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Natural Onsite Low Cost Domestic Wastewater Treatment for Reuse

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ABSTRACT: As we know treated wastewater is an alternative source for agriculture activities or we can also use the same for gardening purpose. Recently we can see there is increasing awareness, treatment of wastewater and its reuse. This research also helps to decrease the costing required for treatment of wastewater and also to enhance the use of natural material for treatment. Microorganisms play important role in treatment of wastewater in biological treatment. This paper intends to give an overview of microbiological activities present in wastewater. For onsite treatment of wastewater there are various alternatives present now a days this research introduces the treatment of domestic wastewater with the help of natural and conventional treatment system. Also, this study aims to treat the wastewater for secondary use. This study is carried out on concept of bio-sand filter and wetland system that are used to treat the domestic wastewater. The domestic waste water and treated wastewater were collected to check physical chemical and biological parameters were analyzed like pH, color, Temp, COD, BOD, DO, TDS, TSS, TPC, EC, MPN. This project gives an idea about low cost treatment to enhance use of environment friendly treatment of domestic wastewater.

KEYWORDS: - Microbiology, wetland, Bio-sand filter

I. INTRODUCTION

This study gives aim to provide a brief overview of various literature from the point of view of low cost and environment friendly treatment of domestic wastewater by using natural system with the combination of some conventional units for best results or output. When we see the sources of generation of wastewater, it can be classified in various combinations like residential, commercial, industrial animal waste etc. Constructed wetlands system supporting vegetation, which provide secondary treatment by physical and biological means to effluent from a primary treatment step and may also may be used for tertiary treatment. This may have mainly one purpose which is treating wastewater coming from different resources such as agricultural, domestic, petroleum, aquaculture and seafood processing wastewater. The macro biologic unit operation require small amount of energy in the form of the appropriate ambient temperature, so they can be performed in the natural conditions, cheaply, if the energy used is the free solar energy, and the collector with the smallest losses in the system is the water itself, or water surface.^[1] The CWs use microorganisms, plants and soil to treat wastewater. Microorganism is used to convert the dissolved and particulate matter into simple product.

II. LITERATURE REVIEW

Shrirang vrushali and Chatterjee Kaustav "Sewage treatment & Reuse- A step towards water conservation"[International science journal, volume-1 Issue 2 (2014)] in this paper aims for the treatment of sewage for various secondary uses. The main objective of this paper is to make a environmentally safe fluid waste stream and waste for reuse. Ranges of COD,BOD,TSS concentrations of sewage from 180-200 mg/l and 150 to 200mg/l respectively is evaluated by the experimentation .Under this paper they told the technology that developed for treatment of sewage. Treatment technology adopted for treatment that is the methodology of this study include: Filtration, Chlorination, Activated Sludge Process. So the results vary encouraging. This treatment system achieves 96.8% BOD

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92.5% COD, 95% TSS & 99% Total coliform removal respectively. They carried out lab scale study of that setup to know the efficiency of that plant with the help of parameters like BOD, COD, TSS, pH, MLSS. Also design a Dual media filter of height 90cm & width 20cm media used in that dual media filter is activated carbon. The aim of this research is to treat the sewage and put it to use for various propose they achieved 90.5% & 79.6% reduction of BOD & COD respectively in 96hr.^[17]

Dong Qing Zhang et al “Applications of constructed wetland for waste water treatment in tropical and subtropical regions (2000-2013)” [Journal of environmental sciences, pg no: 30-46,24 February 2015] The study is carried out on various kind of wetland system that are used to treat the wastewater in tropical and subtropical regions. They concluded that constructed wetland have very high efficiency to treat wastewater especially in tropical region. This research is about various types of wetland like floating treatment wetlands (FTWs), hybrid constructed wetlands, subsurface flow constructed wetlands (SSF CWs), free water surface (FWS) CWs. Also this study shows a comparison of the different types of CWs used to treat the wastewater. In this study, removal of BOD and TSS was very efficient and consistent across all types of treatment wetlands. This paper also highlights the application, practice and research of treatment under tropical and subtropical areas. Removal of COD, BOD, TSS, TN, TP, Nitrate ammonium etc can be effectively done with various types of constructed wetland as mentioned above.

Samar Kamthekar et al “Design and treatment of wastewater (Grey) for two pipe system using wetland STP” [IJESC Volume Issue no 6 DOI 10.40 10/2016.1776] The study is carried out on Mula Mutha and Pavana River flowing through the Pune city and Pimpri Chinchvad industrial are. It is observed that the river water is polluted by various parameters (like COD, BOD, DO, Phosphate etc) and exceeds MPCP limits. There are 13 treatment plant in city which are controlled by SCADA.^[6] They constructed artificial ecosystem to treat sewage which include natural and constructed wetland system to treat domestic and grey water in Pune city.

III. MATERIAL AND METHODES

In this paper the treatment technology adopted for treating domestic wastewater are as follows:

- Comparison of conventional and natural treatment system. (Costing, limitation, Efficiency, feasibility)
- Deciding the microbiological test which is to be carried on the sample.
- Collection of samples
- Model making
- Testing of sample before treatment
- Testing of water after treatment
- Analysis and correlation of results

IV. CONCLUSION

In this study we aimed to find out suitable method of removal of effluent from domestic wastewater sample. We can conclude that by studying the Biology of wastewater, we can decide the treatment required for that water. For primary we carried out literature survey and after analysis we found many microbiological tests. There are various chemicals and biological methods are available for removal of effluent from wastewater. As we know chemical methods having some limitations and slightly, they affect the water bodies and ecosystem. Biological methods are more promising than chemical methods. Also biological methods are cost effective and maintain ecosystem conditions.

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