ANALYSING THE PUZHAL LAKE WATER QUALITY PARAMETERS IN COMPARISON WITH DRINKING WATER QUALITY STANDARDS FOR SUSTAINABLE DEVELOPMENT

Niranjan Reddy.A[1], M.Tholkapiyan[2*]

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Abstract

Aim: The Environmental factors have an impact on water quality sample data collected in puzhal aeri lake water is pH, TDS, TSS, BOD and COD dissolved oxygen. Has been tested in laboratory,according to the water quality standard parameter bureau of inadian standards.

Materials and methods: The study that compared with water quality parameters were collected in puzhal aeri neair 24 different samples (Group 1=12 and Group 2=12)in stations. lake water in puzhal aeri in Red hills chennai commonly collected for water quality testing total Dissolved oxygen, pH, TDS, TSS, BOD and COD testing. reservoir water standards domestic wastewater in water quality parameters of G-power 0.8 with a water quality are 0.07,0.2 With a confidence at 95%. Analysing the lake water quality standard where numbers of samples(N=4) and drinking water samples (N=4).

Results: The water quality mean difference for lake water tested pH, TDS, TSS, BOD, and COD is and Drinking water quality tested pH, TDS, TSS, BOD and COD is we get graphically between the equal variances are assumed and are not assumed for alkalinity mean difference is 60.14. The results of standard testing are statistically represent the lake and their significance of mean difference of the population based on the samples and independent samples polluted or unpolluted performed on two groups it reveals a statistically significant difference ($p > 0.05$).

Conclusion: The limits within this study is to show 12 samples collected in puzhal aeri lake water and the mean value performed equally to the drinking water. This study mainly focuses mainly on the water quality of puzhal aeri water conditions in both drinking irrigation purposes and human usages.

Keywords: Water quality parameters, parameters, water management, waterway, standards in water quality management, innovative puzhal aeri boiler water quality assement, Novel treatment lake water.

[1]Research Scholar Environmental and water Resources Engineering,n Saveetha school of Engineering, Saveetha Institute of Medical and Technical Sciences, Saveetha University,Chennai,Tamil Nadu, India, Pin: 602105

[2*]Project Guide, Environmental and water Resources Engineering, Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Saveetha University,Chennai,Tamil Nadu,India,Pin:602105

1. Introduction

The Puzhal Aeri Lake water in Tamil Nadu has been used all over the sources of human useage and irrigation water of a surface water source and a part of the water cycle in the waterway. It can also be used for agricultural and human usage purposes. The main denefit of agricultural and industrial use of a lake is economic (Ismael et al. 2021). As a result of expanding human development activities, water quality and its impact on people's health, lifestyles, waterway and financial well-being puzhal aeri water has polluted is a major Global issue. puzhal aeri lake water is polluted or unpolluted; test in Novel treatment the water contamination of puzhal lake area is one of the 163 notified areas in the state of tamil nadu (Ponsadailakshmi et al. 2018).

In puzhal aeri lake water is the basis of various parameters Novel treatment standards in water quality management like pH, TSS, BOD, TDS, COD, dissolved oxygen (DO).Nitrogen (NO3-N), turbidity, total coliform and hardness (Maharjan, Joshi, and Shrestha 2018). pH test is a measure of acidic and basic water; it is one of the major tests in water quality standards. Total suspended solids (TSS) is defined as solids in (Martin 2012).puzhal aeri water that are trapped by a filter ("Drinking Water Standards and Risk," n.d.; Binnie, Kimber, and Thomas 2017). To measure TSS the puzhal aeri water sample standards in water quality management is filter dried in oven at 103-105℃ until weight of the filter (Cotruvo 2018). Biochemical oxygen demand (BOD) concentration is measured over a given period of time in water samples in specified temperature. TDS metre is a small hand-held device used in indicial the total Dissolved solids in a solution, usually water. Chemical oxygen demand (COD) is a measure of innovative puzhal aeri lake water. boiler water quality of drinking water and wastewater quality (Jjemba 2005).

Our institution is keen on working on latest research trends and has extensive knowledge and research experience which resulted in quality publications (Rinesh et al. 2022; Sundararaman et al. 2022; Mohanavel et al. 2022; Ram et al. 2022; Dinesh Kumar et al. 2022; Vijayalakshmi et al. 2022; Sudhan et al. 2022; J. A. Kumar et al. 2022; Sathish et al. 2022; Mahesh et al. 2022; Yaashikaa et al. 2022). In view of the writing almost 250 distributed in sciencedirect and 130 papers in google researcher throughout recent 5 years (Makinde-Odusola 2005). The inventive stream water quality evaluation utilises water quality data to decide the water quality boundaries for all streams. Status of these streams can assist us with focusing on our administration activities waterway. Among this examination has been created to dissect the water defilement in contaminated water and unpolluted It decides the premise of different boundaries like the appropriateness of water for various employment. Puzhal aeri waterway supply's normal PH esteem was 7.65 and remained basic; noticed qualities were inside the acknowledgment range (Brune and Tomasso 1991). supply water is delegated hard to hard water.standards in water quality management record of puzhal aeri innovative puzhal aeri boiler water quality supply is 79.54 to 80.50 which implies the water nature of this repository is right by generally excellent, it demonstrates the water quality is protected with conditions from regular or wanted conditions.

Already our group had rich involvement with chipping away at different exploration projects across various disciplines. Presently the developing pattern in this space inspired us to seek after this undertaking.Usage productivity of stream water assets is moderately lower in this concentrated region.The water quality characteristics in chemical and physical qualities of a lake water. The most important factors for long-term water collection in a puzhal aeri reservoir are the water quality parameters of a puzhal aeri research innovative puzhal aeri boiler water quality of physicochemical criteria (Salanki 1989).

2. Materials And Methods

This experiment was performed in the Department of Civil Engineering, Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamilnadu. In this analysis it estimates the two gatherings of water quality as puzhal aeri supply water (Group 1) and drinking water (Ponsadailakshmi et al. 2018).(Group 2) at the poondi repository district. Each gathering contained an example size of 20(Waite 1984). Both the boundaries considered for investigation are PH, turbidity, corrosiveness, alkalinity, broken up oxygen(DO), electrical conductivity, TDS, TSS The examples are kept in reagents that don't change the qualities of the water during the testing . 20 samples of water were gathered close to Puzhal aeri supply (Salome et al. 2007). The fundamental water sources that have been dumping ground for homegrown waste are effluents from modern waste. Appropriate soil the executives techniques are to be taken on in a significant piece of area while utilising poondi repository water for unpolluted purposes. Puzhal aeri repository water as a rule, is drab, acidic, in climate. The water quality in puzhal repository was contemplated to look at the appropriateness of supply water for modern, homegrown , human-

made variables purposes (R. P. Kumar, Pradeep Kumar, and Preethi 2017).

The puzhal aeri reservoir standards in water quality management for industrialization heavy road transportation, overpopulation of a water disposal of significance on water quality availability of reservoir water polluted or unpolluted samples are found in the reservoir(Waite 1984). The reservoir water has been tested in physical and chemical characteristics in puzhal reservoir ph value 7.40 to 8.90 making it an extremely equivalent environment in domestics that the salt content in the study area in case of reservoir water turbidity range between 9 to 12 mg/l in the puzhal aeri reservoir the total hardness value ranges 129.disloved oxygen present in the puzhal aeri 7.00 mg/l, the temperature in puzhal aeri around the region is 20 to 31.6 degree celsius total coliform in the region is 1665 mpn/100ml. The value of the nitrate in the reservoir is 0.76 mgl and the e-coli present by testing from that region is 3.30 water samples collected from the 12 places near the Puzhal area reservoir. 20 water samples were tested in laboratory water quality standard comparing with drinking water and lake water.standards the results that are shown in parameters in study area of drinking water is slightly higher than reservoir water (Nikhitha et al. 2020).

Puzhal lake water collected 12 locations in the puzhal lake and had water samples taken. To assess water quality criteria, 20 samples were analysed. Drinking water and lake water were compared. G-power calculation was found to be 80% accurate. The water quality in the current study region may be suitable for reservoir water and acceptable for drinking water(Martin 2012; Piper 2019a, [b] 2019) .

Statistical Analysis

The independent mean value T-test was performed to estimate the water quality standards of division mean error of the water samples and SPSS was used for statistical comparison of water quality parameters such as drinking water sample and the reservoir water sample innovative puzhal aeri boiler water quality were not independent variables and all of the dependent variables were floating around in the water(Zhang and Yan 2012). The 20 samples of reservoir water single separate sources were submitted to an independent sample T-test to see if there were any mean differences in testing pH, dissolve oxygen, temperature, total coliform, TDS, TSS and BOD.The findings resolve that the sample's that mean difference between the standard reservoir(Wekesa and Otieno 2022) water significance and their stability of mean difference in the population based on the samples were tested (Subramani and Sasikala 2018).

3. Results

The sample bar of laken water samples TDS and TSS bar compute the mean difference, standard deviation, and standard error mean differences.Fig 1. For data analysis, we compared well water and lake water, and we used the Levene test for equality and variances, as well as the T-test for equality of mean, and another analysis for the data variance 90 percent confidence interval of the differences in lower and upper parameter in the bar graph.Fig.2. Sample bar of testing BOD and COD The mean differences for lake water are defined, and the discrepancies between the assumed and unassumed equal variances are visually displayed. 159.3000 is the difference in nitrate levels. Fig 3. pH of lake water is 7.6 and the standard drinking water pH is 7.0 and the lake water pH is slightly more so it is used to drink after the treatment of the water

We assessed the mean data and group data to evaluate the puzhal lake water is to identify the hardness of that water sample for standards it is high It is as low as possible in reservoir water by Novel treatment and analysis for calcium is to be safe for drinking water with calcium in it effects on the health, magnesium is the important thing for drinking water to dissolve the minerals from the water Because of the minerals in hard water, it is not a health hazard.

The water standard polluted to compare with lake water samples to take 4 samples pH, TDS, TSS, BOD, and COD 7.47, 540, 47, 69, and 49.7, and drinking water quality standards of pH, TDS, TSS, BOD, and COD 6.5, 2000,100, 5 and 0.100. The average level of contamination in reservoir water is higher. (Table 1)

Presents factual estimations, such as Mean, Standard Deviation, and Standard Error Median for reservoir and standard drinking water. The t-test used the nature of the water barrier. The pH, TDS, TSS, BOD, and COD of reservoir water are 7.60, 972, 62.50, 45.25, and 342.000, respectively, whereas the pH, TDS, TSS, BOD, and COD of standard drinking water are 7, 2000,100, 5, 10, 200. The pH, TDS, TSS, BOD, and COD of reservoir water are.030, 1.423, 14.310, 330, and 210, respectively, and the pH, TDS, TSS, BOD, and COD of drinking water are.277,.500, 1.618, 0.100, and.200. The Standard Error Medians for pH, TDS, TSS, BOD, and COD in reservoir water are.7.25,.975,.062, 45.25, and 45.25, respectively.(Table 2)

The statistical calculation of water sample test between lake water and Drinking water standards

sig. for pH is 7.54 independent sample t-test with 95% confidence interval for comparing reservoir water and drinking water quality criteria.(Table 3)

4. Discussion

In August, September, October, November, and December, water samples were taken from the lake water.Total dissolved solids, phenolphthalein, pH, electrical conductivity,TDS,TSS BOD and COD and Both total alkalinity and alkalinity as CaCO3 were investigated. Table 2 shows that the pH of water samples taken in the Novel treatment research area ranged from7.3 to 6.7. The pH of the sampled water is suitable for irrigation(Maticic 1999). The pH readings in the second, eleventh, thirteenth, fifteenth, and twentieth samples were all lower. Table 1 shows that the reservoir water's electrical conductivity (EC) ranged from 0.67 to 1.51 micro s/m. The water had an alkaline tinge .(Salanki 1989) The nitrate value of phenolphthalein

The monthly variation is used to plot the Electrical Conductivity of the provided chart. The electrical conductivity of the puzhal aeri lake water sample was 0.63 to 1.56 micro s/m in this graph. At station 1, EC achieves a high of 0.64 s/m and a minimum of 0.53 s/m. The EC value climbed in September before dropping in November and December at this location. The maximum EC value is 1.9 s/m, and the lowest is 0.71 s/m at Station 2. On a monthly basis, the pH changes in the given chart are plotted. The pH in station 1 varies between 6.8 and 7.5. The pH level at this station is 7.5.

The Total Dissolved Solids of the presented chart are plotted monthly variation. The greatest TDS value in station 1 is 545 mg/L, while the lowest TDS value is 540 mg/L. TDS levels are greater in December and lower in August at this station. At station 2, TDS peaks at 530 mg/L in September and falls to 520 mg/L in August and November. At station 3, TDS is 540 mg/L, while at station 4, it is 528 mg/L. At this station, TDS is greater in October and lower in November. TDS at Station 4 peaks at 532 mg/L in December and lowers to 611 mg/L in January.

5. Conclusion

pH, Dissolved oxygen, nitrate, TDS, TSS, BOD, COD, turbidity, total coliform, temperature,total hardness are all relevant water quality metrics in this research. In this regard, it must comply with the planned EC directive on surface water quality. Irrigation and drinking water are both provided by well water. The water quality of well water used for agriculture and consumption is the focus of this research. Furthermore, the research area's water quality in August is lower than in December, indicating a pollution influx from agricultural areas in December. Alternative answers to this problem include the availability and cost of GIS systems. According to the findings,

Declarations:

Conflict of interesting

No conflict of interests in this manuscript

Authors Contributions

Author NK was involved in data collection, data analysis, and manuscript writing. Author MT was involved in conceptualization, data validation, and critical review of manuscript.

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Tables And Figures

Table 1 Lake water is compared to ordinary drinking water in terms of quality. Lake water has pH, TDS, TSS, BOD, and COD of 7.6, 976, 47, 45, 320, 220, whereas drinking water has pH, TDS, TSS, BOD, and COD of 7, 2000, 100, 5, 10, 200.

Test Cases	QUALITY OF WATER									
	Lake Water					Standard drinking water				
	pH	TDS	TSS	BOD	COD	pH	TDS	TSS	BOD	COD
Sample 1	7.47	530	47	54	48.2	7	2000	100	5	0.100
Sample 2	7.30	540	52	66	49.9	7	2000	100	5	0.100

Sample 3	7.45	419	44	55	55.1	7	2000	100	5	0.100
Sample 4	7.6	590	50	69	61.2	7	2000	100	5	0.100
Test Results	7.47	540	47	69	49.9	7	2000	100	5	0.100

Table 2: Water from a lake, standard deviation, and standard deviation were used to calculate median statistical estimates for lake water and ordinary drinking water. The water quality parameter was employed in this experiment. pH, TDS, TSS, BOD, Hardness 7.6, 976, 47, 45, 220, and typical drinking water quality for pH, TDS, TSS, BOD, Hardness 7, 2000, 100, 5, and 200 for pH, TDS, TSS, BOD, Hardness 7, 2000, 100, 5, and 200 for pH, TDS, TSS, BOD, Hardness 7, 2000, 100, 5, and 200 for pH, TDS, TSS, BOD, Hardness 7.6, 9 Water hardness, pH, TDS, TSS, and BOD deviations from the mean 0.265, 0.577, 1.708 1.500, 210 The Most Common Error Hardness of lake 0.143, 0.002, 0.002, 0.200, 0.005 and Standard Error of pH, TDS, TSS, BOD, and Hardness of Reservoir 0.143, 0.002, 0.002, 0.200, 0.005 and Standard Error of pH, TDS, TSS, BOD, and Hardness of Reservoir 0.143, 0.002, 0.002, 0.200, 0.005 Standard Error of pH, TDS, TSS, and BOD 0.143, 0.002, 0.002, 0.200, 0.005 and Hardness of Drinking Water 0.143, 0.002, 0.002, 0.200, 0.005.

Group		N	Mean	Standard Deviation	Standard Error Mean
pH	Lake water	4	7.60	0.216	0.108
	Standard drinking water	4	7.25	0.265	0.132
BOD	Lake water	4	45.25	0.645	0.323
	Standard drinking water	4	10.25	0.289	0.144
TDS	Lake water	4	975.25	3.594	1.797
	Standard drinking water	4	2000.25	1.708	0.854
TSS	Lake water	4	62.50	2.380	1.190
	Standard drinking water	4	99.25	1.500	0.750

COD	Lake water	4	342.0000	15.89549	7.94775
	Standard drinking water	4	251.5000	1.29099	0.64550

Table 3 : Shows the results of a sample test that compared lake water and drinking water. The sig. of pH is 0.204. An independent sample of lake water and a drinking water standard were taken with a 95% confidence interval.

Group		Levene's test for Equality of variances		T-test for Equality of means						
		F	Sig.	t	df	Sig.(2-tailed)	Median Difference	Std.Error Difference	95% Confidence Interval (Lower)	95% Confidence Interval (Upper)
pH	Equal Variances assumed	0.300	0.604	2.049	6	0.086	0.350	0.171	-.068	.768
	Equal Variances not assumed			2.049	5.769	0.088	0.350	0.171	-.072	.772
BOD	Equal Variances assumed	3.000	.134	98.995	6	0.000	35.000	.354	34.135	35.865
	Equal Variances not assumed			98.995	4.154	0.000	35.000	.354	34.033	35.967
TDS	Equal Variances assumed	1.658	.245	-515.190	6	.000	-1025.000	1.990	-1029.868	-1020.132
	Equal Variances not assumed			-515.190	4.289	.000	-1025.000	1.990	-1030.380	-1019.620
TSS	Equal Variances assumed	4.500	.078	-26.123	6	.000	-36.750	1.407	-40.192	-33.308

	Equal Variances not assumed			-26.123	5.058	.000	-36.750	1.407	-40.354	-33.146
COD	Equal Variances assumed	20.819	.004	11.350	6	.000	90.50000	7.98853	70.98853	110.01147
	Equal Variances not assumed			11.350	3.040	.001	90.50000	7.98853	65.30934	115.69066

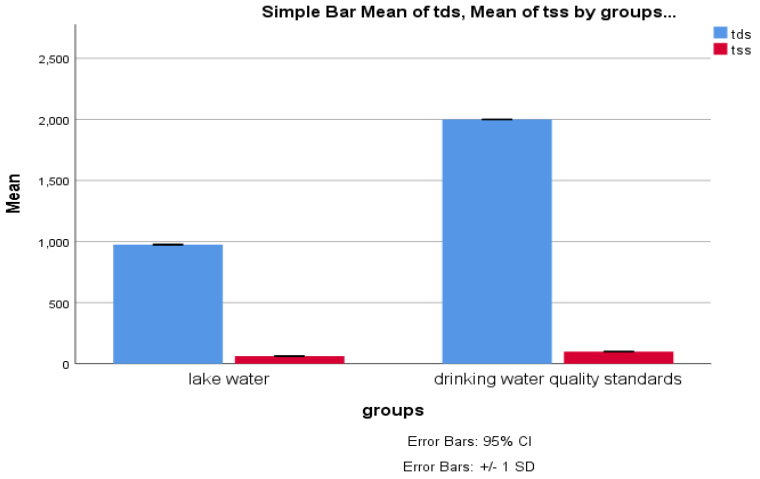

Fig.1 A typical bar graph comparing reservoir water quality to a drinking water standard is shown in TDS and TSS levels in reservoir water are on average 976,47, whereas TDS and TSS levels in drinking water are respectively 2000.0 and 100. The difference between reservoir and drinking water is substantial. X-axis: Drinking water quality standard vs. reservoir water The Y-axis shows the median water quality for keyword identification plus one standard deviation with a 95% confidence interval.

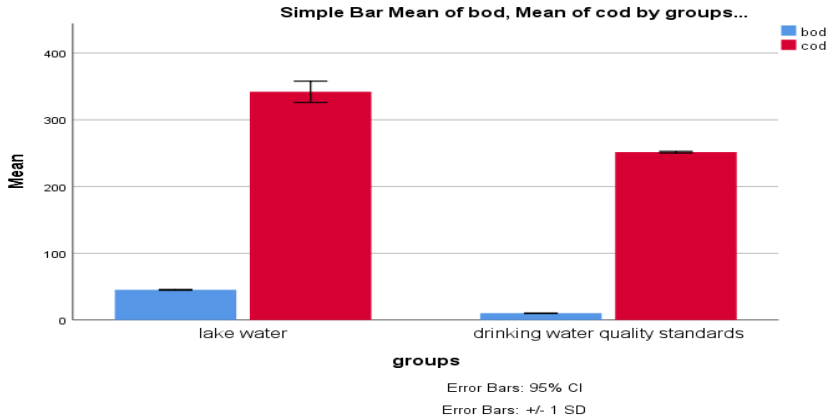

Fig 2. A bar graph illustrating the difference between lake water and ordinary drinking water. Lake water has a mean BOD, COD, and pH of 45, 320, and 7.6, respectively, whereas drinking water has BOD, COD, and pH limits of 5, 0.100, and 7, respectively. The quality of drinking water is compared to lake water on the X-axis. Y-axis: 95% confidence interval for median water quality to keyword recognition _+1 SD.

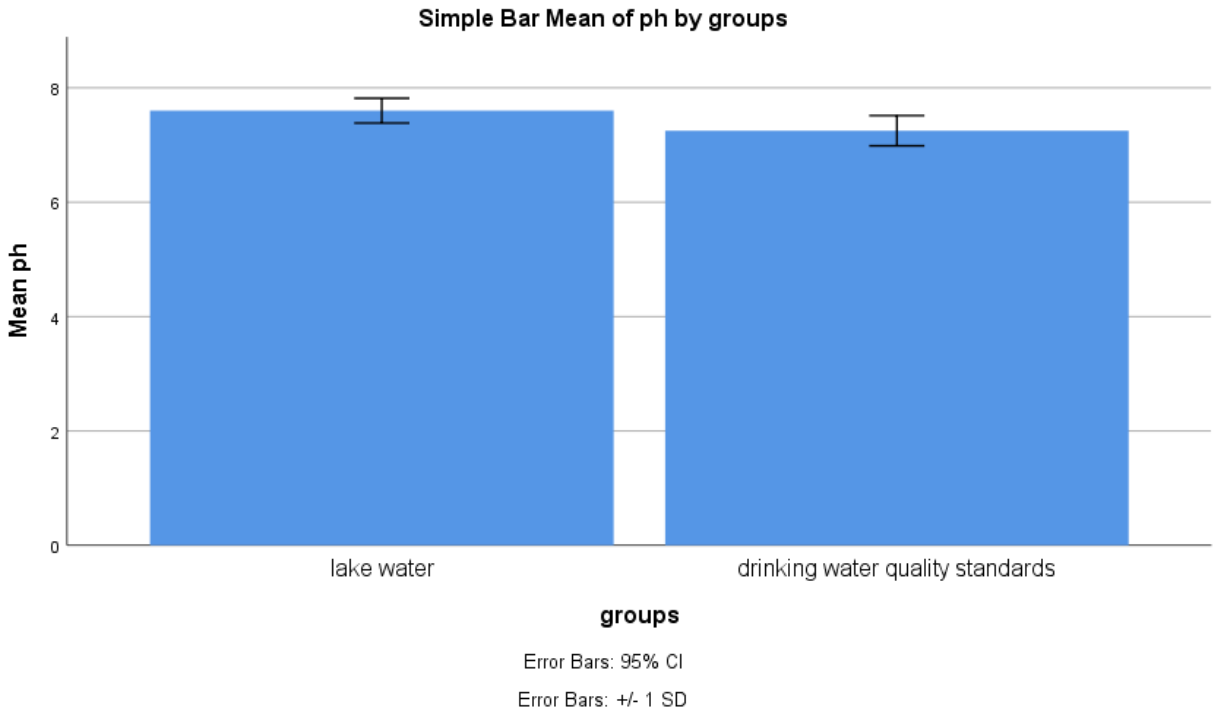

Fig 3. pH of lake water is 7.6 and the standard drinking water pH is 7.0 and the lake water pH is slightly more so it is used to drink after the treatment of the water