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“Analysis and Design of Constructed Wetland for Bamani Village”

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ABSTRACT: In this paper mini model of working Constructed Wetland is prepared to show efficiency of constructed Wetland over traditional sewage treatment system for treating waste water collected from Bamani Village Odha. Physical test and Chemical Test of waste water are compared before and after in constructed wetland. Removal efficiency of metals, bacteria, hard material, phosphorus, harmful chemical components were studied in this project.

KEYWORDS: Constructed Wetland, Efficiency, waste water, removal.

I. INTRODUCTION

The Public interest in the renewal of natural ecosystem has grown steadily during the past few decades. While preservations of habitats is a key to environmental health, there is a growing awareness that restoration, creation and enhancement are essential to recover ecosystems that have been degraded or destroyed.

Constructed Wetlands are affordable and reliable Green Technologies for the treatment of various types of waste waters.

This wetland usually utilised as secondary and even as tertiary treatment alternatively constructed wetland can be used for primary treatment.

The aim of this work has been to study the feasibility of constructed wetland to treat raw waste water, since in order to be an effective disposal system in small population centers.

II. LITERATURE REVIEW

- Md Ekhlasur Rahman, Mohd Izuan Effendi Bin Halmi published paper named “Design, Operation and Optimization of Constructed Wetland for removal of pollutant” published on 11th November, 2020 at the international journal of Environment Research and Public Health.
- Pratik A. Patel and Nishith A. Dharaiya published paper “Manmade wetland for wastewater treatment with special emphasis on design criteria.” On 29, September 2013 at the Scientific Review and Chemical Communication.
- Ashutosh Kumar Choudhary, Chhaya Sharma’s “Constructed Wetland: an approach for wastewater treatment” On 26th July, 2011 at the Department of paper technology, IIT Roorkee.
- S. Juwarkar and S. M. Patnaik paper published on 17th February, 2017 named “Domestic Waste water treatment through constructed wetland in India.” At Science Direct

III. OBJECTIVE

- 1) To provide and inspire sustainable solution for the Performance and application of Constructed Wetland.
- 2) Removal of Contaminants, heavy metal removal.
- 3) Removal of Phosphorus, bacterial removal..

IV. EXPERIMENTAL WORK

A. Sample Collection:

Random sampling method is used to derive the samples of waste water from Bamani village Odha. According to this method samples are collected in glass jar to avoid chemical reactions with metals. And placed in cool and dry place. Tests were taken within 12 hours of sample collection. Following test were taken: Ph., Temperature, colour, odour, hard material, and turbidity test.

Ph. test: Take a pH paper strip and place it on a white tile. Pour a drop of the sample on the pH paper using a clean dropper. Observe the colour of the pH paper. Now compare the colour obtained on the pH paper with the different colour shades of the standard colour pH chart and note down the pH value. Ph. of sample is 5.3

Temperature:

Measure the water temperature by submerging the thermometer two-thirds below the surface of the water. Take the measurement in a central flowing location. Let the thermometer adjust to the water temperature for at least 1 minute before removing the thermometer from the water and quickly. Temperature of the sample is 93f

Colour test: Colour test can be done by eyes. Colour of the sample is partially turbid.

Odour Test: above sample had foul odour.

Hard material: metal, physical substances, other material detected in sample.

Turbidity test: Turbidity of water regularly demonstrates the presence of suspended solids like earth material, silt, clay, organic matter green growth, and different microorganisms. Test was taken with the help of Nephelometric Turbidity test. A Standard formazine solution of N.T.U is placed on turbidimeter in the path of rays and scale is brought 9 N.T.U.

The Water sample is taken in a test and is placed in turbidimeter.

Use a Cell rise if the turbidity is more than 100 N.T.U and get the turbidity dilution factor.

The turbidity of sample is 41.2 N.T.U.

B. Mini Model preparation:

Mini model of size of working table is made to demonstrate working of constructed Wetland. Plants found in local area are used. Such as, these include wetland plants, mosquito repellents and ornamental plants like cattails, bulrush, citronella, canna, hibiscus, fountain grass, flowering herbs, tulsi and ashwagandha. The plants absorb the high levels of phosphorus and nitrogen in the sewage water entering the lake.



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