

## **PHYSICO-CHEMICAL PARAMETERS OF GIRNA PROJECT, DISTRICT-NASHIK (M.S.) INDIA**

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**ABSTRACT:** This investigation reveals as the Physico-chemical parameters of Girna project were monitored over a period of one year from July 2008 to June 2009. The fresh water of the Girna project is mostly used for drinking and agricultural purposes. The study of different parameters like Temperature, Rain fall, pH, Turbidity, T.D.S., Dissolved Oxygen, Dissolved carbon dioxide, Total hardness, calcium, Magnesium, and Chloride were well studied and suggest that the quality of water is not polluted.

**Key words:** Physico-chemical parameters, Girna project, and pollution

### **INTRODUCTION:**

The water is a very important compound of any ecosystem. Lakes, dams, ponds are important for fresh water habitats throughout many regions of the world, although the amount of water in them constitutes only a minute fraction of the total fresh water resource on Earth. A large proportion of the fresh water is stored as icecap at higher altitudes and around the poles or as groundwater as the less than 0.5% is available for use by organisms, including for human civilization.

However, increasing of human population have resulted in accelerating demands of water supply for the drinking, industrial process, hygiene and agriculture. Fresh water has become a scarce commodity due to over exploitation and pollution of water. Increasing population and its necessities have led to the deterioration of surface and subsurface water.

Among various water resources on earth, oceans account for 97.6%, ice caps and glaciers, 1.87%; groundwater, 0.5%; rivers, lakes and inland seas, 0.02%; soil moisture, 0.01%; and atmosphere, 0.0001%. There are three major global resources of water: a) precipitation over the earth's surface in the form of the rain, dew, and snow; b) surface water; as river and lakes; and c) underground water. The water bodies having still water are referred to as "lentic". Those water bodies having running water are called "lotic". These two ecosystems differ considerably in ecological, chemical and physical characteristics.

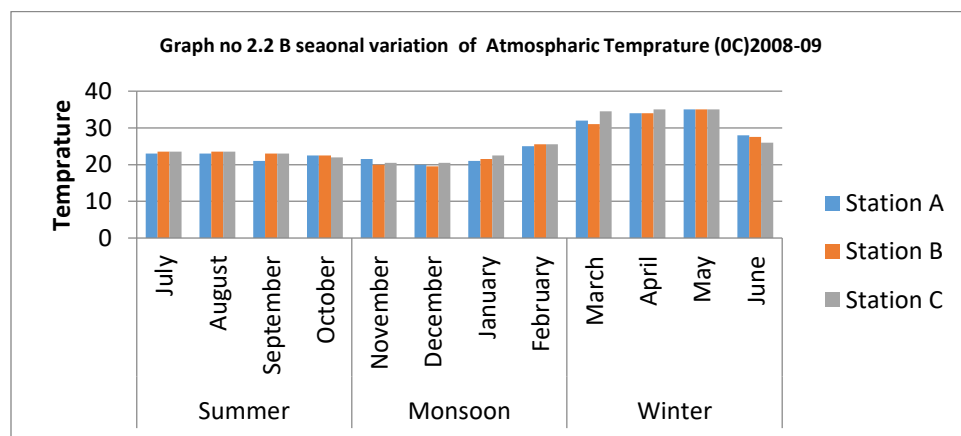
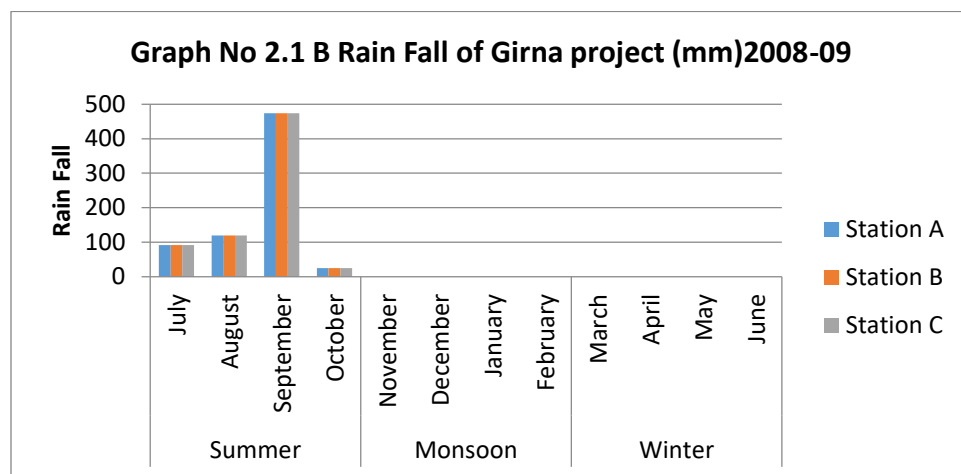
The water of good quality is required for living organisms. The quality of water resources is usually described according to its physical, chemical, and biological characteristics for the good quality of water resources large numbers of physicochemical and biological parameters are to be studied and must be found in normal range.

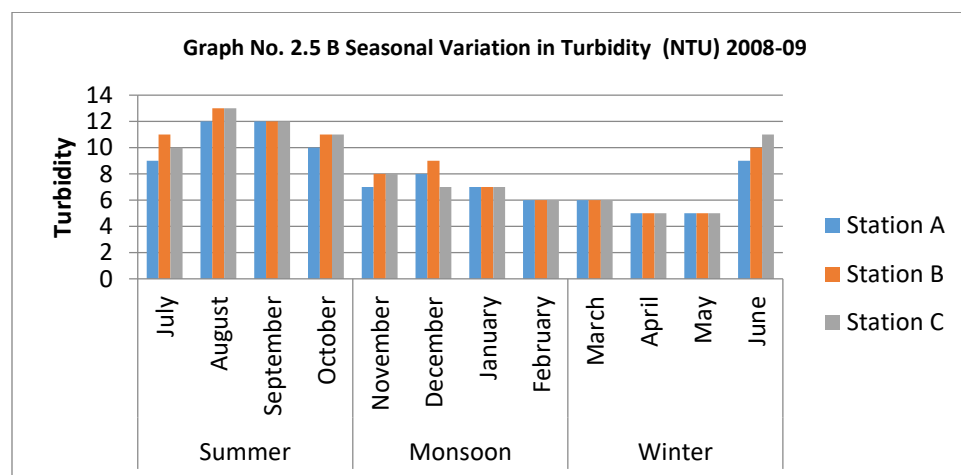
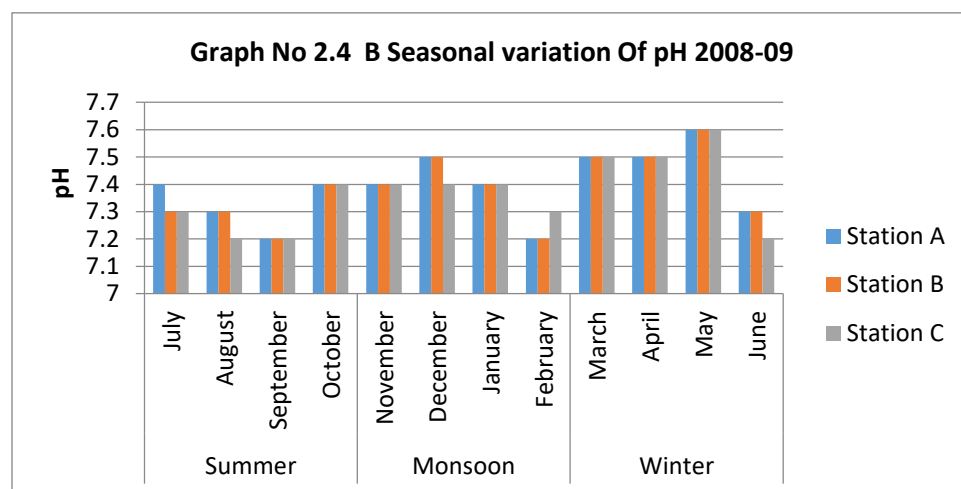
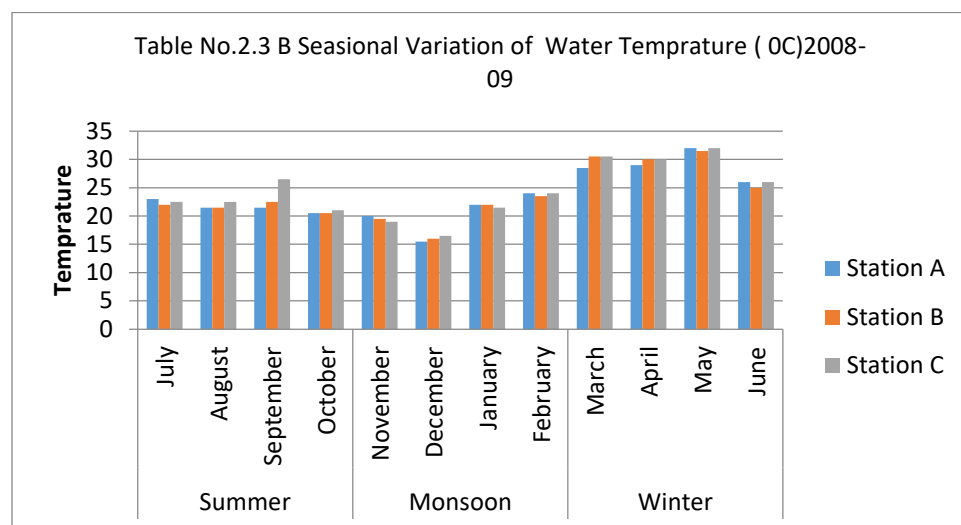
**Material and methods:** The study of this water body specifically and collected the samples from different places of the Girna project. This project is located 74°-39' North Latitude and 20° 29' E Longitude. The people of Nashik district and Jalgaon district were facing the problem of scarcity of water. The total catchment area of this project is 5552 hectares. Girna project built on the Girna River. The start of this project in the year 1955 and its completion in the year 1965.

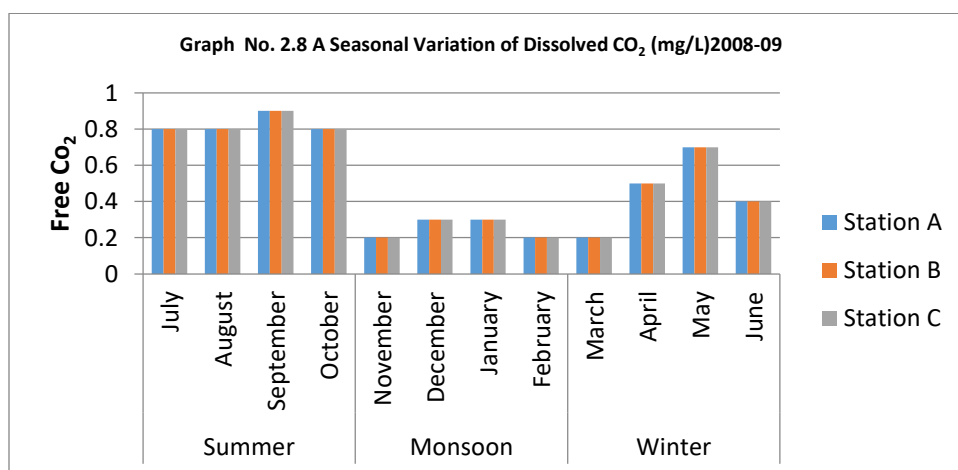
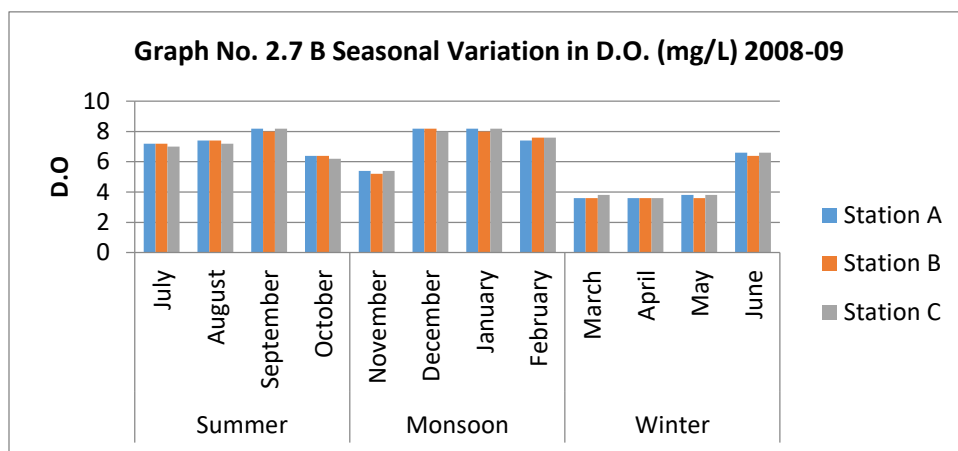
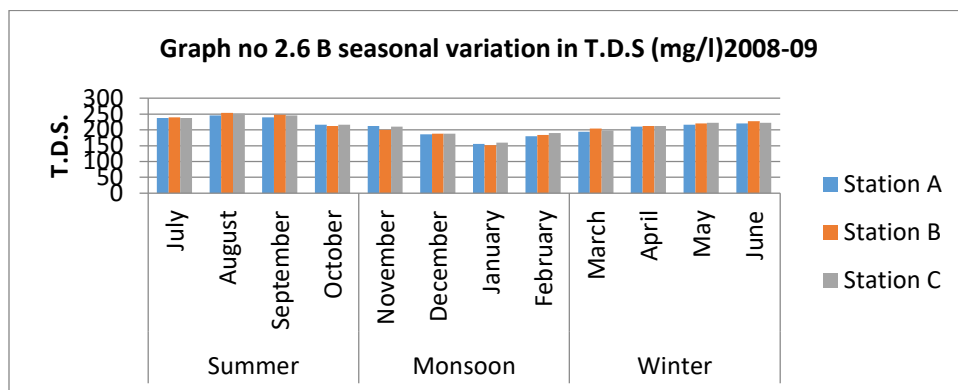
The study period of one year from July-2008 to June 2009, the total period of rain fall data was collected from the project office at Chalisgaon. The Atmospheric temperature (AT) was measured and recorded with the help of mercury thermometer. The water temperature, pH, Dissolved oxygen (DO), Dissolved carbon dioxide were recorded by using advanced water analysis portable kit.

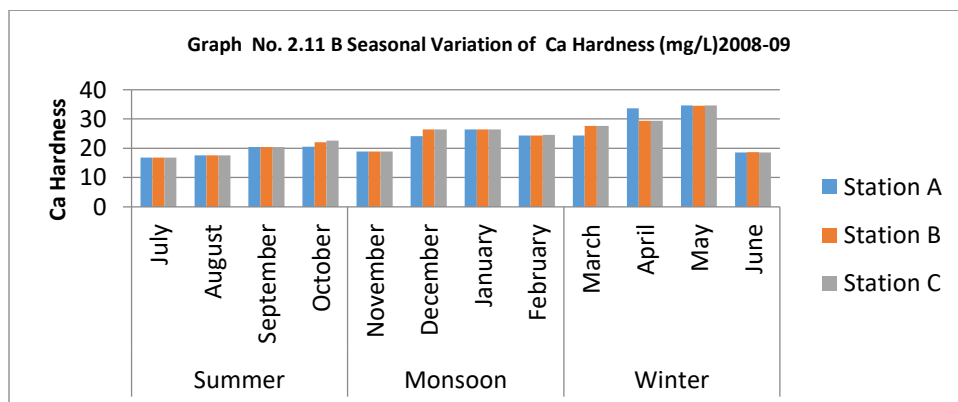
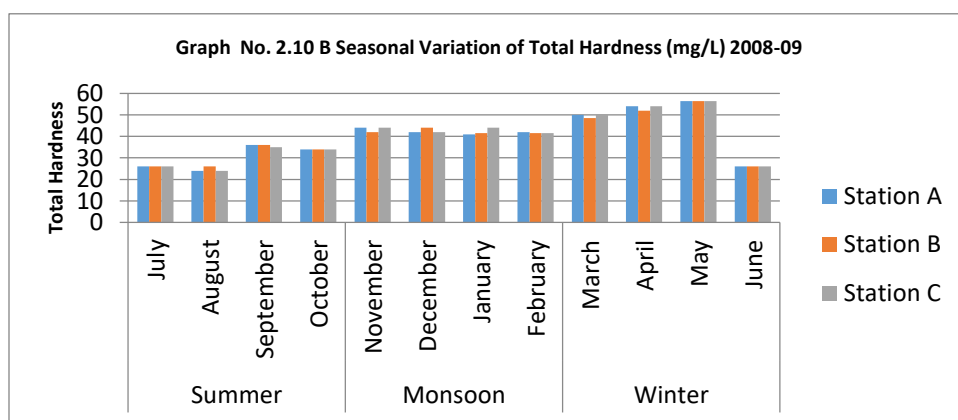
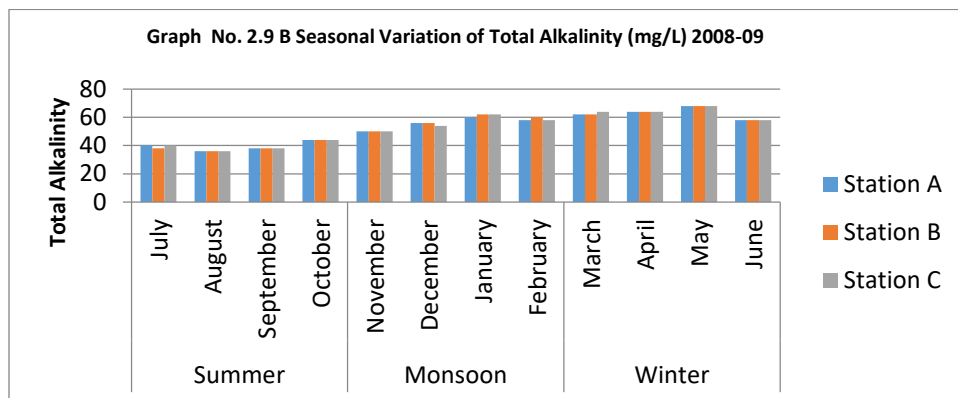
All studied parameters were analyzed when the sample was collected on spots. As early as possible 6 am.to8 am., early morning collect the sample from station A and station B , the distance between station 1.5 to 2 km. The total estimation analyzed in the laboratory immediately like calcium, magnesium and chloride.

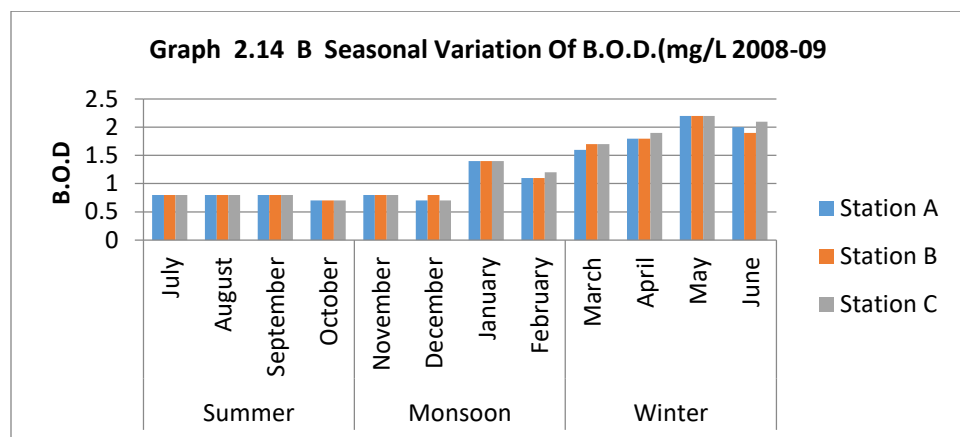
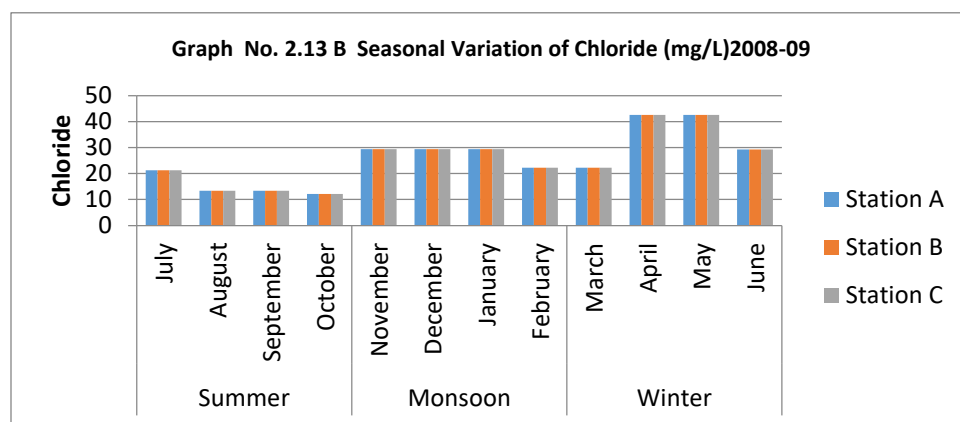
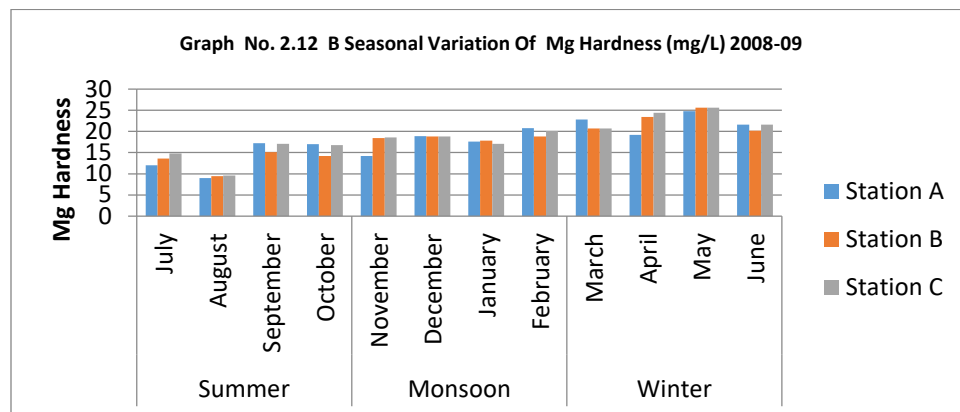
**RESULT AND DISSCUSSION :** The Physico-chemical parameters such as Rain fall, Atmospheric temperature (AT) , water temperature, pH, Turbidity, T.D.S., Dissolved oxygen (DO), Dissolved Carbon Dioxide, Calcium, Magnesium and Chloride were analyzed from station A , station B and station C of the Girna project near Panzangaon, Dist- Nashik. All Physico-chemical parameters were analyzed and discussed seasonally and its variations across are graphically shown in the fig.











#### **Rain fall :**

In the present study of the rainfall July -2008 to June 2009 was recorded. The maximum rain fall was recorded in the Monsoon was 474 mm.at all the stations in the month of September and minimum 25 mm. in the month of October.

#### **Atmospheric temperature:**

The atmospheric temperature was similar at both the sampling stations, they have distance between stations A and station B, 1.5 to 2.00 km. The atmospheric temperature during the July 2008 to 2009 recorded maximum in summer  $35^{\circ}\text{C}$  at the station A, B and station C in the month of May 2008 and minimum was  $19.5^{\circ}\text{C}$ , at station B and station A in the month of December and January 2008. The maximum atmospheric temperature recorded in monsoon  $23.5^{\circ}\text{C}$  at B station in the month of July and minimum was  $21^{\circ}\text{C}$  at the station A in the month of September 2008. In the winter the maximum temperature was recorded  $25.5^{\circ}\text{C}$  at station B in the month of February 2009 and minimum  $19.5^{\circ}\text{C}$  at station B in the month of December.

#### **Water temperature:**

In present investigation the temperature of water was similar almost of all the sampling stations A station B and station C. During the period July 2008 to June 2009 the water temperature recorded in summer maximum  $32^{\circ}\text{C}$  at station A and station C and minimum  $25^{\circ}\text{C}$  at the station B in the month of June 2008. The maximum water temperature in monsoon was  $26.5^{\circ}\text{C}$  at station C in the month of September 2008 and minimum temperature was  $20.5^{\circ}\text{C}$  at the station A and station B in the month of October 2008. The maximum water temperature recorded in winter was  $24^{\circ}\text{C}$  at station A and station C and minimum was  $15.5^{\circ}\text{C}$  at station A in the month of December 2008.

#### **Hydrogen ion concentration (pH):**

The present investigations of the pH at the station A, Station B and station C, varied from 7.2 to 7.6. In the year July 2008 to June 2009 the pH recorded in summer maximum value was 7.6 at all stations in the month of May 2009. The minimum pH 7.2 at all stations in the month of September 2008. The maximum pH recorded in the monsoon in July 2008 to June 2009 was 7.4 at the station A, B and C in the month of October 2008 and minimum 7.2 at the all stations in the month of September 2008. The maximum pH recorded in winter in July 2008 to 2009 was 7.5 at stations A and B in the month of December 2008, February 2009 at the station A and station B and minimum 7.2 at stations A and B in the month of February 2009.

#### **Turbidity:**

The present investigation of the turbidity at station A, B and C. In the year July 2008 to June 2009 the turbidity recorded in summer maximum value was 11 NTU at station C in the month of June 2009. The maximum turbidity recorded in the monsoon in the month of August 2008, and the minimum 9 NTU at the station A in the month of July 2008. The maximum turbidity recorded in winter in December 2008 to June 2009 the turbidity was 9 NTU at station B and minimum 6 NTU at the station A, B and station C in the month of February.

#### **T.D.S:**

The present investigation of the T.D.S. at the station A station B and station C in the year July 2008 to June 2009. The maximum T.D.S was recorded in summer 228 mg/L at stations B in the month of June 2009 and minimum 194 mg/L at the station A in the month of March 2009. The maximum T.D.S was recorded in the monsoon in July 2008 to 2009 was 254 mg/L at the station B in the month of August 2008 and minimum 212 mg/L at the station B in the month of October 2008. The maximum T.D.S was recorded in winter in July 2008 to June 2009 was 21 mg/L at the

station A in the month of November 2008 and minimum 152 mg/L at the station B in the month of January 2009.

#### **Dissolved Oxygen:**

The present investigation the dissolved oxygen at station A, station B and station C was varied. In the year July 2008 to June 2009 the dissolved oxygen recorded in summer maximum value was 6.6 mg/L at the stations A and C in the month of June 2009 and minimum was 3.6 mg / L at all stations in the month of April 2009. The maximum 8.2 mg/L was recorded in monsoon at the station A and C in the month of September 2008 and minimum 6.2 mg/L at the station C in the month of October 2008. The maximum dissolved oxygen in winter during July 2008 to June 2009 was 8.2 mg/L at the station A and station C in the month of December 2008 and January 2009 minimum 5.2 mg/L at the station B in the month of November 2008.

#### **Dissolved Carbon Dioxide:**

In the present study dissolved carbon dioxide at station A station B and station C was varied. During the period of July 2008 to June 2009 dissolved carbon dioxide in summer maximum 0.7 mg/L at all stations in the month of May 2009 and minimum value was 0.2 mg/L at all stations in the months of March 2009. The maximum dissolved carbon dioxide recorded in monsoon in July 2008 to June 2009 was 0.9 mg/L at all stations in the month of September 2008 and minimum 0.8 mg/L at all stations in the month of October 2008. The maximum dissolved carbon dioxide recorded in winter in July 2008 to June 2009 was 0.3 mg/ at all stations in the month of December 2008 and minimum 0.2 mg/L at all stations in the month of February 2009.

#### **Calcium:**

In present investigation the calcium hardness was varied at station A, station B and station C. In the year July 2008 to June 2009 the calcium hardness in summer maximum value was 34.6 mg/L at the station A and station C in the month of May 2009 and minimum value was 18.6 mg/L at the station A in the month of June 2009. The maximum calcium hardness recorded in the monsoon in the year July 2008 to June 2009 was 22.6 mg/L at a stations C in the month of October 2008 and minimum 16.8 mg/L at all stations in the month of June, July 2008. The maximum calcium hardness recorded in winter July 2008 to June 2009 was 26.4 mg/L at all stations in the month of January 2009 and minimum 18.1 mg/L at stations C in the month of November 2008.

#### **Magnesium:**

In the present study the magnesium hardness at station A station B and station C was varied.. In the year July 2008 to June 2009 the Magnesium hardness in summer maximum value was 25.6 mg/L at the station B and station C in the month of May 2009 and minimum value was 19.2 mg/L at the station A in the month of April 2009. The maximum magnesium hardness recorded in the monsoon in the year July 2008 to June 2009 was 17.2 mg/L at station A in the month of September 2008 and minimum 9 mg/L at station A in the month of August 2008. The maximum magnesium hardness recorded in winter in July 2008 to 2009 was 20.8 mg/l at the station A in the month of February 2009 and minimum 14.2 mg/L at the station A in the month of November 2008.

#### **Chloride:**



The present investigation the chloride at station A and station B and station C was varied. In the year July 2008 to June 2009 the chloride recorded in summer maximum value was 42.60 mg/L at all stations in the month of May 2009 and minimum value was 22.30 mg/L at all stations in the month of March 2009. The maximum chloride recorded in the monsoon in the year July 2008 to June 2009 was 21.27 mg/L at all stations in the month of July 2008 and minimum 12.20 mg/L at all stations in the month of October 2008. The maximum chloride recorded in the winter in the year July 2008 to June 2009 was 29.36 mg/L at all stations in the month of November, December and January and minimum 22.30 mg/L at all stations in the month of February 2009.

### **CONCLUSION:**

The study of water sample of different station A, B and C of Girna Project reveals that the value of Physico-Chemical parameters were below the permissible limit given by the World Health Organization. Hence the water of Girna Project is fit for the consumption by the human beings.

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