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

LATUR DISTRICT
MAHARASHTRA

मध्यक्षेत्र, नागपुर

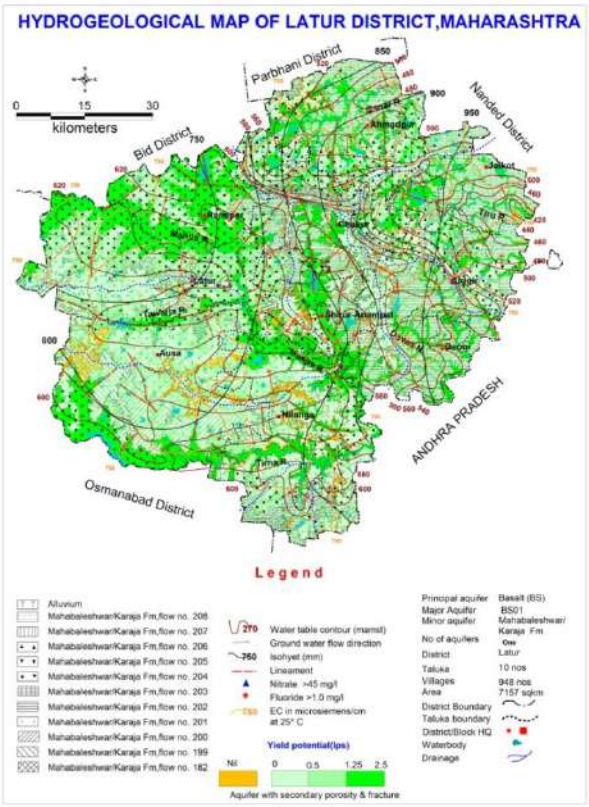
Central Region, Nagpur

दिसम्बर 2019 /DECEMBER 2019

भारतसरकार
Government of India
जलसंसाधन, नदीविकासएवंगंगासंरक्षणमंत्रालय
Ministry of Water Resources, River Development &

जल बचत जल संचय

जिला लातूर, महाराष्ट्र ,के जलभृत नक्शे एवं भूजल प्रबंधन योजना
Aquifer Maps and Ground Water Management Plan of Latur District, Maharashtra



LATUR DISTRICT, MAHARASHTRA

जिला लातुर महाराष्ट्र

मध्यक्षेत्र, नागपुर / Central Region, Nagpur
December 2019

AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, LATUR DISTRICT, MAHARASHTRA.

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LATUR DISTRICT AT A GLANCE

1. SALIENT INFORMATION	
District Name	Latur
Geographical Area (Sq. Km.)	7156.91
Hilly Area (Sq. Km)	521.43
Saline Area (Sq. Km.)	-
Command Area (Sq. Km.)	449.24
Non Command Area (Sq. Km.)	6186.24
Administrative Divisions (as on 31/03/2012)	10 Blocks Ahmedpur, ShirurAnantapal, Ausa, Chakur, Deoni Jalkot, Latur, Nilanga, Renapur, Udgir
Parliamentary Constituencies	Ahmedpur, Ausa, Latur city, Latur Rural, Nilanga&Udgir
Towns / Villages	7 / 928
Population (Census 2011)	2454196
Climate	Tropical Climate
1.1. RAINFALL ANALYSIS	
Normal Rainfall	865.2 mm
Annual Rainfall (2017)	795.61 mm
Decadal Average Annual Rainfall (2008-17)	762.87 mm
Long Term Rainfall Analysis (1901-2015)	Falling Trend: 10.865 mm/year. Probability of Normal/Excess Rainfall-70% &15%. Probability of Drought (Moderate/Severe / Acute)-: 15% Moderate.
1.2. GEOMORPHOLOGY, SOIL & DRAINAGE	
Geomorphic Units	➢ Region of middle level Plateau on Deccasn Traps between 550 to 900 m elevation ➢ Region of low level plateau on Deccan Traps between 350 to 550 m elevation ➢ Denudational Slope on Deccan Traps ➢ Flood Plain (including In-Filled River Bed) ➢ Older Flood Plain
Soil	➢ Shallow Soils (0”-9”): Light brown to dark grey brown in color, loamy to clay-loam in texture with granular to sub-granular, blocky in structure with 1 to 3 percent slope ➢ Medium Deep Soils (18” -36”): The soils are clay-loam to clayey in texture, granular to sub-granular blocky in structure and the lower zone ofthe profile show angular blocky to massive also ➢ Deep Soils (36”): The soils are clayey in texture and sub-angular blocky to blocky in structure.
Drainage	River Manjra and its tributaries, the Terna, the

		Tawarja and the Gharni, the Manar, the Tiru and the Lendi belonging to Godavari drainage system.	
1.3. GEOLOGY			
Geology		Recent River bed Alluvium,Laterite and Basaltic lava flows of Deccan traps belonging to Late Cretaceous to Paleogene (68-62 million years in age) occupy the entire area of the districtwith a few inter-trappean beds	
1.4.LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN(Reference Year 2015-16)			
Geographical Area		7156.91sq. km	
Forest Area		18 Sq. Km.	
Cultivable Area		6495 Sq. Km.	
Net Sown Area		5389 Sq. Km.	
Double Cropped Area		1829 Sq. Km.	
Area under Irrigation	Surface Water	226.02 Sq K	
	Ground Water	419.76 Sq Km	
Principal Crops		**Crop Type**	**Area (Sq. Km.)**
		Cotton	3.18
		Pulses	285.94
		Cereals	88.92
		Oil Seeds	-
Horticultural Crops		Sugarcane	362.95
		Others	38.34
1.5.GROUND WATER ABSTRACTION STRUCTURES (Reference Year: 2006-07)			
Dug Wells		38253	
Bore Wells/Tube Wells		15531	
1.6.GROUND WATER MONITORING WELLS (As on 31/03/2018)			
Dug Wells		38	
Piezometers		06	
1.7. GROUND WATER EXPLORATION (As on 31/03/2018)			
Wells Drilled		EW-74, OW-14, PZ-14	
Depth Range		29.00 to 203.00 m bgl	
Discharge		Traces to 12.18 lps	
Transmissivity		6.15 to 83.53 m^2/day	
Storativity		8.68 x 10^{-3} to 4.7 x 10^{-4}	
2.0. WATER LEVEL BEHAVIOUR			
Premonsoon Depth to Water Level (May-2017) of unconfined Aquifer		2.1 to 28 mbgl	
Postmonsoon Depth to Water Level (Nov.-2017) unconfined Aquifer		0.2 to 18 mbgl	
Premonsoon Depth to Water Level (May-2017) of Semiconfined/Confined Aquifer		9 to 130 mbgl	
Postmonsoon Depth to Water Level (Nov.-2017) Semiconfined/Confined Aquifer		1.48 to 54 mbgl	
Premonsoon Water Level Trend		Rising trend @ 0.0 to 0.399 m/year	

(2008-2017)	Falling trend @0 to 0.7138 m/year /year
Postmonsoon Water Level Trend (2008-2017)	Rising trend @0.0 to 0.58 m/year Falling trend @ 0.0 to 0.79 m/year
2.1.GROUND WATER QUALITY	
Ground Water is suitable for Drinking and Irrigation Purposes except in area where EC> 2250 µS/cm and areas of Fluoride and Nitrate Contamination	
Type of Water	Ca-HCO_3 in majority of samples
2.2.GROUND WATER RESOURCES AVAILABILITY (2013)	
Net Annual Ground Water Availability (MCM)	679.82
Existing Gross Ground Water Draft for All uses (MCM)	533.61
Provision for domestic and industrial requirement supply to 2025(MCM)	40.85
Stage of Ground Water Development %	78.49 %
Category	**SAFE**
Over Exploited Blocks	None
Semi-Critical Blocks	1 - Latur
Notified Blocks	None
2.3.GROUND WATER ISSUES	

- Overexploitation of Ground Water for irrigation purposes despite the decrease in net ground water availability and declining rainfall trend with the frequency of occurance of drought being 1 in 7 years and increase in Stage of Ground Water Development.
- Declining Water Level trend during both Premonsoon and Postmonsoon for the period 2008 to 2017 due to ground water based Sugarcane Cultivation as well as Rabi crops
- Low Yielding Aquifers in major parts of the district with yield mostly ranging between 1 to 1.5 lps.
- Fluoride and Nitrate contamination in unconfined as well Semiconfined Aquifers.

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AQUIFER MAPPING AND MANAGEMENT PLAN OF LATUR DISTRICT, MAHARASHTRA

1.0 INTRODUCTION

In XII five year Plan, National Aquifer Mapping (NAQUIM) had been taken up by CGWB to carry out detailed hydrogeological investigation on topo-sheet scale of 1:50,000. The NAQUIM has been prioritized to study Over-exploited, Critical and Semi-Critical blocks as well as the other stress areas recommended by the State Govt.

The vagaries of rainfall, inherent heterogeneity & unsustainable nature of hard rock aquifers, over exploitation of once copious alluvial aquifers, lack of regulation mechanism has a detrimental effect on ground water scenario of the Country in last decade or so. Varied and diverse hydrogeological settings demand precise and comprehensive mapping of aquifers down to the optimum possible depth at appropriate scale to arrive at the robust and implementable ground water management plans.

Aquifer mapping is a process wherein a combination of geologic, geophysical, hydrologic and chemical analyses is applied to characterize the quantity, quality and sustainability of ground water in aquifers. The proposed management plans will provide the **"Road Map"** for ensuring sustainable management and equitable distribution of ground water resources, thereby primarily improving drinking water security and irrigation coverage. Thus the crux of NAQUIM is not merely mapping, but reaching the goal-that of ground water management through community participation. The aquifer maps and management plans will be shared with the Administration of Amravati for its effective implementation.

The activities under NAQUIM are aimed at:

- identifying the aquifer geometry,
- aquifer characteristics and their yield potential
- quality of water occurring at various depths,
- aquifer wise assessment of ground water resources
- preparation of aquifer maps and
- Formulate ground water management plan.

1.1ABOUT THE AREA

Latur District is one of the eight districts of Marathwada region of Maharashtra State. It is situated in the south-eastern part of the State abutting Karnataka and lies between north latitudes 17°52' and 18°50' and east longitudes 76°12' and 77°18'. The total area of the district is 7156.91 Sq. km. of which only 6635.48Sq Km area is mappable and falls in Survey of India degree sheets 56/B, 56/C and 56/F. The district is bounded onthe0northand north-east by Parbhani and Nanded districts, east and south-east by

Karnatakastate,south-west by Osmanabad district and northwest by Beed district. For administrative purposes, the district is divided into two sub-divisions and 10 blocks. Latur subdivision includes Latur and Ausa tehsils and Udgir subdivision includes Udgir, Ahmadpur, Nilanga, Chakur, Renapur, Deoni, Jalkot and ShirurAnantpal tehsils **(Figure 1.1).**The talukas are further divided into 7 towns, 948 villages and 787 Gram Panchayats. The index map of the district is given in Fig 1.2.

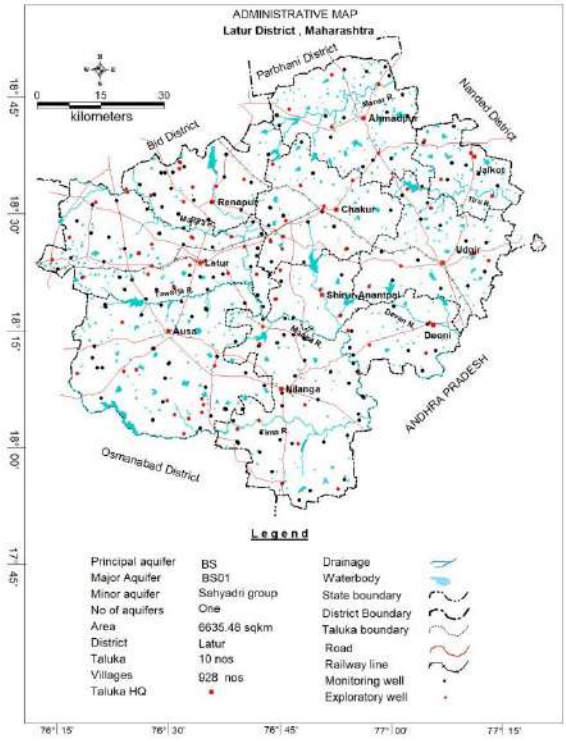


Figure1.1: Administrative Map

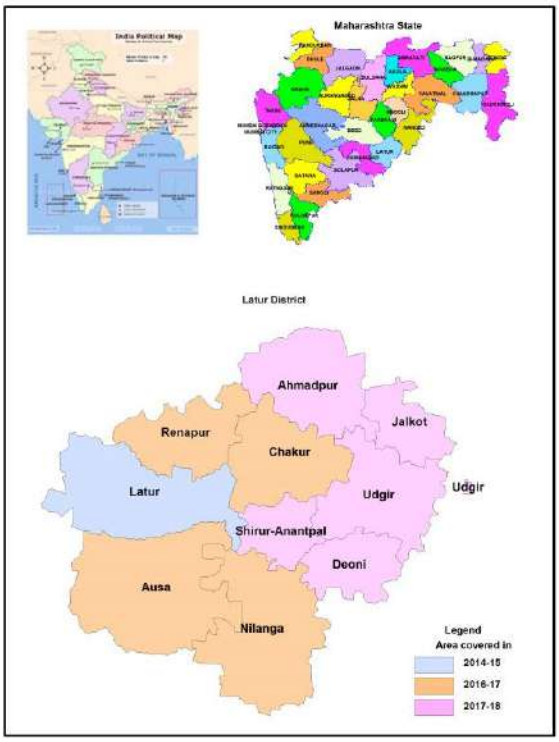


Figure 1. 2: Index Map

Based on the tehsil and district-wise statistics of population as per 2011 census, it has been estimated that the total population of the district is 24, 54,196 out of which 75% is urban population and 25% is rural population with 12, 73,140males and 11, 81,056 females. The average density of population in the district is 343 persons per sq. Km.

The National Aquifer Mapping & Management Programme (NAQUIM) has been taken up in all the blocks of the district in two phases ofXII five Year Plan and in one phase of XIII five Year Plan.

I. LaturBlocks (970.71 Sq Km) in AAP 2014-15.
II. Ausa, Chakur, Nilanga and Renapur Blocks (3505.68Sq Km) in AAP 2016-17.
III. Ahmedpur, Deoni, ShirurAnantpal, Udgir and Jalkot Blocks (2680.52Sq Km) in AAP 2017-18

Based on data gap analysis additional 25 exploration wells were drilled and 139 Key observation wells were inventoried during 2015-16in auasa, Chakur, Nilanga, Renapur and Latur talukas and 50 KOWs were inventoried in 2017-18 in Ahmedpur, Deoni,

ShirurAnantapal, Udgir and Jalkot blocks respectively.to decipher the water level scenario, sub-surface lithological disposition and hydrogeological setup of shallow aquifer and deep aquifers.

1.2 GEOMORPHOLOGY, DRAINAGE, SOIL TYPES, LAND USE

1.2.1 GEOMORPHOLOGY

Physiographically, the district occupies a triangular upland in the southeastern part of the main Maharashtra plateau, known as Balaghat plateau. The northern bounding scarp of the Balaghat plateau running generally eastwards across the middle of Beed district enters Osmanabad district near Degaon. It again runs southwards to the east of Chakur and then south-eastwards and after passing by Udgir continues the south-easterly course and passes out of the district. The Balaghat Plateau is made of residual interfluves and the valleys of streams dissecting the plateau. In this region are included Latur, Ausa, Nilanga, Renapur, Shirur- Anantphal, Deoni and south-western parts of chakur and Udgir tehsil. It is surrounded by undulating low land and has distinct slopes towards south and east. The maximum elevation is 732 m above mean sea level near Nagnath, northeast of Latur and lowest elevation is 493 m above m.s.l, north of Ahmedpur. The northeast region comprises ofAhmadpur andJalkottalukasand north-eastern parts of UdgirandChakurtehsilsin the Manar, Teru and Lendi drainage areas. The geomorphological map of Latur district is depicted in Fig 1.3.

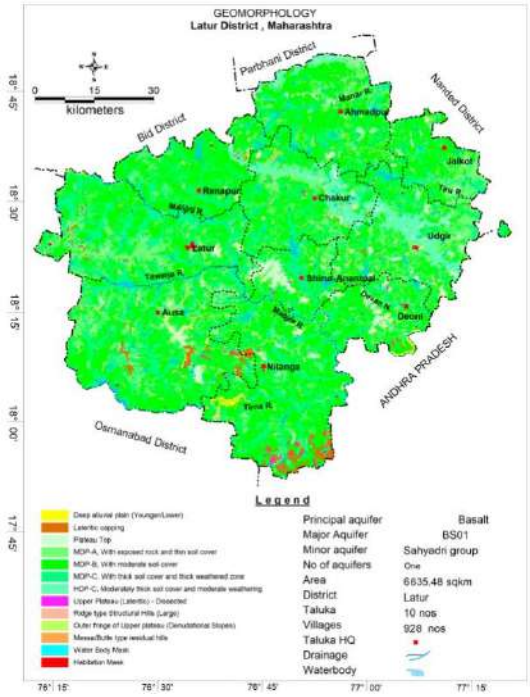


Figure 1.3: Geomorphology of Latur District

1.2.2 DRAINAGE

The district is drained by the river Manjra and its tributaries belonging to Godavari drainage system. The Manjra itself along with its tributaries, the Terna, the Tawarja and the Gharni drains the Balaghat plateau portion, while it's three other tributaries, the Manar, the Tiru and the Lendi drain the area to the north of the plateau as depicted in Fig 1.4. The Manjra River rises above Gaurwadi near the northern edge of the Balaghat Plateau in Beed District, drains the northern and central parts of the district and flows in southeasterly direction. The River Gharni, of about 40 km long forms one of the major left bank tributary of Manjra draining the Balaghat plateau. The chief right bank tributaries of Manjra areTawarja and Terna. The Tawarjariver, about 50 km long, rises near Murud Railway station and has a general easterly course till it joins the Manjra near Seoni village. The Terna River, over 150 Km in length from the source to its confluence with Manjra, has the longest course of all rivers lying entirely within the district. The Manar, northern-most River of the district, flows in an easterly or south-easterly direction in the district. The Tiru River rises on the eastern edge of the plateau near Chakur and has a course of about 56 Km within the district flowing generally eastwards to join the Lendi at Kherka in Nanded district. The Lendi River rises similarly on the edge of the plateau near Udgir further east and has a small course within the district. The rivers show dendritic and rectangular drainage pattern.

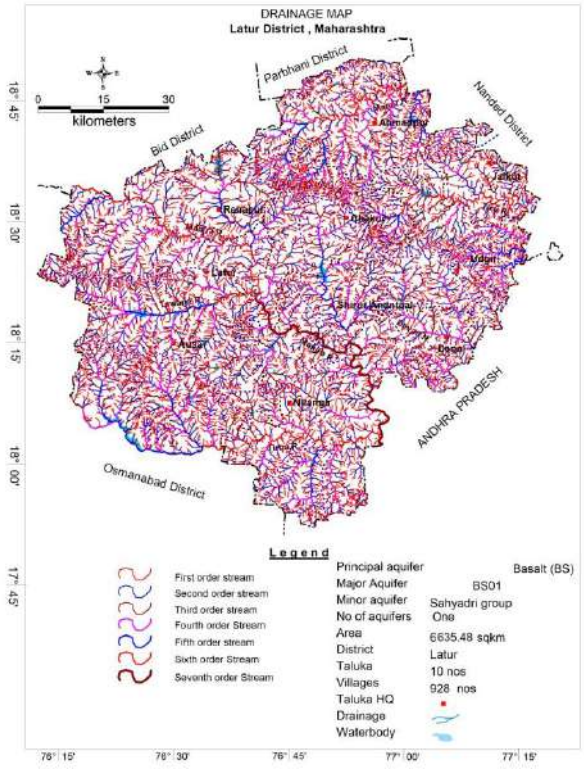


Figure 1.4: Drainage, Latur District

1.2.3 SOIL TYPES

The district can be divided into different soil types based on the characteristics of soil as shown in Figure 1.5 and and the basic physico-chemical property of the profile is:

(1) Shallow Soils (0”-9”): These soils mostly occur in the north-eastern part of the district in AhmedpurandUdgirtalukasand in parts of Latur, Shirur and Ausa talukas. The soil is light brown to dark grey brown in color, loamy to clay-loam in texture with granular to sub-granular, blocky in structure with 1 to 3 percent slope. However, some patches of medium soils are also seen as a result of deposition. High sheet erosion is observed resulting in the exposure of rocks and disintegrated murum at places.

(2) Medium Deep Soils (18” -36”): These type of soils are scattered and found in northern and north-western areas and central zone of the district in Latur, Ausa, Renapur and Chakur talukas. The soils are clay-loam to clayey in texture, granular to sub-granular blocky in structure and the lower zone ofthe profile show angular blocky to massive also.They are dark brown to dark gray brown in colour, and are alkaline in reaction and have a fair amount of phosphate but need the application of nitrogen and organic matter for better yields.

(3) Deep Soils (36”): These zones occur in the south-central and in the river valleys of Terna and Manjra. However, local deep soils are also seen in south-west, north-central and in some other local patches also. The soils are clayey in texture and sub-angular blocky to blocky in structure. The lower zones of the profile show compact to massive structure and the color varies from dark grey brown to very dark grey. They are alkaline in reaction and the total soluble salts are fairly high.Owing to the peculiarity of the soil, both Kharif and Rabi crops are cultivated in this zone.

Soil Infiltration test: To estimate the actual rate of infiltration in various soil types and their impact on recharge to ground water, 5 soilinfiltration tests were conducted on various soil types and the data has been analyzed and the salient features of the soil infiltration tests are presented in **Table 1.1.** The duration of the test ranged from 150 to 200 minutes and the final infiltration rate in the area ranged from 2.4 to 5.4 cm/hr.

TABLE 1.1: Salient Features of Infiltration Tests

Results of Infiltration Tests, LATUR DISTRICT							
S.No	**Village / Location**	**Taluka**	**District**	**Latitude (Deg Min Sec)**	**Longitude (Deg Dec)**	**Test Duration (min)**	**Final Infiltration Rate (cm/hr)**
1	**Deoni**	Deoni	Latur	18° 15' 25"	77° 04’ 46”	200	2.4
2	**ShirurAnantpal**	ShirurAnantpal	Latur	18° 20' 04"	76° 49' 57"	160	5.4
3	**Tondchir**	Udgir	Latur	18° 20' 54"	77° 10' 23"	200	5.4
4	**Jalkot**	Jalkot	Latur	18° 37' 49"	77° 10’ 41”	150	2.4
5	**Ahmadpur**	Ahmedpur	Latur	18° 42' 57"	76° 56' 51"	150	4.2

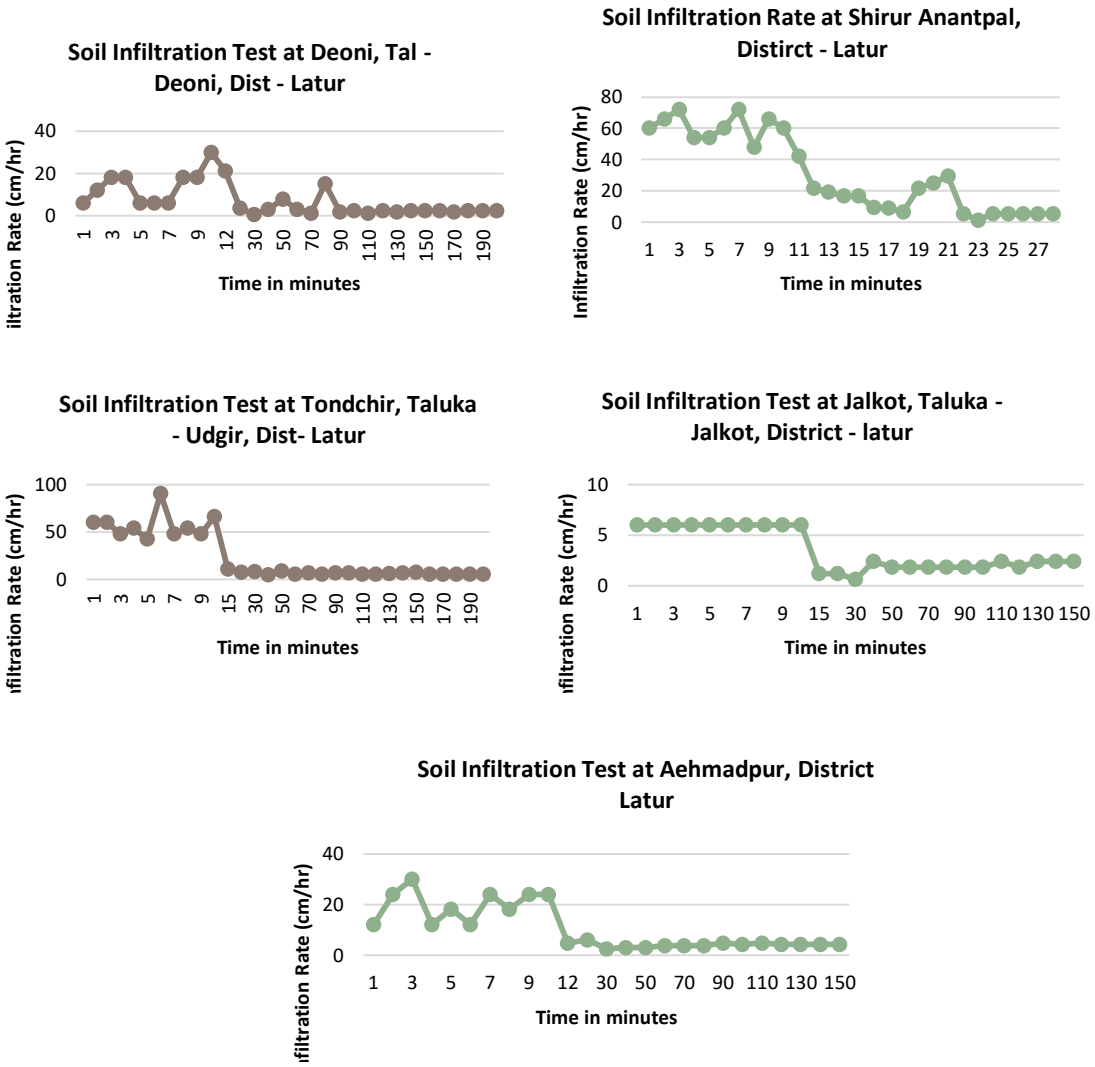


Figure 1.5:Soil Infiltration Tests carried out in diiferent Soil Types of Latur District

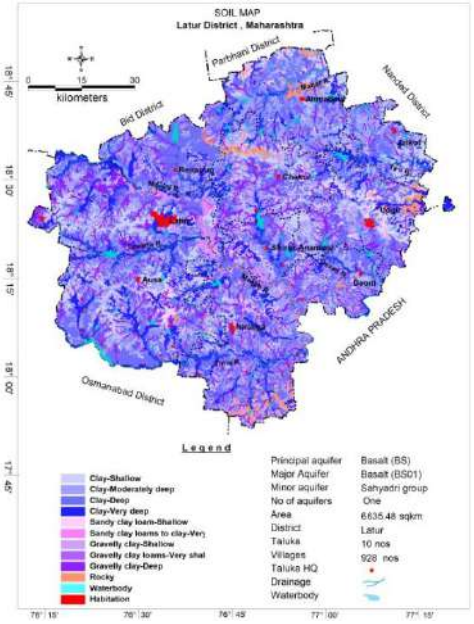


Figure 1.6: Soil Map, Latur District

1.2.4 LAND USE

The total area of the district can be classified into cultivated and uncultivated land. In 2015-16, the total geographical area of the district was 7157 Sq Km area. Out of this, the area under culturable waste land, miscellaneous trees and groves, current fallow, other fallow and net sown area was grouped ascultivable area. It is amounted to 91 percent of the total area of which 25% of cultivable area is sown more than twice.The area under forests, barren land, uncultivable land, permanent pasture and land under non-agricultural use are grouped under area not available for cultivation. The proportion of the gross cropped area in the district is more than the cultivable area. The land use details of the district is given in Table 1.2.

Table 1.2: Land Use Details (Reference Year:2015-16)

District	Forest	Uncultivated Area			Cultivated Area						
		Barren & uncultivated Land	Land under Non-agricultural use	Permanent Pasture	Culturable waste land	Misc. Trees & groves	Current Fallow	Other fallow	Net sown area	Area sown more than once	Gross cropped area
Latur	18	186	243	214	0	207	444	455	5389	1829	7218

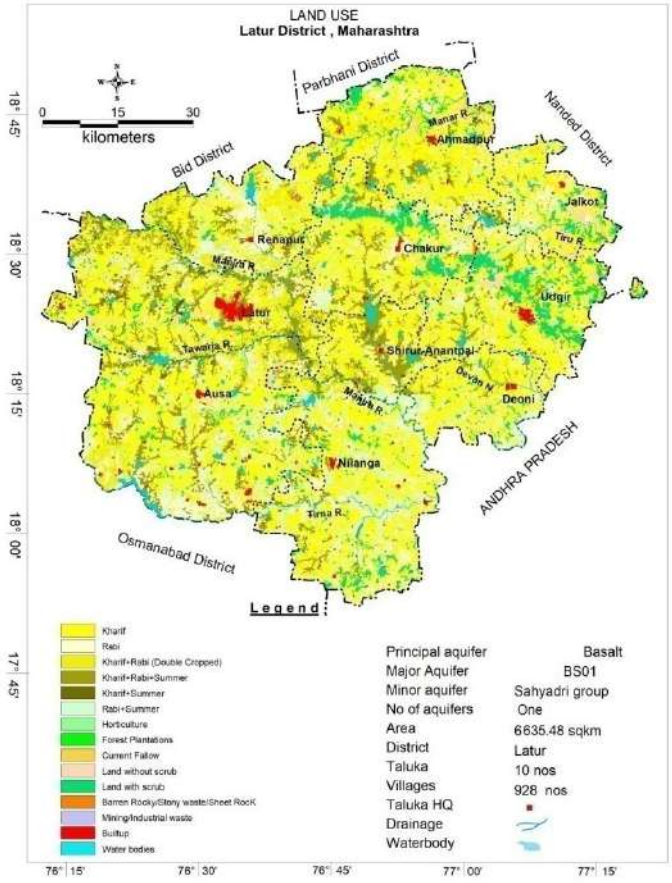


Figure 1.7:Land Use, Latur District

1.2.5 CROPPING PATTERN

The district has more cultivate land under Kharif than in Rabi. The early monsoon crops are called kharif (June-October) and late monsoon crops are called rabi (November to March). The Kharif crops grown in the district comprise jowar, cotton, groundnut, tur and mug while rabi crops include cultivation of wheat, jowar, gram and linseed. Sugarcane on the other hand is a perennial crop and is being increasingly grown in the district. The district is mailnly dependent on ground water for irrigation than surface water and the map showing gross irrigated area by ground water and surface water is depicted in Fig 1.7.

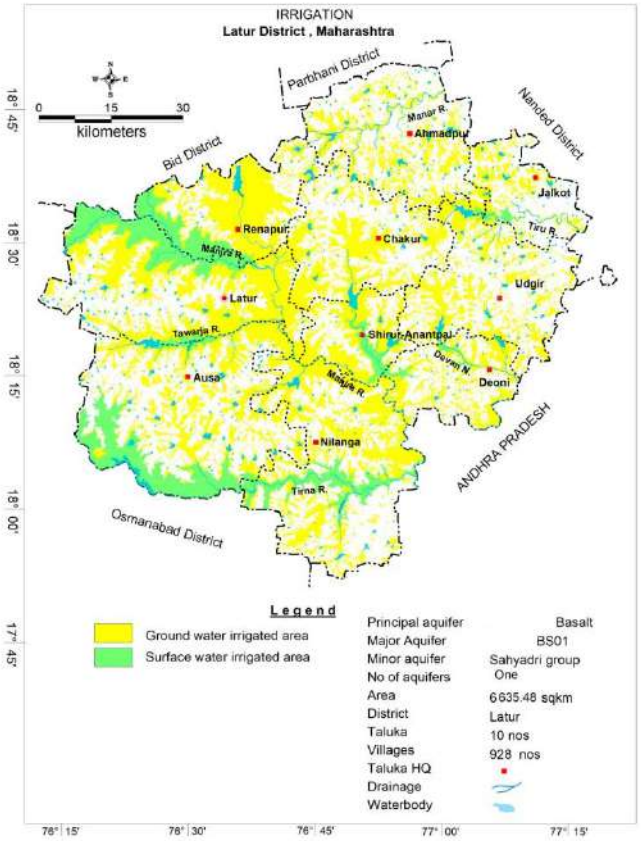


Figure 1.8: Irrigation, Latur District

1.3 CLIMATE & RAINFALL

The district has sub-tropical to tropical wet and dry climate characterized by a very hot summer and very cold winter. The mean minimum temperature during winter is 12.3 °C and the mean maximum temperature during summer is 39.1°C. The district receives south-west monsoon from middle of June to end of September and the temperature varies between 40˚C to 45˚C.

Latur District falls under the rain shadow area of Maharashtra receiving lowest rainfall of the state due to dryness of monsoon reaching the state after passing through the Western Ghats. The current average annual rainfall of the district is 795.61mm whereby the normal rainfall is 865.2 mm.The decadal annual rainfall (2008 to 2017) of the Latur

districtranges from 475 mm to 1161mm with60% normal rainfall, 20% moderate rainfall and 20% excess rainfall and rising trend @ 9.28 mm/year**(Figure 1.8& Table 1.3)**.

The aerial distribution of annual rainfall has been studied by preparing an isohyetal map of the district for 20 year period **(Figure 1.10**). The monthly and annual averages were computed for those stations covering the full period of record and corresponding averages were computed for stations of shorter duration. The isohyetal maps indicate that there is a gradual decline in rainfall from eastern part of the district to western. The long-term rainfall analysis (1998 to 2017) indicates a falling trend @ -10.865 mm/year and standard deviation of 201.3 mm with 45 % of years showing positive departures and 55 % showing negative departures resulting in moderate droughts in 15 % of the years and normal (70%) to excess rainfall (15 %) **(Figure 1.9 & Table 1.4).**

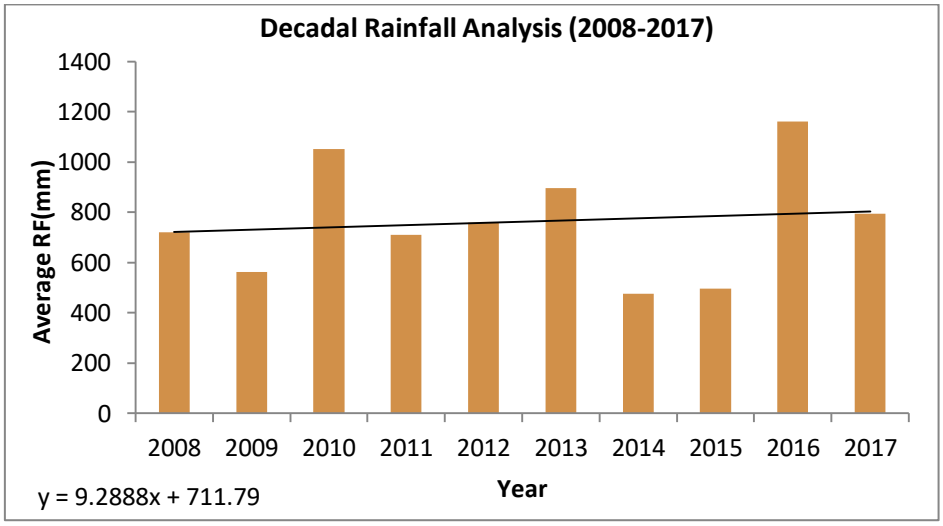


Figure 1.9: Decadal Annual Rainfall Analysis (2008-17) of Latur District.

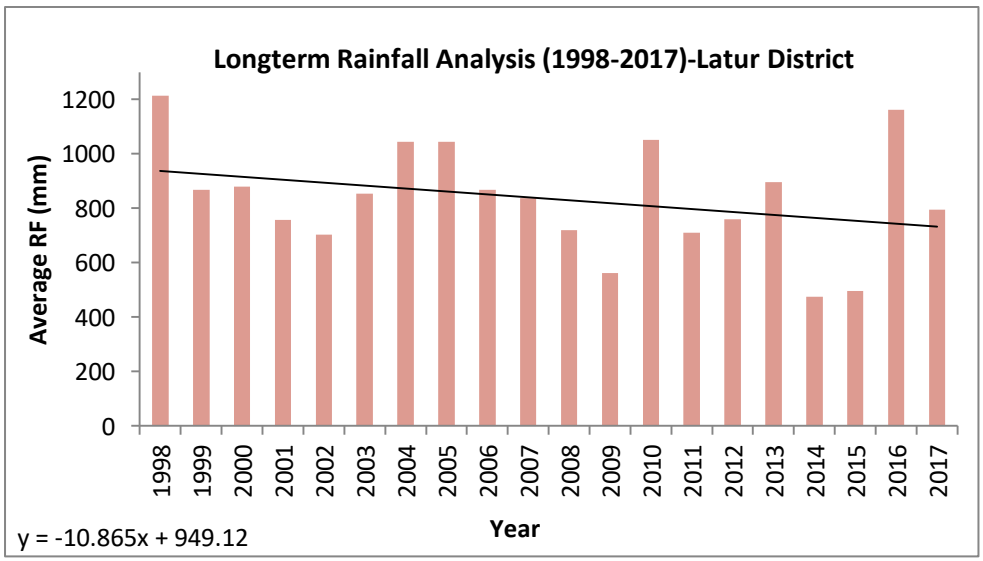


Figure 1.10: Decadal Annual Rainfall Analysis (2008-17) of Latur District.

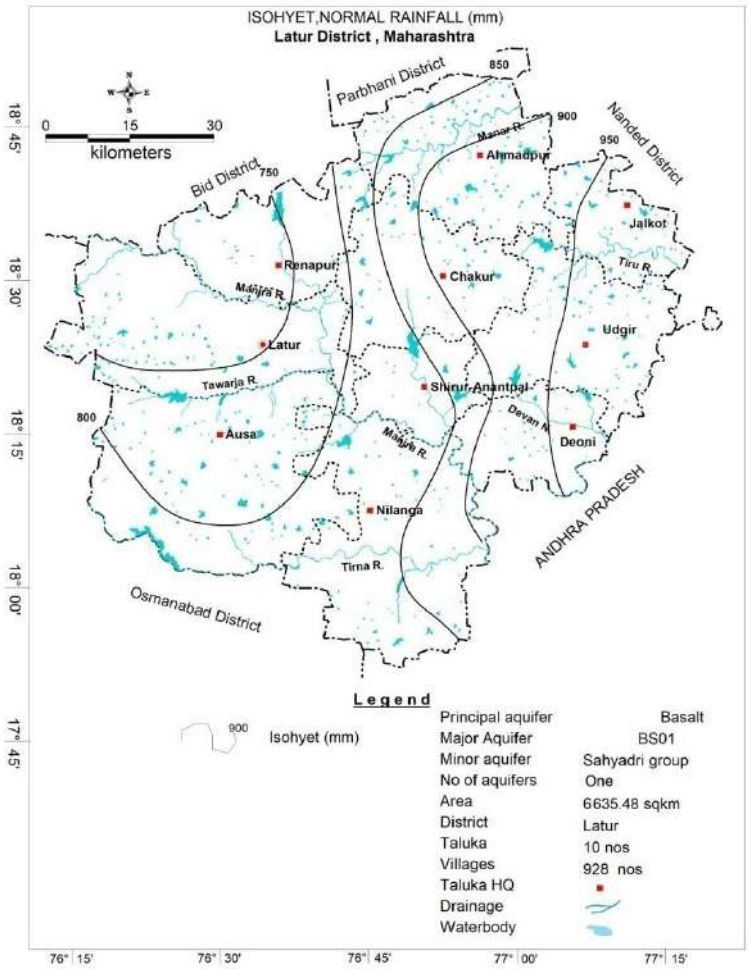


Figure 1.11: Isohyetal Map of the district

Table 1.3: Annual rainfall data (2008-2017) (in mm)

Sl No.	Taluka	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Decadal Avg.
1	Ahmedpur	542.2	466.9	1096.6	679.2	839.3	1000	487.3	399.8	1174.6	799.4	748.53
2	Ausa	711.5	560.9	896.4	541.7	523.9	831.5	398	413.2	1009.6	722.1	660.88
3	Chakur	756.6	541.7	983.7	749.3	819.3	851	556.2	469.3	1320.4	885.8	793.33
4	DEONI	719	463.8	1076	856.2	962.9	976.6	502.6	649.7	1131.2	879.5	821.75
5	Jalkot	753	501	971.3	703	1008	876	431	506.5	1164	766.1	767.99
6	Latur	785.5	720.2	1054.4	726	582.7	758.2	506.2	483.7	1038.6	767.6	742.31
7	Nilanga	644.7	607	1243.2	725	636.2	940.5	524.8	573	1186.2	774.4	785.5
8	Renapur	766.2	571.9	956.9	722.6	860.4	867.5	455.3	577.7	1224.5	952.6	795.56
9	ShirurAnantphal	754.5	658	1028.4	606.2	565.6	874.7	465.7	480	1275.9	771.9	748.09
10	Udgir	769.4	527.8	1209.6	790.1	800.5	983.4	426	415.9	1088.7	636.7	764.81
	Grand Total	**720.26**	**561.92**	**1051.65**	**709.93**	**759.9**	**895.9**	**475.31**	**496.88**	**1161.4**	**795.6**	**762.87**

Table 1.4: Long Term Rainfall Analysis (1998 to 2017) of Latur District

PERIOD = 1998 to 2017				No. of years = 20
YEAR	ANNUAL	NORMAL	DEPARTURE	Normal Rainfall = 865.2 mm
1998	1214	865.2	40.311	Standard Deviation = 201.3mm
1999	868.63	865.2	0.3964	COEFFICIENT OF VARIATION = 24.1%

2000	879.46	865.2	1.6482	MEAN=835		
2001	756.64	865.2	-12.55	MEDIAN=846		
2002	704.33	865.2	-18.59	SLOPE= -10.865 mm/Year		
2003	854.46	865.2	-1.241	INTERCEPT= 949.12 mm		
2004	1044	865.2	20.666	EQUATION OF TREND LINE= y = -10.865x + 949.12		
2005	1044	865.2	20.666	**CATEGORY**	**NUMBER OF YEARS**	**%OF TOTAL YEARS**
2006	868.98	865.2	0.4369	**DEPARTURES**		
2007	837.54	865.2	-3.197	POSITIVE	9	45
2008	720.26	865.2	-16.75	NEGATIVE	11	55
2009	561.92	865.2	-35.05	**DROUGHTS**		
2010	1051.7	865.2	21.55	MODERATE	3	15
2011	709.93	865.2	-17.95	SEVERE	0	0
2012	759.88	865.2	-12.17	ACUTE	0	0
2013	895.94	865.2	3.5529	**NORMAL & EXCESS R/F**		
2014	475.31	865.2	-45.06	NORMAL	14	70
2015	496.88	865.2	-42.57	EXCESS	3	15
2016	1161.4	865.2	34.231	***NB: RAINFALL: EXCESS: > +25; NORMAL: +25 TO -25***		
2017	795.61	865.2	-8.043	***DEOUGHT: MODERATE: -25 TO -50; SEVERE: -50 TO -75; ACUTE: < -75***		

1.4 GEOLOGY

Basaltic lava flows of Deccan traps belonging to Late Cretaceous to Paleogene (68-62 million years in age) occupy the entire area of the district **(Figure 1.12)**with a few inter-trappean beds. The total thickness of the lava pile is 239m, from 493 m to 732 m above msl. They belong to Sahyadri Group comprising Buldhana Formation (=Purandargarh formation) and Karanja Formation (=Mahabaleshwar Formation) in the ascending order of succession. Mineralogically the lava flows are quartz normative thaleiitic in composition. But a few flows show transition to olivine tholeiite.

Buldhana formation is represented by only one flow exposed at a few places in the northern part of the district, its thickness varied from 15 m to 45 m. The rock is dark grey, fine grained, sparsely to moderately porphyritic consisting of fine to medium sized plagioclase phenocrysts. Karanja Formation, occupying almost the entire district, is around 240 m thick and comprises 10 Aa flows and one compound Pahoehoe flow. The individual 'Aa' flow varies in thickness from a few meters to 60 m. and consists of middle massive part and fragmentary top (upto 15 m thick). Majority of the flows comprise dark grey, fine grained non-to sparsely porphyritic basalt with plagioclase phenocrysts upto 1 cm in size. Many of these flows show characteristic columnar joints. Basalt flows generally show gentle southerly gradients varying from 1:577 to 1:4000 have been noted. Inter-trappean beds consisting of chert, cherty limestone and ferruginous limestone, occur within the Mahabaleshwar formation at Godewadi, Kokalgaon, Chutkarwadi and Dhanora. Laterite occurs as cappings over the basalt flows of the Mahabaleshwar formation and varies from 5 m to 35 m thickness. The famous cave carving of Karosa is located within the laterite. Quarterly alluvium(<1.64 m.y) occurs as valley fills and are well exposed along the Manjira river and other major rivers.The various flows of deccan trap basalt is shown in Fig 1.12 and the geological succession of Latur district is presented in Table 1.5and in figure1.13**.**

Table 1.5: Geological succession of Latur district

	Stratigraphy	Age	Lithology
SAHYADRI GROUP DECCAN TRAP		Recent (Holocene)	Alluvium Laterite
	Karanja Formation (=Mahabaleshwar Formation)	Late cretaceous to Paleogene	10 Aa lava flows,1 compound flow Intertrappean: Cherty limestone/sandstone
	Buldhana formation (=Purandargarh formation)	Late cretaceous to Paleogene	1 Aa flow Unclassified basaltic flows

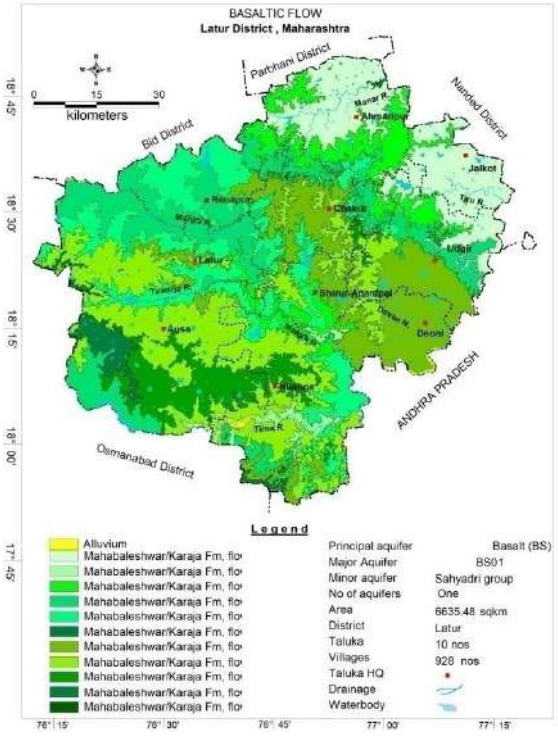
2.0 HYDROGEOLOGY

2.1 MAJOR AQUIFER SYSTEM

Aquifer System in the study area is governed by underlying geological formations, recharge conditions and level of ground water exploitation. Based on the existing data and the data generated so far, the hydrogeological map of the district is depicted Figure 2.1.

DECCAN TRAP BASALT

Deccan Trap Basalt belonging to upper Cretaceous to lower Eocene age occurs in layered sequence ranging in thickness from few meters to 50 m. Flows are represented by massive portion at bottom and vesicular portion at top and are separated from each other by marker bed known as bole bed. Ground water in Deccan Trap Basalt occurs under phreatic conditions at shallow depths upto 15 to 20 m. At deeper levels, the ground water occurs under semi-confined to confined conditions. The weathered and fractured trap occurring in topographic lows, form the main aquifer in the district. The vesicular portion of different lava flow varies in thickness from 15 to 25 m and forms the potential zones. The yield of dugwells tapping upper phreatic aquifer ranges between 25 to 250 m^3/day, whereas that of borewells varies from 0.50 to 52.00 m^3/day depending upon the local hydrogeological conditions. The exploration data of CGWB and borewell data of Groundwater Surveys and Development Agency (GSDA) reveals the presence of promising deeper confined aquifers even below 100 m.



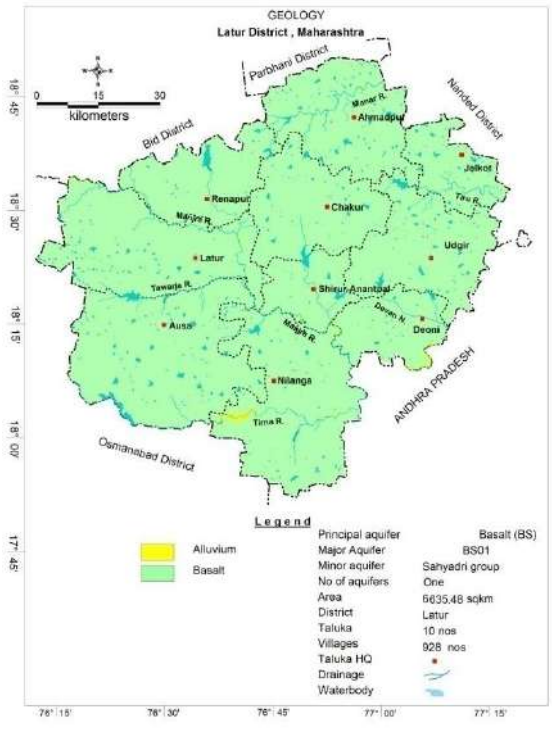


Figure 1.12: Basaltic flow of Latur District **Figure 1. 13: Geology of Latur District**

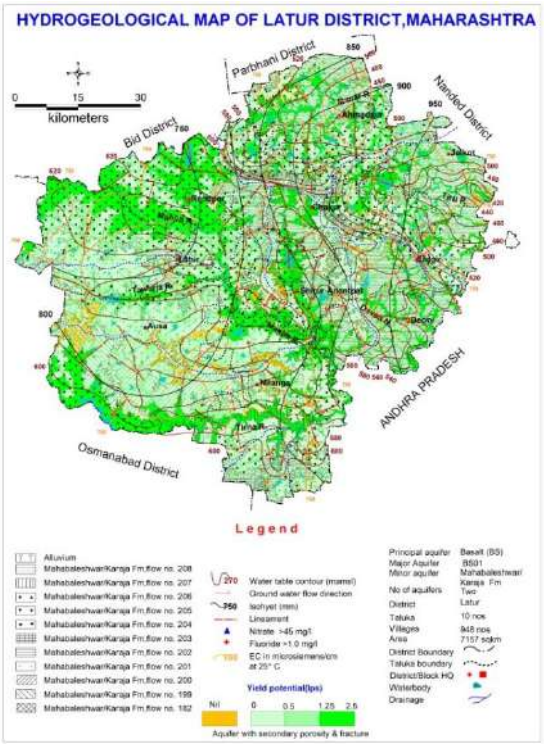


Figure 2.1Hydrogeological Map of Latur District

2.2 AQUIFER PARAMETERS

The major aquifer system of Latur district is Basalt (Aquifer-I & II). The basic characteristic of the major aquifer of the district is given**Table 2.1** and is depicted in **Figures 2.3 to 2.6**.

Table 2.1: Basic Aquifer Characteristics of the major aquifers of the district.

Major Aquifers	**Basalt (Deccan Traps)**	
Type of Aquifer (Phreatic/Semiconfined/Confined)	**Aquifer-I (Phreatic)**	**Aquifer-II (Semiconfined/confined)**
Depth to Bottom of Aquifer (mbgl)	9 to 25	43 to 150
Weathered/ Fractured rocks thickness (m)	5.4 to 14	0.5 to 8.9
Yield Potential	0 to 100	0 to 2.5 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.000145 to 0.0005
Transmissivity (T)	6.15 to 83.53 m^2/day	

2.3. 3D AND 2D AQUIFER DISPOSITION

Based on the existing data and data generated, 3 D aquifer disposition**(Figure 2.2)**and several Hydrogeological cross sections has been prepared along the section lines asshown in**Figure 2.7 t**o understand the sub surface disposition of aquifer system.**Figure 2.8** depicts the 3D Bar Diagram and the cross sections A-A' TO D-D' is shown in**Figure 2.9 (a) to 2.9 (d).**

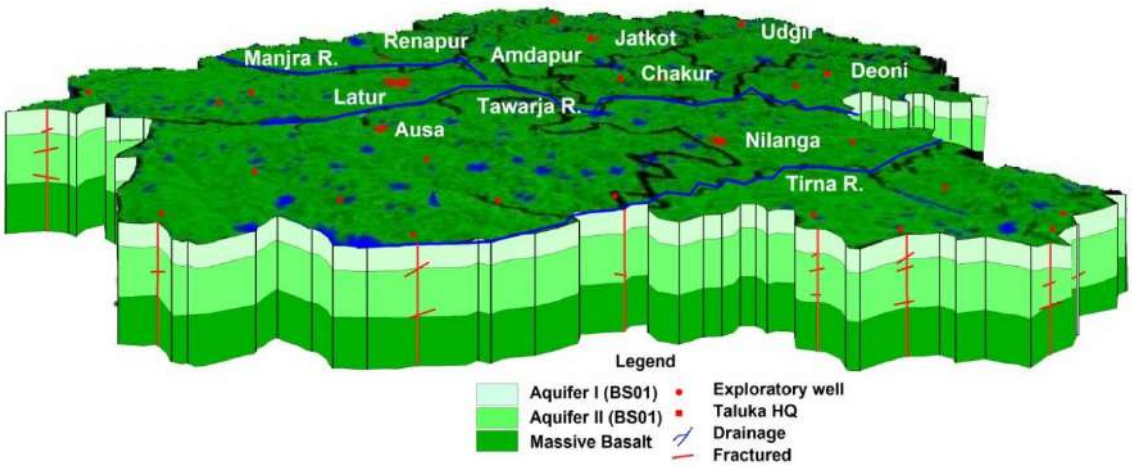


Figure 2. 2: 3D Diagram Aquifer Disposition

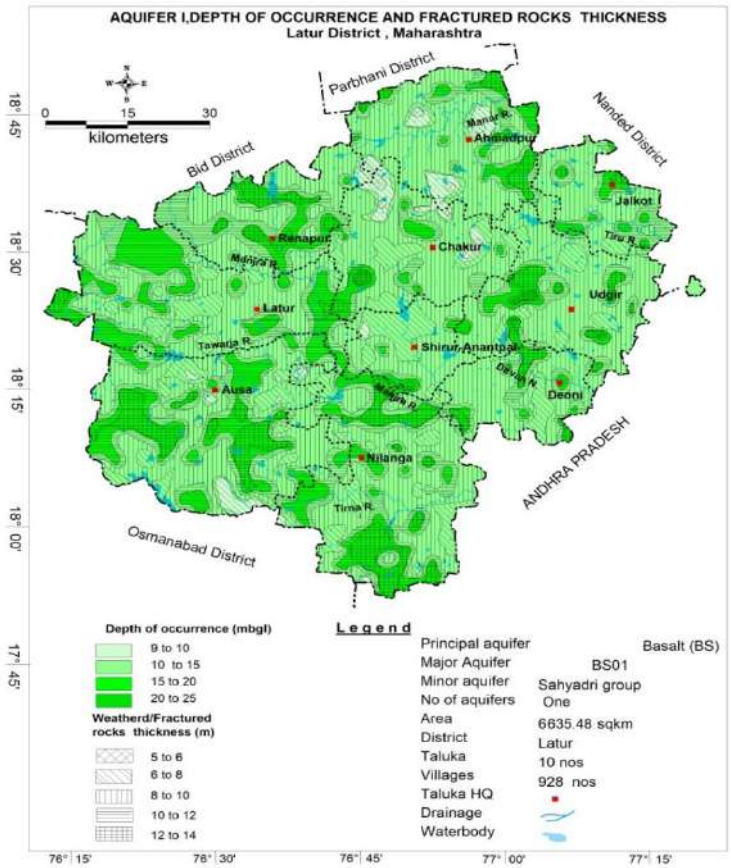


Figure 2. 3: Aquifer-I, Depth of Occurrence and thickness

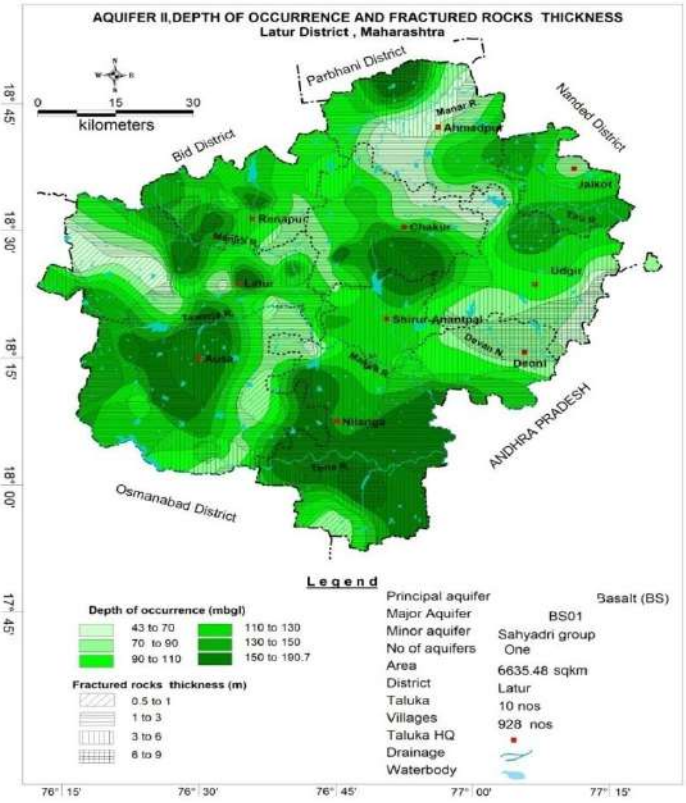


Figure 2. 4: Aquifer-II, Depth of Occurrence and thickness

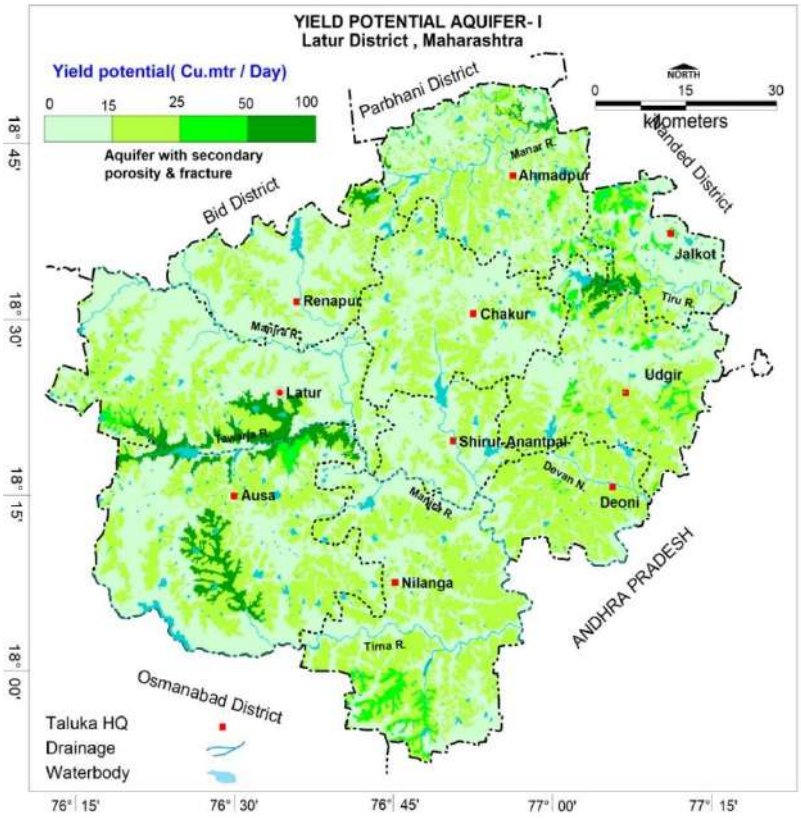


Figure 2.5: Aquifer-I, Yield Potential

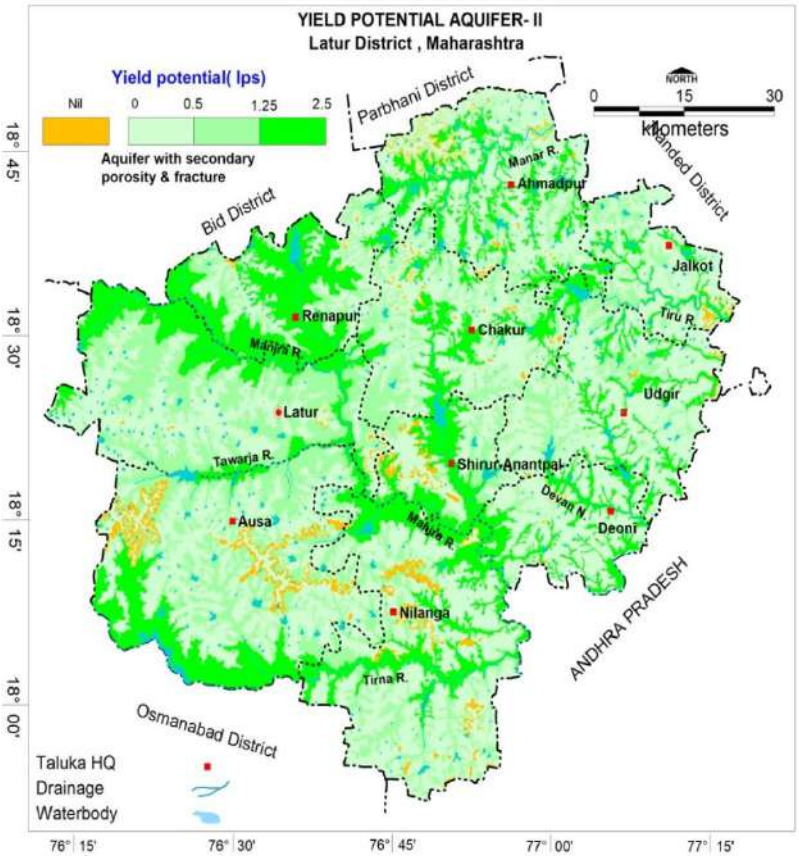


Figure 2.6: Aquifer-II, Yield Potential

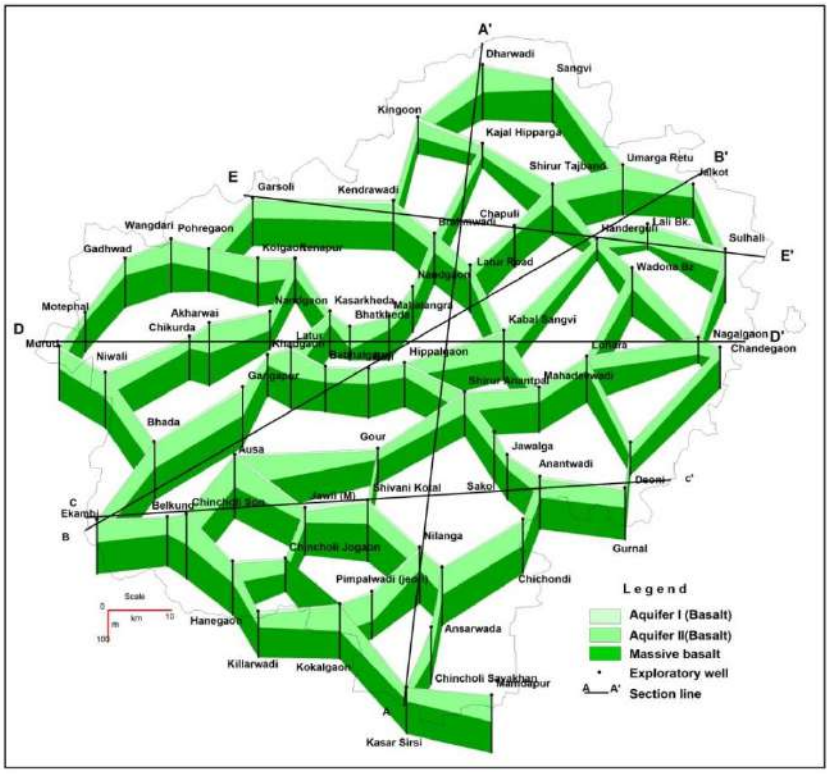


Figure 2. 7: 3D Fence Diagram

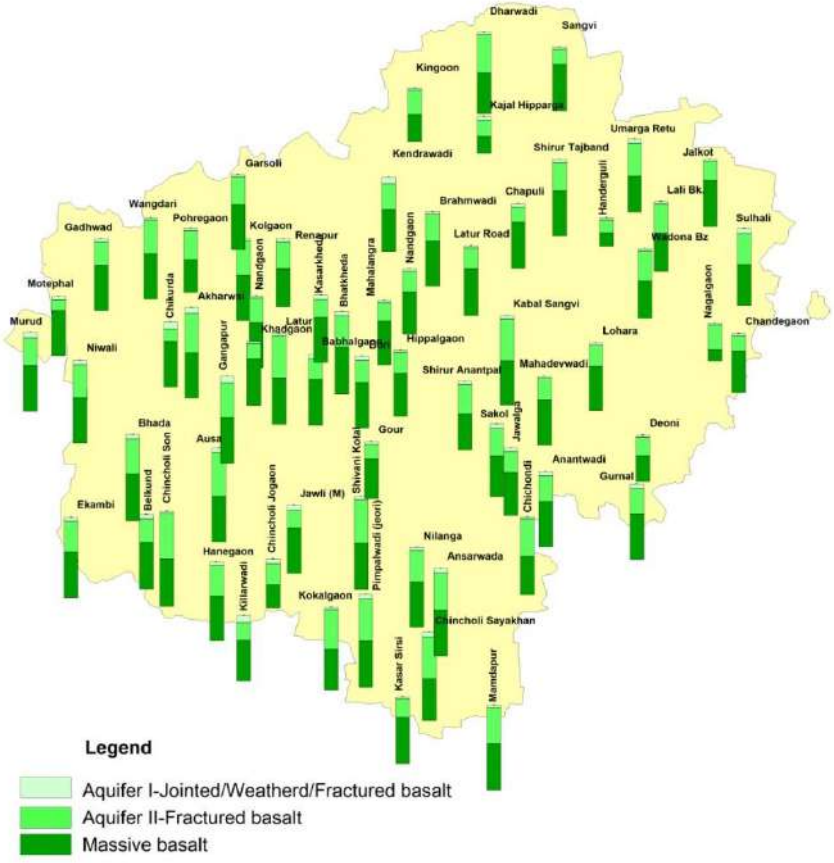


Figure2.8: 3D Bar Diagram

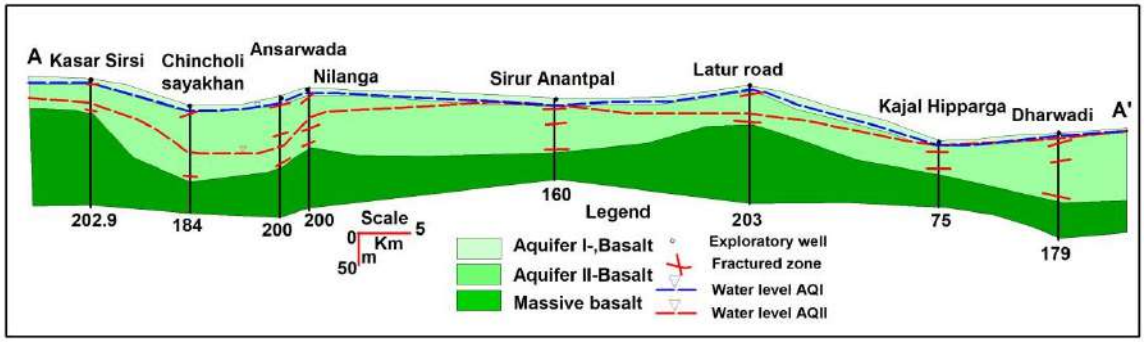


Figure 2. 9 (a): Hydro-geological Cross Section A-A'

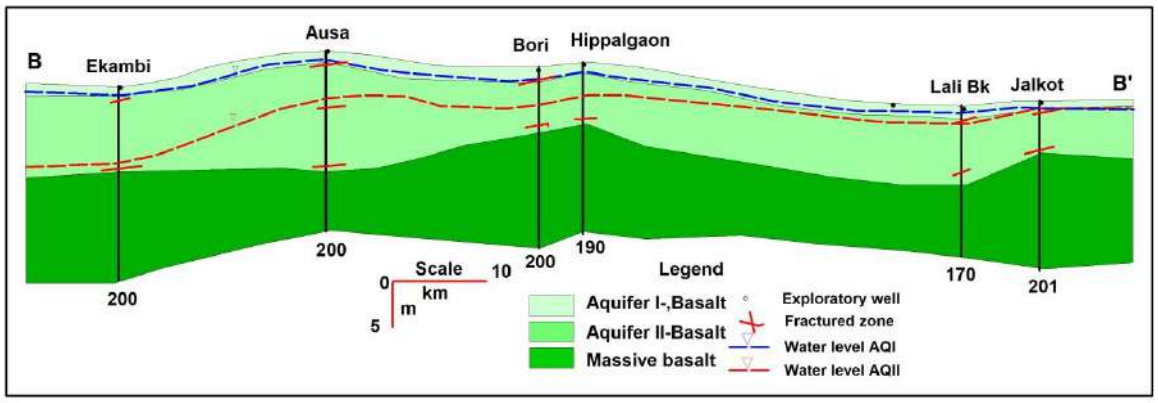


Figure 2. 10 (b): Hydro-geological Cross Section B-B'

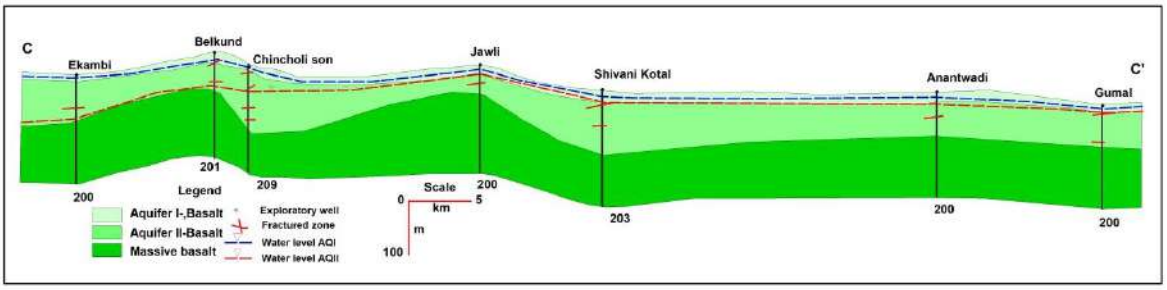


Figure 2. 11 (c):): Hydro-geological Cross Section C-C'

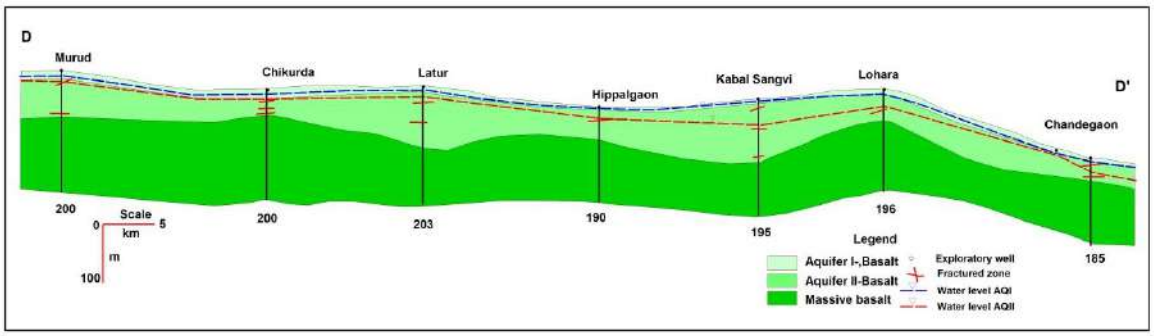


Figure 2. 12 (d): Hydro-geological Cross Section D-D'

3.0 WATER LEVEL SCENARIO

Central Ground Water Board periodically monitors 38 Dugwells and 06 Borewells as Ground Water Monitoring Wells (GWMW) in the district, four times a year i.e. in January, May (Premonsoon), August and November (Postmonsoon). In addition, monitoring of Key observation Wells (KOWs) and Micro-level Hydrogeological investigation was carried out and the data was utilized in the preparation of Water level maps in the NAQUIM undertaken areas.

3.1 DEPTH TO WATER LEVEL (PHREATIC AQUIFER/AQUIFER I)

The Pre-monsoon depth to water level of unconfined aquifer **(Figure 3.1)** ranges from 2.1 mbgl (Ralga, Ahmadpur taluka) to28 mbgl (Khuntegaon, Ausa taluka) as given in **Annexure-1.1**. The major parts of the district covering 4694 Sq Km area has water level in the range of 10 mbgl to 20 mbgl.The deepest water levelof more than 20 mbgl is observed in small patches in Nilanga, Ausa, Renapur and Shirurtalukasin 118 Sq Kmarea.The shallow depth to water level less than 10 mbgl is observed in small parts of all the talukas covering 2393.7 Sq Km area.The deeper depth to water level may be due to exploitation of ground water for irrigation during Rabi season.

The post-monsoon depth to water level of unconfined aquifer **(Figure 3.2)**ranges from 0.2 mbgl (Rui, Ahmedpur taluka) to 18 mbgl (Sakoli, Shrirur taluka) as shown in **Annexure-1.1**. The depth to water level between 5 mbgl and 10 mbgl is observed in major parts of the district covering 4005.6 Sq Km area.The shallow depth to water level less than 5 mbgl is observed in 2180.27 Sq Km area covering parts of Udgir, Deoni, Jalkot, Ahmadpur, Chakur and Renapurtalukas of nortern-north-eastern parts of the district and isolated parts in all the other talukas. The deeper depth to water level of more than 10 mbgl is observed in 1020.95 Sq Km area observedinsmall parts in Latur, Ausa, Nilanga, Shirur, Renapur, Udgir and Deoni talukas (**Figure3.2*) .***

3.2 DEPTH TO WATER LEVEL (SEMICONFINED/CONFINED AQUIFER-AQUIFER II)

The Pre-monsoon depth to water level of semiconfined/confined aquifer**(Figure 3.3)**ranges from 9 mbgl (Jawli, Ausa taluka &Niwali, Latur taluka) to 130 mbgl (PimpalwadiJeori, Nilanga taluka) as given in **Annexure 2.1**. The deeper depth to water level of >30 mbgl is observed in 3788.3 Sq Km area in major parts of Nilanga, Ausa, Latur, Shirur, Chakur and Renapur talukas. The depth to water levelbetween 20 mbgl and 30 mbgl is observed in 2726.57 Sq Km area in all blocks of the district. The depth to water level less than 10 mbgl is observed in 692 Sq Km area only in small patches in Nilanga, Ausa, Renapur, Latur and Ahmedpur districts. **(Figure 3.3)**.

The post-monsoon depth to water level in Semiconfined/Confined aquifers **(Figure 3.4)**rangesfrom1.48 mbgl to 54 mbgl**(Annexure 2.1)**.The depth to water level between 10 mbgl and 20 mbgl is observed in 3624.61 Sq Km area in major parts of the district. The

deeper depths to water level between 20 mbgl and 30 mbgl is observed in 1456 Sq Km area in parts of Nilanga, Ausa, Latur, Renapur and Chakur blocks. The depths to water more than 30 mbgl is observed 1141 Sq Km area in small parts in all the blocks except Jalkot and Deoni talukas**.** The deeper depths to water level may be due to overexploitation of ground water from deeper aquifers.

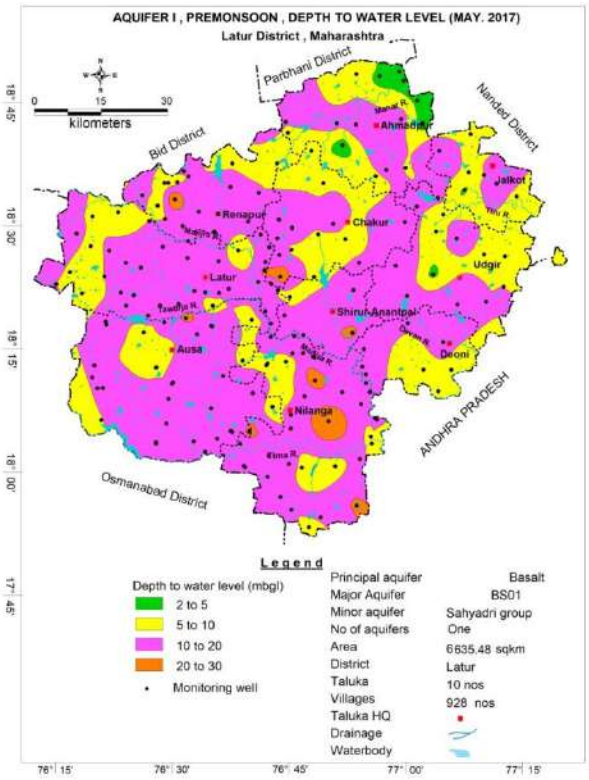


Figure 3.1: Phreatic Aquifer

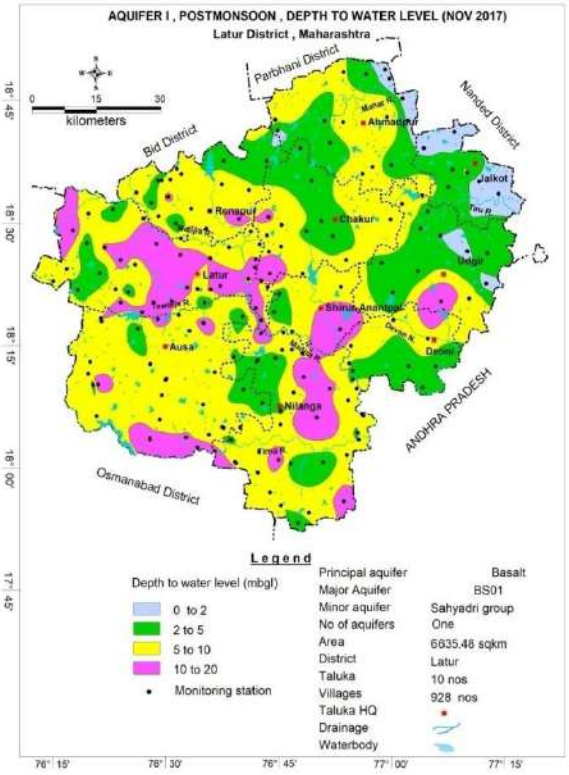


Figure 3. 2: Phreatic Aquifer: Pre-monsoon DTWL(May 2017)Post-monsoon DTWL(Nov. 2017)

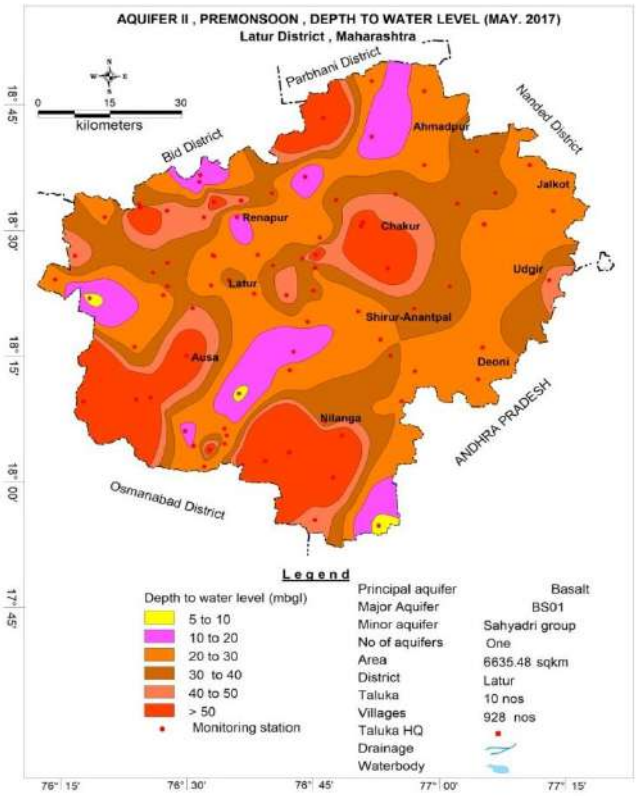


Figure 3.3: Aquifer II:: Pre-monsoon Depth to Water Level (May 2017)

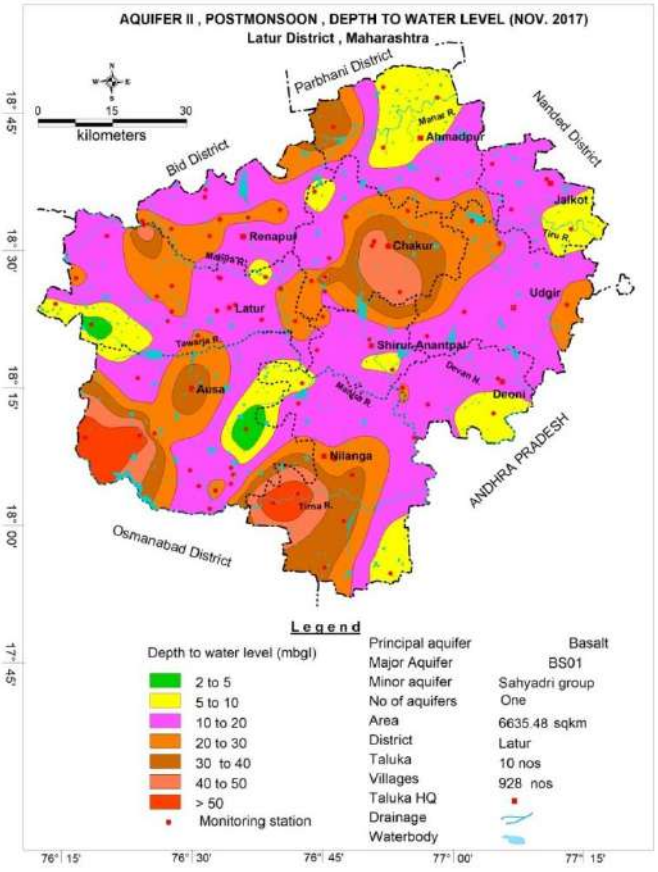


Figure 3. 4: AquiferII:Post-monsoon Depth to Water Level Nov.2017)

3.3 WATER LEVEL TREND (2008-17)

The premonsoon decadal water level trend (2008-17) indicates afalling trend @ 0 to 0.7138 m/year covering5796.5 Sq Km areas**(Annexure 3.1)**. The rising trend is observed in only about 1291.57 Sq Km areas @ 0.0 to 0.399 m/year. The falling trend @ 0.0 m/year to 0.2 m/year is observed in 3298.4SqKm area covering the major parts of the district; the fall @ 0.2 to 0.4 m/year is observed in parts of all the talukas covering 1683 Sq Km area; the falling trend @ 0.4 to 0.6 m/yris observed in Nilanga, Ausa, Latur and Chakur talukas covering 792.3 Sq Km area**(Figure 3.5**). Isolated patches in Ausa, Shirur and Nilanga blocks covering 22 Sq Km area have trend more than 0.6 m/year. The rising trend is observed in small patches in all the blocks of the district.

The postmonsoon decadal water level trend (2008-17) indicates a falling trend @ 0.0to 0.79 m/year covering 5637 Sq Km area **(Annexure 3.1)**. The rising trend is observed in only about 1451 Sq Km area only @ 0.0 to 0.58 m/year. The falling trend @ 0.0 m/year to 0.2 m/year is observed in 2336SqKm areamostly covering Ahmedpur, Deoni, Jalkot, Chakur and Udgir blocksof the district. The fall @ 0.2 to 0.4 m/year is observed in1913 Sq Km area in parts ofAusa, Nilanga and Renapur blocks. The fall between 0.4 m/year and 0.6 m/year is observed in 1133 Sq Km area in Ausa, Nilanga, Renapur, Latur and Chakur blocks. The trend more than 0.6 m/year is observed as isolated patches in various blocks in about 254 Sq Km area. The riding trend is observed in small parts of Latur, Renapur, Ahmedpur, Shirur, Deoni and Jalkot blocks @ 0.2 to 0.6 m/year. **(Figure 3.6).**

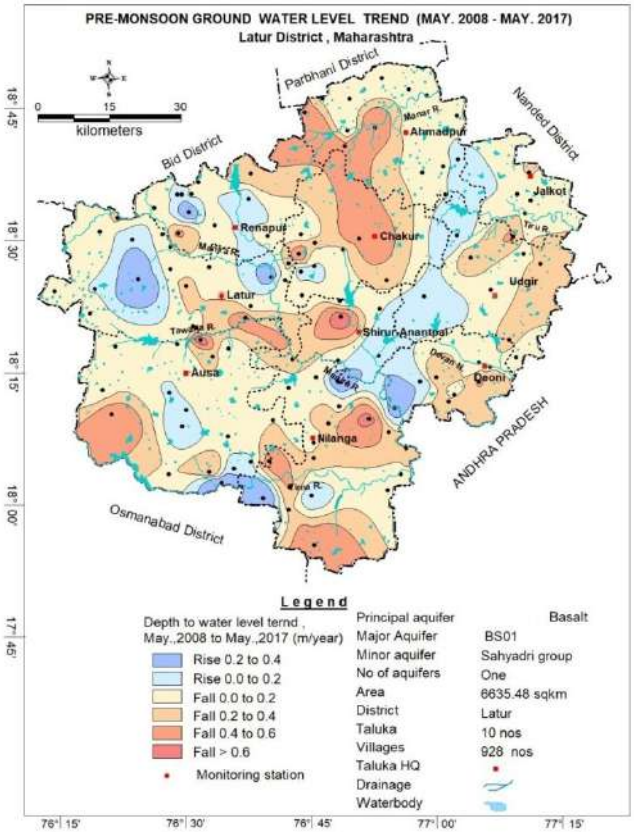


Figure3.5: Premonsoon Water Level Trend (2008-2017)

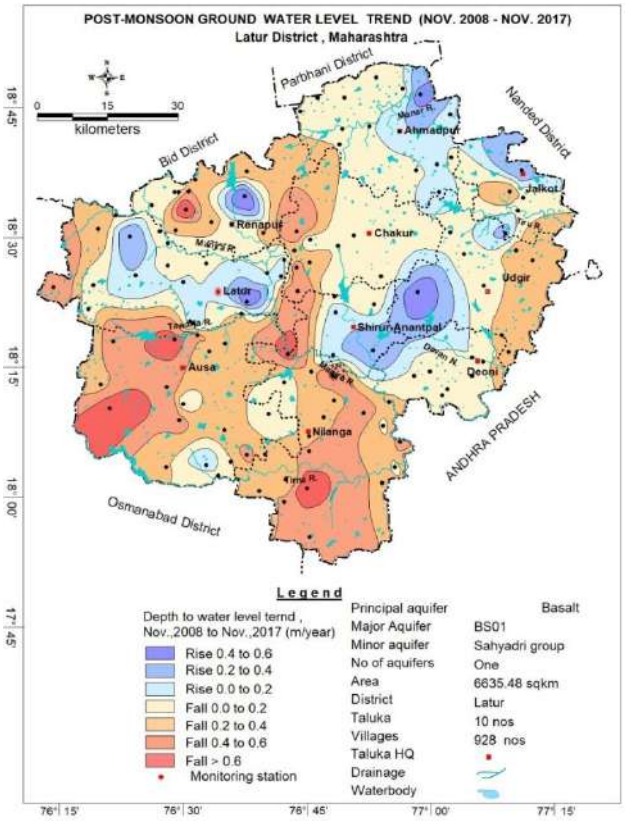
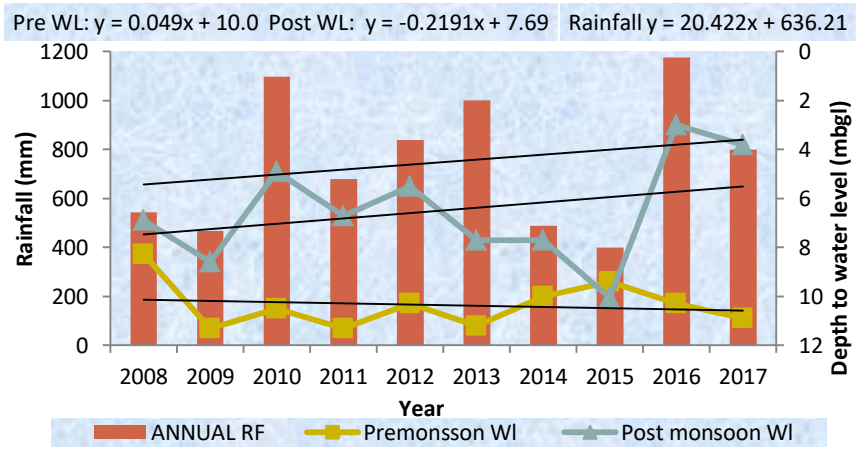


Figure 3.6:Post monsoon Water Level Trend (2008-17)

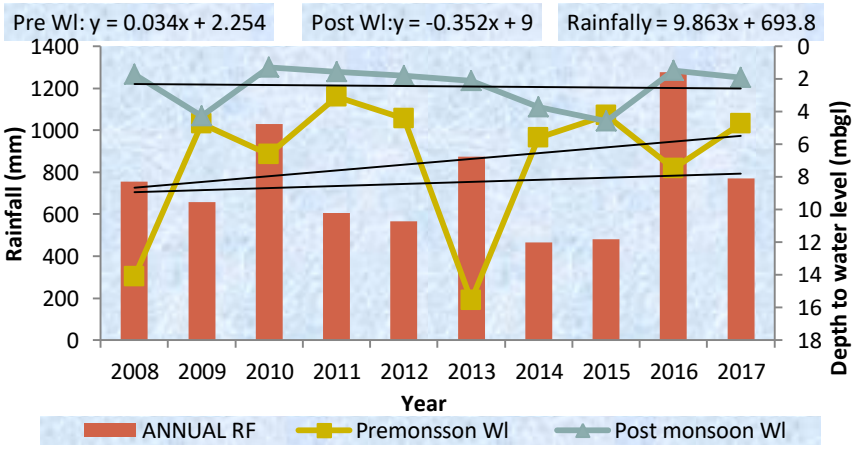
3.4. HYDROGRAPHS

The hydrographs (time series) of selected locations indicating water level over the years (2008 to 2017) is depicted in **Figure 3.7 (a) to 3.7 (j)**. The hydrograph indicates a rise in water level trend in most parts of the block.



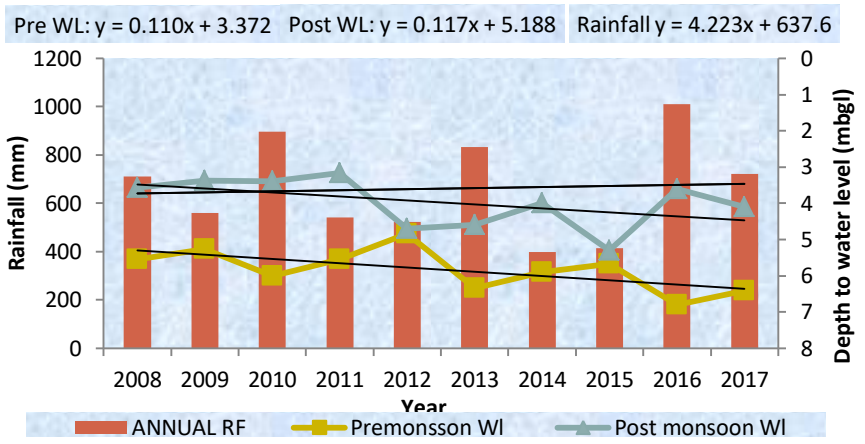
A falling trend during pre-monsoon@ 0.049 m/year and a rising trend during post-monsoon @0.219 m/year respectively.

Figure 3. 7(a) :Hydrograph of Ahmedpur, Ahmedpur Block, Latur District



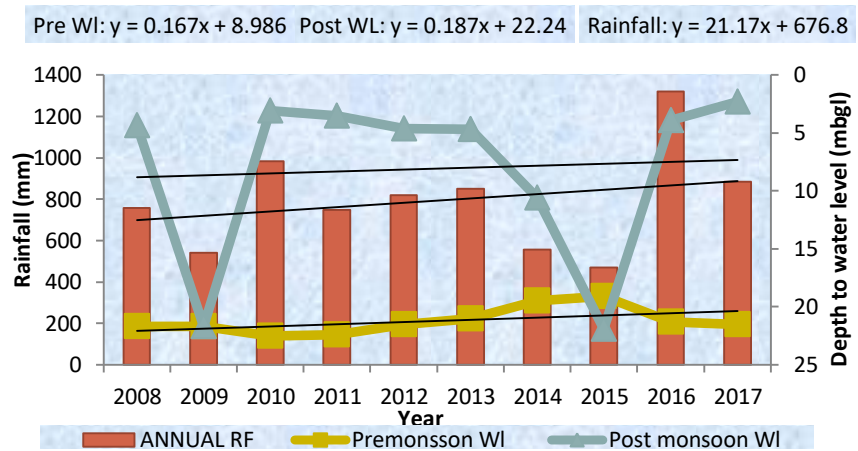
A rising trend @ 0.034 m/year during pre-monsoon and a falling trend @ 0.352 m/year during post-monsoon.

Figure 3. 8(b): Hydrograph of Pandharwadi, ShirurAnantpal, Latur



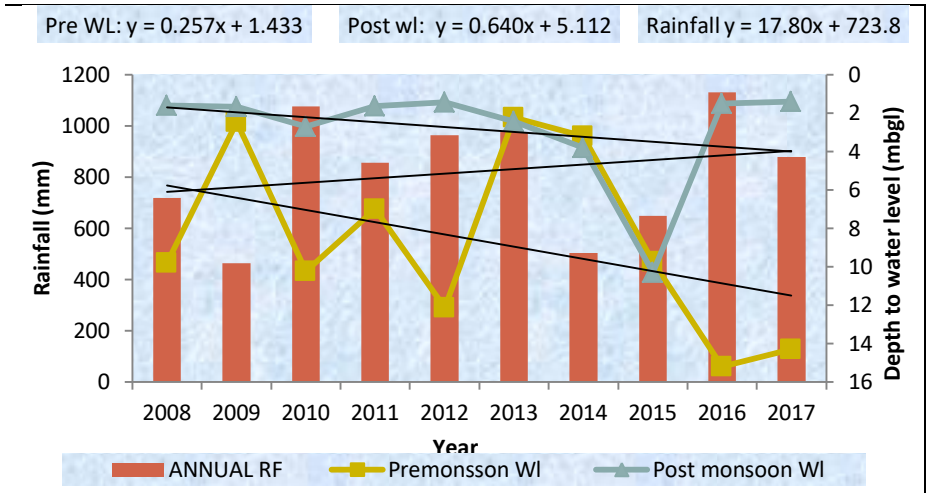
A falling trend during both pre-monsoon and post-monsoon @ 0.0110 m/year and @0.117 m/year respectively.

Figure 3. 9(c):Hydrograph of Ausa, Ausa Block, Latur District



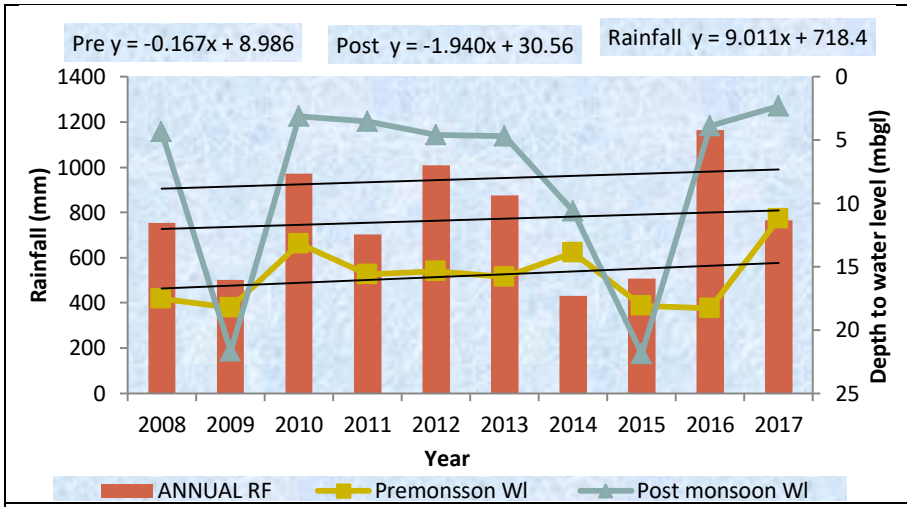
A rising trend during both pre-monsoon and post-monsoon @ 0.167 m/year and 0.187 m/year respectively.

Figure 3. 10(d): Hydrograph of Ashti, Chakur Block, Latur District



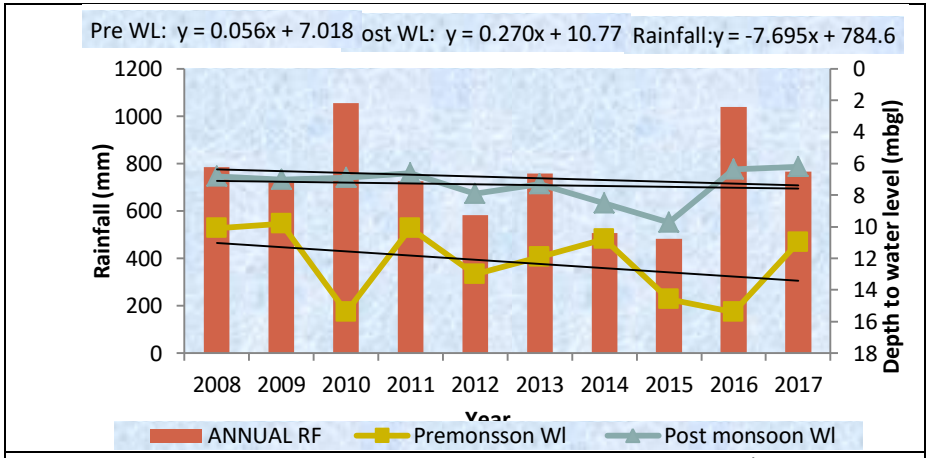
A falling trend during both pre-monsoon and post-monsoon @ 0.257 m/year and 0.640 m/year respectively.

Figure 3. 11(e): Hydrograph of Deoni, Deoni Block, Latur District



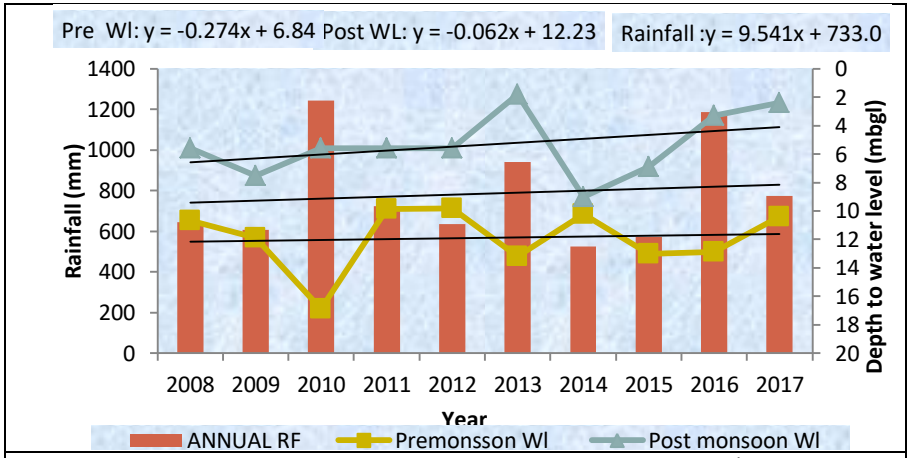
A rising trend during both pre-monsoon and post-monsoon @ 0.167 m/year and 1.94 m/year respectively.

Figure 3. 12(f): Hydrograph of Jalkot, Jalkot Block, Latur District



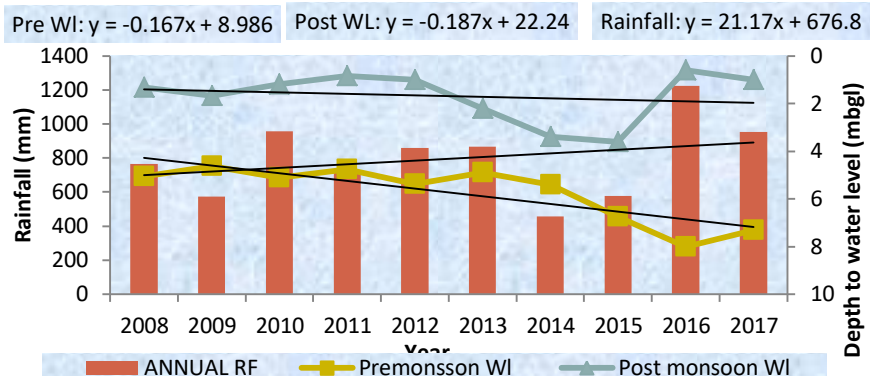
A fallingtrend during both premonsoon and postmonsoon @ 0.056 m/year and 0.270 m/year respectively.

Figure 3. 13(g): Hydrograph of Boregaon Kale, Latur Block, Latur District



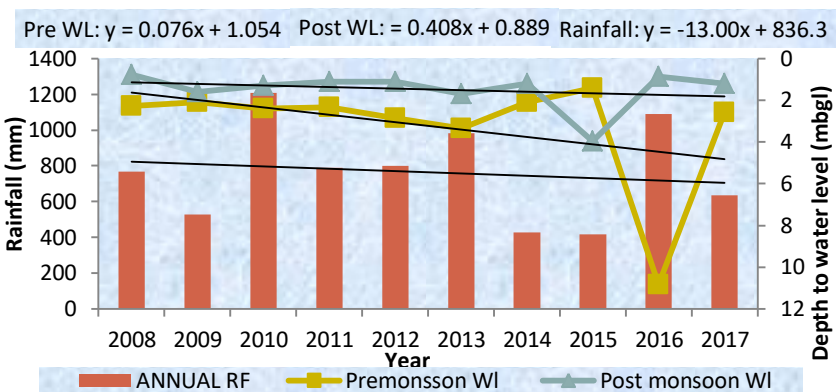
A rising trend during both premonsoon and postmonsoon @ 0.274 m/year and 0.062 m/year respectively.

Figure 3. 14(h): Hydrograph of Kelgaon, NilangaBlock, Latur District



A falling trend during both premonsoon and postmonsoon @ 0.167 m/year and 0.187 m/year respectively.

Figure 3. 15(i): Hydrograph of Renapur, RenapurBlock, Latur District



A fallingtrend during both premonsoon and postmonsoon @ 0.076m/year and 0.408m/year respectively.

Figure 3. 16(j): Hydrograph of Udgir-1, UdgirBlock, Latur District

4.0 GROUND WATER QUALITY

The concentrations of various gases and ions dissolved in water from the atmosphere, soil strata and minerals and rocks with which it comes are the characteristics of water. This ultimately decides the quality of ground water. The concentration of CO_3^{2-}, HCO_3^-, OH^- and H^+ ions and dissolved CO_2 gases in water decide the acidic or basic nature of water while the salts of ions like Ca^{2+} and Mg^{2+} in water makes it soft or hard. Water with high Na^+ and Cl^- concentration can make the water saline. Nitrate ions percolated from anthropogenic sources can become predominant major anion in ground water. The excess fluoride concentration in ground water from fluoride bearing minerals may be related to the concentration of Ca^{2+}, Na^+ and HCO_3^- ions present in ground water.

4.1 ELECTRICAL CONDUCTIVITY

The ground water quality of unconfined aquifer inmajor parts of the district covering 3484S SqKm areahas EC <750 µS/cm**(Figure4.1).** About 3605 Sq Km area has EC values rangingfrom 750 to 2250 µS/cm have brackish nature. This may be due to higher rate of evapotranspiration or higher residence time of ground water bringing more ions to ground water through water rock interaction. The Isolated patches in the district covering82 Sq Km area EC values ranging from 2250 µS/cm to 5000 µS/cm due. High concentration of nitrate (> 45 mg/l) is observed in 21 sitesacross the district. About 6 sites show fluoride contamination (>1.5 mg/l). Under natural geochemical condition, the nitrate rarely becomes a major ion in the ground water. The domestic waste, wastewater and sewage in the urban and rural parts of the district may help NO_3 to percolate in ground water. The presence of Fluoride in water may be due to geogenic source or by excess use of pesticides in agriculture. The **Annexure 4.1** depicts the results of chemical analysis of ground water samples collected from unconfined aquifer during premonsoon, May 2017.

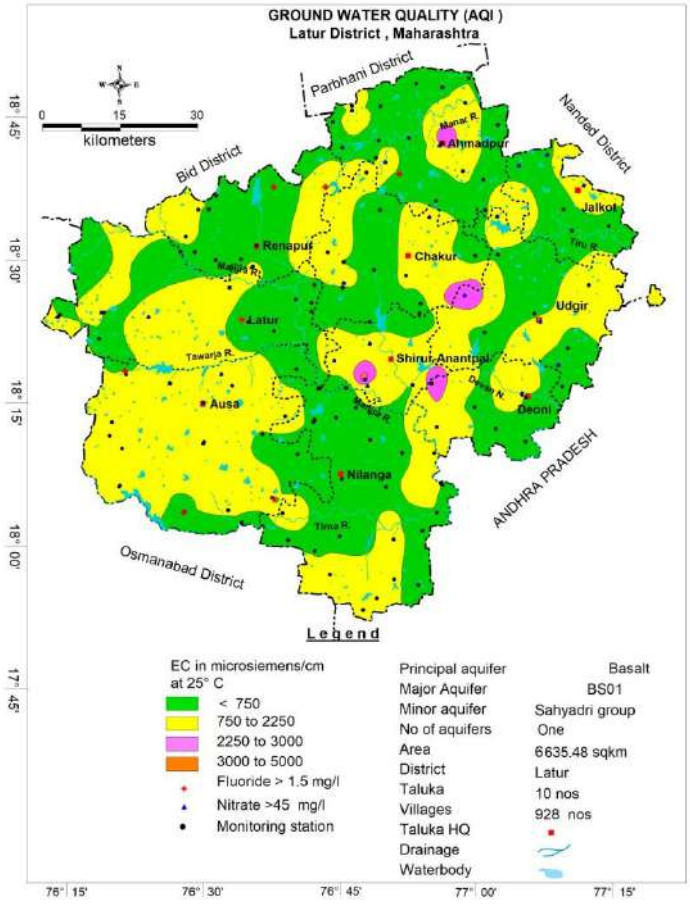


Figure 4.1: Ground Water Quality of Unconfined Aquifers

The quality of Semiconfined/confined aquifers ranges from 231 to 5483 µS/cmas shown in**Figure3.2**. The ground water quality varies from fresh to brackish and saline in places.The fresh water with EC<750 µS/cm is observed in 3812 Sq Km area in major parts of the district.The water with EC ranging between 750 µS/cm to 2250 µS/cm is observed in 3312 Sq Km area.About 51 Sq Km area has only EC values more than 2250 µS/cm. High values of Nitrate>45 mg/l is found observed in 11 sites. Thepresence of Fluoride is also observed in 9 sites.The**Annexure 5.1** depicts the results of chemical analysis of ground water samples collected from confined/semiconfined aquifers.

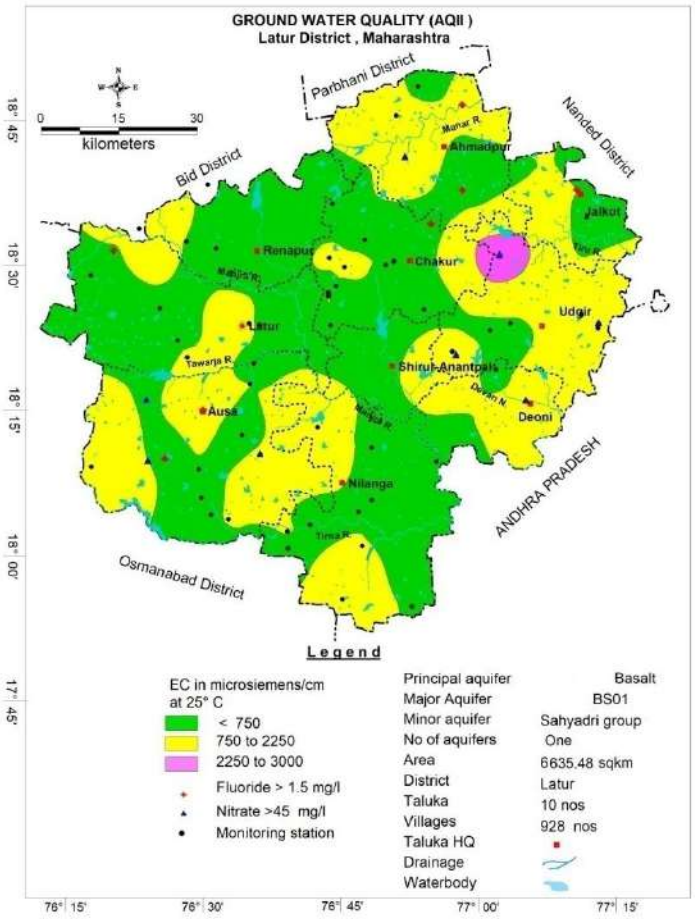


Figure 4.2: Ground Water Quality of Semiconfined/confined Aquifers

4.2 SUITABILITY OF GROUND WATER FOR DRINKING PURPOSES

The suitability of ground water for drinking purpose is determined keeping in view the effects of various chemical constituents in water on the biological system of human being. The standards proposed by the Bureau of Indian Standards (BIS) for drinking water (IS-10500-91, Revised 2012) were used to decide the suitability of ground water for drinking purpose. The overall classification of ground water samples falling below desirable limit (<DL), in the range of desirable and maximum permissible limit (DL-MPL) and above maximum permissible limit (MPL) for drinking water purpose is shown in **Table 4.1** and the graphical representation is shown in **Figure 4.3.**

Table 4.1: Classification of Ground Water Samples as per BIS Drinking Water Standards

Parameter	Drinking water Standards (IS-10500-12)		Total Samples	Samples < DL		Samples between DL and MPL		Samples > MPL	
	DL	MPL		Total Samples	%	Total Samples	%	Total Samples	%
pH	6.5-8.5	-	138	0	0	122	88.40	16	11.59

Parameter	Drinking water Standards (IS-10500-12)		Total Samples	Samples < DL		Samples between DL and MPL		Samples > MPL	
	DL	MPL		Total Samples	%	Total Samples	%	Total Samples	%
TDS	500	2000	138	38	27.53	94	68.11	6	4.34
TH	300	600	138	89	64.49	40	28.98	9	6.52
Ca (mg/L)	75	200	138	69	50	51	36.95	18	13.04
Mg (mg/L)	30	100	138	73	52.89	62	44.92	3	2.173
Cl (mg/L)	250	1000	138	122	88.40	16	11.59	0	0
SO4(mg/L)	200	400	138	124	89.85	11	7.971	3	2.173
NO_3(mg/L)	45	No relax	138	116	84.05	0	0	22	15.94
F (mg/L)	1	1.5	138	121	87.68	12	8.69	5	3.62

DL-Desirable Limit, MPL-Maximum Permissible Limit.

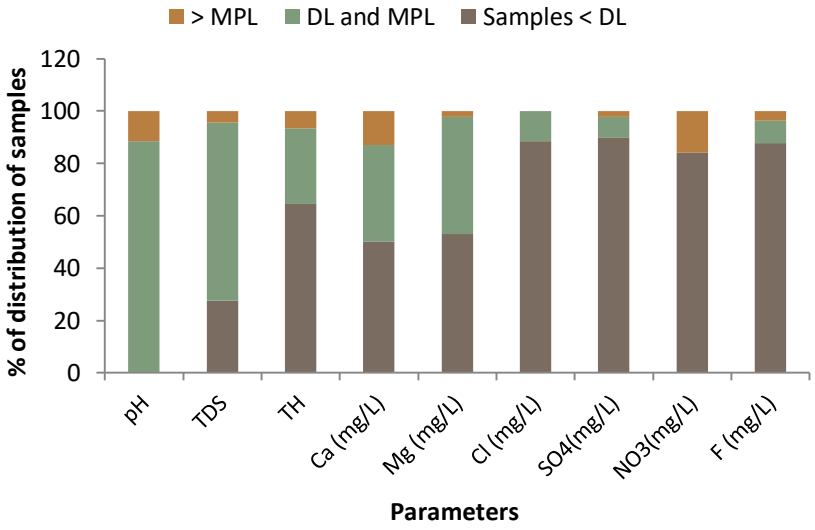


Figure 4.3: Percentage Distribution of Ground Water Samples as per BIS Drinking Water Standards

4.3 SUITABILITY OF GROUND WATER FOR IRRIGATION PURPOSES

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 GW based on EC is discussed in **Table 4.2**

CLASSIFICATION BASED ON EC

Low Salinity Water (EC: 100-250 µS/cm): This water can be used for irrigation with most crops on most soils with little likelihood that salinity will develop.

Medium Salinity Water (EC: 250 – 750 µS/cm): This water can be used if moderate amount of leaching occurs. Plants with moderate salt tolerance can be grown in most cases without special practices for salinity control.

High Salinity Water (EC: 750 – 2250 µS/cm): This water cannot be used on soils with restricted drainage. Even with adequate drainage, special management for salinity control may be required and plants with good salt tolerance should be selected.

Very High Salinity Water (EC: >2250 µS/cm): This water is not suitable for irrigation under ordinary condition. The soils must be permeable, drainage must be adequate, irrigation water must be applied in excess to provide considerable leaching and very salt tolerant crops should be selected.

Table 4.2: Classification of Ground Water Samples based on EC

S.No.	Water Quality Type	EC in µS/cm	No. of samples	% of samples
1	Low Salinity Water	< 250	0	0
2	Medium Salinity Water	250-750	82	59.4
3	High Salinity Water	750-2250	52	37.6
4	Very High Salinity Water	> 2250	4	2.9
		Total	**138**	**100**

Thus, it can be inferred that most parts of the district has medium to high saline water. Thus salt tolerant crops shall be promoted to be grown in brackish water areas and saline areas along with management of Salinity in ground water.

5.0 GROUND WATER RESOURCES

Central Ground Water Board and Groundwater Surveys and Development Agency (GSDA), Govt. of Maharashtra, have jointly estimated the ground water resources of Latur district based on GEC-97 methodology. The same is presented in **Table 5.1** whereas the graphical representations of the resources are shown in **Figure 5.1**.

5.1 GROUND WATER RESOURCES-AQUIFER I

Ground water resource assessmentfor unconfined aquifers was carried out during GEC 2013-14 for 7156.91 sq. km. area of which 449.24 sq. km. area is under command and 6186.24 sq. km. is under non-command area. The stage of ground water development varies from 57.69 % (Jalkot) to 96.27 % (Latur). The overall stage of ground water development for the district is 78.49%. Out of total 10blocks, only oneblock i.e., Latur has beencategorised as “Semi Critical” whereas remaining 9 blocks fall in “Safe” category.

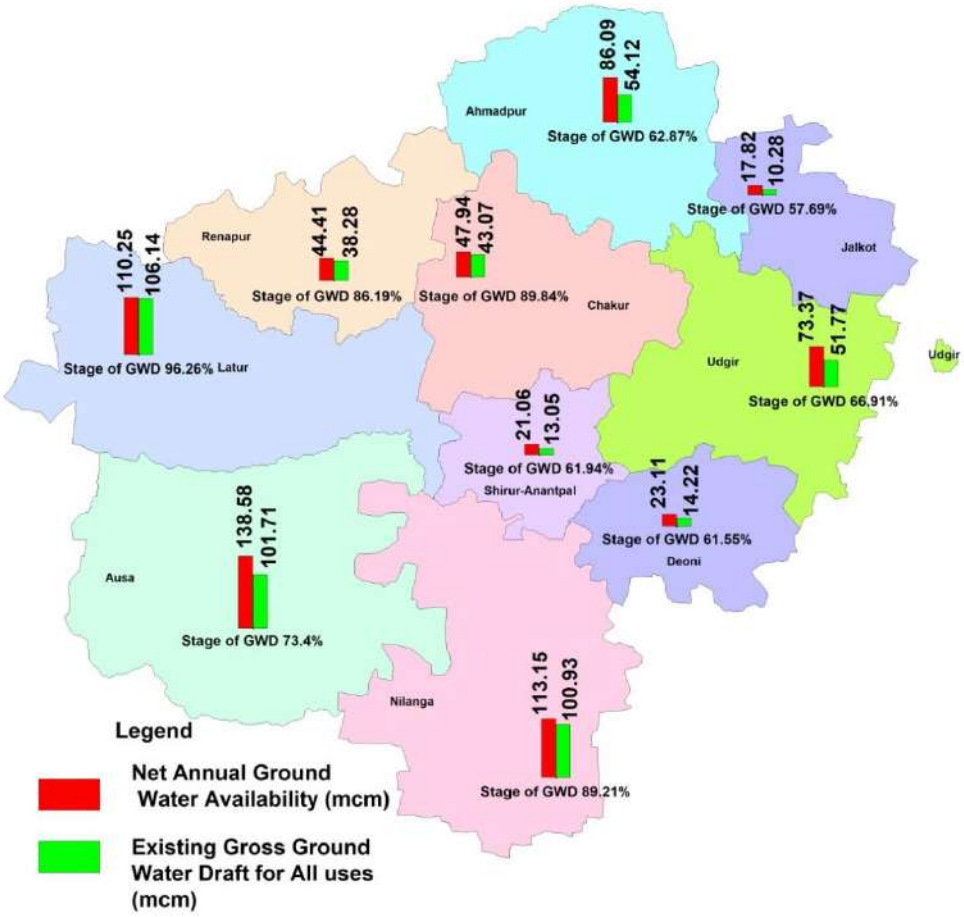


Figure 5.1: Block wise Net GW Availability and Draft for all Purposes

Table 5.1*:* Ground Water Resources, 2013 (Unit in Ham)

District	Administrative Unit	Net Annual GW Availability	Existing Gross GW Draft for irrigation	Existing Gross GW Draft for domestic and industrial water supply	Existing Gross GW Draft for All uses	Provision for domestic and industrial requirement supply to 2025	Net GW Availability for future irrigation development	Stage of GW Development %	Category
Latur	Ahmedpur	8609.19	5096.01	316.85	5412.86	625.55	2873.11	62.87	Safe
Latur	AnantpalShirur	2106.83	1252.90	52.21	1305.12	140.92	678.85	61.95	Safe
Latur	Ausa	13858.10	9814.90	356.84	10171.73	701.95	3371.63	73.40	Safe
Latur	Chakur	4794.06	4143.92	163.25	4307.16	243.05	942.41	89.84	Safe
Latur	DEONI	2311.21	1357.96	64.60	1422.56	140.65	780.92	61.55	Safe
Latur	Jalkot	1782.70	974.24	54.20	1028.44	131.82	672.81	57.69	Safe
Latur	Latur	11025.89	10190.48	423.61	10614.10	710.11	1134.51	96.27	Semi Critical
Latur	Nilanga	11314.92	9653.49	440.42	10093.90	734.06	1586.74	89.21	Safe
Latur	Renapur	4441.60	3693.31	134.78	3828.09	220.38	548.98	86.19	Safe
Latur	Udgir	7737.61	4935.01	242.60	5177.61	437.21	2390.61	66.91	Safe

5.2 GROUND WATER RESOURCES-AQUIFER II

Ground water resources for Semi confined/confined aquifers of Latur District for all the blocks of the district was calculated as per the data available from explorationand is given in **Table 5.2.**

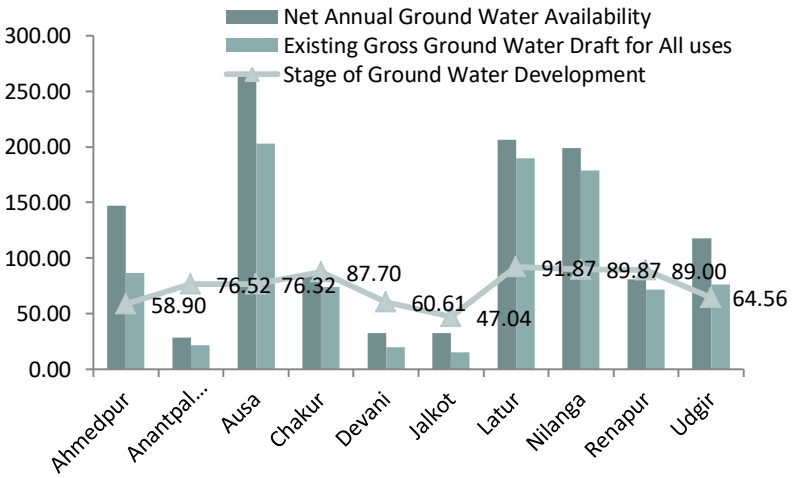
Table 5.2: Ground Water Resources of Semiconfined/Confined Aquifer

Taluka	Area (Sq Km)	Mean thickness (m)	Peizometer (macl)	SY	S	Total resource (MCM)
Ahmadpur	755.76	3.5	66	0.005	0.0000145	13.94906232
Ausa	1214.44	2.7	57	0.005	0.0000247	18.10475008
Chakur	683.76	3.6	57	0.005	0.0000245	13.26255084
Deoni	415.32	5.3	66	0.005	0.0000145	11.40344124
Jalkot	360.77	3.2	68	0.005	0.0000145	6.12803922
Latur	987.98	2.6	61.5	0.005	0.0000145	13.72477117
Nilanga	1063.06	4	78	0.005	0.0000145	22.46352086
Renapur	557.91	2.2	47	0.005	0.0000145	6.517225665
ShirurAnantpal	320.12	4	43	0.01	0.00005	13.493058
Udgir	730.46	4.8	60	0.005	0.0000145	18.1665402

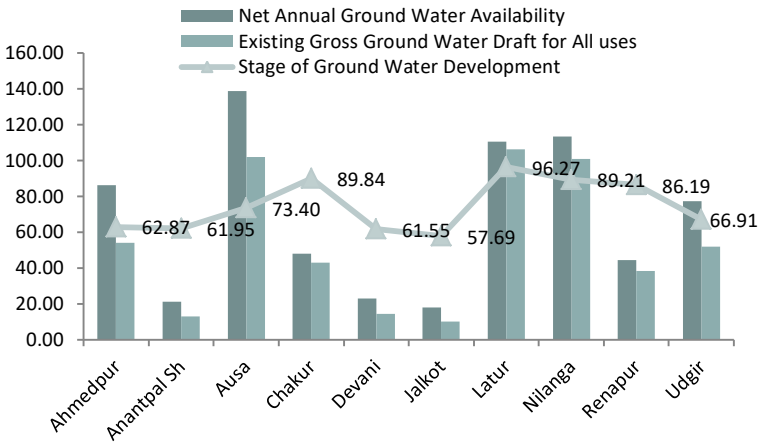
6.0 GROUND WATER RELATED ISSUES

1. OVEREXPLOITATION OF GROUND WATER

The net ground water availability in almost the blocks has been decreasing and the gross draft for all purposes has been increasing over a period of time,2008 to 2013, as shown in **Figure 6.1**. The Stage of Ground Water is also increasing**(Figure 6.2).** This is due to overexploitation of ground water for irrigation purposes despite the decrease in net ground water availability and declining trend of rainfall.



Draft Vs Availability (2008-09)



Draft Vs Availability (2013-14)

Figure 6.1: Draft Vs Availability

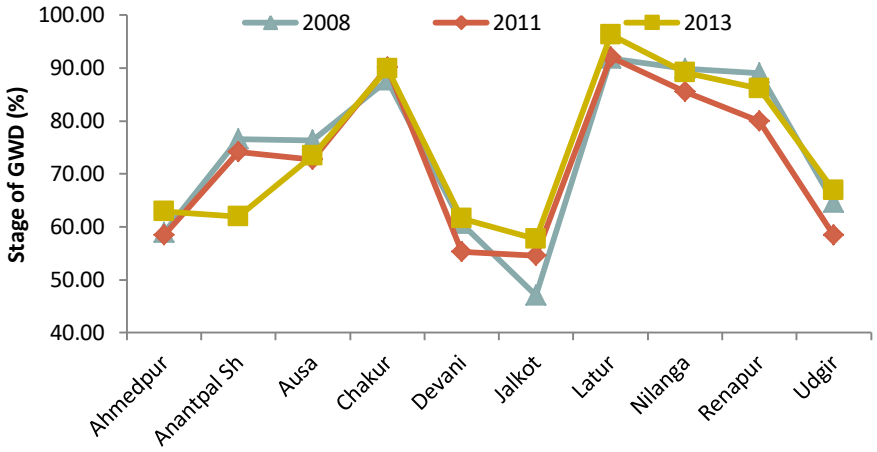


Figure 6.2: Variation in Stage of Ground Water Development (2008 Vs 2011 Vs 2013)

2. DECLINING WATER LEVEL TREND

The declining trend of water level has been observedin the major parts of the district during both premonsoon and post monsoon. During Premonsoon, a falling trend @ 0.0 to 0.7138 m/year is observed in about 5796 Sq Km area and a falling trend @ 0.0 to 0.79 m/year is observed in about 5637 Sq Km area **(Figure 6.3 & 6.4).**This decline in water level is due to ground water based Rabi Cropping in almost all the blocks and SugarcaneCultivation inAhmedpur, Chakur, Shirur, Renapur and Jalkot blocks.**Fig 6.5**represents the sources of irrigation in the district by which it is clear that ground water is the main source of irrigation.

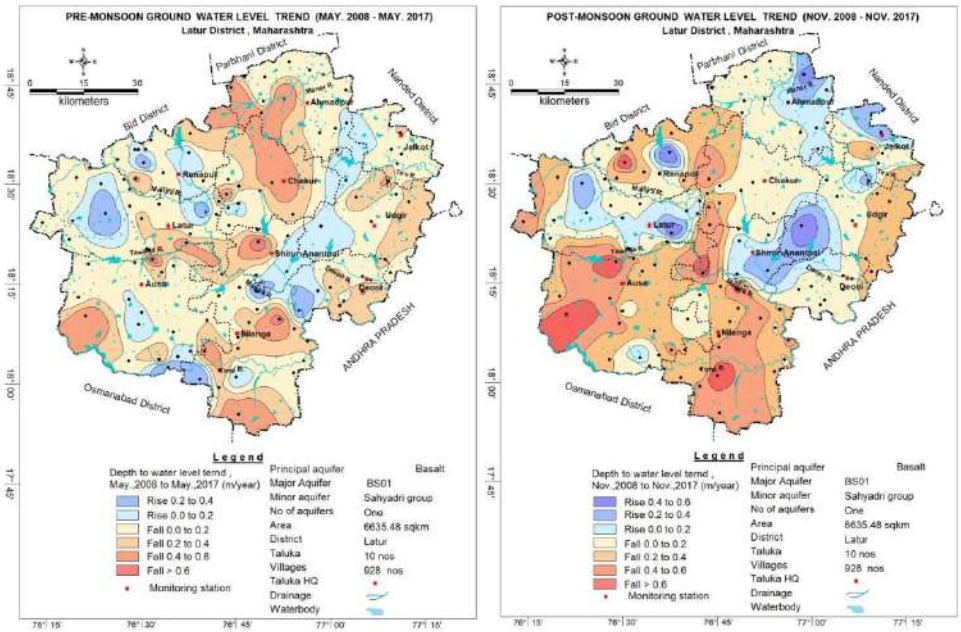


Figure 6.3:Pre-monsoon WL TrendFigure 6. 4: Post-monsoon WL Trend

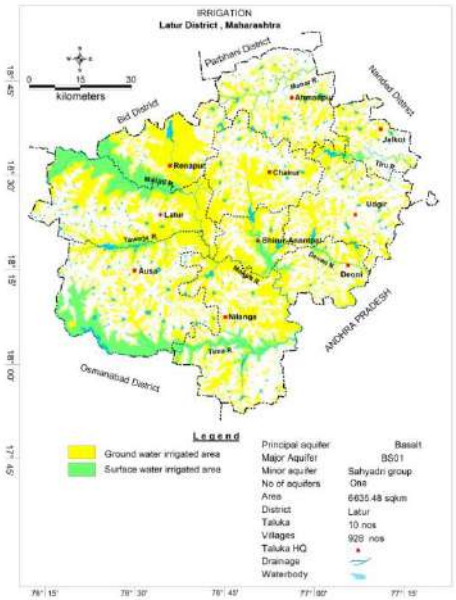


Figure 6.5: Source of Irrigation

3. FLUORIDE CONTAMINATION

The Fluoride contamination in unconfined aquifers is observed in 6 sites in Renapur, Ausa and Ahmedpur blocks and Nitrate contamination is observed in 22 sites of Udgir, Ahmadpur, Ausa, Udgir, ShirurAnantpal, Chakur, Latur, Nilanga and Jalkot blocksIn Semiconfined/confined aquifers, the presence of Flouride was obtained in 9 sites in Ahmadpur, Chakur, Ausa, Latur, Udgir and Jalkot blocks and the nitrate contamination was obtained in 11 sites in Ahmadpur, Ausa, Deoni and Udgir blocks.

The ground water in these sites is neither suitable for drinking nor for irrigation purposes. **Figure 6.6 &6.**7 depicts the Nitrate and Fluoride affected sites of phreatic and semiconfined/confined aquifers.

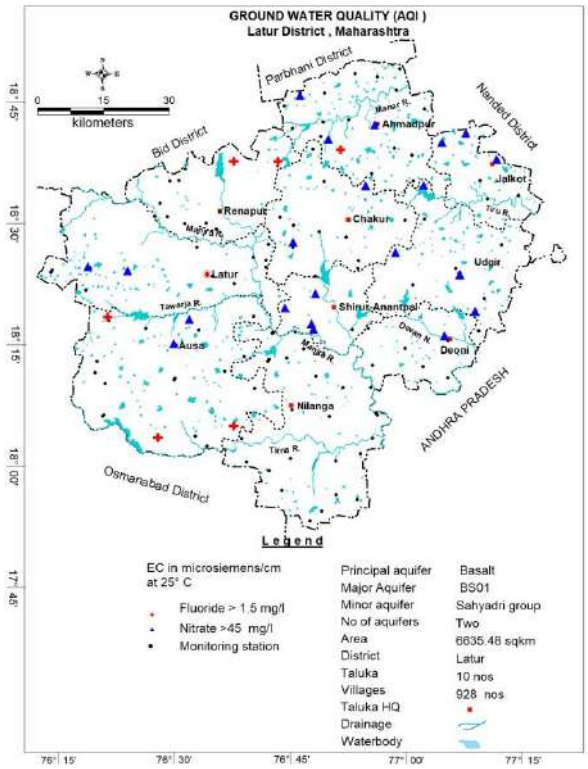


Figure 6.6: GW Quality of Unconfined Aquifer

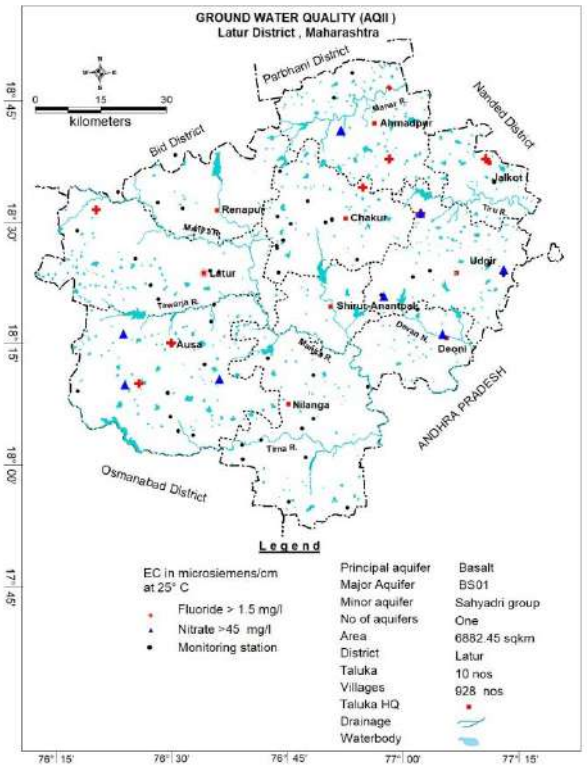


Figure 6. 7: GW Quality of Semiconfined/Confined Aquifers

4. RAINFALL & DROUGHT

The long term rainfall analysis of Latur district for a period of 20 years shows a maximum number of negative departures of rainfall with to respect to normal (865.2 mm) rainfall and declining rainfall trend @ 10.86mm/year. As a result, a moderate drought is observed in the district in 15% of the total years in parts of Ahmedpur,Ausa, Chakur, Deoni, Latur, Nilanga, and Renapur blocks with the frequency of occurance of drought, once in 7 years.

5. LOW YIELDING AQUIFERS

The yield of the aquifer in major parts of the block ranges from 1 to 1.5 lps as given in **Figure 6.8**. This is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.

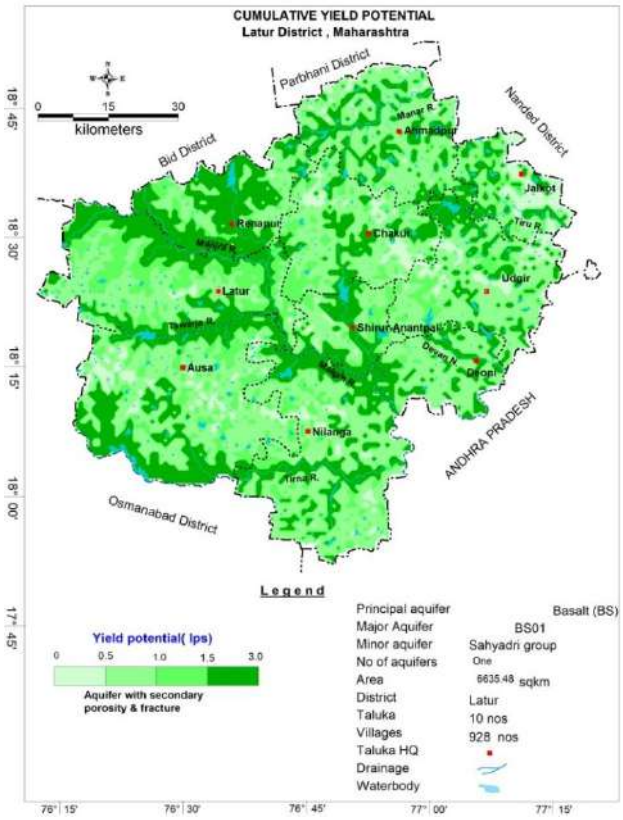


Figure 6.8:Cumulative Yield Potential

7.0 GROUND WATER RESOURCE MANAGEMENT

The management plan has been proposed to manage the ground water resources and to arrest further decline in water levels. The management plan comprises two components namely supply-side management and demand side management. The management Planproposed in all blocks of Latur District is discussed below.

7.1 SUPPLY SIDE MANAGEMENT

The supply side management of ground water resources is proposed based on availability of surplus surface water within river sub basins and micro watersheds and their artificial rechargein unconfined aquifers. The feasibility of the area for recharge, specific yield of the aquifer, the unsaturated volume of the aquifer, the aquifer thickness as well as the unsaturated depth below 5 mbgl is also taken into consideration during AR.

A total of 392 Percolation Tanks and 1112 Check dams to be constructed in 7156.91 Sq Km area of Latur District to arrest the decline in water levels. The **Table 7.1** gives the blockwise volume of water available for recharge& the proposed number of structures.The area recommended for the construction of proposed structures is shown in **Figure 7.1.**

6.

Table 7.1: Proposed AR Structures and area feasible for recharge

Block	Geographical Area(sq. km.)	Area feasible for recharge (sq. km.)	Unsaturated Volume(MCM)	Number of Structures	
				PT	CD
Ahmedpur	755.76	567.36	1134.72	44	129
ShirurAnantpal	320.12	39.82	79.7	3	9
Ausa	1214.44	1076.19	2152.38	84	236
Chakur	683.76	270.89	541.78	21	61
Deoni	415.32	19.35	38.7	2	4
Jalkot	360.77	352.4	704.8	28	79
Latur	987.98	895.49	1790.98	70	198
Nilanga	1063.06	952.43	1904.86	75	210
Renapur	557.91	332.61	665.22	26	75
Udgir	730.46	494.50	988.99	39	111
Total	**7156.91**	**5001.035**	**10002.13**	**392**	**1112**

The volume of subsurface storage space available for AR storage is 200.04 MCM while the surplus availability is 106.66 MCM. The cumulative volume of water expected to be recharged by the Percolation Dams and Check Dams is84.37MCM as given in **Table 9.**

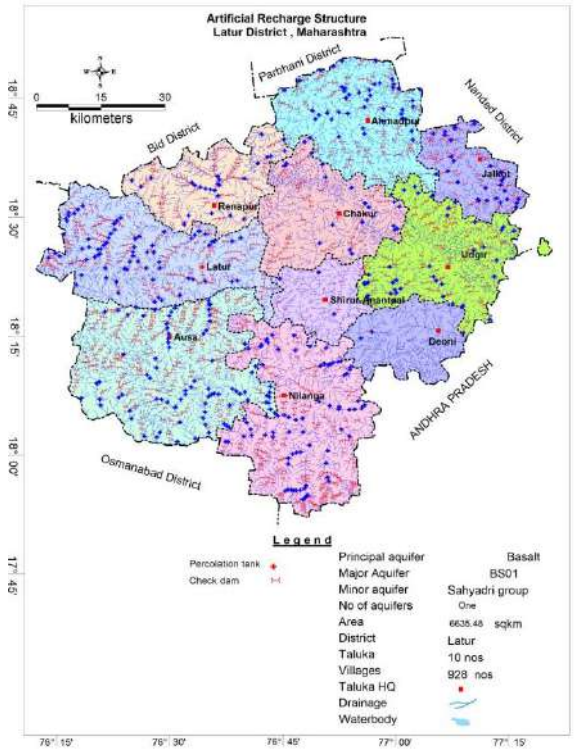


Figure 7.1: Proposed Artificial Recharge Structures

The rainwater harvesting in urban areas can be adopted in 25% of the household with 50 sq. km roof area. A total of 2.77 MCM potential can be generated by taking 80% runoff coefficient. However, it is not recommended as it is economically not viable.

Table 7.2: Volume of water expected to be recharged by Artificial Recharge structures

Block	Volume of Sub-surface storage space available for AR (MCM)	Surplus Water Available (MCM)	Volume of Water expected to be conserved/recharged @ 75% efficiency (MCM) by Percolation Tank	Volume of Water expected to be conserved/recharged @ 75% efficiency (MCM) by Check Dam	Total Volume of Water expected to be conserved/recharged @ 75% efficiency (MCM)
Ahmedpur	22.69	7.45	6.60	2.90	9.50
ShirurAnantpal	1.59	0.89	0.99	0.07	1.06
Ausa	43.05	24.11	12.66	5.42	18.08
Chakur	10.84	6.07	3.19	1.37	4.55
Deoni	0.77	0.33	0.23	0.10	0.33
Jalkot	14.10	7.89	4.14	1.78	5.92
Latur	35.82	20.06	10.53	4.51	15.04
Nilanga	38.10	21.33	11.20	4.80	16.00
Renapur	13.30	7.45	3.91	1.68	5.59
Udgir	19.78	11.08	5.82	2.49	8.31
Total	**200.04**	**106.66**	**59.26**	**25.11**	**84.37**

7.2 DEMAND SIDE MANAGEMENT

The Demand Side Management is proposed in areas where the Stage of Ground Water Development is relatively high andadopting micro-irrigation techniques for water intensive crops or change in cropping pattern or both are required to save water.**Fig 7.2**depicts the proposed demand side interventions of 7156.91 Sq Km area.

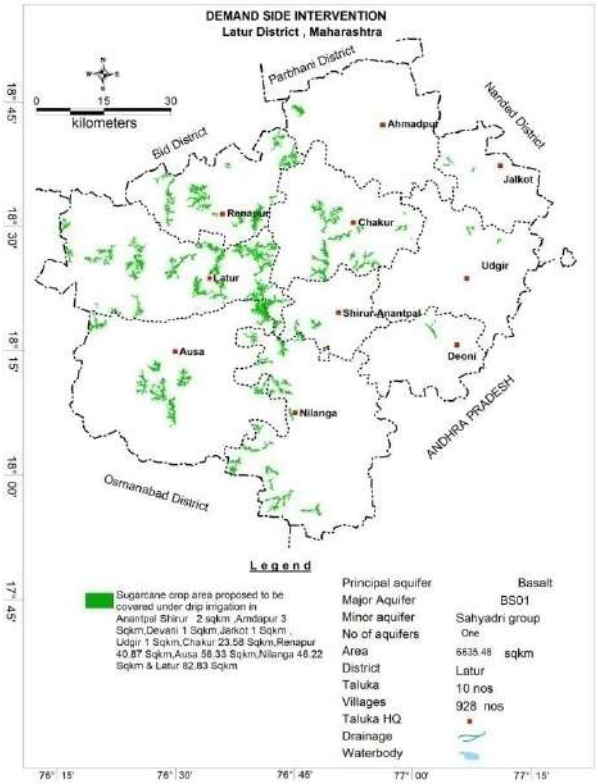


Figure 7.2: Demand Side Interventions proposed

The micro-irrigation techniques are proposed to be adopted in 257.8 Sq. Km area mostly in Ausa, Chakur, Latur, Nilanga and Renapurblocks by saving a total of 147 MCM as given **Table7.3**. No change in cropping patterns is proposed in any of the blocks.

Table 7.3: Demand side interventions proposed

Block	MICROIRRIGATION TECHNIQUES		CROPPING PATTERN CHANGE	
	Sugarcane cropped Area proposed (Sq. Km.)	**Volume of Water saved (MCM)**	**Area under Water Intensive crops (Sq. Km.)**	**Volume of Water saved by change in cropping pattern (MCM)**
Ahmedpur	3	1.71	Nil	Nil
ShirurAnantpal	2	1.14	Nil	Nil
Ausa	56.33	32.1081	Nil	Nil
Chakur	23.58	13.4406	Nil	Nil
Deoni	1	0.57	Nil	Nil
Jalkot	1	0.57	Nil	Nil
Latur	82.83	47.2131	Nil	Nil
Nilanga	46.22	26.3454	Nil	Nil
Renapur	40.87	23.30	Nil	Nil
Udgir	1	0.57	Nil	Nil
Total	**257.8**	**147.0**	**Nil**	**Nil**

7.3 EXPECTED BENEFITS

The impact of groundwater management plans on the groundwater system in the district after its implementation is evaluated and the outcome shows significant improvement in groundwater scenario in all blocks as given in the **Table 7.4**.

Table 7.4: Expected benefits after management options

Block	Additional Volume of Water Available for GWD to 70% (MCM)	Proposed No. of DW (@ 1.5 ham for 90% of GWR Available)	Proposed No. of BW (@ 1.5 ham for 10% of GWR Available)	Additional Area (Sq. Km.) proposed to be brought under assured GW irrigation with average CRW of 0.65 m
Ahmedpur	14.50	870	145	22.32
ShirurAnantpal	3.29	197	33	5.06
Ausa	40.06	2404	401	61.63
Chakur	7.11	427	71	10.95
Deoni	2.75	165	28	4.24
Jalkot	6.91	414	69	10.63
Latur	28.78	1727	288	44.28
Nilanga	15.81	949	158	24.33
Renapur	20.01	1201	200	30.79
Udgir	8.77	526	88	13.50
Total	**148.01**	**8881**	**1480**	**227.71**

7.4 DEVELOPMENT PLAN

The ground water development plan has been proposed in the view of developing the addition ground water resources available after supply side interventions to bring the stage of ground water up to 70%. The development is also proposed in those areas where the ground water development is less than 70%. The 148.01 MCM of volume of ground water generated can bring 227.71 sq km additional area under assured ground water irrigation with average crop water requirement of 0.65 m by constructing 8881 Dug wells and 1480 Borewells (**Table: 7.5). Fig 7.3** depicts the additional area proposed for ground water irrigation after 70% GW development.

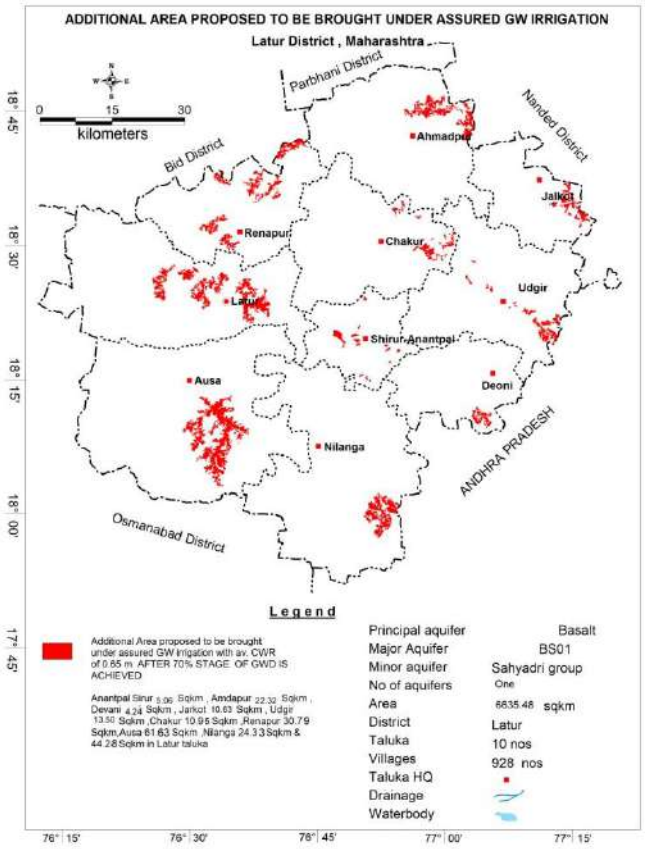


Figure 7.3: Additional Area proposed for GW irrigation

Table 7.5: Block wise additional area under Assured GW Irrigation

Block	Additional Volume of Water Available for GWD to 70% (MCM)	Proposed No. of DW (@ 1.5 ham for 90% of GWR Available)	Proposed No. of BW (@ 1.5 ham for 10% of GWR Available)	Additional Area (Sq. Km.) proposed to be brought under assured GW irrigation with average CRW of 0.65 m
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Udgir	8.77	526	88	13.50
Total	**148.01**	**8881**	**1480**	**227.71**

8.0 SUM UP

1. A thorough study was carried out based on data gap analysis, data generated in-house; data acquired from State Govt. departments and GIS maps prepared for various themes. All the available data was brought on GIS platform and an integrated approach was adopted for preparation of block wise aquifer maps and aquifer management plans of Amravati district.

2. Latur district covering an area of 7156.91 Sq Km has 521.43 sq km of which only 6635.48Sq Km area is mappable.Geologically, Basaltic lava flows of Deccan traps belonging to Late Cretaceous to Paleogene (68-62 million years in age) occupy the entire area of the districtwith a few inter-trappean beds. The stage of ground water development is 74.59 %.The area has witnessed Declining water level trend, Overexploitation,declining rainfall trend, fluoride and nitrate contamination and low yield potential aquifers, being the major issues in the district. Declining water level trend @ 0.0 to 0.7138 m/year is observed in about 5796 Sq Km areaduring pre-monsoon. During post monsoon.declining water level trend@ 0.0 to 0.79 m/year is observed in about 5637 Sq Km.

3. The management plan has been proposed for all theblocks of Latur district to manage the ground water resources and to arrest further decline in water levels. The management plan comprises two components namely supply-side management and demand side management. As a part of Supply side Management, a total 392 Percolation tanks and1112 Check dams are proposed, which will augment ground water resources to the tune of 84.37 MCM (59.26MCM by Percolation tanks and25.11 MCM by Check dams).

4. In Latur District, a total 84.37 MCM ground water resources will be augmented after adopting artificial recharge

5. As a part of Demand side Management, micro-irrigation techniques are to be adopted in257.8 Sq. Km area thereby saving a total of 147MCM. No change in cropping patterns is proposed in any of the blocks.

6. The ground water development plan has been proposed in the view of developing the addition ground water resources available after supply side interventions to bring the stage of ground water up to 70%. The 148.01 MCM volume of ground water generated can bring 227.71 sq km additional area under assured ground water irrigation with average crop water requirement of 0.65 m by constructing 8881Dug wells and 1480 Borewells.

7. These interventions also need to be supported by regulation of deeper aquifer and hence it is recommended to regulate/ban deeper tube wells/borewells of more than 60 m depth in these blocks, so that the deeper ground water resources are protected for future generation and also serve as ground water sanctuary in times of distress/drought. IEC activities and capacity building activities needs to be aggressively propagated to establish the institutional framework for participatory ground water management.

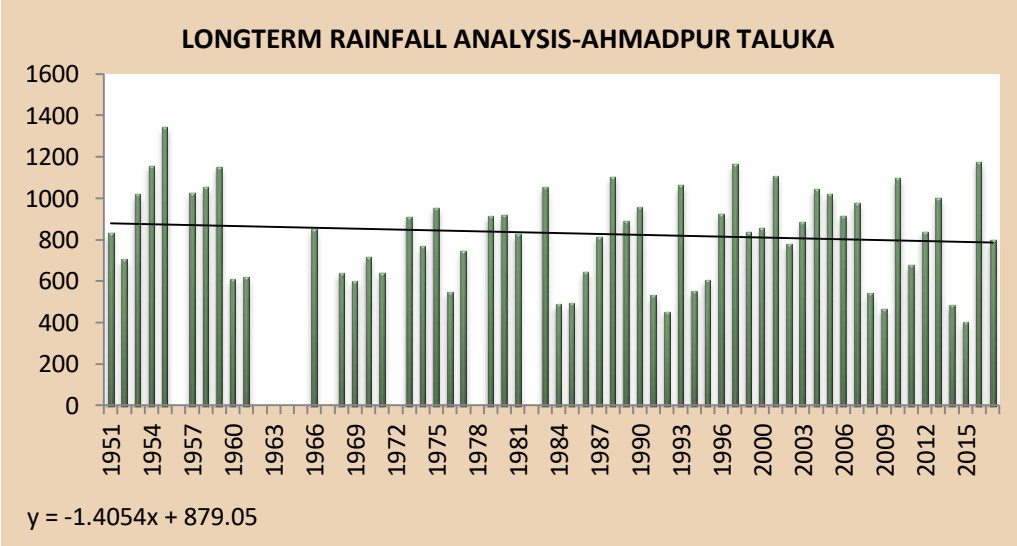
BLOCKWISE AQUIFER MAP AND MANAGEMENT PLAN

- AHMADPUR BLOCK
- RENAPUR BLOCK
- AUSA BLOCK
- CHAKUR SURJI BLOCK
- DEONI BLOCK
- JALKOT BAZAR BLOCK
- LATUR BLOCK
- NILANGA BLOCK
- RENAPUR BLOCK
- UDGIR BLOCK

1. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, AHMADPUR BLOCK, LATUR DISTRICT

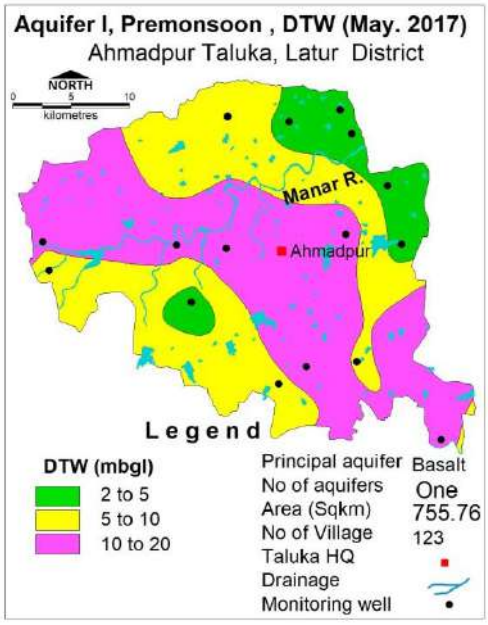
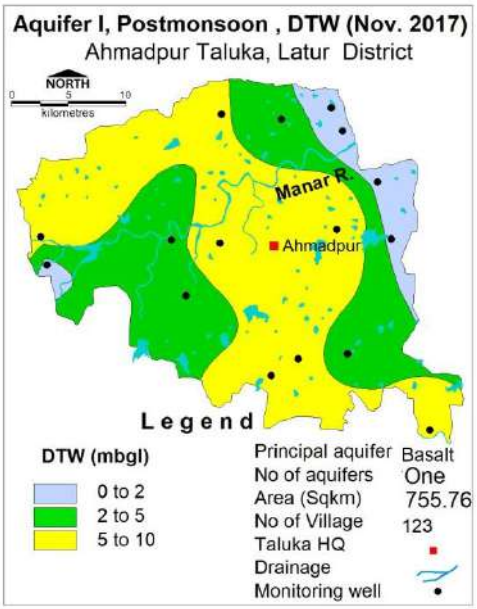
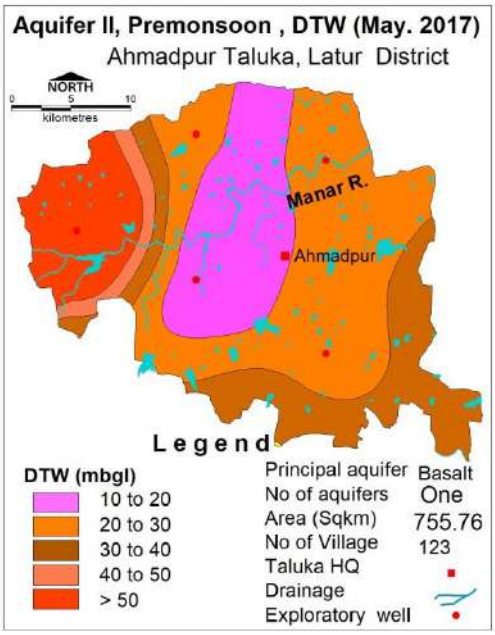
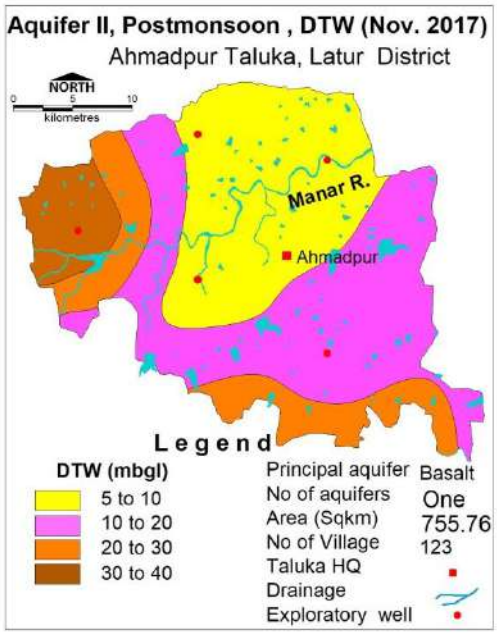
1. SALIENT INFORMATION	
1.1.Introduction	
Block Name	Ahmadpur
Geographical Area (Sq. Km.)	755.76 Sq. Km.
Hilly Area (Sq. Km)	68.49 Sq. Km.
Poor Quality Area (Sq. Km.)	Nil
Population (2011)	236168
Climate	Tropical climate
1.2. Rainfall Analysis	
Normal Rainfall	828.5 mm
Annual Rainfall (2017)	799.4 mm
Decadal Average Annual Rainfall (2008-17)	748.53 mm
Long Term Rainfall Analysis (1951-2017)	Falling Trend:-1.405 m/year. Probability of Normal/Excess Rainfall-54% & 21%. Probability of Drought (Moderate/Severe / Acute)-: 23% Moderate & 2 % Severe. Frequency of occurance of Drought:1 in 4 years

RAINFALL TREND ANALYSIS (1951 to 2017)



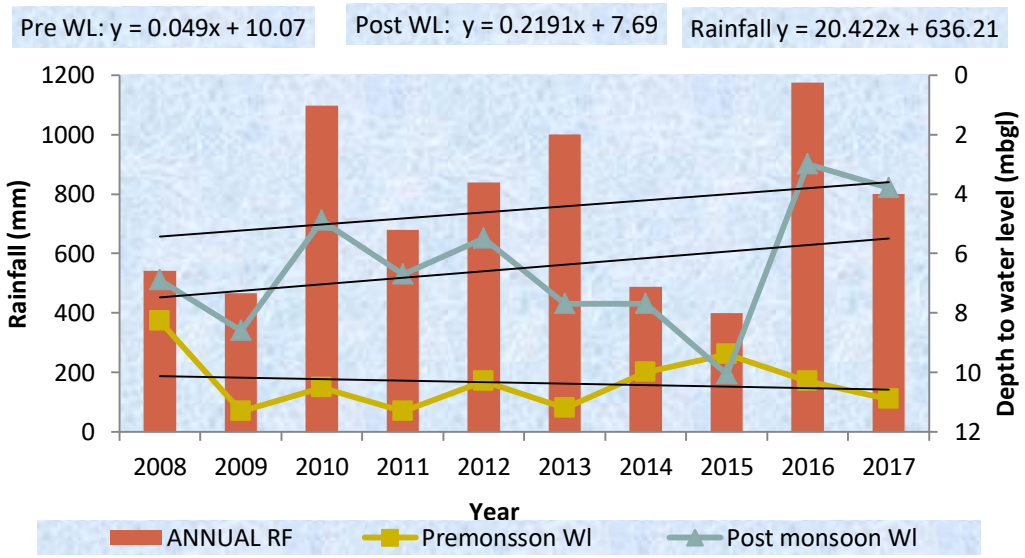
1.3. Geomorphology,Soil&Geology	
Geomorphic Unit	➢ Denudational Slope on Deccan Traps ➢ Region of Low Level Plateau on Deccan Traps between 350 to 550 m elevation
Soil	➢ Medium Deep Soils of 18-36 inch thickness; dark brown to dark gray brown in colour; clay-loam to clayey in texture with granular to sub-granular nature; blocky in structure occurs in major part of the block. ➢ Shallow Soils of 0-9 inch thickness; brown to dark

	grey brown in color; loamy to clay-loam in texture with granular to sub-granular nature; blocky in structure ➢ Deep Soils of 36 inch thickness, clayey in texture and sub-angular blocky to blocky in structure occurs along the river valleys.	
Geology	Recent River Alluvium &Deccan Traps (Basalt) ofLate Cretaceous to Early Eocene Age	
1.4.Hydrology & Drainage		
Drainage	ManarRiverforms the main drainage system of the block.	
Hydrology	Major & Medium Irrigation Projects (>250 Ha) *(Reference Year: 2012-13)*	Nil
	Minor Irrigation Projects (0 to 250 Ha) *(Reference Year: 2016-17)*	Completed:-64 projects; Ongoing: 10 projects
1.5.LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN		
Geographical Area	755.76 Sq. Km.	
Forest Area	2.29 Sq. Km.	
Cultivable Area	863.10 Sq. Km.	
Net Sown Area	683.36. Km.	
Double Cropped Area	179.74 Sq. Km.	
Area under Irrigation *(Reference Year: 2016-17)* – Surface Water	31.64 Sq . Km.	
Area under Irrigation *(Reference Year: 2016-17)* – Ground Water	58.76 Sq. Km.	
Principal Crops	**Crop Type**	**Area (Sq. Km.)**
	Pulses	14.58
	Cotton	1.07
	Cereals	0.79
	Oil Seeds	_
Horticultural Crops	Sugarcane	45.60
	Others	3.59
1.6.WATER LEVEL BEHAVIOUR		
1.6.1. Aquifer-I/Shallow Aquifer (Phreatic Aquifer)		
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**	
➢ Shallow water Level <5 mbgl is observed in 85 Sq Km area as a small single patch in the northeastern end of the taluka and as a small isolated patch in the southwestern part. ➢ About 315 Sq Km area of the block	➢ Shallow water Level less than 5 mbgl is observed in 58 Sq Km area along a single patch in the northeastern end of the taluka. ➢ About 284 Sq Km area of the block has depth to water level between 5 mbgl	

have depth to water level in the range of 5 to 10 mbgl. ➢ About, 368 Sq Km area diagonaly across the block extending from north-west to south-east has deeper depth to water level between 10 mbgl and 20 mbgl	and 10 mbgl observed in the south western parts of the block. ➢ About, 425 Sq Km area has depth to water level between 5 mbgl and 10 mbgl in the northern and north-central parts of the block.
Water Level Map- Aquifer-I/Shallow Aquifer (Phreatic Aquifer)	
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (Nov.2017)**
	
1.6.2. Aquifer-II/Deeper Aquifer (Semiconfined/Confined Aquifer)	
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**
	

Pre-Monsoon Water Level(May 2017)	Post-Monsoon Water Level(November 2017)
➢ Depth to water level between 10 mbgl and 20 mbgl is observed in 163 Sq Km area in thecentre of taluka. ➢ The deeper depth to water level between 20 mgl and 30 mbgl is observed in about 329 Sq Km area in major portions in northeast and southeast directions and small portions in northwest and southwest direction. ➢ The depth to water level more than 30 mbgl is observed along the peripherals of the taluka covering 275 Sq Km area reaching upto water level more than 50 mbgl in 101 Sq Km area in western end of the taluka.	➢ The shallow depth to water level between 5 mbgl and 10 mbgl is observed in 275 Sq Km area of the block along the main drainage of Manarriver in northern and northeastern parts of the districts. ➢ The depth to water level between 10 mbgl and 20 mbgl is observed in about 312 Sq Km area along eastern, southeastern and southwestern parts of the district. ➢ The deeper depth to water level more than 20 mbgl is observed along the peripherals of the taluka covering 180 Sq Km areas in southern, southerastern and western parts of the taluka.

1.7. Hydrograph



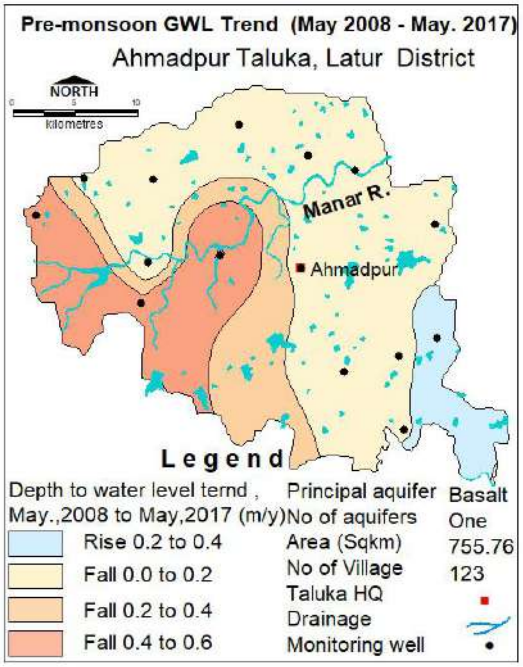
The hydrograph of CGWB Monitoring site at Ahmedpurfor the period 2008 to 2017 shows:

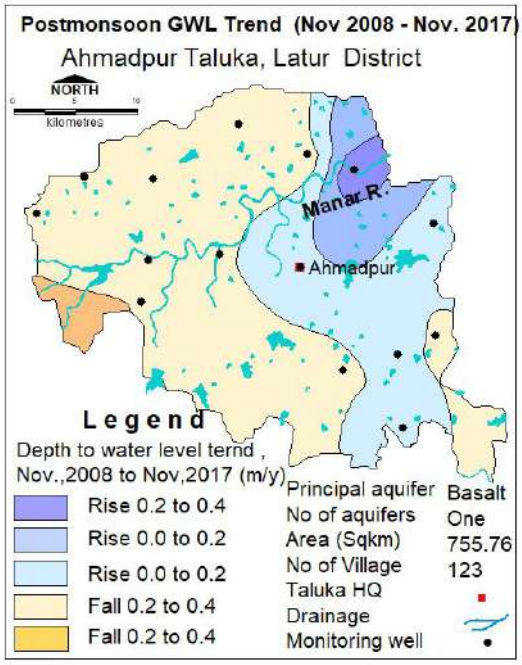
- A falling trend during premonsoon@ 0.049 m/year and a rising trend during postmonsoon @0.219 m/year respectively.
- The depth to water level during premonsoon ranges from 8.27 mbgl to 11.3 mbgl due to overdraft of ground water in dry season.
- The depth to water level during postmonsoon ranges from 3mbgl to 8 mbgl during postmonsoon except in the years 2009 and 2015 when the rainfall recharge was less due to drought conditions.

1.8. Water Level Trend (2008-17)

Pre-Monsoon Trend (May 2008-2017)	Post-Monsoon Trend (November 2008-2017)

Rising Trend @	Falling Trend @	Rising Trend @	Falling Trend @
0.0 to 0.2 m/year in 57.74 Sq Km area	0.0 to 0.2 m/year in 415 Sq Km area; 0.2 to 0.4 m/year in 126 Sq Km area and 0.4 to 0.6 m/year in 155.3 Sq Km area.	0 to 0.2 m/year in 210 Sq Km area; 0.2 to 0.4 m/year in 57.39 Sq Km area and 0.4 to 0.6 m/year in 15 Sq Km area.	0 to 0.2 m/year in 451 Sq Km area and 0.2 to 0.4 m/year in 20.54 Sq Km area.
Pre-Monsoon WL Trend (May 2007-2016)		**Post-Monsoon WL Trend (Nov.2007-2016)**	

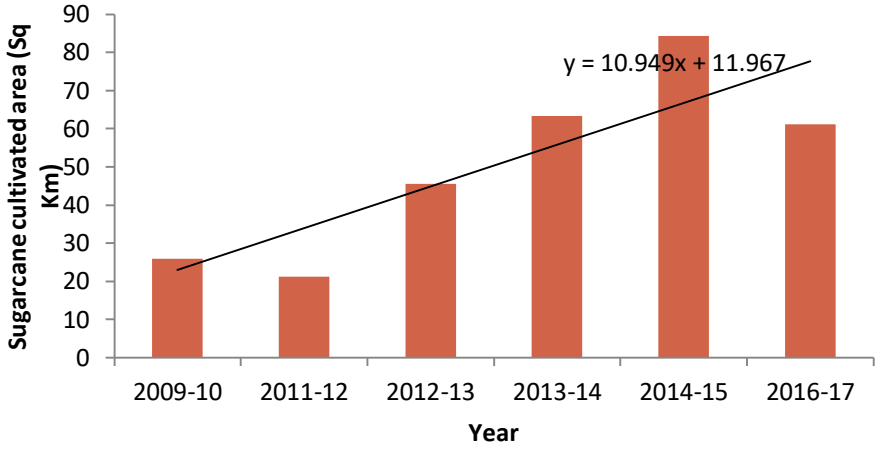




2. GROUND WATER ISSUES

1) **Overexploitation of Ground Water: -**

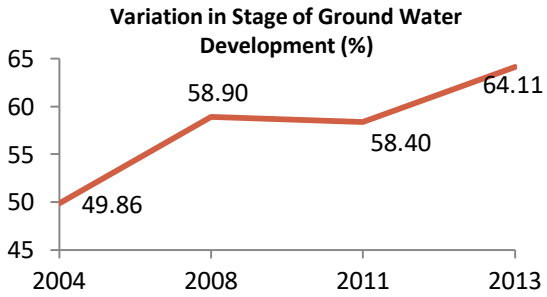
The sugarcane cultivation in the block has increased @ 10.94 Sq Km area per year since 2009-10. The Sugarcane being a Perenial crop, there is a high dependency in ground water for agricultural purposes. This has resulted in overexploitation of ground water.

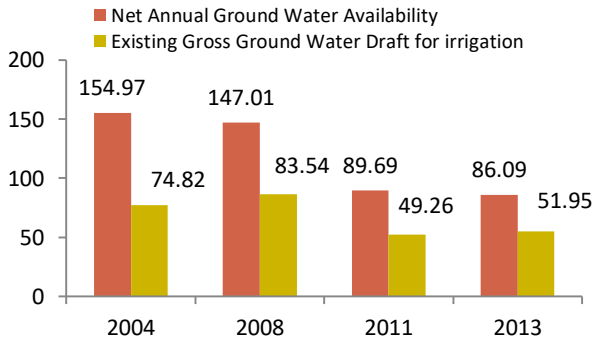


2) **Declining Water Level Trend: -**

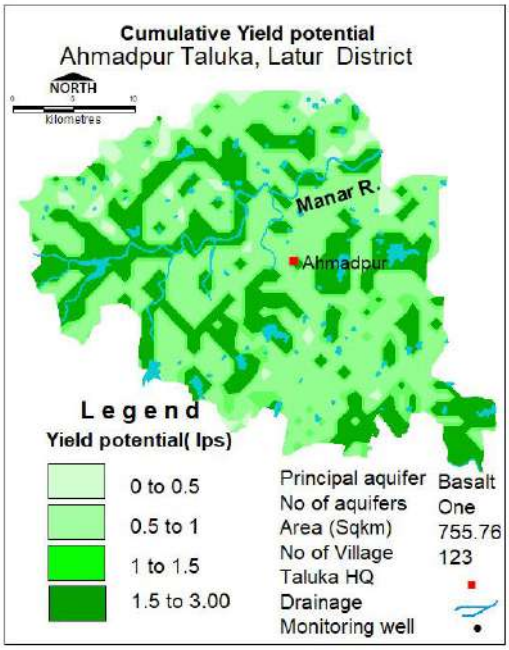
The decline in water level trend despite the increase in rainfall @ 20 mm/year is due to the exploitation of shallow aquifers.The dependency in ground water for irrigation during both Kharif and Rabi season due to lack of availability of surface water has resulted in the overexploitation of ground water. More than 60 % of the net ground water availabilty (as per GEC2013) is utilised for irrigation purposes in the block.

3) **Increase in stage of ground water Development: -**Despite being in Safe category,the stage of ground water development has increased 28% from 49.87 % (2004) to 64.11% (2013). This is due to increase in gross draft for all purposes and decrease in net ground water availabiltydespite increasing trend of rainfall @20.4 mm/year.



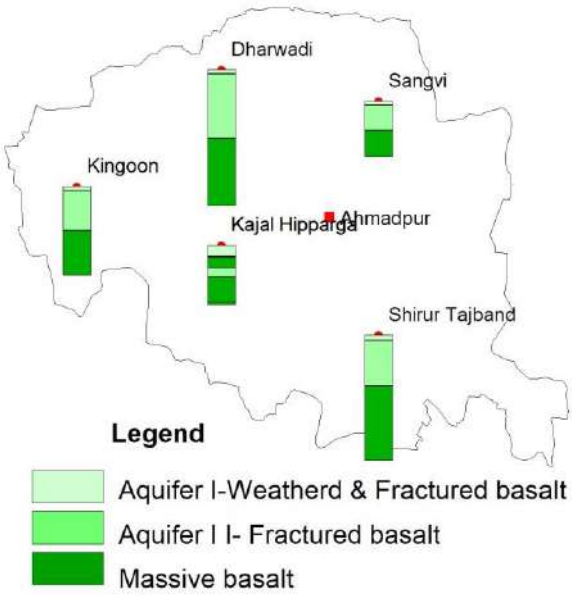


4) **Low Yielding Aquifers**: The yield of the aquifer in major parts of the block is less than 1 lps. This is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.

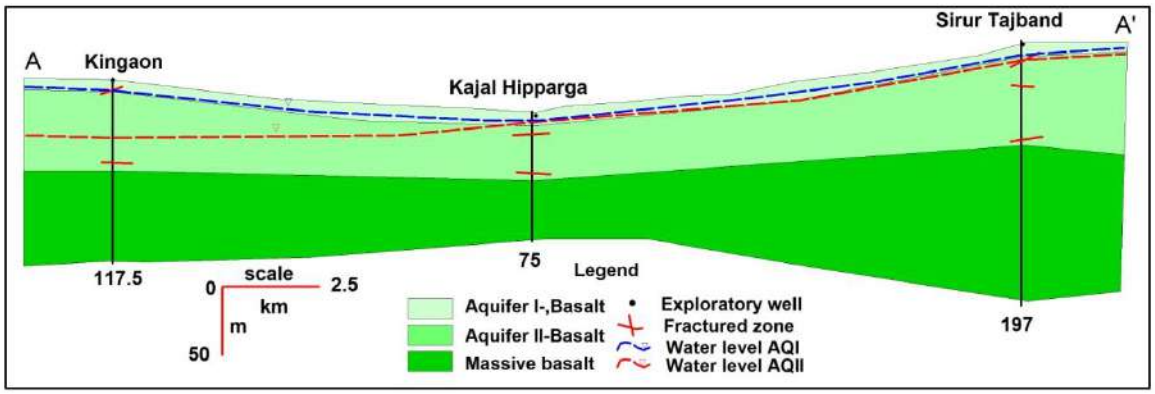


3. AQUIFER DISPOSITION	
3.1. Number of Aquifers (Major)	One: 1) Basalt –Aquifer-I, Aquifer-II

3.2. LITHOLOGICAL DISPOSITION

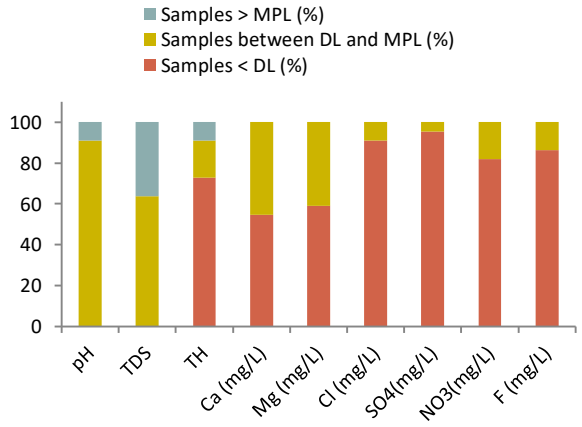


3.3. CROSS SECTIONS



3.4 AQUIFER CHARACTERISTICS

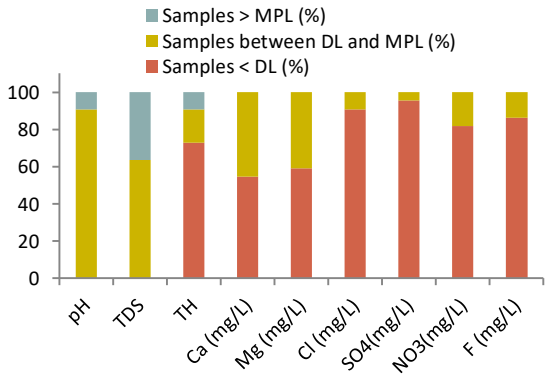
Major Aquifer	Basalt (Deccan Traps)	
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II (Semiconfined /confined)
Depth to bottom of aquifer (mbgl)	9 to 16	110 to 150
Weathered/ Fractured rocks thickness (m)	5.4 to 12.8	3 to 8.9
Yield Potential	0 to 100 m^3/day	0 to 1.2 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.0000145
Transmissivity (T)	T: 3 to 25 m^2/day	
4.CHEMICAL QUALITY OF GROUND WATER &CONTAMINATION		
4.1 Aquifer I/Shallow Aquifer		

Suitability for Drinking Purposes	Suitability for Irrigation Purposes
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except at areas with EC > 2250 microsiemens/cm. About 491 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm whereas 265 sq Km area has EC between 750 and 2250 microsiemens/cm. An isolated patch covering 13 Sq Km area in the northeastern part of the block has EC > 2250 microsiemens/cm. ➢ Nitrate contamination with nitrate more than 45 mg/l is observed in 3 sites ➢ Flouride contamination is observed in one site. The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards is as given below for a total of 22 samples analysed are as given below:  	➢ In major parts of the block covering 491 Sq Km area, plants with moderate salt tolerance can be grown. However, in 265 Sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ The SAR valuesofall the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground is good for irrigation. Hence, the overall quality of ground water is suitable for irrigation purposes. ➢ About 41% of the analysed samples have % Na less than 20; 45% have %Na between 20 and 40 and 18% have %Na between 40 and 60 indicating that the ground water is good for irrigation. Hence, the overall quality of ground water is suitable for irrigation purposes.
4.1 Aquifer III/Deeper Aquifer	
Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes. About 250 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm whereas 519 sq Km area has EC between 750 and 2250 microsiemens/cm. ➢ Nitrate contamination with nitrate	➢ In major parts of the block covering 250 Sq Km area, plants with moderate salt tolerance can be grown. However, in 519 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ The SAR values of all the analysed

more than 45 mg/l is observed in one site and

- Flouride contamination is observed in two sites.

The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standardsfor a total of 9 samples analysed are as given below:



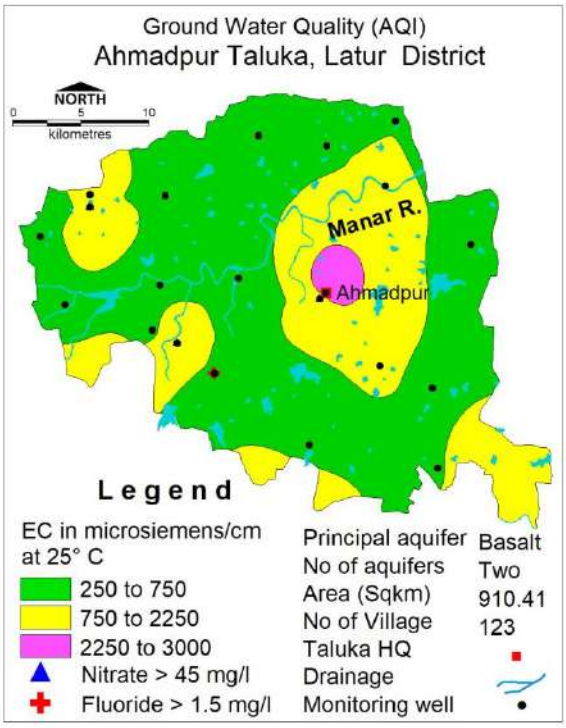
samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation.

- The RSC values of 67%of analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. However, 37% of samples show RSC >1.25 meq/l indicating deteriorating quality of ground water resulting in sodicity hazard.
- About 44% of the analysed samples have % Na between 20 and 40; 44% have %Na between 40 and 60 and 12% have %Na more than 60.

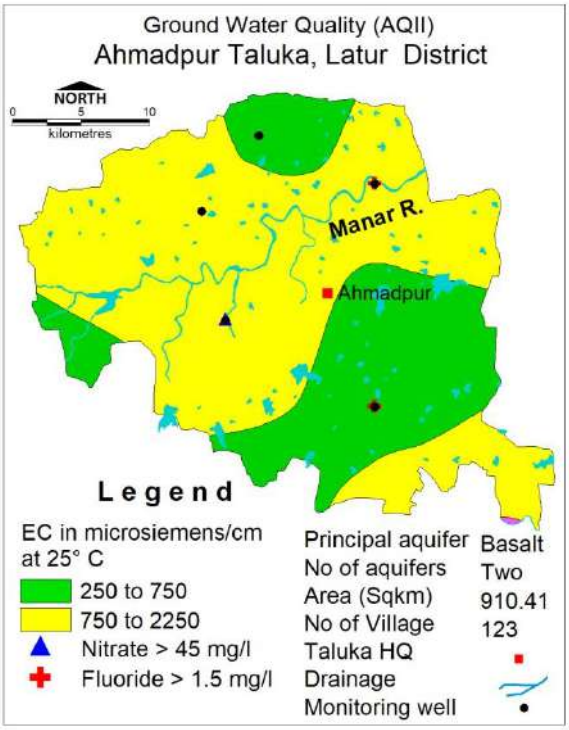
Hence, the overall quality of ground water is suitable for irrigation purposes except in areas where %Na is more than 60.

3.2.CHEMICAL QUALITY MAP

Phreatic Aquifer (Aquifer-I)



Semiconfined/Confined Aquifer (Aquifer II &III)



5. GROUND WATER RESOURCE & EXTRACTION

Aquifer-I/ Phreatic Aquifer (Basalt & Alluvium)

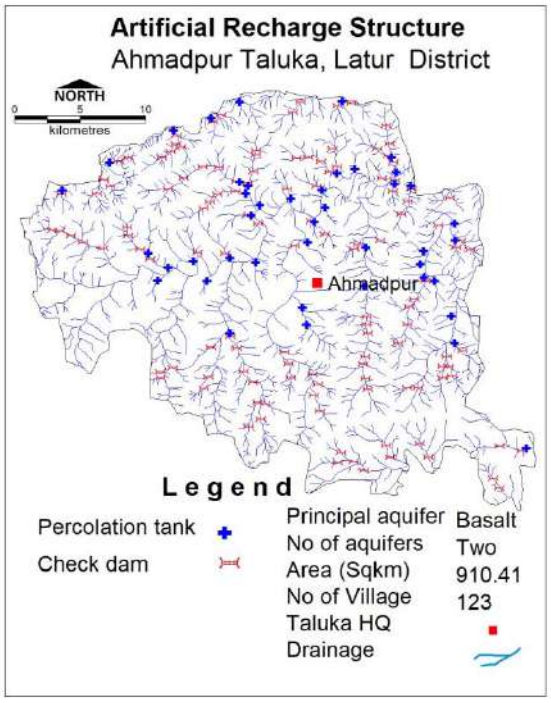
Ground Water Recharge Worthy Area (Sq. Km.)	687.27
Total Annual Ground Water Recharge (MCM)	90.62

Natural Discharge (MCM)			4.53	
Net Annual Ground Water Availability (MCM)			86.09	
Existing Gross Ground Water Draft for irrigation (MCM)			50.96	
Existing Gross Ground Water Draft for domestic and industrial water supply(MCM)			3.16	
Existing Gross Ground Water Draft for All uses(MCM)			54.12	
Net Ground Water Availability for future irrigation development(MCM)			28.73	
Provision for domestic and industrial requirement supply to 2025(MCM)			6.25	
Stage of Ground Water Development %			62.87	
Category			**SAFE**	
Aquifer-II				
Semiconfined/Confined Aquifer (Basalt)				
Total Area (Sq. Km.)	Mean aquifer thickness (m)	Sy	Peizometric Head (m aboveconfining layer)	Total Resource (MCM)
755.76	3.5	0.002	66	13.94
5.0. GROUND WATER RESOURCE ENHANCEMENT				
Available Resource (MCM)		86.09		
Gross Annual Draft (MCM)		54.12		
5.1.SUPPLY SIDE MANAGEMENT				
SUPPLY (MCM)				
Agricultural Supply -GW		50.96		
Agricultural Supply -SW		3.03		
Domestic Supply - GW		3.16		
Domestic Supply - SW		0.79		
Total Supply		**57.94**		
Area of Block (Sq. Km.)		755.76		
Area suitable for Artificial recharge(Sq. Km)		687.27		
Type of Aquifer		Hard Rock	Soft Rock	
Area feasible for Artificial Recharge(WL >5mbgl) (Sq. Km.)		567.36	-	
Volume of Unsaturated Zone (MCM)		1134.71	-	
Average Specific Yield		0.020	-	
Volume of Sub surface Storage Space available for Artificial Recharge (MCM)		22.69	-	
Surplus water Available (MCM)		12.71	-	
Proposed Structures		**Percolation Tank** (Av. Gross Capacity-100	Check Dam (Av. Gross Capacity-10 TCM * 3 fillings =	**Recharge shaft** (Av. Gross Capacity-60

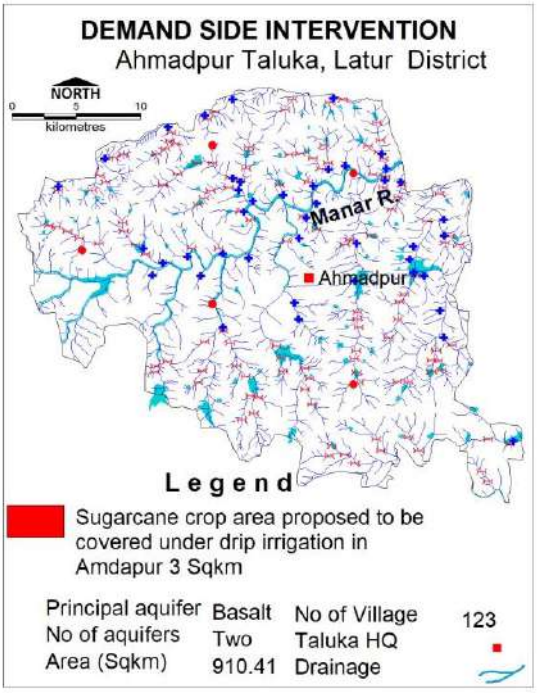
	TCM*2 fillings = 200 TCM)	30 TCM)	TCM)
Number of Structures	44	129	0
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	6.6	2.9025	0
Area of Saline Patch	**Nil**		
Proposed Structures	Nil		
No of farm pond proposed (size: 30m*30m*3) with 3 filling= 0.0081 mcm capacity, 50% available water may be utilized for harvesting through farm ponds.	Nil		
Volume of water available for harvesting	Nil		
Additional volume created by desilting	**Nil**		
RTRWH Structures – Urban Areas			
Households to be covered (25% with 50 m^2area)	9789		
Total RWH potential (MCM)	0.366		
Rainwater harvested / recharged @ 80% runoff co-efficient	0.293 (**Economically not viable & Not Recommended)**		
5.2.DEMAND SIDE MANAGEMENT			
Micro irrigation techniques			
Remaining ground water irrigated Sugarcane cropped area proposed through drip irrigation	3		
Volume of Water expected to be saved (MCM). (Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m)	1.71		
Proposed Cropping Pattern change			
Irrigated area under Water Intensive Crop(ha)	Not proposed		
Water Saving by Change in Cropping Pattern	Nil		
5.3.EXPECTED BENEFITS			
Net Ground Water Availability (MCM)	86.09		
Additional GW resources available after Supply side interventions (MCM)	9.5025		
Ground Water Availability after Supply side intervention	95.59		
Existing Ground Water Draft for	54.12		

All Purposes (MCM)	
Saving of Ground Water through demand side intervention (MCM)	1.71
GW draft after Demand Side Interventions (MCM)	52.41
Present stage of Ground Water Development (%)	62.87
Expected Stage of Ground Water Development after interventions (%)	54.83
Other Interventions Proposed, if any	
Alternate Water Sources Available	Nil
5.4.RECOMMENDATION	
Ground water development is recommended to bring the stage of development from 54.01% to 70%	
5.5.DEVELOPMENT PLAN	
Volume of water available for GWD to 60% (MCM)	14.50
Proposed Number of DW(@ 1.5 ham for 90% of GWR Available)	870
Proposed Number of BW(@ 1.5 ham for 10% of GWR Available)	145
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	22

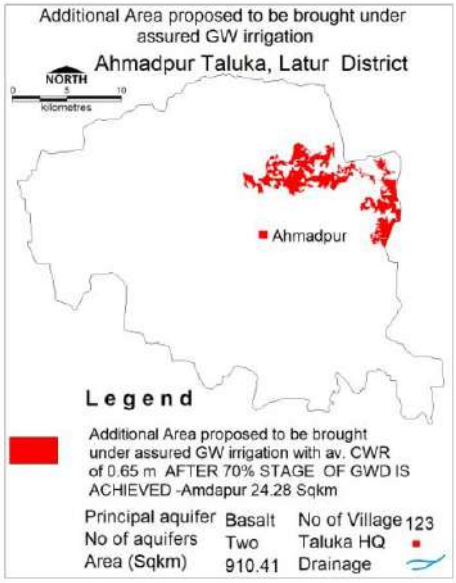
Proposed Artificial Recharge Structure



Additional Area proposed to be brought under Assured Ground Water Irrigation



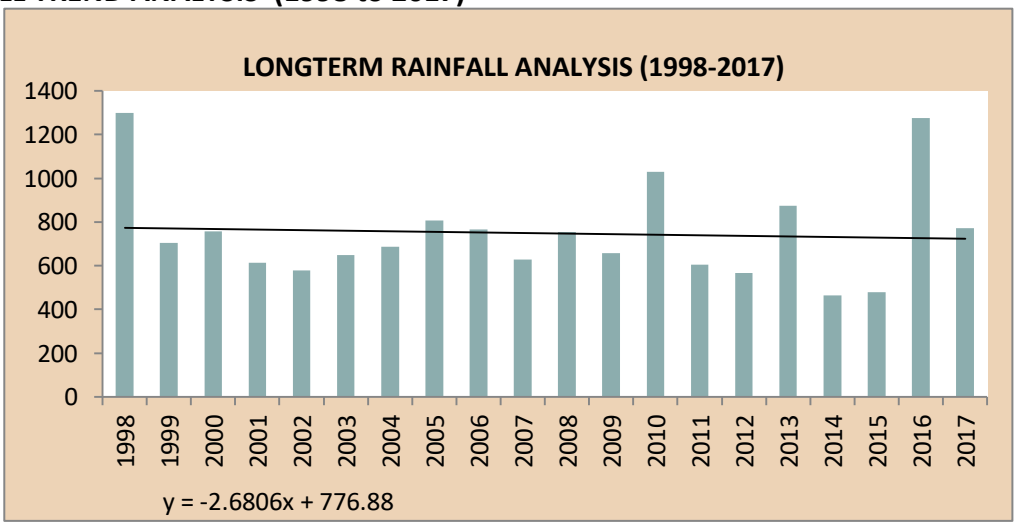
Addditional Area proposed to be brought under assured ground water irrigation


Additional Area proposed to be brought under assured GW irrigation
Ahmadpur Taluka, Latur District
NORTH
0 5 10
kilometres
Ahmadpur
Legend
Additional Area proposed to be brought under assured GW irrigation with av. CWR of 0.65 m AFTER 70% STAGE OF GWD IS ACHIEVED -Amdapur 24.28 Sqkm
Principal aquifer Basalt
No of aquifers Two
Area (Sqkm) 910.41
No of Village 123
Taluka HQ
Drainage

2. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, ANANTPAL SHIRUR BLOCK, LATUR DISTRICT

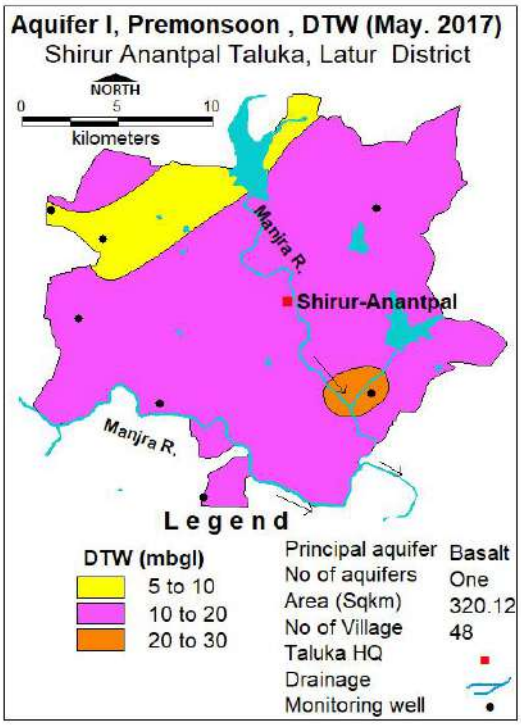
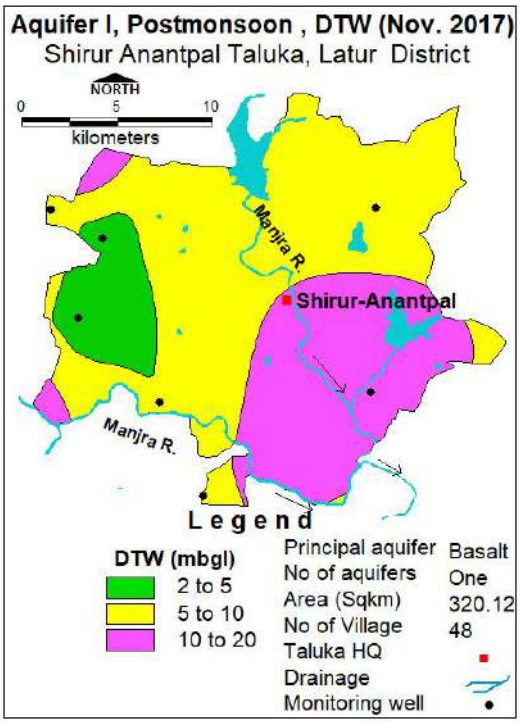
1.0 SALIENT INFORMATION	
1.1.Introduction	
Block Name	AnantpalShirur
Geographical Area (Sq. Km.)	320.12 Sq. Km.
Hilly Area (Sq. Km)	25.43
Poor Quality Area (Sq. Km.)	-
Population (2011)	83,528
Climate	Tropical climate
1.2. Rainfall Analysis	
Normal Rainfall	748.7 mm
Annual Rainfall (2017)	771.9 mm
Decadal Average Annual Rainfall (2008-17)	748.09 mm
Long Term Rainfall Analysis (1998-2017)	Falling Trend- -2.681 mm/year. Probability of Normal/Excess Rainfall-75% &15%. Probability of Drought (Moderate/Severe / Acute)-: 10% Moderate Frequency of Drought: 1 in 10 years

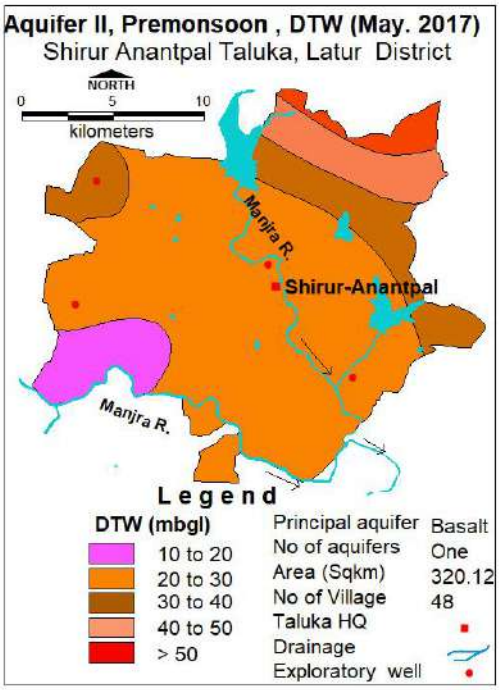
RAINFALL TREND ANALYSIS (1998 to 2017)

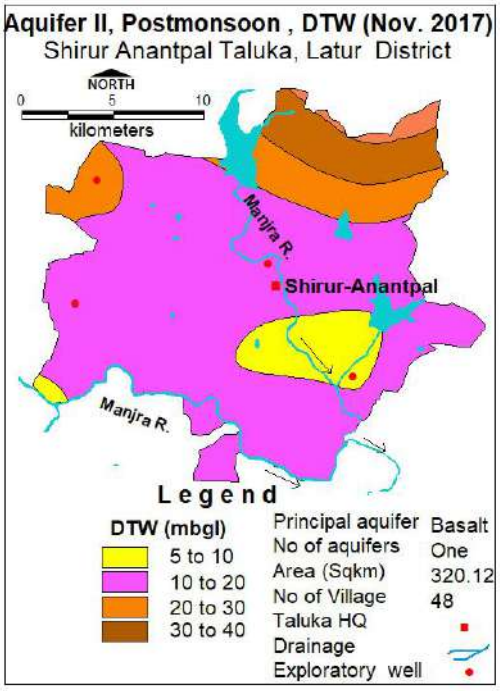


1.3. Geomorphology,Soil&Geology	
Geomorphic Unit	➢ Older Flood Plain ➢ Flood Plain (including Infilled River) ➢ Denudation Slope on Deccan Traps
Soil	➢ Medium Deep Soils of 18-36 inch thickness; dark brown to dark gray brown in colour; clay-loam to clayey in texture with granular to sub-granular nature; blocky in structure occurs in major part of the block. ➢ Deep Soils of 36 inch thickness, clayey in texture

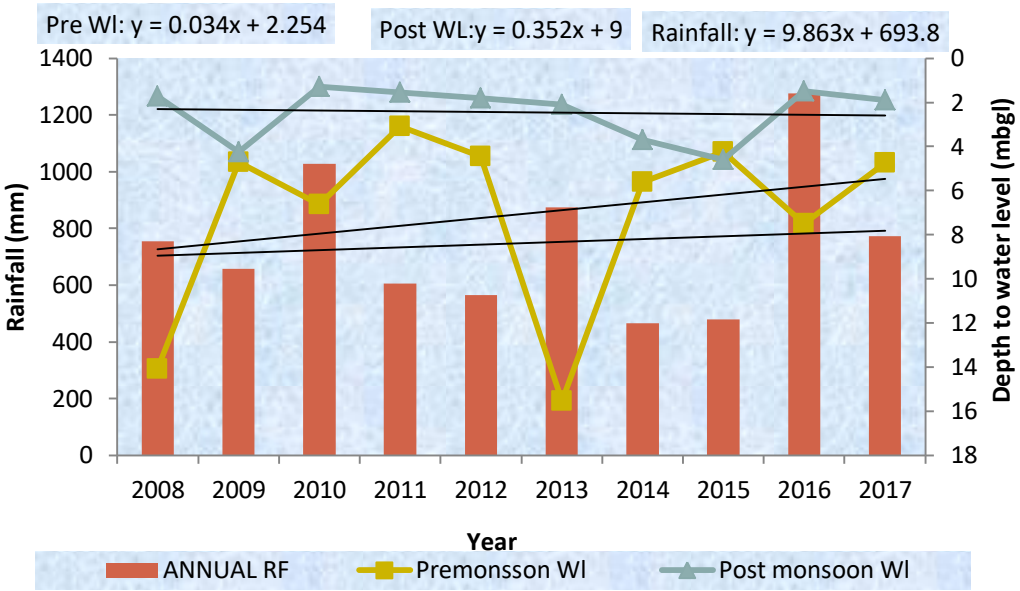
	and sub-angular blocky to blocky in structure occurs along the river valleys. ➢ Shallow Soils of 0-9 inch thickness; brown to dark grey brown in color; loamy to clay-loam in texture with granular to sub-granular nature; blocky in structure	
Geology	Recent River Alluvium & Deccan Traps (Basalt) of Late Cretaceous to Early Eocene Age	
1.4. Hydrology & Drainage		
Drainage	GharniRiver which forms the left hand tributary of Manjra river is the main drainage system of the block.	
Hydrology(as on March 2013)	Major Irrigation Projects (>250 Ha) *(Reference Year: 2012-13)*	Nil
	Minor Irrigation Projects (0 to 250 Ha) *(Reference Year: 2016-17)*	Completed:-62 projects; Ongoing: 4 projects
1.5. LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN		
Geographical Area	320.12Sq. Km.	
Forest Area	3.47 Sq. Km.	
Cultivable Area	Not available	
Net Sown Area	Not available	
Double Cropped Area	179.74 Sq. Km.	
Area under Irrigation – Surface Water	10.32 Sq Km	
Area under Irrigation – Ground Water	19.16Sq. Km.	
Principal Crops	**Crop Type**	**Area (Sq. Km.)**
	Cereals	43.53
	Pulses	32.62
	Oil Seeds	_
Horticultural Crops	Sugarcane	15.02
	Others	0.81
1.6.WATER LEVEL BEHAVIOUR		
1.6.1. Aquifer-I/Shallow Aquifer (Phreatic Aquifer)		
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**	
➢ Shallow water Level between 5 mbgl and 10 mbgl is observed only in 37.81 Sq Km area along asmall patch extending in northwest-north direction. ➢ In about 280.5 Sq Km area, the depth to water level in the range of 10 mbgl and 20 mbgl exists. ➢ The depth to water level more than 20 mgl is observed as a small	➢ Shallow water Level less than 5 mbgl is observed in 32 Sq Km area in the eastern part of the block. ➢ In about189 Sq Km area occupying the major parts of the block except southeastern partshave shallow depths to water level between 5 mbgl and 10 mbgl. ➢ About 104 Sq Km area occupying the southeastern parts of the block has	

isolated patch in southeastern part of the block covering only 6 Sq Km area.	depth to water level more than 10 mbgl.
Water Level Map- Aquifer-I/Shallow Aquifer (Phreatic Aquifer)	
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (Nov.2017)**
	
1.6.2. Aquifer-II/Deeper Aquifer (Semiconfined/Confined Aquifer)	
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**
➢ The depth to water Level between 10 mbgl and 20 mbgl is observed only in 23 Sq Km area as a small isolated patch in the southwestern end of the block. ➢ In about 220 Sq Km area, the depth to water level in the range of 20 mbgl and 30 mbgl is observed. ➢ The deeper depth to water level more than 30 mbgl is observed in 81 Sq Km area as parallel streches in the north-north-east trending direction along the northeastern parts of the district.	➢ Shallow water Level between 5 mbgl and 10 mbgl is observed in 27.6 Sq Km area in small patches in the southeastern part of the block. ➢ In about231 Sq Km area occupying the major parts of the block have depths to water level between 10 mbgl and 20 mbgl. ➢ The deeper depth to water level more than 20 mbgl is observed as parallel stretches in the northeastern pasrts of the block.
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (November 2017)**





1.7. Hydrograph

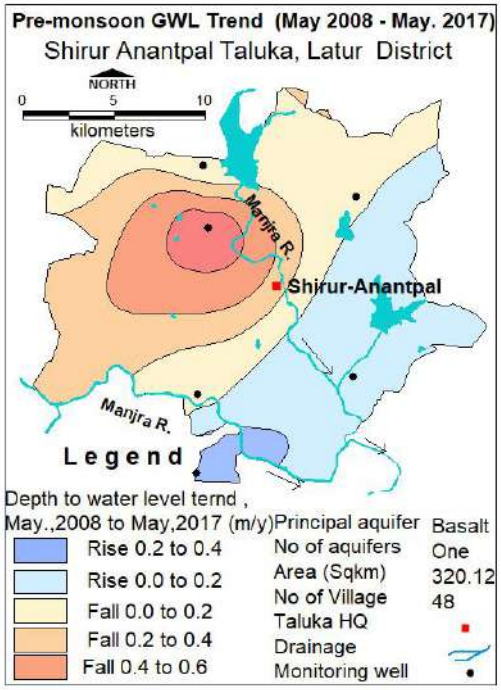
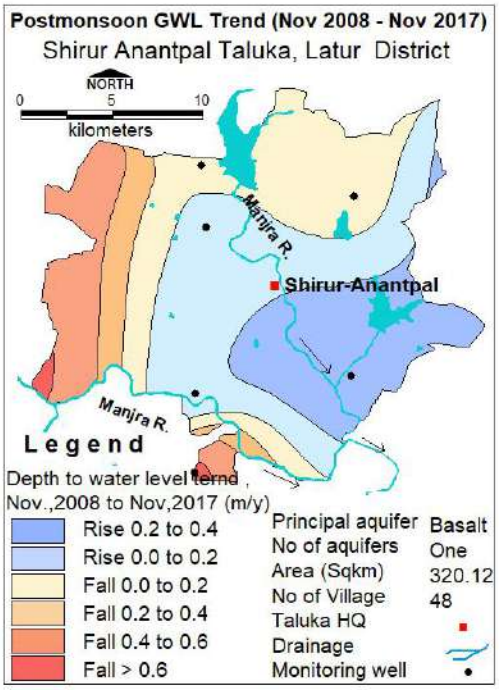


The hydrograph of CGWB Monitoring site at Pandharwadifor the period 2008 to 2017 shows:

- A rising trend @ 0.034 m/year during pre-monsoon and a falling trend @ 0.352 m/year during postmonsoon.
- The depth to water level during premonsoon ranges from 3.1 mbgl to 15.55 mbgl with deeper depths to water level during 2008 and 2013 respectively @ 14.1 mbgl and 15.55 mbgl.
- The depth to water level during postmonsoon ranges from 1.3 mbgl to 4.6 mbgl during postmonsoon due to increase in rainfall trend @ 9.8m/year.

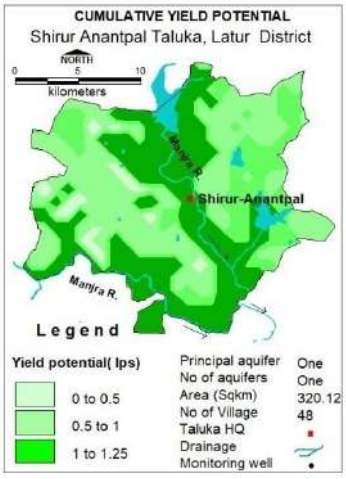
1.8. Water Level Trend (2008-17)

Pre-Monsoon Trend (May 2008-2017)		Post-Monsoon Trend (November 2008-2017)	
Rising Trend @	Falling Trend @	Rising Trend @	Falling Trend @

0.2 to 0.4 m/year in 104 Sq Km area and @ more than 0.4 m/year in 9 Sq Km area.	0.00 to 0.2 m/year in 91 Sq Km area, 0.2 to 0.4 m/year in 69 Sq Km area, 0.4 to 0.6 m/year in 38.48 Sq Km area and more than 0.6 m/year in 12 Sq Km area.	0 to 0.2 m/year in103.4 Sq Km area, @ 0.2 to 0.4 m/year in 73 Sq Km area	0 to 0.2 m/year in 86.51 Sq Km area, @ 0.2 to 0.4 m/year in 21.57 Sq Km area; @ 0.4 to 0.6 m/year in 34.83 Sq Km area and more than 0.6m/year in 2 Sq Km area.
Pre-Monsoon WL Trend (May 2007-2016)		**Post-Monsoon WL Trend (Nov.2007-2016)**	
			

2. GROUND WATER ISSUES

1. **Low Yielding Aquifers**: The yield of the aquifer in major parts of the block is less than 1 lps. This is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.



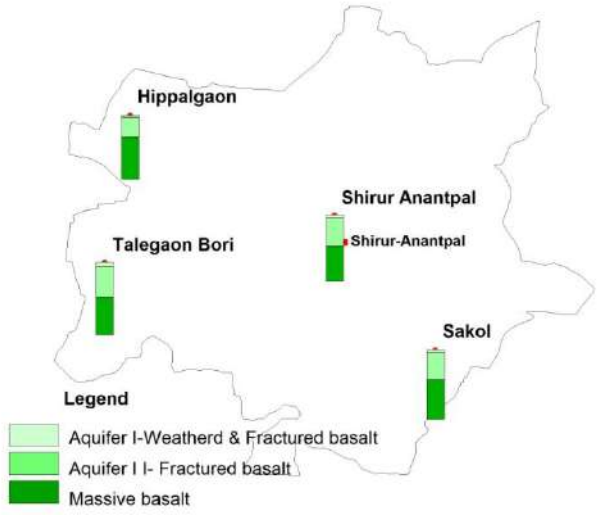
2. **Declining Water Level Trend:-**About 148.5 Sq Km area show declining water level trend during postmonsoon. The declining trend is observed mostly in the discharge areas of Manjra River due to less recharge and over-exploitation of available

freshwater in the area.

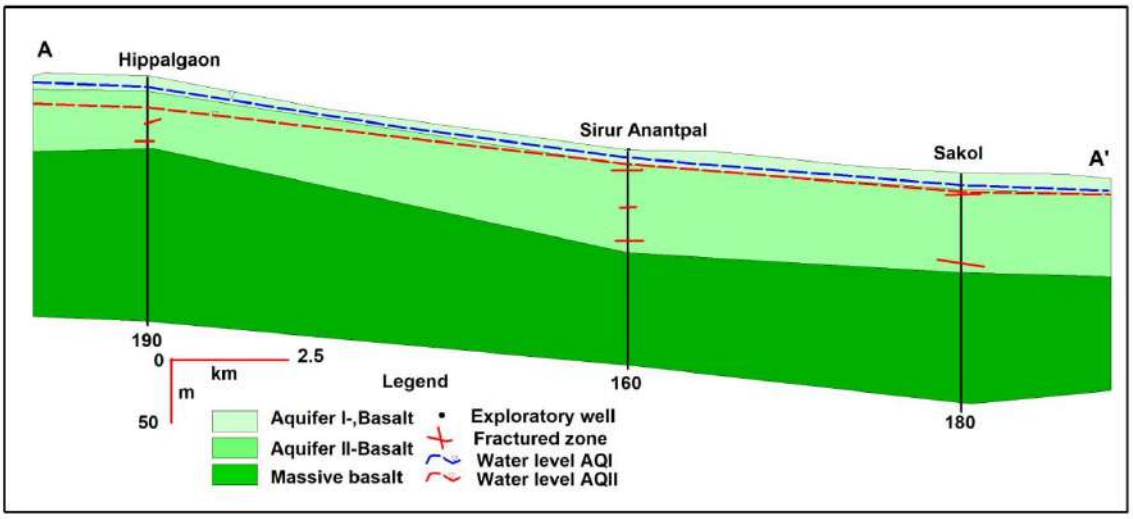
3. AQUIFER DISPOSITION

3.1. Number of Aquifers (Major)	One:Basalt –Aquifer-I, Aquifer-II

3.2. LITHOLOGICAL DISPOSITION



3.3. CROSS SECTIONS



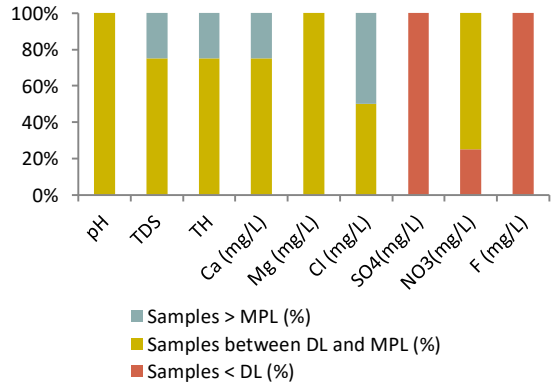
3.4 AQUIFER CHARACTERISTICS

Major Aquifer	Basalt (Deccan Traps)	
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II(Semiconfined /confined)
Depth of Occurrence (mbgl)	10 to 22	130 to 150
Granular/Weathered/ Fractured rocks thickness (m)	7 to 14	1 to 7
Yield Potential	0 to 25 m^3/day	0 to 0.2 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.00005
Transmissivity (T)	32 to 69m^2/day	25 to 195 m^2/day

4.CHEMICAL QUALITY OF GROUND WATER &CONTAMINATION

<table>
<tr><th colspan="2">4.1 Aquifer I/Shallow Aquifer</th></tr>
<tr><th>Suitability for Drinking Purposes</th><th>Suitability for Irrigation Purposes</th></tr>
<tr><td>

The overall quality of Aquifer is potable and useful for drinking and domestic puposes except at areas with EC > 2250 microsiemens/cm and high nitrate contamination.
About 86.37 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm whereas 215.6 sq Km area has EC between 750 and 2250 microsiemens/cm. An isolated patch covering 21.45 Sq Km areas in the easterern and southwestern parts of the block has EC > 2250 microsiemens/cm.
Nitrate contamination with nitrate more than 45 mg/l is observed in 3 sites.

The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards is as given below for a total of 4 samples collected and analysed are as given below:


</td><td>

In major parts of the block covering 215.6 Sq Km area, plants with moderate salt tolerance can be grown. However, in 21.45 Sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected.
The SAR values of the analysed samples in the block are well within 0 to 10 types and are therefore good for irrigation.
The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground is good for irrigation. Hence, the overall quality of ground water is suitable for irrigation purposes.
About 50% of the analysed samples have % Na less than 20 and 50% have %Na between 20 and 40 indicating that the ground water is good for irrigation.

Hence, the overall quality of ground water is suitable for irrigation purposes.
</td></tr>
<tr><th colspan="2">4.1 Aquifer II/ Deeper Aquifer</th></tr>
<tr><th>Suitability for Drinking Purposes</th><th>Suitability for Irrigation Purposes</th></tr>
<tr><td>

The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in areas with nitrate contamination.
About 236.5 Sq Km area of the block has EC well within the potable range of 250 to 750

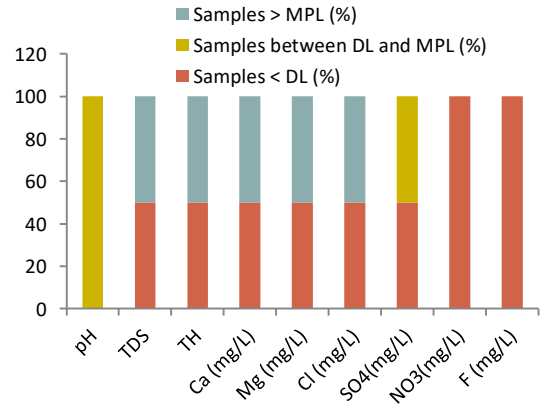
</td><td>

In major parts of the block covering 236.5 Sq Km area, plants with moderate salt tolerance can be grown. However, in 88.71 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be

</td></tr>
</table>

microsiemens/cmwhereas88.71 sq Km area has EC between 750 and 2250 microsiemens/cm. Nitrate contamination with nitrate more than 45 mg/l is observed in foursites.

The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 2 samples collected and analysed are as given below:



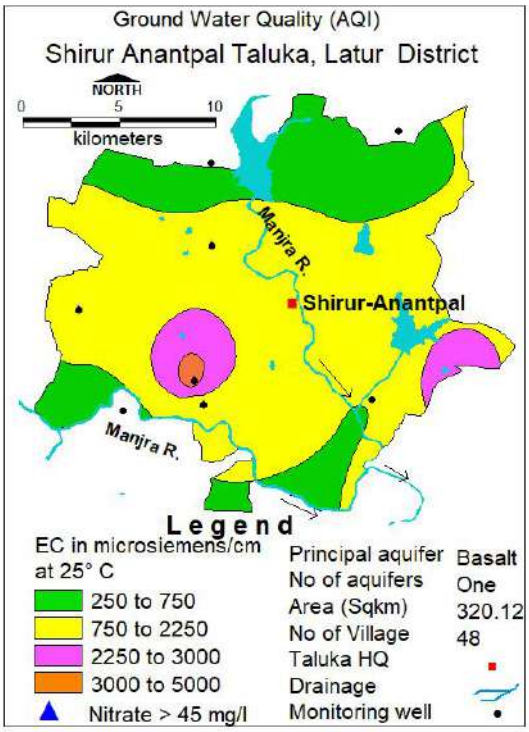
selected.

- The SAR value for all the analysed samples in the block is well within 0 to 10 types and are therefore good for irrigation.
- The RSC values of all theanalysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation.
- About 50% of the analysed samples have % Na less than 20 and 50% have %Na between 20 and 40 indicating that the ground water is good for irrigation.

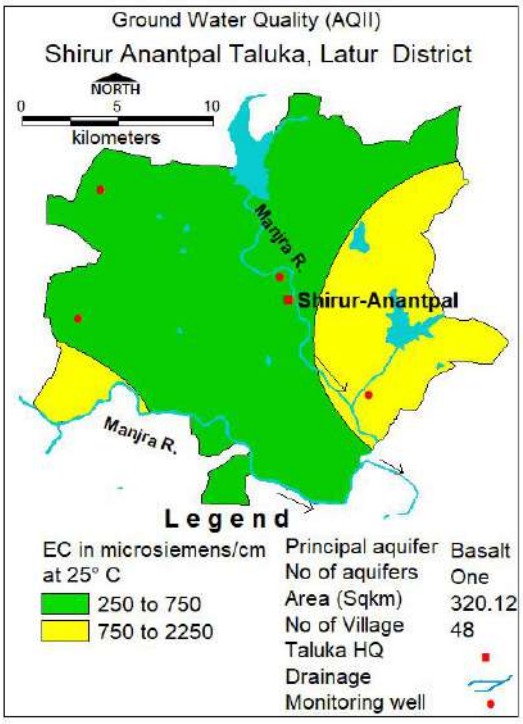
Hence, the overall quality of ground water is suitable for irrigation purposes.

3.2.CHEMICAL QUALITY MAP

Phreatic Aquifer (Aquifer-I)



Semiconfined/Confined Aquifer (Aquifer II &III)



5. GROUND WATER RESOURCE & EXTRACTION

Aquifer-I/ Phreatic Aquifer (Basalt & Alluvium)

Ground Water Recharge Worthy Area (Sq.	177.89

Km.)	
Total Annual Ground Water Recharge (MCM)	22.17
Natural Discharge (MCM)	1.10
Net Annual Ground Water Availability (MCM)	21.06
Existing Gross Ground Water Draft for irrigation (MCM)	12.52
Existing Gross Ground Water Draft for domestic and industrial water supply(MCM)	0.52
Existing Gross Ground Water Draft for All uses(MCM)	13.05
Net Ground Water Availability for future irrigation development(MCM)	6.78
Provision for domestic and industrial requirement supply to 2025(MCM)	1.40
Stage of Ground Water Development %	61.95
Category	**SAFE**

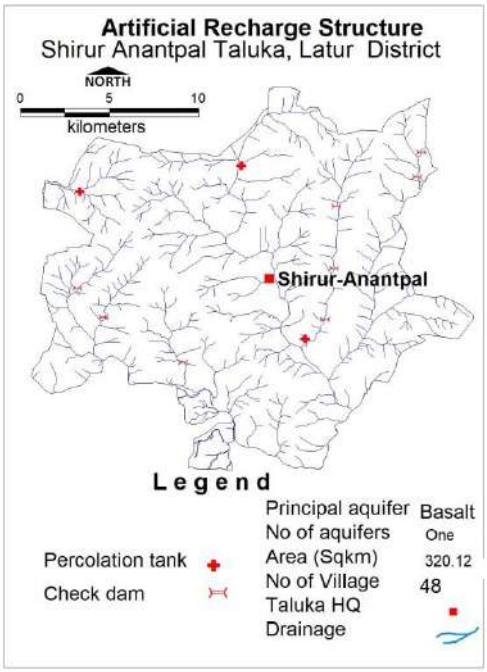
Aquifer-II				
Semiconfined/Confined Aquifer (Basalt)				
Total Area (Sq. Km.)	Mean aquifer thickness (m)	Sy	Peizometric Head (m aboveconfining layer)	Total Resource (MCM)
320.12	4	0.01	43	13.49

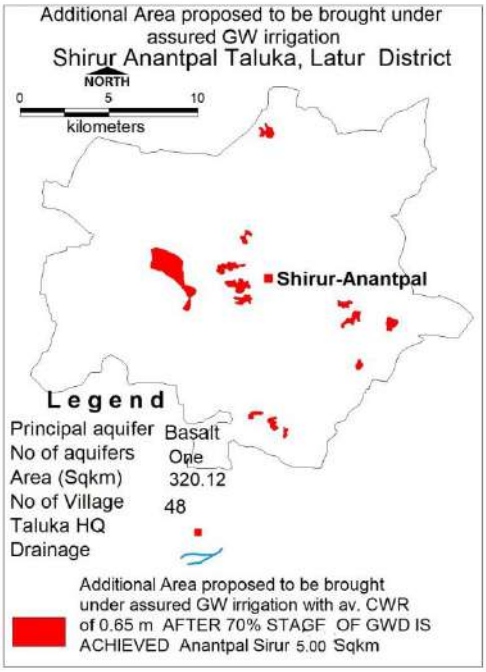
5.0. GROUND WATER RESOURCE ENHANCEMENT		
Available Resource (MCM)	21.06	
Gross Annual Draft (MCM)	13.05	
5.1.SUPPLY SIDE MANAGEMENT		
SUPPLY (MCM)		
Agricultural Supply -GW	12.52	
Agricultural Supply -SW	2.17	
Domestic Supply - GW	0.52	
Domestic Supply - SW	1.10	
Total Supply	**16.31**	
Area of Block (Sq. Km.)	320.12	
Area suitable for Artificial recharge (Sq. Km)	177.89	
Type of Aquifer	Hard Rock	Soft Rock
Area feasible for Artificial Recharge(WL >5mbgl) (Sq. Km.)	39.85	0
Volume of Unsaturated Zone (MCM)	79.7	0
Average Specific Yield	0.020	0.070
Volume of Sub surface Storage Space available for Artificial	1.594	0

Recharge (MCM)			
Surplus water Available (MCM)	0.8926	0	
Proposed Structures	**Percolation Tank** (Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam (Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)	**Recharge shaft** (Av. Gross Capacity-60 TCM)
Number of Structures	3	9	0
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	0.45	0.2025	0
Area of Saline Patch	**Nil**		
Proposed Structures	Nil		
No of farm pond proposed (size: 30m*30m*3) with 3 filling= 0.0081 mcm capacity, 50% available water may be utilized for harvesting through farm ponds.	Nil		
Volume of water available for harvesting	Nil		
Additional volume created by desilting	**Nil**		
RTRWH Structures – Urban Areas			
Households to be covered (25% with 50 m^2area)	4117		
Total RWH potential (MCM)	0.154		
Rainwater harvested / recharged @ 80% runoff co-efficient	0.123 (**Economically not viable & Not Recommended)**		
5.2.DEMAND SIDE MANAGEMENT			
Micro irrigation techniques			
Remaining ground water irrigated Sugarcane cropped area proposed through drip irrigation	2		
Volume of Water expected to be saved (MCM). (Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m)	1.14		
Proposed Cropping Pattern change			
Irrigated area under Water Intensive Crop(ha)	**Nil**		
Water Saving by Change in Cropping Pattern	Nil		
5.3.EXPECTED BENEFITS			
Net Ground Water Availability (MCM)	21.06		

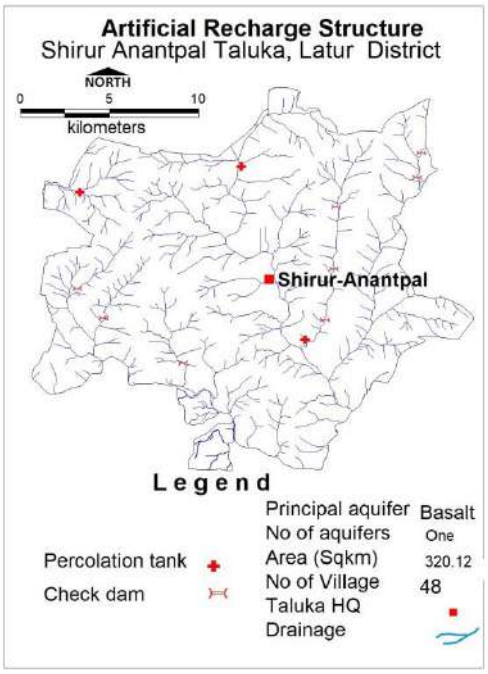
Additional GW resources available after Supply side interventions (MCM)	0.6525
Ground Water Availability after Supply side intervention	21.71
Existing Ground Water Draft for All Purposes (MCM)	13.05
Saving of Ground Water through demand side intervention (MCM)	1.14
GW draft after Demand Side Interventions (MCM)	11.91
Present stage of Ground Water Development (%)	61.96
Expected Stage of Ground Water Development after interventions (%)	54.85
Other Interventions Proposed, if any	
Alternate Water Sources Available	Nil
5.4.RECOMMENDATION	
Ground water development is recommended to bring the stage of development from 54.01% to 70%	
5.5.DEVELOPMENT PLAN	
Volume of water available for GWD to 70% (MCM)	3.28875
Proposed Number of DW(@ 1.5 ham for 90% of GWR Available)	197
Proposed Number of BW(@ 1.5 ham for 10% of GWR Available)	33
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	5

Proposed Artificial Recharge Structure	**Additional Area proposed to be brought under Assured Ground Water Irrigation**





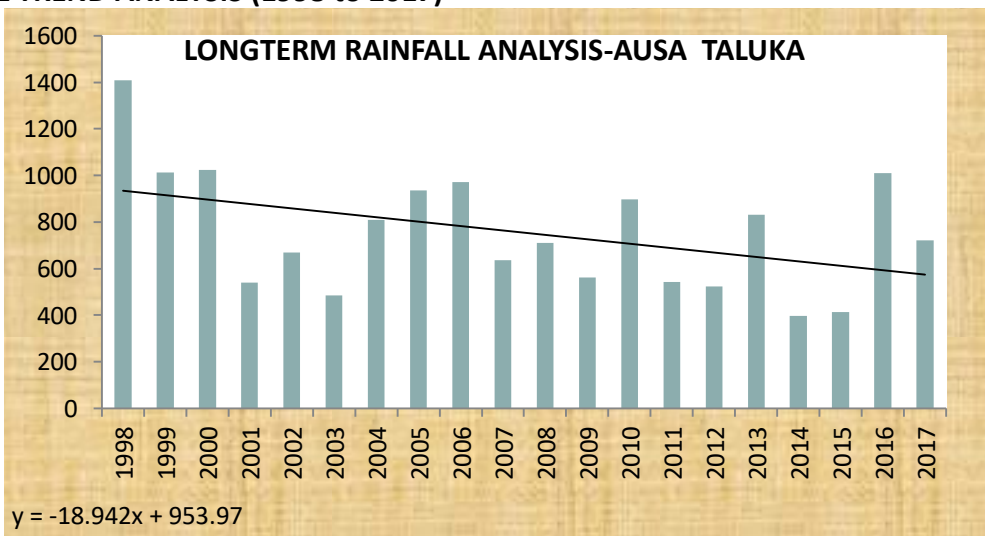
Addditional Area proposed to be brought under assured ground water irrigation



3. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, AUSA BLOCK, LATUR DISTRICT

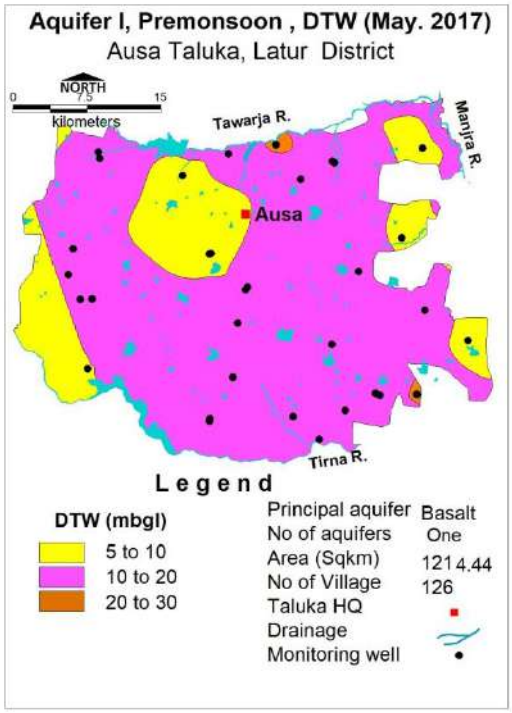
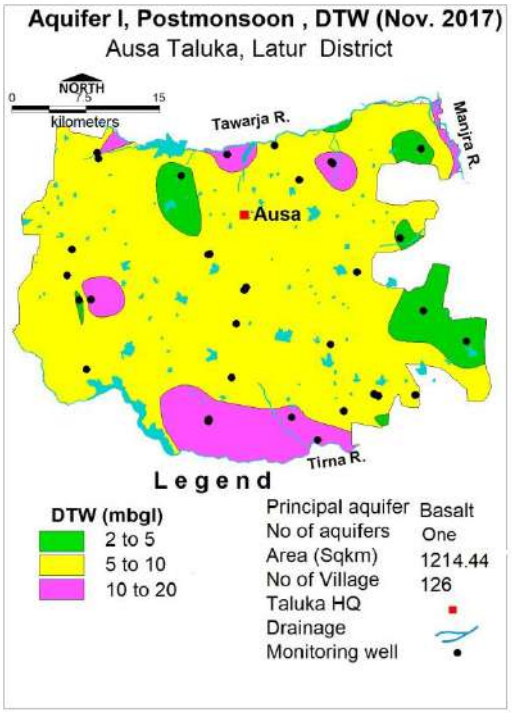
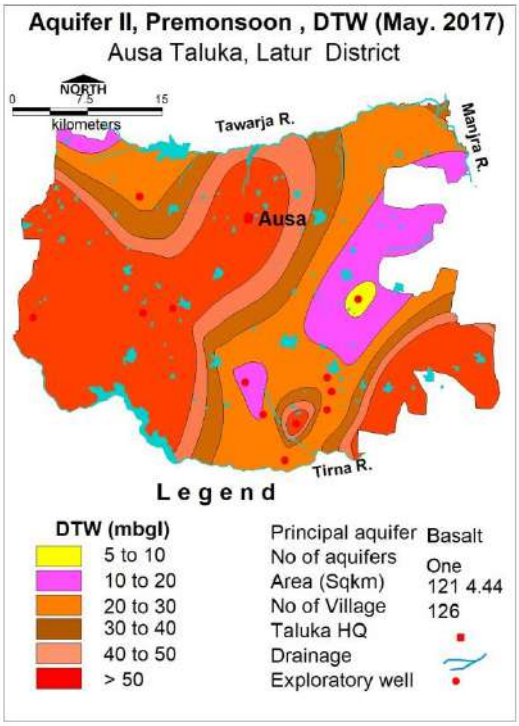
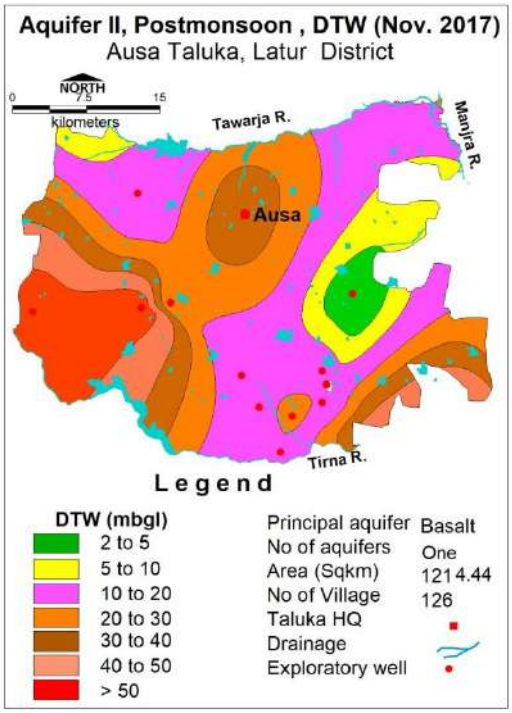
4. SALIENT INFORMATION	
1.1.Introduction	
Block Name	Ausa
Geographical Area (Sq. Km.)	1214.44 Sq. Km.
Hilly Area (Sq. Km)	51.76 Sq. Km.
Poor Quality Area (Sq. Km.)	Nil
Population (2011)	3,09,571
Climate	Tropical climate
1.2. Rainfall Analysis	
Normal Rainfall	755.1 mm
Annual Rainfall (2017)	722.1mm
Decadal Average Annual Rainfall (2008-17)	660.88 mm
Long Term Rainfall Analysis (1998-2017)	Falling Trend: -18.942 m/year. Probability of Normal/Excess Rainfall-40% & 25%. Probability of Drought (Moderate/Severe/Acute)-: 35% Moderate Frequency of occurrence of drought: 1 in 3 years

RAINFALL TREND ANALYSIS (1998 to 2017)



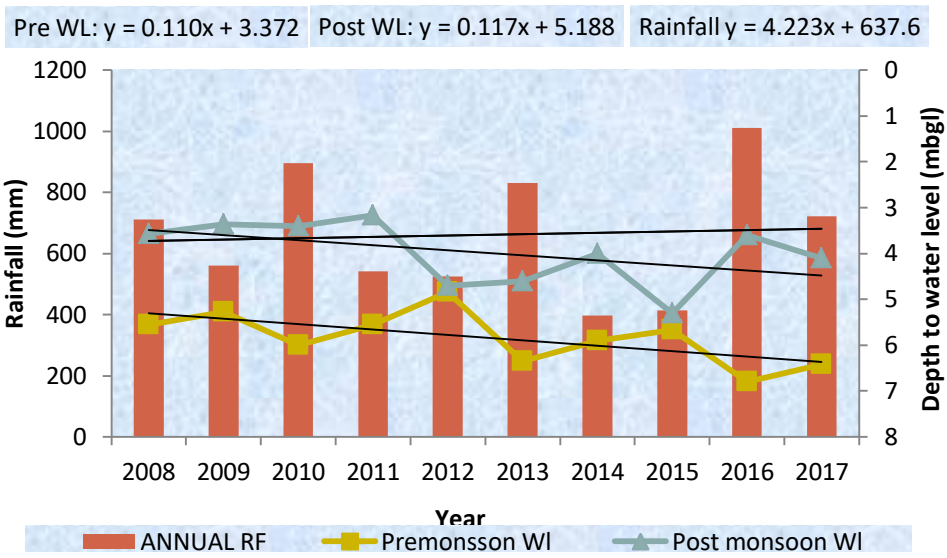
1.3. Geomorphology,Soil&Geology	
Geomorphic Unit	➢ Denudation Slope ➢ Region of Middle Level Plateau on Deccan Traps between 550-900 m elevation
Soil	➢ Medium Deep Soils of 18-36 inch thickness; dark brown to dark gray brown in colour; clay-loam to clayey in texture with granular to sub-granular nature; blocky in structure. ➢ Shallow Soils of 0-9 inch thickness; brown to dark

	grey brown in color; loamy to clay-loam in texture with granular to sub-granular nature; blocky in structure ➢ Deep Soils of 36 inch thickness, clayey in texture and sub-angular blocky to blocky in structure occurs along the river valleys.	
Geology	Recent River Alluvium & Deccan Traps (Basalt) of Late Cretaceous to Early Eocene Age	
1.4. Hydrology & Drainage		
Drainage	Tawarja and Terna rivers forming the tributaries of Manjra river are the major drainage system of the block.	
Hydrology(as on March 2013)	Major & Medium Irrigation Projects (>250 Ha) *(Reference Year: 2012-13)*	NimnaTeranaPrakalp
	Minor Irrigation Projects (0 to 250 Ha) *(Reference Year: 2016-17)*	Completed:-206 projects; Ongoing: 16 projects
1.5. LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN		
Geographical Area	1214.4 Sq. Km.	
Forest Area	235 Sq. Km.	
Cultivable Area	1342.95 Sq. Km.	
Net Sown Area	1225.16 Km.	
Double Cropped Area	117.79 Sq. Km.	
Area under Irrigation – Surface Water	47.57 Sq. Km.	
Area under Irrigation – Ground Water	88.34 Sq. Km.	
Principal Crops	**Crop Type**	**Area (Sq. Km.)**
	Cereals	43.53
	Pulses	32.62
	Cotton	1.07
	Oil Seeds	_
Horticultural Crops	Sugarcane	56.33
	Others	11.91
1.6.WATER LEVEL BEHAVIOUR		
1.6.1. Aquifer-I/Shallow Aquifer (Phreatic Aquifer)		
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**	
➢ Shallow water Level between 5 mbgl and 10 mbgl is observed in 245.87 Sq Km area in the western, northwestern and northeastern parts of the taluka. ➢ About 989.5 Sq. Km area of the block have depth to water level in the range of 10 to 20 mbgl.	➢ Shallow water Level less than 5 mbgl is observed in 152.21 Sq Km area in small patches in the block. ➢ In1007 Sq Km area of the block covering major parts, has depth to water level between 5 mbgl and 10 mbgl. ➢ About, 140.2Sq Km area along	

➢ About, 12 Sq Km area of the block has depth to water level in the range of 20 to 30 mbgl.	southern parts and in small isolated patches has depth to water level between 10 mbgl and 20 mbgl.
Water Level Map- Aquifer-I/Shallow Aquifer (Phreatic Aquifer)	
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (Nov.2017)**
	
1.6.2. Aquifer-II/Deeper Aquifer (Semiconfined/Confined Aquifer)	
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**
	

Pre-Monsoon Water Level (May 2017)	Post-Monsoon Water Level (November 2017)
➢ The depth to water level between 10 mbgl and 20 mbgl is observed in 132.83 Sq Km area along the eastern part of the block and in very small isolated patches in the remaining parts of the block. ➢ The deeper depth to water level between 20 mgl and 30 mbgl is observed in about 310 Sq Km area in parts of northeast, southeast and northwest portions of the block. ➢ The depth to water level more than 30 mbgl is observed 796 Sq Km areain the entire western parts of the block except in northwestern parts.	➢ The shallow depth to water level less than 10 mbgl is observed in 146Sq Km area of the block along the main drainage of Manarriver in the northeastern parts of the block. ➢ The depth to water level between 10 mbgl and 20 mbgl is observed in about 442 Sq Km area central, northeastern and northwestern parts of the block. ➢ The depth to water level between 20 mbgl and 30 mbgl is observed in about 276 Sq Km area. ➢ The deeper depth to water level more than 30 mbgl is observed in 372 Sq Km area in the western and southwestern parts of the taluka.

1.7. Hydrograph



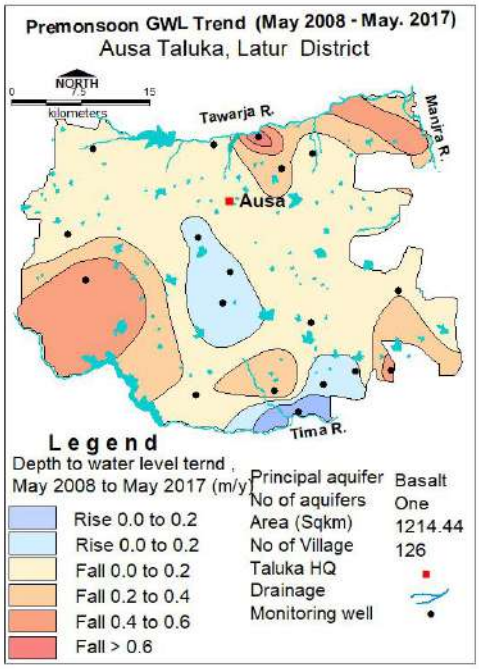
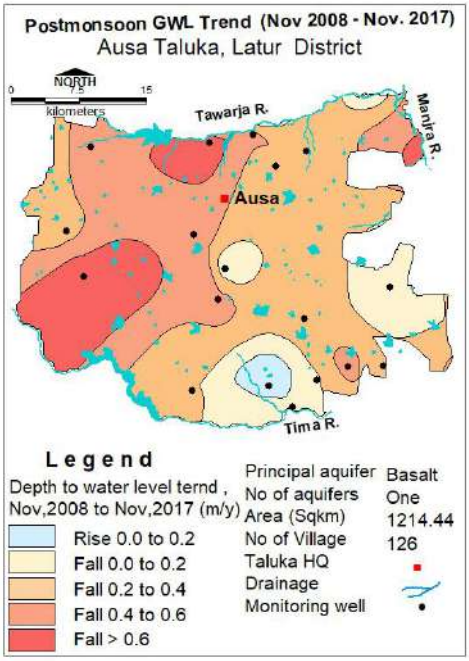
The hydrograph of CGWB Monitoring site at Ausa for the period 2008 to 2017 shows:

- A falling trend during both premonsoon and postmonsoon @ 0.0110 m/year and @0.117 m/year respectively.
- The depth to water level during premonsoon ranges from 4.85 mbgl to 6.8 mbgl.
- The depth to water level during postmonsoon ranges from 3.17 mbgl to 5.3 mbgl during postmonsoon

1.8. Water Level Trend (2008-17)

Pre-Monsoon Trend (May 2008-2017)		Post-Monsoon Trend (November 2008-2017)	
Rising Trend @	Falling Trend @	Rising Trend @	Falling Trend @
0 to 0.2 m/year in 116 Sq Km area and @ 0.2 to 0.4 m/year in 16 Sq	0.02 to 0.20 m/year in 701 Sq Km area , 0.2 to 0.4 m/year in 229.6 Sq Km area, 0.4 to 0.6	0 to 0.2 m/year in 22.7 Sq Km area	0 to 0.2 m/year in 164.85 Sq Km area and 0.2 to 0.4 m/year in 529 Sq Km area,

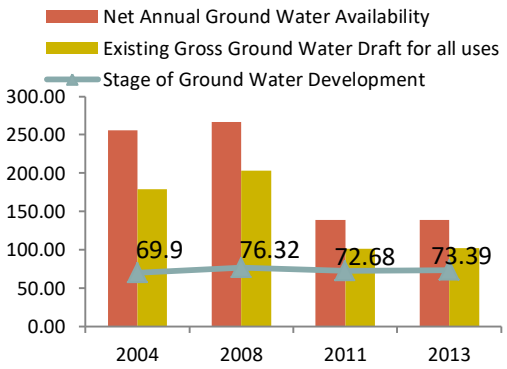
Km area.	m/year in 163 Sq Km area and 0.6 to 0.71 m/year in 3 Sq Km area.		0.4 to 0.6 m/year in 320 Sq Km area and > 0.6 m/year in 174 Sq Km area.

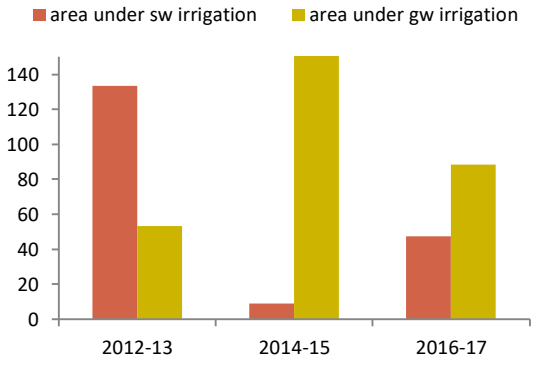
Pre-Monsoon WL Trend (May 2007-2016)	Post-Monsoon WL Trend (Nov.2007-2016)
	

2. GROUND WATER ISSUES

1) **Overexploitation of Ground Water**

The area under ground water irrigation has increased 1.5 times in 2017 as compared to 2012 @ 17.58 Sq Km per year resulting in increase in gross ground water draft all uses and hence, increase in stage of ground water development.





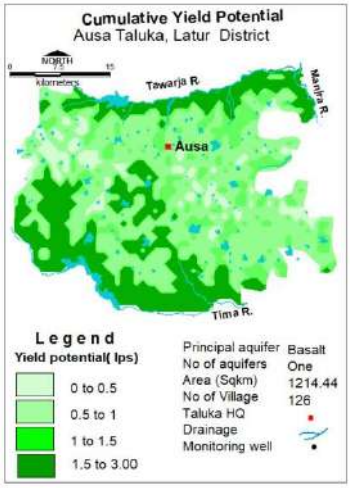
2) **Increase in stage of ground water development**

Despite being in Safe category, the stage of ground water development has increased to four percent from 69.9 % (2004) to 73.39% (2013). This is due to increase in gross draft for all purposes due to high dependency in ground water for agricultural uses and decrease in net ground water availability.

3) Declining Water Level Trend: -

The decline in water level trendupto more than 0.6 m/year is observed in major section of the block during both the seasons despite the increase in rainfall @4.23 mm/year. This is due to the exploitation of shallow aquifers as for the dependency in ground water for irrigation during both Kharif and Rabi season due to lack of availability of surface water. About 71 % of the net ground water availabilty (as per GEC2013) is utilised for irrigation purposes in the block.

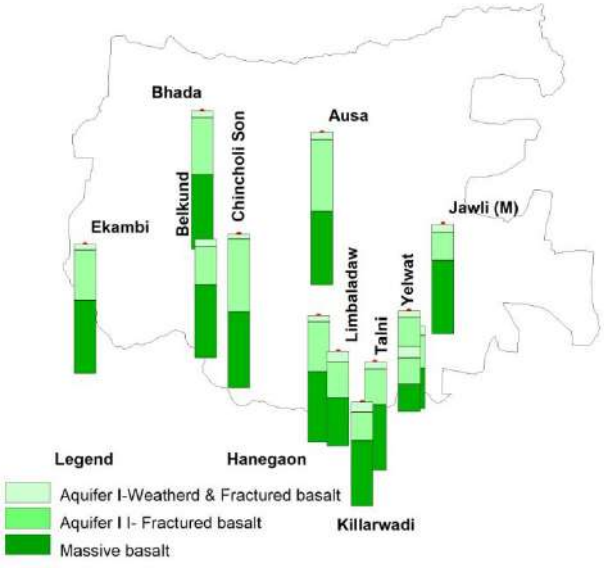
3. **Low ground water yield Potential of the aquifers:**The ground water yield potentiality of the aquifers ranges from 0 to 1lps in major parts of the block. However, high yielding aquifers are obtained only along the drainages, faults/ fractures or joints. The low potential zone in major parts of the block is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.



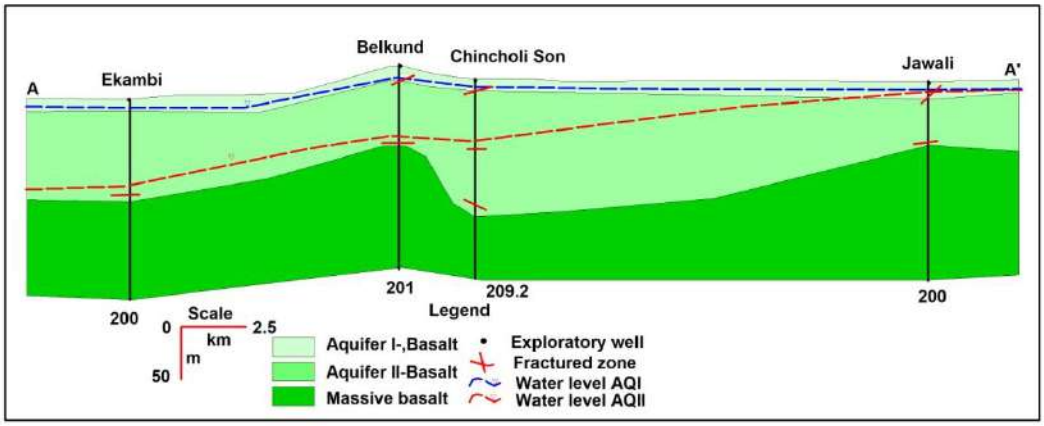
3. AQUIFER DISPOSITION

3.1. Number of Aquifers (Major)	Basalt –Aquifer-I, Aquifer-II

3.2. LITHOLOGICAL DISPOSITION



3.3. CROSS SECTIONS

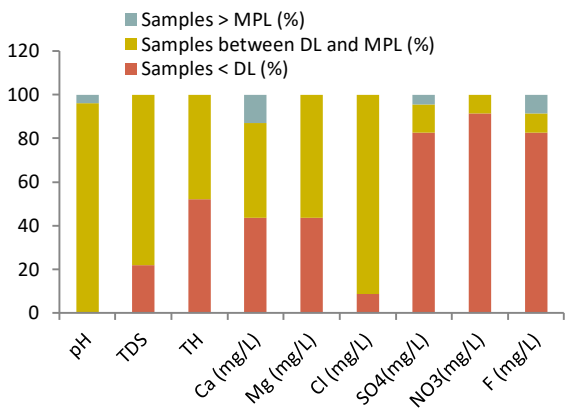
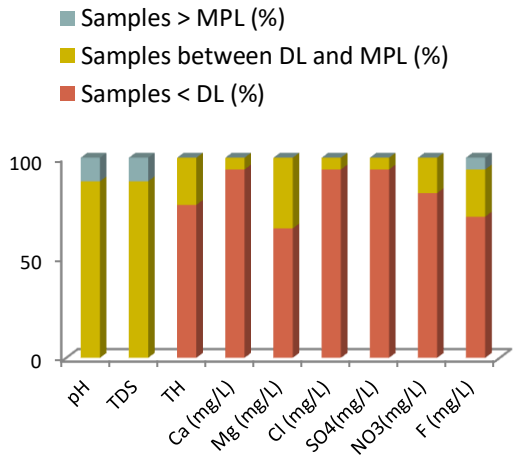


3.4 AQUIFER CHARACTERISTICS		
Major Aquifer	Basalt (Deccan Traps)	
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II(Semiconfined/confined)
Depth of Occurrence (mbgl)	9 to 16	90 to 130
Granular/Weathered/ Fractured rocks thickness (m)	5.4 to12.8	0.5-8.9
Yield Potential	0 to 100 m^3/day	0 to 1.2 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.0000247
Transmissivity (T)	33 to 75m^2/day	26 to 205 m^2/day

4.CHEMICAL QUALITY OF GROUND WATER &CONTAMINATION

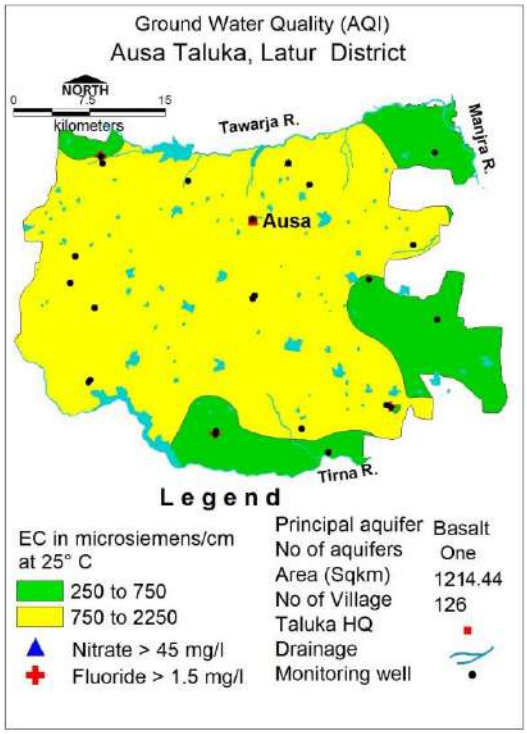
4.1 Aquifer I/Shallow Aquifer

Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ About 267 Sq Km area of the block has EC well within the potable range of 250 to 750 microsiemens/cm whereas 982 sq Km area has EC between 750 and 2250 microsiemens/cm. ➢ **Flouride contamination is observed in three point locations namely** Karla, Boregaon and Nandurga having values more than 1.5 mg/l ➢ Nitrate contamination is observed in two point locations namely Ausa and Budhoda with value more than 45 mg/l. The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards is as given below for a total of 23 samples analysed as given below:	➢ In 267 Sq Km area of the block with medium salinity water, the water can be used if moderate amount of leaching occurs. Plants with moderate salt tolerance can be grown in most cases without special practices for salinity control. However, in 982 Sq Km area where EC >750 microsiemens/cm special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ The SAR value for all the analysed samples in the block are well within 0 to 10 types and are good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground is good for irrigation. Hence, the overall quality of ground water is suitable for irrigation

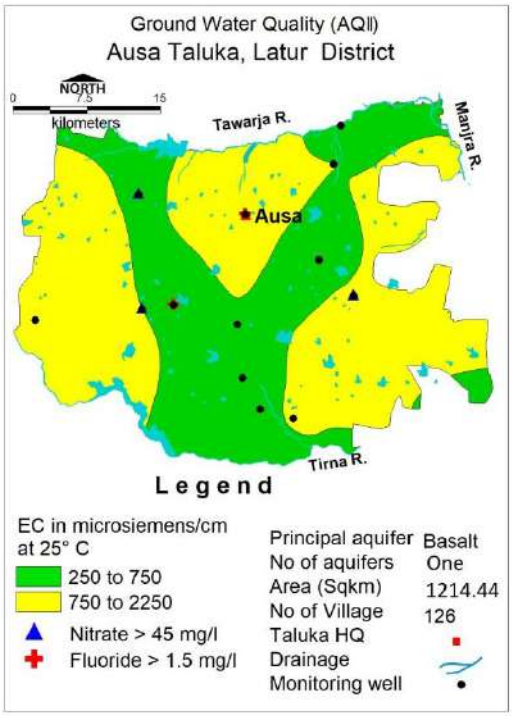
<table>
<tr>
<td> 
</td>
<td>purposes.
➢ About 35% of the analysed samples have % Na less than 20, 43% have %Na between 20 and 40 and 22% have %Na value between 40 and 60 indicating that the ground water is good for irrigation.
Hence, the overall quality of ground water is suitable for irrigation purposes.</td>
</tr>
<tr>
<td colspan="2">4.1 Aquifer II/ Deeper Aquifer</td>
</tr>
<tr>
<td>Suitability for Drinking Purposes</td>
<td>Suitability for Irrigation Purposes</td>
</tr>
<tr>
<td>➢ About 525 Sq Km area of the block has EC well within the potable range of 250 to 750 microsiemens/cm whereas 724 sq Km area has EC between 750 and 2250 microsiemens/cm.
➢ Flouride contamination is observed in two point locations namely Ausa and Chincholi Son having values more than 1.5 mg/l
➢ Nitrate contamination is observed in three point locations namely Bhada, Jawli and Belkuna with value more than 45 mg/l.
The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards is as given below for a total of 23 samples analysed as given below:
 
</td>
<td>➢ In 525 Sq Km area of the block with medium salinity water, the water can be used if moderate amount of leaching occurs. Plants with moderate salt tolerance can be grown in most cases without special practices for salinity control. However, in 724 Sq Km area where EC >750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected.
➢ The SAR value for all the analysed samples in the block are well within 0 to 10 types and are therefore good for irrigation.
➢ Most of the analysed samples have RSC values < 1.25 meq/l indicating that the ground is good for irrigation. However in two locations namely Hanegaon and Killarwadi, RSC value is >1.25 meq/l.
➢ About 12% of the analysed samples have % Na less than 20, 18% have %Na between 20 and 40, 29% have %Na value between 40 and 60and 41% have %Na more than 60. indicating that the ground water is good for irrigation.
Hence, the overall quality of ground water is suitable for irrigation purposes except in areas where %Na is more than 60.</td>
</tr>
</table>

3.2.CHEMICAL QUALITY MAP

Phreatic Aquifer (Aquifer-I)



Semiconfined/Confined Aquifer (Aquifer II &III)



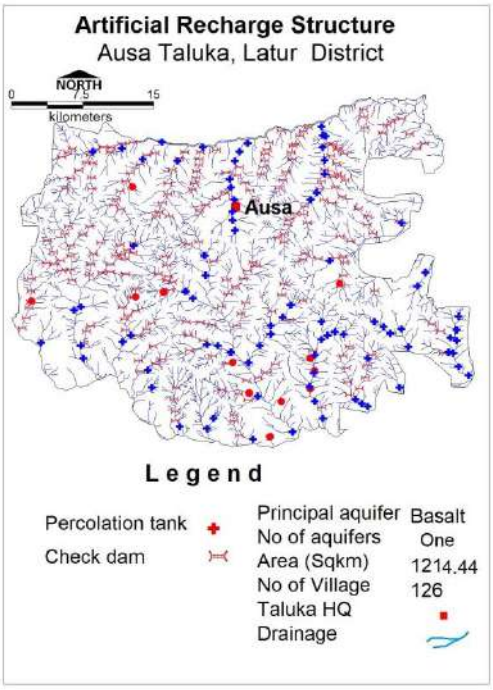
5. GROUND WATER RESOURCE & EXTRACTION				
Aquifer-I/ Phreatic Aquifer (Basalt & Alluvium)				
Ground Water Recharge Worthy Area (Sq. Km.)	1161.91			
Total Annual Ground Water Recharge (MCM)	145.87			
Natural Discharge (MCM)	7.29			
Net Annual Ground Water Availability (MCM)	138.58			
Existing Gross Ground Water Draft for irrigation (MCM)	98.14			
Existing Gross Ground Water Draft for domestic and industrial water supply(MCM)	3.56			
Existing Gross Ground Water Draft for All uses(MCM)	101.71			
Net Ground Water Availability for future irrigation development(MCM)	33.71			
Provision for domestic and industrial requirement supply to 2025(MCM)	7.01			
Stage of Ground Water Development %	73.40			
Category	**SAFE**			
Aquifer-II				
Semiconfined/Confined Aquifer (Basalt)				
Total Area (Sq. Km.)	Mean aquifer thickness (m)	Sy	Peizometric Head (m aboveconfining layer)	Total Resource (MCM)

1214.44	2.7	0.005	57	18.10
5.0. GROUND WATER RESOURCE ENHANCEMENT				
Available Resource (MCM)	138.58			
Gross Annual Draft (MCM)	101.71			
5.1.SUPPLY SIDE MANAGEMENT				
SUPPLY (MCM)				
Agricultural Supply -GW	98.14			
Agricultural Supply -SW	47.57			
Domestic Supply - GW	3.56			
Domestic Supply - SW	0.89			
Total Supply	**150.16**			
Area of Block (Sq. Km.)	1214.44			
Area suitable for Artificial recharge (Sq. Km)	1161.91			
Type of Aquifer	Hard Rock	Soft Rock		
Area feasible for Artificial Recharge(WL >5mbgl) (Sq. Km.)	1076.19	-		
Volume of Unsaturated Zone (MCM)	2152.38	-		
Average Specific Yield	0.020	-		
Volume of Sub surface Storage Space available for Artificial Recharge (MCM)	43.0476	-		
Surplus water Available (MCM)	24.11	-		
Proposed Structures	**Percolation Tank** (Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam (Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)	**Recharge shaft** (Av. Gross Capacity-60 TCM)	
Number of Structures	84	236	0	
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	12.6	5.422	0	
Area of Saline Patch	**Nil**			
Proposed Structures	Nil			
No of farm pond proposed (size: 30m*30m*3) with 3 filling= 0.0081 mcm capacity, 50% available water may be utilized for harvesting through farm ponds.	Nil			
Volume of water available for harvesting	Nil			
Additional volume created by desilting	**Nil**			
RTRWH Structures – Urban Areas				

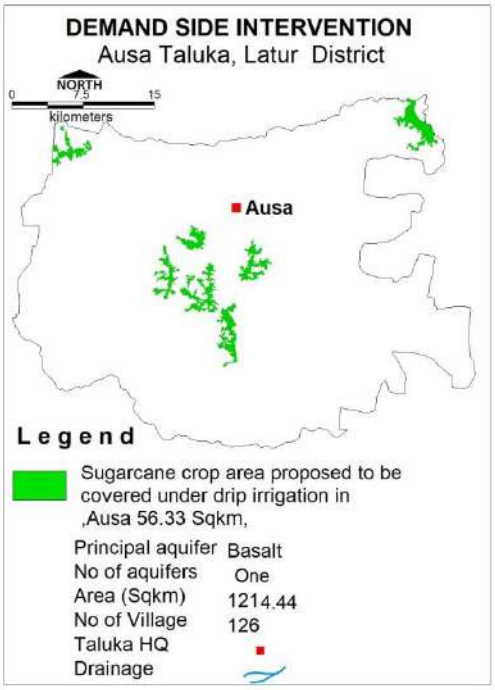
Households to be covered (25% with 50 m^2area)	14448
Total RWH potential (MCM)	0.478
Rainwater harvested / recharged @ 80% runoff co-efficient	0.382 (**Economically not viable & Not Recommended)**
5.2.DEMAND SIDE MANAGEMENT	
Micro irrigation techniques	
Remaining ground water irrigated Sugarcane cropped area proposed through drip irrigation	56.33
Volume of Water expected to be saved (MCM). (Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m)	32.11
Proposed Cropping Pattern change	
Irrigated area under Water Intensive Crop (ha)	Not proposed
Water Saving by Change in Cropping Pattern	Nil
5.3.EXPECTED BENEFITS	
Net Ground Water Availability (MCM)	138.58
Additional GW resources available after Supply side interventions (MCM)	18.08
Ground Water Availability after Supply side intervention	156.66
Existing Ground Water Draft for All Purposes (MCM)	101.71
Saving of Ground Water through demand side intervention (MCM)	32.11
GW draft after Demand Side Interventions (MCM)	69.60
Present stage of Ground Water Development (%)	73.39
Expected Stage of Ground Water Development after interventions (%)	44.43
Other Interventions Proposed, if any	
Alternate Water Sources Available	Nil
5.4.RECOMMENDATION	
Ground water development is recommended to bring the stage of development from 44.43% to 70%	
5.5.DEVELOPMENT PLAN	
Volume of water available for GWD to 70% (MCM)	40.06

Proposed Number of DW(@ 1.5 ham for 90% of GWR Available)	2404
Proposed Number of BW(@ 1 ham for 10% of GWR Available)	401
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	62

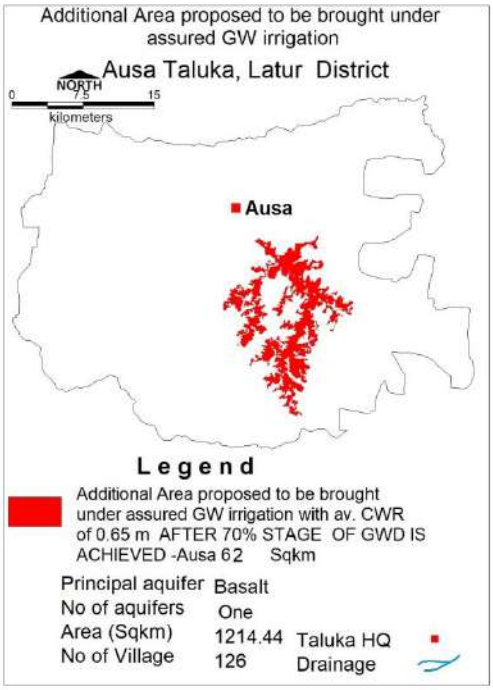
Proposed Artificial Recharge Structure



Demand Side Intervention



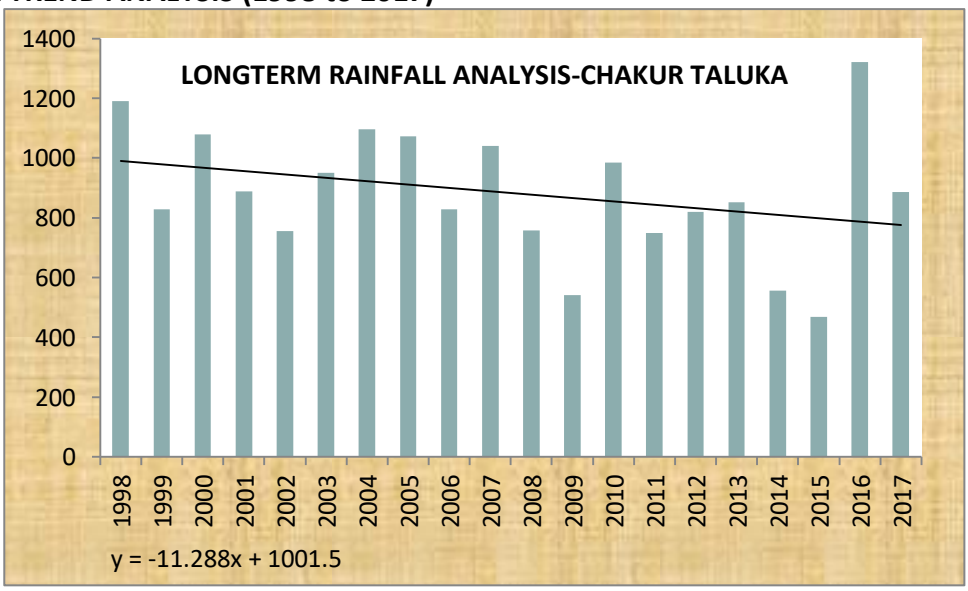
Addditional Area proposed to be brought under assured ground water irrigation



4. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, CHAKUR BLOCK, LATUR DISTRICT

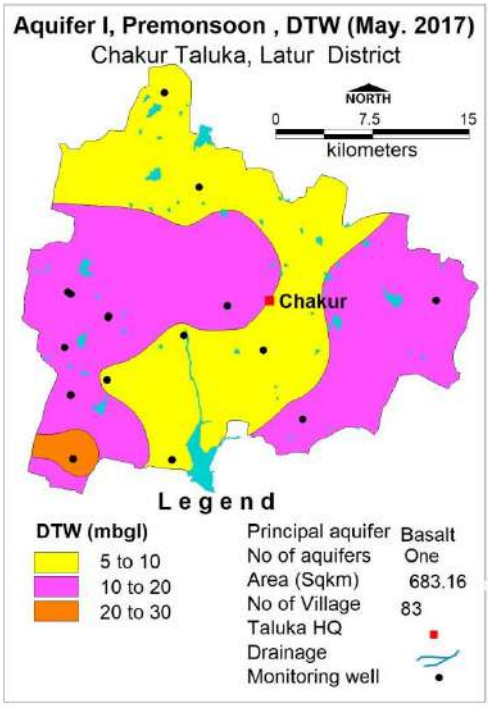
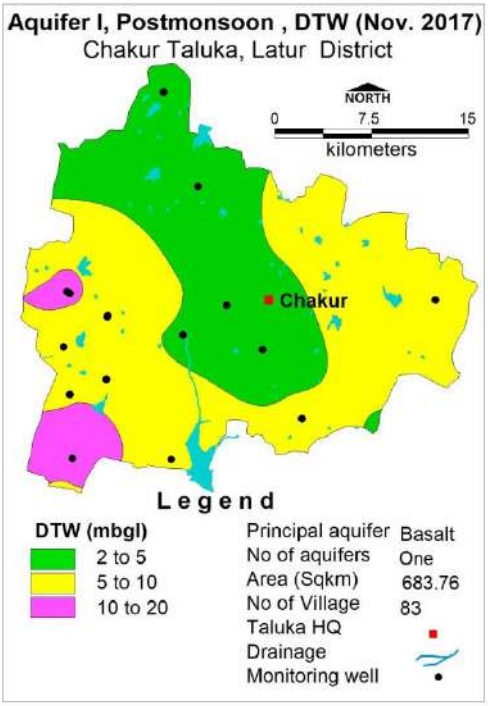
1. SALIENT INFORMATION	
1.1.Introduction	
Block Name	Chakur
Geographical Area (Sq. Km.)	683.76 Sq. Km.
Hilly Area (Sq. Km)	40.40 Sq. Km.
Poor Quality Area (Sq. Km.)	Nil
Population (2011)	177956
Climate	Tropical climate
1.2. Rainfall Analysis	
Normal Rainfall	883 mm
Annual Rainfall (2017)	885.8 mm
Decadal Average Annual Rainfall (2008-17)	793.33 mm
Long Term Rainfall Analysis (1901-2015)	Falling Trend:-11.28 m/year. Probability of Normal/Excess Rainfall:-75% & 10%. Probability of Drought (Moderate/Severe / Acute):- 15% Moderate Frequency of occurance of Drought:- 1 in 7 Years

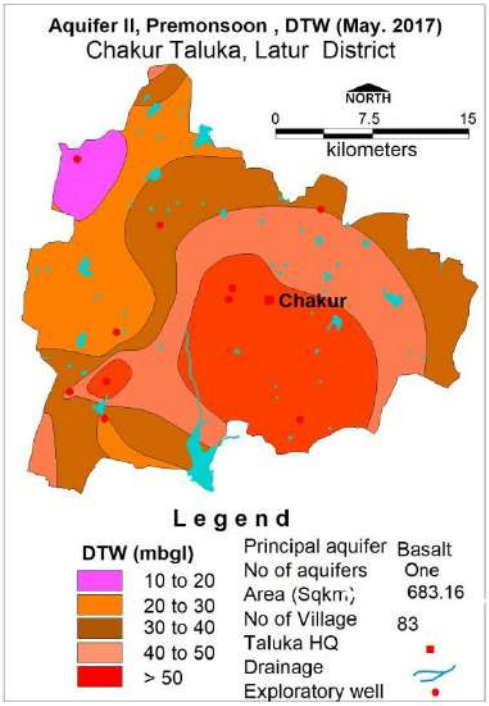
RAINFALL TREND ANALYSIS (1998 to 2017)



1.3. Geomorphology,Soil&Geology	
Geomorphic Unit	➢ Denudational Slope on Deccan Traps ➢ Region of Middle Level Plateau on Deccan Traps between 550 to 900 m elevation ➢ Oilder Flood Plain
Soil	➢ Medium Deep Soils of 18-36 inch thickness; dark brown to dark gray brown in colour; clay-loam to

	clayey in texture with granular to sub-granular nature; blocky in structure occurs in major part of the block. ➢ Shallow Soils of 0-9 inch thickness; brown to dark grey brown in color; loamy to clay-loam in texture with granular to sub-granular nature; blocky in structure	
Geology	Recent River Alluvium & Deccan Traps (Basalt) of Late Cretaceous to Early Eocene Age	
1.4.Hydrology & Drainage		
Drainage	The Gharni river forming the left bank tributary of the Manjra river& the Wakee river forming the right bank tributary of Manar river rises near chapoli in the block	
Hydrology (as on March 2013)	Major & Medium Irrigation Projects (>250 Ha) *(Reference Year: 2012-13)*	GharaniPrakalp
	Minor Irrigation Projects (0 to 250 Ha) *(Reference Year: 2016-17)*	Completed:-124 projects; Ongoing: 30 projects
1.5.LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN		
Geographical Area	683.76 Sq. Km.	
Forest Area	1.55 Sq. Km.	
Cultivable Area	722.67 Sq. Km.	
Net Sown Area	616.52 Km.	
Double Cropped Area	106.15 Sq. Km.	
Area under Irrigation – Surface Water	12.13Sq. Km.	
Area under Irrigation – Ground Water	22.54Sq. Km.	
Principal Crops	**Crop Type**	**Area (Sq. Km.)**
	Pulses	23.4
	Cotton	_
	Cereals	7.73
	Oil Seeds	_
Horticultural Crops	Sugarcane	23.58
	Others	4.32
1.6.WATER LEVEL BEHAVIOUR		
1.6.1. Aquifer-I/Shallow Aquifer (Phreatic Aquifer)		
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**	

❖ Depth to water level between 5 mbgl and 10 mbgl is observed in 297.4 Sq Km area as a central divide along the block as welll as in the northwestern parts. ❖ Depth to water level between 10 mbgl and 20 mbgl observed in 376 Sq Km area in the eastern and westerns of the block ❖ Isolated patch of 13.17 Sq Km area show depth to water level more than 20 mbgl in the southwestern part of the block. The deeper depth to water level may be due to exploitation of ground water during dry period.	❖ Shallow Depth to water level between 2 mbgl and 5 mbgl is observed in 249.7 Sq Km area trending North-South direction along the central part of the block trending NW-SE direction. ❖ Depth to water level between 5 mbgl and 10 mbgl is observed in 393 Sq Km area in the eastern, western and southern parts of the block ❖ Isolated patch of 42.5 Sq Km area show depth to water level more than 10 mbgl in the south-western part of the block. The shallow depths to water level may be due to recharge from rainfall.
Water Level Map- Aquifer-I/Shallow Aquifer (Phreatic Aquifer)	
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (Nov.2017)**
	
1.6.2. Aquifer-II/Deeper Aquifer (Semiconfined/Confined Aquifer)	
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**

<table>
<tr>
<td> 
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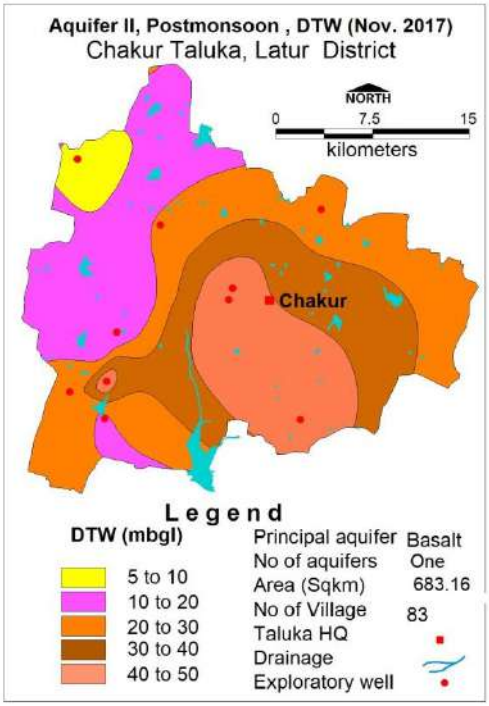
<td> 
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<tr>
<td>Pre-Monsoon Water Level(May 2017)</td>
<td>Post-Monsoon Water Level(November 2017)</td>
</tr>
<tr>
<td>❖ Only an isolated patch of 26 Sq Km area in the north-western end of the block show depth to water level less than 20 mbgl.
❖ The depth to water level between 20 mbgl and 30 mbgl is observed in 129.9 Sq Km area in the north-western parts of the block.
❖ Thedeeper depths to water level between 30 mbgl and 40 mbgl is observed in 180 Sq Km area in a single streching patch along the block boundary in the eatern and northern parts towards central andsouthern western parts.
❖ Depth to water level between 40 mbgl and 50 mbgl is observed in 163 Sq Km area in the eastern, north-central, west-central and south-central parts of the block.
❖ The deeper depth to water level more than 50 mbgl is also observed in 170.5 Sq Km area in thesouth eastern, central and east-central parts of the block.</td>
<td>❖ Only an isolated patch of 25 Sq Km area in the north-western end of the block show depth to water level less than less than 10 mbgl.
❖ The depth to water level between 10 mbgl and 20 mbgl is observed in 168.8 Sq Km area in the north-western parts of the block.
❖ Thedeeper depths to water level between 20 mbgl and 30 mbgl is observed in 210 Sq Km area in a single streching patch along the block boundary in the eatern northern and north-centrsl parts towards southern western parts.
❖ Depth to water level between 30 mbgl and 40 mbgl is observed in 155 Sq Km area in the eastern, east-central, north-central, south-west- west-central and southern parts of the block.
❖ The deeper depth to water level between 40 mbgl and 50 mbgl is observed in 125 Sq Km area in the south eastern, southern, south-central and central parts of the block.</td>
</tr>
<tr>
<td colspan="2">1.7. Hydrograph</td>
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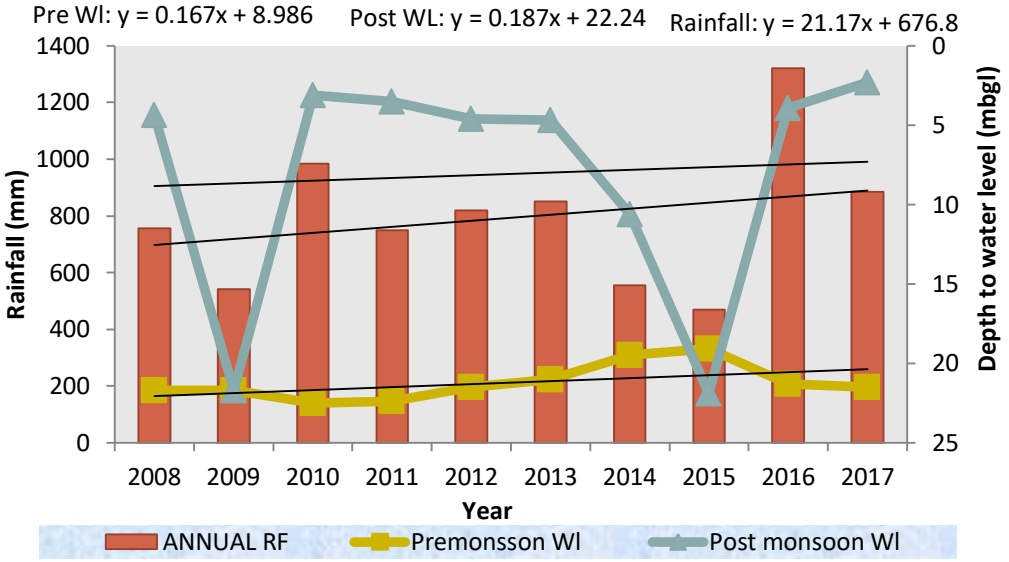
Hydrograph of Ashti village, Chakur Taluka, Latur District

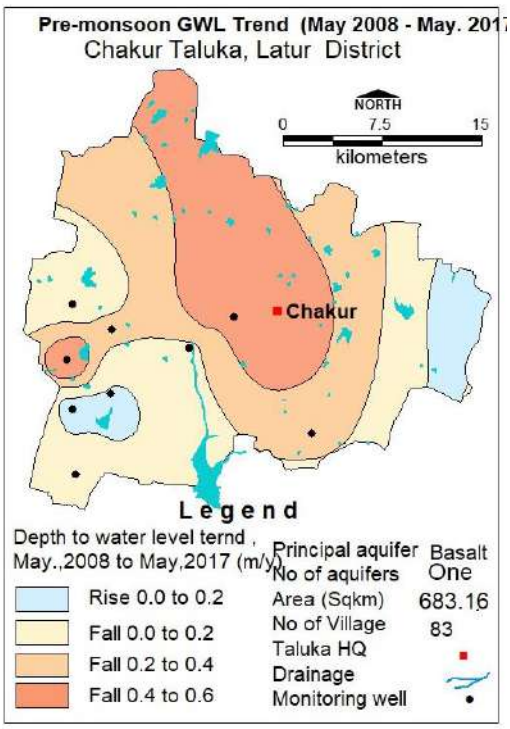


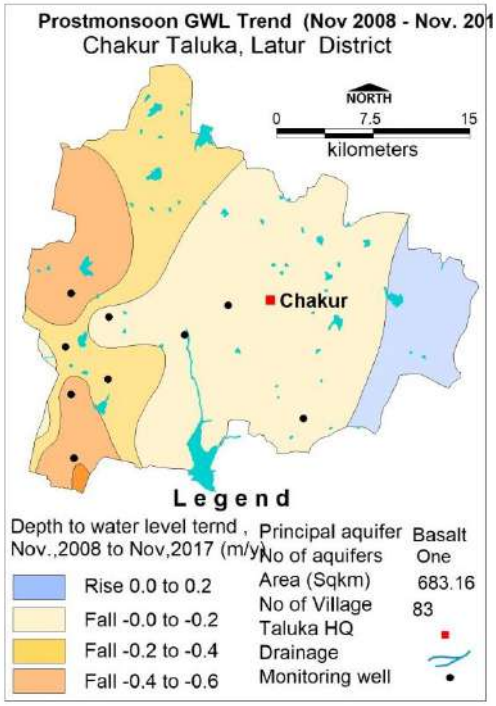
The hydrograph of CGWB Monitoring site at Ashtivillage for the period 2008 to 2017 shows:

- A rising trend during both premonsoon and postmonsoon @ 0.167 m/year and 0.187 m/year respectively.
- Thedepth to water level during premonsoon ranges from 20 mbgl to 23 mbgldue to overdraft of ground waterin dry season
- The depth to water level ranges from 0 to 7 mbgl during postmonsoon except in the years 2009, 2014 and 2015 when the rainfall recharge was less due to drought.

1.8. Water Level Trend (2008-17)

Pre-Monsoon Trend (May 2008-2017)		**Post-Monsoon Trend (November 2008-2017)**	
Rising Trend @	Falling Trend @	Rising Trend @	Falling Trend @
0.00 to 0.2m/year in 52.57 Sq Km area	0.0 to 0.2 m/year in 214.4 Sq Km area, 0.2 to 0.4 m/year in 228 Sq Km area and 0.4 to 0.6 m/year in 191 46 Sq Km area.	0 to 0.2 m/year in 25 Sq Km area	0.0 to 0.2 m/year in 418.9 Sq Km area and 0.2 to 0.4 m/year in 150 Sq Km area and 0.4 to 0.6 m/year 87 Sq Km area
Pre-Monsoon WL Trend (May 2008-2017)		**Post-Monsoon WL Trend (Nov.2008-2017)**	

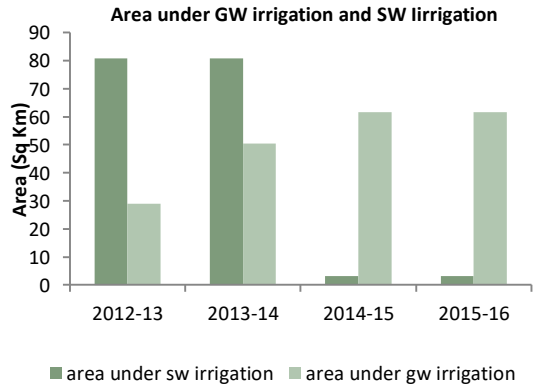


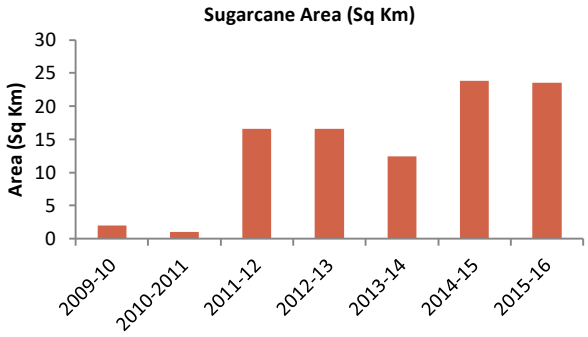


2. GROUND WATER ISSUES

1) Overexploitation of Ground Water: -

The area under ground water irrigation has increased twice in 2017 as compared to 2012 @ 10.91 Sq Km per year resulting in increase in gross ground water draft all uses. About 96% of gross ground water draft for all purposes is used for irrigation in the block. This can be justified by:

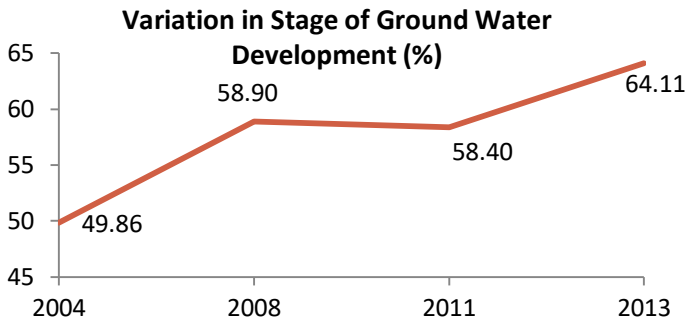




- ❖ Doubling of number of irrigation wellsfrom 2108 (Year 2012) to 4662 (Year 2014) in two years
- ❖ Increase in the area under ground water based sugarcane cultivation from 2.03 Sq Km area in 2009-10 to 23.58 Sq Km area in 2015-16

2) Increase in stage of ground water development

Despite being in Safe category, the stage of ground water development has increased from 49.86 % (2004) to 64.11% (2013). This is due to decrease in net ground water availability, increaseddependency in ground water and hence increases in stage of ground water development.

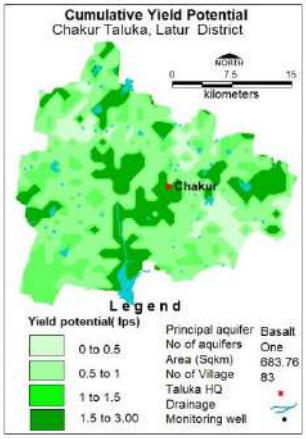


3) Declining Water Level Trend: -

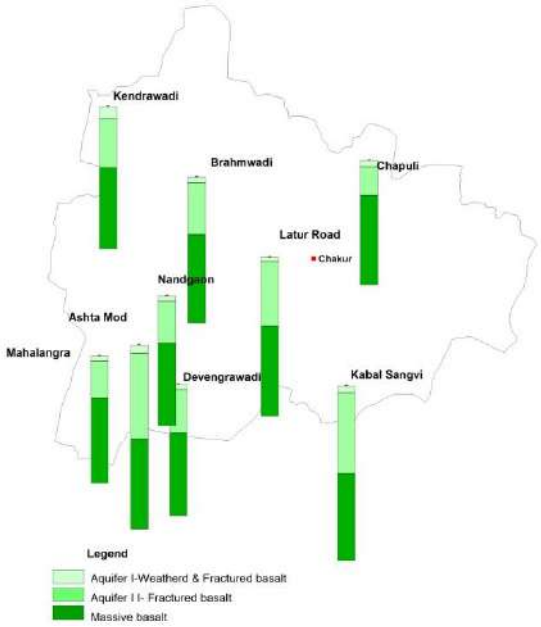
The decline in water level trend (2008-17)upto than 0.6 m/year is observed in major section of the block during both the seasons despite the increase in rainfall @21.17 mm/year. This is due to the exploitation of shallow aquifers as for the dependency in ground water for irrigation during both Kharif and Rabi season due to lack of availability of surface water. About 86 % of the net ground water availabilty (as per GEC2013) is utilised for irrigation purposes in the block.

4) **Low ground water yield Potential of the aquifers:**

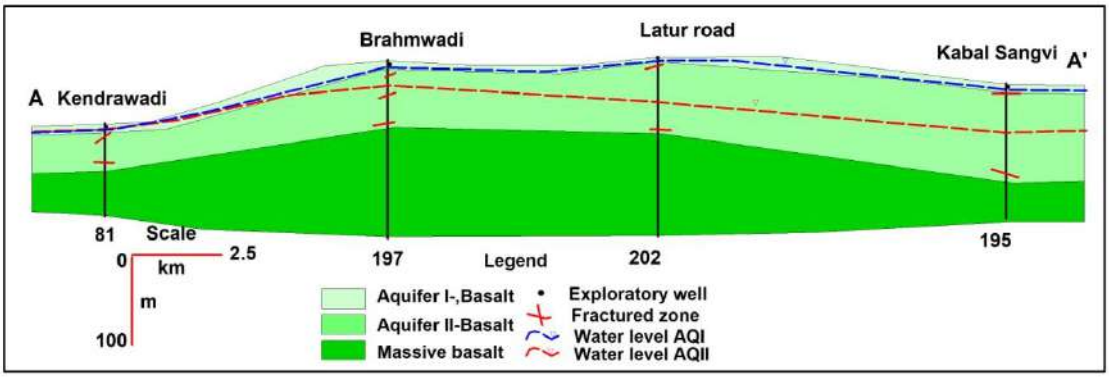
The ground water yield potentiality of the aquifers ranges from 0 to 1 lps in major parts of the block. However, high yielding aquifers are obtained only along the drainages, faults/ fractures or joints. The low potential zone in major parts of the block is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.



3. AQUIFER DISPOSITION	
3.1. Number of Aquifers (Major)	One:Basalt –Aquifer-I, Aquifer-II
3.2. LITHOLOGICAL DISPOSITION	



3.3. CROSS SECTIONS



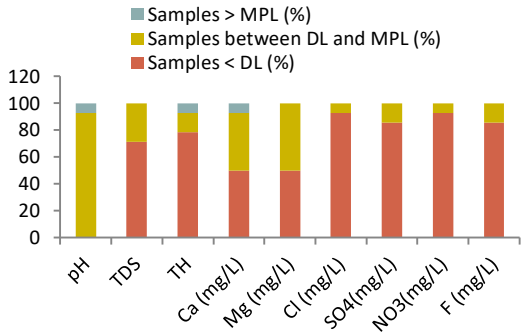
3.4 AQUIFER CHARACTERISTICS

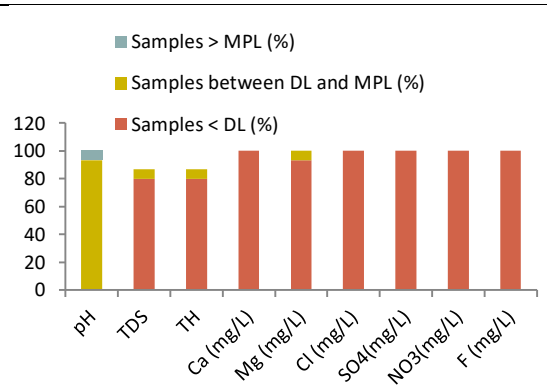
Major Aquifer	Basalt (Deccan Traps)	
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II (Semiconfined /confined)
Depth tobottom of aquifer (mbgl)	9 to 25	43 to 150
Weathered/ Fractured rocks thickness (m)	5.4 to 14	3 to 5
Yield Potential	0 to 50 m^3/day	0 to 0.6 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.0000245
Transmissivity (T)	-	6.15 to 83.53 m^2/day

4.CHEMICAL QUALITY OF GROUND WATER &CONTAMINATION

4.1 Aquifer I/Shallow Aquifer

Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Nitrate affected areas. ➢ About 325 Sq Km area of the block	➢ In major parts of the block covering 325 Sq Km area, plants with moderate salt tolerance can be grown. However, in 348 sq Km area where EC > 750 microsiemens/cm, special

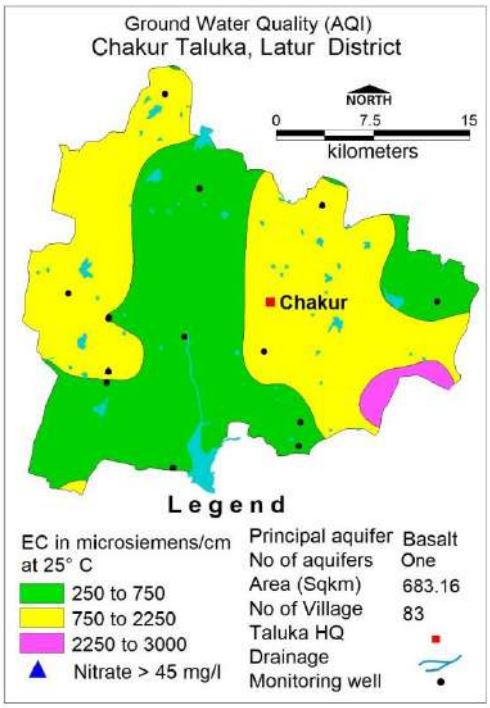
has EC well within the potable range of 250 to 750microsiemens/cm whereas 348 sq Km area has EC between 750 and 2250 microsiemens/cm. ➢ Nitrate contamination with nitrate more than 45 mg/l is observed in two sites namely Ashta and Chapoli. The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 14 samples analysed are as given below:  	management for salinity control may be required and plants with good salt tolerance should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. ➢ About 57% of the analysed samples have % Na less than 20, 36% have %Na between 20 and 40 and 7% have %Na value between 40 and 60 indicating that the ground water is good for irrigation. Hence, the overall quality of ground water is suitable for irrigation purposes.
4.1 Aquifer II/Deeper Aquifer	
Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Flouride affected areas. ➢ About 515 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm whereas 155 sq Km area has EC between 750 and 2250 microsiemens/cm. ➢ Flouride contamination with value more than 1.5 mg/l is observed in one site namedChapoli. The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 15 samples analysed are as given below:	➢ In major parts of the block covering 515 Sq Km area, plants with moderate salt tolerance can be grown. However, in 348 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all theanalysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. ➢ About 27% of the analyzed samples have % Na less than 20, 13% have %Na between 20 and 40, 27% have %Na value between 40 and 60 indicating that the ground water is good for



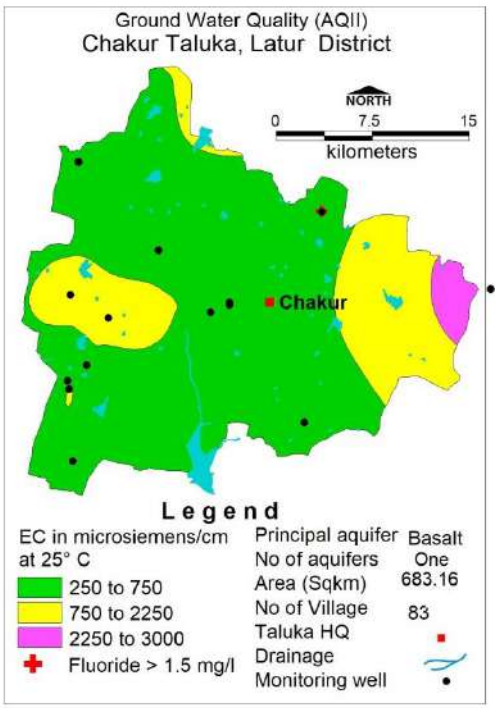
irrigation. However, about 27% of samples have %Na value more than 60% indicating that the water is unsuitable for irrigation purposes.

3.2.CHEMICAL QUALITY MAP

Phreatic Aquifer (Aquifer-I)



Semiconfined/Confined Aquifer (Aquifer II)



5. GROUND WATER RESOURCE & EXTRACTION

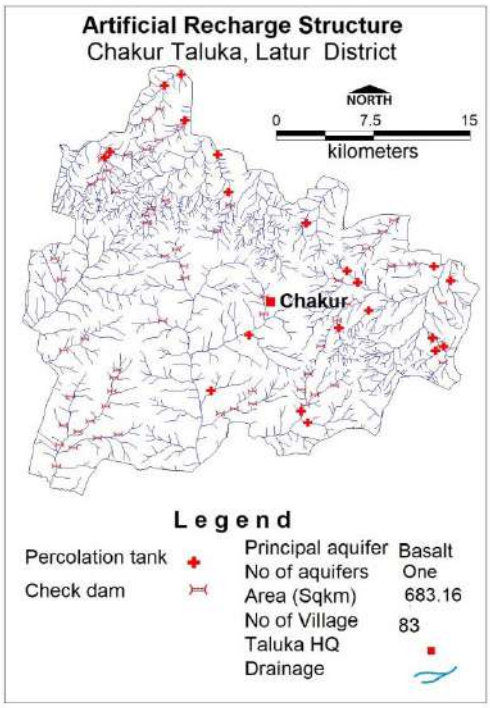
Aquifer-I/ Phreatic Aquifer (Basalt & Alluvium)	
Ground Water Recharge Worthy Area (Sq. Km.)	479.81
Total Annual Ground Water Recharge (MCM)	50.46
Natural Discharge (MCM)	2.52
Net Annual Ground Water Availability (MCM)	47.94
Existing Gross Ground Water Draft for irrigation (MCM)	41.43
Existing Gross Ground Water Draft for domestic and industrial water supply(MCM)	1.63

Existing Gross Ground Water Draft for All uses(MCM)			43.07		
Net Ground Water Availability for future irrigation development(MCM)			9.42		
Provision for domestic and industrial requirement supply to 2025(MCM)			2.43		
Stage of Ground Water Development %			89.84		
Category			**SAFE**		
Aquifer-II					
Semiconfined/Confined Aquifer (Basalt)					
Total Area (Sq. Km.)	Mean aquifer thickness (m)	Sy	Peizometric Head (m aboveconfining layer)		Total Resource (MCM)
683.16	3.6	0.005	57		13.26
5.0. GROUND WATER RESOURCE ENHANCEMENT					
Available Resource (MCM)		47.94			
Gross Annual Draft (MCM)		43.07			
5.1.SUPPLY SIDE MANAGEMENT					
SUPPLY (MCM)					
Agricultural Supply -GW		41.43			
Agricultural Supply -SW		80.77			
Domestic Supply - GW		1.63			
Domestic Supply - SW		0.41			
Total Supply		**124.24**			
Area of Block (Sq. Km.)		683.16			
Area suitable for Artificial recharge (Sq. Km)		479.81			
Type of Aquifer		Hard Rock	Soft Rock		
Area feasible for Artificial Recharge(WL >5mbgl) (Sq. Km.)		270.89	-		
Volume of Unsaturated Zone (MCM)		541.78	-		
Average Specific Yield		0.020	-		
Volume of Sub surface Storage Space available for Artificial Recharge (MCM)		10.84	-		
Surplus water Available (MCM)		6.07	-		
Proposed Structures		**Percolation Tank** (Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam (Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)		**Recharge shaft** (Av. Gross Capacity-60 TCM)
Number of Structures		21	61		0
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)		3.19	1.37		0

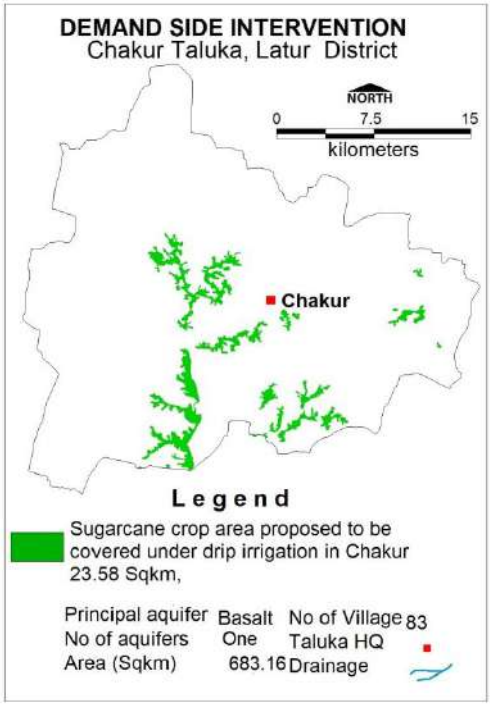
Area of Saline Patch	**Nil**
Proposed Structures	Nil
No of farm pond proposed (size: 30m*30m*3) with 3 filling= 0.0081 mcm capacity, 50% available water may be utilized for harvesting through farm ponds.	Nil
Volume of water available for harvesting	Nil
Additional volume created by desilting	**Nil**
RTRWH Structures – Urban Areas	
Households to be covered (25% with 50 m^2area)	8700
Total RWH potential (MCM)	0.345
Rainwater harvested / recharged @ 80% runoff co-efficient	0.276(**Economically not viable & Not Recommended)**
5.2.DEMAND SIDE MANAGEMENT	
Micro irrigation techniques	
Remaining ground water irrigated Sugarcane cropped area proposed through drip irrigation	23.58
Volume of Water expected to be saved (MCM). (Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m)	13.44
Proposed Cropping Pattern change	
Irrigated area under Water Intensive Crop(ha)	Not proposed
Water Saving by Change in Cropping Pattern	Nil
5.3.EXPECTED BENEFITS	
Net Ground Water Availability (MCM)	47.94
Additional GW resources available after Supply side interventions (MCM)	4.55
Ground Water Availability after Supply side intervention	52.94
Existing Ground Water Draft for All Purposes (MCM)	43.07
Saving of Ground Water through demand side intervention (MCM)	13.44
GW draft after Demand Side Interventions (MCM)	29.63
Present stage of Ground Water	89.84

Development (%)	
Expected Stage of Ground Water Development after interventions (%)	56.45
Other Interventions Proposed, if any	
Alternate Water Sources Available	Nil
5.4.RECOMMENDATION	
Ground water development is recommended, if additional ground water resources are available after bringing the expected stage of development from 56.45% to 70%.	
5.5.DEVELOPMENT PLAN	
Additional Volume of water available for GWD to 70% (MCM)	7.11
Proposed Number of DW(@ 1.5 ham for 90% of GWR Available)	427
Proposed Number of BW(@ 1.5 ham for 10% of GWR Available)	71
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	11

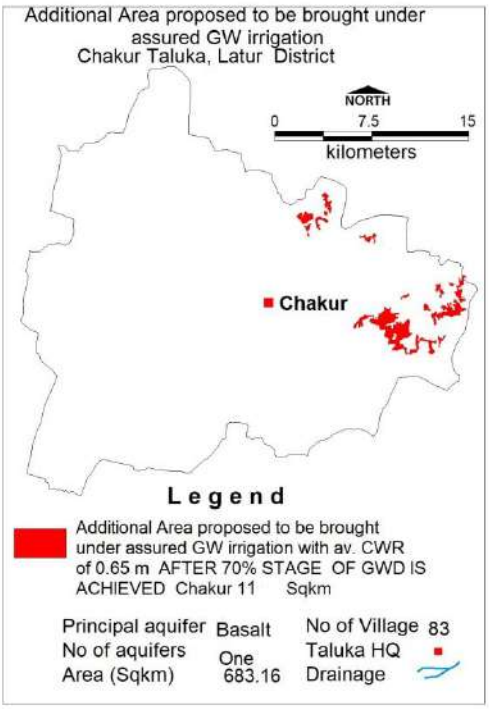
Proposed Artificial Recharge Structure



Demand Side Interventions



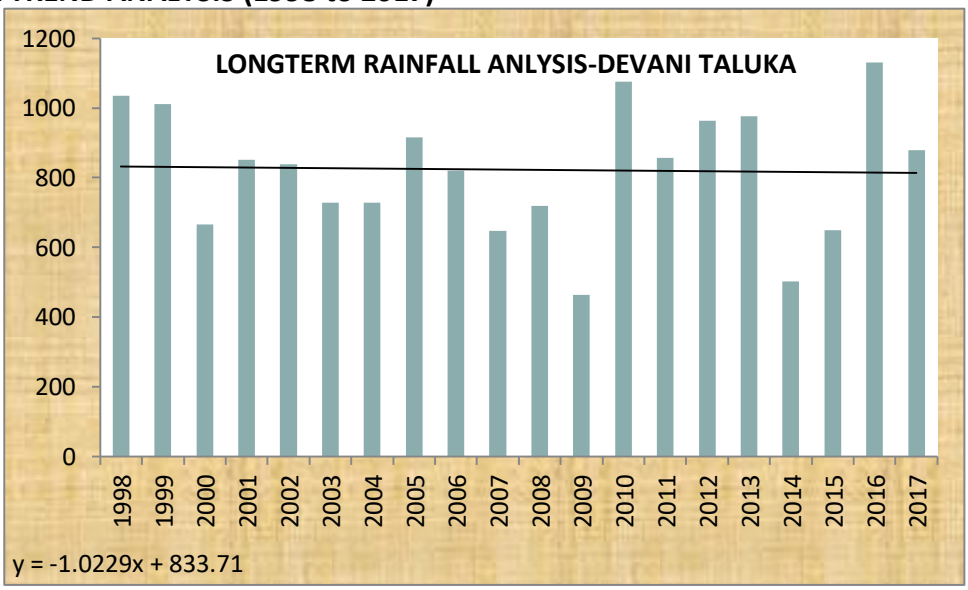
Addditional Area proposed to be brought under assured ground water irrigation


Additional Area proposed to be brought under assured GW irrigation
Chakur Taluka, Latur District
NORTH
0
7.5
15
kilometers
Chakur
Legend
Additional Area proposed to be brought under assured GW irrigation with av. CWR of 0.65 m AFTER 70% STAGE OF GWD IS ACHIEVED Chakur 11 Sqkm
Principal aquifer Basalt
No of aquifers One
Area (Sqkm) 683.16
No of Village 83
Taluka HQ
Drainage

5. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, DEONI BLOCK, LATUR DISTRICT

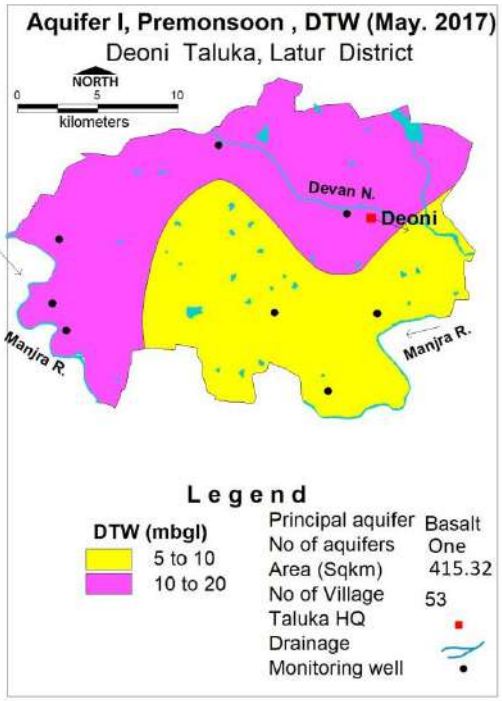
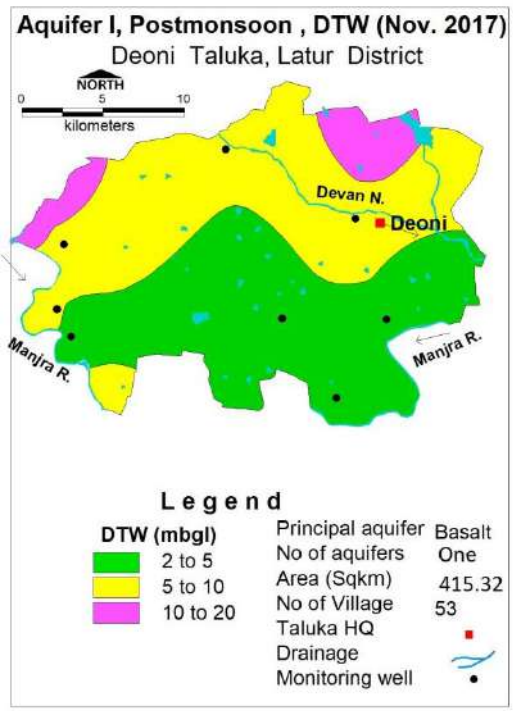
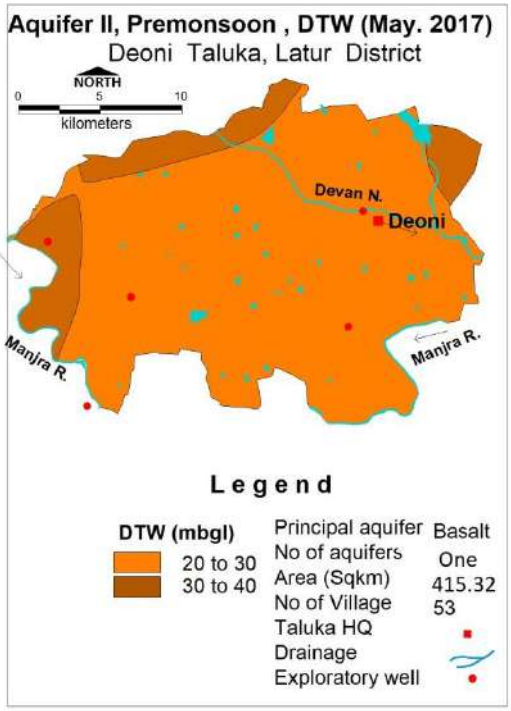
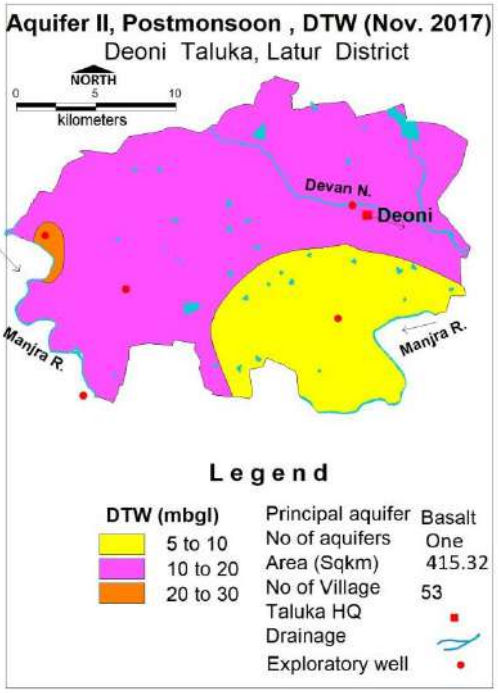
1. SALIENT INFORMATION	
1.1.Introduction	
Block Name	DEONI
Geographical Area (Sq. Km.)	415.32 Sq. Km.
Hilly Area (Sq. Km)	43 Sq. Km.
Poor Quality Area (Sq. Km.)	Nil
Population (2011)	97598
Climate	Tropical climate
1.2. Rainfall Analysis	
Normal Rainfall	823 mm
Annual Rainfall (2017)	879.5 mm
Decadal Average Annual Rainfall (2008-17)	821.75 mm
Long Term Rainfall Analysis (1998-2015)	Falling Trend:-1.023 m/year. Probability of Normal/Excess Rainfall:- 75% & 15%. Probability of Drought (Moderate/Severe/ Acute):- 10% Moderate Frequency of occurance of Drought:- 1 in 10 Years

RAINFALL TREND ANALYSIS (1998 to 2017)



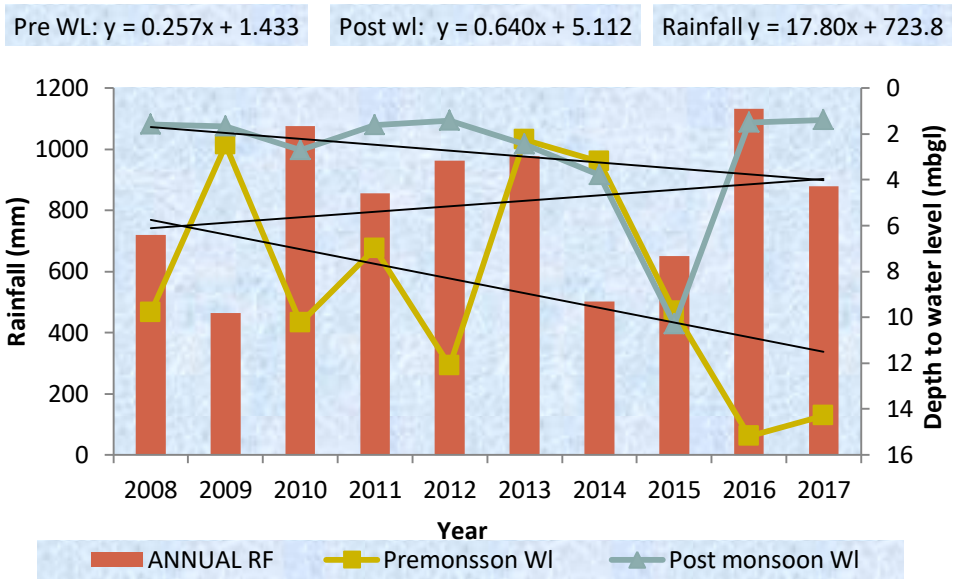
1.3. Geomorphology,Soil&Geology	
Geomorphic Unit	➢ Denudational Slope on Deccan Traps ➢ Region of Middle Level Plateau on Deccan Traps between 550 to 900 m elevation
Soil	➢ Medium Deep Soils of 18-36 inch thickness; dark brown to dark gray brown in colour; clay-loam to

	clayey in texture with granular to sub-granular nature; blocky in structure occurs in major part of the block. ➢ Shallow Soils of 0-9 inch thickness; brown to dark grey brown in color; loamy to clay-loam in texture with granular to sub-granular nature; blocky in structure	
Geology	Recent River Alluvium & Deccan Traps (Basalt) of Late Cretaceous to Early Eocene Age	
1.4.Hydrology & Drainage		
Drainage	Devan river forming the left bank tributary of Manjra river	
Hydrology(as on March 2013)	Major & Medium Irrigation Projects (>250 Ha) *(Reference Year: 2012-13)*	Nil
	Minor Irrigation Projects (0 to 250 Ha) *(Reference Year: 2016-17)*	Completed:-92 projects; Ongoing: 11 projects
1.5.LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN		
Geographical Area	415.32 Sq. Km.	
Forest Area	3.98 Sq. Km.	
Cultivable Area	Not Available	
Net Sown Area	331.52. Km.	
Double Cropped Area	198.04 Sq. Km.	
Principal Crops	**Crop Type**	**Area (Sq. Km.)**
	Pulses	2.53
	Cotton	-
	Cereals	4.16
	Oil Seeds	_
Horticultural Crops	Sugarcane	26.14
	Others	0.78
1.6.WATER LEVEL BEHAVIOUR		
1.6.1. Aquifer-I/Shallow Aquifer (Phreatic Aquifer)		
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**	
❖ The depth to water level between 5 mbgl and 10 mbgl is observed in 180.3 Sq Km area in the eastern, south-eastern, south-central and southwestern parts. ❖ Thedeeper depths to water level between 10 mbgl and 20 mbgl is observed in 225.6 Sq Km area in the north-eastern, northern, north-	❖ Thw shallow deptht o water level below 5 mbgl is observed in 188.3 Sq Km area in the southern, southeastern and southwestern parts of the block. ❖ The depth to water level between 5 mbgl and 10 mbgl is observed in 185.6 Sq Km area in the nothern, north-eastern and northwestern parts. ❖ Thedeeper depths to water level	

western and western parts.	between 10 mbgl and 20 mbgl is observed in 31.69 Sq Km area in isolated patches along the block boundary in the north-eastern and north-western parts.
Water Level Map- Aquifer-I/Shallow Aquifer (Phreatic Aquifer)	
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (Nov.2017)**
	
1.6.2. Aquifer-II/Deeper Aquifer (Semiconfined/Confined Aquifer)	
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**
	

Pre-Monsoon Water Level(May 2017)	Post-Monsoon Water Level(November 2017)
❖ The deeper depth to water level between 20 mbgl and 30 mbgl is observed in 349.8 Sq Km area covering almost entire block. ❖ Thedeeper depths to water level between 30 mbgl and 40 mbgl is observed in 67.49 Sq Km area in small portions along the block boundary in the northeastern, noth-western and western parts.	❖ The depth to water level between 5 mbgl and 10 mbgl is observed in 104.9 Sq Km area in the south-eastern parts of the block. ❖ Thedeeper depths to water level between 10 mbgl and 20 mbgl is observed in 296.8 Sq Km area covering eastern, northern, north-eastern, north-western, western and south-western parts. ❖ An isolated patch having depth to water level between 20 mbgl and 30 mbgl is observed in 4 Sq Km area in the western part of the block along the boundary

1.7. Hydrograph

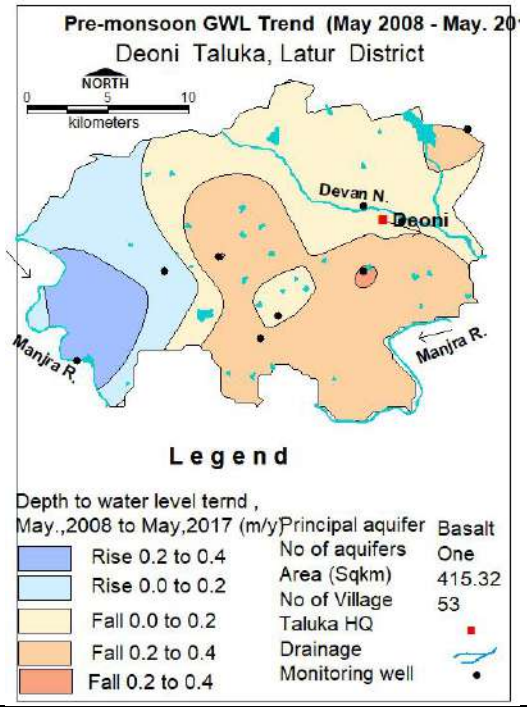
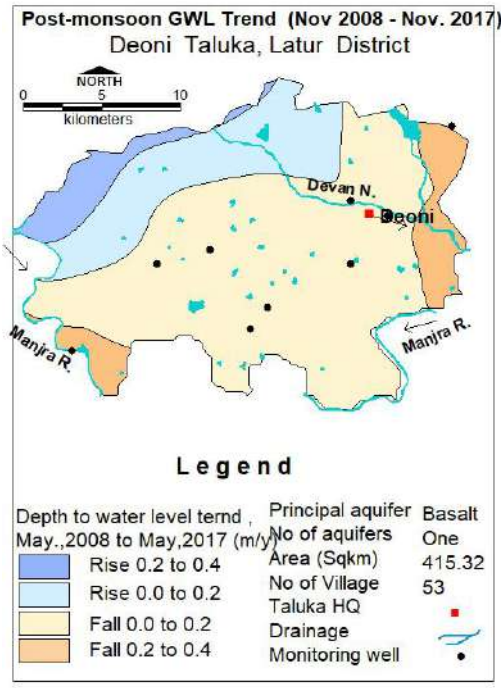


The hydrograph of CGWB Monitoring site at Deoni village for the period 2008 to 2017 shows:

- ❖ A falling trend during premonsoon and rising trend during postmonsoon @ 0.257 m/year and 0.640 m/year respectively.
- ❖ The depth to water level during premonsoon ranges from 2.25 mbgl to 15.2 mbgl. The deeper depths to water level indicates overdraft from the well during dry season.
- ❖ The depth to water level ranges from 1.4 mbgl to 10.3 mbgl during postmonsoon.

1.8. Water Level Trend (2008-17)

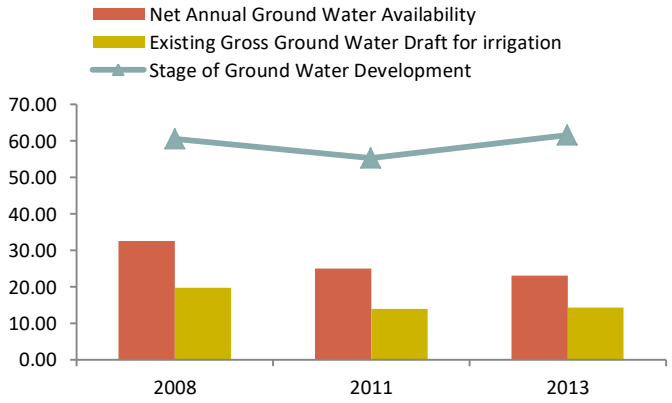
Pre-Monsoon Trend (May 2008-2017)		Post-Monsoon Trend (November 2008-2017)	
Rising Trend @	Falling Trend @	Rising Trend @	Falling Trend @
0.0 to 0.2 m/year in 62.47 Sq Km area&0.2 to 0.4 m/year in	0.0 to 0.2 m/year in 134.9Sq Km area, 0.2 to 0.4 m/year in 152 Sq Km area and 0.4 to 0.6	0 to 0.2 m/year in 78 Sq Km area, 0.2 to 0.4 m/year in 23.97 Sq Km area.	0.0 to 0.2 m/year in 256.9 Sq Km area and 0.24 to 0.4 m/year in 36.31 Sq Km area.

34.43Sq Km area.	m/year in 1.39 Sq Km area.		
Pre-Monsoon WL Trend (May 2007-2016)		**Post-Monsoon WL Trend (Nov.2007-2016)**	
			

2. GROUND WATER ISSUES

1) Increase in stage of ground water development

Despite being in Safe category, the stage of ground water development has increased from 60.61 % (2008) to 61.55% (2013) despite the decrease in net ground water availabilty from 32.59 MCM in 2008 to 23.11 MCM in 2013 @ 4MCM per year.

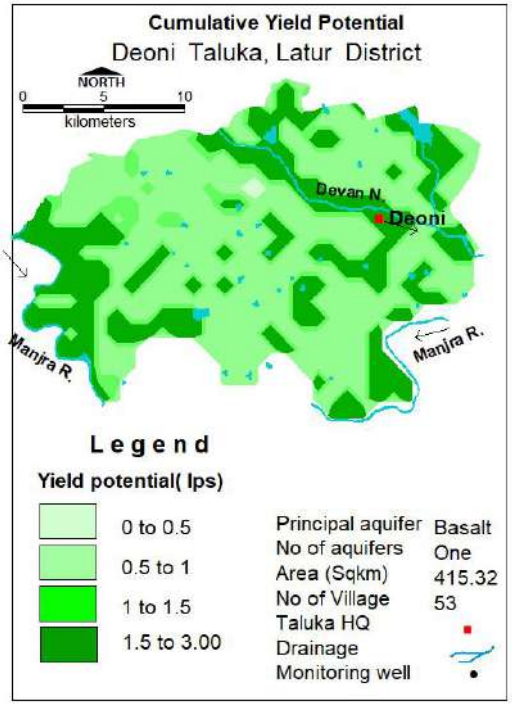


3) Declining Water Level Trend: -

The decline in water level trend (2008-17) upto 0.4 m/year is observed in major section of the block during both the seasons despite the increase in rainfall @17.18 mm/year. This is due to the exploitation of shallow aquifers as for the dependency in ground water for irrigation during both Kharif and Rabi. About 62 % of the net ground water availabilty (as per GEC2013) is utilised for irrigation purposes in the block.

4) **Low ground water yield Potential of the aquifers:**

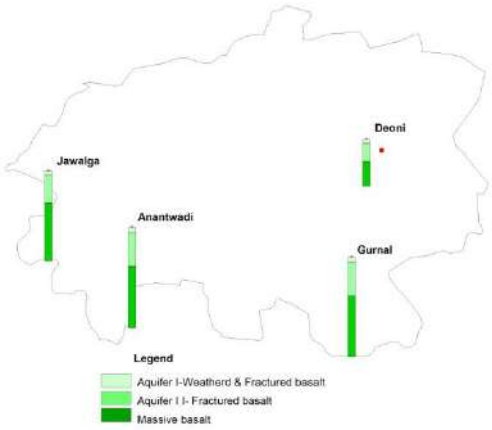
The ground water yield potentiality of the aquifers ranges from 0 to 1 lps in major parts of the block. However, high yielding aquifers are obtained only along the drainages, faults/ fractures or joints. The low potential zone in major parts of the block is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.



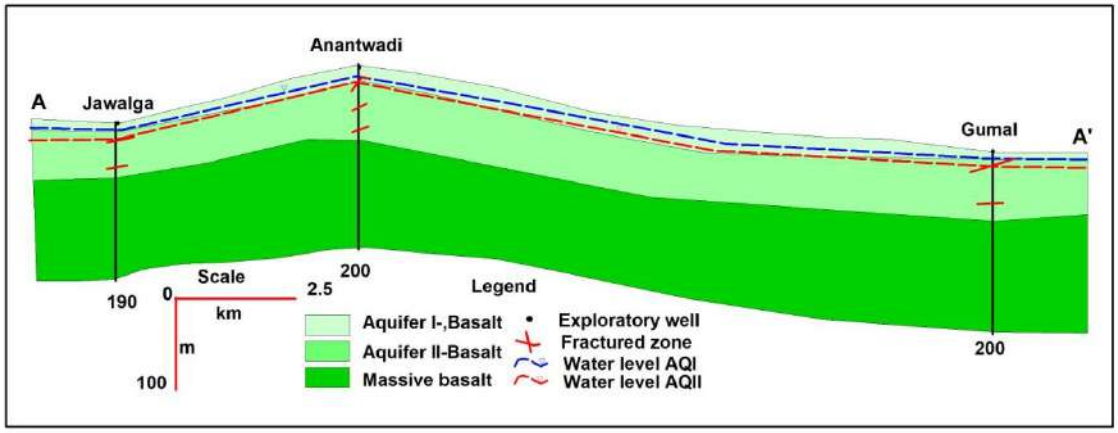
3. AQUIFER DISPOSITION

3.1. Number of Aquifers (Major)	One: 2) Basalt –Aquifer-I, Aquifer-II

3.2. LITHOLOGICAL DISPOSITION



3.3. CROSS SECTIONS

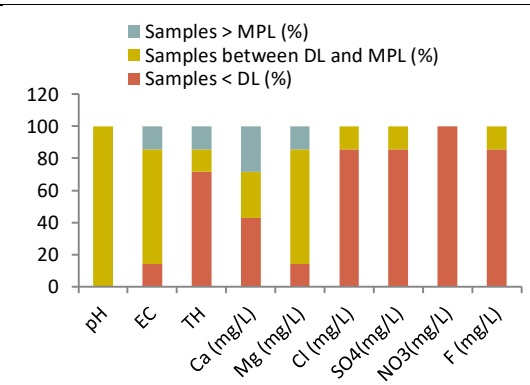


3.4 AQUIFER CHARACTERISTICS		
Major Aquifer	Basalt (Deccan Traps)	
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II (Semiconfined /confined)
Depth to bottom of aquifer (mbgl)	9 to 16	43 to 90
Weathered/ Fractured rocks thickness (m)	5.4 to 12.8	0.5 to 8.9
Yield Potential	0 to 50 m^3/day	0 to 0.6 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.0000145
Transmissivity (T)	32 to 65 m^3/day	27 to 190 m^3/day

4.CHEMICAL QUALITY OF GROUND WATER &CONTAMINATION

4.1 Aquifer I/Shallow Aquifer

Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Nitrate affected areas. ➢ About 196 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm, 196.98 sq Km area has EC between 750 and 2250 microsiemens/cm and 13.50 Sq Km area has EC>2250 microsiemens/cm ➢ Nitrate contamination with nitrate more than 45 mg/l is observed in only one site in Deoni. The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 7 samples analysed are as given below:	➢ In major parts of the block covering 196 Sq Km area, plants with moderate salt tolerance can be grown. However, in 196 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. Howver, in 13 SSq Km are of the block, the ground water is not suitable for irrigation under ordinary condition. In these regions very salt tolerant crops should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is

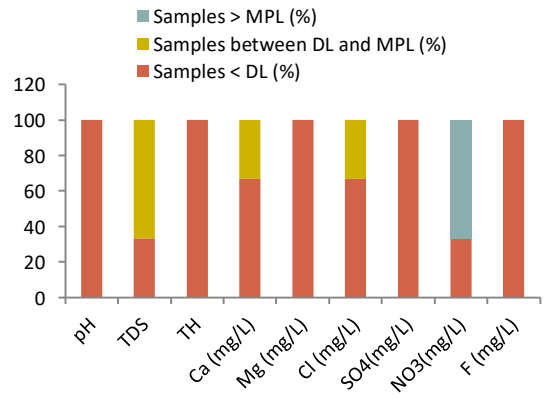


good for irrigation.

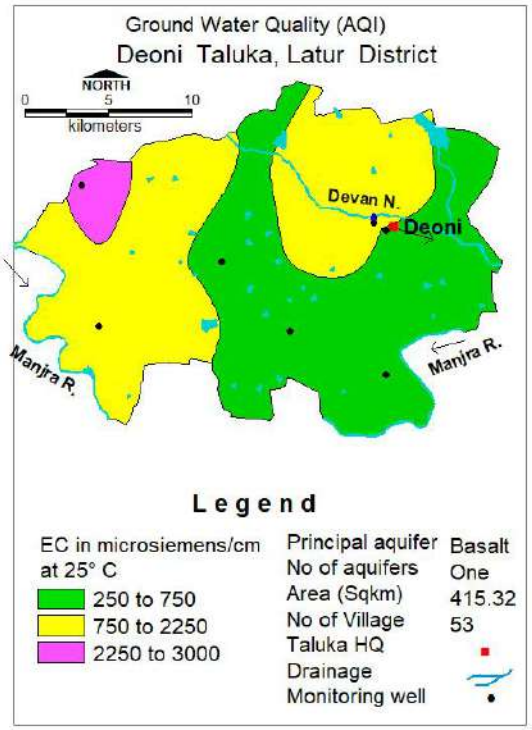
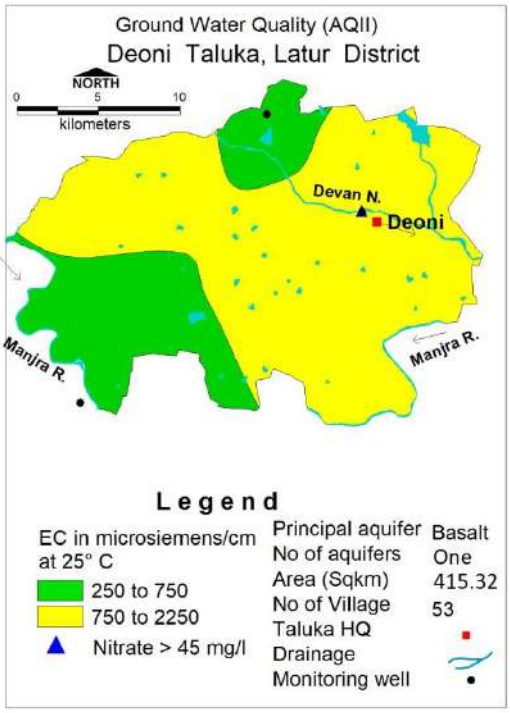
- About 57% of the analysed samples have % Na less than 20 and 43 % have %Na between 20 and 40 indicating that the ground water is good for irrigation.

Hence, the overall quality of ground water is suitable for irrigation purposes except in

4.1 Aquifer II/Deeper Aquifer

Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Nitrate affected areas. ➢ About 112 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm whereas 294 sq Km area has EC between 750 and 2250 microsiemens/cm. ➢ Nitrate contamination with nitrate more than 45 mg/l is observed in only one site in Deoni. The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 3 samples analysed are as given below:  	➢ In major parts of the block covering 112 Sq Km area, plants with moderate salt tolerance can be grown. However, in 249 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. ➢ About 34% of the analysed samples have % Na less than 20 and 33% have %Na between 20 and 40 indicating that the ground water is good for irrigation. However,33% of analysed samples have %Na value more than 60% indicating that the ground water is not good for irrigartion in that area Hence, the overall quality of ground water is suitable for irrigation purposes except in area having high % Na.

3.2.CHEMICAL QUALITY MAP

Phreatic Aquifer (Aquifer-I)	Semiconfined/Confined Aquifer (Aquifer II)
	

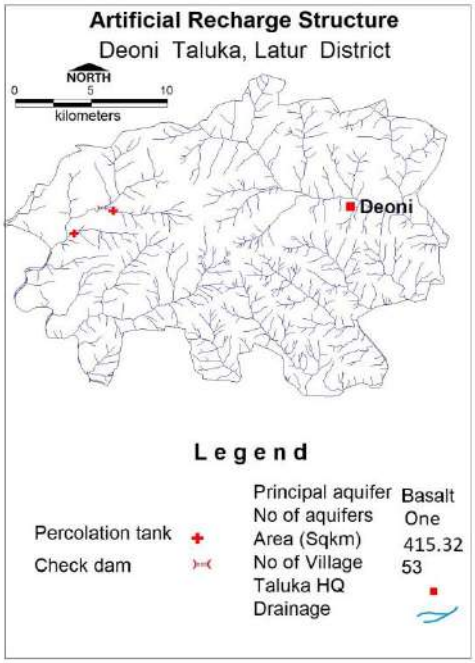
5. GROUND WATER RESOURCE & EXTRACTION				
Aquifer-I/ Phreatic Aquifer (Basalt & Alluvium)				
Ground Water Recharge Worthy Area (Sq. Km.)	255.76			
Total Annual Ground Water Recharge (MCM)	24.32			
Natural Discharge (MCM)	1.21			
Net Annual Ground Water Availability (MCM)	23.11			
Existing Gross Ground Water Draft for irrigation (MCM)	13.57			
Existing Gross Ground Water Draft for domestic and industrial water supply(MCM)	0.64			
Existing Gross Ground Water Draft for All uses(MCM)	14.22			
Net Ground Water Availability for future irrigation development(MCM)	7.81			
Provision for domestic and industrial requirement supply to 2025(MCM)	1.40			
Stage of Ground Water Development %	61.55			
Category	**SAFE**			
Aquifer-II				
Semiconfined/Confined Aquifer (Basalt)				
Total Area (Sq. Km.)	Mean aquifer thickness (m)	Sy	Peizometric Head (m aboveconfining layer)	Total Resource (MCM)
415.32	5.3	0.005	66	11.40

5.0. GROUND WATER RESOURCE ENHANCEMENT			
Available Resource (MCM)	23.11		
Gross Annual Draft (MCM)	14.22		
5.1.SUPPLY SIDE MANAGEMENT			
SUPPLY (MCM)			
Agricultural Supply -GW	13.57		
Agricultural Supply -SW	29.26		
Domestic Supply - GW	0.64		
Domestic Supply - SW	0.16		
Total Supply	**43.63**		
Area of Block (Sq. Km.)	415.32		
Area suitable for Artificial recharge (Sq. Km)	255.76		
Type of Aquifer	Hard Rock	Soft Rock	
Area feasible for Artificial Recharge(WL >5mbgl) (Sq. Km.)	19.35	-	
Volume of Unsaturated Zone (MCM)	38.7	-	
Average Specific Yield	0.020	-	
Volume of Sub surface Storage Space available for Artificial Recharge (MCM)	0.774	-	
Surplus water Available (MCM)	0.433	-	
Proposed Structures	**Percolation Tank** (Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam (Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)	**Recharge shaft** (Av. Gross Capacity-60 TCM)
Number of Structures	2	4	0
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	0.23	0.10	0
Area of Saline Patch	**Nil**		
Proposed Structures	Nil		
No of farm pond proposed (size: 30m*30m*3) with 3 filling= 0.0081 mcm capacity, 50% available water may be utilized for harvesting through farm ponds.	Nil		
Volume of water available for harvesting	Nil		
Additional volume created by desilting	**Nil**		
RTRWH Structures – Urban Areas			
Households to be covered (25%	4698		

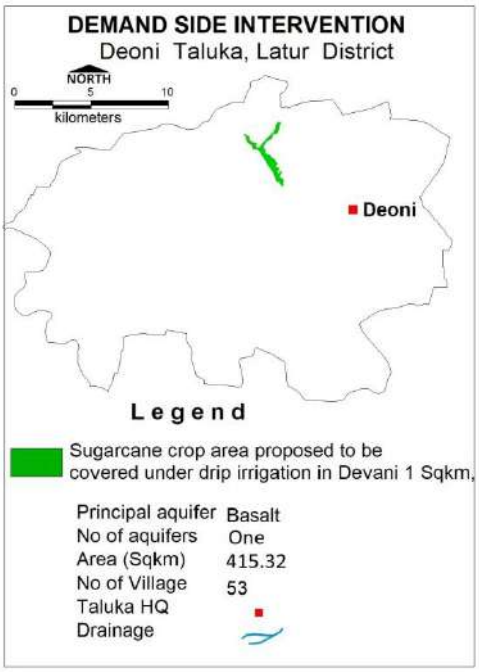
with 50 m^2area)	
Total RWH potential (MCM)	0.193
Rainwater harvested / recharged @ 80% runoff co-efficient	0.154 (**Economically not viable & Not Recommended)**
5.2.DEMAND SIDE MANAGEMENT	
Micro irrigation techniques	
Remaining ground water irrigated Sugarcane cropped area proposed through drip irrigation	1
Volume of Water expected to be saved (MCM). (Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m)	0.57
Proposed Cropping Pattern change	
Irrigated area under Water Intensive Crop(ha)	Not proposed
Water Saving by Change in Cropping Pattern	Nil
5.3.EXPECTED BENEFITS	
Net Ground Water Availability (MCM)	23.11
Additional GW resources available after Supply side interventions (MCM)	0.33
Ground Water Availability after Supply side intervention	23.44
Existing Ground Water Draft for All Purposes (MCM)	14.22
Saving of Ground Water through demand side intervention (MCM)	0.57
GW draft after Demand Side Interventions (MCM)	13.65
Present stage of Ground Water Development (%)	61.53
Expected Stage of Ground Water Development after interventions (%)	58.25
Other Interventions Proposed, if any	
Alternate Water Sources Available	Nil
5.4.RECOMMENDATION	
Ground water development is recommended to bring the stage of development from 58.25% to 70%.	
5.5.DEVELOPMENT PLAN	
Volume of water available for GWD to 70% (MCM)	2.75
Proposed Number of DW(@ 1.5	165

ham for 90% of GWR Available)	
Proposed Number of BW(@ 1.5 ham for 10% of GWR Available)	28
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	4

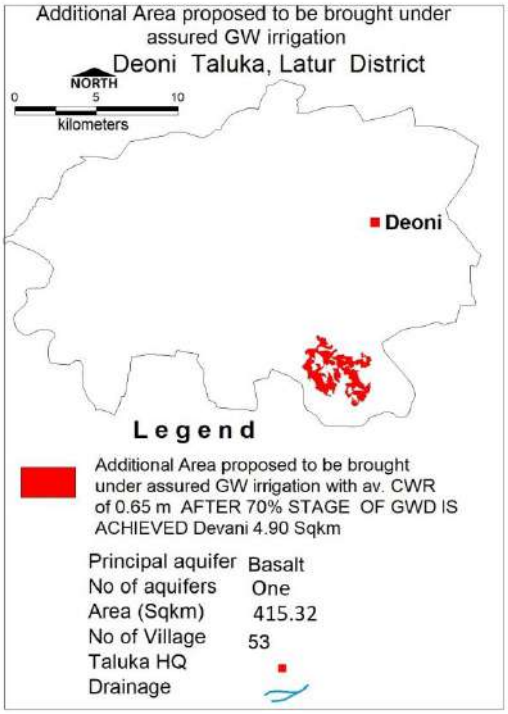
Proposed Artificial Recharge Structure



Demand Side Interventions



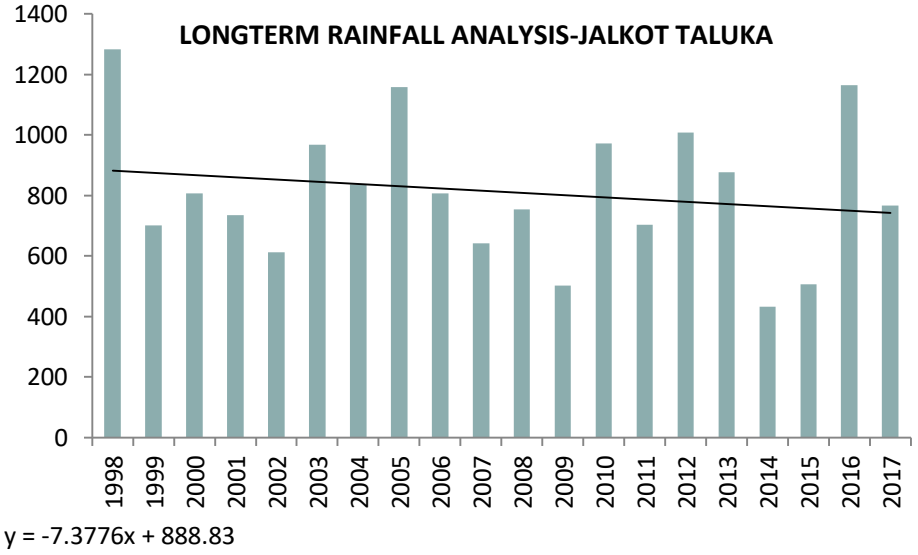
Addditional Area proposed to be brought under assured ground water irrigation



6. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, JALKOT BLOCK, LATUR DISTRICT

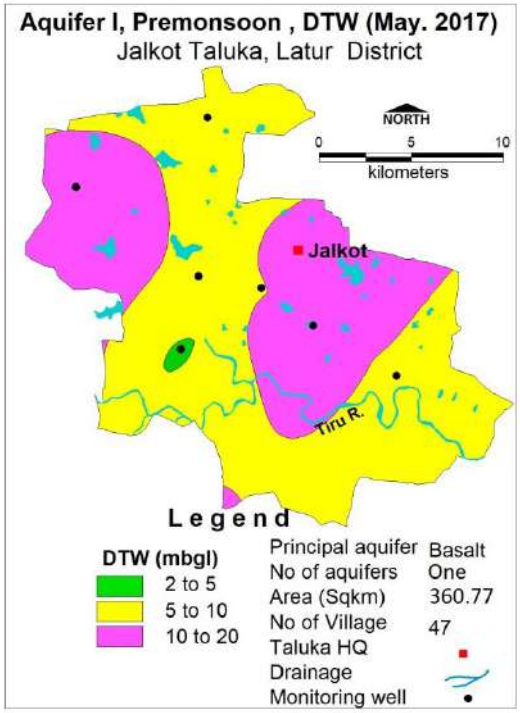
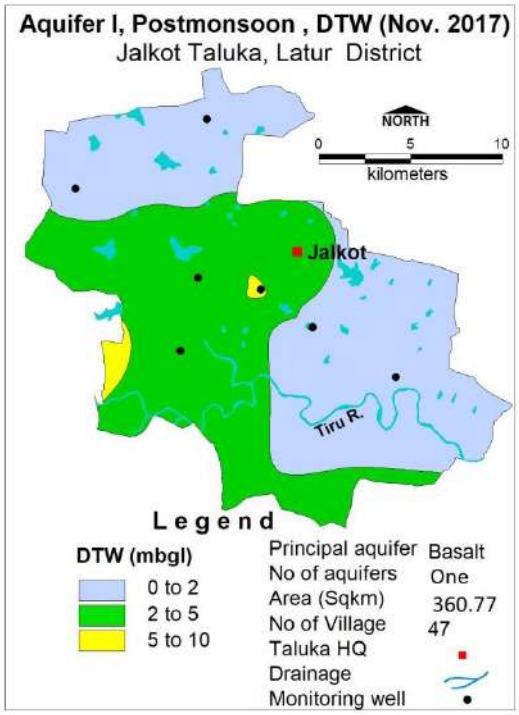
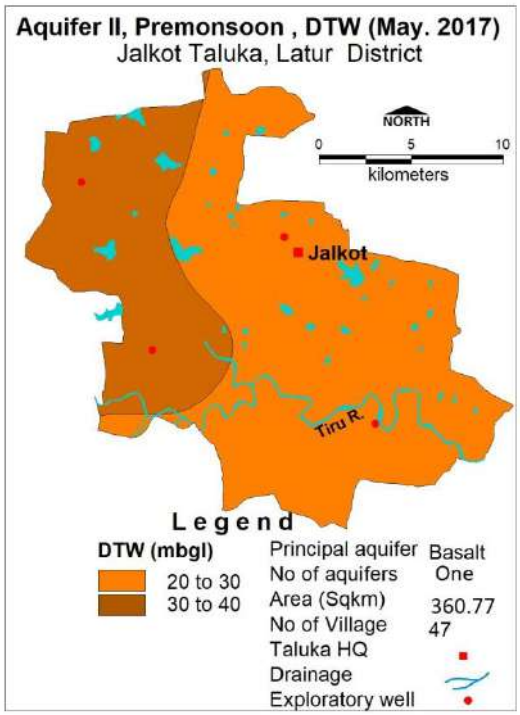
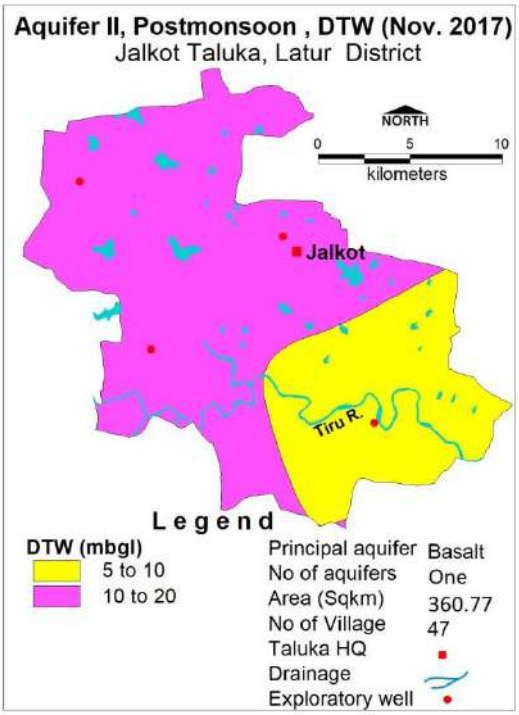
7. SALIENT INFORMATION	
1.1.Introduction	
Block Name	Jalkot
Geographical Area (Sq. Km.)	360.77 Sq. Km.
Hilly Area (Sq. Km)	40.70 Sq. Km.
Poor Quality Area (Sq. Km.)	Nil
Population (2011)	
Climate	Tropical climate
1.2. Rainfall Analysis	
Normal Rainfall	811.4 mm
Annual Rainfall (2017)	766.1 mm
Decadal Average Annual Rainfall (2008-17)	767.99 mm
Long Term Rainfall Analysis (1998-2015)	Falling Trend:-7.378 m/year. Probability of Normal/Excess Rainfall:-65% & 15%. Probability of Drought (Moderate/ Severe/ Acute):- 20% Moderate Frequency of occurance of Drought:- 1 in 5 Years

RAINFALL TREND ANALYSIS (1998 to 2017)



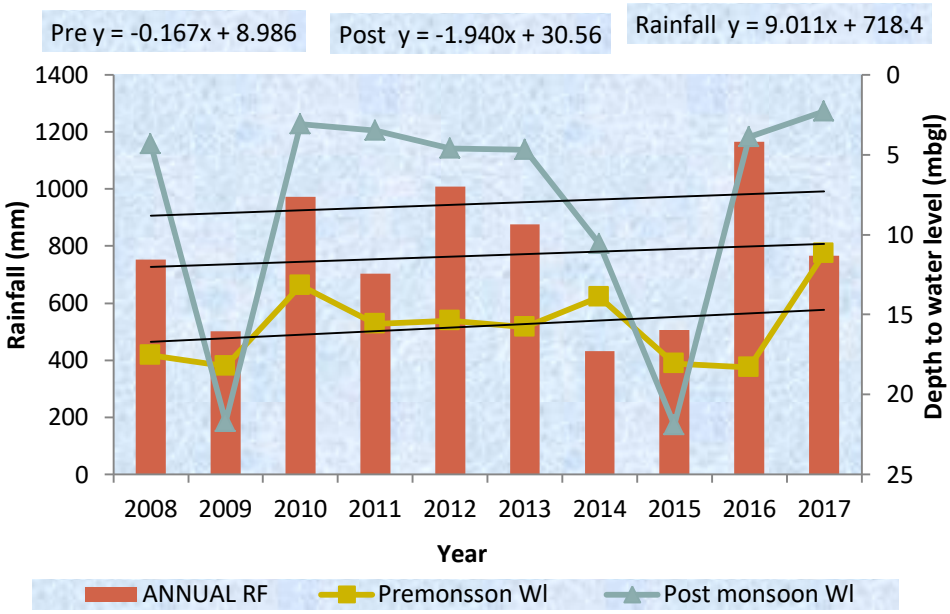
1.3. Geomorphology,Soil&Geology	
Geomorphic Unit	➢ Region of Low Level Plateau on Deccan Traps between 350 to 550 m elevation ➢ Region of Middle Level Plateau on Deccan Traps between 550 to 900 m elevation
Soil	➢ Medium Deep Soils of 18 to 36 inch thickness; clay loam to clayey in texture; granular to subangular blocky in structure; dark grey brown

		to very dark brown; Deficient in nitrogen contents	
Geology		Recent River Alluvium & Deccan Traps (Basalt) of Late Cretaceous to Early Eocene Age	
1.4.Hydrology & Drainage			
Drainage		Tiru river forms the main drainage of the block.	
Hydrology		Major & Medium Irrigation Projects (>250 Ha) *(Reference Year: 2012-13)*	Nil
		Minor Irrigation Projects (0 to 250 Ha) *(Reference Year: 2016-17)*	Completed:-99 projects Ongoing: 16 projects
1.5.LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN			
Geographical Area		360.77 Sq. Km.	
Forest Area		40.70 Sq. Km.	
Cultivable Area		385.23 Sq. Km.	
Net Sown Area		268.04. Km.	
Double Cropped Area		117.19 Sq. Km.	
Area under Irrigation	Surface Water	3.58	
	Ground Water	6.64 Sq. Km.	
Principal Crops		**Crop Type**	**Area (Sq. Km.)**
		Pulses	8.63
		Cotton	-
		Cereals	5.87
		Oil Seeds	_
Horticultural Crops		Sugarcane	2.79
		Others	0.81
1.6.WATER LEVEL BEHAVIOUR			
1.6.1. Aquifer-I/Shallow Aquifer (Phreatic Aquifer)			
Pre-Monsoon (May-2017)		**Post-Monsoon (November-2017)**	
❖ Isolated patch of 2 Sq Km area has depth to water level between 2 mbgl and 5 mbgl ❖ Depth to water level between 5 mbgl and 10 mbgl observed in 131 Sq Km area in the north-eastern, central, western, southern and south-eastern parts of the block. ❖ Depth to water level between 10 mbgl and 20 mbgl observed in 136 Sq Km areas in the north-western, eastern and east-central parts of the block.		❖ Very shallow Depth to water level between less 2 mbgl is observed in 185.9 Sq Km areaalong the northern, eastern and southeastern parts. ❖ Depth to water level between 2 mbgl and 5 mbgl is observed in 161 Sq Km area in the western and south-western and southern parts of the block ❖ Isolated patch of 5 Sq Km area show depth to water level more than 10 mbgl in the western boundary of the block. The shallow depths to water level may be	

The deeper depth to water level may be due to exploitation of ground water during dry period.	dueto recharge from rainfall.
Water Level Map- Aquifer-I/Shallow Aquifer (Phreatic Aquifer)	
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (Nov.2017)**
	
1.6.2. Aquifer-II/Deeper Aquifer (Semiconfined/Confined Aquifer)	
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**
	
Pre-Monsoon Water Level(May 2017)	**Post-Monsoon Water Level(November 2017)**

❖ Depth to water level between 20 mbgl and 30 mbgl observed in 241 Sq Km area in the northern, eastern,southern and south-western parts ❖ Depth to water level between 30 mbgl and 40 mbgl observed in 111 Sq Km areas in the northwestern and western parts. The deeper depth to water level may be due to exploitation of ground water during dry period.	❖ The shallow depth to water level between 5 mbgl and 10 mbgl is observed in 107 Sq Km areain the southeastern parts. ❖ Depth to water level between 10 mbgl and 20 mbgl is observed in 245 Sq Km area in the northern, western, north-eastern and south-western parts. The shallow depths to water level may be due to recharge from rainfall.

1.7. Hydrograph

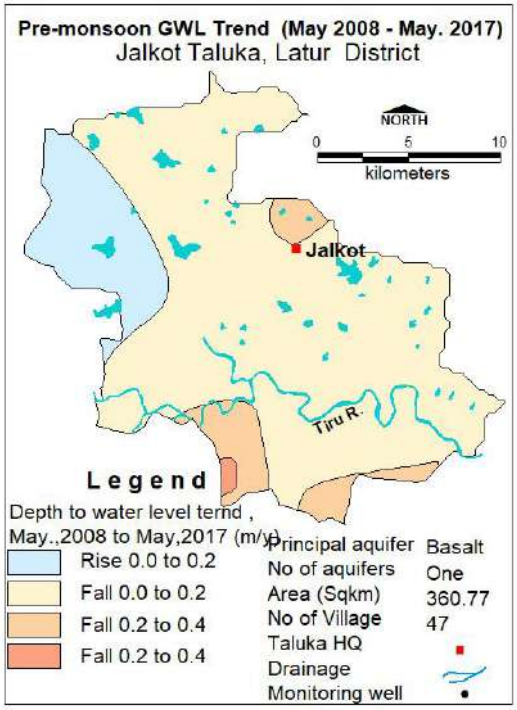
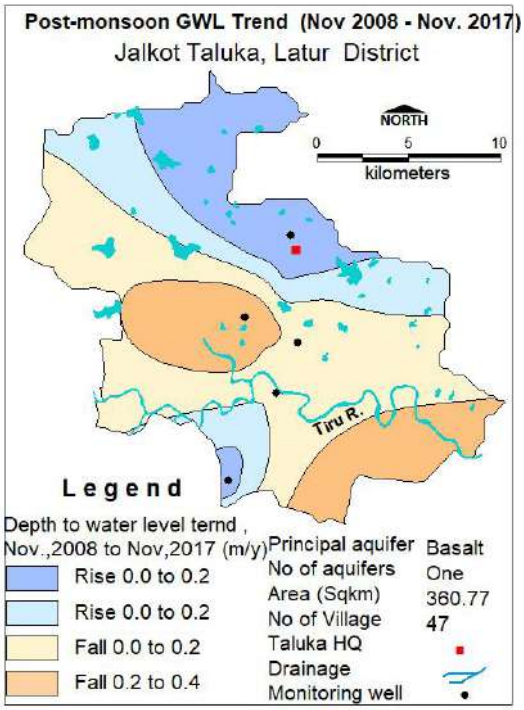


The hydrograph of CGWB Monitoring site at Jalkotfor the period 2008 to 2017 shows:

- ❖ A rising trend during both premonsoon and postmonsoon @ 0.167 m/year and 1.94 m/year respectively.
- ❖ The depth to water level during premonsoon ranges from 11.2 mbgl to 18.3 mbgl. The deeper depths to water level indicates overdraft from the well during dry season.
- ❖ The depth to water level during postmonsoon ranges from 2.3mbgl to 10.6 mbgl with deeper depths to water level of 21.7 mbgl and 21.9 mbgl in the years 2009 and 2015 respectively due to occurance of drought condition, once in five years.

1.8. Water Level Trend (2008-17)

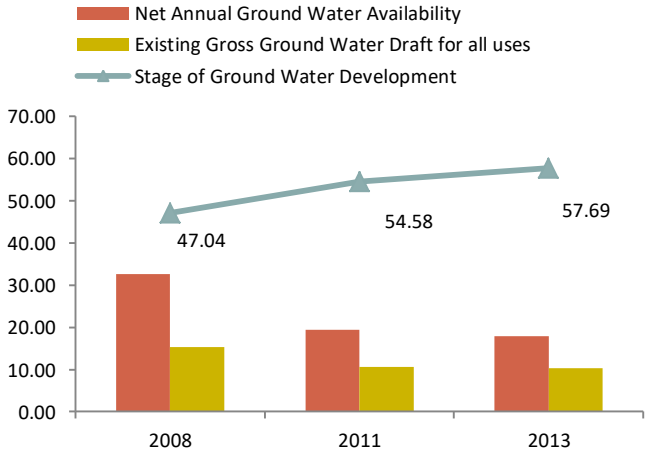
Pre-Monsoon Trend (May 2008-2017)		**Post-Monsoon Trend (November 2008-2017)**	
Rising Trend @	Falling Trend @	Rising Trend @	Falling Trend @
0 to 0.2 m/year in 47.14 Sq Km area	0.00 to 0.2 m/year in 264.5 Sq Km area, 0.2 to 0.4 m/year in 19.65 Sq Km area and more than 0.4 m/year in 1.59 Sq Km area	0 to 0.2 m/year in 66.2 Sq Km area and 0.2 to 0.4 m/year in 61.11 Sq Km area	0 to 0.2 m/year in 142.3 Sq Km area and 0.2 to 0.4 m/year in 70.8 Sq Km area.

Pre-Monsoon WL Trend (May 2008-2017)	Post-Monsoon WL Trend (Nov.2008-2016)
	

2. GROUND WATER ISSUES

1) Increase in stage of ground water development

Despite being in Safe category, the stage of ground water development has increased from 47.04 % (2008) to 57.69% (2013) with decrease in net ground water availabilty from 32.57 MCM in 2008 to 17.82 MCM in 2013 @ 2.5MCM per year.



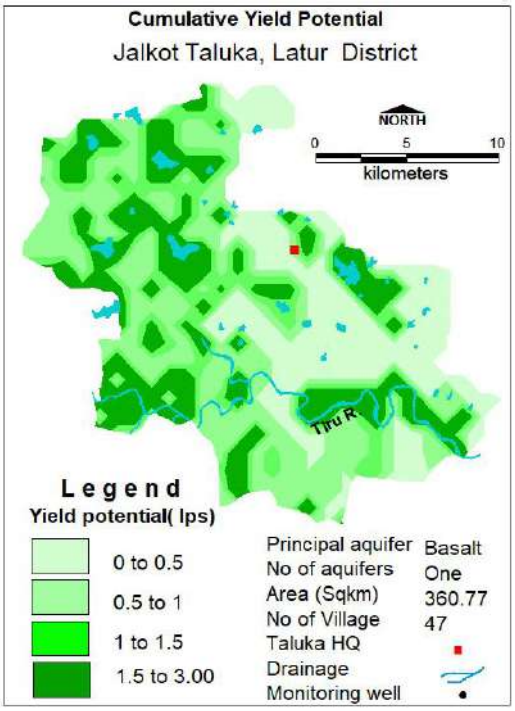
3) Declining Water Level Trend: -

The decline in water level trend (2008-17) upto 0.4 m/year is observed in major section of the block during both the seasons despite the increase in rainfall @9.01 mm/year. This is due to the exploitation of shallow aquifers as for the dependency in ground water for irrigation during both Kharif and Rabi. About 58 % of the net ground water availabilty (as per GEC2013) is utilised for irrigation purposes in the block.

4) **Low ground water yield Potential of the aquifers:**

The ground water yield potentiality of the aquifers ranges from 0 to 1.5 lps in major

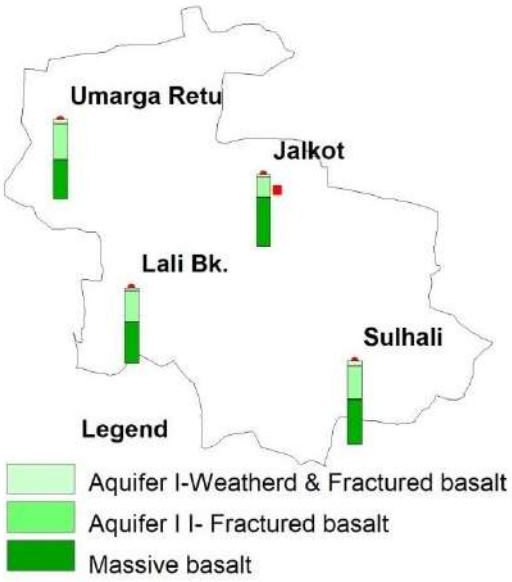
parts of the block. However, high yielding aquifers are obtained only along the drainages, faults/ fractures or joints. The low potential zone in major parts of the block is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.



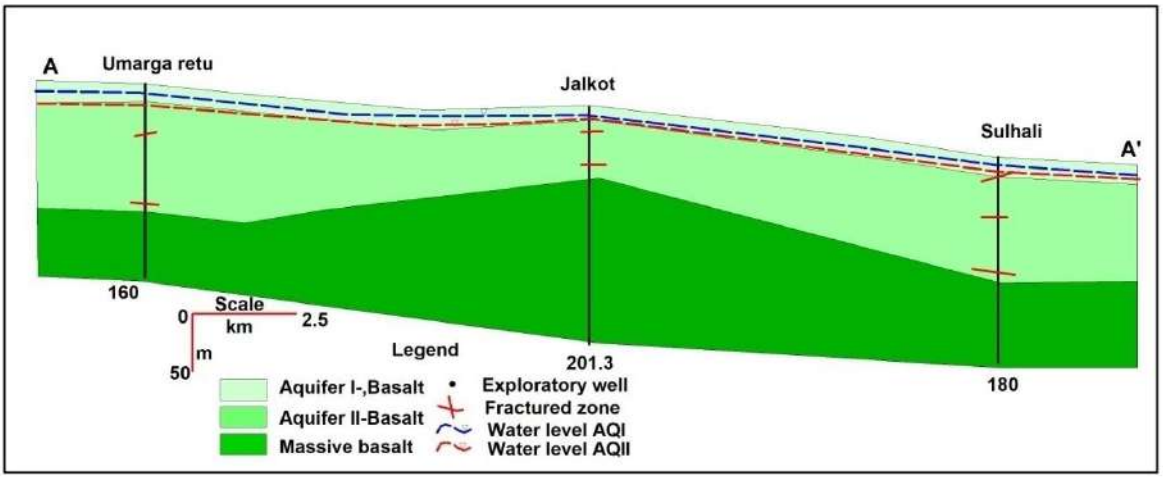
3. AQUIFER DISPOSITION

3.1. Number of Aquifers (Major)	One:Basalt –Aquifer-I, Aquifer-II

3.2. LITHOLOGICAL DISPOSITION



3.3. CROSS SECTIONS

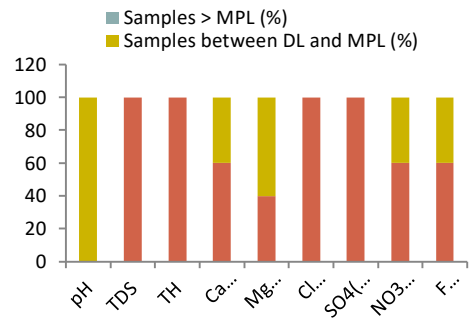


3.4 AQUIFER CHARACTERISTICS		
Major Aquifer	Basalt (Deccan Traps)	
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II(Semiconfined /confined)
Depth of Occurrence bottom of aquifer (mbgl)	10 to 16	70 to 110
Weathered/ Fractured rocks thickness (m)	7 to 12.8	1 to 5
Yield Potential	0 to 100 m^3/day	0 to 1.2 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.0000145
Transmissivity (T)	33 to 78 m^2/day	26 to 210 m^2/day

4.CHEMICAL QUALITY OF GROUND WATER &CONTAMINATION

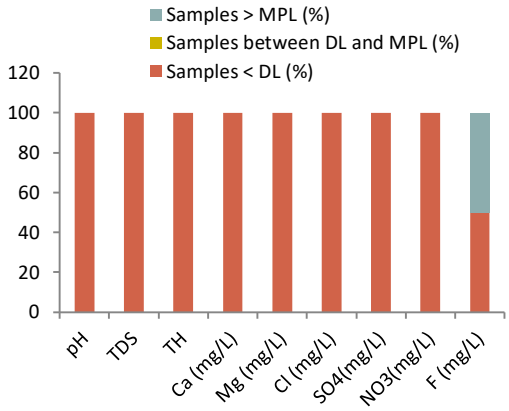
4.1 Aquifer I/Shallow Aquifer

Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Nitrate affected areas. ➢ About 238 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm and 114 sq Km area has EC between 750 and 2250 microsiemens/cm ➢ Nitrate contamination with nitrate more than 45 mg/l is observed in three sites namely Umarga, Hokarna and Jalkot The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 5 samples analysed are as given below:	➢ In major parts of the block covering 238 Sq Km area, plants with moderate salt tolerance can be grown. However, in 114 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. ➢ About 60% of the analysed samples have % Na less than 20 and 40 % have %Na between 20 and 40 indicating that the ground water is good for irrigation.

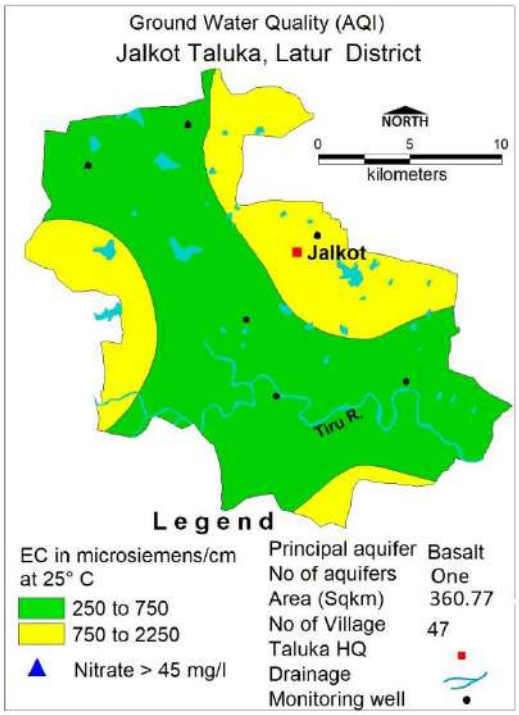
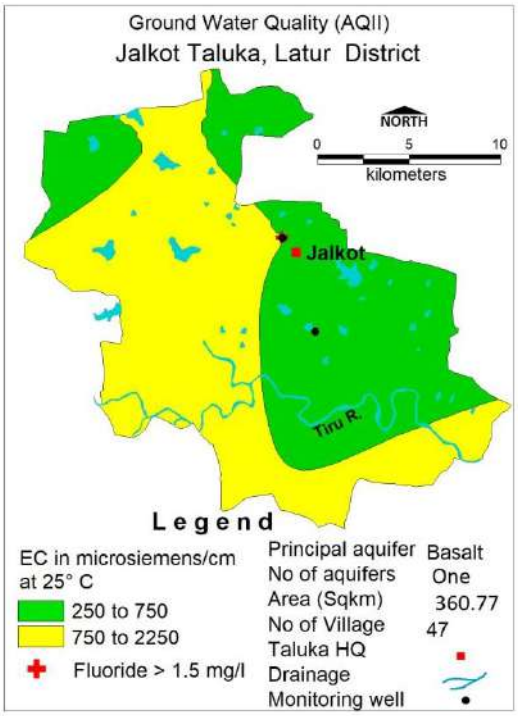


Hence, the overall quality of ground water is suitable for irrigation purposes

4.1 Aquifer II/Deeper Aquifer

Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Fluoride infested areas. ➢ About 159 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm and 192 sq Km area has EC between 750 and 2250 microsiemens/cm. ➢ **Flouride contamination with value more than 1.5 mg/l is observed in one site in Jalkot.** The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 2 samples analysed are as given below:  	➢ In major parts of the block covering 159 Sq Km area, plants with moderate salt tolerance can be grown. However, in 192 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. ➢ All the samples have %Na between 20 and 40 indicating that the ground water is good for irrigation. Hence, the overall quality of ground water is suitable for irrigation purposes

3.2.CHEMICAL QUALITY MAP

Phreatic Aquifer (Aquifer-I)	Semiconfined/Confined Aquifer (Aquifer II &III)
	

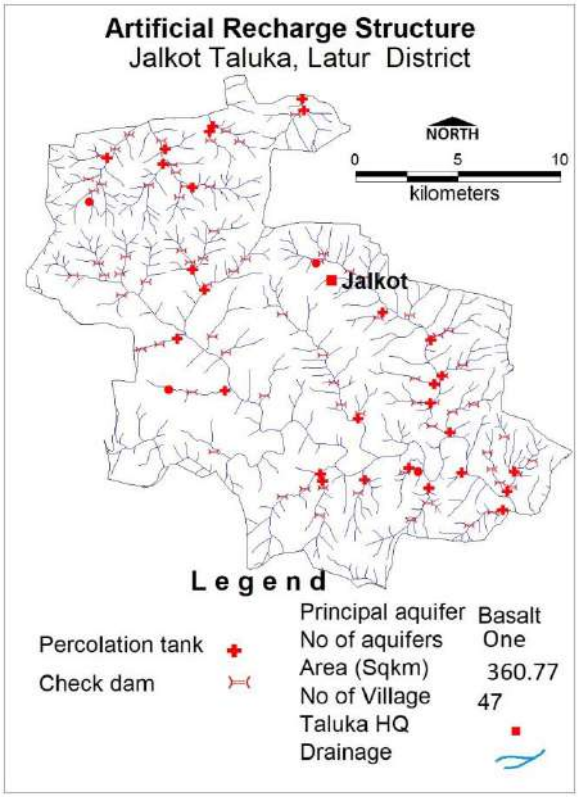
5. GROUND WATER RESOURCE & EXTRACTION				
Aquifer-I/ Phreatic Aquifer (Basalt & Alluvium)				
Ground Water Recharge Worthy Area (Sq. Km.)	320.07			
Total Annual Ground Water Recharge (MCM)	18.76			
Natural Discharge (MCM)	0.93			
Net Annual Ground Water Availability (MCM)	17.82			
Existing Gross Ground Water Draft for irrigation (MCM)	9.74			
Existing Gross Ground Water Draft for domestic and industrial water supply(MCM)	0.54			
Existing Gross Ground Water Draft for All uses(MCM)	10.28			
Net Ground Water Availability for future irrigation development(MCM)	6.72			
Provision for domestic and industrial requirement supply to 2025(MCM)	1.31			
Stage of Ground Water Development %	57.69			
Category	**SAFE**			
Aquifer-II				
Semiconfined/Confined Aquifer (Basalt)				
Total Area (Sq. Km.)	Mean aquifer thickness (m)	Sy	Peizometric Head (m aboveconfining layer)	Total Resource (MCM)
360.77	3.2	0.005	68	6.12

5.0. GROUND WATER RESOURCE ENHANCEMENT			
Available Resource (MCM)	17.82		
Gross Annual Draft (MCM)	10.28		
5.1.SUPPLY SIDE MANAGEMENT			
SUPPLY (MCM)			
Agricultural Supply -GW	9.74		
Agricultural Supply -SW	3.58		
Domestic Supply - GW	0.54		
Domestic Supply - SW	0.14		
Total Supply	**14**		
Area of Block (Sq. Km.)	360.77		
Area suitable for Artificial recharge (Sq. Km)	352.4		
Type of Aquifer	Hard Rock	Soft Rock	
Area feasible for Artificial Recharge(WL >5mbgl) (Sq. Km.)	352.4	-	
Volume of Unsaturated Zone (MCM)	704.8	-	
Average Specific Yield	0.020	-	
Volume of Sub surface Storage Space available for Artificial Recharge (MCM)	14.096	-	
Surplus water Available (MCM)	7.89	-	
Proposed Structures	**Percolation Tank** (Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam (Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)	**Recharge shaft** (Av. Gross Capacity-60 TCM)
Number of Structures	28	79	0
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	4.14	1.78	0
Area of Saline Patch	**Nil**		
Proposed Structures	Nil		
No of farm pond proposed (size: 30m*30m*3) with 3 filling= 0.0081 mcm capacity, 50% available water may be utilized for harvesting through farm ponds.	Nil		
Volume of water available for harvesting	Nil		
Additional volume created by desilting	**Nil**		
RTRWH Structures – Urban Areas			
Households to be covered (25%	4155		

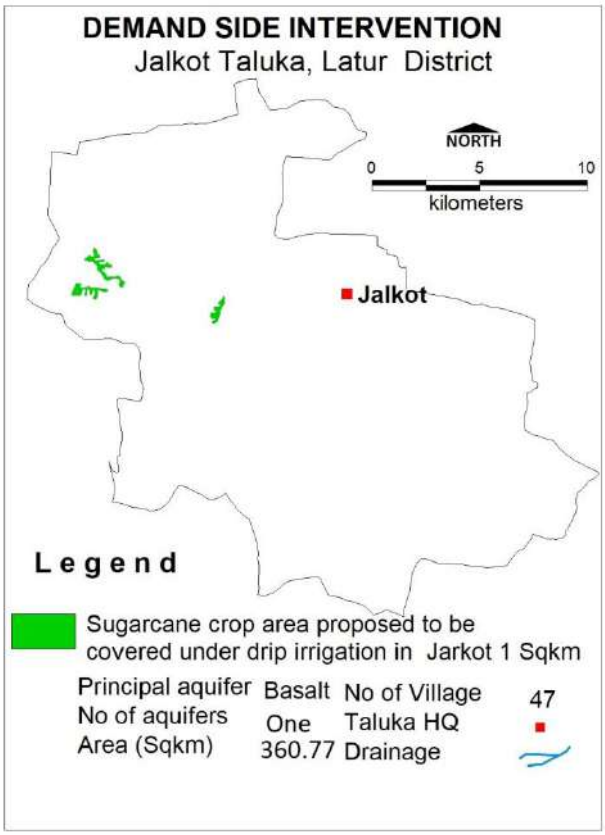
with 50 m^2area)	
Total RWH potential (MCM)	0.160
Rainwater harvested / recharged @ 80% runoff co-efficient	0.128 (**Economically not viable & Not Recommended)**
5.2.DEMAND SIDE MANAGEMENT	
Micro irrigation techniques	
Remaining ground water irrigated Sugarcane cropped area proposed through drip irrigation	1
Volume of Water expected to be saved (MCM). (Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m)	0.57
Proposed Cropping Pattern change	
Irrigated area under Water Intensive Crop(ha)	Not proposed
Water Saving by Change in Cropping Pattern	Nil
5.3.EXPECTED BENEFITS	
Net Ground Water Availability (MCM)	17.82
Additional GW resources available after Supply side interventions (MCM)	5.92
Ground Water Availability after Supply side intervention	23.74
Existing Ground Water Draft for All Purposes (MCM)	10.28
Saving of Ground Water through demand side intervention (MCM)	0.57
GW draft after Demand Side Interventions (MCM)	9.71
Present stage of Ground Water Development (%)	57.68
Expected Stage of Ground Water Development after interventions (%)	40.90
Other Interventions Proposed, if any	
Alternate Water Sources Available	Nil
5.4.RECOMMENDATION	
Ground water development is recommended to bring the expected stage of development from 40.90% to 70%.	
5.5.DEVELOPMENT PLAN	
Volume of water available for GWD to 70% (MCM)	6.908
Proposed Number of DW(@ 1.5	414

ham for 90% of GWR Available)	
Proposed Number of BW(@ 1.5 ham for 10% of GWR Available)	69
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	11

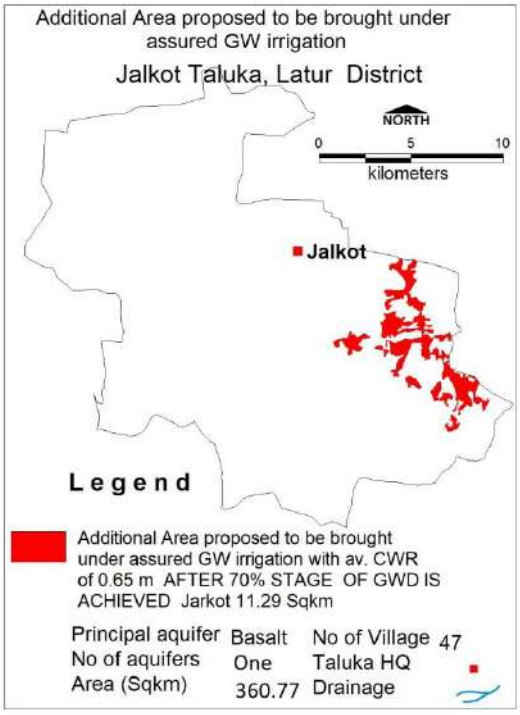
Proposed Artificial Recharge Structure



Demand Side Interventions



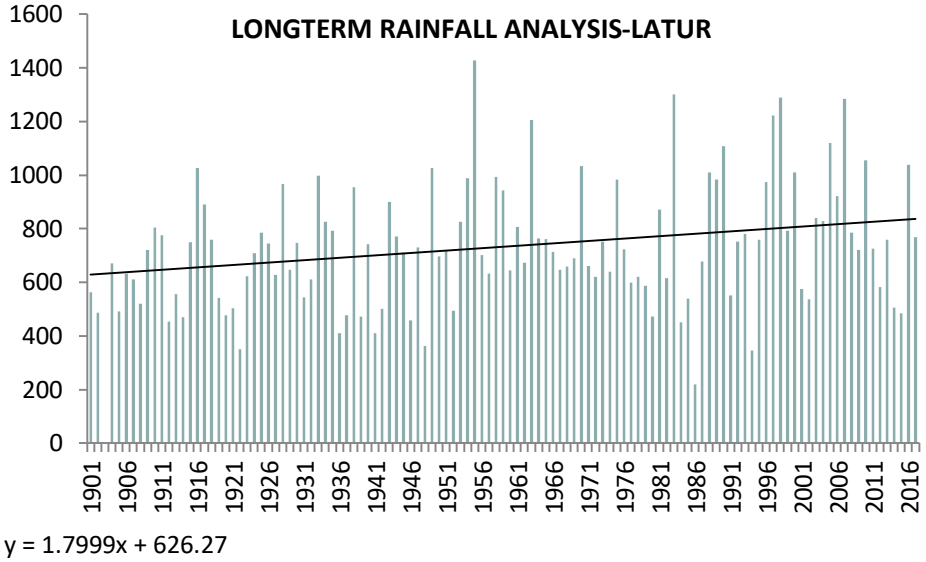
Addditional Area proposed to be brought under assured ground water irrigation


Additional Area proposed to be brought under assured GW irrigation
Jalkot Taluka, Latur District
NORTH
0
5
10
kilometers
Jalkot
Legend
Additional Area proposed to be brought under assured GW irrigation with av. CWR of 0.65 m AFTER 70% STAGE OF GWD IS ACHIEVED Jarkot 11.29 Sqkm
Principal aquifer Basalt
No of aquifers One
Area (Sqkm) 360.77
No of Village 47
Taluka HQ
Drainage

7. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, LATUR BLOCK, LATUR DISTRICT

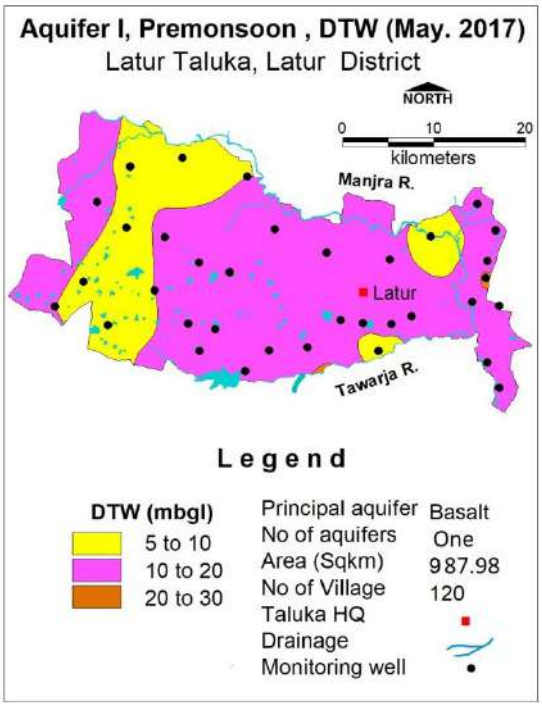
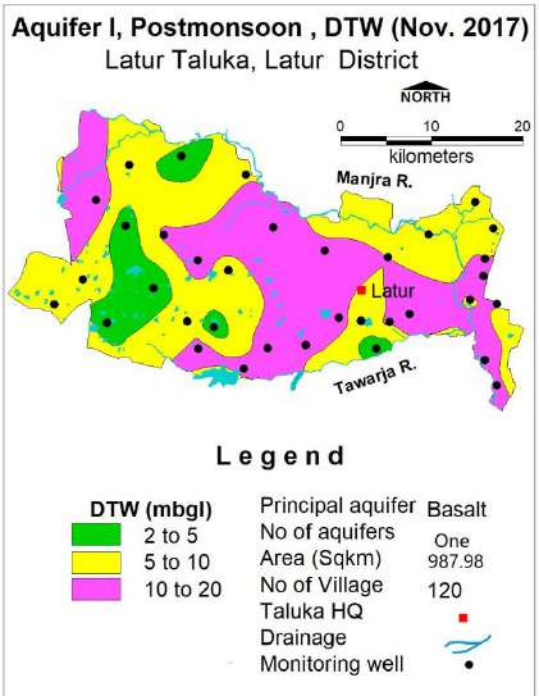
SALIENT INFORMATION	
1.1.Introduction	
Block Name	Latur
Geographical Area (Sq. Km.)	987.98 Sq. Km.
Hilly Area (Sq. Km)	59.98 Sq. Km.
Poor Quality Area (Sq. Km.)	Nil
Population (2011)	683666
Climate	Tropical climate
1.2. Rainfall Analysis	
Normal Rainfall	733.3 mm
Annual Rainfall (2017)	767.6 mm
Decadal Average Annual Rainfall (2008-17)	742.31 mm
Long Term Rainfall Analysis (1901-2015)	Falling Trend: 1.799 m/year. Probability of Normal/Excess Rainfall: - 55% & 22%. Probability of Drought (Moderate/ Severe/ Acute):- 20% Moderate & 3% Acute Frequency of occurance of Drought:- 1 in 4 Years

RAINFALL TREND ANALYSIS (1998 to 2017)



1.3. Geomorphology,Soil&Geology	
Geomorphic Unit	➢ Denudational Slope on Deccan Traps ➢ Region of Middle Level Plateau on Deccan Traps between 550 to 900 m elevation ➢ Older Flood Plain
Soil	➢ Medium Deep Soils of 18-36 inch thickness; dark

	brown to dark gray brown in colour; clay-loam to clayey in texture with granular to sub-granular nature; blocky in structure occurs in major part of the block. ➢ Shallow Soils of 0-9 inch thickness; brown to dark grey brown in color; loamy to clay-loam in texture with granular to sub-granular nature; blocky in structure ➢ Deep Soils of 36 inch thickness, clayey in texture and sub-angular blocky to blocky in structure occurs along the river valleys.	
Geology	Recent River Alluvium & Deccan Traps (Basalt) of Late Cretaceous to Early Eocene Age	
1.4.Hydrology & Drainage		
Drainage	ManarRiverforms the main drainage system of the block.	
Hydrology	Major & Medium Irrigation Projects (>250 Ha) *(Reference Year: 2012-13)*	ManjaraPrakalp&TawarjaPrakalp
	Minor Irrigation Projects (0 to 250 Ha) *(Reference Year: 2016-17)*	Completed:-140 projects; Ongoing: 13 projects
1.5.LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN		
Geographical Area	978.98 Sq. Km.	
Forest Area	0.88 Sq. Km.	
Cultivable Area	919.75 Sq. Km.	
Net Sown Area	822.25. Km.	
Double Cropped Area	97.50 Sq. Km.	
Area under Irrigation – Surface Water	198 Sq Km	
Area under Irrigation – Ground Water	6.5 Sq. Km.	
Principal Crops	**Crop Type**	**Area (Sq. Km.)**
	Pulses	49.05
	Cotton	-
	Cereals	24.93
	Oil Seeds	_
Horticultural Crops	Sugarcane	82.82
	Others	4.12
1.6.WATER LEVEL BEHAVIOUR		
1.6.1. Aquifer-I/Shallow Aquifer (Phreatic Aquifer)		
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**	
❖ Depth to water level between 5 mbgl and 10 mbgl observed in 326Sq Km areas in the north-western, south-western, west-central, north-	❖ The shallow depth to water level between 2 mbgl and 5 mbgl is observed in 98 Sq Km areapatches in north-eastern, south-eastern and	

eastern and south-eastern parts of the block. ❖ Depth to water level between 10 mbgl and 20 mbgl observed in 632Sq Km areas in the major parrts of the block The deeper depth to water level may be due to exploitation of ground water during dry period.	south-western parts of the block. ❖ Depth to water level between 5 mbgl and 10 mbgl is observed in491Sq Km area in the western, north-eastern and south-eastern parts of the block ❖ Depth to water level between 10 mbgl and 20 mbgl is observed in 408 Sq Km area in the central, north-eastern and south-western parts of the block. The shallow depths to water level may be due to recharge from rainfall.
Water Level Map- Aquifer-I/Shallow Aquifer (Phreatic Aquifer)	
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (Nov.2017)**
	
1.6.2. Aquifer-II/Deeper Aquifer (Semiconfined/Confined Aquifer)	
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**

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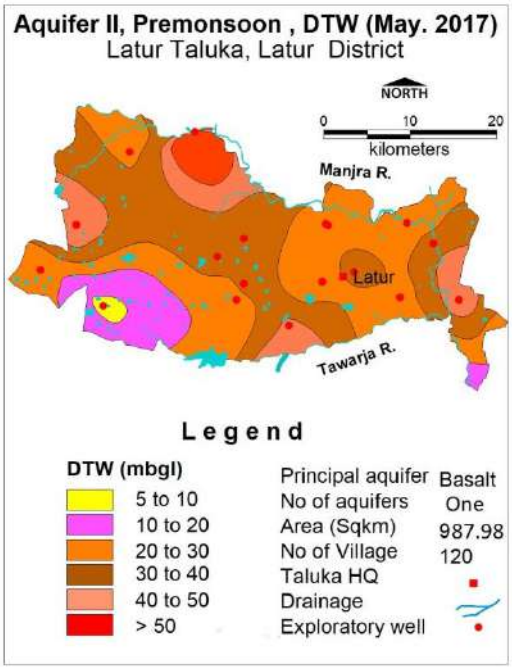
<td> 
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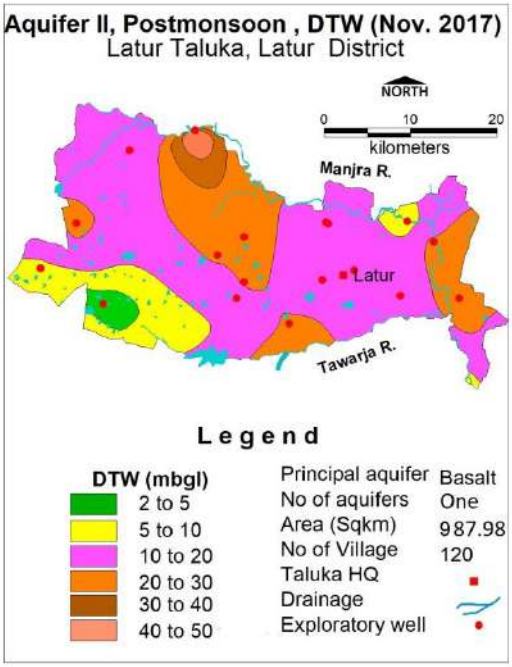
<td> 
</td>
</tr>
<tr>
<td>Pre-Monsoon Water Level(May 2017)</td>
<td>Post-Monsoon Water Level(November 2017)</td>
</tr>
<tr>
<td>❖ The shallow depth to water level between 5 mbgl and 10 mbgl observed in an isolated patch of 8 Sq Km area in the south-western part of the block.
❖ Depth to water level between 10 mbgl and 20 mbgl observed in 85 Sq Km areas in the northwestern parts.
❖ Depth to water level between 20 mbgl and 30 mbgl observed in 377 Sq Km in the south-western, north-western, north-easterna and east-central parts of the block.
❖ Depth to water level between 30 mbgl and 40 mbgl observed in 378 Sq Km along a single strech from nort-western to north-central to southern parts of the block and also observed in small patches in the eastern part of the block.
❖ The deeper depths to water level more than 40 mbgl are observed in 148 Sq Km area in the north-western and south-eastern parts of the block.</td>
<td>❖ The shallow depth to water level between 2 mbgl and 5 mbgl is observed in 20.76 Sq Km area in the south-western parts.
❖ Depth to water level between 5 mbgl and 10 mbgl is observed in107Sq Km area in the south-western parts.
❖ The depth to water level between 10 mbgl and 20 mbgl is observed in about 597 Sq Km area covering major parts of the block
❖ The deeper depths to water level more than 30 mbgl to 40 mbgl is observed in 233 Sq Km area in the north-central, south-central, western and eastern parts of the block.
❖ The deepest deptth to water levels more than 40 mbgl is observed in only 33 Sq Km area in the north-western boundary of the block.
The shallow depths to water level may be due to recharge from rainfall.</td>
</tr>
<tr>
<td colspan="2">1.7. Hydrograph</td>
</tr>
<tr>
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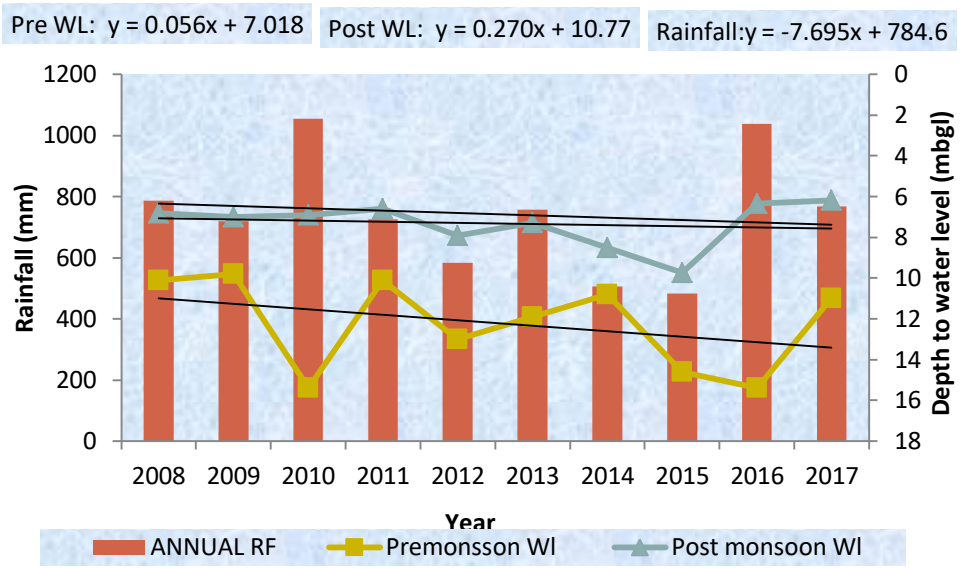
</table>

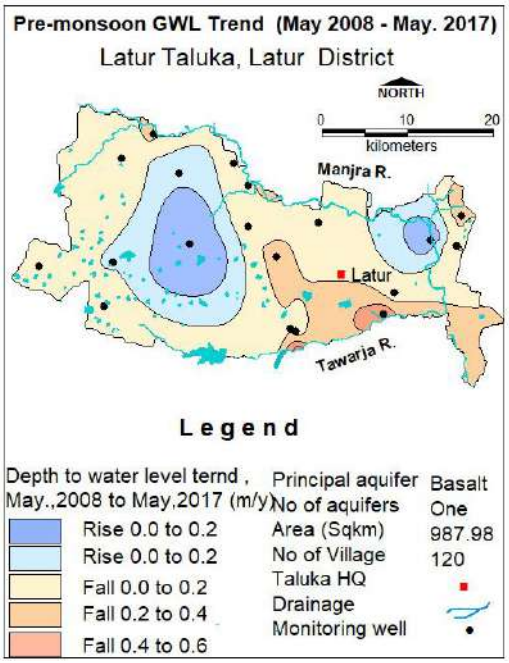


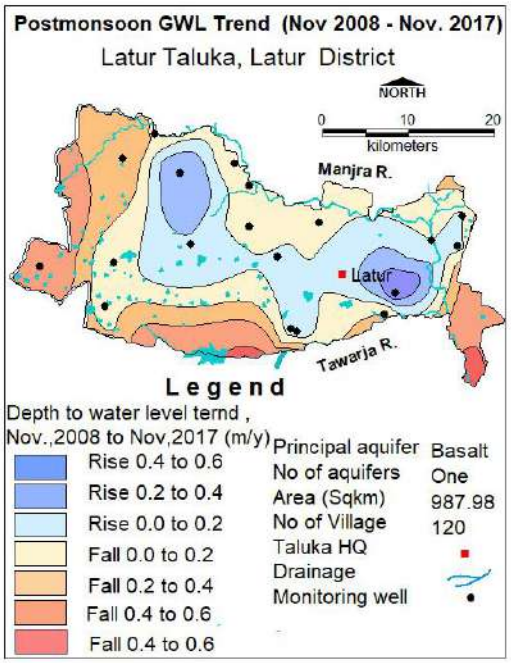
The hydrograph of CGWB Monitoring site at Borgaon Kale for the period 2008 to 2017 shows:

- A fallingtrend during both premonsoon and postmonsoon @ 0.056 m/year and 0.270 m/year respectively.
- The depth to water level during premonsoon ranges from 9.8 mbgl to 15.4 mbgl. The deeper depths to water level indicates overdraft from the well during dry season.
- The depth to water level during postmonsoon ranges from 6.2 mbgl to 9.73 mbgl.

1.8. Water Level Trend (2008-17)

Pre-Monsoon Trend (May 2008-2017)		**Post-Monsoon Trend (November 2008-2017)**	
Rising Trend @	Falling Trend @	Rising Trend @	Falling Trend @
0.01 to 0.17 m/year in 194 Sq Km area and @ 0.27 to 0.35 m/year in 97 Sq Km area.	0.085 to 0.17 m/year in 572 Sq Km area, 0.2 to 0.4 m/year in 129.87 Sq Km area and @ 0.51m/year in 13 Sq Km area.	0.0003 to 0.18 m/year in 267 Sq Km area and 0.2 to 0.4 m/year in 57 Sq Km area	0.025 to 0.19 m/year in 320 Sq Km area, 0.21 to 0.36 m/year in 169.8 Sq Km area and more than 0.4 m/year in 162.02 Sq Km area.
Pre-Monsoon WL Trend (May 2007-2016)		**Post-Monsoon WL Trend (Nov.2007-2016)**	

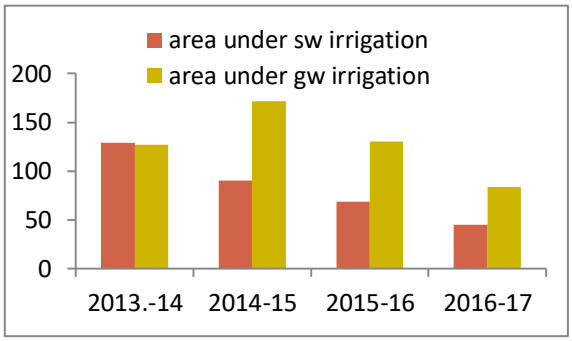




2. GROUND WATER ISSUES

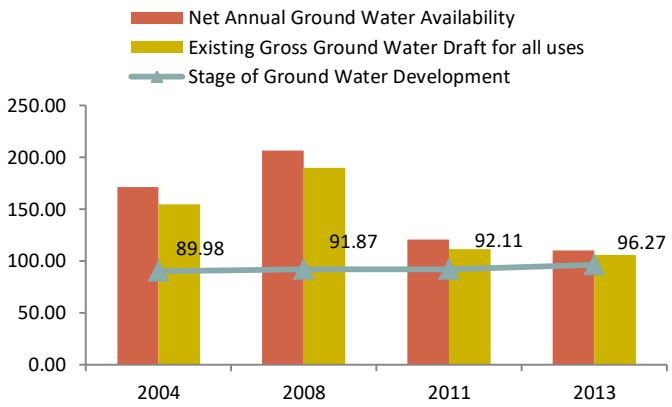
1) Overexploitation of Ground Water: -

The area under ground water irrigation has been increasing with respect to surface water irrigation since 2014. About 96% of gross ground water draft for all purposes is used for irrigation in the block.



2) Increase in stage of ground water development

The stage of ground water development has increased from 89.98 % (2004) to 96.27% (2013). This is due to decreasing net ground water availability, increase independency of ground water and hence, increases in stage of ground water development.

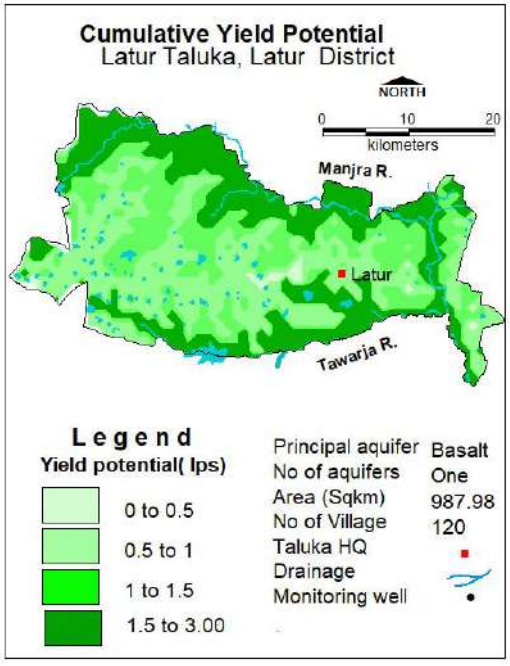


3) Declining Water Level Trend: -

The decline in water level trend (2008-17)upto than 0.6 m/year is observed in major section of the block during both the seasonsin correspondance to the decrease in rainfall @7.65 mm/year. The exploitation of shallow aquifers as for higher dependency in ground water for irrigation during both Kharif and Rabi season due to lack of availability of surface water along with the decreasing trend of rainfall has resulted in the categorisation of block as "Semi Critical". About 92 % of the net ground water availabilty (as per GEC2013) is utilised for irrigation purposes in the block.

4) **Low ground water yield Potential of the aquifers:**

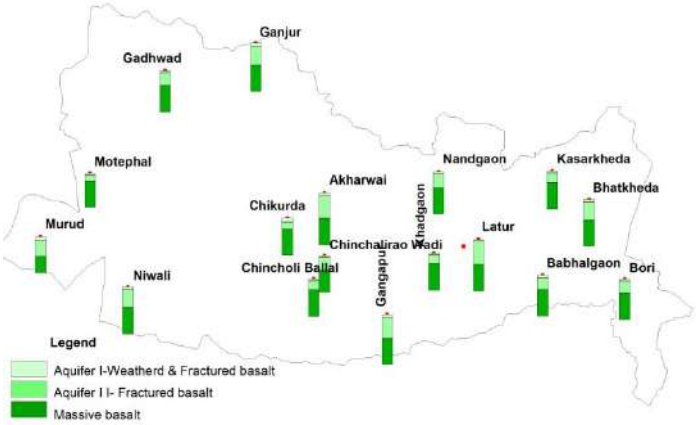
The ground water yield potentiality of the aquifers ranges from 0 to 1 lps in major parts of the block. However, high yielding aquifers are obtained only along the drainages, faults/ fractures or joints. The low potential zone in major parts of the block is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.



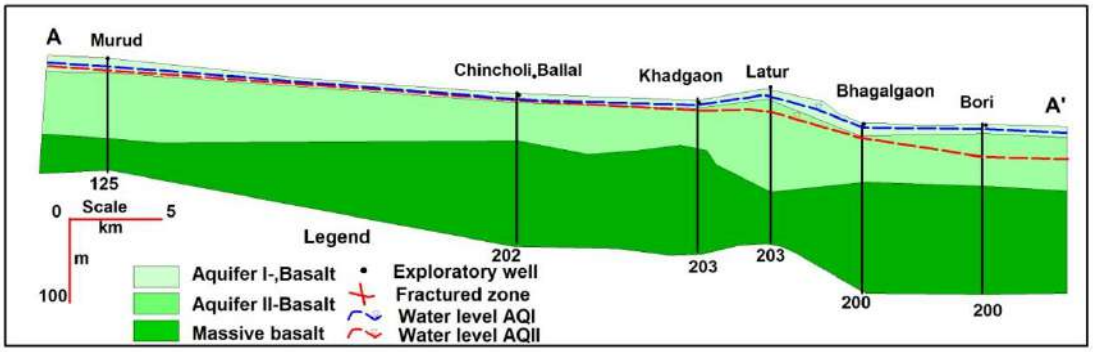
3. AQUIFER DISPOSITION

3.1. Number of Aquifers (Major)	One:Basalt –Aquifer-I, Aquifer-II

3.2. LITHOLOGICAL DISPOSITION



3.3. CROSS SECTIONS



3.4 AQUIFER CHARACTERISTICS

Major Aquifer	Basalt (Deccan Traps)	
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II(Semiconfined /confined)
Depth to bottom of aquifer (mbgl)	10 to 16	43 to 130
Weathered/ Fractured rocks thickness (m)	7 to 12	0.5 to 8.9
Yield Potential	0 to 100 m^3/day	0 to 1.2 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.0000145
Transmissivity (T)	T: 30 to 80 m^2/day	T: 25 to 210 m^2/day

4.CHEMICAL QUALITY OF GROUND WATER &CONTAMINATION

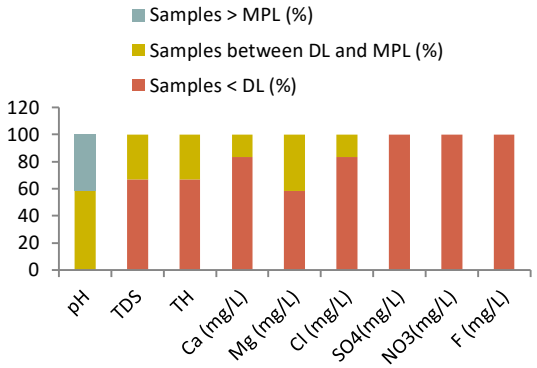
4.1 Aquifer I/Shallow Aquifer

Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Nitrate affected areas. ➢ About 498 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm, 482	➢ In major parts of the block covering 498Sq Km area, plants with moderate salt tolerance can be grown. However, in 482 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt

sq Km area has EC between 750 and 2250 microsiemens/cm and 13.50 Sq Km area has EC>2250 microsiemens/cm

- Nitrate contamination with nitrate more than 45 mg/l is observed in three sites namely Murud, Dorgaon Kale, Murud-Akola and Latur

The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 12 samples analysed are as given below:



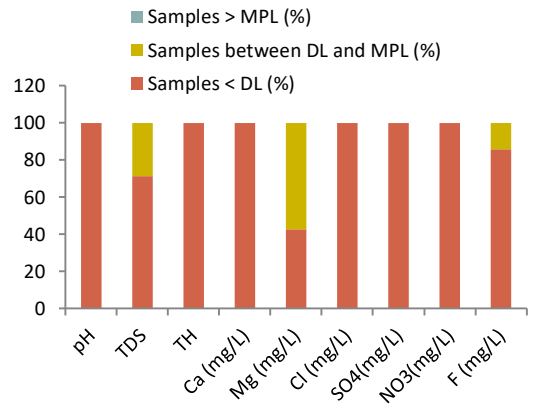
tolerance should be selected.

- All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation.
- The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation.
- About 8% of the analysed samples have % Na less than 20; 67 % have %Na between 20 and 40; 17% have %Na between 40 and 60 and 8% have %Na more tha 60%

Hence, the overall quality of ground water is suitable for irrigation purposes except in areas with %Na value more than 60%.

4.1 Aquifer II/Deeper Aquifer

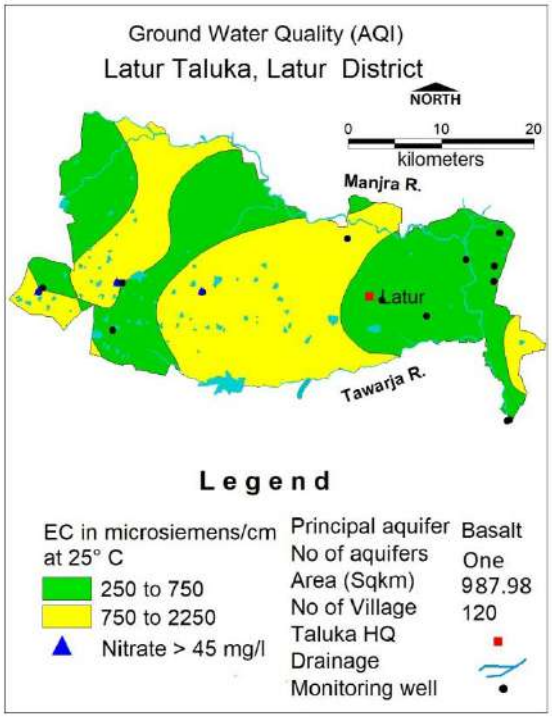
Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Nitrate affected areas. ➢ About 741 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm and 265 sq Km area has EC between 750 and 2250 microsiemens/cm ➢ Fluoride contamination with value more than 1.5 mg/l is observed in one site in Gadhwad The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 7 samples analysed are as given below:	➢ In major parts of the block covering 741 Sq Km area, plants with moderate salt tolerance can be grown. However, in 265 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values for 71% of the analysed samples have values < 1.25 meq/l and 29% have RSC value more 1.25. ➢ About 29% of the analysed samples have % Na between 20 and 40; 43 % have %Na between 40 and 60 and 28% have %Na more than 60.



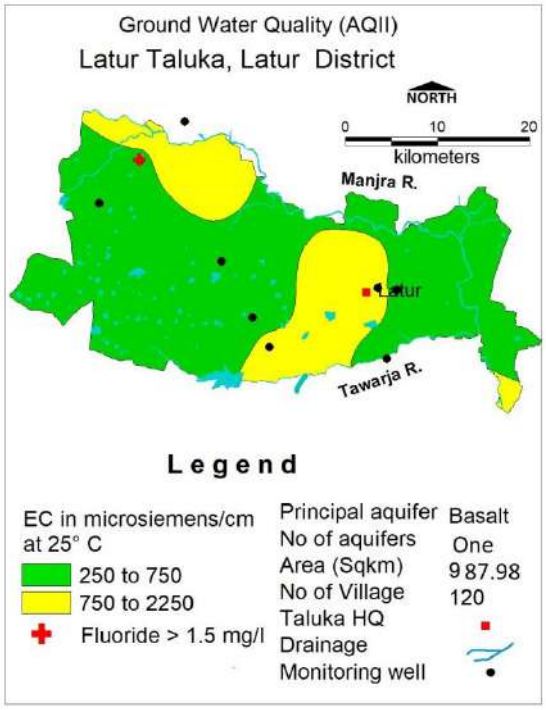
Hence, the quality of ground water is good for irrigation except in areas with high values of RSC and % Na.

3.2.CHEMICAL QUALITY MAP

Phreatic Aquifer (Aquifer-I)



Semiconfined/Confined Aquifer (Aquifer II)



5. GROUND WATER RESOURCE & EXTRACTION

Aquifer-I/ Phreatic Aquifer (Basalt)

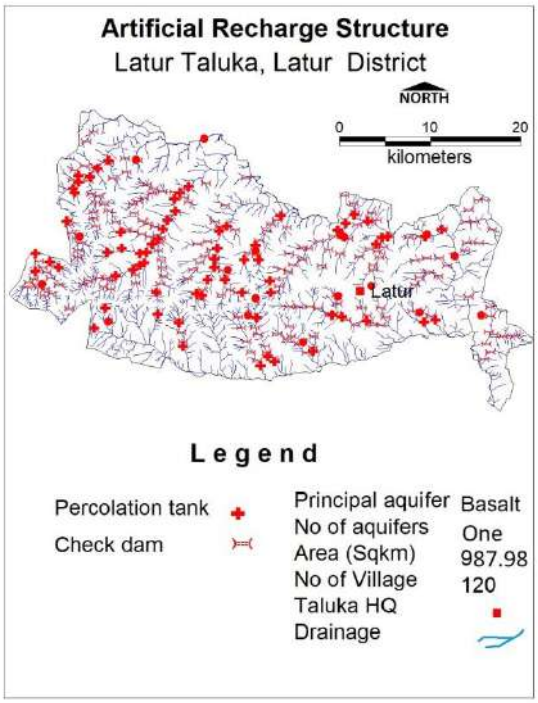
Ground Water Recharge Worthy Area (Sq. Km.)	910.73
Total Annual Ground Water Recharge (MCM)	116.06
Natural Discharge (MCM)	5.80
Net Annual Ground Water Availability (MCM)	110.25
Existing Gross Ground Water Draft for irrigation (MCM)	101.90
Existing Gross Ground Water Draft for domestic and industrial water supply(MCM)	4.23

Existing Gross Ground Water Draft for All uses(MCM)			106.14	
Net Ground Water Availability for future irrigation development(MCM)			11.34	
Provision for domestic and industrial requirement supply to 2025(MCM)			7.10	
Stage of Ground Water Development %			96.27	
Category			**SEMI CRITICAL**	
Aquifer-II				
Semiconfined/Confined Aquifer (Basalt)				
Total Area (Sq. Km.)	Mean aquifer thickness (m)	Sy	Peizometric Head (m above confining layer)	Total Resource (MCM)
987.98	2.6	0.005	61.5	13.72
5.0. GROUND WATER RESOURCE ENHANCEMENT				
Available Resource (MCM)	110.25			
Gross Annual Draft (MCM)	106.14			
5.1.SUPPLY SIDE MANAGEMENT				
SUPPLY (MCM)				
Agricultural Supply -GW	101.90			
Agricultural Supply -SW	128.74			
Domestic Supply - GW	4.23			
Domestic Supply - SW	1.06			
Total Supply	**235.93**			
Area of Block (Sq. Km.)	987.98			
Area suitable for Artificial recharge (Sq. Km)	910.73			
Type of Aquifer	Hard Rock	Soft Rock		
Area feasible for Artificial Recharge(WL >5mbgl) (Sq. Km.)	895.49	-		
Volume of Unsaturated Zone (MCM)	1790.98	-		
Average Specific Yield	0.020	-		
Volume of Sub surface Storage Space available for Artificial Recharge (MCM)	35.82	-		
Surplus water Available (MCM)	20.05	-		
Proposed Structures	**Percolation Tank** (Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam (Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)	**Recharge shaft** (Av. Gross Capacity-60 TCM)	
Number of Structures	70	198	0	
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	10.53	4.51	0	

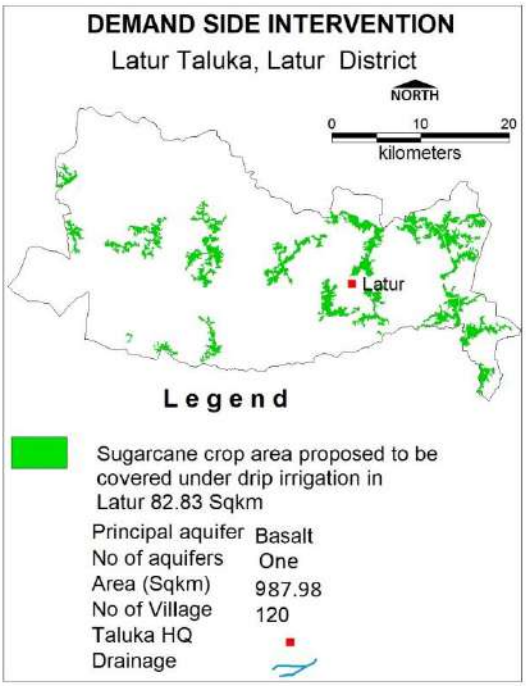
Area of Saline Patch	**Nil**
Proposed Structures	Nil
No of farm pond proposed (size: 30m*30m*3) with 3 filling= 0.0081 mcm capacity, 50% available water may be utilized for harvesting through farm ponds.	Nil
Volume of water available for harvesting	Nil
Additional volume created by desilting	**Nil**
RTRWH Structures – Urban Areas	
Households to be covered (25% with 50 m^2area)	14832
Total RWH potential (MCM)	0.550
Rainwater harvested / recharged @ 80% runoff co-efficient	0.440 (**Economically not viable & Not Recommended)**
5.2.DEMAND SIDE MANAGEMENT	
Micro irrigation techniques	
Remaining ground water irrigated Sugarcane cropped area proposed through drip irrigation	82.83
Volume of Water expected to be saved (MCM). (Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m)	47.21
Proposed Cropping Pattern change	
Irrigated area under Water Intensive Crop(ha)	Not proposed
Water Saving by Change in Cropping Pattern	Nil
5.3.EXPECTED BENEFITS	
Net Ground Water Availability (MCM)	110.25
Additional GW resources available after Supply side interventions (MCM)	15.04
Ground Water Availability after Supply side intervention	125.29
Existing Ground Water Draft for All Purposes (MCM)	106.14
Saving of Ground Water through demand side intervention (MCM)	47.21
GW draft after Demand Side Interventions (MCM)	58.93
Present stage of Ground Water	96.27

Development (%)	
Expected Stage of Ground Water Development after interventions (%)	47.03
Other Interventions Proposed, if any	
Alternate Water Sources Available	Nil
5.4.RECOMMENDATION	
Ground water development is recommended, if additional ground water resources are available after bringing the expected stage of development from 47.03% to 70%.	
5.5.DEVELOPMENT PLAN	
Additional Volume of water available after stage of GWD is brought to 70% (MCM)	28.78
Proposed Number of DW(@ 1.5 ham for 90% of GWR Available)	1727
Proposed Number of BW(@ 1.5 ham for 10% of GWR Available)	288
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	44

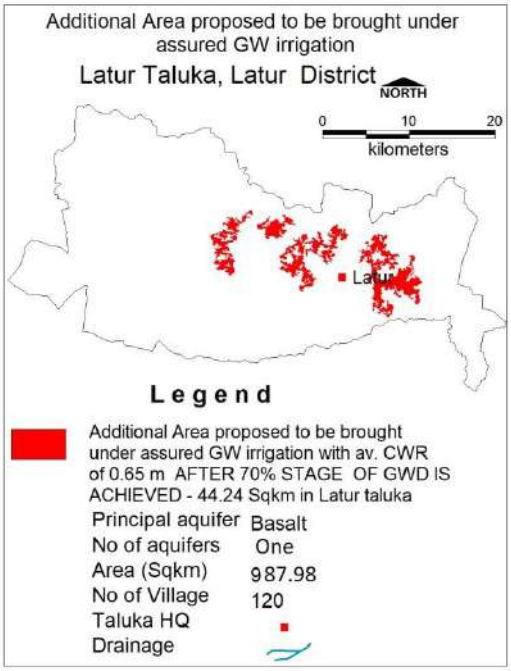
Proposed Artificial Recharge Structure



Demand Side Interventions



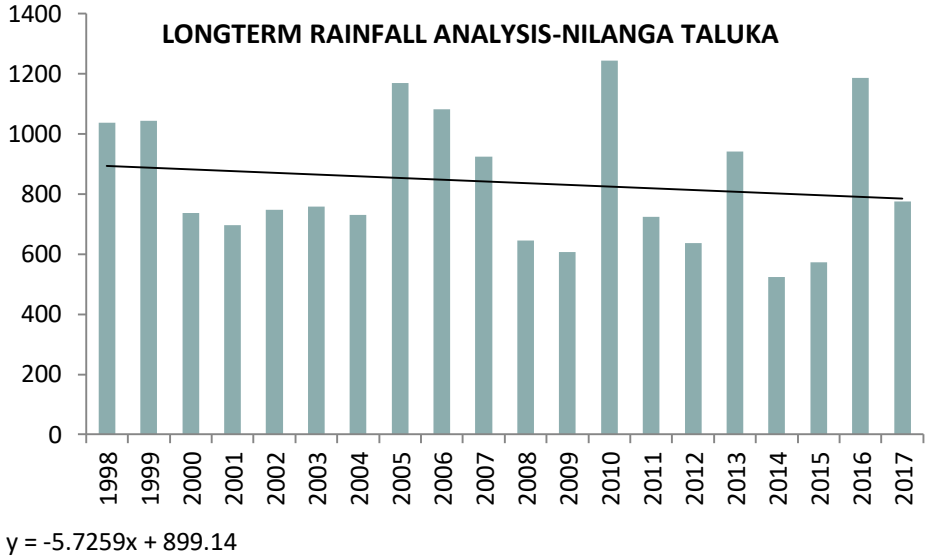
Addditional Area proposed to be brought under assured ground water irrigation


Additional Area proposed to be brought under assured GW irrigation
Latur Taluka, Latur District
NORTH
0
10
20
kilometers
Latur
Legend
Additional Area proposed to be brought under assured GW irrigation with av. CWR of 0.65 m AFTER 70% STAGE OF GWD IS ACHIEVED - 44.24 Sqkm in Latur taluka
Principal aquifer Basalt
No of aquifers One
Area (Sqkm) 987.98
No of Village 120
Taluka HQ
Drainage

8. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, NILANGA BLOCK, LATUR DISTRICT

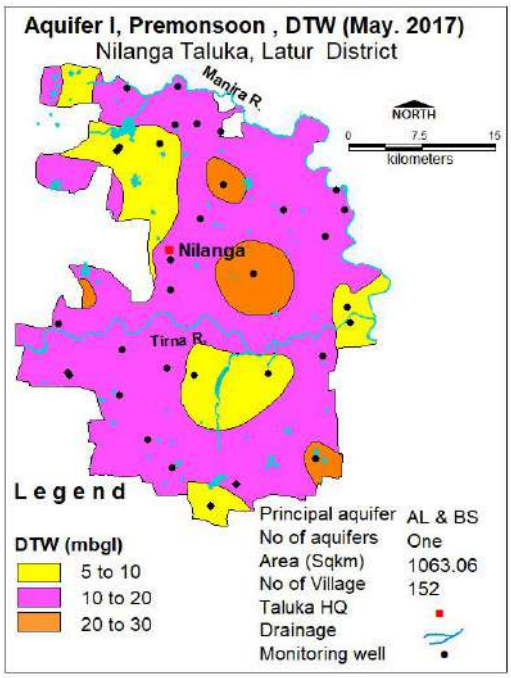
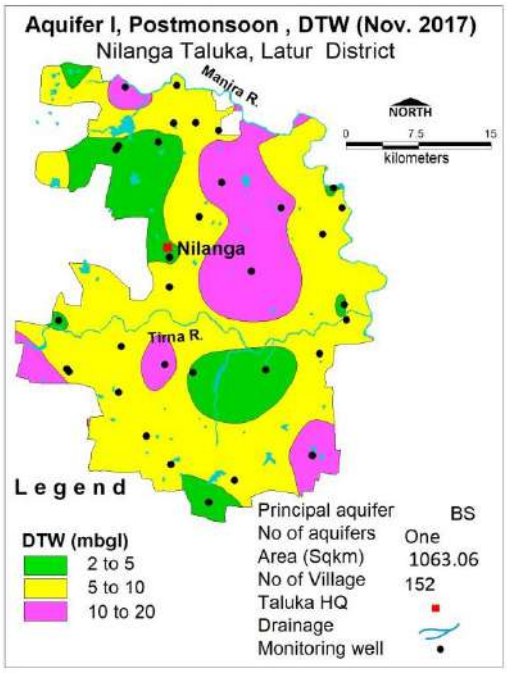
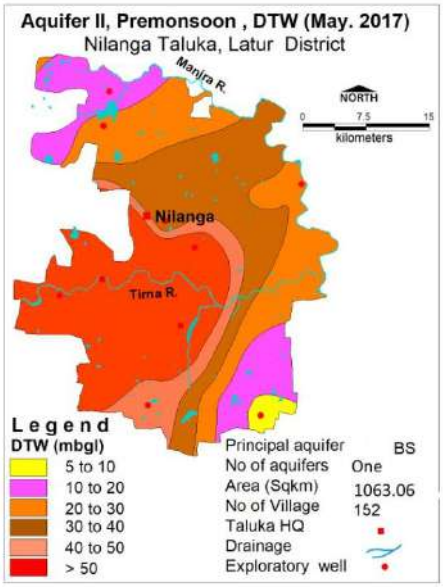
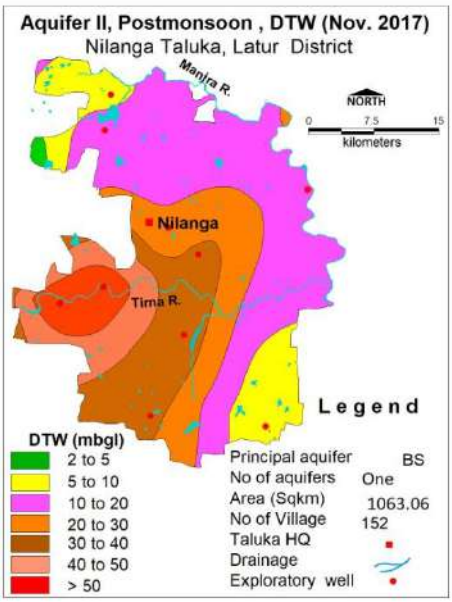
1.SALIENT INFORMATION	
1.1.Introduction	
Block Name	Nilanga
Geographical Area (Sq. Km.)	1063.06 Sq. Km.
Hilly Area (Sq. Km)	48.53 Sq. Km.
Poor Quality Area (Sq. Km.)	Nil
Population (2011)	325255
Climate	Tropical climate
1.2. Rainfall Analysis	
Normal Rainfall	839 mm
Annual Rainfall (2017)	774.4 mm
Decadal Average Annual Rainfall (2008-17)	785.5 mm
Long Term Rainfall Analysis (1998-2015)	Falling Trend: -5.726 m/year. Probability of Normal/Excess Rainfall: - 65% & 20%. Probability of Drought (Moderate/ Severe/ Acute):- 15% Moderate Frequency ofoccurance of Drought:- 1 in 7 Years

RAINFALL TREND ANALYSIS (1998 to 2017)



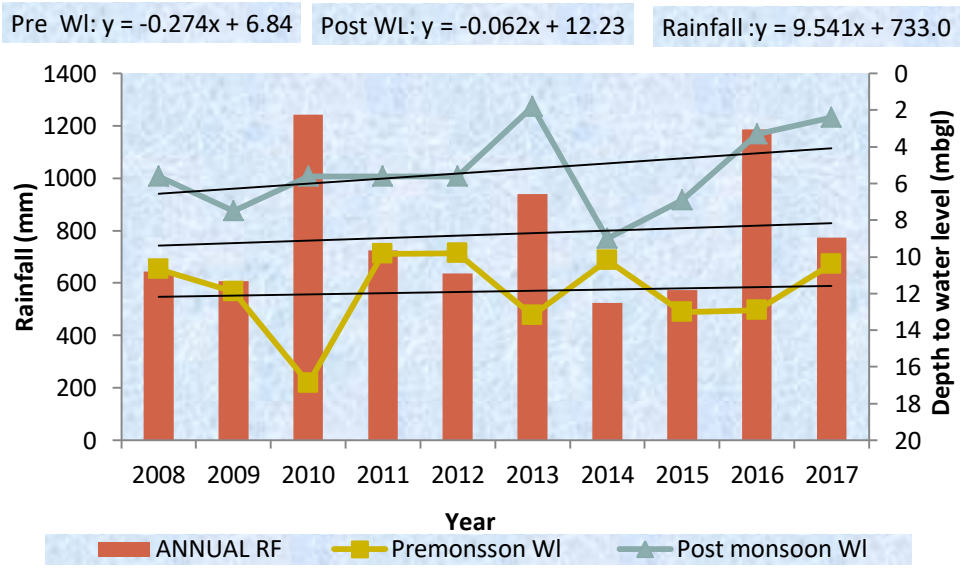
1.3. Geomorphology,Soil&Geology	
Geomorphic Unit	➢ Older Flood Plain ➢ Denudational Slope on Deccan Traps ➢ Flood Plain (including In-Filled River Bed) ➢ Region of mddle level Plateau on Deccan Traps between 550 to 900 m elevation
Soil	➢ Medium soils of 18 to 36 inch thickness; dark brown to dark grey in color; clay loam to clayey

		in texture with granular to sub-granular blocky structure. ➢ Shallow Soils of 0-9 inch thickness; brown to dark grey brown in color; loamy to clay-loam in texture with granular to sub-granular nature; blocky in structure	
Geology		Recent River Alluvium & Deccan Traps (Basalt) of Late Cretaceous to Early Eocene Age	
1.4.Hydrology & Drainage			
Drainage		Tirna Riverforms the main drainage system of the block.	
Hydrology		Major & Medium Irrigation Projects (>250 Ha) *(Reference Year: 2012-13)*	SakolPrakalp, MasalgaPrakalp, GirakchalPrakalp and AuradShahajaniPrakalp
		Minor Irrigation Projects (0 to 250 Ha) *(Reference Year: 2016-17)*	Completed:-131 projects Ongoing: 20 projects
1.5.LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN			
Geographical Area		1063.06 Sq. Km.	
Forest Area		3.50 Sq. Km.	
Cultivable Area		883.13 Sq. Km.	
Net Sown Area		795.96. Km.	
Double Cropped Area		87.17 Sq. Km.	
Area under Irrigation	Surface Water	27.51	
	Ground Water	51.10 Sq. Km.	
Principal Crops		**Crop Type**	**Area (Sq. Km.)**
		Pulses	87.91
		Cotton	-
		Cereals	17.53
		Oil Seeds	_
Horticultural Crops		Sugarcane	46.22
		Others	4.93
1.6.WATER LEVEL BEHAVIOUR			
1.6.1. Aquifer-I/Shallow Aquifer (Phreatic Aquifer)			
Pre-Monsoon (May-2017)		**Post-Monsoon (November-2017)**	
❖ Depth to water level between 5 mbgl and 10 mbgl observed in215Sq Km area in the north-western, southern, western and south central parts of the block. ❖ Depth to water level between 10 mbgl and 20 mbgl observed in 799 Sq Km area in the major parrts of the block		❖ The shallow depth to water level between 2 mbgl and 5 mbgl is observed in 180 Sq Km areain small isolated patches in north-western, south-eastern and southern parts. ❖ Depth to water level between 5 mbgl and 10 mbgl is observed in684Sq Km area in the major parrts of the block ❖ Depth to water level between 10 mbgl	

❖ Depth to water level between 20 mbgl and 30 mbgl is observed in about 79 Sq Km area in isolated patches in the block The deeper depth to water level may be due to exploitation of ground water during dry period.	and 20 mbgl is observed in 225 Sq Km area in the north-central, south-eastern and western parts of the block. The shallow depths to water level may be due to recharge from rainfall.
Water Level Map- Aquifer-I/Shallow Aquifer (Phreatic Aquifer)	
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (Nov.2017)**
	
1.6.2. Aquifer-II/Deeper Aquifer (Semiconfined/Confined Aquifer)	
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**
	

Pre-Monsoon Water Level(May 2017)	Post-Monsoon Water Level(November 2017)
❖ The depth to water level less than 10 mbgl observed in a small isolated patch of 17 Sq Km area in the south-western part of the block. ❖ Depth to water level between 10 mbgl and 20 mbgl is observed in 141.82Sq Km area in the northern and north-eastern parts of the block. ❖ Depth to water level between 20 mbgl and 30 mbgl observed in 235 Sq Km in the north-western, eastern and south-cedntral parts of the block. ❖ Depth to water level between 30 mbgl and 40 mbgl is observed in 257 Sq Km along a single strech from noth-west, noth-central to south-central parts of the block. ❖ Depth to water level more than 40 mbgl is observed in 439 Sq Km area in the western part of the block	❖ The depth to water level less than 10 mbgl is observed in 136.14 Sq Km area in the south-eastern and north-western ends of the block. ❖ Depth to water level between 10 mbgl and 20 mbgl is observed in 429 Sq Km area along the western boundary of the block. ❖ The depth to water level between 20 mbgl and 30 mbgl is observed in 185 Sq Km area in a curvature along from western part of the boundary to southern part along the centre. ❖ The depths to water level between 30 mbgl to 40 mbgl are observed in 184 Sq Km area in the north-western parts of the block. ❖ The deepest depth to water levels more than 40 mbgl is observed in only 155 Sq Km area in the western boundary of the block. The shallow depths to water level may be due to recharge from rainfall.

1.7. Hydrograph



The hydrograph of CGWB Monitoring site at Kelgaonfor the period 2008 to 2017 shows:

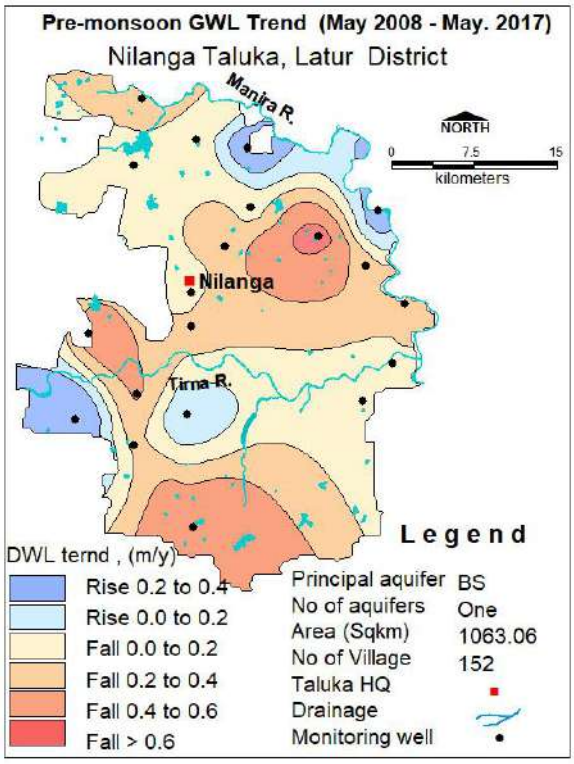
- ❖ A risingtrend during both premonsoon and postmonsoon @ 0.274 m/year and 0.062 m/year respectively.
- ❖ The depth to water level during premonsoon ranges from 9.8 mbgl to 16.9 mbgl. The deeper depths to water level indicates overdraft from the well during dry season.

❖ The depth to water level during postmonsoon ranges from 1.8 mbgl to 9 mbgl.

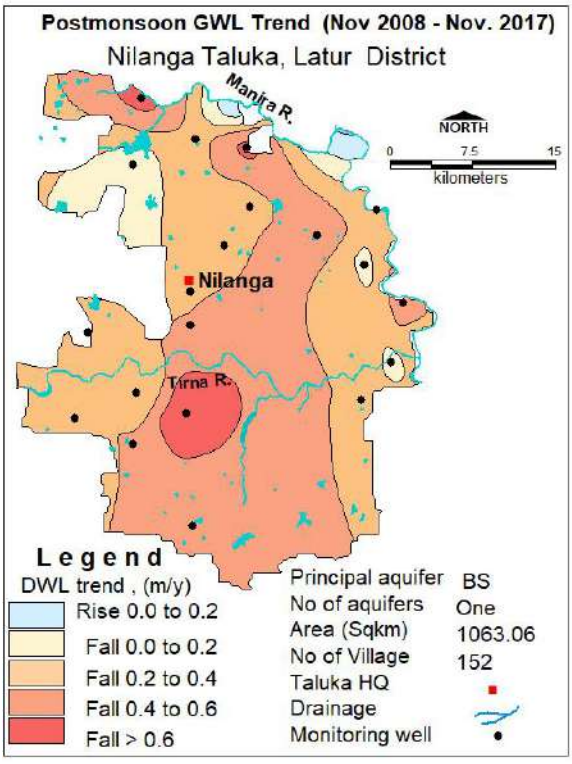
1.8. Water Level Trend (2008-17)

Pre-Monsoon Trend (May 2008-2017)		**Post-Monsoon Trend (November 2008-2017)**	
Rising Trend @	Falling Trend @	Rising Trend @	Falling Trend @
0.0 to 0.2 m/year in 81.22 Sq Km area and @ 0.2 to 0.4 m/year in 55.5 Sq Km area.	0.0 to 0.2 m/year in 402.3 Sq Km area, 0.2 to 0.4 m/year in 306.9 Sq Km area, 0.4 to 0.6 m/year in 181.23 Sq Km area and @ more than 0.6 m/year in 7 Sq Km area.	0 to 0.2 m/year in 9.76 Sq Km area	0 to 0.2 m/year in 69.77 Sq Km area, @ 0.2 to 0.4 m/year in 428.7 Sq Km area, @ 0.4 to 0.6 m/year in 497.18 Sq Km area and @ more than 0.6 m/year in 50.5 Sq Km area.

Pre-Monsoon WL Trend (May 2007-2016)



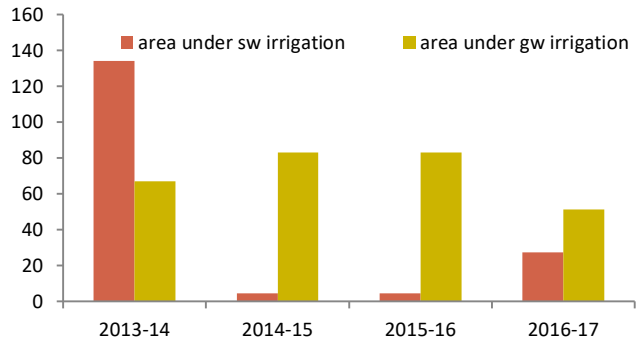
Post-Monsoon WL Trend (Nov.2007-2016)



2. GROUND WATER ISSUES

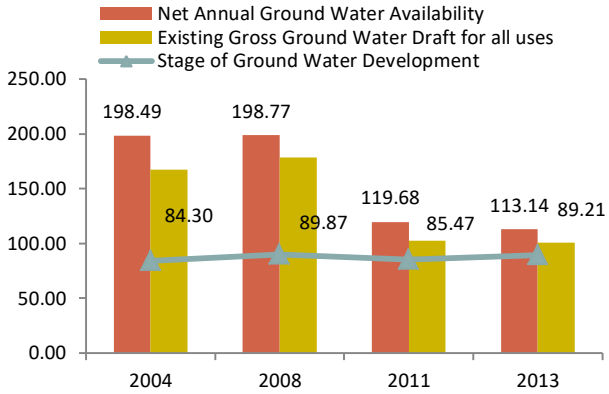
1) **Overexploitation of Ground Water: -**

The area under ground water irrigation has been increasing with respect to surface water irrigation since 2014. About 95.6% of gross ground water draft for all purposes is used for irrigation in the block.



2) Increase in stage of ground water development

The stage of ground water development has increased from 84.30 % (2004) to 89.21% (2013). This is due to decreasing net ground water availability, increase in dependency of ground water and hence, increase in stage of ground water development.

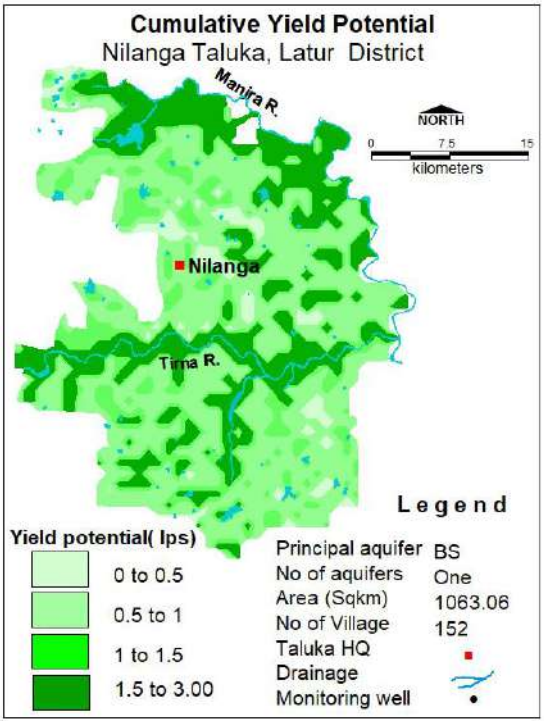


3) Declining Water Level Trend: -

The decline in water level trend (2008-17) upto than 0.6 m/year is observed in almost entire parts of the block during both the seasons despite the increase in rainfall @9.54 mm/year. The exploitation of shallow aquifers as for higher dependency in ground water based irrigation during both Kharif and Rabi season and lack of availability of surface water has resulted in declining trend over the period. About 85 % of the net ground water availabilty (as per GEC2013) is utilised for irrigation purposes in the block.

4) **Low ground water yield Potential of the aquifers:**

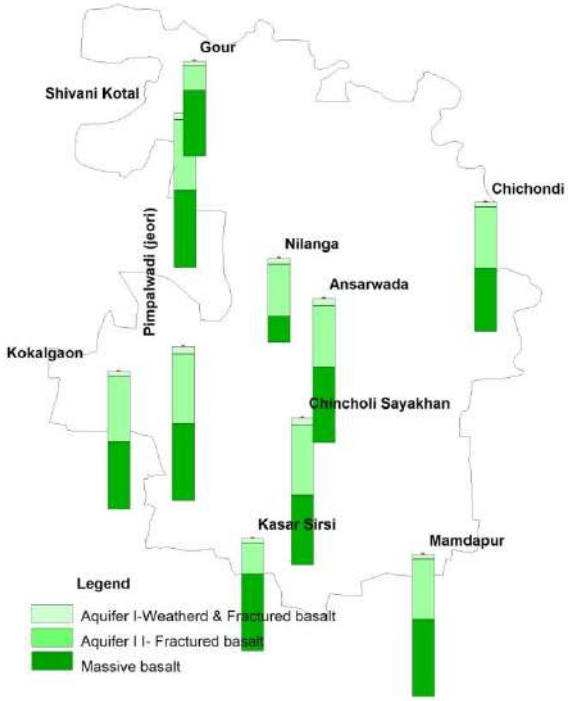
The ground water yield potentiality of the aquifers ranges from 0 to 1.5 lps in major parts of the block. However, high yielding aquifers are obtained only along the drainages, faults/ fractures or joints. The low potential zone in major parts of the block is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.



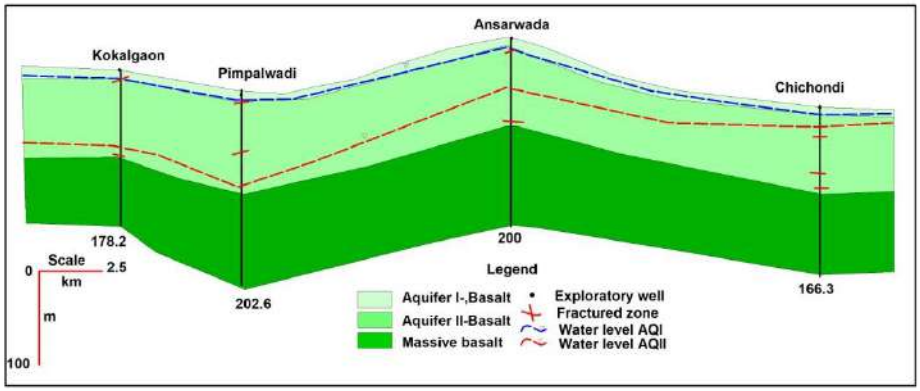
3. AQUIFER DISPOSITION

3.1. Number of Aquifers (Major)	One: Basalt –Aquifer-I, Aquifer-II

3.2. LITHOLOGICAL DISPOSITION



3.3. CROSS SECTIONS

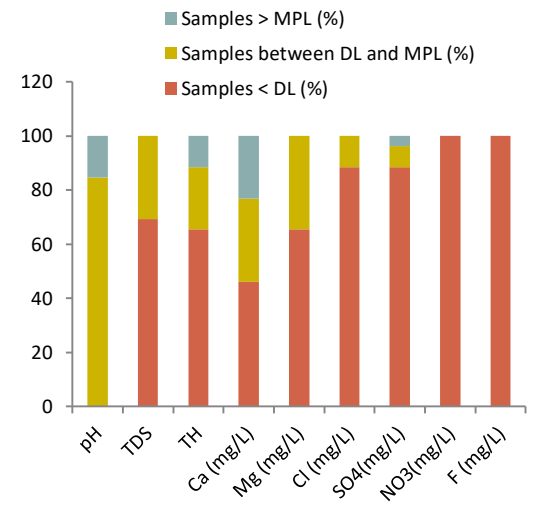


3.4 AQUIFER CHARACTERISTICS		
Major Aquifer	Basalt (Deccan Traps)	
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II (Semiconfined /confined)
Depth to bottom of aquifer (mbgl)	8.9 to 20	43 to 152
Granular/Weathered/ Fractured rocks thickness (m)	5.4 to 12.8	0.5 to 8.9
Yield Potential	0 to 50 m^3/day	0 to 0.6 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.0000145
Transmissivity (T)	30 to 60 m^2/day	27 to 175 m^2/day

4.CHEMICAL QUALITY OF GROUND WATER &CONTAMINATION

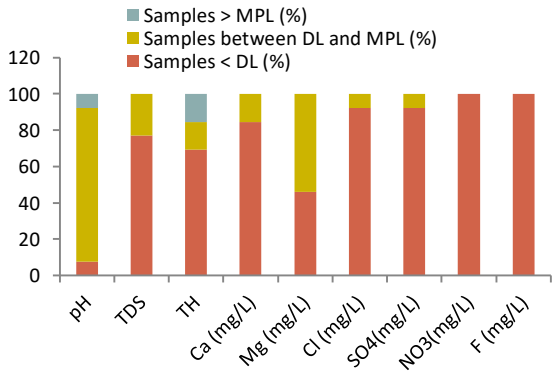
4.1 Aquifer I/Shallow Aquifer

Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes. ➢ About 691 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm and 402 sq Km area has EC between 750 and 2250 microsiemens/cm The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 26 samples analysed are as given below:	➢ In major parts of the block covering 691 Sq Km area, plants with moderate salt tolerance can be grown. However, in 402 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. ➢ About 58 % of the analysed samples have % Na less than 20; 35 % have %Na between 20 and 40; 7% have %Na between 40 and 60 Hence, the overall quality of ground water is

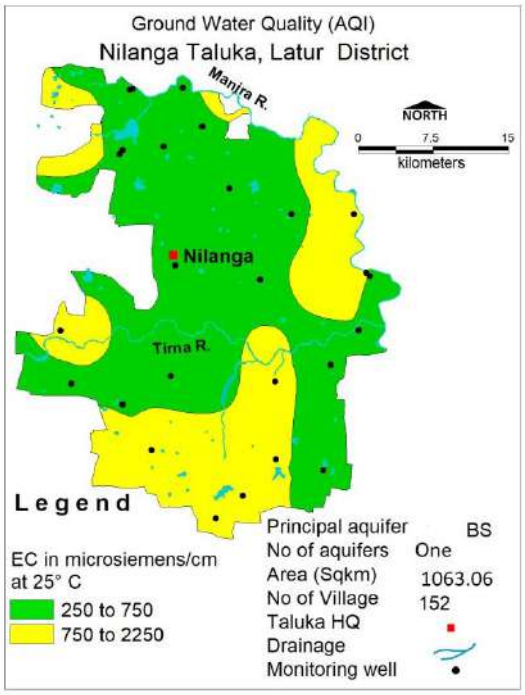
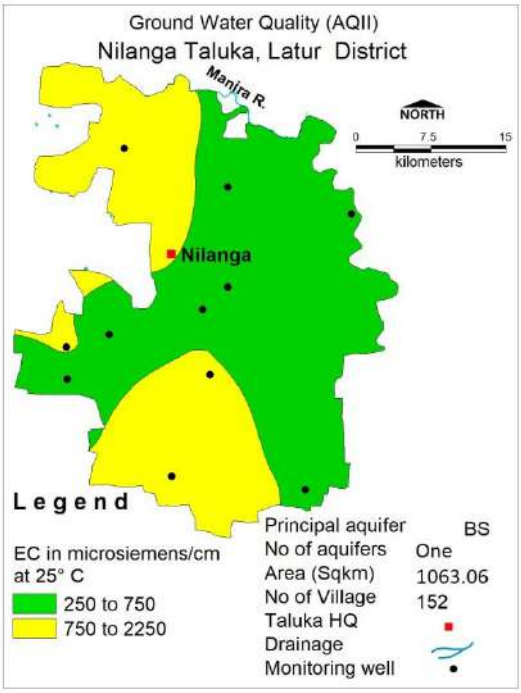


suitable for irrigation purposes except in areas with %Na value more than 60%.

4.1 Aquifer II/Deeper Aquifer

Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes. ➢ About 662 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm, 431 sq Km area has EC between 750 and 2250 microsiemens/cm. The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 13 samples analysed are as given below:  	➢ In major parts of the block covering 662 Sq Km area, plants with moderate salt tolerance can be grown. However, in 431 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. ➢ About 8% of the analysed samples have % Na less than 20; 84 % have %Na between 20 and 40 and 8% have %Na between 40 and 60 Hence, the overall quality of ground water is suitable for irrigation purposes except in areas with %Na value more than 60%.

3.2.CHEMICAL QUALITY MAP

Phreatic Aquifer (Aquifer-I)	Semiconfined/Confined Aquifer (Aquifer II)
	

5. GROUND WATER RESOURCE & EXTRACTION				
Aquifer-I/ Phreatic Aquifer (Basalt)				
Ground Water Recharge Worthy Area (Sq. Km.)	1014.53			
Total Annual Ground Water Recharge (MCM)	119.10			
Natural Discharge (MCM)	5.95			
Net Annual Ground Water Availability (MCM)	113.14			
Existing Gross Ground Water Draft for irrigation (MCM)	96.53			
Existing Gross Ground Water Draft for domestic and industrial water supply(MCM)	4.40			
Existing Gross Ground Water Draft for All uses(MCM)	100.93			
Net Ground Water Availability for future irrigation development(MCM)	15.86			
Provision for domestic and industrial requirement supply to 2025(MCM)	7.34			
Stage of Ground Water Development %	89.21			
Category	**SAFE**			
Aquifer-II				
Semiconfined/Confined Aquifer (Basalt)				
Total Area (Sq. Km.)	Mean aquifer thickness (m)	Sy	Peizometric Head (m aboveconfining layer)	Total Resource in the aquifer (MCM)

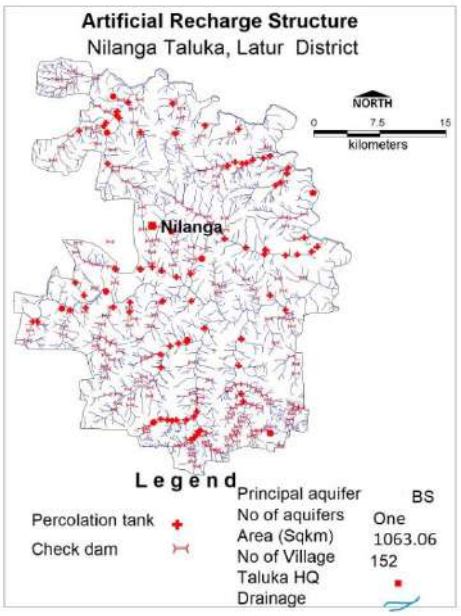
1063.06	4	0.005	78	22.46

5.0. GROUND WATER RESOURCE ENHANCEMENT			
Available Resource (MCM)	113.14		
Gross Annual Draft (MCM)	100.93		
5.1.SUPPLY SIDE MANAGEMENt			
SUPPLY (MCM)			
Agricultural Supply -GW	96.53		
Agricultural Supply -SW	27.51		
Domestic Supply - GW	4.40		
Domestic Supply - SW	1.10		
Total Supply	**129.54**		
Area of Block (Sq. Km.)	1063.06		
Area suitable for Artificial recharge (Sq. Km)	1014.53		
Type of Aquifer	Hard Rock	Soft Rock	
Area feasible for Artificial Recharge(WL >5mbgl) (Sq. Km.)	952.43	-	
Volume of Unsaturated Zone (MCM)	1904.86	-	
Average Specific Yield	0.020	-	
Volume of Sub surface Storage Space available for Artificial Recharge (MCM)	38.10	-	
Surplus water Available (MCM)	21.33	-	
Proposed Structures	**Percolation Tank** (Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam (Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)	**Recharge shaft** (Av. Gross Capacity-60 TCM)
Number of Structures	75	210	0
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	11.20	4.80	0
Area of Saline Patch	**Nil**		
Proposed Structures	Nil		
No of farm pond proposed (size: 30m*30m*3) with 3 filling= 0.0081 mcm capacity, 50% available water may be utilized for harvesting through farm ponds.	Nil		
Volume of water available for harvesting	Nil		
Additional volume created by desilting	**Nil**		
RTRWH Structures – Urban Areas			

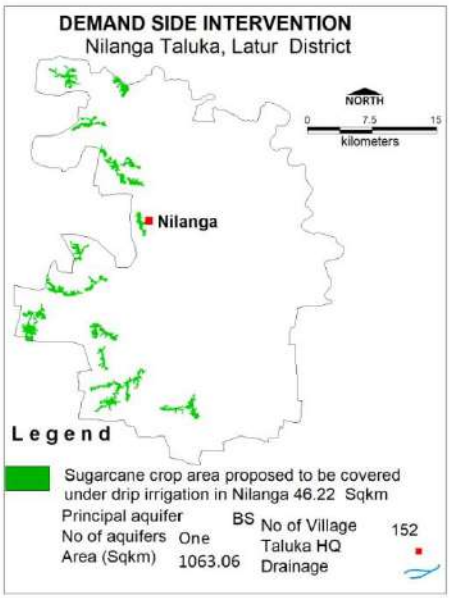
Households to be covered (25% with 50 m^2area)	14306
Total RWH potential (MCM)	0.562
Rainwater harvested / recharged @ 80% runoff co-efficient	0.449 (**Economically not viable & Not Recommended)**
5.2.DEMAND SIDE MANAGEMENT	
Micro irrigation techniques	
Remaining ground water irrigated Sugarcane cropped area proposed through drip irrigation	46.22
Volume of Water expected to be saved (MCM). (Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m)	26.34
Proposed Cropping Pattern change	
Irrigated area under Water Intensive Crop(ha)	Not proposed
Water Saving by Change in Cropping Pattern	Nil
5.3.EXPECTED BENEFITS	
Net Ground Water Availability (MCM)	113.14
Additional GW resources available after Supply side interventions (MCM)	16
Ground Water Availability after Supply side intervention	129.14
Existing Ground Water Draft for All Purposes (MCM)	100.93
Saving of Ground Water through demand side intervention (MCM)	26.345
GW draft after Demand Side Interventions (MCM)	74.58
Present stage of Ground Water Development (%)	89.21
Expected Stage of Ground Water Development after interventions (%)	57.75
Other Interventions Proposed, if any	
Alternate Water Sources Available	Nil
5.4.RECOMMENDATION	
Ground water development is recommended, if additional ground water resources are available after bringing the expected stage of development from 57.75% to 70%.	
5.5.DEVELOPMENT PLAN	
Additional Volume of water available after stage of GWD is	15.81

brought to 70% (MCM)	
Proposed Number of DW(@ 1.5 ham for 90% of GWR Available)	949
Proposed Number of BW(@ 1.5 ham for 10% of GWR Available)	158
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	24

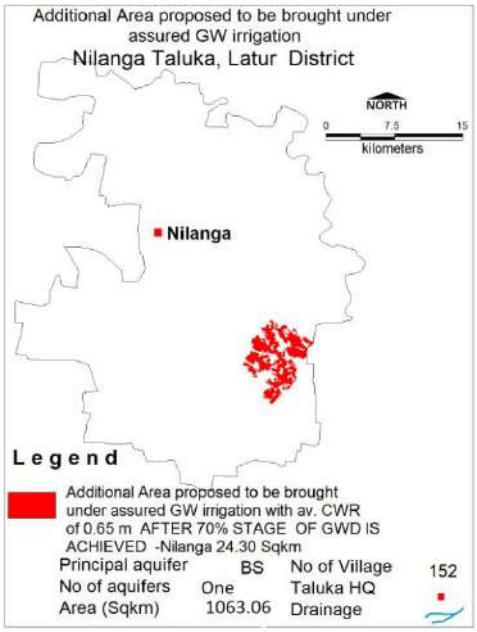
Proposed Artificial Recharge Structure



Demand Side Interventions



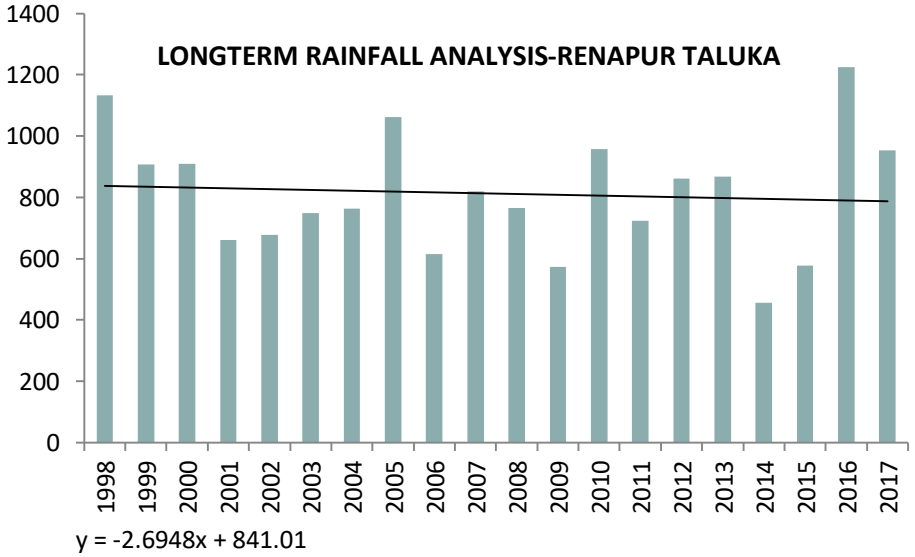
Addditional Area proposed to be brought under assured ground water irrigation



9. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, RENAPUR BLOCK, LATUR DISTRICT

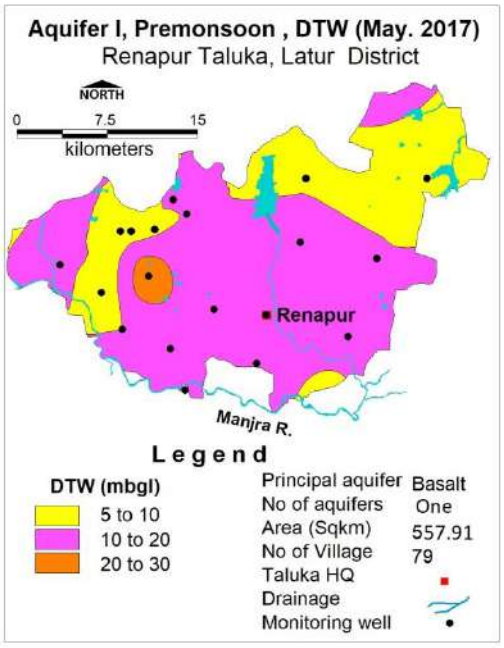
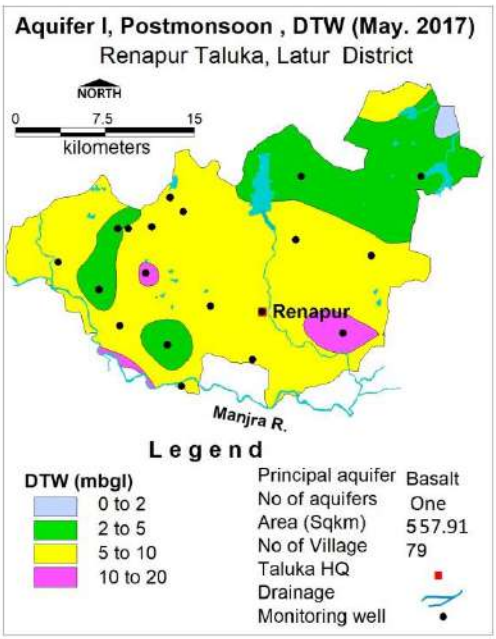
1. SALIENT INFORMATION	
1.1.Introduction	
Block Name	Renapur
Geographical Area (Sq. Km.)	557.91 Sq. Km.
Hilly Area (Sq. Km)	46.30 Sq. Km.
Poor Quality Area (Sq. Km.)	Nil
Population (2011)	142187
Climate	Tropical climate
1.2. Rainfall Analysis	
Normal Rainfall	812.7 mm
Annual Rainfall (2017)	952.6 mm
Decadal Average Annual Rainfall (2008-17)	795.56 mm
Long Term Rainfall Analysis (1998-2017)	Falling Trend: -2.694 m/year. Probability of Normal/Excess Rainfall:- 70% & 15%. Probability of Drought (Moderate/ Severe/ Acute):- 15% Moderate Frequency of occurance of Drought:- 1 in 7 Years

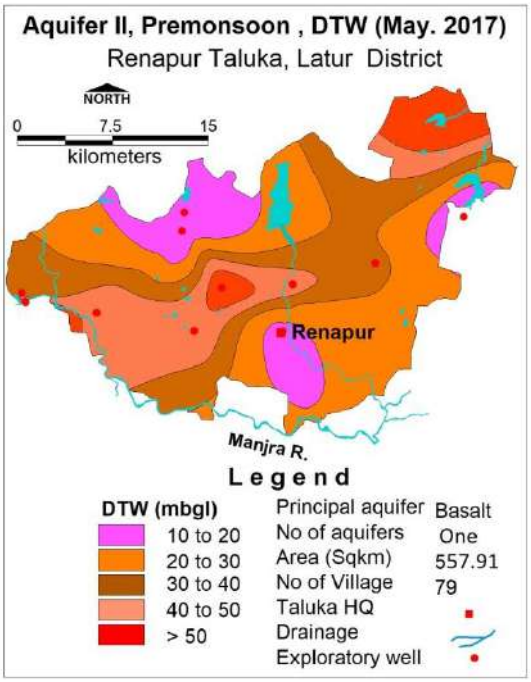
RAINFALL TREND ANALYSIS (1998 to 2017)

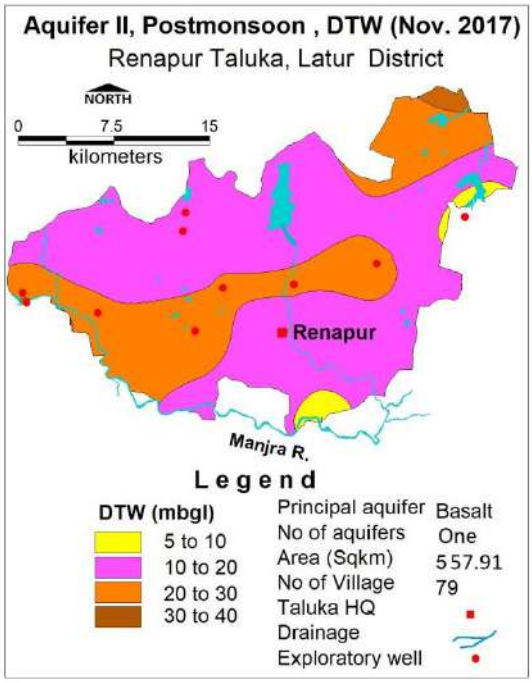


1.3. Geomorphology,Soil&Geology	
Geomorphic Unit	➢ Region of middle level plateau on Deccan Traps between 550 to 900m elevation ➢ Denudational Slope on Deccan Traps ➢ Flood Plain (including In-Filled river bed) ➢ Older Flood Plain
Soil	➢ Medium soils of 18 to 36 inch thickness; dark brown to dark grey in color; clay loam to clayey

	in texture with granular to sub-granular blocky structure. ➢ Shallow Soils of 0-9 inch thickness; brown to dark grey brown in color; loamy to clay-loam in texture with granular to sub-granular nature; blocky in structure ➢ Deep soils of above 36 inch thickness are observed in isolated patches in the Manjra river valleys; clayey in texture; sub granular blocky to blocky in structure; Deficient in nitrogen.	
Geology	Recent River Alluvium & Deccan Traps (Basalt) of Late Cretaceous to Early Eocene Age	
1.4.Hydrology & Drainage		
Drainage	Rena riverforms the main drainage system of the block.	
Hydrology(as on March 2013)	Major & Medium Irrigation Projects (>250 Ha) *(Reference Year: 2012-13)*	VatiPraklap&RenapurPrakalp bringing 1760 Ha and 2445 Ha under irrigation
	Minor Irrigation Projects (0 to 250 Ha) *(Reference Year: 2016-17)*	Completed:-64 projects; Ongoing: 10 projects
1.5.LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN		
Geographical Area	557.91Sq. Km.	
Forest Area	10.33 Sq. Km.	
Cultivable Area	Not Available	
Net Sown Area	Not Available	
Double Cropped Area	27.74 Sq. Km.	
Area under Irrigation – Surface Water	31.92 Sq. Km.	
Area under Irrigation – Ground Water	59.29 Sq Km.	
Principal Crops	**Crop Type**	**Area (Sq. Km.)**
	Pulses	36.9
	Cotton	1.54
	Cereals	17.95
	Oil Seeds	_
Horticultural Crops	Sugarcane	40.87
	Others	3.93
1.6.WATER LEVEL BEHAVIOUR		
1.6.1. Aquifer-I/Shallow Aquifer (Phreatic Aquifer)		
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**	
❖ Depth to water level between 5 mbgl and 10 mbgl observed in 176.58 Sq Km area in the north-eastern and west-central parts of the block.	❖ The shallow depth to water level less than 2 mbgl is obseerved only as an isolated patch in the north-eastern part of the block covering only 4 Sq Km area.	

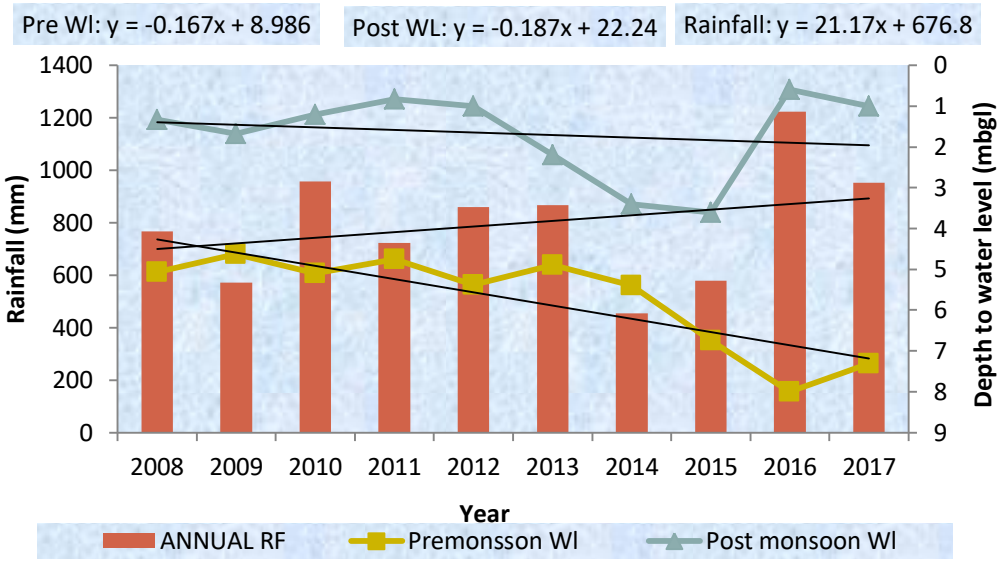
❖ Depth to water level between 10 mbgl and 20 mbgl observed in 378 Sq Km area in the major parrts of the block ❖ Deeper depth to water level between 20 mbgl and 30 mbgl is observed in an isolated patch of 10 Sq Km area. The deeper depth to water level may be due to exploitation of ground water during dry period.	❖ The depth to water level between 2 mbgl and 5 mbgl is observed in 157 Sq Km area in the north-eastern parts of the block as well as small isolated patches in north-western and south-west parts. ❖ Depth to water level between 5 mbgl and 10 mbgl is observed in 384 Sq Km area in the major parts of the block ❖ Depth to water level between 10 mbgl and 20 mbgl is observed in only 20 Sq Km area as isolated patches in the south-eastern and south-western parts.
Water Level Map- Aquifer-I/Shallow Aquifer (Phreatic Aquifer)	
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (Nov.2017)**
	
1.6.2. Aquifer-II/Deeper Aquifer (Semiconfined/Confined Aquifer)	
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**





Pre-Monsoon Water Level(May 2017)	**Post-Monsoon Water Level(November 2017)**
❖ Depth to water level between 10 mbgl and 20 mbgl observed in 77.75 Sq Km area in the northern, south-eastern and north-eastern parts of the block. ❖ Depth to water level between 20 mbgl and 30 mbgl is observed in 201 Sq Km area in the eastern and northern parts of the block. ❖ Depth to water level between 30 mbgl and 40 mbgl is observed in about 148 Sq Km area in a single stretch from north-east to south-west and western parts along the central.	❖ The depth to water level between 5 mbgl and 10 mbgl is observed in only 12 Sq Km area in small isolated patches along the north-eastern and south-eastern boundaries of the block. ❖ Depth to water level between 10 mbgl and 20 mbgl is observed in 371 Sq Km area in the major parrts of the block ❖ Depth to water level between 20 mbgl and 30 mbgl is observed in 176 Sq Km area in the western, central and north-eastern parts of the block. ❖ The deeper deptht o water level of more than 30 mbgl is observed in the north-eastern tip of the block as an isolated patch.

1.7. Hydrograph

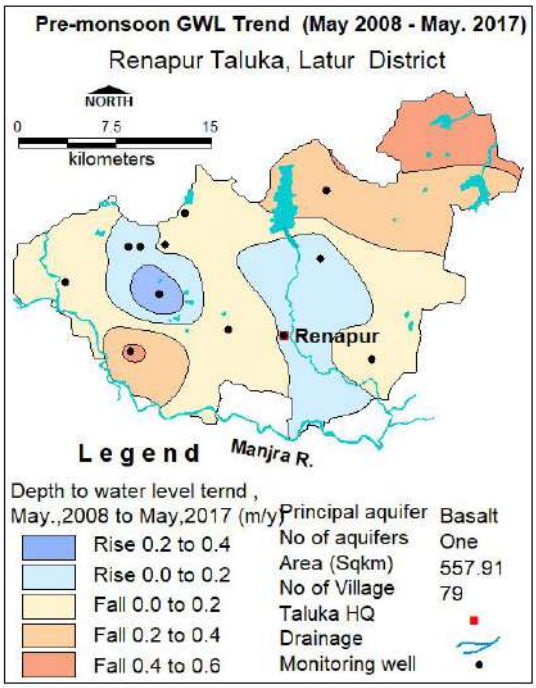


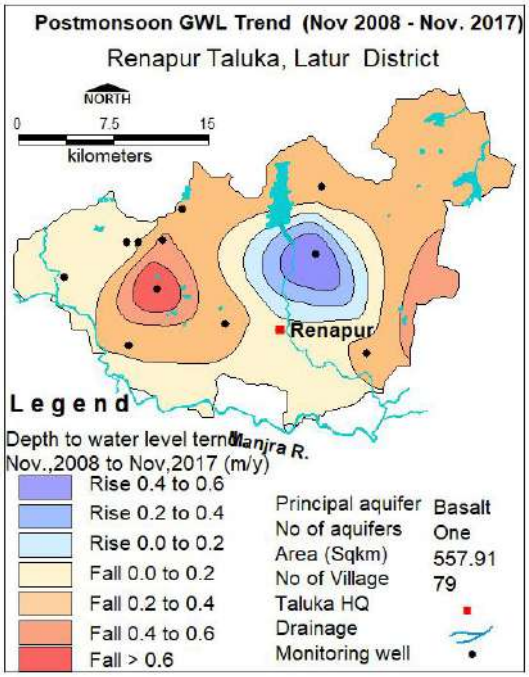
The hydrograph of CGWB Monitoring site at Renapurfor the period 2008 to 2017 shows:

- A falling trend during both premonsoon and postmonsoon @ 0.167 m/year and 0.187 m/year respectively.
- The depth to water level during premonsoon ranges from 4.63 mbgl to 8 mbgl.
- The depth to water level during postmonsoon ranges from 0.6 mbgl to 3.6 mbgl.

1.8. Water Level Trend (2008-17)

Pre-Monsoon Trend (May 2008-2017)		**Post-Monsoon Trend (November 2008-2017)**	
Rising Trend @	Falling Trend @	Rising Trend @	Falling Trend @
0.0 to 0.2 m/year in 126 Sq Km area and @ 0.2 to 0.38 m/year in 11.6 Sq Km area.	0.0 to 0.2 m/year in 251Sq Km areas, 0.2 to 0.4 m/year in 116.82 Sq Km area and @ 0.4 to 0.4 m/year in 45.47 Sq Km area	0.0 to 0.2 m/yr in 28.89 Sq Km area, 0.2 to 0.4 m/year in 20.76 Sq Km area and 0.4 to 0.6 m/year in 15.94 Sq Km area.	0 to 0.2 m/year in 192.6 Sq Km areas, 0.2 to 0.4 m/year in 242.8 Sq Km area, 0.4 to 0.6 m/year in 39.38 Sq Km area and more than 0.6 m/year in 11.7Sq Km area.
Pre-Monsoon WL Trend (May 2007-2016)		**Post-Monsoon WL Trend (Nov.2007-2016)**	



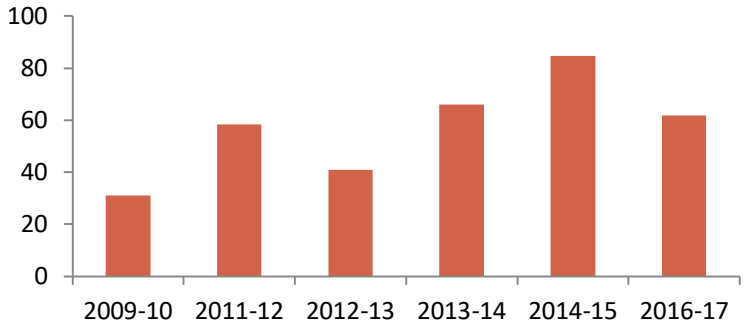


2. GROUND WATER ISSUES

1) Overexploitation of Ground Water: -

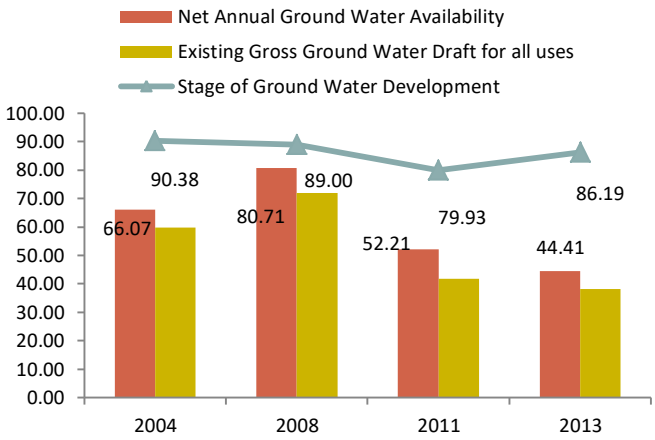
The area under ground water based sugarcane cultivation has been raising @7.3 Sq Km per year since 2010. About 96% of gross ground water draft for all purposes is used for irrigation in the block.

Sugarcane Area (Sq Km)



2) Variation in stage of ground water development

Eventhough the stage of ground water development has been decreased from 90.38 % (2004) to 86.19% (2013), the block is still under water stressed condition due to higher depency in ground water. The net ground water availability has been reduced to 67% of the availability in 2004.

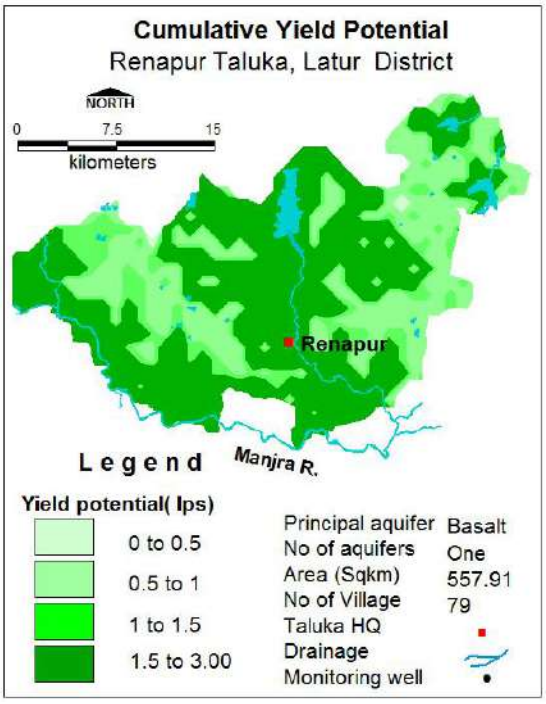


3) Declining Water Level Trend: -

The decline in water level trend (2008-17) upto 0.6 m/year is observed in major parts of the block during both the seasons despite the increase in rainfall @21.17 mm/year. The exploitation of shallow aquifers as for higher dependency in ground water based irrigation during both Kharif and Rabi season and lack of availability of surface water has resulted in declining trend over the period. About 83 % of the net ground water availabilty (as per GEC2013) is utilised for irrigation purposes in the block.

4) **Low ground water yield Potential of the aquifers:**

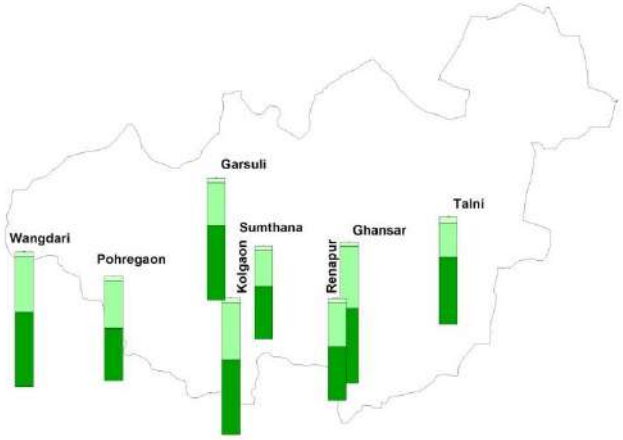
The ground water yield potentiality of the aquifers ranges from 0 to 1.5 lps in major parts of the block. However, high yielding aquifers are obtained only along the drainages, faults/ fractures or joints. The low potential zone in major parts of the block is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.



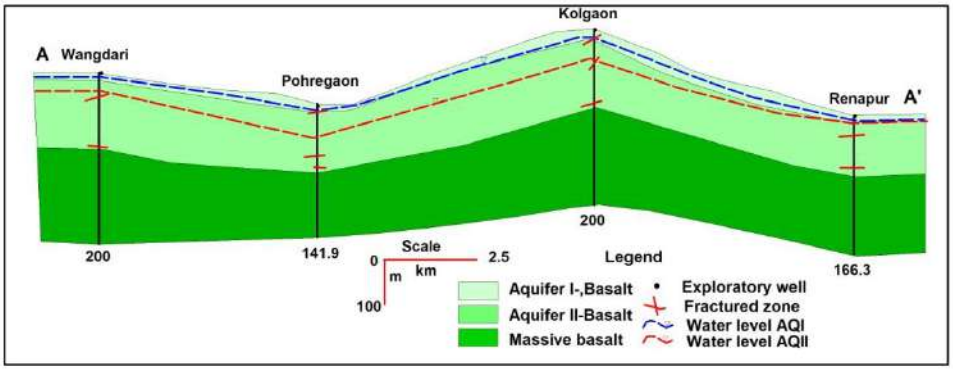
3. AQUIFER DISPOSITION

3.1. Number of Aquifers (Major)	One: Basalt –Aquifer-I, Aquifer-II

3.2. LITHOLOGICAL DISPOSITION



3.3. CROSS SECTIONS



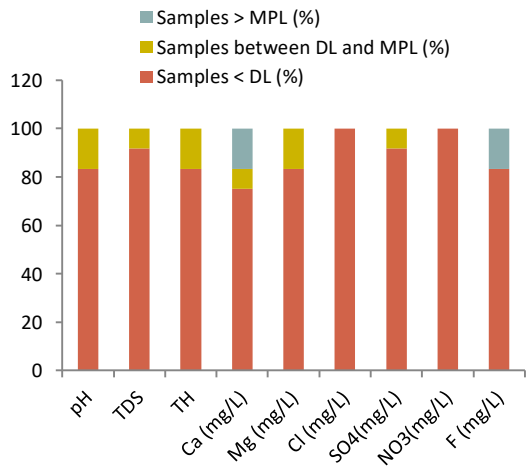
3.4 AQUIFER CHARACTERISTICS

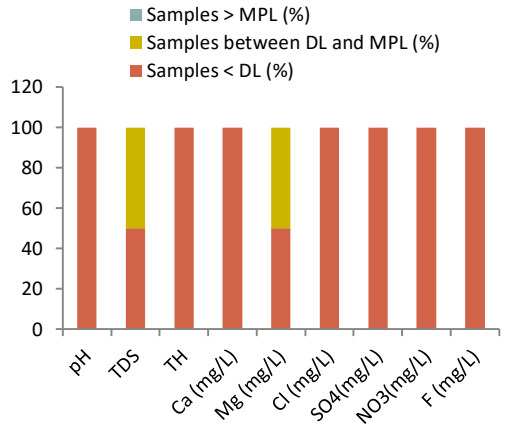
Major Aquifer	Basalt (Deccan Traps)	
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II(Semiconfined/confined)
Depth to bottom of aquifer (mbgl)	9 to 20	70 to 150
Weathered/ Fractured rocks thickness (m)	8 to 12.8	0.5 to 8.9
Yield Potential	0 to 100 m^3/day	0 to 1.25 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.0000145
Transmissivity (T)	32 to 75 m2/day	25 to 190 m2/day

4.CHEMICAL QUALITY OF GROUND WATER &CONTAMINATION

4.1 Aquifer I/Shallow Aquifer

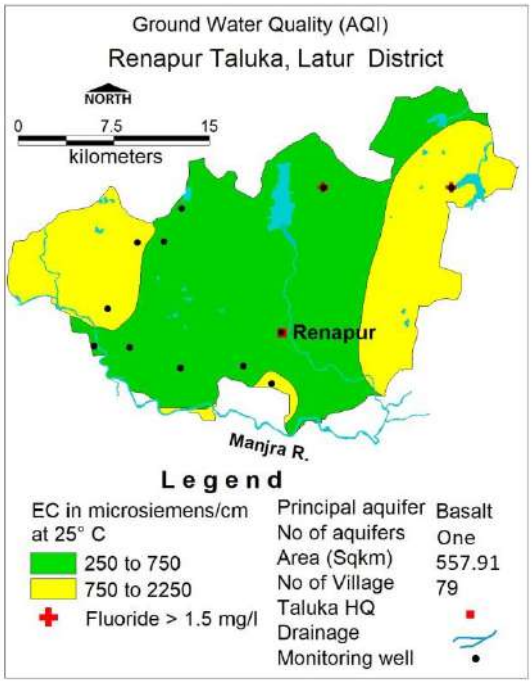
Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Fluoride affected areas in 2 sites.. ➢ About 364 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm and	➢ In major parts of the block covering 364 Sq Km area, plants with moderate salt tolerance can be grown. However, in 203 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt

203 sq Km area has EC between 750 and 2250 microsiemens/cm The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 12 samples analysed are as given below:  	tolerance should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. ➢ About 25 % of the analysed samples have % Na less than 20; 25 % have %Na between 20 and 40; 50% have %Na between 40 and 60 Hence, the overall quality of ground water is suitable for irrigation purposes.
4.1 Aquifer II/Deeper Aquifer	
Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes. ➢ About 500 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm and 67 sq Km area has EC between 750 and 2250 microsiemens/cm The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 2 samples analysed are as given below:	➢ In major parts of the block covering 6500 Sq Km area, plants with moderate salt tolerance can be grown. However, in 67 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. ➢ About 50 % of the analysed samples have % Na less than 20; 50 % have %Na more than 60. Hence, the overall quality of ground water is suitable for irrigation purposes except in areas with %Na value more than 60.

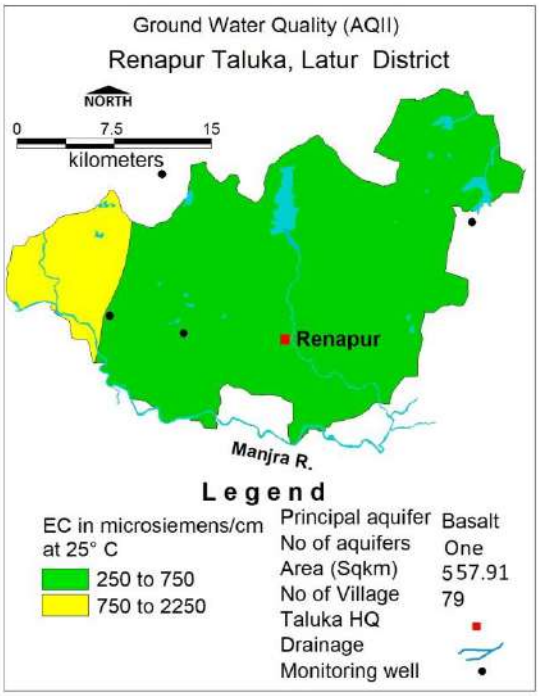


3.2.CHEMICAL QUALITY MAP

Phreatic Aquifer (Aquifer-I)



Semiconfined/Confined Aquifer (Aquifer II &III)



5. GROUND WATER RESOURCE & EXTRACTION

Aquifer-I/ Phreatic Aquifer (Basalt)

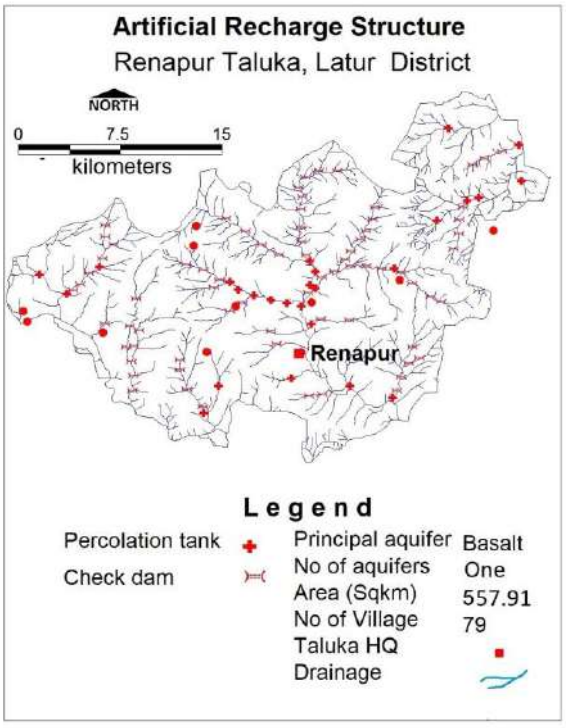
Ground Water Recharge Worthy Area (Sq. Km.)	469.92
Total Annual Ground Water Recharge (MCM)	46.75
Natural Discharge (MCM)	2.33
Net Annual Ground Water Availability (MCM)	44.41
Existing Gross Ground Water Draft for irrigation (MCM)	36.93
Existing Gross Ground Water Draft for	1.34

domestic and industrial water supply(MCM)				
Existing Gross Ground Water Draft for All uses(MCM)			38.28	
Net Ground Water Availability for future irrigation development(MCM)			5.48	
Provision for domestic and industrial requirement supply to 2025(MCM)			2.20	
Stage of Ground Water Development %			86.19	
Category			**SAFE**	
Aquifer-II				
Semiconfined/Confined Aquifer (Basalt)			**Semiconfined/Confined Aquifer (Alluvium)**	
Total Area (Sq. Km.)	Mean aquifer thickness (m)	Sy	Peizometric Head (m above confining layer)	Total Resource (MCM)
557.91	2.2	0.005	47	6.52
5.0. GROUND WATER RESOURCE ENHANCEMENT				
Available Resource (MCM)		44.41		
Gross Annual Draft (MCM)		38.28		
5.1.SUPPLY SIDE MANAGEMENT				
SUPPLY (MCM)				
Agricultural Supply -GW		1.34		
Agricultural Supply -SW		31.92		
Domestic Supply - GW		1.35		
Domestic Supply - SW		0.34		
Total Supply		**70.54**		
Area of Block (Sq. Km.)		557.91		
Area suitable for Artificial recharge (Sq. Km)		469.92		
Type of Aquifer		Hard Rock	Soft Rock	
Area feasible for Artificial Recharge(WL >5mbgl) (Sq. Km.)		332.61	-	
Volume of Unsaturated Zone (MCM)		665.22	-	
Average Specific Yield		0.020	-	
Volume of Sub surface Storage Space available for Artificial Recharge (MCM)		13.30	-	
Surplus water Available (MCM)		7.45	-	
Proposed Structures		**Percolation Tank** (Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam (Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)	**Recharge shaft** (Av. Gross Capacity-60 TCM)
Number of Structures		26	75	0
Volume of Water expected to be		3.91	1.68	0

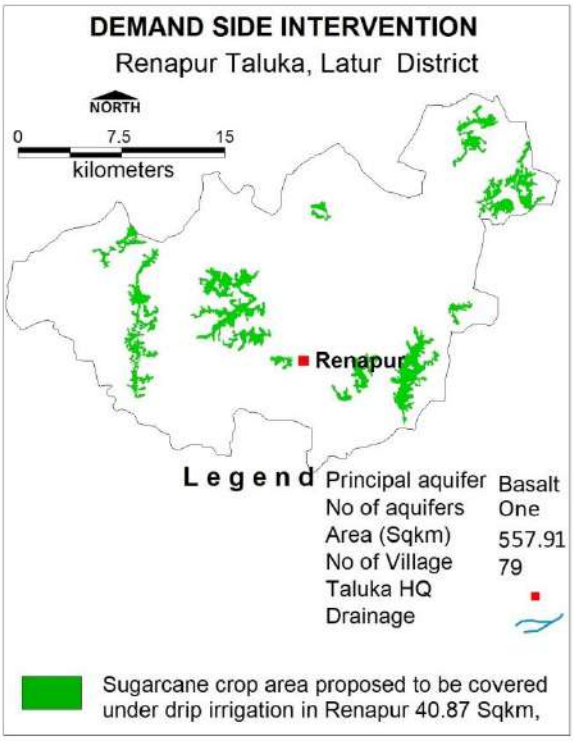
conserved / recharged @ 75% efficiency (MCM)			
Area of Saline Patch	**Nil**		
Proposed Structures	Nil		
No of farm pond proposed (size: 30m*30m*3) with 3 filling= 0.0081 mcm capacity, 50% available water may be utilized for harvesting through farm ponds.	Nil		
Volume of water available for harvesting	Nil		
Additional volume created by desilting	**Nil**		
RTRWH Structures – Urban Areas			
Households to be covered (25% with 50 m^2area)	7205		
Total RWH potential (MCM)	0.287		
Rainwater harvested / recharged @ 80% runoff co-efficient	0.229 (**Economically not viable & Not Recommended)**		
5.2.DEMAND SIDE MANAGEMENT			
Micro irrigation techniques			
Remaining ground water irrigated Sugarcane cropped area proposed through drip irrigation	40.87		
Volume of Water expected to be saved (MCM). (Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m)	23.30		
Proposed Cropping Pattern change			
Irrigated area under Water Intensive Crop(ha)	Not proposed		
Water Saving by Change in Cropping Pattern	Nil		
5.3.EXPECTED BENEFITS			
Net Ground Water Availability (MCM)	44.41		
Additional GW resources available after Supply side interventions (MCM)	5.59		
Ground Water Availability after Supply side intervention	50		
Existing Ground Water Draft for All Purposes (MCM)	38.28		
Saving of Ground Water through demand side intervention (MCM)	23.29		
GW draft after Demand Side	14.98		

Interventions (MCM)	
Present stage of Ground Water Development (%)	86.20
Expected Stage of Ground Water Development after interventions (%)	29.97
Other Interventions Proposed, if any	
Alternate Water Sources Available	Nil
5.4.RECOMMENDATION	
Ground water development is recommended, if additional ground water resources are available after bringing the expected stage of development from 29.97% to 70%.	
5.5.DEVELOPMENT PLAN	
Additional Volume of water available after stage of GWD is brought to 70% (MCM)	20.01
Proposed Number of DW(@ 1.5 ham for 90% of GWR Available)	1201
Proposed Number of BW(@ 1.5 ham for 10% of GWR Available)	200
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	30.79

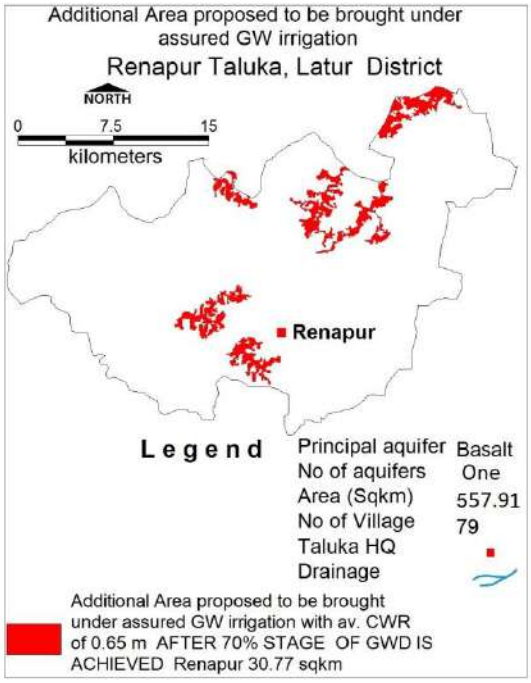
Proposed Artificial Recharge Structure



Demand Side Interventions



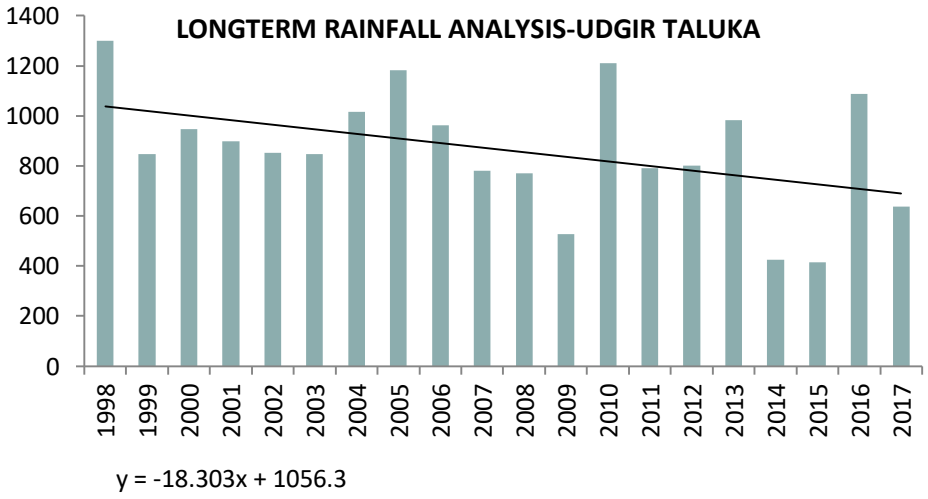
Addditional Area proposed to be brought under assured ground water irrigation


Additional Area proposed to be brought under assured GW irrigation
Renapur Taluka, Latur District
NORTH
0
7.5
15
kilometers
Renapur
Legend
Principal aquifer
Basalt
No of aquifers
One
Area (Sqkm)
557.91
No of Village
79
Taluka HQ
Drainage
Additional Area proposed to be brought under assured GW irrigation with av. CWR of 0.65 m AFTER 70% STAGE OF GWD IS ACHIEVED Renapur 30.77 sqkm

10. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN, UDGIR BLOCK, LATUR DISTRICT

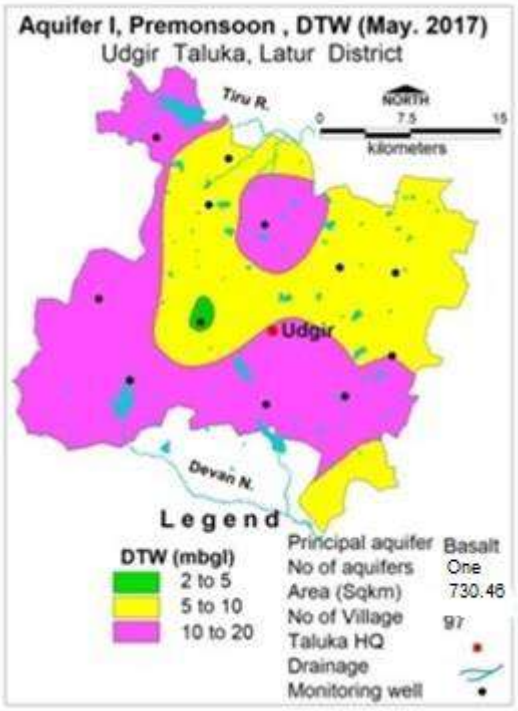
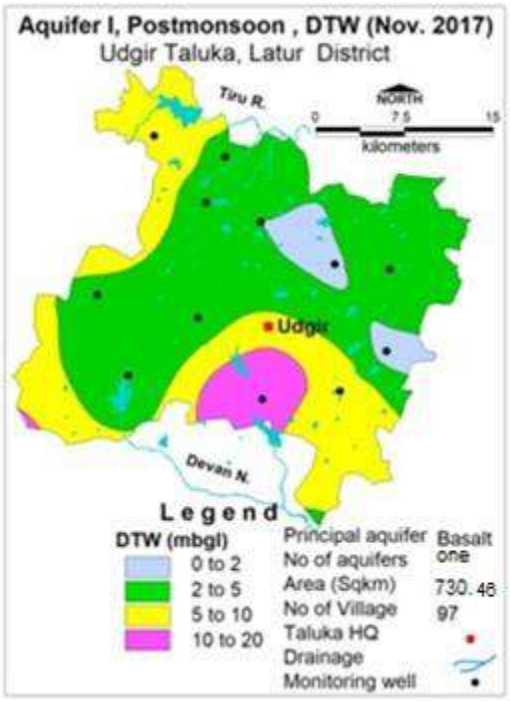
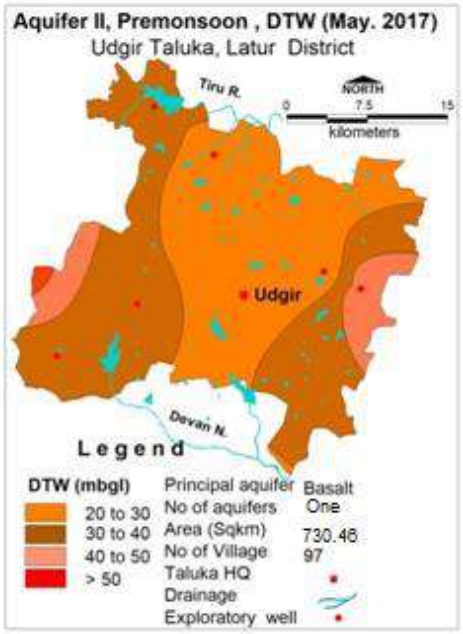
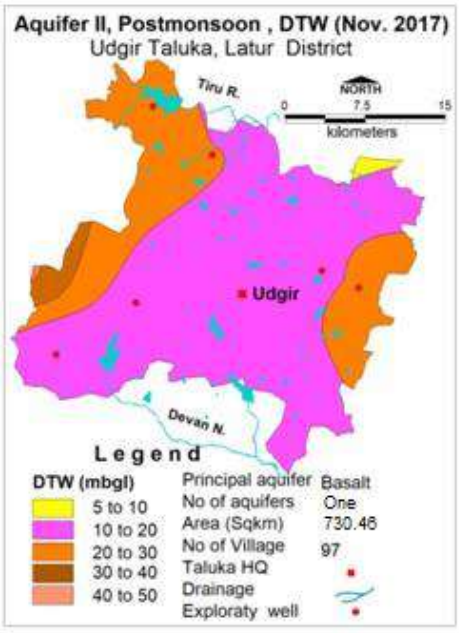
1. SALIENT INFORMATION	
1.1.Introduction	
Block Name	Udgir
Geographical Area (Sq. Km.)	730.46 Sq. Km.
Hilly Area (Sq. Km)	96.84 Sq. Km.
Poor Quality Area (Sq. Km.)	Nil
Population (2011)	311066
Climate	Tropical climate
1.2. Rainfall Analysis	
Normal Rainfall	864.1 mm
Annual Rainfall (2017)	636.7 mm
Decadal Average Annual Rainfall (2008-17)	764.8 mm
Long Term Rainfall Analysis (1998-2015)	Falling Trend: -18.303 m/year. Probability of Normal/Excess Rainfall: - 60% & 20%. Probability of Drought (Moderate/ Severe/ Acute):- 10% Moderate & 10% Severe Frequency of occurance of Drought:- 1 in 5 Years

RAINFALL TREND ANALYSIS (1998 to 2017)



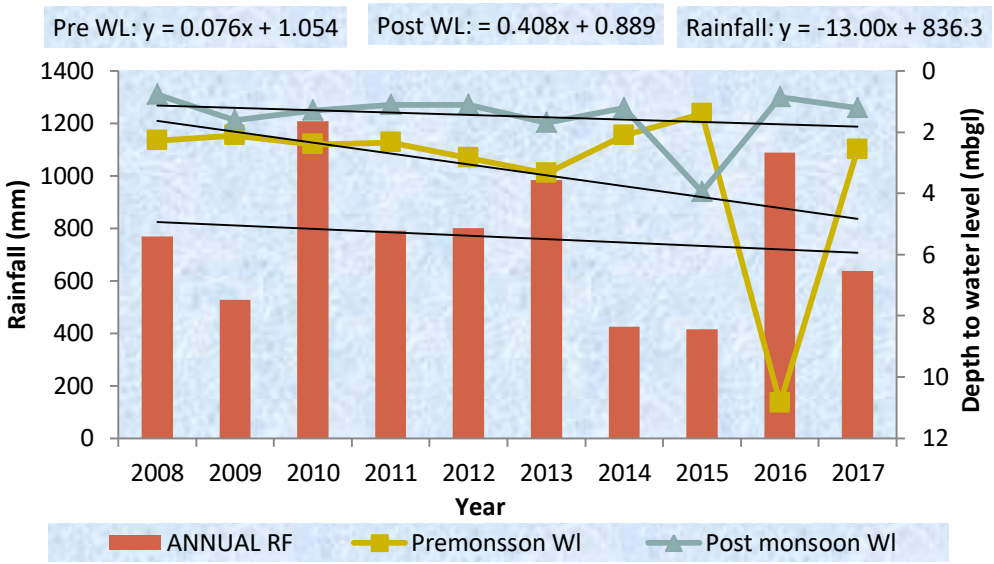
1.3. Geomorphology,Soil&Geology	
Geomorphic Unit	➢ Region of low level plateau on Deccan traps between 550 to 900 m elevation ➢ Denudation slopes on Deccan trap
Soil	➢ Shallow Soils of 0-9 inch thickness; brown to dark grey brown in color; loamy to clay-loam in texture with granular to sub-granular nature; blocky in structure

	➢ Medium soils of 18 to 36 inch thickness; dark brown to dark grey in color; clay loam to clayey in texture with granular to sub-granular blocky structure.	
Geology	Recent River Alluvium & Deccan Traps (Basalt) of Late Cretaceous to Early Eocene Age	
1.4.Hydrology & Drainage		
Drainage	Tiru river in the north and Devan river in the south forms the main drainages	
Hydrology(as on March 2013)	Major & Medium Irrigation Projects (>250 Ha) *(Reference Year: 2012-13)*	DevarjanPrakalp&TiruPrakalp
	Minor Irrigation Projects (0 to 250 Ha) *(Reference Year: 2016-17)*	Completed:-182 projects; Ongoing: 35 projects
1.5.LAND USE, AGRICULTURE, IRRIGATION & CROPPING PATTERN		
Geographical Area	730.46 Sq. Km.	
Forest Area	3.82 Sq. Km.	
Cultivable Area	561.53 Sq. Km.	
Net Sown Area	497.84 Sq. Km.	
Double Cropped Area	63.69 Sq. Km.	
Area under Irrigation – Surface Water	8.72	
Area under Irrigation – Ground Water	16.20 Sq. Km.	
Principal Crops	**Crop Type**	**Area (Sq. Km.)**
	Pulses	15.24
	Cotton	-
	Cereals	5.6
	Oil Seeds	_
Horticultural Crops	Sugarcane	23.58
	Others	38.28
1.6.WATER LEVEL BEHAVIOUR		
1.6.1. Aquifer-I/Shallow Aquifer (Phreatic Aquifer)		
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**	
❖ Depth to water level between 5 mbgl and 10 mbgl observed in 342.82 Sq Km areas in the northern, central, north-eastern and south-eastern parts of the block. ❖ Depth to water level between 10 mbgl and 20 mbgl observed in 404 Sq Km area in the north-western, south-western, southern and north-central parts of the block.	❖ The shallow depth to water level less than 2 mbgl is obseerved only as isolated patches in the northern part of the block covering only 43 Sq Km area. ❖ The depth to water level between 2 mbgl and 5 mbgl is observed in 420 Sq Km area in the major parts of the block. ❖ Depth to water level between 5 mbgl and 10 mbgl is observed in 238 Sq Km	

The deeper depth to water level may be due to exploitation of ground water during dry period.	area in the northwestern, western and southern parts of the block. ❖ Depth to water level between 10 mbgl and 20 mbgl is observed in only 48 Sq Km area as an isolated patch in the south-central part of the block.
Water Level Map- Aquifer-I/Shallow Aquifer (Phreatic Aquifer)	
Pre-Monsoon Water Level (May 2017)	**Post-Monsoon Water Level (Nov.2017)**
	
1.6.2. Aquifer-II/Deeper Aquifer (Semiconfined/Confined Aquifer)	
Pre-Monsoon (May-2017)	**Post-Monsoon (November-2017)**
	

Pre-Monsoon Water Level(May 2017)	Post-Monsoon Water Level(November 2017)
❖ Depth to water level between 20 mbgl and 30 mbgl is observed in 331 Sq Km area in the central part of the block extending in northeast-southwest direction. ❖ Depth to water level between 30 mbgl and 40 mbgl is observed in about 355 Sq Km area in the eastern and western parts of the block extending wholly from north to south. ❖ Depth to water level more than 40 mbgl is observed in only 63 Sq Km area in the western and eastern boundaries of the block.	❖ The depth to water level between 5 mbgl and 10 mbgl is observed in only 5 Sq Km area in the north-eastern boundary of the block. ❖ Depth to water level between 10 mbgl and 20 mbgl is observed in 528 Sq Km area in the major parrts of the block ❖ Depth to water level between 20 mbgl and 30 mbgl is observed in 201 Sq Km area in the western and eastern boundaries of the block. ❖ The deeper depth to water level of more than 30 mbgl is observed in 16 Sq Km area in the western boundary of the block.

1.7. Hydrograph



The hydrograph of CGWB Monitoring site at Udgir-1 for the period 2008 to 2017 shows:

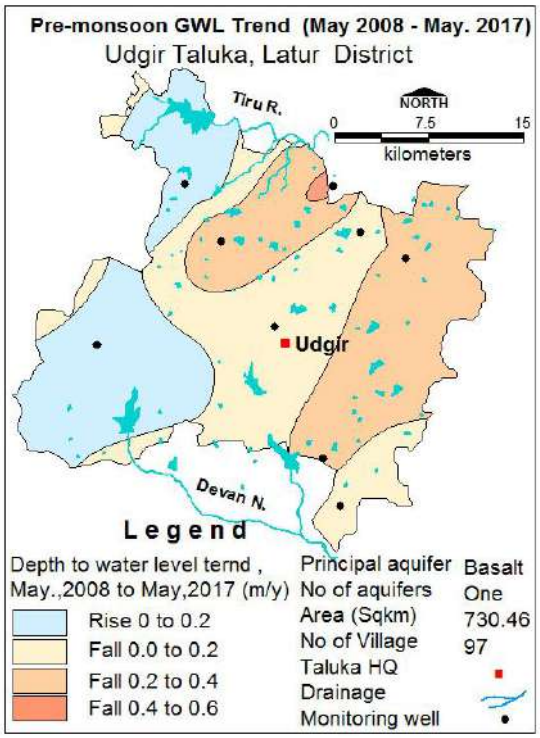
❖ A falling trend during both premonsoon and postmonsoon @ 0.076m/year and 0.408m/year respectively.
❖ The depth to water level during premonsoon ranges from 1.4 mbgl to 10.85 mbgl.
❖ The depth to water level during postmonsoon ranges from 0.78 mbgl to 3.95 mbgl.

1.8. Water Level Trend (2008-17)

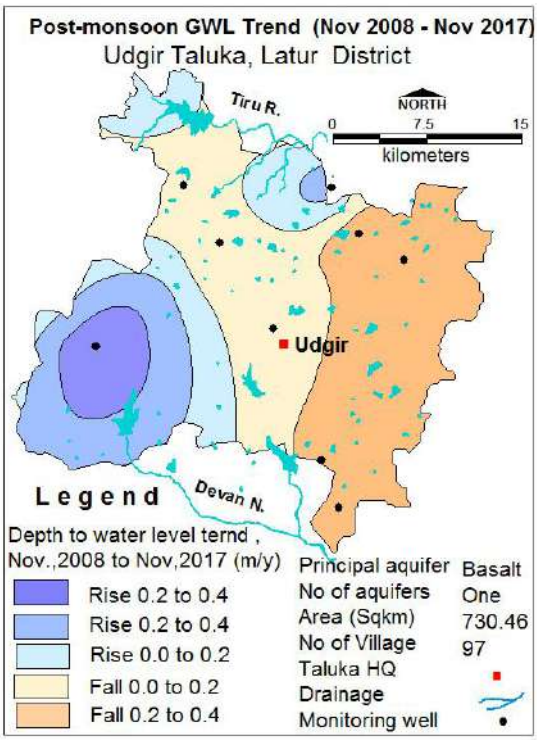
Pre-Monsoon Trend (May 2008-2017)		Post-Monsoon Trend (November 2008-2017)	
Rising Trend @	Falling Trend @	Rising Trend @	Falling Trend @
0.0 to 0.2 m/year in 220 Sq Km area	0.0 to 0.2 m/year in 255 Sq Km area, 0.2 to 0.4 m/year in 255 Sq Km area and 0.4 to 0.6 m/year in 2.7 Sq Km	0 to 0.2 m/year in 117 Sq Km area, 0.2 to 0.4 m/year in 116 Sq Km area and 0.4 to 0.6 m/year in 50Sq Km	0 to 0.2 m/year in 214 Sq Km area and 0.2 to 0.4 m/year in 244 Sq Km area.

	area.	area.	

Pre-Monsoon WL Trend (May 2008-2017)



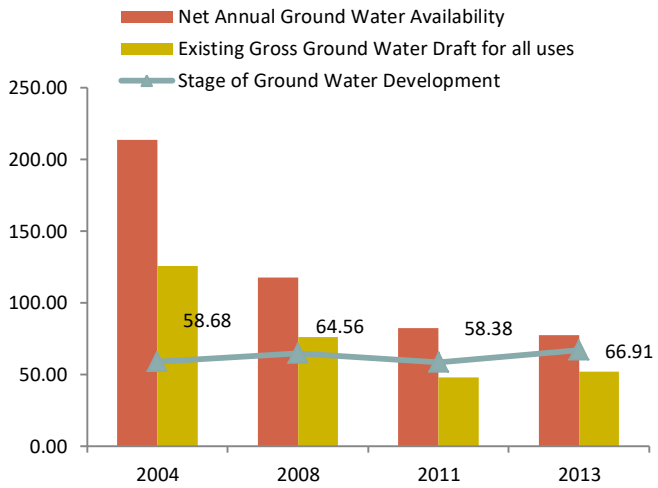
Post-Monsoon WL Trend (Nov.2008-2017)



2. GROUND WATER ISSUES

1) Increase in stage of ground water development

The stage of ground water development has increased from 58.68 % (2004) to 66.91% (2013). This is due to decreasing net ground water availability, increase in dependency of ground water and hence, increase in stage of ground water development.



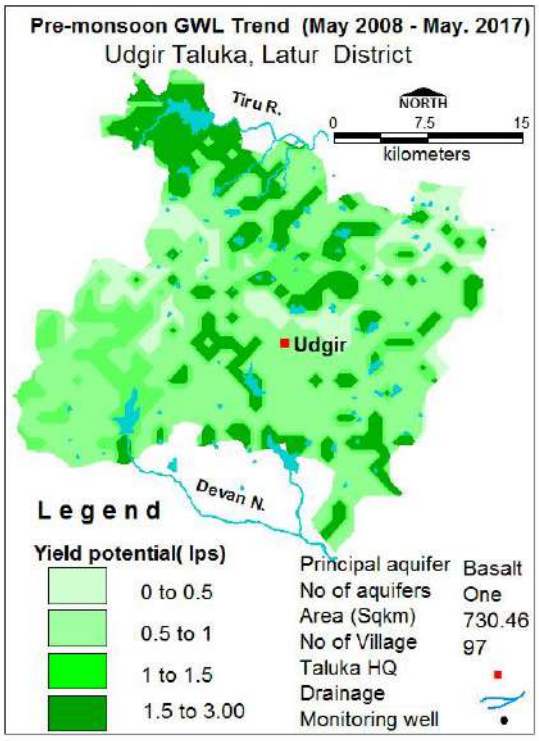
3) Declining Water Level Trend: -

The decline in water level trend (2008-17) up to 0.4 m/year is observed in major parts of the block during both the seasons in line with the decrease in rainfall @13 mm/year. The exploitation of shallow aquifers as for higher dependency in ground water based irrigation during both Kharif and Rabi season and lack of availability of

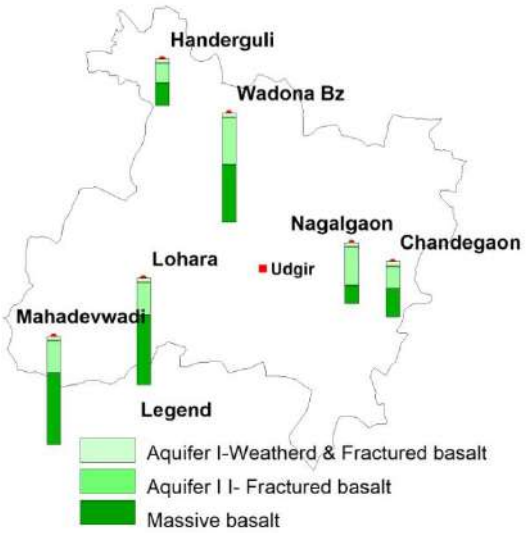
surface water has resulted in declining trend over the period. About 64 % of the net ground water availability (as per GEC2013) is utilized for irrigation purposes in the block.

4) **Low ground water yield Potential of the aquifers:**

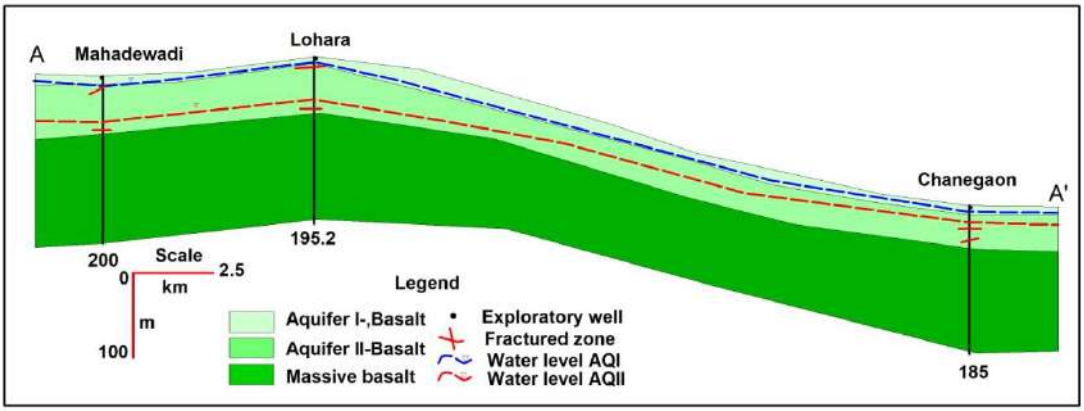
The ground water yield potentiality of the aquifers ranges from 0 to 1.5 lps in major parts of the block. However, high yielding aquifers are obtained only along the drainages, faults/ fractures or joints. The low potential zone in major parts of the block is due to limited extent of porosity and permeability evolved from secondary porosity and hence poor sustainability of aquifers.



3. AQUIFER DISPOSITION	
3.1. Number of Aquifers (Major)	One:Basalt –Aquifer-I, Aquifer-II
3.2. LITHOLOGICAL DISPOSITION	



3.3. CROSS SECTIONS



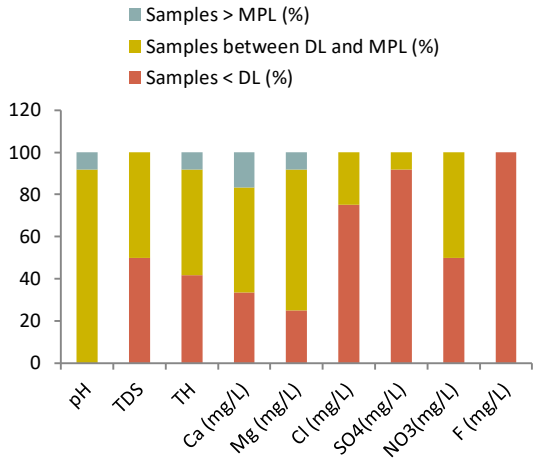
3.4 AQUIFER CHARACTERISTICS

Major Aquifer	Basalt (Deccan Traps)	
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II (Semiconfined/confined)
Depth to bottom of aquifer (mbgl)	10 to 24	70 to 150
Weathered/ Fractured rocks thickness (m)	7 to 12.8	7 to 8.9
Yield Potential	0 to 25 m^3/day	0 to 1.25 lps
Specific Yield (Sy)/ Storativity (S)	0.02	0.0000145
Transmissivity (T)	-	32 to 180 m^2/day

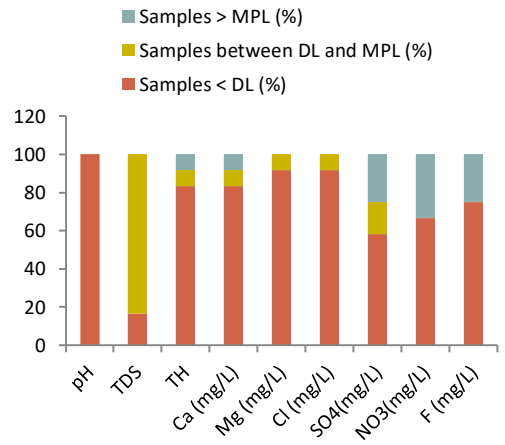
4.CHEMICAL QUALITY OF GROUND WATER &CONTAMINATION

4.1 Aquifer I/Shallow Aquifer

Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**

➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Nitrate affected areas. ➢ About 325 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm; 407 sq Km area has EC between 750 and 2250 microsiemens/cm and 20Sq Km area has EC more than 2250 microsiemens/cm The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking Water Standards for a total of 12 samples analysed are as given below:  	➢ In major parts of the block covering 325 Sq Km area, plants with moderate salt tolerance can be grown. However, in 407 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation. ➢ About 42 % of the analysed samples have % Na less than 20 and 58% have %Na between 20 and 40 Hence, the overall quality of ground water is suitable for irrigation purposes.
4.1 Aquifer II/Deeper Aquifer	
Suitability for Drinking Purposes	**Suitability for Irrigation Purposes**
➢ The overall quality of Aquifer is potable and useful for drinking and domestic puposes except in Nitrate affected areas. ➢ About 114 Sq Km area of the block has EC well within the potable range of 250 to 750microsiemens/cm; 576 sq Km area has EC between 750 and 2250 microsiemens/cm and 63 Sq Km area has EC more than 2250 microsiemens/cm ➢ Nitrate contamination is observed in 3 sites namely Chanaegaon, Hanaerguli and Wadona Budruk. The Percentage Distribution of Ground Water Samples in the block as per BIS Drinking	➢ In major parts of the block covering 114 Sq Km area, plants with moderate salt tolerance can be grown. However, in 576 sq Km area where EC > 750 microsiemens/cm, special management for salinity control may be required and plants with good salt tolerance should be selected. ➢ All the analysed samples in the block have SAR value well within 0 to 10 types and are therefore good for irrigation. ➢ The RSC values of all the analysed samples have values < 1.25 meq/l indicating that the ground water is good for irrigation.

Water Standards for a total of 2 samples analysed are as given below:

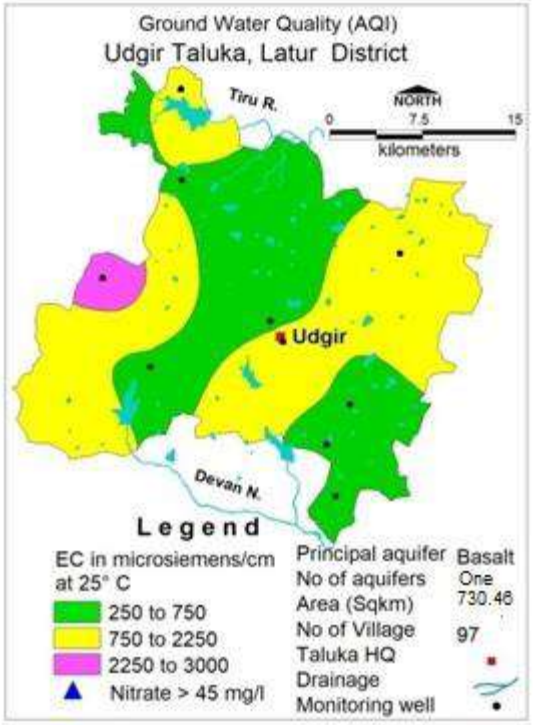


- About 33 % of the analysed samples have % Na less than 20; 25 % have %Na between 40 and 60; 42% have %Na more than 60

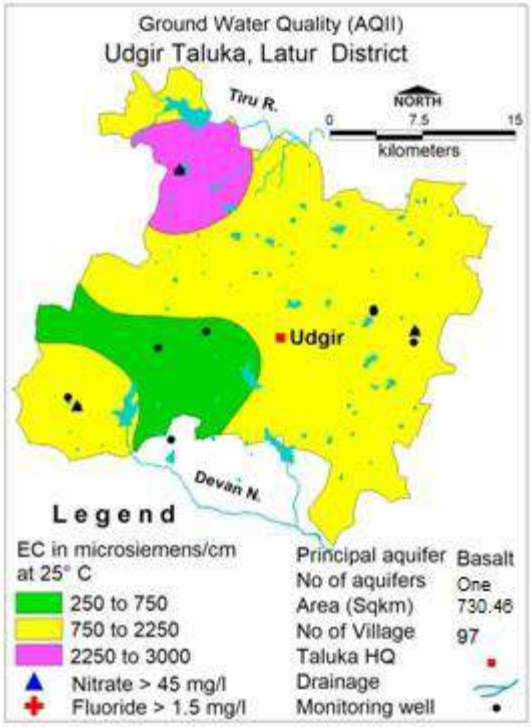
Hence, the overall quality of ground water is suitable for irrigation purposes except in areas where %Na is more than 60.

3.2.CHEMICAL QUALITY MAP

Phreatic Aquifer (Aquifer-I)



Semiconfined/Confined Aquifer (Aquifer II)



5. GROUND WATER RESOURCE & EXTRACTION

Aquifer-I/ Phreatic Aquifer (Basalt)

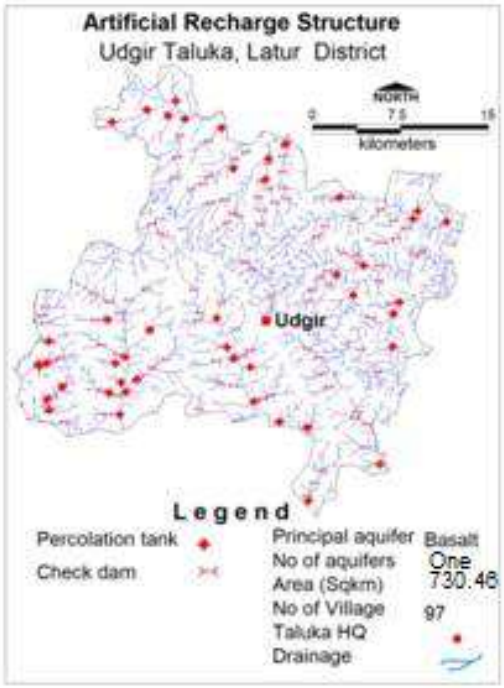
Ground Water Recharge Worthy Area (Sq. Km.)	633.62
Total Annual Ground Water Recharge (MCM)	81.44
Natural Discharge (MCM)	4.07
Net Annual Ground Water Availability (MCM)	77.37
Existing Gross Ground Water Draft for	49.35

irrigation (MCM)				
Existing Gross Ground Water Draft for domestic and industrial water supply(MCM)			2.42	
Existing Gross Ground Water Draft for All uses(MCM)			51.77	
Net Ground Water Availability for future irrigation development(MCM)			23.90	
Provision for domestic and industrial requirement supply to 2025(MCM)			4.37	
Stage of Ground Water Development %			66.91	
Category			**SAFE**	
Aquifer-II				
Semiconfined/Confined Aquifer (Basalt)				
Total Area (Sq. Km.)	Mean aquifer thickness (m)	Sy	Peizometric Head (m above confining layer)	Total Resource in the aquifer (MCM)
730.46	4.8	0.005	60	18.16
5.0. GROUND WATER RESOURCE ENHANCEMENT				
Available Resource (MCM)		77.37		
Gross Annual Draft (MCM)		51.77		
5.1.SUPPLY SIDE MANAGEMENt				
SUPPLY (MCM)				
Agricultural Supply -GW		49.35		
Agricultural Supply -SW		8.72		
Domestic Supply - GW		2.42		
Domestic Supply - SW		0.61		
Total Supply		**61.10**		
Area of Block (Sq. Km.)		730.46		
Area suitable for Artificial recharge (Sq. Km)		633.62		
Type of Aquifer		Hard Rock	Soft Rock	
Area feasible for Artificial Recharge(WL >5mbgl) (Sq. Km.)		494.50	-	
Volume of Unsaturated Zone (MCM)		988.99	-	
Average Specific Yield		0.020	-	
Volume of Sub surface Storage Space available for Artificial Recharge (MCM)		19.78	-	
Surplus water Available (MCM)		11.08	-	
Proposed Structures		**Percolation Tank** (Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam (Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)	**Recharge shaft** (Av. Gross Capacity-60 TCM)

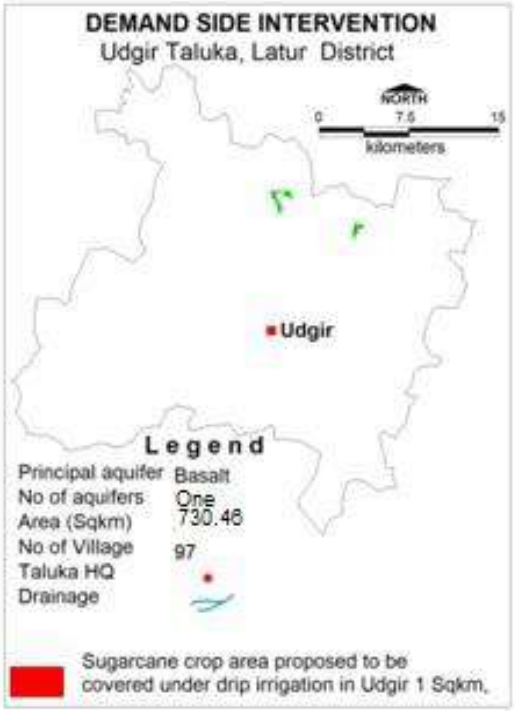
Number of Structures	39	111	0
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	5.82	2.49	0
Area of Saline Patch	**Nil**		
Proposed Structures	Nil		
No of farm pond proposed (size: 30m*30m*3) with 3 filling= 0.0081 mcm capacity, 50% available water may be utilized for harvesting through farm ponds.	Nil		
Volume of water available for harvesting	Nil		
Additional volume created by desilting	**Nil**		
RTRWH Structures – Urban Areas			
Households to be covered (25% with 50 m^2area)	9688		
Total RWH potential (MCM)	0.371		
Rainwater harvested / recharged @ 80% runoff co-efficient	0.296 (**Economically not viable & Not Recommended)**		
5.2.DEMAND SIDE MANAGEMENT			
Micro irrigation techniques			
Remaining ground water irrigated Sugarcane cropped area proposed through drip irrigation	1		
Volume of Water expected to be saved (MCM). (Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m)	0.57		
Proposed Cropping Pattern change			
Irrigated area under Water Intensive Crop(ha)	Not proposed		
Water Saving by Change in Cropping Pattern	Nil		
5.3.EXPECTED BENEFITS			
Net Ground Water Availability (MCM)	77.37		
Additional GW resources available after Supply side interventions (MCM)	8.31		
Ground Water Availability after Supply side intervention	85.68		
Existing Ground Water Draft for All Purposes (MCM)	51.77		
Saving of Ground Water through	0.57		

demand side intervention (MCM)	
GW draft after Demand Side Interventions (MCM)	59.76
Present stage of Ground Water Development (%)	66.91
Expected Stage of Ground Water Development after interventions (%)	59.76
Other Interventions Proposed, if any	
Alternate Water Sources Available	Nil
5.4.RECOMMENDATION	
Ground water development is recommended to bring the stage of development from 59.76% to 70%	
5.5.DEVELOPMENT PLAN	
Volume of water available to bring the stage of GWD is to 70% (MCM)	8.77
Proposed Number of DW(@ 1.5 ham for 90% of GWR Available)	526
Proposed Number of BW(@ 1.5 ham for 10% of GWR Available)	88
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	13.50

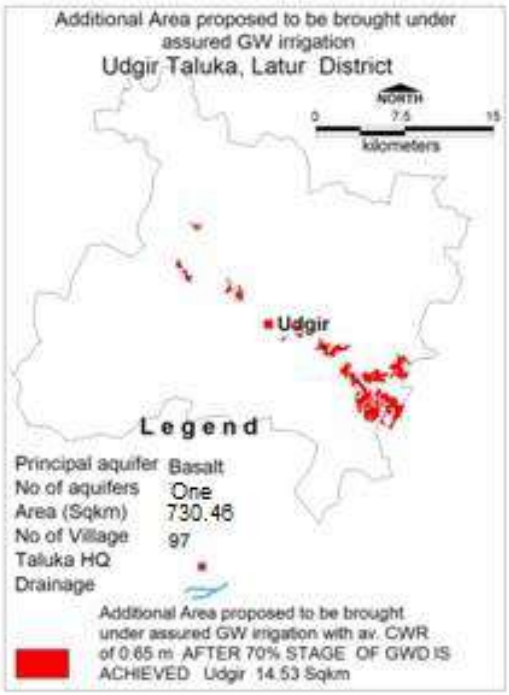
Proposed Artificial Recharge Structure



Demand Side Interventions



Addditional Area proposed to be brought under assured ground water irrigation


Additional Area proposed to be brought under assured GW irrigation
Udgir Taluka, Latur District
NORTH
0
7.5
15
kilometers
Udgir
Legend
Principal aquifer Basalt
No of aquifers One
Area (Sqkm) 730.46
No of Village 97
Taluka HQ
Drainage
Additional Area proposed to be brought under assured GW irrigation with av. CWR of 0.65 m AFTER 70% STAGE OF GWD IS ACHIEVED Udgir 14.53 Sqkm

Annexures

ANNEXURE 1.1 PREMONSOON AND POSTMONSOON DEPTH TO WATER LEVEL OF PHREATIC AQUIFERS

SL NO.	VILLAGE	TALUKA	DISTRICT	TOPOSHEET	LATITUDE	LONGITUDE	RL (m)	BASIN	WELL TYPE	HEIGHT OF MP (magl)	WELL DEPTH (mbgl)	PRE-MONSOON DTWL (MAY 17)	POST-MONSOON DTWL (NOV 17)	FLUCTUATION (m)
1	RALGA	AHMADPUR	LATUR	56 B/13	18.8136	76.9856	478.5	Godavari	Dugwell	0	2.9	2.1	0.5	1.6
2	UJNA	AHMADPUR	LATUR	56 B/13	18.8044	76.9438	490	Godavari	Dugwell	1	5.5	4.2	3.1	1.1
3	KHANDALI	AHMADPUR	LATUR	56 B/13	18.8085	76.8937	519.6	Godavari	Dugwell	0.75	9.35	8.75	5.15	3.6
4	RUI	AHMADPUR	LATUR	57 B/13	18.795	76.9953	478.4	Godavari	Dugwell	1	2.9	2.9	0.2	2.7
5	SHINDGI	AHMADPUR	LATUR	56 F/2	18.7548	77.0245	461.6	Godavari	Dugwell	0.9	7.3	4.3	1.7	2.6
6	THODGE	AHMADPUR	LATUR	56 B/14	18.7171	76.9902	524.2	Godavari	Dugwell	0.6	11.5	11	8.8	2.2
7	KINI (KADU)	AHMADPUR	LATUR	56 F/2	18.7094	77.0359	492.8	Godavari	Dugwell	0.5	5.5	4	1.8	2.2
8	TELGAON	AHMADPUR	LATUR	56 B/14	18.6012	76.9356	576.8	Godavari	Dugwell	0	14.6	7.5	6.6	0.9
9	LANJI	AHMADPUR	LATUR	56 B/14	18.7063	76.8928	502.4	Godavari	Dugwell	0.8	14.8	12.9	9	3.9
10	VILEGAON	AHMADPUR	LATUR	56 B/14	18.7088	76.8522	504.6	Godavari	Dugwell	0	10.7	10.7	3.9	6.8
11	SAWARGAON ROKDA	AHMADPUR	LATUR	56 B/13	18.6646	76.8642	511.4	Godavari	Dugwell	0.9	9.3	4.1	2.1	2
12	GUNJOTHI	AHMADPUR	LATUR	56 B/14	18.6891	76.7481	526.9	Godavari	Dugwell	0.2	8	6.5	1.3	5.2
13	MOHAGAON	AHMADPUR	LATUR	56 B/14	18.7114	76.7428	527.7	Godavari	Dugwell	0.8	15	11	5.8	5.2
14	AMBEGAON	AHMADPUR	LATUR	56 F/2	18.6185	76.9996	553.1	Godavari	Dugwell	0.8	9.7	9.7	3.4	6.3
15	UMERGA RETU	JALKOT	LATUR	56 F/2	18.6529	77.0715	535.9	Godavari	Dugwell	0.9	19.1	15.4	1.8	13.6
16	HOKARNA	JALKOT	LATUR	56 F/2	18.687	77.1393	520.9	Godavari	Dugwell	0.7	8.5	7	1	6
17	SHIRUR TAJBAND	AHMADPUR	LATUR	56 F/2	18.6144	76.9582	578.8	Godavari	Dugwell	1	22	16.6	6.6	10
18	HUNDERGULI	UDGIR	LATUR	56 F/2	18.5394	77.0235	531.5	Godavari	Dugwell	0	11.2	10.7	9.5	1.2
19	SHIVANKHED	AHMADPUR	LATUR	56 F/2	18.558	77.0683	514.2	Godavari	Dugwell	1	12.5	11	7.3	3.7
20	SONEWALE	JALKOT	LATUR	56 F/2	18.5735	77.1256	498	Godavari	Dugwell	0.6	23.16	4.8	3.3	1.5
21	VIRAL	JALKOT	LATUR	56 F/2	18.6092	77.1348	509.6	Godavari	Dugwell	0	6.5	9	2.7	6.3
22	PATODA (BK)	JALKOT	LATUR	56 F/2	18.6035	77.1671	510.7	Godavari	Dugwell	1.1	11.6	9.7	5.2	4.5
23	MALIHAPPARGA	JALKOT	LATUR	56 F/2	18.5851	77.1941	504.6	Godavari	Dugwell	0.9	16.8	15.7	1.3	14.4
24	MARSANGVI	JALKOT	LATUR	56 F/2	18.5604	77.2371	432	Godavari	Dugwell	1	11.8	8.4	1.1	7.3
25	WADHAWANA	UDGIR	LATUR	56 F/2	18.5238	77.0803	519.8	Godavari	Dugwell	0	11	7.6	3.1	4.5
26	EKURKA	UDGIR	LATUR	56 F/3	18.4891	77.0648	549.5	Godavari	Dugwell	0	7.5	5.2	3.7	1.5
27	DONGAR SHELKI	UDGIR	LATUR	56 F/3	18.4746	77.1088	547.1	Godavari	Dugwell	0.8	14.2	13	2	11
28	YEROL	SHIRUR ANANTPAL	LATUR	56 B/15	18.3703	76.8882	618.3	Godavari	Dugwell	0	13.2	11.5	6.8	4.7
29	SAKOLI	SHIRUR ANANTPAL	LATUR	56 B/15	18.2836	76.886	586.5	Godavari	Dugwell	0.9	24.5	20.5	18	2.5
30	JAWALGA	DEONI	LATUR	56 B/15	18.2496	76.9106	572	Godavari	Dugwell	0.5	11.2	11	8.2	2.8

SL NO.	VILLAGE	TALUKA	DISTRICT	TOPOSHEET	LATITUDE	LONGITUDE	RL (m)	BASIN	WELL TYPE	HEIGHT OF MP (magl)	WELL DEPTH (mbgl)	PRE-MONSOON DTWL (MAY 17)	POST-MONSOON DTWL (NOV 17)	FLUCTUATION (m)
	(Sakol)													
31	HELAMB	DEONI	LATUR	56 B/16	18.2139	76.9068	572.5	Godavari	Dugwell	0.4	10	10	6.1	3.9
32	DHANEGAON	DEONI	LATUR	56 B/16	18.1986	76.915	573.4	Godavari	Dugwell (Nizam / Pentagonal)	0.7	16.3	14	2.4	11.6
33	DEONI (BK)	DEONI	LATUR	56 F/3	18.2641	77.0803	583.3	Godavari	Dugwell (Nizam / Pentagonal)	0.6	15.9	14.3	9.2	5.1
34	LASONA	DEONI	LATUR	56 F/4	18.1647	77.0692	551	Godavari	Dugwell	0.5	9.7	6.3	3.2	3.1
35	SINDHIKAMAT	DEONI	LATUR	56 F/4	18.2082	77.0981	548	Godavari	Dugwell	0.7	10.8	7.1	2.7	4.4
36	AMBANAGAR	DEONI	LATUR	56 F/2	18.2087	77.0378	599.1	Godavari	Dugwell	0.6	14	6.4	2.6	3.8
37	HER	UDGIR	LATUR	56 B/15	18.4191	76.978	640.8	Godavari	Dugwell	0.7	19.5	18.1	4.6	13.5
38	BHAKASKHEDA	UDGIR	LATUR	56 F/3	18.3583	77.0027	610	Godavari	Dugwell	1	16	14	2.7	11.3
39	HAIBATPUR	UDGIR	LATUR	56 F/3	18.4019	77.0584	634.3	Godavari	Dugwell	0.2	19.3	4.7	3.2	1.5
40	ANALKANDHA	UDGIR	LATUR	56 F/3	18.4423	77.1678	507.8	Godavari	Dugwell	0.8	9.4	8.7	1.8	6.9
41	SUMTHANE	UDGIR	LATUR	56 F/3	18.4384	77.2121	476.8	Godavari	Dugwell	1.1	12.4	8.1	4.6	3.5
42	JANAPUR	UDGIR	LATUR	56 F/3	18.3766	77.2094	517.4	Godavari	Dugwell	0.7	11.8	10	1.4	8.6
43	TONDCHIR	UDGIR	LATUR	56 F/3	18.3464	77.1721	607	Godavari	Dugwell	0.6	12.6	10.1	6.8	3.3
44	JAKNAL	UDGIR	LATUR	56 F/3	18.3404	77.1101	605.6	Godavari	Dugwell	0.3	18	18	15.1	2.9
45	GURDHAL	DEONI	LATUR	56 F/3	18.3023	77.0046	596.6	Godavari	Dugwell	0.3	10.2	10.2	5.4	4.8
46	BORI	SHIRUR ANANTPAL	LATUR	56 B/11	18.3696	76.7266	602.9	Godavari	Dugwell	0	11.7	9.5	6.2	3.3
47	GANESHWADI	SHIRUR ANANTPAL	LATUR	56 B/15	18.3559	76.7523	630.3	Godavari	Dugwell	1	13	7.6	4.3	3.3
48	TALEGAON (BORI)	SHIRUR ANANTPAL	LATUR	56 B/11	18.3185	76.7402	593.4	Godavari	Dugwell	1	16.7	15.7	3.1	12.6
49	DONGARGAON	SHIRUR ANANTPAL	LATUR	56 B/15	18.2786	76.7805	581.8	Godavari	Dugwell	0.7	19.3	17.2	5	12.2
50	Babulgaon	Latur	Latur	56B11-2B	18.3722	76.6214	603	Godavari	Dugwell	0	0	13.3	12.8	0.5
51	Bamni	Latur	Latur	56B11-1C	18.4828	76.6892	534	Godavari	Dugwell	0	0	13.4	9.1	4.3
52	Bhadi	Latur	Latur	56B11-1C	18.4569	76.7083	597	Godavari	Dugwell	0	0	9.9	8.6	1.3
53	Bhoira	Latur	Latur	56B7-2C	18.3592	76.4178	647	Godavari	Dugwell	0	0	10	3.8	6.2
54	Bodka	Latur	Latur	56B6-3B	18.5281	76.3836	620	Godavari	Dugwell	0	0	6.9	3.1	3.8

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55	Bokargaon	Latur	Latur	56B11-3C	18.3017	76.7119	593	Godavari	Dugwell	0	0	12.5	11.1	1.4
56	Chhata	Latur	Latur	56B7-2B	18.365	76.3897	664	Godavari	Dugwell	0	0	11.2	7	4.2
57	Chikurda	Latur	Latur	56B7-2C	18.4156	76.4325	615	Godavari	Dugwell	0	0	10.5	9	1.5
58	Chincholi Ballanath	Latur	Latur	56B7-1B	18.4503	76.3658	612	Godavari	Dugwell	0	0	11.1	10.2	0.9
59	Chincholirao wadi	Latur	Latur	56B7-2C	18.3383	76.4733	633	Godavari	Dugwell	0	0	15	10.8	4.2
60	Gadwad	Latur	Latur	56B6-3A	18.5194	76.3297	644	Godavari	Dugwell	0	0	8.1	7	1.1
61	Gangapur	Latur	Latur	56B11-2A	18.3414	76.5131	609	Godavari	Dugwell	0	0	13	10.2	2.8
62	Gategaon	Latur	Latur	56B7-1B	18.425	76.4011	596	Godavari	Dugwell	0	0	14	11	3
63	Hanumant Wadi	Latur	Latur	56B11-1B	18.4281	76.5989	625	Godavari	Dugwell	0	0	12.4	10	2.4
64	Jiwali	Latur	Latur	56B7-1C	18.4578	76.4797	610	Godavari	Dugwell	0	0	18	16.6	1.4
65	Kahwa	Latur	Latur	56B11-2B	18.3378	76.5867	564	Godavari	Dugwell	0	0	6.2	3.2	3
66	Kahwa I	Latur	Latur	56B11-2A	18.3656	76.5708	565	Godavari	Dugwell	0	0	12.09	8	4.09
67	Karkatta	Latur	Latur	56B7-2A	18.4064	76.2811	680	Godavari	Dugwell	0	0	8	6.5	1.5
68	Karsa	Latur	Latur	56B6-3C	18.5097	76.4511	609	Godavari	Dugwell	0	0	10	9.8	0.2
69	Kasarkhed	Latur	Latur	56B11-1B	18.4508	76.6411	598	Godavari	Dugwell	0	0	7.3	7	0.3
70	Katpur	Latur	Latur	56B11-2B	18.3647	76.6003	595	Godavari	Dugwell	0	0	14	10.3	3.7
71	Muhammadpur	Latur	Latur	56B11-1C	18.4267	76.6994	592	Godavari	Dugwell	0	0	13.1	10	3.1
72	Murshidabad	Latur	Latur	56B11-2C	18.3822	76.7122	600	Godavari	Dugwell	0	0	14	10.3	3.7
73	Murud Railway Sation	Latur	Latur	56B7-2A	18.3819	76.2517	709	Godavari	Dugwell	0	0	10	9	1
74	Neoli	Latur	Latur	56B7-2A	18.3636	76.3067	665	Godavari	Dugwell	0	0	5.8	3.7	2.1
75	Ramegaon	Latur	Latur	56B7-2B	18.3978	76.3547	669	Godavari	Dugwell	0	0	10	3.1	6.9
76	Sai	Renapur	Latur	56B11-1A	18.4689	76.5342	571	Godavari	Dugwell	0	0	9.95	6	3.95
77	Salgara Buzurg	Latur	Latur	56B11-3C	18.3267	76.6994	583	Godavari	Dugwell	0	0	15	13	2
78	Shirala	Latur	Latur	56B7-1A	18.4594	76.3258	646	Godavari	Dugwell	0	0	6.6	3.5	3.1
79	Shivur	Latur	Latur	56B7-3C	18.3183	76.4489	655	Godavari	Dugwell	0	0	13	10.8	2.2
80	Takli	Latur	Latur	56B7-2B	18.3381	76.4014	629	Godavari	Dugwell	0	0	15	11.3	3.7
81	Umbarga	Latur	Latur	56B11-2C	18.3864	76.6839	602	Godavari	Dugwell	0	0	10.5	9.9	0.6
82	Wagholi	Latur	Latur	56B7-1A	18.4847	76.2953	640	Godavari	Dugwell	0	0	12.9	12	0.9
83	Warwanti	Latur	Latur	56B11-1A	18.4347	76.5331	615	Godavari	Dugwell	0	0	15	12	3
84	Wasangaon	Latur	Latur	56B11-2A	18.3686	76.5475	597	Godavari	Dugwell	0	0	13.5	11	2.5
85	Ashta	Chakur	Latur	56B15-1A	18.4522	76.7561	618.1	Godavari	Dugwell	0	10.5	9.7	8.5	1.2
86	Chawarewadi	Chakur	Latur	56B14-3C	18.5077	76.998	549.3	Godavari	Dugwell	0.3	22.7	15.3	10	5.3

SL NO.	VILLAGE	TALUKA	DISTRICT	TOPOSHEET	LATITUDE	LONGITUDE	RL (m)	BASIN	WELL TYPE	HEIGHT OF MP (magl)	WELL DEPTH (mbgl)	PRE-MONSOON DTWL (MAY 17)	POST-MONSOON DTWL (NOV 17)	FLUCTUATION (m)
87	Ganjnur	Chakur	Latur	56B11-1C	18.475	76.725	615	Godavari	Dugwell	0	19.25	14.2	6.2	8
88	Gharni	Chakur	Latur	56B15-1A	18.4833	76.8125	614	Godavari	Dugwell	0	9.6	9.5	4.6	4.9
89	Hanmant Jawaraga	Chakur	Latur	56B14-2A	18.587	76.8236	571	Godavari	Dugwell	0.1	13.7	9.6	3.8	5.8
90	Jadhala	Chakur	Latur	56B14-2A	18.653	76.7983	540.8	Godavari	Dugwell	1	14.5	7	3	4
91	Kabansangvi	Chakur	Latur	56B15-1B	18.425	76.9	625	Godavari	Dugwell	0	11.2	10.6	5.7	4.9
92	Latur Road	Chakur	Latur	56B14-3B	18.5042	76.8444	641.7	Godavari	Dugwell	0	13.3	13	4.5	8.5
93	Mahalangra	Chakur	Latur	56B11-1C	18.4417	76.7292	610	Godavari	Dugwell	0	15.5	14.5	9.5	5
94	Mamdapur	Latur	Latur	56B11-2C	18.4101	76.698	604.9	Godavari	Dugwell	0.8	24	22.8	15	7.8
95	Nandgaon	Chakur	Latur	56B15-1A	18.497	76.7572	636.8	Godavari	Dugwell	0.3	23.13	16.7	9.8	6.9
96	Nandgaon	Chakur	Latur	56B15-1A	18.4958	76.7569	635.3	Godavari	Dugwell	0	12	9.9	5.7	4.2
97	Shivankhed	Chakur	Latur	56B10-3C	18.5136	76.7274	608	Godavari	Dugwell	0	10.68	10.48	5	5.48
98	Shivankhed	Chakur	Latur	56B10-3C	18.5125	76.7292	606	Godavari	Dugwell	0	70	25	16	9
99	Limbalwadi	Chakur	Latur	56B15-2A	18.3966	76.8037	604	Godavari	Dugwell	0	9.5	9.5	7.4	2.1
100	Sugaon	Chakur	Latur	56B11-2C	18.3972	76.7311	603.2	Godavari	Dugwell	0	60	22.9	16	6.9
101	Tivghyal	Chakur	Latur	56B15-1B	18.473	76.8709	635.7	Godavari	Dugwell	0.3	6.85	7.15	3	4.15
102	Darji Borgaon	Renapur	Latur	56B11-1A	18.4999	76.5226	602.1	Godavari	Dugwell	0.73	12	11	3	8
103	Dawangaon	Renapur	Latur	56B10-2A	18.5889	76.5103	639.1	Godavari	Dugwell	0	11	9	6.4	2.6
104	Dighol deshmukh	Renapur	Latur	56B6-3C	18.5625	76.4361	612	Godavari	Dugwell	0	11.9	11.5	6.1	5.4
105	Faradpur	Renapur	Latur	56B10-2A	18.6004	76.5354	632	Godavari	Dugwell	0.32	10.08	10.08	5.2	4.88
106	Garsuli	Renapur	Latur	56B10-2A	18.6111	76.525	637.3	Godavari	Dugwell	0	10.2	10.2	5.5	4.7
107	Khalangri	Renapur	Latur	56B10-2C	18.627	76.7244	555.5	Godavari	Dugwell	0.8	5.9	5	2.5	2.5
108	Kharola	Renapur	Latur	56B10-3B	18.5089	76.6625	600	Godavari	Dugwell	0	11.5	11.5	10.5	1
109	Kumbhari	Renapur	Latur	56B10-3A	18.5542	76.5056	630.7	Godavari	Dugwell	0	30	24	10.31	13.69
110	Murdhav	Renapur	Latur	56B10-3B	18.5792	76.625	609	Godavari	Dugwell	0	12.2	12.2	6	6.2
111	Nehru Nagar	Renapur	Latur	56B11-1B	18.4889	76.5907	610.5	Godavari	Dugwell	0	16.75	15	7	8
112	Palshi	Renapur	Latur	56B6-2C	18.5875	76.4917	644	Godavari	Dugwell	0	8	6.6	5.5	1.1
113	Pangaon	Renapur	Latur	56B10-2B	18.6269	76.6292	629.7	Godavari	Dugwell	0	10.75	9.7	4.6	5.1
114	Poharegaon	Renapur	Latur	56B6-3C	18.5416	76.4685	614.4	Godavari	Dugwell	0.25	7.27	5.5	3	2.5
115	Renapur	Renapur	Latur	56B10-3B	18.525	76.5978	605.7	Godavari	Dugwell	0	13	13	9.6	3.4
116	Samsapur	Renapur	Latur	56B10-3A	18.5292	76.5569	624.3	Godavari	Dugwell	0	11.4	11.4	7.6	3.8
117	Sayyadpru	Renapur	Latur	56B10-3C	18.5673	76.6849	621.3	Godavari	Dugwell	1	10.7	10.7	5.3	5.4
118	Sindgoan	Renapur	Latur	56B6-3C	18.5144	76.4847	606.1	Godavari	Dugwell	0	10.1	10	6.5	3.5
119	Tattapur	Renapur	Latur	56B6-2C	18.5875	76.4833	641	Godavari	Dugwell	0	8	8	4.6	3.4

SL NO.	VILLAGE	TALUKA	DISTRICT	TOPOSHEET	LATITUDE	LONGITUDE	RL (m)	BASIN	WELL TYPE	HEIGHT OF MP (magl)	WELL DEPTH (mbgl)	PRE-MONSOON DTWL (MAY 17)	POST-MONSOON DTWL (NOV 17)	FLUCTUATION (m)
120	Almala	Ausa	Latur	56B7-3C	18.3042	76.4833	613	Godavari	Dugwell	0	11.1	11	10.7	0.3
121	Ashiv	Ausa	Latur	56B8-2B	18.1062	76.3477	606.2	Godavari	Dugwell	1	20.42	9.95	5.4	4.55
122	Ausa	Ausa	Latur	56B12-1A	18.1792	76.5	623	Godavari	Dugwell	0	19.9	10.2	4.2	6
123	Biravali	Ausa	Latur	56B8-1A	18.1928	76.3289	631.3	Godavari	Dugwell	0	12.56	11.43	7.2	4.23
124	Boregaon	Ausa	Latur	56B7-3B	18.306	76.3574	627.2	Godavari	Dugwell	0.65	15.95	15.66	11	4.66
125	Borfal	Ausa	Latur	56B8-1C	18.2125	76.4667	646	Godavari	Dugwell	0	8.5	8	7.2	0.8
126	Borgaon (n)	Ausa	Latur	56B7-3B	18.3	76.3589	637.3	Godavari	Dugwell	0	12.5	12	9	3
127	Borphal	Ausa	Latur	56B8-1C	18.212	76.4652	644.3	Godavari	Dugwell	0	7.45	7.4	3	4.4
128	Budhada	Ausa	Latur	56B11-3A	18.3125	76.5292	603	Godavari	Dugwell	0	23.5	21.5	9.6	11.9
129	Dapegaon	Ausa	Latur	56B8-2C	18.1486	76.4922	611.2	Godavari	Dugwell	0	30	19.2	9	10.2
130	Haregaon	Ausa	Latur	56B8-2C	18.0987	76.4875	615.6	Godavari	Dugwell	1.4	12.4	12.4	6.4	6
131	Karla	Ausa	Latur	56B12-2B	18.0838	76.6254	595.9	Godavari	Dugwell	0.4	14.7	11.95	7.5	4.45
132	Karla	Ausa	Latur	56B12-3B	18.0819	76.6292	600.7	Godavari	Dugwell	0	9.3	9.25	7	2.25
133	Kharosa	Ausa	Latur	56B12-2C	18.1603	76.6728	631.9	Godavari	Dugwell	0	23.7	19.2	4.1	15.1
134	Khuntegaon	Ausa	Latur	56B11-3B	18.2971	76.5835	604.9	Godavari	Dugwell	0	12.1	12.1	4.4	7.7
135	Khuntegaon	Ausa	Latur	56B11-3B	18.2958	76.5853	603.7	Godavari	Dugwell	0	95	28	18	10
136	Killari	Ausa	Latur	56B12-3A	18.0417	76.5708	591	Godavari	Dugwell	0	18.7	16.6	15	1.6
137	Lakhangaon	Ausa	Latur	56B7-3C	18.2844	76.4391	624.2	Godavari	Dugwell	0	9.52	8.6	4.2	4.4
138	Lamjana Chincholi J	Ausa	Latur	56B12-2B	18.1292	76.5833	627	Godavari	Dugwell	0	17.3	11	5.5	5.5
139	Lodaga	Ausa	Latur	56B11-3C	18.3095	76.6706	594.3	Godavari	Dugwell	1	13.43	8.4	4	4.4
140	Masurdi	Ausa	Latur	56B8-1B	18.1704	76.3401	622.4	Godavari	Dugwell	0	7.9	7.9	3	4.9
141	Mugalewadi	Ausa	Latur	56B12-1B	18.1958	76.6088	623	Godavari	Dugwell	0	24.78	19.83	9.4	10.43
142	Nagarsoga	Ausa	Latur	56B12-1A	18.1818	76.5017	629.1	Godavari	Dugwell	0.8	18.53	16.33	9.8	6.53
143	Nandurga	Ausa	Latur	56B8-3C	18.0606	76.4655	611.7	Godavari	Dugwell	0.2	17.3	16.6	9.6	7
144	Nandurga	Ausa	Latur	56B8-3C	18.0583	76.4653	609.7	Godavari	Dugwell	0	17.9	17	16	1
145	Selu	Ausa	Latur	56B11-3A	18.2806	76.5528	620.6	Godavari	Dugwell	0	10.5	10.5	7.3	3.2
146	Taka	Ausa	Latur	56B8-1B	18.2167	76.3333	639	Godavari	Dugwell	0	13.7	10	8	2
147	Taka	Ausa	Latur	56B8-1B	18.1708	76.3514	628	Godavari	Dugwell	0	13.7	13.7	11	2.7
148	Talni	Ausa	Latur	56B12-3A	18.0625	76.5458	598	Godavari	Dugwell	0	18.9	18.9	10.3	8.6
149	Yeli	Ausa	Latur	56B12-1B	18.227	76.6506	603.1	Godavari	Dugwell	0.5	16.88	8.5	4.9	3.6
150	Yelwat	Ausa	Latur	56B12-3B	18.0681	76.5958	613.3	Godavari	Dugwell	0	79	14	5.1	8.9
151	Ambulaga main	Nilanga	Latur	56B12-1C	18.2241	76.7433	606.9	Godavari	Dugwell	0	21.8	7.94	3	4.94
152	Ambulga	Nilanga	Latur	56C9-1C	17.9908	76.7042	605	Godavari	Dugwell	0	11	10.4	5.2	5.2
153	Ambulga	Nilanga	Latur	56B16-2B	18.1625	76.8639	598	Godavari	Dugwell	0	12.9	12.8	10.5	2.3

SL NO.	VILLAGE	TALUKA	DISTRICT	TOPOSHEET	LATITUDE	LONGITUDE	RL (m)	BASIN	WELL TYPE	HEIGHT OF MP (magl)	WELL DEPTH (mbgl)	PRE-MONSOON DTWL (MAY 17)	POST-MONSOON DTWL (NOV 17)	FLUCTUATION (m)
154	Aurad (shahjani)	Nilanga	Latur	56B16-3C	18.0583	76.9278	567.7	Godavari	Dugwell	0	8.1	8	5.1	2.9
155	Barmachiwadi	Nilanga	Latur	56B12-3C	18.0167	76.75	597	Godavari	Dugwell	0	16.9	15.9	13.2	2.7
156	Borasuri	Nilanga	Latur	56B16-3B	18.0116	76.8485	572	Godavari	Dugwell	1.12	8.36	8.36	3.2	5.16
157	Boregaon Khurd	Nilanga	Latur	56B16-3A	18.0093	76.7773	587.4	Godavari	Dugwell	0.3	8.5	8.5	4.7	3.8
158	Chichondi	Nilanga	Latur	56B16-2C	18.1625	76.9232	571.8	Godavari	Dugwell	0.7	11.65	11.45	7.21	4.24
159	Dangewadi		Latur	56B16-1A	18.2347	76.8022	607.4	Godavari	Dugwell	0	17.7	15	9.6	5.4
160	Hanchnal	Nilanga	Latur	56B16-1B	18.181	76.915	568	Godavari	Dugwell	0	15.7	13	4.6	8.4
161	Gaur	Nilanga	Latur	56B11-3C	18.275	76.7111	583	Godavari	Dugwell	0	13.9	13.5	11.5	2
162	Gunewadi	Nilanga	Latur	56B12-1C	18.217	76.7019	589.7	Godavari	Dugwell	0.4	10.55	6.78	3	3.78
163	Halsi	Nilanga	Latur	56B16-2C	18.1099	76.9347	562.2	Godavari	Dugwell	1.6	11.5	7.83	3	4.83
164	Halsi [t]	Nilanga	Latur	56B16-2C	18.1069	76.9381	568.6	Godavari	Dugwell	0	19.45	15	12.6	2.4
165	Hattrga	Nilanga	Latur	56C9-1C	17.95	76.7318	620.3	Godavari	Dugwell	0.3	18.33	16.1	9	7.1
166	Hosur	Nilanga	Latur	56B16-2B	18.1381	76.9042	573.7	Godavari	Dugwell	0	12.5	12.5	6	6.5
167	Jau	Ausa	Latur	56B12-2C	18.1325	76.7147	616.1	Godavari	Dugwell	0.1	6.63	6.63	3	3.63
168	Kasarshirshi	Nilanga	Latur	56C13-1A	17.9236	76.7556	637.6	Godavari	Dugwell	0	11.9	11.8	5.4	6.4
169	Kelgaon	Nilanga	Latur	56B16-1A	18.1861	76.8056	614.7	Godavari	Dugwell	0	60	27	12	15
170	Kelgaon	Nilanga	Latur	56B16-1A	18.1861	76.8056	614.7	Godavari	Dugwell	0	15.5	21	17	4
171	Korali	Nilanga	Latur	56C13-2A	17.8884	76.7927	626.4	Godavari	Dugwell	1	5.6	5.12	3	2.12
172	Kumtha	Ausa	Latur	56B12-3B	18.0828	76.6653	602.2	Godavari	Dugwell	0	21	21	9	12
173	Lambota	Nilanga	Latur	56B16-2A	18.1542	76.7833	633	Godavari	Dugwell	0	12.8	10.7	7	3.7
174	Madansuri	Nilanga	Latur	56B12-3C	18.0333	76.7069	587.3	Godavari	Dugwell	0	16.2	15.2	6.5	8.7
175	Mannatpur	Nilanga	Latur	56B16-2A	18.0889	76.7542	583.3	Godavari	Dugwell	0	10.5	10	8	2
176	Masobawadi	Nilanga	Latur	56B16-2B	18.1036	76.8347	605.8	Godavari	Dugwell	0.4	18.2	24.6	15	9.6
177	Nelwad	Nilanga	Latur	56C13-2A	17.9088	76.8177	630.6	Godavari	Dugwell	3	13.1	11.1	6	5.1
178	Nilanga	Nilanga	Latur	56B16-2A	18.1167	76.7542	605	Godavari	Dugwell	0	14.8	13.8	4.5	9.3
179	Nitur	Nilanga	Latur	56B16-1A	18.2422	76.7798	588.1	Godavari	Dugwell	0.6	12.3	12.3	5.7	6.6
180	Sangavi	Nilanga	Latur	56B12-3B	18.0577	76.6455	582.5	Godavari	Dugwell	0.92	20.78	10.38	4.5	5.88
181	Sarwadi	Nilanga	Latur	56B12-3B	18.01	76.6559	588	Godavari	Dugwell	1.5	11.7	9.22	5.1	4.12
182	Sarwadi	Nilanga	Latur	56B12-3B	18.0125	76.6536	591	Godavari	Dugwell	0	30	25.7	13.3	12.4
183	Shelgi	Nilanga	Latur	56B16-3B	18.0269	76.9014	574.9	Godavari	Dugwell	0	11.9	11.8	6.1	5.7
184	Shend	Nilanga	Latur	56B15-3A	18.2767	76.7613	580.8	Godavari	Dugwell	0	18.67	11.7	8	3.7
185	Shivni kothal	Nilanga	Latur	56B12-1C	18.2208	76.7042	588	Godavari	Dugwell	0	9.1	9	6.2	2.8
186	Tagarkheda	Nilanga	Latur	56B16-3C	18.0725	76.9253	563.6	Godavari	Dugwell	0	9	9	4.8	4.2
187	Tajpur	Nilanga	Latur	56B16-1A	18.2417	76.7583	598	Godavari	Dugwell	0	13	11.6	9.5	2.1
188	Tambala	Nilanga	Latur	56C13-1B	17.9319	76.8942	652.9	Godavari	Dugwell	1	25.33	20.45	11	9.45

ANNEXURE 2.1: PRE-MONSOON AND POST-MONSOON DEPTH TO WATER LEVEL OF SEMICONFINED/CONFINED AQUIFERS

SN	District	Taluka	Village	Toposheet	Longitude	Latitude	Altitude	Type	Aquifer	Drilling_depth	Casing	AQ_Zones	Drilling_SWL	PYT_SWL	PYT_Discharge	PreSWL (mbgl)	PostSWL (mbgl)
1	Latur	Ausa	Killarwadi	56B12-3A	76.5345	18.0296	588.6	EW	Basalt	179	28.25	44 - ,66.3 -	22.8	22.8	3.17	22.8	14
2	Latur	Ausa	Chincholi Jogaon	56B12-2A	76.575	18.1042	605.1	EW	Basalt	103.9	63.8	6.3 - ,18.5 -	-	-	-	27	14
3	Latur	Ausa	Sirsal	56B12-2A	76.5792	18.0917	605	EW	Basalt	110	24.9	10 - ,21 -	-	-	-	21	9
4	Latur	Ausa	Yelwat	56B12-3A	76.575	18.075	597	EW	Basalt	76.4	31.2	22 -	-	-	-	21	14
5	Latur	Ausa	Limbaladaw	56B12-3A	76.5139	18.0708	596.6	EW	Basalt	131	28.1	27 - ,97 -	-	-	5.15	20	12
6	Latur	Ausa	Hanegaon	56B8-2C	76.4972	18.1	607.4	EW	Basalt	192.3	2.2	18.5 - ,137 -	13.85	13.85	1.05	18	13.85
7	Latur	Ausa	Talni	56B12-3A	76.5458	18.0625	598	EW	Basalt	179.7	27.6	87 - ,97 -	60.34	60.34	2.17	60.34	28
8	Latur	Udgir	Talni	56B10-3C	76.6691	18.5732	618.9	EW	Basalt	-	-		-	-	-	31	21
9	Latur	0	Handerguli	56F2-3A	77.0359	18.5525	518.1	EW	Basalt	62.25	10	10 -	27.5	27.5	-	35	27.5
10	Latur	Udgir	Nagalgaon	56F3-2C	77.1858	18.4142	515.8			50.1	7	60 -62.25	-	-	-	24	12
11	Latur	Udgir	Chandegaon	56F3-2C	77.2183	18.4	499	EW	F Basalt & Granite	185	6	10 -11 ,64 -66	36.1	36.1	4.43	43	25
12	Latur	Udgir	Chandegaon	56F3-2C	77.2183	18.4	499	OW	F Basalt & Granite	81	6	59.8 -61	36.2	36.2	4.43	43	25
13	Latur	Udgir	Wadona Bz	56F2-3B	77.0891	18.5113	522.9	EW	F Basalt & Granite	165	11.7	13 -15.2 ,163 -165	20.25	20.25	12.24	25	20.25
14	Latur	Udgir	Wadona Bz	56F2-3B	77.0887	18.5117	522.7	OW	F Basalt	162	8.3	12 -15.2 ,18.5 -21 ,161 -162 ,128 -131	15.25	15.25	12.18	25	20.25
15	Latur	Jalkot	Jalkot	56F2-2C	77.1792	18.6292	518.9	EW	F Basalt	201.3	8.5	30.5 -33.5 ,79.3 - 82.3	12.55	12.55	-	21	12.6
16	Latur	Deoni	Deoni	56F3-3B	77.0861	18.2667	574.3	EW	F Basalt	112	6.1	6.1 -7.7 ,37.85 - 40.85 ,107 -11 ,81 -	30.85	30.85	9.84	29	11

SN	District	Taluka	Village	Toposheet	Longitude	Latitude	Altitude	Type	Aquifer	Drilling_depth	Casing	AQ_Zones	Drilling_SWL	PYT_SWL	PYT_Discharge	PreSWL (mbgl)	PostSWL (mbgl)
												82					
17	Latur	Deoni	Deoni	56F3-3B	77.0861	18.2667	574.3	OW	F VB	82	6.1	5.6 -7.7 ,38 -41.2	-	-	4.43	29	11
18	Latur	Udgir	Lohara	56F3-2A	77.0211	18.3875	635	EW	F MB	195.2	4.8	15 -16.2 ,45 -46.7	66.3	66.3	1.37	31	17
19	Latur	Chakur	Latur Road	56B14-3B	76.8458	18.5078	651.7	EW	F MB	202	10.5	11 -13 ,141 -144	80.1	80.1	-	56	45
20	Latur	Chakur	Chapuli	56B14-3B	76.9139	18.5708	589.3	EW	F MB	201	7.4	10 -13 ,39 -40	37.94	37.94	-	40	27
21	Latur	Ahmadpur	Shirur Tajband	56B14-2C	76.9708	18.6292	545.9	EW	F MB & F VB	197	14.5	12 -13.45 ,52 -53 ,191 -193 ,117 -120	55.8	55.8	1.37	25	13
22	Latur	Ahmadpur	Sangvi	56B13-3C	76.9708	18.7764	449.7	EW	F VB	201	12.15	43 -44	7.91	7.91	7.76	21	8
23	Latur	Ahmadpur	Sangvi	56B13-3C	76.9708	18.7764	449.7	OW	F VB	70	12.35	43.5 -44	10.06	10.06	3.17	21	8
24	Latur	Ahmadpur	Dharwadi	56B13-3B	76.8667	18.7961	512.4	EW	F MB	179	4.3	81 -83 ,166 -169	20	20	-	21	9
25	Latur	Latur	Bhatkheda	56B11-1C	76.6703	18.4294	581.8	EW	F MB & F VB	184.5	12.6	11 -13.45 ,14 -16.45 ,134 -135.45 ,133 -133.5	9.65	9.65	5.94	38	22
26	Latur	Latur	Bhatkheda	56B11-1C	76.6703	18.4294	581.8	OW	F MB & F VB	201	19.6	11 -13.45 ,136 -138.45	8.5	8.5	-	38	22
27	Latur	Chakur	Kendrawadi	56B10-2C	76.7347	18.6058	575.7	EW	F MB	182	13.5	7 -10.35 ,28 -31.75 ,71 -74.45 ,34 -37.85	5.23	5.23	12.18	11	6.03
28	Latur	Chakur	Kendrawadi	56B10-2C	76.7347	18.6058	575.7	OW	F MB	105	18.4	7 -10.35 ,28.65 -31.75 ,77.4 -	6.03	6.03	3.17	11	6.03

SN	District	Taluka	Village	Toposheet	Longitude	Latitude	Altitude	Type	Aquifer	Drilling_depth	Casing	AQ_Zones	Drilling_SWL	PYT_SWL	PYT_Discharge	PreSWL (mbgl)	PostSWL (mbgl)
												80.5 ,34.75 - 37.85 ,101.3 - 105					
29	Latur	Chakur	Kendrawadi	56B10-2C	76.7347	18.6058	575.7	OW	F MB	81	14	9 -10.45 ,15 -16.55 ,77.45 -81 ,43 -44.05	6.3	6.3	1.37	11	6.03
30	Latur	Ahmadpur	Kajal Hipparga	56B14-1B	76.8667	18.6856	496.4	EW	F MB	75	6	9 -10.35 ,27 -28.65	2.6	2.6	3.17	15	7
31	Latur	Ahmadpur	Kajal Hipparga	56B14-1B	76.8667	18.6856	496.4	OW	F MB	69	6.1	9 -10.35 ,16.8 - 19.9	1.48	1.48	2.16	15	7
32	Latur	Ahmadpur	Kajal Hipparga	56B14-1B	76.8667	18.6856	496.4	OW	F MB	29	3	9 -10.35 ,27 -29	3.15	3.15	1.37	16	9
33	Latur	Ahmadpur	Kingoon	56B14-1A	76.7708	18.7228	528.6	EW	F MB	117.5	6.1	102 -105	77.4	77.4	-	77	35
34	Latur	Renapur	Garsuli	56B10-2A	76.525	18.5958	639	EW	F MB	200	6.1	19.9 -22.9 ,111.9 - 114.4	10.9	10.9	1.05	14	10.9
35	Latur	Renapur	Renapur	56B10-3B	76.6	18.525	602	EW	F MB & F VB	166.3	14.5	29 -31.75 ,61.5 - 62.25 ,80.9 - 83.55 ,69.7 - 71.35 ,140 -141.55	13.27	13.27	4.43	18	13.27
36	Latur	Renapur	Renapur	56B10-3B	76.6	18.525	602	OW	F MB & F VB	142	14	65.6 -68.7 ,71.7 - 74.8 ,140 - 142 ,116 - 117.5	24.3	24.3	4.43	18	13.27
37	Latur	Latur	Chincholi Ballal	56B7-2C	76.4542	18.3708	637.3	EW	F VB & F MB	202	6	14 -16.8 ,58.5 - 59.5	45.17	45.17	-	24	11

SN	District	Taluka	Village	Toposheet	Longitude	Latitude	Altitude	Type	Aquifer	Drilling_depth	Casing	AQ_Zones	Drilling_SWL	PYT_SWL	PYT_Discharge	PreSWL (mbgl)	PostSWL (mbgl)
38	Latur	Latur	Gadhwad	56B6-3B	76.3375	18.525	632	EW	F VB & F MB	200	17	12.5 -13.8 ,98 -99.2	5.36	5.36	1.05	29	12
39	Latur	Latur	Chinchalirao Wadi	56B7-2C	76.4625	18.3878	651.7	EW	F VB & F MB	200	6.9	38.2 -41.2 ,105.3 - 108.3	55	55	3.17	34	21
40	Latur	Latur	Chinchalirao Wadi	56B7-2C	76.4625	18.3878	651.7	OW	F VB & F MB	172	5.62	6.1 -7.35 ,98 -98.85	53.05	53.05	5.94	34	21
41	Latur	Latur	Latur	56B11-2A	76.5833	18.4	640	EW	F VB	203	5.5	47.3 -50.4 ,178.5 - 181.5	5.9	5.9	1.05	35	19
42	Latur	Ausa	Jawli (M)	56B12-1B	76.6042	18.175	633	EW	F MB	200	23.8	53.4 -56.5	1.85	1.85	-	9	1.85
43	Latur	Ausa	Belkund	56B8-2B	76.4	18.1625	648	EW	F VB & F MB	201	15	9.5 -10.7 ,28 -29 ,128 - 129.7 ,101 -102.9	100	100	-	100	54
44	Latur	Ausa	Bhada	56B7-3B	76.3967	18.2675	647	EW	F VB & F MB	203	7.4	105.3 - 108.3 ,153 -154.1	28.4	28.4	-	28.4	12
45	Latur	Ausa	Ausa	56B12-1A	76.5	18.25	639	EW	F VB & F MB	200	6	6 -7.7 ,53.4 - 56.6 ,102 - 105 ,87 - 90 ,169 - 172.4 ,190.7 - 193.7	59	59	2.17	59	35
46	Latur	Nilanga	Nilanga	56B16-2A	76.7737	18.1194	614.2	EW	F MB	200	5.7	51 -	34.61	34.61	3.17	34.61	21
47	Latur	Nilanga	Nilanga	56B16-2A	76.7737	18.1196	614.2	OW	F MB	68.7	5.5	52 -	35.42	35.42	2.16	34.61	21
48	Latur	Ahmadpur	Gour	56B11-3C	76.7112	18.2578	585.9	EW	F MB	172.4	5.4	11 -13.8 ,44.3 -47	9.2	9.2	2.16	15	8
49	Latur	Latur	Akharwai	56B7-1C	76.4625	18.4344	628.7	EW	Basalt	200	30	169.20-172.30			3.169	35	22.8
50	Latur	Latur	Babhalgaon	56B11-2B	76.6339	18.3733	600.3	EW	Basalt	200	18	38.10-41.10			0.78	27	12

SN	District	Taluka	Village	Toposheet	Longitude	Latitude	Altitude	Type	Aquifer	Drilling_depth	Casing	AQ_Zones	Drilling_SWL	PYT_SWL	PYT_Discharge	PreSWL (mbgl)	PostSWL (mbgl)
51	Latur	Latur	Bori	56B11-2C	76.6981	18.3706	591	EW	Basalt	200	18	93-96			0.38	43	26
52	Latur	Latur	Chikurda	56B7-2C	76.4333	18.4156	636.6	EW	Basalt	200	30	DRY			Dry	34	21
53	Latur	Latur	Gangapur	56B11-2A	76.5117	18.3444	619	EW	Basalt	200	30	151-154			0.138	41	21
54	Latur	Renapur	Ganjur	56B6-3B	76.4086	18.5456	611.5	EW	Basalt	200	30	138.70-141.80			5.941	70	47
55	Latur	Latur	Kasarkheda	56B11-1B	76.6411	18.4508	592.2	EW	Basalt	200	18	53.30-56.40			3	21	9
56	Latur	Latur	Kasarkheda	56B11-1B	76.6411	18.4508	592.2	OW	Basalt	200	18	44.20-47.20			0.78	21	9
57	Latur	Latur	Motephal	56B7-1A	76.2786	18.4489	659.6	EW	Basalt	200	30	DRY			Dry	45	21
58	Latur	Latur	Murud	56B3-2C	76.2397	18.4017	673.3	EW	Basalt	200	30	83.80-86.90&122-123			3.17	24	9
59	Latur	Latur	Murud	56B3-2C	76.2397	18.4017	673.3	OW	Basalt	125	30	89.90-93.00&122-123			3.169	24	9
60	Latur	Latur	Nandgaon	56B11-1A	76.552	18.45	599.4	EW	Basalt	200	18	105.20-108.30			2.16	24	12
61	Latur	Latur	Niwali	56B7-2A	76.3083	18.3647	660.2	EW	Basalt	200						9	4
62	Latur	Ausa	Chincholi Son	56B8-1C	76.4283	18.1668	639	EW	Basalt	209.2	6	77.00 - 77.50 198.00 - 198.50	104		0.38	57	24
63	Latur	Ausa	Ekambi	56B8-2A	76.2959	18.1586	626.3	EW	Basalt	200	12	136	130		0.07	130	53
64	Latur	Chakur	Ashta Mod	56B15-1A	76.7561	18.4505	616.2	EW	Basalt	202.9	12	90.00 - 93.00 123.60-126.60 160-163	90.2		1.37	67	45
65	Latur	Chakur	Brahmwadi	56B14-3A	76.7956	18.5599	645.2	EW	Basalt	197	5.5	35.10-38.20 71.70-74.80 114.40-117.50	82		0.14	38	21

SN	District	Taluka	Village	Toposheet	Longitude	Latitude	Altitude	Type	Aquifer	Drilling_depth	Casing	AQ_Zones	Drilling_SWL	PYT_SWL	PYT_Discharge	PreSWL (mbgl)	PostSWL (mbgl)
66	Latur	Chakur	Devengrawadi	56B15-1A	76.7549	18.4247	617.3	EW	Basalt	184.6	12	22.90-26.00	29		0.14	29	19
67	Latur	Chakur	Kabal Sangvi	56B15-1B	76.8983	18.4238	628.3	EW	Basalt	195	6	181.00-181.50	88		3.16	58	45
68	Latur	Chakur	Latur Road	56B14-3B	76.8486	18.5156	655.3	EW	Basalt	203	12	59.50-62.60 90.00 - 93.00	65		0.14	56	45
69	Latur	Chakur	Mahalangra	56B11-1C	76.7289	18.4435	612.1	EW	Basalt	190.7	12	77.80-80.90	40.2		0.14	40.2	25
70	Latur	Chakur	Nandgaon	56B15-1A	76.7635	18.4851	641.6	EW	Basalt	184.5	5.5	35.00-38.10;89.90-93.00	72.5		0.14	21	12
71	Latur	Latur	Khadgaon	56B11-2A	76.5484	18.3895	620.7	EW	Basalt	203	12	62.50-65.50			0.07	21	11
72	Latur	Latur	Nandgaon	56B11-1A	76.5549	18.4482	605	EW	Basalt	184			102.15		0.78	24	12
73	Latur	Nilanga	Ansarwada	56B16-2A	76.8068	18.0914	598.5	EW	Basalt	200	11.6	62.30-65.30	62.3		0.14	63.3	32
74	Latur	Nilanga	Chichondi	56B16-2C	76.9263	18.159	567.2	EW	Basalt	166.3	5.5	163.2	29		0.14	29	15
75	Latur	Nilanga	Chincholi Sayakhan	56B16-3A	76.7909	18.0077	577.8	EW	Basalt	184	17.5	34.90-38.00 71.50-74.60 181.30-184.00	72		4.43	61	33
76	Latur	Nilanga	Kasar Sirsi	56C13-1A	76.7542	17.9231	637	EW	Basalt	202.9	5.6	81	46		less than 0.14	46	31
77	Latur	Nilanga	Kokalgaon	56B12-3B	76.6553	18.0402	589.8	EW	Basalt	178.2	5.5	34.80-37.90 89.70-92.80 171.00-171.50	90		1.37	90	55

SN	District	Taluka	Village	Toposheet	Longitude	Latitude	Altitude	Type	Aquifer	Drilling_depth	Casing	AQ_Zones	Drilling_SWL	PYT_SWL	PYT_Discharge	PreSWL (mbgl)	PostSWL (mbgl)
78	Latur	Nilanga	Mamdapur	56C13-2B	76.8803	17.912	652.7	EW	Basalt	203	5.6	157.10-160.20	G.L.		2.64	9	5
79	Latur	Nilanga	Pimpalwadi (jeori)	56B12-3C	76.7031	18.0576	578.2	EW	Basalt	202.6	18	53.10-56.20 175-184	175		0.14	175	53
80	Latur	Nilanga	Shivani Kotal	56B12-1C	76.7044	18.221	588.3	EW	Basalt	203	5.5	16.80-19.90 184.50-187.60	16		1.05	25	16
81	Latur	Renapur	Garsoli	56B10-2A	76.5267	18.6091	640.1	EW	Basalt	200	6	59.40-62.50 117.4-120.4	117		0.14	14	10.9
82	Latur	Renapur	Ghansar	56B10-3B	76.6075	18.5583	605	EW	Basalt	200	5.5	163.10-166.20			0.07	44	21
83	Latur	Renapur	Kolgaon	56B10-3A	76.534	18.5253	624.7	EW	Basalt	200	12	44.20-47.20 150.90-154.00	123		0.38	44	24
84	Latur	Renapur	Pohregaon	56B6-3C	76.4614	18.5382	606.4	EW	Basalt	141.9	5.5	47.20-53.30 105.20-108.20 123.50-126.50	102		5.94	47	21
85	Latur	Renapur	Sumthana	56B10-3A	76.5543	18.5558	616	EW	Basalt	141.8	12	56.40-59.40 93-96	96		0.14	56	21
86	Latur	Renapur	Wangdari	56B6-3B	76.4058	18.5523	616.4	EW	Basalt	200	5.5	32.00-32.50, 148.00-148.50			2.16	32	21
87	Latur	Jalkot	Umarga Retu	56F2-2A	77.0746	18.6561	527.8	TEW	Basalt	160						35	17
88	Latur	Jalkot	Lali Bk.	56F2-3B	77.1112	18.5736	511.9	TEW	Basalt	170						35	12
89	Latur	Jalkot	Sulhali	56F2-3C	77.2263	18.5378	437	TEW	Basalt	180						21	8
90	Latur	Shirur-	Hippalgaon	56B15-2A	76.7512	18.3787	604.1	TEW	Basalt	190						32	21

SN	District	Taluka	Village	Toposheet	Longitude	Latitude	Altitude	Type	Aquifer	Drilling_ depth	Casing	AQ_Zones	Drilling_ SWL	PYT_SWL	PYT_Discharge	PreSWL (mbgl)	PostSWL (mbgl)
		Anantpal															
91	Latur	Udgir	Mahadevwadi	56B15-2C	76.9502	18.3437	622.8	TEW	Basalt	200						35	12
92	Latur	Shirur-Anantpal	Shirur Anantpal	56B15-2B	76.8402	18.3375	588.5	TEW	Basalt	160						21	12
93	Latur	Shirur-Anantpal	Talegaon Bori	56B11-3C	76.74	18.3178	592.4	TEW	Basalt	170						21	15
94	Latur	Shirur-Anantpal	Sakol	56B15-3B	76.8842	18.2817	583.2	TEW	Basalt	180						23	9
95	Latur	Deoni	Jawalga	56B16-1B	76.9037	18.2497	574.4	TEW	Basalt	190						34	21
96	Latur	Deoni	Anantwadi	56B16-1C	76.9516	18.2191	588.8	TEW	Basalt	200						21	12
97	Latur	Deoni	Gurnal	56F4-1A	77.0776	18.2027	564.6	TEW	Basalt	200						22	7

ANNEXURE 3.1:DECADAL WATER LEVEL TREND (2008-17)

SN	District	Taluka	Village	Latitude	Longitude	Depth	Premonsoon water level_May 2017 (mbgl)	Pre trend	Postmonsoon water level_Nov 2017	Post trend
1	Latur	AHMADPUR	Ahmadpur	18.704	76.938	15.1	10.5	0.1609	2.80	-0.1751
2	Latur	AHMADPUR	Andhori	18.769	76.825	16.1	16	0.0268	2.50	0.0855
3	Latur	AHMADPUR	Deokara	18.743	76.736	21.4	19.5	0.5867	2.70	0.1443
4	Latur	AHMADPUR	Gangahipparga	18.786	76.943	10.5	4.3	0.1118	4.00	0.0675
5	Latur	AHMADPUR	Hadolti	18.654	77.042	12.8	7	-0.1409	1.10	0.0393
6	Latur	AHMADPUR	Hipparga kopdev	18.679	76.816	18.9	18.9	0.4355	6.00	0.1978
7	Latur	AHMADPUR	Khandali	18.808	76.890	9.2	9.2	0.0082	5.50	0.1751
8	Latur	AHMADPUR	Kolwadi	18.769	76.772	15.3	15.1	0.1627	3.00	0.0643
9	Latur	AHMADPUR	Mankhed	18.709	76.821	13.9	13.5	0.0191	2.20	0.1656
10	Latur	AHMADPUR	Sangvi [s]	18.775	76.979	12.9	10	0.0182	0.90	-0.4846
11	Latur	AHMADPUR	Shirur tajband	18.629	76.971	12	12	0.1473	3.00	0.0505
12	Latur	AHMADPUR	Sindgi bk.	18.736	77.039	14.2	4.1	0.1273	3.60	-0.1541
13	Latur	AHMADPUR	Tambatsangvi	18.714	76.876	20.3	10.2	0.6027	3.00	0.0237
14	Latur	AHMADPUR	Waigaon	18.588	77.016	10.5	10.2	0.0036	1.70	-0.1226
15	Latur	AHMADPUR	Walsangi	18.641	77.013	12.5	12	0.1100	2.00	-0.1737
16	Latur	DEONI	Achwala	18.242	76.999	12.3	5.3	0.4018	0.80	0.1351
17	Latur	DEONI	Ambanagar	18.208	77.033	6.5	6	0.0309	0.70	0.0643
18	Latur	DEONI	Deoni Bk	18.269	77.083	18.9	12	0.0491	0.70	0.0013
19	Latur	DEONI	Deoni Kh	18.233	77.083	17.9	5.3	0.4064	0.60	0.1589
20	Latur	DEONI	Hanchnal	18.261	77.106	21.7	21	0.0709	0.80	0.0740
21	Latur	DEONI	Mogha	18.313	77.144	20.6	3.4	0.2900	2.10	0.2562
22	Latur	DEONI	Wadmurmbi	18.196	77.023	13.6	12	0.2918	0.60	0.1038
23	Latur	DEONI	Walandi	18.233	76.967	9.2	5.1	-0.1864	3.00	0.0331
24	Latur	JALKOT	Ghonsi	18.508	77.151	20.3	13.6	0.4200	3.40	-0.2496
25	Latur	JALKOT	Jaikot	18.629	77.183	19.2	16	0.2027	1.30	-0.3819
26	Latur	JALKOT	Kolnur	18.589	77.160	10.9	9	0.0218	1.10	0.3150
27	Latur	JALKOT	Patoda Kh	18.576	77.187	10.9	8.1	0.0836	2.50	0.1670

SN	District	Taluka	Village	Latitude	Longitude	Depth	Premonsoon water level_May 2017 (mbgl)	Pre trend	Postmonsoon water level_Nov 2017	Post trend
28	Latur	JALKOT	Tiruka	18.551	77.176	14.6	13	0.1209	0.90	0.0269
29	Latur	SHIRUR-ANANTPAL	Rapka	18.356	76.808	19.8	6.9	0.6809	2.10	-0.0527
30	Latur	SHIRUR-ANANTPAL	Sakol	18.282	76.884	19	4.1	-0.1791	7.00	-0.3665
31	Latur	SHIRUR-ANANTPAL	Ujed	18.274	76.803	15.4	15	0.0436	9.00	-0.1676
32	Latur	SHIRUR-ANANTPAL	Yerol	18.371	76.885	16.8	16.8	0.0079	4.00	0.0852
33	Latur	UDGIR	Ismailpur	18.468	77.067	17.6	17.6	0.3709	2.60	0.1392
34	Latur	UDGIR	Karadkhel	18.394	76.974	14.9	12.5	-0.1055	4.00	-0.4858
35	Latur	UDGIR	Kiniyalladevi	18.510	77.039	21	21	-0.1182	3.00	0.0844
36	Latur	UDGIR	Kodli	18.456	77.206	9.5	9.5	0.2594	3.80	0.3370
37	Latur	UDGIR	Nalgir	18.475	77.172	12.8	12	0.0903	4.90	0.2917
38	Latur	UDGIR	Somnathpur	18.407	77.107	7.2	7	0.0345	3.00	0.0984
39	Latur	UDGIR	Togari	18.279	77.157	9.5	9.5	0.0600	3.20	0.3088
79	Latur	Latur	Babalgoan	18.376	76.629			0.0882		-0.5455
80	Latur	Latur	Bhadi	18.457	76.704			0.2500		-0.0097
81	Latur	Latur	Bhatkheda	18.431	76.669			-0.2717		-0.0003
82	Latur	Latur	Bhuisamudraga	18.445	76.469			0.1050		0.0994
83	Latur	Latur	Borgaon bk	18.408	76.319			-0.0100		0.0782
84	Latur	Latur	Gadwad	18.517	76.329			0.1300		0.3630
85	Latur	Latur	Gangapur	18.339	76.514			0.2000		-0.0603
86	Latur	Latur	Gategoan	18.427	76.404			-0.3598		-0.1833
87	Latur	Latur	Gumphawadi Murud bk	18.404	76.238			0.0833		0.5836
88	Latur	Latur	Harangul bk	18.414	76.500			0.2283		-0.0109
89	Latur	Latur	Jawala bk	18.501	76.392			-0.1717		-0.3861
90	Latur	Latur	Karsa	18.512	76.453			0.0850		0.1842

SN	District	Taluka	Village	Latitude	Longitude	Depth	Premonsoon water level_May 2017 (mbgl)	Pre trend	Postmonsoon water level_Nov 2017	Post trend
91	Latur	Latur	Mamdapur	18.425	76.698			0.1950		-0.0429
92	Latur	Latur	Nandgaon	18.450	76.546			0.1050		0.0255
93	Latur	Latur	Neoli	18.363	76.309			0.1183		0.1376
94	Latur	Latur	Pakharsangvi	18.335	76.521			0.1642		-0.0776
95	Latur	Latur	Sirsi	18.354	76.618			0.5050		0.2139
96	Latur	Latur	Takli	18.489	76.469			0.1717		0.0509
97	Latur	Latur	Wanjarkheda	18.543	76.364			0.2117		0.1927
98	Latur	CHAKUR	Ashta	18.452	76.756	11	9.7	-0.0103	8.5	0.3182
99	Latur	CHAKUR	Ganjnur	18.475	76.725	19	14.2	0.5482	6.2	0.2943
100	Latur	CHAKUR	Gharni	18.483	76.813	10	9.5	0.1830	4.6	0.1855
101	Latur	CHAKUR	Kabansangvi	18.425	76.900	11	10.6	0.2961	5.7	0.1382
102	Latur	CHAKUR	Latur Road	18.504	76.844	13	13	0.4994	4.5	0.0838
103	Latur	CHAKUR	Mahalangra	18.442	76.729	16	14.5	-0.0576	9.5	0.4788
104	Latur	CHAKUR	Nandgaon	18.496	76.757	12	9.9	0.2376	5.7	0.0767
105	Latur	CHAKUR	Shivankhed	18.513	76.729	70	25	0.0976	16	0.5915
106	Latur	CHAKUR	Shivpur	18.386	76.806	10	9.5	0.0927	7.4	0.0376
107	Latur	CHAKUR	Sugaon	18.397	76.731	60	22.9	0.0758	16	0.5964
108	Latur	RENAPUR	Dawangaon	18.589	76.510	11	6.1	0.0309	6.4	0.4233
109	Latur	RENAPUR	Dighol deshmukh	18.563	76.436	12	11.5	0.0688	6.1	0.0945
110	Latur	RENAPUR	Garsuli	18.611	76.525	10	10.2	0.0164	5.5	0.3067
111	Latur	RENAPUR	Kharola	18.509	76.663	12	11.5	0.0715	10.5	0.2427
112	Latur	RENAPUR	Kumbhari	18.554	76.506	30	24	-0.3891	10.31	0.7916
113	Latur	RENAPUR	Murdhav	18.579	76.625	12	12.2	-0.1533	6	-0.5800
114	Latur	RENAPUR	Palshi	18.588	76.492	8	6.6	-0.0509	5.5	0.2796
115	Latur	RENAPUR	Pangaon	18.627	76.629	11	9.7	0.3924	4.6	0.3315
116	Latur	RENAPUR	Renapur	18.525	76.598	13	13	-0.0103	9.6	0.0400
117	Latur	RENAPUR	Samsapur	18.529	76.557	11	11.4	0.0964	7.6	0.2879
118	Latur	RENAPUR	Sindgoan	18.514	76.485	10	10	0.4273	6.5	0.2330

SN	District	Taluka	Village	Latitude	Longitude	Depth	Premonsoon water level_May 2017 (mbgl)	Pre trend	Postmonsoon water level_Nov 2017	Post trend
119	Latur	RENAPUR	Tattapur	18.588	76.483	8	8	-0.0218	4.6	0.0073
120	Latur	AUSA	Almala	18.304	76.483	11	9.5	0.0739	10.7	0.6406
121	Latur	AUSA	Ausa	18.179	76.500	20	10.2	-0.0164	4.2	0.1348
122	Latur	AUSA	Borfal	18.213	76.467	9	8	-0.0079	8.2	0.5609
123	Latur	AUSA	Borgaon (n)	18.300	76.359	13	12	0.1594	12	0.5758
124	Latur	AUSA	Budhada	18.313	76.529	24	21.5	0.7170	9.6	0.4397
125	Latur	AUSA	Dapegaon	18.149	76.492	30	19.2	-0.1655	9	0.4442
126	Latur	AUSA	Karla	18.082	76.629	9	9.25	-0.0209	9.25	0.4458
127	Latur	AUSA	Kharosa	18.160	76.673	24	19.2	0.1982	4.1	0.1279
128	Latur	AUSA	Khuntegaon	18.296	76.585	95	28	0.1018	18	0.3324
129	Latur	AUSA	Killari	18.042	76.571	19	16.6	-0.3861	15	0.0864
130	Latur	AUSA	Lamjana Chincholi J	18.129	76.583	17	11	0.0885	5.5	0.2924
131	Latur	AUSA	Nandurga	18.058	76.465	18	17	0.1770	16	0.2118
132	Latur	AUSA	Selu	18.281	76.553	11	10.5	0.2236	7.3	0.2839
133	Latur	AUSA	Taka	18.217	76.333	14	10	0.0824	8	0.3512
134	Latur	AUSA	Taka	18.171	76.351	14	13.7	0.5606	13.7	0.7455
135	Latur	AUSA	Talni	18.063	76.546	19	18.9	0.3909	10.3	-0.1400
136	Latur	AUSA	Yelwat	18.068	76.596	79	14	-0.1411	5.1	0.1894
137	Latur	NILANGA	Ambulga	17.991	76.704	11	10.4	0.2258	5.2	0.4288
138	Latur	NILANGA	Ambulga	18.163	76.864	13	12.8	0.6461	10.5	0.5236
139	Latur	NILANGA	Aurad (shahjani)	18.058	76.928	8	8	0.1327	5.1	0.1679
140	Latur	NILANGA	Barmachiwadi	18.017	76.750	17	15.9	-0.1430	13.2	0.7270
141	Latur	NILANGA	Dangewadi	18.235	76.802	18	15	-0.3685	9.6	0.6255
142	Latur	NILANGA	Dhanegaon	18.183	76.915	16	8	-0.3103	4.6	0.2406
143	Latur	NILANGA	Gaur	18.275	76.711	14	13.5	0.3600	11.5	0.6348
144	Latur	NILANGA	Halsi [t]	18.107	76.938	19	15	0.3764	12.6	0.5142
145	Latur	NILANGA	Hosur	18.138	76.904	13	12.5	0.2970	6	0.1652

SN	District	Taluka	Village	Latitude	Longitude	Depth	Premonsoon water level_May 2017 (mbgl)	Pre trend	Postmonsoon water level_Nov 2017	Post trend
146	Latur	NILANGA	Kasarshirshi	17.924	76.756	12	11.8	0.5709	5.4	0.4118
147	Latur	NILANGA	Kelgaon	18.186	76.806	60	27	0.0782	5.3	0.0709
149	Latur	NILANGA	Kumtha	18.083	76.665	21	21	0.4721	9	0.2397
150	Latur	NILANGA	Lambota	18.154	76.783	13	10.7	0.3267	10.7	0.3294
151	Latur	NILANGA	Madansuri	18.033	76.707	16	15.2	0.4091	6.5	0.2215
152	Latur	NILANGA	Mannatpur	18.089	76.754	11	10	0.2824	8	0.4718
153	Latur	NILANGA	Nilanga	18.117	76.754	15	13.8	0.0552	4.5	0.2142
154	Latur	NILANGA	Sarwadi	18.013	76.654	30	25.7	-0.4000	13.3	0.3642
155	Latur	NILANGA	Shelgi	18.027	76.901	12	11.8	0.1164	6.1	0.3824
156	Latur	NILANGA	Shivni kothal	18.221	76.704	9	9	0.0724	6.2	0.1315
157	Latur	NILANGA	Tajpur	18.242	76.758	13	11.6	0.0891	9.5	0.3615

ANNEXURE 4 1: CHEMICAL ANALYSIS OF GW SAMPLES OF PHREATIC AQUIFER

SN	District	Taluka	Village	Latitude	Longitude	pH	EC	TDS	TH	Ca	Mg	Na	K	CO3	HCO3	Cl	SO4	NO3	F	Fe
1	Latur	Renapur	Khalangri	18.627	76.7244	7.6	1068	694	100	59.76	9.7	117.1	0.19	0.0	112.2	182.4	326	7	4.21	0.0
2	Latur	Ahmadpur	Sawargaon Rokda	18.6504	76.8597	7.4	584	391	179	69.7	26.6	42.0	1.2	0.0	124.4	79.7	63	2	3.5	0.0
3	Latur	Renapur	Pangaon	18.6269	76.6292	8.39	472	307	156	28.8	20.4	54.7	0.6	3.3	144.5	74	30	3.52	1.58	0.2
4	Latur	Ausa	Karla	18.0819	76.6292	7.9	687	447	260	41.6	37.9	31.4	0.5	1.7	222.3	58	41	4.22	1.56	0.1
5	Latur	Ausa	Boregaon	18.306	76.3574	7.7	650	436	95	59.76	8.5	105.6	0.13	0.0	131.8	77.1038	168	12	1.52	0.0
6	Latur	Ausa	Nandurga	18.0583	76.4653	8	728	466	208	30.4	32.1	35.0	2	1.5	162.4	64	32	7	1.5	0.4
7	Latur	Chakur	Nandgaon	18.4958	76.7569	8.15	718	467	340	46.4	54.4	47.4	0.4	3.7	280.2	86	43	4.47	1.47	0.1
8	Latur	Ahmadpur	Tambatsangvi	18.7139	76.8764	9.01	307	200	100	30.4	5.8	19.5	2.5	6.3	65.2	36	22	1.5	1.3	0.1
9	Latur	Ausa	Nagarsoga	18.1818	76.5017	7.9	981	638	294	184.26	26.6	83.3	1.55	0.0	185.4	133.647	309	16	1.15	0.0
10	Latur	Ahmadpur	Sindgi bk.	18.7361	77.0394	8.13	495	322	132	28.8	14.6	48.4	1	1.3	98.7	70	30	6.6	1.1	0.1
11	Latur	Chakur	Kabansangvi	18.4236	76.8978	8.2	582	378	240	38.4	35.0	15.2	0.9	3.6	240.3	24	15	5.5	1.1	1.0
12	Latur	Nilanga	Sarwadi	18.01	76.6559	7.6	603	392	70	34.86	8.5	95.7	0.21	0.0	97.6	100.235	73	7	1	0.0
13	Latur	Deoni	Achola	18.2433	76.9972	7.9	572	372	244	40	35.0	18.0	0.8	1.8	246.1	26	14.7	5.7	1	0.1
14	Latur	Ahmadpur	Ahmadpur	18.7042	76.9375	7.9	2690	1749	700	136	87.5	196.0	3.3	0.0	480.7	290	286	5.5	1	0.1
15	Latur	Jalkot	Tiruka	18.5514	77.1756	8.25	320	208	132	35.2	10.7	16.0	3	2.0	117.9	26	17	2.5	1	0.1
16	Latur	Latur	Mamdapur	18.425	76.6981	8.7	414	269	124	27.2	13.6	18.6	0.3	4.7	99.1	26	27	1.7	1	0.4
17	Latur	Jalkot	Kolnoor	18.5889	77.1597	8.4	426	277	124	20.8	17.5	21.7	0.5	2.4	101.5	30	20	1.55	1	1.0
18	Latur	Nilanga	Shelgi	18.0269	76.9014	8.78	478	311	116	22.4	14.6	66.4	1.1	2.8	48.9	92	41	6.2	0.97	0.2
19	Latur	Renapur	Renapur	18.525	76.5978	9.95	448	291	140	27.2	17.5	76.6	1	30.8	36.8	102	37	4.3	0.97	0.2
20	Latur	Ausa	Nandurga	18.0606	76.4655	8.2	609	396	110	74.7	8.5	85.8	0.21	0.0	146.4	77.1038	152	7	0.93	0.0
21	Latur	Ahmadpur	Hipparga kopdev	18.6792	76.8161	8	594	386	172	35.2	20.4	27.0	0.2	1.7	178.3	22	19	9.2	0.9	1.3
22	Latur	Udgir	Kiniyalladevi	18.5097	77.0394	7.9	703	457	244	48	30.1	10.0	0.5	1.7	222.3	14	25	8.2	0.9	0.9
23	Latur	Ahmadpur	Waigaon	18.5875	77.0161	8.2	573	372	264	52.8	32.1	12.7	1.7	3.4	228.5	22	31	6.9	0.9	0.4
24	Latur	Ausa	Borgaon	18.3	76.3589	8.2	1010	657	288	32	50.5	28.0	1.7	0.0	280.6	40	37	5.6	0.9	0.1

SN	District	Taluka	Village	Latitude	Longitude	pH	EC	TDS	TH	Ca	Mg	Na	K	CO3	HCO3	Cl	SO4	NO3	F	Fe
			(n)																	
25	Latur	Latur	Bhatkheda	18.4311	76.6694	8.6	410	267	144	24	20.4	21.0	0.5	4.5	119.3	30	16	1.7	0.9	0.1
26	Latur	Ausa	Killari	18.0417	76.5708	8.35	392	255	104	25.6	9.7	62.5	1	1.7	82.2	96	26	2.25	0.86	0.2
27	Latur	Renapur	Palshi	18.5883	76.4908	8.2	866	563	236	52.8	25.3	61.3	13	0.0	156.2	114	42	13.5	0.84	0.1
28	Latur	Latur	Murud bk	18.4042	76.2375	8.14	398	259	124	11.2	23.3	59.3	0.8	1.0	75.0	96	27	7.25	0.83	0.2
29	Latur	Latur	Latur[t-2]	18.3917	76.5833	8.79	422	274	128	17.6	20.4	58.5	1	4.1	71.5	104	26	1.05	0.83	0.1
30	Latur	Nilanga	Ambulga (bk)	18.1625	76.8642	7.8	539	350	136	24	18.5	40.7	1	0.4	71.5	68	17	12	0.8	0.2
31	Latur	Nilanga	Gaur	18.275	76.7111	7.9	550	358	232	40	32.1	29.0	0.2	1.5	198.5	50	19	9.5	0.8	0.0
32	Latur	Latur	Babalgoan	18.3764	76.6292	7.9	560	364	220	38.4	30.1	30.0	0.6	1.6	218.3	48	28	1.3	0.8	0.0
33	Latur	Deoni	Deoni bk	18.2644	77.0833	8.1	450	293	120	24	14.6	21.0	0.8	1.2	102.7	30	31	0.9	0.8	0.0
34	Latur	Chakur	Gharni	18.4833	76.8125	8.1	465	302	176	25.6	27.2	33.0	1.5	2.3	197.6	26	25	0.05	0.8	0.2
35	Latur	Ahmadpur	Mankhed	18.7092	76.8214	7.96	401	261	116	16	18.5	60.7	0.9	0.7	87.2	102	28	0.45	0.79	0.1
36	Latur	Ausa	Muglewadi	18.1958	76.6088	7.9	729	474	219	94.62	30.3	79.9	1.68	0.0	170.8	100.235	149	14	0.78	0.0
37	Latur	Latur	Nandgaon	18.4514	76.5486	8.08	912	593	236	54.4	24.3	61.1	14	0.0	140.3	114	39	13.5	0.78	0.1
38	Latur	Ahmadpur	Kolwadi	18.7694	76.7722	8.1	864	562	284	49.6	38.9	63.2	15	0.0	208.6	118	42	12.8	0.78	0.2
39	Latur	Ahmadpur	Sangvi [s]	18.775	76.9792	8.67	1158	753	356	33.6	66.1	110.0	0.8	39.6	167.1	202	38	4.65	0.78	0.2
40	Latur	Latur	Neoli	18.3625	76.3092	9.01	385	250	96	24	8.7	79.4	0.9	5.2	54.3	114	29	1.82	0.78	0.2
41	Latur	Latur	Borgaon bk	18.4083	76.3186	8.7	319	207	126	27.2	14.1	18.9	2.5	4.5	95.3	36	19	1.77	0.74	0.1
42	Latur	Ausa	Kharosa	18.1603	76.6728	9.63	251	163	96	12.8	15.6	15.9	3.1	21.1	52.7	22	18	0.15	0.73	0.2
43	Latur	Nilanga	Aurad (shahjani)	18.0583	76.9278	8.19	712	463	232	43.2	30.1	62.2	1.2	3.2	216.8	100	34	1.07	0.72	0.2
44	Latur	Nilanga	Ambulga (v)	17.9911	76.7042	8.06	513	333	260	65.6	23.3	26.0	0.3	2.6	241.3	46	18	1.48	0.71	0.2
45	Latur	Latur	Bhadi	18.4569	76.7036	8	700	455	336	48	52.5	36.0	0.9	2.3	245.6	60	42	22	0.7	0.1
46	Latur	Deoni	Hanchnal	18.2597	77.0903	8.1	679	441	276	46.4	38.9	28.0	0.7	2.5	209.5	46	46.7	10.9	0.7	1.5
47	Latur	Renapur	Rajwadi	18.5014	76.5694	0	606	320	135	36.072	10.9	78.5	1.71	0.0	152.5	120.53	11	5	0.7	0.0
48	Latur	Nilanga	Kelgaon	18.1861	76.8056	8.1	348	226	152	28.8	19.4	15.0	3	1.8	150.2	24	18	0.1	0.7	1.2
49	Latur	Nilanga	Barmachi wadi	18.0167	76.75	8.67	307	200	122	25.6	14.1	16.5	3.1	4.0	91.7	28	18	2.86	0.65	0.2
50	Latur	Ausa	Yeli	18.227	76.6506	7.9	1189	773	408	293.82	27.8	87.7	0.45	0.0	248.9	141.357	186	33	0.62	0.0
51	Latur	Ausa	Ashiv	18.1062	76.3477	7.7	2011	1307	458	224.1	56.9	206.4	0.28	0.0	297.7	316.125	422	28	0.62	0.0
52	Latur	Nilanga	Masobaw	18.1036	76.8347	7.9	693	450	284	164.3	29.0	29.0	0.17	0.0	239.1	46.2	43	30	0.61	0.0

SN	District	Taluka	Village	Latitude	Longitude	pH	EC	TDS	TH	Ca	Mg	Na	K	CO3	HCO3	Cl	SO4	NO3	F	Fe
			adi Latur							4						622				
53	Latur	Ahmadpur	Chincholirao[t-1]	18.7417	76.7375	8.43	351	228	152	33.6	16.5	17.0	2.5	2.8	109.1	32	20	4.64	0.61	0.2
54	Latur	Ausa	Ausa	18.1792	76.5	7.5	1270	826	412	110.4	33.0	97.0	1.9	0.0	240.3	138	85	35	0.6	0.2
55	Latur	Udgir	Somnathpur	18.4069	77.1069	9	411	267	144	12.8	27.2	18.1	0.6	9.2	98.3	24	17	10	0.6	0.3
56	Latur	Chakur	Ashta	18.4514	76.7556	8.1	530	345	240	46.4	30.1	33.0	2.2	2.2	189.7	56	37	9.4	0.6	0.1
57	Latur	Renapur	Dawangaon	18.5889	76.5103	8	502	326	196	32	28.2	37.0	0.5	1.7	178.3	56	27	0.32	0.6	0.1
58	Latur	Renapur	Garsuli	18.6125	76.5236	8	558	363	132	38.4	8.7	84.9	0.6	1.2	130.7	116	30	1.66	0.56	0.2
59	Latur	Renapur	Karsa	18.5154	76.4587	8.04	332	216	144	30.4	16.5	30.7	3.2	1.3	130.6	54	19	1.4	0.56	0.1
60	Latur	Nilanga	Shend	18.2767	76.7613	8	452	294	125	74.7	12.1	41.0	0.18	0.0	239.1	48.8324	10	7	0.55	0.0
61	Latur	Nilanga	Halsi [t]	18.1069	76.9381	8.71	272	177	108	17.6	15.6	20.3	3.4	3.9	79.9	36	19	0.25	0.54	0.2
62	Latur	Ahmadpur	Andhori	18.7686	76.825	7.95	538	350	156	44.8	10.7	46.9	0.7	1.1	130.9	82	20	1.58	0.53	0.2
63	Latur	Renapur	Darji Borgaon	18.4999	76.5226	7.9	405	263	149	89.64	14.5	28.7	0.14	0.0	180.6	28.2714	20	7	0.51	0.0
64	Latur	Nilanga	Nilanga	18.1167	76.7542	8.3	463	301	152	24	22.4	57.6	0.5	1.8	98.1	108	28	2.77	0.51	0.0
65	Latur	Ahmadpur	Khandali	18.8083	76.8903	8.43	297	193	144	28.8	17.5	16.3	3.4	3.6	140.3	26	19	0.57	0.51	0.2
66	Latur	Ausa	Selu	18.2806	76.5528	8	1308	850	300	75.2	27.2	141.0	7.3	0.0	120.0	254	65	27	0.5	0.3
67	Latur	Udgir	Kodli	18.4561	77.2061	8.3	1109	721	392	84.8	43.7	106.0	2.9	8.4	183.0	194	70	19	0.5	1.0
68	Latur	Ahmadpur	Shirur Tajband	18.6557	76.9753	7.7	935	608	115	104.6	2.4	151.4	2.2	0.0	97.6	190.2	84	19	0.5	0.0
69	Latur	Shirur-Anantpal	Sakol	18.2819	76.8833	8.1	765	497	328	116.8	8.7	36.1	0.3	2.8	233.2	68	41	17.1	0.5	0.2
70	Latur	Ausa	Aashiv	18.1042	76.3458	8.1	504	328	128	28.8	13.6	49.0	0.5	1.0	86.9	64	26	10.9	0.5	0.1
71	Latur	Ausa	Taka	18.1708	76.3514	8.5	907	590	292	49.6	40.8	51.7	2.5	9.6	160.6	98	65	8.3	0.5	0.5
72	Latur	Chakur	Shivpur	18.3918	76.8043	9	481	313	72	16	7.8	44.0	0.7	5.1	54.4	58	12	5.7	0.5	0.7
73	Latur	Nilanga	Shivni kothal	18.2208	76.7042	9.29	286	186	112	24	12.6	16.6	1.6	11.6	63.4	30	21	0.6	0.5	0.1
74	Latur	Chakur	Yerol	18.4071	76.8962	8.3	541	352	240	44.8	31.1	15.5	0.4	4.6	247.3	24	25	0.3	0.5	0.4
75	Latur	Nilanga	Koroli	17.8884	76.7927	7.4	1870	1216	627	358.56	65.3	61.1	0.22	0.0	278.2	254.442	193	33	0.42	0.0
76	Latur	Nilanga	Halsi Latur	18.1099	76.9347	7.8	1407	915	354	234.06	29.0	90.0	0.36	0.0	234.2	236.452	206	30	0.41	0.0
77	Latur	Chakur	Hanmant Jawaraga	18.587	76.8236	8.3	514	334	204	114.54	21.8	20.5	0.39	9.6	131.8	131.076	71	11	0.4	0.0
78	Latur	Renapur	Sindgoan	18.5144	76.4847	9.11	435	283	134	12.8	24.8	40.6	0.9	6.8	56.5	68	31	5.8	0.4	0.1

SN	District	Taluka	Village	Latitude	Longitude	pH	EC	TDS	TH	Ca	Mg	Na	K	CO3	HCO3	Cl	SO4	NO3	F	Fe
79	Latur	Udgir	Bhakaskheda	18.3734	77.0151	8	592	370	159	84.7	18.2	52.3	7.6	0.0	205.0	59.1	28	2	0.4	0.0
80	Latur	Deoni	Ambanagar	18.2056	77.036	8.1	578	376	279	104.6	42.4	26.3	0.7	0.0	236.7	30.8	18	29	0.39	0.0
81	Latur	Nilanga	Nelwad	17.9088	76.8177	7.5	1967	1279	772	388.44	93.2	61.3	3.64	0.0	209.8	308.415	285	33	0.38	0.0
82	Latur	Ausa	Kalaka	18.0838	76.6254	7.7	1082	703	448	199.2	60.5	54.3	0.19	0.0	253.8	107.945	225	32	0.37	0.0
83	Latur	Renapur	Poharegaon	18.5416	76.4685	8	1101	716	413	288.84	30.3	47.6	0.13	0.0	209.8	169.628	149	31	0.37	0.0
84	Latur	Nilanga	Ambulagamain	18.2241	76.7433	7.9	722	469	229	154.38	18.2	50.0	0.09	0.0	209.8	51.4025	77	31	0.36	0.0
85	Latur	Chakur	Mamdapur	18.4101	76.698	7.9	654	425	249	184.26	15.7	30.0	0.14	0.0	190.3	59.1129	62	30	0.36	0.0
86	Latur	Nilanga	Nitur	18.2422	76.7798	7.7	384	250	154	99.6	13.3	18.0	0.45	0.0	165.9	35.9817	11	7	0.36	0.0
87	Latur	Chakur	Jadhala	18.653	76.7983	7.9	1020	663	284	159.36	30.3	43.7	7.33	0.0	190.3	48.8324	215	30	0.34	0.0
88	Latur	Chakur	Nandgaon	18.497	76.7572	7.9	761	495	339	253.98	20.6	19.4	1.32	0.0	239.1	59.1129	252	12	0.32	0.0
89	Latur	Udgir	Handargul i	18.576	77.0387	7.9	1746	1091	448	333.7	27.8	71.4	2.9	0.0	146.4	200.5	86	170	0.3	0.0
90	Latur	Ahmadpur	Gunjothi	18.6963	76.7548	7.7	635	413	284	144.4	33.9	15.0	1	0.0	236.7	28.3	38	40	0.3	0.0
91	Latur	Ausa	Shivali	18.2167	76.3333	7.8	1320	858	472	150.4	23.3	110.0	1.9	0.0	236.1	200	70	34.6	0.3	0.6
92	Latur	Chakur	Tivghyal	18.473	76.8709	7.8	833	541	159	134.46	6.1	78.2	0.08	0.0	112.2	159.348	127	17	0.3	0.0
93	Latur	Deoni	Lasona	18.1825	77.0902	7.8	566	368	239	154.4	20.6	18.4	0.9	0.0	190.3	46.3	23	17	0.3	0.0
94	Latur	Nilanga	Gunewadi Latur	18.217	76.7019	7.7	672	437	249	169.32	19.4	45.0	0.11	0.0	244.0	46.2622	13	8	0.3	0.0
95	Latur	Ahmadpur	Walsangi	18.6408	77.0125	8.1	424	276	132	30.4	13.6	14.0	0.4	1.5	130.4	20	20	0.38	0.3	0.5
96	Latur	Latur	Murud-Akola	18.4	76.4		1096	581	415	74.148	55.9	71.3	3.01	0.0	396.5	109.895	33	111	0.29	0.0
97	Latur	Nilanga	Borsuri	18.0116	76.8485	7.7	905	588	393	249	35.1	32.1	0.18	0.0	209.8	89.9544	88	33	0.28	0.0
98	Latur	Nilanga	Hatrga	17.95	76.7318	7.9	1575	1024	623	403.38	53.2	62.7	0.68	0.0	244.0	210.75	194	34	0.27	0.0
99	Latur	Nilanga	Tambala	17.9319	76.8942	7.7	272	177	120	84.66	8.5	12.3	0.03	0.0	156.2	25.7012	3	15	0.27	0.0

SN	District	Taluka	Village	Latitude	Longitude	pH	EC	TDS	TH	Ca	Mg	Na	K	CO3	HCO3	Cl	SO4	NO3	F	Fe
100	Latur	Nilanga	Sangvi	18.0577	76.6455	7.7	989	643	374	169.32	49.6	57.5	0.13	0.0	244.0	159.348	125	10	0.27	0.0
101	Latur	Chakur	Chawarewadi	18.5077	76.998	8	499	324	105	79.68	6.1	28.2	0.16	0.0	234.2	30.8415	16	7	0.26	0.0
102	Latur	Chakur	Shivankhed	18.5136	76.7274	7.9	1222	794	558	393.42	39.9	22.4	0.55	0.0	317.2	136.217	229	31	0.25	0.0
103	Latur	Ausa	Lakhagaon	18.2844	76.4391	7.6	869	589	388	199.2	46.0	30.2	0.2	0.0	180.6	105.375	135	30	0.25	0.0
104	Latur	Nilanga	Kasar Belkunda-1	17.9417	76.8497	0	920	488	310	80.16	26.7	46.3	78.93	0.0	317.2	127.62	35	19	0.24	0.0
105	Latur	Renapur	Nehru Nagar	18.4889	76.5907	7.8	807	525	374	249	30.3	17.8	0.28	0.0	205.0	89.9544	89	31	0.23	0.0
106	Latur	Ausa	Lodaga	18.3095	76.6706	8	553	359	229	154.38	18.2	23.0	0.05	0.0	195.2	46.2622	102	11	0.22	0.0
107	Latur	Jalkot	Hokarna	18.6842	77.1298	8.2	726	472	289	124.5	39.9	38.0	2.9	0.0	185.4	54	65	66	0.2	0.0
108	Latur	Udgir	Tondchira	18.3459	77.1679	7.8	589	368	259	119.5	33.9	15.0	2.5	0.0	248.9	28.3	22	18	0.2	0.0
109	Latur	Ahmadpur	Ralga	18.818	76.9865	7.9	705	458	254	134.5	29.0	14.3	13.3	0.0	244.0	56.5	43	8	0.2	0.0
110	Latur	Udgir	Togari	18.2792	77.1569	8	680	442	280	48	38.9	21.2	0.6	2.3	245.6	36	47	2.1	0.2	0.4
111	Latur	Ausa	Birwali	18.1928	76.3289	7.4	1514	984	508	333.66	42.4	94.9	0.56	0.0	346.5	154.208	363	32	0.19	0.0
112	Latur	Ahmadpur	Patoda	18.6708	76.8333	0	1854	983	640	176.352	48.6	70.8	8.86	0.0	305.0	212.7	31	282	0.16	0.0
113	Latur	Shirur-Anantpal	Talegaon Bori	18.3238	76.7398	7.7	970	631	334	194.2	33.9	33.0	8.5	0.0	180.6	105.4	81	84	0.1	0.0
114	Latur	Ahmadpur	Ahmadpur	18.7	76.9333	0	893	477	425	88.176	49.8	40.3	1.09	0.0	244.0	152.435	38	65	0.14	0.0
115	Latur	Ahmadpur	Chapoli	18.575	76.9139	0	1192	636	525	134.268	46.2	39.9	1.68	0.0	250.1	166.615	43	86	0.12	0.0
116	Latur	Ausa	Ausa	18.25	76.5	0	1282	679	565	136.272	54.7	51.7	4.73	0.0	207.4	230.425	12	191	0.11	0.0
117	Latur	Nilanga	Rapka	18.3536	76.805	0	1246	661	525	158.316	31.6	49.0	2.61	0.0	170.8	237.515	41	120	0.11	0.0
118	Latur	Nilanga	Chichondi Latur	18.1625	76.9232	7.9	2141	1392	563	383.46	43.6	78.0	8.64	0.0	195.2	295.564	418	33	0.11	0.0
119	Latur	Nilanga	Gaur	18.276	76.714	0	477	253	245	72.144	15.8	15.4	1.9	0.0	207.4	38.995	38	2	0.11	0.0
120	Latur	Chakur	Ashta	18.4592	76.7569		1477	781	610	146.292	59.5	66.9	2.27	0.0	213.5	294.235	31	160	0.1	0.0

SN	District	Taluka	Village	Latitude	Longitude	pH	EC	TDS	TH	Ca	Mg	Na	K	CO3	HCO3	Cl	SO4	NO3	F	Fe
121	Latur	Udgir	Mogha	18.3167	77.15	0	437	231	310	44.088	48.6	33.8	2.9	0.0	195.2	67.355	10	105	0.1	0.0
122	Latur	Shirur-Anantpal	Ujed-1	18.2797	76.8008	0	1693	898	600	112.224	77.8	101.8	1.61	0.0	286.7	294.235	48	169	0.14	0.0
123	Latur	Jalkot	Umarga Retu	18.6645	77.0781	7.9	594	386	259	124.5	32.7	21.6	1.1	0.0	163.5	30.8	26	82	0.1	0.0
124	Latur	Jalkot	Marsangvi	18.5586	77.2426	7.7	594	386	244	79.7	39.9	34.4	1.1	0.0	244.0	28.3	20	13	0.1	0.0
125	Latur	Ahmadpur	Telgaon	18.6029	76.926	7.9	415	270	184	94.6	21.8	24.6	1.8	0.0	190.3	10.3	29	8	0.1	0.0
126	Latur	Ausa	Talni	18.0625	76.5458	8.25	1148	746	376	33.6	71.0	77.0	0.6	0.0	336.7	136	50	6.5	0.1	0.1
127	Latur	Ahmadpur	Ujana	18.8018	76.9383	8.1	588	382	274	179.3	23.0	23.5	5.7	0.0	185.4	59.1	43	5	0.1	0.0
128	Latur	Ahmadpur	Kingaon	18.7611	76.7722	0	1409	749	565	136.272	54.7	67.3	2.81	0.0	250.1	255.24	44	176	0.09	0.0
129	Latur	Ausa	Budhoda	18.3	76.5333	0	1075	539	480	120.24	43.7	47.3	5.08	0.0	128.1	198.52	46	148	0.09	0.0
130	Latur	Latur	Borgaon Kale	18.4083	76.3139		1516	795	585	160.32	45.0	69.0	10.8	0.0	164.7	265.875	49	129	0.09	0.0
131	Latur	Latur	Murud	18.4	76.2333		1402	736	540	122.244	57.1	67.7	2.1	0.0	195.2	294.235	43	123	0.09	0.0
132	Latur	Udgir	Udgir1	18.3917	77.1167	0	1322	702	485	106.212	53.5	73.4	1.02	0.0	219.6	258.785	32	115	0.09	0.0
133	Latur	Udgir	Deoni	18.2667	77.0833	0	1725	919	505	142.284	36.5	92.4	85.61	0.0	372.1	280.055	44	84	0.09	0.0
134	Latur	Udgir	Jalkot	18.63	77.1967	0	1314	695	465	100.2	52.3	78.5	2.16	0.0	195.2	244.605	32	81	0.09	0.0
135	Latur	Deoni	Jawalga	18.2843	76.9182	8.2	2610	1697	916	388.4	128.3	259.1	6.6	0.0	146.4	460.1	540	30	0.09	0.0
136	Latur	Shirur-Anantpal	Dongargaon	18.2907	76.7961	8	3139	2040	633	214.1	101.7	161.6	483	0.0	1015.0	434.4	70	80	0.07	0.0
137	Latur	Udgir	Her	18.438	76.9786	8.1	2962	1851	911	348.6	136.7	111.2	111.7	0.0	248.9	365	390	360	0.04	0.0
138	Latur	Deoni	Dhanegaon	18.2083	76.9281	8	1985	1290	483	234.1	60.5	194.9	91.5	0.0	439.2	246.7	130	22	0	0.0

ANNEXURE 5.1: CHEMICAL ANALYSIS OF GW SAMPLES OF SEMICONFINED/CONFINED AQUIFER

SN	District	Taluka	Village	Latitude	Longitude	pH	EC	TDS	TH	Ca	Mg	Na	K	CO3	HCO3	Cl	SO4	NO3	F	Fe
1	Latur	Ambejogai	Wangdari	18.563	76.384	7.3	5483	2898	2145	417	269.0	215.0	2.4	0.0	37.0	1769	374	7	0.71	0.0
2	Latur	Udgir	Wadona Bz	18.517	77.038	7.6	4200	2830	800	264	58.0	598.0	6	0.0	110.0	309	1500	40	3.65	0.0
3	Latur	Udgir	ChaNAegaon	18.4	77.218	8.2	2500	1580	610	214	18.0	285.0	10	0.0	201.0	220	696	35	1.4	0.0
4	Latur	Nilanga	Kasar Sirsi	17.925	76.753	7.9	1741	932	655	128	81.0	48.0	87.9	0.0	110.0	319	226	33	0.44	0.0
5	Latur	Ausa	Ekambi	18.153	76.297	7.2	1550	826	395	64	57.0	164.0	2.74	0.0	110.0	199	299	7	1.43	0.0
6	Latur	Chakur	Nandgaon	18.497	76.757	7.35	1481	963												0.0
7	Latur	Ahmadpur	Kajal Hipparga	18.686	76.867	7.4	1430	880	530	120	56.0	63.0	35	0.0	323.0	174	110	160	0.24	0.0
8	Latur	Udgir	ChaNAegaon	18.4	77.218	8.2	1350	865	180	60	7.0	225.0	5	0.0	220.0	89	306	68	1.2	0.0
9	Latur	Nilanga	Shivani Kotal	18.221	76.708	7.8	1307	694	630	122	79.0	60.0	40.2	0.0	92.0	216	330	32	0.11	0.0
10	Latur	Udgir	HaNAerguli	18.3454	76.9593	8	1280	768	210	72	7.0	146.0	5	0.0	293.0	184	80	78	NA	0.0
11	Latur	Udgir	Handerguli	18.352	76.9523	8	1280	768	210	72	7.0	146.0	5	0.0	293.0	184	80	78	0	0.0
12	Latur	Ahmadpur	Dhalegaon	18.758	76.85	8.3	1196	773	256	35.2	40.8	164.0	0.7	15.6	231.8	220	31	4.82	1	0.2
13	Latur	Ausa	Ausa	18.25	76.5	7.3	1140	520	400	90	43.0	73.0	1	0.0	360.0	96	6	35	4.5	0.0
14	Latur	Ahmadpur	Kajal Hipparga	18.686	76.867	7.9	1100	623	360	86	35.0	68.0	33	0.0	366.0	96	52	70	0.45	0.0
15	Latur	Latur	Latur	18.4	76.583	7.4	1100	570	275	52	35.0	103.0	1.5	0.0	342.0	121	54	30	0.8	0.0
16	Latur	Udgir	Nagalgaon	18.414	77.186	8.25	1100	675	250	500	30.0	138.0	2	0.0	122.0	128	250	13	0	0.0
17	Latur	Udgir	Nagalgaon	18.414	77.186	8.3	1100	675	250	500	30.0	138.0	2	0.0	122.0	128	250	13	NA	0.0
18	Latur	Ahmadpur	Kajal Hipparga	18.686	76.867	8.1	1090	622	385	90	39.0	58.0	28.7	0.0	378.0	96	57	64	0.35	0.0
19	Latur	Deoni	Deoni	18.267	77.086	7.3	1050	636	120	46	1.0	170.0	1.3	0.0	37.0	252	80	67	0.42	0.0
20	Latur	Udgir	Wadona Bz	18.517	77.038	7.6	1020	640	195	52	16.0	145.0	2	0.0	195.0	78	175	72	11.35	0.0
21	Latur	Deoni	Deoni	18.267	77.086	7.6	1010	602	285	82	19.0	95.0	1.6	0.0	244.0	156	75	51	0.58	0.0
22	Latur	Nilanga	Chincholi Sayakhan Z2	18.017	76.789	7.6	1003	533	320	54	45.0	71.0	2.19	0.0	85.0	160	172	7	0.38	0.0
23	Latur	Latur	Deokara[t-3]	18.342	76.471	7.63	978	636	300	49.6	42.8	162.0	13	0.0	209.8	228	42	29.78	0.74	0.1
24	Latur	Ahmadpur	Gour	18.776	76.971	7.7	950	549	210	50	21.0	115.0	2	0.0	134.0	188	76	30	3.8	0.0
25	Latur	Ausa	Jawli (M)	18.175	76.604	7.1	900	492	285	50	39.0	62.0	1.4	0.0	159.0	99	48	113	0.76	0.0
26	Latur	Chakur	Shivankhed	18.513	76.729	8.3	862	560	360	72	43.7	33.6	3.3	0.0	264.0	62	50	13.2	0.4	0.3
27	Latur	Nilanga	Kokalgaon Zone 2	18.042	76.653	7.4	847	452	285	56	35.0	61.0	2.2	0.0	159.0	149	96	13	0.23	0.0
28	Latur	Chakur	Mahalangra	18.447	76.728	7.5	817	425	230	44	29.0	85.0	2.5	0.0	55.0	160	158	28	0.59	0.0
29	Latur	Udgir	Talni	18.416	77.186	8.2	800	500	40	14	1.0	16.0	1.6	0.0	49.0	223	50	NA	NA	0.0
30	Latur	Ausa	Talni	18.063	76.546	8.2	800	500	40	14	1.2	16.3	1.6	0.0	49.0	223	50	0	0	0.0
31	Latur	Udgir	Udgir	18.392	77.217	8.3	797	518	312	88	22.4	33.5	2.9	0.0	264.0	58	20	10.2	0.6	0.6
32	Latur	Ahmadpur	Sangvi	18.776	76.971	7.2	780	425	210	44	24.0	84.0	2	0.0	342.0	43	40	16	0.99	0.0
33	Latur	Nilanga	Kokalgaon Zone 1	18.042	76.653	7.5	758	402	295	58	36.0	30.0	2.4	0.0	195.0	113	56	17	0.2	0.0
34	Latur	Jalkot	Jalkot	18.629	77.179	7.9	750	410	225	46	27.0	71.0	2	0.0	268.0	74	45	12	1.84	0.0

SN	District	Taluka	Village	Latitude	Longitude	pH	EC	TDS	TH	Ca	Mg	Na	K	CO3	HCO3	Cl	SO4	NO3	F	Fe
35	Latur	Ausa	BelkuNA	18.163	76.4	7.3	750	420	310	62	38.0	26.0	1.5	0.0	159.0	78	24	107	0.29	0.0
36	Latur	Ausa	Khuntegaon	18.296	76.585	7.8	750	488	320	60.8	40.8	26.1	1.7	1.4	230.6	48	36	13.4	0.7	1.0
37	Latur	Ahmadpur	Sangvi	18.776	76.971	7.4	740	380	215	20	40.0	72.0	2	0.0	354.0	28	35	5	0.73	0.0
38	Latur	Ausa	Dapegaon	18.149	76.492	8.2	720	468	204	35.2	28.2	67.6	1.2	2.5	165.5	92	38	2.93	0.79	0.1
39	Latur	Ausa	Bhada	18.268	76.397	7.2	700	355	245	44	33.0	28.0	0.9	0.0	238.0	39	22	68	0.16	0.0
40	Latur	Renapur	Pohregaon	18.541	76.47	7.8	691	365	265	48	35.0	18.0	0.28	0.0	92.0	124	69	13	0.2	0.0
41	Latur	Udgir	Haibatpur	18.4	77.058	8	677	440	196	36.8	25.3	17.0	0.9	1.4	146.6	24	24	8.1	0.9	0.5
42	Latur	Latur	Chikurda	18.426	76.422	7.98	676	439	224	40	30.1	73.2	1.2	1.6	180.3	102	31	13.95	1.1	0.2
43	Latur	Nilanga	Sindkhed	18.076	76.782	7.98	662	430	324	52.8	46.7	44.2	0.4	2.1	237.8	84	62	6.5	1.2	0.1
44	Latur	Nilanga	Mamdapur	17.913	76.879	7.6	656	353	195	36	26.0	43.0	1	0.0	67.0	124	67	18	0.23	0.0
45	Latur	Nilanga	Chincholi Sayakhan Z1	18.017	76.789	7.3	624	333	195	14	39.0	42.0	0.88	0.0	85.0	128	55	9	0.26	0.0
46	Latur	Ahmadpur	Khandali	18.808	76.89	7.84	614	399	292	33.6	50.5	38.7	0.5	1.6	250.3	72	40	5.25	0.8	0.2
47	Latur	Udgir	Lohara	18.388	77.021	7	600	339	115	34	7.0	95.0	2.1	0.0	79.0	117	39	3.5	1.7	0.0
48	Latur	Nilanga	Chinchondi	18.162	76.923	8	581	314	175	36	21.0	36.0	4.27	0.0	128.0	74	61	12	0.11	0.0
49	Latur	Chakur	Latur Road	18.501	76.832	8	573	307	90	22	9.0	108.0	3.7	0.0	98.0	64	163	7	0.38	0.0
50	Latur	Nilanga	Kelgaon	18.186	76.806	8.2	563	366	160	48	9.7	62.0	0.6	2.1	137.9	60	56	10.2	0.5	0.6
51	Latur	Jalkot	Mal hipparga	18.583	77.196	8	559	338	104	11.6	18.2	25.3	0.8	1.7	178.3	42	35.2	0.1	0.42	0.2
52	Latur	Nilanga	Pimpalwadi (Jeori)	18.053	76.694	7.8	556	297	155	32	18.0	28.0	0.65	0.0	92.0	53	71	7	0.44	0.0
53	Latur	Chakur	Latur Road	18.508	76.846	8.1	550	299	165	46	12.0	70.0	1.7	0.0	268.0	18	16	1	0.58	0.0
54	Latur	Chakur	Chapuli	18.571	76.914	6.9	530	310	55	14	5.0	97.0	1	0.0	79.0	92	50	6	5.04	0.0
55	Latur	Deoni	Arasnal	18.321	77.031	8.1	530	345	200	46.4	20.4	38.0	0.7	2.3	197.6	58	30	1	1	0.1
56	Latur	Ausa	Nandgaon-Drilling	18.331	76.592	7.9	529	282	120	18	18.0	60.0	1.85	0.0	104.0	92	5	7	1.3	0.0
57	Latur	Ausa	Nandgaon-PYT	18.331	76.592	7.6	525	279	125	22	17.0	57.0	3.92	0.0	73.0	121	5	7	1	0.0
58	Latur	Latur	Sumthana	18.398	76.602	7.9	511	273	180	38	21.0	45.0	0.6	0.0	55.0	64	97	25	1.03	0.0
59	Latur	Renapur	Kolgaon	18.529	76.524	8	494	263	75	18	7.0	79.0	1.3	0.0	122.0	57	51	28	1.13	0.0
60	Latur	Ambejogai	Garsoli	18.639	76.508	8	484	255	145	26	19.0	38.0	0.69	0.0	116.0	53	51	28	0.71	0.0
61	Latur	Ausa	Limbaladaw	18.071	76.514	8.1	460	295	30	10	1.0	92.0	1	0.0	79.0	89	45	NA	NA	0.0
62	Latur	Ausa	Limbaladaw	18.071	76.514	8.14	460	295	30	10	1.2	92.0	1	0.0	79.0	89	45	0	0	0.0
63	Latur	Ahmadpur	Shirur TajbaNA	18.629	76.971	6.8	450	275	25	6	2.0	94.0	1	0.0	67.0	43	75	9	11.78	0.0
64	Latur	Chakur	Sugaon	18.397	76.731	8.9	429	279	100	24	9.7	17.1	0.2	5.5	74.1	24	19	1.73	0.6	0.2
65	Latur	Nilanga	Ansarwada	18.096	76.806	7.8	422	224	140	26	18.0	28.0	0.47	0.0	61.0	60	56	7	0.2	0.0
66	Latur	Ausa	Chincholi Son	18.167	76.431	7.4	422	220	45	6	7.0	107.0	1.4	0.0	92.0	67	82	8	1.49	0.0
67	Latur	Chakur	Ashta Mod	18.464	76.741	7.7	421	224	55	8	9.0	105.0	0.98	0.0	73.0	85	69	7	0.48	0.0
68	Latur	Ausa	Hanegaon	18.1	76.497	7.5	400	255	55	18	2.0	63.0	5.1	0.0	177.0	39	NA	2.2	NA	0.0
69	Latur	Ausa	Hanegaon	18.1	76.497	7.53	400	255	55	18	2.4	63.0	5.1	0.0	177.0	39	0	2.2	0	0.0

SN	District	Taluka	Village	Latitude	Longitude	pH	EC	TDS	TH	Ca	Mg	Na	K	CO3	HCO3	Cl	SO4	NO3	F	Fe
70	Latur	Latur	Chincholi Ballal	18.371	76.454	8.9	390	213	35	10	2.0	73.0	1.4	18.0	122.0	32	16	NA	0.49	0.0
71	Latur	Chakur	Kabal Sangvi	18.424	76.901	8	385	202	95	18	12.0	37.0	1.4	0.0	110.0	43	31	7	0.26	0.0
72	Latur	Latur	Gadhwad	18.525	76.338	8.8	380	278	30	8	2.0	73.0	1.9	24.0	67.0	28	60	40	8.83	0.0
73	Latur	Chakur	Brahmwadi	18.544	76.794	7.9	377	200	105	20	13.0	32.0	1.2	0.0	49.0	78	35	7	0.38	0.0
74	Latur	Chakur	KeNArawadi	18.606	76.735	8.2	350	180	150	44	10.0	11.0	0.6	0.0	189.0	7	8	4	0.09	0.0
75	Latur	Chakur	Latur road.	18.506	76.846	8.2	336	218	148	28.8	18.5	12.8	2.7	2.1	137.9	24	23	0.17	0	0.9
76	Latur	Chakur	KeNArawadi	18.606	76.735	8.1	330	176	135	42	7.0	18.0	0.4	0.0	171.0	11	10	2	0.71	0.0
77	Latur	Chakur	Devengrawadi	18.453	76.727	7.7	327	172	40	10	4.0	57.0	0.6	0.0	55.0	39	43	9.2	0.68	0.0
78	Latur	Chakur	KeNArawadi	18.606	76.735	8.1	320	171	145	48	6.0	13.0	0.8	0.0	171.0	11	7	NA	0.11	0.0
79	Latur	Latur	Bhisewagholi	18.483	76.296	8.6	296	192	136	33.6	12.6	14.9	3	3.9	103.9	28	18	2.37	0.58	0.2
80	Latur	Ausa	Killarwadi	18.208	76.571	8.7	290	175	20	4	2.0	58.0	1	24.0	98.0	18	5	NA	NA	0.0
81	Latur	Ausa	Killarwadi	18.208	76.571	8.68	290	175	20	4	2.4	58.0	1	24.0	98.0	18	5	0	0	0.0
82	Latur	Nilanga	Sarwadi	18.013	76.654	9.52	231	150	100	19.2	12.6	15.9	3.5	16.8	41.0	26	17		0.72	0.2

ANNEXURE 6.1:PROPOSED CHECK DAMS IN LATUR DISTRICT

SN	Village	Taluka	District	Longitude	Latitude	Structure
1	Ajani Kh.	Ahmedpur	Latur	76.9402	18.6156	Checkdam
2	Ajani Kh.	Ahmedpur	Latur	76.9354	18.6262	Checkdam
3	Andhori	Ahmedpur	Latur	76.8301	18.7685	Checkdam
4	Andhori	Ahmedpur	Latur	76.8412	18.776	Checkdam
5	Belur	Ahmedpur	Latur	76.9386	18.6337	Checkdam
6	Belur	Ahmedpur	Latur	76.9348	18.6408	Checkdam
7	Brahampuri	Ahmedpur	Latur	76.8798	18.6586	Checkdam
8	Brahampuri	Ahmedpur	Latur	76.875	18.6668	Checkdam
9	Chikhali	Ahmedpur	Latur	76.8011	18.7365	Checkdam
10	Chikhali	Ahmedpur	Latur	76.8003	18.7421	Checkdam
11	Chilka	Ahmedpur	Latur	76.8951	18.7445	Checkdam
12	Devkara	Ahmedpur	Latur	76.7512	18.7395	Checkdam
13	Devkara	Ahmedpur	Latur	76.7461	18.7401	Checkdam
14	Dhalegaon	Ahmedpur	Latur	76.8655	18.7647	Checkdam
15	Dhalegaon	Ahmedpur	Latur	76.8786	18.7666	Checkdam
16	Dhalegaon	Ahmedpur	Latur	76.8605	18.7596	Checkdam
17	Dhalegaon	Ahmedpur	Latur	76.8559	18.7549	Checkdam
18	Dhaswadi	Ahmedpur	Latur	76.8551	18.7839	Checkdam
19	Dhaswadi	Ahmedpur	Latur	76.8667	18.7835	Checkdam
20	Dhaswadi	Ahmedpur	Latur	76.8686	18.8196	Checkdam
21	Dhaswadi	Ahmedpur	Latur	76.8627	18.8146	Checkdam
22	Gadewadi	Ahmedpur	Latur	76.991	18.5833	Checkdam
23	Gangahipparga	Ahmedpur	Latur	76.9469	18.7801	Checkdam
24	Gangahipparga	Ahmedpur	Latur	76.941	18.7873	Checkdam
25	Gangahipparga	Ahmedpur	Latur	76.9314	18.7903	Checkdam
26	Gangahipparga	Ahmedpur	Latur	76.9521	18.7839	Checkdam
27	Gangahipparga	Ahmedpur	Latur	76.9376	18.7702	Checkdam
28	Gangahipparga	Ahmedpur	Latur	76.9231	18.7897	Checkdam
29	Gothala	Ahmedpur	Latur	76.8949	18.6217	Checkdam
30	Gothala	Ahmedpur	Latur	76.8913	18.6352	Checkdam
31	Gothala	Ahmedpur	Latur	76.8845	18.6427	Checkdam
32	Guttewadi	Ahmedpur	Latur	76.794	18.7877	Checkdam
33	Guttewadi	Ahmedpur	Latur	76.8011	18.7899	Checkdam
34	Hadolti	Ahmedpur	Latur	77.0288	18.6382	Checkdam
35	Hadolti	Ahmedpur	Latur	77.0288	18.6465	Checkdam
36	Hadolti	Ahmedpur	Latur	77.0319	18.6529	Checkdam
37	Hadolti	Ahmedpur	Latur	77.0331	18.6461	Checkdam
38	Hadolti	Ahmedpur	Latur	77.0359	18.6397	Checkdam
39	Hadolti	Ahmedpur	Latur	77.0435	18.6571	Checkdam
40	Hagdal	Ahmedpur	Latur	76.9837	18.7331	Checkdam
41	Jamb	Ahmedpur	Latur	77.0047	18.6873	Checkdam
42	Kalegaon	Ahmedpur	Latur	76.9219	18.7293	Checkdam
43	Kaudgaon	Ahmedpur	Latur	77.0862	18.5881	Checkdam
44	Kendrewadi	Ahmedpur	Latur	76.8098	18.7271	Checkdam
45	Khandali	Ahmedpur	Latur	76.8937	18.7922	Checkdam
46	Khandali	Ahmedpur	Latur	76.8937	18.795	Checkdam
47	Kingaon	Ahmedpur	Latur	76.7685	18.7316	Checkdam
48	Kingaon	Ahmedpur	Latur	76.7596	18.7363	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
49	Kingaon	Ahmedpur	Latur	76.7828	18.7277	Checkdam
50	Kokanga	Ahmedpur	Latur	76.9747	18.6691	Checkdam
51	Kokanga	Ahmedpur	Latur	76.9739	18.6801	Checkdam
52	Kokanga	Ahmedpur	Latur	76.9737	18.6749	Checkdam
53	Kolwadi	Ahmedpur	Latur	76.7781	18.7651	Checkdam
54	Kolwadi	Ahmedpur	Latur	76.788	18.7702	Checkdam
55	Kolwadi	Ahmedpur	Latur	76.7836	18.7753	Checkdam
56	Kopra	Ahmedpur	Latur	76.817	18.7203	Checkdam
57	Kumtha Bk.	Ahmedpur	Latur	77.0703	18.5915	Checkdam
58	Makani	Ahmedpur	Latur	76.9719	18.5746	Checkdam
59	Makani	Ahmedpur	Latur	76.9644	18.5806	Checkdam
60	Makani	Ahmedpur	Latur	76.9551	18.5866	Checkdam
61	Makani	Ahmedpur	Latur	76.9529	18.5798	Checkdam
62	Mandri	Ahmedpur	Latur	76.9966	18.6623	Checkdam
63	Mangdari	Ahmedpur	Latur	77.0343	18.7624	Checkdam
64	Mawalgaon	Ahmedpur	Latur	76.8714	18.7241	Checkdam
65	Methi	Ahmedpur	Latur	76.9004	18.6202	Checkdam
66	Molwan	Ahmedpur	Latur	76.753	18.7647	Checkdam
67	Morechiwadi	Ahmedpur	Latur	76.9878	18.5916	Checkdam
68	Mulki	Ahmedpur	Latur	76.8885	18.6047	Checkdam
69	Nagzari	Ahmedpur	Latur	76.9203	18.8211	Checkdam
70	Nandura Bk.	Ahmedpur	Latur	76.9189	18.6385	Checkdam
71	Nandura Bk.	Ahmedpur	Latur	76.9173	18.6481	Checkdam
72	Nandura Bk.	Ahmedpur	Latur	76.9141	18.6562	Checkdam
73	Narwatwadi	Ahmedpur	Latur	76.8396	18.7974	Checkdam
74	Narwatwadi	Ahmedpur	Latur	76.8253	18.7901	Checkdam
75	Narwatwadi	Ahmedpur	Latur	76.8319	18.7941	Checkdam
76	Narwatwadi	Ahmedpur	Latur	76.8355	18.7995	Checkdam
77	Ralga	Ahmedpur	Latur	76.988	18.8121	Checkdam
78	Rui	Ahmedpur	Latur	76.9815	18.7959	Checkdam
79	Rui	Ahmedpur	Latur	76.9894	18.7914	Checkdam
80	Rui	Ahmedpur	Latur	76.9906	18.7997	Checkdam
81	Rui	Ahmedpur	Latur	76.9934	18.7869	Checkdam
82	Rui	Ahmedpur	Latur	76.9944	18.7744	Checkdam
83	Rui	Ahmedpur	Latur	76.9849	18.7759	Checkdam
84	Rui Tanda (N.V.)	Ahmedpur	Latur	76.9928	18.7671	Checkdam
85	Satala	Ahmedpur	Latur	76.7657	18.6654	Checkdam
86	Satala	Ahmedpur	Latur	76.763	18.6534	Checkdam
87	Sawargaon Rokda	Ahmedpur	Latur	76.8611	18.6593	Checkdam
88	Sawargaon Rokda	Ahmedpur	Latur	76.8561	18.631	Checkdam
89	Sawargaon Rokda	Ahmedpur	Latur	76.8591	18.6389	Checkdam
90	Shenni	Ahmedpur	Latur	76.9338	18.7466	Checkdam
91	Shenni	Ahmedpur	Latur	76.9437	18.7376	Checkdam
92	Shirur Tajband	Ahmedpur	Latur	76.9731	18.6379	Checkdam
93	Shirur Tajband	Ahmedpur	Latur	76.9747	18.6307	Checkdam
94	Shirur Tajband	Ahmedpur	Latur	76.9727	18.6529	Checkdam
95	Shirur Tajband	Ahmedpur	Latur	76.9713	18.6477	Checkdam
96	Shivankhed Kh.	Ahmedpur	Latur	77.0699	18.5621	Checkdam
97	Shivankhed Kh.	Ahmedpur	Latur	77.0655	18.5689	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
98	Sindgi Bk.	Ahmedpur	Latur	77.049	18.7267	Checkdam
99	Sindgi Bk.	Ahmedpur	Latur	77.0423	18.7331	Checkdam
100	Sindgi Bk.	Ahmedpur	Latur	77.0387	18.7282	Checkdam
101	Sindgi Bk.	Ahmedpur	Latur	77.0254	18.7436	Checkdam
102	Sumthana	Ahmedpur	Latur	76.9161	18.7685	Checkdam
103	Takalgaon (Kam)	Ahmedpur	Latur	76.8335	18.6455	Checkdam
104	Takalgaon (Kam)	Ahmedpur	Latur	76.8245	18.6382	Checkdam
105	Takalgaon (Kam)	Ahmedpur	Latur	76.8243	18.6425	Checkdam
106	Thodga	Ahmedpur	Latur	76.9646	18.727	Checkdam
107	Thodga	Ahmedpur	Latur	76.968	18.7304	Checkdam
108	Tirth	Ahmedpur	Latur	77.0085	18.6924	Checkdam
109	Tirth	Ahmedpur	Latur	77.0164	18.7049	Checkdam
110	Ujana	Ahmedpur	Latur	76.9493	18.7963	Checkdam
111	Ujana	Ahmedpur	Latur	76.9259	18.8283	Checkdam
112	Ujana	Ahmedpur	Latur	76.9312	18.8309	Checkdam
113	Umarga Kort	Ahmedpur	Latur	76.8973	18.6096	Checkdam
114	Unni	Ahmedpur	Latur	77.0037	18.6751	Checkdam
115	Wadarwadi (N.V.)	Ahmedpur	Latur	76.9531	18.826	Checkdam
116	Wadarwadi (N.V.)	Ahmedpur	Latur	76.9628	18.8279	Checkdam
117	Waigaon	Ahmedpur	Latur	77.0188	18.5837	Checkdam
118	Waigaon	Ahmedpur	Latur	77.0121	18.5931	Checkdam
119	Wairagadh	Ahmedpur	Latur	76.8512	18.7244	Checkdam
120	Walsangi	Ahmedpur	Latur	77.0113	18.6315	Checkdam
121	Walsangi	Ahmedpur	Latur	77.0033	18.6318	Checkdam
122	Wanjarwadi	Ahmedpur	Latur	76.8877	18.7726	Checkdam
123	Wanjarwadi	Ahmedpur	Latur	76.8917	18.7801	Checkdam
124	Wanjarwadi	Ahmedpur	Latur	76.8794	18.7737	Checkdam
125	Warwanti	Ahmedpur	Latur	76.999	18.7512	Checkdam
126	Warwanti Tanda (N.V.)	Ahmedpur	Latur	77.0037	18.7598	Checkdam
127	Warwanti Tanda (N.V.)	Ahmedpur	Latur	77.0065	18.7685	Checkdam
128	Yeldarwadi	Ahmedpur	Latur	76.8363	18.8053	Checkdam
129	Yertar	Ahmedpur	Latur	76.8879	18.7504	Checkdam
130	Almala	Ausa	Latur	76.463	18.288	Checkdam
131	Almala	Ausa	Latur	76.464	18.294	Checkdam
132	Almala	Ausa	Latur	76.464	18.300	Checkdam
133	Almala	Ausa	Latur	76.481	18.303	Checkdam
134	Anandwadi	Ausa	Latur	76.697	18.137	Checkdam
135	Andora	Ausa	Latur	76.330	18.265	Checkdam
136	Andora	Ausa	Latur	76.335	18.276	Checkdam
137	Apchunda	Ausa	Latur	76.607	18.201	Checkdam
138	Apchunda	Ausa	Latur	76.600	18.200	Checkdam
139	Apchunda	Ausa	Latur	76.605	18.221	Checkdam
140	Apchunda	Ausa	Latur	76.615	18.216	Checkdam
141	Ashiv	Ausa	Latur	76.348	18.118	Checkdam
142	AUSA	Ausa	Latur	76.470	18.250	Checkdam
143	AUSA	Ausa	Latur	76.481	18.257	Checkdam
144	AUSA	Ausa	Latur	76.489	18.262	Checkdam
145	AUSA	Ausa	Latur	76.514	18.264	Checkdam
146	AUSA	Ausa	Latur	76.520	18.254	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
147	AUSA	Ausa	Latur	76.490	18.281	Checkdam
148	Ausa (Rural)	Ausa	Latur	76.464	18.245	Checkdam
149	Banegaon	Ausa	Latur	76.523	18.086	Checkdam
150	Banegaon	Ausa	Latur	76.511	18.083	Checkdam
151	Belkund	Ausa	Latur	76.387	18.153	Checkdam
152	Belkund	Ausa	Latur	76.396	18.162	Checkdam
153	Belkund	Ausa	Latur	76.400	18.170	Checkdam
154	Belkund	Ausa	Latur	76.400	18.149	Checkdam
155	Bhada	Ausa	Latur	76.381	18.256	Checkdam
156	Bhada	Ausa	Latur	76.385	18.263	Checkdam
157	Bhada	Ausa	Latur	76.390	18.273	Checkdam
158	Bhada	Ausa	Latur	76.395	18.281	Checkdam
159	Bhada	Ausa	Latur	76.405	18.289	Checkdam
160	Bhada	Ausa	Latur	76.411	18.298	Checkdam
161	Bhada	Ausa	Latur	76.385	18.246	Checkdam
162	Bhada	Ausa	Latur	76.378	18.250	Checkdam
163	Bheta	Ausa	Latur	76.336	18.304	Checkdam
164	Bheta	Ausa	Latur	76.332	18.300	Checkdam
165	Bheta	Ausa	Latur	76.326	18.296	Checkdam
166	Bhusani	Ausa	Latur	76.656	18.330	Checkdam
167	Birawali	Ausa	Latur	76.337	18.179	Checkdam
168	Birawali	Ausa	Latur	76.335	18.188	Checkdam
169	Birawali	Ausa	Latur	76.326	18.187	Checkdam
170	Birawali	Ausa	Latur	76.318	18.193	Checkdam
171	Birawali	Ausa	Latur	76.310	18.195	Checkdam
172	Borgaon	Ausa	Latur	76.376	18.305	Checkdam
173	Borgaon	Ausa	Latur	76.367	18.306	Checkdam
174	Borgaon	Ausa	Latur	76.360	18.303	Checkdam
175	Borgaon	Ausa	Latur	76.355	18.298	Checkdam
176	Borgaon	Ausa	Latur	76.357	18.290	Checkdam
177	Borgaon	Ausa	Latur	76.350	18.290	Checkdam
178	Borgaon	Ausa	Latur	76.374	18.301	Checkdam
179	Borphal	Ausa	Latur	76.453	18.213	Checkdam
180	Borphal	Ausa	Latur	76.463	18.215	Checkdam
181	Borphal	Ausa	Latur	76.478	18.197	Checkdam
182	Budhada	Ausa	Latur	76.525	18.280	Checkdam
183	Budhada	Ausa	Latur	76.527	18.286	Checkdam
184	Budhada	Ausa	Latur	76.529	18.292	Checkdam
185	Budhada	Ausa	Latur	76.530	18.299	Checkdam
186	Budhada	Ausa	Latur	76.532	18.303	Checkdam
187	Budhada	Ausa	Latur	76.533	18.310	Checkdam
188	Budhada	Ausa	Latur	76.545	18.321	Checkdam
189	Chalburga	Ausa	Latur	76.583	18.199	Checkdam
190	Chincholi Kajale	Ausa	Latur	76.351	18.130	Checkdam
191	Chincholi Kajale	Ausa	Latur	76.355	18.135	Checkdam
192	Dapegaon	Ausa	Latur	76.486	18.153	Checkdam
193	Dapegaon	Ausa	Latur	76.505	18.146	Checkdam
194	Dhanora	Ausa	Latur	76.628	18.341	Checkdam
195	Fattepur	Ausa	Latur	76.517	18.196	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
196	Fattepur	Ausa	Latur	76.521	18.193	Checkdam
197	Gadhawewadi	Ausa	Latur	76.536	18.149	Checkdam
198	Ganjankheda	Ausa	Latur	76.499	18.044	Checkdam
199	Ganjankheda	Ausa	Latur	76.512	18.064	Checkdam
200	Gondri	Ausa	Latur	76.647	18.319	Checkdam
201	Gondri	Ausa	Latur	76.652	18.326	Checkdam
202	Gulkheda	Ausa	Latur	76.390	18.184	Checkdam
203	Gulkheda	Ausa	Latur	76.374	18.186	Checkdam
204	Haldurg	Ausa	Latur	76.432	18.270	Checkdam
205	Haldurg	Ausa	Latur	76.432	18.261	Checkdam
206	Haldurg	Ausa	Latur	76.427	18.252	Checkdam
207	Haregaon	Ausa	Latur	76.477	18.106	Checkdam
208	Haregaon	Ausa	Latur	76.491	18.099	Checkdam
209	Hasala	Ausa	Latur	76.564	18.316	Checkdam
210	Hasalgaon	Ausa	Latur	76.440	18.076	Checkdam
211	Hasalgaon	Ausa	Latur	76.438	18.065	Checkdam
212	Hasalgaon	Ausa	Latur	76.439	18.054	Checkdam
213	Hasegaon	Ausa	Latur	76.601	18.290	Checkdam
214	Hasegaon	Ausa	Latur	76.604	18.304	Checkdam
215	Hasegaon	Ausa	Latur	76.609	18.299	Checkdam
216	Hasegaon	Ausa	Latur	76.597	18.308	Checkdam
217	Hasegaon	Ausa	Latur	76.602	18.303	Checkdam
218	Hasegaon	Ausa	Latur	76.629	18.324	Checkdam
219	Hasegaon	Ausa	Latur	76.628	18.334	Checkdam
220	Hasegaonwadi	Ausa	Latur	76.610	18.273	Checkdam
221	Hipparga	Ausa	Latur	76.402	18.126	Checkdam
222	Hipparga	Ausa	Latur	76.411	18.132	Checkdam
223	Hipparga	Ausa	Latur	76.416	18.138	Checkdam
224	Holi	Ausa	Latur	76.689	18.309	Checkdam
225	Jau	Ausa	Latur	76.705	18.130	Checkdam
226	Jawalga P.O.	Ausa	Latur	76.501	18.135	Checkdam
227	Jawli	Ausa	Latur	76.606	18.173	Checkdam
228	Jawli	Ausa	Latur	76.608	18.183	Checkdam
229	Kalmata	Ausa	Latur	76.397	18.310	Checkdam
230	Kalmata	Ausa	Latur	76.386	18.309	Checkdam
231	Kalmata	Ausa	Latur	76.420	18.300	Checkdam
232	Kanheri	Ausa	Latur	76.572	18.233	Checkdam
233	Karajgaon	Ausa	Latur	76.549	18.215	Checkdam
234	Karajgaon	Ausa	Latur	76.542	18.219	Checkdam
235	Karajgaon	Ausa	Latur	76.549	18.223	Checkdam
236	Karla	Ausa	Latur	76.614	18.070	Checkdam
237	Karla	Ausa	Latur	76.613	18.081	Checkdam
238	Karla	Ausa	Latur	76.624	18.075	Checkdam
239	Karla	Ausa	Latur	76.630	18.085	Checkdam
240	Karla	Ausa	Latur	76.632	18.097	Checkdam
241	Kawali	Ausa	Latur	76.417	18.115	Checkdam
242	Khuntegaon	Ausa	Latur	76.595	18.297	Checkdam
243	Khuntegaon	Ausa	Latur	76.593	18.308	Checkdam
244	Killari	Ausa	Latur	76.586	18.057	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
245	Kininawre	Ausa	Latur	76.639	18.168	Checkdam
246	Kininawre	Ausa	Latur	76.640	18.180	Checkdam
247	Kinithot	Ausa	Latur	76.637	18.223	Checkdam
248	Kinithot	Ausa	Latur	76.632	18.231	Checkdam
249	Kinithot	Ausa	Latur	76.632	18.239	Checkdam
250	Kinithot	Ausa	Latur	76.623	18.247	Checkdam
251	Korangla	Ausa	Latur	76.421	18.240	Checkdam
252	Kumtha	Ausa	Latur	76.662	18.083	Checkdam
253	Kumtha	Ausa	Latur	76.658	18.095	Checkdam
254	Lakhangaon	Ausa	Latur	76.437	18.284	Checkdam
255	Lamjana	Ausa	Latur	76.567	18.159	Checkdam
256	Lamjana	Ausa	Latur	76.577	18.111	Checkdam
257	Limbala Dau	Ausa	Latur	76.486	18.074	Checkdam
258	Limbala Dau	Ausa	Latur	76.498	18.050	Checkdam
259	Limbala Dau	Ausa	Latur	76.503	18.071	Checkdam
260	Lodga	Ausa	Latur	76.674	18.318	Checkdam
261	Lodga	Ausa	Latur	76.681	18.304	Checkdam
262	Malkondji	Ausa	Latur	76.454	18.112	Checkdam
263	Malkondji	Ausa	Latur	76.453	18.126	Checkdam
264	Malubra	Ausa	Latur	76.451	18.139	Checkdam
265	Mangrul	Ausa	Latur	76.503	18.031	Checkdam
266	Masalga Kh.	Ausa	Latur	76.465	18.138	Checkdam
267	Masalga Kh.	Ausa	Latur	76.476	18.135	Checkdam
268	Masalga Kh.	Ausa	Latur	76.468	18.121	Checkdam
269	Matola	Ausa	Latur	76.405	18.091	Checkdam
270	Matola	Ausa	Latur	76.420	18.099	Checkdam
271	Matola	Ausa	Latur	76.426	18.103	Checkdam
272	Matola	Ausa	Latur	76.403	18.102	Checkdam
273	Mogarga	Ausa	Latur	76.608	18.107	Checkdam
274	Mogarga	Ausa	Latur	76.614	18.115	Checkdam
275	Mogarga	Ausa	Latur	76.637	18.108	Checkdam
276	Mugalewadi	Ausa	Latur	76.609	18.195	Checkdam
277	Nagarsoga	Ausa	Latur	76.491	18.179	Checkdam
278	Nagarsoga	Ausa	Latur	76.512	18.187	Checkdam
279	Nagarsoga	Ausa	Latur	76.493	18.166	Checkdam
280	Nagarsoga	Ausa	Latur	76.500	18.173	Checkdam
281	Nagarsoga	Ausa	Latur	76.508	18.180	Checkdam
282	Nagarsoga	Ausa	Latur	76.510	18.157	Checkdam
283	Nanand	Ausa	Latur	76.707	18.109	Checkdam
284	Pardhewadi	Ausa	Latur	76.611	18.095	Checkdam
285	Ringni	Ausa	Latur	76.353	18.184	Checkdam
286	Ringni	Ausa	Latur	76.355	18.193	Checkdam
287	Ringni	Ausa	Latur	76.358	18.203	Checkdam
288	Ringni	Ausa	Latur	76.366	18.185	Checkdam
289	Ringni	Ausa	Latur	76.375	18.194	Checkdam
290	Ringni	Ausa	Latur	76.380	18.202	Checkdam
291	Samdarga	Ausa	Latur	76.423	18.244	Checkdam
292	Samdarga	Ausa	Latur	76.434	18.239	Checkdam
293	Sarni	Ausa	Latur	76.440	18.045	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
294	Sarola	Ausa	Latur	76.569	18.249	Checkdam
295	Sarola	Ausa	Latur	76.568	18.242	Checkdam
296	Sarola	Ausa	Latur	76.588	18.255	Checkdam
297	Sarola	Ausa	Latur	76.586	18.273	Checkdam
298	Sarola	Ausa	Latur	76.589	18.284	Checkdam
299	Sarola	Ausa	Latur	76.597	18.277	Checkdam
300	Sarola	Ausa	Latur	76.600	18.267	Checkdam
301	Sarola	Ausa	Latur	76.602	18.281	Checkdam
302	Sarola	Ausa	Latur	76.606	18.278	Checkdam
303	Sarola	Ausa	Latur	76.607	18.258	Checkdam
304	Sarola	Ausa	Latur	76.597	18.252	Checkdam
305	Satdharwadi	Ausa	Latur	76.459	18.271	Checkdam
306	Satdharwadi	Ausa	Latur	76.460	18.276	Checkdam
307	Satdharwadi	Ausa	Latur	76.461	18.282	Checkdam
308	Satdharwadi Laman Tand	Ausa	Latur	76.456	18.265	Checkdam
309	Selu	Ausa	Latur	76.543	18.266	Checkdam
310	Selu	Ausa	Latur	76.547	18.274	Checkdam
311	Selu	Ausa	Latur	76.550	18.282	Checkdam
312	Selu	Ausa	Latur	76.556	18.294	Checkdam
313	Selu	Ausa	Latur	76.556	18.300	Checkdam
314	Selu	Ausa	Latur	76.560	18.308	Checkdam
315	Selu	Ausa	Latur	76.557	18.307	Checkdam
316	Shivani Bk.	Ausa	Latur	76.666	18.332	Checkdam
317	Shivli	Ausa	Latur	76.329	18.223	Checkdam
318	Shivli	Ausa	Latur	76.333	18.230	Checkdam
319	Shivli	Ausa	Latur	76.335	18.212	Checkdam
320	Shivli	Ausa	Latur	76.347	18.222	Checkdam
321	Shivli	Ausa	Latur	76.354	18.230	Checkdam
322	Shivli	Ausa	Latur	76.335	18.202	Checkdam
323	Shivli	Ausa	Latur	76.324	18.198	Checkdam
324	Shivli	Ausa	Latur	76.318	18.205	Checkdam
325	Shivli	Ausa	Latur	76.311	18.217	Checkdam
326	Sindala Jagir	Ausa	Latur	76.568	18.321	Checkdam
327	Sindala Jagir	Ausa	Latur	76.573	18.324	Checkdam
328	Sindala Lohara	Ausa	Latur	76.432	18.183	Checkdam
329	Sindala Lohara	Ausa	Latur	76.431	18.193	Checkdam
330	Sindala Lohara	Ausa	Latur	76.434	18.169	Checkdam
331	Sindala Lohara	Ausa	Latur	76.437	18.177	Checkdam
332	Sindala Lohara	Ausa	Latur	76.431	18.178	Checkdam
333	Sindala Lohara	Ausa	Latur	76.422	18.184	Checkdam
334	Sindalwadi	Ausa	Latur	76.430	18.201	Checkdam
335	Talani Laman Tanda (N.	Ausa	Latur	76.532	18.091	Checkdam
336	Talani Laman Tanda (N.	Ausa	Latur	76.540	18.099	Checkdam
337	Tavshi Tad	Ausa	Latur	76.390	18.131	Checkdam
338	Tavshi Tad	Ausa	Latur	76.389	18.142	Checkdam
339	Tavshi Tad	Ausa	Latur	76.392	18.146	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
340	Ujani	Ausa	Latur	76.286	18.133	Checkdam
341	Ujani	Ausa	Latur	76.290	18.143	Checkdam
342	Umbadga Kh.	Ausa	Latur	76.501	18.279	Checkdam
343	Umbadga Kh.	Ausa	Latur	76.504	18.286	Checkdam
344	Uti Bk.	Ausa	Latur	76.449	18.301	Checkdam
345	Uti Bk.	Ausa	Latur	76.443	18.295	Checkdam
346	Utka	Ausa	Latur	76.549	18.175	Checkdam
347	Utka	Ausa	Latur	76.546	18.165	Checkdam
348	Utka	Ausa	Latur	76.554	18.141	Checkdam
349	Wadji	Ausa	Latur	76.356	18.277	Checkdam
350	Wadji	Ausa	Latur	76.356	18.265	Checkdam
351	Wadji	Ausa	Latur	76.343	18.283	Checkdam
352	Wagholi	Ausa	Latur	76.567	18.199	Checkdam
353	Wagholi	Ausa	Latur	76.569	18.204	Checkdam
354	Wagjewadi	Ausa	Latur	76.509	18.271	Checkdam
355	Warwada	Ausa	Latur	76.365	18.214	Checkdam
356	Yakatpur	Ausa	Latur	76.552	18.232	Checkdam
357	Yakatpur	Ausa	Latur	76.554	18.237	Checkdam
358	Yakatpur	Ausa	Latur	76.559	18.242	Checkdam
359	Yekambi	Ausa	Latur	76.295	18.168	Checkdam
360	Yekambi	Ausa	Latur	76.294	18.158	Checkdam
361	Yekambi	Ausa	Latur	76.293	18.152	Checkdam
362	Yekambiwadi (N.V.)	Ausa	Latur	76.296	18.180	Checkdam
363	Yeli	Ausa	Latur	76.663	18.235	Checkdam
364	Yelori	Ausa	Latur	76.384	18.212	Checkdam
365	Yelori	Ausa	Latur	76.386	18.203	Checkdam
366	Yelori	Ausa	Latur	76.391	18.207	Checkdam
367	Yelori	Ausa	Latur	76.398	18.213	Checkdam
368	Yelori	Ausa	Latur	76.397	18.205	Checkdam
369	Yelori	Ausa	Latur	76.389	18.200	Checkdam
370	Yerandi	Ausa	Latur	76.584	18.266	Checkdam
371	Ajansonda Bk.	Chakur	Latur	76.946	18.545	Checkdam
372	Ajansonda Bk.	Chakur	Latur	76.958	18.556	Checkdam
373	Ajansonda Bk.	Chakur	Latur	76.966	18.564	Checkdam
374	Ashta	Chakur	Latur	76.763	18.460	Checkdam
375	Ashta	Chakur	Latur	76.761	18.455	Checkdam
376	Ashta	Chakur	Latur	76.759	18.445	Checkdam
377	Ashta	Chakur	Latur	76.755	18.435	Checkdam
378	Atola	Chakur	Latur	76.863	18.437	Checkdam
379	Belgaon	Chakur	Latur	76.794	18.620	Checkdam
380	Belgaon	Chakur	Latur	76.810	18.630	Checkdam
381	Bolegaon	Chakur	Latur	76.849	18.433	Checkdam
382	Bolegaon	Chakur	Latur	76.862	18.445	Checkdam
383	Borgaon Bk	Chakur	Latur	76.965	18.533	Checkdam
384	Bothi	Chakur	Latur	76.925	18.495	Checkdam
385	Bothi	Chakur	Latur	76.932	18.506	Checkdam
386	Brahmawadi (N.V.)	Chakur	Latur	76.789	18.572	Checkdam
387	Chakur	Chakur	Latur	76.871	18.499	Checkdam
388	Chakur	Chakur	Latur	76.871	18.511	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
389	Devangra	Chakur	Latur	76.764	18.415	Checkdam
390	Dongraj	Chakur	Latur	77.002	18.465	Checkdam
391	Dongraj	Chakur	Latur	77.002	18.476	Checkdam
392	Ganjur	Chakur	Latur	76.724	18.473	Checkdam
393	Ganjur	Chakur	Latur	76.740	18.482	Checkdam
394	Gharola	Chakur	Latur	76.797	18.494	Checkdam
395	Hadoli	Chakur	Latur	76.784	18.635	Checkdam
396	Hali Kh.	Chakur	Latur	76.837	18.557	Checkdam
397	Himpalner	Chakur	Latur	76.846	18.575	Checkdam
398	Jadhala	Chakur	Latur	76.795	18.642	Checkdam
399	Janwal	Chakur	Latur	76.784	18.568	Checkdam
400	Janwal	Chakur	Latur	76.785	18.562	Checkdam
401	Kawathali	Chakur	Latur	76.722	18.523	Checkdam
402	Kawathali	Chakur	Latur	76.718	18.537	Checkdam
403	Mahalangra	Chakur	Latur	76.729	18.441	Checkdam
404	Mahalangrawadi	Chakur	Latur	76.743	18.424	Checkdam
405	Mahalungi	Chakur	Latur	76.771	18.610	Checkdam
406	Mahalungi	Chakur	Latur	76.785	18.614	Checkdam
407	Mahalungi	Chakur	Latur	76.756	18.599	Checkdam
408	Mahalungi	Chakur	Latur	76.753	18.606	Checkdam
409	Mahalungi	Chakur	Latur	76.751	18.593	Checkdam
410	Mandurki	Chakur	Latur	76.913	18.476	Checkdam
411	Murambi	Chakur	Latur	76.721	18.408	Checkdam
412	Murambi	Chakur	Latur	76.724	18.421	Checkdam
413	Nagadarwadi	Chakur	Latur	76.980	18.534	Checkdam
414	Nageshwadi	Chakur	Latur	76.904	18.457	Checkdam
415	Nalegaon	Chakur	Latur	76.839	18.430	Checkdam
416	Raiwadi	Chakur	Latur	76.745	18.589	Checkdam
417	Ramwadi (N.V.)	Chakur	Latur	76.762	18.584	Checkdam
418	Shelgaon	Chakur	Latur	77.002	18.507	Checkdam
419	Shrinal	Chakur	Latur	76.926	18.523	Checkdam
420	Sugaon	Chakur	Latur	76.734	18.417	Checkdam
421	Sugaon	Chakur	Latur	76.731	18.406	Checkdam
422	Sugaon	Chakur	Latur	76.749	18.412	Checkdam
423	Ujalamb	Chakur	Latur	76.901	18.435	Checkdam
424	Ujalamb	Chakur	Latur	76.899	18.446	Checkdam
425	Ujalamb	Chakur	Latur	76.908	18.443	Checkdam
426	Ujalamb	Chakur	Latur	76.923	18.449	Checkdam
427	Wadwal Nagnath	Chakur	Latur	76.813	18.524	Checkdam
428	Wadwal Nagnath	Chakur	Latur	76.812	18.532	Checkdam
429	Wadwal Nagnath	Chakur	Latur	76.807	18.544	Checkdam
430	Wadwal Nagnath	Chakur	Latur	76.798	18.539	Checkdam
431	Zari Kh.	Chakur	Latur	76.799	18.578	Checkdam
432	Kawathala	Deoni	Latur	76.9402	18.2609	Checkdam
433	Atnoor	Jalkot	Latur	77.2641	18.5329	Checkdam
434	Atnoor	Jalkot	Latur	77.2696	18.5311	Checkdam
435	Atnoor	Jalkot	Latur	77.2661	18.5531	Checkdam
436	Atnoor	Jalkot	Latur	77.2602	18.5389	Checkdam
437	Atnoor	Jalkot	Latur	77.2582	18.5464	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
438	Chera	Jalkot	Latur	77.1018	18.6634	Checkdam
439	Chincholi	Jalkot	Latur	77.2307	18.524	Checkdam
440	Dhamangaon	Jalkot	Latur	77.121	18.6295	Checkdam
441	Dhamangaon	Jalkot	Latur	77.1171	18.6347	Checkdam
442	Dhamangaon	Jalkot	Latur	77.1269	18.6313	Checkdam
443	Dhorsangvi	Jalkot	Latur	77.0982	18.5915	Checkdam
444	Dhorsangvi	Jalkot	Latur	77.1069	18.5937	Checkdam
445	Domgaon	Jalkot	Latur	77.0912	18.6321	Checkdam
446	Domgaon	Jalkot	Latur	77.0786	18.6291	Checkdam
447	Gawhan	Jalkot	Latur	77.279	18.5426	Checkdam
448	Gawhan	Jalkot	Latur	77.272	18.5367	Checkdam
449	Ghonsi	Jalkot	Latur	77.1635	18.527	Checkdam
450	Ghonsi	Jalkot	Latur	77.1741	18.5303	Checkdam
451	Ghonsi	Jalkot	Latur	77.1808	18.5188	Checkdam
452	Ghonsi	Jalkot	Latur	77.1824	18.5307	Checkdam
453	Gutti	Jalkot	Latur	77.1985	18.5285	Checkdam
454	Gutti	Jalkot	Latur	77.2232	18.5165	Checkdam
455	Haladwadona	Jalkot	Latur	77.2224	18.6064	Checkdam
456	Haladwadona	Jalkot	Latur	77.2079	18.6052	Checkdam
457	Hawarga	Jalkot	Latur	77.0884	18.6243	Checkdam
458	Hawarga	Jalkot	Latur	77.0813	18.6239	Checkdam
459	Hawarga	Jalkot	Latur	77.0892	18.6153	Checkdam
460	Hokarna	Jalkot	Latur	77.1438	18.6824	Checkdam
461	Hokarna	Jalkot	Latur	77.1375	18.6869	Checkdam
462	Hokarna	Jalkot	Latur	77.1305	18.6828	Checkdam
463	Jagalpur Bk.	Jalkot	Latur	77.0672	18.6239	Checkdam
464	Jalkot	Jalkot	Latur	77.1804	18.6302	Checkdam
465	Jalkot	Jalkot	Latur	77.1827	18.6332	Checkdam
466	Jalkot	Jalkot	Latur	77.1945	18.6257	Checkdam
467	Jalkot	Jalkot	Latur	77.2016	18.6228	Checkdam
468	Jirga	Jalkot	Latur	77.1006	18.6209	Checkdam
469	Karanji	Jalkot	Latur	77.1375	18.59	Checkdam
470	Kekat Sindagi	Jalkot	Latur	77.1698	18.6943	Checkdam
471	Konali Dongar	Jalkot	Latur	77.1552	18.571	Checkdam
472	Kunki	Jalkot	Latur	77.1289	18.6198	Checkdam
473	Kunki	Jalkot	Latur	77.1411	18.6257	Checkdam
474	Kunki	Jalkot	Latur	77.1466	18.631	Checkdam
475	Malihapparga	Jalkot	Latur	77.1996	18.5635	Checkdam
476	Malihapparga	Jalkot	Latur	77.1875	18.5769	Checkdam
477	Malihapparga	Jalkot	Latur	77.1824	18.5888	Checkdam
478	Malihapparga	Jalkot	Latur	77.2248	18.5784	Checkdam
479	Mangrul	Jalkot	Latur	77.132	18.5467	Checkdam
480	Marsangvi	Jalkot	Latur	77.2378	18.5799	Checkdam
481	Marsangvi	Jalkot	Latur	77.2327	18.5579	Checkdam
482	Marsangvi	Jalkot	Latur	77.2338	18.5683	Checkdam
483	Marsangvi	Jalkot	Latur	77.2519	18.5672	Checkdam
484	Marsangvi	Jalkot	Latur	77.2421	18.5639	Checkdam
485	Marsangvi	Jalkot	Latur	77.2256	18.568	Checkdam
486	Mewapur	Jalkot	Latur	77.25	18.5143	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
487	Mewapur	Jalkot	Latur	77.2606	18.5199	Checkdam
488	Patoda Bk.	Jalkot	Latur	77.1635	18.6067	Checkdam
489	Patoda Kh.	Jalkot	Latur	77.1906	18.5672	Checkdam
490	Ravankola	Jalkot	Latur	77.2354	18.5974	Checkdam
491	Ravankola	Jalkot	Latur	77.2468	18.5847	Checkdam
492	Ravankola	Jalkot	Latur	77.2405	18.5997	Checkdam
493	Sheldara	Jalkot	Latur	77.0801	18.6764	Checkdam
494	Sheldara	Jalkot	Latur	77.0864	18.679	Checkdam
495	Sonwala	Jalkot	Latur	77.1218	18.5728	Checkdam
496	Sorga	Jalkot	Latur	77.0927	18.6854	Checkdam
497	Sulhali	Jalkot	Latur	77.2201	18.5378	Checkdam
498	Umarga Retu	Jalkot	Latur	77.0801	18.6638	Checkdam
499	Umarga Retu	Jalkot	Latur	77.0766	18.6608	Checkdam
500	Umarga Retu	Jalkot	Latur	77.0739	18.666	Checkdam
501	Viral	Jalkot	Latur	77.1312	18.597	Checkdam
502	Wadgaon	Jalkot	Latur	77.1077	18.6828	Checkdam
503	Wanjarwada	Jalkot	Latur	77.1301	18.6626	Checkdam
504	Wanjarwada	Jalkot	Latur	77.1187	18.663	Checkdam
505	Wanjarwada	Jalkot	Latur	77.1159	18.6582	Checkdam
506	Wanjarwada	Jalkot	Latur	77.1128	18.6723	Checkdam
507	Wanjarwada	Jalkot	Latur	77.132	18.6433	Checkdam
508	Wanjarwada	Jalkot	Latur	77.1143	18.669	Checkdam
509	Akharwai	Latur	Latur	76.463	18.430	Checkdam
510	Akharwai	Latur	Latur	76.455	18.432	Checkdam
511	Akoli	Latur	Latur	76.461	18.359	Checkdam
512	Akoli	Latur	Latur	76.447	18.359	Checkdam
513	Akoli	Latur	Latur	76.453	18.345	Checkdam
514	Akoli	Latur	Latur	76.457	18.334	Checkdam
515	Akoli	Latur	Latur	76.443	18.369	Checkdam
516	Babhalgaon	Latur	Latur	76.626	18.375	Checkdam
517	Babhalgaon	Latur	Latur	76.644	18.370	Checkdam
518	Bamni	Latur	Latur	76.682	18.464	Checkdam
519	Bamni	Latur	Latur	76.691	18.464	Checkdam
520	Bamni	Latur	Latur	76.685	18.476	Checkdam
521	Bamni	Latur	Latur	76.695	18.485	Checkdam
522	Bhadi	Latur	Latur	76.709	18.456	Checkdam
523	Bhatangali	Latur	Latur	76.681	18.435	Checkdam
524	Bhatangali	Latur	Latur	76.683	18.443	Checkdam
525	Bhatangali	Latur	Latur	76.695	18.443	Checkdam
526	Bhatkheda	Latur	Latur	76.662	18.420	Checkdam
527	Bhatkheda	Latur	Latur	76.654	18.428	Checkdam
528	Bhosa	Latur	Latur	76.273	18.514	Checkdam
529	Bhosa	Latur	Latur	76.271	18.505	Checkdam
530	Bhuisamudraga	Latur	Latur	76.478	18.461	Checkdam
531	Bhuisamudraga	Latur	Latur	76.474	18.455	Checkdam
532	Bhuisamudraga	Latur	Latur	76.466	18.445	Checkdam
533	Bokangaon	Latur	Latur	76.701	18.327	Checkdam
534	Bopala	Latur	Latur	76.386	18.345	Checkdam
535	Borgaon Bk.	Latur	Latur	76.336	18.411	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
536	Borgaon Bk.	Latur	Latur	76.306	18.408	Checkdam
537	Borgaon Bk.	Latur	Latur	76.311	18.406	Checkdam
538	Bori	Latur	Latur	76.711	18.352	Checkdam
539	Bori	Latur	Latur	76.706	18.355	Checkdam
540	Bori	Latur	Latur	76.707	18.370	Checkdam
541	Bori	Latur	Latur	76.708	18.379	Checkdam
542	Borwati	Latur	Latur	76.590	18.434	Checkdam
543	Chata	Latur	Latur	76.382	18.367	Checkdam
544	Chata	Latur	Latur	76.384	18.354	Checkdam
545	Chata	Latur	Latur	76.404	18.387	Checkdam
546	Chincholi Ballalnath	Latur	Latur	76.357	18.459	Checkdam
547	Chincholi Ballalnath	Latur	Latur	76.349	18.462	Checkdam
548	Chincholi Ballalnath	Latur	Latur	76.352	18.449	Checkdam
549	Chincholi Ballalnath	Latur	Latur	76.361	18.443	Checkdam
550	Chincholi Ballalnath	Latur	Latur	76.363	18.448	Checkdam
551	Chincholi Rao	Latur	Latur	76.472	18.341	Checkdam
552	Chincholi Rao	Latur	Latur	76.474	18.334	Checkdam
553	Chincholi Raowadi	Latur	Latur	76.465	18.352	Checkdam
554	Dagadwadi	Latur	Latur	76.721	18.350	Checkdam
555	Dhoki	Latur	Latur	76.377	18.493	Checkdam
556	Dhoki	Latur	Latur	76.392	18.483	Checkdam
557	Dhoki	Latur	Latur	76.388	18.488	Checkdam
558	Dhoki	Latur	Latur	76.387	18.495	Checkdam
559	Gadhawad	Latur	Latur	76.339	18.524	Checkdam
560	Gadhawad	Latur	Latur	76.327	18.513	Checkdam
561	Gadhawad	Latur	Latur	76.326	18.527	Checkdam
562	Gadhawad	Latur	Latur	76.313	18.507	Checkdam
563	Gadhawad	Latur	Latur	76.310	18.522	Checkdam
564	Gangapur	Latur	Latur	76.522	18.339	Checkdam
565	Gangapur	Latur	Latur	76.523	18.350	Checkdam
566	Gangapur	Latur	Latur	76.515	18.333	Checkdam
567	Gangapur	Latur	Latur	76.508	18.343	Checkdam
568	Gategaon	Latur	Latur	76.391	18.407	Checkdam
569	Gategaon	Latur	Latur	76.397	18.416	Checkdam
570	Gategaon	Latur	Latur	76.404	18.423	Checkdam
571	Gategaon	Latur	Latur	76.409	18.429	Checkdam
572	Gategaon	Latur	Latur	76.416	18.436	Checkdam
573	Gategaon	Latur	Latur	76.401	18.441	Checkdam
574	Gategaon	Latur	Latur	76.412	18.444	Checkdam
575	Gondegaon	Latur	Latur	76.363	18.426	Checkdam
576	Gondegaon	Latur	Latur	76.360	18.435	Checkdam
577	Gumphawadi	Latur	Latur	76.267	18.377	Checkdam
578	Harangul Bk.	Latur	Latur	76.482	18.394	Checkdam
579	Harangul Bk.	Latur	Latur	76.487	18.400	Checkdam
580	Harangul Bk.	Latur	Latur	76.482	18.407	Checkdam
581	Harangul Bk.	Latur	Latur	76.489	18.417	Checkdam
582	Harangul Bk.	Latur	Latur	76.497	18.380	Checkdam
583	Harangul Bk.	Latur	Latur	76.496	18.413	Checkdam
584	Harangul Bk.	Latur	Latur	76.501	18.421	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
585	Harangul Kh.	Latur	Latur	76.497	18.432	Checkdam
586	Harangul Kh.	Latur	Latur	76.511	18.438	Checkdam
587	Harangul Kh.	Latur	Latur	76.511	18.426	Checkdam
588	Harangul Kh.	Latur	Latur	76.517	18.437	Checkdam
589	Hasori	Latur	Latur	76.335	18.455	Checkdam
590	Hasori	Latur	Latur	76.343	18.451	Checkdam
591	Jewali	Latur	Latur	76.495	18.458	Checkdam
592	Kanadi Borgaon	Latur	Latur	76.293	18.553	Checkdam
593	Karkatta	Latur	Latur	76.282	18.402	Checkdam
594	Karkatta	Latur	Latur	76.287	18.406	Checkdam
595	Karkatta	Latur	Latur	76.298	18.408	Checkdam
596	Karsa	Latur	Latur	76.452	18.507	Checkdam
597	Kasar Jawala	Latur	Latur	76.410	18.502	Checkdam
598	Kasargaon	Latur	Latur	76.571	18.429	Checkdam
599	Kasargaon	Latur	Latur	76.580	18.437	Checkdam
600	Kasargaon	Latur	Latur	76.591	18.428	Checkdam
601	Kasarkheda	Latur	Latur	76.634	18.449	Checkdam
602	Kasarkheda	Latur	Latur	76.622	18.448	Checkdam
603	Katgaon	Latur	Latur	76.430	18.480	Checkdam
604	Kavha	Latur	Latur	76.585	18.362	Checkdam
605	Kavha	Latur	Latur	76.593	18.362	Checkdam
606	Khadgaon	Latur	Latur	76.547	18.382	Checkdam
607	Khadgaon	Latur	Latur	76.547	18.391	Checkdam
608	Khandapur	Latur	Latur	76.497	18.360	Checkdam
609	Khandapur	Latur	Latur	76.500	18.350	Checkdam
610	Khandapur	Latur	Latur	76.495	18.347	Checkdam
611	Khandapur	Latur	Latur	76.485	18.352	Checkdam
612	Khopegaon	Latur	Latur	76.566	18.361	Checkdam
613	Khuntephal	Latur	Latur	76.295	18.459	Checkdam
614	Kolpa	Latur	Latur	76.628	18.425	Checkdam
615	Kolpa	Latur	Latur	76.641	18.428	Checkdam
616	LATUR	Latur	Latur	76.585	18.421	Checkdam
617	LATUR	Latur	Latur	76.578	18.371	Checkdam
618	LATUR	Latur	Latur	76.572	18.378	Checkdam
619	LATUR	Latur	Latur	76.585	18.416	Checkdam
620	Mahapur	Latur	Latur	76.583	18.463	Checkdam
621	Mahapur	Latur	Latur	76.583	18.472	Checkdam
622	Mahapur	Latur	Latur	76.589	18.465	Checkdam
623	Malwati	Latur	Latur	76.596	18.439	Checkdam
624	Manjari	Latur	Latur	76.424	18.459	Checkdam
625	Manjari	Latur	Latur	76.419	18.464	Checkdam
626	Matephal	Latur	Latur	76.277	18.429	Checkdam
627	Matephal	Latur	Latur	76.277	18.436	Checkdam
628	Matephal	Latur	Latur	76.275	18.447	Checkdam
629	Matephal	Latur	Latur	76.281	18.443	Checkdam
630	Matephal	Latur	Latur	76.270	18.453	Checkdam
631	Matephal	Latur	Latur	76.267	18.461	Checkdam
632	Murud Akola	Latur	Latur	76.429	18.408	Checkdam
633	Murud Akola	Latur	Latur	76.428	18.415	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
634	Murud Akola	Latur	Latur	76.407	18.397	Checkdam
635	Murud Akola	Latur	Latur	76.426	18.391	Checkdam
636	Murud Bk.	Latur	Latur	76.249	18.392	Checkdam
637	Murud Bk.	Latur	Latur	76.242	18.396	Checkdam
638	Murud Bk.	Latur	Latur	76.242	18.390	Checkdam
639	Murud Bk.	Latur	Latur	76.236	18.398	Checkdam
640	Murud Bk.	Latur	Latur	76.234	18.401	Checkdam
641	Murud Bk.	Latur	Latur	76.231	18.407	Checkdam
642	Murud Bk.	Latur	Latur	76.225	18.404	Checkdam
643	Murud Bk.	Latur	Latur	76.223	18.399	Checkdam
644	Murud Bk.	Latur	Latur	76.256	18.402	Checkdam
645	Murud Bk.	Latur	Latur	76.248	18.408	Checkdam
646	Murud Bk.	Latur	Latur	76.244	18.414	Checkdam
647	Murud Bk.	Latur	Latur	76.240	18.418	Checkdam
648	Murud Bk.	Latur	Latur	76.236	18.425	Checkdam
649	Nandgaon	Latur	Latur	76.559	18.447	Checkdam
650	Nandgaon	Latur	Latur	76.568	18.461	Checkdam
651	Nilkanth	Latur	Latur	76.290	18.491	Checkdam
652	Nilkanth	Latur	Latur	76.287	18.504	Checkdam
653	Nilkanth	Latur	Latur	76.298	18.489	Checkdam
654	Niwali	Latur	Latur	76.337	18.403	Checkdam
655	Niwali	Latur	Latur	76.311	18.397	Checkdam
656	Niwali	Latur	Latur	76.304	18.400	Checkdam
657	Pakharsangvi	Latur	Latur	76.519	18.379	Checkdam
658	Pakharsangvi	Latur	Latur	76.528	18.378	Checkdam
659	Pakharsangvi	Latur	Latur	76.507	18.380	Checkdam
660	Pimpalgaon (Amba)	Latur	Latur	76.283	18.519	Checkdam
661	Pimpri Amba	Latur	Latur	76.334	18.481	Checkdam
662	Pimpri Amba	Latur	Latur	76.339	18.484	Checkdam
663	Pimpri Amba	Latur	Latur	76.346	18.487	Checkdam
664	Pimpri Amba	Latur	Latur	76.355	18.497	Checkdam
665	Pimpri Amba	Latur	Latur	76.349	18.501	Checkdam
666	Raiwadi	Latur	Latur	76.538	18.436	Checkdam
667	Raiwadi	Latur	Latur	76.551	18.432	Checkdam
668	Raiwadi	Latur	Latur	76.528	18.445	Checkdam
669	Raiwadi	Latur	Latur	76.543	18.449	Checkdam
670	Ramegaon	Latur	Latur	76.358	18.395	Checkdam
671	Ramegaon	Latur	Latur	76.362	18.402	Checkdam
672	Ramegaon	Latur	Latur	76.366	18.410	Checkdam
673	Ramegaon	Latur	Latur	76.364	18.418	Checkdam
674	Sai	Latur	Latur	76.566	18.473	Checkdam
675	Sai	Latur	Latur	76.564	18.482	Checkdam
676	Sai	Latur	Latur	76.555	18.489	Checkdam
677	Sakhara	Latur	Latur	76.436	18.396	Checkdam
678	Sakhara	Latur	Latur	76.444	18.393	Checkdam
679	Salgara Bk.	Latur	Latur	76.708	18.335	Checkdam
680	Salgara Bk.	Latur	Latur	76.703	18.343	Checkdam
681	Salgara kh.	Latur	Latur	76.733	18.350	Checkdam
682	Samangaon	Latur	Latur	76.440	18.455	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
683	Sarola	Latur	Latur	76.628	18.401	Checkdam
684	Sarola	Latur	Latur	76.633	18.408	Checkdam
685	Sarola	Latur	Latur	76.643	18.413	Checkdam
686	Sevadasnagar(N.V.)	Latur	Latur	76.285	18.543	Checkdam
687	Shirala	Latur	Latur	76.316	18.464	Checkdam
688	Shirala	Latur	Latur	76.344	18.465	Checkdam
689	Shirala	Latur	Latur	76.335	18.472	Checkdam
690	Shirala	Latur	Latur	76.328	18.456	Checkdam
691	Shiur	Latur	Latur	76.464	18.327	Checkdam
692	Sikandarpur	Latur	Latur	76.593	18.378	Checkdam
693	Sikandarpur	Latur	Latur	76.598	18.369	Checkdam
694	Sonavati	Latur	Latur	76.653	18.409	Checkdam
695	Takali Bardpur	Latur	Latur	76.485	18.466	Checkdam
696	Tandulja	Latur	Latur	76.295	18.519	Checkdam
697	Umbarga	Latur	Latur	76.685	18.389	Checkdam
698	Wagholi	Latur	Latur	76.293	18.467	Checkdam
699	Wagholi	Latur	Latur	76.293	18.473	Checkdam
700	Wagholi	Latur	Latur	76.295	18.483	Checkdam
701	Wagholi	Latur	Latur	76.308	18.474	Checkdam
702	Wagholi	Latur	Latur	76.304	18.481	Checkdam
703	Warwanti	Latur	Latur	76.531	18.420	Checkdam
704	Wasangaon	Latur	Latur	76.539	18.373	Checkdam
705	Wasangaon	Latur	Latur	76.547	18.374	Checkdam
706	Wasangaon	Latur	Latur	76.557	18.367	Checkdam
707	Yeli	Latur	Latur	76.354	18.492	Checkdam
708	Yeli	Latur	Latur	76.365	18.493	Checkdam
709	Ambewadi Masalga	Nilanga	Latur	76.734	18.232	Checkdam
710	Ambulga (V.)	Nilanga	Latur	76.701	17.982	Checkdam
711	Ambulga (V.)	Nilanga	Latur	76.702	17.993	Checkdam
712	Ambulga (V.)	Nilanga	Latur	76.698	17.998	Checkdam
713	Ambulga (V.)	Nilanga	Latur	76.709	17.988	Checkdam
714	Ambulga (V.)	Nilanga	Latur	76.704	17.979	Checkdam
715	Ambulga Men	Nilanga	Latur	76.740	18.219	Checkdam
716	Anandwadi	Nilanga	Latur	76.666	18.284	Checkdam
717	Anandwadi	Nilanga	Latur	76.652	18.276	Checkdam
718	Anandwadi (A.V.)	Nilanga	Latur	76.692	18.003	Checkdam
719	Anandwadi (Sk.)	Nilanga	Latur	76.696	18.228	Checkdam
720	Anandwadi (Sk.)	Nilanga	Latur	76.685	18.226	Checkdam
721	Anandwadi (Sk.)	Nilanga	Latur	76.692	18.222	Checkdam
722	Anandwadi Ambulga Bk.	Nilanga	Latur	76.880	18.185	Checkdam
723	Ansarwada	Nilanga	Latur	76.796	18.091	Checkdam
724	Ansarwada	Nilanga	Latur	76.795	18.104	Checkdam
725	Ansarwada	Nilanga	Latur	76.803	18.092	Checkdam
726	Ansarwada	Nilanga	Latur	76.808	18.102	Checkdam
727	Aundha	Nilanga	Latur	76.803	17.943	Checkdam
728	Aundha	Nilanga	Latur	76.795	17.926	Checkdam
729	Badur	Nilanga	Latur	76.796	17.954	Checkdam
730	Badur	Nilanga	Latur	76.798	17.946	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
731	Badur	Nilanga	Latur	76.805	17.949	Checkdam
732	Badur	Nilanga	Latur	76.805	17.957	Checkdam
733	Bamani	Nilanga	Latur	76.712	18.067	Checkdam
734	Bhutmugli	Nilanga	Latur	76.752	18.022	Checkdam
735	Bhutmugli	Nilanga	Latur	76.756	18.034	Checkdam
736	Bujrugwadi	Nilanga	Latur	76.782	18.206	Checkdam
737	Channachiwadi	Nilanga	Latur	76.862	18.060	Checkdam
738	Chilwantwadi	Nilanga	Latur	76.880	17.943	Checkdam
739	Chilwantwadi	Nilanga	Latur	76.877	17.947	Checkdam
740	Chilwantwadi	Nilanga	Latur	76.874	17.952	Checkdam
741	Chilwantwadi	Nilanga	Latur	76.867	17.956	Checkdam
742	Chilwantwadi	Nilanga	Latur	76.862	17.959	Checkdam
743	Chilwantwadi	Nilanga	Latur	76.852	17.963	Checkdam
744	Chilwantwadi	Nilanga	Latur	76.845	17.963	Checkdam
745	Chincholi Pan	Nilanga	Latur	76.674	18.280	Checkdam
746	Chincholi Pan	Nilanga	Latur	76.665	18.272	Checkdam
747	Chincholi Pan	Nilanga	Latur	76.692	18.277	Checkdam
748	Dagadwadi	Nilanga	Latur	76.657	18.268	Checkdam
749	Gaur	Nilanga	Latur	76.719	18.255	Checkdam
750	Gaur	Nilanga	Latur	76.693	18.249	Checkdam
751	Gunewadi	Nilanga	Latur	76.694	18.210	Checkdam
752	Gunjarga	Nilanga	Latur	76.821	18.065	Checkdam
753	Gurhal	Nilanga	Latur	76.803	18.137	Checkdam
754	Hadga	Nilanga	Latur	76.727	18.185	Checkdam
755	Hadga	Nilanga	Latur	76.714	18.186	Checkdam
756	Hadoli	Nilanga	Latur	76.700	18.010	Checkdam
757	Hadoli	Nilanga	Latur	76.692	18.010	Checkdam
758	Hadoli	Nilanga	Latur	76.698	18.024	Checkdam
759	Hadoli	Nilanga	Latur	76.706	18.007	Checkdam
760	Haidarwadi	Nilanga	Latur	76.739	18.009	Checkdam
761	Halgara	Nilanga	Latur	76.889	18.071	Checkdam
762	Halgara	Nilanga	Latur	76.876	18.099	Checkdam
763	Hallali	Nilanga	Latur	76.859	17.909	Checkdam
764	Hallali	Nilanga	Latur	76.862	17.911	Checkdam
765	Hallali	Nilanga	Latur	76.863	17.915	Checkdam
766	Hallali	Nilanga	Latur	76.868	17.915	Checkdam
767	Hallali	Nilanga	Latur	76.874	17.915	Checkdam
768	Halsi (Ha.)	Nilanga	Latur	76.727	17.958	Checkdam
769	Halsi (Ha.)	Nilanga	Latur	76.738	17.965	Checkdam
770	Halsi Bk.	Nilanga	Latur	76.754	17.966	Checkdam
771	Halsi Kh.	Nilanga	Latur	76.744	17.970	Checkdam
772	Handral	Nilanga	Latur	76.701	17.969	Checkdam
773	Hanmantwadi (Ha)	Nilanga	Latur	76.710	18.005	Checkdam
774	Hanmantwadi(A.V.)	Nilanga	Latur	76.718	17.997	Checkdam
775	Harijawalga	Nilanga	Latur	76.756	17.994	Checkdam
776	Harijawalga	Nilanga	Latur	76.748	17.991	Checkdam
777	Harijawalga	Nilanga	Latur	76.744	17.989	Checkdam
778	Hattarga (Halsi)	Nilanga	Latur	76.750	17.951	Checkdam
779	Hattarga (Halsi)	Nilanga	Latur	76.729	17.941	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
780	Hattarga (Halsi)	Nilanga	Latur	76.730	17.948	Checkdam
781	Hosur	Nilanga	Latur	76.905	18.133	Checkdam
782	Hosur	Nilanga	Latur	76.917	18.137	Checkdam
783	Hosur	Nilanga	Latur	76.895	18.134	Checkdam
784	Hosur	Nilanga	Latur	76.897	18.125	Checkdam
785	Jajnur	Nilanga	Latur	76.813	18.135	Checkdam
786	Jamga	Nilanga	Latur	76.824	18.057	Checkdam
787	Jamga	Nilanga	Latur	76.829	18.063	Checkdam
788	Jewari	Nilanga	Latur	76.691	18.062	Checkdam
789	Kalandi	Nilanga	Latur	76.806	18.218	Checkdam
790	Kasar Balkunda	Nilanga	Latur	76.836	17.929	Checkdam
791	Kasar Balkunda	Nilanga	Latur	76.838	17.933	Checkdam
792	Kasar Balkunda	Nilanga	Latur	76.841	17.938	Checkdam
793	Kasar Balkunda	Nilanga	Latur	76.846	17.942	Checkdam
794	Kasar Balkunda	Nilanga	Latur	76.846	17.951	Checkdam
795	Kasar Balkunda	Nilanga	Latur	76.858	17.942	Checkdam
796	Kasar Balkunda	Nilanga	Latur	76.862	17.941	Checkdam
797	Kasarshirshi	Nilanga	Latur	76.746	17.917	Checkdam
798	Kasarshirshi	Nilanga	Latur	76.747	17.920	Checkdam
799	Kasarshirshi	Nilanga	Latur	76.747	17.913	Checkdam
800	Katejavalga Bk.	Nilanga	Latur	76.831	18.184	Checkdam
801	Kedarpur	Nilanga	Latur	76.847	18.184	Checkdam
802	Kelgaon	Nilanga	Latur	76.805	18.182	Checkdam
803	Kelgaon	Nilanga	Latur	76.815	18.184	Checkdam
804	Kelgaon	Nilanga	Latur	76.826	18.187	Checkdam
805	Khadak Umarga	Nilanga	Latur	76.838	18.221	Checkdam
806	Kokalgaon	Nilanga	Latur	76.664	18.037	Checkdam
807	Korali	Nilanga	Latur	76.780	17.899	Checkdam
808	Korali	Nilanga	Latur	76.784	17.900	Checkdam
809	Korali	Nilanga	Latur	76.792	17.907	Checkdam
810	Korali	Nilanga	Latur	76.801	17.879	Checkdam
811	Korali	Nilanga	Latur	76.796	17.884	Checkdam
812	Korali	Nilanga	Latur	76.796	17.890	Checkdam
813	Korali	Nilanga	Latur	76.795	17.897	Checkdam
814	Korali	Nilanga	Latur	76.794	17.902	Checkdam
815	Koyachiwadi	Nilanga	Latur	76.854	18.070	Checkdam
816	Lambota	Nilanga	Latur	76.782	18.150	Checkdam
817	Lambota	Nilanga	Latur	76.793	18.142	Checkdam
818	Limbala	Nilanga	Latur	76.761	18.046	Checkdam
819	Madansuri	Nilanga	Latur	76.703	18.033	Checkdam
820	Madansuri	Nilanga	Latur	76.709	18.041	Checkdam
821	Madansuri	Nilanga	Latur	76.728	18.042	Checkdam
822	Madansuri	Nilanga	Latur	76.733	18.030	Checkdam
823	Madansuri	Nilanga	Latur	76.728	18.023	Checkdam
824	Makni	Nilanga	Latur	76.844	18.079	Checkdam
825	Malegaon (Je)	Nilanga	Latur	76.683	18.089	Checkdam
826	Malegaon (Je)	Nilanga	Latur	76.671	18.098	Checkdam
827	Malegaon (Je)	Nilanga	Latur	76.673	18.108	Checkdam
828	Malegaon (Kalyani)	Nilanga	Latur	76.903	17.991	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
829	Malegaon (Kalyani)	Nilanga	Latur	76.908	17.984	Checkdam
830	Malegaon (Kalyani)	Nilanga	Latur	76.908	17.974	Checkdam
831	Mamdapur	Nilanga	Latur	76.877	17.919	Checkdam
832	Mamdapur	Nilanga	Latur	76.891	17.899	Checkdam
833	Manathpur	Nilanga	Latur	76.752	18.087	Checkdam
834	Manathpur	Nilanga	Latur	76.753	18.099	Checkdam
835	Mane Jawalga	Nilanga	Latur	76.879	18.030	Checkdam
836	Masalga	Nilanga	Latur	76.732	18.246	Checkdam
837	Masalga	Nilanga	Latur	76.739	18.255	Checkdam
838	Mirgan Halli	Nilanga	Latur	76.835	17.900	Checkdam
839	Mirgan Halli	Nilanga	Latur	76.836	17.907	Checkdam
840	Mirgan Halli	Nilanga	Latur	76.840	17.911	Checkdam
841	Mirgan Halli	Nilanga	Latur	76.843	17.915	Checkdam
842	Mirgan Halli	Nilanga	Latur	76.846	17.919	Checkdam
843	Mirgan Halli	Nilanga	Latur	76.844	17.912	Checkdam
844	Mirgan Halli	Nilanga	Latur	76.843	17.904	Checkdam
845	Mubarakpur	Nilanga	Latur	76.741	18.144	Checkdam
846	Mudgad (Ekoji)	Nilanga	Latur	76.618	18.007	Checkdam
847	Mudgad (Ekoji)	Nilanga	Latur	76.621	18.018	Checkdam
848	Mudgad (Ekoji)	Nilanga	Latur	76.632	18.024	Checkdam
849	Mudgad (Ramline)	Nilanga	Latur	76.712	17.937	Checkdam
850	Mudgad (Ramline)	Nilanga	Latur	76.716	17.943	Checkdam
851	Mudgad (Ramline)	Nilanga	Latur	76.716	17.953	Checkdam
852	Mudgad (Ramline)	Nilanga	Latur	76.704	17.952	Checkdam
853	Nadiwadi	Nilanga	Latur	76.894	18.183	Checkdam
854	Nadiwadi	Nilanga	Latur	76.895	18.171	Checkdam
855	Nelwad	Nilanga	Latur	76.826	17.892	Checkdam
856	Nelwad	Nilanga	Latur	76.823	17.895	Checkdam
857	Nelwad	Nilanga	Latur	76.818	17.896	Checkdam
858	Nelwad	Nilanga	Latur	76.813	17.900	Checkdam
859	Nelwad	Nilanga	Latur	76.810	17.903	Checkdam
860	Nelwad	Nilanga	Latur	76.808	17.910	Checkdam
861	Nelwad	Nilanga	Latur	76.808	17.914	Checkdam
862	Nelwad	Nilanga	Latur	76.814	17.913	Checkdam
863	NILANGA	Nilanga	Latur	76.777	18.108	Checkdam
864	NILANGA	Nilanga	Latur	76.780	18.120	Checkdam
865	NILANGA	Nilanga	Latur	76.749	18.110	Checkdam
866	NILANGA	Nilanga	Latur	76.743	18.122	Checkdam
867	NILANGA	Nilanga	Latur	76.756	18.110	Checkdam
868	NILANGA	Nilanga	Latur	76.761	18.125	Checkdam
869	Nitur	Nilanga	Latur	76.776	18.253	Checkdam
870	Nitur	Nilanga	Latur	76.778	18.222	Checkdam
871	Nitur	Nilanga	Latur	76.783	18.236	Checkdam
872	Nitur	Nilanga	Latur	76.784	18.246	Checkdam
873	Pirupatelwadi	Nilanga	Latur	76.836	17.960	Checkdam
874	Pirupatelwadi	Nilanga	Latur	76.835	17.956	Checkdam
875	Ramtirth	Nilanga	Latur	76.680	18.037	Checkdam
876	Sangareddiwadi	Nilanga	Latur	76.865	18.051	Checkdam
877	Sardarwadi	Nilanga	Latur	76.849	17.924	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
878	Sardarwadi	Nilanga	Latur	76.852	17.929	Checkdam
879	Sardarwadi	Nilanga	Latur	76.868	17.938	Checkdam
880	Sarwadi	Nilanga	Latur	76.657	18.013	Checkdam
881	Sarwadi	Nilanga	Latur	76.658	18.022	Checkdam
882	Sawangira	Nilanga	Latur	76.831	18.133	Checkdam
883	Shedol	Nilanga	Latur	76.654	18.206	Checkdam
884	Shedol	Nilanga	Latur	76.646	18.193	Checkdam
885	Shelgi	Nilanga	Latur	76.893	18.031	Checkdam
886	Shelgi	Nilanga	Latur	76.900	18.036	Checkdam
887	Shelgi	Nilanga	Latur	76.901	18.030	Checkdam
888	Shelgi	Nilanga	Latur	76.903	18.022	Checkdam
889	Shindi Jawalga	Nilanga	Latur	76.713	18.182	Checkdam
890	Shindkhed	Nilanga	Latur	76.795	18.080	Checkdam
891	Shindkhed	Nilanga	Latur	76.775	18.085	Checkdam
892	Shindkhed	Nilanga	Latur	76.777	18.098	Checkdam
893	Shiradhon	Nilanga	Latur	76.776	17.926	Checkdam
894	Shiradhon	Nilanga	Latur	76.784	17.923	Checkdam
895	Singnal	Nilanga	Latur	76.708	18.083	Checkdam
896	Singnal	Nilanga	Latur	76.692	18.086	Checkdam
897	Sonesangvi	Nilanga	Latur	76.705	18.243	Checkdam
898	Tadmugli	Nilanga	Latur	76.886	18.006	Checkdam
899	Tagarkheda	Nilanga	Latur	76.894	18.059	Checkdam
900	Tagarkheda	Nilanga	Latur	76.916	18.073	Checkdam
901	Takali	Nilanga	Latur	76.815	17.967	Checkdam
902	Talikhed	Nilanga	Latur	76.815	18.129	Checkdam
903	Talikhed	Nilanga	Latur	76.826	18.118	Checkdam
904	Talikhed	Nilanga	Latur	76.832	18.121	Checkdam
905	Tambala	Nilanga	Latur	76.901	17.921	Checkdam
906	Tambala	Nilanga	Latur	76.901	17.927	Checkdam
907	Tambala	Nilanga	Latur	76.904	17.933	Checkdam
908	Tambala	Nilanga	Latur	76.908	17.937	Checkdam
909	Tambala	Nilanga	Latur	76.908	17.940	Checkdam
910	Tambala	Nilanga	Latur	76.903	17.942	Checkdam
911	Tambalwadi	Nilanga	Latur	76.914	17.939	Checkdam
912	Tambarwadi	Nilanga	Latur	76.909	18.112	Checkdam
913	Umarga (Hadga)	Nilanga	Latur	76.724	18.172	Checkdam
914	Umarga (Hadga)	Nilanga	Latur	76.735	18.165	Checkdam
915	Usturi	Nilanga	Latur	76.796	17.985	Checkdam
916	Wadgaon	Nilanga	Latur	76.710	18.203	Checkdam
917	Wadi (Shedol)	Nilanga	Latur	76.665	18.218	Checkdam
918	Wadi Hasori	Nilanga	Latur	76.750	17.960	Checkdam
919	Walsangvi	Nilanga	Latur	76.878	18.206	Checkdam
920	Zari	Nilanga	Latur	76.822	18.177	Checkdam
921	Zari	Nilanga	Latur	76.821	18.166	Checkdam
922	Anandwadi	Renapur	Latur	76.683	18.522	Checkdam
923	Bhandarwadi	Renapur	Latur	76.614	18.575	Checkdam
924	Bhandarwadi	Renapur	Latur	76.600	18.599	Checkdam
925	Bhandarwadi	Renapur	Latur	76.603	18.590	Checkdam
926	Bhokaramba	Renapur	Latur	76.446	18.571	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
927	Bhokaramba	Renapur	Latur	76.451	18.578	Checkdam
928	Bhokaramba	Renapur	Latur	76.461	18.588	Checkdam
929	Bitargaon	Renapur	Latur	76.543	18.573	Checkdam
930	Bitargaon	Renapur	Latur	76.539	18.569	Checkdam
931	Darji Borgaon	Renapur	Latur	76.520	18.501	Checkdam
932	Darji Borgaon	Renapur	Latur	76.531	18.489	Checkdam
933	Dawangaon	Renapur	Latur	76.520	18.584	Checkdam
934	Dhaweli	Renapur	Latur	76.698	18.559	Checkdam
935	Dighol Deshmukh	Renapur	Latur	76.440	18.566	Checkdam
936	Garsuli	Renapur	Latur	76.547	18.614	Checkdam
937	Ghansargaon	Renapur	Latur	76.605	18.565	Checkdam
938	Godhala	Renapur	Latur	76.728	18.654	Checkdam
939	Godhala	Renapur	Latur	76.740	18.659	Checkdam
940	Itti	Renapur	Latur	76.484	18.561	Checkdam
941	Kadepur	Renapur	Latur	76.707	18.594	Checkdam
942	Kadepur	Renapur	Latur	76.710	18.604	Checkdam
943	Kadepur	Renapur	Latur	76.711	18.613	Checkdam
944	Kamkheda	Renapur	Latur	76.584	18.590	Checkdam
945	Kamkheda	Renapur	Latur	76.572	18.597	Checkdam
946	Khalangri	Renapur	Latur	76.713	18.622	Checkdam
947	Kharola	Renapur	Latur	76.670	18.509	Checkdam
948	Kharola	Renapur	Latur	76.667	18.500	Checkdam
949	Kharola	Renapur	Latur	76.675	18.518	Checkdam
950	Kumbharwadi	Renapur	Latur	76.678	18.529	Checkdam
951	Lakhamapur	Renapur	Latur	76.469	18.597	Checkdam
952	Makegaon	Renapur	Latur	76.720	18.650	Checkdam
953	Manusmarwadi	Renapur	Latur	76.642	18.601	Checkdam
954	Manusmarwadi	Renapur	Latur	76.635	18.593	Checkdam
955	Mohgaon (Talni)	Renapur	Latur	76.634	18.547	Checkdam
956	Morwad	Renapur	Latur	76.463	18.610	Checkdam
957	Morwad	Renapur	Latur	76.463	18.602	Checkdam
958	Murambi	Renapur	Latur	76.719	18.393	Checkdam
959	Murdhav	Renapur	Latur	76.623	18.579	Checkdam
960	Murdhav	Renapur	Latur	76.634	18.583	Checkdam
961	Murdhav	Renapur	Latur	76.646	18.583	Checkdam
962	Narvatwadi (N.V.)	Renapur	Latur	76.651	18.622	Checkdam
963	Niwada	Renapur	Latur	76.515	18.520	Checkdam
964	Niwada	Renapur	Latur	76.515	18.514	Checkdam
965	Pangaon	Renapur	Latur	76.650	18.613	Checkdam
966	Pangaon	Renapur	Latur	76.645	18.606	Checkdam
967	Pangaon	Renapur	Latur	76.612	18.646	Checkdam
968	Pangaon	Renapur	Latur	76.603	18.642	Checkdam
969	Pangaon	Renapur	Latur	76.598	18.635	Checkdam
970	Pangaon	Renapur	Latur	76.601	18.629	Checkdam
971	Pangaon	Renapur	Latur	76.600	18.621	Checkdam
972	Pangaon	Renapur	Latur	76.600	18.608	Checkdam
973	Patharwadi	Renapur	Latur	76.631	18.587	Checkdam
974	Phawadewadi	Renapur	Latur	76.625	18.646	Checkdam
975	Pohregaon	Renapur	Latur	76.480	18.543	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
976	Pohregaon	Renapur	Latur	76.477	18.529	Checkdam
977	Pohregaon	Renapur	Latur	76.463	18.544	Checkdam
978	Renapur	Renapur	Latur	76.613	18.548	Checkdam
979	Renapur	Renapur	Latur	76.582	18.531	Checkdam
980	Renapur	Renapur	Latur	76.579	18.540	Checkdam
981	Renapur	Renapur	Latur	76.606	18.496	Checkdam
982	Renapur	Renapur	Latur	76.615	18.498	Checkdam
983	Sangvi	Renapur	Latur	76.482	18.500	Checkdam
984	Sayyadpur Bk.	Renapur	Latur	76.691	18.562	Checkdam
985	Sevanagar (N.V.)	Renapur	Latur	76.561	18.606	Checkdam
986	Shera	Renapur	Latur	76.487	18.540	Checkdam
987	Sindhgaon	Renapur	Latur	76.483	18.530	Checkdam
988	Sindhgaon	Renapur	Latur	76.481	18.519	Checkdam
989	Sindhgaon	Renapur	Latur	76.483	18.510	Checkdam
990	Sumthana	Renapur	Latur	76.550	18.553	Checkdam
991	Sumthana	Renapur	Latur	76.559	18.558	Checkdam
992	Talni	Renapur	Latur	76.669	18.579	Checkdam
993	Talni	Renapur	Latur	76.656	18.581	Checkdam
994	Talni	Renapur	Latur	76.677	18.571	Checkdam
995	Vanjarwadi	Renapur	Latur	76.531	18.580	Checkdam
996	Bolegaon Bk.	Shirur-Anantpal	Latur	76.8595	18.4108	Checkdam
997	Digol	Shirur-Anantpal	Latur	76.9231	18.378	Checkdam
998	Digol	Shirur-Anantpal	Latur	76.9255	18.3905	Checkdam
999	Hisamabad	Shirur-Anantpal	Latur	76.7987	18.2841	Checkdam
1000	Pandharwadi	Shirur-Anantpal	Latur	76.879	18.3317	Checkdam
1001	Talegaon (Deoni)	Shirur-Anantpal	Latur	76.8742	18.306	Checkdam
1002	Talegaon Bori	Shirur-Anantpal	Latur	76.7427	18.3218	Checkdam
1003	Umardara	Shirur-Anantpal	Latur	76.7566	18.3068	Checkdam
1004	Yerol	Shirur-Anantpal	Latur	76.8802	18.3633	Checkdam
1005	Avalkonda	Udgir	Latur	77.1902	18.4389	Checkdam
1006	Avalkonda	Udgir	Latur	77.1645	18.4332	Checkdam
1007	Banshelki	Udgir	Latur	77.0959	18.368	Checkdam
1008	Banshelki	Udgir	Latur	77.1014	18.3721	Checkdam
1009	Banshelki	Udgir	Latur	77.0746	18.3639	Checkdam
1010	Banshelki	Udgir	Latur	77.0794	18.3751	Checkdam
1011	Banshelki	Udgir	Latur	77.0892	18.3449	Checkdam
1012	Banshelki	Udgir	Latur	77.0774	18.3471	Checkdam
1013	Belaskarga	Udgir	Latur	77.1871	18.3206	Checkdam
1014	Belaskarga	Udgir	Latur	77.1886	18.3243	Checkdam
1015	Bhakaskheda	Udgir	Latur	76.9948	18.3691	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
1016	Chighali	Udgir	Latur	77.0228	18.3587	Checkdam
1017	Chighali	Udgir	Latur	77.0133	18.3516	Checkdam
1018	Dawangaon	Udgir	Latur	77.0609	18.3269	Checkdam
1019	Dewarjan	Udgir	Latur	76.9945	18.337	Checkdam
1020	Dewarjan	Udgir	Latur	76.9866	18.3228	Checkdam
1021	Dhondi Hipparga	Udgir	Latur	77.1973	18.3154	Checkdam
1022	Digras	Udgir	Latur	76.9367	18.393	Checkdam
1023	Digras	Udgir	Latur	76.9343	18.3986	Checkdam
1024	Digras	Udgir	Latur	76.9367	18.4057	Checkdam
1025	Dongarshelki	Udgir	Latur	77.1104	18.4692	Checkdam
1026	Dongarshelki	Udgir	Latur	77.1124	18.48	Checkdam
1027	Ekurka Road	Udgir	Latur	77.0699	18.4856	Checkdam
1028	Gangapur	Udgir	Latur	76.9823	18.3408	Checkdam
1029	Gudsur	Udgir	Latur	77.1226	18.4856	Checkdam
1030	Gudsur	Udgir	Latur	77.132	18.4889	Checkdam
1031	Gudsur	Udgir	Latur	77.1285	18.4975	Checkdam
1032	Gudsur	Udgir	Latur	77.1277	18.5098	Checkdam
1033	Gudsur	Udgir	Latur	77.1281	18.5214	Checkdam
1034	Gudsur	Udgir	Latur	77.1305	18.5289	Checkdam
1035	Gurdhal (Udgir)	Udgir	Latur	77.1918	18.3729	Checkdam
1036	Haibatpur	Udgir	Latur	77.0617	18.4008	Checkdam
1037	Haibatpur	Udgir	Latur	77.0593	18.3949	Checkdam
1038	Haknakwadi	Udgir	Latur	77.0976	18.4399	Checkdam
1039	Hangarga Kuder	Udgir	Latur	77.0294	18.4617	Checkdam
1040	Her	Udgir	Latur	76.9964	18.4005	Checkdam
1041	Her	Udgir	Latur	76.9882	18.4098	Checkdam
1042	Her	Udgir	Latur	76.976	18.4154	Checkdam
1043	Hipparga	Udgir	Latur	77.1088	18.4901	Checkdam
1044	Hipparga	Udgir	Latur	77.1116	18.502	Checkdam
1045	Hipparga	Udgir	Latur	77.1163	18.5162	Checkdam
1046	Hipparga	Udgir	Latur	77.1175	18.4964	Checkdam
1047	Honihipparga	Udgir	Latur	77.0228	18.4692	Checkdam
1048	Jaknal	Udgir	Latur	77.1124	18.3348	Checkdam
1049	Jaknal	Udgir	Latur	77.1187	18.3378	Checkdam
1050	Janapur	Udgir	Latur	77.2051	18.3553	Checkdam
1051	Kallur	Udgir	Latur	77.0813	18.4882	Checkdam
1052	Kallur	Udgir	Latur	77.0927	18.4755	Checkdam
1053	Kallur	Udgir	Latur	77.0837	18.4706	Checkdam
1054	Kallur	Udgir	Latur	77.088	18.4781	Checkdam
1055	Karadkhed	Udgir	Latur	76.9819	18.3762	Checkdam
1056	Karadkhed	Udgir	Latur	76.9772	18.3956	Checkdam
1057	Karwandi	Udgir	Latur	76.9516	18.3169	Checkdam
1058	Kasral	Udgir	Latur	77.235	18.4456	Checkdam
1059	Kasral	Udgir	Latur	77.2413	18.4483	Checkdam
1060	Kawalkhed	Udgir	Latur	77.158	18.3542	Checkdam
1061	Kawalkhed	Udgir	Latur	77.158	18.3665	Checkdam
1062	Kiniyalladevi	Udgir	Latur	77.0401	18.505	Checkdam
1063	Kodali	Udgir	Latur	77.2181	18.4721	Checkdam
1064	Kodali	Udgir	Latur	77.2079	18.4557	Checkdam

SN	Village	Taluka	District	Longitude	Latitude	Structure
1065	Kodali	Udgir	Latur	77.2201	18.4583	Checkdam
1066	Kodali	Udgir	Latur	77.2283	18.4662	Checkdam
1067	Kumdal	Udgir	Latur	77.1996	18.3971	Checkdam
1068	Kumtha Kh.	Udgir	Latur	77.0039	18.4106	Checkdam
1069	Kumtha Kh.	Udgir	Latur	77.018	18.4199	Checkdam
1070	Limbgaon	Udgir	Latur	77.2158	18.4079	Checkdam
1071	Lohara	Udgir	Latur	77.0338	18.365	Checkdam
1072	Lohara	Udgir	Latur	77.0208	18.3893	Checkdam
1073	Loni	Udgir	Latur	77.0786	18.4087	Checkdam
1074	Mahadevwadi	Udgir	Latur	76.9422	18.3367	Checkdam
1075	Mahadevwadi	Udgir	Latur	76.9512	18.3452	Checkdam
1076	Malkapur	Udgir	Latur	77.0904	18.3885	Checkdam
1077	Manjari	Udgir	Latur	77.1879	18.4445	Checkdam
1078	Manjari	Udgir	Latur	77.178	18.4468	Checkdam
1079	Mogha	Udgir	Latur	77.1489	18.3139	Checkdam
1080	Mortalwadi	Udgir	Latur	77.171	18.4886	Checkdam
1081	Muttalgaon	Udgir	Latur	77.2083	18.4807	Checkdam
1082	Nagalgaon	Udgir	Latur	77.1586	18.4285	Checkdam
1083	Nagalgaon	Udgir	Latur	77.1658	18.4231	Checkdam
1084	Nalgir	Udgir	Latur	77.1627	18.4677	Checkdam
1085	Nalgir	Udgir	Latur	77.1839	18.4901	Checkdam
1086	Nalgir	Udgir	Latur	77.1855	18.4736	Checkdam
1087	Nanwadi	Udgir	Latur	77.156	18.4602	Checkdam
1088	Nideban	Udgir	Latur	77.1485	18.3736	Checkdam
1089	Rawangaon	Udgir	Latur	77.1957	18.2975	Checkdam
1090	Sambhu Umarga	Udgir	Latur	76.9367	18.3299	Checkdam
1091	Satala	Udgir	Latur	76.9426	18.3643	Checkdam
1092	Somalakashiratanda	Udgir	Latur	77.2063	18.4259	Checkdam
1093	Somnathpur	Udgir	Latur	77.1037	18.4345	Checkdam
1094	Sukani	Udgir	Latur	77.0428	18.5207	Checkdam
1095	Sukani	Udgir	Latur	77.0452	18.5378	Checkdam
1096	Sumthana	Udgir	Latur	77.2063	18.4374	Checkdam
1097	Togari	Udgir	Latur	77.1485	18.2601	Checkdam
1098	Togari	Udgir	Latur	77.1544	18.2702	Checkdam
1099	Togari	Udgir	Latur	77.1611	18.2799	Checkdam
1100	Tondar	Udgir	Latur	77.057	18.4191	Checkdam
1101	Tondchira	Udgir	Latur	77.1662	18.3437	Checkdam
1102	UDGIR	Udgir	Latur	77.1195	18.4138	Checkdam
1103	UDGIR (Rural)	Udgir	Latur	77.1523	18.4192	Checkdam
1104	UDGIR (Rural)	Udgir	Latur	77.1493	18.4099	Checkdam
1105	Umarga Manna	Udgir	Latur	77.0542	18.496	Checkdam
1106	Umarga Manna	Udgir	Latur	77.0636	18.5005	Checkdam
1107	Wadhawana Bk.	Udgir	Latur	77.0896	18.5192	Checkdam
1108	Wadhawana Bk.	Udgir	Latur	77.0986	18.5248	Checkdam
1109	Wadhawana Kh.	Udgir	Latur	77.0684	18.5334	Checkdam
1110	Wadhawana Kh.	Udgir	Latur	77.0695	18.5057	Checkdam
1111	Waigaon	Udgir	Latur	76.9496	18.3665	Checkdam
1112	Waigaon	Udgir	Latur	76.9375	18.3796	Checkdam

ANNEXURE 7.1:PROPOSED PERCOLATION TANKS IN LATR DISTRICT

SN	Village	Taluka	District	Longitude	Latitude	Structure
1	AHMEDPUR	Ahmedpur	Latur	76.9272	18.6866	Percolation tank
2	AHMEDPUR	Ahmedpur	Latur	76.9304	18.675	Percolation tank
3	Brahampuri	Ahmedpur	Latur	76.8746	18.6691	Percolation tank
4	Dhaswadi	Ahmedpur	Latur	76.8612	18.8172	Percolation tank
5	Gangahipparga	Ahmedpur	Latur	76.9524	18.7793	Percolation tank
6	Gangahipparga	Ahmedpur	Latur	76.9414	18.7677	Percolation tank
7	Guttewadi	Ahmedpur	Latur	76.7873	18.7867	Percolation tank
8	Hadolti	Ahmedpur	Latur	77.0373	18.6624	Percolation tank
9	Kalegaon	Ahmedpur	Latur	76.9308	18.7316	Percolation tank
10	Kaudgaon	Ahmedpur	Latur	77.0892	18.5901	Percolation tank
11	Khandali	Ahmedpur	Latur	76.8816	18.8284	Percolation tank
12	Kinikadu	Ahmedpur	Latur	77.0228	18.7052	Percolation tank
13	Kopra	Ahmedpur	Latur	76.8156	18.7242	Percolation tank
14	Mangdari	Ahmedpur	Latur	77.0373	18.7446	Percolation tank
15	Mangdari	Ahmedpur	Latur	77.0534	18.7688	Percolation tank
16	Mankhed	Ahmedpur	Latur	76.8223	18.7055	Percolation tank
17	Mogha	Ahmedpur	Latur	77.0149	18.7257	Percolation tank
18	Mogha	Ahmedpur	Latur	77.0125	18.7167	Percolation tank
19	Mogha	Ahmedpur	Latur	77.0153	18.7074	Percolation tank
20	Molwan	Ahmedpur	Latur	76.7531	18.7674	Percolation tank
21	Rudha	Ahmedpur	Latur	76.9434	18.7554	Percolation tank
22	Rui	Ahmedpur	Latur	76.9952	18.78	Percolation tank
23	Rui	Ahmedpur	Latur	76.9917	18.7901	Percolation tank
24	Rui Tanda (N.V.)	Ahmedpur	Latur	76.9941	18.7718	Percolation tank
25	Sangvi (Sunegaon)	Ahmedpur	Latur	76.965	18.7819	Percolation tank
26	Sawargaon Thot	Ahmedpur	Latur	77.0349	18.681	Percolation tank
27	Shendri	Ahmedpur	Latur	76.919	18.7618	Percolation tank
28	Shenni	Ahmedpur	Latur	76.9359	18.7458	Percolation tank
29	Sindgi Bk.	Ahmedpur	Latur	77.0377	18.7331	Percolation tank
30	Sonkhed	Ahmedpur	Latur	76.8301	18.7141	Percolation tank
31	Sora	Ahmedpur	Latur	76.8934	18.7175	Percolation tank
32	Takalgaon (Senkud)	Ahmedpur	Latur	76.8966	18.7573	Percolation tank
33	Thodga	Ahmedpur	Latur	76.9717	18.7015	Percolation tank
34	Thodga	Ahmedpur	Latur	76.9732	18.7279	Percolation tank
35	Vilegaon	Ahmedpur	Latur	76.8746	18.7208	Percolation tank
36	Vilegaon	Ahmedpur	Latur	76.8581	18.7052	Percolation tank
37	Wadarwadi (N.V.)	Ahmedpur	Latur	76.9559	18.8288	Percolation tank
38	Wairagadh	Ahmedpur	Latur	76.8482	18.7186	Percolation tank
39	Wanjarwadi	Ahmedpur	Latur	76.8875	18.7707	Percolation tank
40	Wanjarwadi	Ahmedpur	Latur	76.8816	18.7733	Percolation tank
41	Warwanti Tanda (N.V.)	Ahmedpur	Latur	77.0059	18.7707	Percolation tank
42	Yeldarwadi	Ahmedpur	Latur	76.8337	18.8087	Percolation tank
43	Yertar	Ahmedpur	Latur	76.886	18.7651	Percolation tank

SN	Village	Taluka	District	Longitude	Latitude	Structure
44	Yertar	Ahmedpur	Latur	76.8899	18.7499	Percolation tank
45	Almala	Ausa	Latur	76.467	18.305	Percolation tank
46	Apchunda	Ausa	Latur	76.594	18.197	Percolation tank
47	Ashiv	Ausa	Latur	76.345	18.116	Percolation tank
48	Ashiv	Ausa	Latur	76.347	18.104	Percolation tank
49	AUSA	Ausa	Latur	76.494	18.275	Percolation tank
50	AUSA	Ausa	Latur	76.495	18.267	Percolation tank
51	AUSA	Ausa	Latur	76.498	18.255	Percolation tank
52	AUSA	Ausa	Latur	76.497	18.244	Percolation tank
53	AUSA	Ausa	Latur	76.497	18.236	Percolation tank
54	AUSA	Ausa	Latur	76.499	18.226	Percolation tank
55	Banegaon	Ausa	Latur	76.513	18.1	Percolation tank
56	Bhada	Ausa	Latur	76.407	18.294	Percolation tank
57	Borgaon	Ausa	Latur	76.357	18.301	Percolation tank
58	Borphal	Ausa	Latur	76.469	18.202	Percolation tank
59	Chincholi Jo	Ausa	Latur	76.579	18.107	Percolation tank
60	Chincholi Tapse	Ausa	Latur	76.524	18.116	Percolation tank
61	Chincholi Tapse	Ausa	Latur	76.535	18.127	Percolation tank
62	Chincholi Tapse	Ausa	Latur	76.535	18.135	Percolation tank
63	Ganjankheda	Ausa	Latur	76.522	18.068	Percolation tank
64	Gubal	Ausa	Latur	76.471	18.037	Percolation tank
65	Gubal	Ausa	Latur	76.478	18.047	Percolation tank
66	Haregaon	Ausa	Latur	76.495	18.11	Percolation tank
67	Hatkarwadi	Ausa	Latur	76.586	18.122	Percolation tank
68	Hatkarwadi	Ausa	Latur	76.592	18.126	Percolation tank
69	Hatkarwadi	Ausa	Latur	76.599	18.129	Percolation tank
70	Hatkarwadi	Ausa	Latur	76.608	18.127	Percolation tank
71	Jamalpur	Ausa	Latur	76.586	18.325	Percolation tank
72	Jamalpur	Ausa	Latur	76.587	18.317	Percolation tank
73	Jamalpur	Ausa	Latur	76.59	18.316	Percolation tank
74	Jau	Ausa	Latur	76.721	18.131	Percolation tank
75	Jau	Ausa	Latur	76.715	18.124	Percolation tank
76	Jauwadi	Ausa	Latur	76.723	18.144	Percolation tank
77	Jawalga P.O.	Ausa	Latur	76.471	18.117	Percolation tank
78	Jawalga P.O.	Ausa	Latur	76.482	18.116	Percolation tank
79	Kalmata	Ausa	Latur	76.386	18.304	Percolation tank
80	Karla	Ausa	Latur	76.632	18.058	Percolation tank
81	Karla	Ausa	Latur	76.626	18.061	Percolation tank
82	Karla	Ausa	Latur	76.62	18.065	Percolation tank
83	Karla	Ausa	Latur	76.632	18.104	Percolation tank
84	Khuntegaon	Ausa	Latur	76.587	18.305	Percolation tank
85	Khuntegaon	Ausa	Latur	76.589	18.293	Percolation tank
86	Killari	Ausa	Latur	76.587	18.047	Percolation tank

SN	Village	Taluka	District	Longitude	Latitude	Structure
87	Killari	Ausa	Latur	76.579	18.063	Percolation tank
88	Killariwadi	Ausa	Latur	76.557	18.034	Percolation tank
89	Kumtha	Ausa	Latur	76.664	18.076	Percolation tank
90	Lamjana	Ausa	Latur	76.586	18.139	Percolation tank
91	Mangrul	Ausa	Latur	76.517	18.027	Percolation tank
92	Masurdi	Ausa	Latur	76.345	18.153	Percolation tank
93	Masurdi	Ausa	Latur	76.338	18.15	Percolation tank
94	Matola	Ausa	Latur	76.416	18.076	Percolation tank
95	Matola	Ausa	Latur	76.412	18.093	Percolation tank
96	Nanand	Ausa	Latur	76.733	18.088	Percolation tank
97	Nanand	Ausa	Latur	76.723	18.096	Percolation tank
98	Nanand	Ausa	Latur	76.718	18.109	Percolation tank
99	Nanand	Ausa	Latur	76.721	18.121	Percolation tank
100	Nanand	Ausa	Latur	76.713	18.11	Percolation tank
101	Ramegaon	Ausa	Latur	76.682	18.173	Percolation tank
102	Ramegaon	Ausa	Latur	76.69	18.186	Percolation tank
103	Ramwadi	Ausa	Latur	76.639	18.139	Percolation tank
104	Sarni	Ausa	Latur	76.444	18.039	Percolation tank
105	Sarola	Ausa	Latur	76.589	18.28	Percolation tank
106	Sarola	Ausa	Latur	76.575	18.255	Percolation tank
107	Shivani Lakh	Ausa	Latur	76.673	18.115	Percolation tank
108	Shivani Lakh	Ausa	Latur	76.666	18.132	Percolation tank
109	Shivani Lakh	Ausa	Latur	76.655	18.128	Percolation tank
110	Shivani Lakh	Ausa	Latur	76.648	18.134	Percolation tank
111	Sirsal	Ausa	Latur	76.578	18.09	Percolation tank
112	Tavshi Tad	Ausa	Latur	76.395	18.126	Percolation tank
113	Tungi Bk.	Ausa	Latur	76.457	18.161	Percolation tank
114	Tungi Bk.	Ausa	Latur	76.45	18.168	Percolation tank
115	Ujani	Ausa	Latur	76.305	18.119	Percolation tank
116	Umbadga Bk.	Ausa	Latur	76.512	18.309	Percolation tank
117	Umbadga Bk.	Ausa	Latur	76.504	18.301	Percolation tank
118	Umbadga Bk.	Ausa	Latur	76.499	18.292	Percolation tank
119	Uti Bk.	Ausa	Latur	76.442	18.292	Percolation tank
120	Uti Bk.	Ausa	Latur	76.426	18.31	Percolation tank
121	Utka	Ausa	Latur	76.547	18.143	Percolation tank
122	Utka	Ausa	Latur	76.555	18.155	Percolation tank
123	Wangji	Ausa	Latur	76.387	18.12	Percolation tank
124	Wanwada	Ausa	Latur	76.47	18.183	Percolation tank
125	Yelavat	Ausa	Latur	76.574	18.077	Percolation tank
126	Yeli	Ausa	Latur	76.666	18.233	Percolation tank
127	Yelori	Ausa	Latur	76.398	18.211	Percolation tank
128	Yerandi	Ausa	Latur	76.581	18.262	Percolation tank
129	Belgaon	Chakur	Latur	76.813	18.634	Percolation tank

SN	Village	Taluka	District	Longitude	Latitude	Structure
130	Bothi	Chakur	Latur	76.926	18.489	Percolation tank
131	Chakur	Chakur	Latur	76.86	18.484	Percolation tank
132	Chapoli	Chakur	Latur	76.902	18.562	Percolation tank
133	Dongraj	Chakur	Latur	76.997	18.473	Percolation tank
134	Dongraj	Chakur	Latur	77.003	18.476	Percolation tank
135	Hatkarwadi	Chakur	Latur	76.832	18.445	Percolation tank
136	Himpalner	Chakur	Latur	76.845	18.584	Percolation tank
137	Himpalner	Chakur	Latur	76.837	18.61	Percolation tank
138	Jadhala	Chakur	Latur	76.81	18.666	Percolation tank
139	Jadhala	Chakur	Latur	76.798	18.658	Percolation tank
140	Kabansangvi	Chakur	Latur	76.903	18.423	Percolation tank
141	Kalkoti	Chakur	Latur	76.948	18.501	Percolation tank
142	Mahalungi	Chakur	Latur	76.758	18.612	Percolation tank
143	Mahalungi	Chakur	Latur	76.754	18.608	Percolation tank
144	Mashanerwadi	Chakur	Latur	76.94	18.521	Percolation tank
145	Mashanerwadi	Chakur	Latur	76.932	18.529	Percolation tank
146	Nagadarwadi	Chakur	Latur	76.996	18.532	Percolation tank
147	Sangyyachiwadi (N.V.)	Chakur	Latur	76.995	18.482	Percolation tank
148	Ujalamb	Chakur	Latur	76.898	18.431	Percolation tank
149	Wadgaon (Ekki)	Chakur	Latur	77.008	18.522	Percolation tank
150	Dhangarwadi	Deoni	Latur	76.9229	18.2451	Percolation tank
151	Kawathala	Deoni	Latur	76.9473	18.2585	Percolation tank
152	Atnoor	Jalkot	Latur	77.2673	18.529	Percolation tank
153	Atnoor	Jalkot	Latur	77.2708	18.5377	Percolation tank
154	Chincholi	Jalkot	Latur	77.2313	18.5305	Percolation tank
155	Chincholi	Jalkot	Latur	77.2464	18.5372	Percolation tank
156	Dhamangaon	Jalkot	Latur	77.1222	18.6263	Percolation tank
157	Dhorsangvi	Jalkot	Latur	77.1151	18.5961	Percolation tank
158	Ghonsi	Jalkot	Latur	77.182	18.5336	Percolation tank
159	Haladwadona	Jalkot	Latur	77.2099	18.6076	Percolation tank
160	Hokarna	Jalkot	Latur	77.1314	18.6892	Percolation tank
161	Hokarna	Jalkot	Latur	77.1299	18.6868	Percolation tank
162	Kekat Sindagi	Jalkot	Latur	77.1735	18.6961	Percolation tank
163	Kekat Sindagi	Jalkot	Latur	77.1727	18.7011	Percolation tank
164	Kunki	Jalkot	Latur	77.1277	18.6173	Percolation tank
165	Malihapparga	Jalkot	Latur	77.1985	18.5609	Percolation tank
166	Marsangvi	Jalkot	Latur	77.2411	18.5551	Percolation tank
167	Marsangvi	Jalkot	Latur	77.2319	18.5676	Percolation tank
168	Marsangvi	Jalkot	Latur	77.2372	18.5797	Percolation tank
169	Marsangvi	Jalkot	Latur	77.2338	18.5761	Percolation tank
170	Mewapur	Jalkot	Latur	77.2653	18.521	Percolation tank
171	Ravankola	Jalkot	Latur	77.2323	18.5953	Percolation tank
172	Sheldara	Jalkot	Latur	77.0825	18.6751	Percolation tank

SN	Village	Taluka	District	Longitude	Latitude	Structure
173	Sonwala	Jalkot	Latur	77.1371	18.5733	Percolation tank
174	Sulhali	Jalkot	Latur	77.2016	18.5342	Percolation tank
175	Sulhali	Jalkot	Latur	77.2221	18.5394	Percolation tank
176	Tiruka	Jalkot	Latur	77.1812	18.5368	Percolation tank
177	Wadgaon	Jalkot	Latur	77.1094	18.679	Percolation tank
178	Wanjarwada	Jalkot	Latur	77.122	18.6622	Percolation tank
179	Wanjarwada	Jalkot	Latur	77.1083	18.6725	Percolation tank
180	Akharwai	Latur	Latur	76.462	18.44	Percolation tank
181	Akharwai	Latur	Latur	76.465	18.426	Percolation tank
182	Babhalgaon	Latur	Latur	76.65	18.366	Percolation tank
183	Babhalgaon	Latur	Latur	76.638	18.364	Percolation tank
184	Bhosa	Latur	Latur	76.277	18.509	Percolation tank
185	Bhosa	Latur	Latur	76.271	18.496	Percolation tank
186	Bhosa	Latur	Latur	76.277	18.503	Percolation tank
187	Bhosa	Latur	Latur	76.273	18.492	Percolation tank
188	Bhoyara	Latur	Latur	76.406	18.39	Percolation tank
189	Bopala	Latur	Latur	76.386	18.34	Percolation tank
190	Borgaon Bk.	Latur	Latur	76.316	18.41	Percolation tank
191	Borgaon Bk.	Latur	Latur	76.334	18.416	Percolation tank
192	Borgaon Bk.	Latur	Latur	76.341	18.42	Percolation tank
193	Borwati	Latur	Latur	76.6	18.449	Percolation tank
194	Borwati	Latur	Latur	76.594	18.448	Percolation tank
195	Borwati	Latur	Latur	76.588	18.441	Percolation tank
196	Chata	Latur	Latur	76.4	18.392	Percolation tank
197	Chata	Latur	Latur	76.382	18.363	Percolation tank
198	Chikhalthana	Latur	Latur	76.657	18.456	Percolation tank
199	Chikhurda	Latur	Latur	76.45	18.426	Percolation tank
200	Chincholi Ballalnath	Latur	Latur	76.378	18.474	Percolation tank
201	Chincholi Ballalnath	Latur	Latur	76.36	18.446	Percolation tank
202	Chincholi Ballalnath	Latur	Latur	76.365	18.456	Percolation tank
203	Chincholi Ballalnath	Latur	Latur	76.37	18.465	Percolation tank
204	Chincholi Rao	Latur	Latur	76.482	18.325	Percolation tank
205	Chincholi Rao	Latur	Latur	76.475	18.33	Percolation tank
206	Chincholi Raowadi	Latur	Latur	76.463	18.368	Percolation tank
207	Dhoki	Latur	Latur	76.377	18.486	Percolation tank
208	Dhoki	Latur	Latur	76.383	18.492	Percolation tank
209	Ekurga	Latur	Latur	76.358	18.393	Percolation tank
210	Ekurga	Latur	Latur	76.36	18.372	Percolation tank
211	Gangapur	Latur	Latur	76.522	18.335	Percolation tank
212	Gategaon	Latur	Latur	76.419	18.427	Percolation tank
213	Gategaon	Latur	Latur	76.422	18.437	Percolation tank
214	Gondegaon	Latur	Latur	76.346	18.423	Percolation tank
215	Gondegaon	Latur	Latur	76.348	18.433	Percolation tank

SN	Village	Taluka	District	Longitude	Latitude	Structure
216	Gondegaon	Latur	Latur	76.354	18.441	Percolation tank
217	Gondegaon	Latur	Latur	76.341	18.432	Percolation tank
218	Harangul Bk.	Latur	Latur	76.477	18.405	Percolation tank
219	Harangul Bk.	Latur	Latur	76.478	18.393	Percolation tank
220	Kasar Jawala	Latur	Latur	76.392	18.498	Percolation tank
221	Kasarkheda	Latur	Latur	76.639	18.449	Percolation tank
222	Khandala	Latur	Latur	76.322	18.437	Percolation tank
223	Khandala	Latur	Latur	76.307	18.433	Percolation tank
224	Khopegaon	Latur	Latur	76.578	18.365	Percolation tank
225	Mahapur	Latur	Latur	76.579	18.464	Percolation tank
226	Manjari	Latur	Latur	76.424	18.454	Percolation tank
227	Matephal	Latur	Latur	76.265	18.464	Percolation tank
228	Murud Akola	Latur	Latur	76.412	18.406	Percolation tank
229	Murud Akola	Latur	Latur	76.419	18.418	Percolation tank
230	Murud Akola	Latur	Latur	76.43	18.406	Percolation tank
231	Murud Bk.	Latur	Latur	76.232	18.432	Percolation tank
232	Murud Bk.	Latur	Latur	76.232	18.414	Percolation tank
233	Murud Bk.	Latur	Latur	76.247	18.424	Percolation tank
234	Murud Bk.	Latur	Latur	76.256	18.418	Percolation tank
235	Nandgaon	Latur	Latur	76.556	18.462	Percolation tank
236	Nilkanth	Latur	Latur	76.289	18.508	Percolation tank
237	Niwali	Latur	Latur	76.305	18.378	Percolation tank
238	Niwali	Latur	Latur	76.293	18.358	Percolation tank
239	Pimpalgaon (Amba)	Latur	Latur	76.297	18.516	Percolation tank
240	Raiwadi	Latur	Latur	76.548	18.455	Percolation tank
241	Sai	Latur	Latur	76.565	18.47	Percolation tank
242	Sakhara	Latur	Latur	76.448	18.393	Percolation tank
243	Samangaon	Latur	Latur	76.432	18.459	Percolation tank
244	Shirala	Latur	Latur	76.321	18.453	Percolation tank
245	Shiur	Latur	Latur	76.467	18.321	Percolation tank
246	Takali Bardpur	Latur	Latur	76.488	18.469	Percolation tank
247	Tandulja	Latur	Latur	76.308	18.524	Percolation tank
248	Wasangaon	Latur	Latur	76.552	18.369	Percolation tank
249	Wasangaon	Latur	Latur	76.542	18.371	Percolation tank
250	Ambulga Men	Nilanga	Latur	76.74	18.222	Percolation tank
251	Aundha	Nilanga	Latur	76.798	17.93	Percolation tank
252	Aundha	Nilanga	Latur	76.801	17.935	Percolation tank
253	Bolegaon Kh.	Nilanga	Latur	76.781	18.005	Percolation tank
254	Borsuri	Nilanga	Latur	76.849	18.009	Percolation tank
255	Chilwantwadi	Nilanga	Latur	76.849	17.953	Percolation tank
256	Chincholi (S)	Nilanga	Latur	76.79	18.006	Percolation tank
257	Chincholi (S)	Nilanga	Latur	76.809	18.02	Percolation tank
258	Dadgi	Nilanga	Latur	76.763	18.079	Percolation tank

SN	Village	Taluka	District	Longitude	Latitude	Structure
259	Dhanora	Nilanga	Latur	76.74	18.081	Percolation tank
260	Halgara	Nilanga	Latur	76.875	18.101	Percolation tank
261	Halgara	Nilanga	Latur	76.874	18.096	Percolation tank
262	Halgara	Nilanga	Latur	76.897	18.095	Percolation tank
263	Halsi Bk.	Nilanga	Latur	76.762	17.98	Percolation tank
264	Halsi Tugaon	Nilanga	Latur	76.931	18.104	Percolation tank
265	Halsi Tugaon	Nilanga	Latur	76.925	18.099	Percolation tank
266	Hangarga	Nilanga	Latur	76.854	18.103	Percolation tank
267	Harijawalga	Nilanga	Latur	76.762	17.993	Percolation tank
268	Harijawalga	Nilanga	Latur	76.772	18.002	Percolation tank
269	Kalandi	Nilanga	Latur	76.81	18.228	Percolation tank
270	Kasar Balkunda	Nilanga	Latur	76.851	17.945	Percolation tank
271	Kasarshirshi	Nilanga	Latur	76.774	17.925	Percolation tank
272	Kasarshirshi	Nilanga	Latur	76.769	17.926	Percolation tank
273	Kasarshirshi	Nilanga	Latur	76.762	17.927	Percolation tank
274	Kasarshirshi	Nilanga	Latur	76.755	17.924	Percolation tank
275	Kedarpur	Nilanga	Latur	76.861	18.193	Percolation tank
276	Kedarpur	Nilanga	Latur	76.855	18.19	Percolation tank
277	Kedarpur	Nilanga	Latur	76.842	18.191	Percolation tank
278	Kedarpur	Nilanga	Latur	76.834	18.187	Percolation tank
279	Kedarpur	Nilanga	Latur	76.85	18.189	Percolation tank
280	Kokalgaon	Nilanga	Latur	76.664	18.039	Percolation tank
281	Korali	Nilanga	Latur	76.801	17.911	Percolation tank
282	Korali	Nilanga	Latur	76.798	17.908	Percolation tank
283	Korali	Nilanga	Latur	76.795	17.906	Percolation tank
284	Limbala	Nilanga	Latur	76.764	18.048	Percolation tank
285	Madansuri	Nilanga	Latur	76.711	18.042	Percolation tank
286	Madansuri	Nilanga	Latur	76.728	18.037	Percolation tank
287	Madansuri	Nilanga	Latur	76.729	18.047	Percolation tank
288	Manathpur	Nilanga	Latur	76.753	18.083	Percolation tank
289	Masalga	Nilanga	Latur	76.714	18.239	Percolation tank
290	Masalga	Nilanga	Latur	76.717	18.236	Percolation tank
291	Masalga	Nilanga	Latur	76.727	18.252	Percolation tank
292	Masalga	Nilanga	Latur	76.715	18.243	Percolation tank
293	Masobawadi	Nilanga	Latur	76.831	18.112	Percolation tank
294	Mudgad (Ekoji)	Nilanga	Latur	76.624	18.027	Percolation tank
295	Mudgad (Ekoji)	Nilanga	Latur	76.629	18.027	Percolation tank
296	Nadiwadi	Nilanga	Latur	76.886	18.167	Percolation tank
297	Nadiwadi	Nilanga	Latur	76.891	18.17	Percolation tank
298	Nadiwadi	Nilanga	Latur	76.898	18.179	Percolation tank
299	Nadiwadi	Nilanga	Latur	76.9	18.185	Percolation tank
300	Nelwad	Nilanga	Latur	76.805	17.915	Percolation tank
301	Nelwad	Nilanga	Latur	76.803	17.914	Percolation tank

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302	Nitur	Nilanga	Latur	76.775	18.251	Percolation tank
303	Nitur	Nilanga	Latur	76.778	18.22	Percolation tank
304	Ramtirth	Nilanga	Latur	76.681	18.041	Percolation tank
305	Sangareddiwadi	Nilanga	Latur	76.88	18.054	Percolation tank
306	Sangvi (Je.)	Nilanga	Latur	76.679	18.054	Percolation tank
307	Sangvi (Je.)	Nilanga	Latur	76.67	18.067	Percolation tank
308	Shelgi	Nilanga	Latur	76.897	18.039	Percolation tank
309	Shindi Jawalga	Nilanga	Latur	76.705	18.189	Percolation tank
310	Shindkhed	Nilanga	Latur	76.779	18.073	Percolation tank
311	Shindkhed	Nilanga	Latur	76.794	18.076	Percolation tank
312	Shiradhon	Nilanga	Latur	76.779	17.926	Percolation tank
313	Shiradhon	Nilanga	Latur	76.789	17.926	Percolation tank
314	Shirol	Nilanga	Latur	76.846	18.225	Percolation tank
315	Shivani (Ko)	Nilanga	Latur	76.703	18.231	Percolation tank
316	Shivani (Ko)	Nilanga	Latur	76.701	18.228	Percolation tank
317	Singnal	Nilanga	Latur	76.713	18.081	Percolation tank
318	Takali	Nilanga	Latur	76.846	17.982	Percolation tank
319	Tambarwadi	Nilanga	Latur	76.909	18.096	Percolation tank
320	Tambarwadi	Nilanga	Latur	76.917	18.113	Percolation tank
321	Wadi (Shedol)	Nilanga	Latur	76.674	18.223	Percolation tank
322	Walsangvi	Nilanga	Latur	76.88	18.197	Percolation tank
323	Walsangvi	Nilanga	Latur	76.873	18.195	Percolation tank
324	Yelnur	Nilanga	Latur	76.795	18.048	Percolation tank
325	Bhandarwadi	Renapur	Latur	76.606	18.586	Percolation tank
326	Bhokaramba	Renapur	Latur	76.459	18.582	Percolation tank
327	Bitargaon	Renapur	Latur	76.55	18.572	Percolation tank
328	Bitargaon	Renapur	Latur	76.556	18.567	Percolation tank
329	Brahmawadi (N.V.)	Renapur	Latur	76.542	18.503	Percolation tank
330	Darji Borgaon	Renapur	Latur	76.532	18.485	Percolation tank
331	Dighol Deshmukh	Renapur	Latur	76.436	18.564	Percolation tank
332	Ghansargaon	Renapur	Latur	76.6	18.556	Percolation tank
333	Ghansargaon	Renapur	Latur	76.61	18.568	Percolation tank
334	Ghansargaon	Renapur	Latur	76.606	18.57	Percolation tank
335	Godhala	Renapur	Latur	76.752	18.663	Percolation tank
336	Kadepur	Renapur	Latur	76.695	18.613	Percolation tank
337	Kamkheda	Renapur	Latur	76.61	18.579	Percolation tank
338	Khalangri	Renapur	Latur	76.724	18.628	Percolation tank
339	Khalangri	Renapur	Latur	76.716	18.626	Percolation tank
340	Kharola	Renapur	Latur	76.664	18.495	Percolation tank
341	Kostagaon	Renapur	Latur	76.703	18.674	Percolation tank
342	Motegaon	Renapur	Latur	76.417	18.577	Percolation tank
343	Renapur	Renapur	Latur	76.593	18.508	Percolation tank
344	Renapur	Renapur	Latur	76.607	18.544	Percolation tank

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345	Saygaon	Renapur	Latur	76.754	18.639	Percolation tank
346	Selu Kh.	Renapur	Latur	76.634	18.503	Percolation tank
347	Sumthana	Renapur	Latur	76.579	18.56	Percolation tank
348	Takalgaon	Renapur	Latur	76.567	18.563	Percolation tank
349	Takalgaon	Renapur	Latur	76.59	18.558	Percolation tank
350	Talni	Renapur	Latur	76.665	18.581	Percolation tank
351	Dhamangaon	Shirur-Anantpal	Latur	76.8297	18.3837	Percolation tank
352	Hippalgaon	Shirur-Anantpal	Latur	76.7439	18.3705	Percolation tank
353	Sakol	Shirur-Anantpal	Latur	76.8635	18.2958	Percolation tank
354	Bamni	Udgir	Latur	77.1254	18.317	Percolation tank
355	Banshelki	Udgir	Latur	77.0888	18.3658	Percolation tank
356	Banshelki	Udgir	Latur	77.0833	18.3744	Percolation tank
357	Banshelki	Udgir	Latur	77.1022	18.3591	Percolation tank
358	Bhakaskheda	Udgir	Latur	77.0007	18.3669	Percolation tank
359	Bhakaskheda	Udgir	Latur	76.9933	18.3617	Percolation tank
360	Bhakaskheda	Udgir	Latur	76.9978	18.347	Percolation tank
361	Chandegaon	Udgir	Latur	77.2228	18.4091	Percolation tank
362	Chaundi	Udgir	Latur	77.261	18.4709	Percolation tank
363	Chighali	Udgir	Latur	77.0102	18.3494	Percolation tank
364	Chimachiwadi	Udgir	Latur	77.042	18.564	Percolation tank
365	Dewarjan	Udgir	Latur	76.9964	18.3226	Percolation tank
366	Dewarjan	Udgir	Latur	76.9882	18.339	Percolation tank
367	Dewarjan	Udgir	Latur	77.0015	18.3399	Percolation tank
368	Dewulwadi	Udgir	Latur	77.2338	18.4731	Percolation tank
369	Dewulwadi	Udgir	Latur	77.2378	18.4791	Percolation tank
370	Gudsur	Udgir	Latur	77.1309	18.5313	Percolation tank
371	Hali	Udgir	Latur	77.0184	18.5573	Percolation tank
372	Hali	Udgir	Latur	76.9905	18.5477	Percolation tank
373	Handarguli	Udgir	Latur	77.0491	18.5499	Percolation tank
374	Hipparga	Udgir	Latur	77.1143	18.5037	Percolation tank
375	Hipparga	Udgir	Latur	77.1171	18.5193	Percolation tank
376	Karadkhed	Udgir	Latur	76.9866	18.3956	Percolation tank
377	Loni	Udgir	Latur	77.075	18.3968	Percolation tank
378	Mogha	Udgir	Latur	77.1482	18.3122	Percolation tank
379	Mortalwadi	Udgir	Latur	77.1749	18.4899	Percolation tank
380	Nagalgaon	Udgir	Latur	77.1721	18.4303	Percolation tank
381	Netragaon	Udgir	Latur	77.1053	18.3327	Percolation tank
382	Rawangaon	Udgir	Latur	77.2071	18.2842	Percolation tank
383	Sambhu Umarga	Udgir	Latur	76.9378	18.3342	Percolation tank
384	Sambhu Umarga	Udgir	Latur	76.9396	18.3259	Percolation tank
385	Satala	Udgir	Latur	76.9375	18.3617	Percolation tank

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386	Satala	Udgir	Latur	76.9308	18.3616	Percolation tank
387	Satala	Udgir	Latur	76.9312	18.3595	Percolation tank
388	Shirol	Udgir	Latur	77.2177	18.3748	Percolation tank
389	Sumthana	Udgir	Latur	77.1941	18.4374	Percolation tank
390	Togari	Udgir	Latur	77.1493	18.2559	Percolation tank
391	Wadhawana Kh.	Udgir	Latur	77.079	18.5432	Percolation tank
392	Waigaon	Udgir	Latur	76.9394	18.3789	Percolation tank