GOVERNMENT OF KERALA
GROUNDWATER DEPARTMENT

GROUNDWATER LEVEL MONITORING REPORT – MAY 2020

Water is a replenishable natural resource which is essential for the existence of all living beings. In the past, the demand of water is mostly limited to domestic and in the agricultural sector. Due to the developments in agricultural and industrial sector the demand of water is increasing many folds since last few decades. Surface water resource alone couldn't meet the increasing demand and hence persuaded to depend on groundwater resource during the past few decades made stress on groundwater regime. In order to sustain the groundwater resources, proper groundwater management practices are needed.

Rainfall is the primary source for groundwater recharge and has a vital role in the sustainability of groundwater resource in the state. Groundwater level fluctuation results from the seasonal availability of rainfall. Kerala state experiences four distinct seasons namely winter (January-February), Pre-monsoon (March-May), Monsoon (South-West) June to September and Post-monsoon (North-East) from October to December. Average annual precipitation in the state is nearly 3000 mm. The rainfall in the State is controlled primarily by the South-West and North-East monsoons. About 90% of the rainfall occurs during six monsoon months (South-West monsoon contributes major portion of rainfall (65-70%) and about 16% from the North-East) and remaining from summer showers.

The winter rainfall (January-February) occurred in the state during 2019 is 13.1 mm, which is 46% deficient than that of the normal Rainfall (24.4 mm). The state received 169.1mm pre-monsoon rainfall during 2019, which is 55.5% deficient with that of the normal rainfall (379.70mm).

While the winter rainfall occurred in the state during 2020 (January - February) is 9.6mm, which is 57% deficient than that of the Normal Rainfall. But the pre-monsoon rainfall occurred in the state during 2020 is 387.5mm, which is 7% more than that of the normal rainfall in this season. Due to the excess rainfall received from the pre-monsoon season, groundwater replenishment occurred in the state during May 2020 than the previous year (May 2019).

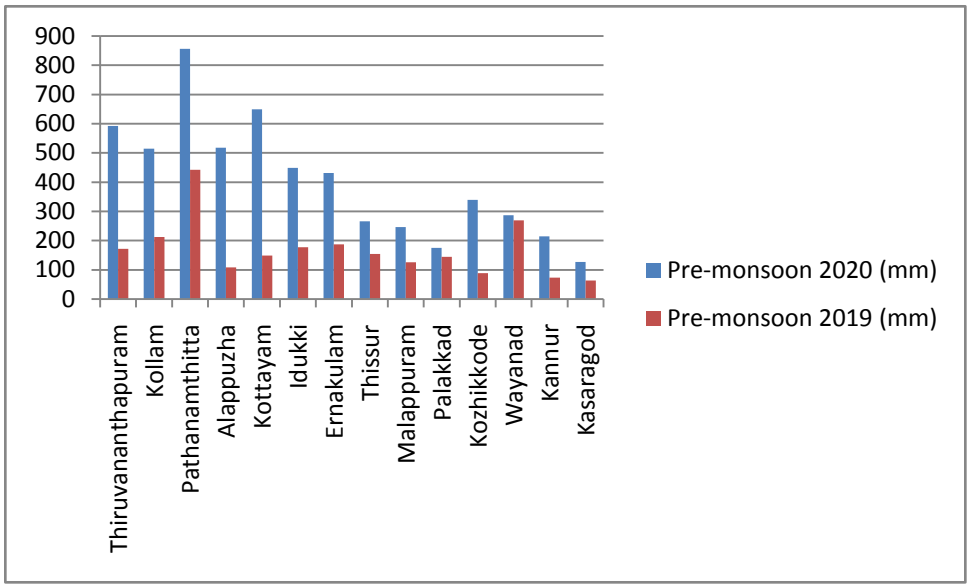

Fig:1. Comparison of pre-monsoon rainfall 2020 wrt 2019

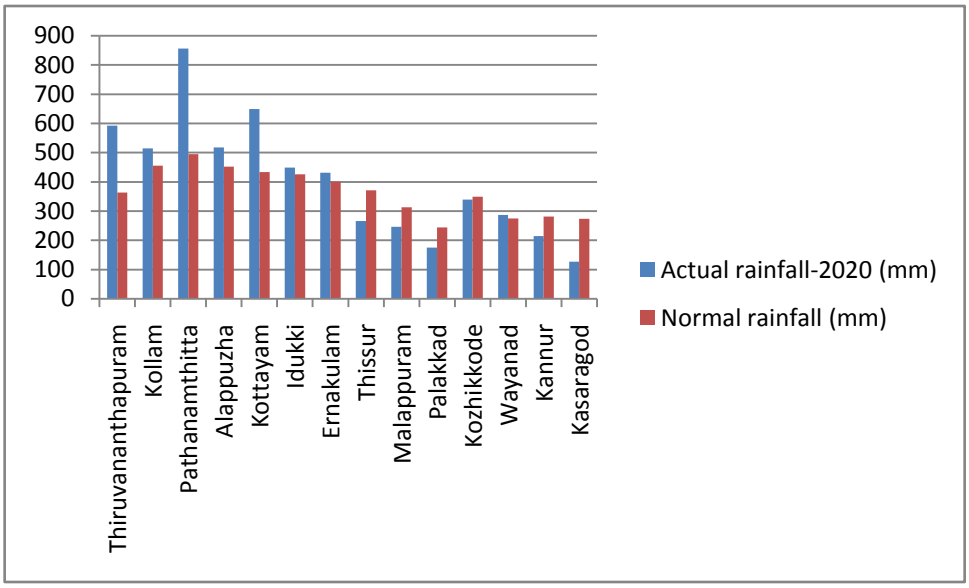

Fig:2. Comparison of pre-monsoon actual rainfall 2020 wrt Normal Rainfall

Geology: Kerala, the southernmost state of Indian peninsula, is having a geographical area of 38863 km^2. The land area extends between latitude 8°17'30" and 12°27'40" and longitude 74°51'57" and 77°24'47". Physiographically, Kerala state is sandwiched between Western Ghats on the east and Arabian Sea on the west. Being the part of the southern Indian peninsula, the peninsular geological formations exist in the state. The major geological formations in the state

comprises crystalline rocks of Archaean Age, sedimentary rock formations of tertiary age and sub recent to recent rock formations of quaternary age.

Occurrence of Groundwater resource: Groundwater occurs under phreatic, semi-confined and confined conditions, Groundwater in unconfined aquifer is mainly utilized through tube wells in sedimentary terrain and through bore wells in hard rock areas.

Groundwater monitoring network: Short term and long term changes in the climatic conditions influence the groundwater scenario of an area. Groundwater level data are the principal information required for assessing the groundwater status and groundwater resource estimation.

Groundwater Department is maintaining a network of observation wells throughout the state representing various hydrogeological units. Observation wells includes dug wells (owned by public and private) and purpose built piezometers (bore wells and tube wells). Water level data has been collected monthly and water samples collected and analysis done periodically.

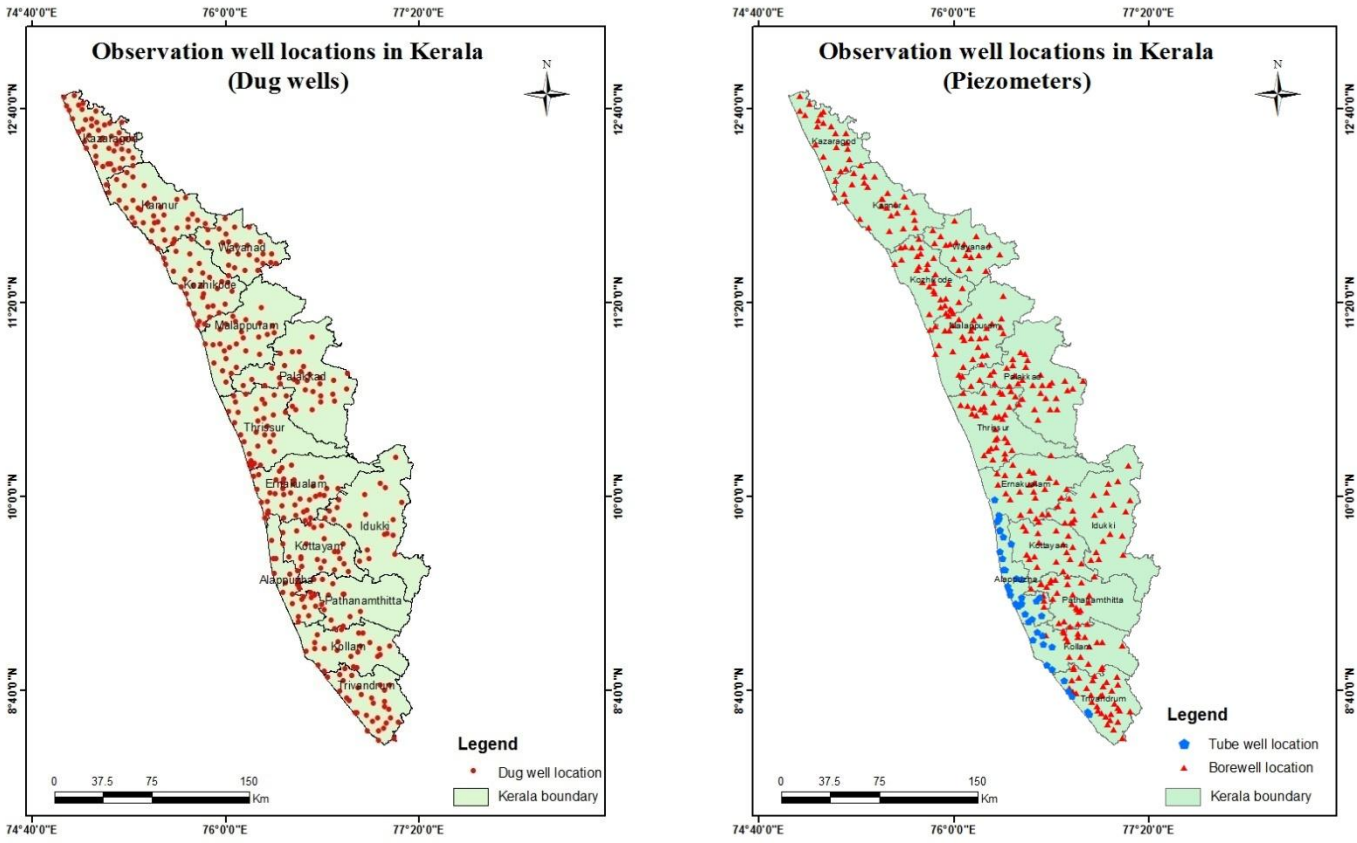

Fig:3. Location map of observation dug wells and piezometers (bore wells & tube wells)

Analysis of Groundwater level data – May 2020

During the month of May 2020, groundwater level in 359 dug wells and 376 purpose built piezometers (bore wells- 339 and tube wells – 37) has been monitored. The data collected from the observation wells during the month of May 2020 has been compared with previous year's corresponding month and also with respect to decadal mean of the corresponding month to assess the groundwater scenario in the state.

I. Depth to Groundwater level during May 2020

Dug wells- The depth to groundwater level in the observation dug wells during the month of May 2020 ranges from a minimum of -0.05 m to a maximum of 16.41 mbgl. Out of 339 dug wells monitored water level in 13% of dug wells shows a depth to water level ranges from 0-2 m, 32% ranges between 2-5 m, 40% ranges between 5-10 m and 15% dug wells recorded depth to water level ranges between 10-20 mbgl. Table showing well frequency during May2020 is appended. (Annexure-I)

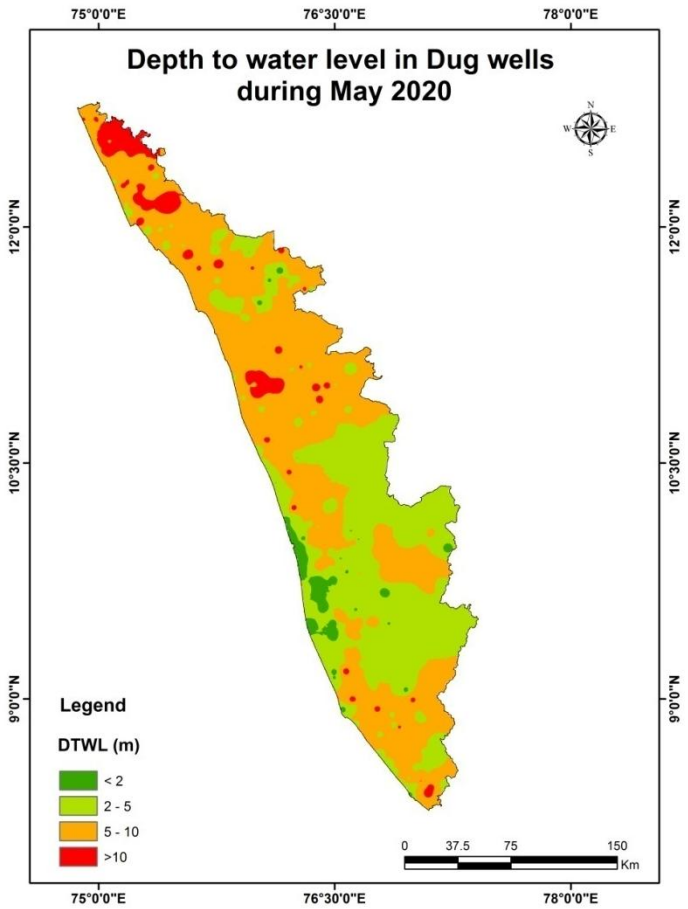

Fig:4. Depth to water level in Dug wells during May 2020

Borewells (hardrock terrain):- The depth to groundwater level in the observation bore wells during the month of May 2020 ranges from a minimum of 0.27m to a maximum of 39.78 mbgl. Out of 339 bore wells monitored, water level in 6% of bore wells shows a depth to water level range from 0-2 m, 18 % ranges between 2-5 m, 36% ranges between 5-10 m, 31% of bore wells ranges between 10-20 m, and 9% ranges more than 20 m . Table showing well frequency during May 2020 is appended. (Annexure-I)

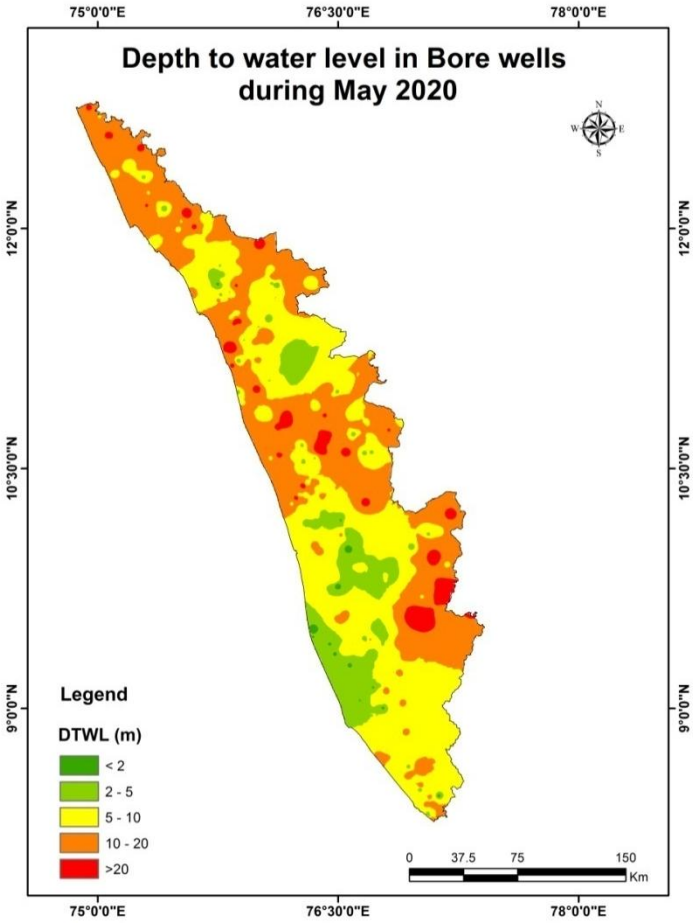

Fig:5. Depth to water level in Bore wells during May 2020

Tube wells (coastal sedimentary terrain) - The depth to groundwater level in the observation tube wells during the month of May 2020 range from a minimum of 0.56 m to a maximum of 35.3 mbgl . Out of 37 tube wells monitored in the state, water level in 19 % of tube wells shows a depth to water level range from 0-2 m, 41% of tube wells ranges between 2-5 m, 22% of tube wells ranges between 5-10 m, 13 % of tube wells ranges between 10-20 m, and 5% ranges more than 20 m .Table showing well frequency is appended.(Annexure-I)

II. Comparison of Groundwater level in May 2020 with respect to May 2019

Comparison of the groundwater level in May 2020 with respect to the corresponding month in the previous year, indicates that 20 % of observation dug wells show a fall in water level and 80 % of the wells shows no remarkable change /marginal rise in water level. Out of 20% of the dug wells shows a falling trend, majority (71%) recorded fall in water level less than 0.5m , 16 % of dug wells show fall in the range between 0.5-1m ,11 % of dug wells show fall in the range between 1-1.5 m, 1% of dug wells show a fall in the range between 1.5 -2m and 1% dug wells show a fall in water level between 2.5 - 3m. Table showing water level comparison of dug wells during May 2020 with respect to May 2019 is appended. (Annexure-II).

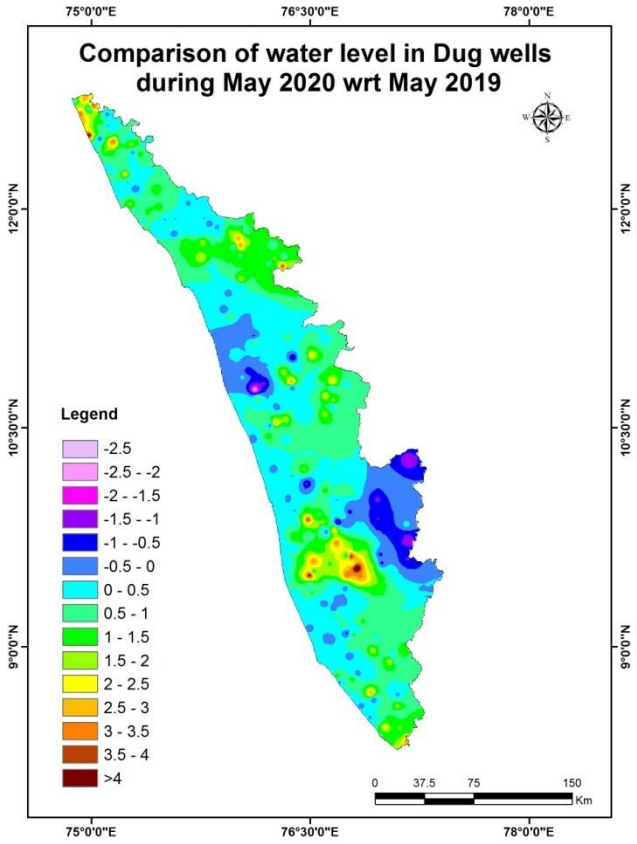

Fig:6. Comparison of water level in Dug wells during May 2020 wrt May 2019

Comparison of the water level in observation bore wells (hard rock terrain in midland and high land areas) in May 2020 with that of the previous year, it has been noticed that 26% of bore wells show fall in water level and 74 % of the wells shows no remarkable change / marginal rise in water level. Out of 26 % of the bore wells shows a falling trend , 47 % of the

bore wells recorded fall in water level less than 0.5m, 23 % show fall in the range between 0.5 - 1m, 9% of bore wells show fall in the range between 1 - 1.5m, 7 % of bore wells show a fall in range between, 1.5-2m, 3% of bore wells show a fall in range between 2- 2.5m, 3% of bore wells show a fall in range between 2.5-3m , 1% of bore wells show a fall in range between 3-3.5m and 7% of bore wells show a fall in water level more than 4m. Table showing water level comparison of bore wells during May 2020 with respect to May2019 is appended. (Annexure-II)

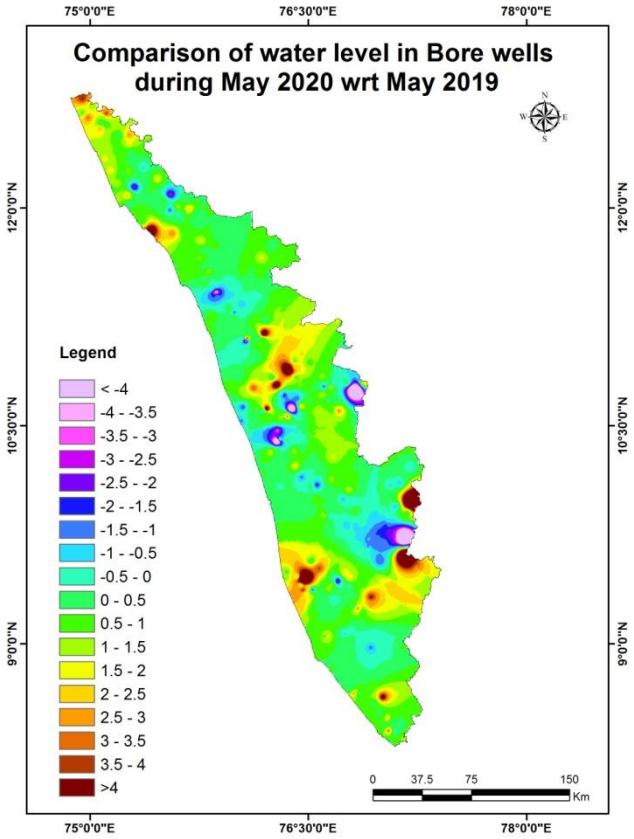

Fig:7. Comparison of water level in Bore wells during May 2020 wrt May 2019

Comparison of the water level in observation tube wells (in the coastal sedimentary areas) during May 2020 with that of the previous year reveals that 22 % of tube wells recorded a falling trend and 78 % of the wells shows no remarkable change /marginal rise of water level. Out of 22% of the tube wells shows a falling trend, majority (74 %)of the tube wells recorded fall in water level less than 0.5m, 13 % of tube wells show fall in the range between 0.5 - 1m and 13 % of tube wells show fall in the range between 1.5 - 2m. Table showing comparison of water level during May 2020 with respect to May 2019 is appended. (Annexure-II)

III. Comparison of Groundwater level in May 2020 with respect to Decadal mean (2010- 19)

Comparison of the water level in May 2020 with respect to the decadal mean, it has been noticed that 38 % of observation dug wells recorded a fall in water level and 62 % of the wells shows marginal rise /no remarkable change in water level .Out of 38% of the dugwells shows a falling trend, majority (64%) of the dug wells recorded fall in water level less than 0.5m, 22% show fall in the range between 0.5-1m, 8% of dug wells show fall in the range between 1-1.5m, 4 % of dug wells show a fall in range between 1.5-2m, 2 % of dug wells show a fall in range between 2 - 2.5m and 0.01% of dug wells show a fall in water level between 3.5 - 4m. Table showing water level comparison of dug wells during May 2020 with respect to decadal mean is appended. (Annexure-III)

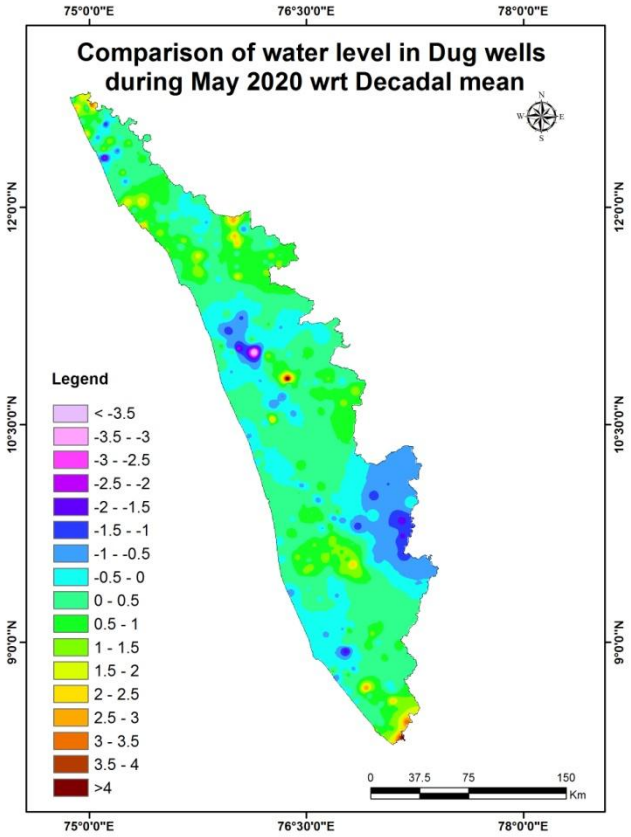

Fig:7. Comparison of water level in Dug wells during May 2020 wrt Decadal mean

Comparison of the water level in the observation bore wells during May 2020 with that of the decadal mean. It has been noticed that 50% of bore wells show fall in water level, and 50 % of the wells shows marginal rise, no remarkable change in water level.Out of 50 % of the bore

wells shows a falling trend , 40 % shows a fall in water level less than 0.5m, 21 % show fall in the range between 0.5 - 1m, 11% show fall in the range between 1-1.5 m, 3% of wells show a fall in range between 1.5to 2m ,5% show a fall in range between 2-2.5 m, 4% of bore wells show a fall in range between 2.5-3 m ,2% of bore wells show a fall in range between 3-3.5m, 2% of bore wells show a fall in range between 3.5-4m and 12% of bore wells show a fall in water level more than 4 m. Table showing water level comparison of bore wells during May 2020 with respect to decadal mean is appended. (Annexure-III)

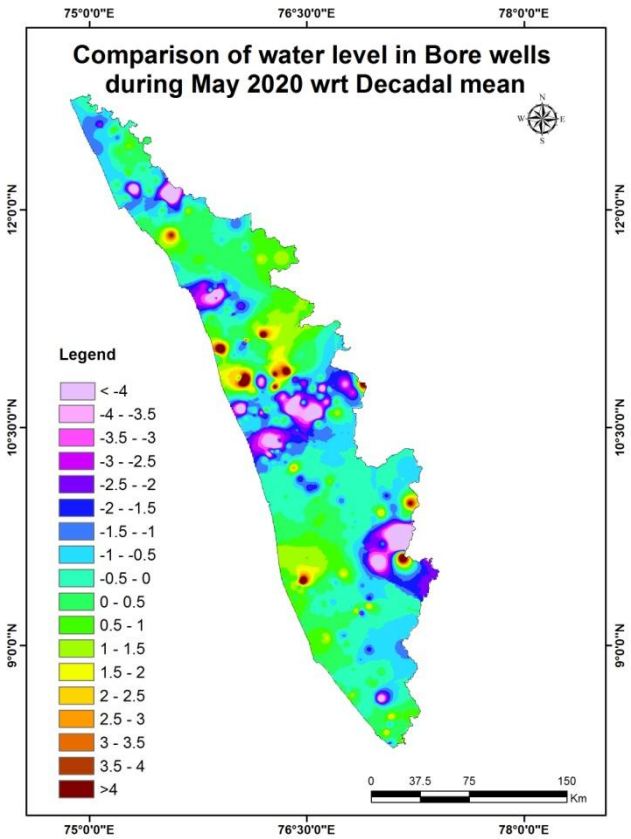

Fig:8. Comparison of water level in Bore wells during May 2020 wrt Decadal mean

Comparison of the water level in the observation tube wells during May 2020 with that of the decadal mean reveals that 57 % of tube wells recorded a falling trend and 43 % of the tube wells shows marginal rise/no remarkable change in water level. Out of 57 % of the tube wells shows a falling trend, majority (60 %) of tube wells show fall in water level less than 0.5m and 40% of tube wells show fall in the range between 0.5-1 m. Table showing water level comparison of tube wells during May 2020 with respect to decadal mean is appended. (Annexure-III)

Summary

Rainfall

- The state received 169.1mm pre-monsoon rainfall during 2019, which is 55.5% deficient with that of the normal rainfall (379.70mm).
- The pre-monsoon rainfall occurred in the state during 2020 is 387.5mm, which is 7% more than that of the normal rainfall in this season.

Groundwater level

- The depth to groundwater level in the observation dug wells during the month of May 2020 range from a minimum of -0.05 m to a maximum of 16.41 mbgl , in bore wells 0.27 m to a maximum of 39.78 mbgl and in the tube wells 0.56 m to a maximum of 35.3 mbgl.
- Comparison of the water level in May 2020 with respect to the previous year, reveals that 20 % of observation dug wells, 26 % of bore wells and 22% of tube wells recorded a falling trend. In that majority of the observation wells show decline of water level less than 0.5 m only.
- Comparison of groundwater level in May 2020 with respect to the decadal mean, reveals that 38 % of observation dug wells, 50 % of bore wells and 57% of tube wells recorded a falling trend. In that majority of the observation wells, shows decline of water level less than 0.5 m only
- Wells showing decline of water level more than 4 m during long term analysis will be monitored closely.
- Due to the excess rainfall received from the pre-monsoon rainfall, groundwater replenishment occurred in the state during May 2020 than the previous year (May 2019). Most of the wells get recharged during this season and the percentage of fall in water level gets minimized during May 2020 than that of the previous year.

Districtwise Observation well Frequency on May 2020 **Annexure I**

District	Well Type	No. of WL measured	DTWL(mbgl)		Location		Depth range of wells (mts)				
			Min	Max	Min	Max	0 to 2	2 to 5	5 to 10	10 to 20	>20
	Dug well	25	0.77	12.22	Thiruvallam -Kovalam	Neyyattinkara	2	10	10	3	0
	Bore well	30	0.27	19.29	Peringamala (Venkolla)	Parassala	2	3	15	10	0
Thiruvananthapuram	Tube well	4	4.45	10.97	Azhoor	Sarkara-Chirayinkeezhu	0	1	2	1	0
	Dug well	22	0.85	12.14	Karavoor	Mantrothuruth	4	5	9	4	0
	Bore well	15	0.92	11.96	Kottarakkara	Vilakudy	1	1	11	2	0
Kollam	Tube well	7	3.46	35.3	Panmana	Mynagappally	0	2	2	1	2
	Dug well	14	2.02	9.3	Peringara	Kunnamthanam	0	13	1	0	0
Pathanamthitta	Bore well	25	0.59	18.06	Kalanjoor	Konni	2	7	10	6	0
	Dug well	18	-0.05	12.46	Neelamperoor	Kattanam	7	8	1	2	0
	Bore well	1	4.01	4.01	Mulakkuzha	Mulakkuzha	0	1	0	0	0
Alappuzha	Tube well	25	0.56	17.95	Thrikkunnappuzha	Charummoodu	7	12	4	2	0
	Dug well	21	0.31	9.29	Vaikom	Panachikkad	8	8	5	0	0
Kottayam	Bore well	24	0.47	18.06	Kaduthuruthy	Kanjirappally	8	7	6	3	0
	Dug well	19	1.3	8.82	Udumbanchola	Kattappana	1	11	7	0	0
Idukki	Bore well	23	2.05	39.68	Udumbannoor	Chakkupallam	0	7	7	5	4
	Dug well	38	0.25	10.12	Chellanam	Kizhakambalam	12	10	15	1	0
	Bore well	23	0.33	11.48	Velloorkunnam(vazhapilly)	Rayamangalam	3	7	10	3	0
Ernakulam	Tube well	1	10.11	10.11	Cochin	Cochin	0	0	0	1	0
	Dug well	24	1.53	12.72	Pariyaram	Poyya	4	8	9	3	0
Thrissur	Bore well	37	2.36	39.78	Chengallur	Vadakkethara	0	6	13	10	8
	Dug well	27	3.52	15.23	Malappuram	Othukkungal	0	6	14	7	0
Malappuram	Bore well	28	2.28	32.94	Vazhikkadavu	Perinthalmanna	0	7	13	5	3
	Dug well	31	1.99	11.17	Alathur	Sreekrishnapuram	1	13	14	3	0
Palakkad	Bore well	33	2.4	27.8	Kuzhalmannam	Pattambi	0	5	5	17	6
	Dug well	17	2.38	13.11	Perambra	Vanimel	0	6	10	1	0
Kozhikkode	Bore well	33	0.94	39.19	Kuttiadi	Unnikkulam	2	7	10	10	4
	Dug well	26	0.21	11.7	Poothadi	Cheeral	4	6	13	3	0
Wayanad	Bore well	19	1.5	23.32	Muttil North	Thirunelly	1	1	6	10	1

Districtwise Observation well Frequency on May 2020											
District	**Well Type**	**No. of WL measured**	**DTWL(mbgl)**		**Location**		**Depth range of wells (mts)**				
			Min	**Max**	**Min**	**Max**	**0 to 2**	**2 to 5**	**5 to 10**	**10 to 20**	**>20**
	Dug well	35	1.78	16.25	Vekkalam	Kooveri	3	7	17	8	0
Kannur	Bore well	27	1.65	29.42	Kooveri	Eruvassy	1	0	11	12	3
	Dug well	42	2.55	16.41	Chittarikkal	Muliyar	0	5	20	17	0
Kasaragod	Bore well	21	3.55	26.45	Beemanady	Badiyadka	0	1	5	12	3

Comparison of Water level May 2020 with respect to May 2019 **Annexure II**

District	Well Type	No. of WL Measured	Water level	Total	0 - 0.5 m	0.5 - 1 m	1-1.5 m	1.5 - 2 m	2 - 2.5 m	2.5 - 3 m	3 - 3.5 m	3.5 - 4 m	>4 m
					No.	No.	No.	No.	No.	No.	No.	No.	No.
Thiruvananthapuram	Dug well	25	Rise	19	4	6	4	2	1	1	1	0	0
			Fall	6	6	0	0	0	0	0	0	0	0
	Bore well	29	Rise	25	13	5	3	0	0	2	1	0	1
			Fall	4	3	1	0	0	0	0	0	0	0
	Tube well	4	Rise	2	2	0	0	0	0	0	0	0	0
			Fall	2	2	0	0	0	0	0	0	0	0
Kollam	Dug well	22	Rise	18	9	3	3	2	0	1	0	0	0
			Fall	4	4	0	0	0	0	0	0	0	0
	Bore well	15	Rise	7	4	3	0	0	0	0	0	0	0
			Fall	8	5	2	1	0	0	0	0	0	0
	Tube well	7	Rise	3	2	0	1	0	0	0	0	0	0
			Fall	4	3	0	0	1	0	0	0	0	0
Pathanamthitta	Dug well	13	Rise	10	5	3	2	0	0	0	0	0	0
			Fall	3	2	1	0	0	0	0	0	0	0
	Bore well	25	Rise	16	6	4	1	2	0	1	1	0	1
			Fall	9	6	1	0	1	0	1	0	0	0
Alappuzha	Dug well	16	Rise	14	12	1	0	0	0	0	0	0	1
			Fall	2	2	0	0	0	0	0	0	0	0
	Bore well	1	Rise	1	1	0	0	0	0	0	0	0	0
			Fall	0	0	0	0	0	0	0	0	0	0
	Tube well	24	Rise	22	18	4	0	0	0	0	0	0	0
			Fall	2	1	1	0	0	0	0	0	0	0
Kottayam	Dug well	21	Rise	20	1	4	4	3	1	1	4	0	2
			Fall	1	1	0	0	0	0	0	0	0	0
	Bore well	24	Rise	24	4	7	1	4	3	1	0	1	3
			Fall	0	0	0	0	0	0	0	0	0	0
Idukki	Dug well	19	Rise	4	2	1	0	1	0	0	0	0	0
			Fall	15	5	4	5	1	0	0	0	0	0
	Bore well	23	Rise	6	2	2	0	0	0	0	0	0	2
			Fall	17	6	7	2	0	1	0	0	0	1
Ernakulam	Dug well	38	Rise	32	19	7	2	2	1	0	0	1	0
			Fall	6	4	1	1	0	0	0	0	0	0
	Bore well	23	Rise	18	11	2	4	1	0	0	0	0	0
			Fall	5	2	1	1	1	0	0	0	0	0
	Tube well	1	Rise	1	0	0	1	0	0	0	0	0	0

Comparison of Water level May 2020 with respect to May 2019													
District	**Well Type**	**No. of WL Measured**	**Water level**	**Total**	**0 - 0.5 m**	**0.5 - 1 m**	**1-1.5 m**	**1.5 - 2 m**	**2 - 2.5 m**	**2.5 - 3 m**	**3 - 3.5 m**	**3.5 - 4 m**	**>4 m**
					No.	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**
Ernakulam	Tube well		Fall	0	0	0	0	0	0	0	0	0	0
Thrissur	Dug well	24	Rise	20	9	7	1	2	0	1	0	0	0
			Fall	4	4	0	0	0	0	0	0	0	0
	Bore well	37	Rise	26	9	8	3	4	0	0	1	0	1
			Fall	11	3	1	1	3	0	0	1	0	2
Malappuram	Dug well	15	Rise	9	7	2	0	0	0	0	0	0	0
			Fall	6	4	2	0	0	0	0	0	0	0
	Bore well	15	Rise	10	4	4	0	0	0	0	0	0	2
			Fall	5	3	0	1	0	0	0	0	0	1
Palakkad	Dug well	31	Rise	26	12	6	0	4	2	1	1	0	0
			Fall	5	2	1	1	0	0	1	0	0	0
	Bore well	33	Rise	29	4	8	5	3	5	1	1	0	2
			Fall	4	1	1	1	0	0	0	0	0	1
Kozhikkode	Dug well	17	Rise	14	6	4	2	2	0	0	0	0	0
			Fall	3	3	0	0	0	0	0	0	0	0
	Bore well	33	Rise	21	7	11	2	1	0	0	0	0	0
			Fall	12	6	4	0	1	0	0	0	0	1
Wayanad	Dug well	26	Rise	25	4	6	9	2	1	1	1	1	0
			Fall	1	0	1	0	0	0	0	0	0	0
	Bore well	19	Rise	18	9	7	1	1	0	0	0	0	0
			Fall	1	1	0	0	0	0	0	0	0	0
Kannur	Dug well	34	Rise	25	13	6	3	3	0	0	0	0	0
			Fall	9	9	0	0	0	0	0	0	0	0
	Bore well	27	Rise	21	10	3	3	1	2	1	0	0	1
			Fall	6	2	1	1	0	1	1	0	0	0
Kasaragod	Dug well	40	Rise	36	14	5	6	3	0	3	2	2	1
			Fall	4	3	1	0	0	0	0	0	0	0
	Bore well	21	Rise	20	5	3	4	3	0	2	1	1	1
			Fall	1	1	0	0	0	0	0	0	0	0

Comparison of Water level May 2020 with respect to Decadal mean(2010-2019) **Annexure III**

District	Well Type	No. of WL Measured	Water level	Total	0 - 0.5 m No.	0.5 - 1 m No.	1-1.5 m No.	1.5 - 2 m No.	2 - 2.5 m No.	2.5 - 3 m No.	3 - 3.5 m No.	3.5 - 4 m No.	>4 m No.
Thiruvananthapuram	Dug well	25	Rise	17	5	6	2	0	0	1	2	0	1
			Fall	8	6	2	0	0	0	0	0	0	0
	Bore well	30	Rise	16	6	6	1	1	1	1	0	0	0
			Fall	14	10	2	0	0	1	0	0	0	1
	Tube well	4	Rise	1	1	0	0	0	0	0	0	0	0
			Fall	3	3	0	0	0	0	0	0	0	0
Kollam	Dug well	21	Rise	12	5	5	2	0	0	0	0	0	0
			Fall	9	7	1	0	1	0	0	0	0	0
	Bore well	15	Rise	5	5	0	0	0	0	0	0	0	0
			Fall	10	4	2	3	1	0	0	0	0	0
	Tube well	7	Rise	1	0	0	0	0	0	0	0	0	1
			Fall	6	1	5	0	0	0	0	0	0	0
Pathanamthitta	Dug well	12	Rise	4	3	1	0	0	0	0	0	0	0
			Fall	8	6	2	0	0	0	0	0	0	0
	Bore well	25	Rise	8	3	2	0	1	2	0	0	0	0
			Fall	17	7	7	1	0	1	0	0	0	1
Alappuzha	Dug well	16	Rise	8	7	0	1	0	0	0	0	0	0
			Fall	8	7	1	0	0	0	0	0	0	0
	Bore well	1	Rise	1	1	0	0	0	0	0	0	0	0
			Fall	0	0	0	0	0	0	0	0	0	0
	Tube well	23	Rise	13	11	1	1	0	0	0	0	0	0
			Fall	10	8	2	0	0	0	0	0	0	0
Kottayam	Dug well	21	Rise	17	2	5	8	1	0	1	0	0	0
			Fall	4	3	1	0	0	0	0	0	0	0
	Bore well	24	Rise	22	8	7	3	3	0	0	0	0	1
			Fall	2	2	0	0	0	0	0	0	0	0
Idukki	Dug well	19	Rise	1	0	1	0	0	0	0	0	0	0
			Fall	18	5	7	4	2	0	0	0	0	0
	Bore well	23	Rise	9	5	1	0	0	1	0	0	0	2
			Fall	14	3	5	2	1	0	0	0	0	3

Comparison of Water level May 2020 with respect to Decadal mean(2010-2019)													
District	**Well Type**	**No. of WL Measured**	**Water level**	**Total**	**0 - 0.5 m**	**0.5 - 1 m**	**1-1.5 m**	**1.5 - 2 m**	**2 - 2.5 m**	**2.5 - 3 m**	**3 - 3.5 m**	**3.5 - 4 m**	**>4 m**
					No.	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**
Ernakulam	Dug well	38	Rise	29	21	3	5	0	0	0	0	0	0
			Fall	9	7	1	1	0	0	0	0	0	0
	Bore well	23	Rise	9	4	3	1	0	0	1	0	0	0
			Fall	14	9	1	1	1	2	0	0	0	0
	Tube well	1	Rise	0	0	0	0	0	0	0	0	0	0
			Fall	1	0	1	0	0	0	0	0	0	0
Thrissur	Dug well	24	Rise	12	10	1	0	0	0	1	0	0	0
			Fall	12	6	5	1	0	0	0	0	0	0
Malappuram	Bore well	37	Rise	12	9	2	1	0	0	0	0	0	0
			Fall	25	7	4	2	0	2	3	0	0	7
	Dug well	27	Rise	10	5	4	1	0	0	0	0	0	0
			Fall	17	7	5	2	1	1	0	0	1	0
	Bore well	28	Rise	14	8	3	0	0	0	0	0	0	3
			Fall	14	6	3	2	0	1	0	0	0	2
Palakkad	Dug well	30	Rise	22	10	7	4	0	0	0	0	0	1
			Fall	8	7	1	0	0	0	0	0	0	0
	Bore well	33	Rise	17	6	3	1	1	1	0	0	0	5
			Fall	16	4	0	1	0	1	1	2	3	4
Kozhikkode	Dug well	17	Rise	10	6	0	2	2	0	0	0	0	0
			Fall	7	7	0	0	0	0	0	0	0	0
	Bore well	33	Rise	19	11	7	1	0	0	0	0	0	0
			Fall	14	5	3	1	1	0	2	1	0	1
Wayanad	Dug well	26	Rise	20	8	5	2	2	0	3	0	0	0
			Fall	6	4	0	2	0	0	0	0	0	0
	Bore well	19	Rise	16	10	4	1	1	0	0	0	0	0
			Fall	3	0	2	1	0	0	0	0	0	0
Kannur	Dug well	35	Rise	27	14	8	1	1	3	0	0	0	0
			Fall	8	6	2	0	0	0	0	0	0	0

Comparison of Water level May 2020 with respect to Decadal mean(2010-2019)													
District	**Well Type**	**No. of WL Measured**	**Water level**	**Total**	**0 - 0.5 m**	**0.5 - 1 m**	**1-1.5 m**	**1.5 - 2 m**	**2 - 2.5 m**	**2.5 - 3 m**	**3 - 3.5 m**	**3.5 - 4 m**	**>4 m**
					No.	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**
Kasaragod	Bore well	27	Rise	14	11	1	0	1	0	0	0	0	1
			Fall	13	8	0	2	1	0	0	0	0	2
	Dug well	38	Rise	27	11	6	5	2	1	1	0	1	0
			Fall	11	7	1	1	1	1	0	0	0	0
	Bore well	21	Rise	7	2	3	2	0	0	0	0	0	0
			Fall	14	3	6	4	0	0	1	0	0	0

Observation well frequency on May 2020 **Abstract I**

Well Type	No of WL measured	DTWL (mbgl)		Location		Depth range of wells (m)				
		min	max	min	max	0 to 2	2 to 5	5 to 10	10 to 20	>20
Dug well	359	-0.05	16.41	Neelamperoor (Alappuzha)	Muliyar (Kasaragod)	46	116	145	52	0
	%					13%	32%	40%	15%	0%
Bore well	339	0.27	39.78	Peringamala (Thiruvananthapuram)	Vadakkethara (Thrissur)	20	60	122	105	32
	%					6%	18%	36%	31%	9%
Tube well	37	0.56	35.3	Thrikkunnapuzha (Alappuzha)	Mynagappally (Kollam)	7	15	8	5	2
	%					19%	41%	22%	13%	5%

Comparison of Water level May 2020 with respect to May 2019 **Abstract II**

Well type	No. of WL Measured	Water level	Total	0 - 0.5 m	0.5 - 1 m	1 - 1.5 m	1.5 - 2 m	2 - 2.5 m	2.5 - 3 m	3 - 3.5 m	3.5 - 4 m	>4 m
Dug well	341	Rise	272	117	61	36	26	6	9	9	4	4
		%	80%	43%	22%	13%	10%	2%	3%	3%	2%	2%
		Fall	69	49	11	7	1	0	1	0	0	0
		%	20%	71%	16%	11%	1%	0%	1%	0%	0%	0%
Bore well	325	Rise	242	89	67	27	20	10	8	5	2	14
		%	74%	37%	28%	11%	8%	4%	3%	2%	1%	6%
		Fall	83	39	19	8	6	2	2	1	0	6
		%	26%	47%	23%	9%	7%	3%	3%	1%	0%	7%
Tube well	36	Rise	28	22	4	2	0	0	0	0	0	0
		%	78%	79%	14%	7%	0%	0%	0%	0%	0%	0%
		Fall	8	6	1	0	1	0	0	0	0	0
		%	22%	74%	13%	0%	13%	0%	0%	0%	0%	0%

Comparison of Water level May 2020 with respect to 10 yrs mean **Abstract III**

Well type	No. of WL Measured	Water level	Total	0 - 0.5 m	0.5 - 1 m	1 - 1.5 m	1.5 - 2 m	2 - 2.5 m	2.5 - 3 m	3 - 3.5 m	3.5 - 4 m	>4 m
Dug well	349	Rise	216	107	52	33	8	4	7	2	1	2
		%	62%	50%	25%	15%	5%	2%	3%	0.01%	0.01%	0.01 %
		Fall	133	85	29	11	5	2	0	0	1	0
		%	38%	64%	22%	8%	4%	2%	0%	0%	0.01%	0%
Bore well	339	Rise	169	89	42	11	8	5	2	0	0	12
		%	50%	53%	25%	6%	5%	3%	1%	0%	0%	7%
		Fall	170	68	35	20	5	8	7	3	3	21
		%	50%	40%	21%	11%	3%	5%	4%	2%	2%	12%
Tube well	35	Rise	15	12	1	1	0	0	0	0	0	1
		%	43%	79%	7%	7%	0%	0%	0%	0%	0%	7%
		Fall	20	12	8	0	0	0	0	0	0	0
		%	57%	60%	40%	0%	0%	0%	0%	0%	0%	0%