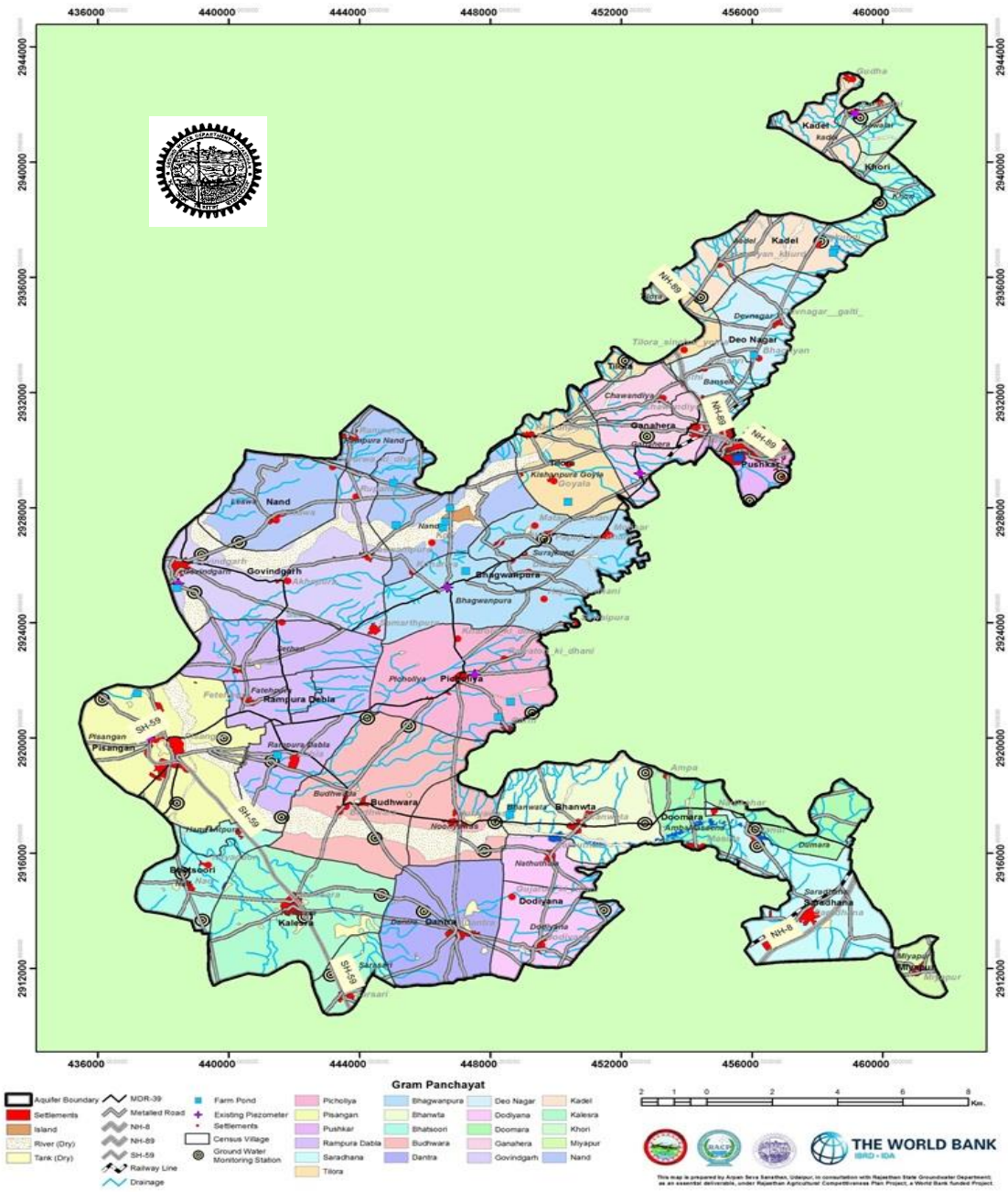
GOVERNMENT OF RAJASTHAN

NOTE ON CHANGE IN WATER LEVELS BETWEEN

PRE – MONSOON 2016 to 2018

Peesangan Ground Water Cluster, District Ajmer



OFFICE OF SENIOR HYDROGEOLOGIST

GROUND WATER DEPARTMENT, AJMER

AJMER **JULY 2018**

NOTE ON CHANGE IN WATER LEVELS BETWEEN PRE – MONSOON 2016-2017-2018 PEESANGAN GROUND WATER CLUSTER, DISTRICT AJMER

INTRODUCTION

The Peesangan Ground Water Cluster, district – Ajmer covers an area of 31825 Hectares and located in the NW of the district area and lies between 26°20’20’’ to 26°28'30’’ North Latitude and 74°17'20’’ to 74°31' East longitude. It is situated in the vicinity of Aravalli Mountain ranges and part of the Luni river basin and has seen to be at the verge of extinction under pressure of growing population & urbanization. The project villages are located around the block headquarter Peesangan itself about 19 km from Ajmer-Beawer NH 8 from Mangaliawas. It is approximately 38 to 45 km from the district head quarter. The project area is located approximately 47 km from the district head quarter and in 6km radius from Block/Sub-division/Tehsil headquarter ‘Peesangan’. The total maximum length of the project area from west to east is 22 km while the breadth from north to south is 13 km approximately. The undulating topography, high wind velocity & varying intensity of rainfall are causing moderate to severe erosion in the area. The area is located in a gap through the Aravalli hills. The significance of this is that surrounding land is susceptible to wind-blown sand, especially during the dry summer months when the vegetation (due to drought & grazing pressure) is least able to hold the sand against the drinking force of the strong summer winds. This has not threatened the area itself but they have rolled over vegetated land & there are, today, mobile dune fronts and a great requirement for soil and water conservation is generated. As far environment Protection are concern, the two key Problems in the area are the destruction of plant biomass because of uncontrolled grazing & the depletion of underground water by over-pumping. Henceforth the water table is declining rapidly. Therefore measures to

control water demand need to be introduced or used more widely. The climate of the cluster area is semi-arid. The average annual rainfall (last 10 years) is 525 mm and the main hydro geological formations are alluvium followed by Schist & soil texture is Sandy loam & loam.

TREND OF CHANGE IN WATER LEVEL BETWEEN PRE – MONSOON 2016, 2017 & 2018

A comparison of changes in water level for the period pre monsoon 2016 v/s 2018, 2016 v/s 2017 & 2017 v/s 2018 has been made in Peesangan Ground Water Cluster, District – Ajmer. The village wise depth to water levels in aforesaid period and their respective changes are appended in **Annexure I** and Gram Panchayat wise summary sheet showing depletion, rise & variation in water level **(Table-1)**, area represented in different depth range of water level **(Table-2)** and village wise Pre & Post water level **(Table-3)** is tabulated. Water Level Contour Map & Fluctuation Map also prepared.

PRE MONSOON VILLAGE WISE WATER LEVEL 2016-2017-2018 AND THEIR FLUCTUATION OF PEESANGAN GROUND WATER CLUSTER, DISTRICT AJMER

ANNEXURE – I

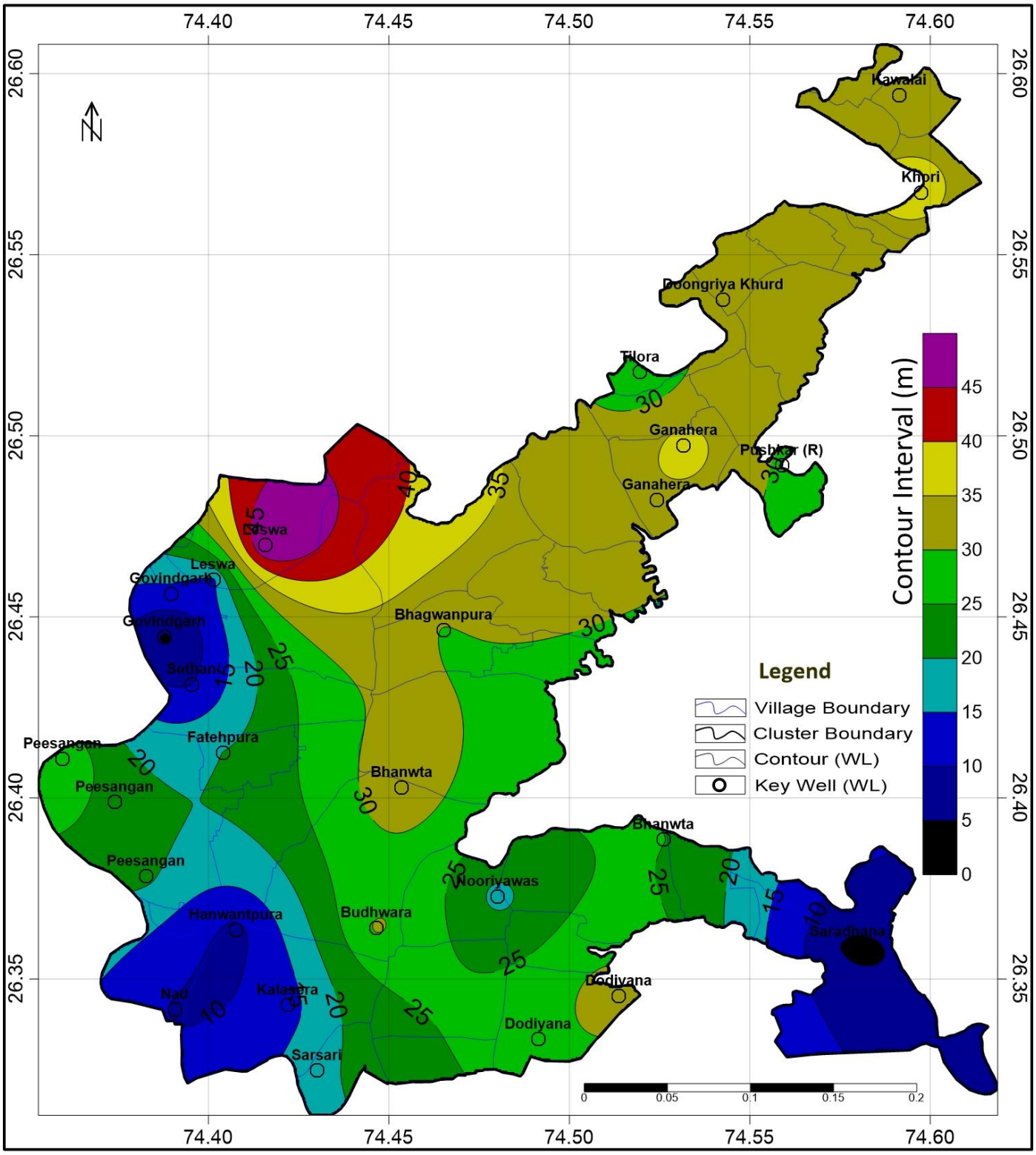
S. No	Well No.	Name of Village	Gram Panchayat	Latitude	Longi-tude	Hyd Formation	Type of Well	TOC (m)	Total Depth (m)	Pre Monsoon Water Level (m)			Change in Water Level (m)			Monsoon rainfall (mm)	
										2016	2017	2018	2016-18	2016-17	2017-18	2016	2017
1	Pz	Bhagwanpura	Bhagwanpura	26.44633	74.46520	Allu/Sch	Pz	0.75	50.00	29.75	31.55	32.10	-2.35	-1.80	-0.55	607.5	364
2	4/249	Bhanwta	Bhanwta	26.38845	74.52608	Allu/Sch	DW	0.50	27.70	25.10	22.38	25.90	-0.80	2.72	-3.52	607.5	364
3	05/287	Bhanwta	Bhanwta	26.40286	74.45361	Allu/Sch	DW	0.75	43.20	33.30	35.10	34.20	-0.90	-1.80	0.90	607.5	364
4	005/108	Budhwara	Budhwara	26.36410	74.44660	Allu/Sch	DW	0.30	39.90	30.60	-	-	-	-	-	607.5	364
5	011/055	Dodiyana	Dodiyana	26.34527	74.51370	Allu/Sch	DW	0.00	44.85	33.00	40.60	43.50	-10.50	-7.60	-2.90	607.5	364
6	011/056	Dodiyana	Dodiyana	26.33333	74.49139	Allu/Sch	DW	0.15	40.40	28.10	-	28.30	-0.20	-	-	607.5	364
7	19/42	Doongriya Khurd	Kadel	26.53755	74.54262	Allu/Sch	DW	0.60	35.95	32.85	32.80	34.20	-1.35	0.05	-1.40	607.5	364
8	40/001	Fatehpura	Rampura Dabla	26.41249	74.40414	Allu/Sch	DW	0.00	25.50	20.10	-	24.05	-3.95	-	-	607.5	364
9	16/99	Ganahera	Ganahera	26.49732	74.53169	Allu/Sch	DW	0.40	40.75	37.15	34.20	36.05	1.10	2.95	-1.85	607.5	364
10	Pz	Ganahera	Ganahera	26.48228	74.52417	Allu/Sch	Pz	0.85	36.00	-	33.95	35.20	-	-	-1.25	607.5	364
11	17/91	Govindgarh	Govindgarh	26.45635	74.38973	Allu/Sch	DW	0.60	18.85	13.80	13.50	18.00	-4.20	0.30	-4.50	607.5	364
12	17/128	Govindgarh	Govindgarh	26.44448	74.38785	Allu/Sch	DW	0.70	13.30	4.30	9.40	9.45	-5.15	-5.10	-0.05	607.5	364
13	47/12	Hanwantpura	Bhatsoori	26.36353	74.40772	Allu/Sch	DW	0.50	21.10	8.75	-	13.75	-5.00	-	-	607.5	364
14	21/28	Kalasera	Kalasera	26.34275	74.42202	Allu/Sch	DW	0.00	14.05	12.90	10.80	12.90	0.00	2.10	-2.10	607.5	364

15	27/10	Kawalai	Khori	26.59404	74.59143	Allu/Sch	DW	0.60	45.90	33.60	32.90	32.70	0.90	0.70	0.20	607.5	364
16	28/93	Khori	Khori	26.56719	74.59744	Allu/Sch	DW	0.90	41.10	35.80	40.10	43.60	-7.80	-4.30	-3.50	607.5	364
17	32/11	Leswa	Nand	26.46023	74.40137	Allu/Sch	DW	0.00	21.00	14.30	14.50	18.20	-3.90	-0.20	-3.70	607.5	364
18	Pz	Leswa	Nand	26.46978	74.41575	Allu/Sch	Pz	1.00	100.00	51.00	56.00	58.90	-7.90	-5.00	-2.90	607.5	364
19	46/30	Nad	Bhatsoori	26.34156	74.39069	Allu/Sch	DW	0.00	18.30	9.60	-	14.65	-5.05	-	-	607.5	364
20	006/63	Nooriyawas	Budhwara	26.37274	74.48017	Allu/Sch	DW	0.00	25.70	18.40	15.85	19.05	-0.65	2.55	-3.20	607.5	364
21	35/180	Peesangan	Peesangan	26.37835	74.38275	Allu/Sch	DW	0.50	26.65	21.10	20.40	24.70	-3.60	0.70	-4.30	607.5	364
22	Pz	Peesangan	Peesangan	26.39884	74.37404	Allu/Sch	Pz	1.00	100.00	22.80	20.06	19.80	3.00	2.74	0.26	607.5	364
23	35/184	Peesangan	Peesangan	26.41078	74.35963	Allu/Sch	DW	0.50	30.25	29.25	20.40	19.00	10.25	8.85	1.40	607.5	364
24	Pz	Pushkar (R)	Pushkar	26.49178	74.55888	Allu/Sch	Pz	0.00	50.00	29.20	29.95	30.10	-0.90	-0.75	-0.15	607.5	364
25	43/060	Saradhana	Saradhana	26.35884	74.57715	Allu/Sch	DW	0.00	8.35	4.20	3.60	-	-	0.60	-	607.5	364
26	22/006	Sarsari	Kalasera	26.32467	74.43008	Allu/Sch	DW	0.00	27.20	18.80	18.55	16.20	2.60	0.25	2.35	607.5	364
27	42/019	Sethan	Rampura Dabla	26.43131	74.39544	Allu/Sch	DW	0.20	11.80	9.90	-	11.05	-1.15	-	-	607.5	364
28	45/050	Tilora	Tilora	26.51755	74.51951	Allu/Sch	DW	0.80	26.40	25.15	22.40	24.80	0.35	2.75	-2.40	607.5	364
								Average		**23.44**	**25.41**	**26.17**	**-1.89**	**0.03**	**-1.58**	**607.5**	**364**

PRE-MONSOON 2016 V/S 2018

During this period total 25 representative wells were under observation. Out of which 18 wells have shown depletion trend while in 7 wells shows rising trend in the cluster. The average depth to water levels in the cluster for pre monsoon 2016 is 23.44 and pre monsoon 2018 is 26.17, it shows that an average 2.73 meter depletion of depth to water level in pre monsoon 2016 & 2018 in the cluster area. Rise of water level ranges between 0.35 to 10.25 m and depletion of water level ranges between -10.50 to -0.20 m., with an average depletion of the cluster is to the tune of -1.89 m. It is observed that 72.00 % of total area of cluster shows depletion and in 28.00 % of total area shows the rising trend of water level during this period. Significant decline (more than 05.00 m.) has been observed in villages Dodiyana, Govindgarh, Leswa and Khori while in village Peesangan significant rise in water level (> 10 m) has been observed.

Water Level Contour Map (Pre-Monsoon 2016)
Peesangan Ground Water Cluster



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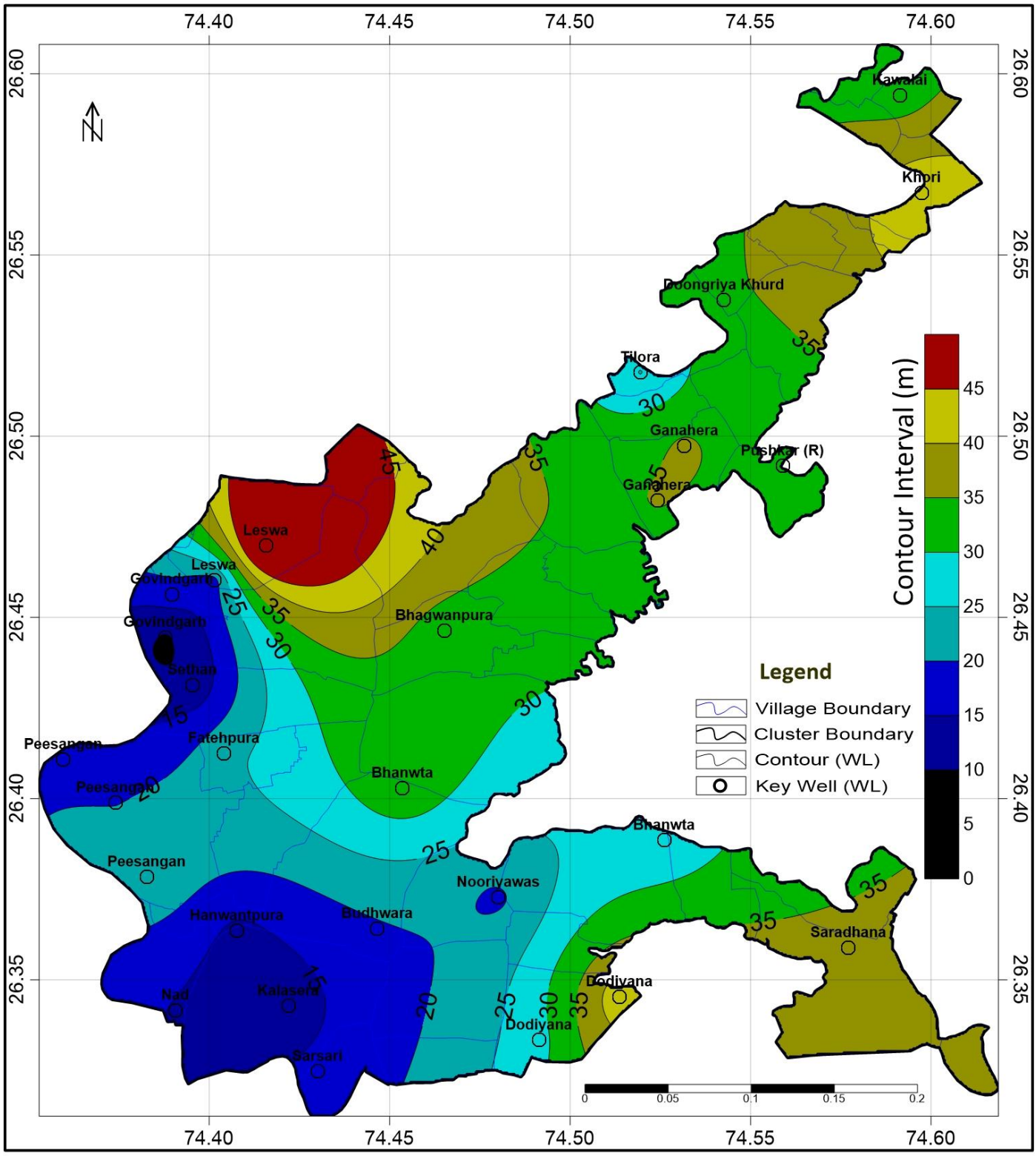
Water Level Contour Map (Pre-Monsoon 2018)
Peesangan Ground Water Cluster



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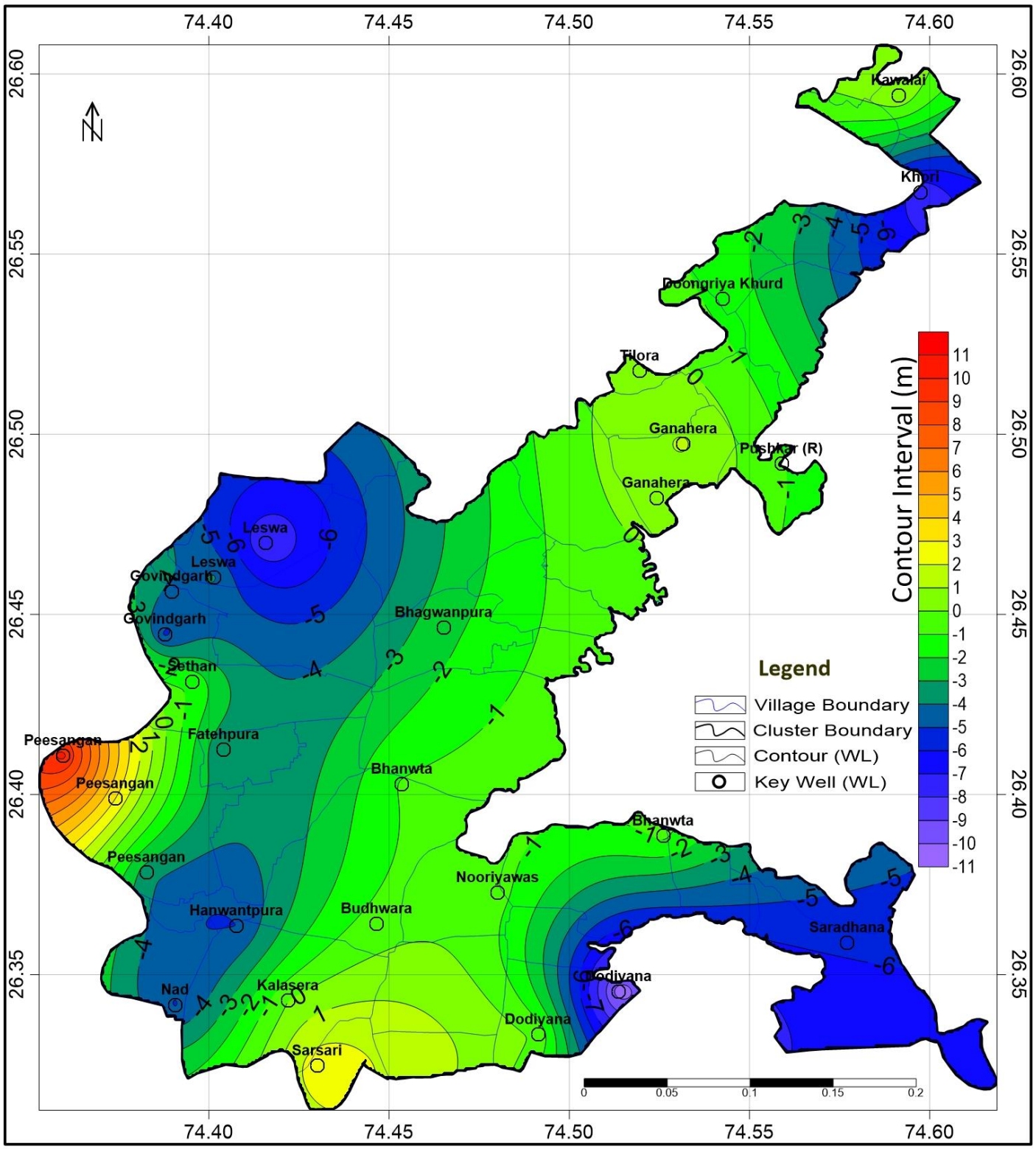
Water Level Fluctuation Map (Pre-Monsoon 2016-2018)
Peesangan Ground Water Cluster



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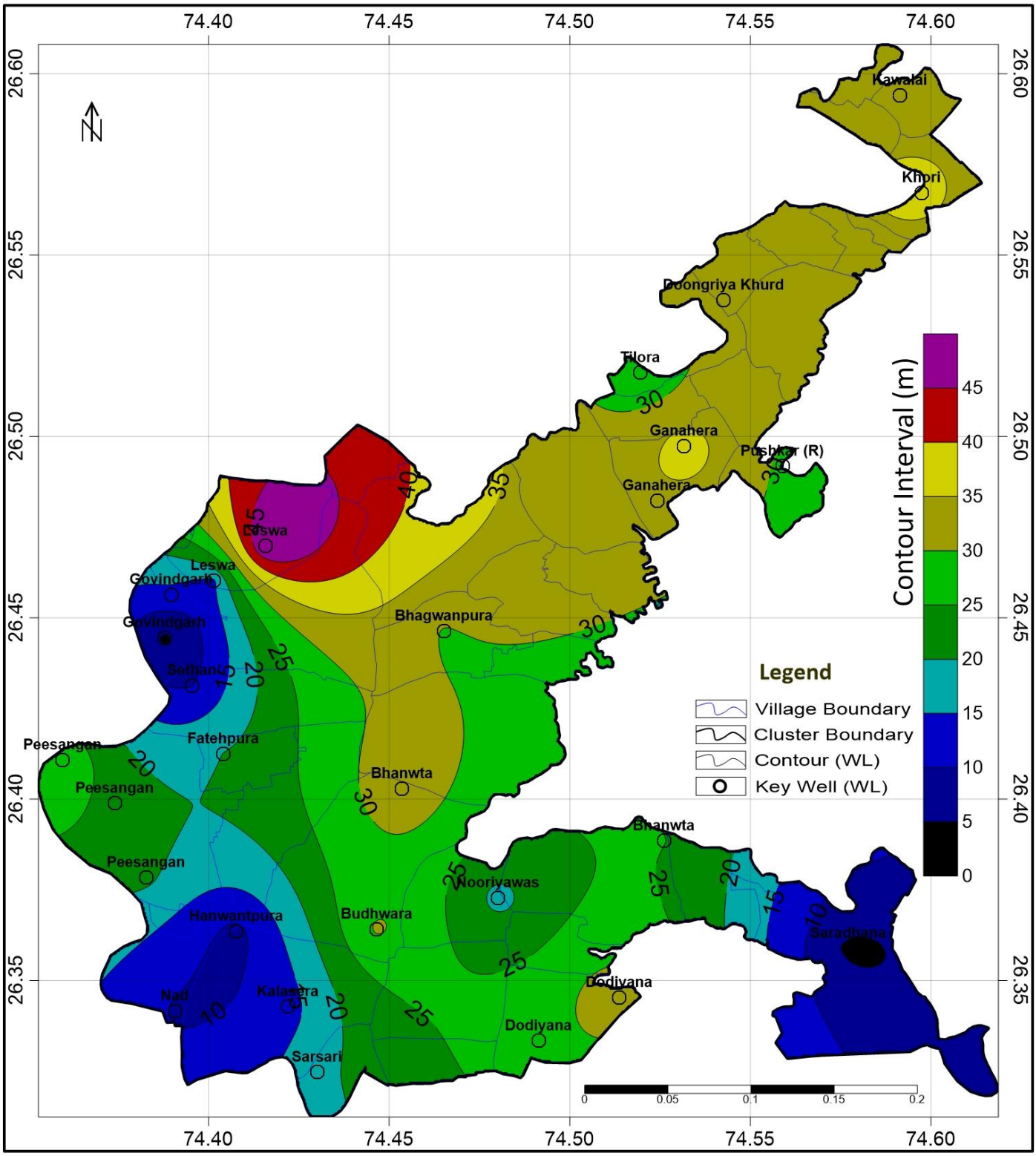
PRE-MONSOON 2016 V/S 2017

During this period total 21 representative wells were under observation. Out of which 7 wells have shown depletion trend while in 14 wells shows rising trend in the cluster. The average depth to water levels in the cluster for pre monsoon 2016 is 23.44 and pre monsoon 2017 is 25.41, it shows that an average 1.97 meter depletion of depth to water level in pre monsoon 2016 & 2017 in the cluster area. Rise of water level ranges between 0.05 to 8.85 m and depletion of water level ranges between -7.60 to -0.20 m., with an average rise of the cluster is to the tune of 0.03 m. It is observed that 38.10 % of total area of cluster shows depletion and while **61.90 %** of total area shows the **rising trend** of water level during this period. Significant decline (more than 05.00 m.) has been observed in villages Dodiyana, Govindgarh, and Leswa while in village Peesangan significant rise in water level (> 8 m) has been observed.

Water Level Contour Map (Pre-Monsoon 2016)
Peesangan Ground Water Cluster



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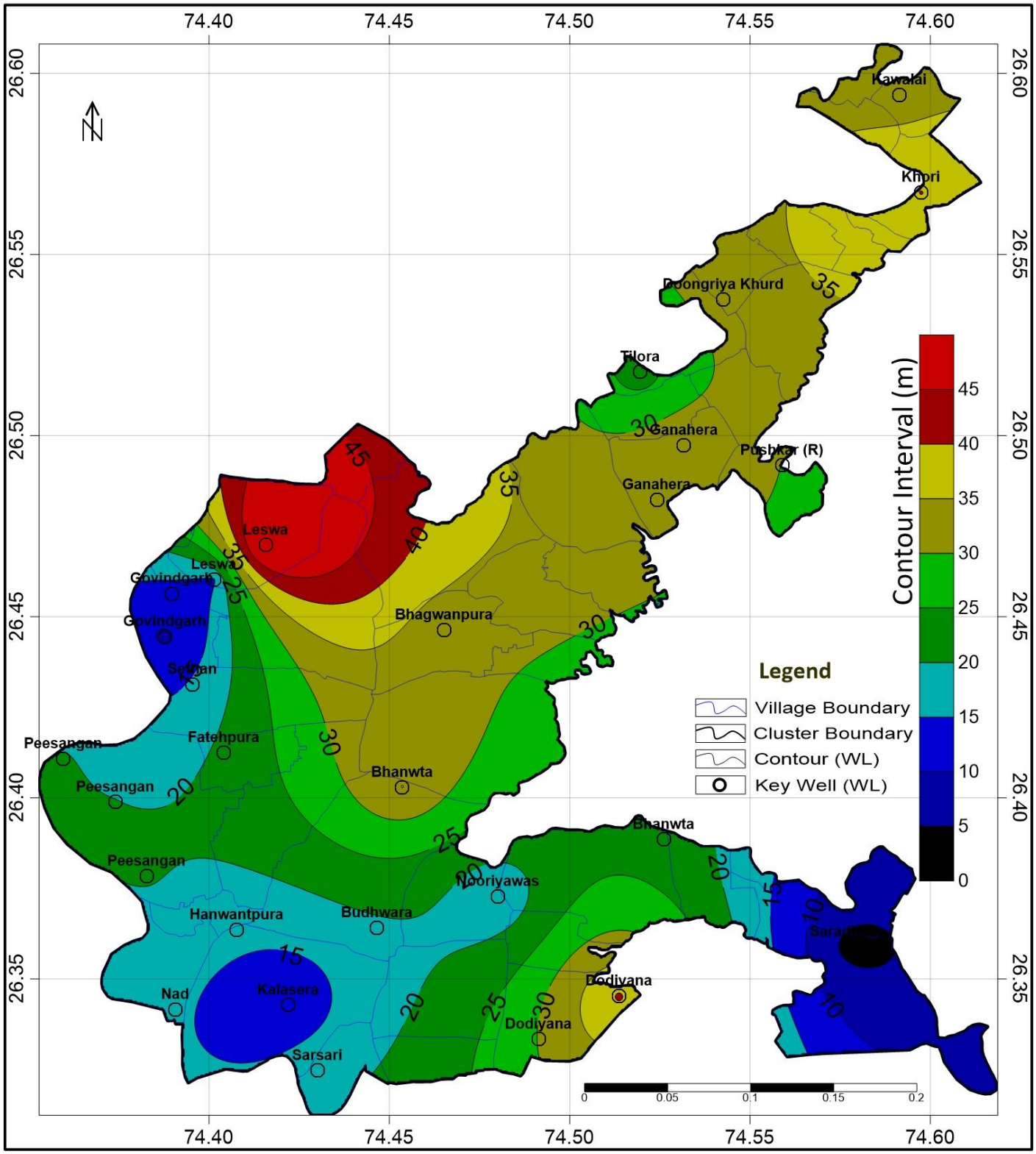
Water Level Contour Map (Pre-Monsoon 2017)
Peesangan Ground Water Cluster



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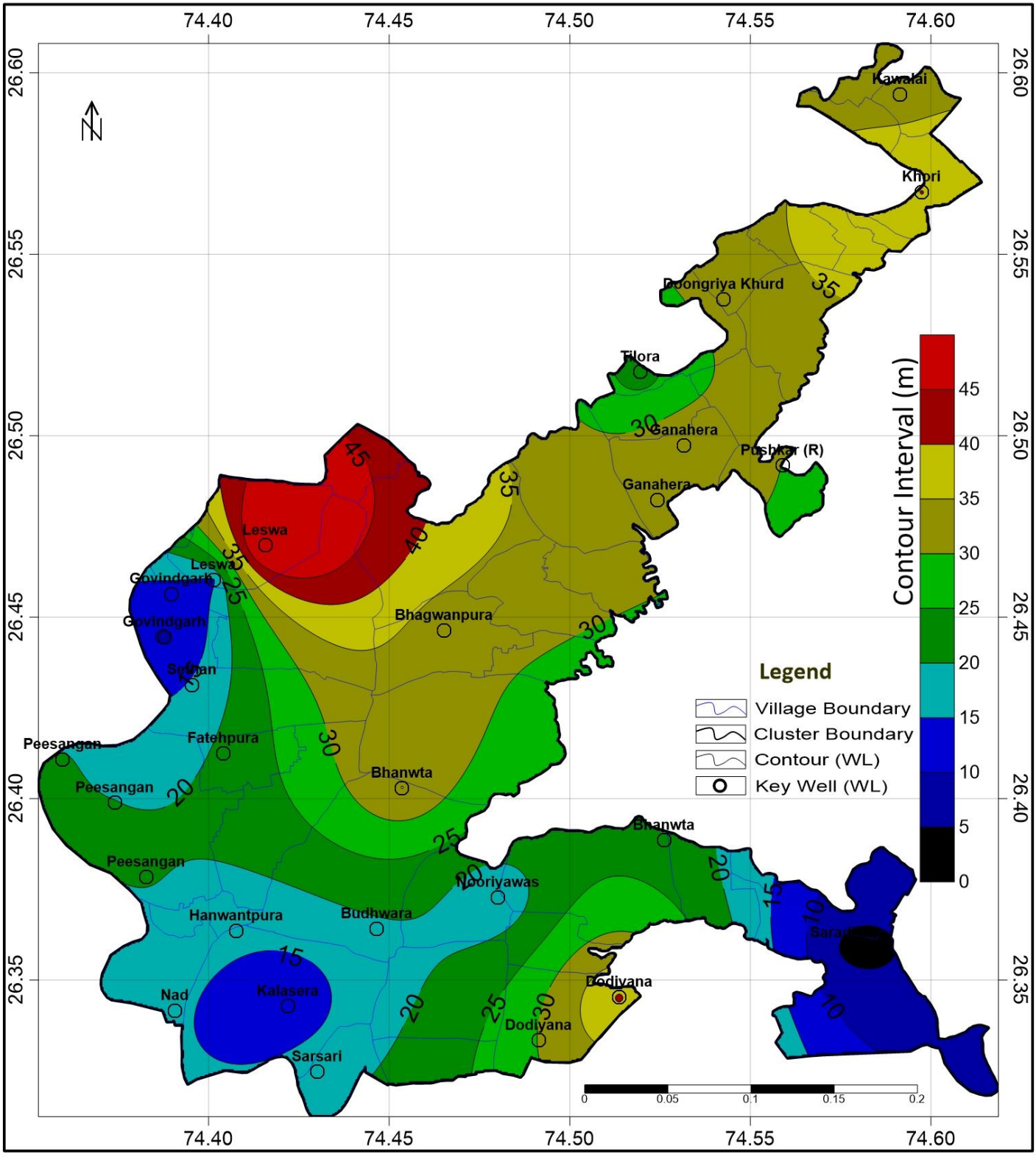
PRE-MONSOON 2017 V/S 2018

During this period total 21 representative wells were under observation. Out of which 16 wells have shown depletion trend while in 05 wells shows rising trend in the cluster. The average depth to water levels in the cluster for pre monsoon 2017 is 25.41 and pre monsoon 2018 is 26.17, it shows that the average 0.76 meter depletion of depth to water level in pre monsoon 2017 & 2018 in the cluster area. Rise of water level ranges between 0.20 to 2.35 m and depletion of water level ranges between -4.50 to -0.05 m., with an average depletion in the cluster is to the tune of -1.58 m. It is observed that 23.81 % area there are rising trend of water level while 76.19 % of total area of cluster shows depletion trend during this period. The maximum depletion -4.50 m observed in village Govindgarh and Significant rise (more than 2 m.) in village Sarsari has been observed.

An attempt has also been made to correlate monsoon rainfall for the year 2016 and 2017 with corresponding pre-monsoon water levels for the period 2016 and 2017. Monsoon Rainfall & Water Level analysis reveals that an overall 40% less rainfall in the cluster area has been observed during the year 2017 as compared with the year 2016 which has shown that there are no more prospects available for ground water withdrawals for crops. This phenomenon has also been confirmed during pre-monsoon 2016 ground water investigations.

Water Level Contour Map (Pre-Monsoon 2017)
Peesangan Ground Water Cluster



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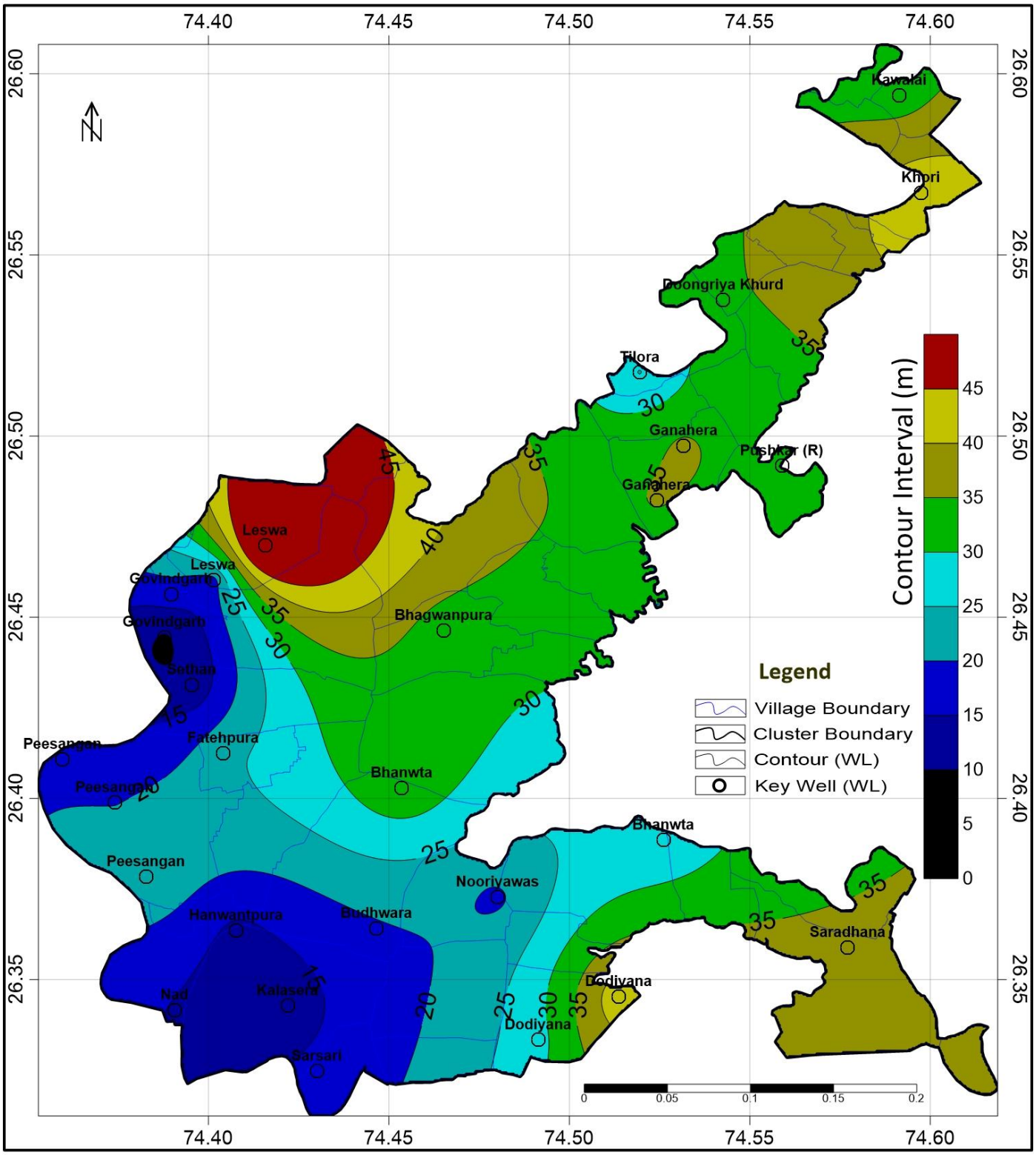
Water Level Contour Map (Pre-Monsoon 2018)
Peesangan Ground Water Cluster



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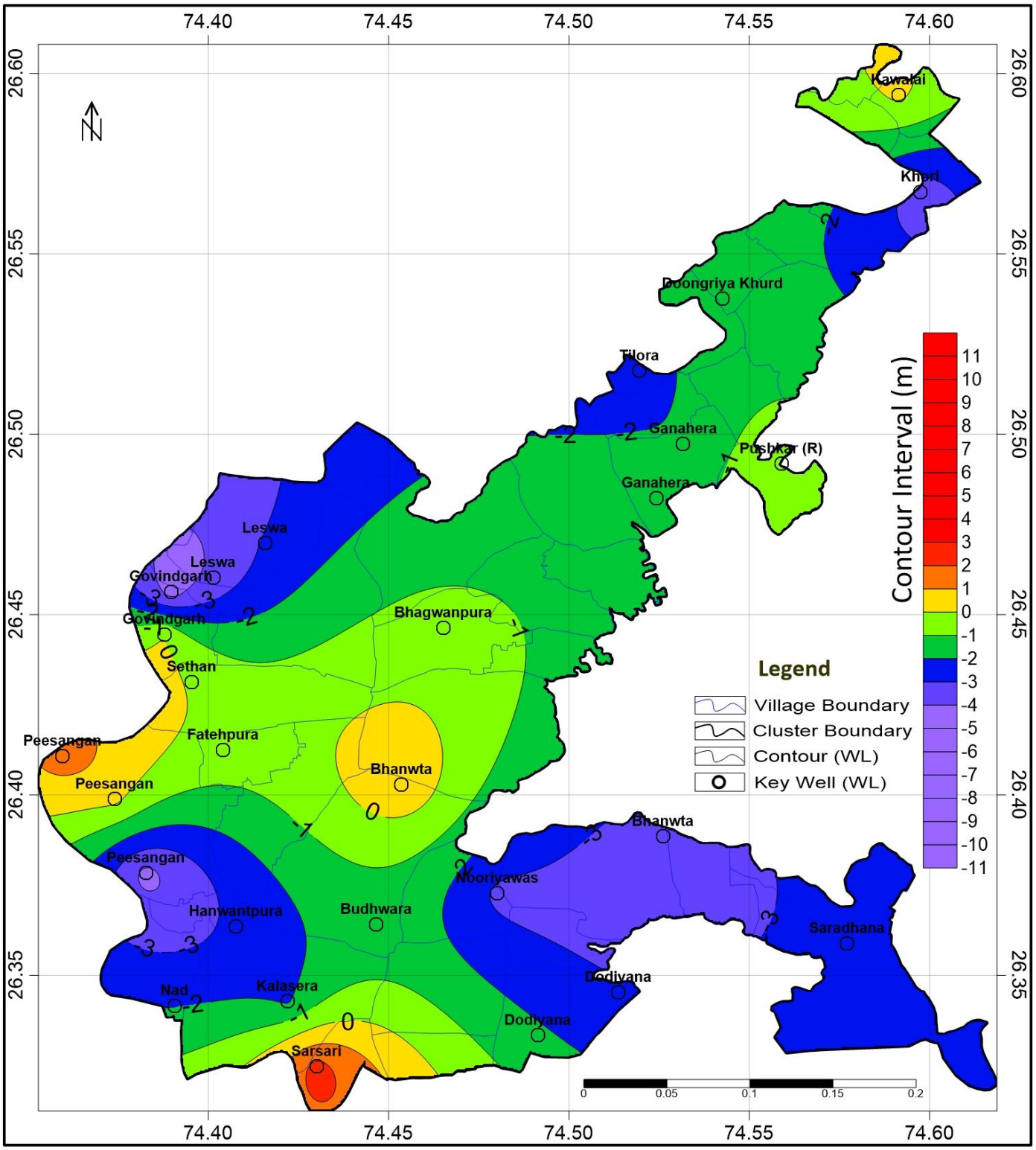
Water Level Fluctuation Map (Pre-Monsoon 2017-2018)
Peesangan Ground Water Cluster



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GRAM PANCHAYAT WISE CHANGE IN WATER LEVELS (No. of KW / PIEZOMETERS) BETWEEN PRE - MONSOON 2016-2017 & 2018
Ground Water Cluster Peesangan, District – Ajmer
TABLE – 1

Sr. No.	Gram Panchayat	KW (No.)	Pre 2016-2018		Pre 2016-2017		Pre 2017-2018	
			Depletion	Rise	Depletion	Rise	Depletion	Rise
1	Bhagwanpura	1	1	-	-	1	1	-
2	Bhanwta	2	2	-	1	1	1	1
3	Bhatsoori	2	2	-	-	-	-	-
4	Budhwara	2	1	-	-	1	1	-
5	Dodiyana	2	2	-	1	-	1	-
6	Ganahera	2	-	1	-	1	2	-
7	Govindgarh	2	2	-	1	1	2	-
8	Kadel	1	1	-	-	1	1	-
9	Kalasera	2	-	2	-	2	1	1
10	Khori	2	1	1	1	1	1	1
11	Nand	2	2	-	2	-	2	-
12	Peesangan	3	1	2	-	3	1	2
13	Pushkar	1	1	-	1	-	1	-
14	Rampura Dabla	2	2	-	-	-	-	-
15	Saradhana	1	-	-	-	1	-	-
16	Tilora	1	-	1	-	1	1	-
TOTAL		**28**	**18**	**7**	**7**	**14**	**16**	**5**

S. No.	Cluster	Pre 2016-2018		Pre 2016-2017		Pre 2017-2018		Monsoon rainfall (mm)		% Variation
		Depletion %	Rise %	Depletion %	Rise %	Depletion %	Rise %	2016	2017	2016-17
1	**Peesangan G.W.C.**	72.00%	28.00%	38.10%	61.90%	76.19%	23.81%	608	364	-40
	TOTAL	**18**	**7**	**7**	**14**	**16**	**5**	**608**	**364**	**-40**

AREA REPRESENTATED IN DIFFERENT RANGE OF WATER LEVELS BETWEEN PRE - MONSOON 2016-2017 & 2018
Ground Water Cluster Peesangan, District – Ajmer
TABLE – 2

S. No.	Range (m.)	Pre 2016-2018			Pre 2016-2017			Pre 2017-2018		
		No. of wells	Area	%	No. of wells	Area	%	No. of wells	Area	%
1	< -7	3	38.19	12.00	1	15.15	4.76	0	0.00	0.00
2	-5 to -7	2	25.46	8.00	1	15.15	4.76	0	0.00	0.00
3	-3 to -5	5	63.65	20.00	2	30.31	9.52	6	90.93	28.57
4	-1 to -3	3	38.19	12.00	2	30.31	9.52	7	106.08	33.33
5	0 to -1	5	63.65	20.00	2	30.31	9.52	3	45.46	14.29
6	0 to 1	3	38.19	12.00	6	90.93	28.57	3	45.46	14.29
7	1 to 3	2	25.46	8.00	6	90.93	28.57	2	30.31	9.52
8	3 to 5	1	12.73	4.00	0	0.00	0.00	0	0.00	0.00
9	5 to7	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
10	>7	1	12.73	4.00	1	15.15	4.76	0	0.00	0.00
Total		**25**	**318.25**	**100.00**	**21**	**318**	**100.00**	**21**	**318.25**	**100.00**

PRE-POST VILLAGE WISE WATER LEVEL (2016- 2017) & PRE-2018
Ground Water Cluster Peesangan, District – Ajmer
TABLE – 3

S. No	Well No.	Name of Village	Type of Well	Year 2016			Year 2017			Pre 2018
				Pre-16	Post-16	FLU	Pre-17	Post-17	FLU	
1	Pz	Bhagwanpura	Pz	29.75	28.40	1.35	31.55	29.10		32.10
2	05/287	Bhanwta	Dug Well	33.30	32.30	1.00	35.10	35.94	-0.84	34.20
3	4/249	Bhanwta	Dug Well	25.10	21.60	3.50	22.38	24.70	-2.32	25.90
4	005/108	Budhwara	Dug Well	30.60	14.25	16.35		23.00		
5	011/056	Dodiyana	Dug Well	28.10	25.70	2.40		27.30		28.30
6	011/055	Dodiyana	Dug Well	33.00	32.60	0.40	40.60	39.60	1.00	43.50
7	19/42	Doongriya Khurd	Dug Well	32.85	31.80	1.05	32.80	31.05	1.75	34.20
8	40/001	Fatehpura	Dug Well	20.10	19.60	0.50		16.20		24.05
9	16/99	Ganahera	Dug Well	37.15	35.65	1.50	34.20	32.90	1.30	36.05
10	Pz	Ganahera	Pz	-	31.77	-	33.95	31.10		35.20
11	17/128	Govindgarh	Dug Well	4.30	3.70	0.60	9.40	4.00	5.40	9.45
12	17/91	Govindgarh	Dug Well	13.80	12.90	0.90	13.50	14.65	-1.15	18.00
13	47/12	Hanwantpura	Dug Well	8.75	7.40	1.35		10.00		13.75
14	21/28	Kalasera	Dug Well	12.90	5.60	7.30	10.80	6.54	4.26	12.90
15	27/10	Kawalai	Dug Well	33.60	32.90	0.70	32.90	32.10	0.80	32.70
16	28/93	Khori	Dug Well	35.80	35.45	0.35	40.10	36.90	3.20	43.60
17	Pz	Leswa	Pz	51.00	47.20	3.80	56.00	40.50		58.90
18	32/11	Leswa	Dug Well	14.30	14.20	0.10	14.50	13.70	0.80	18.20
19	46/30	Nad	Dug Well	9.60	8.10	1.50		10.50		14.65
20	006/63	Nooriyawas	Dug Well	18.40	2.50	15.90	15.85	13.10	2.75	19.05
21	Pz	Peesangan	Pz	22.80	12.74	10.06	20.06	15.80		19.80
22	35/180	Peesangan	Dug Well	21.10	3.00	18.10	20.40	8.90	11.50	24.70
23	35/184	Peesangan	Dug Well	29.25	16.55	12.70	20.40	18.25	2.15	19.00
24	Pz	Pushkar (R)	Pz	29.20	30.05	-0.85	29.95	30.90		30.10
25	43/060	Saradhana	Dug Well	4.20	3.50	0.70	3.60	1.95	1.65	
26	22/006	Sarsari	Dug Well	18.80	14.90	3.90	18.55	17.40	1.15	16.20
27	42/019	Sethan	Dug Well	9.90	9.25	0.65		9.35		11.05
28	45/050	Tilora	Dug Well	25.15	24.90	0.25	22.40	24.00	-1.60	24.80
Cluster (Avg)				**23.44**	**17.75**	**3.93**	**25.41**	**21.41**	**1.87**	**26.17**