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Farmer's Background Variables And Attitudes Toward Sustainable Agricultural Practices In Ikom Education Zone Of Cross River State, Nigeria

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Abstract
This study examined Farmer's Background Variables and Attitude towards Sustainable Agricultural Practices in Ikom Education Zone, Cross River State. Farmers background variables are crucial aspects in the realm of agriculture which enhances agricultural sustainability. This research seeks to contribute valuables insights to the field and potentially inform strategies to promote sustainable farming practices and environment awareness among farmers: During the period of my study three hypotheses were formulated to guide the study Literature review was carried out based on the variables under study. Survey research design was considered most suitable for the study. Stratified and simple random sampling technique was adopted in selecting the 651 respondents sampled for the study. A validated 20 item four point modified likert scale questionnaire was the instrument used for data collection. The reliability estimates of the instrument ranged from 0.64-0.80 using Cronbach Alpha method. To test the hypotheses formulated for the study, Independent t-test and one way analysis of variance statistical tools were used. The hypotheses were tested at 0.05 level of significance. The findings revealed that there is no significant influence of gender, age and Educational level on farmers' attitude towards sustainable agricultural practices. It was recommended among others that vigorous efforts should be made towards designing joint agricultural management programmes which would stem the tide of unsustainable practices among old and young farmers within the study area.

Key words: gender, age, Educational level on farmers', attitudes, sustainable agricultural practices.

Introduction and Background
Agriculture has long been the economic backbone of many nations, with two-thirds of the global population relying on it. Farming remains a crucial means of survival, involving domestication and cultivation of various crops and livestock. However, these activities

contribute to environmental degradation and climate change (Barrow, Lawrence & Walker, 2009). Studies have shown that inadequate soil management and poor adoption of improved technologies hinder agricultural productivity in Cross River State. For instance, cocoa farmers in Etung, Boki, and Ikom deplete soil nutrients due to poor organic manure application (Ibiremo et al., 2017). Small-scale cassava and yam farmers struggle with low yields due to technical inefficiencies (Itam et al., 2015; Ibok et al., 2015), while rice farmers in Abi face similar issues due to limited use of advanced production techniques (Bassey, 2016). Farmers' attitudes toward sustainable practices influence their adoption of methods that ensure long-term agricultural productivity.

Crop rotation helps maintain soil fertility by alternating crops, reducing pests, minimizing chemical use, and improving carbon sequestration. Similarly, mixed cropping (intercropping) enhances biodiversity, improves soil quality, and reduces risks of single-crop failure. The use of manure organic or inorganic—also plays a vital role in improving yields. However, these practices have both positive and negative impacts on forest ecosystems, raising concerns about sustainability. This study explores the effects of these farming practices on forest ecosystems in Ikom Education Zone, Cross River State. Additionally, assessing farmers' attitudes toward sustainable agriculture may provide insights into their awareness of environmental degradation and their willingness to adopt sustainable farming initiatives. Research has shown that attitudes significantly influence behavior in sustainable agriculture (Velten et al., 2015; Okoro, Etuk & Akpan, 2016).

Several factors influence farmers' attitudes toward sustainable farming, including gender, age, education, income, and climate change awareness. While some studies suggest gender significantly impacts sustainable agricultural practices (Nwaobiala, 2014; Itam et al., 2014), others find little effect (Okoro et al., 2016). Age has also been debated, with some research highlighting its importance (Itam et al., 2015), while others dismiss its significance (Tadesse & Teketay, 2017). Education has been identified as a key factor (Adeogun et al., 2013), though some studies reject this claim (Daksa & Kotu, 2015). Despite experiencing climate variations, many Africans lack sufficient knowledge about global climate change (Godfrey et al., 2009; Taderera, 2010). Limited awareness campaigns and competing socio-economic challenges contribute to this low awareness (UNFCCC, 2007; UNDP, 2007). Climate change perceptions also vary globally, with poorer nations more likely to see it as a direct threat (GlobeScan, 2006; Pew Research Centre, 2006).

Government and non-governmental organizations have implemented environmental regulations, awareness campaigns, and training programs to reduce unsustainable practices in

Nigeria. However, issues such as bush burning, deforestation, excessive pesticide use, and poor soil management persist, leading to environmental degradation. These unsustainable practices contribute to climate change, global warming, and pollution. Attitudes toward sustainable agricultural practices in Ikom Education Zone remain concerning. Despite the expectation that farmers should adopt sustainable methods, research continues to reveal unsustainable practices, including inadequate fallow periods, overreliance on inorganic fertilizers, and deforestation. Climate change is widely recognized, yet many Nigerians remain unaware of its impact, focusing instead on food insecurity caused by extreme weather. Given these concerns, this study seeks to determine whether background variables and climate change awareness influence farmers' attitudes toward sustainable agriculture in Ikom Education Zone, Cross River State, Nigeria.

The purpose of the study was to ascertain the influence of background variables and awareness of climate change on farmers' attitude towards sustainable agricultural practices in Ikom Education Zone Cross River State. Specifically, the study seeks to ascertain the influence of;

1. Gender on farmers' attitude towards sustainable agricultural practices
2. Age on farmers' attitude towards sustainable agricultural practices
3. Educational level on farmers' attitude towards sustainable agricultural practices

Statement of hypotheses

The following are the study's hypotheses;

1. There is no significant influence of farmers' background on farmers' attitude towards sustainable agricultural practices

2. Age has no significant influence on farmers' attitude towards sustainable agricultural practices

3. There is no significant influence of background level on farmers' attitude towards sustainable agricultural practices

Literature Review

Gender and Farmers' Attitudes Toward Sustainable Agricultural Practices

Gender plays a crucial role in agricultural decision-making and access to resources, influencing attitudes toward sustainable farming (Doss, 2018). While some studies highlight women's contributions to conservation (FAO, 2020), others note gender disparities in sustainable practices adoption (Meinzen-Dick et al., 2019). Research indicates that gender, along with age and education, affects farmers' participation in agri-environmental programs (Wilson & Hart, 2000; Lambert et al., 2007).

Studies on gender differences in environmental attitudes show mixed results. While some findings suggest women exhibit higher environmental concern (Terrants & Cordel, 2007), others report no significant gender-based differences in agricultural attitudes. A study in Tehran found that environmental attitudes are influenced by gender, but this does not necessarily translate into differences in farming practices. These variations may stem from differences in personal preferences and background variables, such as economic concerns or access to information (Hanne, 2011).

Despite increasing attention to conservation, little research examines how female agricultural landowners and operators differ from their male counterparts in environmental decision-making. As global food demand rises, understanding these differences becomes critical. A 2010 survey in Iowa explored gender-based conservation knowledge, revealing that targeted programs could enhance women's participation in sustainable agriculture. Women, often primary food producers, possess valuable knowledge and skills for sustainable farming. When given access to resources and policies supporting gender equity, they contribute significantly to environmental protection (Asian and Pacific Ministerial Declaration, 2014). In India and Nepal, community forestry groups with more female members achieved better forest regeneration (ESCAP, 2014).

Research generally supports the idea that women in agriculture are more environmentally conscious than men. Women are more likely to support environmental regulations (Filson, 2006), practice organic farming (Egri, 2009), and engage in conservation programs (Curtis & DeLacy, 1996). However, some studies find no significant gender-based differences in environmental behavior (Borsotto et al., 2008; Best, 2009).

Farmers' knowledge also affects attitudes toward sustainability (Duncan, 2004; Chizari, 2009). Access to information increases confidence and willingness to adopt sustainable practices (Karami, 2007). Attitudes shape professional behavior, and pro-environmental engagement is often higher among women due to greater awareness of environmental consequences (Xiaodong et al., 2011). Understanding gender differences in environmental behavior is essential for promoting sustainable agricultural practices.

Age and Farmers' Attitude Toward Sustainable Agricultural Practices

Pro-environmental behavior is influenced by environmental attitudes and socio-demographic factors such as employment, leadership roles, urban living, and marital status. Studies indicate that younger, educated individuals with strong environmental concerns are more likely to engage in pro-environmental actions (Filson, 2013; Sager & Proost, 2007). China's rapid urbanization may further shape such behaviors in the future. Age significantly impacts

farmers' attitudes toward sustainability. Older farmers often rely on traditional methods, whereas younger farmers are more open to innovation and sustainable practices (Prokopy et al., 2015). While many studies suggest younger farmers are more inclined toward environmental programs (Bonnieux, Rainelli & Vermersch, 2008; Vanslembrouck et al., 2012), others argue that age is not a reliable predictor (Rougoor et al., 2008; Pannell et al., 2016). Some research even suggests younger farmers may resist conservation efforts due to a preference for intensive farming (Kristensen et al., 2004; Burton & Wilson, 2006).

Robert and Andreas (2014) identified 18 factors influencing environmental attitudes, including education, personality, political views, social class, and proximity to environmental problems. These factors interact in complex ways, making it difficult to attribute pro-environmental behavior solely to age. Across childhood and adolescence, the ability to manage resources sustainably grows with cognitive development (Gifford, 1982). Some studies suggest younger individuals express greater environmental concern than older ones (Arcury & Christianson, 2003; Klineberg et al., 2008). However, older generations may engage in more conservation behaviors due to experiences from economic hardships in the 1930s and 1940s (Gilg, Barr & Ford, 2005). This suggests that historical context, rather than aging itself, influences environmental behavior.

Two additional theories explain age-related trends. First, concern for the environment may decline with age, reflecting a true age effect. Second, societal changes may be shaping environmental attitudes, suggesting an era effect (Honnold, 2005). A study comparing different generations found that political and social climates impact environmental concern across age groups. Kimmel (2008) studied age-related attitudes toward conservation, analyzing data from 1,539 individuals across 30 communities. Findings revealed that human development involves changes and continuity across life stages, influencing attitudes and behaviors. Thus, while younger farmers may show more concern for environmental issues, generational experiences and societal shifts play a crucial role in shaping sustainable agricultural practices.

Sustainable Agriculture: Attitudes and Influencing Factors

The rapid growth of the human population and increased food demand have transformed traditional farming systems. Technologies such as genetic engineering, high-yield crop varieties, and chemical fertilizers have boosted agricultural production, particularly in developing nations. However, these advancements have led to environmental issues like soil erosion, pest outbreaks, and declining nutrient quality (Hashemi & Damalas, 2011). Consequently, there has been a shift towards sustainable agriculture, emphasizing environmental protection and resource-efficient practices aligned with rural communities' needs (Omani, 2000).

Sustainable agriculture integrates ecological, economic, social, and cultural aspects. It seeks to balance human needs with environmental conservation, ensuring long-term viability. Unlike modern industrial agriculture, it follows a holistic approach, focusing on responsible resource management and minimizing ecological degradation (Aghdari, 2002). While interpretations of sustainable agriculture vary, the most accepted definition includes economic, social, and environmental considerations within a unified system (SalmanZadeh, 2012).

Studies on attitudes toward sustainable agriculture reveal varying perspectives. Hayati et al. (2010) found that agricultural experts in Eastern Azerbaijan, Iran, held moderate attitudes toward sustainable practices. Factors such as academic background, career experience, and access to scientific publications significantly influenced their perspectives. Similarly, Alibeigi et al. (2006) reported positive attitudes among university faculty, with research output and experience explaining 27% of attitudinal variance. Farmer attitudes also differ based on demographics. Mansourabedi and Karami (2007) found women farmers in Kazeroon County had more positive attitudes than men, influenced by education and information access. Studies in Saudi Arabia (Alhag, 2007) and Iran (Bagheri et al., 2008) revealed that literacy, income, and participation in agricultural extension programs positively correlated with pro-sustainability attitudes. Iran has integrated sustainable agriculture into its development policies, promoting education, extension services, and research on eco-friendly technologies, genetic resources, and farmer participation (Committee of Sustainable Agricultural Development, 2000).

Education enhances awareness and access to information, fostering positive attitudes toward sustainability (Tey et al., 2017). Farmers with higher education levels are more likely to adopt sustainable practices due to exposure to scientific knowledge and extension services (Scott & Mayits, 2004). Education facilitates attitude change and deepens understanding of environmental issues, making farmers more receptive to sustainable agriculture.

Numerous studies link education to sustainable practices, such as organic farming (Stock, 2007; Best, 2009) and participation in agri-environmental schemes (Wilson & Hart, 2000; Mathijs, 2003; Smithers & Furman, 2003). However, some research finds no relationship (Best, 2009; Yiridoc et al., 2010) or even an inverse one (Bonnieux et al., 1998; Ondersteijn, 2003). Siebert et al. (2006) noted that while education generally supports participation in sustainable agriculture, results remain inconclusive, partly due to variations in measuring education levels.

Most studies assess education through years of schooling or highest qualification (McCann et al., 1997; Wilson, 1997). However, some argue that content matters more, as conventional agricultural education may lead to different behaviors than general education (Pannell et al., 2006; Murphy et al., 2011). Riley (2006) found that conventional agricultural education increased intensive hay-meadow management, while Murphy et al. (2011) showed that biodiversity conservation varied based on education type. Education influences environmental behavior by shaping attitudes, as proposed in the Theory of Planned Behavior (Ajzen, 1991). It dispels myths, introduces new knowledge (Jackson-Smith & McEvoy, 2011), and improves farm management efficiency (Adrian et al., 2005; Solano et al., 2006). However, environmental knowledge alone does not always predict pro-environmental behavior (Levine & Strube, 2012). While education often correlates with environmental concern (Arcury & Christianson, 1993), its effect varies by context (Grendstad & Wollebaek, 1998).

Business and technology students tend to be less environmentally concerned than those in other disciplines (Tikka, Kuitnen, & Tynys, 2000). Environmental education (EE) programs increase environmental knowledge and commitment (Gifford, Hay, & Boros, 1982-83), though students in EE programs may already have stronger environmental attitudes (Reid & Sa'di, 1997). Similarly, reading environmental literature correlates with pro-environmental behavior (Mobley, Vagias, & DeWard, 2010).

Agricultural communities are undergoing rapid change (Paquette & Domon, 1999; Statistics Canada, 2011). Background variables significantly influence farmers' environmental behavior (Burton, 2014), making them a key consideration for policymakers. Issues like nutrient management and carbon emissions require policies that reflect evolving community profiles (Below et al., 2012). Education is a crucial factor in environmental behavior, as complex issues demand informed decision-making. Higher education levels correlate with the adoption of organic farming and agri-environmental schemes (Best, 2009; Barreiro-Hurle et al., 2010). However, some studies find no or even negative relationships between education and pro-environmental behavior (Burton, 2014).

Human activity has significantly altered ecosystems, prompting calls for behavioral change (Abrahamse et al., 2005; Swim et al., 2011). Cynthia (2012) found that informal and non-formal education enhance environmental literacy, suggesting alternative learning methods are crucial for fostering pro-environmental behaviors. Joysee (2005) identified barriers to sustainable agriculture adoption, including lack of information, economic constraints, and ineffective government programs. Farmers struggle to access reliable knowledge, while change agents are often unprepared to support adoption efforts. Economic support programs are poorly designed, and social barriers such as land tenure further hinder progress. Strategies

like better information management and targeted extension services could help address these challenges.

Methodology

This study adopted a Survey Research Design, which is suitable for examining people's opinions, beliefs, attitudes, and behaviors. The study focuses on background variables, climate change awareness, and farmers' attitudes toward sustainable agriculture in Central Cross River State, Nigeria. The study area is Ikom Education Zone in Cross River State, Nigeria. It includes Abi, Boki, Etung, Ikom, Obubra, and Yakurr Local Government Areas. The zone borders Ogoja and Yala to the north, Biase and Akamkpa to the south, Cameroon to the east, and Ebonyi State to the west. It spans 306 km² and has a projected population of 1,163,903 (National Population Commission, 2015). The major ethnic groups are Yakurr/Agoi and Bahumono**,** with dialects including Lokaa, Ohumono, Etung, Olulumo, and Boki.

The people engage in farming and hunting due to the Cross River National Park's extension. Major agricultural products include cassava (garri), banana, plantain, cocoa, and bush meat. The area has educational institutions such as CRUTECH**,** ITM Ugep**,** Nogak Polytechnic, and several secondary and primary schools. The culture features traditional dances like Ekoi**,** Obarn, Egib, and festivals like the Leboku New Yam Festival**.** Tourist sites include the Agbokim Waterfalls and Afi Mountain Wildlife Sanctuary. The zone has health facilities, private hospitals, primary healthcare centers**,** and **a** radio station (CRBC Ikom)**.**
The district observes dry and wet seasons including heavy annual rainfall extending from 2,900 to 3000mm. The maximum temperature observed in March is up to 30°C, while the minimum annual temperattire is 27°C.Cross River Agricultural Development Programme (CRADP,1992). Generally, the vegetation of the study area is a tropical rainforest and the soil and also hydrology of the investigation zone allow the development of a large portion of Nigeria's staple harvests and still permit adequate open doors for grazing, fishing and forest improvement.

The population of this study is made up or all the 131, 044 registered farmers of Ikom Education Zone of Cross River State (CRADP, 2015). The number of registered farmers in the study area is shown in Table- I. The age range includes farmers from the ages of 15 and 65ycars. This is considered appropriate for the study because the people within this age are matured and are in the best position to provide responses regarding sustainable agricultural practices as well must have practiced farming for at least one farming season.

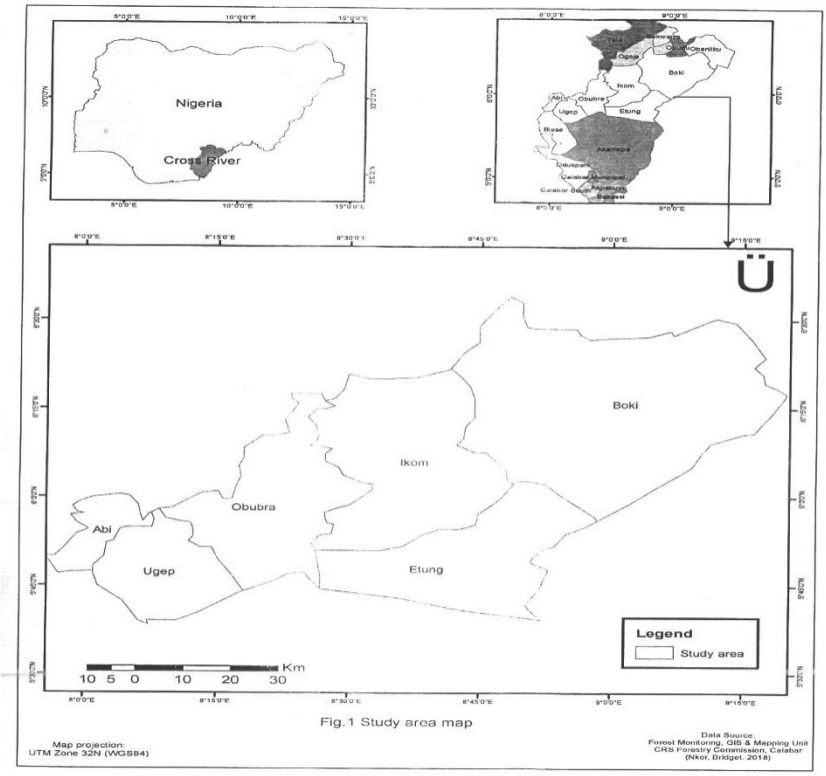

Figure 1: Map of Nigeria, Cross River State and Ikom Education Zone

Sampling Technique

This study employed a stratified random sampling technique. The population was divided based on Local Government Areas (LGAs), and 15% of communities in each LGA were selected. Additionally, 0.5% of the registered farming population was sampled to determine the number of respondents. For instance, Abi LGA has 31 communities (15% × 31 = 5), from which three were selected. Similar calculations yielded 21 communities from Boki, 6 from Etung, 22 from Ikom, 14 from Obubra, and 4 from Yakurr.

A total of 651 respondents were sampled from 70 communities across six LGAs. The proportionate sampling technique ensured a fair representation due to population differences across LGAs. A simple random sampling technique was used to select the communities and respondents. Community names were written on papers, placed in a bag, and randomly drawn to ensure equal selection opportunities.

The study used a 20-item questionnaire, titled "Farmers' Background Variables, Awareness of Climate Change, and Farmers' Attitudes towards Sustainable Agricultural Practices

Questionnaire (FDVACCATSAPQ)." Experts in Environmental Education and Test & Measurement from the University of Calabar validated it.

The instrument had two sections: Section A: Collected demographic data (age, education, income level). Section B: Measured awareness and attitudes using a 4-point Likert scale (SA = 4, A = 3, D = 2, SD = 1). Face and content validity were established through expert review, leading to item modifications. A trial test with 50 respondents in Northern Cross River State assessed reliability using Cronbach Alpha Coefficient.

The researcher obtained community leader permission, trained five research assistants, and ensured informed consent before administering questionnaires. Assistants provided dialect interpretation where needed. After collecting the questionnaires, codes and scores were assigned to each item. A coding schedule was developed for data preparation. The raw scores for each variable were summed, and data analysis was conducted using SPSS version 20. Results were presented in frequencies, percentages, and tables, with hypotheses tested at a 0.05 significance level (95% confidence interval).

Results and discussion

Ho_1

The hypothesis tested whether gender influences farmers' attitudes toward sustainable agricultural practices in Ikom Education Zone. An independent t-test was conducted at a 0.05 significance level (Table 1). Results showed that male farmers (M = 2.969, SD = 0.6870) had a slightly lower mean score than female farmers (M = 2.998, SD = 0.6743). However, the t-value (0.544) and p-value (0.753) indicated no statistically significant difference. Thus, the null hypothesis was upheld, confirming that gender does not significantly influence farmers' attitudes toward sustainable agricultural practices.

Table 1: Independent t-test analysis of gender and attitude toward sustainable agricultural practices in Ikom Education Zone (N=651)

Gender	N	Mean	SD	t-value	p-level
Male	296	2.969	.6870		
				-.544*	.753
Female	355	2.998	.6743		

*Significant at .05 level; p>.05

H_{O2}

The hypothesis tested whether age influences farmers' attitudes toward sustainable agricultural practices in Ikom Education Zone. One-way ANOVA was conducted at a 0.05 significance level (Table 2). Results showed that farmers below 26 years (M = 3.005, SD = 0.6797) had a slightly higher mean score than those aged 26–45 years (M = 2.981, SD = 0.6786) and above 45 years (M = 2.974, SD = 0.6834). However, the F-ratio (0.111) and p-value (0.895) indicated no statistically significant difference. Thus, the null hypothesis was upheld, confirming that age does not significantly influence farmers' attitudes toward sustainable agricultural practices.

Table 2: One-way ANOVA of age and farmers' attitude toward sustainable agricultural practices in lkom Education Zone (651)

Age	N	Mean	SD
Below 26 years	174	3.005	.6767
26 -45 years	236	2.981	.6786
Above 46 years	241	2.974	.6834
Total	651	2.985	.6797

Source of variance	Sum of squares	Df	Mean square	F-ratio	p-level
Between groups	.103	2	0.52	.111*	.895
Within groups	300.216	648	.463		
Total	300.319	650			

*Mean difference is not significant at .05 level; p>.05

H_{O3}

A One-way ANOVA tested the influence of educational level on farmers' attitudes toward sustainable agricultural practices at a 0.05 significance level (Table 3). Results showed that farmers with FSLC/SSCE (M = 2.939, SD = 0.6931) had lower mean scores than those with NCE/ND (M = 2.961, SD = 0.6935) and B.Sc/HND and above (M = 3.012, SD = 0.6679). This suggests that higher education levels correlate with more positive attitudes. The F-ratio (0.609) and p-value (0.544) indicated a statistically significant difference, leading to the

rejection of the null hypothesis. Fisher's LSD Post Hoc Test (Table 11) confirmed that attitudes among FSLC/SSCE holders did not significantly differ from NCE/ND holders (MD = -0.226, p > .05) or B.Sc/HND holders (MD = -0.731, p > .05).

Table 3: One-way ANOVA of educational level and farmers' attitude: toward sustainable agricultural practices in lkom Education Zone (651)

Educational level	N	Mean	SD
FSLC/SSCE	88	2.939	.6931
NCI:/ND	222	2.961	.6935
B.S-/HND	341	3.012	.6679
Total	651	2.985	.6797

Sourct of variance	Sum of squares	Df	Mean square	F-ratio	p-level
Between groups	.563	2	. 282	.609*	.544
Within groups	299.756	648	.463		
Total	300.319	650			

*Mean difference is signilicant at .05 level: p<.05

Table 4: Scheffe Post Hoc Test for educational level and farmers' attitude toward sustainable agricultural practices in Ikom Education Zone

Age	Joint	N	Mean	Mean difference	p-level
FSLC/SSCE	NCE/ND	222	2.961	-.0226*	.966
	B.Sc/HND above	341	3.012	-.0734	.666
NCE/ND	FSLC/SSCE	88	2.961	.0226*	.966
	B.Sc/HND above	341	3.012	-.0508	.688
B.Sc/HND above	FSLC/SSCE	88	2.939	.0734*	.666
	NCE/ND	222	2.961	.0508	.688

*Mean difference is significant at .05 level; p>.05.

Furthermore, the mean score in farmers' attitude towards sustainable agricultural practices among the subjects who have NCE/ND differ significantly in absolute when compared with the mean score of those who have B.Sc/HND and above in favour of those who have B.Sc/HND (MD= -0.508; p>.05). Based on these, the source of the difference was more from the subjects who have higher degree followed by those who have FSLC/SSCE, NC/IND and B.Sc/HND and above respectively.

Discussions of findings

Gender and Farmers' Attitude Toward Conservation

The study found no significant influence of gender on farmers' attitudes toward sustainable agricultural practices in Ikom Education Zone. This aligns with the idea that men and women in the same geographical zone engage in similar agricultural practices. However, this contradicts Terrants and Curdel (2007), who argued that gender influences environmental attitudes and behaviors. Similarly, the Asian and Pacific Ministerial Declaration (2014) noted that women, as key food producers, possess valuable knowledge and skills that could enhance sustainable agriculture if given access to resources and gender-responsive policies.

Filson (2006) suggested that women are generally more environmentally oriented than men, supporting government regulations and engaging more in organic farming (Egri, 2009). Women's involvement in decision-making also fosters conservation efforts (Hall & Mogyorody, 2007). However, some studies (Borsotto et al., 2008; Conradie et al., 2013) found no significant relationship between gender and environmental behavior, supporting the findings of this study.

Age and Farmers' Attitude Toward Sustainable Practices

The study also found no significant influence of age on farmers' attitudes. Younger individuals show little interest in farming, while older farmers continue traditional sustainable practices such as crop rotation and shifting cultivation. This contradicts Zhang (2013), who argued that younger people are generally more environmentally concerned, and Filson (2013), who found younger farmers more likely to adopt environmental enhancement programs. However, other studies suggest age is an unreliable indicator of environmental attitudes (Rougoor et al., 2008; Knowler & Bradshaw, 2017). Some research found no difference in conservation participation based on age (Wilson, 2007), while others noted younger farmers' preference for intensive farming (Burton & Wilson, 2000).

Educational Level and Farmers' Attitude Toward Sustainability

Unlike gender and age, educational level significantly influenced farmers' attitudes, with higher education correlating with a stronger commitment to sustainable practices. This aligns

with Scott and Mayits **(**2004**)**, who found that education increases environmental engagement by exposing individuals to information on ecological harm. Education enhances farm management skills, helping farmers adopt new technologies (Adrian et al., 2005) and understand complex farming systems (Solano et al., 2006).

Kreutzwiser et al. (2011) noted that education dispels environmental myths and fosters awareness, leading to more sustainable behavior. However, education alone does not always translate into action, as attitudes and behavior may not always align. Nevertheless, better-educated farmers are more likely to adopt conservation-oriented practices.

Implications and Recommendations

Findings suggest that targeted educational interventions and climate change awareness campaigns should be prioritized to improve farmers' adoption of sustainable practices. Since gender and age showed no significant influence, sustainability programs should target all farmers inclusively. Policymakers should integrate climate education into agricultural extension services, and collaborative efforts between educational institutions, NGOs, and extension workers can enhance knowledge-sharing. To ensure sustainable resource use, farmers' attitudes should be considered in policy planning. Cooperative agricultural programs should address generational gaps, and extension services should promote sound farming practices to build a more resilient agricultural sector.

References

Adeogun, S., Fapojuwo, D., Oyeyinka, E., Adamu, A. & Abioma, S. (2013). agricultural extension professionals toward sustainable agriculture concepts. Journal of Agriculture and Social Sciences, 4(3), 101-106.

Ajzen, I. (1991). The Theory of planned behavior. Organizational Behaviour and Human Decision Processes, 50, 179-211.

Arcury, T. A., & Christianson, E. H. (1993). Rural-urban differences in environmental knowledge and actions. Journal of Environmental Education, 25, 19-25.

Barrow, C. J., Lawrence, C., & Walker, T. (2009). Issues and challenges of sustainable agriculture in the Cameron Hihlands. Malaysian Journal of Environmental Management, 10 (2), 89-114.

Bassey, J. J. (2016). Comparative analysis of system of rice intensification and behaviour: prediction of intentions to quit smoking using past behaviour as moderator. Addiction research and theory, 18(5), 572-585.

Below, T., Artner, A., Siebert, R., & Sieber, S. (2010). Micro-level practices to adapt to climate change for African small-scale farmers: A review of selected literature. Environment and Production Technology Division Discussion Paper.

Best, H. (2009). Organic farming as a rational choice: Empirical investigations in environmental decision making. Rationality and Society, 21, 197-224.

Bohnet, I. C., Roberts, B., Harding, E. & Haug, K. J. (2011). A typology of graziers to inform a more targeted approach for developing natural resource management policies and agricultural extension programs. Land Use Policy, 28, 629-637.

Bonnieux, F., Rainelli, P. & Vermersch, D. (2008). Estimating the supply of environmental benefits by agriculture: A French case study. Environmental and Resource Economics, 11, 135-153.

Borsotto, P., Henke, R., Macil, M. C. & Salvoni, C. (2008). Participation in rural landscape conservation schemes in italy, landscape Research, 33, 347 -363

Brodt, S. Klonsky, K., Tourte. L. (2016). Farmer goals and management styles: implication for advancing biologically based agriculture. Agricultural Systems, 89, 90-105.

Brotherton, I. (1991). What limits participation in ESAs? Journal of Environmental Management. 32(3), 211-251.

Chizari, M., Lindner, J. R, Zoghie, M. (2009). Perceptions of extension agents, educational needs regarding sustainable agricultural in the Khorasan provinve, Iran. Journal of Agricultural Education, 40(4), 20-27.

Curtis, A & De Lacy, T.(1996). Landcare in Australia: does it make a difference? Australian Journal of Environmental Management, 16(2), 119-137.

Cynthia, L. B. D. (2012) the infleunces of Socio-demographic Factors, and Non-formal and informal Learning Participation on Adult Environmental Behaviours. International Electronic Journal of Environmental Education, 3, (3), 37-55.

Daksa, M. B. & Kotu, B. H. (2015), Determinants of deforestation in Western Oromia region of Ethiopia: the case od Kongto Forest, Journal of Horticulture and Forestry. 7(5), 118-126.

Doss, C. (2018). Women and agricultural productivity: Reframing the issues. Development Policy Review, 36(1), 35-50. https://doi.org/10.1111/dpr.12243

Egri, C. P. (2009). Attitudes, Backgrounds and Information Preferences of Canadian Organic and conventional farmers: Implication for Organic Farming Advocacy and Extension. Journal of Sustainable Agriculture, 13(3), 45-72.

FAO. (2020). Gender and sustainable agriculture: Building resilience to climate change. Food and Agriculture Organization of the United Nations.

Filson, G. C. (2013). Comparative Differences in Ontario Farmers' Environmental Attitude. Journal of Agricultural and Environmental Ethics, 6(2), 165-184.

Filson, G. C., (2006). Demographic and Farm Characteristic Difference in Ontario Farmers' Views about Sustainability Policies. Journal of Agricultural and Environmental Ethics, 9(2), 165-180.

Gifford, R.(1982). Children and the commons dilemma, Journal of Applied Social Psychology, 12,269-280).

Gilg, A., Barr, S., & Ford, N. (2005). Green consumption or sustainable lifestyles? Identifying the sustainable consumer. Futures, 37 481-504.

GlobeScan, (2006). 30-country poll finds worldwide consensus that climate change is a serious problem. Toronto, Canada: GlobeScan, Inc.

Godfrey, A., Le Roux-Rutledge E., Cooke, S. & burton, M. (2009). Africa talks climate. The public understanding of climate change in ten countries. Research Report. London. U. K.: BBC World Service Trust.

Grendstad, G. & Wolleback, I). (2008). Greener still? An empirical examination of Eckersley's eccentric approach. Environment and Behaviour, 50,653-675.

Hall, A. (2010). Organic Farming Gender, and the Labour Process. Rural sociology 72(2). 289-316.

Hashemi, S. M. & Damalas, C. A. (2011). Farmer's perceptions of pesticide efficacy: reflections on the importance of pest management practices adoption. Journal of Sustainable Agronomy, 45:1-17.

Hayati, B., Momenlehelki, D., Zarifian, S. H., Galalian M. (2010). Personnel's attitude of jinad agriculture organization of East Azarbayejan toward sustainable agriculture and effective factors. Journal of Iran Agricultural Development ad Economices 41(1). 71-73.

Honnold, J. A. (1984-85). Age and environmental concern: some specification of effects. Journal of environmental education, 16 (1), 4-9

Hossien, A.. Khadileh M. & Nashmil, A. (2012). Agricultural graduate students' attitudes towards sustainable agriculture: a case of razi university, iran. Annals of biological research, 3 (8), 407-411.

Ibiremo, O. S., Hoyanomon, C. L., Oloyede, A. A Lawal, J. O. & Alhassan, I. (2017). Strengthen cocoa production through site specific fertilizer recommendation in Five Local Government Area of Cross River Stat, Nigeria. Journal of Agriculture and ecology research international, 13 (4), 1-11.

Ibok, O. W., Ekanem, J. T. & Umoh, I. U. (2015). Factor influencing the utilization of agricultural extension technologies by yam farmers in Yakurr LGA of Cross River State, Nigeria. Journal of Basic and Applied Research International, 5 (2), 100-109.

Itam, K. O., Ajah E. A. Ofem, U. I & Abam, O. E. (2015) Technically efficiency analysis of small scale cassava farmers in Cross River State, Nigeria: A stochastic production frontier approach. Applied Economics and Finance, 2 (4), 10-19.

Itam, K. O., Etuk E. A. & Ukpong I. G. (2014). Analysis of resource use efficiency among small scale from farms in Cross River State. International Journal of Fishers Aquaculture 6 (7). 80-86.

Jackson-Smith, D. B., McEvoy, J. P. (2011). Assessing the Long-term Impacts of Water Quality Outreach and Education Efforts on Agricultural Landowners. The Journal of Agricultural Education and Extension, 17(4), 341-353.

Karami, E. (2007). Social and economical factors Relationships with technical knowledge and sustainable agriculture among wheat growers. Institution of Planning and agricultural economic researches,

Karami, E., Masoorabdi, A. (2009). Sustainable agricultural attitudes and behaviors: a gender analysis of Iranian farmers. Environment Development Sustainable, 10, 833-898.

Klineberg, S. L., Mckeever, M., & Rothenbach B. (1998). Demographic predictors of environmental concern: it does make a difference how its measured. Social Science Quarterly, 79, 734-753.

Knowler, D., Bradshaw, B. (2017). Farmers' adoption of conservation agriculture: A review and synthesis of recent research. Food Policy, 32, 25-48.

Kothari, M. (1990). Attitude change and Radio-TV. Ministry of culture and Iran Islamic consultation, Iran.

Kreutzwiser, R. De Loe, R., lingrund, K., Conboy, M. J., Simpson, H. & Plummer, R. (2011). Understanding stewardship behaviour: Factors facilitating and constraining private water well stewardship. Journal of Environmental Management, 92, 1104-1114.

Kristensen, L. S. Thenail, C. & Kristensen, S. P. (2004). Landscape changes in agrarian landscapes in the 1990: the interaction between farmers and the farmers landscape. A case study from Jutland, Denmark. Journal of Environmental Management, 71, 231-244.

Lambert, D., Sullivan, P., Classen, R., Foreman, L. (2007). Profiles of US farm households and adopting conservation-compatible practices. Land Use Policy, 24, 72-88.

Mathijs, E. (2013). Social capital and farmers' mayingness to adopt countryside stewardship schemes. Outlook on Agriculture, 32 (1), 13-16.

Meinzen-Dick, R., Quisumbing, A., Doss, C., & Theis, S. (2019). Women's land rights as a pathway to poverty reduction: Framework and review of available evidence. Agricultural Systems, 172, 72-82. https://doi.org/10.1016/j.agsy.2017.10.009

Murphy, G., Hynes, S., Murphy, E., O'Donoghue, C., Green, S. (2011). Assessing the compactibility of farmland biodiversity and habitats to the specifications of agri-environmental schemes using a multinomial logit approach. Ecological Economics, 71, 111-121.

Nwaobiala, C., J. (2014). Socio-economic factors influencing farmers' participation in community based programme in Abia and Cross River States of Nigeria. Journal of Agricultural Extension, 18 (1), 48-61.

Nwaobiala, C., J. (2017). Factors influencing farmers' output in the international fund for agricultural development community-based project in Abia and Cross River States of Nigeria. Journal of Agricultural Extension, 21 (1), 135-148.

Okoro, G. O., Etuk, U. R. & Akpan, E. I. (2016). Utilization of sustainable agricultural practice among crop farmers' in Ibesikpo Asutan Local Government Area, Akwa Ibom State. International Journal of Agricultural Extension and Rural Development Studies, 3(3), 52-60.

Ommani, A.R. (2000). Extension of suitable technology, and strategic in the sustainable agriculture, New perspective.jihad, 232:13-23.

Pannell, D., Marshall, G.R., Bar, N., Curtis, A., Vanclay, F., Wilkinson, R. (2006). Understanding and promoting adoption of conservation practices by rural landholders. Australian Journal of Experimental Agriculture, 46, 1407-1424.

Paquette, S., & Domon, G. (1999). Agricultural trajectories(1961-991), resulting agricultural profiles and current sociodemographic profiles of rural communities in Southern Quebee (Canada): A typological outline. Journal of rural studies. 15:279-295.

Pew Research Centre (2013). Most Americans believe climate change is real, but fewer..... it as a threat. The Pew Research Centre for the people & the press, Washington.

Pew Research Centre(2006). No global warming alarm in the U.S., China. The Pew Research Centre for the people & the press, Washington, DC.

Robert, G. & Andreas, N. (2014). Personal and social factors that influence pro-environmental concern and behaviour: A review. International Journal of psychology.

Roberts, J.A. (1993). Sex differences in socially responsible consumers' behaviours. Psychological Reports,73,139-148.

Rougboor, C.W., Trip, G., Huirne, R., Renkema, J.(2008). How to define and study farmers' management capacity: theory and use in agricultural economics. Agricultural Economics, 18,261-272.

Scott, D. & Mayits, F.K.(2014). Environmental attitudes and behaviour: a pennysylvaniasurvey. Environment and Behaviour,26(2),239-260.

Siebert, Berger G., Lorenz, J. & Pfeffer, H. (2010). Assessing German farmers' attitude regarding nature conversation set-aside in regions dominated by arable farming Journal for Nature Conservation, 18,327-337.

Siebert, R., Toogood, M., Knierim, A.(2006). Factors affecting European Farmers' participating biodiversity policies. Sociologia Ruralis, 46 (4), 318-340.

Smithers & Furman, 2003).

Solano, C., Leon, H., Perez., E., Tole, L., Faweett, R., Herrero, M., (2006). Using farmer decision making profiles and managerial capacity as predictors of farms. Agricultural Systems 88, 395-428.

Stock, P.,2007. Good farmers as reflexive producers: an examination of family organic farmers in the US Midwest. Sociologia Ruralis,47,(2),83-102.

Stone, T.H., Jawaha I. M.& Kisamore, J. L.(2010). Predicting academic misconduct intention and behaviour using the theory of planned and personality. Basic and applied Serial Psychology, 32(1),35-45.

Swim J. K., Stern, P.C., Doherty, T., Clayton, S., Reser, J.P., Weber, E. U. And Howard, G.S.(2011).psychology's contribution in understanding and addressing global climate change mitigation and adaptation. American psycologist,66, 241-250.

Szagun,G.,and Mesenholl, E.(2003). Environmental ethics: An empirical study of West German adolescents. Journal of environmental education, 25(1),37-44.

Taderera, D.92010).south african's awareness of climate change. Briefing papers no.235.cape town, S.A: The Catholic Parliamentary Liaison Office.

Terrants. K. G. H. & Cordel, II.(2007).Analyzing Of Economic Condition Of Transforming Agriculture To Organic Farming With Using The Model Of Dynamic Linear Planning .Article Of Second National Congress Of Agro Ecological Knowledge, Iran :Gorgan, 2727-2737.

Tey, Y. S., Li, E., Bruwer, J., & Abdullah, A. M. (2017). Factors influencing the adoption of sustainable agricultural practices in developing countries: A review. Environmental Management and Sustainable Development, 6(1), 17-35. https://doi.org/10.5296/emsd.v6i1.10622

Tiku N.E.,Simonya, J.B.,Agbogo,E.A. Andibor.G.I.(2010). The efficiency of inputs utilization of rice production in Obubra Local Government Area of Cross River State Nigeria,11(2),86-93.

UNDP (2007) Fighting Climate Change: Human Solidarity In a Divided World UNDP New York

Vanslembrouck, I., Van Huylenbroeek,G., Verbeke, W. (2012). Determinants of the Mayingness of Belgian Farmers to participate in Agri-environmental measures. Journal of agricultural economics, 53 (3), 489-511.

Velten, S., Leventon,J., Jager,N. and Newig, J.(2015). What is sustainable agriculture? A systematic review. Sustainability,7, 7833-7865.

Wilson, G. A.(1997). Factors Influencing Farmers Participation In The Environmentally Sensitive Area Scheme. Journals of environmental management,50,67-93.

Wilson, G. A., Hart .K.(2000).Financial imperative or conservation concern? EU farmers motivation for participation in voluntary agri-environmental schemes. Environment and planning, 32, 2161-2185.

Xiaodong, C., M. Nils P.,Vanessa, H.,Chundan, L., Graise, D. L., Dayong, H. & Jianguo, L. (2011).Effect of attitudinal and socio-demographic factors on pro-environmental behavior in urban china. Environmental conservation 1:8.

Yiridoe, E. K., Atari, D. O. A., Gordon, R and Smale, S. (2010). Factors influencing participation in the Nova Scotia Environmental Farm Plan Program. Land Use Policy,27, 1097-1106.

Zhang, J. (2013). Environmental hazards in the Chinese public eyes. Risk Analysis, 13,509 513.