

Studies on the effect of percolation tank in augmenting the ground water recharge

R.G. BHAGYAWANT

Dept. of Irrigation & Drainage Engineering, College of Agricultural Engineering & Technology,
Marathwada Agricultural University, PARBHANI (M.S.) INDIA

ABSTRACT

The present study was undertaken on the assessment of ground water recharge through percolation tank. The percolation tank at Jamb located 10 K.M. away from Parbhani city (Maharashtra State) was selected for the study in the year 2003-2005. The reconnaissance survey was carried out to locate the wells at downstream of the tank. Water levels in the selected wells and water levels in the tank were recorded before the start of pump. The flood routing components of percolation tank were estimated from the recorded observations. It was observed that the average recharge over the period of September 2003 to April 2005 was approximately 60.13 per cent of the total water stored into the tank and the average recharge rate was 1.22 cm/day. It was also observed that the tank influenced upto a distance of 1081 meter in the zone of influence of percolation tank.

Key words : Percolation tank, Ground water

INTRODUCTION

In the state of Maharashtra, 82 per cent of the geographical area is occupied by hard rock like Deccan Trap. 16 per cent of the total cultivable area is irrigated and out of this about 50 per cent area is irrigated by ground water through wells. The irrigation through ground water storage by wells is more useful because wells can be completed within three months and at a cost of approximately Rs. 60,000/- (including pump set). Whereas approximately Rs. 80,000/- are required to create the irrigation potential for one hectare by medium or major irrigation projects.

Maharashtra has more than 8000 percolation tanks constructed all over the state. The recharge occurred from these percolation tanks have helped to generate additional groundwater potential to increase the irrigation, the irrigation activities as well as water supply available for drinking purpose in summer seasons. An ideal percolation tank will fill up in the rainy season and have adequate cultivable area in the down stream. Research on assessment of groundwater recharge through percolation tank is scanty. Therefore, it is necessary to quantify the groundwater recharge through the percolation tank and assess the area of the influence (distribution) of groundwater recharge in the down stream region of the percolation tank in order to know the irrigation potential of the tank.

MATERIALS AND METHODS

The percolation tank at Jamb located 10 KM away from Parbhani city was selected for the study in the year 2003. The reconnaissance survey was carried out to locate the wells at zone of influence of tank, pump installed by the farmers on their wells, natural stream etc. Six wells were selected for recording weekly water level fluctuations. The water levels in the wells were recorded before the start of pump. The different flood routing components like storage in pond (Ha-m), evaporation (Ha-m), water spread area (ha), volumetric recharge and recharges in forms of depth of percolation tank in study area were estimated from the recorded observations. Similarly the area of influence of percolation tank was determined by noting the water level fluctuations in the wells and their respective distance from the percolation tank. The best fit equation for this relationship was determined. The RL of the wells and their distances from percolation tank is given in the Table 1.

RESULTS AND DISCUSSION

The variations of reduced water level in some wells located at different distances from the percolation tank and reduced water level in the percolation tank during the study period are shown in Fig.1. It is observed from the figure that the water level in the well decreased with its distance from the percolation tank. It is also observed from the figure that the trend of variation of water level