

Accelerated Level of Phosphates in Krishna River at Wai

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Abstract- Rivers play an important role in human development and are an important finite natural resource. The physico-chemical characteristics of water determine to examine the water quality. The study of water quality involves a description of occurrence of various constituents in water and relation of these constituents to water use. The present study was undertaken to carry out a quality assessment on behalf of phosphates in surface water of Krishna River at Wai and to ascertain its suitability for domestic, industrial and agricultural purpose. The phosphates present in the Krishna river water in Wai taluka found to be higher than permissible limit and it is factor to blame for eutrophication.

I. INTRODUCTION

Krishna River is one of the major perennial rivers, which drains three important States of South India. Wai is a town in Satara District, in Maharashtra state located on the Krishna River; Wai is located at 17.94°N 73.88°E, approximately 35 km north of the city of Satara, India. Dhom Dam, west of Wai, was completed in 1982. The Krishna River flows through the Western Ghats at elevation of 1337m. Krishna is Major River in Maharashtra, which is originated at Mahabaleshwar and travels 1400 kms till empties in Bay of Bengal. For Wai taluka particularly Krishna has a length of approximately 36 kms. The Wai is known as the city of temples “Dakshin Kashi”, there are more than 100 of temples situated in Wai. Wai taluka has seven ghats on the Krishna's banks Gangapuri, Madhi Aali, Ganpati Aali, Dharmapuri, Brahmanshahi, Ramdoh Aali and Bhimkund Aali and Menavali is 8th ghat which is 3-4 kms away from Wai. For the study purpose five points were selected on the river for collection of water samples.

II. OBJECTIVES

1. To find out the amount of phosphates present in the Krishna river water.
2. How it is harmful to aquatic and human life.
3. To study the growth of algae and hyacinth in river water.
4. Effects of accelerated growth.
5. Observing the factors which boost phosphates.

III. METHODOLOGY

1. Selection of water collection points on the Krishna River in Wai was done with the help of maps, river bank survey and with public interaction. In mid of September and October
2. After surveying 5 different nodal points were selected on the Krishna River in Wai.
3. The wastewater samples were collected after 9.00 am from selected locations.
4. The samples were collected on following date 19th Nov 2015.
5. Various parameters were tested in the laboratory by using APHA (American Public Health Association) standards. We are having a discussion on Phosphates only.
6. After testing collected samples in laboratory obtained results were tabulated suitably. This recorded results, then analysed for interpretation of results.
7. The obtained results are compared with WHO standards because no standards were set for phosphates by BIS.

IV. FIELD APPLICATION

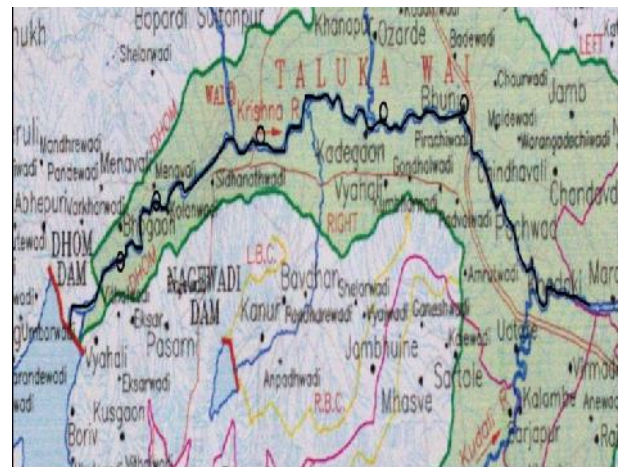


Fig.1. Sample collection points

For study purpose five points along the river bank were selected as shown in fig.1 from dhom dam to bhujinj marked as black circles. Detailed survey was done along the river to calculate discharge variations at various points due to joining tributaries, odha's (streams), culverts etc. Approaching

and connecting roads were marked on map for further use. To gather information local public helped me out. Water collection points were selected approximately 200 m to 300 m away from habitation and connecting streams at downstream side. This is the first time in last 40 years the river discharge is very poor due to insufficient raining this season.



Fig.2. Sample collection from various points

Experimental work:-

After studying this aspect of Wai 5 different sample collection points were selected. The samples were collected in 2 lit polyethylene bottles from selected location in between 9.00am to 11.am. Then samples were brought to the laboratory for testing within 4 hours after collection. The samples were tested in the laboratory by APHA (American Public Health Association) standards.

V. RESULTS AND DISCUSSIONS

Following table shows the laboratory results after testing of water samples.

Table.1. Obtained results

Sr. No.	Sampling Location	Phosphates mg/l
1	Bhogaon	1.05
2	Menavali	0.36
3	Bhadreshwar	1.59
4	Kadegaon	1.74
5	Bhuinj	1.12

Note: Following results for date 19.11.2015

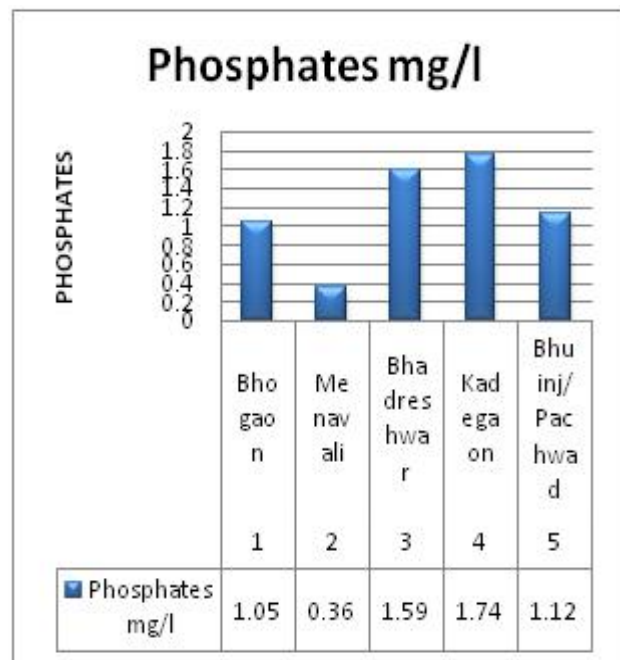


Fig.3. Graphical representation for phosphates in water

BIS has not set any standards for phosphates in drinking water, while WHO (1993) has fixed it to be 0.1 mg/l. The above graph and table represents the presence of phosphates in the Krishna River. The obtained figures are much higher than permissible limits set by WHO.

Bhadreshwar and Kadegaon obtained higher values 1.59 mg/l and 1.74 mg/l respectively. As the values are high the consequences of that much of phosphates leads to phytoplankton growth in water body which helpful for hyacinth growth in water and algae formation.

There are various reasons for the acceleration of phosphates in the Krishna River at Wai.

- Phosphates presence in river water due to geological condition of the river bed i.e. weathering of rock.

- J Fertilizers and pesticides used in farming, cleaning agents used in households, etc.
- J Industrial and domestic sewage in water bodies.
- J M.I.D.C and other small scale industries present in nearby area.

Discussion over phosphates in the Krishna River

Wai is surrounded by agriculture land and the use of fertilizers and pesticides for farming may be the reason for phosphate content in river water. Rainfall can cause varying amounts of phosphates to wash from farm soils into nearby waterways. Phosphate will stimulate the growth of plankton and aquatic plants which provide food for fish. This may cause an increase in the fish population and improve the overall water quality. However, if an excess of phosphate enters the waterway, algae, and aquatic plants will grow wildly, choke up the waterway and use up large amounts of oxygen. This condition is known as eutrophication or over-fertilization of receiving waters. This rapid growth of aquatic vegetation eventually dies and as it decays it uses up oxygen. This process in turn causes the death of aquatic life because of the lowering of dissolved oxygen levels.

There is no any Solid waste disposal facility in town. Wai is known as “Dakshnin Kashi” city of temples every year many people visits Wai. As Hindus religious belief the best of garlands and food directly discharged in the Krishna river. Bathing and washing clothes at ghats increases detergent level in river water. The water from households directly discharged in the river. Which boost up the level of phosphates in river water?



Fig.4. Hyacinth spread



Fig.5. Hyacinth spread

Causes:-

1. If too much phosphate is present in the water the algae and weeds will grow rapidly, may choke the waterway, and use up large amounts of precious oxygen (in the absence of photosynthesis and as the algae and plants die and are consumed by aerobic bacteria.) The result may be the death of many fish and aquatic organisms.
2. Digestive problems could occur from extremely high levels of phosphate
3. Phosphates are not toxic to people or animals unless they are present in very high levels. Digestive problems could occur from extremely high levels of phosphate.
4. If ignored increases Eutrophication.
5. Increases algae and hyacinth growth in water.



Fig.6. Algae growth at some parts of river

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