

C H A P T E R - I

I N T R O D U C T I O N

The Panchaganga river system is developed on the eastern flank of Sahyadri ranges. It lies within the Kolhapur district of Maharashtra and it is constituted of five nearest flowing streams namely, Bhogavati, Tulsi, Kasari, Kumbhi and Dhamini which meet the eastward flowing Kasari river at Prayag 12 Km. to north of Kolhapur city. The stream originate at about 900 m. to 800 m altitude and beyond Prayag the Panchaganga flows over broad plain at about 550 m altitude.

The Bhogavati and Tulsi rivers have dams constructed cross them near their source. The Radhanagari dam on the Bhogavati river has a reservoir with catchment area 108.80 sq.km., gross storage capacity of 236.79 million cubic meter with live storage capacity of 219.97 million cubic meter and dead storage capacity of 16.82 million cubic meter.

The Tulsi dam on the Tulsi river has catchment area 34.92 sq.km. gross storage capacity of 98.29 million cubic meter with live storage capacity of 91.92 million cubic meter and dead storage of 6.37 million cubic meter. Both rivers have wide alluvial floors and meet at Bid, after flowing about 60 to 80 kms. To the north of these rivers are Dhamani and Kumbhi rivers that confluence at Chougulewadi. The combined stream

later meet the Bhogavati river at Bahereswar. The Kesari river originate near Gayapur and flows south-east upto Dhanagarwadi about 25 Km. and then eastward for a stretch of 75 km. It is met by Bhogavati at Prayag. The lower reaches of the river beyond Bhogaon shows meanders.

This rivers have cut through a thick pile of Deccan basalts which represent the Kolhapur unit of Mahabaleshwar formation and the Panhala formation.¹

The Panchaganga river system have major pollution sources emanating from major sugar factories :

- 1) Bhogawati Sahakari Sakhar Karkhana Ltd. at Parite on the bank of river Bhogavati.
- 2) Kumbhi-Kasari Sahakari Sakhar Karkhana Ltd. at Kuditre on the bank of river Kumbhi.
- 3) Shri Datta Sahakari Sakhar Karkhana Ltd at Asule Porle on the bank of Kasari river.
- 4) Rajaram Sahakari Sakhar Karkhana Ltd. at Kasaba Bavada on the Bank of river Panchaganga.
- 5) Panchaganga river also receives effluents from Shivaji Udyamnagar. The industrial units include fabrication electroplating and automobile service centres.
- 6) Chhatrapati Shahu Mill - Textile Mill.
- 7) Jayanti Nala - The sewage retained behind this barricade

is pumped to a sewage treatment plant situated at Bavada. The excess of sewage goes into Panchaganga without any treatment.

Review of Literature :

India is one of the most polluted countries in the world today. According to report from Chairman of Central Pollution Control Board, India, about 7006.74 mld waste water is generated in Class-I cities of India; out of 50% is collected and only 37 % gets some kind of treatment.²

According to Haque and Sharma³ Indian Class-I cities were producing 900 million litres of sewage per day and only 1/3 portion of it was getting some kind of treatment. Due to domestic and industrial discharges a variety of chemicals have been moniterred in aquatic environment. These chemicals have been known to be mutagenic, teratogenic, enurotoxic and biocidal to various types of organisms including man.

In 1938 it was shown that water-hyacinth has a capacity to remove nitrogen and phosphorus from secondary sewage treatment effluent pond.⁴ Trivedi and Khomane (1985) studied the removal of nutrients from distillery waste, textile mill waste and metal ork waste by waterhyacinth⁵. India is bestowed upon great domain of water resources in the form of rivers, rivulets,

medium tanks minor tanks, percolated tanks, village tanks. It is estimated that present culturable water spread area of the country is about 2.3 million hectares⁶. The literature available on ground water quality, with the significant contributions in this regard being those by Hem⁷, Handa⁸, Adyalkar⁹, Sastri¹⁰, Viswanathai¹¹, Suryanarayan¹², and Ravi Prakash¹³. Acute toxicity of Zn shown by Hilmy¹⁴, Toxicity of Cd and Pb to some freshwater animals has been reviewed by Gadkari and Marathe¹⁵. Acute toxicity of copper and LC 50 values were studied by Mystus bleekeri by Gupta and Rajanesh¹⁶. Accumulation of metal residue of Hg, As, Pb, Cd and Se in fish were studied by Walsh¹⁷.

Chemical Treatment of River Water :

Now-a-days water pollution has become a burning problem. People are becoming aware about impact of water pollution caused by rapid urbanization and industrialization. Water pollution controlled Board Authorities and various voluntary organization are working hard to control water pollution and to achieve goal of clean environment.

Kolhapur city is one of the highly industrialized city has number of sugar factories, and the individual effluent treatment plants have become unmanageable and uneconomical to small scale industries. As it has become difficult for them to achieve the standards prescribed by Pollution Board authorities.

Investigations are needed to assess the pollution load contributed by these industries.

All industries have provided neutralization and chemical/Biological oxidation for their effluent treatment schemes. To achieve good efficiency from any type of treatment plant adequate know-how proper maintenance is necessary. Therefore, it is decided to assess the existing treatment plant efficiency under well operated conditions.

The Study includes -

- (1) Collection of water from various sources and municipal waste-data.
- (2) Chemical treatment of water
 - i) to study effect of coagulation of water
 - ii) to study removal of Hardness of water,
 - i ii) colour removal
 - iv) odour reduction.