A Study On The Water Quality Of Kondakarla Awa Lake

Visakhapatnam - Andhra Pradesh

Pericherla sravani
Assistant Professor, Department of Environmental Sciences
Pragati Engineering College
Visakhapatnam, India

Abstract—**This Wetlands provides a rich biodiversity which is of a great social, economic, and cultural values for communities, regardless of their importance and values wetlands are under constant threat in the form of modification or reclamation along with the unsustainable usage, Kondakarla Awa is one such wetland system in Andhra Pradesh reporting a constant deterioration in its ecological parameters , present study focused on the assessment of the Physico chemical parameters of the water in Kondakarla Awa Lake using the standard analytical methods as recommended by APHA for two seasons. Results reveled the impact of anthropogenic activities on the quality of the aquatic ecosystem of the kondakarla Awa lake, which ultimately effecting the diversified flora & fauna of the lake and subsistence livelihood of the people around kondakarla awa lake.**

Keywords— Wetlands, Physico Chemical analysis, Ecosystem, Livelihood

I. INTRODUCTION

Wetlands provides a rich biodiversity which is of a great social, economic, and cultural values for communities, regardless of their importance and values wetlands are under constant threat in the form of modification or reclamation along with the unsustainable usage, world has lost almost 50% wetlands since 1900 (Wetland Internationals, 2006). "Lakes and reservoirs hold a great promise as a source of freshwater whose demand is expected to increase with the time. Unfortunately, management of these ecosystems are being neglected and destroyed in rural as well as in urban areas which demands for a clear-cut lake and reservoir protection strategy as an integral component of natural water policy (Rao, R.D. 1984). Water relies on healthy ecosystems to remain clean, pure, and available. Protecting watersheds, wetlands, and wild, natural rivers is the cheapest and easiest way to provide clean, safe water, The quality of water resource is usually described according to its physical, chemical and biological characteristics for confirming the good quality of water resources, The types of analysis could vary from simple field testing for a single analysis to laboratory based multi component instrumental analysis. (APHA, 2000).

II. MATERIALS AND METHODS

A. Study area

Kondakarla awa lake is a second largest natural fresh water lake lies between (Lat**.** 17° 35'30"N and 17°36'02"N) and (Long. 82°59'27"E and 83°01'02"E**)** of Visakhapatnam district, Andhra Pradesh which is classified as perennial ,warm, polymitic, euphotic, eutropic shallow fresh water lentic body which is a part of Sarada riverine system. Kondakarla awa wetland has a total water spread of 753.93 ha, with a self-catchment area of about 2538.19 ha, The Annual rainfall in the study area is 955 mm and with mean temperatures varied from 23.5°C to 31.2°C.

B. Sampling & Analysis

Random stratified sampling technique was adopted in the study and water samples were collected from TEN sampling stations (Fig. 1.) across the kondakarla awa lake during the monsoon and post monsoon seasons and the collected samples were analysed at Department of Environmental sciences, Andhra University by using the standard operating procedures as prescribed by APHA 2006 and the list of standard methods and instruments used in the study is presented in Table.I.

TABLE I. LIST OF STANDARD METHODS USED FOR ANALYSIS

S.No	Parameter	Method	Instruments
A.	**Physico-chemical**		
1.	pH	Electrometric	pH Meter
2.	Conductivity	Electrometric	Conductivity Meter
3	Turbidity	Nephlometer method	Nephlometer
4.	TDS	Electrometric	Conductivity/TDS Meter
5.	Alkalinity	Titritimertric method	-
6.	Hardness	Titritimertric method	-
7.	Chloride	Argentometric method	-
8.	Nitrate	Phenol disulphonic acid method	-
9.	DO	Winkler's method	-
10.	BOD	Winkler's method	BOD Incubator

Fig. 1. Study area map showing different study location.

III. RESULTS & DISCUSSION

1) Temperature: Temperature in the study area varied from 24ºC to 24.9ºC during the monsoon season and 26ºC to 27 ^{0}C during the pre monsoon season , the mean temperature value in the study region was recorded as 25.05 ± 1.4.

2) pH: pH in the study area varied from 7.9 to 8.3 during the monsoon season and 7.6 to 8.3 during the pre monsoon season , the mean pH value in the study region was recorded as 8.0 ± 0.07.

3) E.C: E.C in the study area varied from 475 µs/cm to 494 µs/cm during the monsoon season and 430 µs/cm to 538 µs/cm during the pre monsoon season, the mean pH value in the study region was recorded as 485 ± 10.2.

4) Turbidity: Turbidity in the study area varied from 6.9 NTU to 7.9 NTU during the monsoon season and 6.2 NTU to 8.1 NTU during the pre monsoon season, the mean Turbidity value in the study region was recorded as 7.4 ± 0.6.

5) Total Hardness: Total Hardness in the study area varied from 341 mg/l to 423 mg/l during the monsoon season and 246 mg/l to 417 mg/l during the pre monsoon season, the mean total hardness value in the study region was recorded as 367 ± 25.8.

6) TDS: Total dissolved solids in the study area varied from 231mg/l to 265 mg/l during the monsoon season and 214 mg/l to 269 mg/l during the pre monsoon season, the mean TDS value in the study region was recorded as 243 ± 7.7.

7) Alkalinity: Alkalinity in the study area varied from 175 mg/l to 260 mg/l during the monsoon season and 164 mg/l to 232 mg/l during the pre monsoon season, the mean Alkalinity value in the study region was recorded as 218 ± 28.9.

8) Chlorides: Chlorides in the study area varied from 142 mg/l to 198 mg/l during the monsoon season and 67 mg/l to 100 mg/l during the pre monsoon season, the mean chloride value in the study region was recorded as 130.5 ± 60.8.

9) Dissolved Oxygen: Dissolved oxygen in the study area varied from 3.3 mg/l to 4.9 mg/l during the monsoon season and 3.5 mg/l to 4.6 mg/l during the pre monsoon season , the mean Turbidity value in the study region was recorded as 4.17 ± 0.24.

10) Biological Oxygen Demand: Biological Oxygen demand in the study area varied from 2.2 mg/l to 2.8 mg/l during the monsoon season and 0.6 mg/l to 3.6 mg/l during the pre monsoon season, the mean Turbidity value in the study region was recorded as 2.25 ± 0.24.

N o.	Parameter	Sampling Station Nos.																			
		1		2		3		4		5		6		7		8		9		10	
		M	PM	M	PM	M	PM	M	PM	M	PM	M	PM	M	PM	M	PM	M	PM	M	PM
1	Temp. (ºC)	24	27	24.1	26.9	24.9	25.9	24.9	26	24	26.1	24	26.2	24	26	24	26.1	24	26.1	24	26.2
2	pH	7.9	8.1	8	8.1	8.1	7.6	8.1	8.3	7.9	7.7	8	7.9	8.2	8.1	8	7.9	8.1	8	8.3	7.9
3	Electrical conductivity (µs)	475	446	483	441	497	469	510	430	481	509	488	478	518	522	519	538	494	485	509	478
4	Turbidity (NTU)	7.2	7.6	7.8	6.9	7.96	6.2	8	7.2	7.7	6.7	7.9	6.2	8.4	6.9	6.5	7.9	7.9	8.1	6.7	7.9
5	Hardness (mg/l)	341	304.8	376	361	384	248	392	338	373	246	388	338	423	417	373	372.5	389	395	395	391
6	TDS (ppm)	240	221	234	221	248	236	258	214	231	254	253	238	265	262	260	269	249	243	256	237
7	Alkalinity (mg/l)	219	195	228	212	257	190	260	232	271	164	221	192	241	213	175	199	236	200	244	196
8	Chlorides (mg/l)	142	98	150	100	165	95	148	67	167	78	180	100	191	98	194	80	196	70	198	75
9	DO (mg/l)	4.8	4.5	4	3.5	4.6	4	4.1	3.7	3.3	4.2	4.7	3.5	4.9	4.6	3.8	4.1	4.1	4	4.9	3.9
10	BOD (mg/l)	2.7	2.4	2.6	1.9	2.2	0.6	2.1	0.7	2.3	3.1	2.7	1.5	2.8	3.6	2.3	2.2	2.2	2.9	2.4	1.8

CONCLUSION

All the ten water samples tested in the study region are in compliance with BS(IS:10500:1991) drinking water standards , mean electrical conductivity values of 485 µs/cm in the lake suggests its suitability as a good water resource for irrigation ,however there is a need for a detail study in the aspects of microbial contaminations, heavy metal contaminations, pesticide contaminations in the lake need to be studied in depth as the lake serves as a major drinking water source & irrigation source for 21 surrounding villages.

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