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MINISTRY OF WATER RESOURCES RIVER DEVELOPMENT AND GANGA REJUVENATION

CENTRAL GROUND WATER BOARD

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GROUND WATER YEAR BOOK OF KERALA (2014-2015)

केरल क्षेत्र

KERALA REGION

तिरुवनंतपुरम

THIRUVANANTHAPURAM

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GROUND WATER YEAR BOOK OF KERALA
(2014 -15)

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FOREWORD

Ground water is an important source of water for meeting the drinking, agricultural and industrial needs in India. Over the last few decades, the use of ground water in the country has increased manifold, exerting pressure on the limited resources available and threatening their long-term sustainability in many places. Kerala, though blessed with copious rainfall and abundant surface water resources, depends heavily on the limited ground water resources to meet its drinking and domestic water requirements, especially in the rural habitations. In the recent past, scarcity of drinking water resources during summer months is being faced by several habitations in the State with increasing regularity.

Kerala State has limited ground water development prospects owing to the largely undulating topography and predominance of crystalline rocks devoid of any primary porosity. Increasing demand of fresh water resources due to change in life styles, agricultural practices and urbanisation has resulted in increasing stress on the ground water regime in several areas of the State. Contamination of ground water resources from natural and anthropogenic sources is also emerging as a major threat to the sustainability of ground water resources in many areas. Anticipated impact of impending climate change and sea level rise also has the potential to change the ground water regime in the State. Scientific management of ground water resources of the State has become imperative to ensure prevention of further ground water depletion and contamination and to ensure its long-term sustainability.

To build a realistic ground water management strategy, assessment of ground water availability and its quality is a pre-requisite. With this in view, Central Ground water Board has established a network of Ground Water Monitoring Wells (GWMW) tapping different aquifers in the State. Presently, there are 1638 GWMW in Kerala State, out of which 1369 are dug wells tapping phreatic aquifers and 269 are bore wells /tube wells tapping deeper semi-confined/confined aquifers, which are monitored four times a year. The document "**Ground Water Year Book Kerala (2014-15)**" is a compilation of water level and water quality data collected from these wells during 2014-15. The behaviour of water level during the four monitoring periods and their fluctuations – both seasonal and long term, have been analysed and included in this report. Besides this, behaviour of piezometric heads of deeper aquifers in hard rock as wells as in sedimentary aquifers have also been discussed. The chapter on Hydrochemistry brings out the ground water quality of water samples collected from the wells tapping the phreatic aquifer.

The efforts of the Officers of CGWB, Kerala Region, Thiruvananthapuram in collecting the data and the meticulous work done by the team of officers comprising N. Vinayachandran, Scientist D, Rani V. R., Scientist-C, Smt. V. N. Sreelatha, Sc- C, and Smt. Bindu J. Viju, Scientist- B in compiling this document deserve appreciation. I hope this compilation will be of use to planners, policy makers and stakeholders in the field of ground water in Kerala.

Thiruvananthapuram
October 2015

(Dr. Nandakumaran P)
Regional Director

I INTRODUCTION

The awareness among the public about the importance of the groundwater has increased during the recent years. The need for groundwater being felt by all sectors because of the shortage of surface water sources to mitigate the growing needs of the society. Recently the problems of decline in water table, contamination of groundwater, seawater intrusion etc are being reported at many places. The shortage of rainfall in recent years and the increased utilisation of ground water caused concern among the public that water may become scarce commodity in future. In order to assess the real situation of groundwater conditions, it is very essential to monitor the groundwater level and water quality over time and space. Central Ground Water Board is monitoring water level and quality through a network of Ground Water Monitoring Wells distributed throughout the State. The monitoring started from the year 1969 for nine monitoring wells and the numbers of monitoring wells were increased during the subsequent years and became 224 by the year 1979 and the number became 460 by the year 1988. Presently the total number of Ground Water Monitoring Wells (GWMWs) through out the Kerala State is 1638. Water level is being monitored four times a year during January, April, August and November months and water quality is being monitored from the water samples collected from GWMWs during April.

Kerala State is a narrow stretch of land covering 38863 sq.km area bordering the Lakshadweep Sea on the western side and Tamil Nadu and Karnataka States on the eastern side. The length of the State from north to south is 560 km and the average width is 70 km. with a maximum of 125 km. It lies between North latitudes $08^0$18' and $12^0$48' and East longitudes $74^0$52' and $77^0$22'.

The total number of GWMWs as on 31.3.2015 is 1638. Out of these, 1369 are dug wells tapping phreatic aquifers and 269 are borewells /tubewells tapping deeper aquifers of confined / semi-confined nature. These GWMWs are spread over all the physiographic divisions of the State. About 62% of the GWMWs fall in the midland region, 18% in coastal plains, 15% in highlands and 5% in Plateau region. Among the GWMWs tapping phreatic aquifer, 65% are tapping laterite, 17% tapping weathered and fractured crystallines, 15% tapping coastal alluvium and 3% tapping riverine alluvium. The data of these GWMWs were analysed to understand the depth to water level scenario in the State, annual fluctuation in the water levels due to the monsoon recharge, long term trend in water levels and the nature of the quality of ground water and the salient features are brought out in this report.

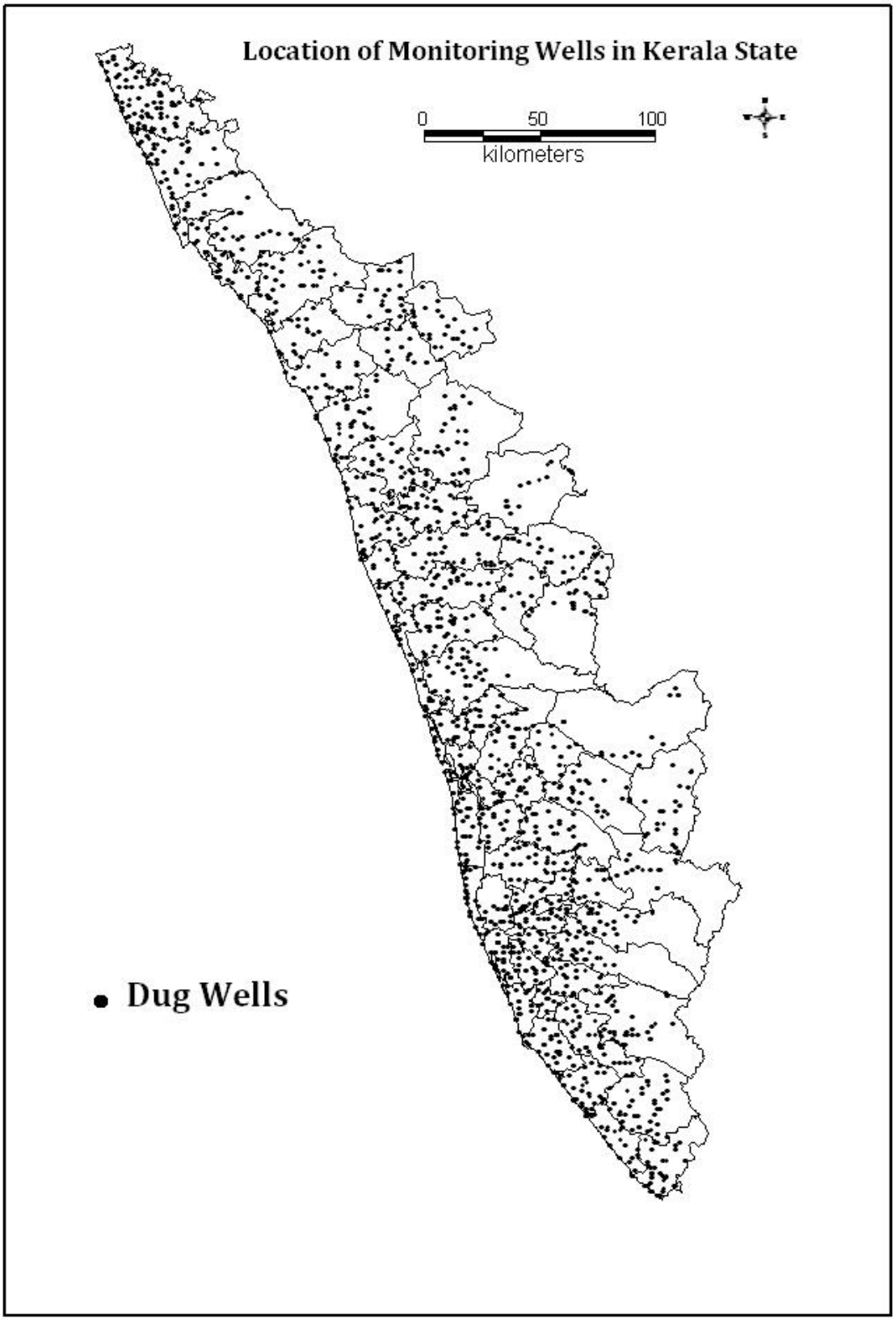
Maps of depth to water level, water level fluctuation with respect to April and decadal mean are prepared using the data of GWMWs tapping phreatic aquifer. Some hydrographs representing phreatic, semi-confined and confined aquifers in sedimentary and hard rock aquifers are also incorporated in this report.

The district wise break-up of GWMWs are given in the **Table 1.1** and locations are shown in **Figure 1.1**. The water level data collected during the year 2014 - 15 of GWMWs (dug wells) are given in **Annexure-I.** The hydro-chemical data of water samples collected during April and November 2010 are given in **Annexure- II**.

Table 1.1: District wise breakup of Ground Water Monitoring Wells in Kerala State as on 31-03-2015

Sl. No.	Name of district	No. of GWMW as on 31-03--2015			Density
		Dug Wells	Piezometers	Total	km^2/ GWMW
1	Thiruvananthapuram	116	22	138	16
2	Kollam	109	20	129	19
3	Pathanamthitta	80	14	94	28
4	Alappuzha	81	22	103	14
5	Kottayam	99	8	107	21
6	Idukki	69	8	77	58
7	Ernakulam	115	18	133	22
8	Thrissur	120	21	141	22
9	Palakkad	112	44	156	29
10	Malappuram	115	22	137	26
11	Kozhikode	79	20	99	24
12	Wayanad	75	9	84	25
13	Kannur	95	16	111	27
14	Kasaragod	104	25	129	15
	Total	**1369**	**269**	**1638**	**24**

Figure 1.1: Location of Ground Water Monitoring Wells in Kerala



II HYDROGEOLOGY

The occurrence and movement of ground water is mainly controlled by factors like physiography, geological setting etc and are described in the following paragraphs.

Physiography

Physiographically the State is divided into three major units viz. the coastal plains, the midlands and the hill ranges. The coastal plains have an elevation of less than 7.6m whereas the elevation of the midland ranges from 7.6 to 76 m and that of the hill ranges is more than 76 m above mean sea level (amsl). Along the hill ranges two distinct plateau regions are seen, the important being the Wayanad plateau, which covers major part of Wayanad district, the general elevation of which is above 700 m amsl. The other plateau is the Munnar plateau in Idukki district, the elevation of which is about 1000 m amsl.

Geology

Geologically 88% of the State is underlain by crystalline rocks of Archaean age, which is a part of the peninsular shield. The crystalline complex of Kerala is composed of charnockites, gneisses, schists, migmatites and rocks of the Wayanad supracrustals. Along the western portion of the State the crystalline rocks are overlain by the sedimentary formations of Tertiary age and Recent alluvial formations. The Tertiary sequence of formations have been divided into four beds viz. Alleppey, Vaikom, Quilon and Warkalli, the age of which ranges from Eocene to Lower Miocene. Laterites of Sub-recent age derived from the crystallines as well as sedimentary formations are seen all along the midlands. Along the coastal plains, sedimentaries and laterites are overlain by alluvium of Recent age. The geological succession in Kerala is given in **Table 2.1.** The geological map of Kerala State is shown in **Figure 2.1**.

Table 2.1: Geological Succession of Kerala

AGE	FORMATION	LITHOLOGY
Recent	Alluvium	Sand, clay, riverine alluvium etc. and flood plain deposits of Kuttanad area
Sub-recent	Laterite	Derived from crystalline and sedimentary rocks
Tertiary	Warkalli	Sand stone, clays with lignite seams
	Quilon	Limestone, marl and clay
	Vaikom	Sandstone with pebbles and gravel beds, clay and lignite
	Alleppey	Carbonaceous clay and fine sand
Undated	Intrusives	Dolerite, Gabbro, Granites, Quartzo-feldspathic Veins
Archaean	Wayanad group	Granitic gneiss and Schists
	Charnockites	Charnockites and associated rocks
	Khondalites	Khondalites suite of rocks and its associates

Occurrence of Groundwater

Groundwater occurs under phreatic, semi-confined and confined conditions in the above formations. The weathered crystallines, laterites and alluvial formations form the major phreatic aquifers, whereas the deep fractures in the crystallines and the granular zones in the Tertiary sedimentary formations form the semi-confined and confined aquifers.

Thick zones of weathered crystallines are seen along midland region. The depth to water level in the weathered crystallines in the midland area ranges from 3 to 16 mbgl. The midland area sustains medium capacity dug wells for irrigation. Along the hill ranges, the crystalline rocks are covered by thin weathered zone. Mostly dug wells that can cater to domestic needs are feasible along topographic lows. Bore wells tapping deeper fractured aquifer are feasible along potential fractures in the midland and hill ranges. Potential fractures are seen down to 240 mbgl and the most productive zone lies between 60 and 175 mbgl and the discharge of bore wells range between 36,000 and 1,25,000 lph.

Of the four Tertiary beds, the two beds viz. the Vaikom and Warkalli form potential aquifers. The oldest Alleppey beds contain brackish water as inferred from electrical logs, whereas the Quilon beds are poor aquifers. The Vaikom aquifer is seen all along the coast between Quilon and Ponnani and the historical piezometric surface ranges from 1 to 18 m above msl. The aquifer is extensively developed between Quilon and Kayamkulam. The aquifer contains fresh water south of Karuvatta in Alleppey district and also in isolated pockets in Ernakulam district. The annual flow in the aquifer is computed as 43 MCM, of which 10 MCM is brackish. The Warkalli aquifer is seen south of Cochin. The historical piezometric head in the aquifer varies from 2.6 m above msl to 10 m below msl. The aquifer is largely developed in and around Alleppey. The annual flow in the aquifers is computed as 63 MCM and the draft is around 22 MCM.

Laterites are the most widely distributed lithological unit in the State and the thickness of the formation varies from a few meters to about 30m. The depth to water level in the formation ranges from less than a meter to 25 mbgl. Laterite forms potential aquifers along valleys and can sustain medium duty irrigation wells with the yields in the range of 0.5 - 6 m^3 per day.

The alluvium forms potential aquifer along the coastal plains and ground water occurs under phreatic and semi-confined conditions in this aquifer. The thickness of this formation varies from few meters to above 100 m and the depth to water level ranges from less than a meter to 6 mbgl. Filter point wells are feasible wherever the saturated thickness exceeds 5 m.

III RAINFALL DISTRIBUTION IN KERALA DURING 2014 - 15

Introduction

Rainfall is the major source of ground water recharge and the rainfall pattern plays an important role on the water levels in the phreatic aquifers and also to the deeper aquifers. The rainfall data received from India Meteorological Department, Trivandrum for the period of April 2014 to March 2015 is analysed and discussed in this report.

Annual rainfall distribution

The total rainfall ranged from 1876 to 3769 mm during the period from April 2014 to March 2015. The maximum rainfall was recorded in Idukki district and the minimum in Trivandrum district.

During the southwest monsoon season, Trivandrum district recorded 871 mm and Kasargod district recorded 3007 mm, which are the lowest and highest rainfall respectively. During the northeast monsoon season, Kasargod district recorded the lowest rainfall of 338 mm and kottayam district recorded the highest rainfall of 639 mm.

Monthly rainfall distribution

The monthly rainfall data for all the fourteen districts are given in Table 3.1. Almost all the districts recorded sufficient rainfall during the month of June to September due to the influence of south-west monsoon season.

Normal rainfall vs. actual rainfall

The rainfall during different seasons has been compared with the normal rainfall of the seasons to find out the variation of the rainfall and is discussed in details in the following paragraphs. As per the IMD norms districts were recorded with normal, deficient and scanty types of rainfall during this period.

Hot weather period

The seasonal and their percentage departure from normal rainfall are given in Table 3.2. During the months of April-May 2014, the departure of pre-monsoon rainfall varied from -20 to 25% in different districts. The maximum departure on negative side was observed in Thrissur district and deviation of - 20% from the normal in the southern part of Kerala. Excess rainfall was received in Wayanad, Trivandrum, Pathanamthitta and Kollam districts

and remaining all the districts were received normal rainfall. There is no scanty rainfall observed during this period. The details are presented in Figure 3.1(a) and table. 3.2

South-west monsoon period

During the southwest monsoon season from June to September 2014, the departure of rainfall varied from – 11% to 19% in different districts. There is no scanty and deficient rainfall recordrd during this season. The details are given in Figure 3.1(b) and table.3.2.

North-east monsoon period

During the northeast monsoon season from October to December 2014, the departure of rainfall varied from – 30% to 16 % in different districts. The maximum departure in the deficient type of rainfall from the normal is recorded in Alapuzha district. There are four districts were received deficient type of rainfall during this season. Normal rainfall is recorded in ten districts. The details are presented in Figure 3.1(c) and table.3.2.

Winter period

During the months of January to March 2015, the departure of rainfall varied from -45 to 173%. Four districts were recorded maximum from the deficient rainfall in the negative side. Record time six districts have recorded with excess rainfall .No scanty rainfall was recorded during the winter season. Four districts were received normal rainfall. The details are presented in Figure 3.1(d) and table.3.2.

Seasonal rainfall contribution to the total rainfall of the year 2014-15

The seasonal rainfall contributions to the total rainfall in percentages are worked out and are given in Table 3.3 and shown in Figure 3.2. The pattern shows that the southwest monsoon season's contribution is increasing from south to north and whereas during the northeast monsoon season the rainfall is increasing from north to south. The other two seasons do not follow any pattern as such.

The rainfall during April and May contributes 7.92 to 22.20 %, south-west monsoon season from June to September 48.46 to 80.80 %, north-east monsoon season from October to December 8.67 to 21.82 % and January to March 0.3 to 4.1 % in different districts.

Comparison of 2014-15 rainfall with previous year rainfall

The rainfall in the various seasons of 2014-15 has been compared with the previous year rainfall for the better assessment of the change in the ground water regime. The details are given in the following paragraphs.

Summer season

The rainfall of April and May 2014 has been compared with the summer rainfall of 2013 and the departure is given in Table 3.4 and Figure 3.3. The departure varied from 188.7 to 3.6 % at different districts. The maximum departure is for Pathanamthitta district and the minimum observed at Palakkad district.

Southwest monsoon season

The rainfall during June to September of 2014 has been compared with the 2013 June to September rainfall and the departure is given in Table 3.4 and Figure 3.3. The departure varied from -0.6 to 47.3 %. All the twelve districts were received less rainfall and remaining two districts were received excess rainfall in comparison with the previous year. The average rainfall during the season is 2133 mm which is 70% of the year.

Northeast monsoon season

The rainfall during October to December 2014 has been compared with the 2013 October to December rand the departure is given in Table 3.4 and Figure 3.3. The departure varied from – 16.4 to 122 %. Eight districts viz., Alapuzha, Kannur, Kasargod Kottayam, Kozhikode, Pathanamthitta, Malapuram, and Palakkad were recorded excess rainfall, remaining six districts were received less rainfall in comparison with previous year.

Winter season

The rainfall during January to March of 2015 has been compared with the rainfall of January to March 2014 and the departure is given in Table 3.4 and Figure 3.3. The departure varied from 3680 to -38.7 %. During the winter season, only two district were received normal rainfall and eleven district were received excess rainfall and only Trivandrum districts were received deficient rain fall in comparison with the previous year.

Table 3.1: Monthly Rainfall Distribution during 2014-2015(Figures in mm)

Sl.No.	District	2014									2015			Total
		April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
1	Allapuzha	144.1	258.3	377.2	340.1	647.4	193.6	317.1	86.1	53.9	3.2	19.5	80.2	2520.7
2	Kannur	23.2	261.1	675.5	928.6	928.9	329.3	267.3	87.0	29.4	5.0	5.6	1.7	3542.6
3	Ernakulam	91.1	295.0	580.4	595.3	895.9	304.5	426.1	122.7	98.5	2.4	7.1	35.6	3454.6
4	Idukki	113.8	232.5	492.5	874.3	921.3	418.7	427.5	121.5	54.1	1.4	28.0	53.4	3739.0
5	Kasaragod	11.7	256.4	964.2	341.4	1025.7	390.0	312.0	26.8	24.6	0.9	3.5	27.6	3384.8
6	Kollam	203.1	295.7	299.1	267.9	607.5	248.4	389.0	140.4	49.5	6.2	34.5	22.1	2563.5
7	Kottayam	139.1	315.2	507.2	475.7	832.2	291.1	469.6	153.0	97.1	8.6	24.6	82.1	3395.4
8	Kozhicode	48.1	268.0	532.4	1017.7	894.9	328.6	351.2	86.1	9.2	0.0	4.8	30.3	3571.3
9	Malappuram	49	232.1	576.0	770.4	672.7	277.0	382.1	110.4	42.3	0.0	1.3	36.5	3149.8
10	Palakkad	36.4	177.0	324.1	556.7	598.6	228.8	280.4	42.5	12.1	0.0	3.4	30.5	2290.5
11	Pathanamthitta	287	293.2	441.6	399.5	795.7	276.5	382.5	112.8	77.7	6.4	36.2	26.6	3135.7
12	Thiruvananthapuram	136.6	279.9	149.5	111.4	461.7	186.5	293.2	116.2	90.6	9.6	12.5	28.2	1876.0
13	Trichur	47.6	246.0	483.0	516.6	686.1	262.0	401.7	100.3	21.4	0.9	0.9	40.2	2806.7
14	Waynad	142	179.3	560.8	993.9	701.8	303.1	250.3	33.7	57.7	0.1	0.3	53.3	3276.3

Table 3.2:Seasonal Rainfall, Normal Rainfall and the percentage Departure in 2014-2015 in Kerala State

Sl.No.	District	Summer Season			S.W. Monsoon Season			N.E. Monsoon Season			Winter season		
		2014			2014			2014			2015		
		April + May	Normal	% Dep	June to September	Normal	% Dep	October to December	Normal	% Dep	January to March	Normal	% Dep
1	Allapuzha	402.4	432.7	-7	1558.3	1745.9	-11	403.2	572.1	-30	103.0	90.5	14
2	Ernakulam	284.3	292.9	-3	2862.3	2669	7	354.3	345.1	3	12.3	12.1	2
3	Idukki	386.1	412.4	-6	2376.1	2065	15	548.8	489.3	12	45.1	63.2	-29
4	Kannur	346.3	383	-10	2706.8	2276.2	19	549.0	564.2	-3	82.8	79.1	5
5	Kasaragod	268.1	264.5	1	2721.3	3007.5	-10	338.8	337.9	0	32.0	11.7	173
6	Kollam	498.8	407	23	1422.9	1332.3	7	529.5	638.6	-17	62.8	113.8	-45
7	Kottayam	454.3	417.9	9	2106.2	1897.3	11	622.6	535.1	16	115.3	80.2	44
8	Kozhicode	316.1	337.5	-6	2773.6	2603.1	7	437.3	422.2	4	35.1	21.3	65
9	Malappuram	281.1	308.1	-9	2296.1	2060.4	11	492.5	448.3	10	37.8	18.3	107
10	Palakkad	213.4	257.4	-17	1708.2	1572.7	9	322.9	428	-25	33.9	31.9	6
11	Pathanamthitta	580.2	479.6	21	1913.3	1715.7	12	495.3	624.2	-21	69.2	138.9	-50
12	Thiruvananthapuram	416.5	333.3	25	909.1	871.3	4	409.4	522.7	-22	50.3	75.9	-34
13	Trichur	293.6	368.3	-20	1947.7	2197.5	-11	502.0	469.4	7	42.1	27.9	51
14	Waynad	321.3	257.9	25	2559.6	2632.1	-3	284.0	332.5	-15	53.7	30.6	75

Table 3.3: Seasonal Rainfall Distribution and their Percentage Contribution to Annual Rainfall (2014-2015)

Sl.No.	District	April + May 2014		June to September 2014		October to December 2014		January to March 2015		Annual rainfall
		Rainfall	%	Rainfall	%	Rainfall	%	Rainfall	%	mm
1	Allapuzha	402.4	15.96	1558.3	61.82	403.2	15.99	103.0	4.1	2520.7
2	Ernakulam	284.3	8.02	2862.3	80.80	354.3	10.00	12.3	0.3	3542.6
3	Idukki	386.1	11.18	2376.1	68.78	548.8	15.89	45.1	1.3	3454.6
4	Kannur	346.3	9.26	2706.8	72.39	549.0	14.68	82.8	2.2	3739.0
5	Kasaragod	268.1	7.92	2721.3	80.40	338.8	10.01	32.0	0.9	3384.8
6	Kollam	498.8	19.46	1422.9	55.51	529.5	20.65	62.8	2.4	2563.5
7	Kottayam	454.3	13.38	2106.2	62.03	622.6	18.34	115.3	3.4	3395.4
8	Kozhicode	316.1	8.85	2773.6	77.66	437.3	12.24	35.1	1.0	3571.3
9	Malappuram	281.1	8.92	2296.1	72.90	492.5	15.63	37.8	1.2	3149.8
10	Palakkad	213.4	9.32	1708.2	74.58	322.9	14.10	33.9	1.5	2290.5
11	Pathanamthitta	580.2	18.50	1913.3	61.02	495.3	15.80	69.2	2.2	3135.7
12	Thiruvananthapuram	416.5	22.20	909.1	48.46	409.4	21.82	50.3	2.7	1876.0
13	Trichur	293.6	10.46	1947.7	69.39	502.0	17.89	42.1	1.5	2806.7
14	Waynad	321.3	9.81	2559.6	78.13	284.0	8.67	53.7	1.6	3276.3

Table 3.4: Comparison of 2014-2015 Seasonal Rainfall with the Seasonal Rainfall of 2013-2014

Sl.No.	District	Summer Season			S.W. Monsoon Season			N.E. Monsoon Season			Winter season		
		2013 (mm)	2012 (mm)	% Dep	2013 (mm)	2012 (mm)	% Dep	2013 (mm)	2012 (mm)	% Dep	2014 (mm)	2013 (mm)	% Dep
1	Allapuzha	402.36	177.7	126.4	1558.3	2111	-26.2	403.2	373.1	8.1	103.0	32.7	214.9
2	Ernakulam	284.27	126.6	124.5	2862.3	3441.4	-16.8	354.3	381	-7.0	12.3	7	75.7
3	Idukki	386.13	188.8	104.5	2376.1	2774.1	-14.3	548.8	574.9	-4.5	45.1	35.5	27.0
4	Kannur	346.3	205.4	68.6	2706.8	3345.2	-19.1	549.0	442.7	24.0	82.8	29.1	184.5
5	Kasaragod	268.11	133	101.6	2721.3	2739	-0.6	338.8	172.5	96.4	32.0	0	100.0
6	Kollam	498.79	249.8	99.7	1422.9	1777.4	-19.9	529.5	544.2	-2.7	62.8	73.4	-14.5
7	Kottayam	454.26	258.6	75.7	2106.2	2581.3	-18.4	622.6	608.7	2.3	115.3	57.2	101.5
8	Kozhicode	316.14	215.7	46.6	2773.6	3166.6	-12.4	437.3	379.4	15.2	35.1	2.3	1426.1
9	Malappuram	281.06	202.3	38.9	2296.1	1558.9	47.3	492.5	221.8	122.0	37.8	1	3680.0
10	Palakkad	213.43	206	3.6	1708.2	1223.1	39.7	322.9	262.7	22.9	33.9	9.2	268.2
11	Pathanamthitta	580.2	201	188.7	1913.3	1928.4	-0.8	495.3	592.5	-16.4	69.2	65.4	5.7
12	Thiruvananthapuram	416.54	152.6	173.0	909.1	1108.7	-18.0	409.4	463.4	-11.7	50.3	82.1	-38.7
13	Trichur	293.56	139.5	110.4	1947.7	2456	-20.7	502.0	511.9	-1.9	42.1	4.2	902.0
14	Waynad	321.3	152.9	110.1	2559.6	2689.6	-4.8	284.0	230.7	23.1	53.7	26	106.5

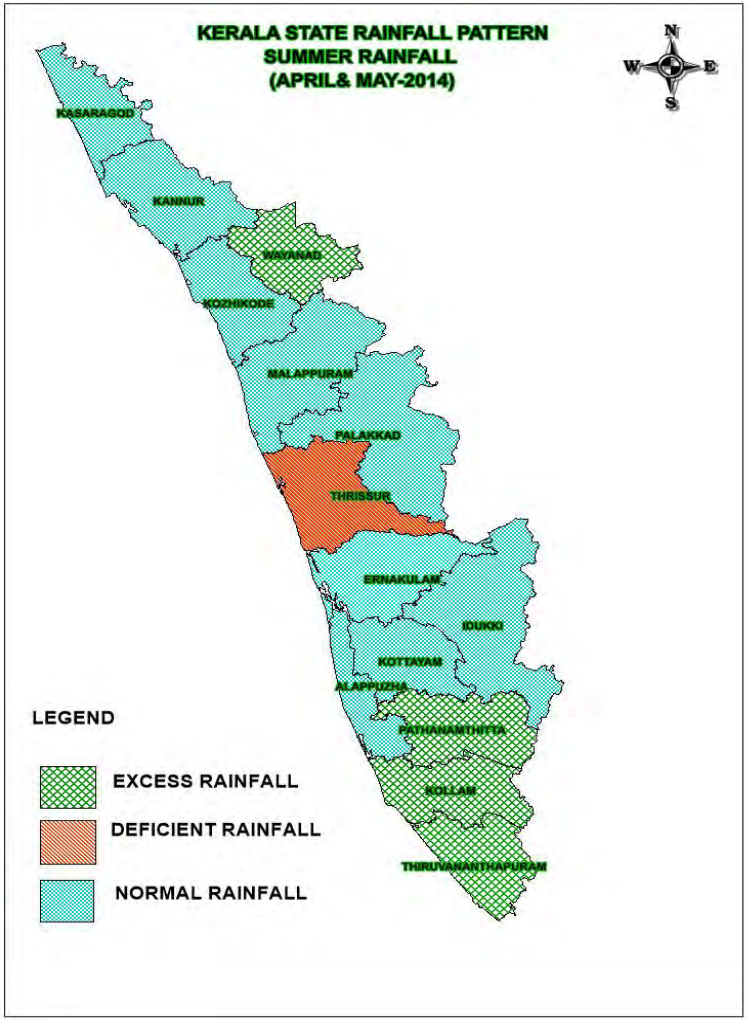


Figure 3.1(a): Kerala State Rainfall Pattern(April & May2014)

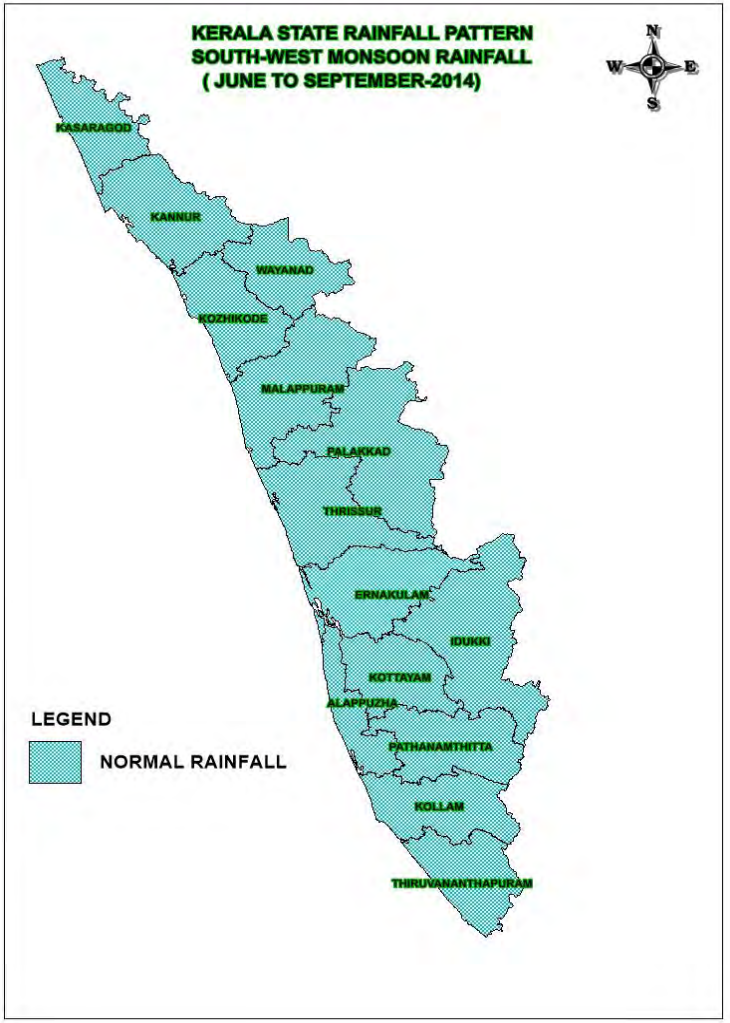


Figure 3.1(b): Kerala State Rainfall Pattern (June & September 2014)

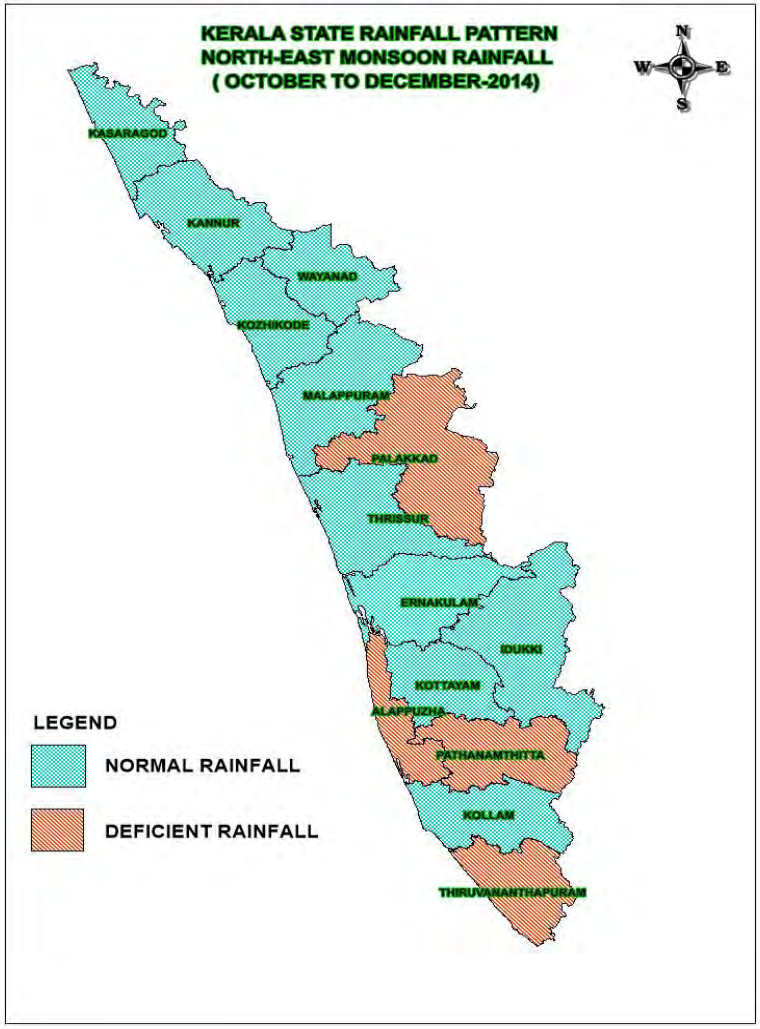


Figure 3.1(c): Kerala State Rainfall Pattern(Oct & Dec 2013)

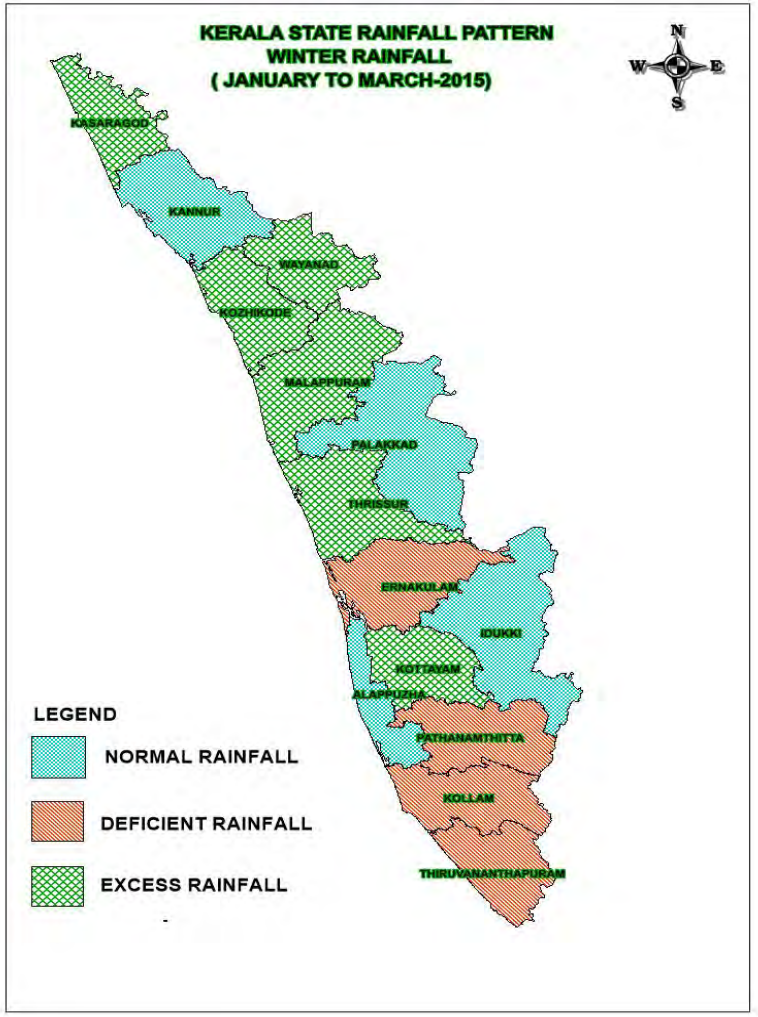


Figure 3.1(d) Kerala State Rainfall Pattern(Jan & March 2013)

Fig. 3.2 Seasonal rainfall contribution to annual rainfall in percentage (2014-15)

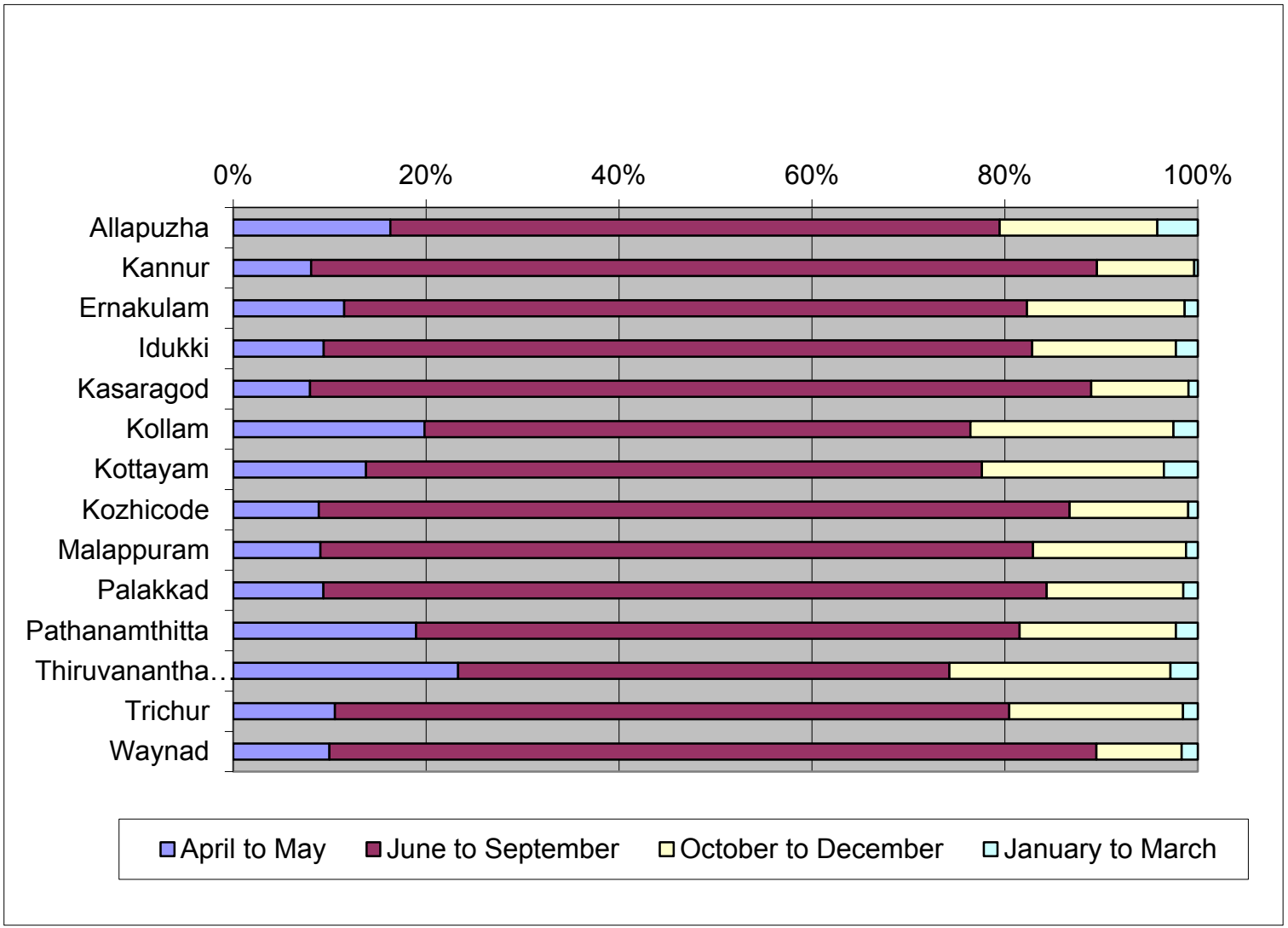
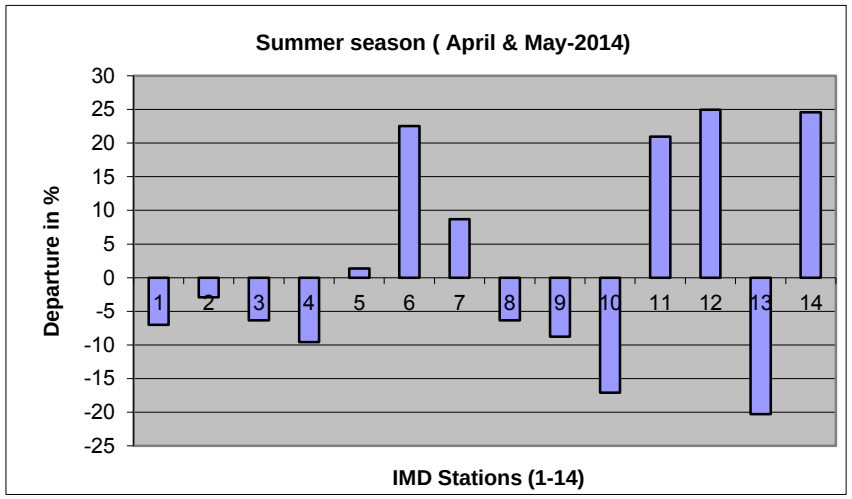
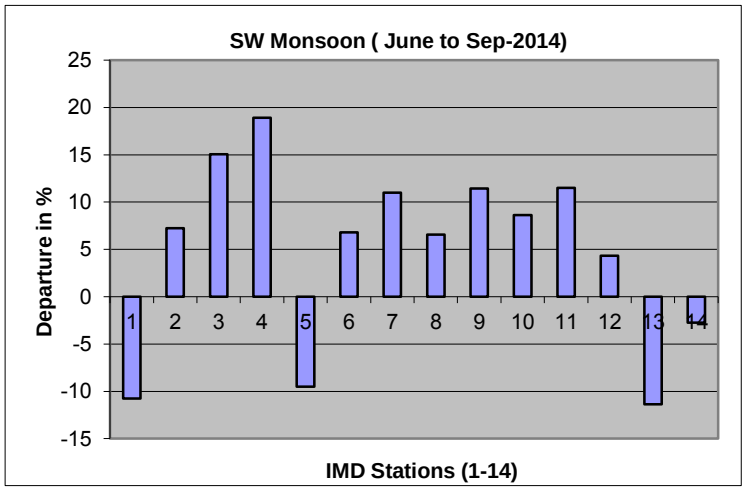
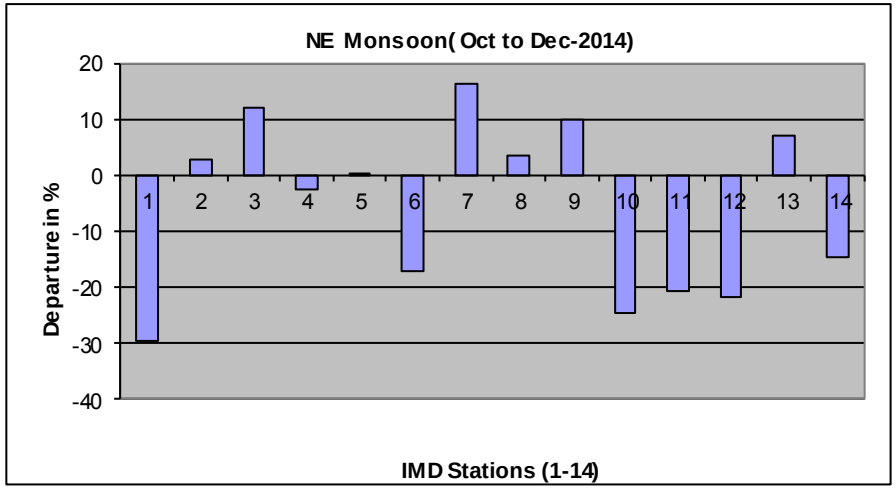
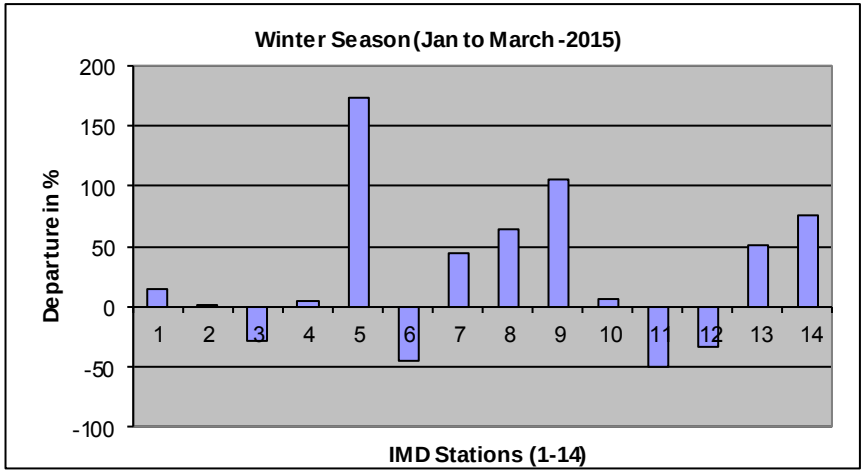


Fig.3.3 Seasonal rainfall Departure from its Normal during the period 2014-15



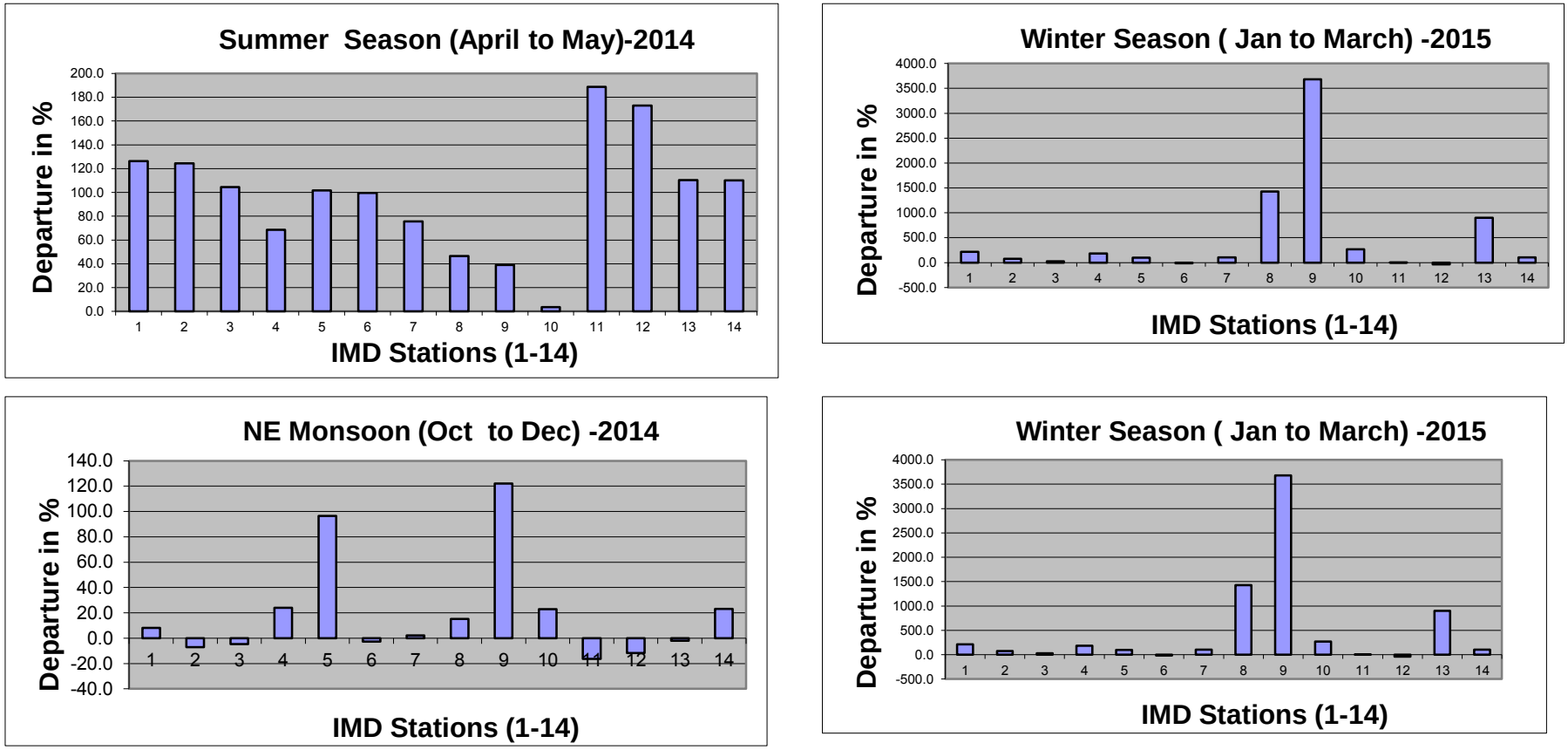






1. Alapuzha 2.Ernakulam 3. Idukki 4. Kannur 5. Kasaragod 6. Kollam 7. Kottayam 8. Kozhikode 9. Malapuram 10 Palakkad 11. Pathanamthitta 12. Thiruvananthapuram 13. Thrichur 14. Wayanad

Fig.3.4 Comparison of Seasonal rainfalls of year (2014-15) with previous year (2013-14) rainfall



. Alapuzha 2.Ernakulam 3. Idukki 4. Kannur 5. Kasaragod 6. Kollam 7. Kottayam 8. Kozhikode 9. Malapuram 10 Palakkad 11. Pathanamthitta 12. Thiruvananthapuram 13. Thrichur 14. Wayanad

IV DEPTH TO WATER LEVEL SCENARIO DURING 2014 - 15

The depth to water level was monitored from 1638 monitoring wells distributed throughout the State during the months of April, August, November and January. The water level measured during the month of April is taken as pre-monsoon water level and the data of August and November are taken as post-monsoon water level depending on the rainfall distribution. The water level data of GWMWs during 2014-15 is compiled in **Annexure I.**

The depth to water level mostly depends on the hydrogeological conditions of the area as well as topography, rainfall pattern etc. In coastal plains the depth to water level is generally restricted to 6 mbgl. In midland areas, where the undulating topography is seen, the depth to water level generally varies from near ground level to 25 mbgl. The variation is mostly due to topographical variations, thickness of lateritic overburden etc. In areas where laterites are underlain by sedimentary aquifers of Tertiary age, the water level goes very deep, even to the extent of 55 mbgl. In highlands the depth to water level is in the range of few cm to 10 mbgl depending on the topography and thickness of overburden (weathered zone).

Depth to water level during April 2014

During the month of April 2014 the depth to water level in Kerala State in dug wells varied widely from 0.17 to 53.0 mbgl. Shallow water level in the range of 0 – 2 mbgl is seen in Alappuzha district, coastal tracts of Ernakulam, in the valley portion found in the eastern part of Idukki district and also as small patches in remaining districts. The areas falling in the midland region generally show water level in the range of 2 – 10 mbgl. Water level of more than 20 m bgl is seen as patches in Thiruvananthapuram,Kollam,Palakkad, Malappuram, Kannur and Kasargod districts. The district-wise well frequency for different ranges of depth to water level during April 2014 has been prepared and is given in **Table 4.1**. The analysis of the data reveals that 81.26 % of the monitoring wells (GWMWs) shows water level within the range of 0.1 to10 mbgl. Deeper water level (> 20 mbgl) is seen in Thiruvananthapuram (Poovar, Pulluvila and Kanjiramkulam), Kollam, Malappuram and Kasargod district as isolated pockets which can be attributed to the local hydrogeological conditions mainly due to thick lateritic overburden and moreover the wells are located in an elevated area. The map showing the depth to water level in Kerala State during April 2014 is given in **Figure 4.1**. In four districts viz Kollam, Malappuram, Palakkad and Kannur, more than 50% of monitoring wells show water level greater than 5 m bgl.Deepest water level is encountered in Thiruvananthapuram district..

Depth to water level during August 2014

During the month of August 2014 the depth to water level in Kerala State in dug wells varied widely from 0.05 to 55.0 mbgl. Shallow water level in the range of 0 – 2 mbgl is seen in Alappuzha district, coastal tracts of Ernakulam, in the valley portion found in the eastern part of Idukki and Kottayam districts and also as small patches in remaining districts. The areas falling in the midland region generally show water level in the range of 2 – 10 mbgl. Water level of more than 20 m bgl is seen as patches in Thiruvananthapuram, and Kasargod districts. The district-wise well frequency for different ranges of depth to water level during August 2014 has been prepared and is given in **Table 4.2**. The analysis of the data reveals that 93.36 % of the monitoring wells (GWMWs) shows water level within the range of 0.1 to10 mbgl. Deeper water level (> 20 mbgl) is seen in Thiruvananthapuram (Poovar, Pulluvila and Kanjiramkulam), and Kasargod district as isolated pockets which can be attributed to the local hydrogeological conditions mainly due to thick lateritic overburden and moreover the wells are located in an elevated area. The map showing the depth to water level in Kerala State during August 2014 is given in **Figure 4.2**. Only Kasargod district it is observed that more than 50% of monitoring wells show water level greater than 5 m bgl.Deepest water level is encountered in Thiruvananthapuram district.

Depth to water level during November 2014

During the month of November 2014 the depth to water level in the State varied widely from 0.05 to 56.5 mbgl in dug wells. Shallow water level in the range of 0 – 2 mbgl is seen in Alappuzha district, coastal tracts of Ernakulam, Thrissur,Kozhikkod and Kannur districts and in the valley portion located in the eastern part of Idukki and Kottayam districts and also as small patches in remaining districts. The areas falling in the midland region generally show water level in the range of 2 – 10 mbgl. Water level of more than 20 m bgl is seen as isolated patches in Thiruvananthapuram, and Kasargod districts. The district-wise well frequency for different ranges of depth to water level during November 2014 has been prepared and is given in **Table 4.3**. The analysis of the data reveals that 90.84 % of the monitoring wells (GWMWs) have water levels within the range of 0.1 to10 mbgl. Deeper water level (> 20 mbgl) is seen in Thiruvananthapuram (Poovar, Pulluvila and Kanjiramkulam), and Kasargod district as isolated pockets which can be attributed to the local hydrogeological conditions such as thick lateritic overburden and the wells situated at elevated areas. The map showing the depth to water

level in Kerala State during November 2014 is given in **Figure 4.3**. Only in Kasargod district more than 50% of monitoring wells show water level greater than 5 m bgl.Deepest water level is recorded in Thiruvananthapuram district.

Depth to water level during January 2015

During the month of January 2015 the depth to water level in the State varied widely from 0.25 to 60 mbgl in dug wells. Shallow water level in the range of 0 – 2 mbgl is seen in Alappuzha district, coastal tracts of Ernakulam, Thrissur,Kozhikkod and Kannur districts and in the valley portion located in the eastern part of Idukki and Kottayam districts and also as small patches in remaining districts. The areas falling in the midland region generally show water level in the range of 2 – 10 mbgl. Water level of more than 20 m bgl is seen as isolated patches in Thiruvananthapuram, and Kasargod districts. The district-wise well frequency for different ranges of depth to water level during January 2015 has been prepared and is given in **Table 4.4**. The analysis of the data reveals that 86.16 % of the monitoring wells (GWMWs) have water levels within the range of 0.1 to10 mbgl. Deeper water level (> 20 mbgl) is seen in Thiruvananthapuram (Poovar, Pulluvila and Kanjiramkulam), and Kasargod district as isolated pockets which can be attributed to the local hydrogeological conditions such as thick lateritic overburden and the wells situated at elevated areas. The map showing the depth to water level in Kerala State during January 2015 is given in **Figure 4.4**. Only in Kollam district more than 50% of monitoring wells show water level greater than 5 m bgl and in Kasargod district it is around 50%. Deepest water level is recorded in Thiruvananthapuram district.

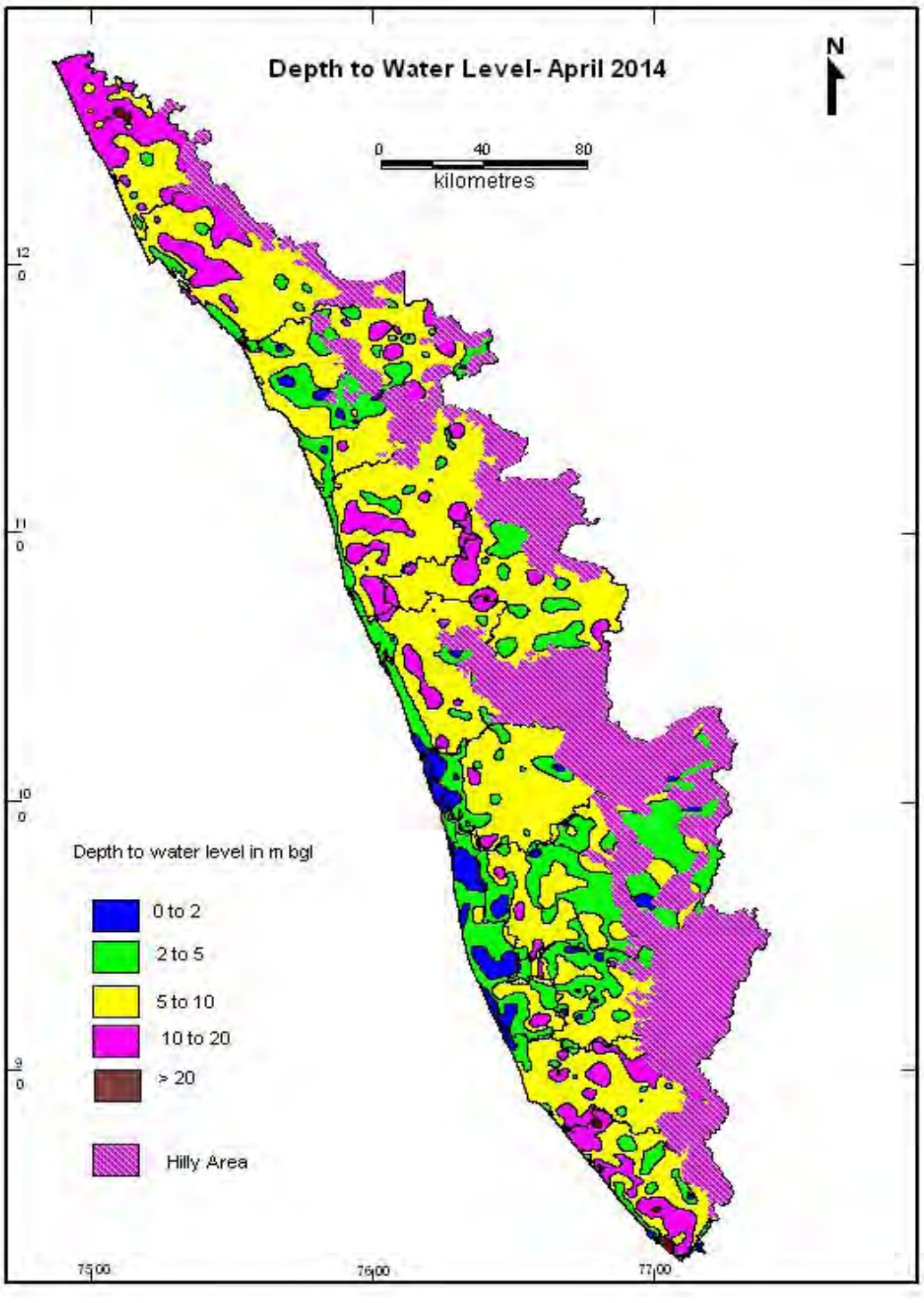


Figure 4.1: Depth to water level in Kerala State during April 2014

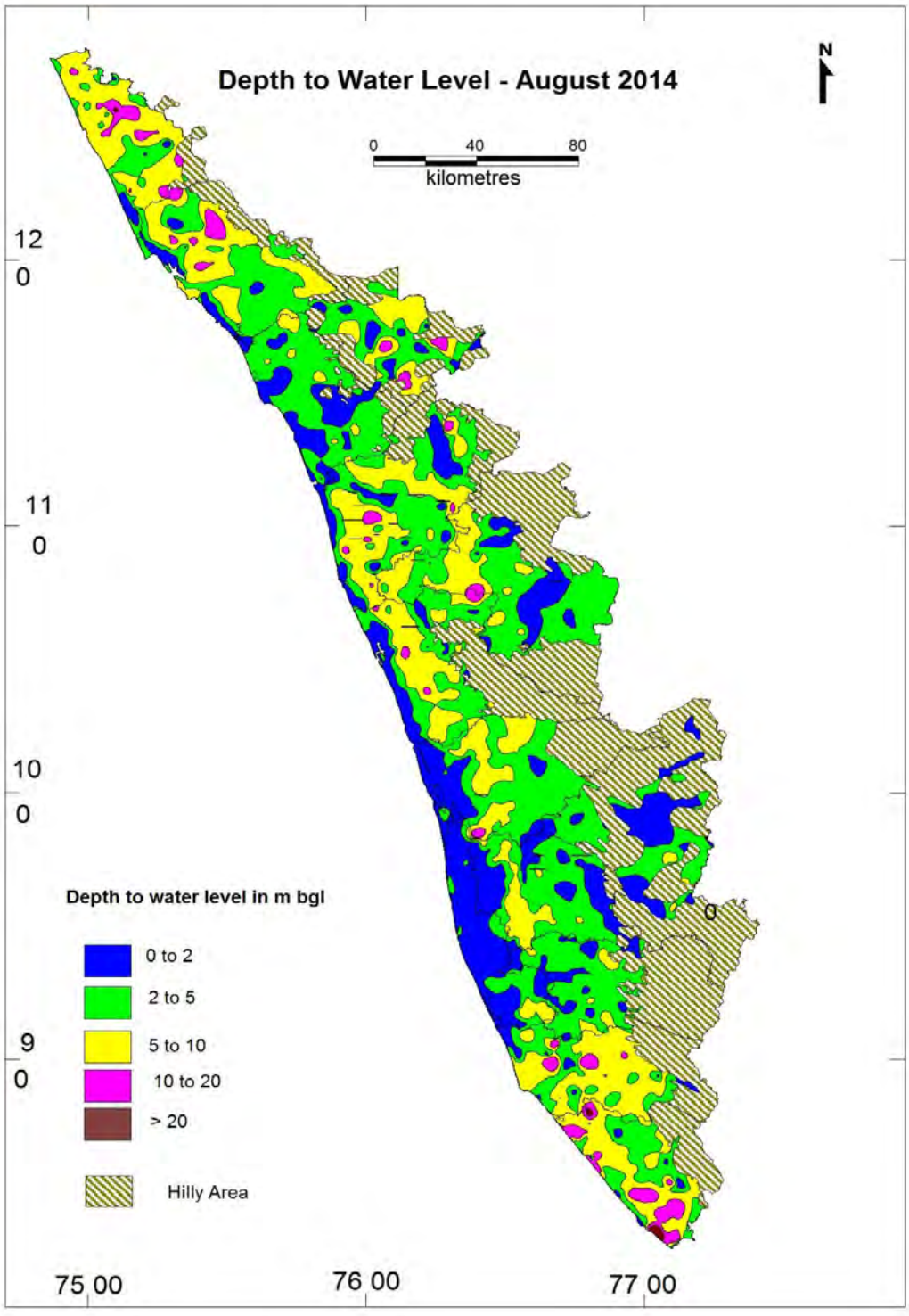


Figure 4.2: Depth to water level in Kerala State during August 2014

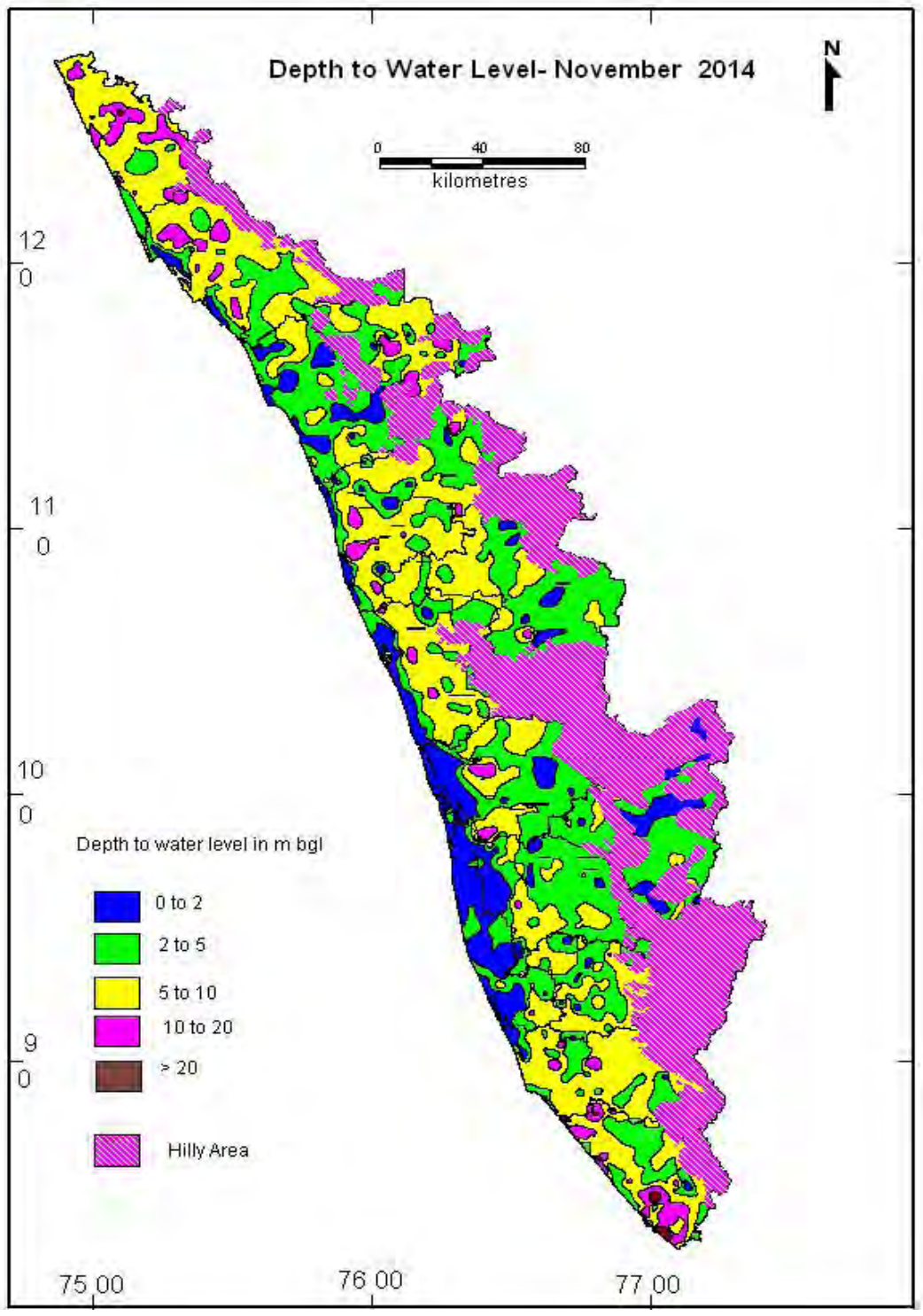


Figure 4.3: Depth to water level in Kerala State during November 2014

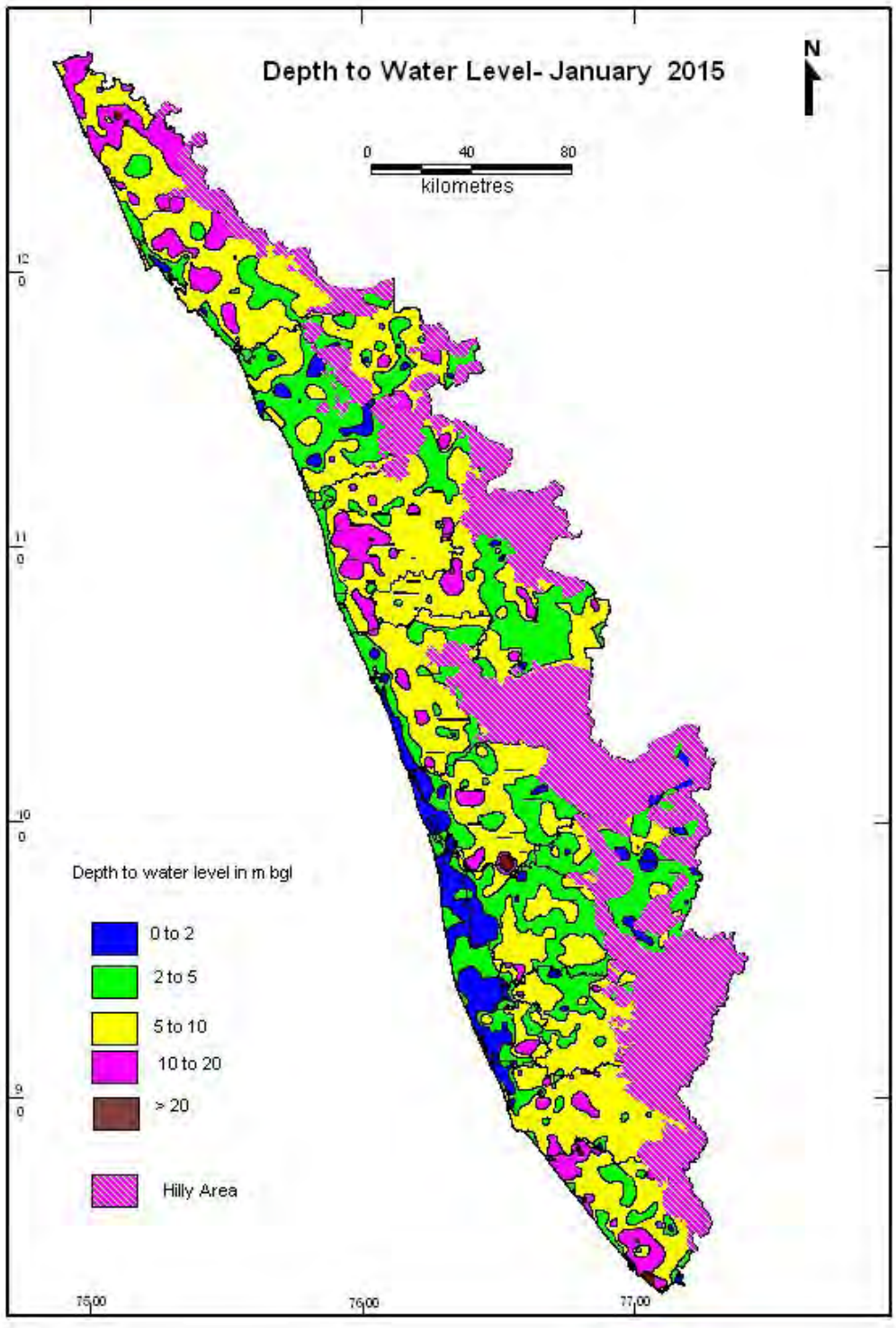


Figure 4.4: Depth to water level in Kerala State during January2015

Table 4.1: District wise Well Frequency for Different ranges of depth to water level for April 2014

District	No. of Wells Analysed	Depth to Water level(mbgl)		No. &Percentage of Wells Showing Depth to Water Table (mbgl) in the Range of					
		Min	Max	0.0 – 2.0	2.0 – 5.0	5.0 – 10.0	10.0 – 20.0	20.0 – 40.0	> 40.0
ALAPPUZHA	82	0.19	12.54	30 36.59%	35 42.68%	9 10.98%	89.76%	0	0
ERNAKULAM	104	0.17	13.66	18 17.31%	36 34.62%	46 44.23%	4 3.85%	0	0
IDUKKI	67	0.52	10.62	5 7.46%	36 53.73%	25 37.31%	1 1.49%	0	0
KANNUR	63	2.19	22.2	0	14 22.22%	32 50.59%	16 25.4%	1 1.59%	0
KASARGOD	109	2.35	26.75	0	7 6.42%	39 35.78%	60 55.05%	3 2.75%	0
KOLLAM	102	0.62	21.02	4 3.92%	14 13.73%	60 58.82%	22 21.57%	2 1.96%	0
KOTTAYAM	85	1.01	14.03	6 7.06%	38 44.71%	36 42.35%	5 5.88%	0	0
KOZHIKODE	65	0.8	16.4	8 12.31%	22 33.85%	30 46.15%	5 5.88%	0	0
MALAPPURAM	88	1.67	19.63	2 2.27%	17 19.32%	51 57.95%	18 20.45%	0	0
PALAKKAD	96	1.46	32.5	2 2.08%	23 23.96%	53 55.21%	14 14.58%	4 1.17%	0
PATHANAMTHITTA	81	0.78	15.5	10 12.35%	29 35.8%	38 46.91%	4 4.94%	0	0
THIRUVANANTHAPURAM	108	0.75	53	5 4.63%	27 25%	37 34.26%	33 30.56%	5 4.63%	1 0.93%
THRISSUR	108	0.84	13.92	11 10.19%	29 26.85%	58 33.7%	10 9.26%	0	0
WAYANAD	59	1.35	17.8	3 5.08%	19 32.2%	25 42.37%	12 20.34%	0	0
TOTAL	1217	0.17	53	104 8.54%	346 28.43%	539 44.28%	212 17.41%	15 1.23%	1 0.08%

Table 4.2 : District Wise Well Frequency For Different Ranges Of Depth To Water Level For August 2014

District	No. of Wells Analysed	Depth to Water level(mbgl)		No. &Percentage of Wells Showing Depth to Water Table (mbgl) in the Range of					
		Min	Max	0.0 – 2.0	2.0 – 5.0	5.0 – 10.0	10.0 – 20.0	20.0 – 40.0	> 40.0
ALAPPUZHA	77	0.05	10.15	54 70.13%	14 18.18%	8 10.39%	1 1.3%	0	0
ERNAKULAM	108	0.15	13.3	39 36.11%	40 37.04%	28 25.93%	1 0.93%	0	0
IDUKKI	65	0.37	7.63	26 40.00%	33 50.77%	6 9.23%	0	0	0
KANNUR	87	0.34	19.99	13 14.94%	32 36.78%	33 37.93%	09 10.34%	0	0
KASARGOD	118	0.46	21.94	10 8.47%0	24 20.34%	65 55.08%	18 15.25%	1 0.85%	0
KOLLAM	104	0.25	19.15	17 16.35%	37 35.58%	42 40.38%	08 7.697%	0	0
KOTTAYAM	89	0.16	10.3	32 35.96%	35 39.33%	21 23.6%	1 1.12%	0	0
KOZHIKODE	76	0.17	8.7	35 46.05%	28 36.84%	13 17.11%	0	0	0
MALAPPURAM	103	0.2	19.2	29 28.16%	31 31.1%	34 33.01%	9 8.74%	0	0
PALAKKAD	114	0.44	28.9	26 22.81%	54 47.37%	28 24.56 %	5 4.39%	1 0.85%	0
PATHANAMTHITTA	77	0.2	12.9	26 33.77%	43 55.84%	7 9.09%	1 1.3%	0	0
THIRUVANANTHAPURAM	112	0.05	55	9 8.04%	43 38.39%	38 33.93%	18 16.07%	3 2.68%	1 0.89%
THRISSUR	110	0.15	11.35	30 27.27%	40 36.36%	37 33.64%	3 2.73%	0	0
WAYANAD	55	0.45	15.7	20 36.36%	13 23.64%	16 29.09%	06 10.91%	0	0
TOTAL	1295	0.05	55	366 28.26%	467 36.06%	376 29.03%	80 6.17%	5 0.38%	1 0.08%

Table 4.3: District Wise Well Frequency For Different Ranges Of Depth To Water Level For November 2014

District	No. of Wells Analysed	Depth to Water level(mbgl)		No. &Percentage of Wells Showing Depth to Water Table (mbgl) in the Range of					
		Min	Max	0.0 – 2.0	2.0 – 5.0	5.0 – 10.0	10.0 – 20.0	20.0 – 40.0	> 40.0
ALAPPUZHA	71	0.01	11.15	43 60.56%	17 23.94%	8 11.27%	3 4.23%	0	0
ERNAKULAM	116	0.05	15.2	42 36.21%	36 31.03%	33 28.45%	5 4.31%	0	0
IDUKKI	63	0.4	8.1	15 23.81%	37 58.73%	11 17.46%	0	0	0
KANNUR	81	0.59	19.25	9 11.11%	24 29.63%	36 44.44%	12 14.81%	0	0
KASARGOD	120	1.45	39.3	4 3.33%	17 14.17%	68 56.67%	28 15.25%	3 2.5%	0
KOLLAM	98	0.52	18.88	14 14.29%	23 23.47%	55 56.12%	6 6.12%	0	0
KOTTAYAM	86	0.3	11.35	18 20.93%	39 45.35%	27 31.4%	2 2.33%	0	0
KOZHIKODE	86	0.34	13.42	25 29.07%	33 38.37%	25 29.07%	3 3.49%	0	0
MALAPPURAM	104	0.4	16.11	17 16.35%	28 26.92%	48 46.15%	11 10.58%	0	0
PALAKKAD	122	0.54	18.2	17 13.93%	61 50.00%	38 31.15%	6 4.92%	0	0
PATHANAMTHITTA	81	0.7	14.8	13 16.05%	28 34.57%	38 46.91%	2 2.47%	0	0
THIRUVANANTHAPURAM	119	0.85	56.5	5 4.2%	40 33.61%	47 39.5%	22 18.49%	4 3.36%	1 0.84%
THRISSUR	111	0.54	11.62	22 19.82%	35 31.53%	50 45.05%	4 3.6%	0	0
WAYANAD	63	0.94	16.82	8 12.7%	21 33.33%	25 39.68%	9 14.29%	0	0
TOTAL	1321	0.05	56.5	252 19.07%	439 33.23%	509 38.53%	113 8.55%	7 0.52%	1 0.07%

Table 4.4: District Wise Well Frequency For Different Ranges Of Depth To Water Level For January 2015

District	No. of Wells Analysed	Depth to Water level(mbgl)		No. & Percentage of Wells Showing Depth to Water Table (mbgl) in the Range of					
		Min	Max	0.0 – 2.0	2.0 – 5.0	5.0 – 10.0	10.0 – 20.0	20.0 – 40.0	> 40.0
ALAPPUZHA	88	0.25	22.71	50 56.82%	22 25.00%	9 10.23%	6 6.82%	1 1.14%	0
ERNAKULAM	118	0.45	60	24 20.34%	38 32.2%	50 42.37%	5 4.24%	1 0.85%	0
IDUKKI	75	0.50	10.15	13 17.33%	42 56.00%	18 24.00%	2 2.67%	0	0
KANNUR	86	1.29	19.38	5 5.81%	19 22.09%	47 54.65	15 17.44%	0	0
KASARGOD	102	1.96	23.6	1 0.98%	10 9.8%	50 49.02%	39 38.24%	2 1.96%	0
KOLLAM	111	0.63	19.73	10 9.01%	13 11.71%	71 63.96%	17 15.32%	0	0
KOTTAYAM	102	1.05	12.75	16 15.69%	39 38.24%	43 42.16%	4 3.92%	0	0
KOZHIKODE	87	0.78	13.9	12 13.79%	40 45.98%	30 34.48%	5 5.75%	0	0
MALAPPURAM	114	1.52	26.9	1 0.88%	30 26.32%	55 48.25%	27 23.68%	1 0.88%	0
PALAKKAD	126	0.4	20.16	09 7.14%	49 38.89%	56 44.44%	11 8.73%	1 0.79%	0
PATHANAMTHITTA	88	1.3	16.4	6 6.82%	37 42.05%	41 46.59%	4 4.55%	0	0
THIRUVANANTHAPURAM	117	0.88	55.8	4 4.2%	32 27.35%	48 41.03%	27 23.08%	5 4.27%	1 0.84%
THRISSUR	112	0.85	12.6	9 3.42%	37 33.04%	49 43.75%	7 6.25%	0	0
WAYANAD	69	1.17	17.56	9 16.96%	19 27.54%	29 42.03%	12 17.39%	0	0
TOTAL	1395	0.25	60	179 19.07%	427 30.60%	596 42.72%	181 12.97%	11 0.78%	1 0.07%

V. WATER LEVEL FLUCTUATION IN KERALA DURING 2014-2015

In Kerala the premonsoon water level measurements are carried out during April and postmonsoon measurements during August and November. The fourth water level measurement is during January. The estimation of water level fluctuation between premonsoon and postmonsoon is very important in the estimation of natural recharge to groundwater regime, which gives the dynamic resource of available groundwater.

The water level fluctuation between and pre and postmonsoon periods in coastal alluvium, riverine alluvium and valley fills are mostly restricted to 4 meters. In laterites water level fluctuation is generally in the range of a few centimetres to 9 metres, but mostly restricted to 4 m. In crystalline areas the water level fluctuation is in the range of a few cm to 6m.

Fluctuation between April 2014 and August 2014

Comparison of August 2014 water level with that of April 2014 indicates rise in water level in the range of 0 – 8 .00 metres in most parts of the State whereas fall in water level also is noticed in certain small isolated pockets mainly in Thiruvananthapuram, Kollam,Kottayam,Pathanamthitta, Ernakulam , Kozhikkode and hilly tracts of the western boarder of Kannur and Wayanad districts. In the southern districts of Kerala the rise in water level is in the range of 0 – 2 m as seen in major parts of the area, whereas in the northern districts of Kerala rise in water level up to 8 m is seen. Rise in water level is represented by 94.55 % of total monitoring wells.

The map of Kerala showing fluctuation between August 2014 and April 2014 is given in **Figure 5.1**. District-wise well frequency for different ranges of water level fluctuation (August 2014 and April 2014) is given in **Table 5.1**.

Fluctuation between April 2014 and November 2014

Comparison of November 2014 water level with that of April 2014 indicates rise in water level in the range of 0 – 8 .00 metres in most parts of the State whereas fall in water level also is noticed in certain small isolated pockets mainly in Thiruvananthapuram, Kottayam,Pathanamthitta, Ernakulam , Kozhikkode and Wayanad districts. In the southern and northern districts of Kerala state, the rise in water level is in the range of 2-8 m, whereas in the central districts of Kerala rise in water level in the range of 0-2 is predominantly seen. Also the rise in water level in Malappuram, Thrissur and Palakkad districts is in the range of 2-8 m.Rise in water level is represented by 88.79 % of total monitoring wells.

The map of Kerala showing fluctuation between November 2014 and April 2014 is given in **Figure 5.2**. District-wise well frequency for different ranges of water level fluctuation (November 2014 and April 2014) is given in **Table 5.2**.

Fluctuation between April 2014 and January 2015

Comparison of January 2015 water level with that of April 2014 indicates rise in water level in the range of 0 – 4 .00 metres in most parts of the State whereas fall in water level is noticed in certain small isolated pockets mainly in Thiruvananthapuram, Kollam ,Kottayam,Pathanamthitta, Ernakulam , Kozhikkode and Kasargod districts. In general the rise in water level is in the range of 0-2 m theought out all districts except Pathanamthitta district where fall is predominant. Rise in water level in the range of 4 m and above is noticed in isolated pockets in Palakkad, Thrissur and Thiruvananthapuram districts. Rise in water level is represented by 75.13 % of total monitoring wells.

The map of Kerala showing fluctuation between January 2015 and April 2014 is given in **Figure 5.2**. District-wise well frequency for different ranges of water level fluctuation (January 2015 and April 2014) is given in **Table 5.2**.

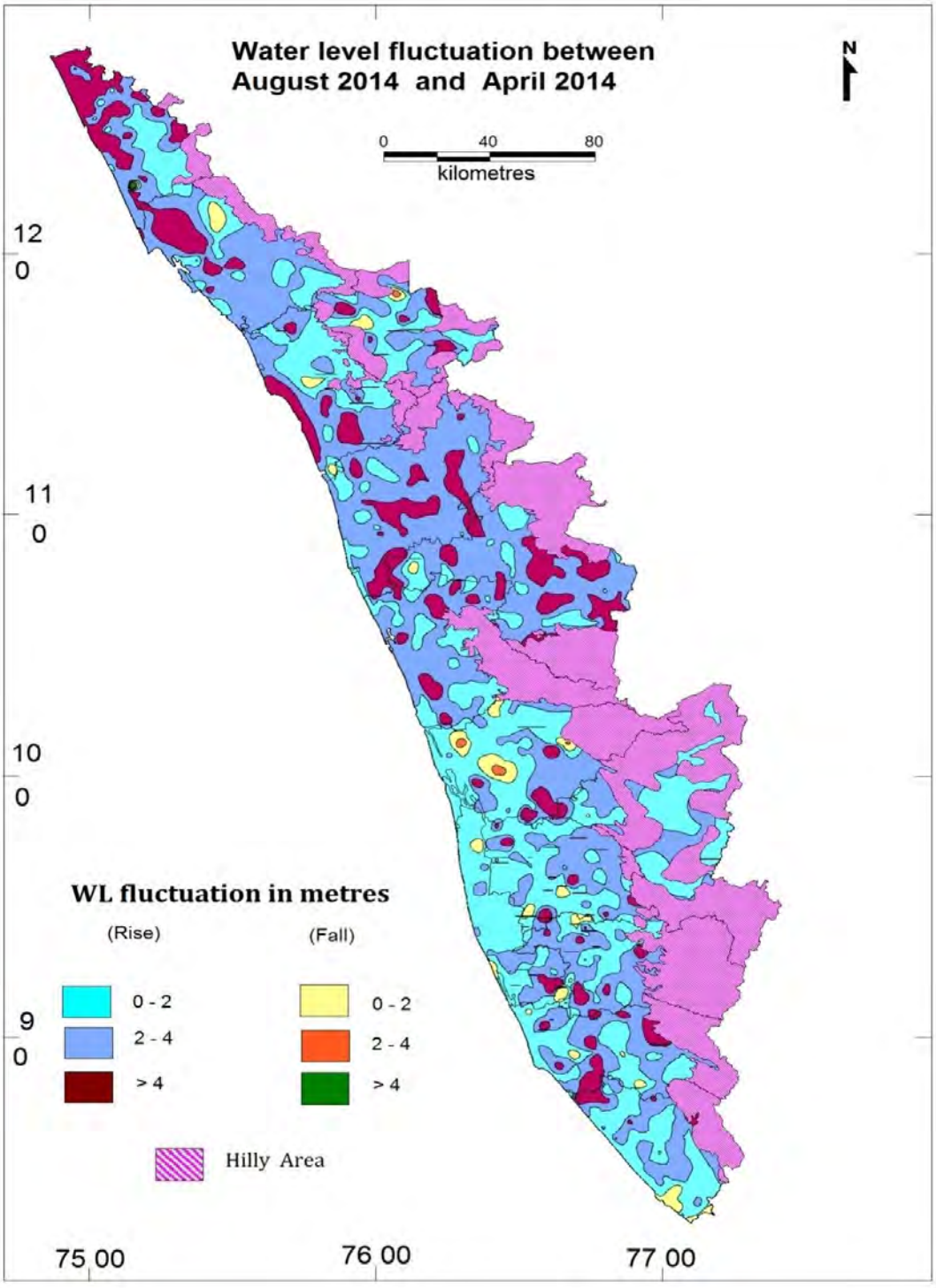


Figure 5.1: Water Level Fluctuation between April 2014 and August 2014

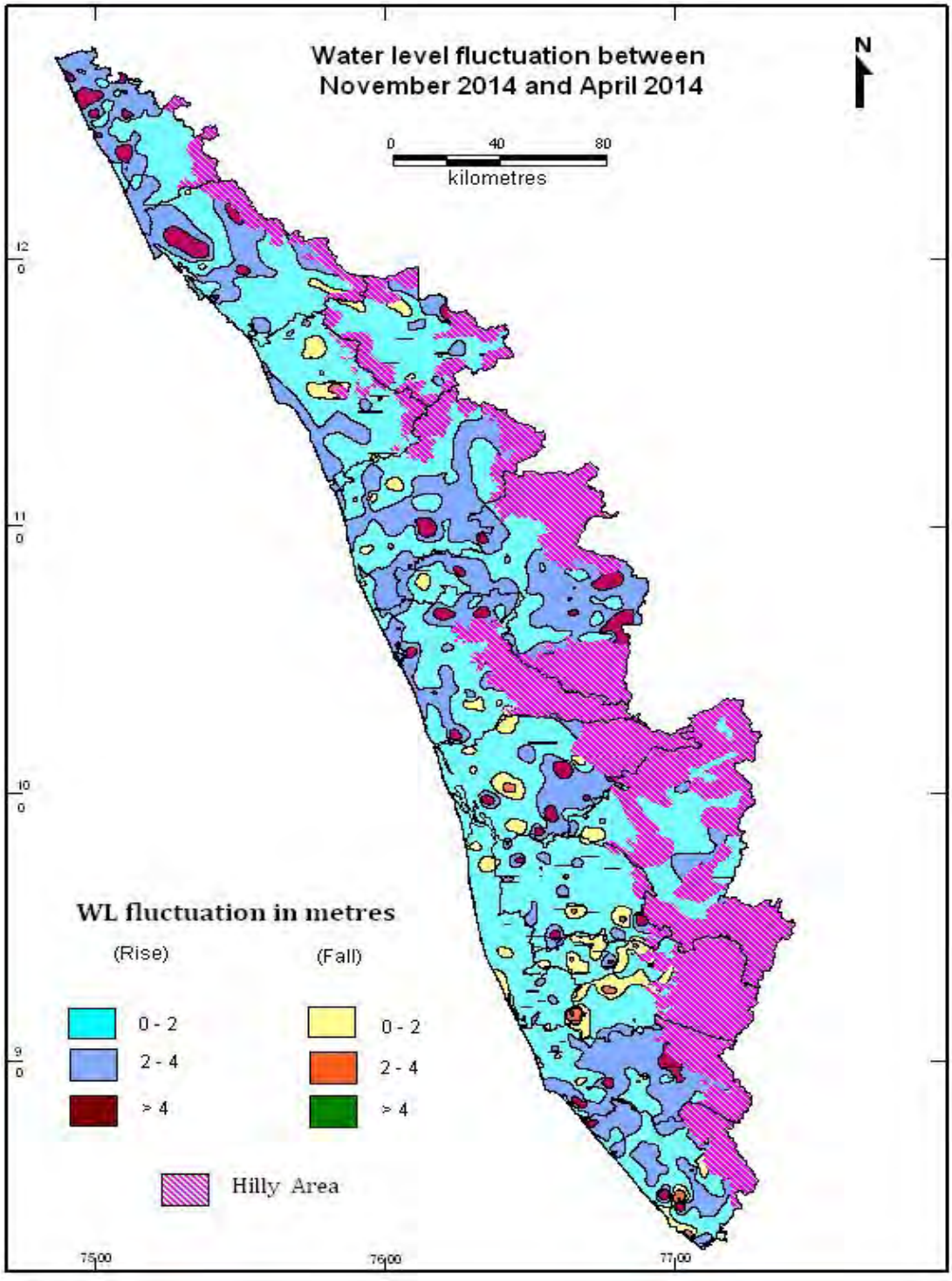


Figure 5.2: Water Level Fluctuation between April 2014 and November 2014

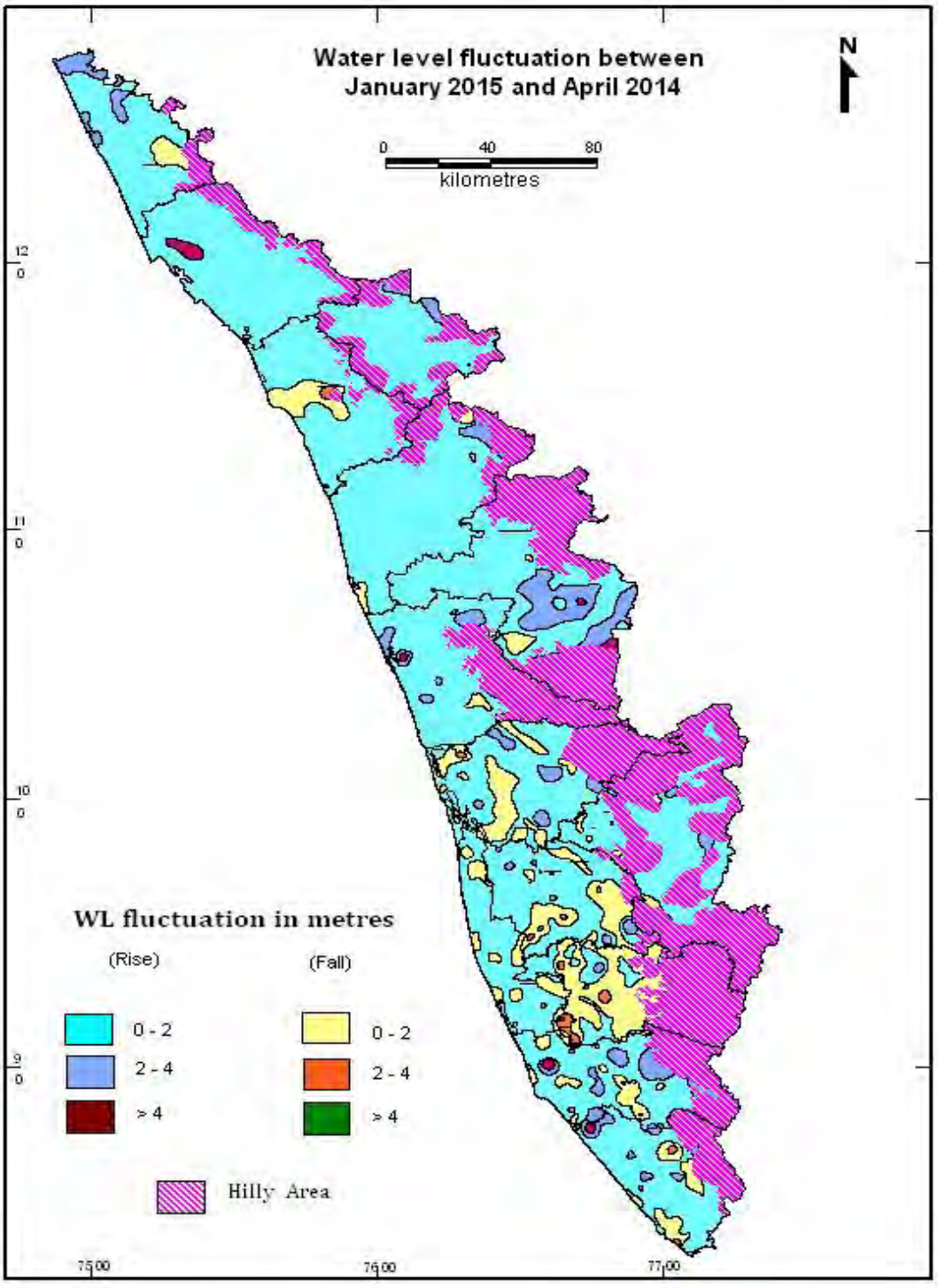


Figure 5.3: Water Level Fluctuation between January and 2015April 2014

Table 5.1: District wise – Fluctuation and Frequency Distribution for Different Ranges from April 2014 – August 2014

District	No. of Wells	Range of Fluctuation (m)				No. &Percentage of Wells /Percentage Showing Fluctuation						Total No. of Wells	
		Rise		Fall		Rise			Fall			Rise	Fall
		Min	Max	Min	Max	0 to 2	2 to 4	>4	0 to 2	2 to 4	>4		
ALAPPUZHA	70	0.07	6.75	0.03	1.96	45 64.29%	15 21.43%	5 7.14%	5 7.14%	0		65	5
ERNAKULAM	93	0.02	6.86	0.1	3.15	51 54.84%	26 27.96%	6 6.45%	6 6.45%	3 3.23%	0	83	9
IDUKKI	63	0.07	5.84	0.07	0.07	35 55.56%	23 36.51%	4 6.3%	1 1.59%	0	0	62	1
KANNUR	61	0.46	7.41	0.05	2.8	18 29.51%	26 42.62%	13 21.31%	2 3.28%	2 3.28%	0	57	4
KASARGOD	106	0.38	15.41	0.28	7.81	24 22.64%	27 25.47%	53 50.00%	1 0.94%	0	1 0.94%	104	2
KOLLAM	99	0.11	15.99	0.06	3.77	35 35.35%	37 37.37%	20 20.2%	6 6.06%	1 1.01%	0	92	7
KOTTAYAM	83	0.1	8.17	0.07	1.57	44 53.01%	30 36.14%	6 7.23%	3 3.61%	0	0	80	3
KOZHIKODE	63	0.25	7.7	1.25	3.9	20 31.75%	25 39.68%	15 23.81%	1 1.59%	1 1.59%	0	60	2
MALAPPURAM	91	0.01	14.94			17 18.68%	46 50.55%	28 30.77%	0	0	0	91	0
PALAKKAD	95	0.3	17.06	0.04	2.69	24 25.26%	39 41.05%	28 12.5%	2 2.11%	2 2.11%	0	91	4
PATHANAMTHITTA	72	0.08	7	0.02	0.59	27 37.5%	30 41.67%	9 12.5%	6 8.33%	0	0	66	6
THIRUVANANTHAPURAM	102	0.1	6.59	0.08	4.04	49 48.04%	31 30.39%	10 9.8%	10 9.8%		1 0.98%	90	11
THRISSUR	103	0.05	6.39	0.35	1.11	37 35.92%	48 46.6%	15 14.5%	3 2.91%	0	0	100	3
WAYANAD	55	0.2	13.3	1.35	2.69	24 43.64%	16 29.09%	12 21.82%	1 1.82%	1 1.82%	0	52	2
TOTAL	**1156**	**0.46**	**5.84**	**0.00**	**7.81**	**450** 38.92%	**419** 36.24%	**224** 19.37%	**47** 4.06%	**10** 0.86%	**2** 0.17%	**1093** **94.55** %	**59** **5.1%**

Table 5.2: District wise – Fluctuation and Frequency Distribution for Different Ranges from April 2014 – November 2014

District	No. of Wells	Range of Fluctuation (m)				No. &Percentage of Wells /Percentage Showing Fluctuation						Total No. of Wells	
		Rise		Fall		Rise			Fall			Rise	Fall
		Min	Max	Min	Max	0 to 2	2 to 4	>4	0 to 2	2 to 4	>4		
ALAPPUZHA	64	0.01	2.92	0.06	4.21	53 82.81%	5 7.81%	0	5 7.81%	0	1 1.56%	58	6
ERNAKULAM	96	0.1	7.45	0.05	3.25	61 63.54%	15 15.63%	7 7.29%	11 11.46%	2 2.08%	0	83	13
IDUKKI	60	0.12	4.02	0.02	0.87	47 78.33%	8 13.33%	1 1.67%	4 6.67%	0	0	56	4
KANNUR	57	0.1	6.35	0.04	3.25	31 54.38%	14 24.56%	7 12.28%	3 5.26%	2 3.51%	0	52	5
KASARGOD	106	0.05	11.9	0.4	7.7	41 38.68%	41 38.68%	22 20.75%	1 0.94%	0	1 0.94%	104	2
KOLLAM	93	0.1	12.66	0.04	3.78	42 45.16%	32 34.41%	12 12.9%	6 6.45%	1 1.08%	0	86	7
KOTTAYAM	82	0.01	4.97	0.03	2.27	62 75.61%	10 12.2%	4 4.88%	4 4.88%	2 2.24%	0	76	6
KOZHIKODE	64	0.18	5.99	0.04	5.37	31 48.44%	21 32.81%	1 1.56%	7 10.94%	3 4.69%	1 1.56%	53	11
MALAPPURAM	84	0.11	16.61	0.09	1.7	41 48.81%	35 41.67%	3 3.57%	5 5.95%	0	0	79	5
PALAKKAD	95	0.08	15.16	0.80	2.77	36 37.89%	40 42.11%	16 16.84%	1 1.05%	2 2.11%	0	92	3
PATHANAMTHITTA	76	0.03	4.24	0.03	6.96	40 52.63%	2 2.63%	2 2.63%	27 35.53%	4 5.26%	1 1.32%	44	32
THIRUVANANTHAPURAM	107	0.01	10.77	0.03	4.04	44 41.12%	33 30.84%	13 12.15%	14 13.08%	2 1.87%	1 0.93%	90	17
THRISSUR	102	0.16	6.04	0.09	1.94	56 54.9%	29 28.43%	7 6.8%	10 9.81%	0	0	92	10
WAYANAD	56	0.08	9.45	0.01	1.87	35 62.50%	12 21.43%	2 3.57%	7 12.5%	0	0	49	7
TOTAL	**1142**	**0.18**	**2.92**	**0.01**	**7.7**	**620** 54.29%	**297** 26%	**97** 8.49%	**105** 9.19.%	**18** 1.57%	**5** 0.43%	**1014** **88.79** %	**128** **11.2%**

Table 5.3: District wise – Fluctuation and Frequency Distribution for Different Ranges from April 2014 – January 2015

District	No. of Wells	Range of Fluctuation (m)				No. &Percentage of Wells /Percentage Showing Fluctuation						Total No. of Wells	
		Rise		Fall		Rise			Fall			Rise	Fall
		Min	Max	Min	Max	0 to 2	2 to 4	>4	0 to 2	2 to 4	>4		
ALAPPUZHA	77	0.02	2.1	0.03	4.21	53 68.83%	2 2.6%	0	21 27.27%	0	1 1.3%	55	22
ERNAKULAM	94	0.05	3.82	0.08	24.8	51 54.26%	9 9.57%	0	30 31.91%	1 1.06%	2 2.1%	60	33
IDUKKI	62	0.02	2.92	0.01	2.13	49 79.03%	5 8.06%	0	7 11.29%	1 1.61%	0	54	8
KANNUR	60	0.01	5.39	0.03	4.28	37 61.67%	6 10.00%	3 5.00%	11 18.33%	2 3.33%	1 1.61%	46	14
KASARGOD	91	0.05	10.96	0.04	9.16	46 50.55%	25 27.47%	7 7.69%	11 12.09%	1 1.1%	1 1.1%	78	13
KOLLAM	100	0.01	10.44	0.03	4.88	56 56.00%	14 14.00%	4 4.00%	21 21.00%	3 3.00%	1 1.00%	74	25
KOTTAYAM	82	0.01	3.47	0.03	3.49	54 65.85%	6 7.32%	0	18 21.95%	4 4.88%	0	60	22
KOZHIKODE	61	0.02	3.45	0.1	6.17	43 70.49%	4 14.00%	0	8 13.11%	5 8.2%	1 1.64%	47	14
MALAPPURAM	90	0.03	9.7	0.04	4.44	51 56.57%	7 7.78%	2 2.22%	27 30.00%	1 1.11%	1 1.11%	60	29
PALAKKAD	93	0.03	10.82	0.02	0.93	56 60.22%	24 25.81%	6 6.43%	7 7.53%	0	0	86	7
PATHANAMTHITTA	79	0.03	2.59	0.01	3.25	28 35.44%	2 2.53%	0	44 55.70%	4 5.06%	0	30	48
THIRUVANANTHAPURAM	102	0.07	10.48	0.01	2.81	61 59.8%	14 13.73%	2 1.96%	21 20.59%	4 3.92%	0	77	25
THRISSUR	99	0.02	4.92	0.01	1.03	75 75.76%	10 10.10%	3 3.03%	10 10.1%	0	0	88	10
WAYANAD	56	0.06	7.31	0.03	2.45	39 69.64%	5 8.93%	2 3.57%	7 12.5%	3 5.36%	0	46	10
TOTAL	**1146**	**0.07**	**2.1**	**0.01**	**24.8**	**699** 60.99%	**133** 11.60%	**29** 2.53%	**243** 21.20.%	**29** 2.53%	**8** 0.69%	**861 75.13** %	**280** **24.43**%

VI. COMPARISON OF 2014-15 WATER LEVELS WITH THE DECADAL MEAN (2004-2013)

Water levels during the year 2014-15 in comparison with the decadal mean (2004-2013) value of the respective measurements is discussed in this chapter. The analysis brings out the deviations in water level from the general behaviour of water level of the past decade. In general, the change in water level is confined to the range of +2 to –2 m.

Fluctuation between Mean April (2004-2013) and April 2014

The change in water level over the last ten years period is brought out by the comparison of water level with the mean value of April measurements of the period 2004-2013.This analysis indicate that the change in water level is mostly restricted to +2 (rise) to -2 (fall) m as recorded by 89.54 % of GWMW. However fall in waterlevel is predominant in many parts of the state as represented by 47.36 %. of monitoring wells. The frequency of wells showing rise and fall in different ranges (0-2m,2-4m, 4m) when compared with decade mean water level is given in **Table 6.1**. **Figure 6.1** shows the fluctuation in Kerala state for April 2014 with respect to Decadal mean (2004-2013).

Fluctuation between Mean August (2004-2013) and August 2014

The change in water level over the last ten years period is brought out by the comparison of water level with the mean value of August measurements of the period 2004-2013.This analysis indicate that the change in water level is mostly restricted to +2 (rise) to -2 (fall) m as recorded by 89.88 % of GWMW. However fall in waterlevel is predominant in many parts of the state as represented by 27 % of monitoring wells.The frequency of wells showing rise and fall in different ranges (0-2m,2-4m, 4m) when compared with decade mean water level is given in **Table 6.2**. **Figure 6.2** shows the water level fluctuation in the state for August 2014 with respect to Decadal mean (2004-2013).

Fluctuation between Mean November (2004-2013) and November 2014

The change in water level over the last ten years period is brought out by the comparison of water level with the mean value of November measurements of the period 2004-2013.This analysis indicate that the change in water level is mostly restricted to +2 (rise) to -2 (fall) m as recorded by 93.47 % of GWMW. However fall in waterlevel is predominant mainly in central and northern parts of the state as represented by 57.48 % of monitoring wells. Rise in water level is confined to Trivandrum and Kolam and isolated patches in Kannur and Kasargod districts.The frequency of wells showing rise and fall in different ranges (0-2m,2-4m, 4m) when compared with decade

mean water level is given in **Table 6.3**. **Figure 6.3** shows the water level fluctuation in the state for November 2014 with respect to Decadal mean (2004-2013).

Fluctuation between Mean January (2005-2014) and January 2015

The change in water level over the last ten years period is brought out by the comparison of water level with the mean value of January measurements of the period 2005-2014.This analysis indicate that the change in water level is mostly restricted to +2 (rise) to -2 (fall) m as recorded by 92.22 % of GWMW. However fall in waterlevel is predominant mainly in Kollam, Palakkad and Malappuram districts as represented by 46.86 % of monitoring wells. Rise in water level is predominant in Kottayam,Ernakulam,Thrissur,Kozhikkod and Wayanad and Kannur districts and southern side of Iduki and Trivandrum districts.The frequency of wells showing rise and fall in different ranges (0-2m,2-4m, 4m) when compared with decade mean water level is given in **Table 6.4**. **Figure 6.4** shows the water level fluctuation in the state for January 2015 with respect to Decadal mean (2005-2014).

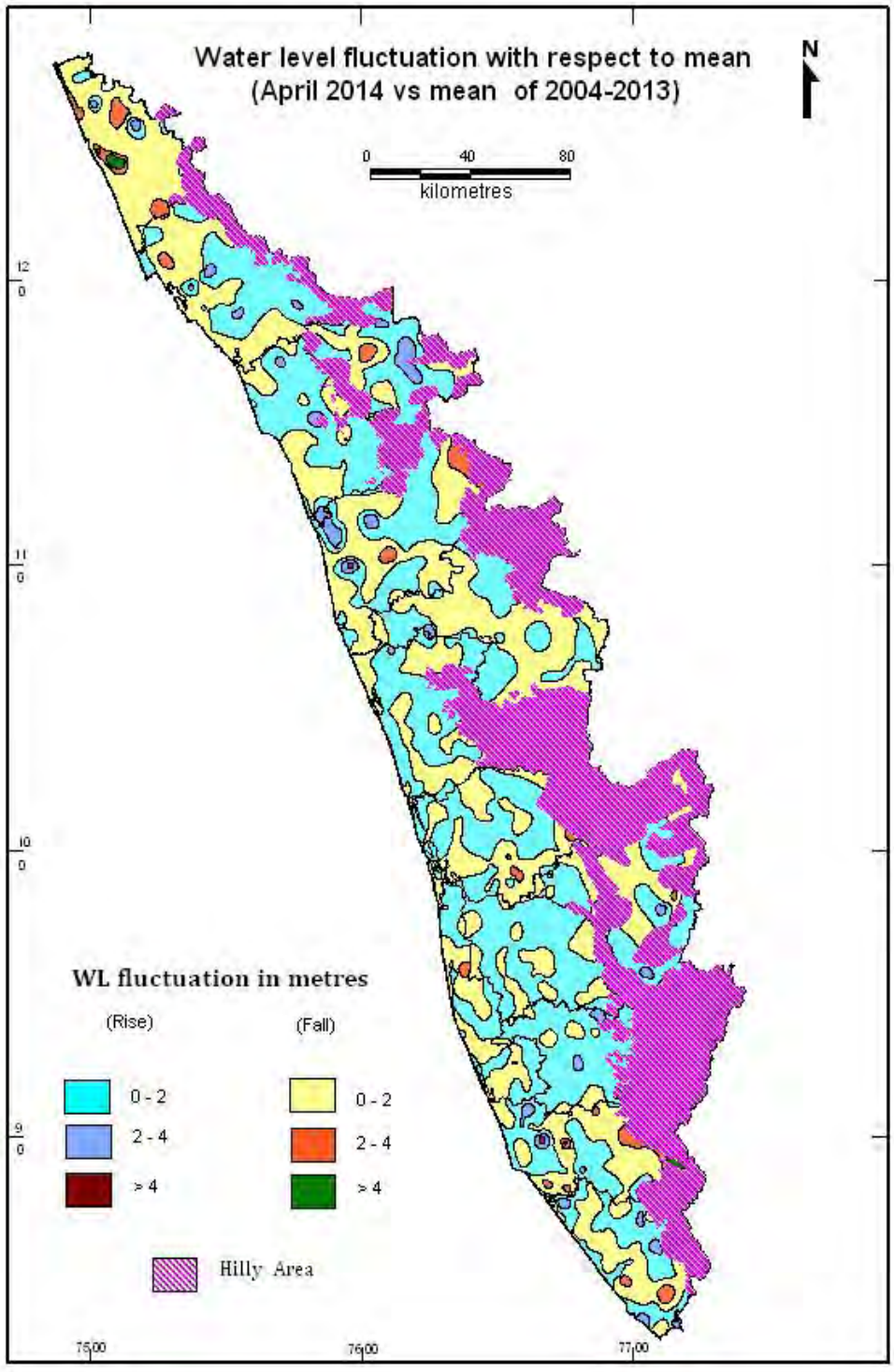


Figure 6.1: Water Level Fluctuation April 2014 with respect to Decadal mean

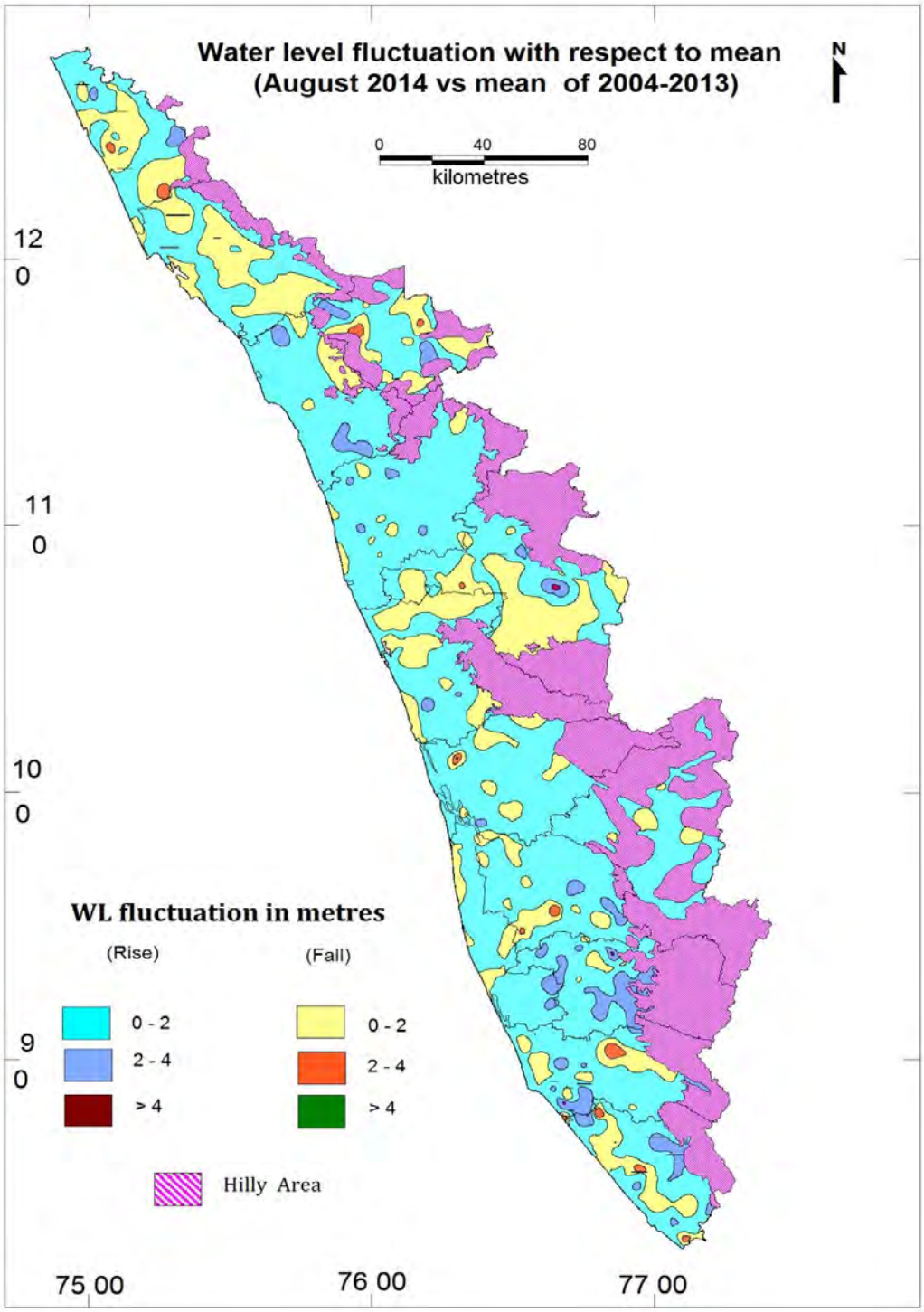


Figure 6.2: Water Level Fluctuation August 2014 with respect to Decadal mean

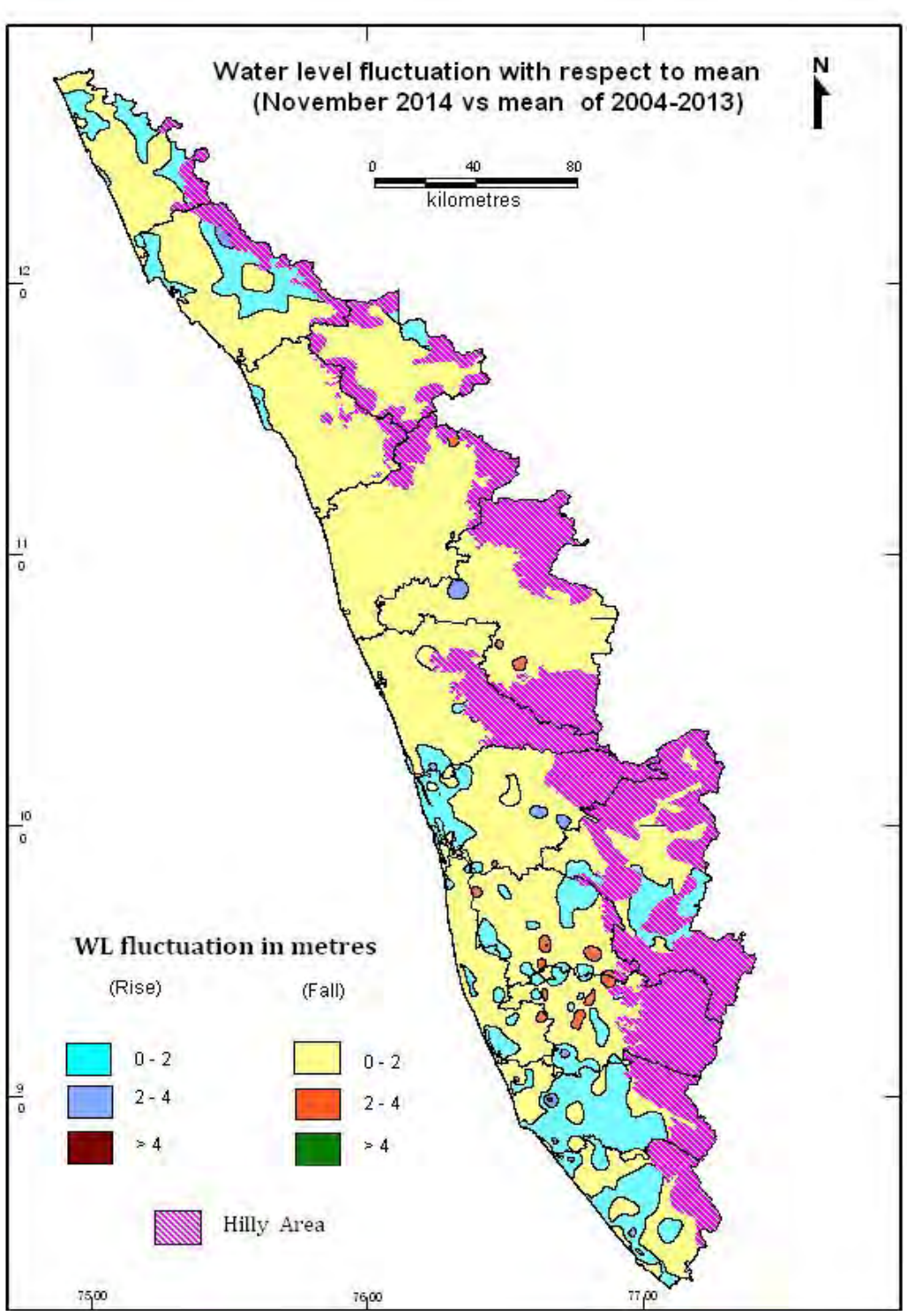


Figure 6.3: Water Level Fluctuation November 2014 with respect to Decadal mean

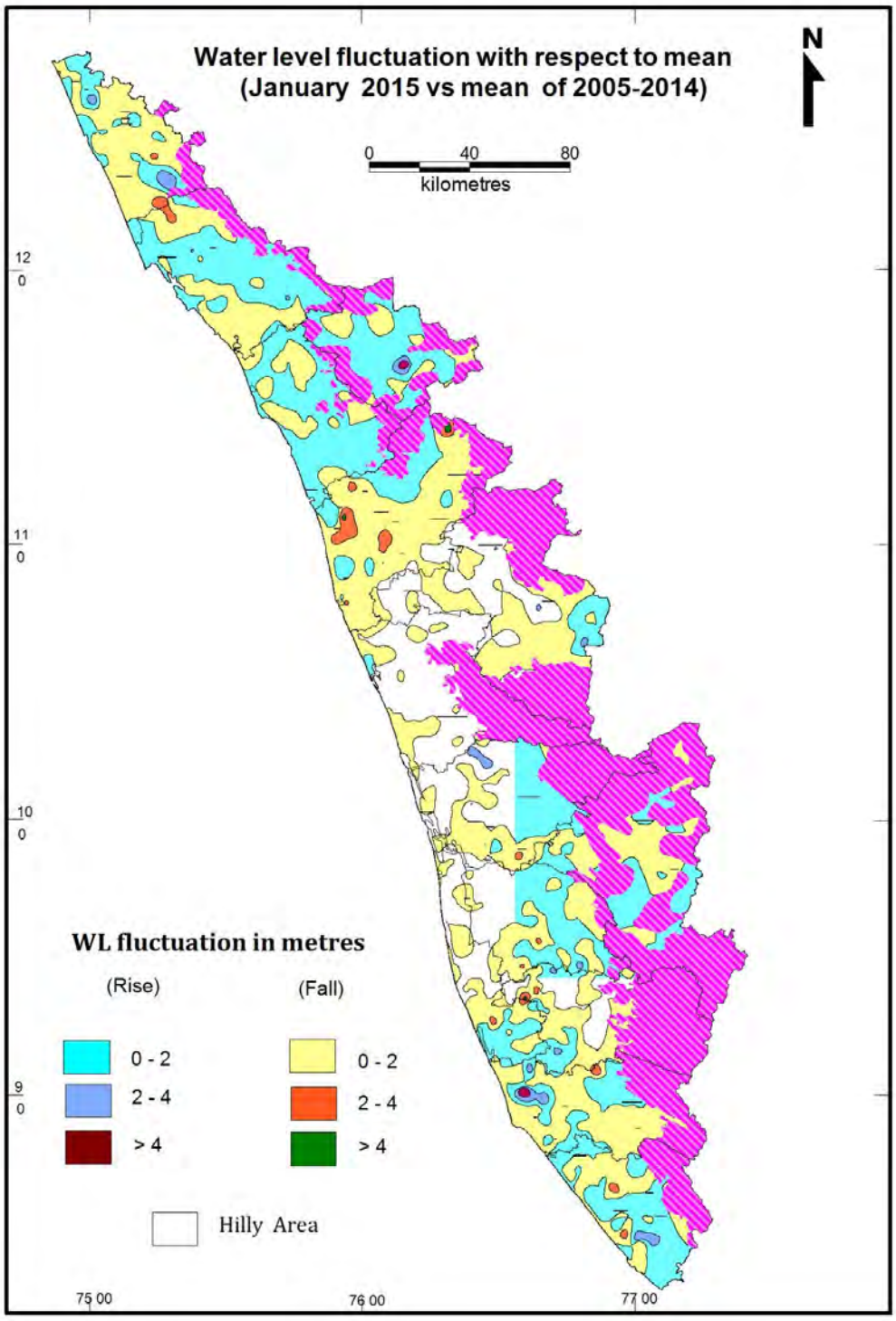


Figure 6.4: Water Level Fluctuation January 2015 with respect to Decadal mean

Table 6.1: District wise Well Frequency for Different Ranges of Water Level Fluctuation (April 2014 – Decadal mean (April 2004-2013)

District	No. of Wells	Range of Fluctuation (m)				No. &Percentage of Wells /Percentage Showing Fluctuation						Total No. of Wells	
		Rise		Fall		Rise			Fall			Rise	Fall
		Min	Max	Min	Max	0 to 2	2 to 4	>4	0 to 2	2 to 4	>4		
ALAPPUZHA	68	0.02	1.58	0.03	3.21	40 58.82%	0	0	25 36.76%	2 2.94%		40	27
ERNAKULAM	84	0.01	2.9	0.01	2.46	40 47.62%	1 1.19%	0	39 46.43%	4 4.76%	0	41	43
IDUKKI	50	0.05	6.26	0.03	2.22	25 50.00%	1 2.00%	1 2.00%	21 42.00%	1 2.00%	0	27	22
KANNUR	52	0.05	5.26	0.06	2.65	18 34.62%	3 5.77%	2 3.85%	27 51.92%	2 3.85%	0	23	29
KASARGOD	58	0.03	5.71	0.06	8.35	4 6.90%	1 1.72%	1 1.72%	39 67.24%	9 15.52%	4 6.9%	6	52
KOLLAM	62	0.01	1.27	0.04	5.8	24 38.71%	2 3.23%	4 6.45%	26 41.94%	3 4.84%	3 4.84%	30	32
KOTTAYAM	67	0.05	1.48	0.02	1.83	44 65.67%	0	0	23 34.33%	0	0	44	23
KOZHIKODE	54	0.02	8.19	0.03	3.9	26 48.15%	3 5.56%	1 1.85%	22 40.74%	2 3.7%	0	30	24
MALAPPURAM	61	0.01	4.42	0.01	4.04	25 40.98%	2 3.28%	1 1.64%	31 50.82%	1 1.25%	1 1.25%	28	33
PALAKKAD	80	0.02	3.57	0.05	2.14	31 38.75%	3 3.75%	0	44 55.00%	1 1.25%	0	34	45
PATHANAMTHITTA	62	0.09	3.42	0.04	0.99	49 79.03%	4 6.45%	0	9 14.52%	0	0	53	9
THIRUVANANTHAPURAM	74	0.05	3.61	0.1	3.44	31 41.89%	9 12.16%	0	29 39.19%	5 6.76%	0	40	34
THRISSUR	72	0.02	2.27	0.02	3.51	36 50.00%	1 1.39%	0	34 47.22%	1 1.39%	0	37	35
WAYANAD	59	0.04	4.7	0.02	3.93	29 59.18%	04 8.16%	1 2.04%	14 28.57%	1 2.04%	0	34	15
TOTAL	**893**	**1.48**	**0.09**	**0.01**	**8.35**	**422** 64.08%	**34** 13.51%	**11** 3.8%	**383** 16.33%	**32** 0.9%	**8** 0.6%	**467** 52.29 %	**423** 47.36**%**

Table 6.2: District wise Well Frequency for Different Ranges of Water Level Fluctuation (August 2014-Decadal mean (August 2004-2013)

District	No. of Wells	Range of Fluctuation (m)				No. &Percentage of Wells /Percentage Showing Fluctuation						Total No. of Wells	
		Rise		Fall		Rise			Fall			Rise	Fall
		Min	Max	Min	Max	0 to 2	2 to 4	>4	0 to 2	2 to 4	>4		
ALAPPUZHA	60	0.01	3.71	0.03	1.91	43 71.67%	5 8.33%	0	12 20.00%	0		48	12
ERNAKULAM	81		3.32	0.04	4.17	61 75.31%	3 3.7%	0	16 19.75%	0	1 1.23%	64	17
IDUKKI	50	0.04	4.18	0.08	0.77	44 88.00%	1 2.00%	1 2.00%	4 8.00%	0	0	46	4
KANNUR	54	0.01	4.58	0.07	1.53	24 34.44%	1 1.85%	1 1.85%	27 50.00%	0	0	56	27
KASARGOD	59	0.01	5.38	0.00	2.95	28 47.46%	2 3.39%	1 3.39%	25 42.37%	3 5.08%	0	31	28
KOLLAM	67	0.01	12.26	0.04	3.49	33 49.25%	13 19.4%	6 8.96%	11 16.42%	4 5.97%	0	52	15
KOTTAYAM	69	0.04	3.37	0.01	3.58	50 72.46%	3 4.35%	0	14 20.29%	2 2.9%	0	53	16
KOZHIKODE	56	0.00	3.5	0.15	0.95	40 71.43%	9 16.07%	0	6 10.71%	0	0	49	6
MALAPPURAM	76	0.08	5.45	0.05	1.33	59 77.63%	5 6.58%	1 1.32%	11 14.47%	0	0	65	11
PALAKKAD	77	0.03	4.32	0.01	3.65	34 44.16%	2 2.6%	1 1.3%	39 50.65%	1 1.3%	0	37	40
PATHANAMTHITTA	58	0.07	8.23	0.1	0.62	31 53.45%	14 21.14%	7 12.07%	6 10.34%	0	0	52	6
THIRUVANANTHAPURAM	77	0.03	3.22	0.00	4.75	39 50.65%	14 18.18%	0	17 22.08%	5 6.49%	2 2.6%	53	24
THRISSUR	70	0.04	4.06	0.00	1.28	45 64.29%	1 1.43%	1 1.43%	23 32.86%	0	0	47	23
WAYANAD	46	0.00	3.8	0.04	5.4	27 58.7%	5 10.87%	0	10 21.74%	3 6.52%	1 2.17%	32	14
TOTAL	**900**	**3.22**	**0.08**	**0.00**	**5.4**	**588** 65.33%	**78** 8.66%	**19** 2.11%	**221** 24.55%	**18** 2 %	**4** 0.44%	**655** **73** %	**243** **27%**

Table 6.3: District wise Well Frequency for Different Ranges of Water Level Fluctuation (November 2014 – Decadal mean (November 2004-2013)

District	No. of Wells	Range of Fluctuation (m)				No. &Percentage of Wells /Percentage Showing Fluctuation						Total No. of Wells	
		Rise		Fall		Rise			Fall			Rise	Fall
		Min	Max	Min	Max	0 to 2	2 to 4	>4	0 to 2	2 to 4	>4		
ALAPPUZHA	64	0	7.5	0.07	2.88	18 71.67%	0	1 1.56%	43 67.19%	2 3.13%		19	45
ERNAKULAM	97	0.01	2.96	0.02	5.06	56 75.31%	3 3.09%	0	35 36.08%	1 1.03%	2 2.06%	59	38
IDUKKI	46	0.02	1.18	0.01	2.48	18 88.00%	0	0	27 58.7%	1 2.17%	0	18	28
KANNUR	54	0.01	2.69	0.07	1.8	17 34.44%	2 3.7%	0	35 64.81%	0	0	19	35
KASARGOD	65	0.01	7.07	0.04	26.21	26 47.46%		1 1.54%	33 50.77%	4 6.15%	1 1.54%	27	38
KOLLAM	65	0.06	9.86	0.01	2.28	35 49.25%	2 3.08%	3 4.62%	24 36.92%	1 1.54%	0	40	25
KOTTAYAM	67	0.04	1.7	0.00	4.09	12 72.46%	0	0	51 76.12%	3 4.48%	1 1.49%	12	55
KOZHIKODE	71	0.02	1.51	0.02	1.37	28 71.43%	0	0	43 60.56%	0	0	28	43
MALAPPURAM	80	0.01	3.27	0.11	2.83	38 77.63%	2 2.5%	0	36 45.00%	4 5.00%	0	40	40
PALAKKAD	92	0.02	7.06	0.06	3.8	44 44.16%	4 4.35%	3 3.26%	38 41.3%	2 2.17%	0	51	40
PATHANAMTHITTA	73	0.05	2.5	0.02	3.8	16 53.45%	1 1.37%	0	50 68.49%	6 8.22%	0	17	56
THIRUVANANTHAPURAM	82	0.05	2.85	0.02	29.71	27 50.65%	6 7.32%	0	44 53.66%	3 3.66%	2 2.44%	33	49
THRISSUR	85	0.01	2.57	0.01	1.2	41 64.29%	1 1.18%	0	42 49.51%	0	0	42	42
WAYANAD	54	0.02	3.01	0.02	1.53	15 58.7%	1 1.85%	0	38 70.37%	0	0	16	38
TOTAL	**995**	**1.18**	**0.06**	**0.00**	**29.71**	**391** 39.29%	**22** 2.21%	**8** 0.8	**539** 54.17%	**27** 5.72%	**6** 0.6%	**421** 42.31 %	**572** 57.48**%**

Table 6. 4: District wise Well Frequency for Different Ranges of Water Level Fluctuation (January 2015 – Decadal mean (January 2005-2014)

District	No. of Wells	Range of Fluctuation (m)				No. Percentage of Wells /Percentage Showing Fluctuation						Total No. of Wells	
		Rise		Fall		Rise			Fall			Rise	Fall
		Min	Max	Min	Max	0 to 2	2 to 4	>4	0 to 2	2 to 4	>4		
ALAPPUZHA	62	0.03	8.20	0.02	14.55	47 73.44%	2 3.13%	1 1.56%	9 14.06%	0	3 4.65%	50	12
ERNAKULAM	87	0.02	9.74	0.06	1.90	53 60.92%	4 4.60%	2 2.30%	28 32.18%	0	0	59	28
IDUKKI	46	0.11	3.66	0.08	0.51	36 78.26%	6 13.04%	0	4 8.70%	0	0	42	4
KANNUR	48	0.02	2.98	0.03	3.26	38 79.17%	4 8.33%	0	5 10.42%	1 2.08%	0	42	6
KASARGOD	51	0.10	9.25	0.03	9.06	25 49.02%	8 15.69%	5 9.80%	10 19.61%	2 3.92%	1 1.96%	38	13
KOLLAM	57	0.08	9.35	0.06	7.08	31 54.39%	11 19.30%	4 7.02%	8 14.04%	1 1.75%	1 1.75%	46	10
KOTTAYAM	65	0.02	24.75	0.11	1.62	43 66.15%	10 15.38%	2 3.08%	10 15.38%	0	0	55	10
KOZHIKODE	59	0.03	3.74	0.02	4.12	37 62.71%	5 8.47%	0	14 23.73%	1 1.69%	1 1.69%	42	16
MALAPPURAM	79	0.01	8.01	0.01	2.06	54 68.35%	9 11.39%	4 5.06%	11 13.92%	1 1.27%	0	67	12
PALAKKAD	87	0.10	12.14	0.10	1.65	51 58.62%	22 25.29%	6 6.90%	7 8.05%	0	0	79	7
PATHANAMTHITTA	59	0.10	6.75	0.10	1.50	42 71.19%	1 1.69%	1 1.69%	14 23.73%	0	0	44	14
THIRUVANANTHAPURAM	67	0.08	6.67	0.01	2.38	40 59.70%	16 23.88%	4 5.91%	6 8.96%	1 1.49%	0	60	7
THRISSUR	74	0.02	7.62	0.03	1.24	48 64.86%	10 13.51%	4 5.41%	12 16.22%	0	0	62	12
WAYANAD	45	0.10	4.10	0.07	3.10	24 53.33%	12 26.67%	1 2.22%	7 15.56%	1 2.22%	0	37	8
TOTAL	**888**					**569** 64.01%	**120** 13.51%	**34** 3.82%	**145** 16.32%	**8** 0.9%	**6** 0.7%	**723** 81.4%	**159** 17.9%

VII LONG TERM GROUND WATER LEVEL TREND

The long-term water level data was analysed for the period of 2005-2014. The analysis of pre-monsoon water level trend for the last decadal period (i.e during 2005 – 2014) indicates that only 37.74 % of GWMWs have recorded negligible change in water level in the range of +0.05 to –0.05 m/year. 28.67% of monitoring wells have recorded declining trend in the range of 0.05 to 0.2 m/year and 10.84 % of monitoring wells have recorded declining trend above 0.2 m/year. The 15.45 % of monitoring wells have recorded rising trend in the range of 0.05 to 0.2 m/year and 7.28 % of monitoring wells have recorded rising trend above 0.2 m/year. From the above data, it is clear that the long term trend for the pre-monsoon period indicates a decline in water level represented by about 39.51 % of the total wells excluding the wells showing negligible change in water level which is of 37.74% . The maps showing pre-monsoon water level trend for the period 2004-2013 is shown in **Figure 7.1.**

The analysis of post-monsoon water level trend for the last decadal period (i.e during 2005–2014) indicates that only 26.77 % of GWMWs have recorded negligible change in water level in the range of +0.05 to –0.05 m/year. The 16.86 % of monitoring wells have recorded declining trend in the range of 0.05 to 0.2 m/year and 7.8 % of monitoring wells have recorded declining trend above 0.2 m/year. 26.77 % of monitoring wells have recorded rising trend in the range of 0.05 to 0.2 m/year and 8.13 % of monitoring wells have recorded rising trend above 0.2 m/year. The data analysis indicates that the long-term ground water level trend shows a rising trend in major portions of the state represented by about 34.9 % of the total wells excluding the wells showing negligible change in water level which is of 40.38%. The maps showing pre-monsoon water level trend for the period 2004-2013 is shown in **Figure 7.2.**

Typical hydrographs showing the negligible change in water level are depicted in **Figures 7.3 & 7.4**. Many of the monitoring wells which are showing declining pre-monsoon water level, have a rising or a steady post monsoon water level trend, indicating the enhanced ground water recharge to recoup to the original level **(Figure 7.5 & 7.6)**. A few monitoring wells like Palakkad and Mannanthala have shown falling trend of both pre-monsoon and post-monsoon water levels **(Figure 7.7 & 7.8).**

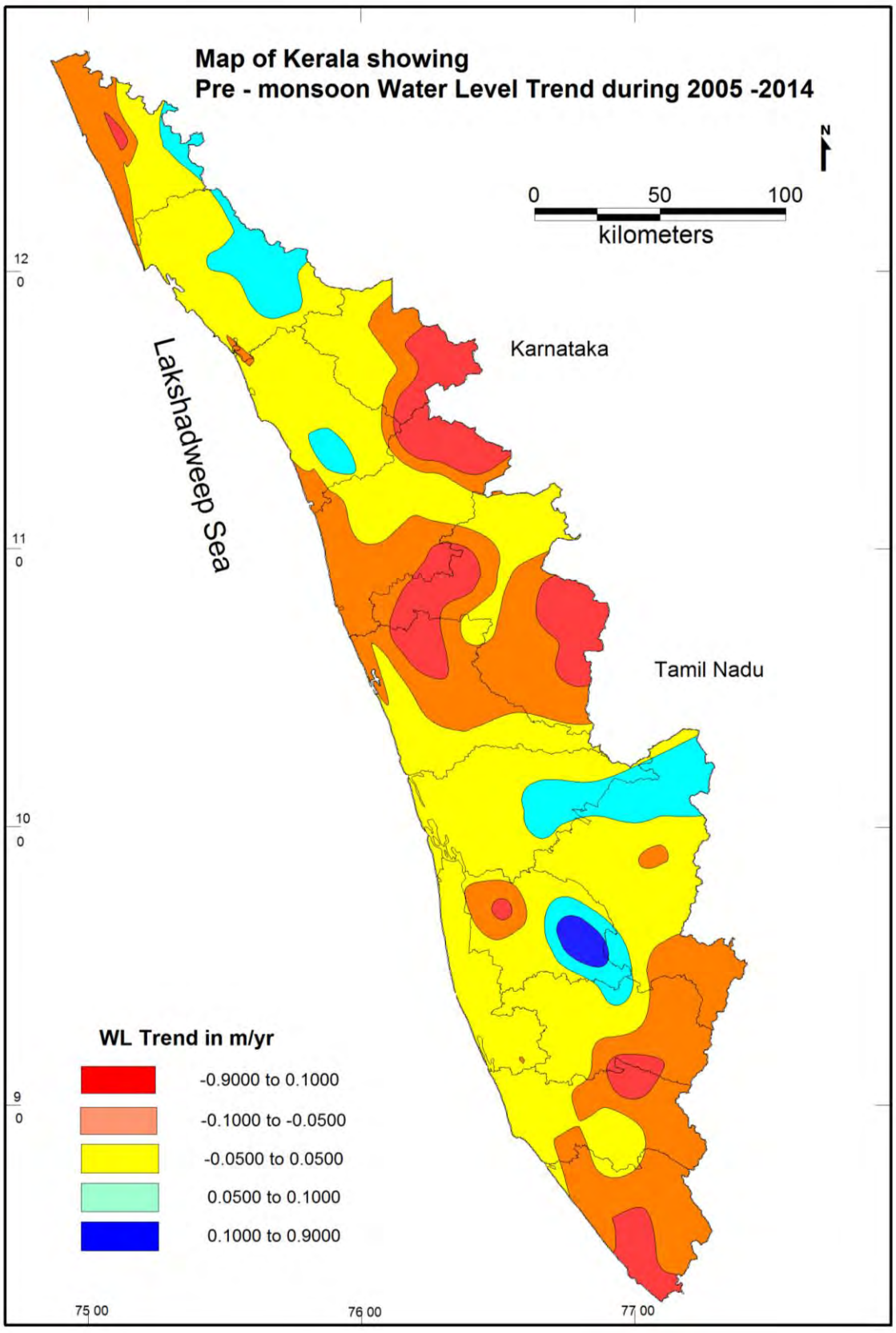


Figure 7.1: Pre-monsoon water level trend for the period 2005-2014

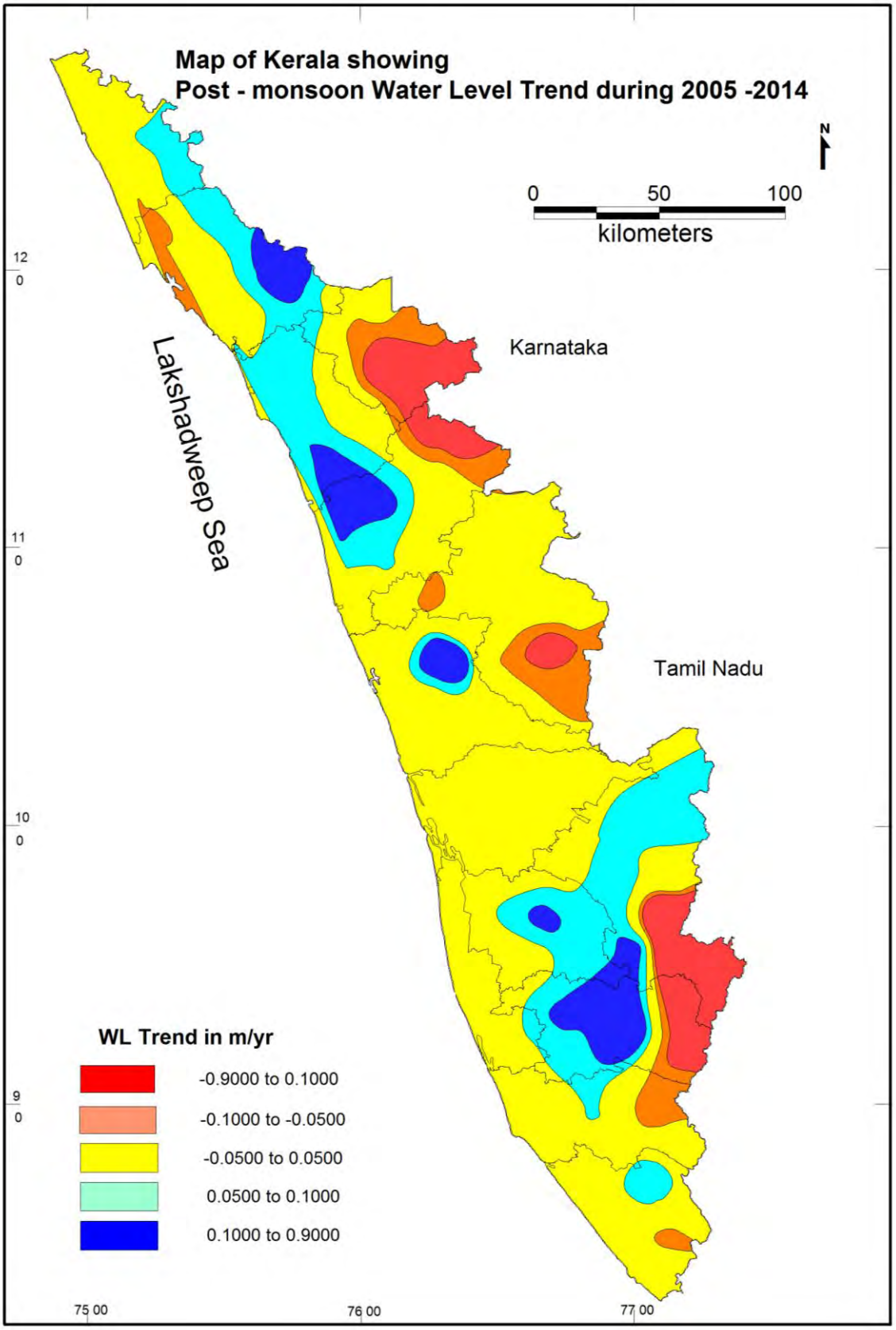


Figure 7.2: Post -monsoon water level trend for the period 2005-2014

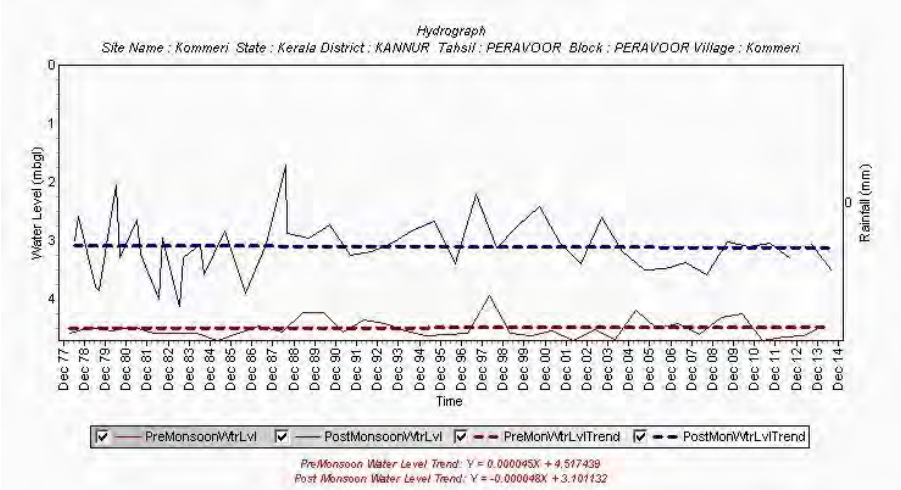


Figure 7.3: Hydrograph of GWMWs tapping phreatic aquifer in laterites at Kommeri, Kannur

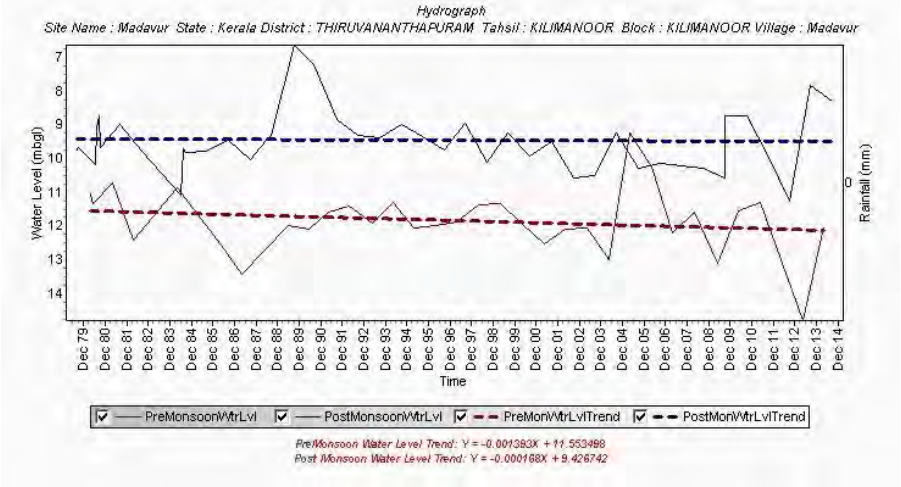


Figure 7.4: Hydrograph of GWMW tapping phreatic aquifer in laterites at Madavur, Thiruvananthapuram District

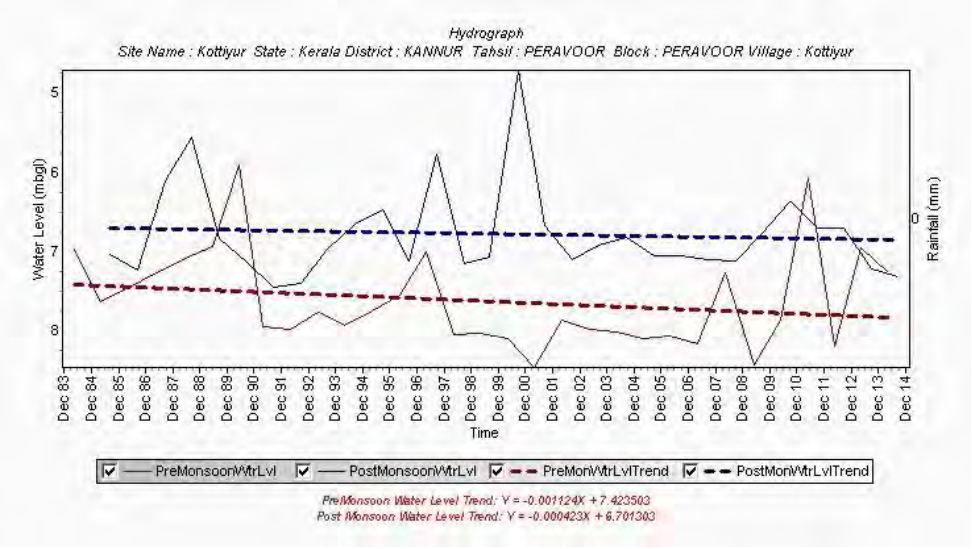


Figure 7.5: Hydrograph of GWMW tapping phreatic aquifer in laterites at Kottiyur, Kannur District

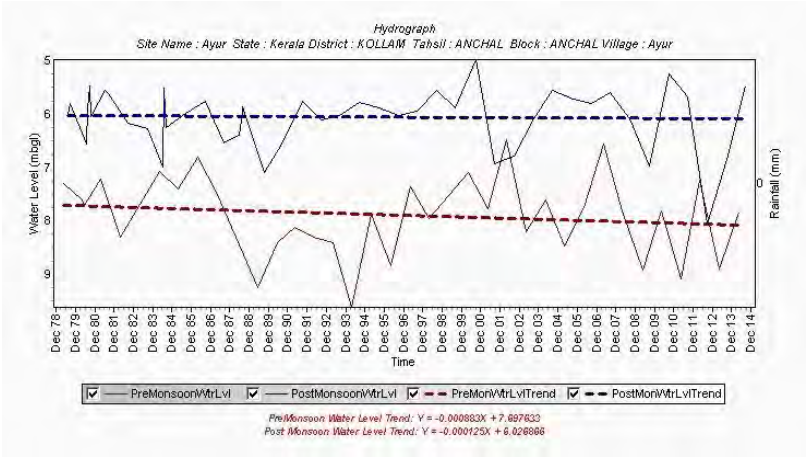


Figure 7.6: Hydrograph of GWMW tapping phreatic aquifer in laterites at Ayur, Kollam District

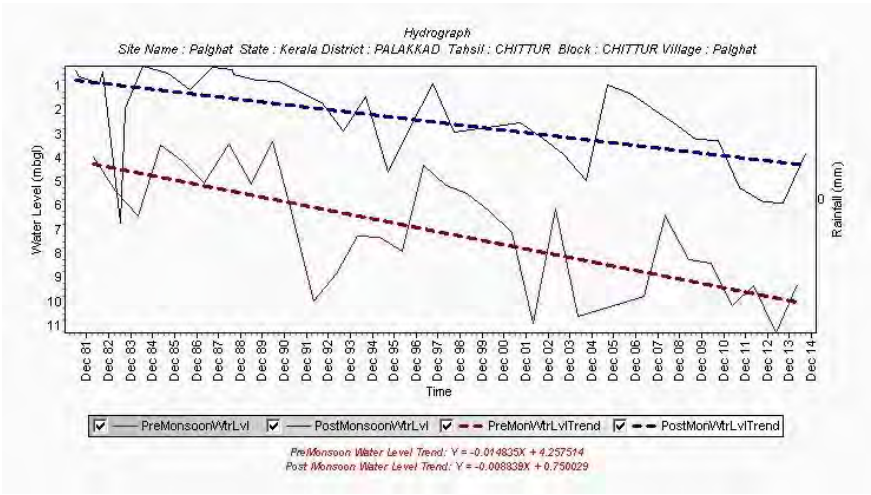


Figure 7.7: Hydrograph of GWMW tapping phreatic aquifer in weathered crystallines at Palghat, Palakkad District

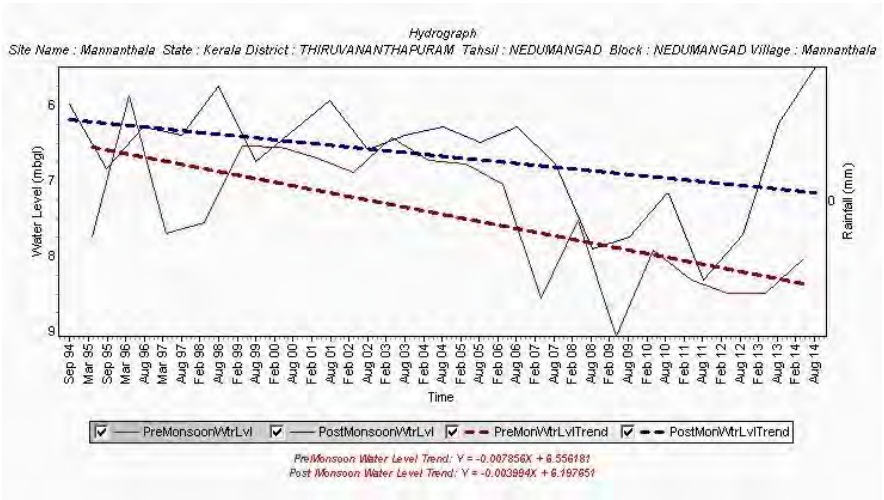


Figure 7.8: Hydrograph of GWMW tapping phreatic aquifer in laterites at Mannanthala, Thiruvananthapuram District

VIII. BEHAVIOUR OF PIEZOMETRIC HEADS IN DEEP AQUIFERS OF CONFINED/SEMICONFINED NATURE DURING THE YEAR 2014-2015

A total of 269 piezometers constructed by CGWB in various districts of the State are being monitored four times a year. Out of these 74 piezometers (Tube wells) are constructed in sedimentary areas. The depth range of these piezometers is from 10 m. to 450 m. The remaining 195 piezometers (Bore wells) are in hard rock areas and the depth range of these wells is from 10 m. to 300 m. About 44% of these borewells are tapping shallow fracture zones within 30 metres depth. These wells were manually monitored for water level during the months of April, August, November 2014 and January 2015. The analysis of the data acquired from these piezometers is discussed below.

Sedimentary area:

In the deeper aquifers of Tertiary age, ground water occurs under confined / semi-confined conditions. In the shallow aquifers in Tertiary formation in northern Kerala and in Recent alluvial formations in coastal plains, ground water occurs under unconfined to semi-confined condition. The piezometric heads in these aquifers is at about 18 m.amsl in the eastern boundary of recharge areas of Tertiary beds and reduced to near MSL in coastal areas. The depth to piezometric heads in deep tube wells tapping confined aquifers ranges from 1.08 to 29.02 mbgl during April 2014 (premonsoon). The annual fluctuation of the piezometric head in the year 2014 – 15 is mostly restricted to 3 metres. Free flowing wells are also encountered in some places and the decline in head with time is inferred from the reduction in free flow. Analysis of the long term piezometric head data of deeper aquifers at Karthikapally tapping Quilon and Warkali formations are showing a declining trend in both during pre-monsoon and post-monsoon. Hydrographs of piezometers at Karthikapally (Alleppey District) tapping Warkali and Quilon aquifers are shown in **Figures 8.1 & 8.2**.

Crystalline area:

In hard rock areas, groundwater occurs under confined / semi-confined conditions in the deep fracture zones and unconfined to semi-confined conditions in shallow fractured zones. The depth to piezometric heads in bore wells range from 0.12 to 31.15 m bgl during pre-monsoon period (April 2013). About 88.7 % of the borewells in the hard rock areas are showing piezometric head of less than 10 mbgl. The annual fluctuation of piezometric head (between April and November months) is in the range of 0.3 – 10 metres. The hydrograph of the hard rock piezometers are given in **Figures. 8.3** & **8.4**.

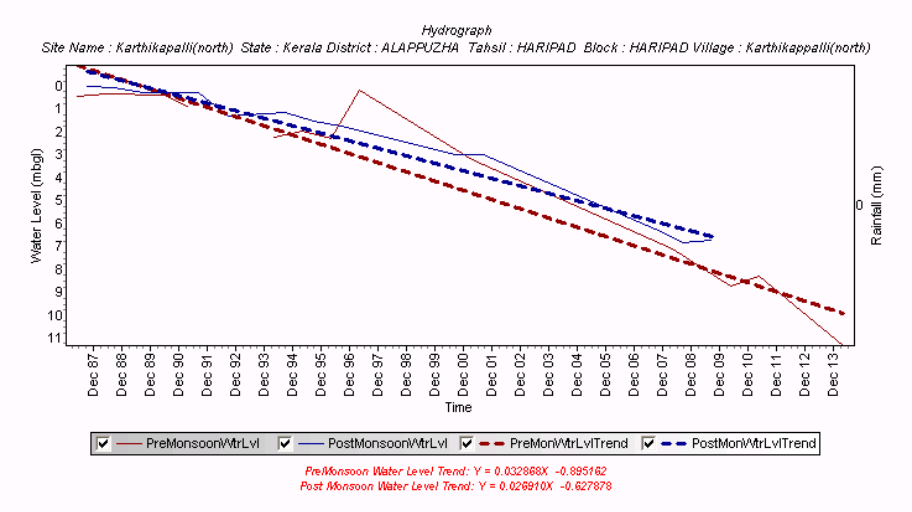


Figure 8.1 Hydrograph of Piezometer tapping Warkalai aquifer at Karthikapally(N), Alappuzha District

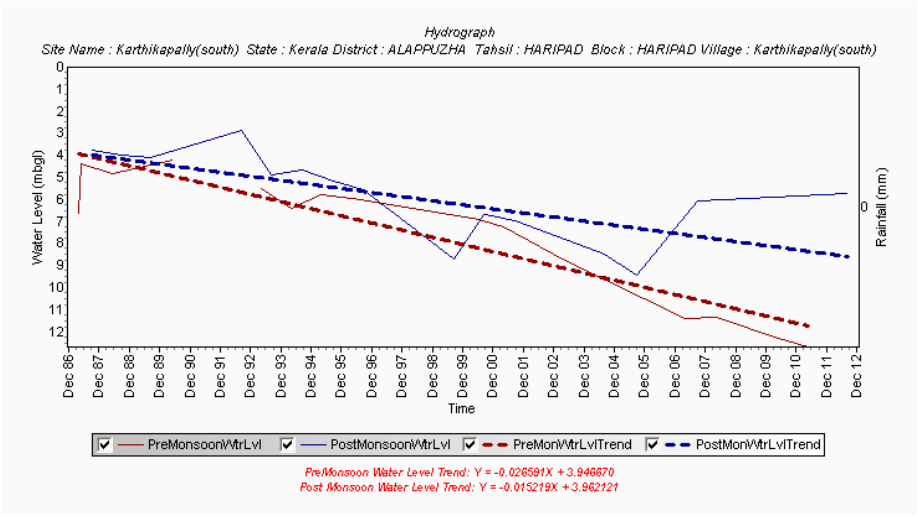


Figure 8.2 Hydrograph of Piezometer tapping Quilon aquifer at Karthikapally(S), Alappuzha District

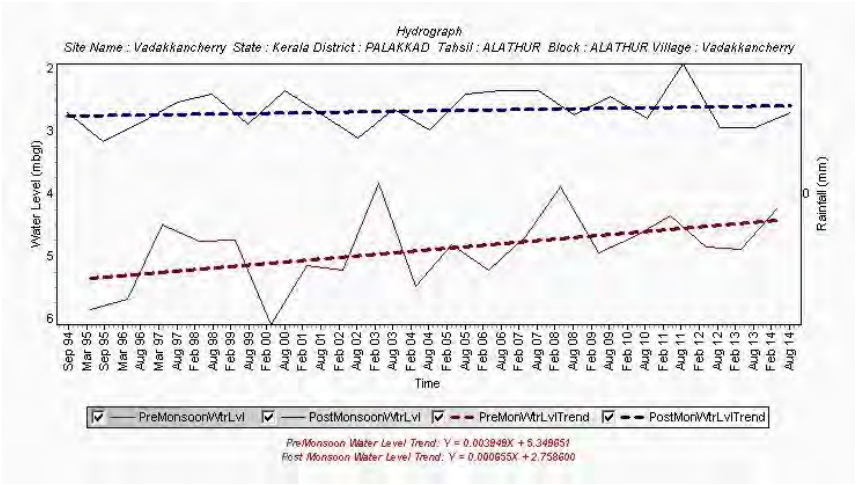


Figure 8.3 Hydrograph of Piezometer tapping fractured aquifers at Vadakkancherry, Palakkad District

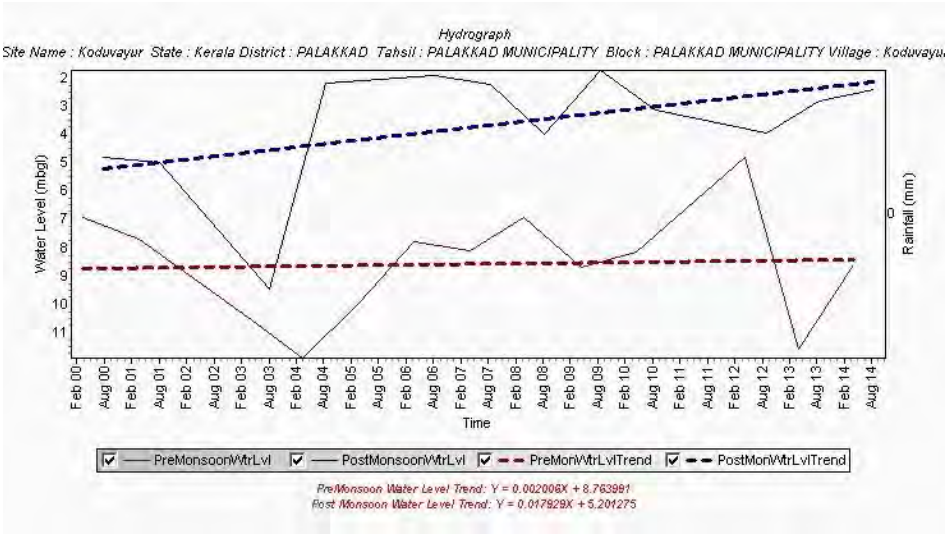


Figure. 8.4: Hydrograph of Piezometer tapping fractured aquifers at Koduvayur, Palakkad District

IX. HYDROCHEMISTRY

The chemical quality of shallow groundwater in Kerala State has been evaluated by sampling and analysing the water samples from 620 National Hydrograph Monitoring Wells. The water samples were collected during April 2012 representing the premonsoon quality. The frequency distribution of electrical conductivity data of National Hydrograph Monitoring Wells is presented for entire Kerala State as well as district-wise in **Tables 9.1**and **9.2.**

Table 9.1: Frequency Distribution of Electrical Conductivity (Microsiemens/cm at 25^0C) in the National Hydrograph MonitoringWells in Kerala State during April 2012- Statewise

Electrical Conductivity Range (Microsiemens/cm at 25^0C)	No. of Monitoring Wells	%
0-500	569	91.8
501-1000	42	6.8
>1000	9	1.4

Table 9.2: Frequency Distribution of Electrical Conductivity (Microsiemens/cm at 250C) in National Hydrograph Monitoring Wells during April 2012- Districtwise

Sl. No.	Name of the district	Total No.of Samples	Electrical Conductivity (Microsiemens/cm at 25^0C)					
			0-500		501-1000		>1000	
			No.of Samples	%	No.of Samples	%	No.of Samples	%
1	Kasargod	21	21	100	0	0	0	0
2	Cannanore	39	39	100	0	0	0	0
3	Calicut	46	46	100	0	0	0	0
4	Wyanad	34	34	100	0	0	0	0
5	Malappuram	59	53	89.8	5	8.47	1	1.6
6	Trichur	50	47	94	2	4	1	2
7	Palakkad	75	51	68	19	26	5	6
8	Ernakulam	47	45	95.7	1	2.1	1	2.1
9	Kottayam	54	54	100	0	0	0	0
10	Idukki	39	37	94.8	2	5.2	0	0
11	Alleppey	46	37	80.43	8	17.39	1	2.1
12	Pathanamthitta	35	34	97.1	1	2.9	0	0
13	Kollam	40	38	95	2	5	0	0
14	Thiruvananthapuram	35	32	91.4	1	2.85	2	5.7

The shallow groundwater in Kerala State is generally of good quality, 91.6% of the wells had registered electrical conductivity below 500 Microsiemens/cm at 25^0C, 8% of the wells had recorded electrical conductivity in the range 501-1000 Microsiemens/cm at 25^0C and 1.4% had recorded electrical conductivity above 1000 Microsiemens/cm at 25^0C. Out of 11 wells which had registered electrical conductivity value 1000Microsiemens/cm at 25^0C and above, three wells namely Azhikode of Thrissur district, Srikandapuram of Ernakulam district and Patannakad of

Alleppey district had recorded the value as more than 3000 Microsiemens/cm at 25^0C. Other 9 wells had registered their electrical conductivity value less than 2000Microsiemens/cm at 25^0C.

Locations where the values of parameters like electrical conductivity more than 750 Microsiemens/cm at 25^0C, chloride more than 250 mg/L and nitrate more than 45 mg/L are tabulated in **Table 9.3.**

The locations where the electrical conductivity had exceeded 1000 Microsiemens/cm at 25^0C in districts other than Palghat district are all in Coastal plains. Due to Closeness to sea and backwaters a marginal increase of dissolved solids in groundwater is observed during the summer months. In Palghat district all the locations where the electrical conductivity had exceeded 1000 Microsiemens/cm at 25^0C are situated in the eastern and southern part of the district. The easten part of Palghat district is more mineralised as per the geological set up of the State, which is evident from the Geological Map of Kerala State. 25 wells which had shown nitrate concentration above 45mg/L in the entire state are distributed sporadically over the State and are not confined to any area. These stations are most likely to represent the levels of localized pollution. The locations where the value of electrical conductiovity exceeds 1000 Microsiemens/cm at 25^0C and nitrate more than 45 mg/L is given in **Figure 9.1 and 9.2** respectively.

During 2010, permonsoon and postmonsoon samples has been collected and the chemical analysis data of water samples is given in **Annexure II**.

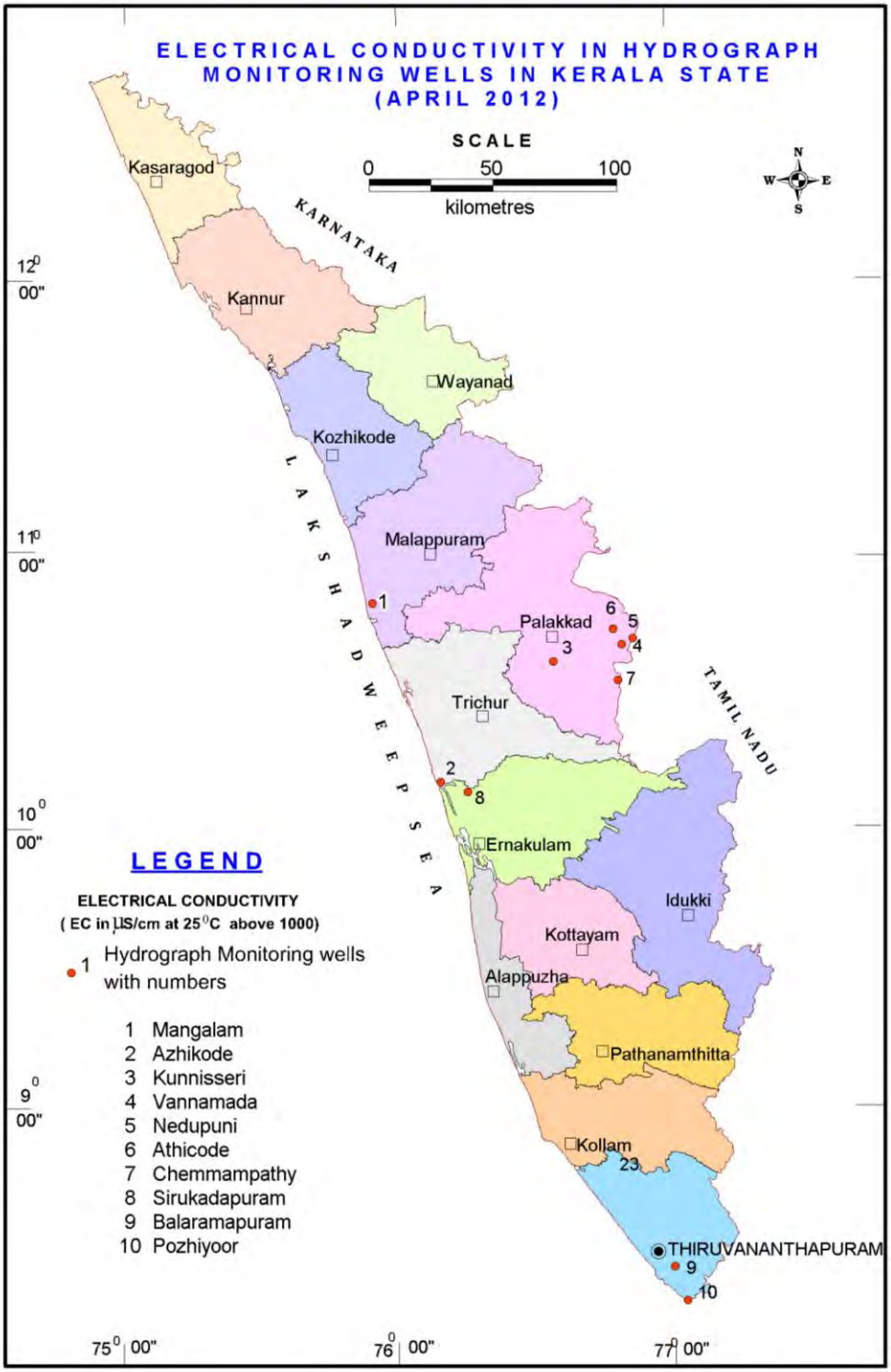


Figure 9.1: Locations showing Electrical Conductivity more than 1000 µS/cm(April 2012)

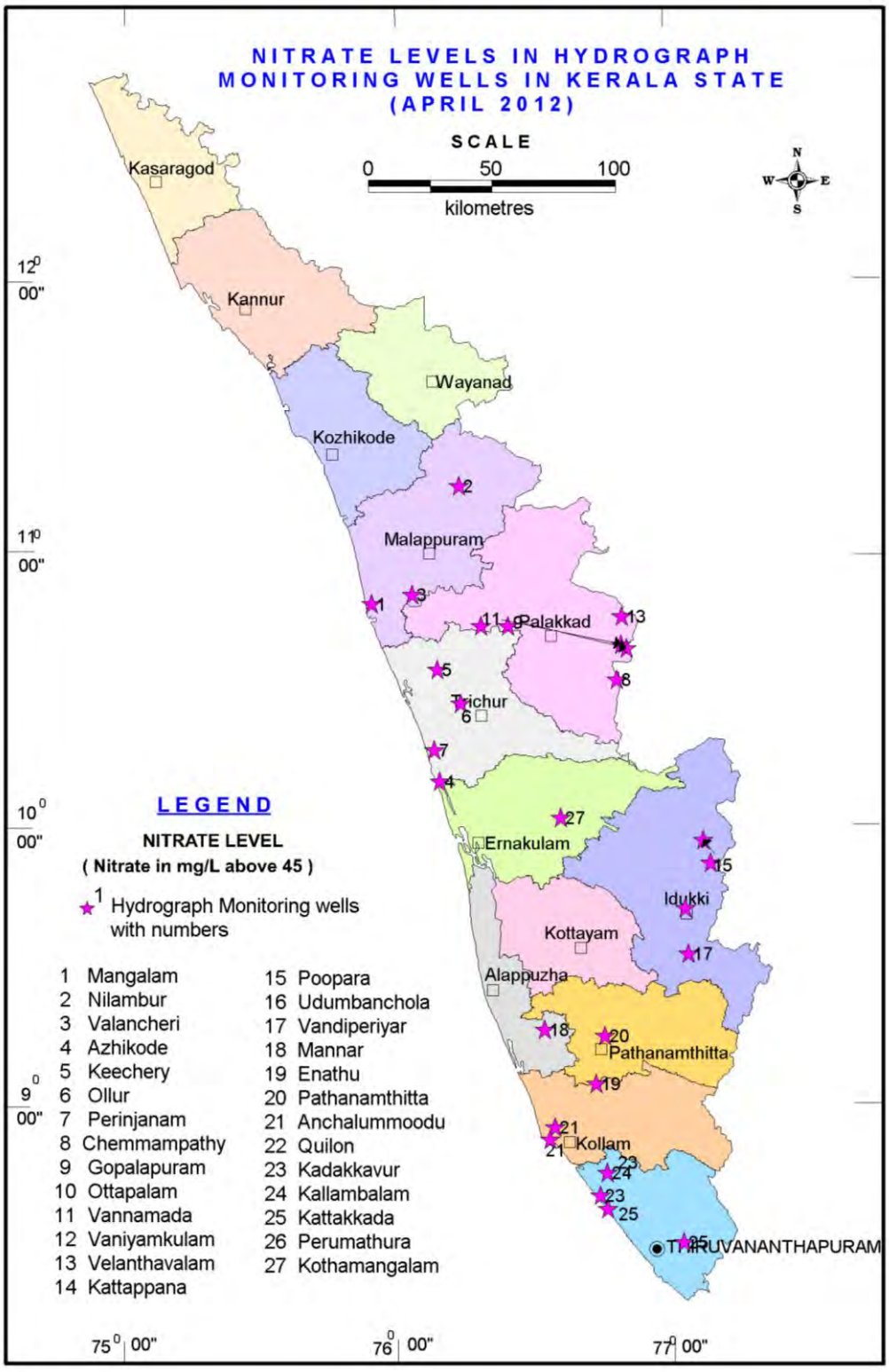


Figure 9.1: Locations showing Nitrate more than 45mg/l(April 2012)

Table 9.3: National Hydrograph Monitoring Wells noted for localized pollution

Sl No.	Location	District	Latitude	Long	EC > 1000µS/cm	Cl> 250 mg/l	NO_3>45mg/l
1	Mangalam	Malappuram	10.85	75.92	1040		227
2	Azhikode	Trichur	10.20	76.17	3400	1065	59
3	Kunnisseri	Palghat	10.64	76.59	1900	532	-
4	Vannamada	Palghat	10.70	76.85	1100	-	106
5	Nedupuni	Palghat	10.72	76.89	1100	-	-
6	Athicode	Palghat	10.76	76.81	1280	-	-
7	Chemmampathy	Palghat	10.57	76.83	1140	-	100
8	Sirukadapuram	Ernakulam			3600	1136	-
9	Balaramapuram	Trivandrum	8.43	77.05	1020		-
10	Pozhiyoor	Trivandrum	8.3	77.10	1360	256	-
11	Nilambur	Malappuram	11.28	76.24	-	-	73
12	Valancheri	Malappuram	10.88	76.07	-	-	47
13	Keechery	Trichur	10.61	76.16	-	-	68
14	Ollur	Trichur	10.48	76.25	-	-	63
15	Gopalapuram	Palghat	10.69	76.87	-	-	168
16	Ottapalam	Palghat	10.77	76.43	-	-	83
17	Vaniyamkulam	Palghat	10.77	76.33	-	-	56
18	Velanthavalam	Palghat	10.80	76.85	-	-	59
19	Kattappana	Idukki	9.73	77.09	-	-	101
20	Poopara	Idukki	9.98	77.15	-	-	72
21	Udumbanchola	Idukki	9.9	77.18	-	-	58
22	Vandiperiyar	Idukki	9.57	77.1	-	-	75
23	Mannar	Alleppey			-	-	81
24	Enathu	Pathanamthitta	9.09	76.76	-	-	60
25	Pathanamthitta	Pathanamthitta	9.26	76.79	-	-	70

26	Anchalummoodu	Quilon	8.93	76.60	-	-	69
27	Quilon	Quilon	8.88	76.58	-	-	93
28	Kadakkavur	Trivandrum	8.68	76.77	-	-	53
29	Kallambalam	Trivandrum	8.76	76.80	-	-	52
30	Kattakkada	Trivandrum	8.51	77.08	-	-	55
31	Perumathura	Trivandrum	8.63	76.80	-	-	57

X SUM UP

1. The total number of Ground Water Monitoring Wells (GWMW) in Kerala State as on 31.03.2015 was 1638. These monitoring wells include 1369 dug-wells tapping phreatic aquifers and 269 piezometers tapping phreatic zones and deeper aquifers in sedimentary as well as hard rock terrains. The water level monitoring was carried out in the months of April, August and November 2014 and January 2015. Water sampling was carried out in 620 GWMWs (dug-wells) during the month of April 2012.

2. The monitoring wells are spread over in all the physiographic regions of the State. 62 % of which fall in the midland region, 18 % in coastal plains, 15 % in high lands and 5 % in plateau region.

3. Out of the monitoring wells tapping phreatic aquifer, 65% of the well are tapping lateritic aquifer which is the widely distributed aquifer in the State, 17 % tapping weathered and fractured crystallines followed by coastal alluvium and river alluvium represented by 15 % and 3 % respectively.

4. The total rainfall ranged from 1876 to 3769 mm during the period from April 2014 to March 2015. The maximum rainfall was recorded in Idukki district and the minimum in Trivandrum district. During the southwest monsoon season, Trivandrum district recorded 871 mm and Kasargod district recorded 3007 mm, which are the lowest and highest rainfall respectively. During the northeast monsoon season, Kasargod district recorded the lowest rainfall of 338 mm and kottayam district recorded the highest rainfall of 639.

5. During the southwest monsoon season from June to September 2014, the departure of rainfall varied from – 11% to 19% in different districts. There is no scanty and deficient rainfall recordrd during this season.

6. During the northeast monsoon season from October to December 2014, the departure of rainfall varied from – 30% to 16 % in different districts There are four districts were received deficient type of rainfall during this season. Normal rainfall is recorded in ten districts.

7. During the months of January to March 2015, the departure of rainfall varied from -45 to 173%. Four districts were recorded maximum from the deficient rainfall in the negative side.No scanty rainfall was recorded during the winter season.

8. The depth of water level varies from place to place according to the topographical conditions and is widely in the range of near ground level to 55 m bgl. However water level is in the range of 1 – 10 mbgl in major parts of Kerala State. In the coastal plains of the Kerala State and in certain areas in high ranges of Idukki and Pathanamthitta districts shallow water level in the range of 1 – 6 m bgl is seen. In mid land region water level is generally in the range of 2 – 15 m bgl. However deep water level in the range of 10 – 30 m bgl is seen in certain areas of Kasaragod, Wayanad, Palakkad, Kollam and Thiruvananthapuram districts where thick lateritic overburden occurs.

9. During April 2014 about 81.26% of monitoring wells was showing water level within the depth range of 0.10 to 10 mbgl. Whereas about 93.36% of monitoring wells were showing water level of less than 10 mbgl during August 2013.

10. The comparison of August 2013 water level with that of April 2013 indicates that 80.72% of monitoring wells shows rise in water level whereas 18.21% shows fall in water level. Rise in water level is recorded in major part of the state.

11. Comparison of water level data of the year 2014 – 2015 with the decadal mean value of the period 2004 – 2013 and 2005-2014 indicates that majority of monitoring wells (80%-April, 89%-August, 93%- November, 92%-January) have recorded either rise or fall in water level with the magnitude of less than 2 m. indicating insignificant change in water level over the past decade.

12. Long term ground water level trend for the pre-monsoon period indicate a rise in water level in the range of 0.05-0.2 m/year is more predominant.

13. Long term ground water level trend for the post-monsoon period indicate that majority of the state shows negligible change in the trend.

14. The chemical quality of shallow groundwater in Kerala State has been evaluated by sampling and analysing the water samples collected from Ground Water Monitoring Wells established in various physiographic divisions tapping different aquifers. During April 2012, 620 water samples have been collected which

represents the premonsoon ground water quality and are subjected to physical and chemical analysis.

15. Majority of the water samples show electrical conductivity within 500 µS/cm. The low conductivity of water samples can be attributed to the peculiar physiographic setting of the state. 91.6% of the wells had registered electrical conductivity below 500 µS /cm at 25^0C, 8% of the wells had recorded electrical conductivity in the range 501-1000 µS /cm at 25^0C and 1.4 % had recorded electrical conductivity above 1000 µS /cm at25^0C which is local in nature.

16. The chemical analysis data shows that in some of the water samples concentration of chloride, fluoride and nitrate are above the permissible limit. In the case of fluoride, concentration in excess of 1.5 m/l is observed only in the eastern part of Palakkad district tapping shallow dug wells. While nitrate concentration above 45 mg/l is noticed in 25 wells in the entire state which are sporadically distributed over the state and are not confined to any area represents the local pollution.

****

Annexure I

Ground Water Level Data of GWMW's in Kerala State during 2014 -15

District	Well Type	Site Name	April 14	August 14	November 14	January 15
ALAPPUZHA	**Dug Well**	Adikattukulangara	5.55	3.4	3.55	5
		Alapuzha Town	3.9	3	3.5	3.8
		Alleppey	1.95	1.21	1.91	2.11
		Ambalapuzha	1.9	0.3	1	1.4
		Aranootimangalam	9.6	5.1	7.45	7.5
		Arukutti	2.2	0.92	1.42	2.07
		Arur	1.82	0.3	1	1.45
		Champakulam	0.71	0.5	1.8	1.47
		Chandirur(R1)	2.12	0.49	1.34	1.84
		Charummud		2.64	5.15	2.71
		Chelakkad				1.65
		Chengannur	6.65	1.8	6.6	4.7
		Chennithala South	2.84	1.91	1.15	1.7
		Cherthalai	0.91	0.54	0.75	0.8
		Cheruvaranam	2.57	0.45	1.4	2
		Chettikulangara	2.05	0.65	1.1	1.15
		Edathua(R2)	1.02	0.7	0.5	1
		Eramallur	2.3	0.85	1.5	1.7
		Ezhupunna1		0.97	0.95	
		Haripad	3.03	0.74	1.37	1.98
		Idakunnam	12.54	7.32	10.8	12.5
		Kadaikadu				4.2
		Kaidavana-R1	1.35	0.3		1.3
		Kaipapuram (Muhamma)				2
		Kalavamkodam	1.82	0.45	1.65	1.85
		Kalavur	1.57	0.25	0.65	1.05
		Kallissery	3.53	1.93	3.3	3.6
		Kanichukulangara	2.22	2.1	2	2.2
		Karumancherry				2.15
		Karuvatta (R1)		0.4	2.3	1.75
		Kattanam	11.85	10.15	11.15	12.35
		Kattoor1	1.87	0.87		1.45
		Kavungal				1.75
		Kayamkulam	1.28	0.2	0.15	0.6
		Kokkamangalam				1.9
		Kudassanad	5.26		4.8	5.9
		Kunnamkari	0.85			1.65
		Kuttitheruvu (Kayamkulam)	3.21	0.49	1.2	2.1

ALAPPUZHA	**Dug Well**	Kuzhamathu	12.25	5.5	10.5	12.5
		Mahadevikad	0.56	0.3	0.55	0.7
		Mananchery	2.82	0.3	2.2	2.8
		Mancombu	0.37	0.3	1.5	1.4
		Mannar	5.62	4.37	2.7	5.67
		Mavelikara	3.11	0.54	1.54	2.24
		Mulakuzha1	4.87	1.15	3.95	6.27
		Muthukulam	2.4	0.4	0.7	1.65
		Muttam		0.25	1.05	1.4
		Muttar	1.32			1.4
		Naduvattom	2.16			4.05
		Nangiarkulangara	2.25		0.75	1.1
		Nedumudi (pupalli)	0.43	0.05	0.1	0.25
		Neerkunnam(R1)	2.21	0.3	1.15	
		Nooranad	5.34	7.3	9.55	9.55
		Oachira1 (Krishnapuram)	4.69	1.68	2.51	3.31
		Ottappunna	0.67	2.15	2.15	2.45
		Pacha(R3)	1.34	0.25	0.63	1.15
		Pallarimangalam	2.47	0.55	1	1.25
		Panavally	2.1	0.5	1	1.3
		Pandanad	3.5	2.52	3	5.37
		Panurkara				1.65
		Parayakkad				2.5
		Parumala-R1	7.08	3.2	5.75	6.35
		Pathiyur-R1	1.64	0.1	0.5	0.8
		Pattanakad	1.55	0.95	0.95	1.25
		Punnapra	2.76		2.1	2
		Purakkad (R1)	2.45	1.51	2.41	2.41
		Ramankari-R1	0.64	0.3	0.5	0.95
		Thaikattusseri-R1	1.52	0.5	1	1.3
		Thakazhi	1.9	0.25		0.95
		Thalavadi (R1)				1.45
		Thamarakulam	3.28	2.86		3.1
		Thaneermukkam	1.15	0.4		1.3
		Thevery	2.41	0.4		
		Thottapally	2.32	0.18		1.1
		Thuravur	3.32	2.12		2.2
		Trikkunnapuzha (R1)	0.19	1.2	1.45	1.05
		Valavanad	1.51	0.3	0.7	1
		Vallikunnam	3.24	1.27	3.3	1.8
		Vanaswargam	1.88	0.64	0.55	1.5
		Vandanam	2.98	0.2	1.98	2.25

ALAPPUZHA	**Dug Well**	Veeyapuram		0.8	1	1.2
		Venmani (R1)	2.7	0.97	1.75	2
	Tube Well	Chettikulangara Pz		3.7		3.3
		Ezhupunna	1.6	1.12	1.2	1.5
		Haripad(c)	10.55	6.15		10.45
		Haripad(e)		5.48	8.27	8.48
		Haripad(n)	10.7	7.05	8.5	10.95
		Haripad(s)	10.25			
		Haripad(w)	10.3			
		Kalarkode(c)	3.34	3.55	3.05	3.25
		Kalarkode(e)	3.38			5.32
		Kalarkode(s)	2.07	2.1	1.4	
		Kalarkode(w)		3.1	6.8	
		Karthikapalli(north)	11.3			
		Karthikapally(south)			14	13.45
		Karumady	2.05	1.61	1.86	2.21
		Kattanam1	11.8	8.4	9.95	11.1
		Krishnapuram(n)	15.5		11.99	14.82
		Krishnapuram(s)			5.4	6.5
		Mannancherry (30m)	7.5			
		Mannar	6.07	4.37	2.7	5.67
		Mudhukulam	1			0.45
		Muttam(south)	4.61	2.32	6.37	4.42
		Preethigulangara-centre	12.99			
ERNAKULAM	**Bore Well**	Aikaranad1		2.75	3.15	3.15
		Arakuzha Pz	6.9	4.4	4.4	4.9
		Edakkattuvoyal PZ		8.9	14.1	9.7
		Illithode	6.52	5.72	6.22	6.82
		Irumbanam2	4.44	0.48	1.23	2.38
		Kanjiramattom	13.66	13.3	13.1	13.75
		Kizhakombu	6.94	1.85	0.7	8.8
		Kodussery	8.17	7.37	6.77	8.17
		Koovappady	6.05			
		Malayattur1		8.85	8.7	9.2
		Namakuzhi	9.9	3	5.9	6.9
		Poothrikka Pz				9.15
		Punnakad	2.56	1.25	0.95	2.35
		Thirumaradi	4.81	4.1	4.25	5.4
		Vazhagam	6.97			
		Veliyanad	4.97	2.45	3.95	4.05
	Dug Well	Aikaranad	4.75	7.3	7.3	4.9
		Alwaye	12.05		11.15	11.25

ERNAKULAM	**Dug Well**	Anchalpetty-R1	6.15	5.85	6.05	5.85
		Angamali (R1)	7.18	5.48	5.6	6.88
		Anicadu				3.1
		Arakunnam			8.95	10.55
		Arakuzha				6.15
		Attara	6.3	6.75	7	3.9
		Chalakka		1.83	1.88	2.48
		Chellanum	1.16	0.91	0.81	1.11
		Chengamanad	8.98	7.18	7.68	8.58
		Cherai	1.4	0.8	0.7	1.5
		Cheria Kadavu	0.42	0.4	0.47	0.6
		Cherukadapuram	2.11	1.3	1.25	1.58
		Chowara (R1)	6.35	5.15	6.25	7.15
		Chulli (R1)	4.39	2.25	3.85	4.65
		East Marady			5.2	5.9
		Edakkatuvayal	10.27	9.17	10.52	11.32
		Edapally	1.78	1.12	1.32	1.62
		Edavanakad	0.17			0.7
		Elur North (R1)	1.75	1.9	2.05	
		Fort cochin	2.37	1.45	1.65	2.25
		Ilanji				7.55
		Illithode 1				6.8
		Irumbanam (R1)	3.31	0.5	1.2	2.65
		Jaikeralam	7.46	5	5.65	7
		Kadavoor				5.7
		Kadungallur		1.55	1.95	
		Kakur	3.55	2.65	3.25	3.85
		Kalady (R1)			3.4	5.6
		Kallorkad	3	2.8	2.5	2.9
		Kalur	7	4	2.9	6
		Kandakadavu				1.7
		Kanjavamattom	6.6	6.7	6.8	7.2
		Kanjur	7.4	5.2	6.2	6.9
		Kapparassery	2.32		1.12	1.82
		Karukutti (R2)		6.85	6.65	8.15
		Karumalloor				2.95
		Keerampara	3	2.9	2.2	3.3
		Keezhillam	7.3	6.9	6.3	7
		Kizhakombu	8.15	1.85	0.7	8.8
		Kodanad				4.7
		Kodussery	9.4	7.37	6.77	8.17
		Kodussery (R1)				7.7

ERNAKULAM	**Dug Well**	Koothattukulam	5.27		3.62	4.72
		Koothattukulam1	5.65	3.3	4	
		Koovapady	7.05	4.85	3.15	6.45
		Kothamangalam		2	0.83	2.7
		Kothamangalam (R1)			1.2	4
		Kothamangalam (R2)	3.77	3.5	0.2	3.1
		Kottapadi	3.39	1.63	1.23	2.97
		Kottapuram (Alangadu)	2.55	5.7	1.3	1.65
		Kottapuram (Veliyanad)	2.85	1.2	6.1	7.9
		Kumbalangi (R1)	2.49	0.75	0.85	1.55
		Kundannur (R1)			0.15	0.6
		Kunnukara	4.42	5.28	4.98	6.92
		Kurumassery				8.6
		Kuruppampady	5.62	4.25	4.85	5.7
		Kuthukuzhi	5.02	2.4	1.5	4.3
		Malayattur	8	5.8	6.7	7.35
		Malipuram	0.95	0.4	0.6	0.9
		Mamallassery	4.95	4.15	5.05	5.4
		Manjapra	5.07	4.63	4.58	2.43
		Mannur	4.75	3.45	3.1	3.95
		Maradu	2.1	0.55	0.45	1.45
		Mulanthuruthi	8.2	4.3	8	8.9
		Mullankunnu	10.2	8	1.02	9.4
		Mullassery	4.01	3	3.1	1.4
		Munambam (R1)	1.23	0.4	0.38	
		Muvattupuzha	7.4	4	3.8	5.85
		Nallimolam	7.86	5.84	6.34	6.65
		Nallimolam (R1)				6.65
		Namakuzhi	7.42	3	5.9	6.9
		Nayarambalam	2.16	1.2	1.8	1.4
		Nellikuzhi		1.6		
		Nellikuzhi			3.6	
		Neriyamangalam	7.41	3.52	3.17	3.97
		Njarakkal	0.87	0.6	0.68	1
		North Parur	1	0.55	0.5	0.8
		Okkal				3.6
		Okkal			3.1	
		Oonnukal	6.3	3.9	3.2	6.2
		Paingottur	6.2	3.85	2.7	5.2
		Palakuzha North	9.9	3.23	4.53	6.08
		Pallikara-Chittanadu		6.9	7.5	6.8
		Palluruthy	1.31	0.85	0.85	1.45

ERNAKULAM	**Dug Well**	Pambakuda	6.75	4.2	4.9	6.9
		Parakkadavu	2.92	1.1	0.9	2.3
		Paravur	1.5	0.75	1.1	8.17
		Pattimattom	6.8	4.3		
		Payyal	6	2.35	2.15	3.8
		Peechanikad	9.11	5.9		
		Perumbadavam	7.2	5.45	5.75	6.85
		Perumbavoor (R1)		1.4	1.15	
		Pindimana	5	0.25	0.05	1.95
		Piravom	5	5	5.15	5.7
		Poothotta	3.18	0.78	1.98	2.58
		Poothrikka				8.2
		Pothanikad	4.5	2.2	0.8	
		Pulluvazhi	5.3	4.6	4.5	4.9
		Punithura	3.12	2.85	1.25	2.25
		Punnakad1	0.5	0.7	0.25	1.75
		Puthankurissu (Neriyamangalam Road)	5.16		2.8	3.05
		Puthankurisu (R1)	5.26	4.3	4.5	5.8
		Ramamangalam	6.54	6.3	6	6.7
		Randar				4.63
		Thabore				8
		Thalakode	4.45	3.4	2.8	3.9
		Thattekad		3.45		
		ThattekadR-1	1.3	3.45	2.25	1.65
		Thirumaradi	4.76	4.1	4.25	5.4
		Thrikalathur		4.5	4.5	5.1
		Thuruthi	3.89	2.5	2	3.3
		Trikkakara	9.55			9.4
		Tripunithura	3.1	1.7	1.7	2.5
		Vadavucode			1.35	
		Valayanchirangara	6.92	6.62	6.42	8.12
		Vallom (R1)	7.53	5.88	6.18	6.85
		Varapuzha	2.5	0.35		2.25
		Vazhakkulam North	5.55	5.25	5.65	6.45
		Vypeen	0.8	0.22	0.35	0.45
		Vytila	2.53	1.35	1.65	2.1
	Tube Well	Kadavanthara	6.3	5.8	5.9	5.9
IDUKKI	**Bore Well**	Alakode	4.36	3.09	3.73	4.33
		Anakkara	49.4	49.4	49.4	41.4
		Karimkunnam2	3.18	1.38	3.7	2.55
		Karumannur	4.42	2.11	3.26	4.11
		Kattappana	10.52	6.66	6.74	

IDUKKI	**Dug Well**	Mundieruma	5.6	3.64	4.1	4.65
		Santhanpara	4.14	2.2		
		Thankamoni	3.48	1.48	3.5	2.3
		Adimali	6	4.07	4.87	6.47
		Alakkode1	4.28	3.4	4.1	4.2
		Ambazhachal	6.04	3.62	3.45	3.33
		Amravathi	3.44	2.53	2.45	2.75
		Anakkara	7.36	5.94	6.55	41.4
		Anavilasam			5.2	5.2
		Arikuzha	5.37	2.3	4.7	5.2
		Balagram (Third camp)				3
		Byson Valley			9.85	10
		Carady Goody Estate	2.56	0.89	1.7	1.85
		Chathurangapara	0.52	0.45	0.4	0.5
		Cheenikuzhi	3.16	0.94	1.53	2.2
		Cheriyar	2.96	2	2.4	2.45
		Chittoor	4.24	2.3	3.81	4.05
		Churuli	2.56	1.73	1.93	2.18
		Cumbummettu			2.15	3.05
		Devikulam	3.41	2.35	2.85	3
		Elamdesom	6.78	3.12	5.25	6.1
		Elappara	1.55	1.13	1.37	1.52
		Idukki	4.53	2.57	3.05	3.45
		Irattayar (R1)	2.81	2.12	2.25	2.45
		Kaliyar	6.08	3.77	4.75	5.3
		Kanchiyar	10.62	7.63	7.55	8.8
		Karimkunnam (R1)		2.8	3.25	3.4
		Karumanoor	4.12	1.78	3.2	3.95
		Kattapana	3.28	1.6	2.15	2.52
		Kochera			0.8	1.9
		Kodikulam east	5.29	2.5	4	4.9
		Kolani	3.91	1.2	2.55	3.3
		Kolapra	5.52	3.8	4.1	4.25
		Kulamavu	7.69	4.15	6.3	6.55
		Kumaramangalam	4.14	3.15	3.7	4.35
		Kumili	3.93	1.51	1.8	2.2
		Kuttikanam (R1)	6.22	1.9	5.2	8.35
		Machiplavu	9.02	5.85	7.9	8.8
		Manjappara	2.7	1.4	1.8	1.55
		Marykulam	4.71	2.12	2.85	3.95
		Memala			4	4.5
		Moolamattam	5.68	3.5	4.4	5.9

IDUKKI	**Dug Well**	Mundiyeruma	5.65	3.56	4.2	4.65
		Munnar	1.72	0.37	0.9	1.25
		Murikkassery			9.85	
		Murikkassery				10.15
		Nedumkandam	6.22	2.83	2.9	3.3
		Nirmala City	1.68	0.69	0.95	1.25
		Njarukutty	3.52	1.25	1.3	1.5
		Pachakanam				2.1
		Pallikkamury	8.33	4.8	6.4	
		Pambadumpara	4.76	1.48	2.31	2.56
		Pampanar	2.51	0.8	1.3	1.95
		Pannimattom	4.19	2.66	3.1	3.65
		Peerumedu	2.87	2.65	2.1	3.3
		Perumuttom	3.13	3.2	4	3.2
		Peruvanthanam		0.4	4.05	2.75
		Poopara	1.61	0.57	0.75	0.85
		Rajakkad				9.5
		Rajakumary			9.75	10.15
		Thankamani	2.02	0.87	1.6	1.35
		Thodupuzha	7.54	6.27	8.1	8.55
		Thopramkudi			0.95	1
		Thumbachi	4.82	3.11	3.59	3.94
		Udumbanchola	9.37	4.43	5.35	7.1
		Udumbannur	6.93			6.94
		Valara (R2)	9	5.55	7.98	8.95
		Vallakadavu	4.76	2.31		3.15
		Vandanmedu (R1)	3.77	2.14	2.1	2.2
		Vandiperiyar	6.88	5.72	6.3	6.55
		Vazhithala	6.32	0.48	2.68	4.48
		Vellathooval	2.88	1.06	1.7	2.45
		Vellilamkandam	6.39	3.4	2.7	4.6
KANNUR	**Bore Well**	Anthoor	9.5	7.26	9.4	9.54
		Kakkeyamkadu	5.95	2.11	2.05	5.07
		Kankole1	10.95	5.66	6.95	8.07
		Kelakkam		7.33	9.75	9.85
		Kizhallur	6.18	2.67	3.8	5.76
		Kolacheri	9.15	3.06	7.2	8.36
		Kommery	4.5	3.01	3.39	4.49
		Kottayampoyil	8.69	3.89	6.33	7.41
		Kurumathur	9.3	5		7.19
		Manathana	2.61	5.14	5.86	6.89
		Munderi	4.63	3.01	3.6	4.07

KANNUR	**Bore Well**	Oduvallithattu	11.46	13.04		12.14
		Panoor	5.4	1.49	3.35	4.66
		Parassinikadavu	22.2	19.99		19.38
		Pulingome1	7.95	4.28	6	7.16
	Dug Well	Alacode	12.3			
		Alacode (R1)			7.85	11
		Alavil		3.76	4.95	6.42
		Ambilad	10.44			
		Andoor				7.06
		Anjarakandi	7.5	5.28	6.92	8.26
		Chakkarakkale	10.5	6.75	7.7	9.04
		Chalad		2.19	4.43	6.91
		Chavassery	6	3.37	3.85	4.16
		Cheleri	14.17	8.82	10.9	12.72
		Chepparapadavu	4.25	2.52	3.55	3.42
		Cherupuzha		3.42	4.4	5.22
		Cheruthazam	12.99	6.27	8.1	8.85
		Chundaparambu		6.35		
		Chundaparambu			6.4	6.88
		Chural	7.6	4.54	5.7	8.76
		Dharmadam				2.94
		Echilamvayal				4.12
		Edakkad	2.31	0.68	1.53	2.3
		Edayannur	5.22	3.97	4.35	4.86
		Edoor				4.23
		Elambara		3.26	3.75	4.68
		Ettikkulam				9.77
		Ezhilode		8.32	11.1	12.43
		Irikkur	6.77	3.17	4.13	5.1
		Kadannapally		9.66	12.4	11.34
		Kakkathodu		2.56		3.22
		Kalliassery	9.15	6.44	6.82	7.5
		Kallumutty		5.58		7.08
		Kanhirangad		11.04	11.25	10.99
		Kannapuram	3.28	1.58	1.8	2.4
		Kannavam	6.19	4.19	5.14	5.46
		Kannur	10.24	7.89	7.96	8.6
		Kelakam				8.12
		Kizhpalli				5.72
		Kolachery		8.06	8.13	8.62
		Kolakkad	9.72	8.47	8.94	9.64
		Kolayad	7.28	5.08	7.32	7.32

KANNUR	**Dug Well**	Kommeri	4.45	3.52	4.16	4.36
		Koothuparamba	9.35	5.21	7.02	8.33
		Koottummukham		4.38	5.4	4.87
		Kottayampoil	8.74	5.3	6.92	7.52
		Kottiyur	7.28	7.33	7.44	7.19
		Kotty		1.61	1.85	2.42
		Kozhichal	5.33	3.68	4.8	6.73
		Kunnaru	2.84	0.52	0.92	1.47
		Kunnoth		2.06	4.87	5.32
		Kuppam		1.78	1.8	1.83
		Kuyilur		1.33	2.97	3.81
		Mahe (R1)				1.67
		Manantheri	9.22	5.52	6.64	7.86
		Manattana	4.49	2.2	2.67	3.12
		Mathamangalam (R1)	7.28			
		Mathil	9.21	6.42	7.6	8.3
		Mattanur	7.78	4.98	6	7.94
		Mayyil	11.73	10.01	10.25	10.45
		Mekunnu				5.62
		Mele Chovva	7.98	7.52	7.65	8.01
		Melepukkom	10.26	6.23	5.79	8.25
		Meruvambayi	5.8	2.63	4.51	5.44
		Mokeri	7.12	7.05	8.37	9.87
		Munderi	9.21	5.88	6.32	7.24
		Muzhakunnu	4.5	3.46	3.54	4.47
		Nayattupara	14.45	7.04	8.1	9.06
		Nellunni				3.92
		Nuchiyad		5.52	7.41	7.58
		Oduvalli		15.47	15.05	16.86
		Palleri				7.02
		Pallikkuni	3.45	1.54	2.92	4.22
		Palloor (Mahe)				9.04
		Pannoor				4.14
		Panunda		8.72	12.02	13.64
		Pappinissery West		1.08	1.2	1.84
		Parassinikadavu DW	10.6	13.4	13.75	14.46
		Pathiriyad				7.82
		Pattiyam	2.19	1.27	1.77	5.64
		Payyannur	6.9	3.34	4.63	5.72
		Pazhayangadi	2.9	0.34	0.9	1.51
		Peravoor	5.2	4.31	4.98	4.85
		Peringome	8.22	5.24	7.66	7.51

KANNUR	**Dug Well**	Pukkundu	9.77	8	8.8	9.9
		Pulingome		2.46	4.53	6.3
		Puthiyatheru		3.92	6.6	7.86
		Ramantalai	9.7	5.27	7.5	8.12
		Sreekandapuram	8.51	5.14	5.57	7.22
		Taliparamba	15.15	8.74	9.65	10.02
		Thalassery	5.49	2.78	3.92	4.87
		ThazheChovva	4.94	0.5	0.59	1.29
		Ulikkal (R1)	5.88	2.74	4.15	5.42
		Valakkai		4.23	4.41	5.11
		Valapattanam	11.12	7.81	8.82	9.82
		Varam	6.05	3.16	4.52	5.54
		Vattiyamthodu	8.11	4.37		4.24
		Vayyakara	19.2	17.98	19.25	19.35
	Tube Well	Cannanore1	14.8	10.24	10.3	11.16
KASARAGOD	**Bore Well**	Bella		8.37	11.7	12.88
		Bovikkanam	12.5	8.61		15.66
		Chalingal Pz	12.3	5.28	7.2	8.76
		Chamundikunnu		9.23	9.65	10.75
		Chattanchal	16.3	11.32	13.4	13.61
		Karindalam	19.2	19.91	20.4	19.7
		Kumbala	16	4.16	9	11.82
		Kundamkuzhi	8.5	5.07	6.9	8.92
		Kuniya	18	6	6.2	7.04
		Mangad	19.4	7.04	7.5	10.36
		Manjeshwar	13.35	5.23	9.35	10.4
		Mylatti	8.8	5.24	5.3	6.64
		Pachakkad CPCRI	10.3	6.72	7.78	6.56
		Pallikkara	8.8	5.16	6.4	6.56
		Periye Pz	17.1	6.19	8.5	9.06
		Seethamgulli	9.7	4.1	6.5	8.3
		Vidyanagar	10.5	6.06	8.55	11.32
	Dug Well	Adhuru	10.9		6.75	8.06
		Adhuru (R1)				8.06
		Adkasthala	11.95	9.08	10.14	11.56
		Adoor	12.65	7.07	10.9	11.65
		Ambalathara	6.42	2.18	3.3	4.16
		Anangoor	13.8	11.52	12.6	13.2
		Angadimogar	11.85	5.63	8.4	9.96
		Arladuka	18.35	13.1	13.48	14.51
		Badiadka-R1	16.97	11.51	11.97	14.51
		Bandadka	10.8	10.07	10.75	10.75

KASARAGOD	**Dug Well**	Bangathadka	17	14.58	14.9	13.4
		Banputhadka	8.5	7.2	7.25	5.72
		Bayar	13.4	6.18	8.2	8.3
		Bedadka-R1		11.89	13.05	13.67
		Bedradka		7.85	9.52	11.6
		Bedrampalla (R1)	9.3	1.75	3.9	6.82
		Bekal	10.1	5.67	7.78	8.98
		Bela (R1)	12	10.66	10.7	10.86
		Bethoorpara		7.89	8	10.07
		Bhimanadi (R1)	9.38	9	8.55	5.44
		Bhimanadi-II	5.52	3.74	4.2	6.02
		Chalingal		5.35	7.02	8.42
		Chamundikunnu DW	11.6	9.42	9.75	10.34
		Cheemeni	8.22	5.87	6.85	9.07
		Cherkala	10.9	5.38	8.6	9.72
		Chittarikal	6.35	4.7	4.75	5.32
		Choyankod (R1)	9.08	4.75	5.93	6.64
		Dharmathadka	10.5	6.49	9.02	10.07
		Elambachi	5.27	2.14	2.7	4.73
		Iriyani	10.8	9.04	9.05	9.21
		Jodukallu	11	5.41	8.05	8.66
		Kadambar	14.07	8.64	11.2	11.02
		Kadappallam				9.59
		Kakkadavu	12.3	11.74	11.68	12.5
		Kalathur	15.5	7.44	6.2	6.85
		Kalichanadukkam	6.35	5.25	5.2	5.34
		Kalikadavu	6.9	1.82	4.4	4.95
		Kanhangad Coast (R1)	3.48	2.74	3.03	
		Kanhangad Town	10.25	7.01	8	9.21
		Kaniyala		2.32	4.9	
		Kannadipara	12	8.48	10.12	
		Karinthalam	11.9	8.28	9.62	
		Kasaragod	10.6	7.12	8.95	
		Kinningar	7.6	3.12	4.9	
		Kolichal	5.35	0.91	4.4	
		Koliyarpadavu (R1)	12.5	7.86	8.7	
		Koolom Road	9.85	6.01	8.45	
		Kottiyadi	9.8	6.44	7.8	
		Kovval	8.9	3.96	6.3	
		Kudlu	10.95	3.76	7.03	
		Kumbadaje	11.2	6.91	8.3	
		Kumbla (R1)	14	5.78	9.17	

KASARAGOD	**Dug Well**	Kundamkuzhy	7.47	2.12	3.85	
		Kuttikol	15.2	14.73	14.6	
		Madhur	16.1	8.38	4.9	6.34
		Mandecap	8.35	4.16	5.92	
		Mangad	13	7.04	9.25	10.36
		Mangalpady (R1)	12.75	7.24	10.4	11.7
		Manjeswar	7.6	2.68	3.65	6.41
		Mavinakatta	26.75	21.94	22.7	23.6
		Mavungal	9.6	2.62	5.55	5.96
		Melparamba	15.8	9.72	11.68	13.25
		Miyapadavu	13.12	11.18	11.27	12.02
		Mogral (R1)	11.45	2.2	7.45	10.54
		Mogral Puthur				11.46
		Movvar		14.32	13.9	14.19
		Muligadde	9.64	5.05	8.47	8.99
		Muliyar	7.05	5.02	5.75	6.32
		Mulleria	17.1	17.38	17.5	18.2
		Munnad	10.45	9.08	9.63	9.52
		Naimarmoola	8.85	7.06	8.1	8.32
		Nattakkal	12.6	12.2	11.8	13.72
		Nellikatta	9.9	4.54	7.3	8.64
		Nileshwar	5.9	1.92	3.75	4.91
		Odayanchal	3.72	1.92	2.4	2.85
		Pachambla	11	5.66	6.9	9.16
		Padiyathadka	9.4	5.82	7.02	7.9
		Paivalike	10.4	6.94	8.28	8.86
		Pallam	10.1	5.16	7	8.87
		Panathur	11.15	5.97	10.55	10.97
		Parappa north	9.1	7.2	8.36	9.22
		Peraladkam	6.95	3.29	6.21	6.99
		Periyattadukkam	12.7	5.38	7.3	9.26
		Periye	11.8	7.77	8.2	8.81
		Perla	9.5	5.64	6.75	8.14
		Poinachi-R1	14.45	13.47	13.45	14.24
		Pookatta	16.85	7.51	8.5	11.21
		Povval	13.3	11.64	12.5	12.71
		Pullur	8.6	5.32	6.85	7.62
		Putheriyadukkam	2.7	10.51	10.4	11.86
		Puthige	12.6	5.46	7.6	9.05
		Rajapuram	6.05	4.11	5.35	7.82
		Sasthangode (Sastha Nagar)	25.2	19.73	21.15	23.36
		Sorga	9.5	6.01	6.6	7.46

KASARAGOD	**Dug Well**	Thachangad	11.05	6.38	7.9	9.85
		Thaniyadi	5.7	3.99	4.85	4.86
		Thoyammel	11.9	9.04	9.2	10.19
		Trikaripur	4.35	1.12	1.85	2.82
		Udinur Central	4.65	1.78	2.35	3.07
		Ukkinadka	9.4	5.02	5.15	5.56
		Uppla	14.6	6.24	9.9	13.47
		Vorkady		8.78	11.7	12.5
		Yethadka	5.6	4.4	5.35	6.4
	Tube Well	Ajannur(s2)	2.35	0.46	1.45	2.19
		Ajannur(s3)		0.53	1.52	2.22
		Ajannur(s4)	2.45	0.78	1.52	1.96
KOLLAM	**Bore Well**	Anchal	8.47	6.3	5.9	7.52
		Chadayamangalam Pz				1.7
		Kalluvathukkal	9.62	3.69	7.67	7.65
		Koovakad	4.76	1.34	0.7	3.75
		Kulathupuzha1	6.13		7.44	5.86
		Nellikunnam	1.64	0.73	1.3	1.78
		Pathanapuram	0.43	0.04	0.46	0.43
		Ummmannur				11.1
		Vazhathopu	6.25	2.24	3.4	5.31
		Yeroor1	5.98	4.85	5.23	5.66
	Dug Well	Achenkovil(R1)	7.65	2.55		4.95
		Aerom -Panayancheri	5.84		6.21	7.9
		Ailara	2.66	1.65	1.66	2.56
		Akkal	9.8	8.62	8.41	9.16
		Alayamon	8.87	6.64	5.56	8.19
		Alumoodu	9.2	2.85	6.45	8.82
		Anayadi	13.87	4.49	9.15	12.25
		Anchal DW	11.92	8.5	7.8	9.8
		Anchalammud	9.46	6.88	7.47	8.89
		Ariyankavu	12.5	0.25		5.95
		Avaneswaram	8.75	8.13	5.38	5.88
		Ayathil	7.76	3.29	4.99	7.75
		Ayur	7.82	5.47	5.95	8.6
		Bharathipuram	8.39	7.84	6.71	9.82
		Bhoothakulam	11	7.67	7.64	11.15
		Chadayamangalam1	8.78	7.23	7.64	10.45
		Chakkuvalli	8.15	4.5	5.93	7.63
		Channapetta	13.4	9.55	8.69	11.05
		Chathannur		7.9		11.3
		Chavara1	1.1	0.48	0.93	1.29

KOLLAM	**Dug Well**	Chenkulam	5.27	1.51	4.25	5.15
		Chithara	8.46	6.61	6.04	7.8
		Choorakulam Jn	7.58	6.96	5.59	8.43
		Cinemaparambu DW	12.57	8.53	8.57	11.47
		Edamon	12.98	8.04	7.64	7.64
		Edamulakkal	5.88	5.75	5.92	6.07
		Edayam	9.8	10.26	9.46	12.11
		Elavakode			6.65	8.26
		Ezhamkulam	9.45	5.74	5.6	7.05
		Ezhukone	4.79	1.06	2.07	3.6
		Iravipuram1	3.48	1.74	1.66	2.74
		Ithikara	16.61	16.5	14.9	16
		Kadakkal	6.18	6.69	6	8.27
		Kadapuzha	2.61	1.76	2.36	1.53
		Kallumthazham	3.37	2.3	5.27	3.73
		Kalluvathukkal		3.69		6.58
		Kalluvettumkuzhi	8.21	4.51	7.52	4.51
		Kamukanchery	10.31	7.93		
		Kandanchira			6.2	6.7
		Kangathumukku	6.72	4.92	1	6.26
		Kanjiramkode	6.63	4.82	4.99	6.13
		Kanjiramvila			7.7	8.44
		Karamkode			10.9	11.25
		Karukone	8	5.37	4.3	7.1
		Karunagapally	4.32	2.72	3.51	4.78
		Karunthalakode				1.2
		Karunthalakode		1.5		
		Kavanadu			5.25	
		Koovakad DW	4.55	2.19	1.81	5.17
		Kottakayam	9.01	4.6		8.15
		Kottamkulangara		1.5		1.47
		Kottarakara (R1)	15.8	14.3	13.5	16.08
		Kottiyam	20.2	4.21	7.54	9.76
		Kulakada	7.65	3.4	3.8	6.9
		Kulapadam	8.56	6.55	6.52	7.12
		Kulathupuzha	6.57	4.3	4.06	5.61
		Kumbalam	21.02	19.15	18.88	19.73
		Kunnada	11.61	7.96	8.12	10.2
		Kunnathur	19.03	18.26	15.19	16.66
		Kuripalli	8.91	0.51	7.21	8.67
		Kurungapalli	2.35	2.72		1.82
		Kutavettur	8.04	6.31	6.52	7.1

KOLLAM	**Dug Well**	Madathara		4.65	4.45	6.58
		Manapalli	6.33	3.13	4.43	5.77
		Mayyanad	6.16			
		Mayyanad		4.75		5.47
		Meenad	6.05	3.56	4.56	5.31
		Meenkulam	8.8	7.68	6.33	8.18
		Mulavana	12.1		9.1	11.05
		Muthukumel	6.64	4.24	4.26	6.33
		Mynagapalli	10.82	5.23	7.1	8.53
		Nallila	6.27	5.64	5.81	6.35
		Nedungolam	12.48	3.84	7.03	9.3
		Neendakara1	0.95	0.59	0.84	1.05
		Nellikunnam DW			1.05	2.36
		Nilamel	4.15	3.45	3.4	4.11
		Oachira1	0.62	4.39	0.52	0.83
		Odanavattom	7.65	4.09	4.33	5.51
		Ottakal	6.84	6.27	5.12	7.25
		Oyur	10.2	5.35	6.93	8.5
		Palamoodu	9.82	3.4	7.85	11.44
		Pallickal	6.77	4.43	3.35	5.75
		Pangalukadu	5.98	6.13	5.39	6.52
		Panmana-Manayil	3.38	0.99	1.55	2.62
		Paripally1	12.38	4.9	8.92	8.98
		Pattanapuram	11.15	8.04	6.73	9.14
		Pavitreswaram	5.39	2.82	3.4	4.36
		Perinad	6.98	5.81	6.17	7.55
		Perumkulam	8.28	6.21	4.96	6.55
		Pozhikara	6.14	3.8	4.8	5.75
		Punalur-i1		10.23		8.97
		Punnala (R1)	7.25	5.86	5.38	6.08
		Puthiyathura		0.65	0.58	0.63
		Quilon	8.12	7.13	7.4	8.32
		Roduvila	8.82	4.68	6.49	7.72
		Sasthamkottah (R1)	5.59	2.73	4.93	5.59
		Sooranadu	6.38	3.58	4.68	5.61
		Tadicaud	8.6	6.12	6.18	7.71
		Tevalakara	8.06	7.12	8.13	2.71
		Thattamala	2.85	1.28	1.38	2.88
		Thenmala		6.39	6.2	7.03
		Ummannur	9.8	6.86	6.79	8.45
		Vadakkumthala west	2.29	0.75	1.42	2.02
		Vallikavu	1.8	0.34	0.83	1.06

KOLLAM	**Dug Well**	Vazhathoppu	7.95	4.25	5.12	7.13
		Veliyam	12.07	7.12	7.04	9.03
		Vendar	7.89			
		Vilakkupara	11.77	8.54	7.52	9.85
		Yeroor	2.72	1.21	1.33	1.87
	Tube Well	Chavara-e	13.81	11.05	14.41	13.91
		Chavara-n2	1.03			
		Chavara-n3	14.33			
		Chavara-west	1.9	1.68	1.78	1.86
		Manappalli	12.32	12.38	16.1	17.2
		Nallila1	6.07	7.35	7.03	7.5
		Perinad1	34	32	33.3	34.3
		Trikkadavur	15.45	10.37	9.68	13.58
		Vayyankara	15.33	15.52	14.1	15.4
KOTTAYAM	**Bore Well**	Ettumannur	1.56	0.88	0.75	1.4
		Kidangoor	7.62	4.68	5.7	6.8
		Kuravilangad	5	1.98	3.03	4.33
		Poonjar	5.63	2.1	3.53	5.73
		Thrikodithanam	13.51	8.82	10.55	
	Dug Well	Anandasram	8.19	9.76	7.65	10.45
		Arunuttimangalam	6.39	5.75	5.82	5.77
		Ayamkudi	12.14	6.05	7.25	9.45
		Ayarkunnam	7.03	3.81	3.75	4.7
		Brahmamangalam	10.7	6.25	6.6	8.2
		Chamampathal	4.07	2.95	3.15	3.3
		Changanasserry	2.92	1.72	1.96	2.41
		Chempu	2.97	1.13	1.8	2.45
		Chengalam South	1.01	1.08	1	1.25
		Cheruthikara	4.94	3.05	4.05	5.3
		Cheruvalli	6.02	5.48	5	5.95
		Chotti	3.97	1	3.9	5.4
		Chungam				3.72
		Edakadathy			9.5	9.2
		Edamaruku	4.82	1.76	3.3	4
		Edinjillam	3.61	1.65	2	2.6
		Elamkulam	4.44	1.89	3.3	3.47
		Erumeli	4.42	2.25	3.7	4.9
		Ethakuzhy (Kallara)	3.53	1.62	2.4	2.95
		Ettumannur East	3.89	2.83		
		Ettumannur East (R1)			5.55	7
		Iykarakunnam	9.39	7.37	8.32	8.57
		Kadaplamattom	5.37	5.07	5.35	5.5

KOTTAYAM	**Dug Well**	Kaduthuruthi	6.51	5.97	5.37	5.87
		Kalakatty	4.04	2.44	3.74	4.34
		Kalathipady	8.72	6.85	8.7	9.5
		Kalathur	6.17	7.44	6.2	6.85
		Kangazha	6.48	5.18	5.7	6.35
		Kanjirapally	8.98	3.88	4.44	8.1
		Kidangur-R1	5.07	3.22	3.7	4.75
		Kollappally	3.17	0.63	2.5	3.25
		Kooroppada	4.49	3.3	3.8	4.3
		Koothrappally	5.44	3.5	5.3	4.65
		Kottayam1	12.77	9.39	10.74	11.44
		Kozha	3.68	1.46	1.7	2.1
		Kozhuvanal	4.86	2.88	4.48	4.68
		Kudavechur	3.02	0.9	0.4	1.8
		Kumarakom	1.18	0.16	0.45	1.05
		Kummannur	7.36	5.18	5.25	5.5
		Kuravilangad1	6.08	2.35	3.3	3.9
		Kurichy (Sachivothamapuram)				8
		Kuruppanthara			1.8	2
		Kuttikal-R1	3.32	2.15	2.83	3.62
		Kuvapalli	4.58	3.81	6.85	6.25
		Madapally	2.61	1.11	1.4	1.85
		Manimala	4.58	3.83	4.65	5.3
		Mannanam		5.67	6.3	6.95
		Marangattu palli	3.47	1.44	2.52	2.65
		Melukavu Mattom	6.48	3.56	4.75	5.8
		Monipalli	1.28	0.94	1.22	1.27
		Mukkada	7.96	3.72	4.25	4.8
		Mukkoottuthara			1.6	1.95
		Mundakayam	9.12	0.95	4.15	5.65
		Mundukuzhi	11.58	5.78	6.65	10.3
		Mutholi			5.9	6.3
		Narianganam	4.7	2.39	3.15	4.75
		Nedumkunnam			5.3	5.5
		Neendur	4.12	1.95	2.33	2.9
		Paippad	9.23	6.46	7.25	8.15
		Palai	6.04	3.33	4.67	5.17
		Palamkadavu	2.35	1.21	1.56	2.2
		Pallikathodu	7.51	2.35		
		Pallikkathodu (R1)			5.25	6.55
		Pallom (nattagam)	7.47	4.79	5.05	6.85
		Pambadi	5.96	7.16	8.2	8.2

KOTTAYAM	**Dug Well**	Panackapalam Jn	5.51	4.45	5.1	5.45
		Paruthumpara	7.71	7.02	6.75	7.85
		Plakkalpadi	7.12	4.35	5.25	6.1
		Ponad	8.41	4.9	5.9	7.45
		Ponkunnam	6.61	3.68	5.9	5.4
		Ponthanpuzha	5.69	4.1	4.02	4.65
		Poovathilappu			2.57	4.45
		Pravithanam		1.77	3.85	5.2
		Pulikkal Kavala		3.06	3.55	3.6
		Pulikuttisseri	1.53	0.97	1.2	1.48
		Punjar	1.77	0.2	0.3	1.8
		Punnaveli			4.3	4.65
		Puthupally			6.95	7.05
		Ramapuram (R1)	4.22	2.8	3.65	4.45
		Teekoy				4.85
		Thalayolaparambu (R1)		2.59		2.85
		Thazhathangadi			2	2.1
		Thekethukavala	6.22	5.05	5.4	5.85
		Thidanad	3.69	1.98	3.93	7.18
		Thiruvanchoor	4.33	3.02	2.9	3.8
		Thiruvarpu	2.22	0.65	0.8	1.5
		Thottakam		1.07	1.35	1.9
		Thottakkad	6.1	5.25	5.2	5.65
		Trikodithanam	14.03	10.3	11.35	12.75
		Udayanapuram	2.01	0.7	1.03	1.35
KOTTAYAM	**Dug Well**	Urulikunnam	4.31	1.26	3.5	4.18
		Uzhavoor (R1)	3.45	2.14	2.45	
		Vaikom	3.85	0.99	3.95	2.75
		Vakathanam	6.03	5.4	4.4	8.3
		Vazhur	5.03	3.88	4.6	4.8
		Vechur	2.57	1.06	1.02	1.7
		Vellur-II	3.4	2.63		3.21
		Vellur-III	4.24		3.1	3.4
		Vempalle	3.59	1.48	1.63	1.7
		Veyilnanampara (Kondur)	5.54	2.92	4.4	6.81
	Tube Well	Chempu - I(East)	2.52		2.2	2.4
		Chempu- West	3.11	0.23	0.61	1.01
		Kumarakom Pz			2	1.35
KOZHIKODE	**Bore Well**	Atholi pz	5.5	2.9	4.03	4.85
		Balussery pz		3.95	6.08	7.19
		Cheruvannur pz			4.08	6.23
		Chevayur pz	26	18.5	23.61	24.59

KOZHIKODE	**Dug Well**	Feroke pz	3.55	7.45	8.92	9.72
		Kalikadavu pz	3.6	3.05	2.84	3.31
		Karuvannur pz	1.25		0.47	0.78
		Kokallur pz	8.25	6.75	7.03	7.03
		Mavoor pz				4.43
		Mavoor pz			5.63	
		Thodannur(east)	5.44	1.59		
		Thodannur(west)			5.31	5.82
		Thuneri pz	5.12	2.6	3.55	4.06
		Vellimadakunnu pz	13.4	7	20	19.5
		Atholi	4.7	1.65	3	3.45
		Badagara	5.76	3.94	4.81	5.44
		Balusseri	7.38	2.43	5.46	7.08
		Beypore	4.05	0.45	0.86	2.31
		Bhumivathukkal	6.67	0.87	5.98	6.77
		Calicut Beach	2.8	1.15	2.18	2.62
		Chaliyam		0.9	1.47	2.64
		Chelannur	1.6	0.4	0.34	0.99
		Chelavur	5.9	2.4	8.5	9.37
		Chemencheri		0.73	1.65	2.6
		Cheruvannur West	5.3	2.5	3.25	4.14
		Chevayur	13.65	8.05	9.75	12.16
		Chiulavi (Niravamal)				7.41
		Chulur	6.1	1.55		5.55
		Devarkoil	6	4.7	7.07	8.2
		Elattur	4.25		1.7	
		Elattur (R1)		0.25		
		Feroke DW	12.9	10.82	11.83	12.26
		Kakkayam	3.55	2.7	3.21	3.2
		Kakkur	6.8	2.45	3.99	5.24
		Kallachi	1.3	0.7	0.8	1.52
		Kannoor			4.39	4.6
		Karaparamba	2.8	2	2.48	2.64
		Kariyathumpara	2.9	1.85	3	2.88
		Karuvannur	1.1	2.35	3.24	3.27
		Kayapanachi	4.69	3	3.9	4.54
		Kodencherry			1.08	1.17
		Kodinattumukku	3.5	1.6	0.71	
		Koduvalli	8.95	2.05	6.17	7.85
		Koduvalli North				4.23
		Koodathumpara	3.7	0.37	0.42	
		Koothali	4.7	2.5	2.58	4.47

KOZHIKODE	**Dug Well**	Kozhikode	16.4	8.7	10.41	13.09
		Kunnamangalam	12.1	5.23	8.43	10.22
		Kunnumakkara			1.28	1.82
		Kurachund	4.2	3.95	5.32	5.38
		Kuttampur	4.95	1.85	2.02	
		Kuttiyadi	7.3	6.4	7.88	7.67
		Malayamma	5.2	1.02	1.22	4.55
		Manassery				3.23
		Mattanodu	9.2	6.7	8.14	8.75
		Mavoor-i	5.35	2.75	6.53	5.24
		Mavoor-ii	9.45	5.7	8.07	9.04
		Melady 1		1.35	0.82	1.45
		Meppayur	0.8	0.8	3.41	3.89
		Moodali				1.97
		Mukkali	5.27	2.23	3.53	4.48
		Muliyangal				1.98
		Murampathy				5.75
		Nadapuram		1.3	1.86	2.77
		Naduvannur	7.4	3.85	6.18	7.3
		Nallalam	4.5	0.7	0.99	2.21
		Nanminda	6.95	2.5	3.87	5.9
		Narikunni	4.7	0.6	1	1.25
		Nayarkuzhi	7.15	3.2	5.78	6.3
		Orkattery			1.15	2.63
		Pathimangalam	12.1	5.8	10.1	10.75
		Pavangad				2.38
		Perambra	5.4	1.15	2.26	6.82
		Perumpally				3.45
		Peruvayal	6.3	2.77	5.23	6.6
		Pudukayam	9.16	6.8	7.08	7.87
		Pudupadi	2.55	2.05	2.37	2.33
		Pudupanam		3.5	4.5	5.38
		Punnasseri	7.9	4.55	5.3	7.25
		Puthur	8.4	5.35	6.64	7.57
		Quilandy		3.13	4.64	5.5
		Ramanattukara (R1)		0.85	1.69	2.07
		Tamarasseri	1.72	0.77	1.19	1.13
		Thenamkuzhi		1.4	1.56	2.97
		Thikkodi	6.75	2	4.3	7.07
		Thiruvallur	1.5	0.65	0.62	1.12
		Thiruvambady			3.2	3.85
		Thodannur		3.9	6.35	6.23

KOZHIKODE	**Dug Well**	Tuneri1	4.47	3	3.49	3.96
		Ulliyeri	3.6	1.55	2.48	3.08
		Unnikulam	1.5	0.95	1.27	2.32
		Valayam	8.13	4.5	5.92	6.47
		Vattoli	4.6	2.5	3.7	4.81
		Vellimadakunnu	13.3	7	13.42	12.97
		Villyapalli	7.65	5.1	6.31	6.57
		West Pudupadi	2.5	1.9	2.54	4.59
	Tube Well	Chombala(pz)				4.55
		Chombala(w1)	5.21	1.65	3.11	4.08
		Chombala(w2)		1.9	2.82	3.51
		Chombala(w3)	5.03	1.5	3.04	4.29
		Chombala(w4)			2.97	4.24
		Meladi		0.17	0.86	1.38
MALAPPURAM	**Bore Well**	Anakkayam	7.9	4.8	7.02	7.52
		Cherukulam	12	7.69	9.96	11.1
		Edakkara	17.5	14.66	14.92	16.3
		Kaladi1	9.94	6.85	7.09	7.55
		Karavarakundu Pz	12.22	6.17	9.5	11.5
		Karulayi	4.18	1.59	2.31	3.91
		Karuvambram	20.25			
		Kavanur	7.47			
		Kizhakkumpuram	23.6			
		Narukara	4.74			
		Nediyirippu Pz	2.74			
		Othukkungal	34.14	19.2		26.9
		Pandalur	9.9	5.66	6.84	9.2
		Pangh	15.37	8.5	9.64	11.6
		Parambilpeedika	24.74	25.29	22.69	26.4
		Ponmala	13.01	5.51		9.42
		Puzhakkattkiri		3.38	6.6	6.8
		Thelakkad	20.52			10.82
		Thiruvali	7.64	5.3	5.5	7.8
		Thozhuvannur	25.22			
		Thuvur	11.41	6.91	8.04	9.81
		Wandur Pz	16.4			
	Dug Well	Akkaparamba	8.87	6.82	7.92	8.65
		Amminikad	6.58	2.12	4.25	5
		Anakkayam	8.26	3.77	5.64	7.52
		Angadipuram	8.51	4.54	6.55	9.04
		Arikode		4.7	0.65	8.31
		Ariyallur	3.57	0.6	0.91	2.86

MALAPPURAM	**Dug Well**	Athani		1.67	6.62	7.47
		Athanikkal	6.12	0.56	3.56	4.5
		Athirumada	13.27	11.7	11.95	13.39
		Beeranchira	6.83	6.25	6.44	7.8
		Buliyampadam (Velumbiampadam)	5.1	2	4	4.95
		Chamravattom	1.67	0.2	0.4	1.52
		Chemmalassery				5.4
		Cherani	7.4	2	4.47	6.1
		Cherukara	7.34	4.72	5.87	7.65
		Cherukode				5.2
		Cherukulam	11.7	7.69	9.96	11.1
		Chokkad		1.3	2.35	4.3
		Chungathara1	4.35	0.95	1.95	2.95
		Edappal	14.36	10.2	11.2	13.07
		Edavanna1	9.92	6	8.45	9.51
		Edayur	8.02	3.8	6.7	7.8
		Eriyad	4.87	2.1	2.85	3.3
		Iswaramangalam	3.92	0.6	1.15	2.04
		Kadalundi	5.01	3.05	3.61	4.6
		Kadampuzha	10.46	7.75	9.58	10.42
		Kadannamanna	7.54	3.09	3.56	6.2
		Kadungapuram	9.74	7.4		8.4
		Kalikavu	5.4	2.35	3.65	4.6
		Kanjiramukku	6.97	2.9	4.15	5.72
		Kariavattam	8.8	5.22	7	7.7
		Karipol	11.07	9.07	9.35	9.6
		Karulai	8.65	6.87	8.05	8.71
		Karumbil			12.25	13.75
		Karunechi	19.63	14.2	16.11	16.31
		Karuvankallu	6.74	6.73	7.86	8.4
		Karuvarakundu	3.41	1.37	2.05	3.05
		Kattumunda (R1)		6.7	9.9	10.5
		Kavanur1	9.5	5.95	7.86	9
		Kizhumuri	12	7.9	9.95	12.45
		Kondotty	4.67	0.89	1.5	3.54
		Kottakkal	8.84	6.12	7.31	10
		Kottapuram	7.27	5.92	5.2	8.56
		Krishnapuram Puthentheru	4.29	0.72	1.46	3.6
		Kulattur		1.45	3.1	6.12
		Kuruva		9.92	10.77	13
		Kuttipuram		0.42	0.9	3.5
		Malappuram	11.6	6.25	7.66	11

MALAPPURAM	**Dug Well**	Mangalam		1.35	1.75	2.9
		Manjeri	4.92	2	3.76	6.14
		Mankeri	6.26	0.9	3.87	6.35
		Marancheri	6.92	3.8	5.45	7.47
		Maruda	8.02	4.75	6.98	9.8
		Melattur	6.87	3.83	5.73	7.3
		Moothedam			2.2	4.2
		Mudikode	5.37	1.25	3.89	6.55
		Narokavu	15.5	11.02	11.8	14
		Nediyirippu	4.16	1.37	2.87	4.5
		Nellikuth	7	4.36	5.7	6.8
		Nilambur	4.5			
		Olavattur	9.76	6.86	7.1	10.38
		Othukkungal DW	15.05	6.2		13.4
		Padikkal				10.32
		Pandalur DW	7.5	5.84	8.03	8.2
		Pandikkad (R1)	6.32	2.9	3.61	6.32
		Paral	6.31	2.81	5.6	7.5
		Parambilpeedika	12.65	9.85	9.84	13.6
		Parappanangadi	3.11	0.95	1.32	2.65
		Pathiriyal				8.2
		Pathiriyal			6.3	
		Payyanad				9.1
		Perinthalmanna	9.05	5.56	5.57	6.3
		Perumpadappu	6.54	0.4	3	5.87
		Peruvakkad				6.91
		Ponnani1	1.82	1.1	1.31	2.7
		Pookottoor	2.78	0.45	0.7	2.82
		Pookottumpadam	5.94	1.65		4.5
		Pukattery	9.44	2.78	6.82	9.4
		Pukothu	7.41		6.4	7.5
		Pulamantol	7.5	5.41	6.2	6.21
		Purathur	2.6	0.8	1.14	2.72
		Puthenkulam		0.82	1.7	3.72
		Puzhakkatteri			5.02	7
		Ramapuram	10.44	3.55	4.6	7.4
		Tachinganedam	8.1	3.52	4.51	6.65
		Tanur	5.32	2.31	3.2	5
		Tenjippalam (R1)	9.76	9.6	9.85	10.35
		Thavanur	11.54	8.05	9	10.62
		Thazhekod Kappumugham		0.83	5.34	6.9
		Thazhekode	7.74	5.95	6.65	7.41

MALAPPURAM	**Dug Well**	Thirunavaya	4.88	2.52	3.82	5
		ThiruvaliDW		0.47	0.91	2
		Thrikkalangode	4.21	0	1.6	4
		Thuvur DW		5.95	8.25	10.81
		Tirukkad		3.5	5.95	7.9
		Tirur	14.24	10.6	14.36	10.81
		Tirurangadi	12.12			13.65
		Tripanchi	7.7	6.72	9.4	10.6
		Uppada	4.11	0.7	1.5	3
		Vadakkemanna	8.75	3.95	5.2	8.08
		Valancheri	7.32	6.64		
		Valancheri R1			9.32	10.1
		Valavannur	10.66	6.92	10.55	15.1
		Valiyakunnu				9.25
		Vallambur	8.7	4.67	6.96	8.3
		Vaniyambalam			3.71	6.81
		Vazhikadavu	7.45	3.81	3.83	4.61
		Vellila1		4.4	6.1	7
		Vengad	7.06	8.51	6.72	8.9
		Vengad	7.06	3.38	6.72	8.9
		Venniyur				9.45
		Vettom1	3.78	2.2	1.86	2.9
		Vylattur (R1)	10.45	8.2	9.91	12.4
		Wandur	9.68	6.4	8.3	9.65
	Tube Well	Vettom	3.64			
PALAKKAD	**Bore Well**	Cherpulassery Pz	22.5	8.66	7.34	18.27
		Kadukkankunnu				3.03
		Kallepully				5.54
		Kanjikode(FCRI)	12.3	5.61	5.2	8.08
		Kannadi	1.6	0.96	2.12	2.87
		Karimpuzha	4.9	2.34	2.7	4.24
		Koduvayur	8.62	2.42	5.78	5.35
		Kongad	5.8	3	3.1	4.68
		Kozhipara Pz	5.2	1.56	1	2.38
		Kulapully Pz				19.74
		Kunnamkattupathy Pz				9.62
		Kunnissery	10.7	7.74	6.3	7.34
		Lakkidi Thekkumangalam	17.5	9.6	14.8	17.08
		Malampuzha Pz				7.87
		Malampuzha1	5	1.72	4.4	5.08
		Moochangundu	32.5	11.3	10.7	10.89
		Mundur Pz	24	12.1	14.12	19.24

PALAKKAD	**Bore Well**	Muttikulangara Pz				16.64
		Nemmara1				3.36
		Ottapalam Pz	32.5	28.9		
		Padur	17.4	14.5	18.2	16.17
		Panayur(Athikodu) Pz				4.18
		Pattambi Pz	8.4	5.6	6.8	6.97
		Peringottukurissu	12.57	10.1	10.06	11.04
		Perumatty		10.9	9.5	
		Plachimada	21.5	4.44	9.36	10.68
		Pullundassery	5.2	2.16	2.26	2.68
		Thenkara	2.31	0.64	1.26	1.15
		Thirumittacode	27.6	17.9	10.46	
		Thiruveegapuram	13.54	11.1	10.1	10.42
		Trithala Pz	4.9	7.3	7.67	4.23
		Vadakarapathy Pz				16.69
		Vadakkancherry1	12.9	7.72	9.08	10.16
		Vadanamkurissu	11.12			
		Vaniyamkulam1	9.32	9.02	6.56	6.88
		Vennakara				14.21
		Villooni	62	24.15	11.12	20.17
	Dug Well	Adiparanda	8.55	3.51	4.24	6.26
		Alanallur	10.21	6.16	7.16	8.32
		Alathur	5.76	2.08	1.88	2.19
		Ambalaparambu		1.02	1.32	0.92
		Ambalappara	9.13	5.82	7.21	8.12
		Ariyur		8.22	7.52	9.23
		Ariyur (R1)	10.61	8.22	7.52	9.35
		Athipetta	4.16	1.3	2.22	3.07
		Banglow Kunnu	9.42	5.75	7.69	8.13
		Chakkanthara	3.08	1.22	1.82	2.48
		Chalisseri	10.1	5.66	7.72	8.98
		Chemmampathi	10.83	4.55	4	6.3
		Cherpulassery (R1)	10.05	7.65	8.16	9.35
		Chittoor	5.99	2.3	3.81	4.05
		Chulliar Dam	4.54	3.09	4.31	
		Chullimada		3.56	4.46	2.22
		Chullimade	9.13	3.4	3.79	
		Chunangad				7.8
		Dhoni	7.7	1.6	4.75	6.69
		Ellissery	6.46	4.52	5.3	5.73
		Eruthenpathi			2.78	3.72
		Gopalapuram	13.72	6.54	5.92	8.4

PALAKKAD	**Dug Well**	Kadampazhipuram	3.92	3.62	3.67	4.4
		Kalladikode	8.26	3.44	6.08	8.36
		Kambilichungam	4.24	0.88	1.08	2.54
		Kanjikode	7.8	2.02	2.82	5.58
		Kanjirapuzha		1.26	2.12	2.42
		Kannadi	4.95	0.7	0.54	1
		Kannimari	6.1	1.71	2.61	3.48
		Karimpuzha	3.12	1.46	2.45	2.04
		Kodavayur	6.88	2.36	2.81	4.52
		Kodumbu				3.5
		Kodunthirapalli				4.3
		Kollengode	4.25	3	1.96	4.16
		Kongad1		3.14	3.62	5.04
		Kootanad	9.13	4.96	8.94	10.02
		Koppam	6.04	3.57	4.4	5.53
		Koppanur				2.99
		Kottapuram		2.6	5.2	7
		Kottassery (Vattassery)			2.62	3.52
		Kottayi				2.6
		Kozhinjampara			3.62	
		Kozhinjampara-R1		2.5	3.62	5.78
		Kozhipara	5.8	2.14	1.92	2.9
		Kudallur	7.8	4.61	4.76	6.06
		Kullimattom		2.05	2.47	4.2
		Kumaramputtur	3.6	1.16	2.04	4.02
		Kumaranallur	10.26	7.52	9.07	9.82
		Kunisseri	5.87	1	2.27	3.81
		Kuzhalmannam	5.51	1.53	2.1	2.75
		Malampuzha	3.36	1.42	1.75	1.68
		Mankara	5.44	3.56	3.72	3.48
		Mannarkkad			3.28	
		Mannarkkad (R1)	4.44	3.62	3.28	3.98
		Mathur				3.62
		Mattumanda	3.56	1.81	2.97	3.28
		Meenakshipuram	6.78	2.7	2.95	5.48
		Meenkara	6.6	1.2	1.52	4.07
		Melarkode	7.56	4.45	7.11	7.53
		Mochukundu		2.65	4.72	6.71
		Mundur	4.62	0.44	1.25	2.86
		Muthalamada1	7.2	3.06	3.13	4.28
		Naikarapadi			5.98	6.97
		Nellaya		5.82	2.82	7.92

PALAKKAD	**Dug Well**	Nemmara	2.81	1.32	1.79	2.53
		Odannur	7.4	2.5	4.96	4.06
		Ongallur		5.65	6.77	7.9
		Oothara		1.18	1.03	2.01
		Ottapalam	9.2	5.16	7.79	7.38
		Padur DW	7.02	3.24	4.02	4.15
		Palakkad	6.02	1.3	1.97	2.52
		Palamattom		4	5.38	7.62
		Palappuram-ii	8.82	6.97	5.97	7.76
		Palghat	9.3	3.8	5.72	7.52
		Pallathery	5.25	1.86	1.85	1.43
		Panayur	4.4	2.08	2.12	1.81
		Pattambi	5.83	2.67	4.39	6.53
		Pattanchery	3.93	1.61	2.78	2.03
		Peringode	9.38	7.27	8.47	9.47
		Peringottukurissu DW	6.33	3.46	3.58	4.07
		Perumatty1	5.45	3.66	2.8	3.02
		Pookkottukavu				5.58
		Pudhunagaram		1.7	3.16	5.26
		Pudhupariyaram	6.02	2.05	3.17	4.68
		Pulpally	4.55	0.6	1.44	1.45
		Punchapadam	8.49	6.04	6.32	6.82
		Ramakrishnapady	8.73	5.02	4.26	7.51
		Shoranur	6.22	5.27	5.27	6.13
		Sreekrishnapuram	9.12	7.04	7.52	8.33
		Tannirkod			7.65	7.79
		Tannirkod		4.61		
		Tenkara	2.31	1.37	1.47	2.24
		Thachanattukara	12.74	7.44	7.93	10
		Thachanpara	2.61	0.74	1.24	1.71
		Thirumittacode DW		2.16	4.44	5.63
		Thiruvegapuram	9.22	7.38	7.44	7.81
		Tholanur	3.87	2.3	3.1	2.42
		Trittala	5.02	7.71	7.48	4.37
		Ummini	6.3	3.22	4.67	4.55
		Vadakkancherry	4.23	2.7	3.32	5.16
		Vadanakkurissi	5.58	3.89	5.5	4.57
		Vallapuzha	7.32	2.18	2.96	5.14
		Vaniyamkulam	7.59	3.76	5.08	6.14
		Vannamada	7.35	3.26	3.47	4.62
		Velanthavalam		4.28	4.02	5.7
		Vilayur	7.19	3.71	4.2	5.19

PALAKKAD	**Dug Well**	Walayar	6.04	4.07	3.02	4.63
PATHANAMTHITTA	**Bore Well**	Chandanapally	1.43		0.29	
		Chetheckal	1.13	1.05		2.45
		Elanthoor	1.75	1.8	1.9	3.9
		Ezhamkulam	6.54	5.74	5.6	7.05
		Kadumeenchira Pz	15.5	12.9	14.8	16.4
		Kalleli Pz	4.21		2.65	4.75
		Koipuram Pz	11.83		12.1	11.9
		Kottangal Pz	2.24		9.2	2.6
		Kunnamthanam	3.75	0.2	1.85	3.45
		Malayalapuzha Pz	18.25		6.6	18.4
		Manthanam	11.27			9.9
		Ottathekku	5.34	0.9	4.15	5.25
		Pandalam		3.05	3.85	4.15
		Thayattumala	9.34	6.45	8.65	9.35
		Vallicode	3.37	2.55	3.25	2.75
PATHANAMTHITTA	**Dug Well**	Adoor (R2)	9.26	2.32	9.05	8.8
		Adoor Bypass				3.7
		Angadikkal		7.2	8.2	9
		Ankamuzhi	5.76	2.51	5.79	5.94
		Aruvapulam				4.2
		Athiringal (R1)	7.79	3.51	6.6	5.3
		Chalapally	1.82		3.05	2.1
		Cherukolpuzha (Airoor)	6		4	4.8
		Chethekkal	1.88	1.75	2	2.5
		Chittar (R1)	9.36	3.22	8.4	9.3
		Churakod	7.08	3.7	5.4	6.2
		Edakkulam	5.97	2.89	7.37	6.15
		Elanthur	2.44	2.08	2.1	2
		Elavumthitta	7.06	3.5	6.4	7
		Enathu	8.65	3.4	4.55	7.35
		Eraviperoor	2.85	1.25	5.25	6.1
		Ezhamkulam	6.86	4.8	5.6	7.05
		Ezhumattoor	3.83	3.85	3.8	4.7
		Kadambanad	3.71	2.6	4.45	6.95
		Kadammanitta	5.55	3.36	6.75	6.7
		Kadumeenchira	9.22	4.6	5.8	7.5
		Kaipattoor				6.8
		Kalanjoor	5.69	2.65	3.45	7.65
		Karikulam (R1)	2.34	1.6	3.8	3.6
		Kaviyur (R1)	10.53	6.2	9.2	9.2
		Kidanganoor	4.6	0.75	3.9	4.8

PATHANAMTHITTA	**Dug Well**	Kodumon		4.2		6.3
		Koipuram (R1)	6.92	2.97	7.3	8.47
		Konni	5.2	3.15	4.05	5.25
		Koodal	6.69	6.27	6.72	6.92
		Kottanadu	3.7	2.25	5.25	3.65
		Kottangal	1.47	1.77	3.05	1.9
		Kozhenchery	1.84	1	1.6	3.1
		Kuditha				8.87
		Kulanada			7.8	4.65
		Kumbanad	6.13	3.23	6.48	6.43
		Kumplampoika	2.24	2	2	2.45
		Kunnamthanam1		6.2	9.7	13.4
		Kuttoor	3.22	1.47	3.3	3.92
		Laha balawadi	2.3	2.4	2.4	2.9
		Laha peruman	9.9	9.4	9.7	9.9
		Malayalapuzha	5.28	3.7	5.65	6.6
		Mallapally	4	3	4.15	4.65
		Maniyar	4.91	2.4	5.2	4.7
		Mannadi	3.16	0.85	1.4	2.3
		Murani	2.87		2.8	2.3
		Muthoor	4.17	1.5	2.75	3.7
		Naduvathumuzhi	5.08	1.8		6.6
		Naranganam (R1)	3.4	1.9	1.9	1.51
		Nilakkal	5.75	4.47	5.47	5.47
		Omallur(R1)	8.28	4.75	7.85	8.25
		Pandalam Town	0.78	1.1	0.7	2.22
		Pandalam-1	4.19	1.45	4.55	3.95
		Paranthal	8.3	1.3		
		Pathanamthitta	1.53	1.45	3.75	4.75
		Pattazhi	6.75			
		Peringara (R1)	2.22	0.5	1.6	1.85
		Plappally	2.4	0.91	1.66	2.46
		Podiyadi	3.1	0.5	3.65	2.1
		Poothangara				5.2
		Prakkanam	5.66	2.95	8.2	6.2
		Pulikeezh	3.39	1.42	3.55	1.55
		Pullad	6.02	3.1	7.1	7.32
		Ranni i	5.74	2.3	1.5	3.15
		Ranni perunad	6.73		5.85	6.25
		Thadiyur	7.33	2.6	7.3	7.65
		Thannithodu	6.04	3.2	6.2	7.1
		Thatta (R1)	1.24	0.2	1.2	2.06

PATHANAMTHITTA	**Dug Well**	Thelliyur	8.3	5	7.3	7.55
		Thiruvalla		3.35	8.1	10.5
		Thumpaman	8.04	4.15	7.6	8.45
		Ullannur	6.67	4.3	7.1	7
		V Kottayam	8.53	4.7	6.7	9.3
		Vadasserikara	3.45	3.05	2.95	3.9
		Vaipur	1.28	1.87	1.4	1.3
		Valiakavu (Vakayar)				3.4
		Vallamkulam	5.06	2.45	4.05	5.35
		Vallikod	4.4	2.6	4.1	4.9
		Vechoochira	3.58	3.4	5.7	4.55
		Vennikulam	3.34	2.85	3.55	3.55
THIRUVANANTHAPURAM	**Bore Well**	Aralumoodu Pz			40	
		Ariyanadu Pz	5.28	3.59	6.07	7.03
		Attingal Pz	6.69	6.2	5.8	6.1
		Chengal Pz	16.71	16.85	13.07	14.05
		Kulathoor pz	16.26	16.8	12.2	
		Manambur Pz	12.78	10.68	11.97	12.02
		Mangalapuram Pz	21	16.3	18.95	18.98
		Mannanthala Pz	6.84		5.18	5.83
		Mithranikethan Pz		10.5	8.03	9.66
		Nemom Pz	14.05	13.55	3.95	3.57
		Pattom Pz	8.84	6.8	8.1	7.53
		Peringamala Pz	12.67	9.55	9.47	11.95
		Perumkadavila Pz	10.41		7.72	7.65
		Ponganadu Pz	7.4	6.3	2.55	
		Sreekariyam Pz	14		10.57	11.85
		Thattattumala	7.37	6.89	5.57	5.77
		Udayankulangara Pz				10.9
		Udayankulangara Pz			10.85	
		Vazhakkad Pz	9.25		10.01	10.01
		Vengod Pz	8.51	5.71	5.44	6.52
		Vilappilsala Pz	9.17	6.69	6.58	9.07
	Dug Well	Amboori	9.45	6.3	7.33	9
		Anappara	9.49	4	5.1	5.94
		Anjengo	0.75	0.05	1.25	0.9
		Aralumoodu	11.71	15.75	13.02	14.16
		Ariyanadu	4.25	3.3	3.89	5.44
		Arukannukuzhi	4.43	4.43	3.93	6.49
		Aruvikara	4.15	1.5	1.99	2.63
		Athazhamangalam	19.2	18	17.6	17.7
		Attingal	11.73	9.2	8.45	9.95

THIRUVANANTHAPURAM	**Dug Well**	Ayyankode	8.06		5.72	7.69
		Azhoor	12.34	9.85	7.49	11.22
		Balaramapuram(R1)	9.49	7.35	6.82	8.22
		Bharathanoor	9.62	6.07	6.15	7.62
		Changa	10.38	6.5	5.37	7.02
		Chaykottukonam	7.92	5.8	5.77	7.3
		Cheeranikara		4.7	5.29	7.32
		Chembur	11.47	7.25	7.7	9.23
		Chennampara	9.84	5.05	6.83	8.15
		Cherunniyur	15.76	14.3	13.05	14.55
		Chirayinkil	10.3	8.7	6.96	8.7
		Chittagode	6.48	5.48	5.99	6.36
		Chowara				19.9
		Chullimanoor	6.17	4.15	4.85	6.43
		Edavai	13.28	7.9	8.12	
		Ithye	6.26	4.5	7.13	7.74
		Kadakkavur(R1)	4.5	2.7	2.55	3.3
		Kallambalam(R1)	9.46	4.91	7.06	8.93
		Kallar		2.21	3.6	4.08
		Kallikkad	1.32	0.8	0.85	1.38
		Kandala	12.15	8.75	9.8	10.5
		Kanjiramkulam	60	55	60	
		Kanjiramkulam Church				21.36
		Kappil	10.6	9.5	10.63	11.16
		Karakulam	3.42	3.5	2.4	2.9
		Kariavattom	4.42	2.65	2.7	3.14
		Karinga	2.9	2.3	2.38	2.52
		Kattakkada	5.5	2.15	2.75	4.08
		Kazhakkuttom	3.8	2.55	2.63	2.8
		Kilimannor		3.84	5.34	6.95
		Kochuveli(R1)	2.53	1.7	2.36	2.95
		Korani	7.92	6.95	6.4	6.38
		Kulathur	12.44	10.76	9.81	10.76
		Madavur	12.01	8.3	8.86	10.15
		Malayadi	3.8	5.15	4.28	4.5
		Mangalapuram	20.37	18.85	18.52	18.73
		Mannanthala	8.04	5.5	6.3	7.6
		Maruthamala		3.71	6.16	7.51
		Meenangal	6.95		6.76	7.72
		Melvettoor	35.25	35.95	33.75	33.05
		Mulloor	20.81	14.66	24.85	20.2
		Murukumpuzha(R1)	3.62	2.15	2.51	3.11

THIRUVANANTHAPURAM	**Dug Well**	Muzhi	3.42	2.75	2.8	3.32
		Nagapuram	18.56	15.76	14.51	15.96
		Nanniyode	4.41	2.75	3.32	3.15
		Navaikulam	13.32	11.5	8.68	10.5
		Nedumangad	10	8.05	7.45	8.02
		Nemom	4.95	1.9	2.75	4.31
		Neyyattinkara	13.68	11.7	11.71	12.35
		Ookod	10.11	7.7	10.1	10.53
		Ottashekharamangalam	4.05	3.95	4.03	3.1
		Palayamkunnu	16.2		9.4	11.6
		Palode	3.87	2.6	3.05	3.8
		Pangode	8.21	4.08	4.95	5.8
		Parandakuzhi		5.85	11.9	13.75
		Parandod	3.4	1.5	3.86	4.82
		Parassala	1.49	2.05	2.15	1.35
		Peringamala	8.57	4.95	7.4	8
		Perumathura	1.75	2.75	1.87	2.05
		Perumgulam		4.65	7.25	7.6
		Perumkuzhi	4.12	3.03	2.78	3.4
		Perunkadavila	14.16	13.85	11.48	
		Pirappankod		5.2	4.43	8.82
		Ponganadu	6.8	4.3	4	5
		Ponmudi(R1)	4.02	3.3	3.94	4.03
		Poonkulam			14.68	16
		Poonthura	3.11	2.8	3.26	2.68
		Poovachal		12.1	11.15	11.93
		Poovar-ii	24	22.4	20	22.5
		Pothencod	11.3	9.68	8.77	9.52
		Pozhiyoor(R1)		4.35	8.29	4.67
		Pudukurichi	2.95	2.14	3.19	3.3
		Pulluvila	53	55	56.5	55.8
		Puvar School	6.07			
		Sasthanthala	4.52	2.97	4.2	4.22
		Sasthavattom	5.83	1.8	2.22	3.57
		Shankaramugham	6.31	3.49	5.48	5.95
		Tekkada	4.2	3.5	2.81	3.76
		Tholicode	8.42	4	6.1	6.98
		Thonakkal	18.44	11.85	7.67	14.97
		Thumba	3.53	2.7	3.03	3.57
		Trivandrum	16.74	13.25	10.67	16.59
		Udyankulangara	12.24	9.75	11.1	
		Uzhamalakkal	6.67	3.6	2.54	3.86

THIRUVANANTHAPURAM	**Dug Well**	Vakkom	5.65	3.85	2.96	3.64
		Valakkad	10.96	9.81	9.3	9.74
		Vamanapuram	3.08	1.5	2.2	2.93
		Varkala	15.21	11.36	12.86	13.54
		Vattapara	11.02	8.55	7.43	8.51
		Vattavila	7.99	7	10.05	8.46
		Vazhichal	6.4	5.6	4.71	5.93
		Veeranakavu	4.6	4.4	4.53	5.05
		Vellanad		3.8	4.88	5.55
		Vellarada(R1)	4.9	2.9	3.68	4.83
		Venganoor				19.79
		Vengod				6.7
		Venjaramoodu	10.78	7.3	7.9	9.03
		Venpakal	7.98	8.6	8.49	8.72
		Veyloor	26.38	26.72	25.72	25.32
		Vilapilshala	9.54	8	6.5	7.4
		Vithura	8.32	6.22	7.42	8.86
		Vizhinjam	0.95	1.05	1.12	0.88
THIRUVANANTHAPURAM	**Tube Well**	Edava	18	13.28	13.92	14.77
	Tube Well	Varkala Deep	18.85	20.65	19.75	20.05
		Varkala(shallow)	18.27	16.52	16.58	17
THRISSUR	**Bore Well**	Arimpur	8	4.19	5.57	6.45
		Ayyanthole	10.53	4.22	5.6	
		Chelakara Pz	7.09		2.96	3.6
		Chowannur	19.83	19.5	16.33	21.69
		Desamangalam	7.62			
		Kodakara	12.47	9.71		
		Madakkathara Pz	6.55			
		Mapranam	13.84	10.75	11.27	12.4
		Palakal	11.29	7.21	8.36	10.37
		Poyya (poopathy)	10.2	7.11	8	9.25
		Ramavarmapuram	23.4	27.52	22.13	15.15
		Vandarapalli	7.58		7.33	7.9
		Velloor		6.84		14.05
		Velur		6.51	10.15	13.97
	Dug Well	Adatt	12.75	11.35	11.62	12.02
		Akalad	4.03	2.71	2.95	3.6
		Amballur	7.28	5.35	6.97	7.4
		Annamanda	5	2.88	3.32	4.4
		Arimpur1	4.02	3.25	3.25	3.25
		Athani	8	1.67	6.62	7.47
		Athani Parambu				1.54

THRISSUR	**Dug Well**	Attoor	7.59	6.8	7.68	
		Ayyanthole DW	11.82	7.65	9.95	11.8
		Azhikode	1.51		0.54	
		Azhikode1	1.81	1.33	1.29	1.79
		Chalakudi	9.22	7.44	8.05	8.58
		Chammannur	3.99	2.24	2.17	3.55
		Chavakkad	5.07	1.22	1.24	2.22
		Chelakara	6.82	2.15	2.02	3.55
		Chelakod	3.43	1.85	2.25	2.37
		Cherenkonam	6.06	3.12	3.87	4.99
		Cherpu	9.65	6.45	6.97	7.52
		Cherukunnu	5.65	2.35	3.3	4.62
		Cheruthuruthi (R1)				6.4
		Cheruthuruthi1	5.43			
		Choondal	9.32	6.77	7.7	8.62
		Deshamangalam				7.9
		Deshamangalam			6.67	
		Dyyal Ambalam Jn		6.7	8.05	8.62
		East Fort	8.55	6.48	7.88	8.32
		Echipara	7.5	3.55	1.98	2.88
		Edamuttom	3.06	0.15	0.64	1.42
		Edathrinji	0.84	0.57	0.68	0.85
		Engandiyur-R1	3.87	1.8	1.91	2.8
		Eriyad	1.85	2.1	1.19	3.3
		Eriyad1	1.85			1.35
		Erumapetty	9.78	5.67	5.91	7.33
		Guruvayur	1.74	1.24	0.92	2.26
		Irinjalakuda	8.84	2.95	6.42	7.65
		Irinjalakuda1	4.67	3.35	3.97	5.32
		Kallettumkara	4.26	3.93	4.54	4.1
		Kallumpuram	8.41	7.3	7.55	8.3
		Kallur	9.65	7.05	7.7	7.95
		Kanjirapally	4.75	3.88	4.44	4.55
		Kannara		5.65	7.6	4.95
		Karikkad	8.79	4.18	6.77	7.75
		Karuppadanna	3.26	0.56	0.8	1.73
		Kattakampala	13.76	10.58	10.75	11.25
		Kattoor	8.18	3.12	4.07	5.6
		Keecheri	8.6	6.94	7.1	7.75
		Killimangalam	7.43	6.3	5.73	7
		Kizhakkumuri	6.84	6.53	6.65	7.15
		Kodacherry	1.48	2.59	3	1.28

THRISSUR	**Dug Well**	Kodakara1	9.82	6.44	7.03	7.87
		Kodali	7.08	4.43	5.57	
		Kodungallur1	3.56	2.75	2.88	2.97
		Konnakuzhi-i	5.36	5.71	7.3	6.3
		Konnakuzhi-ii	4.51	4.38	5.62	5.54
		Konnakuzhi-iii	1.87	2.79	2.93	1.82
		Kottappadi	4.65	0.7	0.6	1.52
		Kundannur	6.69	0.7	0.65	2.45
		Kunnamkulam	7.42	6.78	6.82	6.8
		Kurancherry	6.64	1.93	4.04	5.53
		Kuttanellur	9.07	7.25	8.44	8.82
		Logamalleswaram	3.25	1.84	2.03	2.42
		Mala	9.71	6.79	6.99	8.64
		Manalur	3.32	0.73	0.9	1.9
		Manamangalam	5.12	4.63	5.3	4.7
		Mannuthy		1.48	4.85	1.41
		Mapranam1		9.93	10.58	11.5
		Mathilakom (R1)	3.79	2.22	2.79	3.4
		Mattathur	7.3	4.85	6.8	7.65
		Methalpadam	1.88	0.68	0.78	1.15
		Mulankunnathukavu	7.02	4.95	6.05	6.48
		Mullassery	6.32	3	3.1	1.4
		Mullurkara(Vazhathodu Jn)	6.67	2.5	2.84	4.55
		Mundur	8.14	7.45	7.86	7.93
		Mupliyam	7.84	3.95	4.95	7.47
		Muringur	7.78	4.9	5.97	7.2
		Muriyad	8.68	6.3	8.03	8.35
		Nandipulam	7.02	4.13	6.36	7.02
		Nellai	4.67	3.95	4.95	4.55
		Olarikara	11.06	7.23	7.91	8.97
		Ollur	8.92	6.1	7.44	8.35
		Orumanayur	3.34	1.1	1.08	2.24
		Padakulam	3.7	1.68	1.9	2.65
		Palakkal			7.22	9.85
		Palayamthuruthu	1.16	0.58	0.85	1.18
		Pallichira		3.97	4.4	4.75
		Pallikandam				1.72
		Pallikunnu	9.05	6.42	7.22	8.4
		Pappali				3.9
		Parappukara	5.94	3.5	4.05	4.45
		Parappur	10.82	8.05	8.85	9.82
		Pariyaram	7.03	11.16	12.15	13.2

THRISSUR	**Dug Well**	Pattikad	1.59	1.54		
		Pavaratty1	3.57	0.92	1.39	2.4
		Pazhayannur	6.39	2.1	4.27	5.81
		Pazhuvil	10.38	7.56	9.14	9.82
		Perambra	6.44	4.99	2.26	6.82
		Perinjanam (R1)	2.27	1.47	0.95	2.1
		Perumpilavu Junction	9.96	6.82	9.26	9.8
		Potta	2.55	2.05	3.02	1.25
		Poyya	13.92	7.53	8.04	12.6
		Pudukad1	2.94	1.73	1.93	2.4
		Pullikanni	3.92	0.46	1.12	1.95
		Punnayoor	5.42	2.55	2.9	4.22
		Puthenchira	9.95	7.64	8.2	8.75
		Ramanchetty	5.87	3.1	3.83	4.47
		Tekkumkara	8.37	5.55	6.15	7.35
		Trichur	7.02	6.04	6.33	6.88
		Triprayar	4.38	1.95	2.65	3.4
		Vadanapalli				1.54
		Vaniyampara	5.52	1.17	2.09	3.82
		Varavur	6.65	4.75	6.4	6.25
		Vellanikara	4.16	1.59	2.33	2.9
		Vellikulangara	5.27	4.4	5.05	4.7
		Vellur	8.7	6.15	6.5	6.8
		Velupadam	5.88	3.38	4.3	
		Vettikkattiri	7.5	2.02	4.92	7.07
		Viyyur	4.87	1.92	2.25	2.4
		Wadakkanchery	11.86	9		10.4
	Tube Well	Arattukadavu	1.34		0.73	0.83
		Engandiyur1	4.67	2.64	2.72	
WAYANAD	**Bore Well**	Kottathara	3.8	3.15	3.49	3.53
		Kuppadi(east)	19.7	17.4	15.31	15.33
		Pookode	2.3	1.4	2.41	2.2
		Poothady	8.15		5.72	
		Pozhutana1	2.8		2.94	3.27
		Ullissery(w)	1.4		0.33	0.67
		Valliyurkavu(e)	2.15	0.32	1.2	1.16
		Valliyurkavu(w)	2.1	0.45	1.22	1.23
	Dug Well	Ambalavayal	7.9	3.15	9.12	9.07
		Appapara	5.85	2.15	3.02	3.4
		Arimula	9.2	5.85	8.04	7.38
		Baveli				5.12
		Begur	8.8	8.55	8.24	8.5

WAYANAD	**Dug Well**	CC Junction			9.52	9.78
		Cheenkeri	7.75	4.9	5.52	6.83
		Chellakod			7.1	7.49
		Chenad	15.7	15.7	14.41	14.18
		Cheyyambam	2.6	1	1.92	3.7
		Chulliyod			11.66	12.59
		Dasanakkara	2.7	2.5	4.24	5.15
		Kalpetta-R1	2.85	1.05	2.39	2.9
		Kamblakat	16.9	13.25	15.62	16.16
		Kanjirangad				1.87
		Kappiset			6.09	8
		Karani			6.26	6.57
		Kattikulam	4.4	7.09	4.32	6.45
		Kavumandam	5.9	5.4	5.58	5.62
		Kellur -5th Mile	14.2	0.9	4.75	6.89
		Koliyadi	2.85	0.82	1.21	1.37
		Koodal Kadavu	15.6	13.6	14.78	15.1
		Koroth	3.45	1.75	2.56	2.71
		Kottathara	3.8	3.15	4.06	4.48
		Kottavayal	4.2			4.03
		Krishnagiri	4.75	0.77	3.75	4.2
		Kuppadi	16.5	15.4	14.34	14.74
		Lakkidi	1.4	0.65	0.94	1.18
		Mampayil	2.48	0.7	2.76	2.91
		Manjapara	9.6	5.37	6.39	7.1
		Mannanthody	7.65	4.1	6.13	6.93
		Melaputhenkunnu	13.75	11.55	11.99	12.23
		Meppady	17.8	14.2	16.82	17.56
		Minangadi	5.75	3.95	5.37	1.17
		Moolankavu	7.35	4.83	5.32	6.17
		Mullankolly				2.62
		Muthunga	3.65		2.66	2.61
		Muttil	2.65	1.15	2.07	2.03
		Nadavayal	6.7	2.75	3.89	4.17
		Naykatti	5.45		4.37	4.52
		Nedugarana	8.45	6.3	6.87	7.5
		Neervaram	14.85	9.36	12.52	13.79
		Nenmeni Kunnu	2.2	1.6	2.03	2.28
		Noolpuzha			2.11	
		Noolpuzha (R1)	3.25	1.45	2.31	2.76
		Ondyangadi	7.7	6.8	9.57	10.02
		Pachilakkad				7.07

WAYANAD	**Dug Well**	Padinjarattara	8.85	4.6		7.73
		Pakkam				4.58
		Panamaram	3.65	2.55	2.82	2.9
		Pattanikoopu	9.1	5.4	6.12	7.1
		Perikallur	13	5.4	7.82	10.32
		Perya	5.5	1.12	5.28	5.31
		Pookode1	2.25	1.05	2.26	2.45
		Pozhutana	6.4	5.58	6.31	6.17
		Pulpally	1.6	0.6	1.44	0.4
		Punchvayal	11	5.5	7.68	8.6
		Puthadi	10.2			
		Puthadi		4.4		
		Sulthan Battery	7.1	2.1	3.82	6.88
		Talapuzha	2.2	0.5	1.12	1.2
		Taruvana	10.6	6.4	8.38	9.1
		Thetrode	11.3	7.75	9.06	9.7
		Thirunelly	6.45	3.9		
		Thirunelly (R1)	5.95	1	4.83	5.26
		Tholpetty	8.6	4.7	3.11	4.52
		Thonichal	5.92	2.72	4.9	5.01
		Ullisseri	3.2	0.45	1.13	1.54
		Uppupara				6.97
		Vaduvanchal	9.15	7.75	8.29	8.44
		Valad (R1)				10.01
		Valatt	10.8	4.45	9.78	
		Vallathur	1.35	1.1	1.12	1.38
		Vallithodu (Periye)				7.65
		Varayal	4.05	1.75	4.23	3.99
		Vayittiri	7.5	6.4	7.22	7.1
		Vellamunda	5.4	6.75	4.58	4.83
		Vengapalli	14.7	8.7	12.83	14.2
		Vilambukandam			14.85	

Annexure II

Chemical Analysis Data of Water
Samples Collected from GWMW's during April and November 2010

Alleppey District

Sl. No.	Location	Month	pH	EC in µS/cm at 25^0C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Alleppey	April	8	179	52	14	4.4	14	1.9	0	66	4.5	24	0.17	1.4
		November	-	134	38	10	2.9	7.6	2.3	-	-	3.7	9.9	0.08	3.2
2	Aranootimangalam	April	7.77	135	28	9.6	0.97	12	1.3	0	39	7.4	17	0.04	2.8
		November	7.41	119	24	8.8	0.49	11	1.7	0	22	4.6	18	0.14	12
3	Arukutti	April	8.64	181	56	18	2.4	12	2.1	4.8	24	30	20	0.21	1.8
		November	-	200	48	18	0.97	9.7	2.1	-	-	6.5	7.1	0.09	2.9
4	Chandirur	April	7.96	198	62	22	1.9	14	3.4	0	90	8.3	20	0.02	1.4
		November	8.49	470	68	24	1.9	74	3.5	4.8	78	9	105	0.08	0.64
5	Chettikulangara	April	-	149	46	14	2.4	8	2.2	-	-	16	11	0.11	0.9
		November	8.23	166	60	21	1.9	9.7	2.1	0	80	9.2	11	0.02	0.7
6	Edathuva	April	-	270	56	8.8	8.3	32	3.8	-	-	14	43	0.25	3
		November	8.55	173	34	13	0.49	23	7.7	4.8	49	9.9	23	0.2	4.2
7	Haripad	April	8.29	167	44	14	2.4	-	-	-	-	-	14	0	1.2
8	Idakkunnam	April	6.86	56	6	1.6	0.49	8.2	1.2	0	9.8	0.84	11	0.08	4.6
		November	6.95	85	14	4.8	0.49	9.8	1.1	0	9.8	0.38	17	0.04	12
9	Kaidavana	April	8.65	220	68	22	3.4	-	-	-	-	-	14	0.33	5.6
10	Kallissery	April	7.86	53	16	5.6	0.49	3.3	0.9	0	20	1.2	5.7	0.04	0.71
		November	-	62	16	5.6	0.49	4.6	1	-	-	3.2	7.1	0.03	0.59
11	Kandiyoor	April	7.89	210	52	19	0.97	-	-	-	-	-	38	0.16	2.5
12	Karuvatta	April	8.39	720	95	28	6.1	-	-	-	-	-	139	0.38	2.6
13	Kattanam	April	6.84	38	6	2.4	0	3.8	0.7	0	4.9	0.92	7.1	0.17	2.9
		November	7.07	39	12	3.2	0.97	3.3	0.1	0	7.3	0.48	7.1	0.05	1.5

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
14	Kattoor	April	8.19	109	42	15	0.97	3.8	3	0	56	6.4	7.1	0.09	2.2
		November	8.1	107	48	17	1.5	3.1	0.9	0	66	0.48	5.7	0.2	2
15	Kayamkulam	April	8.18	280	80	24	4.9	20	7	0	76	17	45	0.17	0.55
		November	8.18	210	58	18	3.4	22	7.4	0	78	18	21	0.08	0.7
16	Kuzhamathu	April	5.98	116	14	3.2	1.5	-	-	-	-	-	20	0.02	14
17	Mavelikara	April	-	290	54	20	0.97	17	8.2	-	-	16	26	0	21
		November	8.73	179	38	13	1.5	15	7.9	9.6	44	12	20	0.12	3
18	Muttam	April	-	490	50	7.2	7.8	-	-	-	-	-	51	0.32	2.9
19	Nedumudi	April	-	600	60	10	8.5	-	-	-	-	-	128	0.59	2.2
20	Neerkunnam	April	-	116	36	10	2.4	-	-	-	-	-	9.9	0	3.8
21	Nooranad	April	6.67	25	4	0	0.97	3.2	0.6	0	4.9	1.6	5.7	0.05	1.1
		November	7	54	18	4.8	1.5	3.8	0.7	0	20	1.3	7.1	0.13	4
22	Oachira	April	8.26	164	50	18	1.5	-	-	-	-	-	8.5	0.05	2.9
23	Pacha	April	-	1080	85	8	16	-	-	-	-	-	220	0.09	5.1
24	Pallarimangalam	April	-	94	32	9.6	1.9	-	-	-	-	-	2.8	0.29	3.8
25	Parumala	April	7.68	49	12	4	0.49	4.7	0.4	0	12	1.4	7.1	0	3.3
		November	6.61	40	8	2.4	0.49	4.9	0.2	0	4.9	0.39	8.5	0.01	0.46
26	Pattanakkad	April	-	119	30	10	0.97	7.9	2.9	-	-	9.5	11	0.05	3.3
		November	8.34	178	68	23	2.4	7.5	2.3	4.8	85	8.6	9.9	0.1	2.8
27	Pattiyur	April	-	1060	140	32	15	-	-	-	-	-	181	0.23	14
28	Purakkad	April	-	350	72	18	6.3	40	10	-	-	2	52	0.1	2.3
29	Ramankari	April	8.59	188	46	12	3.9	18	4.4	7.2	54	14	26	0.08	0.69
		November	8.04	250	74	15	8.8	27	4.4	0	105	3.2	40	0.06	1.2
30	Sherthalai	April	8.14	690	100	26	8.5	-	-	-	-	-	146	0.27	1.3
31	Taikattusseri	April	8.12	186	62	22	1.9	8.3	4.7	0	68	18	16	0.1	4.5
		November	-	134	40	14	1.5	10	2.6	-	-	12	16	0.25	3.6
32	Thakazhi	April	-	980	82	11	13	168	11	-	-	114	60	0.43	4.2
		November	-	195	28	9.6	0.97	26	2.8	-	-	16	28	0.14	2.4
33	Thamarakulam	April	6.95	72	16	3.2	1.9	7.6	1.2	0	9.8	3.9	16	0.05	0.73
		November	7.57	86	12	4.8	0	9.4	1.6	0	9.8	2.7	18	0.01	3.5
34	Thevery	April	8.29	340	110	23	13	27	5.9	0.01	112	44	33	0.15	0.68

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	7.92	116	50	18	0.97	4.9	0.5	0	73	2.4	2.8	0.08	0.32
35	Thuravur	April	-	199	42	14	1.5	18	5.8	-	-	17	31	0.02	2.8
		November	-	230	40	12	2.4	20	11	-	-	27	24	0.12	2.1
36	Valavanad	April	-	99	26	9.6	0.49	6	4.2	-	-	2.1	11	0	1.9
		November	7.82	106	38	10	2.9	6.6	2.8	0	46	5.2	11	0.06	2.5
37	Vallikunnam	April	8.06	280	62	23	0.97	17	17	0	85	14	21	0.09	29
		November	-	164	44	16	0.97	9.1	9	-	-	16	9.9	0.1	13
38	Venmani(Thazhakam)	April	-	230	32	10	1.5	26	1.7	-	-	16	31	0.29	1.2
		November	8.77	133	28	8.8	1.5	23	1.3	7.2	37	8.1	14	0.17	1.4

ERNAKULAM DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^0C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Aikaranad	April	6.9	26	6	1.6	0.49	-	-	-	-	-	5.7	0.03	1
2	Aluva	April	7.52	71	24	7.2	1.5	-	-	-	-	-	5.7	0.19	2.3
3	Anchalpetty	April	7.33	81	16	4.8	0.97	6.2	1.4	0	7.3	2.7	14	0.12	8.3
		November	6.68	111	24	8	0.97	7.8	2	0	7.3	2.4	14	0.01	20
4	Angamali	April	7.59	270	48	15	2.4	19	7.5	0	15	12	34	0	45
		November	7.84	310	64	21	2.9	19	8.6	0	27	18	34	0	47
5	Attara	April	6.92	36	8	1.6	0.97	2.7	0.6	0	4.9	3.7	4.3	0.15	4.3
		November	-	40	10	2.4	0.97	2.8	0.8	-	-	1.3	5.7	0.06	6.7
6	Chalakka	April	-	310	18	5.6	0.97	-	-	-	-	-	44	0.22	3
8	Chengamanad	April	7.33	118	24	6.4	1.9	8.2	3	0	9.8	0.11	18	0.12	19
		November	6.28	119	18	4.8	1.5	9	2.6	0	15	0.22	17	0.07	11
9	Chowara	April	7.02	60	22	7.2	1	-	-	-	-	-	5.7	0.19	2
10	Edapally	April	-	360	68	25	1.5	23	8.5	-	-	14	45	0.34	4.8

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	-	176	-	-	-	-	-	-	-	-	-	-	-
12	Edakkattuvayal	April	7.53	57	10	3.2	0.49	-	-	-	-	-	5.7	0.08	3.1
13	Elur North	April	-	2000	155	26	22	-	-	-	-	-	576	0.56	3.5
14	Illithode	November	-	133	32	12	0.49	3.8	0.9	-	-	1.9	7.1	0.06	3.4
15	Koothattukulam	April	7.25	65	20	5.6	1.5	3.1	1.1	0	9.8	1.8	8.5	0.1	1.8
		November	7.41	172	30	9.6	1.5	11	13	0	20	7.5	21	0.04	21
16	Kothamangalam	November	7.25	67	16	5.6	0.49	5.2	1.5	0	15	2.7	8.5	0	4.9
17	Kottapuram	April	7.87	121	24	7.2	1.5	8.2	4.4	0	24	12	13	0.16	0.86
		November	-	167	36	13	0.97	12	5	-	-	13	17	0.03	2.2
18	Kumbalangi	April	-	173	24	9.6	0	13	5.4	-	-	15	14	0.16	1.4
		November	8.84	280	122	46	1.9	3.9	2.4	9.6	122	6.6	4.3	0.15	3.4
19	Malayattur	April	7.26	83	22	5.6	1.9	-	-	-	-	-	7.1	0.2	3.6
20	Malipuram	April	8.26	240	74	25	2.9	16	2.7	0	85	3.1	30	0.25	3
		November	-	280	46	16	1.5	10	3.7	-	-	3.7	20	0.12	1.6
21	Mallussery	April	6.89	122	14	4.8	0.49	11	3.1	0	4.9	1.1	23	0.23	14
		November	6.65	90	14	4	0.97	7.5	2.4	0	2.4	0	17	0.07	9.4
22	Mulanthuruthi	April	7.48	58	16	5.6	0.49	3.3	1.2	0	20	2	7.1	0.12	0.19
		November	7.43	131	24	9.6	0	10	1.3	0	9.8	2.2	18	0.19	23
23	Munambam	April	-	380	60	13	6.8	41	8.2	-	-	31	68	0.36	2.9
		November	-	360	78	28	1.9	5.7	2.1	-	-	0	2.8	0.37	3.4
24	Muvattupuzha	April	8.59	240	70	20	4.9	5.1	10	4.8	34	30	17	0.02	8.6
		November	7.7	230	78	23	4.9	6.8	7.9	0	46	23	16	0.12	17
25	Neriyamangalam	April	8.03	88	32	10	1.5	1.9	1.1	0	34	0.97	7.1	0.03	0.55
		November	7.2	68	22	7.2	0.97	2.7	1.4	0	20	1.5	4.3	0	6.8
26	Oonukkal	April	8.98	290	66	14	7.8	28	2.4	12	56	53	4.3	0.27	0.53
		November	6.87	86	26	8	1.5	3.2	1.2	0	4.9	5.7	9.9	0	18
27	Pambukuda	April	7.33	83	16	5.6	0.49	6.1	4.3	0	7.3	3.4	11	0.11	16
		November	7.53	80	18	4.8	1.5	4.7	3.2	0	9.8	1.7	9.9	0.19	13
28	Palakuzha North														

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	7.06	79	14	4	0.97	6.1	3.9	0	7.3	0.97	13	0	8.9
29	Parakadavu	April	8.23	380	98	25	8.8	-	-	-	-	-	48	0.35	0.56
30	Perumbavur														
		November	7.97	290	92	27	5.8	10	12	0	71	30	20	0.04	14
31	Perumbadavam	April	-	54	14	4	0.97	4.1	1.7	-	-	0	8.5	0.25	1.2
		November	6.56	28	6	1.6	0.49	3.2	0.2	0	4.9	0.75	5.7	0	3.1
32	Piravom	April	-	126	22	6.4	1.5	9.2	3.9	-	-	2.7	18	0.36	8.7
		November	6.8	66	12	3.2	0.97	6.9	1.2	0	12	1.3	11	0.13	5.6
33	Punithura	April	8.01	157	60	20	2.4	6.2	1.3	0	59	4.9	14	0.33	1.7
		November	-	145	40	15	0.49	4	1.7	-	-	14	5.7	0.12	1.3
34	Puthenkurisu	April	6.86	60	12	4.8	0	4	0.7	0	7.3	2.2	5.7	0.11	7.6
		November	7.5	75	18	5.6	0.97	4.7	0.8	0	4.9	3	11	0.03	12
35	Puthotta	April	7.97	260	78	24	4.4	-	-	-	-	-	27	0.23	7.1
36	Ramamangalam	November	7.65	62	12	4	0.49	4.4	1.9	0	4.9	1.2	8.5	0.04	7.3
37	Sirukadapuram	April	8.45	390	118	20	16	-	-	-	-	-	62	0.26	1.6
38	Sulli	April	7.06	58	16	5.6	0.49	-	-	-	-	-	5.7	0.05	2.4
39	Tripunithura	April	7.97	430	116	40	3.9	-	-	-	-	-	40	0.3	21
40	Vallom	April	6.97	192	22	4.8	2.4	-	-	-	-	-	26	0.2	35
41	Vazhakulam North	April	7.14	55	16	4.8	1	-	-	-	-	-	7.1	0.15	2.3

IDUKKI DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^0C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Adimali	April	7.02	176	26	8	1.5	15	3.4	0	4.9	4.1	30	0.36	28
		November	6.25	187	24	6.4	1.9	19	3.9	0	2.4	0.83	31	0.35	29

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2	Anakkara	April	7.63	91	30	10	0.97	2.7	1.6	0	37	2.4	5.7	0.16	4.4
		November	7.74	100	38	14	0.97	3.1	1.7	0	54	0.46	5.7	0.46	2.8
3	Chinikuzhi	April	7.33	91	26	8.8	0.97	-	-	-	-	-	7.1	0.12	2.4
4	Churuli	April	8.44	105	38	10	2.9	5	1.2	4.8	46	2	7.1	0.13	0
		November	7.64	74	22	5.6	1.9	5	1.2	0	39	1	4.3	0.52	0.77
5	Elapara	April	6.97	176	38	11	2.4	8.9	3.6	0	20	3.2	24	0.11	22
		November	7.52	149	38	12	1.9	8.9	4.7	0	37	4.4	18	0.45	10
6	Idukki	April	7.63	64	14	4.8	0.49	4.7	1.2	0	22	2	7.1	0.18	0.84
		November	7.21	58	12	3.2	0.97	5.9	0.9	0	20	1	7.1	0.44	3.2
7	Kaliyar	April	7.13	198	44	11	3.9	12	5.4	0	22	11	26	0.15	27
		November	7	210	48	12	4.4	13	6.6	0	12	3	30	0.48	42
8	Kanchiyar	April	7.68	271	96	13	16	4.7	2.6	0	76	0.94	27	0.32	28
		November	7.91	153	56	14	5.4	6.4	1.8	0	73	0	13	0.57	6.1
9	Karimkunnam	April	7.42	251	58	17	3.9	11	7.1	0	39	8.9	28	0.16	26
		November	7.19	66	14	4	0.97	4.5	4.1	0	22	2.9	7.1	0.45	5.2
10	Karumannoor	April	7.36	115	28	8	1.9	-	-	-	-	-	18	0	4.2
11	Kattapana	April	5.32	749	130	28	15	52	16	0	0	1.2	107	0.18	173
		November	4.71	590	104	24	11	46	20	0	0	0.37	89	0.78	133
12	Koilkadavu	April	7.77	246	66	17	5.8	13	4.6	0	68	13	26	0.33	11
		November	7.89	270	74	18	7.3	19	5.7	0	66	11	27	0.74	31
13	Kulamavu	April	7.42	156	32	7.2	3.4	11	2	0	12	0.29	24	0.09	31
		November	6.49	116	24	4.8	2.9	7.3	2.9	0	4.9	0	17	0.48	30
14	Kumili	April	8.19	520	140	26	18	-	-	-	-	-	78	0.36	10
15	Kuttikanam	April	6.81	49	14	3.2	1.5	2.3	1.6	0	9.8	1.7	5.7	0.1	5.1
		November	6.97	54	12	4	0.49	3.1	2.2	0	9.8	1.5	7.1	0.44	7.6
16	Marykulam	April	7.16	64	18	3.2	2.4	3.5	2.5	0	17	1	8.5	0.14	9.3
		November	7.42	47	12	3.2	0.97	3.8	0.9	0	17	0	7.1	0.38	0
17	Moolamattom	April	7.29	128	34	10	1.9	6.7	0.7	0	27	4.7	14	0.17	15
		November	7.15	80	24	5.6	2.4	5.3	0.6	0	20	0.93	9.9	0.44	10

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
18	Munnar	April	7.33	80	18	5.6	0.97	4.8	3	0	15	1.3	8.5	0.25	16
		November	7.29	97	20	6.4	0.97	6.7	2.7	0	20	1.5	11	0.48	12
19	Nedumkandam	April	7.3	298	72	22	3.9	18	3.1	0	61	4.7	58	0.2	1.7
		November	7.75	340	90	29	4.4	27	3.6	0	76	3.8	65	0.43	1.2
20	Nirmala City	April	7.82	106	26	5.6	2.9	5.5	1.8	0	22	5.8	11	0.2	7.7
		November	7.4	82	18	4	1.9	5.9	0.9	0	24	0.46	11	0.43	0
21	Pambadumpara	April	-	152	32	8	2.9	12	1.8	-	-	4.6	20	-	7.3
		November	7.17	143	34	7.2	3.9	10	3.3	0	29	1.7	17	0.37	16
22	Peruvanthanam	April	7.03	59	14	3.2	1.5	3.7	1	0	9.8	1.5	7.1	0.52	8.6
		November	6.99	48	12	3.2	0.97	3.3	0.9	0	9.8	0	5.7	0.54	9.5
23	Poopara	April	7.58	635	150	38	13	41	10	0	61	12	96	0.2	121
		November	7.78	350	90	23	7.8	26	8.7	0	90	14	37	0.62	39
24	Thodupuzha	April	7.61	145	36	10	2.4	-	-	-	-	-	16	0.28	24
25	Thumbachi	April	7.21	63	18	6.4	0.49	3	1.4	0	22	2.2	5.7	0.21	3.6
		November	7.38	51	14	4.8	0.49	2.8	0.6	0	22	0.1	2.8	0.5	3.2
26	Udumbanchola	April	7.04	328	66	18	5.4	-	-	-	-	-	81	0.27	55
27	Valara	April	7.37	103	30	8.8	1.9	3.9	3.3	0	27	1.9	9.9	0.39	11
		November	7.24	79	16	4.8	0.97	4.3	5.1	0	12	0	11	0.46	9
28	Vaden	April	7.74	339	70	20	4.9	-	-	-	-	-	43	0.25	8.6
29	Vallakadavu	April	7.62	164	46	10	4.9	9.6	2.6	0	73	3	9.9	0.23	8.5
		November	7.75	169	52	14	3.9	11	3.7	0	88	3.6	11	0.48	2.5
30	Vandiperiyar	April	7.1	756	105	22	12	-	-	-	-	-	110	0.17	128
31	Vellathuval	April	7.47	70	18	5.6	0.97	5.5	0.9	0	34	0.84	4.3	0.19	1.6
		November	7.2	49	12	4	0.49	4.3	0.9	0	20	0	4.3	0.53	1.3
32	Vellilamkandam	April	7.16	63	10	3.2	0.49	-	-	-	-	-	11	0.04	0.41
33	Vazhuthala	April	7.39	56	14	4	0.97	3.2	0.7	0	15	2.1	7.1	0.19	0.06
		November	7.33	59	14	4.8	0.49	4.1	0.9	0	20	0.1	7.1	0.46	0.58

KANNUR DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^{0}C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Aralam	April	7.63	34	10	1.6	1.5	2.8	0.2	0	12	0	2.8	0	0.21
		November	7.45	34	10	3.2	0.49	2.6	0.2	0	12	0.00	5.70	0.00	0.00
2	Kannur	April	7.77	152	38	11	2.4	-	-	-	-	-	13	0.50	0.30
3	Chakkarakkallu	April	7.15	111	14	4	0.97	-	-	-	-	-	20	0.18	18
4	Chepparapadavu	April	7.43	66	20	3.2	2.9	4.8	0.4	0	17	1.00	9.90	traces	4.40
		November	7.19	64	20	4.8	1.9	4.6	0.5	0	24	0.00	8.50	0.00	4.40
5	Cheleri	April	9.43	42	8	3.2	traces	2.4	0.8	-	-	traces	5.70	0	3.80
		November	6.51	30	6	1.6	0.49	2.8	0.4	0.00	4.90	0.00	5.70	0.10	3.30
6	Cheruthazham	April	7.11	44	6	1.6	0.49	4.7	0.3	0	7.30	1.00	8.50	0.46	3.20
		November	6.98	43	6	1.6	0.49	4.7	0.4	0	2.40	0.00	8.50	0.00	4.20
7	Chural	April	7.16	54	14	4.8	0.49	-	-	-	-	-	7.10	0.14	2.40
8	Dharmadam	April	8.09	118	28	10	0.49	9.2	0.9	0	27	4.60	17	0.17	1.90
9	Edakkad	April	7.56	186	50	14	3.4	-	-	-	-	-	24	0.34	1.60
		November	7.64	200	58	20	1.9	13	2.5	0	59	13	23	0.04	5.60
10	Edayannur	April	7.37	43	10	3.2	0.49	-	-	-	-	-	8.50	0.09	12
11	Ettikulam	April	7.66	73	20	6.4	0.97	4.2	1.1	0	24	1.50	7.10	0.54	0.50
		November	6.99	36	8	1.6	0.97	3.6	0.4	0	7.30	0.00	7.10	0.01	2.30
12	Irikkur	April	7.38	280	114	31	8.8	8	3.9	9.6	90	22	17	0.17	0.28
		November	7.95	141	44	9.6	4.9	8.6	2.8	0	56	1.20	14.00	0.00	7.00
13	Iritty	April	7.14	43	8	2.4	0.49	4.1	0.7	0	12	2.00	5.70	0	1.20
		November	7.11	55	12	4	0.49	3.6	2	0	9.80	0.72	7.10	0.04	5.50
14	Kannapuram	April	7.48	68	18	4	2	4.3	1.3	0	15	2.00	8.5	0.37	3.70
		November	8.15	490	156	55	4.4	25	28	0	246	22.00	36.00	0.13	14.00

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
15	Kannavam	April	8.43	190	42	12	2.9	15	2.7	2.4	39	8.00	24	0.04	5.50
		November	7.59	80	22	4.8	2.4	6.1	1.6	0	24	1.20	9.90	0.04	6.40
16	Kommeri	April	7.9	55	20	3.2	2.9	3	0.4	0	22	1.60	4.30	0	0.32
		November	7.37	36	12	3.2	0.97	2.1	0.1	0	15	0.00	5.70	0.02	0.00
17	Koothuparamba	April	7.5	460	92	23	8.3	-	-	-	-	-	61	0.14	132
18	kottayampoyil	April	7.09	59	6	1.6	0.49	7.5	0.4	0	4.90	0	11	0	8.90
		November	6.11	58	8	1.6	0.97	7.5	0.3	0	4.90	0.00	11.00	0.07	9.80
19	Kottiyur	April	8.02	124	44	14	2.4	5	0.5	0	46	1.50	13	0	0.23
		November	7.29	61	22	5.6	1.9	3.9	0.4	0	29	0.00	5.70	0.00	2.00
20	kozhichal	April	7.79	95	34	5.6	4.9	4.7	0.5	0	39	1.10	7.10	0.08	3.30
		November	6.92	42	14	2.4	1.9	2.4	0.3	0	15	0.00	5.70	0.08	2.20
21	Mahe	April	-	670	105	34	4.9	-	-	-	-	-	128	0.39	4.60
22	Manantheri	April	8.06	116	36	6.4	4.9	-	-	-	-	-	8.50	0.14	0.73
23	Manathana	April	7.12	63	8	1.6	0.97	-	-	-	-	-	11	0.08	4.40
24	Mathamangalam	April	7.14	93	16	2.4	2.4	9.4	1.2	0	4.90	0	14	0	16
		November	6.81	80	16	4.8	0.97	6.7	0.7	0	9.80	0.00	9.90	0.01	16.00
25	Mattannur	April	6.24	173	28	6.4	2.9	12	6.6	0	2.40	0	28	0.05	30
		November	6.26	190	36	7.2	4.4	15	7.2	0	4.90	0.00	34.00	0.04	37.00
26	Mattara	April	7.364	68	22	4.8	2.4	-	-	-	-	-	7.10	0.02	2.20
27	Mayyil	April	7.16	69	14	4	0.97	-	-	-	-	-	13	0.08	4.70
28	Melepukkam (Peringalam)	April	7.02	75	10	1.6	1.5	-	-	-	-	-	16	0.14	11
29	Meruvambayi	April	7.75	91	18	3.2	2.4	7.8	1.1	0	17	1.50	9.90	0	8.60
		November	7.02	46	10	3.2	0.49	5.2	0.3	0	12	0.29	8.50	0.20	3.50
30	Mokeri	24.04.10	7.19	210	16	4	1.5	-	-	-	-	-	43	0.14	20
31	Muzhakkunnu	April	8.11	120	28	7.2	2.4	8.5	2.1	0	34	4.50	13	0	1.10
		November	8.04	80	20	5.6	1.5	6.6	1.2	0	24	0.00	11.00	0.00	0.73
32	Padiriyad	April	7.39	48	8	3.2	traces	-	-	-	-	-	11	0.08	2.20
33	Pallikunnu	April	7.05	35	8	1.6	0.97	-	-	-	-	-	7.10	0.09	2.40

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
34	Palloor	April	-	280	36	12	1.5	-	-	-	-	-	53	0.32	34
35	Panunda	April	7	60	8	1.6	0.97	-	-	-	-	-	9.90	0.12	6.7
36	Pattiyam	April	7	86	16	3.2	1.9	-	-	-	-	-	16	0.12	7.2
37	Pazhayangadi	April	7.51	121	48	14	2.9	4.6	0.3	0	37	15	4.30	0.5	2.9
		November	7.83	178	72	25	2.4	4.7	1.1	0	88	9.80	9.90	0.03	1.30
38	Peringome	April	7.39	159	36	9.6	2.9	11	3.4	0	20	4.10	21	0.02	18
		November	7.44	127	36	9.6	2.9	8.4	4.1	0	29	2.80	16.00	0.00	10.00
39	Pukkundu	April	8.09	109	28	8	1.9	7.5	1.8	0	44	0	8.50	0	3.20
		November	7.18	89	14	4.8	0.49	10	0.5	0	4.90	0.00	14.00	0.00	16.00
40	Pulingome	April	8.69	200	82	17	9.7	-	-	-	-	-	14	0.14	0.25
41	Ramanthali	April	6.59	39	10	1.6	1.5	4.1	0.4	0	2.40	1.00	9.90	0	2.70
		November	6.8	36	6	1.6	0.49	3.9	0.2	0	2.40	0.00	8.50	0.00	2.20
42	Sreekandapuram	April	8.38	78	16	3.2	1.9	-	-	-	-	-	13	0.08	7.9
43	Taliparamba	April	8.46	197	58	14	5.8	14	4.4	9.6	66	3.50	13	0.02	0.36
		November	-	240	48	14	3.4	19	9.9	-	-	4.60	33.00	0.07	39.00
44	Thalassery	April	8.42	360	76	22	5.4	26	14	18	24	24	37	0.5	37
		November	7.85	470	142	48	5.4	25	18	0	171	21	36	0	45
45	Ullikkal	April	7.42	51	8	3.2	traces	-	-	-	-	-	14	0.05	3.5
46	Valapattanam	April	8.04	260	84	26	4.4	12	5.7	0	83	20	20	0.44	5.1
		November	7	127	30	8.8	1.9	10	0.7	0	12	12	16	0	10
47	Vayakkara	April	8.3	250	104	18	14	-	-	-	-	-	7.1	0.22	0.25

KASARGOD DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^0C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Angadimogar	April	7.74	166	42	9.6	4.4	13	1.4	0	27	0.44	26	0.06	15

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	7.5	173	36	11	1.9	18	0.9	0	37	0	28	0.05	13
2	Badiadka	April	7.83	131	44	17	0.49	6.9	1.4	0	46	12	8.5	0.12	2.4
		November	-	143	38	13	1.5	6.7	1.5	-	-	7.6	9.9	0.31	1.3
3	Bandadukka	April	7.13	87	24	8	0.97	4.8	1.4	0	20	5.4	9.9	0.05	1.8
		November	7.5	69	18	6.4	0.49	4.6	1	0	20	1.8	8.5	0.01	3.6
4	Bedadka	April	7.08	42	14	1.6	2.4	3.3	0.2	0	9.8	0.53	5.7	0.01	3
		November	-	50	10	2.4	0.97	4.8	0.4	-	-	0	8.5	0.18	1.5
5	Bedrampalla	April	-	95	24	7.2	1.5	-	-	-	-	-	4.3	0	4.2
6	Bekal	April	-	176	28	6.4	2.9	18	1.5	-	-	0.76	26	0.18	36
		November	4.73	270	66	14	7.8	19	2.9	0	0	0	37	0.31	18
7	Bhimanadi	April	-	73	20	4	2.4	6	0.4	-	-	0	8.5	0	0.37
		November	7.28	47	12	3.2	0.97	4.3	0.2	0	17	0	5.7	0.17	2.6
8	Chayangode	April	8.17	165	54	14	4.9	13	1.7	0	100	2.5	7.1	0.15	0.23
9	Chittarikkal	April	7.81	60	18	4.8	1.5	3.8	0.2	0	22	2.2	5.7	0	2.8
		November	7.33	47	16	3.2	1.9	2.9	0.1	0	15	0	5.7	0	4.7
10	Kadapallam	April	7.76	94	34	11	1.5	4.6	1.5	0	37	3.4	7.1	0.07	0.51
		November	-	69	16	5.6	0.49	3.3	1.1	-	-	1	8.5	0	0.14
11	Kakkadavu	April	8.74	131	50	15	2.9	6.6	1.8	4.8	51	3.5	14	0.04	0.38
12	Kasargod	April	7	181	32	8.8	2.4	18	3	0	12	8.1	34	0.15	12
		November	7.38	151	28	8.8	1.5	14	2.7	0	15	6.3	27	0	9
13	Koliyurkadavu	April	7.01	22	4	0.8	0.49	-	-	-	-	-	4.3	0.17	0.13
14	Kumbla	April	8.32	190	68	18	5.8	11	2.8	0.01	90	5	13	0	0.45
		November	-	116	26	7.2	1.9	12	1.3	-	-	0	20	0.2	9.7
15	Kuttikole	April	7.47	39	10	0.8	1.9	3.2	0.8	0	12	1.1	4.3	0	1.1
		November	-	37	8	2.4	0.49	2.5	0.4	-	-	0	4.3	0	0.38
16	Manjeshwar	April	7.27	230	26	7.2	1.9	29	4.4	0	15	0	51	0.12	13
		November	7.21	210	28	7.2	2.4	22	4.9	0	7.3	0	45	0.27	23
17	Mavinakatta	April	-	133	30	10	0.97	-	-	-	-	-	9.9	0	1.2
18	Mogaral	April	-	103	18	7.2	0	9.8	1.1	-	-	5.6	16	0.12	2.1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	6.84	79	12	3.2	0.97	9.6	0.6	0	7.3	0	14	0.2	10
19	Muliyar	April	7.57	95	16	4.8	0.97	11	2.1	0	24	2.3	17	0.05	2.6
		November	7.1	94	12	3.2	0.97	12	1.2	0	12	1.3	18	0.05	6.4
20	Mulleriya	April	7.33	129	24	5.6	2.4	11	4.1	0	15	1.4	21	0.04	21
		November	7.25	129	30	8	2.4	7.3	6.2	0	9.8	3.4	21	0.14	18
21	Mulligadde	April	6.96	65	14	4	0.97	5.7	1.2	0	9.8	0.33	9.9	0	9.7
		November	7.04	56	10	3.2	0.49	5.2	1	0	4.9	0	9.9	0.07	11
22	Nattakkal	April	-	83	20	5.6	1.5	6.4	0.7	-	-	0.3	11	0.14	2.1
		November	-	68	16	4.8	0.97	5.1	0.2	-	-	0	9.9	0	0
23	Nileshwar	April	8	131	28	10	0.49	7.5	6.4	0	27	3.5	20	0	4.6
24	Odayanchal	April	7.34	54	16	3.2	1.9	4.6	0.4	0	20	0.5	8.5	0.07	4
		November	8.79	44	12	3.2	0.97	3.7	0.4	4.8	7.3	1	2.8	0.22	0.11
25	Paivalke	April	7.22	74	12	4	0.49	8.7	0.9	0	12	1.3	13	0.02	6.4
		November	-	83	14	4	0.97	8.5	0.9	-	-	0	13	0.2	6.4
26	Panavoor	April	-	60	14	2.4	1.9	-	-	-	-	-	9.9	0.07	0.84
27	Parappa North	April	7.6	57	16	4	1.5	4.5	0.4	0	20	1.5	7.1	0.02	0.22
		November	7.45	45	10	2.4	0.97	4.5	0.5	0	15	1.9	7.1	0.02	0.47
28	Peraludkam	April	6.89	41	6	0.8	0.97	5	0.3	0	7.3	0.68	8.5	0.1	2.6
		November	6.94	44	8	2.4	0.49	4.4	0.5	0	7.3	0	8.5	0.01	4
29	Poinachi	April	7.17	42	10	2.4	0.97	3.8	0.7	0	12	0	7.1	0	1.3
		November	7.19	39	6	1.6	0.49	4.5	0.4	0	7.3	0	7.1	0	4
30	Pullur	April	7.17	45	10	3.2	0.49	4.4	0.4	0	9.8	0.83	8.5	0.05	0.45
		November	-	59	10	3.2	0.49	5.3	1.3	-	-	0	11	0.06	0.75
31	Rajapuram	April	-	63	12	4.8	0	-	-	-	-	-	8.5	0.06	1.6
32	Thanniyadi	April	7.88	76	22	5.6	1.9	5.6	0.7	0	32	0.08	5.7	0.01	0.44
		November	-	45	8	3.2	0	4.6	0.6	-	-	0	5.7	0.09	0
33	Thrikkarippur	April	6.47	57	12	3.2	0.97	4.2	0.7	0	7.3	4	8.5	0.01	4.8
		November	7.00	38	12	4	0.49	2.2	0.1	0	12	0.39	4.3	0	2
34	Udma	April	8.16	163	54	9.6	7.3	-	-	-	-	-	5.7	0.25	3

KOLLAM DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^{0}C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
2	Ailara	April	-	98	22	8	0.49	9.4	2.1	-	-	2.5	17	0.03	5
		November	7.25	68	8	3.2	0	9.9	1.7	0	7.3	0.59	16	0	8.5
3	Akkal	April	7.86	137	24	6.4	1.9	13	4.1	0	29	0.44	14	0.26	22
		November	8.19	192	16	3.2	1.9	28	3.5	0	17	0.3	26	0	46
4	Ariyankavu	April	7.42	51	10	2.4	0.97	-	-	-	-	-	7.1	0.24	4.1
5	Avaneeswaram	April	7.66	81	24	7.2	1.5	5.2	4.3	0	29	1.2	7.1	0.25	6
		November	7.54	59	12	3.2	0.97	6	3.7	0	17	0.98	7.1	0.05	5.5
6	Ayoor	April	-	108	22	5.6	1.9	-	-	-	-	-	7.1	0.24	2.3
7	Chadayamangalam	April	-	156	14	4	0.97	17	4.5	-	-	0.22	26	0.44	2
		November	7.36	192	4	1.6	0	32	3.7	0	12	0.2	48	0.09	13
8	Channapetta	April	8.49	260	38	8.8	3.9	26	6.6	7.2	20	4.7	37	0.28	28
		November	7.03	340	40	8.8	4.4	46	6.8	0	7.3	2.2	62	0.06	69
9	Chenkulam	April	8.4	104	20	7.2	0.49	-	-	-	-	-	11	0.29	8.4
10	Edamon	April	7.43	51	12	4.8	0	3.7	2.2	0	12	1.6	7.1	0.17	6.3
		November	7.33	37	6	2.4	0	4.1	1.8	0	9.8	0.59	4.3	0.01	4.5
11	Ezhukone	April	7.85	94	20	6.4	0.97	-	-	-	-	-	14	0.23	2.9
12	Iravipuram	April	8.53	340	92	30	3.9	26	11	7.2	71	27	40	0.16	18
		November	8.44	380	104	37	2.9	39	7	4.8	85	50	38	0.04	23
13	Ithikkara	April	7.24	172	42	14	1.5	11	3.8	0	32	2.2	20	0.3	20
		November	7.26	260	40	12	2.4	30	5.1	0	9.8	0.5	45	0.17	50
14	Kadakkal	April	5.89	470	75	18	7.3	34	32	0	0.01	1.3	71	1.37	119
		November	6	194	26	8	1.5	16	13	0	15	-	31	0.06	30

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
15	Kadapuzha	April	7.41	88	28	4.8	3.9	-	-	-	-	-	8.5	0.21	0.66
16	Kuttavettur	April	7.64	125	32	10	1.5	10	1	0	34	3.2	13	0.22	14
		November	8.33	128	20	5.6	1.5	16	1	Tr	24	1.2	21	0	15
17	Karunagapally	April	8.17	330	96	32	3.9	-	-	-	-	-	40	0.24	4.7
18	Kollam	April	7.77	148	40	14	1.5	9.8	1.6	0	34	2.2	20	0.12	4.8
		November	8.13	230	64	24	0.97	20	1.8	0	49	7.7	31	0	22
19	Kottakayam	April	7.56	51	14	4.8	0.49	3.4	0.9	0	22	0.66	2.8	0.27	1.2
		November	7.48	49	10	3.2	0.49	4.4	1.2	0	12	0	5.7	0.04	7.8
20	Kottarakkara	April	8.45	200	38	11	2.4	19	5.7	4.8	27	3.2	30	0.15	17
		November	7.57	146	24	6.4	1.9	16	3.5	0	20	1.7	30	0.06	11
21	Kulakkada	April	8.49	280	104	37	2.9	10	4.7	7.2	100	12	14	0.22	4.1
		November	7.57	98	18	5.6	0.97	12	1.4	0	22	0.98	17	0.06	8.3
22	Kulathupuzha	April	7.54	270	34	10	1.9	26	8.9	0	22	2.2	41	0.2	46
		November	7.64	230	30	8	2.4	26	9.2	0	20	5.2	40	0.06	32
23	Kumbalam	April	7.92	90	26	9.6	0.49	-	-	-	-	-	11	0.19	7.2
24	Kunnada	April	8.05	97	22	7.2	0.97	8	4.7	0	27	1.2	14	0.13	7.4
		November	7.06	76	6	2.4	0	11	2.9	0	4.9	0.79	20	0	4.6
25	Madathara	April	7.35	198	36	10	2.4	-	-	-	-	-	30	0.21	31
26	Nallila	April	7.1	84	22	7.2	0.97	5.9	1.7	0	15	1.8	13	0.08	14
		November	6.44	88	10	2.4	0.97	11	1.4	0	4.9	1.1	18	0.04	10
27	Neendakara	April	8.23	210	78	22	5.8	-	-	-	-	-	14	0.19	4.3
28	Oyur	April	7.99	99	24	8	0.97	-	-	-	-	-	9.9	0.15	11
29	Paripalli	April	6.92	184	32	6.4	3.9	-	-	-	-	-	31	0.29	38
30	Pavitreswaram	April	7.89	100	12	3.2	0.97	11	2.5	0	9.8	1.5	20	0.31	3.3
		November	7.22	47	4	0.8	0.49	5.7	1.7	0	4.9	0.69	11	0.06	0.64
31	Perinad	April	7.75	176	32	12	0.49	19	1	0	32	2.2	28	0.13	8.4
		November	7.32	165	28	9.6	0.97	18	2.3	0	12	8	30	0	15
32	Pozhikkara	April	7.42	440	78	14	10	47	1.2	0	41	41	75	0.2	9.4
		November	7.72	260	50	9.6	6.3	32	0.1	0	20	38	48	0.02	5.4

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
33	Punalur	April	7.91	112	30	11	0.49	-	-	-	-	-	11	0.12	0.75
34	Punnila	April	8.25	104	22	7.2	0.97	9	4.7	0	34	1.8	11	0.25	6.2
		November	7.46	98	16	4	1.5	12	3.6	0	15	1.6	23	0	6.1
35	Sasthamkotta	April	7.38	123	24	7.2	1.5	-	-	-	-	-	21	0.2	8
36	Sooranadu	April	7.38	82	16	4.8	0.97	-	-	-	-	-	13	0.16	11
37	Tadicaud	April	-	143	22	5.6	1.9	-	-	-	-	-	21	0.22	3
38	Thenmala	April	-	120	20	4.8	1.9	-	-	-	-	-	14	0.33	3.2
39	Thevalakkara	April	7.13	101	22	7.2	0.97	8.9	1.5	0	17	2.5	16	0.12	8.1
		November	4.87	88	8	2.4	0.49	8	0.8	0	0	0.3	14	0	9.8
40	Ummannur	April	-	230	36	12	1.5	19	8.6	-	-	2.3	31	0.35	20
41	Vadakkumthala West	April	3.87	510	85	26	4.9	36	12	0	0	34	68	0.29	70
		November	7.66	290	66	23	2.1	24	6.7	0	20	27	43	0.05	42
42	Vallikavu	April	8.98	210	66	22	2.9	12	2.6	9.6	44	11	23	0.25	1.5
		November	-	146	30	11	0.62	17	0.3	-	-	11	24	0.08	1.9
43	Yeroor	April	-	420	70	19	5.4	-	-	-	-	-	55	0.22	57

KOTTAYAM DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^0C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Anandasram	April	7.21	85	22	8.8	0	4.2	1.2	0	22	1.3	9.9	0.26	6.8
		November	-	85	14	4	0.97	6	4.8	-	-	1.6	13	0.32	4.9
2	Ariparamba	April	7.7	117	26	7.2	1.9	-	-	-	-	-	16	0.19	2.3
3	Ayamkudi	April	7.35	50	12	3.2	0.97	-	-	-	-	-	7.1	0	3.3
4	Changanassery	April	7.2	544	96	25	8.3	-	-	-	-	-	77	0	50
5	Edinjillam	April	7.06	304	36	10	2.4	13	27	0	4.9	32	28	0.17	43
		November	-	250	32	10	1.5	14	28	-	-	33	23	0.1	17
6	Elamkulam	April	7.86	136	52	16	2.9	2	2.3	0	54	5.1	5.7	0.19	5.1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	8.19	65	24	7.2	1.5	3	0.7	0	29	2.6	4.3	0.12	0.69
7	Iykarakunnam	April	7.65	96	12	3.2	0.97	9.2	2.1	0	12	1.5	16	0.04	7.7
		November	7.62	89	20	5.6	1.5	7.9	1.8	0	24	5.2	14	0.12	0
8	Kaduthuruthi	April	7.13	252	40	9.6	3.9	18	3.8	0	15	2.9	51	0.22	16
		November	7.58	192	38	9.6	3.4	19	3.7	0	24	7.5	33	0.31	11
9	Kalakatty	April	7.74	142	42	13	2.4	5	4.6	0	34	6.9	9.9	0.35	13
		November	-	97	24	8	0.97	5.1	4.8	-	-	5.4	8.5	0.15	1.4
10	Kalattur	April	7.27	63	18	4.8	1.5	3.6	1.2	0	7.3	0.32	9.9	0.27	9.8
		November	6.61	43	10	3.2	0.49	3.1	0.9	0	4.9	1.4	7.1	0.15	4.6
11	Kanjirapalli	April	8.12	113	30	8	2.4	4.5	1.4	0	17	6	8.5	0	13
		November	7.65	77	30	10	0.97	2	0.5	0	27	10	2.8	0.1	3.1
12	Kangazha	April	7.4	147	36	11	1.9	-	-	-	-	-	17	0.13	16
13	Kidangur	April	7.14	70	12	3.2	0.97	5.9	1	0	7.3	0.47	13	0.05	8.6
		November	6.98	68	14	3.2	1.5	6.8	1.2	0	9.8	1.6	11	0.06	10
14	Kottayam	April	6.93	53	8	3.2	0	4.2	0.6	0	2.4	2.1	8.5	0	6.8
		November	7.41	330	74	22	4.4	25	12	0	37	27	38	0.11	46
15	Kozha	April	6.96	96	20	5.6	1.5	5.6	2.7	0	7.3	1.6	13	0.36	18
		November	7.44	81	16	4.8	0.97	5.9	2.8	0	12	2.1	13	0.07	9.3
16	Kozhuvanal	April	8.56	67	16	4.8	0.97	-	-	-	-	-	8.5	0.1	5.9
17	Kumarakom	April	8.25	424	180	65	4.4	-	-	-	-	-	26	0	2
18	Kuttikkal	April	6.8	87	18	4.8	1.5	-	-	-	-	-	9.9	0.24	13
19	Kuvapalli	April	7.42	95	32	9.6	1.9	2.7	1	0	22	1.2	7.1	0	22
		November	7.08	49	16	5.6	0.49	2.9	0.7	0	12	0.26	5.7	0.23	9.4
20	Marangattupalli	April	7.2	113	24	7.2	1.5	8.3	1.4	0	17	7	18	0.07	4
		November	6.98	132	24	7.2	1.5	12	1.7	0	15	3.3	23	0.19	15
21	Monipalli	April	7.19	121	28	7.2	2.4	-	-	-	-	-	17	0	19
22	Mukkada	April	7.74	172	40	10	3.4	-	-	-	-	-	20	0.22	28
23	Mundakayam	April	6.85	60	16	4	1.5	2.8	0.6	0	4.9	0.98	8.5	0.18	13
		November	-	101	26	8	1.5	6.9	2.4	-	-	7.4	11	0.08	11

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
24	Mundukuzhi	April	7.06	40	10	3.2	0.49	-	-	-	-	-	7.1	0.05	3.2
25	Naranganam	April	7.07	33	8	2.4	0.49	1.8	0.6	0	2.4	0.98	4.3	0.3	3.4
		November	7.29	32	12	3.2	0.97	1.6	0.8	0	9.8	2.4	4.3	0.21	3.4
26	Paipad	April	5.8	238	38	11	2.4	12	12	0	0	5.5	33	0	49
		November	6.32	51	10	3.2	0.49	4.5	0.5	0	2.4	1.6	8.5	0.22	7.4
27	Pala	April	7.52	105	30	8	2.4	4.5	0.7	0	29	4.5	9.9	0.34	4.9
		November	7.46	66	22	5.6	1.9	4.9	0.4	0	22	2.8	5.7	0.15	7.3
28	Palamkadavu	April	7.56	520	96	21	11	-	-	-	-	-	101	0.22	7.3
29	Pallikathodu	April	7.78	70	20	7.2	0.49	2	1.8	0	24	3.5	5.7	0.11	0.82
		November	7.15	54	14	3.2	1.5	5.3	0.8	0	12	2	9.9	0.09	5.9
30	Pallom(Nattagam)	April	7.12	87	16	5.6	0.49	-	-	-	-	-	13	0.03	9.8
31	Pambadi	April	7.45	97	22	6.4	1.5	-	-	-	-	-	9.9	0.11	0
32	Paruthumpara	April	7.07	125	14	4.8	0.49	14	3	0	4.9	1.5	26	0	9.7
		November	7.34	61	14	4.8	0.49	4.6	1.5	0	12	4.5	7.1	0.1	6.7
33	Plakkalpadi	April	7.21	150	20	4.8	1.9	14	0.9	0	4.9	1.3	31	0	12
		November	6.88	72	16	4	1.5	6	2.2	0	9.8	3.3	11	0.06	10
34	Pulikuttisseri	April	7.84	459	156	53	5.8	-	-	-	-	-	60	0.2	1.4
35	Punjar	April	7.08	46	10	2.4	0.97	4	1	0	7.3	1.7	7.1	0.08	5
		November	7.2	30	8	2.4	0.49	2.3	0.8	0	9.8	1.5	4.3	0.12	0.89
36	Talayolaparambu	April	7.34	429	106	34	5.4	17	16	0	34	46	55	0.42	27
		November	7.61	350	94	30	4.9	19	15	0	44	40	34	0.08	16
37	Thekkethumkavala	April	7.76	113	30	5.6	3.9	-	-	-	-	-	9.9	0.24	3.7
38	Tiruvarpu	April	8.12	447	110	33	6.8	33	11	0	151	18	50	0.38	0.85
		November	7.23	83	18	4.8	1.5	6	2.7	0	12	2	11	0.06	11
39	Tottakkad	April	7.06	64	18	4	1.9	3.7	0.9	0	17	1.8	7.1	0	5.9
		November	6.75	40	8	3.2	0	3.5	0.8	0	7.3	1.2	7.1	0	5.5
40	Trikodithanam	April	7.22	104	18	5.6	0.97	-	-	-	-	-	18	0.16	4.2
41	Urulikunnam	April	7.34	85	12	2.4	1.5	-	-	-	-	-	14	0.32	9
42	Vaikom	April	8	1625	370	126	13	-	-	-	-	-	362	0.13	49

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
43	Vazhur	April	7.6	55	14	4	0.97	-	-	-	-	-	7.1	0	2.2
44	Vechur	April	7.7	179	64	22	2.4	-	-	-	-	-	8.5	0	3.3
45	Velloor	April	7.74	185	46	7.2	6.8	15	0.5	0	66	13	17	0	2
		November	7.43	58	16	3.2	1.9	5.2	1.1	0	17	0	8.5	0.09	3.9
46	Vempallil	April	7.05	90	16	4	1.5	-	-	-	-	-	14	0	8.6
		November	6.75	40	8	3.2	0	3.5	0.8	0	7.3	1.2	7.1	0	5.5

KOZHIKODE DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^0C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Badagara	April	7.49	370	110	30	8.5	-	-	-	-	-	57	0.18	31
		November	7.7	590	100	29	6.8	-	-	-	-	-	54	-	35
2	Balusseri	April	7.07	210	34	8	3.4	25	4.8	0	12	2	47	0	18
		November	7.05	240	36	9.6	2.9	24	6.7	0	7.3	0.49	45	0	41
3	Beypore	April	7.96	440	115	32	8.5	-	-	-	-	-	51	0.14	52
4	Bhoomivathukkal	April	7.4	69	16	4.8	0.97	6.5	0.9	0	17	0	11	0.22	6.9
		November	7.17	64	10	3.2	0.49	7.2	1.8	0	12	0	11	0	5.9
5	Chelavur	April	7.52	140	24	4.8	2.9	-	-	-	-	-	24	0.14	11
6	Chemencheri	April	7.74	220	75	26	2.4	-	-	-	-	-	20	0.18	17
7	Chevayur	April	7.53	120	34	8.8	2.9	-	-	-	-	-	14	0.16	11
8	Devarkoil	April	8.45	160	34	10	2	14	1.5	7.2	2.4	2.5	33	0	17
		November	7.04	160	34	9.6	2.4	16	1.7	0	15	1.9	28	0	21
9	Elattur	April	8.11	230	100	34	3.4	6.2	8	0	149	2.5	11	0.05	4.9
		November	-	250	54	19	1.5	16	7	-	-	0	26	0.53	16
10	Farooq	April	6.65	426	46	15	1.9	-	-	-	-	-	48	-	10
11	Kakkayam	April	7.39	60	12	3.2	0.97	5.2	1.5	0	22	2	5.7	0.17	4.4

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	6.94	37	10	3.2	0.49	2.7	1.1	0	15	1.5	4.3	0	1.3
12	Kannankara	April	8.54	170	38	11	2.4	16	4.9	0	27	10	24	0.09	15
13	Kayapanachi	April	7.27	137	24	4	3.4	-	-	-	-	-	37	0.12	1.2
14	Koduvalli	April	7.87	110	36	9.6	2.9	8.4	1.2	0	73	0	7.1	0.11	0.26
		November	7.43	71	18	4	1.9	5.9	1.8	0	24	0	8.5	0	5.1
15	Koodathumpara	April	7.89	97	24	6.4	2	-	-	-	-	-	17	0.16	1.1
16	Koothali	April	7.05	44	8	3.2	traces	3	1.8	0	7.3	0	5.7	0.02	8
		November	7.11	32	6	1.6	0.49	2.5	0.9	0	7.3	0.3	4.3	0.15	2.2
17	Kozhikode	April	7.75	230	60	18	3.4	18	1.3	0	39	7.5	38	0.09	15
		November	7.94	220	74	26	1.9	10	1.4	0	71	16	18	0	10
18	Malayamma	April	7.23	78	20	4	2.4	6.5	0.9	0	27	0	9.9	0.09	3.9
		November	7.48	56	16	4.8	0.97	4.1	0.1	0	22	0.2	5.7	0	2.9
19	Mattanad	April	7.25	81	22	5.6	2	6.7	1	0	15	1	16	0.04	6.4
		November	7.96	60	16	5.6	0.49	5.4	0.7	0	15	0	9.9	0	4.2
20	Mavoor I	April	7.26	39	10	1.6	1.5	-	-	-	-	-	11	0.16	4.4
21	Mavoor II	April	7.22	84	16	4.8	0.97	-	-	-	-	-	14	0.1	1
22	Meppayyur	April	7.1	136	32	9.6	2	10	4.5	0	9.8	7	21	0.04	16
		November	4.74	43	4	0.8	0.49	0.8	0.4	0	0	3.5	2.8	0	0.96
23	Modern Bazaar	April	7.63	250	70	22	3.9	-	-	-	-	-	28	0.2	6.5
24	Mukkali	April	6.94	97	20	4.8	2	9.7	4.6	0	7.3	6.5	16	0.12	6.2
		November	6.77	75	14	4.8	0.49	5.9	2.3	0	4.9	4.1	11	0	6
25	Nadapuram	April	7.47	160	44	13	2.9	14	2.9	0	56	7	19	0.12	4.1
		November	8.84	141	28	7.2	2.4	16	2.7	9.6	24	6.3	20	0.2	0.83
26	Perambra	April	7.48	106	30	12	traces	6.3	1.7	0	39	0	9.9	0.1	8.4
		November	7.7	93	34	13	0.49	4.5	0.8	0	46	2	8.5	0	0
27	Peruvayal	April	7.44	77	24	5.6	2.4	4.9	0.7	0	34	traces	8.5	0.2	1.6
		November	7.77	114	34	9.6	2.4	7.4	1	0	49	5.1	11	0.17	0
28	Pudukayam	April	7.28	41	10	2.4	0.97	4.1	0.4	0	12	0	5.7	0.07	2.6
		November	7.07	39	8	2.4	0.49	4.1	0.5	0	12	0	5.7	0	2.3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
29	Pudupadi	April	7.32	71	18	5.6	0.97	4.9	1.5	0	20	0	11	0.1	5.5
		November	7	75	18	4.8	1.5	6.6	2.5	0	12	2.4	11	0	6
30	Punnasseri	April	7.04	47	16	2.4	2.4	5.1	0.6	0	12	0	7.1	0.12	3.9
		November	7.78	60	10	2.4	0.97	5.7	1.8	0	15	0	11	0	1
31	Quilandy	April	7.84	682	148	54	3.4	-	-	-	-	-	50	-	30
32	Ramanattukara	April	7.9	380	112	23	13	31	5.6	0	112	51	44	0.18	1.8
		November	7.78	390	124	30	12	26	5	0	93	79	27	0.08	1.4
33	Thamarasseri	April	7.56	110	32	10	1.5	-	-	-	-	-	11	0.15	1
34	Thiruvallur	April	7.66	240	56	15	4.4	22	9.3	0	56	5.5	41	0.17	8.1
		November	7.62	91	20	7.2	0.49	7.6	5	0	34	2.2	11	0	0.81
35	Tikkodi	April	7.1	118	20	4.8	2	8.8	5.9	0	4.9	0	19	0.15	13
		November	7.36	171	60	20	2.4	5.9	4	0	32	18	16	0	22
36	Ulliyeri	April	7.16	53	12	3.2	0.97	5.2	0.8	0	12	0	13	0.2	3.3
		November	7.47	72	18	4.8	1.5	5.7	0.7	0	22	0.29	9.9	0.3	4.1
37	Unnikulam	April	7.15	64	26	3.2	4.4	7	1	0	9.8	0	17	0.1	8.2
		November	6.99	60	8	3.2	0	7.4	0.8	0	9.8	0	9.9	0	7.3
38	Valayam	April	7.37	110	22	4	2.9	11	1.9	0	20	0	20	0.26	10
		November	7.03	81	12	3.2	0.97	10	1.6	0	9.8	0	16	0	7.7
39	Vellimadukunnu	April	7.54	150	34	9.6	2.4	-	-	-	-	-	26	0.21	16
40	Villiappally	April	7.34	93	22	4.8	2.4	8.9	0.7	0	17	0	11	0.18	9.9
		November	7.07	103	22	4.8	2.4	11	0.8	0	15	2.6	16	0.01	13

MALAPPURAM DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^0C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Amminikkad	April	-	189	16	5.6	0.49	-	-	-	-	-	30	0.18	1.4
2	Arikode	April	-	220	42	15	0.97	18	4.1	-	-	1	37	0.21	20

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	7.73	129	36	8.8	3.4	8.6	2.4	0	41	1.5	13	0.15	12
3	Athiramada	April	7.63	66	18	6.4	0.49	5.7	0.6	0	27	1.7	7.1	0.04	2
		November	7.5	71	16	4.8	0.97	5.7	0.9	0	22	1.3	8.5	0.11	3.9
4	Buliyampadam	April	-	250	20	5.6	1.5	23	32	-	-	14	27	0	8.3
		November	8.46	410	58	11	7.3	40	30	7.2	115	22	38	0.21	26
5	Chamravattam	April	8.16	525	80	20	7.3	72	1.3	0	73	16	121	0.32	0.61
		November	8.16	230	78	16	9.2	16	2.2	0	102	6.5	24	0.32	2.7
6	Cherukara	April	7.25	88	16	4	1.5	9.7	1.3	0	15	1.1	16	0.04	11
		November	7.42	142	28	4.8	3.9	14	2.3	0	17	3.1	21	0.11	21
7	Chokkad	April	-	198	20	7.2	0.49	31	2.7	-	-	2.7	43	0.1	1.3
		November	8.17	420	116	30	10	30	6.1	0	105	5.9	68	0.22	20
8	Chungathara	April	-	520	68	18	5.4	78	8.8	-	-	29	119	0.37	13
		November	4.28	350	44	8.8	5.4	40	6.5	0	0	0.47	67	0.16	44
9	Edappal	April	7.61	131	36	7.2	4.4	8.9	0.5	0	27	1	16	0	16
		November	5.91	191	26	5.6	2.9	23	2.4	0	4.9	0.28	33	0.13	38
10	Edavanna	April	7.78	175	40	11	2.9	-	-	-	-	-	23	0.11	15
11	Iswaramangalam	April	8.49	1195	230	30	38	178	13	30	214	23	241	0.35	2.2
12	Kadalundi	April	-	910	275	74	22	-	-	-	-	-	103	0.27	3.3
13	Kadannamanna	April	7.86	78	18	4	1.9	-	-	-	-	-	5.7	0.1	0.5
14	Kalikavu	April	-	124	16	5.6	0.49	12	4.1	-	-	2.6	20	0.21	11
		November	7.25	146	26	6.4	2.4	12	4.5	0	15	1.3	21	0.17	18
15	Kanjiramukku	April	7.8	169	36	10	2.4	17	1.2	0	39	3.5	30	0.05	2.3
		November	7.94	330	62	23	0.97	32	1.4	0	68	4.7	64	0.14	3.8
16	Karavarakundu	April	7.68	71	18	4	1.9	6.8	1.5	0	22	1.9	9.9	0	5.4
		November	7.15	85	16	4.8	0.97	7.7	1.5	0	12	1.2	14	0.14	9.9
17	Kariavattom	April	7.8	109	22	5.6	1.9	12	1.7	0	37	0.79	18	0	1.4
		November	7.04	110	14	3.2	1.5	11	2.2	0	4.9	0.29	21	0.08	14
18	Karipol	April	7.73	54	14	3.2	1.5	-	-	-	-	-	8.5	0.15	1
19	Karulai	April	-	230	38	8	4.4	-	-	-	-	-	34	0.21	5.9

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
20	Kattumunda	April	-	82	14	5.6	0	-	-	-	-	-	9.9	0.02	5.7
21	Kizhmuri	April	7.61	112	16	4.8	0.97	-	-	-	-	-	16	0	20
22	Kondotty	April	-	99	20	4.8	1.9	11	1	-	-	0	17	0.22	5.9
		November	7.38	105	26	5.6	2.9	7.4	1.5	0	29	3.5	11	0.12	6
23	Kottakkal(nearby well)	April	-	550	68	18	5.8	-	-	-	-	-	100	0	73
24	Kulattur(nearby well)	April	-	138	20	7.2	0.49	-	-	-	-	-	21	0.54	6.4
25	Kuruva	April	8.2	108	32	11	0.97	-	-	-	-	-	5.7	0.06	0.5
26	Kuttipuram	April	-	298	35	10	2.4	37	4.8	-	-	17	36	0.26	11
27	Malappuram	April	-	123	24	5.6	2.4	11	2.9	-	-	1.8	21	0.22	5.1
		November	7.16	150	22	4.8	2.4	17	1.4	0	15	1.6	24	0.13	22
28	Mangalam	April	3.44	824	150	50	6.1	69	14	*0	*0	90	85	0.26	145
29	Manjeri	April	-	460	68	16	6.8	-	-	-	-	-	77	0.25	24
30	Marancheri	April	7.03	108	24	7.2	1.5	7.9	2.1	0	17	4.1	14	0.02	27
31	Maruda	April	-	220	30	11	0.49	26	3.2	-	-	0.9	44	0.11	30
		November	7.86	185	52	16	2.9	13	1.5	0	54	0.38	24	0.2	11
32	Melattur	April	-	172	40	14	0.97	16	0.7	-	-	0.97	37	0.11	9
		November	7.73	210	60	13	6.8	14	0.8	0	41	0.95	36	0.1	13
33	Mudikode	April	8.12	160	32	8	2.9	-	-	-	-	-	24	0.06	9.8
		November	8	370	92	28	5.4	25	13	0	71	38	45	0.1	11
39	Perinthalmanna	April	8.5	400	90	22	8.8	-	-	-	-	-	58	0.26	38
40	Perumpadappu	April	7.34	210	30	9.6	1.5	28	5	0	17	10	44	0.09	12
		November	6.51	64	8	2.4	0.49	5.9	1	0	2.4	0.57	13	0.1	7.1
41	Ponnani	April	-	1360	160	46	11	208	12	-	-	53	383	0.03	20
42	Pookottor	April	7.8	141	38	8	4.4	13	2.2	0	51	5.3	20	0.1	2.6
		November	7.81	134	34	8.8	2.9	8.9	2.3	0	46	3.2	14	0.12	1.4
43	Pukattery	April	-	171	40	14	1.5	-	-	-	-	-	14	0.49	2.1
44	Pukoothu	April	8.22	113	34	8.8	2.9	-	-	-	-	-	11	0.19	1.4
45	Pulamanthol	April	-	430	58	18	3.4	48	18	-	-	0	99	0.19	38
		November	7.58	660	95	18	12	82	17	0	37	9.2	164	0.12	45
46	Tachinganedam	April	-	115	34	8.8	2.9	-	-	-	-	-	5.7	0.06	2.9

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
47	Tanur	April	7.89	176	20	6.4	0.97	-	-	-	-	-	27	0.06	0.55
48	Tazhekode	April	-	129	26	6.4	2.4	-	-	-	-	-	23	0.15	8.4
49	Tenhipalam	April	7.43	109	16	4.8	0.97	-	-	-	-	-	18	0.05	12
50	Thavannur	April	8.33	166	58	21	1.5	7.7	1.2	4.8	59	5	16	0	0.09
51	Thiruvali	April	8.2	121	34	8.8	2.9	-	-	-	-	-	9.9	0.22	1.9
52	Thuvur	April	-	159	34	11	1.5	-	-	-	-	-	20	0.16	7.9
53	Tirunavaya	April	8.89	282	94	15	14	19	1.5	18	67	20	26	0.15	3.2
54	Tirur	April	7.84	153	34	8	3.4	13	1.9	0	27	3	21	0.06	17
		November	8.09	220	72	15	8.3	15	2.1	0	88	4.1	24	0.32	6.3
55	Tirurangadi	April	7.44	95	16	5.6	0.49	-	-	-	-	-	17	0.07	4
56	Tripanchi	April	8.72	94	22	4.8	2.4	8.7	0.7	7.2	4.9	0.32	16	0.15	6.6
		November	7.36	101	22	4	2.9	7.2	0.5	0	12	0.19	17	0.08	10
57	Vadakkemanna	April	-	220	32	10	1.5	-	-	-	-	-	40	0.42	24
58	Valancheri	April	8.88	645	110	26	11	72	12	6	31	11	146	0.05	50
		November	7.12	80	10	2.4	0.97	8.5	2.2	0	7.3	0.09	16	0.12	7.3
59	Vazhikadavu	April	8.12	360	86	18	9.7	38	16	0	171	19	34	0.17	0.9
		November	7.88	91	34	8	3.4	5.3	0.5	0	54	0.85	2.8	0.14	0.2
60	Vylattur	April	4.49	76	6	1.6	0.49	-	-	-	-	-	13	0.07	12
61	Wandur	April	7.32	210	34	8.8	2.9	21	7.7	0	17	0.9	41	0.15	28
		November	7.37	68	14	3.2	1.5	6.1	0.9	0	12	0.47	9.9	0.08	6.3

PALAKKAD DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^0C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Adiparanda	April	8.94	154	24	7.2	1.5	20	1.1	14	32	0	23	0.37	1.1
		November	8.44	95	22	6.4	1.5	9.5	1.6	2.4	44	1.1	8.5	0.12	0.27
2	Agali	April	8.21	800	185	44	18	89	3.2	0	92	49	142	0.44	76

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	8.36	540	115	22	15	72	2.3	12	146	52	53	0.46	42
3	Alanallur	April	-	250	26	9.6	0.49	-	-	-	-	-	50	0.27	4.6
4	Alathur	April	8.64	510	145	22	22	41	2.4	18	67	21	107	0.63	3.5
		November	8.51	460	138	22	20	41	5.7	7.2	115	31	71	0.56	0.52
5	Ambalappara	April	7.89	139	34	8.8	2.9	12	0.9	0	46	0	24	0.23	0
		November	7.74	91	16	4.8	0.97	11	0.5	0	15	0.32	24	0.02	2.7
6	Ariyur	April	7.94	74	26	9.6	0.49	-	-	-	-	-	2.8	0.16	0.27
7	Athikode	April	8.82	1640	236	14	49	-	-	-	-	-	292	1.3	1.6
8	Athipetta	April	8.53	430	98	12	16	36	24	9.6	134	0	74	0.38	0.34
		November	8.34	240	88	22	8.3	15	1.5	Tr	107	6.6	21	0.4	0.75
9	Chakkanthara	April	-	250	36	7.2	4.4	-	-	-	-	-	27	0.16	0.74
10	Chalisseri	April	7.95	151	26	7.2	1.9	16	4.7	0	34	0	31	0.14	1.1
		November	6.7	152	22	6.4	1.5	13	4.5	0	4.9	0.63	27	0.08	21
11	Chavadiyur	April	8.55	540	160	9.6	33	-	-	-	-	-	25	0.71	7.2
12	Chemmampathi(Near by well)	April	-	500	100	16	15	57	16	-	-	38	103	0.61	25
		November	8.42	390	164	25	25	16	2.3	4.8	122	71	14	0.26	5.3
13	Cherpulassery	April	-	156	48	2.4	10	13	15	-	-	8.1	16	0.22	2.5
		November	-	200	60	14	6.3	16	4.7	-	-	5.3	30	0.16	1.3
14	Chittoor	April	-	790	60	6	11	-	-	-	-	-	68	0.43	2.4
15	Chullimade	April	-	740	120	10	23	117	2.4	-	-	45	100	0.58	0.6
		November	-	1060	115	10	22	210	2.5	-	-	43	92	1.56	4.9
16	Erattakulam	April	8.74	250	74	9.6	12	-	-	-	-	-	24	0.43	0.6
17	Gopalapuram	April	-	670	120	30	11	84	2.6	-	-	0	156	0.63	68
		November	-	630	150	38	13	61	1.2	-	-	3.9	107	0.4	101
18	Kakkupady	April	-	147	26	9.6	0.49	-	-	-	-	-	17	0.27	0.69
19	Kalladikode	April	8.77	114	14	4	0.97	-	-	-	-	-	17	0.08	5.6
20	Kanjikode	April	-	820	25	4	3.6	115	82	-	-	40	132	0.49	36
		November	-	850	90	6	18	83	96	-	-	37	114	0.22	21

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
21	Kanjirapuzha	April	8.1	106	34	13	0.49	6.8	1.4	0	59	0	8.5	0.17	0.84
		November	7.95	98	26	8.8	0.97	8.2	0.6	0	41	0.95	11	0.02	2.4
22	Karavannorthara	April	8.74	520	165	36	18	-	-	-	-	-	115	0.47	0.56
23	Karimpuzha	April	7.28	35	6	0.8	0.97	-	-	-	-	-	8.5	0.03	0.51
24	Karumkulam	April	8.76	380	138	14	25	-	-	-	-	-	37	0.42	0.76
25	Kodavayur	April	8.6	200	38	6.4	5.4	-	-	-	-	-	18	0.66	0.39
26	Kollengode	April	-	540	110	9.6	21	-	-	-	-	-	92	0.38	1
27	Kongad	April	8.82	350	82	17	9.7	-	-	-	-	-	50	0.17	52
28	Kopanur	April	-	1930	50	4	9.7	-	-	-	-	-	231	4.85	2.1
29	Koppam	April	-	161	30	7.2	2.9	20	2.5	-	-	0	33	0.18	0.58
		November	-	157	24	7.2	1.5	20	2	-	-	1.3	33	0.14	12
30	Kottanad	April	8.65	121	22	7.2	0.97	-	-	-	-	-	20	0.06	5.4
31	Kottapuram	April	8.44	210	48	13	3.9	-	-	-	-	-	28	0.15	15
32	Kozhippara	April	8.61	970	225	18	44	-	-	-	-	-	178	0.5	0.66
33	Kudallur	April	8.59	153	38	13	1.5	-	-	-	-	-	17	0.2	0.27
34	Kumaramputhur	April	8.18	117	34	9.6	2.4	-	-	-	-	-	9.9	0.21	0.07
35	Kumaranallur	April	8.32	129	30	8	2.4	-	-	-	-	-	23	0	0.86
36	Kuzhalmannam	April	8.82	490	88	13	14	-	-	-	-	-	50	0.6	0.24
37	Malampuzha	April	8.57	340	72	16	7.8	-	-	-	-	-	58	0.17	1.3
		November	8.27	195	74	18	7.3	9.7	3	0	88	12	13	0.26	0.52
38	Mankara	April	-	230	30	10	0.97	24	12	-	-	17	33	0.21	8
		November	8.29	290	68	14	8.3	25	12	0	78	21	34	0.06	14
39	Mannarghat	April	-	280	52	15	3.4	-	-	-	-	-	43	0.11	37
40	Mattumandha	April	-	290	32	10	1.5	-	-	-	-	-	54	0.15	1.6
41	Mattathukkad	April	8.97	790	130	10	26	-	-	-	-	-	85	1.29	33
42	Meenakshipuram	April	-	740	80	14	11	108	11	-	-	48	146	0.42	70
		November	-	790	155	24	23	94	8.4	-	-	58	110	0.2	80
43	Mundur	April	-	157	28	9.6	0.97	19	2.6	-	-	0	20	0.39	5
		November	-	210	62	10	8.8	17	6.3	-	-	5.5	16	0.16	2.7

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
44	Nadupeni	April	8.97	1140	215	16	43	-	-	-	-	-	142	1.42	41
45	Odannur	April	7.72	137	34	7.2	3.9	10	3.1	0	39	0	18	0.26	0
		November	8.01	159	44	8.8	5.4	12	3.4	0	37	10	23	0.1	4.5
46	Oottara	April	-	770	95	2	22	-	-	-	-	-	103	1.25	6.6
47	Ottapalam	April	7.92	370	46	9.6	5.4	54	1.4	0	59	0	77	0.14	24
		November	8.48	520	90	18	11	54	27	6	49	38	75	0.1	71
48	Palappuram	April	8.82	710	115	24	13	-	-	-	-	-	96	0.18	108
49	Palghat	April	8.79	410	64	11	8.8	60	2	9.6	63	27	75	0.57	2.6
		November	-	480	124	15	21	52	1.5	-	-	39	67	0.75	0.49
50	Panayur	April	8.85	470	142	14	26	-	-	-	-	-	60	0.62	0.72
51	Pattambi	April	8.7	280	66	16	6.3	26	5.3	7.2	49	12	44	0.26	7.9
		November	8.18	270	64	15	6.3	25	5.3	0	49	17	43	0.06	20
52	Peringode	April	7.8	118	20	5.6	1.5	-	-	-	-	-	24	0.04	0.83
53	Perumatti	April	8.75	410	124	14	22	-	-	-	-	-	34	1.11	0.48
54	Pudhupariyaram	April	-	260	48	10	5.4	-	-	-	-	-	40	0.45	11
55	Punchapadam	April	8.71	74	12	4	0.49	7.5	3.8	2.4	24	0	9.9	0.25	0.78
		November	7.42	81	16	3.2	1.9	7.4	4	0	15	0.1	11	0.02	9.4
56	RVP Pudhur	April	8.65	290	102	15	16	-	-	-	-	-	23	0.58	1.3
57	Shornur	April	8.81	210	74	18	6.8	14	2.9	14	83	1.8	24	0.23	0
		November	8.05	126	28	6.4	2.9	12	2.2	0	44	2.8	17	0.02	4.5
58	Tachanattukara	April	-	183	20	8	0	-	-	-	-	-	33	0.04	18
59	Tannirkode	April	-	112	16	5.6	0.49	-	-	-	-	-	18	0.23	4.4
60	Tavalam	April	-	230	42	16	0.49	-	-	-	-	-	40	0.26	22
61	Tenkara	April	-	110	24	8.8	0.49	-	-	-	-	-	9.9	0.19	3.2
62	Thachanpara	April	-	162	24	8	0.97	14	8.6	-	-	0.58	21	0.24	2.6
		November	8.13	240	46	15	1.9	28	3.4	0	41	2.4	33	0.03	42
63	Tholanur	April	8.41	350	102	23	11	25	15	7.2	117	10	45	0.41	1.2
		November	8.22	125	40	11	2.9	7.1	2	0	56	3.2	8.5	0.1	2.9
64	Trittala	April	-	410	88	13	14	-	-	-	-	-	62	0.32	0.67

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
65	Vadakkancherry	April	-	780	100	14	16	-	-	-	-	-	146	0.27	49
66	Vallapuzha	April	8.16	134	34	7.2	3.9	-	-	-	-	-	13	0.23	4.2
67	Vaniyamkulam	April	-	870	90	32	2.4	-	-	-	-	-	220	0.38	59
68	Vattassery(Kottassery)	April	7.78	110	30	8	2.4	-	-	-	-	-	7.1	0.07	1.2
69	Walayar(near by well)	April	8.87	720	195	18	36	-	-	-	-	-	139	0.92	6.7

PATHANAMTHITTA DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^{0}C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Angadikkal North	April	8.39	70	18	7.2	0	4.3	2.1	2.4	24	1.7	5.7	0.27	0.57
		November	7.21	73	22	5.6	1.9	3.5	0.5	0	24	1.4	5.7	0	3
2	Ankamuzhi	April	7.33	96	18	5.6	0.97	7.3	3.9	0	15	0	9.9	0.2	15
		November	6.91	60	10	3.2	0.49	4.5	3.6	0	7.3	0.97	8.5	0.08	8.4
3	Aranmula	April	7.7	220	66	13	8.3	14	1.2	0	54	11	17	0.3	23
		November	7.68	250	80	15	10	15	1.2	0	61	11	24	0	30
4	Enathu	April	8.49	500	90	24	7.3	46	16	4.8	27	21	88	0.31	43
		November	7.93	330	80	23	5.4	24	12	0	78	33	36	0.07	21
5	Ilanthur	April	8.44	82	18	6.4	0.49	6.6	2.6	2.4	15	2.1	13	0.35	4.5
		November	7.16	92	20	5.6	1.5	7.2	3.4	0	22	2.5	13	0.06	5.7
6	Karikulam	April	7.34	137	34	9.6	2.4	7.7	1.9	0	24	3.3	17	0.17	12
		November	7.36	63	22	6.4	1.5	4	1.4	0	29	1.4	7.1	0.01	3.4
7	Kaviyur	April	7.65	56	12	4	0.49	5.2	0.9	0	12	1.2	5.7	0.2	9
		November	5.73	69	10	2.4	0.97	8.5	1.2	0	7.3	0.29	14	0.11	9.6
8	Konni	April	-	132	28	8.8	1.5	6.8	7.5	-	-	0	17	0.36	2.9
		November	6.81	220	40	8	4.9	19	8.2	0	9.8	1.4	45	0.03	24
9	Koodal	April	7.13	74	18	5.6	0.97	-	-	-	-	-	9.9	0.15	10

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
10	Kootanadu	April	7.37	133	24	6.4	1.9	11	3.3	0	15	3.1	23	0.32	10
		November	6.88	125	20	4.8	1.9	11	4.2	0	9.8	2.8	20	0.13	16
11	Kumplanipoika	April	8.5	73	20	5.6	1.5	-	-	-	-	-	8.5	0.34	7.1
12	Laha Balawadi	April	7.41	87	24	7.2	1.5	4	3.8	0	20	4.4	9.9	0.23	11
		November	6.88	48	12	3.2	0.97	2.4	2.5	0	9.8	2.4	5.7	0	7
13	Mallapally	April	7.25	60	14	4	1	4.7	1.4	0	9.8	1.4	8.5	0.18	6.6
		November	6.94	53	12	4	0.49	4.8	1.4	0	9.8	0.97	8.5	0	6
14	Muthoor	April	7.25	92	30	9.6	1.5	3.3	2.5	0	17	13	8.5	0.31	1.7
		November	7.19	188	40	14	0.97	15	4.8	0	24	21	20	0	23
15	Naduvathumuzhi	April	-	93	22	8	0.5	-	-	-	-	-	7.1	0.19	1.1
16	Nilakkal	April	-	87	24	8	1	4.4	2.2	-	-	0.78	8.5	0.19	3.1
		November	6.66	89	20	4.8	1.9	7.4	1.3	0	9.8	0.29	18	0.01	11
17	Pandalam	April	7.48	69	24	4	3.4	5.3	0.2	0	24	0.7	8.5	0.26	4.3
		November	7.16	57	16	2.4	2.4	5.3	0.4	0	22	0.57	8.5	0	2.8
18	Pathanamthitta	April	7.29	230	52	13	4.9	18	5.6	0	17	3.9	31	0.22	57
		November	6.95	230	58	18	3.4	17	5.9	0	15	11	30	0.15	53
19	Peringara	April	8.09	172	52	9.6	6.8	13	0.9	0	63	3.3	20	0.3	5.8
		November	7.52	106	36	5.6	5.4	7.8	0.2	0	44	2.5	11	0.22	6.3
20	Plapally	April	7.75	55	16	5.6	0.5	2.5	2.4	0	24	1.5	4.3	0.03	0.49
		November	7.15	43	12	4	0.49	2.2	2	0	17	1.7	4.3	0	1.6
21	Prakkanam	April	8.16	63	10	3.2	0.5	5.4	4.6	0	15	0.43	9.9	0.24	4.3
		November	6.93	44	8	2.4	0.49	4.4	1.1	0	4.9	0.96	9.9	0.04	4.1
22	Pulikeezh	April	-	85	30	9.6	1.5	4.1	1.1	-	-	3.5	7.1	0.28	1.3
		November	8.04	161	74	26	2.2	4.2	0.7	0	95	9.6	4.3	0.06	0.09
23	Ranni	April	7.74	61	12	4.8	0	4.3	2	0	12	0.74	7.1	0.2	7.7
		November	7.15	43	8	1.6	0.97	3.9	1.6	0	7.3	0	8.5	0.16	5.2
24	Ranni Perunad	April	-	93	26	7.2	1.9	4.9	4.1	-	-	0	5.7	0.41	1.4
		November	7.55	82	24	7.2	1.5	6.1	2	0	29	2.4	7.1	0	7.9
25	Thatta	April	7.99	82	26	8.8	1	3.9	2.5	0	27	6.8	7.1	0.57	0.77

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	7.56	69	22	8	0.49	4.4	1.3	0	29	2.5	8.5	0.37	0.71
26	Thelliyur	April	7.76	103	30	8	2.4	7	3.1	0	29	5.5	11	0.32	5.2
		November	8.33	99	26	8	1.5	7.3	2.5	Tr	32	7	9.9	0.05	5
27	Ullannur	April	7.35	51	18	4.8	1.5	3	2.7	0	15	2.4	4.3	0	3.7
		November	7	43	8	2.4	0.49	4	2.1	0	4.9	0.76	9.9	0	4.4
28	Vadasserikkara	April	8.19	124	50	16	2.4	3.5	0.9	0	44	7.8	5.7	0.35	9.2
		November	7.49	85	32	11	1.1	3.2	0.5	0	32	7.3	4.3	0.31	5.6
		November	7.15	43	8	1.6	0.97	3.9	1.6	0	7.3	0	8.5	0.16	5.2
24	Ranni Perunad	April	-	93	26	7.2	1.9	4.9	4.1	-	-	0	5.7	0.41	1.4
		November	7.55	82	24	7.2	1.5	6.1	2	0	29	2.4	7.1	0	7.9
25	Thatta	April	7.99	82	26	8.8	1	3.9	2.5	0	27	6.8	7.1	0.57	0.77
		November	7.56	69	22	8	0.49	4.4	1.3	0	29	2.5	8.5	0.37	0.71
26	Thelliyur	April	7.76	103	30	8	2.4	7	3.1	0	29	5.5	11	0.32	5.2
		November	8.33	99	26	8	1.5	7.3	2.5	Tr	32	7	9.9	0.05	5
27	Ullannur	April	7.35	51	18	4.8	1.5	3	2.7	0	15	2.4	4.3	0	3.7
		November	7	43	8	2.4	0.49	4	2.1	0	4.9	0.76	9.9	0	4.4
28	Vadasserikkara	April	8.19	124	50	16	2.4	3.5	0.9	0	44	7.8	5.7	0.35	9.2
		November	7.49	85	32	11	1.1	3.2	0.5	0	32	7.3	4.3	0.31	5.6

THRISSUR DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^0C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Adatt	April	7.32	153	20	5.6	1.5	16	3.4	0	12	0.5	28	0	15
		November	6.94	129	14	4	0.97	20	2.4	0	4.9	0	28	0.32	12
2	Annamanada	April	7.81	151	24	5.6	2.4	17	7.2	0	9.8	3.1	26	0.04	20
		November	6.93	168	26	7.2	1.9	19	5.2	0	7.3	0	37	0.11	20

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
3	Athani	April	7.83	95	16	5.6	0.5	7.1	2.4	0	9.8	0	17	0.14	12
		November	8.45	184	46	13	3.4	15	10	7.2	49	3	27	0.2	0.66
4	Azhikode	April	-	1850	220	38	31	260	27	-	-	225	420	0.33	8.5
5	Chalakudy	April	-	62	10	3.2	0.49	7.4	1.9	-	-	1.2	11	0	2.1
		November	6.11	50	16	2.4	2.4	4.7	0.2	0	7.3	0	9.9	0.16	5.2
6	Chavakkad	April	8.8	210	54	17	2.9	17	7.2	9.6	39	21	23	0.2	2.4
		November	7.79	192	62	22	1.9	12	2.7	0	78	12	16	0.27	1.6
7	Chelakkara	April	-	240	32	13	0	29	1.4	-	-	15	38	0.65	1.2
		November	8.22	440	160	22	26	32	4.1	0	185	19	55	0.53	0
8	Chelakkod	April	-	68	14	3.2	1.5	6.2	1.4	-	-	0.3	8.5	0.24	1
9	Cherukunnu	April	7.33	69	8	1.6	0.97	-	-	-	-	-	11	0.02	0.4
10	Echipara	April	-	66	18	7.2	0	4.3	1.4	-	-	2.1	8.5	0	0.32
11	Erumapetty	April	-	97	16	4	1.5	9	2	-	-	2.2	14	0.12	5.9
		November	7.44	95	18	4	1.9	10	2.1	0	12	0	16	0.12	10
12	Guruvayur	April	8.58	200	58	16	4.4	17	2.5	4.8	59	5	26	0.13	2.3
		November	7.94	200	60	15	5.4	22	2.4	0	90	1	26	0.14	0
13	Irinjalakuda	April	7.59	73	20	6.4	0.97	5.7	1.5	0	22	2.6	8.58	0.14	2.7
14	Keechery	April	-	350	56	14	5.4	-	-	-	-	-	60	0.2	61
		November	8.27	480	104	23	11	62	4.4	Tr	195	15	62	0.36	0
15	Kallumpuram	April	7.9	300	60	12	7.3	-	-	-	-	-	48	0.16	61
16	Kodungallur	April	-	350	48	18	0.97	30	11	-	-	28	43	0.36	17
		November	-	520	94	34	1.9	46	12	-	-	48	60	0.56	48
17	Kombazha	April	7.6	137	30	8.8	1.9	13	4.6	0	46	3.5	14	0.23	1.8
		November	8.29	135	18	5.6	0.97	13	8.2	Tr	39	3	20	0	3.3
18	Konnakuzhi I	April	7.22	34	10	2.4	0.97	2.8	0.5	0	12	0.3	5.7	0.1	0.1
		November	7.21	35	12	3.2	0.97	2.8	0	0	17	0	4.3	0.07	0.29
19	Konnakuzhi ii	April	6.31	90	14	4	0.97	9.5	2.3	0	4.9	3.1	18	0	9.8
20	Kunnamkulam	April	-	69	14	3.2	1.5	-	-	-	-	-	11	0.14	3.4
21	Kundannur	April	8.57	460	134	17	22	-	-	-	-	-	85	0.34	4.6

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
22	Mala	November	7.14	135	38	9.6	3.4	7.1	6.1	0	20	15	8.5	0.03	9.9
23	Manalur	April	7.3	37	8	0.8	1.5	4.2	0.6	0	9.8	1.1	7.1	0.09	2.2
24	Manamangalam	April	6.8	35	6	1.6	0.49	4.8	0.5	0	9.8	1.2	4.3	0.09	0.32
		November	6.97	37	8	1.6	0.97	4.5	0	0	17	0	4.3	0.07	0.74
25	Mattathur	April	7.48	26	8	0.8	1.5	2.8	0.6	0	9.8	0.4	2.8	0	0.56
		November	5.88	24	6	1.6	0.49	2.4	0.1	0	7.3	0	4.3	0.14	0.25
26	Methalapadam	April	-	175	26	7.2	1.9	-	-	-	-	-	21	0.16	2.9
27	Mulankunnathukavu	April	-	320	42	14	1.5	-	-	-	-	-	34	0.26	25
28	Mupiliyam	April	-	91	12	4	0.49	9.7	4.2	-	-	1.2	18	0.08	1.8
29	Muringur	April	-	107	28	7.2	2.4	9.5	2.1	-	-	3.7	18	0.17	1
30	Padakulam	April	8.7	140	46	16	1.5	-	-	-	-	-	7.1	0.14	2.8
31	Parappur	April	7.78	162	22	7.2	0.97	-	-	-	-	-	27	0.14	2.4
32	Parapukara	April	8.84	179	44	7.2	6.3	-	-	-	-	-	13	0.32	50
33	Pattikkad	April	8.03	98	30	7.2	2.9	-	-	-	-	-	7.1	0.22	1
34	Perinjanam	April	8.4	190	72	25	2.4	8	2.6	4.8	76	5.6	13	0.11	2.2
35	Potta	April	8.64	107	24	5.6	2.4	9.5	3.1	2.4	9.8	11	14	0.04	6.1
36	Tekkumkara	April	7.89	62	12	4.8	0	6.6	1.6	0	20	2.3	8.5	0	0.32
		November	7.5	56	16	5.6	0.49	4.3	0.1	0	22	0	8.5	0.15	0.38
37	Trichur	April	-	54	12	3.2	0.97	4.4	0.8	-	-	5.3	8.5	0	1
		November	6.95	65	14	4.8	0.49	5.5	0.1	0	7.3	2.2	8.5	0.02	5.4
38	Vadakkancherry	April	-	147	22	7.2	0.97	14	2.8	-	-	11	17	0.43	2.1
		November	8.41	108	24	6.4	1.9	12	1.4	7.2	24	2.3	16	0.22	0.39
39	Vellanikkara	April	7.56	102	18	6.4	0.5	8.4	1.4	0	20	0	14	0.2	9.4
40	Vellikulangara	April	7.51	75	12	3.2	0.97	-	-	-	-	-	16	0.01	1.7

TRIVANDRUM DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^{0}C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	F	NO_3
					<----------Concentration in mg/L---------->										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	Amboori	April	7.72	119	24	7.2	1.5	13	0.8	0	15	0	17	0.1	21
		November	6.36	106	16	4.8	0.97	12	1	0	4.9	1.5	17	0.1	23
2	Anjengo	April	-	258	46	12	3.9	-	-	-	-	-	34	0	1.5
3	Aruvikkara	April	8.02	95	18	6.4	0.49	-	-	-	-	-	14	0	3
4	Athazhamangalam	April	7.94	116	26	7.2	1.9	-	-	-	-	-	17	0.4	4.4
5	Attingal	April	7.71	115	26	8.8	0.97	-	-	-	-	-	18	0.13	3.4
6	Chirayinkil	April	7.72	341	38	9.6	3.4	-	-	-	-	-	70	0.3	8.8
7	Chittagodu	April	7.89	312	36	10	2.4	-	-	-	-	-	50	0.29	18
8	Kadakkavur	April	7.55	388	86	19	9.2	31	3	0	24	26	62	0.02	53
		November	7.2	320	88	22	8.3	24	3.7	0	34	82	21	0.2	17
9	Kallambalam	April	-	431	44	12	3.4	-	-	-	-	-	67	0.36	52
10	Kallar	April	-	96	32	9.6	1.9	6.1	2.6	-	-	1.5	8.5	0.08	3.6
		November	7.37	55	16	4.8	0.97	3.2	1.1	0	20	2.8	5.7	0.12	1.2
11	Kallikkad	April	8.1	290	24	7.2	1.5	-	-	-	-	-	62	0.27	8.4
12	Kattakada	April	7.81	410	40	9.6	3.9	44	17	0	4.9	0.07	112	0.25	15
		November	4.3	290	22	4.8	2.4	24	14	0	0	1.5	74	0.15	7.5
13	Kazhakuttam	April	8.49	390	90	27	5.4	30	5.9	2.4	32	56	41	0	43
		November	7.7	370	110	35	5.4	30	7.6	0	112	63	30	0.09	9
14	Kilimanoor	April	7.89	204	44	14	2.4	-	-	-	-	-	24	0.26	8.7
15	Kochuveli	April	8.06	207	44	15	1.5	-	-	-	-	-	14	0.12	2
16	Korani	April	7.93	165	30	10	0.97	16	2.9	0	34	6	26	0.06	5.1
		November	7.57	220	26	9.6	0.49	35	1.6	0	32	2.1	44	0.1	22
17	Kulathur	April	8.16	141	38	13	1.5	-	-	-	-	-	14	0.38	2.6
18	Madavur	April	-	115	14	4	0.97	9.7	4.6	-	-	0.14	17	0.12	8.8

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		November	7.17	93	16	4.8	0.97	8.9	2.7	0	22	0.97	14	0.09	7.6
19	Mannanthala	April	7.66	232	24	5.6	2.4	26	6.4	0	15	0.04	43	0.09	31
		November	6.69	230	22	4.8	2.4	35	8.1	0	9.8	0.58	50	0.15	41
20	Maruthamala	April	8.23	140	34	11	1.5	9.8	4.6	0	41	2.6	14	0.17	9.2
		November	7.14	96	16	5.6	0.49	8.4	3.7	0	12	3	13	0.06	12
21	Murukumpuzha	April	7.81	298	66	22	2.4	-	-	-	-	-	55	0	0.62
22	Nagapuram	April	7.96	189	30	8	2.4	-	-	-	-	-	41	0.11	3.1
23	Nedumangad	April	7.97	166	24	8	0.97	16	5.6	0	34	2.1	27	0.07	13
		November	7.27	106	28	9.6	0.97	5	2.4	0	17	8.9	13	0.13	4.9
24	Nemom	April	8.23	410	64	16	5.8	42	12	0	15	8.4	74	0.16	79
		November	6.96	440	78	16	9.2	42	13	0	7.3	4.6	77	0.21	82
25	Neyyattinkara	April	7.69	230	38	10	2.9	22	3.8	0	22	0.82	33	0.13	38
		November	7.44	210	34	8.8	2.9	22	3.4	0	29	1.3	37	0.1	28
26	Palode	April	8.35	179	28	8.8	1.5	16	6.9	2.4	24	6.1	21	0.35	20
		November	7.06	165	28	8.8	1.5	13	7.1	0	12	2.6	23	0.06	34
27	Panavoor	April	-	109	20	7.2	0.49	-	-	-	-	-	13	0.2	2
28	Pangode	April	-	271	28	10	49	30	7.3	-	-	0	50	0	51
		November	7	139	18	5.6	0.97	17	4.4	0	7.3	0.19	24	0.18	27
29	Parassala	April	-	1169	155	28	21	-	-	-	-	-	295	0.38	2.9
30	Perumathura	April	-	706	100	36	2.4	-	-	-	-	-	149	0.58	34
31	Perumgur	April	-	246	16	4.8	0.97	-	-	-	-	-	50	0.18	4.2
32	Perumkadavila	April	8.19	102	22	5.6	1.9	8	3.4	0	29	2	11	0.16	4.8
		November	7.4	102	24	5.6	2.4	7.2	4	0	32	1.5	14	0.32	6
33	Perumkuzhi	April	8.44	330	86	26	5.4	24	0.9	4.8	39	34	40	0	20
		November	7.99	570	194	63	8.8	39	0.5	0	122	39	68	0.13	66
34	Pirappankod	April	-	107	14	5.6	0	8.6	4.9	-	-	0	14	0.27	7.7
		November	7.11	130	14	4.8	0.49	19	2.4	0	12	0.39	21	0.35	23
35	Pudukurichi	April	-	719	100	32	4.9	89	15	-	-	28	132	0.51	80
		November	8.33	530	122	38	6.8	62	9.9	Tr	183	13	75	0.3	22

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	Ponmudi	April	7.6	84	22	6.4	1.5	-	-	-	-	-	8.5	0.02	12
37	Poonthura	April	-	270	64	20	3.4	16	6.5	-	-	14	31	0.25	42
		November	8.33	200	50	16	2.4	11	8.8	2.4	32	6.7	27	0.1	12
38	Pozhiyoor	April	-	1480	145	14	27	238	23	-	-	149	284	0.32	23
		November	8.22	1960	275	46	39	272	33	0	238	191	390	0.35	22
39	Pulluvila	April	-	-	-	-	-	-	-	-	-	-	-	-	-
		November	7.17	116	20	4.8	1.9	14	0.7	0	15	1.2	27	0.1	9.5
40	Puvar(School)	April	8.39	964	145	34	15	-	-	-	-	-	178	0.18	51
41	Sasthanthala	April	-	1286	40	10	3.6	-	-	-	-	-	373	0.28	1
42	Thonnakkal	April	7.48	158	28	8.8	1.5	-	-	-	-	-	23	0.16	20
43	Trivandrum	April	8.55	232	44	11	3.9	22	3.9	4.8	20	4.6	37	0.07	22
		November	7.08	139	30	8.8	1.9	12	2.2	0	9.8	8.2	20	0.21	19
44	Vamanapuram	April	8.31	369	66	20	3.9	28	26	4.8	88	20	47	0.4	3.9
		November	7.9	360	94	31	3.9	26	20	0	107	26	43	0.23	24
45	Varkala	April	-	329	54	16	3.4	32	2.9	-	-	5.2	58	0.06	46
		November	6.73	270	44	9.6	4.9	26	2.6	0	4.9	0.68	61	0.2	41
46	Vellanad	April	7.77	74	18	6.4	0.49	-	-	-	-	-	7.1	0.2	4.6
47	Vellarada	April	-	772	40	6	6.1	-	-	-	-	-	164	0.02	21
48	Vellayani	April	-	185	34	9.6	2.4	-	-	-	-	-	33	0.16	7.3
49	Veiyloor	April	7.88	554	45	12	3.6	-	-	-	-	-	110	0.02	50
50	Venpakal	April	-	133	28	9.6	0.97	-	-	-	-	-	14	0	0.65
51	Vidura	April	7.88	147	28	8.8	1.5	-	-	-	-	-	18	0.04	23

WAYANAD DISTRICT

Sl. No.	Location	Month	pH	EC in µS/cm at 25^0C	TH as $CaCO_3$	Ca	Mg	Na	K	CO_3	Cl	F	NO_3
					<----------Concentration in mg/L---------->								
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1	Ambalavayal	April	7.36	220	50	12	4.9	20	6.1	0	18	3	31

		November	7.77	99	28	10	0.49	6	2.3	0	34	8.6	9.9
2	Appappara	April	8.46	179	66	18	5.4	8.9	2.6	12	85	traces	8.5
		November	8	158	58	17	3.9	7.5	2.4	0	95	0	9.9
3	Chenad	April	7.95	150	50	13	4.4	7.3	1.5	0	61	traces	14
		November	7.89	136	42	10	3.9	8	1.4	0	63	0.48	13
4	Cheyyambam	April	8.92	360	130	16	22	20	0.5	24	104	6.5	50
		November	8.1	260	90	14	14	17	3.5	0	127	4.4	18
5	Kalpetta	April	8.36	510	115	32	8.5	37	25	12	104	21	67
		November	8.23	330	64	18	4.9	25	19	0	98	19	34
6	Kamblakat	April	8.14	154	46	13	3.4	11	0.8	0	55	traces	9.9
		November	7.51	109	24	8	0.97	11	0.5	0	37	0	9.9
7	Kattikulam	April	9.67	179	46	8	63	17	3.2	-	-	9	17
		November	7.75	142	46	10	4.9	7.6	2.7	0	44	7.2	11
8	Kavumandam	April	7.88	112	28	8	2	7.2	2.9	0	37	2.5	11
9	Kellur	April	7.77	240	50	12	4.9	25	1.5	0	37	0	38
		November	7.95	300	76	23	4.4	20	5	0	66	3.1	43
10	Koroth	April	7.56	64	20	6.4	0.97	3.7	1.3	0	24	1.5	8.5
		November	7.44	66	20	7.2	0.49	3.4	1.6	0	29	1.3	7.1
11	Lakkidi	April	7.42	54	18	4.8	1.5	2.7	0.4	0	27	3.5	4.3
12	Mananthody	April	8.2	380	75	24	3.6	29	19	6	79	38	36
		November	7.99	370	94	28	5.8	26	16	0	102	33	37
13	Meppady	April	7.41	156	32	8	2.9	14	0.7	0	27	traces	26
		November	7.29	127	24	6.4	1.9	12	0.3	0	15	0.29	23
14	Minangadi	April	-	240	35	12	1.2	26	2.2	-	-	11	40
		November	-	210	36	12	1.5	24	3.3	-	-	19	31
15	Muthanga	April	8.32	280	60	18	3.6	26	1.1	traces	85	17	36
		November	7.99	350	130	25	16	15	1.5	0	93	23	33
16	Naykatti	April	8.27	290	80	20	7.3	22	1.7	12	67	20	31
		November	7.99	187	60	15	5.4	13	1.4	0	95	3.4	16
17	Noolpuzha	April	8.16	150	52	10	6.3	8.8	1.1	0	85	2.5	8.5

1	2	3	4	5	6	7	8	9	10	11	12	13	14
18	Padinjarattara	April	-	96	32	8	2.9	4.8	1.1	-	-	0	5.7
		November	7.4	310	66	17	5.8	32	1.6	0	29	7.5	45
19	Panamaram	April	8.37	310	75	18	7.3	27	5.2	12	98	17	34
		November	-	191	38	11	2.4	17	4.8	-	-	6.2	26
20	Perikallur	April	9.68	320	40	14	1.2	39	2.3	-	-	7.5	64
		November	7.92	240	42	12	2.9	33	1.3	0	93	0.19	36
21	Periya	April	8.17	96	30	7.2	2.9	5.8	1.9	0	39	1	11
		November	6.96	22	6	1.6	0.49	2	0.5	0	7.3	0	4.3
22	Pozhutana	April	7.39	103	24	5.6	2.4	6.2	6.3	0	34	5	13
23	Pulpally(new well)	April	8.72	400	110	14	18	42	4.5	24	153	15	40
		November	8.39	590	125	14	22	60	33	18	159	55	50
24	Sulthan Bathery	April	8.53	530	120	18	18	51	29	18	116	20	87
		November	-	260	20	7.2	0.49	25	24	-	-	26	34
25	Talapozha	April	7.68	85	26	8	1.5	5.6	0.7	0	32	1	14
26	Taruvana	April	6.72	101	22	3.2	3.4	9	0.4	0	9.8	traces	21
		November	4.67	102	24	4	3.4	6.3	0.6	0	0	0	23
27	Tirunelly	April	7.26	43	14	4	0.97	2.6	0.5	0	24	traces	5.7
28	Vaduvanchal	April	7.24	169	44	11	3.9	9.7	5.8	0	22	0	19
		November	7.19	167	42	10	3.9	10	5.3	0	20	0.39	20
29	Valatt	April	8.3	82	32	11	0.97	3.1	0.7	4.8	37	0	7.1
		November	7.42	57	20	6.4	0.97	2.8	0.5	0	22	0.38	7.1
30	Vellamunda	April	8.31	240	110	30	8.5	13	3.4	12	110	8.5	21
		November	7.3	49	12	3.2	0.97	4.1	1.5	0	20	0	7.1
31	Vyttiri	April	7.78	182	48	13	3.9	11	7	0	44	20	19
		November	7.41	260	64	18	4.4	13	9.4	0	37	24	28
		November	8.39	590	125	14	22	60	33	18	159	55	50

- Not Analysed

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