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RESEARCH PAPER

Fluctuation in wells/tube wells water table of Dev Bhumi Dwarka district of Gujarat

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Abstract : In order to study the fluctuation of wells/tube wells water table, 30 sites each from 4 talukas of Dev Bhumi Dwarka district from where water table depths were measured before and after monsoon. In all, 94 wells and 26 tube wells water table levels were studied in May, 2015 and again after 6th month in November, 2015. The water table before monsoon (May, 2015) in wells and tube wells ranged from 3.05 to 27.44 and 6.71 to 192.1 with mean value of 15.56 and 75.99 m, respectively. At the end of the monsoon (November, 2015), the overall water table of Dev Bhumi Dwarka district in well ranged from 1.83 to 18.29 and in tube well from 5.49 to 51.83 m with mean value of 5.79 and 21.39 m, respectively. The minimum fluctuation of water table of well (7.72 m) and tube well (21.55 m) was observed in Dwarka taluka. The maximum fluctuation of water table in well (12.73 m) and tube well (104.37 m) was observed in Bhanvad taluka.

Key Words : Water table fluctuation, Well/tube well, Water table

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INTRODUCTION

Groundnut is the main crop of Dev Bhumi Dwarka district which is cultivated in *Kharif* as rainfed crop besides cotton as fibre crop. Wheat and gram is following by groundnut in *Rabi* season, but still wherever irrigation facilities available, farmers grow groundnut and sesamum in summer as irrigated crop. Because of assured yield and high productivity, the area under summer cultivation for both the crop are increasing day by day. Though, there has been an increase in the area under irrigation on one hand, inconsistent precipitation and insufficient recharge of ground water on the other hand has caused further lowering of water table, which results into deterioration in quality of irrigation water. Poor crop growth due to salt hazards during dry winter and summer seasons in coastal region is mainly attributed to the use of such irrigation water. Therefore, generation of a detailed information about fluctuation of water table in wells/tube wells water table of Dev Bhumi Dwarka district is imperative for developing a strategy for judicious use of existing water resources of this region.

MATERIAL AND METHODS

In order to study the present and fluctuation of wells/

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tube wells water table of groundnut, cotton, sugarcane, wheat and sesamum growing areas of Dev Bhumi Dwarka district of Gujarat, 30 sites each from four talukas (Kalyanpur, Dwarka, Khambhalia and Bhanvad) from where water table depth were measured before (May, 2015) and after monsoon (November, 2015). In all, 94 wells and 26 tube wells water table levels were studied in May, 2015 and again after 6th month in November, 2015 at same site.

RESULTS AND DISCUSSION

The data presented in Table 1 revealed that the highest (13.72 m) well water table during summer was found in Dwarka taluka, which was very close to adjoining Khambhalia (15.12 m) and Kalyanpur taluka (15.73 m) near the sea cost. Almost similar observation were noted in case of tube well water table. The lowest well (17.53 m) and tube well (131.6 m) water table was noted in Bhanvad taluka. The overall water table of Dev Bhumi Dwarka district in well ranged from 3.05 to 27.44 m and in tube well 6.71 to 192.1 m with mean value of 15.56 and 75.99 m, respectively.

The maximum (3.02 m) water table during monsoon in well was noted in Kalyanpur taluka and in tube well in Dwarka (8.23 m) taluka. Similar observations were also reported by Gupta and Khosla (1982) during July and August, when most of the rains were received. Similarly, More *et al.* (1988); Kadam *et al.* (1995) and Kabariya *et al.* (2004) reported that the water table starts rising from month of July and is almost at ground level in the month of September and noted that some of wells and tube wells flawing frealy on soil surface during monsoon. The lowest (5.42 m) well water table was noted in Khambhalia and in tube well in Bhanvad (24.39 m) taluka in between July – October 2015. The overall water table depth in well varied from 0.91 to 15.24 and in tube well from 3.66 to 30.79 m with mean value of 3.79 and 15.32 m, respectively. At the end of monsoon (November, 2015), the highest (4.79 m) and the lowest (6.89 m) water tables in wells were noted in Bhanvad and Khambhalia, while in case of tube wells it was in Dwarka (11.59 m) and Kalyanpur (29.27 m) taluka, respectively. The overall water table of Dev Bhumi Dwarka district after monsoon in well ranged from 1.83 to 18.29 and in tube well from 5.49 to 51.83 m with with mean values of 5.79 and 21.39 m, respectively. These observations support the earlier work of Bharamde *et al.* (2001), Kabariya *et al.* (2004) and Polara and Chauhan (2015).

The minimum fluctuation of water table in well (7.72 m) and in tube well (21.55 m) was observed in Dwarka taluka. The maximum fluctuation of water table in well (12.73 m) and tube well (104.37 m) was observed in Bhanvad taluka. The overall water table fluctuation at the end of monsoon (November, 2015) of Dev Bhumi Dwarka district in well ranged from 0.61 to 21.34 and in tube well from 1.22 to 158.54 m with mean value of 9.86 and 55.26 m, respectively. There was a rapid rise in water table with the onset of rainy season and it remained close to the soil surface during August and September. From October on wards, the water table receded with occasional sharp rise due to rainfall.

Table 1: Fluctuation of well/tube well water table in Dev Bhumi Dwarka district

Name of taluka		Water table (m)							
		Before monsoon (May, 2015)		After monsoon (November, 2015)		Maximum		Fluctuation	
		Well	Tube well	Well	Tube well	Well	Tube well	Well	Tube well
Kalyanpur	Range	3.05-24.39	54.88-64.00	1.83-18.29	10.67-51.83	0.91-6.10	6.10-15.24	0.61-21.34	3.05-50.30
	Mean	(15.73)	(59.76)	(6.28)	(29.27)	(3.02)	(10.98)	(9.96)	(29.88)
Dwarka	Range	4.57-22.87	6.71-60.98	3.05-11.89	5.49-18.29	1.52-9.15	3.66-15.24	0.61-14.63	1.22-46.95
	Mean	(13.72)	(32.66)	(6.11)	(11.59)	(4.26)	(8.23)	(7.72)	(21.55)
Khambhalia	Range	8.84-23.78	21.34-125.0	2.74-15.24	6.40-36.59	1.52-15.24	3.66-30.79	1.53-16.16	14.94-100.61
	Mean	(15.12)	(82.64)	(6.89)	(21.99)	(5.42)	(17.26)	(8.39)	(61.52)
Bhanvad	Range	10.67-27.44	85.37-192.1	2.74-9.15	17.68-36.59	1.22-6.10	15.24-30.49	6.71-19.21	67.68-158.54
	Mean	(17.53)	(131.6)	(4.79)	(27.74)	(3.05)	(24.39)	(12.73)	(104.37)
Overall	Range	3.05-27.44	6.71-192.1	1.83-18.29	5.49-51.83	0.91-15.24	3.66-30.79	0.61-21.34	1.22-158.54
	Mean	(15.56)	(75.99)	(5.79)	(21.39)	(3.79)	(15.32)	(9.86)	(55.26)

*Figures in the parenthesis indicates the mean value

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