IV STUDY AREA

Plate No. 1

Map of India
PLATE NO. 2

Map of India Showing Study Area
PLATE NO. 3

Map of Maharashtra Showing Study Area

PLATE NO. 4

Map of Sangli Showing Study Area
PLATE NO. 5

Map Showing Sampling Sites on River Krishna at Sangli.
4.1 The topographical setting of River Krishna.

The river Krishna is one of the major river in southern region of India which flow through three states that is Maharashtra, Karnataka and Andhra Pradesh and finally joins to Bay of Bengal at Machalipattan. The river Krishna Originates at Dhom Mahabaleshwara ranges in Satara District at a Height of about 1220 meters. It flows over Deccan Plateau from western crest to east crest. The rivers Venna, Koyana, Gayatri and Savitri also originate at Mahabaleshwara. At first it runs south then towards east and finally southeast. In Maharashtra it flows from north to South.

The total length of river Krishna is 1280 kms. In Maharashtra it measures about 282 kms. The total area of Basin Measures 2,59,000 sq. kilometers, while in Maharashtra its basin is about 28,700 sq. kilometers. At origin river Krishna lies between 17° 59’N latitudes and 73° 38’ E latitude. The River Krishna is fed by number of tributaries out of them main three are River Koyana, River Warana And Panchganga, which originates at Mahabaleshwara, Patherpunj of Satara district and Prayag Chikhali Respectively. All Tributaries are on the right bank. The river Koyana Joins at Karad of Satara District, River Warana merges into river Krishna at Haripur of Sangli District while the River Panchganga Joins Near Kurundawad of Kolhapur District.

4.2 Climate: -

The climate of Krishna basin is typical wet–mансoonal climate. The rainfall distribution in the Krishna basin is varying from place to place. In the region of origin annual average rainfall has recorded above 500 to 600 cm. mostly during month of June to September. While in the south (lower part of the basin) the average annual rainfall is less than 200 to 300 cm. The average
maximum temperature recorded in the valley is 25 $^\circ$C to 30 $^\circ$C. While average minimum temperature is about 10 $^\circ$C to 15 $^\circ$C

4.3  Geology: -

The only geological formation in Krishna basin is the Deccan Traps. The Deccan lava flows & is found usually in the form of horizontal bedded sheets. The lava flows are more or less uniform in composition corresponding to Dolerite or basalt, which is dark gray or greenish gray in colour. The laterite soil occurs in the upper part of the Krishna basin. The rich bauxite layers are found on the top of the Bhimashankar, Mahabaleshwar, and Pachagani Sada. The rich black soil or Regur soil occurs in the lower part of the Krishna basin while towards mouth Costal Alluvium soil occurs.

4.4  Administrative regions of the river Krishna: -

River Krishna runs through Satara, Sangli & Karnataka districts. The villages like Wathar, Targaon, Koparde, Bhilwadi, Sangli, Ankali & Manjari are situated at left bank of this river, while the villages like Dhamner, Kashil, Karad, Bahe, Walwa, Audumbar & Nrusinhawadi are situated on the right bank of this river.

4.5  Krishna Irrigation Project: -

The Krishna irrigation project involves construction of Dhom Dam & the K. T. weirs (Kolhapur Type Weirs) across the river. These K. T. weirs are situated near the villages like Kashil, Koparde of Satara district, Bahe,
Borgaon, Nagthane, Moujedigraj, Haripur of Sangli district & Mhaishal, Hasur, Nrusinhawadi of Kolhapur district.

4.6 Sources of pollution:

The water of river Krishna has major pollution sources emanating from 3-4 major sugar factories. The water released from Koyana dam in dry period contributes to major flow of water in Krishna River. Sangli city, which is close to river Krishna, is a commercial city. It is headquarter & is one of the prosperous growing towns in Southern Maharashtra. It is an important educational commercial city. The source of water supply for Sangli town is Krishna River, which flows through the town. A K. T. weir has been constructed for storage of water. The topography of Sangli town is such that the river Krishna flowing through the town divides the town in two parts. There is Sheri Nala on the north side of main city & it flows from northeast to west & divides the town in two different segments. There is another nala called as Haripur nala, which is on southern side of the city & flows from east to west. There is a bridge between Haripur nala & Sheri nala, which passes through the center of the town & is in the east-west direction. The topography of the town is very flat with variation of ground level of only about 20 meters.

The major pollution point is Sheri nala which joins the river at upstream of K.T. weir. Sheri nala contributes flow from northern part of the town & pollutes river Krishna. In addition surface drains at Jejuri Maruti Mandir & Amardham carry sewage to the river. As mentioned earlier the sewage of Sangli town flows to the river Krishna through different nalas.
In Sangli town there are two industries Viz. Vasantdada Sahakari Sakhar Karakhana Ltd. Sangli & Madhavnagar Cotton Mill & one Industrial Estate having mostly Engineering Industries. For last six years, Madhavnagar Cotton Mill is not in operation. There is one cement factory, Tile factory, Technical Institute etc. There is zero discharge from the industrial estate, as all industries are only engineering industries.

**Objectives of the present work:**

From the description given above it is evident that the effluents from sugar factories, distillery are the main sources of pollution of water in river Krishna. The effluents from the sugar factory used to irrigate the sugar cane & excessive fertilizers used in the sugar fields are carried to the streams & contribute to the pollution. The principle objectives of the present study are therefore to;

- Determine physical, chemical & biological characteristics of water.
- Evaluate the quality of water of river Krishna during different seasons of the year.
- Assessment of suitability of water for various purposes such as drinking, industrial, irrigation & fisheries.
- Determination of pollution sources.
- Identified changes in water chemistry & biology.
- Establish patterns, if any in variation of water quality.
- Recognize microbial pollution if any.
- Establish pattern, if any in over all conservation of ecosystem.
- Suggest some low cost remedy to control water pollution.

In order to utilize a freshwater body it is very important to study the biotic and abiotic factor influencing the biological production of said water body. Research in this field is no doubt of indirect assistance but it will serve as a guideline to maximize the use of the productivity of water.

Thus in present investigation an attempt has been made to evaluate the important Physico-chemical parameters, biological parameters such as plankton, aquatic micro flora, macro flora of the River Krishna.

**Selection of Sampling Stations:**

The study was carried out by selecting six different sampling stations considering the source & type of pollution. The analysis was carried out for two years for a frequency of one month for each parameter.

Total ten K.T. weirs are constructed on the river Krishna in Maharashtra by public irrigation Department of Maharashtra Govt. These K.T. weirs are the best suitable sites for collection of water samples. The sites selected for sample collection are as follows;

a) Sampling station - upstream of Sheri nala at Sangli.
b) Sampling station - downstream of Sheri nala at Sangli.
c) Sampling station - upstream of K.T. weir at Sangli.
d) Sampling station – downstream of K. T. weir at Sangli.
e) Sampling station — upper region of Haripur before river Warana merges with river Krishna.

f) Sampling station — lower region of Haripur just after river Warana merges with river Krishna.
PLATE NO.8
SAMPLING SITE C

PLATE NO.9
SAMPLING SITE D
PLATE NO.10
SAMPLING SITE E

PLATE NO.11
SAMPLING SITE F
PLATE NO.12
River Warana merges into river Krishna

PLATE NO.13
Sheri Nala carrying Industrial and domestic waste at site B.