



A Note on Haripura Percolation Tank and its Impact on Local Hydrology, District Jalgaon, Maharashtra

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Abstract: *Percolation tanks play an important role to meet the growing demand of water for irrigation in Jalgaon district of Maharashtra. For the present study a percolation tank located at Haripura village in Yaval tehsil of Jalgaon district has been selected. For geohydrological investigation both dug wells and tube wells were selected to understand the nature of the subsurface strata and also to collect water level data. Questionnaire survey was carried out among the farmers benefitted from this percolation tank. Water quality analysis was carried out, which reveals that tank water is more suitable for irrigation purpose than ground water in the study area.*

Introduction

Jalgaon district is well known for the cultivation of cash crops like banana and cotton. Both are water intensive crops and are responsible for depletion of ground water in the alluvial belt of northern part of Jalgaon district. Various methods of ground water recharge have been implemented in this part and percolation tank is one of them.

Percolation tanks serve two purposes —i) it helps to increase the ground water level and recharge the dug wells and tube wells, ii) it also fulfils the domestic water requirement of the village. An attempt has been made in this paper to analyse the geohydrological role of

Haripurapercolationtank (GoM, 1962, GSI, 1976).

Study area

A percolation tank located about 500 m south of Haripura village in Yaval tehsil of Jalgaon district has been selected for the present study (75°39'24"E. and 21°15'38"N) (Fig. 1). It has maximum storage capacity of 22 TMC (CGWB, 2013) (Table 1). The village is located at the foothill of Satpura mountain. It presents an ideal geographical situation for the recharge of groundwater because of the accumulation of coarser fan material at the foothill zone.

The catchment area of this percolation tank is partly included in the hilly area and partly in the foothills of Satpura mountain. The total catchment area of the percolation tank is 4.25 km²

samples collected from dug wells and tube wells.

Methods and materials

The present work is based upon detailed field work and analytical work carried out in the

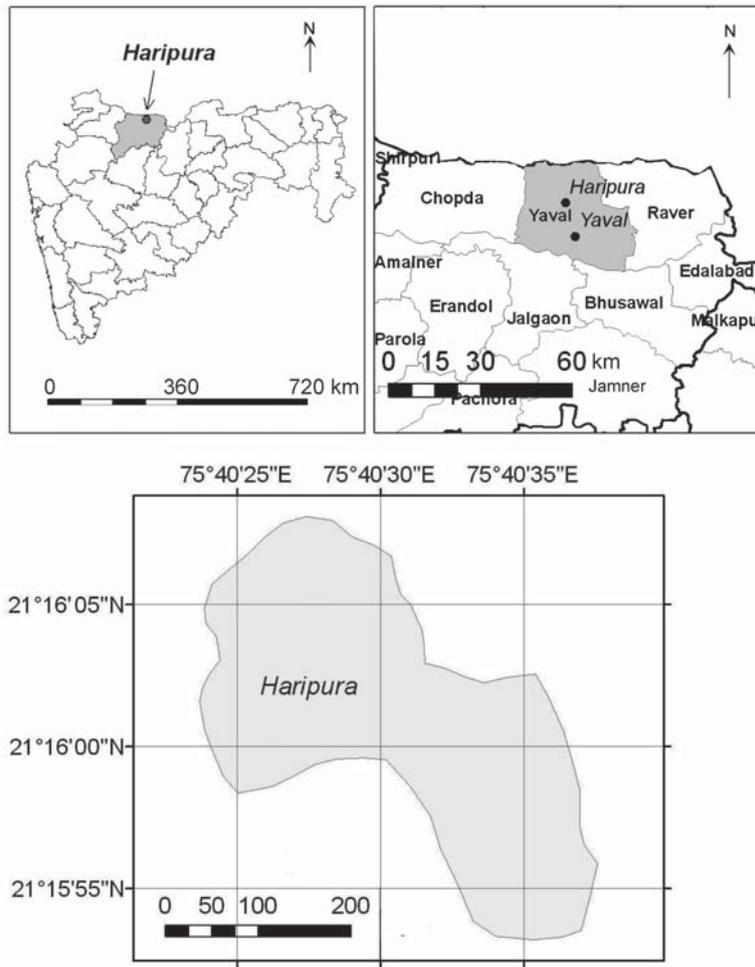


Figure 1. Location of the study area

Objectives

- To study the hydrology of the dug wells in the recharge zone of the tank.
- To analyse and compare the chemical quality of tank water and groundwater from

laboratory. Morphometric analysis of the stream was carried out from S.O.I topographical sheet 46 O/12, using Horton's (1945) method. With the help of dumpy level contouring was done at 1 m interval (Fig. 2). For water quality

Table 1. Secondary data sources used for the study

Sl.no.	Features	Details
1	Topographical sheet no.	46 O/11
2	Location	75°39'24"E and 21°15'38"N
4	Catchment area in km ² .	4.25
5	Submergence area (in '000 m ²)	7.8
6	Quaternary to recent formation	Bazada (talus and scree)
7	Storage capacity (TMC)	0.012
8	Maximum flood discharge (m ³ s ⁻¹ .)	35
9	Dam wall length (m)	66
10	Maximum height (m)	6.9
11	Top width (m)	2.4

analysis water samples were collected from the percolation tank, dug wells and tube wells. Chemical analysis of parameters like pH, EC, TH as CaCO₃, Ca⁺, Mg⁺⁺, Na⁺, K⁺, Cl, SO₄ was carried out.

Results and concluding note

There are 15 dug wells located in the recharge zone of Haripura tank. For the better understanding of aquifer characteristics detailed cross sections of four dug wells have been studied.

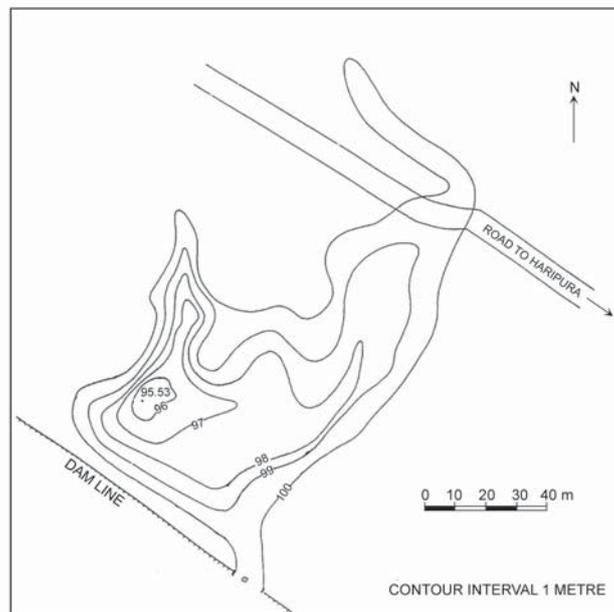


Figure 2. Contour map of percolation tank, Haripura.

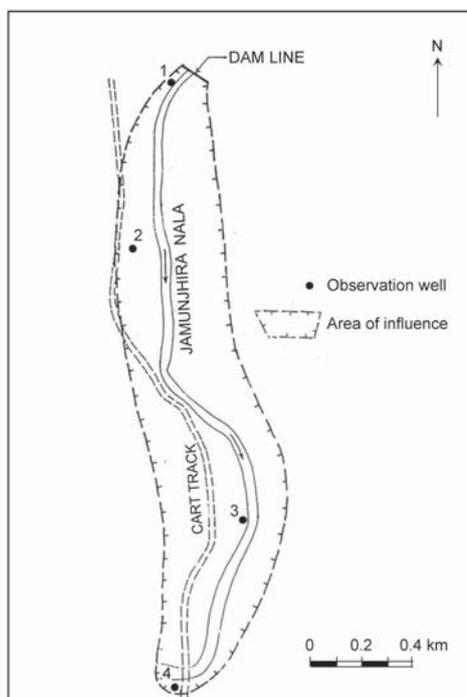


Figure 3. Area of influence of Haripura percolation tank.

Table 2. Comparison of tank water and groundwater quality, Haripura percolation tank

Sl.no.	Chemical element	Tank water	Groundwater	Augmented groundwater
1	pH	7	8.8	8.7
2	EC at 25°C	544	670	610
3	TH as CaCO ₃	250	270	230
4	Ca ⁺	85	54	28
5	Mg	10	34	36
6	Na	2.3	27	35
7	K	21	0	1
8	CO ₃	Nil	20	30
9	HCO ₃	270	320	280
10	Cl	8	16	7
11	SO ₄	14	3	--
12	NO ₃	26	7	5

More than 20 m thick, highly porous and permeable formation is present below the surface (IDJ, 2010).

The area of influence of the tank has been marked based on observations of water level fluctuation and the information collected from the farmers. The influence of the tank was observed up to 1 km downstream of the tank (Fig. 3).

Water quality analysis

The water samples from the tank water and well water were collected and analysed in the laboratory. The result of the analysis of tank water and groundwater were compared (Table 2).

From the comparison of chemical properties of tank water and groundwater it is found that

- The water samples from the percolation tank have more concentration of elements like K^+ , SO_4 and NO_3 .
- The water of tank also indicates higher concentration of total dissolved salts. It may be due to the sewage water released from

the village. But the overall water quality of this percolation tank is good.

- The quality of water samples taken from the native ground water and augmented ground water appears to be more or less similar.

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Date received: 1 November 2015

Date accepted after revision: 21 June 2016