

DOMESTIC WASTE WATER PURIFICATION BY BIO-FILTERS

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ABSTRACT

In the present study, a cost-effective and simple stone media was a pilot-scale trickling biofilter (TBF). Designed, constructed and operated in continuous recirculation mode to treat wastewater, With a hydraulic flow rate of 1.2 L/min ($Q = 0.072 \text{ m}^3/\text{h}$) and hydraulic loading (Q/A) 0.147 m³/day, 9 weeks at a temperature range of 14.5 - 36°C. A significant drop in the average Concentration of various pollution indicators like Chemical Oxygen Demand (COD) (202 mg/l), Biochemical oxygen demand (BOD) (90mg/l), total dissolved solids (TDS) (386 mg/l), total suspended Solids (TSS) (142 mg/l), Turbidity (NTU) (920.4), was observed during 15 weeks of operational period. So significant increase in dissolved oxygen (DO) level (1.4 mg/l) was then observed. Treatment of waste water through TBF system. Most likely there is no significant decrease in numbers. An index of faecal coliforms (MPN) was detected in the effluent during the first 9 weeks of operation. However, a significant reduction in MPN of faecal coliforms was observed, i.e. The last few weeks of treatment. Thus, the overall results indicate that pilot -scale TBF excels Potential for transfer to field scale for wastewater treatment for developing small community's country, to produce good quality wastewater, which can be safely used for irrigation as well as for ornamental purposes.

Key words – (cost-effective, bio filter, waste water treatment, pollutants.)

INTRODUCTION:

Wastewater treatment is a process of removing pollution. Lutants in wastewater for the production of treat Waste streams and sediments will be released into the environment. Reuse or reuse for agricultural operations. About 80-90%g of all wastewater generated in developing countries discharged directly into surface waters corpse. As predicted, about 2000 million gallons of domestic wastewater contain-Human and animal wastes are discharged directly into a Natural drains or open agricultural tracts. The situation is worsening day by day due to the pollution of fresh water reservoirs with municipal impact. Scale decentralized natural biological systems to restore a variety of small scale and chemical, physical and biological integrity of natural water bodies to prevent waterborne diseases, eutrophication of water body and degraded fresh water quality. Local experience and research results reported in the operation recommend the applicability of the available literature on the associated growth process for wastewater treatment. Attached growth biological systems include rotatable biological contactors, fluidized

bed biofilm reactors, membrane immobilized reactors, and high-rate plastic media filters, airlift reactors, and trickling bio filter (TBF) systems. Among them, TBF is expected to be the most effective for wastewater treatment due to its simple design, easy construction, low space and energy requirements, and low operating and maintenance costs. Furthermore, various research groups are involved in the construction and performance evaluation of modified and hybrid TBF systems such as vertical and horizontal flow trickling filters for rural wastewater.

METHEDOLOGY

- Literature Review, Research paper Study
- Visit on Site, Collection of Information
- Study Existing Method
- Visit to selected Bio-Filter plant site
- Observation and data collection
- Analysis of data collected
- To suggest suitable soil and water conservation structure
- Result and Conclusion

Site Selection:

We initially studied literature reviews and online data, and hence we selected Domestic waste water purification by Bio-filters which is situated in C3 304-B, Saudamini Complex, Bhusari Colony, Paud Road, Kothrud, Pune 411038, Pune district in the western part of Maharashtra in India.

Site Location (1): Shri. Vasantrao bagul udyan, 500km Tiger bio filter plant, Sahkar Nagar, Pune Maharashtra, 411009

Site Location (2): 1MLD- Golf club Yerwada, Pune.



Site Location: Shri.Vasantrao bagul udyan, 500km Tiger bio filter plant, Sahkar nagar, Pune.

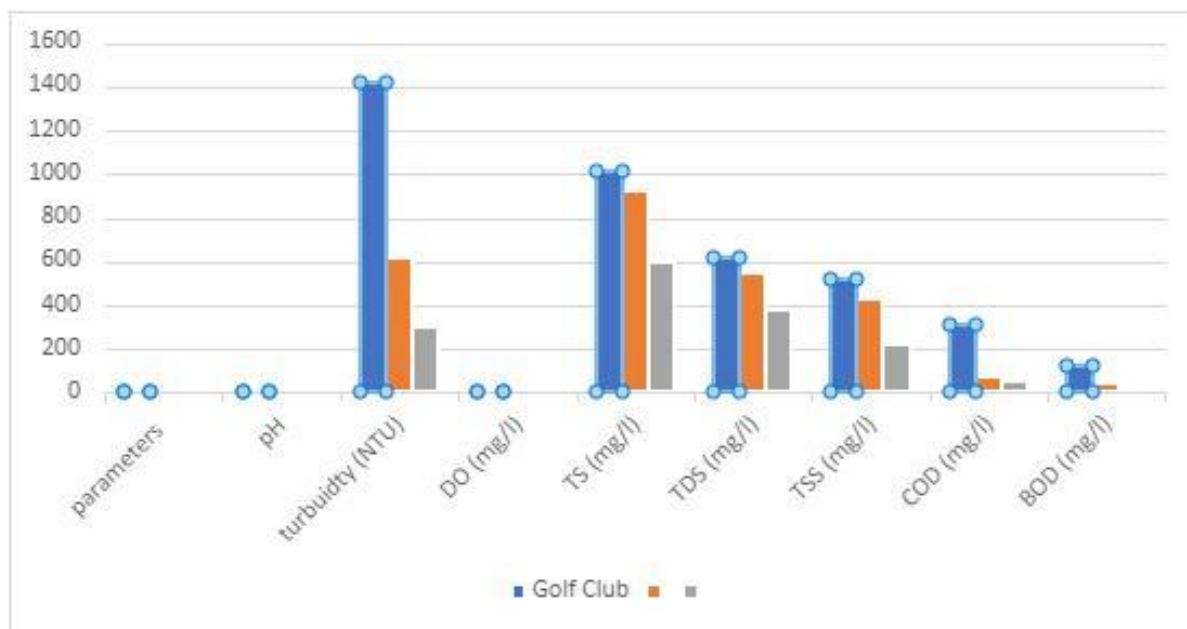
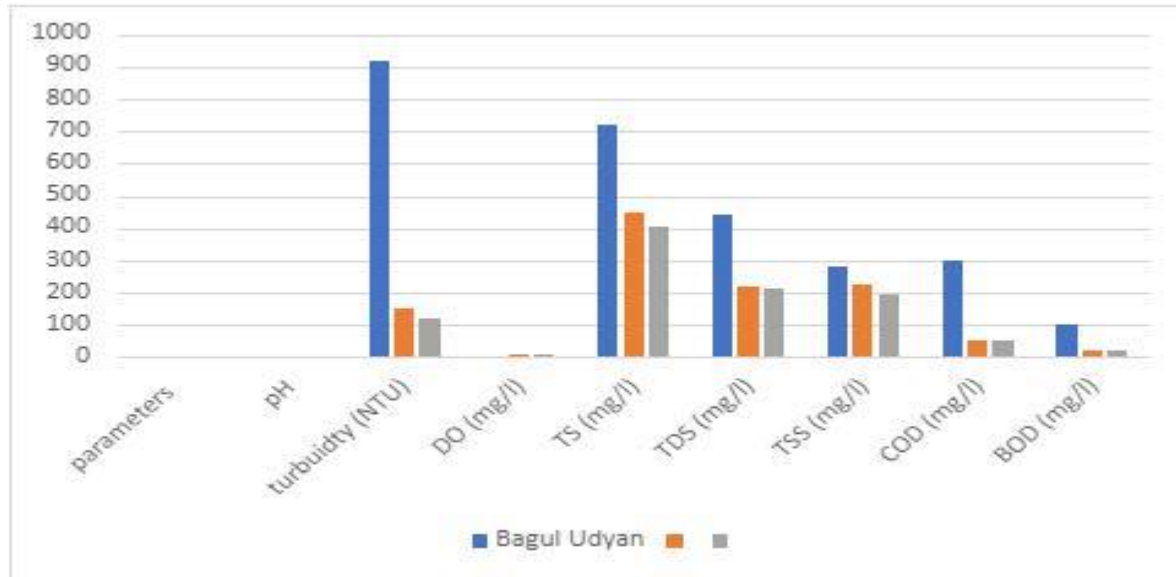
Pre-field Work:

In pre-field work we collected information regarding about our topic and from survey of India and studied previous literature data about it, in India and particularly in Maharashtra. The rapid urbanization of Indian cities has created a major of faecal sludge Management.

Field Investigation:

In preliminary survey of the selected bio-filters we studied about the selected region considering various parameters. Also, we got to know about the effluent from the Bio filter can be used for irrigation purpose and with added treatment such as a sand filter, carbon filter units.

Observation:



RESULT

Details of sample: Waste water Sample

Sample Container & Quantity: Plastic Bottle – 1000 ml

Nature: Treated (Final Bed Outlet)

Sr. no	Description of Parameters	Unit	Results	Test Method Reference
01	pH	- - -	6.98	APHA 23 rd Ed2017,4500-H ² B
02	Electrical Conductivity	ms/cm	0.564	APHA 23 rd Ed2017,2510B
03	Total Suspended Solids	mg/lit	19.00	APHA 23 rd Ed2017,2540E
04	Total Dissolved Solids	mg/lit	378.00	APHA 23 rd Ed2017,2540C
05	Chemical Oxygen Demand	mg/lit	24.00	APHA 23 rd Ed2017,5220C
06	Biochemical Oxygen Demand (27 ⁰ C for 5 days)	mg/lit	7.00	APHA 23 rd Ed2017,5210B
07	Oil & Grease	mg/lit	NIL	APHA 23 rd Ed2017,5520B
08	Fecal Coliform	Org/100 ml	42.00	APHA 23 rd Ed2017,9221G

CONCLUSION

In the present study, it was observed that, out of the various parameters studied, TSS, BOD, COD values exceeds the prescribed standard for disposal into inland surface water. Some of the parameters like total hardness, alkalinity, TKN,BOD, COD, phosphate, sulphate, sodium, chromium, Zn, Cu were found to be higher in S1 in comparison to other stations. However, parameters like pH, TSS, sulphide, K, oil and grease, Fe are higher in S2. It is suggested that, the domestic wastewater before discharged into outside should be properly diluted or treated in order to reduce its pollution effect on the environment. Since the domestic wastewater contains many essential plant nutrients, through careful study it can be utilized for agricultural purposes

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