

# Cause Analyses of River Water Quality Deterioration a Case Study of South Pennar River in Krishnagiri Dist. Tamilnadu

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**Abstract** - South Pennar river is flowing continuously for 400km. It passes through many villages, town and Krishnagiri District. It is a perennial river and monsoon based catchment. The Thenpennai River is the main source for irrigating over 38,000 acres in Krishnagiri District. It is also the main source of drinking water to more than 100 villages. Many pollutants are added to this river at all points, especially those closer to human settlements and industrial developments suffer from acute levels of pollution. River that flow through densely populated areas including towns and housing areas are often polluted with solid wastes. To use the river water to water supply to many towns which include Krishnagiri, Hosur. Entire flow on the river has turbidity. Considerable amount of population depend upon the river directly for their daily use, a study has become necessary in the present days to determine the suitability of these river water for Domestic Use.

**Key Words** - River South Pennar, Water Quality, Water Pollution

## I. INTRODUCTION

### 1 Need of Study:

Our planet Earth is a live planet because of some special ingredients out of which water plays a great role. Water has been considered as the most important and vital resource for the upbringing of the biological sphere as well as the human civilisation. . The other agents which are responsible for the biosphere on globe are Air, Heat, Soil and Sky. All these agents are linked in between themselves to a much greater extent and any irregularities in one of them affects others as well. Along with the progress of our civilisation, this

resource has begun being polluted and its quality started depleting due to various reasons like the onset of industry, domestic wastes, runoff from urban areas, urban and rural garbage.

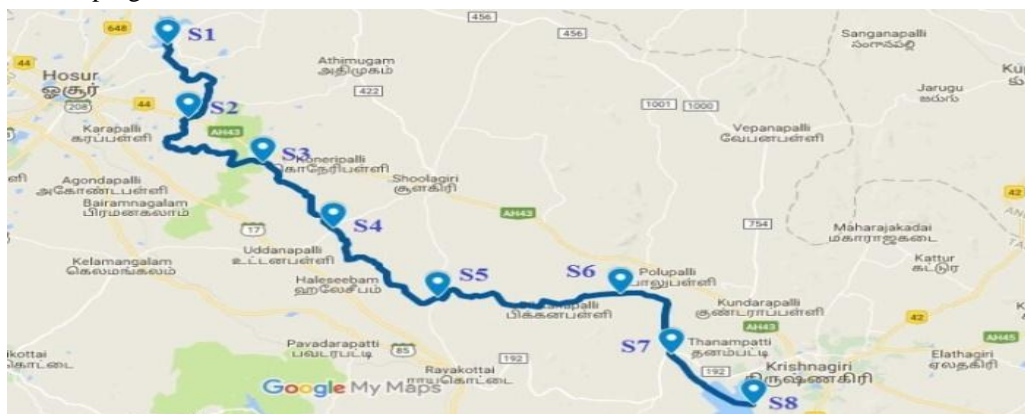
### 1.2 Objectives of Study

The chief and primary sources of water supply to the villages in Krishnagiri district is SOUTHPENNA R river. A considerable amount of the population uses the river water directly for fulfilling their daily demands. Considering the requirement of the availability of pure water which meets the public standards for the daily use purpose, the water of the river must be pure and clean which doesn't have the potential to cause any threat for the health of people. A few studies have been carried out to determine the water quality of this river for the purpose of finding out the suitability of their domestic and industrial use. So, the sole purpose of this study is to analyse the present scenario of water quality of the SOUTHPENNA R river.

## II. SAMPLING

### 2.1 Sampling Areas:

The sampling site for the South Pennar river the water samples were collected from Kelaverapalli Dam to KRP Dam. The length of the stretch is 70km from kelaverapalli dam to KRP dam. In this stretch is divided in to 7 parts of each 10km length. The sampling stations have been highlighted in following map.



### 2.2 Sampling Process:

The samples were collected on a one day for the rivers. They were collected in the day in one plastic non-reacting bottles of 1litres capacity each. Immediately after sampling, the bottles were recapped. These sealed bottles were put inside a deep fridge till it was carried to AERI for carrying out the laboratory analysis.

## III. EXPERIMENTS

### 3.1 Tests:

After the samples were preserved and brought to the laboratory, various experimental analysis were carried out on them in order to determine the water quality. The parameters for which tests were conducted include the following viz. pH, Turbidity, DO, Chloride, Sulphate, Dissolved Solids, Hardness and Fluoride. These above tests are done in the AERI environmental engineering laboratory by using the procedure using Indian Standards.

## IV. RESULT AND DISCUSSIONS

### 4.1 Results:

The samples from all the sampling points were collected in one day and analyzed. The various physical and chemical parameter that were analyzed and the water quality parameters of samples are given below in table.

The pH values of all the sampling locations shows that the pH is within the permissible limits of 6 - 8. There is a slight increase in the pH downstream which shows that there may be a small impact of urbanization on the river but not enough to affect its quality.

Parameter	S1	S2	S3	S4	S5	S6	S7	S8
pH	7.2	7.2	7.2	7.2	7.34	7.43	7.13	8.5
Turbidity	6.7	4.4	4.9	5.0	9.1	6.3	6.8	18.2
DO	7.2	7.1	7.3	7.2	7.3	7.4	7.2	8.9
Chloride	250	262	254	260	258	255	210	275
Sulphate	32	35	35	35	36	35	32	35
TDS	425	460	490	500	520	580	500	605
Hardness	310	295	280	320	380	320	390	300
Fluoride	1.04	1.11	1.05	1.02	1.13	1.11	1.04	1.16

Table 1 Water Quality Parameters of Samples

### 4.2 Discussions:

The parameters which were tested for the river South Pennar generally always lied in between the prescribed values as per IS 10500-2012, only except some anomalies. The reason behind these exceptions can be attributed to various facts e.g. faulty methods of sampling, faulty analysis, considerable increase in the activity of the population on some particular festival days, effluents on a particular time of a day or week etc.

For South Pennar River, some sampling site showed the most exceptions as it is a village and people directly depend on the river for their daily activities. Turbidity also constantly gives a higher value for all the sampling points.

The permissible level of turbidity is 5NTU Turbidity is a measure of suspended minerals, bacteria, plankton, and dissolved organic and inorganic substances. Turbidity level is higher then permissible limits at all station points.

The DO values of all the sampling stations shows that the DO is exceed their permissible limits of 5-6mg/l. This will occur due to decomposition of algae, plants and etc.

The chloride value in the river remains constant and some are within permissible limits. There is due to effect of urbanization in the chloride concentration in the river. The high value of Chloride greater than the permissible limit of 275mg/L at KRP Dam is only due to the influence of improper use from the peoples.

The sulphate value in the river water remains constant and all are within the safe permissible limits of 200mg/l. The permissible limit for TDS is 500mg/L. The TDS value in the upstream of the stretch is within permissible limit it increases in downstream of the stretch. It will cause for garbage dumping directly into the river.

Permissible limits of total hardness 200 mg/L. The graph clearly shows that the hardness value exceeds the hardness value of South Pennar during both the seasons. The steady increase of hardness could due to urban activities like bathing, washing clothes, vehicles etc which release detergents and other impurities into the water which increases the hardness of the water. The Fluoride value in the river are all within the permissible limit 1.5mg/l

## V. CONCLUSION

Neglecting a few anomalies, generally all the parameters lied within the prescribed range though some of them are showing exceeds viz. turbidity, hardness, dissolved oxygen etc. which is obviously a threat for a dangerous tomorrow. They have the potential to cause threat to the Health, because of the effluent discharge from industries, garbage dumping and etc. goes on then it will surely cause to peoples in future. Similarly the increasing the population also affected to a much greater extent on the river. Water quality deteriorated, as river flows downstream especially towards the KRP dam.

So, suitable preventive measure must be taken implemented strictly from right now to get a control a deterioration of river. It must be remembered that "A STICH IN TIME SAVES NINE"

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