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Research Article

**COMPREHENSIVE STUDY OF PHYSICO-CHEMICAL  
PARAMETERS OF DRINKING WATER OF VARIOUS  
SOURCES OF BAGMANDLA, TALUKA, SHRIWARDHAN**

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**Abstract:**

*Drinking water is most essential for livelihoods. This paper presents comprehensive analysis of drinking water in Bagmandla. In order to ascertain water quality for human consumption major and minor parameters were evaluated, in drinking water supplied to the villagers from Gram panchayat and well available in village. The objective of the study was derived from the data analysis. Four sources of water were selected for evaluation. First two samples were tap water & another two samples were well water which is supply by Gram Panchayat. Standard method were used for determining chemical & physical parameters such as Odour, pH, Total Hardness, Chlorides etc.*

**Key Words:** Water quality, Physico-chemical parameters, IS, Bagmandla.

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**INTRODUCTION:**

Drinking water is indispensable for human existence. Water sustains all life on earth. It is a dynamic system containing living as well as nonliving, organic, inorganic, soluble as well as insoluble substances. so its quality is likely change day by day & sources to sources. The quality of water for drinking has deteriorated because of the inadequacy of drinking treatment plants, direct discharge of untreated sewage in water and inefficient management of the piped water distribution system. Bagmandla is a village situated at the coast line of Savitri River. Bagmandla has great population. There are many water sources available in Bagmandla like wells, tap water & bore well. People of Bagmandla have different opinions about the same water sources. Near about 60% people drink tap water & remaining prefers well water. In Bagmandla tap water is available till the month of February. After that people has to drink well water. But because of prejudices that only tap water is good for drinking they start storing of water from the month of December & Others peoples who drink well water even in rainy

**Observation:**

season when tap water is available. Therefore in the present research an attempt has been made to check & compare various physico-chemical parameters of tap water, well water & other drinking water sources of Bagmandla.

**Sample collection:**

Four stations were selected from Bagmandla. The first station is tap water tank -1 situated near Savitri River. The second station is tap water tank -2 which is 2 KM away from first station in forest area. The water in both tanks comes from same source from Nandruki River; Kolmandla is 5 km away from the selected stations. Third station is well-1 located in middle of farm & the forth one is well-2.

**MATERIALS AND METHOD:**

Samples of water were collected in sterile polythene bottles from all the stations. At the sampling temperature of the all stations were noted. The physico-chemical analysis was carried out in Laboratory as per standard procedures. The chemicals were used A.R grade & standardized before use.

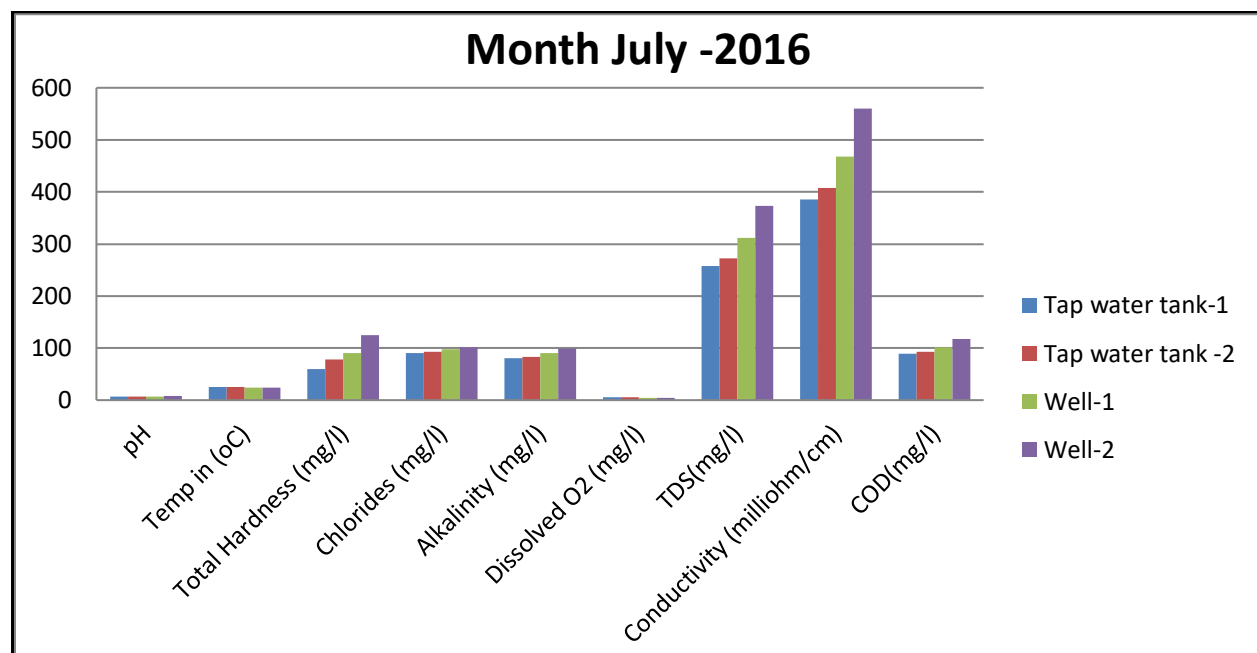
**Table1 No: 1. Month July -2016:**

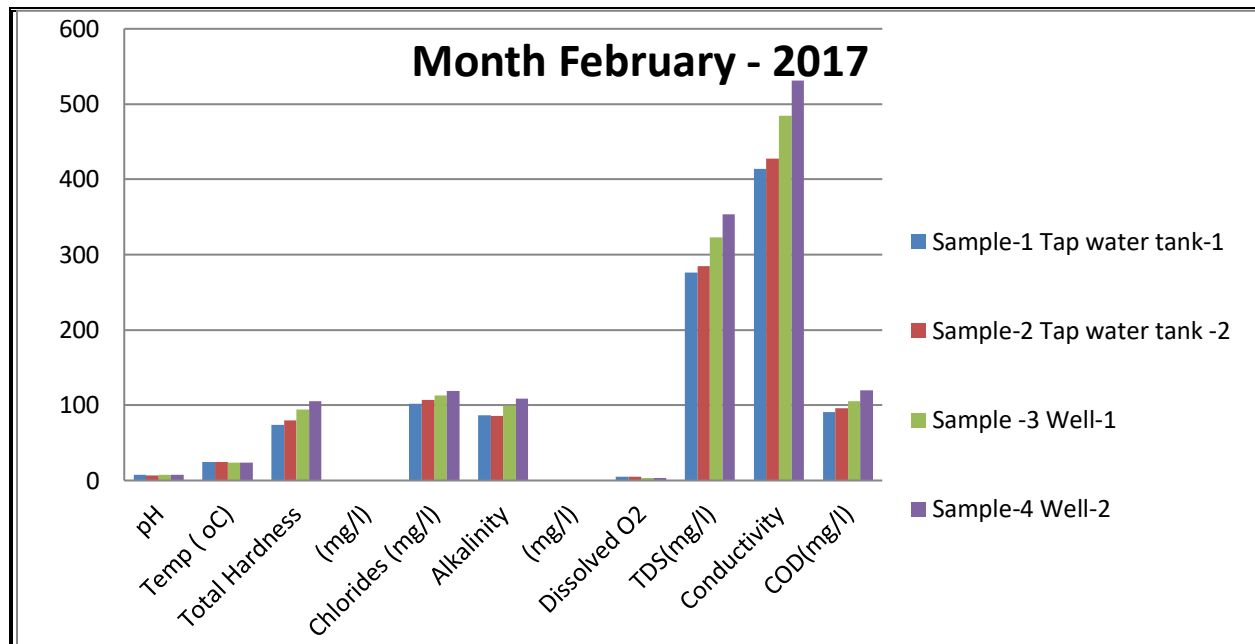
Parameters used	Sample-1 Tap water tank-1	Sample-2 Tap water tank-2	Sample -3 Well-1	Sample-4 Well-2	Permissible parameters
Odour	unobjectionable	unobjectionable	unobjectionable	unobjectionable	unobjectionable
Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
pH	7.1	7.2	7.2	7.5	6.5 to 8.5
Temp in (°C)	25	25.5	24.1	24.2	25 to 27
Total Hardness (mg/l)	60	78	90	125	300
Chlorides (mg/l)	91	93	98	102	250
Alkalinity (mg/l)	80	83	91	99	200
Dissolved O <sub>2</sub> (mg/l)	5.4	5.3	4.3	4.3	6
TDS(mg/l)	257	272	312	373	500
Conductivity (milliohm/cm)	385.5	408	468	559.5	750
COD(mg/l)	89	93	101	117	250

Table No: 2: Month February - 2017:

Parameters used	Sample-1 Tap water tank-1	Sample-2 Tap water tank - 2	Sample -3 Well-1	Sample-4 Well-2	Permissible parameters
Odour	unobjectionable	unobjectionable	unobjectionable	unobjectionable	unobjectionable
Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
pH	7.3	7.1	7.4	7.5	6.5 to 8.5
Temp ( °C)	24.8	24.6	23.6	23.7	25 to 27
Total Hardness (mg/l)	74	80	94	105	300
Chlorides (mg/l)	102	107	113	119	250
Alkalinity (mg/l)	87	86	99	109	200
Dissolved O <sub>2</sub>	4.8	4.9	3.7	3.5	6
TDS(mg/l)	276	285	323	354	500
Conductivity	414	427.5	484.5	531	750
COD(mg/l)	91	96	105	120	250

Graph showing Concentration range of various parameters





### RESULTS AND DISCUSSION:

**pH:** pH has no direct adverse effect on health. The lower value of pH (< 4) will produce sour taste and higher value (> 8.5) alkaline taste water. pH of all water samples were found to be in the permissible limits. As compared to February to pH of July month has slightly increased but which were in the permissible limits.

**Temperature:** Temperature is basically important for its effects on chemical & biological reactions in the organism in aquatic system. At higher temperature, water becomes tasteless even does not quench the thirst and decrease the solubility of Oxygen. Temperature of tap water is slightly greater than well water. Temperature increases in winter season (February month).

**Total Hardness:** Total hardness of all water is due to presence of Calcium & Magnesium ions & it is an important factor that indicates poisons & toxic effects. Hard water is not suitable for domestic & irrigation purpose. Hard ness of tap water is less as compare to well water. Total hardness of water samples was found to be normal in both the months.

**Chlorides:** The contents of Chloride due to evaporation. The Chlorides content where in the

range as per standards in all water samples, in both months, but slightly varied in different seasons.

**Dissolved O<sub>2</sub>:** It is an important critical factor in natural water both as regulator & metabolic process of biotic community and it is an indicator of aquatic health. In station 1 & 2 (Tap water) dissolved O<sub>2</sub> were found near about in range of 4-5, which is slightly greater than well water. But were found in permissible limits.

**Alkalinity:** Alkalinity of water is its capacity into neutralize a strong acid and is characterized by the presence of salt of weak acid such as silicate, phosphate etc. However the carbonates & bicarbonates sharing the most part of total alkalinity. Observed value of alkalinity of all water samples are in the safe range.

**TDS & CONDUCTIVITY:** In natural water dissolved solids are composed mainly of Carbonate, bicarbonate, nitrate, magnesium etc. Concentration of solid is an important water parameter in drinking water & other water quality standards. They give particular taste to water at higher concentrations. TDS of well water was slightly higher in February as compared to July. And due to this conductivity also increased in this month. But all values of TDS & Conductivity were in the permissible limits.

**COD:** COD is the amount of dissolved O<sub>2</sub> required to cause chemical oxidation of the organic material in water. COD is the key indicator of environmental health of surface water supply & determine by APHA method. COD of all water samples were in a IS range.

#### CONCLUSION:

Values of Physico-chemical parameters of water samples of all stations are within a permissible range except station no.4 which has slightly greater values of TDS, Hardness & Conductivity. As per the result it concluded that all sources have near about same range so people could not distinguished good & bad water. All water samples are suitable for drinking purpose & other domestic activities.

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