



IMPACT OF EFFLUENT OUTFALL ON THE PHYSICO-CHEMICAL WATER QUALITY INDEX AT KALU RIVER TITWALA, MAHARASHTRA, INDIA

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AUTHOR'S CONTRIBUTION

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Kalu river at Titwala, is a major tributary of the Ulhas river that flows in western India in the states of Maharashtra. It is a potential source of water supply to several regions in Thane district. However effluent outfall from nearby industries pollutes the natural river water. The main objective of the study was to determine the impact of the effluent outfall on the physicochemical Water Quality Index (WQI) and also to evaluate if the WQI are within permissible limits of WHO standards (1993) for drinking purpose. Physicochemical WQI such as Temperature (T), Electrical conductivity (EC), Turbidity, Total solids (TS), Salinity, Total Hardness (TH), Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) were assessed from two different zones (Zone I and Zone II), with three sampling stations selected at each zone. Statistical tools of correlation matrix and Wilcoxon signed rank test were applied to evaluate the WQI. The results obtained shows a significant difference ($P < 0.05$) in WQI of Zone I and Zone II.

At both zones, temperature, turbidity, pH, total solids, salinity and BOD were found to be within the permissible limits of WHO standards for drinking purpose. However, in Zone II the COD levels were found to be very high and DO levels were low than the recommended levels by WHO standards, thereby making the water not suitable for consumption. This study concludes that there is a need for effluent treatment to reduce the COD levels and to prevent water pollution at Kalu river.

Keywords: Kalu river; Water Quality Index (WQI); effluent outfall; water pollution.

1. INTRODUCTION

The Ulhas river flows in the Thane, Raigad and Pune districts of western India in the states of Maharashtra.

The river basin lies between North latitudes of $18^{\circ} 44'$ to $19^{\circ} 42'$ and East longitudes of $72^{\circ} 45'$ to $73^{\circ} 48'$. It rises from Sahyadri hill ranges in the Raigad district at an elevation of 600 meter above sea level. The

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