# INVESTIGATION OF THE DRINKING WATER QUALITY IN TOWN- AMBAH MUNICIPAL COUNCIL (M.P.)

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## ABSTRACT

*There are a lot of countries which are facing water scarcity problem. Now a days water related diseases are very common among the people, it's a serious public health issue. The goal of the study of the water to know the quality of the drinking water in ambah city. To perform the analysis of the drinking water, we collect total 18 samples and out of which 5 from old pipeline, 5 from the new pipe line, 5 from different tubewells and 4 from the Chambal river. After the study of all the sample we get average of the different parameters as follows: pH(7.4), total dissolved solid(TDS)(567.75mg/L), electrical conductivity(EC)(915.25 μS/cm) , Turbidity(-0.24NTU), magnesium (10.625mg/L),total hardness(315.31mg/L), fluoride(0.57mg/L), calcium(36.55mg/L), nitrate(2.72mg/L), sulphate(142.5mg/L), Phosphate(0.05) are the physicochemical parameter analysed. The study of all the parameters reveals that most of the parameters are with in the standard recommended by the WHO. But there is some of the parameters such as total dissolved solid (TDS), electrical conductivity (EC),Phosphate and total hardness does not meet the standards. TDS level in samples lies between the range of the 480mg/L to 650mg/L with the average of the 567.75mg/L which is more than the WHO recommendation of <300mg/L. concentration of phosphate in Chambal water is more than the recommendation due to the organic waste thrown in it. apart from the some exceptions , water quality of the water of ambah municipal town is suitable for drinking. A questionnaire was designed with the help of existing literature about public awareness on water quality. Public satisfaction can be enhanced by the dissemination of the significant importance of the water quality in annual government. Reports to the public i.e. print media social media television and news paper*

**Keywords:** **Water quality, drinking water, Ambah, Madhya Pradesh, Water polluion, public awareness, health risk, human health.**

**INTRODUCTION**

The availability of ground water is the most important sources in many developing countries water quality and risk of water related disease are serious public health issues. Water is one of the important content of life.[1-3] It plays a vital role in the human life. Fresh water is the basic human need. Access to safe drinking water is a global concern. It helps us to survive, not only for humans but also for the animals[4-5]. It also provide some important nutrient dissolved in it. But due to the false or improper practices the water get contaminated with the harmful chemicals which harms our body. [6-7] Due to which the survival of the humans and other animals and plants are at stake. Since the most of the freshwater is reserve in the form of ice and slowly flowing through the rivers but most of the toxic factories are around the river it get polluted and due to the insufficient surface water most of the population depends on the ground water because primary source of freshwater is ground water[8-10], as a result the water level of the ground water is going deep which create a different type of scarcity. As the population of the world is increases, the demand of the fresh water increases and due to which the exploitation of the water resources is increases rapidly[11-12]. In Ambah town main source of water supply are a huge water tank by which the supply of water is conducted through pipeline which is the main source of water for all the citizens of Ambah town[13-14]. Some of the households has their own tubewell for water supply. And very few peoples are dependent on the Chambal river for direct water supply for now a days. Hence most of the population of Ambah Town is dependent on the tank water supply through pipeline, in parallel another pipeline for water supply is employed by municipal corporation of Ambah which is directly connected to the ground water tubewell and supply direct water from ground water which we regarded as the new pipeline water[15].

Figure-1
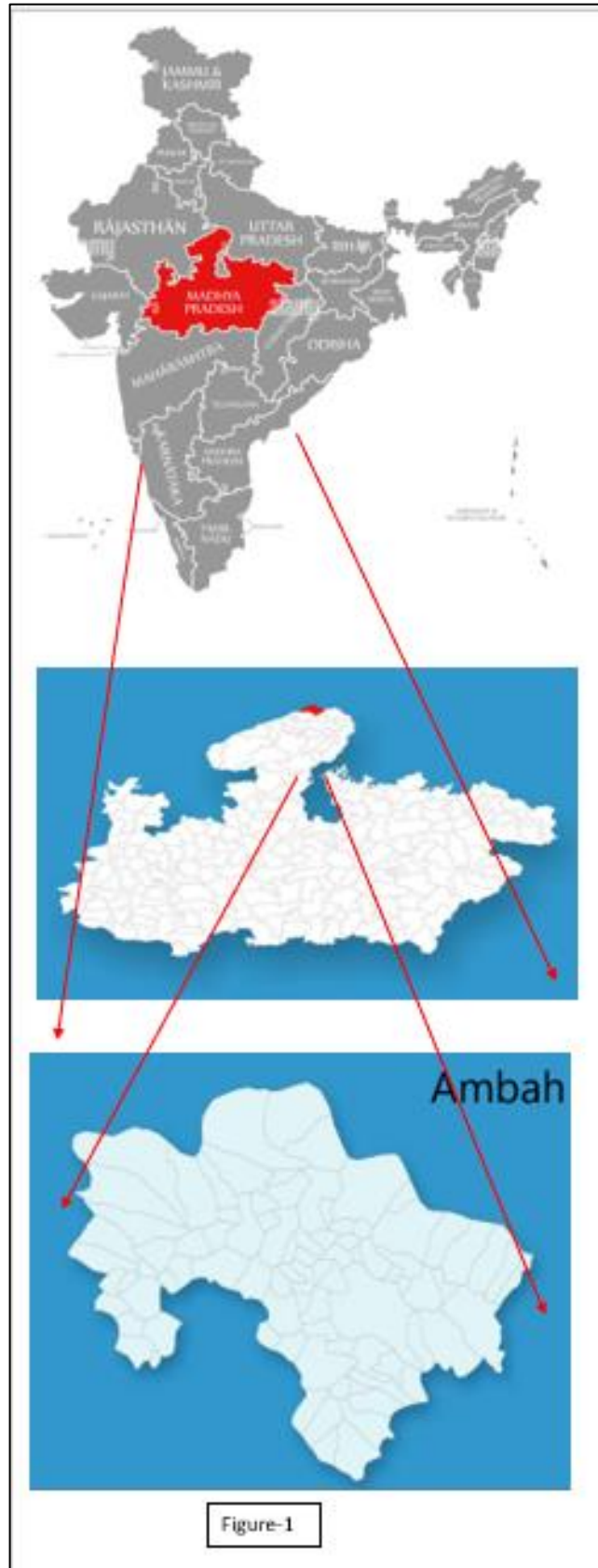
## RESEARCH METHODOLOGY

**Description of the study area**- this study is carried out in Ambah, a town near Morena, MP, India. The town is situated between the 26.7009o N and78.2269o E longitude, at a height of 170.25 metre from sea level.

**Climate-** Ambah town has hot temperature lies between 9.4oC in winter and 43.4oC in summer with the average wind speed is 9.5km/hr with the highest wind speed in June having average 12.8km/hr. having highest humidity 68% in August with yearly humidity nearly 41% and annual precipitation nearly 39mm with wettest month august nearly 164mm.

**Geology**- Ambah town lies in the Central highland platue surrounded by the ravines of the Chambal river in north and east side whereas ravines of the kuwari river in west and south direction having low tree density.

**Sampling**- we collect samples from the different sites, 4 samples from the old pipe line , 5 from the new pipe line , 5 from different tubewells and 4 from the Chambal river at different places across the ambah. All the samples are collected in the contamination free bottles and all the instrument used for the analysis are caliberated with labeling of time and type of the sample. The area of ambah is shown in the figure 1

**Physicochemical Test Procedures**- most of the water quality parameters were determined on the same day, the temperature of the sample is recorded with thermometer and using digital pH meter we calculate pH in our own institute, thereafter we also determined the TDS and electrical conductivity using the digital conductivity meter and other parameters are followed by them.

## RESULTS AND DISCUSSION

**The physicochemical parameters results**

The physicochemical parameters such as total dissolved solids (TDS), turbidity, electrical conductivity (EC), temperature, pH, calcium, magnesium, total hardness, alkalinity, fluoride, nitrate ($NO_3$), Sulphate ($SO_4$), phosphate ($PO_4$), and residual chlorine at different sample locations.

| Sample | pH | TDS | EC | turbidity | magnesium | Total hardness | flouride | calcium | nitrate | Phosphate | sulphate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Old tap** | 7.2 | 480 | 921 | -0.30 | 10.2 | 320.16 | 0.5 | 21.3 | 2.5 | 0.02 | 100 |
| **New tap** | 7.3 | 621 | 910 | -0.21 | 10.4 | 310.2 | 0.6 | 20.5 | 1.7 | 0.01 | 130 |
| **Tubewell** | 7.4 | 520 | 890 | -0.25 | 12 | 300.5 | 0.5 | 32.1 | 3.2 | 0.04 | 90 |
| **Chambal** | 7.9 | 650 | 940 | -0.20 | 9.9 | 330.4 | 0.9 | 72.31 | 3.5 | 0.13 | 250 |
| **WHO standard** | 6.5 – 8.5 | <300 mg/L | <400 µS/cm | <5 NTU | 10–30 mg/L | 300mg/l | 0.5–1 ppm | 100–300 mg/litre | 10mg/l | <0.05mg/L | 500mg/l |

**Total dissolved solid(TDS)-** There is no health based limit of TDS in drinking water. Whereas the permissible TDS limit by WHO and NDWQS is 1000 mg/l
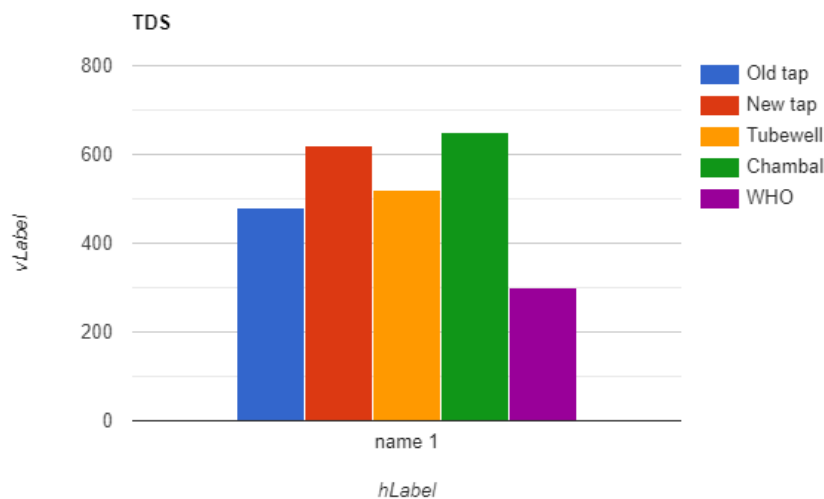


**Electrical conductivity (EC)** – The ability of the water to conduct electric current is known as the electrical conductivity which is directly proportional to the minerals dissolved in the water but by using that we cannot determine the element present in it. If the conductivity of the water is higher which means that the water get polluted and chloride and nitrates may be present in it and recommended electrical conductivity by the WHO is not exceeded 400µS/cm
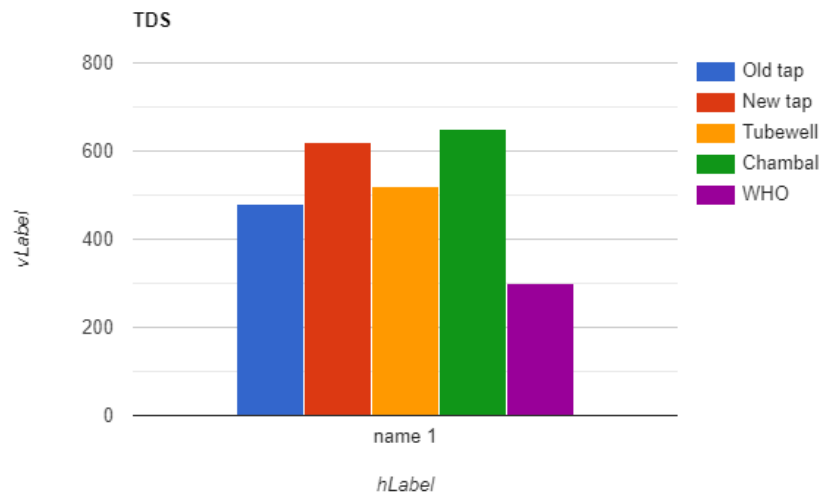
**Turbidity**- the permissible limits of the turbidity in drinking water is less than 5 NTU even it can be in negative which is better. In the samples that we collected, turbidity is under limit.
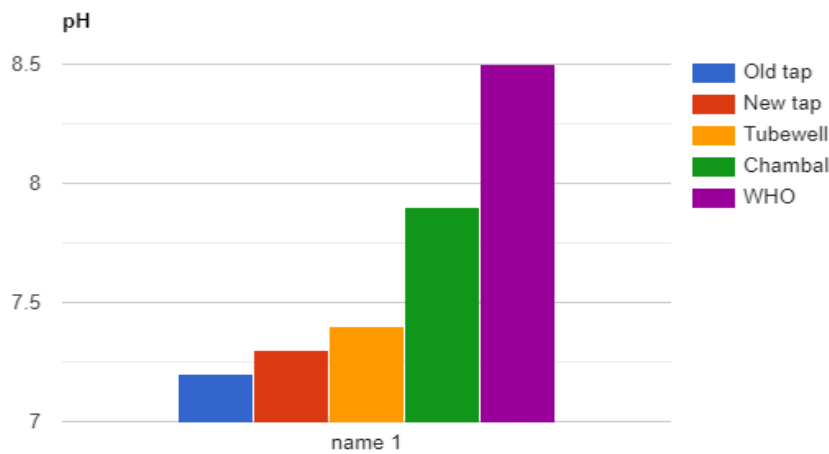


**pH**- The permissible limit which WHO defines is maximum 8.5 and minimum 6.5. All the water sample pH ranges between the permissible limits.
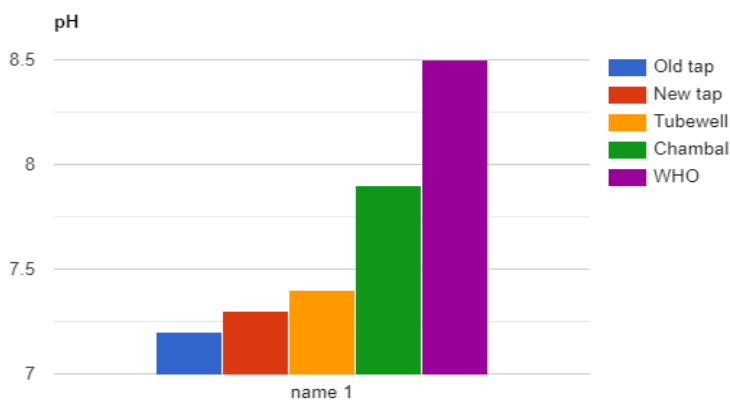
**Calcium and Magnesium**- the level prescribed by the WHO for calcium is 75mg/l. the value for calcium in old pipeline tape water, new pipeline tap water, tubewell water and Chambal River is 21.3,20.5,32.1,72.31(in mg/L). Which is under limit as the WHO prescribed. the value for magnesium in old pipeline tape water, new pipeline tap water, tubewell water and Chambal river is 10.2,10.4,12,9.9(in mg/L).which is under limit as the WHO prescribed.
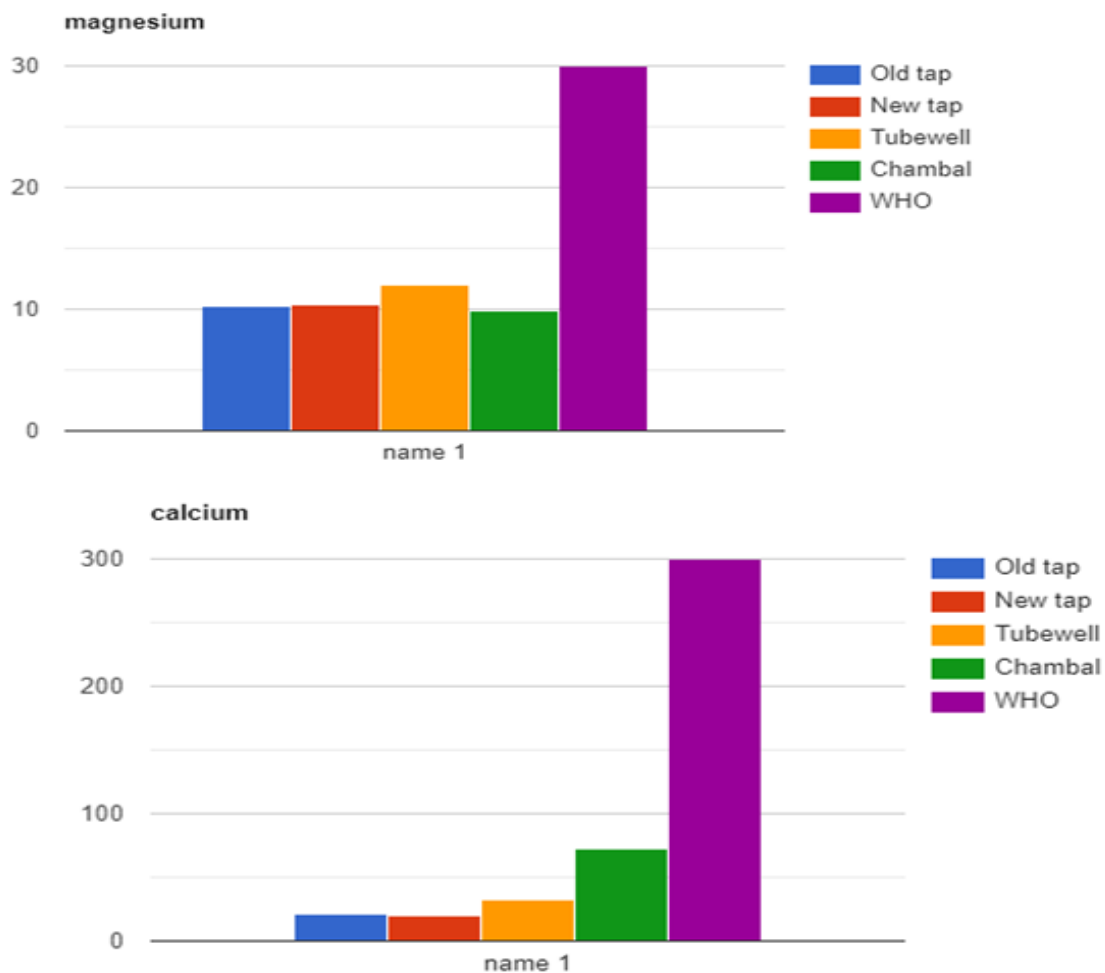




**Total Hardness** – total hardness can be defined as the total amount of calcium and magnesium ion present in the water, the highest permissible limit of total hardness as CaCO3 according to WHO is 300mg/l, the average hardness of old pipeline water, new pipeline water, tubewell water and Chambal river water is 320,310,300,330(in mg/L). Which is under standard prescribed by WHO.

**DOI Link:** https://doi-ds.org/doilink/07.2024-86186398/UIJIR
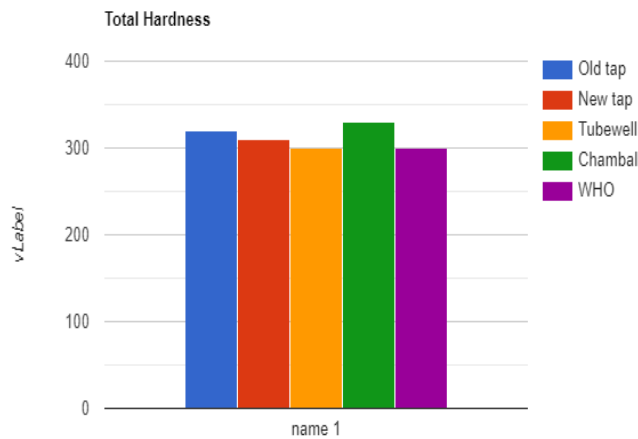
**Fluoride**- the fluoride concentration in water recommended by WHO is 1.5mg/l. the value for fluoride in old pipeline tape water, new pipeline tap 0.5, 0.6,0.5,0.9(in mg/L). Which is under limit as the WHO prescribed.
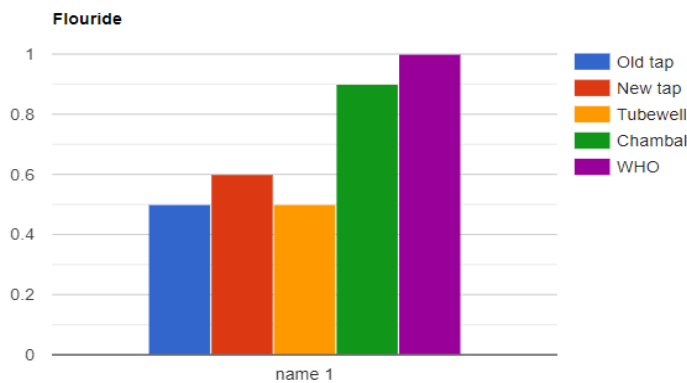


**Nitrate**- Water having nitrate concentration more the 10mg/l has harmful effect on our body. And the value of nitrate concentration in the old pipeline tape water, new pipeline tap water, tubewell water and Chambal river is 2.5, 1.7,3.2,3.5(in mg/L).which is under limit as the WHO prescribed.
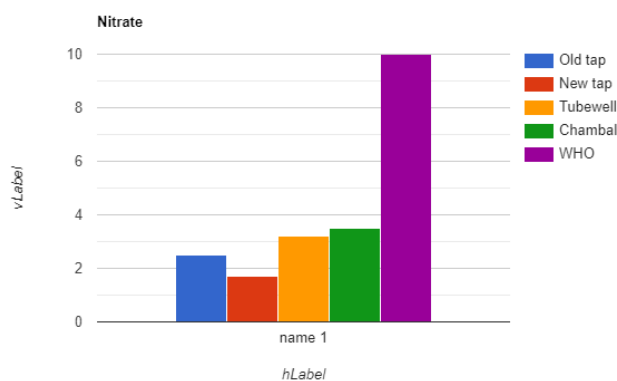
**Sulphate-** water with the sulphate above 500 mg/l can affect the health, it has change in their taste as well as damage to the distribution system due to corrosion and plastic pipes are used generally for the water supply. Sulphate concentration in the old pipeline tape water, new pipeline tap water, tubewell water and Chambal river is100,130,90,250 (in mg/L) .There is no special recommendation by the WHO.
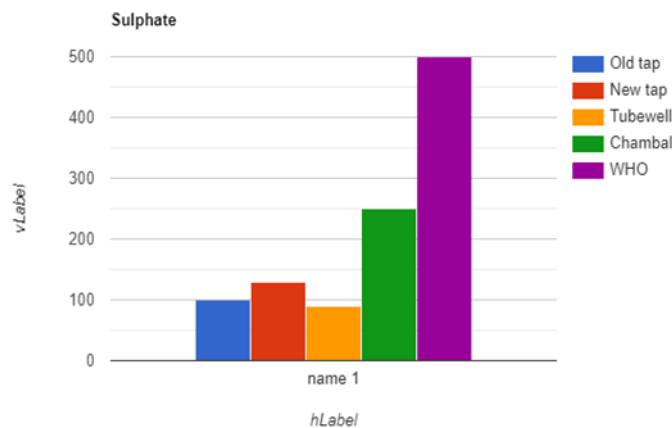


**Phosphate**- microbiological decomposition of the organic material gives phosphorus in the form of phosphate. the value of phosphate concentration in the old pipeline tape water, new pipeline tap water, tubewell water and Chambal river is 0.02,0.01,0.04,0.13 (in mg/L)
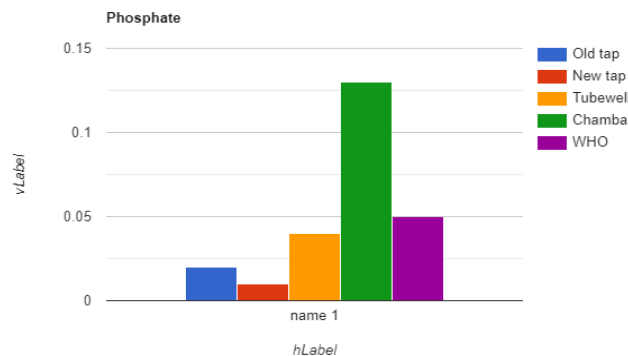


**CONCLUSION**

The study goals was to access the drinking quality of Ambah (M.P.) by looking at the physical chemical and biological parameters of drinking water. The life cannot Imagine without water, water maintain the right pH balance in the body. Government of India has started "Har Ghar Jal mission". The drinking water quality parameters from the Ambah city water supply source. Tap water, river water were examined using on site measurement and experimental Analysis. The

Total dissolved Solids (TDS), Electrical conductance, pH, Total hardness, turbidity, calcium, Magnesium, Nitrate, shulphate, Acidity, flouride among them. One cannot imagine the life without water, without water life cannot possible. Drinking water is very necessary to all of us. The drinking water quality parameter from the ambah city water supply's sources old tap, new tap, tubewell and Chambal were examined using on site measurement and experimental analysis. The findings revealed that the majority of the water quality parameters were within the WHO. However some physicochemical parameters do not meet standard. The temp of all water samples from the sources, tap water, Chambal, tubewell exceeded 24oC.Most of the water parameters are higher than the WHO recommendation are found in Chambal river sample, it is due to the leather and soap factory on the bank of Chambal river near the Dholpur(RJ). Which discharge the inorganic waste of leather and untreated water directly to the Chambal river due to which the contamination of some of the parameters increaseas in the Chambal river water. The mean phosphate concentration is 0.05 with highest 0.13 at river Chambal but for old tap water and new tap water it is under the limit <0.05. Water quality of ambah water is best for drinking based on the all the parameters,the analysis of the water has limit to evaluate bacteria and some other factor such as heavy metals. To get much more clear picture of water of ambah city, there should be investigation with the factors which are now not accessiable to this study at present. And for the best results there should be regular analysis of the water tankers, pipe lines and tubewells to compare its quality and put forward the step to avoid the practices which harm the quality of the water in ambah city.

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