



**THE STATE OF SEASONAL VARIATION IN SOME PHYSICO-CHEMICAL  
PARAMETERS OF WATER IN AND AROUND NANDURBAR DISTRICT  
(TRIBAL AREA)**

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**Abstract**

*The water originates from life and is important part in nature. Increase of population and development of society, waste water treatment became necessary in most areas, different waste water treatment methods have developed, including physical, chemical, bio-treatment techniques. The different industries like forestry, fishery, mining, stock breeding, agriculture, urban human activities, manufacturing industries, construction work and other industries have turned to create water pollution. The ground water is found at variable depths hence exhibits variable properties.*

**Keywords:** Water samples,  $P^H$ , EC, TDS



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**Introduction :** Seasonal water level fluctuation in entire district rise in water level in the range of 0.16 m to 18.07m (Dhadgaon) is observed with rise of more than 4-5m being the most dominant range observed in entire northern, and south west areas occupying entire Akrani, Taloda, Shahada taluks and some part of Navapur taluka. Central ground water board and ground water survey and development agency (GSDA) have jointly estimated the ground water and River water resources of tribal area in Nandurbar District. The ground water is found at variable depths hence exhibits variable properties. Some of important terminologies about various types of ground waters are explained in this chapter. Water which has never been a part of the hydrosphere similarly, water that has recently been involved in atmospheric circulation is known as meteoric water. The water that has been in association with rock

during metamorphism is termed as metamorphic water. The water that is derived from magma is known as magmatic water. The magmatic water found at shallow depth is known as volcanic water and that at considerable depth as plutonic water. Water used for the drinking purposes is known as potable water, which must be sparklingly clear, odorless, neither very hard nor too soft and be free from bacteria. Saltiest water often fails in quenching the thrust, hence must satisfy<sup>2,3</sup>.

### **1.1. Material and Methods:**

#### **Water sampling:**

The representative sample of water that is taken should be the one that truly reflects the composition of water sample to be analyzed. Due to varying period of time that may lapse between sample collection and analysis.

#### **p<sup>H</sup> :**

p<sup>H</sup> measures hydrogen ion activity, is used to express the intensity of acidic or alkaline condition of a solution.

The p<sup>H</sup> was determined by using before analysis p<sup>H</sup> meter standardized by using buffer solution of known value by means of glass electrode.

#### **Electrical conductivity (EC):**

It is measured with the help of conductivity meter having conductance cell with platinum electrode<sup>4</sup>.

#### **Total Dissolved Solids (TDS):**

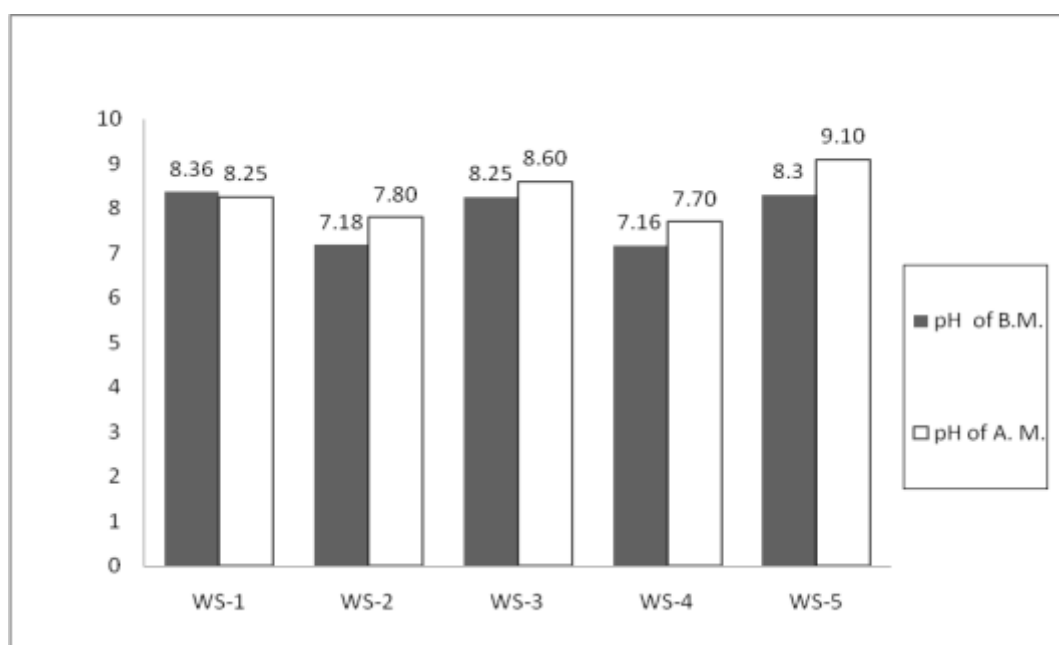
TDS content of water & waste water are defined as residue left upon evaporation at 103<sup>0</sup>c – 105<sup>0</sup>c. it is an aggregated amount of entire floating, suspended, settleable and dissolved solid present in water sample. TDS was determined by using the formula (USD manual Richards).

### **Results and Discussion:**

**p<sup>H</sup>:** p<sup>H</sup> measured the hydrogen ion concentration. The test for p<sup>H</sup> of water and soils were carried out to determine whether it is acidic or Alkaline in nature the values obtained for five soil and well samples are within the range 7.16-8.36 before monsoon and 7.80-9.10 after monsoon

**Table No.1****P<sup>H</sup> and Electrical conductivity in water samples. (Before and After Monsoon)**

| Sr. No. | Site of sample collection | P <sup>H</sup> |      |
|---------|---------------------------|----------------|------|
|         |                           | B.M.           | A.M. |
| 1       | WS No.1                   | 8.36           | 8.25 |
| 2       | WS No.2                   | 7.18           | 7.80 |
| 3       | WS No.3                   | 8.25           | 8.60 |
| 4       | WS No.4                   | 7.16           | 7.70 |
| 5       | WS No.5                   | 8.3            | 9.10 |

**WS- Water sample****Fig – 1. P<sup>H</sup> of Water samples (Before and after monsoon).****Conductivity:**

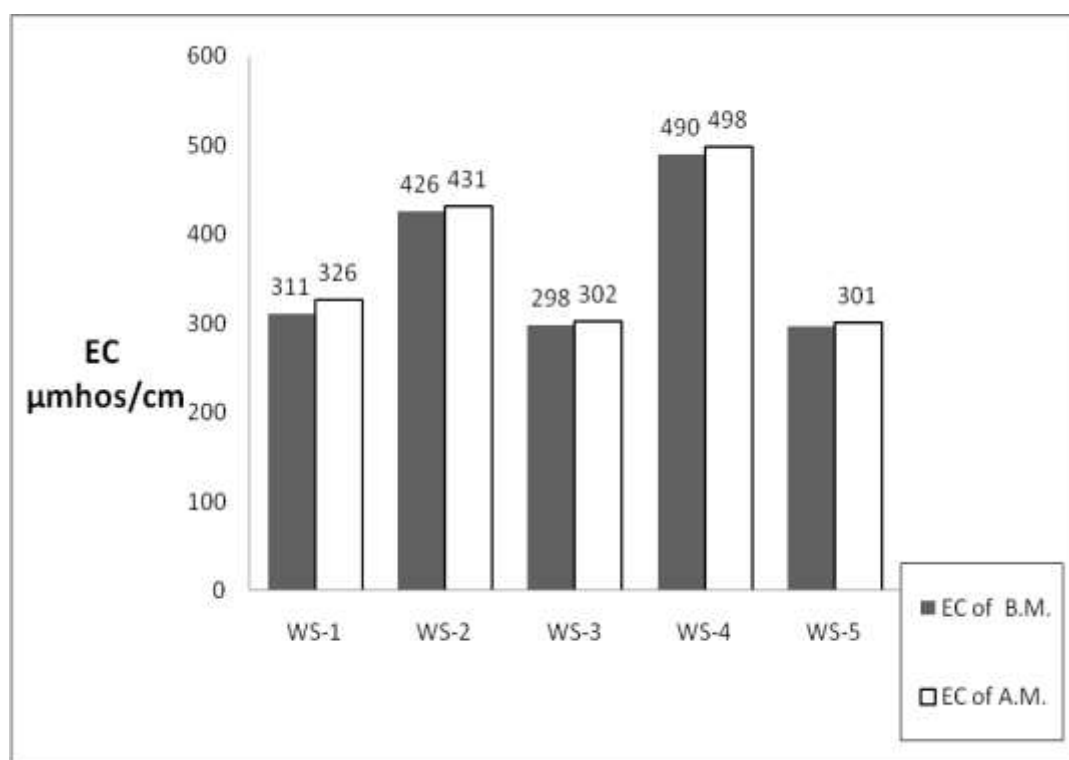
Electrical conductance is the ability of the substance to conduct the electric current in water and measured by specific conductivity test. It is property caused by the presence of various ionic species. It is  $E_c \propto 1/R$ .

The EC value varied from 298-490  $\mu$  mho/cm. before monsoon and 301-498  $\mu$  mho/cm. after monsoon three sampling sites WS-1, WS-4 water samples exceeded the permissible limit (300  $\mu$  mho/cm.) except WS-3, WS-5 due to presences of ionic constituents are present in the water bodies.

Table No. 2

**Electrical conductivity in water samples. (Before and After Monsoon)**

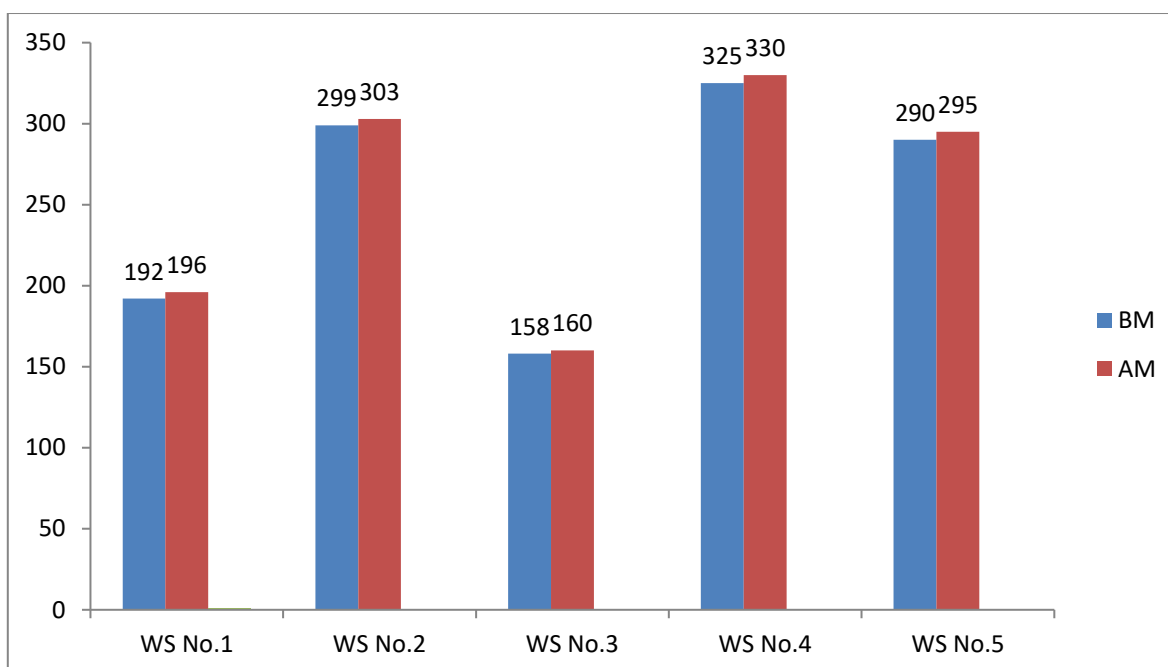
| Sr. No. | Site of sample collection | Electrical conductivity $\mu$ mho/cm. |      |
|---------|---------------------------|---------------------------------------|------|
|         |                           | B.M.                                  | A.M. |
| 1       | WS No.1                   | 311                                   | 326  |
| 2       | WS No.2                   | 426                                   | 431  |
| 3       | WS No.3                   | 298                                   | 302  |
| 4       | WS No.4                   | 490                                   | 498  |
| 5       | WS No.5                   | 296                                   | 301  |

**WS- Water sample****Fig – 2. EC of Water samples (Before and after monsoon).**

**Total dissolved solids (TDS) :** The TDS values for water samples in the range of 158-325 mg/lit before monsoon and 160-330 mg/lit after monsoon (Table No.2) are the lower than the recommended value of 500 mg/lit by national guideline and standard for water quality in Nigeria an World Health Organization (WHO) specification limit (1000 mg/lit.) for drinking water. (Edimeh et. al., 2001)

**Table No. 3**  
**TDS of water samples (Before and After monsoon).**

| Sr. No. | Site of sample collection | TDS mg/lit. |     |
|---------|---------------------------|-------------|-----|
|         |                           | BM          | AM  |
| 1       | WS No.1                   | 192         | 196 |
| 2       | WS No.2                   | 299         | 303 |
| 3       | WS No.3                   | 158         | 160 |
| 4       | WS No.4                   | 325         | 330 |
| 5       | WS No.5                   | 290         | 295 |



**Fig. 3:- TDS of Water Samples (BM and AM)**

#### **Conclusion:**

The conclusion in the work on above study is that the physico-chemical parameters like as  $P^H$ , electrical conductivity and TDS of water samples in and around Nandurbar district (Trible area) Except  $P^H$  (9.10 A.M. Table No.1) shows the value within permissible limits of WHO standards and BIS (Bureau of Indian Standards) well water and soil is suitable for flora and fauna, after proper treatment water can be used for drinking purpose.

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