

# Study of Physico-Chemical Properties of Sasta-Oxbow Lake at Paroo Block in Muzaffarpur, Bihar, India

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## ABSTRACT

Present study has been Conducted to investigate the Physico Chemical properties of water of Sasta oxbow lake at Paroo block in Muzaffarpur district, Bihar The Physico-chemical properties like pH, TDS, DO, BOD, COD, hardness chloride, calcium and magnesium were studied by various analytical techniques It was observed that most of the water quality parameters are in the acceptable limits for growth and development of aquatic organism accordance with WHO standards.

**Key Words:-**Water quality, Physico-chemical parameters, Sasta oxbow lake Muzaffarpur

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## INTRODUCTION

Sasta lake is an oxbow lake in paroo block of Muzaffarpur district, It is formed as residuary part of Budhi Gandak river. It is famous for gaza-grah battle. In several part years elephant and crocodile battle were take place in bank of Sasta oxbow lake. The present investigation was carried out to evaluate the physico-chemical properties of Sasta oxbow lake at Paroo block in Muzaffarpur, district, Bihar.

## MATERIALS AND METHODS

Water samples were collected from three sites site-I Hirapur, site II Sanpura and site III Deoria once in a month for period of one year between August 2021 to July 2022. The sampling period was divided in three Season Summer, Rainy and Winter. The sampling was done during morning 8-9 am. The water samples for physico-chemical analysis were collected in two litre plastic bottle from each site. The selected physico-chemical parameters analyzed during investigation were temperature turbidity, BOD COD, pH Total hardness, total dissolved solids, dissolved oxygen, total alkalinity, sulphate, chloride, calcium, magnesium. Selected physico-chemical parameters were analyzed with standard analytical method. To determine the BOD according to the standard methods, samples were incubated at 20°C for five days. COD, hardness, calcium and magnesium were analyzed by standard methods prescribed by APHA 1995, DO, TDS and pH were determined by VSI-06 water analyzer kit.

## WATER TEMPERATURE

Temperature of water is significant because it affects the amount of dissolved oxygen in the water The amount of oxygen that will dissolved in water increases as temperature decrease. In the present investigation maximum temperature was recorded during summer while minimum temperature was observed during winter months . It was also observed that water temperature is influenced by air temperature The water temperature ranged between 17.1-30.6 for site I ,

**Dissolved oxygen (Do) :-**Dissolved oxygen in an important parameter for water quality. It is an indicator of the physical, chemical and biological activities of water body. Dissolved oxygen ranged between 6.8-8.1. During investigation the maximum value of dissolved oxygen of water was recoded during winter while minimum during summer season. The highest dissolved oxygen during winter month might be due to high photosynthetic activity during these month.

**BOD:** Biochemical oxygen demand measures the amount of oxygen used by microorganism. BOD is the oxidizable organic matter found in water and its value may be used as a measure of waste strength as well as aquatic pollution. In the investigation BOD ranged between 2.0-3.1 BOD was recorded maximum during summer while minimum during winter.

**Total Hardness :-**

The total hardness of water is caused by chlorides sulphate, carbonates, bicarbonates, nitrate of calcium, magnesium ions. In present investigation maximum value of total hardness was observed during winter season. The total hardness of water ranged between 195-240

**COD :-**

Chemical oxygen demand is the total measurement of organic and inorganic chemical in the water COD values are always greater than BOD values. COD ranged between 8.0-9.8. In the investigation the water of Sasta oxbow lake of Deoria region was receiving many pollutants due to heavy transporting by the NH 77.

**Total Dissolved Solids :-**

Dissolved solid substances influence the hardness. Taste and corrosive property of water. Dissolved solids in water include salts and small amount of organic matter. In the investigation the amount of dissolved solids ranged between 245-380. The high amount of suspended dissolved and total solids adversely affects the quality of water and that water unsuitable for any purpose like drinking, irrigation etc.

**pH :-**

pH is one of the most important parameters in water. pH is a measure of the acidity or alkalinity of water. The pH ranged between 6.8-7.1 for site I. Extreme values of pH can cause problems for aquatic fauna.

**Chloride :-**

The level of chloride ranged between 23.8-27.9 for site I, 37.9-40.7 for site II and 35.4-40.2 for site III. In investigation chloride was minimum during winter and maximum during summer season. The major anthropogenic sources of chloride in surface water, urban and agriculture run off municipal discharges etc.

**Sulphate :-**

The maximum concentration of sulphate was recorded during winter while minimum during summer months. Sulphate ranged between 140-188 for site I, 142-190 for site II and 140-151 for site III

### CONCLUSION

Based on results of the physico-chemical parameters it is evident that Sasta oxbow lake at Paroo block in Muzaffarpur district is permissible for survival of aquatic life. In commercial point of view Sasta oxbow lake is bright future for neighbouring population

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