

Environmental Impact Statement on Kolleru Lake Water



M. Satish Kumar, V.Lakshmi Prasanna, K.Madhu Sudana Vijaya bhaskar, J.Naveen Kumar, N.Venkateswarlu

Abstract: Catchments are most important for the purpose of practicing irrigation and recharging groundwater by collecting water during the rainy season so that the nearby land will be in surplus quantity of groundwater due to the continues percolation of water from the catchments, even the stored water in the form of catchments will be used as an alternative water source for other requirements apart from the irrigation practices such as for industries and other developmental activities taking place nearby the catchments. Year by year it was noticed that in the world scenario the pollutant concentration is keep on increasing especially water and air pollution due to the excessive load of population that is increasing from the rural to urban areas [10]. Coming to water pollution the major portion of pollution is increasing in the surface water bodies [4] due to various activities like surface runoff, intentionally releasing of untreated effluents from the nearby industries into the catchments [8] and the agricultural runoff etc, whatever the reason there is an immediate need and an emergency to monitor these catchments as the average rainfall is gradually decreasing due to the changing climatic conditions like global warming which leads to the reduced availability of water in the surface water bodies at the other side the existing water is being contaminated [5] by the activities of nearby people. The impact will be severe when the same situation continues in the days to come where the living standards of the people will be decreased at a notable level and the impact will be much more severe on the irrigated land which depends on the catchments. The study has done at Kolleru Lake in west godavari district, Andhra Pradesh. Collected Six Water samples from six locations around the lake for analysis [7] and then the results of the analysis compared with Central Pollution Control Board 1979 and Indian standards 1982 guidelines for water in the surface water bodies to find out the present scenario of lake water.

Keywords: Catchments, Contaminated, effluents, groundwater, population, runoff.

I. INTRODUCTION

Water is one of the natural resource which is very much linked with the existence of human life on the earth which is in demand due to the increased population and the pressure that is increasing year by year on agricultural practices to meet the food requirements as well as on the other developmental activities such as industrial sector, public water supply system etc. catchments are the best buffer zones for water resources in the time of need which collects water in rainy seasons and the same will be distributed to the public for whenever in the need during the other seasons of the year especially during the summer season. Even these are also serving as the best recharging practices of groundwater [9] to overcome groundwater depletion at nearby surroundings as they supply water through the process of continuous percolation. The dependency on surface water bodies has been increasing due to the reducing groundwater and also because of unavailability of groundwater at certain areas where the rainfall is not maintaining even at minimum levels continuously for long years, so people are looking for the protection strategies of surface water to meet the requirements of the nearby the catchment but unfortunately due to the pressure on the water quantity, unscientific handling of water along with the surface runoff [1] they are getting contaminated and failed to serve as alternative source of water to the public.

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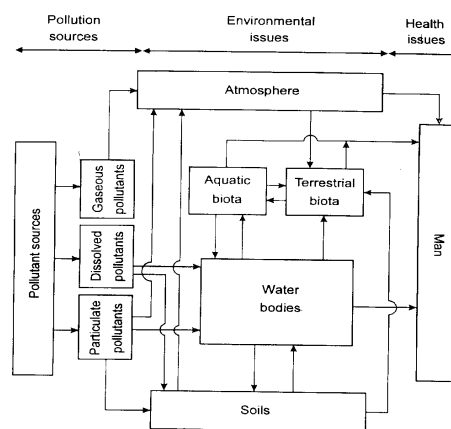


Figure 1: Possible pathways for lake water contamination

Source: Deborah Chapman 1996, second edition on assessment of quality for water

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II. OBJECTIVES

1. Identification of locations for sampling of water and sediments
2. Analysis of water and sediments for identifying the lake quality status
3. Correlation of obtained results with surface water quality standards given by Central Pollution Control Board 1979 and Indian standards 1982 guidelines for water in the surface water bodies

III. METHODOLOGY

III. Identification of locations for sampling:

1. The sampling locations were identified based on the possible entry of water flow into the lake along with the lake central part for sampling
2. Clean and sterilized glass bottles were used to collect the water samples.
3. All the collected sampling bottles were named with labelling with respect to the location and the collected date.

III.II Analysis of lake water quality:

1. The analysis was carried out for three consecutive cycles of three months study period.
2. Standard procedure [3] used to determine the concentration of different parameters of water as per Central Pollution Control Board 1979 and Indian standards 1982 guidelines for water in the surface water bodies

3. The obtained values of different parameters for three consecutive cycles average was considered as the final result for various parameters concentration in the water body.

IV RESULTS AND DISCUSSIONS OF THE STUDY:

1. Colour (Hazen units): The color of the lake water has crossed the acceptable limits as per Central Pollution Control Board 1979 and Indian standards 1982 guidelines [6] for water in the surface water bodies

2. P^H of the water samples: P^H of the water samples analysis indicates that Lake P^H is within the acceptable limits as per Central Pollution Control Board 1979 and Indian standards 1982 guidelines for water in the surface water bodies

3. Electrical Conductivity: Electrical conductivity also crossed the acceptable limits as per surface water quality standards given Central Pollution Control Board 1979 and Indian standards 1982 guidelines for water in the surface water bodies

4. Total dissolved Solids: The TDS of the water samples has crossed the acceptable limits as per the Central Pollution Control Board 1979 and Indian standards 1982 guidelines for water in the surface water bodies

The remaining parameters like chlorides, Fluorides, Iron also crossed the accepting limits as per Central Pollution Control Board 1979 and Indian standards 1982 guidelines for water in the surface water bodies

Table 1 Water quality analysis of the lake

S.No	PARAMETER	LOCATION CODE					
		L 1	L 2	L 3	L 4	L 5	L 6
1	Colour(HAZEN)	70	50	40	30	30	100
2	p ^H	7.5	7.6	7.3	7.4	7.5	7.8
3	E.C(mg/lit)	6500	7590	6590	5800	6600	7600
4	T.D.S(mg/lit)	4290	4950	4349	3828	4356	5016
5	CHLORIDES(mg/lit)	1920	2216	1600	1540	2200	2060
6	IRON(mg/lit)	+	+	+	TRACES	TRACES	TRACES
7	FLOURIDES(mg/lit)	0.3	0.1	0.1	0.3	0.1	0.3
8	AMONICAL NITROGEN(mg/lit)	NILL	NILL	NILL	NILL	NILL	NILL
9	NITRITE(mg/lit)	0.25	LIGHT TRACES	NILL	NILL	NILL	NILL

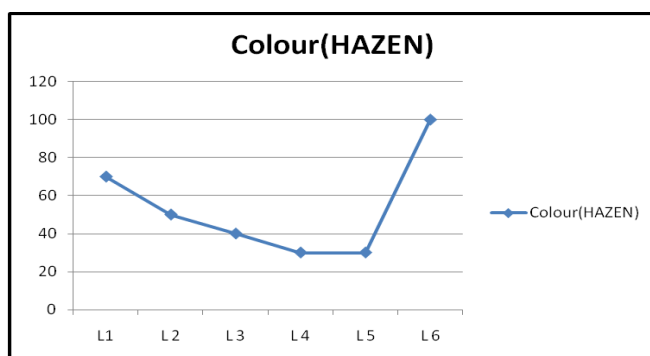


Figure 1: Representation of Colour in Graph

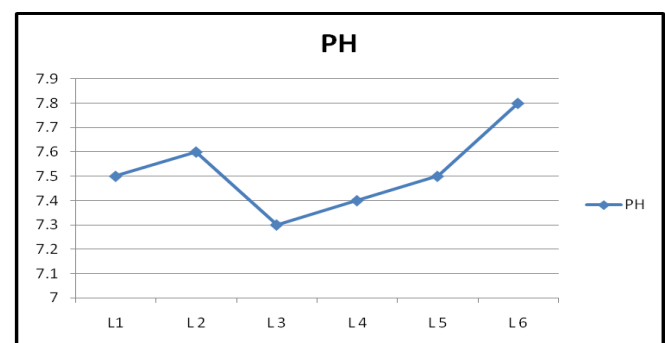


Figure 2: Representation of P^H in Graph

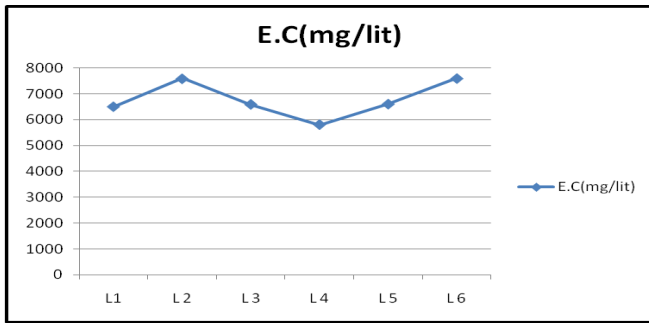


Figure 3: Representation of E.C in Graph

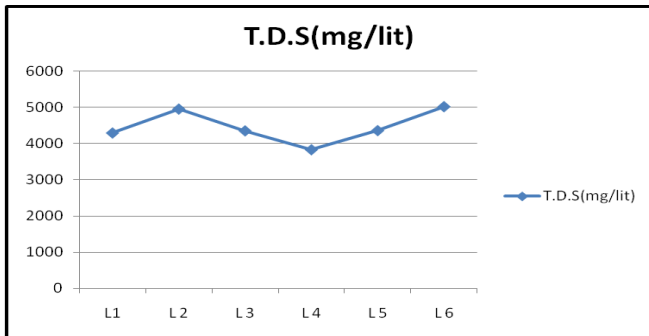


Figure 4: Representation of T.D.S in Graph

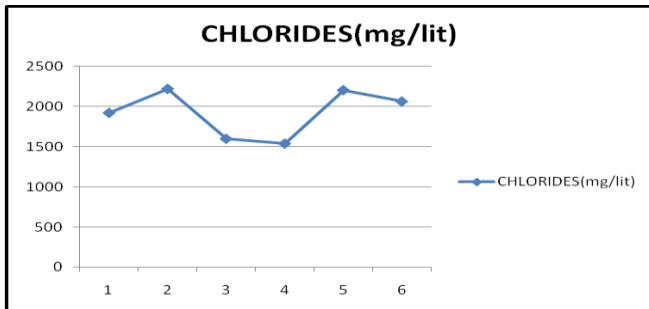


Figure 5: Representation of Chlorides in Graph



Figure 6: Sampling and analysis of water quality

V CONCLUSIONS:

1. The quality of lake water is not in the acceptable limits as per the surface water quality standards by Central Pollution Control Board 1979 and Indian standards 1982 guidelines for water in the surface water bodies
1. There is an immediate need to reduce the contaminant levels of the lake with suitable measures like prohibiting releasing of untreated chemicals from the nearby sources
2. Strict policies with clear cut guidelines on releasing of untreated effluents [2]
3. Maintenance of vegetative cover near by the surroundings to reduce the surface runoff
4. Periodical monitoring of lake water quality to rejuvenate the lake water quality

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