

## **GROUND WATER**

Groundwater has been the mainstay for meeting the domestic needs of more than 80% of rural and 50% of urban population besides, fulfilling the irrigation needs of around 50% of irrigated agriculture. The ease and simplicity of its extraction has played an important role in its development. Recent the problems of decline in water table, contamination of groundwater, seawater intrusion etc. are being reported at many places.

The ground water potential of Kerala is very low as compared to that of many other states in the country. The estimated ground water balance is 5590Mm<sup>3</sup>. Dug wells are the major ground water extraction structure in Kerala. The dug wells have a maximum depth of about 10 to 15 meters and have a diameter of about 1 to 2 meters in coastal region and 2 to 6 meters in the midland and high land. The open well density in Kerala is perhaps the highest in the country – 200 wells per sq.km in the coastal region, 150 wells per sq.km in the midland and 70 wells per sq.km in the high land. The ground water withdrawal is estimated as 980Mm<sup>3</sup> and the State Ground Water Department calculate the effective recharge as 8134 sq Mm<sup>3</sup>.The ground water level receding drastically during the summer months and drying up of wells are common features of the ground water levels in many parts of Kerala. The ground water replenishment and hence the levels depends also on the geo-morphological, physical and chemical properties of the soil in general, The depth of water level in Kerala state varies from few cm bgl to 56 M bgl and most of the area fall under 0-20 M bgl. The depth of the water level in the weathered crystalline of midland areas in Kerala varies from 3- 16 M bgl. The midland area sustains medium capacity dugwells. Borewells tapping deeper fractured aquifer are feasible along potential features in the midland and hill ranges. Potential fractures are seen down to 240 M and the most productive zone is between 60 M and 175 M. The discharge of borewells range between 3,600 lph and 1,25,000 lph. In laterites, which is the most widely distributed lithological area in the state having a thickness from a 3 M to 30 M, the depth of water level ranges from less than a meter to 25 M.bgl. Lateries from potential aquifer along valleys and can sustain wells with yields in the range of 0.5 M<sup>3</sup> to 6 M<sup>3</sup> per day. Along the coastal plains the ground water occurs at depth ranging from less than a meter to 6 M.bgl. Filter point wells are feasible wherever the saturated availability indicate that ground water depths are farthest for laterite regions and shallowest for

coastal alluvium during all times of the year. The availability of the groundwater level between the post and pre monsoon levels varies widely. The water level fluctuations in the post monsoon and pre monsoon vary between coastal alluvium, river alluvium and valley hills.

The details of the ground water resource, ground water resource potential and observation wells in the study area are given below:

**Table: Ground water resource of Vamanapuram Block  
(As per GEC – 1997) on 31<sup>st</sup> March 2004**

1	Domestic 2004	8.28
2	Domestic 2009	10.24
3	Industrial 2004	
4	Industrial 2009	0.56
5	Total Annual GW recharge (MCM)	54.71
6	Natural discharge during non-monsoon season (MCM)	5.47
7	Net annual GW availability (MCM) (5-6)	49.24
8	Existing gross ground water draft for irrigation (MCM)	8.41
9	Existing gross ground water draft for domestic & Industrial water supply (MCM)	8.28
10	Existing gross ground water draft for all uses (MCM) (8+9)	16.69
11	Allocation for domestic and industrial water supply upto next 25 years (MCM)	10.80
12	Requirement for domestic and industrial water supply upto next 25 years (MCM)	11.47
13	Net GW availability for future irrigation development (MCM) (7-8-11)	30.03
14	Stage of GW Development in % (10/7 x 100)	33.90
15	Category	safe

**Ground Water Resource Potential of Vamanapuram Block  
as on 31<sup>st</sup> March, 2004 in MCM**

1	Command/Non command (NC)	NC
2	Recharge from Rainfall during Monsoon season	24.37

3	Recharge from other sources during monsoon season	Nil
4	Recharge from Rainfall during non monsoon season	27.34
5	Recharge from other sources during non monsoon season	3.00
6	Total Annual Ground Water Recharge	54.71
7	Natural Discharge during non monsoon season	5.47
8	Net Annual Ground Water Availability	49.24

**Observation wells**

The details regarding the location of observation wells, depth of well and water table are given below:

Table: Distribution of observation wells in the watershed area

No.	Watershed code	Longitude	Latitude	Depth of well	Depth of water table
1	4V25a	76° 58' 41"	8° 41' 42"	3.5 Meters	1.9 Meters
2	4V25a	76° 57' 23"	8° 41' 19"	13.9 Meters	13.1 Meters
3	4V26a	76° 56' 34"	8° 40' 47"	3.1 Meters	1.9 Meters
4	4V26a	76° 57' 13"	8° 40' 18"	10.8 Meters	6 Meters
5	4V26a	76° 58' 35"	8° 40' 27"	12.8 Meters	12.1 Meters
6	4V26a	76° 56' 20"	8° 40' 38"	2 Meters	3.8 Meters
7	4V29b	76° 53' 42"	8° 40' 42"	9.1 Meters	7.3 Meters
8	4V29b	76° 55' 3"	8° 40' 46"	8 Meters	6 Meters
9	4V29b	76° 54' 45"	8° 39' 44"	7.2 Meters	6.6 Meters
10	4V29b	76° 52' 36"	8° 40' 52"	13.1 Meters	10.9 Meters
11	4V29b	76° 54' 26"	8° 41' 38"	8.3 Meters	5.4 Meters
12	4V10a	76° 58' 9"	8° 42' 37"	7 Meters	5.7 Meters
13	4V10a	76° 57' 18"	8° 42' 57"	11.7 Meters	9.1 Meters
14	4V10a	76° 58' 48"	8° 42' 58"	9.7 Meters	8.9 Meters
15	4V10a	76° 57' 44"	8° 43' 41"	14.1 Meters	13.2 Meters
16	4V10a	76° 56' 53"	8° 44' 51"	8.9 Meters	7.7 Meters
17	4V11b	76° 58' 53"	8° 43' 44"	11.9 Meters	11.1 Meters
18	4V11b	76° 58' 21"	8° 44' 40"	10.4 Meters	8.7 Meters