

Evaluating Seasonal Variation for Anthropogenic and Natural Factors' Impact on Water Quality of Pichola Lake, Udaipur, Rajasthan, India

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The characteristics of water are proportional to environmental quality around it. An attempt has been made in the current research to assess various characteristics of the physico-chemical quality of water and significant factors in determining biodiversity in Pichola lake, Udaipur. Most importantly various anthropogenic activities, for example mining, soil erosion, religious activities, hospitality industry, etc., are responsible for downgrading the water quality of the Pichola lake. A significant impact of the anthropogenic activity, like mining, discharge of sewage effluent and excessive use of agrochemicals is affirmed. In this research study, we have measured pre and post-monsoon physico-chemical parameters and computed water quality index, eutrophication index and organic pollution index. Parameters, pH, EC, alkalinity, TDS, phosphate, COD and nitrate of Pichola lake are within acceptable limit; however, chloride content, dissolved oxygen and post-rainfall BOD are beyond the permissible limit. Therefore, present study provides essential information about deteriorating water quality of Pichola lake.

KEYWORDS

Physico-chemical, Deflocculation, Lake ecosystem, Water monitoring

1. INTRODUCTION

On surface, lakes are singular and significant feature that provide significant social, environmental and economic benefits, such as drinking water, flood control, biodiversity and the development of local tourism. It offers the villagers an efficient means of subsistence [1]. The nutrient load of these lakes has, catalytically, increased due to recent major population development, exploitative agricultural techniques to improve productivity and large-scale sewage leaks from metropolitan areas. It leads to eutrophication [2,3]. Urban lakes can serve as recreational areas with water sports and other amenities or as tourism destinations. This makes a major contribution to the regional economy and aids in addressing the social and economic requirements of the populace. One of most well-known tourist sites in world is Udaipur, which is known for its stunning lakes. The settlement is situated between 23°46'0 and 25°05'0 N and 73°09'0 and 74°35'0 E, the line dividing the Thar desert from the plain, near southernmost point of the Aravalli mountains range, East Rajasthan plateau. There is total of eight lakes in the city. For both inhab-

itants and visitors, Pichola lake is the most well-known. Since there are no perennial rivers in cities, like Udaipur, many cities rely on lakes for recreation, irrigation and drinking water supply. In terms of surface water resources, tourism and entire ecosystem, lake system provides a source of life for the city. However, managing water quality is severely hampered by rising urbanisation and population density. The catchment areas of lake in Udaipur have extensively deteriorated over last few ten years due to widespread deforestation and inefficient land management, which has also increased the inflow of silt into these areas. In order to: (i) evaluate the impact of anthropogenic stress and temporal fluctuations on lake's overall water quality and (ii) determine the load of organic matter and the lake's nutritional state, this study was carried out. We have used geostatistical methods to locate different pollution sources.

1.1 Study area

The local communities place a lot of attention on Pichola lake. The specific status of the water characteristics in Pichola lake has been investigated across various weather cycles (2021) across 10 sampling stations with three replicates each based on contact with the human population with respect to tourism through a seasonal survey. The area around Pichola lake was fur-