



केन्द्रीय 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

**Jaunpur District
Uttar Pradesh**

उत्तरी क्षेत्र, लखनऊ
Northern Region, Lucknow



**Govt. of India
Ministry of Jal Shakti
Central Ground Water Board**

**NATIONAL AQUIFER MAPPING AND MANAGEMENT PLAN
(NAQUIM)
JAUNPUR DISTRICT
UTTAR PRADESH**

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DISTRICT AT A GLANCE:

GENERAL INFORMATION	
Name of the District	Jaunpur
ADMINISTRATIVE DIVISIONS	
Number of Tehsils	6
Number of Blocks	21
Number of Villages	3374
POPULATION (2011 Census)	
Total population	41,74,642
Male	20,55,160
Female	21,19,482
Population density per Sq.Km.	1033
LAND USE LAND COVER (LULC)	
Geographical Area (Sq. Km.)	4038
Agricultural Land (Sq. Km.)	3109
Built up area (Sq. Km.)	501
Forest (Sq. Km.)	1
Wastelands (Sq. Km.)	324
Water bodies (Sq. Km.)	101
RAINFALL	
Average normal rainfall (mm)	646.4
Monsoon rainfall (mm)	573.22
Non monsoon rainfall (mm)	73.22
Major rainfall months	June, July, August, September
DEMOGRAPHICS	
Gross irrigated area (hectares)	4,10,824
Net irrigated area (hectares)	240894
Ratio gross to net irrigated area	1.7
Net sown area (hectares)	2,76,221
Area sown more than once in year (hectares)	223257
Area irrigated by Ground water	1,47,398.6
Percentage of area irrigated by Ground water	73.33 %
Area irrigated by surface water (hectares)	54,875
Percentage of area irrigated by surface area	27.3%
IRRIGATION BY SOURCES (hectares)	
Area irrigated by Canals	54,801
Area irrigated by Tube wells	183,830

Area irrigated by ponds	74
Area irrigated by Wells	815
Area irrigated by other sources	28
WATER BODIES	
Total length of Canals (Km)	1705
Total no of state Tube wells	542
Total no of pucca Tube wells	1978
Total no of Shallow Tube wells	92201
Total no of medium depth Tube wells	206
Total no of deeper Tube wells	52
GEOMORPHOLOGY	
Major Physiographic Units	The district is part of Central Ganga Plain with almost flat topography with gentle slopping land towards southeast it is divided into two units (i) Upland region and (ii) Lowland region.
RIVERS AND DRINAGE	
Major drainage	Gomati and Sai are the main rivers. Varuna and Basuhi are other two rivers which unite in the extreme south and discharge into Ganges.
Drainage pattern	The general drainage pattern of the area is Dendritic in nature where streams/ drains are joining the major rivers
GEOLOGY	Kaimur formation consisting Sandstone, grey to white buff, arkosic with limestone and quartzite. Older Alluvium consisting of Fairly consolidated clay with kankar, medium to fine grained sand with some gravel and Newer Alluvium consisting of Unconsolidated sand, silt and clays
MAJOR SOIL TYPES	fine grained loamy soil mainly comprising of sand, silt and clay in different proportions
SLOPE	The elevation of the district ranges from 73 to 108 meters above sea level.
GROUND WATER RESOURCE	
Annual Ground water recharge (Ham)	131876.34
Annual extractable ground water resource (Ham)	121359.98
Total draft for irrigation (Ham)	74007
Total draft for industries (Ham)	0
Total draft for domestic use (Ham)	12180.13

Total Ground water Draft in Ham	86187.13
Stage of Ground water development (%)	72.67
CATEGORISATION OF BLOCKS	
Number of blocks in Safe category	11
Number of blocks in Sub- Critical category	8
Number of blocks in Critical category	2
Number of blocks in Over exploited category	0
WATER LEVEL DATA	
Pre monsoon water level (2021)	0.75 to 23.65 mbgl
Post monsoon water level (2021)	0.30 to 21.05 mbgl
Water level Fluctuation (2021)	0.63 to 7.32 mbgl
Ground water exploration	
No of exploratory wells	21
No of observatory wells	12
AQUIFER SYSTEM	
No of aquifer system	2
GROUND WATER CHEMISTRY	
Total no of Ground water samples collected	78
GW Chemical analysis	Basic and heavy metals
P.H Range	8.34 to 9.15
Electrical conductivity range ($\mu\text{S cm}^{-1}$)	318 to 865
Total hardness range (mg/l.)	70.1 to 300.00
Total Dissolved Salts (mg/lit)	247.74 -1812.10
Nitrate (mg/lit)	0 to 76
Fluoride (mg/lit)	0.09 -1.8
GROUND WATER INTERVENTION	
Proposed no of check dams (10000 cubic meter capacity)	46
Proposed stream development length (Km.)	46
Proposed no of Nala bunds (7500cubic meter capacity)	46
Proposed no of ponds (1000 cubic meter capacity)	47
Proposed on farm activities (Ha)	43905
WUE (Ha)	43905
Annual extractable G.W resource before intervention (Ham)	1213.6
Annual extractable G.W resource after intervention (Ham)	1216.54
Annual present G.W extraction (Ham)	861.87
Annual G.W extraction after proposed intervention (Ham)	746.5

Present stage of Ground water development (%)	71.02
Stage of Ground water development after intervention (%)	61.36

I. Introduction

Aquifer mapping is a process wherein a combination of geologic, geophysical, hydrologic and chemical analyses is applied to characterize the quality, quantity and sustainability of Ground water in aquifers. In recent past there has been a paradigm shift from Ground water development to Ground water management. As large parts of India has become water stressed due to rapid growth in demand for water due to population growth, rapid growth in industrialization and urbanization. Therefore in order to have an accurate and comprehensive micro level picture of Ground water in India aquifer mapping in different hydrological settings at the appropriate scale is devised and implemented to enable the robust Ground water management plans so as achieve drinking water security, improved irrigation facility and sustainability in water resource development in large parts of rural and many parts of urban India.

I. Objective

Central Ground Water Board (CGWB) has implemented the National Aquifer Mapping Programme in Jaunpur district, Uttar Pradesh with broad objective of preparing an aquifer wise management plan for the district. The broad objective of the study is to establish the geometry of the underlying aquifer system in horizontal and vertical domain and characterize them, to work out the development potential and prepare aquifer wise management plan using Ground Water simulation model and also to assess Ground water wise availability, utilization and water quality in the district.

II. Scope of study

The scope of the present study is broadly outlined within the framework of National Aquifer Management Programme (NAQUIM) being implemented by CGWB. There are four major activities viz: **(I). Data collection/compilation (II). Data gap analysis (iii). Data generation (iv). Preparation of aquifer maps and management plan to achieve the primary objectives.** Data compilation includes collection of data and all maps from concerned agencies, such as the survey of India, Geological survey of India, State ground water department data, and preparation of a database. Identification of Data gap included ascertaining requirement for further data generation in respect of hydro meteorological, hydro geological, geophysical, chemical, studies. In continuity of data gap analysis, data generation includes those of hydro meteorological, soil infiltration, and sub-surface geophysics, chemical quality of ground water, lithologs and aquifer parameters. Generation of ground water chemical quality data was accomplished by collection of water samples and their laboratory analysis for all major parameters, heavy metals, pesticides and bacteria. Sub-surface geophysical studies are incorporated vertical electrical sounding, two dimensional image profiling, and borehole logging. Additional data pertaining to sub-surface lithology and aquifer parameters are obtained through drilling of additional exploratory wells and slim holes, pumping tests at the drilling sites and slug tests in a numbers required and their analysis.

III. Approach and Methodology

An approach and methodology adapted to achieve the major objective are compilation of existing data collected from different sources and agencies and identification of data gaps. Based on existing data various thematic layers and maps have been prepared in GIS environment and aquifer maps incorporating the data and management plans are prepared.

1. Study Area

Jaunpur district is situated in the Eastern part of the state Uttar Pradesh. It is surrounded by Sultanpur District in North, Sultanpur in South, Azamgarh and Varanasi in East, Alahabad and Pratapgarh in West and Saant Ravidas Nagar in South. Jaunpur city is the administrative Headquarters of the district. District encompasses an area of 4038 Sq. Km. and lies between latitude 25°22'30" to 26°10'00" North and longitude 82°06'00" to 83°00'00" East. The district falls No. 63K and 63J. and the district is well connected by roads and train routes.

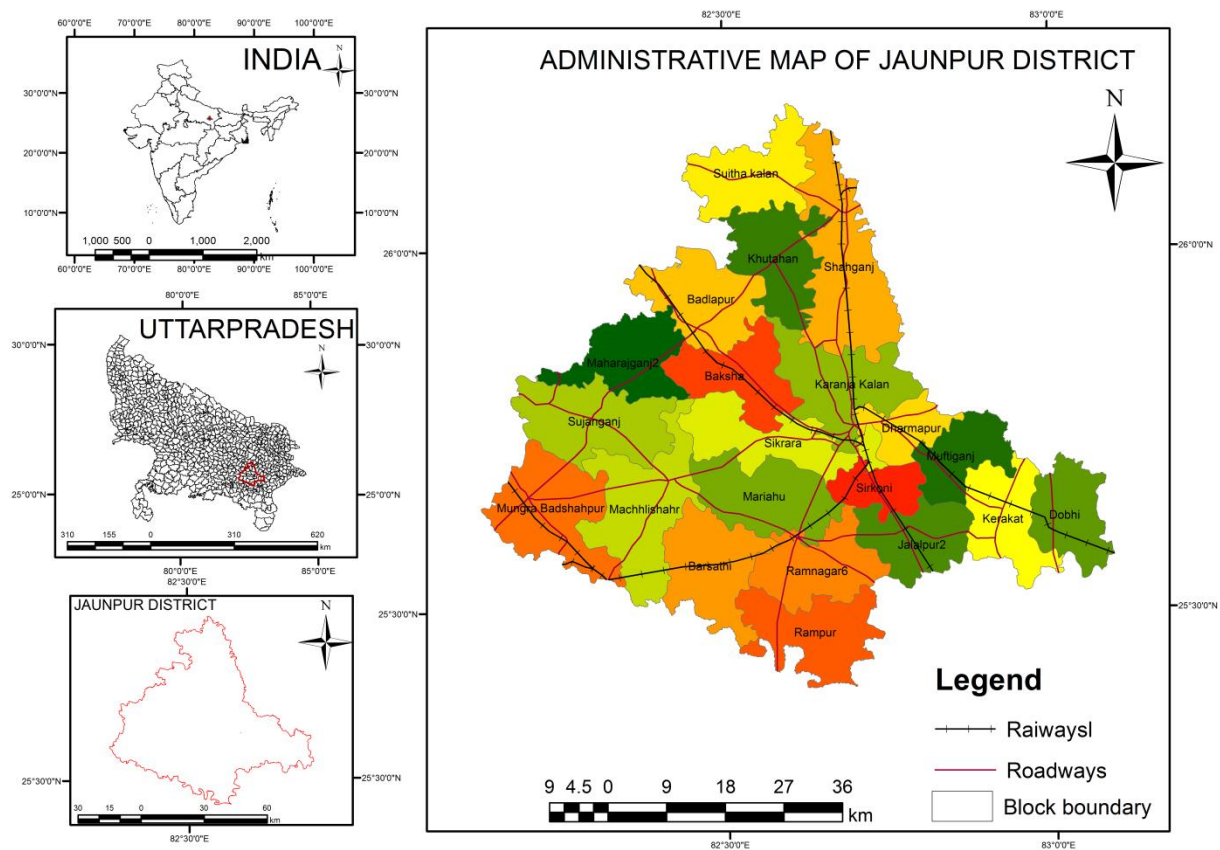


Figure 1: Administrative map of Jaunpur District

Administratively the district is subdivided in to Seven Tehsils. The district is further sub divided in to Twenty one blocks namely Badlapur, Baksha, Barsathi, Dharmapur, Dobhi, Jalalpur, Karanjakalan, Kerakat, Khutahan, Machhlishahr, Maharajganj, Mariahu, Muftiganj, Mungra Badshahpur, Ramnagar, Rampur, Shahganj, SIKRARA, Sikroni, Suitha Kalan, and Sujanganj.

Gomti and Sai are two prominent rivers that drain through the district. Besides Gomti and Sai rivers Varuna, Basuhi, Pili, Mamur and Gangi rivers also drain through the district bur relatively smaller in size. The main crops cultivated in the district are: rice, maize, pigeon pea, pearl millet, black gram wheat and chickpea. Rainfall and irrigation are the major source of water for cultivation in the district.

1.1. Demography

The total population of the Jaunpur district is **41, 74, 642 (As per 2011 census)** out of which about 92% is rural and remaining is urban with decadal population growth 14.19%. Total Male population is **2055160** and Female population is **2119482** . Average population density of the district is **1033** persons/ Sq.Km.

Name of the block	Male population	Female population	Total population	Decadal growth
BADLAPUR	113332	116613	229945	14.81
BAKSHA	98834	102862	201696	11.97
BARSATHI	94284	104565	198849	5.71
DHARMAPUR	61918	63421	125339	8.27
DOBHI	82777	85368	168145	14.39
JALALPUR	83820	86264	170084	11.31
KARANJA KALAN	122591	121411	244002	17.42
KERAKAT	89789	94312	184101	13.58
KHUTAHAN	108500	109268	217768	17.02
MACHHLISHAHR	109058	114916	223974	17.64
MAHARAJGANJ	81814	83993	165807	13.79
MARIAHU	102267	109858	212125	12.41
MUFTIGANJ	97433	100446	197879	12.13
MUNGRA BADSHAHPUR	60572	67125	127697	18.97
RAMNAGAR	103349	107678	211027	10.08
RAMPUR	104894	109021	213915	9.22
SHAHGANJ	156233	155045	311278	23.98
SIKRARA	91415	91609	183024	16.49
SIRKONI	95773	94847	190620	15.26
SUITHA KALAN	93379	93575	186954	19.32
SUJANGANJ	103128	107285	210413	14.25

Table 1: Block wise population statics of jaunpur district, Uttar Pradesh.

1.2. Data Availability and Data Gap Analysis

The data pertaining to various attributes of ground water were collected from available literatures of Central Ground Water Board, State Departments and other agencies. The compiled data were plotted on 1:50,000 scale map and analysis of Data Gap was carried out for ascertaining additional requirement of Hydrogeological, Hydrological, Hydrochemical, and Geophysical Studies. Data Requirement, Data Availability and Data Gap Analysis are summarized in the following table

Sl.No.	Study Aspect	Data Requirement	Data Availability	Data Gap
1	Rainfall and Other Climatic data	Normal Rainfall and Past 10 Years Rainfall	Rainfall data of study area available	-
2	Soil	Soil Map and Soil Infiltration rate	Soil Map	Soil Infiltration test
3	Land Use	Latest Land use Pattern in GIS Environment	Land Use available in Satellite data and UP Statistics Department 2015-16	No data gap
4	Geomorphology	Digitized Geomorphological Map	Digitized Geomorphological Map Available	No data gap
5	Geophysics	Geophysical logs	Geophysical logs	No data gap
6	Exploration		21 Exploratory well	
			12 Observatory well	

Table 2: Data requirement, data availability and data gap of Jaunpur district.

1.3. Land Use, Irrigation and Cropping Pattern

The total reported area of the Jaunpur district is 396825 hectare, out of which only 69.5 % is under cultivation and the remaining 30.5 % area is mainly in the form of forest, barren cultivable waste land, fallow land, other fallow land, barren uncultivable land, pasture land, under bush/gardens, and land used other than agriculture.

Block name	Gross irrigated area	Net irrigated area	Ratio gross to net irrigated area
BADLAPUR	14558	12050	1.21
BAKSHA	18485	9414	1.96
BARSATHI	21385	13275	1.61
DHARMAPUR	14213	6167	2.30
DOBHI	17416	9808	1.78
JALALPUR	17080	9780	1.75
KARANJA KALAN	21058	13238	1.59
KERAKAT	17997	10288	1.75
KHUTAHAN	17622	9597	1.84
MACHHLISHAHR	24580	15937	1.54
MAHARAJGANJ	25508	16887	1.51
MARIAHU	18609	11104	1.68
MUFTIGANJ	24709	13857	1.78
MUNGRA BADSHAHPUR	15790	8687	1.82
RAMNAGAR	20579	11272	1.83
RAMPUR	18472	10068	1.83
SHAHGANJ	26268	14068	1.87
SIKRARA	17668	9963	1.77
SIRKONI	15276	8191	1.86
SUITHA KALAN	17683	11678	1.51
SUJANGANJ	22222	14219	1.56
Total	410824	240894	1.70

Table 3: Block wise gross and net irrigated area in hectares of Jaunpur District.

The Surface as well as Ground Water Resources is in the use for the irrigation purposes. The gross irrigated area in the district is 410824 hectares and net irrigated area in the district is 240894 hectares. Net sown area in the district is 276221 hectares and area sown more than once in a year is 223257 hectare. Area irrigated by surface water is 54875 hectares which is 22.77 % of the net irrigated area. Canals and ponds are the major mode of water supply for surface water irrigation. Area irrigated by Ground water is 77.33% of the net irrigated area. Public and private tube wells are the major source of water for ground water irrigation. Total length of the canals in the district is 1705 km.

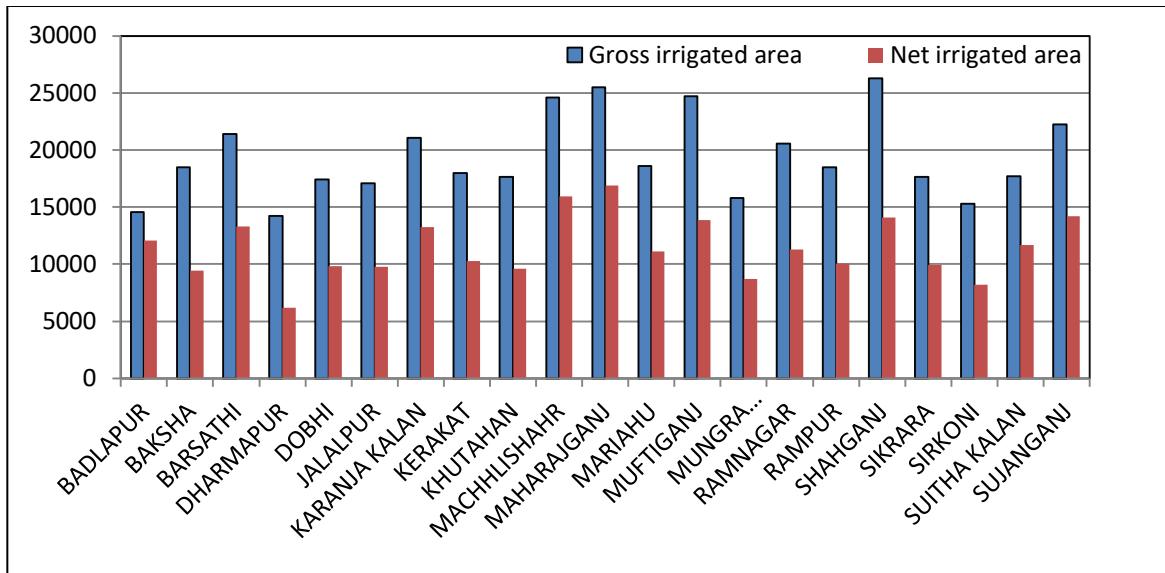


Figure 2: Block wise gross to net irrigated area in hectares of Jaunpur district.

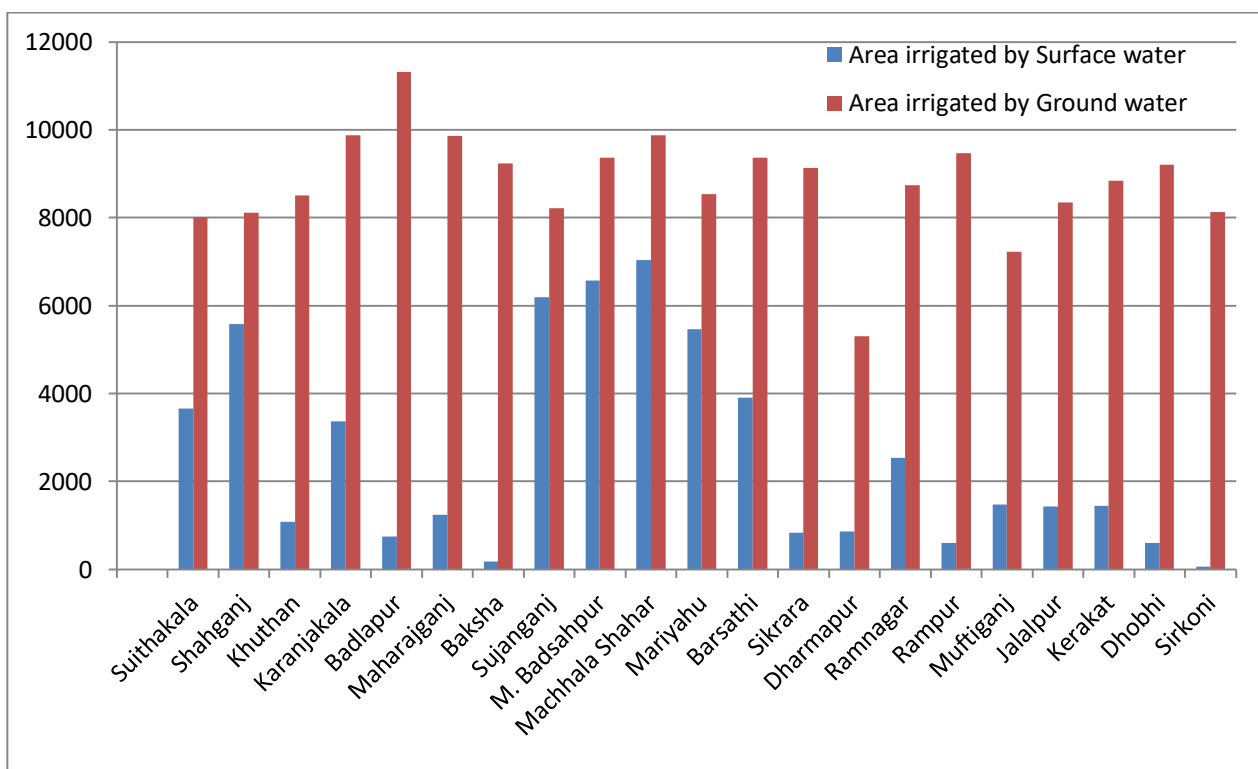


Figure 3: Block wise area irrigated by Surface and Ground water in hectares of Jaunpur district.

Block name	Canal	Tube well		The well	pond	other	Total
		State	Private				
Suithakala	3660	123	7839	56	0	0	11678
Shahganj	5582	49	8060	0	0	0	13691
Khuthan	1084	98	8415	0	0	0	9597
Karanjakala	3363	76	9799	0	0	0	13238
Badlapur	737	0	11219	94	8	0	12058
Maharajganj	1243	0	9811	50	2	0	11106
Baksha	173	76	9165	0	0	0	9414
Sujanganj	6198	0	8106	100	0	8	14412
M. Badsahpur	6570	100	9217	50	0	0	15937
Machhala Shahar	7017	169	9661	40	20	0	16907
Mariyahu	5457	67	8476	0	10	0	14010
Barsathi	3911	106	9098	150	0	10	13275
Sikrara	827	51	9035	50	4	0	9967
Dharmapur	863	61	5243	0	0	0	6167
Ramnagar	2531	132	8609	0	10	0	11282
Rampur	604	168	9296	0	0	0	10068
Muftiganj	1468	82	7137	0	0	0	8687
Jalalpur	1428	119	8088	125	0	10	9770
Kerakat	1445	84	8706	50	0	0	10285
Dhobhi	595	93	9070	50	0	0	9808
Sirkoni	45	106	8020	0	20	0	8191

Table 4: Block wise area irrigated by different sources in hectares of Jaunpur district.

Block name	Length of canals (km)	State tube well (number)	Pucca well (number)	Geostationary Pump set (Number)	Shallow tube wells			Medium Tube (Number)	Deep Tube (Number)
					Electrically operated	Diesel powered	other		
Suithakala	123	36	6	6	1637	3931	2	21	1
Shahganj	174	9	52	0	683	6500	142	1	1
Khuthan	73	42	0	0	1048	4553	89	5	0
Karanjakala	55	15	30	1	850	4624	53	1	0
Badlapur	73	0	319	0	719	5042	93	4	1
Maharajganj	89	0	27	0	686	5042	7	8	1
Baksha	53	7	0	1	1550	2812	7	5	1
Sujanganj	105	3	76	0	449	4605	142	10	3
M.Badsahpur	86	62	484	0	761	2186	100	5	6
Machhala Shahar	158	32	0	0	801	3850	116	15	2
Mariahu	109	9	125	1	650	4418	12	11	6
Barsathi	97	41	0	0	989	2574	16	7	0
Sikrara	28	13	46	0	1510	3158	9	36	1
Dharmapur	57	1	501	0	522	2756	24	0	2
Ramnagar	79	38	32	0	997	1725	47	21	0
Rampur	122	62	6	2	1446	1665	0	20	6
Muftiganj	44	21	43	0	1143	2407	42	11	6
Jalalpur	61	47	231	8	1365	1114	28	8	6
Kerakat	54	29	0	0	1650	1913	6	8	3
Dhobhi	49	44	0	1	1782	1596	23	9	4
Sirkoni	16	31	0	0	1280	2229	25	0	2
Total	1705	542	1978	20	22518	68700	983	206	52

Table 5: Block wise Water structures of Jaunpur district.

1.4. Geomorphology and Drainage

Physiography

The district is a part of Central Ganga Plain which is almost a flat topography with gentle sloping land towards South- East. The average elevation of the land ranges from 95.00 Meters ASL in the west to 60 meters ASL in the East. The district is sub divided in to two units' i.e. Upland region and Low land region. The low land region occupies Flood plain region of the present drainage system.

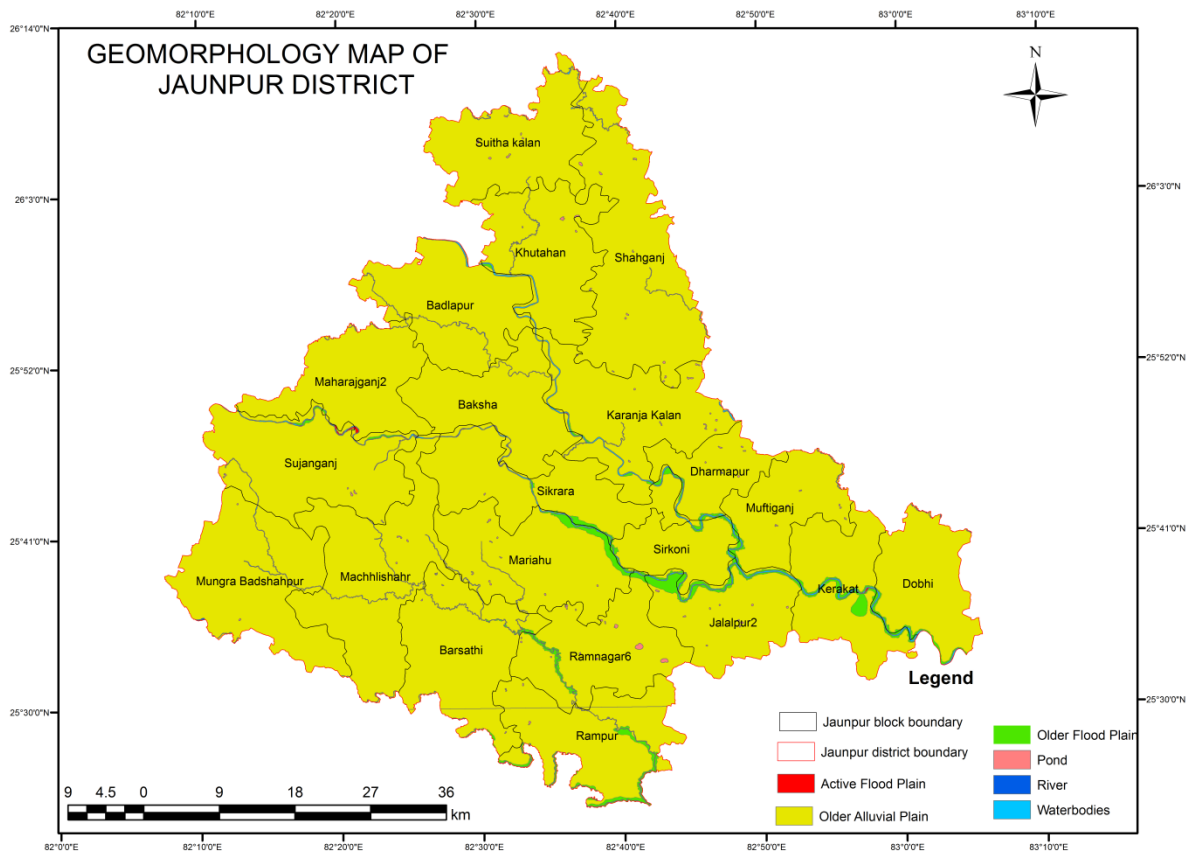


Figure 4: Geomorphological map of Jaunpur District

Geomorphology of the district defined by the Older Alluvium Plain in most of the areas with some patches of Younger Alluvium Plain along Dhobi, Jaunpur and Gazipur blocks. Flood plains are restricted along the river channels. Other than this two type, back swamp, cut off meander, ravines, point bar etc geomorphic features also present as a sporadic distribution and along the paleo channels of Gomti River.

The major geomorphological unit observed in the Jaunpur district is as followed

- ❖ **Flood Plain:** It is restricted all along the river channels. The area is mostly covered by present rivers (Gomti and Sai) and its adjacent smooth plains.

- ❖ **Older Alluvial Plain:** The older alluvial plain forms the whole part of the Gomti River in the district. The older alluvium of the Ganga valley form slightly elevated land surface of the area.
- ❖ **Younger flood Plain:** It is restricted in the border of Dobhi, Sikrara, Sikronu, and Kerakhat blocks.
- ❖ **Active flood plain:** Active flood plains is restricted in small patches along the boundary of Maharajganj and Sujanganj blocks

1.5. Drainage:

The district is drained mainly by Gomti followed by effluent Sai River. Varuna and Baushi are other two rivers which unite in extreme South and discharge in to the Ganges. Minor streams like Pili, Manger and Gangei also drain along the district. In addition several drains/ streamlets are mainly confined in South-Eastern part of the district. The drainage pattern follows natural slope of the area from North- West to South- East. The general drainage pattern of the area is Dendritic in nature where streams/ drains are joining the major rivers.

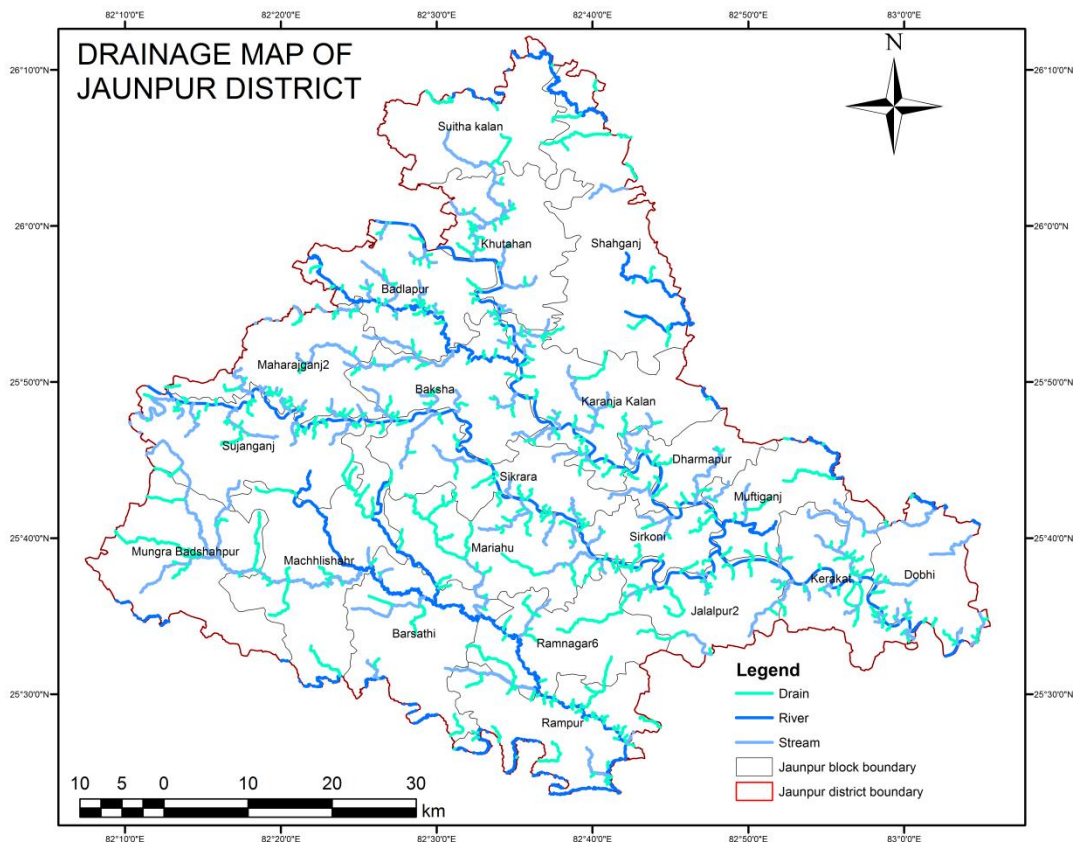


Figure 5: Drainage map of Jaunpur District

1.6. Land use and Land cover

Economy of the district mainly governs by agricultural activity. The fine loamy soils of the area are very fertile. About 77% of the total geographical area of the district is cultivated area. The main crops are wheat, oil seeds,

paddy, pulses etc. 12.41% of the district area is under settlements, water bodies cover 2% of the area, 0.022% of the area is under forest cover and 8.02% of the district area is under wasteland.

S.No	Particulars	Area (Sq.Km)	Percentage of area
1	Agricultural Land	3109	77.03
2	Built up area	501	12.41
3	Forest	1	0.02
4	Wastelands	324	8.03
5	Water bodies	101	2.50

Table 6: Land use and Land cover of Jaunpur District.

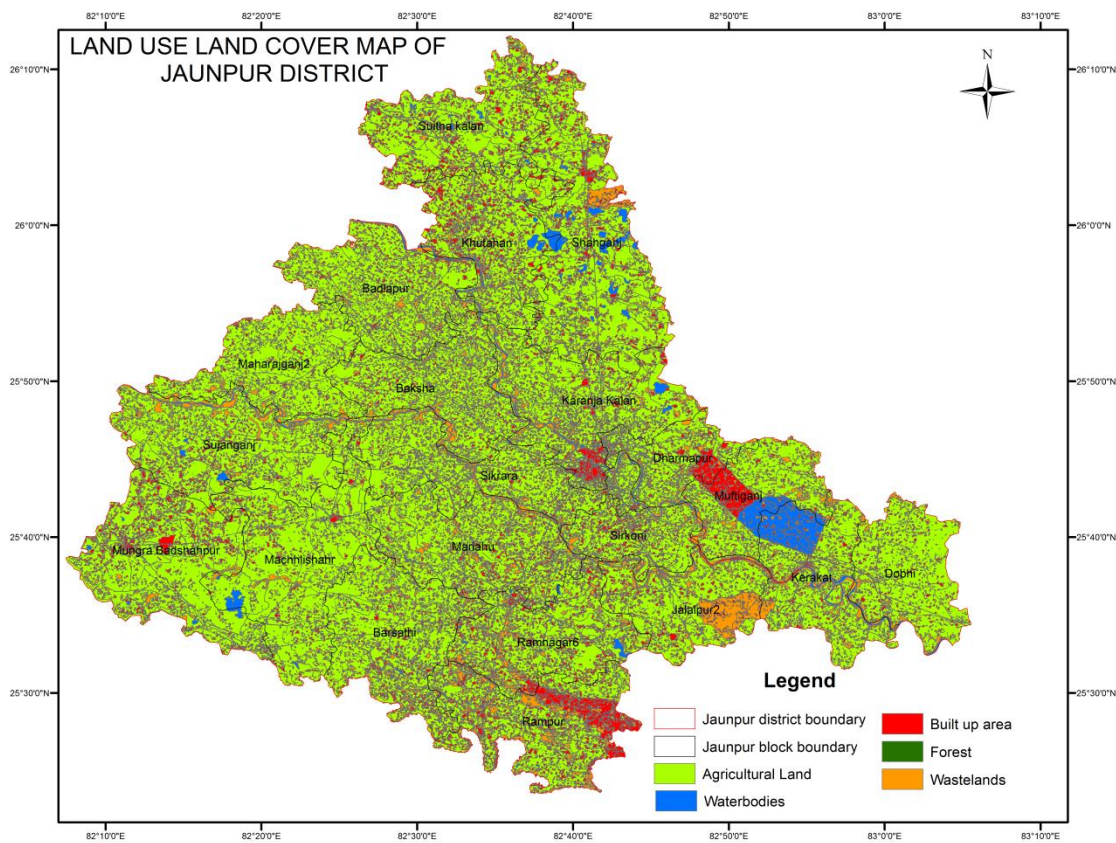


Figure 6: Land use and Land cover of Jaunpur District.

1.7. Geology

The district Jaunpur mainly consists of Gangetic Alluvium, the deposition of which commences from the Pleistocene period after the final upheaval of the Himalayas. Lithologically Indo Gangetic alluvium is mainly composed of inner bedded layers of sand, silt and clay which are associated at places with kankar. The maximum thickness explored is 752 meters below ground level.

Age	Formation	Lithology
Upper Pleistocene to recent	Newer Alluvium	Unconsolidated sand, silt and clays
Middle to upper Pleistocene	Older Alluvium	Fairly consolidated clay with kankar, medium to fine grained sand with some gravel
Vindhyan	Kaimur Formation	Sandstone, grey to white buff, arkosic with limestone and quartzite.

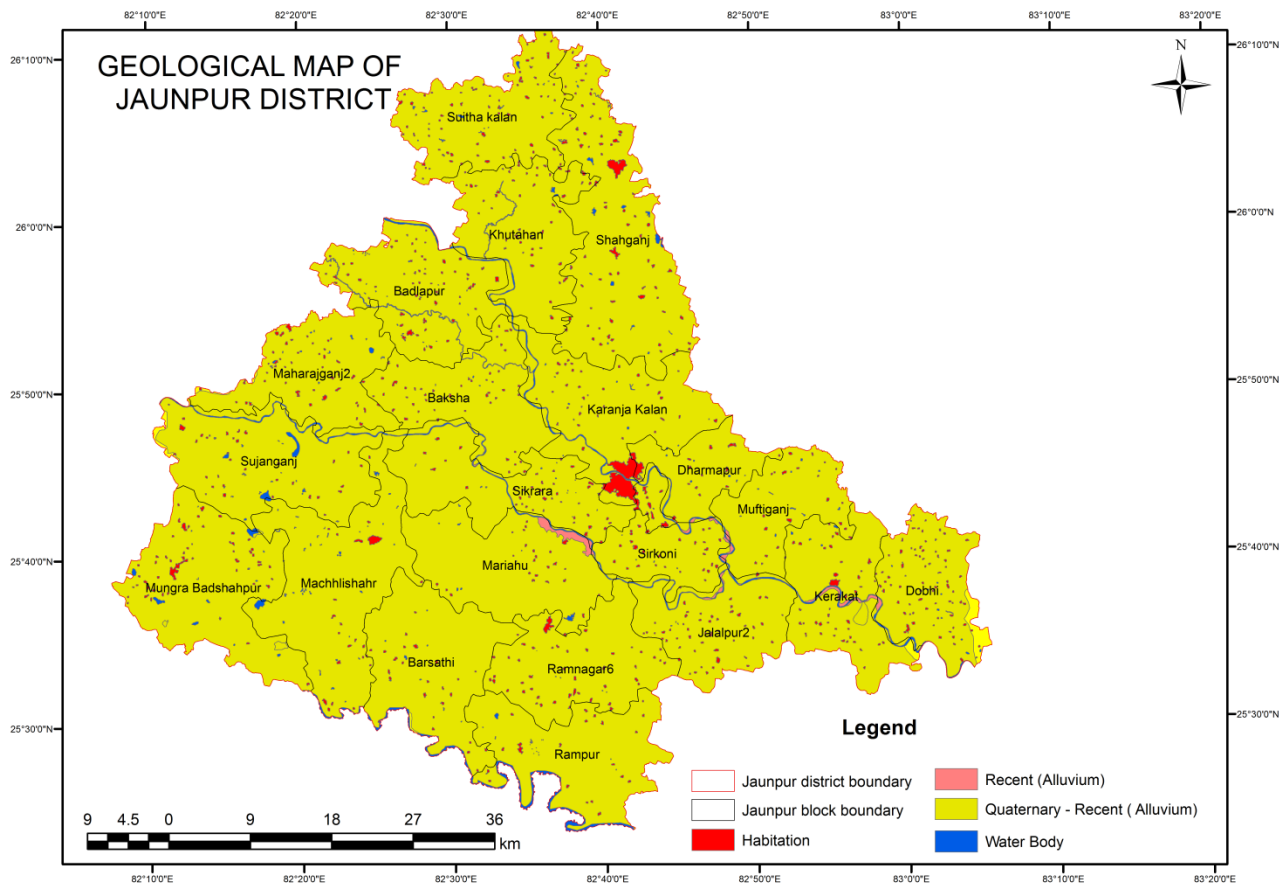


Figure 7: Geological map of Jaunpur District.

The older Alluvial deposits generally occupy the higher elevation. These sediments are clastic in nature and belong to middle to upper Pleistocene period deposited by the existing drainage system and overlies, directly on formations belonging to Vindhyan group. The newer alluvial sediments are confined all along the present drainage system and are of flood plains deposits which are predominantly sandy in nature. Silt and clay are invariably present in lenses at different depths.

1.8. Soil

Soil of the district is mainly transported i.e. deposited by the perennial rivers draining through the district. Soil type of the district is fine grained loamy soil mainly comprising of sand, silt and clay in different proportions.

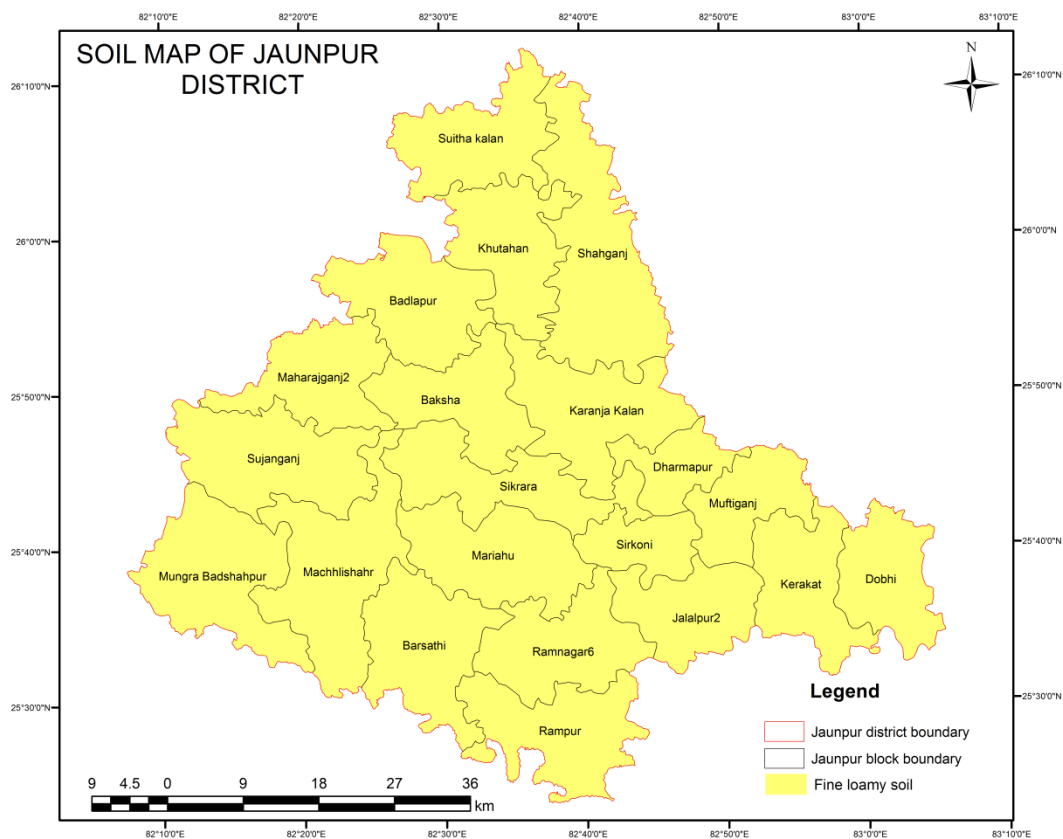


Figure 8: Soil map of Jaunpur District.

1.9. Slope

The elevation of the district ranges from 73 to 108 meters above sea level. The average elevation is approximately 85 meters above sea level. High Elevations are observed along the North-west and South- West and Western part of the district and the elevations gradually decreases along the South- Eastern part of the district which is supported the course of the rivers draining through the district, as the drainage pattern follows natural slope of the area from North- West to South- East.

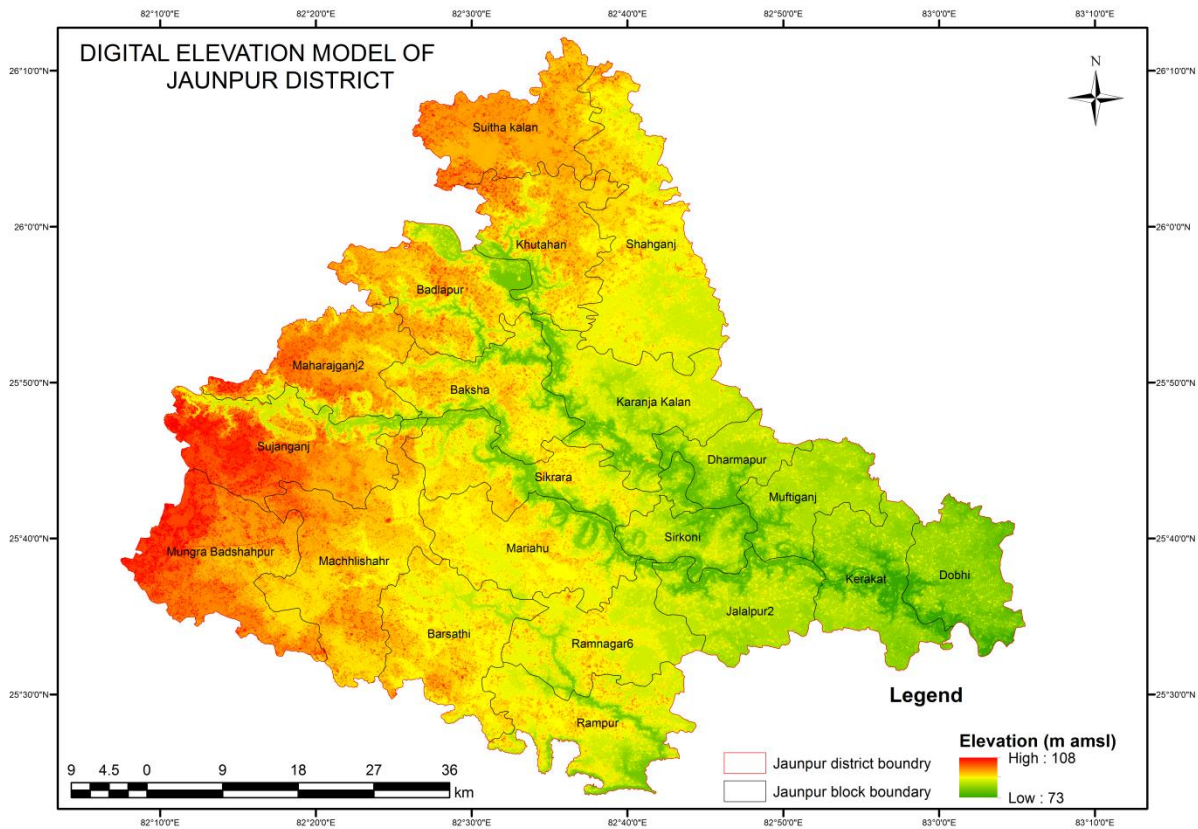


Figure 9: Slope map of Jaunpur district.

1.10. Rainfall

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Monsoon (June to Sept)	Non-Monsoon (Oct to May)
2011	0.0	0.0	0.0	0.0	3.5	171.1	99.2	157.5	217.6	0.0	0.0	0.0	648.9	645.4	3.5
2012	12.1	1.1	1.5	0.0	0.0	16.3	199.7	195.7	156.9	9.8	0.0	0.0	593.1	568.6	24.5
2013	5.8	41.6	1.1	1.1	0.0	168.9	149.0	136.5	74.9	147.9	0.0	0.0	726.8	529.3	197.5
2014	40.4	19.4	22.0	0.0	16.7	14.3	160.5	98.9	50.3	69.6	0.0	0.0	492.1	324	168.1
2015	48.5	0.5	25.8	22.7	0.5	61.1	200.8	201.8	10.0	3.9	0.0	1.2	576.8	473.7	103.1
2016	1.9	0.0	12.4	0.0	17.8	53.1	207.9	238.0	205.4	7.7	0.0	0.0	744.2	704.4	39.8
2017	3.9	0.0	0.0	0.0	7.6	21.5	206.3	105.9	65.0	0.9	0.0	0.0	411.1	398.7	12.4
2018	0.0	1.7	0.0	2.9	7.5	19.0	192.4	191.5	93.5	0.0	0.0	0.0	508.5	496.4	12.1
2019	7.96	9.65	3.64	1.01	0.83	24.73	337.6	152.11	463.59	30.78	4	22.27	1058.17	978.03	80.14
2020	6.93	5.96	34.15	13.29	25.03	152.41	147.41	152.21	161.39	2.14	1.12	2.18	704.22	613.42	90.8

Table 7: Year wise and month wise rainfall in millimeters of Jaunpur District.

The average normal Rainfall of the district is 646.4 mm. Rainfall in the district predominantly occurs in monsoon season. The monsoon season occurs from the third week of June to the first week of October. The average rainfall during monsoon season is 573.22 mm. The average rainfall during non-monsoon season is 73.22 mm. 90% of the total precipitation is contributed by Monsoon Rainfall.

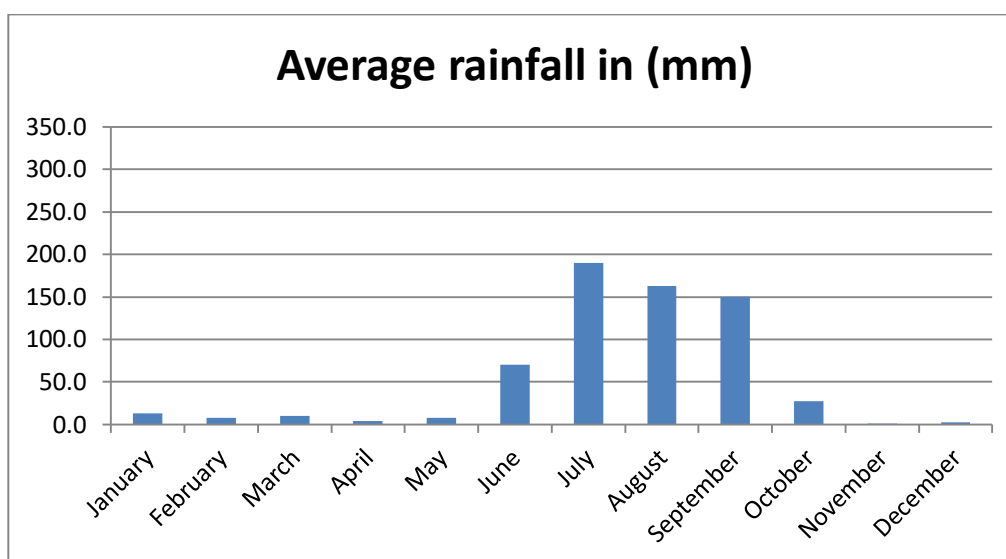


Figure 10: Month wise average rainfall in millimeters of Jaunpur District.

Study of 10 years month wise average Rainfall reflects that maximum rainfall occurs in the month July-September in the District that is during monsoon season. Year wise analysis of Monsoon v/s Non

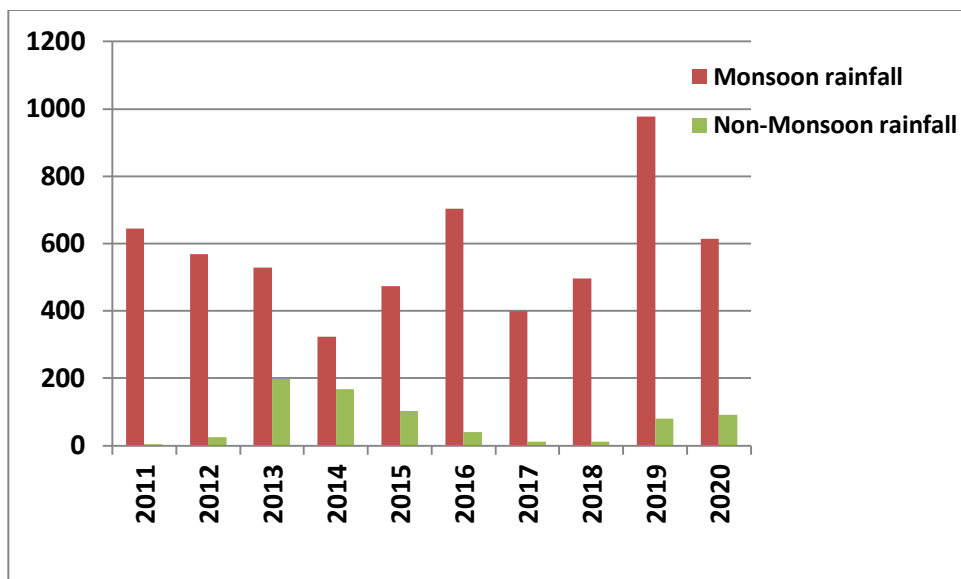


Figure 11: Year wise monsoon v/s Non monsoon rainfall in millimeters of Jaunpur District (2011-20).

Monsoon Rainfall study reveals over normal monsoon rainfall in the calendar year 2011, 2016, 2019-20 whereas over normal non-monsoon rainfall in the calendar year 2013-14.

Year	Monsoon rainfall (mm)	Monsoon normal rainfall (mm)	Deviation (mm)	Non-monsoon rainfall (mm)	Non-monsoon normal rainfall (mm)	Deviation (mm)
2011	645.4	573.2	12.60	3.5	73.19	-95.22
2012	568.6	573.2	-0.80	24.5	73.19	-66.53
2013	529.3	573.2	-7.66	197.5	73.19	169.85
2014	324	573.2	-43.48	168.1	73.19	129.68
2015	473.7	573.2	-17.36	103.1	73.19	40.87
2016	704.4	573.2	22.89	39.8	73.19	-45.62
2017	398.7	573.2	-30.44	12.4	73.19	-83.06
2018	496.4	573.2	-13.40	12.1	73.19	-83.47
2019	978.03	573.2	70.63	80.14	73.19	9.50
2020	613.42	573.2	7.02	90.8	73.19	24.06

Table 8: Year wise deviation in monsoon and non-monsoon rainfall in millimeters of Jaunpur district (2011-20).

- ❖ **Negative (-)** Deviation means below normal and **positive (+)** Deviation means above normal rainfall
- ❖ As per IMD's classification, $-20 > \text{Deviation} < +20$ seems to be normal scenario and accordingly calendar years mentioned.

1.11. Water level

S.No	Block	Pre Monsoon-2021			Post Monsoon-2021			Fluctuation		
		Min	Max	Average	Min	Max	Average	Min	Max	Average
1	BADLAPUR	3.72	17.95	12.95	1.6	15.4	10.57	-0.63	5	1.73
2	BAKSHA	3.68	18.5	11.69	1.55	14.4	8.43	1.5	7.32	3.26
3	BARSATHI	1.77	8.3	6.18	0.1	5.05	2.06	1.4	6.5	4.11
4	DHARMAPUR	3.39	19.39	11.21	1.03	13.98	7.85	1.24	5.49	3.36
5	DOBHI	8.69	9.76	9.23	7.21	7.82	7.52	1.48	1.94	1.71
6	JALALPUR	3.3	14.26	9.75	2.15	9.9	5.37	1.15	6.12	4.38
7	KARANJA KALAN	5.62	15.28	9.28	1.4	15.47	6.31	-0.19	6.8	2.96
8	KERAKAT	3.35	17.55	11.13	1.03	15.62	8.35	1.05	4.77	2.78
9	KHUTAHAN	0.75	8.75	3.86	0.25	6.25	2.46	0.4	2.5	1.4
10	MACHHLISHAHR	1.85	8.96	4.02	0.65	4.82	1.94	1.2	4.14	2.08
11	MAHARAJGANJ	1.41	14.05	3.8	0.39	11.35	2.22	0.62	4.59	1.59
12	MARIAHU	3.45	10.12	6.71	0.75	8.53	4.09	1.4	3.53	2.62
13	MUFTIGANJ	6.02	6.02	6.02	4.87	4.87	4.87	1.15	1.15	1.15
14	MUNGRA BADSHAHPUR	3.55	11.15	7.95	1.55	7.9	3.88	1.35	6.41	4.06
15	RAMNAGAR	5.2	12.57	9.08	2.75	9.72	6.1	1.36	4.27	2.99
16	RAMPUR	3.55	15.7	8.45	0.83	10.75	5.19	1.81	4.95	3.26
17	SHAHGANJ	1.45	1.55	1.5	0.3	0.55	0.43	1	1.15	1.08
18	SIKRARA	6.3	18.38	11.94	2.43	15.03	9.39	0.95	3.87	2.55
19	SIRKONI	4.45	23.65	15.57	2.48	21.05	13.75	-0.62	3.78	1.82
20	SUITHA KALAN	1.15	2.35	1.75	0.35	1.05	0.7	0.8	1.3	1.05
21	SUJANGANJ	1.58	7.68	4.7	0.35	5.75	2.76	1.23	3.26	1.95

Table 9: Pre and Post Monsoon 2021 of Jaunpur District.

The Pre Monsoon 2021 water level data of the district ranges from **0.75 mbgl to 23.65 mbgl**. The Shallower water level during pre-monsoon was observed in **Khauthan block i.e. 0.75 mbgl** and deeper level of water level during pre-monsoon was observed in **Sikroni block i.e. 23.65 mbgl**. The average water level in the district is **8.92 mbgl**.

The Post Monsoon 2021 water level data of the district ranges from **0.30 mbgl to 21.05 mbgl**. The Shallower water level during pre-monsoon was observed in **Shahganj block i.e. 0.30 mbgl** and deeper level of water level during pre-monsoon was observed in **Sikroni block i.e. 21.05 mbgl**. The average water level in the district is **6.302 mbgl**. The deeper water levels both during pre-monsoon and post monsoon was observed in Sikroni block.

The Fluctuations between pre monsoon and post monsoon 2021 of the Jaunpur district ranges **from -0.63 mbgl to 7.32 mbgl**. The minimum fluctuation in water level was observed in **Badlapur block i.e. -0.63 mbgl** and the maximum fluctuation in the water level was observed in **Baksha block i.e. 7.32 mbgl**. The average fluctuation in Ground water level data of Jaunpur district is **2.618 mbgl**.

Ground water trend analysis

Pre- Monsoon Water level trend 2012-21 in (meters/year)							
Block	Rising (m/yr.)			Falling (m/yr.)			Nature of trend
	Min	Max	Avg.	Min	Max	Avg.	
BADLAPUR	0.208	0.208	0.208				Rising
BAKSHA				0.123	0.222	0.175	Falling
BARSATHI	0.126	0.22	0.173	0.013	0.013	0.013	
DHARMAPUR	0.036	0.036	0.036	0.119	0.119	0.119	Mixed trend, predominantly falling
DOBHI	0.193	0.193	0.193				Rising
JALALPUR	0.045	0.14	0.09				Rising
KARANJA KALAN	0.049	0.049	0.049				Rising
KERAKAT	0.009	0.021	0.015				Rising
KHUTAHAN	0.08	0.317	0.175				Rising
MACHHLISHAHR	0.013	0.08	0.035				Rising
MAHARAJGANJ	0.259	0.46	0.324				Rising
MARIAHU				0.032	0.312	0.137	Falling
MUFTIGANJ	0.144	0.144	0.144				Rising
MUNGRA BADSHAHPUR	0.007	0.176	0.091	0.04	0.159	0.074	Mixed trend, predominantly falling
RAMNAGAR	0.077	0.125	0.101	0.162	0.249	0.205	Mixed trend, predominantly falling
RAMPUR	0.158	0.518	0.361	0.248	0.248	0.248	Mixed trend, predominantly rising
SHAHGANJ	0.322	0.322	0.322				Rising
SIKRARA	0.023	0.226	0.094	0.189	0.271	0.23	Mixed trend, predominantly falling
SIRKONI	0.063	0.376	0.182	0.009	0.883	0.422	Mixed trend, predominantly falling
SUITHA KALAN	0.049	0.133	0.091				Rising
SUJANGANJ	0.085	0.085	0.085	0.05	0.124	0.086	Mixed trend, predominantly falling

Table 10: Pre- Monsoon water level trend of Jaunpur, District, 2012-2021.

Block wise pre monsoon Pre monsoon water level trend was calculated for the last ten years i.e. from 2012-21. Out of 21 blocks in the district total **eleven blocks showed a rising water level trend, one block showed a falling water level trend and rest of the nine block showed a mixed water level trend during pre-monsoon season.** The minimum, maximum and Average Rise and fall in the water level for the last ten year is given in **Table: 10.**

Post- Monsoon Water level trend 2011-21 in (meters/year)							
Block	Rising			Falling			Nature of trend
	Min	Max	Avg	Min	Max	Avg	
BADLAPUR	0.215	0.215	0.215				Rising
BAKSHA	0.075	0.013	0.044	0.015	0.015	0.015	Mixed trend, predominantly rising
BARSAHI	0.278	0.53	0.383				Rising
DHARMAPUR	0.149	0.149	0.149	0.085	0.085	0.085	Mixed trend, predominantly rising
DOBHI	0.259	0.259	0.259				Rising
JALALPUR	0.019	0.351	0.214				Rising
KARANJA KALAN	0.09	0.09	0.09				Rising
KERAKAT	0.035	0.072	0.053				Rising
KHUTAHAN	0.054	0.4	0.214				Rising
MACHHLISHAHR	0.01	0.312	0.109				Rising
MAHARAJGANJ	0.163	0.398	0.278				Rising
MARIAHU	0.033	0.094	0.063	0.005	0.274	0.109	Mixed trend, predominantly falling
MUFTIGANJ				0.026	0.026	0.026	Falling
MUNGRA BADSHAHPUR	0.067	0.188	0.155	0.009	0.147	0.078	Mixed trend, predominantly rising
RAMNAGAR	0.213	0.327	0.251	0.208	0.208	0.208	Mixed trend, predominantly rising
RAMPUR	0.162	0.818	0.436				Rising
SHAHGANJ	0.161	0.161	0.161				Rising
SIKRARA	0.165	0.271	0.218	0.135	1.351	0.592	Mixed trend, predominantly falling
SIRKONI	0.026	0.519	0.266	0.086	0.865	0.46	Mixed trend, predominantly falling
SUITHA KALAN	0.067	0.067	0.067	0.045	0.045	0.045	Mixed trend, predominantly rising
SUJANGANJ	0.004	0.041	0.021	0.041	0.041	0.041	Mixed trend, predominantly rising

Table 11: Post- Monsoon water level trend of Jaunpur, District, 2012-2021.

Block wise Post monsoon water level trend was calculated for the last ten years i.e. from 2012-21. Out of 21 blocks in the district total **eleven blocks showed a rising water level trend, one block showed a falling water level trend and rest of the nine block showed a mixed water level trend during post-monsoon season.** The minimum, Maximum and Average Rise and fall in the water level during post monsoon for the last 10 year is given **Table: 11.**

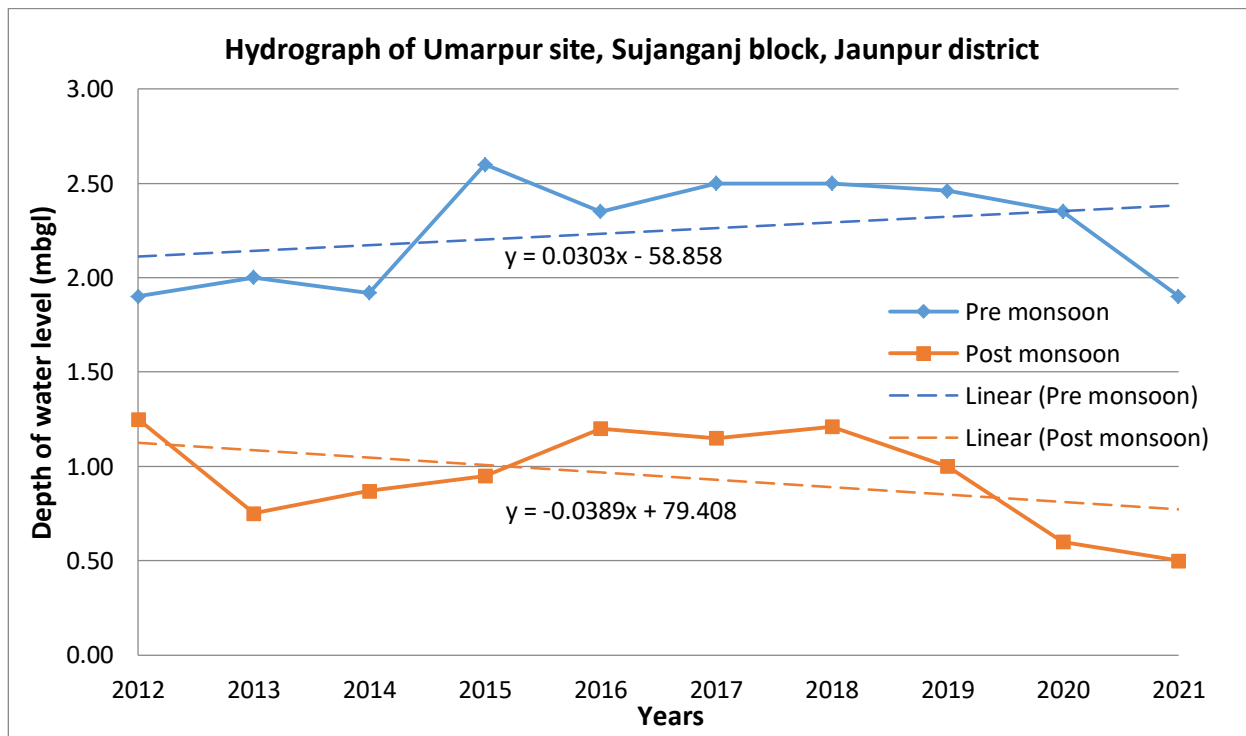
Annual Water level trend 2011-21 in (meters/year)							
Block	Rising			Falling			Nature of trend
	Min	Max	Avg	Min	Max	Avg	
BADLAPUR	0.211	0.211	0.211				Rising
BAKSHA				0.005	0.119	0.059	Falling
BARSATHI	0.165	0.375	0.247				Rising
DHARMAPUR	0.093	0.093	0.093	0.102	0.102	0.102	Mixed trend, predominantly falling
DOBHI	0.226	0.226	0.226				Rising
JALALPUR	0.079	0.209	0.152				Rising
KARANJA KALAN	0.069	0.069	0.069				Rising
KERAKAT	0.022	0.046	0.034				Rising
KHUTAHAN	0.067	0.278	0.194				Rising
MACHHLISHAHR	0.002	0.173	0.072				Rising
MAHARAJGANJ	0.197	0.396	0.301				Rising
MARIAHU	0.031	0.031	0.031	0.008	0.293	0.119	Mixed trend, predominantly falling
MUFTIGANJ	0.059	0.059	0.059				Rising
MUNGRA BADSHAHPUR	0.037	0.131	0.07	0.031	0.153	0.092	Mixed trend, predominantly rising
RAMNAGAR	0.082	0.169	0.132	0.229	0.229	0.229	Mixed trend, predominantly rising
RAMPUR	0.181	0.668	0.433	0.043	0.043	0.043	Mixed trend, predominantly rising
SHAHGANJ	0.241	0.241	0.241				Rising
SIKRARA	0.094	0.249	0.171	0.203	0.659	0.367	Mixed trend, predominantly falling
SIRKONI	0.14	0.338	0.264	0.048	0.874	0.4	Mixed trend, predominantly falling
SUITHA KALAN	0.002	0.1	0.051				Rising
SUJANGANJ	0.051	0.051	0.051	0.005	0.062	0.042	Mixed trend, predominantly falling

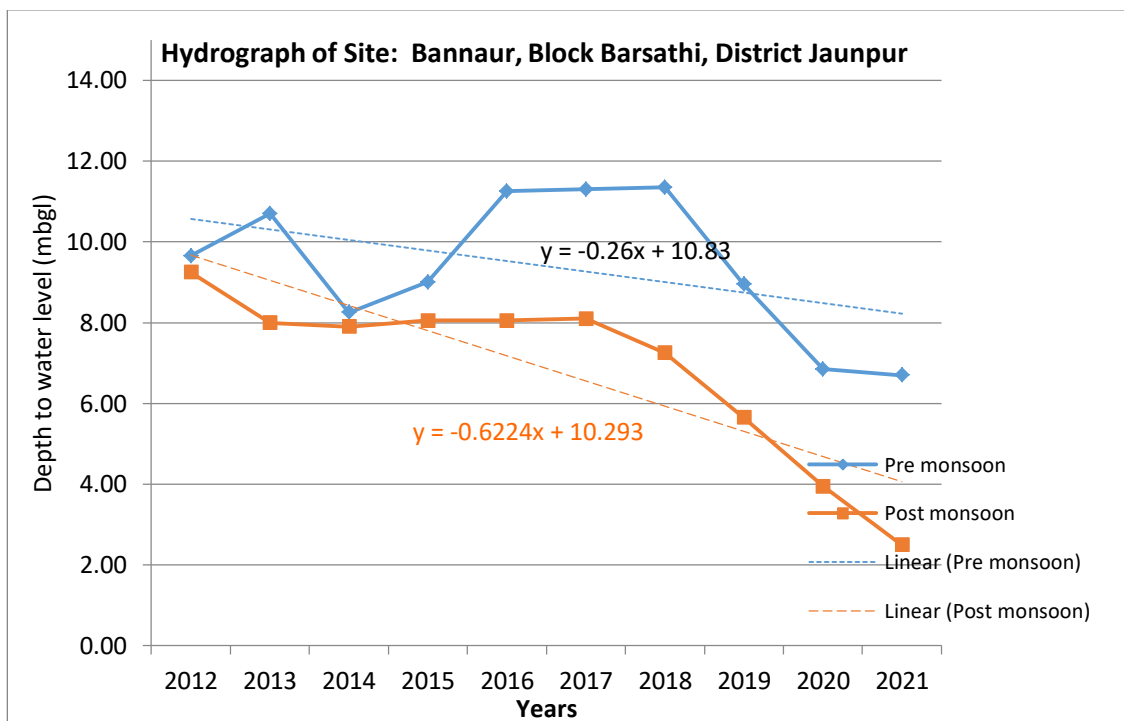
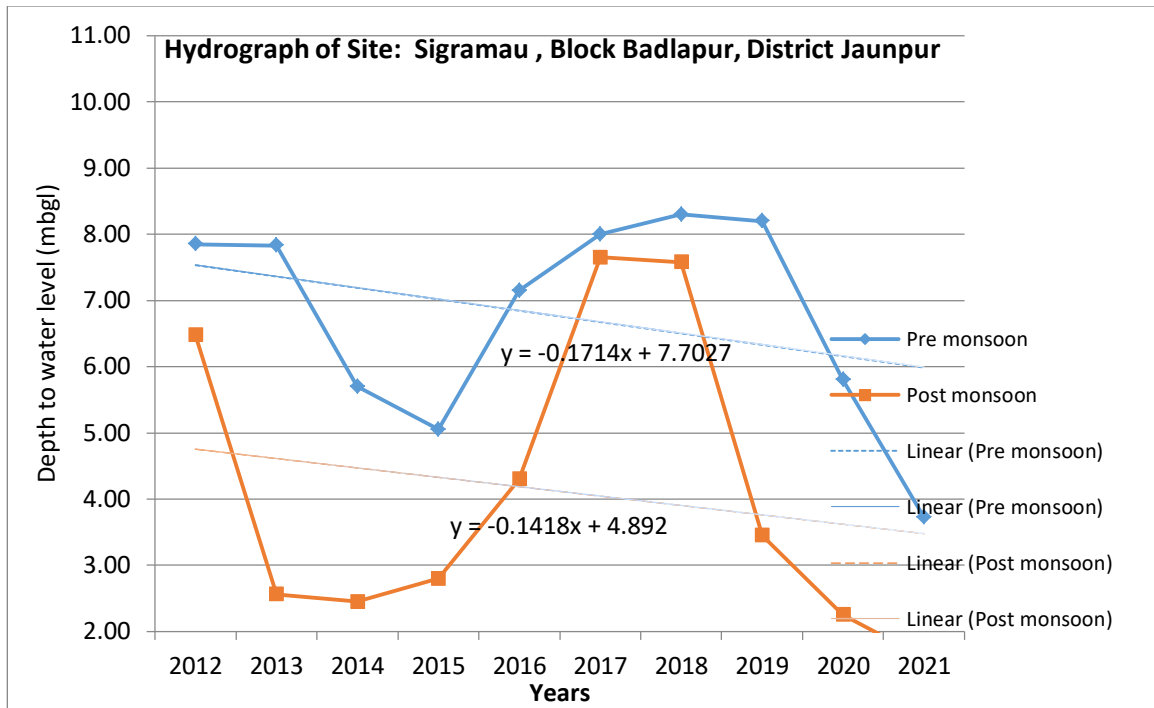
Table 12: Annual water level trend of Jaunpur, District, 2012-2021.

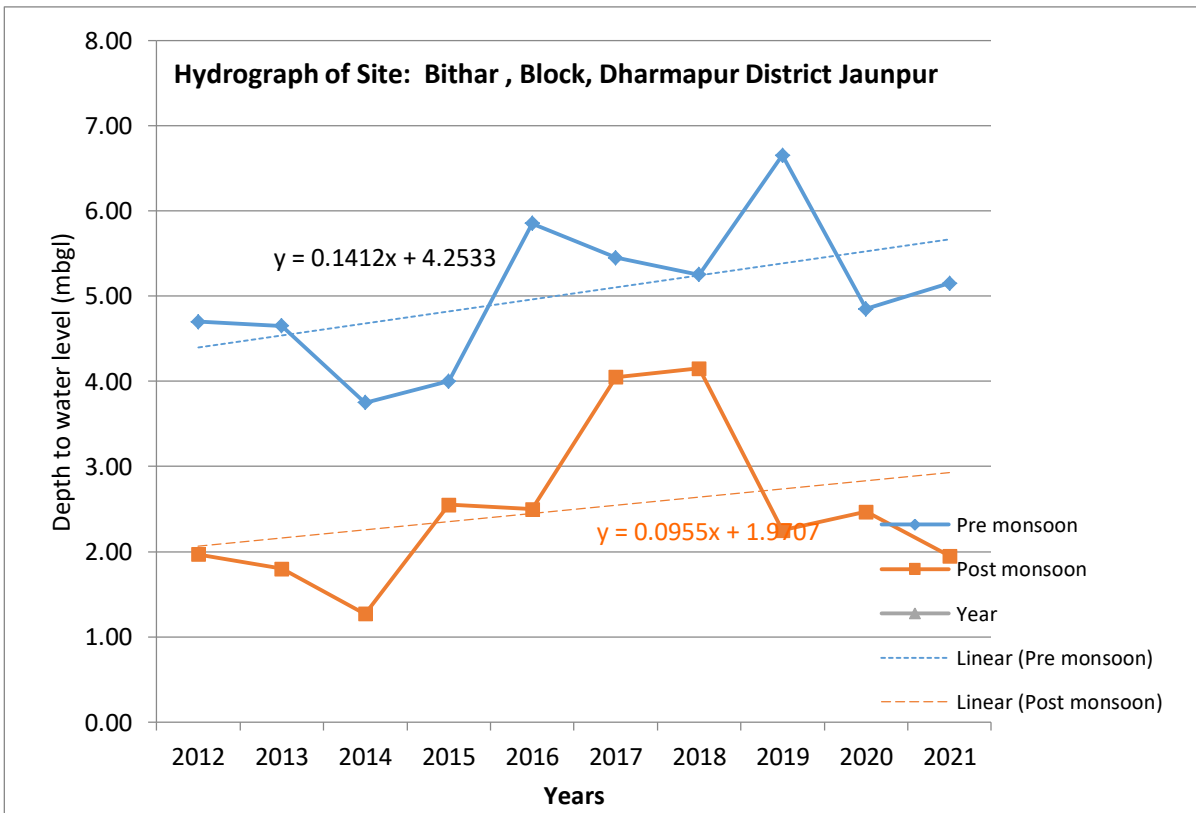
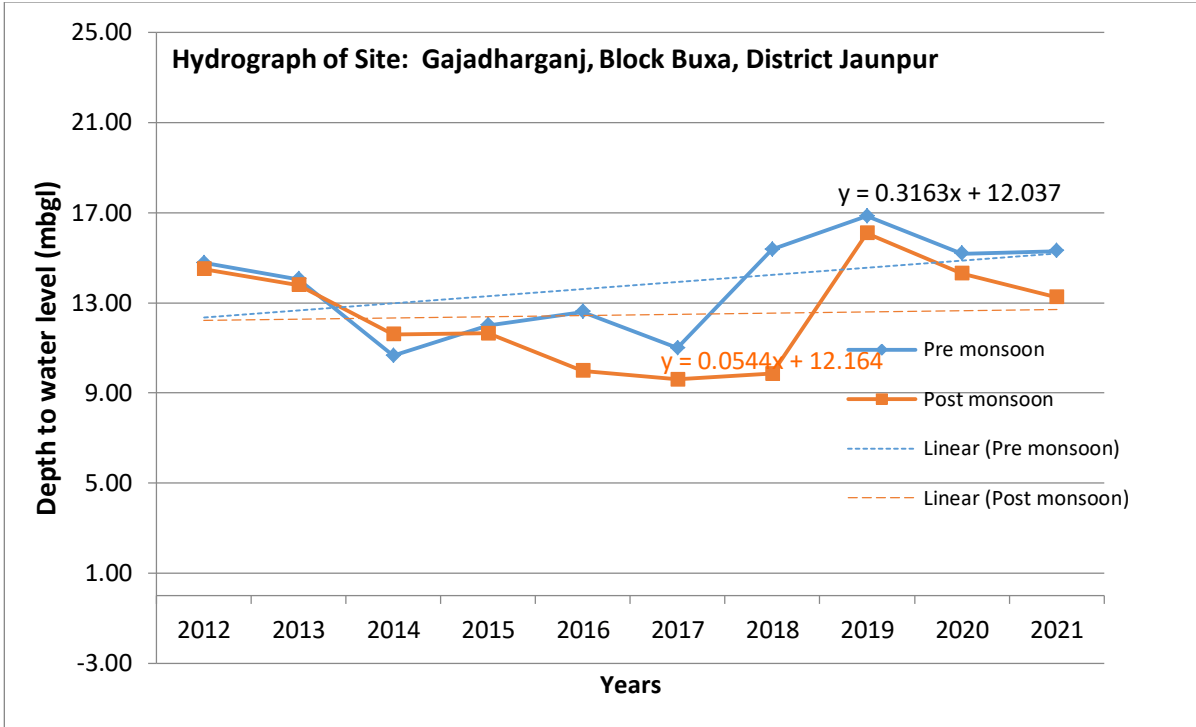
Block wise annual water level trend was calculated for the last ten years i.e. from 2012-21. Out of 21 blocks in the district total **ten blocks showed a rising water level trend, one block showed a falling water level trend and rest of the nine block showed a mixed annual water level.** The minimum, Maximum and Average Rise and fall in the annual water level trend for the last ten year is given in **table no 12:**

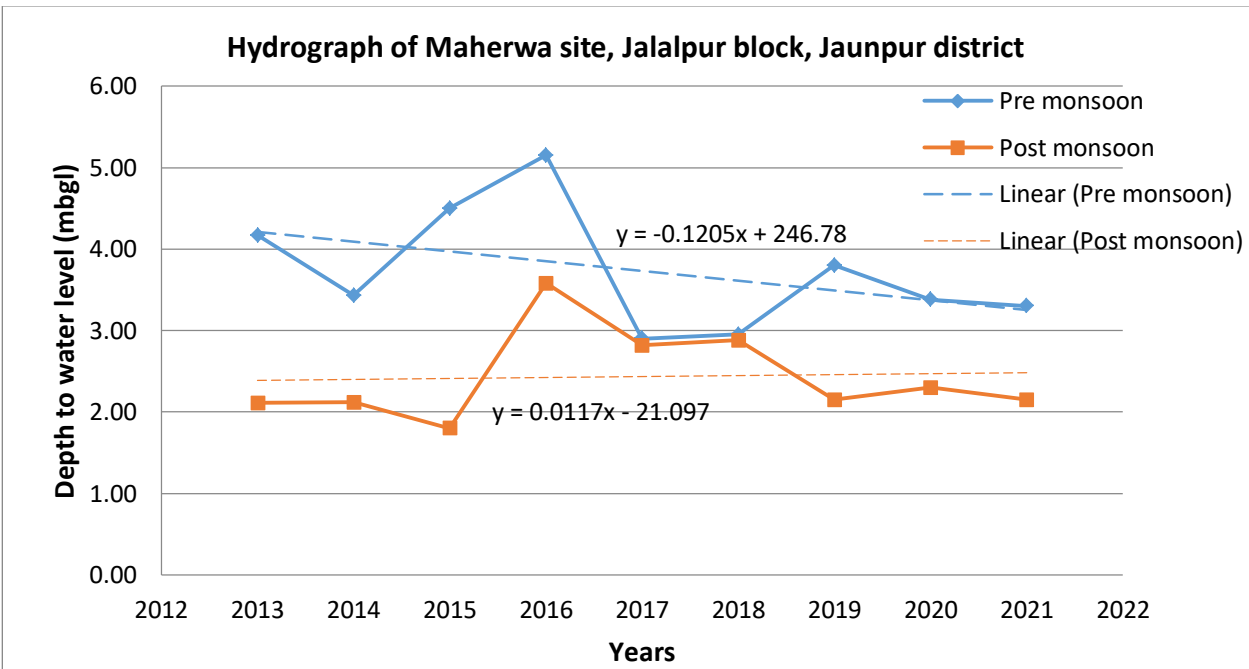
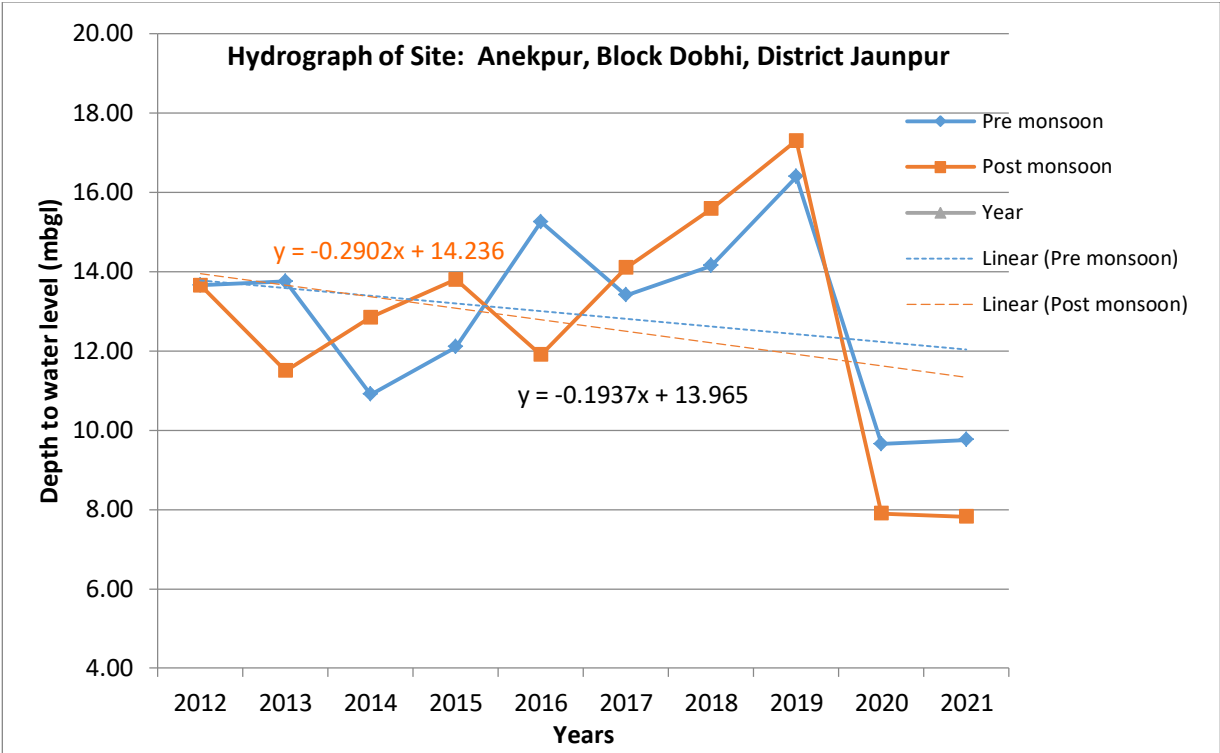
1.12. Hydrographs

Block wise Hydrograph were plotted for all the 21 blocks of Jaunpur district taking in to account last ten years 2012-2021 pre monsoon and post monsoon water level data. The details of the block wise hydrograph plot along with the trend line during pre and post monsoon are given below.

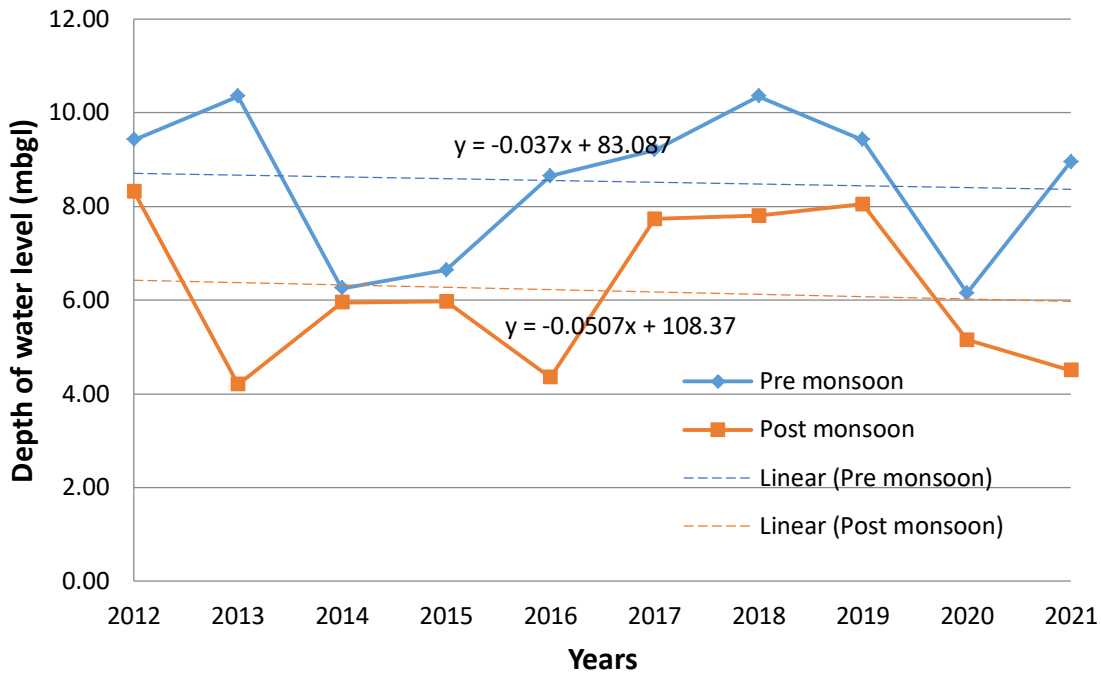




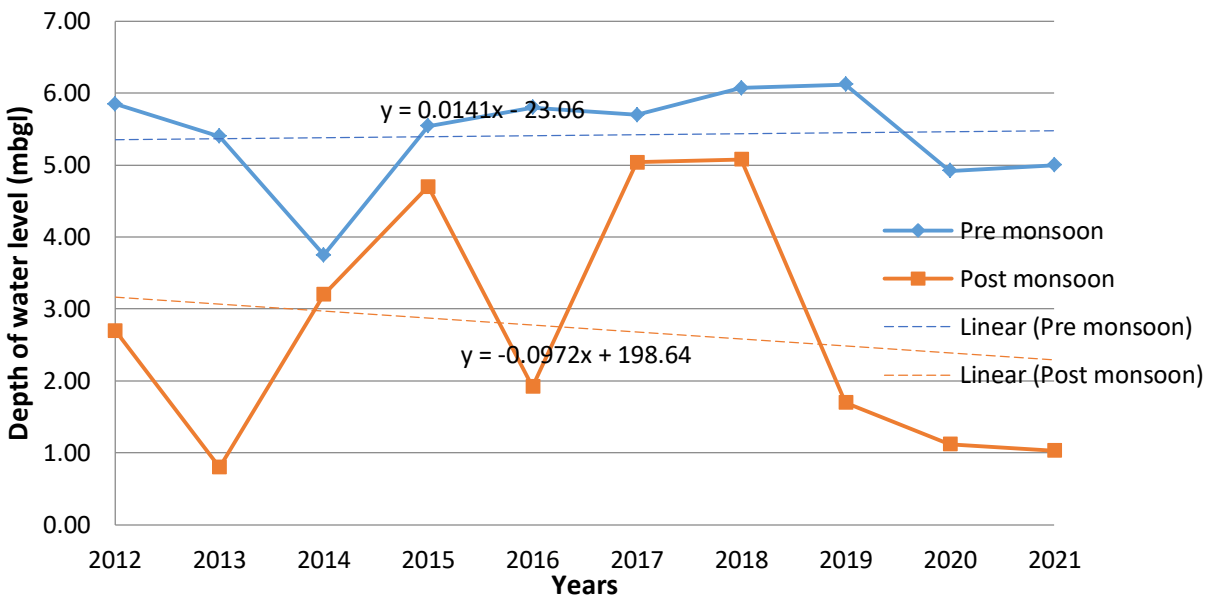




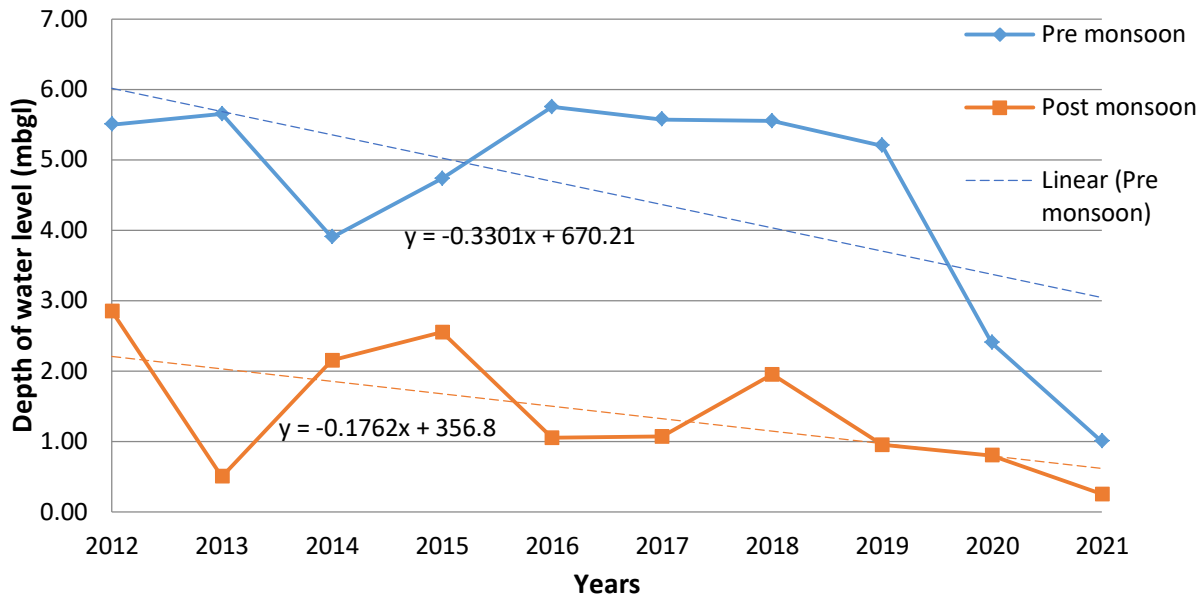
Hydrograph of Karanjakalan site, Karanjakalan block, Jaunpur district



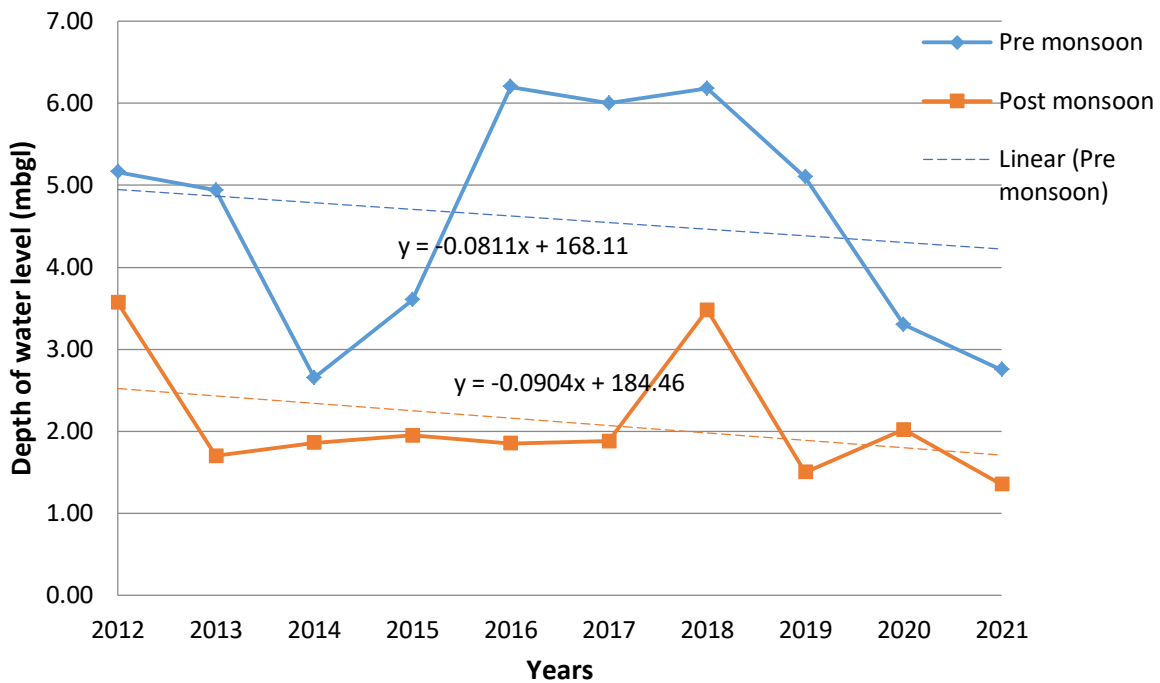
Hydrograph of Sultanpur site, Kerakhat block, Jaunpur district

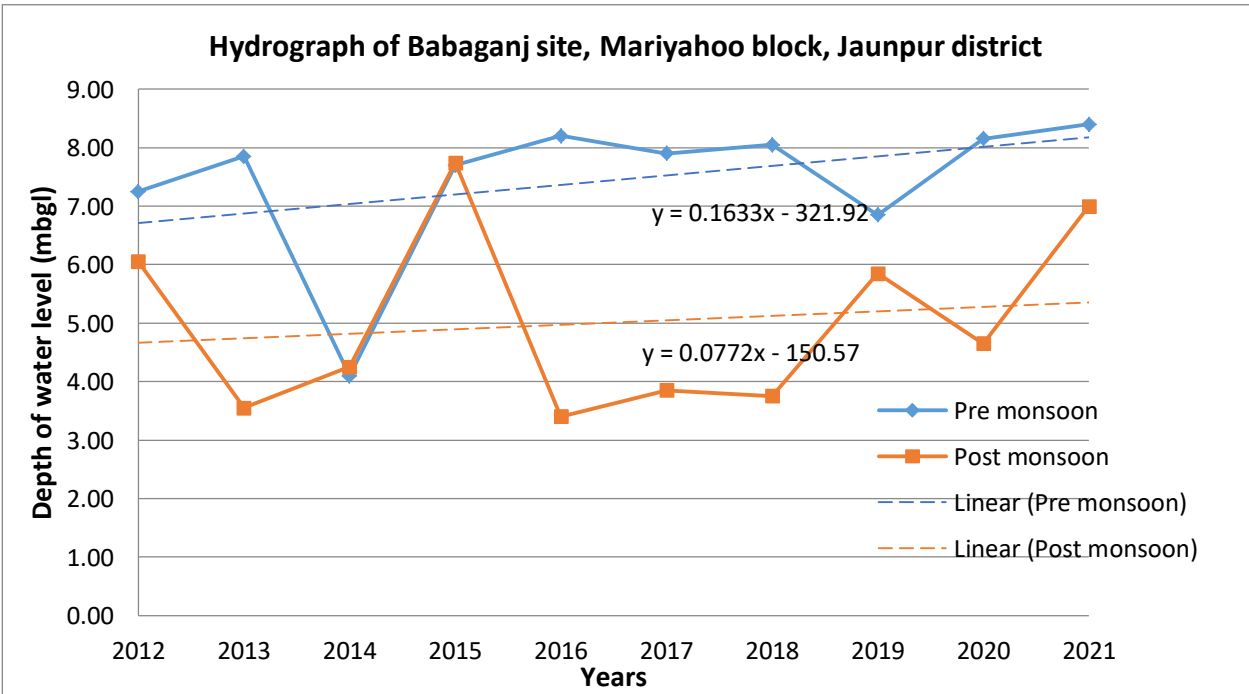
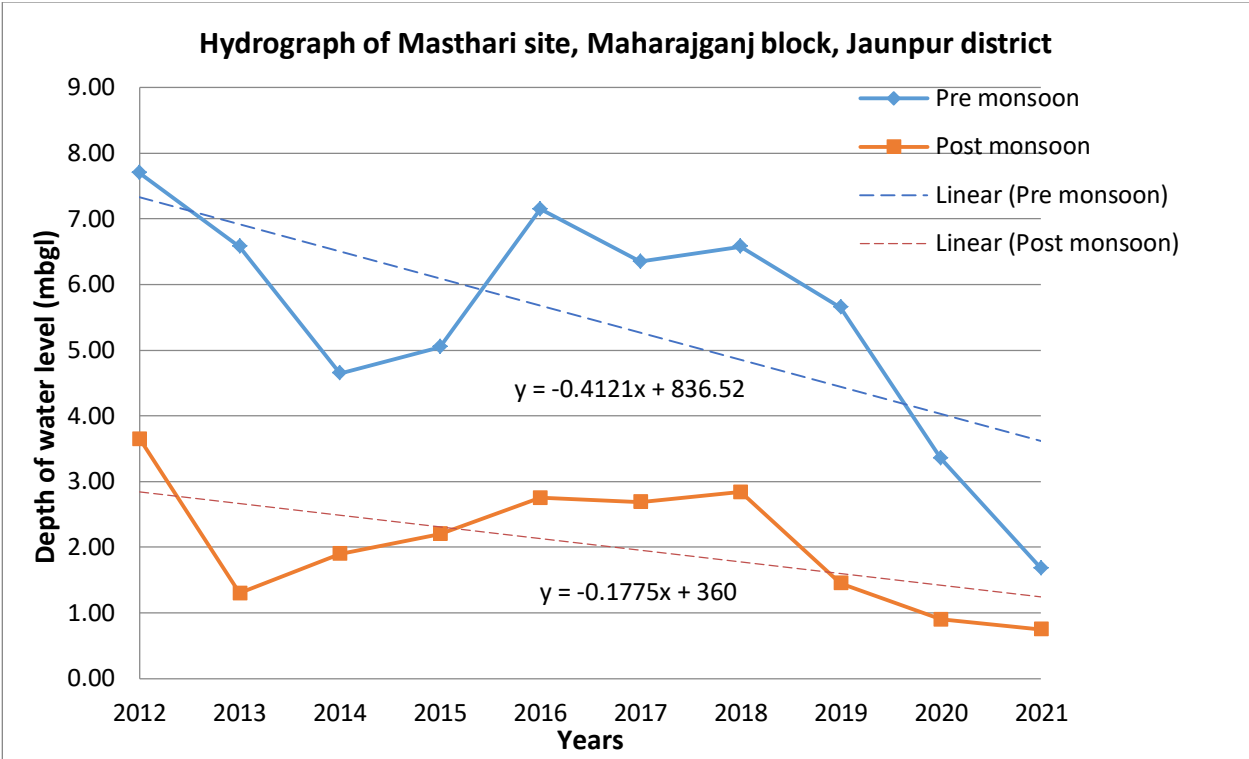


Hydrograph of Budhanpur site, Khuthan block, Jaunpur district

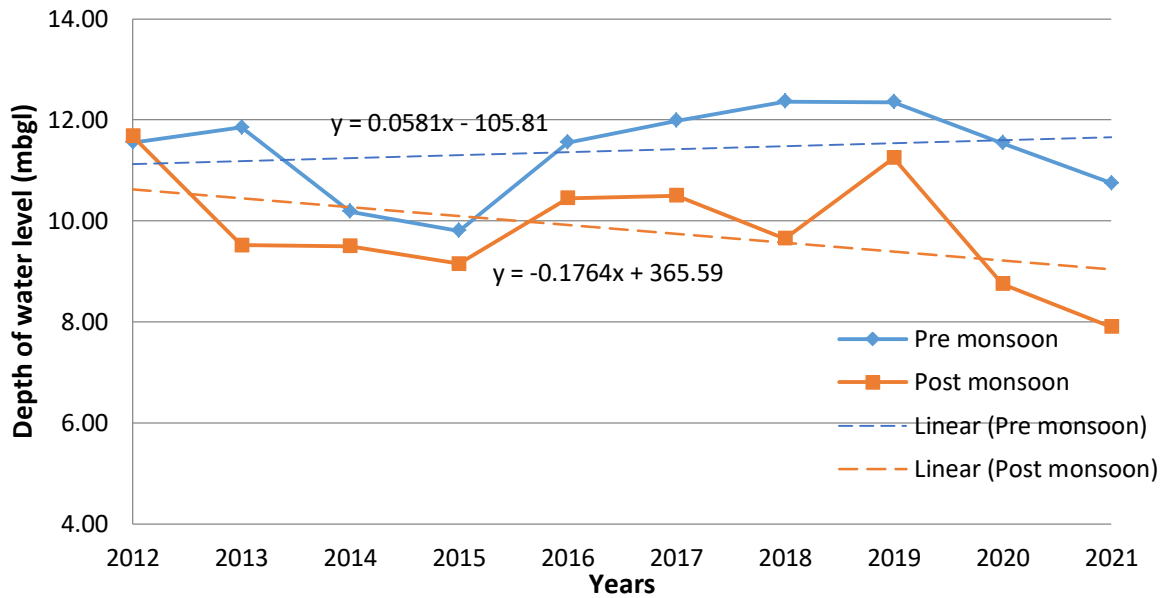


Hydrograph of Jhasapur site, Machalishahar block, Jaunpur district

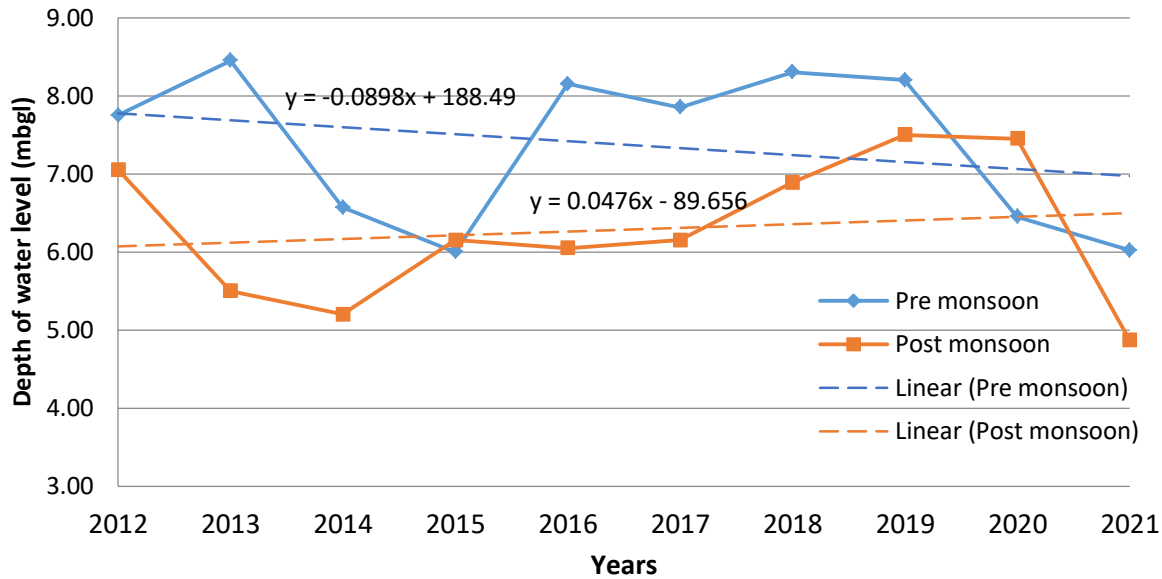




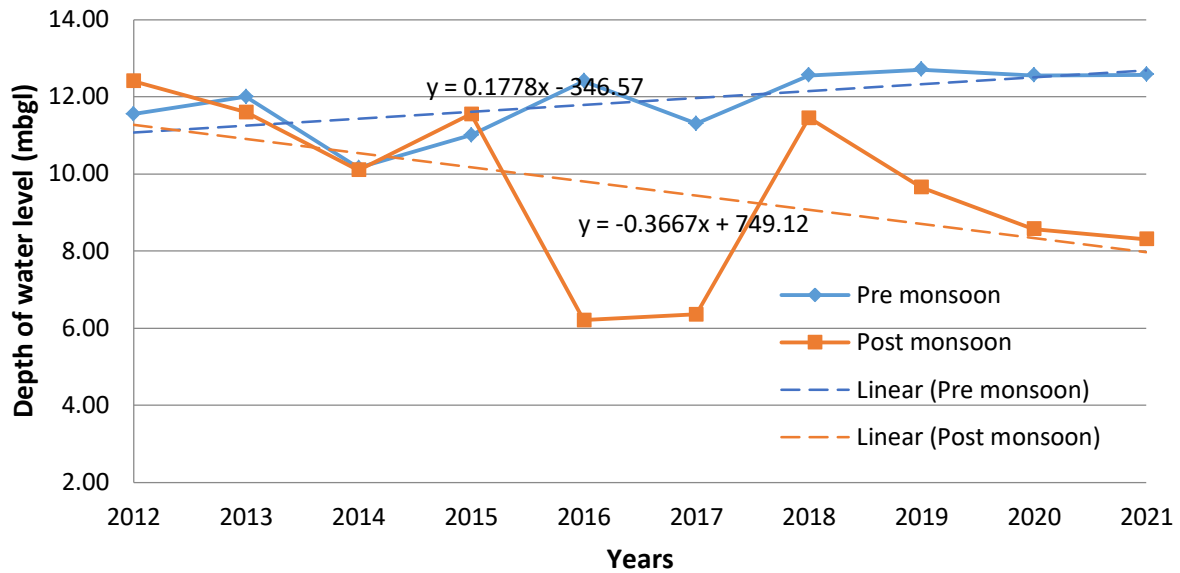
Hydrograph of Jaipalpur site, Mongrabadshahpur block, Jaunpur district



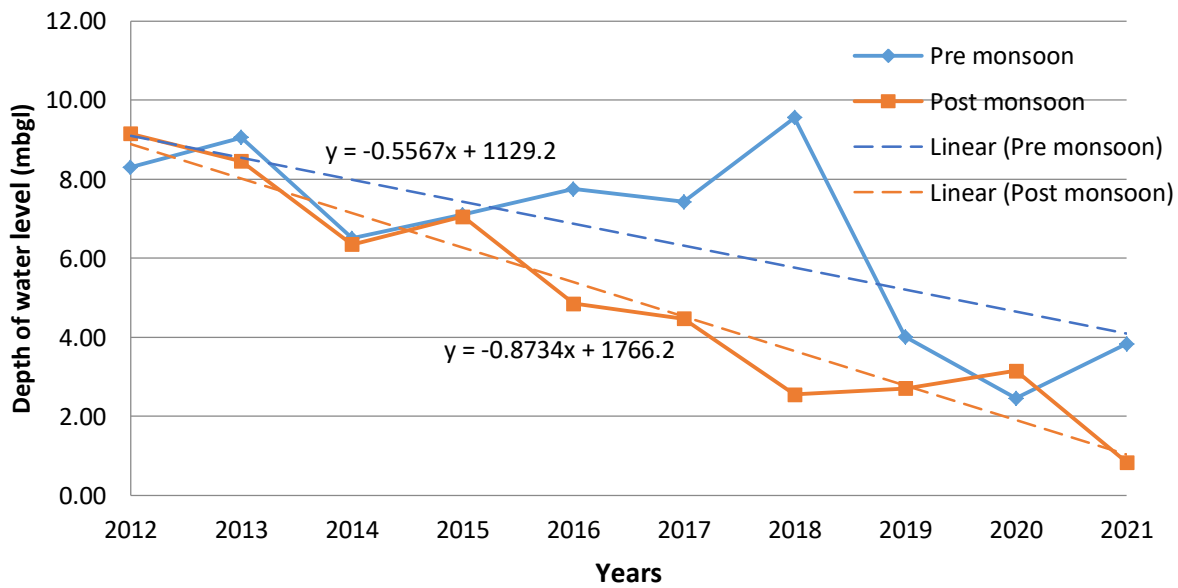
Hydrograph of Muftiganj site, Muftiganj block, Jaunpur district

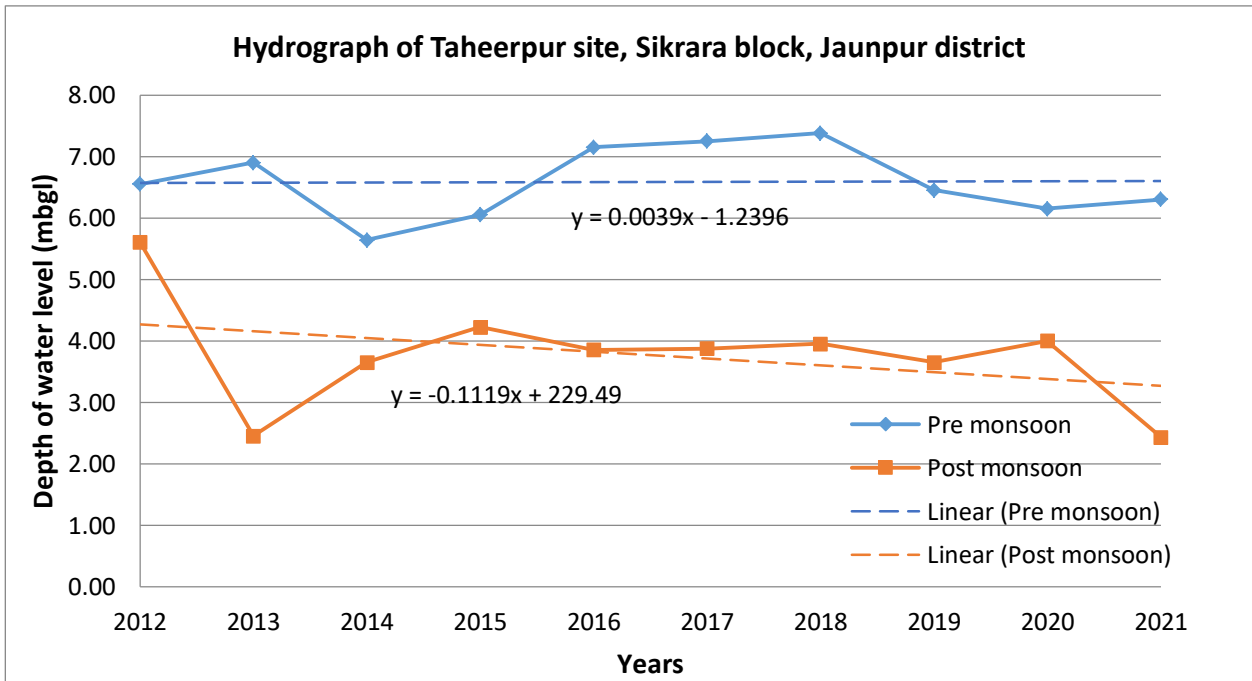
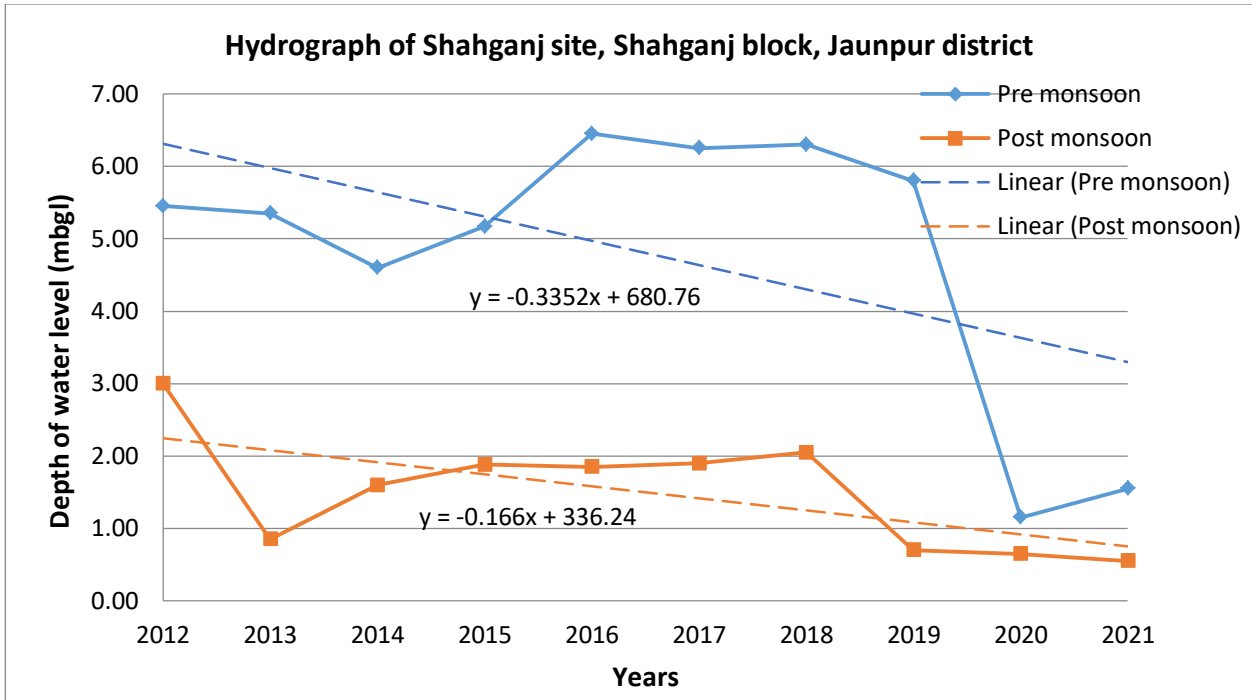


Hydrograph of Budhipur site, Ramnagar block, Jaunpur district

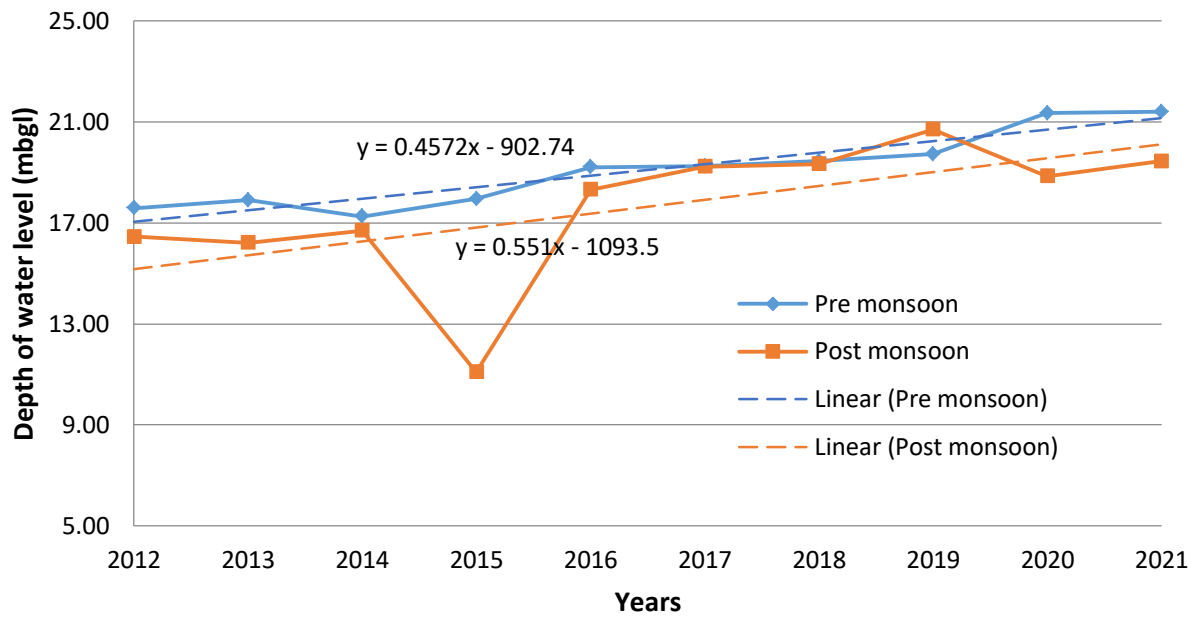


Hydrograph of Rampur site, Rampur block, Jaunpur district

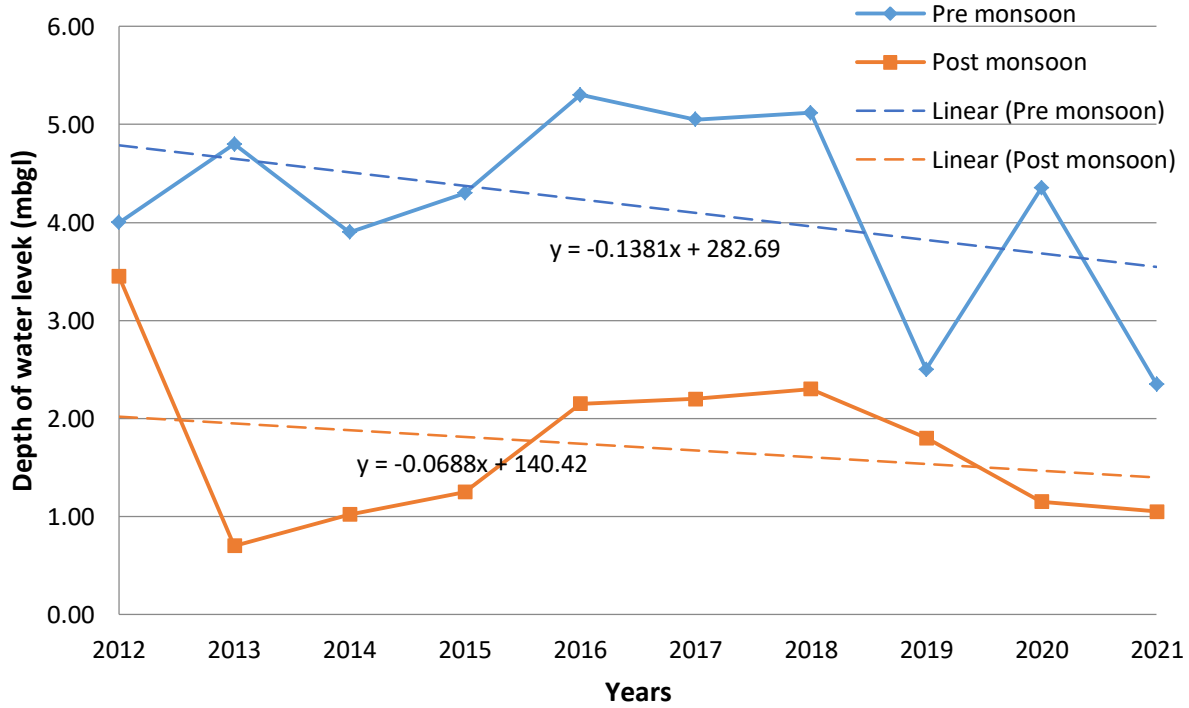




Hydrograph of Bansgalpur site, Sirkoni block, Jaunpur district



Hydrograph of Piprauwal site, uithakalan block, Jaunpur district



2. Data collection generation and aquifer mapping

A total number of nine exploratory wells were constructed by CGWB. Exploratory wells were constructed in Suithakala, Sujanganj, Mungrabadshahpur, Machlishahar, Muftiganj, Dharmapur, Karanjakalan and Mariahu blocks. Exploratory wells were drilled in the depth range of **30.32 to 611.45 mbgl** and well development was in the depth range of **299.00 to 416.00 mbgl**.

S.No	Nam of the site	Block	Latitude	Longitude	Total depth drilled	Total depth of tube well
1	Atardiha EW	Suithakala	26°09'	82°37'	549.00	Abandoned
2	Belhramau EW	Sujanganj	25°09'20"	82°18'20"	610.00	388.27
3	Nibhapur EW	Mungra badshahpur	25°36'	82°15'	424.70	299.00
4	Kurni EW	Machlishahar	25°41'	82°27'	541.53	345.00
5	Sakra EW	Muftiganj	25°37'	82°34'	413.00	288.14
6	Amlu EW	NA	25°43'	82°45'	306.32	228.03
7	Karmahi EW	Dharmapur	25°44'	82°45'	557.73	342.28
8	Hamzapur EW	Karanja Kalan	25°47'	82°40'	611.45	416.00
9	Majghawan EW	Mariahu	25°47'	82°40'	516.36	299.46

Table 13: List of Exploratory wells constructed by CGWB.

S.No	Nam of the site	Block	Latitude	Longitude	Total depth drilled	Total depth of tube well
1	Jamuhar EW	Mchhalishahar	25°39'0"	82°22'29"	171.00	1508.00
2	Jamuhar EW	Mchhalishahar	25°37'14"	83°23'40"	28.84	259.00
3	Naharpue EW	Maharajganj	25° 51' 45"	25° 51' 45"	154.42	126.00
4	Naharpue EW	Maharajganj	25° 51' 4"	82° 22' 57"	299.07	267.00
5	Pali EW	Mariahu	25°39'16.5"	82°37'01.4"	141.06	128.00
6	Pali EW	Mariahu	25°39'16.5"	82°37'01.4"	305.06	272.00
7	Suraila EW	Muftiganj	25°44'18.4"	82°54'17.2"	149.31	118.00
8	Suraila EW	Muftiganj	25°44'18.4"	82°54'17.2"	305.03	251.00
9	Shahganj EW	Shahganj	26°04'25.8"	82°40'56.8"	156.00	126.00
10	Shahganj EW	Shahganj	26°04'25.8"	82°40'56.8"	307.70	286.00
11	Uttarpatti EW	Karanjakalan	25°51'40.8"	82°36'42.2"	156.00	134.00
12	Uttarpatti EW	Karanjakalan	25°51'40.8"	82°36'42.2"	314.40	304.00

Table 14: List of Exploratory wells constructed by WABCOS.

S.No	Nam of the site	Block	Latitude	Longitude	Total depth drilled	Total depth of tube well
1	Jamuhar OW	Mchhalishahar	25 ⁰ 39'0"	82 ⁰ 22'29"	168.00	158.00
2	Jamuhar OW	Mchhalishahar	25 ⁰ 37'14"	83 ⁰ 23'40"	273.50	259.00
3	Naharpue OW	Maharajganj	25 ⁰ 51' 45"	25 ⁰ 51' 45"	132.19	126.00
4	Naharpue OW	Maharajganj	25 ⁰ 51' 4"	82 ⁰ 22' 57"	279.98	267.00
5	Pali OW	Mariahu	25 ⁰ 39'16.5"	82 ⁰ 37'01.4"	135.00	128.00
6	Pali OW	Mariahu	25 ⁰ 39'16.5"	82 ⁰ 37'01.4"	289.62	272.00
7	Suraila OW	Muftiganj	25 ⁰ 44'18.4"	82 ⁰ 54'17.2"	121.60	118.00
8	Suraila OW	Muftiganj	25 ⁰ 44'18.4"	82 ⁰ 54'17.2"	265.76	251.00
9	Shahganj OW	Shahganj	26 ⁰ 04'25.8"	82 ⁰ 40'56.8"	135.00	126.00
10	Shahganj OW	Shahganj	26 ⁰ 04'25.8"	82 ⁰ 40'56.8"	294.31	286.00
11	Uttarpatti OW	Karanjakalan	25 ⁰ 51'40.8"	82 ⁰ 36'42.2"	141.00	135.00
12	Uttarpatti OW	Karanjakalan	25 ⁰ 51'40.8"	82 ⁰ 36'42.2"	318.04	304.00

Table 15: List of Exploratory wells constructed by WABCOS.

Apart from CGWB, **WABCOS** has constructed total 24 no of wells in the district out of which twelve no are exploratory wells and twelve no are Observatory wells. The wells were constructed in Mchhalishahar, Mariahu, Maharajganj, Muftiganj, Shahganj and Karanjakalan blocks. The wells developed by WABCOS constitute a well field where different aquifers are tapped at same location through different exploratory and observatory wells. Total 2 no of Aquifers were tapped in the wells constructed by WABCOS.

2.1. Aquifer Geometry:

To understand the lithological frame work and aquifer disposition in the sub surface aquifers, the litho log data of wells drilled by CGWB of Jaunpur District are used to compile, optimized and modeled into 3D synoptic picture by using the RockWorks16 Trial Version software.

Lithological log of all the exploratory sites has been prepared on field. , lithological model of the area obtained by 3D co-relation in Rockworks Software is based on the following parameters.

- ❖ Grain size distribution,
- ❖ Geophysical log and
- ❖ Composite log.

Jaunpur District

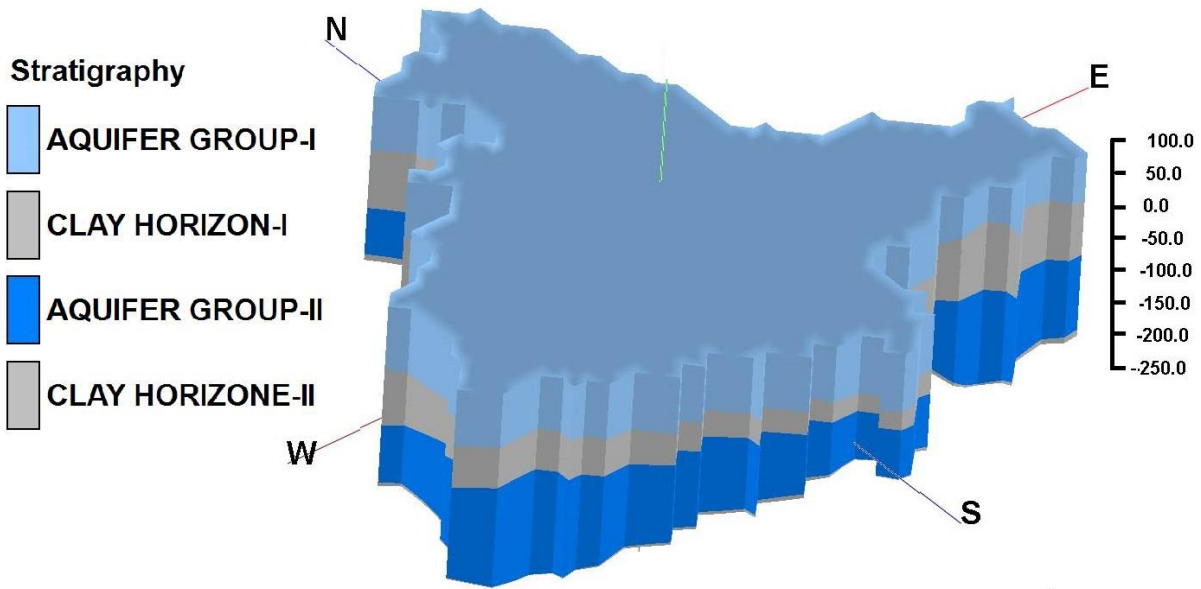


Figure 12 : 3-D Aquifer Model diagram of Jaunpur District

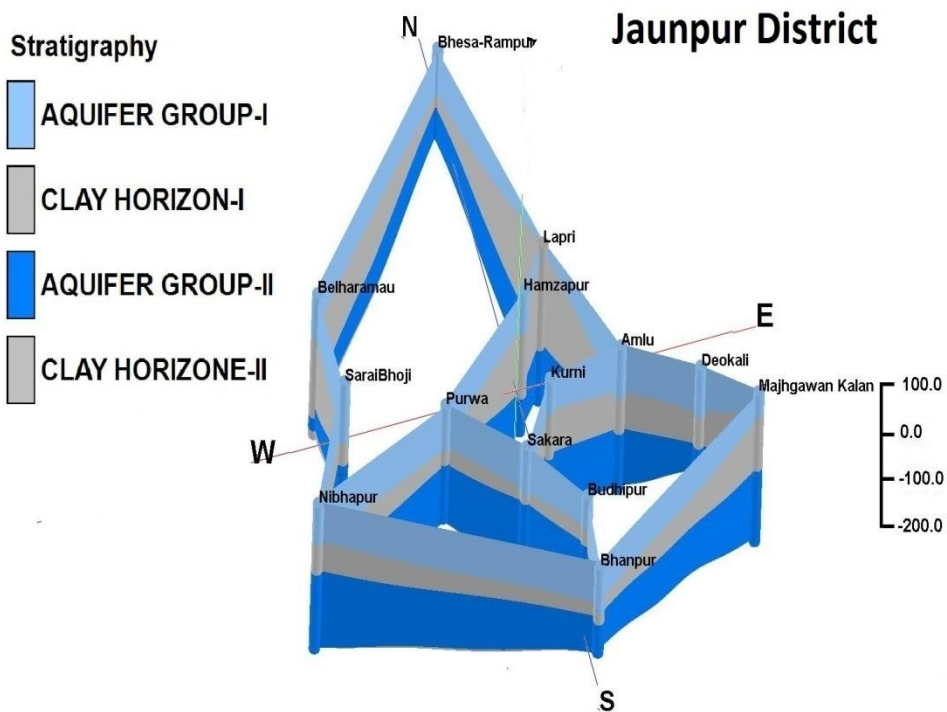


Figure 13: Panel diagram of Jaunpur District.

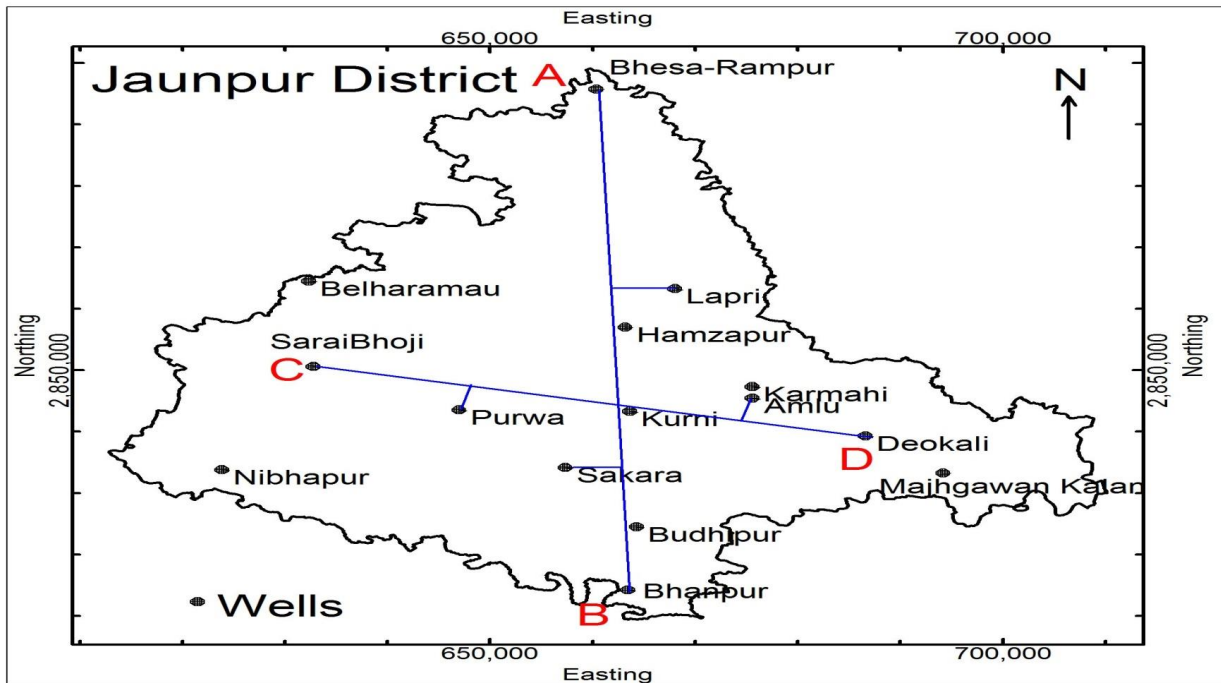


Figure 14: Map showing orientation of various sections of Jaunpur District.

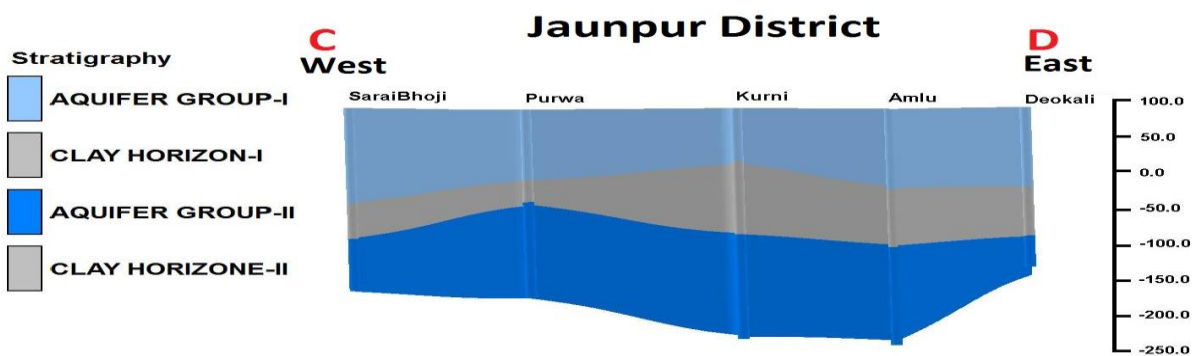


Figure 15: Hydrogeological Cross section of Jaunpur District along E-W direction.

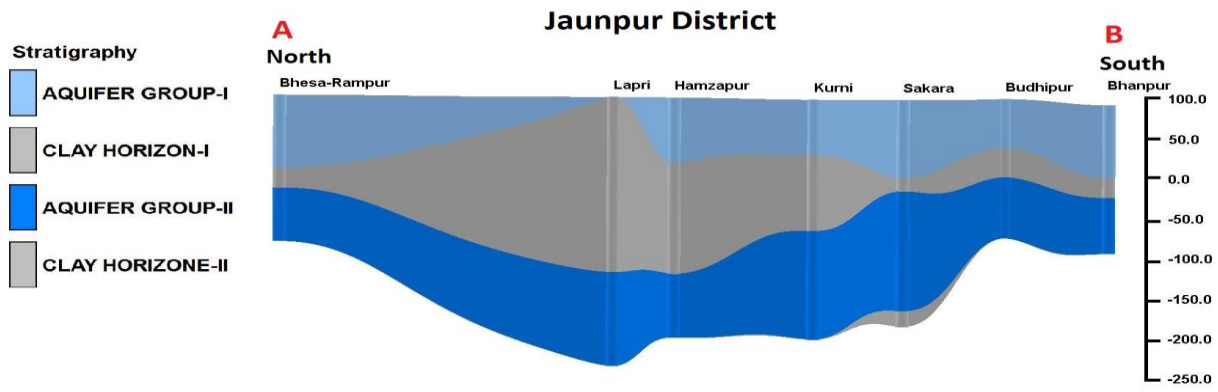


Figure 16: Hydrogeological cross section of Jaunpur District along N-S direction.

3. Ground water Quality

Central Ground Water Board has collected total of 78 water samples from 21 blocks of Jaunpur district for analysis of Basic Parameters and Heavy Metals. The samples were collected from dug wells. The analysis of the samples was carried out in Chemical lab CGWB, NR Lucknow and detailed interpretation of Ground water chemical behavior is given below.

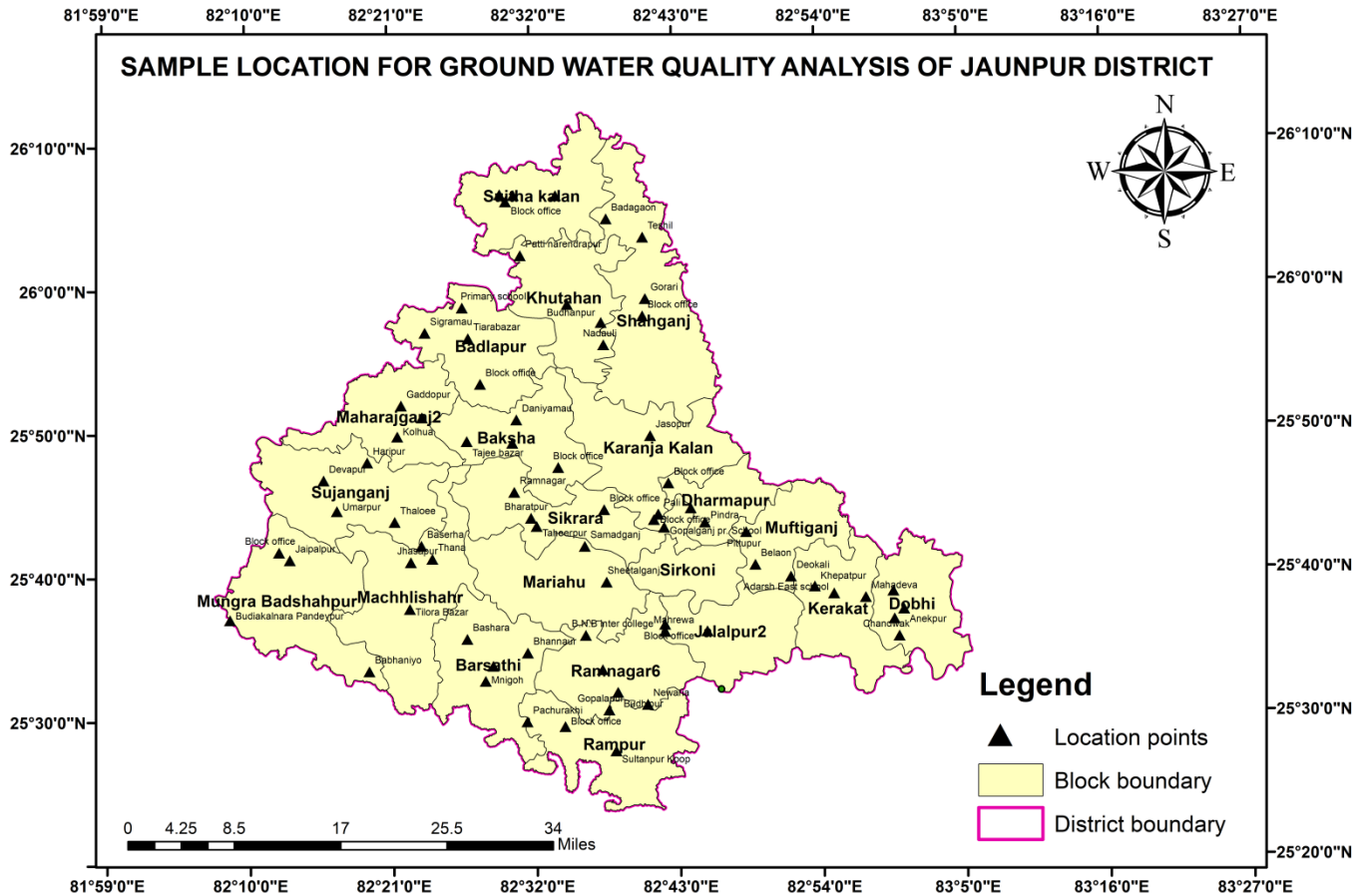


Figure 17: Location of Ground water Quality samples of Jaunpur District.

P.H

The PH indicates the strength of the water to react with the acidic or alkaline material present in the water. The acceptable limit of pH in Ground water is 6.5-8.5. The pH in the groundwater samples collected varied from 8.34 to 9.15. The mean value of P.H is 8.68.

ELECTRICAL CONDUCTIVITY

EC values of the samples collected from district varied from 318 to 865 $\mu\text{S cm}^{-1}$ with an average EC value of Ground water 654 $\mu\text{S cm}^{-1}$. EC value in some parts of Shahganj, Sikroni, Mariyahu, Rampur, Barsathi, Machlishahar and Mungrabadshahpur blocks ranges from 1416 to 2431 $\mu\text{S cm}^{-1}$.

TOTAL HARDNESS

Total hardness of the groundwater samples collected from the district ranges 70.1 to 300.00 mg/l. The average hardness of the analyzed samples was found to be 176.12 mg/l. The nature of total hardness of Ground water is Moderately hard to hard with 67.11 % of the samples analyzed are found to be hard and 31.58 % of the samples analyzed are found to be moderately hard.

Total Hardness as CaCo3(mg/l)	Range	No of samples	% of samples
Soft	0 – 75	1	1.32
Moderately Hard	75 – 150	24	31.58
Hard	150 – 300	51	67.11
Very Hard	>300	0	0.00

Table 16: Classification of Ground water based on Total hardness.

TOTAL DISSOLVED SALTS

TDS of the samples analyzed in found to be in between 247.74 -1812.10 mg/lit with average value is 411.57 mg/lit

NITRATE

Nitrate concentration in the Ground water ranges from 0 to 76 mg/l with the average concentration value of 7.83 mg/l. Nitrate concentration in most of the blocks exceeds the prescribed drinking water limits that is 10 mg/lit. Nitrate concentration of one sample collected from Karyalay jilaadhikari site, Sirkoni block exceeds the permissible limit in of Nitrate concentration in Ground water that is 45.00 mg/l.

FLOURIDE

Concentration of Fluoride in ground water ranges from 0.09 -1.8 mg/lit with average concentration of Fluoride is 0.70 mg/lit. Fluoride concentration in some parts of Khuthan,Sirkoni, Rampur, Machlishahar, and Mungrabadshahpur blocks exceeds the permissible limit that is 1.5mg/lit.

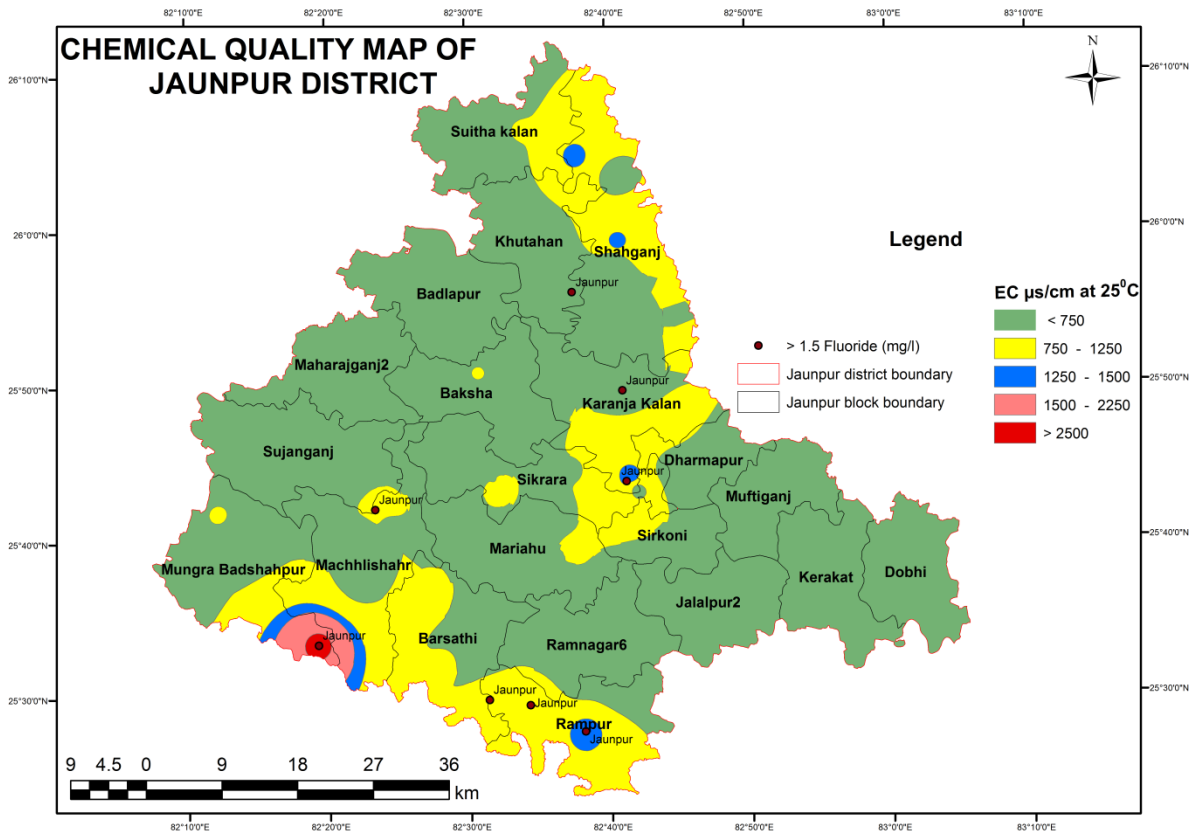


Figure 18: Chemical quality map of Jaunpur district.

HILL PIPER DIAGRAM

Hill piper diagram is commonly and popularly used to plot the ions in triangle. The cations are plotted in the left hand triangle whereas the anions are plotted in right hand triangle. The cations and anions are projected onto diamond shape field which is often used to determine the Facies of ground water. As shown in figure cationic Facies show dominance $\text{Na}+\text{K}$ and Mg type of cations, whereas anionic Facies shows the HCO_3+CO_3 type. However cumulative plot of ions on to the diamond shape field reflects that the major ground water is Magnesium bicarbonate to mixed type of water.

HILL PIPER DIAGRAM OF JAUNPUR DISTRICT

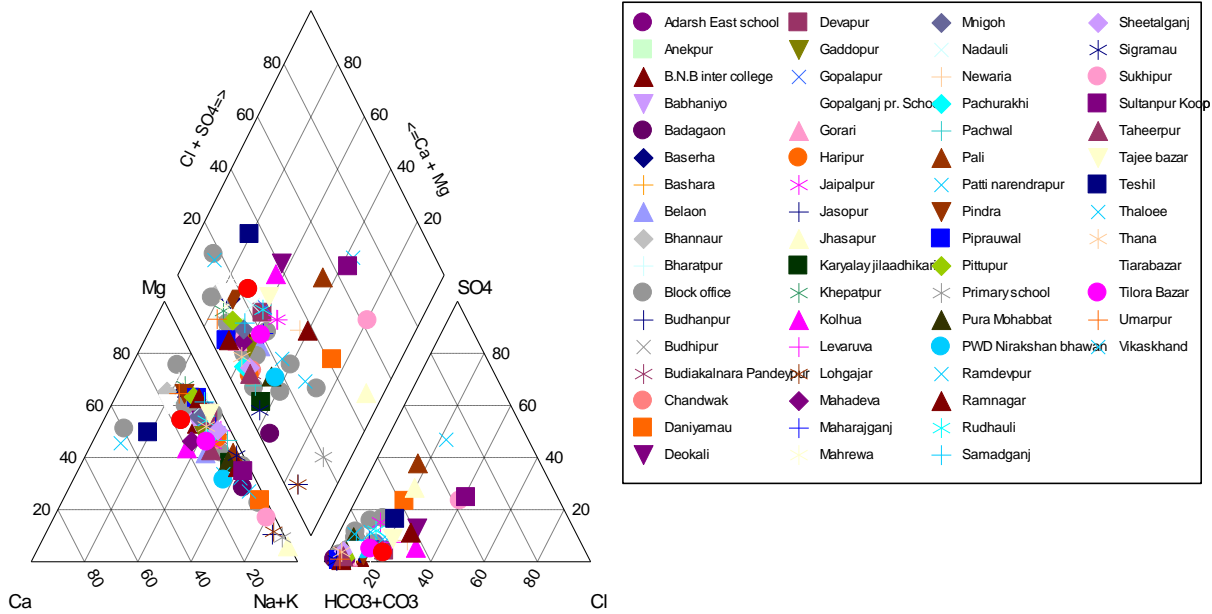


Figure 19: Hill piper of Jaunpur District.

SCHOELLER DIAGRAM

Schoeller diagram is mainly used to represent the ionic concentration of the various constituents available in the ground water. This diagram helps to interpret the several ionic constituents in ground. Water samples. The major ionic constituents of the ground water samples of the Jaunpur district is represented in order of decreasing constituents as Na, HCO₃, Mg, SO₄, Cl, Mg and Ca.

SCHOELLER DIAGRAM OF JAUNPUR DISTRICT

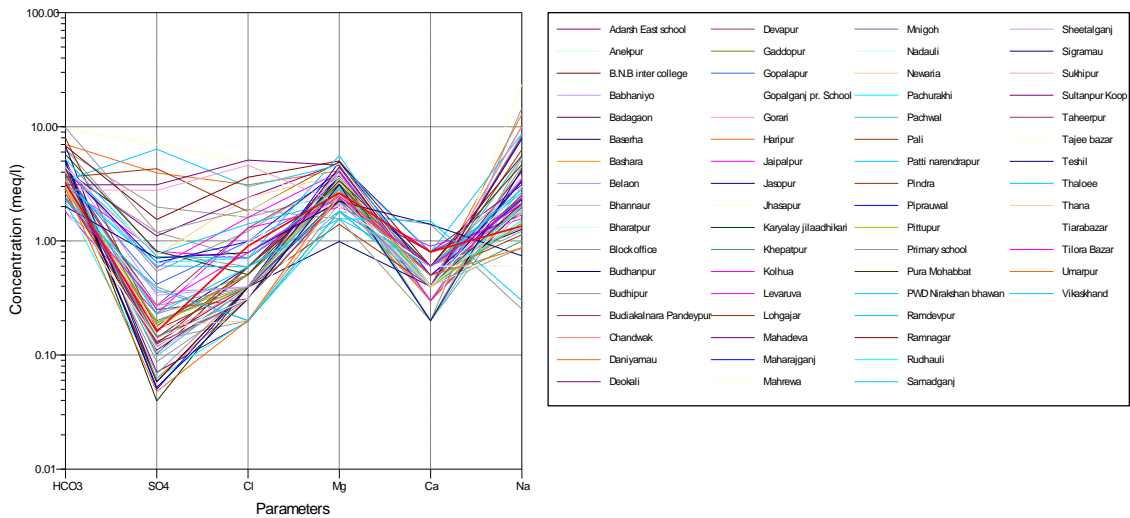


Figure 20: Schoeller diagram of Jaunpur district.

3.1. Suitability of Ground water for drinking

The quality of drinking water plays an important role in overall health of an individual. Deterioration in quality of drinking water leads to various water borne diseases. Deturation in quality in turn shows effect on parameters like PH, TDS, NO₃ etc. Of ground water. Deturation of quality occurs both by anthropogenic and natural sources. Parameter wise percentage of samples collected which falls in the suitability range of drinking water is tabulated below. The acceptable and permissible limit of all the parameters is taken as per ISO: 2011 standard.

Parameter	Range		% of samples
PH	Acceptable limit	6.5- 8.5	22.36
	Permissible limit	No relaxation	
TDS	Acceptable limit	500	77.63
	Permissible limit	2000	22.37
NO3	Acceptable limit	45	98.68
	Permissible limit	No relaxation	
Fl	Acceptable limit	1	85.52
	Permissible limit	1.5	6.57
Ca	Acceptable limit	75	100
	Permissible limit	200	-
Cl	Acceptable limit	250	100
	Permissible limit	1000	-
Fe	Acceptable limit	0.3	86.84
	Permissible limit	No relaxation	
Cu	Acceptable limit	0.05	100
	Permissible limit	1.5	-
Mn	Acceptable limit	0.1	100
	Permissible limit	0.3	-

Table 17: Parameter wise Ground water suitability for drinking of Jaunpur district.

3.2. Suitability of Ground Water for Irrigation

The ground water used for irrigation is an important factor in productivity of crop, its yield and quality of irrigated crops. The quality of irrigation water depends primarily on the presence of dissolved salts and their concentrations. The Electrical Conductivity (EC), Sodium Absorption Ratio (SAR) and Residual Sodium Carbonate (RSC) are the most important quality criteria, which influence the water quality and its suitability for irrigation. The quality of groundwater based on EC and SAR is discussed below.

Type of Water	EC Range	Classification	No of Samples	% samples	Activities required
Low Saline	EC < 250 mg/l	Excellent	0	0	Good for all crops
					little likelihood of development of salinity
Medium Saline	EC 250–750 mg/l	Good	58	76.31	Plants with moderate salt tolerance
					No special practices for salinity control required.
					Moderate amount of leaching occurs
Highly Saline	EC 750 –2250 mg/l	Permissible	17	22.36	Cannot be used on soils with restricted drainage. Even with adequate drainage,
					special management for salinity control may be required
					Plants with good salt tolerance should be selected
Very Highly saline	EC>2250mg/l	Doubtful	1	1.31	Not suitable for irrigation under ordinary condition.
					soils must be permeable, drainage must be adequate, irrigation
					water must be applied in excess to provide considerable leaching
					very salt tolerant crops should be selected

Table 18: Suitability of Ground Water for irrigation based on Electrical Conductivity.

SODIUM PERCENT (Na %)

The sodium in irrigation waters is usually denoted as percent of sodium. According to Wilcox (1955), in all natural waters Na% is a common parameter to assess its suitability for irrigational purposes. The sodium percent (Na %) values were obtained by using the following equation:

$$\text{Na}\% = \frac{[\text{Na}^+ + \text{K}^+]}{[\text{Ca}^{2+} + \text{Mg}^{2+} + \text{Na}^+ + \text{K}^+]} \times 100$$

all ionic concentrations are expressed in meq/l.

Low sodium (alkali) water can be used for irrigation on almost all soils with little danger of the development of harmful levels of exchangeable sodium. Medium sodium water will present an appreciable sodium hazard in fine textured soils having high cation exchange capacity especially under low leaching conditions. This water can be used on coarse textured or organic soils with good permeability

Sodium percent (Na%) of Jaunpur district			
Water Class	Range	No of Samples	% samples
Excellent	< 20	5	6.57
Good	20 - 40	33	43.42
Medium	40 - 60	26	34.21
Bad	60 - 80	8	10.52
Very Bad	> 80	4	5.26

Table 19: Suitability of Ground Water for irrigation based on Sodium percentage.

SODIUM ADSORPTION RATIO (SAR)

High concentration of sodium in water produces undesirable effects of changing soil properties and reducing soil permeability and thus reduces the supply of water needed for the crops. It is calculated from the ratio of sodium to calcium and magnesium by the following formula:

$$SAR = Na^+ / [(Ca^{2+} + Mg^{2+})/2]^{0.5}$$

where all ionic concentrations are expressed in meq/l.

Cumulative effect of salinity and sodium hazard in the study area can be study by plotting sodium-absorption ratio and electrical conductivity data on US Salinity Laboratory diagram (USSL, 1954). Sodium Percent (Na %): The sodium in irrigation waters is usually denoted as percent.

Sodium Adsorption Ratio Of Ground Water, Jaunpur district			
Water Class	Range	No of Samples	% samples
Excellent	<10	73	96.05
Good	10 to 18	2	2.63
Medium	18 to 26	1	1.31
Bad	>26	0	0.00

Table 20: Suitability of Ground Water for irrigation based on SAR.

RESIDUAL SODIUM CARBONATE (RSC)

Residual Sodium Carbonate (RSC) has been used to determine the harmful effect of carbonate and bicarbonate on the quality of water for agricultural purpose and is estimated by the formula.

$$RSC = (HCO_3 + CO_3) - (Ca^{2+} + Mg^{2+})$$

where all ionic concentrations are expressed in meq/L.

According to the RSC classification for irrigation purposes, the water samples with values greater than 2.5 meq/l are unsuitable for irrigation

Residual Sodium Carbonate OF Ground water, Jaunpur district		
Range	No of Samples	% samples
< 1.25	46	60.53
1.25 - 2.0	13	17.11
2.0 - 2.5	2	2.63
2.5 - 3.0	3	3.95
> 3.0	12	15.79

Table 21: Suitability of Ground Water for irrigation based on RSC.

US SALINITY DIAGRAM

In this diagram the data of EC verses SAR are plotted and diagram is separated by several class depending on increasing value of EC as C1,C2, C3,C4 and SAR as S1,S2,S3,S4. Usually higher EC and SAR value samples are not suitable for irrigation purpose. The data of the district fall under the category of C2S1, C3S1 and C3S2. Moreover the US salinity diagram reveals that the ground water samples are suitable for irrigation use.

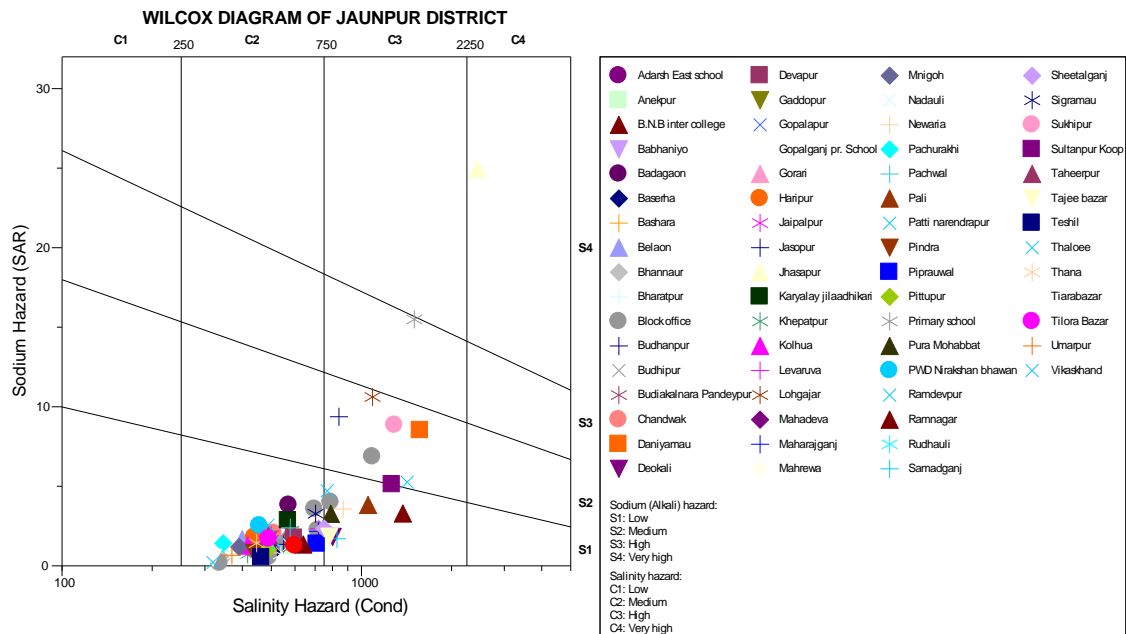


Figure 21: U.S. Salinity diagram of Jaunpur district.

HEAVY METALS

- ❖ Zinc concentration in all the samples collected from the district in below determination limit.
- ❖ Chromium concentration in all the samples collected from the district in below determination limit.
- ❖ Manganese concentration in all the locations are within permissible limit (0.3 mg/lit).
- ❖ Copper concentration in all the locations are within permissible limit (1.5 mg/lit).

Parameter	Min	Max	Mean	Median	Standard Dev.
pH	8.34	9.15	8.68	8.68	0.19
E.C. (microS/cm)	318	2431	654	522	351.04
Cl (ppm)	7	181	32.98	18	37.79
CO ₃ (ppm)	6	96	37.65	36	19.8
HCO ₃ (ppm)	110	598	244.27	235	95.48
NO ₃ (ppm)	0.05	76	8.27	5.55	10.58
SO ₄ (ppm)	1.9	338	33.03	10.3	61.78
F (ppm)	0.09	8.1	0.7	0.5	0.94
Ca (ppm)	4	30	10.02	8	4.9
Mg (ppm)	12	68	36.8	34.5	12.28
Na (ppm)	5.8	539	79.14	51	83.6
K (ppm)	1.3	100	5.12	3.5	11.15
SiO ₂ (ppm)	0.24	37	26.88	28	5.27
Total Hardness (ppm)	0	0	0	0	0

Table 22: Range of GW Quality Parameters (basic elements), Jaunpur District.

Parameter	Min	Max	Mean	Median	Standard Dev.
Cu (ppm)	0.021	0.025	0.023	0.023	0.013
Fe (ppm)	0.1	0.1	0.48	0.44	0.281
Mn (ppm)	0.058	0.058	0.07	0.07	0.014
Zn (ppm)	Below determining limit				
Cr (ppb)					

Table 23: Range of GW Quality Parameters (Heavy metals), Jaunpur District.

4. Ground Water Resources

Dynamic Ground Water Resource Estimation (As on March, 2020)

The main source of ground water recharge in the district is rainfall and the other sources of recharge are Canal Seepages, return seepages from irrigation and infiltration from Lakes, Ponds etc. The block wise recharge of ground water through rainfall has been estimated by the methodology of GEC-2015 as follows:-

- (i) Estimation of rainfall recharge by Adhoc Norm Method.
- (ii) Estimation of rainfall recharge by Water Fluctuation Method.

The ground water recharge through rainwater during the monsoon period has been estimated as per the above mentioned methods separately and the values thus obtained are compared for each block. Final values have been adopted on the following criteria.

- a. If the, Percentage Difference (PD) is greater than or equal to -20% and less than or equal to $+20\%$, the rainfall recharge is taken as obtained by the water table fluctuation method.
- b. If the PD is less than -20% , the rainfall recharge is taken as equal to 0.80 times the value obtained by the rainfall infiltration factor (Adhoc-Norm Method).
- c. If PD is greater than $+20\%$, the rainfall recharge is taken as equal to 1.2 times of the value obtained by the rainfalls infiltration factor method.

4.1. Ground Water Recharge Components

4.1.1. Rainfall Recharge Estimation by Water Table Fluctuation Method

This method is based on the water balance approach, so it may also be referred as “Ground Water Balance Method”. The block wise average water table fluctuation for the entire district has been calculated for the study year. The ground water recharge has been estimated taking into account the block wise specific yield. In these block wise recharge values, the values of monsoon ground water draft have been added, and the values of recharge by other sources during monsoon have been subtracted. Subsequently the block wise values of rainfall recharge have been normalized by taking into account the rainfall of the year and the Normal rainfall. In this way the Net ground water recharge only by the rainfall has been estimated by this method

4.1.2. Ground Water Recharge by Other Sources

The recharge by other sources mainly includes canal seepages, return flow from surface and ground water irrigation and infiltration from lakes, ponds and surface reservoirs. The recharge from other sources in the district for monsoon is **19753.21 ham** and for non-monsoon is **36126.92 ham**, hence the total annual recharge from the other sources is **55880.13 ham**

❖ Recharge from Irrigation Water applied by Surface Water Irrigation:

The recharge by surface water irrigation has been derived by taking into account the return flow factor of 40% for monsoon crops (Kharif) and 30% for non-monsoon crops (Rabi). The quantity of irrigation water released in the distributaries canal system has been taken from the irrigation department and ground water department U.P.

❖ **Recharge from Irrigation Water Applied by Ground Water Irrigation**

The recharge from irrigation water applied by ground water irrigation is the sum of 45% gross ground water draft during monsoon period and 25% gross ground water draft during non- monsoon period.

❖ **Recharge from Canal Seepage:**

The estimation of recharge by the seepage from canal system has been computed by utilizing the block wise lengths of main canal, branch canal, distributary and minor canal segments. The other factors utilized are wetted perimeter area, number of days the canal segment is in operation during monsoon & non-monsoon seasons, and the seepage factor of wetted area

❖ **Recharge from Canal Seepage:**

The estimation of recharge by the seepage from canal system has been computed by utilizing the block wise lengths of main canal, branch canal, distributary and minor canal segments. The other factors utilized are wetted perimeter area, number of days the canal segment is in operation during monsoon & non-monsoon seasons, and the seepage factor of wetted area.

❖ **Recharge from Lakes, Ponds and Tanks:**

Block wise recharge estimated under this head has been carried out by taking into account the total water spread area for the year under such structures, number of days water is available during monsoon & non-monsoon seasons, and the infiltration factor.

Rainfall Recharge Estimation by Adhoc Norm or Rainfall Infiltration Factor (RIF) Method:

The rainfall recharge by this method has been estimated separately for monsoon non- monsoon seasons on the basis of block wise normal rainfall and rainfall infiltration factor.

4.2. Determination of Annual Rainfall Ground Water Recharge

The rainfall recharge during monsoon season has been estimated block wise separately by water table fluctuation, and Rainfall Infiltration Factor (RIF) methods. The values arrived by both the methods have been compared block wise and then any one has been adopted on the Percentage of Difference (PD) criteria of 2015 norm. Whereas, the non-monsoon rainfall recharge values have been computed only by the Rainfall Infiltration Factor Method. The recharge from Rainfall in the district for monsoon is **75996.21 ham** and for non-monsoon is **0 ham**, hence the total annual recharge from Rainfall is **75996.21 ham**

4.2.1. Total Annual Ground Water Recharge

The Total Annual Ground Water Recharge of the district is 131876.34 ham which has been arrived by adding the annual rainfall recharge and annual recharge from other sources.

Sl.No.	Name of the block	Total area of assessment unit (Ha)	Recharge from rainfall monsoon season (Ham)	Recharge from other sources monsoon season (Ham)	Recharge from rainfall non monsoon season (Ham)	Recharge from other sources non monsoon season (Ham)	Total natural discharges (Ham)	Annual extractable Ground water resources (Ham)
1	BADLAPUR	21427	2931.28	827.09	0	1280.95	503.93	4535.39
2	BAKSHA	20828	2849.33	723.19	0	1136.92	470.94	4238.5
3	BARSATHI	17001	3061.2	771.52	0	1222.05	252.74	4802.03
4	DHARMAPUR	9958	1962.13	603.25	0	1182.21	187.38	3560.21
5	DOBHI	14739	3024.51	1285.42	0	2940.43	725.03	6525.33
6	JALALPUR	14849	3047.08	1508.89	0	3522.02	807.8	7270.19
7	KARANJA KALAN	18751	3847.79	1352.62	0	2555.03	775.54	6979.9
8	KERAKAT	15242	3058.75	904.46	0	1770.56	286.69	5447.08
9	KHUTAHAN	19698	4042.12	926.21	0	1978.37	694.67	6252.03
10	MACHHLISHAHR	25018	4907.12	1515.23	0	2524.76	447.36	8499.75
11	MAHARAJGANJ	18892	3876.72	761.73	0	1422.31	606.08	5454.68
12	MARIAHU	21254	4361.42	1154.4	0	1981.2	749.7	6747.32
13	MUFTIGANJ	22498	3805.21	684.2	0	1154.14	282.18	5361.37
14	MUNGRA BADSHAHPUR	13279	2724.91	1220.82	0	1993.46	593.92	5345.27
15	RAMNAGAR	18353	3512.82	573.08	0	888.7	248.74	4725.86
16	RAMPUR	20251	4155.6	382.08	0	640.45	517.82	4660.31
17	SHAHGANJ	28959	5942.52	1486.56	0	2582.41	1001.15	9010.34
18	SIKRARA	14772	3031.28	360.17	0	593.29	398.47	3586.27
19	SIRKONI	17037	3218.77	329.58	0	587.19	206.78	3928.76
20	SUITHA KALAN	21608	4291.47	1097.13	0	2015.99	370.23	7034.36
21	SUJANGANJ	22411	4344.18	1285.58	0	2154.48	389.21	7395.03
Total		396825	75996.21	19753.21	0	36126.92	10516.36	121359.98

Table 24: Block-wise Dynamic GW Recharge and Annual Extractable GW Resources, Jaunpur, UP.

4.3. Net Annual Ground Water Availability

The Net Annual Ground Water Availability in the district is **121359.98 ham** which has been arrived by subtracting the provision for natural discharge from the total annual ground water recharge. The provision for natural discharge has been taken as 10% of the total annual ground water recharge.

4.4. Ground Water Draft/ Extraction

The block wise estimation of ground water draft has been done on the basis of the actual number of different ground water exploitation structures & their unit draft values.. The gross annual draft for the domestic and industrial has been calculated from extrapolated population on March, 2020 and per capita water requirements. In the entire district, the estimated gross annual draft for irrigation is **74007.00 ham**, and gross annual draft for domestic and industrial purpose is **12180.13 ham**. Thus the estimated gross annual draft for all uses accounts for **86187.13 ham**, which is **71.07 %** of the net annual ground water availability.

Sl.No	Name of the block	Total area of assessment unit (Ha)	Existing Gross Ground Water Draft for irrigation (Ham)	Existing Gross Ground Water Draft for industries (Ham)	Existing Gross Ground Water Draft for Domestic uses (Ham)	Total extraction(Ham)
1	BADLAPUR	21427	3441	0	760.66	4201.66
2	BAKSHA	20828	3006.88	0	390.91	3397.79
3	BARSAHI	17001	3073.68	0	704.49	3778.17
4	DHARMAPUR	9958	2002.68	0	612.59	2615.27
5	DOBHI	14739	3784	0	559.68	4343.68
6	JALALPUR	14849	3645.2	0	466.34	4111.54
7	KARANJA KALAN	18751	5094.4	0	443.31	5537.71
8	KERAKAT	15242	4056.72	0	717.62	4774.34
9	KHUTAHAN	19698	3928.8	0	4.37	3933.17
10	MACHHLISHAHR	25018	4294.52	0	1077.86	5372.38
11	MAHARAJGANJ	18892	4553.6	0	527.91	5081.51
12	MARIAHU	21254	3814.96	0	864.08	4679.04
13	MUFTIGANJ	22498	4164.4	0	494.85	4659.25
14	MUNGRA BADSHAHPUR	13279	2967.88	0	641.58	3609.46
15	RAMNAGAR	18353	2457.24	0	581.54	3038.78
16	RAMPUR	20251	2596.8	0	571.08	3167.88
17	SHAHGANJ	28959	4276.6	0	783.27	5059.87
18	SIKRARA	14772	2254.64	0	478.36	2733.00
19	SIRKONI	17037	2538.92	0	537.45	3076.37
20	SUITHA KALAN	21608	4040.24	0	424.73	4464.97
21	SUJANGANJ	22411	4013.84	0	537.45	4551.29
Total		396825	74007	0	12180.13	86187.13

Table 25: Block wise Ground water draft of Jaunpur district, Uttar Pradesh.

4.5. Stage of Ground Water Extraction

The block wise determination of the present level of ground water Extraction has been done on the basis of the percentage ratio between the net annual availability of ground water and present gross annual ground water Extraction for all uses. Thus the present level of ground water Extraction is maximum (92.64 %) in Badlapur Block, and minimum (56.16 %) in Shahganj block.

4.6. Net Annual Ground Water Availability for all Future Uses

This component for the study area has been estimated block wise on the basis of net annual availability and gross annual draft of ground water for all purposes. Thus the net annual ground water availability for all future uses has been estimated **33627.11 ham** and allocation of GW for domestic purposes on 2025 as **13725.89 ham**.

Sl.No	Name of the block	Annual GW allocation for the domestic use as on 2025 (Ham)	Net Ground Water availability for future use (Ham)
1	BADLAPUR	851.81	242.58
2	BAKSHA	398.66	832.96
3	BARSATHI	790.97	937.39
4	DHARMAPUR	695.78	861.75
5	DOBHI	641.82	2099.52
6	JALALPUR	518.76	3106.23
7	KARANJA KALAN	497.6	1387.91
8	KERAKAT	803.51	586.85
9	KHUTAHAN	5.15	2318.08
10	MACHHLISHAHR	1187.79	3017.43
11	MAHARAJGANJ	610.01	291.07
12	MARIAHU	1015.97	1916.39
13	MUFTIGANJ	569.73	627.24
14	MUNGRA BADSHAHPUR	740.37	1637.02
15	RAMNAGAR	653.97	1614.65
16	RAMPUR	632.45	1431.06
17	SHAHGANJ	883.95	3849.79
18	SIKRARA	520.04	811.59
19	SIRKONI	614.23	775.61
20	SUITHA KALAN	479.09	2515.03
21	SUJANGANJ	614.23	2766.96
Total		13725.89	33627.11

Table 26: Block wise Ground water availability for future use of Jaunpur district, Uttar Pradesh.

4.7. Categorization of Blocks

As per GEC-2015 norms, assessment units categorized based on Stage of GW Extraction (SOGE). If, SOGE $\leq 70\%$, Safe, 2. SOGE $>70\%$ and $\leq 90\%$, Semi critical, 3. SOGE $>90\%$ and $\leq 100\%$, Critical, 4. $>100\%$, Over-Exploited

In Jaunpur District, out of 21 blocks, in 11 blocks, SOGE is $\leq 70\%$, hence categorized as "SAFE" as per GWRE-2020. Eight block, have SOGE $>70\%$ and $\leq 90\%$, hence Categorized as "Semi-Critical". Two block SOGE is $>90\%$ and $\leq 100\%$, hence categorized as critical.

So in summary, out of the total 21 blocks, 11 blocks are in Safe Category and 8 blocks are in Semi- Critical category and 2 blocks are in critical category.

Sl.No	Name of the block	Total natural discharges (Ham)	Annual extractable Ground water resources (Ham)	Total extraction(Ham)	Net Ground Water availability for future use (Ham)	Stage of Ground water extraction	Category
1	BADLAPUR	503.93	4535.39	4201.66	242.58	92.64	critical
2	BAKSHA	470.94	4238.5	3397.79	832.96	80.16	semi critical
3	BARSATHI	252.74	4802.03	3778.17	937.39	78.68	semi critical
4	DHARMAPUR	187.38	3560.21	2615.27	861.75	73.46	semi critical
5	DOBHI	725.03	6525.33	4343.68	2099.52	66.57	safe
6	JALALPUR	807.8	7270.19	4111.54	3106.23	56.55	safe
7	KARANJA KALAN	775.54	6979.9	5537.71	1387.91	79.34	semi critical
8	KERAKAT	286.69	5447.08	4774.34	586.85	87.65	semi critical
9	KHUTAHAN	694.67	6252.03	3933.17	2318.08	62.91	safe
10	MACHHLISHAHR	447.36	8499.75	5372.38	3017.43	63.21	safe
11	MAHARAJGANJ	606.08	5454.68	5081.51	291.07	93.16	critical
12	MARIAHU	749.7	6747.32	4679.04	1916.39	69.35	safe
13	MUFTIGANJ	282.18	5361.37	4659.25	627.24	86.90	semi critical
14	MUNGRA BADSHAHPUR	593.92	5345.27	3609.46	1637.02	67.53	safe
15	RAMNAGAR	248.74	4725.86	3038.78	1614.65	64.30	safe
16	RAMPUR	517.82	4660.31	3167.88	1431.06	67.98	safe
17	SHAHGANJ	1001.15	9010.34	5059.87	3849.79	56.16	safe
18	SIKRARA	398.47	3586.27	2733.00	811.59	76.21	semi critical
19	SIRKONI	206.78	3928.76	3076.37	775.61	78.30	semi critical
20	SUITHA KALAN	370.23	7034.36	4464.97	2515.03	63.47	safe
21	SUJANGANJ	389.21	7395.03	4551.29	2766.96	61.55	safe
	Total	10516.36	121359.98	86187.13	33627.11		

Table 27: Block wise stage of Ground water development of Jaunpur district, Uttar Pradesh.

Sl.No	Name of the block	Annual Ground Water Recharge (Ham)	Existing Gross Ground Water draft (Ham)	Gap (Recharge - Draft) in Ham
1	Badalapur	5039.32	4201.66	837.66
2	Baksha	4709.44	3397.79	1311.65
3	Barasathi	5054.77	3778.16	1276.61
4	Dharamapur	3747.59	2615.27	1132.32
5	Dobhi	7250.36	4343.67	2906.69
6	Jalalpur	8077.99	4111.54	3966.45
7	Karanjakalan	7755.44	5537.7	2217.74
8	Kerakat	5733.77	4774.34	959.43
9	Khuthan	6946.7	3933.17	3013.53
10	Machhali Shahar	8947.11	5372.39	3574.72
11	Mahrajganj	6060.76	5081.51	979.25
12	Mariyadoo	7497.02	4679.04	2817.98
13	Muftiganj	5643.55	4659.25	984.3
14	Mograbadshahpur	5939.19	3609.46	2329.73
15	Ramnagar	4974.6	3038.78	1935.82
16	Rampur	5178.13	3167.88	2010.25
17	Shahganj	10011.49	5059.87	4951.62
18	Sikarara	3984.74	2733	1251.74
19	Sirkoni	4135.54	3076.37	1059.17
20	Suitha Kalan	7404.59	4464.97	2939.62
21	Sujanganj	7784.24	4551.29	3232.95
Total		131876.34	86187.11	45689.23

Table 28: Block wise stage of Ground water development of Jaunpur district, Uttar Pradesh.

5. Ground water related problems

The following under mentioned Ground Water related problems/issues and have been identified in the Jaunpur district viz.

1. Depletion of the water level of shallow aquifers due to high draft of Ground water for irrigation and domestic purposes.
2. The P.H of the Ground water in most all the blocks is above permissible limits. The average P.H value of the Ground water samples analyzed in the district is 8.68 which are above permissible limit as per ISO: 2011 standard.
3. The Fluoride concentration in parts of Rampur, Sikroni, Karanjakalan and Khutan are above permissible limits.
4. Salinity in parts of Karanjakala, Suithakalan, Shahganj, Buxa, Sikroni, Mariyaho, Rampur, Sikrara, Barsathi, Machalishahar and Mungrabadshahpur are in the range of 750 – 2250mg/l which makes it very difficult for irrigation. Only crops with high salt tolerance can be cultivated in such regions.
5. High Sodium percentage (Na %) in parts of Dhobi, Karanjakalan, Shahganj, Buxa, Sikroni, Mariyahu, Rampur, Machalishahar and Mungrabadshahpu blocks. The Sodium percentage (Na %) in parts of the above mentioned blocks is greater than 60.
6. The Concentration of Fe is above the permissible limit in parts of Dobhi, Kerakhat, Muftiganj, Dharmapur, Balapur, Buxa and Sikroni blocks.
7. Stage of GW Extraction above 90% in Badlapur and Maharajganj blocks.
8. Conventional agricultural practices mainly flood irrigation in almost all the blocks of the district and total extraction of Ground water is from shallow aquifer.

6. Geophysical studies

Village	Jamuhar
Block	Machhalishahar
District/State	Jaunpur, U.P.
Drilling Depth	282 mbgl

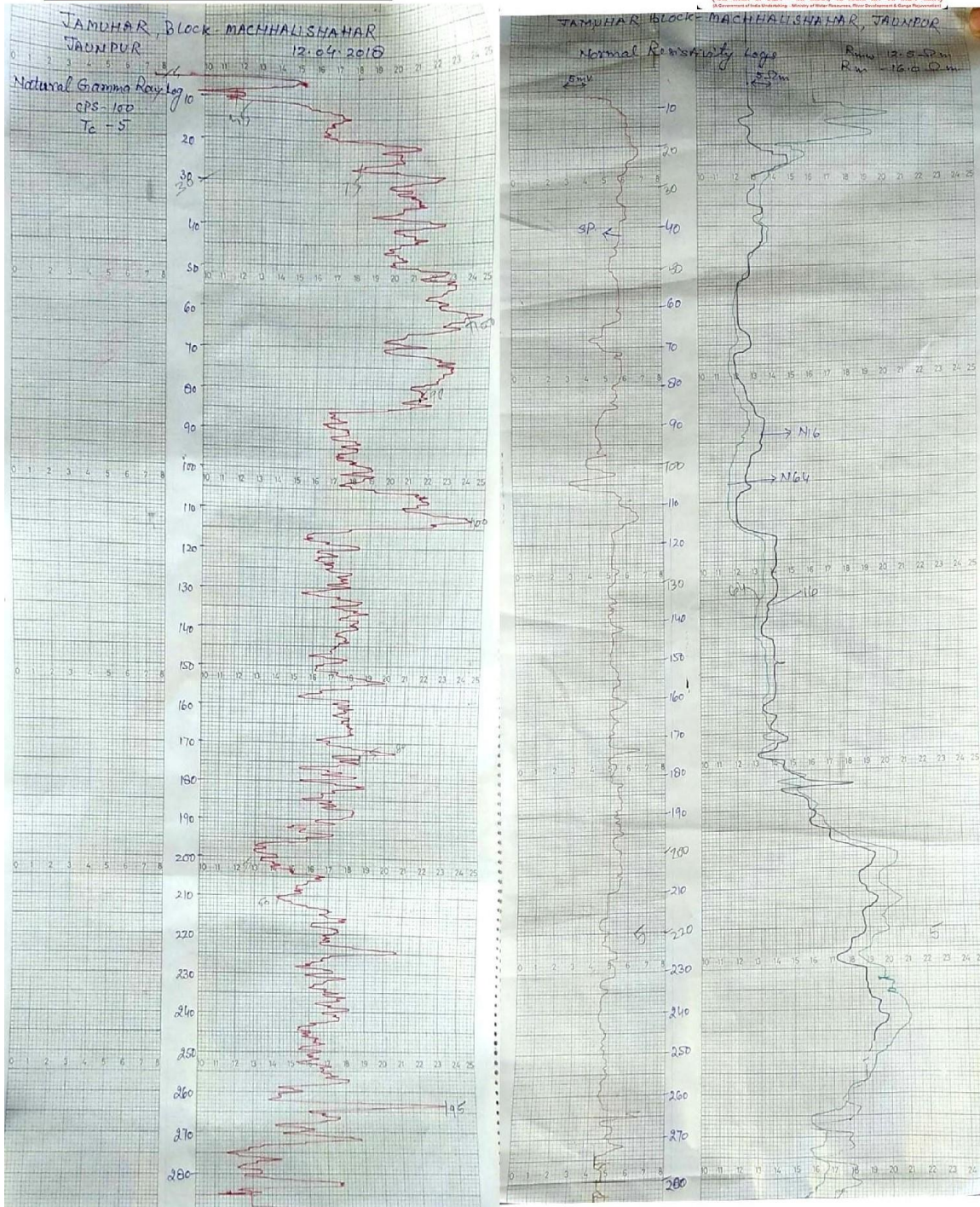


Figure 22: Geophysical log of Jamuhar EW, Jaunpur district.

Village	Naharpur
Block	Maharajganj
District/State	Jaunpur, U.P.

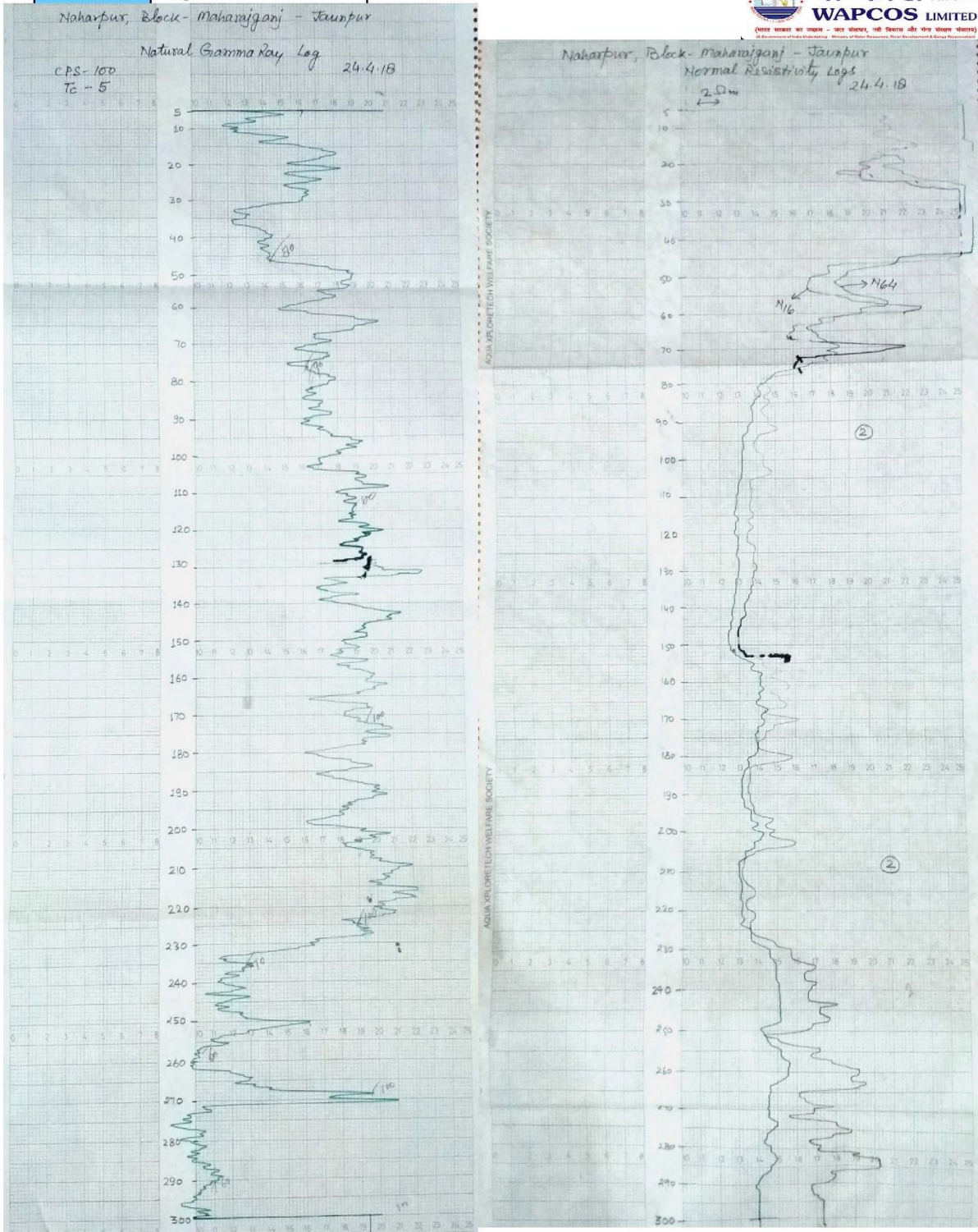


Figure 23: Geophysical log of Naharpur EW, Jaunpur District.

Site	Pali
District	Mariahu
State	Jaunpur

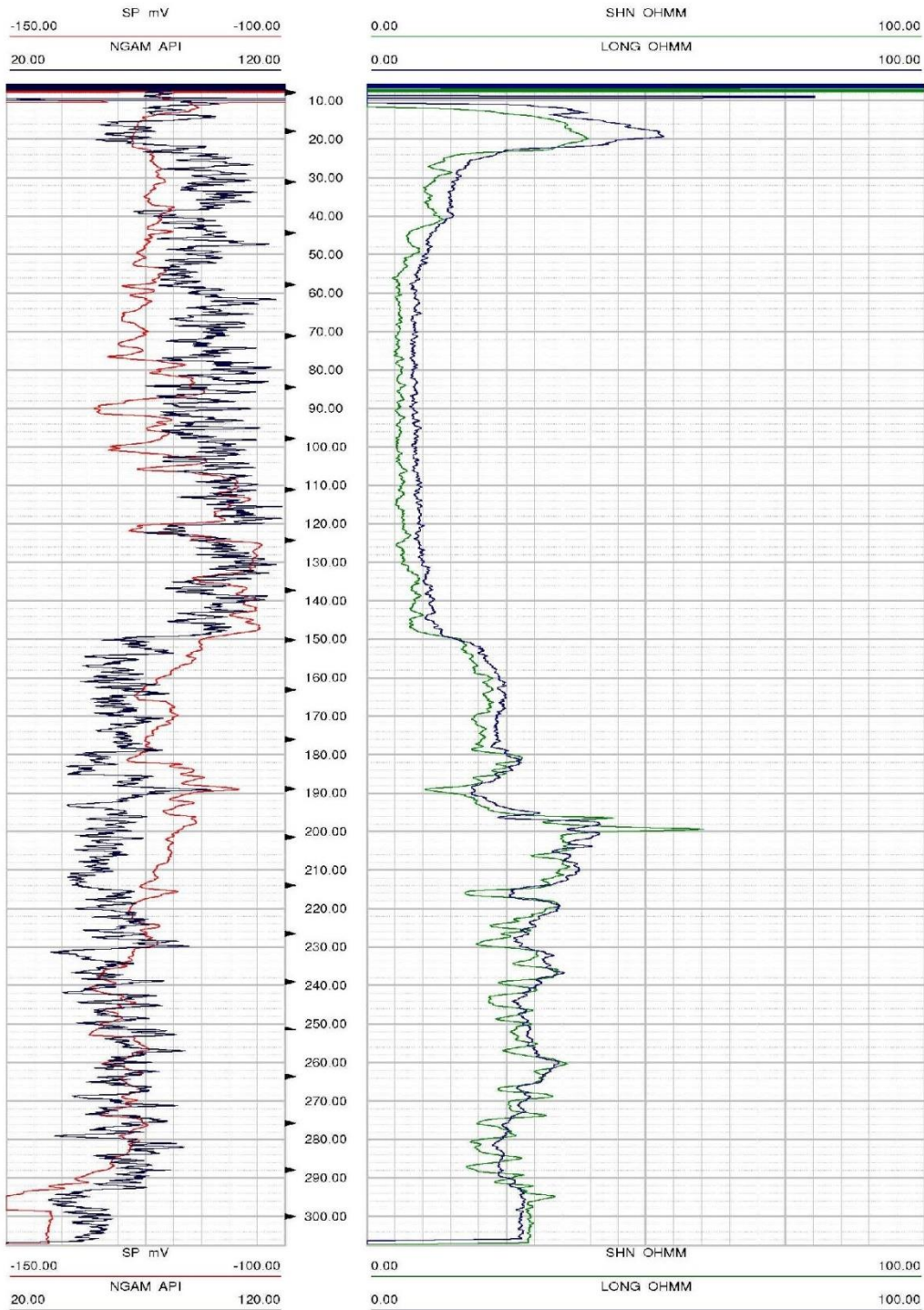


Figure 24: Geophysical log of Pali EW, Jaunpur District.

Site	Suraila
District	Muftiganj
State	Jaunpur

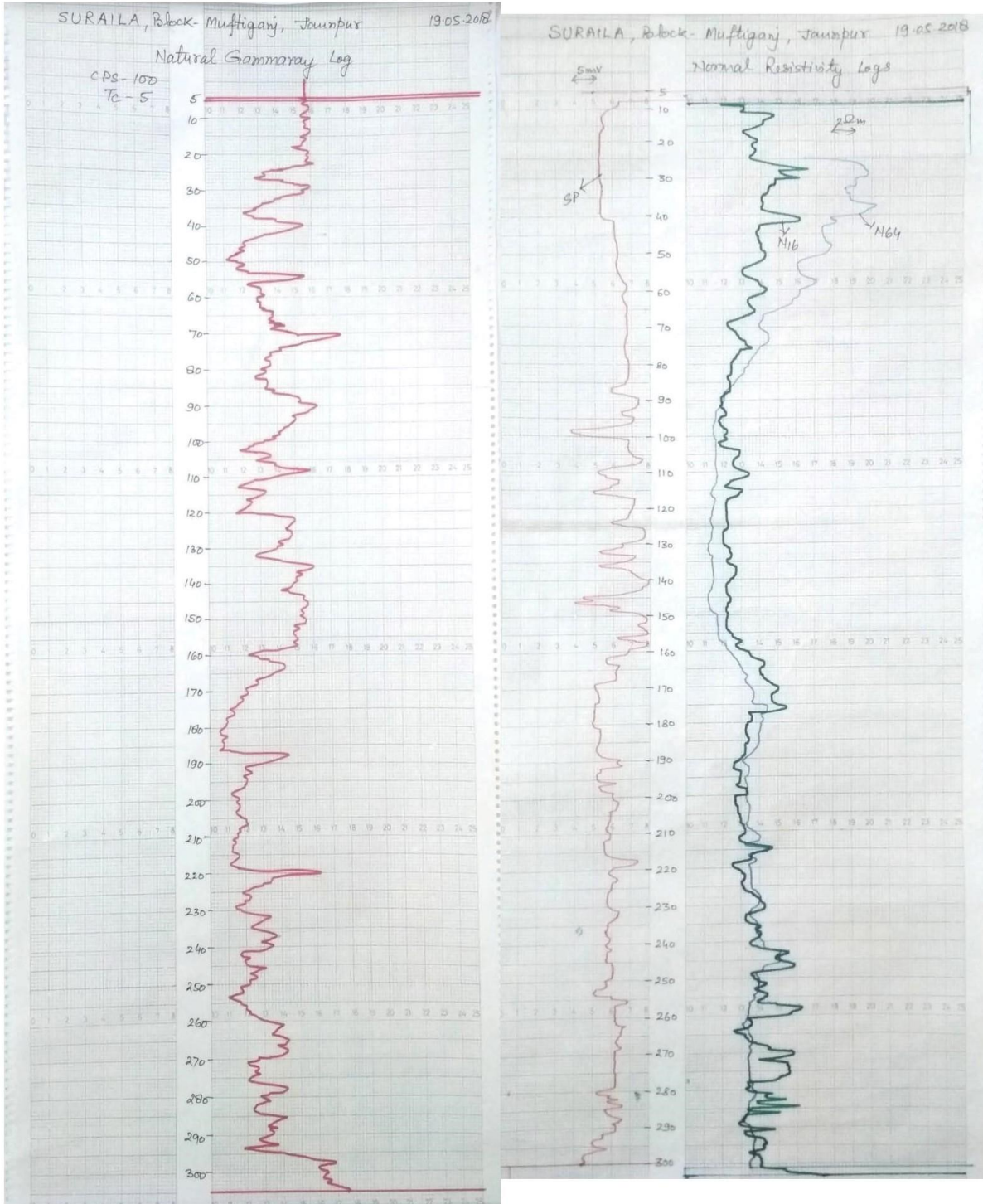


Figure 25: Geophysical log of Suraila EW, Jaunpur District.

Site	Takha East
District	Shahganj
State	Jaunpur



वाष्कोस लिमिटेड
WAPCOS LIMITE
 (भारत सरकार का उपक्रम - जल संवर्धन, नदी विकास और भूगोल संवर्धन मंत्रालय)
 A Government of India Undertaking - Ministry of Water Resources, River Development & Canal Regulation

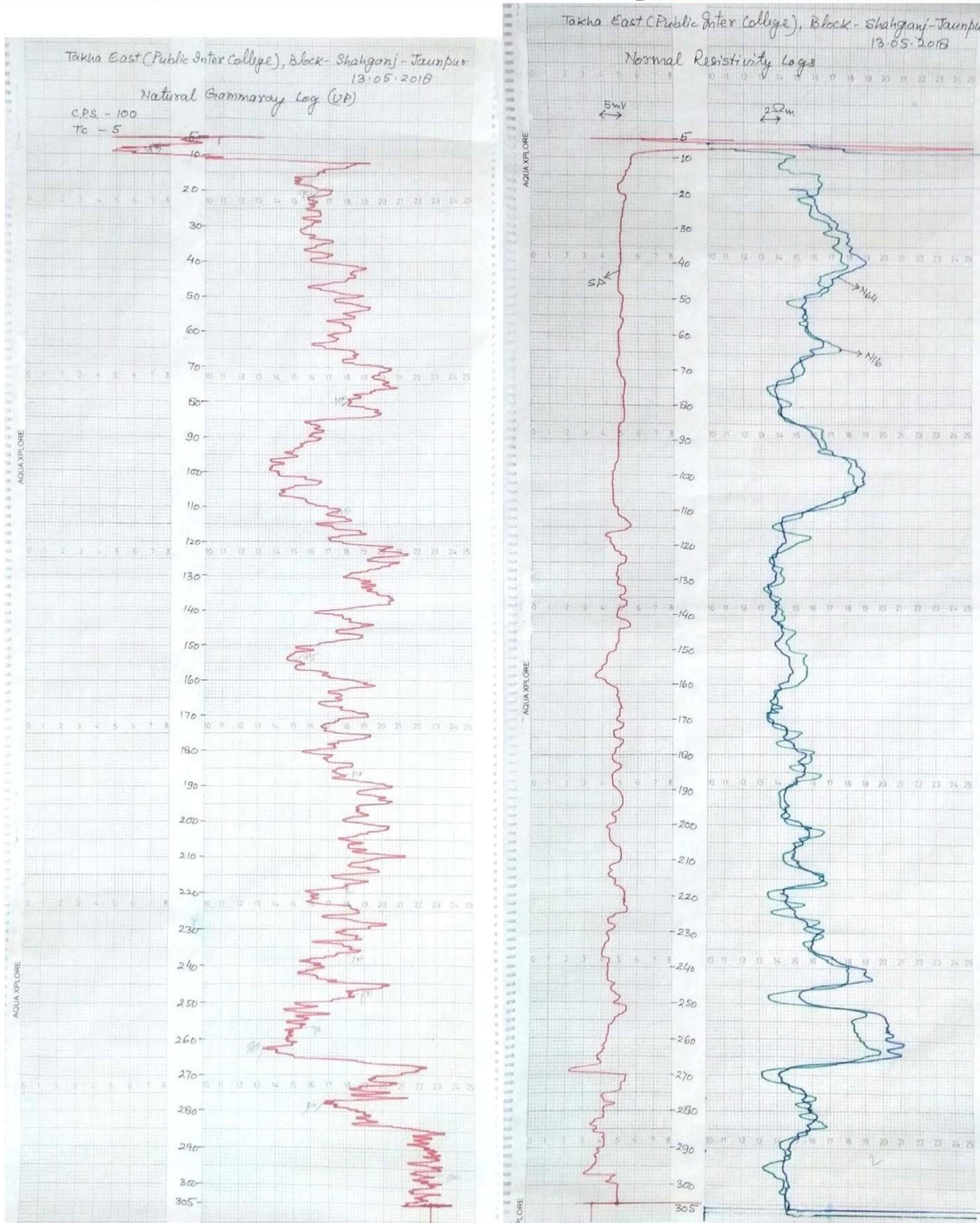


Figure 26: Geophysical log of Shahganj EW, Jaunpur District.

Site	Uttarpatti
District	KaranjaKalan
State	Jaunpur

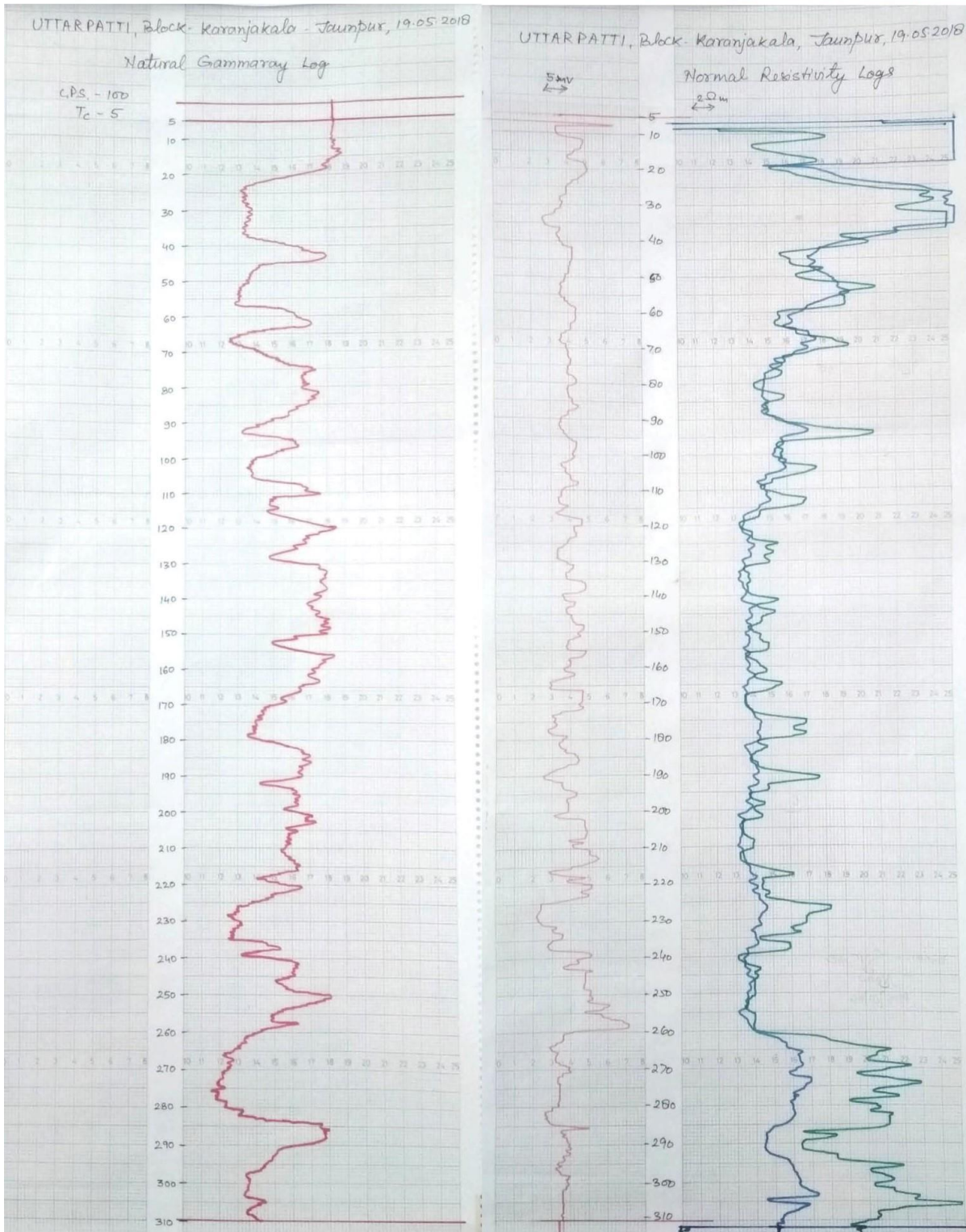


Figure 27: Geophysical log of Uttar Patti EW, Jaunpur District

7. Ground Water Management Strategies

Block wise management plan is prepared by considering the following parameters

- ❖ The present water level
- ❖ Water level trend
- ❖ Category of the block

There are total twenty one blocks in the district out of which **eleven blocks** of the district are categorized as **safe**, **eight blocks** are categorized as **semi-critical** and **two blocks** are categorized as **Critical**.

There is urgent need for taking up suitable water management interventions So that the blocks which are falling in Semi-Critical and Critical stage can be brought in to safe category.

Ground water management is based on integrated approach, which includes the following under mentioned techniques

- ❖ Augmentation of ground water resources through appropriate techniques.
- ❖ Adoption of suitable water conservation measures, such as ensuring water use efficiency through creation of additional water storage facility, maintenance / renovation of existing water bodies etc.
- ❖ Water awareness and capacity building of the stakeholders are also the important attributes of water management interventions as envisaged in the Nation Water Policy.

Ground water issues can be addressed mainly by focusing on two things i.e.

- I. **Measures to increase recharge**
- II. **Suitable measures to reduce the draft.**

It can be managed by a mix of measures such as **supply side and demand side management**.

7.1. Supply Side Management

Supply side management Interventions includes the following under mentioned techniques.

- ❖ Artificial Recharge to ground water
- ❖ Water conservation and On Farm Activities to Increasing storage capacity and conservation of rainfall.

Based on available information about the area such as ground water scenario, hydrogeology, hydrology, topography, rainfall pattern, drainage, soil cover, utilizable rainfall, etc., scope for various interventions has been studied and assessment of suitable areas, tentative design and costs of structures has been worked out.

SI No	Block	Draft For Irrigation (from Resource)	Net Irrigated Area (From Statistical Diary)	Gross Irrigated Area	Unit Draft (Total Draft/ Ne)	Ratio (Gross/ Net)
1	BADLAPUR	3441.00	12050	14558	0.29	1.21
2	BAKSHA	3006.88	9414	18485	0.32	1.96
3	BARSAHI	3073.68	13275	21385	0.23	1.61
4	DHARMAPUR	2002.68	6167	14213	0.32	2.30
5	DOBHI	3784.00	9808	17416	0.39	1.78
6	JALALPUR	3645.20	9780	17080	0.37	1.75
7	KARANJA KALAN	5094.40	13238	21058	0.38	1.59
8	KERAKAT	4056.72	10288	17997	0.39	1.75
9	KHUTAHAN	3928.80	9597	17622	0.41	1.84
10	MACHHLISHAHR	4294.52	15937	24580	0.27	1.54
11	MAHARAJGANJ	4553.60	16887	25508	0.27	1.51
12	MARIAHU	3814.96	11104	18609	0.34	1.68
13	MUFTIGANJ	4164.40	13857	24709	0.30	1.78

14	MUNGRA BADSHAHPUR	2967.88	8687	15790	0.34	1.82
15	RAMNAGAR	2457.24	11272	20579	0.22	1.83
16	RAMPUR	2596.80	10068	18472	0.26	1.83
17	SHAHGANJ	4276.60	14068	26268	0.30	1.87
18	SIKRARA	2254.64	9963	17668	0.23	1.77
19	SIRKONI	2538.92	8191	15276	0.31	1.86
20	SUITHA KALAN	4040.24	11678	17683	0.35	1.51
21	SUJANGANJ	4013.84	14219	22222	0.28	1.56
Total		74007.00	239548.00	407178	0.31	1.73

Table 29: Demand Side Ground Water Management, Jaunpur District, Uttar Pradesh.

7.1.1. Artificial Recharge to ground water Recharge / Water Conservation

Water conservation structures such as check dams, farm ponds, nala bunds, Stream Development etc results in ground water recharge to the tune of about 50% of the storage capacity considering 3 annual fillings. Further construction of recharge trenches in the upstream side of the check dams is also proposed to enhance rate of infiltration by about 30 to 40%.

- ❖ The existing ponds and tanks lose their storage capacity as well as the natural ground water recharge due to siltation and encroachment by farmers for agricultural purposes. Through desilting, coupled with providing proper waste weir, the village tanks can be converted into recharge structure.
- ❖ Stream Development, desiltation of channel of nalas, canals and Small River for increasing storage capacity of the stream and ground water recharge.
- ❖ In supply side management interventions, structures and interventions are proposed for behavioral changes and to increase the recharge of ground water. In Jaunpur district,
 - I. Total **46 no's of check dams** are proposed throughout the district, of **10,000 Cubic Meter capacity** of each check dams.. For calculation of benefits, a total 3 filling in each year and 50% of the total storage capacity is taken for supply in irrigation.
 - II. **Total 46 kilometer of** stream development/ desiltation of stream, nala and unlined canals are proposed for increasing the storage capacity and Ground Water recharge.
 - III. Total **46 No's of Nala bunds** are proposed throughout the district of **7500 Cubic Meter capacity** of each.
 - IV. Total **47 no of ponds** of **10, Cubic Meter capacity** of each proposed for desiltation of the pond-bed.

All the proposed numbers of the interventions are based on the following under mentioned parameters

- ❖ Area of the blocks
- ❖ Water level of the blocks,
- ❖ Long term ground water trend and
- ❖ Feasibility of the aquifer to incorporate the extra amount of water within aquifer.

Block	Supply Side Management																	Annual Recharge (MCM) (~50% of total storage)
	Check Dam				Stream Development				Nala Bunds				Ponds				Total Storage (MCM)	
	Check Dams (10000cum)	Storage (MCM) 3 FILLINGS	Recharge from CHECK DAMS (MCM)	Supply for Irrigation (MCM)	Stream Development (Km)	Storage (MCM) 3 FILLINGS	Recharge Stream Dev (MCM)	Supply for Irrigation (MCM)	Nala Bunds (Capacity 7500 cub.m each)	Storage (MCM)	GW Recharge NALA BUNDS (MCM)	Supply for Irrigation (MCM)	Ponds (capacity 10000 cub.m each)	Storage (MCM)	GW Recharge from PONDS (MCM)	Supply for Irrigation (MCM)		
BADLAPUR	4	0.11	0.05	0.05	4	0.16	0.08	0.08	4	0.08	0.04	0.04	4	0.13	0.06	0.06	0.48	0.24
BAKSHA	3	0.08	0.04	0.04	3	0.12	0.06	0.06	3	0.06	0.03	0.03	3	0.08	0.04	0.04	0.33	0.17
BARSATHI	2	0.06	0.03	0.03	2	0.10	0.05	0.05	2	0.05	0.02	0.02	2	0.06	0.03	0.03	0.27	0.14
DHARMAPUR	1	0.04	0.02	0.02	1	0.06	0.03	0.03	1	0.03	0.01	0.01	1	0.04	0.02	0.02	0.16	0.08
DOBHI	1	0.04	0.02	0.02	1	0.07	0.03	0.03	1	0.03	0.02	0.02	1	0.04	0.02	0.02	0.19	0.09
JALALPUR	1	0.04	0.02	0.02	1	0.07	0.03	0.03	1	0.03	0.02	0.02	1	0.04	0.02	0.02	0.19	0.09
KARANJA KALAN	2	0.07	0.04	0.04	2	0.11	0.05	0.05	2	0.05	0.03	0.03	2	0.07	0.04	0.04	0.30	0.15
KERAKAT	2	0.06	0.03	0.03	2	0.09	0.04	0.04	2	0.04	0.02	0.02	2	0.06	0.03	0.03	0.24	0.12
KHUTAHAN	2	0.06	0.03	0.03	2	0.09	0.04	0.04	2	0.04	0.02	0.02	2	0.06	0.03	0.03	0.25	0.13
MACHHLISHAHR	3	0.08	0.04	0.04	3	0.11	0.06	0.06	3	0.06	0.03	0.03	3	0.08	0.04	0.04	0.32	0.16
MAHARAJGANJ	3	0.09	0.05	0.05	3	0.14	0.07	0.07	3	0.07	0.04	0.04	4	0.11	0.06	0.06	0.42	0.21
MARIAHU	2	0.06	0.03	0.03	2	0.10	0.05	0.05	2	0.05	0.02	0.02	2	0.06	0.03	0.03	0.27	0.14
MUFTIGANJ	3	0.08	0.04	0.04	3	0.13	0.06	0.06	3	0.06	0.03	0.03	3	0.08	0.04	0.04	0.36	0.18
M. BADSHAHPUR	1	0.04	0.02	0.02	1	0.06	0.03	0.03	1	0.03	0.01	0.01	1	0.04	0.02	0.02	0.17	0.08
RAMNAGAR	2	0.06	0.03	0.03	2	0.08	0.04	0.04	2	0.04	0.02	0.02	2	0.06	0.03	0.03	0.23	0.12
RAMPUR	2	0.06	0.03	0.03	2	0.09	0.05	0.05	2	0.05	0.02	0.02	2	0.06	0.03	0.03	0.26	0.13
SHAHGANJ	3	0.09	0.04	0.04	3	0.13	0.07	0.07	3	0.07	0.03	0.03	3	0.09	0.04	0.04	0.37	0.18
SIKRARA	2	0.06	0.03	0.03	2	0.08	0.04	0.04	2	0.04	0.02	0.02	2	0.06	0.03	0.03	0.24	0.12
SIRKONI	2	0.06	0.03	0.03	2	0.10	0.05	0.05	2	0.05	0.02	0.02	2	0.06	0.03	0.03	0.27	0.14
SUITHA KALAN	2	0.06	0.03	0.03	2	0.10	0.05	0.05	2	0.05	0.02	0.02	2	0.06	0.03	0.03	0.28	0.14
SUJANGANJ	2	0.07	0.03	0.03	2	0.10	0.05	0.05	2	0.05	0.03	0.03	2	0.07	0.03	0.03	0.29	0.14
Total	46	1.37	0.69	0.69	46	2.06	1.03	1.03	46	1.03	0.51	0.51	47	1.41	0.71	0.71	5.88	2.94

Table 30: Supply Side Ground Water Management, Jaunpur District, Uttar Pradesh.

6.3. Demand Side Management Interventions

It mainly includes adoption of techniques to enhance Water Use Efficiency for reducing draft of ground water and on farm practices.

On Farm Practices

- ❖ Leveling of crop field is essential for uniform distribution of water. Laser leveling has been found very effective ensuring saving of 10 to 30% of applied irrigation.
- ❖ The in situ farm activities such as contour bunding, land leveling, bench terracing, water harvesting structures, afforestation and diversification of cropping pattern are other measures to increase recharge in the block.

Efficient Irrigation

In flood / furrow irrigation method more than 50% of applied water is wasted through seepage to deeper level, localized inundation causes loss through evaporation and it teaches out the nutrients from the plant. While through drip & sprinkler irrigation wastage of irrigational water could be minimized. The conveyance losses (mainly seepage & evaporation) can be saved up to 25 to 40% through utilization of HDPE pipes. Scope for agricultural water savings by:

- ❖ **Engineering measures:** such as irrigation water distribution through lowpressure pipes (instead of earth canals) and irrigation water application by drip and microsprinkler technology
- ❖ **Management measures:** to improve irrigation water scheduling and soil moisture management
- ❖ **Agronomic measures:** such as deep ploughing, straw and plastic mulching, and the use of improved strains/seeds and drought-resistant agents. If larger water savings are needed, then consideration should also be given to changes in crop type and land use (e.g. through higher-value crops under greenhouse cultivation or returning a proportion of the area to dry land cultivation of drought-resistant crops). An even more radical option would be to place a ban on the cultivation of certain types of irrigated crop in critical groundwater areas.

Conjunctive Use

Water resource management strategy in which groundwater and surface water are used in tandem, making use of the comparative advantages of both is termed conjunctive use. Examples include:

- ❖ Use of surface water for inefficient flood irrigation to enhance aquifer recharge in the wet season
- ❖ Use of groundwater in dry periods for irrigation to replace the normal surface water supply currently, conjunctive use (where practiced) tends to have arisen more by accident than design.

Block	On-farm Area (ha)	Saving in Draft (ham) On-farm	WUE Area (ha)	Saving in Draft (ham) WUE	Tot GW Saving (MCM)
BADLAPUR	4761.90	3.29	4761.90	4.93	8.45
BAKSHA	2571.00	3.22	2571.00	4.84	8.23
BARSATHI	2941.80	2.19	2941.80	3.29	5.62
DHARMAPUR	1597.60	2.39	1597.60	3.59	6.06
DOBHI	1097.50	1.50	1097.50	2.26	3.85
JALALPUR	1073.20	1.40	1073.20	2.10	3.59
KARANJA KALAN	2653.80	3.25	2653.80	4.87	8.27
KERAKAT	2340.80	3.23	2340.80	4.84	8.19
KHUTAHAN	1227.80	1.85	1227.80	2.77	4.74
MACHHLISHAHR	1620.20	1.35	1620.20	2.02	3.53
MAHARAJGANJ	5505.00	4.48	5505.00	6.73	11.42
MARIAHU	1318.90	1.52	1318.90	2.28	3.93
MUFTIGANJ	2965.20	3.18	2965.20	4.77	8.12
MUNGRA BADSHAHPUR	961.60	1.19	961.60	1.79	3.07
RAMNAGAR	1264.00	1.01	1264.00	1.51	2.63
RAMPUR	1340.10	1.27	1340.10	1.90	3.30
SHAHGANJ	1839.70	2.09	1839.70	3.13	5.41
SIKRARA	2190.40	1.76	2190.40	2.64	4.51
SIRKONI	1885.60	2.18	1885.60	3.27	5.59
SUITHA KALAN	1230.40	1.29	1230.40	1.93	3.36
SUJANGANJ	1518.30	1.34	1518.30	2.01	3.49
Total	109948.40	44.97	43904.80	67.46	115.37

Table 31: Demand Side Ground Water Management, Jaunpur District, Uttar Pradesh.

SI No	Block	CDs (Nos)	NBs (Nos)	Str Dev (Km)	Ponds (Nos)	On-farm (ha)	WUE (ha)
1	BADLAPUR	4	4	4	4	4762	4762
2	BAKSHA	3	3	3	3	2571	2571
3	BARSAHI	2	2	2	2	2942	2942
4	DHARMAPUR	1	1	1	1	1598	1598
5	DOBHI	1	1	1	1	1098	1098
6	JALALPUR	1	1	1	1	1073	1073
7	KARANJA KALAN	2	2	2	2	2654	2654
8	KERAKAT	2	2	2	2	2341	2341
9	KHUTAHAN	2	2	2	2	1228	1228
10	MACHHLISHAHR	3	3	3	3	1620	1620
11	MAHARAJGANJ	3	3	3	4	5505	5505
12	MARIAHU	2	2	2	2	1319	1319
13	MUFTIGANJ	3	3	3	3	2965	2965
14	MUNGRA BADSHAHPUR	1	1	1	1	962	962
15	RAMNAGAR	2	2	2	2	1264	1264
16	RAMPUR	2	2	2	2	1340	1340
17	SHAHGANJ	3	3	3	3	1840	1840
18	SIKRARA	2	2	2	2	2190	2190
19	SIRKONI	2	2	2	2	1886	1886
20	SUITHA KALAN	2	2	2	2	1230	1230
20	SUJANGANJ	2	2	2	2	1518	1518
10	District Total	46	46	46	47	43905	43905

Table 32: Block wise proposed intervention summary, Jaunpur District, Uttar Pradesh.

SI No	Block	Check Dams (No's)	Nala Bands (No's)	Stream Development (Km)	Ponds (No's)	On-farm activities (ha)	Water use efficiency (ha)	Recharge form Structures(MCM)	Saving from Structures(MCM)	Saving form On-farm & WUE MCM	Total Recharge MCM	Total Saving MCM	Present Stage of Ground Water Development (%)	Projected Stage of Development (%) After Interventions
1	BADLAPUR	4	4	4	4	4762	4762	0.24	0.24	8.21	0.24	8.45	92.64	73.62
2	BAKSHA	3	3	3	3	2571	2571	0.17	0.17	8.06	0.17	8.23	80.16	60.51
3	BARSATHI	2	2	2	2	2942	2942	0.14	0.14	5.49	0.14	5.62	78.68	66.78
4	DHARMAPUR	1	1	1	1	1598	1598	0.08	0.08	5.98	0.08	6.06	73.46	56.32
5	DOBHI	1	1	1	1	1098	1098	0.09	0.09	3.76	0.09	3.85	66.57	60.57
6	JALALPUR	1	1	1	1	1073	1073	0.09	0.09	3.49	0.09	3.59	56.55	51.55
7	KARANJA KALAN	2	2	2	2	2654	2654	0.15	0.15	8.12	0.15	8.27	79.34	67.34
8	KERAKAT	2	2	2	2	2341	2341	0.12	0.12	8.07	0.12	8.19	87.65	72.44
9	KHUTAHAN	2	2	2	2	1228	1228	0.13	0.13	4.61	0.13	4.74	62.91	55.22
10	MACHHLISHAHR	3	3	3	3	1620	1620	0.16	0.16	3.37	0.16	3.53	63.21	58.95
11	MAHARAJGANJ	3	3	3	4	5505	5505	0.21	0.21	11.21	0.21	11.42	93.16	71.94
12	MARIAHU	2	2	2	2	1319	1319	0.14	0.14	3.80	0.14	3.93	69.35	63.39
13	MUFTIGANJ	3	3	3	3	2965	2965	0.18	0.18	7.94	0.18	8.12	86.90	71.51
14	M.BADSHAHPUR	1	1	1	1	962	962	0.08	0.08	2.99	0.08	3.07	67.53	61.68
15	RAMNAGAR	2	2	2	2	1264	1264	0.12	0.12	2.52	0.12	2.63	64.30	58.59
16	RAMPUR	2	2	2	2	1340	1340	0.13	0.13	3.17	0.13	3.30	67.98	60.73
17	SHAHGANJ	3	3	3	3	1840	1840	0.18	0.18	5.22	0.18	5.41	56.16	50.05
18	SIKRARA	2	2	2	2	2190	2190	0.12	0.12	4.40	0.12	4.51	76.21	63.42
19	SIRKONI	2	2	2	2	1886	1886	0.14	0.14	5.45	0.14	5.59	78.30	63.87
20	SUITHA KALAN	2	2	2	2	1230	1230	0.14	0.14	3.22	0.14	3.36	63.47	58.58
21	SUJANGANJ	2	2	2	2	1518	1518	0.14	0.14	3.35	0.14	3.49	61.55	56.71
	District Total	46	46	46	47	43905	43905	3	3	112	3	115	1526	1304

Table 33: Block wise expected outcomes from Ground Water Management interventions, , Jaunpur District, Uttar Pradesh.

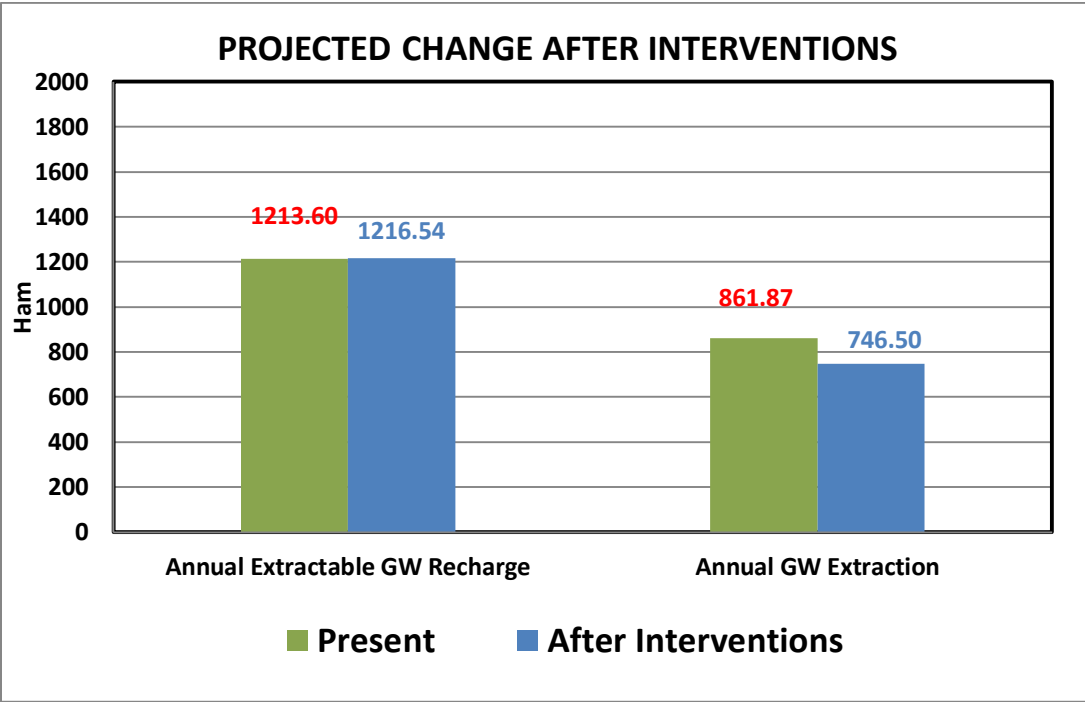


Figure 28: Projected Change of Ground Water Scenario after Management, Jaunpur District.

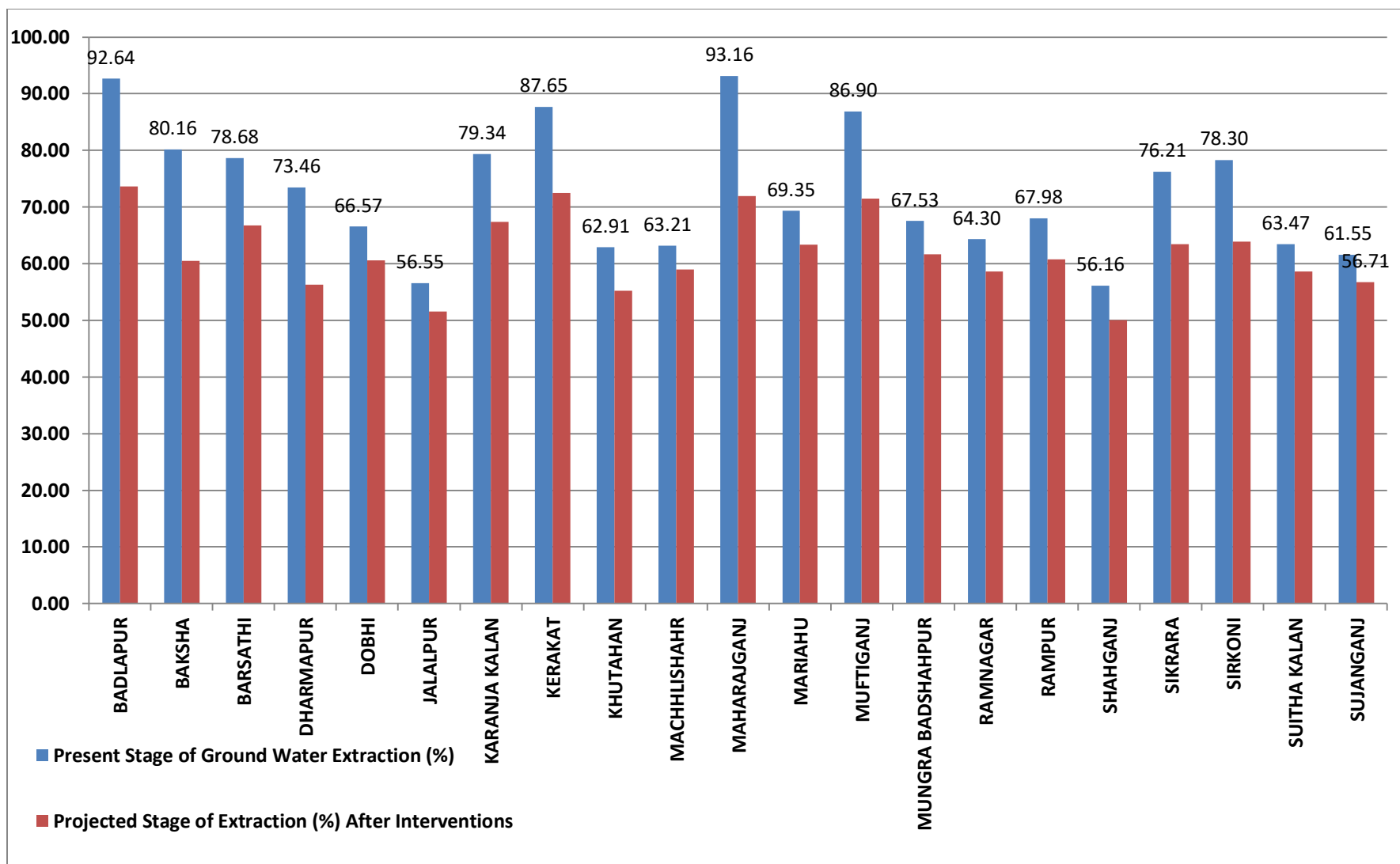


Figure 29: Block wise projected Change in Stage of Ground Water Extraction after Interventions, Jaunpur District.

8. Public interaction Programme

Central Ground Water Board, SUO Allahabad has organized one no of Pubic Interaction Programme in Jaunpur district (Kamalpur village, Mungrabdshahpur block) as per the Annual Action Plan of **2021-22**. The Public Interaction Programme was organized on 11.03.2022. The Target group for Public Interaction Programme was students. Total **69 students** participated in the programmme which includes **35 male** and **34 female**. The following topics were discussed during Public Interaction Programme with the students.

- ❖ Importance of Ground Water.
- ❖ Ground water scenario in Uttar Pradesh and in Jaunpur district.
- ❖ Aquifer Mapping and Management.
- ❖ Local Ground Water issues.
- ❖ Ground water conservation techniques.

The details of the Public interaction Programme are tabulated below.

Name of the venue	Saint Mary Gold School
Date of PIP	11.03.2022
Village	Kamalpur
Block	Mungrabdshahpur
Location	Latitude: 25 ⁰ 39'03" N
	Longitude: 82 ⁰ 10'50" E
Total no of participants	69
Male	35
Female	34
Name of the organizers	Sri. Umareddy Dereddy (Scientist- B)
	Sri. Vipin Kumar Mishra (Assistant Hydrogeologist)
Topics covered in PIP	Importance of Ground Water
	Ground water scenario in Uttar Pradesh and in Jaunpur district
	Aquifer Mapping and Management
	Local Ground Water issues
	Ground water conservation techniques.

Table 34: Details of Public Interaction Programme, Jaunpur District.



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Figure 30: Public Interaction Programme, Jaunpur District.

9. Conclusions

The National Aquifer Management Programme (NAQUIM) has been implemented in the Junpur district by the CGWB (Northern Region, Lucknow) under AAP: 2021-22. Jaunpur district is situated in the Eastern part of the state Uttar Pradesh. It is surrounded by Sultanpur District in North, Sultanpur in South, Azamgarh and Varanasi in East, Alahabad and Pratapgarh in West and Saant Ravidas Nagar in South. Jaunpur city is the administrative Headquarters of the district. District encompasses an area of 4038 Sq. Km. and lies between latitude 25°22'30" to 26°10'00" North and longitude 82°06'00" to 83°00'00" East. The district falls No. 63K and 63J. and the district is well connected by roads and train routes.

Administratively the district is subdivided in to Seven Tehsils. The district is further sub divided in to Twenty one blocks namely Badlapur, Baksha, Barsathi, Dharmapur, Dobhi, Jalalpur, Karanjakalan, Kerakat, Khutahan, Machllishahar, Maharajganj, Mariahu, Muftiganj, Mungra Badshahpur, Ramnagar, Rampur, Shahganj, SIKRARA, Sikroni, Suitha Kalan, and Sujanganj.

Geomorphology of the district defined by the Older Alluvium Plain in most of the areas with some patches of Younger Alluvium Plain along Dhobi, Jaunpur and Gazipur blocks. Flood plains are restricted along the river channels. Other than this two type, back swamp, cut off meander, ravines, point bar etc geomorphic features also present as a sporadic distribution and along the paleo channels of Gomti River.

The average normal Rainfall of the district is 646.4 mm. Rainfall in the district predominantly occurs in monsoon season. The average rainfall during monsoon season is 573.22 mm. The average rainfall during non-monsoon season is 73.22 mm. 90% of the total precipitation is contributed by Monsoon Rainfall.

During Pre Monsoon 2021 water level data of the district ranges from 0.75 mbgl to 23.65 mbgl. The Shallower water level during pre-monsoon was observed in Khauthan block i.e. 0.75 mbgl and deeper level of water level during pre-monsoon was observed in Sikroni block i.e. 23.65 mbgl. The average water level in the district is 8.92 mbgl.

During Post Monsoon 2021 water level data of the district ranges from 0.30 mbgl to 21.05 mbgl. The Shallower water level during pre-monsoon was observed in Shahganj block i.e. 0.30 mbgl and deeper level of water level during pre-monsoon was observed in Sikroni block i.e. 21.05 mbgl. The average water level in the district is 6.302 mbgl. The deeper water levels both during pre-monsoon and post monsoon was observed in Sikroni block.

Block wise Post monsoon water level trend of i.e. from 2012-21. Out of 21 blocks in the district total eleven blocks showed a rising water level trend, one block showed a falling water level trend and rest of the nine block showed a mixed water level trend during post-monsoon season. Block wise Post monsoon water level trend was calculated for the last ten years i.e. from 2012-21. Out of 21 blocks in the district total eleven blocks showed a rising water level trend, one block showed a falling water level trend and rest of the nine block showed a mixed water level trend during post-monsoon season.

Ground Water Quality parameters of the shallow aquifers are mostly within BIS: 10500- 2012 permissible limit. The most ground water quality related issue is concentration of the Fe, Fl in some of

the blocks in the district. The P.H of Ground water in most of the blocks is above the permissible limit. Higher salinity of Ground water in some parts of Karanjakala, Suithakalan, Shahganj, Buxa, Sikroni, Mariyaho, Rampur, Sikrara, Barsathi, Machalishahar and Mungrabadshahpur blocks in the district.

As per Dynamic GW resources 2020 out of 21 blocks, 11 blocks are in Safe category, 8 blocks are in Semi- critical category and 2 blocks are in critical category. As per Dynamic GW resources 2020 total extractable ground water resources of the district is 121359.98 Ham and total ground water draft of the district is 86187.13 Ham. The stage of Ground after development in the district is 71.02 %

Ground water Management plan of the whole district i.e. for 21 blocks was proposed as part of Ground Water Management strategies in the district. Total 46 Check dams, 46 Nala Bunds, 47 Ponds recommended for supply side management and total 43905 hectare agricultural area recommended for Demand side management interventions. Upon n successful implementation of the Ground water management interventions, average stage of GW Extraction of the districts will decreases to 61.36 % from 71.02 %.

10. Recommendations

The following under mentioned recommendations are recommendations are made for effective future ground water development, utilization and management.

1. Adoption of proper rain water harvesting techniques to reduce the wastage of rain water in the form of surface run off in the district.
2. Construction and restoration of existing aquifer recharge structures like ponds, percolation tanks to enhance the infiltration rate of surface run off water in to Ground Water Aquifers.
3. In canal command area combined use of surface and Ground water for irrigation will reduce the pressure on ground water draft for irrigation and also ensures the right balance between surface and Ground water.
4. Cultivation of water less intensive crops in non-canal command areas where there is a high depletion in Ground water levels.
5. Use of the modern techniques in the field of irrigation reduces the ground water draft for irrigation. The modern techniques in irrigation field include
 - ❖ Drip & Sprinkler irrigation
 - ❖ Furrow irrigation
6. Area with high water table may be allowed only for kharif irrigation and during Rabi farmers can cultivate with the help of dug wells and tube wells.
7. Creating wide awareness to farmers, students and other stake holders regarding the effective utilization of Ground water and methods to conserve the ground water through Public Interaction Programmes.
8. Implementation of the proposed Management Plan i.e. construction of proposed no of check dams, nala bunds, ponds and implementation of on farm activities.

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12. Annexures

Annexure 1: Lithological logs of Exploration wells

Name of the site	From	To	Thickness (m)	Lithology
Jamuhar EW	0.00	6.85	6.85	Surface Soil
Jamuhar EW	6.85	84.60	77.75	Clay
Jamuhar EW	84.60	107.06	22.46	Sand
Jamuhar EW	107.06	114.54	7.48	Clay
Jamuhar EW	114.54	130.50	15.96	Sand
Jamuhar EW	130.50	145.83	15.33	Clay with Kankar
Jamuhar EW	145.83	160.36	14.53	Sand
Jamuhar EW	160.36	192.92	32.56	Clay with Kankar
Jamuhar EW	192.92	254.60	61.68	Sand
Jamuhar EW	254.60	270.29	15.69	Clay with Kankar
Jamuhar EW	270.29	282.84	12.55	Sand

Name of the site	From	To	Thickness (m)	Lithology
Naharpur EW	0.00	7.97	7.97	Surface Soil
Naharpur EW	7.97	27.33	19.36	Kankar
Naharpur EW	27.33	30.33	3.00	Clay with Kankar
Naharpur EW	30.33	33.81	3.48	Kankar
Naharpur EW	33.81	40.28	6.47	Clay with Kankar
Naharpur EW	40.28	66.13	25.85	Kankar
Naharpur EW	66.13	79.07	12.94	Clay with Kankar
Naharpur EW	79.07	82.07	3.00	Sand
Naharpur EW	82.07	92.01	9.94	Kankar
Naharpur EW	92.01	107.93	15.92	Clay with Kankar
Naharpur EW	107.93	111.41	3.48	Kankar
Naharpur EW	111.41	114.41	3.00	Clay with Kankar
Naharpur EW	114.41	143.73	29.32	Kankar
Naharpur EW	143.73	146.73	3.00	Clay with Kankar
Naharpur EW	146.73	169.59	22.86	Kankar
Naharpur EW	169.59	182.52	12.93	Clay with Kankar
Naharpur EW	182.52	227.72	45.20	Kankar
Naharpur EW	227.72	230.72	3.00	Clay with Kankar
Naharpur EW	230.72	247.08	16.36	Kankar
Naharpur EW	247.08	299.07	51.99	Sand

Name of the site	From	To	Thickness (m)	Lithology
Pali EW	0.00	10.00	10.00	Surface Soil
Pali EW	10.00	150.00	140.00	Clay with Kankar
Pali EW	150.00	186.00	36.00	Sand
Pali EW	186.00	196.00	10.00	Clay
Pali EW	196.00	300.00	104.00	Sand

Name of the site	From	To	Thickness (m)	Lithology
Suraila EW	0.00	3.00	3.00	Surface Soil
Suraila EW	3.00	19.19	16.19	Clay
Suraila EW	19.19	160.61	141.42	Clay with Kankar
Suraila EW	160.61	182.27	21.66	Sand
Suraila EW	182.27	185.40	3.13	Clay
Suraila EW	185.40	188.40	3.00	Clay
Suraila EW	188.40	209.69	21.29	Sand
Suraila EW	209.69	215.78	6.09	Clay
Suraila EW	215.78	305.03	89.25	Sand

Name of the site	From	To	Thickness (m)	Lithology
Uttar Patti EW	0.00	6.10	6.10	Surface Soil
Uttar Patti EW	6.10	101.70	95.60	Clay with Kankar
Uttar Patti EW	101.70	114.70	13.00	Clay
Uttar Patti EW	114.70	127.50	12.80	Clay with Kankar
Uttar Patti EW	127.50	209.10	81.60	Kankar
Uttar Patti EW	209.10	215.70	6.60	Clay with Kankar
Uttar Patti EW	215.70	228.50	12.80	Kankar
Uttar Patti EW	228.50	304.80	76.30	Sand

Name of the site	From	To	Thickness (m)	Lithology
Atardiha EW	0.00	476.20	476.20	Clay with Kankar
Atardiha EW	476.20	486.21	10.01	Clay
Atardiha EW	486.21	522.04	35.83	Sand
Atardiha EW	522.04	549.00	26.96	Clay

Name of the site	From	To	Thickness (m)	Lithology
Takha East EW	0.00	6.50	6.50	Surface Soil
Takha East EW	6.50	26.50	20.00	Clay
Takha East EW	26.50	93.15	66.65	Clay with Kankar
Takha East EW	93.15	105.90	12.75	Kankar
Takha East EW	105.90	137.96	32.06	Sand
Takha East EW	137.96	150.51	12.55	Clay with Kankar
Takha East EW	150.51	189.24	38.73	Kankar
Takha East EW	189.24	229.19	39.95	Clay with Kankar
Takha East EW	229.19	249.22	20.03	Kankar
Takha East EW	249.22	265.29	16.07	Clay with Kankar
Takha East EW	265.29	294.78	29.49	Sand
Takha East EW	294.78	307.70	12.92	Kankar

Name of the site	From	To	Thickness (m)	Lithology
Belhramau EW	0.00	1.50	1.50	Top soil
Belhramau EW	1.50	136.47	134.97	Clay
Belhramau EW	136.47	150.48	14.01	Clay with Kankar
Belhramau EW	150.48	240.82	90.34	Clay
Belhramau EW	240.82	281.57	40.75	Sand
Belhramau EW	281.57	610.00	328.43	Clay

Name of the site	From	To	Thickness (m)	Lithology
Nibhapur EW	0.00	143.73	143.73	Clay with Kankar
Nibhapur EW	143.73	323.67	179.94	Sand
Nibhapur EW	323.67	407.49	83.82	Clay
Nibhapur EW	407.49	414.69	7.20	Sand
Nibhapur EW	414.69	421.19	6.50	Clay
Nibhapur EW	421.19	424.70	3.51	Limestone

Name of the site	From	To	Thickness (m)	Lithology
Kurni EW	0.00	135.54	135.54	Clay with Kankar
Kurni EW	135.54	138.54	3.00	Sand
Kurni EW	138.54	163.93	25.39	Clay
Kurni EW	163.93	523.89	359.96	Sand
Kurni EW	523.89	530.90	7.01	Clay with Kankar
Kurni EW	530.90	538.03	7.13	Sand
Kurni EW	538.03	541.53	3.50	Limestone

Name of the site	From	To	Thickness (m)	Lithology
sakra EW	0.00	5.00	5.00	Surface soil
sakra EW	5.00	72.00	67.00	Clay
sakra EW	72.00	97.70	25.70	Sand
sakra EW	97.70	114.06	16.36	Clay
sakra EW	114.06	246.04	131.98	Sand
sakra EW	246.04	264.04	18.00	Clay
sakra EW	264.04	284.09	20.05	Sand
sakra EW	284.09	357.06	72.97	Clay
sakra EW	357.06	389.06	32.00	Sand
sakra EW	389.06	413.00	23.94	Limestone

Name of the site	From	To	Thickness (m)	Lithology
Karmahi EW	0.00	1.00	1.00	Surface soil
Karmahi EW	1.00	109.34	108.34	Clay with Kankar
Karmahi EW	109.34	123.31	13.97	Kankar
Karmahi EW	123.31	186.56	63.25	Clay
Karmahi EW	186.56	190.58	4.02	Sand
Karmahi EW	190.58	193.58	3.00	Clay
Karmahi EW	193.58	200.61	7.03	Sand
Karmahi EW	200.61	203.99	3.38	Clay
Karmahi EW	203.99	226.76	22.77	Sand
Karmahi EW	226.76	230.76	4.00	Kankar
Karmahi EW	230.76	348.78	118.02	Sand
Karmahi EW	348.78	352.78	4.00	Clay
Karmahi EW	352.78	373.40	20.62	Sand
Karmahi EW	373.40	405.07	31.67	Clay
Karmahi EW	405.07	415.84	10.77	Clay with Kankar
Karmahi EW	415.84	472.86	57.02	Clay
Karmahi EW	472.86	541.48	68.62	Clay with Kankar
Karmahi EW	541.48	552.19	10.71	Clay
Karmahi EW	552.19	557.73	5.54	Clay with Kankar

Name of the site	From	To	Thickness (m)	Lithology
Hamzapur EW	0.00	3.00	3.00	Surface soil
Hamzapur EW	3.00	220.40	217.40	Clay with Kankar
Hamzapur EW	220.40	428.25	207.85	Sand
Hamzapur EW	428.25	547.00	118.75	Clay with Kankar
Hamzapur EW	547.00	549.00	2.00	Kankar
Hamzapur EW	549.00	611.40	62.40	Limestone

Name of the site	From	To	Thickness (m)	Lithology
Majhgawan EW	0.00	5.00	5.00	Surface soil
Majhgawan EW	5.00	27.62	22.62	Clay with Kankar
Majhgawan EW	27.62	34.52	6.90	Clay
Majhgawan EW	34.52	44.52	10.00	Sand
Majhgawan EW	44.52	160.26	115.74	Clay with Kankar
Majhgawan EW	160.26	319.29	159.03	Sand
Majhgawan EW	319.29	350.38	31.09	Clay
Majhgawan EW	350.38	368.21	17.83	Sand
Majhgawan EW	368.21	389.01	20.80	Clay with Kankar
Majhgawan EW	389.01	426.03	37.02	Clay
Majhgawan EW	426.03	430.03	4.00	Sand

Annexure- II: Chemical data (results) of basic elements of Jaunpur District, U.P.

Block	Location	Latitude	Longitude	P.H	EC(µs/cm) at 25°C	TDS	CO3 mg/l	HCO3 mg/l	Cl mg/l	Fmg/l	NO3 mg/l	SO4 mg/l	TH mg/l	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Sio2 mg/l	NA	K	CA	MG	CO3	HCO3
Dobhi	Chandwak	25.5916	82.9999	8.45	475.00	304.00	12.00	238.00	21.00	0.44	12.00	4.90	170.00	12.00	34.00	41.00	3.20	28.00	1.78	0.08	0.6	2.80	0.4	3.90
Dobhi	Ramdevpur	25.6116	82.9939	8.35	485.00	310.40	12.00	262.00	14.00	0.33	6.90	5.00	175.00	12.00	35.00	41.00	3.60	28.00	1.78	0.09	0.6	2.88	0.4	4.30
Dobhi	Anekpur	25.6230	83.0062	8.70	570.00	364.80	24.00	317.00	7.00	0.54	0.27	3.40	110.00	8.00	22.00	93.00	3.30	29.00	4.04	0.08	0.4	1.81	0.8	5.20
Dobhi	Levaruva	25.6438	82.9929	8.35	500.00	320.00	6.00	250.00	21.00	0.58	24.00	8.60	210.00	12.00	44.00	29.00	3.10	31.00	1.26	0.08	0.6	3.62	0.2	4.10
Karakat	Mahadeva	25.6370	82.9574	8.45	386.00	247.04	12.00	207.00	11.00	0.80	5.00	2.60	160.00	12.00	32.00	23.00	2.20	32.00	1.00	0.06	0.6	2.63	0.4	3.39
Karakat	Adarsh East school	25.6418	82.9170	8.34	435.00	278.40	6.00	195.00	32.00	0.84	10.00	7.70	170.00	16.00	32.00	31.00	2.40	30.00	1.35	0.06	0.8	2.63	0.2	3.20
Karakat	Khepatpur	25.6502	82.8924	8.63	490.00	313.60	18.00	244.00	11.00	0.48	22.00	5.70	225.00	8.00	50.00	20.00	2.30	33.00	0.87	0.06	0.4	4.11	0.6	4.00
Muftiganj	Deokali	25.6618	82.8618	8.35	501.00	320.64	6.00	226.00	35.00	0.21	10.00	20.00	170.00	16.00	32.00	47.00	4.30	32.00	2.04	0.11	0.8	2.63	0.2	3.70
Muftiganj	Belaon	25.6762	82.8166	8.65	536.00	343.04	18.00	250.00	32.00	0.50	6.70	8.20	235.00	12.00	50.00	26.00	3.90	30.00	1.13	0.10	0.6	4.11	0.6	4.10
Muftiganj	Pittapur	25.7142	82.8052	8.66	485.00	310.40	18.00	250.00	14.00	0.70	5.30	5.40	175.00	6.00	39.00	41.00	3.40	32.00	1.78	0.09	0.3	3.21	0.6	4.10
Dharmapur	Pindra	25.7259	82.7527	8.68	596.00	381.44	48.00	244.00	18.00	0.56	16.00	6.80	225.00	8.00	50.00	45.00	2.30	32.00	1.96	0.06	0.4	4.11	1.6	4.00
Dharmapur	Block office	25.7425	82.7349	8.69	547.00	350.08	24.00	268.00	18.00	0.52	3.00	9.20	205.00	8.00	45.00	42.00	5.00	28.00	1.83	0.13	0.4	3.70	0.8	4.39
Karanjakh alan	Sukhipur	25.7619	82.6883																0.00	0.00	0	0.00	0	0.00
Karanjakh alan	Block office	25.7719	82.7065	8.84	787.00	503.68	24.00	390.00	21.00	1.30	0.22	38.00	170.00	4.00	39.00	121.00	1.80	21.00	5.26	0.05	0.2	3.21	0.8	6.39
Karanjakh alan	Jasopur	25.8271	82.6838	8.80	553.00	353.92	36.00	244.00	14.00	1.50	0.11	13.00	200.00	8.00	44.00	46.00	4.00	23.00	2.00	0.10	0.4	3.62	1.2	4.00
Shahganj	Block office	25.9660	82.6754	8.60	455.00	291.20	24.00	195.00	21.00	0.41	0.05	11.00	110.00	12.00	19.00	61.00	5.50	29.00	2.65	0.14	0.6	1.56	0.8	3.20
Shahganj	Gorari	25.9862	82.6794	8.48	1416.00	906.24	24.00	207.00	106.00	0.38	26.00	306.00	270.00	16.00	56.00	200.00	7.00	30.00	8.70	0.18	0.8	4.61	0.8	3.39
Shahganj	Teshil	26.0576	82.6767	8.68	637.00	407.68	60.00	268.00	14.00	0.33	5.10	2.80	240.00	8.00	54.00	49.00	3.30	27.00	2.13	0.08	0.4	4.44	2	4.39
Shahganj	Badagaon	26.0791	82.6304	8.78	1370.00	876.00	48.00	415.00	128.00	0.19	9.90	74.00	280.00	12.00	61.00	128.00	100.00	36.00	5.57	2.56	0.6	5.02	1.6	6.80

					00	80			0							0	00								
Suitha Kalan	Ramnagar	26.1069	82.5654	8.60	778.00	497.92	48.00	268.00	64.00	0.23	3.10	37.00	260.00	8.00	58.00	69.00	7.80	28.00	3.00	0.20	0.4	4.77	1.6	4.39	
Suitha Kalan	Rudhauili	26.1076	82.5114	8.35	462.00	295.68	24.00	122.00	28.00	0.26	15.00	34.00	180.00	28.00	27.00	17.00	4.40	20.00	0.74	0.11	1.4	2.22	0.8	2.00	
Suitha Kalan	Piprauwal	26.1087	82.4937	8.62	485.00	310.40	24.00	195.00	21.00	0.63	ND	29.00	120.00	12.00	22.00	65.00	4.50	28.00	2.83	0.12	0.6	1.81	0.8	3.20	
Suitha Kalan	Block office	26.1003	82.5011	8.59	445.00	284.80	36.00	183.00	7.10	0.51	0.12	8.60	145.00	8.00	30.00	40.00	5.00	27.00	1.74	0.13	0.4	2.47	1.2	3.00	
Khuthan	Patti narendrapur	26.0377	82.5193	8.49	449.00	287.36	36.00	195.00	14.00	0.23	6.00	3.30	180.00	12.00	36.00	30.00	3.20	30.00	1.30	0.08	0.6	2.96	1.2	3.20	
Khuthan	Block office	25.9805	82.5790	8.80	465.00	297.60	36.00	195.00	7.10	0.54	7.90	6.40	125.00	8.00	26.00	56.00	5.00	30.00	2.43	0.13	0.4	2.14	1.2	3.20	
Khuthan	Budhanpur	25.9590	82.6223	8.50	713.00	456.32	48.00	268.00	43.00	0.63	6.10	26.00	220.00	12.00	46.00	77.00	6.00	28.00	3.35	0.15	0.6	3.79	1.6	4.39	
Khuthan	Nadauli	25.9331	82.6251	8.46	335.00	214.40	30.00	110.00	7.10	1.60	0.14	19.00	160.00	28.00	22.00	5.80	3.10	21.00	0.25	0.08	1.4	1.81	1	1.80	
Badlapur	Tiarabazar	25.9421	82.4512	8.88	715.00	457.60	60.00	256.00	35.00	0.31	0.19	31.00	225.00	8.00	50.00	76.00	4.10	26.00	3.30	0.10	0.4	4.11	2	4.20	
Badlapur	Primary school	25.9777	82.4441	8.62	376.00	240.64	24.00	159.00	14.00	0.59	3.00	5.50	155.00	8.00	33.00	21.00	3.20	30.00	0.91	0.08	0.4	2.72	0.8	2.61	
Badlapur	Sigramau	25.9489	82.3958	8.67	389.00	248.96	36.00	146.00	14.00	0.67	1.30	9.60	140.00	8.00	29.00	33.00	2.10	24.00	1.43	0.05	0.4	2.39	1.2	2.39	
Badlapur	Block office	25.8889	82.4663	8.75	572.00	366.08	36.00	195.00	35.00	0.62	5.50	13.00	200.00	8.00	44.00	44.00	4.60	29.00	1.91	0.12	0.4	3.62	1.2	3.20	
Buxa	Daniyamau	25.8471	82.5124	8.83	765.00	489.60	48.00	256.00	50.00	0.62	9.10	37.00	130.00	8.00	27.00	125.00	4.50	37.00	5.43	0.12	0.4	2.22	1.6	4.20	
Buxa	Block office	25.7913	82.5656	8.61	437.00	279.68	36.00	159.00	21.00	0.42	4.80	6.00	180.00	10.00	38.00	26.00	3.10	30.00	1.13	0.08	0.5	3.13	1.2	2.61	
Buxa	Pura Mohabbat	25.8201	82.5069	9.01	708.00	453.12	60.00	317.00	14.00	0.53	7.80	2.40	270.00	10.00	60.00	53.00	4.30	32.00	2.30	0.11	0.5	4.94	2	5.20	
Buxa	Tajee bazar	25.8227	82.4486	8.75	486.00	311.04	36.00	195.00	14.00	0.53	8.00	9.30	190.00	8.00	41.00	33.00	4.20	29.00	1.43	0.11	0.4	3.37	1.2	3.20	
Sirkoni	PWD Nirakshan bhawan	25.7297	82.6874	8.85	1286.00	823.04	48.00	171.00	163.00	1.80	21.00	133.00	125.00	8.00	26.00	230.00	3.10	24.00	10.00	0.08	0.4	2.14	1.6	2.80	
Sirkoni	Karyalay jilaadhikari	25.7359	82.6930	8.68	1262.00	807.68	36.00	189.00	181.00	0.48	76.00	149.00	250.00	8.00	56.00	187.00	4.30	26.00	8.13	0.11	0.4	4.61	1.2	3.10	
Sirkoni	Gopalganj pr. School	25.7206	82.7003	8.70	488.00	312.32	30.00	238.00	11.00	0.41	3.60	6.00	145.00	12.00	28.00	54.00	4.20	28.00	2.35	0.11	0.6	2.30	1	3.90	
Sirkoni	Bakrabad pr school	25.6475	82.7470																0.00	0.00	0	0.00	0	0.00	
Mariyaho	Pali	25.7358	82.6930	8.95	1566.00	1002.24	84.00	427.00	110.00	1.20	17.00	189.00	225.00	8.00	50.00	295.00	2.60	24.00	12.83	0.07	0.4	4.11	2.8	7.00	
Mariyaho	Sheetalganj	25.6578	82.6259	8.38	798.00	510.72	24.00	256.00	85.00	0.47	1.90	53.00	280.00	16.00	58.00	71.00	4.60	27.00	3.09	0.12	0.8	4.77	0.8	4.20	

Mariyaho	B.N.B inter college	25.5962	82.5984	8.84	595.00	380.80	30.00	232.00	46.00	0.38	8.10	13.00	200.00	8.00	44.00	58.00	1.90	29.00	2.52	0.05	0.4	3.62	1	3.80
Mariyaho	Samadganj	25.6995	82.5984	8.63	488.00	312.32	24.00	232.00	18.00	0.74	0.42	9.10	160.00	12.00	32.00	49.00	2.60	25.00	2.13	0.07	0.6	2.63	0.8	3.80
Ramnagar	Block office	25.5562	82.6196	8.85	568.00	363.52	24.00	305.00	14.00	0.36	0.42	1.90	140.00	8.00	29.00	78.00	4.00	0.24	3.39	0.10	0.4	2.39	0.8	5.00
Ramnagar	Budhipur	25.5298	82.6389	8.53	415.00	265.60	30.00	183.00	11.00	0.49	2.20	7.00	175.00	8.00	38.00	23.00	3.90	32.00	1.00	0.10	0.4	3.13	1	3.00
Ramnagar	Newaria	25.5153	82.6768	8.42	416.00	266.24	24.00	110.00	46.00	0.37	14.00	11.00	145.00	18.00	24.00	36.00	3.00	30.00	1.57	0.08	0.9	1.97	0.8	1.80
Ramnagar	Gopalapur	25.5093	82.6274	8.63	718.00	459.52	24.00	281.00	57.00	0.17	19.00	28.00	215.00	6.00	49.00	80.00	6.90	34.00	3.48	0.18	0.3	4.03	0.8	4.61
Rampur	Block office	25.4906	82.5708	9.15	1085.00	694.40	96.00	488.00	14.00	1.60	1.30	8.00	90.00	8.00	17.00	232.00	2.20	22.00	10.09	0.06	0.4	1.40	3.2	8.00
Rampur	Pachwal	23.8722	82.4031	8.49	489.00	312.96	24.00	195.00	14.00	0.20	12.00	6.20	150.00	16.00	27.00	39.00	2.70	34.00	1.70	0.07	0.8	2.22	0.8	3.20
Rampur	Sultanpur Koop	25.4617	82.6358	9.05	1496.00	957.44	84.00	598.00	67.00	1.50	22.00	57.00	90.00	4.00	19.00	335.00	5.00	21.00	14.57	0.13	0.2	1.56	2.8	9.80
Rampur	Pachurakhi	25.4966	82.5225	8.78	787.00	503.68	42.00	348.00	18.00	1.70	5.60	39.00	200.00	12.00	41.00	107.00	3.10	22.00	4.65	0.08	0.6	3.37	1.4	5.70
Barasathi	Mnigoh	25.5443	82.4696	8.78	865.00	553.60	48.00	256.00	85.00	0.50	23.00	36.00	210.00	8.00	46.00	120.00	4.90	29.00	5.22	0.13	0.4	3.79	1.6	4.20
Barasathi	Vikaskhand	25.5617	82.4796	8.66	344.00	220.16	36.00	134.00	7.10	0.54	2.60	3.00	110.00	8.00	22.00	35.00	3.30	27.00	1.52	0.08	0.4	1.81	1.2	2.20
Barasathi	Bhannaur	25.5765	82.5240	8.82	576.00	368.64	36.00	281.00	14.00	0.43	4.20	4.70	160.00	4.00	36.00	70.00	5.00	28.00	3.04	0.13	0.2	2.96	1.2	4.61
Barasathi	Bashara	25.5932	82.4465	8.86	1048.00	670.72	48.00	220.00	64.00	0.29	9.60	206.00	265.00	8.00	60.00	145.00	4.10	30.00	6.30	0.10	0.4	4.94	1.6	3.61
Machhlish ahar	Tilora Bazar	25.6286	82.3734	8.76	495.00	316.80	42.00	195.00	18.00	0.21	6.90	12.00	150.00	6.00	33.00	55.00	3.60	30.00	2.39	0.09	0.3	2.72	1.4	3.20
Machhlish ahar	Thana	25.6866	82.4029	8.81	695.00	444.80	48.00	244.00	25.00	0.56	6.60	57.00	155.00	6.00	34.00	103.00	3.00	27.00	4.48	0.08	0.3	2.80	1.6	4.00
Machhlish ahar	Jhasapur	25.6828	82.3754	8.70	578.00	369.92	48.00	250.00	14.00	0.19	4.20	11.00	190.00	4.00	44.00	54.00	7.80	28.00	2.35	0.20	0.2	3.62	1.6	4.10
Machhlish ahar	Baserha	25.7017	82.3891	8.89	1085.00	694.40	60.00	378.00	57.00	1.60	1.20	95.00	150.00	8.00	32.00	195.00	4.50	23.00	8.48	0.12	0.4	2.63	2	6.20
Sikarara	Ramnagar	25.7632	82.5087	8.48	505.00	323.20	24.00	195.00	25.00	0.09	16.00	31.00	170.00	8.00	36.00	46.00	3.40	31.00	2.00	0.09	0.4	2.96	0.8	3.20
Sikarara	Taheerpur	25.7232	82.5371	8.88	825.00	528.00	72.00	317.00	25.00	0.81	5.70	35.00	300.00	8.00	68.00	69.00	3.80	26.00	3.00	0.10	0.4	5.60	2.4	5.20
Sikarara	Bharatpur	25.7329	82.5298	8.99	748.00	478.72	72.00	293.00	14.00	0.49	8.20	16.00	230.00	8.00	51.00	83.00	3.20	28.00	3.61	0.08	0.4	4.20	2.4	4.80
Sikarara	Block office	25.7418	82.6237	8.92	700.00	448.00	72.00	299.00	11.00	1.20	0.91	2.50	165.00	4.00	38.00	98.00	1.70	26.00	4.26	0.04	0.2	3.13	2.4	4.90
Jalalpur	Block office	25.6080	82.7002	8.71	468.00	299.52	42.00	171.00	18.00	0.22	9.50	8.50	160.00	8.00	34.00	44.00	3.20	30.00	1.91	0.08	0.4	2.80	1.4	2.80
Jalalpur	Mahrewa	25.5996	82.7002	8.55	398.00	254.72	36.00	146.00	14.00	0.49	0.26	17.00	120.00	12.00	22.00	43.00	1.90	22.00	1.87	0.05	0.6	1.81	1.2	2.39

Jalalpur	Lohgajar	25.5996	82.7541	8.54	340.0 0	217. 60	36.00	128.00	11.00	0.91	ND	5.70	150.00	12.00	29.00	14.00	1.90	26.00	0.61	0.05	0.6	2.39	1.2	2.10
Maharajganj	Maharajganj	25.5997	82.7542	8.78	548.0 0	350. 72	36.00	256.00	14.00	0.33	0.24	5.30	200.00	6.00	45.00	45.00	3.40	16.00	1.96	0.09	0.3	3.70	1.2	4.20
Maharajganj	Block office	25.8507	82.3911	8.65	444.0 0	284. 16	24.00	214.00	11.00	0.56	2.60	4.20	180.00	10.00	38.00	28.00	4.30	29.00	1.22	0.11	0.5	3.13	0.8	3.51
Maharajganj	Gaddopur	25.8647	82.3645	8.79	578.0 0	369. 92	42.00	262.00	11.00	0.41	0.06	12.00	165.00	8.00	38.00	68.00	4.90	29.00	2.96	0.13	0.4	3.13	1.4	4.30
Maharajganj	Kolhua	25.8289	82.3594	8.77	508.0 0	325. 12	48.00	207.00	14.00	0.28	4.00	6.70	150.00	8.00	32.00	59.00	1.30	24.00	2.57	0.03	0.4	2.63	1.6	3.39
Sujanganj	Haripur	25.7990	82.3206	8.50	318.0 0	203. 52	24.00	116.00	11.00	0.33	13.0 0	6.60	130.00	12.00	24.00	14.00	2.80	26.00	0.61	0.07	0.6	1.97	0.8	1.90
Sujanganj	Thaloe	25.7296	82.3549	9.10	489.0 0	312. 96	60.00	140.00	28.00	0.47	0.29	13.00	155.00	12.00	30.00	49.00	6.00	24.00	2.13	0.15	0.6	2.47	2	2.30
Sujanganj	Devapur	25.7786	82.2643	8.53	368.0 0	235. 52	24.00	177.00	7.10	0.95	3.30	2.30	155.00	10.00	32.00	20.00	2.50	23.00	0.87	0.06	0.5	2.63	0.8	2.90
Sujanganj	Umarpur	25.7428	82.2811	8.49	318.0 0	203. 52	18.00	140.00	7.10	0.97	ND	18.00	155.00	30.00	19.00	6.90	2.40	20.00	0.30	0.06	1.5	1.56	0.6	2.30
Mungrabadshahpur	Jaipalpur	25.6865	82.2200	8.63	438.0 0	280. 32	24.00	220.00	11.00	0.23	ND	3.00	130.00	6.00	28.00	48.00	5.90	22.00	2.09	0.15	0.3	2.30	0.8	3.61
Mungrabadshahpur	Budiakalna Pandeypur	25.6175	82.1428	8.65	498.0 0	318. 72	24.00	183.00	25.00	0.21	3.80	39.00	150.00	10.00	30.00	55.00	3.10	27.00	2.39	0.08	0.5	2.47	0.8	3.00
Mungrabadshahpur	Block office	25.6955	82.2065	8.99	838.0 0	536. 32	60.00	415.00	14.00	0.75	0.32	2.80	70.10	8.00	12.00	180.0 0	1.70	18.00	7.83	0.04	0.4	0.99	2	6.80
Mungrabadshahpur	Babhaniyo	25.5567	82.3208	9.08	2431. 00	1555. .84	96.00	586.00	170.0 0	8.10	24.0 0	338.0 0	90.10	4.00	19.00	539.0 0	12.0 0	16.00	23.4 3	0.31	0.2	1.56	3.2	9.61

Annexure- III: Chemical data (results) of Heavy elements of Jaunpur District, U.P.

S.No	District	Block	Source	Location	Latitude	Longitude	Cu (mg/l)	Fe(mg/l)	Mn(mg/l)	Zn(mg/l)	Cr(mg/l)
1	Jaunpur	Dobhi	Pz	Chandwak	25.59164	82.9999	0.021	1.085	BDL	BDL	BDL
2	Jaunpur	Dobhi	Pz	Ramdevpur	25.61164	82.99392	BDL	BDL	BDL	BDL	BDL
3	Jaunpur	Dobhi	Pz	Anekpur	25.62297	83.00617	BDL	BDL	BDL	BDL	BDL
4	Jaunpur	Dobhi	Dw	Levaruva	25.64384	82.99294	0.025	0.569	BDL	BDL	BDL
5	Jaunpur	Kerakat	Pz	Mahadewa	25.63701	82.95743	BDL	BDL	BDL	BDL	BDL
6	Jaunpur	Kerakat	Pz	Adarsh East School	25.64181	82.91701	BDL	1.15	BDL	BDL	BDL
7	Jaunpur	Kerakat	Dw	Khepatpur	25.65017	82.89237	BDL	0.704	BDL	BDL	BDL
8	Jaunpur	Muftiganj	Pz	Deokali	25.66184	82.8618	BDL	0.731	BDL	BDL	BDL
9	Jaunpur	Muftiganj	Pz	Belaon	25.67617	82.81657	BDL	0.135	BDL	BDL	BDL
10	Jaunpur	Muftiganj	Pz	Pittupur	25.7142	82.80524	BDL	BDL	BDL	BDL	BDL
11	Jaunpur	Dharmapur	Pz	Pindra	25.72592	82.75266	BDL	BDL	BDL	BDL	BDL
12	Jaunpur	Dharmapur	Pz	Block Office	25.74254	82.73487	BDL	0.569	BDL	BDL	BDL
13	Jaunpur	KaranjaKalan	Pz	Sukhipur	25.76189	82.68833	BDL	BDL	BDL	BDL	BDL
14	Jaunpur	KaranjhaKalan	Pz	Block Office	25.77188	82.70649	BDL	BDL	BDL	BDL	BDL
15	Jaunpur	KaranjhaKalan	Dw	Jasopur	25.82714	82.68384	BDL	BDL	BDL	BDL	BDL
16	Jaunpur	Shahganj	Pz	Block Office	25.96603	82.67542	BDL	BDL	0.058	BDL	BDL
17	Jaunpur	Shahganj	Dw	Gorari	25.98618	82.67937	BDL	BDL	BDL	BDL	BDL
18	Jaunpur	Shahganj	Pz	Tehsil	26.05758	82.6767	BDL	BDL	BDL	BDL	BDL
19	Jaunpur	Shahganj	Dw	Badagaon	26.07913	82.63035	BDL	BDL	BDL	BDL	BDL
20	Jaunpur	Suitha kalan	Pz	Ramnagar	26.10687	82.56544	BDL	0.208	BDL	BDL	BDL
21	Jaunpur	Suitha kalan	DW	Rudhauri	26.10757	82.51138	BDL	BDL	BDL	BDL	BDL
22	Jaunpur	Suitha kalan	Pz	Piprauwal	26.10871	82.49371	BDL	BDL	BDL	BDL	BDL
23	Jaunpur	Suitha kalan	Dw	Block Office	26.10028	82.50112	BDL	BDL	BDL	BDL	BDL
24	Jaunpur	Khuthan	Dw	Patti Narendrapur	26.03765	82.51931	BDL	BDL	BDL	BDL	BDL
25	Jaunpur	Khuthan	Dw	Block Office	25.98048	82.57898	BDL	BDL	BDL	BDL	BDL
26	Jaunpur	Khuthan	Dw	Budhanpur	25.95901	82.62225	BDL	BDL	BDL	BDL	BDL
27	Jaunpur	Khuthan	Pz	Nadauli	25.93313	82.62514	BDL	0.208	BDL	BDL	BDL

28	Jaunpur	Badlapur	Dw	Tiarabazar	25.94209	82.45122	BDL	BDL	BDL	BDL	BDL
29	Jaunpur	Badlapur	Pz	Primary School	25.97766	82.44408	BDL	0.358	BDL	BDL	BDL
30	Jaunpur	Badlapur	Dw	Sigra mau	25.94888	82.39582	BDL	0.342	BDL	BDL	BDL
31	Jaunpur	Badlapur	Pz	Block Office	25.8889	82.4663	BDL	0.289	BDL	BDL	BDL
32	Jaunpur	Buxa	Pz	Daniyama u	25.84707	82.51242	BDL	BDL	BDL	BDL	BDL
33	Jaunpur	Buxa	Pz	Block Office	25.79133	82.56555	BDL	BDL	BDL	BDL	BDL
34	Jaunpur	Buxa	Pz	PuraMohabbat	25.82007	82.50691	BDL	BDL	BDL	BDL	BDL
35	Jaunpur	Buxa	Pz	Tajee Bazar	25.82266	82.44857	BDL	0.523	0.096	BDL	BDL
36	Jaunpur	Sirkoni	Pz	PWD Nirakshan Bhawan	25.72968	82.6874	BDL	0.696	BDL	BDL	BDL
37	Jaunpur	Sirkoni	Pz	Karyalay Jilaadhikari	25.73589	82.69301	BDL	BDL	BDL	BDL	BDL
38	Jaunpur	Sirkoni	Pz	Gopalganj Pr. School	25.72063	82.70027	BDL	BDL	BDL	BDL	BDL
39	Jaunpur	Sirkoni	Pz	Bakrabad Pr. School	25.64749	82.74697	BDL	BDL	BDL	BDL	BDL
40	Jaunpur	Mariyahoo	Pz	Pali	25.7358	82.69295	BDL	BDL	BDL	BDL	BDL
41	Jaunpur	Mariyahoo	Dw	Sheetalganj	25.6578	82.62587	BDL	BDL	BDL	BDL	BDL
42	Jaunpur	Mariyahoo	Dw	B.N.B. Inter College	25.59621	82.59843	BDL	BDL	BDL	BDL	BDL
43	Jaunpur	Mariyahoo	Dw	Samadganj	25.69953	82.59843	BDL	BDL	BDL	BDL	BDL
44	Jaunpur	Ramnagar	Pz	Block Office	25.55619	82.6196	BDL	BDL	BDL	BDL	BDL
45	Jaunpur	Ramnagar	Pz	Budhipur	25.5298	82.63892	BDL	BDL	BDL	BDL	BDL
46	Jaunpur	Ramnagar	Pz	Newaria	25.51531	82.67681	BDL	BDL	BDL	BDL	BDL
47	Jaunpur	Ramnagar	Dw	Gopalapur	25.50926	82.62737	BDL	0.1	BDL	BDL	BDL
48	Jaunpur	Rampur	Pz	Pachwal	23.87224	82.40308	BDL	BDL	BDL	BDL	BDL
49	Jaunpur	Rampur	Dw	Sultanpur Koop	25.4617	82.63577	BDL	BDL	BDL	BDL	BDL
50	Jaunpur	Rampur	Dw	Pachurakhi	25.49657	82.52248	BDL	BDL	BDL	BDL	BDL
51	Jaunpur	Barasathi	Dw	Nigoh	25.54428	82.46958	BDL	BDL	BDL	BDL	BDL
52	Jaunpur	Barasathi	Pz	Vikaskhand	25.56171	82.47956	BDL	BDL	BDL	BDL	BDL
53	Jaunpur	Barasathi	Pz	Bhannaur	25.57654	82.52395	BDL	BDL	BDL	BDL	BDL
54	Jaunpur	Barasathi	Pz	Bashara	25.59316	82.44652	BDL	BDL	BDL	BDL	BDL
55	Jaunpur	Machhlishahar	Pz	Tilora bazar	25.62864	82.3734	BDL	0.135	BDL	BDL	BDL
56	Jaunpur	Machhlishahar	Dw	Thana	25.68661	82.40285	BDL	BDL	BDL	BDL	BDL
57	Jaunpur	Machhlishahar	Dw	Jhasapur	25.68278	82.37535	BDL	BDL	BDL	BDL	BDL
58	Jaunpur	Machhlishahar	Dw	Baserha	25.70174	82.38911	BDL	BDL	BDL	BDL	BDL

59	Jaunpur	Sikarara	Pz	Ramnagar	25.76324	82.50871	BDL	BDL	BDL	BDL	BDL
60	Jaunpur	Sikarara	Dw	Taheerpur	25.72319	82.53709	BDL	BDL	BDL	BDL	BDL
61	Jaunpur	Sikarara	Pz	Bharatpur	25.73286	82.52982	BDL	BDL	BDL	BDL	BDL
62	Jaunpur	Sikarara	Pz	Block Office	25.7418	82.62366	BDL	BDL	BDL	BDL	BDL
63	Jaunpur	Jalalpur	Pz	Block Office	25.60797	82.7002	BDL	BDL	BDL	BDL	BDL
64	Jaunpur	Jalalpur	Dw	Mahrewa	25.59962	82.7002	BDL	BDL	BDL	BDL	BDL
65	Jaunpur	Jalalpur	Pz	Lohgajar	25.59962	82.75411	BDL	BDL	BDL	BDL	BDL
66	Jaunpur	Maharajganj	Pz	Maharajganj	25.59969	82.75415	BDL	BDL	BDL	BDL	BDL
67	Jaunpur	Maharajganj	Pz	Block Office	25.85065	82.39112	BDL	BDL	BDL	BDL	BDL
68	Jaunpur	Maharajganj	Dw	Gaddopur	25.86468	82.36448	BDL	BDL	BDL	BDL	BDL
69	Jaunpur	Maharajganj	Dw	Kolhua	25.82886	82.35939	BDL	BDL	BDL	BDL	BDL
70	Jaunpur	Sujanganj	Pz	Haripur	25.79898	82.32056	BDL	BDL	BDL	BDL	BDL
71	Jaunpur	Sujanganj	Dw	Thaloe	25.72964	82.35491	BDL	BDL	BDL	BDL	BDL
72	Jaunpur	Sujanganj	Dw	Devapur	25.77856	82.26427	BDL	BDL	BDL	BDL	BDL
73	Jaunpur	Sujanganj	Dw	Umarpur	25.74284	82.28111	BDL	BDL	BDL	BDL	BDL
74	Jaunpur	Mungrabadshahpur	Pz	Jaipalpur	25.68653	82.22004	BDL	BDL	BDL	BDL	BDL
75	Jaunpur	Mungrabadshahpur	Dw	Budiakalnara Pandeypur	25.61748	82.14275	BDL	BDL	BDL	BDL	BDL
76	Jaunpur	Mungrabadshahpur	Pz	Block Office	25.6955	82.20645	BDL	BDL	BDL	BDL	BDL
77	Jaunpur	Mungrabadshahpur	Dw	Babhaniyo	25.55666	82.32083	BDL	BDL	BDL	BDL	BDL

Annexure- IV: Block wise water level data, Jaunpur District, Uttar Pradesh.

BLOCK	HYD_NAME	LONG	LAT	PRM_21	PTM_21
BADALAPUR	GHANSHAYAM PUR	82° 31' 38.000" E	25° 56' 25.000" N	17.05	15.40
BADALAPUR	SIGRAMAU	82° 23' 37.000" E	25° 56' 39.000" N	3.72	1.60
BADALAPUR	Tiyara	82° 27' 00.000" E	25° 59' 20.000" N	17.95	12.95
BADALAPUR	GAHARA BORING PATTI DAYALPUR	82° 28' 16.000" E	25° 52' 04.000" N	6.90	5.40
BADALAPUR	HIMMATPUR	82° 30' 23.000" E	25° 52' 36.000" N	13.45	12.73
BADALAPUR	MACHHALI GANW	82° 31' 31.000" E	25° 24' 00.000" N	14.70	15.33
BARASATHI	BARASATHI	82° 30' 30.000" E	25° 31' 30.000" N	1.77	0.37
BARASATHI	BASHARA	82° 26' 43.000" E	25° 35' 30.000" N	7.52	2.30
BARASATHI	BASHARA	82° 27' 30.000" E	25° 36' 30.000" N	6.60	0.10
BARASATHI	BHANNAUR	82° 31' 35.000" E	25° 34' 30.000" N	6.70	2.50
BARASATHI	NIGOH	82° 27' 8.223" E	25° 30' 0.685" N	8.30	5.05
BUXA	BUXA	82° 35' 5.352" E	25° 47' 16.730" N	18.50	14.40
BUXA	DANIYAMAU	82° 31' 30.000" E	25° 50' 0.000" N	9.53	7.60
BUXA	Gajadharganj	82° 33' 13.000" E	25° 48' 37.000" N	15.30	13.25
BUXA	Paranpatti	82° 34' 0.000" E	25° 51' 0.000" N	10.55	9.05
BUXA	RASIKIAPUR	82° 24' 40.000" E	25° 50' 07.000" N	3.68	1.55
BUXA	BANGAWA	82° 27' 28.000" E	25° 50' 37.000" N	13.12	5.80
BUXA	MAKADUMPUR	82° 29' 58.000" E	25° 49' 39.000" N	11.15	7.35
DHARAMAPUR	BITHAR	82° 46' 20.000" E	25° 46' 12.000" N	5.15	1.95
DHARAMAPUR	DHARAMPUR	82° 45' 37.383" E	25° 43' 34.050" N	13.66	11.81
DHARAMAPUR	EKAUNA PIE	82° 47' 20.000" E	25° 44' 20.000" N	8.75	4.35
DHARAMAPUR	Mohiuddinpur	82° 44' 48.000" E	25° 45' 11.000" N	12.93	7.95
DHARAMAPUR	Pindra	82° 45' 57.000" E	25° 42' 48.000" N	15.22	13.98
DHARAMAPUR	KADIPUR	82° 43' 28.000" E	25° 43' 10.000" N	19.39	13.90
DHARAMAPUR	PILIKHANI	82° 49' 52.000" E	25° 45' 03.000" N	3.39	1.03
DOBHI	Anekpur	83° 0' 0.000" E	25° 37' 0.000" N	9.76	7.82
DOBHI	Laberuaon	83° 0' 0.000" E	25° 38' 0.000" N	8.69	7.21

JALALPUR	Chauri	82° 46' 5.632" E	25° 36' 16.067" N	11.80	6.6
JALALPUR	JALALPUR-1	82° 45' 40.000" E	25° 36' 25.000" N	14.26	9.9
JALALPUR	Lohgajar	82° 46' 0.000" E	25° 36' 0.000" N	10.85	5.8
JALALPUR	MAHREWA	82° 42' 20.000" E	25° 36' 25.000" N	3.30	2.15
JALALPUR	RAHATI	82° 46' 37.000" E	25° 35' 7.000" N	8.52	2.4
KARANJAKALAN	KARANJAKALAN	82° 41' 22.000" E	25° 48' 18.000" N	8.95	4.5
KARANJAKALAN	BLOCK (GAHARI BORING)	82° 41' 22.000" E	25° 48' 18.000" N	5.62	4.39
KARANJAKALAN	ADAMPUR	82° 36' 15.000" E	25° 52' 15.000" N	8.33	5.8
KARANJAKALAN	KHOBARIYA	82° 44' 52.000" E	25° 50' 05.000" N	8.20	1.4
KARANJAKALAN	HARKHAMPUR	82° 37' 40.000" E	25° 48' 40.000" N	15.28	15.47
KERAKAT	KHARSENPUR	82° 52' 58.000" E	25° 35' 50.000" N	3.35	2.3
KERAKAT	KHEPATPUR	82° 56' 24.667" E	25° 37' 43.609" N	14.89	12.67
KERAKAT	SULTANPUR	82° 56' 47.000" E	25° 41' 58.000" N	5.00	1.03
KERAKAT	KHARGSENPUR	82° 52' 53.000" E	25° 35' 48.000" N	7.32	2.55
KERAKAT	BEHADHA	82° 56' 07.000" E	25° 35' 53.000" N	14.07	10.4
KERAKAT	Mahadewa 1	82° 54' 55.231" E	25° 36' 57.205" N	15.76	13.9
KERAKAT	Mahadewa GAHARI BORING 2	82° 54' 60.231" E	25° 36' 57.205" N	17.55	15.62
KHUTHAN	CHAKSOITHA	82° 36' 9.000" E	26° 0' 45.000" N	0.75	0.35
KHUTHAN	KHUTHAN P	82° 32' 50.702" E	25° 59' 13.638" N	7.25	4.95
KHUTHAN	NADAULI	82° 36' 0.000" E	25° 59' 0.000" N	1.55	0.5
KHUTHAN	PATTI NARENDRAPUR	82° 32' 0.000" E	26° 2' 0.000" N	8.75	6.25
KHUTHAN	Budhanpur	82° 37' 30.000" E	25° 58' 00.000" N	1.00	0.25
MACHHALI SHAHAR	BSEKHA	82° 23' 30.000" E	25° 42' 7.000" N	2.52	0.95
MACHHALI SHAHAR	JHASAPUR	82° 22' 28.000" E	25° 41' 0.000" N	2.75	1.35
MACHHALI SHAHAR	MACHHALI SHAHAR	82° 24' 23.000" E	25° 41' 10.000" N	1.85	0.65
MACHHALI SHAHAR	Tilora Bazar	82° 22' 23.000" E	25° 37' 43.000" N	8.96	4.82
MAHRAJGANJ	Bhatpura	82° 21' 55.000" E	25° 49' 53.000" N	2.07	1.45
MAHRAJGANJ	GADDOPUR	82° 21' 49.000" E	25° 51' 51.000" N	3.15	1.75
MAHRAJGANJ	KOLHUA	82° 21' 33.000" E	25° 49' 45.000" N	2.90	1.65
MAHRAJGANJ	MASTHARI	82° 22' 33.000" E	25° 50' 1.000" N	1.68	0.75

MAHRAJGANJ	PURAGAMBHIRSHAH	82° 25' 12.000" E	25° 52' 11.000" N	1.41	0.39
MAHRAJGANJ	NAHARPUR	82° 23' 00.000" E	25° 51' 30.000" N	1.90	1.1
MAHRAJGANJ	AHIRAOULI	82° 25' 12.000" E	25° 52' 11.000" N	1.94	0.95
MAHRAJGANJ	BHAGWANPUR	82° 14' 40.000" E	25° 49' 25.000" N	14.05	11.35
MAHRAJGANJ	VIKASH KHAND GAHARA BORING	82° 23' 27.000" E	25° 51' 02.000" N	5.14	0.55
MARIYAHOO	B.N.B. Inter college	82° 36' 0.000" E	25° 37' 0.000" N	4.57	1.36
MARIYAHOO	BABAGANJ	82° 37' 55.434" E	25° 40' 15.282" N	8.40	7
MARIYAHOO	JOGAPUR -	82° 36' 38.000" E	25° 37' 9.000" N	3.45	0.75
MARIYAHOO	MARIYAHOO	82° 36' 27.000" E	25° 36' 43.000" N	4.78	1.25
MARIYAHOO	MARIYAHOO block	82° 36' 52.000" E	25° 38' 20.000" N	10.12	8.53
MARIYAHOO	Mehandi Ganj	82° 35' 0.000" E	25° 40' 0.000" N	8.93	5.65
MOGRABADSHAHPUR	AHAMADPUR	82° 12' 48.000" E	25° 40' 28.000" N	11.15	6.65
MOGRABADSHAHPUR	BABHANIYO	82° 19' 15.000" E	25° 33' 24.000" N	3.55	2.2
MOGRABADSHAHPUR	Jaipalpur	82° 13' 13.000" E	25° 41' 13.000" N	10.75	7.9
MOGRABADSHAHPUR	Mongrabadshahpur block	82° 13' 30.000" E	25° 38' 0.000" N	6.57	3.45
MOGRABADSHAHPUR	Mongrabadshahpur health	82° 13' 50.000" E	25° 38' 50.000" N	8.80	2.39
MOGRABADSHAHPUR	PANWARAN	82° 17' 6.000" E	25° 40' 0.000" N	8.10	3.03
MOGRABADSHAHPUR	PURAUPUR	82° 10' 1.000" E	25° 38' 13.000" N	6.70	1.55
MUFTIGANJ	MUFTIGANJ	82° 50' 48.717" E	25° 42' 59.774" N	6.02	4.87
RAMNAGAR	Budhipur	82° 41' 0.000" E	25° 33' 0.000" N	12.57	8.3
RAMNAGAR	CHORARE	82° 38' 46.143" E	25° 34' 31.619" N	5.68	2.75
RAMNAGAR	JOGAPUR	82° 35' 4.000" E	25° 32' 16.000" N	8.40	4.3
RAMNAGAR	Newaria	82° 42' 0.000" E	25° 32' 0.000" N	11.08	9.72
RAMNAGAR	RAMNAGAR	82° 43' 30.000" E	25° 33' 12.000" N	11.57	8.35
RAMNAGAR	SHIVPUR	82° 35' 58" E	25° 39' 53" N	5.20	3.15
RAMPUR	Nonari	82° 40' 0.000" E	25° 27' 0.000" N	12.82	8.6
RAMPUR	PCHRUKHI	82° 31' 44.128" E	25° 29' 28.155" N	3.55	1
RAMPUR	Pachwal	82° 35' 0.000" E	25° 28' 0.000" N	6.36	4.55
RAMPUR	RAMPUR	82° 34' 28.000" E	25° 28' 31.000" N	8.45	5.4
RAMPUR	RAMPUR	82° 33' 30.000" E	25° 29' 10.000" N	3.83	0.83

RAMPUR	Thathar	82° 42' 0.000" E	25° 27' 0.000" N	15.70	10.75
SHAHGANJ	SHAHGANJ TAHASIL	82° 40' 36.000" E	26° 3' 27.000" N	1.45	0.3
SHAHGANJ	Shahganj block	82° 40' 0.000" E	25° 57' 0.000" N	1.55	0.55
SIKARARA	Bharatpur	82° 31' 48.000" E	25° 44' 0.000" N	7.75	6.8
SIKARARA	Jam	82° 35' 0.000" E	25° 44' 0.000" N	18.38	15.03
SIKARARA	Lakhawa	82° 31' 0.000" E	25° 45' 0.000" N	12.96	12
SIKARARA	Mukundipur	82° 28' 32.000" E	25° 46' 13.000" N	9.50	6.9
SIKARARA	Ramnagar	82° 30' 32.000" E	25° 45' 48.000" N	16.75	13.2
SIKARARA	TAHEERPUR	82° 32' 35.000" E	25° 43' 40.000" N	6.30	2.43
SUITHA KALAN	PIPRAUWAL	82° 29' 32.085" E	26° 6' 17.358" N	2.35	1.05
SUITHA KALAN	SUITHA KALAN	82° 32' 20.000" E	26° 05' 22.000" N	1.15	0.35
SUJANGANJ	DEVAPUR	82° 15' 0.000" E	25° 46' 0.000" N	7.65	5.75
SUJANGANJ	HARIPUR Mishran	82° 20' 0.000" E	25° 47' 30.000" N	7.68	4.42
SUJANGANJ	THALOOE	82° 21' 18.000" E	25° 43' 47.000" N	1.58	0.35
SUJANGANJ	UMARPUR	82° 17' 6.740" E	25° 44' 13.631" N	1.90	0.50
SIRKONI	Bakrabad	82° 46' 0.000" E	25° 38' 0.000" N	17.83	16.70
SIRKONI	Bansgopalpur	82° 41' 58.287" E	25° 41' 46.455" N	21.40	19.45
SIRKONI	Haidarganj Bhandari	82° 46' 14.380" E	25° 40' 23.140" N	11.71	10.15
SIRKONI	Husainabadward-8 power Ho	82° 44' 25.000" E	25° 39' 23.000" N	19.70	17.47
SIRKONI	Ishapur ward-10	82° 41' 38.000" E	25° 45' 49.000" N	16.71	17.33
SIRKONI	Makadoompur Zafrabad ward-2	82° 46' 0.000" E	25° 39' 30.000" N	12.65	9.70
SIRKONI	Mandi naseeb khan ward- 19	82° 42' 22.659" E	25° 41' 19.389" N	18.63	18.65
SIRKONI	Nehru nagar	82° 46' 40.000" E	25° 40' 43.000" N	4.45	2.48
SIRKONI	Ramnagar ward -3	82° 44' 24.000" E	25° 39' 19.000" N	23.65	21.05
SIRKONI	GGIC Zafrabad ward-3	82° 41' 40.202" E	25° 41' 8.421" N	12.24	9.00
SIRKONI	Zila Prashikshan sansthan Mirmast pur	82° 42' 57.904" E	25° 41' 3.955" N	15.57	14.45
SIRKONI	Primary school Zafrabad ward-3	82° 42' 57.904" E	25° 41' 3.955" N	12.35	8.57