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# "Identification of sources of pollution & designing of effective domestic waste water treatment plant at identified sources to control Panchganga River pollution"

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**Abstract -** *The increasing rate of human population and rapid pace of industrialization has created many problems of pollution in the rivers and streams. The domestic wastes and industrial effluents are being indiscriminately discharged in the nearby rivers, reservoirs, lakes and tanks. In Kolhapur city similar situation is observed in Panchganga river where twelve nalahs directly release effluents into the river. As the pollutants are discharged in the river through these nalahs, the intensity of river pollution is increasing highly. Present study was carried out by selecting major sources of pollution in kolhapur city. Selected sources are Domestic, Industrial, Agriculture.*

***Key Words*: Kolhapur, Domestic waste, Nalah, Effluents, Water Pollution**

## 1. INTRODUCTION

CPCB of India announced that Panchganga River is one of the highly polluted rivers in India in 2009. Many NGO's, citizens started movement against Panchganga river pollution & filed cases against responsible authorities. As per recompilation from high court Mumbai, it was expected to establish waste water treatment plant by respective authorities as well as in industrial areas. But still waste water & effluent treatment plants are not capable to treat waste water coming from cities, villages, domestic & industrial areas, commercial areas completely. Which resulted increase in pollution of Panchganga River.

Hence, there is an urgency to identify sources of pollution & develop low cost waste water treatment strategies to treat waste water coming from industrial, domestic & commercial areas.

### 1.1 Objectives

Due to increase in Industrialization and population, pollution of Panchganga river is increasing rapidly. To reduce the adverse effects of river pollution study is carried out. The present study deals with achieving the following objectives.

1) Review of Panchganga River from 2001 to 2017.
2) Development of effective remedial measures to control Panchganga river pollution.
3) Awareness about pollution control.
4) Designing of waste water treatment plants.

### 1.2 Sources and its Parameters

**Sources**

**Domestic waste-**
Domestic water pollution is defined as the waterborne waste generated from Home, animal or food processing plants which also includes human excreta, soaps and organic materials.

**Industrial waste-**
Industrial waste is defined as the waste generated from Industries during manufacturing processes which includes toxic chemicals.

**Agriculture waste-**
Agricultural waste is defined as the waste generated due to use of biotic and abiotic by-products by farmers during the farming practices resulting in the contamination and degradation of environment and surrounding eco systems.

**Parameters**
PH, BOD(Biochemical Oxygen Demand),COD(Chemical Oxygen Demand),DO(Dissolved Oxygen), Suspended Solis, WQI(Water Quality Index).

## 2. ANALYSIS AND DISCUSSION

It is important to consider places where the waste water mixes in the river, waste water quality and quantity. Following table shows the divisions of the total area of the city of drains.

| Culinary watershed | Sub grooves | Nalah watershed zone (hectare) | Remedies which are prepared by Kolhapur Municipal Corporation |
|---|---|---|---|
| Dudhali | Fulewadi and Dudhali | 1447.87 | 17 MLD and STP (Nargorothan) start construction |
| | Lakshatirth | 260.23 | Barrier obstruction and divert |
| | Jamadar Kalab | 19.36 | Diverted to Rabade pumping station |
| | Total | 1727.46 | |
| Jayanti | Jayanti-Gomti | 2446.62 | 76 MLD. STP. (NRCD) |
| | CPR | 20.21 | Barrier obstruction and divert |
| | Juna budhwar | 26.19 | Barrier obstruction and divert |
| | Total | 2493.02 | |
| Bapat camp | Bapat camp | 982.83 | Barrier obstruction and divert - start construction |
| | Kawala naka | 592.63 | Divert and start construction |
| | Total | 1575.66 | |
| Line Bazar | Rajhouns | 106.82 | Barrier obstruction and divert |
| | Raman mala | 124.95 | Barrier obstruction and divert |
| | Dream world | 107.66 | Barrier obstruction and divert |
| | Line bazar | 196.01 | Barrier obstruction and divert |
| | Kasba bawda | 131.09 | Barrier obstruction and divert |
| | Total | 666.53 | |
| Brick kiln | Brick kiln | 217.33 | Barrier obstruction and divert |
| TOTAL | | 6680 | |

**Table -1:** Divisions of the total area of the city of drains


**Fig -1**: Study Area

The above table shows the study area of our project. Area of study starts from Panchaganga river entering Kolhapur city to the end of the city.

## 3. Remedial Measures

**Wetland-**
Natural functioning of vegetation, soil and organisms are used to treat waste water in constructed wetlands. Pre and post treatments are necessary depending upon type of the waste water required to be treated.

**Root zone Technique-**
It is the system in which sewage is introduced into soil matrix colonized by wetland plant species over or through which sewage flow in a horizontal or vertical direction. It is the system in which sewage is introduced into soil matrix colonized by wetland plant species over or through which sewage flow in a horizontal or vertical direction. The plant are grown in a specially designed swamp in which hollow roots called rhizomes are send down in a prepared bed. Hence it is called as Root Zone Technique.

**Oxidation Pond-**
Oxidation Ponds are also known as stabilization ponds, they are large, shallow ponds constructed to treat waste water through the interaction of sunlight, bacteria and algae. Oxidation pond normally has a depth of 2 to 6 ft. where BOD deduction of waste water takes place by supporting algae bacterial growth.

**Lagoons-**
Lagoons are pond like bodies of water or basins constructed to receive, hold and treat waste water for a pre-determined period of time. If necessary they are lined with materials such as clay or an artificial liner to prevent leaks to the groundwater below.

## 4. CONCLUSIONS

In this study we have reviewed the Panchaganga River for identifying the sources causing pollution like residential, service centers and agriculture.

Hence, we can conclude that pollution of Panchaganga river (untreated waste water) can be reduced by constructing wetlands, oxidation ponds, lagoons and sewage treatment plant at identified sources.

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