

**STATUS OF DRINKING WATER IN RURAL AREAS OF
CHANDIGARH**

Er. Bhavana Arora¹, Er. Arvind Dewangan² and Er. Sunita Kumari³

1. Er. Bhavana Arora, Haryana College of Technology & Management, Kaithal, Haryana, India. Email: arora.bhavana@yahoo.com
2. Er. Arvind Dewangan, Haryana College of Technology & Management, Kaithal, Haryana, India, Email: arvinddewangan237@gmail.com
3. Er. Sunita Kumari, Swami Vivekanand Institute of Emerging Technology, Ramnagar, Banur, Punjab. Email: sunitavibhav@yahoo.com

ABSTRACT

This paper reveals about the significance of water in rural areas. Of the many essential elements for the existence of human beings and animals and universally known as air, water, food, shelter etc., the importance of water is rated as the highest. It is the Nature's free gift to human race. The importance of water in human life is so much that the development of every city of the world has practically taken place near some source of water supply. Safe drinking water supply and basic sanitation are vital human needs for health and efficiency. All the ill health, diseases and deaths in developing nations including India are attributed to the lack of these essentials. According to W.H.O. about 30000 people die everyday in the world due to unsafe water consumption and insufficient sanitation. Water is essential to sustain life and a satisfactory supply must be made available to consumers. Every effort should be made to achieve drinking water quality as high as practicable. Protection of water supplies from contamination is the first line of defence.

Key words: 1. Drinking water 2. Rural Areas 3. Water borne diseases 4. Potable Water
5. Water Treatment

SUB AREA: WATER SUPPLY ENGINEERING.
BROAD AREA: ENVIRONMENTAL ENGG.

INTRODUCTION

Source protection is almost invariably the best method of ensuring safe drinking water and is preferred to treating a contaminated water supply to render it suitable for consumption. Failure to provide adequate protection and effective treatment will expose the community to the risk of outbreaks of intestinal and other infectious diseases. Those at greater risk of water borne disease are infants and young children. Many parameters must be taken into consideration in the assessment of water quality, such as source protection, treatment efficiency and reliability and protection of the distribution network (e.g. Corrosion control). The costs associated with water quality surveillance and control, must be carefully evaluated before developing national standards. Whenever there is shortage of water, people look for whatever water from other sources is available, irrespective of its potable quality. The sense of survival predominates the requirement of quality of drinking water. The investigation of quality of potable water for the city is of utmost importance at present and this significance shall not diminish in the times to come. The concerned authorities therefore need to look into this aspect in the proper perspective and plan a continuous water quality investigation system for the future. Some 200 million Indians do not have access to safe and clean water. An estimated 90% of the country's water resources are polluted with untreated industrial and domestic waste, pesticides and fertilizers. Hence for providing safe water to the people in an effective manner a study of the quality of water being consumed by the people in rural and urban areas in present time is essential to be carried out. This study shall help in improving the drinking water quality by giving stable treatment to existing water and bringing its quality to the better level to match to the W.H.O. standards. There are three basic criteria to evaluate the quality of water – physical, chemical and bacteriological. The physical and chemical methods are concerned with a variety of procedures, each applicable to a particular situation. In many instances a combination of chemical analysis is needed to obtain a reasonably accurate picture of the quality of water. The customary methods for the bacteriological analysis refer to pollution evaluation in the term of the presence and relative evidence of pathogenic bacteria and other microscopic organisms.

PARAMETERS

In the present paper, the quality of water samples collected from various villages in Chandigarh were analysed for the following parameters :

- ▶ pH
- ▶ Turbidity
- ▶ Chloride
- ▶ Carbonates
- ▶ Bicarbonates
- ▶ Total hardness
- ▶ Calcium
- ▶ Magnesium
- ▶ Fluorides
- ▶ Nitrates

- ▶ Sodium
- ▶ Potassium

The samples were collected from the tap or hand pump depending on the type of source of water supply existing in a particular place.

Table showing values of different parameters in the drinking water of the villages of Chandigarh taken for the study

SAMPLE STUDY

The various villages numbered as different sample stations in the table are:

Sample No. 1 Attawa

Sample No. 2 Kajheri

Sample No. 3 Halomajra

Sample No. 4 Maloya

Sample No. 5 Palsora

Sample No. 6 Burail

Sample No. 7 Dhanas

Sample No. 8 Badheri

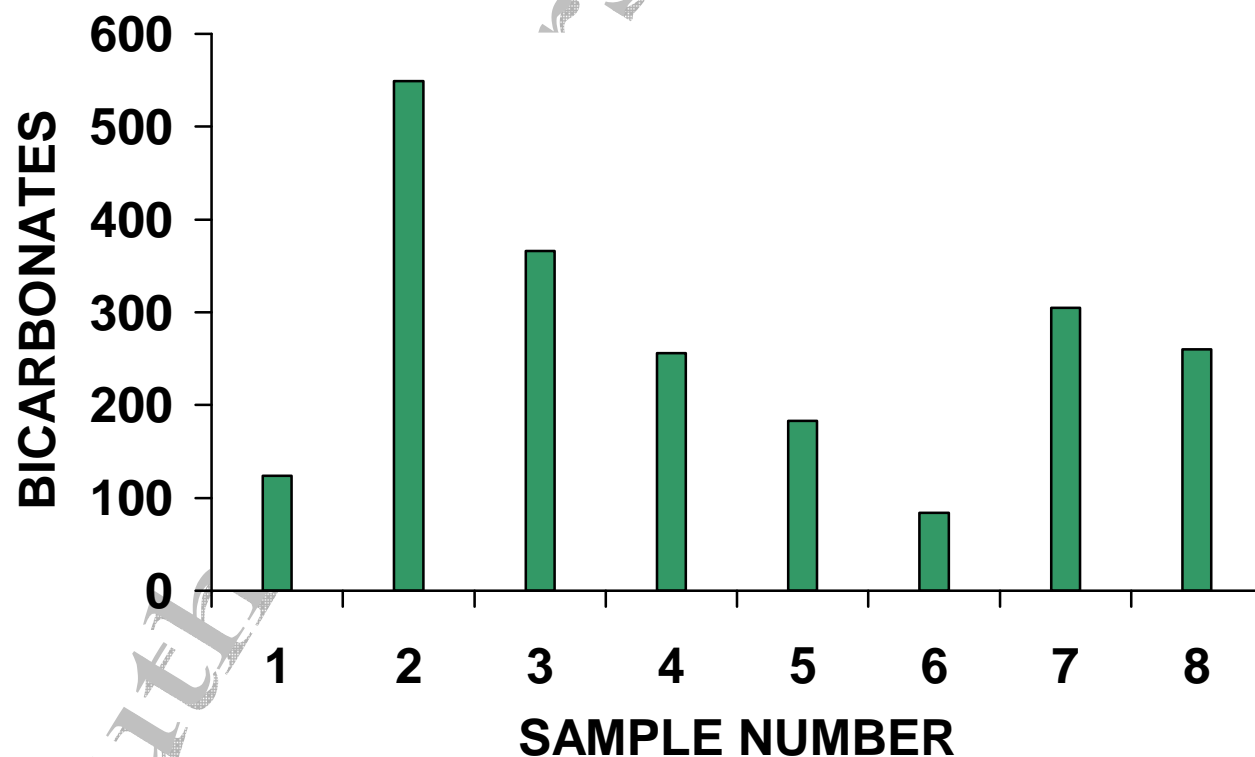
VALUES FROM VARIOUS SAMPLE STATIONS

PARAMETERS	1	2	3	4	5	6	7	8
PH	7.57	7.27	7.75	7.20	7.85	6.91	7.56	7.15
TURBIDITY	2.5	3.5	3.0	1.6	1.3	3.2	4.1	3.7
CHLORINE	1.1	125	18	74	46	202	50	46
CARBONATES	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
BICARBONATES	124	549	366	256	183	84	305	260
TOTAL HARDNESS	126	541	247	270	145	330	295	206
CALCIUM	40	183	86	70	45	66	38	55
MAGNESIUM	6	20	8	23	9	40	49	16
FLUORIDES	0.5	0.42	0.35	0.52	0.67	0.82	0.64	0.75
NITRATES	NIL	155	22	12	19	37	12	50
SODIUM	10	105	43	20	30	34	18	34
POTASSIUM	2	65	2	16	31	16	12	55

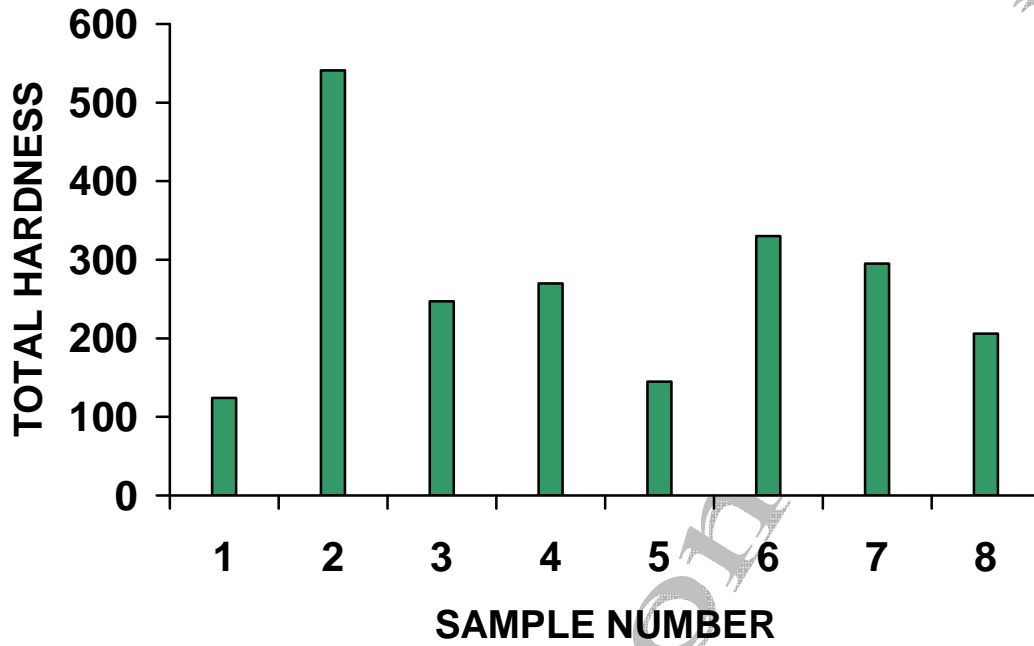
Table showing standards of different Parameters

PARAMETERS	INDIAN STANDARDS	WORLD HEALTH ORGANISATION
PH	6.5-8.5	6.5-8.5
TURBIDITY ,UNITS	5	5
CHLORIDES (mg/l)	250	200
BICARBONATES (mg/l)	200	200
TOTAL HARDNESS (mg/l)	300	300
CALCIUM (mg/l)	75	75
NITRATES (mg/l)	45	45
FLUORIDES (mg/l)	1	1.0-1.5

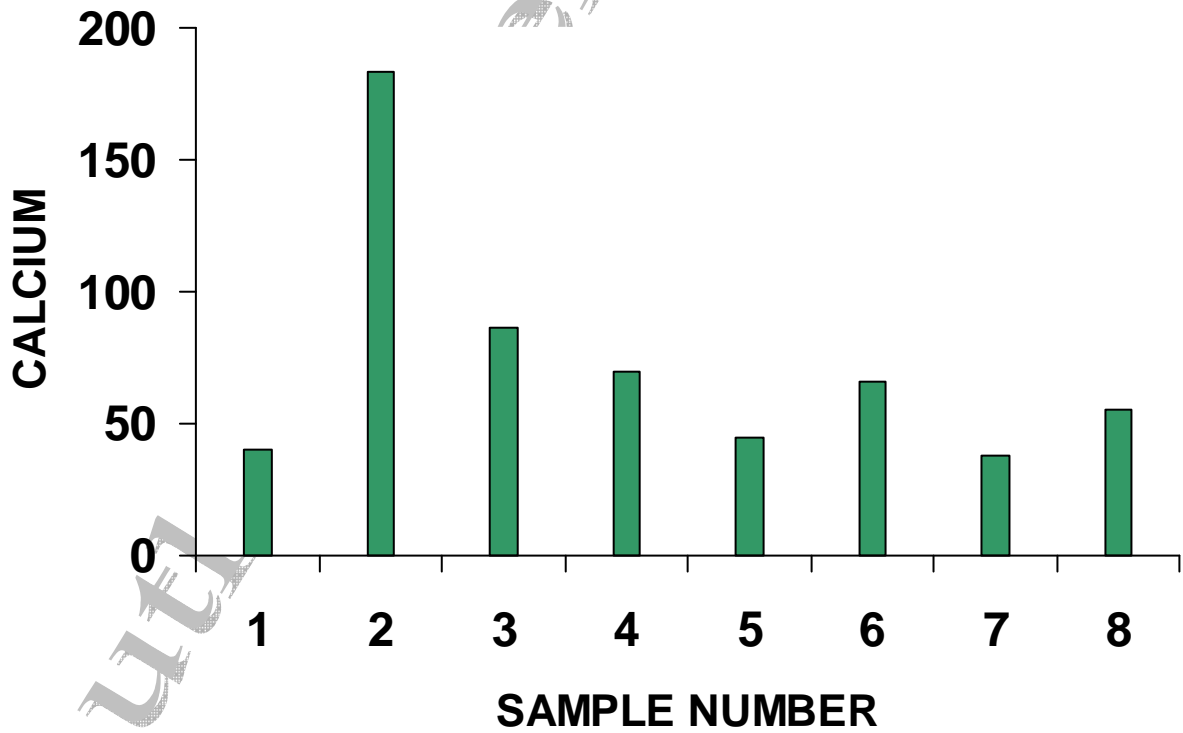
GRAPHICAL REPRESENTATION OF BICARBONATES RESULTS



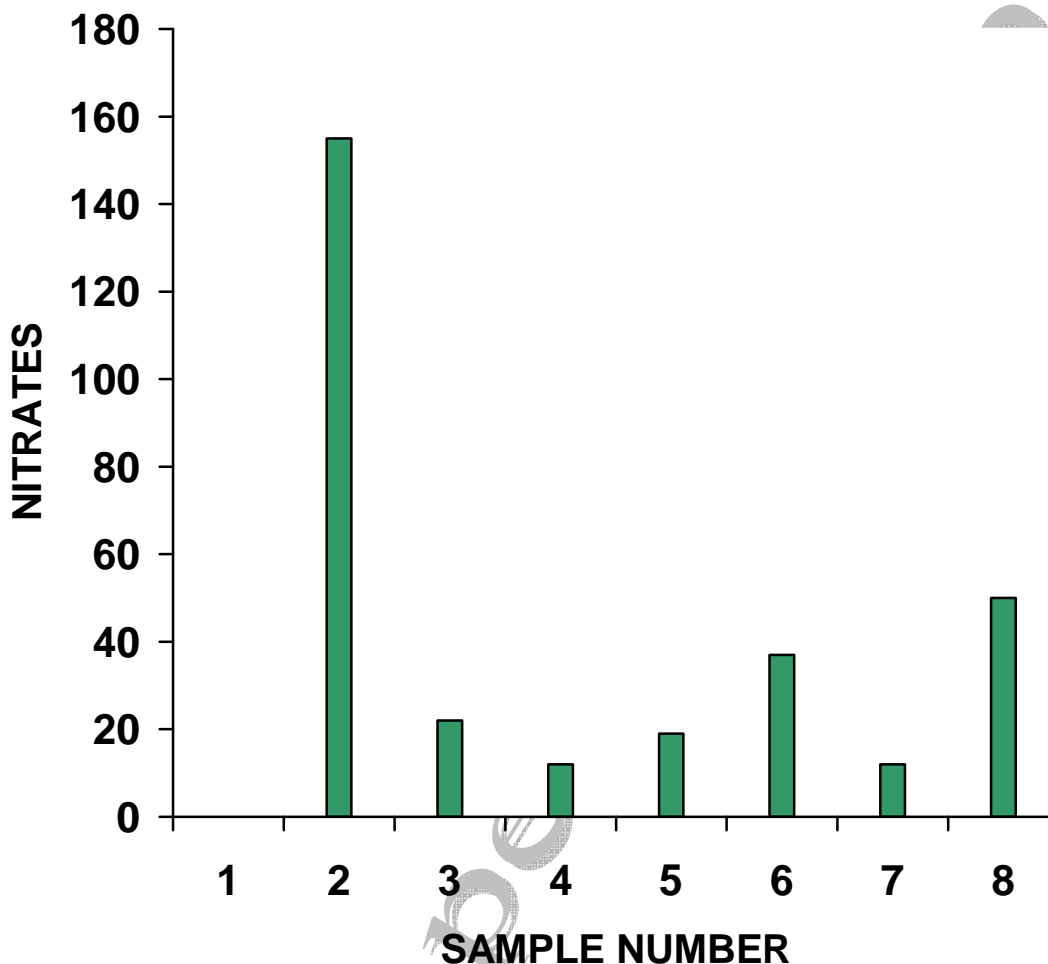
GRAPHICAL REPRESENTATION OF TOTAL HARDNESS RESULTS



GRAPHICAL REPRESENTATION OF CALCIUM RESULTS



GRAPHICAL REPRESENTATION OF NITRATES RESULTS



The present investigative study leads to the following conclusions:

- The water of some of the villages does not fulfil the conditions laid down by Indian Standards and by WHO and thus is unfit for human consumption. The quality of these sources of water is as follows:

1. The Bicarbonates value of the water samples from the hand pumps located in Kajheri, Halomajra, Dhanas and Badheri and from tap water in Maloya are more than the prescribed standard values. This imparts bitter taste to water and is thus unfit for human consumption.
2. The Chloride value of water from the hand pumps of Burail is a bit higher than the prescribed WHO standard but is in prescribed limits according to Indian Standards.
3. The value of Nitrates of water from the hand pumps in Kajheri and Badheri are more than the prescribed standard values. This can cause infant methaemoglobinemia (blue babies) at very high concentration. It causes gastric cancer and affects central nervous system adversely.

4. The Calcium value of water from the hand pumps located in Kajheri, Halomajra is more than the prescribed standard values. This causes incrustation in water supply system and can cause kidney or bladder stone problems.
5. The Total Hardness value of water from hand pumps of Kajheri and Burail is higher than the prescribed values. Thus the water of these places is unfit for drinking purposes.

■ The potable water supplied to the city beautiful by the Public Health Department of Chandigarh Administration meets the requirement laid down by the Indian Standards and by the World Health Organization and therefore is safe for human consumption. The water of some of the villages is beyond the prescribed limits but does not harm the people too much. But due to demand and supply, people are forced to look for alternative source of water supply, hand pumps being the only one in the city. Also due to restricted hours of water supply petty traders resort to hand pump water to meet the increasing demand of water supply. The water supply will not be able to fully cater to the needs of the rural population. Consequently, people will have to look for hand pump water as the source of water supply and the administration needs to take certain actions to improve the quality of water.

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