



केंद्रीय भूमि जल बोर्ड

जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय

भारत सरकार

CENTRAL GROUND WATER BOARD

Department of Water Resources, River Development &

Ganga Rejuvenation

Ministry of Jal Shakti

Government of India

AQUIFER MAPS AND GROUND WATER

MANAGEMENT PLAN

NANDURBAR DISTRICT, MAHARASHTRA

AAP 2019-2020

मध्यक्षेत्र, नागपुर / Central Region, Nagpur

अगस्त 2021 /August 2021

**AQUIFER MAPS AND GROUND WATER MANAGEMENT PLANS
NANDURBAR DISTRICT, MAHARASHTRA
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NANDURBAR DISTRICT AT A GLANCE

1. GENERAL INFORMATION		
Geographical Area	:	5951.85 sq. km
Administrative Divisions	:	Taluka – 6; Akkalkuwa, Akrani, Nandurbar, Nawapur, Shahada, Taloda,
Villages	:	952
Population (2011)	:	16,48,295
Normal Annual Rainfall	:	720.9 mm to 1198.7 mm
2. GEOMORPHOLOGY		
Major Physiographic unit	:	4; Satpura Hilly Regions, Tapi River Valley proper, Regions of the dykes and Residual hills of Sahyadri spurs
Major Drainage	:	Two: Tapi and Narmada
3. LAND USE		
Forest Area	:	741.16 sq km
Net Area Sown	:	2950.19 sq km
Cultivable Area	:	3179.75 sq km
4. SOIL TYPE		
Three types	:	Coarse shallow soils, medium deep soils and black deep soils
5. PRINCIPAL CROPS		
Rice	:	260.99 sq km
Wheat	:	110.14 sq km
Jowar	:	444.14 sq km
Cereals	:	2077.11 sq km
Total Pulses	:	398.31 sq km
Cotton	:	949.22 sq km
6. IRRIGATION BY DIFFERENT SOURCES		
Dugwells	:	21544/444.75
Shallow Tubewells/ Deep Tubewells	:	22156/339.80
7. GROUND WATER MONITORING WELLS (As on Jnauary 2019)		
Dugwells	:	28 + 78 = 106
Piezometers	:	00
8. GEOLOGY		
Recent	:	Alluvium
Upper Cretaceous to Eocene	:	Deccan Trap (Basalt)
Middle Upper Cretaceous	:	Bagh Bed
9. HYDROGEOLOGY		
Water Bearing Formation	:	Basalt- Weathered /Fractured / Jointed/ Vesicular/ massive/ under Phreatic and semi confined to confined Condition
Pre-monsoon Depth to Water Level (May-2019)	:	2.00 to 24.00 mbgl
Post-monsoon Depth to Water Level (Dec.- 2019)	:	1.1 to 15.3 mbgl
Pre-monsoon Water Level	:	Rise: 0.0045 to 1.1762 m/year

	Trend (2010-2019)		Fall: 0.0024 to 1.6414 m/year
	Post-monsoon Water Level Trend (2010-2019)	:	Rise: 0.0142 to 0.6108 m/year Fall: 0.003 to 0.5485 m/year
10. GROUND WATER EXPLORATION			
	Wells Drilled	:	EW-39, OW-16, Pz-4
	Depth Range	:	16.70 to 200.00 mbgl
	Discharge	:	0.20 to 18.49 lps
	Transmissivity (T)		0.31 to 6394 m ² /day
	Storativity (S)		2×10^{-4} to 1.05×10^{-1}
11. GROUND WATER QUALITY			
	Ground Water is Suitable for Drinking and irrigation purpose, however localized total hardness contamination observed.		
12. DYNAMIC GROUND WATER RESOURCES- (2017)			
	Annual Replenishable GW Resources	:	474.23 MCM
	Gross Ground Water Draft	:	206.56 MCM
	Projected Demand (Domestic + Industrial)	:	30.65 MCM
	Stage of Ground Water Development	:	42.24%
14. GROUND WATER CONTROL & REGULATION			
	Over-Exploited Taluka	:	Nil
	Critical Taluka	:	Nil
	Semi-critical Taluka		Nil
15. MAJOR GROUND WATER PROBLEMS AND ISSUES			
	<p>The stage of ground water development in 6 talukas (Nandurbar, Nawapur, Shahada, Taloda, Akkalkuwa, Akrani) has reached up to 42.24%. Eastern part of the district generally has low rainfall.</p> <p>The northern part of the district has prominent Satpura hill ranges, undulating topography, which gives rise to very high surface run-off. The underlying basalt formation has medium storage and transmission capability rendering the aquifer to sufficient potential. The unconfined aquifer gets fully recharged instantaneously and a situation of rejected recharge emerges. Also, the unconfined aquifer gets drained off quickly due to sloping and undulating topography.</p>		
14. AQUIFER MANAGEMENT PLAN			
	Supply side Management		Proposed AR structures: 75 Percolation Tanks, 135 Check Dams and 41 Recharge shafts. The expected recharge every year from these structures is 19.01 MCM/yr.
	Demand side Management		A total of 37.02 sq.km area of sugarcane, which is under groundwater irrigation is proposed to be covered by Drip irrigation. Total water saved by implementing Drip irrigation would be 37.02 MCM.
	Development plan		Proposed 6629 Dugwells and 1105 Borewells in phased manner for 6 years to bring additional 169.98 sq. km. area under assured ground water irrigation

AQUIFER MAPS AND GROUND WATER MANAGEMENT PLANS NANDURBAR DISTRICT, MAHARASHTRA

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AQUIFER MAPS AND GROUND WATER MANAGEMENT PLANS NANDURBAR DISTRICT

1. INTRODUCTION

National Aquifer Mapping (NAQUIM) has been taken up in XII five-year plans by CGWB to carry out detailed hydrogeological investigation on toposheet 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. Aquifer mapping is a process wherein a combination of geological, geophysical, hydrological and chemical analyses is applied to characterize the quantity, quality and sustainability of ground water in aquifers.

The vagaries of rainfall, inherent heterogeneity & unsustainable nature of basalt 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. Thus, prompting the paradigm shift from “traditional ground water development concept” to “modern ground water management concept”.

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. 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 Wardha district, Maharashtra 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

1.1 About the Area

Nandurbar district was derived from Dhule district on 1st July, 1998 and it is surrounded by Dhule district in the south and east, Gujarat state in the west and Madhya Pradesh state in the north. Nandurbar district is located in the western part of Deccan plateau and lies between north latitude 21°00'00" to 22°00'30" and east longitude 73°31'00" to 74°45'30". The entire area of the district falls in parts of Survey of India degree sheet numbers 46-G and 46-K. The district has an area of 5034 sq.km, which constitutes

about 1.64 % of the total area of Maharashtra. The district is divided in 6 talukas, namely Nandurbar, Nawapur, Shahada, Taloda, Akkalkuwa and Akrani. There are four Vidhan Sabha constituencies in this district. All four Vidhan Sabha constituencies of the district namely Nandurbar, Nawapur, Shahada and Akkalkuwa and Sakri and Shirpur from Dhule district are part of Nandurbar (Lok Sabha Constituency). Nandurbar is the district headquarter and well connected with roads & railway network and other major towns include Nandurbar, Nawapur, Shahada, Akkalkuwa and Taloda. This district comes under Nashik Administrative Division along with Nashik, Dhule, Nandurbar, Ahmednagar and Jalgaon.

The total population of Nandurbar district as per 2011 census is 16,48,295 out of which rural population is 13,72,865 (83.29%) while urban population is 2,75,430 (16.71%). The male population is 8,33,870 and female population is 8,15,125 whereas the population density is 276 person/sq.km. The increase in population is 25.66% over the period of 10 years from 2001 to 2011.

Nandurbar city is of historical importance; King Nanda from Gawali dynasty had ruled the region. Ruins of the historical fort still toady represent the glory of imperial days. Other historical sites include Akrani Fort from Dhadgaon, old wells & water resources constructed by Rani Ahilyadevi Holkar of Indore around Nandurbar city, a monument of young freedom fighter Sirishkumar Mehta located in heart of Nandurbar city. Ancient Hazira & Rangmahal also contributes to the historical heritage of the city.

Nandurbar district represents well-diversified community living from urban to tribal population and this cultural conglomeration fabricates sound harmony. The places of cultural & religious interest include famous Dandapaneshwar Ganpati Temple, Durga of Imam Badshah, Wageshwari Temple, Kedareshwar Temple of Prakasha, and Dutta Temple of Sarangkhedha. Tribal community has its own cultural identity & their Holi festival is admirable.

Since 1980, Central Ground Water Board has taken up several studies in the district. Keeping in view the current demand and supply and futuristic requirement of water, Central Ground Water Board has initiated the National Aquifer Mapping Programme (NAQUIM) in country during XII five-year plan, with a priority to study Over-exploited, Critical and Semi-Critical talukas. Hence, Nandurbar district has been taken up to carry out detailed hydrogeological investigations in the year 1965-66, 1986-87, 1988-89, 1997-98 and 2019-20. Nandurbar district is categorized as safe as per Ground Water Resources Estimation as on March 2020. The Administrative and Index map of the study area is presented in **Fig.1 a & 1b**.

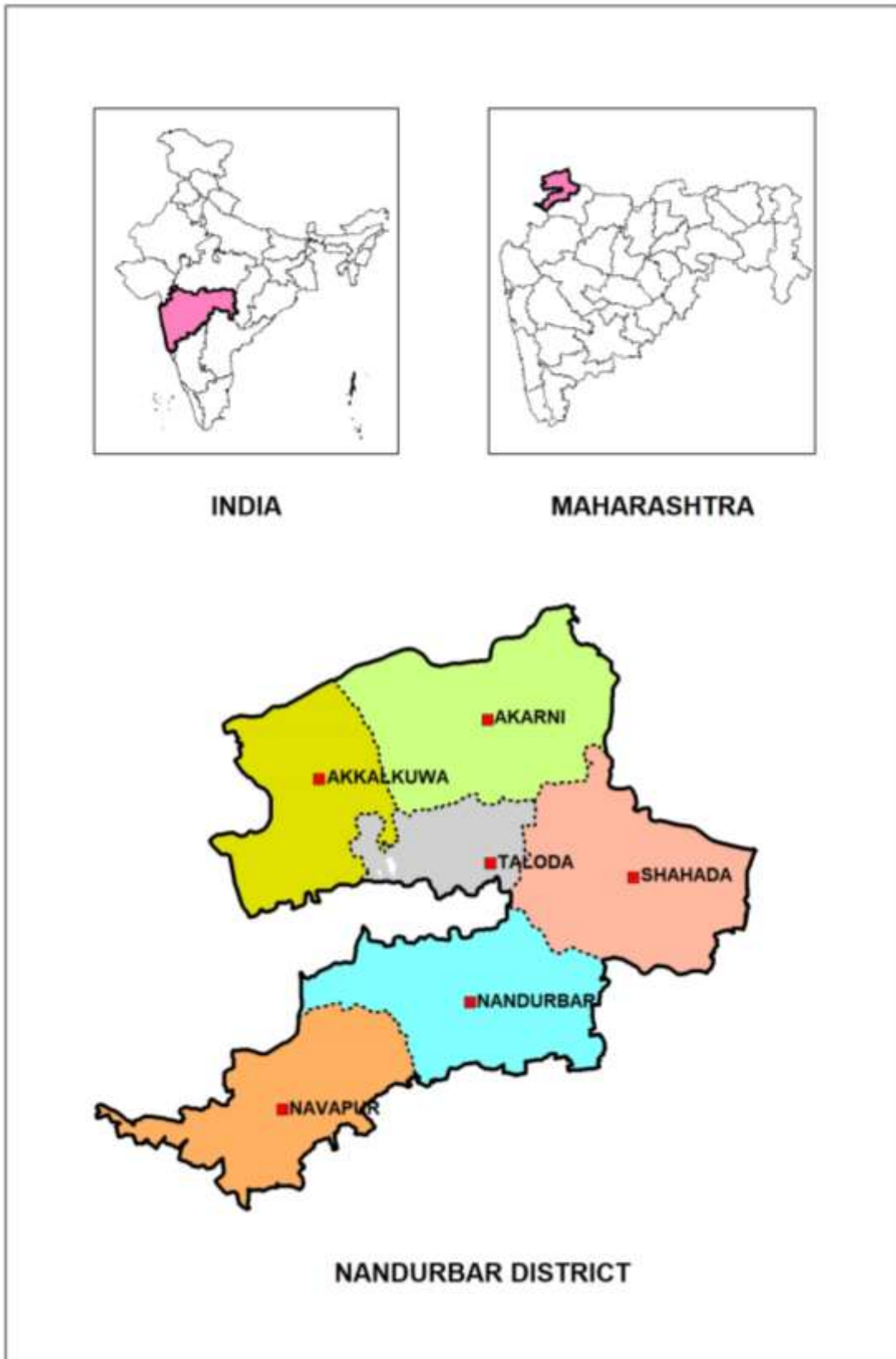


Figure 1.1 (a): Index Map, Nandurbar district

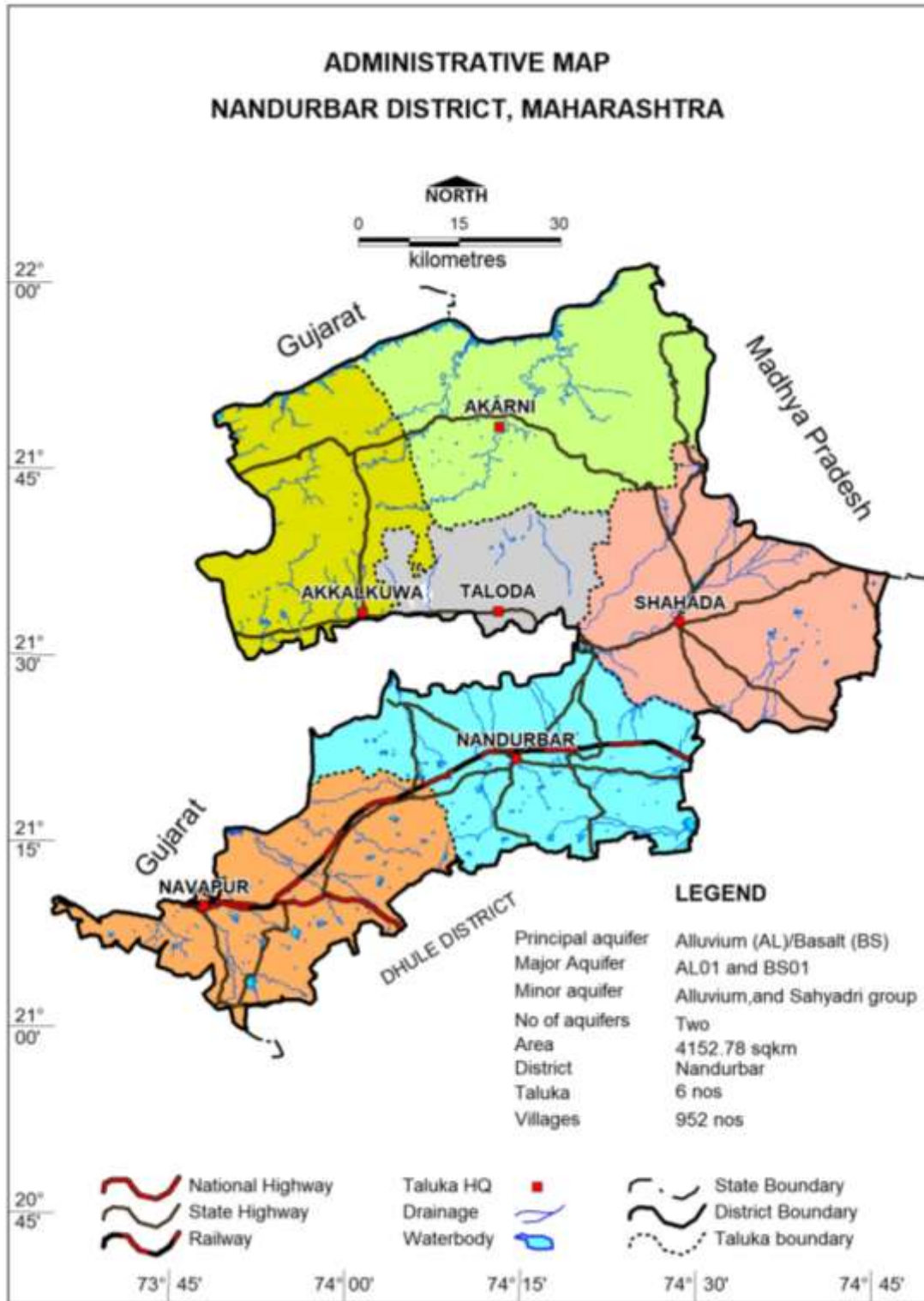


Figure 1.1(b): Administrative map, Nandurbar District

Ground water exploratory drilling in the district has been taken up during 1982-87 and 2019-20. The ground water exploration has been done in Alluvial and hard rock areas occupied by Deccan Trap Basalt. To establish the aquifer geometry, disposition and potential of aquifers, ground water exploration down to the depth of 200 m bgl has been taken up where the data gap exists and accordingly 22 exploratory wells and 11 observation wells and 04 Piezometer have been constructed during 1982-87 and 17 exploratory wells and 5

observation wells have been constructed during 2019-20. A total of 39 EW, 16 OW and 4 Piezometers have been constructed till March 2020. Brief details are given below and the salient features of Ground Water Exploration are given in Annexure –I.

S. No	Taluka	Wells Drilled	Drilled Depth (m bgl)	Zones (m bgl)	Discharge (lps)	SWL (m bgl)
1.	Nandurbar	8EW + 2 OW + 1 Pz	157.76 to 200.00	29.00 to 193.91	0.2 to 18.49	3.52 to 116.81
2.	Nawapur	5EW + 2OW + 1Pz	122.78 to 200.00	24.36 to 183.00	Traces to 18.00	8.40 to 49.80
3.	Shahada	7EW + 5OW + 1Pz	26.50 to 165.50	05.00 to 63.00	1.10 to 4.00	1.50 to 36.20
4.	Taloda	11EW + 5OW + 1 Pz	26.60 to 162.50	5.30 to 66.44	0.27 to 6.10	5.23 to 16.27
5.	Akkalkuwa	4EW + 1OW	16.70 to 200.00	5.18 to 198.00	1.86 to 7.80	5.18 to 113.69
6.	Akrani	4EW + 1OW	139.00 to 200.00	32.00 to 190.00	1.74 to 17.94	5.09 to 31.25
Total		39 EW + 16 OW + 4 PZ	26.50 to 200.00	5.00 to 198.00	Traces to 18.49	1.50 to 116.81

A total of 28 existing ground water monitoring stations were being monitored 4 times in a year to assess the ground water scenario of the district. Based on data gap analysis additional 78 KOWs were inventoried to acquire micro level hydrogeological data to decipher the water level scenario, sub-surface lithological disposition and hydrogeological setup of shallow aquifer (Aquifer-I). The details of KOWs and GWM wells are given in Annexures-II and III. Locations of existing ground water monitoring stations and exploratory wells are shown in **Figure.1.2**.

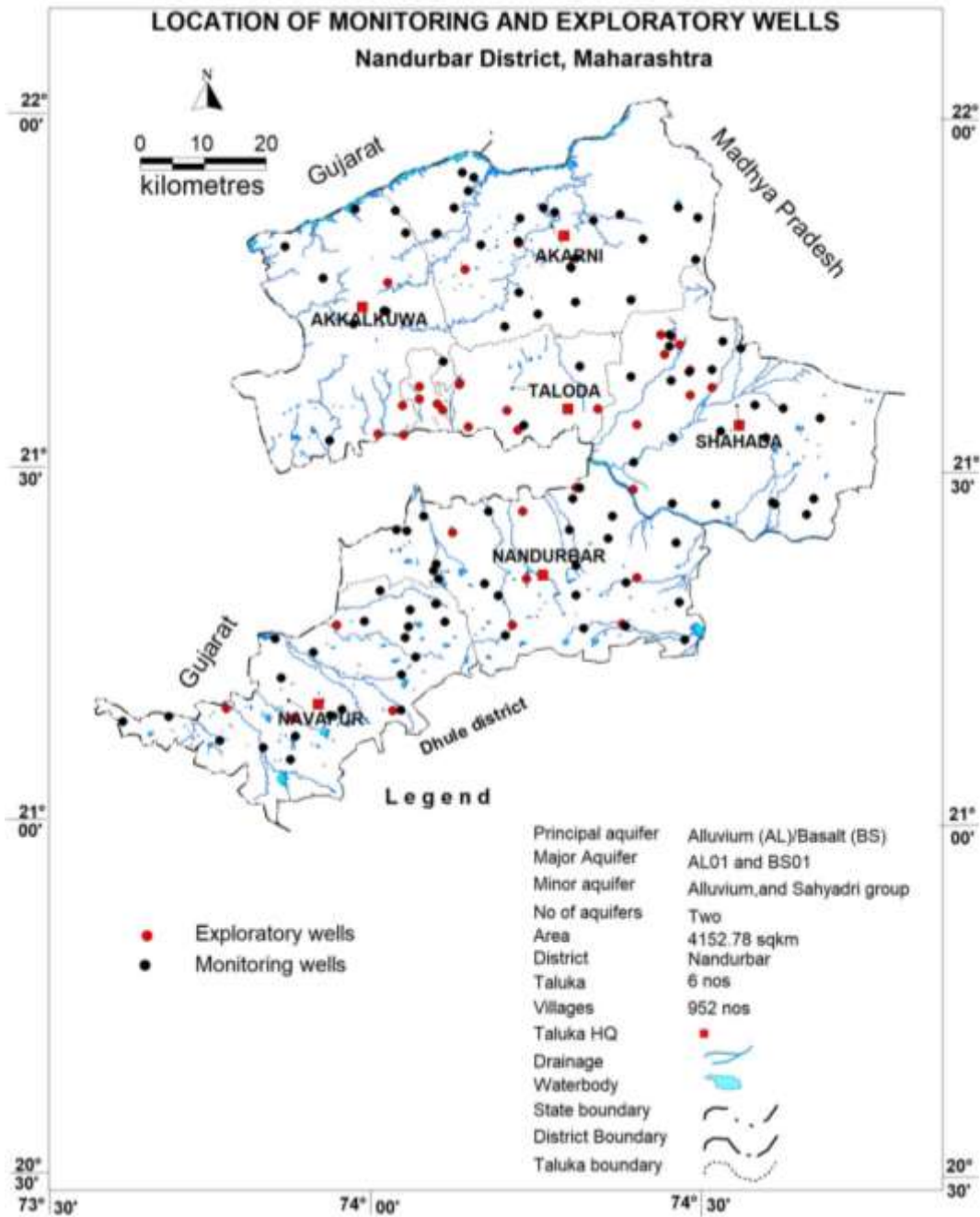


Figure 1.2: Locations of Existing Exploratory wells and Ground Water Monitoring Wells.

1.2 Geomorpholgy, Drainage, Land Use and Soil Types

Physiographically, the district forms part of north western Maharashtra plateau and can be broadly divided in four major units viz., Satpuda hilly region, Tapi river valley proper, Region of the dykes, and residual hills of Sahyadri spurs with eastward trending streams in between Nawapur and western Nandurbar region with a westerly aspect below the Sahyadri scraps. North of Tapi River, the whole length of rich alluvial plain bounded by the steep southern face of the Satpudas, a belt of mountain land about 30 km broad. Satpudas rise from the first range of hills, ridge behind ridge to the central ridge to a height of about 600 metres above mean sea level (m amsl) and then slope down rather steeply towards the Narmada. The Tapi River valley is observed on both sides of Tapi River in parts of Nandurbar,

Shahda and Taloda talukas and Sindkhed talukas. The region of dykes and residual hills of the Sahyadri Spurs comprises southern part of Nandurbar taluka. Nawapur and western Nandurbar region with a westerly aspect below the Sahyadrian scarps, is full of steep hill ranges covered with forests. The highest elevation is Asthamba peak with an elevation of 1150 m amsl and second highest hill station of Maharashtra i.e. Toranmal Plateau with an elevation of about 1100 m amsl. The average elevation of the plain areas ranges between 550 to 675 m amsl. The geomorphological map of Nandurbar district is shown in **Figure. 1.3**.

The entire Nandurbar district falls within the drainage system of the Tapi River basin and Narmada River basin. The northern part of Nandurbar district is drained by Narmada River and its tributaries such as Katri, Devnadi/Devganga, and Udai rivers while rest of the district is drained by Tapi River and its tributaries such as Nagan, Shivan, Gomai and Dehali etc. Total drainage network of the district contains about 29 watersheds out of which 21 are in Tapi river basin while 8 are in Narmada basin. The entire river system has sub-parallel to semi-dendritic drainage pattern and the drainage density is quite high in the district. The drainage map of Nandurbar district is shown in **Figure. 1.4**.

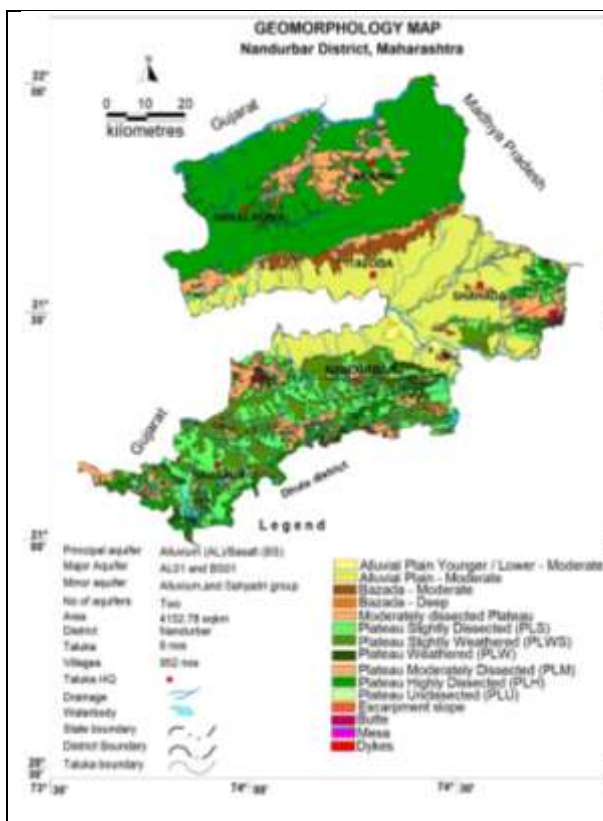


Figure 1.3: Geomorphology of Nandurbar District

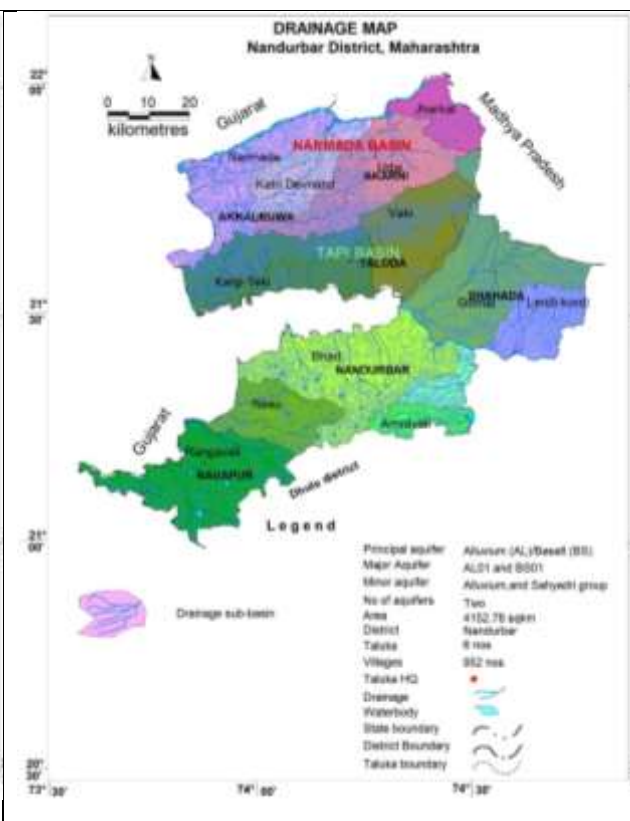


Figure 1.4: Drainage, Nandurbar District

Land Use (**Figure .1.5**) show that the major parts of the district are covered by cultivable area of 4130 Sq.km (69.39%) with net sown area of 840 Sq.km (14.11%). Forest covers area of 1040 Sq.km (17.47%). The built-up area is reflected wherever settlement have come up.

Mainly three types of soils are observed in the district i.e., coarse shallow soils, medium deep soils and deep black soils. The soils of the district are basically derived from Deccan Trap Basalt to the south of Tapi River. North of Tapi River the soils are from Deccan

Trap Basalt as well as from alluvial formations. The northern part of the district has dark brown to yellowish brown coarse shallow to medium deep soils, with clayey loamy deep soils of Tapi River and Narmada River valley to its south and north respectively. Below the Tapi River valley comes the belt of medium deep soils mostly with interception of medium and shallow soils in scattered patches, depending on the local conditions. The thematic map of soil distribution in the district is shown in **Figure. 1.6**.

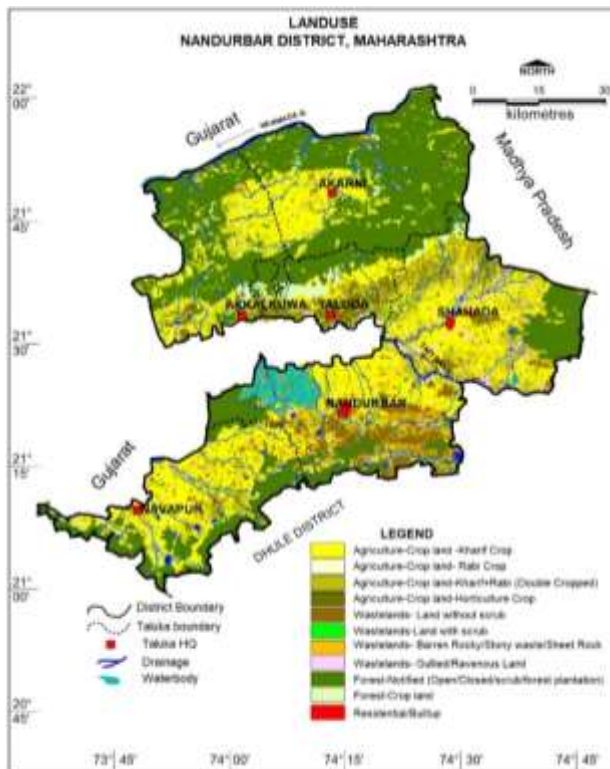


Figure 1.5: Land Use of Nandurbar District

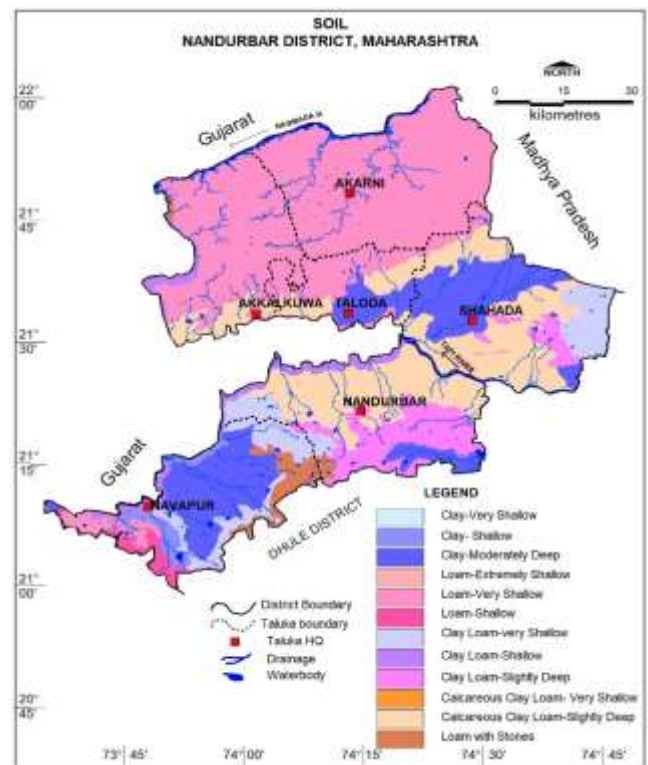


Figure 1.6: Soil, Nandurbar District

1.3 Climate and Rainfall

The Climate of Nandurbar District is generally hot and dry. As the rest of India Nandurbar District has three distinct seasons - summer, monsoon/rainy and the winter season. Summer is from March to mid of June. Summers are usually hot and dry. During the month of May the summer is at its peak. Temperatures can be as high as 45° Celsius during the peak of Summer. The Monsoon sets in during the mid or end of June. Monsoon season is from the mid of June to October. During this season, the weather is usually humid and hot. The northern and western regions receive more rainfall than the rest of the region. The average rainfall is 807.03 mm through the district. Winter is from the month of November to February. Winters are mildly cold but dry. The daily mean minimum temperature is 15.8°C and mean maximum temperature is 40.7°C.

The Normal rainfall of the district is 907.7 mm spread over 32 to 81 rainy days in normal condition. Long term rainfall analysis (1998-2019) and annual rainfall data of last ten years is given in **Table 1.1** and **1.2** and **Figure. 1.7**. The spatial distribution of the rainfall is given in **Figure. 1.8**.

Table 1.1: Long-term rainfall analysis

District	Period	No. of Years	Normal Rainfall (mm)	Std. Deviation (mm)	Coefficient of Variation (%)	Rainfall Trend mm/year
Nandurbar	1998-2019	22	907.7	287.1464	32.1	-5.99
CATEGORY	NUMBER OF YEARS			% of Total Years		
DEPARTURES						
POSITIVE	9			41		
NEGATIVE	13			59		
DROUGHTS						
MODERATE	4			18		
SEVERE	0			0		
ACUTE	0			0		
NORMAL & EXCESS R/F						
NORMAL	14			64		
EXCESS	4			18		

Table 1.2: Annual rainfall data (2010-2019) (in mm)

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average RF (mm)
Nandurbar RF mm	827. 2	800. 7	727. 1	1353. 7	604. 2	726. 2	677. 9	795. 5	516. 3	1041. 5	807.03

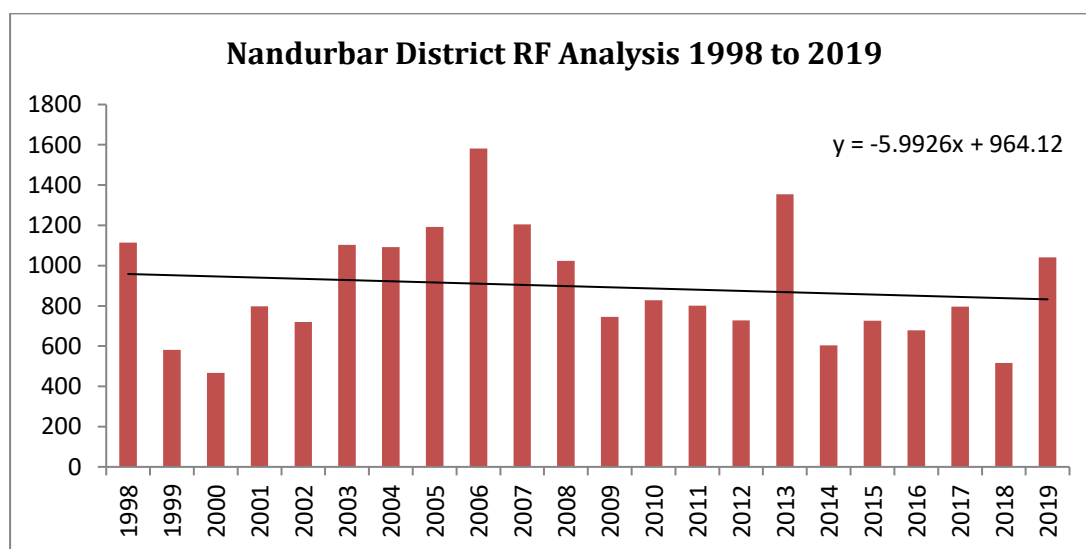


Figure 1.7: Rainfall Analysis (1998-2019), Nandurbar District

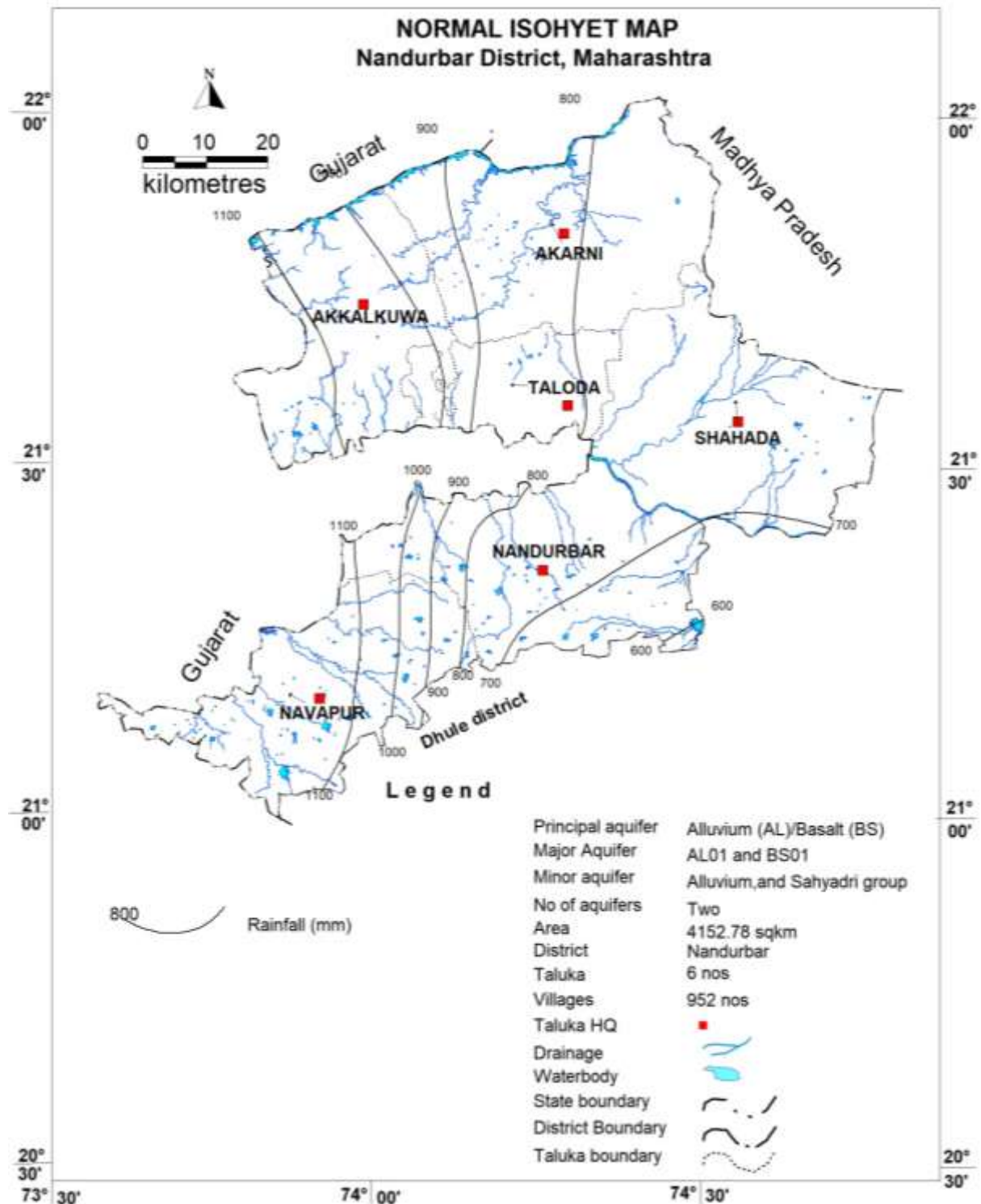


Figure.1.8. Isohyet map of Nandurbar district.

1.4 Soil Infiltration Tests

To estimate the actual rate of infiltration of various soil cover and their impact on recharge to ground water, 2 infiltration tests have been conducted at Loy and Waghoda in various soil types. The data has been analyzed and the salient features of the infiltration

tests are presented in **Table 1.3**, whereas the data is presented in **Annexure-IV**. The duration of the test ranges from 120 to 160 minutes, the depth of water infiltrated varied from 7.4 cm to 24.5 cm and the final infiltration rate in the area are 2.4 cm/hr at Waghoda and 4.8 cm/hr at Loy.

Table 1.3: Salient Features of Infiltration Tests

Sr. No.	Village	Date of Test	Duration (min)	Water Level depth (cm agl)	Final Infiltrated water depth (cm)	Final Infiltration rate (cm/hr)
1	Loy	28.02.2020	160	22.2	24.5	4.8
2	Waghode	03.03.2020	120	22.6	7.4	2.4

1.5 Specific Yield Tests

To estimate the aquifer parameters of shallow aquifer (Aquifer-I) in the area, 2 pumping tests on open dug wells have been conducted. The data has been analyzed by Kumarswamy method. The salient features of pumping tests are given in **Table 1.4**. The discharge of the wells ranged from 120 to 150 lpm for pumping duration of 150 to 180 minutes.

The drawdown observed at the end of the pumping ranged from 2.45 to 3.3 m and the residual drawdown for the last minute was observed to be ranging from 0.48 to 0.52 m. The aquifer parameter values estimated by Kumarswamy method are observed to be well within the general range of values for weathered and jointed basalt i.e., the transmissivity value was observed from 3883 to 5054 m²/day, whereas the specific yield 0.03% to 0.04%, whereas specific capacity values ranged from 36.36 to 61.22 lpm/m.

Table 1.4: Salient Features of Specific Yield Tests.

Sr No	Village	Dia meter (m)	Depth (mbgl)	SWL (mbgl)	Q (lpm)	Pt (min)	DD (m)	RDD (m)	C (lpm/m)	T (m ² /day)	Sy
1	Bhadvad	8	10.5	6.2	150	150	2.45	0.52	61.22	5054	0.0267
2	Shams herpur	6.5	11	4.8	120	180	3.3	0.48	36.36	3883	0.0381

Q=Discharge in LPM; Pt=Pumping duration in Minutes; DD=Drawdown in meter; RDD=Residual drawdown in meters; C=Specific Capacity in lpm/m; T=Transmissivity in m²/day; S_y=Specific Yield

2. HYDROGEOLOGY

2.1 Major Aquifer Systems

There are 2 types of aquifer systems in the area namely Alluvium and Basalt. The map showing major aquifer systems of Nandurbar district is shown in **Figure 2.1**.

2.1.1 Deccan Trap Basalt

Deccan Trap includes several flows of basalt which are supposed to have extruded from fissure volcanoes. The flows are mainly of two types i.e., "Pahoehoe" and "aa" types, the former being very common. It is observed in north. The flows have been intruded by large number of doleritic dykes. The dykes are generally 1 m to 20 m in width. However, few dykes are as much as 50 m wide. The dykes are aligned in an ENE-WSW direction, and a few gave N-S or WNE-ESE trends. A map depicting hydrogeological features is presented in **Figure 2.2** and water table contour map is shown in **Figure 2.3**.

The ground water occurs under unconfined conditions in the near surface strata down to the depth of 20 m in the weathered zone of the vesicular/amygdaloidal Basalt, jointed and fractured units of massive Basalt. Ground water occurs under semi-confined to confined conditions generally below 40 m depth beneath the red bole and dense massive Basalt in the fractured or jointed massive/vesicular/amygdaloidal Basalt. Confined aquifers generally at deeper levels in flows and available from about 60 m to 195 m. On the elevated plateau tops having good areal extent, local water table develops in topmost layers and the wells in such areas show rapid decline water levels in postmonsoon season and go dry during peak summer. In the foothills zone the water table is relatively shallow near the water courses and deep away from it and near the water divides. In the valleys and plains of river basin the water table aquifer occurs at shallow depth and the wells in such areas do not go dry and sustain perennial yield except in extreme summer or drought conditions. The yield of the dugwells varies from 60 to 125 m³/day, whereas that of borewells varies from 2 to > 20 m³/hr, however in most of the borewells it ranges between 2 to 10 m³/hr.

2.1.2 Alluvium

The Alluvial deposits are restricted along the bank of Tapi River valley and occur in long narrow basin, which are probably caused by faulting. About a 15% of the district is occupied by Alluvium. It consists of clays, silt, sand, gravels and boulders etc. The beds of sand and gravels are discontinuous and lenticular and pinch out laterally within short distance. They are mixed with large proportions of clayey material rendering delimiting of individuals granular horizons difficult. As per ground water exploration data Alluvium is encountered down to 100 m depth. Ground water occurs under water table, semi-confined and confined conditions in inter granular pore spaces of gravel and sand. The yield of the dugwells varies between 150 and 200 m³/day, whereas that of exploratory wells varies from 0.27 to 7.40 lps as per exploration data. The yields of the tubewells drilled by State ground water department/agency ranges from 20 to 250 m³/hr.

2.1.3 Bagh Beds

The oldest geological formation met within the north-western part of the district is the Bagh beds of Middle to Upper Cretaceous age. They occur as inliers within the Deccan Traps over an area 9 km in length and 5 km in width. These rocks are conspicuously exposed on the banks of Devganga River and its tributaries. The formation comprises of Nimar

Sandstone, Shale, grey Limestone and upper Sandstone. The Sandstone beds are porous and permeable, and the Limestone holds water in the joints, fissures and solution cavities.

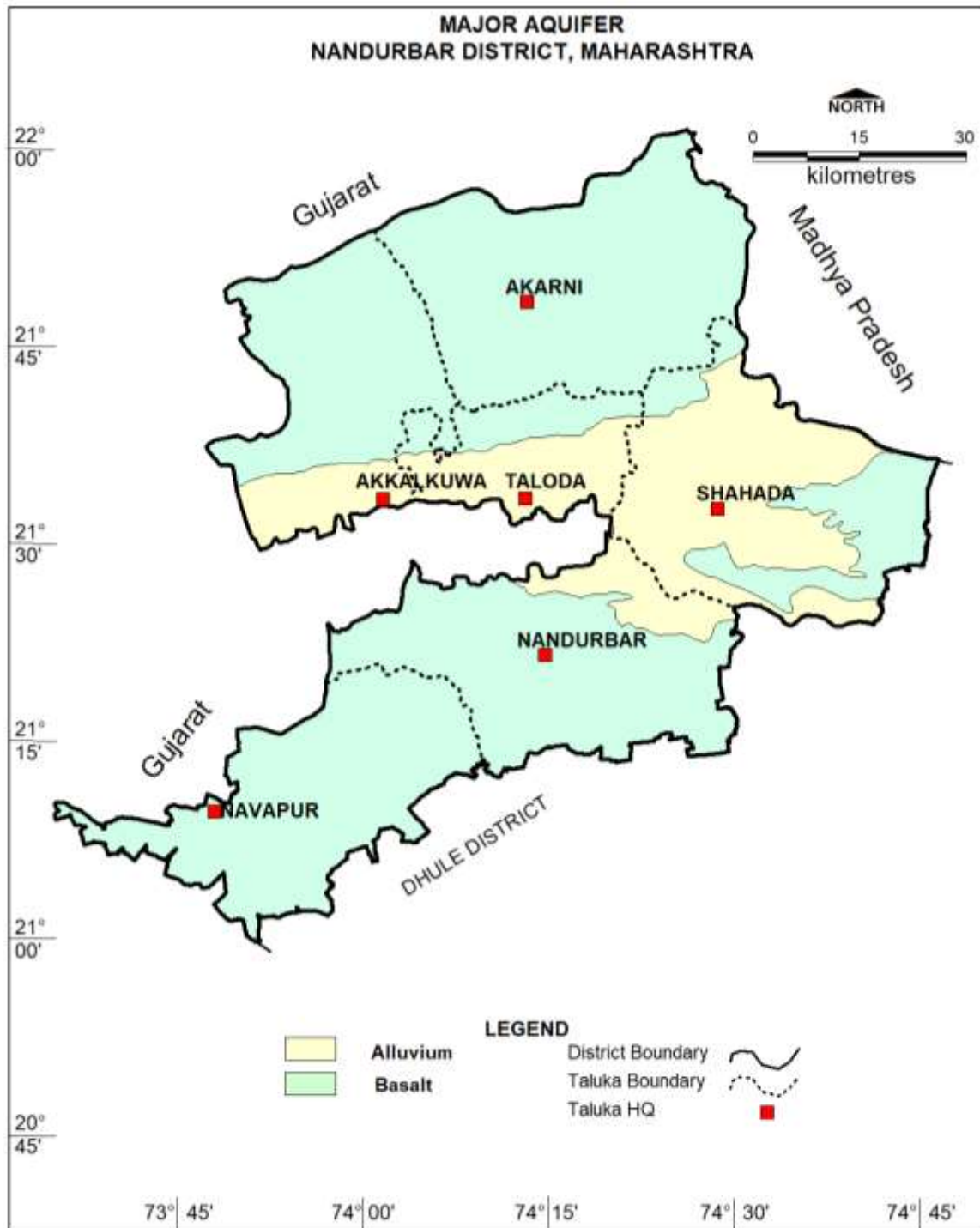


Figure 2.1: Major Aquifers

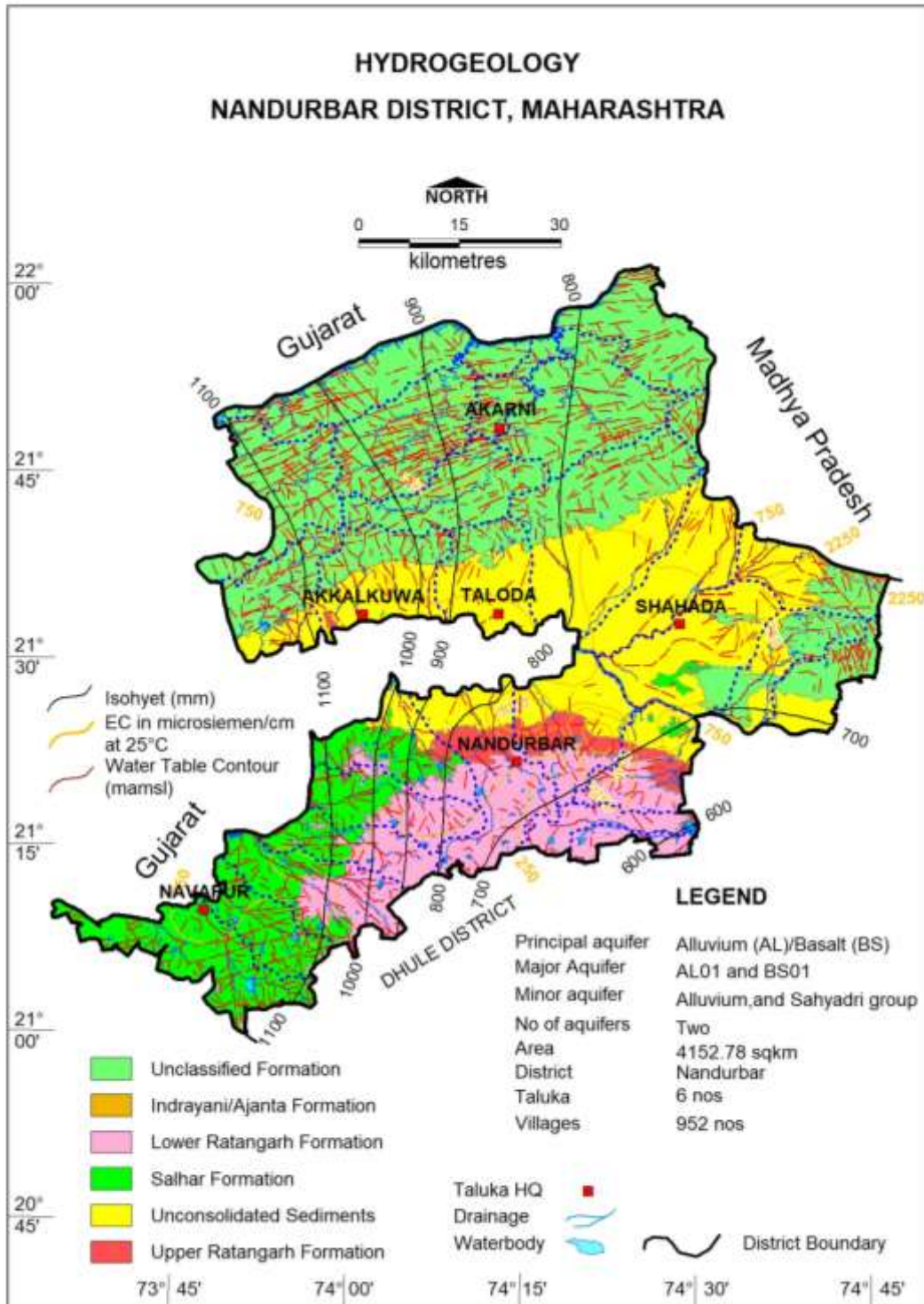


Figure 2.2: Hydrogeology

Water Table Elevation in Nandurbar district ranges between 150 m amsl and 750 m amsl. The northern part of the district is drained by Narmada River and its tributaries, the slope is northwards and towards Narmada River while rest of the district is drained by Tapi River and its tributaries, the slope is southwards in the north of Tapi River, southwestwards in the eastern part of the district while it is northwards in the south of Tapi River and towards Tapi River. Tapi River has ground water movement from SE to NW with elevation of around 150 m amsl while Narmada River in northern part of the district has ground water

movement from NE to SW with elevation from 200 m to 300 m amsl. It has been observed that the ground water flow direction follows the drainage and topography of the area.

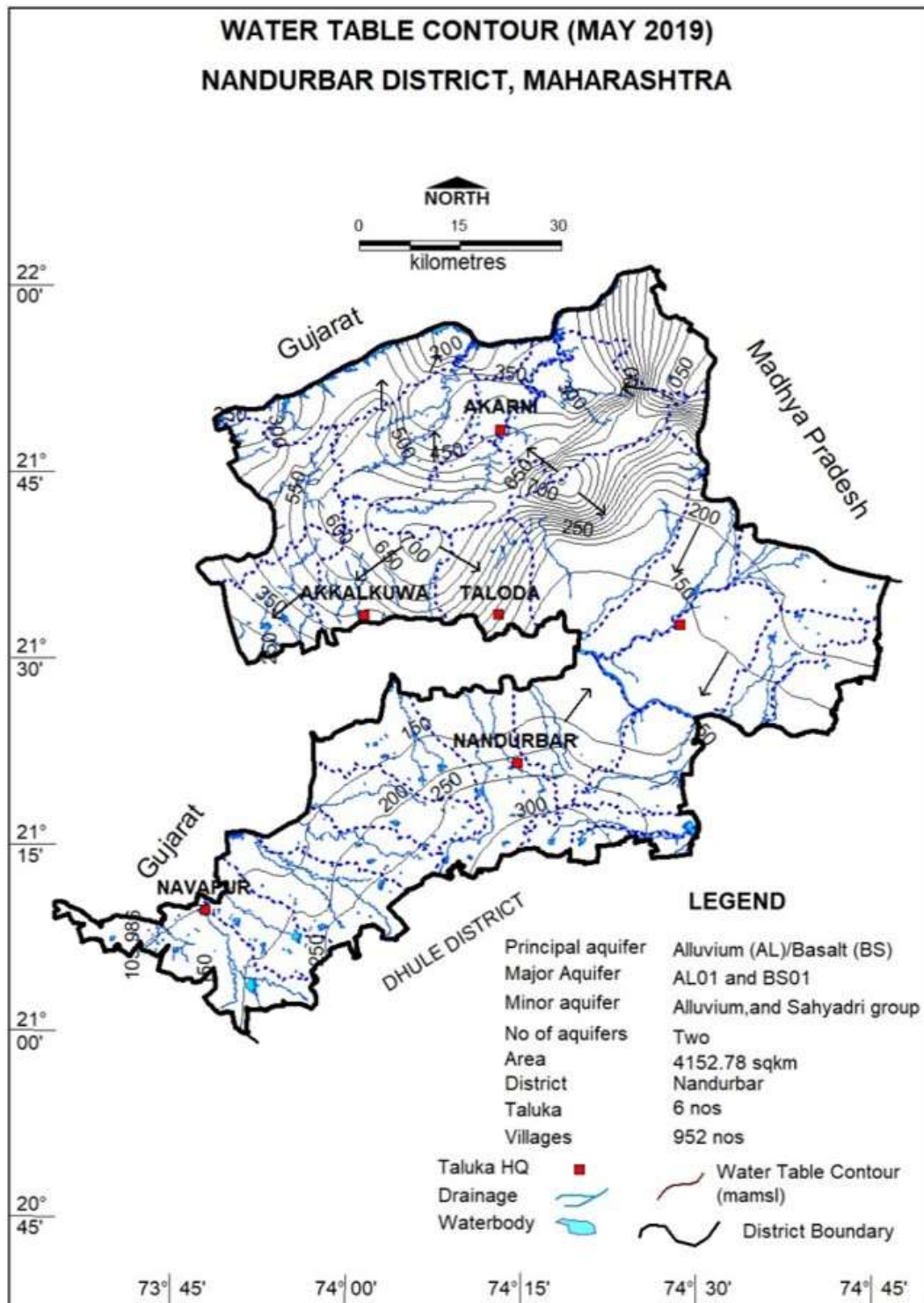


Figure 2.3: Water Table Contour

Table.2.1: Aquifer Characteristic of Nandurbar district

Major Aquifers	Basalt (Deccan Traps)		Alluvium
Type of Aquifer	Aquifer-I	Aquifer-II	Aquifer-I (AL)
Formation	Weathered/ Fractured Basalt	Jointed/ Fractured Basalt	Alluvium- Sand/ Silt & Caly
Depth of Occurrence (mbgl)	5 to 30	35-200	21 to 70
SWL (mbgl)	5.5 to 27.9	2.82-116.8	5.4 to 21.25
Granular/ Weathered/ Fractured rocks thickness (m)	5 to 30	1 to 8	2 to 18
Fractures/ Granular zone encountered (mbgl)	Up to 30	35 to 198	Up to 70
Yield	60-100 m ³ /day	Meager to 18.49 lps	43-1728 m ³ /day
Sustainability	1 to 4 hrs	0.5 to 17 hrs	3 to 15 hrs
Transmissivity (m ² /day)	6 to 96	0.31 to 69.46	32.17 to 6394
Specific Yield/ Storativity (Sy/S)	0.017 to 0.0429	2.39*10 ⁻⁴ to 1.88*10 ⁻²	1.94*10 ⁻⁴ to 10.51x10 ⁻²
Suitability for drinking/ irrigation	Suitable for both except for high Nitrate (>45mg/l)	Suitable for both except high EC	Suitable for both

Aquifer Characteristic of Nandurbar district is shown in **Figure 2.1**. There are two major aquifers such as Deccan Trap Basalt and Alluvium. Weathered/Fractured Basalt and Jointed / Fractured Basalt are the water bearing formations in Deccan Trap Basalt of Nandurbar District. Yield of Aquifer –I is 60 – 125 m³/day, Aquifer-II is meagre to 18.49 lps and Aquifer-I Alluvium having yield of 150-200 m³/day.

Depth of occurrence and fractured/granular rock thickness of Aquifer-I and Aquifer-II is shown in **Figure 2.4 and 2.5** respectively. Depth of occurrence of Aquifer–I Basalt (Weathered /Fractured Basalt) is 5 to 30 m, Aquifer–I Alluvium are 5 to 70 m while depth of occurrence of Aquifer-II Basalt (Jointed & Fractured Basalt) is 30 to 198 m.

Yield Potential of Aquifer-I (Basalt & Alluvium) and Aquifer-II (Basalt) is shown in **Figure 2.6 and 2.7**. Aquifer–I Alluvium having yield potential of 150 to 200 m³/day while yield potential of Aquifer-I Basalt is 60 to 125 m³/day. Yield Potential of Aquifer-II Basalt is meagre to 18.49 lps.

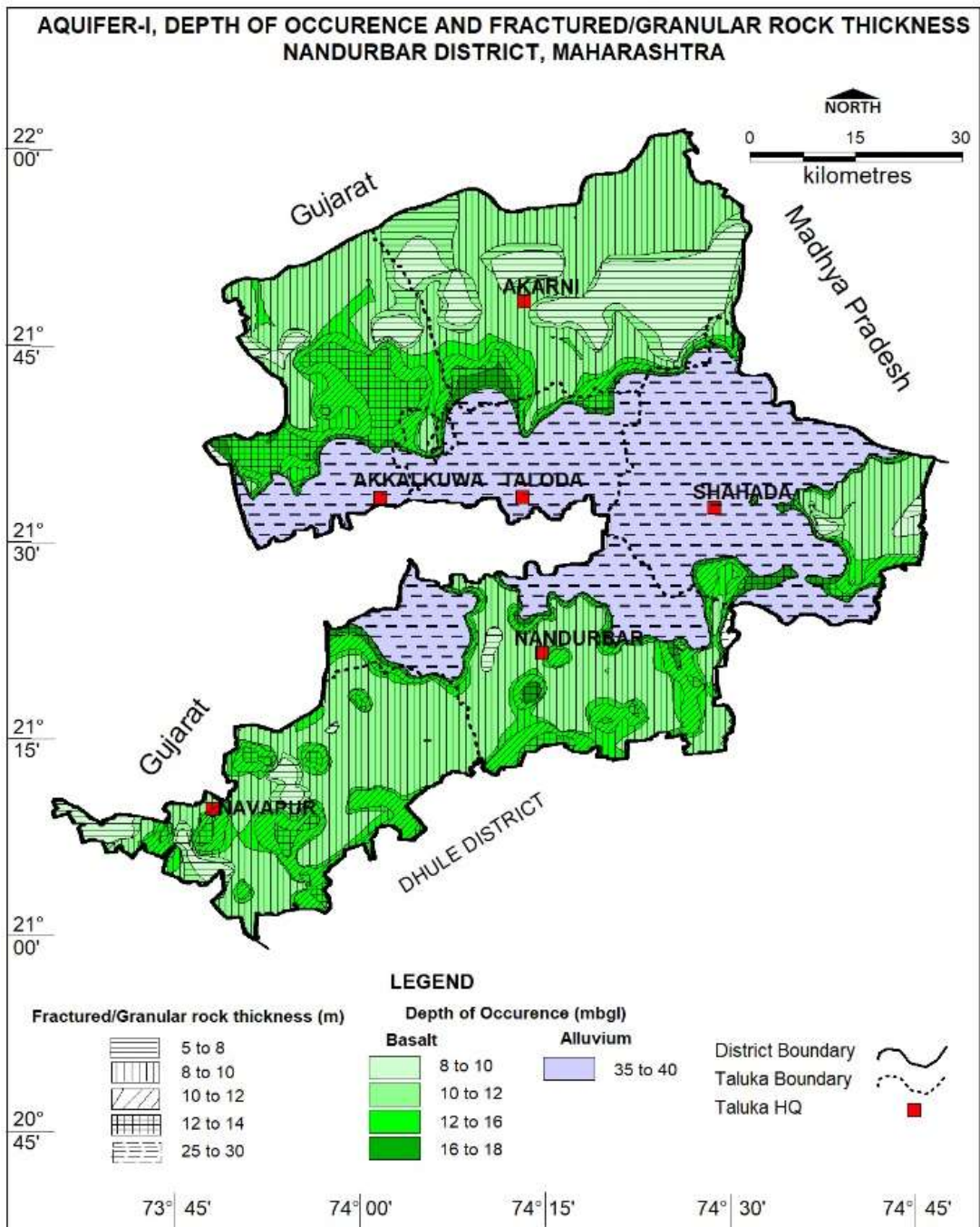


Figure 2.4: Depth of occurrence and fractured/granular rock thickness of Aquifer-I

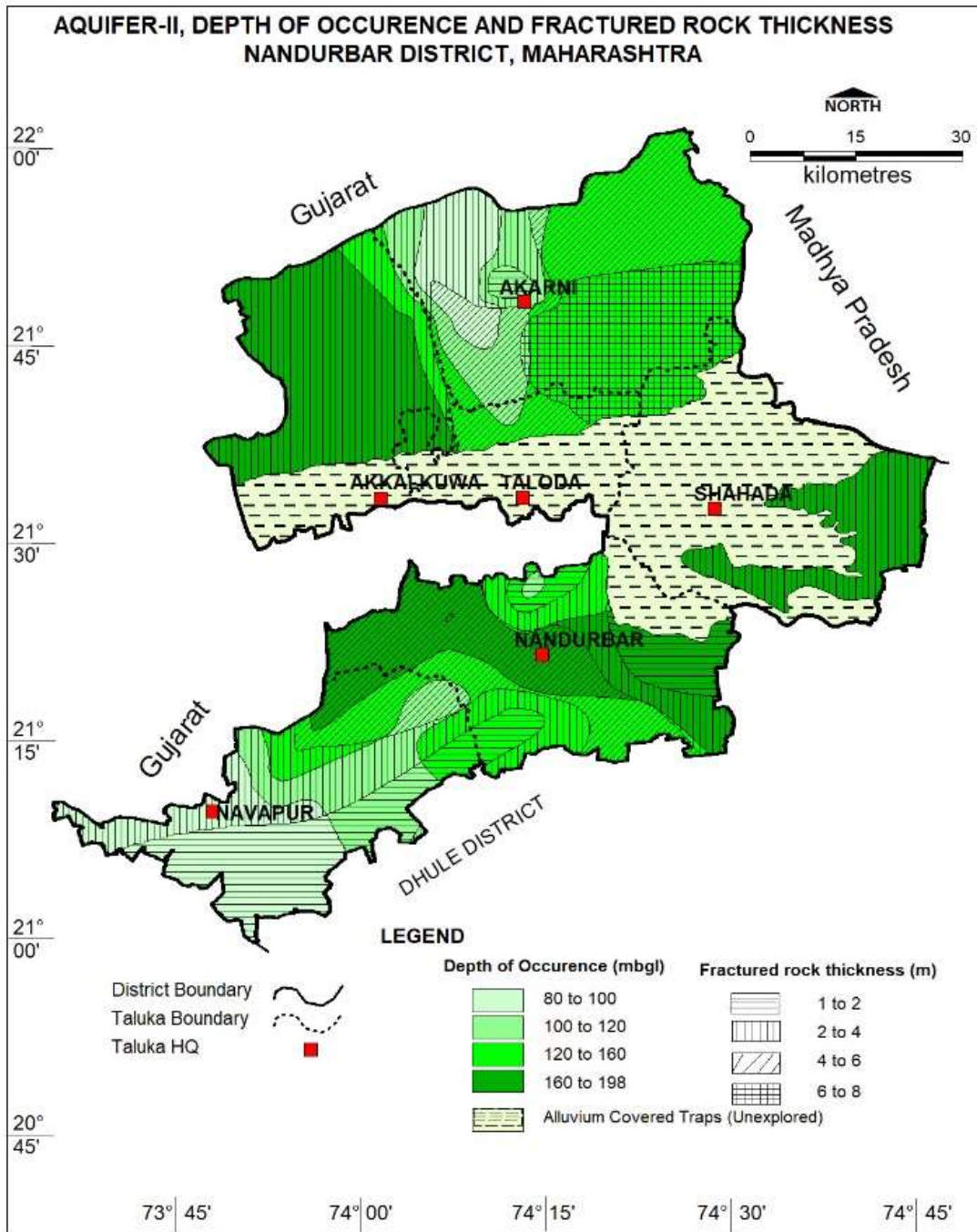


Figure 2.5: Depth of occurrence and fractured/granular rock thickness of Aquifer-II

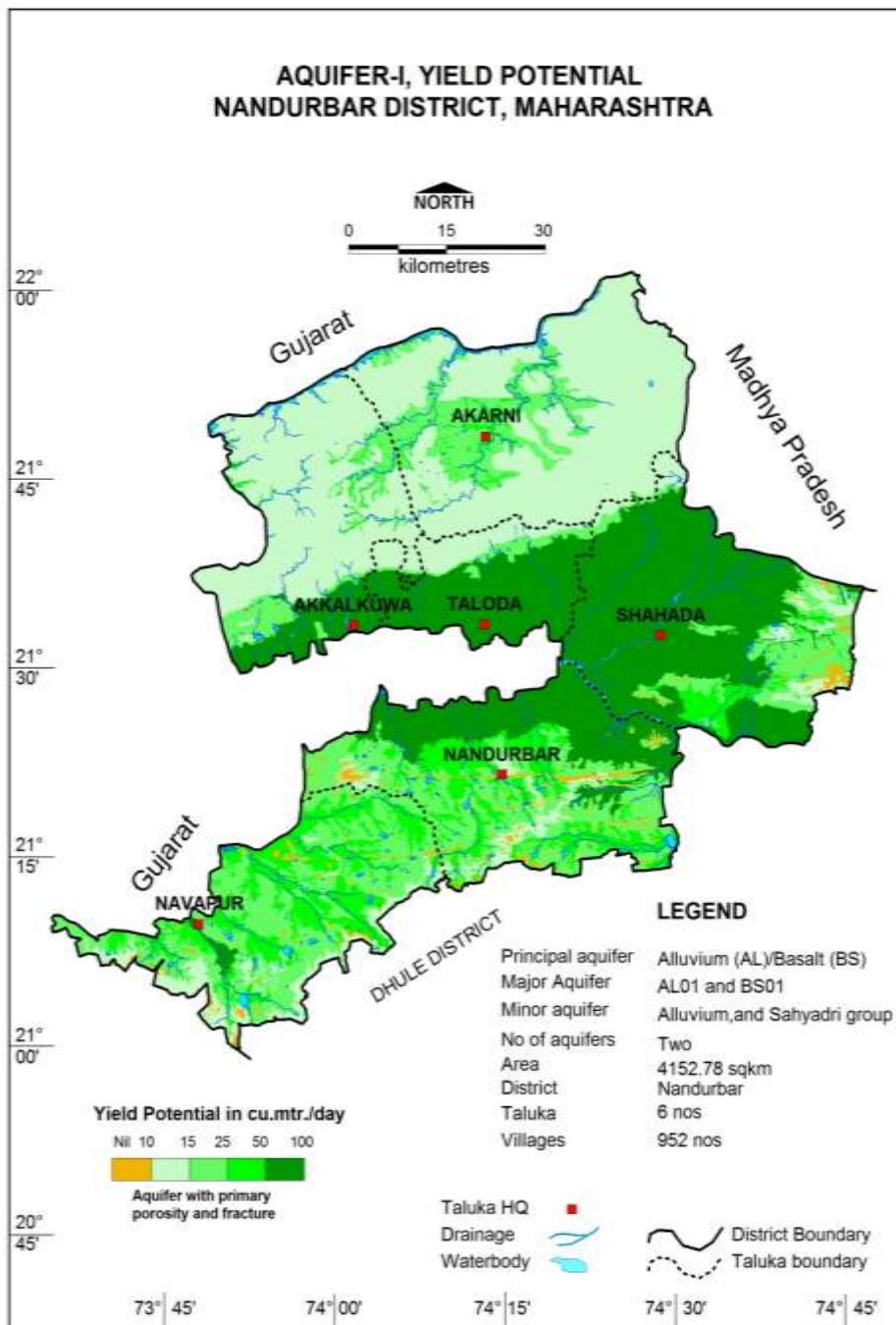


Figure 2.6: Aquifer-I Yield Potential (Basalt & Alluvium)

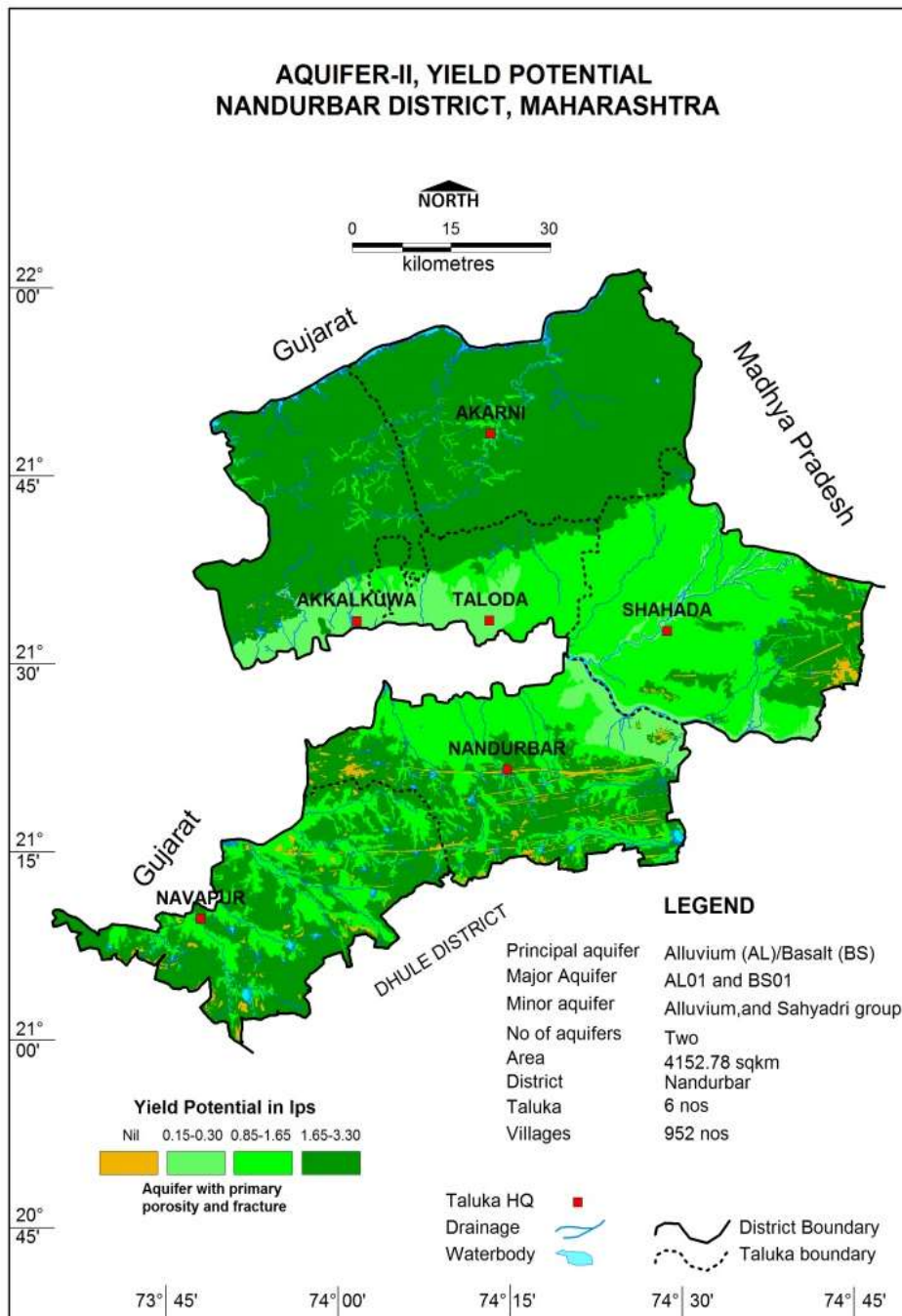


Figure 2.7: Aquifer-II Yield Potential (Basalt)

2.2 Aquifer Parameters

Aquifer parameters are available from ground water exploration carried out in the basaltic area of the district as well as from the pumping tests carried out on dugwells in Basaltic and Alluvial terrain. The specific capacity of the wells tapping Deccan Trap Basalt ranges between 41 and 220 lpm/m-drawdown and the transmissivity ranges from 6 to 96 m²/day. During the pumping tests conducted on the exploratory wells in Basalt, the transmissivity was found to vary from 10.27 to 94.40 m²/day. The storage coefficient varied between 2.39x10⁻⁴ to 1.88x10⁻².

2.3 3-D and 2-D Aquifer Disposition

Based on the existing data, 3D aquifer disposition, Fence diagram, Bar diagram and hydrogeological sections along different directions have been prepared and shown in **Figures 2.8, 2.9, 2.10 and 2.11 (a to e)** to understand the subsurface disposition of aquifer system.

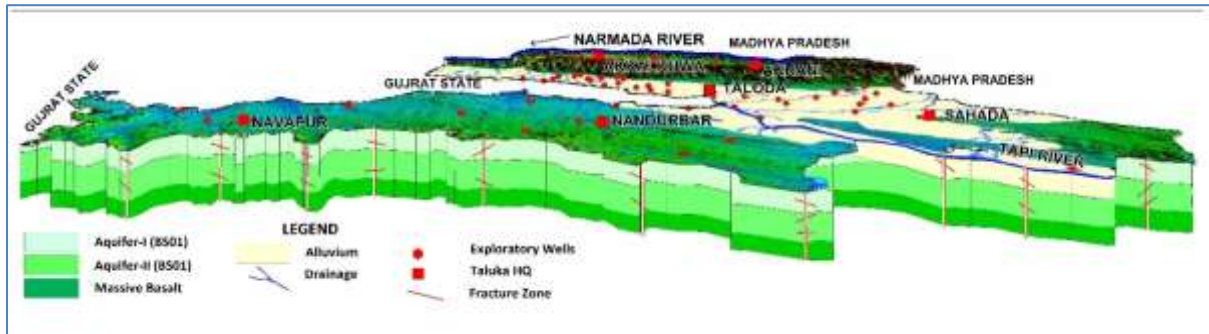


Figure.2.8: 3-D Aquifer Disposition

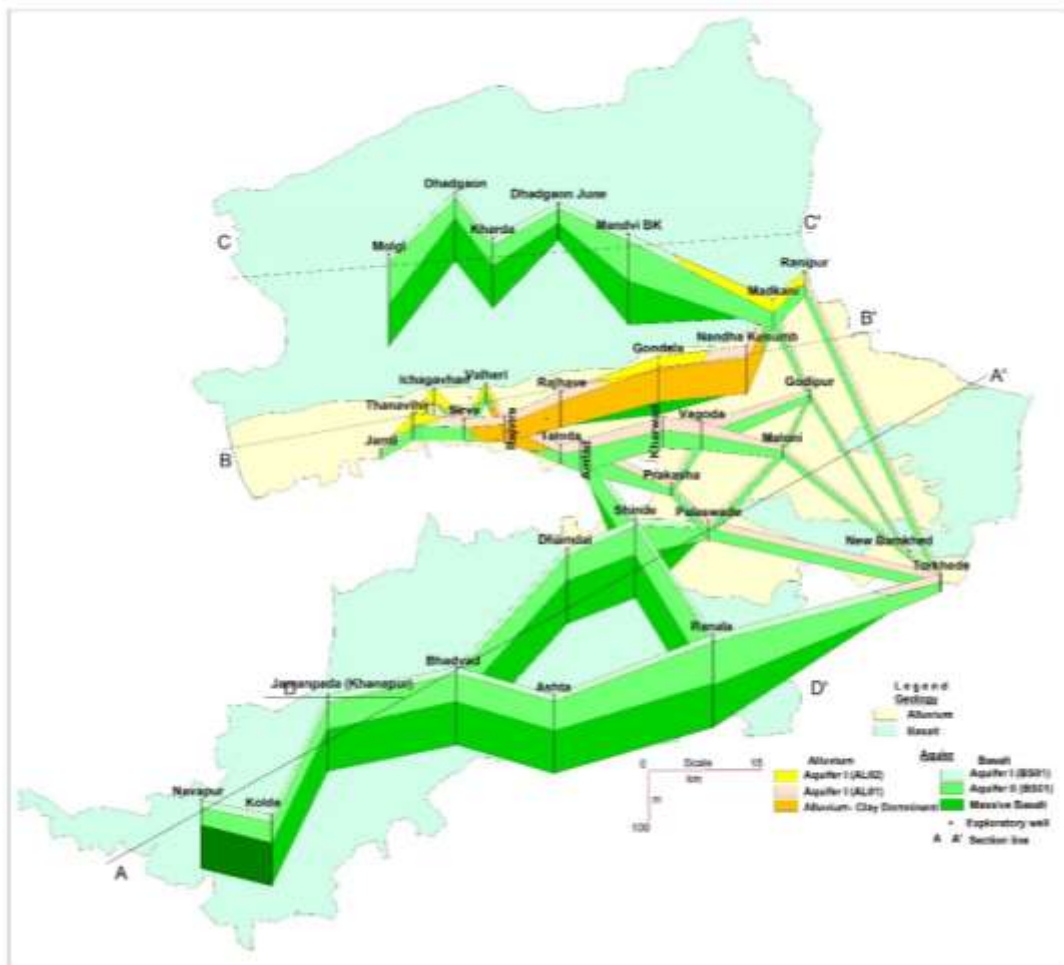


Figure 2.9: Fence Diagram

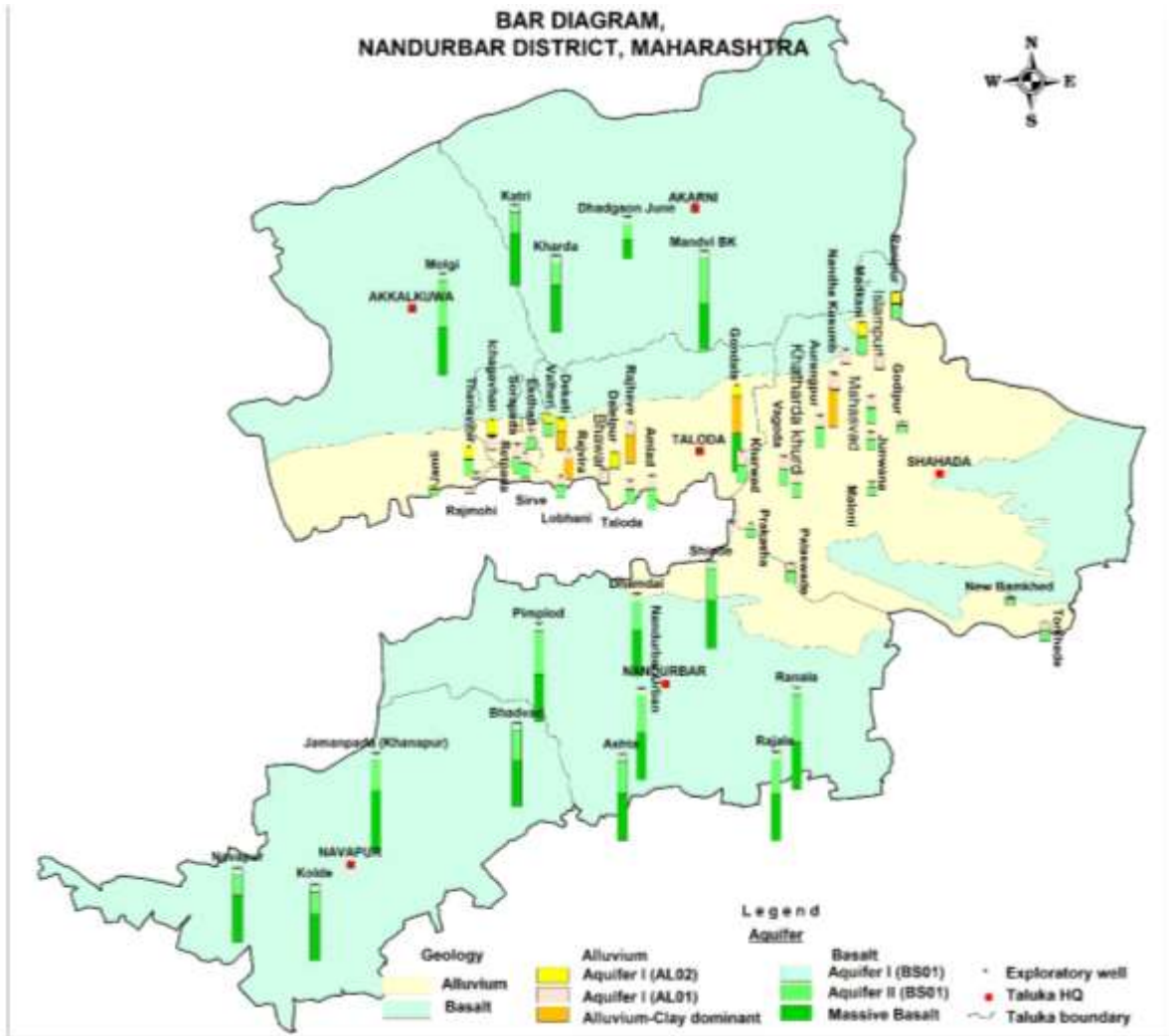


Figure 2.10: Bar Diagram

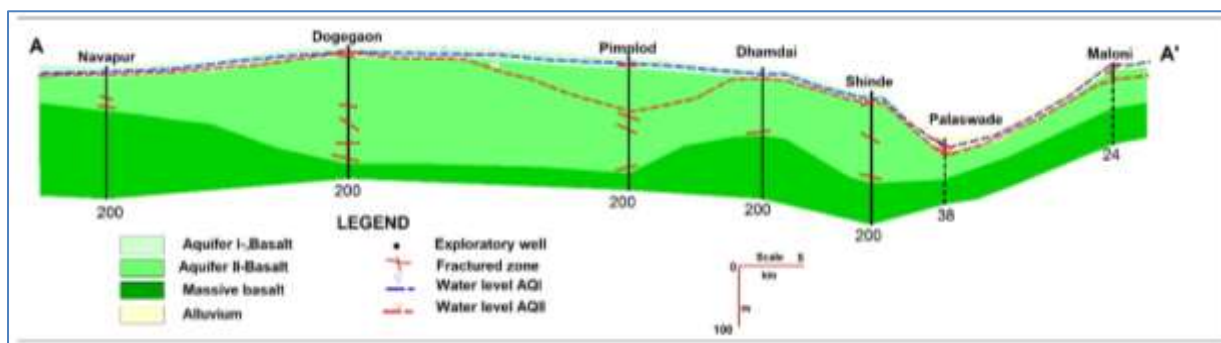


Figure 2.11 (a): Lithological section A-A'

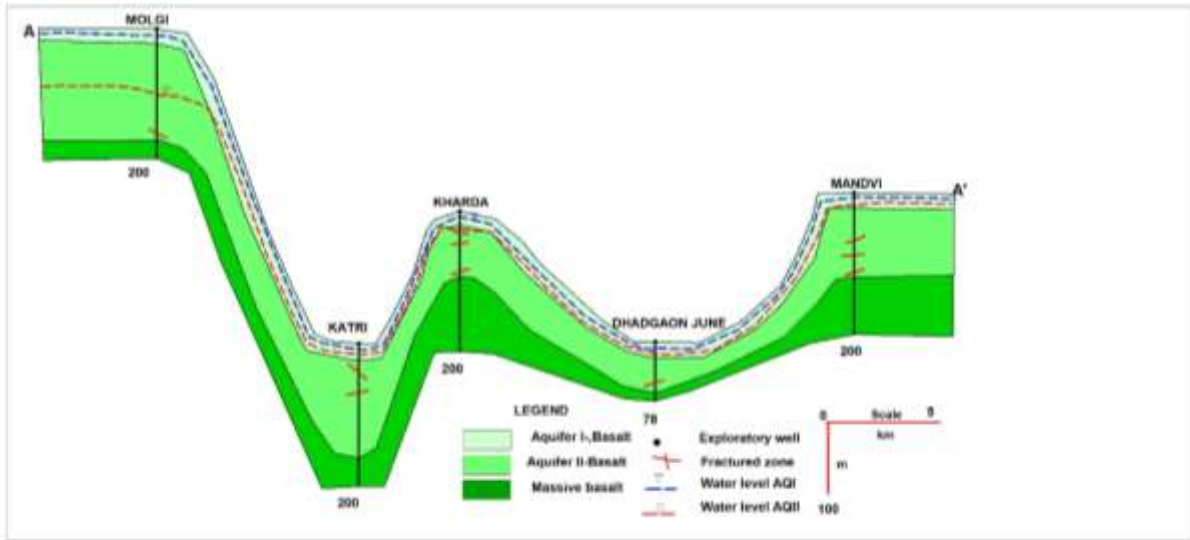


Figure 2.11 (b): Lithological section-1'

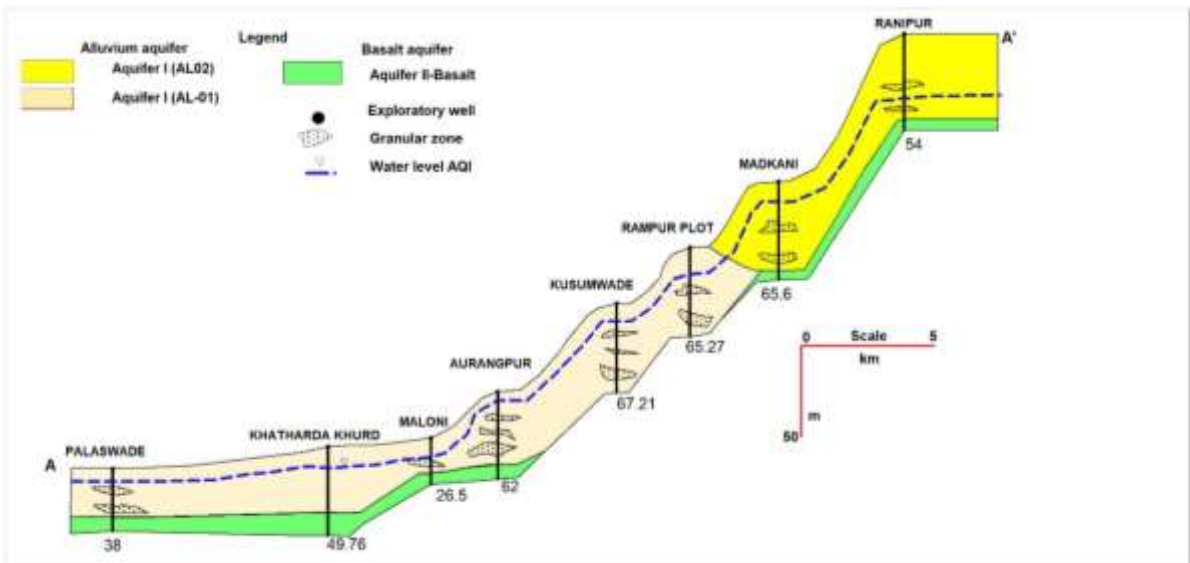


Figure 2.11(c): Lithological section-2'

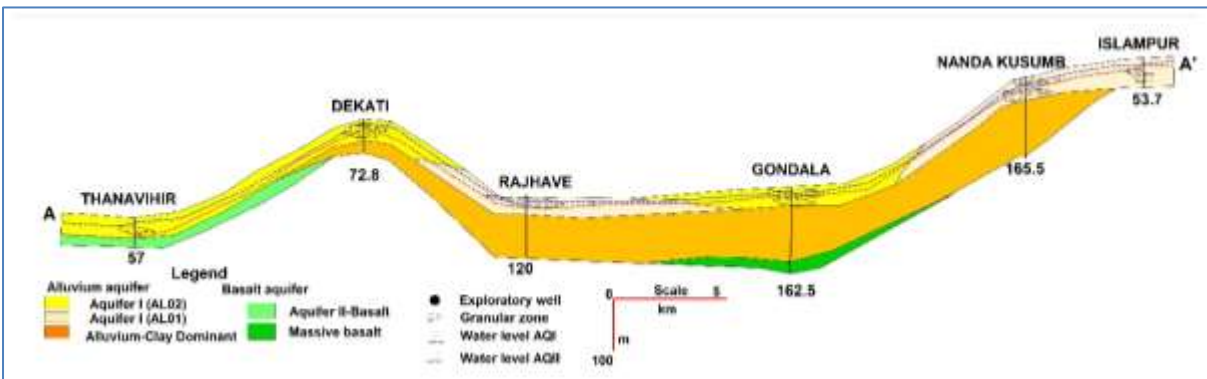


Figure 2.11 (d): Lithological section-3'

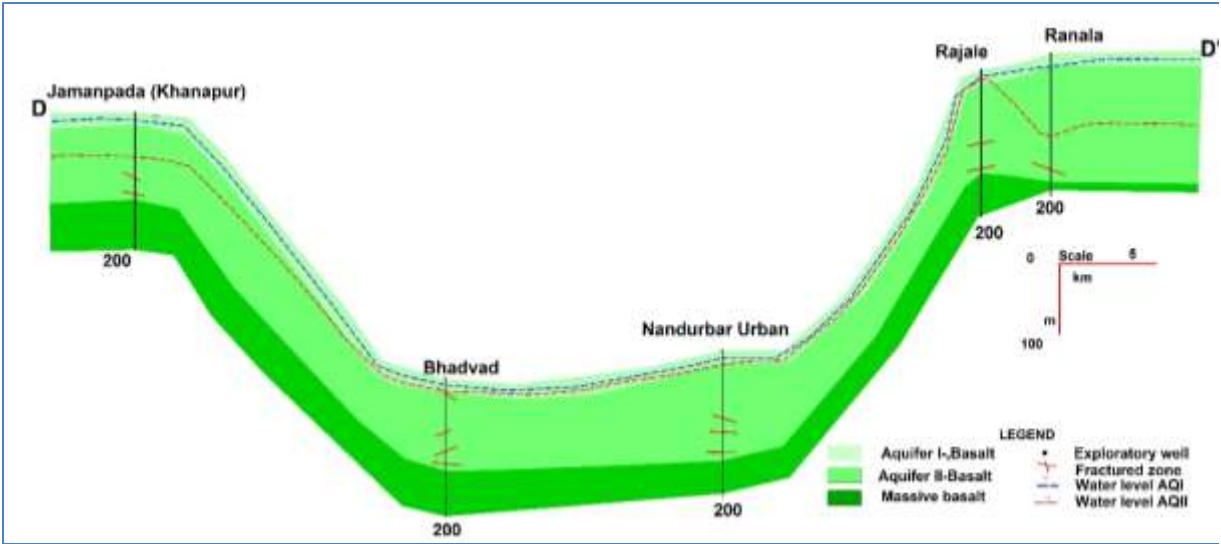


Figure 2.11(e): Lithological section D-D'

3. 3. WATER LEVEL SCENARIO

3.1 Depth to water level (Aquifer-I/ Shallow Aquifer)

Central Ground Water Board periodically monitors 28 Ground Water monitoring wells in the Nandurbar district, four times a year i.e., in January, May (Premonsoon), August and November (Postmonsoon). Apart from this under NAQUIM study, 78 KOW were also established and monitored during the year 2019. These data have been used for preparation of depth to water level maps of the district. Pre-monsoon and post monsoon water levels along with fluctuation during 2019 and long-term water level trends (2010-2019) are given in **Annexure-V**.

3.1.1 Pre-monsoon DTW (May-2019)

The depth to water levels in Nandurbar district during May 2019 ranges between 2.00 (Palaskhobra, Akkalkuwa block and Mal, Taloda block) and 27.99 mbgl (Rampur, Shahada block). The depth to water levels less than 5 mbgl are observed in north western part of Akklalkuwa and Akrani talukas and in isolated patches of Nandurbar taluka. The depth to water level between 5-10 mbgl and 10-20 mbgl covers almost the entire area of the district. Water level range more than 20 mbgl is observed in northern parts of Shahada and Taloda taluka. The pre-monsoon depth to water level map is depicted in **Figure. 3.1**.

3.1.2 Post-monsoon DTW (November-2019)

The depth to water levels in Nandurbar district during Nov. 2019 ranges between 1 mbgl (Khuntamodi, Akrani taluka) and 16.0 mbgl (Rampur, Shahada taluka). Shallow water levels within 5 m bgl are observed in major parts of the Akrani, Akkalkuwa and Taloda talukas and in some isolated patches of Shahada, Nandurbar and Navapur talukas. The depth to water level between 10 to 20 mbgl has been observed in parts of Shahada, Nandurbar and Taloda talukas while water level ranges between 5 to 10 mbgl are observed mostly in parts of Navapur, Nandurbar, Shahada and in south western part of Akkalkuwa taluka. The pre-monsoon depth to water level map is depicted in **Figure. 3.2**.

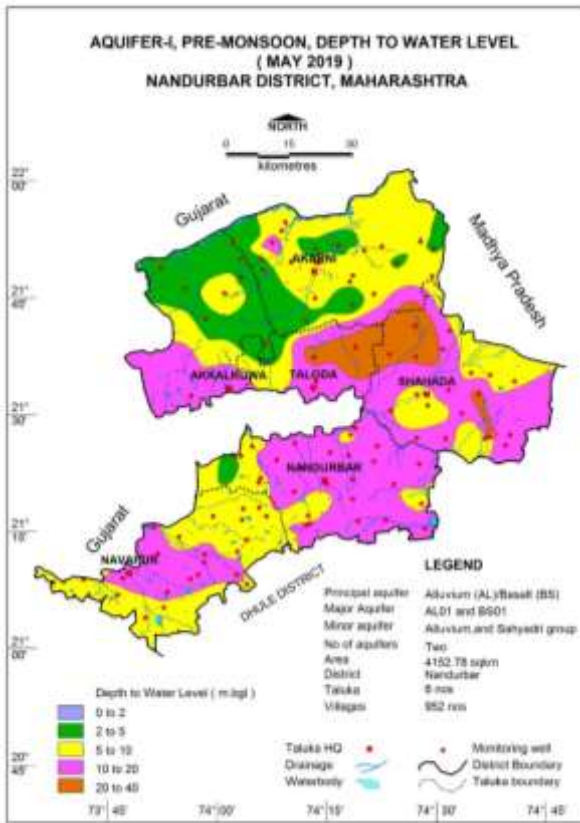


Figure 3.1: DTWL shallow aquifer (May 2019)

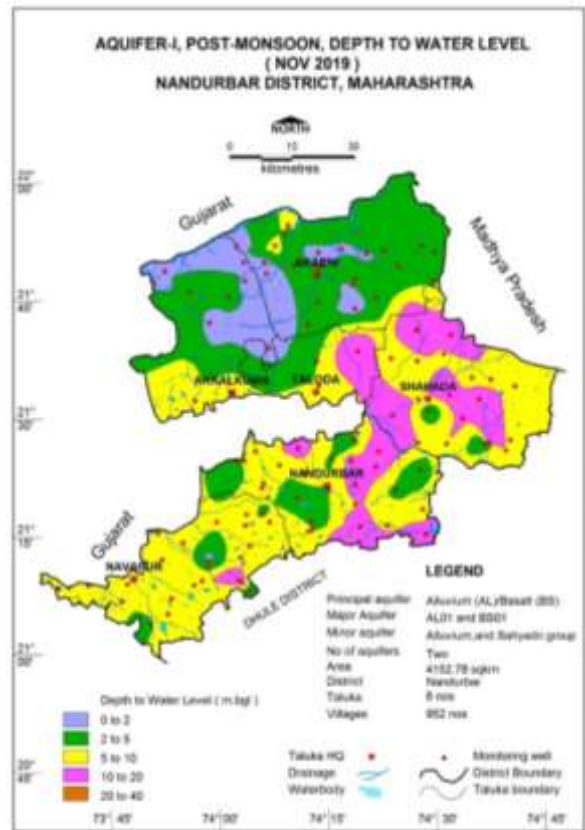


Figure 3.2: DTWL shallow aquifer (Nov. 2019)

3.1.3 Seasonal Water Level Fluctuation (May-Nov. 2019)

It is observed that minimal water level fluctuation was observed at Bhangda, Nandurbar block (0.35 m) while maximal water level fluctuation was measured at Rojhawe, Taloda block (18.99 m). The water level fluctuation was less than 5 m in major parts of the district except Taloda, southern Akkalkuwa, in parts of Shahada, Nandurbar, Navapur and Akrani blocks. The water level fluctuation more than 10 m observed in central part of Taloda and some patches of Shahada and Nandurbar blocks. The map depicting seasonal fluctuation is shown in **Figure 3.3**.

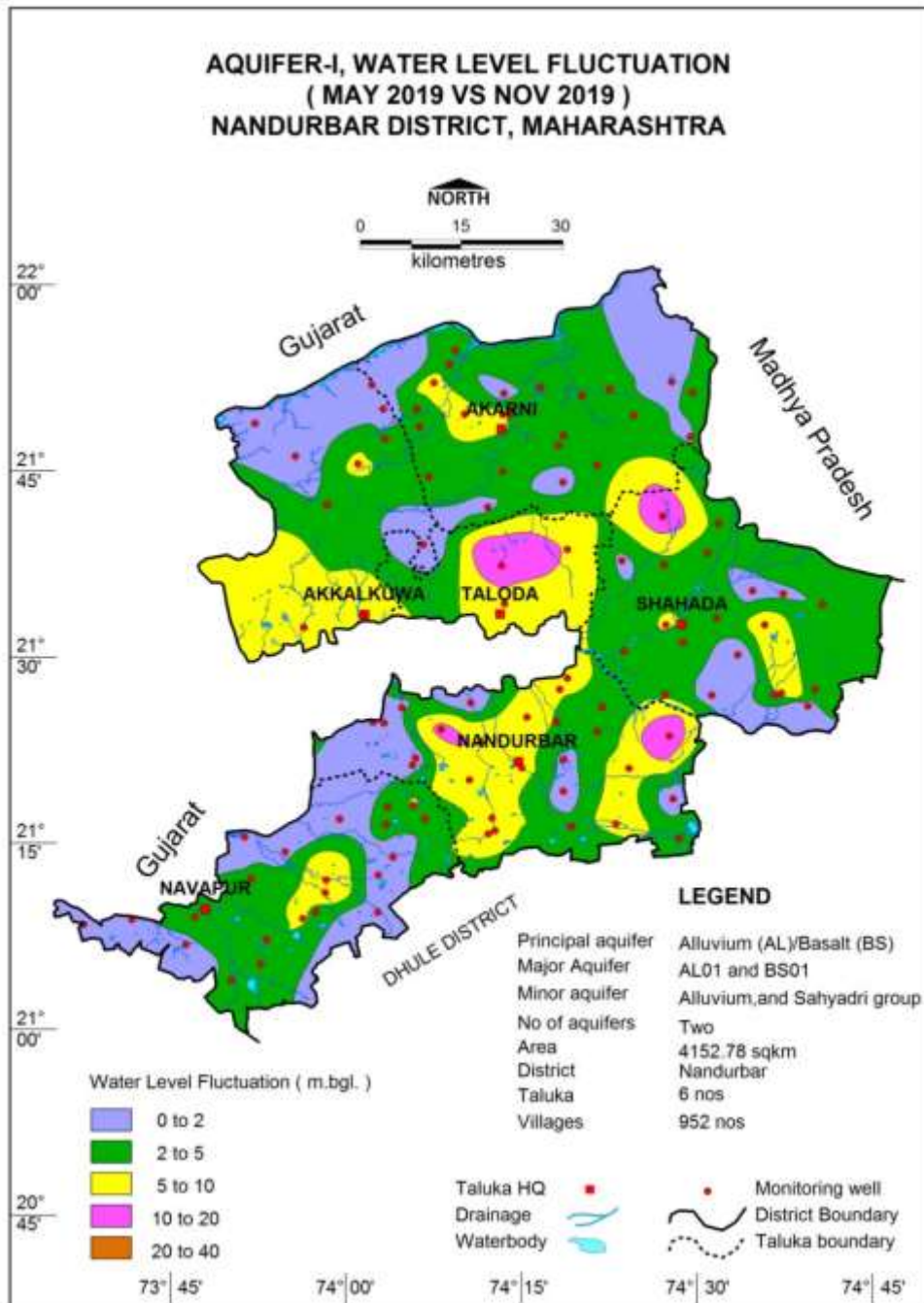


Figure 3.3: Seasonal Fluctuation, shallow aquifer (May-19 vs Nov- 19)

3.2 Depth to Water Level (Aquifer-II/ Deeper Aquifer)

3.2.1 Pre-monsoon Depth to Water Level (May-2019)

The pre-monsoon depth to water level in deeper aquifer of Nandurbar district, during May 2019 range from 6.52 mbgl (Katri, Akrani taluka) to 120.21 mbgl (Molgi, Akkalkuwa taluka). The depth to water level between 10 and 20 mbgl is observed in the south western parts of Akkalkuwa, northern parts of Nandurbar and Akrani talukas. The depth to water level between 20 and 50 mbgl is observed in major parts of the district. The deepest water level (>50 mbgl) has been observed in Molgi, Akkalkuwa taluka. The pre-monsoon depth to water level map of Aquifer-II is given in **Figure 3.4**.

3.2.2 Post-monsoon Depth to Water Level (Nov.-2019)

In Aquifer-II, the post-monsoon depth to water levels in Nandurbar District during November 2019 range between 3.52 mbgl (Dhamdai, Nandurbar taluka) and 116.81 mbgl (Pimplod, Nandurbar taluka). Depth to water level less than 10 mbgl has been observed in parts of Navapur, Nandurbar and Akrani talukas. Depth to water level more than 20 mbgl is observed in major parts of Nandurbar, Navapur, Akrani, Akkalkuwa talukas and in parts of Shahada taluka. The post-monsoon depth to water level map of Aquifer-II is given in **Figure 3.5**.

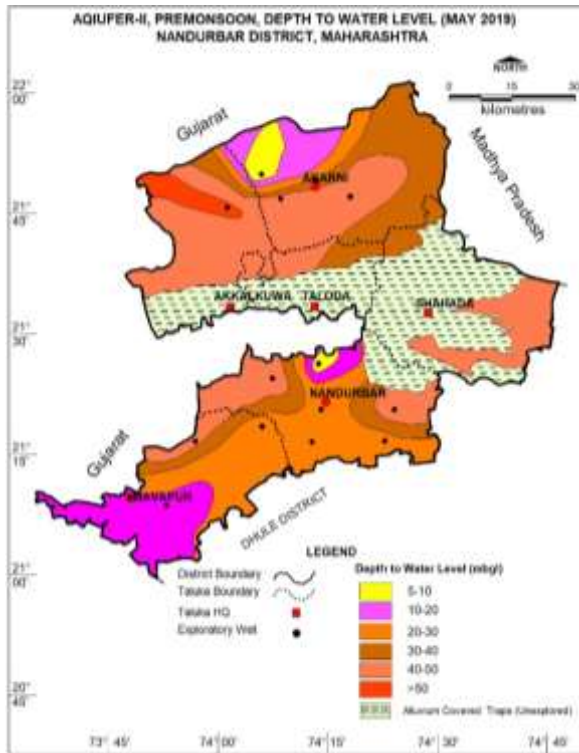


Figure 3.4: DTWL deeper aquifer (May 2019)

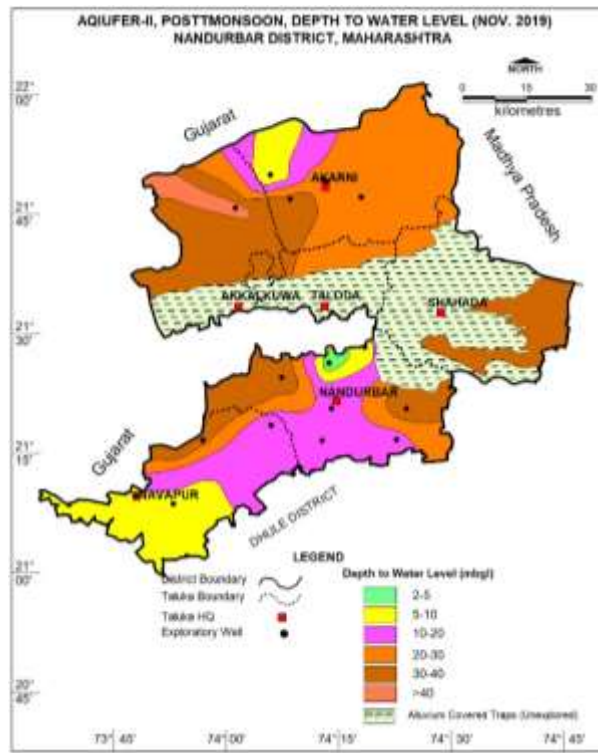


Figure 3.5: DTWL deeper aquifer (Nov. 2019)

3.3 Water Level Trend (2010-2019)

During pre-monsoon, rise in water level trend has been recorded at 57 stations and ranges from 0.0045 m/year (Sonwad, Shahada taluka) to 1.18 m/year (Rojhave, Taloda taluka) while falling trend was observed in 18 stations varying from 0.0024 (Umrani Kh, Akrani taluka) to 1.64 m/year (Wadali, Shahada taluka). Area showing rising trend >0.2 m observed in 172.08 Km². Area showing falling trend >0.2 m observed in 2159.17 Km². (**Figure 3.6**).

During post monsoon, rise in water level trend has been recorded at 36 stations and it ranges between 0.0142 m/year (Kadwan, Navapur taluka) to 0.61 m/year (Rajale, Nandurbar taluka) while falling trend was observed in 40 stations varying from 0.003 (Mograni, Navapur taluka) to 0.55 m/year (Visarwadi, Navapur taluka). Area showing rising trend >0.2 m observed in 121.46 Km². Area showing falling trend >0.2 m observed in 1388.2 Km². (**Figure 3.7**).

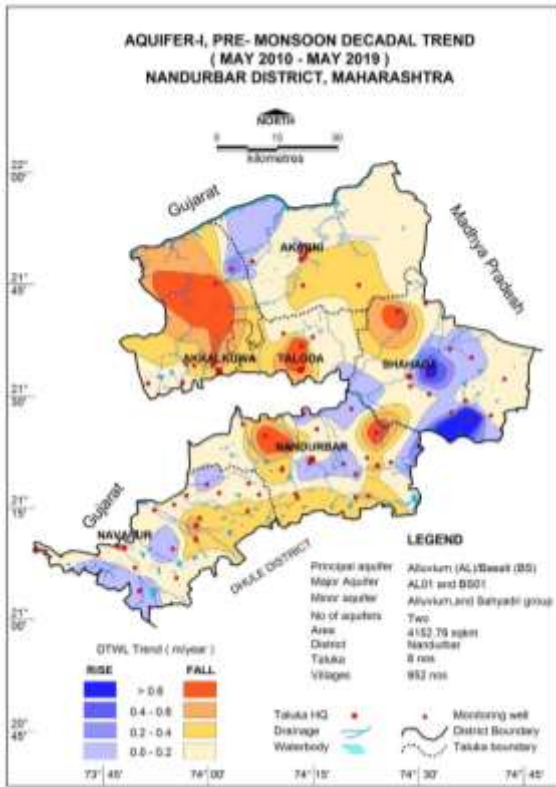


Figure 3.6: Pre-monsoon decadal trend (2010-19)

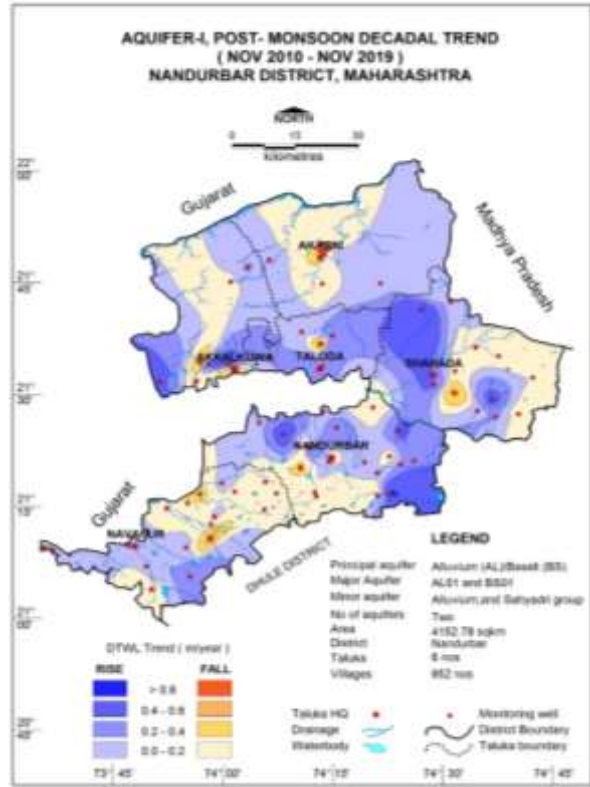


Figure 3.7: Post-monsoon decadal trend (2010-19)

3.4 Hydrograph Analysis

The variation in short term and long-term water level trends may be due to variation in natural recharge due to rainfall and withdrawal of groundwater for various agricultural activities, domestic requirements, and industrial needs. The analysis of hydrographs shows that the annual rising limbs in hydrographs indicate the natural recharge of groundwater regime due to monsoon rainfall, as the monsoon rainfall is the sole source of natural recharge to the ground water regime (Figure. 3.8 a to i). However, continuous increase in the groundwater draft is indicated by the recessionary limb.

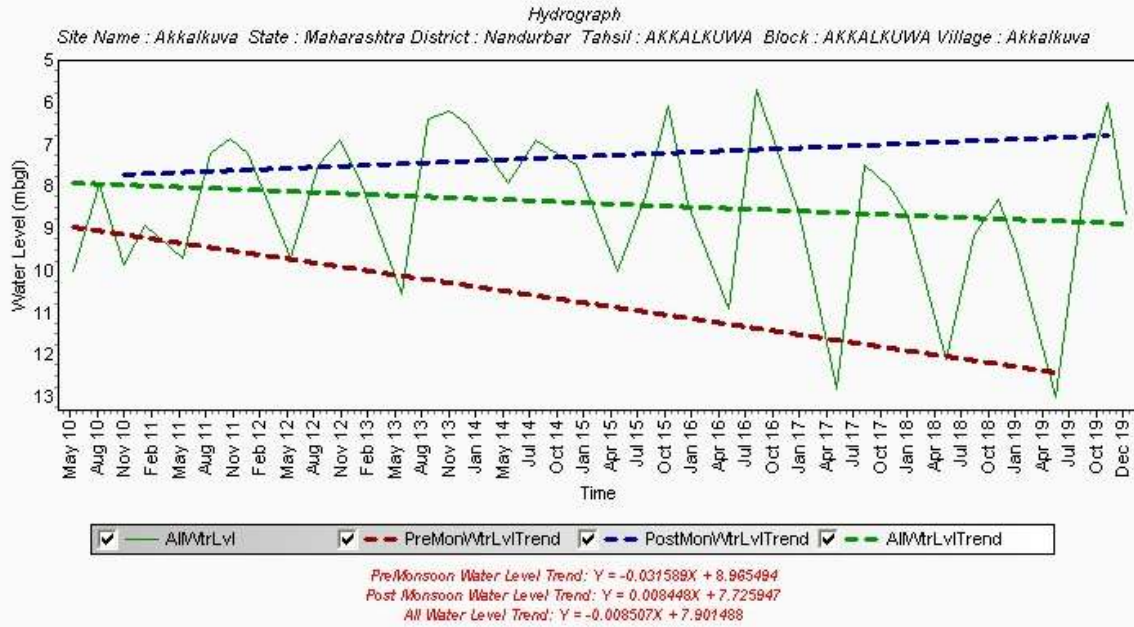


Figure 3.8(a): Hydrograph (2010-19), Akkalkuwa, Akkalkuwa Taluka

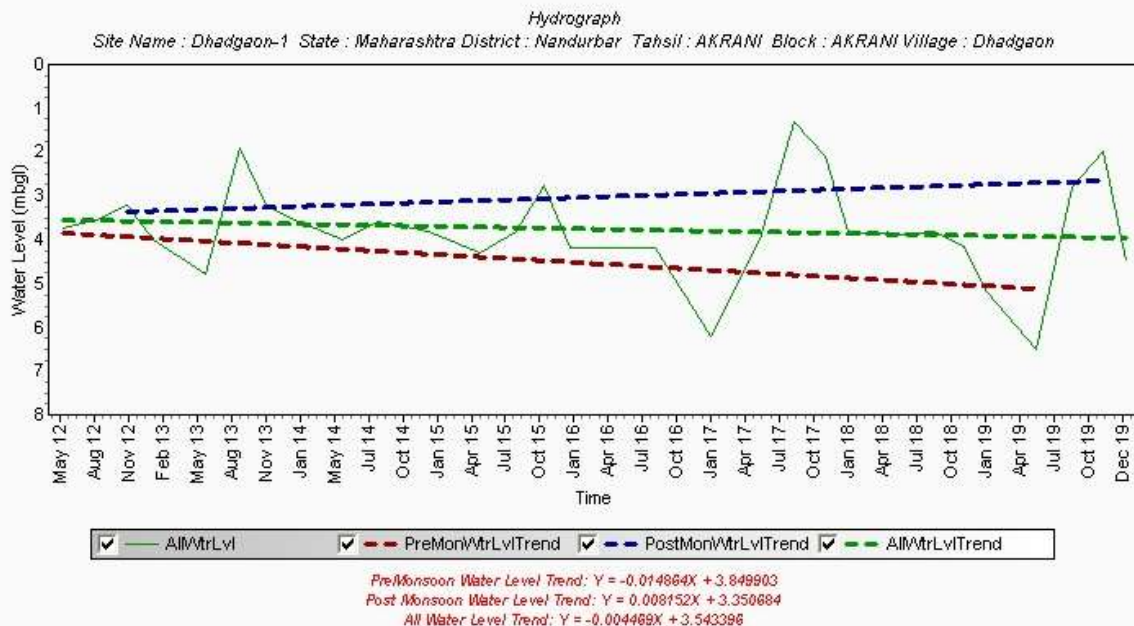


Figure 3.8(b): Hydrograph (2012-19), Dhadgaon, Akrani Taluka

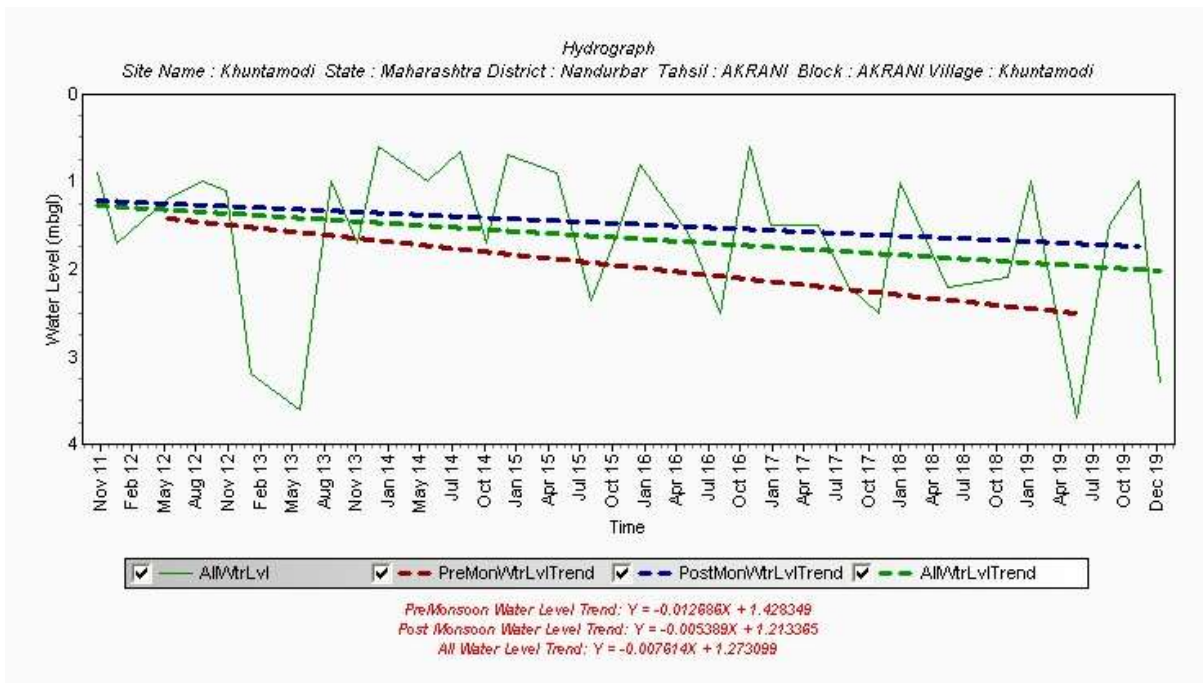


Figure 3.8(c): Hydrograph (2011-19), Khuntamodi, Akrani Taluka

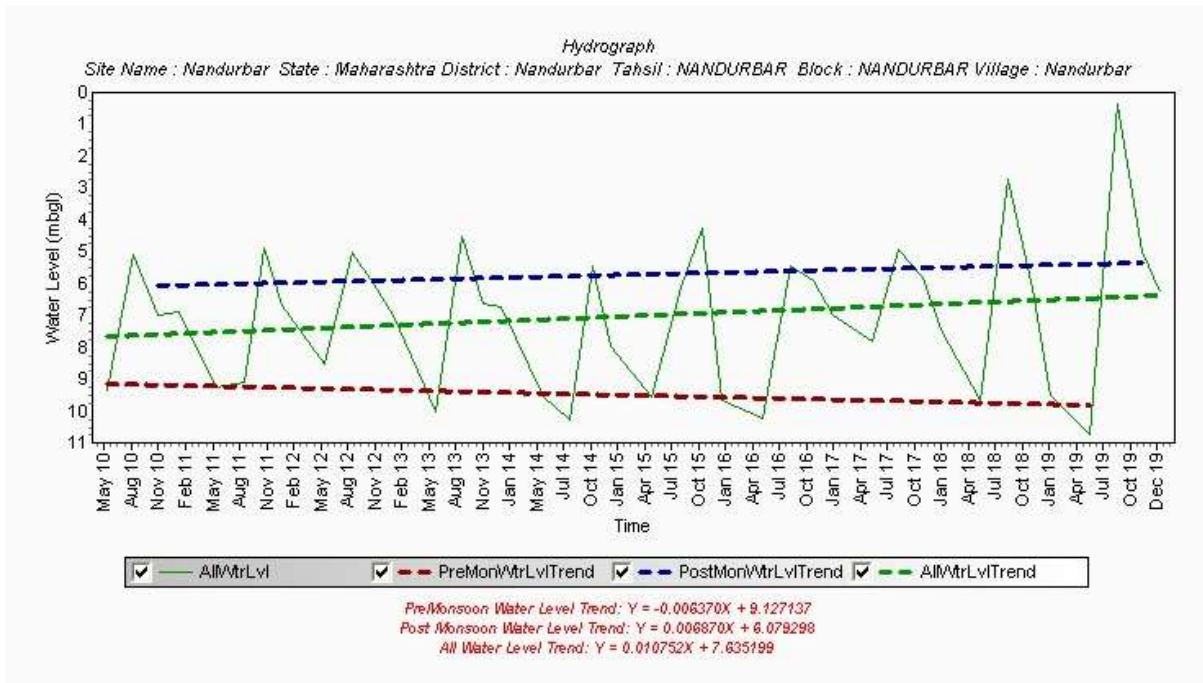


Figure 3.8(d): Hydrograph (2010-19), Nandurbar, Nandurbar Taluka

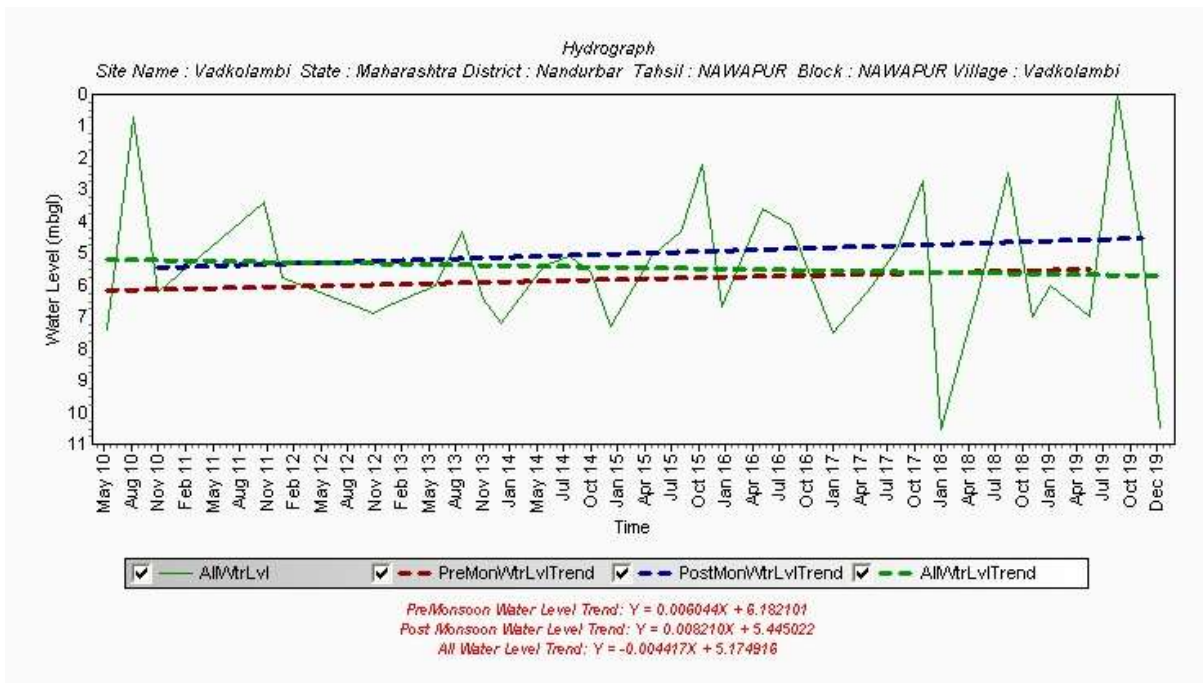


Figure 3.8(e): Hydrograph (2010-19), Vadkalambi, Navapur Taluka

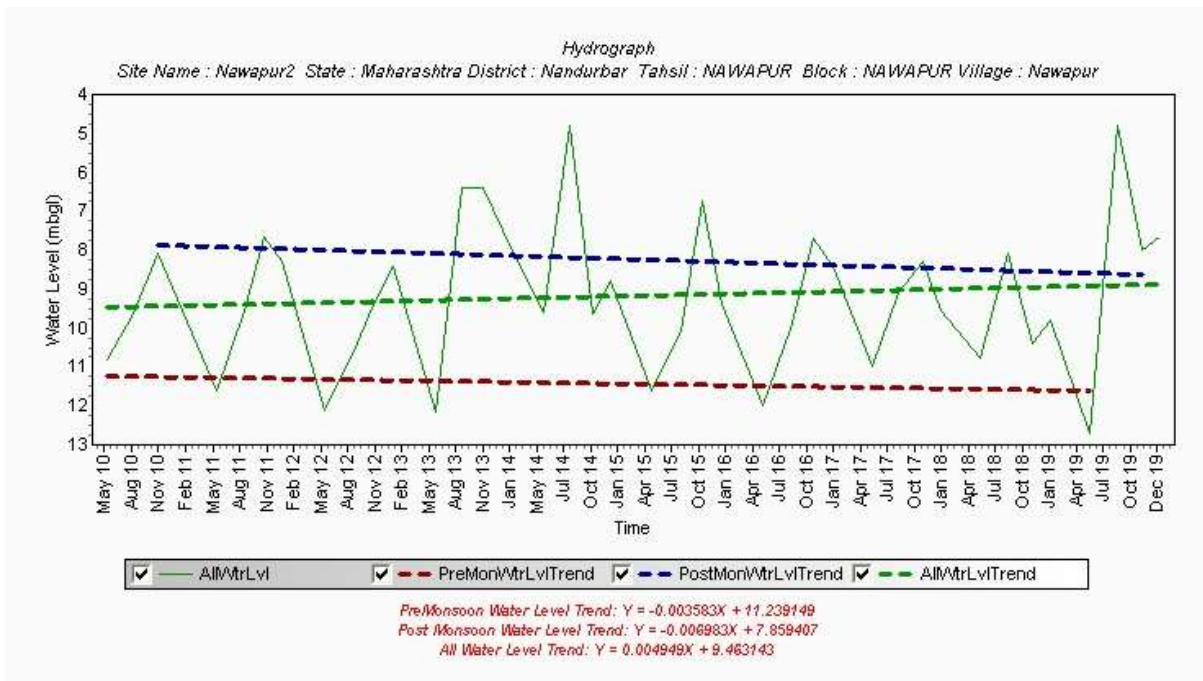


Figure 3.8(f): Hydrograph (2010-19), Navapur, Navapur Taluka

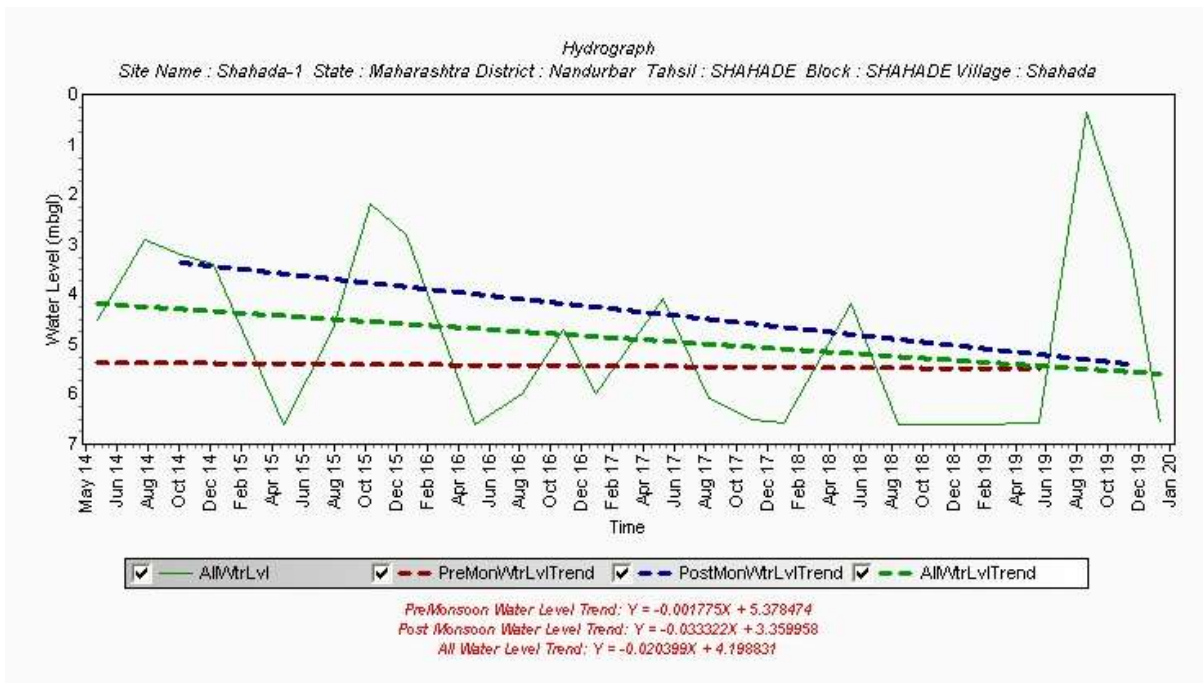


Figure 3.8(g): Hydrograph (2014-20), Shahada, Shahada Taluka

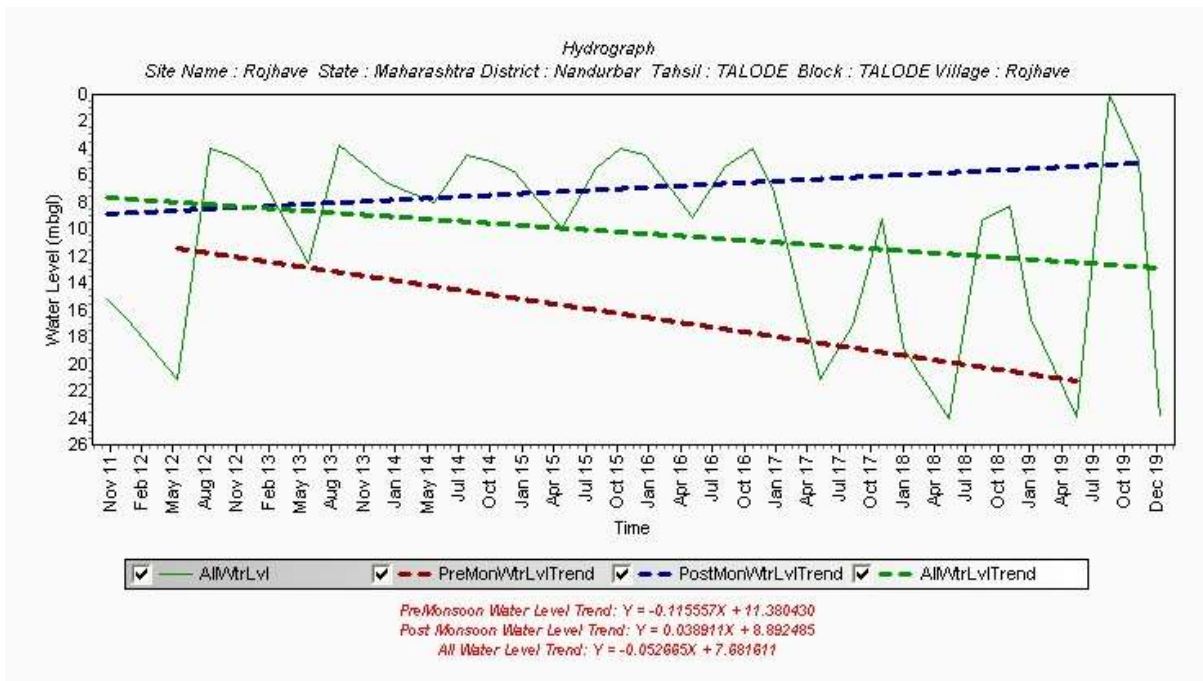


Figure 3.8(h): Hydrograph (2011-19), Rojhave, Taloda Taluka

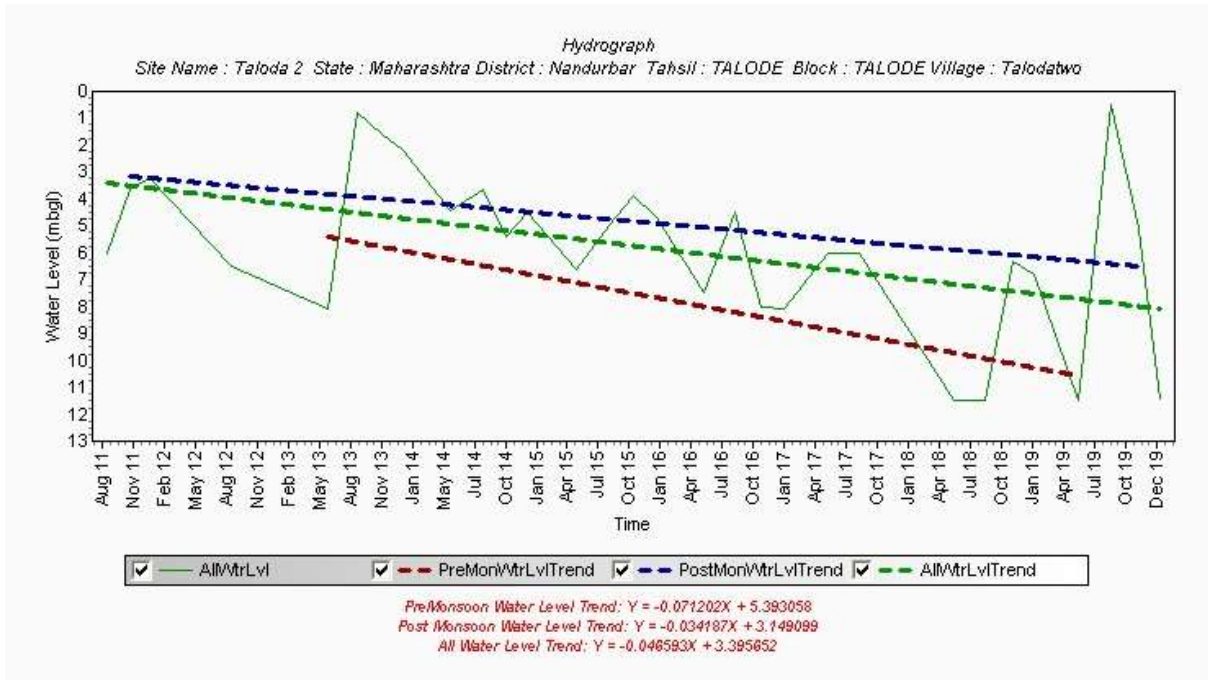


Figure 3.8(i): Hydrograph (2011-19), Taloda, Taloda Taluka

4. GROUND WATER QUALITY

Water sampling is being done every year from GWM wells during pre-monsoon period (May). The data gap analysis has been carried out to find out the adequacy of information on water quality and identified additional locations, 404 for shallow and 469 for deeper aquifers. Ground water quality data of 61 kow's, 16 NHS monitoring wells of CGWB and 327 wells of GSDA representing shallow aquifer have been utilised to decipher the quality scenario of shallow aquifer. 469 exploratory wells / tubewells / borewells of CGWB and GSDA representing deeper aquifer have been utilised to decipher the quality scenario of deeper aquifer. The aquifer wise ranges of different chemical constituents present in ground water are given in **Table 4.1**. The details of chemical analysis are given in **Annexure VI and VII**.

Table 4.1: Aquifer wise ranges of chemical constituents in Nandurbar district

Constituents	Shallow aquifer		Deeper aquifer	
	Min	Max	Min	Max
pH	5.1	8.2	3.17	8.55
EC	194	6088	417.91	2187
TDS	126	3957	153	4038
TH	48	1300.5	49.96	1800
Calcium	16	319.4	16.67	237.59
Magnesium	8.2	209.01	0.59	454
Potassium	0.15	144.2	0	1
Sodium	7	261.2	25.6	106.8
Bicarbonate	39	648.28	0	310
Chloride	10	880	20	998
Sulphate	0.38	167	0.24	505.89
Nitrate	0.53	88	0.19	44.74
Iron	0.01	0.44	0.01	0.3
Fluoride	0.02	1.04	0.05	0.2

4.1 Electrical Conductivity (EC)

4.1.1 Distribution of Electrical Conductivity in Shallow Aquifer

The concentration of EC in shallow aquifer varies between 194 (Goramba, Akrani taluka) and 6088 $\mu\text{S}/\text{cm}$ (Nagaon, Nandurbar taluka). Out of 77 samples collected from dug wells, 42 samples are having EC below 750 $\mu\text{S}/\text{cm}$. Northern and south western part of the district shows EC less than 750 $\mu\text{S}/\text{cm}$. Major part of rest of the district shows EC in the range of 750-2250 $\mu\text{S}/\text{cm}$. Only 4 samples are having EC more than 2250 $\mu\text{S}/\text{cm}$ around Ghuli, Vikhran, Nagaon, Nandurbar taluka, Mandane, Shahada taluka. The ground water is potable in mostly all parts of district except few villages. The distribution of electrical conductivity in shallow aquifers is shown in **Figure 4.1** and analytical data is presented in **Table 4.2**.

4.1.2 Distribution of Electrical Conductivity in Deeper Aquifer

The concentration of EC in deeper aquifer varies between 403 (Kharda, Akrani taluka) and 2187 $\mu\text{S}/\text{cm}$ (Arale, Nandurbar taluka). All 46 samples collected from tube wells/bore wells are having EC in less than of 2250 $\mu\text{S}/\text{cm}$. The ground water is potable in major parts of the district. The distribution of electrical conductivity in deeper aquifers is shown in **Figure 4.2** and analytical data is presented in **Table 4.2**.

Table 4.2: Aquifer wise Electrical conductivity data

S.No.	EC ($\mu\text{S}/\text{cm}$)	shallow aquifer		Deeper Aquifer	
		No. of samples	% of samples	No. of samples	% of samples
1	< 250	1	1.30	0	0
2	>250-750	41	53.25	17	36.96
3	>750-2250	31	40.26	29	63.04
4	2250-3000	2	2.59	0	0
5	3000-7500	2	2.60	0	0
6	>7500	0	0	0	0
Total samples		77		46	

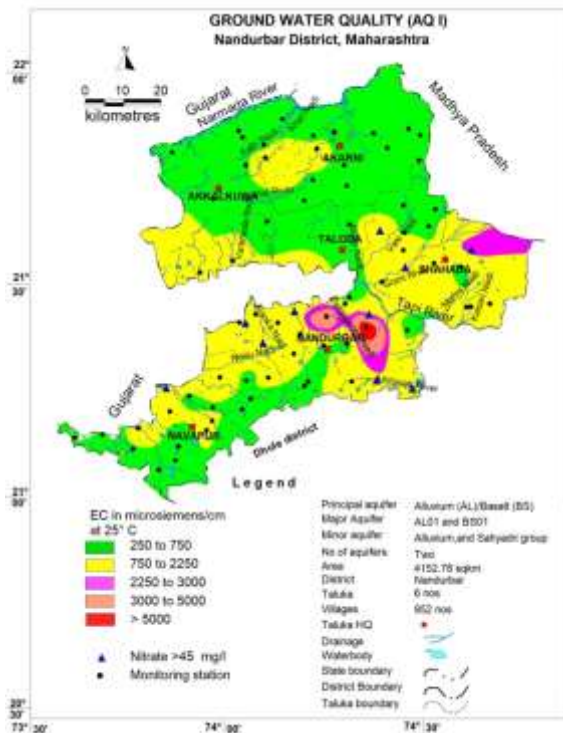


Figure.4.1: Ground Water Quality, Aquifer-I

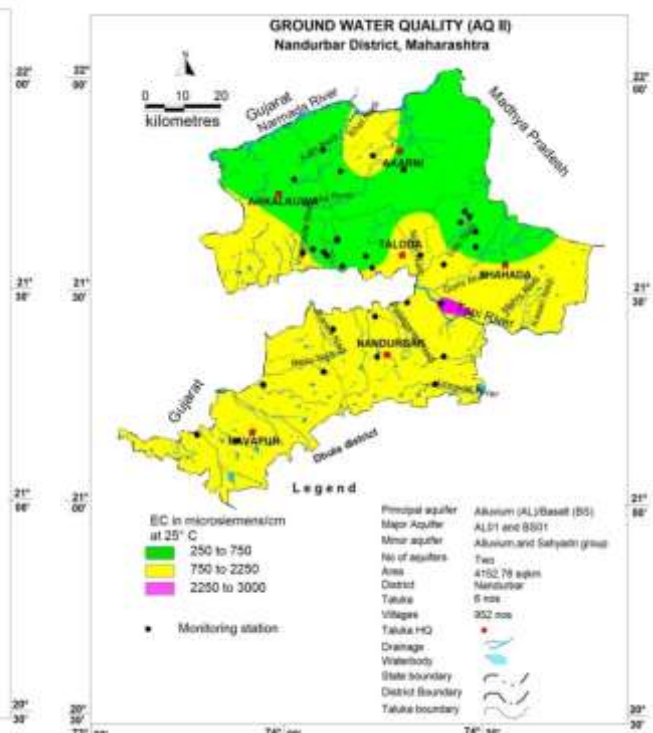


Figure 4.2: Ground Water Quality, Aquifer-II

4.2 Nitrate

Nitrogen in the form of dissolved nitrate nutrient for vegetation, and the element is essential to all life. The major contribution in ground water is from sewage, waste disposal, nitrate fertilizer and decaying of organic matter. In Nandurbar district nitrate concentration varies between 0.53 to 88 mg/l (Dhulwad, Nandurbar Taluka). As per BIS (2012) the desirable limit is 45 mg/l. In shallow aquifer, 404 samples were analysed, out of these, 11 water samples show the nitrate concentration exceeded the desirable limit of 45 mg/l. The high concentration of Nitrate may be due to domestic waste and sewage in the urban and rural parts of district. In deeper aquifer, nitrate concentration varies between negligible to 45 mg/l (Talvel, Taloda Taluka). Out of 452 water samples analysed from CGWB and GSDA, no water samples show the nitrate concentration exceeded the desirable limit of 45 mg/l. The deeper aquifer is not affected by nitrate contamination. Aquifer wise nitrate concentration is given in **Table 4.3**.

4.3 Fluoride

In shallow aquifer, concentration of fluoride ranges from 0.2 (Toranmal, Akrani Taluka and Ganor, Shahada Taluka) to 1.04 mg/l (Khuntamodi, Shahada Taluka). Out of 404 samples analyzed, only 1 sample shows fluoride concentration more than 1 mg/l. In Deeper Aquifer, concentration of fluoride ranges from 0.05 to 0.2 mg/l (Rajale, Nandurbar Taluka). Out of 452 samples analysed, no sample show fluoride concentration more than 1 mg/l. In Deeper aquifer, the concentration of fluoride is under desirable limit and suitable for drinking purpose. Aquifer wise fluoride concentration is given in **Table 4.3**.

Table 4.3: Aquifer wise Nitrate and Fluoride concentration in Nandurbar district

Taluka	No ₃ > 45 mg/l		fluoride >1.5 mg/l	
	No of samples	No of samples	No of samples	No of samples
	Shallow Aquifer	Deeper Aquifer	Shallow Aquifer	Deeper Aquifer
Akkalkuwa	0	0	0	0
Akrani	0	0	0	0
Nandurbar	6	0	0	0
Navapur	1	0	0	0
Shahada	3	0	0	0
Taloda	0	0	0	0
Grand Total	10	0	0	0

4.4 Suitability of Ground Water for Drinking Purpose

Ground Water in shallow aquifer of Nandurbar District is mostly potable and fit for drinking, irrigation and industrial use, as evident from chemical analysis of 403 ground water samples from shallow aquifer and 452 ground water samples from deeper aquifer. TDS concentration more than maximum permissible limit (MPL) of 2000 mg/l was detected only in 2 ground water samples (0.5%) from shallow aquifer and 3 samples (0.66 %) from deeper aquifer. Nitrate concentration above permissible limit of 45 mg/l is detected only in 10 water samples from shallow aquifer and none of the samples from deeper aquifer. Fluoride concentration above permissible limit of 1.5 mg/l is not detected in any water sample from shallow aquifer and deeper aquifer. It is seen that only a few samples from shallow aquifer

at Ghuli, Nagaon, Rajale, Vikharan, Vaindane, Mangrul, Umaj and Dhulwad villages of Nandurbar taluk; Navagaon village in Navapur taluka and Javade-t-board, Mandane and Pingane villages of Shahada taluka and few samples from deeper aquifer at Pimplod, Nandurbartaluka, Bhadvad, Dogegaon, Navapur taluka, Prakasha, Shahada taluka have more than one parameter like TH, Ca, Mg, NO₃ and Fe beyond the maximum permissible limit for drinking, indicating water from such area is not fit for drinking purpose if directly consumed without treatment. Concentration of Chemical constituents in shallow Aquifer is given in Table 4.4 and Concentration of Chemical constituents in deeper aquifer is given in Table 4.5.

Table 4.4: Concentration of Chemical constituents in shallow Aquifer

Parameter	Drinking water Standards (IS-10500-2012)		Total no of ground water samples	Shallow aquifer					
				Samples (<DL)		Samples (DL-MPL)		Samples (>MPL)	
	DL	MPL		No	%	No	%	No	%
pH	6.5-8.5	-	403	1	0.25	402	99.75	0	0.00
TDS	500	2000	403	175	43.42	226	56.08	2	0.50
TH	300	600	403	281	69.73	114	28.29	8	1.99
Ca (mg/L)	75	200	76	48	63.16	27	35.53	1	1.32
Mg (mg/L)	30	100	76	45	59.21	29	38.16	2	2.63
Cl (mg/L)	250	1000	403	330	81.89	73	18.11	0	0.00
SO ₄ (mg/L)	200	400	403	403	100.00	0	0.00	0	0.00
NO ₃ (mg/L)	45	No relax	403	393	97.52	0	0.00	10	2.48
Fe (mg/L)	0.3	1	347	327	94.24	17	4.90	3	0.86
F (mg/L)	1	1.5	403	402	99.75	1	0.25	0	0.00

(Here, DL- Desirable Limit, MPL- Maximum Permissible Limit)

Table 4.5: Concentration of Chemical constituents in Deeper Aquifer

Parameter	Drinking water Standards (IS-10500-2012)		Total no of ground water samples	Deeper aquifer					
				Samples (<DL)		Samples (DL-MPL)		Samples (>MPL)	
	DL	MPL		No	%	No	%	No	%
pH	6.5-8.5	-	452	5	1.11	446	98.67	1	0.22
TDS	500	2000	452	145	32.08	304	67.26	3	0.66
TH	300	600	452	281	62.17	162	35.84	9	1.99
Ca (mg/L)	75	200	41	15	36.59	23	56.10	3	7.32
Mg (mg/L)	30	100	41	33	80.49	4	9.76	4	9.76
Cl (mg/L)	250	1000	451	340	75.39	111	24.61	0	0.00
SO ₄ (mg/L)	200	400	452	451	99.78	0	0.00	1	0.22
NO ₃ (mg/L)	45	No relax	451	451	100.00	0	0.00	0	0.00
Fe (mg/L)	0.3	1	452	451	99.78	1	0.22	0	0.00
F (mg/L)	1	1.5	452	452	100.00	0	0.00	0	0.00

(Here, DL- Desirable Limit, MPL- Maximum Permissible Limit)

4.5 Suitability of Ground Water for Irrigation

The 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.

Electrical Conductivity (EC)

The amount of dissolved ions in the water is best represented by the parameter electrical conductivity. The classification of water for irrigation based on the EC values is given in **Table 4.6** and discussed as follows: -

Low Salinity Water (EC: 100-250 $\mu\text{S/cm}$): 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 $\mu\text{S/cm}$): 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 $\mu\text{S/cm}$): 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 $\mu\text{S/cm}$): 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 4.6: Classification of Ground water for Irrigation based on EC values

sl.	Water Quality Type	EC in $\mu\text{S/cm}$	shallow aquifer		Deeper Aquifer	
			No. of samples	% of samples	No. of samples	% of samples
1	Low Salinity Water	< 250	1	1.30	0	0.00
2	Medium Salinity Water	250 to 750	41	53.25	17	36.96
3	High Salinity Water	750 to 2250	31	40.26	29	63.04
4	Very High Salinity Water	> 2250	4	5.19	0	0.00
Total			77		46	

In shallow as well as deeper aquifer, maximum numbers of samples fall under the category of medium to high salinity type of water. In general, Plants with moderate salt tolerance can be grown in most cases and special management for salinity control may be required and plants with good salt tolerance should be selected. In shallow aquifer, Ghuli, Vikhran & Nagaon in Nandurbar taluka and Mandane in shahada taluka, \very high salinity prevails (>2250 $\mu\text{S/cm}$) and around this area ground water can be used for irrigation for very high salt tolerant crops and with proper soil and crop management practices. No sample from deeper aquifer recorded very high salinity.

Sodium Absorption Ratio (SAR)

Since Calcium and Magnesium will replace Sodium more readily than vice versa, the ratio reflects the Sodium hazard. The SAR indicates the relative activity of the Sodium ions in exchange reactions with the soil. The main problem with high sodium concentration is its effect on soil permeability, hardening of soil & water irrigation system. Sodium also contributes directly to the total salinity of the water and may be toxic to sensitive crops such as fruit trees. The higher value of SAR indicates soil structure damage.

It is observed that Sodium hazard is not present in ground water of the area in shallow as well as deeper aquifer, and as per SAR values, the water is suitable for irrigation. In shallow aquifer, out of 76 samples, all the 76 (100%) samples are having SAR less than 10 in 'Good' category.

While in deeper aquifer, 100% samples are having SAR value less than 10 in 'Good' category'.

The classification of ground water samples based on SAR values for its suitability for irrigation purpose is shown in **Table 4.7**.

Table 4.7: Classification of Ground water for Irrigation based on SAR values

Characteristics	Quality	SAR value							
		< 10		10 to 18		18 to 26		> 26	
	Good	Good to Permissible	Doubtful		Bad (Unsuitable)				
	Total No of GW samples	No. of Samples	No. of Samples	No. of Samples	No. of Samples	No. of Samples	%	%	
		%	%	%	%	%	%	%	
Shallow Aquifer	76	76	100	0	0	0	0	0	0
Deeper Aquifer	40	40	100	0	0	0	0	0	0
Total	116	116	100	0	0	0	0	0	0

Residual Sodium Carbonate (RSC)

Residual Sodium Carbonate (RSC) is considered to be superior to SAR as a measure of sodicity particularly at low salinity levels. Calcium reacts with bi-carbonate and precipitate as CaCO₃. Magnesium salt is more soluble and so there are fewer tendencies for it to precipitate. When calcium and magnesium are lost from the water, the proportion of sodium is increased resulting in the increase in sodium hazard. This hazard is evaluated in terms of RSC. The classification of ground water samples based on RSC values for its suitability for irrigation purpose is shown in **Table 4.8**.

Table 4.8: Classification of Ground water for Irrigation based on RSC values.

Characteristics	Quality	RSC values (meq/L)					
		< 1.25		1.25-2.50		> 2.50	
	Total No of GW samples	Good		Doubtful		Bad (Unsuitable)	
		No. of Samples		No. of Samples		No. of Samples	
	%		%		%		
Shallow Aquifer	76	76	100	0	0	0	0
Deeper Aquifer	40	39	97.5	0	0	1	2.5
Total	116	115	99.14	0.00	0.00	1.00	0.86

In shallow aquifer, it is observed that the ground water of the area is suitable for irrigation as 100 % samples show RSC values less than 1.25 meq/l.

Ground water of deeper aquifer of the area, in general, is suitable for irrigation as 99.14 % samples show RSC values less than 1.25 meq/l and 0.856% samples show RSC values more than 2.50 meq/l at Kharda village, Akrani taluka - ground water around this village is not suitable for irrigation.

5. GROUND WATER RESOURCES

5.1 Ground Water Resources- Aquifer-I

Central Ground Water Board and Ground Water Survey and Development Agency (GSDA) have jointly estimated the ground water resources of Nandurbar district based on GEC-2015 methodology. Taluka wise ground water resources are given in **Table 5.1**, and graphical representations of the resources on the map are shown in **Figure-5.1**.

Ground Water Resources estimation was carried out for 5951.85 sq. km. area out of which 181.53 sq. km. is under command and 3971.25 sq. km. is non-command. There is no poor ground water quality area in the district. As per the estimation, the net annual ground water availability comes to 474.23 MCM. The gross draft for all uses is estimated at 206.56 MCM with irrigation sector being the major consumer having a draft of 175.91 MCM. The domestic and industrial water requirements are worked at 30.65 MCM. The net ground water availability for future irrigation is estimated at 179.42 MCM. Stage of ground water development varies from 25.15% (Akroni taluka) to 61.32 % (Nandurbar taluka). The overall stage of ground water development for the district is 42.24%. Taluka wise assessments indicate that all the talukas in the district fall under “Safe” category.

5.2 Ground Water Resources- Aquifer-II

The ground water resources of Aquifer-II (Basalt and Alluvium) were also assessed to have the correct quantification of resources so that proper management strategy can be framed. The total resources of aquifer-II have been estimated as 137.47 MCM respectively. Taluka wise summarized Ground Water Resources of Aquifer-II are given in Table 5.2.



Figure 5.1: Ground Water Resources, Nandurbar district

Table 5.1: Ground water resources, Aquifer-I (Shallow aquifer), Nandurbar district (2017)

Administrative Unit	Command / Non-Command / Total	Net Annual Ground Water Availability	Existing Gross Ground Water Draft for irrigation	Existing Gross Ground Water Draft for domestic and industrial water supply	Existing Gross Ground Water Draft for All uses	Provision for domestic and industrial requirement supply to 2025	Net Ground Water Availability for future irrigation development	Stage of Ground Water Development %
Akkalkuwa	Total	4761.32	1226.95	494.36	1721.31	2235.48	1298.9	36.15 / Safe
Akrani	Total	3773.49	602.74	346.40	949.14	1712.88	1461.93	25.15 / Safe
Nandurbar	Total	10648.14	6045.79	483.39	6529.18	1648.76	2991.92	61.32 / Safe
Navapur	Total	13519.33	3947.28	777.18	4724.46	2216.70	7317.03	34.95/ Safe
Shahada	Total	10963.58	4147.47	614.16	4761.62	2587.56	4283.47	43.43 / Safe
Taloda	Total	3757.06	1620.64	349.20	1969.84	1533.51	588.46	52.43 / Safe
Total (ham)		47422.91	17590.87	3064.69	20655.55	11934.89	17941.71	42.24
Total (MCM)		474.23	175.91	30.65	206.56	119.35	179.42	

Table 5.2: Taluka wise summarized Ground Water Resources of Aquifer-II (Deeper aquifer)

Taluka	Area	Average	Piezometric head (m)	Sy	S	Sum of Resource above confining layer (mcm)	Sum of Resource in aquifer (mcm)	Sum of Total resource (mcm)
	(Sq km)	Mean aquifer thickness						
Akkalkuwa	944.78	6.38	22	0.002	0.0000438	0.910390008	12.0553928	12.96578281
Akrani	1112.42	10	26	0.002	0.0000438	1.266823896	22.2484	23.5152239
Nandurbar	1114	16.57	54.78	0.002	0.0000438	2.672891496	36.91796	39.5908515
Navapur	1250.21	11.79	10.4	0.002	0.0000438	0.569495659	29.4799518	30.04944746
Shahada	1191.34	9.53	10.4	0.002	0.0000438	0.542679197	22.7069404	23.2496196
Taloda	339.1	11.64	14	0.002	0.0000438	0.20793612	7.894248	8.10218412
Total	5951.85					6.17021638	131.30289	137.4731094

6. GROUND WATER RELATED ISSUES

6.1 Declining Water Levels

Pre monsoon ground water falling trend greater than 0.2/ year covered mostly western part of the Akkalkuwa taluka and in some parts of Shahada, Nandurbar and Taloda talukas, Post monsoon ground water falling trend greater than 0.2/ year is found in some patches of Akkalkuwa, Shahada, Nandurbar and Navapur talukas. The average annual rainfall during is also minimum in this part. Thus, future water conservation and artificial recharge structures in the district may be prioritized in this part of the district.

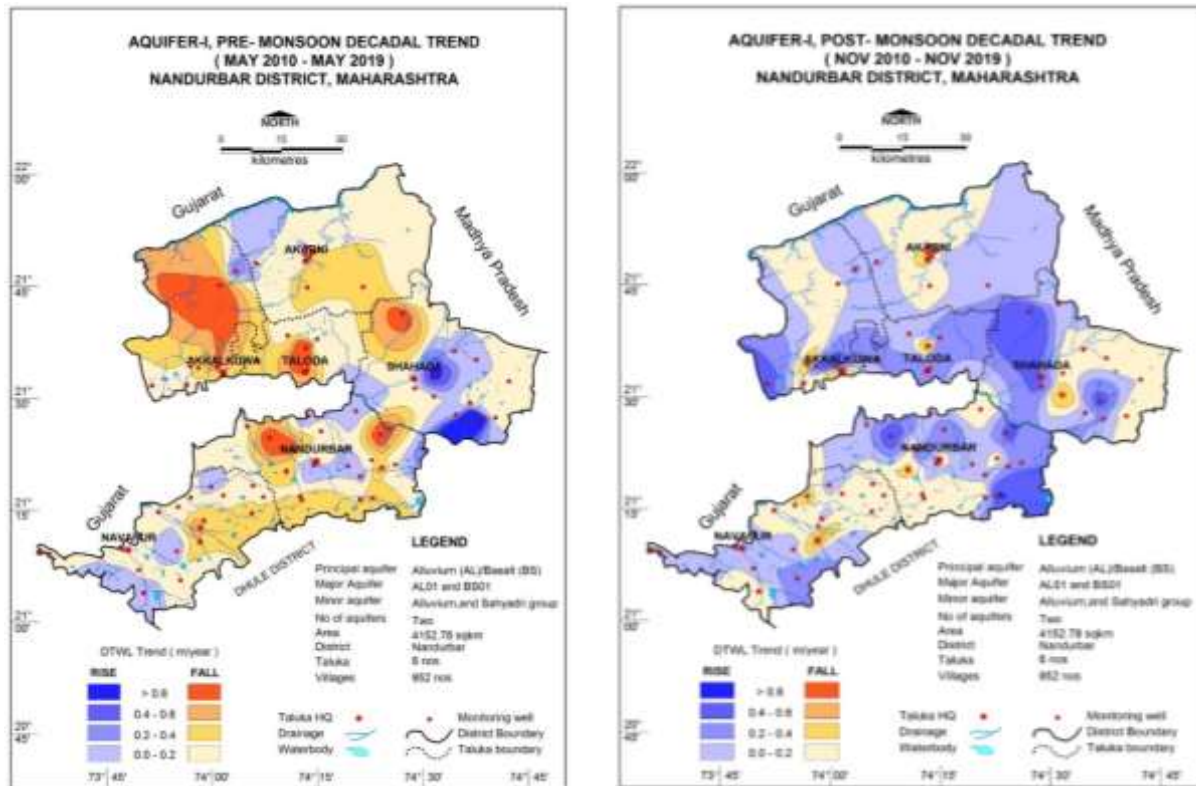


Figure 6.1: Ground water related issues – Declining Water Levels

6.2 Rainfall and Droughts

Based on the decadal rainfall trend analysis from 2010 to 2019 it is observed that the 4 talukas of Nandurbar district experience low and declining rainfall trend (Figure 6.2 a to d) and drought area have been observed in parts of Akklakuwa Nandurbar, Shahada and Taloda talukas.

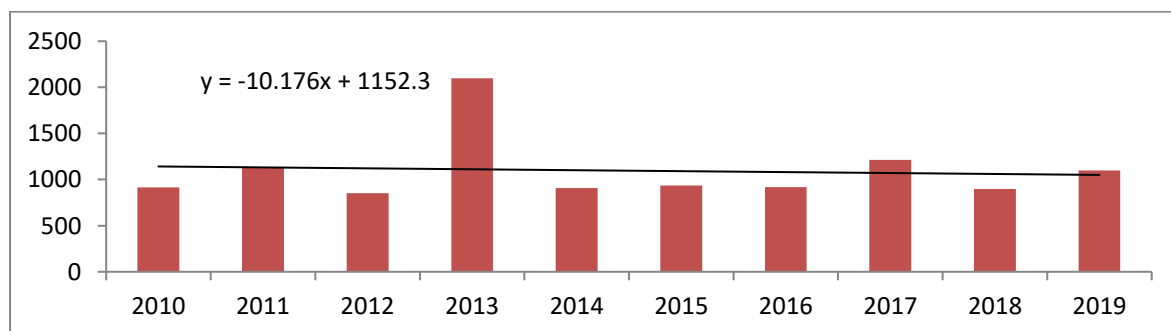


Figure 6.2 (a): Rainfall Trend (2010-19), Akkalkuwa taluka

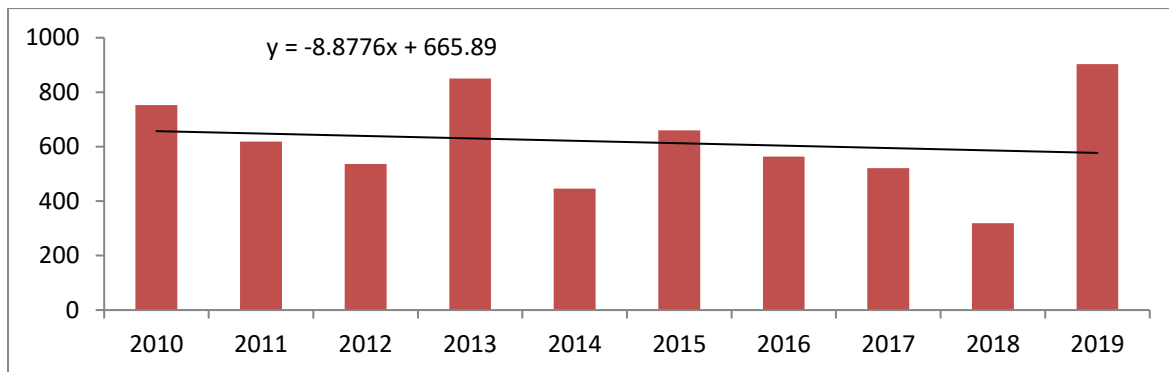


Figure 6.2(b): Rainfall Trend (2010-19), Nandurbar taluka

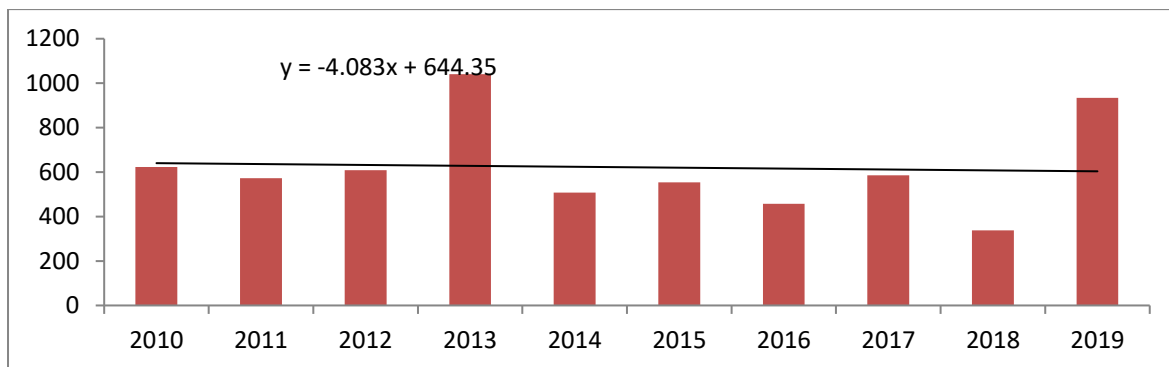


Figure 6.2(c): Rainfall Trend (2010-19), Shahada taluka

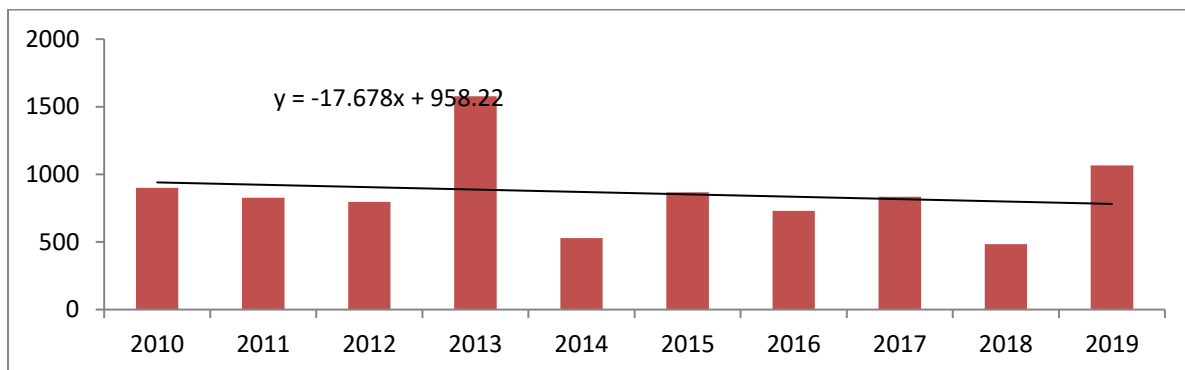


Figure 6.2(d): Rainfall Trend (2010-19), Taloda taluka

6.3 Caving and losses

Red boles, the intertrappean beds, have collapsible nature when they are saturated leading to caving and loss of drilling fluid. The weathered/highly fractured saturated formation at the contact zones also collapse as a result of which drill rods assembly gets stuck up. This sometimes leads to loss of circulation of fluid there by compounding the problems further.

Loss of air in jointed and fractured Basalt was observed during drilling. The problem can be solved by sealing the zones by lowering casing or by cement sealing. This process may often damage the potential aquifer zones if not carried out meticulously with proper equipment. This problem was noticed during drilling of exploratory well at Mandvi at 139 m bgl.

7. GROUND WATER MANAGEMENT PLAN

Taluka wise aquifer management plans have been prepared for Aquifer I (Weathered and jointed fractured Basalt) and Aquifer II (jointed and fractured basalt), with the objective of bringing the current stage of ground water development up to 60% by adopting supply side and demand side interventions, for the six talukas of Nandurbar District, namely, Akkalkuwa, Akrani, Nandurbar, Navapur, Shahada and Talod. 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 supply side Management is proposed based on surplus surface water availability and the unsaturated thickness of aquifer whereas the demand side management is proposed by use of micro irrigation techniques. Change in cropping pattern towards less water-intensive irrigation crops (Demand side intervention) has not been proposed in the area cash crop cultivation drives the economy of the region.

7.1 Supply Side Management

The supply side management of ground water resources can be done through the artificial recharge of surplus runoff available within river sub basins and micro watersheds. Also, it is necessary to understand the unsaturated aquifer volume available for recharge. The unsaturated volume of aquifer was computed based on the area feasible for recharge, unsaturated depth below 5 mbgl and the specific yield of the aquifer. The **Table 7.1** gives the taluka wise volume available for the recharge.

Table 7.1: Area feasible and volume available for Artificial Recharge

Taluka	Geographical Area (sq. km.)	Area feasible for recharge (Sqkm)	Unsaturated Volume (MCM)
Akkalkuwa	944.78	240.92	481.83
Akrani	1112.42	0	0
Nandurbar	1114	208.49	416.97
Navapur	1250.21	34.18	68.36
Shahada	1191.34	1014.48	2028.96
Taloda	339.1	199.69	399.38
Total	5951.85	1697.76	3395.5

The total unsaturated volume available for artificial recharge is 3395.5 MCM and it ranges from 0 MCM in Akrani taluka to 2028.96 MCM in Shahada taluka. The available surplus runoff can be utilized for artificial recharge through construction of percolation tanks, Check dams and recharge shafts at suitable sites. The number of percolation tanks, and check dams are decided based on the number of suitable streams available in the district.

Thus, after taking into consideration all the factors, only 24.04 MCM of surplus water can be utilised for recharge, which is given in **Table 7.2**. This surplus water can be utilized for constructing 135 check dams, 75 percolation tanks and 41 recharge shafts at suitable sites. The number of feasible artificial recharge structures was calculated by considering 0.20 MCM per percolation tank, 0.03 MCM per check dam and 0.06 MCM per recharge shaft. This intervention should lead to recharge @ 75% efficiency of about 19.01 MCM/year. Tentative locations of these structures are given in **Figure 7.1** and details also given in **Annexure VIII** (Percolation Tanks), **Annexure IX** (Check Dams) and **Annexure X** (Recharge shafts).

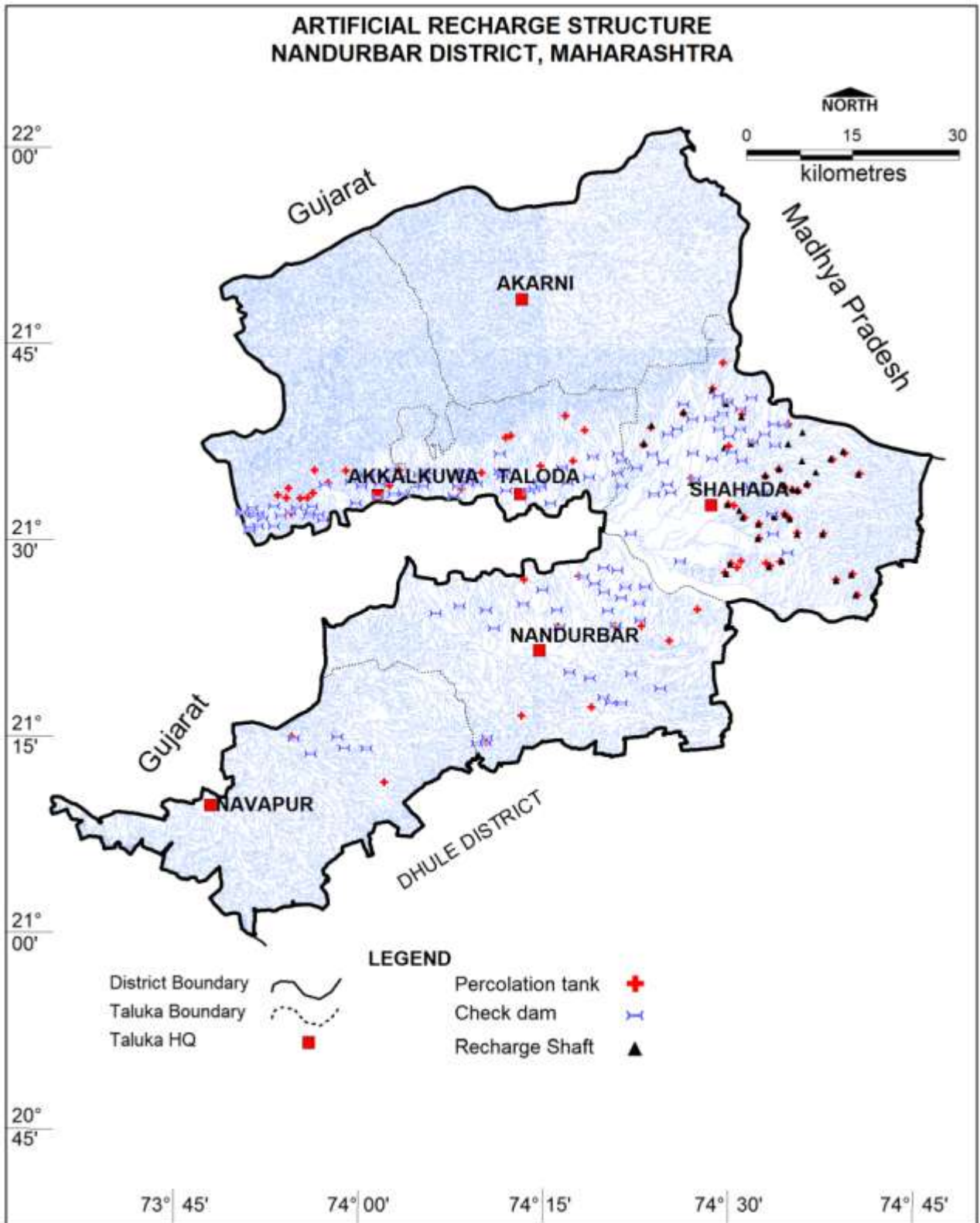


Figure 7.1: Proposed Artificial Recharge structures

Table 7.2: Proposed Recharge Structures

Taluka	Geographical Area (Sqkm)	Area feasible for recharge (sq. km.)	Unsaturated Volume (MCM)	Surplus water available for AR (MCM)	Proposed number of structures			Total Volume of Water expected to be recharged@ 75 % efficiency (MCM)			Total recharge d @ 75 % efficiency (MCM)
					PT	CD	RS	PT	CD	RS	
Akkalkuwa	944.78	240.92	481.83	3.41	12	34	0	2.39	1.02	0	2
Akrani	1112.42	0	0	0	0	0	0	0	0	0	
Nandurbar	1114	208.49	416.97	2.95	10	30	0	2.07	0.89	0	2
Navapur	1250.21	34.18	68.36	0.48	2	5	0	0.34	0.15	0	0
Shahada	1191.34	1014.48	2028.96	14.37	41	38	41	8.2	1.14	2.46	11
Taloda	339.1	199.69	399.38	2.83	10	28	0	1.98	0.85	0	2
Total	5951.85	1697.76	3395.5	24.04	75	135	41	14.98	4.05	2.46	19

7.2 Demand Side Management

Demand side intervention such as change in cropping pattern has not been proposed in the area, cash crop cultivation drives the economy of the region. However, as discussed earlier, there is a scope for increasing areas under micro-irrigation techniques like drip irrigation (about 37.02 sq km area of sugarcane is under groundwater irrigation is proposed to be covered under Drip). Volume of Water expected to be saved is estimated as 21.10 MCM in sugarcane crop (Sugarcane Surface Flooding irrigation req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m).

Table 7.3: Area Proposed for Drip Irrigation Demand Side Management

Taluka	Geographical Area (Sqkm)	Sugarcane crop area under ground water irrigation (100% ground water irrigated area proposed to be covered under Drip)	Volume of Water expected to be saved (MCM). Surface Flooding req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m	Total water saved
		(sq.km.)		(MCM)
Akkalkuwa	944.78	0.81	0.46	0.46
Akrani	1112.42	0	0.00	0.00
Nandurbar	1114	1.15	0.66	0.66
Navapur	1250.21	3.04	1.73	1.73
Shahada	1191.34	26.48	15.09	15.09
Taloda	339.1	5.54	3.16	3.16
Total	5951.85	37.02	21.10	21.10

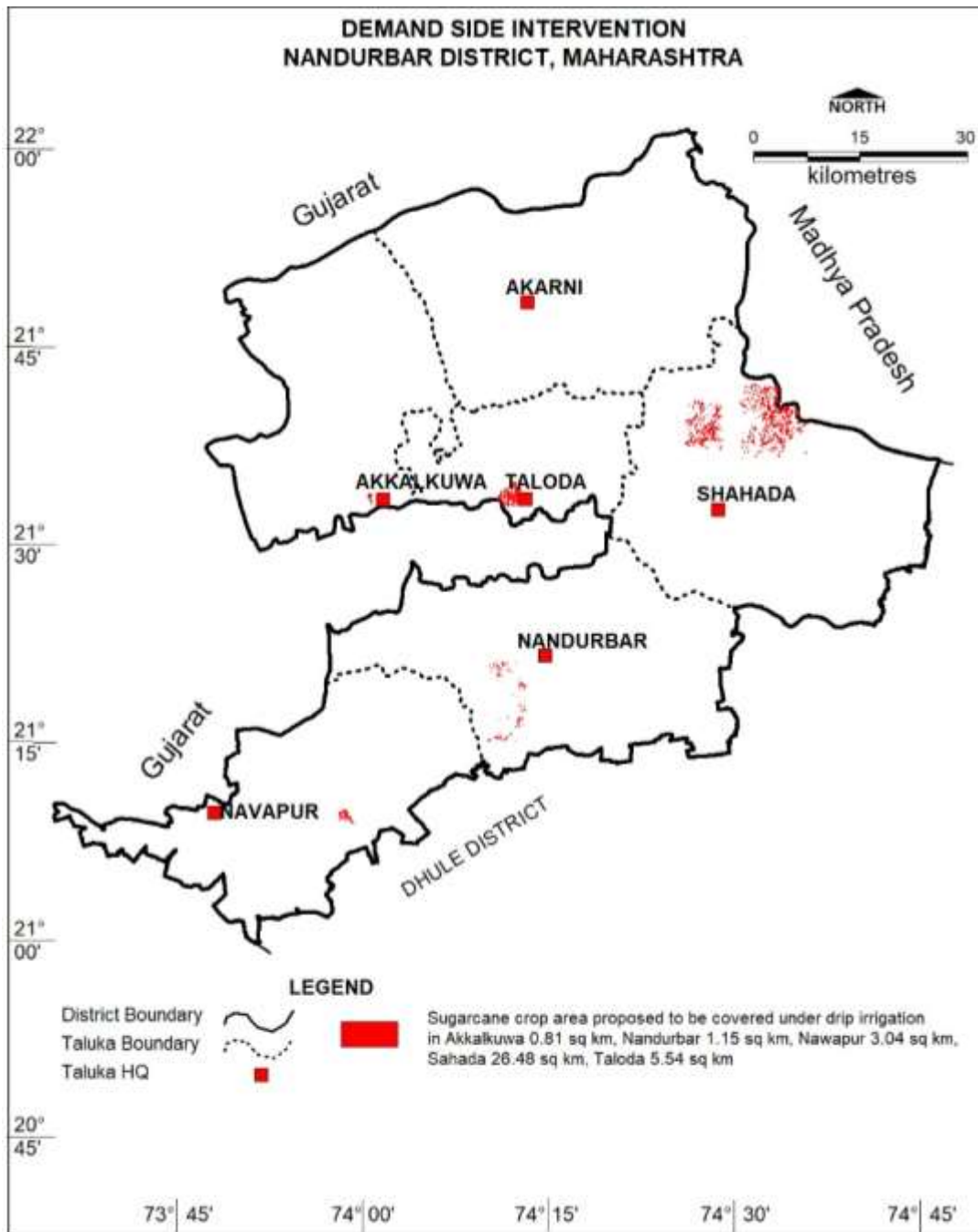


Figure 7.2: Location of Proposed Demand side interventions

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 talukas as given in the **Table 7.4**.

Table 7.4: Expected benefits after management options

Taluka	Water Recharged by Supply side intervention (MCM)	Water saving by demand side interventions (MCM)	Net Ground water availability (MCM)	Total ground water draft (MCM)	Ground water resources after supply side management (MCM)	Ground water Draft after demand side management	Expected stage of Development (%)
						(MCM)	
Akkalkuwa	2.56	0.46	47.61	17.21	50.17	16.75	33.39
Akrani	0	0.00	37.73	9.49	37.73	9.49	25.15
Nandurbar	2.21	0.66	106.48	65.29	108.69	64.63	59.46
Navapur	0.36	1.73	135.19	47.24	135.55	45.51	33.57
Shahada	11.76	15.09	109.64	47.62	121.40	32.53	26.80
Taloda	2.12	3.16	37.57	19.70	39.69	16.54	41.67
Total	19.01	21.10	474.23	206.56	493.24	185.46	37.60

7.4 Development Plan

The ground water development plan is recommended to bring the stage of development upto 60%. Balance ground water resources available for ground water development is 110.49 MCM after the stage of is brought up to 60% after implementing demand side management, which can bring additional 169.98 sq. km. area under assured ground water irrigation. The details of the development plan are given in **Table 7.5**.

Table 7.5: Development Plan

Taluka	Ground water resources after supply side management (MCM)	Ground water Draft after demand side management (MCM)	Expected stage of Development %	Balance GWR available for GW Development after STAGE OF GWD is brought to 60% (MCM)	Proposed No. of DW @1.5 ham for 90% of GWR Available)	Proposed No. of BW @1.0 ham for 10% of GWR Available)	Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m after 60% stage of GWD is achieved (Sq.Km)
Akkalkuwa	50.17	16.75	33.39	13.35	801	133	20.54
Akrani	37.73	9.49	25.15	13.15	789	132	20.23
Nandurbar	108.69	64.63	59.46	0.59	35	6	0.90
Navapur	135.55	45.51	33.57	35.83	2150	358	55.12
Shahada	121.40	32.53	26.80	40.30	2418	403	62.00
Taloda	39.69	16.54	41.67	7.28	437	73	11.19
Total	493.24	185.46	37.60	110.49	6629	1105	169.98

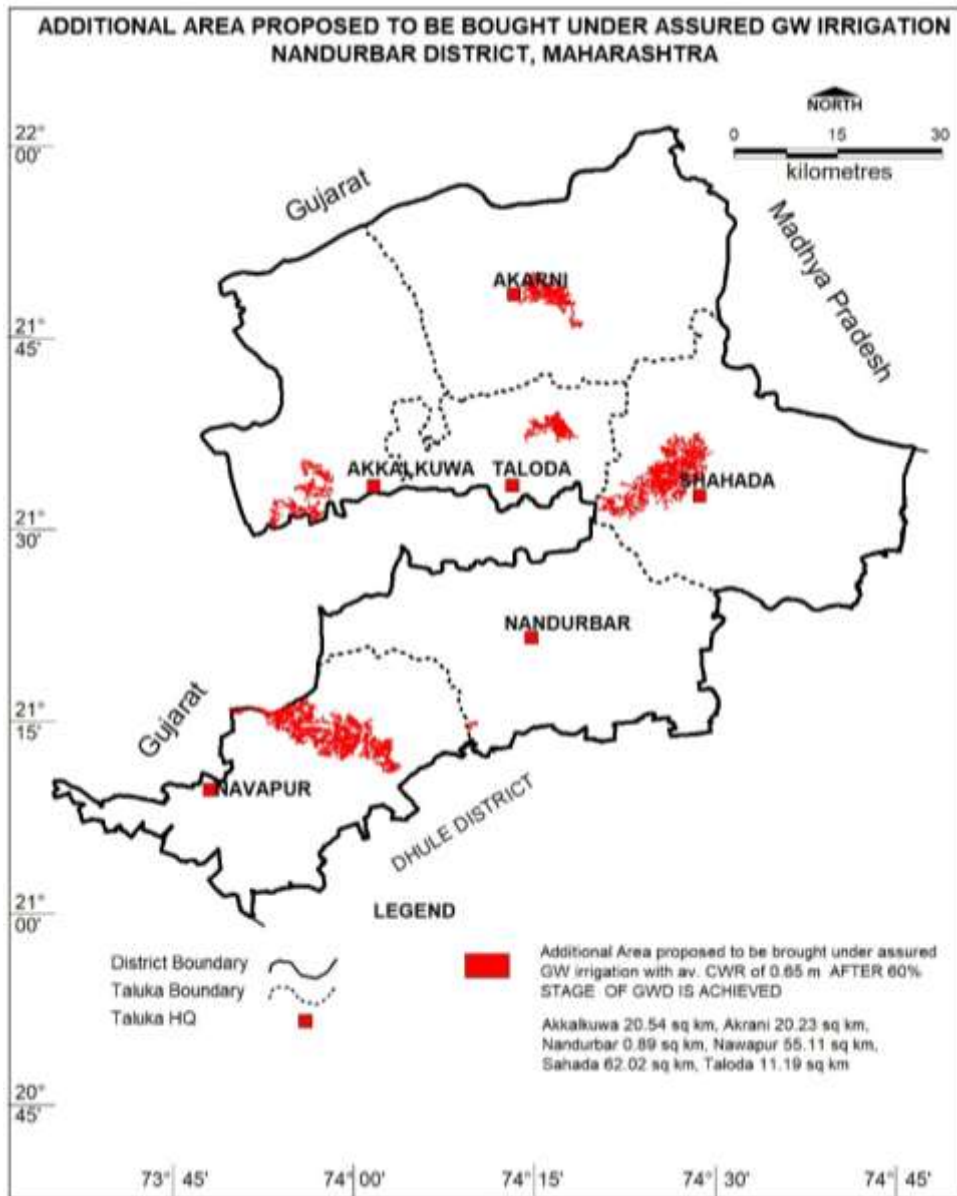


Figure 7.3: Additional area under Assured GW irrigation.

8. SUM UP

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 taluka wise aquifer maps and aquifer management plans of Nandurbar district.

Nandurbar district was derived from Dhule district on 1st July 1998, and it is surrounded by Dhule district in the south and east, Gujarat state in the west and Madhya Pradesh state in the north. Nandurbar district is located in the western part of Deccan plateau and lies between north latitude 21°00'00" to 22°00'30" and east longitude 73°31'00" to 74°45'30". The entire area of the district falls in parts of Survey of India degree sheet numbers 46-G and 46-K. The district has an area of 5034 sq.km, which constitutes about 1.64 % of the total area of Maharashtra. The district is divided in 6 talukas, namely Nandurbar, Nawapur, Shahada, Taloda, Akkalkuwa and Akrani. Physiographically, the district forms part of north western Maharashtra plateau and can be broadly divided in four major units viz., Satpuda hilly region, Tapi river valley proper, Region of the dykes, and residual hills of Sahyadri spurs with eastward trending streams in between Nawapur and western Nandurbar region with a westerly aspect below the Sahyadri scraps. The entire Nandurbar district falls in the drainage of the Tapi river basin and Narmada river basin. The northern part of Nandurbar district is drained by Narmada River and its tributaries such as Katri, Devnadi/Devganga, and Udai rivers while rest of the district is drained by Tapi River and its tributaries such as Nagan, Shivan, Gomai and Dehali etc. Total drainage network of the district contains about 29 watersheds out of which 21 are in Tapi river basin while 8 are in Narmada basin. The entire river system has sub-parallel to semi-dendritic drainage pattern and the drainage density is quite high in the district. The average rainfall is 767 mm through the district.

Deccan Trap Basalt of upper Cretaceous to lower Eocene age is the major rock formation in the district, whereas only a very narrow belt confined to the banks of rivers is underlain by Recent Alluvium. Alluvium and Basalt aquifers are the main aquifers in the district. Two aquifer Systems in Basalt and one shallow aquifer in Alluvium (limited to riverbanks) are found to be prevailing in the district. Deccan basalts are hydrogeologically in-homogeneous rocks. The weathered and jointed /fractured parts of the rock, as also permeable inter-flow beds constitute the zone of ground water storage and flow.

For aquifer-I (Deccan Trap- Weathered/Fractured Basalt), yield varies from 60 to 125 m³/day, specific capacity of the wells ranges from 41 to 220 lpm/m of drawdown and the transmissivity ranges from 6 to 96 m²/day. The specific yield ranges from 0.017 to 0.0429. The depth to water level, during pre-monsoon (May 2019), ranges between 2.00 (Palaskhobra, Akkalkuwa block and Mal, Taloda block) and 27.99 mbgl (Rampur, Shahada block) and during post-monsoon (Nov. 2019), ranges between 1 mbgl (Khuntamodi, Akrani taluka) and 16.0 mbgl (Rampur, Shahada taluka). Deep water level range more than 20 mbgl is observed in northern parts of Shahada and Taloda taluka. The analysis of hydrographs shows falling trends of water levels during the premonsoon in the Nandurbar, Akkalkuwa and Navapur talukas and postmonsoon falling trend in Navapur taluka in 2019 while rising trend of water levels during post-monsoon in Nandurbar, Navapur and Akkalkuwa talukas. Instead of that all the talukas of the district have stage of ground water development less than 70% and falls under safe category. For Nandurbar district, as per Ground Water Resource Estimation (2017), the net annual ground water availability is 474.23 MCM. The gross draft for all uses is estimated at 206.56 MCM with irrigation sector

being the major consumer having a draft of 175.91 MCM. The overall stage of ground water development for the district is 42.24%. All the Talukas of the district are categorized as "Safe".

In Deeper Aquifer-II (Jointed/Fractured Basalt), yield is meager (Dogegeon, Navapur taluka) to 18.49 lps (Rajale, Nandurbar taluka), the transmissivity varies from 10.27 to 94.40 m²/day. The storage coefficient varied between 2.39×10^{-4} to 1.88×10^{-2} . The pre-monsoon depth to water level during May 2019 range from 6.52 mbgl (Katri, Akrani taluka) to 120.21 mbgl (Molgi, Akkalkuwa taluka) and post-monsoon (November 2019) depth to water levels range between 3.52 mbgl (Dhamdai, Nandurbar taluka) and 116.81 mbgl (Pimplod, Nandurbar taluka).

In shallow aquifer, the quality of ground water is found suitable for drinking, domestic, and irrigation purposes. Samples from shallow aquifer of Ghuli, Nagaon, Rajale, Vikharan, Vaindane, Mangrul, Umaj and Dhulwad villages, Nandurbar taluka, Navagaon village in Navapur taluka and Javade-t-board, Mandane and Pingane villages of Shahada taluka have more than one parameter like TH, Ca, Mg, NO₃ and Fe beyond the maximum permissible limit for drinking, indicating water from such area is not fit for drinking purpose if directly consumed without treatment. Out of 77 samples, only 4 samples are having very high salinity, EC more than 2250 μ S/cm, around Ghuli, Vikhran, Nagaon, Nandurbar taluka, Mandane, Shahada taluka. The ground water is potable in mostly all parts of district except few villages. Ground water may be used for drinking only after suitable treatment in these villages, and for irrigation, water can be used for very high salt tolerant crops and with proper soil and crop management practices. In shallow aquifer, high concentration of fluoride is found in Khuntamodi village, Shahada taluka (1.04 mg/l), high concentration of Nitrate (>45mg/l) is found in Rajale, Vikhran, Vaindane, Mangrul, Umaj & Dhulwad, Nandurbar taluka, Navagaon, Navapur taluka, Javade t-board, Mandane, Pingane, Shahada taluka, RSC values more than 2.50 meq/l is not found in any sample in the district - ground water of these areas is not suitable for irrigation.

In Deeper aquifer, the quality of ground water is found suitable for drinking, domestic, and irrigation purposes. Around Pimplod, Nandurbar taluka, Bhadvad, Dogegaon, Navapur taluka, Prakasha, Shahada taluka have more than one parameter like TH, Ca, Mg, NO₃ and Fe beyond the maximum permissible limit for drinking, indicating water from such area is not fit for drinking purpose if directly consumed without treatment. Out of 46 samples, no one sample having very high salinity, EC more than 2250 μ S/cm, in any part of the district. Fluoride and Nitrate concentrations are under within permissible limit in all the samples from deeper aquifer. Ground water of deeper aquifer of the area, in general, is suitable for irrigation However, RSC values more than 2.50 meq/l is found at Kharda (3.5 meq/l), Akrani taluka, - ground water around this village is not suitable for irrigation.

Taluka wise aquifer management plan have been prepared for Aquifer I (Weathered and jointed fractured Basalt) and Aquifer II (jointed and fractured basalt), with the objective of bringing the current stage of ground water development up to 60% by adopting supply side and demand interventions, for the six talukas of Nandurbar District, namely, Akkalkuwa, Akrani, Nandurbar, Navapur, Shahada and Taloda, where aquifer mapping has been completed till 2019-20. 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 supply side Management is proposed based on surplus surface water availability and the unsaturated thickness of aquifer whereas the demand side management is proposed by use of micro irrigation techniques. Change in cropping pattern towards less water-intensive irrigation crops (Demand side intervention) has

not been proposed in the area cash crop cultivation drives the economy of the region. The supply side interventions include utilizing 19.01 MCM (out of 24.04 MCM) of surplus runoff water by a proposal to construct 75 Percolation Tanks, 135 Check Dams and 41 Recharge shafts. This supply side intervention should lead to recharge (@ 75% efficiency) of about 19.01 MCM/year. The demand side interventions include proposal to bring 100 % ground water irrigated Sugarcane crop area (37.02 sq.km.) to be covered under Drip Irrigation. Volume of Water expected to be saved is estimated as 21.10 MCM in sugarcane crop (Sugarcane Surface Flooding irrigation req- 2.45 m. Drip Req. - 1.88, WUE- 0.57 m).

Balance ground water resources available for ground water development is 110.49 MCM after the stage of ground water development is brought up to 60% after implementing demand side management, which can bring additional 169.98 sq. km. area under assured ground water irrigation through proposed 6629 Dugwells and 1105 Borewells in phased manner.

These interventions also need to be supported by regulation of deeper aquifer and hence it is recommended to regulate/ban deeper tubewells/borewells of more than 60 m depth in these talukas, 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 need to be aggressively propagated to establish the institutional framework for participatory ground water management.

B LOCK WISE AQUIFER MAPS AND MANAGEMENT PLAN

1. **AKKALKUWA BLOCK**
2. **AKRANI BLOCK**
3. **NANDURBAR BLOCK**
4. **NAVAPUR BLOCK**
5. **SHAHADA BLOCK**
6. **TALODA BLOCK**

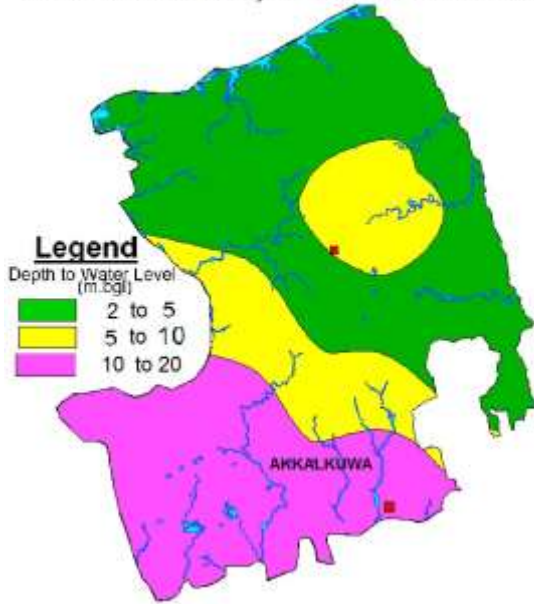
9. AQUIFER MAPS AND GROUND WATER MANAGEMENT PLAN

9.1 AKKALKUWA BLOCK, NANDURBAR DISTRICT, MAHARASHTRA

1. SALIENT FEATURE																																															
1.1 Introduction																																															
Block Name	Akkalkuwa																																														
Geographical Area (Sq. Km.)	944.78 Sq. Km.																																														
Forest Area (Sq. Km)	433.78 Sq. Km.																																														
Population (2011)	245861																																														
Climate	Monsoon sub-tropical																																														
Net Annual Ground Water Availability (MCM)	47.61																																														
Existing Gross Ground Water Draft for All uses (MCM)	17.21																																														
Stage of Ground Water Development (%)	36.15																																														
Category	SAFE																																														
1.2 Rainfall Analysis																																															
Normal Rainfall	1091 mm																																														
Annual Rainfall (2019)	1098.2 mm																																														
Decadal Average Annual Rainfall (2010-19)	1096.36 mm																																														
Long Term Rainfall Analysis (1998-2019)	Rising Trend 10.51 mm/year. Probability of Normal/Excess Rainfall- 68%/18%. Probability of Drought (Moderate /Sever)-: 5% Moderate & 9%Sever.																																														
Rainfall Trend Analysis (1998 To 2019)																																															
<table border="1"> <caption>Annual Rainfall Data (1998-2019)</caption> <thead> <tr> <th>Year</th> <th>Rainfall (mm)</th> </tr> </thead> <tbody> <tr><td>1998</td><td>1250</td></tr> <tr><td>1999</td><td>500</td></tr> <tr><td>2000</td><td>500</td></tr> <tr><td>2001</td><td>850</td></tr> <tr><td>2002</td><td>650</td></tr> <tr><td>2003</td><td>1000</td></tr> <tr><td>2004</td><td>1150</td></tr> <tr><td>2005</td><td>1150</td></tr> <tr><td>2006</td><td>1750</td></tr> <tr><td>2007</td><td>1650</td></tr> <tr><td>2008</td><td>1500</td></tr> <tr><td>2009</td><td>900</td></tr> <tr><td>2010</td><td>900</td></tr> <tr><td>2011</td><td>1100</td></tr> <tr><td>2012</td><td>850</td></tr> <tr><td>2013</td><td>2100</td></tr> <tr><td>2014</td><td>900</td></tr> <tr><td>2015</td><td>950</td></tr> <tr><td>2016</td><td>900</td></tr> <tr><td>2017</td><td>1200</td></tr> <tr><td>2018</td><td>900</td></tr> <tr><td>2019</td><td>1100</td></tr> </tbody> </table>		Year	Rainfall (mm)	1998	1250	1999	500	2000	500	2001	850	2002	650	2003	1000	2004	1150	2005	1150	2006	1750	2007	1650	2008	1500	2009	900	2010	900	2011	1100	2012	850	2013	2100	2014	900	2015	950	2016	900	2017	1200	2018	900	2019	1100
Year	Rainfall (mm)																																														
1998	1250																																														
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2016	900																																														
2017	1200																																														
2018	900																																														
2019	1100																																														
EQUATION OF TREND LINE: $Y= 10.51x+971.42$																																															
1.3 Geomorphology, Soil & Geology																																															
Geomorphic Unit	Highly dissected plateau covers major area, followed by moderately dissected plateau, slightly dissected plateau, moderate bazada, and moderate alluvial plain.																																														
Geology	Deccan Traps (Basalt). Age: Late Cretaceous to Eocene Alluvium covered traps. Age: Recent to sub recent																																														
Soil	Dark brown to yellowish brown coarse shallow to medium deep soils, with calcareous clayey loam slightly deep soils, loamy very shallow																																														
1.4Hydrology & Drainage																																															
Drainage	The main rivers are tributaries of Tapi and Narmada basins of																																														

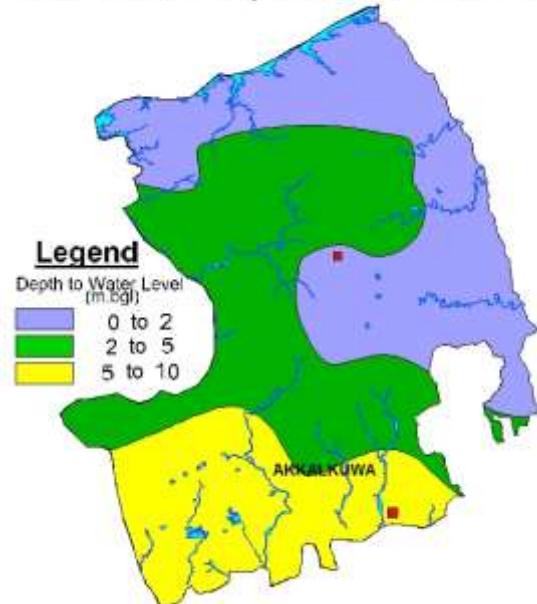
		Nandurbar district.	
Hydrology	Major project		0
	Medium		1 (Dehali)
	Bigger Minor (250 to 600 and >600 Ha.)		2
	Minor Irrigation Project (100 to 250 Ha)		0
	Minor Irrigation Project (0 to 100 Ha.)		111 minor irrigation project, 31 KT Weirs, 47 Cement Nala Band
1.5 Land Use, Agriculture, Irrigation & Cropping Pattern			
Geographical Area		944.78 Sq. Km.	
Forest Area		433.78 Sq. Km.	
Cultivable Area		383.04 Sq. Km.	
Net Sown Area		358.89 Sq. Km.	
Double Cropped Area		24.15 Sq. Km.	
Irrigation	Surface Water		1.75
	Ground Water		12.27
Principal Crops (Reference year 2013-14)		Crop Type	Area (Sq. Km.)
		Cotton	26.80
		Cereals	327.69
		Pulses	102.03
		Oil Seeds	15.43
Horticultural Crops		Sugarcane	0.81
		Fruits and vegetables	11.61
		Spices	0.53
Water Level Behaviour			
Aquifer-I/Shallow Aquifer			
Pre-Monsoon Water Level (May 2019)		Post-Monsoon Water Level (Nov. 2019)	

**Aquifer I, Premonsoon DTW (May. 2019)
Akkalkua Taluka, Nandurbar District**



Water level between 10 -20 m bgl is observed in southern part of the block. Water level ranges between 5-10 m bgl are covered mostly central part of the Block. Water level ranges between 2-5 m bgl observed in mostly in northern part of the block.

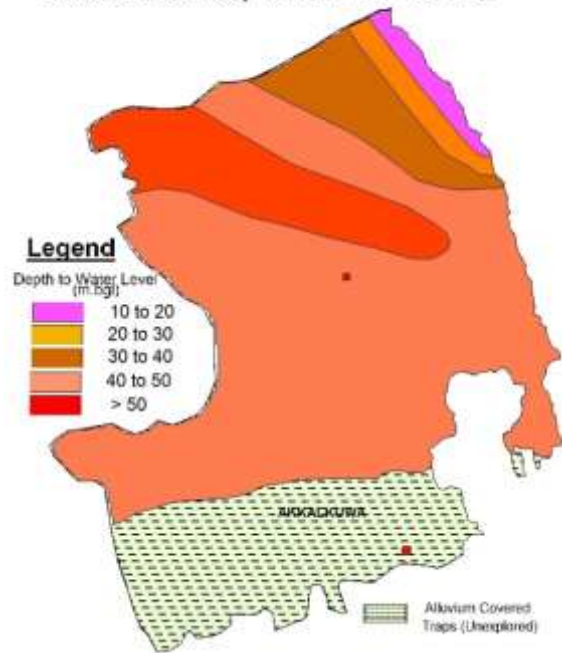
**Aquifer I, Post-monsoon DTW (Nov. 2019)
Akkalkua Taluka, Nandurbar District**



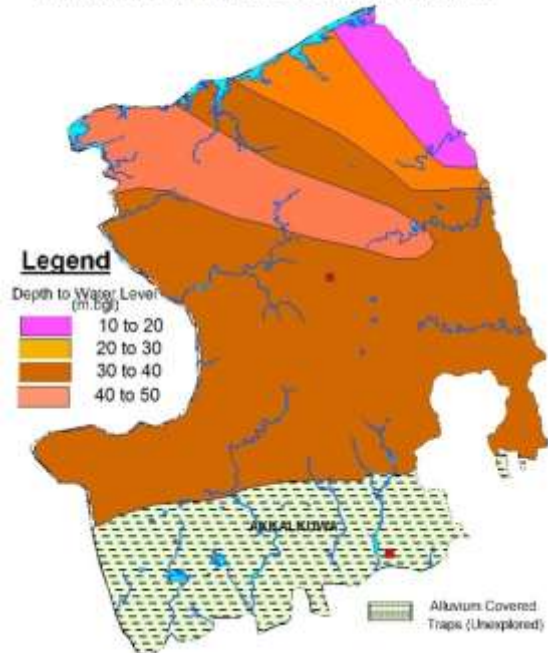
Water level between 5-10 m bgl is observed in the southern part of the block. Water level ranges between 2-5 m bgl are covered mostly central part of the block. Water level ranges between 0-2 m bgl covering mostly northern and eastern part of the block.

Aquifer-II/Deeper Aquifer

**Pre-Monsoon Water Level (May 2019)
Aquifer II, Premonsoon DTW (May. 2019)
Akkalkua Taluka, Nandurbar District**



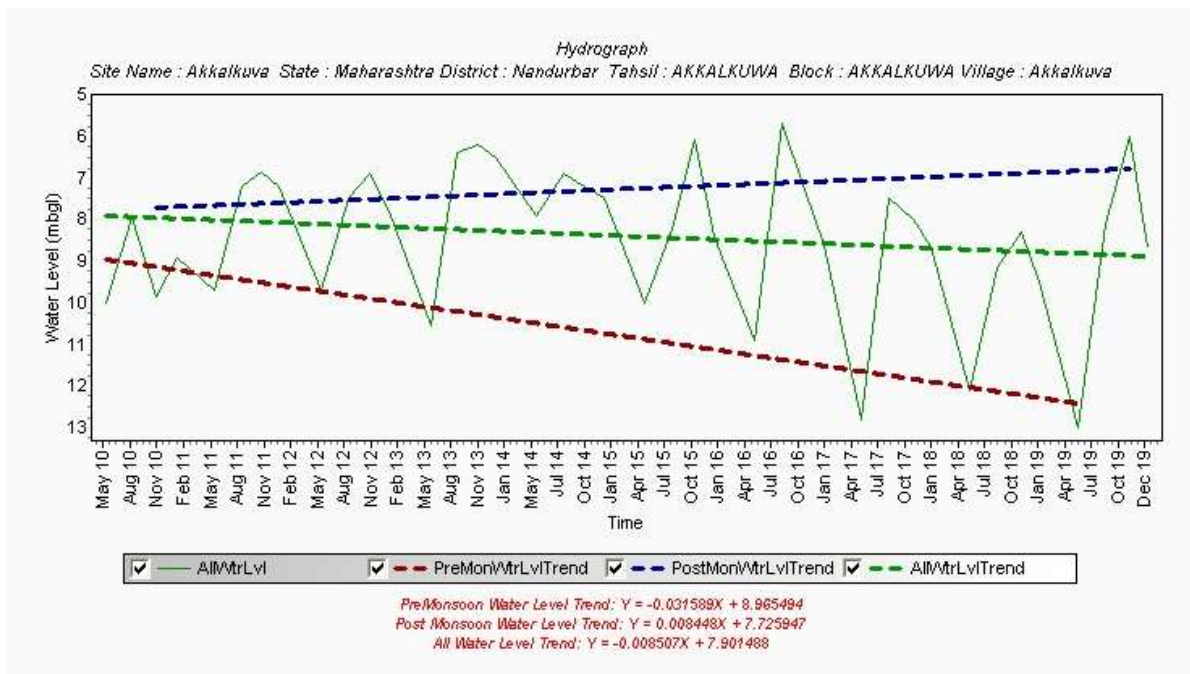
**Post-Monsoon Water Level (Nov. 2019)
Aquifer II, Post-monsoon DTW (Nov. 2019)
Akkalkua Taluka, Nandurbar District**



Water level >40 mbgl is observed in maximum part of the block while water level between 30-40 mbgl is observed in north eastern parts of the block. Water level between 20-30 mbgl is observed in a straight patch in north eastern part of the block while water level between 10-20 mbgl observed in the north eastern fringe of the block. Southern part of the block is Alluvium covered traps and unexplored.

Water level between 40-50 mbgl is observed in north western part of the block while water level between 30- 40 mbgl is observed in major parts of the block. Water level between 20-30 mbgl observed in the straight patch in north eastern part of the block. Water level between 10-20 mbgl observed in the north eastern fringe of the block. Southern part of the block is Alluvium covered traps and unexplored.

Hydrograph



Hydrograph shows Pre-monsoon falling water level trend @ 0.031 m/year

Hydrograph shows Post- monsoon rising water level trend @ 0.008 m/year

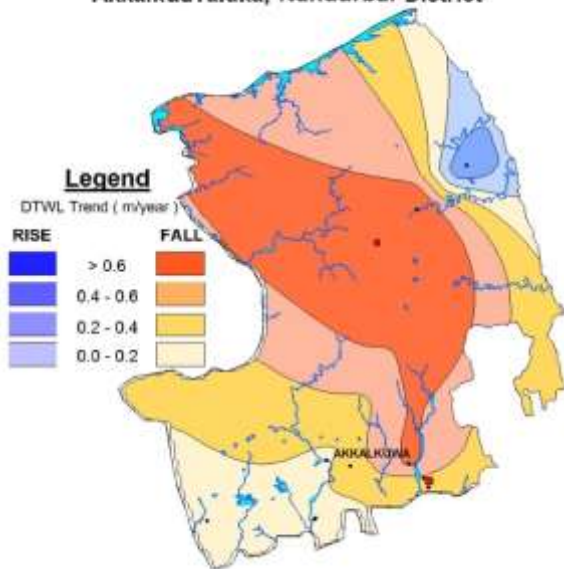
Pre-Monsoon trend
 Falling 0.023 to 0.379 m/year,
 Rising 0.172 to 0.788 m/year

Post-Monsoon trend
 Falling 0.05 to 0.38 m/year,
 Rising 0.09 to 0.488 m/year

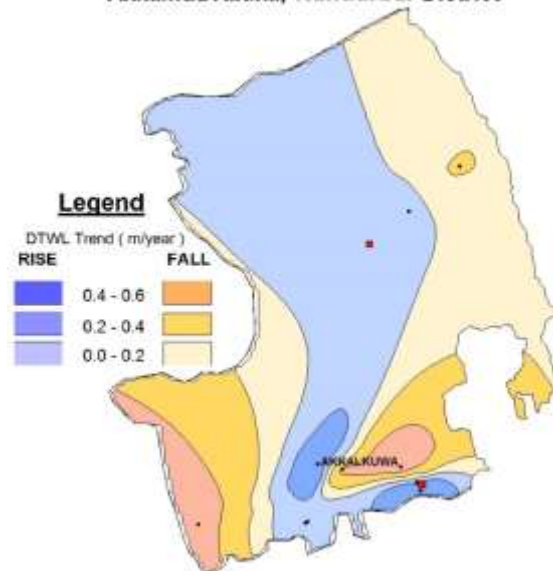
Pre-Monsoon Water Level Trend (2010-2019)
 Almost entire taluka is showing falling trend. Rising trend is observed in north eastern part of the block. Maximum area of taluka is showing >0.2 m falling trend. Falling trend >0.6 observed in maximum central part of the block. Falling trend between 0.2 -0.4 m and 0.4-0.6 m are observed in southern and north eastern part of the block.

Post-Monsoon Water Level Trend (2010-2019)
 Almost half area of the taluka is showing Rising trend and other half is showing falling trend. Area showing rising trend >0.2 m is observed in isolated patches in southern part of the block while area showing falling trend >0.2 observed in south western and south eastern part of the block. North eastern part of the taluka showing 0.0-0.2m falling trend while north western part showing 0.0 -0.2m rising trend.

**Pre-monsoon GWL Trend (May 2010 - May 2019)
 Akkalkua Taluka, Nandurbar District**



**Post-monsoon GWL Trend (Nov. 2010 - Nov. 2019)
 Akkalkua Taluka, Nandurbar District**



2. GROUND WATER ISSUES

Limited aquifer potential
 Water scarcity in lean period
 Declining Water Level trend is observed in major part of the block.

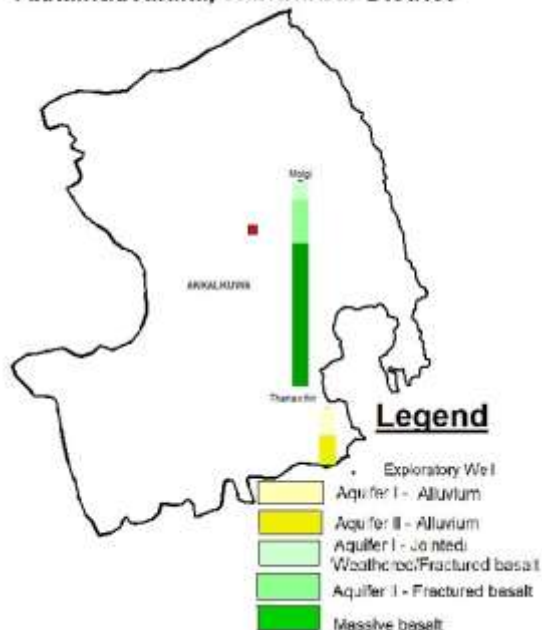
3. AQUIFER DISPOSITION

3.1 Number of Aquifers

Basalt – Aquifer-I (weathered & fractured basalt)
 Basalt – Aquifer-II (Jointed & fractured basalt)
 Alluvium

3.2 Aquifer Disposition

SUBSURFACE DISPOSITION OF AQUIFER SYSTEM
Akkalkua Taluka, Nandurbar District



3.4 Aquifer Characteristics

Major Aquifers	Basalt (Deccan Traps)		Alluvium
Type of Aquifer (Phreatic/Semiconfined/Confined)	Aquifer-I (Phreatic)	Aquifer-II (Semi-confined/ confined)	Aquifer -I
Depth of Occurrence (mbgl)	9 to 30	40- 195.30	16.7-57.0
Granular/weathered/fractured rocks thickness (m)	5 to 30	88 -195	5 to 48
Yield	60 - 125m ³ /day	Up to 4.5 lps	86-639 m ³ /day
Specific yield/Storativity (S)	0.019 – 0.028	0.00043 8	0.02
Transmissivity (T)	30-80 m ² /day	16.81 m ² /day	938-1961 m ² /day

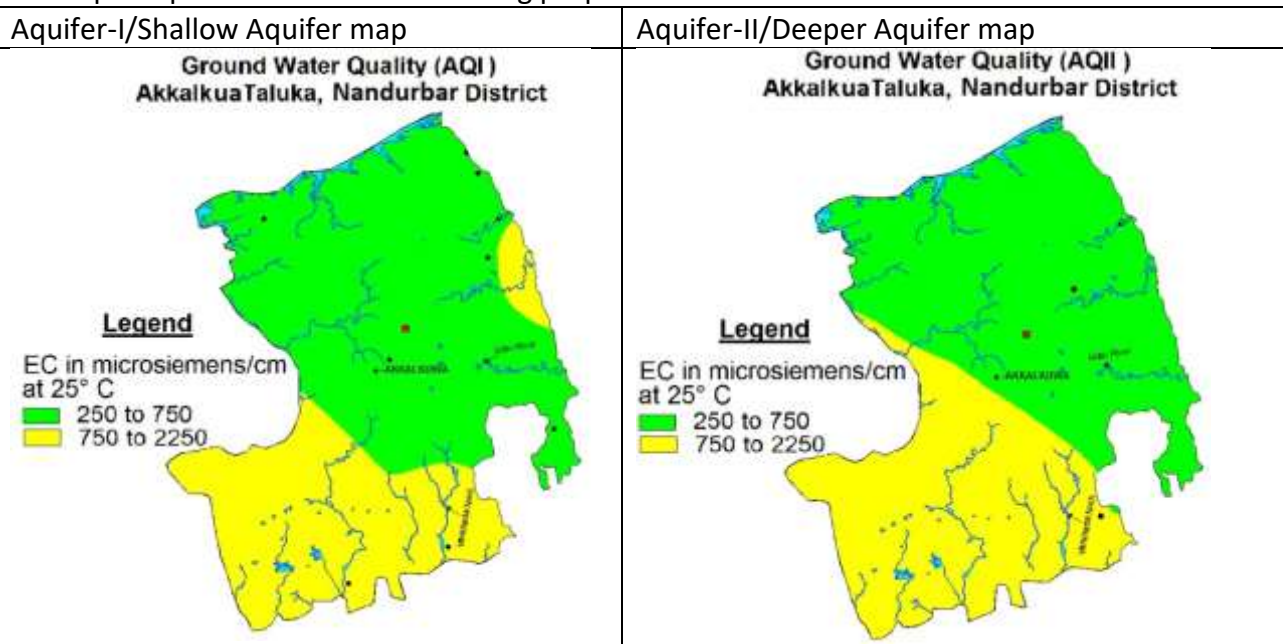
4. GROUND WATER QUALITY

4.1 Aquifer-I/Shallow Aquifer

EC between 750- 2250 μ S/cm has been observed in major part of the northern block. Area showing EC 750 to 2250 μ S/cm observed in southern part of the block.

4.2 Aquifer-II/Deeper Aquifer

EC between 750- 2250 $\mu\text{S}/\text{cm}$ has been observed in major part of the northern block. Area showing EC 750 to 2250 $\mu\text{S}/\text{cm}$ observed in southern part of the block. The ground water quality of deeper aquifer is suitable for drinking purpose.



5. GROUND WATER RESOURCES

5.1 Aquifer-I/Shallow Aquifer

Ground Water Recharge Worthy Area (Sq. Km.)	414.28
Command Area (Sq.Km.)	10.45
Non-Command Area (Sq.Km.)	403.83
Total Annual Ground Water Recharge (MCM)	51.24
Natural Discharge (MCM)	3.63
Net Annual Ground Water Availability (MCM)	47.61
Existing Gross Ground Water Draft for irrigation (MCM)	12.27
Existing Gross Ground Water Draft for domestic and industrial water supply(MCM)	4.94
Existing Gross Ground Water Draft for all uses	17.21
Provision for domestic and industrial requirement supply to 2025(MCM)	22.36
Net Ground Water Availability for future irrigation development (MCM)	12.99
Stage of Ground Water Development (%)	36.15
Category	SAFE

5.2 Aquifer-II/Deeper Aquifer

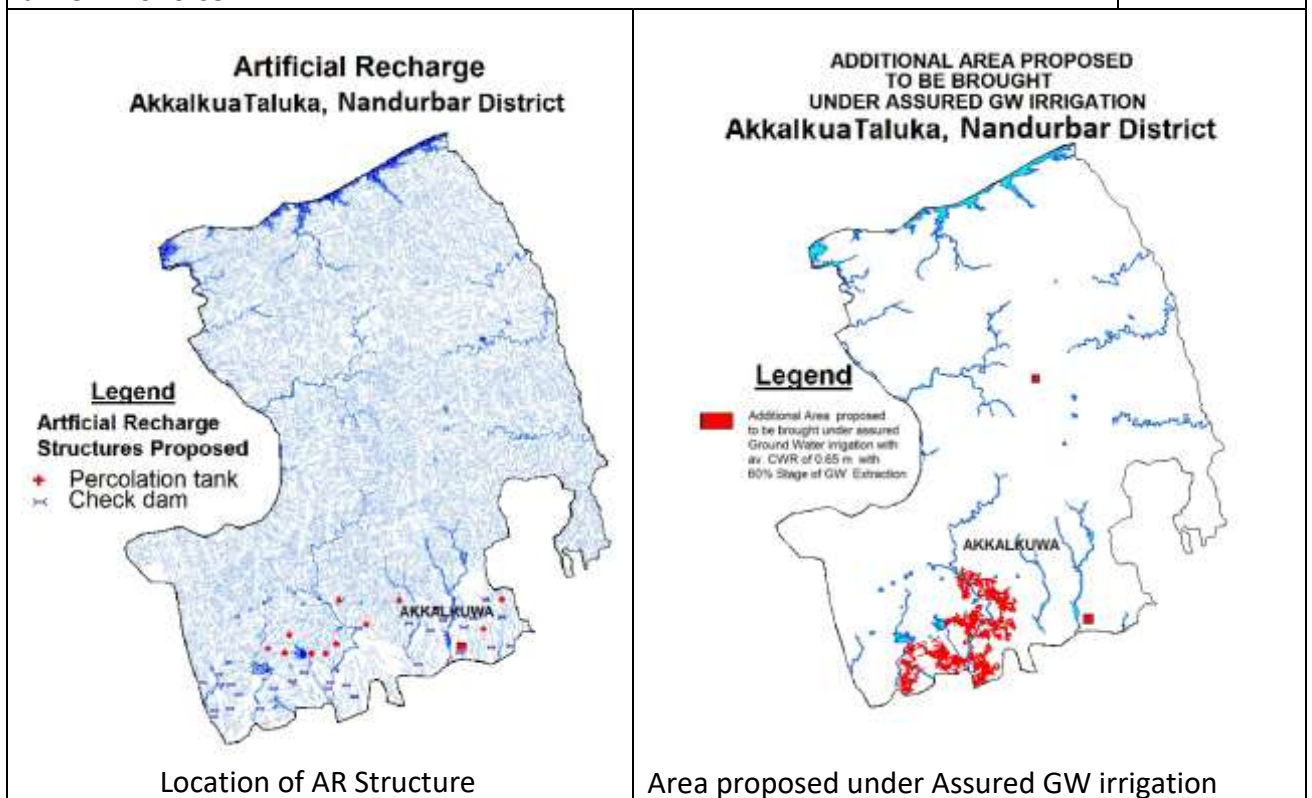
Taluka	Mean thickness (m)	Area in sqkm	Piezo-metric head meter above bottom of confining layer	S	Sy	Resource in layer above confining layer (mcm)	Resource in confining layer (mcm)	Total resource (mcm)
Akkalkuwa	6.38	944.78	22	0.0000438	0.002	0.91039008	12.0553928	12.96578281
TOTAL								12.96578281

6. GROUND WATER RESOURCE MANAGEMENT

Net Annual Ground Water Availability (MCM)	47.61
Gross Annual Draft (MCM)	17.21

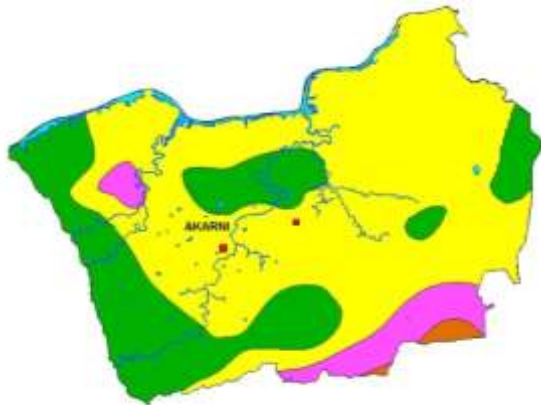
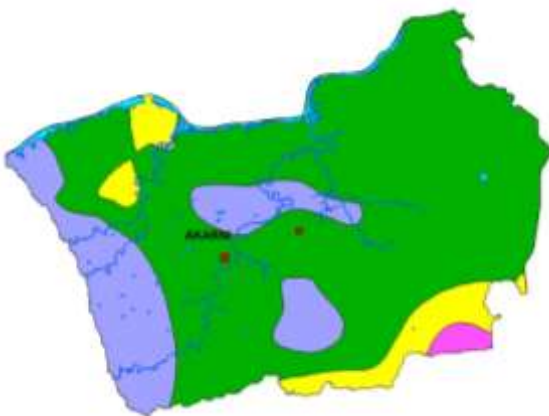
Stage of Ground Water Development (%)		36.15
6.1 Supply Side Management		
SUPPLY (MCM)		
Agricultural Supply –GW		12.27
Agricultural Supply –SW		1.75
Domestic Supply – GW		4.94
Domestic Supply – SW		1.24
Total Supply		20.20
Area of Block (Sq. Km.)		944.78
Area suitable for Artificial recharge(Sq. Km)		414.28
Type of Aquifer		Hard Rock
Area feasible for Artificial Recharge (WL >5mbgl) (Sq. Km.)		240.92
Volume of Unsaturated Zone (MCM)		481.83
Average Specific Yield		0.02
Recharge Potential (MCM)		9.64
Surplus water Available (MCM)		3.41
Proposed Structures	Percolation Tank, Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)
Number of Structures	12	34
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	2.39	1.02
RTRWH Structures – Urban Areas		
Households to be covered (50% with 50 m ² area)		Nil
Total RWH potential (MCM)		Nil
Rainwater harvested / recharged @ 80% runoff co-efficient		Nil
RTRWH & AR is economically not viable& hence not recommended.		
6.2 Demand Side Management		
Micro irrigation techniques		
Irrigation Area (sq. km.) proposed for irrigation through Drip and Sprinkler		0.81
Water Saving by use of Drip and Sprinklers		0.46
Proposed Cropping Pattern change		Not proposed
Ground water Irrigated area under Water Intensive Crop (sq.km)		NIL
Water Saving by water use efficiency (MCM)		NIL
6.3 Expected Benefits		
Net Ground Water Availability (MCM)		47.61
Existing Ground Water Draft for All Uses (MCM)		17.21
Present stage of Ground Water Development (%)		36.15
Additional GW resources available after Supply side interventions (MCM)		2.56
Ground Water Availability after Supply side intervention (MCM)		50.17
Additional GW resources available after Demand side interventions (MCM)		0.46
Ground Water Availability after Demand side intervention (MCM)		16.75

Stage of Ground Water Development after Supply and Demand side Interventions (%)	33.39
Total GWR available for GW Development (MCM)	13.35
Other Interventions Proposed if any	
Alternate Water Sources Available	NIL
6.4 Development Plan	
Volume of water available for GWD to enhance stage of GWD to 60% (MCM)	13.35
Proposed Number of DW (@ 1.5 ham for 90% of GWR Available)	801
Proposed Number of BW (@ 1 ham for 10% of GWR Available)	133
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	20.54

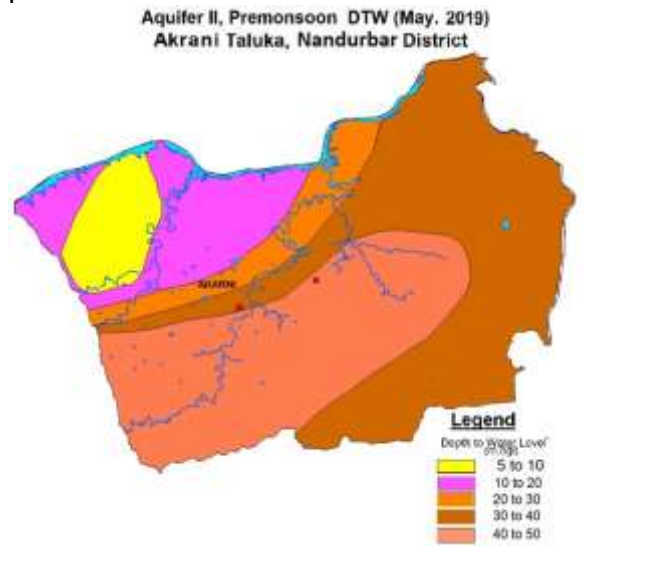


9.2 AKRANI BLOCK, NANDURBAR DISTRICT, MAHARASHTRA

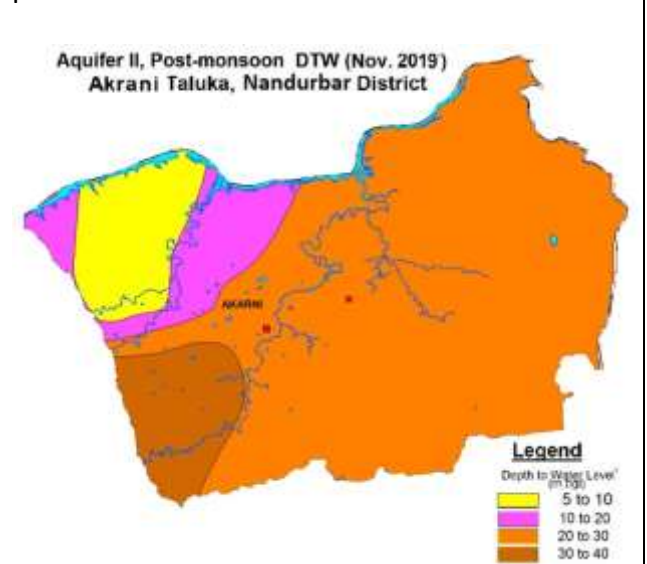
1. SALIENT FEATURE																																															
1.1 Introduction																																															
Block Name	Akrani																																														
Geographical Area (Sq. Km.)	1112.42 Sq. Km.																																														
Forest Area (Sq. Km)	74.98 Sq. Km.																																														
Population (2011)	195754																																														
Climate	Monsoon sub-tropical																																														
Net Annual Ground Water Availability (MCM)	37.73																																														
Existing Gross Ground Water Draft for All uses (MCM)	9.49																																														
Stage of Ground Water Development (%)	25.15																																														
Category	SAFE																																														
1.2 Rainfall Analysis																																															
Normal Rainfall	845.3 mm																																														
Annual Rainfall (2019)	1032.8 mm																																														
Decadal Average Annual Rainfall (2010-19)	848.01 mm																																														
Long Term Rainfall Analysis (1998-2019)	Falling Trend @0.7075 mm/year. Probability of Normal/Excess Rainfall: 68%/18 %. Probability of Drought (Moderate/Sever)-: 9 % Moderate & 5 % Sever.																																														
Rainfall Trend (1998- 2019)																																															
<table border="1"> <caption>Annual Rainfall Data (1998-2019)</caption> <thead> <tr> <th>Year</th> <th>Rainfall (mm)</th> </tr> </thead> <tbody> <tr><td>1998</td><td>900</td></tr> <tr><td>1999</td><td>550</td></tr> <tr><td>2000</td><td>300</td></tr> <tr><td>2001</td><td>850</td></tr> <tr><td>2002</td><td>900</td></tr> <tr><td>2003</td><td>1350</td></tr> <tr><td>2004</td><td>900</td></tr> <tr><td>2005</td><td>900</td></tr> <tr><td>2006</td><td>2000</td></tr> <tr><td>2007</td><td>1100</td></tr> <tr><td>2008</td><td>900</td></tr> <tr><td>2009</td><td>600</td></tr> <tr><td>2010</td><td>700</td></tr> <tr><td>2011</td><td>800</td></tr> <tr><td>2012</td><td>700</td></tr> <tr><td>2013</td><td>1450</td></tr> <tr><td>2014</td><td>650</td></tr> <tr><td>2015</td><td>800</td></tr> <tr><td>2016</td><td>750</td></tr> <tr><td>2017</td><td>850</td></tr> <tr><td>2018</td><td>700</td></tr> <tr><td>2019</td><td>1032.8</td></tr> </tbody> </table>		Year	Rainfall (mm)	1998	900	1999	550	2000	300	2001	850	2002	900	2003	1350	2004	900	2005	900	2006	2000	2007	1100	2008	900	2009	600	2010	700	2011	800	2012	700	2013	1450	2014	650	2015	800	2016	750	2017	850	2018	700	2019	1032.8
Year	Rainfall (mm)																																														
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2018	700																																														
2019	1032.8																																														
EQUATION OF TREND LINE: $Y = -0.7075x + 913.86$																																															
1.3 Geomorphology, Soil & Geology																																															
Geomorphic Unit	Highly dissected plateau covers major area, followed by moderately dissected plateau.																																														
Geology	Deccan Traps (Basalt), Age: Late Cretaceous to Eocene																																														
Soil	Loamy very shallow soil in almost entire area.																																														
1.4 Hydrology & Drainage																																															
Drainage	The main rivers are tributaries of Narmada basin of Nandurbar district.																																														
Hydrology	Major project	0																																													
	Medium	0																																													
	Bigger Minor (250 to 600 and >600 Ha.)	0																																													
	Minor Irrigation Project (100 to 250 Ha.)	0																																													
	Minor Irrigation Project (0 to	42 KT Weirs, 9 PT, 146 Minor Irrigation																																													

	100 Ha.)	project, 42 Cement Nala Band
1.5 Land Use, Agriculture, Irrigation & Cropping Pattern		
Geographical Area		1112.42 Sq.km.
Forest Area		74.98 Sq. Km.
Cultivable Area		182.59 Sq. Km.
Net sown area		179.93 sq. km
Double cropped area		2.66 sq. km
Irrigation	Surface Water	2.15
	Ground Water	6.03
Principal Crops (Reference year 2013-14)	Crop Type	Area (Sq. Km.)
	Cotton	0.99
	Cereals	171.57
	Pulses	36.05
	Oil Seeds	9.12
Horticultural Crops	Fruits and vegetables	1.02
	Sugarcane	0
	Spices	0.08
1.6 Water Level Behaviour`		
1.6.1 Aquifer-I/Shallow Aquifer		
<p>Pre-Monsoon Water Level (May 2019) Water level ranging from 2 to 5 mbgl is observed in western part of the block and isolated patches in rest of the area while water level in the range of 5 to 10 mbgl is observed in major parts of the block. Water level ranges from 10-20 mbgl observed in the south eastern and isolated patch in western parts of the block.</p>		<p>Post-Monsoon Water Level (Nov. 2019) Water Level between 0-2 mbgl observed in eastern part and isolated patches in central and southern part of the block while water level between 2-5 mbgl observed in the major parts of the block. Water level between 5-10 mbgl and 10-20 mbgl is observed in isolated patches in south eastern and north western part of the block.</p>
		
Aquifer-I Premonsoon DTW (May-2019)		
1.6.2 Aquifer-II/Deeper Aquifer		
<p>Pre-Monsoon Water Level (May 2019) Water level between 5-10 mbgl is observed in north western parts of the block while water level between 10-20 mbgl is observed in north western part of the block. Water level between</p>		<p>Post-Monsoon Water Level (Nov. 2019) Water level 20-30 mbgl is observed in major part of the block while water level between 30-40 mbgl is observed in the south western part of the block. water level between 5-10 mbgl</p>

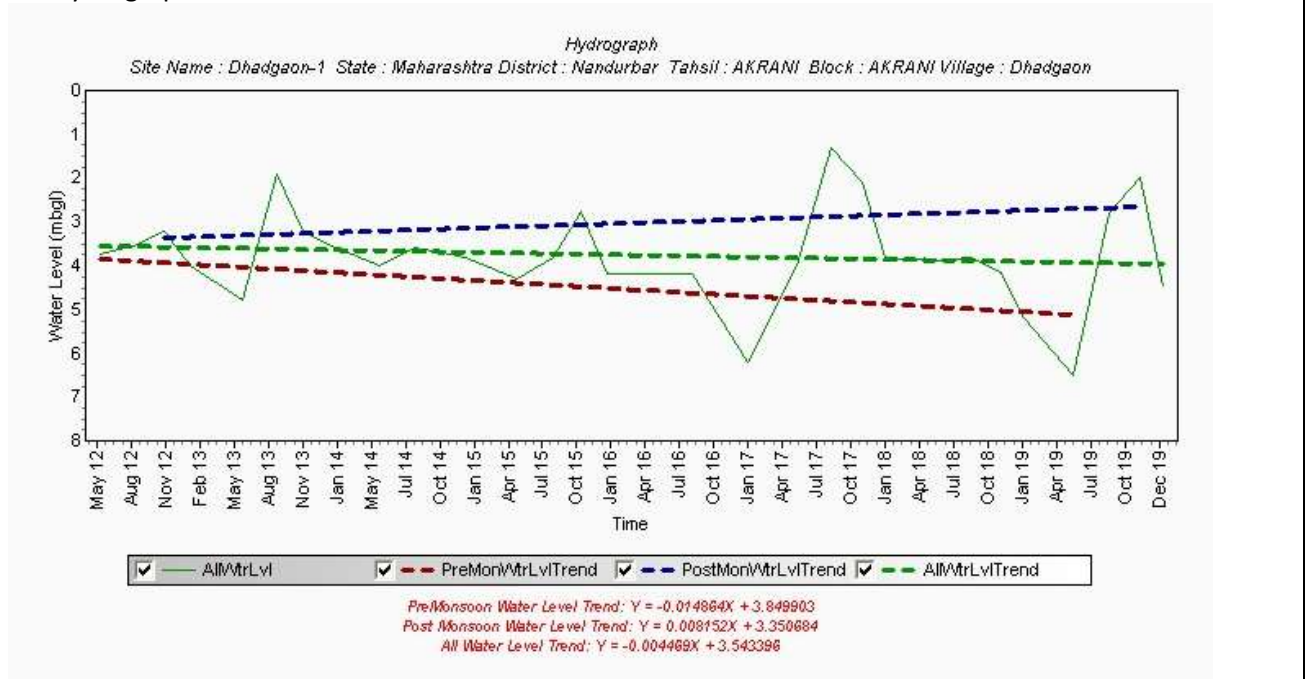
30-40 mbgl and 40-50 mbgl is observed in major parts of the block.



and 10-20 mbgl is observed in north western parts of the block.



1.7 Hydrograph



Hydrograph shows Pre-monsoon falling water level trend @ 0.01486 m/year

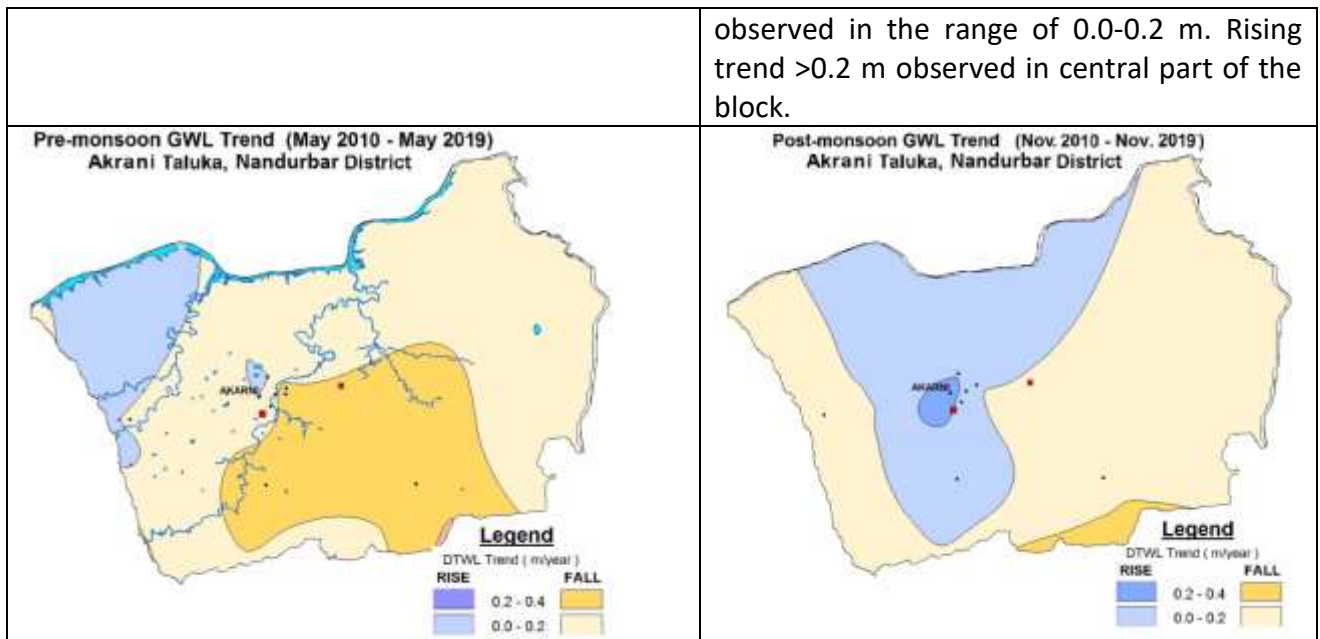
Hydrograph shows Post- monsoon rising water level trend @ 0.0081 m/year

Pre-Monsoon trend
Rising 0.026 to 0.263 m/year
Falling 0.002 m/year

Post-Monsoon trend
Rising 0.065 to 0.111 m/year
Falling 0.008 to 0.322 m/year

Pre-Monsoon Water Level Trend (2010-2019)
Almost entire taluka is showing falling trend in the range of 0-0.2 m and 0.2-0.4m. Area showing rising trend 0.0-0.2 m observed in north western part of the block while falling trend in rest of the area. Falling trend >0.2 m observed in southern part of the block.

Post-Monsoon Water Level Trend (2010-2019)
Major part of taluka is showing falling trend. Maximum area of taluka is showing falling trend in the range of 0 to 0.2 m. Area having falling trend >0.2 m observed in southern part of the block. Rising trend mostly



2. GROUND WATER ISSUES

Limited aquifer potential
 Water scarcity in lean period
 Declining Water Level trend during pre and post monsoon in major part of the block

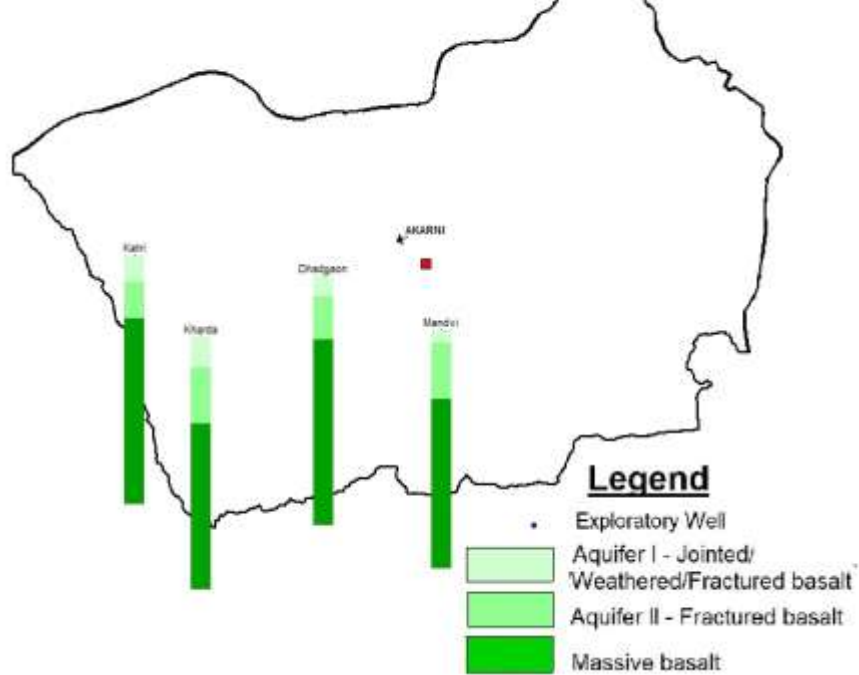
3. AQUIFER DISPOSITION

3.1 Number of Aquifers

Basalt – Aquifer-I (weathered& fractured basalt)
 Basalt – Aquifer-II (Jointed & fractured basalt)

3.2 Lithological disposition

SUBSURFACE DISPOSITION OF AQUIFER SYSTEM
Akrani Taluka, Nandurbar District



3.4 Aquifer Characteristics			
Major Aquifers	Basalt (Deccan Traps)		Alluvium
Type of Aquifer (Phreatic/Semi-confined/Confined)	Aquifer-I (Phreatic)	Aquifer-II (Semi-confined /confined)	Aquifer-I
Depth of Occurrence (mbgl)	9 to 30	43 to 200	Nil
Granular/weathered/fractured rocks thickness (m)	3 to 8	8 to 12	Nil
Yield	10 – 100m ³ /day	1.74 to 18.0 lps	Nil
Specific yield/Storativity (S)	0.019 – 0.028	0.00162	Nil
Transmissivity (T)	30-80 m ² /day	0.93-69.46 m ² /day	Nil

4. GROUND WATER QUALITY

4.1 Aquifer-I/Shallow Aquifer

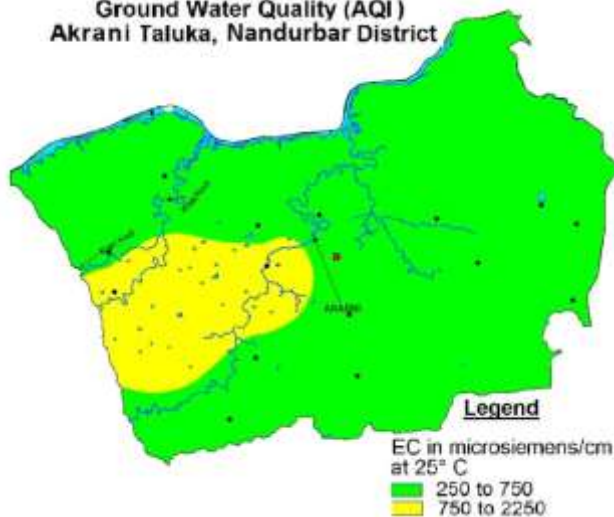
EC between 250- 750 $\mu\text{S/cm}$ has been observed in most of the part of the block while western part of the block showing EC 750 to 2250 $\mu\text{S/cm}$.

4.2 Aquifer-II/Deeper Aquifer

EC between 250- 750 $\mu\text{S/cm}$ has been observed in most of the part of the block while northern part of the block showing EC 750 to 2250 $\mu\text{S/cm}$. The ground water quality of deeper aquifer is suitable for drinking purpose

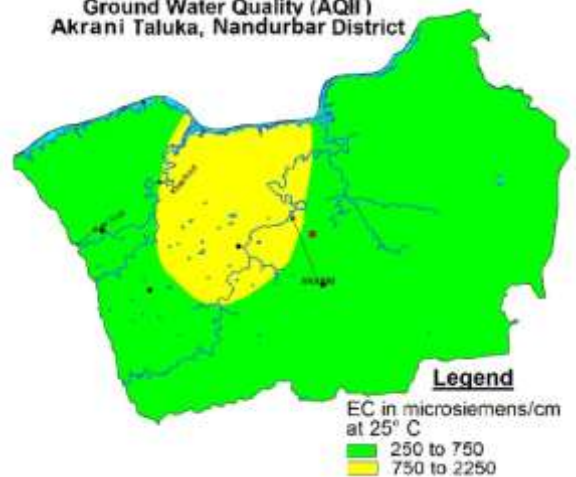
Aquifer-I/Shallow Aquifer map

Ground Water Quality (AQI)
Akranl Taluka, Nandurbar District



Aquifer-II/Deeper Aquifer map

Ground Water Quality (AQII)
Akranl Taluka, Nandurbar District



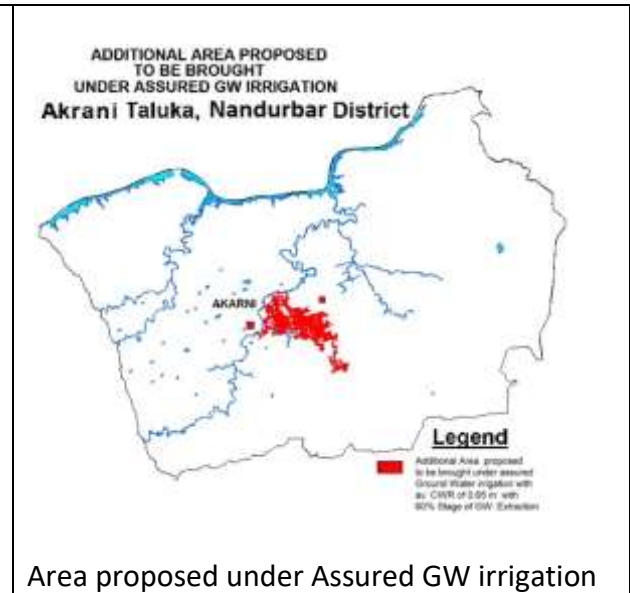
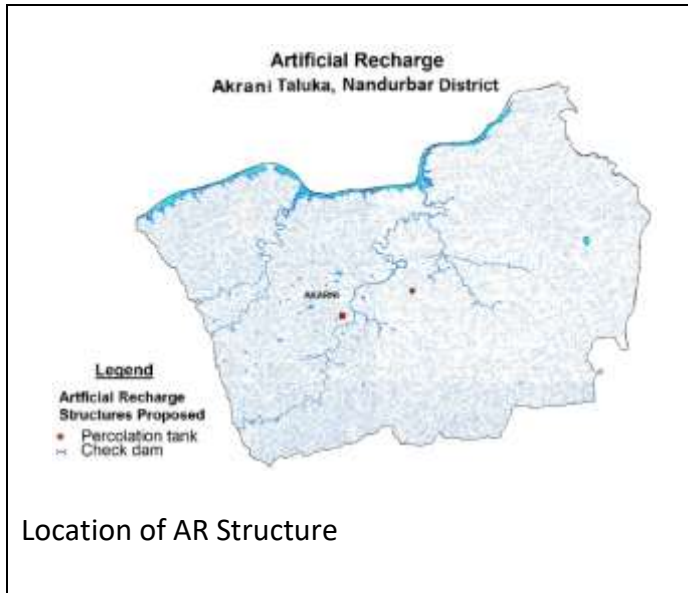
5. GROUND WATER RESOURCES

5.1 Aquifer-I/Shallow Aquifer

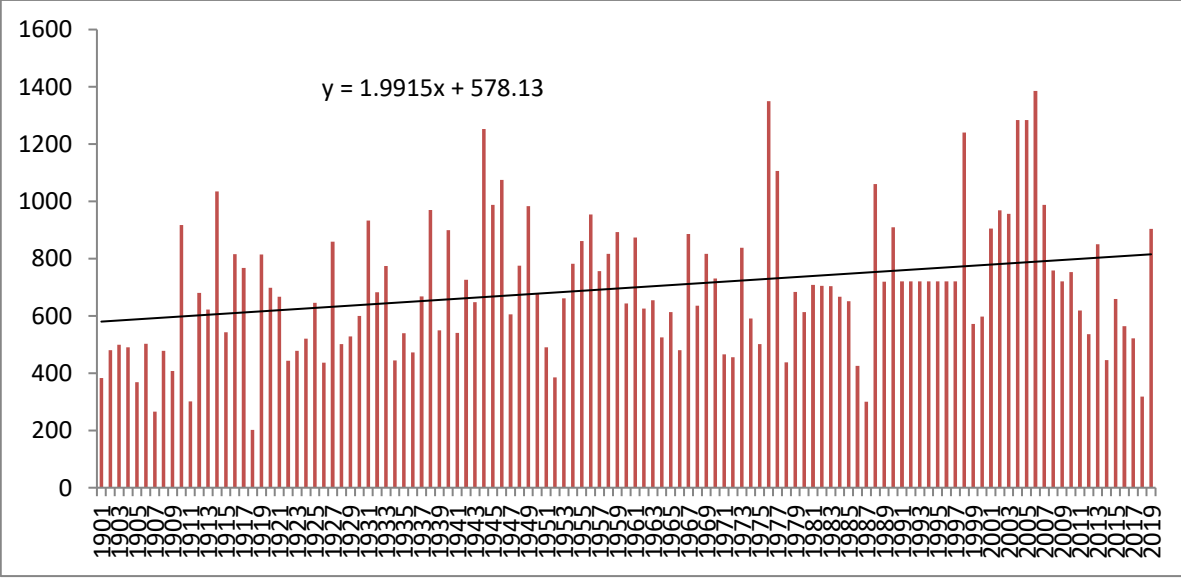
Ground Water Recharge Worthy Area (Sq. Km.)	379.51
Command (Sq. Km.)	0
Non-command (Sq. Km.)	379.51
Total Annual Ground Water Recharge (MCM)	41.52
Natural Discharge (MCM)	3.79
Net Annual Ground Water Availability (MCM)	37.74

Existing Gross Ground Water Draft for irrigation (MCM)								6.03
Existing Gross Ground Water Draft for domestic and industrial water supply (MCM)								3.46
Existing Gross Ground Water Draft for All uses(MCM)								9.49
Provision for domestic and industrial requirement supply to 2025(MCM)								17.13
Net Ground Water Availability for future irrigation development (MCM)								14.62
Stage of Ground Water Development (%)								25.15
Category								Safe
5.2 Aquifer-II/Deeper Aquifer								
Taluka	Mean thickness (m)	Area in sqkm	Piezometric head meter above bottom of confining layer	S	Sy	Resource in above confining layer (mcm)	Resource in confining layer (mcm)	Total resource (mcm)
Akrani	10	1112.42	26	0.0000438	0.002	1.266823896	22.2484	23.5152239
Total								23.5152239
6. GROUND WATER RESOURCE MANAGEMENT								
Net Annual Ground Water Availability (MCM)								37.74
Gross Annual Draft (MCM)								9.49
Stage of Ground Water Development (%)								25.15
6.1 Supply Side Management								
SUPPLY (MCM)								
Agricultural Supply -GW								6.03
Agricultural Supply -SW								2.15
Domestic Supply - GW								3.46
Domestic Supply - SW								0.87
Total Supply								12.51
Area of Block (Sq. Km.)								1112.42
Area suitable for Artificial recharge(Sq. Km)								379.51
Type of Aquifer								Hard Rock
Area feasible for Artificial Recharge (WL >5mbgl) (Sq. Km.)								0
Volume of Unsaturated Zone (MCM)								0
Average Specific Yield								0.02
Recharge Potential (MCM)								0
Surplus water Available (MCM)								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)	
Number of Structures				0			0	
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)				0			0	
RTRWH Structures – Urban Areas								

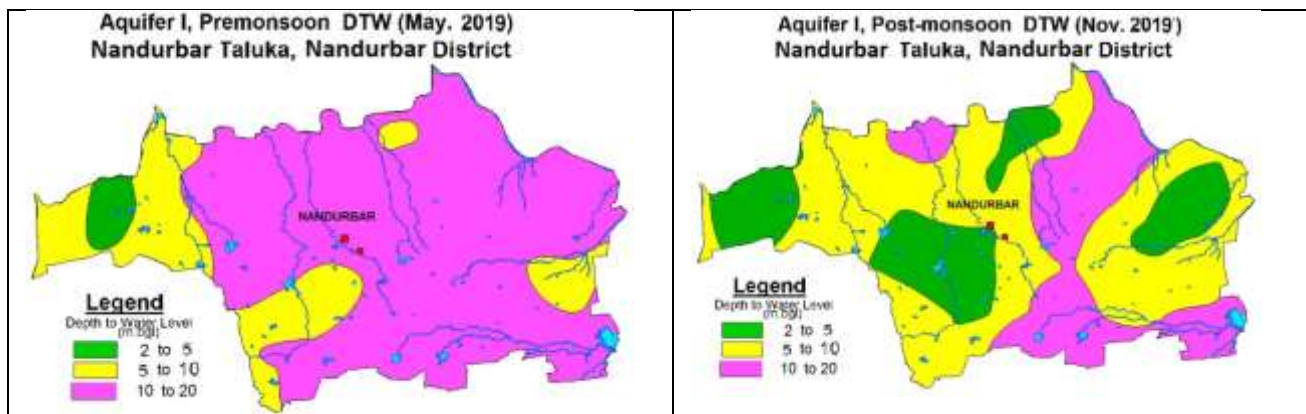
Households to be covered (50% with 50 m ² area)	0
Total RWH potential (MCM)	0
Rainwater harvested / recharged @ 80% runoff co-efficient	0
Estimated Expenditure (Rs. In Cr.) @ Rs.30000/-per HH	0
RTRWH & AR is economically not viable & hence, not recommended.	
6.2 Demand Side Management	
Micro irrigation techniques	
Irrigation Area (sq. km.) proposed for irrigation through Drip and Sprinkler	Nil
Volume of Water expected to be saved (MCM). Surface Flooding req- 0.815 m. Drip Req. -0.511, WUE- 0.304 m	Nil
Proposed Cropping Pattern change	Not proposed
Ground water Irrigated area under Water Intensive Crop (sq.km)	Nil
Water Saving by water use efficiency (MCM)	Nil
6.3 Expected Benefits	
Net Ground Water Availability (MCM)	37.74
Existing Ground Water Draft for All Uses (MCM)	9.49
Present stage of Ground Water Development (%)	25.15
Additional GW resources available after Supply side interventions (MCM)	Nil
Ground Water Availability after Supply side intervention (MCM)	37.74
Additional GW resources available after Demand side interventions (MCM)	Nil
Ground Water Availability after Demand side intervention (MCM)	9.49
Stage of Ground Water Development after Supply side and Demand side Interventions (%)	25.15
Total GWR available for GW Development (MCM)	13.15
Other Interventions Proposed, if any	Not proposed
Alternate Water Sources Available	NIL
6.4 Development Plan	
Volume of water available for GWD to enhance stage of GWD to 60% (MCM)	13.15
Proposed Number of DW (@ 1.5 ham for 90% of GWR Available)	789
Proposed Number of BW (@ 1 ham for 10% of GWR Available)	132
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	20.23



9.3 NANDURBAR BLOCK, NANDURBAR DISTRICT, MAHARASHTRA

1.SALIENT FEATURE	
1.1 Introduction	
Block Name	Nandurbar
Geographical Area (Sq. Km.)	1114 Sq. Km.
Forest Area (Sq. Km)	75.33 Sq. Km.
Population (2011)	367446
Climate	Monsoon sub-tropical
Net Annual Ground Water Availability (MCM)	106.48
Existing Gross Ground Water Draft for All uses(MCM)	65.29
Stage of Ground Water Development (%)	61.32
Category	SAFE
1.2 Rainfall Analysis	
Normal Rainfall	720.9 mm
Annual Rainfall (2019)	903.6 mm
Decadal Average Annual Rainfall (2010-19)	617.06 mm
Long Term Rainfall Analysis (1901-2019)	Rising Trend @ 1.99 mm/year. Probability of Normal/Excess Rainfall: 52%/18%. Probability of Drought (Moderate/Sever)-: 25 % Moderate & 4% Sever.
Rainfall Trend (1901-2019)	
	
EQUATION OF TREND LINE: Y= 1.9915x + 578.13	
1.3 Geomorphology, Soil & Geology	
Geomorphic Unit	Slightly weathered plateau, followed by weathered plateau, Highly dissected plateau, moderately dissected plateau, slightly dissected plateau, regions of dykes and butte, and moderate alluvial plain and younger alluvial plain.
Geology	Deccan Traps (Basalt) Age: Late Cretaceous to Eocene Alluvium (sand/ silt and clay alternating beds). Age: Recent to Sub-recent
Soil	Major part of the block is covered by clayey loamy slightly deep and

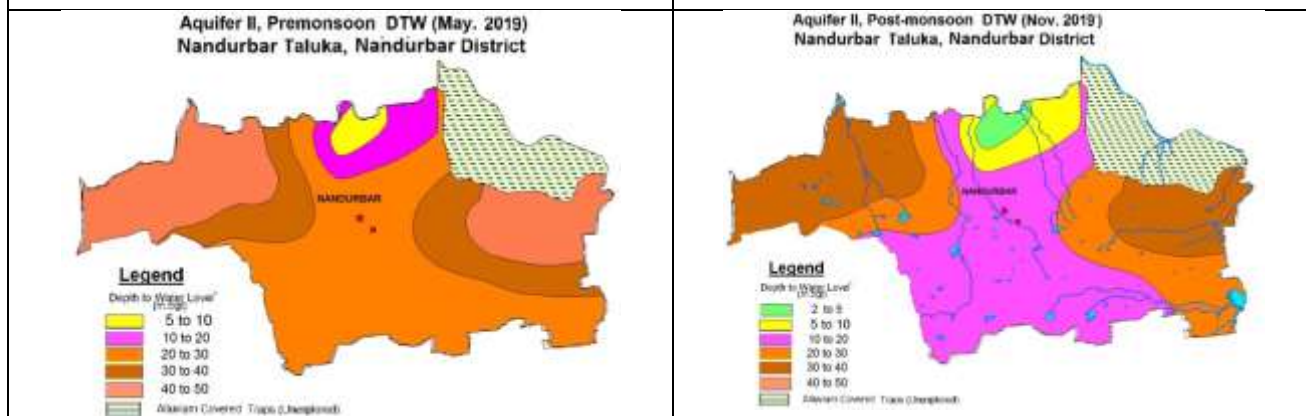
	calcareous loamy slightly deep soil, shallow clay loam, very shallow clay loam, moderately deep clay.	
1.4 Hydrology & Drainage		
Drainage	The main rivers are tributaries of Tapi river basin of Nandurbar district.	
Hydrology	Major project	0
	Medium	1 (shivan)
	Bigger Minor (250 to 600 and >600 Ha.)	5
	Minor Irrigation Project (100 to 250 Ha)	0
	Minor Irrigation Project (0 to 100 Ha.)	61 PT, 180 KT Weirs, 375 Minor Irrigation Scheme, 405 Cement Nala Band
1.5 Land Use, Agriculture, Irrigation & Cropping Pattern		
Geographical Area		1114 Sq. Km.
Forest Area		75.33 Sq. Km.
Cultivable Area		842.60 Sq. Km.
Net Sown Area		794.65 Sq. Km.
Double Cropped Area		47.95 Sq. Km.
Irrigation	Surface Water	177
	Ground Water	60.46
Principal Crops (Reference year 2013-14)	Crop Type	Area (Sq. Km.)
	Cotton	314.25
	Cereals	474.19
	Pulses	79.23
	Oil Seeds	15.61
Horticultural Crops	Fruits and Vegetables	33.49
	Sugarcane	1.15
	Spices	26.35
1.6 Water Level Behaviour		
1.6.1 Aquifer-I/Shallow Aquifer		
Pre-Monsoon Water Level (May 2019) Water level between 10-20 mbgl is observed in almost entire block while water level between 5-10 mbgl observed in the western part and isolated patches in eastern and northern part of the block. Water level between 2-5 m bgl observed in isolated patch in western part of the block.		Post-Monsoon Water Level (Nov. 2019) Water level between 2 to 5 mbgl observed in the northern, eastern, and western parts of the block as patches. Water level between 5-10 mbgl is observed in almost entire block. Water level between 10-20 mbgl is observed in the north eastern and south eastern parts of the block.



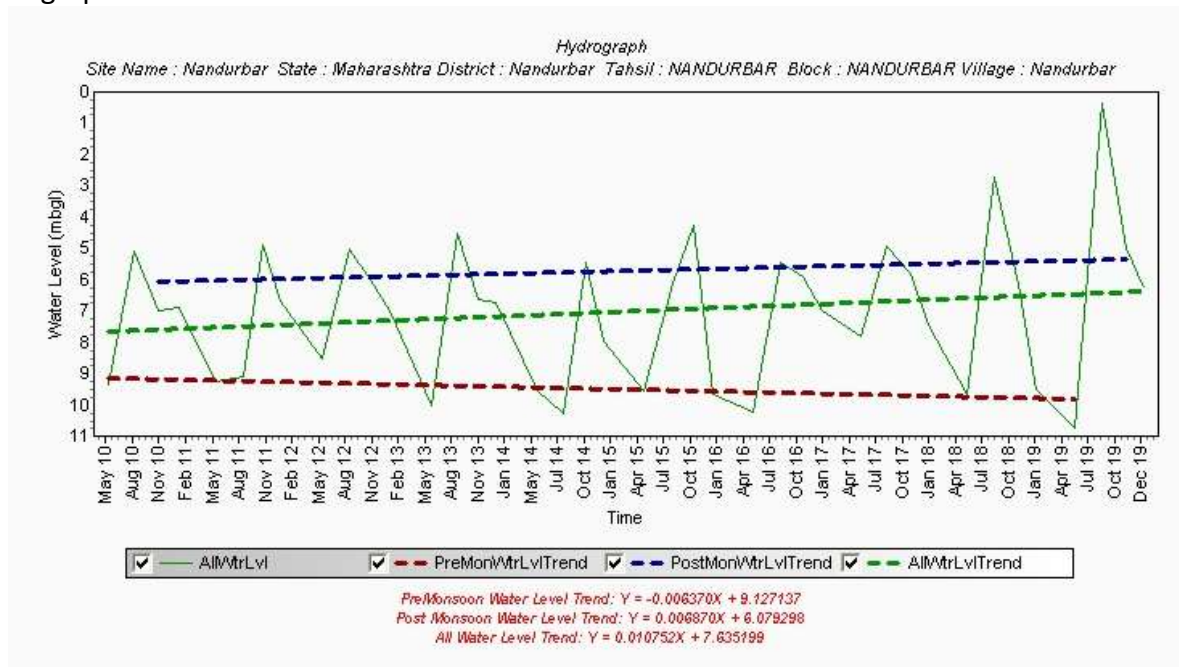
1.6.2 Aquifer-II/Deeper Aquifer

Pre-Monsoon Water Level (May 2019)
Water level between 5-10 mbgl and 10-20 mbgl is observed in north part of the block as an isolated patch while water level between 20-30 mbgl observed in eastern and north western part of the block. Water level between 30-40 mbgl and 40-50 mbgl is observed in major part of the area. North eastern part of the block is alluvium covered traps and unexplored.

Post-Monsoon Water Level (Nov. 2019)
Water level between 2-5 mbgl and 5-10 mbgl is observed in northern part of the block while water level between 10-20 mbgl observed in the central and southern part of the block. Water level between 20-30 mbgl and 30-40 mbgl observed in the eastern and north western part of the block. North eastern part of the block is alluvium covered traps and unexplored.



Hydrograph



Hydrograph shows Pre-monsoon falling water level trend @ 0.006 m/year

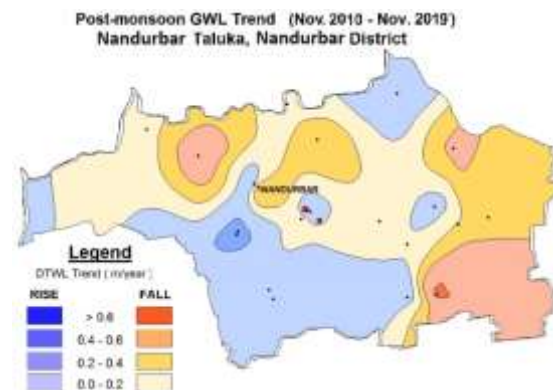
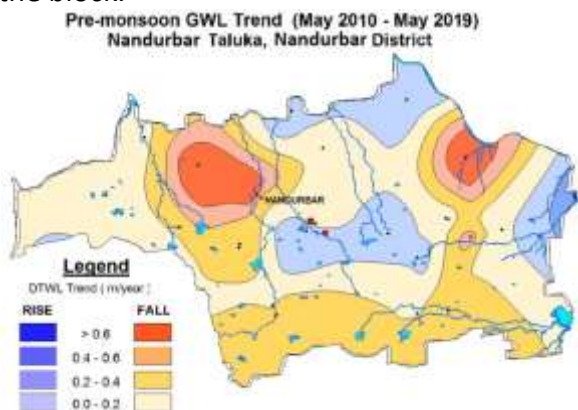
Hydrograph shows Post-monsoon rising water level trend @ 0.0069 m/year

Pre-Monsoon trend
Rising 0.014 to 0.769 m/year
Falling 0.048 to 0.201 m/year

Post-Monsoon trend
Rising 0.021 to 0.611 m/year
Falling 0.062 to 0.397 m/year

Pre-Monsoon Water Level Trend (2010-2019)
Almost entire taluka is showing falling trend, except northern, eastern and central part of the block. Area showing rising trend >0.2 m is observed in eastern tip of the block. Area showing falling trend >0.2 m observed in southern, north eastern and north western part of the block. Falling trend >0.6 m is observed in the north eastern and north western part of the block.

Post-Monsoon Water Level Trend (2010-2019)
Most part of the taluka is showing falling trend. Maximum area of taluka is showing falling trend in the range of 0 - 0.2 m. Rising trend of 0 to 0.2 and 0.2-0.4 m are observed in the southern, western and isolated patches in central, northern part of the block. Falling trend >0.2 m observed in eastern and isolated patches in northern part of the block.



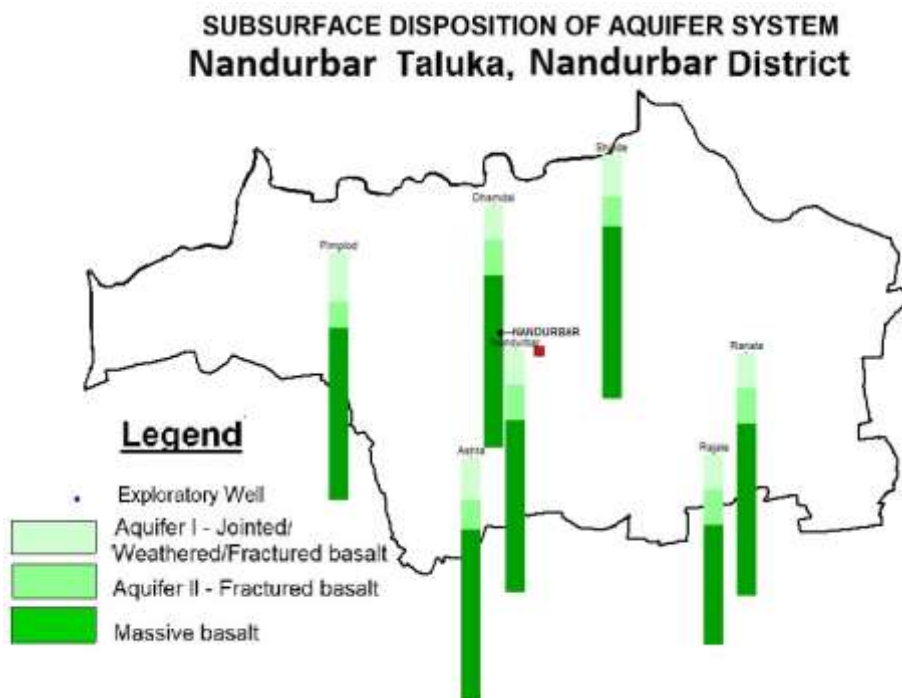
2. GROUND WATER ISSUES

Water scarcity in lean period
 Declining Water Level trend is observed in major part of the block.
 Nitrate>45 mg/l

3. AQUIFER DISPOSITION

3.1 Number of Aquifers	Basalt – Aquifer-I (weathered& fractured basalt) Basalt – Aquifer-II (Jointed & fractured basalt)
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3.2 Lithological disposition



3.4 Aquifer Characteristics

Major Aquifers	Basalt (Deccan Traps)		Alluvium
	Aquifer-I (Phreatic)	Aquifer-II (Semi-confined /confined)	Aquifer-I
Type of Aquifer (Phreatic/Semi-confined/Confined)			
Depth of Occurrence (mbgl)	10 to 30	157.76 to 200	Nil
Granular/weathered/fractured rocks thickness (m)	5 to 12	5.6 to 29	Nil
Yield	10 – 100m ³ /day	0.2 to 18.49 lps	Nil
Specific yield/Storativity (S)	0.019 – 0.028	0.00214 to 0.000239	Nil
Transmissivity (T)	30-80 m ² /day	0.31-62.93 m ² /day	Nil

4. GROUND WATER QUALITY

4.1 Aquifer-I/Shallow Aquifer

EC between 750 and 2250 µS/cm has been observed in the major parts of the block. Nitrate and

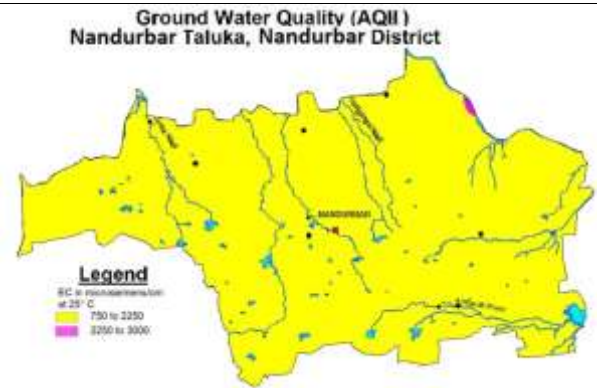
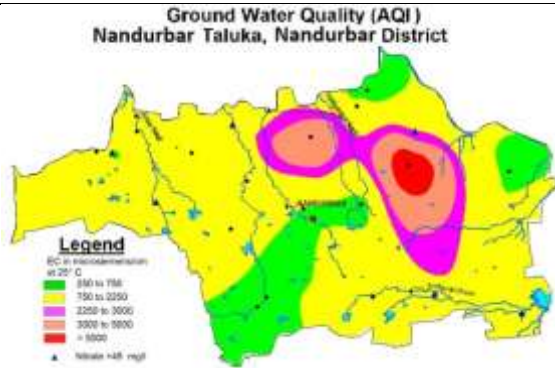
Fluoride observed in few locations of southern part of the block. Area showing EC>2250 $\mu\text{S}/\text{cm}$ observed in central and northern part of the block.

4. 1 Aquifer-II/Deeper Aquifer

EC between 750-2250 $\mu\text{S}/\text{cm}$ is observed in almost entire part of the block. Overall the ground water quality of deeper aquifer is suitable for irrigation purpose and for drinking purpose with primary treatment.

Aquifer-I/Shallow Aquifer map

Aquifer-II/Deeper Aquifer map



5. GROUND WATER RESOURCES

5.1 Aquifer-I/Shallow Aquifer

Ground Water Recharge Worthy Area (Sq. Km.)	983.70
Command Area (Sq.Km.)	35.65
Non-Command Area (Sq.Km.)	948.05
Total Annual Ground Water Recharge (MCM)	113.26
Natural Discharge (MCM)	6.78
Net Annual Ground Water Availability (MCM)	106.48
Existing Gross Ground Water Draft for irrigation (MCM)	60.46
Existing Gross Ground Water Draft for domestic and industrial water supply (MCM)	4.83
Existing Gross Ground Water Draft for All uses (MCM)	65.29
Provision for domestic and industrial requirement supply to 2025(MCM)	16.49
Net Ground Water Availability for future irrigation development (MCM)	29.92
Stage of Ground Water Development (%)	61.32
Category	Safe

5.2 Aquifer-II/Deeper Aquifer

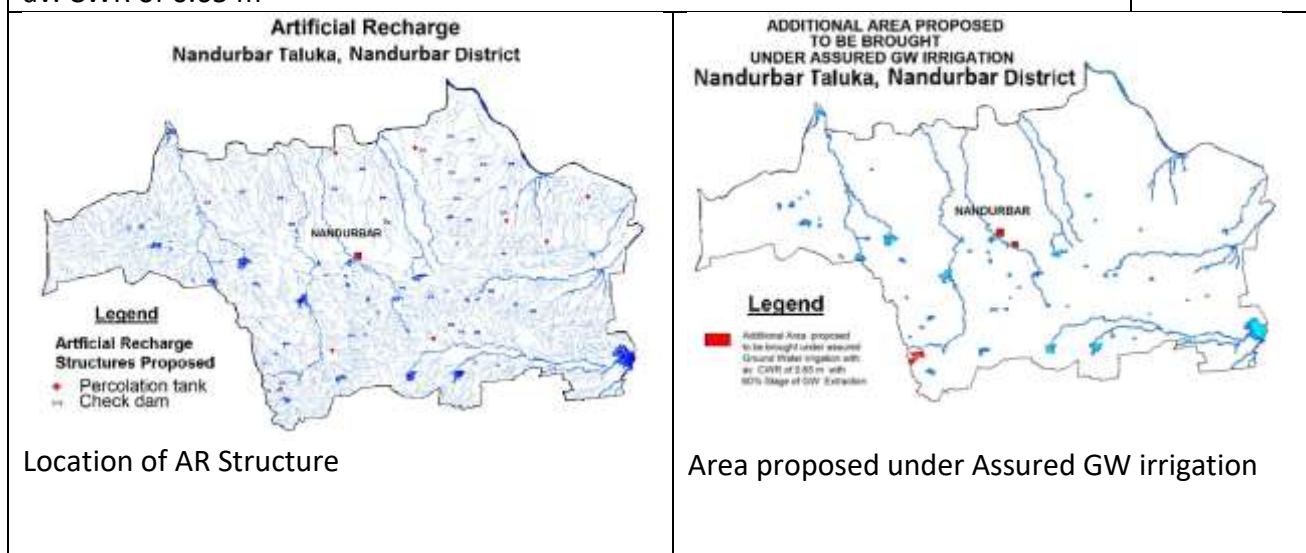
Taluka	Mean thickness (m)	Area in sqkm	Piezometric head meter above bottom of confining layer	S	Sy	Resource in above confining layer (mcm)	Resource in confining layer (mcm)	Total resource (mcm)
Nandurbar	16.57	1114	54.78	0.0000438	0.002	2.672891496	36.91796	39.5908515
Total								39.5908515

6. GROUND WATER RESOURCE MANAGEMENT

Net Annual Ground Water Availability (MCM)	106.48
Gross Annual Draft (MCM)	65.29

Stage of Ground Water Development (%)	61.32	
6.1 Supply Side Management		
SUPPLY (MCM)		
Agricultural Supply -GW	60.46	
Agricultural Supply -SW	177.00	
Domestic Supply - GW	4.83	
Domestic Supply - SW	1.21	
Total Supply	243.50	
Area of Block (Sq. Km.)	1114	
Area suitable for Artificial recharge(Sq. Km)	208.49	
Type of Aquifer	Hard Rock	
Area feasible for Artificial Recharge (WL >5mbgl) (Sq. Km.)	208.49	
Volume of Unsaturated Zone (MCM)	416.97	
Average Specific Yield	0.02	
Recharge Potential (MCM)	8.34	
Surplus water Available (MCM)	2.95	
Proposed Structures	Percolation Tank, Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)
Number of Structures	10	30
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	2.07	0.89
RTRWH Structures – Urban Areas		
Households to be covered (50% with 50 m ² area)	Nil	
Total RWH potential (MCM)	Nil	
Rainwater harvested / recharged @ 80% runoff co-efficient	Nil	
RTRWH & AR is economically not viable & hence, not recommended.		
6.2 Demand Side Management		
Micro irrigation techniques		
Irrigation Area (sq. km.) proposed for irrigation through Drip and Sprinkler	1.15	
Water Saving by use of Drip and Sprinklers	0.66	
Proposed Cropping Pattern change	Not proposed	
Ground water Irrigated area under Water Intensive Crop (sq.km)	NIL	
Water Saving by water use efficiency (MCM)	0.66	
6.3 EXPECTED BENEFITS		
Net Ground Water Availability (MCM)	106.48	
Existing Ground Water Draft for All Uses (MCM)	65.29	
Present stage of Ground Water Development (%)	61.32	
Additional GW resources available after Supply side interventions (MCM)	2.21	
Ground Water Availability after Supply side intervention (MCM)	108.69	
Additional GW resources available after Demand side interventions (MCM)	0.66	
Ground Water Availability after Demand side intervention (MCM)	64.63	

Stage of Ground Water Development after Supply and Demand side Interventions (%)	59.46
Total GWR available for GW Development (MCM)	0.59
Other Interventions Proposed, if any	Not proposed
Alternate Water Sources Available	NIL
6.4 Development Plan	
Volume of water available for GWD to enhance stage of GWD to 60% (MCM)	0.59
Proposed Number of DW (@ 1.5 ham for 90% of GWR Available)	35
Proposed Number of BW (@ 1 ham for 10% of GWR Available)	6
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	0.90



9.4 NAVAPUR BLOCK, NANDURBAR DISTRICT, MAHARASHTRA

1. SALIENT FEATURE	
1.1 Introduction	
Block Name	Navapur
Geographical Area(Sq. Km.)	1250.21 Sq. Km.
Forest Area (Sq. Km)	81.58 Sq. Km.
Population (2011)	271852
Climate	Monsoon sub-tropical
Net Annual Ground Water Availability (MCM)	135.19
Existing Gross Ground Water Draft for All uses(MCM)	47.24
Stage of Ground Water Development (%)	34.95
Category	SAFE
1.2 Rainfall Analysis	
Normal Rainfall	1198.7 mm
Annual Rainfall (2019)	1371.1 mm
Decadal Average Annual Rainfall (2010-19)	956.32 mm
Long Term Rainfall Analysis (1901-2019)	Falling Trend @ 1.3185 mm/year. Probability of Normal/Excess Rainfall: 54%/15%. Probability of Drought (Moderate)-: 31 % Moderate.
Rainfall Trend 1901-2019	
<p>The figure is a bar chart titled 'Rainfall Trend 1901-2019'. The vertical axis (y-axis) is labeled 'mm' and ranges from 0 to 2500 in increments of 500. The horizontal axis (x-axis) is labeled with years from 1901 to 2019. Each year is represented by a red vertical bar indicating the annual rainfall. A black trend line is drawn across the chart, starting at approximately 1066.8 mm in 1901 and ending at approximately 1066.8 + 1.3185 * 118 = 1215.5 mm in 2019. The equation for this trend line is given as $y = 1.3185x + 1066.8$. The chart shows high variability in annual rainfall, with many years having rainfall between 500 and 1500 mm, and a few years with rainfall exceeding 2000 mm. The overall trend shows a slight decrease in rainfall over the 118-year period.</p>	
EQUATION OF TREND LINE: $Y= 1.3185x + 1066.8$	
1.3 Geomorphology, Soil & Geology	
Geomorphic Unit	Slightly weathered plateau, followed by moderately dissected plateau, slightly dissected plateau, regions of dykes and butte.
Geology	Deccan Traps (Basalt). Age: Late Cretaceous to Eocene
Soil	Moderately deep clayey soil found in the major parts of the block followed by shallow clayey soil, very shallow clayey soil, shallow loamy

soil, very shallow loamy soil, loam with stones.

1.4 Hydrology & Drainage

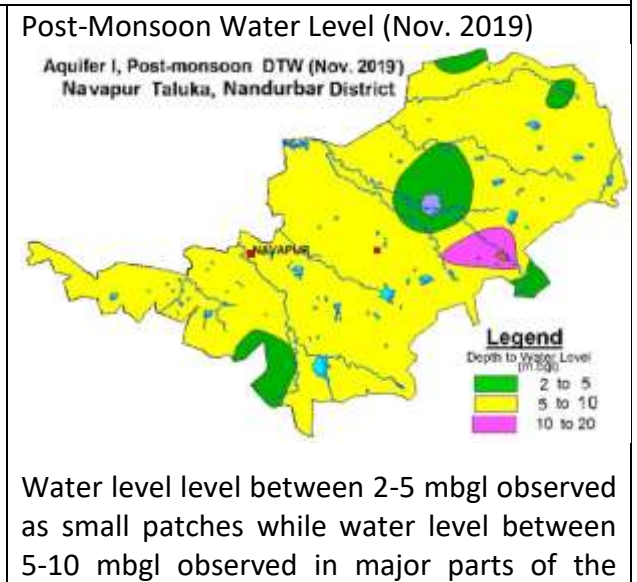
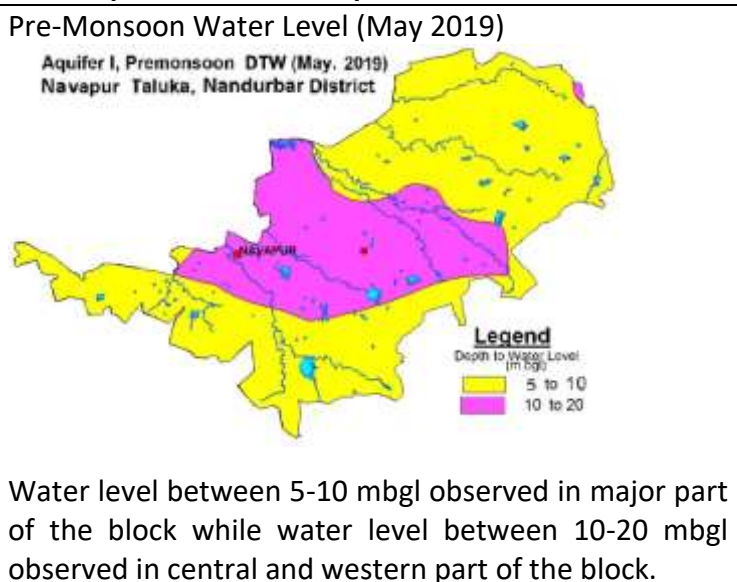
Drainage	The main rivers are tributaries of Tapi river basin of Nandurbar district.	
Hydrology	Major project	0
	Medium	3 (Rangawali, Kordi, Nagan Bhardu)
	Bigger Minor (250 to 600 and >600 Ha.)	11
	Minor Irrigation Project (100 to 250 Ha.)	0
	Minor Irrigation Project (0 to 100 Ha.)	58 PT, 206 KT Weirs, 205 Minor Irrigation Scheme, 93 Cement Nala Band

1.5 Land Use, Agriculture, Irrigation & Cropping Pattern

Geographical Area		1250.21 Sq. Km.
Forest Area		81.58 Sq. Km.
Cultivable Area		609.85 Sq. Km.
Net Sown Area		609.85 Sq. Km.
Double Cropped Area		0 Sq. Km.
Irrigation	Surface Water	77.32
	Ground Water	39.47
Principal Crops (Reference year 2013-14)	Crop Type	Area (Sq. Km.)
	Cotton	102.72
	Cereals	489.91
	Pulses	72.68
	Oil Seeds	5.17
Horticultural Crops	Fruits and Vegetables	1.34
	Sugarcane	3.04
	Spices	3.80

1.6 Water Level Behaviour

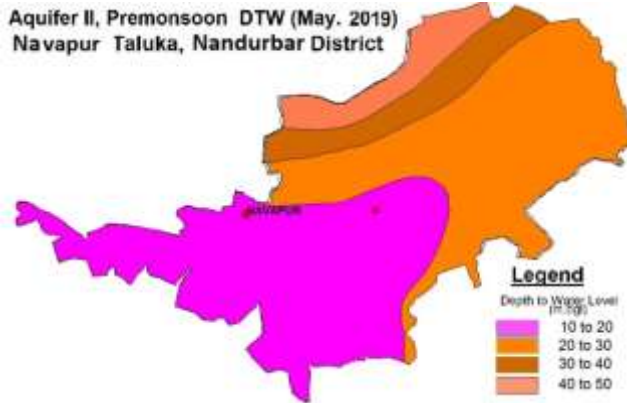
1.6.1 Aquifer-I/Shallow Aquifer



block. Water level between 10-20 mbgl observed in small patch in the south eastern part of the block.

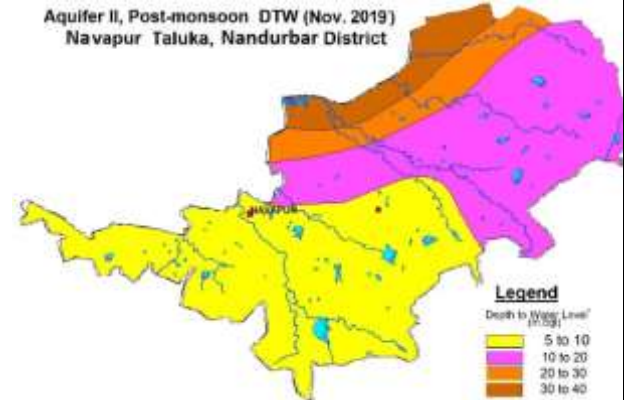
1.6.2 Aquifer-II/Deeper Aquifer

Pre-Monsoon Water Level (May 2019)



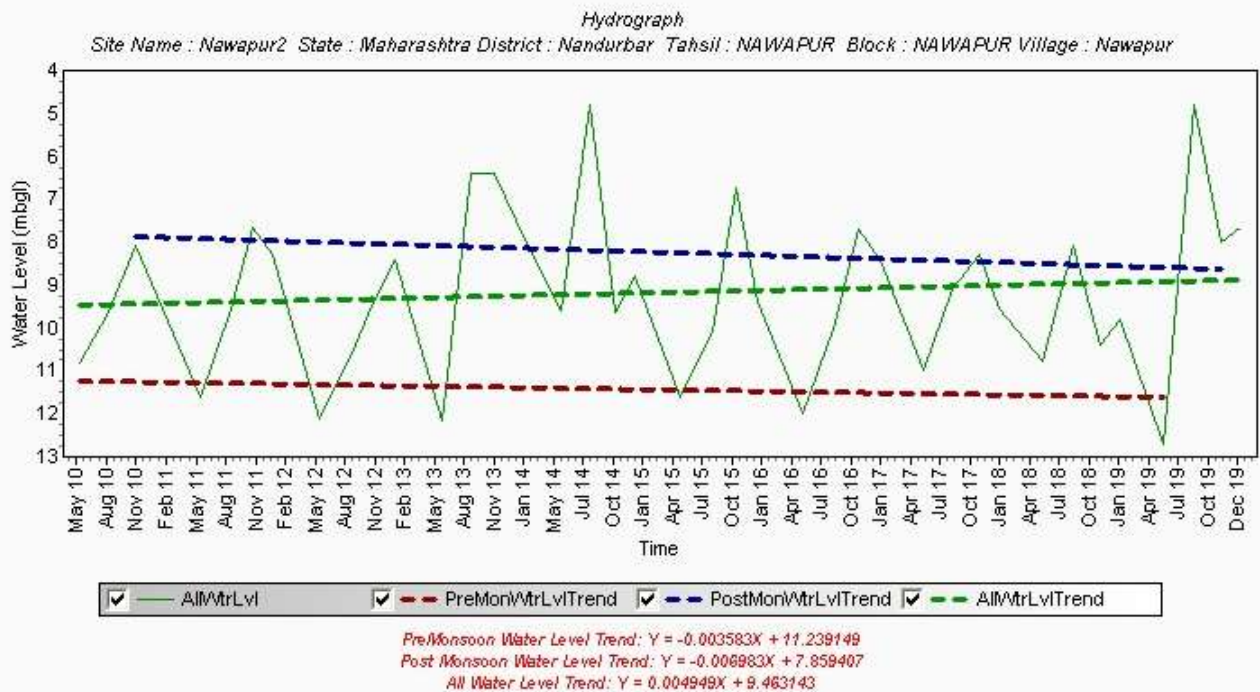
Water level between 10-20 mbgl is observed in almost half area of the block in southern and western part of the block while water level between 20-30, 30-40 and >40 mbgl observed in the northern, eastern parts of the block.

Post-Monsoon Water Level (Nov. 2019)



Water level between 5-10 mbgl is observed in southern and western part of the block while water level between 10-20, 20-30 and 30-40 mbgl observed in eastern and northern part of the block.

Hydrograph

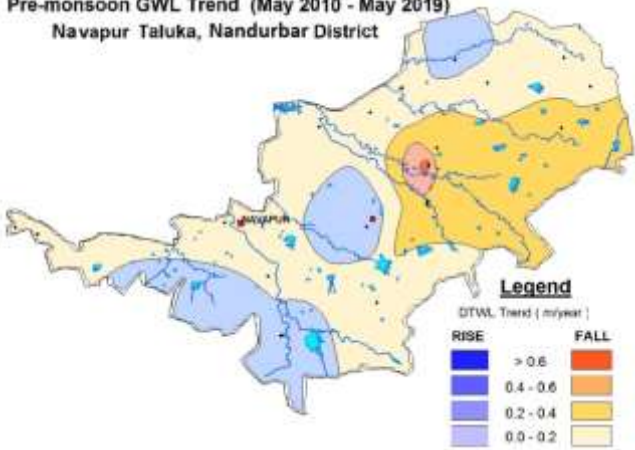
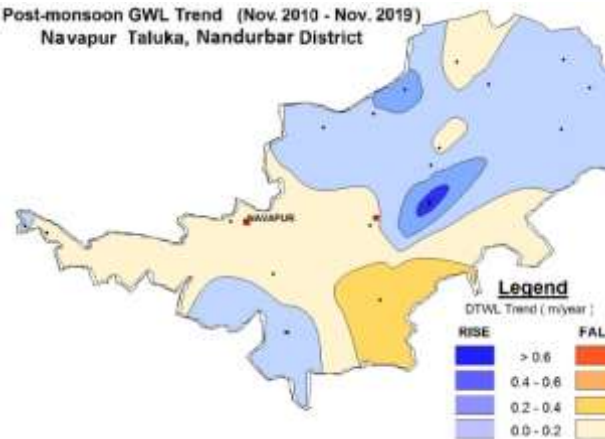


Hydrograph shows Pre-monsoon falling water level trend @ 0.00358 m/year

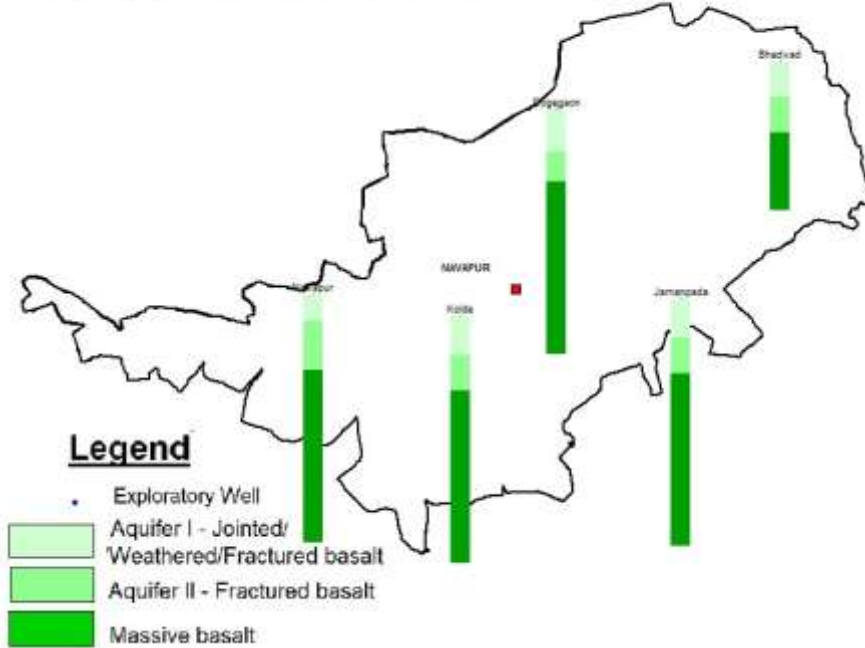
Hydrograph shows post-monsoon falling water level trend @ 0.00698 m/year

Pre-Monsoon Water Level Trend (2010-2019)
Rising 0.023 to 0.786 m/year

Post-Monsoon Water Level Trend (2010-2019)

<p>Falling 0.031 to .10 m/year</p>	<p>Rising 0.014 to 0.342 m/year Falling 0.003 to 0.549 m/year</p>
<p>Major part of the taluka is showing falling trend, except north, central and south eastern part of the block. Area showing rising trend in the range of 0-0.2 m observed in north, central and south eastern part of the block. Falling trend > 0.2 m is observed in eastern and central part of the block.</p> <p>Pre-monsoon GWL Trend (May 2010 - May 2019) Navapur Taluka, Nandurbar District</p> 	<p>Taluka is showing rising and falling trend almost equally in the area. Area showing rising trend in northern, eastern, central and south western part of the block while falling trend in the south and western part of the block. Rising trend >0.2m is observed in the central part of the block while falling trend >0.2 m is observed in the southern part of the block.</p> <p>Post-monsoon GWL Trend (Nov. 2010 - Nov. 2019) Navapur Taluka, Nandurbar District</p> 
<p>2. Ground Water Issues Limited aquifer potential Water scarcity in lean period Declining Water Level trend is observed in major part of the block. Nitrate>45 mg/l</p>	
<p>3. AQUIFER DISPOSITION</p>	
<p>3.1 Number of Aquifers Basalt – Aquifer-I (weathered& fractured basalt) Basalt – Aquifer-II (Jointed & fractured basalt)</p>	
<p>3.2 Lithological Disposition</p>	

**SUBSURFACE DISPOSITION OF AQUIFER SYSTEM
Navapur Taluka, Nandurbar District**



3.3 Cross Sections

Section AA'

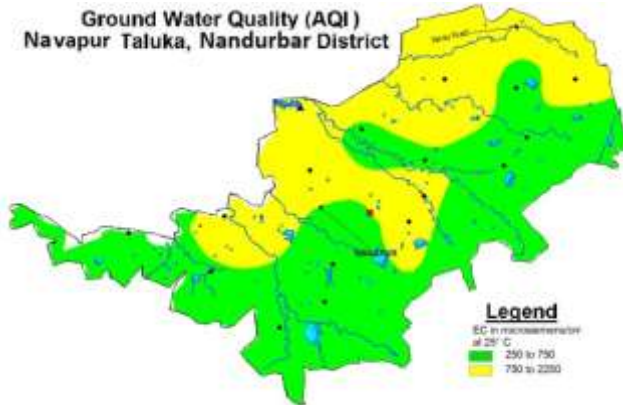
3.4 Aquifer Characteristics

Major Aquifers	Basalt (Deccan Traps)		Alluvium
Type of Aquifer (Phreatic/Semi-confined/Confined)	Aquifer-I (Phreatic)	Aquifer-II (Semi-confined /confined)	Aquifer-I
Depth of Occurrence (mbgl)	5 to 30	122.78-200.00	Nil
Granular/weathered/fractured rocks thickness (m)	5 to 12	3 to 18	Nil
Yield	10 – 100m ³ /day	meagre to 18 lps	Nil
Specific yield/Storativity (S)	0.019 – 0.028	0.000438	Nil
Transmissivity (T)	30-80 m ² /day	3.06 to 37.34 m ² /day	Nil

4. GROUND WATER QUALITY

4.1 Aquifer-I/Shallow Aquifer

Ground Water Quality (AQI)
Navapur Taluka, Nandurbar District



EC between 250 – 750 $\mu\text{S}/\text{cm}$ has been observed in southern part of the block in more than half area of the block. While northern part of the block shows EC between 750-2250 $\mu\text{S}/\text{cm}$.

4.2 Aquifer-II/Deeper Aquifer

Ground Water Quality (AQI)
Navapur Taluka, Nandurbar District



The ground water quality of deeper aquifer is suitable for irrigation purpose. EC between 750-2250 $\mu\text{S}/\text{cm}$ observed in almost entire part of the block.

5. GROUND WATER RESOURCES

5.1 Aquifer-I/Shallow Aquifer

Ground Water Recharge Worthy Area (Sq. Km.)	909.52
Command Area (Sq.Km.)	72.37
Non-Command Area (Sq.Km.)	837.15
Total Annual Ground Water Recharge (MCM)	143.27
Natural Discharge (MCM)	8.08
Net Annual Ground Water Availability (MCM)	135.19
Existing Gross Ground Water Draft for irrigation (MCM)	39.47
Existing Gross Ground Water Draft for domestic and industrial water supply (MCM)	7.77
Existing Gross Ground Water Draft for All uses (MCM)	47.25
Provision for domestic and industrial requirement supply to 2025(MCM)	22.17
Net Ground Water Availability for future irrigation development (MCM)	73.17
Stage of Ground Water Development (%)	34.95
Category	Safe

5.2 Aquifer-II/Deeper Aquifer

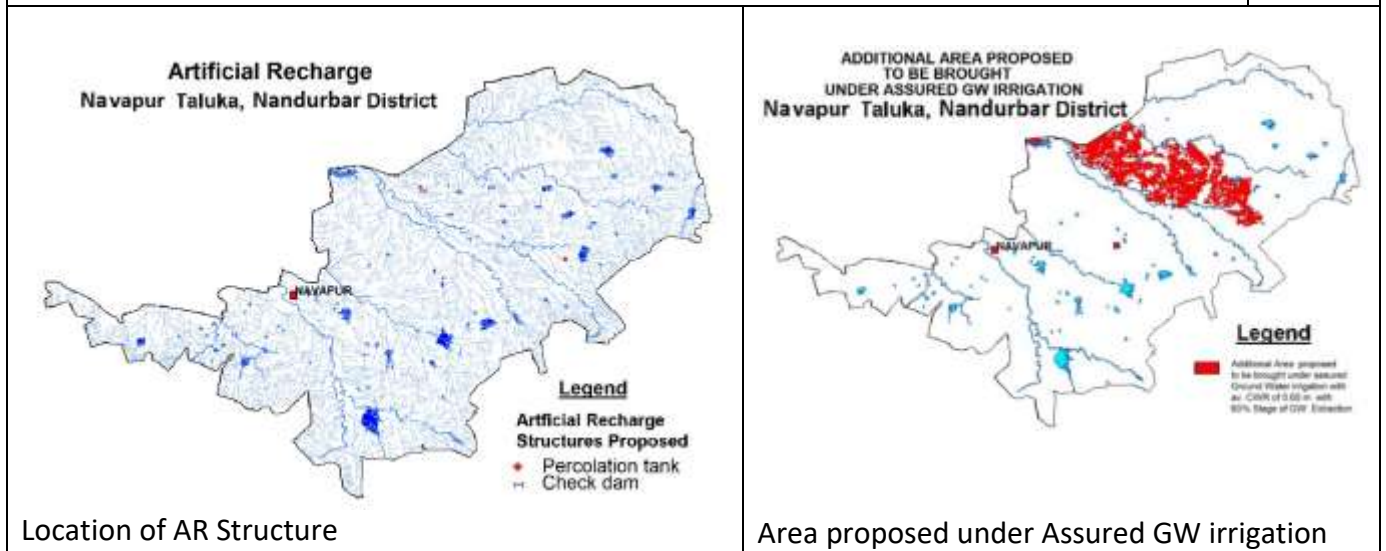
Taluka	Mean thickness (m)	Area in sqkm	Piezometric head meter above bottom of confining layer	S	Sy	Resource in above confining layer (mcm)	Resource in confining layer (mcm)	Total resource (mcm)
Navapur	11.79	1250.21	10.4	0.0000438	0.002	0.569495659	29.4799518	30.04944746
Total								30.04944746

6. GROUND WATER RESOURCE MANAGEMENT

Net Annual Ground Water Availability (MCM)	135.19
--	--------

Gross Annual Draft (MCM)		47.25
Stage of Ground Water Development (%)		34.95
6.1 Supply Side Management		
SUPPLY (MCM)		
Agricultural Supply -GW		39.47
Agricultural Supply -SW		77.32
Domestic Supply - GW		7.77
Domestic Supply - SW		1.94
Total Supply		126.51
Area of Block (Sq. Km.)		1250.21
Area suitable for Artificial recharge (Sq. Km)		34.18
Type of Aquifer		Hard Rock
Area feasible for Artificial Recharge (WL >5mbgl) (Sq. Km.)		34.18
Volume of Unsaturated Zone (MCM)		68.36
Average Specific Yield		0.02
Recharge Potential (MCM)		1.37
Surplus water Available (MCM)		0.48
Proposed Structures	Percolation Tank, Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM)
Number of Structures	2	5
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	0.34	0.15
RTRWH Structures – Urban Areas		
Households to be covered (50% with 50 m ² area)		Nil
Total RWH potential (MCM)		Nil
Rainwater harvested / recharged @ 80% runoff co-efficient		Nil
RTRWH & AR is economically not viable & hence, not recommended.		
6.2 Demand Side Management		
Micro irrigation techniques		
Irrigation Area (sq. km.) proposed for irrigation through Drip and Sprinkler		3.04
Water Saving by use of Drip and Sprinklers		1.73
Proposed Cropping Pattern change		Not proposed
Ground water Irrigated area under Water Intensive Crop (sq.km)		NIL
Water Saving by water use efficiency (MCM)		NIL
6.3 EXPECTED BENEFITS		
Net Ground Water Availability (MCM)		135.19
Existing Ground Water Draft for All Uses (MCM)		47.25
Present stage of Ground Water Development (%)		34.95
Additional GW resources available after Supply side interventions (MCM)		0.36

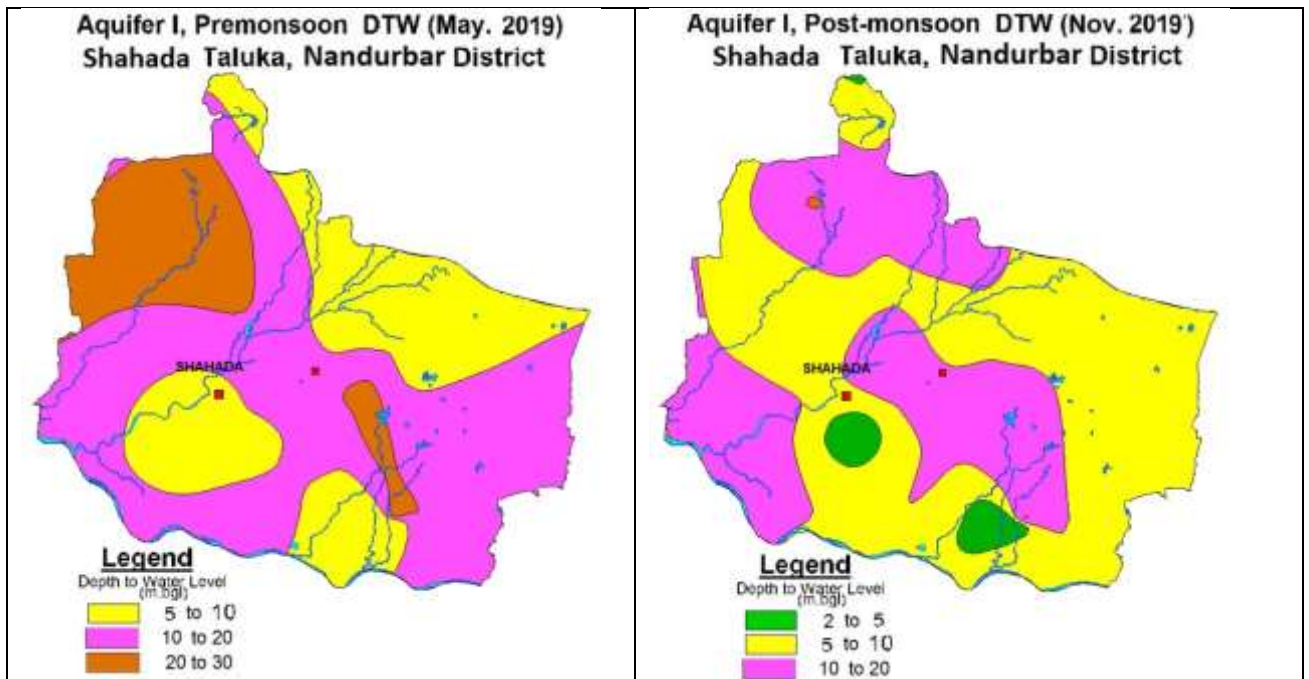
Ground Water Availability after Supply side intervention (MCM)	135.55
Additional GW resources available after Demand side interventions (MCM)	1.73
Ground Water Availability after Demand side intervention (MCM)	45.51
Stage of Ground Water Development after Supply and Demand side Interventions (%)	33.57
Total GWR available for GW Development (MCM)	35.83
Other Interventions Proposed if any	Not proposed
Alternate Water Sources Available	NIL
6.4 Development Plan	
Volume of water available for GWD to enhance stage of GWD to 60% (MCM)	35.83
Proposed Number of DW (@ 1.5 ham for 90% of GWR Available)	2150
Proposed Number of BW (@ 1 ham for 10% of GWR Available)	358
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	55.12



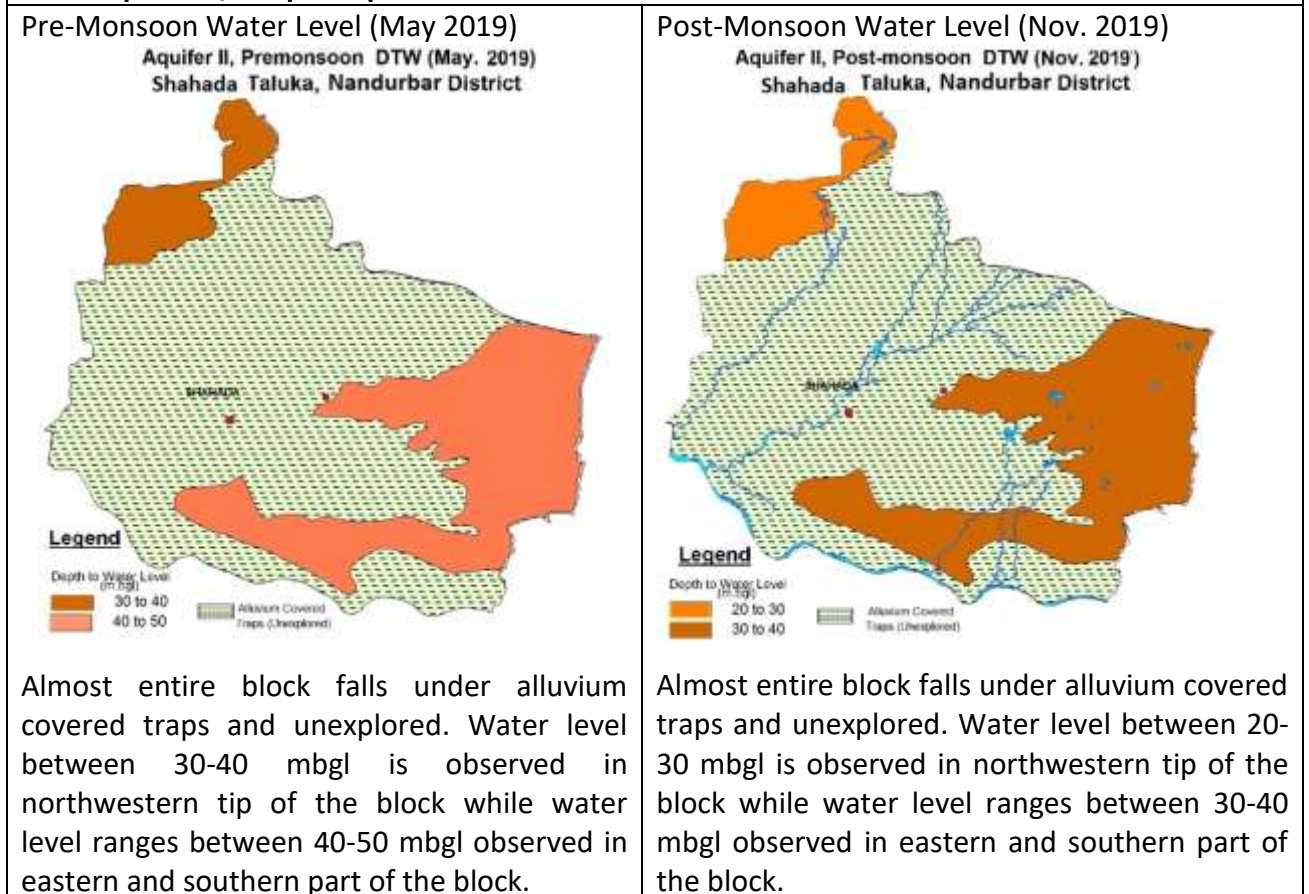
9.5 SHAHADA BLOCK, NANDURBAR DISTRICT, MAHARASHTRA

1. SALIENT FEATURE	
1.1 Introduction	
Block Name	Shahada
Geographical Area (Sq. Km.)	1191.34 Sq. Km.
Forest Area (Sq. Km)	37.37 Sq. Km.
Population (2011)	407728
Climate	Monsoon sub-tropical
Net Annual Ground Water Availability (MCM)	109.64
Existing Gross Ground Water Draft for All uses(MCM)	47.62
Stage of Ground Water Development (%)	43.43
Category	Safe
1.2 Rainfall Analysis	
Normal Rainfall	755.6 mm
Annual Rainfall (2019)	933.7 mm
Decadal Average Annual Rainfall (2008-17)	621.89 mm
Long Term Rainfall Analysis (1901-2019)	Rising Trend @ 0.4119 mm/year. Probability of Normal/Excess Rainfall: 61%/6%. Probability of Drought (Moderate/Severe)-: 28 % Moderate & 6% Severe.
Rainfall Trend (1901-2019)	
1.3 Geomorphology, Soil & Geology	
Geomorphic Unit	Major parts of the block covered by moderate alluvial plain followed by younger alluvial plain, slightly weathered plateau, moderately dissected plateau, slightly dissected plateau, regions of dykes, butte.
Geology	Major parts of the block covered by Alluvium (sand/ silt and clay alternating beds). Age: Recent to Sub-recent Deccan Traps (Basalt)Age: Late Cretaceous to Eocene
Soil	Slightly deep calcareous clayey loamy soil and moderately deep clayey soil covered major part of the block, slightly deep clayey loamy soil, very shallow clayey loamy soil.
1.4 Hydrology & Drainage	

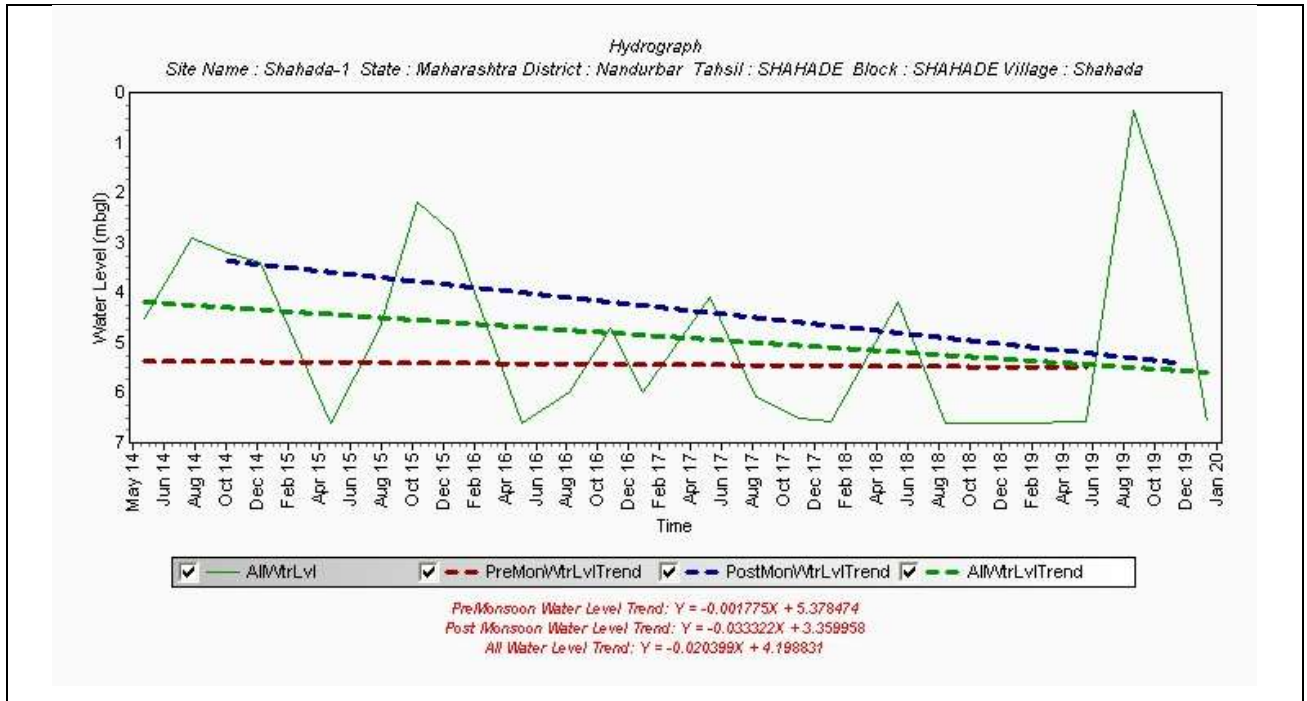
Drainage	The main rivers are tributaries of Tapi river basin of Nandurbar district.	
Hydrology	Major project	0
	Medium	3 (Dara, Sarangkhedha, Prakasha Barrage)
	Bigger Minor (250 to 600 and >600 Ha.)	2
	Minor Irrigation Project (100 to 250 Ha.)	0
	Minor Irrigation Project (0 to 100 Ha.)	24 PT, 49 K T Weirs, 146 minor irrigation project, 69 Cement Nala Band
1.5 Land Use, Agriculture, Irrigation & Cropping Pattern		
Geographical Area		1191.34 Sq. Km.
Forest Area		37.37 Sq. Km.
Cultivable Area		902.73 Sq. Km.
Net Sown Area		789.94 Sq. Km.
Double Cropped Area		112.79 Sq. Km.
Irrigation	Surface Water	105.96
	Ground Water	41.474
Principal Crops (Reference year 2013-14)	Crop Type	Area (Sq. Km.)
	Cotton	479.11
	Cereals	386.89
	Pulses	95.01
	Oil Seeds	4.63
Horticultural Crops	Fruits and Vegetables	23.02
	Sugarcane	26.48
	Spices	6.22
1.6 Water Level behaviour		
1.6.1 Aquifer-I/Shallow Aquifer		
Pre-Monsoon Water Level (May 2019) Water level between 5-10 mbgl is observed in northern and isolated patches in southern part of the block while water level in the range of 10-20 mbgl is observed in almost entire block. Water level between 20-30 mbgl observed in northwestern part of the block and as isolated patches in the block.		Post-Monsoon Water Level (Nov. 2019) Water Level less between 2-5 mbgl is observed in small patches while water level between 5-10 mbgl observed in almost entire part of the block. Water level between 10-20 mbgl observed in northern, central, southwestern part of the block.



1.6.2 Aquifer-II/Deeper Aquifer



1.7 Hydrograph & Water Level Trend (2010-2019)



Hydrograph shows Pre-monsoon falling water level trend @ 0.00177 m/year

Hydrograph shows Post- monsoon falling water level trend @ 0.0333 m/year

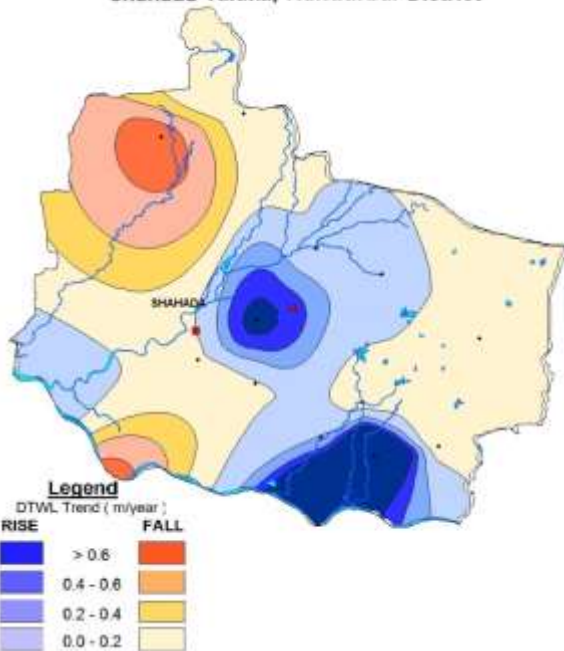
Pre-Monsoon Water Level Trend (2010-2019)

Post-Monsoon Water Level Trend (2010-2019)

Pre-Monsoon trend
 Rising 0.005 to 0.67 m/year
 Falling 0.035 to 1.64 m/year

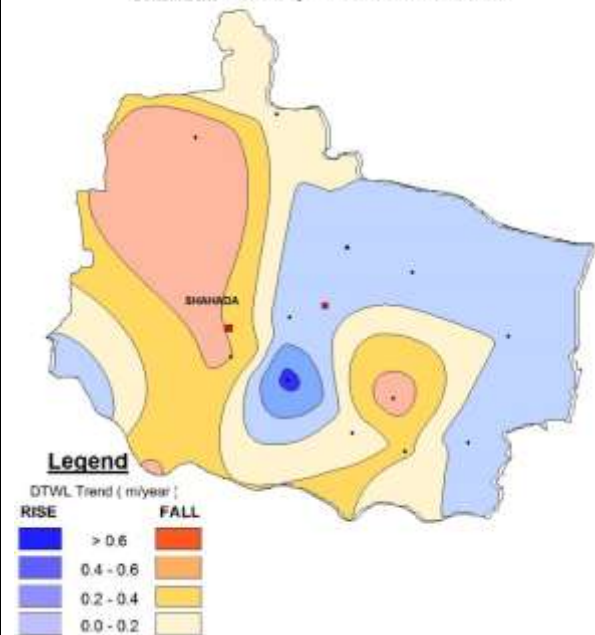
Post-Monsoon trend
 Rising 0.111 to 0.595 m/year
 Falling 0.004 to 0.431 m/year

Pre-monsoon GWL Trend (May 2010 - May 2019)
 Shahada Taluka, Nandurbar District



Major part of the block is showing falling trend, except central, southern and western tip of the block. Area showing rising trend

Post-monsoon GWL Trend (Nov. 2010 - Nov. 2019)
 Shahada Taluka, Nandurbar District



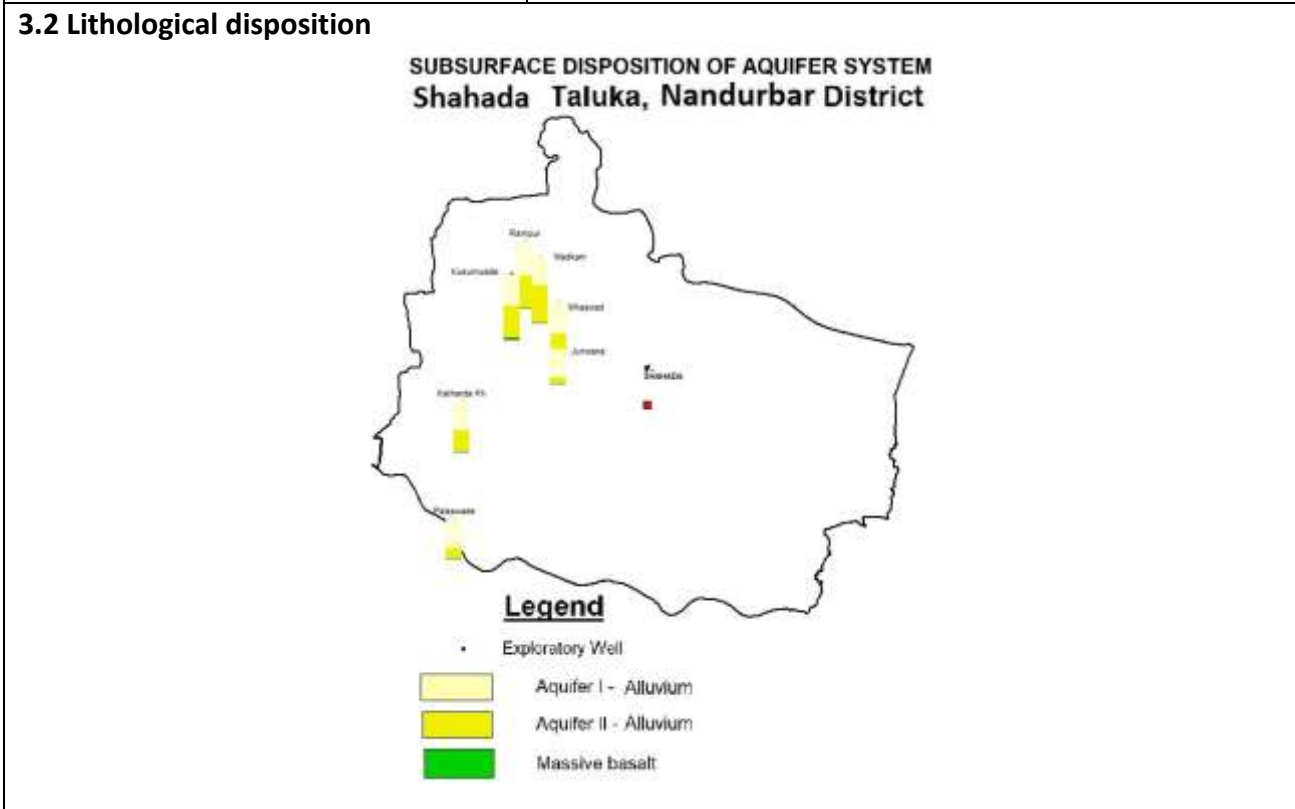
Almost entire block is showing falling trend in the range between 0 -0.2, 0.2-0.4 and 0.4-0.6 m while rest of the block having rising trend. Area showing rising trend >0.2 m is observed in

<p>>0.2 m is observed in central, southern part of the district. Most of the area shows falling trend in the range between 0 to 0.2 m. Area showing falling trend >0.2 m observed in north western part and south western tip of the block.</p>	<p>isolated patch in central part of the block. Area showing falling trend >0.2 m observed in central, southern and north western part of the block.</p>
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2.0 GROUND WATER ISSUES
 Water scarcity in lean period
 Declining Water Level trend is observed in major part of the block.
 Nitrate>45 mg/l

3.0AQUIFER DISPOSITION

3.1 Number of Aquifers	Aquifer I- Alluvium
	Aquifer II- Alluvium



3.4 Aquifer Characteristics

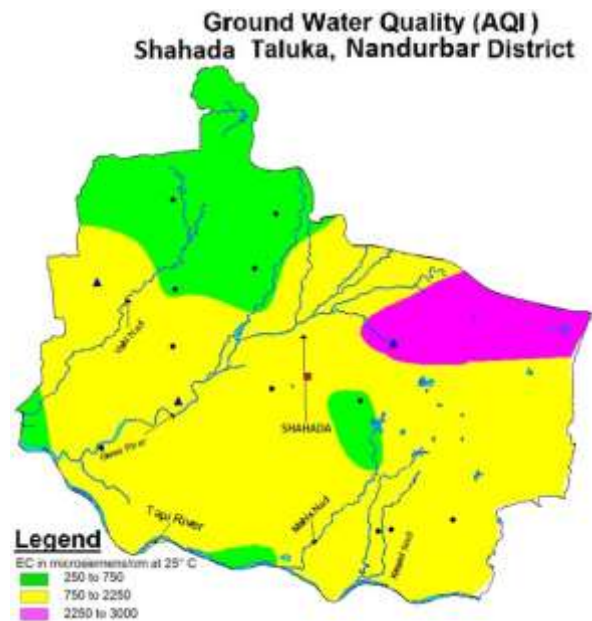
Major Aquifers	Basalt (Deccan Traps)		Alluvium
	Aquifer-I (Phreatic)	Aquifer-II (Semi-confined /confined)	Aquifer-I
Type of Aquifer (Phreatic/Semi-confined/Confined)			
Depth of Occurrence (mbgl)	9 - 27	Nil	21 to 67.21
Granular/weathered/fractured rocks thickness (m)	5.4 – 14	Nil	4 to 17

Yield	10 - 100m ³ /day	Nil	0.2 -20 lps
Specific yield/Storativity (S)	0.019 – 0.028	Nil	0.0076 to 0.00053
Transmissivity (T)	30-80 m ² /day	Nil	113.15 - 3162

4. GROUND WATER QUALITY

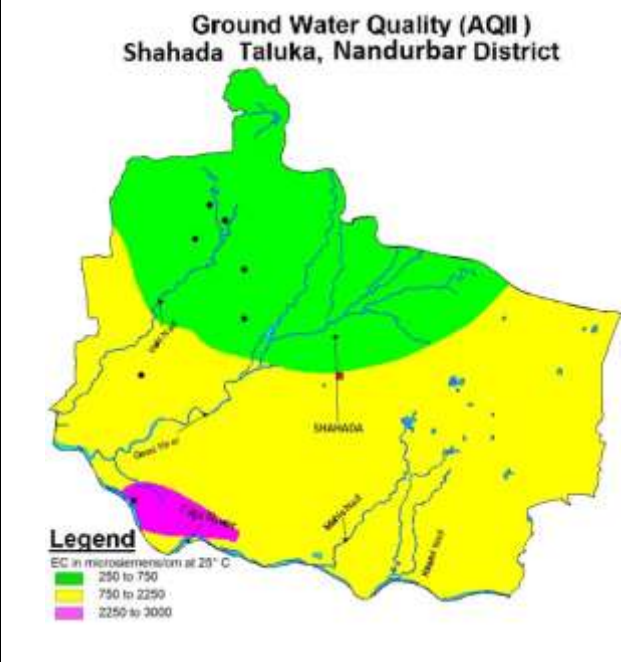
4.1 Aquifer-I/Shallow Aquifer

EC between 750- 2250 μ S/cm has been observed in major parts of the block. EC between 250- 750 μ S/cm has been observed in northwestern part of the block and as isolated patches in the block. EC >2250 μ S/cm has been observed in northeastern portion of the block.



4.2 Aquifer-II/Deeper Aquifer

EC between 250- 750 μ S/cm is observed in mostly northern part of the block. EC between 750- 2250 μ S/cm has been observed in entire part of the block except northern part. EC > 2250 μ S/cm has been observed in southwestern tip of the block.



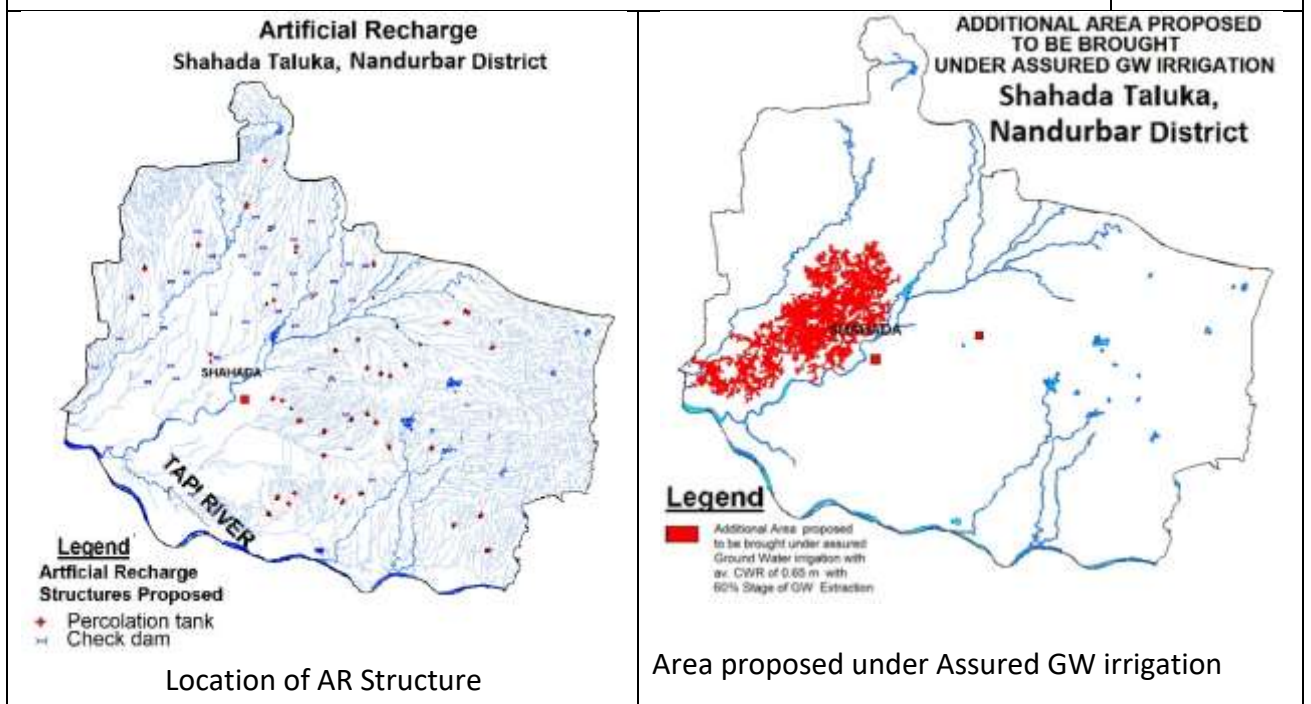
5. GROUND WATER RESOURCES

5.1 Aquifer-I/Shallow Aquifer

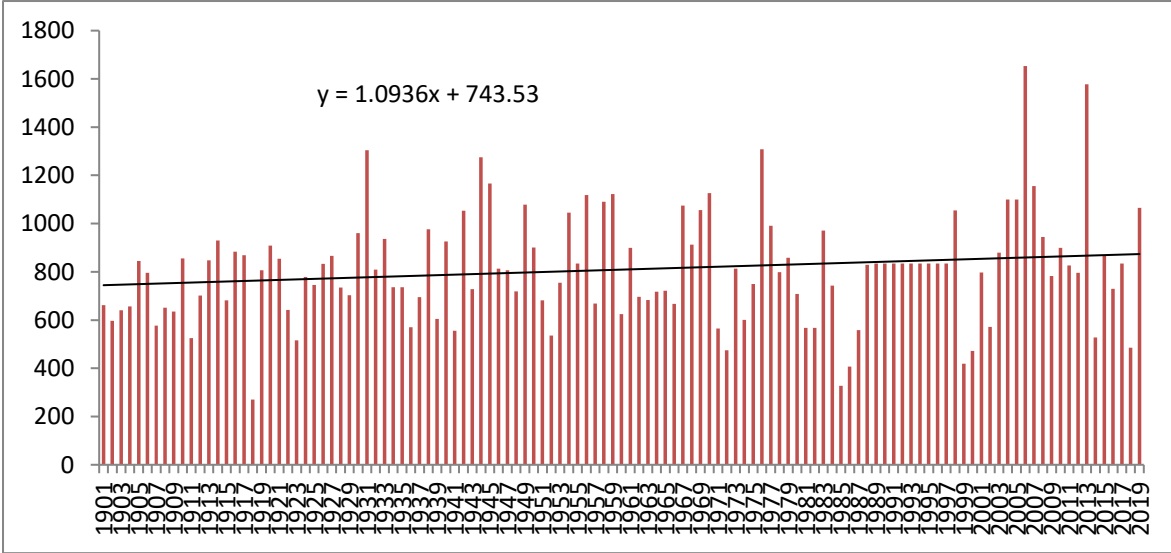
Ground Water Recharge Worthy Area (Sq. Km.)	1138.02
Command Area (Sq.Km.)	60.02
Non-Command Area (Sq.Km.)	1078
Total Annual Ground Water Recharge (MCM)	117.06
Natural Discharge (MCM)	7.43
Net Annual Ground Water Availability (MCM)	109.63
Existing Gross Ground Water Draft for irrigation (MCM)	41.48
Existing Gross Ground Water Draft for domestic and industrial water supply (MCM)	6.14
Existing Gross Ground Water Draft for All uses(MCM)	47.62
Provision for domestic and industrial requirement supply to 2025(MCM)	25.88
Net Ground Water Availability for future irrigation development (MCM)	42.84
Stage of Ground Water Development (%)	43.43

Category								Safe
5.2 Aquifer-II/Deeper Aquifer								
Taluka	Mean thickness (m)	Area in sqkm	Piezometric head meter above bottom of confining layer	S	Sy	Resource in above confining layer (mcm)	Resource in confining layer (mcm)	Total resource (mcm)
Shahada	9.53	1191.34	10.4	0.0000438	0.002	0.542679197	22.7069404	23.2496196
Total								23.2496196
6. GROUND WATER RESOURCE MANAGEMENT								
Net Annual Ground Water Availability (MCM)								109.63
Gross Annual Draft (MCM)								47.62
Stage of Ground Water Development (%)								43.43
6.1 Supply Side Management								
SUPPLY (MCM)								
Agricultural Supply -GW								41.47
Agricultural Supply -SW								105.96
Domestic Supply - GW								6.14
Domestic Supply - SW								1.54
Total Supply								155.11
Area of Block (Sq. Km.)								1191.34
Area suitable for Artificial recharge (Sq. Km)								1014.48
Type of Aquifer								Alluvium
Area feasible for Artificial Recharge (WL >5mbgl) (Sq. Km.)								1014.48
Volume of Unsaturated Zone (MCM)								2028.96
Average Specific Yield								0.07
Recharge Potential (MCM)								142.03
Surplus water Available (MCM)								14.37
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				41	38	41		
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)				8.2	1.14	2.46		
RTRWH Structures – Urban Areas								
Households to be covered (50% with 50 m ² area)								0
Total RWH potential (MCM)								0
Rainwater harvested / recharged @ 80% runoff co-efficient								0
Estimated Expenditure (Rs. In Cr.) @ Rs.30000/-per HH								0
RTRWH & AR is economically not viable & hence, not recommended.								
6.2 Demand Side Management								

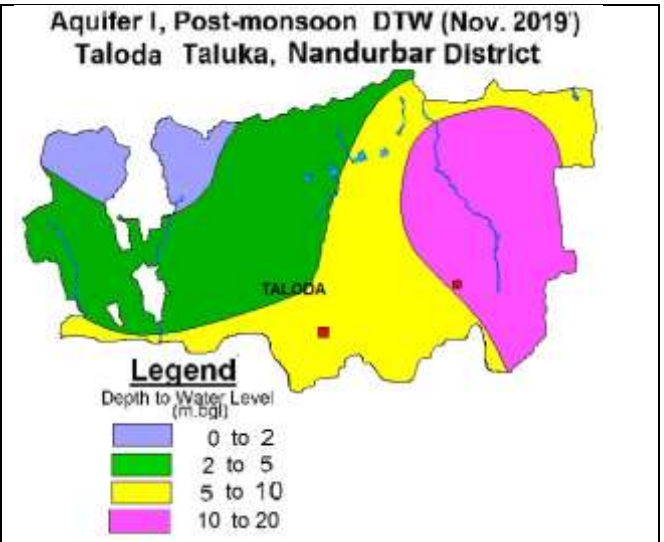
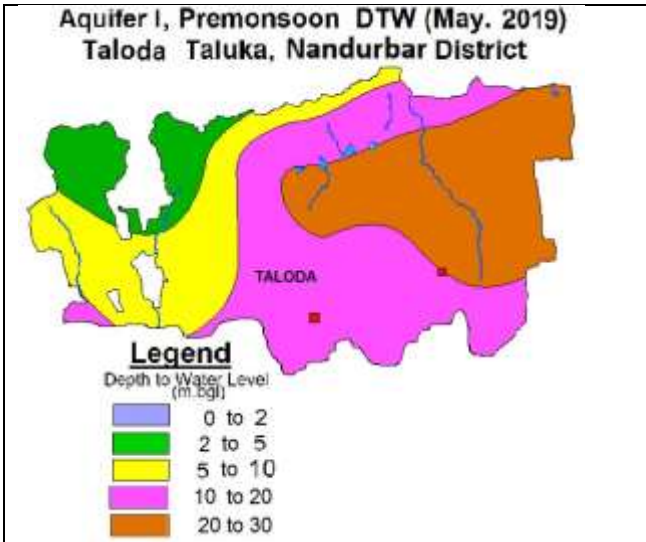
Micro irrigation techniques	
Irrigation Area (sq. km.) proposed for irrigation through Drip and Sprinkler	26.48
Volume of Water expected to be saved (MCM). Surface Flooding req- 0.815 m. Drip Req. -0.55, WUE- 0.304 m	15.09
Proposed Cropping Pattern change	Not proposed
Ground water Irrigated area under Water Intensive Crop (sq.km)	NIL
Water Saving by water use efficiency (MCM)	NIL
6.3 EXPECTED BENEFITS	
Net Ground Water Availability (MCM)	109.63
Existing Ground Water Draft for All Uses (MCM)	47.62
Present stage of Ground Water Development (%)	43.43
Additional GW resources available after Supply side interventions (MCM)	11.76
Ground Water Availability after Supply side intervention (MCM)	121.40
Additional GW resources available after Demand side interventions (MCM)	15.09
Ground Water Availability after Demand side intervention (MCM)	32.53
Stage of Ground Water Development after Supply side and Demand side Interventions (%)	26.80
Total GWR available for GW Development (MCM)	40.30
Other Interventions Proposed, if any	Not proposed
Alternate Water Sources Available	NIL
6.4 Development Plan	
Volume of water available for GWD to enhance stage of GWD to 60% (MCM)	40.30
Proposed Number of DW (@ 1.5 ham for 90% of GWR Available)	2418
Proposed Number of BW (@ 1 ham for 10% of GWR Available)	403
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	62



9.6 TALODA BLOCK, NANDURBAR DISTRICT, MAHARASHTRA

1.0 SALIENT FEATURE	
1.1 Introduction	
Block Name	Taloda
Geographical Area (Sq. Km.)	339.1
Forest Area (Sq. Km)	38.12
Population (2011)	159654
Climate	Monsoon sub-tropical
Net Annual Ground Water Availability (MCM)	37.57
Existing Gross Ground Water Draft for All uses(MCM)	19.70
Stage of Ground Water Development (%)	52.73
Category	SAFE
1.2 Rainfall Analysis	
Normal Rainfall	834.1 mm
Annual Rainfall (2019)	1065.3 mm
Decadal Average Annual Rainfall (2010-19)	860.99 mm
Long Term Rainfall Analysis (1901-2019)	Rising Trend @ 1.0936 mm/year. Probability of Normal/Excess Rainfall: 61%/18%. Probability of Drought (Moderate/Sever)-: 18 % Moderate/ 3% Sever
Rainfall Trend (1901-2019) 	
1.3 Geomorphology, Soil & Geology	
Geomorphic Unit	Major parts of the block are occupied by moderate alluvial plain, followed by moderate bazada, moderately dissected plateau and highly dissected plateau.
Geology	Major parts of the block covered by Alluvium (sand/ silt and clay alternating beds). Age: Recent to Sub-recent Deccan Traps (Basalt)Age: Late Cretaceous to Eocene
Soil	Major parts of the block covered by moderately deep clayey soil, followed by very shallow loamy soil and extremely shallow loamy soil.

1.4 Hydrology & Drainage		
Drainage	The main rivers are tributaries of Tapi river basin of Nandurbar district.	
Hydrology	Major project	0
	Medium	0
	Bigger Minor (250 to 600 and >600 Ha.)	3
	Minor Irrigation Project (100 to 250 Ha.)	0
	Minor Irrigation Project (0 to 100 Ha.)	4 PT, 12 KT Weirs, 26 Minor Irrigation Scheme, , 21 Cement Nala Band
1.5 Land Use, Agriculture, Irrigation & Cropping Pattern		
Geographical Area		339.1 Sq. Km.
Forest Area		38.12 Sq. Km.
Cultivable Area		258.84 Sq. Km.
Net Sown Area		216.93 Sq. Km.
Double Cropped Area		42.01 Sq. Km.
Irrigation	Surface Water	10.53
	Ground Water	16.21
Principal Crops (Reference year 2013-14)	Crop Type	Area (Sq. Km.)
	Cotton	25.35
	Cereals	226.86
	Pulses	13.31
	Oil Seeds	3.93
Horticultural Crops	Fruits and Vegetables	6.19
	Sugarcane	55.40
	Spices	0.09
1.6 Water Level Behavior		
1.6.1 Aquifer-I/Shallow Aquifer		
Pre-Monsoon Water Level (May 2019) Water level between 2-5 mbgl is observed in northwestern part of the block, while water level in the range of 5 to 10 mbgl is observed western and northern part of the block. Water level ranges from 10-20 and 20-30 mbgl observed in eastern, central and southern parts of the block.	Post-Monsoon Water Level (Nov. 2019) Water level between 0-2 mbgl is observed in northwestern part of the block, while water level in the range of 2 to 5 mbgl is observed western, central and northern part of the block. Water level ranges from 10-20 mbgl observed in eastern part of the block. Water level ranges from 5-10 mbgl observed in southern, central and northern parts of the block.	



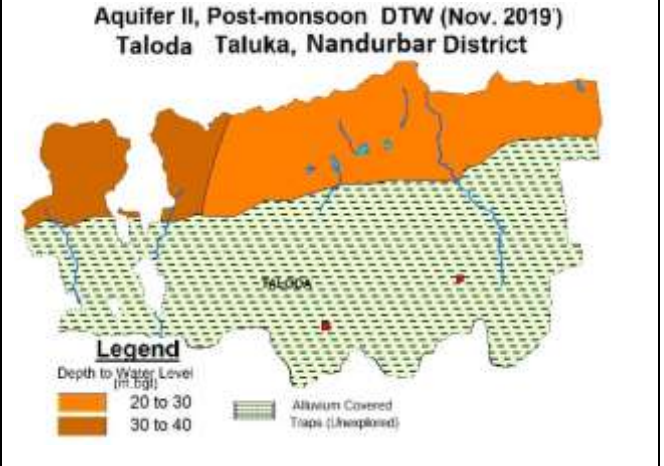
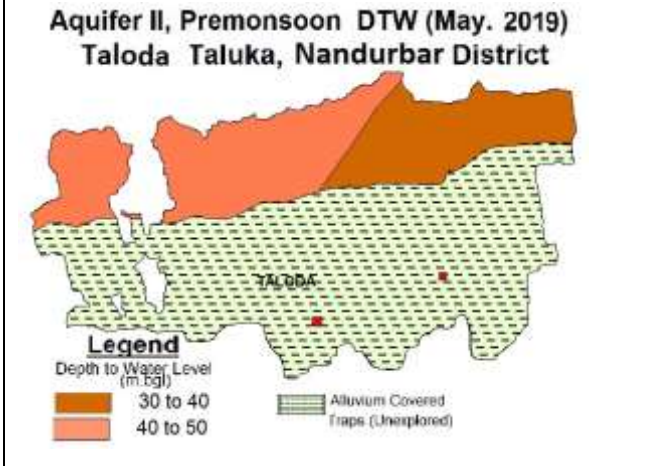
1.6.2 Aquifer-II/Deeper Aquifer

Pre-Monsoon Water Level (May 2019)

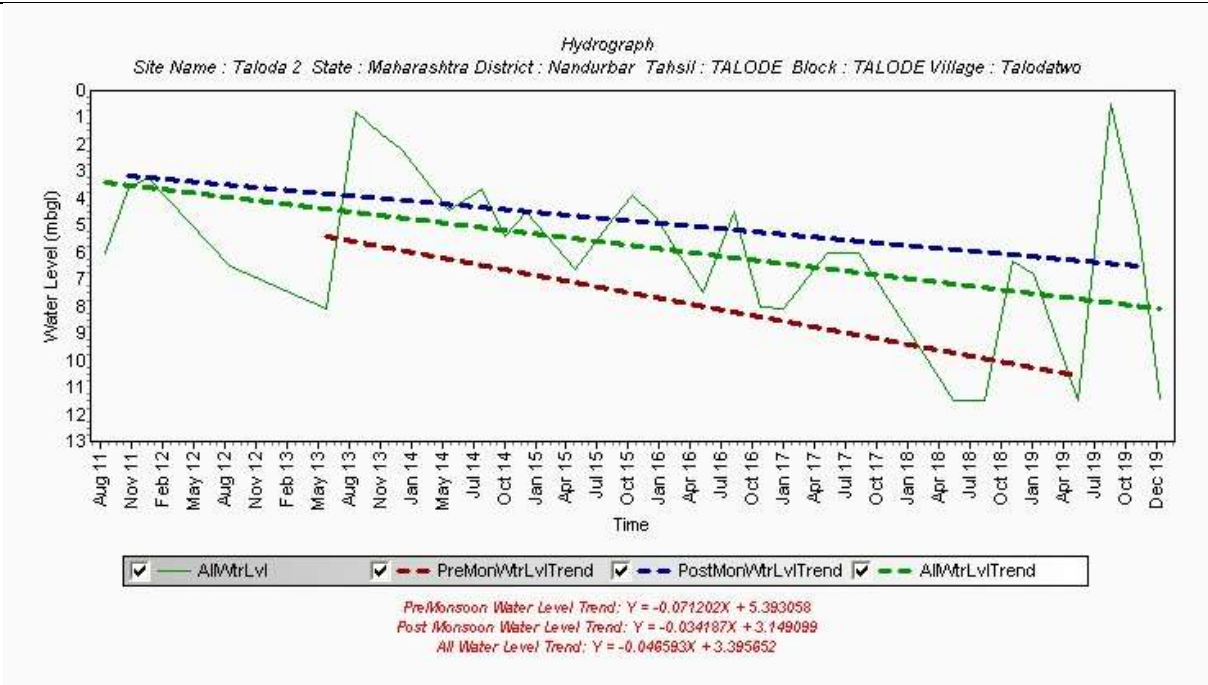
Water level between 30-40 mbgl is observed in north western part of the block. Water level between 40-50 mbgl observed in the north eastern part of the block. Major part of the block comes under alluvium covered traps and unexplored.

Post-Monsoon Water Level (Nov. 2019)

Water level between 20-30 mbgl is observed in north western part of the block. Water level between 30-40 mbgl observed in the north eastern part of the block. Major part of the block comes under alluvium covered traps and unexplored.



1.7 Hydrograph and Water Level Trend (2010-2019)



Hydrograph shows Pre-monsoon falling water level trend @ 0.0712 m/year

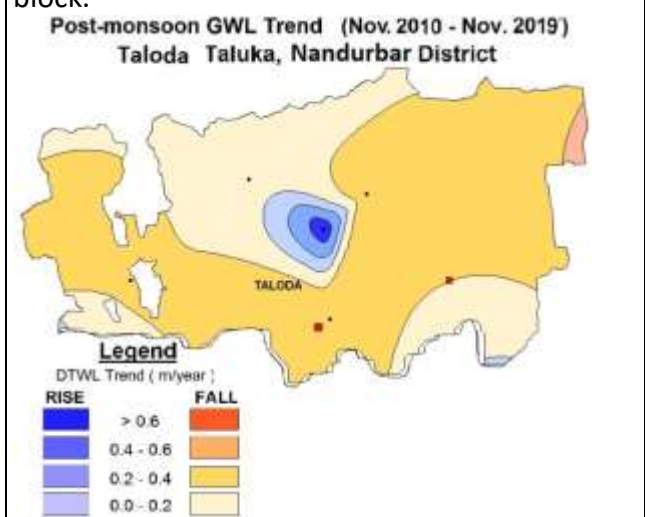
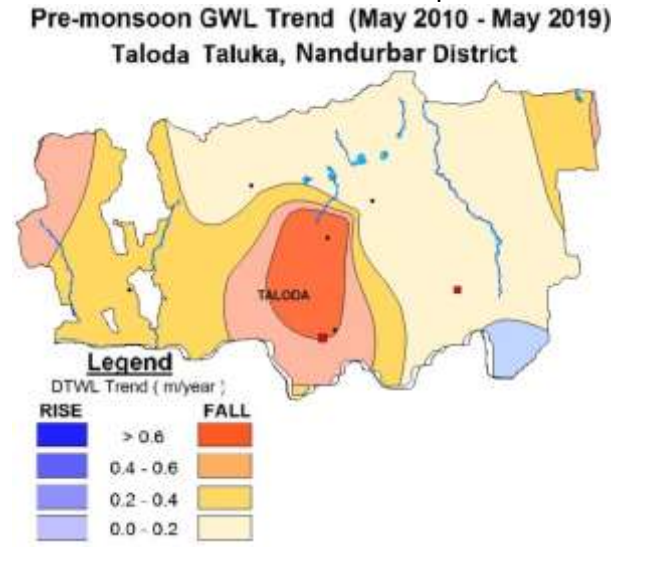
Hydrograph shows Post-monsoon falling water level trend @ 0.0342 m/year

Pre-Monsoon trend
Rising 0.0096 to 1.176 m/year

Post-Monsoon trend
Rising 0.098 to 0.365 m/year
Falling 0.471 m/year

Pre-Monsoon Water Level Trend (2010-2019)
Almost entire taluka is showing falling trend, except south eastern tip of the block. Falling trend between 0 -0.2m m is observed in major part of the block. Area showing falling trend >0.2 m is observed in central, southern and western part of the block. Rising trend in the range 0-0.2 m is observed in south eastern tip of the block.

Post-Monsoon Water Level Trend (2010-2019)
Almost entire taluka is showing falling trend, except central, south eastern tip of the block. Falling trend between 0 -0.2m m is observed in northern part of the block and isolated patches in south eastern and south western tip of the block. Area showing falling trend >0.2 m is observed in major part of the block. Rising trend >0.2 m is observed in central part of the block.



2.0 GROUND WATER ISSUES

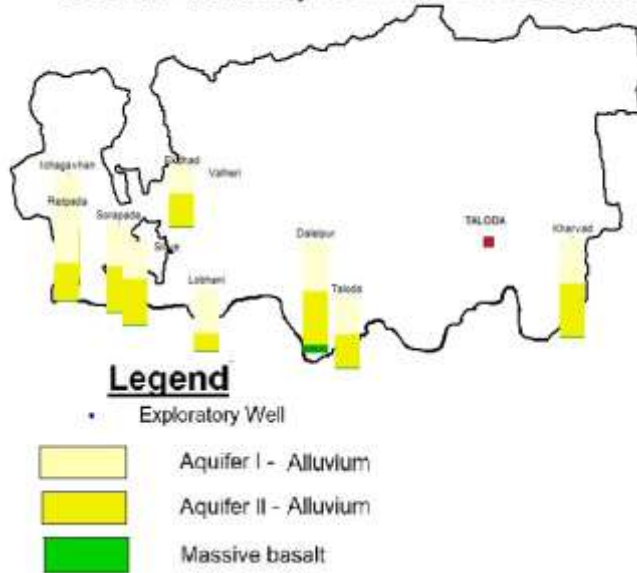
Water scarcity in lean period
Declining Water Level trend is observed in major part of the block.

3.0 AQUIFER DISPOSITION

3.1 Number of Aquifers	Alluvium (sand/ silt and clay alternating beds). Basalt – Aquifer-I (weathered& fractured basalt)
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3.2 Lithological disposition

**SUBSURFACE DISPOSITION OF AQUIFER SYSTEM
Taloda Taluka, Nandurbar District**

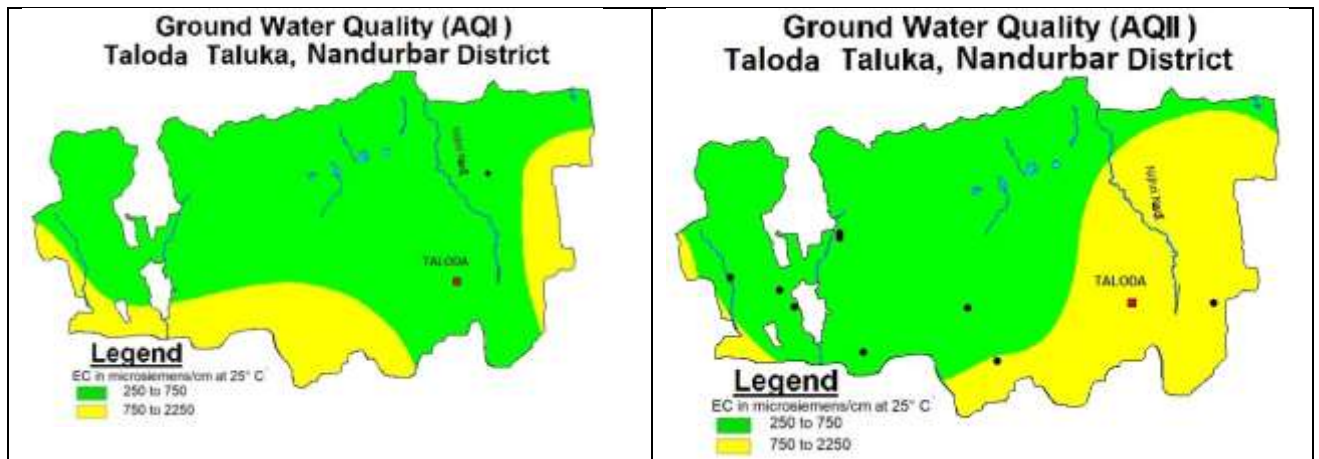


3.4 Aquifer Characteristics

Major Aquifers	Basalt (Deccan Traps)	Alluvium
Type of Aquifer (Phreatic/Semi-confined/Confined)	Aquifer-I (Phreatic)	Aquifer-I
Depth of Occurrence (mbgl)	9 to 29	34.50 to 70
Granular/weathered/fractured rocks thickness (m)	5.4 to 12	3.5 to 18
Yield	10 – 100 m ³ /day	Up to 12 lps
Specific yield/Storativity (S)	0.02	1.94* 10 ⁻⁴ to 10.51*10 ⁻²
Transmissivity (T)		32.17 to 6394

4.GROUND WATER QUALITY

4.1 Aquifer-I/Shallow Aquifer EC between 250-750 μS/cm has been observed in almost entire part of the block while 750-2250 μS/cm observed eastern, southern and western tip of the block.	4.2 Aquifer-II/Deeper Aquifer The ground water quality of deeper aquifer is suitable for drinking purpose. The EC between 250-750 μS/cm is observed in almost entire part of the block. EC between 750- 2250 μS/cm has been observed in eastern, south eastern part and western tip of the block.
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5. GROUND WATER RESOURCES

5.1 Aquifer-I/Shallow Aquifer

Ground Water Recharge Worthy Area (Sq. Km.)	327.75
Command Area (Sq.Km.)	3.04
Non-Command Area (Sq.Km.)	324.71
Total Annual Ground Water Recharge (MCM)	39.88
Natural Discharge (MCM)	2.31
Net Annual Ground Water Availability (MCM)	37.57
Existing Gross Ground Water Draft for irrigation (MCM)	16.21
Existing Gross Ground Water Draft for domestic and industrial water supply (MCM)	3.49
Existing Gross Ground Water Draft for All uses (MCM)	19.70
Provision for domestic and industrial requirement supply to 2025(MCM)	15.34
Net Ground Water Availability for future irrigation development (MCM)	5.89
Stage of Ground Water Development (%)	52.43
Category	Safe

5.2 Aquifer-II/Deeper Aquifer

Taluka	Me an thic kne ss (m)	Area in sqkm	Piezome tric head meter above bottom of confinin g layer	S	Sy	Resource in above confining layer (mcm)	Resource in confining layer (mcm)	Total resource (mcm)
Taloda	11.64	339.1	14	0.0000438	0.002	0.20793612	7.894248	8.10218412
Total								8.10218412

6. GROUND WATER RESOURCE MANAGEMENT

Net Annual Ground Water Availability (MCM)	37.57
Gross Annual Draft (MCM)	19.70
Stage of Ground Water Development (%)	52.43

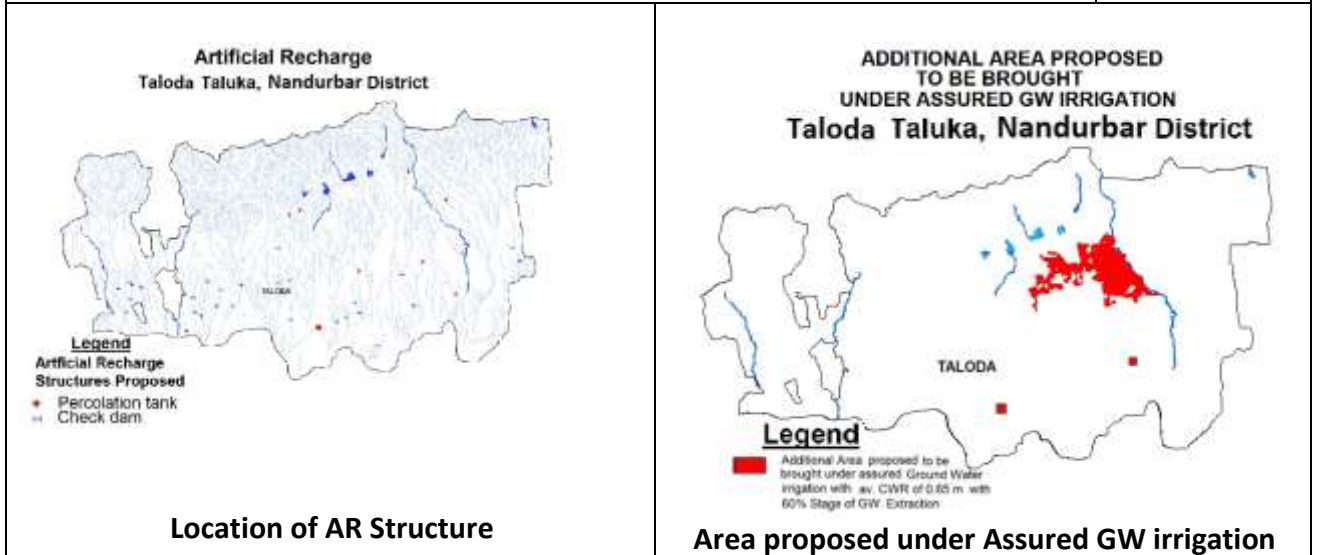
6.1 Supply Side Management

SUPPLY (MCM)

Agricultural Supply -GW	16.21
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Agricultural Supply -SW		10.53
Domestic Supply - GW		3.49
Domestic Supply - SW		0.87
Total Supply		31.10
Area of Block (Sq. Km.)		339.1
Area suitable for Artificial recharge (Sq. Km)		199.69
Type of Aquifer		Hard Rock
Area feasible for Artificial Recharge (WL >5mbgl) (Sq. Km.)		199.69
Volume of Unsaturated Zone (MCM)		399.38
Average Specific Yield		0.02
Recharge Potential (MCM)		7.99
Surplus water Available (MCM)		2.83
Proposed Structures	Percolation Tank Av. Gross Capacity-100 TCM*2 fillings = 200 TCM)	Check Dam Av. Gross Capacity-10 TCM * 3 fillings = 30 TCM
Number of Structures	10	28
Volume of Water expected to be conserved / recharged @ 75% efficiency (MCM)	1.98	0.85
RTRWH Structures – Urban Areas	No Urban area	
Households to be covered (50% with 50 m ² area)		0
Total RWH potential (MCM)		0
Rainwater harvested / recharged @ 80% runoff co-efficient		0
Estimated Expenditure (Rs. In Cr.) @ Rs.30000/-per HH		0
RTRWH & AR is economically not viable & hence, not recommended.		
6.2 Demand Side Management		
Micro irrigation techniques		
Irrigation Area (sq. km.) proposed for irrigation through Drip and Sprinkler		5.54
Water Saving by use of Drip and Sprinklers		3.16
Proposed Cropping Pattern change		Not proposed
Ground water Irrigated area under Water Intensive Crop (sq.km)		NIL
Water Saving by water use efficiency (MCM)		NIL
6.3 EXPECTED BENEFITS		
Net Ground Water Availability (MCM)		37.57
Existing Ground Water Draft for All Uses (MCM)		19.70
Present stage of Ground Water Development (%)		52.43
Additional GW resources available after Supply side interventions (MCM)		2.12
Ground Water Availability after Supply side intervention (MCM)		39.69
Additional GW resources available after Demand side interventions (MCM)		3.16
Ground Water Availability after Demand side intervention (MCM)		16.54
Stage of Ground Water Development after Supply side and Demand side Interventions (%)		41.67
Total GWR available for GW Development (MCM)		7.28
Other Interventions Proposed, if any		Not proposed

Alternate Water Sources Available	NIL
6.4 Development Plan	
Volume of water available for GWD to enhance stage of GWD to 60% (MCM)	7.28
Proposed Number of DW (@ 1.5 ham for 90% of GWR Available)	437
Proposed Number of BW (@ 1 ham for 10% of GWR Available)	73
Additional Area (sq.km.) proposed to be brought under assured GW irrigation with av. CWR of 0.65 m	11.19



10. ANNEXURES

Annexures

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Annexure-I: Salient Features of Ground Water Exploration

Sr No	Taluka	Village	Long	Lat	Altitude (m)	Type of well	Aquifer	Dilling-depth (m)	Const-depth (m)	Casing (mbgl)	AQ-Zones (m)	SWL (m)	PYT-discharge (lps)	PYT-DD (m)	Aquifer-I	Aquifer-II	Aquifer Thickness	APT-SWL	APT-discharge	APT-DD (m)	T (m ² /day)
1	Akrani	Mandvi Bk	74.295873	21.790524	532	EW	FMB	192		30	52.56-55.56, 87.54-90.84, 110.88-113.88, 185.22-190.91	24	18	—		192	12	26	9	5	47
2	Akrani	Mandvi Bk	74.294885	21.790574	533	OW	FMB	139		30	70.05-73.05, 78.88-81.71, 110.88-113.88	25.08	17.94	—		139	9	25.08	—	5.35	69.46
3	Akrani	Katri	74.090330	21.836420	353	EW	FMB	200		30	17.50-20.50, 43.83-46.67, 87.53-90.53	5.09	9.86	7.75		91	9	—	—	—	33.62
4	Akrani	Kharda	74.134993	21.785263	488	EW	FMB	200		30	32.07-35.07, 64.15-67.15, 91.58-93.98	31.25	9.86	4.85		94	8.6	—	—	—	31.2
5	Akrani	Dhadgaon	74.216846	21.823397	350	EW	FMB	200		30	10.67-13.67, 45.08-48.08, 130.42-133.42	26.42	1.74	14.58		134	9	—	—	—	0.93
6	Akkalkuwa	Thanavihir	74.041667	21.591667	182	EW	AL	57	57	—	23.50-26.50, 36.50-	17	1	—		55	12.5	—	—	—	—

											44.00, 46.00- 48.00										
7	Akkalk uwa	Chhoti Rajmohi	74.0 430 56	21.55	136	EW	AL	27	27	-	14.00- 16.00	12.8 2	5.99	8.05		26	2	-	-	-	938
8	Akkalk uwa	Jamli	74.0 041 67	21.551 389	136	EW	AL	16.7	16.7	-	5.18- 8.23, 10.70- 12.50	7.93	7.4	1.25		16	5	-	-	-	1961
9	Akkalk uwa	Molgi	74.0 182 67	21.766 670	776	EW	FMB	200		30	88.23- 91.58, 192.30- 195.30,	113. 69	4.25	15.81		196	6	-	-	-	16.81
10	Taloda	Retpada	74.0 666 67	21.601 389	190	EW	AL	60	60	-	30.00- 35.00, 52.00- 58.00	21.2 5	1	-		59	11	-	-	-	-
11	Taloda	Ichagav han	74.0 666 67	21.619 444	222	EW	AL	70	70	-	30.50- 33.50, 47.00- 51.00, 60.00- 66.00	18	0.5	-		68	13	-	-	-	-
12	Taloda	Sorapad a	74.0 944 44	21.594 444	162	EW	AL	56.44	56.44	-	22.00- 26.00, 34.00- 38.00, 42.00- 47.00, 51.50- 54.50	14	4	-		56	16	-	-	-	-
13	Taloda	Ekdhad	74.1 277 78	21.622 222	204	EW	AL	39	39	-	25.00- 37.00	18	0.8	-		39	12	-	-	-	-
14	Taloda	Valheri	74.1 277 78	21.625 000	204	EW	AL	41.8	41.8	-	21.00- 25.00, 28.00- 36.00	17.5	1	-		41	12	-	-	-	-

15	Taloda	Lobhani	74.1 416 67	21.562 500	122	EW	AL	41.99	41.99	-	28.00- 29.50, 33.50- 37.00	5.4	3.75	-	41	5	-	-	-	-
16	Taloda	Dalelpur	74.2 000 00	21.586 111	136	EW	AL	70	70	-	28.00- 31.00, 35.00- 39.00, 46.00- 48.00, 52.00- 54.00, 59.00- 61.00, 63.00- 65.00	16.5	12	-	67	15	-	-	-	-
17	Taloda	Taloda	74.2 166 67	21.558 333	120	EW	AL	45.5	45.5	-	31.00- 33.00, 34.80- 38.00	15	3.04	-	44	5	15	3.04	3.7	32.17
18	Taloda	Taloda	74.2 166 67	21.558 333	120	OW	AL	34.5	34.5	-	28.50- 30.00, 31.50- 33.50		3	-	34	3.5	15.05	-	1.12	-
19	Taloda	Sirve	74.1 027 78	21.586 111	141	EW	AL	50.85	50.85	-	25.50- 37.50, 40.50- 43.50	6.67	7.33	-	50	15	6.69	7.33	4.05	6394
20	Taloda	Sirve	74.1 027 78	21.586 111	141	OW	AL	53	53	-	25.00- 27.00, 30.50- 40.00, 42.00- 44.00	6.09	-	-	52	13.5	6.6	-	0.109	-
21	Taloda	Kharvad	74.3 375 00	21.588 889	130	EW	AL	65.4	65.4	-	32-36, 46-55, 57.5- 62.0	4.2	2.7	-	63	18	4.76	2.7	8.94	210

22	Taloda	Kharvad	74.3 375 00	21.588 889	130	OW	AL	65.6	65.6	-	23.00- 40.50			-		63	17	5.03	-	0.25	-
23	Taloda	Rampur plot	74.4 500 00	21.691 667	218	EW	AL	65.27	65.27	-	34.00- 35.00, 41.00- 46.00, 62.00- 63.00	19.8	4	-		63	7	-	-	-	-
24	Shaha da	Madkan i	74.4 625 00	21.680 556	205	EW	AL	65.6	65.6	-	27.00- 30.00, 56.00- 64.00	15.1	20	-		63	11	-	-	-	-
25	Shaha da	Kusumw ade	74.4 388 89	21.666 667	192	EW	AL	67.21	67.21	-	28.00- 32.00, 44.00- 47.00, 54.00- 64.00	15	16.5	-		66	17	-	-	-	-
26	Shaha da	Junwan a	74.4 777 78	21.608 333	156	EW	AL	30.83	30.83	-	22.50- 25.00, 28.00- 29.50	15.1 2	4	-		30	4	-	-	-	-
27	Shaha da	Godipur	74.5 111 11	21.619 444	0	EW	AL	21	21	-	19.50- 20.75	18	0.2	-		20	1.75	-	-	-	-
28	Shaha da	Kathard a Kh	74.3 972 22	21.566 667	131	EW	AL	49.76	49.76	-	25.00- 29.00, 34.00- 45.00	19.8	6	-		49	15	-	-	-	-
29	Shaha da	Palaswa de	74.3 916 67	21.475 000	120	EW	AL	38.1	38.1	-	25.00- 28.00, 31.00- 35.50, 36.50- 37.50	14.8	13.5	-		37	8.5	-	-	-	-
30	Shaha da	Mhaswa d	74.4 777 78	21.644 444	180	EW	AL	53.3	53.3	-	29.50- 32.50, 34.00- 39.00,	10.4 3	7.42	-		52	9	10.43	6.58	7.56	113.1 5

											45.00-46.00										
31	Shahada	Mhaswad	74.477778	21.64444	180	OW	AL	50	50	-	29.50-37.50, 43.00-46.00	10.85	2.64	-		49	11	10.85	-	1.06	-
32	Shahada	Nandha	74.433333	21.69444	210	EW	AL	165	165	-	29.50-31.50, 42.00-45.00, 48.00-51.00, 57.00-60.00	20.52	7	-		60	11	20.34	7	8.8	3162
33	Shahada	Nandha	74.433333	21.69444	210	OW	AL	53.5	53.5	-	29.00-31.50, 32.70-34.00, 49.00-52.00	20.63	7	-		52	7	21.13	-	0.09	-
34	Nandurbar	Nandurbar urban	74.230770	21.347427	229	EW	FMB	200		30	92.47-95.47, 116.71-128.39, 153.19-158.88	17.9	7.73	-		159	20	17.9	7.73	10.2	37.36
35	Nandurbar	Nandurbar urban	74.230597	21.347638	229	OW	FMB	200		30	116.71-122.55, 134.07-139.75, 151.11-154.11, 185.22-193.91	17.92	7.73	-		194	22	17.92	7.73	4.88	62.93
36	Nandurbar	Dhamdahi	74.224611	21.443417	140	EW	FMB	200		30	8.31-10.67, 114.61-120.17	3.52	0.2	-		120	8	-	-	-	5.51

37	Nandurbar	Pimplod	74.1 188 42	21.412 665	145	EW	FMB	200		30	29.21- 32.21, 122.55- 125.55, 145.43- 156.80, 173.87- 182.56	116. 81	5.39	-		183	26	116.81	5.39	11.03	26.37
38	Nandurbar	Pimplod	74.1 188 26	21.412 758	145	OW	FMB	200		30	20.53 - 23.57, 29.21- 40.90 , 78.88- 87.54 , 145.43- 148.43, 188.22- 190.91	112. 8	5.39	-		192	29	112.8	5.39	3.08	26.37
39	Nandurbar	Rajale	74.3 759 33	21.284 016	301	EW	FMB	157.76		30	101.25 - 106.33, 144.04 - 147.04, 149.4- 152.4	17.3	18.49	5.1		152	11	-	-	-	43.59
40	Nandurbar	Ranala	74.3 981 18	21.349 629	311	EW	FMB	200		30	193.91 - 199.59	112. 6	0.57	-		200	5.6	-	-	-	1.96
41	Nandurbar	Shinde	74.3 053 03	21.476 348	131	EW	FMB	200		30	10.67- 13.67, 29.72- 35.07, 83.14- 85.23, 136.04- 138..72	6.47	1.18	14.48		139	12.5	-	-	-	1.87
42	Nandurbar	Ashta	74.2 100 98	21.281 431	299	EW	FMB	200		30	32.22- 35.06, 93.37 - 102.21,	15.5 8	2.2	72.65		137	15	-	-	-	0.31

											134.07 - 137.07										
43	Navapur	Bhadva d	74.0 951 37	21.312 026	214	EW	FMB	200		30	19.01- 21.36, 24.36 - 29.72, 93.85- 96.17, 117.44- 120.44	14.9	3.74	-		120	12.5	14.9	3.74	30.48	13.18
44	Navapur	Bhadva d	74.0 955 01	21.312 070	214	OW	FMB	122.78		30	19.01- 21.36, 24.36 - 29.72, 93.85- 96.17, 117.44- 120.44	15	18	-		120	13	15	18	15.77	35.12
45	Navapur	Dogega on	73.9 433 61	21.280 476	150	EW	FMB	200		30	32.21 - 35.06, 125.55- 128.39, 142.75- 145.43, 173.87- 182.56	14.7	9.88	-		183	18	14.7	9.88	18.01	22.59
46	Navapur	Dogega on	73.9 428 31	21.280 607	150	OW	FMB	200		30	29.22- 32.22	14.2	meag er	-			3	14.2	meag er	1.4	33.23
47	Navapur	Jamanp ada	74.0 290 55	21.159 514	289	EW	FMB	200		30	29.72- 32.07, 93.85- 99.17, 122.78- 125.78	49.8	5.39	9.62		126	12	-	-	-	11.83
48	Navapur	Kolde	73.8 784 03	21.147 538	171	EW	FMB	200		30	26.32- 32.02, 96.70- 105.05	8.4	1.18	4.52		105	15	-	-	-	37.34

49	Navapur	Navapur	73.7 777 78	21.161 110	138	EW	FMB	200		30	14.69- 17.53, 58.59 - 61.39, 78.88- 81.71	9.75	1.74	20.23		82	9	-	-	-	3.06
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Annexure-II: Aquifer I depth to water level details in Nandurbar district

S. No.	Taluka	Village	X Long.	Y Lat.	Elevation (m)	Depth (mbgl)	Pre-monsoon-WL (mbgl)	Postmonsoon WL (mbgl)	Fluctuation (m)	RL- Pre-monsoon (m amsl)
1	Akkalkuwa	Jangthi	73.8612	21.8161	280	5	2.53	1.64	0.89	277.47
2	Akkalkuwa	Pimpalkhuta	73.9199	21.7721	421	5.5	4.12	3.64	0.48	416.88
3	Akkalkuwa	Dahel	73.9662	21.7076	613	5	4	1.43	2.57	609
4	Akkalkuwa	Palaskhobra	74.0289	21.8687	443	60	2	1.42	0.58	441
5	Akkalkuwa	Khapar	73.9333	21.5422	133.82		12.99	5.65	7.34	120.83
6	Akkalkuwa	Akkalkuva	74.0158	21.5592	125.7		12.99	6	6.99	112.71
7	Akkalkuwa	Bajri Pati	74.0092	21.7625	632.3		7.79	2.4	5.39	624.51
8	Akkalkuwa	Kathi	74.0478	21.7964	513.7		4.3	1.8	2.5	509.4
9	Akrani	Burumpada	74.4885	21.8607	1071	5	4.9	2.3	2.6	1066.1
10	Akrani	Kotbandhni	74.4857	21.8007	483	6.7	6.5	4.61	1.89	476.5
11	Akrani	Rampur	74.4468	21.6944	223	27	Dry	14.1		
12	Akrani	Goramba	74.4051	21.8298	694	5	4.9	2.4	2.5	689.1
13	Akrani	Mandvi Bk	74.2966	21.7886	519	5	Dry	1.82		
14	Akrani	Telkhedi	74.3041	21.8023	478	9	6	3.69	2.31	472
15	Akrani	Amala	74.2185	21.8584	402	4	2.5	1.1	1.4	399.5
16	Akrani	Trishul	74.3303	21.8561	264	7.5	6	1.67	4.33	258
17	Akrani	Khutwada	74.2708	21.8673	353	5	4.5	1.84	2.66	348.5
18	Akrani	Chichkhedi	74.1481	21.9158	185	8	7.5	5.2	2.3	177.5
19	Akrani	Velkhedi	74.3703	21.8644	333	6	5.5	3.13	2.37	327.5
20	Akrani	Son Khurd	74.1178	21.8725	350	13	12.5	6.23	6.27	337.5
21	Akrani	Maujapada	74.0448	21.8365	554	4.5	2.8	1.94	0.86	551.2
22	Akrani	Roshamal Kh	74.1392	21.8969	268	7.5	7.3	4.2	3.1	260.7
23	Akrani	Katri	74.0924	21.8366	332	60	4.5	1.32	3.18	327.5
24	Akrani	Bijari	74.2172	21.7538	505	6.5	6.05	2.78	3.27	498.95
25	Akrani	Valiamba	74.1958	21.705	663	4	4	2.21	1.79	659
26	Akrani	Padamund	74.1382	21.0854	534	8	7.6	4.56	3.04	526.4

S. No.	Taluka	Village	X Long.	Y Lat.	Elevation (m)	Depth (mbgl)	Pre-monsoon-WL (mbgl)	Postmonsoon WL (mbgl)	Fluctuation (m)	RL- Pre-monsoon (m amsl)
27	Akrani	Zummad	74.3036	21.7398	855	5	2.5	1.34	1.16	852.5
28	Akrani	Toranmal (june)	74.4593	21.8752	1010	5.5	5.08	3.68	1.4	1004.92
29	Akrani	Kakarda	74.3525	21.7625	592		6.7	2.7	4	585.3
30	Akrani	Khuntamodi	74.0972	21.8133	392		3.7	1	2.7	388.3
31	Akrani	Dhadgaon	74.2167	21.8303	346.15		6.49		6.49	339.66
32	Akrani	Dhadgaon-1	74.2267	21.8303	332		6.49	2	4.49	325.51
33	Akrani	Survani	74.1619	21.8303	413		8.49	2.8	5.69	404.51
34	Nandurbar	Shinde	74.3114	21.4766	133	13.5	13	6.51	6.49	120
35	Nandurbar	Vikharan	74.3609	21.4371	134	16.5	15.2	12.35	2.85	118.8
36	Nandurbar	Manjre	74.4578	21.3989	152	18	17	3.03	13.97	135
37	Nandurbar	Chaupale	74.3057	21.3664	230	15	14.1	12.36	1.74	215.9
38	Nandurbar	Gangapur	74.3178	21.2771	344	15.5	14.5	12.21	2.29	329.5
39	Nandurbar	Rajale	74.3816	21.2806	299	18	15.3	8.65	6.65	283.7
40	Nandurbar	Vaindane	74.4713	21.2621	228	18	17	13.62	3.38	211
41	Nandurbar	Mangrul	74.0493	21.4148	134	10.5	8.8	7.8	1	125.2
42	Nandurbar	Bhangda	74.0332	21.4159	136	12	4	3.65	0.35	132
43	Nandurbar	Dhanora	74.0748	21.4355	122	10	8.3	6.4	1.9	113.7
44	Nandurbar	Umaj	74.0943	21.3678	171	9.3	9.12	7.98	1.14	161.88
45	Nandurbar	Dhulwad	74.173	21.4428	134	13	12.5	11.62	0.88	121.5
46	Nandurbar	Ghoghatgaon	74.1989	21.267	313	14.8	Dry	8.52		
47	Nandurbar	Dhamdod	74.2958	21.4171	172	16.8	16.2	11.36	4.84	155.8
48	Nandurbar	Umaj	74.0897	21.3585	165	9.5	9.3	7.64	1.66	155.7
49	Nandurbar	Chakle	74.3061	21.3243	291	18	11.2	9.84	1.36	279.8
50	Nandurbar	Nagaon	74.3541	21.4047	161	18	15.3	12.36	2.94	145.7
51	Nandurbar	Khokrale	74.4631	21.3149	220	8.5	8	6.84	1.16	212
52	Nandurbar	Lahan Shahada (Korit)	74.3005	21.4609	138	13.5	8.5	3.43	5.07	129.5
53	Nandurbar	Ashti	74.2086	21.2711	291		10.2	3.5	6.7	280.8

S. No.	Taluka	Village	X Long.	Y Lat.	Elevation (m)	Depth (mbgl)	Pre-monsoon-WL (mbgl)	Postmonsoon WL (mbgl)	Fluctuation (m)	RL- Pre-monsoon (m amsl)
54	Nandurbar	Ranala	74.4	21.3558	229.07		10.59	4.5	6.09	218.48
55	Nandurbar	Nandurbar	74.2464	21.3558	230.3		10.76	5	5.76	219.54
56	Nandurbar	Sundarde-1	74.1881	21.3897	174.3		15.9	6	9.9	158.4
57	Nandurbar	Loy	74.1306	21.4067	146.61		16.3	5.5	10.8	130.31
58	Nandurbar	Ghuli	74.2536	21.4236	149.4		11.8	4.8	7	137.6
59	Nandurbar	Dekhwad	74.1717	21.3389	220		11.15	3.5	7.65	208.85
60	Navapur	Malvan	74.0525	21.2785	219	10	9.95	7.53	2.42	209.05
61	Navapur	Wanzale	74.0633	21.235	251	10	9.5	8.21	1.29	241.5
62	Navapur	Deolipada	74.0421	21.2103	255	8.5	8	6.85	1.15	247
63	Navapur	Navagaon	73.8508	21.2605	114	7.3	Dry	6.59		
64	Navapur	Menatalav (n.v.)	73.8602	21.2049	166	12	11.73	9.35	2.38	154.27
65	Navapur	Sonkhadake	73.8824	21.1226	198	13.5	11.3	8.86	2.44	186.7
66	Navapur	Bhavre	73.7679	21.1153	171	6.3	6.25	5.15	1.1	164.75
67	Navapur	Nagziri	73.8749	21.0894	213	10.5	Dry	8.38		
68	Navapur	Kokniwada	73.9086	21.2413	145	8.2	8.15	6.51	1.64	136.85
69	Navapur	Bedki	73.9347	21.1516	218	13	Dry	7.34		
70	Navapur	Vatvi	74.0551	21.3022	203	10.5	9.82	7.43	2.39	193.18
71	Navapur	Mogarani	74.1081	21.286	242	10	9.9	7.45	2.45	232.1
72	Navapur	Kareghat	73.6212	21.1413	141	9	Dry	8.23		
73	Navapur	Haldani	73.9529	21.1608	205	12.5	Dry	9.49		
74	Navapur	Khanapur	74.0415	21.1603	306	17.3	16.53	15.3	1.23	289.47
75	Navapur	Moulipada	73.986	21.2855	177	9.7	6.63	5.32	1.31	170.37
76	Navapur	Zamanzar	73.6907	21.1485	139	8.9	8.5	6.87	1.63	130.5
77	Navapur	Vadkolambi	73.8325	21.0678	193.54		7	4.8	2.2	186.54
78	Navapur	Nawapur2	73.7806	21.1525	129.17		12.7	8	4.7	116.47
79	Navapur	Viasarwadi	73.9667	21.1864	202.1		13.79	4.8	8.99	188.31
80	Navapur	Shravani	74.2042	21.2881	291.3		7.9	2.8	5.1	283.4

S. No.	Taluka	Village	X Long.	Y Lat.	Elevation (m)	Depth (mbgl)	Pre-monsoon-WL (mbgl)	Postmonsoon WL (mbgl)	Fluctuation (m)	RL- Pre-monsoon (m amsl)
81	Navapur	Bhadavad	74.0917	21.305	215.8		9.34	4.1	5.24	206.46
82	Navapur	Bhardu	73.9678	21.2033	187.7		10.99	1.6	9.39	176.71
83	Shahada	Javade-t-board	74.3884	21.6344	162	8.5	Dry	6.8		
84	Shahada	Budigavhan	74.4492	21.6294	164	60	-	-		
85	Shahada	Sulwade	74.5109	21.6453	184	12.6	Dry	9.68		
86	Shahada	Lohare	74.5761	21.5948	184	8.2	8	6.84	1.16	176
87	Shahada	Ganor	74.5271	21.685	221	18	Dry	13.62		
88	Shahada	Mandane	74.6197	21.5907	207	8.5	8.3	6.54	1.76	198.7
89	Shahada	Chandsaili	74.6759	21.5766	247	10	Dry	7.95		
90	Shahada	Ujlod	74.5933	21.5488	212	22	21.5	14.94	6.56	190.5
91	Shahada	Damarkheda	74.3923	21.5136	121	15	Dry	12.11		
92	Shahada	Sasde	74.4513	21.4548	124	14.5	Dry	9.84		
93	Shahada	Tembhe Bk	74.6078	21.4542	146	5	5	2.53	2.47	141
94	Shahada	Dongargaon	74.5248	21.5576	176	17	16.5	12.35	4.15	159.5
95	Shahada	Pusanad	74.5178	21.4542	128	11	Dry	9.84		
96	Shahada	Kakarde Bk	74.666	21.4626	188	13.5	13	9.34	3.66	175
97	Shahada	Torkheda	74.6556	21.4403	146	11	Dry	9.54		
98	Shahada	Pingane	74.4518	21.5486	138	15	Dry	9.84		
99	Shahada	Wadali-1	74.6178	21.4575	149.2		23.9	15.1	8.8	125.3
100	Shahada	Rampur	74.4464	21.6947	441		27.99	16	11.99	413.01
101	Shahada	Shahada-1	74.4761	21.5253	136.9		6.59	3	3.59	130.31
102	Shahada	Kahatool	74.5547	21.5083	165.9		11	10.55	0.45	154.9
103	Taloda	Mal	74.1033	21.6545	713	3.5	2	1.34	0.66	711
104	Taloda	Nyuban	74.3105	21.6493	190	26	24	14.2	9.8	166
105	Taloda	Taloda 2	74.2208	21.5761	112.26		11.49	5.1	6.39	100.77
106	Taloda	Rojhave	74.2167	21.6269	167		23.99	5	18.99	143.01

Annexure-III A: Aquifer II depth to water level details in Nandurbar district

Sr No	Taluka	Village	X Long	Y Lat	Altitude (m)	Type of well	Aquifer	Drilling-depth (mbgl)	Const-depth (m)	Casing (mbgl)	AQ-Zones	Pre SWL
1	Akkalkuwa	Thanavihir	74.041667	21.591667	182	EW	Alluvium	57	57	-	23.50-26.50, 36.50-44.00, 46.00-48.00	17
2	Akkalkuwa	Chhoti Rajmohi	74.0430556	21.55	136	EW	Alluvium	27	27	-	14.00-16.00	12.82
3	Akkalkuwa	Jamli	74.0041667	21.551389	136	EW	Alluvium	16.7	16.7	-	5.18-8.23, 10.70-12.50	7.93
4	Taloda	Retpada	74.066667	21.601389	190	EW	Alluvium	60	60	-	30.00-35.00, 52.00-58.00	21.25
5	Taloda	Ichagavhan	74.066667	21.619444	222	EW	Alluvium	70	70	-	30.50-33.50, 47.00-51.00, 60.00-66.00	18
6	Taloda	Sorapada	74.094444	21.594444	183	EW	Alluvium	56.44	56.44	-	22.00-26.00, 34.00-38.00, 42.00-47.00, 51.50-54.50	21
7	Taloda	Ekdhad	74.127778	21.622222	231	EW	Alluvium	39	39	-	25.00-37.00	27
8	Taloda	Valheri	74.127778	21.625000	230	EW	Alluvium	41.8	41.8	-	21.00-25.00, 28.00-36.00	26
9	Taloda	Dalelpur	74.200000	21.586111	157	EW	Alluvium	70	70	-	28.00-31.00, 35.00-39.00, 46.00-48.00, 52.00-54.00, 59.00-61.00, 63.00-65.00	21
10	Taloda	Taloda	74.216667	21.558333	143	EW	Alluvium	45.5	45.5	-	31.00-33.00, 34.80-38.00	23
11	Taloda	Sirve	74.102778	21.586111	153	EW	Alluvium	50.85	50.85	-	25.50-37.50, 40.50-43.50	12
12	Taloda	Sirve	74.102778	21.586111	152	OW	Alluvium	53	53	-	25.00-27.00, 30.50-40.00, 42.00-44.00	11

Sr No	Taluka	Village	X Long	Y Lat	Altitude (m)	Type of well	Aquifer	Drilling-depth (mbgl)	Const-depth (m)	Casing (mbgl)	AQ-Zones	Pre SWL
13	Shahada	Rampur	74.450000	21.691667	246	EW	Alluvium	65.27	65.27	-	34.00-35.00, 41.00-46.00, 62.00-63.00	28
14	Shahada	Madkani	74.462500	21.680556	221	EW	Alluvium	65.6	65.6	-	27.00-30.00, 56.00-64.00	16

Annexure-III B: Aquifer II depth to water level details in Nandurbar district

Sr No	Taluka	Village	X Long	Y Lat	Altitude (m)	Type of well	Aquifer	Drilling depth (mbgl)	Const-depth (m)	Casing (mbgl)	AQ- Zones	Post SWL
1	Akrani	Mandvi Bk	74.295873	21.790524	532	EW	FMB	192		30	52.56-55.56, 87.54-90.84, 110.88-113.88, 185.22-190.91	24.39
2	Akrani	Mandvi Bk	74.2948849	21.790574	533	OW	FMB	139		30	70.05-73.05, 78.88-81.71, 110.88-113.88	25.08
3	Akrani	Katri	74.090330	21.836420	353	EW	FMB	200		30	17.50-20.50 , 43.83-46.67, 87.53-90.53	5.09
4	Akrani	Kharda	74.134993	21.785263	488	EW	FMB	200		30	32.07-35.07, 64.15-67.15, 91.58-93.98	31.25
5	Akrani	Dhadgaon	74.216846	21.823397	350	EW	FMB	200		30	10.67-13.67, 45.08-48.08, 130.42-133.42	26.42
6	Akkalkuwa	Molgi	74.018267	21.766670	776	EW	FMB	200		30	88.23-91.58, 192.30-195.30,	113.69
7	Taloda	Sorapada	74.094444	21.594444	162	EW	Alluvium	56.44	56.44	-	22.00-26.00, 34.00-38.00, 42.00-47.00, 51.50-54.50	14
8	Taloda	Ekdhad	74.127778	21.622222	204	EW	Alluvium	39	39	-	25.00-37.00	18

Sr No	Taluka	Village	X Long	Y Lat	Altitude (m)	Type of well	Aquifer	Drilling depth (mbgl)	Const-depth (m)	Casing (mbgl)	AQ- Zones	Post SWL
9	Taloda	Valheri	74.127778	21.625000	204	EW	Alluvium	41.8	41.8	—	21.00-25.00, 28.00-36.00	17.5
10	Taloda	Lobhani	74.141667	21.562500	122	EW	Alluvium	41.99	41.99	—	28.00-29.50, 33.50-37.00	5.4
11	Taloda	Dalelpur	74.200000	21.586111	136	EW	Alluvium	70	70	—	28.00-31.00, 35.00-39.00, 46.00-48.00, 52.00-54.00, 59.00-61.00, 63.00-65.00	16.5
12	Taloda	Taloda	74.216667	21.558333	120	EW	Alluvium	45.5	45.5	—	31.00-33.00, 34.80-38.00	15
13	Taloda	Sirve	74.102778	21.586111	141	EW	Alluvium	50.85	50.85	—	25.50-37.50, 40.50-43.50	6.67
14	Taloda	Sirve	74.102778	21.586111	141	OW	Alluvium	53	53	—	25.00-27.00, 30.50-40.00, 42.00-44.00	6.09
15	Taloda	Kharvad	74.337500	21.588889	130	EW	Alluvium	65.4	65.4	—	32-36, 46-55, 57.5-62.0	4.2
16	Shahada	Rampur	74.450000	21.691667	218	EW	Alluvium	65.27	65.27	—	34.00-35.00, 41.00-46.00, 62.00-63.00	19.8
17	Shahada	Madkani	74.462500	21.680556	205	EW	Alluvium	65.6	65.6	—	27.00-30.00, 56.00-64.00	15.1

Sr No	Taluka	Village	X Long	Y Lat	Altitude (m)	Type of well	Aquifer	Drilling depth (mbgl)	Const-depth (m)	Casing (mbgl)	AQ- Zones	Post SWL
18	Shahada	Kusumwade	74.438889	21.666667	192	EW	Alluvium	67.21	67.21	-	28.00-32.00, 44.00-47.00, 54.00-64.00	15
19	Shahada	Junwana	74.477778	21.608333	156	EW	Alluvium	30.83	30.83	-	22.50-25.00, 28.00-29.50	15.12
20	Shahada	Godipur	74.5111111	21.619444	0	EW	Alluvium	21	21	-	19.50-20.75	18
21	Shahada	Katharda Kh	74.397222	21.566667	131	EW	Alluvium	49.76	49.76	-	25.00-29.00, 34.00-45.00	19.8
22	Shahada	Palaswade	74.391667	21.475000	120	EW	Alluvium	38.1	38.1	-	25.00-28.00, 31.00-35.50, 36.50-37.50	14.8
23	Shahada	Mhaswad	74.477778	21.644444	180	EW	Alluvium	53.3	53.3	-	29.50-32.50, 34.00-39.00, 45.00-46.00	10.43
24	Shahada	Mhaswad	74.477778	21.644444	180	OW	Alluvium	50	50	-	29.50-37.50, 43.00-46.00	10.85
25	Shahada	Nandha	74.4333333	21.694444	210	EW	Alluvium	165	165	-	29.50-31.50, 42.00-45.00, 48.00-51.00, 57.00-60.00	20.52
26	Shahada	Nandha	74.4333333	21.694444	210	OW	Alluvium	53.5	53.5	-	29.00-31.50, 32.70-34.00, 49.00-52.00	20.63

Sr No	Taluka	Village	X Long	Y Lat	Altitude (m)	Type of well	Aquifer	Drilling depth (mbgl)	Const-depth (m)	Casing (mbgl)	AQ- Zones	Post SWL
27	Nandurbar	Nandurbar urban	74.230770	21.347427	229	EW	FMB	200		30	92.47- 95.47 , 116.71-128.39, 153.19-158.88	17.9
28	Nandurbar	Nandurbar urban	74.230597	21.347638	229	OW	FMB	200		30	116.71-122.55, 134.07-139.75, 151.11-154.11, 185.22-193.91	17.92
29	Nandurbar	Dhamdai	74.224611	21.443417	140	EW	FMB	200		30	8.31- 10.67 , 114.61-120.17	3.52
30	Nandurbar	Pimplod	74.118842	21.412665	145	EW	FMB	200		30	29.21- 32.21, 122.55- 125.55, 145.43- 156.80, 173.87- 182.56	116.81
31	Nandurbar	Pimplod	74.118826	21.412758	145	OW	FMB	200		30	20.53 - 23.57, 29.21- 40.90 , 78.88- 87.54 , 145.43- 148.43, 188.22- 190.91	112.8
32	Nandurbar	Rajale	74.375933	21.284016	301	EW	FMB	157.76		30	101.25 -106.33, 144.04 -147.04, 149.4- 152.4	17.3
33	Nandurbar	Ranala	74.398118	21.349629	311	EW	FMB	200		30	193.91 -199.59	112.6

Sr No	Taluka	Village	X Long	Y Lat	Altitude (m)	Type of well	Aquifer	Drilling depth (mbgl)	Const-depth (m)	Casing (mbgl)	AQ- Zones	Post SWL
34	Nandurbar	Shinde	74.305303	21.476348	131	EW	FMB	200		30	10.67-13.67, 29.72-35.07, 83.14-85.23, 136.04-138..72	6.47
35	Nandurbar	Ashta	74.210098	21.281431	299	EW	FMB	200		30	32.22- 35.06, 93.37 - 102.21, 134.07 - 137.07	15.58
36	Navapur	Bhadvad	74.095137	21.312026	214	EW	FMB	200		30	19.01- 21.36, 24.36 - 29.72, 93.85- 96.17, 177.44- 120.44	14.9
37	Navapur	Bhadvad	74.095501	21.312070	214	OW	FMB	122.78		30	19.01- 21.36, 24.36 - 29.72, 93.85- 96.17, 117.44- 120.44	15
38	Navapur	Dogegaon	73.943361	21.280476	150	EW	FMB	200		30	32.21 -35.06, 125.55- 128.39, 142.75- 145.43, 173.87- 182.56	14.7
39	Navapur	Dogegaon	73.942831	21.280607	150	OW	FMB	200		30	29.22-32.22	14.2
40	Navapur	Jamanpada	74.029055	21.159514	289	EW	FMB	200		30	29.72- 32.07, 93.85- 99.17, 122.78- 125.78	49.8
41	Navapur	Kolde	73.878403	21.147538	171	EW	FMB	200		30	26.32- 32.02, 96.70- 105.05	8.4

Sr No	Taluka	Village	X Long	Y Lat	Altitude (m)	Type of well	Aquifer	Drilling depth (mbgl)	Const-depth (m)	Casing (mbgl)	AQ- Zones	Post SWL
42	Navapur	Navapur	73.777778	21.161110	138	EW	FMB	200		30	14.69-17.53, 58.59 - 61.39, 78.88-81.71	9.75

Annexure-IV: Soil Infiltration Test data

DATA SHEET FOR INFILTRATION TEST (AAP 2019-20)	
Date	28.02.2020
Uniqui ID No.	SITENONAND-01
AAP	2019-20
Village	Loy
Location	In the premises of Gram Panchayat office, Loy
Taluka	Nandurbar
District	Nandurbar
Coordinates	21.419611, 74.129875
Elevation/ RL (m amsl)	141
Initial water level	15.0 cm
Geology	Deccan Basalt
soil Type	Brown to Black cotton soil, mixed with clayey material, fine to medium grained
Final infiltration rate	4.8 cm/hr

Sr. No.	Clock Time	Duration (minutes)	Cumulative Time (minutes)	Water level depth (cm)	Infiltrated water depth (cm)	Infiltration Rate (cm/hr)	Remarks
0	15:05	0	0	22.2			
1	15:06	1	1	21.4	0.8	48	
2	15:07	1	2	20.7	0.7	42	
3	15:08	1	3	20.2	0.5	30	
4	15:09	1	4	19.8	0.4	24	
5	15:10	1	5	19.4	0.4	24	
6	15:11	1	6	19	0.4	24	
7	15:12	1	7	18.6	0.4	24	
8	15:13	1	8	18.2	0.4	24	

Sr. No.	Clock Time	Duration (minutes)	Cumulative Time (minutes)	Water level depth (cm)	Infiltrated water depth (cm)	Infiltration Rate (cm/hr)	Remarks
9	15:14	1	9	17.8	0.4	24	
10	15:15	1	10	17.4	0.4	24	
11	15:17	2	12	16.5	0.9	27	
12	15:19	2	14	15.7	0.8	24	
13	15:21	2	16	15	0.7	21	
14	15:23	2	18	22	0.8	24	water filled upto 22.8 cm
15	15:25	2	20	21.2	0.8	24	
16	15:30	5	25	19.8	1.4	16.8	
17	15:35	5	30	18.6	1.2	14.4	
18	15:40	5	35	17.4	1.2	14.4	
19	15:45	5	40	16.4	1	12	
20	15:50	5	45	21.7	0.8	9.6	water filled upto 22.5 cm
21	15:55	5	50	21	0.7	8.4	
22	16:05	10	60	19.8	1.2	7.2	
23	16:15	10	70	18.8	1	6	
24	16:25	10	80	18	0.8	4.8	
25	16:35	10	90	17.2	0.8	4.8	
26	16:45	10	100	16.4	0.8	4.8	
27	17:05	20	120	14.8	1.6	4.8	
28	17:25	20	140	19.7	1.6	4.8	water filled upto 21.3 cm
29	17:45	20	160	18.1	1.6	4.8	

DATA SHEET FOR INFILTRATION TEST (AAP 2019-20)

Date	03.03.2020
Uniqui ID No.	SITENONAND-02
AAP	2019-20
Village	Waghoda
Location	Adjacent to Gram Panchayat office, Waghode
Taluka	Shahada
District	Nandurbar
Coordinates	21.581101, 74.391173
Elevation/ RL (m amsl)	136
Initial water level	14.2 cm
Geology	Deccan Basalt
Soil Type	Brown to Black cotton soil, mixed with clayey material, fine to medium grained
Final infiltration rate	2.4 cm/hr

Sr. No.	Clock Time	Duration (minutes)	Cumulative Time (minutes)	Water level depth (cm)	Infiltrated water depth (cm)	Infiltration Rate (cm/hr)	Remarks
0	14:50	0	0	22.6			
1	14:51	1	1	22.1	0.5	30	
2	14:52	1	2	22	0.1	6	
3	14:53	1	3	21.8	0.2	12	
4	14:54	1	4	21.7	0.1	6	
5	14:55	1	5	21.6	0.1	6	
6	14:56	1	6	21.4	0.2	12	
7	14:57	1	7	21.3	0.1	6	
8	14:58	1	8	21.1	0.2	12	
9	14:59	1	9	21	0.1	6	

Sr. No.	Clock Time	Duration (minutes)	Cumulative Time (minutes)	Water level depth (cm)	Infiltrated water depth (cm)	Infiltration Rate (cm/hr)	Remarks
10	15:00	1	10	20.9	0.1	6	
11	15:02	2	12	20.7	0.2	6	
12	15:04	2	14	20.5	0.2	6	
13	15:06	2	16	20.3	0.2	6	
14	15:08	2	18	20.1	0.2	6	
15	15:10	2	20	19.9	0.2	6	
16	15:15	5	25	19.6	0.3	3.6	
17	15:20	5	30	19.3	0.3	3.6	
18	15:25	5	35	19	0.3	3.6	
19	15:30	5	40	18.6	0.4	4.8	
20	15:35	5	45	18.3	0.3	3.6	
21	15:40	5	50	18.1	0.2	2.4	
22	15:50	10	60	17.6	0.5	3	
23	16:00	10	70	17.2	0.4	2.4	
24	16:10	10	80	16.8	0.4	2.4	
25	16:20	10	90	16.4	0.4	2.4	
26	16:30	10	100	16	0.4	2.4	
27	16:40	20	120	15.2	0.8	2.4	

Annexure-V: Water Level trend (2010-2019)

Sr. No.	Taluka	Village	Y Latitude	X Longitude	Depth	Year	Pre-monsoon water level (mbgl)	Post-monsoon water level (mbgl)	Pre-trend (m/year)		Post-trend (m/year)	
									Rise	Fall	Rise	Fall
1	Akkalkuwa	Gavhali	21.5306	73.85		2019	11	2	0.172		0.445	
2	Akkalkuwa	Khapar	21.5319	73.9319		2019	7	0.2		-0.023		-0.371
3	Akkalkuwa	Khapar	21.5333	73.9333		2019	12.99	5.65	0.342		0.091	
4	Akkalkuwa	Akkalkuva	21.5556	74.0194		2019	12	1.5	0.214			-0.376
5	Akkalkuwa	Akkalkuva	21.5619	74.0158		2019	12.99	6	0.378			-0.103
6	Akkalkuwa	Digiamba	21.5708	73.9597		2019	9	1.9	0.298		0.420	
7	Akkalkuwa	Karanpada	21.5725	74.0044		2019	11	0.4	0.610		0.488	
8	Akkalkuwa	Raisingpur	21.5744	73.9411		2019	11.5	0.9	0.186			-0.339
9	Akkalkuwa	Bajri Pati	21.7553	74.0092		2019	7.79	2.4	0.788			-0.050
10	Akkalkuwa	Kathi	21.7875	74.0478		2019	4.3	1.8		-0.379	0.221	
11	Akrani	Bijari	21.7517	74.2189		2019	6	0.3	0.263			-0.107
12	Akrani	Kakarda	21.7533	74.3525		2019	6.7	2.7	0.252		0.111	
13	Akrani	Khuntamodi	21.8056	74.0972		2019	3.7	1	0.026		0.065	
14	Akrani	Dhadgaon	21.8172	74.2222		2019	10	0.4	0.167			-0.073
15	Akrani	Dhadgaon June_Pz	21.825	74.2125		2019						-0.322
16	Akrani	Dhadgaon-1	21.8267	74.2267		2019	6.49	2	0.17791			-0.098
17	Akrani	Dhanaje Bk	21.8319	74.2361		2019	6.5	0.25	0.24424			-0.008
18	Akrani	Umarani kh	21.8417	74.2194		2019	7.5	1		- 0.0024		-0.191
19	Nandurbar	Ashti	21.2769	74.2086		2019	10.2	3.5	0.293			-0.149
20	Nandurbar	Shanimandal	21.2792	74.3472		2019	14.8	2.5	0.195			-0.084

21	Nandurbar	Rajale	21.2819	74.3778		2019	12.2	3	0.315		0.611	
22	Nandurbar	Dhandane	21.3306	74.3472		2019	6.5	1.2		-0.048	0.021	
23	Nandurbar	Dhekwad	21.3389	74.1708		2019	11.7	1.9	0.502			-0.062
24	Nandurbar	Dekhwad	21.3422	74.1717		2019	11.15	3.5	0.093			-0.397
25	Nandurbar	Ranala	21.35	74.4		2019	10.59	4.5	0.440		0.205	
26	Nandurbar	Vavad	21.3528	74.3181		2019	11.3	2.2		-0.062	0.149	
27	Nandurbar	Nandurbar	21.3542	74.2375		2019	8.9	0.2		-0.201	0.025	
28	Nandurbar	Karli	21.3569	74.4308		2019	9.25	2	0.014		0.337	
29	Nandurbar	Nandurbar	21.3619	74.2464		2019	10.76	5	0.076			-0.083
30	Nandurbar	Akarale	21.3667	74.375		2019	9.3	0.9	0.107			-0.084
31	Nandurbar	Sundarde	21.3847	74.1931		2019	13.4	2.7	0.235		0.408	
32	Nandurbar	Sundarde-1	21.3886	74.1881		2019	15.9	6	0.704			-0.087
33	Nandurbar	Loy	21.4153	74.1306		2019	16.3	5.5	0.769		0.531	
34	Nandurbar	Loya	21.4236	74.3944		2019	16.5	3.7	0.754		0.427	
35	Nandurbar	Ghuli	21.4311	74.2536		2019	11.8	4.8	0.193		0.339	
36	Nandurbar	Dhanora	21.4406	74.0769		2019	7.1	1.6	0.176		0.142	
37	Nandurbar	Patharai	21.4653	74.2222		2019	12.5	2.5		-0.140	0.107	
38	Nandurbar	Samsherpur	21.4764	74.3361		2019	12.3	0.7		-0.129		-0.174
39	Nawapur	Vadkolambi	21.0667	73.8325		2019	7	4.8		-0.072		-0.099
40	Nawapur	Vadkalambiob	21.0669	73.8347		2019	6.2	2.1		-0.100		-0.091
41	Nawapur	Kamod	21.0958	73.9208		2019	7.4	2	0.109		0.342	
42	Nawapur	Jamtalav	21.1181	73.8208		2019	9.95	0.1	0.049		0.115	
43	Nawapur	Khokarwade	21.1528	73.6083		2019	6.35	1.1	0.023		0.154	
44	Nawapur	Lakkadkot	21.1583	73.5875		2019	6.3	0.9	0.075			-0.015
45	Nawapur	Vadkhut	21.1611	73.9111		2019	5.5	1.1		-0.066	0.026	
46	Nawapur	Nawapur2	21.1639	73.7806		2019	12.7	8	0.043		0.084	
47	Nawapur	Visarwadi	21.1806	73.9667		2019	12.7	0.5		-0.064		-0.548

48	Nawapur	Viasarwadi	21.1833	73.9667		2019	13.79	4.8	0.786			-0.344
49	Nawapur	Bhardu	21.2144	73.9678		2019	10.99	1.6	0.631			-0.098
50	Nawapur	Kadwan	21.2297	73.9753		2019	7.95	0.1	0.289		0.014	
51	Nawapur	Dokare	21.2472	73.8667		2019	6.1	1.2	0.043			-0.055
52	Nawapur	Kolvihir	21.2472	74.0903		2019	7.9	1.1	0.266			-0.016
53	Nawapur	Anjane	21.2597	73.9139		2019	11.9	1.3	0.042			-0.185
54	Nawapur	Dogegaon	21.2811	73.9431		2019	11.2	1.9	0.034			-0.263
55	Nawapur	Mograni	21.2833	74.1167		2019	6.7	0.3	0.127			-0.003
56	Nawapur	Shravani	21.2856	74.2042		2019	7.9	2.8	0.155			-0.039
57	Nawapur	Shravani	21.2861	74.0214		2019	7.1	1.4	0.085			-0.046
58	Nawapur	Nijampur	21.3056	73.9917		2019	7.1	0.1		-0.031	0.059	
59	Nawapur	Bhadavad	21.3083	74.0917		2019	9.34	4.1	0.064			-0.174
60	Shahada	Wadali-1	21.4556	74.6178		2019	23.9	15.1		-1.641	0.220	
61	Shahada	Kakarde kh	21.4625	74.6694		2019	12.5	6.5	0.091			-0.086
62	Shahada	Kukwal	21.4694	74.575		2019	13.4	3.6		-0.206	0.111	
63	Shahada	Jayanagar	21.4958	74.6083		2019			0.045		0.448	
64	Shahada	Sonwad	21.5097	74.5222		2019	12.1	3	0.005			-0.431
65	Shahada	Shahada-1	21.5272	74.4761		2019	6.59	3	0.021		0.400	
66	Shahada	Manmodya	21.5436	74.7019		2019	6.7	0.7	0.129			-0.004
67	Shahada	Dongargaon	21.5575	74.5236		2019	13.2	4.7		-0.668		-0.077
68	Shahada	Mandane	21.5919	74.6236		2019	7.25	1.8		-0.093		-0.110
69	Shahada	Gogapur	21.6111	74.5708		2019	11.2	5		-0.035		-0.200
70	Shahada	Rampur	21.6944	74.4464		2019	27.99	16	0.670		0.595	
71	Shahada	Kotbandhani	21.7125	74.5125		2019	6.9	1	0.085		0.138	
72	Taloda	Taloda 2	21.5667	74.2208		2019	11.49	5.1	0.607		0.365	
73	Taloda	Shirwe	21.5875	74.1017		2019	14	3	0.225		0.222	
74	Taloda	Rojhave	21.6167	74.2167		2019	23.99	5	1.176			-0.470

75	Taloda	Gopalpur	21.6367	74.2425		2019	21.2	13.5	0.010		0.273	
76	Taloda	Horpada	21.6444	74.1722		2019	5.5		0.171		0.098	

Annexure-VI: Aquifer I Chemical Analysis of ground water samples

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
					µS/cm															
1	Akkalkuwa	Visarwadi	NHS	7.5	1046	439	554	40	1.85	86	53	0	404	78	44	68	0.55		0.67969	2.06329
2	Akkalkuwa	Kathi	NHS	7.6	696	270	368	25	0.66	86	13	0	268	46	24	37	0.33		0.60326	1.00525
3	Akkalkuwa	Jangthi	KOW-2019	7.9	580	159.4	377	22.08	8	59.9	24.2	0	229.4	30.8	9	11	0.18		0.51393	1.22611
4	Akkalkuwa	Dahel	KOW-2019	8	369	94.6	240	23.36	7	31.9	15.2	0	136.6	30.8	10	9	0.22		0.70962	0.60668
5	Akkalkuwa	Palaskhobra	KOW-2019	7.7	411	114.5	267	28.39	8.6	43.9	17.2	0	175.7	15.4	8	9	0.04	8.68	0.77863	0.73031
6	Akkalkuwa	Korai	GSDA	7.8	NA	174	352	-	-	NA	NA	-	-	42	20	3	0.1	0.15	-	-
7	Akkalkuwa	Korai	GSDA	7.7	NA	190	425	-	-	NA	NA	-	-	80	38	4	0.1	0.16	-	-
8	Akkalkuwa	Korai	GSDA	7.1	NA	264	596	-	-	NA	NA	-	-	110	40	8	0.1	0.11	-	-
9	Akkalkuwa	Korai	GSDA	7.0	NA	192	406	-	-	NA	NA	-	-	62	32	8	0.7	0.26	-	-
10	Akkalkuwa	Korai	GSDA	7.0	NA	180	415	-	-	NA	NA	-	-	80	31	3	0.2	0.16	-	-
11	Akkalkuwa	Korai	GSDA	7.2	NA	230	455	-	-	NA	NA	-	-	56	32	8	0.1	0.26	-	-
12	Akkalkuwa	Gotpada	GSDA	7.7	NA	212	370	-	-	NA	NA	-	-	46	28	4	0.2	0.16	-	-
13	Akkalkuwa	Gotpada	GSDA	7.8	NA	244	452	-	-	NA	NA	-	-	72	33	10	0.3	0.26	-	-
14	Akkalkuwa	Gotpada	GSDA	7.6	NA	190	389	-	-	NA	NA	-	-	40	30	9	0.1	0.11	-	-
15	Akkalkuwa	Gotpada	GSDA	7.8	NA	190	371	-	-	NA	NA	-	-	38	28	4	0.2	0.24	-	-
16	Akkalkuwa	Gotpada	GSDA	7.9	NA	186	363	-	-	NA	NA	-	-	34	30	3	0.1	0.16	-	-
17	Akkalkuwa	Gotpada	GSDA	8.0	NA	168	318	-	-	NA	NA	-	-	44	15	3	0.1	0.32	-	-
18	Akkalkuwa	Gotpada	GSDA	7.9	NA	140	253	-	-	NA	NA	-	-	30	11	2	0.1	0.16	-	-
19	Akkalkuwa	Gotpada	GSDA	7.7	NA	180	351	-	-	NA	NA	-	-	44	10	3	0.1	0.24	-	-
20	Akkalkuwa	Kaulli	GSDA	7.8	NA	248	427	-	-	NA	NA	-	-	78	20	4	0.4	0.15	-	-
21	Akkalkuwa	Kaulli	GSDA	7.8	NA	224	409	-	-	NA	NA	-	-	52	18	3	0.2	0.20	-	-
22	Akkalkuwa	Jambhipani	GSDA	7.7	NA	252	602	-	-	NA	NA	-	-	62	11	5	0.6	0.16	-	-
23	Akkalkuwa	Jambhipani	GSDA	7.8	NA	248	487	-	-	NA	NA	-	-	50	18	6	0.1	0.18	-	-
24	Akkalkuwa	Jambhipani	GSDA	8.0	NA	98	241	-	-	NA	NA	-	-	18	8	7	0.4	0.26	-	-
25	Akkalkuwa	Jambhipani	GSDA	7.8	NA	174	308	-	-	NA	NA	-	-	30	11	3	0.6	0.28	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
					µS/cm															
26	Akkalkuwa	Razani	GSDA	7.8	NA	172	355	-	-	NA	NA	-	-	36	13	3	0.3	0.16	-	-
27	Akkalkuwa	Wadli	GSDA	7.8	NA	182	344	-	-	NA	NA	-	-	30	12	1	0.4	0.24	-	-
28	Akkalkuwa	Khapar	GSDA	7.3	NA	198	561	-	-	NA	NA	-	-	122	26	10	0.2	0.18	-	-
29	Akkalkuwa	Udepur Chhote	GSDA	7.6	NA	220	536	-	-	NA	NA	-	-	44	23	3	0.1	0.17	-	-
30	Akkalkuwa	Guliumbar	GSDA	7.2	NA	166	359	-	-	NA	NA	-	-	70	15	1	0.1	0.34	-	-
31	Akkalkuwa	Debramal	GSDA	7.2	NA	178	308	-	-	NA	NA	-	-	48	10	3	0.3	0.20	-	-
32	Akkalkuwa	Debramal	GSDA	7.1	NA	186	318	-	-	NA	NA	-	-	46	2	3	0.7	0.15	-	-
33	Akkalkuwa	Debramal	GSDA	7.3	NA	176	322	-	-	NA	NA	-	-	42	16	3	0.8	0.25	-	-
34	Akkalkuwa	Debramal	GSDA	7.2	NA	144	322	-	-	NA	NA	-	-	42	18	3	0.1	0.12	-	-
35	Akkalkuwa	Debramal	GSDA	7.4	NA	132	309	-	-	NA	NA	-	-	64	10	3	0.1	0.20	-	-
36	Akkalkuwa	Debramal	GSDA	7.5	NA	156	309	-	-	NA	NA	-	-	40	4	11	0.1	0.13	-	-
37	Akkalkuwa	Kanjala	GSDA	7.7	NA	178	346	-	-	NA	NA	-	-	54	12	8	0.1	0.26	-	-
38	Akkalkuwa	Kanjala	GSDA	7.8	NA	186	378	-	-	NA	NA	-	-	52	14	9	0.8	0.16	-	-
39	Akkalkuwa	Kanjala	GSDA	7.4	NA	174	333	-	-	NA	NA	-	-	50	10	2	0.1	0.18	-	-
40	Akkalkuwa	Wadibar	GSDA	7.2	NA	122	217	-	-	NA	NA	-	-	32	3	1	0.1	0.20	-	-
41	Akkalkuwa	Urmilamal	GSDA	7.4	NA	180	314	-	-	NA	NA	-	-	40	10	8	0.1	0.13	-	-
42	Akkalkuwa	Bedakund	GSDA	7.5	NA	180	226	-	-	NA	NA	-	-	28	4	3	0.2	0.20	-	-
43	Akkalkuwa	Manibeli	GSDA	7.4	NA	146	290	-	-	NA	NA	-	-	48	4	2	0.1	0.20	-	-
44	Akkalkuwa	Manibeli	GSDA	7.6	NA	134	280	-	-	NA	NA	-	-	50	2	3	0.2	0.15	-	-
45	Akkalkuwa	Manibeli	GSDA	7.8	NA	144	303	-	-	NA	NA	-	-	54	3	5	0.2	0.40	-	-
46	Akkalkuwa	Manibeli	GSDA	7.2	NA	150	343	-	-	NA	NA	-	-	56	2	10	0.1	0.16	-	-
47	Akkalkuwa	Manibeli	GSDA	7.0	NA	136	238	-	-	NA	NA	-	-	32	5	3	0.1	0.08	-	-
48	Akkalkuwa	Dhankhedi	GSDA	7.0	NA	142	308	-	-	NA	NA	-	-	44	3	4	0.2	0.10	-	-
49	Akkalkuwa	Dhankhedi	GSDA	7.1	NA	128	261	-	-	NA	NA	-	-	40	8	3	0.1	0.24	-	-
50	Akkalkuwa	Dhankhedi	GSDA	7.6	NA	122	229	-	-	NA	NA	-	-	28	4	5	0.3	0.11	-	-
51	Akkalkuwa	Dhankhedi	GSDA	7.3	NA	130	253	-	-	NA	NA	-	-	36	3	7	0.1	0.36	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
					µS/cm															
52	Akkalkuwa	Jangthi	GSDA	7.6	NA	144	259	-	-	NA	NA	-	-	24	2	7	0.2	0.12	-	-
53	Akkalkuwa	Jangthi	GSDA	7.7	NA	132	311	-	-	NA	NA	-	-	46	8	9	0.6	0.03	-	-
54	Akkalkuwa	Jangthi	GSDA	7.7	NA	156	282	-	-	NA	NA	-	-	24	10	2	0.1	0.20	-	-
55	Akkalkuwa	Jangthi	GSDA	7.3	NA	130	266	-	-	NA	NA	-	-	36	8	4	0.2	0.10	-	-
56	Akkalkuwa	Jangthi	GSDA	7.6	NA	140	238	-	-	NA	NA	-	-	40	6	3	0.1	0.03	-	-
57	Akkalkuwa	Jangthi	GSDA	7.7	NA	162	289	-	-	NA	NA	-	-	20	5	1	0.4	0.11	-	-
58	Akkalkuwa	Jangthi	GSDA	7.3	NA	134	266	-	-	NA	NA	-	-	36	3	3	0.3	0.20	-	-
59	Akkalkuwa	Jamkhurd	GSDA	7.2	NA	68	188	-	-	NA	NA	-	-	44	1	1	0.1	0.14	-	-
60	Akkalkuwa	Choplaipada	GSDA	7.6	NA	96	208	-	-	NA	NA	-	-	36	1	1	0.1	0.25	-	-
61	Akkalkuwa	Dadipada	GSDA	7.2	NA	96	198	-	-	NA	NA	-	-	38	1	1	0.1	0.11	-	-
62	Akkalkuwa	Malpada	GSDA	7.6	NA	246	375	-	-	NA	NA	-	-	30	10	2	0.7	0.10	-	-
63	Akkalkuwa	Malpada	GSDA	7.5	NA	244	398	-	-	NA	NA	-	-	50	2	2	0.6	0.14	-	-
64	Akkalkuwa	Malpada	GSDA	7.0	NA	206	352	-	-	NA	NA	-	-	28	9	5	0.1	0.18	-	-
65	Akkalkuwa	Malpada	GSDA	7.1	NA	244	339	-	-	NA	NA	-	-	30	6	6	0.1	0.20	-	-
66	Akkalkuwa	Malpada	GSDA	7.0	NA	244	336	-	-	NA	NA	-	-	32	3	7	0.3	0.06	-	-
67	Akkalkuwa	Malpada	GSDA	7.0	NA	244	403	-	-	NA	NA	-	-	40	3	4	0.2	0.13	-	-
68	Akkalkuwa	Malpada	GSDA	7.4	NA	220	386	-	-	NA	NA	-	-	44	8	3	0.3	0.10	-	-
69	Akkalkuwa	Malpada	GSDA	7.2	NA	254	410	-	-	NA	NA	-	-	48	3	2	0.2	0.13	-	-
70	Akkalkuwa	Malpada	GSDA	7.2	NA	254	406	-	-	NA	NA	-	-	52	2	1	0.2	0.12	-	-
71	Akkalkuwa	Jamana	GSDA	7.4	NA	164	312	-	-	NA	NA	-	-	42	3	2	0.3	0.16	-	-
72	Akkalkuwa	Jamana	GSDA	7.3	NA	188	298	-	-	NA	NA	-	-	28	3	3	0.3	0.12	-	-
73	Akkalkuwa	Jamana	GSDA	7.4	NA	168	327	-	-	NA	NA	-	-	36	3	3	0.3	0.10	-	-
74	Akkalkuwa	Jamana	GSDA	7.0	NA	190	302	-	-	NA	NA	-	-	28	3	3	0.1	0.20	-	-
75	Akkalkuwa	Jamana	GSDA	7.0	NA	194	290	-	-	NA	NA	-	-	26	2	2	0.2	0.13	-	-
76	Akkalkuwa	Jamana	GSDA	7.1	NA	194	293	-	-	NA	NA	-	-	30	2	1	0.1	0.10	-	-
77	Akkalkuwa	Jamana	GSDA	7.2	NA	194	312	-	-	NA	NA	-	-	34	2	4	0.1	0.20	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
					µS/cm															
78	Akkalkuwa	Jamana	GSDA	7.0	NA	170	275	-	-	NA	NA	-	-	36	3	4	0.2	0.17	-	-
79	Akkalkuwa	Jamana	GSDA	7.2	NA	190	299	-	-	NA	NA	-	-	28	2	4	0.3	0.19	-	-
80	Akkalkuwa	Jamana	GSDA	7.0	NA	170	301	-	-	NA	NA	-	-	30	2	3	0.3	0.21	-	-
81	Akkalkuwa	Jamana	GSDA	7.1	NA	170	302	-	-	NA	NA	-	-	42	3	3	0.3	0.03	-	-
82	Akkalkuwa	Gavhali	GSDA	7.7	NA	440	812	-	-	NA	NA	-	-	140	25	10	0.3	0.25	-	-
83	Akkalkuwa	Gavhali	GSDA	7.8	NA	300	671	-	-	NA	NA	-	-	122	17	5	0.5	0.31	-	-
84	Akkalkuwa	Gavhali	GSDA	7.3	NA	350	695	-	-	NA	NA	-	-	130	12	7	0.2	0.26	-	-
85	Akkalkuwa	Gavhali	GSDA	7.6	NA	420	797	-	-	NA	NA	-	-	122	28	4	0.1	0.28	-	-
86	Akkalkuwa	Gavhali	GSDA	7.6	NA	420	713	-	-	NA	NA	-	-	134	21	8	0.3	0.28	-	-
87	Akkalkuwa	Gavhali	GSDA	7.4	NA	420	714	-	-	NA	NA	-	-	140	25	8	0.3	0.30	-	-
88	Akkalkuwa	Gavhali	GSDA	7.8	NA	424	721	-	-	NA	NA	-	-	128	19	8	0.2	0.28	-	-
89	Akkalkuwa	Gavhali	GSDA	7.8	NA	320	684	-	-	NA	NA	-	-	120	16	5	0.3	0.15	-	-
90	Akkalkuwa	Umaragavhan	GSDA	7.5	NA	146	207	-	-	NA	NA	-	-	28	2	1	0.1	0.16	-	-
91	Akkalkuwa	Umaragavhan	GSDA	7.4	NA	146	217	-	-	NA	NA	-	-	30	2	1	0.2	0.20	-	-
92	Akkalkuwa	Moramba	GSDA	7.2	NA	132	241	-	-	NA	NA	-	-	40	2	3	0.2	0.18	-	-
93	Akkalkuwa	Bri Ankush Vahir	GSDA	7.0	NA	164	424	-	-	NA	NA	-	-	40	10	3	0.2	0.18	-	-
94	Akkalkuwa	Bri Ankush Vahir	GSDA	7.1	NA	156	456	-	-	NA	NA	-	-	48	10	3	0.2	0.20	-	-
95	Akkalkuwa	Bri Ankush Vahir	GSDA	7.2	NA	202	448	-	-	NA	NA	-	-	44	11	5	0.2	0.17	-	-
96	Akkalkuwa	Mogra	GSDA	7.2	NA	100	168	-	-	NA	NA	-	-	24	1	1	0.1	0.14	-	-
97	Akkalkuwa	Mogra	GSDA	7.1	NA	122	205	-	-	NA	NA	-	-	24	1	1	0.2	0.17	-	-
98	Akkalkuwa	Ohava	GSDA	7.3	NA	102	262	-	-	NA	NA	-	-	50	2	2	0.2	0.44	-	-
99	Akkalkuwa	Ohava	GSDA	7.0	NA	110	195	-	-	NA	NA	-	-	30	1	0	0.2	0.15	-	-
100	Akkalkuwa	Dahel	GSDA	7.5	NA	124	201	-	-	NA	NA	-	-	30	1	1	0.1	0.06	-	-
101	Akkalkuwa	Dahel	GSDA	7.2	NA	120	220	-	-	NA	NA	-	-	30	1	1	0.6	0.13	-	-
102	Akkalkuwa	Dahel	GSDA	7.0	NA	120	230	-	-	NA	NA	-	-	40	2	1	0.2	0.20	-	-
103	Akkalkuwa	Dahel	GSDA	7.4	NA	132	275	-	-	NA	NA	-	-	50	2	1	0.3	0.15	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
					µS/cm															
104	Akkalkuwa	Dahel	GSDA	7.2	NA	184	250	-	-	NA	NA	-	-	20	3	3	0.1	0.13	-	-
105	Akkalkuwa	Akkalkuva	GSDA	7.2	NA	124	178	-	-	NA	NA	-	-	14	1	1	0.1	0.12	-	-
106	Akkalkuwa	Kolavimal	GSDA	7.0	NA	120	201	-	-	NA	NA	-	-	20	1	1	0.1	0.10	-	-
107	Akkalkuwa	Kankalamal	GSDA	7.1	NA	150	190	-	-	NA	NA	-	-	18	1	1	0.1	0.04	-	-
108	Akkalkuwa	Kankalamal	GSDA	7.1	NA	98	174	-	-	NA	NA	-	-	16	1	1	0.2	0.10	-	-
109	Akkalkuwa	Kankalamal	GSDA	7.0	NA	98	170	-	-	NA	NA	-	-	20	1	1	0.5	0.10	-	-
110	Akkalkuwa	Khadaka Pani	GSDA	7.0	NA	102	186	-	-	NA	NA	-	-	20	1	1	0.1	0.11	-	-
111	Akkalkuwa	Koyalivihir	GSDA	7.0	NA	184	387	-	-	NA	NA	-	-	62	3	3	0.3	0.26	-	-
112	Akkalkuwa	Koyalivihir	GSDA	7.2	NA	240	321	-	-	NA	NA	-	-	36	3	3	0.2	0.22	-	-
113	Akkalkuwa	Koyalivihir	GSDA	7.4	NA	246	462	-	-	NA	NA	-	-	72	4	5	0.3	0.30	-	-
114	Akkalkuwa	Danel	GSDA	7.2	NA	184	332	-	-	NA	NA	-	-	42	2	2	0.1	0.22	-	-
115	Akrani	Nawapur2	NHS	7.4	1154	439	611	58	0.95	80	57	0	488	76	43	47	0.55		0.97469	-0.69173
116	Akrani	Burumpada	KOW-2019	7.4	376	109.6	244	12.36	1.28	43.9	16	0	117.1	23.1	14	16	0.11		0.34585	-1.5922
117	Akrani	Kotbandhni	KOW-2019	7.6	597	159.4	388	23.62	17	61.9	23.7	0	244	28.3	10	15	0.09		0.54908	-1.04562
118	Akrani	Goramba	KOW-2019	7.5	194	49.8	126	7	0.28	16	8.2	0	48.8	18	2	4	0.11		0.29355	-0.6749
119	Akrani	Khadkale Kh	KOW-2019	7.9	489	144.4	318	16.6	5	47.9	23.5	0	190.3	18	18	16	0.11		0.40784	-1.20948
120	Akrani	Amla	KOW-2019	7.8	442	134.5	287	11.75	3.9	51.9	20.1	0	126.9	15.4	31	13	0.2		0.29735	-2.16899
121	Akrani	Khutwada	KOW-2019	7.7	541	109.6	352	27.7	14	37.9	17.4	0	161	23.1	40	15	0.12	0.29	0.78073	-0.68775
122	Akrani	Velkhedi	KOW-2019	7.7	598	159.4	389	21.02	8	59.9	24.2	0	190.3	25.7	36	16	0.19	0.15	0.48926	-1.8671
123	Akrani	Roshanmal Khurd	KOW-2019	8	546	159.4	355	16.4	6.7	61.9	23.7	0	180.6	33.4	27	13	0.11		0.38124	-2.08496
124	Akrani	Karbharipada	KOW-2019	8.1	336	54.8	218	34.14	0.15	20	8.5	0	131.8	15.4	7	9	0.17		1.35525	0.46107
125	Akrani	Katri	KOW-2019	7.8	397	69.7	258	44	6.3	20	12.1	0	58.6	74.5	7	22	0.09		1.56414	-1.03523
126	Akrani	Bijari	KOW-2019	7.9	638	204.2	415	23.14	2.3	73.9	31.7	0	263.5	23.1	12	9	0.11	0.48	0.47658	-1.98438
127	Akrani	Valiamba	KOW-2019	7.7	417	104.6	271	22.36	0.26	39.9	15.7	0	156.2	18	12	8	0.05		0.64248	-0.72653
128	Akrani	Zummad	KOW-2019	7.8	318	89.6	207	10.39	5	33.9	13.5	0	107.4	20.6	11	9	0.05		0.32279	-1.04546
129	Akrani	Toranmal (June)	KOW-2019	8	335	79.7	218	21.35	8.4	24	13.5	0	136.6	18	12	7	0.02		0.70963	-0.07177

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
					µS/cm															
130	Nandurbar	Dhadgaon-1	NHS	7.4	1157	428	613	62	1.01	112	35	0	506	76	43	19	0.59		1.12799	-0.2342
131	Nandurbar	Loy	NHS	7.6	858	230	455	38	0.61	63	17	0	190	46	41	34	0.74		0.95637	-1.44855
132	Nandurbar	Sundarde	NHS	7.3	1679	525	887	50	2.21	104	63	0	375	177	44	79	0.37		0.77803	-4.27076
133	Nandurbar	Ashti	NHS	7.5	420	168	222	23	1.47	53	9	0	208	19	5	14	0.26		0.70208	0.05508
134	Nandurbar	Ghuli	NHS	7.5	4005	1301	2118	215	30.44	170	209	0	648	716	44	55	0.55		2.01862	-15.0583
135	Nandurbar	Dekhwad	NHS	7.5	1177	449	624	38	1.41	112	40	0	315	71	43	88	0.34		0.66833	-3.75426
136	Nandurbar	Korit	KOW-2019	7.9	1335	318.7	868	54.43	29	126	46.9	0	97.6	272	42	45	0.1		0.8943	-8.54508
137	Nandurbar	Rajale	KOW-2019	7.9	2154	343.6	1400	171.1	67	116	55.4	0	248.9	326	86	59	0.24		2.72527	-6.26934
138	Nandurbar	Shinde	KOW-2019	5.1	448	79.7	291	26.3	8.4	27.9	12.6	0	131.8	33.4	9	7	0.11		0.86823	-0.27138
139	Nandurbar	Vikharan	KOW-2019	7.7	2286	458.2	1486	104.3	76	144	76.4	0	180.6	476	54	35	0.26		1.44322	-10.5124
140	Nandurbar	Manjre	KOW-2019	8	700	109.6	455	49.3	14.3	39.9	16.9	0	146.4	46.3	41	18	0.22		1.38695	-0.98595
141	Nandurbar	Chaupale	KOW-2019	7.8	645	124.5	419	41.62	13	39.9	20.6	0	200.1	38.6	30	14	0.3		1.1027	-0.41015
142	Nandurbar	Gangapur	KOW-2019	7.8	1365	164.3	887	102.9	38	59.9	25.4	0	126.9	249	24	18	0.31	0.44	2.36074	-3.00521
143	Nandurbar	Vaindane	KOW-2019	8.1	1741	358.6	1132	77.04	13.38	104	61.9	0	283	224	67	18	0.4		1.20791	-5.64531
144	Nandurbar	Mangrul	KOW-2019	7.8	679	134.5	441	29.64	14	43.9	22	0	175.7	38.6	47	12	0.24		0.75568	-1.12537
145	Nandurbar	Bhangda	KOW-2019	7.9	1031	174.3	670	55.03	3.8	59.9	27.8	0	122	144	16	23	0.15		1.22972	-3.28307
146	Nandurbar	Dhanora	KOW-2019	7.9	1717	244	1116	118.6	54.8	91.8	37	0	39	406	11	40	0.08	0.46	2.23101	-6.99592
147	Nandurbar	Umaj	KOW-2019	7.6	1322	244	859	85.3	21.1	83.8	38.9	0	165.9	144	86	38	0.06		1.61146	-4.67197
148	Nandurbar	Dhulwad	KOW-2019	8.1	1756	333.7	1141	90.41	28.8	126	50.5	0	239.1	237	88	46	0.23		1.45499	-6.52171
149	Nandurbar	Ghohatgaon	KOW-2019	7.7	554	89.6	360	40.62	15	31.9	14	0	146.4	43.7	32	15	0.1	0.12	1.2648	-0.34726
150	Nandurbar	Nagaon	KOW-2019	8.1	6088	816.7	3957	261.2	144.2	319	120.9	0	610	715	44	167	0.12		2.68156	-15.9206
151	Nandurbar	Khokrale	KOW-2019															0.783	#DIV/0!	0
152	Nandurbar	Gujarbhavali	GSDA	7.0	NA	240	721	-	-	NA	NA	-	-	216	1	14	0.1	0.07	-	-
153	Nandurbar	Dhulvad	GSDA	7.6	NA	426	1161	-	-	NA	NA	-	-	594	19	11	0.1	0.03	-	-
154	Nandurbar	Dhulvad Pada	GSDA	7.0	NA	286	635	-	-	NA	NA	-	-	224	10	21	0.1	0.03	-	-
155	Nandurbar	Dhulvad	GSDA	7.2	NA	324	829	-	-	NA	NA	-	-	390	18	25	0.1	0.03	-	-

S. No.	Taluka	Location	Agency	pH	EC µS/cm	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
156	Nandurbar	Karajkupa	GSDA	7.7	NA	358	1310	-	-	NA	NA	-	-	840	1	18	0.1	0.01	-	-
157	Nandurbar	Karajkupa	GSDA	6.8	NA	286	1265	-	-	NA	NA	-	-	880	1	15	0.2	0.01	-	-
158	Nandurbar	Khodasgaav	GSDA	7.5	NA	280	705	-	-	NA	NA	-	-	156	5	3	0.1	0.02	-	-
159	Nandurbar	Khodasgaav	GSDA	6.9	NA	270	706	-	-	NA	NA	-	-	150	10	4	0.1	0.01	-	-
160	Nandurbar	Khodasgaav	GSDA	7.0	NA	280	696	-	-	NA	NA	-	-	158	10	3	0.1	0.04	-	-
161	Nandurbar	Lonkheda	GSDA	7.5	NA	400	910	-	-	NA	NA	-	-	280	10	14	0.1	0.03	-	-
162	Nandurbar	Chopale	GSDA	7.5	NA	400	858	-	-	NA	NA	-	-	280	7	12	0.1	0.02	-	-
163	Nandurbar	Nalve Kh	GSDA	7.4	NA	280	872	-	-	NA	NA	-	-	410	10	5	0.1	0.04	-	-
164	Nandurbar	Velavad	GSDA	6.8	NA	210	786	-	-	NA	NA	-	-	304	5	5	0.1	0.04	-	-
165	Nandurbar	Aadchi	GSDA	7.5	NA	48	546	-	-	NA	NA	-	-	230	7	1	0.1	0.01	-	-
166	Nandurbar	Aadchi	GSDA	7.7	NA	162	653	-	-	NA	NA	-	-	230	10	1	0.1	0.02	-	-
167	Nandurbar	Vavad	GSDA	7.6	NA	350	859	-	-	NA	NA	-	-	260	4	6	0.1	0.04	-	-
168	Nandurbar	Vyahur	GSDA	7.6	NA	418	1080	-	-	NA	NA	-	-	404	10	6	0.1	0.01	-	-
169	Nandurbar	Rajale	GSDA	7.0	NA	378	1058	-	-	NA	NA	-	-	220	10	4	0.1	0.01	-	-
170	Nandurbar	Vaindane	GSDA	7.4	NA	408	1111	-	-	NA	NA	-	-	422	5	1	0.1	0.04	-	-
171	Nandurbar	Karli	GSDA	7.5	NA	280	805	-	-	NA	NA	-	-	272	5	2	0.1	0.04	-	-
172	Nandurbar	Karli	GSDA	6.9	NA	178	628	-	-	NA	NA	-	-	226	5	1	0.1	0.04	-	-
173	Nandurbar	Ranle	GSDA	7.5	NA	248	568	-	-	NA	NA	-	-	178	5	1	0.1	0.04	-	-
174	Nandurbar	Ranle	GSDA	7.8	NA	312	704	-	-	NA	NA	-	-	156	3	5	0.1	0.01	-	-
175	Nandurbar	Ranle	GSDA	7.5	NA	384	991	-	-	NA	NA	-	-	374	2	5	0.1	0.01	-	-
176	Nandurbar	Ranle	GSDA	7.7	NA	226	465	-	-	NA	NA	-	-	116	5	3	0.1	0.02	-	-
177	Nandurbar	Balvand	GSDA	7.4	NA	394	1028	-	-	NA	NA	-	-	286	10	4	0.1	0.01	-	-
178	Nandurbar	Baripada	GSDA	7.5	NA	368	811	-	-	NA	NA	-	-	216	5	9	0.1	0.01	-	-
179	Nandurbar	Talvade Bk	GSDA	7.6	NA	204	818	-	-	NA	NA	-	-	366	10	2	0.1	0.04	-	-
180	Nandurbar	Talvade Bk	GSDA	7.7	NA	204	670	-	-	NA	NA	-	-	224	10	1	0.1	0.04	-	-
181	Nandurbar	Shanimandal	GSDA	7.7	NA	166	653	-	-	NA	NA	-	-	232	7	1	0.1	0.04	-	-

S. No.	Taluka	Location	Agency	pH	EC µS/cm	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
182	Nandurbar	Dhandhane	GSDA	7.8	NA	444	971	-	-	NA	NA	-	-	246	7	1	0.1	0.01	-	-
183	Nandurbar	Saitane	GSDA	7.9	NA	282	771	-	-	NA	NA	-	-	346	7	1	0.1	0.01	-	-
184	Nandurbar	Tilali	GSDA	7.5	NA	282	927	-	-	NA	NA	-	-	386	3	1	0.1	0.19	-	-
185	Nandurbar	Varur	GSDA	7.7	NA	268	962	-	-	NA	NA	-	-	476	3	1	0.1	0.19	-	-
186	Nandurbar	Aasane	GSDA	7.4	NA	314	974	-	-	NA	NA	-	-	424	3	1	0.1	0.18	-	-
187	Nandurbar	Talvade Kh	GSDA	7.6	NA	290	895	-	-	NA	NA	-	-	250	11	4	0.1	0.01	-	-
188	Nandurbar	Dahindule Kh	GSDA	7.4	NA	240	1053	-	-	NA	NA	-	-	560	11	4	0.1	0.02	-	-
189	Nandurbar	Dahindule Bk	GSDA	7.5	NA	560	1346	-	-	NA	NA	-	-	562	11	2	0.1	0.03	-	-
190	Nandurbar	Dhamdod	GSDA	7.8	NA	442	957	-	-	NA	NA	-	-	140	10	5	0.1	0.03	-	-
191	Nandurbar	Dhamdod	GSDA	7.7	NA	320	880	-	-	NA	NA	-	-	196	9	5	0.1	0.05	-	-
192	Nandurbar	Bhaler	GSDA	7.4	NA	500	1420	-	-	NA	NA	-	-	564	1	5	0.1	0.01	-	-
193	Nandurbar	Kharde Kh	GSDA	7.4	NA	336	786	-	-	NA	NA	-	-	182	4	6	0.1	0.01	-	-
194	Nandurbar	Indari Hatti	GSDA	7.0	NA	338	777	-	-	NA	NA	-	-	180	4	5	0.1	0.01	-	-
195	Nandurbar	Vasdare	GSDA	7.5	NA	368	771	-	-	NA	NA	-	-	154	6	13	0.1	0.01	-	-
196	Nandurbar	Umaj	GSDA	7.7	NA	364	949	-	-	NA	NA	-	-	344	4	5	0.1	0.03	-	-
197	Nandurbar	Khondamali	GSDA	7.7	NA	266	935	-	-	NA	NA	-	-	444	10	4	0.1	0.02	-	-
198	Nandurbar	Kanlada	GSDA	7.2	NA	164	476	-	-	NA	NA	-	-	142	1	6	0.1	0.01	-	-
199	Nandurbar	Bhone	GSDA	7.8	NA	240	547	-	-	NA	NA	-	-	166	1	6	0.1	0.09	-	-
200	Nandurbar	Vikharan	GSDA	7.5	NA	206	457	-	-	NA	NA	-	-	120	1	5	0.1	0.06	-	-
201	Nandurbar	Vikharan	GSDA	7.2	NA	176	572	-	-	NA	NA	-	-	220	1	3	0.1	0.04	-	-
202	Nandurbar	Narayanpur	GSDA	7.2	NA	208	512	-	-	NA	NA	-	-	108	2	14	0.1	0.04	-	-
203	Nandurbar	Narayanpur	GSDA	7.7	NA	198	541	-	-	NA	NA	-	-	164	1	1	0.1	0.03	-	-
204	Nandurbar	Virachak	GSDA	7.8	NA	204	989	-	-	NA	NA	-	-	504	1	7	0.1	0.01	-	-
205	Nandurbar	Patilpada	GSDA	7.5	NA	344	1013	-	-	NA	NA	-	-	444	1	3	0.1	0.01	-	-
206	Nandurbar	Wadgaon Bk	GSDA	7.2	NA	310	903	-	-	NA	NA	-	-	324	5	15	0.1	0.01	-	-
207	Nandurbar	Ranale Kh	GSDA	7.2	NA	482	1113	-	-	NA	NA	-	-	304	6	5	0.1	0.03	-	-

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208	Nandurbar	Waghoda	GSDA	7.7	NA	366	1052	-	-	NA	NA	-	-	452	10	4	0.1	0.01	-	-
209	Nandurbar	Waghoda	GSDA	8.2	NA	482	1115	-	-	NA	NA	-	-	304	10	3	0.1	0.04	-	-
210	Nandurbar	Umarde Kh	GSDA	8.0	NA	202	827	-	-	NA	NA	-	-	366	10	14	0.1	0.04	-	-
211	Nandurbar	Kalamadi	GSDA	7.8	NA	246	668	-	-	NA	NA	-	-	160	4	4	0.1	0.04	-	-
212	Nandurbar	Rakaswade	GSDA	7.5	NA	588	1255	-	-	NA	NA	-	-	270	5	1	0.1	0.04	-	-
213	Nandurbar	Aashte	GSDA	7.5	NA	336	778	-	-	NA	NA	-	-	182	2	1	0.1	0.04	-	-
214	Nandurbar	Waghaoda	GSDA	7.2	NA	366	813	-	-	NA	NA	-	-	202	6	3	0.1	0.01	-	-
215	Nandurbar	Bhilai	GSDA	7.8	NA	368	805	-	-	NA	NA	-	-	216	7	1	0.1	0.04	-	-
216	Nandurbar	Shrirampur	GSDA	7.2	NA	200	628	-	-	NA	NA	-	-	222	5	1	0.1	0.02	-	-
217	Nandurbar	Nimgaon	GSDA	7.8	NA	378	735	-	-	NA	NA	-	-	148	4	4	0.1	0.03	-	-
218	Nandurbar	Nimgaon	GSDA	6.9	NA	146	460	-	-	NA	NA	-	-	166	10	4	0.1	0.02	-	-
219	Nandurbar	Dhirajgaon	GSDA	7.7	NA	310	783	-	-	NA	NA	-	-	276	3	1	0.1	0.02	-	-
220	Nandurbar	Fulasare	GSDA	7.8	NA	198	675	-	-	NA	NA	-	-	284	8	21	0.1	0.01	-	-
221	Nandurbar	Jalakhe	GSDA	7.7	NA	652	1093	-	-	NA	NA	-	-	234	11	18	0.1	0.19	-	-
222	Nandurbar	Sundarde	GSDA	7.7	NA	244	632	-	-	NA	NA	-	-	160	11	16	0.1	0.02	-	-
223	Nandurbar	Dhekawad	GSDA	7.1	NA	282	1044	-	-	NA	NA	-	-	476	11	18	0.1	0.03	-	-
224	Nandurbar	Dhekawad	GSDA	7.2	NA	386	1117	-	-	NA	NA	-	-	476	18	19	0.1	0.03	-	-
225	Nandurbar	New Songiar	GSDA	7.9	NA	284	907	-	-	NA	NA	-	-	250	6	17	0.1	0.01	-	-
226	Nandurbar	Nagaon	GSDA	7.0	NA	170	729	-	-	NA	NA	-	-	280	10	21	0.1	0.01	-	-
227	Nandurbar	Biladi	GSDA	7.2	NA	248	682	-	-	NA	NA	-	-	178	6	19	0.1	0.01	-	-
228	Nandurbar	Nandarkhe	GSDA	8.0	NA	196	663	-	-	NA	NA	-	-	226	17	19	0.1	0.03	-	-
229	Nandurbar	Nandarkhe	GSDA	8.0	NA	196	758	-	-	NA	NA	-	-	292	17	15	0.1	0.03	-	-
230	Nandurbar	Dhanora	GSDA	7.2	NA	282	778	-	-	NA	NA	-	-	246	10	4	0.1	0.03	-	-
231	Nandurbar	Dhanora	GSDA	7.8	NA	306	687	-	-	NA	NA	-	-	138	7	4	0.1	0.03	-	-
232	Nandurbar	Dhanora	GSDA	7.2	NA	510	1070	-	-	NA	NA	-	-	272	10	2	0.1	0.04	-	-
233	Nandurbar	Dhanora	GSDA	7.1	NA	316	674	-	-	NA	NA	-	-	170	11	3	0.1	0.03	-	-

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					µS/cm															
234	Nandurbar	Dhanora	GSDA	7.2	NA	318	711	-	-	NA	NA	-	-	186	8	2	0.1	0.02	-	-
235	Nandurbar	Dhanora	GSDA	7.7	NA	166	523	-	-	NA	NA	-	-	108	9	2	0.1	0.02	-	-
236	Nandurbar	Bhvanipada	GSDA	7.8	NA	250	673	-	-	NA	NA	-	-	120	3	20	0.2	0.02	-	-
237	Nandurbar	Devpur	GSDA	7.5	NA	312	800	-	-	NA	NA	-	-	204	1	12	0.1	0.02	-	-
238	Nandurbar	Pimplod	GSDA	7.4	NA	286	836	-	-	NA	NA	-	-	288	2	12	0.1	0.02	-	-
239	Nandurbar	Natavad	GSDA	7.5	NA	178	639	-	-	NA	NA	-	-	226	10	7	0.1	0.03	-	-
240	Nandurbar	Taklipada	GSDA	7.5	NA	198	677	-	-	NA	NA	-	-	212	9	12	0.1	0.02	-	-
241	Nandurbar	Thanepada	GSDA	7.7	NA	240	619	-	-	NA	NA	-	-	126	9	13	0.1	0.03	-	-
242	Nandurbar	Jambhipada	GSDA	7.5	NA	222	780	-	-	NA	NA	-	-	320	1	1	0.1	0.03	-	-
243	Nandurbar	Dudhale	GSDA	7.2	NA	368	770	-	-	NA	NA	-	-	184	9	11	0.1	0.02	-	-
244	Nandurbar	Patharai	GSDA	7.7	NA	264	645	-	-	NA	NA	-	-	178	5	10	0.1	0.02	-	-
245	Nandurbar	Patonda	GSDA	7.2	NA	286	859	-	-	NA	NA	-	-	266	6	7	0.1	0.02	-	-
246	Nandurbar	Kothali Kh	GSDA	7.5	NA	332	783	-	-	NA	NA	-	-	202	10	4	0.1	0.01	-	-
247	Nandurbar	Kothali Kh	GSDA	7.3	NA	326	754	-	-	NA	NA	-	-	200	10	2	0.1	0.01	-	-
248	Nandurbar	Hol T Haveli	GSDA	6.9	NA	262	663	-	-	NA	NA	-	-	190	3	1	0.1	0.02	-	-
249	Nandurbar	Vaslai	GSDA	6.9	NA	240	842	-	-	NA	NA	-	-	230	1	2	0.1	0.03	-	-
250	Nandurbar	Bhadavad	GSDA	7.2	NA	584	1535	-	-	NA	NA	-	-	580	1	1	0.1	0.03	-	-
251	Nandurbar	Bhadavad	GSDA	7.2	NA	564	1430	-	-	NA	NA	-	-	484	1	2	0.1	0.02	-	-
252	Nandurbar	Bhadavad	GSDA	7.3	NA	384	1175	-	-	NA	NA	-	-	484	1	1	0.1	0.02	-	-
253	Nandurbar	Nyahali	GSDA	6.9	NA	300	1114	-	-	NA	NA	-	-	300	10	4	0.1	0.02	-	-
254	Nandurbar	Ghotane	GSDA	6.9	NA	288	726	-	-	NA	NA	-	-	176	8	4	0.1	0.02	-	-
255	Nandurbar	Baladane	GSDA	6.9	NA	298	746	-	-	NA	NA	-	-	182	8	8	0.1	0.02	-	-
256	Nandurbar	Koparli	GSDA	7.5	NA	320	686	-	-	NA	NA	-	-	148	8	1	0.1	0.01	-	-
257	Nandurbar	Palashi	GSDA	7.8	NA	340	778	-	-	NA	NA	-	-	178	10	21	0.1	0.03	-	-
258	Nandurbar	Palashi	GSDA	7.8	NA	360	723	-	-	NA	NA	-	-	128	10	21	0.1	0.01	-	-
259	Nandurbar	Kandhare	GSDA	7.1	NA	348	713	-	-	NA	NA	-	-	146	9	6	0.1	0.01	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
					µS/cm															
260	Nandurbar	Kandhare	GSDA	7.5	NA	264	618	-	-	NA	NA	-	-	168	10	9	0.1	0.02	-	-
261	Nandurbar	Hol T Ranala	GSDA	7.5	NA	336	692	-	-	NA	NA	-	-	108	9	5	0.1	0.02	-	-
262	Nandurbar	Khokrale	GSDA	7.4	NA	346	727	-	-	NA	NA	-	-	164	8	5	0.1	0.02	-	-
263	Nandurbar	Khokrale	GSDA	7.4	NA	310	793	-	-	NA	NA	-	-	178	8	3	0.1	0.01	-	-
264	Nandurbar	Kesarpada	GSDA	7.4	NA	420	890	-	-	NA	NA	-	-	254	8	1	0.1	0.01	-	-
265	Nandurbar	Umarde Bh	GSDA	7.2	NA	296	818	-	-	NA	NA	-	-	268	6	10	0.1	0.03	-	-
266	Nandurbar	Nimbhel	GSDA	7.1	NA	176	691	-	-	NA	NA	-	-	218	8	27	0.1	0.03	-	-
267	Nandurbar	Mangarul	GSDA	7.8	NA	230	816	-	-	NA	NA	-	-	264	15	16	0.1	0.01	-	-
268	Nandurbar	Malpur	GSDA	8.1	NA	322	682	-	-	NA	NA	-	-	124	8	18	0.1	0.02	-	-
269	Nandurbar	Malpur	GSDA	7.5	NA	410	773	-	-	NA	NA	-	-	138	8	17	0.1	0.02	-	-
270	Nandurbar	Malpur	GSDA	7.2	NA	320	721	-	-	NA	NA	-	-	138	8	16	0.1	0.01	-	-
271	Nandurbar	Malpur	GSDA	7.3	NA	280	674	-	-	NA	NA	-	-	138	8	17	0.1	0.02	-	-
272	Nandurbar	Malpur	GSDA	7.2	NA	384	799	-	-	NA	NA	-	-	150	10	11	0.1	0.02	-	-
273	Nandurbar	Malpur	GSDA	7.3	NA	400	834	-	-	NA	NA	-	-	168	15	11	0.1	0.03	-	-
274	Nandurbar	Malpur	GSDA	7.4	NA	386	816	-	-	NA	NA	-	-	166	15	11	0.1	0.04	-	-
275	Nandurbar	Saturkhe	GSDA	7.8	NA	310	754	-	-	NA	NA	-	-	170	6	21	0.1	0.05	-	-
276	Nandurbar	Osarli	GSDA	7.7	NA	342	800	-	-	NA	NA	-	-	178	5	26	0.1	0.01	-	-
277	Nandurbar	Akrale	GSDA	7.3	NA	286	664	-	-	NA	NA	-	-	164	10	6	0.1	0.05	-	-
278	Nandurbar	Nalave Kh	GSDA	7.6	2043	200	1000	-	-	-	-	-	-	400	10	40	0.1	0.05	-	-
279	Navapur	Nandurbar	NHS	7.5	747	321	395	36	0.67	72	34	0	315	56	15	35	0.45		0.73066	-1.2101
280	Navapur	Vadkolambi	NHS	7.5	418	153	222	26	1.4	43	11	0	208	16	2	14	0.27		0.80473	0.36607
281	Navapur	Bhardu	NHS	7.6	692	245	366	24	0.66	63	21	0	250	41	25	30	0.26		0.57577	-0.7736
282	Navapur	Malvan	KOW-2019	7.9	557	74.7	362	52.19	6	24	12.3	0	97.6	48.8	25	20	0.14		1.78702	-0.61235
283	Navapur	Wanzale	KOW-2019	8	481	144.4	313	18.84	16.6	51.9	22.5	0	205	28.3	17	11	0.1		0.46158	-1.0862
284	Navapur	Deolipada	KOW-2019	7.9	372	109.6	242	16.12	8.6	39.9	16.9	0	112.2	28.3	37	12	0.07	0.54	0.4535	-1.5466
285	Navapur	Navagaon	KOW-2019	7.7	1264	363.5	822	16.11	7.9	142	53.9	0	165.9	165	76	34	0.1	1.13	0.24797	-8.80154

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
					µS/cm															
286	Navapur	Menatalav (N.V.)	KOW-2019	7.7	841	159.4	547	47.2	13.1	61.9	23.7	0	209.8	54	37	27	0.07	0.60	1.09723	-1.60627
287	Navapur	Son	KOW-2019	8.2	583	174.3	379	13.65	7.7	61.9	27.3	0	214.7	20.6	31	11	0.08	0.24	0.30467	-1.82224
288	Navapur	Bhavre	KOW-2019	7.8	695	159.4	452	26.4	8	59.9	24.2	0	185.4	54	19	13	0.04		0.61448	-1.94743
289	Navapur	Nagziri	KOW-2019	8	484	74.7	315	39.36	10.3	24	12.3	0	175.7	25.7	9	9	0.05		1.34772	0.66798
290	Navapur	Kokniwada	KOW-2019	7.8	707	104.6	460	41.53	14.4	33.9	17.2	0	146.4	54	28	21	0.08		1.20027	-0.71064
291	Navapur	Mogarani	KOW-2019	7.7	1051	219.1	683	33.33	9	81.8	33.4	0	165.9	105	24	28	0.08		0.66185	-4.1193
292	Navapur	Kareghat	KOW-2019	7.8	709	189.2	461	28.9	11.2	71.9	28.5	0	297.7	18	13	9	0.04		0.61731	-1.06035
293	Navapur	Haldani	KOW-2019	8	788	224.1	512	23.92	8.88	83.8	34.1	0	253.8	38.6	31	16	0.04	0.33	0.46975	-2.83593
294	Navapur	Moulipada	KOW-2019	7.9	1578	273.9	1026	98.36	10.9	102	41.8	0	156.2	272	13	45	0.05		1.74802	-5.96967
295	Navapur	Zamanzar	KOW-2019															0.83	#DIV/0!	0
296	Navapur	Navagaon	GSDA	7.0	NA	308	631	-	-	NA	NA	-	-	128	9	8	0.1	0.04	-	-
297	Navapur	Kekada	GSDA	7.0	NA	212	417	-	-	NA	NA	-	-	64	1	10	0.1	0.04	-	-
298	Navapur	Raipur	GSDA	7.5	NA	324	588	-	-	NA	NA	-	-	92	1	1	0.1	0.02	-	-
299	Navapur	Harnipada	GSDA	7.4	NA	336	671	-	-	NA	NA	-	-	132	2	14	0.1	0.01	-	-
300	Navapur	Khairve	GSDA	7.0	NA	376	682	-	-	NA	NA	-	-	120	1	14	0.1	0.03	-	-
301	Navapur	Vatvi	GSDA	7.5	NA	192	446	-	-	NA	NA	-	-	80	1	2	0.1	0.03	-	-
302	Navapur	Borchak West	GSDA	7.3	NA	368	717	-	-	NA	NA	-	-	160	1	1	0.1	0.01	-	-
303	Navapur	Borchak West	GSDA	7.2	NA	336	652	-	-	NA	NA	-	-	128	6	2	0.1	0.01	-	-
304	Navapur	Khadaki	GSDA	7.0	NA	268	535	-	-	NA	NA	-	-	132	1	1	0.1	0.01	-	-
305	Navapur	Pimpale	GSDA	7.0	NA	272	582	-	-	NA	NA	-	-	144	1	2	0.1	0.03	-	-
306	Navapur	Dhong	GSDA	7.0	NA	268	546	-	-	NA	NA	-	-	104	2	1	0.1	0.03	-	-
307	Navapur	Itwai	GSDA	7.1	NA	314	640	-	-	NA	NA	-	-	128	2	1	0.1	0.03	-	-
308	Navapur	Shegave	GSDA	7.5	NA	632	1120	-	-	NA	NA	-	-	240	1	1	0.1	0.01	-	-
309	Navapur	Mehendipada	GSDA	7.8	NA	272	520	-	-	NA	NA	-	-	96	1	2	0.1	0.03	-	-
310	Navapur	Shalafali	GSDA	7.5	NA	448	791	-	-	NA	NA	-	-	172	1	1	0.1	0.01	-	-
311	Navapur	Dapur	GSDA	7.5	NA	146	309	-	-	NA	NA	-	-	72	2	1	0.1	0.03	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
					µS/cm															
312	Navapur	Uchimouli	GSDA	7.7	NA	138	282	-	-	NA	NA	-	-	50	2	1	0.1	0.01	-	-
313	Navapur	Dogegaon	GSDA	7.4	NA	492	856	-	-	NA	NA	-	-	152	2	1	0.1	0.03	-	-
314	Navapur	Bokalzar	GSDA	7.5	NA	296	561	-	-	NA	NA	-	-	96	8	10	0.1	0.01	-	-
315	Navapur	Zamtyavad	GSDA	7.5	NA	360	657	-	-	NA	NA	-	-	96	11	11	0.1	0.01	-	-
316	Navapur	Shehi	GSDA	7.4	NA	508	1022	-	-	Fit	Fit	-	-	292	7	12	0.1	0.04	-	-
317	Navapur	Shehi	GSDA	7.4	NA	248	507	-	-	NA	NA	-	-	72	9	12	0.1	0.03	-	-
318	Navapur	Shehi	GSDA	7.5	NA	320	602	-	-	NA	NA	-	-	88	11	12	0.1	0.03	-	-
319	Navapur	Shehi	GSDA	7.4	NA	472	842	-	-	NA	NA	-	-	152	9	15	0.1	0.01	-	-
320	Navapur	Devmogara	GSDA	7.5	NA	788	1310	-	-	NA	NA	-	-	312	12	12	0.1	0.01	-	-
321	Navapur	Devmogara	GSDA	7.5	NA	1028	1708	-	-	NA	NA	-	-	456	15	15	0.1	0.02	-	-
322	Navapur	Devmogara	GSDA	7.5	NA	744	1304	-	-	NA	NA	-	-	336	14	12	0.1	0.02	-	-
323	Navapur	Vasada	GSDA	7.5	NA	568	1057	-	-	NA	NA	-	-	282	9	12	0.1	0.03	-	-
324	Navapur	Bilda	GSDA	7.4	NA	356	750	-	-	NA	NA	-	-	144	12	15	0.1	0.03	-	-
325	Navapur	Sharavani	GSDA	7.5	NA	568	1029	-	-	NA	NA	-	-	212	7	12	0.1	0.03	-	-
326	Navapur	Vadasatra	GSDA	7.4	NA	456	803	-	-	NA	NA	-	-	144	7	15	0.1	0.03	-	-
327	Navapur	Nimdarda	GSDA	7.3	NA	332	629	-	-	NA	NA	-	-	112	9	12	0.1	0.03	-	-
328	Navapur	Kukaran	GSDA	7.5	NA	216	474	-	-	NA	NA	-	-	96	9	10	0.1	0.10	-	-
329	Navapur	Navisavrat	GSDA	7.5	NA	252	514	-	-	NA	NA	-	-	84	9	15	0.1	0.01	-	-
330	Navapur	Devlipada	GSDA	7.3	NA	224	433	-	-	NA	NA	-	-	64	12	10	0.1	0.01	-	-
331	Navapur	Kholvihir	GSDA	7.5	NA	328	604	-	-	NA	NA	-	-	80	11	14	0.1	0.01	-	-
332	Navapur	Lahan Kadvan	GSDA	7.4	NA	232	479	-	-	NA	NA	-	-	72	10	10	0.1	0.01	-	-
333	Navapur	Tilasar	GSDA	7.4	NA	212	416	-	-	NA	NA	-	-	72	9	8	0.1	0.03	-	-
334	Navapur	Chorvihir	GSDA	7.5	NA	212	404	-	-	NA	NA	-	-	52	9	8	0.1	0.01	-	-
335	Navapur	Chorvihir	GSDA	7.5	NA	208	393	-	-	NA	NA	-	-	48	9	6	0.1	0.02	-	-
336	Navapur	Kolda	GSDA	7.2	NA	124	286	-	-	NA	NA	-	-	48	7	8	0.1	0.01	-	-
337	Navapur	Kolda	GSDA	7.2	NA	126	276	-	-	NA	NA	-	-	40	9	8	0.1	0.01	-	-

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					µS/cm															
338	Navapur	Kolda	GSDA	7.2	NA	124	284	-	-	NA	NA	-	-	44	8	9	0.1	0.05	-	-
339	Navapur	Morkaranja	GSDA	7.2	NA	136	299	-	-	NA	NA	-	-	52	5	1	0.1	0.08	-	-
340	Navapur	Ampada	GSDA	7.2	NA	168	402	-	-	NA	NA	-	-	72	5	11	0.1	0.06	-	-
341	Navapur	Ampada	GSDA	7.2	NA	168	381	-	-	NA	NA	-	-	60	12	11	0.1	0.03	-	-
342	Navapur	Ampada	GSDA	7.2	NA	168	376	-	-	NA	NA	-	-	56	11	11	0.1	0.01	-	-
343	Navapur	Vavdi	GSDA	7.0	NA	98	141	-	-	NA	NA	-	-	10	12	11	0.1	0.06	-	-
344	Shahada	Khuntamodi	NHS	7.8	1648	520	875	148	0.69	53	92	0	547	140	44	78	1.04		2.15333	-1.28856
345	Shahada	Wadali	NHS	7.5	1165	485	618	38	1.35	133	36	0	434	78	43	48	0.34		0.65709	-2.52625
346	Shahada	Javade-T-Board	KOW-2019	7.7	1089	254	708	44.06	15	89.8	39.9	0	219.6	129	59	15	0.05		0.8147	-4.17395
347	Shahada	Budigavhan	KOW-2019	7.8	712	134.5	463	42.36	16.4	47.9	21	0	205	56.5	30	10	0.04		1.07671	-0.76274
348	Shahada	Sulwade	KOW-2019	7.6	618	119.5	402	36.37	16	41.9	18.9	0	200.1	41.1	25	9	0.04		0.98011	-0.37023
349	Shahada	Ganor	KOW-2019	7.8	567	149.4	369	29	10	55.9	22.7	0	190.3	33.4	43	9	0.02	0.07	0.69771	-1.54364
350	Shahada	Mandane	KOW-2019	7.8	2402	488	1561	159.7	49.5	184	74	0	312.3	440	53	66	0.12	0.02	2.12395	-10.1509
351	Shahada	Ujlod	KOW-2019	8.1	627	104.6	408	54.2	17	31.9	17.7	0	190.3	46.3	14	40	0.18		1.56952	0.06788
352	Shahada	Damarkheda	KOW-2019	7.9	979	199.2	636	43.64	23	67.9	31.9	0	58.6	97.7	20	84	0.1		0.91256	-5.05986
353	Shahada	Rampur	KOW-2019	7.8	466	114.5	303	19.56	12	33.9	19.6	0	165.9	23.1	18	10	0.08		0.54214	-0.5885
354	Shahada	Tembhe Bk	KOW-2019	7.8	805	204.2	523	38.35	19.9	77.8	30.7	0	302.6	54	20	10	0.11		0.78849	-1.45609
355	Shahada	Dongargaon	KOW-2019	7.9	964	219.1	627	23	4.6	83.8	32.9	0	53.7	79.7	22	132	0.16	0.12	0.4563	-6.01749
356	Shahada	Kakarde Bk	KOW-2019	7.8	1165	234.1	757	40.99	15.2	91.8	34.6	0	224.5	113	11	12	0.08		0.78587	-3.75741
357	Shahada	Alkhed	KOW-2019	7.9	1443	159.4	938	116.4	13.6	59.9	24.2	0	102.5	234	12	40	0.07		2.70814	-3.30644
358	Shahada	Pingane	KOW-2019	7.8	1885	308.8	1225	105.1	41.7	120	45.9	0	283	226	80	26	0.07	0.15	1.7557	-5.12843
359	Shahada	Pimparde	GSDA	7.5	NA	270	811	-	-	NA	NA	-	-	410	29	35	0.1	0.16	-	-
360	Shahada	New Aslod	GSDA	7.5	NA	280	613	-	-	NA	NA	-	-	200	30	15	0.1	0.13	-	-
361	Shahada	Karjod	GSDA	7.5	NA	336	757	-	-	NA	NA	-	-	296	35	40	0.1	0.15	-	-
362	Shahada	Mandana	GSDA	7.5	NA	320	698	-	-	NA	NA	-	-	210	4	29	0.1	0.15	-	-
363	Shahada	Malgaon	GSDA	7.5	NA	248	529	-	-	NA	NA	-	-	104	37	48	0.1	0.16	-	-

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					µS/cm															
364	Shahada	Guralpani	GSDA	7.5	NA	330	723	-	-	NA	NA	-	-	124	35	18	0.1	0.15	-	-
365	Shahada	Chandsaili	GSDA	7.5	NA	244	418	-	-	NA	NA	-	-	70	35	26	0.1	0.31	-	-
366	Shahada	Manmode	GSDA	7.5	NA	140	331	-	-	NA	NA	-	-	64	20	31	0.1	0.10	-	-
367	Shahada	Manmode	GSDA	7.5	NA	280	660	-	-	NA	NA	-	-	120	20	15	0.1	0.06	-	-
368	Shahada	Shahana	GSDA	7.5	NA	198	413	-	-	NA	NA	-	-	80	3	31	0.1	0.07	-	-
369	Shahada	Shahana	GSDA	7.5	NA	150	575	-	-	NA	NA	-	-	180	30	13	0.1	0.09	-	-
370	Shahada	Wadgaon	GSDA	7.5	NA	224	669	-	-	NA	NA	-	-	384	4	20	0.1	0.07	-	-
371	Shahada	Wadgaon	GSDA	7.5	NA	280	596	-	-	NA	NA	-	-	120	7	20	0.1	0.09	-	-
372	Shahada	Kolpandri	GSDA	7.5	NA	280	624	-	-	NA	NA	-	-	110	13	29	0.1	0.10	-	-
373	Shahada	Mahupada	GSDA	7.5	NA	284	544	-	-	NA	NA	-	-	130	35	29	0.1	0.11	-	-
374	Shahada	Lambi	GSDA	7.5	NA	250	521	-	-	NA	NA	-	-	80	34	9	0.1	0.11	-	-
375	Shahada	Raykhed	GSDA	7.5	NA	150	446	-	-	NA	NA	-	-	240	25	27	0.1	0.11	-	-
376	Shahada	Kukawal	GSDA	7.5	NA	490	1065	-	-	NA	NA	-	-	400	34	47	0.1	0.09	-	-
377	Shahada	Ozara	GSDA	7.5	NA	228	598	-	-	NA	NA	-	-	264	13	12	0.1	0.06	-	-
378	Shahada	Javade	GSDA	7.5	NA	330	738	-	-	NA	NA	-	-	300	2	25	0.1	0.10	-	-
379	Shahada	Gogapur	GSDA	7.5	NA	210	768	-	-	NA	NA	-	-	510	26	29	0.1	0.10	-	-
380	Shahada	Wagharde	GSDA	7.5	NA	240	701	-	-	NA	NA	-	-	344	25	7	0.1	0.08	-	-
381	Shahada	Nawanagar	GSDA	7.5	NA	256	601	-	-	NA	NA	-	-	80	36	32	0.1	0.08	-	-
382	Shahada	Tuki	GSDA	7.5	NA	656	1075	-	-	NA	NA	-	-	220	40	27	0.1	0.08	-	-
383	Shahada	Javakhed	GSDA	7.5	NA	250	468	-	-	NA	NA	-	-	80	22	17	0.1	0.09	-	-
384	Shahada	Kotbandhani	GSDA	7.5	NA	204	555	-	-	NA	NA	-	-	140	34	34	0.1	0.18	-	-
385	Shahada	Warul.T.	GSDA	7.5	NA	150	513	-	-	NA	NA	-	-	176	21	14	0.1	0.19	-	-
386	Shahada	Kurhawad	GSDA	7.5	NA	250	595	-	-	NA	NA	-	-	220	33	1	0.1	0.22	-	-
387	Shahada	New Tembha	GSDA	7.5	NA	204	755	-	-	NA	NA	-	-	200	3	4	0.1	0.17	-	-
388	Shahada	Kansai	GSDA	7.5	NA	276	525	-	-	NA	NA	-	-	104	27	33	0.1	0.15	-	-
389	Shahada	Lahan Doba	GSDA	7.5	NA	240	541	-	-	NA	NA	-	-	64	9	39	0.1	0.13	-	-

S. No.	Taluka	Location	Agency	pH	EC µS/cm	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
390	Shahada	Javada	GSDA	7.5	NA	384	667	-	-	NA	NA	-	-	124	34	70	0.1	0.06	-	-
391	Taloda	Akalkuva	NHS	7.4	1144	454	605	59	0.91	96	51	0	416	78	43	54	0.65		0.99832	-2.17928
392	Taloda	Khapar	NHS	7.5	1151	439	610	40	1.25	106	41	0	393	71	44	89	0.35		0.7066	-2.28017
393	Taloda	Mal	KOW-2019	7.7	310	69.7	202	9.6	0.78	20	12.1	0	58.6	18	7	10	0.05		0.34127	-1.03523
394	Taloda	Nyuban	KOW-2019	7.7	642	134.5	417	41.4	13	49.9	20.5	0	224.5	46.3	13	8	0.05	0.01	1.05072	-0.50191
395	Taloda	Khardi Kh	GSDA	7.0	NA	180	398	-	-	NA	NA	-	-	90	32	9	0.1	0.08	-	-
396	Taloda	Alwan	GSDA	7.5	NA	180	281	-	-	NA	NA	-	-	28	8	14	0.1	0.07	-	-
397	Taloda	Lakhapur [®]	GSDA	7.5	NA	224	541	-	-	NA	NA	-	-	100	17	13	0.1	0.09	-	-
398	Taloda	Borad	GSDA	7.5	NA	288	865	-	-	NA	NA	-	-	144	40	15	0.1	0.06	-	-
399	Taloda	Karde	GSDA	7.5	NA	250	451	-	-	NA	NA	-	-	140	14	24	0.1	0.07	-	-
400	Taloda	Kothar	GSDA	7.5	NA	140	271	-	-	NA	NA	-	-	50	14	23	0.1	0.10	-	-
401	Taloda	Modalpada	GSDA	7.5	NA	220	519	-	-	NA	NA	-	-	100	12	12	0.1	0.06	-	-
402	Taloda	Modalpada	GSDA	7.5	NA	260	418	-	-	NA	NA	-	-	84	13	11	0.1	0.06	-	-
403	Taloda	Kevalapani	GSDA	7.5	NA	140	238	-	-	NA	NA	-	-	50	12	10	0.1	0.09	-	-
404	Taloda	Kevalapani	GSDA	7.5	NA	168	304	-	-	NA	NA	-	-	60	13	17	0.1	0.06	-	-
405	Taloda	Malkhurd	GSDA	7.5	NA	124	280	-	-	NA	NA	-	-	50	19	18	0.1	0.11	-	-

Annexure VII: Aquifer II Chemical analysis of ground water samples

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
					μS/cm															
1	Akkalkuwa	Thanavahir	EW	7.95	850	310	525	52	0.3	52	44	0	92	28		300			1.0191	-4.7132
2	Akkalkuwa	Molgi	EW Drilling	8.24	507.46	166.54	340	36.4	0.3	51.68	9.09	0	120	85.99	2.1	25.6	0.2	0.15	1.1080	-1.3649
3	Akkalkuwa	Molgi	EW PYT	8.28	507.46	149.89	340	35.6	0.6	52.52	454	0	120	72.99	3.9	18.4	0.2	0.16	0.2489	-38.0250
4	Akkalkuwa	Dongaripada	GSDA	7.8	NA	230	498	-	-	NA	NA	-	-	56	17	8	0.16	0.16	-	-
5	Akkalkuwa	Akkalkuwa	GSDA	7.2	660	180	429	-	-	NA	NA	-	-	42	2	2	0.1	0.28	-	-
6	Akkalkuwa	Akkalkuwa	GSDA	7.1	709	198	461	-	-	NA	NA	-	-	44	2	2	0.1	0.13	-	-
7	Akkalkuwa	Akkalkuwa	GSDA	7.2	713	190	464	-	-	NA	NA	-	-	46	2	3	0.1	0.15	-	-
8	Akrani	Mandvi	EW Drilling	8.18	507.46	179.04	340	26.8	0.2	45.01	16.17	0	120	126.99	2.1	28.6	0.2	0.14	0.7435	-1.6142
9	Akrani	Mandvi	EW APT	8.06	537.31	550	360	75.2	0.7	55.02	16	0	160	196.99	3.6	24.9	0.2	0.17	1.9926	-1.4449
10	Akrani	Mandvi	OW Drilling	7.93	417.91	231.08	280	38.4	0.2	55.85	10	0	90	76.99	2.3	24.3	0.19	0.17	1.1207	-2.1401
11	Akrani	Mandvi	OW APT	7.94	567.16	231.08	380	36.1	0.5	55.85	22.23	0	162	128.9	3.6	16.8	0.2	0.15	0.8739	-1.9664
12	Akrani	Katri	EW Drilling	7.61	552.24	229	370	32.8	0.3	56.68	21.22	0	130	84.95	4.6	24.6	0.2	0.15	0.8018	-2.4494
13	Akrani	Katri	EW PYT	8.12	582.09	229	390	38.8	0.4	54.18	23	0	120	89.99	4.6	19.6	0.2	0.15	0.9361	-2.6348
14	Akrani	Kharda	EW Drilling	8.55	895	54.12	720	88.4	0.4	16.67	3.03	0	280	228.86	15	6.2	0.2	0.15	4.7092	3.5073
15	Akrani	Kharda	EW PYT	8.43	402.99	49.96	270	25.6	0.2	16.67	2.02	0	46	54.99	3.2	16.5	0.2	0.15	1.4577	-0.2457
16	Akrani	Dhadgaon	EW Drilling	8.25	1164.18	480.02	780	74.5	0.5	162.01	16.17	0	210	369.95	4.6	72.6	0.2	0.15	1.3963	-5.9887
17	Akrani	Dhadgaon	EW PYT	7.97	1089.55	358.08	730	54.8	0.6	170.04	14.15	0	180	186.95	5.4	59.2	0.2	0.17	1.0238	-6.7158
18	Akrani	Bijari	GSDA	7.1	NA	300	560	-	-	NA	NA	-	-	60	18	26	0.1	0.02	-	-
19	Akrani	Jarli	GSDA	7.4	NA	360	980	-	-	NA	NA	-	-	290	19	30	0.1	0.03	-	-
20	Akrani	Jarli	GSDA	7.2	NA	400	900	-	-	NA	NA	-	-	202	18	21	0.1	0.03	-	-
21	Akrani	Shirsani	GSDA	7.2	NA	260	680	-	-	NA	NA	-	-	120	10	30	0.1	0.02	-	-
22	Akrani	Kakdada	GSDA	7.0	NA	200	481	-	-	NA	NA	-	-	82	17	28	0.1	0.02	-	-
23	Akrani	Khuntamodi	GSDA	7.4	NA	142	388	-	-	NA	NA	-	-	64	6	19	0.1	0.01	-	-
24	Akrani	Khuntamodi	GSDA	7.4	NA	142	388	-	-	NA	NA	-	-	64	7	19	0.1	0.01	-	-
25	Akrani	Khuntamodi	GSDA	7.5	NA	142	378	-	-	NA	NA	-	-	82	7	18	0.1	0.10	-	-
26	Akrani	Khuntamodi	GSDA	7.5	NA	122	378	-	-	NA	NA	-	-	100	7	17	0.1	0.09	-	-
27	Akrani	Khuntamodi	GSDA	7.6	NA	170	378	-	-	NA	NA	-	-	70	7	17	0.1	0.07	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
28	Akrani	Khuntamodi	GSDA	7.4	NA	160	378	-	-	NA	NA	-	-	62	7	21	0.1	0.11	-	-
29	Akrani	Khuntamodi	GSDA	7.3	NA	122	383	-	-	NA	NA	-	-	102	7	17	0.1	0.09	-	-
30	Akrani	Palkha	GSDA	7.1	NA	140	370	-	-	NA	NA	-	-	60	6	11	0.1	0.10	-	-
31	Akrani	Astamba	GSDA	7.1	NA	198	411	-	-	NA	NA	-	-	60	8	11	0.1	0.19	-	-
32	Nandurbar	Nandurbar	EW Drilling	6.7	925.37	270.64	620	48.6	0.3	92.53	9.6	0	180	128.95	3.4	54.4	0.2	0.16	1.1995	-2.4658
33	Nandurbar	Nandurbar	EW APT	7.48	731.34	129.07	490	28.6	0.3	44.18	4.54	0	160	86.99	6.8	26.4	0.2	0.16	1.0228	0.0403
34	Nandurbar	Nandurbar	OW Drilling	7.27	820.9	260.23	550	36.4	0.4	90.3	0.59	0	140	122.99	6.3	45.6	0.2	0.14	1.0422	-2.2685
35	Nandurbar	Nandurbar	OW APT	7.46	582.09	265.22	390	38.6	0.3	96.88	9.27	0	140	74.95	4.6	25.6	0.19	0.17	0.9404	-3.3119
36	Nandurbar	Dhamdai	EW Drilling	7.4	1105.97	414.29	741	86.5	1	115.04	30.83	0	160	127.87	6.4	42.6	0.2	0.16	1.6164	-5.6665
37	Nandurbar	Pimplod	EW Drilling	3.17	1449.25	930.59	971	86.4	0.5	148.3	135.96	0	0	268.95	8.4	68.4	0.2	0.16	0.9733	-18.6051
38	Nandurbar	Pimplod	EW APT	3.4	1140.3	1005.54	764	52.69	0.5	208.41	117.76	0	0	79.99	4.6	78.6	0.2	0.16	0.5934	-20.1127
39	Nandurbar	Pimplod	OW Drilling	3.57	1865.67	687.01	1250	86.4	0	156.72	11.77	0	0	268.95	10.6	54.6	0.2	0.18	1.6993	-8.8047
40	Nandurbar	Pimplod	OW APT	3.27	1468.66	262	984	65.9	0.6	208.41	117.76	0	0	272.95	4.6	54.6	0.2	0.15	-	-
41	Nandurbar	Rajale	EW Drilling	7.9	1552.24	337.26	1040	86.8	0.6	125.04	6.06	0	248	285.95	8.6	62.5	0.2	0.16	1.9822	-2.6852
42	Nandurbar	Rajale	EW PYT	7.85	1820.9	491.32	1220	88.6	0.7	183.4	8	0	246	136.99	6.9	110.6	0.2	0.12	1.6823	-5.7956
43	Nandurbar	Ranala	EW during drilling	4.96	1791.04	378.9	1200	106.8	0.8	145.05	4.04	0	60	235.76	8.2	110.4	0.2	0.12	2.3338	-6.6014
44	Nandurbar	Ranala	EW after drilling	7.48	1119.4	455.92	750	68.4	0.7	131.71	9.62	0	188	169.99	4.2	38.6	0.2	0.18	1.4715	-4.2953
45	Nandurbar	Shinde	EW Drilling	7.76	1194.03	437.19	800	86.4	0.4	115.04	36.39	0	210	264.85	6.1	75.4	0.2	0.16	1.5503	-5.3044
46	Nandurbar	Shinde	EW PYT	7.82	1223.88	482.99	820	75.2	0.6	116.71	46.5	0	210	210.99	2.8	128.66	0.2	0.14	1.2589	-6.2200
47	Nandurbar	Rajapur	GSDA	7.5	NA	296	704	-	-	NA	NA	-	-	130	16	12	0.1	0.11	-	-
48	Nandurbar	Dhulvad	GSDA	7.2	NA	424	1308	-	-	NA	NA	-	-	758	11	11	0.1	0.03	-	-
49	Nandurbar	Nalve Bk	GSDA	7.5	NA	544	1207	-	-	NA	NA	-	-	558	2	4	0.1	0.04	-	-
50	Nandurbar	Velavad	GSDA	6.8	NA	148	740	-	-	NA	NA	-	-	310	6	3	0.1	0.04	-	-
51	Nandurbar	Velavad	GSDA	6.8	NA	304	978	-	-	NA	NA	-	-	402	10	1	0.1	0.01	-	-
52	Nandurbar	Rajale	GSDA	6.9	NA	288	811	-	-	NA	NA	-	-	240	4	4	0.1	0.01	-	-
53	Nandurbar	Rajale	GSDA	6.9	NA	424	1298	-	-	NA	NA	-	-	378	10	4	0.1	0.01	-	-
54	Nandurbar	Vaindane	GSDA	7.5	NA	286	934	-	-	NA	NA	-	-	388	10	2	0.1	0.01	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
55	Nandurbar	Vaindane	GSDA	7.5	NA	382	1051	-	-	NA	NA	-	-	400	10	2	0.1	0.04	-	-
56	Nandurbar	Pachorabari	GSDA	7.5	NA	240	510	-	-	NA	NA	-	-	126	10	3	0.1	0.04	-	-
57	Nandurbar	Pachorabari	GSDA	7.5	NA	206	659	-	-	NA	NA	-	-	302	9	4	0.1	0.01	-	-
58	Nandurbar	Pachorabari	GSDA	7.5	NA	468	1111	-	-	NA	NA	-	-	296	9	4	0.1	0.04	-	-
59	Nandurbar	Pachorabari	GSDA	7.7	NA	482	1115	-	-	NA	NA	-	-	304	9	4	0.1	0.01	-	-
60	Nandurbar	Pachorabari	GSDA	6.8	NA	280	790	-	-	NA	NA	-	-	248	6	3	0.1	0.01	-	-
61	Nandurbar	Lahan Shahada	GSDA	7.5	NA	202	816	-	-	NA	NA	-	-	366	10	2	0.1	0.04	-	-
62	Nandurbar	Lahan Shahada	GSDA	7.4	NA	222	835	-	-	NA	NA	-	-	368	7	1	0.1	0.04	-	-
63	Nandurbar	Kolda	GSDA	7.5	NA	318	707	-	-	NA	NA	-	-	186	3	3	0.1	0.19	-	-
64	Nandurbar	Dhamdai	GSDA	7.5	NA	324	923	-	-	NA	NA	-	-	374	3	8	0.1	0.18	-	-
65	Nandurbar	Dhamdod	GSDA	7.5	NA	510	1369	-	-	NA	NA	-	-	564	11	2	0.1	0.03	-	-
66	Nandurbar	Borala	GSDA	7.7	NA	388	792	-	-	NA	NA	-	-	184	2	1	0.1	0.08	-	-
67	Nandurbar	Bhagsari	GSDA	8.0	NA	378	780	-	-	NA	NA	-	-	144	1	11	0.1	0.06	-	-
68	Nandurbar	Bamdod	GSDA	7.9	NA	344	783	-	-	NA	NA	-	-	176	2	6	0.1	0.01	-	-
69	Nandurbar	Khamgaon	GSDA	7.5	NA	384	763	-	-	NA	NA	-	-	154	6	5	0.1	0.03	-	-
70	Nandurbar	Nashinda	GSDA	7.3	NA	468	861	-	-	NA	NA	-	-	148	6	5	0.1	0.03	-	-
71	Nandurbar	Hatmohida	GSDA	7.1	NA	268	955	-	-	NA	NA	-	-	464	6	5	0.1	0.03	-	-
72	Nandurbar	Samsherpur	GSDA	7.2	NA	224	816	-	-	NA	NA	-	-	384	10	4	0.1	0.07	-	-
73	Nandurbar	Samsherpur	GSDA	7.8	NA	536	1087	-	-	NA	NA	-	-	160	10	4	0.1	0.06	-	-
74	Nandurbar	Samsherpur	GSDA	7.5	NA	498	1154	-	-	NA	NA	-	-	310	5	5	0.1	0.02	-	-
75	Nandurbar	Sujalpur	GSDA	7.2	NA	248	831	-	-	NA	NA	-	-	422	10	5	0.1	0.01	-	-
76	Nandurbar	Khondamali	GSDA	7.2	NA	276	999	-	-	NA	NA	-	-	488	10	3	0.1	0.02	-	-
77	Nandurbar	Khondamali	GSDA	7.8	NA	224	915	-	-	NA	NA	-	-	482	10	14	0.1	0.08	-	-
78	Nandurbar	Korit	GSDA	7.5	NA	242	811	-	-	NA	NA	-	-	394	3	1	0.1	0.09	-	-
79	Nandurbar	Savalade	GSDA	8.0	NA	244	605	-	-	NA	NA	-	-	164	10	11	0.1	0.01	-	-
80	Nandurbar	Korit	GSDA	7.1	NA	178	481	-	-	NA	NA	-	-	146	1	3	0.1	0.03	-	-
81	Nandurbar	Bhone	GSDA	7.7	NA	136	421	-	-	NA	NA	-	-	144	1	5	0.1	0.06	-	-
82	Nandurbar	Bhone	GSDA	7.8	NA	324	694	-	-	NA	NA	-	-	236	1	4	0.1	0.06	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
83	Nandurbar	Shindgavhan	GSDA	7.2	NA	266	806	-	-	NA	NA	-	-	342	1	14	0.1	0.04	-	-
84	Nandurbar	Kanlamba	GSDA	8.0	NA	226	577	-	-	NA	NA	-	-	158	1	11	0.1	0.08	-	-
85	Nandurbar	Virachak	GSDA	7.7	NA	224	769	-	-	NA	NA	-	-	304	3	8	0.1	0.03	-	-
86	Nandurbar	Virachak	GSDA	7.7	NA	402	1037	-	-	NA	NA	-	-	364	10	9	0.1	0.04	-	-
87	Nandurbar	Shinde	GSDA	7.8	NA	482	1149	-	-	NA	NA	-	-	404	1	14	0.1	0.03	-	-
88	Nandurbar	Haripur	GSDA	7.9	NA	370	988	-	-	NA	NA	-	-	290	4	4	0.1	0.01	-	-
89	Nandurbar	Haripur	GSDA	7.5	NA	334	899	-	-	NA	NA	-	-	288	3	4	0.1	0.01	-	-
90	Nandurbar	Haripur	GSDA	7.7	NA	286	719	-	-	NA	NA	-	-	216	4	4	0.1	0.01	-	-
91	Nandurbar	Sutare	GSDA	7.5	NA	364	954	-	-	NA	NA	-	-	344	10	4	0.1	0.01	-	-
92	Nandurbar	Rakaswade	GSDA	7.0	NA	168	682	-	-	NA	NA	-	-	268	5	2	0.1	0.01	-	-
93	Nandurbar	Rakaswade	GSDA	7.0	NA	178	776	-	-	NA	NA	-	-	348	4	2	0.1	0.04	-	-
94	Nandurbar	Nimbhoni Bk	GSDA	7.5	NA	424	833	-	-	NA	NA	-	-	168	5	2	0.1	0.04	-	-
95	Nandurbar	Ambaur	GSDA	7.5	NA	378	772	-	-	NA	NA	-	-	144	3	1	0.1	0.04	-	-
96	Nandurbar	Ajepur	GSDA	7.6	NA	368	804	-	-	NA	NA	-	-	178	3	1	0.1	0.04	-	-
97	Nandurbar	Aashte	GSDA	7.0	NA	168	585	-	-	NA	NA	-	-	166	10	3	0.1	0.02	-	-
98	Nandurbar	Bahyane	GSDA	7.6	NA	386	1039	-	-	NA	NA	-	-	422	9	4	0.1	0.01	-	-
99	Nandurbar	Tokartale	GSDA	7.4	NA	350	902	-	-	NA	NA	-	-	220	9	3	0.1	0.01	-	-
100	Nandurbar	Wadagaon	GSDA	7.5	NA	290	901	-	-	NA	NA	-	-	250	9	4	0.1	0.01	-	-
101	Nandurbar	Tokartale	GSDA	7.7	NA	282	637	-	-	NA	NA	-	-	86	9	4	0.1	0.01	-	-
102	Nandurbar	Tokartale	GSDA	7.8	NA	324	924	-	-	NA	NA	-	-	374	9	4	0.1	0.01	-	-
103	Nandurbar	Waghaoda	GSDA	6.9	NA	304	924	-	-	NA	NA	-	-	396	6	4	0.1	0.01	-	-
104	Nandurbar	Waghaoda	GSDA	7.5	NA	222	836	-	-	NA	NA	-	-	368	5	3	0.1	0.01	-	-
105	Nandurbar	Waghaoda	GSDA	7.5	NA	166	659	-	-	NA	NA	-	-	232	4	9	0.1	0.01	-	-
106	Nandurbar	Junmohida	GSDA	7.5	NA	196	426	-	-	NA	NA	-	-	86	10	9	0.1	0.10	-	-
107	Nandurbar	Junmohida	GSDA	7.5	NA	206	456	-	-	NA	NA	-	-	102	10	1	0.1	0.04	-	-
108	Nandurbar	Pimpri	GSDA	7.8	NA	468	1110	-	-	NA	NA	-	-	296	10	2	0.1	0.04	-	-
109	Nandurbar	Shrirampur	GSDA	7.1	NA	204	669	-	-	NA	NA	-	-	224	5	5	0.1	0.04	-	-
110	Nandurbar	Balamrai	GSDA	7.9	NA	440	1046	-	-	NA	NA	-	-	262	5	2	0.1	0.01	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
111	Nandurbar	Chakale	GSDA	8.0	NA	402	1024	-	-	NA	NA	-	-	262	5	2	0.1	0.01	-	-
112	Nandurbar	Dhirajgaon	GSDA	7.8	NA	402	861	-	-	NA	NA	-	-	154	10	8	0.1	0.04	-	-
113	Nandurbar	Jalakhe	GSDA	7.8	NA	328	744	-	-	NA	NA	-	-	192	13	17	0.1	0.19	-	-
114	Nandurbar	New Songiar	GSDA	7.8	NA	266	847	-	-	NA	NA	-	-	256	7	19	0.1	0.01	-	-
115	Nandurbar	Nagaon	GSDA	7.5	NA	280	827	-	-	NA	NA	-	-	272	19	11	0.1	0.03	-	-
116	Nandurbar	Ghogaigaon	GSDA	7.5	NA	280	815	-	-	NA	NA	-	-	272	5	12	0.1	0.03	-	-
117	Nandurbar	Khothade	GSDA	7.2	NA	206	564	-	-	NA	NA	-	-	102	10	15	0.1	0.03	-	-
118	Nandurbar	Khothade	GSDA	7.3	NA	468	1118	-	-	NA	NA	-	-	296	6	14	0.1	0.02	-	-
119	Nandurbar	Khatavadpada	GSDA	7.4	NA	482	1027	-	-	NA	NA	-	-	206	10	13	0.1	0.02	-	-
120	Nandurbar	Khothade	GSDA	7.5	NA	280	734	-	-	NA	NA	-	-	200	10	15	0.1	0.02	-	-
121	Nandurbar	Arditara	GSDA	7.5	NA	246	771	-	-	NA	NA	-	-	248	10	15	0.1	0.02	-	-
122	Nandurbar	Isainagar	GSDA	7.2	NA	384	746	-	-	NA	NA	-	-	158	4	4	0.1	0.04	-	-
123	Nandurbar	Bandharfali	GSDA	7.7	NA	346	660	-	-	NA	NA	-	-	108	4	4	0.1	0.04	-	-
124	Nandurbar	Kothali Kh	GSDA	7.7	NA	354	787	-	-	NA	NA	-	-	200	10	4	0.1	0.01	-	-
125	Nandurbar	Amalthe	GSDA	7.5	NA	350	888	-	-	NA	NA	-	-	244	12	2	0.1	0.03	-	-
126	Nandurbar	Umarde Bh	GSDA	7.1	NA	280	818	-	-	NA	NA	-	-	266	6	10	0.1	0.03	-	-
127	Nandurbar	Tisi	GSDA	7.2	NA	226	723	-	-	NA	NA	-	-	180	5	28	0.1	0.03	-	-
128	Nandurbar	Tisi	GSDA	7.2	NA	360	886	-	-	NA	NA	-	-	180	5	28	0.1	0.03	-	-
129	Nandurbar	Nagaon	GSDA	7.7	NA	188	683	-	-	NA	NA	-	-	230	10	3	0.1	0.01	-	-
130	Nandurbar	Hatmohida	GSDA	7.2	NA	376	819	-	-	NA	NA	-	-	188	5	21	0.1	0.02	-	-
131	Nandurbar	Hatmohida	GSDA	7.7	NA	368	780	-	-	NA	NA	-	-	158	5	19	0.1	0.02	-	-
132	Nandurbar	Khapardheda	GSDA	7.3	NA	364	784	-	-	NA	NA	-	-	160	3	24	0.1	0.01	-	-
133	Nandurbar	Aarale	GSDA	7.4	NA	386	796	-	-	NA	NA	-	-	148	3	25	0.1	0.02	-	-
134	Nandurbar	Aarale	GSDA	7.7	NA	348	767	-	-	NA	NA	-	-	154	2	25	0.1	0.04	-	-
135	Nandurbar	Aarale	GSDA	7.9	NA	320	756	-	-	NA	NA	-	-	160	6	26	0.1	0.04	-	-
136	Nandurbar	Osarli	GSDA	7.6	NA	310	753	-	-	NA	NA	-	-	168	8	21	0.1	0.06	-	-
137	Nandurbar	Dudhale	GSDA	7.7	1613	296	1044	-	-	-	-	-	-	348	8	14	0.05	0.01	-	-
138	Nandurbar	Arale	GSDA	6.7	2187	286	1000	-	-	-	-	-	-	350	28	20	0.05	0.01	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
139	Navapur	Bhadvad	EW Drilling	7.63	1104.48	399.71	740	64.8	0.4	120.88	73.75	0	280	139.69	3.8	62.4	0.2	0.16	0.9344	-7.5238
140	Navapur	Bhadvad	EW APT	7.94	1925.37	628.72	1290	68.9	0.7	237.59	8.59	0	218	365.95	6.8	79.6	0.2	0.14	1.1619	-9.0127
141	Navapur	Bhadvad	OW Drilling	6.71	895.52	231.08	600	54.8	0.3	55.85	22.23	0	80	162.99	6.4	44.2	0.2	0.15	1.3266	-3.3107
142	Navapur	Bhadvad	OW APT	6.7	985.07	347.73	660	65.2	0.7	123.38	16.17	0	210	139.45	4.6	36.8	0.2	0.13	1.3491	-4.0572
143	Navapur	Dogegaon	EW Drilling	7.76	1373.13	543.36	920	86.4	0.6	188.4	17.69	0	310	298.95	10.6	74.5	0.2	0.14	1.5128	-5.7940
144	Navapur	Dogegaon	EW APT	6.61	1343.28	1260	900	75.2	0.7	155.06	28.81	0	210			505.89	0.2	0.18	1.3081	-6.6816
145	Navapur	Dogegaon	OW Drilling	7.9	1358.21	505.89	910	68.4	0.4	155.06	28.81	0	250	258.95	6.7	46.2	0.2	0.12	1.1898	-6.0258
146	Navapur	Dogegaon	OW APT	7.4	1223.88	518.38	820	72.6	0.6	162.56	28	0	180	264.99	4.9	62.8	0.2	0.12	1.2508	-7.4817
147	Navapur	Jamanpada	EW Drilling	7.89	435.82	239.41	292	36.4	0.2	55.02	24.76	0	150	89.99	2.1	26.4	0.2	0.16	0.8566	-2.3298
148	Navapur	Jamanpada	EW PYT	7.68	611.94	281.05	410	45.6	0.6	70.02	25.77	0	150	170	3.6	38.4	0.2	0.14	1.0076	-3.1630
149	Navapur	Kolde	EW Drilling	7.47	1029.85	360.16	690	44.6	0.4	108.37	21.73	0	220	128.95	3.6	38.4	0.2	0.16	0.9143	-3.6004
150	Navapur	Kolde	EW PYT	7	746.27	233.16	500	46.2	0.2	76.69	10.1	0	160	136.95	4.2	25.8	0.2	0.14	1.2116	-2.0428
151	Navapur	Navapur	EW Drilling	8.1	761.19	237.33	510	32	0.3	71.69	14.15	0	62	110.15	7.2	42	0.2	0.16	0.8091	-3.7327
152	Navapur	Navapur	EW PYT	6.72	835.82	694	560	65.3	0.5	75.02	8	0	188	189.99	4.9	26.9	0.2	0.14	1.7836	-1.3275
153	Navapur	Bilbara	GSDA	7.5	NA	384	819	-	-	NA	NA	-	-	208	9	7	0.1	0.04	-	-
154	Navapur	Navagaon	GSDA	7.0	NA	360	699	-	-	NA	NA	-	-	144	6	7	0.1	0.02	-	-
155	Navapur	Navagaon	GSDA	7.0	NA	548	1193	-	-	NA	NA	-	-	452	2	4	0.1	0.01	-	-
156	Navapur	Kokanipada	GSDA	7.2	NA	80	153	-	-	NA	NA	-	-	20	1	6	0.1	0.02	-	-
157	Navapur	Kekada	GSDA	7.0	NA	216	418	-	-	NA	NA	-	-	68	1	11	0.1	0.04	-	-
158	Navapur	Karanjvell	GSDA	7.2	NA	452	799	-	-	NA	NA	-	-	144	1	8	0.1	0.02	-	-
159	Navapur	Bijadevi	GSDA	7.0	NA	292	603	-	-	NA	NA	-	-	120	1	8	0.1	0.04	-	-
160	Navapur	Raipur	GSDA	7.5	NA	304	608	-	-	NA	NA	-	-	132	2	1	0.1	0.07	-	-
161	Navapur	Khairve	GSDA	7.0	NA	288	619	-	-	NA	NA	-	-	128	1	14	0.1	0.03	-	-
162	Navapur	Khairve	GSDA	7.0	NA	452	758	-	-	NA	NA	-	-	152	1	14	0.1	0.03	-	-
163	Navapur	Vatvi	GSDA	7.0	NA	336	662	-	-	NA	NA	-	-	128	1	14	0.1	0.03	-	-
164	Navapur	Khandbara	GSDA	7.5	NA	388	853	-	-	NA	NA	-	-	280	1	14	0.1	0.03	-	-
165	Navapur	Khandbara	GSDA	7.4	NA	368	721	-	-	NA	NA	-	-	172	1	2	0.1	0.03	-	-
166	Navapur	Khandbara	GSDA	7.4	NA	572	1157	-	-	NA	NA	-	-	336	2	14	0.1	0.03	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
167	Navapur	Khandbara	GSDA	7.4	NA	360	658	-	-	NA	NA	-	-	96	2	14	0.1	0.03	-	-
168	Navapur	Borchak West	GSDA	7.2	NA	412	824	-	-	NA	NA	-	-	240	1	1	0.1	0.03	-	-
169	Navapur	Talavipada	GSDA	7.5	NA	272	613	-	-	NA	NA	-	-	128	2	1	0.1	0.01	-	-
170	Navapur	Shegave	GSDA	7.5	NA	592	1154	-	-	NA	NA	-	-	272	1	1	0.1	0.01	-	-
171	Navapur	Malvan	GSDA	7.4	NA	272	535	-	-	NA	NA	-	-	112	2	2	0.1	0.03	-	-
172	Navapur	Malvan	GSDA	7.4	NA	260	511	-	-	NA	NA	-	-	104	1	1	0.1	0.03	-	-
173	Navapur	Navli	GSDA	7.3	NA	264	524	-	-	NA	NA	-	-	80	2	1	0.1	0.03	-	-
174	Navapur	Navli	GSDA	7.4	NA	336	686	-	-	NA	NA	-	-	144	2	1	0.1	0.03	-	-
175	Navapur	Dhavalipada	GSDA	7.5	NA	312	669	-	-	NA	NA	-	-	168	2	1	0.1	0.03	-	-
176	Navapur	Keli	GSDA	7.5	NA	200	443	-	-	NA	NA	-	-	72	1	1	0.1	0.03	-	-
177	Navapur	Punarvasan	GSDA	7.5	NA	208	441	-	-	NA	NA	-	-	68	2	1	0.1	0.03	-	-
178	Navapur	Anjane	GSDA	7.5	NA	100	266	-	-	NA	NA	-	-	56	1	1	0.1	0.03	-	-
179	Navapur	Dogegaon	GSDA	7.4	NA	512	903	-	-	NA	NA	-	-	168	2	3	0.1	0.03	-	-
180	Navapur	Jamda	GSDA	7.3	NA	376	684	-	-	NA	NA	-	-	112	2	1	0.1	0.03	-	-
181	Navapur	Tarapur	GSDA	7.7	NA	308	599	-	-	NA	NA	-	-	108	1	1	0.1	0.03	-	-
182	Navapur	Anjane	GSDA	7.4	NA	336	641	-	-	NA	NA	-	-	112	9	10	0.1	0.03	-	-
183	Navapur	Suli	GSDA	7.4	NA	320	598	-	-	NA	NA	-	-	104	6	12	0.1	0.01	-	-
184	Navapur	Mentalav	GSDA	7.4	NA	392	722	-	-	NA	NA	-	-	132	9	10	0.1	0.01	-	-
185	Navapur	Vadasatra	GSDA	7.4	NA	448	775	-	-	NA	NA	-	-	144	5	10	0.1	0.03	-	-
186	Navapur	Moulipada	GSDA	7.4	NA	208	402	-	-	NA	NA	-	-	48	11	12	0.1	0.01	-	-
187	Navapur	Moulipada	GSDA	7.4	NA	212	418	-	-	NA	NA	-	-	52	11	12	0.1	0.01	-	-
188	Navapur	Moulipada	GSDA	7.5	NA	280	548	-	-	NA	NA	-	-	96	7	15	0.1	0.01	-	-
189	Navapur	Nijampur	GSDA	7.3	NA	336	601	-	-	NA	NA	-	-	88	11	14	0.1	0.01	-	-
190	Navapur	Navisavrat	GSDA	7.5	NA	336	594	-	-	NA	NA	-	-	80	7	12	0.1	0.01	-	-
191	Navapur	Junisavrat	GSDA	7.5	NA	392	786	-	-	NA	NA	-	-	160	15	15	0.1	0.01	-	-
192	Navapur	Karanji Bu	GSDA	7.6	NA	264	531	-	-	NA	NA	-	-	80	11	12	0.1	0.01	-	-
193	Navapur	Mohanpada	GSDA	7.7	NA	224	478	-	-	NA	NA	-	-	72	7	12	0.1	0.01	-	-
194	Navapur	Primpran	GSDA	7.6	NA	212	489	-	-	NA	NA	-	-	96	15	11	0.1	0.10	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness		TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
						μS/cm	mg/l														
195	Navapur	Bhomdipada	GSDA	7.6	NA	252	517	-	-	NA	NA	-	-	80	9	12	0.1	0.01	-	-	
196	Navapur	Kholvihir	GSDA	7.5	NA	208	470	-	-	NA	NA	-	-	72	15	12	0.1	0.02	-	-	
197	Navapur	Kholvihir	GSDA	7.6	NA	252	528	-	-	NA	NA	-	-	80	14	12	0.1	0.01	-	-	
198	Navapur	Kholvihir	GSDA	7.5	NA	360	642	-	-	NA	NA	-	-	80	11	12	0.1	0.01	-	-	
199	Navapur	Kholvihir	GSDA	7.5	NA	320	618	-	-	NA	NA	-	-	92	15	12	0.1	0.01	-	-	
200	Navapur	Amlan	GSDA	7.5	NA	372	662	-	-	NA	NA	-	-	104	11	12	0.1	0.01	-	-	
201	Navapur	Amlan	GSDA	7.5	NA	260	492	-	-	NA	NA	-	-	84	7	10	0.1	0.01	-	-	
202	Navapur	Raingan	GSDA	7.5	NA	452	804	-	-	NA	NA	-	-	144	9	12	0.1	0.03	-	-	
203	Navapur	Raingan	GSDA	7.5	NA	376	684	-	-	NA	NA	-	-	132	9	7	0.1	0.01	-	-	
204	Navapur	Raingan	GSDA	7.5	NA	512	945	-	-	NA	NA	-	-	212	9	9	0.1	0.03	-	-	
205	Navapur	Raingan	GSDA	7.5	NA	508	892	-	-	NA	NA	-	-	168	9	9	0.1	0.03	-	-	
206	Navapur	Raingan	GSDA	7.5	NA	232	437	-	-	NA	NA	-	-	72	6	4	0.1	0.03	-	-	
207	Navapur	Chorvihir	GSDA	7.5	NA	240	441	-	-	NA	NA	-	-	60	9	8	0.1	0.02	-	-	
208	Navapur	Pangharan	GSDA	7.6	NA	328	595	-	-	NA	NA	-	-	92	9	4	0.1	0.03	-	-	
209	Navapur	Pangharan	GSDA	7.6	NA	376	711	-	-	NA	NA	-	-	144	9	3	0.1	0.02	-	-	
210	Navapur	Pangharan	GSDA	7.6	NA	304	563	-	-	NA	NA	-	-	92	9	3	0.1	0.03	-	-	
211	Navapur	Gangapur	GSDA	7.4	NA	376	663	-	-	NA	NA	-	-	100	9	13	0.1	0.01	-	-	
212	Navapur	Gangapur	GSDA	7.4	NA	384	671	-	-	NA	NA	-	-	104	9	6	0.1	0.02	-	-	
213	Navapur	Gangapur	GSDA	7.4	NA	380	660	-	-	NA	NA	-	-	100	9	7	0.1	0.03	-	-	
214	Navapur	Chikhali	GSDA	7.5	NA	336	603	-	-	NA	NA	-	-	92	7	4	0.1	0.01	-	-	
215	Navapur	Jamanpada	GSDA	7.2	NA	154	297	-	-	NA	NA	-	-	40	12	11	0.1	0.03	-	-	
216	Navapur	Sonkhamb	GSDA	7.2	NA	172	359	-	-	NA	NA	-	-	64	5	1	0.1	0.04	-	-	
217	Navapur	Bedkipada	GSDA	7.3	NA	152	328	-	-	NA	NA	-	-	48	11	11	0.1	0.01	-	-	
218	Navapur	Bedkipada	GSDA	7.3	NA	320	597	-	-	NA	NA	-	-	96	8	11	0.1	0.04	-	-	
219	Navapur	Bhangarpada	GSDA	7.5	NA	352	613	-	-	NA	NA	-	-	92	12	11	0.1	0.01	-	-	
220	Navapur	Visarvadi	GSDA	7.4	NA	372	670	-	-	NA	NA	-	-	88	12	23	0.1	0.01	-	-	
221	Navapur	Visarvadi	GSDA	7.4	NA	380	698	-	-	NA	NA	-	-	104	5	23	0.1	0.03	-	-	
222	Shahada	Rampur	EW	7.98	520	190	260	30	1.2	30	28	0	244	18		30					

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
223	Shahada	Madkani	EW	7.98	520	190	250	33	1.2	18	35	0	293	14		0				
224	Shahada	Kusumwade	EW	7.98	450	165	220	28	0.9	24	26	0	250	14		0				
225	Shahada	Junwana	EW	7.89	680	280	440	69	1	30	50	0	372	39		60				
226	Shahada	Katharda Kh	EW	8.26	920	195	480	122	1.2	26	32	0	415	74		15				
227	Shahada	Palaswade	EW	7.75	2300	420	1560	446	2	34	81	0	659	433		230				
228	Shahada	Mhaswad	EW	7.95	730	350	405	42	0	50	54	0	451	43		5				
229	Shahada	Bupakari	GSDA	7.5	NA	134	321	-	-	NA	NA	-	-	60	35	21	0.1	0.22	-	-
230	Shahada	Manrad	GSDA	7.5	NA	580	1296	-	-	NA	NA	-	-	460	35	21	0.1	0.18	-	-
231	Shahada	Lamboda	GSDA	7.5	NA	122	965	-	-	NA	NA	-	-	360	36	24	0.1	0.16	-	-
232	Shahada	Vaijali	GSDA	7.5	NA	300	1017	-	-	NA	NA	-	-	254	22	34	0.1	0.20	-	-
233	Shahada	Nadarkheda	GSDA	7.5	NA	96	791	-	-	NA	NA	-	-	250	37	30	0.1	0.03	-	-
234	Shahada	Palaswada	GSDA	7.5	NA	250	702	-	-	NA	NA	-	-	200	36	85	0.1	0.03	-	-
235	Shahada	Prakasha	GSDA	7.5	NA	1800	4038	-	-	NA	NA	-	-	998	39	30	0.1	0.17	-	-
236	Shahada	Prakasha	GSDA	7.5	NA	1600	3061	-	-	NA	NA	-	-	800	40	26	0.1	0.17	-	-
237	Shahada	Prakasha	GSDA	7.5	NA	140	347	-	-	NA	NA	-	-	54	4	23	0.1	0.13	-	-
238	Shahada	Prakasha	GSDA	7.5	NA	144	318	-	-	NA	NA	-	-	60	13	27	0.1	0.12	-	-
239	Shahada	Prakasha	GSDA	7.5	NA	166	327	-	-	NA	NA	-	-	54	4	12	0.1	0.10	-	-
240	Shahada	Nadarde	GSDA	7.5	NA	132	877	-	-	NA	NA	-	-	250	36	40	0.1	0.10	-	-
241	Shahada	Alsane	GSDA	7.5	NA	400	922	-	-	NA	NA	-	-	200	7	20	0.1	0.10	-	-
242	Shahada	Budigavhan	GSDA	7.5	NA	290	608	-	-	NA	NA	-	-	150	7	34	0.1	0.10	-	-
243	Shahada	Budigavhan	GSDA	7.5	NA	164	458	-	-	NA	NA	-	-	100	7	34	0.1	0.04	-	-
244	Shahada	Pimpari	GSDA	7.5	NA	270	806	-	-	NA	NA	-	-	220	35	34	0.1	0.05	-	-
245	Shahada	Junwane	GSDA	7.5	NA	240	803	-	-	NA	NA	-	-	300	6	21	0.1	0.10	-	-
246	Shahada	Junwane	GSDA	7.5	NA	154	379	-	-	NA	NA	-	-	96	30	26	0.1	0.08	-	-
247	Shahada	Hol	GSDA	7.5	NA	216	728	-	-	NA	NA	-	-	160	34	25	0.1	0.09	-	-
248	Shahada	Untawad	GSDA	7.5	NA	220	741	-	-	NA	NA	-	-	170	34	24	0.1	0.10	-	-
249	Shahada	Purshottam Nagar	GSDA	7.5	NA	208	643	-	-	NA	NA	-	-	164	35	23	0.1	0.08	-	-
250	Shahada	Mhasavad	GSDA	7.5	NA	248	584	-	-	NA	NA	-	-	110	32	18	0.1	0.07	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
251	Shahada	Mhasavad	GSDA	7.5	NA	290	583	-	-	NA	NA	-	-	102	33	18	0.1	0.08	-	-
252	Shahada	Mhasavad	GSDA	7.5	NA	220	580	-	-	NA	NA	-	-	140	32	18	0.1	0.10	-	-
253	Shahada	Mhasavad	GSDA	7.5	NA	254	587	-	-	NA	NA	-	-	120	32	18	0.1	0.08	-	-
254	Shahada	Mhasavad	GSDA	7.5	NA	344	702	-	-	NA	NA	-	-	164	31	35	0.1	0.10	-	-
255	Shahada	Padalda	GSDA	7.5	NA	200	537	-	-	NA	NA	-	-	164	34	34	0.1	0.08	-	-
256	Shahada	Padalda	GSDA	7.5	NA	320	663	-	-	NA	NA	-	-	250	26	13	0.1	0.18	-	-
257	Shahada	Warde T Shahada	GSDA	7.5	NA	190	1144	-	-	NA	NA	-	-	242	27	30	0.1	0.16	-	-
258	Shahada	Pimparde	GSDA	7.5	NA	430	860	-	-	NA	NA	-	-	260	34	35	0.1	0.15	-	-
259	Shahada	Pimparde	GSDA	7.5	NA	420	948	-	-	NA	NA	-	-	300	29	60	0.1	0.16	-	-
260	Shahada	Tembhali	GSDA	7.5	NA	310	853	-	-	NA	NA	-	-	320	28	28	0.1	0.17	-	-
261	Shahada	Tembhali	GSDA	7.5	NA	310	791	-	-	NA	NA	-	-	320	29	27	0.1	0.17	-	-
262	Shahada	Purshottam Nagar	GSDA	7.5	NA	280	1145	-	-	NA	NA	-	-	744	5	51	0.1	0.15	-	-
263	Shahada	Lohare	GSDA	7.5	NA	324	705	-	-	NA	NA	-	-	280	4	39	0.1	0.18	-	-
264	Shahada	Mandana	GSDA	7.5	NA	320	701	-	-	NA	NA	-	-	260	4	30	0.1	0.17	-	-
265	Shahada	Mandana	GSDA	7.5	NA	300	699	-	-	NA	NA	-	-	240	4	29	0.1	0.15	-	-
266	Shahada	Damarkheda	GSDA	7.5	NA	180	360	-	-	NA	NA	-	-	60	21	22	0.1	0.14	-	-
267	Shahada	Damarkheda	GSDA	7.5	NA	170	354	-	-	NA	NA	-	-	68	21	22	0.1	0.17	-	-
268	Shahada	Chandsaili	GSDA	7.5	NA	360	678	-	-	NA	NA	-	-	150	34	27	0.1	0.17	-	-
269	Shahada	Bhulane	GSDA	7.5	NA	98	270	-	-	NA	NA	-	-	50	20	55	0.1	0.14	-	-
270	Shahada	Bhulane	GSDA	7.5	NA	116	270	-	-	NA	NA	-	-	50	20	51	0.1	0.16	-	-
271	Shahada	Bhulane	GSDA	7.5	NA	116	270	-	-	NA	NA	-	-	50	20	48	0.1	0.06	-	-
272	Shahada	Bhulane	GSDA	7.5	NA	116	270	-	-	NA	NA	-	-	50	20	49	0.1	0.07	-	-
273	Shahada	Manmode	GSDA	7.5	NA	240	659	-	-	NA	NA	-	-	100	20	39	0.1	0.08	-	-
274	Shahada	Shahana	GSDA	7.5	NA	190	542	-	-	NA	NA	-	-	90	3	31	0.1	0.11	-	-
275	Shahada	Shahana	GSDA	7.5	NA	200	448	-	-	NA	NA	-	-	70	3	31	0.1	0.12	-	-
276	Shahada	Shahana	GSDA	7.5	NA	124	372	-	-	NA	NA	-	-	80	29	13	0.1	0.10	-	-
277	Shahada	Shahana	GSDA	7.5	NA	220	427	-	-	NA	NA	-	-	80	29	13	0.1	0.11	-	-
278	Shahada	Wadgaon	GSDA	7.5	NA	250	609	-	-	NA	NA	-	-	120	8	20	0.1	0.09	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
279	Shahada	Wadgaon	GSDA	7.5	NA	244	616	-	-	NA	NA	-	-	124	8	20	0.1	0.10	-	-
280	Shahada	Wadgaon	GSDA	7.5	NA	260	572	-	-	NA	NA	-	-	124	9	20	0.1	0.10	-	-
281	Shahada	Kolpandri	GSDA	7.5	NA	280	624	-	-	NA	NA	-	-	110	13	29	0.1	0.11	-	-
282	Shahada	Dudhkhed	GSDA	7.5	NA	220	513	-	-	NA	NA	-	-	122	34	43	0.1	0.12	-	-
283	Shahada	Kochara	GSDA	7.5	NA	360	890	-	-	NA	NA	-	-	320	35	26	0.1	0.13	-	-
284	Shahada	Bahirpur	GSDA	7.5	NA	190	427	-	-	NA	NA	-	-	110	36	16	0.1	0.16	-	-
285	Shahada	Gannor	GSDA	7.5	NA	240	416	-	-	NA	NA	-	-	102	32	16	0.1	0.22	-	-
286	Shahada	Gannor	GSDA	7.5	NA	190	401	-	-	NA	NA	-	-	124	34	16	0.1	0.14	-	-
287	Shahada	Khed Diggar	GSDA	7.5	NA	256	467	-	-	NA	NA	-	-	110	33	34	0.1	0.13	-	-
288	Shahada	Khed Diggar	GSDA	7.5	NA	176	380	-	-	NA	NA	-	-	94	34	34	0.1	0.11	-	-
289	Shahada	Adgaon	GSDA	7.5	NA	150	338	-	-	NA	NA	-	-	70	34	30	0.1	0.13	-	-
290	Shahada	Lakkadkot	GSDA	7.5	NA	200	471	-	-	NA	NA	-	-	110	26	31	0.1	0.12	-	-
291	Shahada	Ambapur	GSDA	7.5	NA	200	465	-	-	NA	NA	-	-	136	33	33	0.1	0.13	-	-
292	Shahada	Ambapur	GSDA	7.5	NA	214	438	-	-	NA	NA	-	-	120	33	31	0.1	0.07	-	-
293	Shahada	Biladi	GSDA	7.5	NA	184	442	-	-	NA	NA	-	-	100	34	25	0.1	0.12	-	-
294	Shahada	Nagziri	GSDA	7.5	NA	184	348	-	-	NA	NA	-	-	70	26	26	0.1	0.08	-	-
295	Shahada	Maloni	GSDA	7.5	NA	500	1096	-	-	NA	NA	-	-	180	34	27	0.1	0.08	-	-
296	Shahada	Maloni	GSDA	7.5	NA	410	1110	-	-	NA	NA	-	-	250	25	28	0.1	0.09	-	-
297	Shahada	Maloni	GSDA	7.5	NA	450	1087	-	-	NA	NA	-	-	250	33	28	0.1	0.10	-	-
298	Shahada	Tavalai	GSDA	7.5	NA	256	585	-	-	NA	NA	-	-	104	31	28	0.1	0.08	-	-
299	Shahada	Hingani	GSDA	7.5	NA	400	1185	-	-	NA	NA	-	-	570	29	29	0.1	0.09	-	-
300	Shahada	Hingani	GSDA	7.5	NA	400	1095	-	-	NA	NA	-	-	280	8	29	0.1	0.15	-	-
301	Shahada	Kothaval	GSDA	7.5	NA	210	710	-	-	NA	NA	-	-	256	8	29	0.1	0.13	-	-
302	Shahada	Kothaval	GSDA	7.5	NA	220	684	-	-	NA	NA	-	-	370	8	29	0.1	0.09	-	-
303	Shahada	Khairave	GSDA	7.5	NA	180	705	-	-	NA	NA	-	-	130	25	30	0.1	0.09	-	-
304	Shahada	Khairave	GSDA	7.5	NA	130	540	-	-	NA	NA	-	-	112	25	30	0.1	0.09	-	-
305	Shahada	Bamkhed	GSDA	7.5	NA	280	490	-	-	NA	NA	-	-	60	25	30	0.1	0.08	-	-
306	Shahada	Bamkhed	GSDA	7.5	NA	132	491	-	-	NA	NA	-	-	150	25	30	0.1	0.10	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
307	Shahada	Fes	GSDA	7.5	NA	230	491	-	-	NA	NA	-	-	80	1	30	0.1	0.10	-	-
308	Shahada	Fes	GSDA	7.5	NA	198	342	-	-	NA	NA	-	-	60	1	30	0.1	0.10	-	-
309	Shahada	Dodwada	GSDA	7.5	NA	400	1181	-	-	NA	NA	-	-	264	35	23	0.1	0.09	-	-
310	Shahada	Dodwada	GSDA	7.5	NA	140	791	-	-	NA	NA	-	-	148	28	38	0.1	0.10	-	-
311	Shahada	Wadali	GSDA	7.5	NA	190	575	-	-	NA	NA	-	-	230	20	38	0.1	0.10	-	-
312	Shahada	Torkheda	GSDA	7.5	NA	210	474	-	-	NA	NA	-	-	90	20	48	0.1	0.22	-	-
313	Shahada	Khaparkheda	GSDA	7.5	NA	100	484	-	-	NA	NA	-	-	250	1	52	0.1	0.08	-	-
314	Shahada	Kothali	GSDA	7.5	NA	170	913	-	-	NA	NA	-	-	430	0	36	0.1	0.08	-	-
315	Shahada	Kothali	GSDA	7.5	NA	288	1088	-	-	NA	NA	-	-	550	5	67	0.1	0.09	-	-
316	Shahada	Jaynagar	GSDA	7.5	NA	160	502	-	-	NA	NA	-	-	230	3	51	0.1	0.08	-	-
317	Shahada	Nimbhora	GSDA	7.5	NA	460	1151	-	-	NA	NA	-	-	560	35	53	0.1	0.08	-	-
318	Shahada	Nimbhora	GSDA	7.5	NA	500	1171	-	-	NA	NA	-	-	400	35	56	0.1	0.10	-	-
319	Shahada	Katharde Diggar	GSDA	7.5	NA	204	511	-	-	NA	NA	-	-	110	27	52	0.1	0.08	-	-
320	Shahada	Katharde Diggar	GSDA	7.5	NA	174	431	-	-	NA	NA	-	-	120	27	61	0.1	0.07	-	-
321	Shahada	Kurangi	GSDA	7.5	NA	208	444	-	-	NA	NA	-	-	84	30	61	0.1	0.07	-	-
322	Shahada	Jaam	GSDA	7.5	NA	250	853	-	-	NA	NA	-	-	460	31	35	0.1	0.07	-	-
323	Shahada	Damlada	GSDA	7.5	NA	250	1072	-	-	NA	NA	-	-	680	25	59	0.1	0.07	-	-
324	Shahada	Kavlith	GSDA	7.5	NA	236	633	-	-	NA	NA	-	-	290	13	12	0.1	0.08	-	-
325	Shahada	Aasus	GSDA	7.5	NA	450	1056	-	-	NA	NA	-	-	300	34	11	0.1	0.07	-	-
326	Shahada	Javade	GSDA	7.5	NA	264	737	-	-	NA	NA	-	-	300	2	33	0.1	0.07	-	-
327	Shahada	Bhortek	GSDA	7.5	NA	350	653	-	-	NA	NA	-	-	200	25	33	0.1	0.12	-	-
328	Shahada	Chikhali	GSDA	7.5	NA	690	1056	-	-	NA	NA	-	-	154	34	33	0.1	0.09	-	-
329	Shahada	Wagharde	GSDA	7.5	NA	384	953	-	-	NA	NA	-	-	400	35	54	0.1	0.08	-	-
330	Shahada	Titari	GSDA	7.5	NA	204	727	-	-	NA	NA	-	-	450	4	20	0.1	0.10	-	-
331	Shahada	Nawanagar	GSDA	7.5	NA	200	392	-	-	NA	NA	-	-	60	34	0	0.1	0.10	-	-
332	Shahada	Sonawal	GSDA	7.5	NA	544	1047	-	-	NA	NA	-	-	210	31	9	0.1	0.10	-	-
333	Shahada	Kakarde Kh	GSDA	7.5	NA	330	665	-	-	NA	NA	-	-	100	30	11	0.1	0.19	-	-
334	Shahada	Kakarde Kh	GSDA	7.5	NA	236	659	-	-	NA	NA	-	-	256	29	6	0.1	0.18	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
335	Shahada	Pusanad	GSDA	7.5	NA	560	1064	-	-	NA	NA	-	-	240	4	9	0.1	0.22	-	-
336	Shahada	Kanadi	GSDA	7.5	NA	380	1179	-	-	NA	NA	-	-	710	4	10	0.1	0.19	-	-
337	Shahada	Kauthal	GSDA	7.5	NA	160	1088	-	-	NA	NA	-	-	224	38	0	0.1	0.22	-	-
338	Shahada	Deur	GSDA	7.5	NA	464	1059	-	-	NA	NA	-	-	240	37	3	0.1	0.18	-	-
339	Shahada	Old Tembha	GSDA	7.5	NA	200	921	-	-	NA	NA	-	-	210	28	8	0.1	0.17	-	-
340	Shahada	Biladi	GSDA	7.5	NA	100	806	-	-	NA	NA	-	-	220	22	24	0.1	0.21	-	-
341	Shahada	Anarad	GSDA	7.5	NA	320	750	-	-	NA	NA	-	-	160	4	38	0.1	0.18	-	-
342	Shahada	Sasade	GSDA	7.5	NA	260	1270	-	-	NA	NA	-	-	380	33	36	0.1	0.16	-	-
343	Shahada	Sasade	GSDA	7.5	NA	280	1049	-	-	NA	NA	-	-	470	33	35	0.1	0.16	-	-
344	Shahada	Shelti	GSDA	7.5	NA	284	2016	-	-	NA	NA	-	-	636	33	51	0.1	0.18	-	-
345	Shahada	Shelti	GSDA	7.5	NA	320	1082	-	-	NA	NA	-	-	200	31	29	0.1	0.23	-	-
346	Shahada	Shelti	GSDA	7.5	NA	320	1082	-	-	NA	NA	-	-	150	31	51	0.1	0.23	-	-
347	Shahada	Kurhawad	GSDA	7.5	NA	148	343	-	-	NA	NA	-	-	60	31	19	0.1	0.22	-	-
348	Shahada	Kauthal	GSDA	7.5	NA	300	1142	-	-	NA	NA	-	-	244	33	11	0.1	0.22	-	-
349	Shahada	Biladi	GSDA	7.5	NA	224	1174	-	-	NA	NA	-	-	630	34	12	0.1	0.17	-	-
350	Shahada	Biladi T. S	GSDA	7.5	NA	256	1167	-	-	NA	NA	-	-	624	37	24	0.1	0.17	-	-
351	Shahada	Shrikhed	GSDA	7.5	NA	250	562	-	-	NA	NA	-	-	116	33	39	0.1	0.17	-	-
352	Shahada	Shrikhed	GSDA	7.5	NA	250	557	-	-	NA	NA	-	-	108	33	39	0.1	0.15	-	-
353	Shahada	Shrikhed	GSDA	7.5	NA	250	559	-	-	NA	NA	-	-	110	32	39	0.1	0.15	-	-
354	Shahada	Shrikhed	GSDA	7.5	NA	250	561	-	-	NA	NA	-	-	116	32	39	0.1	0.16	-	-
355	Shahada	Aurangpur	GSDA	7.5	NA	100	250	-	-	NA	NA	-	-	50	3	31	0.1	0.14	-	-
356	Shahada	Fattepur	GSDA	7.5	NA	190	478	-	-	NA	NA	-	-	80	27	11	0.1	0.09	-	-
357	Shahada	Bhutte Akashpur	GSDA	7.5	NA	196	425	-	-	NA	NA	-	-	70	20	22	0.1	0.11	-	-
358	Shahada	Bhutte Akashpur	GSDA	7.5	NA	168	375	-	-	NA	NA	-	-	56	20	22	0.1	0.16	-	-
359	Shahada	Chikhali	GSDA	7.5	NA	236	438	-	-	NA	NA	-	-	80	32	49	0.1	0.11	-	-
360	Shahada	Chikhali	GSDA	7.5	NA	250	450	-	-	NA	NA	-	-	84	33	49	0.1	0.13	-	-
361	Shahada	Islampur	GSDA	7.5	NA	240	445	-	-	NA	NA	-	-	80	32	20	0.1	0.15	-	-
362	Shahada	Pimpalod	GSDA	7.5	NA	240	654	-	-	NA	NA	-	-	140	28	74	0.1	0.10	-	-

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363	Shahada	Pimpalod	GSDA	7.5	NA	230	637	-	-	NA	NA	-	-	140	28	72	0.1	0.10	-	-
364	Shahada	Nawagaon	GSDA	7.5	NA	310	589	-	-	NA	NA	-	-	80	35	39	0.1	0.14	-	-
365	Shahada	Nawagaon	GSDA	7.5	NA	310	587	-	-	NA	NA	-	-	80	35	39	0.1	0.12	-	-
366	Shahada	Nawagaon	GSDA	7.5	NA	310	589	-	-	NA	NA	-	-	80	36	27	0.1	0.16	-	-
367	Shahada	Libardi	GSDA	7.5	NA	310	481	-	-	NA	NA	-	-	80	6	27	0.1	0.15	-	-
368	Shahada	Libardi	GSDA	7.5	NA	330	645	-	-	NA	NA	-	-	190	19	27	0.1	0.14	-	-
369	Shahada	Libardi	GSDA	7.5	NA	220	500	-	-	NA	NA	-	-	120	15	27	0.1	0.14	-	-
370	Shahada	Libardi	GSDA	7.5	NA	222	510	-	-	NA	NA	-	-	120	14	27	0.1	0.13	-	-
371	Shahada	Malpurpada	GSDA	7.5	NA	260	522	-	-	NA	NA	-	-	76	9	34	0.1	0.13	-	-
372	Shahada	Malpurpada	GSDA	7.5	NA	372	586	-	-	NA	NA	-	-	80	11	30	0.1	0.13	-	-
373	Shahada	Ratanpur	GSDA	7.5	NA	304	650	-	-	NA	NA	-	-	140	12	39	0.1	0.13	-	-
374	Shahada	Satpimpri	GSDA	7.5	NA	284	581	-	-	NA	NA	-	-	84	7	49	0.1	0.14	-	-
375	Shahada	Juni Libardi	GSDA	7.5	NA	310	529	-	-	NA	NA	-	-	110	12	22	0.1	0.14	-	-
376	Shahada	Menyaval	GSDA	7.5	NA	260	584	-	-	NA	NA	-	-	80	12	22	0.1	0.13	-	-
377	Shahada	Nande	GSDA	7.5	NA	200	442	-	-	NA	NA	-	-	104	11	22	0.1	0.11	-	-
378	Shahada	Nande	GSDA	7.5	NA	220	435	-	-	NA	NA	-	-	104	13	21	0.1	0.11	-	-
379	Shahada	Kulawad	GSDA	7.5	NA	250	613	-	-	NA	NA	-	-	108	19	16	0.1	0.10	-	-
380	Shahada	Talawadi	GSDA	7.5	NA	220	497	-	-	NA	NA	-	-	164	15	17	0.1	0.13	-	-
381	Shahada	Kusumwada	GSDA	7.5	NA	198	397	-	-	NA	NA	-	-	98	19	12	0.1	0.14	-	-
382	Shahada	Aamoda	GSDA	7.5	NA	220	455	-	-	NA	NA	-	-	100	13	12	0.1	0.14	-	-
383	Shahada	Kalmadi	GSDA	7.5	NA	202	452	-	-	NA	NA	-	-	100	33	4	0.1	0.11	-	-
384	Shahada	Kalmadi	GSDA	7.5	NA	200	386	-	-	NA	NA	-	-	80	34	4	0.1	0.11	-	-
385	Shahada	Kahatul	GSDA	7.5	NA	130	437	-	-	NA	NA	-	-	120	4	30	0.1	0.12	-	-
386	Shahada	Sonawad	GSDA	7.5	NA	430	1098	-	-	NA	NA	-	-	300	33	30	0.1	0.07	-	-
387	Shahada	Mohida	GSDA	7.5	NA	200	667	-	-	NA	NA	-	-	150	15	49	0.1	0.10	-	-
388	Shahada	Kanadi-T	GSDA	7.5	NA	224	531	-	-	NA	NA	-	-	190	30	4	0.1	0.09	-	-
389	Shahada	Katharde Kh	GSDA	7.5	NA	290	567	-	-	NA	NA	-	-	84	25	3	0.1	0.09	-	-
390	Shahada	Londhare	GSDA	7.5	NA	484	832	-	-	NA	NA	-	-	180	24	36	0.1	0.30	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
391	Shahada	Shahada	GSDA	7.5	NA	388	957	-	-	NA	NA	-	-	180	12	10	0.1	0.18	-	-
392	Taloda	Retpada	EW	8.01	500	170	260	37	2	56	7	0	275	18		0				
393	Taloda	Sorapada	EW	8.1	380	130	190	25	2	28	15	0	201	18		Tr				
394	Taloda	Ekdhad	EW	8.1	400	135	200	30	2	32	13	0	226	14		0				
395	Taloda	Valheri	EW	7.8	390	140	200	23	2	28	17	0	214	14		Tr				
396	Taloda	Lobhani	EW	7.69	670	270	390	56	1	60	29	0	421	28		0				
397	Taloda	Dahelpur	EW	7.9	360	125	180	23	0.4	24	16	0	189	18		0				
398	Taloda	Taloda	EW	8.28	760	285	400	49	0	52	38	0	390							
399	Taloda	Sirve	EW	7.8	440	200	245	19	1	46	21	0	262	18		5				
400	Taloda	Kharvad	EW	7.5	1275	265	710	177	12	46	36	0	549	138		15				
401	Taloda	Tarhavad	GSDA	7.5	NA	350	1041	-	-	NA	NA	-	-	720	7	9	0.1	0.12	-	-
402	Taloda	Dalelpur	GSDA	7.5	NA	150	310	-	-	NA	NA	-	-	80	25	13	0.1	0.10	-	-
403	Taloda	Dalelpur	GSDA	7.5	NA	140	327	-	-	NA	NA	-	-	70	38	14	0.1	0.10	-	-
404	Taloda	Chaugaon Bk	GSDA	7.5	NA	198	455	-	-	NA	NA	-	-	98	43	15	0.1	0.09	-	-
405	Taloda	Morwada	GSDA	7.5	NA	164	450	-	-	NA	NA	-	-	84	9	21	0.1	0.07	-	-
406	Taloda	Morwada	GSDA	7.5	NA	160	450	-	-	NA	NA	-	-	100	8	19	0.1	0.09	-	-
407	Taloda	Kazipur	GSDA	7.5	NA	160	392	-	-	NA	NA	-	-	84	29	18	0.1	0.09	-	-
408	Taloda	Kazipur	GSDA	7.5	NA	276	758	-	-	NA	NA	-	-	168	32	17	0.1	0.06	-	-
409	Taloda	Talve	GSDA	7.5	NA	170	516	-	-	NA	NA	-	-	96	45	17	0.1	0.07	-	-
410	Taloda	Talve	GSDA	7.5	NA	172	462	-	-	NA	NA	-	-	80	44	17	0.1	0.06	-	-
411	Taloda	Narmadanagara	GSDA	7.5	NA	140	282	-	-	NA	NA	-	-	46	32	16	0.1	0.06	-	-
412	Taloda	Dhanpur	GSDA	7.5	NA	190	366	-	-	NA	NA	-	-	42	2	11	0.1	0.07	-	-
413	Taloda	Dhanpur	GSDA	7.5	NA	184	347	-	-	NA	NA	-	-	46	6	11	0.1	0.10	-	-
414	Taloda	Kharvad	GSDA	7.5	NA	230	1093	-	-	NA	NA	-	-	530	43	10	0.1	0.11	-	-
415	Taloda	Revanagar	GSDA	7.5	NA	100	223	-	-	NA	NA	-	-	60	31	9	0.1	0.07	-	-
416	Taloda	Revanagar	GSDA	7.5	NA	150	297	-	-	NA	NA	-	-	60	24	8	0.1	0.07	-	-
417	Taloda	Old Silingpur	GSDA	7.5	NA	180	329	-	-	NA	NA	-	-	80	31	7	0.1	0.11	-	-
418	Taloda	New Silingpur	GSDA	7.5	NA	140	253	-	-	NA	NA	-	-	60	30	9	0.1	0.08	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
419	Taloda	Rozave	GSDA	7.5	NA	240	609	-	-	NA	NA	-	-	90	15	19	0.1	0.10	-	-
420	Taloda	Rozave	GSDA	7.5	NA	264	661	-	-	NA	NA	-	-	100	14	18	0.1	0.10	-	-
421	Taloda	Jivannagar	GSDA	7.5	NA	220	491	-	-	NA	NA	-	-	54	13	15	0.1	0.10	-	-
422	Taloda	Pratappur	GSDA	7.5	NA	220	406	-	-	NA	NA	-	-	80	16	22	0.1	0.12	-	-
423	Taloda	Sardarnagar	GSDA	7.5	NA	200	362	-	-	NA	NA	-	-	40	10	22	0.1	0.11	-	-
424	Taloda	Sardarnagar	GSDA	7.5	NA	220	346	-	-	NA	NA	-	-	70	10	20	0.1	0.11	-	-
425	Taloda	Sardarnagar	GSDA	7.5	NA	216	342	-	-	NA	NA	-	-	64	10	19	0.1	0.10	-	-
426	Taloda	Salsadi	GSDA	7.5	NA	190	376	-	-	NA	NA	-	-	40	37	18	0.1	0.07	-	-
427	Taloda	Pandulki	GSDA	7.5	NA	120	347	-	-	NA	NA	-	-	90	36	20	0.1	0.08	-	-
428	Taloda	Nawagaon	GSDA	7.5	NA	120	280	-	-	NA	NA	-	-	24	6	21	0.1	0.11	-	-
429	Taloda	Savarpada	GSDA	7.5	NA	216	467	-	-	NA	NA	-	-	78	34	14	0.1	0.01	-	-
430	Taloda	Savarpada	GSDA	7.5	NA	168	361	-	-	NA	NA	-	-	56	34	21	0.1	0.01	-	-
431	Taloda	Savarpada	GSDA	7.5	NA	290	645	-	-	NA	NA	-	-	96	32	19	0.1	0.12	-	-
432	Taloda	Savarpada	GSDA	7.5	NA	244	598	-	-	NA	NA	-	-	84	32	15	0.1	0.09	-	-
433	Taloda	Borad	GSDA	7.5	NA	260	946	-	-	NA	NA	-	-	250	44	20	0.1	0.07	-	-
434	Taloda	Borad	GSDA	7.5	NA	260	896	-	-	NA	NA	-	-	200	43	19	0.1	0.06	-	-
435	Taloda	Borad	GSDA	7.5	NA	256	984	-	-	NA	NA	-	-	250	44	18	0.1	0.06	-	-
436	Taloda	Borad	GSDA	7.5	NA	200	745	-	-	NA	NA	-	-	194	44	18	0.1	0.06	-	-
437	Taloda	Borad	GSDA	7.5	NA	200	587	-	-	NA	NA	-	-	202	42	10	0.1	0.08	-	-
438	Taloda	Chota Dhanpur	GSDA	7.5	NA	156	327	-	-	NA	NA	-	-	68	16	16	0.1	0.09	-	-
439	Taloda	Rampur	GSDA	7.5	NA	168	337	-	-	NA	NA	-	-	96	13	20	0.1	0.08	-	-
440	Taloda	Karde	GSDA	7.5	NA	244	440	-	-	NA	NA	-	-	140	12	19	0.1	0.08	-	-
441	Taloda	Shirve	GSDA	7.5	NA	140	253	-	-	NA	NA	-	-	44	11	20	0.1	0.09	-	-
442	Taloda	Ratanpada	GSDA	7.5	NA	102	220	-	-	NA	NA	-	-	60	13	24	0.1	0.12	-	-
443	Taloda	Padalpur	GSDA	7.5	NA	196	467	-	-	NA	NA	-	-	100	15	22	0.1	0.10	-	-
444	Taloda	Jamunipada	GSDA	7.5	NA	190	520	-	-	NA	NA	-	-	64	15	24	0.1	0.09	-	-
445	Taloda	Jamunipada	GSDA	7.5	NA	184	376	-	-	NA	NA	-	-	90	14	27	0.1	0.10	-	-
446	Taloda	Bandhara	GSDA	7.5	NA	180	289	-	-	NA	NA	-	-	60	13	20	0.1	0.09	-	-

S. No.	Taluka	Location	Agency	pH	EC	Hardness	TDS	Na	K	Ca	Mg	CO ₃	HCO ₃	Cl	NO ₃	SO ₄	F	Fe	SAR	RSC
447	Taloda	Kothar	GSDA	7.5	NA	350	766	-	-	NA	NA	-	-	144	14	20	0.1	0.13	-	-
448	Taloda	Varpada	GSDA	7.5	NA	120	269	-	-	NA	NA	-	-	40	14	21	0.1	0.09	-	-
449	Taloda	Khedale	GSDA	7.5	NA	280	650	-	-	NA	NA	-	-	140	19	20	0.1	0.12	-	-
450	Taloda	Modalpada	GSDA	7.5	NA	248	385	-	-	NA	NA	-	-	40	13	16	0.1	0.07	-	-
451	Taloda	Modalpada	GSDA	7.5	NA	250	524	-	-	NA	NA	-	-	120	12	19	0.1	0.06	-	-
452	Taloda	Dhavalivihir	GSDA	7.5	NA	150	262	-	-	NA	NA	-	-	60	11	28	0.1	0.06	-	-
453	Taloda	Dhavalivihir	GSDA	7.5	NA	228	404	-	-	NA	NA	-	-	144	12	20	0.1	0.09	-	-
454	Taloda	Belipada	GSDA	7.5	NA	150	344	-	-	NA	NA	-	-	64	14	15	0.1	0.09	-	-
455	Taloda	Budhaval (G)	GSDA	7.5	NA	220	395	-	-	NA	NA	-	-	84	14	19	0.1	0.09	-	-
456	Taloda	Gadikothda	GSDA	7.5	NA	180	396	-	-	NA	NA	-	-	120	12	12	0.1	0.06	-	-
457	Taloda	Ranipur	GSDA	7.5	NA	190	446	-	-	NA	NA	-	-	110	23	19	0.1	0.11	-	-
458	Taloda	Mod	GSDA	7.5	NA	230	427	-	-	NA	NA	-	-	136	16	16	0.1	0.10	-	-
459	Taloda	Mod	GSDA	7.5	NA	308	661	-	-	NA	NA	-	-	250	16	15	0.1	0.09	-	-
460	Taloda	Mod	GSDA	7.5	NA	350	733	-	-	NA	NA	-	-	198	19	15	0.1	0.09	-	-
461	Taloda	Mod	GSDA	7.5	NA	248	562	-	-	NA	NA	-	-	198	19	14	0.1	0.08	-	-
462	Taloda	Mod	GSDA	7.5	NA	460	897	-	-	NA	NA	-	-	450	19	13	0.1	0.11	-	-
463	Taloda	Mod	GSDA	7.5	NA	246	724	-	-	NA	NA	-	-	198	19	12	0.1	0.11	-	-
464	Taloda	Mod	GSDA	7.5	NA	308	674	-	-	NA	NA	-	-	250	6	16	0.1	0.11	-	-
465	Taloda	Somaval Kh	GSDA	7.5	NA	140	228	-	-	NA	NA	-	-	40	11	19	0.1	0.09	-	-
466	Taloda	Somaval Kh	GSDA	7.5	NA	140	255	-	-	NA	NA	-	-	40	11	21	0.1	0.12	-	-
467	Taloda	Walheri	GSDA	7.5	NA	80	166	-	-	NA	NA	-	-	42	10	16	0.1	0.08	-	-
468	Taloda	Ekdhad	GSDA	7.5	NA	68	168	-	-	NA	NA	-	-	46	10	20	0.1	0.11	-	-
469	Taloda	Amoni	GSDA	7.5	NA	100	214	-	-	NA	NA	-	-	40	38	18	0.1	0.11	-	-

Annexure-VIII: Locations of proposed Percolation Tanks in Nandurbar district

Sr No	Taluka	Village
1	Akkalkuwa	Amali
2	Akkalkuwa	Amali
3	Akkalkuwa	Guliumbar
4	Akkalkuwa	Moramba
5	Akkalkuwa	Moramba
6	Akkalkuwa	Moramba
7	Akkalkuwa	Moramba
8	Akkalkuwa	Moramba
9	Akkalkuwa	Moramba
10	Akkalkuwa	Moramba
11	Akkalkuwa	Moramba
12	Akkalkuwa	Vadali
13	Nandurbar	Akhatwade
14	Nandurbar	Bhaler
15	Nandurbar	Ghoghalgaon
16	Nandurbar	Ghoghalgaon
17	Nandurbar	Manjre
18	Nandurbar	Nimbhel
19	Nandurbar	Patharai
20	Nandurbar	Patonda
21	Nandurbar	Shahade
22	Nandurbar	Vadbare
23	Navapur	Dudhave
24	Navapur	Khanapur
25	Shahada	Alkhed
26	Shahada	Anarad
27	Shahada	Asalod
28	Shahada	Chandsaili
29	Shahada	Chirde
30	Shahada	DhandreBk
31	Shahada	Godipur
32	Shahada	Isalampur
33	Shahada	Javade-t-borad
34	Shahada	Kakardebk
35	Shahada	Kakardebk
36	Shahada	Kalambu
37	Shahada	Kalambu
38	Shahada	Karjot

Sr No	Taluka	Village
39	Shahada	Kauthal-t-shahade
40	Shahada	Kavalith
41	Shahada	Kochare
42	Shahada	Kondaval
43	Shahada	Kukaval
44	Shahada	Lakkadkot
45	Shahada	Lohare
46	Shahada	Londhare
47	Shahada	Mandane
48	Shahada	Nandya
49	Shahada	Pimparde
50	Shahada	Pimparde
51	Shahada	Pimplod
52	Shahada	Purushottamnagar (C
53	Shahada	Pusanad
54	Shahada	Pusanad
55	Shahada	Pusanad
56	Shahada	Sawakheda
57	Shahada	Shahade (M Cl)
58	Shahada	Shahade (r)
59	Shahada	Sultanpur
60	Shahada	Talavadi
61	Shahada	Torkheda
62	Shahada	Udhalod
63	Shahada	Vadchhil
64	Shahada	Vadchhil
65	Shahada	Vadgaon
66	Taloda	Amalpada
67	Taloda	Budhavali
68	Taloda	Dhanpur
69	Taloda	KhardiKh
70	Taloda	Khusgavhan
71	Taloda	Navagaon
72	Taloda	Rapapur
73	Taloda	Rozave
74	Taloda	Rozave
75	Taloda	Umri

Annexure-IX: Location of proposed Check Dams in Nandurbar district

Sr No	Taluka	Village
1	Akkalkuwa	Amali
2	Akkalkuwa	Amali
3	Akkalkuwa	Amali
4	Akkalkuwa	Amali
5	Akkalkuwa	Amali
6	Akkalkuwa	Amali
7	Akkalkuwa	Ankushvihir (Bri)
8	Akkalkuwa	Dogripada
9	Akkalkuwa	GalothaBk
10	Akkalkuwa	Gavhali
11	Akkalkuwa	Gavhali
12	Akkalkuwa	Guliumbar
13	Akkalkuwa	Jamali (umar-kuwa)
14	Akkalkuwa	Kakerpada
15	Akkalkuwa	Makranifali
16	Akkalkuwa	Moramba
17	Akkalkuwa	Moramba
18	Akkalkuwa	Moramba
19	Akkalkuwa	Moramba
20	Akkalkuwa	Moramba
21	Akkalkuwa	Moramba
22	Akkalkuwa	Moramba
23	Akkalkuwa	Moramba
24	Akkalkuwa	Moramba
25	Akkalkuwa	Moramba
26	Akkalkuwa	Moramba
27	Akkalkuwa	Moramba
28	Akkalkuwa	Moramba
29	Akkalkuwa	Moramba
30	Akkalkuwa	Moramba
31	Akkalkuwa	Nawapada
32	Akkalkuwa	Ratanpada
33	Akkalkuwa	Shelwai
34	Akkalkuwa	Umarkuva
35	Nandurbar	Bhagsari
36	Nandurbar	Bhaler
37	Nandurbar	Bhavanipada
38	Nandurbar	Bhone
39	Nandurbar	Chakle
40	Nandurbar	Ghoghalgaon

Sr No	Taluka	Village
41	Nandurbar	Ghoghalgaon
42	Nandurbar	Ghoghalgaon
43	Nandurbar	Gu.jambholi
44	Nandurbar	Hatmohide
45	Nandurbar	Jun Mohide
46	Nandurbar	Karankheda
47	Nandurbar	Khaparkhede
48	Nandurbar	Khondamali
49	Nandurbar	Lonkheda
50	Nandurbar	Loya
51	Nandurbar	Mandal
52	Nandurbar	Mandal
53	Nandurbar	Palashi
54	Nandurbar	Patonda
55	Nandurbar	Patonda
56	Nandurbar	Ranale
57	Nandurbar	Ranale
58	Nandurbar	Samsherpur
59	Nandurbar	Samsherpur
60	Nandurbar	Shahade
61	Nandurbar	Shindgavhan
62	Nandurbar	Vikharan
63	Nandurbar	Wadwad
64	Nandurbar	Wankute
65	Navapur	Bilbare
66	Navapur	Chorvihir
67	Navapur	Kadwan
68	Navapur	Kadwan
69	Navapur	SonareDigar
70	Shahada	Alkhed
71	Shahada	Ambapur
72	Shahada	Amode
73	Shahada	Awage
74	Shahada	Borad
75	Shahada	Chandsaili
76	Shahada	Fattepur
77	Shahada	Fattepur
78	Shahada	Godipur
79	Shahada	Isalampur
80	Shahada	Isalampur

Sr No	Taluka	Village
81	Shahada	Isalampur
82	Shahada	Javkheda
83	Shahada	Kahatul
84	Shahada	Kalsadi
85	Shahada	Kalsadi
86	Shahada	Kanadi-t-haveli
87	Shahada	Karankheda
88	Shahada	KathardeKh
89	Shahada	Kothali-t-haveli
90	Shahada	Lachore
91	Shahada	Matkut
92	Shahada	Padalde-bk
93	Shahada	Prakasha
94	Shahada	Raikhed
95	Shahada	Raikhed
96	Shahada	Sawakheda
97	Shahada	Sawakheda
98	Shahada	Sonval-t-borad
99	Shahada	Sultanpur
100	Shahada	Sultanpur
101	Shahada	Sulwade
102	Shahada	Talavadi
103	Shahada	Tarhadi-t-borad
104	Shahada	Tawalai
105	Shahada	Tawalai
106	Shahada	Vadchhil
107	Shahada	Vardhe
108	Taloda	Amaled

Sr No	Taluka	Village
109	Taloda	Amaled
110	Taloda	Amalpada
111	Taloda	Amalpada
112	Taloda	Belipada
113	Taloda	Bhabalpur
114	Taloda	Bhavar
115	Taloda	Borad
116	Taloda	Borad
117	Taloda	ChaugaonBk
118	Taloda	ChaugaonBk
119	Taloda	Chinode
120	Taloda	Dalelpur
121	Taloda	Dalelpur
122	Taloda	Halalpur
123	Taloda	Kakalpur
124	Taloda	Kalmadi-t-borad
125	Taloda	KazipurTalawadi
126	Taloda	Khusgavhan
127	Taloda	Khusgavhan
128	Taloda	Mod
129	Taloda	Nalgavhan
130	Taloda	Navagaon
131	Taloda	Rajviri
132	Taloda	Rajviri
133	Taloda	Ranapur
134	Taloda	Rapapur
135	Taloda	Somawalkh

Annexure-X: Location of proposed Recharge Shafts in Nandurbar district

Sr No	Taluka	Village
1	Shahada	Alkhed
2	Shahada	Amode
3	Shahada	Anarad
4	Shahada	Asalod
5	Shahada	Bamkheda-t-tarhad
6	Shahada	Chandsaili
7	Shahada	DhandreBk
8	Shahada	Isalampur
9	Shahada	Jainagar
10	Shahada	Javade-t-borad
11	Shahada	Kakardebk
12	Shahada	Kalambu
13	Shahada	Kalmad-t-haveli
14	Shahada	Karjot
15	Shahada	Kauthal-t-shahade
16	Shahada	Kavalith
17	Shahada	Kochare
18	Shahada	Kukaval
19	Shahada	Kurangi
20	Shahada	Kurangi
21	Shahada	Lohare
22	Shahada	Londhare
23	Shahada	Londhare
24	Shahada	Mandane
25	Shahada	Mandane
26	Shahada	Nandya
27	Shahada	Pimparde
28	Shahada	Pimparde
29	Shahada	Pimplod
30	Shahada	Purushottamnagar (C
31	Shahada	Pusanad
32	Shahada	Sawakheda
33	Shahada	Shahade (M Cl)
34	Shahada	Shahade (r)
35	Shahada	Sultanpur
36	Shahada	Talavadi
37	Shahada	Tawalai
38	Shahada	Torkheda
39	Shahada	Vadchhil
40	Shahada	Vadchhil
41	Shahada	Vadgaon