

Effects of Industrial Pollution on well-being of Residents in Trans-Amadi Industrial Layout, Port Harcourt, Rivers State

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Abstract

This study examined the effects of industrial pollution on the well-being of residents in Trans-Amadi industrial layout, Port Harcourt. Three research questions gave the focus of the study. The study adopted the descriptive survey research design. The population consist of 1100 resident members of communities within the industrial layout. The simple random sampling technique was used in choosing 220 respondents for the study. A 15-item instrument titled Industrial Pollution on well-being of Resident Questionnaire (IPWBRQ) with $r = 0.72$ was used for data collection. The data was analysed using mean score statistic. The results showed that industrial pollution constitutes adverse effects on residents resulting to chronic health hazards, pollution of the air, destruction of the eco-system and absence of basic amenities for maintenance of health care services. These factors undermine the realization of health and improved quality of well-being of residents of the industrial Area. Based on the study, it is recommended that efforts should be made to enforce government policies to protect and preserve the environment and residents suffering from environmental health hazards and adverse effects of pollution. Residents should be adequately rehabilitated to promote public health care services as a means of securing qualitative health care delivery and well-being of residents at Trans Amadi layout, Port Harcourt, Rivers State.

Keywords: *Effects of Industrial Pollution, Well-being of Communities, Human Development, and Environmental Degradation.*

Human

Background of the Study

Globally, the challenge of Environmental Pollution has become a common human phenomenon and has gained attention in the 21st century, particularly in the developing countries of the world. It therefore raises serious concern since it affects every aspect of the environment where man dwells as his habitation. Eheazu (2016) sees environmental pollution as the deterioration or reduction in quality of environment through any undesirable change, depletion or alteration of elements of the natural environment such as air, land, water, forest and wild life. The threat of pollution is one of the many environmental hazards facing the world today and its

impact is becoming more severe in developing countries, leading to varied kind of ill health, disabilities of millions of people, and death annually (Oluwasola 2014). Pollution is defined as the release to the natural environment substances that either their compositions or the amount released cannot be rendered harmless by normal biological process. Pollution can simply be seen as the contamination, spoilage or defilement of the surrounding ecosystem contravening human habitation. The United States' National Research Council's committee on pollution(1965) as cited by, Anthony (2005) defines pollution as the undesirable change in the physical, chemical, or biological characteristics of the surroundings that may be harmful to human and other life, living conditions, industrial processes and cultural assets.

Industrial pollution is therefore a disorder knowingly or unknowingly initiated by industries within an environment in the process of using the resources and from the by-products of the energy conservation. Industrial Pollution is a major contributor to the menace of degradation of the environment. Earlier, industries were small factories that produced smoke are seen as the main pollutant. However, since the number of factories were limited and worked only a certain number of hours a day, the levels of pollution did not grow significantly. But when these factories became full scale industries and manufacturing units, the issue of industrial pollution started to take on more importance. (Mohamed 2011). Pollution from the industries negatively impacts the neighbouring communities, and poor urban communities are often overlooked by industries and sometimes even the government; meanwhile the influx and cluster of these industries in close proximity to residential buildings, and the haphazard and scattered manner in which they were sited makes the residents vulnerable to industrial pollution and health hazards. (Olalekan 2015). In developing countries such as Nigeria, the siting of industries is determined by various criteria, some of which are environmentally unacceptable and pose serious threats to public health (WHO/UNEP, 1997).

Therefore any form of pollution that can trace its immediate source to industrial practices is known as industrial pollution. Increased industrialization and urbanization are some other factors that has led to increase in pollution, which arises from lack of proper control of pollutant industries. Industrialization, with its economic growth and prosperity can also bring unintended and adverse effects to the natural resources and livelihoods of community members within the vicinity and this can hampers the quality of life of people in the community.

Industrial pollution can occur and take different forms depending on the source of pollution. It can contaminate many sources of drinking water, releases unwanted toxins into the air and reduces the quality of soil all over the world. Major environmental disasters have been caused due to industrial mishaps, which have yet to be brought under control. Air, soil and water pollution frequently reduce agricultural yields, lower health status, increase the prices that consumers of agricultural product must pay and after the returns accruing to owners of agricultural inputs and increase morbidity pattern of the population (Adam and Crodar, 1991, Somorin,1998), cited in Adebowale, Adebowale and Oyesola, (2011)

Apart from health effects, which indirectly affect human productivity, polluted water also affects land productivity. Crop production suffers from contaminated irrigation water from both surface sources and from ground water spillers. There are also important economic costs from industrial pollution which include paying to clean up contaminated sites, regulating waste-generating industries and ensuring medical treatment for the adverse effects of environmental exposures. Olalekan (2015), asserted that the non-monetary costs include the depletion of non-renewable resources, consumptive land use and degradation of ecosystems. These factors contribute in no small way to the impact of environmental pollution on overall human and ecological well-being of people in affected areas.

Trans-Amadi layout is a thousand hectare (2,500-arce) industrial area, as well as a diverse residential neighbourhood that supports a strong manufacturing sector and is considered to be a major industrial zone in Port Harcourt, Rivers State, Regus building (2016). Industries such as glass bottles, tires, aluminium and paper have production plants and so many other companies that do business in this area, both in Oil drilling and Oil well services. Some of these industries includes Total ELF by Elekahia community, LNG along Amadi Ama Community, Anadrill Schlumberger Nig Ltd, AOSORWELL Ltd in Oginigba community, Ariboil Company, Drillog Petro-Dynamics Ltd, Oil field Services Company Ltd among others The communities that harbour these industries include Oginigba, Okujagu, Elekahia, Amadi Ama and Mkpogu community that make up the Trans-Amadi industrial layout, Regus building (2016). It is presumed that these industries pay huge taxes to the account of the Rivers State Government as revenue to undertake human and infrastructural development. Therefore much is not expected of companies in terms of provision of amenities as government is expected to provide essential

amenities and health facilities for people in the industrial Area. Yet some activities of industrial companies are important factors that brings about environmental pollution and degradation which could be harmful as shown on figure 1 below:



Fig 1: Solid waste burning site behind an Industrial Company in Trans-Amadi industrial Layout Port Harcourt, Rivers State.

The causes and effects of environmental degradation is a serious concern to man and the livelihood of the community. (Godson 2009) identified the causes of industrial pollution to include the following:

- i. **Lack of effective Policies to Control Pollution** resulting to mass scale destruction of the environment and people's livelihood in affected areas.
- ii. **Unplanned Industrial Growth:** In most industrial townships, unplanned growth took place wherein those companies flouted rules and norms and polluted the environment with both air and water pollution.
- iii. **Use of Outdated Technologies:** Most industries still rely on old technologies to produce products that generate large amount of waste. To avoid high cost and expenditure, many companies still make use of traditional technologies to produce high end products.
- iv. **Presence of Large Number of Small Scale Industries:** Many small scale industries and factories that don't have enough capital and rely on government grants to run their day-to-day businesses often escape environment regulations and release large amount of toxic gases in the atmosphere.
- v. **Inefficient Waste Disposal:** Water pollution and soil pollution are often caused directly due to inefficiency in disposal of waste. Long term exposure to polluted

air and water causes chronic health problems, making the issue of industrial pollution into a severe one. It also lowers the air quality in surrounding areas which causes many respiratory disorders.

- vi. **Leaching of Resources from Our Natural World: Industries** do require large amount of raw material to make them into finished products. This requires extraction of minerals from beneath the earth. The extracted minerals can cause soil pollution when spilled on the earth. Leaks from vessels can cause oil spills that may prove harmful for marine life.

On the other hand, Industrial pollution according to Rinkesh (2009) produces adverse effects on the human eco-system. These effects are far reaching and liable to affect the eco-system for many years to come especially on water and aquatic life. Most industries require large amounts of water for their work. When involved in a series of processes, the water comes into contact with heavy metals, harmful chemicals, radioactive waste and even organic sludge. These are either dumped into open oceans or rivers. As a result, many of our water sources have high amount of industrial waste in them which seriously impacts the health of our eco-system. The same water is then used by farmers for irrigation purpose(s) which affects the quality of food that is produced.

Similarly, Air pollution has led to a steep increase in various illnesses and it continues to affect people on a daily basis. With so many small, medium and large scale industries coming up, air pollution has taken toll on the health of the people and the environment. **Also, wildlife Extinction is another effect that is brought about as a result of pollution.** This phenomenon result to loss of habitats, species are becoming extinct and difficulty for the environment to recover from natural disaster.

Further, industrial pollution brings about the effect of global Warming. With the rise in industrial pollution, global warming has been increasing at a steady pace. Smoke and greenhouse gases are being released by industries into the air which causes increase in global warming. Melting of glaciers, extinction of polar bears, floods, tsunamis, hurricanes are few of the effects of global warming. (Godson, 2009).

Statement of the Problem

The citing of any industrial outfit in a community or a nation is very crucial to the socio-economic development and growth of that nation. However, man's quest to satisfy his desire

through exploitation of his environment by engaging in some activities has caused some adverse effects on the health and cultural challenges, economic problems and even technological problems that is impacting negatively on generations. (Olusola 2014). The establishment and siting of Trans-Amadi industrial layout by the Rivers State government was intended to bring about industrial development without any form of human predicament in the State. However, it is evident that the operational activities of companies in the industrial layout may not be unconnected to untold hardship and adverse effect suffered by resident of communities in the past. Specifically, resident of the industrial area sometimes experienced the dumping of hazardous waste on their surrounding land and river outlets, combustion of industrial chemicals, high decibel of noise by companies, leaching of contaminated underground water and so on which might affect the health and well-being of the resident. The question that arises is, do these activities perpetrated by industrial companies have any effect on the inhabitants of communities? How are the inhabitants fairing with the perceived hazards produced by industrial pollution due to the presence of the industrial layout in the Area? This is why the main focus of this paper is to examine the effects of industrial pollution on well-being of residents in Trans-Amadi Industrial Layout, Port Harcourt, Rivers State.

Purpose of the Study

The purpose of this study is to:

- i. ascertain the major causes of industrial pollution in Trans-Amadi Industrial Area of Port Harcourt, Rivers State.
- ii. examine the major effects of industrial pollution on well-being of residents in Trans-Amadi Industrial Area of Port Harcourt, Rivers State.
- iii. identify the negative socio-economic effects of industrial pollution in Trans-Amadi Industrial Area of Port Harcourt, Rivers State.

Research Questions

The following research questions are posed to guide the study:

1. What are the causes of industrial pollution in Trans-Amadi Industrial Area of Port Harcourt, Rivers State?
2. To what extent has industrial pollution affected well-being of residents in Trans-Amadi Industrial Area of Port Harcourt, Rivers State?

3. What are the negative socio-economic effects of industrial pollution on the well-being of resident in Trans-Amadi Industrial Area of Port Harcourt, Rivers State?

Methodology

The descriptive survey research design was used for this study. The Population is made up of One thousand and one hundred (1100) members of organised institutions comprising, Council of chiefs, women groups and youth bodies who are members of Oginigba, Amadi Ama, Elekahia and Mkpogu communities that makes up the Trans-Amadi industrial layout in Port Harcourt, Rivers State. Simple Random sampling technique was used to randomly select 220 respondents as sample size which represents 20% of the Population. A validated 15-item instrument titled "Questionnaire on Industrial Pollution on well-being of Resident Questionnaire (IPWBRQ) with $r = 0.72$ was used for data collection. 217 completed copies of questionnaire were analysed using mean statistics of each item to measure the cause and effect of industrial pollution on residents in the study area, Criterion mean was 2.5 All items whose values are below 2.5 were rejected and items equal or above 2.5 were accepted.

Analysis of Results

Research Questions 1: What are the causes of industrial pollution in Trans-Amadi Industrial Area of Port Harcourt, Rivers State?

Table 1: Mean Score Analysis of the Causes of Industrial Pollution in Trans-Amadi Industrial Area of Port Harcourt, Rivers State.

S/No	Statement	Responses					Total	X	R
	(RQ ₁). What are the causes of industrial pollution in Trans-Amadi Area of Port Harcourt, Rivers State?	SA (4)	A (3)	D (2)	SD (1)	N=220	Mean		



1.	Improper location of industries in Trans-Amadi causes industrial pollution to the environment	150 (600)	60 (180)	10 (20)	-	220 (800)	3.6	Accepted
2.	Use of Low quality Materials by industries causes industrial pollution to the environment	120 (480)	80 (240)	15 (30)	5 (5)	220 (755)	3.4	Accepted
3.	Bad or Damage infrastructures used in the industries cause pollution in the environment and the community.	134 (536)	70 (210)	16 (32)	-	220 (778)	3.5	Accepted
4.	Lack of appropriate control measure and corrupt practices by Government agencies encourages industrial pollution in the environment	174 (696)	46 (138)	-	-	220 (834)	3.8	Accepted
5.	Lack of industrial effective policies that will caution the exploitative activities of the industries causes industrial pollution	94 (376)	86 (258)	40 (80)	-	220 (714)	3.2	Accepted
Grand mean (x)							3.5	

The above table 1 shows the weighted mean score obtained from the respondents on the causes of industrial pollution in Trans-Amadi Area of Port Harcourt, Rivers State. Items 1,2,3,4, and 5 with weighted values of 3.6, 3.4, 3.5, 3.8 and 3.2 respectively in conformity with the 3.5 grand mean implies that improper location of industries, use of low quality materials, use of bad and damage infrastructures/equipment, lack of appropriate control measure and corrupt practices by government agencies encourages industrial pollution, and lack of effective industrial policies to checkmate the industries to observe environmental laws are the causes of industrial pollution in Trans-Amadi Area of Port Harcourt, Rivers State.

Research Questions 2: To what extent has industrial pollution affected the well-being of Residents in Trans-Amadi Industrial Area of Port Harcourt?

Table 2: Mean Score Analysis of Extent to which Industrial Pollution has affected the Well-Being of Residents in Trans-Amadi Industrial Area of Port Harcourt

S/N	Statement	Responses						
0	To what extent has industrial pollution affected well-being of communities in Trans-Amadi Area of Port Harcourt, Rivers State?	SA (4)	A (3)	D (2)	SD (1)	Total N=220	X Mean	R



6.	Chronic health issues and ill-health amongst the people are effect of industrial pollution in our community	151 (604)	69 (207)	-	-	220 (811)	4.0	Accepted
7.	Air pollution by the industries has long impact on the eco system in the Area	121 (484)	76 (228)	15 (30)	8 (8)	220 (750)	3.4	Accepted
8.	More money is spent to access health and medical facilities to promote the well-being of people in the area	86 (344)	97 (291)	20 (40)	17 (17)	220 (692)	3.1	Accepted
9.	Health hazards posed by industrial activities result in urban dwellers spending more to maintain their health	134 (536)	70 (210)	10 (20)	6 (6)	220 (772)	3.5	Accepted
10.	Close proximity of industries to residential Area generate much heat in the environment that people do not sleep comfortably	148 (592)	65 (195)	7 (14)	-	220 (801)	3.6	Accepted
Grand mean (x)							3.5	

The above table 2 shows the weighted mean score obtained from the respondents on the extent to which industrial pollution has affected the community in Trans-Amadi Area of Port Harcourt, Rivers State. Items 6,7,8,9, and 10 with weighted values of 4.0, 3.4, 3.1, 3.5 and 3.6 respectively in agreement with the 3.5 grand mean implies that chronic health issues, air pollution impact on the eco system, community spending more money on basic social amenities, Health hazards from industrial activities resulting in huge medical bills by the people, and close proximity of industries to the residential area generate much heat that people do not sleep comfortably in their homes, are the extent to which industrial pollution affected well-being of residents in Trans-Amadi Industrial Area of Port Harcourt

Research Questions 3: What are the negative socio-economic effects of industrial pollution on the well-being of Residents in Trans-Amadi Industrial Area of Port Harcourt, Rivers State?

Table 3: Mean Score Analysis of Negative Socio-Economic Effects of Industrial Pollution on the Well-Being of residents in Trans-Amadi Industrial Area of Port Harcourt, Rivers State.

S/No	Statement	Responses						
	What are the negative socio economic effects of industrial pollution on communities in Trans-Amadi Area of Port Harcourt, Rivers State?	SA	A	D	SD	Total	X	R
		(4)	(3)	(2)	(1)	N= 220	Mean	

11.	Community members lack the cooperation to plan community development activities due to social inequity and social unrest caused by industrial pollution in the Area	92 (368)	75 (225)	33 (66)	20 (20)	220 (679)	3.1	Accepted
12.	There is neglect in the provision of amenities for the area by the government due to the presence of industries	112 (428)	84 (252)	15 (30)	9 (9)	220 (719)	3.2	Accepted
13.	Encroachment of the industries to the residential Area has cause pollution and slow down economic development of the Area	124 (496)	76 (228)	14 (28)	6 (6)	220 (758)	3.4	Accepted
14.	Bad road network or lack of access caused by the industries hinder socio-economic growth and development in the affected community	117 (468)	78 (234)	13 (26)	11 (11)	220 (739)	3.3	Accepted
15.	There is lack of synergy between the industries and the community to improve the socio-economic development in the area.	122 (488)	70 (210)	18 (36)	10 (10)	220 (744)	3.4	Accepted
Grand mean (x)						3.3		

Table 3 above shows that item 11, 12, 13, 14 and 15 has a weighted mean score of 3.1, 3.2, 3.4, 3.3 and 3.4 respectively in conformity with the grand mean(x) score 3.3 indicates that community members lack cooperation to plan development of the Area due to social inequity and social unrest, there is neglect by the government in terms of provision of social amenities, industrial encroachment to the residential area which has slow down economic development, Bad road network or lack of access to the area that has hinders socio-economic growth and development, and lack of synergy between the industries and the community to improve the socio-economic development, are the negative socio-economic effects of industrial pollution in Trans-Amadi Industrial Area of Port Harcourt, Rivers State.

Discussion of Findings

Research question one, on Table 1 that was meant to examine the causes of industrial pollution in Trans-Amadi Area of Port Harcourt in Rivers state showed that improper location of industries, use of low quality materials, use of bad and damage infrastructures/equipment, lack of appropriate control measure and corrupt practices by government agencies encourages industrial

pollution, and lack of appropriate control measures to checkmate the industries that causes industrial pollution in Trans-Amadi Area of Port Harcourt, Rivers State. This finding agrees with the assertion of WHO/UNEP (1997), that in developing countries such as Nigeria, the siting of industries is determined by various criteria, some of which are environmentally unacceptable laws which pose serious threats to public health. Ideally, the siting of industries should achieve a balance between socio- economic and environmental considerations, relevant factors to access to raw materials, the proximity of water sources, a market for the products, the cost of effective transportation, and labour and infrastructural amenities. The finding also reaffirm the research conducted by Olalekan (2015) on Industrial Pollution in Ota, where it was revealed that citizens believe the government has not been effective in managing industrial pollution despite its claim that various policy options are being used to address the issue.

Research question two, on Table 2 which was meant to ascertain the extent to which industrial pollution has affected the well-being of residents in Trans Amadi Area of Port Harcourt, Rivers State, the finding exposed the serious negative effect of industrial pollution which involve, chronic health hazards like cancer, diarrhoea, respiratory track diseases , air pollution impact on the eco system, residents spending more money on basic social amenities instead of the government or the industries, and close proximity of industries to residential area generate much heat that people do not sleep comfortably in their homes. These factors explained the extent to which industrial pollution has affected the overall well-being of resident in Trans-Amadi Area of Port Harcourt, Rivers State. This finding affirms the postulation of NuiSSL et al. (2009) as cited in Olalekan (2015) who asserted that land use due to industrial development exerts serious environmental pressure on landscapes which inevitably leads to change that has an impact on ecological quality and human health. This is particularly true in parts of the world which are poor and where regulations to control pollution are weak or weakly enforced, such as in many sub-Saharan African countries. The finding also affirm a related research conducted by Oyinloye (2015) on environmental pollution and health risks of residents living near Lafarge Cement Factory, Ewekoro. It is confirmed that air pollution is the major environmental problem experienced in the community where industries are present. Although, water bodies are contaminated and unsuitable for domestic and agricultural purposes due to the effects of pollution from the cement factory.

Research Question three, on Table 3 which was meant to identify the negative socio-economic effects of industrial pollution on the well-being of inhabitants in Trans-Amadi Area of Port Harcourt, Rivers State, indicated that community members lack cooperation to plan for their well-being to promote development of the Area due to social inequity and social unrest. There is neglect by the government in terms of provision of social amenities, industrial encroachment to the residential area which has slow down economic development, bad road network or lack of access to the area that has hinders socio-economic growth and development, and lack of synergy between the industries and the community to improve the socio-economic development of the Area, are some of the negative socio-economic effects of industrial pollution in Trans-Amadi Area of Port Harcourt, Rivers State. This agrees with an assertion by Idemudia and Ite (2006) that despite the fact that the oil industry in Nigeria is predominantly located within the Niger Delta region, there is high incidence of poverty because of environmental degradation. This has culminated in violent conflicts between host communities and oil companies. This finding also corroborate an assertion by Shrivastava (1995) cited in Olalekan (2015) who stated that corporate social responsibility (CSR) play a major role in the welfare of the people. The author said the society will be better off if the industries are strong defenders of the environment because they possess organizational capacity for environmental protection.

Conclusion

Industrial pollution is a major environmental problem in Nigeria and it arises from lack of proper control of pollutant industries. The issue of industrial pollution concerns every nation on the planet. As a result, many steps have been taken to seek permanent solutions to the problem. Better technology is being developed for disposal of waste and recycling as much polluted water in the industries as possible. Organic methods are being used to clean the water and soil, such as using microbes that naturally uses heavy metals and waste as feed. In Nigeria, it is clear firms do not address environmental concerns; Policies are being pushed into place to prevent further misuse of land. However, industrial pollution is still rampant and will take some years to be brought under control if Government and appropriate agencies will take drastic measures to monitor these industries and enforce the necessary policies. All hands must be on deck to protect our environment and to compensate the victims of environmental degradation.

Recommendations

Based on the findings and conclusion of this study, it is recommended that:

1. The Rivers State Government should enact industrial laws and regulate effective compliance with guidelines to ensure environmental Protection. To this end, the State Environmental Protection Agency (SEPA) should brace up to implement the policies of government on environment without partiality or prejudice to protect the health of resident around the industrial area especially in Trans-Amadi layout, Port Harcourt.
2. The manufacturing Association of Nigeria (MAN) responsible for the implementation of the use of standardised infrastructure in the manufacturing industries must be up and doing to monitor the activities of these industries and enforce the use of quality equipment, as this will reduce industrial pollution
3. The industries operating in Trans-Amadi Area of Port Harcourt should be involved in Community Social Responsibility (CSR) yearly to contribute their quota to the development of the host community and the residents should be involved to enhance sustainability.
4. The Rivers State Government, Public Relations Unit of industrial Companies, Non-governmental organizations (NGOs) and community members should work in partnership through periodic dialogue, sensitization and awareness creation. This will offer opportunity for stakeholders to identify and proffer solutions to problems encapsulated by industrial pollution to maintain a healthy environment needed to promote healthy well-being of residents in Trans-Amadi industrial layout, Port Harcourt.

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