

# IMPACT OF DOMESTIC SEWAGE AND INDUSTRIAL EFFLUENT (sugarcane effluent)

## FOR IRRIGATION ON PROPERTIES OF SOIL

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**Abstract** - Now-a-days due to the increasing the population, the demand of water has increased considerably resulting in the generation of more domestic waste water. The use of the domestic wastewater and industrial sewage were checked to improve the physicochemical properties of the soil as compared to the application of ground water. For this project, Industrial effluent was taken from TIRUTTANI Co .Op. Sugar Mills Ltd. That is, we have chosen sugarcane effluent as the Industrial effluent in this project. Domestic wastewater helps in better crop growth with increased fertility status of the soil. Application of domestic water increases total N, P, K and organic carbon content of soil & thereby increases the yield of crops compared to irrigation with ground water. The use of the sewage improves the physicochemical properties of the soil as compared to the application of groundwater. Sewage leads to increase of crop yield with an improved fertility status of the soil. There is a significant change in the properties of the soils irrigated with sewage and groundwater. Thus, use of sewage for irrigation is a considerable method for the management of wastewater.

**Key Words:** Domestic sewage, soil parameters (N, P, K), irrigation, Crops.

### 1. INTRODUCTION

The growth of towns, cities, and development of industries by 19<sup>th</sup> century leads to problem of disposal of sewage, which encouraged the use of sewage wastewater in irrigation. The practice of use of domestic sewage in farming is becoming prevalent as the demand of water is increasing. Due to fast industrial development and the growth of population, the availability of water decreases day to day. In this increase in the population has led to increased demand of water and the increased generation of wastewater. The high quality water is preserved and the lower quality is used for agricultural purposes. Irrigation with sewage became a prevalent practice in arid and semiarid regions, where it was readily available and economic to freshwater. The final aim of sewage management is the protection of the environment which the ultimate goal of wastewater management is the protection of the environment in a manner corresponding with public health and socio-economic concerns. Domestic wastewater is less expensive and considered an attractive source of irrigation water now a day. Therefore, the interest in reusing waste water for irrigation is rapidly growing in

most countries. In addition wastewater is a valuable source for plant nutrients and organic matter needed for maintaining fertility and productivity of arid soils. In most of the cities disposal of effluent is carried out by using it for irrigation. Industrial waste water is used as a source of irrigation for fodders and vegetable crops grown around the cities. Raw sewage and sludge depending upon their source may contain an appreciable amount of metallic micronutrients and heavy toxic metals. Domestic wastewater contains essential plant nutrients such as N, P, K and micronutrients which are beneficial for plants growth. The usage of domestic sewage for irrigation is mainly followed in arid and semi arid countries.

### 1.1 EXISTING SYSTEM:

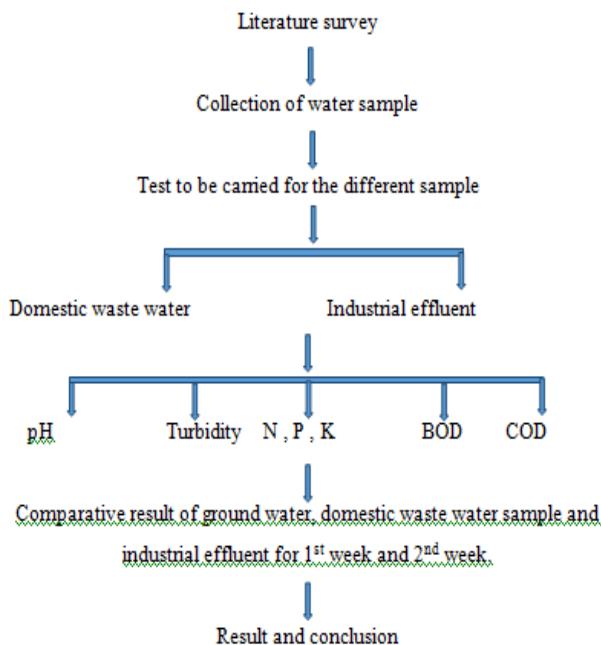
In the existing system the domestic sewage is used for irrigation to get the good yield in crops. And the domestic sewage undergone the test on N,P, K and Ph . The test is carried for soil on 3, 7 and 10 days. Then the result of domestic sewage is compared with the ground water.

### 1.2 PROPOSED SYSTEM:

In the proposed system the domestic sewage is used for irrigation to notice the yield of crops. In this project the soil is tested for 1<sup>st</sup> and 2<sup>nd</sup> weeks after irrigation of domestic and industrial sewage .And then the soil undergoes the test of N,P,K, Ph and turbidity.

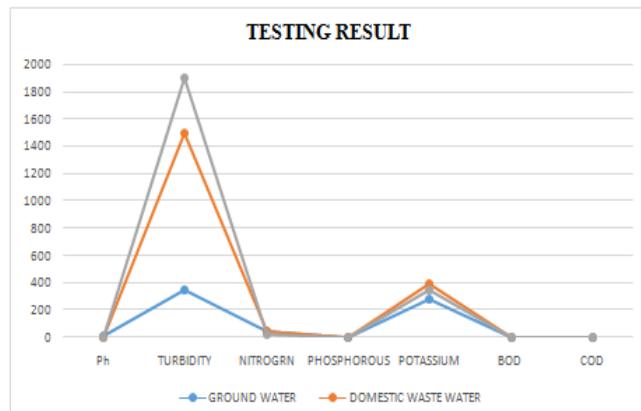
### 2. OBJECTIVE OF THE STUDY

The main objective of this project is to determine the application of using domestic sewage and industrial sewage for irrigation .To investigate the beneficial impacts of domestic waste water on soil properties, groundwater, industrial sewage and domestic waste water samples are discharged into the soil separately. After 1<sup>st</sup> and 2<sup>nd</sup> weeks of application of wastewater soil parameters N, P, K & pH ,BOD ,COD and turbidity, of two soil sample containing domestic waste water, industrial effluent and groundwater was determined.



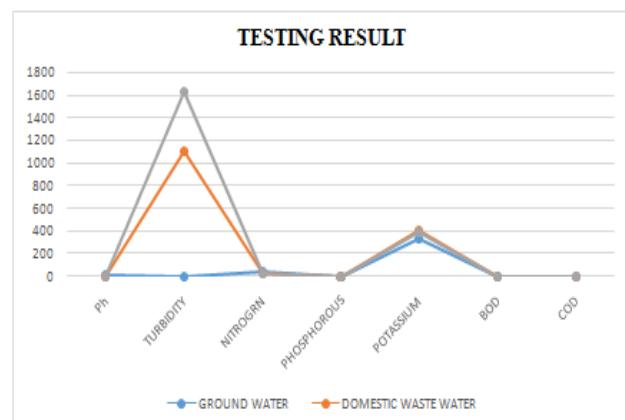
soil sample after 15 days of application waste water.  
5.Determining the soil parameters (N, P, K & pH) of two soil sample after 20 days of application waste water.

#### COMPARATIVE STUDY OF GROUND AND DOMESTIC WASTE

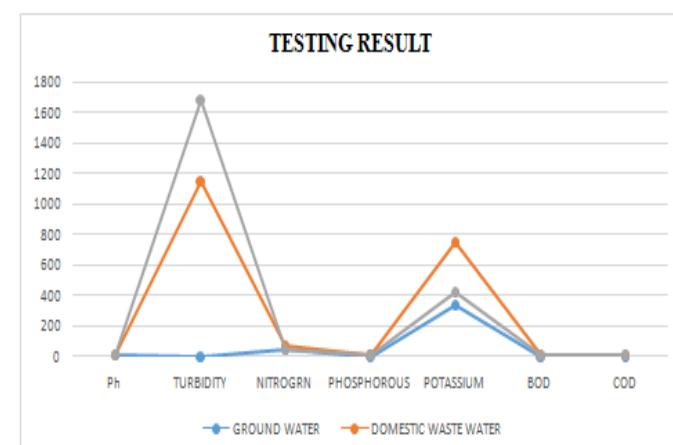


#### WATER BEFORE TREATMENT:

#### COMPARATIVE STUDY OF GROUND AND DOMESTIC WASTE WATER FOR 1<sup>ST</sup> WEEK:



#### COMPARATIVE RESULT FOR GROUND WATER, DOMESTIC WASTE INDUSTRIAL WATER FOR 2<sup>ND</sup> WEEK:



## 2.2 MATERIALS AND METHODS:

**SOIL SAMPLE COLLECTION & ANALYSIS :** An experimental setup was made for conducting the work to investigate the impact of application of domestic wastewater and industrial waste water on soil. For this purpose agricultural soil was collected. Then determine the soil parameters like N, P, K, & pH before applying wastewater.

**SAMPLING OF DOMESTIC AND INDUSTRIAL WASTEWATER & ANALYSIS:** - The sewage wastewater was collected and industrial effluent (sugarcane effluent) was collected

**METHODS AND ANALYSIS:** - Discharge these two water sample into the soil separately. After 10 days, 15 days, 20 days of application of wastewater soil parameters N, P, K, & pH, of two soil sample containing sewage wastewater and kitchen wastewater was determined.

#### TEST PERFORMED:

Treatment Process for waste water:

- 1.Coagulation process
2. Screening process
- 3.filtration process

Following test was performed on soil and waste water:

- 1.Determining the soil parameters (N, P, K & pH) before applying wastewater.
- 2.Determining pH & B.O.D of two sample of waste water.
- 3.Determining the soil parameters (N,P,K & pH) of two soil sample after 10 days of application of waste water.
- 4.Determining the soil parameters (N,P,K & pH) of two

### 3. CONCLUSION

In this project the domestic and industrial waste water is collected and it is treated and then it is used for the irrigation purpose. This was conducted due to the scarcity of ground water now a days. So that the waste water from various place can be collected and it have been undergone the primary treatment and then it is used for the irrigation purpose due to its presence of nitrogen, phosphorous and potassium content in the domestic waste water sample. The test have been carried for 2 weeks to get the result of the domestic and the industrial waste water. so that the results have been obtained that the value of nitrogen, phosphorous and the potassium level gets gradual increase when compared with the 1<sup>st</sup> week than 2<sup>nd</sup> week .

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