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Assessment of wastewater quality of Kham river for Irrigation[★]

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Abstract

Aurangabad being one of the fastest developing cities in the entire continent, there is a rapid increase in population and industries. This sudden growth also comes with sudden increase of wastewater production from both residential and industrial sectors. Up until 2015-2016 there have been hardly any operational sewage treatment plants in Aurangabad this led to dumping of raw sewage in rainwater drains, Kham river being the major river basin of Aurangabad carries most of the sewage of the city. This study was conducted to assess the quality of water in the drain, the assessment was done from October 2015 to March 2016 (6 months). Major water quality parameters like pH, BOD, TSS, TDS, EC, Ca, Mg, Cl, B and SO₄, water quality index was also computed. The result showed that the stream is heavily polluted throughout the process and unfit for human contact. Regular treatment of waste water was required before discharging into the stream to make the stream water less hazardous for soil or human contact.

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1. Introduction

Aurangabad has a population of 10 lakh and is spread over an area of 137.40 Sq. Kms. It is located latitude 19°53'59" north and longitude 75°20' east. The city lies on the bank of river Kham. Kham River flows through Aurangabad city, Maharashtra, India[10][11]. This river flows with freshwater in monsoon only. Rest of the year it receives wastewater from the city. The Kham River receives sewage from the nallas flowing through densely populated areas. Near the Holy Cross School, the river crosses the city boundary and receives a nalla coming from the Station area MIDC. Kham River passes through Himayat baugh, Padampura, Chawni, Banewadi, Pandharpur, Waluj and usually the Wastewater stream is utilized at Pimparkheda village.

Kham River being the major drain basin receives rainwater in monsoon and wastewater throughout the year.

2. Material and Methods:

2.1. Location:

In the current study three sampling stations were selected they are, Banewadi, Waluj, Pimparkheda.

Banewadi: Banewadi lies on the outskirts of Aurangabad city just beyond Railway station. It consists of small agricultural fields, Buffalo stables and residential areas. Here wastewater carried by the Kham river stream is being utilised for irrigation. It was selected to provide information about the domestic sewage loading of the city. **Figure 1** shows Kham river at Banewadi

Waluj: Waluj is major Industrial sector of Aurangabad district. To verify whether there are untreated Industrial Effluents discharge in the stream the site was selected which lies on the downstream of industrial sector. This station was selected with view to verify the status of Industrial effluent in the kham river. The station was selected where water was being drawn for Irrigation.

Pimparkheda: Pimperkheda is a village that lies just beyond Waluj and is also the last village that the Kham river stream visits before it dries up. Here the water is less polluted as compared to other stations as the waste water discharge in the stream is stopped for a long length giving the stream chance to self purify and stabilise. This village contains Agricultural fields and a large no. of villagers engaged in Animal husbandry. This is the station where the kham river dries. Here the stream is being obstructed to recharge ground water level so as to utilise filter water by ground media for Irrigation and animal husbandry.

Monthly water samples were collected from October 2015 to March 2016 (6 months), covering three seasons.

2.2. Purpose:

As mentioned above the river water being use for Irrigation, Animal Husbandary and often comes in human contact it is necessary to monitor the quality of the stream to so as to provide proper warning to the population when necessary, to monitor and detect the presence of heavy industrial effluent and to design minimum or adequate treatment for use in irrigation. For this purpose major water quality parameter like pH, BOD, TSS, TDS, EC, Ca, Mg, Cl, B, SO₄, Sodium adsorbtion Ratio and Residual sodium carbonate.

The water parameters are compared to both standard drinking parameters and Irrigational parameters. The drinking parameters are as shown in the **Table 1** and the water quality in index of the water is calculated using this standard values.

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