

Analysis of Water Quality at Jami Masjid Vav using Physico-Chemical Parameters

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Abstract: Air, Soil and Water are the main components of environment. Water is the main source to maintain and transport elements in each sphere of Earth as well as vital for life molecule to survive. Water is a limiting factor for survival of any organism due to its complex physical, chemical and biological properties. Humans need water for various purposes such as in agriculture, industry, recreation that depends on the quantity and quality of water required. With a view to use water for drinking purpose, water sample was collected from Jami Maasjid Vav to know its physical, chemical and Biological properties. The samples were analyzed in laboratory facilities through very specific standard methods. The result shows that the vav was under eutrophication.

Keywords: Water, Jami Masjid, Specific standard, Eutrophication.

1. INTRODUCTION

Jama Masjid (Also known as Jami Masjid, meaning "Public Mosque") is in Champaner, Gujarat state, western India, is part of the Champaner-Pavagadh Archaeological Park. It was declared as a World Heritage Site by UNESCO in 2004. It's among the 114 monuments which are listed by the Baroda Heritage Trust. It is situated about 47 km from the city of Vadodara.

It has a blend of Hindu and Muslim architecture, and is considered one of the finest mosques in Western India with its elegant interiors. An ablution tank of octagonal kund appearance is near the building which was used for rainwater harvesting and washing before prayer. The present study was conducted on this Kund (Vav). The below image shows the Google Map View of the Kund.



2. METHODOLOGY

The present study was conducted in Jami Masjid Vav in Panchmahal district near Pavagadhand the water sample were collected using grab sampling method. The study was conducted on 06.08.2015. A team of students visited the site and collected the water sample. The water sample was collected and stored in sterile plastic bottle and were placed in ice box during transportation. It was then transferred immediately to the lab and stored at 4°C for further analysis. Basic water quality parameters such as pH, Temperature were measured onsite.

Water samples were collected and processed according to approved methods as in APHA. Conductivity, pH and temperature were measured using a portable meter. Dissolved Oxygen was fixed onsite.

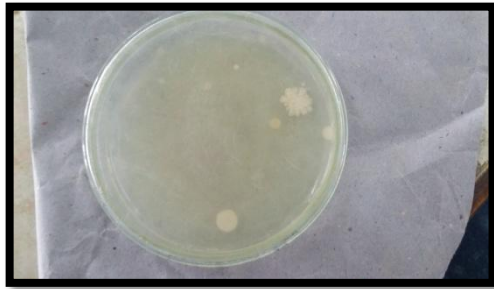
3. RESULTS

(A) Water Analysis

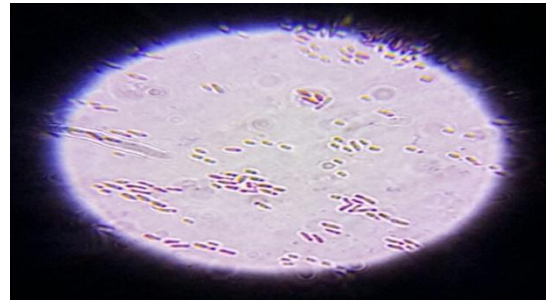
The water analysis was divided into two categories i.e. physical parameters and chemical parameters.

The physical parameters include color, odour, taste, temperature, turbidity and total solids. The chemical parameters include pH, electrical conductivity, acidity, alkalinity, chloride, sulphate, nitrite, phosphorus, total hardness. The results of all the parameters are shown in table no. 1 and 2 and their graphical representation in figure no. 1.1 and 1.2.

(B) Microbial Analysis(Source: Patel and Patel, 2000)
1 ml water sample was taken and its serial dilution was done from 10^{-1} to 10^{-12} . 0.1 ml from dilutions 10^{-2} , 10^{-4} , 10^{-6} , 10^{-8} , 10^{-10} and 10^{-12} was taken for spreading on Nutrient Agar Plate. The plates were then incubated in an incubator for 24 hrs at 37°C . After incubation various colonies were observed and counted manually. The below figure shows colony on plate and its observation.



10⁻¹⁰ DILUTION PLATE



OBSERVATION UNDER MICROSCOPE

PHYSICAL PARAMETERS:

TABLE 1

| Sr.No. | PARAMETER | STANDARD (IS:10500) | READING |
|--------|------------------------------|--------------------------|-------------------------|
| 1. | Temperature | $\leq 5^{\circ}\text{C}$ | $27-28^{\circ}\text{C}$ |
| 2. | Turbidity (NTU) | 10 | 7.6 |
| 3. | Total Suspended Solids, mg/L | 100 | 2.4 |
| 4. | Total Dissolved Solids, mg/L | 500 | 0.72 |
| 5. | Total Solids, mg/L | 600 | 3.12 |

CHEMICAL PARAMETERS:

TABLE 2

| Sr .No. | PARAMETER | STANDARD (IS:10500) | READING |
|---------|----------------------|---------------------|---------|
| 1. | pH | 6.5-8.5 | 7.83 |
| 2. | Alkalinity, mg/L | 200 | 96 |
| 3. | Total Hardness, ml/L | 300 | 92 |
| 4. | Chlorides, mg/L | 250 | 47.98 |
| 5. | Sulphates, mg/L | 150 | 51.43 |
| 6. | Nitrates, mg/L | 45 | 16.52 |
| 7. | Phosphate, mg/L | - | 68.17 |
| 8. | COD, mg/L | 30 | 576 |
| 9. | Nitrite, mg/l | - | 0.54 |
| 10. | Acidity, mg/L | - | 156 |

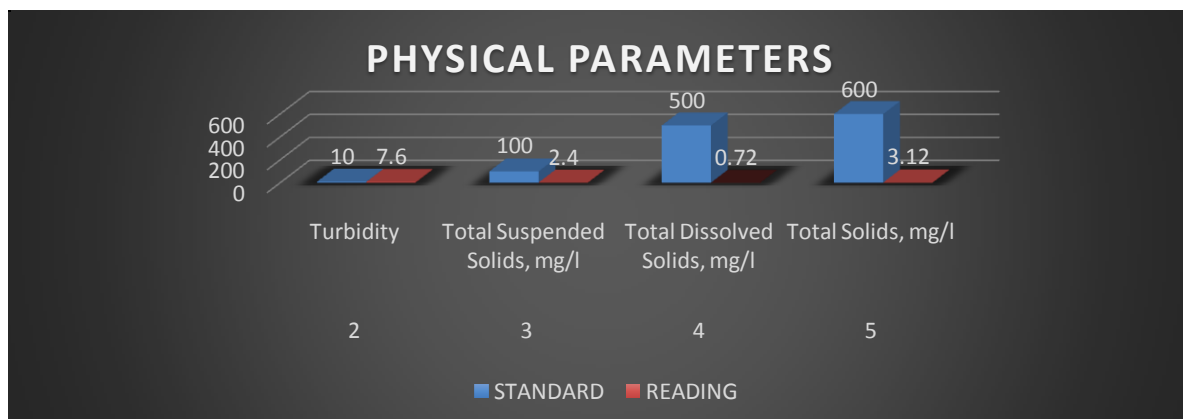


FIGURE 1.1

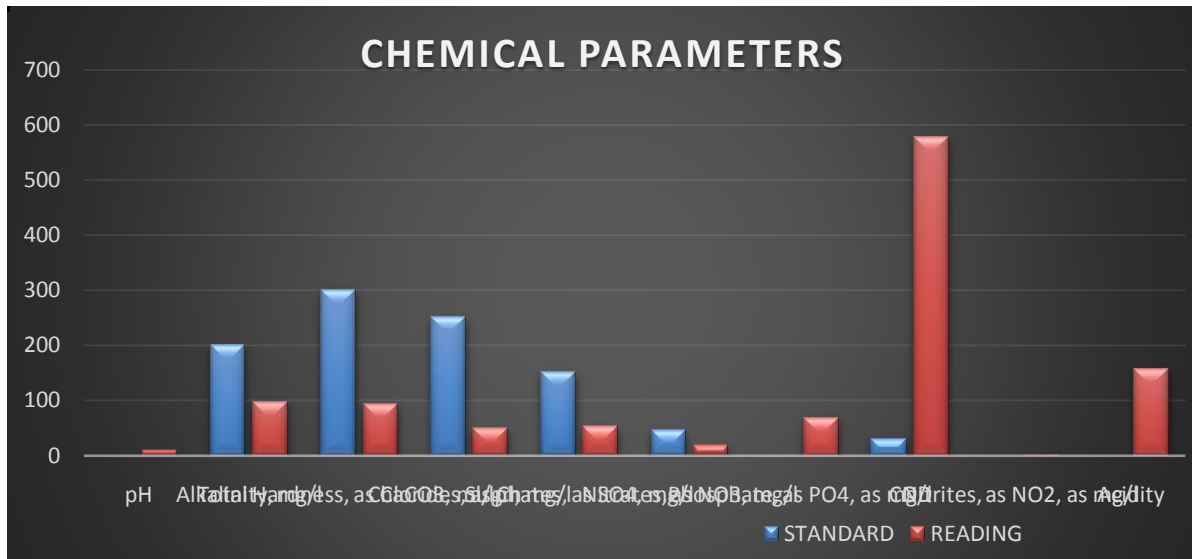


FIGURE 1.2

4.DISCUSSION

According to the value of physical parameters observed we can say that the water meets the standards of IS: 10500. Chemical parameters which were chosen for analysis showed that most parameters were as per norms only. Chemical Oxygen Demand (COD) value was much higher than the standard value due to the presence of eutrophication. Therefore, the water collected from the sampling site should be treated and chlorinated before consumption.

5.CONCLUSION

The present study gives scope for further research. It provides plans for restoration of water for local use as water has become a critical component of nature due to severe unavailability of pure fresh water. Hence there is an urgent need for fruitful storage and conservation of consumable fresh water.

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