

**Health and Environmental Problems Associated with Water Pollution in Gokana Local Government Area of Rivers State**

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**Abstract**

This study identifies the health and environmental problems associated with water pollution in Gokana Local Government Area of Rivers State. The area of the study was Gokana which is one the Local Government Areas in Rivers State, Nigeria. A descriptive survey design was adopted for the study with the population of 435,682 persons used for the study. A sample size of 250 individuals was used for the study. A two-stage sampling procedure was adopted to select the sample of this study. The questionnaire was designed by the researcher titled “Health and Environmental Problems Associated with Water Pollution Questionnaire (HEPWPQ)”. The reliability of the validated instrument was obtained using Pearson Product Moment Correlation and the coefficient value of 0.78. Collected data was analyze using SPSS version 25. The result showed that physical health problems such as bacteria and viral parasitic were associated with water pollution ( $X=3.54$ ,  $SD=0.73$ ) in Gokana Local Government Area of Rivers State. The result also depicted that mental health problems such as brain malfunction, depression, aresenicosis ( $X=2.97$ ,  $SD=0.84$ ) were associated with exposure to water pollution in Gokana Local Government Area of Rivers State. The result illustrated that social health problems such as discrimination, self-isolation, sociopathic ( $X=2.57$ ,  $SD=0.96$ ) form arsenicosis were associated with water pollution in Gokana Local Government Area of Rivers State. The result also indicated that environmental problems such as burning of toxic waste, indiscriminate dumping of waste, excessive cultivation, flooding, and urbanization ( $X=3.29$ ,  $SD=0.83$ ) were associated with water pollution in Gokana Local Government Area of Rivers State. Considering the findings of this study, it was concluded that health and environmental problems are strongly associated with water pollution leading to physical, social and mental health problems. Hence, the need to control indiscriminate disposition of solid waste and other particulates in the water bodies.

*Keywords:* health, environmental problems, water pollution.

**Introduction**

The impact of water pollution is one major devastating contributing factor to environmental problems in Nigeria; Rivers State is one of the states in Nigeria that are seriously suffering from the menace of Water pollution on the environment. Many people dump garbage onto streams, lakes, rivers and seas, thus, making water bodies the final resting place of cans, bottle, plastics and other household products. Human infectious diseases are among the most serious effects of water pollution, especially in developing countries, where sanitation may be inadequate or non-existent. Water pollution is as a result of many anthropogenic pollutants that contaminate the water. Water pollution is a chemical, physical or biological change in the quality of water that has a harmful effect on any living thing that drinks or uses or lives in it. Health officials emphasize the importance of drinking water at least eight glasses of drinking water to maintain good health (WHO, 2004). Water borne diseases occur when parasite or other micro-organisms contaminate water particularly from pathogens originating from excreta of human and animal. Some disease conditions that result include typhoid fever, intestine parasite or intestine worm infection, cholera, dysentery, diarrhea which are from bacterial or virus source. The most serious parasite disease caused by water ( $H_2O$ ) pollution are amoebiasis, giardiasis, ascariasis, hookworm, stomach grape, aches, cholera, hepatitis, raches, pink eyes, dysentery among

others (Ansari & Akhmatov, 2020). The Central Pollution Control Board (CPCB) is the national apex body for assessment, monitoring and control of water pollution. It advises the central government on all matters concerning the prevention and control of water pollution and provides technical services to the ministry of environment for implementing the provision of the environment (protection) Act 1986.

Michael (2010) defined Water pollution as the introduction by man, directly or indirectly, of substances or energy into the marine (Water) environment (including estuaries) resulting in such deleterious effects as harm to living resources, hazards to human health, hindrance to Water activities, including fishing, impairment of quality use of water and reduction of amenities.

Water is one of the natural resources that constitute the environment. And according to Eheazu (2016), the natural environment of man on planet earth is segmented into four spheres; namely, the atmosphere (made up of gaseous layers), the hydrosphere (water, including waters and rivers); the lithosphere (soil of the Earth crust, with underlying minerals), and the biosphere (containing living organisms like man, plants and animals). Water (H<sub>2</sub>O) is a liquid at standard ambient temperature and pressure, but it often co-exists on earth with its solid state, ice, and gaseous state steam (water pollution). In summary, Eheazu (2016) sees the human environment as consisting of all the external factors and forces with which individuals interact from conception to the grave. This tells us that humans interact greatly with their environment. However, the four systems are in constant change and such changes are affected by human activities (Kumarasany et al., 2004). Human beings are the causes of pollution due to their various activities carried out on the environment. In short, to prevent pollution in the environment particularly Water pollution, it is primarily necessary to educate human beings. Environmental adult education can be used as a powerful tool in this context.

Michael (2010) defined environment as the sum of all living and non-living things that surround an organism or group of organisms. The word environment simply connotes factors and conditions that have some impacts on growth and development of certain organisms. It includes both biotic and abiotic factors that have influence on observed organism. Abiotic factor such as light temperature, water, atmosphere, gases combined with biotic factors (all surrounding species).

One of the major problems in Nigeria today is linked with the environment. Excessive cultivation has resulted in less of soil fertility. The environment is considered unhealthy when it harbours those factors that are injurious to human body and over those which the individual has little control of. The burning of toxic waste and urban water pollution are problems in most developed areas. In some cases, heaps of rubbish announce the approaching city with half of the highway ridiculously engage with refuse (Chowdhary et al., 2020). Nigerian cities for example Gokana Local Government Area of Rivers State are getting dirtier everyday and that refuse dumps have become the city trade mark which low sensitization, block drainage system, non-implementation of sanitation law leave dirty surrounding more offensive, terrifying remarkably to our poor appreciation of the importance of basic hygiene.

Pollution has been a fact of life for many centuries, but it becomes a real problem since the start of the industrial revolution. According to Odibo (2005), pollution is the contamination of the physical and biological compound of the earth/atmosphere processes which are adversely affected. Russel (2002) sees pollution as was what takes place when the environment cannot process and neutralize harmful by-products of human activities (for example, poisonous gas emission) in due course without any functional or structured damage to its system. Development of natural sciences led to their better understanding of negative effects produced by pollution in the environment. Environmental pollution is a problem both in developed and developing countries (Bessong et al., 2009).

Factors such as population growth and urbanization invariably place greater demands on the planet and stretch the use of natural resources to the maximum. In this part of the country, Gokana Local Government Area of Rivers State for example, as civilization progresses, the need for clean environment become necessary. Water pollution is of major concern to man because of the effects associated with them. Our environment is faced with a lot of pollution because people never cared about the effects it has on their health.

World Health Organization (2019) defined health as a state of complete physical, mental and social wellbeing and not merely the absence of diseases or infirmities. Water pollution is causing a lot of havoc not only on humans but also animals, driving many animal species to extinction. We should

apply a holistic view of nature, the nature is us, we are an inalienable part of it, and we should care for it in the most appropriate manner.

According to Achalu (2004), pollution is the introduction of contaminant into a natural environment that causes instability, disorder, harm or discomfort to the ecosystem i.e. physical system or living organism - pollution can take the form of chemical substances or energy such as noise, heat, or light pollutants, the elements of pollution can be foreign substances or non-point. A pollutant is a waste that pollutes air, soil, or water. Three factors determine the severity of a pollutant. Its chemical nature, the concentration and the persistence, any use of natural resources at a rate higher than nature's capacity to restore itself can result in pollution of air, water and land (Russel, 2002). Achalu (2004) defined pollution as the introduction of contaminant into a natural environment that causes instability, disorder, harm or discomfort to the ecosystem i.e. physical system or living organism – pollution can take the form of chemical substances or energy such as noise, heat, or light pollutants, the elements of pollution can be foreign substances or non-point. A pollutant is a waste that pollutes air, soil, or water. Three factors determine the severity of a pollutant. Its chemical nature, the concentration and the persistence, any use of natural resources at a rate higher than nature's capacity to restore itself can result in pollution of air, water and land. Pollution has a detrimental effect on any living organism in an environment making it virtually impossible to sustain life. It can be asserted that it is essential that environmental health conditions of people be properly safeguard to avoid untimely death. Our environment needs to be kept clean and government should try and create a central dumping site to refuse.

In Gokana Local Government Area of Rivers State, the occupational activities of the adults are mainly fishing and farming. It was observed that most fishermen make use of dynamite which contain chemicals to kill fish for human consumption have contributed to several health problems. Also, water pollution was traceable to oil spillage due to pipeline vandalization and oil theft, indiscriminate dumping of solid waste and sewage disposal constitute physical and environmental problems. The effective role of environmental adult education will help the adults to adopt environmentally friendly methods to mitigate the menace of water pollution and bring about sustainable fishing practices as well as sustainable development. Therefore, the researcher deemed it necessary to investigate health and environmental problems associated with water pollution in Gokana Local Government Area of Rivers State.

### **Research Questions**

1. What are the physical health problems associated with water pollution in Gokana Local Government Area of Rivers State?
2. What are the mental health problems associated with water pollution in Gokana Local Government Area of Rivers State?
3. What are the social health problems associated with water pollution in Gokana Local Government Area of Rivers State?
4. What are the environmental problems associated with water pollution in Gokana Local Government Area of Rivers State?

### **Methodology**

**Study setting:** The area of this study is Gokana Local Government Area of Rivers State which comprised 17 communities and 17 political wards.

**Study design:** Cross sectional survey design was adopted.

**Population of the study:** The Local Government has an estimated population of about 435,682 persons (National Population Commission, 2016 projection of 2021).

**Sample and Sampling Techniques:** A sample size of 250 individuals was used for the study. The stratified and simple random sampling technique was used. The first stage was the use of stratified random sampling technique to select ten communities in Gokana Local Government Area of Rivers State. The second stage involves using simple random sampling technique to select 25 respondents from each of the communities selected for the study.

**Instrument for Data Collection:** The questionnaire was designed by the researcher titled Health and Environmental Problems Associated with Water Pollution Questionnaire (HEPWPQ). **Reliability of the Instrument**

In other to ascertain the reliability co-efficient of the instrument, the instruments retrieved from the field testing were sorted and tested for reliability of instrument. The test-re-test approach was carried out in Khana Local Government Area of Rivers State. The research instrument was administered to 20 respondents, they earnestly responded to the instrument and after two weeks, the research instruments were re-administered to the same respondents. Khana Local Government Area was chosen by the researchers because they have similar characteristics like (culture, occupation, language etc) with Gokana Local Government Area. The reliability of the instrument was obtained using Pearson Product Moment Correlation and the coefficient value of 0.78.

**Method of Data analysis**

Collected data were coded and analyzed using Statistical Package for Social Sciences (SPSS) version 25.0. Percentage was used to analyzed socio-demographic data while mean and standard deviation with the criterion mean value of 2.5 for research questions.

**Results**

**Research Question 1:** What are the physical health problems associated with water pollution in Gokana Local Government Area of Rivers State?

**Table 1: Descriptive Analysis of physical health problems associated with water pollution in Gokana Local Government Area of Rivers State.**

S/N	ITEMS	SA	A	D	SD	Mean	St. D.
<b>Physical health problems associated with water pollution</b>							
1.	Bacterial Diseases is a Physical Health Problems.	164	60	6	20	3.47	0.88
2.	Viral Diseases is one of the Physical Health Problems.	125	110	7	8	3.87	0.66
3.	Parasitic Diseases is a Physical Health Problems.	130	107	13	0	3.45	0.59
4.	Swimming in polluted water result to health problem like cancer, reproductive problems, typhoid and stomach sickness in humans.	139	91	17	3	3.46	0.67
5.	Oil spill in the water causes water animals to die when encountered it.	154	66	17	13	3.44	0.84
<b>Grand Mean</b>						<b>3.54</b>	<b>0.73</b>

Table 1 describes the descriptive analysis of physical health problems associated with water pollution in Gokana Local Government Area of Rivers State. From the table above, item 7 (viral Diseases is one of the Physical Health Problems) has the highest mean (3.87) and standard deviation (0.66). The item with the least mean (3.45) and standard deviation (0.59) was item 8 (Parasitic Diseases is a Physical Health Problems). Since the grand mean (3.54) and standard deviation (0.73) is greater than the critical value of 2.50, then we agree that the physical health problems such bacteria, viral parasitic and oil spilled are associated with water pollution in Gokana Local Government Area of Rivers State.

**Research Question 2:** What are the mental health problems associated with water pollution in Gokana Local Government Area of Rivers State?

**Table 2: Descriptive Analysis of mental health problems associated with water pollution in Gokana Local Government Area of Rivers State.**

S/N	ITEMS	SA	A	D	SD	Mean	St. D.
<b>Mental health problems associated with water pollution</b>							
1.	Malfunction of the brain is one of the Mental Health problems.	199	199	12	0	3.43	0.58
2.	Drinking arsenic contaminated water directly affect the probability of depression.	47	112	82	9	2.78	0.78
3.	Arsenicosis is a mental health sickness.	68	97	34	51	2.72	1.07
4.	A person affected by arsenicosis do fall sick.	60	99	62	29	2.70	0.95
5.	Having a symptom of arsenicosis can make one worry about his/her health.	112	94	35	9	3.24	0.82
<b>Grand Mean</b>						<b>2.97</b>	<b>0.84</b>

Table 2 portrays the descriptive analysis of mental health problems associated with water pollution in Gokana Local Government Area of Rivers State. From the table above, item 11(Malfunction of the brain is one of the Mental Health problems) has the highest mean (3.43) and standard deviation (0.58). The item with the least mean (2.70) and standard deviation (0.95) was item 14 (A person affected by arsenicosis do fall sick.). Meanwhile, grand mean (2.97) and standard deviation (0.84) is greater than the critical value of 2.50, hence we conclude that mental health problems such as malfunction, drinking, arsenicosis are associated with water pollution in Gokana Local Government Area of Rivers State.

**Research Question 3:** What are the social health problems associated with water pollution in Gokana Local Government Area of Rivers State?

**Table 3: Descriptive Analysis of social health problems associated with water pollution in Gokana Local Government Area of Rivers State.**

S/N	ITEMS	SA	A	D	SD	Mean	St. D.
<b>Social health problems association with water pollution</b>							
	Discrimination is one of the social health problems.	111	98	24	17	3.21	0.87
	Arsenicosis patients are not allow to join people in the public or been isolated.	44	32	107	67	2.21	1.03
	An individual suffering from social health problems will be afraid to go to school and church.	46	42	63	99	2.14	1.13
	Arsenicosis may be contacted if living with a person suffering from it.	22	60	101	67	2.15	0.91
	Arsenic affects individual socially leading to sociopathic.	107	91	39	13	3.16	0.87
<b>Grand Mean</b>						<b>2.57</b>	<b>0.96</b>

Table 3 explained the descriptive analysis of social health problems associated with water pollution in Gokana Local Government Area of Rivers State. From the table above, item 16 (discrimination is one of the social health problems.) has the highest mean (3.21) and standard deviation (0.87). The item with the least mean (2.14) and standard deviation (1.13) was item 18 (An individual suffering from social health problems will be afraid to go to school and church). Given that the grand mean (2.57) and standard deviation (0.96) is greater than the critical value of 2.50, then we agree that the social

health problems such as discrimination, arsenic and arsenicosis are associated with water pollution in Gokana Local Government Area of Rivers State.

**Research Question 4:** What are the environmental problems associated with water pollution in Gokana Local Government Area of Rivers State?

**Table 4: Descriptive Analysis of environmental problems associated with water pollution in Gokana Local Government Area of Rivers State**

S/N	items	SA	A	D	SD	Mean	St. Dev.
<b>Environmental problems associated with water pollution</b>							
	Burning of toxic waste and urban pollution is an environmental problems associated with water pollution.	136	83	23	18	3.27	0.90
	Less in soil fertility is a result of excessive cultivation.	136	96	4	14	3.41	0.78
	Population growth and urbanization is an environmental problems associated with water pollution.	73	109	23	45	2.84	1.04
	Water pollution affects the economy and contribute to degradation of the environment.	143	93	7	7	3.49	0.69
	Flooding due to the accumulation of solid waste and soil erosion an environmental problem.	135	96	8	11	3.42	0.76
<b>Grand Mean</b>						<b>3.29</b>	<b>0.83</b>

Table 4 showed the descriptive analysis of environmental problems associated with water pollution in Gokana Local Government Area of Rivers State. From the table above, item 23(Population growth and urbanization is an environmental problem associated with water pollution.) has the highest mean (3.84) and standard deviation (1.04). The item with the least mean (3.27) and standard deviation (0.90) was item 21 (Burning of toxic waste and urban pollution is an environmental problem associated with water pollution). In view of the fact that the grand mean (3.29) and standard deviation (0.83) is greater than the critical value of 2.50, then we agree that the environmental problems associated with water pollution in Gokana Local Government Area of Rivers State.

**Discussion of Findings**

The result of this study in table 2 indicated that the grand mean (3.54) and standard deviation (0.73) is greater than the critical value of 2.50, then it was agreed that the physical health problems such bacteria, viral parasitic and oil spilled are associated with water pollution in Gokana Local Government Area of Rivers State. the result of this study is in credence with report of World Health Organization (2015) that the major cause of physical health problems are water pollution which affect the health status of the population resulting into millions of death of children and adults. The result of this study is in agreement with Chowdhary et al. (2020) that thousands to millions of people dead daily and yearly from contraction of water borne infections caused by availability of water pollutants. Mondal (2015) added that physical health problems such as dysentery, diarrhea, cholera, salmonellosis, schistosomiasis, among others are caused by water infections. Marisa and Carl (2012) affirmed that several physical health challenges such as microbial infections are traceable to water pollution that may cause death of the population. It is plausible because water pollution is a major cause water-borne infections that causes millions of deaths of the population. As of the time of this study, there was contrary findings that were not in consonance with the present study.

The grand mean (2.97) and standard deviation (0.84) is greater than the critical value of 2.50, hence it was concluded that mental health problems such as malfunction, drinking, arsenicosis are associated

with water pollution in Gokana Local Government Area of Rivers State. The result of this study was expected because water pollution can cause water borne infections that affect the health status of population. The result of this study is in credence with report of United Nation Environmental Programme (2006) that water pollution occurs as a result of introduction of pollutants through man's activities that affect the health status of workers such as mental health problems and others. The result of this study is in corroboration with findings of Ansari and Akhmatov (2020) which revealed that water pollution has been the major of death aquatic animals and ill-health in human. Isaiah (2012) and Pitt et al. (2012) whose studies buttressed that the effect of water pollution to human being was nervous system disorder leading to morbidity and mortality increase among the population. Previously, Ansari and Akhmatov (2020) and Chen (2019) added that water pollution had contributed several health care problems to population among which are mental health problems. It is possible that water pollution is one of the environmental problems that cause deleterious and adverse effects to human especially poor health status.

The grand mean (2.57) and standard deviation (0.96) is greater than the critical value of 2.50, then it was agreed that the social health problems such as discrimination, arsenic and arsenicosis are associated with water pollution in Gokana Local Government Area of Rivers State. The result of this study is required because open dumping and indiscriminate disposal of waste in the environment does not only cause physical implication but affect the social well-being of the environment. The result of this study is in line with Ansari and Akhmatov (2020) that offensive smell from domestic and solid waste affect the beautification of the environment causing poor health status. Isaiah (2012) which indicated that poor disposal of domestic waste cause the environment to be ugly and pose offensive smell to the environment thereby affect social well-being. Okunniyi (2004) affirmed that indiscriminate dumping of solid waste and other chemical pollutants in the environment are very offensive to the population and leads to health problems.

The grand mean (3.29) and standard deviation (0.83) is greater than the critical value of 2.50, then it was agreed that the environmental problems associated with water pollution in Gokana Local Government Area of Rivers State. The result of this study is required because water pollution is one of the major environmental problems that are adverse and deleterious to human and others organisms. The result of this study is in line with Mondal (2015) which revealed that pollutants such as herbicides, fertilizers, manures, and other hazardous chemicals cause water pollution that affect the environment. Afroz et al. (2017) buttressed that the major problem in the environment is the release of pollutants and particulates into the water bodies and waste disposal Safari et al. (2014) and Marisa and Carl (2012) whose studies affirmed that the contamination of water such as water pollution constitute adverse effects to human beings. Anderson and Fenger (2003) added that water pollution constitutes a major environmental problem that affects plants and animals including human being. It is possible because water is part of the environment that are affected impurities and particulates leading to reduction of qualities of water. Once water bodies are affected by pollutants the environment is also affected.

### **Conclusion**

Considering the findings of this study, it was concluded that health and environmental problems are strongly associated with water pollution leading to physical, social and mental health problems, hence the need to control indiscriminate disposition of solid waste and other particulates in the water bodies.

### **Recommendations**

1. Government should make laws against indiscriminate disposal of waste in the water bodies as a means of controlling water pollution.
2. Government and non-governmental organization should launch a campaign and awareness programme to the population on the consequences of dumping waste in the water environment.
3. Government should make provision of waste disposal equipment and facilities to the pollution to reduce improper disposal of solid waste and other forms of waste.
4. Individual and communities should desist from dumping waste into the water bodies as it would cause impure water affecting the source of drinking water.

5. Families should ensure that borehole facility should constructed at 6 metres away from the sewage tank prevent pollution of underground water.

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