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STUDY OF WATER CHARACTERISTICS OF KHABRA POND BY ANALYSING SELECTED PHYSICO-CHEMICAL PARAMETERS.

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ABSTRACT:

Khabra pond is situated in Khabra village which is adjacent to the district Head Quarter, Muzaffarpur city. This pond is perennial source of water for the population living in the catchment area of the pond. They are utilizing this pond water for their daily use such as bathing, washing, and irrigation and also for fish farming. But the quality of this pond water is gradually deteriorating due to the release of waste water, domestic solid waste, and agricultural runoff during rainy season. For knowing the quality of this pond water, selected physico-chemical parameters were studied from January to December, 2024. Temperature of the pond water ranged between 9.5^0C to 33.7^0C, pH 6.5 to 8.8, the Total Dissolved Solid 625 mg/l to 840 mg/l. Transparency between 44 cm to 110 cm, Electrical Conductivity between 210 µS/cm to 324 µS/cm, Dissolved Oxygen between 4.5 mg/l to8.8 mg/l, Biochemical Oxygen Demand between 4.2 mg/l to 7.20 mg/l, the Chemical Oxygen Demand between 8.5 mg/l to 10.62 mg/l, Free Carbon Dioxide between 5.0 mg/l to 7.68 mg/l, Carbonate 36.20 mg/l to 66.44 mg/l, bicarbonate between 118.54 mg/l to 158.64 mg/l and total hardness between 146.38 mg/l to 280.62 mg/l respectively.

KEY WORDS:

Khabra Pond, Physico-Chemical Parameters, Water Quality, Catchment Areas, Rain Water Runoff, Domestic Wastes.

INTRODUCTION:

Presence of water is essential for the survival of all the living organisms on this earth. In India, we get different fresh water rivers, lakes, wetlands and ponds in its different parts. However, due to over exploitation, population growth, and also due to anthropogenic pollution, now a day, fresh water has become a scarce commodity. Water resources and quality of fresh

water are the foremost basic need for flourishing ecological diversity and sustainable development (Mishra *et al*; 2008; Arya *et al*; 2011; Arvind Kumar *et al*; 2018). Domestic solid and liquid wastes, residues of worship domestic as well as temples, animal farms residues and agricultural residues during rainy seasons are continuously added in this pond water. Due to this the physico-chemical characteristics of the pond water is changing and making it unfit for domestic and other utility and fish farming (Gupta *et al*; 2011; Bhattacharyya (nee) Ghosh 2018).

Khabra pond is a perennial source of water for the local people. The maintenance of healthy pond is dependent on the physico-chemical properties and biological activities, and it fluctuates due to a variety of the factors such as the source of water, the type of pollution, seasonal fluctuations and the local human activities and intervention, allof which affects its quality and as a result, its suitability for the utility, fish farming and other application. (Saha *et al*; 2017; Aquatic organisms depends on the water's physico-chemical properties for survival and growth (Dixit, 2015).

Ponds play a significant role in fish cultivation and maintaining ecology. Despite of their small size, ponds have essential environmental, social, and economic services such as supplying drinking water for cattle, recharging ground water, sustaining biodiversity, and giving livelihood through fish cultivation. (Saha *et al*;2017). Pond is a more petite body of fresh water than a lake. Ponds are significant hot spots for the fish cultivation and biodiversity. Collectively they support more species and scarce species than any other fresh water habitat.

Physico-chemical parameters of different ponds have been analysed by several workers. Some of them are being mentioned here. Singh *et al*; (2012); Banerjee and Gupta (2013); Swarnkar and Chaubey (2016); Chakraborty *et al*; (2017); Gokhle *et al*; (2019); Sarkar *et al*; (2020); Seetha and Chauhan (2020).

Study Area:

Khabra pond is present in the village Khabra, of Muzaffarpur district. This village is now a part of District head quarter, Muzaffarpur city. Once this pond was in remote area of Khabra village, but now it has been surrounded by dense populations. Different cattle farms and agricultural lands are present inits catchment area. Because this pond serves as perennial source of water and all the year round the adults and children's do taken bath in this water, therefore, this pond was selected for evaluation of purity of its water through analysis of selected physico-chemical parameters.

MATERIALS & METHODS:

The area of this pond is about 4 acres. There ispitched road from East and South, while from West and North, it is surrounded by cattle farm and agricultural lands. The source of water is rain and runoff water during monsoon. However, due to its depth, water remains in the pond even during summer, although depth of water is reduced to 4-5 feet and area of water in the bed only.

To evaluate the pollution load of the pond water selected physico-chemical parameters were studied, which includes Temperature, pH, Total Dissolved Solids, Transparency, Electrical Conductivity, Dissolved Oxygen, Biochemical Oxygen Demand, Chemical Oxygen Demand, Free Carbon dioxide, Carbonate, Bicarbonate, and Total hardness.

Here on the site, Temperature was measured with the help of laboratory thermometer (100^0C); pH with digital pH meter, Transparency with the help of Secchi disc, Rest parameters were analysed in the laboratory for which the sample water was collected in well cleaned, dried, poly jar having suitable cap. Dissolved oxygen was determined by Winkler's methods. All

precautions were taken during sample collection for determination of dissolved oxygen. Similarly, for BOD, the blank was used with dilution water. Dilution water was prepared following the methodology as described in the text book. For COD also first the digestion experiment was done then the titration work was done. Actually, DO, BOD and COD, were determined by titrimetric methods, and calculation was done through the formula mentioned in the text. Conductivity was determined with the help of conductivity meter. The unitofmeasurement was µS/cm. Free carbon dioxide, carbonate, bicarbonate, and total hardness was determined as the methodology mentioned in APHA (2005).

RESULTS AND DISCUSSIONS:

Temperature:

Temperature of pond water depends on the air temperature, exposure to sun light, depth of the water. Due to above reasons temperature of Khabra pond varied from 9.5^0C in January to 33.7^0C in the month of June. As June month is the hottest month of the year, so naturally both the air temperature and water temperatures were high during this month. When rain started, there was gradual decrease in temperature and finally in winter it was the lowest because January is the coldest month of the season.

pH:

The pH (Potential of Hydrogen) of a solution refers to its hydrogen ion activity and is expressed as the logarithm of the reciprocal of the hydrogen ion, activity at a given temperature. The permissible limit of pH in drinking water is within 6.5 to 8.5 according to Bureau of Indian Standard (BIS). Here value of pH of Khabra pond ranged between 6.5 to 8.8 from January to December. In most of the month water was alkaline, but in some it was acidic also.

Total Dissolved Solid (TDS)

Total Dissolved Solids denote mainly the different kinds of minerals present in pond water. The permissible value as is recommended for TDS is 500 mg/l prescribed by BIS. In the present study TDS, ranged between 625 mg/l to 840 mg/l respectively. Here lowest value was observed in the month of January,while the highest in September respectively.

Transparency:

This indicates penetration of light in water to a particular depth. This depends on the conditions of water as to how much suspended particles and micro organisms are present in it. In the Khabra pond water transparency ranged between 44.0 cm to 110.cm respectively from January to December. Here the lowest value was noted inthemonth of September while the highest value 110 cm in the month of March of the study year.

Electrical Conductivity (EC)

The minimum and maximum values of Electrical Conductivity of Khabra pond water ranged between 200.10µS/cm to 324.58µS/cm respectively, during the study year. Here during winter and summer the value of Electricalconductivity was lower.

Dissolved Oxygen (DO):

Dissolved Oxygen in water comes from the atmosphere and also released bythe submerged aquatic plants and algae that they release during day time in course of photosynthesis. Concentration of Dissolved Oxygen varied between 4.5 mg/l to 8.8 mg/l in

different months of the study period. Concentration of DissolvedOxygen is directly related with the temperature of water.

Biological Oxygen Demand

Biological Oxygen Demand of Khabra pond ranged between 4.2 mg/l to 7.20 mg/l from January to December of the study year. The variations of the biological oxygen demand have been tabulated in table-1, where monthly data can be seen.

Chemical Oxygen Demand (COD)

Chemical Oxygen Demand of a water body is good indicator of the health of that ponds etc. The Chemical Oxygen Demand of the Khabra pond varied between 8.5 mg/l to 10.62 mg/l from January to December. Monthly variations have been mentioned in table-1.

Free Carbon Dioxide:

Such carbon dioxides are absorbed from atmosphere and also released by plants and higher animals during respiration. This form of carbon dioxide is essential for the submerged macrophytes for their photosynthesis. In the present study, form the table-1, it may be noted that free carbon dioxide concentrations ranged between 5.0 mg/l to 7.24 mg/l in different months of the study period.

Carbonate (CO_3^-)

During the study of chemical parameters of Khabra pond water, the value of carbonates wasnoted. From the table-1, it may be noted that the values of carbonate varied from 36.20 mg/l to 66.44 mg/l. Here the lowest value was noted in themonth of December and highest in the month of June itself.

Bicarbonates (HCO_3^-)

Bicarbonate concentrations of bicarbonates of Khabra ponds were also studied for twelve months. The data obtained were mentioned in table-1. From the table-1, it may be noted that bicarbonates concentrations of the pond water varied from 115.36 mg/l to 158.52 mg/l respectively.

Total Hardness:

Total hardness of Khabra pond was also studied from January to December of the study period. Data obtained were presented in table-1. From the table-1, it may be noted that total hardness of pond water ranged between 166.38 mg/l to 280.62 m/gl. Here the lowest value was noted in the month of April while the highest in the month of October itself.

DISCUSSION:

From the data obtained in the present study, it was noted that temperature of pond varied according to the air temperature of the month. Due to this, it was lowest in January and December, while highest in the month of May and June, in which the air temperature is very high. Temperature is one of the essentialand changeable environmental factors, because it influences the growth and distribution of the flora and fauna. It has also vital role in chemical and biological activities. Above findings are in agreement with the findings of Mishra *et al*; (2008); Tirupathaih *et al*; (2012).

pH:

Analysis of pH revealed that except in the months of October and November of the study period, the pond water was alkaline. In the month of June, it is the highest that was 8.8. pH of water is an important indication of its quality and provides information in many types of geochemical equilibrium. As WHO (1988), the range of pH in water for domestic use is 6.5 to 8.5. (Chaudhary *et al*; 2014) also reported a range of pH in between 7.0 and 8.3. In addition above findings are supported with the findings of Sharma *et al*; (2016); Ranjan *et al*; (2017).

Total Dissolved Solids (TDS):

It was also studied from January to December. Here higher amount of TDS was noted in themonth ofSeptember that is 840 mg/l. Total concentrations of dissolved solids; in water body is found useful parameter in describing the chemical density as a fitness factor and as a general measure of edaphic relationship and productivity of the water. (Devi K. and Lekeshmanasamy, 2018).

Transparency:

Transparency of water indicates penetration of light in the water body. Transparency or light penetration depends on the intensity of sun light, suspended solid particles and turbidity of water received from the catchment area, and density of planktons. Lower transparency during August and September may be due to introduction of turbid runoff water during rainy season, while, maximum due to settlement of the suspendedsalts and clay particles. Above findings corroborate with the findings of Kumar and Singh (2013); Abir (2014); and Devi K. and Lekeshmanaswamy (2018).

Electrical Conductivity

Electrical Conductivity of pond water was also studied. Here minimum electrical conductivity was observed during winter and maximum during September of the working year. Conductivity is a measure of the ability of an aqueous solution to carry an electric current. The ability depends on the presence of ions and their total concentrations mobilityand valence. Present findings are in agreement with the findings of Bhatnagar and Devi (2013); Rani (2019); and Perumal and Gopalsamy (2020).

Dissolved Oxygen:

Dissolved Oxygen of Khabra pond also revealed monthly variations. During study period it was found that very low concentrations 4.5 mg/l was noted during summer in the month of June, while higher concentration 8.8 mg/l during winter in themonth of January itself. This low concentration was due to high temperature of pond water as the ability dissolution of oxygen is reduced at high temperature. Similar findings are presented by Tiwari (2015); Paul *et al*; (2019) respectively.

Biological Oxygen Demand (BOD)

Amount of oxygen consumed bythe microbes in degradation of organic matter is said tobe Biological Oxygen Demand (BOD). This indicates the presence of organic pollutant in the pond water. Here low value 4.2 mg/l of BOD was noted in the month of Januarywhile highest 7.20 mg/l in December. This may be due to addition of different domestic solids and liquid wastes as well as remains of different festivals in the months of November. The biodegradation of organic matters exerts oxygen tension in water and also increase the biochemical oxygen demand (Devi K. and Lekeshmanaswamy, 2018); Rajani (2020).

Chemical Oxygen Demand (COD)

In the present study, it was noted that the chemical oxygen demand ranged between 8.5 mg/l to 10.62 mg/l. Here an increase in COD value was noted in the month of June and July while decrease in themonth of January. COD values of any water body are a reliable parameter for analysis of pollutants in the water bodies. It also gives information about organic compounds present in the water. Above findings are supported by the findings of Manglaweda and Nayak(2019); Sarkar *et al*; (2020) respectively.

Free Carbon Dioxide (CO_2)

The amountof CO_2 absorbed directly from the atmosphere and released bythe aquatic flora and fauna during respiration is known as free carbon dioxide. Theyare as yet not assimilated by the green plants. A considerable variation in free CO_2 was noted in the present study that was 5.0 mg/l to 7.68 mg/l respectively. Free CO_2 indicates decomposable organic matter, bacterial action on such organic matters, and physiological activities of living organisms. Above findings accompanied bythe findings off Devi K. and Lekeshmanaswamy (2018); Saha *et al*; (2021).

Carbonates and Bicarbonates were also analysed and a considerable variations in both were found. Here minimum carbonates 36.20 mg/l was noted in December, while maximum 66.44 mg/l in June itself. Similarly, minimum bicarbonates were noted in April that was 115.36 mg/l while maximum 158.52 mg/l in January. Both the above compounds are the major component of alkalinity of surface water. Shaik and Kunda (2019); Anubha Kumari and Bhardwaj (2022).

Total Hardness:

In the present study, it was noted that Khabra pond water is alkaline in most of the months, due to presence of carbonate and bicarbonates. Here total hardness ranged between 146.38 mg/l to 280.3 mg/l lowest value during October and highest value during June. Total Hardness is due to Calcium and Magnesium ions. These cations increase hardness. When the temperature is high the solubility of the divalent cations increases (Ca^{++}, Mg^{++}). Due to this hardness increase (Mehta and Kumari, 2022; Mukherjee *et al*; 2022 and Shivashankar and Alvandi 2023).

CONCLUSION:

The Khabra pond water had variations in its Temperature, pH, Turbidity, Total Hardness, Electrical Conductivity, Dissolved Oxygen, Free Carbon Dioxide& in Total Dissolved Solids. In some months of the year, these parameters were above or below the standard values. But in rest months these parameters were below the standard values. But over all the conditions are alarming and need precautions so that there should not be more increase among the above parameters.

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CONFLICTS:

There are no conflicts for the publication of this paper.

TABLE-1

Monthly variations of selected physico-chemical parameters of Khabra pond of Muzaffarpur

Parameters	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Temp. (^{0}C)	9.5	15.6	23.8	26.5	32.4	33.7	28.6	28.2	27.5	27.0	21.3	12.4
pH	7.6	7.7	7.8	8.2	8.5	8.88	7.4	7.2	7.0	6.8	6.55	7.2
TDS (mg/l)	625	640	705	720	780	790	825	836	840	730	700	650
Transparency (cm)	85.0	94.0	100.0	110.0	80.0	68.0	62.0	46.0	44.0	70.0	76.0	78.0
EC(µS/cm)	200.10	230.0	252.0	260.0	258.0	260.30	288.0	296.0	324.0	242.0	230.0	210.0
DO (mg/l)	8.8	8.4	7.8	6.40	5.20	4.50	6.20	6.55	6.80	7.15	7.60	8.25
BOD (mg/l)	4.2	4.6	5.4	5.8	5.18	4.36	5.10	5.24	6.20	6.45	6.80	7.20
COD (mg/l)	8.5	9.2	9.6	9.8	10.2	10.44	10.62	10.36	10.14	9.50	9.10	9.20
Free Carbon Dioxide (mg/l)	6.40	6.58	6.82	7.24	7.68	6.85	6.10	5.60	5.45	5.30	5.12	5.0
Carbonate (mg/l)	40.65	46.54	49.62	54.28	62.34	66.44	52.18	48.15	40.22	38.64	37.56	36.20
Bicarbonate (mg/l)	158.52	160.46	172.18	188.20	1194.35	198.64	132.60	129.74	126.34	120.28	118.54	130.15
Hardness (mg/l)	210.56	191.34	186.28	240.46	262.58	280.34	176.28	188.34	176.62	146.38	148.52	186.81

TDS = Total Dissolved Solids, EC = Electrical Conductivity, DO = Dissolved Oxygen, BOD = Biochemical Oxygen Demand, COD= Chemical Oxygen Demand,

REFERENCES:

Abir S. (2014): Seasonal variations in physico-chemical characteristics of Rudrasagar Wetland- A Ramsar Site Tripura, North East, India. *Res. J. of Chem. Sci*. 4(1): 31-40.

Anubha Kumari and Nalini Bhardwaj (2022): Studies on physico-chemical status of two ponds in Chapra. *The Scientific Temper* 13(1): 115-118

Arvind Kumar R., Farah D., Biswajit, P.A. (2013): Seasonal variations of different physico-chemical water quality parameters of Indrapuri dam Rohtas district, Bihar. *Int. J. Environ. Sci*. 2(3): 125-134.

Arya S., Kumar V., Raikwar M. and Dhaka A. (2011): Physico-chemical analysis of selected surface water samples of Laxmi Tal (Pond) in Jhansi city, U.P. Bundelkhand Region, India. *J. of Exp. Sci*. 2(8): 01-06.

Banerjee U.S., Gupta S. (2013): Impact of Industrial waste effluents on river Damodar adjacent to Durgapur Industrial Complex, West Bengal, India. *Environ. Monit. and Assessment* 3: 2083-2094.

Bhatnagar, A. and P. Devi (2013): Water quality guidelines of the management off pond fish culture. *Int.J of Environ. Sci*. 3(6): 1980-2009.

Bhattacharyaa (Nee) Ghosh Vidisha (2018): Physico-chemical analysis of pond water in Purba Barddhaman, West Bengal, India. *Int. Res. J. of Environmental Sci.* 7(2): 54-59.

Chakraborty S, Kausor M.A, Goyal A.K., Basumatry A., Brahma B.K. (2017): Studies on physico-chemical parameters of fish inhabiting four water bodies in the vicinity of Kokrajhar, Assam. *Int. J. of Applied Chemistry* 3: 409-420.

Chaudhary P., Dhakad N.K., Jain R. (2014): Physico-chemical parameters of Bilawali Tank, Indore, M.P., India. *Journ.of Environ. Sci. Toxicol. and Food Technol.* 8(1): 37-40.

Devi K., Anusiya and Lekeshmanaswamy M. (2018): Monthly variations in physico-chemical parameters of perurchettipalayam lake, Coimbatore, Tamilnadu, India. *Int. J. of Pharmacy and Biological Sci.* 8(1): 44-65.

Dixit A.K. (2015): Study of physico-chemical parameters off different pond water of Bilaspur district Chhattishgarh, India. *Environ. Skeptics and Critics* 4(3): 89-97.

Gokhle, G., Sharma G.D., Disha D. (2019): Seasonal variations of physico-chemical assessment of Satak reservoir Khargone (M.P.) *Emerg. Technol. Innov. Res.* 6(3): 338-347.

Gupta A.K., K. Mishra, P. Kumar, C. Singh and S.Srivastava (2011): Impact of religious activities on the water characteristics of prominent ponds at Varanasi, U.P. *Plant Arch.* 11(1):297-300.

Kumar N., Singh N.P. (2013): Studies on the ichthyofauna of Kararia Lake of Motihari, East Champaran, Bihar, India. *Res. J. of Animal Vetenary and Fisheries Sci.* 1(9): 8-12.

Manglaweda, S.S., Nayak M.S. (2019): Seasonal variations in physico-chemical parameters of Belur pond of DharwadTaluk, Karnatka, India. *Int. J. Sci. Res. Rev*. 8(2): 40-47.

Mehta N.K. and Dr. Arti Kumari (2022): Study of water quality using of physico-chemical parameters of two perennial fish pond of Darbhanga. *Int. J. of fisheries and Aquatic Studies.* 10(3): 128-132.

Mishra R.R., Rath B. and Thatoi H. (2008): Water quality assessment of Aquaculture ponds located in BhitarKanikaMangroove Ecosystem, Odissa, India. *Turkish Journ.of Fish and Aqua Sci.* 8: 71-77.

Mishra, V.R., Upadhyaya R.R., Pandey S.K. and Tripathi B.D. (2008): Heavy metal pollution induced due to local mining effluent on surrounding aquatic ecosystem and its management through naturally occurring aquatic macrophytes. *BioresourceTechnology* 99: 930-936.

Mukherjee P., P. Kumar, Shashi Kumar Gupta and Rahul Kumar (2022): Seasonal variation in physico-chemical parameters and suitability for various uses of Bouli pond water, Jharkhand. *Water Science* 36(1): 125-135.

Paul Jaishankar, E.Beliya, S. Tiwari, N. Gupta, Diverma, S.K. Jadhav (2019): Comparative studies of physico-chemical properties of water from various ponds in Raipur. *New World J. of Biotechnol.* 1(2): 23-27.

Perumal, M., &Gopalsamy, S. (2020). Climatic variation in water quality assessment of selected temple ponds In Kanchipuram.*Executive Editor*, 11(7), 536-538

Rajani V. (2020): Preliminary studies on the physico-chemical characteristics of perennial fresh water lake of Warangal district, Telangana, India. *IJRASET* 8(12): 800-803.

Rani S. (2019): Physico-chemical properties of fresh water fish pond in relation to fish farming in Darbhanga district. *J. of Emerging Technologies and Innovative Research* 6(6): 541-544.

Ranjan R., Srivastava S, Ramanathan A.L. (2017): An assessment of the hydrogeochemistry of two wetlands located in Bihar state in the subtropical climatic zone of India. *Environ Earth Sci.* 76: 16-24.

Saha, A., Ramya, V. L., Jesna, P. K., Mol, S. S., Panikkar, P.,Vijaykumar, M. E., & Das, B. K. (2021). Evaluation of spatio-temporal changes in surface water quality and their suitability for designated uses, Mettur reservoir, India. *Natural Resources Research*, 30(2), 1367–1394.

Saha, S., Mandal, A., &Sahoo, D. (2017). Study of physico-chemical parameters of three different urban pond water of Nadia district, West-Bengal, India. *International Journal of Fisheries and Aquatic Studies*, 5(6), 23–27.

Sarkar, R., Ghosh, A. R., &Mondal, N. K. (2020). Comparative study on physicochemical status and diversity of macrophytes and zooplanktons of two urban ponds of Chandannagar, WB, India.*Applied Water Science*, 10(2), 1–8.

Seetha V. and M. Chauhan (2020): Comparative analysis of the physico-chemical parameters of selected pond water samples in and around Vellore district, India. *Int. J. Curr. Microbiol. App. Sci*. 9(4): 1373-1382.

Shaik M.S., Kunda S.K. (2019): Assessment of physico-chemical parameters of selected fish farm near Kolleurlake, Andhra Pradesh, India. *J. Human Univ. (Nat. Sci.)* 40(2): 97-105.

Sharma R.C., Singh N., and Chauhan A. (2016): The influence of physico-chemical parameters on phytoplankton distribution in a heat water stream ofGarhwal, Himalayas: A case Studies. *Egyptian J of Aquatic Res*. 42: 11-21.

Shivashankar, B.P. and SwethaAlvandi (2023): Analysis of physico-chemical parameters of water of ponds/lakes in and around ArsikereTaluk, Hassan District, Karnatka, India. *Asian J. of Biol. and Life Sci.* 12(3): 628-638.

Singh S.N., Srivastava G., Bhatt A. (2012): Physico-chemical determination of pollutants in waste water in Dehradun. *Curr. World Environ*. 7: 133-138.

Swarnkar A.K., Chaubay S. (2016): Testing and analysis of pond water in Raipur City, Chhattisgarh, India. Int. *Journ. of Sci. and Res*. 5(4): 1962-1965.

Tirupathaih M., Samatha C.H, Chentha S. (2012): Analysis of water quality usingphysico-chemical parameters in lower manair reservoir of Karim Nagar district, Andhra Pradesh. *Int. J. of Environ. Sci.* 3(1): 172-180.

Tiwari S. (2015): Water quality parameters – A review. *Int. J. ofEngin. Sci. Innov. Res. Dev.* 1: 319-324.