

# Purification of Drainage Water for Farming Situated Near Railway Tracks

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**Abstract:** - This examination manages the horticultural practices that are conveyed other than the rail tracks around there. A cautious and nitty gritty examination has been done on the different boundaries. The boundaries that taken under perception for water test were pH, hardness, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Turbidity and Total Solids and Dissolve Oxygen (DO) etc. After the examining the waste-water it is inferred that water contains unfortunate contaminations and it is inadmissible for water system. In light of the nearby condition diverse channel Medias were utilized to eliminate pollutions from water which incorporates sifter, charcoal channel, sand channel and fiber channel. Sifter is utilized for eliminate huge size particles. Initiated carbon channel (Charcoal) is utilized for eliminate compound harmful debasements. Two kinds of charcoal channel are utilized for example Pre actuated and Post activated charcoal channel. Fine suspended molecule is eliminated by sand channel of total size 3-15mm. For eliminating residue and earth Fiber Filter is utilized.

**Key Words:** — *Railway Track, Vegetables, Testing and Analysis.*

## I. INTRODUCTION

India is an agrarian country. Practically 72% of the absolute populace relies upon farming as their methods for live-hood. The vast majority of the yields and different vegetables are developed and developed in various pieces of India and a large portion of them being traded to various pieces of the world [6]. Wastewater reuse in horticulture includes the further utilization of "treated" wastewater for crop water system. This sort of reuse is viewed as a productive instrument for overseeing water assets, coming from the requirement for a directed stock that makes up for water deficiencies brought about via irregularity or the unpredictable accessibility of other water hotspots for crop water system all through the hydrological year [5]. With the rising populace lately, numerous nations overall fight with the issue of waste administration, particularly the proficient treatment of waste water just as its removal. This has led to different types of contamination [2]. Assets are constantly restricted. Also, in a creating and profoundly crowded nation like India, assets are considerably more difficult to find [4].

Enacted carbon has been utilized as water separating vehicle for cleaning of drinking water for a long time.

It is broadly utilized for the evacuation impurities in water because of their high limit with regards to adsorption of such compound, emerging from their huge surface region and porosity [3]. Initiated charcoal alludes to a type of handled carbon with high porosity and an enormous surface region for adsorption. It can adequately decrease certain natural and inorganic mixtures like miniature contaminations, lead, chlorine, fluorine, broken up radon, disintegrated oxygen, shading, innocuous taste and scent causing compounds, which may not be taken out in sluggish sand filtration [2]. Initiated carbons have fluctuated surface attributes and pore sizes circulation, this trait of actuated carbon assume significant part in adsorption of impurities in water [3].

Vegetables are rich wellsprings of nutrients, minerals, and filaments, and furthermore have valuable enemy of oxidative impacts. Be that as it may, admission of weighty metal-debased vegetables may represent a danger to the human wellbeing. Hefty metal tainting of the food things is quite possibly the main parts of food quality affirmation [6]. Metropolitan Agriculture is one of the arrangements that are seen universally to fulfil the need of food of metropolitan populace. There are

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various routes through which metropolitan farming can, on a basic level, affect metropolitan food security [4].

## II. OBJECTIVES

Present look at entails the usage of drainage water for cultivation of leafy vegetables near the railway song. Accordingly, the targets of supposed project are as observe: -

- To analyses the drainage water properties. (Which includes heavy steel, physical homes i.e. colour, turbidity, taste and odour, temperature and chemical homes i.e. pH, BOD, COD, and hardness).
- To signify filtration procedure to remove impurities present in wastewater.
- To use without difficulty to be had and price-efficient filter media.
- To layout a drainage water filtered out for irrigation motive. To enhance first-rate of wastewater.
- To make wastewater usable for other purpose.
- Prevention of water high-quality of herbal water sources.
- Enhancing the exceptional of surface water with the aid of preventing the release of raw, un-purified sewage in lakes, rivers, seas, and so on.

## III. MATERIAL AND METHODS

The take a look at become performed along near Koparkhairne Railway Station, Navi Mumbai.

The technique of the layout is starting from deciding on the materials, design the filter, testing the clear out and the water nice and ultimately gain the end result. The tracking turned into carried out at Koparkhairne Railway Station. Sample series is a crucial a part of the wastewater tracking application. The water samples were collected in plastic bottles. The water samples were taken in a 500 ml bottle.

The transportable water filtered out layout consists 3 components; the filter medium, the storing of water and the release to plant or greens.

### *Filter Media:*

Inside the wastewater there are numerous impurities were gift; like heavy steel, sand debris, turbidity and chemical were found.

*Strainer* uses a perforated plate or screen mesh to take away larger particles from a technique move.

*Activated carbon filter* is commonplace used to adsorb herbal natural compounds, taste and smell compounds, and artificial natural chemical substances found in water. Activated carbon may be powerful in lowering hundreds of substances which includes contaminants and different chemical substances from the faucet water. While the water flows thru lively carbon filters the chemicals stick to the carbon resulting in purer water output.

Another filter out procedure were used for filtration is *slow sand filter* process. Sand is one of the oldest and maximum usually used methods of filtration. Sand Filters put off particulate remember, impurities that are not dissolved. The variety of water filter gravel and aid pebble are spherical in form and allow even distribution in guide beds and top flow. Sand and Gravel filter eliminates micro-organism and other small debris from water the use of easy and expressible era. The sand is a physical medium to dispose of particles and huge organisms.

*Sediment filter* clear out are used to dispose of suspended solids; along with sediment, turbidity or particulate. A sediment filter clear out basically capabilities like an internet that catches undesirable dust particles as your water flows via the system. Herbal fibres like cotton that may produce surprisingly green media for filtration however in terms of toughness it's far constrained for use in comparison with synthetic fibres. The material clear out is a fee effective and appropriate approach for lowering contamination of ingesting water. It is easy to maintain and can be used anywhere.

*Aeration* is the technique of bringing water and air into close touch that allows you to get rid of dissolved gases, which include carbon dioxide, and to oxidize dissolved metals together with iron. It can also be used to get rid of risky natural chemical compounds (VOC) within the water. Aeration is often the first most important technique on the treatment plant.

## IV. EXPERIMENTAL PROCESS OF SEWAGE WATER TREATMENT PLANT

Sewage collection and treatment within the United State is usually challenge to nearby, country and federal policies and standards.

Treating wastewater has the intention to provide an effluent with a purpose to do as little damage as possible when discharged to the encircling surroundings, thereby stopping pollutants as compared to liberating untreated wastewater into the environment.

Sewage treatment generally includes 3 degrees, called primary, secondary and tertiary treatment.

#### A. Primary Treatment

Primary treatment includes temporarily retaining the sewage in a quiescent basin wherein heavy solids can settle to the bottom at the same time as oil, grease and lighter solids waft to the surface. The settled and floating materials are eliminated and the remaining liquid can be discharged or subjected to secondary treatment. Some sewage treatment flora which might be related to a mixed sewer machine have a pass association after the primary treatment unit. Because of this throughout very heavy rainfall occasions, the secondary and tertiary treatment systems can be bypassed to guard them from hydraulic overloading, and the aggregate of sewage and storm water simplest receives primary treatment.

#### B. Secondary Treatment

Secondary treatment removes dissolved and suspended biological be counted. Secondary treatment is normally carried out by indigenous, water-borne micro-organisms in a controlled habitat. Secondary treatment may additionally require a separation process to put off the micro-organisms from the treated water previous to discharge or tertiary treatment.

#### C. Tertiary Treatment

Tertiary treatment is occasionally defined as whatever more than primary and secondary treatment so one can permit ejection right into a pretty sensitive or fragile environment (estuaries, low-float Rivers, coral reefs...). Dealt with water is once in a while disinfected chemically or physically (for instance, by way of lagoons and microfiltration) previous to discharge right into a flow, river, bay, lagoon or wetland, or it can be used for the irrigation of a golf route, greenway or park. If it is satisfactorily smooth, it may also be used for groundwater recharge or agricultural purposes.

## V. RESULTS AND DISCUSSION

The water quality from the channel must be resolved to demonstrate that it is working in a tough climate. There are a few tests that have been led. Among the tests are Chemical Test (pH, COD, BOD, Hardness and DO) and Physical Test (Colour, Turbidity, Odour and Taste, Temperature).

The time span "pH" alludes back to the element of hydrogen particle leisure activity in the appropriate response. Assurance of pH assumes a significant part inside the wastewater cure way. The normal pH cost of soil for plant increment is 5.5 - 8

and water pH esteem is 6.5-8.5. Wastewater treatment vegetation use BOD expense as a file to inspect the general recognition of regular contamination in a water supply. A BOD investigates is commonly done over a boundless five-days hatching length at 20°C (68°F) for the most right outcomes. The COD investigate shows the amount of organics in the water. The COD is estimated through deciding the oxygen ate up in corrupting the regular matter (Biodegradable or Non-biodegradable). It is miles settled through estimating the disintegrated oxygen utilized at some stage in the substance oxidation of natural matter in three hours. For land water system the normal cost of COD is significantly less than 250 mg/L. Hardness in water is a direct result of the presence of disintegrated salt of calcium and magnesium. It isn't commendable for ingesting, washing, washing and it also scales in boilers. Hardness of water is dictated by utilizing titrating with a favored arrangement of ethylene diamine tetra acidic corrosive (EDTA) which is a complexing specialist. Wastewater that has DO is known as high-impact or clean. The solvency of oxygen in shimmering water levels from 14.6 mg/L at 0°C to around 07 mg/L at 35°C at 1.0 ATM pressure.

Turbidity is the darkness or cloudiness of a liquid because of man or lady trash (suspended solids) which are normally undetectable to the uncovered eye. The estimation of turbidity is a key investigate water good. Liquids can involve suspended stable be tallied which incorporate particles of numerous unmistakable sizes. WHO sets up that the turbidity of devouring water shouldn't be extra than 5 NTU (Nephelometric Turbidity devices), and should in a perfect world be under 1 NTU. Tinge in water might be coming about because of the presence of minerals like iron and manganese or via materials of vegetable beginning comprehensive of green growth and weeds. Shading tests show the adequacy of the water treatment contraption. Clean waste water is gentle grey colour. With time the water changes in darkish colour. After more prominent time it is were given in dark tone (septic). Some time it benefits the purple tone because of green growth or because of modern tones. Scent and taste are related with the presence of dwelling infinitesimal creatures, or rotting characteristic be checked alongside weeds, green growth, or business waters containing smelling salts, phenols, incandescent light, hydrocarbons. Indeed, even as chlorination weakens scent and taste coming about because of a couple of impurities. Temperature of wastewater fluctuates incredibly, depending upon such a tasks being led at your establishment. Temperature of sewage the sewage is marginally more prominent than that of water, because of the presence of business sewage. The temperature alterations while sewage

becomes septic due to synthetic strategy. The lower temperature proposes the passageway of ground water into the sewage. The temperature of waste water test was estimated utilizing thermometer at room temperature (29°C), where in favoured temperature of seepage water is 28°C.

#### A. Standard Limit of Wastewater Quality as Per Is 2296:1982

Table1. Physical Standards

Sr. No.	Physical Characteristics	Standard Value
1.	Colour Test	Colourless
2.	Turbidity Test	10 NTU
3.	Odour Test	Odourless
4.	Temperature Test	28°C

Table.2. Chemical Standards

Sr. No.	Chemical Characteristics	Standard Value
1.	pH Value Test	7.25
2.	Dissolve Oxygen	4-5 Mg/lit
3.	BOD Test	5 Mg/lit
4.	COD Test	4 Mg/lit
5.	Hardness Test	60-120

## VI. CONCLUSION

- The characteristics of wastewater were determined. The direct use of drainage water is not suitable for farming and vegetation.
- The vegetation grown on sewage water may have some serious effects on human health. This study conclude that drainage water must be purified before use for farming.
- For the cultivable land the nitrogen value should be within the range of 0.06% - 0.5%
- The average soil pH value for plant growth is 5.5 – 8 & water pH value is 6.5 – 8.5
- The average value of BOD for land irrigation must be 100 mg/L.

- For land irrigation the average value of COD is less than 250 mg/L.

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