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Farmers' demographic variables: An insight into environmental conservation in Calabar

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This study examined the influence of farmers' demographic variables on environmental conservation in Calabar education zone of Cross River State, Nigeria. Four null hypotheses were formulated and tested. The total number of registered farmers in the State with the Ministry of Agriculture and Natural Resources, Calabar were 28,248. Eight communities in Calabar education zone were selected; purposive sampling was used to obtain 376 respondents. A 33 items questionnaire was used to collate data. Cronbach Alpha method was used to estimate the reliability of the questionnaire. Independent t-test and one-way analysis of variance were used to test the hypotheses and significance was accepted at $p \leq 0.05$. The results obtained indicate that the level of education does not influence environmental conservation. Rather, income level and knowledge of the environment significantly influenced environment conservation. Thus, people should be educated and informed about the need for environmental conservation.

INTRODUCTION

Conservation of life and environmental resources by humans depends on the understanding and knowledge (Ogunjinmi et al., 2013). The capacity and willingness to engage conservation and protection of endangered species in our environment depends on some demographic variables. It is very important to conserve the environment to save environmental resources, reduces level of pollution and waste. It has been observed that environmental conservation plays a role in a nation's development process. A conserved environment provides the background for continuous human existence, sustainable agricultural production and advancement of tourism. Government and private organizations, showed great interest in the conservation of environment (Aja, 2005). A properly conserved environment serves human in three basic dimensions: as a resource bank for raw

materials; as a habitat; and as a sink for waste absorption (Ndahlahwa,2005). Poor conservation of the environment poses a major challenge to development (Olalekan, 2004). A defective or pseudo-conservation programmes by government and non-governmental organization usually pave ways for a widespread deforestation, erosion, soil depletion, biodiversity annihilation and extinction. The Nigerian environment today is represented with litany of environmental conservation neglect. Considering the role of environmental conservation in livelihood, there is urgent need for environmental protection and conservation (Ajao et al., 2009). Pollution of environment by fumes emitted from the use of plan generators has adverse effects on the health of the populace and atmospheric oxygen, exemplified in ozone layer depletion, acid rain and poor visibility from inorganic particles. Conservation of environment is a way which preserved natural resources can be sustained. One factor that influence people towards conservation practices is income level (Lise, 2000). The rich and poor are

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responsible for deforestation of the forest and depletion of forest resources (Abdullahi, 2012). The poor interaction of human with the environment has left unguided impacts on the environment. In parts, human knowledge through education has transformed the environment to imbalances in the ecosystem (Zarrintaj et al., 2011). These changes exposed so many species to hazard. Ogunbode and Arnold (2012) asserted that in the sub-Saharan Africa and other third-world countries, environmental pollution has aggravated widespread poverty, rapid population growth and negligence on environmental sustainability. Knowledge on the environment must go beyond awareness on individuals to finding the relationship that exists between the biotic, abiotic and human life (Offiong et al., 2014). This implied that, knowledge and understanding by humans change of attitude and behaviour worthy of good environmentalist (Petters et al., 2010). It is necessary to raise the environmental consciousness of Nigerians to transform their vague awareness to environmental conservation.

As human population increases, coupled with global environmental burden facing the earth, it is necessary to assess the degree of environmental knowledge on selected farmers based on demographic variables to identify, solve and prevent environmental pollution.

Identity theory by Stryker (1980) cited in Sheldon (2007)

Identity theory was propounded by Sheldon Stryker in 1980. The theory states that "the more one is dedicated to an identity, the higher the identity will be in the salience hierarchy and if the identity is positively assessed in terms of the reactions of others and broader value standards, then the identity will move up an individual's hierarchy". The theory begins with structural and symbolic interactions (Sheldon, 2007). The author opined that the behaviour exhibited by humans is arranged by symbolic descriptions of different parts of natural environment. Identity theory associate with reason why irrational behaviors are sometimes perpetuated in human. According to Stets and Carter (2011), identity theory deals with gender which is categorized into three: person identities, role identities, and social identities. Person identities refer to the self-meanings such as being dominant, competitive, caring, or honesty that allows the person to realize a sense of individuality.

Theory of planned behaviour by Ajzen (1991)

Ajzen's theory of planned behaviour (TPB) was propounded by Icek Ajzen in 1985 in addition to the theory of reasons and actions by Martin Fishbein. These include the determination of human behaviour (Ajzen,

1991). The theory states that, 'attitude toward behaviour, subjective norms, and perceived behavioural control, together shape an individual's behavioural intentions and behaviour' (Stets and Carter, 2011).

Environmental awareness conceptual model (1999)

This was proposed by Partanen-Hertell et al. (1999), as a model that explains the stages of environmental awareness developed among individuals within a given society to the point that the individuals become committed to environmental matters. This awareness starts developing when people notice unsuitable and life threatening conditions in the environment. The realization that a degraded environment takes a long period to restore itself stimulates Partanen-Hertell and others to create a system that shows how environmental awareness develops (Figure 1).

Firstly, knowledge, motivation and skills for and about the environment are based on a growing concern over unfavourable changes in the environment. There is a general feeling by people; organizations and institutions that the state of the environment is degenerating and something should be done to improve it. At this stage, people do not see themselves as actors in the process of improving or restoring the environment. They look up to the government, scientists, non-governmental organizations and international communities to intervene and work out strategies towards improving or restoring environmental quality (Partanen-Hertell et al., 1999).

Secondly, there is an increase in the level of environmental awareness basically as a result of environmental laws and administrative structures that are effective and functional in the state. In addition, the systems for monitoring the current state of the environment and evaluation have been put in place. The utilization of facilities, systems and adequate technologies for the control of environmental pollution are efficiently used. However, it is expected that the separate environmental conservation measures for pollution control do work together to succeed but the measures do not support each other. The programmes to raise environmental awareness of people in the society are schedule to commence from the most influential category.

Knowledge, motivation and skills are in a growing synergy in the third stage. Issues pertaining to the environment become part and parcel of professional and public awareness. Awareness about the environment and conservation supports the sustainability of the environment and the society made advances from a carbon based economy which pollutes the environment to a green economy which supports the conservation of the environment.

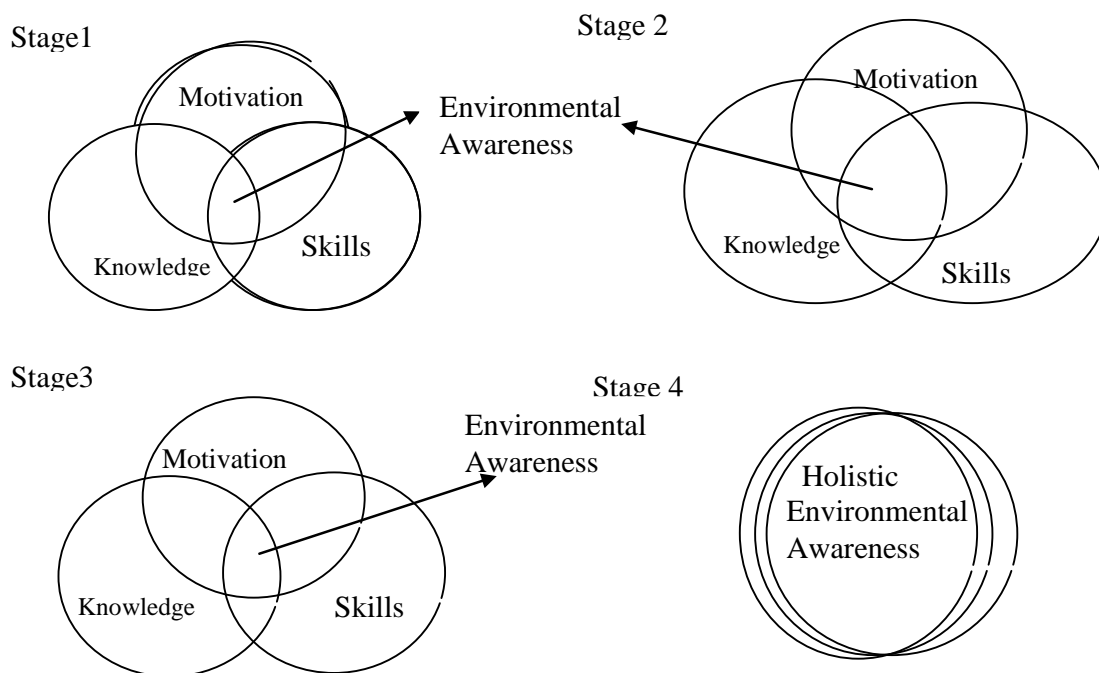Fourthly, awareness about the environment is

Figure 1. A scheme of environmental awareness.
Source: Partanen-Hertell et al. (1999).

incorporated into different disciplines, professional training and community based programmes to a point that it becomes part of the individual and affects life choices. There is a holistic and comprehensive development of knowledge, motivation and skills about the environment. The environment is now perceived from another angle not the anthropocentric point of view that regards humans as masters of the world but rather seen from a biocentric point of view that all living things have their right to existence. Therefore, the environment is no longer considered to belong to a philosophy known as anthropocentrism, which in earlier stages gave rise to excessive consumption of environmental resources.

The quest for development, human anthropogenic activities such as deforestation for agriculture and urban growth gave rise to continuous insult and degradation to the environment. Agriculture and urban growth have reduced the stability and diversity of the ecosystem and the impact on climate change is increasing. Trees are cut down, some animal species are annihilated and soil is depleted of nutrient by erosion. This research evaluated whether farmers demographics variable may influence the conservation and protection of environment.

Research questions

The research questions were formulated to guide this study.

i. Does income level influence environmental conservation in Calabar Education Zone, Cross River State?
ii. How does knowledge of the environment influence environmental conservation?
iii. Does the level of education influence environmental conservation in Calabar Education Zone, Cross River State?

The following hypotheses were formulated and tested.

i. Income level does not significantly influence environmental conservation.
ii. Level of education does not significantly influence environmental conservation.
iii. Knowledge of the environment does not significantly influence environmental conservation in Calabar Education Zone, Cross River State.

METHODOLOGY

Study area

This research was carried out in Calabar Education Zone of Cross River State, Nigeria. The study area is made up of Akamkpa, Akpabuyo, Bakassi, Biase, Calabar Municipality, Calabar South and Odukpani Local Government Areas (LGA). According to Balogun (2009),

Table 1. Population distribution of registered farmers per Local Government Area.

Local government	Registered farmers
Akamkpa	6909
Akpabuyo	7809
Biase	4509
Odukpani	9021
Total	28248

Source: Ministry of Agriculture and Natural Resources, Cross River State (2016).

the study area is lies between latitude 04°27' and 05°32' North of the Equator and longitude 07°50' and 09°28' East of the Greenwich Meridian. It is bounded to the north by Yakurr LGA, to the south by Atlantic Ocean, to the east by the Republic of Cameroon and to the west by Abia and Akwa Ibom States, respectively.

Four out of the seven LGAs were covered in this research. They are Awi, Mbarakom, Ikot Nakanda, Atimbo East, Adim, Ehom, Eki and Ekori Anaku villages in Calabar Education Zone.

Study population

The study population consists of all the farmers in Calabar Education Zone who have registered with Ministry of Agriculture and Natural Resources, Cross River State in the year 2016. Statistics from the ministry as at 2016 revealed that 42,060 registered farmers live in Calabar Education Zone. The population distribution for the study consists of registered farmers in Akamkpa, Akpabuyo, Biase and Odukpani LGAs of Cross River State. The population is estimated to be 28,248 registered farmers. The population distribution is presented in Table 1.

Sampling technique

Purposive sampling technique was adopted to choose four LGAs out of seven in Calabar Education Zone and two villages from the four LGAs was also chosen. The researcher adopted purposive sampling technique because of the prevalence of deforestation in the selected LGAs and the ease with which the method afforded the researcher to get responses from respondents.

Registered farmers were located in their homes in the eight villages and questionnaires were administered to them.

Sampling

A total of 376 farmers who registered with Ministry of Agriculture and Natural Resources, Cross River State in the year 2014 was the sample size for this study. This is a proportion of 9% of the registered farmers in the eight villages (a total 28,248 registered farmers) was used for the study. This percentage represents a sizable homogenous population (farmers only) that the researcher could effectively managed. The sample size is presented in Table 2.

Instrumentation

Questionnaire was the instrument used for collecting data. The questionnaire was divided into three sections. Respondents' personal data was contained in section 1. Sections 2 and 3 consisted of 10 and 20 items designed to measure knowledge of the environment and conservation, respectively. The instrument was designed with response options; SA stand for strongly agree which attracted 4 points, A stand for agree which attracted 3 points, D stand for disagree which had 2 points and SD stand for strongly disagree 1 point only for all worded items that are positive. For worded items that are negative, the scoring was reversed.

Statistical analysis

The hypotheses were tested using one way analysis of variance (ANOVA) and Scheffe Post Hoc test. P≤0.05 was considered statistically significant.

RESULTS

Hypothesis one

Income level does not significantly influence environmental conservation in the study area. In hypothesis two, income level is the independent variable while environmental conservation is the dependent variable. From the results in Table 3 (p≥0.05), therefore hypothesis was rejected. This shows that income level significantly influence environmental conservation in the study area. To find out the source of difference, Scheffe Post Hoc test for income level and environmental conservation was carried out. The result is shown in Table 4.

From the result of the Scheffe Post Hoc test in Table 4, we can observe that the result is significant when comparing those that earn below ₦100,000 with those that earn between ₦100,000–₦200,000 but not significant when comparing those that earn below ₦100,000

Table 2. Distribution of sampled farmers across the Local Government Areas and towns.

Local Government Areas	Towns	Numbers of registered farmers	Numbers of selected farmers
Akamkpa	Awi	896	77
	Mbarakom	182	16
Akpabuyo	Atimbo East	519	47
	Ikot Nakanda	579	52
Biase	Adim	726	65
	Ehom	758	63
Odukpani	Eki	82	7
	Ekori Anaku	440	40
	Total	4182	367

Table 3. Summary of ANOVA between income level and environmental conservation.

Income level	N	Mean $\bar{X}$	SD		
Below ₦100,000	146	57.23	6.00		
₦100,000 to ₦200,000	188	58.87	6.15		
Above ₦200,000	33	58.64	5.13		
Total	367	58.20	6.04		
Source of variance	**Sum of squares**	**Df**	**Mean square**	**F**	**p-value**
Between groups	227.83	2	113.91	3.16*	0.04
Within groups	13138.67	364	36.10		
Total	13366.48	366			

*Significant at 0.05 alpha level. p≤0.05, Critical F=3.04.

Table 4. Scheffe Post Hoc test for income level and environmental conservation.

Income level	N	Mean	SD	T	p-value
Below ₦100,000	146	57.23	6.00	1.64*	0.048
₦100,000 to ₦200,000	188	58.87	6.15		
Below ₦100,000	146	57.23	6.00	1.64*	.048
Above ₦200,000	33	58.64			
₦100,000 to ₦200,000	188	58.87	6.15	0.24	0.98
Above ₦200,000	33	58.64	5.13		

*Mean difference is significant at p≤0.05.

with those that earns above ₦200,000. Finally, the result is not significant when comparing those that earn between ₦100,000–₦200,000 with those that earns above ₦200,000.

Hypothesis two

Level of education does not significantly influence environmental conservation in Calabar Education Zone, Cross River State. In hypothesis three, level of education is the independent variable while environmental conservation is the dependent variable. This hypothesis was tested with (ANOVA) as presented in Table 5.

From the results in Table 5 (p≤0.05), the hypothesis that educational qualification does not significantly influence environmental conservation in Calabar Education Zone was upheld.

Table 5. Summary of ANOVA between level of education and environmental conservation.

Level of education	Number of samples (N)	Mean	Standard deviation
Primary	102	57.36	6.15
Secondary	224	58.60	6.12
Tertiary	21	57.62	4.03
Total	367	58.20	6.04
Variance	**Sum of square**	**DF**	**Mean square**
Between groups	117.31	2	58.66
Within group	13249.17	364	36.40
Total	13366.17	366	

Not significant at 0.05 alpha level. p>0.05, Critical F=3.04.

Table 6. Summary of (ANOVA) between knowledge of the environment and environmental conservation (N=367).

Knowledge about environment	N	Mean $\bar{X}$	SD		
Low	61	51.64	1.74		
Moderate	241	58.56	5.77		
High	65	63.03	3.98		
Total	367	58.20	6.04		
Source	**Sum**	**df**	**Mean**	**F**	***p*-value**
Of variance	Of squares		square		
Between groups	4172.98	2	2086.49	82.61*	0.00
Within groups	9193.50	364	25.26		
Total	13366.48	366			

*Significant at 0.05 alpha level p≤0.05, Critical F=3.04.

Table 7. Scheffe Post Hoc test for knowledge of the environment and environmental conservation.

Knowledge about environment	N	Mean $\bar{X}$	SD	T-value	p-value
Low	61	51.64	1.74	6.92	0.00
Moderate	241	58.56	5.77		
Low	61	51.64	1.74	11.39	0.00
High	65	63.03	3.98		
Moderate	241	58.56	5.77	4.47	0.00
High	65	63.03	3.98		

*Mean difference is significant at the 0.05 level, p≤0.05.

Hypothesis three

Knowledge of the environment does not significantly influence environmental conservation in the study area. Knowledge of the environment was the independent variable while environmental conservation was the dependent variable. The hypothesis was tested using (ANOVA) as presented in Table 6.

From the results in Table 6 p≥0.05; as a result, hypothesis four was not accepted. This shows that knowledge of the environment significantly influence environmental conservation in Calabar Education Zone of

Cross River State.

To find out the source of difference, Scheffe Post Hoc test for knowledge of the environment and environmental conservation was carried out. The result is shown in Table 7. From the results, it is observed that the result is significant when compared with knowledge of the environment, it's low with those who have moderate knowledge of the environment and also significant when compared with those whose knowledge of the environment is low with those whose knowledge of the environment is high. Finally, the result is significant when compared with those whose knowledge of the environment is moderate with those whose knowledge of the environment is high.

DISCUSSION

Income level and environmental conservation

The results obtained in hypothesis one agree with Ezebilo et al. (2010) who stated that local residents who earned more income were those willing to contribute towards the conservation and improvement of the ecotourism project. Economic factor ranked first amongst the factors that made farmers retain some species of trees in their method of cultivation. This made Ajake (2012) to suggest that integration of deliberate forest tree retention and cultivation methods gives high yield of crops production.

Level of education and conservation

From the results of hypothesis two, the level of education does not significantly influence conservation in the selected study area. This result is in agreement with the reports of Philip et al. (2014). They suggested that traditional belief, practices and indigenous knowledge may help conserve the natural resources than adopting Western Rot approach. Although educational attainment of an individual plays a role in shaping perception, it does not necessarily translate to effective participation in the conservation of the environment.

Knowledge of the environment and environmental conservation

The result of hypothesis three is in line with Ajake (2012), who reported that farmers deliberately leave forest trees during clearing. The deliberate act of leaving trees and even planting certain species is as a result of environmental knowledge on the part of the indigenous farmers, which is a precursor of environmental literacy.

In addition, Omoogun and Odok (2013) stated that the workings of a human being's mindset go a long way to influencing how they act towards conserving natural resources. They observed that the relationship between awareness on the environment and the attitude of the local residents was significant and it tilt towards the conservation of the forest. The reason is that knowledge about the environment provides background knowledge and experience to engage in more pro-environmental conservation behaviours.

Conclusion

From the analysis of data and testing of hypotheses in this study, it can be inferred that farmers who earn more income are pivotal to improving and conserving the environment. The level of education of a farmer does not necessarily qualify the individual as environmental conservator. Farmers who have knowledge of the environment exert positive influence and can identify, solve, and prevent environmental problems.

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