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EVALUATION OF ENVIRONMENTAL AWARENESS LEVEL AMONG STAKEHOLDERS IN RURAL AND URBAN COMMUNITIES, SOUTHERN NIGERIA

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ABSTRACT

This study was carried out to evaluate the level of environmental awareness of stakeholders in the urban and rural settlements in Delta State, southern Nigeria so as to infer the depth of environmental education that would be embarked on. Five major stakeholders in the state that constituted the major strata of sampling were selected. A total of 14 communities; 7 in the urban/semi urban local governments and 7 in the rural local governments were studied using the stratified sampling technique. Descriptive statistic was adopted for the study and questionnaires were administered to stakeholders. The study revealed that contrary to findings from a number of studies in other part of the globe, students were more knowledgeable on environmental issues followed by public/civil servants and traders/businessmen among stakeholders from the urban settlements. Stakeholders younger in age were not more knowledgeable than older stakeholders in the rural settlements about environmental problems. Male stakeholders had higher percentage level of awareness than their female counterparts. A higher percentage of stakeholders from the rural settlements are still not aware on the environmental terms sought for in this study than stakeholders from urban settlements. This study recommends that given the current level of environmental degradation experienced on a daily base in Nigeria and the limited awareness level of stakeholders on environmental issues, government at various levels should through wider publicity in the ministries of environment and education intensify the campaign on environmental education.

Contribution/Originality: This study is one of the very few studies which have investigated the environmental awareness level among stakeholders in the rural-urban communities of Nigeria. The analysis and findings will enrich the depth of available literature on environmental awareness of stakeholders in developing nations.

1. INTRODUCTION

Environmental issues are one of the main problems of humanity that have perhaps attracted more lively discussion than any other scientific topics across the globe [1, 2]. The extent of this phenomena however differ from continent to continent, country to country, and region to region depending on the population size, birth rate of population, advancement in technology available to the people, how vulnerable is the environmental units of that region and their characteristics, as well as the percentage level of the region's socio-economic development which have recently awakened global fears and reactions [3]. Humans like any

other creature on earth rely heavily on the natural environment as life support system. Environmental deterioration has no respect for territorial boundaries. The global environment has negatively been impacted by various human activities; thereby giving rise to several environmental problems ranging from acid rain, climate change, ozone layer depletion, rise in sea level, extinction of biodiversity, urban flooding, deforestation and pollution of air, water and land [2].

The quality of our immediate environment affects the quality of human lives. Human's action as producers, consumers, and procreators cumulatively impact on the quality of the environment that sustains life [4]. In advanced countries, cleanup operations, green technological innovation, and socio-economic policies have considerably helped to reduce the negative impact of human activities on the environment; particularly at the local level of our immediate surroundings [5]. With the current record of growth in human population globally, many nations have exploited excessively from the available earth's resources which in turn has impacted negatively on planet earth at every increasing rate. Unfortunately, some of the renewable resources have been used at rates that exceed the speed at which they could be replenished. It is believed that the extent at which these have happened would not have been, if the citizenries concerned had been aware of the detrimental effects of their actions on the environment [6].

Sustainability of the natural environment has been a growing perspective in the 21st century that is aimed at changing the orientation of stakeholders for the betterment of the environment. Environmental sustainability implies the need to strike a balance between current socio-economic activities and the geometric pace in infrastructural development, on one hand; and on the other ensures environmental protection and preservation of cultural diversity for future generations [7, 8]. Education has been understood to be a vital key in promoting sustainable environment and improving people's capacities to manage with the pace of development-related issues and environmental challenges [9]. Learning is the key ingredient in becoming more sustainable. Over the past two decades, the stress which the environment has been undergoing have attracted the attention of decision makers, scientists, non-government organizations and even laymen in many parts of the world. In response to a growing understanding that the environment is being impacted negatively by human activities; an aspect of education called environmental education has been more focused on how to reduce human impact on the environment and promote a more sustainable future.

Some of the major global environmental issues include ozone layer depletion, waste production, toxin from chemicals, climate change, soil degradation, deforestation, land use, intensive farming, flooding, over population, global warming, acid rain and carbon footprint. Many rural and urban dwellers are ignorant on how their actions and inaction have contributed to these challenges. Noticeable scholars have worked and reported findings on people's perception and understanding in handling these environmental problems [10-14]. In most reported findings, some researchers observed that the groups studied have low understanding on the issues; whereas some others discovered that theirs have a fair understanding on the issues mainly due to environmental education which they have been subjected to. Skamp, et al. [11] posit that in order to change behaviours of individuals to reduce greenhouse emissions, it is likely that a multidisciplinary approach will be needed, with education being an important component. Given the magnitude and the imminence of the problem of climate change, it is reasonable to suggest that such education should now be directed at least in part, to including behaviour change. One of the best ways of preserving our environment is by creating environmental awareness among several segments of the society including public servants, farmer, artisans, civil servants, traders and politicians. Awareness should also be created according to Alerby [15] among students who are the future leaders, policy makers, planners, future custodians and educators of the environment and its issues. This awareness among the students provides them with the opportunity on how to nurture nature as well as prepare them to become environmental responsible managers. Improvement in

public awareness and consciousness on environmental matters may offer future generation healthier life and a more sustainable environment.

Choker [16] asserted that public environmental awareness is a synthesis of people's conception, interpretations and perceptions of environmental issues. It is assumed that such conceptions and the like would affect their behaviour, and the quality of responses and reactions to environmental problems. It's usage in shaping desirable environmental management practices and affecting control can therefore not be overemphasized. Choker [16] summarized the role of environmental awareness as thus:

- A vigorous programme of public awareness that can enlighten the people on the dangers of environmental problems and promote appropriate attitudes to them and thereby minimize the impact on environmental health. Not majority of Nigerians for instance knows the effect of indiscriminate discharge by industries liquid, solid and gaseous wastes on farmlands and rivers, or toxic effects of pesticides and lead on human beings. Greater awareness of such issues can raise public consciousness and redirect efforts on tacking them.
- Public awareness can promote environmental pressure groups and spirited public participation in pollution control. Such a force would give birth to a more healthy debate on the environment. Public awareness can thus act as an effective counterforce to elite or industrialists' interest.
- Much of the traditional management practices like economic evaluation, ecological ideas and government regulations often arouse conflict. Public awareness and debate on issues can promote a forum of dialogue and conflict resolution in environmental management.
- Public awareness can also enable policy makers to identify problems of most concerns to people and their actual significance from a scientific point of view.
- Public awareness of pollution can in the long run be expedient, effective and cost saving, as expected attitude change following awareness of hazards would not only minimize the extent of the hazard but reduce the need for control. Natural resources such as farmlands would also in the process be preserved.
- Public awareness can create public pressure by stimulating public debates especially over controversial issue and promote public commitment to policies.

Intensifying the effort on awareness of a target population on environmental issues can lead to, but not guaranteed of, their being sensitized [17]. To strengthen environmental awareness through enlightenment is simply to make the target population to become conscious of the prevailing environmental issues and possible solutions, whereas to sensitize them is to stimulate their feelings in such a way that they develop concern, and responsible attitudes towards the environment [17]. Hence, sensitization leads to cultivation of positive environmental attitudes which in normal circumstances, translate into positive environmental behaviours that are best expressed in actions. This study therefore seeks to evaluate the level of environmental awareness among stakeholders in rural and urban communities in Delta State, Nigeria in order to ascertain the level of environmental sensitization they need to be given to live sustainably.

1.1. Delta State and Environmental Challenge

Delta state is located in the south-south geographical region of Nigeria. The state occupies a landmass of 16,842 square kilometers and is located in the Niger Delta region. It lies approximately between longitude $5^{0}00$ and $6^{0}45^{1}$ East and latitude $5^{0}00$ and $6^{1}30$ North see Figure 1. The state is bounded in the north and west by Edo state, the east by Anambra, Imo and Rivers state, southwest by Bayelsa state and on the southern extreme is the Bight of Benin which covers about 160 kilometres of the state coastline [18]. The state capital is Asaba, located at the northern end, whereas Warri, Effurn, Sapele, Ughelli and Kwale are the industrial hub of the state. Agbor, Bomadi, Ibusa, Ogwashi uku, Oghara and Udu are the commercial centres in the state. Delta state comprises of 25 local government areas and 268 communities. The state population as at 2006

census is 4,112,445 (Males: 2,069,309; Females: 2,043,136) [19]. The people of Delta state are multi-ethnic comprising of the Enuani people, Ika, Ukwuani, Isoko, Urhobo, Itsekiri and Ijaw. Their occupations include farming, fishing, trading, skilled work, industry, civil and public servants as well as academic among others. 68% of the state population is estimated to live in the urban areas resulting from rapid industrialization. The resultant effect on urbanization is the emergence of urban slums since social facilities and infrastructure are stretched above their limits. The indigenes of the state are hardworking, resourceful and enterprising. There are reputable federal indices acknowledging the state as one of the highest man power employer, though with a considerable moderate level of poverty. Education is a major industry in the state with series of established tertiary institutions.

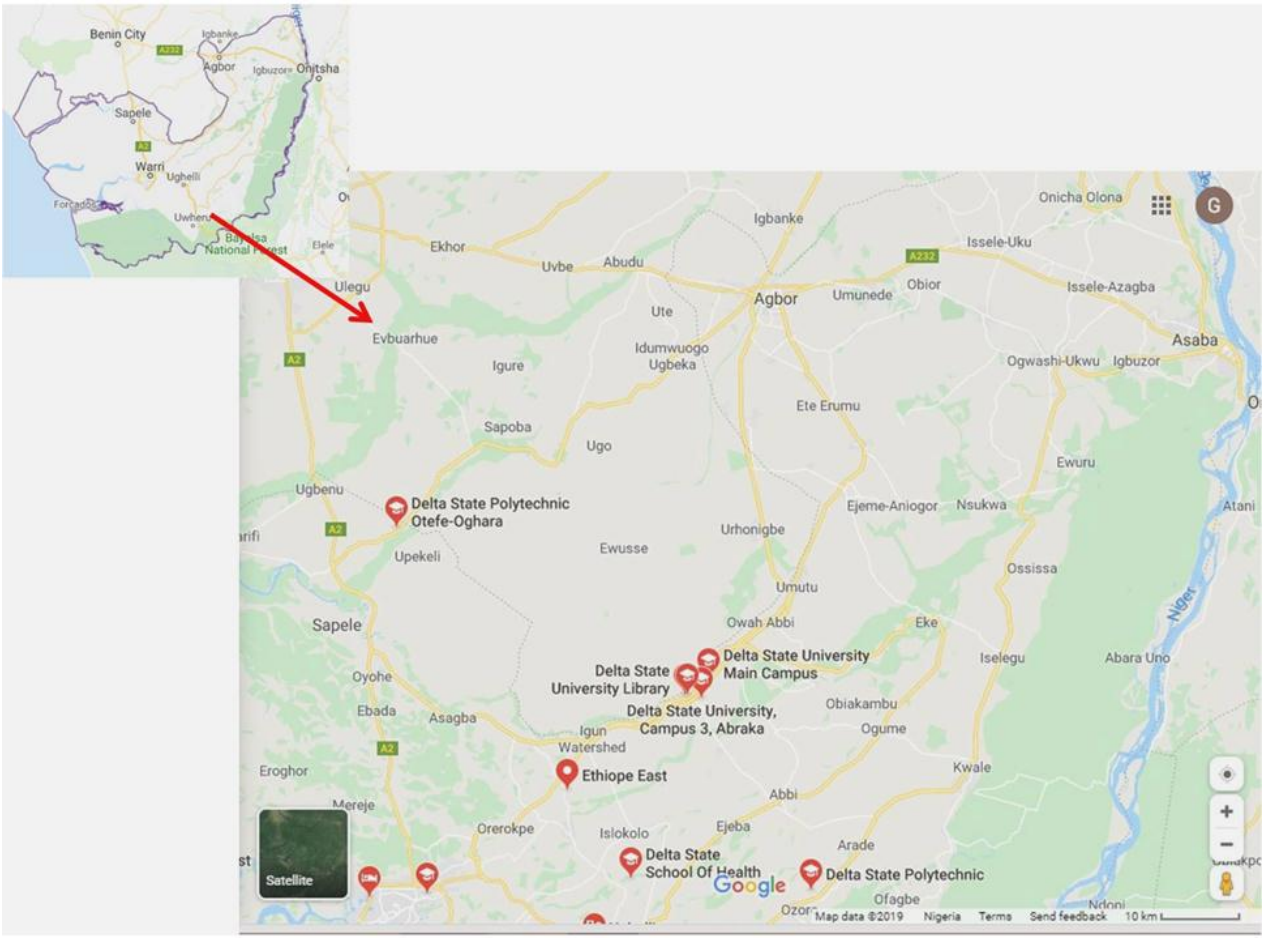

Figure-1. Map of Delta State showing the study area.

Source: Topographic map sheet (2018).

Delta state like every other state within the country continues to urbanize with its pace in industrialization and attendant level in population explosion. There are recorded major urban centres in the state namely; Asaba, Agbor, Ibusa, Kwala, Ogwashi uku, Sapele, Warri, Effurun, Ughelli, Agbarho, Bomadi, Obiarukwu and Ozoro. This massive rate in urban expansion increases exponentially the number of people that move in and out of the state on daily basis with its attendant environmental disturbances. The current environmental status of the state is a clear indication that the level of environmental literacy in the state is quite moderate.

The environmental challenges confronting the state may include; flooding, air pollution and high temperature from gas flaring sites, erosion, inadequate management of hazardous waste, water and land pollution from industrial wastewater discharge and oil spillage, poor municipal solid waste management,

proliferation of illegal structures, deforestation, socio-cultural practices and other global contemporary environmental issues of which activities from Delta state contribute to like ozone layer depletion, acid rain and global warming.

An overall evaluation reveals that people are not only unaware of some of the environmental challenges but are also not informed on their causes and effects. Hence, there is no gain saying the fact that a grass root environmental sensitization campaign is very crucial so as to create awareness and alleviate the environmental problems confronting the state. Environmental education is therefore an important tool that is needed to be employed as a strategy in enlightening citizenries on the environmental problems; to make them more knowledgeable about their actions and inactions that directly or indirectly contribute to the challenges, provide them with skills and motivation on how to resolve these problems and prevent new ones from occurring. For this to be achieved, a baseline study evaluating the level of awareness of stakeholders is fundamental. This is the gap this study seeks to address.

1.2. Sampling Data and Method of Analysis

In order to assess the awareness and sensitization levels of the public about environmental issues and obtain an all inclusive public participation in decision making process for planning attempts, descriptive survey research design was adopted for the study [10]. The five major stakeholders (artisans, public/civil servants, farmers, students and traders/business) in the state selected for this study constituted the major strata from which sampling of sub-stratum that makeup the respondents were taken. A total of 14 communities (7 in the urban/semi urban local governments and 7 in the rural local governments) were studied using the stratified sampling technique. A total of 2000 questionnaires were administered through face to face interview among the stakeholders that constituted the sample; 1000 for urban communities and 1000 for their rural counterparts. This ensured that the researchers achieved a response percentage of 98% which was higher than any other expected methods to be employed. A test questionnaire was developed in reference to the subject in order to measure the knowledge level of the stakeholders about the environment and environmental issues. The instrument was sectionalized into two aspects. The first section was designed to obtain demographic information of respondents whereas the second aspect seeks to elicit direct responses from respondents on level of awareness on environmental issues confronting the state. Descriptive statistical methods were employed in the analysis of data. Descriptive here refers to the usage of contingency table in analyzing the level of awareness among the sampled stakeholders.

2. RESULTS AND DISCUSSION

Demographic data as reported in Table 1 revealed that 614(62.7%) from the sampled urban stakeholders are male, whereas 366(37.3%) of the stakeholders are female. More so, 407(41.5%) from the sampled rural stakeholders are male while 573(58.5%) of them are female. This clearly revealed that majority of the stakeholders in the urban communities are male; whereas the female stakeholders are higher in population when compared to the male stakeholders in the rural communities.

Also displayed in the table above is the percentage of stakeholders' age range; as Table 1 revealed that stakeholders from the urban communities shows that 187(19.1%) were within the age range of 18-27 years, 258(26.3%) were within the age range of 28-37 years; 324(33.1%) were within the range of 38-47 years; 113(11.5%) were within the age range of 48-57 years and 98(10%) were over 57 years of age. For stakeholders from the rural communities, it was revealed that 139(14.2%) of the sample were within the age range of 18-27; 85(8.7%) were within the range of 28-37 years; 169(17.2%) were within the age range of 38-47 years; 276(28.2%) were of the age range of 48-57 years while the other 311(31.7%) of the sampled stakeholders were over 57 years of age. This study clearly revealed that a higher percentage of the stakeholders which were

younger in age range reside within the urban communities when compared to the rural communities that were mainly dominated by stakeholders that were older in age. This finding corroborated the report of Milfont [20] and Milfont and Duckitt [21].

Table-1. Demographic and socio-economic characteristics of stakeholders.

Variables	Options	Urban communities		Rural communities	
		Frequency	Percentage	Frequency	Percentage
Gender	Male	614	62.7	407	41.5
	Female	366	37.3	573	58.5
	Total	980	100	980	100
Age range	18-27	187	19.1	139	14.2
	28-37	258	26.3	85	8.7
	38-47	324	33.1	169	17.2
	48-57	113	11.5	276	28.2
	Over 57	98	10	311	31.7
	Total	980	100	980	100
Level of education	Illiterate	62	6.3	115	11.7
	Primary school	117	11.9	142	14.5
	Junior secondary school	138	14.2	286	29.2
	Senior secondary school	210	21.4	253	25.8
	Diploma/NCE	253	25.8	109	11.1
	University/Polytechnic	200	20.4	75	7.7
	Total	980	100	980	100
Source of income	Farming	78	7.9	324	33.1
	Artisans	148	15.1	128	13.1
	Traders/business	302	30.8	294	30
	Public/civil servants	196	20	98	10
	Student	256	26.2	136	13.8
	Total	980	100	980	100

Source: Fieldwork (2019).

Investigation concerning stakeholders' level of educational attainment revealed that stakeholders from urban communities had 62(6.3%) illiteracy level, 117(11.9%) attended primary school; 138(14.2%) stopped at junior secondary school; 210(21.4%) attended senior secondary school; 253(25.8%) consented to have obtained the National Diploma/NCE certificate and 200(20.4%) of the sampled urban stakeholders attended either university or polytechnic. Report for stakeholders from rural communities revealed that 115(11.7%) were illiterate; 142(14.5%) attended primary school; 286(29.2%) acclaimed to have stopped at junior secondary school level; 253(25.8%) consented to have obtained senior secondary school certificate; 109(11.1%) had either National Diploma or NCE certificate whereas only 75(7.7%) from the rural stakeholders had attended either the university or polytechnic. Comparatively, the result revealed that on average, a higher percentage of stakeholders from the urban communities are more educated than those from the rural communities. This finding was in conformity with the studies of Sullivan, et al. [22]; Yan, et al. [23] and Mei, et al. [24] whereas differs with the report of Ogunbode and Arnold [28] who studied the effects of education and income on environmental awareness and attitudes of Ibadan, south western Nigeria.

The socio-economic status of the stakeholders as revealed from their opinions showed that respondents from urban communities had 78(7.9%) stakeholders as farmers; 148(15.1%) were artisans; 302(30.8%) were into business or trading; 196(20%) of them were public or civil servants that works in various government ministries and parastatals; whereas 256(26.2%) were students. Analysis of respondents from rural communities revealed that 324(33.1%) stakeholders were engaged in farming; 128(13.1%) were artisans; those into business or trading accounted for 294(30%) of the stakeholders; 98(10%) of them were public or civil servants whereas 136(13.8%) were students residing in the sampled rural communities. This study revealed a higher percentage of students in the urban communities than the rural communities. This may be attributed

to the fact that urban communities have better educational facilities, quality teachers/instructors and conducive studying environment when compared to the rural communities that are starved with quality teachers/instructors and modern teaching facilities; hence rapidly encouraging rural-urban migration. Also revealed in the study was that the rural communities commanded a higher percentage of stakeholders who were into farming than their urban stakeholders. This may be attributed to the fact that majority of the rural communities are endowed with arable land for farming.

Four major environmental terms that awareness level of the stakeholders was sought for include: global warming, ozone layer depletion, acid rain and climate change. Major stakeholders responded either Yes or No to being aware or having heard of the environmental terms as presented in Table 2.

Table-2. Stakeholder responses on environmental problems by knowledge.

Variables	Option	Urban communities				Rural communities			
		YES		NO		YES		NO	
		F	%	F	%	F	%	F	%
Have you heard of global warming	Farming	66	(84.6)	12	(15.4)	151	(46.6)	173	(53.4)
	Artisans	106	(71.6)	42	(28.4)	66	(51.6)	62	(48.4)
	Traders/business	215	(71.2)	87	(28.8)	134	(45.6)	160	(54.4)
	Public/civil servants	195	(99.5)	1	(0.5)	98	(100)	0	(0)
	Student	248	(96.9)	8	(3.1)	114	(83.8)	22	(16.2)
Have you heard of ozone layer depletion	Farming	70	(89.7)	8	(10.3)	109	(33.6)	215	(66.4)
	Artisans	106	(71.6)	42	(28.4)	58	(45.3)	70	(54.7)
	Traders/business	182	(60.3)	120	(39.7)	128	(43.5)	166	(56.5)
	Public/civil servants	195	(99.5)	1	(0.5)	96	(97.9)	2	(2.1)
	Student	248	(96.9)	8	(3.1)	114	(83.8)	22	(16.2)
Have you heard of acid rain?	Farming	66	(84.6)	12	(15.4)	129	(39.8)	195	(60.2)
	Artisans	106	(71.6)	42	(28.4)	63	(49.2)	65	(50.8)
	Traders/business	206	(68.2)	96	(31.8)	107	(36.4)	187	(63.6)
	Public/civil servants	192	(98)	4	(2.0)	96	(97.9)	2	(2.1)
	Student	233	(77.1)	23	(8.9)	114	(83.8)	22	(16.2)
Have you heard of climate change	Farming	66	(84.6)	12	(15.4)	136	(41.9)	188	(58.1)
	Artisans	106	(71.6)	42	(28.4)	83	(64.8)	45	(35.2)
	Traders/business	215	(71.2)	87	(28.8)	195	(66.3)	99	(33.7)
	Public/civil servants	195	(99.5)	1	(0.5)	95	(96.9)	3	(3.1)
	Student	248	(96.9)	8	(3.1)	136	(100)	0	(0)

Source: Fieldwork (2019).

Table 2 showed major stakeholders responses on their knowledge of global warming, ozone layer depletion, climate change and acid rain. Evidence from the data collected and analysed revealed that respondents that were into farming in the sampled urban communities had more knowledge of global warming, climate change, ozone layer depletion and acid rain than stakeholders from the rural communities that were into farming. It was also revealed in Table 2 that a higher percentage of students' respondents 248(96.9%) in the urban communities were more knowledgeable on the environmental items sought for in this study compared to students' respondents 114(83.8%) from the rural communities. On the other hand, stakeholders that were traders or engaged in business and artisans from the urban communities revealed to have a better knowledge on global warming (71.2% and 71.6%), climate change (71.6 and 68.2%), acid rain (71.6% and 68.2%) and ozone layer depletion (71.6% and 60.3%) than when compared to stakeholders from the sampled rural communities that were artisans and traders/businessmen on global warming (48.4% and 54.4%), ozone layer depletion (54.7% and 56.5%), acid rain (50.8% and 63.6%) and climate change (35.2% and 33.7%) respectively. Although, the study revealed that among the 980 sampled stakeholders from urban communities; students had a higher percentage level on knowledge of environmental problems followed by public/civil servant, and traders/businessmen than stakeholders that were farmers and artisans. This trend was also exhibited among stakeholders from the sampled rural communities.

To ascertain if there was age bias in responses of stakeholders; the study further sought to disaggregate the responses by age of the sampled stakeholders within urban and rural communities and found out, that stakeholders from urban communities who were within the age range of 28-37 had more knowledge on global warming (78.7%), ozone layer depletion (71.5%), climate change (78.7%), and acid rain (67.4%); followed by age group of 38-47 and finally, those of 48-57 years. See details as presented in Table 3 below. This may be adduced to the fact that age group of 28-37 years in urban communities were mainly students who had been educated through recent research and advancement in technology on environmental issues. This finding confirms the assertion of other studies by Arcury and Christianson [25]; Mckenzie-Mohr [26]; Abdul-Wahab and Abdo [27] and Yildiz, et al. [10]. Further findings, revealed that stakeholders from rural communities within age range of over 57 years had a better knowledge on global environmental awareness; followed by age group of 18-27, and 38-47 years. This may also be attributed to the fact that age group of over 57 years are mainly elderly stakeholders who had lived their entire youthful age working as public/civil servants or technicians in the urban communities hence exposing them to real life situation. This finding was in uniformity with the report by Ogunbode and Arnold [28] who asserted that age alone has been identified as a major determinant of environmental attitudes among rural dwellers. The study further revealed that stakeholders from urban settings in term of age range were more knowledgeable on the concept of environmental variables like global warming, ozone layer depletion, acid rain and climate change than their rural counterparts.

Table-3. Stakeholders' responses on climate change by age.

Age	Option	Urban communities		Rural communities	
		YES (%)	NO (%)	YES (%)	NO (%)
Have you heard of global warming	18-27	52.3	47.7	42.9	57.1
	28-37	78.7	21.3	47.5	52.5
	38-47	72.5	27.5	46.3	53.7
	48-57	64.1	35.9	35.4	64.6
	Over 57	58.6	41.4	22.8	77.2
Have you heard of ozone layer depletion	18-27	54.8	45.2	39.4	60.6
	28-37	71.5	28.5	44.9	55.1
	38-47	72.5	27.5	48.6	51.4
	48-57	66.4	33.6	39.2	60.8
	Over 57	60.9	39.1	25.4	74.6
Have you heard of acid rain?	18-27	53.7	46.3	39.4	60.6
	28-37	67.4	32.6	44.9	55.1
	38-47	70.1	29.9	48.6	51.4
	48-57	61.5	38.5	39.2	60.8
	Over 57	55.2	44.8	25.4	74.6
Have you heard of climate change	18-27	52.3	47.7	49.1	50.9
	28-37	78.7	21.3	51.4	48.6
	38-47	72.5	27.5	56.7	43.3
	48-57	64.1	35.9	51.8	48.2
	Over 57	58.6	41.4	49.5	50.5

Source: Fieldwork (2019).

Inquiry on stakeholders based on their gender responses followed the above first two enquiries and found out that male stakeholders from urban communities were more informed on the environmental terms: climate change, global warming, acid rain and ozone layer depletion than their rural counterparts. This finding is in line with the submission of Ogunbode and Arnold [28] who reported that male respondents scored significantly higher percentage than the female respondents in terms of measured knowledge on environmental issues, and as well reported a higher rate of encounter with environmental information.

Table-4. Stakeholders' responses on climate change by gender.

Sex	Option	Urban communities		Rural communities	
		YES (%)	NO (%)	YES (%)	NO (%)
Have you heard of global warming	Male	73.5	26.5	30.6	69.4
	Female	66.8	33.2	21.8	78.2
Have you heard of ozone layer depletion	Male	74.6	25.4	46.3	53.7
	Female	78.9	21.1	37.4	62.6
Have you heard of acid rain?	Male	82.7	17.3	63.2	36.8
	Female	77.1	22.9	58.8	41.2
Have you heard of climate change	Male	86.3	13.7	67.6	32.4
	Female	78.5	21.5	55.3	44.7

Source: Fieldwork (2019).

Another major question that was asked to stakeholders has to do with causes of environmental problems such as acid rain, ozone layer depletion; global warming and climate change because if this is ascertained, it will be a stepping stone towards discouraging activities that can continuously aggravate the challenge. The result as presented in Table 5 suggested that the percentage of students that were aware of the cause and solution to environmental problems such as global warming, ozone layer depletion, acid rain and climate change were the highest for stakeholders from urban communities; followed by that of public/civil servants and finally traders/businessmen. These findings can be said to have met the prior expectation, given the fact that most of the traders in the state were nonchalant of issue not affecting their businesses directly. The result further revealed that stakeholders that were farmers from the rural communities were the least among the respondents who had limited knowledge on the causes of environmental problems; followed by traders/businessmen and artisans. The study revealed that students were the stakeholders from the rural communities that were more knowledgeable on the causes of environmental problems; followed by those who were public/civil servants. Overall, stakeholders from urban communities had a higher percentage of knowledge on the causes of environmental problems than their rural counterparts.

A look at Table 5 critically, shows that though the proportion of stakeholders that were students and public/civil servants who are knowledgeable on the causes of ozone layer depletion from rural communities were higher than that of traders/businessmen, artisans and farmers but in terms of action plans that should be taken to reduce these environmental problems such as global warming and ozone layer depletion, the proportion of stakeholders that were traders/businessmen, artisans and farmers who are aware of these further reduced. This is an indication that there is need for public awareness creation on the subject matter since our everyday activities contribute to some of these global environmental challenges.

Critical study of the analysis in Table 6 which sought to know the general responses of stakeholders on different actions that can affect the climate as well as the general understanding of the different roles and awareness of climate problems by the five major classified stakeholders in the state revealed that a higher percentage of them from urban settlements consented to the question that the use of chemicals for agriculture, cutting down of tress and bush burning as well as firm emission from vehicles impacts on the climate. However, a lower percentage of stakeholders from the urban communities acclaimed to dispose their waste indiscriminately without recourse to sorting or separation. Also revealed in Table 6 is that a higher percentage of urban stakeholders fell short of switching off their electrical appliances before leaving their apartments.

Table-5. Stakeholders' responses on the causes of environmental problems.

Urban communities					Rural communities				
Global warming	**Do you know the cause?**		**Do you know of any action you can take to reduce it?**		**Global warming**	**Do you know the cause?**		**Do you know of any action you can take to reduce it?**	
	Yes	**No**	**Yes**	**No**		**Yes**	**No**	**Yes**	**No**
	F %	**F %**	**F %**	**F %**		**F %**	**F %**	**F %**	**F %**
Farming	55 (70.5)	23 (29.5)	55 (70.5)	23 (29.5)	Farming	126 (38.8)	198 (61.2)	126 (38.8)	198 (61.2)
Artisans	81 (54.7)	67 (45.3)	81 (54.7)	67 (45.3)	Artisans	52 (40.6)	76 (59.4)	52 (40.6)	76 (59.4)
Traders/ business	166 (55.0)	136 (45.0)	160 (52.9)	142 (47.1)	Traders/business	119 (40.5)	175 (59.5)	99 (33.6)	195 (66.3)
Public/ civil servants	195 (99.8)	1 (0.2)	190 (96.9)	6 (3.1)	Public/civil servants	95 (96.9)	3 (3.1)	95 (96.9)	3 (3.1)
Student	248 (96.8)	8 (3.2)	248 (96.8)	8 (3.2)	Student	125 (91.9)	11 (8.1)	125 (91.9)	11 (8.1)
Ozone layer depletion	**Do you know the cause?**		**Do you know of any action you can take to reduce it?**		**Ozone layer depletion**	**Do you know the cause?**		**Do you know of any action you can take to reduce it?**	
	Yes	**No**	**Yes**	**No**		**Yes**	**No**	**Yes**	**No**
	F %	**F %**	**F %**	**F %**		**F %**	**F %**	**F %**	**F %**
Farming	47 (60.3)	31 (39.7)	47 (60.3)	31 (39.7)	Farming	119 (36.7)	205 (63.3)	113 (34.8)	211 (65.2)
Artisans	86 (58.1)	62 (41.9)	86 (58.1)	62 (41.9)	Artisans	61 (47.7)	67 (52.3)	50 (39.1)	78 (60.9)
Traders/ business	215 (71.2)	87 (28.8)	209 (69.2)	93 (30.8)	Traders/ business	123 (41.8)	171 (58.2)	108 (36.7)	186 (63.3)
Public/ civil servants	196 (100)	0 (0)	196 (100)	0 (0)	Public/civil servants	91 (92.8)	7 (7.2)	91 (92.8)	7 (7.2)
Student	252 (98.4)	4 (1.6)	252 (98.4)	4 (1.6)	Student	131 (96.3)	5 (3.7)	131 (96.3)	5 (3.7)
Acid rain?	**Do you know the cause?**		**Do you know of any action you can take to reduce it?**		**Acid rain?**	**Do you know the cause?**		**Do you know of any action you can take to reduce it?**	
	Yes	**No**	**Yes**	**No**		**Yes**	**No**	**Yes**	**No**
	F %	**F %**	**F %**	**F %**		**F %**	**F %**	**F %**	**F %**
Farming	59 (75.6)	19 (24.4)	55 (70.5)	23 (29.5)	Farming	100 (30.8)	224 (69.2)	100 (30.8)	224 (69.2)
Artisans	96 (64.9)	52 (35.1)	91 (61.5)	57 (38.5)	Artisans	42 (32.8)	86 (67.2)	42 (32.8)	86 (67.2)
Traders/ business	222 (73.5)	80 (26.5)	189 (62.6)	113 (37.4)	Traders/ business	102 (34.7)	192 (65.3)	102 (34.7)	192 (65.3)
Public/ civil servants	193 (98.5)	3 (1.5)	193 (98.5)	3 (1.5)	Public/civil servants	97 (98.9)	1 (1.1)	97 (98.9)	1 (1.1)
Student	247 (96.5)	9 (3.5)	247 (96.5)	9 (3.5)	Student	134 (98.5)	2 (1.5)	134 (98.5)	2 (1.5)
Climate change	**Do you know the cause?**		**Do you know of any action you can take to reduce it?**		**Climate change**	**Do you know the cause?**		**Do you know of any action you can take to reduce it?**	
	Yes	**No**	**Yes**	**No**		**Yes**	**No**	**Yes**	**No**
	F %	**F %**	**F %**	**F %**		**F %**	**F %**	**F %**	**F %**
Farming	67 (85.9)	11 (14.1)	67 (85.9)	11 (14.1)	Farming	114 (35.2)	210 (64.8)	90 (27.8)	234 (72.2)
Artisans	117 (79.1)	31 (20.9)	117 (79.1)	31 (20.9)	Artisans	50 (39.1)	78 (60.9)	34 (26.6)	94 (73.4)
Traders/ business	237 (78.5)	65 (21.5)	237 (78.5)	65 (21.5)	Traders/ business	111 (37.8)	183 (62.2)	88 (29.9)	206 (70.1)
Public/ civil servants	196 (100)	0 (0)	196 (100)	0 (0)	Public/civil servants	95 (96.9)	3 (3.1)	95 (96.9)	3 (3.1)
Student	254 (99.2)	2 (0.8)	254 (99.2)	2 (0.8)	Student	136 (100)	0 (0)	136 (100)	0 (0)

Source: Fieldwork (2019).

Table-6. General responses of different actions that can affect the climate (yes responses).

Urban Communities												
Variable	**Do you think that use of chemicals for agriculture affects the environment**		**Do you think that cutting down trees and bush burning affect the environment**		**Are you concerned about smoke emitted by vehicles?**		**Do you separate your waste at source?**		**Do you know the effects of disposing waste in the drainage channel during rainfall?**		**Do you switch off your electrical appliances before leaving your apartment?**	
	Yes (%)	**No (%)**	**Yes (%)**	**No (%)**	**Yes (%)**	**No (%)**	**Yes (%)**	**No (%)**	**Yes (%)**	**No (%)**	**Yes (%)**	**No (%)**
Farming	80.8	19.2	68.3	31.7	56.4	43.6	48.1	51.9	57.6	42.4	46.5	53.5
Artisans	77.4	22.6	61.6	38.4	51.8	48.2	42.2	57.8	61.5	38.5	41.9	58.1
Traders/business	71.9	28.1	70.8	29.2	53.3	46.7	41.6	58.4	67.3	32.7	43.2	56.8
Public/civil servants	83.6	16.4	84.3	15.7	73.9	26.1	48.3	51.7	86.1	13.9	47.4	52.6
Student	91.2	8.8	92.5	7.5	81.4	18.6	52.5	47.5	91.7	8.3	49.8	50.2
Rural Communities												
Variable	**Do you think that use of chemicals for agriculture affects the environment**		**Do you think that cutting down trees and bush burning affect the environment**		**Are you concerned about smoke emitted by vehicles?**		**Do you separate your waste at source?**		**Do you know the effects of disposing waste in the drainage channel during rainfall?**		**Do you switch off your electrical appliances before leaving your apartment?**	
	Yes (%)	**No (%)**	**Yes (%)**	**No (%)**	**Yes (%)**	**No (%)**	**Yes (%)**	**No (%)**	**Yes (%)**	**No (%)**	**Yes (%)**	**No (%)**
Farming	42.6	57.4	38.3	61.7	45.0	55.0	19.3	80.7	34.5	65.5	18.0	82.0
Artisans	45.3	54.7	43.0	57.0	35.1	64.9	25.3	74.7	37.9	62.1	34.2	65.8
Traders/business	43.1	56.9	36.1	63.9	37.8	62.2	28.1	71.9	41.4	58.6	31.7	68.3
Public/civil servants	67.8	32.2	76.5	23.5	60.4	39.6	41.5	58.5	73.0	27.0	43.4	56.6
Student	74.5	25.5	81.9	18.1	73.8	26.2	46.4	53.6	77.2	22.8	46.0	54.0

Source: Fieldwork (2019).

Table 6 further revealed that more than 50% of stakeholders that were traders/businessmen, artisans and farmers in the rural communities were deficient in knowledge that the use of chemicals for agriculture, cutting down of trees and bush burning impacts on the environment; and equally were not concerned about the smoke/firms emitted by their vehicles and other automobiles. A higher proportion of these same stakeholders do not separate their waste at source neither do they switch off their electrical appliances before leaving their apartments. Also more than 50% of stakeholders from the rural communities that were students and public/civil servants interviewed, do not separate their waste at source before final disposal nor switch off their electrical appliances before leaving their various apartments.

Similarly, results presented in Table 7 below which analyses the general understanding of the different roles and awareness level of climate problems by stakeholders from both urban and rural communities, suggested that only stakeholders who were students and public/civil servants from urban scored over 80% for responses which confirmed that they have a role to play in resolving the environmental problems; and also believing that environmental awareness is necessary. Although, responses of stakeholders from the sampled rural communities who believed that they have a role to play in resolving environmental problems revealed students' as the only stakeholders to score over 80%; followed by public/civil servants (76.8%), artisans (63.1%), trades/businessmen

(58.4%) and farmers (57.3%). Overall, stakeholders from the rural communities consented that environmental awareness is necessary with all scoring above 50%.

Table-7. General understanding of their different roles and awareness of climate problems.

Urban communities					Rural communities				
Occupation	**Do you think you have role to play in environmental problems?**		**Do you think that environmental awareness is necessary?**		**Occupation**	**Do you think you have role to play in environmental problems?**		**Do you think that environmental awareness is necessary?**	
	YES (%)	**NO (%)**	**YES (%)**	**NO (%)**		**YES (%)**	**NO (%)**	**YES (%)**	**NO (%)**
Farming	71.6	28.4	68.5	31.5	Farming	57.3	42.7	52.0	48.0
Artisans	67.9	32.1	73.2	26.8	Artisans	63.1	36.9	50.4	49.6
Traders/business	72.3	27.7	80.5	19.5	Traders/ business	58.4	41.6	65.9	34.1
Public/civil servants	85.8	14.2	92.1	7.9	Public/civil servants	76.8	23.2	71.3	28.7
Student	94.1	5.9	96.0	4.0	Student	80.5	19.5	77.3	22.7

Source: Fieldwork (2019).

Table-8. Environmental attitude of the respondents.

Questions	Options	Urban Communities (%)	Rural Communities (%)
How do you normally deal with wastewater, such as washing waster etc.?	splashed somewhere conveniently	69.2	87.6
	Sewage pipes (no treatment)	28.3	11.7
	Sewage pipes (with treatment)	2.4	0.7
How do you normally deal with domestic garbage?	Dispose off conveniently without recourse to the environment	72.4	88.2
	Dispose in garbage can	9.2	3.7
	Disposed after sorted	1.1	0
	Other ways	17.3	8.1
How do you normally deal with human & animal wastes?	Use as fertilizer	6.8	28.7
	Dispose on an close water body	35.4	16.5
	Throw in garbage bin	4.6	2.1
	Pay someone to clean up	19.3	0.4
	Centralized treatment	0.8	0
	No treatment (just dispose off in any close by)	33.1	52.3

Source: Fieldwork (2019).

Environmental attitude includes individual attitude towards the environment in everyday life, and is measured by the participation attitude exhibited by stakeholders in the field of environmental protection and oversight. Among these, the attitude of stakeholders residing in the communities on daily bases is commonly deemed to be the most important feature. An analysis of responses on environmental attitude of stakeholders revealed that stakeholders from urban communities terms to be more cautious in mismanaging the environment than their rural counterparts. This is revealed in Table 8 as 69.2% of urban dwellers against 87.6% of rural communities' term to splash their wastewater somewhere convenient for them, 28.3% against 11.7% make use of sewage pipe with no treatment and 2.4% against 0.7% uses sewage pipes with treatment. Further revealed in Table 8 is how both stakeholders normally manage their domestic garbage. The result shows that 72.4% of stakeholders from urban communities against 88.2% of their rural counterparts dispose off their domestic garbage conveniently without recourse to the environment; 9.2% against 3.7% dispose in garbage can, 17.3% against 8.1% uses other methods to dispose their waste. Finally, analysis on how they manage human and animal wastes revealed that 28.7% of the rural stakeholders against 6.8% of urban stakeholders make use of the waste as fertilizer for farming, 16.5% against

35.4% dispose on any close water body, 2.1% against 4.6% throw in garbage bin, 0.4% against 19.3% pays someone to clean up, 52.3% of rural stakeholder against 33.1% of urban just dispose off in any close by without recourse to treatment.

Table-9. Behaviour of respondents toward environmental improvement.

Questions	Options	Urban communities (%)	Rural communities (%)
Who do you think should bear the responsibility to improve the environment?	No need to improve	1.9	6.1
	Improve by government	55.3	76.5
	Improve by individuals & society	42.8	17.4
What do you think of government's policy on measures to protect the environment?	I oppose this measures	1.4	16.7
	I do not care about it	0.6	33.5
	Comply with government directions	42.3	22.9
	I support these measures	24.1	12.3
	I strongly support these measures	31.6	14.6
Would you consent to make payment to implement some measures for environmental protection?	Unwilling to pay	4.3	19.4
	follow general trend (other advice)	18.3	38.2
	Comply with the direction made by local government	49.6	33.8
	willing to pay	27.8	8.6

Source: Fieldwork (2019).

The behaviour of stakeholders toward environmental improvement includes respondents' responsibility to improve the environment, willingness to pay for environmental protection and a cultured attitude toward environmental protection measures. Table 9 revealed that stakeholders from the urban communities had a relatively positive behaviour toward environmental improvement compared with their rural counterparts. On the spot assessment and interview revealed that the main reason was that stakeholders from the urban settlements were more exposed to modern technology and informed than their rural counterparts. For instant, their responses to the question on if they will consent to make payment to implement some measures for environmental protection revealed that 49.6% of stakeholders from urban dwelling consented to comply with the directives made by their local government when compared to 33.8% of their rural counterparts. Also, 27.8% of urban stakeholders showed willingness to pay whereas only 8.6% of the rural stakeholders were willing to pay. With particular emphasis on the issue of who should bear the responsibility of improving the environment, 76.5% of the rural stakeholders against 55.3% of the urban stakeholder claimed that it is the sole responsibility of government to improve the environment; 17.4% against 42.8% of urban stakeholders consented that individuals and society should improve the environment and 6.1% of rural stakeholders against 1.9% of urban confirmed that there was no need to improve the environment Table 9. Similarly, stakeholders whose thought that it would be wise to oppose government policy on measures to protect the environment accounted for 16.7% for rural stakeholders to 1.4% for urban stakeholders. 33.5% of rural stakeholders against 0.6% of stakeholders from urban dwellings do not care of complying with the policies.

3. CONCLUSION AND RECOMMENDATIONS

This study attempt to evaluate the level of awareness that have been created in Delta state among stakeholders on environmental problems. Findings from the study have revealed that by and large, there is a very low awareness level on the environmental challenges assessed across the state with emphases on the responses of stakeholders that resides within the urban and rural settlements in the state which call for more awareness creation. Also, the study revealed that majority of the stakeholders in the rural settlements of the state are still not aware of the effects of chemical usage for agriculture; falling down of trees and bush burning; firms emitted by vehicles and automobiles;

separation of waste at source; disposing waste in the drainage channel during rainfall as well as switching off electrical appliances before leaving one's apartment. There is need for aggressive environmental awareness campaign in the state in order to make headway in her fight for environmental sustainability. It should also be stressed that different stakeholders including the government and the governed have their various roles to play in maintaining a stable environment. Therefore, this study recommends that given the current level of environmental degradation experienced on a daily base in Nigeria and limited awareness level of stakeholders on environmental issues, government at various levels should through wider publicity in the ministries of environment and education intensify the campaign on environmental education in order to develop a reasonable level of stakeholders knowledge base on environmental problems.

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