Biodiversity Conservation Friendliness Status of Rural Farmers in Abak Agricultural Zone of Akwa Ibom State

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Authors’ contributions

This work was carried out in collaboration among all authors. Author JTE designed the study, performed the statistical analysis and wrote the protocol. Author JI wrote the first draft of the manuscript. Authors JTE and JI managed the analyses of the study. Author NUO managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Consolidating on farmers’ agro-ecological knowledge to design environmental-friendly agricultural systems is crucial given the environmental impact of commercial agriculture. The study aimed at assessing the awareness level of the respondents on biodiversity conservation, their biodiversity conservation information source(s), respondents’ information seeking behaviour and their perception towards biodiversity conservation. A survey was conducted on 120 respondents using simple random sampling procedure. Data collected were analysed using frequency distributions, and composite index analytical technique. Findings revealed that all of the respondents had average to high level of awareness of biodiversity conservation practices. Findings also revealed that the information on biodiversity conservation were mostly gotten from friends/neighbors, other farmers, radio/television and internet/electronic mails. The respondents had very positive or favourable perception of biodiversity conservation but biodiversity conservation information seeking behaviour of the respondents was not quite high. Six (6) independent variables contributed a 

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multiple correlation influence ($R = 0.606$) on the respondents’ perception on biodiversity conservation. However, awareness of biodiversity conservation ($\beta = 0.598$, $t = 6.882$, $P = 0.000$) was found to significantly and statistically influence the respondents’ perception on biodiversity conservation. These findings are crucial for policy orientations, research and development to efficiently support the implementation of more environmental-friendly farming systems in the study area.

Keywords: Biodiversity conservation; friendliness status; farmers; agricultural zone.

1. INTRODUCTION

Biodiversity also known as biological diversity refers to the degree to which individual organisms differ from one another. [1] defines biodiversity as a comprehensive umbrella term for the extent of nature’s variety or variation within the natural system; both in number and frequency. Biodiversity as a concept was first defined at the United Nations Convention on Biodiversity, 1992 as the variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and ecosystems [2].

Biodiversity is important to agriculture at both the subsistence and commercial levels. As observed by [3] biodiversity and most of its interactions are an integral part of agriculture’s productivity and sustainability. Human beings’ survival depends largely on biological resources. Africans and indeed Nigerians livelihood is dependent on having free and open access to a great variety of biological resources for food, fibre, fuel, medicines, housing materials and economic security [4]. According to [4] biodiversity represents an indispensable resource endowment as most rural Nigerians depend on herbal remedies for their primary health care, fuel wood and charcoal for energy sources and local plants materials as necessary farming implements, housing and craft.

Maintenance and sustainable utilization of biological resources are beneficial to humans while exploitation of same threatens human benefits. There is need to conserve biodiversity in view of its importance on socio-economic lives and survival of human beings. Conservation of biological resources is to avoid extinction of species and ecosystem for all time benefit to human beings.

It has been recorded that biodiversity is under serious threat today. It is being destroyed at an alarming rate. The principal cause of this threat is the degradation and destruction of habitats by human actions [4].

Human activities on ecosystem are steadily transforming them into poor system as they have altered the global environment [5]. Alterations in biodiversity and ecosystem properties affect the cultural, intellectual, aesthetic and spiritual values that are important to society. As observed by [6] some major threats to biodiversity conservation in Nigeria include poverty, economic development, incomplete or non implementation and non ratification by government of international treaties and conventions on conservation issues, ambiguous governmental laws on biodiversity, climate change, pollution, invasion by alien species etc.

This is in addition to economic impacts related to the reduction of food resources, fuel and structural materials, medicinal or genetic resources as well as abundance of other species that control ecosystem processes leading to further changes in community composition and vulnerability to extinction [5].

Agriculture in Nigeria and particularly Akwa Ibom State is largely based on traditional technology. Continuous farming and shifting cultivation remains a major farming system which are the primary cause of habitat destruction. These farming methods destroy vegetation alongside Indiscriminate bush burning and overgrazing. Possible remedies include concerted effort towards the implementation and ratification of treaties and conventions on biodiversity, educating the populace to forgo cultural practices that are inimical to conservation of biological resources [6] and possible empowerment of local people who depends largely on the ecosystem for their survival.

There seems to be a rise in national, regional, and international policy mechanisms aimed at biodiversity conservation [7]. Formation of protected areas, species protection and recovery measures for threatened species, ecosystem restoration, ex-situ and in-situ conservation
services, incorporating consideration of biodiversity conservation into management practices in sectors such as agriculture, forestry and fisheries, capture of benefits by local communities, public awareness, communication and education, integration of biodiversity conservation and development are some of the actions taken for biodiversity conservation [5] cited among others.

Behavioural adjustments can be seen as an outcome of effective awareness efforts and the awareness processes can be driven intrinsically and extrinsically. [8] propounded a behavioural change theory which states that when knowledge increases, environmentally favourable attitudes that lead to responsible environmental actions are developed. This directly implies that if people were better informed, they would become more aware of environmental problems and consequently be motivated to behave in an environmentally responsible manner. Biodiversity conservation practices as conceptualized in this study are concerned with the preservation, maintenance, sustainable use, recovery and enhancement of the components of biological diversity.

To promote societal responsiveness toward biodiversity conservation, there is need to comprehend how biodiversity and its resulting ecosystem services are perceived by humans [9,10]. Moreover, understanding and acknowledging residents’ knowledge and perceptions about biodiversity conservation is an important part of a process of engaging with local communities and building constructive relationships between residents and protected area management [11]. Here, perceptions refer to the way humans understand, interpret, and value biodiversity and ecosystem services [10]. However, understanding the links between biodiversity, ecosystem services, and human perceptions still remains a critical challenge. Strategies to stop the loss of biodiversity in agricultural areas will be more successful if farmers are well informed and have the means to understand changes in biodiversity on their farms and to assess the effectiveness of biodiversity promoting measures. The construct of biodiversity conservation friendliness status portrays the extent of familiarity that the farming households have about the advantages and disadvantages of biodiversity conservation. This would also be characterized by the preparedness of the farming households to understand the principles of biodiversity conservation and their willingness to voluntarily seek for biodiversity conservation information so that they could take relevant actions.

Nsengimana et al. [5] noted that the majority of the rural population in developing countries are poor and illiterate and are economically and socially disadvantaged and their information needs have not been receiving much attention. It is not clear whether farmers in Abak agricultural zone of Akwa Ibom State are familiar with and conscious of biodiversity conservation; what their perception is on biodiversity conservation and how they source for information about biodiversity conservation practices. This study is therefore an attempt to provide answers to these unanswered questions by assessing biodiversity conservation friendliness status among rural farmers in Abak Agricultural Zone of Akwa Ibom State.

The study specific objectives were to identify the socio-economic characteristics of the rural farmers, assess the respondents’ awareness level of biodiversity conservation practices, identify the biodiversity conservation information sources of the respondents, examine the biodiversity conservation information seeking behaviour of the respondents, examine the perception of the respondents on biodiversity conservation and determine the relationship between selected predictors (age, household size, years of formal education, monthly income, awareness of biodiversity conservation and biodiversity conservation information seeking behaviour) and the respondents’ perception on biodiversity conservation.

2. METHODOLOGY

The study was conducted in Abak agricultural zone of Akwa Ibom State, Nigeria. It is located in the coastal southern part of the country; it covers a total land area of 7249 km². Akwa Ibom State has six (6) agricultural zones namely: Uyo, Oron, Ikot Ekpene, Eket, Abak and Etinan. Abak Agricultural Zone consists of five (5) local government areas, which are: Abak, Oruk Anam, Etim Ekpo, Ukanafun, and Ika. There are nine (9) blocks with a total of 56 cells in the study area. The study area is in the rain forest zone and has two distinct seasons viz: the rainy and the dry season. Most of the inhabitants of the study area are farmers dwelling especially in the peri-urban and rural communities and the most commonly cultivated crops grown in the area include: Yam, Cassava, Cocoyam, Plantain, Maize, Oil Palm,
Banana, Coconut, Citrus and vegetables etc. In addition, some micro-livestock are usually raised at background of most homesteads.

A two-stage sampling procedure was deployed in the selection of the respondents for this study. In the first stage, simple random sampling (by balloting) was used to select five (5) and two (2) cells from each of 5 blocks selected in the zone. The rationale here was to ensure that all the blocks are represented. In the second stage, systematic sampling technique was deployed in the selection of twelve (12) farming households, with particular focus on the household heads, in each of the selected cells. This summed up to 24 farming household heads from each block. Therefore, a total of 10 cells and 120 respondents were selected for the study.

Questionnaire consisting of subsections to reflect the specific objectives of the study were used to collect the data in each of the cells. Each section had various questions and the score was based on the selected answer. To assess the knowledge of respondents (awareness) on biodiversity conservation practices, every correct answer was scored one (1) and every wrong answer was scored zero (0). To identify the biodiversity conservation information sources of the respondents, A 3-point rating scale of Never=0, rarely = 1, often =2 was used. To examine the biodiversity conservation information seeking behaviour of the respondents, A 4-point Likert-type scale of strongly disagree=1, disagree =2, agree = 3, strongly agree = 4 was used. The scale was scored otherwise where the statement is negative. To examine the perception of the respondents on biodiversity conservation, the 4-point Likert scale of strongly disagree=1, disagree =2, agree = 3, strongly agree = 4 was also used. Data collected were analyzed using descriptive statistics such as simple percentages, frequencies, and composite index.

3. RESULTS AND DISCUSSION

3.1 Socio-Economic Profile of the Respondents

The sex distribution of the respondents as seen in Table 1 reveals that 52.5% were male and 7.5% were females. It implies that with depletion of biodiversity, more men are likely to be impacted because they outnumbered the women in the study area. The result as presented in Table 1 disagrees with the findings of [12] who reported that both men and women are impacted upon equally by biodiversity exploitation in their communities. Table 1 reveals that 30.1% of the respondents were less than 30 years of age, 35.0% of the respondents aged between 31 - 40 years old, 18.3% were aged between 41 - 50 years old, 10.8% were aged between 51 - 60 years old, while 5.8% were above 60 years old. The age distribution pattern of the respondents indicates that the respondents are relatively young people and are economically productive and active. This set of people ought to be very inquisitive and learn to know more about their environment. Majority (60.0%) of the respondents were married while 28.3% were single, 5.0% and 6.7% were separated and widowed respectively. The high percentage of married respondents is consistent with [13] who noted that getting married is highly cherished among ruralites in Nigeria with intentions of using these women for unpaid family labour. The level of education among rural dwellers may enhance or constrain their ability to understand and react to environmental situations [14]. The results shows that 0.8% of the respondents had no formal education; 31.7% had primary education, 48.3% had secondary education while 19.2% of the respondents read up to tertiary education. The result shows that the farmers have sufficient education to enable them cope or understand the issues surrounding biodiversity conservation. Majority (58.3%) of the farmers had household sizes of 1 - 5 persons. A good number of the respondents (41.7%) also had household sizes of 6 – 10 persons. This result is an indication of the African culture of extended family practices or polygamy were close relatives live together. It also shows that in farming communities, family labour is an important factor in crop production. [15], in their study, reviewed that farmers’ household size had an inverse and significant effect on the rice enterprises technical inefficiency.

3.2 Awareness Level of Biodiversity Conservation Practices

The emphasis here was on ascertaining if farmers in Abak Agricultural Zone of Akwa Ibom State understand what it means and the things that can be done to conserve biodiversity. Results from Table 2 reveals that almost all the respondents had average to very high level of awareness of biodiversity conservation practices. This is confirmed by the awareness incidence indicators shown in Table 3 because the closer the indicator is to 1, the higher the level of awareness. This implies that majority of the
respondents were aware of that particular biodiversity conservation practice. Results show that 98.7% of the respondents said ‘yes’ to the fact that avoiding water, air and soil pollution are ways of conserving biodiversity. This attracted a very high awareness incidence of 0.99. On the other hand, 0.8% said No in disagreement to that fact while 28.3% of the respondents did not have any idea concerning that fact. Furthermore, the respondents were aware that taking good care of our plants and animals are ways of conserving biodiversity (0.97), avoiding excessive use of chemicals when checking pest and diseases are ways of conserving biodiversity (0.96), avoiding bush burning is a way of conserving biodiversity (0.92), planting of trees is a way of conserving biodiversity (0.93) and that establishment of zoos and national parks are practices of conserving biodiversity (0.92) to mention but a few. Only items 6 (Avoiding the tilling/disturbance of soil is a way of conserving biodiversity) and item 8 (Establishment of museums, gene banks, botanical gardens and arboretums are ways of conserving biodiversity) attracted average level of awareness with incidence of 0.62 and 0.59 respectively. This is a situation that should really be encouraged since conservation policies and practices are a result of human decisions and behaviour, either intended or unintended. From the results, it implies that with this level of awareness farmers (respondents) can fine-tune and adapt their agronomic practices in ways that will guarantee continuous and sustainable benefits from these free gifts of nature. This finding is consistent with the findings of [16] as well as [17].

Table 1. Distribution of respondents based on socio-economic characteristics

| S/n | Variable                                | Frequency | Percentage (%) |
|-----|-----------------------------------------|-----------|----------------|
| 1   | Gender                                  |           |                |
|     | Male                                    | 63        | 52.5           |
|     | Female                                  | 57        | 47.5           |
|     | Total                                   | 120       | 100.0          |
| 2   | Age                                     |           |                |
|     | Less than 30 years old                  | 36        | 30.1           |
|     | 31 - 40 years old                       | 42        | 35.0           |
|     | 41 - 50 years old                       | 22        | 18.3           |
|     | 51 - 60 years old                       | 13        | 10.8           |
|     | Above 60 years old                      | 7         | 5.8            |
|     | Total                                   | 120       | 100.0          |
| 3   | Marital status                          |           |                |
|     | Single                                  | 34        | 28.3           |
|     | Married                                 | 72        | 60.0           |
|     | Divorced/separated                      | 6         | 5.0            |
|     | Widowed                                 | 8         | 6.7            |
|     | Total                                   | 120       | 100.0          |
| 4   | Highest Level of Education              |           |                |
|     | No formal education                     | 1         | 0.8            |
|     | Primary education                       | 38        | 31.7           |
|     | Secondary education                     | 58        | 48.3           |
|     | Tertiary Education                      | 23        | 19.2           |
|     | Total                                   | 120       | 100.0          |
| 5   | Household size                          |           |                |
|     | 1 - 5 persons                           | 70        | 58.3           |
|     | 6 - 10 persons                          | 50        | 41.7           |
|     | Total                                   | 120       | 100.0          |
| 6   | Any Occupation besides farming          |           |                |
|     | Yes                                     | 110       | 91.7           |
|     | No                                      | 10        | 8.3            |
|     | Total                                   | 120       | 100.0          |
| 7   | Income flow                             |           |                |
|     | Daily                                   | 75        | 62.5           |
|     | Weekly                                  | 23        | 19.2           |
|     | Monthly                                 | 22        | 18.3           |
|     | Total                                   | 120       | 100.0          |

Source: Field survey, 2019
Table 2. Distribution of respondents based on awareness level of biodiversity conservation practices

| S/N | Biodiversity, Conservation, Practices | Yes | No | Don’t know | Awareness incidence | Remark |
|-----|--------------------------------------|-----|----|------------|---------------------|--------|
| 1   | Biodiversity means the various plants, animals and microorganisms living on earth | 85  | 1  | 34         | 0.71                | High   |
|     |                                       | (70.8) | (0.8) | (28.3) |                     |        |
| 2   | Biodiversity conservation is about saving the lives of plants, animals and microorganisms on earth | 91  | 0  | 29         | 0.76                | High   |
|     |                                       | (75.8) |    | (24.2)    |                     |        |
| 3   | Avoiding bush burning is a way of conserving biodiversity | 110 | 3  | 7          | 0.92                | High   |
|     |                                       | (91.7) | (2.5) | (5.8) |                     |        |
| 4   | Planting of trees is a way of conserving biodiversity | 112 | 2  | 6          | 0.93                | High   |
|     |                                       | (93.3) | (1.7) | (5.0) |                     |        |
| 5   | Allowing forests to grow in our communities is a way of conserving biodiversity | 98  | 12 | 10         | 0.82                | High   |
|     |                                       | (81.7) | (10.0) | (8.3) |                     |        |
| 6   | Avoiding the tilling/disturbance of soil is a way of conserving biodiversity | 75  | 20 | 25         | 0.63                | Average|
|     |                                       | (62.5) | (61.7) | (20.8) |                     |        |
| 7   | Establishment of zoos and national parks are ways of conserving biodiversity | 110 | 2  | 8          | 0.92                | High   |
|     |                                       | (91.7) | (1.7) | (6.7) |                     |        |
| 8   | Establishment of museums, gene banks, botanical gardens and arboretaums are ways of conserving biodiversity | 71  | 16 | 33         | 0.59                | Average|
|     |                                       | (59.2) | (18.3) | (27.5) |                     |        |
| 9   | Taking good care of our plants and animals are ways of conserving biodiversity | 117 | 2  | 1          | 0.98                | Very High |
|     |                                       | (97.5) | (1.7) | (0.8) |                     |        |
| 10  | Avoiding excessive use of chemicals when checking pest and diseases are ways of conserving biodiversity | 115 | 0  | 5          | 0.96                | Very High |
|     |                                       | (95.8) |    | (4.2) |                     |        |
| 11  | Avoiding water, air and soil pollution are ways of conserving biodiversity | 117 | 0  | 3          | 0.98                | Very High |
|     |                                       | (97.8) |    | (2.5) |                     |        |
| 12  | Irrigation (supplying water to our plants) can help in preserving biodiversity | 79  | 12 | 29         | 0.66                | Average|
|     |                                       | (65.8) | (10.0) | (24.2) |                     |        |

Source: Field survey, 2019. Note: values in parenthesis represent the percentages while values outside parenthesis indicate the frequencies

3.3 Biodiversity Conservation Information Sources of the Respondents

Analysis was done to identify the sources of information the farmers in the study area used to get information on biodiversity conservation. They were further examined on the extent to which they utilize these information sources. Table 3a reveals that respondents got information on biodiversity conservation majorly from Friends/neighbors (32.5%), other farmers (28.3%), Radio/Television (22.5%) and Internet/electronic mails (14.2%). Results in Table 3b reveals that majority (91.7%) of the respondents fell under the low level of information sourcing with only (8.3%) falling under the average level of information sourcing. The result of the study shows that the sampled farmers very lowly utilized various tools to source for information about biodiversity conservation. This could be suggesting that farmers who had low usage of some of the tools were those who did not have interest in using these tools or perhaps they had scanty knowledge of how to use the information sources. Therefore, there is need to strongly expose the rural farmers to the usage of more information sources/tools so as to improve their degree of biodiversity conservation information sourcing. This finding tends to corroborate with the report in a survey to environmental protection Agency of Ghana, that the main sources of environmental protection information were found to be friends and neighbours, followed by television and radio. [5] also reported that even if the level of knowledge of pre-service teachers on biodiversity conservation is generally appreciable, the majority of them did not at all appreciate how it is integrated and taught in their combinations. They said that biodiversity conservation as a course or module does not exist. It is only a very small component inserted in the component of ecology,
in the module entitled human biology and elements of ecology. They explained that the skills they have is from the media such as radios, televisions and newspapers, workshops and seminars as well as the information about biodiversity conservation from community conservation initiatives around where they are coming from.

3.4 Analysis on Biodiversity Conservation Information Seeking Behaviour of the Respondents

A four-point likert scale was used to measure the biodiversity conservation information seeking behavior of the respondents in the study area. A list of statement portraying information seeking dispositions was drawn from literature, trial tested and presented to the respondents to agree or disagree with, as it applies to them. All of the statements were negatively worded. The behavioural pattern of the respondents regarding biodiversity conservation information seeking is presented in Table 4. The mean scores of their responses were also calculated. Any mean score from 2.5 and above was regarded as high information seeking behaviour while mean scores below 2.5 was regarded as low biodiversity conservation information seeking behaviour of that particular statement since the maximum response score for each item was 4 and minimum was 1. Most of the statements

| Table 3a. Distribution of respondents based on biodiversity conservation practices information sources |
|---------------------------------------------------------------|
| **S/N** | **Information Sources** | **Frequency of Use** | **Incidence of utilization** | **Rank** |
|---|--------------------------|----------------------|-----------------------------|---------|
| 1. | Libraries(libs) | Often | Rarely | Never | 0.13 | 6th |
| A | Textbooks | 16(13.3) | 41(34.2) | 63(52.5) | |
| B | Catalogues | 8(6.7) | 3(2.5) | 109(52.5) | 0.06 | 8th |
| C | Conference proceedings | 3(2.5) | 10(8.3) | 107(89.2) | 0.03 | 9th |
| D | Dissertations and thesis | 2(1.7) | 7(7.5) | 111(92.5) | 0.02 | 10th |
| E | Journals | 3(2.5) | 15(12.5) | 102(85.0) | 0.03 | 9th |
| F | Monograph | 2(1.7) | 7(5.8) | 111(92.5) | 0.02 | 10th |
| H | News letters | 7(5.8) | 23(19.2) | 90(75.0) | 0.06 | 8th |
| I | Newspapers/magazines | 11(9.2) | 34(24.3) | 75(62.5) | 0.09 | 7th |
| 2 | Seminars/Conferences | 4(3.3) | 11(9.2) | 105(87.5) | 0.03 | 9th |
| 3 | Discussions with peer and others | 13(10.8) | 56(46.7) | 51(42.5) | 0.11 | 6th |
| 4 | ICT Tools | | | | |
| A | CD Rom literature search | 1(.8) | 7(5.8) | 112(93.3) | 0.01 | 11th |
| B | Radio/Television | 27(22.5) | 49(40.8) | 44(36.7) | 0.23 | 3rd |
| C | Internet/electronic mails | 17(14.2) | 34(28.3) | 69(57.5) | 0.14 | 4th |
| 5 | Friends/neighbors | 39(32.5) | 48(40.0) | 33(27.5) | 0.33 | 1st |
| 6 | Other farmers | 34(28.3) | 49(40.8) | 37(30.8) | 0.28 | 2nd |
| 7 | Extension officers | 2(1.7) | 10(8.3) | 108(90.0) | 0.02 | 10th |
| 8 | Others (please specify) | 0 | 1(8) | 119(99.2) | 0.00 | 12th |

*Source: Field survey, 2019. Note: values in parenthesis represent the percentages while values outside parenthesis indicate the frequencies*

| Table 3b. Distribution of respondents based on extent of utilization of information sources (EUISs) |
|---------------------------------------------------------------|
| **EUISs Index Interval** | **EUISs Interpretations** | **Frequency** | **Percentages (%)** |
|---|--------------------------|----------------|-------------------|
| 0.0 - 0.33 | Low | 110 | 91.7 |
| 0.34 – 0.66 | Average | 10 | 8.3 |
| 0.67 – 1.00 | High | 0 | 0 |
| **Total** | | 120 | 100 |

*Source: computed from field survey, 2019*
had mean response less than 2.5 indicating a low biodiversity conservation information seeking behaviour of the respondents. Results show that, most of the respondents agreed that they find it hard to go about searching biodiversity conservation information or literatures in the libraries (\(\bar{x} = 1.65\)). They agreed also that they don't always like to waste their energy searching for biodiversity conservation information (\(\bar{x} = 1.99\)). They said they do feel discouraged because library services are poorly organized (1.93) and that it is discouraging to search because my expectations are hardly met (\(\bar{x} = 1.93\)). However, item 9, ‘I have no interest to search for information about biodiversity conservation’ (\(\bar{x} = 2.90\)) and item 10, ‘I personally take no time to search for information from my friends and colleagues’ (\(\bar{x} = 2.85\), had higher means indicating a high behavioural disposition for those statements. Findings from this study revealed that majority of the respondents are not strongly disposed to voluntarily seeking for biodiversity conservation information. These could be due to lack of interest as expressed by them, motivation or low level of awareness on information sourcing to encourage the rural farmers. Therefore more incentives should be provided to motivate more rural farmers to voluntarily seek for information especially on biodiversity conservation issues.

### 3.5 Analysis on Perception of Biodiversity Conservation

Results of analysis on perception of the respondents towards biodiversity conservation are shown in Table 5. The frequency distributions, percentages show the pattern of agreement of the respondents with the biodiversity conservation statements. The mean scores of the responses on biodiversity conservation statements were also calculated. Any statement that has a mean score of 2.5 and above was regarded as positive or favourable perception of that particular statement since the maximum response score for each item was 4 and minimum was 1. The mean score distribution shows that all the statements attracted a mean score above 2.5. This means that the respondents had very positive or favourable perception of biodiversity conservation. There perceived that they depend on biodiversity for the air they breathe (\(\bar{x} = 3.80\)), for the food/meat, the water they drink (\(\bar{x} = 3.80\)), that many drugs in our modern pharmacies are derived from plant species in our environment (\(\bar{x} = 3.91\)), that excessive commercial fishing and hunting, can greatly reduce or extinct species of fishes and other animals in our environment (\(\bar{x} = 3.79\)), that conserving biodiversity will help in reducing the negative effect of climate change (\(\bar{x} = 3.60\)), that many human activities can have a negative effect on biodiversity (\(\bar{x} = 3.64\)), that biodiversity conservation improves soil fertility, increase crop yields and long-term soil productivity (\(\bar{x} = 3.60\)). They also perceived that biodiversity conservation helps crops to endure extreme conditions and recover more easily from droughts (\(\bar{x} = 3.54\)). This finding is consistent with [15,16] who posits that to foster societal change toward biodiversity conservation, there is a need to comprehend how biodiversity and its resulting ecosystem services are perceived by humans. [18] also found that proposed on-farm biodiversity advice at a whole farm level, when delivered by a trained and credible advisor,
raised the willingness of farmers to implement biodiversity conservation measures.

### 3.6 Relationship between Selected Predictors (Age, Household Size, Awareness of Biodiversity Conservation and Biodiversity Conservation Information Seeking Behaviour) and the Respondents’ Perception on Biodiversity Conservation

Table 6 shows that all the six (6) independent variables taken together were significant in influencing the variance in respondents’ perception on biodiversity conservation, \( R = 0.606; F = 9.279; P = .05 \). The table also indicates that 36.7% variance in respondents’ perception on biodiversity conservation was accounted for by the six (6) independent variables. A critical examination of the Beta coefficients shows that the only independent variable that significantly contributed to the model is respondents’ awareness of biodiversity conservation practices. Results on the table reveals that the coefficient of awareness of biodiversity conservation is 0.598 implying that a unit increase in the respondents’ awareness of biodiversity conservation practices increases their perception on biodiversity conservation by 0.598 units. Other variables did not significantly contribute to the model.

#### Table 5. Perception on biodiversity conservation

| S/N | Statements                                                                                   | Mean | SD   |
|-----|----------------------------------------------------------------------------------------------|------|------|
| 1   | We depend on biodiversity for the air we breathe                                               | 3.80 | 0.47 |
| 2   | We depend on biodiversity for the food/meat we eat, and the water we drink.                   | 3.80 | 0.49 |
| 3   | Conserving biodiversity will help in reducing the negative effect of climate change            | 3.63 | 0.56 |
| 4   | Many human activities can have a negative effect on biodiversity                               | 3.64 | 0.59 |
| 5   | Excessive commercial fishing and hunting, can greatly reduce or extinct species of fishes and other animals in our environment | 3.79 | 0.53 |
| 6   | Biodiversity supports food security and sustained livelihoods                                 | 3.59 | 0.51 |
| 7   | Many drugs in our modern pharmacies are derived from plant species in our environment          | 3.91 | 0.37 |
| 8   | Biodiversity Conservation helps our crops to endure extreme conditions and recover more easily from droughts | 3.54 | 0.59 |
| 9   | Biodiversity Conservation improves soil fertility, greater crop yields, and long-term soil productivity | 3.60 | 0.58 |
| 10  | Biodiversity Conservation helps our crops to endure extreme conditions and recover more easily from prolonged rains and floods | 3.48 | 0.57 |

Source: Field survey, 2019. SD = Standard Deviation

#### Table 6. Selected variables and perception on biodiversity conservation

| S/N | Variables                              | Coefficients (Linear/ t-values/ standard error) |
|-----|----------------------------------------|-------------------------------------------------|
| 1   | Age of Farmers                         | 0.100 (1.281) (0.022)                           |
| 2   | Household size                         | -0.037 (-0.431) (0.200)                         |
| 3   | Inform. seeking behaviour              | -0.093 (-0.926) (0.031)                         |
| 4   | Years of formal education              | -0.153 (-1.526) (0.94)                          |
| 5   | Monthly income                         | 0.003 (0.032) (0.000)                           |
| 6   | Awareness of biodiversity conservation | 0.598 (6.882)* (0.124)                          |
|     | Constant                               | 30.556                                          |
|     | \( R \)                                | 0.606                                           |
|     | \( R^2 \)                              | 0.367                                           |
|     | Standard error of Estimate             | 3.044                                           |
|     | \( F \)-value                         | 9.279                                          |
|     | Significant                           | 0.000                                           |

Source: Computed from Field survey, 2019

Note: Values in the second bracket represents t-values while values in the last parenthesis represent standard error. * Significant at 5% level of significance
4. CONCLUSION AND RECOMMENDATION

Results have shown that an assessment into the biodiversity conservation friendliness status of rural farmers, can produce useful information that could be incorporated into the decision-making process, biodiversity conservation management planning and also used as a starting point to improve park-community relationships. The most important findings of this study are: i) all of the respondents had average to very high level of awareness of biodiversity conservation practices; ii) information on biodiversity conservation were mostly gotten from; Friends/neighbors, other farmers, Radio/Television and Internet/electronic mails; iii) The respondents had very positive or favourable perception of biodiversity conservation and despite the relatively high level of awareness, utilization of information sources and positive/favourable perception, biodiversity conservation information seeking behaviour of the respondents was low. Furthermore, respondents’ awareness of biodiversity conservation practices significantly contributed to their perception.

In conclusion therefore, it will be valuable for the conservation organizations (both government and non-governmental organizations) to collaboratively develop an environmental education and awareness programme about natural resources conservation to cover the study area. Research institutions and government agencies should exert much effort in extending the biodiversity conservation awareness campaign to the rural areas so that the rural farming households will benefit and be more informed. More studies, especially, in the direction of examining the extent of involvement of the rural farmers in biodiversity conservation practices in the study area should be conducted by the government.

CONSENT

As per international standard or university standard guideline participant consent has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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