

## PHYSICO-CHEMICAL ANALYSIS OF WATER QUALITY OF SARKAR BANDH POND OF JAMTARA DISTRICT, JHARKHAND

<sup>1</sup>Ashok Kumar Singh and <sup>2</sup>Sanjeev Kumar Sinha

<sup>1</sup>Asst. Professor, Mahila Sandhya College, Jamtara (Jharkhand).

<sup>2</sup>Deptt. Of Chemistry, Jharkhand Rai University, Ranchi (Jharkhand).

### ABSTRACT

Water is one of the most important compound to the ecosystem. Better quality of water described by its Physical, Chemical and Biological characteristics. But some co-relation was possible among these parameters and the significant one would be useful to indicate its quality. The present paper includes an assessment of quality of water in various seasons in the most popular Sarkar Bandh pond of Jamtara district of Jharkhand state. Since 'good' water quality will produce healthier humans than one with 'poor' water quality, an analysis on the physico-chemical parameters was made for welfare of poor mass of people. Regular and frequent survey was made to analyse physical and chemical parameters such as Temperature, Odour, pH, Total Dissolved Solids, Total hardness, Dissolved oxygen, TSS, amount of present Nitrates, Fluoride and Iron. The findings of the analysis will prove to be quite informative for the daily consumers dependent on this water body.

**Key words:** Physico-chemical parameters, Sarkar bandh pond, Jamtara, Jharkhand.

### INTRODUCTION

Water is one of the abundantly available substances in nature which man has exploited more than any other resources for the sustenance of life. Water of "good" quality is required for living organisms. The chemistry of water is influenced by the input of material containing minerals, their solubility and chemical equilibrium prevailing in the aqueous solution. Any water is capable of assimilating certain amount of pollution without serious effect due to dilution and self-purification factors. The physico-chemical characteristics of any aquatic ecosystem and the nature and distribution of its biota are directly related to and influenced by each other and controlled by a multiplicity of natural regulatory mechanisms. However, because of man's exploitation of the water resources, the normal dynamic balance in the aquatic ecosystem is continuously disturbed, and often results in each dramatic response as depletion of fauna and flora,

fish kill, change in physico-chemical character etc. (Sakhre V.B and P.K. Joshi, 2003).

Artificial changes which lead to such ecological responses are referred to as pollution and pollutional stage may reach a stage when these valuable aquatic resources are no longer safe for human use. Everything originated in the water and water sustains everything. All life on the earth depends on water. Water is significant source of habitat for plants, animals, and is found in every section of ecosphere. Source of water are atmospheric, with surface water, stored water and ground water. Stored water present in ponds, reservoirs, lakes or oceans is important features of the earth landscape. Water quality can have great influence on ability of aquatic organism to exist and to grow in a stream, pond or lake. It is well known

that pollution of water cause adverse effect on fish and other aquatic organisms. Numerous anthropogenic activities like disposal of sewage and industrial water, recreational activities, excess fertilization of land and use of pesticides has threatened environmental health of both surface and ground water. Water pollution is now a day is considered not only in the term of public health but also in terms of its conservation, aesthetics and preservation of natural beauty and resources.

Water pollution has however threatened to reduce the quantity in ponds, lakes and rivers and reservoirs due to disposal of sewage, industrial water and due to other human activities (Trivedi and Chandrasekhar, 1999). Leading to water quality and depletion of aquatic biota, it is necessary that the quality of water should be checked at regular interval for actual analysis and assessment. Human population suffers from a number of water borne diseases due to consumption of contaminated water. My present work is solely based on welfare of human civilization as it can be regarded as the least developed part of Indian sub-continent.

## MATERIALS & METHODS

The present work is based on regular survey of one of the most important Sarkar bandh pond located

near Railway station in Jamtara district which lies between 23°10' and 24°05' north latitudes and 86°30' and 87°15' east longitudes. It is located at a lower altitude of Chhotanagpur Plateau. The site was visited in the months of August and December in 2015 to analyse the change of physico-chemical parameters. Most of the natives of this locality are dependent on this water body for their daily needs. This water body is also used for fishing. Some of the native people of this locality like Ujjwal Mandal, Sadhan da, Tapas, Babloo, Habulal saha and Saroj da were also contacted to know the history and age of this water body and other aspects. The water samples were collected mainly in morning hours between 9 to 11 am in glass test tube and jars. The samples were brought to laboratory for physico-chemical analysis. Some of the properties like, water temperature, transparency and odour were recorded at the sampling site. Transparency was measured with the help of Secchi Disc while other parameters were estimated in the laboratory by using standard methods as prescribed by APHA.

## RESULT & DISCUSSION

The seasonal variation in physico-chemical parameters has been summarised in the following Table- 1 (Following below)

Sl.No.	Parameters	August' 2015	December'2015
1.	Air Temperature in °C	30	15
2.	Water Temperature in °C	28.5	11
3.	Odour	Objectionable	Unobjectionable
4.	pH	8.5	7.6
5.	Total Hardness in mg/l	350	378
6.	DO in mg/l	3.2	2.9
7.	TSS in mg/l	318	380
8.	Nitrate in mg/l	20	45
9.	Fluoride in mg/l	0.5	0.2
10.	Iron in mg/l	0.4	0.3

It is quite clear from the above table that there is gradual change of physical and chemical parameters with change in season. However, the data does not show much more variation of physico-chemical parameters as decided by the WHO, but the site seems to be polluted during rainy season.

## CONCLUSION

The present study concludes that the most of the parameters of Sarkar bandh pond is under the permissible limit fixed by WHO. There is need to aware the people to make the habitat pollution free and avoid disposal of wastes and contaminants in it. The reservoir is used for fishing as well as daily activities, so its maintenance is the responsibility of local residents in general and the district administration in particular.

## REFERENCES

- APHA: In; "Standard Methods for the Examination of Water and Wastewater". 17th ed., American Public Health Association, Washington, D.C. (1998).
- Arvind kumar, (1995): Some Immunological Aspects of the Fresh water Tropical Wetland of Santhal Pargana (Bihar) India, J. Envi. Poll.2 (3): 137-141.
- Kadam, M. S. Pampatwar D. V. and Mali R. P. (2007): Seasonal variations in different physico-chemical characteristics in Masoli reservoir of Parbhani district, Maharashtra, J. Aqua. Biol. 22(1): 110-112.
- Pandey, A. K., Siddiqi S. Z. and Rama Rao (1993): Physico-chemical and biological characteristics of Husain sagar, an industrially polluted lake, Hyderabad. Proc. Acad. Environ. Biol. 2(2), 161-167.
- Sakhre V.B and P.K. Joshi (2003): Physico- chemical Limnology of Papnas; A major wetland in Tuljapur town, Maharashtra, J.Aqua. Biol.,vol 18(2) 93-95.
- Sinha D.K. Roy S.P.: "Assessment of drinking water quality of Santhal Pargana, Bihar." J. Envi. Eco. & Conserv. .8(3) 937-941, (1990).
- Trivedy, R. K. and Goel P. K. (1986): Chemical and biological methods for water pollution studies, Environmental Publication, Karad, Maharashtra.
- Trivedi, R.K. Chandrashekhar T.R : "Sediment characteristic of freshwater bodies Manglore.Karnataka.'J.Eobiol.11 (1) pp.59-64, (1999).
- WHO: In: "International standards for drinking water" World Health Organization, 3rd ed. Geneva, (1984). It is quite clear from the above table that there is gradual change of physical and chemical parameters with change in season. However, the data does not show much more variation of physico-chemical parameters as decided by the WHO, but the site seems to be polluted during rainy season.