



# Physico-Chemical Parameters of Water-A Review

Vighe Sanket T<sup>1</sup>, Shinde Dattatraya L<sup>2</sup> Sherkar Gayatri C<sup>3</sup>,  
Sunsule Akshay B<sup>4</sup>, Kamble Vishal P<sup>5</sup>

<sup>1</sup>(Civil Department, Anantrao Pawar College of engineering/ Pune University, India)

<sup>2</sup>(Civil Department, Samarth Polytechnic college / Mumbai University, India)

<sup>3</sup>(Civil Department, Matoshri College of engineering/ Pune University, India)

<sup>4</sup>(Civil Department, Samarth Polytechnic college / Mumbai University, India)

<sup>5</sup>(Civil Department, Samarth Polytechnic college / Mumbai University, India)

**Abstract :** Due to increase population, advanced agricultural practices, industrialization, man-made activity, water is being highly polluted with different contaminants. In present situation, the waterway water has become wastewater because of removal of city squander through which it streams. Water is a vital resource for human survival. His accessibility of good quality water is an essential component for forestalling infections and improving personal satisfaction. It is necessary to know details about different physico-chemical parameters such as color, temperature, total dissolved solids, Total hardness, and pH, dissolve oxygen, chemical oxygen demand, used for testing of water quality.

**Keywords:** Agricultural Runoff, BOD and COD, Domestic Waste, Heavy Metals, Industrial Effluent

## I.Introduction

River water finds multiple uses in every sector of development like agriculture, industry, transportation, aquaculture, public water supply etc. In addition, since old times, river waters have also been used for cleaning and other domestic purposes. The developing issue of corruption of our waterway biological system has required the observing of water nature of different streams everywhere on the nation to assess their creation limit, utility potential and to plan restorative measures, Rivers and their catchments are highly important parts of the natural heritage. Rivers have been utilized by mankind for thousands of years to the extent that few of them are now in their natural condition. Aquatic systems worldwide are reported to be much polluted due to untreated sewage disposal and industrial effluents being disposed directly into the rivers.

The water issue is a worldwide marvel, and isn't limited to any one country. Water contamination has been the unavoidable result of the human's ground-breaking want for improvement of expectations for everyday comforts, through expanding endeavors and exercises showing as weighty industrialization and steady urbanization prompting reformist sea-going framework contamination. Person really relies upon sustainable new water for drinking, water system of yields, and modern uses too for creation, transportation, diversion and garbage removal. In numerous areas of the world, the sum and nature of water accessible to address human issues are now restricted. The hole between freshwater organic markets will augment during the coming century due to environmental change and expanding utilization of water and expanding populace. The adjustment in water quality likewise differs because of an adjustment in synthetic creation of the basic silt and spring. Around 33% of the drinking water necessity of the world is gotten from surface sources like streams, dams, lakes and waterways. The substance and physiological cycle of organic entity includes usage of water in some structure or the other. Water assumes a fundamental job in a few life exercises... It has become our prime responsibility to maintain the quality of water from such water samples from rivers and lakes creates an excellent platform to the study of various physico-chemical parameters of water namely pH, turbidity, total dissolved solids (TDS), hardness, chemical oxygen demand (COD), biological oxygen demand (BOD). The physicochemical properties will likewise help in the recognizable proof of wellsprings of contamination, for leading further examination on the eco-biological impacts and furthermore for starting important strides for healing in case of polluted water bodies. In India, many researchers have worked on physicochemical and biological characteristics of reservoirs and river.

## II.Literature Review

Physico-synthetic boundary study is vital to get careful thought regarding the nature of water and we can contrast consequences of physicochemical boundary esteems and standard qualities. The broad writing survey was done by alluding standard diaries and meeting procedures. The significant work completed by various scientists is summed up underneath:

1.1 S. N. Thitame and G. M. Pondhe (2010) have considered, in present examination an endeavor was made for appraisal of Seasonal Variety in Physicochemical Attributes and Quality of Pravara River Water for Irrigation during year 2008..that the vast majority of the physicochemical boundaries of waterway water at five chose locales show moderate variety in their focus for all seasons. Anyway site 3 and 4 stands proof of release of waste water from the city in the water-way. This understudy showed the nature of water for water system in the study region. The Sodium assimilation proportion and Residual sodium carbonate esteems show great water quality for water system. Anyway at site 3 and 4 the estimations of Kelly's record and Soluble Sodium Percentage surpass their principles in rainstorm season showing farfetched nature of water for water system.

1.2 P. J. Puri, M. K. N. Yenkie, et al (2011) have examined water quality record (WQI) has been determined for various surface water assets particularly lakes, in Nagpur city, Maharashtra (India), for the meeting January to December 2008; including three seasons, summer, winter and stormy season. Inspecting focuses were chosen based on their significance. Water quality list was determined utilizing water quality file adding machine given by National Sanitation Foundation (NSF) data framework. The determined (WQI) for different considered lakes indicated reasonable water quality in storm season which at that point changed to medium in winter and poor for summer season. Gorewada Lake indicated medium water quality rating in the entire season aside from storm season. Futala, Ambazari and Gandhisagar lake has additionally declined in stylish quality over past decade following intrusion of sea-going weeds, for example, hydrilla and water primrose, so the motivations to import water quality change and measures to be taken up as far as surface water (lakes) quality administration are required.

1.3 Patil. P.N et al(2012) examined "Physico-substance boundaries for testing of water" People on globe are under enormous danger because of undesired changes in the physical, synthetic and natural attributes of air, water and soil. Because of expanded human populace, industrialization, utilization of composts and man-made movement water is exceptionally contaminated with various unsafe pollutants. Normal water defiles due to enduring of rocks and filtering of soils, mining handling and so forth It is important that the nature of drinking water ought to be checked at standard time stretch, on the grounds that because of utilization of sullied drinking water, human populace experiences shifted of water borne illnesses. The accessibility of good quality water is a fundamental component for forestalling sicknesses and improving personal satisfaction. It is important to know insights concerning distinctive physico-synthetic boundaries, for example, shading, temperature, sharpness, hardness, pH, sulfate, chloride, DO, BOD, COD, alkalinity utilized for testing of water quality. Substantial metals, for example, Pb, Cr, Fe, Hg and so forth are of extraordinary concern since they produce water or persistent harming in amphibian creatures. Some water investigation reports with physic-chemical boundaries have been given for the investigating boundary study. Rules of various physic-compound boundaries likewise have been given for looking at the estimation of genuine water test.

1.4 Mane A. V. et al (2013) considered "Water quality and dregs investigation at chose areas of Pavana waterway of Pune locale, Maharashtra" Water contamination is one of the major worldwide natural issues. It is an intense issue practically in every significant waterway and water supplies in India. Water contamination is expanding and getting serious step by step and representing an incredible danger to human wellbeing and other living life forms. There is developing worry on the decay of ground water quality due to geogenic and anthropogenic exercises. Present examination focuses on knowledge about the degree of foreign substances of surface water, groundwater and dregs investigation of chose areas of Pavana waterway of Pimpri-Chinchwad territory of Pune locale. An endeavor has been made to survey the water quality, dregs and weed examination of the examples. A higher estimation of TDS was seen at groundwater site G4 with 834.27 mg/l while it was lower at surface water site 1 by 65.12 mg/l. Broken down oxygen substance of the water tests was noticed very well in cutoff yet it was lower with 1.6 mg/l at surface water site 4 while higher at surface water site 2 with 5.23 mg/l. In the current investigation, most elevated estimation of COD was seen by estimation of 120 at surface water site S4 while was least with just 64 mg/l at groundwater site G4. True to form groundwater tests indicated higher estimations of hardness content when contrasted with surface water tests of Pavana waterway. Nickel content was discovered to be available at all locales with a scope of 22 to 40 mg/kg. There is earnest requirement for more delegate tests to be utilized to go past fundamental appraisal as revealed in the current investigation for making fitting proposals.

1.5 Chandanshiv Navnath Eknath (2013) contemplated "The Seasonal Fluctuation of Physico-Chemical boundaries of River Mula-Mutha at Pune, India and their Impact on Fish Biodiversity" The paper features contamination status and effect on fish variety in Mula-Mutha River and dams on it. 72 species was accounted for in 1942 in this waterway. In any case, it has been seen that fish variety is steadily diminishing since most recent thirty years unprecedentedly, fundamentally because of complex human movement. Fish variety in halfway of stream is turning out to be uncommon and just four species have been accounted for structure dirtied stretch of waterway. The stream Mula-Mutha is moving through city territory and is one of the significant wellsprings of water body due to seven dams on it and its significance in agrarian, mechanical and advancement of Pune city. Its enduring nature underpins bounty of sea-going life including fish fauna. Around Sixty Three types of various fishes have been accounted for from upstream from January 2003-December - 2007 and just Four types of fishes in the downstream during winter and summer. The Mula-Mutha River and its feeders are profoundly dirtied because of homegrown and mechanical squanders. The physicochemical parts of water contamination of Mula-Mutha Rivers were investigated occasionally concerning following boundaries from July-2004 to May-2005. i. Water temperature, ii. pH, iii. Disintegrated solids, iv. Broken down oxygen, v. free carbon dioxide, vi. Sharpness, vii. Alkalinity, viii. Chloride content, ix. Nitrates, x. Phosphates, xi. Organic oxygen interest, xii) Chemical oxygen interest. It is seen that the degree of these boundaries was ideal during and winter and summer season

### III. Analysis Of Water Quality

Observing stream requires a wide range of boundaries to be examined. For the evaluation of water contamination status of the water bodies the accompanying water quality boundaries are dissected: 1) Temperature 2) pH 3) DO 4) BOD 5) COD 6) TDS 7) Turbidity 8) Heavy Metals

- III.1. Temperature: In a set up framework the water temperature controls the pace of every synthetic response, and influences fish development, proliferation and invulnerability. Exceptional temperature changes can be deadly to fish. The temperature is estimated by utilizing computerized thermometer the thermometer is plunged in the example and the temperature is recorded.
- III.2. pH: pH is the proportion of the sharpness of an answer of water. The pH scale regularly goes from 0 to 14. The scale isn't straight but instead it is logarithmic. For instance, an answer with a pH of 6 is multiple times more acidic than an answer with a pH of 7. Water with a pH below 7.0 is considered acidic while water with pH greater than 7.0 is considered basic or alkaline.
- III.3. DO: The assurance of disintegrated oxygen present in River is vital, on the grounds that amphibian existence of waterway is rely on DO and least 4 ppm DO is needed to endurance of sea-going life. To guarantee this, DO tests are performed. DO test is measure nearby of test assortment with the assistance of Digital Dissolve Oxygen Meter. Due to on location estimation of DO gives the precise outcome and on the off chances that DO is measure after some time-frame, at that point in light of temperature changes and environmental changes DO get changed.
- III.4. BOD: Monitoring stream requires various boundaries to be examined. The boundaries broke down in this examination include: BOD is a proportion of natural material pollution in water, indicated in mg/L. Body is the measure of broke up oxygen needed for the biochemical deterioration of natural mixes and the oxidation of certain inorganic materials (e.g., iron, sulfites). Normally the test for BOD is directed over a five-day time span
- III.5. COD: COD is another proportion of natural material pollution in water determined in mg/L. COD is the measure of disintegrated oxygen needed to cause synthetic oxidation of the natural material in water. Both BOD and COD are key markers of the natural soundness of a surface water supply. They are usually utilized in waste water treatment yet once in a while as a rule water treatment.
- III.6. 3.6. TDS: Total suspended solids are those solids which are held by the channel of 1 miniature m pores, and they are, thusly, likewise called as non-filterable solids. Their amount can be controlled by passing a known volume of sewage test through a glass fiber channel device and gauging the dry buildup (e.g., iron, sulfites). Typically the test for BOD is conducted over a five-day period.
- $$\text{TDS. (mg/l)} = \frac{\text{Mass of the residue}}{\text{Volume of sample filtered}}$$
- III.7. Turbidity: Determine turbidity as soon as possible after the sample is taken. Gently agitate all samples before examination to ensure are preventative measurement. Sample preservation is not practical, begin analysis promptly. Refrigerate or cool to 4°C, to minimize microbiological decomposition of solids, if storage is required. For best results, measure turbidity immediately without altering the original sample conditions such as temperature or pH. Turbidity is measure with the help of Digital turbidity meter. This calibrated with the help of standard NTU.
- III.8. Heavy Metal: The concentration of Cd, Co, Cr, Cu, Ni, Pb and Zn in each water sample were determined by using an Atomic Absorption Spectrometer (AAS: AAS: LABINDIA: AA- 7000) AAS required an acid digestion step prior to analysis by treating the samples with concentrated HNO<sub>3</sub>.

### IV. Conclusion

The water quality is dependent on the type of pollutant added. River water quality is poor in summer season than winter Season. This could be due to the fact that the microbial activity get reduced due to low temperature, thereby keeping DO level at a very satisfactory range during entire winter season. The physic-chemical parameters are varies with sources of pollutants.

### References

- [1] S. N. Thitameand G. M. Pondhe, - "Assessment of seasonal variation in physico-chemical characteristics and quality of Pravara River water for irrigation use in Sangamner, Dist Ahmednagar, Maharashtra", *Journal of Chemical and Pharmaceutical Research*, *J.Chem.Pharm.Res.*, 2(2):316-320, 2010.
- [2] P. J. Puri, M. K. N. Yenkie, S. P. Sangal, N. V. Gandhare, G. B. Sarote and D. B. Dhanorkar - "Surface water (Lakes) quality assessment in Nagpur city (India) based on Water quality index (WQI)", *Vol.4, No.1, 43-48* (2011).
- [3] Patil. P. N., Sawant. D.V, Deshmukh. R.N "Physico-chemical parameters for testing of water-A review" *P-ISSN 2349-8528E-ISSN 2321-4902IJCS* 2015; 3(4): 24-28© 2015JEZS.
- [4] Mane A. V., 2 PardeshiR. G., 3Gore V. R., 3Walave R. L., and 3Manjrekar S. S. and 3Sutar G. N "Water quality and sediment analysis at selected locations of Pavana river of Pune district, Maharashtra," *Journal of Chemical and Pharmaceutical Research*, 2013, 5(8):91-102.
- [5] Chitaranjan Dalai and Ramakar Jha "Review on Water Treatment Techniques Used for Riverbank Filtration" *International Journal of Civil Engineering Research*. ISSN 2278-3652 Volume 5, Number 3 (2014).

