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Assessment of farm pond with respect to water harvesting and recycling

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ABSTRACT : The study was conducted during the year 2010-11 at demonstration farm of the M.K.V., Parbhani . The observation regarding daily depth of water impounded in the farm pond was recorded on the farm pond constructed at that site. Daily rainfall and pan evaporation data was collected from the meteorological observatory of the University. The daily water evaporated (m^3) through the farm pond were calculated by multiplying daily depth of water evaporated from the farm pond to the water storage area for a particular day. The daily water storage area and volume of water impounded was estimated for particular depth of impounding of water. The harvested water in the farm pond was utilized for irrigating the safflower crop. For this the experiment was laid in Randomized Block Design with 6 replications and 3 treatments *viz.*, T_1 (one irrigation), T_2 (two irrigation), T_3 (No irrigation). The area of top section and bottom section of the farm pond was 309.491m^2 and 674.736 m^2, respectively. The average elevation of embankment at top was 413.130m. The average elevation of bottom of pond was 410.244m. The elevation at the bottom of outlet was 412.437m. The maximum depth of water impounded and storage volume in pond was 2.193m and 1079.20$m^{3,}$ respectively. Total evaporation and seepage loss through farm pond for the period 1st July 2010 to 31st December 2010 was 228.661 m^3 and 2775.554 m^3, respectively. The weight of silt deposited in the farm pond for the monsoon season 2010 was recorded as 11.95 tones. Treatment of two protective irrigation (T_2) recorded significantly higher grain yield (606.99 kg/ha) than treatment of one protective irrigation (T_1) and no protective irrigation (T_3).

KEY WORDS : Farm pond, Water harvesting, Recycling

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Rainwater management is the most critical component of rainfed farming (Gajri *et al.*, 1982). The successful production of rainfed crops largely depends on how efficiently soil moisture is conserved *in situ* or the surplus runoff is harvested, stored and recycled for supplemental irrigation. India has a long history of rainwater harvesting through a variety of structures and systems (tanks, ponds, khadins etc.), which are built by the Government and local bodies and managed by the community and village level institutions. However, after independence, with the availability of electricity and pumping technology, private investment on tube wells has enormously increased and the tank systems were gradually ignored. The emphasis shifted from community based structures, which use surface water, to individual investments which exploited ground water (Goyal, 1995).

METHODOLOGY

The study entitled, 'assessment of farm pond with respect to water harvesting and recycling' was conducted at the demonstration farm of Marathwada Krishi Vidyapeeth, Parbhani. The farm pond was constructed at demonstration cum seed production farm of the Marathwada Krishi Vidyapeeth, Parbhani. Area comes under assured rainfall zone. The soils are medium deep to deep black and mostly clay in texture with pH 7.5. The soil was upto 3-4 feet medium black from the top followed by 5-6 feet soft murum. Below soft murum hard murum was found. The catchment area of farm pond was 3.20 ha. The dimensions of the farm pond at bottom and top such as bottom length, bottom width, top length and top width were measured with the help of measuring tape. The area of top section and bottom section of the farm pond was 309.491m^2 and 674.736 m^2, respectively. The average elevation of embankment at top was 413.130m. The average elevation of bottom of pond was 410.244m. The elevation at the bottom of outlet was 412.437m. The maximum depth of water impounded and storage volume in pond was 2.193m and 1079.20$m^{3,}$ respectively. The daily rainfall and pan evaporation data for the period 1st June-31st December, 2010 were collected from