

Research Paper :

**Tube well recharge techniques in vertisol of Raisen district of M.P.**

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**ABSTRACT**

Ground water plays an important role in irrigated agriculture. Study area received average annual rainfall of 1327 mm but it is erratic and undependable. The average rainfall of June, July, August and September is 156.3mm, 473.3mm, 371.1mm and 214.1mm, respectively. The irrigated area of the district is 180839 ha in which well irrigated area is 92564 ha. There is good potential for artificial recharge through wells for increasing the productivity of land and for stable agricultural production. Study carried out in Raisen district of M.P. reveals that due to over exploitation of ground water without adequate recharge resulted lowering of water level as well as enhancement of pumping cost. The recharge tube wells resulted in rise in ground water level by 0.7 to 1.97 m per annum. The payback period for the system is nine months.

**Key words :** Ground water, Tubewell, Recharge, M.P.

Uncontrolled development of ground water resource leads to sharp decline in ground water levels resulting in dwindling of yield or drying up of wells. The vagaries of monsoon add to compounding of water scarcity and drought becomes a recurring features. Ground water management require consideration of efficiency, equity and long term sustainability of ground water resource in term of both quantity and quality at desired levels. Ground water management is essential to balance the exploitation of the resource with the increasing demand of water.

Athaiya, 2002 suggests managemental strategies for protecting as GW resource. Surplus water during monsoon must be conserved and artificially recharged to ground water system. Roof top rainwater harvesting is to be made mandatory in urban areas amending the bylaws.

In Madhya Pradesh annual rainfall varies from 800 to 1600 mm. There is very good potential for rainwater harvesting and recycling for increasing the productivity of land and stable agricultural production. The ultimate usable ground water resources are 350 km<sup>3</sup> out of which 260 km<sup>3</sup> will be available for irrigation. The category wise water used in undivided Madhya Pradesh is given in Table 1.

**Table 1 : Category wise water used in Madhya Pradesh (km<sup>3</sup>)**

Category	1989	2002	2025
Irrigation	303	383	505
Community water supply (Urban)	7	10	18
Power Plants	4	6	15
Industries	10	18	50
Miscellaneous	10	15	40

Source: Mohale and Goel (1996)

**METHODOLOGY**

**Study area detail:**

The Raisen area received on average annual rainfall of 1327 mm, about 90% of this is received during June to September as torrential monsoon showers. The average rainfall during June, July, August and September is 156.3 mm, 473.3 mm, 371 mm and 214.1 mm, respectively in Raisen District. The rainfall during 2004-05 to 2006-07 is given in the Table 2.

**Table 2 : Rainfall data of Raisen district during 2004-07 (in mm)**

Year / Month	2004-05	2005-06	2006-07
June	227.4	95.4	17.2
July	228.6	759.4	337.6
August	442.3	182.1	464.8
Sept.	72.3	165.8	266.9
Oct.	61.6	4.7	1.7

The Table 2 show that in the year 2004-05, the maximum 442.3mm rainfall occurred in the month of August followed by 228.6mm in July. In year 2006-07 maximum 464.8mm rainfall was recorded in August followed by 337.6mm in July.

The data in the Table 3 indicated that area under cultivation in *rabi* and *kharif* season are 39700 ha and 138500 ha, respectively. The data revealed that total irrigated area is 180839 ha. in which 66,635 ha of the area is irrigated by tubewell followed by 55,573 ha of canal irrigation and 25,929 ha area under open well.

Through tube well, water is drawn from the deep