



# केन्द्रीय भूमिजल बोर्ड

जल शक्ति मंत्रालय, जल संसाधन, नदी विकास और गंगा संरक्षण विभाग  
भारत सरकार

## Central Ground Water Board

Ministry of Jal Shakti,  
Department of Water Resources, River Development  
and Ganga Rejuvenation  
Government of India

Report on

## **AQUIFER MAPPING AND MANAGEMENT PLAN**

**Virajpet Taluk, Kodagu District, Karnataka**

दक्षिण पश्चिमी क्षेत्र, बेंगलुरु

South Western Region, Bengaluru

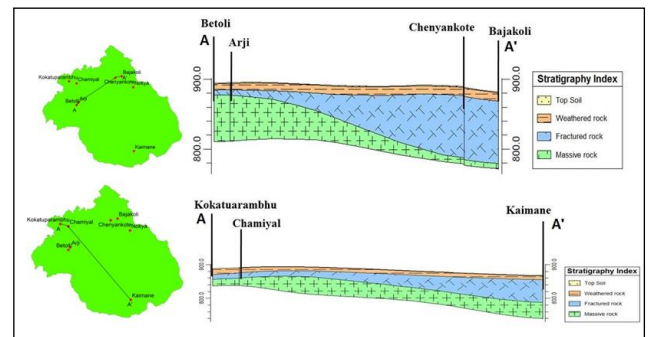
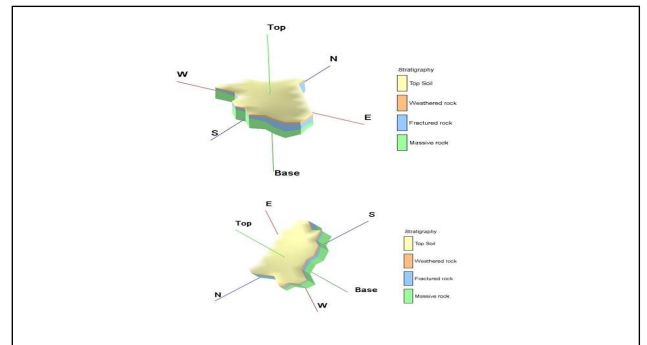
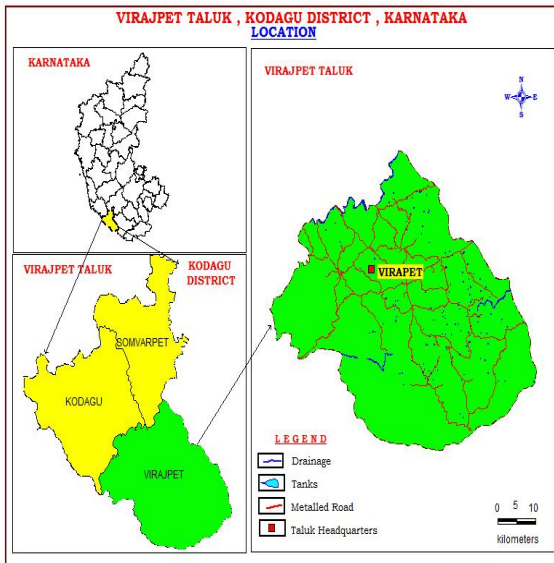
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# AQUIFER MAPS AND MANAGEMENT PLAN, VIRAJPET TALUK, KODAGU DISTRICT, KARNATAKA STATE

(AAP: – 2022-2023)



By  
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# AQUIFER MAPS AND MANAGEMENT PLAN, VIRAJPET TALUK, KODAGU DISTRICT, KARNATAKA STATE

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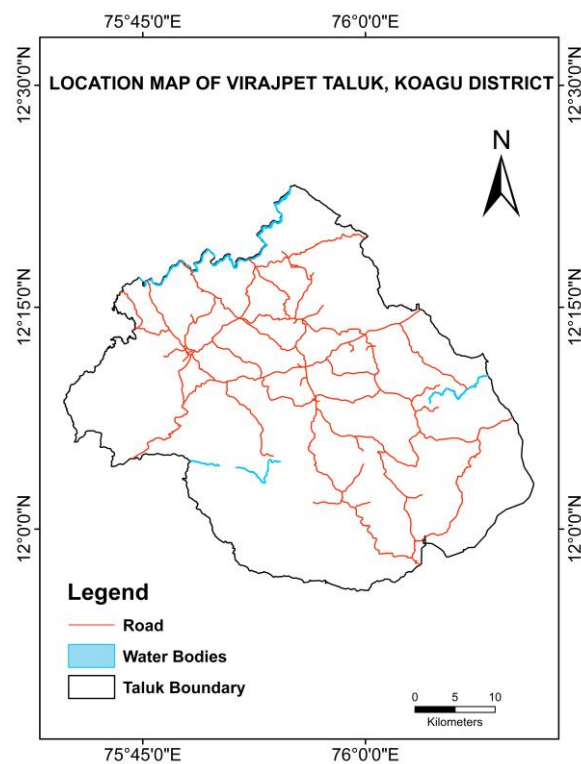
# **AQUIFER MAPS AND MANAGEMENT PLAN, VIRAJPET TALUK, KODAGU DISTRICT, KARNATAKA STATE**

## **1.0 SALIENT INFORMATON**

Name of the taluk	: Virajpet
District	: Kodagu
State	: Karnataka
Area	: 1666 sq.km.
Population (Census 2011)	: 2,01,431
Normal annual Rainfall	: 2540 mm

## **1.1 Study Area**

Aquifer Mapping Studies have been carried out in Virajpet taluk, Kodagu district, Karnataka state under National Aquifer Mapping Project. The Taluk is covering an area of 1666 sq.kms. The Geographical extent of Virajpet taluk is located between North Latitudes 12°23'11.10'' to 11°56'30.51'' and East Longitudes between 76° 8' 28.52'' to 75°47'55.77''. The taluk is covered in parts of Survey of India Toposheet Nos. 48P/15, P/16, P/12, 57D/3, D/4, 49M/13 and 58A/1. Virajpet taluk is bounded on the East by somwarpet taluk, on the North by Dakshin Kannada, on the South by Virajpet taluk, on the West by Kerala. Taluk administration of Virajpet is divided into 6 Hoblies and 38 Gram panchayats. Virajpet town is taluk Headquarter. There are 94 villages resent in this taluk. Location map of Virajpet taluk of Kodagu district is presented in Fig-1.



**Figure 1 Location map of Virajpet taluk of Kodagu district**

## 1.2 Population

According to 2011 census, the human population in Virajpet taluk is 2,01,431 in which 1,75,879 constitute the rural population and 25,552 is the urban population . The taluk has an overall population density of 124 persons per sq.km. The decadal variation in population from 2001-2011 is 3.12% in Virajpet taluk. The population details are given in table-1.

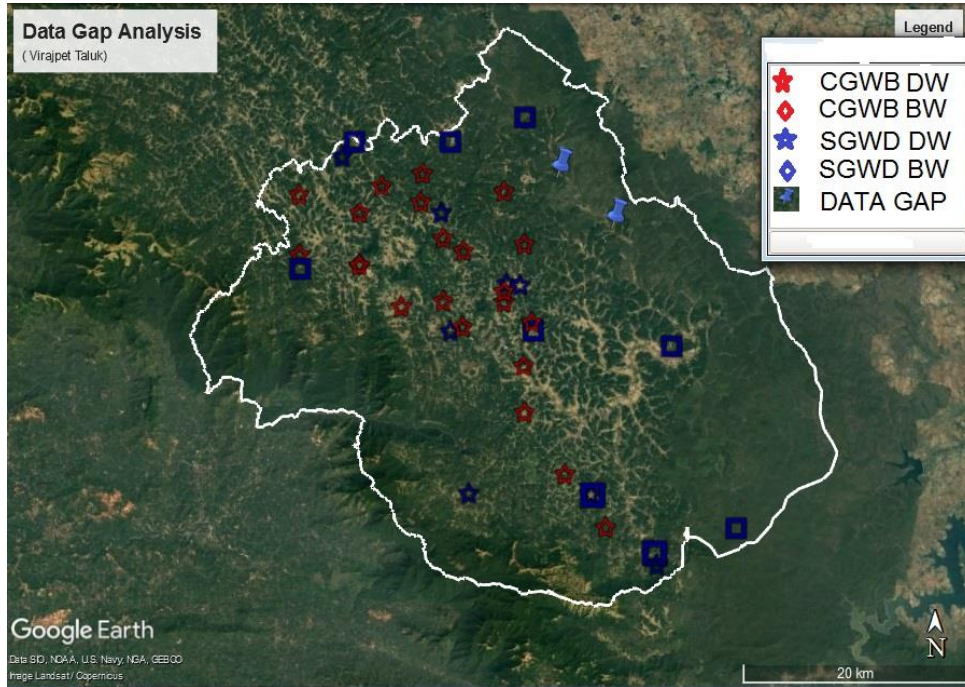
**Table 1 Population details**

Total	Male	Female	%Share of the district Population	Rural Population	Urban Population	Decadal change in Population	Decadal change in rural Population	Decadal change in urban Population
2,01,431	99754	1,01,677	36.3	1,75,879	25,552	0.40	-1.29	12.02

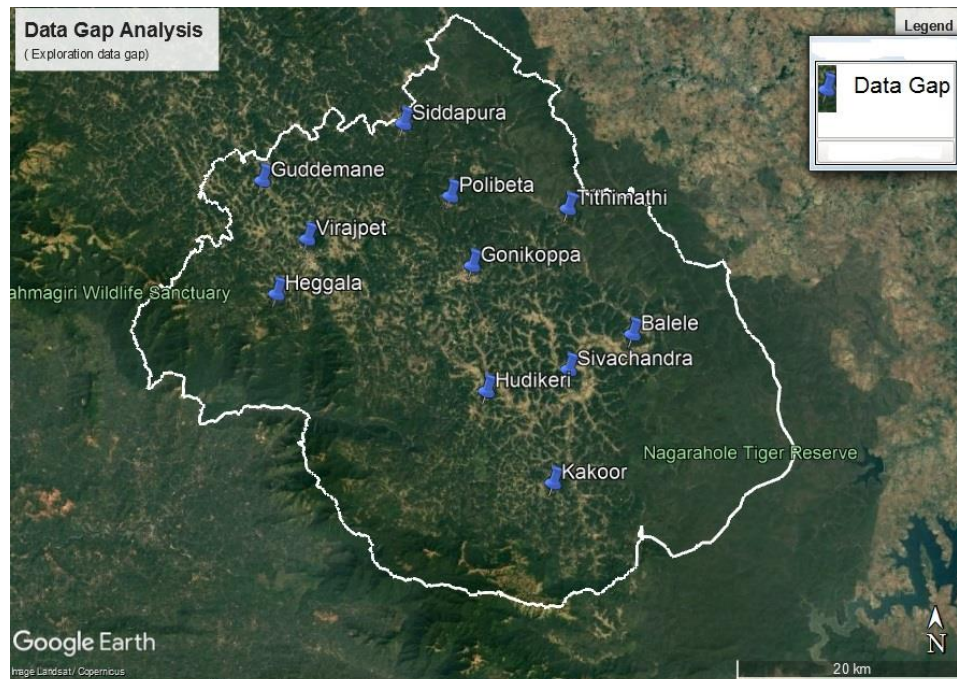
Source: District at a glance 2018-19, Govt. of Karnataka

### **1.3 Data Gap Analysis**

During the aquifer mapping period, existing data of CGWB i.e. exploration, depth to water level, water quality, geophysical logging and groundwater resource data have been collected and compiled. In addition to this, bore well data & water level data have been collected from Ground Water Directorate, Govt.of Karnataka. As per the guidelines of data gap analysis for aquifer mapping, two monitoring wells have to identify to fill the data gap in the taluk after integrating Central Ground Water Board and State Ground Water Directorate monitoring wells data. Dug wells 29 Nos. are available to monitor the first phreatic aquifer and 12 bore wells are available to know the aquifer characters of semi-confined aquifer system. Ground water quality monitoring is being done through 26 Nos. of established dug wells for first phreatic aquifer and through 01 Nos. of bore wells drilled by CGWB for the Semiconfined aquifer in order to assess the groundwater quality for drinking and irrigation purposes. Additional 20 Nos. of bore wells have to be identified (in Semi-confined Aquifer) through Field survey to assess the Groundwater quality for drinking and irrigation purposes. Total 11 Nos. of wells through Field survey have to be identified to complete the gaps in the data for Aquifer Information. Location of ground water observation wells and exploration wells are presented in Figure 2 & 3.



**Figure 2 Location map of GW Monitoring wells**



**Figure 3 Location map of Exploration wells**

## 1.4 Rainfall and Climate

The annual rainfall data from 2013 to 2022 of the Virajpet taluk is given in Table.2. The Monthly rainfall analysis for the period from 2013 to 2022 is shown Table.3.

**Table 2 Actual Annual Rainfall of Virajpet taluk from 2013 to 2022**

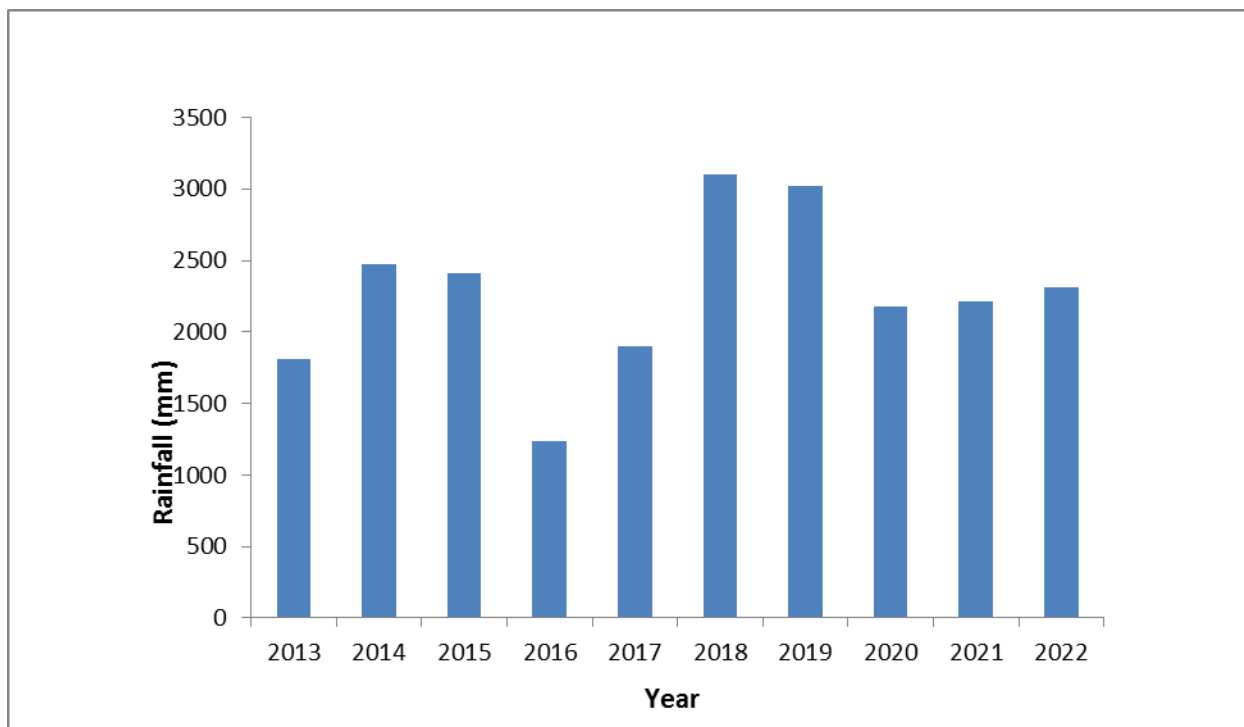
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Rainfall (mm)	1811	2471	2410	1240	1902	3106	3017	2177	2210	2312

(Source: Directorate of Economic and Statistics)

**Table 3 Monthly rainfall data of Virajpet taluk**

Year	JAN	FEB	MAR	APR	MAY	PRE	JUN	JUL	AUG	SEP	SW M	OCT	NOV	DEC	NE M	ANN .
2013	0	07	23	15	0	45	350	294	634	204	1482	155	129	0	284	1811
2014	0	0	0	93	196	289	185	826	629	375	2015	128	39	0	167	2471
2015	0	0	15	149	202	366	971	285	231	282	1769	180	95	0	275	2410
2016	0	0	0	05	132	137	372	389	210	92	1063	14	05	21	40	1240
2017	40.5	0.1	17.6	95.7	155.7	309.6	396	368	400	321	1485	71	10	25	106	1902
2018	0.3	8.0	18	61	245	325.1	849	877	795	122	2643	116	12	03	131	3106
2019	0	02	03	82	86	173	288	522	1280	438	2528	255	26	35	316	3017
2020	01	01	03	72	131	208	292	377	761	382	3823	121	25	11	157	2177
2021	26.6	13.9	7.3	67.8	244.1	359.7	358.5	499.2	227	255	1339.7	382	119	11	512	2210
2022	0	2.2	35.8	100.1	220	356	187.8	789.4	564.4	237.6	1779.1	130.9	20.7	24	175.2	2312





**Figure 4 Rainfall Trend Analysis**

### 1.5 Agriculture & Irrigation

Agriculture is the main occupation in Virajpet taluk. Major crops are Paddy, Fruits and Vegetables. Water intensive crops Paddy is grown in Virajpet Taluk (Table.4). Under Plantation coffee plant is grown more in taluk and water dependent.

**Table 4 Cropping pattern in Virajpet taluk 2018-2019 (Ha)**

Year	Paddy	Jowar	Ragi	Maize	Wheat	Fruits	Oil seeds	Sugarcane	Cotton
	Area under cultivation (in ha)								
2018-2019	11928	0	0	0	-	1754	477	-	0

About 39.96% of the Geographical area is covered by forest. It is observed that net sown area accounts 42.67 % and area sown more than once is 4.51% of total geographical area in Virajpet taluk. Area not available for cultivation, the other uncultivable land and Fallow land cover 7.28%, 5.1% and 3.65% respectively of total geographical area. The details of land use and details of irrigation are given in Table-5 and Table-6 respectively. The land use pattern is given in Fig-5.

**Table 5 of land use in Virajpet taluk 2018-2019 (Ha)**

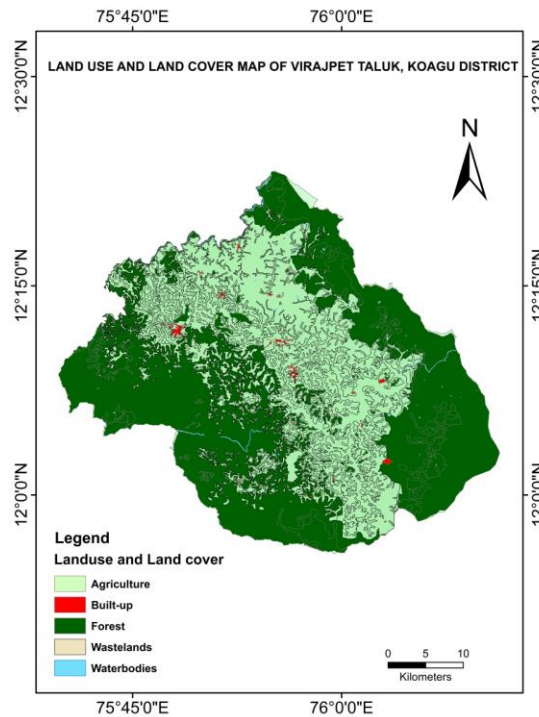
Taluk	Total Geographical Area	Area under Forest	Area not available for cultivation	Other Uncultivable land	Fallow land	Net sown area	Area sown more than once	Gross sown area
VIRAJPET	165731	66234	12072	8463	6054	70733	7487	78220
% of the area	-	39.96	7.28	5.1	3.65	42.67	4.51	47.19

Source: District at a glance 2018-19, Govt. of Karnataka

**Table 6 Irrigation details in Virajpet taluk (in ha)**

Source of Irrigation	Length in Km/ No of Structure	Gross irrigated area	Net area irrigated (Ha.)	% of area
Canals	30 (Km)	0	0	0
Tanks	747	0	0	0
Wells	137	0	0	0
Bore wells/ Tube wells	122	0	0	0
Lift Irrigation	3	41	41	100
Other Sources		0	0	0
<b>Total</b>			<b>41</b>	

Source: District at a glance 2018-19, Govt. of Karnataka



**Figure 5 Land use Map**

## 1.6 Geomorphology, Physiography & Drainage

The geomorphology of the Virajpet is formed by hilly area covered western and South western part. Central and south eastern part area covered by piedmont zone and plains. Virajpet taluk also shows reservoir , river/ stream and tanks etc. The General topographic elevation in the taluk varies from 1439 m in the South-western to 87 m amsl in the North-western part of the taluk. The differential altitude is significant because, it is likely to cause irregular ground water flow patterns on the micro scale (Fig.-6). Topography is dominantly controlled by geological structures. The entire Virajpet taluk falls in Cauvery river basin. The taluk is drained by 1st to 4th order streams. The drainage system is well developed in the taluk. The Drainage pattern is dendritic to sub-dendritic (Fig.-7).

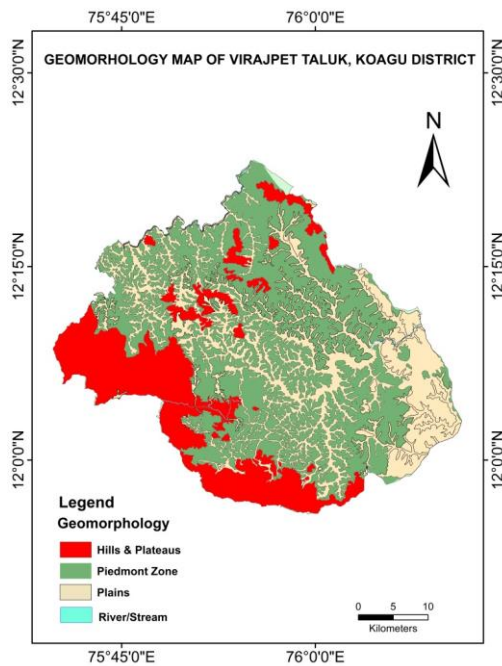


Figure 6 Geomorphology Map

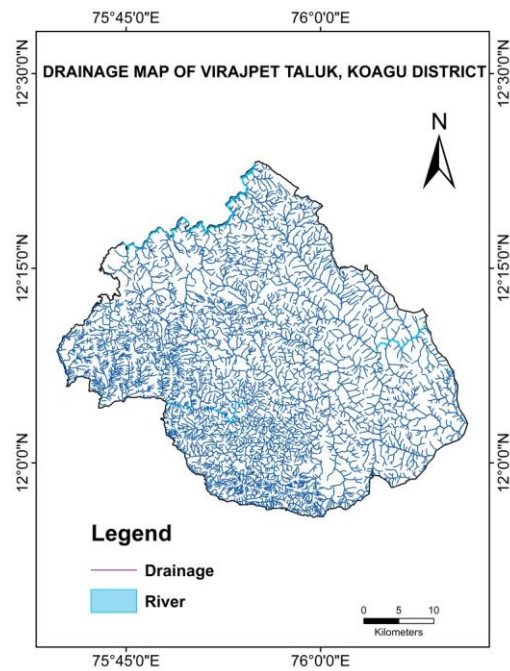


Figure 7 Drainage Map

## 1.7 Geology and Soil

Geologically, the taluk is mainly composed of metamorphic rocks of Pre-Cambrian age either exposed at the surface or covered with a thin mantle of residual and transported soils. The rock formation in the taluk falls into two groups, Banded Gneissic Complex and Charnockite formation (Fig-8). In Banded Gneissic Complex, Schist and Granite patches are found. The identification of stream pattern in the taluk is helpful in identification and interpretation of many geological features. The soil type of Virajpet taluk can broadly be classified into Clayey soils, Clayey Skeletal and Loamy soils. These soils vary in depth and texture, depending on the parent rock type, physiographic settings and climatic conditions. It is less permeable compare to the sandy soil. It is having good moisture holding capacity and is fertile (Fig-9).

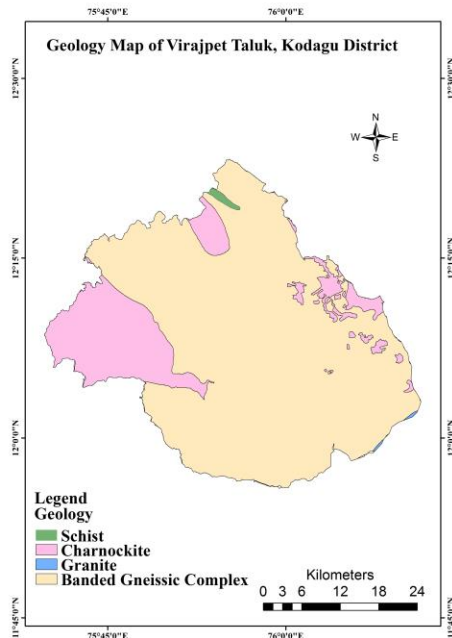


Figure 8 Geology Map

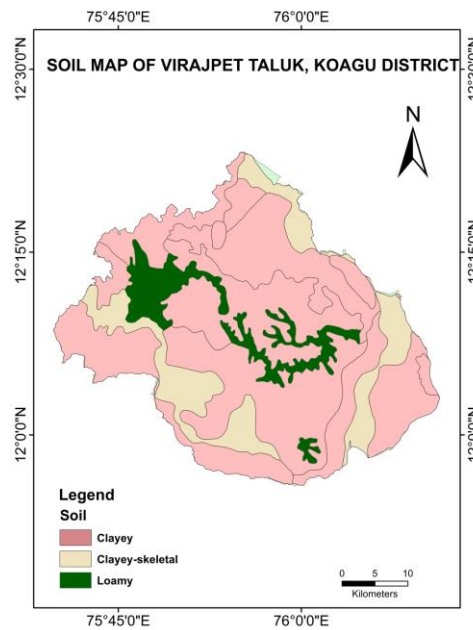


Figure 9 Soil Map

## 1.8 Hydrogeology

Hydrogeologically, the area forms a part of hard rock terrain comprising of Granite gneiss, charnockites, Schist and Granite (Figure 10). The flat and low-lying areas are covered by a thick mantle of fertile soil. The Groundwater occurs under phreatic conditions in weathered zones of Granite gneiss and Charnockite, and under semiconfined to confined conditions in fractures (Secondary porosity) of these rocks at deeper level. Yield ranges from Negligible to 4.57 lps.

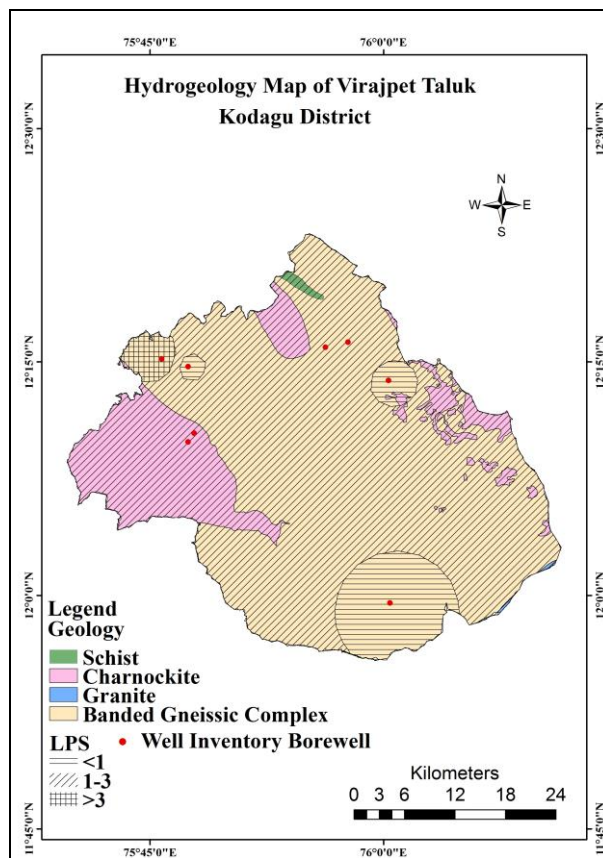


Figure 10 Hydrogeology Map of Virajpet taluk

### 1.9 Ground water resource availability and extraction

As per Groundwater resource estimation 2022 Table 7, the data on Groundwater resources shows that the net groundwater availability is 12553.46 Ham. The existing gross groundwater for irrigation is 3583.1 Ham. The existing gross groundwater for domestic and industrial is 404.58 Ham. The existing gross groundwater for draft is 3987.69 Ham. The stage of Groundwater development is 31.76 % and falling under 'Safe' category.

**Table 7 Dynamic Ground Water Resources (2022) (Ham)**

Net Annual Extractable Groundwater Resources	Existing Gross Groundwater Extraction For Irrigation	Existing Gross Groundwater Extraction For Domestic And Industrial Water Supply	Existing Gross Groundwater Extraction For All Uses	Allocation For Domestic And Industrial Use For Next 25 Years	Net Ground Water Availability For Future Irrigation Development	Stage Of Groundwater Extraction (%)	Category
12553.46	3583.1	404.58	3987.69	392.05	8561.07	31.76	Safe

Aquifer wise total Groundwater resources down to 200 m depth is given in **Table-8** below as per 2022 estimation.

**Table 8 Total Groundwater Resources (2022) (Ham)**

Taluk	Annual replenishable GW resources	Fresh In-storage GW resources		Total availability of fresh GW resources
Virajpet		Phreatic	Fractured (Down to 200m)	Dynamic + phreatic in-storage + fractured
	12553.46	16890	3514	32957.46

*(Note- Annual replenishable GW resources is taken from GWRA-2022 and Fresh In-storage GW resources is taken from GEC – 2017)*

### 1.10 Existing and future water demands (as per GWRA-2020 & GWRA-2022)

The details of Groundwater resources for Virajpet taluk as on 2020 and 2022 is shown in **Table.9 and Table.10** It is observed that the stage of Groundwater extraction is 48.52 % to 31.76 % from 2020 to 2022.

**Table 9 Dynamic Groundwater Resources (2020) (Ham)**

Net Annual Extractable Groundwater Resources	Existing Gross Groundwater Extraction For Irrigation	Existing Gross Groundwater Extraction For Domestic And Industrial Water Supply	Existing Gross Groundwater Extraction For All Uses	Allocation For Domestic And Industrial Use For Next 25 Years	Net Ground Water Availability For Future Irrigation Development	Stage Of Groundwater Extraction (%)	Category
13231.95	5673.2	746.47	6419.67	1065.65	6493.1	48.52	Safe

**Table 10 Dynamic Groundwater Resources (2022) (Ham)**

Net Annual Extractable Groundwater Resources	Existing Gross Groundwater Extraction For Irrigation	Existing Gross Groundwater Extraction For Domestic And Industrial Water Supply	Existing Gross Groundwater Extraction For All Uses	Allocation For Domestic And Industrial Use For Next 25 Years	Net Ground Water Availability For Future Irrigation Development	Stage Of Groundwater Extraction (%)	Category
12553.46	3583.1	404.58	3987.69	392.05	8561.07	31.76	Safe

### **1.11 Water level behavior**

The water level data have been monitored from the representative dug wells and bore wells under NHS monitoring for pre monsoon seasons during 2022 in Aquifer I and Aquifer II. During Pre monsoon season water level ranges from 1.05 to 13.9 mbgl in Aquifer- I (Phreatic aquifer) (Fig-11) and water level ranges from 7.56 to 27.75 mbgl in Aquifer- II (Confined / Semi confined) (Fig-14). During Post monsoon season water level ranges from 0.55 to 11.03 mbgl in Aquifer- I (Phreatic aquifer) (Fig-12) and water level ranges from 6.91 to 24.46 mbgl in Aquifer- II (Confined / Semi confined) (Fig-15). Decadal Average water level ranges for Pre Monsoon from 2.38 to 13.71 mbgl (Fig-17). Decadal Average water level ranges for Post Monsoon from 0.27 to 11.98 mbgl (Fig-18).

#### **Seasonal Water level Fluctuation:**

Seasonal water level fluctuation In Aquifer- I shows raise in water level between 0.07 to 11.56 meter and fall of water level 0.05 to 0.37 meter (**Fig-13**). In Aquifer- II water level raises 0.65 to 4.95 meter and fall of water level 0.0 to 0.65 meter (**Fig-16**). Raise in water level is observed in major part of area and fall of water level observed in patches in west and South-west part of taluk.

#### **Decadal Water level Fluctuation (2012-2021 with respect to 2022):**

Decadal water level fluctuation, In Pre- Monsoon shows raise in water level between 0.25 to 5.83 meter (**Fig-19**). In Post-Monsoon water level raises 0.09 to 8.32 meter and fall of water level 0.0 to 2.61 meter (**Fig-20**). In Pre-Monsoon rise in water level is observed in all part of taluk. In post-Monsoon fall of water level is observed in North to North-west and South part of taluk. Raise in water level is observed in central part of taluk.



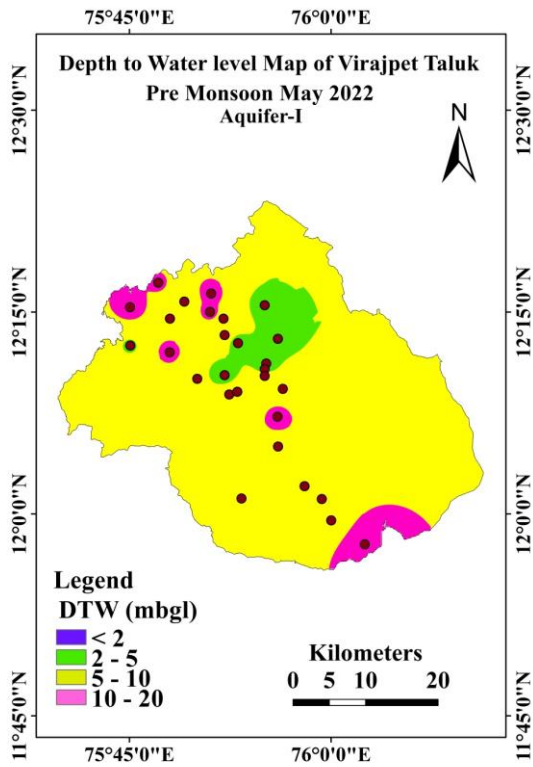


Figure 11 Pre Monsoon Depth to Water level Map

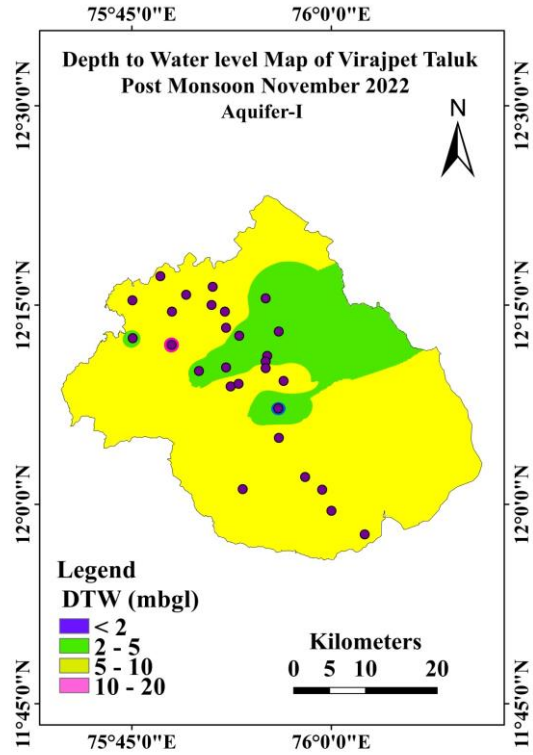


Figure 12 Post Monsoon Depth to Water level Map

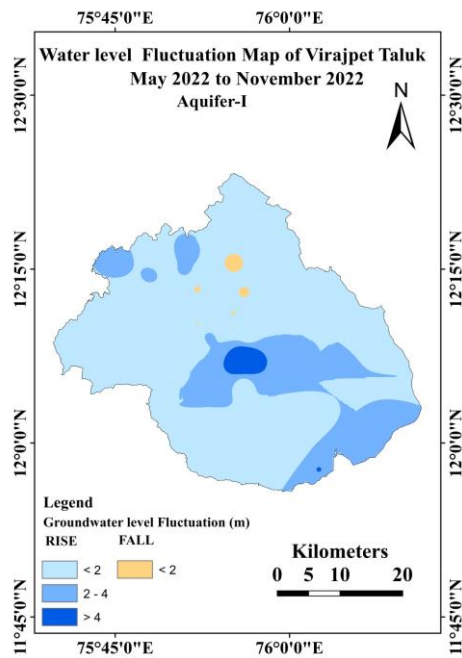


Figure 13 Water level Fluctuation Map

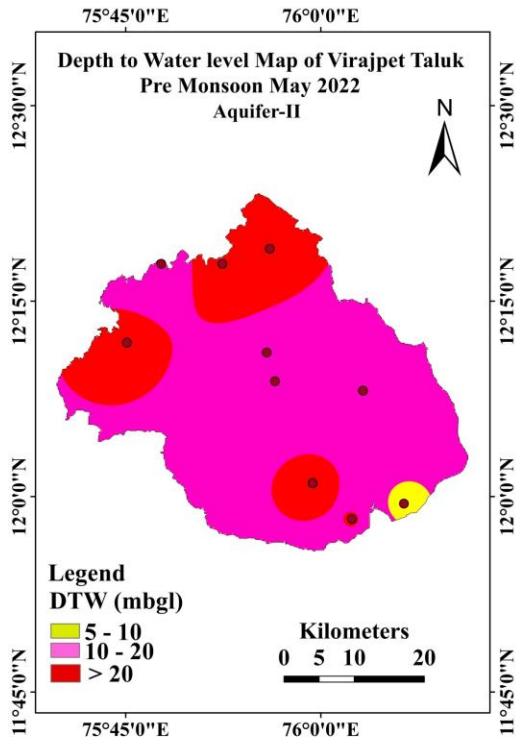


Figure 14 Pre Monsoon Depth to Water level Map

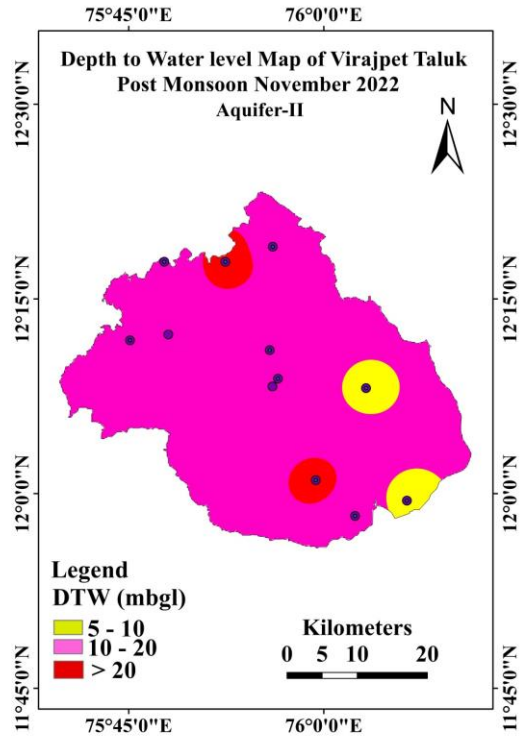


Figure 15 Post Monsoon Depth to Water level Map

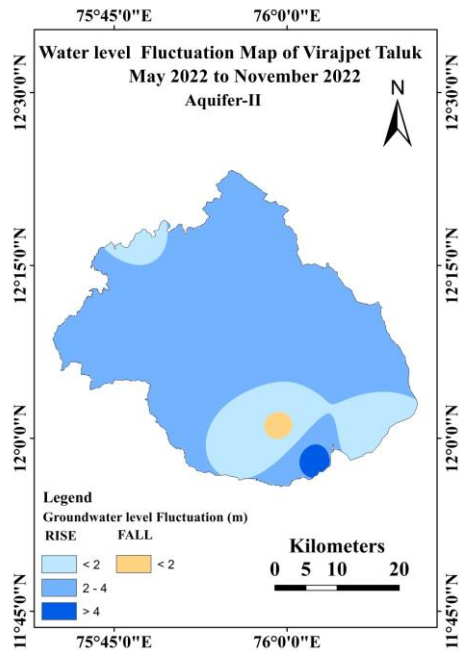


Figure 16 Water level Fluctuation Map

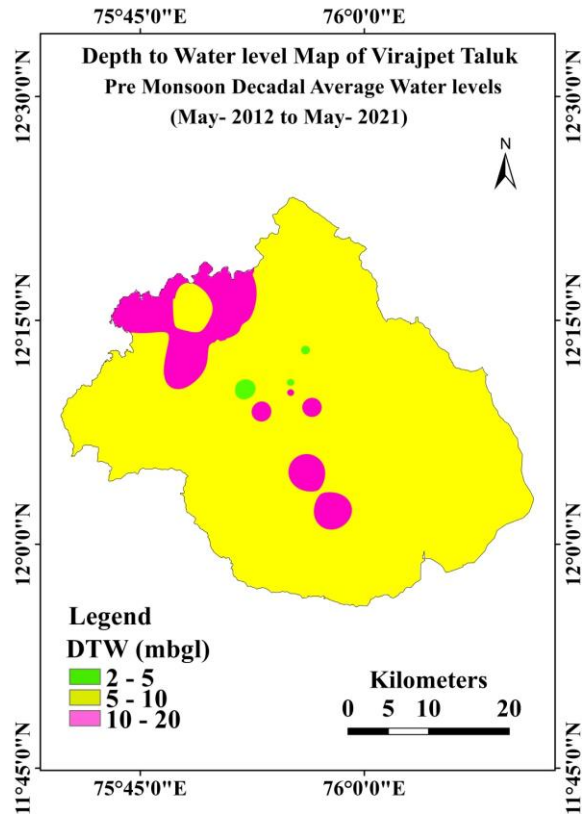


Figure 17 Pre Monsoon Decadal Water level Map

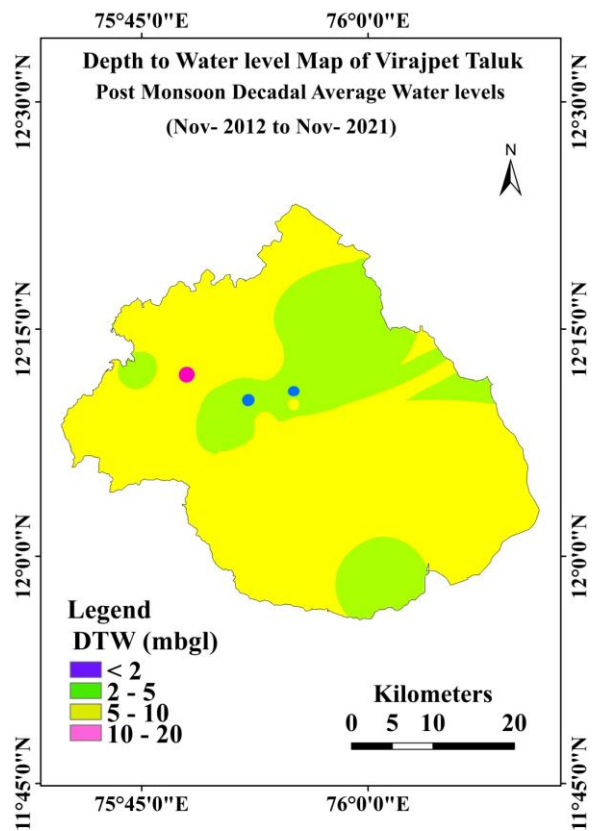


Figure 18 Post Monsoon Decadal Water level Map

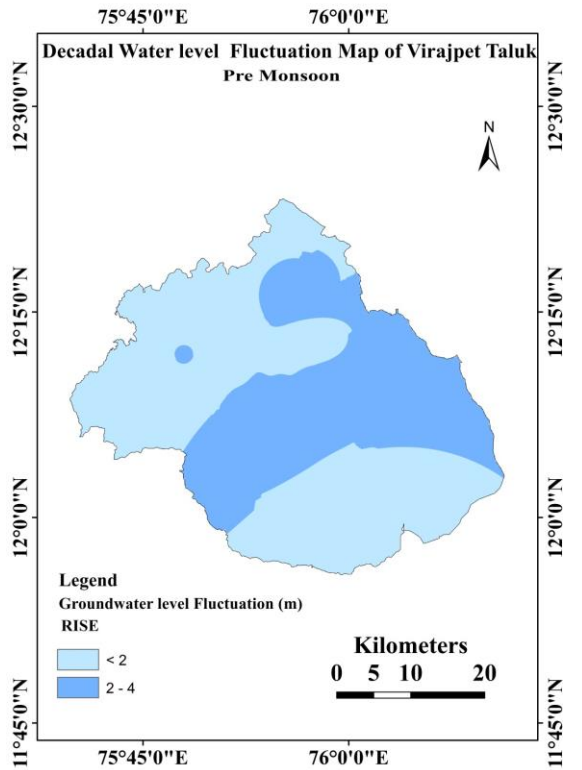


Figure 19 Pre Monsoon Decadal Fluctuation Map

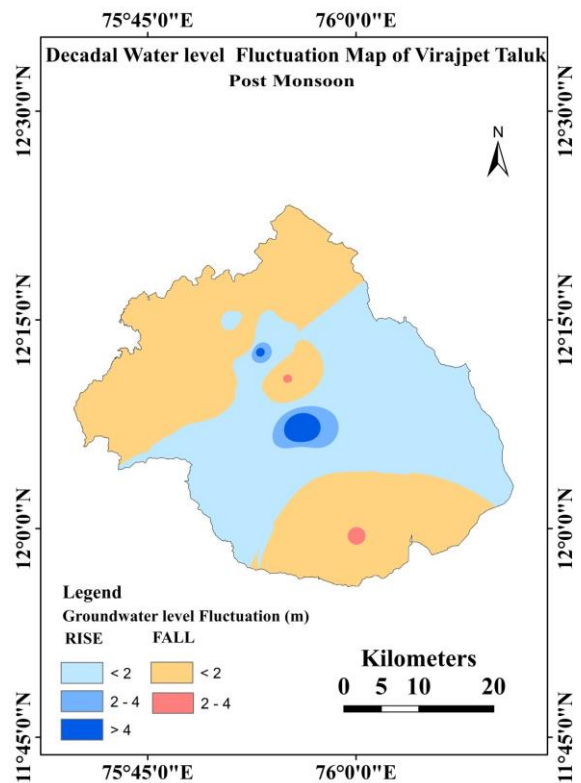


Figure 20 Post Monsoon Decadal Fluctuation Map

**Table 11 Depth to water level of Pre and Post-monsoon (2022), CGWB**

Sl No.	Site_type	Location name	May 22 WL (mbgl)	Nov 22 WL (mbgl)	Fluctuation (meter)
1	Dug well	Ammathi	9.56	7.62	1.94
2	Dug well	Begur	12.5	0.94	11.56
3	Dug well	Bittangala	5.2	4.2	1.0
4	Dug well	Chembellur	-	0.55	-
5	Dug well	Devanagere	9.35	6.95	2.4
6	Dug well	Devarapura	3.35	2.6	0.75
7	Dug well	Gonikoppal	3.82	3.92	-0.1
8	Dug well	Haathuru	1.05	1.1	-0.05
9	Dug well	Hosuru Betekeri	7.1	7.35	-0.25
10	Dug well	Hudikeri	8.28	7.27	1.01
11	Dug well	Ingilgere	11.3	8.2	3.1
12	Dug well	Jodubeeti	7.78	7.03	0.75
13	Dug well	Kaarekaadu	3.37	2.02	1.35
14	Dug well	Kadanur	4.37	4.3	0.07
15	Dug well	Kaimane	6.68	6.3	0.38
16	Dug well	Kakotu parambu	11.5	8.5	3.0
17	Dug well	Kunda	7.92	5.4	2.52
18	Dug well	Ontiangadi	7.85	7.3	0.28
19	Dug well	Ponnampet A	8.1	8.15	-0.05
20	Dug well	Siddapura-A	11.14	8.79	2.35
21	Bore well	Ponnampet	-	12.37	-
22	Dug well	T. Settigere	8.9	7.6	1.3
23	Dug well	Titimathi	2.15	2.52	-0.37
24	Bore well	Virajpet	-	15.27	-
25	Dug well	Virajpet1	11.43	11.03	0.4

**Table 12 Depth to water level of Pre and Post-monsoon (2022) (Ground Water Dept., Govt. of Karnataka)**

Sl No	Site_type	Location name	May 22 WL (mbgl)	Nov 22 WL (mbgl)	Fluctuation (meter)
1	Dug well	Gonikoppa	3.23	3.38	-0.15
2	Dug well	Ponnampet	10.3	8.77	1.53
3	Dug well	Srimangala	10.1	9.3	0.8
4	Dug well	Kutta	13.9	9.87	4.03
5	Dug well	Nagarahole Nalkeri	6.9	5.27	1.63
6	Dug well	Kondangeri	10.32	8.32	2.0
7	Bore well	Balele	10.29	7.52	2.77
8	Bore well	Ponnampete	14.1	10.4	3.7
9	Bore well	Kutta	20.2	15.25	4.95
10	Bore well	Nagarahole Nalkeri	7.56	6.91	0.65
11	Bore well	Srimangala	22.8	23.45	-0.65
12	Bore well	Maldare	22.3	18.48	3.82
13	Bore well	Kondangeri	12.0	10.86	1.14

14	Bore well	Siddapurqa	19.57	16.52	3.05
15	Bore well	Virajpet	22.21	19.87	2.34
16	Bore well	Ammathi	27.75	24.46	3.29

**Table 13 Decadal Average Pre Monsoon and Fluctuation Water level (2012-2021 w.r.t 2022), CGWB**

Sl.No	Site Type	Location	Mean WL (mbgl)	May 22 WL (mbgl)	Fluctutation (meter)
1	Dug well	Ammatti	9.81	9.56	0.25
2	Dug well	Bittangala	6.63	5.2	1.43
3	Dug well	Devanagere	10	9.35	0.65
4	Dug well	Devarapura	3.81	3.35	0.46
5	Dug well	Gonikoppal	4.8	3.82	0.98
6	Dug well	Haathuru	2.38	1.05	1.33
7	Dug well	Hosuru Betekeri	8.92	7.1	1.82
8	Dug well	Hudikeri	10.6	8.28	2.32
9	Dug well	Ingilgere	13.19	11.3	1.89
10	Dug well	Jodubeeti	10.82	7.78	3.04
11	Dug well	Kaarekaadu	5.13	3.37	1.76
12	Dug well	Kadanga	17.1	16.68	0.42
13	Dug well	Kadanur	5.94	4.37	1.57
14	Dug well	Kaimane	7.94	6.68	1.26
15	Dug well	Kakotu Parambu	12.1	11.5	0.6
16	Dug well	Kunda	11.75	7.92	3.83
17	Dug well	Majiyalla Ana Camp	7.4	5.53	1.87
18	Dug well	Marandodu	12.63	12.02	0.61
19	Dug well	Ontiangadi	8.35	7.85	0.5
20	Dug well	Ponnampet A	11.04	8.1	2.94
21	Dug well	Siddapura-A	13.11	11.14	1.97
22	Dug well	T.Settigere	10.53	8.9	1.63
23	Dug well	Thayagathoor	9.69	3.86	5.83
24	Dug well	Titimathi	6.08	2.15	3.93
25	Dug well	Virajpet I	13.71	11.43	2.28

**Table 14 Decadal Average Post Monsoon and Fluctuation Water level (2012-2021 w.r.t 2022), CGWB**

Sl.NO	Site Type	Location	Mean WL (mbl)	November 2022 WL (mbgl)	Fluctuation (meter)
1	Dug well	Ammatti	7.47	7.62	-0.15
2	Dug well	Begur	9.26	0.94	8.32
3	Dug well	Bittangala	3.53	4.2	-0.67
5	Dug well	Devanagere	5.94	6.95	-1.01
6	Dug well	Devarapura	0.27	2.6	-2.33
7	Dug well	Gonikoppal	3.87	3.92	-0.05
8	Dug well	Haathuru	1.19	1.1	0.09
9	Dug well	Hosuru Betekeri	5.35	7.35	-2
10	Dug well	Hudikeri	7.36	7.27	0.09
11	Dug well	Ingilgere	7.89	8.2	-0.31
13	Dug well	Kaarekaadu	6.97	2.02	4.95
14	Dug well	Kadanga	11.98	14.55	-2.57
15	Dug well	Kadanur	3.06	4.3	-1.24
16	Dug well	Kaimane	4.18	6.3	-2.12
17	Dug well	Kakotu parambu	8.38	8.5	-0.12
18	Dug well	Kunda	5.53	5.4	0.13
19	Dug well	Majiyalla Ana Camp	1.74	4.35	-2.61
22	Dug well	Ponnampet A	6.26	8.15	-1.89
23	Dug well	Siddapura-A	9.18	8.79	0.39
25	Dug well	T.settigere	6.07	7.6	-1.53
26	Dug well	Thayagathoor	6.97	2.46	4.51
27	Dug well	Titimathi	2.46	2.52	-0.06
29	Dug well	Virajpet1	11.03	11.03	0

## 2. AQUIFER DISPOSITION

The occurrence and movement of water in the subsurface is broadly governed by geological Frame works i.e., nature of rock formations including their porosity (primary and secondary) and Permeability. The principal aquifers in the area are Banded Gneissic Complex, Charnockite, Schist and Granite and the occurrence and movement of ground water in these rocks is controlled by various factors and it primarily depends on the degree of interconnection of secondary pores/voids developed by fracturing and weathering in the hard rock.

### 2.1 Number of aquifers:

In Virajpet, there are mainly two types of aquifer systems;

#### Aquifer-I (Phreatic aquifer)

Depth of weathered zone ranges from 6.1 mbgl to 24.4 mbgl (Fig-21). Major part of the weathering zone is ranges from 10.0 to 20.0 m. Weathering zone from 20 to 24 meters occurred in North-west part of taluk . Weathered thickness ranges from 5 to 10 meters in major part of taluk. Weather thickness ranges from 1 to 5 meters occurred in central part of area. Weather thickness ranges from 20 to 24 meters occurred in North-west part of area. Due to Weathering of Granite gneiss formed thick sandy residuum, which forms phreatic aquifer.

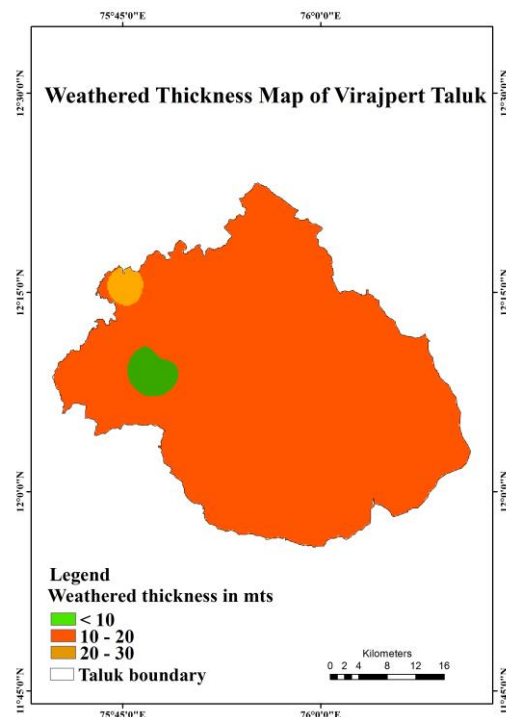


Figure 21 Weathered Thickness Map

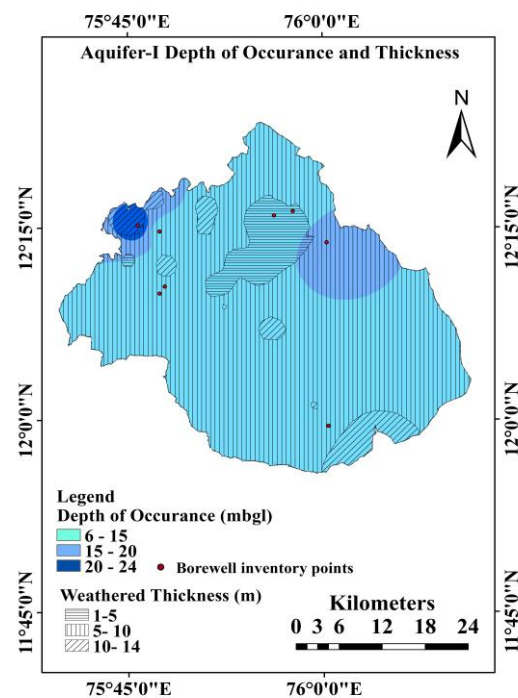


Figure 22 Depth of Occurrence and Thickness Map (Aquifer-I)

## Aquifer-II (Fractured aquifer)

In Virajpet taluk, Banded gneissic complex and Charnockite are the main water bearing formations (Fig-8). Ground water occurs within the weathered and fractured Granite Gneissic, Charnockite and Schist under water table condition and semi-confined condition. In Virajpet taluk bore wells were drilled from a minimum depth of 45.75 mbgl to a maximum of 131.15 mbgl. Ground water exploration reveals that aquifer-II fractured formation was encountered between the depths of 10.67 to 118.95 mbgl. Major part of the fracture formation (about 60%) occupied by 50 -100 meters. It is followed by fracture formation (about 25%) between 25-50 meters. Fracture Thickness ranges from 0 to 1 meter in all over taluk (based on well inventory data). Yield ranges from Negligible to 4.57 lps. The basic characteristics of each aquifer are summarized Table-15. The 3D aquifer disposition models, 2D aquifer sections and 3D aquifer fence diagrams have been prepared based on Exploration data and bore well inventory data and it presented in Fig-24, Fig-25 and Fig-26.

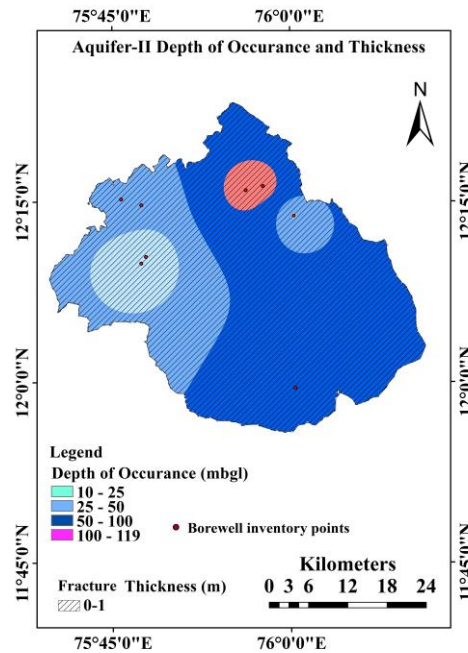


Figure 23 Depth of Occurrence and Thickness Map (Aquifer-II)



**Table 15 Details of Bore well inventory data**

<b>Sl.No</b>	<b>Location</b>	<b>Lat &amp;Long</b>	<b>Depth (m bgl)</b>	<b>Casing (m)</b>	<b>Lithology</b>	<b>Fracture (m)</b>	<b>Q (lps)</b>
1	Betolli	12.164582 75.790694	79.3	6.1	Charnockite	10.67	1.41
2	Arji	12.173719 75.797289	95.46	12.2	Charnockite	14.33	1.41
3	Kokatuparambhu	12.253392 75.762596	54.9	24.4	Granite Gneiss	36.6	4.57
4	Chamiyal	12.245266 75.790866	39.04	12.2	Granite Gneiss	27.45	0.39
5	Bajakoli	12.271415 75.961728	115.9	12.2	Granite Gneiss	109.8	1.41
6	Chenyakote	12.265844 75.937639	122	12.2	Granite Gneiss	118.95	2.22
7	Kaimane	11.991887 76.006557	131.15	12.2	Granite Gneiss	82.35	0.8
8	Nokya	12.230488 76.005104	45.75	18.3	Granite Gneiss	24.4	0.8

## 2.2 3 D aquifer disposition and Cross-Sections

### Aquifer disposition

The disposition of Aquifer-I and Aquifer-II followed by massive formation can be observed in the 3-D aquifer disposition. The depth of the top soil is in the range of 0 to 1 m bgl, followed by weathered aquifer observed upto 24.4 m, which is followed by fractured aquifer which is disposed from 24.4 to 118.95 m bgl depth followed by massive formation devoid of any ground water (Fig.-24).

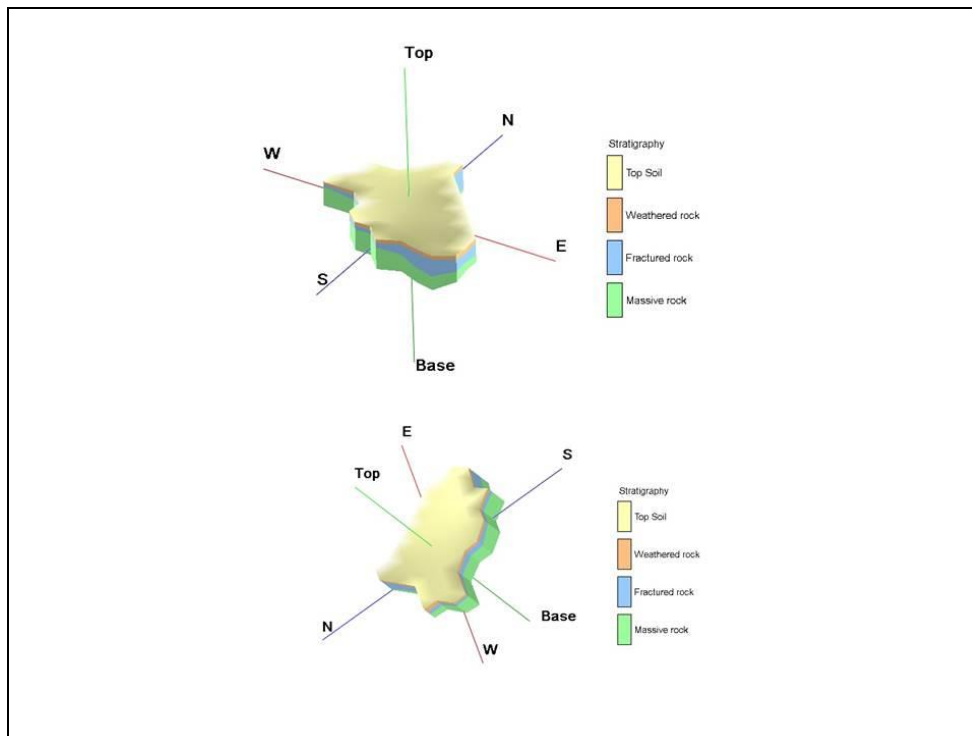


Figure 24 3D aquifer Disposition

### Hydrogeological Cross Sections

Hydrogeological cross section A-A' (Fig.-25) represents North west – North east direction and data of well inventory borewell have been utilised. It can be clearly seen from the north west – North east direction i.e., from Betoli to Bajakoli, the thickness of Aquifer-II (deeper aquifer) is increasing. On the contrary, the thickness of Aquifer-I (shallow aquifer) is same throughout the cross section. The maximum depth of Aquifer-II is attained at Chenyankote an Bajakoli location.

Hydrogeological cross section A-A' (Fig.-25) represents North west – South direction and data of well inventory borewell have been utilised. It can be clearly seen from the section that the thickness of Aquifer-II is increasing towards south part of taluk. In aquifer – I disposition is same throughout the cross section.

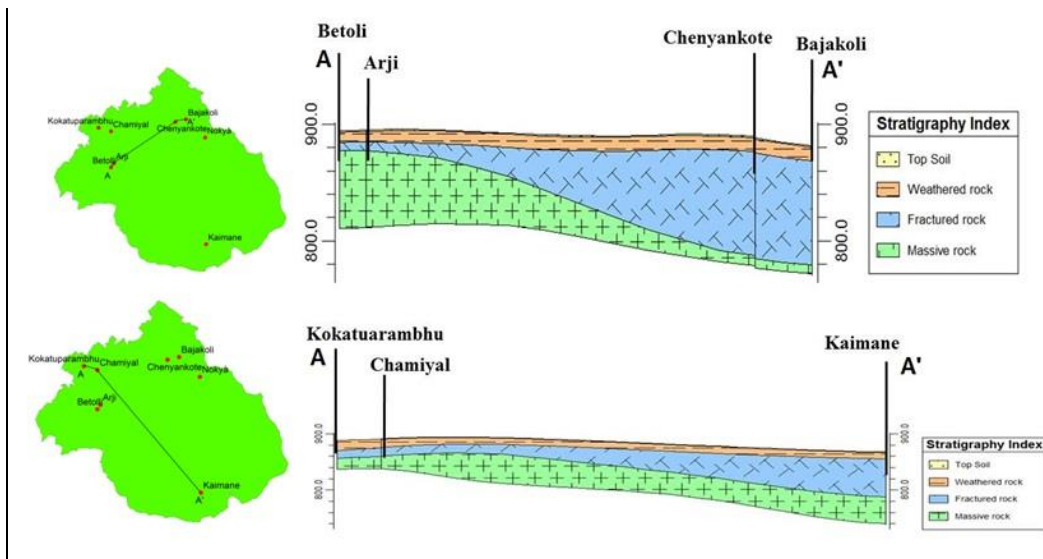


Figure 25 Cross sections in different directions

### Aquifer Fence diagram

The fence diagram indicating the disposition of various aquifers is presented in **Fig.-26**. The Fence diagram shows Aquifer Disposition from different direction. The top soil is followed by weathered formation (up to 24.4 meter). Fracture formation ranges from 24.4 meter to 118.95 meter. It is followed by massive formation.

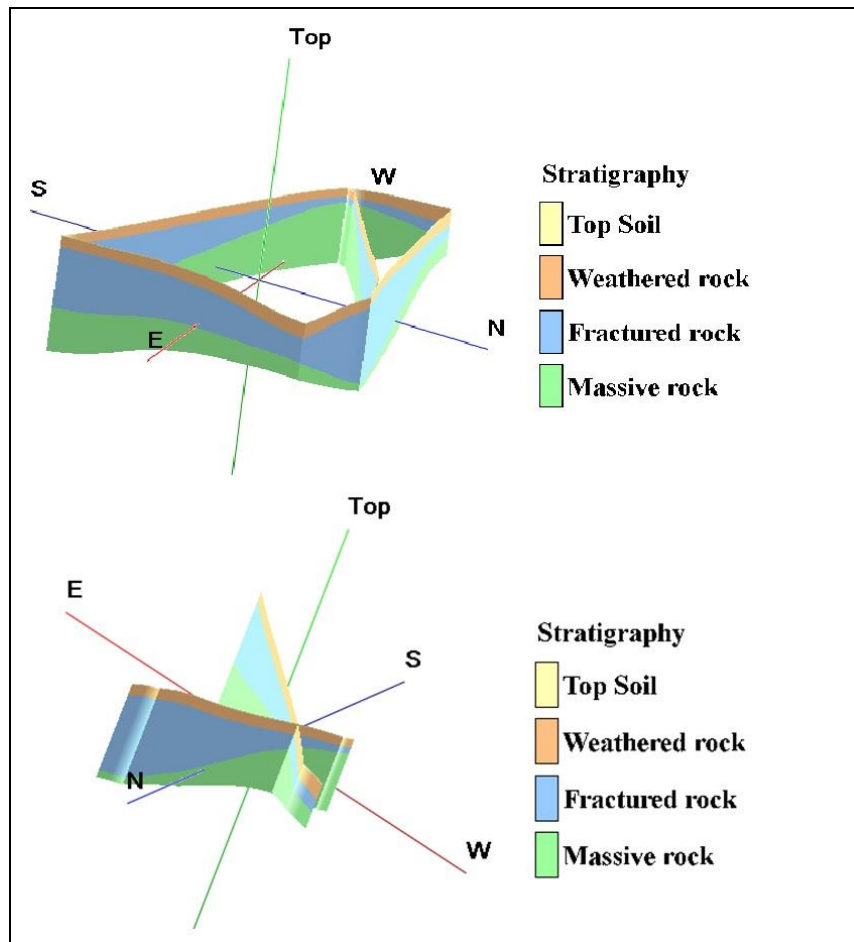


Figure 26 3D Aquifer Fence Diagram

### 3. Groundwater resource, extraction, contamination and other issues

#### 3.1 Comparison of Groundwater availability and draft scenario in Virajpet taluk

The Dynamic Ground Water Resource 2022 and as on 2020 have summarized and presented in Table-11. It is observed that the ground water availability in 2022 is decreased compare to 2020. Groundwater draft in 2022 is less compare to 2020. Stage of Groundwater development is 31.76%. As Virajpet taluk is 'safe' category, there is scope to develop the Groundwater resources in this taluk through additional wells in feasible areas. In view of the prevailing practice of abstraction structures, bore wells are the preferred structures in the area.

**Table 16 Total Groundwater Resources (2022) (Ham)**

Taluk	GW availability (in ham)	GW draft (in ham)	Stage of GW development	GW availability (in ham)	GW draft (in ham)	Stage of GW development
	2022			2020		
Virajpet	12553.46	3987.69	31.76	13231.95	6419.67	48.52

#### 3.2 Chemical Quality of Groundwater and Contamination

The water samples were collected in different parts of Virajpet taluk and analyses in CGWB, Bangalore laboratory. Interpretation from Chemical Analysis results in Virajpet taluk is mentioned as under: (**Table-17 & Table-18**). Electrical Conductivity, In general, ranges from 90 to 610  $\mu$ /mhos/cm in the Aquifer-I at 25°C (**Fig-27**) and range from 80 to 1150  $\mu$ /mhos/cm in the Aquifer-II (**Fig-30**). Electrical Conductivity in Aquifer-I is fresh as values are within 750  $\mu$ /mhos/cm, but in Aquifer-II two sample locations (Nokya- 1150  $\mu$ /mhos/cm and Chenyanakkote – 820  $\mu$ /mhos/cm) values are above 750  $\mu$ /mhos/cm. Fluoride concentration in Groundwater ranges between 0.11 and 0.45 mg/l in the Aquifer-I (**Fig-28**) and ranges between 0.12 and 1.2 mg/l in the Aquifer-II (**Fig-31**). Fluoride concentration in Groundwater samples for both Aquifer within the Permissible limit (1.5 mg/l). Nitrate concentration in Groundwater ranges from 0.28 and 45.57 mg/l in the Aquifer -I (**Fig-29**) and ranges from 0.20 and 38.8 mg/l in the Aquifer –II (**Fig-32**). Nitrate concentration in one Sample location (Ammati - 45.57 mg/l) is above Permissible limit (45 mg/l).

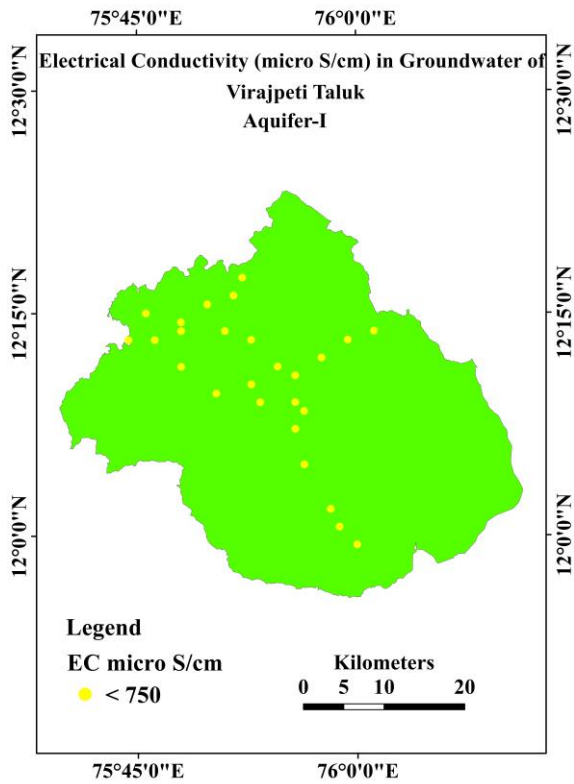


Figure 27 EC Distribution Map

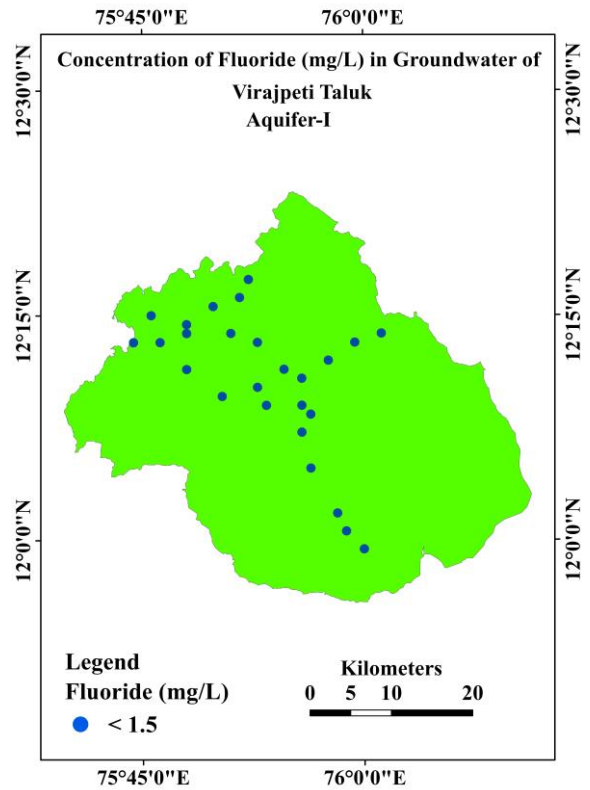


Figure 28 Fluoride Distribution Map

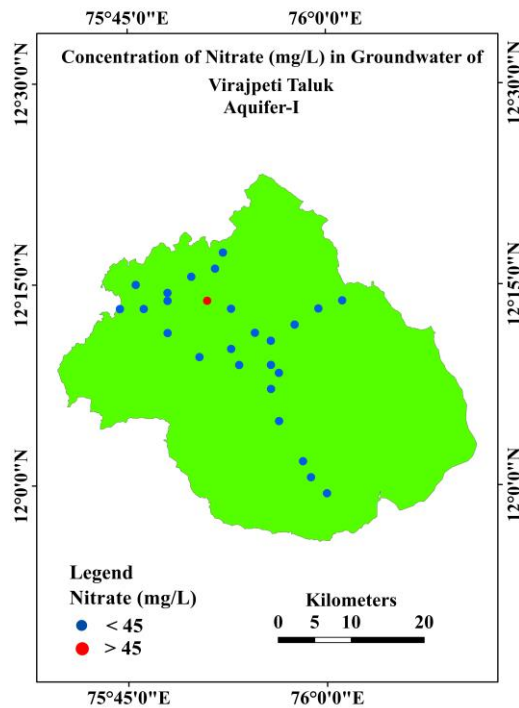
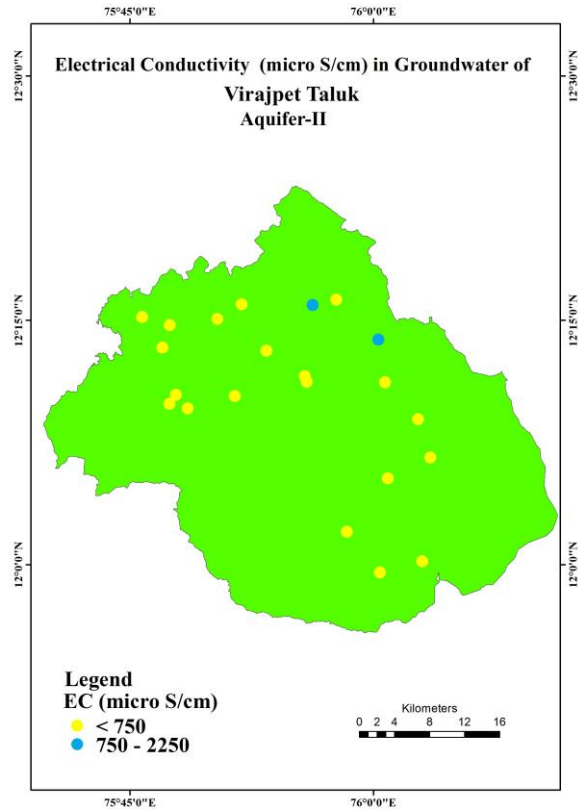
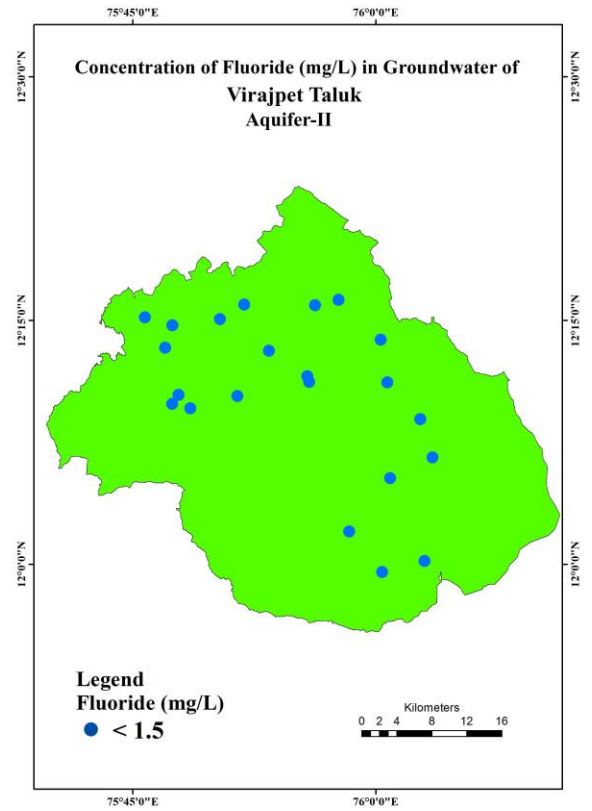


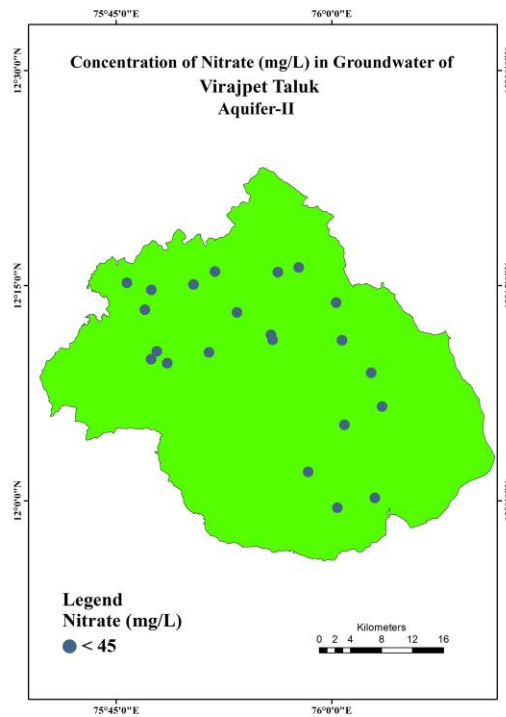
Figure 29 Nitrate Distribution Map



**Figure 30 EC Distribution Map**



**Figure 31 Fluoride Distribution Map**



**Figure 32 Nitrate Distribution Map**

**Table 17 Water quality parameters (Aquifer-I)**

Sl. No.	Location	Type of sample	EC (micro S/cm)	F (mg/L)	NO3 (mg/L)
1	Siddapura	DW	500	0.27	41.56
2	Injalagere	DW	260	0.21	20.26
3	Ammatti	DW	500	0.19	45.57
4	Ontiangandi	DW	150	0.17	12.98
5	Hosuru Betakeri	DW	150	0.16	15.87
6	Karekkadu	DW	300	0.15	35.04
7	Gonikoppal	DW	410	0.15	39.83
8	Jodubeeti	DW	190	0.16	16.18
9	Ponnampet	DW	120	0.16	18.59
10	Begur	DW	100	0.12	1.11
11	Hudukeri	DW	180	0.13	18.44
12	T.Settigere	DW	100	0.13	8.30
13	Srimangala	DW	190	0.11	3.09
14	Kaimane	DW	150	0.14	3.64
15	Devapura	DW	490	0.38	39.73
16	Titimathi	DW	610	0.45	36.90
17	Majiyalla Ana Camp	DW	470	0.28	37.95
18	Kunda	DW	100	0.18	1.57
19	Haathuru	DW	160	0.2	0.89
20	Bittangala	DW	190	0.21	16.41
21	Virajendrapet	DW	590	-	-
22	Chembebellur	DW	160	0.18	3.21
23	Devanageri	DW	120	0.13	7.12
24	Kadanur	DW	150	0.15	0.28
25	Kakotu Parambu	DW	90	0.15	2.28
26	Kadanga	DW	170	0.15	10.36



**Table 18 Water quality parameters (Aquifer-II)**

Sl. No.	Location	Type of Sample	EC (micro S/cm)	F (mg/l)	NO3 (mg/l)
1	Betoli	BW	220.0	0.56	0.00
2	Arii	BW	100.0	0	8.94
3	Perambadi	BW	300.0	0	0.30
4	Bygodu	BW	220.0	0	0.00
5	Mullermadi	BW	320.0	0.8	0.20
6	Kokatapurambhu	BW	180.0	0.64	5.50
7	Chamiyal	BW	80.0	0.16	4.20
8	Halugonda	BW	360.0	0.66	0.68
9	Injilgere	BW	340.0	0.82	24.20
10	Bajakolli	BW	740.0	0.21	38.80
11	Chenyanakkote	BW	820.0	0.12	7.32
12	Hosur	BW	150.0	0.23	0.80
13	Athur	BW	130.0	0.84	0.24
14	Gonikopa	BW	320.0	1.1	0.71
15	T setthigere	BW	220.0	0.81	0.59
16	Kaimane	BW	490.0	0.95	0.57
17	Badaga	BW	210.0	0.71	9.25
18	Kanoor	BW	340.0	0.81	0.79
19	Nittur	BW	200.0	1.2	0.73
20	Balele	BW	540.0	1	19.82
21	Arekeri	BW	500.0	0.97	0.95
22	Nokya	BW	1150.0	0.69	0.73

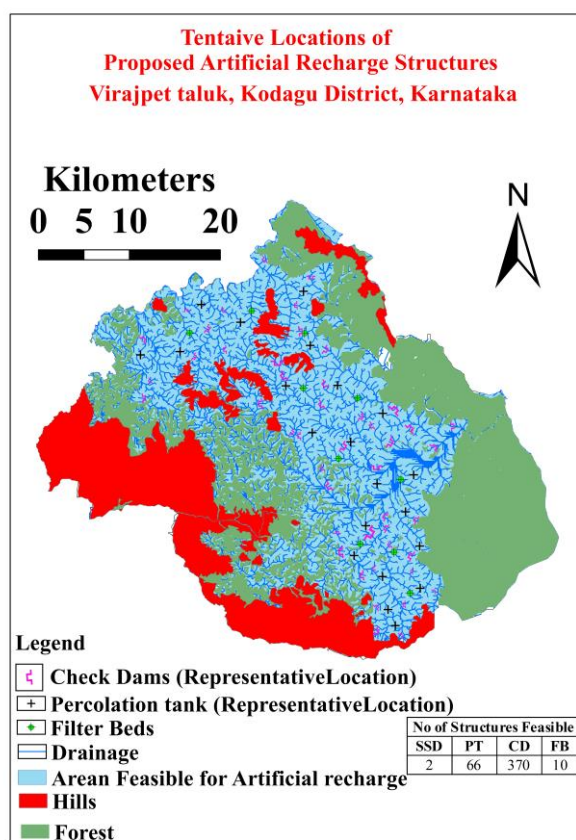
## 4. GROUNDWATER RESOURCE ENHANCEMENT AND PROPOSED MANAGEMENT STRATEGY

### 4.1 Aquifer wise space available for recharge and proposed interventions

Recharge dry **phreatic aquifer (Aq-I)** in the taluk, through construction of artificial recharge structures, viz; check dams, percolation tanks & Sub surface dyke (Table-19). The choice of recharge structures should be site specific and such structures need to be constructed in areas as feasible for artificial recharge.

**Table 19 of non-committed surface runoff & expected recharge through AR structures**

Artificial Recharge Structures Proposed	Virajpet taluk
Non committed monsoon runoff available (MCM)	73.414
Total no. of existing Artificial Recharge Structures	448
Number of Check Dams	370
Number of Percolation Tanks	66
Number of Sub surface dyke	2
Tentative total cost of the project (Rs. in lakhs)	5070.442 Lakhs
Excepted recharge (MCM)	55.060
Additional Irrigation Potential ( MCM)	66



**Figure 33 Tentative locations of representative Artificial Recharge Structures**

**Table 20 Improvement in GW availability due to Recharge, Virajpet taluk**

Taluk	Net annual ground water availability	Existing gross ground water draft for all uses	Existing stage of ground water development	Expected recharge from proposed artificial recharge structures	Expected improvement in stage of ground water development after the implementation of the project	Expected improvement in overall stage of ground water development
—	HAM	HAM	%	HAM	%	%
Virajpet	12553.46	3987.69	31.76	5506	22.08	9.68

After implementation of Artificial Recharge structures for GW recharge, the annual Groundwater availability will increase from 12553.46 to 18059.46 ham and the expected improvement in stage of development is 9.68% from 31.76% to 22.08%.

#### **4.1.1 Strategic Action Plan**

The provision for minimum protective irrigation can only improve the agricultural growth in the taluk which is dependent on rain. This objective can be achieved by utilizing the rain water more efficiently by harvesting structures like farm ponds, check-dams, barrages and other surface structures. The Strategic Action Plan, prepared for the taluk has included the irrigation infrastructure for major irrigation, minor irrigation, ground water recharge, harvesting of rain water, improvement of irrigation efficiency and strengthening the adoption of micro-irrigation. Considering the existing infrastructure in the taluk and considering the irrigation potential required to be created to meet the gap between demand and supply of all the sectors of water use, the Strategic Action Plans are developed under PMKSY project and the same is given below.

#### **4.1.2 Benefits of Artificial recharge scheme**

- These structures have proved in building-up of ground water levels and sustainability of ground water abstraction structures, mainly in bore wells.
- An increase in the area irrigated by ground water source is also observed in the area of influence.
- Such activities help in providing sustainable drinking water to the rural population. The qualitative result from farmer's perception indicate that, there is rising trend in ground water levels in the area of influence, productivity of crops enhanced and improvement in yield is observed in bore wells.

### **4.2 Resource Savings by Demand Side Interventions**

#### **4.2.1 Water Use Efficiency by Micro Irrigation Practices**

Virajpet Taluk falls under Safe category with the stage of groundwater extraction of 31.76 %. However, Water Use Efficiency (WUE) practices like Drip irrigation needs to be strengthened. This ultimately enhances the area under irrigation potential.

### **4.3. Groundwater Development Plan**

In Virajpet taluk, the present stage of ground water extraction (2022) is merely 31.76 % with net ground water availability for future use of 8953.12 ham and total extraction of 3987.69 ham. The ground water draft for irrigation purpose is estimated to be 3583.1ham and there is further scope for developing the resource for irrigation as a part of development with appropriate scientific backing. The implementation of the plan should be based on site specific detailed

hydrogeological and scientific surveys for pinpointing the sites for construction of additional abstraction structures. As per tentative estimates, 88 dug wells and 319 bore wells are recommended to be constructed in feasible areas which is likely to create about 490 hectares of additional irrigation potential (Table.21).

**Table 21 Feasibility of Additional GW abstraction structures based on GWRA 2022 availability**

Annual Extractable GW Resource (Ham)	12553.46
Total Extraction / Draft (Ham)	3987.69
Stage of GW Extraction (%)	31.76
GW Resources available to increase SOE to 60% (Ham)	7532.076
Balance GWR available to enhance SOE 60% (Ham)	3544.386
DW unit draft (Ham)	1.00
BW unit draft (Ham)	1.25
No. of DW feasible considering 10% of balance GWR with unit draft of 1 ham	354
No. of BWs feasible considering 90% of balance GWR with unit draft of 1.25 ham	3190
GW Resource to be developed through Dug well (ham) (25% taken of actual nos.)	88
GW Resource to be developed through Bore well (ham) (12.5% taken of actual nos.)	319
Additional Irrigation Potential created by Dug Wells (Ha)	106
Additional Irrigation Potential created by Bore Wells (Ha)	384
Total additional Irrigation Potential created by Bore wells and Dug wells (ha)	490

*(Note- Hydrogeological and scientific intervention is needed for pinpointing the sites for construction of dug wells and Bore wells)*

#### **4.4. Regulation and Control**

Virajpet taluk has been categorized as "Safe". However, the mandatory guidelines like rainwater harvesting and artificial recharge issued by Karnataka Ground Water Authority(KGWA) needs to be strictly implemented to avoid the taluk from safe category to semi critical or higher category in the future.

#### **4.5. Other interventions proposed**

- Periodical maintenance of artificial recharge structures should also be incorporated in the Recharge Plan.
- Excess nitrate concentration is found in ground water samples (One sample; Location- Ammati) require remedial measures viz. dilution of nitrate rich ground water through artificial recharge & water conservation.
- Roof top rain water harvesting

## 5 SUMMARY AND RECOMMENDATIONS

The main ground water issues are Low Ground Water Development, Limited Ground Water Potential / Limited Aquifer Thickness / Sustainability, which are all inter-related or inter dependent and Inferior Ground Water Quality due to nitrate contamination major part of the area. The summary of ground water management plan of Virajpet taluk is given in Table-22.

**Table 22 Summary of Management plan of Virajpet taluk**

Virajpet taluk is Safe & present stage of Ground water extraction (2022)		31.76%
Net Annual Ground Water Availability (MCM)		125.53
Existing Gross Ground Water extraction for all uses(MCM)		39.87
Total GW Resources (Dynamic & Static upto the depth of 150 mbgl) (MCM)		00
Expected additional recharge from monsoon surplus runoff (MCM)		55.060
Change in Stage of GW development, %		31.76 to 22.08
Excess nitrate concentration	Dilution of nitrate rich ground water through artificial recharge & water conservation. Roof top rain water harvesting.	
Water Use efficiency measures	Government to take initiative to encourage at least 70% farmers to adopt water use efficiency irrigations practices like dip & sprinkler irrigation	

As per the resource estimation – 2022, Virajpet taluk falls under Safe category with the stage of Groundwater extraction is 31.76 %. However, there is need to formulate management strategy to tackle the water scarcity related issues in the taluk in the coming days to avoid water crisis in the future. It is suggested to adopt a scientific and multi-pronged ground water management strategy covering supply side interventions, demand side interventions, ground water development interventions and groundwater quality protection aspects as mentioned in the management plan suggested above.

**Ground water resource enhancement by supply side interventions:** Quantity of surface water available through non-committed surface run-off is estimated to be 4662.59 ham. This can be used to recharge the aquifer mainly through percolation tanks (66), check dams (370) and sub-surface dyke structures (2). The volume of water expected to be conserved/recharged is 5506 ham through these AR structures. The approximate cost estimate for construction of these AR structures is Rs. 50.70 Cr. The additional area which can be brought under assured ground water irrigation will be about 6600 hectares. However, the figures given are tentative and pre-field studies / DPR are recommended prior to implementation of these recharge structures.

**Groundwater resource enhancement by demand side interventions:** The micro irrigation practices like drip and sprinkler irrigation are needs to be strengthened for irrigation. The micro irrigation water efficient methodology needs to be adopted for growing water intensive crop like Paddy. Implementation of efficient irrigation techniques will contribute in saving Groundwater. Artificial recharge structures like check dam, nala bund, percolation tank and roof top rainwater harvesting structures should also be incorporated in taluk.

By adopting the supply side and demand side management plan itself, the stage of groundwater extraction decreases to 22.08 % from 31.76% and the taluk falls under safe category.

**Annexure-I: Tentative locations of Proposed Check Dams, Virajpet Taluk, Kodagu District**

SI NO	Longitude	Latitude	Village	Gramapanchayat	Taluk
1	76.005793	11.952565	Mandalli	Kutta	Virajpet
2	76.010859	11.953585	Mandalli	Kutta	Virajpet
3	76.029428	11.955179	Kutta	Kutta	Virajpet
4	76.005812	11.957757	Mandalli	Kutta	Virajpet
5	76.026067	11.958930	Kutta	Kutta	Virajpet
6	76.012575	11.961056	Mandalli	Kutta	Virajpet
7	76.003315	11.966905	Mandalli	Kutta	Virajpet
8	76.039390	11.967812	Kutta	Kutta	Virajpet
9	76.039242	11.969440	Kutta	Kutta	Virajpet
10	76.003327	11.970228	Mandalli	Kutta	Virajpet
11	76.021048	11.970579	Kutta	Kutta	Virajpet
12	76.013636	11.973013	Mandalli	Kutta	Virajpet
13	76.038402	11.975844	Thyla	Kutta	Virajpet
14	76.021914	11.976392	Kutta	Kutta	Virajpet
15	76.031197	11.976773	Thyla	Kutta	Virajpet
16	76.038799	11.978822	Thyla	Kutta	Virajpet
17	76.013491	11.980576	Shrimangala	Srimangala	Virajpet
18	76.004214	11.981856	Mandalli	Kutta	Virajpet
19	76.022994	11.983241	Thyla	Kutta	Virajpet
20	76.031651	11.985079	Thyla	Kutta	Virajpet
21	76.060766	11.985801	Badaga	K.Badaga	Virajpet
22	76.021956	11.987607	Thyla	Kutta	Virajpet
23	76.026608	11.990497	Thyla	Kutta	Virajpet
24	76.040536	11.991692	Badaga	K.Badaga	Virajpet
25	76.042233	11.994178	Badaga	K.Badaga	Virajpet
26	76.013562	11.995163	Kummatturu	Srimangala	Virajpet
27	76.055742	11.995789	Badaga	K.Badaga	Virajpet
28	76.064607	11.997002	Badaga	K.Badaga	Virajpet
29	75.996267	12.000992	Kurchi	Srimangala	Virajpet
30	76.010195	12.001773	Kummatturu	Srimangala	Virajpet
31	76.004077	12.002002	Kummatturu	Srimangala	Virajpet
32	76.038893	12.003329	Badaga	K.Badaga	Virajpet
33	76.013794	12.005290	Kummatturu	Srimangala	Virajpet
34	76.032995	12.005843	Badaga	K.Badaga	Virajpet
35	75.990803	12.006827	Kurchi	Srimangala	Virajpet
36	76.043132	12.008298	Badaga	K.Badaga	Virajpet
37	76.001149	12.008867	Shrimangala	Srimangala	Virajpet
38	76.025625	12.009609	Badaga	K.Badaga	Virajpet
39	76.043990	12.012033	Badaga	K.Badaga	Virajpet



40	76.031126	12.013535	Badaga	K.Badaga	Virajpet
41	75.989143	12.014309	Shrimangala	Srimangala	Virajpet
42	76.039786	12.016203	Badaga	K.Badaga	Virajpet
43	76.010889	12.018178	Kummatturu	Srimangala	Virajpet
44	76.032202	12.019138	Badaga	K.Badaga	Virajpet
45	76.026298	12.019991	Badaga	K.Badaga	Virajpet
46	75.986637	12.021380	Shrimangala	Srimangala	Virajpet
47	76.001830	12.021741	Kummatturu	Srimangala	Virajpet
48	76.011757	12.024613	Kummatturu	Srimangala	Virajpet
49	75.981587	12.025136	Shettygeri	T.Shettigeri	Virajpet
50	75.995725	12.025709	Shettygeri	T.Shettigeri	Virajpet
51	76.021259	12.026656	Badaga	K.Badaga	Virajpet
52	75.984131	12.028450	Shettygeri	T.Shettigeri	Virajpet
53	75.988360	12.030928	Shettygeri	T.Shettigeri	Virajpet
54	76.039009	12.033652	Nalkeri	Nalkeri	Virajpet
55	75.966638	12.034119	Shettygeri	T.Shettigeri	Virajpet
56	76.011163	12.035000	Nalkeri	Nalkeri	Virajpet
57	75.990907	12.035073	Shettygeri	T.Shettigeri	Virajpet
58	75.968340	12.038060	Thavalageri	T.Shettigeri	Virajpet
59	76.032294	12.043230	Nalkeri	Nalkeri	Virajpet
60	76.018201	12.044159	Nalkeri	Nalkeri	Virajpet
61	75.981656	12.044244	Thavalageri	T.Shettigeri	Virajpet
62	76.039062	12.047359	Kotthuru	Kanooru	Virajpet
63	75.970696	12.047605	Thavalageri	T.Shettigeri	Virajpet
64	75.993488	12.048356	Thavalageri	T.Shettigeri	Virajpet
65	75.986741	12.050041	Thavalageri	T.Shettigeri	Virajpet
66	76.010376	12.050372	Nalkeri	Nalkeri	Virajpet
67	75.972399	12.051753	Thavalageri	T.Shettigeri	Virajpet
68	75.976620	12.052154	Thavalageri	T.Shettigeri	Virajpet
69	75.998994	12.053736	Harihara	T.Shettigeri	Virajpet
70	75.979793	12.054220	Thavalageri	T.Shettigeri	Virajpet
71	75.992044	12.057500	Harihara	T.Shettigeri	Virajpet
72	75.964823	12.057595	Thavalageri	T.Shettigeri	Virajpet
73	75.981710	12.059198	Harihara	T.Shettigeri	Virajpet
74	76.003659	12.059950	Harihara	T.Shettigeri	Virajpet
75	76.013794	12.061575	Nalkeri	Nalkeri	Virajpet
76	75.975811	12.061711	Thavalageri	T.Shettigeri	Virajpet
77	76.024770	12.062366	Kotthuru	Kanooru	Virajpet
78	75.983414	12.063346	Harihara	T.Shettigeri	Virajpet
79	75.996934	12.067451	Harihara	T.Shettigeri	Virajpet
80	75.988496	12.068312	Belluru	Hudikeri	Virajpet
81	76.043366	12.068943	Kotthuru	Kanooru	Virajpet
82	76.012996	12.073624	Kotthuru	Kanooru	Virajpet
83	75.983268	12.081208	Balyamanduru	Ballyamandooru	Virajpet

84	75.998684	12.084061	Balyamanduru	Ballyamandooru	Virajpet
85	75.970812	12.084159	Thuchamakeri	Ballyamandooru	Virajpet
86	75.964988	12.085706	Thuchamakeri	Ballyamandooru	Virajpet
87	76.040057	12.086401	Kanuru	Kanooru	Virajpet
88	76.005875	12.088189	Balyamanduru	Ballyamandooru	Virajpet
89	75.957049	12.091395	Konageri	Hudikeri	Virajpet
90	76.026572	12.092267	Kanuru	Kanooru	Virajpet
91	76.001251	12.093190	Balyamanduru	Ballyamandooru	Virajpet
92	76.041779	12.095118	Kanuru	Kanooru	Virajpet
93	76.009709	12.097728	Bekke Sodlur	Kanooru	Virajpet
94	76.069651	12.098750	Nittur	Nittooru	Virajpet
95	75.987348	12.100509	Balyamanduru	Ballyamandooru	Virajpet
96	75.984394	12.100727	Balyamanduru	Ballyamandooru	Virajpet
97	75.949413	12.100849	Nadikeri	Ballyamandooru	Virajpet
98	76.040538	12.101768	Nidugumba	Kanooru	Virajpet
99	75.956536	12.102115	Chikkamanduru	Ballyamandooru	Virajpet
100	75.938817	12.103793	Beguru	Hudikeri	Virajpet
101	76.017331	12.103931	Bekke Sodlur	Kanooru	Virajpet
102	76.040131	12.105508	Nidugumba	Kanooru	Virajpet
103	76.049420	12.106304	Kottageri	Nittooru	Virajpet
104	75.935567	12.108687	Beguru	Hudikeri	Virajpet
105	75.997088	12.108989	Besaguru	Ponnappasanthe	Virajpet
106	76.052597	12.109200	Kottageri	Nittooru	Virajpet
107	76.004899	12.109377	Bekke Sodlur	Kanooru	Virajpet
108	75.987806	12.110269	Kotthuru	Ponnappasanthe	Virajpet
109	75.984643	12.110903	Kotthuru	Ponnappasanthe	Virajpet
110	75.937154	12.111068	Nadikeri	Ballyamandooru	Virajpet
111	76.022426	12.111881	Bekke Sodlur	Kanooru	Virajpet
112	75.929983	12.112546	Beguru	Hudikeri	Virajpet
113	76.034250	12.113007	Kottageri	Nittooru	Virajpet
114	75.993727	12.113155	Besaguru	Ponnappasanthe	Virajpet
115	75.927834	12.115680	Beguru	Hudikeri	Virajpet
116	76.034051	12.116123	Kottageri	Nittooru	Virajpet
117	75.930840	12.116281	Cheenivada	Hudikeri	Virajpet
118	76.024137	12.117786	Kottageri	Nittooru	Virajpet
119	76.057067	12.118737	Nittur	Nittooru	Virajpet
120	76.065299	12.118913	Nittur	Nittooru	Virajpet
121	75.987841	12.119823	Kotthuru	Ponnappasanthe	Virajpet
122	75.949849	12.119955	Mugutageri	Ponnampet	Virajpet
123	76.005574	12.120590	Besaguru	Ponnappasanthe	Virajpet
124	76.045305	12.122104	Kottageri	Nittooru	Virajpet
125	76.013182	12.123054	Besaguru	Ponnappasanthe	Virajpet
126	75.943137	12.124017	Mugutageri	Ponnampet	Virajpet
127	76.050758	12.124576	Kottageri	Nittooru	Virajpet

128	75.930453	12.126252	Hoodhuru	Ponnampet	Virajpet
129	76.003493	12.128489	Besaguru	Ponnappasanthe	Virajpet
130	76.014048	12.128866	Besaguru	Ponnappasanthe	Virajpet
131	75.941017	12.129124	Mugutageri	Ponnampet	Virajpet
132	75.985767	12.129799	Kiruguru	Kirugooru	Virajpet
133	75.981124	12.129816	Kiruguru	Kirugooru	Virajpet
134	75.998855	12.130168	Nalluru	Ponnappasanthe	Virajpet
135	76.044730	12.130414	Balale	Balele	Virajpet
136	75.992955	12.132681	Nalluru	Ponnappasanthe	Virajpet
137	76.024869	12.132980	Kottageri	Nittooru	Virajpet
138	76.003513	12.133889	Nalluru	Ponnappasanthe	Virajpet
139	76.077814	12.134441	Nittur	Nittooru	Virajpet
140	75.936399	12.136617	Hoodhuru	Ponnampet	Virajpet
141	76.026769	12.137127	Beluru	Ponnappasanthe	Virajpet
142	75.927748	12.137684	Hoodhuru	Ponnampet	Virajpet
143	75.949279	12.137819	Matthuru	Ponnampet	Virajpet
144	76.037410	12.137918	Beluru	Ponnappasanthe	Virajpet
145	75.979048	12.139377	Kiruguru	Kirugooru	Virajpet
146	76.006490	12.139694	Nalluru	Ponnappasanthe	Virajpet
147	75.971876	12.140648	Kiruguru	Kirugooru	Virajpet
148	75.936414	12.140771	Hoodhuru	Ponnampet	Virajpet
149	76.063065	12.141144	Devanuru	Balele	Virajpet
150	76.037842	12.141322	Beluru	Ponnappasanthe	Virajpet
151	76.043310	12.141965	Balale	Balele	Virajpet
152	75.926497	12.142050	Halligattu	Ponnampet	Virajpet
153	76.072357	12.142147	Devanuru	Balele	Virajpet
154	75.960061	12.142351	Matthuru	Ponnampet	Virajpet
155	75.963449	12.145247	Matthuru	Ponnampet	Virajpet
156	76.020654	12.145250	Beluru	Ponnappasanthe	Virajpet
157	75.996515	12.146273	Nalluru	Ponnappasanthe	Virajpet
158	75.990263	12.146814	Nalluru	Ponnappasanthe	Virajpet
159	75.934748	12.147422	Halligattu	Ponnampet	Virajpet
160	76.061459	12.147796	Devanuru	Balele	Virajpet
161	76.038397	12.148507	Beluru	Ponnappasanthe	Virajpet
162	76.022641	12.148929	Beluru	Ponnappasanthe	Virajpet
163	76.035656	12.149140	Beluru	Ponnappasanthe	Virajpet
164	76.027819	12.150120	Beluru	Ponnappasanthe	Virajpet
165	76.009908	12.150481	Beluru	Ponnappasanthe	Virajpet
166	75.984577	12.150573	Kiruguru	Kirugooru	Virajpet
167	76.088440	12.152260	Nittur	Nittooru	Virajpet
168	75.970018	12.152286	Kiruguru	Kirugooru	Virajpet
169	75.926322	12.152436	Halligattu	Ponnampet	Virajpet
170	76.056779	12.152799	Devanuru	Balele	Virajpet
171	75.933924	12.153241	Halligattu	Ponnampet	Virajpet

172	76.043483	12.153472	Balale	Balele	Virajpet
173	76.078950	12.154375	Nittur	Nittooru	Virajpet
174	75.920208	12.154741	Mugatagri	Aruvthoklu	Virajpet
175	75.960107	12.155228	Kiruguru	Kirugooru	Virajpet
176	75.956730	12.155240	Kiruguru	Kirugooru	Virajpet
177	75.966019	12.155623	Kiruguru	Kirugooru	Virajpet
178	75.953353	12.155667	Kiruguru	Kirugooru	Virajpet
179	76.004025	12.157980	Nalluru	Ponnappasanthe	Virajpet
180	76.056380	12.158615	Devanuru	Balele	Virajpet
181	76.026830	12.159558	Balale	Balele	Virajpet
182	75.947035	12.159842	Matthuru	Ponnampet	Virajpet
183	76.039499	12.160341	Balale	Balele	Virajpet
184	75.931417	12.160726	Aruvathoklu	Ponnampet	Virajpet
185	75.919385	12.160974	Aruvathoklu	Ponnampet	Virajpet
186	76.081721	12.161010	Devanuru	Balele	Virajpet
187	75.998972	12.161321	Rudrabeedu	Ponnappasanthe	Virajpet
188	76.031482	12.161617	Balale	Balele	Virajpet
189	76.017761	12.161668	Balale	Balele	Virajpet
190	75.966465	12.162267	Rudrabeedu	Ponnappasanthe	Virajpet
191	76.094818	12.163450	Devanuru	Balele	Virajpet
192	76.051333	12.163619	Devanuru	Balele	Virajpet
193	75.972804	12.163699	Rudrabeedu	Ponnappasanthe	Virajpet
194	75.942406	12.164012	Aruvathoklu	Ponnampet	Virajpet
195	75.954655	12.165424	Balaji	Mayamudi	Virajpet
196	76.085117	12.165565	Devanuru	Balele	Virajpet
197	75.923414	12.166153	Aruvathoklu	Ponnampet	Virajpet
198	75.985300	12.166178	Dhanugala	Mayamudi	Virajpet
199	75.932281	12.166539	Aruvathoklu	Ponnampet	Virajpet
200	76.047967	12.166540	Balale	Balele	Virajpet
201	76.014616	12.167495	Balale	Balele	Virajpet
202	75.982953	12.168132	Dhanugala	Mayamudi	Virajpet
203	75.941638	12.168425	Aruvathoklu	Ponnampet	Virajpet
204	75.971978	12.168894	Dhanugala	Mayamudi	Virajpet
205	76.000744	12.169375	Dhanugala	Mayamudi	Virajpet
206	76.026868	12.169527	Balale	Balele	Virajpet
207	75.921315	12.169899	Aruvathoklu	Ponnampet	Virajpet
208	75.912871	12.169927	Aruvathoklu	Ponnampet	Virajpet
209	75.990855	12.171320	Dhanugala	Mayamudi	Virajpet
210	76.039968	12.172385	Balale	Balele	Virajpet
211	75.944338	12.173144	Aruvathoklu	Ponnampet	Virajpet
212	75.951519	12.173950	Balaji	Mayamudi	Virajpet
213	76.004370	12.174764	Dhanugala	Mayamudi	Virajpet
214	75.991633	12.174848	Dhanugala	Mayamudi	Virajpet
215	75.914577	12.174906	Kaikeri	Hathuru	Virajpet

216	75.978968	12.175308	Mayamudi	Mayamudi	Virajpet
217	75.999869	12.175441	Dhanugala	Mayamudi	Virajpet
218	75.937383	12.176491	Aruvathoklu	Ponnampet	Virajpet
219	75.926405	12.176528	Aruvathoklu	Ponnampet	Virajpet
220	75.970319	12.177208	Mayamudi	Mayamudi	Virajpet
221	76.022678	12.177850	Balale	Balele	Virajpet
222	75.955755	12.177882	Balaji	Mayamudi	Virajpet
223	75.982992	12.178683	Mayamudi	Mayamudi	Virajpet
224	75.936547	12.178986	Aruvathoklu	Ponnampet	Virajpet
225	75.968181	12.180161	Mayamudi	Mayamudi	Virajpet
226	75.958298	12.180573	Balaji	Mayamudi	Virajpet
227	76.010233	12.180595	Siddapura	Thithimathi	Virajpet
228	76.017624	12.181191	Siddapura	Thithimathi	Virajpet
229	75.985324	12.181309	Mayamudi	Mayamudi	Virajpet
230	75.948951	12.183125	Balaji	Mayamudi	Virajpet
231	75.907850	12.183236	Kaikeri	Hathuru	Virajpet
232	75.887587	12.184963	Kalattthamadu	Hosuru	Virajpet
233	75.956837	12.185147	Balaji	Mayamudi	Virajpet
234	75.912924	12.185504	Kaikeri	Hathuru	Virajpet
235	75.933199	12.187513	Aruvathoklu	Gonikoppalu	Virajpet
236	75.970789	12.190083	Mayamudi	Mayamudi	Virajpet
237	75.928564	12.190229	Atthuru	Gonikoppalu	Virajpet
238	75.795552	12.190229	Betoli	Betoli	Virajpet
239	75.771485	12.191128	Kottoli	Kedmulluru	Virajpet
240	75.989584	12.191470	Mayamudi	Mayamudi	Virajpet
241	75.803157	12.191869	Ambette	Bittangala	Virajpet
242	75.927094	12.192518	Atthuru	Gonikoppalu	Virajpet
243	75.991701	12.193124	Mayamudi	Mayamudi	Virajpet
244	75.972701	12.193607	Aruvathoklu	Gonikoppalu	Virajpet
245	75.924573	12.196265	Atthuru	Hathuru	Virajpet
246	76.006492	12.196394	Siddapura	Thithimathi	Virajpet
247	75.912962	12.196512	Atthuru	Hathuru	Virajpet
248	75.977991	12.196704	Hebbale	Devarapura	Virajpet
249	75.872427	12.197474	Hosakote	Bilugunda	Virajpet
250	75.961950	12.198007	Aruvathoklu	Gonikoppalu	Virajpet
251	75.983064	12.198347	Aruvathoklu	Gonikoppalu	Virajpet
252	75.794732	12.198539	Kukkuluru	Chembebelluru	Virajpet
253	75.993834	12.198932	Nokya	Thithimathi	Virajpet
254	75.918672	12.199193	Atthuru	Hathuru	Virajpet
255	75.969556	12.199641	Hebbale	Devarapura	Virajpet
256	76.004609	12.200762	Siddapura	Thithimathi	Virajpet
257	75.956895	12.201347	Hebbale	Devarapura	Virajpet
258	76.001664	12.203680	Siddapura	Thithimathi	Virajpet
259	75.951836	12.203857	Hebbale	Devarapura	Virajpet

260	75.922914	12.204786	Atthuru	Hathuru	Virajpet
261	75.967895	12.207124	Nokya	Thithimathi	Virajpet
262	75.941714	12.207215	Nellugote	Hathuru	Virajpet
263	75.925667	12.207269	Atthuru	Hathuru	Virajpet
264	75.777023	12.207729	Kadhanuru	Kadanooru	Virajpet
265	75.976346	12.208756	Nokya	Thithimathi	Virajpet
266	75.967062	12.210450	Hebbale	Devarapura	Virajpet
267	75.960306	12.210474	Hebbale	Devarapura	Virajpet
268	75.910899	12.210642	Hosoor	Hosuru	Virajpet
269	75.788012	12.211021	Kadhanuru	Kadanooru	Virajpet
270	75.953558	12.212990	Hebbale	Devarapura	Virajpet
271	75.930756	12.213448	Nellugote	Hathuru	Virajpet
272	75.921467	12.213930	Atthuru	Hathuru	Virajpet
273	75.952094	12.216733	Hebbale	Devarapura	Virajpet
274	75.983981	12.217867	Hebbale	Devarapura	Virajpet
275	75.783823	12.222664	Bellarymadu	Chembebelluru	Virajpet
276	75.964151	12.222922	Hebbale	Devarapura	Virajpet
277	75.951060	12.222968	Hebbale	Devarapura	Virajpet
278	75.905454	12.223952	Hosoor	Hosuru	Virajpet
279	75.801992	12.225520	Padhakote	Chembebelluru	Virajpet
280	75.857745	12.227636	Karmadu	Karmadu	Virajpet
281	75.870416	12.228219	Belagundha	Bilugunda	Virajpet
282	75.885759	12.228989	Bettagera	Hosuru	Virajpet
283	75.946016	12.229631	Hebbale	Devarapura	Virajpet
284	75.850575	12.230774	Karmadu	Karmadu	Virajpet
285	75.821857	12.230861	Chambe Belluru	Karmadu	Virajpet
286	75.772870	12.231834	Arameri	Kadanooru	Virajpet
287	75.815105	12.232543	Chambe Belluru	Karmadu	Virajpet
288	75.966699	12.233711	Devamachi Forest	Thithimathi	Virajpet
289	75.867570	12.234145	Karmadu	Karmadu	Virajpet
290	75.948144	12.234193	Hebbale	Devarapura	Virajpet
291	75.856504	12.235740	Karmadu	Karmadu	Virajpet
292	75.837921	12.235797	Kavadi	Karmadu	Virajpet
293	75.774150	12.236400	Arameri	Kadanooru	Virajpet
294	75.829688	12.236446	Kavadi	Karmadu	Virajpet
295	75.842151	12.237654	Kumberi	Karmadu	Virajpet
296	75.955338	12.238322	Hebbale	Devarapura	Virajpet
297	75.823994	12.238747	Chambe Belluru	Karmadu	Virajpet
298	75.851447	12.239079	Kumberi	Karmadu	Virajpet
299	75.883138	12.239399	Bettagera	Hosuru	Virajpet
300	75.976670	12.239493	Devamachi Forest	Thithimathi	Virajpet
301	75.841316	12.240772	Kumberi	Karmadu	Virajpet
302	75.903826	12.241820	Mekuru Hosakeri	Palibetta	Virajpet
303	75.825693	12.242065	Chambe Belluru	Karmadu	Virajpet

304	75.930012	12.242147	Chennaiahanakote	Chennaiyanakote	Virajpet
305	75.859059	12.242379	Ammatthi	Ammathi	Virajpet
306	75.772056	12.242637	Arameri	Kadanooru	Virajpet
307	75.788120	12.247576	Mythale	Kadanooru	Virajpet
308	75.871165	12.247698	Ammatthi	Ammathi	Virajpet
309	75.890223	12.248095	Mekuru Hosakeri	Palibetta	Virajpet
310	75.878720	12.248963	Ammatthi	Ammathi	Virajpet
311	75.858871	12.249441	Ammatthi	Ammathi	Virajpet
312	75.894561	12.249742	Mekuru Hosakeri	Palibetta	Virajpet
313	75.770391	12.250950	Mythale	Kadanooru	Virajpet
314	75.943559	12.251240	Chennaiahanakote	Chennaiyanakote	Virajpet
315	75.878520	12.252286	Ammatthi	Ammathi	Virajpet
316	75.871340	12.252309	Puliyeri	Ammathi	Virajpet
317	75.784756	12.252571	Mythale	Kadanooru	Virajpet
318	75.812635	12.253320	Devanageri	Chembebelluru	Virajpet
319	75.807574	12.255828	Devanageri	Chembebelluru	Virajpet
320	75.930061	12.256271	Chennaiahanakote	Chennaiyanakote	Virajpet
321	75.843903	12.257380	Kannangala	Karmadu	Virajpet
322	75.835462	12.259483	Kannangala	Kannangala	Virajpet
323	75.814771	12.261206	Kannangala	Kannangala	Virajpet
324	75.844763	12.262362	Kannangala	Kannangala	Virajpet
325	75.853213	12.263167	Puliyeri	Ammathi	Virajpet
326	75.923330	12.263770	Mekuru Hosakeri	Palibetta	Virajpet
327	75.843079	12.264029	Kannangala	Kannangala	Virajpet
328	75.815207	12.265775	Byrambada	Halugunda	Virajpet
329	75.876039	12.268495	Puliyeri	Ammathi	Virajpet
330	75.922928	12.269587	Mekuru Hosakeri	Palibetta	Virajpet
331	75.882806	12.270965	Puliyeri	Ammathi	Virajpet
332	75.914914	12.272937	Badaga Banangala	Maldere	Virajpet
333	75.924211	12.274152	Badaga Banangala	Maldere	Virajpet
334	75.876482	12.274724	Puliyeri	Ammathi	Virajpet
335	75.860432	12.274775	Guyya	Siddapura	Virajpet
336	75.841003	12.275251	Kannangala	Kannangala	Virajpet
337	75.827068	12.276539	Yaduru	Kannangala	Virajpet
338	75.814398	12.277408	Byrambada	Halugunda	Virajpet
339	75.850726	12.277713	Guyya	Siddapura	Virajpet
340	75.883680	12.279686	Siddapura	Siddapura	Virajpet
341	75.914095	12.280417	Badaga Banangala	Maldere	Virajpet
342	75.838066	12.281491	Yaduru	Kannangala	Virajpet
343	75.924240	12.282460	Badaga Banangala	Maldere	Virajpet
344	75.815261	12.283221	Yaduru	Kannangala	Virajpet
345	75.861731	12.284741	Guyya	Siddapura	Virajpet
346	75.884120	12.285085	Siddapura	Siddapura	Virajpet
347	75.834276	12.285241	Yaduru	Kannangala	Virajpet

348	75.921728	12.289114	Badaga Banangala	Maldere	Virajpet
349	75.907367	12.289162	Kodagu Srirangapatna	Maldere	Virajpet
350	75.839787	12.291455	Hachhinadu	Kannangala	Virajpet
351	75.892381	12.292119	Siddapura	Siddapura	Virajpet
352	75.906537	12.293734	Kodagu Srirangapatna	Maldere	Virajpet
353	75.888590	12.295455	Siddapura	Siddapura	Virajpet
354	75.907192	12.299755	Kodagu Srirangapatna	Maldere	Virajpet
355	75.928107	12.301139	Kodagu Srirangapatna	Maldere	Virajpet
356	75.888188	12.301479	Karadigodu	Siddapura	Virajpet
357	75.938670	12.301934	Badaga Banangala	Maldere	Virajpet
358	75.923051	12.304895	Kodagu Srirangapatna	Maldere	Virajpet
359	75.895594	12.305401	Karadigodu	Siddapura	Virajpet
360	75.903201	12.306207	Karadigodu	Siddapura	Virajpet
361	75.952209	12.307702	Chennangi	Chennayyanakote	Virajpet
362	75.938697	12.309411	Badaga Banangala	Maldere	Virajpet
363	75.957083	12.312047	Maldhare	Maldere	Virajpet
364	75.951177	12.314352	Maldhare	Maldere	Virajpet
365	75.907665	12.314500	Karadigodu	Siddapura	Virajpet
366	75.904936	12.319494	Karadigodu	Siddapura	Virajpet
367	75.896909	12.319520	Chikkaneelaya	Siddapura	Virajpet
368	75.952257	12.320995	Maldhare	Maldere	Virajpet
369	75.948032	12.321009	Maldhare	Maldere	Virajpet
370	75.891442	12.327015	Chikkaneelaya	Siddapura	Virajpet

*(Source: Master Plan, CGWB, 2020. It is likely that the number of structures proposed may vary depending upon the ground truth verification and feasibility criteria)*

## **Annexure-II: Tentative location of Proposed Percolation Tanks, Virajpet taluk, Kodagu District**

SI No	Longitude	Latitude	Village	Gramapanchayat	Taluk
1	76.023677	11.963747	Kutta	Kutta	Virajpet
2	76.006164	11.974937	Mandalli	Kutta	Virajpet
3	76.016325	11.979683	Thyla	Kutta	Virajpet
4	76.054237	11.989302	Badaga	K.Badaga	Virajpet
5	76.007574	11.996206	Kummatturu	Srimangala	Virajpet
6	76.029943	11.999235	Badaga	K.Badaga	Virajpet



7	76.048940	12.000780	Badaga	K.Badaga	Virajpet
8	75.995707	12.010736	Shrimangala	Srimangala	Virajpet
9	76.010845	12.012509	Kummatturu	Srimangala	Virajpet
10	76.049096	12.017073	Badaga	K.Badaga	Virajpet
11	76.029454	12.025847	Nalkeri	Nalkeri	Virajpet
12	76.042013	12.028279	Badaga	K.Badaga	Virajpet
13	76.003699	12.032190	Shettygeri	T.Shettigeri	Virajpet
14	75.982241	12.033493	Shettygeri	T.Shettigeri	Virajpet
15	76.048552	12.042788	Kotthuru	Kanooru	Virajpet
16	75.980890	12.050855	Thavalageri	T.Shettigeri	Virajpet
17	76.022371	12.056761	Nalkeri	Nalkeri	Virajpet
18	75.994198	12.063179	Harihara	T.Shettigeri	Virajpet
19	75.969735	12.071564	Belluru	Hudikeri	Virajpet
20	76.034367	12.076930	Kotthuru	Kanooru	Virajpet
21	76.050669	12.101341	Nittur	Nittooru	Virajpet
22	76.005705	12.104863	Bekke Sodlur	Kanooru	Virajpet
23	75.991907	12.106011	Balyamanduru	Ballyamandooru	Virajpet
24	76.042768	12.113555	Kottageri	Nittooru	Virajpet
25	76.007854	12.127630	Besaguru	Ponnappasanthe	Virajpet
26	75.942961	12.138606	Hoodhuru	Ponnampet	Virajpet
27	75.986285	12.141369	Kiruguru	Kirugooru	Virajpet
28	75.979197	12.146582	Kiruguru	Kirugooru	Virajpet
29	76.049244	12.148066	Devanuru	Balele	Virajpet
30	75.965535	12.148871	Kiruguru	Kirugooru	Virajpet
31	75.953734	12.152030	Kiruguru	Kirugooru	Virajpet
32	75.999748	12.152938	Nalluru	Ponnappasanthe	Virajpet
33	76.031339	12.155161	Beluru	Ponnappasanthe	Virajpet
34	75.940441	12.155957	Halligattu	Ponnampet	Virajpet
35	76.013068	12.159831	Beluru	Ponnappasanthe	Virajpet
36	75.934199	12.171898	Aruvathoklu	Ponnampet	Virajpet
37	75.968011	12.173657	Balaji	Mayamudi	Virajpet
38	76.011817	12.174922	Balale	Balele	Virajpet
39	75.985433	12.176457	Dhanugala	Mayamudi	Virajpet
40	75.962429	12.182069	Mayamudi	Mayamudi	Virajpet
41	75.954647	12.192482	Aruvathoklu	Gonikoppalu	Virajpet
42	75.987957	12.198795	Aruvathoklu	Gonikoppalu	Virajpet
43	75.784840	12.202416	Kottoli	Kedmulluru	Virajpet
44	75.913946	12.202639	Atthuru	Hosuru	Virajpet
45	75.966084	12.202909	Hebbale	Devarapura	Virajpet
46	75.949138	12.207715	Hebbale	Devarapura	Virajpet
47	75.778557	12.214257	Kadhanuru	Kadanooru	Virajpet
48	75.996320	12.220610	Nokya	Thithimathi	Virajpet
49	75.839552	12.229281	Karmadu	Karmadu	Virajpet
50	75.767068	12.233888	Arameri	Kadanooru	Virajpet

51	75.807065	12.236977	Chambe Belluru	Karmadu	Virajpet
52	75.920380	12.237650	Hosoor	Hosuru	Virajpet
53	75.861074	12.238991	Ammatthi	Ammathi	Virajpet
54	75.938674	12.242693	Chennaiahanakote	Chennayyanakote	Virajpet
55	75.796020	12.249675	Devanageri	Chembebelluru	Virajpet
56	75.865803	12.250202	Ammatthi	Ammathi	Virajpet
57	75.923248	12.252767	Mekuru Hosakeri	Palibetta	Virajpet
58	75.828279	12.256948	Kannangala	Kannangala	Virajpet
59	75.783980	12.261471	Mythale	Kadanooru	Virajpet
60	75.834445	12.264925	Kannangala	Kannangala	Virajpet
61	75.868285	12.266046	Puliyeri	Ammathi	Virajpet
62	75.929636	12.267967	Chennaiahanakote	Chennayyanakote	Virajpet
63	75.828723	12.283720	Yaduru	Kannangala	Virajpet
64	75.849103	12.285003	Yaduru	Kannangala	Virajpet
65	75.872137	12.292609	Siddapura	Siddapura	Virajpet
66	75.932012	12.296546	Badaga Banangala	Maldere	Virajpet

*(Source: Master Plan, CGWB, 2020. It is likely that the number of structures proposed may vary depending upon the ground truth verification and feasibility criteria)*

#### **Annexure-III: Tentative location of Proposed Filter Beds, Virajpet taluk, Kodagu District**

SI No	Longitude	Latitude	Village	Gramapanchayat	Taluk
1	76.038660	11.995763	Badaga	K.Badaga	Virajpet
2	76.022516	12.036556	Nalkeri	Nalkeri	Virajpet
3	75.988578	12.045004	Thavalageri	T.Shettigeri	Virajpet
4	76.029849	12.109026	Nidugumba	Kanooru	Virajpet
5	75.966915	12.130010	Matthuru	Ponnampet	Virajpet
6	75.986168	12.189985	Aruvathoklu	Gonikoppalu	Virajpet
7	75.931354	12.200089	Atthuru	Hathuru	Virajpet
8	75.933028	12.254783	Chennaiahanakote	Chennayyanakote	Virajpet
9	75.816659	12.255563	Kannangala	Kannangala	Virajpet
10	75.879447	12.277207	Puliyeri	Ammathi	Virajpet

*(Source: Master Plan, CGWB, 2020. It is likely that the number of structures proposed may vary depending upon the ground truth verification and feasibility criteria)*