

EXECUTIVE SUMMERY OF THE PROJECT

TITLE OF THE PROPOSED RESEARCH PROJECT

**“QUALITATIVE ANALYSIS OF WATER OF
RIVER KALI IN UTTARA KANNADA DISTRICT
OF KARNATAKA”**

UGC Ref. No : MRP(S)-1319 / 11-12 / KAKA 099 / UGC-SWRO

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EXECUTIVE SUMMARY

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QUALITATIVE ANALYSIS OF WATER OF RIVER KALI IN UTTAR KANNADA DISTRICT OF KARNATAKA

All living organisms on the earth need water for their survival and growth. But due to increase in human population, industrialization, use of fertilizers in the agriculture, it is highly polluted with different harmful contaminants. Therefore, it is necessary that the quality of drinking water should be checked at regular intervals of time. Because of contaminated drinking water human populations suffers from water borne diseases.

The availability of good quality water is an indispensable feature for preventing diseases and improving quality of life. Research has proved the long term use of this sewage effluent for irrigation. But this contains considerable amount of potential harmful substances including soluble salts and heavy metals. Addition of heavy metals are undesirable. So it is necessary to know details about different physico-chemical parameters such as colour, acidity, hardness, pH, sulphate, chloride DO, BOD, COD, alkalinity, etc. Some water analysis report with physico-chemical parameters have been given for exploring parameter study.

In general rivers are known as store house of information regarding the present and past climate, environment of pollution and degree of pollution or contamination of pollutants. It is with the background studies on physico-chemical characteristics of the water body have been conducted on the rivers the theme, Mississippi, the Amazon, the Nile. Physical and chemical methods indicates whether the pollution is of organic or inorganic origin. Although much work has been carried out on many Indian rivers and reservoirs. No detailed project work has been reported on the limnology of the river Kali of Uttar Kannada District. It is with this strong background a detailed investigation on the limnology of river Kali of Uttar Kannada District was taken up for the period of 18 months.

The river Kali has its origin near the village of Kusnavali of Joida Taluk. It is a black river. The river is lifeline to about 5 lakhs people in the Uttar Kannada District. The river runs 184 kms. before joining Arabian Sea.

Water samples were collected seasonally by selecting 5 upghat and 5 downghat stations. It is possible to find out ion composition of water during its flow from upghat to downghat. The upghat station of the river is thickly wooded with hilly area and received maximum rainfalls. The river bottom is muddy and full of silt. The 5 stations of upghat are Haliyal, Dandeli, Dandelappa, Ganeshgudi Dam and Ganeshgudi. Downstream stations are covered by semi evergreen forest. The stations are Kodsalli, Kadra, Kerwadi, Ulga and Siddar.

Water samples were collected from all the 10 sampling stations of Kali river in pre-washed polyethylene bottle of 2 ltrs. capacity fitted with screw caps seasonally.

Data Generated from the water quality study is very useful and can be fruitfully employed to;

- ❖ To establish baseline information with regard to the trends and concentrations.
- ❖ To assess the impact of addition from point and non-point source.
- ❖ To define the zones for designates best uses.
- ❖ Early warning and detection of pollution.
- ❖ To recommended the remedial actions.

Few parameters like pH, conductance and dissolved oxygen (DO) were measured in the field using portable kits at the time of sample collection. Selection of parameters for testing of water is solely depends upon the fact for what purpose we are going to use that water. The water does contain different types of plotting, dissolved, suspended and microbiological as well as bacteriological impurities.

Some physical tests should be performed for testing of its physical appearance, such as colour, odour, pH, turbidity, TDS. While chemical test should be performed for its BOD, COD, dissolved oxygen, hardness and other characters.

Temperature plays a vital role in either increasing or decreasing of particular chemical factor of set in water body. In present study, the water temperature at all the 10 sampling stations of Kali river showed partial as well as seasonal variation according to local climatic conditions. In Kali river it ranges from 22.1⁰C to 32.3⁰C.

Colour is an important factor in determining the suitability of water for drinking, domestic and industrial purposes. Kali river water is clear accept in rainy season at all stations. The ability of the solution to conduct electric current is governed by the migration of ions in solution and is depends on the nature and number of ionic species present. In the present study, electric conductivity of Kali river water ranges between minimum of 98 μ mhos/cm during September 2013 and maximum of 254 μ mhos/cm May 2014.

Seasonwise electrical conductivity of Kali river showed lowest electrical conductivity during rainy season and highest during summer season.

pH is the term used to express the intensity of acid or alkaline condition of a solution. During the present study period, pH of the Kali river water at all the stations was generally observed to be slightly acidic to neutral and ranged from minimum of 4 at upstream stations and maximum of 9 at downstream stations.

All living organisms are depends on oxygen in one form or another form to maintain metabolic process that produced energy for growth and reproduction. The amount of oxygen in water is called dissolved oxygen (DO) concentrations and is influenced by water temperature. The cold the water, the more oxygen it can hold because gases like oxygen more easily dissolved in cold water. The solubility of oxygen is less in salt containing water than in clear water. The dissolved oxygen of Kali water varied from a minimum of 9.0 mg/l at upstream stations, in summer season during the year 2013 to maximum of 11.7 mg/l at station 10 during the month of September 2014.

The solid present in water may be in the form of total solids (TS), total suspended solids (TSS) and to the dissolved solids (TDS). Solids are mainly the sum of suspended solids and dissolved solids present in water. Highest value of total solids present in the rainy season (i.e. due to the south-west monsoon in flow).

Carbonates and bicarbonates are the ions which influence the alkalinity of water. In the present study, carbonates were found in the range of 33.2 mg/l to 54.6 mg/l at all sampling stations of Kali river water. Whereas, bicarbonates were found to be present in the range of 34 mg/l at station 1 and a maximum of 52.6 mg/l at stations 9 & 10 during the summer season. Chlorine is an ion found in variable amounts in natural water and wastewater. The chlorine content normally increases as the mineral content increases. In the present study, chlorine contents of Kali river water were found to vary from 25.1 mg/l at station 1 during the year 2013 to a maximum of 850 mg/l at station 10 during September 2014. The chlorine content was low at upstream stations and increased at downstream stations. Sulphate is one of the major anions occurring in natural water. It may enter natural water through weathering. Sulphate concentration was ranging from 0.2 mg/l to 0.5 mg/l from upstream station to downstream station.

The compounds of nitrogen are of great importance because of their role in the life process of all organisms. Ammonia is present naturally in surface water and wastewater. Ammonia nitrogen of the Kali river varies from a minimum of 4.42 mg/l at upstream stations of post-monsoon part during the year 2013 to a maximum of 6.2 mg/l at stations 7 to 10 during September 2014. The determination of nitrogen is important particularly in drinking water as it has an adverse effect on health above a certain concentration.

The present investigation of Kali river nitrate value varies from minimum of 10 mg/l at station 4 during summer season of the year 2013 to maximum of 20 mg/l at station 10 during the month of September 2014. The Kali river water showed very low concentration of nitrate during the study period indicates good quality of water. In the present study of Kali river no detectable nitrite amount was found during the period of investigation infers good quality of water for drinking purpose. In the present study, Kali river water quantity of phosphate not detected throughout the period of investigation indicates good quality of water along its river stretch.

Hardness of Kali river water in the present study ranges between a minimum of 60 mg/l at station 1 in rainy season and maximum of 2120mg/l at station 10 during summer season of the year 2014. In our present study, it is observed that the concentration of sodium and potassium in Kali river varies from minimum of 40 mg/l at station 1 during winter season of the year 2014 and maximum of 126 mg/l at station 10 of summer season of the year 2014.

Iron in water occurs mainly in Fe(II) and ferric (Fe III) states. In Kali river, iron seasonal concentration ranges from a minimum of 0.1 mg/l in upstream station to 0.68 mg/l in downstream station of the period. Kali river is well within the permissible limit for drinking water (0.3 mg/l – WHO standard). BOD is defined as the amount of oxygen required by the microorganisms while stabilizing biologically decomposable organic matter in waste water under aerobic condition. The volume of BOD of Kali river is very low except in the month of September and hence indicates no sign of pollution due to organic pollution. The physico-chemical parameters of Kali river were found to be within the permissible limits of standard quality of drinking water.

Suggestions:

- People must be educated and awareness is created regarding the importance of water and impact of water pollution on living beings.
- Human activities like mass washing of clothes, automobiles and domestic animals in the river waters should be avoided.
- Sewage material should be treated before dumping to the river water.
- Plantations should be encouraged on the banks of the river stretch since it prevents soil erosion and siltation.
- There must be continuous monitoring of river water quality.
- The Government / Administration must strictly enforce the environmental regulations.