

***Petroleum Exploration and Environmental Degradation of the Oil Rich Niger Delta  
Region of Nigeria: The Role of Environmental Adult Education***

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**Abstract**

*This study investigated the extent to which Environmental Adult Education could assist in curbing the problems associated with petroleum exploration in the oil rich Niger Delta Region of Nigeria. Two purposes and two hypotheses were stated to guide the study. Ex Post Facto research design was adopted for the study. A sample of 565 adult males and females in the oil producing areas of Akwa Ibom and Cross River States was drawn from the population of 6,803,654, using stratified and accidental sampling techniques. A questionnaire titled “Petroleum Exploration and Environmental Adult Education Questionnaire” (PEEAEQ) was the instrument used for data collection. It was validated by two experts in Test and Measurement from the University of Calabar, Nigeria. Split half reliability method was adopted to ascertain the reliability of the instrument, and coefficients ranging from .73 to .83 were obtained. The result indicated, among others, that awareness creation through environmental adult education has significant influence in curbing the problems associated with petroleum exploration in the oil rich Niger Delta region of Nigeria. It was recommended, among others, that there should be a concerted effort by environmental experts to create awareness to all stakeholders on the consequences of petroleum exploration to man.*

**Keywords:** petroleum, exploration, environmental, degradation, education

**Introduction**

The Niger Delta region, otherwise referred to as the South-South geopolitical zone of Nigeria, is bestowed with bounties of nature. It is a blessed Delta with both human and material resources. Since the discovery of oil in commercial quantity in the area, the Gross Domestic Product (GDP) of the country has increased; but the unfavourable manner in which the resources are harnessed overtime has kept the region in pains and misery. It is

in light of this that Ndukwe (2000) opined that “there is no ecological zone which has been so degraded and laid waste as the Niger Delta”.

The region has been inundated with oil pollution since the beginning of petroleum exploration and the geographical area has become synonymous with poverty and squalor. Pollution has led to environmental degradation which has adversely affected the lives of the inhabitants and ruined the local economy of the region. Before the discovery of oil in commercial quantity in the region, agriculture was the dominant occupation of the inhabitants. The discovery of oil and its eventual exploration resulted to environmental degradation due to neglect of the environment by the multinational companies (Eregha & Irughe 2009). Flaring and burning of gases has resulted in a plethora of environmental hazards such as gradual disappearance of habitats, desertification, and destruction of habitat and extinction of species. Persistent emission of carbon dioxide and oil pollution in the area has contaminated arable land, destroyed fishing ponds, polluted the air; and all these have multiplier effects such as alarming unemployment and high level of poverty. This ugly development has become a matter of grave concern that calls for urgent attention of both the government, non-governmental organizations and the multinational companies. The government in an attempt to curb these problems enacted laws such as “The Oil Pipelines Act” to regulate the petroleum sector (Ndukwe 2000).

Despite the frantic efforts so far made, the problem remains unsolved due to lack of commitment by the oil and gas companies and the government’s inability to provide social amenities to the host communities. This has resulted to animosity, restiveness and militancy, in the region, in order to press on both the government and multinational companies to improve on the wellbeing of the residents of the area. The inhabitants still live in squalor, their agricultural land are degraded, the fishing ponds are destroyed; and these have generated chronic poverty. It is therefore hoped that with the help of Environmental Adult Education both the oil companies and the host communities will become aware of the danger of petroleum exploration on the lives of the inhabitants and the environment at large. It is based on this that this study seeks to examine the extent to which environmental adult education could be used to solve the problems of petroleum exploration in the Niger Delta region of Nigeria (Fega & Uchechukwu, 2019).

Petroleum is a naturally occurring yellowish black liquid found in geological formation beneath the earth surface. It is a mixture of hydrocarbon which is present in suitable rock strata and can be extracted and refined to produce fuels including petrol, paraffin and diesel oil. Petroleum is a general name for oil and natural gas. Oil and natural gas are important fossil fuels formed from the decomposition and pressurization of algae plankton and other organisms. It is call fossil fuel because it was formed from the remains of tiny

sea particles. It is a renewable source of energy and could also be referred to as crude oil which literally refers to 'rock oil'.

Petroleum exploration is the process of examining places where abundant oil and natural gas resources potentially exist underneath the earth surface by geologists with the aim of identifying the volume of hydrocarbon which might be contained in the potential reservoirs and to evaluate the risk inherent in the project itself. It is a search by petroleum geologists and geophysicists for hydrocarbon deposits beneath the earth surface such as oil and natural gas. Petroleum exploration is about exploring and discovering new crude oil and gas fields, including drilling and bringing the products to the surface (Anthony, 2022).

According to Shagufta (2014), environmental degradation is a reduction of an ecosystem's or habitat's ability to support its natural biota, or a destruction of a potentially renewable resources such as soil, grassland, forest or wildlife by using it at a faster rate than it is naturally replenished. It could also be seen as an alteration of the environment that makes it less productive. Environmental degradation is the deterioration of the environment through depletion of resources such as quality of air, water and soil, extinction of wildlife; the destruction of ecosystems and pollution (Hanachor, 2016). It is the reduction of the capacity of the environment to meet social and ecological objectives and needs. It could also be referred to as any change or disturbance to the environment perceived to be deleterious or undesirable. It could also be defined as a process through which the natural environment is compromised by reducing its biological diversity and the general health of the environment. It is one of the major threat facing the planet today. Environmental degradation could be caused by both the natural and man-made factors. The natural factors that may contribute to environmental degradation include earthquakes, hurricanes, tsunamis, landslide, volcanic eruption, typhoons and cyclones. While the human induced factors include land disturbance, deforestation, population explosion, urbanization, increased energy consumption, mining, industrialization, among others. Environmental degradation has serious impact on both humans and the ecosystem. This includes loss of biodiversity, human health hazards, climate change, ozone layer depletion, scarcity of resources, loss of ecotourism sites, natural calamities or disaster, among others.

According to Okukpon (2008), environmental adult education is a learning and action process which consists of the development of basic awareness based on the acquisition of knowledge and the understanding of the natural and man-made environments and their basic mechanisms as part of life support system. Anthony (2012) sees environmental adult education as a field of study which strives to recognize values and clarifies concepts in

adults, in order to develop their knowledge, skills and attitudes which will help them understand and appreciate the interrelatedness among man, his culture and bio-physical surroundings. It therefore aims at developing the citizenry that is aware and concerned about the environment and its associated problems. It helps the adult citizens of a nation to be knowledgeable, skillful, have desirable attitudes, motivation and commitment to work individually and collectively towards a solution to current environmental problems and the prevention of new ones. It entails practice in decision making and self-formation of a code of behaviour about issues concerning environmental quality.

According to UNEP (2008), environmental adult education strives to inculcate in learners with knowledge of environmental problems and their causes, the skills to engage in social activities to combat these problems, the attitudes, respect and connection to the natural world, and the desire to change current practices in order to protect the earth. Anthony and Awhem (2012) view environmental adult education as a community-based method in which educators listen and respect the inputs of learners and where all participants involved in the learning process are considered essential. It is the effort of teaching environmental issues to adults, individually or in groups, in order to enable them manage their lifestyles and ecosystems, and to live sustainably. Environmental adult education therefore sensitizes the adult persons to be aware of the problems associated with the environment and how to develop basic skills to solve them; acquire the right attitudes that would help him to protect and preserve the environment, and help them to be committed to the effective control or management of the environment.

The ultimate goal of environmental adult education, according to Anijah-Obi (2001), is to enhance the quality of life of man. To improve the quality of life therefore implies caring for the earth in such a way that its degradation and destruction can be guarded against, for the benefit of mankind. Environmental adult education therefore aims at producing environmentally literate citizens who are willing and capable of taking positive environmental actions in their lives. Okukpon (2008) summarized the broad aims of environmental education to include: awareness, commitment and action. The mission of environmental adult education therefore is to provide knowledge and skills to halt the degradation of the environment in order to enhance the development of the planet earth for the common good of all.

The world intergovernmental education otherwise call Tbilisi 1977 maintains that the ultimate goal of environmental education is to “develop a citizenry that is aware of the concern about the total environment and its associated problems”, which has knowledge, attitude, motivations, commitment and skills to work individually and collectively

towards solving current environmental issues and preventing new ones. To achieve this goal, an adult learner or participants should be helped to:

1. Obtain a basic knowledge of how environmental problems can be solved, and recognize the responsibility of individual, and for individuals and groups to cooperate in solving the problems.
2. Obtain understanding that people are an inseparable part of an environmental system and that whatever they indulge in alter their surrounding either negatively or positively.
3. Develop analytical thinking and action, skills for understanding, preventing and helping to correct environmental degradation.

Anthony (2012) summarized environmental adult education objectives to include: knowledge acquisition, awareness creation, attitudinal change, skill acquisition, participation and evaluation. According to him, environmental adult education should assist adult learners or participants either in groups or individually to:

1. Acquire knowledge that will help them gain a variety of experiences in the environment and have basic understanding of the total environment and its associated problems.
2. Have awareness that should help to sensitize them about the total environment and its allied problems.
3. Acquire attitudes, social values, strong feeling and concern for the environment, and motivation to actively participate in its protection and improvement. It should therefore help people to change their attitudes towards nature and other forms of life.
4. Acquire skills for solving environmental problems and to foster a dialogue between different groups in the community. This requires the application of the psychomotor domain of learning in conserving and managing the environment.
5. Have the sense of responsibility and urgency regarding environmental problems, to ensure appropriate action that will help solve these problems.
6. Evaluate environmental measures and educational programmes that deal with issues such as ecology, politics, economy, aesthetic and social aspects of life.

Eheazu (2016) enumerated the objectives of environmental education as follows: awareness creation, knowledge inculcation, attitudinal change, skills development and encouragement of participation towards solving environmental problems.

The role of Environmental Adult Education in curbing the problems associated with petroleum exploration in the Niger Delta Region of Nigeria cannot be over emphasized. In line with the cardinal objectives of environmental adult education, Anthony (2012) stressed that one of the major roles played by environmental adult education in curbing

the problems associated with petroleum exploration is to create awareness. He maintained that through awareness creation process of environmental adult education, the public could be sensitized on various ways of reducing pollution caused by petroleum exploration activities. According to him, through environmental adult education, the individual and community at large will gain better awareness about their environment, thereby acquiring knowledge, skills, values and experiences that will help them to act individually or collectively in solving the problems associated with petroleum exploration. Individuals therefore need adequate awareness about the environment to enable them protect and preserve the environment from imminent degradation. This could be through education of the adult citizens. The education referred to here is not the very narrow conception which aid learners to pass examinations, but education in a wider sense of the word. Education that will help to develop learners' understanding, improve their skills, attitudes, values and commitment which will improve the quality of life as well as enhancing the protection and preservation of the environment.

Anijah-Obi (2001) opines that there is urgent need to acquaint the average citizen with the global and national environmental issues that affect man and the environment. The author enumerated some of these world threatening environmental problems to include population explosion, rapid urbanization pollution, acid rain, deforestation, global warming, ozone layer depletion, among others. Okukpon (2008), stressing on the import of awareness creation in solving environmental problems, maintains that environmental adult education contents should be based on a clear awareness of the environment. He further opined that through awareness creation, the adult citizens should be sensitized on how, where, and when to become aware of environmental problems such as pollution.

Eheazu (2016) commented on the role of environmental literacy in curbing the problems associated with petroleum exploration. According to him, environmental literacy predisposes the learner towards development of positive attitudes to the environment; helps the individual acquire skills to read and write about his environment; raises individual consciousness about their environment, and encourages learners to adopt environmentally friendly approaches which will lead to environmental protection. With environmental literacy education, people should be able to demonstrate in some observable behaviours what they have learned. Okukpon (2008) stresses on the need for people to become environmentally literate in order to enable them protect the environment from degradation. He maintains that environmental functionally illiterate persons do not usually possess the basic knowledge, awareness, skills and attitudes which will help them to be committed to the effective control or management of the environment. He said that such illiterate persons turn out to be a threat to the environment. Anthony (2012) sees environmental literacy as a learned ability to create situations that enhance the

maintenance of essential ecological processes and life support system, preserving genetic diversity, ensuring sustainable utilization of species and the ecosystem. He maintains that all citizens need adequate level of environmental literacy to reduce the negative consequences and hazards of various development efforts in the community, society or the country at large.

Anijah-Obi (2001) identified man as the critical agent who makes and unmakes the environment. He maintains that environmental literacy is a veritable tool that can help the individual to appreciate and understand the existing and impending woes of environmental degradation. Environmental literacy and education provide the necessary knowledge for the sustainable management of the environment. Environmental literacy, whether it is formal or informal, is instrumental in the attainment of sustainable development. Environmental adult education helps people to put up a positive attitude towards the environment thereby assisting them to have a strong feeling and concern for the environment and motivate them to actively participate in its protection. By changing people's attitudes toward the environment, the multinational companies involved in petroleum exploration will do everything possible to curb the challenges associated with petroleum exploration such as pollution, environmental health hazard and global warming (Anthony & Awhen, 2012).

Anijah-Obi (2001) posits that environmental adult education will help individuals and social groups acquire social values and ethics, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement. According to her, attitudinal change encourages individuals to emphasize the care for the environment so as to engender lasting environmental friendliness with change of attitudes towards nature, and where other forms of lives of plant and animals is respected.

### **Statement of the problem**

The Niger Delta region of Nigeria has been blessed with abundant petroleum resources. This development has helped to increase the gross domestic product of the country, provide job opportunities to many citizens, ease transportation and provide energy in homes. The region however has also experience a plethora of social and environmental hazards. Since the beginning of petroleum exploration in the region, the geographical region has been turned into squalor, poverty and pollution. Oil exploration in the region has led to environmental degradation which has adversely affected the lives of the inhabitants and ruined the local economy of the region. The use of fossil fuel has contributed to the emission of carbon-dioxide and other dangerous gases into the atmosphere resulting to global warming and climate change. Gas flaring and burning has

resulted in a plethora of environmental hazards such as gradual disappearance of habitats, endangering and extinction of species, deforestation, desertification and persistent emission of greenhouse gases. The emission of greenhouse gases and oil pollution in the area has led to contamination of arable land, destruction of fishing ponds and air pollution which has multiplier effects on humans and the environment.

The government, non-governmental organization and the multinational companies have made frantic efforts to solve these problems. The government, for instance, enacted laws such as, “The Oil Pipeline Act”, the “Petroleum Act” and “The Federal Environmental Protection Act” in an attempt to curb the problems, but the problems still persist. The inhabitants of the area still live in squalor with the agricultural land degraded and the fishing ponds polluted and destroyed. It is therefore hoped that with the knowledge of environmental adult education both the oil companies and the host communities will become aware of the consequences of petroleum exploration to the lives of the inhabitants and the environment at large. It is based on the above that this study is carried out to empirically investigate the extent to which environmental adult education could be used to curb the problem associated with petroleum exploration in the Niger Delta region of Nigeria.

### **Purpose of the study**

The purpose of the study is to:

1. Find out the extent to which awareness creation through environmental adult education is perceived to contribute to curbing the problems associated with petroleum exploration in the Niger Delta region of Nigeria.
2. Examine the extent to which the acquisition of environmental literacy education is perceived to contribute to curbing the problems associated with petroleum exploration in the Niger Delta region of Nigeria.

### **Hypotheses**

The following hypotheses were formulated to guide and direct the study:

**Ho1:** Awareness creation through environmental adult education has no significant perceived contribution to curbing the problems associated with petroleum exploration in the Niger Delta region of Nigeria.

**Ho2:** The acquisition of environmental adult literacy education has no significant perceived contribution to curbing the problems associated with petroleum exploration in the Niger Delta region of Nigeria.



## **Methodology**

The ex post facto research design was adopted for this study. The design according to Isangedighi et al. (2004) is a systematic empirical inquiry in which the researcher does not have direct control of the independent variable because their manifestations have already occurred and therefore cannot be manipulated. More so, inferences about relationship among variables are made without direct intervention from the concomitant of the independent variable. The ex post facto design is suitable for this study because the study sought to investigate role which environmental adult education could play in curbing the problems associated with petroleum exploration in the Niger Delta region of Nigeria which had already occurred before the study was undertaken.

The study is carried out in the Niger Delta region of Nigeria. The region is a vast low-lying region through which waters of the Niger Delta drains into the gulf of Guinea. The area is dominated with lakes, rivers, fresh water, swamp and mangrove vegetation. It is made up of the nine coastal southern states viz: Cross River, Edo, Delta, Abia, Imo, Bayelsa, Rivers, Akwa-Ibom and Ondo States. The area is densely populated and sometimes referred to as the “oil river” because it was once the major producer of palm oil. The area is blessed with abundant petroleum products and has been the centre of international concern over pollution caused from oil spills of the petroleum industry. The area extends to about 70,000km<sup>2</sup> (27,000sqmi) and cover about 7.55% of Nigeria land mass. The Niger Delta region has a population of about 30million people with more than 40 ethnic groups speaking about 500 dialects. The major languages spoken by the people in the area include Ibibio, Efik, Ijaw, Itsekiri, Edoid, Yoruboid and Iboid Languages. The region is divided into sub regions viz: western Niger Delta which consists of states such as Delta, and Ondo State; Central Niger Delta which consists of states such as Bayelsa, Rivers, Abia and Imo and the eastern Niger Delta which is made up of Akwa Ibom and Cross River States where this study was carried out. The major occupations of the people are fishing, farming, trading and craft making.

A sample of 565 adult males and females in the oil producing areas of Akwa Ibom and Cross River States was drawn from the population of 6,803,654 using stratified and accidental sampling techniques. The population of the study consist of adult males and females from 20 years to sixty years of age.

An instrument titled “Petroleum Exploration and Environmental Adult Education Questionnaire” (PEEAEQ) was used for data collection. The instrument was sub-divided into two parts (section A and B). Section A contains information on respondents’ demographic data such as sex, educational level, as well as residential area, while section B contains 12 items that measured the role of Environmental Adult Education. Six items

were targeted at each hypothesis. The items in the questionnaire were developed on a modified four point Likert type scale. Two experts in the Department of Educational Foundations, University of Calabar, Nigeria validated the instrument. Split half reliability method was adopted to ascertain the reliability estimate for the instrument. Twenty five male and female adults who were not part of the study sample were used for the reliability test and the coefficients obtained ranged from .73 to .83 which was considered high enough for the test instrument. The data collected was analysed using simple regression statistical tool.

### Presentation of results

**Ho1:** Awareness creation through environmental adult education has no significant perceived contribution to curbing the problems associated with petroleum exploration in the Niger Delta Region of Nigeria.

The independent variable here is awareness creation through environmental adult education while the dependent variable is curbing the problems associated with petroleum exploration. Simple regression statistics was used for data analysis. The results of the analysis is presented in table 1.

**Table 1:** Simple regression analysis of the perceived contribute of awareness creation through environmental adult education in curbing the problems associated with petroleum exploration

Model	R	R-square	Adjusted R square	Std error of the estimated	
1	.558(a)	.311	.310	2.59437	
Model	Sum of squares	Df	Mean Squares	F	p- value
Regression	1713.153	1	1713.153	254.526*	.000(a)
Residual	3789.420	563	6.731		
Total	5502.573	564			
Variable	Unstandarized regression weight (B)	Standardize regression weight		Beta weight	P-value
Constant	22.225	.878		25.316	.000
Awareness creation	.655	.041	.558	15.954	.000

\*Significant at P<.05 level

The R-value (.558) in the regression table shows a significant moderate positive relationship between awareness creation through environmental adult education and curbing the problems associated with petroleum exploration in the study area. The simple regression analysis of the perceived contribution of awareness creation through environmental adult education in curbing the problems associated with petroleum exploration produced an adjusted R<sup>2</sup> of .310. This indicates that awareness creation accounts for 31.0% of the contribution in curbing the problems associated with petroleum exploration in the study area. This finding is an indication that awareness creation through environmental adult education is relatively low in the study area. The F-value of the analysis of variance (ANOVA) obtained from the regression table was 254.226 and sig. value of .000 (OR p<.05) at degrees of freedom (df) of 1 and 564. The implication of this result is that awareness creation through environmental adult education has significant perceived contribution to curbing the problems associated with petroleum exploration in the study area.

**Ho2:** The acquisition of environmental adult literacy education has no significant perceived contribution to curbing the problems associated with petroleum exploration in the Niger Delta region of Nigeria.

The independent variable here is acquisition of environmental adult literacy education while the dependent variable is curbing the problems associated with petroleum exploration. Simple regression statistics was used for data analysis. The results of the analysis is presented in table 2.

**Table 2:** Simple regression analysis of the influence of the acquisition of Environmental Education in curbing the problems associated with petroleum exploration

Model	R	R-square	Adjusted R square	Std error of the estimate	
1	.343(a)	.118	.116	2.93677	
Model	Sum of square	Df	Mean square	F	P-value
Regression	646.902	1	646.902	75.006*	.000(a)
Residual	4855.672	563	8.625		
Total	5502.573	564			

Variable	Unstandardized regression weight (B)	Standardize regression weight		Beta weight	P-value
Constant	30.683	.640		47.941	.000
Acquisition of environmental adult literacy education	264	.031	.343	8.661	.000

\*Significant at .05 level

The R-value (.343) in the regression table shows a weak positive relationship between the acquisition of environmental adult literacy education and curbing the problems associated with petroleum exploration in the study area. The simple regression analysis of the perceived contribution of environmental adult literacy education to curbing the problems associated with petroleum exploration produced an adjusted  $R^2$  of .116. This indicates that the acquisition of environmental adult literacy education accounted for 11.6% of the contribution to curbing the problems associated with petroleum exploration in the study area. This finding is an indication that the acquisition of environmental adult literacy education is relatively low in the study area. The F-value of the analysis of variance (ANOVA) obtained from the regression table was 75.006 and the sig. value of .000 (or  $P < .05$ ) at the degrees of freedom (df) of 1 and 564. The implication of this result is that the acquisition of environmental adult literacy education has significant perceived contribution to curbing the problems associated with petroleum exploration in the study area.

### Discussion of the findings

The finding from hypothesis one indicates that awareness creation through environmental adult Education has significant perceived contribution to curbing the problems associated with petroleum exploration in the Niger Delta region of Nigeria. The result of this study is supported by the views of Anthony (2012) who asserts that one of the major role played by environmental adult education is to create awareness among the people. He stressed that the public could be sensitized on various ways of reducing pollution which is caused by petroleum exploration. The result of the study also agrees with Anijah-Obi (2001) who called for an urgent need to acquaint the citizens with the global and national environmental issues that affect man and the environment. It is therefore clear that awareness creation campaign on the consequences of petroleum exploration to both individuals and community at large will help stakeholders to solve the problems associated with petroleum exploration in the study area.

The finding from the second hypothesis reveals that the acquisition of Environmental Literacy Education has significantly contributed to curbing the problems associated with petroleum exploration in the study area. The result of this study supports the assertion of Eheazu (2016) who stressed that Environmental Literacy Education predisposes the learners towards development of positive attitudes to the environment. The result is also in support of the views of Okukpon (2008) who stressed on the need for people to become environmentally literate in order to enable them protect their environment from degradation. This implies that with the acquisition of environmental literacy education, illiterate adult could possess the basic knowledge, skills and attitudes that will help them to be committed to effective control and management of their environment.

### **Conclusion**

Environmental adult education, no doubt, contributes significantly to curbing the problems associated with petroleum exploration in the Niger Delta region of Nigeria. Through awareness creation and acquisition of literacy education, people will be conscious of the consequences of petroleum exploration to man and the ecosystem.

### **Recommendations**

Based on the findings of this study, the following recommendations are made:

1. There should be a concerted effort by environmental experts to create awareness to all the stakeholders on the consequences of petroleum exploration to man and the environment.
2. The government at all levels should encourage the teaching of environmental education in schools and colleges.
3. The local populace who are mostly affected by the consequences of petroleum exploration should be encouraged to enroll on environmental literacy education programmes.
4. The multinational companies should do everything possible to sponsor both their staff and the local inhabitants on developmental courses that will help in promoting environmental quality of the region.

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