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RECYCLING OF GREY WATER INTO USABLE WATER BY USING NATURAL MATERIALS

Gaurav Santosh Patil, Divya Nitin Patil, Sneha Hemkant Rane, Shubham Vijay Satelkar

(Bachelor of Engineering Department of Civil Engineering Mumbai University/Viva Institute of Technology Mumbai-401305)

Abstract *: Recycling of Grey water generated from different industries by using the natural filter materials and making the water reusable for sanitary and irrigation purposes. The aim is to reduce the costly recyclable process of grey water to its minimum cost, hence making it suitable for village and low-income areas when such water can be treated at place with less cost and by achieving almost same quality of water. In view of rising concern about pollution of water bodies due to discharge of waste in them, it is necessary to initiate alternative thinking as conventional methods through Sewage treatment Plants have had limited success. In Rural areas we have some natural materials which can purify the water if used properly. In recent years many techniques by using such natural filters for purifying Grey water had came up. It treats the wastewater in natural manner without the use of chemicals. In short, the method used for this project is the improved method of using natural materials for recycling Grey water and obtaining best quality of recycled Grey water. The main objective of present research work is to provide and popularize a simple, feasible, practically sound, ecofriendly and cost-effective technology for wastewater treatment. In this filter the filtration is done by gravitational force. By using such Techniques, the load on the sewage impact will be reduced and will be converted into useable water for sanitary, gardening and irrigation purposes.*

Keywords: *Grey water, Agricultural waste, low-cost filtration, ecofriendly, natural materials for filtration.*

I. INTRODUCTION

The planet Earth is a watery place. But only 3% of total water available on the planet is fresh water and of that, only about 1.2% can be used for drinking purpose. Such a problem of water scarcity brings us to the solution of recycling and reusing the grey water which can be mainly useful for agriculture and also for other uses where fresh water is required. In todays date, for recycling and reusing the grey water there are many methods and modern techniques are used which are little costly. Recycling the grey water by using agricultural waste can be more economical and also such process can be carried out in small scale too. Individual grey water treatment through physical, chemical or biological method is often very costly and results in a large amount of sludge. It has been reported that about 80% of the water supply used by the society returns as domestic grey water in the sewer system. In most cases, huge amount of diverse nature of effluents released from varied industries are disposed in open environment causing pollution of soil and water resources. Individual grey water treatment through physical, chemical or biological method is often very costly. Even though numerous solutions were adopted for the treatment of grey water but among all the technologies it has been found that using natural materials is more effective technique. Using such materials, we get a low cost, odorless and non-laborious intensive method of grey water treatment and do not occupy large area for the treatment facility to set up. Nationally there are many filters used for filtration of Grey water but, majority of them uses chemicals which are not good for quality of recycled water and other filters are costly which cannot be afforded by small villages or low revenue areas. In such case, natural filters are used for recycling the grey water generated within the area and using it for gardening, irrigation and for sanitary purposes.

II. METHODOLOGY

The process of methodology is carried out in the following stages:

Stage – 1: Site selection and Collection of Grey water

We selected the site at Palghar, the name of the area is Genesis. Over here we have collected the grey water which comes out ofsome industries and also from domestic sources altogether. The grey water is collected from the outlet pipe of the industries. We collected around 2 liters of grey water and the image for the sample of water is given below.

Stage – 2: Test on Grey water

Initially the grey water is collected from the industrial and domestic outlet and stored in the sedimentation/storage tank where sedimentation of suspended solids takes place. The filtration process begins here and the method which is followed is aeration method. For aeration to be done we use fish tank motor. The filters are connected using pvc pipe. The collected grey water characteristics is first tested for pH, Hardness, Turbidity, BOD, COD, TDS, TSS, Chlorine, Nitrate, Ammonia.

Stage – 3: Filtering the Grey water

The grey water is then allowed to flow through all the listed filters like tamarind seed powder, charcoal, drumstick seed powder and fine sand. The recycled grey water is then again tested for its characteristics and then compared to that of standard water used for irrigation and gardening. The materials used for the filtration process are collected as a agricultural waste from the fields and the sand is collected from the river side.

Stage – 4: Calculating the Efficiency of filter

The volumetric efficiency of the filter will also be analyzed based on the water obtained after the treatment process. The calculation of volumetric efficiency is to be necessarily calculated for getting the output volume percentage when compared to the input volume.

The volumetric efficiency of the filter is calculated by:

Step 1: Amount of sewage water taken = A, Amount of treated water obtained = B

Step 2: Efficiency of the filter = B/A 100%

III. TABLE

Table: Results of test on Grey water sample

Sr. No.	Tests	Results	Unit
1	pH	7.8	..
2	TDS	283.0	mg/l
3	COD	228.74	mg/l
4	BOD	90.1	mg/l
5	Nitrate	0.35	mg/l
6	Ammonia	0.2	mg/l
7	TSS	30.0	mg/l
8	Hardness	60	mg/l
9	Chlorine	105.0	mg/l

IV. CONCLUSION

- Such type of filters can reduce the cost of recycling of grey water to a great extent by providing the same quality of water.
- Due to the less finance required for running and maintaining the filter, it can be used in rural areas where less finance is available for recycling of grey water.
- As the filter uses the natural waste materials for its functioning, therefore those materials are used again and the wastage of agricultural products is minimized.
- The transportation cost of fresh water from cities to the rural areas can be reduced by using such filters in the rural areas.
- The agricultural waste of tamarind seeds and rice husk is reused as the filter for the filtration process and thus helped in reducing the waste of seeds and husk.
- Due to its environment friendly process, it causes no pollution to the nature and it makes the filter an eco-friendly filter.
- Such Grey water recycling technique achieves standards for water treatment with low cost, low maintenance, noise-free, no electricity, no chemicals for pH adjustment.

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