

Water Quality Analysis of Nardipur lake in Gandhinagar District, Gujarat, India

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Abstract— Water is the most important in shaping the land and regulating the climate. It is one of the most important compounds that profoundly influence life. The quality of water is usually described according to its physical, chemical and biological characteristics. The physicochemical parameters such as pH, Electrical conductivity (EC), Alkalinity, Total Solids (TS), Hardness, Chloride, Dissolved Oxygen (DO), Biological Oxygen Demand (BOD) & Most Probable Number (MPN) were evaluated at selected lakes of Gandhinagar District. The lakes are subjected to severe domestic and sewage pollution at selected sites of Gandhinagar.

Key words:

Lakes, Nardipur taluka, Gandhinagar, physico-chemical, water quality, analysis.

1). INTRODUCTION:

India is land of great contrasts and incongruities. The state of her water resources replicates them most. A yearly rain is around 117 cm mighty Himalayas with their perennial snow cover and numerous glaciers ensure a wealth of water properties in our country India (Brij Gopal., 2017). Water is the most abundant compound of the ecosystem. All the living organisms on the earth need a water for their survival and growth (Patil.P.N *et al*, 2012). The lakes, rivers and wetlands provide a number of environmental, social and educational benefits to mankind. The quality and quantity of these resources is an indicator of sustainable development of a country. Everything oriented in the water and everything is sustained by water. All life on the earth depends on water. Water is not only essential to life but is the predominant inorganic constituent of living matter, forming in general nearly three quarters of the weight of living cell. The physico-chemical methods are used to detect the effects of pollution on the water quality. Changes in the water quality are reflected in the biotic community structure. Water quality in the water bodies is generally dependent on physical, chemical and biological parameters (Prachi and Rajiv, 2020). The lake, streams and wetlands provide an environmental, social and educational benefits to mankind. These resources is an indicator of sustainable development of a country (P. Chaudhry, *et al*.,2013).

Pollution is one of the most burning problems before mankind. It reasons harms to the human being on the hand and his substance (forest land, crop, animals, Industrial Area etc.) the Pollution is an unwanted change in the physical in the physical, chemical or biological characteristic of air, water and soil that have damaging effect on the life or create a probable health danger of any living organisms. Now a days in our country's quick development and industrial development Fast industrialization and unselective use of chemical fertilizers and pesticides are causing very highly and it effects the pollution in aquatic

environment leading to water quality and exhaustion of aquatic biota. Water pollution is a serious problem in all the main lakes of India (Bhargava, 1987). The lake also takes arrival of contaminated water from the surrounding slum area. The colored water holding chemical was also released by the dhobis, small scale industries also free their waste openly into the lake.

2). Materials and Methods:

Study site:



Nardipur lake

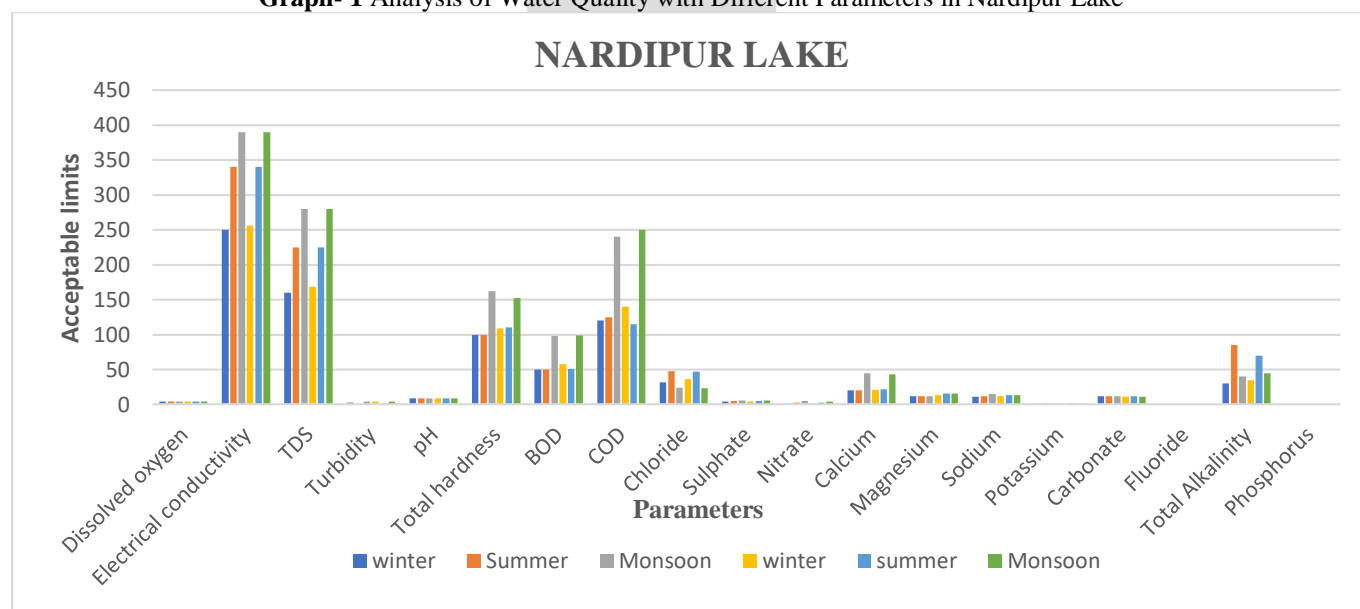
The Water Samples from Gandhinagar district were collected from four Different Stations in the Morning Hours between 9 to 4 pm, in Polythene Bottle in summer season. All samples were collected from a depth of 1m from surface. The sample bottle was labelled with date and location. The Water samples were immediately brought in to Laboratory for the Estimate of various Physico-chemical Parameters like Water Temperature Transparency and pH were recorded at the time of Sample Collection, by using Thermometer and Pocket Digital pH Meter. While other Parameters Such as DO, TDS, Free CO₂, Hardness, Chlorides, Alkalinity, Phosphate and Nitrate were estimated in the Laboratory By using Standard Methods as Prescribed by APHA.

3). Result and Discussion:

Table: 1 PHYSICO CHEMICAL PARAMETERS OF NARDIPUR LAKE

Sr no	Parameters	Acceptable limits	Winter 2022	Summer 2022	Monsoon 2022	Winter 2023	Summer 2023	Monsoon 2023
1	Dissolved oxygen	Max. 1.0 mg/L	4.2	4.1	4.2	4.1	4.1	4.2
2	Electrical conductivity	Max. 750	250	340	390	256	340	390
3	TDS	Max.500 mg/L	160	225	280	168	225	280
4	Turbidity	Max.1 NTU	3	1	4	4	1	4
5	pH	6.5-8.5	8.64	8.97	8.63	8.54	8.90	8.63
6	Total hardness	Max.200	100	100	162.5	109	110	152.5
7	BOD	Max. 0.5	50	50	98	58	51	99
8	COD	Max. 0.5	120	125	240	140	115	250
9	Chloride	Max.250 mg/L	32	48	24	36	47	23
10	Sulphate	Max. 200 mg/L	4.2	4.6	5.8	4.1	4.8	5.7
11	Nitrate	Max. 45 mg/L	0.62	2.9	4.6	0.72	2.8	4.3
12	Calcium	Max. 75 mg/L	20	20	45	21	22	43
13	Magnesium	Max. 30	12	12	12	13	16	16
14	Sodium	Max. 200 mg/L	10.8	12	15	11.8	13	13
15	Potassium	Max.12 mg/L	1.1	1.8	1.2	1.1	1.9	1.1
16	Carbonate	Max.200 mg/L	12	12	12	11	12	11
17	Fluoride	Max.1.0 mg/L	BDL	BDL	BDL	BDL	BDL	BDL
18	Total Alkalinity	Max.200 mg/L	30	85	40	35	70	45
19	Phosphorus	Max. 0.5 mg/L	BDL	BDL	BDL	BDL	BDL	BDL

Graph- 1 Analysis of Water Quality with Different Parameters in Nardipur Lake



During the monsoon season in the year 2022 most of the parameters observed highly concentration in water. BOD 98 mg/L and COD 250 mg/L was observed highest amount in monsoon. pH value was highly showed in summer season. Total hardness recorded maximum amount in monsoon season. Potassium value 1.9

mg/L in monsoon season. Dissolved oxygen showed higher amount during the winter season. TDS recorded higher amount during the monsoon season. Turbidity is maximum in monsoon season. Chloride, total alkalinity observed maximum in summer season. Sulphate, nitrate, sodium concentration maximum during monsoon season (Graph-1).

4) Conclusion:

The water quality considers physical, chemical and biological parameters for defining the quality of water and its maintenance. The result obtained during study was compared with standards and it was found that maximum number of parameters in selected lakes were above desirable limit in all the summer season. This result shows that the selected lakes obtain very high amount of pollution from the nearby. And the water of lake is highly polluted and if the similar condition carries on for the extended period, selected lakes may soon become ecological inactive. Water budget and drought condition have primary importance in the quality of the lake. These physic-chemical parameters and have been resulted as an outcome of efforts and research and development carried out by district government agencies and experts in these areas.

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