Chemical Assessment Of Seasonal Variations For 2021-2022 And 2022-2023 In Water Quality Of Annamayya Project On Cheyyeru River

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Abstract:

Water spread diseases are increased day by day due to lack of awareness of water pollution and its contamination in rivers. In the current research an investigation has been carried out to examine quality of water in Cheyyeru River**.** The main objective of present research work is to compute the Water Quality Index and to investigate its suitability for drinking purpose in Cheyyeru River water, Annamayya dam. Water samples were taken during both seasons of pre- and post-monsoon. The different laboratory chemical water parameter tests such as Electric conductivity ,Total Suspended Solids ,pH, Nitrogen, Biological Oxygen Demand, Chlorine, Total Dissolved Solids, chemical oxygen demand , dissolved Oxygen , phosphorous, sulfur and potassium are conducted and analyzed for drinking purposes. From the laboratory investigation it is observe that all parameters of water quality are within the WHO permissible limits. Therefore, study is useful for agriculture and agro-ecological planning.

Keywords: Annamayya dam, Water Quality Index, parameters of water quality.

1. Introduction:

Water found under the Earth's surface in soil pores and broken rock formations is referred to as groundwater. Water is a critical natural resource and a basic human necessity. Humans, as well as many other creatures, cannot survive in our planet without water [18.]. There was a conjecture that out of total population in the world, one- third consumes water beneath the ground for drinking purposes. A side from that, it is largely utilized in washing, cleaning, agricultural, and other sectors. Freshwater is becoming very less as a result of

over-exploitation and pollution [19.]. Unlike rivers, the water stored in the aquifer suffers from widespread pollution that is typically irreversible. When compared to surface water, the speed of moving forward or head of groundwater replenishment is slower [16.].

2. Literature Review

Prakash, K. L. and Somashekhar, R. K., (2006)[13.] studied to found that the groundwater quality in Anekaltaluk, Bangalore urban district, India, is generally good. However, the water quality in some areas is affected by agricultural runoff and industrial pollution. The study recommends that regular monitoring of groundwater quality be conducted in the area to ensure that the water is safe for human consumption.

Arumugam, K. and Elangovan, K., (2009)[12.] studied to found that the groundwater quality in Tirupur region, Coimbatore district, Tamil Nadu, India, is generally good. However, the water quality in some areas is affected by agricultural runoff and industrial pollution. The study recommends that regular monitoring of groundwater quality be conducted in the region to ensure that the water is safe for human consumption.

A G S Reddy and K Niranjan Kumar (2009)[9.] concluded that the water quality of the Cheyyeru River is influenced by the monsoon season and that this should be taken into account when assessing the quality of the river's water.

Chatterjee. R et al., (2010)[11.] studied to found that the groundwater quality in Dhanbad district, Jharkhand, India, is generally good. However, the water quality in some areas is affected by agricultural runoff and industrial pollution. The study recommends that regular monitoring of groundwater quality be conducted in the district to ensure that the water is safe for human consumption.

Majid M. A. and Sharma S. K. 2010 [3.] studied indicates analysis of the water samples show the water parameters have already exceeded their tolerance limits. To this end research and monitoring of the water flow in the Karna fully must continue. People should be aware of the possible threats on water pollution in the river.

WHO Guidelines for drinking water quality (2011)[14.] The World Health Organization (WHO) has published guidelines for drinking water quality. These guidelines set standards for the maximum concentrations of various contaminants that are allowed in drinking water.

Fakayode SO (2015) [6.]studied to found that industrial effluents from factories in Ibadan, Nigeria, were significantly

impacting the water quality of the Alaro River. The effluents were found to contain high levels of pollutants, including heavy metals, organic matter, and nutrients. These pollutants were found to be harming the river's ecosystem and reducing its ability to support aquatic life. The study concluded that the discharge of industrial effluents into the Alaro River was a serious environmental problem and that measures needed to be taken to reduce the pollution levels.

Alam et al., 2016[2.] explained that relevant estimated the total pollution loads to water by all the industrial sectors of Bangladesh using the Industrial Pollution Protocol System (IPPS) method developed by the World Bank. In terms of pollution, the most polluting sector is the food industry, where the sugar mills and oil/fat factories cause most of the pollution. Pulp and paper industry is the worst water polluter. Metal industries (ferrous and nonferrous) rank first in terms of toxic metals emission. The largest amounts of toxic chemicals are released by the tanneries and leather industries (raw and processed). In terms of the total emission to air, water, and land, the top three most polluting industries are pulp and paper, food industry and tanneries/leather.

Husna Israt Pia et al.,2017[4.] analysed reveals that the Shitalakhya River has an enormous effect on the agro-ecological diversity of the nearest area of this river. The chemical analysis of the various parameters of this river is done in a systematic way so that the risk assessment is clearly understood. The contamination from the various industrial effluents and wastes are extremely affecting the agricultural and daily usable water sources through the Shitalakhya River.

Nag, S. K. and Das, S., (2017) [10.] studied to found that the groundwater quality in Bankura district, West Bengal, India, is generally good. However, the water quality in some areas is affected by agricultural runoff and industrial pollution. The study recommends that regular monitoring of groundwater quality be conducted in the district to ensure that the water is safe for human consumption.

Husna Israt Pia, et al., 2018 [1.] studied that the Shitalakhya River has an enormous effect on the agro-ecological diversity of the nearest area of this river. The chemical analysis of the various parameters of this river is done in a systematic way so that the risk assessment is clearly understood. The contamination from the various industrial effluents and wastes are extremely affecting the agricultural and daily usable water sources through the Shitalakhya River.

Mahto et al., (2019) [19.] explained investigated the performance of ERA-5 and other reanalysis products for hydrologic applications in India. The study found that ERA-5

outperforms other reanalysis products in terms of its accuracy in simulating precipitation and stream flow. The study's findings suggest that ERA-5 can be used to improve the understanding of the hydrology of India and to develop better models for predicting droughts and floods.

K.Sreenivasulu, Kaizar Hossain and T. Damodharam (2019)[20.] studied to found that the water quality of To Nellore Cheruvu (Tank) in India varies seasonally. The water quality is best during the monsoon season and worst during the summer season. The main threats to the water quality of the tank are agricultural runoff, industrial pollution, and sewage discharge.

Hara, J.; Atique, U. (2020)[22.] identifying long-term links between water chemistry, algal chlorophyll, drought-flood regime, and nutrient enrichment in a reservoir in Bangladesh. The study suggests that these factors can interact to cause changes in the trophic status of reservoirs in monsoonal regions.

Pravat Rabi Naskar et al.,(2021)[5.] analysis shows that most of the parameters are within limits prescribed by BIS, WHO, and CPCB for water used in drinking and other purposes. Considering eight parameters shown in Tables 3 and 4, WQI is calculated. It is found that during the post-monsoon season, the water quality of all the stations falls in the category of excellent, and during the pre-monsoon season, the water quality of most of the stations is good.

P. R. .Naskar et al.,2021[7.] study found that the chemical composition of groundwater in Burdwan, West Bengal, India, varied significantly between the pre-monsoon and post-monsoon seasons. The levels of dissolved solids, cations, and anions were all higher in the post-monsoon season, which was attributed to the increased rainfall and runoff during this time.

P. R .Naskar and S.Naskar (2021)[8.] study investigated the synoptic and dynamical characteristics of Super Cyclone Amphan, which made landfall in India and Bangladesh in May 2020. The study found that Amphan was a very intense cyclone, with sustained winds of up to 240 kilometers per hour. The study also found that Amphan was a very well-organized cyclone, with a well-defined eye and concentric bands of thunderstorms.

P. R Naskar,(2021)[15.] Analysed about investigated the wind characteristics and wind energy potential of Port Blair, India. The study found that the wind speed in Port Blair is generally strong, with an average of 10.5 m/s. The study also found that the wind direction is predominantly from the southwest. The study's findings suggest that Port Blair has a high potential for

wind energy generation.

ŁukaszGruss et al., (2021) [16.] explained that investigated the changes in the quality of surface water in a river-reservoir system. The study found that the water quality in the river deteriorated after the construction of the reservoir. The study's findings suggest that reservoirs can have a negative impact on the quality of surface water.

Tianjia Liu1 et al.,(2021)[17.] studied to found investigated the delay in post-monsoon agricultural burning across Punjab, India. The study found that the delay in agricultural burning was caused by a number of factors, including the government's crop residue burning ban and the increase in the use of machinery for crop residue management. The study's findings suggest that the delay in agricultural burning could have a negative impact on air quality in Punjab.

Justus Reymond and Karuppasamy Sudalaimuthu (2021)[18.] studied to found investigated the water quality during pre-monsoon and post-monsoon seasons in the Tamiraparani River in Tamilnadu, India. The study found that the water quality in the river deteriorated during the post-monsoon season. The study's findings suggest that the deterioration in water quality is caused by a number of factors, including the increase in agricultural runoff and the discharge of untreated waste water.

Su-mi Kim and Hyun-suKim (2021) [21.] Experimenting that the trophic status of a reservoir in South Korea varies seasonally and annually in response to monsoon precipitation. The reservoir is more eutrophic during the monsoon season and less eutrophic during the dry season. The study suggests that monsoon precipitation plays an important role in regulating the trophic status of reservoirs in monsoonal regions.

Kim, J.Y.; Atique, U. (2021) [23.] studied to found that there are long-term and seasonal links between the nutrient regime, sestonic chlorophyll, and dominant blue-green algae in a drinking water reservoir in Bangladesh. The study suggests that these factors can interact to cause changes in the water quality of drinking water reservoirs in monsoonal regions.

3. Resources and Techniques:

An every pattern is a composite of 20 samples all through both seasons of Pre-monsoon (March-May months of 2021& 2022) and Post-monsoon (October and November months of 2022 & 2023). Aeration was prevented as a whole lot as possible throughout the sampling technique. pH, DO, BOD and COD have been all evaluated at once after collection.

Focused HNO_3 (5 ml/l) changed into used to acidify the pattern. Gravimetric analysis became used to decide the amount of suspended solid [15]. The sample's pH, EC, DO and TDS have been determined the experiments of a pH, EC, DO, and TDS meter was done respectively.

Samples were obtained near the effluent floor to prevent floating contaminants. The oxygen concentration in the samples was measured before and after a 5-days dark incubation at 200°C for the BOD test [4]. At trimetric approach was used to determine the COD [7].

The analysis's findings indicate that the majority of the parameters are within the ranges that BIS, WHO, and CPCB have established for water used for drinking and other uses. By observing table 1.1.(A) & (B) Various Chemical Analysis values for 2021-2022 and 2022-2023 (Pre-Monsoon and Post-Monsoon) are parameters get almost similar values **.** WQI is determined using eight parameters that are displayed in Tables 3.1 and 3.2.
Tripaty and Sahu[24.] was proposed by weighted arithmetic method of water quality index and also Husna Israt Pia et al.,[1.] was proposed to estimate $W_{QIA}$is a using the form:

$$W_{QIA}= \sum_{i=1}^{n} wiqi/ \sum_{i=1}^{n} wi$$

Where n is the number of parameters, wi and qi is the ith parameter's of the relative weight and water quality rating. The different water quality measures' unit weights (wi) are inversely related to the standards proposed for the related parameters.

The following equation is used by to compute the value of qi:

$$qi=[(v_i-v_{id})/(s_i-v_{id})]*100$$

Where v_i and s_i represents the observed and standard allowable value of the i^{th} parameter, v_{id} represents the ideal value of the i^{th} parameter in pure water. Tripaty and Sahu[24.] was proposed by except for pH and dissolved oxygen, for all values of parameters (v_{id}) for drinking water are set to zero. As per WHO permissible limit for pH for general water is 7, while an acceptable number is 8.5. (for polluted water). As a result, the pH quality rating is computed using the following equation:

$q_{ph}=100*[(v_{ph}-7)/(8.5-7)]$ Where v_{ph} is observed value for pH

As per WHO permissible limits dissolved oxygen is given by 14.6 ppm, but we considered standard values for this is 5 ppm for calculating rate of quality based on following equation.

$q_{Do}=[(v_{do}-14.6)/(5-14.6)]*100$

As per WHO Table 1. Shows the water quality classification by using the weighted arithmetic wqi approach.

Table 1. Shows the water quality classification by using the weighted arithmetic wqi approach.

Sl.no	Range for wiqi	Quality
1.	0 to 25	Excellent
2.	26 to 50	Good
3.	51 to 75	Poor
4.	76 to 100	Very Poor
5.	above 100	Unsuitable for Drinking Purposes

Table 2. Water quality variables and their corresponding Sn and Wi values

S. No	Parameters	Sn	W_i
1	Ph	8.5	4
2	Turbidity	5	4
3	Electrical Conductivity	2000	4
4	TDS	1000	4
5	DO	5	3
6	BOD	5	3
7	Total Hardness as CaCo3	300	2
8	Ca^{2+}	200	2
9	Mg^{2+}	50	2
10	Total Alkalinity	250	3
11	Cl^{-}	200	3
12	Na^{+}	200	2
13	K^{+}	10	2
14	Ammonia Nitrogen	1.5	2
15	NO_3^{-}	50	2
16	PO_4^{3-}	0.4	2
17	SO_4^{2-}	250	4
18	HCO_3^{-}	150	3

4. Results and Discussions

Table 3.Thefollowing tables depict various chemical analysis values.

Table3.1.(A) Various Chemical Analysis values for 2021-2022 (Pre-Monsoon and Post-Monsoon)											
Post- Monsoon (Oct and Nov-2021)	**EC s/m**	**TSS (ppm)**	**pH**	**N (ppm)**	**Cl (ppm)**	**BOD (ppm)**	**COD (ppm)**	**TDS (ppm)**	**DO (ppm)**	**S (ppm)**	**K (ppm)**

b1	209.2	100	7.4	0	3.4	2.5	1.8	98.4	4.6	6.2	11
b2	214.4	101	7.0	0	3.5	2.4	1.9	97.2	4.7	5.4	10.56
b3	216.3	102	7.2	0	3.45	2.5	1.9	99.5	4.5	5.2	10.78
AVG	**213.3**	**101**	**7.2**	**0**	**3.45**	**2.47**	**1.87**	**98.37**	**4.6**	**5.6**	**10.78**
Pre- Monsoon (March to May-2022)	**EC s/m**	**TSS (ppm)**	**pH**	**N (ppm)**	**CL (ppm)**	**BOD (ppm)**	**COD (ppm)**	**TDS (ppm)**	**DO (ppm)**	**S (ppm)**	**K (ppm)**
a1	112.2	117	7.5	0	4.13	1.2	1.0	111	4.3	5.0	8.35
a2	116.6	116	7.4	0	3.85	1.05	1.01	113	4.8	5.4	7.36
a3	115.3	118	7.3	0	4.11	1.2	1.05	112	4.5	5.2	7.89
AVG	**114.7**	**117**	**7.4**	**0**	**4.03**	**1.15**	**1.02**	**112**	**4.53**	**5.2**	**7.87**

Table 3.1.(B) Various Chemical Analysis values for 2022-2023 (Pre-Monsoon and Post-Monsoon)

Post-Monsoon (Oct and Nov-2022)	**EC s/m**	**TSS (ppm)**	**pH**	**N (ppm)**	**CI (ppm)**	**BOD (ppm)**	**COD (ppm)**	**TDS (ppm)**	**DO (ppm)**	**S (ppm)**	**K (ppm)**
b1	208.2	103	7.1	0	3.5	1.1	1.01	97.4	4.61	6.1	11
b2	215.4	104	7.2	0	3.4	1.15	1.01	96.2	4.72	6.4	10.66
b3	215.3	102	7.2	0	3.45	1.1	1.05	98.5	4.7	5.5	10.7
AVG	**212.97**	**103**	**7.17**	**0.00**	**3.45**	**1.12**	**1.02**	**97.37**	**4.68**	**6.00**	**10.79**
Pre-Monsoon (March to May-2023)	**EC s/m**	**TSS (ppm)**	**pH**	**N (ppm)**	**CL (ppm)**	**BOD (ppm)**	**COD (ppm)**	**TDS (ppm)**	**DO (ppm)**	**S (ppm)**	**K (ppm)**
a1	114.5	114	7.6	0	4.01	2.42	1.7	114	4.5	5.1	8.15
a2	115.8	117	7.2	0	3.9	2.41	1.8	111	4.4	5.2	7.56
a3	114.5	120	7.1	0	4.11	2.52	1.9	112	4.7	5.3	7.92
AVG	**114.93**	**117**	**7.30**	**0**	**4.01**	**2.45**	**1.8**	**112.33**	**4.53**	**5.2**	**7.88**

The analysis's findings indicate that the majority of the parameters are within the ranges that BIS, WHO, and CPCB have established for water used for drinking and other uses. By observing table 3.1.(A) & (B) Various Chemical Analysis values for 2021-2022 and 2022-2023 (Pre-Monsoon and Post-Monsoon) are parameters get almost similar values **.** WQI is determined using eight parameters that are displayed in Tables 4.1 and 4.2.

Table4. The following tables for water quality index values.

Table 4.1.Thefollowing tables for Water Quality Index values for Post Monsoon k=0.87

Parameter	**Average values for Observed Value (vi)**	**Standard value for parameter (si) Ppm**	**Unit weight of parameter (wi)**	**Rating of Water Quality (qi)**	**Wiqi**
EC	213.3	250	0.0348	85.32	0.296
TSS	101	500	0.0174	20.2	0.0351
pH	7.2	6.5-8.5	0.1338	13.33	1.784
N	0	50	0.0174	0	0
CL	3.45	250	0.0348	1.38	0.048
BOD	1.15	5	0.174	23	4.002
COD	1.02	4	0.2175	25.5	5.54
TDS	98.4	500	0.0174	19.68	0.0342
DO	4.64	5	0.174	103.75	18.05
P	5.2	4-20	0.2175	26	5.655
S	10.78	200	0.0435	5.39	0.023
K	11	27.51	0.0417	16.130	0.6726
			Σwi=0.9759		Σwiqi=36.0919

Table4.2.Thefollowing tables for Water Quality Index values for Pre monsoon k=0.87					
Parameter	Average values for Observed Value (vi)	Standard value for parameter (si) ppm	Unit weight of parameter (wi)	Rating of Water Quality (qi)	Wiqi
EC	114.7	250	0.0348	45.6	0.158
TSS	117	500	0.0174	23.4	0.040
Ph	7.4	6.5-8.5	0.1338	26.66	3.56
N	0	50	0.0174	0	0
CL	4.03	250	0.0348	1.61	0.056
BOD	2.46	5	0.174	49.2	8.56
COD	1.86	4	0.2175	46.5	10.11
TDS	112.0	500	0.0174	22.4	0.0389
DO	4.53	5	0.174	104.89	18.25
P	5.60	4-20	0.2175	28	6.09
S	7.87	200	0.0435	3.935	0.0171
K	24.26	27.51	0.0417	20.45	0.852
			Σwi=0.990		Σwiqi=47.478

Water quality index for Post Monsoon = Σwiqi/Σwi =36.0919/0.9759=36.983
Water quality index for Pre Monsoon = Σwiqi/Σwi =47.478/0.990= 47.957

It was determined that the water quality of every parameter is great during the pre-and post-monsoon seasons and that the majority of stations have good water quality during the pre-monsoon season. The water can be used for irrigation, washing, bathing, and purposes related to fisheries and wildlife growth.

The electric conductivity could increase as the temperature.

The electric conductivity of water inside the Cheyyeru River varies from 111.2-116.6 s/m in the pre-monsoon season to 209.2-216.30S/m in the post-monsoon season, according to this experimented chart. EC has a standard value of 250 S/m as shown in Fig 1 and tabulated in Table 3.1.

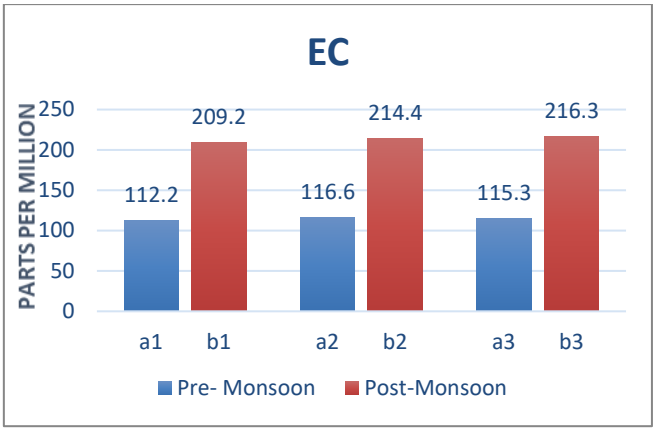

Fig1.Similarities for both seasons of pre- and post-monsoon in Cheyyeru River water by EC

Total suspended Solids (TSS) are biological and synthetic materials consisting of sand, industrial wastewater, and decomposing plants that may be collected in water. TSS stages within the pre- monsoon season vary from 117 to 118 ppm, according to the facts above [13]. Animal parts and business rubbish also are protected other than something else and suspended debris in water are effortlessly observable. The Cheyyeru River water, Annamayya dam, then again, has a number a100-102 ppm in the season of post monsoon, based on this criteria fact every parameter has wide spread restrictions and As per WHO permissible limits for TSS need to be 500 ppm [9] as shown in Fig 2. and tabulated in Table 3.1.

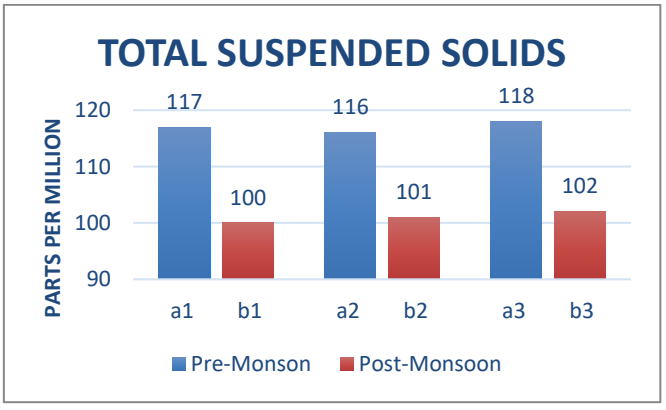

Fig 2. Similarities for both seasons of pre- and post-monsoon in Cheyyeru River water by TSS

The pH will affected by the in the water components. The pH scale water-soluble samples, alkalinity and acidity are

measured. It is an abbreviation for hydrogen potential and important indication of chemical changes. If pH is stages within the pre- monsoon season vary from7.3-7.5 low and The Cheyyeru River water, Annamayya dam, then again, has a number a 7.0-7.4 in the season of post monsoon, and As per WHO permissible limits for pH need to be between 6.5 and 8.0 ppm [9] as shown in Fig 3. and tabulated in Table 3.1. 1 [1] .

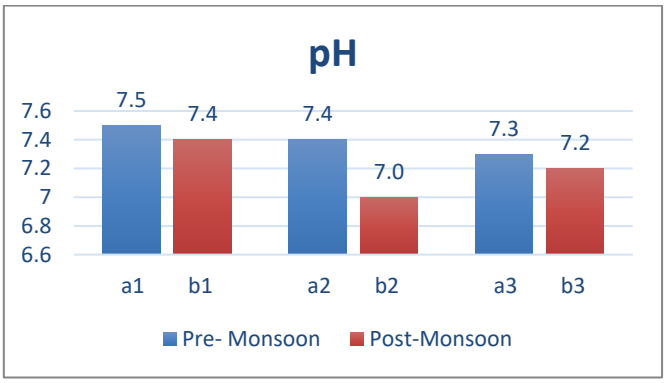

Fig3.Similarities for both seasons of pre- and post-monsoon in Cheyyeru River water by pH

One of the most abundant elements in the environment is nitrogen, supporting the boom of aquatic and algae flora that provide meals and safe haven fordifferent aquatic life creatures[22.] however, excessive ranges of nitrogen inside the air and water maybe unfavorable given that they advocate environmental infection. In both seasons (pre-monsoon and post-monsoon seasons) the extent of nitrogen within the Cheyyeru River is zero ppm, for experimental statistics[18.] but, As per WHO permissible limits for nitrogen is 50 ppm.

Chlorine concentration, when during mixed with water inexactlymeasured proportions, destroys microorganisms. [17.]Chlorineis one of the mostcrucialadditives usedin living organisms.The extent of Chlorine inside the Cheyyeru River, in the post- monsoon season as 3.4-3.45 parts per millon and pre- monsoon season with in the 3.85-4.13parts per millon as shown in Fig 4., and tabulated in Table 3.1. As per WHO permissible limits for chlorine concentration is 250 ppm.

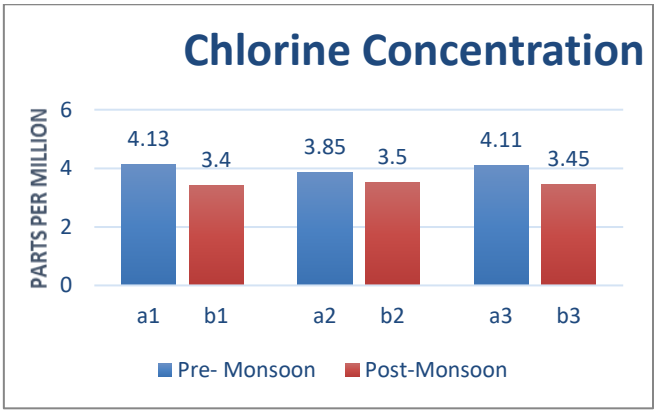

Fig4.Similarities for both seasons of pre- and post-monsoon in Cheyyeru River water by Chlorine Concentration

The quantity of oxygen consumed by bacteria during the oxidation of organic materials in a sample is known as BOD. The Cheyyeru River's pre-monsoon BOD levelis2.4-2.5ppm, where as the post-monsoon BODlevelis1.05-1.2 ppm[19]. At a specific temperature, cardio organic organisms spoil down the natural cloth contained in the water frame. The WHO considers 5.00ppm BOD to be a suitable limit [19] as shown in Fig5.,and tabulated in Table3.1.

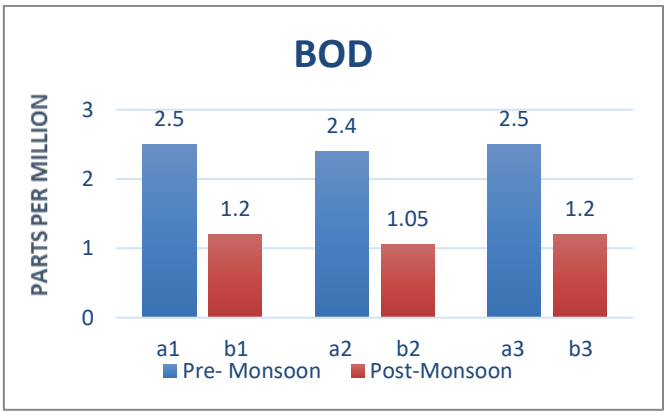

Fig5.Similarities for both seasons of pre- and post-monsoon in Cheyyeru River water by BOD

COD is a rough estimate for the oxygen and may be utilized in water by means of reactions that oxidize soluble and particulate natural materials. It offers an indicator of the effect that liberating wastewater and may have on the surroundings, similar to BOD. The COD inside the Cheyyeru River is 1.8-1.9ppmfor the pre- monsoon season and 1.0-1.05 ppm for post-monsoon season. As per WHO permissible limits for COD is 4.0 ppm [9] which as shown inFig 6., and tabulated in Table 3.1.

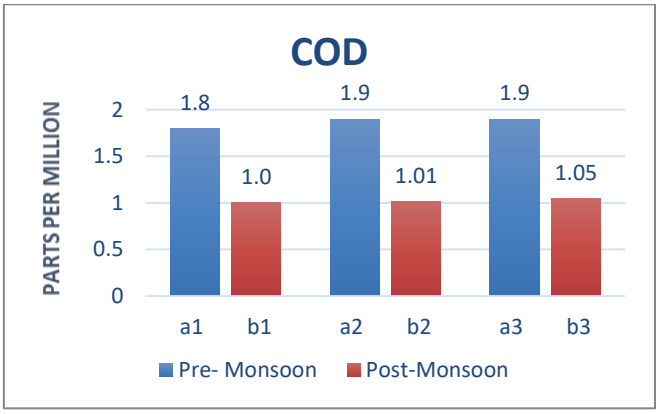

Fig6.Similarities for both seasons of pre- and post-monsoon in Cheyyeru River water by COD

Inorganic salts including chlorides, potassium, calcium, magnesium and sulphates as well as certain small quantities of organic count number dissolved in water, make up overall dissolved solids. TDS in water comes from a variety of herbal asset [21.]. Overall dissolved solids inside the Cheyyeru River variety from 111-113 ppm within the pre-monsoon season to 97.20-99.50 ppm inside the put up-monsoon season. As per WHO permissible limits forTDS is drinking water satisfy in between 500-2000ppm [9] as shown in Fig 7., and tabulated in Table 3.1.

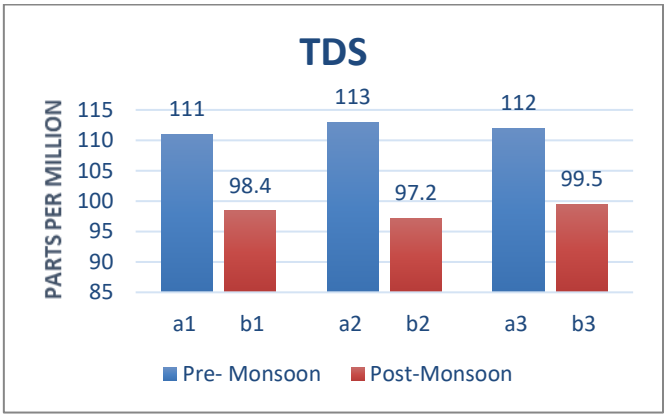

Fig7.Similarities for both seasons of pre- and post-monsoon in Cheyyeru River water by TDS

Dissolved oxygen is necessary for underwater life, because it is requires oxygen to survive [23.]. The DO scales from pre-monsoon 4.3-4.8ppm to the post-monsoon season as 4.58-4.70ppmrespectively, according to figure analyzed on the chemical parameters of Cheyyeru River. As per WHO permissible limits for the standard limit DO was 5.00 parts per million [9] as shown in Fig8.,and tabulated in Table 3.1.

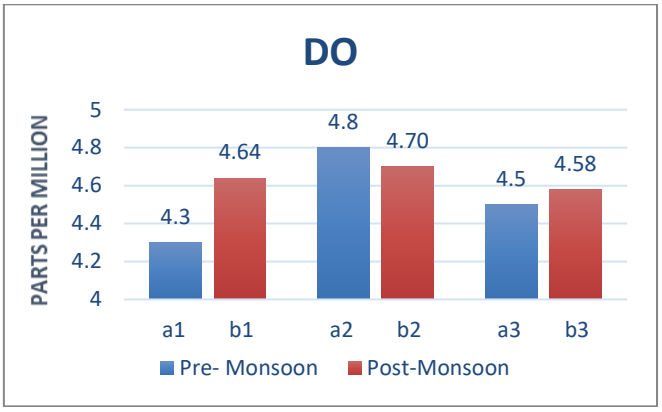

Fig8.Similarities for both seasons of pre- and post-monsoon in Cheyyeru River water by DO

Sulfur, a mineral derived from the earth's mantle, is essential to human health and serves as a food source in a range of ways. Sulfur can seep intowater beneath the ground as sulfate when sulfite ores are oxidized. As per WHO permissible limits for Sulfur in drinking water is 4-20 ppm [20].However, on at the foregoing information, weareableto seethat Sulfur levels within the Cheyyeru River the totally based on the variety from 7.36-8.35 ppm inside the pre-monsoon season are 10.56-11.0 ppm within the Post-monsoon season [19] as shown in Fig 10., and tabulated in Table 3.1.

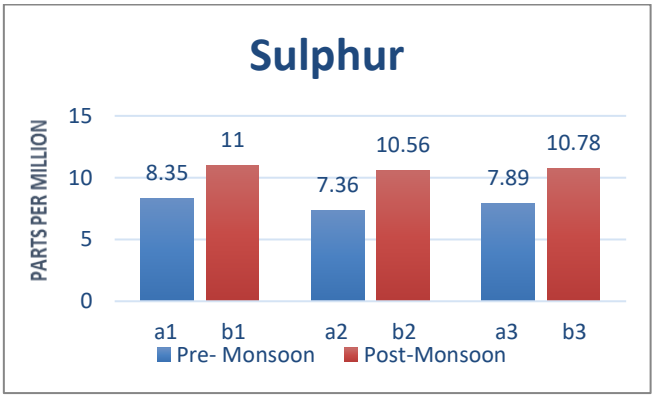

Fig10.Similarities for both seasons of pre- and post-monsoon in Cheyyeru River water by Sulfur

The test results exhibited the values for the potassium levels in pre-monsoon and post-monsoon seasons of the River Cheyyeru and obtained as 23.4 to 24.80 ppm and 10-12 ppm as shown in Fig 11., and tabulated in Table 3.1. According to theWHO, the permissible limits for potassium in drinking water are lower than 200ppm those for healthy human beings [16].

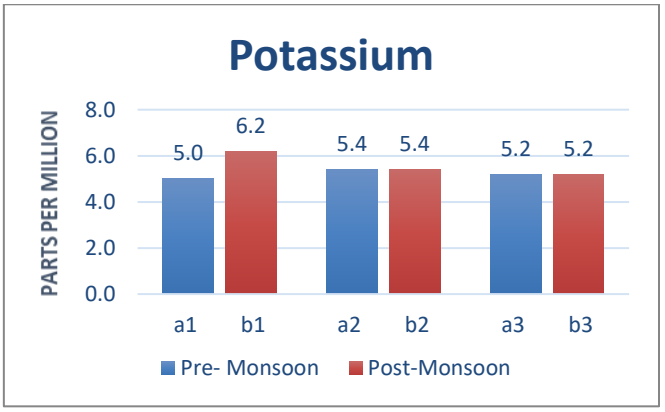

Fig11.Similarities for both seasons of pre- and post-monsoon in Cheyyeru River

Conclusion:

The Cheyyeru River water, Annamayya dam has a widespread impact on the agro- ecological range the rivers has immediate impact on the environment, which is consistent with this information. The chemicals in this river were having many parameters that can be used to ensure that continuous monitoring of water quality parameters. It is observed that increase in water quality parameters and water is effectively utilized in and around Cheyyeru river water .Hence there is a need of the hour to consistently monitor and creating awareness about water spread diseases nearby vicinity of the dam.

From the table 3.1 & 3.2 the chemical analysis reveals during pre-and post-monsoons, River water qualities (Table 4.) is good and is within the WHO, CPCB and BIS permissible limits. The Cheyyeru river water collected can be used for drinking, domestic and other purposes.

From table 4 the water quality index 47.957 and 36.983 is observed or both seasons of pre-and post-monsoons respectively. Therefore, in the present research it is observed that the water quality index is good 26-50, based on standard water quality index and it is in within the WHO permissible limits.

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