

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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A PROJECT REPORT

On

**STUDIES ON HEAVY METAL CONCENTRATION AND
EUTROPHICATION IN POLLUTED LAKES AND MITIGATION
THROUGH BIOREMEDIATION**

**“A CASE STUDY ON BYRAMANGALA LAKE, RAMANAGARA
DISTRICT”**

(Sponsored by KSCST, IISC, Bangalore)

PROJECT (CVP87)

In the partial fulfillment of award of Degree to B.E (CIVIL)

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ABSTRACT

The domestic waste water entering into the water bodies is the main cause for the pollution. The heavy inflow of the pollutants into the water bodies directly affects the aquatic life, human health, loss of soil fertility and reduction in the yield. Due to rapid urbanization and industrialization, encroachment of land and change in land use pattern is affecting the sources for replenishment of water bodies.

Byramangala reservoir was built by the British in 1942 as a result of impoundment of Vrishabhavathi stream south of Bangalore City. Its exact location on the map is on latitude $12^{\circ}47''\text{N}$ and longitude $77^{\circ}20''\text{E}$. The total area of the lake is 412 hectares. The lake water is being utilised for agriculture, fisheries and for other various vegetation purposes. Until in the late 60's, the Byramangala water quality was of the highest purity. Since then the water quality has been receding to a point where the reservoir is highly polluted as it receives both industrial effluents and untreated sewage from the Bangalore Urban Area.

The analysis of reservoir water quality is done by collecting six surface water samples from various locations of the Lake. Each sample was analyzed for 25 parameters such as pH, turbidity, total hardness, Calcium, Sulphates, Flourides, Iron, Chromium, Zinc, Magnesium, Total nitrogen, Total phosphorous, BOD, COD, etc. The analysis was carried out as per the IS standards. It was observed that the Lake is getting polluted over time. The lake was initially mesotrophic which was gradually changed to hyper-eutrophic; perhaps due to the increased Total Nitrogen and Total phosphorous content and various anthropogenic activities in the catchment. The values of Total Nitrogen, Total Phosphorous and Chlorophyll A were well above the permissible limits which indicated that the Lake is severely affected by Eutrophication. The results indicate that both Carlson's and Indiana TSI can be applied to Indian lakes as both gave the same TSI of Byramangala Lake. It was concluded that both the systems can be very well used to assess the Eutrophication status of a given water body.

Once the TSI and sources of pollution were qualitatively and quantitatively assessed, the Bioremediation techniques such as Anoxic Bioremediation Technology (ABR), Green Bridge Technology, Soil Scape Filter etc. to be applied were suggested that can be implemited.