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Impact of Water Contamination in Domestic Water Sources in Tirupattur Taluk, Vellore District

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Research Article

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ABSTRACT

Water is one of the most important needs of living things. It is second only to the air we breathe. In fact, some scientists believe that all life began in water. Water is regarded as polluted when it is changed in its quality or composition, directly or indirectly as a result of human activities. So that it becomes useless or less suitable for drinking, domestic, agricultural, fisheries or other purposes for which it would otherwise be quite suitable in its natural or unpolluted state. Any human activity that impairs the use of water a resource may be called water pollution. It is estimated that a global annual discharge of 440 cubic kilometres of sewage and a considerable amount of the 510 tons of diverse agricultural, industrial and wastes get into the biosphere. In India alone it is estimated that municipal sewage accounts for 3650 million cubic meters against 750 million cubic meters industrial effluents dumped into our rivers. The important objectives of this study are to examine the health impact of the people due to contaminated drinking water in the study area. In order to obtain the objectives of this study, we used primary and secondary data for the period of 2014. This study is descriptive type in nature simple percentage tables and diagrams were used for analysis.

INTRODUCTION

Water is one of the most important needs of living things. It is second vital resource to the air used to breathe. In fact, some scientists believe that all life began in water. In rural and small town places, the provision of basic retail, social, health, education, sanitation and infrastructure services provide a crucial foundation for day-to-day activities. Air, water and food are the three natural resources which determine the existence of human beings [1-3]. Even though air is polluter, it is available in abundance and so it is free to be consumed. Water is a naturally occurring substance covering more than 70 % of the surface of the Earth, and is vital to all life forms. Water is used for agriculture, industrial and domestic purpose. Water is also used for drinking, cooking, washing and bathing is called water for personal demand [4]. The water used for drinking purpose must be free from all types of contaminations.

Water Pollution

Water is regarded as polluted when it is changed in its quality or composition, directly or indirectly as a result of human activities. So that it becomes useless or less suitable for drinking, domestic, agricultural, fisheries or other purposes for which it would otherwise be quite suitable in its natural or unpolluted state. Any human activity that impairs the use of water a resource may be called water pollution [2]. Similarly, when there is drought condition, water level goes down and it may get contaminated through seepage on saline water. Pollution in a natural way is not very serious, as the pollutants get assimilated by water is a natural ways. Pollutants bring about physical and chemical changes not only in the surface water, but also in the ground water. The water is fit for consumption if it has biological organisms like guinea worms, tape worms, cholera and typhoid creating bacteria and excess chemicals such as fluoride, iron, arsenic and nitrate [5].

India could use only 1,09,20,000 lakh cubic meter water, of which 80 per cent to agriculture and irrigation, 14% electricity

generation, 4 per cent to industry and around 2% for domestic purposes & drinking purposes would be used. It is estimated that a global annual discharge of 440 cubic kilometres of sewage and a considerable amount of the 510 tons of diverse agricultural, industrial and wastes get into the biosphere. In India alone it is estimated that municipal sewage accounts for 3650 million cubic meters against 750 million cubic meters industrial effluents dumped into our rivers. Around 1.1billon people in the world are still without access to safe hygienic water supply as a result 250 million people suffer from water related diseases and 3million people die due to water related diseases in the world. The world Health organization estimate that 5 million deaths occur annually due to unsafe drinking water [6]. In India the water pollution at regional and local level causes substantial amount of damage to Human Health and effect productivity and income.

Lather industry is one of the highly polluting industries and could polluted land, water and atmosphere pollution is a worldwide problem and is one of the reasons for causing the shifting of this industry from the developed to developing countries. Assuming that processing all the raw material available within the country will yield about 45 million litres of effluent per day [7,8]. Treatment of his quantity of effluent will require of massive investment of capital cost of Rs.8.10 crores and about Rs.1.2 lakhs per day as treat charges. The problem of effluent treatment is gaining more momentum day by day. In fact this is the burning problem of the leather industry. Government has begun pressing the farmer is speed up its construction of treatment plants. The construction of plants for which the government are disposal of effluents has now a days because a serious problem, construction of plants, bristles with difficulties. Availability of qualified engineer correct guidance from government & control leather research institute are the major aspects of the problem.

Sources of Water Pollution

Paper Industry: The chemicals used in this industry like alum; talc, rosin, chlorine, caustic soda etc. dissolve in water and pollute water.

Distillery: The distillery wastes are rich in organic compounds. If these wastes are mixed with the nearby river without proper treatment, it will spoil the water quality [5].

Electroplating Plants: The effluents of this plant contain heavy metals and cyanides which cause excessive acidity or alkalinity in waters of rivers which is very harmful to aquatic life. Asbestos industry and steel industry also pollutes water.

Origin of the Problem

A study on the quality of Drinking Water in around TirupatturTaluk has expressed concern at the presence of high levels of total dissolved solids in groundwater. The crisis of availability of water and pollution is worsening day by day. On the one hand, the groundwater level is going down rapidly and on the other the quality is getting worsens. Drinking Water pollution reduces the amount of pure, fresh or treated drinking water that is available for such necessities as drinking and cleaning and for such activities as swimming and fishing. The water pollution that affects water comes mainly from industries, farms and sewage systems[9]. Industrial wastes include chemicals, wastes from animal and plant matter and other substances; they ruin water by upsetting natural cycles [10,11].

The aim of the study to overcome the issues drinking water sources in study area. To find out whether the people are having potable water supply throughout the year. To examine the health impact due to contamination in the potable water supply in the study area.

METHODOLOGY

In this study both primary and secondary data was used. Secondary source of data was collected from journal, newspaper, books and Electronic sources. Primary data was collected from the household level survey in the study area such as Tirupattur Taluk. The numbers of samples were 66 samples at the household level in the study area. In the study area there is 33 wards and in each ward two samples was collected. Purposive random sampling techniques were used in the study at the time of primary data collection with well-designed interview scheduled. Chi-Square (χ^2) statistics was performed with the following test hypothesis[12]. H_o (Null Hypothesis): There is no significance between polluted Drinking Water and people affected. H_1 (Alternative Hypothesis): There is significance between polluted Drinking Water and people affected.

ANALYSIS and INTERPRETATION

In this chapter deals with primary data analysis and interpretation is focuses reality of the study area. In this chapter we have tried to solve / overcome the problems by achieving our objectives. The main purpose of this chapter is to represent the primary data and analysis with the help of basic statistical tools such asper cent correlation, cross table etc, this was simplified with tables and diagram representation[8].

Sufficient Drinking Water Supply

We have taken sufficient water supply for a day as a variable for our analysis, through which we can identify the respondents

are get sufficient potable water supply. It helps us to get sufficient information where we can reduce bias in the study.

The above **Table 1**, infers that almost 71.2 per cent of the respondents are getting insufficient water per day and only 28.8 per cent of the respondents are getting sufficient water supply per day. From the above analysis, it can be generalised in the study area [13]. Hence, water is necessary for our survival, without this we can't survey. Scarcity of water supply plays a vital role in deciding the standard of living condition of the community in Tirupattur Taluk.

Table 1. Sufficient Drinking water Supply.

Sufficient water	Number of respondents	percent
Yes	19	28.8
No	47	71.2
Total	66	100.0

Contamination in Drinking Water Source

The contamination of drinking water is taken as a variable for analysis, through which we can identify the affect health in the potable water contamination. It helps us to get sufficient information where we can reduce bias in the study.

In **Table 2**, the contamination of drinking water sources is studied. Among the sample, almost 89.4 per cent of the respondents have stated that their drinking water is contaminated due to penetration of sewage water into the water pipelines and it is further discussed in the below table and only 10.6 per cent of the respondents are stated drinking water is unpolluted [14]. The potable water polluted the respondents is very useful studying the quality of water supply. The contamination of drinking water was realised and it is discussed in the below table.

Table 2. Contamination in Drinking Water.

Polluted	Number of respondents	percent
Yes	59	89.4
No	7	10.6
Total	66	100.0

In **Table 3**, almost 90 percent of the respondents stated that their water source is contaminated. Among the sample, about 77.3 per cent of the respondents are identified and reported that their water source is contaminated through taste &colour, 9.1 per cent respondents are said that there is contaminated with dust & insects, only 3 per cent of the respondents are realised through odour and 10.6 per cent nearly one tenth of respondents said that their water is not contaminated [15]. Majority of the respondents (89.4) realised the contamination in their potable water supply.

Table 3. Realising the contamination.

Find out water polluted	Number of respondents	percent
Taste and Colour	51	77.3
Dust and Insects	6	9.1
Odour	2	3.0
No Contamination	7	10.6
Total	66	100.0

Contamination Water Colour

We have taken water colour as a variable for our analysis, through which we can identify the how to find colour of contamination in the potable water. It helps us to get sufficient information where we can reduce bias in the study.

From the above **Table 4**, it is known that almost 84.8% of the respondents are stated that their water colour is yellow, 3per cent of the respondents are realised their potable water is brown colour, and only 1.5per cent of the respondents have found their water in black colour, 10.6per cent of the respondents are stated that their potable water are no any changes.

Table 4. Realising the contamination.

Water colour	Number of respondents	Percent
Black	1	1.5
Brown	2	3.0
Yellow	56	84.8
No changes	7	10.6
Total	66	100.0

Impact of Health Owing to Contaminated Water

We have taken people are affected diseases as a variable for our analysis, through which we can identify the affected health through contamination in the potable water [7]. It helps us to get sufficient information where we can reduce bias in the study.

From the above **Table 5**, it is known that nearly 45.5 per cent of the respondents are said that their family members are

affected with typhoidthrough contamination in the potable water, 28.8per cent of the respondents are said that their family members are affected with allergy through contamination in the potable water, 16.2per cent of the respondents are said that their family members are affected with viral fever through contamination in the potable water, 6.1per cent of the respondents are said that their family members are affected with diarrheal through contamination in the potable water, and the remaining 3.0per cent of the respondents are said that their family members are affected with cholera through contamination in the potable water. Contamination water plays a major role in spreading water born disease.

Table 5. Diseases through contamination in the potable water.

Diseases	Number of respondents	percent
Typhoid	30	45.5
Cholera	2	3.0
Viral Fever	11	16.7
Diarrhea	4	6.1
Allergy	19	28.8
Total	66	100.00

Mode of Water Purification

We have taken people are water purify as a variable for our analysis, through which we can identify the health protect through contamination in the potable water supply. It helps us to get sufficient information where we can reduce bias in the study.

From **Table 6**, the majority of 39.4 per cent of the respondents are using filter water by manual, 25.6 per cent of the respondents are purifying their water by boiling, 21.2per cent of the respondents are using R.O. system for potable water and the remaining 13.8per cent of the respondents are not purify but their consuming directly **(Tables 7 and 8).**

Table 6. Mode of Water purify.

Water Purify	Number of respondents	percent
Boiling	17	25.6
Filter	26	39.4
Purify in R.O.	14	21.2
Direct usage	9	13.8
Total	66	100.0

Table 7. Drinking Water is polluted.

Polluted	Observed N	Expected N	Residual
Yes	59	33.0	26.0
No	7	33.0	-26.0
Total	66		

Table 8. People affected with contaminated Drinking Water.

Affected	Observed N	Expected N	Residual
Yes	49	33.0	16.0
No	17	33.0	-16.0
Total	66		

Table 9. Test Statistics

Test	Drinking water polluted	People affected due to intake of contaminated in the drinking water
Chi-Square	40.970[a]	15.515[a]
Df	1	1
Asymp. Sig.	0.000	.002

The minimum expected cell frequency is 33.0.From the above **Table 9**, it is the outcome of the Chi-square analysis is highly significant with the contamination of potable water and people affected. Hence, null hypothesis (Ho) is rejected & alternative hypothesis is accepted and it is statistically significant at 99 per cent.

CONCLUSION

The outcome of this paper is based on the survey conducted. In the study almost 89.4 per cent of the respondents are expressed that their water sources is affected to contamination in the potable water sources and resulted with explosion of health damage. Hence, the water pipeline is running through drainage in all the junction point. It becomes major threat for the contamination in the potable water source. To reduce contamination the pipeline should not cross with drainage channel through we can prevent the drainage. From the analysis Chi-square test proved that the contamination drinking water leads to health damage. Health is very important for increasing the standard of living. Hence, the optimal solution to overcome the issue is to have separate water pipeline in one side and in another side the drainage and other amenities can be established.

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