

Water quality analysis of Shivan irrigation dam Near Murtizapur, dist. Akola.

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ABSTRACT

The study of the water quality analysis of Shivan Irrigation Dam near Murtizapur, Maharashtra. Monthly Changes In Physical and chemical Parameters Such as Water Temperature, Transparency, Turbidity, Total Dissolved Solids, pH, Dissolved Oxygen, Free Carbon dioxide, and Total Hardness, Chlorides, Alkalinity, Phosphate and Nitrates were analyzed for a periods of twelve months from February 2019 to January 2020. All Parameters were within the Permissible limits. The results indicate that the dam is polluted.

Keywords: Water quality, Monthly variation, Dissolve Solids.

INTRODUCTION

Water is one of the most important of all natural resources known on earth. It is important to all living organisms, ecological systems, human health, food production and economic development. The safety of drinking water is important for the health. The safety of drinking water is affected by various contaminants which included chemical and microbiological. Such contaminants cause serious health problems. Due to these contaminants quality of drinking water becomes poor. Sometimes such poor quality water causes many diseases in the humans, so that quality of water must be tested for both the chemical as well as for the microbial contaminants.

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Water is one of the most Important Compound to the Ecosystem. Better Quality of water Described by its Physical, Chemical and Biological Characteristics. But some Correlation was Possible among these Parameters and the Significant One would be Useful to Indicate Quality of water. Due to Increased Human Population, Industrialization, Use of Fertilizers in Agriculture and Man-made activity. It is difficult to understand The Biological Phenomena fully because the Chemistry of water reveals much about the Metabolism of The Ecosystem and explain the General Hydro Biological Relationship. Environment leading to water Quality and Depletion of aquatic Biota. It is therefore Necessary that the Quality of Drinking water should be checked at regular time interval because due to use of Contaminated Drinking water, Human Population Suffers From a variety of Water Borne Diseases[1].

The Natural Aquatic Resources are causing Heavy and varied Pollution in aquatic The Physico-chemical Parameters of water and the dependence of all life process of these factors make it desirable to take as an environ In Present Study involves the Analysis of Water Quality in Terms of Physico-chemical Parameters. The dam water is basically not used for Domestic, Agriculture Purpose. In India Still now several Researchers have done Study on Physicochemical and Biological characteristic of Standing and Running Water Resources [2].

METHODOLOGY

The Water Samples from Shivan Irrigation dam were collected in the Morning Hours between 6 to 8 am, in Polythene Bottle Regularly for Every Month. The Water samples were immediately brought in to Laboratory for the Estimation 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. Transparency was measured with the help of Secchi Disc. While other Parameters Such as DO, TDS, Free CO₂, Hardness, Chlorides, Biostatistical Analysis of Physical Alkalinity, Phosphate and Nitrate were Parameters of dam in Estimated in the Laboratory By using Standard Methods as Prescribed By[3].

RESULTS AND DISCUSSION

The minimum (12°C) in the month of January and maximum (44°C) temperature was recorded in the Month of May and It showed that Higher Temperature in summer and relatively lowers in winter [4]. Similar study observed that during summer, Water Temperature was high due to Low Water Level, High Temperature and clear atmosphere. Water Temperature Plays an Important Factor which Influences the chemical, Biochemical and Biological characteristics of water body [5]. Transparency of Water Fluctuates from 8 cm to 78 cm. The Maximum (78 cm) was recorded in the month of October (winter) and minimum (8 cm) in the month of May during summer reported that higher transparency occurred, during winter and summer due to absence of rain, runoff and flood water as well as gradual settling of

suspended particles [6-7]. Turbidity of water fluctuates from 2.4 NTU to 12 NTU. The maximum values (12 NTU) was recorded in the month of February. It might be due to human activities, decrease in the water level and presence of suspended particulate matter, and minimum value (2.4 NTU) in the month of October. The total dissolved solids fluctuate from 320 mg/l to 2100 mg/l. the maximum value (2100 mg/l) was recorded in the month of June. It is due to heavy rainfall and minimum value (300 mg/l) in the month of May.

The pH was alkaline values ranges from 7.3 to 8.2. The maximum pH value (8.2) was recorded in the month of May and minimum (7.3) in the month of October. The factors like air temperature bring about changes the pH of water. Most of biochemical and chemical reactions are influenced by the pH. The reduced rate of photosynthetic activities reduces the assimilation of carbon dioxide and bicarbonates which are ultimately responsible for increase in pH, the low oxygen values coincided with high temperature during the summer month [8].

The value of DO fluctuates from 7.4 mg/l to 12.6 mg/l. The maximum values (12.6 mg/l) was recorded in the month of May and minimum values (7.4 mg/l) in the month of November. The high DO in summer is due to increase in temperature and duration of bright sunlight has influence on the percentage of soluble gases (O_2 & Co_2). The long days and intense sunlight during summer seem to accelerate photosynthesis by phytoplankton, utilizing Co_2 and giving off oxygen. This possibly accounts for the greater qualities of O_2 recorded during summer. The quality is slightly lesser during winter [9]. The value of free Co_2 ranges from 0.0 mg/l to 28.3mg/l. The maximum value (28.3

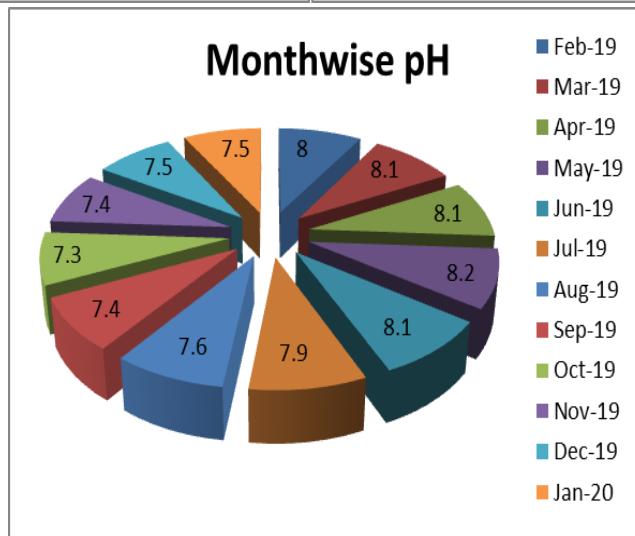
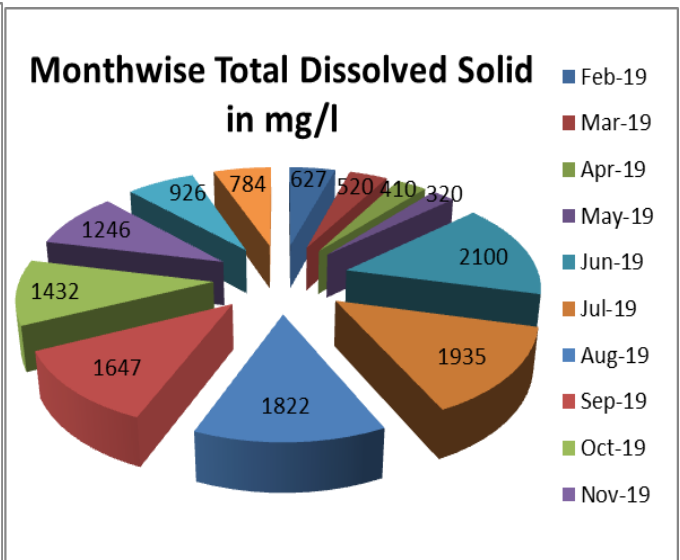
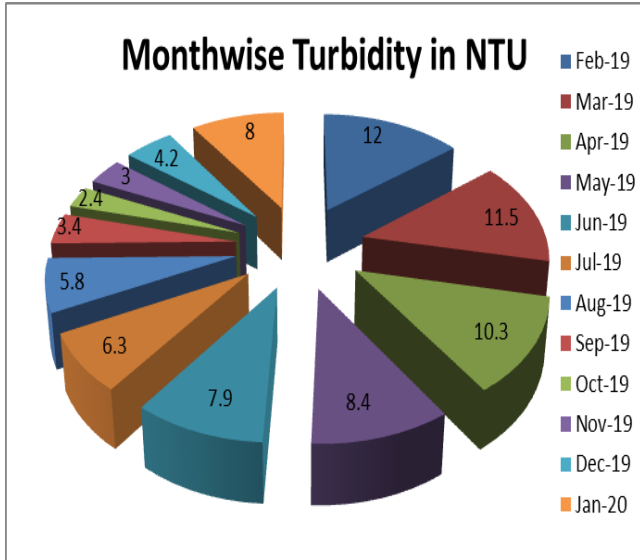
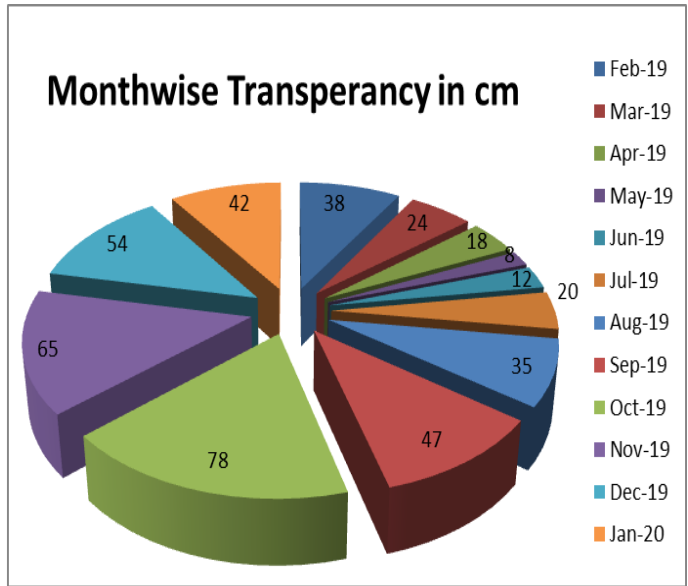
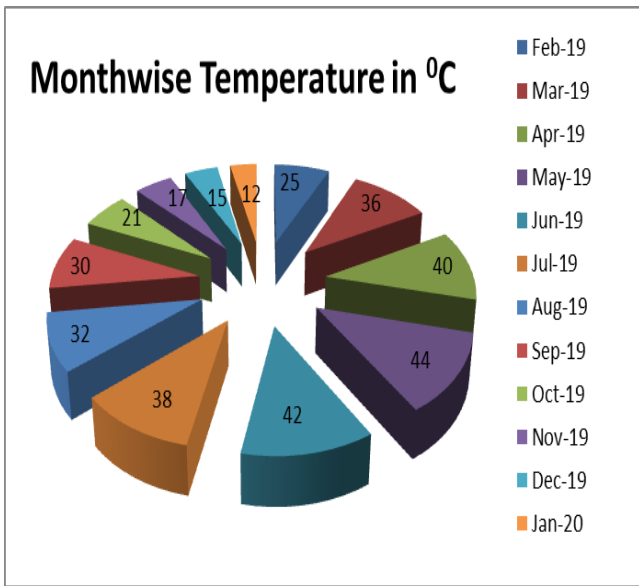
mg/l) was recorded in the month of November and minimum value (0.0mg/l) in the month of March.

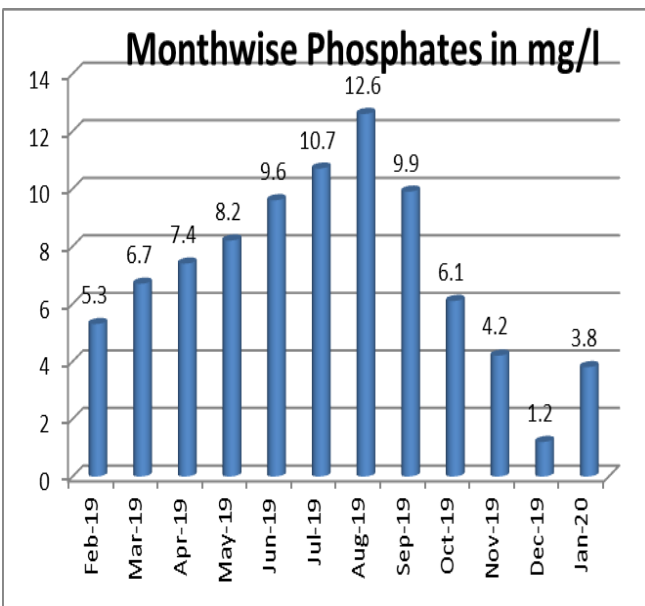
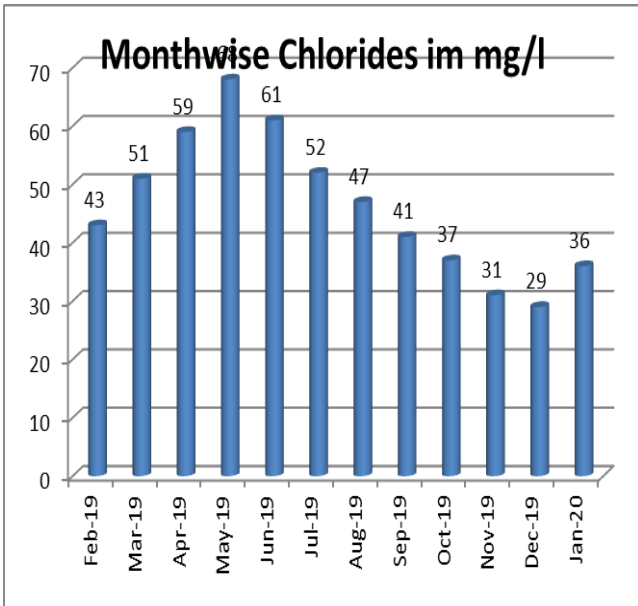
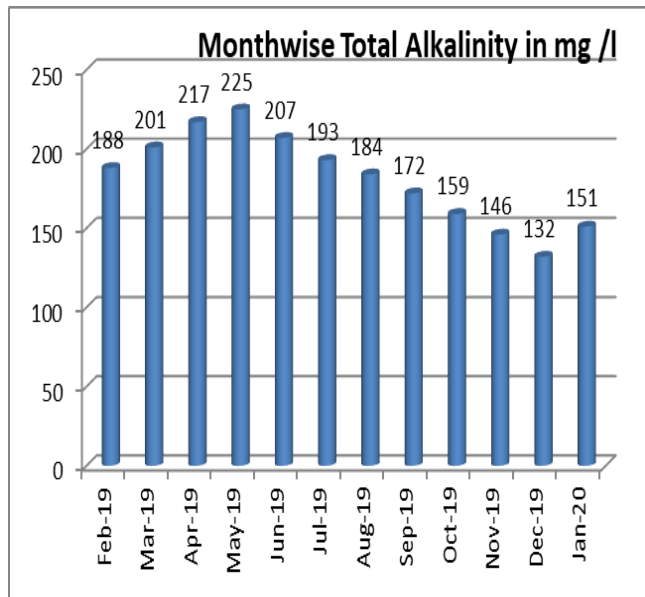
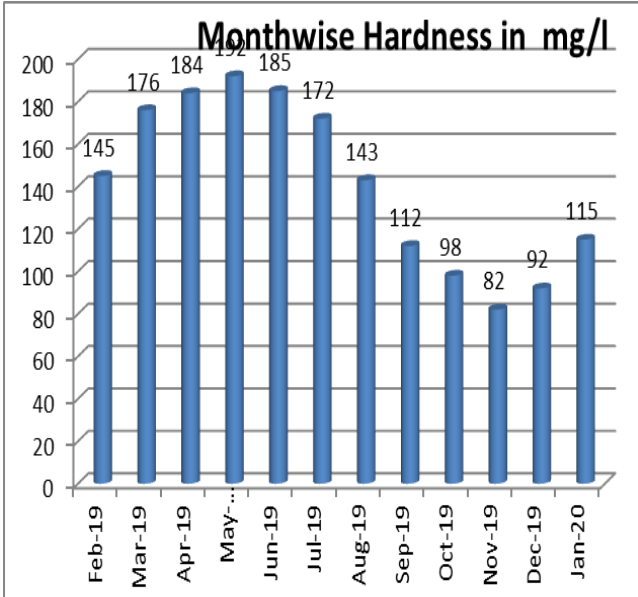
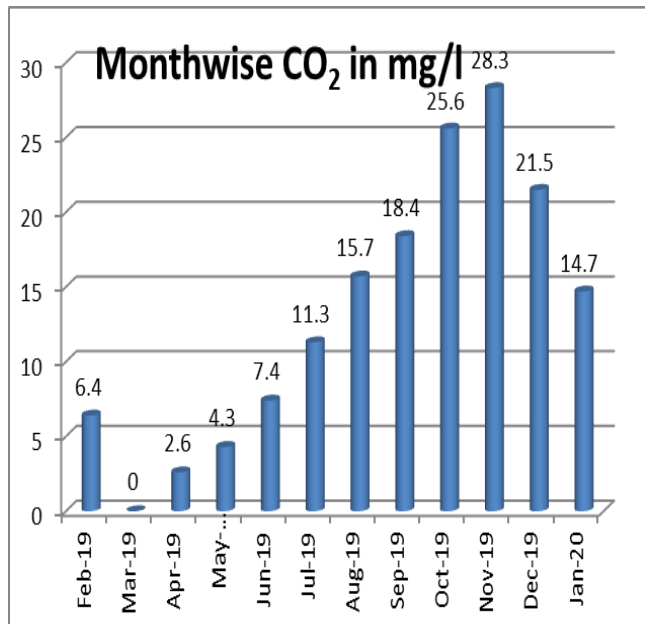
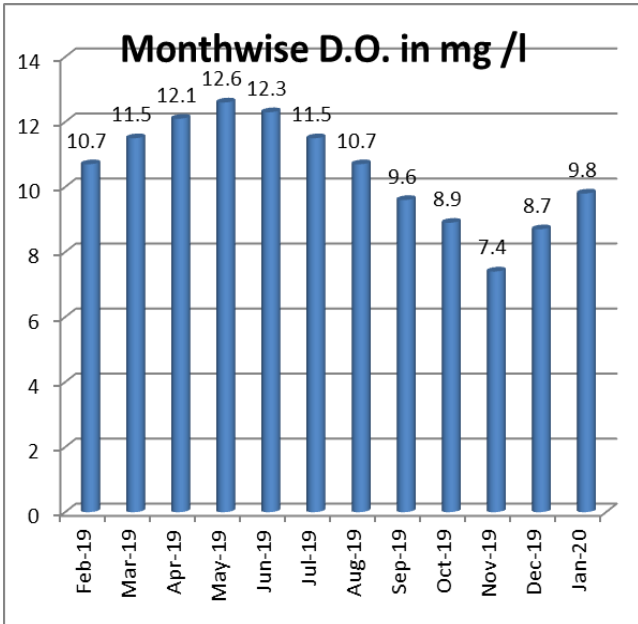
This may be depends upon alkalinity and hardness of water body. The value of CO_2 was high in November. This could be related to the high rate of decomposition in the warmer months. The value of hardness fluctuates from 82 mg/l to 192 mg/l. The maximum value (192 mg/l) was recorded in the month of May and minimum value (82 mg/l) in the month of November. Total hardness was high during summer than monsoon and winter. High value of hardness during summer can be attributed to decrease in water volume and increase of rate of evaporation of water. Similar results were obtained in the present study [10]. Total alkalinity ranges from 132 mg/l to 225 mg/l. the maximum value (225 mg/l) was recorded in the month of May and minimum value (132 mg/l) in the month of December. The alkalinity was maximum value in May due to increase in bicarbonates in the water. Similar results that it was maximum in summer and minimum in winter due to high photosynthetic rate.

The values of chlorides range from 29 mg/l to 68 mg/l. The maximum value (68 mg/l) was recorded in the month of May and minimum value (29 mg/l) in the month of December. In the present study maximum value of chloride reaches in summer [11]. The value of phosphate fluctuates from 1.2 mg/l to 12.6 mg/l. the maximum value (12.6 mg/l) was recorded in the month of August and minimum value in the month of December. The high values of phosphate in August months are mainly due to rain, surface water runoff, agriculture run off; washer man activity could have also contributed to the inorganic phosphate content[12].



Actual Photograph of Sampling Station of Shivan Irrigation Dam





CONCLUSION

A better understanding of the structure, evolution and functioning of the aquatic and natural ecosystem is certainly a better preservation of biodiversity. The interactions between the components of biodiversity are fundamental to the understanding of how this ecosystem functions. The analysis of physicochemical parameters indicates that certain environmental factors are essential to the growth of planktons in dam. These parameters include nutrients, dissolved oxygen, pH and temperature. Rotifers were the most dominant zooplankton group observed during the study period in Shivan Irrigation dam. This illustrates both their role and importance in energy transfer. This rich zooplankton may be a source of important food for wading birds and sedentary abundant downstream. This study would still be continued to better understand the structure, functioning and ecology of zooplankton community of the dam.

Conflicts of interest: The authors stated that no conflicts of interest.

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