to 100 m3/day
No. of Potential Zone	1 to 2set < 50 m 1 to 2set: 50m to 100m 1 set: 100m to 200m (Most potential zone- 50 to 100m)	-

Aquifer Map

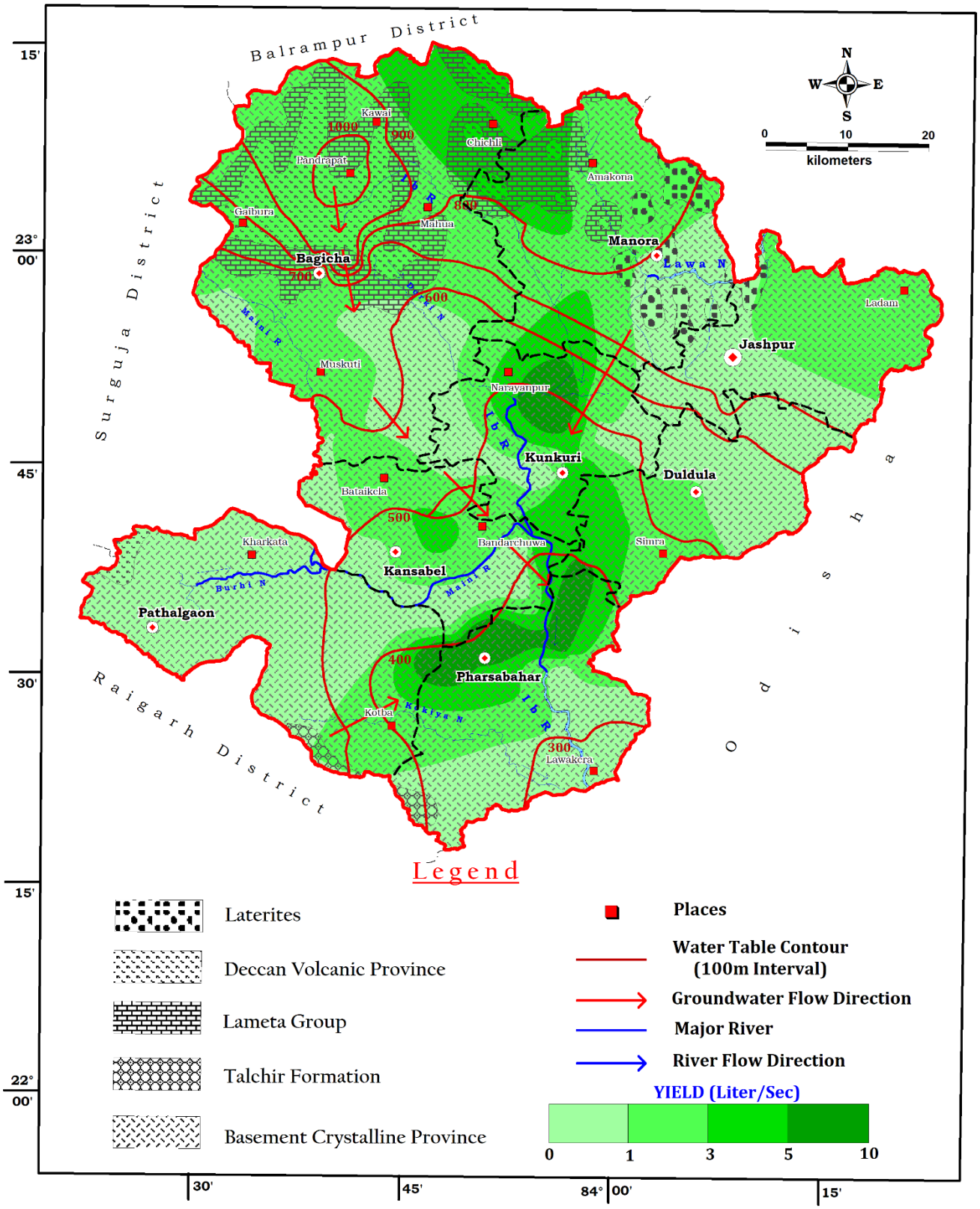


Figure 15 Aquifer Map of Study Area

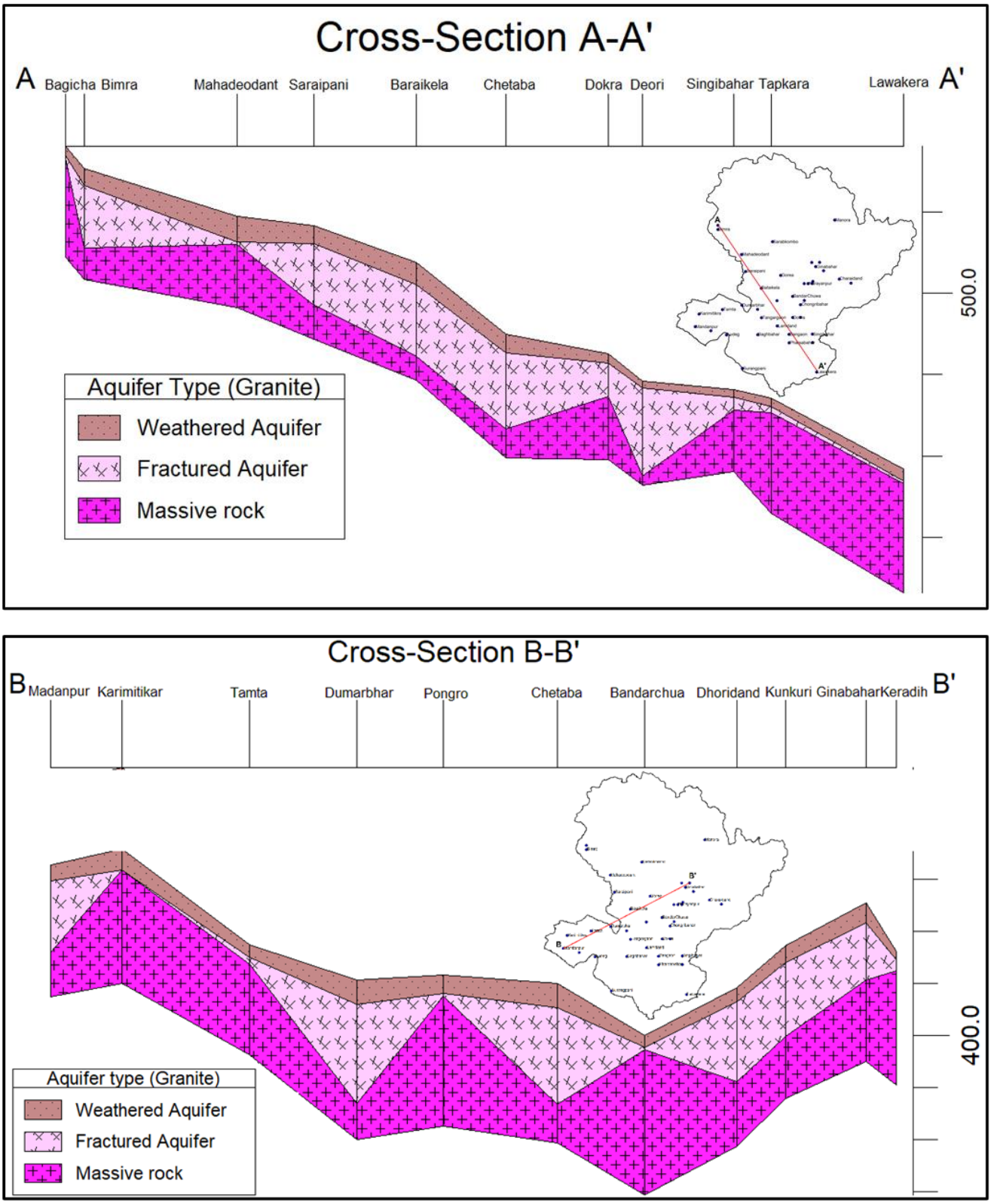


Figure 16 Cross-section of Study area

Aquifer Disposition in Jashpur District

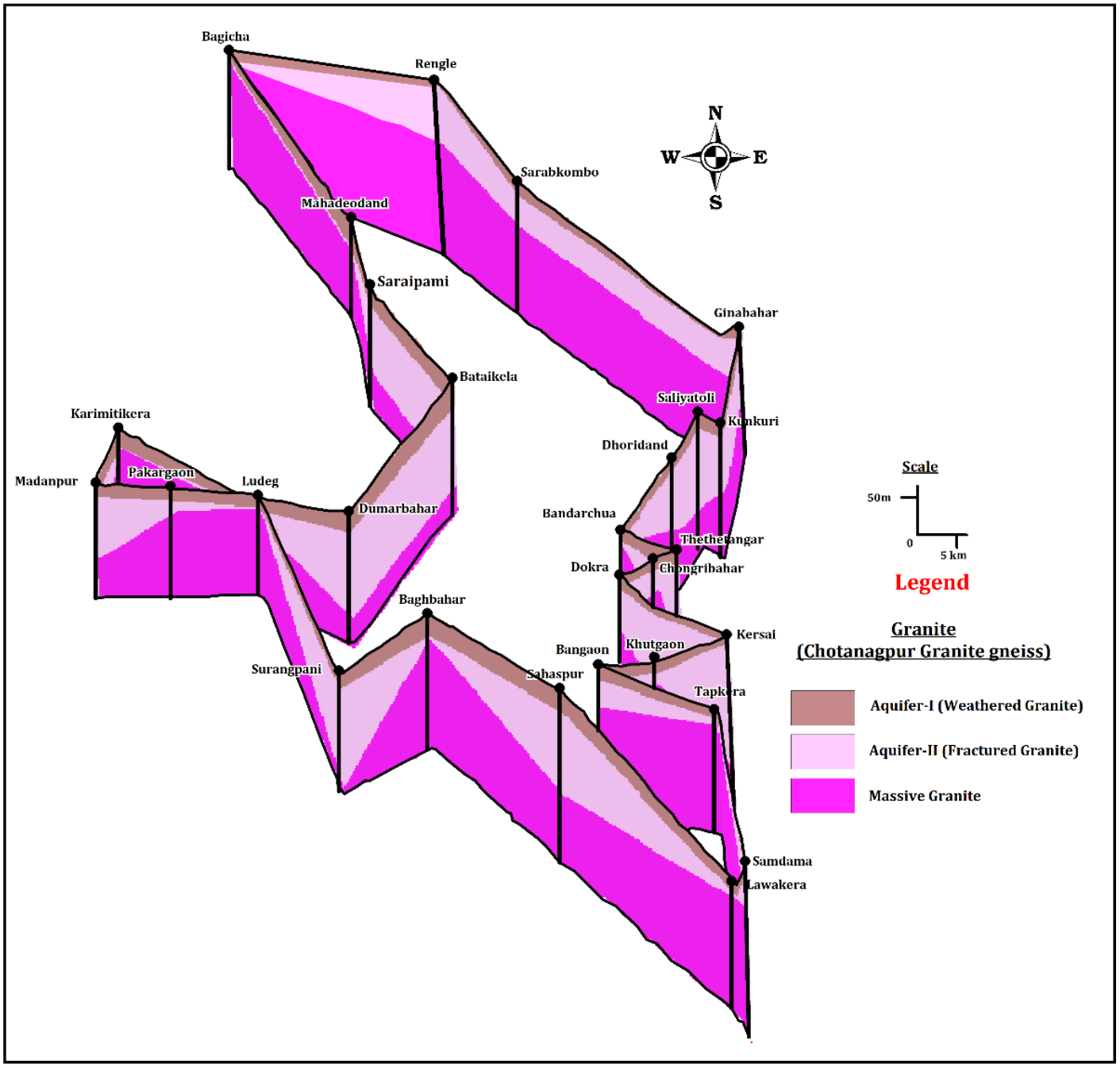


Figure 17 Fence diagram of Study area

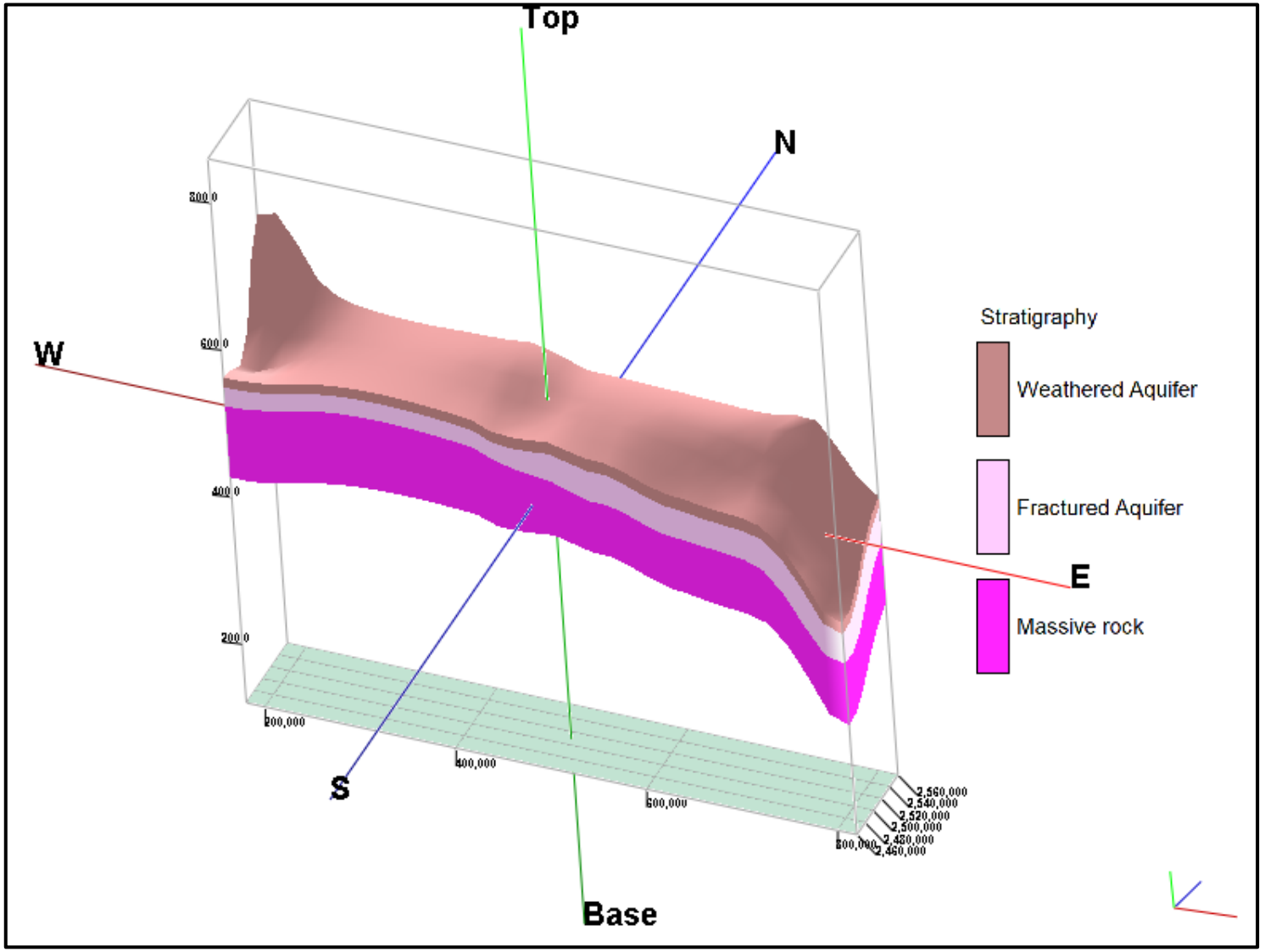


Figure 18 3D model diagram of study area

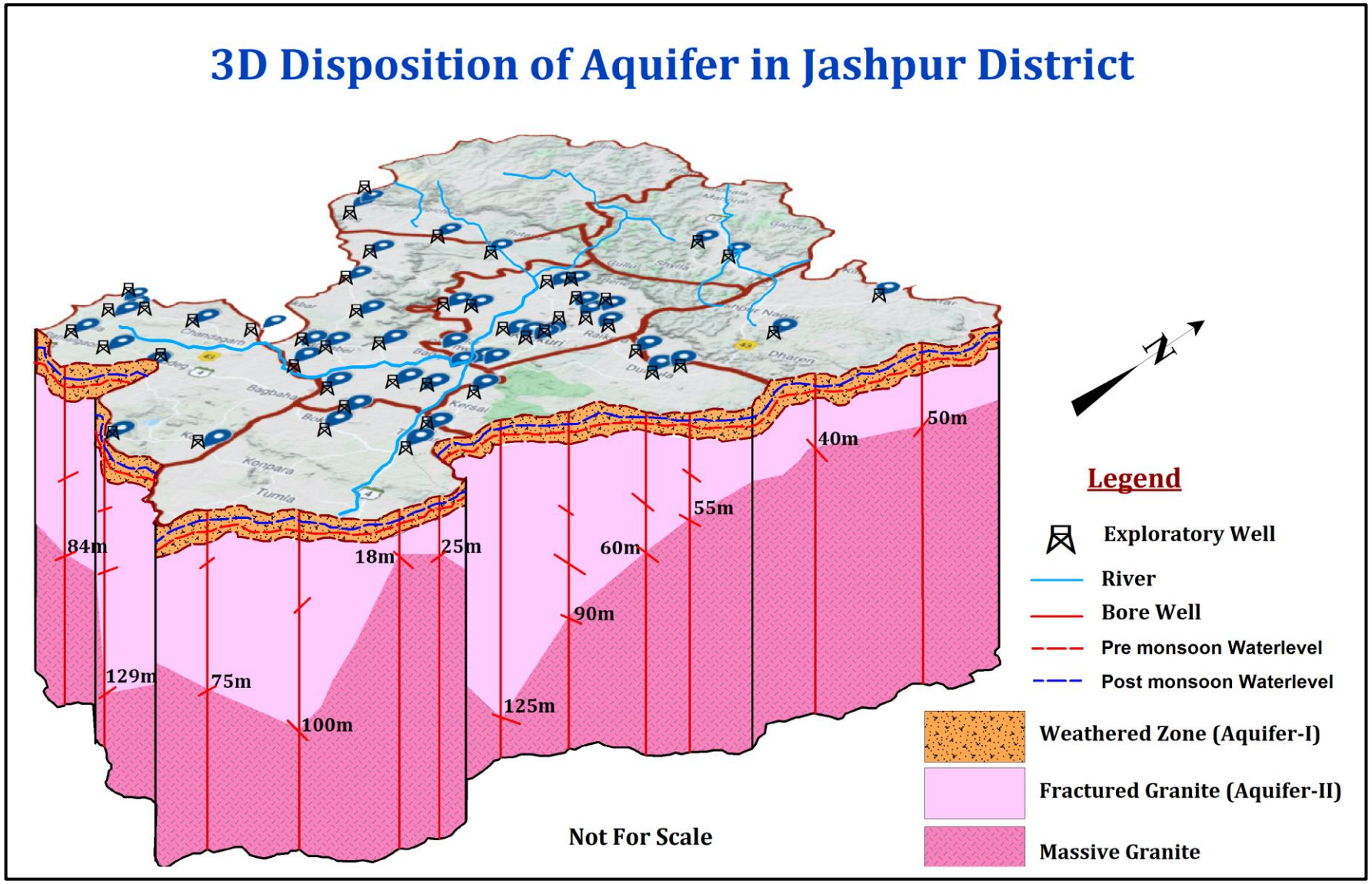


Figure 19 3D disposition of aquifer in study area

3.2 Groundwater Resources Availability and Extraction

In the ground water resource estimation, the unit of assessment to ground water resources has been taken as the smallest administrative unit i.e. Block. The hilly areas (slope greater than 20%) have been excluded from the computations. The assessment unit has been divided into command and non-command areas and ground water resources have been estimated separately for command and non-command areas. The ground water recharge in the monsoon season and non- monsoon season has also been estimated separately.

The water level data collected by CGWB through NHS monitoring and from state ground water survey, has been utilized for resource estimation. The rainfall data from Indian Meteorological Department has been incorporated in the assessment. The irrigation data for tube wells and dug wells were provided by Water Resources Department. The state could not get success to obtain the stream data from the concern department. The domestic dug wells & bore wells data are not available, therefore per capita consumption of 60 liters per day per person for rural areas and 100 liters per day per person for urban areas have been taken into consideration. The data of ground water withdrawal for industries incorporated from the NOC issued by CGWA and from State Industries Department.

The district is mainly underlain by crystalline rocks of Proterozoic age belonging to Chota Nagpur gneissic complex. Presence of sandstone and Limestone of Lameta Formation (infra-trappeans) and Deccan trap basalt though insignificant, have also been reported. Extensive lateritisation with occasional bauxite deposits are also found. Laterite, which forms the phreatic aquifer, is extensive and is exploited through dug wells. Average thickness of laterite is 15m. At places it is as high as 30m. Potential of the basalts as aquifer material has not been explored properly as this part is covered mostly by forests and is thinly populated. Total Annual Ground Water Recharge and Annual Extractable Ground Water Recharge of the district have been estimated to be 39433 Ham and 35676 Ham respectively. Gross ground water Extraction for all uses in the district is only 13944 Ham. Stage of ground water extraction in the district is 39.09%. All the blocks in the district have been categorised as ‘safe’.

Based on the resource assessment made, the resource availability in Block wise in Jashpur district upto 100m depth is given in Table no 6

Table 6 Groundwater Resource up to 100m bgl (MCM)

District	Block	Dynamic Resources (MCM)		Insitu Resources (MCM)		Total Resources (MCM)
		Aquifer I	Aquifer II	Aquifer I	Aquifer II	
Jashpur	**Bagicha**	85.08	2.05	83.48	337.55	**508.16**
	Duldula	26.59	0.58	23.68	95.1	**145.96**
	Jashpur	35.14	0.67	27.2	110.33	**173.34**
	Kansabel	33.64	0.57	23.39	92.41	**150.02**
	Kunkuri	31.52	0.63	25.7	101.35	**159.20**
	Manora	40.03	1.01	41.06	164.37	**246.47**
	Pathalgaon	40.69	0.9	36.52	145.93	**224.04**
	Pharsabahar	64.08	0.9	36.73	145.76	**247.46**

3.3 Existing and Future Water Demand (2025)

Table 7 Ground Water Resources of the Study area in Ham

Block	Total Annual Ground Water (Ham) Recharge	Total Natural Discharges (Ham)	Annual Extractable Ground Water (Ham) (3=1-2)	Current Annual Ground Water Extraction (Ham)				Annual GW Allocation for Domestic Use as on 2025	Net Ground Water Availability for future use (9=3-4-5-8)	Stage of ground water development in % (7/3 *100)
				Irrigation Use	Industrial Use	Domestic Use	Total Extraction (7=4+5+6)			
	1	2	3	4	5	6	7	8	9	
Jashpur	3700.25	186.72	3513.53	1717.75	0	246.06	1963.81	269.48	1526.3	55.89
Pathalgaon	4521.44	452.15	4069.29	2137.85	4	469.68	2611.53	520.07	1407.37	64.18
Kansabel	3738.17	373.82	3364.35	1294.5	16	179.01	1489.51	194.58	1859.27	44.27
Kunkuri	3502.1	350.21	3151.89	1356.75	20.22	228.9	1605.87	244.58	1530.34	50.95
Duldula	2951.12	292	2659.12	1063.85	0	119.22	1183.07	130.47	1464.8	44.49
Pharsabahar	7119.48	711.95	6407.53	1852.07	0	252.33	2104.4	273.15	4282.31	32.84
Bagicha	9453.06	945.3	8507.76	1336.31	0	416.54	1752.85	465.49	6705.96	20.6
Manora	4448.07	444.81	4003.26	1090.66	0	143.27	1233.93	158.13	2754.47	30.82
TOTAL	**39433.69**	**3756.96**	**35676.73**	**11849.74**	**40.22**	**2055.01**	**13944.96**	**2255.95**	**21530.83**	**39.09**

The existing demand for irrigation in the area is 11849.74 Ham while the same for domestic use is 2055.01 Ham and for industrial field is 40.22 Ham. To meet the future demand for ground water, a total quantity of 21530.83 ham of ground water is available for future use.

4. GROUND WATER RELATED ISSUES

- **Drying of Dugwells and handpumps during summer-** Dugwells dug in Granitic aquifers gradually becomes dry in lean period in Summer. Hence the number of Dugwells are decreasing gradually.
- **Inherent hydrogeological character of aquifer-** The aquifer itself is a low yielding one in Pathalgaon block, Mnora block, lower part of Jashpur block and upper part of Duldula block (i.e. less than 1 lps) which indicate uneven distribution of yield potential in consolidated Chotanagpur granite gneiss. Good potential zone confined in structurally low laying areas whereas in higher elevation, it is poorly yielding.
- **Fluoride concentration** – Fluoride observed in granitic terrain at palces of Jashpur district (Annexure-4). More than permissible limit found at Betara and Bend (Bagicha block).
- **Iron contamination-** More than permissible limit found in villages Kuthera and Bataikela (Kansabel Block). Shown in Annexure 4.
- **Nitrate contamination:** More than permissible limit found in villages Goria (Kunkuri Block), Sukra (Manora Block). Shown in Annexure 4.

5. GROUND WATER MANAGEMENT STRATEGY

- It has been observed during fieldwork, there is colossal wastage of groundwater through private well and public water supply system. So, Information, Education and Communication (IEC) activities need to be organized to sensitize people on the issues of depleting groundwater resource. Massive awareness campaigns are essential to aware people about the importance of community participation in saving water.
- Desiltation of existing Tanks and Talabs to be carried out for efficient storage of rainwater. Also Rain water harvesting structures may be constructed in villages to reduce stress on groundwater.
- It has been observed that the demand of ground water is increasing for irrigation, industrial and domestic uses. At locations where water level is declining, we have to go for artificial recharge on a long-term sustainability basis. Artificial Recharge structures may be constructed at suitable locations especially in the areas where the water level remains more than 3m in the post-monsoon period in this block to arrest the huge non-committed run-off and augment the ground water storage in the area. The different types of artificial structures feasible in the block are described in table 8. Probable sites

are also identified for the construction of Artificial Recharge structure such as percolation tank, Nala bunding/ cement plug/ check dam, Gully Plugs/ gabion structures in district as shown in figure 18 and details of the sites has been provided in Annexure 2.

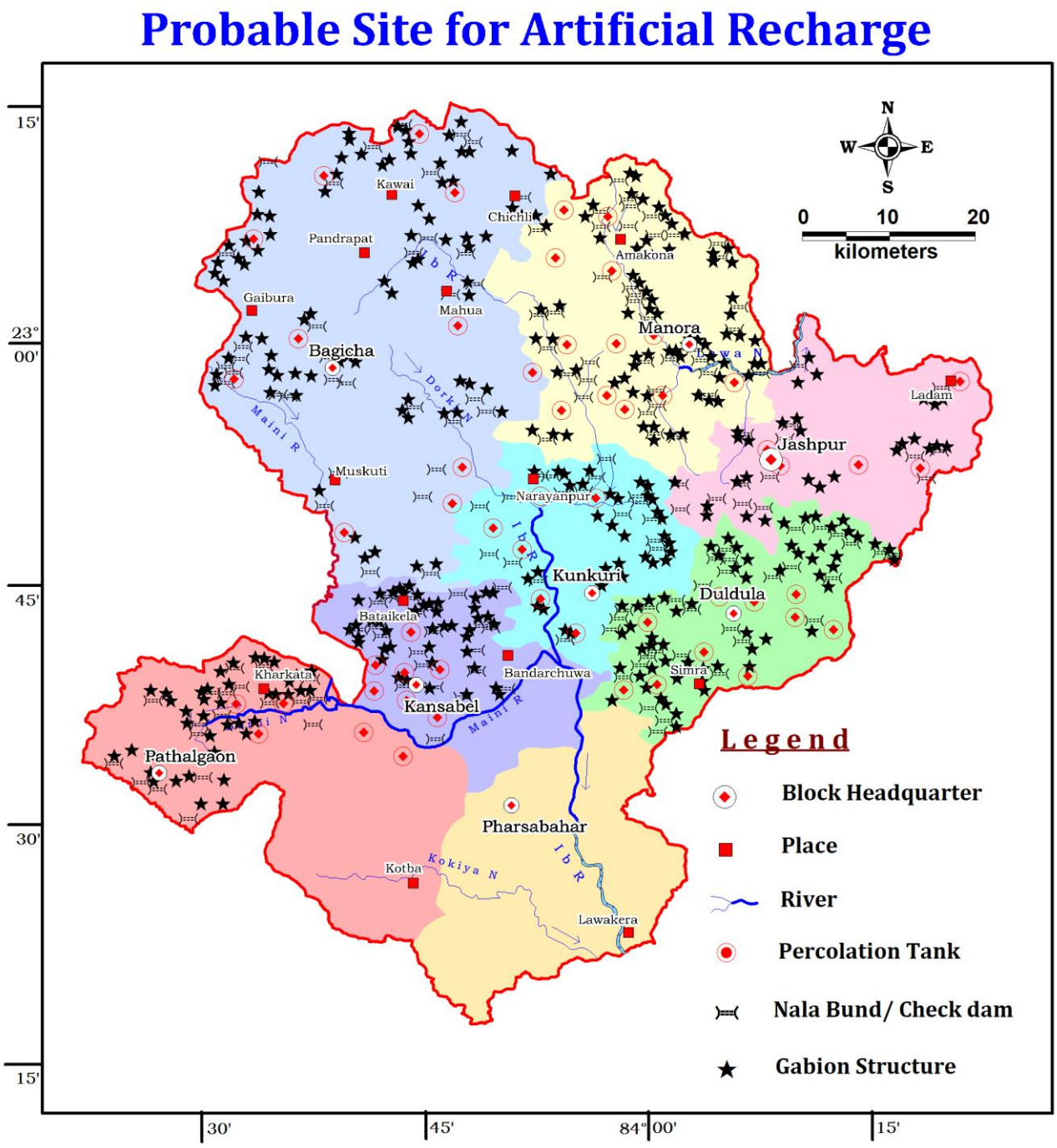


Figure 20 Probable site for Artificial Recharge structure in the study area

Table 8 Types of Artificial Recharge structures feasible

Block/District	Area Feasible for recharge (sq.km)	Vol. of Sub Surface Potential for Artificial recharge (MCM)	Types of Structures Feasible and their Numbers			
			Percolation tank	Nalas bunding cement plug/ check dam	Gravity head /Dug well/ tube well/Recharge shaft	Gully plugs Gabion structures
Recharge Capacity - (MCM)/structure			**0.2192**	**0.0326**	**0.00816**	**0.0073**
Bagicha	130.34	4.826	11	37	90	65
Duldula	143.76	4.351	10	33	80	59
Jashpur	126.57	2.091	5	15	37	28
Kansabel	191.28	3.056	7	23	57	42
Kunkuri	152.41	2.543	6	19	45	33
Manora	162.07	5.18	12	39	94	70
Pathalgaon	72.7	2.22	5	18	30	40
Pharsabahar	0	0	0	0	0	0
Total (Jashpur)	**979.12**	**24.267**	**56**	**184**	**433**	**337**

- Abandoned tube well and dug well may be used for the recharge through shaft especially in urban and water stressed areas.
- Fluoride and Iron filter plant may be installed in the villages having higher value of contaminants.
- In urban areas STP may be installed for the treatment of sewage water in proper numbers to avoid contamination of ground water. Treatment of sewage water in village through soak pit for the individual houses and Seechewal model or similar model for community level may be adopted to avoid contamination of ground water. Treated water may also be reused for irrigation and other industrial purposes.
- Since the stage of development in the district is 39.09 %. There is scope of utilizing more ground water for future irrigation purpose. Additional number of Ground water abstraction structure may be developed for the effective utilization of ground water resources in the block. The ground water is presently developed through dug wells and tube wells. Yield potential for the block has been shown in Aquifer map (Figure 16). Sites for wells need to be selected only after proper scientific investigation. The ground water quality also needs to be ascertained and the wells used for water supply should be first checked for Iron, Fluoride and other pollutants.

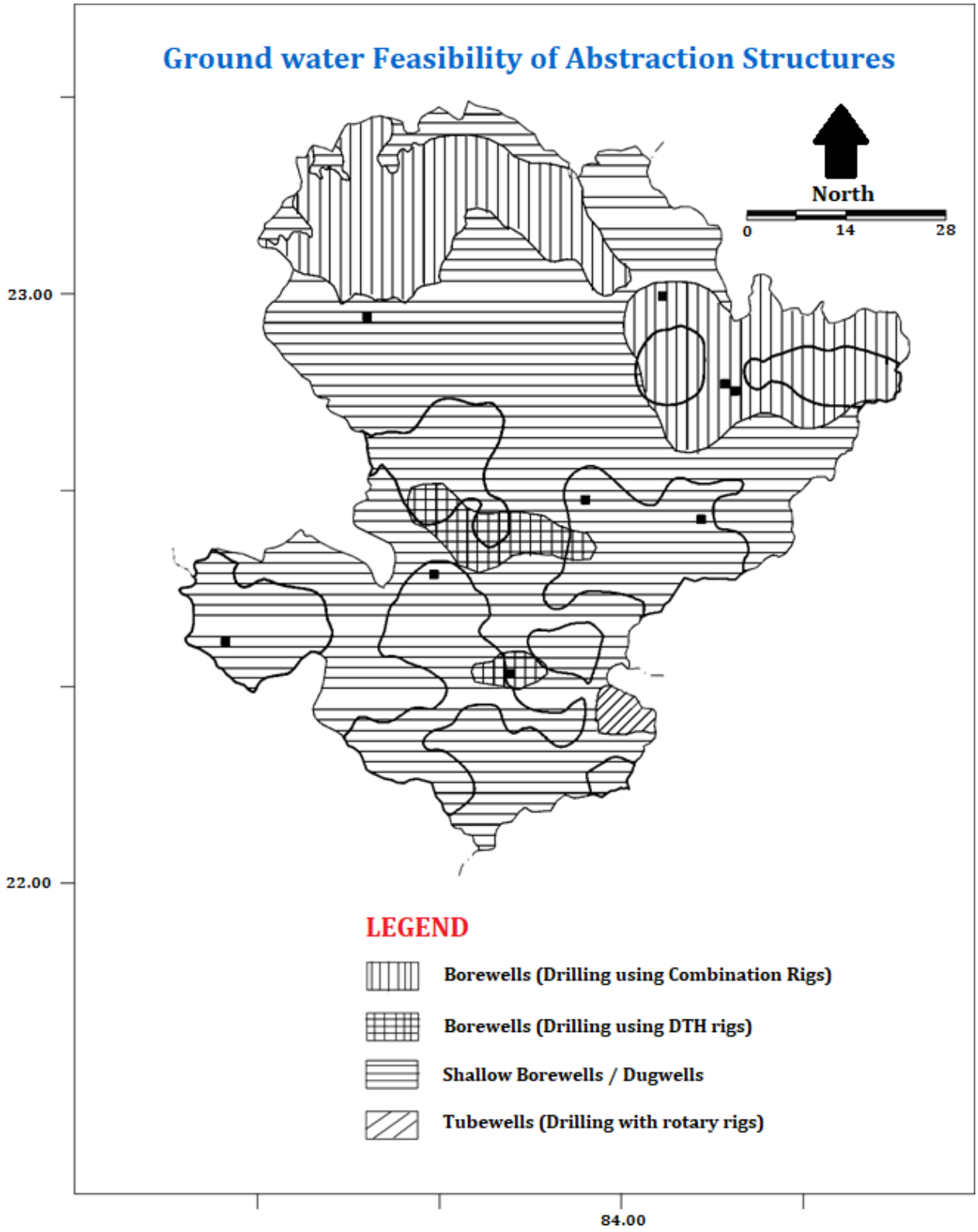


Figure 21 Ground water feasibility of Abstraction structures

Table 9 Potential of Additional GW abstraction structure creation

Block	Net Groundwater availability (ham)	Present Stage of ground water Development (%)	Present ground water draft (Ham)	Ground water draft at 70% stage of development (ham)	Surplus ground water at present Stage of Development (ham)	Number of TW/BW Recommended in each block (Assuming unit draft as 1.6 ham/structure/ year)	Number of DW Recommended in each block (Assuming unit draft as 0.72 ham/structure/year)
Bagicha	8507.76	20.6	1752.85	5955.43	4202.58	1576	2335
Duldula	2659.12	44.49	1183.07	1861.38	678.31	254	377
Jashpur	3513.53	55.89	1963.81	2459.47	495.66	186	275
Kansabel	3364.35	44.27	1489.51	2355.05	865.54	325	481
Kunkuri	3151.89	50.95	1605.87	2206.32	600.46	225	334
Manora	4003.26	30.82	1233.93	2802.28	1568.36	588	871
Pathalgaon	4069.29	64.18	2611.53	2848.5	236.97	89	132
Pharsabahar	6407.53	32.84	2104.4	4485.27	2380.87	893	1323
Total (Jashpur)	**35676.73**	**39.09**	**13944.96**	**24973.71**	**11028.75**	**4136**	**6127**

6. CONCLUSION:

For effective utilization of Ground water existing draft for irrigation may be coupled with micro irrigation system. Change in irrigation pattern, optimum use of available resource, use of ground water potential created after artificial recharge can lead to groundwater savings and increase in gross cropped area of the district (Table 10).

Table 10 Detail of groundwater saved through change in cropping pattern and other interventions

Block	Existing Gross Ground Water Draft for Irrigation in Ham	Additional Saving of GW after using Micro Irrigation methods in Ham (Assuming 30 % saving)	GW Potential created after Artificial recharge structure in Ham	Development by new GW abstraction structure	Additional GW irrigation Potential created in Ham	Additional Irrigation potential creation for Maize/ wheat in winter season in Ha (Assuming 500 mm water requirement)	Percent increase in Crop area compare to Gross cropped area
Bagicha	1336.31	400.89	482.63	4202.58	5086.1	10172.21	19.08%
Duldula	1063.85	319.16	435.13	678.31	1432.6	2865.2	16.48%
Jashpur	1717.75	515.33	209.13	495.66	1220.12	2440.23	10.38%
Kansabel	1294.5	388.35	305.59	865.54	1559.48	3118.95	12.36%
Kunkuri	1356.75	407.03	254.27	600.46	1261.75	2523.5	9.18%
Manora	1090.66	327.2	517.98	1568.36	2413.54	4827.07	18.33%
Pathalgaon	2137.85	641.36	221.96	236.97	1100.29	2200.58	4.12%
Pharsabahar	1852.07	555.62	0	2380.87	2936.49	5872.99	19.33%
Total (Jashpur)	**11849.74**	**3554.92**	**2426.7**	**11028.75**	**17010.37**	**34020.74**	**13.24%**

Annexure 1 Details of key wells established

S.No	District	Block	Village	Long	Lat	May	Nov	Fluctuation	Type of well
1	Jashpur	Pathalgaon	Amatolli	83.7442	22.4711	5.3	2.32	2.98	DW
2	Jashpur	Farsabahar	Amdiha	83.955	22.466	5.35	2.19	3.16	DW
3	Jashpur	Bagicha	Bagicha	83.6542	22.9764	4.15	2.76	1.39	DW
4	Jashpur	Jashpur	Balachhappar	84.1478	22.8494	4.55	3.17	1.38	DW
5	Jashpur	Kunkuri	Bandarchuwa	83.8583	22.6861	8.35	4.02	4.33	DW
6	Jashpur	Kansabel	Bewrapali	83.7475	22.9083	7.15	3.52	3.63	DW
7	Jashpur	Kunkuri	Chhapartoli	83.9217	22.8094	7	2.92	4.08	DW
8	Jashpur	Jashpur	Chiraidand	84.0753	22.7781	11.1	4.58	6.52	DW
9	Jashpur	Kansabel	Dokra	83.86933	22.62075	6.24	3.72	2.52	DW
10	Jashpur	Farsabahar	Farsabahar	83.8553	22.5089	3.25	0.52	2.73	DW
11	Jashpur	Kunkuri	Farsakanhi	83.8958	22.7042	7.16	5.5	1.66	DW
12	Jashpur	Kansabel	Garaibandh	83.5415	22.578	6.2	3.47	2.73	DW
13	Jashpur	Kunkuri	Ghatmunda	83.9331	22.7881	9.16	5.32	3.84	DW
14	Jashpur	Jashpur	Jakba	84.2069	22.9089	6.16	3.36	2.8	DW
15	Jashpur	Jashpur	Jashpurnagar	84.1389	22.8833	8.9	4.22	4.68	DW
16	Jashpur	Kunkuri	Kandora	83.9681	22.7558	7.05	3.39	3.66	DW
17	Jashpur	Bagicha	Kanpoda	83.83154	22.88022	5.85	2.86	2.99	DW
18	Jashpur	Kansabel	Kansabel	83.74115	22.6401	10.9	2.7	8.25	DW
19	Jashpur	Duldula	Kersai	83.9583	22.6	5.5	3.4	2.1	DW
20	Jashpur	Pathalgaon	Kotba	83.7403	22.4333	6.3	2.66	3.64	DW
21	Jashpur	Duldula	Kunjara	83.9583	22.6653	5.3	4.8	0.5	DW
22	Jashpur	Farsabahar	Lavakera	83.9819	22.3847	9.08	5.08	4	DW
23	Jashpur	Jashpur	Loro	84.1507	22.7515	6.75	4.06	2.69	DW
24	Jashpur	Pathalgaon	Ludeg	83.6042	22.5542	6.73	2.61	4.12	DW
25	Jashpur	Kansabel	Mahuadih	83.6743	22.7823	3.75	2.53	1.22	DW
26	Jashpur	Bagicha	Maini	83.5403	22.9806	7.2	6	1.2	DW
27	Jashpur	Kansabel	Muskuti	83.675	22.8625	6.94	3.48	3.46	DW
28	Jashpur	Kunkuri	Matasi	83.8136	22.894	7.23	3.71	3.52	DW
29	Jashpur	Kansabel	Narayanbahal	83.7814	22.6531	7.74	4.05	3.69	DW
30	Jashpur	Pathalgaon	Nawaguda	83.4442	22.5864	6.15	4.89	1.26	DW
31	Jashpur	Pathalgaon	Palidih	83.5069	22.5581	9.4	3.16	6.24	DW
32	Jashpur	Bagicha	Peta	83.5983	22.9594	8	5.65	2.35	DW
33	Jashpur	Kansabel	Phooldih	83.6306	22.9028	4.95	1.7	3.25	DW
34	Jashpur	Bagicha	Raikera	83.6542	22.9347	6.95	4.73	2.22	DW
35	Jashpur	Kunkuri	Raikera	84.025	22.7708	7.42	3.92	3.5	DW
36	Jashpur	Bagicha	Raoni	83.6614	23.0067	5.12	4	1.12	DW
37	Jashpur	Kansabel	Shabdmunda	83.8349	22.5795	8.65	3.9	4.75	DW
38	Jashpur	Kansabel	Saraipani	83.6694	22.7944	6.03	4.25	1.78	DW
39	Jashpur	Kansabel	Tangargaon	83.73236	22.60972	8.75	4.97	3.78	DW
40	Jashpur	Kansabel	Budadand	83.64231	22.89049	5.77	1.1	4.67	DW
41	Jaspur	Kansabel	Thakurtola	83.839662	22.685977	7.65	3.87	3.78	DW
42	Jaspur	Kansabel	Jumaikela	83.833595	22.72994	4.68	3.43	1.25	DW
43	Jaspur	Kunkuri	Goria	83.823897	22.766264	7.56	3.48	4.08	DW
44	Jaspur	Kunkuri	Behrakhar	83.817088	22.79876	7.32	7.2	0.12	DW
45	Jaspur	Bagicha	Ghugri	83.709151	22.822347	6	1.89	4.11	DW
46	Jaspur	Bagicha	Rengola	83.685299	22.833619	4.62	3.1	1.52	DW
47	Jaspur	Bagicha	Dumarkachar	83.685299	22.833619	5.74	3.39	2.35	DW
48	Jaspur	Bagicha	Bamha-Pasiya	83.617546	22.868285	8.07	3.1	4.97	DW
49	Jaspur	Bagicha	Jujgu	83.598552	22.900355	5.65	1.85	3.8	DW
50	Jaspur	Bagicha	Baigakona	83.598552	22.968603	5.9	2.2	3.7	DW
51	Jaspur	Bagicha	Ghurmakona	83.716544	22.988979	3.92	2.4	1.52	DW
52	Jaspur	Bagicha	Bend	83.730124	22.954646	3	2.7	0.3	DW
53	Jaspur	Bagicha	Barpaat	83.691589	23.095692	4.95	1.44	3.51	DW

54	Jaspur	Bagicha	Nanhesir	83.75322	23.160257	4.6	2.65	1.95	DW
55	Jaspur	Bagicha	Champa	83.752308	23.2158	10.8	5.26	5.54	DW
56	Jaspur	Bagicha	Dumarpani	83.694243	22.994871	4.95	1.06	3.89	DW
57	Jaspur	Bagicha	Kamrima	83.725012	23.071241	3.55	2.41	1.14	DW
58	Jaspur	Manora	sardih	83.875801	23.051738	5.85	1	4.85	DW
59	Jaspur	Manora	Dabdara	83.896281	23.030663	9.34	5.03	4.31	DW
60	Jaspur	Manora	sonkyari	83.91302	23.032663	10.1	6.34	3.76	DW
61	Jaspur	Manora	Parasura	83.8234	23.051904	14.9	4.67	10.23	DW
62	Jashpur	Duldula	Bhumra	84.036925	22.754649	8.25	2	6.25	DW
63	Jashpur	Duldula	Telatoli	84.072534	22.730059	7.45	4	3.45	DW
64	Jashpur	Duldula	Sirimkela	84.077582	22.70194	8.2	3.68	4.52	DW
65	Jashpur	Duldula	Barpani	84.090542	22.664133	4.35	3.47	0.88	DW
66	Jashpur	Duldula	Simda	84.099906	22.641672	2.9	2	0.9	DW
67	Jashpur	Duldula	Dipatoli	84.1117	22.703874	8.4	5	3.4	DW
68	Jashpur	Duldula	Bangurkela	84.137624	22.67234	5.95	3.44	2.51	DW
69	Jashpur	Kunkuri	Jamchua	83.992445	22.680125	6.75	4.83	1.92	DW
70	Jashpur	Pathalgaon	Surangpani	83.665996	22.407815	5.1	2.69	2.41	DW
71	Jashpur	Bagicha	Bagicha	83.6542	22.9764	6.3	3.73	2.57	HP
72	Jashpur	Kunkuri	Banderchuha	83.858333	22.686111	9.73	2.5	7.23	HP
73	Jashpur	Kansabel	Kasabel D	83.743056	22.640278	12.88	9.83	3.05	HP
74	Jashpur	Kunkuri	Kunkuri	83.954167	22.741944	21.1	13.2	7.92	HP
75	Jashpur	Farsabahar	Lavakera	83.825	22.404167	10.35	4.18	6.17	HP
76	Jashpur	Kunkuri	Narayanpur	83.8825	22.857222	6.51	3.55	2.96	HP
77	Jashpur	Kansabel	Jumaikela	83.830607	22.736363	7.2	4.34	2.86	HP
78	Jashpur	Kunkuri	Goria	83.823897	22.766264	7.63	5.26	2.37	HP
79	Jashpur	Kunkuri	Behrakhar	83.826600	22.770196	20.5	11.7	8.83	HP
80	Jashpur	Kansabel	Marol	83.765641	22.80178	21.33	12.5	8.88	HP
81	Jashpur	Kansabel	Ghugri	83.710983	22.820864	15.75	8.33	7.42	HP
82	Jashpur	Kansabel	Bambapasiya	83.617546	22.868285	11.02	7.2	3.82	HP
83	Jashpur	Bagicha	Betara	83.734641	22.981104	10.37	6.12	4.25	HP
84	Jashpur	Bagicha	Baigakona	83.598552	22.968603	8.2	5.65	2.55	HP
85	Jashpur	Bagicha	Jujgu	22.900355	83.598552	6.14	3.86	2.28	HP
86	Jashpur	Bagicha	Barpaat	83.650902	23.040291	17.31	10.3	7.03	HP
87	Jashpur	Bagicha	Rouni	83.650902	23.040291	7.33	4.83	2.5	HP
88	Jashpur	Bagicha	Bend	83.730932	22.953838	19.75	9.48	10.27	HP
89	Jashpur	Bagicha	Nanhesir	83.753122	23.160257	6.45	5.88	0.57	HP
90	Jashpur	Bagicha	Sanna	83.811135	23.082678	9.24	5.22	4.02	HP
91	Jashpur	Bagicha	Bahora	83.691589	23.095692	12.33	8.29	4.04	HP
92	Jashpur	Bagicha	khairapaat	83.741448	23.049251	32.3	21.1	11.2	HP
93	Jashpur	Bagicha	Champa	83.753167	23.212563	22	15.4	6.58	HP
94	Jashpur	Manora	Sonkyari	83.91302	23.032663	15.4	8.83	6.57	HP
95	Jashpur	Manora	Dumartoli	83.937457	23.045597	10.3	5.87	4.43	HP
96	Jashpur	Pathalgaon	Jamjhor	83.759903	22.460601	11.85	9.48	2.37	HP
97	Jashpur	Pathalgaon	Baghbara	83.73889	22.54444	8.43	4.42	4.01	HP
98	Jashpur	Pharsabahar	Shirshringa	22.5189	83.8036	8.95	4.75	4.2	HP
99	Jashpur	Duldula	Telatoli	84.072534	22.730059	5.07	4.89	0.18	HP
100	Jashpur	Duldula	Sirimkela	84.077582	22.70194	9.05	7.34	1.71	HP
101	Jashpur	Duldula	Simda	84.099906	22.641672	2.56	2.54	0.02	HP
102	Jashpur	Duldula	Duldula	84.111315	22.70351	31.2	22.4	8.77	HP
103	Jashpur	Duldula	Bangurkela	84.148584	22.678438	12.25	7.56	4.69	HP
104	Jashpur	Duldula	Bipatpur	84.172695	22.669701	9.77	8.43	1.34	HP
105	Jashpur	Duldula	Chatakpur	84.051005	22.699004	7.1	6.33	0.77	HP
106	Jashpur	Duldula	Jamchua	83.992762	22.680436	18.47	11.1	7.42	HP

Annexure 2 Details of Proposed Artificial Recharge Structures

Si. No	District	Block	Panchayat	Village	AR Structure	Longitude	Latitude
1	Jashpur	Bagicha	Durgapara	Durgapara	Check dam	83.5353	22.9766
2	Jashpur	Bagicha	Bimda	Bimda	Check dam	83.5434	22.9704
3	Jashpur	Bagicha	Bimda	Bimda	Check dam	83.5511	22.985
4	Jashpur	Bagicha	Maini	Maini	Check dam	83.5549	22.9974
5	Jashpur	Bagicha	Bimda	Bimda	Check dam	83.5343	22.9603
6	Jashpur	Bagicha	Peta	Sonpur	Check dam	83.5936	22.947
7	Jashpur	Bagicha	Peta	Sonpur	Check dam	83.6052	22.9457
8	Jashpur	Bagicha	Raikera	Rebare	Check dam	83.6563	22.9626
9	Jashpur	Bagicha	Tangardih	Tangardih	Check dam	83.671	22.9586
10	Jashpur	Bagicha	Bhitghra	Bhitghra	Check dam	83.747	22.9332
11	Jashpur	Bagicha	Sarbkambo	Sarbkambo	Check dam	83.7912	22.9175
12	Jashpur	Bagicha	Bhanwar	Sonmuth	Check dam	83.7482	23.0942
13	Jashpur	Bagicha	Bhanwar	Bhanwar	Check dam	83.7647	23.1092
14	Jashpur	Bagicha	Sanna	Sanna	Check dam	83.8071	23.0928
15	Jashpur	Bagicha	Ukai	Bhattha	Check dam	83.8708	23.1511
16	Jashpur	Bagicha	Gailunga	Gailunga	Check dam	83.8156	22.9409
17	Jashpur	Bagicha	Bachhranw		Check dam	83.8286	22.9276
18	Jashpur	Bagicha	Kudmura	Kudmura	Check dam	83.7718	22.8677
19	Jashpur	Bagicha	DhodharAmba	DhodharAmba	Check dam	83.7558	22.8391
20	Jashpur	Bagicha	Ghoghar	Ghoghar	Check dam	83.6963	22.7612
21	Jashpur	Bagicha			Check dam	83.7645	22.7592
22	Jashpur	Bagicha	Basen	Basen	Check dam	83.6605	22.8652
23	Jashpur	Bagicha	Laranga	Lodhena	Check dam	83.7896	23.0504
24	Jashpur	Bagicha	Mahuwadih	Mahuwadih	Check dam	83.6452	22.8305
25	Jashpur	Bagicha	Rouni	Rouni	Check dam	83.6384	23.0184
26	Jashpur	Bagicha	Bagicha	Kurumkela	Check dam	83.6518	22.9857
27	Jashpur	Bagicha	Fuljhar	Gurguri	Check dam	83.8033	23.2172
28	Jashpur	Bagicha	Champa	Champa	Check dam	83.7371	23.2284
29	Jashpur	Bagicha	Dangari	Dangari	Check dam	83.5848	23.1901
30	Jashpur	Bagicha	Marangi	Marangi	Check dam	83.8161	23.2093
31	Jashpur	Bagicha	Khakhra	Khakhra	Check dam	83.7029	23.2053
32	Jashpur	Bagicha	Sulesa	Sulesa	Check dam	83.6589	23.1672
33	Jashpur	Bagicha	Songersa	Sarudhap	Check dam	83.5372	23.0946
34	Jashpur	Bagicha	Kodopara	Kodopara	Check dam	83.7685	23.1776
35	Jashpur	Bagicha	Tora	Parasura	Check dam	83.8168	23.0608
36	Jashpur	Duldula	Manjurchundi		Check dam	83.9814	22.7186
37	Jashpur	Duldula	Kendapani	Kendapani	Check dam	83.9801	22.649
38	Jashpur	Duldula	Gondama	Dhuriya Amba	Check dam	84.0086	22.6161
39	Jashpur	Duldula	Kardega	PandriAmba (Pandripani)	Check dam	84.0183	22.5917
40	Jashpur	Duldula	Kendapani	Kendapani	Check dam	83.9991	22.661
41	Jashpur	Duldula	Manjurchundi		Check dam	83.9761	22.7104
42	Jashpur	Duldula	Chatakpur	Chatakpur	Check dam	84.058	22.7189
43	Jashpur	Duldula	Bhusaditoli	Bhusaditoli	Check dam	84.0709	22.7436
44	Jashpur	Duldula	Jamtoli	Kendapani	Check dam	84.2169	22.7499
45	Jashpur	Duldula	Barpani	Dharen	Check dam	84.2237	22.7951
46	Jashpur	Duldula	Kastura	Kastura	Check dam	84.1714	22.762
47	Jashpur	Duldula	Khatanga	Khatanga	Check dam	84.0859	22.7717
48	Jashpur	Duldula	Manjurchundi		Check dam	84.0076	22.6697
49	Jashpur	Duldula	Manjurchundi		Check dam	83.967	22.6988
50	Jashpur	Duldula	Kardega	PandriAmba (Pandripani)	Check dam	84.0263	22.6033
51	Jashpur	Duldula	Loro	Loro	Check dam	84.1497	22.752

52	Jashpur	Duldula	Barpani	Barpani	Check dam	84.2055	22.8026
53	Jashpur	Duldula	Barpani	Jud Wain	Check dam	84.2383	22.7857
54	Jashpur	Duldula	Barpani	Jud Wain	Check dam	84.2729	22.776
55	Jashpur	Duldula	Barpani	Jud Wain	Check dam	84.2849	22.774
56	Jashpur	Duldula	Chapatoli	Chapatoli	Check dam	84.176	22.8019
57	Jashpur	Duldula	Khatanga	Basudeopur	Check dam	84.1011	22.7705
58	Jashpur	Duldula	Khatanga	Khatanga	Check dam	84.0973	22.7579
59	Jashpur	Duldula	Manjurchundi		Check dam	84.0398	22.7288
60	Jashpur	Duldula	Manjurchundi		Check dam	84.0108	22.7213
61	Jashpur	Duldula	Manjurchundi		Check dam	84.0171	22.6755
62	Jashpur	Duldula	Kendapani	DhandhAmba	Check dam	84.0459	22.6713
63	Jashpur	Duldula	Duldula	Duldula	Check dam	84.1019	22.698
64	Jashpur	Duldula	Dobh	Dobh	Check dam	84.1148	22.6852
65	Jashpur	Duldula	Jhargaon	Kadopani	Check dam	84.1959	22.7063
66	Jashpur	Duldula	Khatanga	Basudeopur	Check dam	84.0976	22.7808
67	Jashpur	Duldula	Sanpghara	Sanpghara	Check dam	84.0882	22.6514
68	Jashpur	Duldula	Kendapani	DhandhAmba	Check dam	84.052	22.6547
69	Jashpur	Jashpur	Girang	Girang	Check dam	84.1716	22.9105
70	Jashpur	Jashpur	Jamtoli	Jamtoli	Check dam	84.3423	22.9476
71	Jashpur	Jashpur	Banaibada	Banaibada	Check dam	84.3388	22.8814
72	Jashpur	Jashpur	Portenga	Bhelwadih	Check dam	84.3114	22.8759
73	Jashpur	Jashpur	Luikona	Khunti Toli	Check dam	84.0872	22.8345
74	Jashpur	Jashpur	Kinkel		Check dam	84.0453	22.8495
75	Jashpur	Jashpur	Kinkel		Check dam	84.0461	22.8237
76	Jashpur	Jashpur	Jashpur Nagar	Bamhanidand	Check dam	84.1195	22.9018
77	Jashpur	Jashpur	Girang	Dipa Toli	Check dam	84.1651	22.8965
78	Jashpur	Jashpur	Purna Nagar	Balachhapar	Check dam	84.1478	22.8562
79	Jashpur	Jashpur	Kanmora	Jobla	Check dam	84.1152	22.8493
80	Jashpur	Jashpur	Rengola	Raikona	Check dam	84.1165	22.8288
81	Jashpur	Jashpur	Sitonga	Sitonga	Check dam	84.1401	22.8242
82	Jashpur	Jashpur	Ratamati	Ratamati	Check dam	84.1818	22.9722
83	Jashpur	Jashpur	Salekera	Salekera	Check dam	84.3237	22.8529
84	Jashpur	Kansabel	Bataikela	Bataikela	Check dam	83.7049	22.7295
85	Jashpur	Kansabel	Bataikela	Bataikela	Check dam	83.7281	22.7342
86	Jashpur	Kansabel	Bataikela	Bataikela	Check dam	83.7165	22.7353
87	Jashpur	Kansabel	Bataikela	Bataikela	Check dam	83.7417	22.7336
88	Jashpur	Kansabel	Sagibhouna	Kharpani	Check dam	83.7663	22.7251
89	Jashpur	Kansabel	Bataikela	Bataikela	Check dam	83.7484	22.7185
90	Jashpur	Kansabel	Chhera Ghoghra	Chhera Ghoghra	Check dam	83.8228	22.7037
91	Jashpur	Kansabel	Jumai Kela	Jumai Kela	Check dam	83.8447	22.744
92	Jashpur	Kansabel	Sagibhouna	Sagibhouna	Check dam	83.7671	22.6979
93	Jashpur	Kansabel	Siharbud	Dandpani	Check dam	83.7496	22.6771
94	Jashpur	Kansabel	Siharbud	Siharbud	Check dam	83.7552	22.6634
95	Jashpur	Kansabel	Kenadand	Madia Jhariya	Check dam	83.8141	22.6785
96	Jashpur	Kansabel	Chetawa	Chetawa	Check dam	83.815	22.6566
97	Jashpur	Kansabel	Sajapani		Check dam	83.6821	22.7015
98	Jashpur	Kansabel	Sajapani		Check dam	83.7031	22.7032
99	Jashpur	Kansabel	Khutera	Khutera	Check dam	83.7093	22.6944
100	Jashpur	Kansabel	Kansabel	Kansabel	Check dam	83.7335	22.6417
101	Jashpur	Kansabel	Farsa Judwain	Dandajor	Check dam	83.7671	22.6404
102	Jashpur	Kansabel	Pusra	Pusra	Check dam	83.7995	22.6294
103	Jashpur	Kansabel	Sujibahar	Sikariya	Check dam	83.8478	22.6383
104	Jashpur	Kansabel	Hathgarha	Hathgarha	Check dam	83.7681	22.5859
105	Jashpur	Kansabel	Kodliya	Kodliya	Check dam	83.7948	22.7376
106	Jashpur	Kansabel	Kenadand	Kenadand	Check dam	83.8317	22.7017
107	Jashpur	Kunkuri	Chatakpur	Chatakpur	Check dam	83.9637	22.8768

108	Jashpur	Kunkuri	Darakharika	Darakharika	Check dam	83.9514	22.8579
109	Jashpur	Kunkuri	Ranikombo	Charaimara	Check dam	83.9376	22.8434
110	Jashpur	Kunkuri	Ranikombo	Ranikombo	Check dam	83.9145	22.8422
111	Jashpur	Kunkuri	Narayanpur	Narayanpur	Check dam	83.9005	22.8593
112	Jashpur	Kunkuri	Bardand	Matasi	Check dam	83.8879	22.8604
113	Jashpur	Kunkuri	Charaikhara	Belsunga	Check dam	83.8203	22.8289
114	Jashpur	Kunkuri	Jokbahala	Kotiya	Check dam	83.8556	22.8378
115	Jashpur	Kunkuri	Goriya	Goriya	Check dam	83.8303	22.7786
116	Jashpur	Kunkuri	Harradand	Tangar Bahari	Check dam	83.857	22.7697
117	Jashpur	Kunkuri	Harradand	Harradand	Check dam	83.8852	22.7504
118	Jashpur	Kunkuri	Barangjor	Barangjor	Check dam	83.915	22.6883
119	Jashpur	Kunkuri	Kharwatoli	Botaidand	Check dam	83.9979	22.8375
120	Jashpur	Kunkuri	Keradih	Keradih	Check dam	84.0015	22.8311
121	Jashpur	Kunkuri	Kamtara	Kamtara	Check dam	84.0139	22.8135
122	Jashpur	Kunkuri	Bhandri	Bhandri	Check dam	84.0179	22.7911
123	Jashpur	Kunkuri	Bhandri	Bhandri	Check dam	84.0199	22.7828
124	Jashpur	Kunkuri	Remate	Remate	Check dam	83.9361	22.7543
125	Jashpur	Kunkuri	Khutgaon(Ambat	Khutgaon (Ambatoli)	Check dam	83.9806	22.8189
126	Jashpur	Manora	Mado	Dhengani	Check dam	83.981	23.1677
127	Jashpur	Manora	Mado	Dhengani	Check dam	83.9913	23.1481
128	Jashpur	Manora	Mado	Gowaru	Check dam	83.9939	23.1408
129	Jashpur	Manora	Khamli	Khamli	Check dam	83.9596	23.1353
130	Jashpur	Manora	Khamli	Andhala	Check dam	83.96	23.1197
131	Jashpur	Manora	Karadari		Check dam	83.961	23.0671
132	Jashpur	Manora	Alori	Alori	Check dam	83.9458	22.9782
133	Jashpur	Manora	Alori	Alori	Check dam	83.943	22.9597
134	Jashpur	Manora	Alori	Alori	Check dam	83.9386	22.9417
135	Jashpur	Manora	Kardana	Chhatouri	Check dam	84.0079	22.9781
136	Jashpur	Manora	Manora	Pakari Toli	Check dam	84.0368	22.9803
137	Jashpur	Manora	Khuntapani	Khuntapani	Check dam	84.0099	22.9245
138	Jashpur	Manora	Remne		Check dam	83.8987	22.9932
139	Jashpur	Manora	Remne	Gedai	Check dam	83.8885	23.0283
140	Jashpur	Manora	Gajma	Kulador	Check dam	84.0918	23.1009
141	Jashpur	Manora	Harri	Kothadih	Check dam	84.0174	23.1299
142	Jashpur	Manora	Tempoo	Kesara	Check dam	84.0792	22.9652
143	Jashpur	Manora	Chadiya	Gorya Toli	Check dam	84.071	22.9789
144	Jashpur	Manora	Kharsota	Khokhso(Benjora)	Check dam	84.1097	23.0112
145	Jashpur	Manora	Ordih	Kandora	Check dam	83.9986	23.0478
146	Jashpur	Manora	Kardana	Dhasma	Check dam	84.0126	23.0233
147	Jashpur	Manora	Remne	Kapsela	Check dam	83.922	22.9657
148	Jashpur	Manora	Gindha	Gindha (Gidha)	Check dam	83.8884	23.1164
149	Jashpur	Manora	Khuntapani	Khuntapani	Check dam	84.021	22.9322
150	Jashpur	Manora	Alori		Check dam	83.8966	22.8978
151	Jashpur	Manora	Harri	Kothadih	Check dam	84.0204	23.1104
152	Jashpur	Manora	Gajma	Kulador	Check dam	84.0938	23.0868
153	Jashpur	Manora	Dadgaon	Dadgaon	Check dam	84.1381	22.9646
154	Jashpur	Manora	Sogda	Sogda	Check dam	84.0795	22.9433
155	Jashpur	Manora	Sardih	Saraidih	Check dam	84.027	23.0903
156	Jashpur	Manora	Kaprol		Check dam	84.0425	23.1102
157	Jashpur	Manora	Madhwa	Madhwa	Check dam	84.1142	23.0345
158	Jashpur	Manora	Chadiya	Gorya Toli	Check dam	84.0648	22.9902
159	Jashpur	Manora	Ordih	Kandora	Check dam	83.9975	23.0415
160	Jashpur	Manora	Khuntapani	Shylla	Check dam	84.0212	22.9478
161	Jashpur	Manora	Sonkyari	Sonkyari	Check dam	83.9075	23.0306

162	Jashpur	Manora	Harra Dipa	Beldih	Check dam	83.9935	23.0556
163	Jashpur	Manora	Asta	Asta	Check dam	83.991	23.1199
164	Jashpur	Manora	Pondi Patkona	Kalaru	Check dam	84.0443	22.8984
165	Jashpur	Manora	Surjula	Surjula	Check dam	84.0186	22.903
166	Jashpur	Pathalgaon	Balajhar	Balajhar	Check dam	83.5753	22.6638
167	Jashpur	Pathalgaon	JamjunWani	Mauhadarha	Check dam	83.5428	22.6616
168	Jashpur	Pathalgaon	Kharkata	Kharkata	Check dam	83.5336	22.6358
169	Jashpur	Pathalgaon	Kharkata	Kharkata	Check dam	83.5484	22.6425
170	Jashpur	Pathalgaon	Pandaripani Ka	Pandaripani Kalan (Pandaripani	Check dam	83.6282	22.6498
171	Jashpur	Pathalgaon	Pandaripani Ka	Pandaripani Kalan (Pandaripani	Check dam	83.617	22.6265
172	Jashpur	Pathalgaon	Pandaripani Ka	Pandaripani Kalan (Pandaripani	Check dam	83.6353	22.6293
173	Jashpur	Pathalgaon	Chandagarh	Chandagarh	Check dam	83.5818	22.6253
174	Jashpur	Pathalgaon	JamjunWani	JamjunWani	Check dam	83.5163	22.6364
175	Jashpur	Pathalgaon	Ila	Batura Kachhar	Check dam	83.4507	22.6286
176	Jashpur	Pathalgaon	Joradol	Joradol	Check dam	83.4057	22.5631
177	Jashpur	Pathalgaon		Pathalgaon	Check dam	83.4365	22.543
178	Jashpur	Pathalgaon		Pathalgaon	Check dam	83.4548	22.536
179	Jashpur	Pathalgaon	Gala	Gala	Check dam	83.4891	22.5047
180	Jashpur	Pathalgaon	Palidih	Palidih	Check dam	83.5057	22.5479
181	Jashpur	Pathalgaon	Diwanpur	Diwanpur	Check dam	83.5013	22.5932
182	Jashpur	Pathalgaon	Mirzapur	Makkapur	Check dam	83.5025	22.6029
183	Jashpur	Pathalgaon	Kodekela [Dhar	Kodekela [Dharjiya B	Check dam	83.5277	22.6125
184	Jashpur	Pathalgaon	Shekharpur	Shekharpur	Check dam	83.6304	22.602
185	Jashpur	Bagicha	Kamarima	Kamarima	Gully plug	83.7231	23.0536
186	Jashpur	Bagicha	Kamarima	Kamarima	Gully plug	83.7148	23.0658
187	Jashpur	Bagicha	Chhichhali	Chhichhali	Gully plug	83.6309	23.0328
188	Jashpur	Bagicha	Lota	Bhatthikona	Gully plug	83.624	23.0266
189	Jashpur	Bagicha	Ratba		Gully plug	83.6814	22.9818
190	Jashpur	Bagicha	Ratba		Gully plug	83.6736	22.9887
191	Jashpur	Bagicha	Ratba	Gamhariya	Gully plug	83.6636	22.9825
192	Jashpur	Bagicha	Bagicha	Bagicha	Gully plug	83.6314	22.9676
193	Jashpur	Bagicha	Bagdol	Jhagarpur	Gully plug	83.613	22.9707
194	Jashpur	Bagicha	Peta	Peta	Gully plug	83.593	22.9684
195	Jashpur	Bagicha	Peta	Peta	Gully plug	83.5836	22.9748
196	Jashpur	Bagicha	Bimda	Bimda	Gully plug	83.5864	22.9894
197	Jashpur	Bagicha	Samarbar	Samarbar	Gully plug	83.576	23.0069
198	Jashpur	Bagicha	Samarbar	Samarbar	Gully plug	83.5576	23.009
199	Jashpur	Bagicha	Maini	Maini	Gully plug	83.538	22.9873
200	Jashpur	Bagicha	Sardih	Sardih	Gully plug	83.5242	22.9698
201	Jashpur	Bagicha	Sardih	Sardih	Gully plug	83.5225	22.9586
202	Jashpur	Bagicha	Jurgum	Khantadand	Gully plug	83.6139	22.9478
203	Jashpur	Bagicha	Peta	Peta	Gully plug	83.585	22.9509
204	Jashpur	Bagicha	Harradipa	Harradipa	Gully plug	83.7931	23.1698
205	Jashpur	Bagicha	Kodopara	Gamharkona	Gully plug	83.781	23.1684
206	Jashpur	Bagicha	Fuljhar	Fuljhar	Gully plug	83.7791	23.1889
207	Jashpur	Bagicha	Sulesa	Sulesa	Gully plug	83.6616	23.1781
208	Jashpur	Bagicha	Sulesa	Sulesa	Gully plug	83.6483	23.1602
209	Jashpur	Bagicha	Fuljhar	Gurguri	Gully plug	83.8034	23.2004
210	Jashpur	Bagicha	Marangi	Marangi	Gully plug	83.8124	23.2008

211	Jashpur	Bagicha	Bedekona	Inchli (Incholi)	Gully plug	83.8032	23.232
212	Jashpur	Bagicha	Fuljhar	Gurguri	Gully plug	83.7894	23.218
213	Jashpur	Bagicha	Champa	Champa	Gully plug	83.7405	23.2238
214	Jashpur	Bagicha	Champa	Champa	Gully plug	83.7315	23.2272
215	Jashpur	Bagicha	Champa	Kurwan (Kurunawa)	Gully plug	83.7435	23.2116
216	Jashpur	Bagicha	Nanhesar	Nanhesar	Gully plug	83.746	23.1989
217	Jashpur	Bagicha	Chhiradih	Chhiradih	Gully plug	83.6675	23.1956
218	Jashpur	Bagicha	Chhiradih	Burjudih	Gully plug	83.6762	23.2209
219	Jashpur	Bagicha	Chhiradih	Burjudih	Gully plug	83.6767	23.214
220	Jashpur	Bagicha	Chhiradih	Chhiradih	Gully plug	83.6902	23.1988
221	Jashpur	Bagicha	Kawai	Kawai	Gully plug	83.7212	23.1928
222	Jashpur	Bagicha	Kawai		Gully plug	83.7133	23.1875
223	Jashpur	Bagicha	Mudhi	Mudhi	Gully plug	83.5394	23.1045
224	Jashpur	Bagicha	Songersa	Sarudhap	Gully plug	83.5272	23.0871
225	Jashpur	Bagicha	Songersa	Songersa	Gully plug	83.5234	23.0759
226	Jashpur	Bagicha	Mudhi	Mudhi	Gully plug	83.5595	23.1093
227	Jashpur	Bagicha	Mudhi	Mudhi	Gully plug	83.572	23.0995
228	Jashpur	Bagicha	Songersa	Sarudhap	Gully plug	83.5566	23.085
229	Jashpur	Bagicha	Songersa	Sarudhap	Gully plug	83.5498	23.0913
230	Jashpur	Bagicha	Bhadiya	Bhadiya	Gully plug	83.5863	23.1159
231	Jashpur	Bagicha	Bhadiya	Bhadiya	Gully plug	83.586	23.1354
232	Jashpur	Bagicha	Bhadiya	Bhadiya	Gully plug	83.5718	23.1369
233	Jashpur	Bagicha	Bhadiya	Bhadiya	Gully plug	83.5735	23.1603
234	Jashpur	Bagicha	Songersa	Songersa	Gully plug	83.5328	23.0681
235	Jashpur	Bagicha	Tora	Parasura	Gully plug	83.8104	23.0509
236	Jashpur	Bagicha	Tora	Parasura	Gully plug	83.8084	23.0646
237	Jashpur	Bagicha	Sanna	Sanna	Gully plug	83.8103	23.101
238	Jashpur	Bagicha	Sanna	Sanna	Gully plug	83.8299	23.1121
239	Jashpur	Bagicha	Sanna	Sanna	Gully plug	83.8078	23.1103
240	Jashpur	Bagicha	Dumarkona	Dumarkona	Gully plug	83.8864	23.1335
241	Jashpur	Bagicha	Dumarkona	Dumarkona	Gully plug	83.8707	23.1331
242	Jashpur	Bagicha	Dumarkona	Dumarkona	Gully plug	83.8602	23.1415
243	Jashpur	Bagicha	Ukai	Bhattha	Gully plug	83.9037	23.1762
244	Jashpur	Bagicha	Ukai	Ukai	Gully plug	83.8603	23.2014
245	Jashpur	Bagicha	Loro	Bhadu	Gully plug	83.7539	23.1448
246	Jashpur	Bagicha	Loro	Loro	Gully plug	83.7659	23.1306
247	Jashpur	Bagicha	Bahora	Bahora	Gully plug	83.7458	23.1137
248	Jashpur	Bagicha	Loro	Ankarikona	Gully plug	83.7841	23.1086
249	Jashpur	Bagicha	Bhanwar	Sonmuth	Gully plug	83.7529	23.0884
250	Jashpur	Bagicha	Bhanwar	Sonmuth	Gully plug	83.7471	23.085
251	Jashpur	Bagicha	Kaliya	Kaliya	Gully plug	83.799	22.9614
252	Jashpur	Bagicha	Kaliya	Kaliya	Gully plug	83.81	22.9579
253	Jashpur	Bagicha	Dobh		Gully plug	83.8294	22.9519
254	Jashpur	Bagicha	Bachhranw	Bachhranw	Gully plug	83.846	22.9284
255	Jashpur	Bagicha	Gailunga		Gully plug	83.7955	22.9284
256	Jashpur	Bagicha	Bhitghra		Gully plug	83.7403	22.923
257	Jashpur	Bagicha	Bhitghra	Bhitghra	Gully plug	83.7336	22.9313
258	Jashpur	Bagicha	Kaliya	Dumarpani	Gully plug	83.7405	22.9425
259	Jashpur	Bagicha	Sarbkambo	Kuhapani	Gully plug	83.7808	22.9275
260	Jashpur	Bagicha			Gully plug	83.7704	22.7704
261	Jashpur	Bagicha	Ghoghar	Ghoghar	Gully plug	83.7012	22.7836
262	Jashpur	Bagicha	Ghoghar	Ghoghar	Gully plug	83.6901	22.7773
263	Jashpur	Bagicha	Ghoghar	Ghoghar	Gully plug	83.6793	22.7988
264	Jashpur	Bagicha	Gudalu	Gudalu	Gully plug	83.6393	22.8478
265	Jashpur	Bagicha	Marol	Samdura	Gully plug	83.7483	22.7681
266	Jashpur	Duldula	Kendapani	Fotakosemar	Gully plug	83.9766	22.66

267	Jashpur	Duldula	Kendapani	Kendapani	Gully plug	83.9985	22.6511
268	Jashpur	Duldula	Kendapani	Kendapani	Gully plug	84.0122	22.6587
269	Jashpur	Duldula	Manjurchundi		Gully plug	84.0275	22.6668
270	Jashpur	Duldula	Manjurchundi		Gully plug	84.012	22.6835
271	Jashpur	Duldula	Manjurchundi		Gully plug	84.0014	22.6793
272	Jashpur	Duldula	Manjurchundi		Gully plug	84.0256	22.6839
273	Jashpur	Duldula	Kendapani	DhandhAmba	Gully plug	84.0527	22.6647
274	Jashpur	Duldula	Kendapani	DhandhAmba	Gully plug	84.0404	22.6482
275	Jashpur	Duldula	Simral	Simral (Simda)	Gully plug	84.0699	22.6586
276	Jashpur	Duldula	Sanpghara	Barpani	Gully plug	84.0862	22.6609
277	Jashpur	Duldula	Dobh	Dobh	Gully plug	84.1252	22.678
278	Jashpur	Duldula	Dobh	Dobh	Gully plug	84.1191	22.6956
279	Jashpur	Duldula	Duldula	Khutitoli	Gully plug	84.0581	22.7264
280	Jashpur	Duldula	Manjurchundi		Gully plug	84.0272	22.7326
281	Jashpur	Duldula	Manjurchundi		Gully plug	84.0099	22.7303
282	Jashpur	Duldula	Manjurchundi		Gully plug	83.9794	22.7247
283	Jashpur	Duldula	Kardega	Kardega	Gully plug	84.0218	22.6275
284	Jashpur	Duldula	Kardega	Kardega	Gully plug	84.0275	22.6211
285	Jashpur	Duldula	MakariBandha	MakariBandha	Gully plug	84.039	22.6112
286	Jashpur	Duldula	MakariBandha	MakariBandha	Gully plug	84.0393	22.5976
287	Jashpur	Duldula	Jampani	Jampani	Gully plug	84.2176	22.7633
288	Jashpur	Duldula	Jamtoli	Kendapani	Gully plug	84.2022	22.7547
289	Jashpur	Duldula	Chapatoli	Chapatoli	Gully plug	84.1784	22.7778
290	Jashpur	Duldula	Kastura	Kastura	Gully plug	84.1941	22.7718
291	Jashpur	Duldula	Loro	Loro	Gully plug	84.1577	22.76
292	Jashpur	Duldula	Khatanga	Basudeopur	Gully plug	84.1092	22.7843
293	Jashpur	Duldula	Khatanga	Basudeopur	Gully plug	84.0998	22.7942
294	Jashpur	Duldula	Charaidand	Charaidand	Gully plug	84.0886	22.7763
295	Jashpur	Duldula	Khatanga	Basudeopur	Gully plug	84.1073	22.7634
296	Jashpur	Duldula	Patratoli	Patratoli	Gully plug	84.1193	22.7526
297	Jashpur	Duldula	Chapatoli	Chapatoli	Gully plug	84.163	22.8096
298	Jashpur	Duldula	Chapatoli	Hatklata	Gully plug	84.1988	22.816
299	Jashpur	Duldula	Chapatoli	Hatklata	Gully plug	84.1867	22.8142
300	Jashpur	Duldula	Barpani	Jud Wain	Gully plug	84.2359	22.8001
301	Jashpur	Duldula	Barpani	Jud Wain	Gully plug	84.2458	22.7941
302	Jashpur	Duldula	Barpani	Jud Wain	Gully plug	84.2651	22.7866
303	Jashpur	Duldula	Korna	Tangrtoli	Gully plug	84.1926	22.6963
304	Jashpur	Duldula	Jamtoli	Kendapani	Gully plug	84.2121	22.7424
305	Jashpur	Duldula	Barpani	Dharen	Gully plug	84.2165	22.8046
306	Jashpur	Duldula	Barpani	Dharen	Gully plug	84.2297	22.8118
307	Jashpur	Duldula	Barpani	Jud Wain	Gully plug	84.2813	22.7806
308	Jashpur	Duldula	Barpani	Jud Wain	Gully plug	84.2864	22.7698
309	Jashpur	Duldula	Charaidand	Charaidand	Gully plug	84.0798	22.7861
310	Jashpur	Duldula	Manjurchundi		Gully plug	84.0126	22.6913
311	Jashpur	Duldula	Manjurchundi		Gully plug	83.9886	22.7028
312	Jashpur	Duldula	Simral	Simral (Simda)	Gully plug	84.0687	22.645
313	Jashpur	Duldula	MakariBandha	MakariBandha	Gully plug	84.0707	22.6353
314	Jashpur	Duldula	Chapatoli	Chapatoli	Gully plug	84.1706	22.7861
315	Jashpur	Duldula	Jampani	Jampani	Gully plug	84.2037	22.7853
316	Jashpur	Duldula	Jampani	Jampani	Gully plug	84.2219	22.7739
317	Jashpur	Duldula	Khatanga	Basudeopur	Gully plug	84.1211	22.772
318	Jashpur	Duldula	Manjurchundi		Gully plug	83.979	22.6955
319	Jashpur	Duldula	Manjurchundi		Gully plug	83.9972	22.7241
320	Jashpur	Duldula	Chatakpur	Dandahadih	Gully plug	84.0402	22.7183
321	Jashpur	Duldula	Korna	Korna	Gully plug	84.1411	22.6886
322	Jashpur	Duldula	Dobh	Dandpani	Gully plug	84.1224	22.6601
323	Jashpur	Duldula	Kendapani		Gully plug	84.0057	22.6388

324	Jashpur	Duldula	Gattibuda	Gattibuda	Gully plug	83.9668	22.626
325	Jashpur	Jashpur	Girang	Girang	Gully plug	84.1826	22.9058
326	Jashpur	Jashpur	Girang	Girang	Gully plug	84.1785	22.918
327	Jashpur	Jashpur	Baghima	Tikait Ganj	Gully plug	84.1622	22.9143
328	Jashpur	Jashpur	Jashpur Nagar	Jashpur Nagar	Gully plug	84.1241	22.8957
329	Jashpur	Jashpur	Sarudih	Komdo	Gully plug	84.1121	22.8992
330	Jashpur	Jashpur	Jashpur Nagar	Bamhanidand	Gully plug	84.1116	22.9055
331	Jashpur	Jashpur	Purna Nagar		Gully plug	84.121	22.8577
332	Jashpur	Jashpur	Kanmora	Jobla	Gully plug	84.1105	22.8535
333	Jashpur	Jashpur	Sitonga	Sitonga	Gully plug	84.1206	22.8168
334	Jashpur	Jashpur	Sitonga	Sitonga	Gully plug	84.1415	22.8122
335	Jashpur	Jashpur	Kinkel		Gully plug	84.0759	22.8183
336	Jashpur	Jashpur	Kinkel	Kere	Gully plug	84.0766	22.828
337	Jashpur	Jashpur	Kinkel		Gully plug	84.0401	22.8537
338	Jashpur	Jashpur	Portenga	Bhelwadih	Gully plug	84.3112	22.8956
339	Jashpur	Jashpur	Portenga	Bhelwadih	Gully plug	84.2969	22.8909
340	Jashpur	Jashpur	Salekera	Ranpur	Gully plug	84.2905	22.8842
341	Jashpur	Jashpur	Pilkhi	Dholduba	Gully plug	84.3473	22.8869
342	Jashpur	Jashpur	Banaibada	Banaibada	Gully plug	84.3363	22.8885
343	Jashpur	Jashpur	Banaibada	Banaibada	Gully plug	84.3278	22.8852
344	Jashpur	Jashpur	Jamtoli	Jamtoli	Gully plug	84.3217	22.9374
345	Jashpur	Jashpur	Chailitangar T	Charaidand	Gully plug	84.3342	22.9314
346	Jashpur	Jashpur	Putrichoura	Konbira	Gully plug	84.3438	22.9366
347	Jashpur	Jashpur	Badakorenja	Badakorenja	Gully plug	84.2017	22.9645
348	Jashpur	Jashpur	Painku	Painku	Gully plug	84.193	22.9821
349	Jashpur	Jashpur	Neemgaon	Neemgaon	Gully plug	84.18	22.9559
350	Jashpur	Jashpur	Boki	Boki	Gully plug	84.2039	22.8466
351	Jashpur	Jashpur	Devidand Gaon	Jhilmili	Gully plug	84.2198	22.8572
352	Jashpur	Jashpur	Ichkela	Ichkela	Gully plug	84.1909	22.8546
353	Jashpur	Kansabel	Nakbar	Nakbar	Gully plug	83.6827	22.7333
354	Jashpur	Kansabel	Bataikela	Bataikela	Gully plug	83.7066	22.7395
355	Jashpur	Kansabel	Bataikela	Bataikela	Gully plug	83.7218	22.7418
356	Jashpur	Kansabel	Bataikela	Bataikela	Gully plug	83.74	22.748
357	Jashpur	Kansabel	Bataikela	Bataikela	Gully plug	83.7494	22.7384
358	Jashpur	Kansabel	Bataikela	Bataikela	Gully plug	83.7334	22.7398
359	Jashpur	Kansabel	Sajapani		Gully plug	83.7061	22.7105
360	Jashpur	Kansabel	Sajapani		Gully plug	83.6977	22.7116
361	Jashpur	Kansabel	Sajapani		Gully plug	83.6793	22.7071
362	Jashpur	Kansabel	Sajapani		Gully plug	83.6722	22.7023
363	Jashpur	Kansabel	Sajapani		Gully plug	83.7136	22.701
364	Jashpur	Kansabel	Sagibhouna		Gully plug	83.7721	22.73
365	Jashpur	Kansabel	Sagibhouna	Kharpani	Gully plug	83.7624	22.7291
366	Jashpur	Kansabel	Sagibhouna	Kharpani	Gully plug	83.7558	22.7272
367	Jashpur	Kansabel	Bataikela	Bataikela	Gully plug	83.7466	22.7219
368	Jashpur	Kansabel	Kenadand	Kenadand	Gully plug	83.8349	22.707
369	Jashpur	Kansabel	Chhera Ghoghra	Chhera Ghoghra	Gully plug	83.8284	22.7149
370	Jashpur	Kansabel	Jumai Kela	Jumai Kela	Gully plug	83.8341	22.7397
371	Jashpur	Kansabel	Chhera Ghoghra	Chhera Ghoghra	Gully plug	83.8168	22.713
372	Jashpur	Kansabel	Chetawa	Chetawa	Gully plug	83.8042	22.6783
373	Jashpur	Kansabel	Chetawa	Chetawa	Gully plug	83.8124	22.6615
374	Jashpur	Kansabel	Farsa Judwain	Dandajor	Gully plug	83.7618	22.6405
375	Jashpur	Kansabel	Siharbud	Siharbud	Gully plug	83.765	22.6675
376	Jashpur	Kansabel	Siharbud	Dandpani	Gully plug	83.7617	22.6835
377	Jashpur	Kansabel	Kansabel	Kansabel	Gully plug	83.736	22.6494
378	Jashpur	Kansabel	Pongro	Pongro	Gully plug	83.7268	22.6519

379	Jashpur	Kansabel	Pusra	Pusra	Gully plug	83.8032	22.6336
380	Jashpur	Kansabel	Sujibahar	Sikariya	Gully plug	83.8363	22.6403
381	Jashpur	Kansabel	Sujibahar	Sikariya	Gully plug	83.8404	22.6332
382	Jashpur	Kansabel	Chhera Ghoghra	Chhera Ghoghra	Gully plug	83.7874	22.706
383	Jashpur	Kansabel	Sagibhouna	Sagibhouna	Gully plug	83.7787	22.7053
384	Jashpur	Kansabel	Sagibhouna	Sagibhouna	Gully plug	83.7661	22.703
385	Jashpur	Kansabel	Jumai Kela	Jumai Kela	Gully plug	83.8263	22.7402
386	Jashpur	Kansabel	Bataikela	Bataikela	Gully plug	83.729	22.7451
387	Jashpur	Kansabel	Khutera	Khutera	Gully plug	83.7179	22.6841
388	Jashpur	Kansabel	Khutera	Khutera	Gully plug	83.7113	22.6818
389	Jashpur	Kansabel	Kusumtal	Kusumtal	Gully plug	83.7089	22.6711
390	Jashpur	Kansabel	Kenadand	Madia Jhariya	Gully plug	83.804	22.6939
391	Jashpur	Kansabel	Chhera Ghoghra	Chhera Ghoghra	Gully plug	83.8073	22.7012
392	Jashpur	Kansabel	Kodliya	Baiga Amba	Gully plug	83.8133	22.7235
393	Jashpur	Kansabel	Kodliya	Baiga Amba	Gully plug	83.8141	22.7345
394	Jashpur	Kansabel	Sajapani	Sajapani	Gully plug	83.682	22.6888
395	Jashpur	Kansabel	Sajapani	Sajapani	Gully plug	83.6821	22.6942
396	Jashpur	Kansabel	Sagibhouna		Gully plug	83.7705	22.7205
397	Jashpur	Kunkuri	Darakharika	Darakharika	Gully plug	83.9441	22.8665
398	Jashpur	Kunkuri	Darakharika	Hastinapur	Gully plug	83.9361	22.8524
399	Jashpur	Kunkuri	Narayanpur	Chitakwain	Gully plug	83.9219	22.8506
400	Jashpur	Kunkuri	Narayanpur	Chitakwain	Gully plug	83.9157	22.8628
401	Jashpur	Kunkuri	Narayanpur	Narayanpur	Gully plug	83.9089	22.8658
402	Jashpur	Kunkuri	Bardand	Matasi	Gully plug	83.8821	22.8666
403	Jashpur	Kunkuri	Kharwatoli	Botaidand	Gully plug	84.0096	22.8503
404	Jashpur	Kunkuri	Joratarai	Nawapara	Gully plug	84.0012	22.8538
405	Jashpur	Kunkuri	Kharwatoli	Kharwatoli	Gully plug	84.0147	22.8356
406	Jashpur	Kunkuri	Kharwatoli	Dumartoli	Gully plug	84.01	22.8396
407	Jashpur	Kunkuri	Jokari	Jokari	Gully plug	84.025	22.8156
408	Jashpur	Kunkuri	Jokari	Jokari	Gully plug	84.0203	22.8225
409	Jashpur	Kunkuri	Bhandri	Deobora	Gully plug	84.0351	22.7804
410	Jashpur	Kunkuri	Bhandri	Ganjhar	Gully plug	84.0331	22.7902
411	Jashpur	Kunkuri	Bhandri	Ganjhar	Gully plug	84.0279	22.7976
412	Jashpur	Kunkuri	Raikera	Raikera	Gully plug	84.0292	22.7717
413	Jashpur	Kunkuri	Raikera	Bhursa	Gully plug	84.0145	22.7694
414	Jashpur	Kunkuri	Lodhma	Lodhma	Gully plug	84.0062	22.7759
415	Jashpur	Kunkuri	Barangjor	Barangjor	Gully plug	83.9151	22.6998
416	Jashpur	Kunkuri	Barangjor	Barangjor	Gully plug	83.9213	22.6968
417	Jashpur	Kunkuri	Dondapani	Dondapani	Gully plug	83.8906	22.7219
418	Jashpur	Kunkuri	Dondapani	Dondapani	Gully plug	83.8839	22.7254
419	Jashpur	Kunkuri	Harradand	Harradand	Gully plug	83.8847	22.7609
420	Jashpur	Kunkuri	Harradand	Harradand	Gully plug	83.8736	22.7537
421	Jashpur	Kunkuri	BemataToli	BemataToli	Gully plug	83.9767	22.7693
422	Jashpur	Kunkuri	Gina Bahar	Gina Bahar	Gully plug	83.9614	22.7641
423	Jashpur	Kunkuri	Ghumadand	Ghumadand	Gully plug	83.9802	22.7552
424	Jashpur	Kunkuri	Remate	Remate	Gully plug	83.9565	22.7461
425	Jashpur	Kunkuri	Rengarghat	Rengarghat	Gully plug	83.967	22.8414
426	Jashpur	Kunkuri	Joratarai	Chitak Wain	Gully plug	83.9758	22.837
427	Jashpur	Kunkuri	Khutgaon(Ambat	Khutgaon(Ambatoli)	Gully plug	83.9687	22.8088
428	Jashpur	Kunkuri	Khutgaon(Ambat	Khutgaon(Ambatoli)	Gully plug	83.9828	22.7975
429	Jashpur	Kunkuri	Kudukela	Kudukela	Gully plug	83.9525	22.8187
430	Jashpur	Manora	Irai	Irai	Gully plug	84	23.1736
431	Jashpur	Manora	Irai	Irai	Gully plug	83.9932	23.1766

432	Jashpur	Manora	Mado	Ajdha	Gully plug	84.0077	23.1492
433	Jashpur	Manora	Irai	Irai	Gully plug	83.9946	23.1551
434	Jashpur	Manora	Khamli	Khamli	Gully plug	83.9513	23.1439
435	Jashpur	Manora	Asta	Benjora	Gully plug	83.9588	23.1092
436	Jashpur	Manora	Khamli		Gully plug	83.9422	23.1318
437	Jashpur	Manora	Gindha	Gindha (Gidha)	Gully plug	83.8979	23.1229
438	Jashpur	Manora	Harri	Khadkona	Gully plug	84.0255	23.1407
439	Jashpur	Manora	Harri	Khadkona	Gully plug	84.0327	23.1319
440	Jashpur	Manora	Harri	Harri	Gully plug	84.04	23.1231
441	Jashpur	Manora	Harri	Harri	Gully plug	84.0546	23.1127
442	Jashpur	Manora	Kaprol		Gully plug	84.0365	23.0963
443	Jashpur	Manora	Sardih	Sardih	Gully plug	84.0109	23.1063
444	Jashpur	Manora	Gajma	Kulador	Gully plug	84.0864	23.0837
445	Jashpur	Manora	Gajma	Kulador	Gully plug	84.0865	23.092
446	Jashpur	Manora	Gajma	Kulador	Gully plug	84.1074	23.0825
447	Jashpur	Manora	Gajma	Kulador	Gully plug	84.1034	23.0971
448	Jashpur	Manora	Madhwa	Madhwa	Gully plug	84.1075	23.0455
449	Jashpur	Manora	Madhwa	Madhwa	Gully plug	84.1052	23.028
450	Jashpur	Manora	Kharsota	Khokhso(Benjora)	Gully plug	84.1007	23.0076
451	Jashpur	Manora	Kharsota	Khokhso(Benjora)	Gully plug	84.1149	23.0055
452	Jashpur	Manora	Kantabel	Kantabel	Gully plug	84.0759	22.9967
453	Jashpur	Manora	Kantabel	Kantabel	Gully plug	84.0675	23.0016
454	Jashpur	Manora	Manora	Manora	Gully plug	84.0586	23.0027
455	Jashpur	Manora	Manora	Manora	Gully plug	84.0554	22.9969
456	Jashpur	Manora	Kantabel	Kantabel	Gully plug	84.0821	22.9839
457	Jashpur	Manora	Chadiya	Chadiya	Gully plug	84.0972	22.9775
458	Jashpur	Manora	Chadiya	Chadiya	Gully plug	84.0923	22.9624
459	Jashpur	Manora	Sogda	Sogda	Gully plug	84.0899	22.9371
460	Jashpur	Manora	Sogda	Sogda	Gully plug	84.08	22.9382
461	Jashpur	Manora	Tempoo		Gully plug	84.0679	22.9437
462	Jashpur	Manora	Kharsota	Kharsota	Gully plug	84.1314	22.9762
463	Jashpur	Manora	Dadgaon	Dadgaon	Gully plug	84.1387	22.9766
464	Jashpur	Manora	Harra Dipa	Beldih	Gully plug	84.0025	23.0621
465	Jashpur	Manora	Harra Dipa	Beldih	Gully plug	83.9952	23.07
466	Jashpur	Manora	Ordih	Ordih	Gully plug	84.0103	23.0523
467	Jashpur	Manora	Ordih	Ordih	Gully plug	84.0165	23.044
468	Jashpur	Manora	Ordih	Kandora	Gully plug	83.9895	23.0301
469	Jashpur	Manora	Khonga	Bhimsila	Gully plug	84.0226	23.0293
470	Jashpur	Manora	Khonga	Bhimsila	Gully plug	84.0143	23.0343
471	Jashpur	Manora	Manora	Pakari Toli	Gully plug	84.0479	22.9848
472	Jashpur	Manora	Manora	Pakari Toli	Gully plug	84.0427	22.9907
473	Jashpur	Manora	Manora	Pakari Toli	Gully plug	84.0353	22.9902
474	Jashpur	Manora	Ghaghra	Shakardih	Gully plug	84.0122	22.9871
475	Jashpur	Manora	Kardana	Chhatouri	Gully plug	83.9985	22.9843
476	Jashpur	Manora	Kardana	Chhatouri	Gully plug	83.9963	22.9755
477	Jashpur	Manora	Khuntapani	Shylla	Gully plug	84.0101	22.9438
478	Jashpur	Manora	Khuntapani	Shylla	Gully plug	83.9939	22.9478
479	Jashpur	Manora	Sonkyari	Sonkyari	Gully plug	83.9123	23.0391
480	Jashpur	Manora	Sonkyari	Sonkyari	Gully plug	83.8912	23.0354
481	Jashpur	Manora	Remne	Remne	Gully plug	83.904	23.0041
482	Jashpur	Manora	Remne		Gully plug	83.8851	23.0048
483	Jashpur	Manora	Remne	Kapsela	Gully plug	83.9089	22.9695
484	Jashpur	Manora	Alori	Alori	Gully plug	83.93	22.9718
485	Jashpur	Manora	Patia	Patia	Gully plug	83.9846	22.9625

486	Jashpur	Manora	Patia	Patia	Gully plug	83.9735	22.9577
487	Jashpur	Manora	Pondi Patkona	Kalaru	Gully plug	84.0496	22.9039
488	Jashpur	Manora	Surjula	Surjula	Gully plug	84.0171	22.9116
489	Jashpur	Manora	Surjula	Surjula	Gully plug	84.017	22.8974
490	Jashpur	Manora	Surjula	Surjula	Gully plug	84.0359	22.9031
491	Jashpur	Manora	Alori		Gully plug	83.9188	22.9032
492	Jashpur	Manora	Alori		Gully plug	83.9035	22.9048
493	Jashpur	Manora	Alori		Gully plug	83.8799	22.9089
494	Jashpur	Manora	Surjula	Surjula	Gully plug	84.0056	22.9117
495	Jashpur	Manora	Dadgaon	Jaimarga	Gully plug	84.1322	23.0005
496	Jashpur	Manora	Kharsota	Kharsota	Gully plug	84.1249	22.964
497	Jashpur	Manora	Sardih	Sardih	Gully plug	84.0002	23.0981
498	Jashpur	Pathalgaon	Balajhar	Balajhar	Gully plug	83.5869	22.6693
499	Jashpur	Pathalgaon	Balajhar	Balajhar	Gully plug	83.5759	22.6728
500	Jashpur	Pathalgaon	JamjunWani		Gully plug	83.5659	22.6743
501	Jashpur	Pathalgaon	JamjunWani	Mauhadarha	Gully plug	83.5412	22.6686
502	Jashpur	Pathalgaon	Rairuma Kalan	Rairuma Kalan	Gully plug	83.5265	22.66
503	Jashpur	Pathalgaon	JamjunWani	JamjunWani	Gully plug	83.5358	22.6463
504	Jashpur	Pathalgaon	JamjunWani	JamjunWani	Gully plug	83.5117	22.6416
505	Jashpur	Pathalgaon	JamjunWani	JamjunWani	Gully plug	83.5048	22.6387
506	Jashpur	Pathalgaon	Khardhodhi	Khardhodhi	Gully plug	83.5079	22.6309
507	Jashpur	Pathalgaon	Kerakachhar	Kerakachhar	Gully plug	83.4701	22.6292
508	Jashpur	Pathalgaon	Kerakachhar	Kerakachhar	Gully plug	83.465	22.6375
509	Jashpur	Pathalgaon	Susdega	Susdega	Gully plug	83.4477	22.6405
510	Jashpur	Pathalgaon	Khardhodhi	Khardhodhi	Gully plug	83.5268	22.6269
511	Jashpur	Pathalgaon	Chandagarh	Chandagarh	Gully plug	83.5887	22.6352
512	Jashpur	Pathalgaon	Chandagarh	Chandagarh	Gully plug	83.5803	22.6362
513	Jashpur	Pathalgaon	Tamta	Tamta	Gully plug	83.604	22.6487
514	Jashpur	Pathalgaon	Pandaripani Ka		Gully plug	83.6125	22.655
515	Jashpur	Pathalgaon	Pandaripani Ka		Gully plug	83.6293	22.6597
516	Jashpur	Pathalgaon	Pandaripani Ka	Pandaripani Kalan (P	Gully plug	83.627	22.6393
517	Jashpur	Pathalgaon	Pandaripani Ka	Pandaripani Kalan (P	Gully plug	83.6165	22.6389
518	Jashpur	Pathalgaon	Chandagarh	Chandagarh	Gully plug	83.6023	22.6351
519	Jashpur	Pathalgaon	Pakargaon	Pakargaon	Gully plug	83.519	22.5753
520	Jashpur	Pathalgaon	Raghunathpur	Tuku Pakhana	Gully plug	83.5144	22.5929
521	Jashpur	Pathalgaon	Karmitikara	Karmitikara	Gully plug	83.4874	22.6184
522	Jashpur	Pathalgaon	Mirzapur	Mirzapur	Gully plug	83.4883	22.6057
523	Jashpur	Pathalgaon	Mirzapur		Gully plug	83.5073	22.6134
524	Jashpur	Pathalgaon	Kodekela [Dhar	Kodekela [Dharjiya B	Gully plug	83.5339	22.6039
525	Jashpur	Pathalgaon	Kodekela [Dhar	Kodekela [Dharjiya B	Gully plug	83.5465	22.6053
526	Jashpur	Pathalgaon	Kodekela [Dhar	Hirapur	Gully plug	83.5649	22.6076
527	Jashpur	Pathalgaon	Kodekela [Dhar	Hirapur	Gully plug	83.5553	22.5945
528	Jashpur	Pathalgaon	Palidih	Palidih	Gully plug	83.4905	22.5507
529	Jashpur	Pathalgaon		Pathalgaon	Gully plug	83.4758	22.5454
530	Jashpur	Pathalgaon		Pathalgaon	Gully plug	83.4506	22.5451
531	Jashpur	Pathalgaon		Pathalgaon	Gully plug	83.447	22.5548
532	Jashpur	Pathalgaon	Kumekela	Kumekela	Gully plug	83.4477	22.5724
533	Jashpur	Pathalgaon	Joradol	Joradol	Gully plug	83.4262	22.5783
534	Jashpur	Pathalgaon	Joradol	Joradol	Gully plug	83.4063	22.5721
535	Jashpur	Pathalgaon	Mudapara	Mudapara	Gully plug	83.5293	22.546
536	Jashpur	Pathalgaon	Pangswa	Pangswa (Pangsua)	Gully plug	83.528	22.5212

537	Jashpur	Pathalgaon	Jhakadpur [Ben	Jhakadpur [Bendojor]	Gully plug	83.5034	22.5214
538	Jashpur	Bagicha	Champa	Champa	Percolation Tank	83.7562	23.2188
539	Jashpur	Bagicha	Bimda	Bimda	Percolation Tank	83.5446	22.9643
540	Jashpur	Bagicha	Dobh	Tamaya	Percolation Tank	83.8811	22.9685
541	Jashpur	Bagicha	Ranpur	Ranpur	Percolation Tank	83.7894	22.832
542	Jashpur	Bagicha	Saraipani	Saraipani	Percolation Tank	83.6673	22.8028
543	Jashpur	Bagicha	Mudhi	Mudhi	Percolation Tank	83.5679	23.1102
544	Jashpur	Bagicha	Laranga	Laranga	Percolation Tank	83.7974	23.0179
545	Jashpur	Bagicha	Harradipa	Harradipa	Percolation Tank	83.7956	23.1571
546	Jashpur	Bagicha	Sulesa	Sulesa	Percolation Tank	83.6474	23.1758
547	Jashpur	Bagicha	Rokda	Mahadeojobla	Percolation Tank	83.6175	23.0057
548	Jashpur	Bagicha	Kudmura	Kudmura	Percolation Tank	83.8013	22.8699
549	Jashpur	Duldula	Chherdand	Chherdand	Percolation Tank	84.1284	22.7267
550	Jashpur	Duldula	Raidih	Gidhasand	Percolation Tank	84.1744	22.7097
551	Jashpur	Duldula	Jamtoli	Pakartoli	Percolation Tank	84.1757	22.734
552	Jashpur	Duldula	Bhusaditoli	Bhusaditoli	Percolation Tank	84.0897	22.732
553	Jashpur	Duldula	Manjurchundi		Percolation Tank	84.0085	22.7065
554	Jashpur	Duldula	Dobh	Dandpani	Percolation Tank	84.1202	22.6489
555	Jashpur	Duldula	Jhargaon	Jhargaon	Percolation Tank	84.2173	22.6966
556	Jashpur	Duldula	Kendapani	Kendapani	Percolation Tank	84.0183	22.6411
557	Jashpur	Duldula	Simral	Simral (Simda)	Percolation Tank	84.0712	22.6747
558	Jashpur	Duldula	Gondama	Gondama	Percolation Tank	83.9805	22.6356
559	Jashpur	Jashpur	Salekera	Salekera	Percolation Tank	84.3171	22.8639
560	Jashpur	Jashpur	Jakba	Dabnipani	Percolation Tank	84.2478	22.8686
561	Jashpur	Jashpur	Gamhariya	Gamhariya	Percolation Tank	84.1595	22.8685
562	Jashpur	Jashpur	Jashpur Nagar	Jashpur Nagar	Percolation Tank	84.145	22.8852
563	Jashpur	Jashpur	Lodam	Lodam	Percolation Tank	84.3634	22.9539
564	Jashpur	Kansabel	Kansabel	Kansabel	Percolation Tank	83.7342	22.6563
565	Jashpur	Kansabel	Tangargaon	Tangargaon	Percolation Tank	83.736	22.627
566	Jashpur	Kansabel	Farsa Judwain	Dandajor	Percolation Tank	83.7741	22.6589
567	Jashpur	Kansabel	Pongro		Percolation Tank	83.6994	22.6371
568	Jashpur	Kansabel	Sagibhouna		Percolation Tank	83.7419	22.6981
569	Jashpur	Kansabel	Chidora	Chidora	Percolation Tank	83.7017	22.6643

570	Jashpur	Kansabel	Barjor	Barjor	Percolation Tank	83.7705	22.6092
571	Jashpur	Kunkuri	Charaikhara	Charaikhara	Percolation Tank	83.8353	22.8063
572	Jashpur	Kunkuri	Barangjor	Barangjor	Percolation Tank	83.9276	22.6955
573	Jashpur	Kunkuri	Rengarghat	Bilaspur	Percolation Tank	83.9512	22.8365
574	Jashpur	Kunkuri	Ranikombo	Ranikombo	Percolation Tank	83.8892	22.839
575	Jashpur	Kunkuri	Kaliba	Kaliba	Percolation Tank	83.8676	22.7837
576	Jashpur	Kunkuri	Dondapani	Dondapani	Percolation Tank	83.8881	22.7319
577	Jashpur	Manora	Patia	Patia	Percolation Tank	83.9649	22.9434
578	Jashpur	Manora	Patia	Orkela	Percolation Tank	83.9847	22.9287
579	Jashpur	Manora	Khuntapani	Shylla	Percolation Tank	84.028	22.9429
580	Jashpur	Manora	Gindha	Gindha (Gidha)	Percolation Tank	83.9086	23.088
581	Jashpur	Manora	Karadari	Karadari	Percolation Tank	83.9716	23.0738
582	Jashpur	Manora	Kardana	Kardana	Percolation Tank	83.976	22.9979
583	Jashpur	Manora	Dumartoli	Dumartoli	Percolation Tank	84.1091	22.9557
584	Jashpur	Manora	Khamli	Amgaon	Percolation Tank	83.9186	23.1376
585	Jashpur	Manora	Remne	Remne	Percolation Tank	83.9203	22.9974
586	Jashpur	Manora	Alori	Jhargaon	Percolation Tank	83.9133	22.9283
587	Jashpur	Manora	Mado	Mado	Percolation Tank	83.968	23.1303
588	Jashpur	Manora	Kardana	Dhasma	Percolation Tank	84.0182	23.0062
589	Jashpur	Pathalgaon	Chandagarh	Chandagarh	Percolation Tank	83.5975	22.6252
590	Jashpur	Pathalgaon	Kodekela [Dhar	Kodekela (Dharjiya)	Percolation Tank	83.544	22.6246
591	Jashpur	Pathalgaon	Tirsonth	Chaura Ama	Percolation Tank	83.569	22.5932
592	Jashpur	Pathalgaon	Bangaon	Bangaon	Percolation Tank	83.6875	22.5943
593	Jashpur	Pathalgaon	Pemla	Pemla	Percolation Tank	83.7313	22.5686

Annexure 3 Details of Exploration in Jashpur District

Sl. No	Location	District	Block	Lat	Long	Depth	Casing	Formation	Zone encountered	Discharge
1	Baghbahar	JASHPUR	Pathalgaon	22.5333	83.7167	152.8	25.5	Granitic gneiss	28-29	0.5
2	Pandripani	JASHPUR	Pharsabahar	22.5167	83.8167	152.8	18.28	Granitic gneiss	46-50,84.40 to 84.90	7.757
3	Lawakera	JASHPUR	Pharsabahar	22.3833	83.9667	152.8	14.43	Granitic gneiss	10--18	0.5
4	Haldimunda	JASHPUR	Duldula	22.6167	83.95	152.9	8.5	Granitic gneiss	-	dry
5	Narayanpur	JASHPUR	Kunkuri	22.7333	83.9333	152.8	19.2	Granitic gneiss	107.2-108.8	0.5
6	Ginabahar	JASHPUR	Kunkuri	22.8	83.9667	152.9	19.5	Granitic gneiss	19.5-22,71-74	3.5
7	Kunkuri	JASHPUR	Kunkuri	22.7419	83.9542	146.56	15.7	Granitic gneiss	10-11,12.5-13.5,77-87	3.5
8	BandarChuwa	JASHPUR	Kunkuri	22.6833	83.8667	152.9	10.9	Granitic gneiss	12-13.5	2.5
10	Sarabkombo	JASHPUR	Bagicha	22.9	83.7833	152.9	14.9	Granitic gneiss	50	0.5
11	Kudukela	JASHPUR	Kunkuri	22.8167	83.95	152.9	2.95	Granitic gneiss	7.5-8,42.5-43	6.5
12	Dhoridand	JASHPUR	Kunkuri	22.7333	83.9167	152.9	13.4	Granitic gneiss	90-90.5	0.5
14	Chetaba EW	JASHPUR	Kansabel	22.6667	83.8	152.9	23.29	Granitic gneiss	54-54.2,85-85.3,116-116.5	3.3
15	Chetaba OW	JASHPUR	Kansabel	22.6667	83.8	130.1	24.15	Granitic gneiss	15--25	0.5
16	Thethetangar	JASHPUR	Kansabel	22.6667	83.9167	145.3	25.2	Granitic gneiss	65.3-65.8,76.9-77.2,124.5-125	4.5
17	Dumarbhar	JASHPUR	Pathalgaon	22.65	83.65	152.9	23.2	Granitic gneiss	50.1-50.5,118-118.5	0.16
18	Bangaon	JASHPUR	Pharsabahar	22.5333	83.85	152.9	15.6	Granitic gneiss	23-23.5,46-46.5	7.74
19	Lamdand	JASHPUR	Kansabel	22.5667	83.8	152.9	16	Granitic gneiss	31.3-32,137.7-138	0.09
20	Ludeg	RAIGARH	Lailunga	22.5333	83.5833	112.15	13.84	Granitic gneiss	14.6-15.5	0.15
21	Tamta	JASHPUR	Pathalgaon	22.6333	83.5667	105.5	11.69	Granitic gneiss	11.5-18	0.5
23	Kaliba	JASHPUR	Kunkuri	22.7333	83.9333	152.3	18.1	Granitic gneiss	114.3-117.9	0.5
24	Bhithghara	JASHPUR	Bagicha	22.9167	83.7	145.7	15.54	Granitic gneiss	-	dry
25	Bimra	JASHPUR	Bagicha	22.95	83.55	136.24	21.54	Granitic gneiss	33-34,69.5-67,97-98	0.6
26	Saraipani	JASHPUR	Bagicha	22.7833	83.6667	139.85	22.22	Granitic gneiss	37-38,72-72.5,78-79,97-98	1
27	Bataikela	JASHPUR	Kansabel	22.7167	83.7333	145.21	27.14	Granitic gneiss	31-32,42.5-43,65-66,75-76,114-115	2.5
28	Chongribahar	JASHPUR	Kansabel	22.65	83.9	127.78	10.78	Granitic gneiss	33-33.5	0.25
29	Dokra	JASHPUR	Kansabel	22.6	83.8667	130.97	11.68	Granitic gneiss	52.5-53	0.4
30	Surangpani	JASHPUR	Pathalgaon	22.4	83.65	135.35	17.18	Granitic gneiss	61-62,126-129	1
31	Mandanpur	JASHPUR	Pathalgaon	22.5667	83.45	126.33	15.3	Granitic gneiss	72-73,82-84	0.5
32	Saliyatoli	JASHPUR	Kunkuri	22.7333	83.95	152.9	13.91	Granitic gneiss	72.9-76.9	0.5
33	Karimitikra	JASHPUR	Pathalgaon	22.6167	83.4667	128.98	19.85	Granitic gneiss	15-20	0.6
34	Mahadeodant	JASHPUR	Bagicha	22.85	83.65	112.48	31 (28-31 slotted pipe)	Granitic gneiss	30-31,31-34.5,34.5-35	2
35	Charaidand	JASHPUR	Duldula	22.75	84.0667	150	16.25	Granitic gneiss	14--18	0.15

36	Ambatoli	JASHPUR	Duldula	22.7167	84.1	140.63	2.85	Granitic gneiss	8-8.6,17-17.5,53-54	1.5
37	Bagicha	JASHPUR	Bagicha	22.9667	83.55	136.37	10.89	Granitic gneiss	10.8-12,13.5-14.5	1.5
38	Keradih	JASHPUR	Kunkuri	22.8167	83.9833	128.24	8.3	Granitic gneiss	16-18.5	1.89
39	Patratoli	JASHPUR	Duldula	22.7333	84.1167	140.86	12.1	Granitic gneiss	14-18	0.4
40	Ichkela	JASHPUR	Jashpur	22.8333	84.1833	22.9	-	Granitic gneiss	-	dry
41	Patratoli	JASHPUR	Jashpur	22.95	84.25	146.56	14.2	Granitic gneiss	45-50	1.29
42	Deori	JASHPUR	Kansabel	22.6	83.9	128.24	8.6	Granitic gneiss	114.5-117	0.6
43	Pongro	JASHPUR	Kansabel	22.6333	83.7167	145.31	17.75	Granitic gneiss	17.5-17.9	0.5
44	Tangargaon	JASHPUR	Kansabel	22.6	83.7333	127.41	20.2	Granitic gneiss	27.38-31.71	0.85
45	Narayanpur	JASHPUR	Kunkuri	22.85	83.9	18.29	-	Granitic gneiss	-	dry
46	Gorea	JASHPUR	Kunkuri	22.7667	83.8167	136.48	13.68	Granitic gneiss	13.5-13.95	0.4
47	Lodhama	JASHPUR	Kunkuri	22.7833	84	123.66	10.76	Granitic gneiss	91.5-94	0.25
48	Manora	JASHPUR	Manora	22.9833	84.05	119.08	13.5	Granitic gneiss	19-22	0.5
50	Pakargaon	JASHPUR	Pathalgaon	22.55	83.5167	122.04	14.1	Granitic gneiss	24	0.5
51	Sureshpur-Thelupara	JASHPUR	Pathalgaon	22.65	83.45	100	21.07	Granitic gneiss	36.4-36.5	0.27
52	Tamta	JASHPUR	Pathalgaon	22.6333	83.5667	152.9	5.5	Granitic gneiss	110.9-111.5	0.16
53	Pharsabahar	JASHPUR	Pharsabahar	22.5	83.85	114.5	17.47	Granitic gneiss	18-22,95-100	4.55
54	Singibahar	JASHPUR	Pharsabahar	22.5333	83.95	100.76	9.9	Granitic gneiss	14-25	6
55	Tapkara	JASHPUR	Pharsabahar	22.5	83.95	141.98	10.13	Granitic gneiss	13-18	0.4

Annexure 4 Details of Chemical Analysis

District	Block	Location	Lat	Long	pH	EC	CO3	HCO3	Cl	F	SO4	TH	Ca	Mg	Na	K	Si	PO4	NO3
(In ppm)																			
Jaspur	Kunkuri	Goria	22.76626	83.8239	7.82	313	0	61	24.85	0.18	5.3	90	24	7.2	20.3	0.71	24.2	0.16	60.7
Jaspur	Kunkuri	Behrakhar	22.79876	83.81709	8.24	301	0	109.8	21.3	0.91	11.1	90	30	3.6	24.5	1.94	22.4	0.15	31.1
Jaspur	Kansabel	Thakurtola	22.68598	83.83966	8.3	286	3	111	14.2	0.94	11.8	95	24	8.4	14.3	1.7	19.1	0.02	23.1
Jaspur	Kansabel	Jumaikela	22.72994	83.8336	8.45	502	6	85.4	49.7	1.1	39.6	140	28	16.8	41.7	1.37	28	0.03	44.5
Jaspur	Kansabel	Marol	22.80178	83.76564	8.02	137	0	38.8	7.1	0.13	3.2	35	12	1.2	12.7	3.63	14.5	0	39.7
Jaspur	Kansabel	Rengola	22.83362	83.6853	8.36	150	3	89.3	7.1	0.98	2.4	50	18	1.2	13.5	1.87	23.8	0.02	0
Jaspur	Kansabel	Dumarkachar	22.83362	83.6853	8.31	283	3	152.5	10.65	1.2	3.9	105	32	6	21.4	2.5	28.1	0.02	0
Jaspur	Kansabel	Bamha-Pasiya	22.86829	83.61755	8.26	389	0	213.5	10.65	0.42	12.9	125	26	14.4	39.5	1.75	16	0	3.6
Jaspur	Bagicha	Ghugri	22.82086	83.71098	8.11	129	0	61	10.65	0.25	3.6	40	10	3.6	12.7	1.5	22.7	0.11	3
Jaspur	Bagicha	Jujgu	22.90036	83.59855	7.97	149	0	61	7.1	0.46	4	55	16	3.6	12.9	1.1	19.8	0.08	21.5
Jaspur	Bagicha	Baigakona	22.9686	83.59855	8.06	253	0	122	14.2	0.89	10.1	85	20	8.4	14.3	1.5	14.1	0.14	3.3
Jaspur	Bagicha	Ghurmakona	22.98898	83.71654	8.35	229	3	122	7.1	0.51	7.9	80	20	7.2	11.5	0.97	18.7	0.04	0
Jaspur	Bagicha	Betara	22.9811	83.73464	8.59	483	12	274.5	14.2	1.5	4.9	185	60	8.4	29.2	2.1	23.1	0.64	5.2
Jaspur	Bagicha	Bend	22.95384	83.73093	8.53	278	9	146.4	10.65	1.5	4.4	65	14	7.2	33.4	2.3	19.5	0.06	0
Jaspur	Bagicha	Barpaat	23.09569	83.69159	7.8	44	0	12.2	7.1	0.12	3.5	15	4	1.2	2.5	1.1	2.9	0.04	3.4
Jaspur	Bagicha	Nanhesir	23.16026	83.75322	8.17	189	0	79.3	10.65	0.14	3	70	20	4.8	8.6	5.3	7.6	0.04	24.1
Jaspur	Bagicha	Champa	23.2158	83.75231	7.9	70	0	24.4	7.1	0.1	3.7	25	8	1.2	5.3	1.26	3.9	0	17.9
Jaspur	Bagicha	Orka	22.96269	83.68474	8.2	310	0	140.3	14.2	1.08	9	120	34	8.4	15.1	2.9	20.4	0.07	15.01
Jaspur	Bagicha	Dumarpani	22.99487	83.69424	8.12	145	0	79.3	7.1	0.25	3.5	65	16	6	5.4	0.38	27.7	0.017	3
Jaspur	Bagicha	Khairapaat	23.04925	83.74145	8.34	307	3	154.2	14.2	0.42	9.2	145	32	15.6	9.6	3.9	29.9	0.08	0
Jaspur	Bagicha	Kamrima	23.07124	83.72501	8.3	229	0	134.2	7.1	0.77	9.1	105	28	8.4	6.1	2	25.7	0.11	1.1
Jaspur	Manora	Sardih	23.05174	83.8758	7.81	135.5	0	36.6	17.75	0.27	3.2	35	12	1.2	8.7	4.4	9.6	0.09	22.8
Jaspur	Manora	Dabdara	23.03066	83.89628	8.1	256	0	85.4	24.85	0.16	9.7	105	22	12	14.4	2.5	9	0.1	20.8
Jaspur	Manora	Dumartoli	23.0456	83.93746	8.42	179	6	67.1	14.2	0.28	4.2	60	18	3.6	9.8	2.3	19.3	0.19	14.9
Jaspur	Manora	Paraswra	23.0519	83.8234	8.47	342	6	140.3	17.75	0.11	6.3	135	42	7.2	14.3	3.5	16.4	0.1	31.5
Jaspur	Manora	Sukra	23.02168	83.85402	7.7	184	0	24.4	14.2	0.68	3.7	55	14	4.8	14.5	2.3	19.2	0.13	69.2