International Review of Business and Economics

Volume 1 | Issue 3 Article 44

1-2-2018

Externality Of Water Pollution And Its Impact On Human Health

Suresh B. Ph.D.
ataraja College of Arts& Science, rbseconomics@yahoo.com

48. EXTERNALITY OF WATER POLLUTION AND ITS IMPACT ON HUMAN HEALTH

Dr.SURESH.B, Assistant Professor of Economics, J.K.K. Nataraja College of Arts& Science (Govt. Aided),Komarapalayam-638 183, MAIL: rbseconomics@yahoo.com CELL:9600614208.

ABSTRACT

Water is one of the natural resources which is essential to sustain life. Water pollution is any chemicals, physical or biological that changes the quality of water and has harmful effects on any living organism that uses it. When humans drink polluted water, it often has serious affects on their health. The objective of the study is 1) to evaluate the nature of the ground water in study area, 2) to study the Socio-economic characteristics of the respondents, 3) to examine the awareness of the respondents about the water pollution, and to find out the methods to control the ill effects of water pollution on human health.

The present study was conducted to assess the ill effects of water pollution on human health in Erumapalayam village in Salem District. Salem is the fifth largest city in Tamil Nadu State. A sample of 50 respondents was selected through simple random sampling techniques. The data was collected through well structured interviewing schedule. The collected data was analyzed by using descriptive and inferential statistics. The physical and chemical analysis conducted the water sample, it is found that the appearance of samples is slight-brownish color and they have objectionable odour and taste, Turbidity of the samples is found to be not in the range of permissible limit, I.e., 36 mg/L. As per the standard of Central Public Health Engineering Environmental Organization (CPHEEO) water sample is physically and chemically not potable due to appearance of odour and TDS, ALK, TH, FE, NO3 and C1 value exceeds the maximum permissible limits.

KEYWORDS: Pollution, Human Health, Awareness

INTRODUCTION

Water pollution is any chemicals, physical or biological that changes the quality of water and has harmful effects on any living organism that uses it. When humans drink polluted water, it often has serious affects on their health. Water pollution can also make water unsuited for the desired use. A little negligence on the part of civic bodies can result in the spread of many diseases. Access to safe drinking water remains an urgent necessity, as 30% of urban and 90% of rural households still depend completely on untreated surface or groundwater. While access to drinking water in India has increased over the past decade, the tremendous adverse impact of unsafe water on health continues. It is estimated that about 21% of communicable diseases in India is water related. A majority of inland rivers which are the sources of drinking water in urban India are also contaminated. While the shift in usage from surface water to groundwater has undoubtedly controlled microbiological problems in rural India. The same has however, led to newer problems of fluorosis and arsenicosis. Excess iron is an endemic water quality problem in many parts of eastern India. Hardness is mainly caused by the presence of carbonate, bicarbonate, choloride and sulphate salts of calcium and magnesium in water. Iron is found in parts of Madhya Pradesh, Uttar Pradesh, Coastal Orissa, Andhra Pradesh and Tamil Nadu.

THEORETICAL BACKGROUND OF THE STUDY

Environmental pollution is an 'externality' in welfare economics. An externality is present whenever individual A's utility and production relationships include real (i.e. non-monetary) variables, whose values are chosen by others (persons, corporations, governments) without particular attention to the effects on A's welfare. An externality can be either beneficial (positive) or harmful (negative). Examples of beneficial externalities are, a neighbour's rose garden entering as a real variable in the utility functions of others living in the neighbourhood, and services of a lighthouse entering as a real variable in the production function of shipping companies. Negative externalities include noise pollution by aircrafts using an airport, which enters as a real variable in the utility functions of persons living in the neighbourhood, and the pollution of a river, which enters as a real variable in the production function of water-supply undertakings drawing from the river or agriculture. With this background, the present study has also been undertaken to assess the impact of polluted water on the health status of the Erumapalayam village in Salem District.

OBJECTIVES

1.To study the Socio-economic characteristics of the respondents

2.To examine the awareness of the respondents

about the water pollution
3.To find out the methods to control the ill effects of water pollution on human health.

METHODOLOGY

The present study was conducted to assess the ill effects of water pollution on human health in Erumapalayam village in Salem District. Salem is the fifth largest city in Tamil Nadu State. A sample of 50 respondents was selected through simple random sampling techniques. The data was collected through well structured interviewing schedule. The collected data was analyzed by using descriptive and inferential statistics.

RESULT AND DISCUSSION

PHYSICAL CHARACTERIZATION

From the study area physical and chemical analysis conducted the water sample, it is found that ground water sample which are taken within ½ km from the solid waste dumping site are unfit for drinking purpose. The appearance of samples is slight-brownish colour and they have objectionable odour and taste, Turbidity of the sample is found to be not in the range of permissible limit i.e., 36mg/lit. Turbidity in water is caused by suspended matter such as clay, silts, finely divided organic and inorganic matter, soluble coloured organic compounds and plankton and other microscopic organisms. As per the standard of Central Public Health Engineering Environmental Organization (CPHEEO) water sample is Physically and chemically not potable due to appearance of odour and TDS, ALK, TH, Fe, No3 and C1 value exceeds the maximum permissible limits. The Total Dissolved Solids, PH, Electrical Conductivity, Chloride. Total Hardness, Nitrates (No3) and Fluoride contents are higher than the maximum limits. The following table 1 shows the physical and chemical characteristics of ground water quality at Erumapalayam village in Salem.

Table: 1 Physical and Chemical Characteristics of Ground Water in Salem

Parameters	Acceptable Limit	Rejection	Results of the Sample
Physical Examination	(A)	(B)	
Appearance	-	-	Sli.brownish
Colour (Pt.CoScale)	5	25	-
Odour	Unobjectionable	-	Objectionable Odour
Turbidity NT units	2.5	10	36
Total Dissolved Solids mg/ lit	500	2000	4283
Electrical Conductivity micromho/cm	-	-	6140
Chemical Examination			
PH	7.0-8.5	6.5-9.2	`6.91
Iron (Fe)	0.1	1.0	2.8
Total Alkalinity	-	600	2.8
Total Hardness as CaCo3	200	600	964
Nitrate as No3	46	100	2240
Chloride as C1	200	1000	155
Fluoride as F	1.0	1.5	1.0
Sulphate as SO4	200	400	110

(A) CPHEEO (Central Public Health Engineering Environmental Organization) Standards- Acceptable Limit
(B) CPHEEO Standards- Cause of rejection when exceed Result of Chemical Examination are expressed in mg/lit Acceptable limit fro Mg can go upto 125 mg/lit with and allowance of 1 mg per 25 mg so4

The analysis of water samples reveals that the quality of ground water in the solid waste dumping site are affected and the ground water from these nearer sites are not fit for human

consumption.

Distribution of the respondents with regard to their age, education and income has been given table 2. Majority of the respondents (50%) said that the main reason of water pollution was solid waste dumping and bad sewage system. Majority (50%) respondents were not satisfied with the quality of water that they drink.

Table: 2

Distribution of the respondents with regard to their Age, Education and Income

Age (in years)	Frequency	Percentage
Below- 20	4	8
31-40	6	12
41-50	11	22
51-60	22	44
61-Above	7	14
Education of Respondents		
Illiterate	10	20
Primary	16	32
High School	17	34
HSC	4	8
Degree	3	6
Monthly income of the Respondents		
Less than-2000	9	12
2001-3000	6	12
3001-4000	2	4
4001-5000	7	14
5001-6000	7	14
6001-7000	11	22
7001-Above	8	16
Total	**50**	**100**

Source: Primary Data

Majority of the respondents (74%) replied that some members of their family suffered from any disease due to polluted water and (26%) said that none of their family member suffered from any disease due to polluted water. Distribution of the respondents according to the type of disease they suffered due to polluted water is given in table 3.

Table: 3

Distribution of the respondents according to the type of disease *(Source : Primary Data)*		
Type of Diseases	**Frequency**	**Percentage**
No disease	13	26
Diarrhoea	3	6
Cholera	2	4
Hepatitis	10	20
Typhoid	4	8
Skin disease	3	6
Common Cold	13	26
Viral Fever	2	4
Total	**50**	**100**

Table: 4
Association between Education of the respondents and their awareness about Water Pollution

(Hypothesis 1: Higher will be the education, higher will be the awareness about water pollution)

Education Level	Awarness about Water Pollution		Total
	NO	YES	
Illiterate	6(12%)	4(8)	10(20%)
Primary	4(8%)	12(24%)	16(32%)
Secondary	1(2%)	16(32%)	17(34%)
HSC	0	4(8%)	4(8%)
Degree	0	3(6%)	3(6%)
Total	**11(22%)**	**39(78%)**	**50(100%)**

Source: Primary Data X2=15.680 d.f.=1 Significance=.000 *= Significance

The Chi-Square value shows a significant association between education of the respondents and their awareness about water pollution. Chi-Square=15.680with 1 degree of freedom and it is statistically significant. It means highly educated respondents had more awareness about water pollution. So the hypothesis "higher will be the education, higher will be the awareness" is accepted.

Table: 5
Association between income of the respondents and their awareness about Water pollution

(Hypothesis 2: Higher will be the income, higher will be the awareness about water pollution)

Income (Rs.)	Awarness about Water Pollution		Total
	NO	YES	
Below-2000	7(14%)	2(4%)	9(18%)
2001-3000	1(2%)	3(6%)	4(8%)
3001-4000	2(4%)	1(2%)	5(10%)
4001-5000	1(2%)	5(10%)	6(12%)
5001-6000	0	8(16%)	8(16%)
6001-7000	0	10(20%)	10(20%)
7001-Above	0	10(20%)	10(20%)
Total	**11(22%)**	**39(78%)**	**50(100%)**

Source: Primary Data X2=15.680 d.f.=1 Significance=.000 *= Significance

The Chi-Square value shows a significant association between income of the respondents and their awareness about water pollution. Chi-Square=15.680 with 1 degree of freedom and it is statistically significant. It means higher income respondents had more awareness about water pollution. So the hypothesis "higher will be the income, higher will be the awareness" is accepted.

CONCLUSION

The water pollution should be included in the national curriculum for creating awareness about the benefits of body water and all effects of poor quality water on human health. Mass media can play vital role to create awareness among the public about the problem of water pollution. Social workers, local government and leaders should be involved to seek greater public participation in seminars and workshops about awareness of water pollution in rural areas. The programmes on T.V. and radio should be presented in easy languages so that illiterate persons may also get awareness about water pollution.

REFERENCES

1.Mukhi, H.R. and R.S Srivastava, An introduction to social sciences. Satya Prakashan Incorporating: Tech. India Publications 16/7698, 6th ed. New Market, New Rohta Road, New Delhi, India, 1987.

2.Srikanth, R. (2009) Challenges of sustainable water quality management in rural India, Current Science, Vol.97, No.3, 10 August 2009, P.p317-325.

3.Rakesh Kumar, Singh, R.D. and Sharma, K.D., Water resources in India. Current Science, 2005, 89, P.p 794-881.

4.Brandon, C. And Homman, K., The cost of inaction: Valuing the economy-wide cost of environment Division, World Bank 7, October memo, 1995.

5.Bhardwaj, R. M., Water quality monitoring in India. IWG-ENV, International Conference on Water Statistics, Vienna, June 2005, P.p 20-22.

6.Smedley, P.L., Groundwater quality problems in costal Orissa, India, British Geological Survey Technical Report, WD/91/48R, 1991, P. 33.

7.Rajiv Gandi Drinking Water Mission, Guidelines for the National Rural Drinking Water Quality Monitoring and Surveillance Programme, 2006.

8.Naheed Akhtar et.al, Impact of Water Pollution on Human Health in Faisalabad City, Journal of Agriculture and Social Sciences, 1813-2235/2005/ P.p 43-44.

9.K. Govindarajalu, Industrial Effluent and Health Status- A Case Study of Noyyal River Basin, Proceedings of the Third International Conference on Environment and Health, Chennai, India, December, 2003.