



Environmental Studies of the River Darna With Reference To Water Quality evaluation From District Nashik- Maharashtra

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Abstract:

The present study was carried out from origin of Darana river to Darana sangam. The aim was to assess the impact of agriculture and domestic waste on the quality of surface water and to locate various sources and type of pollutants responsible for changes in river water quality. To assess the river water quality, as many as 23 sampling stations, which are scattered in the area of approximately 80 Km. were selected for the proposed study.

INTRODUCTION

Water, the most vital natural resource for life and its sustenance, plays a very significant role in the developmental processes. Various developmental activities in vicinity of the water body necessarily influence the quality of water. Inputs of agrochemicals from the agricultural sector and release of municipal and industrial waste has been emerging as important challenge for the environment. In the view of this, the present study was undertaken on River Darna which is one of the important water sources of Nasik District (Maharashtra, India). Efforts are made to evaluate the quality of river water on the basis of systematic collection and analysis of physico-chemical and biological parameters.

MATERIALS AND METHODS

In the analysis, physical parameters (Temperature, Turbidity, Conductivity, Electromotive Force); chemical parameters (PH, Free carbon dioxide, Dissolved Oxygen, Biological Oxygen Demand, Nitrate, Nitrite, Phosphate, Sulphate, Chloride, Total Hardness, Total Dissolved Solid, Sodium, Potassium, Calcium) are analyzed (Straube C.P., 1973). In addition to this, biological assessment of these samples was also carried out with the record of foal and faunal diversity and Most Probable Number, Feecal Count, TVC. The methodology used for water analysis was as per standard method (APHA)

RESULTS AND DISCUSSION

Land use pattern and the catchments area of the river Darna is mostly intensive agricultural while few stations also receive domestic wastes e. g. Take bridge, Vihigaon, Chehedi bridge. River also flows from Deolali area and receives city sewage. The results obtained from the water parameter studies are

Please cite this Article as : Dube Dilip Karbhari , Environmental Studies of the River Darna With Reference To Water Quality evaluation From District Nashik- Maharashtra : Indian Streams Research Journal (July ; 2012)



statistically analyzed and presented in the form of tables and graphs. The results for various months were grouped in the form of seasons such as summer, winter, rainy. It is clear from analysis whenever there is inflow of sewage there is increase in turbidity such as sampling points 5, 6, 14, 15, as well as 20 to 23. In rainy season 5, 6 sample points show less turbidity due to dilution factor. The results of electrical conductivity were also higher side in the samples such as 3, 5, 6 onwards. The highest electrical conductance was found in the samples 19. This is due to waste and leaches joining the river Darna from thermal power plant. The electromotive force was also studied. Whenever pH values increased corresponding the values declined to negative side and vice versa e.g. sample spot 5,11,12,19. The pH is close to neutral and alkaline. Analysis of dissolved oxygen clearly shows gradual reduction at the places where there is flow of waste and gradually increase in downstream. This fluctuation is mostly due to utilization of oxygen for degradation of waste. Similarly biological oxygen demand was also analyzed to know the degree of pollution. The highest level of BOD in the sampling sites 3, 6, 12, 14 indicate high load of waste. The analysis of nutrients such as nitrate and phosphate show gradual increase at station 1 onwards whenever there is inflow of waste. The higher level of nitrate in summer at sampling stations 3 and 5 as compared to winter and rainy is basically due to reduction in river flow in summer months. The analysis of sulphate as expected show highest concentration of 271 mg/lit at sampling station 19 due to waste from thermal power station. Similarly the analysis of chloride indicates sewage inflow in the river, which contributes higher level of chloride. The analysis of total dissolved solid, hardness show variations. The data from water quality parameters is pooled to correlate interrelationship-using PPL (Pooled Pollution Level).

On the basis of present analysis, clear patterns for the sources of pollution and its impact in the form of water quality parameters have been established. This work forms the baseline study not only to understand the factors responsible for the water quality degradation but also derives chain of processes involved in their magnification in the river. It clearly points out that hardness of water is due to the chloride content that is introduced from agricultural sector. It emerges out as primary pollutant for this water body.

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