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Efficient Strategies for Gray Water Reuse in Construction: Economical Approaches

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ABSTRACT

Water is one of the most abundant resources. India is suffering from the worst water crisis in its history and around 700 million people face problem of water shortage, approximately 200000 people die every year due to inadequate access to clear water .As due to increase in population , water demand has also increase which has led to the idea of using grey water as a source of water .Grey water is a waste water generated from household, office buildings and streams .This includes water from kitchen, showers, sinks etc. the best alternative and cost effective process in rural areas is the reuse of grey water. With the help of proper treatment grey water can be put to good use. By applying proper and economical treatment grey water can be reused for other purposes. As there are some low-cost technologies which will help to treat the grey water. Discharge of household greywater into water bodies can lead to an increase in contamination levels in terms of the reduction in dissolved oxygen resources and rapid bacterial growth. Therefore, the quality of greywater has to be improved before the disposal process

Keywords: Greywater, Economical, Household, Water, (Water from Bathroom, Kitchen, etc.)

I. INTRODUCTION

Water shortage problems have become one of the most urgent problems of the 21st century. Some researchers have suggested that water shortage will become more serious than oil shortage in the future. Significant 50–80% of the household wastewater can be classified as greywater. Biological treatment techniques are highly efficient compared to physical and chemical. On-site greywater reuse is highly advantageous and can positively impact the environment. Policymakers & governmental agencies of water scarcity regions should promote such systems. Current building standards & codes underutilizing the benefit of those systems. Wastewater can also refer to groundwater that is contaminated due to a leaking septic tank or agents such as insecticide, petroleum products.

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Blood, or cleaning liquids. Often, contaminated water can also be run through the municipal filtration system and be prepared for use once again. However, the nature of the contaminants may require additional measures before the water is suitable for use once more. Along with the use of chemicals to treat wastewater, the uses of environmentally friendly methods are sometimes employed. The building sectors are remarkably the largest consumers of fresh water in the world; thus, the reclamation and reuse of greywater for non-potable purposes helps to reduce a significant amount of water consumed within a building Grey water contains chemical contaminants, physical contaminants and microorganisms. Grey water may contain chemicals from soap, dyes, and bleaches. It may also contain bacteria, viruses, protozoa. So, it is very important to treat grey water by using low-cost technologies. Wastewater originating from households is divided into greywater and black water, based on its composition. Greywater is wastewater discharged from showers, bathtubs, washing machines and kitchen sinks, while black water is toilet wastewater. The advantage of recycling grey water is that it is a plentiful water source with a low pathogen and organic content. To il- lustrate, grey water represents 50–70% of total consumed water but contains only 30% of the organic fraction and 9–20% of the nutrients, thereby making it a good source for water reuse.

A. Objective Of The Work

- To study about the waste greywater sources.
- To prepare a proposal of a treatment unit which can clean water.
- To Provide clean and reusable water for flushing, garages, and gardens etc.by Economical technique.

B. Importance of quality management in Construction Industry

The importance of properly established and managed quality control and quality assurance systems and other quality documents for the achievement of company business objectives cannot be ignored. Identifying potential critical factors that affect the quality performance of small-scale contractors before the commencement of projects will ensure client satisfaction at the completion of project. The aim of quality management is to do things at first time, eliminating waste and rework. To achieve this, it is necessary focus on "processes". A process is a task or a series of tasks. A process might be the vibration of fresh concrete, the preparation of drawing, or the way in which the quality manager acts with a client and with other members of construction projects.

C. Discussion

- pH is within the as per MPCB limit.
- The number of total solids was high before treating but after treatment value is within limit.
- The value BOD3 was also more than limits before treating but after treatment value is within the limit.
- The value of COD was also more than limits before treating but after treatment value is within the limit.
- The value of Dissolved Oxygen is less than required limit hence this water if disposed in water bodies will be harmful for aquatic organisms.
- Therefore, this treated water can be used for cleaning, washing, flushing, and gardening
- Hence the plants used in Phytocide bed worked effectively and had less maintenance.

II. METHODOLOGY

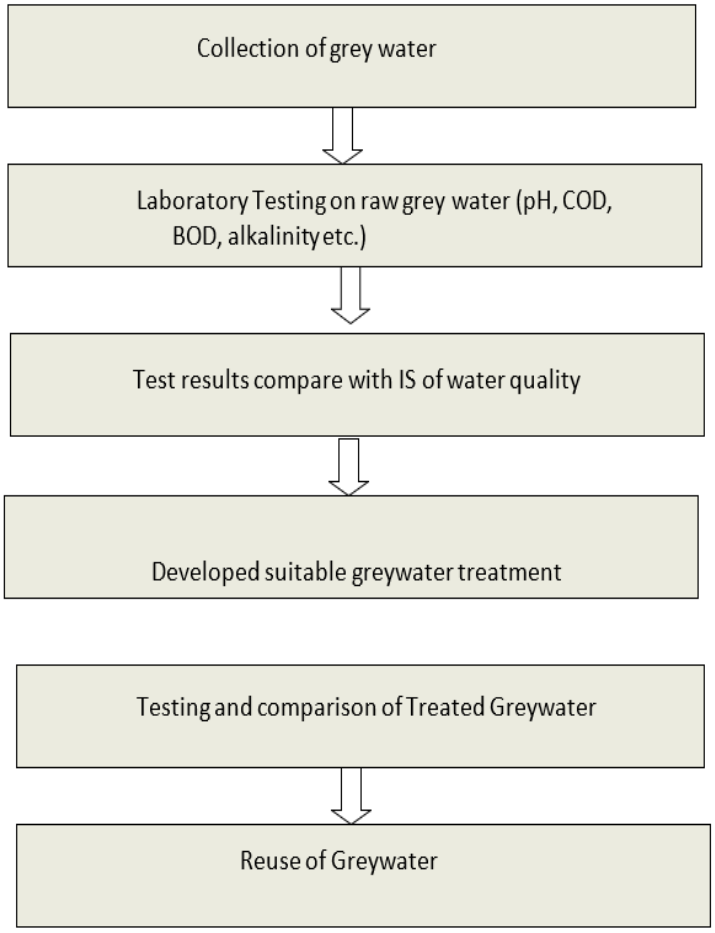

Figure1:Methodology

III.EXPERIMENTAL RESULTS

TABLE I EXPERIMENTAL RESULTS OF WATER

Parameters	Sample1		Sample2		Sample3	
	RawGreyWater	TreatedWater	RawGreyWater	TreatedWater	RawGrey Water	TreatedWater
pH	8.4	7.06	8.54	8.02	9.03	7.09
Hardness(mg/L)	248	205	267	170	371	110
TDS(mg/L)	420	340	440	329	460	390
TSS(mg/L)	159	95	182	88	198	82
Chloride(mg/L)	41	31	48	28	66	25
Turbidity NTU)	45	4.9	58	3.8	85	3.2

DO(mg/L)	2.2	8	2.5	10	2.7	12
BOD(mg/L)	112	65	123	42	138.82	147.79
COD(mg/L)	303	110	322	145	339	158

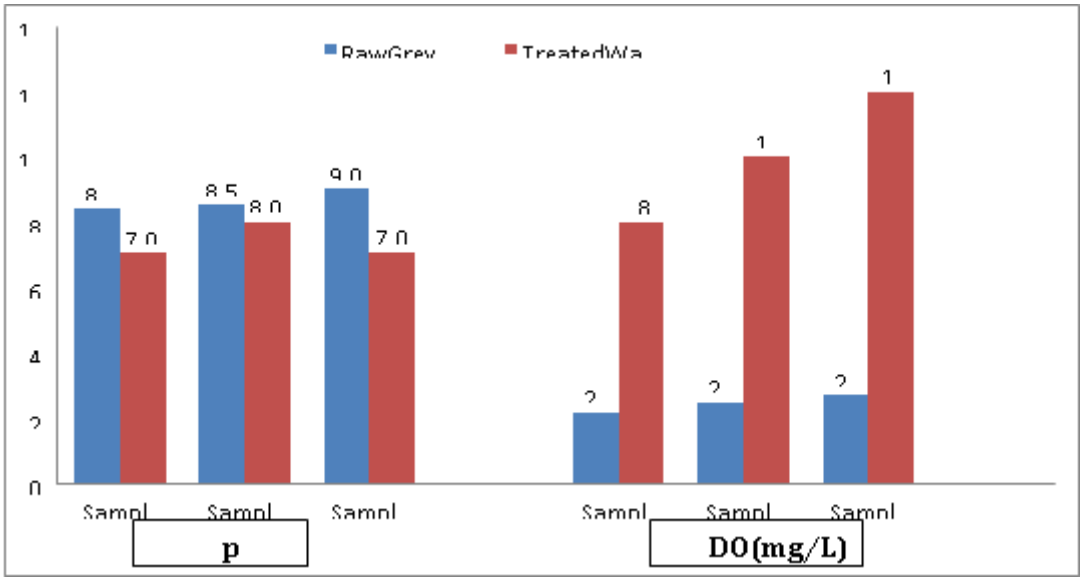

Figure2:Graphical representation of PH & DO

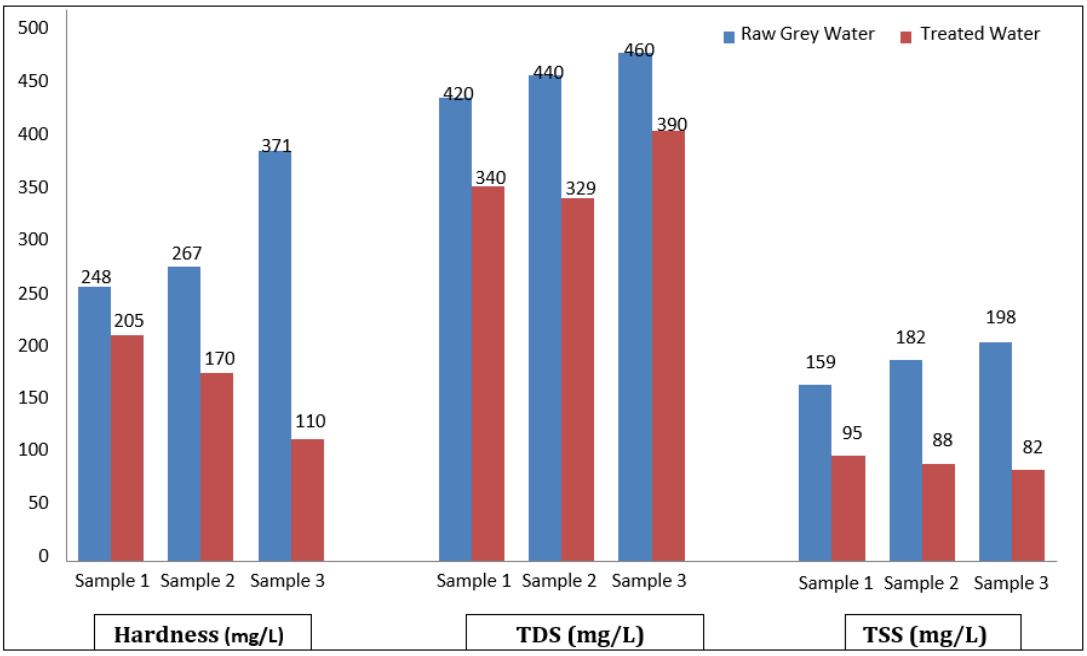

Figure3:Graphical representation of Hardness, TDS & TSS

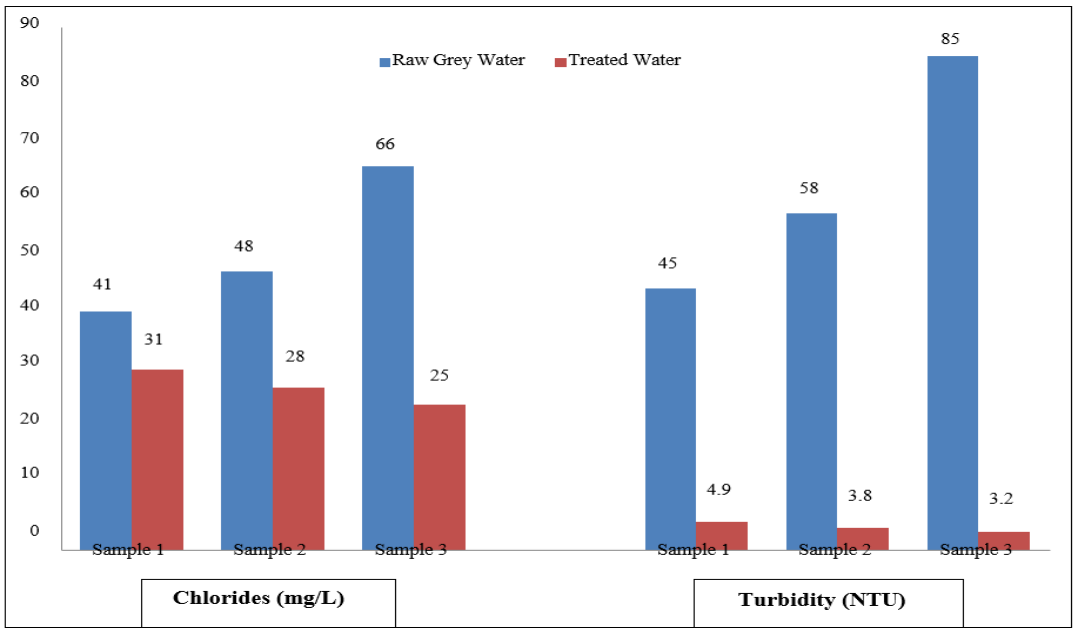

Figure4:Graphical representation of Chlorides & Turbidity

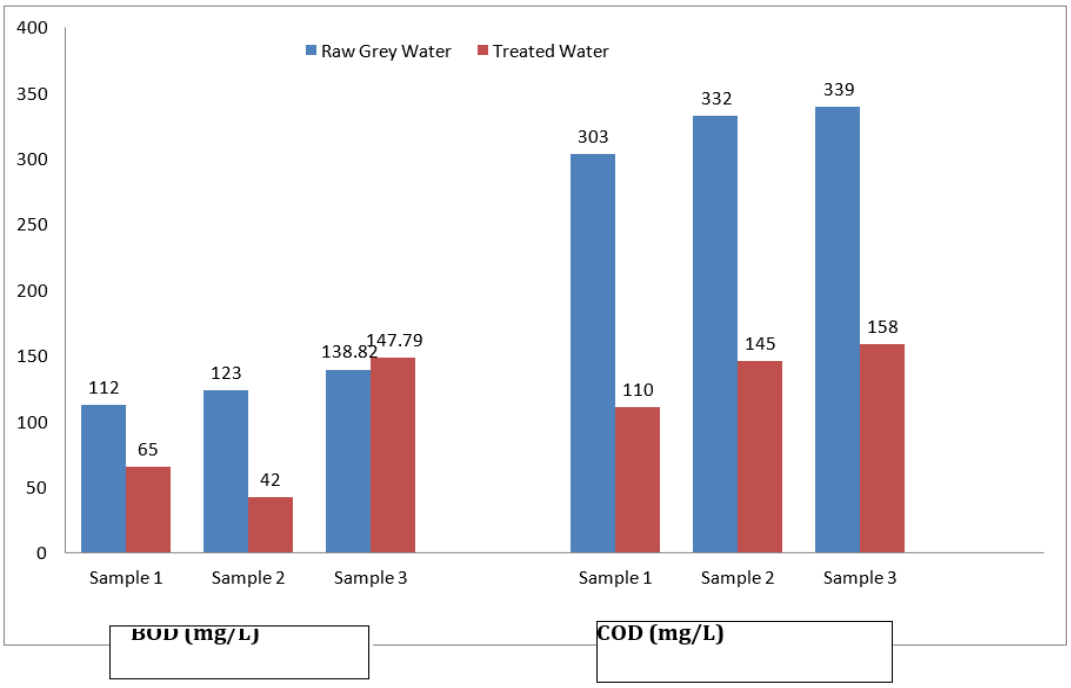

Figure5: Graphical representation of BOD& COD

IV. CONCLUSION

This study demonstrated that the designed sub-surface horizontal flow constructed wetland system could be used for treatment of the society waste water. A constructed wetland system can be an effective treatment facility for campus waste water.

Regarding the performance achieved, the sub-surface horizontal flow constructed wetland was able to reduce further the level of the main physicochemical pollution parameters. The plants do play an important role in the treatment.

The treatment level was affected by not only by the change of seasons, but also by the variation in influent quality and quantity.

The overall experimental results demonstrated the feasibility of applying sub- surface horizontal flow constructed wetland unit to treat Society waste waters. Thus, the root zone treatment can be utilized independently or as an addition to conventional treatment for complete treatment of waste water.

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