



Water Quality Status of Mula-Mutha River

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ABSTRACT

Mula- Mutha River is the among most polluted rivers in India. It flows through the Pune city which automatically affects Pune's Environment in different manners like Aesthetic view, Environmental, Health, Fulfillment of water demand etc. Everyone wants clean water for drinking, and all other basic needs. If water becomes polluted, it loses its value to us economically and aesthetically. Hence, it can become a threat to our health as well as to the survival of aquatic life. The BOD, COD, DO, etc. concentration of Mula- Mutha River has been studied in this research. The study consists of 15 sampling stations along the course of Mula- Mutha River starting from Khadakwasla and Mulshi Dam to Manjari Budruk. From the results it was found that the river receives heavy domestic wastes along with the loads of agricultural runoff. It also receives industrial effluents from small-scale industries which are located along the river bank

KEYWORDS : Mula- Mutha River, BOD, COD, DO, sampling stations, heavy domestic wastes, remedies, industrial effluents

RIVER POLLUTION:-

Water pollution is an acute problem in all the major rivers. Dirty water is the biggest health risk and continues to threaten both quality of life and public health. Water is known to contain a large numbers of chemical elements. The interactions of both the physical and chemical properties of water play a significant role in composition, distribution and abundance of aquatic organisms. In the wake of increasing urbanization and industrialization, the pollution of river giving momentum day by day.

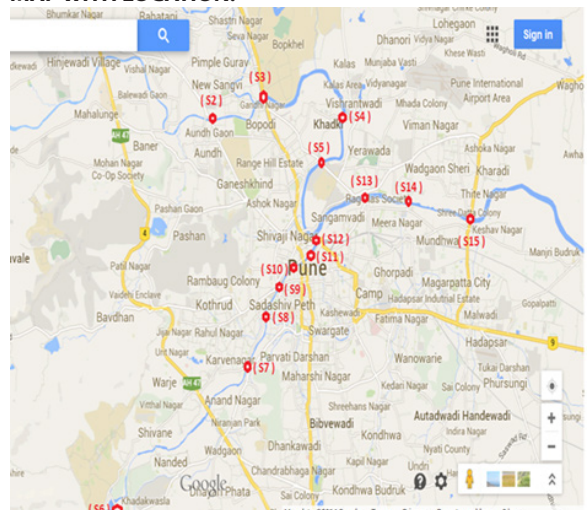
With growing urbanization and industrialization India faces the challenges of providing clean and safe water to all citizens. In the name of economy growth most rivers and streams are turning into sewers. As more and more rivers are getting polluted, the municipalities are finding it difficult to treat river water to safe levels and supply it to citizen.

INTRODUCTION OF MULA-MUTHA RIVER:-

Mula-Mutha River is a river in India which passes through center of Pune city. Mula-Mutha River is confluence of Mula and Mutha River. Mula originates from Mulshi Dam. It passes through Paud, Lavasa, Wakad, Balewadi, Baner, Aundh, Khadki, Vishrantwadi and ends at Sangamwadi.

Whereas MUTHA river origin from Khadakwasla dam. It passes through Dhari, Nanded, Z-Bridge, Juna-Bazaar, Pune RTO and ends at Sangamwadi. Both MULA and MUTHA River merge at Sangamwadi which is further joined by Indrayani River and further joins Bhima River.

MAP WITH LOCATION:-



SAMPLING METHOD:-

Samples collected from following stations:-

MULA RIVER:-

- 1) Mulshi dam (S1)
- 2) Aundh-Ravet Rd Bridge (S2)
- 3) Khadki Bridge (S3)
- 4) Kalsa Malwadi Bridge (S4)
- 5) Holkar Bridge (S5)

MUTHA RIVER:-

- 1) Khadakwasla Dam (S6)
- 2) Rajaram bridge (S7)
- 3) Mhatre Bridge (S8)
- 4) Sambhaji Bridge (S9)
- 5) MaharshiShinde Bridge (S10)
- 6) Tilak Bridge (S11)
- 7) Sangamwadi Bridge (S12)

MULA-MUTHA RIVER:-

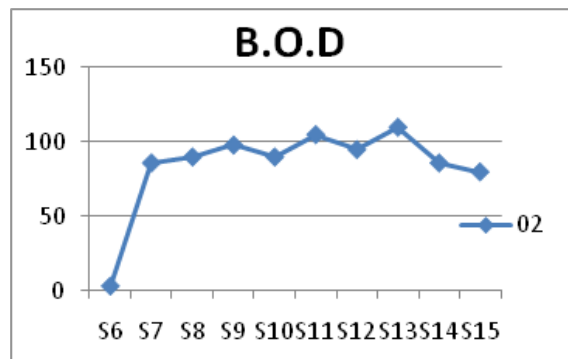
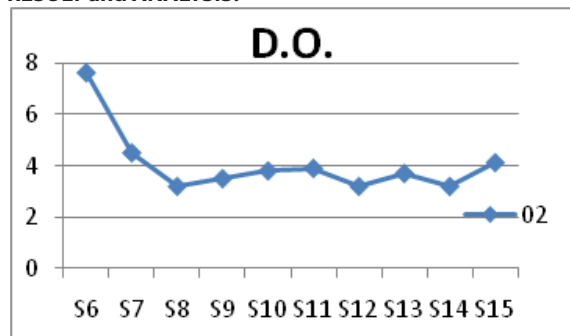
- 1) Yerawada Bridge (S13)
- 2) K.P. Bridge (S14)
- 3) Mundhwa Bridge (S15)

Sampling was made for the physico-chemical factors from the 15 stations on the surface water on Mula-Mutha river.

Standard Operating Procedure (SOP) is applicable to the collection of representative

liquid samples, both aqueous and nonaqueous from streams, rivers, lakes, ponds, lagoons, embayments, and surface impoundments. It includes samples collected from depth, as well as samples collected at the surface. Sampling for the physico-chemical parameters were done on each station. Water samples were collected in plastic bottles and partially tested in the field, as well as in the

RESULT and ANALYSIS:-



As per result analysis, it is found that some point are highly polluted. Different point are polluted by different pollutant. Some points are polluted by solid particle. Some point are laboratories. polluted by chemical particle. Some points are polluted by organic particle or inorganic particle. Some points are polluted by suspended particle such as polythene, plastic bag, plastic bottle etc. Temperature was measured using Mercury in glass thermometer accurate to 0.1 C. pH was measured using portable pH meter and Dissolved oxygen was determined by modified Winkler azide method. Bjochemical oxygen demand (with duration of 3 days of incubation at 27 C) and chemical oxygen demand (by dichromate titration method) were also estimated. All test are carried out with full concentration to obtain the correct result. All test are conducted by IS standard under supervision.

REMEDIES

- 1) By Awareness 2) By Increasing STPs 3) By Eco-technology And 4) Drainage line on Both Side of River.

1) Awareness:- This method is based on a thought i.e. "Prevention

is better than cure ". Awareness can be done by manually, by poster making, advertising etc. Making awareness to the people about "how to keep the river clear" is the best and economic way to keep the river clean. But it is not a ideal method to work out, as people are not follow the rules strictly. Therefore, depending only on awareness method is not sufficient to keep the river clean, we need some other alternative method also along with awareness method.

2) By increasing STPs: As per details available MPCV has been recovering this charge from the civic body for the last 15 years. Currently 218 MLD of sewage water is getting mix into the river. Currently PuneKars consumes 1125MLD water for drinking and domestic use, out of that 750 MLD turn into sewage. There are 10 sewage treatment plants (STP) which recycle 532 MLD of the 750 MLD sewage water. The recycle water is then supply to domestic use. The reaming 218 MLD sewage water is ejected into the river. "The existing 10 STPs are inadequate considering the total use of water 10 more STPs are offering so more sewage water can be reuse" said PMC office. Also because of some drawback of STPs, it is also not sufficient to keep the river clean. PMC has been working and planning towards making Pune environment friendly and health in every possible way.

3) By Eco-technology: Eco-technology is an applied knowledge and skill that searches for accomplishing human needs with minimum ecological disruption. Eco-technology is essential discipline of sustainable development and ecological engineering can facilitate restoration and preservation of the environment health for the survival, development and economy of society through the integration of engineering and ecological principles with modernizing trends of market and development. An ecologically resounding approach to engineering considers that nature responds comprehensively, persistently and cumulatively. Eco-technology operates within the borders of ecosystem rather than flouting or disregarding or overcoming or overpowering it. Ecological engineering and eco-technologies are dependent on the self -designing, resilient abilities of ecosystems and their natural biotic and abiotic forces. Ecological engineering has emerged as an integration of ecology and engineering concerned with the design, monitoring and construction of human relationship with ecosystem for exchange of energy, food.

Application of Eco-technology

Applications of ecological engineering principles, environmental chemistry, microbiology, interactions of organisms and succession of biological communities are very useful to consume organic and inorganic pollutants from the wastewaters and bio-convert them into non-toxic form.

In the eco-technology, attempt has been made to apply natural flora and fauna in well-designed manner to develop technologies like Green Bridge, Green Lake Eco-Systems, Green channel, and Stream Eco-Systems. The success implementation of the scheme with natural technologies like Green Bridge, Green Lake and Stream Eco-System implied that the eco-technology can be employed to treat the waste streams coming from the non-point sources. This can be very economical, say capital expenditure can be 5 - 10% of the total for conventional mechanized aerobic and anaerobic treatment systems.

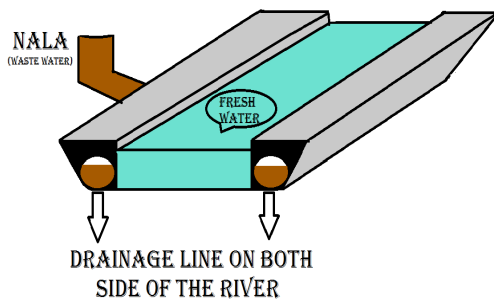
Effectiveness of Eco-technology

- 1. Eco-technological systems can be developed and operated in combination with conventional systems to improve the performance of the latter.
- 2. Eco-technological systems reduce the eco-toxicity of the man-made substances released into the water bodies and facilitate the eco-assimilation those pollutants into the ecological cycles thus reducing the quantum of hazardous residues to zero which otherwise require costly secured landfill and incineration techniques.
- 3. Eco-technological system's capital expenditure is comparable with the annual operational cost of conventional bioremediation systems.

4) Drainage line on Both Side of River.

Our suggestion is that drainage line should be provided on both sides of river. Drainage line should be provided along the length of the river from polluted area i.e. {S7} to the another polluted area {S15}. Arrangement of drainage line should be made in such a way that adjoining waste water should not interfere with the main river water i.e. if we construct drainage line on both the sides of river it will help to flow

the sewage water along the sides of the river water without interfering with the main river water. Ultimately it helps to keep the main river water clean and fresh.



Advantages

- 1) Main River will not effect by sewage water.
- 2) Sewage water can bring to a STP directly.
- 3) Pollution and smell will under control.
- 4) Appearance will be good.
- 5) It will help to keep healthy Environment.

Disadvantages

- 1) Initial construction cost will be very high.
- 2) Cross-section area of river will be decrease.
- 3) Maintenance will be required time to time.
- 4) Human source will require for maintenance.

CONCLUSION:-

As per our study on Mula-Mutha river, it is seen that river can be clean up permanently in future with some efforts by the govt. of Maharashtra.

To clean up the river permanently, it is necessary to take a proper decision by the govt.

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