

PROPOSAL OF A SCHEME FOR CIRCULATION OF WATER IN THE TANKS OF BRAHMA SAROVAR AND SANNIHITH SAROVAR

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ABSTRACT

The current study is to propose a scheme for the circulation of water between Narwana Branch canal at JyotisarTeerth and Brahma Sarovar and SannihithSarovar for maintaining proper quality standards in Brahma Sarovar and SannihithSarovar.

Key words: poor water quality, maintenance, circulation of water

I. INTRODUCTION

India being a nation having great religious values consists of many number of temples. In most of the cases it is observed that a water body is being associated with temples because of water having its importance in terms of religious rituals. Some of the themgain more importance because of their sacredness being mentioned in mythological aspects and attract pilgrims in large number to perform various rituals on days of special occasions. As large number of pilgrims visit there, there is a necessity to concentrate on water quality of such water bodies. So, for current study two such water bodies namely Brahma Sarovar and SannihithSarovar of Kurukshetra District of Haryana, India (figure 1) are considered where large crowd is being observed on the days of Solar eclips and new moon days performing different rituals and taking holy bath in the water.

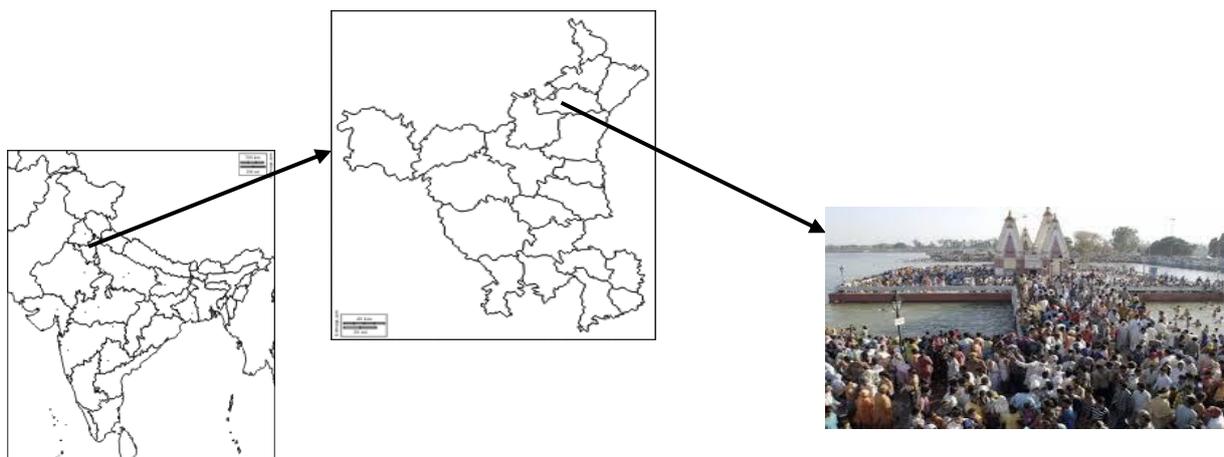


Figure 1: Location of Brahma Sarova and SannihithSarovar

So, by considering above fact a study of water quality test is carried out on the water in the water body. Some of the important parameters like pH[1], dissolved oxygen(DO)[2], biological oxygen demand(BOD)[3], total alkalinity[4], total hardness[5] and coliform index(MNP)[6] of the water are being tested. The results (table 1)implied that there is a necessity to concentrate on the water quality of the water body as water of poor quality is considered as major reason for affecting human health by WHO [7]. So, this paper discusses a solution for the existing problem of water quality in Brahma Sarovar and SannihithSarovar.

Table 1: Comparison with standard values

S.no	Parameter	Standard values	Values at Brahma Sarovar
1	pH	6.5-8[1]	9.2
2	DO(mg/l)	≥5[2]	4
3	BOD(mg/l)	≤3[3]	11
4	Total alkalinity(mg/l)	200[4]	340
5	Total hardness(mg/l)	600[5,6]	850
6	Total coliform(MNP/100ml)	≤500[4,]	1200

II. MATERIALS AND METHODS

On analysing the prevailing condition it was observed that there are two major reasons of depriving water quality in Brahma Sarovar and SannihithSarovar. The reasons are mass bathing and the open channelled Thanesar Distributary that brings in water to these water bodies. The water is carried by Thanesar Distributary to the pump house and is pumped to the water body(figure 2). After reaching the water body, the water gets stagnated adding in one more reason of contamination of water.

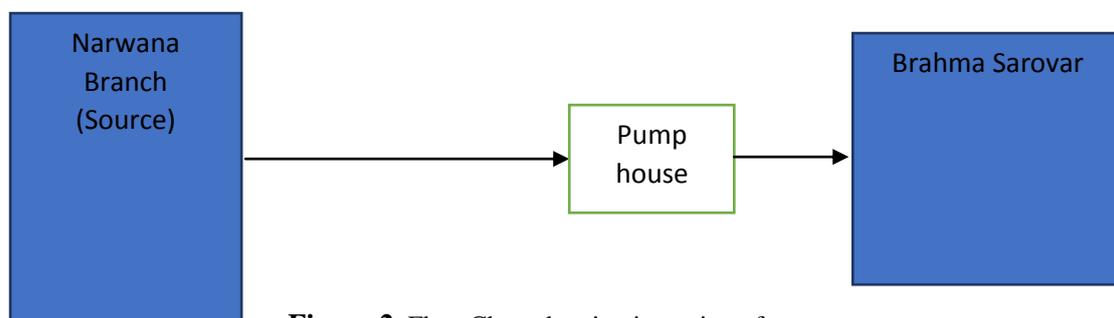


Figure 2: Flow Chart showing incoming of water

2.1 Methodology:

So, by observing all the means of contamination, it is suggested that there is a requirement of bringing in fresh water more frequently and removing the contaminated water from the water body. This means that there is a need of circulation of water between the source and the two water bodies.

III.RESULTS AND DISCUSSION

The circulation of water between Brahma Sarovar and Narwana branch canal can be discussed in two stages:

a)OnwardJournyb) Return Journey

Onward Journey:

On its onward journey a total of 50 Cusecs of water is being carried by Thanesar Distributary which is an open channelled lined canal. Out of this 50 cusecs, 20 Cusecs are pumped into Brahma Sarovar and the rest 30Cusecs is carried forward for the purpose of cultivation and other needs. This canal on its way to Brahma Sarovar passes through Mirzapur Village, Bhatta Colony and Kurukshetra University. In Mirzapur village it is being observed that the villages carryout cattle farming on the banks of the canal (fig 3) and it is also seen that they have dumped solid waste into the canal(fig 4). The canal before entering Kurukshetra University has a ghat where laundry work for a large number of clothes is carried out resulting in polluting the water with chemicals, detergents etc. (fig 5).



Figure 3: Cattle Farming at Mirzapur village



Figure 4: Garbage dumped in the distributary



Figure 5: Laundry on the banks of distributary

So, by keeping in mind the above mentioned aspects that effect the water quality, a proposal of carrying the water in closed conduits is planned. This provides a one-step solution to all the problems mentioned above. Two conduits are to be designed for a discharge carrying capacity of 20Cusecs and 30 Cusecs. The one with the 20 Cusecs terminates at pump house to get pumped into Brahma Sarovar and the one with 30 Cusecs is being carried forward for the purpose of agriculture. Concrete pipes can be used as conduits and as the bed has sufficient slope, the water can be transported by the action of gravity.

Return Journey:

Onits return journey a total of 20 Cusecs is collected at pump house out of which 15 Cusecs is gathered from south-west corner of left wing of Brahma Sarovar and other 5 Cusecs from SannihithSarovar. This water is pumped to some distance by a cement concrete pipe and the rest of the journey is carried out in open channel for meeting the needs of the villagers as the villagers were dependent on the distributary for many years. And this gravity flow can be attained by discharging the water into Satluj-Yamuna Link (SYL) with bed levels below the bed levels of Narwana Branch canal and running parallel to it. SYL is running out of water because of the disputes between the states of Haryana and Punjab. So, it can be used to dump the water.

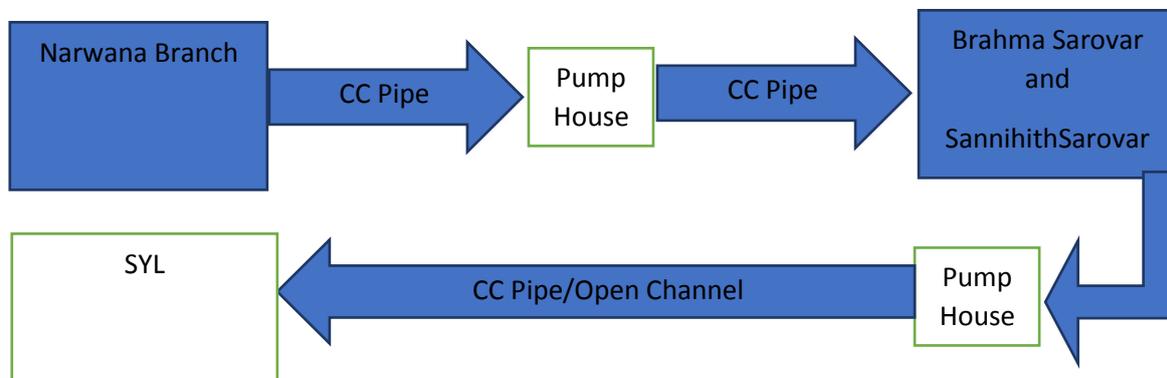


Figure 6: Flow Chart showing the whole circulation

IV. CONCLUSION

The water quality of the tank under existing conditions are observed to be very poor. So, to overcome the problem a scheme is proposed that would help to improve the water quality standards. The scheme is to circulate the water between the source i.e. Narwana Branch Canal and the Brahma Sarovar and Sannihith Sarovar. In the onward journey the water is carried in a closed cement concrete pipe and in the return journey it is pumped till midway i.e. till Mirzapur and the rest of the journey is carried out in an open channel for meeting the needs of the people who are habituated to be dependent on the canal. And the return journey terminates where the open channel falls into SYL that runs parallel to Narwana Branch canal but with lower bed levels.

REFERENCES:

- [1] U. Mishra and P. Bhora, "Assessment of Indicator Parameters to Investigate the Variations in Ground Water Quality of West Districts Tripura using Entropy and Correlation", International Journal of Chemistry and Chemical Engineering, vol. 3, no. 3, pp-215222, 2013.
- [2] Organization for Economic Co-operation and Development (OECD), Task Force for the Implementation of the Environmental Action Programme for Central and Eastern Europe, Caucasus and Central Asia: Regulatory Environmental Programme and Implementation Network, ENV/EPOC/EAP/REPIN(2011)1/FINAL, OECD, Paris, France, 2011.
- [3] Central Pollution Control Board (CPCB), Guidelines for Water Quality Management, CPCB, DELHI, INDIA, 2008.
- [4] UNESCO/WHO/UNEP, Water Quality Assessment-A Guide to the Use of Biota, Sediment and Water in Environmental Monitoring, 2nd edition, 2001.
- [5] Bureau of Indian Standards (BIS), Indian Standard Drinking Water Specifications, First Revision, Bureau of Indian Standards (BIS), 1991.
- [6] V.K. Tyagi, A. Bhatia, R.Z. Gaur et al., "Impairment of Water Quality of Ganges River and Consequential Health Risks on account of Mass Ritualistic Bathing", Desalination and Water Treatment, vol. 51, no. 10-12, pp-2121-2129, 2013
- [7] WHO (World Health Organization), Guidelines of Drinking Water Quality, vol 1, 2nd Edition, 1993.