STUDY ON THE QUALITY OF TAMIRAPARANI RIVER IN KANYAKUMARI DISTRICT

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Abstract:- **Tamiraparani river is located in India, It originates from western side of the western Ghats in Kanyakumari district. This river runs for 59Km before it joins the Arabian Sea near Thengapatanam. My present study is to evaluate in water quality of Tamiraparani River .Rapid industrialization, indiscriminate usage of chemical fertilizers, dumping of municipal wastes and discharge of wastes from bricks and rubber industries pollute the river to a great extent.It is therefore necessary to check the water quality at regular intervals of time.**
Keywords :Tamiraparani river, Physicochemical parameters.

I. INTRODUCTION

Now days Water pollution is one of the main environmental issue in the industrialised world. Good quality freshwater may become a scarce resource inthe near future.[2] Developing countries and countries with transition economies have increase their interest in water quality monitoring programs.[1]

Kanyakumari district its area of 1,684sq.kmand occupies 1.295 percentage of total area of tamil nadu.[17] The river has to be enjoys the full benefit of both monsoons.So it makes the river peremial,The river is heavy floods especially during the northeast monsoon,In 1992 there was an unexpeceted flood in tamirabarani. The south west monsoon is from June to September, while the second one northeast is from October to December which provide abundant water source to this district. Tamiraparani river runs for 59Km before it joins the Arabian sea near Thengapatanam.The two main tributaries are Paraliyar and Kodayar.[3] The river is characterised by uni- directional current with a relatively high, average flow velocity ranging from 0.1 to $1ms^{-1}$. The river flow is highly variable in time depending on the climatic situation and the drainage pattern.

According to WHO estimate about 80% of water pollution in India is due to domestic waste.[4]The improper usage of water systems may cause dangerous problems in availability of drinking water. Water resource is over and over again polluted by industrial effluents as they are discharged without proper treatment. The physical, chemical and biological quality of water are altered in such a way that they are not useful for the purpose for which they are intended[5].Consideration of water quality is important in wetland habitat assessment because a host of interacting physical and chemical factors can influence the levels of the primary productivity and thus manipulate tropic structure and total biomass throughout the aquatic food web [6]. This paper deals with the study of water quality by assessing different physico-chemical parameters which were reported by different scholars at different stations of tamiraparani.

II. MATERIALS AND METHODS OF ANALYSIS

The study involves the consideration of water quality parameters like temperature, P^H, dissolved oxygen, Total Dissolved solid (TDS), Phosphate(PO_4^{3-}), Nitrate(NO_3^{-}), total hardnessand Sulphate.These water parameters were determined by the standard methods as given in APHA. The results from various studies were analysed and discussed below.

III. RESULT AND DISCUSSION
IV.

1. **Temperature:** Temperature is the most significant environmental factor with effect on plants and animals. [13]The water temperature depends on the depth of the water, climatic and topographic changes. The oscillation of temperature usually depends on the season, geographic location, sampling point in time and content of effluents entering the river[15]. The temperarure of the river water was found to be in the range of 28.8 -29.82^0C.The temperature values were highest in post monsoon season and lowest during monsoon season.

2. **P^H :**The P^Han important parameter of water, is the negative logarithm of the hydrogen ion concentration of a solution of water.[7] The p^H scale normally ranges from 0 to 14. Water with a P^H below 7.0 is considered acidic while water with p^H greater than 7.0 is considered basic or alkaline. This river water is found to be slightly alkaline with pH range of 6.6 -8.3. There is slight increase in the P^H which shows that there may be small impact of urbanization on the river but not sufficient to affect its quality.

3. **Dissolved Oxygen:** Dissolved Oxygen is a very important indicator of water body's ability to support aquatic life. They also indicate the degree of pollution in water bodies..[8]the permissible limit of DO is 4-8mg/l. A low dissolved oxygen (less than 4mg/l) would indicate poor water quality and thus would have difficulty in sustaining many sensitive aquatic life[9]. Different studies showed that the DO content in river is 6.54 -2.42mg/l.The high value indicates the high level of photosynthetic activity of hydrilla plants .The low value was due to the inflow of field water in to the river in smaller quantities and probably with microbial activity.

4. **Nitrate – Nitrogen ($NO_3 – N$):** Different agricultural activities results in the increase of nitrate concentration in ground and surface water.[10] Increase in the amount of Nitrate-Nitrogen in surface water causes different results in effects on the aquatic life plants and algae.[11] Blue baby syndrome disease in human body occurred due to reaction of nitrite and iron in with red blood cell create methemoglobin which stops oxygen level. The Nitrate of river was found to be in the range of 2.0 – 6.0mg/l.High concentration of nitrates will lead to phyloplankton (algae) and macrophyte (aquatic plant) production.This is mostly due to the usage of fertiliser.

5. **Total Dissolved Solids (TDS):** The total dissolved solids in water consist of inorganic salts and dissolved materials which is calculated from the total amount of mobile charged ions.The river water comprised of anions such as carbonates, chlorides, sulphates and nitrates and cations such as potassium, magnesium, calcium and sodium.[12]Total dissolved solid is directly related to the purity of water and the quality of water purification system and affects everything that consumes or use water.The range of TDS was found to be 161mg/l – 700mg/l. The reason for minimum total dissolved solids in the river may be due to dilution of sewage and effluents.

6. **Total Hardness:** The total hardness of water is not a specific constituent but is a variable.[13]It is defined as the sum of calcium and magnesium hardnessin mg/L as $CaCO_3$. Total hardness in fresh water is usually in the range of 15 to 375mg/L as $CaCO_3$. Calcium hardness in fresh water is in the range of 10 to 250 mg/L often double that of magnesium hardness (5 to 125 mg/L).WHO permissible limit for total hardness of water is 150mg/L and ISI desirable limit was 300mg/L.The total hardness was found on the river is range between 18 -347 mg/l. In some places the hardness will be high due to urban activities like bathing, washing clothes which release detergents and other impurities.

7. **Sulphate :** The recommended maximum concentration of sulphate is 500mg/l. Excess sulphate levels may have a laxative effect on new users and produce an objectionable taste.[14]Higher concentration of sulphate in water have three effects a) Water containing appreciable amounts of sulphate (SO_4^{2-}) tend to form hard scale. b) Sulphate cause taste effects. c) Diarrhoea can be induced at sulphate levels greater than 500mg/l.Different studies showed that the sulphate content inthe river is in the range of 3.63 – 195 mg/l. Sulphate content was minimum during pre – monsoon season and maximum during post-monsoon season .Sulphate is an important anion occurring in river water which causes permanent hardness.

8. **Phosphate:**Phosphorous has proved one of the limiting nutrients for algal growth in fresh water bodies which regulate the phytoplankton production. [16] It is also an indicator of water pollution.The Phosphate of the river water was found to be in the range of 0.43 -0.18 mg/l.Limit of Phosphate is 0.1 mg/l. Phosphate is non-poisonous at the present concentration and thus poses no threat to aquatic lives and health of human beings.

CONCLUSION

The increasing in discharge of domestic wastes, animal wastes and the growth of large urban centres have been accompanied by increases in the pollution pressure on the aquatic environment. Water in river has also been considered as a suitable receiver of wastes. This use (or abuse) conflicts with almost all other uses of water and most sincerely with the use of fresh water for drinking, personal hygiene and food processing. [18]This study reveals that the water quality is deteriorating and need proper maintenance to preserve the water quality. The research in water quality would be very useful in the improvement of future water resource program.Only by identifying the sources of contamination will it be possible to select and implement the most correct and appropriate solution to those quality issues. [19]

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