

WATER QUALITY ANALYSIS IN OLD PALLAVARAM WETLAND, CHENNAI- A REVIEW

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ABSTRACT :

Water plays a significant role in maintaining the human health and welfare. Contaminants in the water can affect the water quality and consequently the human health. Clean drinking water is currently perceived as an essential right of people. Water quality refers to the chemical, physical, biological, and radiological characteristics of water and helps us to monitor the quality of water in the area and if also helps us to find out its purposes. The water nature of lake is affected by both characteristic and anthropogenic exercises. The nature of surface water fluctuate with geography of the specific zone, depth of water table, seasonal changes, composition of dissolved salts depending upon sources of salt and surface environment.

KEYWORD :

Water quality; physical and chemical parameters; standard values; anthropogenic exercises.

1. INTRODUCTION :

1.1.1 Significance of water :

Water is the most significant assets of nature. Water takes up an essential part in the advancement of a sound society. It is a

prime regular asset, an essential need and a valuable resource, without which no socio-economic developmental activities can sustain. This sustainable and unlimited asset yet is in a bad position nowadays. Rapid growth in population and urbanization act as a main driving force for altering local and regional hydrology. Water contains distinctive sorts of drifting, broke up, suspended and microbiological and in addition bacteriological polluting influences. Demand of water has been expanding consistently as its supply diminishing. Water shortage is expanding worldwide and weight on the current water assets is expanding due to developing interest of various parts, for example, residential, horticulture and modern and so forth. Thus the assessment of water quality has been a vital research lately. Water quality record is a standout among the best instruments to impart data on the nature of water to the concerned nationals and strategy creators. It subsequently progresses toward becoming an essential parameter for the evaluation and administration of surface water.

1.1.2 Water availability :

If we take a look at the water assets of India in the worldwide interface, India has 4 percent water though it has housing of 16 percent of the total population. It implies

that per capita accessibility of water is very low in our nation. India positions first in the world in irrigated zone. One-eighth region of the nation is flood prone and one-sixth territory is under the hold of drought. Today, in any case, augmentation of horticulture, damming, preoccupation, over-usage, and pollution undermine these vital essential resources in various parts of the globe. All around, there is expanding threat that the water will be a standout among the most basic regular asset in future.

1.1.3 Surface Water resource :

There are 17 river basins in Tamil Nadu Cauvery is the main significant basin. There are 17 noteworthy stream basin in the State with 61 reservoirs and around 41,948 tanks. At 75 percent dependability, the annual surface water generated in the State is 692.78 TMC. The water is got from the States of Andhra Pradesh, Karnataka, Kerala and Maharashtra. Of the yearly water capability of 46540 million cubic meters (MCM), surface streams represent about half of it. The vast majority of the surface water has just been tapped, fundamentally for water system like irrigation which is the biggest needs. 24 lakhs hectares are irrigated by surface water through real, medium and minor plans. The use of surface water for water system is around 90 per cent.

1.2 Water chemistry- Importance :

Increased anthropogenic effect on surface water system result in high contamination loads, for example, phosphorous and nitrogen mixes, heavy metals, agrochemicals and so on., which cause quick weakening in water quality. Lakes are moderately less

unique and subsequently are less dynamic and vulnerable against exogenic input sources and accumulate pollutants with time. The lake water gets its composition from the response of environmental precipitation with the nation rocks and extra contributions from different sources, for example, stream/spring water, industrial disposal of solid/ liquid wastes and so on. The lakes don't manage themselves for long time scales, since quick sedimentation and eutrophication are improved because of human exercises.

The nature of water of the lake is mostly affected by the anthropogenic exercises in the catchment. Lake's water quality additionally gets impacted by surface water as it goes about as influent or effluent attributes during different seasons. During summer season the surface water picks up water from lake because of invasion through lake surface. Amid winter and rainstorm season the surface water goes about as loosing medium and gives water to the lake system because of sudden expanding in water table because of penetration of rain.

1.3 Water Quality :

Water is fundamental to human life and the well being of the earth. As a significant normal asset, it includes marine, estuarine, freshwater (rivers and lakes) and surface water situations that extend across coastal and inland regions. Water has two measurements that are firmly connected: amount and quality. Water quality is usually characterized by its physical, chemical, biological and aesthetic (appearance and smell) attributes. Water quality in a

waterway impacts the manner by which groups utilize the water for activities such as drinking, swimming or business purposes.

Anthropogenic exercises have brought about a huge reduction in surface water nature of aquatic systems in watersheds in India, streams are a vital wellspring of water, as the same number of Indian urban areas are arranged on the banks of the waterways. Untreated release of toxins into a stream from local sewers, storm water releases, industrial wastewaters, agricultural runoff and different sources can have short-term as well as long-term impacts on the water nature of a waterway system. High levels of pollutant contribution to river water systems cause an expansion in biological oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids(TDS), total suspended solids (TSS). A water quality index in view of some critical parameters can give a single indicator of water quality. The general WQI was produced by Brown et al., (1970) and enhanced by Deininger for the Scottish Improvement Department (1975). It is a standout amongst the best approaches to impart water quality. To find out the quality of water some physical test ought to be performed for testing its physical parameters, for example, temperature, pH, turbidity, TDS, and so forth., substance tests ought to be performed for its BOD, disintegrated oxygen, alkalinity, hardness and different characters. Water quality concerns are frequently the most vital part to measure access to enhanced water sources. Satisfactory quality demonstrates the security of savoring water in terms of its physical, concoction and bacteriological parameters.

2. LITERATURE SURVEY :

Dr. C. Nagamani, Siti Hajar Bt Ali, M. Homayoonfard, N. J. Ali, M. Rehan, Y. Sadeh, and A. S. Nizami(2015) has discussed about the quality of water in both Urban and Rural areas of Bangalore. On referring Gurunathan, 2006 he tells us about how human alteration of the landscape has an extensive influence on watershed hydrology. Samples of 4 were collected and were tested for parameters like pH, Specific conductance, Calcium and Magnesium, Chloride etc.. Of the four samples one of them was Mineral water, which the author used for comparison of the other samples and for better understanding. To assess the quality of water each parameter was compared with the standard desirable limits prescribed by World health organization and the study concluded that Bangalore Urban water is safe for drinking whereas water in the Rural Bangalore is moderately hard.

M.Mamatha (2017) has used Weighted Arithmetic Index method to find out the water quality index of Kukkarahalli lake. The author briefs the history about the lake and the cause of contaminations such as increased sewage dumping, industrial wastes and excessive land encroachments. Samples were collected and tested for physical and chemical parameters and were compared with WHO and IS standard. Next she finds out the water quality index using a set of formulas followed by calculation. The Water Quality Index for the samples was calculated and was found to be 81.09 and 76.74 for the samples. The study conducted on the Kukkarahalli lake water reveals that the water quality is very poor.

Rashmi C, Sahana S, Sandesh N, Shivakumar V, Poornima K, (2017) examined the qualities of water in Shantisagara lake which is the second biggest lake on the planet. Three samples were collected for the 1st week, and was tested for 10 parameters, then again fresh sample were collected at the same stations for the second week and was tested. The same procedure was followed for the third week. The author compares the data of all the collected samples on the weekly basis. The results showed that all the parameters were within the acceptable limits except for total suspended solids which was high for the third samples of all the three weeks.

N. Rahmanian, Siti Hajar Bt Ali, M. Homayoonfard, N. J. Ali, M. Rehan, Y. Sadeh, and A. S. Nizami (2015) carried out the study of drinking water quality in Perak state, Malaysia which is the second largest land area state of Malaysia among the 14 states. The determination of inspecting focuses depended on the populace thickness, modern or anthropogenic exercises, for example, mining exercises, and the stream catchment regions, in light of outlined criteria eight distinct areas were decided for gathering tests. Drinking water samples were taken from the tap water of residential and commercial areas along with which samples of bottled mineral water purchased from local super market and reverse osmosis water were collected and tested for different parameters and the results were compared by standard values. In the case of total suspended solids the sample collected at certain points in the areas had filtration

systems attached to the taps, thus removing all the suspended particles which results in very little TSS content which was below the standard values. Similarly the mineral water, which was expected to be the cleanest water, thus had lowest turbidity values. The author come to a conclusion that the samples were found to be within the recommended limits of WHO and that it can be used for drinking purposes.

Vaishali Sahu, Prachi Sohoni(2014) examined the water quality of river Yamuna which is a holy river in Indian mythology and one of the most polluted rivers in India. Most vital uses of Yamuna water are water system, household water supply and industrial utilize. As per Central Pollution Control Board (CPCB) the water quality of River Yamuna is of the category E which makes it fit only for irrigation, industrial cooling and controlled waste disposal. This causes a high discharge of polluted water into the river. Ten samples were taken and tested for some of the water quality parameters and found that most of the were higher than the standard values. The investigation presumes that in contrast with CPCB the outcomes are illustrative aside from TDS and COD which are which are inaccurate results. The comparison to standards for irrigation and drinking water quality was not representative which indicates a bad water quality.

Asheesh Shrivastava, Shalini A Tandon, Rakesh Kumar (2015) discuss about the water characteristics of Patalganga river located about 60 km from Mumbai. A total of 14 water samples from different point

sources of pollution were collected and grouped into three, and were tested for physico chemical parameters and then compared to WHO standards. Highly correlated water quality parameters were found using correlation coefficient. Hierarchical cluster analysis (HCA) was used to analyze the water quality data spatial and temporal differences and also finds out the water quality index of the river. The author also discusses about various management plans for water quality and then concludes that based on WQI, it could be inferred that water quality at these above mentioned sampling stations are “Good”, “Medium” and “Bad” category and can only be used for drinking after conventional treatment and disinfection.

Smita Rout, Asit Kumar Behera, Aliva Patnaik (2016) analysed the physico-chemical properties of Mahanadi river water from five different locations of Sambalpur city of Odisha during the month of March and August. Analysed parameters like pH, DO, TH, Chloride, Sulphate, and TDS were found within permissible limit prescribed by IS 10500 except Nitrate and Fluoride content which exceeds at some sites. The author explains about the climatic conditions in the area and the changes in water quality parameters due to the changes. Finally she concludes that Mahanadi River water in Sambalpur city be an eye opener which is very much prone towards alarmic condition that is the water quality in river Mahanadi is poor and is unsuitable for drinking purposes.

A. Kistan (2013) investigates the quality of the lake water located at the Ambattur. The

gathered samples were broke down for various Physico-chemical parameters, for example, pH, BOD, COD, Total hardness, colour, odour, alkalinity, chloride, calcium, and magnesium according to the standard strategies and the outcomes were compared with Indian Standards for consumable water. Ambattur Lake water demonstrates high mineral substance in terms of disintegrated solids, add up to hardness, Calcium, Magnesium, Nitrate and Chloride. The author concludes that lake water of the study area is not suitable for drinking purpose and must to do the recycling procedure before using irrigation purpose also. So we must to take special care for lake water further more pollution should be avoided in and around lake water.

Abdelfattah S Saad, Magdy A Massoud, Ranya A Amer , and Mohamed A Ghorab(2016) studies the behaviour of the change in the quality of water in and around Mariout Lake. Tests were gathered from five examining stations during the time of June to November and were tested for water quality parameters and found that temperature, pH, total alkalinity, dissolved oxygen, biological oxygen demand, chemical oxygen demand, calcium hardness past the prescribed limits of WHO. We found that two recognized sources are the primary root of most toxins in this Lake, to be specific: El-Kalaa deplete and modern exercises in Alexandria City. From the data of water quality index (WQI) and other parameters indicates that one of the site, EL-Mex Bay is more polluted than the other sites. The author concludes that the

difference between the data of the previous studies and that of the present one reflects an increase in the pollution status of Mariout Lake during the last three decades.

I. AmeethBasha, Shanthi and R. Nagalakshmi (2016) collected three water samples in which two were bore water sample and one from municipal supply these were collected from different location of Chinna Kanchipuram, Tamil Nadu, India and analyzed for different water quality parameters. Effects of municipal sewage, agricultural runoff, dyeing effluents on the water quality have been examined. The author determines the physical, chemical parameters of water samples and compared it with the standard values to appraise the pollution load. The results exposed that most of the water samples were within the confines in a few features according to the water quality standards. This analysis illustrates the samples can be used for household purpose. It was also found that the sample which was collected from the municipal supply was not contaminated much.

Sabrina Sorlini, Daniela Palazzini, Joseph M. Sieliechi, Martin B. Ngassoum (2013) portrays the study that was carried out in the Logone Valley (Chad Cameroon) to evaluate the physical-substance nature of various sorts of water sources utilized by town individuals for human utilization. As regards physical-chemical parameters, the result was that drinking water sources have a reasonably good chemical quality, with key exceptions related to the occurrence of lead

contamination. This identified chemical water quality concern is significant and an immediate intervention is required to prevent widespread and long-term exposure. The study also mentions that elevated lead levels were detected both in aquifers and in surface waters, confirming that further investigations of the occurrence of lead contamination in the Logone valley are warranted.

KrajncGalunder, Mitja Kolar (2010) presents the physical and substance parameters of the River Mura's water for the period 1996 to 2009. Samples (336) of water were taken at four diverse estimating spots and examinations were performed. Compared to the period 1990-1996 values over the period 1996-2009 had stabilized. Th author concludes that the performed analyses of River Mura's water samples, have certainly contributed to people's and industry's awareness regarding emissions, because the reduced amount of emissions ensured an improvement in the water quality of the River Mura.

3. CONCLUSION :

From the above studies we come to a conclusion that water which is the most significant assets of nature is being contaminated by various activities such as industrialization, rapid growth in population and urbanization. So to monitor the quality of water we follow certain parameters which includes pH, turbidity, TDS, Specific conductance, Calcium and Magnesium, Chloride etc.. The results that we get is compared with India Standard values and

accordingly the purpose of water is determined whether it's safe or unsafe.

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