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Water Quality Assessment of Godavari River, Nashik City

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Abstract: *As the main source of water for Nashik city is River Godavari. It becomes a priority to keep Godavari River clear and free from impurities. The river Godavari is second largest river in India, which is 82 percent polluted considerably. Rapid growth of population and its repetitive activities along the river pose a concerned impact on the river system. The water quality and quantity are under constant pressure by the presence of different human activities like removal of vegetation, industrial activities, and encroachment, domestic and religious activities. These all activities resulted in degradation of water quality. These all problems are largely concentrated in and around urban areas. Physico- chemical parameters like pH, turbidity, BOD, COD, DO, TDS havebeen analyzed by standard method. The overall valuesshowed good water quality at upper stream in the study area, but as it enters in urban area water quality becomes deteriorate at upper stream in the study area, but as it enters in urban area water quality becomes deteriorate By conductingabove mentioned test on godavari river we will get to know the various location across its journey, where the river godavari gets polluted. And necessary meaures can be implmented to avoid pollution of river Godavari.*

Keywords: Godavari river, pH, chemical oxygen demand, biological Oxygen demand, turbidity, dissolved oxygen, total dissolved solid

I. INTRODUCTION

Water is an important natural resource and precious national assets. It forms the chief constituent of ecological system. Everyone knows that water is essential to `and personal usage. Big amount of water is often required for industrial and commercial uses such as fisheries, hydropower generation. In some parts of the country, large quantities of water for irrigation are necessary to support agriculture.Watersources may be mainly in the form of rivers, lakes, ground water etc. The availability and qualityof water either surface or ground, is getting deteriorated due to some important factors like increasing human activities at the water bodies, sewage discharge, Agricultural effluents, industrialization, urbanization etc. Surface water pollution with chemical, physical and biological contaminants by anthropogenic activities is of great environmental attention all over the world. Rivers play an important role in carrying off municipal and industrial wastewater and run-off from agricultural land. Rivers are one of the most susceptible water bodies to pollutants. Rivers are the main water sources for domestic, industrial and agricultural irrigation purposes in a region. River water quality is one of important factors directly concerning with health of human and living beings. Therefore, it is important to have reliable information on characteristics of water quality for effective pollution control and water resource management. (Bhukya Ramakrishna,2017)From time immemorial, the rivers are said to be the lifeline for living beings, as all types of developments, directly or indirectly relate to them. That is why all the oldest civilizations developed at the bank of rivers e.g. Indus Valley at Indus, Egypt at Nile, Babylon at Tigris, Mesopotamia between Euphreatusand Tigris. Even the old cities were located at the bank of rivers considering river as lifeline. Being so close to human activities, rivers are sink of terrestrial and aquatic pollution. Water contamination weakens or destroys natural ecosystems that support human health, food production and biodiversity. Livelihoods such as agriculture, fishing and animal husbandry are affected by poor

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water quality. Biodiversity, especially of fresh water ecosystems is under threat due to water pollution. The most polluting source for rivers is the city sewage and industrial waste

II. LITERATURE SURVEY

S.E Pote et.al (2012) have studied assessment of surface water quality of Godavari river at Aurangabad
According to them Rivers are under increasing stress due to urbanization and other anthropogenic activities, leading to their overexploitation and degradation. Godavari originates near Triambak in the Nasik district of Maharashtra, and flows through Madhya Pradesh, Karnataka, Orissa and Andhra Pradesh. Although its point of origin is just 80 km away from the Arabian Sea, it journeys 1465 km to fall into the Bay of Bengal. Like most other rivers, domestic pollution is the biggest polluter of the river Godavari, accounting for 82% of total pollution, whereas industrial pollution accounts for about 18%. The study covers 78 km of the river starting from the Kaigaon Toka to Shahagad. Six locations were selected for collection of water samples from the river and were analysed for water quality parameters in the environmental laboratory of Maharashtra Pollution Control Board (MPCB),Aurangabad. This data as well as the data from the Central Pollution Control Board were used to compute the National Sanitation, Foundation Water Quality Index (NSFWQI), which is generally applicable in USA and India. The results of the NSFWQI of Godavari River indicates its water quality as bad-medium over the stretch. Based on the results, the existing conservation measures have been reviewed and additional measures are suggested. The study concludes that major stress is industrial effluents and domestic pollution

Jyotiprakash Girdharilal Nayak et. al (2016) had done the study which covers about 24 km of Godavari river starting from Gangapur dam to Dasak village. Fifteen locations were selected for collection of water samples from the river and water samples were analysed for water quality parameters. It was observed that untreated or partially treated sewage alongwith industrial wastewater is entering into the river at twelve prominent locations in the study stretch. This data was used to compute the value of National Sanitation Foundation Water Quality Index(NSFWQI), mostly applicable in USA and India. The results of NSFWQI of Godavari river indicates that its water quality as 'Good' (70- 90) from Gangapur dam to Someshwar, 'Bad' (25-50) from Aanadwalli bridge to Samtanagar and 'Very bad' (0-25) at Agartakli STP downstream. Based upon the results, the existing conservation measures have been reviewed and additional measures are suggested. The study concludes that infiltration of sewage is the main precursor of Godavari river pollution and available sewage treatment facilities in the
region are inadequate

Bhukya Ramakrishna(2017) et.al have carried out systematic study to assess the water quality of Godavari River at Basara. Water samples from seven sampling stations were collected and physical and chemical parameters were analyzed by the standard methods. In this study Water Quality was determined on the basis of twelve parameters like PH, Electrical Conductivity, Alkalinity, Hardness, TDS, TSS, TS, DO, BOD, COD, Fluorides, Nitrates. The pollution level over a period of time is increasing on the river water mainly due to industrial and other waste waters are directly discharge in the river. The aim of the study was to examine the water quality of the Godavari River and to evaluate the impact of such contaminated water.

Prof.P.M.Pathak et.al (2016) carried the study assess the impact of mass bathing on water quality of river Godavari River during Kumhmela 2015 at Nasik. The Godavari river water samples collected from three different selected sites at different times of the day. The physico-chemical and biological parameters were analyzed such as Dissolved Oxygen (DO), Biological Oxygen Demand (BOD), pH, Chlorides, Conductivity, Turbidity, Hardness and Most Probable Number (MPN). Few parameters were within the permissible limit but it is also observed that water is not fit for drinking purpose. The parameters were compared with BIS standards (2012). The turbidity and MPN was also observed more than permissible limit

III. MATERIALS

pH Meter: A pH meter is a fundamental tool used in scientific research, industrial processes, environmental monitoring, and various other fields to measure the acidity or alkalinity of liquids accurately. Operating on the principle of detecting the concentration of hydrogen ions (H+) in a solution, pH meters utilize a pH electrode and a reference electrode to generate a voltage proportional to the pH value. Calibration of pH meters is essential for maintaining accuracy, achieved

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by immersing the electrode in standard solutions with known pH values. The applications of pH meters are diverse, spanning environmental monitoring of water quality in natural ecosystems and wastewater treatment plants, to industrial processes in chemical manufacturing and food production, as well as agricultural soil testing for optimal crop growth.

DO Meter: A Dissolved Oxygen (DO) meter is a vital instrument utilized in groundwater quality testing to measure the concentration of oxygen dissolved in water. This measurement is crucial as it provides insights into the health and stability of groundwater ecosystems, particularly in assessing the availability of oxygen to support aquatic life. DO meters typically consist of a probe equipped with a sensor that detects dissolved oxygen levels and converts them into electrical signals, which are then displayed on the meter's screen. By immersing the probe into a groundwater sample, the meter provides real-time data on oxygen levels, allowing researchers, environmental scientists, and water quality professionals to monitor changes over time and identify potential sources of contamination or pollution. Low DO levels in groundwater can indicate hypoxic conditions, which may harm aquatic organisms and disrupt ecosystem balance. Therefore, DO meters play a critical role in assessing groundwater quality, guiding conservation efforts, and informing resource management decisions. It's essential to calibrate and maintain DO meters regularly to ensure accurate and reliable measurements, thereby supporting effective groundwater quality monitoring and protection initiatives.

Digital Turbidity Meter: A digital turbidity meter is a crucial tool employed in groundwater quality testing to measure the clarity or cloudiness of water caused by suspended particles. This instrument utilizes light scattering principles, where a light source emits a beam of light into a water sample, and a photodetector measures the intensity of light scattered by particles within the sample. The turbidity meter then converts these measurements into turbidity units, providing a quantitative assessment of water clarity. In groundwater quality testing, the use of digital turbidity meters facilitates efficient and reliable assessment of water clarity, supporting informed decision-making and management of groundwater resources. Regular monitoring of turbidity levels helps ensure the safety and sustainability of groundwater supplies for various uses, including drinking water, irrigation, and industrial processes

BOD Meter: BOD, also called biological oxygen demand, is the amount of dissolved oxygen needed (i.e., demanded) by aerobic biological organisms to break down organic material present in a given water sample at certain temperature over a specific time period

Fig:1 (turbidity Meter)

IV. RESULTS

4.1 Sample Testing Results -:

Sr. No.	Sample station	Reading (NTU)				
		pH	Turbidity	TDS	DO	COD
1	Kushawart	6.61	1	136	7.8	10
2	Gangapur Dam	6.91	2	205	7.8	10
3	Navshya Ganpati	7.09	2	196	7.4	13
4	Ram kund	7.25	1	213	7.6	14

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V. CONCLUSION

In the study water quality of Godavari river in Nashik was evaluated, to evaluate water quality of Godavari river 4 sampling stations were determined,and 6 parameter were selected.

The physico-chemical analysis of water samples indicates that the river water sample has alkaline properties.

As pollutants are added in the river water at various stations, it has increased the biological oxygen demand

TDS parameter showed good value at S1 hence the water is excellent and suitable for drinking

Water quality parameters pH, DO, BOD were used to calculate water quality index for evaluation of water quality

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