International Scientific Journal of Engineering and Management (ISJEM) ISSN: 2583-6129
Volume: 04 Issue: 04 | April – 2025 DOI: 10.55041/ISJEM02638
An International Scholarly || Multidisciplinary || Open Access || Indexing in all major Database & Metadata

Water Quality Assessment of River Patalganga

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Abstract - The Patalganga River, flowing through the Western Ghats, is an important natural water source for the region. Over the years, its banks have attracted many industries because of the easy availability of raw water. However, rapid industrial growth has led to significant pollution, affecting the river's water quality. Waste from factories and other human activities has altered its physical, chemical, and biological properties, making it less suitable for various uses. The deterioration of the river is a growing concern, as it directly impacts the people and environment that depend on it. To assess the extent of pollution, river water was tested for various parameters. The analysis showed that several factors, such as turbidity, hardness, color, and PH, Temperature, Clorine Content, Electric Conductivity, were above the recommended safe levels. High turbidity, or cloudiness of water, indicates the presence of suspended particles, making the water difficult to purify. Increased hardness means the water contains excess minerals, which can affect its taste and usability for household chores. The presence of unnatural color suggests contamination from industrial discharge or other pollutants Pollution in the Patalganga River not only affects human health but also disrupts the local ecosystem. Aquatic plants and animals depend on clean water to survive, and the introduction of harmful substances can lead to a decline in fish populations and other wildlife. If the pollution continues to rise, it could permanently damage the river's biodiversity. Additionally, polluted water can seep into the ground, contaminating wells and underground water sources that many people depend on for drinking and farming. To determine whether the river water is safe for drinking, its quality was compared to the standards set by IS 10500. This standard provides guidelines for safe drinking water in India, ensuring that it does not pose risks to human health. Additionally, WHO (2006) guidelines were referenced where necessary to understand the global recommendations for water safety. The findings suggest that immediate steps are needed to improve the water quality.

***Key Words*:** Turbidity, Hardness, pH, Temperature, Electric Conductivity, Chlorine content

1.INTRODUCTION

Rivers are the prime resources for the sustenance of life. River water plays an important role in the development of various sectors, viz. agricultural, transportation, industry, public water supply etc. It's a fact that 70% of water in developing economies is being soiled gradually due to discharge of domestic and industrial effluents in various water resources. Distribution of treated water is essential to overcome the water borne diseases and contamination from anthropogenic sources. Contamination of fresh waters has become a matter of great concern due to heavy industrialization and urbanization of states, adaptation of modern agricultural practices in nearby riverine or aquatic systems. Water has a unique property of dissolving and transporting substances and gets easily contaminated There are mainly two types sources of pollutants Point sources and

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Non-Point sources. Apart from the point sources, the non-point sources are also major contributors of pollution contaminating the riverine systems and damaging aquatic ecology

In the assessment of primary stage, river pollution is mainly defined by physiochemical and microbiological parameters. However, several parameters viz. pH, temperature, colour, hardness, Clorine Content, Electric Conductivity, and have been widely used for the assessment of drinking and surface waters quality. These parameters act as water quality indicators. The secondary stage of river pollution is characterized mainly by trace metal contents with other pollutants viz. pesticides, emerging contaminants (pharmaceuticals, cosmetics) organophosphates and newly emerged plastics contents .Due to public ignorance of environmental health of river, water and sediments are being contaminated by several ways through unregulated or regulated viz. disposal of anthropogenic waste in low lying areas, unplanned application of agrochemicals in river basin plantation, discharge of untreated sewage to rivers through small channels etc. which polluted the river system through bioaccumulation of contaminants in surface water and upper bed sediments. And this environmental degradation causes serious health hazards through bio accumulation and bio-magnification which is quite prominent Heavy metals are the hazardous substances due to their insistent nature as non-degradable, toxicity, affinity to accumulated in water and sediments and also get biomagnified. Metals entering into the water body get transported from one place to another and join sediments as the ultimate sink. Transportation dynamics of sediments in fluvial systems depends on crystal deformation and climatic behavior of environment. This largely involves weathering, erosion, transportation and deposition processes which results to enhance the understanding about the chemistry and fate of contaminants in river sediment. Farming runoff includes contaminants which enter in riverine system, may lead to be toxic for plants and animals.

II. OBJECTIVES

1. Find Pollution: Check for harmful substances like chemicals or waste in the river.

2. Protect Wildlife: See how the water quality affects fish and other animals living in the river.

3. Make Water Safe: Ensure the water is safe for drinking, swimming, and farming.

4. Track Changes: Monitor how the water quality changes over time.

5. Follow Rules: Make sure the river water meets health and environmental standards.

III. METHODOLOGY

A. *Problem statement:*

- Temperature Test on Water
- pH of Water
- Turbidity Test on Water
- Colour Test on Water
- Hardness Test on Water
- Chlorine Content test on Water
- Electric Conductivity of Water

Sample Stations	Description
1	Khopoli gagangiri Maharaj math
2	Khopoli fata
3	Sawroil khalapur
4	Kharsundi
5	Lohop
6	vashivali
7	Rasyani
8	Gulsunde (Shiv temple)
9	Apta
10	kasar Bhat

Table 1: List of Water Sample collected Stations

B. *Results:*

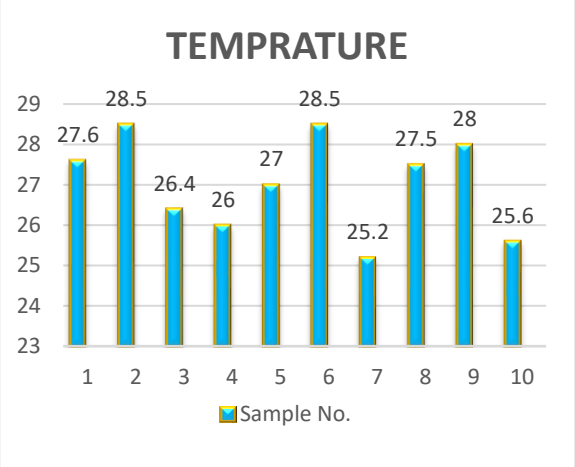

Fig.no. 1 Temperature test Reading

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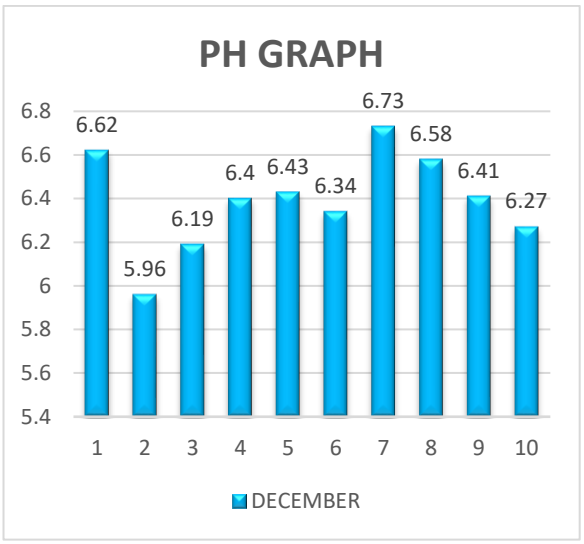

Fig.no. 2 PH test Reading

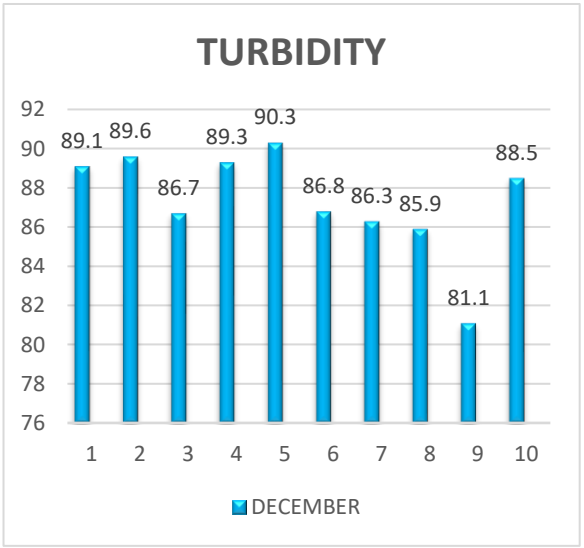

Fig.no. 3 Turbidity test Reading

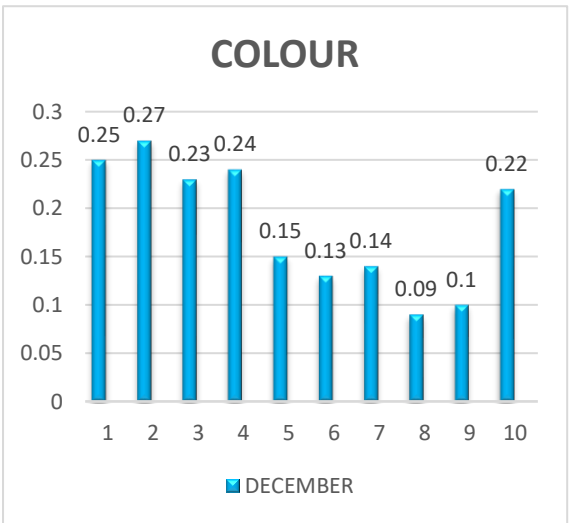

Fig.no. 4 Colour test Reading

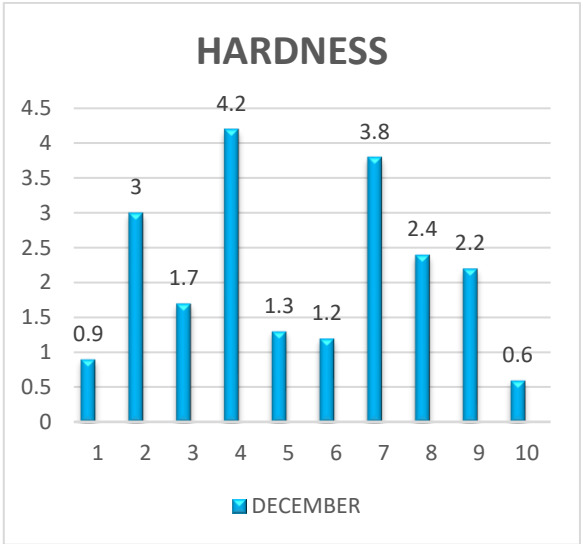

Fig.no. 5 Hardness test Reading

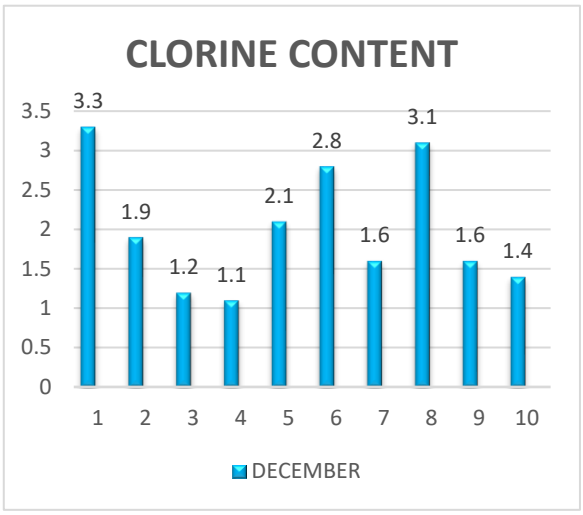

Fig.no. 6 Clorine content test Reading

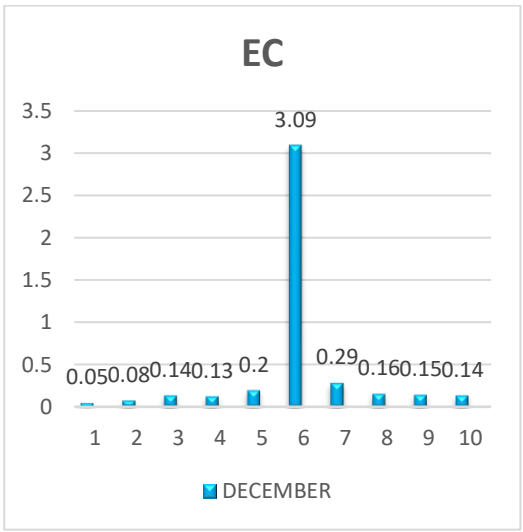

Fig.no. 7 Electric Conductivity test Reading

3. CONCLUSIONS

Based on the work presented, following conclusion can be drawn:

The water quality of the Patalganga River is influenced by both weather conditions and human activities. Although the pH and temperature remain within safe limits, other factors vary significantly. The river's flow is steadier than during the summer, which reduces the impact of excessive hardness, but pollutants continue to accumulate. Turbidity is lower than during the monsoon because there is little rain to wash waste into the river. However, pollution remains a serious concern, particularly in areas near monitoring stations six to ten, where many steel and dye factories are located. These industries often release untreated or poorly treated waste into the river, leading to contamination. Without heavy rainfall to dilute the pollutants, they remain in the water for extended periods, which can harm aquatic life and people who depend on the river. Unlike in the summer, where slow water flow increases hardness, or during the monsoon, when rain carries waste into the river, pollution in this period is mainly due to industrial waste lingering in the water. Further studies are needed to understand how the lower biological activity during this time affects pollution and the river's ability to recover. It is crucial to improve waste management and ensure industries properly treat their wastewater before releasing it into the river. Authorities must enforce strict regulations and conduct regular inspections to monitor pollution levels. If pollution continues unchecked, it could damage the river's ecosystem and pose health risks to local communities. Protecting the Patalganga River is vital for both the environment and people. Efforts to reduce pollution, monitor contamination sources, and ensure industries follow proper waste disposal methods will help maintain water quality. Public awareness and stringent environmental policies are necessary to prevent further degradation. By acting responsibly, industries, local authorities, and citizens can work together to safeguard the river. Proper planning and strict enforcement of pollution control measures will ensure that the Patalganga River remains a vital resource for future generations.

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