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Water Quality Assessment and Health Survey in Dhundi Village – A Case Study

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ABSTARCT:
Drinking water is an important environmental factor, which influences the health of the population. Contaminated water is a source for different infectious diseases. One of the important issues that impacts sustainable water management practice in India is related to water quality. In Dhundi village there is serious threats regarding water quality specially Fluoride in the community. Also the village was suffering from skin, skeletal, dental and other various diseases. Hence, attempt has been made in the present study to assess water quality and health problem in the study area. The actual data of the study area was acquired by house to house survey and analyzed. The results reveals that the Fluoride content is within (0.05<1.5mg/l) desirable limit. All the sources in the study area are highly biologically contaminated. Most of the population in the area are illiterate and during survey 311 patients of skin and joint were examined by reputed physician in the camp were organized at Dhundi..

Keywords: *Fluoride1; Water2; Quality3.*

1. INTRODUCTION

Treatment of raw water for different water quality parameter is essential for supplying water to a community and as well as at domestic level. World water vision has proclaimed that clean and adequate supplies are fundamental to the successful exercise of human rights. However, a large number of people in different parts of the world do not have access to safe drinking water and these pose serious threats to their health and livelihoods. Ground water forms a major source of drinking water supply for urban and rural areas of India. Since public health depends to a great extend on the quality of drinking water, it is imperative that in depth information about the quality of drinking water is systematically collected and monitored. The chemical data on ground water is necessary to evaluate its suitability for drinking purposes. Fluoride in ground water in many states of India has caused human health and physiological action. Drinking water is typically the largest single contributor to daily fluoride intake. A high concentration of fluoride in drinking water mainly affects the teeth and skeleton causing fluorosis. The prevention of fluorisis through management of drinking water is a difficult task, which requires favorable condition combining knowledge, motivation, privatization discipline and technical and organizational support.

2. IMPORTANCE OF WATER QUALITY ASSESSMENT

A large number of people in different parts of the world do not have access to safe drinking water and this poses serious threats to their health and livelihoods. A large volume of chemical data on ground water from different parts of the country has been generated to evaluate its suitability for drinking purposes. The major problems identified are excess fluoride content, higher salinity levels, and excess of iron, arsenic and nitrates in underground water. The Dhundi villagers have threats regarding water quality due to various health problems in their area. Hence an attempt has been made in the present study to carry out house to house survey to acquire the information to know different water quality parameters and its impact on health.

2.1. *Effects of Fluoride on Human Body*

Drinking water is an important environmental factor, which influences the health of the population. Contaminated water is a source for different infections disease. One of the important issues that impacts

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sustainable water management practice in India is related to water quality. The text of this chapter deals with the methodology for water quality assessment and Health survey in Dhundi Village. Table 1.shows the effects of Fluoride on human body. And Table.2 shows drinking water standard for Fluoride ion by various authorities.

Table 1: Effects of Fluoride on Human Body

F(mg/L)	Physiological effects
1.0	Dental carries reduction
2.0	Mottled enamel
5.0	Osteoscleriosis
8.0	10% Osteoscleriosis
20-80	Crippling fluorosis
100	J Retardation
125	Kidney changes
2500	Death

Table 1: Drinking Water Standard for Fluoride Ion by Various Authorities.

Sr.No.	Authority	Permissible limit, mg/l
1	WHO (in Indian context)	1.50
2	WHO (international standard)	0.50
3	BIS (IS-10500)	1.0-1.5
4	ICMR	1.0-2.0
5	CPHEEO	1.0-1.5
6	US Public Health	0.7-1.2

2.2. *Objectives of Study*

The main objective of the present study was
1. To acquire the desired data by house to house survey to know various water quality Parameters and health problem.
2. To acquire the information regarding existing water sources and systematic collection of water sample.
3. To conduct Biological and chemical testing of water sample for assessment of its quality.
4. To organize health camp to know the causes of various diseases in the study area.
5. To analyze the data to create awareness regarding water quality and health problem amongst the community.
6. To suggest household method for defluoridation and filtration to mitigate the contamination.

3. METHODOLOGY

Drinking water is an important environmental factor, which influences the health of the population. Contaminated water is a source for different infections disease. One of the important issues that impacts sustainable water management practice in India is related to water quality. The text of this chapter deals with the Methodology for water quality assessment and Health survey in Dhundi Village.

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3.1 Health Survey And Water Quality Assessment

More than 60% of the programme implementers and 90% of the community do not understand the problem in its totality. They only understand that the excess Fluoride in drinking water is to be removed. Training is to be imparted to doctors, Medical officers, Health administrators Public Health engineers, water analysis and administrators, Dentist and dental Health Administrators and health workers, Grass root level functionaries and community leaders.
The information was to be recorded.

- Total population
- Number of water resources.
- School existing with total number of children and teachers present.
- Annual rainfall
- Nature of water
- Availability of surface water source.
- Primary Health Center Operating in the area.
- Number of doctors and Health workers posted in the area.
- Water quality testing facility.

3.2 About Study Area

The Dhundi (Jawahar Nagar) is a tribal village in Pusad Tehsil of Yavatmal District in Maharashtra, India. The Dhundi village situated on Pusad Nagpur Road 10km away from Pusad. The brief information regarding the Dhundi village are shown in ***Table 3.***InStudy area source of drinking water was found as one Bore and three Open wells.

Table 3: Data Collection.

1	Distance	10km away from Pusad
2	Total population (As per census 2001)	2875
3	No. of wards	03
4	No. of houses	575
5	Existing water sources	05
6	Total no. of School exists	02
7	Average Annual rainfall	834.9mm
8	Existing water facility	Z. P. Water supply scheme.
9	G.S.R.(02 capacity)	-25000lit.each
10	Nature of water	Biologically and chemically contaminated
11	Primary health center operating in the Area	P.H.C. sub center but not functional
12	No. of Doctors and health workers posted in the Area	02
13	Water quality testing facility	There is no water testing facility.
14	Any reputed NGO working in the Area	No
15	Community suffering from diseases	a) Skin problem b) Renal problem c) Joint problem d) Dental problem
16	No of handicapped found	11
17	Occupation of villagers	Agriculture

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3.3 Testing Result And Discussion

From each source 5 liters water sample collected for testing. The test report as shown in graph. The tested sample found Non potable in microbial test. After chemical analysis of water it is found that there is no hidden danger of fluoride as it is below desirable limit. (0.05 < 1.5 mg/l) prescribed by WHO. This analysis removes the fear in the mind of community regarding fluoride. But the water sources of that village was microbial contaminated which in term cause various harmful diseases like dysentery, typhoid and other diseases.

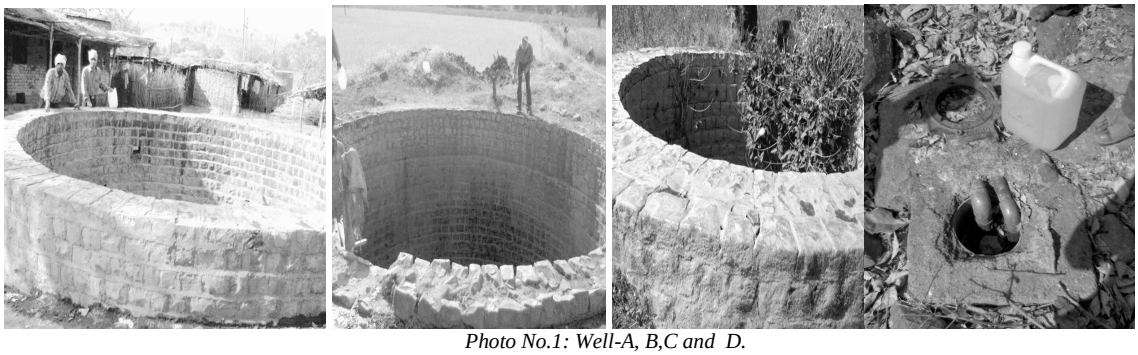
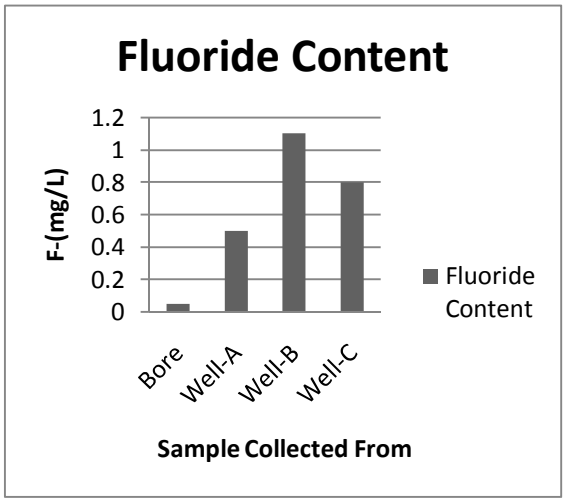
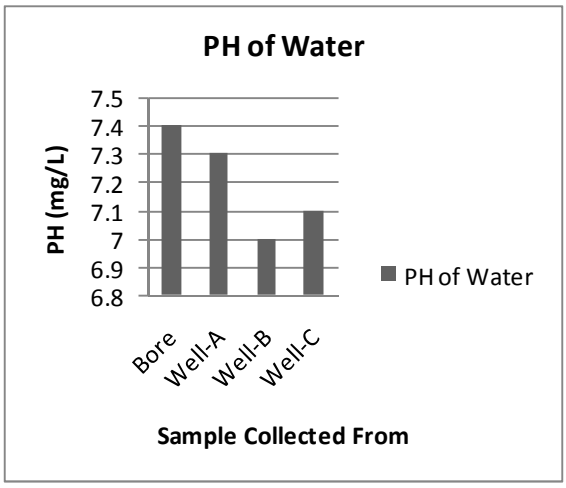


Photo No.1: Well-A, B,C and D.

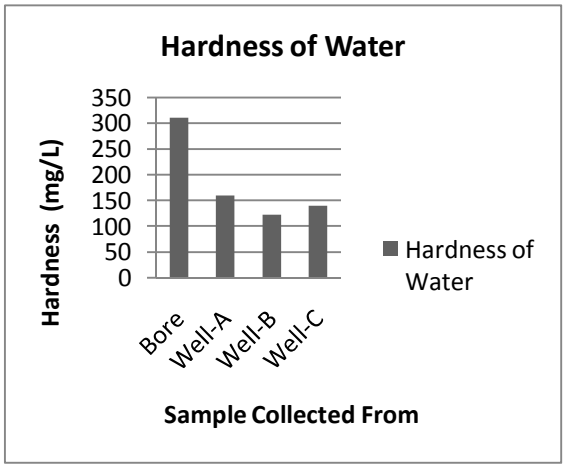
Result graph as shown,



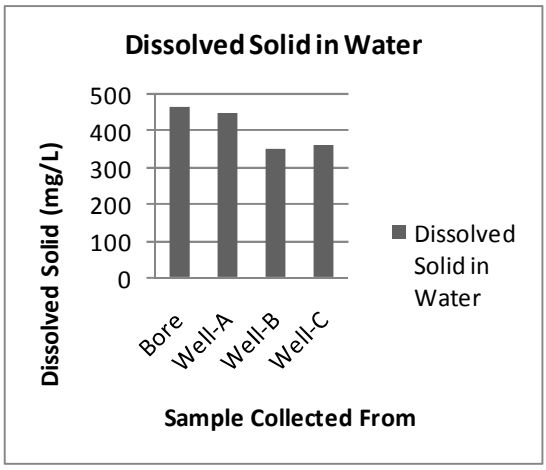
Graph 1.Fluoride Content



Graph 2. PH of water



Graph 3. Hardness of water



Graph 3. Dissolved solid in water

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3. CONCLUSION

Based on the detailed analysis performed during the study following major conclusion can be made.
1. Large number of people in the study area are illiterates.
2. There is no hidden danger of fluoride in the study area because fluoride content is within desirable limit (0.05 < 1.5 mg/l).
3. All the sources in the study area highly biologically contaminated.
4. The extension of existing water supply scheme and proper chlorination is essential in the village.
5. There are various diseases like Dental, Skeletal and Skin found in the study area. This may be due to biological contamination of water.
6. Due to consumption of biologically contaminated water community suffering from various diseases like Food poisoning, Diarrhea, Typhoid, leaving the immunity system weak.

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