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## Effect of Environmental Adult Education on Environmentally-Unfriendly Methods of Fishing in Rivers State

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### Abstract

The study examined how environmental adult education can promote environmentally-friendly methods of fishing in Rivers State. One research question and one hypothesis guided the study. Descriptive survey design was adopted. Accidental/convenience sampling technique was used to obtain a sample of 461 artisanal fisher folk among the target population in Rivers State. The questionnaire on EUFMFIQ was face and content validated by experts from the Departments of Adult and Non-Formal Education and Measurement and Evaluation. Reliability of 0.94 was obtained using Cronbach Alpha method. The research question was answered using mean statistics, while the hypothesis was tested using independent t-test analysis. The result revealed that of all the environmentally-unfriendly methods of fishing, the artisanal fisher folk choose fishing with nets with tiny holes as their most environmentally-unfriendly method of fishing. The hypothesis revealed that there is no significant influence on the knowledge gained and the stoppage of the practices of environmentally-unfriendly methods of fishing among the target population. It was recommended among other things that fisher folk should be introduced to other areas of agriculture like fish farming (fish pond) to sustain them in their period of hardship.

**Keywords:** Environmental Adult Education Programmes, Environmentally-Unfriendly, Fishing Methods

## Introduction

The global and local concern about growing environmental degradation has called for the need to help people transform their attitudes and practices. Consequently, education has been recognised as one of the important tools for conserving the environment through the cultivation of knowledge, skills, values and positive attitudes towards the environment among the people. The need for and importance of environmental adult education through environmental education has been emphasised as a strategy for addressing the growing trend of environmental problems. For instance, the need for environmental education which was emphasised at the United Nations Conference on Human Environment in Stockholm in 1972 was meant to attack the world's environmental crises. The Belgrade Charter (UNESCO, 1976), The Tbilisi Declaration (UNESCO, 1978), The Brundtland Report (WCED, 1987), The Rio Earth Summit (UNCED, 1992) and the Johannesburg (UN, 2002) were all out to tackle environmental issues and problems.

This is with the belief that if steps (such as encouraging environmental adult education in order to propel the desired change in individual's orientation to the environment; the need to save man from disaster through their knowledge of environmental adult education whether individually or in groups at any level and many more) are taken, greater awareness will be created about environmental issues and problems bearing in mind that man's economy is largely dependent on the environment and natural resources. Therefore, in order to curb the natural and pathogenic environmental issues and problems (such as pollution, deforestation, poor sanitation, lack of clean and safe water, land degradation due to unfriendly methods of fishing, unsustainable ways of harvesting natural resources like fishing with different types of chemicals and many more, loss of biodiversity which are threatening the life support system of the environment) environmental adult education has to be adopted (Ministry of Education and Vocational Training (MoEVT), 2005; MoEVT, 2007; United Republic of Tanzania (URT, 2004). These problems are as a result of the various factors like population pressure, environmentally-unfriendly fishing practices and high rate of degradation (Johnson-Pynn & Johnson, 2005; Sheridan, 2004; URT, 1997). Education for awareness-raising and finding solutions for these issues and problems is considered necessary, hence environmental adult education is recognised as education to attain quality life, healthy and well-conserved environment.

It is very important to note that the very essence of man's existence can always be traced to the environment. This is because man has always depended on the environment for his survival, health and safety. Man's quest for the survival of his vast population has led man into the various activities that has devastated and destroyed the environment. Clover (2010) confirms that in a world of food surpluses, the United Nations estimates that about 850 million people are chronically undernourished, and at least 60 million face acute food shortages due to natural disasters or conflicts. Therefore in a bid to solve the problem of acute food shortage, man had through his agricultural activities affected the environment negatively. The fisher folk degrade the environment by employing the use of net with tiny holes, chemicals like Gamaline 20, Dynamite and many others to kill fish of all kinds and sizes without giving way for tiny fishes to get matured and to reproduce others for sustainability.

The above mentioned activities of the artisanal fisher folk among the target population have over time caused havoc to lives and the entire ecosystem. The fisher folk degrade the environment and endanger lives as the use of chemicals for fishing cause pollution in water. The

use of net with tiny holes causes extinction of fishes in the water; destroys aquatic lives, and poisons the fish, biodiversity and human beings through consumption. Many more dangers experienced through these unwholesome and environmentally-unfriendly activities endanger lives, properties and the ecosystem. It is therefore necessary that the fisher folk are encouraged to take alternative methods for the sustenance of lives and the entire ecosystem. Some of the reasons why the environment is negatively affected could be traced to lack of environmental literacy, poverty, lack of awareness/knowledge, poor attitude to environmental issues, lack of appropriate skills to tackle environmental issues and also lack of participation in solving environmental problems (Apel & Camozzi, 1991). EAE is a serious necessity among the fisher folk in order to bring them to the awareness of what the environment is and how man should cooperatively relate with the environment which they too are part.

Agriculture, right from inception of Nigeria through the era of the colonial masters until the first republic in the 1960s has been the major source of revenue, employment, provision of food, foreign exchange earnings, among other things in Nigeria (Nwachukwu, 2006). In actualising this purpose, the fisher folk were empowered through the various agricultural development schemes and projects. Consequently, notable agencies like Agricultural Development Programme (ADP), International Fund for Agricultural Development (IFAD), Shell Petroleum Development Company (SPDC) Agricultural Programme, Green River Project of the Nigerian AGIP Oil Company (GRP) have intervened by assisting to increase the small-scale fisher folk to gain new skills, techniques and adopt new technologies to raise their level of production and improve on their level of living, especially in the areas where they have great expectation for crude oil and natural gas (Alfred-Ochiya et al., and Davies, in Tawari and Davies, 2010).

Looking critically into these objectives, all emphasis have been on exploitation of the environment and adoption of new techniques, access to credit loans, and so on in order to enhance productivity in the agricultural sector (Ihimodu & Ochomma, in Tawari & Davies, 2009). These methods could only be considered as a means for the better living of the fish families and not a guide against environmental degradation. Some other governmental agencies in Rivers State like the Ministry of Agriculture; Ministry of Environment and others have embarked on several projects but only for boosting agricultural production for food security. Only a little effort has been put by the "Fadama" (meaning fertile or rich land) programmes which consider environmental sustainability in its move to assist the artisanal fisher folk in boosting their economy and means of livelihood. This invariably means that much emphasis has not been laid on environmentally-friendly methods of fishing such as the use of adequate size of nets and others for fishing which signify environmentally-friendly methods of fishing in the target areas.

Rivers State is a state endowed with great potentials like petroleum resources, water resources, forest resources and many more which are meant to enrich her citizenry. Communities in Rivers State are fondly categorised as riverine and upland communities due to the geographical location of the state. The riverine communities are characterised with fishing. The riverine local government areas of the state who are predominant fisher folk are Andoni, Opobo/Nkoro, Okrika, Kalabari, and Bonny; though there are some minor fisher folk in other local government areas of the state that are not mentioned. The artisanal fisher folk in these areas produce fish, periwinkle, oyster, scallop, crayfish, prunes, lobsters, and many more shell fishes.

Through these activities, it could be seen that the indigenes of Rivers State, at the riverine areas devastate the environment through their methods of agriculture which is fishing with chemical that poisons the water, kill all categories of fish and at the same time poison human beings through consumption. They also carry out fishing with tiny nets which sweeps all grades of fish whether big or small, leaving no one to reproduce more fish thereby causing fish scarcity and rendering the people impoverished.

These and many other activities have led to the degradation of the environment thereby making fishing activities in the state environmentally-unfriendly and unsustainable. These activities and unfriendly attitudes towards the environment have given rise to the need to carry out this study which is particular about how to effect change in the fisher folk for a sustainable and environmentally-friendly fishing among the artisanal fisher folk. The fisher folk therefore, need EAE so as to live and maintain a sustainable environment which will also help them to improve in their socio-economic activities. It is very important to note that a sustainable environment will encourage a sustainable economy.

However, some efforts have been made to guide the fisher folk back to sustainable way of carrying out their occupation hence the office of the Agricultural Development Programme (ADP) at Rumuodumanya, Port Harcourt, through the environmental unit of "Fadama" project of the World Bank also throw more light on their effort to achieve a sustainable fishing by organising seminars, workshops to educate the fisher folk on how to exploit the environment without degrading it (Opurum, 2014). Despite all the little efforts put in by the bodies mentioned above and some communities to minimise environmentally-unfriendly methods used by the fisher folk in the target areas, experience revealed that the problem still persist. It is therefore pertinent to note that Environmental Adult Education (EAE) programmes such as environmental education, environmental basic literacy, public adult education, vocational adult education and many more (Mbalisi, 2016) through seminars, workshops, talks would help in solving these problems because no normal human being would ever want to hurt himself. The power of illiteracy/ignorance should never be underrated; it is indeed very dangerous. It is on this note that this study is carried out to identify and recommend the EAE programmes for the promotion of environmentally-friendly methods of fishing in the target population of Rivers State.

Population pressure and environmental illiteracy among other factors have made the promotion of environmentally-friendly methods of fishing difficult for adults in the target areas of Rivers State. Fishing with nets with tiny holes, chemicals, poisons, explosives, and many more environmentally-unfriendly activities associated with fishing have brought about degradation of the environment and destruction of biological lives (Biodiversity). It is clear therefore that the fisher folk in the target areas degrade the environment and this shows that they need some level of education that would enable them become aware of issues that affect them and the environment.

Environmental adult education is that education that would influence positive changes in the attitudes of the fisher folk towards the environment and also educate them on sustainable/environmentally-friendly methods of fishing. Considering this fact, there is therefore a need to find out how environmental adult education would help to re-orientate the fisher folk towards the promotion of environmentally-friendly methods of fishing.

### **Objective of the Study**

The objective this study seeks to specifically pursue is to:

Identify the most environmentally-unfriendly methods of fishing among the target population in Rivers State.

### **Research Question**

The research question posed for this study is:

What are the most environmentally-unfriendly methods of fishing among the target populations in Rivers State?

### **Hypothesis**

One null hypothesis is formulated for this study at 0.05 level of significance.

H<sub>01</sub>: Knowledge gained from EAE will not significantly influence the stoppage of the practices of Environmentally-Unfriendly methods of fishing among the target population in Rivers State.

### **Methodology**

Descriptive survey design was adopted and accidental/convenience sampling technique was used to obtain a sample of 461 respondents to diagnose the existing activities of the artisanal fisher folk and prescribe better options for the activities. The population of the study was made up of all the artisanal fisher folk in the three Senatorial Districts in Rivers State, totaling 9,225. Three communities were selected from the three senatorial districts with a total of 2,304 respondents from Rivers West; 2,345 from Rivers East and 4,576 from Rivers South-East. A sample size of 461 respondents was distributed into the three communities from the three Senatorial Districts through accidental/convenience sampling technique with 115 respondents from Ke community in Rivers West; 117 from Ogoloma community in Rivers East and 229 from Andoni community in Rivers South-East Senatorial Districts respectively giving a total sample of 461.

A 5-item structured questionnaire was developed and validated by two experts from the Departments of Adult and Non-Formal Education and Measurement and Evaluation. Thereafter it was tested for reliability using Crombach Alpha method and a coefficient of 0.94 was obtained and was considered high and taken to be reliable. The questionnaire was administered to the fisher folk in their different fishing communities with the help of trained research assistants. The research question was analyzed using mean and standard deviation, while the hypothesis was tested using independent t-test statistics at 0.05 level of significance.

### **Results and Discussion of Findings**

The results of the data analysis were presented in tables according to the research question and hypothesis.

**Research Question:** What are the most environmentally-unfriendly methods of fishing among the target populations in Rivers State?

**Table 1**

*The most environmentally-unfriendly methods of fishing among the target populations in Rivers State of Nigeria?*

**1.1: Mean and Standard Deviation Analysis of the Environmentally-unfriendly methods of fishing among the target population**

S/N	Questionnaire Item	SA	A	D	SD	N	(x)	Remarks
		4	3	2	1			
1	Gamaline 20, Andrex 40, etc helps to boost my fish harvest.	202	161	55	43	461	3.13	Agree
		808	483	110	43	1444		
		43.81%	34.92%	23.86%	9.32%	100%		
2	Explosives like Dynamites, Granades, give me opportunities to catch enough fishes.	211	152	58	40	461	3.15	Agree
		844	456	116	40	1456		
		45.77%	32.97%	12.58%	8.67%	100%		
3	Fishing nets with tiny holes (tinymesh), drag-nets etc are good instruments for fish catch.	213	201	29	18	461	3.32	Agree
		852	603	58	18	1531		
		46.20%	43.60%	6.29%	3.90%	100%		
4	I like to defecate in the river where I catch fish.	205	132	78	44	461	3.07	Agree
		820392	396	156	44	1416		
		44.46%	28.63%	16.91%	9.54%	100%		
5	Smooking my fish with firewood is an age-long method of drying fish.	210	151	93	7	461	3.22	Agree
		840	453	186	7	1486		
		45.55%	32.75%	20.17%	1.51%	100%		
Grand Mean							3.17	Agree

In Table 1.1, for item one, 202 respondents with weighted response of 808 strongly agreed that Gamaline 20, Andrex 40, etc helps to boost their fish harvest; 161 respondents with weighted response of 483 agreed that Gamaline 20, Andrex 40, etc helps to boost their fish harvest 55 respondents with weighted response of 110 disagreed; also 43 respondents with weighted response of 43 strongly disagreed to this item. The respondents' weighted responses

on this item gave a mean of 3.13 which is greater than the criterion mean of 2.5. This implies that the respondents agreed that Gamaline 20, Andrex 40, etc helps to boost their fish harvest.

For item two, 211 respondents with weighted response of 844 strongly agreed that explosives like Dynamites, Grenades, etc gives them opportunities to catch enough fishes; 152 respondents with weighted response of 456 agreed that explosives like Dynamites, Grenades, etc give them opportunities to catch enough fishes but 133 respondents with weighted response of 116 disagreed, also 40 respondents with weighted response of 40 strongly disagreed. The respondents weighted response on this item gave a mean of 3.15 which is greater than the criterion mean of 2.5. This implies that the respondents disagreed that explosives like Dynamites, Grenades; etc gives them opportunities to catch enough fishes.

For item three, 213 respondents with weighted response of 852 strongly agreed that Fishing nets with tiny holes (tiny mesh), drag-nets etc are good instruments for fish catch; 201 respondents with weighted response of 603 agreed, but 29 respondents with weighted response of 58 disagreed, also 18 respondents with weighted response of 18 strongly disagreed. The respondents weighted response on this item gave a mean of 3.32 which is greater than the criterion mean of 2.5. This implies that the respondents disagreed with the fact that that fishing nets with tiny holes (tiny mesh), drag-nets etc are good instruments for fish catch.

For item four, 205 respondents with weighted response of 820 strongly agreed that they like to defecate in the river where they catch fish; 132 respondents with weighted response of 396 agreed but 78 respondents with weighted response of 156 disagreed, also 44 respondents with weighted response of 44 strongly disagreed to this item. The respondents weighted response on this item gave a mean of 3.07 which is greater than the criterion mean of 2.5. This implies that the respondents agreed that they like to defecate in the river where they catch fish.

For item five, 210 respondents with weighted response of 840 strongly agreed that smoking their fish with firewood is an age-long method of drying fish; 151 respondents with weighted response of 453 agreed but 93 respondents with weighted response of 186 disagreed, also 7 respondents with weighted response of 7 strongly disagreed to this item. The respondents weighted response on this item gave a mean of 3.13 which is greater than the criterion mean of 2.5. This implies that the respondents agreed that smoking their fish with firewood is an age-long method of drying fish.

The respondents' responses on RQ<sub>i</sub> gave a grand mean of 3.17 which is greater than the criterion mean of 2.5. This implies that the respondents agreed that the use of Gamaline 20; Andrex 40 help to boost their harvest; that Dynamites; Grenades etc give them opportunities to catch enough fishes; they agreed that fishing with nets with tiny holes, drag-nets etc are good instruments for fish catch; they agreed that they like to defecate in the river where they catch fish and agreed that smoking their fish with firewood is an age-long method of drying fish.

### Testing of Hypothesis

**H<sub>01</sub>:** Knowledge gained from EAE will not significantly influence the stoppage of the practices of Environmentally-Unfriendly methods of fishing among the target population in Rivers State.

To test this null hypothesis, the mean of scale measuring the knowledge gained in EAE in relation to fisher folk was obtained. This gave a mean score of 10.50 which is approximately 11.00 and it



serves as a criterion score used to classify the fisher folk into high and low level of knowledge groups. Thereafter the scores of these fisher folk in the scale used to measure the stoppage of the practices of environmentally-unfriendly methods of fishing were determined and were subjected to an independent t-test statistics. The results obtained are as presented in Table 2

**Table 2**

**1.2: Independent t-test analysis on the influence of knowledge gained in EAE on the stoppage of the practices of environmentally-unfriendly methods of fishing.**

KGAE (Crop Farming) Level	N	Mean	SD	df	t-value	P-value
High	41	7.80	3.22	421	1.503	0.134
Low	382	7.08	2.91			

In table 2, it is shown that the number of fisher folk who gained high and low level of knowledge on EAE were 41 and 382 respectively. It was also shown that the mean scores of the fisher folk who gained high and low level of knowledge from EAE are 7.80 and 7.08 respectively on the scales that measures the practices of the stoppage of the environmentally-unfriendly methods of fishing. The standard deviations of their scores are 3.22 and 2.91 respectively. Based on their mean scores, it could be deduced that the fisher folk who gained high level of knowledge from EAE had a higher mean score than their counterparts who gained low level of knowledge from EAE by a difference of 0.72.

Later when this observed mean difference was subjected to an independent t-test, a calculated t-value of 1.503 was obtained at df of 421 at 0.134 level of significance. Therefore the null hypothesis is accepted, indicating that knowledge gained in EAE did not significantly influence the stoppage of the practices of environmentally-unfriendly methods of fishing.

### **Discussion of Findings**

The study shows that, of all the environmentally-unfriendly methods of fishing used among the target population including fishing with chemical of all kinds, explosives, bottom trawling, bycatch, ghost fishing and many more; fishing with nets with tiny holes are discovered to be the most environmentally-unfriendly method of fishing in the target populations. This finding is in line with a claim from a respondent through interview statement that their intention of using nets with tiny holes is because there are areas where nets with large holes cannot catch any fish; therefore to avoid them being starved, they prefer to go by the use of nets with tiny holes. They also anchored their reason on the fact that oil and gas pollution on the river has destroyed a lot of aquatic lives rendering the fisher folk impoverished thereby giving rise to their environmentally-unfriendly methods of fishing. In the same vein, the study conducted by Okwu et al (2011) on Analysis of Artisanal Fisher folk Information need and Accessibility in Benue State, Nigeria identified low level of formal education (illiteracy), low income (poverty) and lack of information (unawareness) among other things as hindrances to the adults' inability to adopt environmentally-friendly methods of fishing in the target population.

Furthermore in the study carried out by Tawari and Davies (2009) on the effectiveness of agricultural agencies in enhancing and promoting fisheries production and management in their areas of operation within the Niger Delta, Nigeria, showed that agricultural agencies were not helpful to the respondents in their fishing operations. This is because there was a lack of credit facilities, inadequate extension services and non-provision of improved fishing input to enhance the effectiveness of agencies and personal characteristics of fisher folk. In the light of this therefore, appropriate, consistent and sustainable interventions in the aforementioned areas were highly recommended.

Consequently a study carried out by Adesehinwa and Bolorunduro (2007) on effectiveness and constraints of the existing fisheries technologies and approaches for information dissemination in two maritime states of Nigeria, was to document available traditional practices and improved technologies in the fisheries sub-sector of two maritime states in Nigeria (Lagos and Rivers states) and the effectiveness of approaches used in information dissemination of such technologies. Results obtained showed that subsistence practices characterised the fisheries sub-sector in the two states. The result showed that even though there was a significant recognition of the use of hook and line and the use of nets as fishing gears and the use of kilns and oven for drying/smoking of fish which seem to go in line with environmentally-friendly methods of fishing, it was identified that the awareness and adoption level of improved fisheries technologies among the respondents were generally low.

This goes to support the findings from the study carried out by Tawari and Davies (2009) with a complaint from the fisher folk which stated that agricultural agencies are not helpful to their fishing operations. It therefore means that there is need for effective intervention from agricultural agencies to enable the fisher folk see reasons to adopt environmentally-friendly methods of fishing in their areas. The null hypothesis shows that there is no significant influence on the knowledge the respondents gained on environmentally-friendly methods of fishing (if any) and their stoppage of environmentally-unfriendly methods of fishing.

### **Conclusion**

The study has revealed that artisanal fisher folk did not see anything wrong in the use of Gamaline, Andre 40, explosives/dynamites/grenades defecating and smoking with firewood as environmentally unfriendly methods of fishing because it was an age long practice by the fisher folk. The only unfriendly method to them is fishing with tiny nets with tiny holes. The training received on the stoppage of unfriendly methods of fishing was not utilized by the fisher folk in the study area due to poverty. The reason for doing this was based on the degraded environmental pollution caused by oil and gas among other things which has destroyed the aquatic system leaving little or nothing for them to survive with. The study also revealed that illiteracy, poverty, population pressure among other things hinders them from adopting environmentally-friendly methods of fishing in the target population.

### **Recommendations**

Based on the findings of the study, the following recommendations were made:

- i. Fisher folk should be encouraged to use environmentally-friendly methods of fishing with a lot of conscientization and incentives which will enable them take care of their family while they adopt the new techniques of environmentally-friendly methods of fishing.
- ii. Fisher folk should be introduced to other areas of agriculture like fish farming (fish pond) and many others to sustain in their hard times.
- iii. The extension workers should organise constantly environmentally-friendly methods of fishing, create and conscientise the fisher folk on the need to protect and preserve the environment for sustainable development.

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