

# Domestic Wastewater Treatment By using Natural Filter Media

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## ABSTRACT

Wastewater is liquid waste discharged by domestic residential buildings, commercial buildings, industrial buildings, agriculture, which often contains some parameters that result from the mixing of wastewater from different sources. Wastewater obtained from various sources we need to be treated it very effectively in order to create a hygienic environment. If proper arrangements for collection, treatment and disposal of all the waste produce from city or town are not made, they will go on accumulating and create a foul condition that the safety of the structures such that building, roads will be danger. Domestic Waste water is an immense resource that could find significant applications in regions of water scarcity. support the economy so new treatment & technology are needed to be discovered for the treatment of domestic waste water. Therefore in the interest of the community of the town or city it is most essential to collect, treat and dispose of all the wastewater of the city in such a way that it may not cause harm to the people residing in the town. The extent and the type of treatment required, however depends on the character and quality of both sewage and sources of disposal available.

**Keyword :** - Domestic wastewater, treatment, Bio filtration

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## I. INTRODUCTION

The reuse of domestic water in certain countries will solve many problems related to wastewater, and it will lead to the saving of financial resources which in turn helps to support the economy so new treatment & technology are needed to be discovered for the treatment of domestic waste water. Therefore in the interest of the community of the town or city it is most essential to collect, treat and dispose of all the wastewater of the city in such a way that it may not cause harm to the people residing in the town. The extent and the type of treatment required, however depends on the character and quality of both sewage and sources of disposal available. The sewage after treatment may be disposed either into a

water body such as lakes, streams, river, estuary and ocean or into land. It may be used for several purposes such as conservation, industrial use or reclaimed sewage effluent in cooling systems, boiler feed, process water, reuse in agriculture, horticulture, sericulture, watering of lawns.

## 1.2 Objective

The principal aim of wastewater treatment is generally to allow human and industrial parameters to be disposed without danger to human health or unacceptable damage to the natural environment. To find the economical way to treat domestic wastewater and to solve the problem of water.

## 1.3 Problem Definition

**Problems concerning water sanitation** stem from the rise in urban migration and the practice of discharging untreated wastewater. The uncontrolled growth in urban areas has made planning and expansion of water and sewage systems very difficult and expensive to carry out.

## II. LITERATURE SURVEY AND PROJECT OVERVIEW

### 2.1 Literature Survey

Wastewater is any water that has been adversely affected in quality by anthropogenic influence. It comprises liquid waste discharged by domestic residences, commercial properties, industry, and/or agriculture and can encompass a wide range of potential contaminants and concentrations. In the most common usage, it refers to the municipal wastewater that contains a broad spectrum of contaminants resulting from the mixing of wastewaters from different sources. Wastewater also known as sewage originates from residential commercial and industrial area. Wastewater engineering is that branch of environmental engineering in which the basic principles of science and engineering are applied to solving the issues associated with the treatment and reuse of wastewater. The ultimate goal of wastewater engineering is the protection of public health in a manner commensurate with environmental, economic, social, and political concerns. When untreated wastewater accumulates and is allowed to go septic, the decomposition of the organic matter it contains will lead to nuisance conditions including the production of malodorous gases. In addition, untreated wastewater contains numerous pathogenic microorganisms that dwell in the human intestinal tract. Wastewater also contains nutrients, which can stimulate the growth of aquatic plants, and may contain toxic compounds or compounds that potentially may be mutagenic or carcinogenic. reasons, the immediate and nuisance-free removal of wastewater from its sources of generation, followed by treatment, reuse, or dispersal into the environment is necessary to protect public health and the environment

## III. METHODOLOGY

The analysis of physical-chemical product started with sample collection. Before a sampling program is taken, a detailed sampling arrangement must be developed and as a minimum the following item must be specified.

1) Sampling of plan 2) Sample of labeling 3) Sample storage 4) Sample testing

The Sample are collected from residence in the closed lid plastic bottle at three different time in weekly and store in Environmental Engineering lab refrigerator . the water sample are subjected to analysis within 24hr of collection for the physical-chemical parameters like color, odor, pH, BOD, COD, DO, TDS, TSS, chloride, hardness, acidity, alkalinity, fluoride etc.

### 3.1 Material Used

The Model is Made up of Glass tank, Filter media made up of 6 layers which are porous cloth, cotton, Natural sand, washed coal , coarse aggregate, etc.

### 3.2 Experimental Set Up

In this study, a laboratory-scale experimental set-up was used. The set-up is made with glass materials of thickness 30mm and the length, breadth and depth 30 are cm, 30cm and 36cm respectively.



**Fig- BIO- FILTER**



**Fig – Wastewater Sample**

### 3.3 Bio filtration

Filtration is one of the most important treatment processes used in water and wastewater treatment. In water treatment, it is used to purify the surface water for potable use whereas in wastewater treatment, the main purpose of filtration is to produce effluent of high quality so that it can be reused for various purposes. Any type of filter with attached biomass on the filter-media can be defined as a bio filter. It can be the trickling filter in the wastewater treatment plant, or horizontal rock filter in a polluted stream, or granular activated carbon (GAC) or sand filter in water treatment plant. Bio filter has been successfully used for air, water, and wastewater treatment. It was first introduced in England in 1893 as a trickling filter in wastewater treatment [Metcalf and Eddy, 1991], and since then, it has been successfully used for the treatment of domestic and industrial wastewater. Originally, bio filter was developed using rock or slag as filter media, however at present, several types and shapes of plastic media are also used. There are a number of small package treatment plants with different brand names currently available in the market in which different shaped plastic materials are packed as filter media and are mainly used for treating small amount of wastewater (e.g. from household or hotel

## IV. RESULT AND CONCLUSION

Parameters	Before filtration	After filtration
<b>PH</b>	8.3	7.9
<b>Odor</b>	Non- offensive	Non-offensive
<b>Color</b>	Gray	Light
<b>DO</b>	15.07	9.16
<b>BOD</b>	41.86	37.4
<b>COD</b>	5112	137.8
<b>Alkalinity</b>	312	240

<b>Hardness</b>	195.5	113.3
<b>Acidity</b>	315	45.3
<b>Chlorides</b>	88.91	59.27
<b>Fluorides</b>	0.447	0.235
<b>TDS</b>	161.16	145.6
<b>TSS</b>	200.16	157.4



**Chart-1: KITCHEN WASTE**

Parameters	Before Filtration	After Filtration
<b>PH</b>	8.0	7.4
<b>Odor</b>	Non- Offensive	Non- Offensive
<b>Color</b>	Light	Light
<b>DO</b>	15.07	2.26
<b>BOD</b>	6.206	2.26
<b>COD</b>	836	285
<b>Alkalinity</b>	280	168
<b>Hardness</b>	173	542
<b>Acidity</b>	0	0
<b>Chlorides</b>	88.91	59.27
<b>Fluorides</b>	0.132	0.111
<b>TDS</b>	154.2	132.8
<b>TSS</b>	148.3	112.4

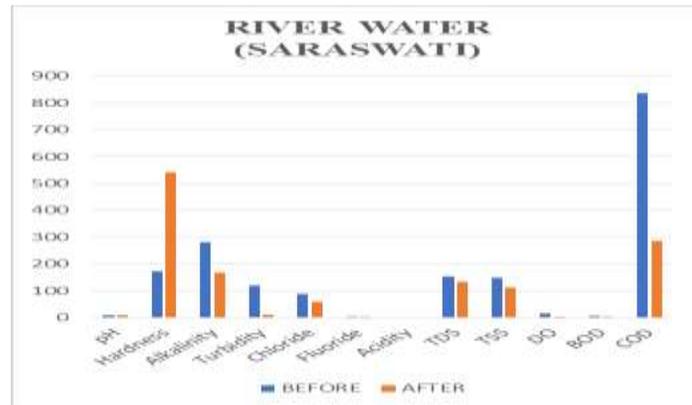


Chart-2: RIVER WATER

#### 4.1 Advantages

1. Waste Reduction. Through the treatment of wastewater, the amount of waste that is usually released into the environment is reduced thus improving environment health.
2. Energy Production.
3. Fertilizer Production
4. The wastewater treatment process does not only produce clean reusable water, but also has the potential to produce various other benefits. It has the potential to reduce a country's waste production, to produce energy through methane harvesting, and the potential to produce natural fertilizer from the waste collected through the process.

#### 4.2 Applications

1. Providing Economical Filter media
2. Re-Use & Recycle Of Wastewater
3. A Way to Minimize Waste
4. Treating of wastewater Blocked Harmful Diseases

#### 4.3 Conclusion

This project will help to understand a new approach of an environmentally friendly filtration technique which can be used commonly in the household. Overall performance of the filter was satisfactory since the quality of domestic wastewater after filtration was improved considerably. This water now can be used as washing, toilet flushing, gardening purposes. The reuse of wastewater in certain countries will solve many problems related to water scarcity, and will lead to the saving of financial resources which in turn helps to support the economy.

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