

Influence of Farmers' Income Level on Attainment of Sustainable Development Goal Two in Cross River State, Nigeria

Usang, Nkanu Onnoghen¹
usangonnoghen@gmail.com

Diwa Juliana Bebuo²
Diwajuliana83@gmail.com

Ogre, Gabriel Ogre³
Gabrielogre114@gmail.com

Ogar, Timothy Okey⁴
Timexo2@yahoo.com

^{1,2,3} Department of Environmental Education, Faculty of Science Education, University of Calabar, Nigeria

⁴Department of Geography Education, Cross River State, College of Education, Akamkpa.

DOI: <https://doi.org/10.60787/tjesds.vol2no2.139>

ABSTRACT

This study focused on farmers' income level and attainment of sustainable development goal two in Cross River State, Nigeria. To achieve the purpose of this study, a null hypothesis was formulated to guide the study. A review of related literature was carried out based on the variable of this study. The survey research design was considered useful for the study. Multi-stage sampling approach involving stratified sampling, simple random sampling, and systematic random sampling techniques were used in the study to select 900 subjects used as sample in each ward in the research area. A twenty-item modified four (4) points Likert scale questionnaire titled Farmers' income and Attainment of Sustainable Development Goal 2 Questionnaire (FIASDGQ) was used for gathering data for the study. The hypothesis formulated was tested at 0.05 alpha level. To test the hypotheses formulated for the study, One Way Analysis Of Variance (ANOVA) statistical tool was used for data analysis. The results from data analysis and hypothesis testing indicated that there is a significant influence of farmers' income level on the attainment of sustainable development goal two in the study area. Based on the findings of the study, it was recommended among others that farmers are advised to diversify their income sources by engaging in off farm income activities that can relive capital constraints and provides a safety net against agricultural loses.

KEY WORD: farmers, income level, attainment, sustainable development, goal two, Cross River State.

INTRODUCTION

The world is experiencing a steady increase in population growth. The world population reached 8billion in late 2022 and 8.2-8.3 billion in 2025/2026 and it is expected to reach 8.6 billion in 2030, 9.8-10 billion in 2050, and could peak at 10.3-11.2 billion before the end of the century. Nigeria's population in 2026 is projected to be approximately 242 to 243 million people and it is projected to reach approximately 262-264 million people by 2030 and as the most populous country in Africa and number sixth in the world, the worldometer estimates a yearly growth of around 2.06% to 2.1% with projections suggesting it could become the world's third most populous country by 2050. This increase in the world population is certainly going to bring a high demand on the limited world resources, most notably on food production and supply chain. In this era of globalization coupled with the projected increase in the world population, rise in global conflicts together with

poverty escalation becomes a global challenge for humanity in achieving sustainability. This unarguably poses a threat to the second global sustainable development goal and to promote sustainable agriculture and its related environmental security comes with a significant challenge to attain food security. The Food and Agriculture Organization of the United Nations (FAO, 2020), defines food security to be a situation whereby all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life.

Farming remains the backbone of Nigeria's economy that is employing millions and contributing significantly to ending of hunger and national food security. Therefore to meet the increasing demand for agricultural produce, farmers' access to farm implements has become very essential concern. Obu and Lawrence (2025) assert that, farm implements, ranging from simple hand tools to sophisticated machines for agricultural produce, adopting efficient tools and technologies in farming play a crucial role in achieving higher productivity and reducing labour intensive processes. They observe that, farmers in rural areas require easy access to farm implements stressing that, stakeholders in agriculture must work together to make this possible for farmers with low income standing. The researchers suggest that extension services should help rural farmers learn how to use implements effectively for higher productivity, while public and private sectors should provide financing options such as hiring-purchasing or leasing for expensive machinery like tractors to smallholder farmers. Massey, (2026) notes that farm implements are essential for scaling up agricultural production in Nigeria. He believes that from tractors and plough to sprayers and planters, are tools that revolutionizing how farming is done, enabling farmers to save time, improve yields, and reduce costs. The researcher noted that, with increased awareness, affordable options, and government backed up initiatives for easy access to basic farm implements, Nigeria farmers can look forward to a more productive and profitable farming seasons. This implies that, by investing in the right implements, the agricultural sector in Nigeria can continue to grow, ensuring food security and improving livelihoods.

Obu and Lawrence (2025), observe that, most rural farmers are still using poor and unimproved planting materials whether it is seeds or seedlings, roots or tubers, stems or cuttings in crop production due to its unavailability and lack of awareness about the importance of improve seeds/seedlings in crop production. This, they attributed it to farmers' lack of basic knowledge a simple seed selection to maintain good and high yielding seeds from their existing crops. As a result, the productivity of common food crops is low in their local agro climatic zones. From the foregoing, planting materials are very important components of crop production because good seeds/seedlings interact with good environment around it and it determines the health and performance of the

crop/plant but, if the environment is conducive and the seeds are poor, production is likely to be less. Hence, farmers' access to good and healthy seeds/seedlings from a healthy seed source and having at least basic knowledge of healthy seeds selection and conservation practices become imperative in the fight against hunger and food insecurity. For improve and sustainable food production, farmers can also procure traditional varieties from good sources and improved and high yielding varieties from various resource institutions such as agricultural universities and reputed agro companies. From the above background, it is crystal clear that sustainable agriculture is largely dependent on the quality of plantings materials accessible by the farmers.

As the countdown to the sustainable development goal two (SDG2) 2030 targets tickles, this study would explore the current state of food security within the sub-Saharan Africa and the connection of food security with the various contributing factors such as economic growth, governance, geopolitical, climatic, population, and environmental factors in relation to achieving sustainable development goal2 in the study area. Sustainable agriculture and government institutions play crucial role in achieving sustainable development goal two with emphasis on ending hunger, achieving food security, improving nutrition, and promoting sustainable agriculture. This may involve the protection and sustainable management of the ecosystems, including forests, wetlands, and agricultural lands.

Ipeh and Agbebia (2023) contend that the preservation of ecosystems by encouraging sustainable water use, promoting water-saving irrigation techniques, safeguarding water quality, support food production and ensures the availability of natural resources necessary for agricultural production and environmental sustainability is a sure way in addressing climate change which can affects crop yield, water availability and food production. Ekposin (2025) believes that government institutions can affects sustainable agriculture by facilitating capacity-building programs and knowledge sharing platforms for farmers, such as training on sustainable agricultural practices, providing access to information and technology, and promoting farmer-to-farmer knowledge exchange through collaboration among governments, stakeholders, and community farmers in the area of food security is essential for effective implementation of short and long-term success in ending hunger and reduce poverty. He observes further that the integration of environmental sustainability into agricultural practices and leveraging on the role of government institutions by creating an enabling environment for food production and strengthening government institutions may also help to effectively achieve sustainable development goal two even as it requires a multi-dimensional approach involving policy coherence, capacity-building, stakeholder engagement, and sustainable farming practices at all levels of the agricultural system.

Adams (2022), states that given the multi-disciplinary and multi-sectoral nature of food security, studies have utilized different parameters to develop proxies to measure food security such as; Household Consumption and Expenditure Surveys (HCES) which estimates household-level food consumption patterns, poverty, economic status, and consumer price indices of the household. He notes that this approach gives information on food expenditures based on the monetary value of the quantity of food acquired by the household. The researcher asserts that Food Consumption Score (FCS) is a measure of the composite score with a primary focus on dietary diversity, consumption frequency, and the relative nutritional relevance of various food groups. He also affirms that the food consumption score is usually used by the World Food Program to access food security on a regional scale. Studies from different parts of the world including Africa indicated a positive relationship between food consumption scores and the daily per capita kilocalorie intake. According to him the Household Dietary Diversity Score (HDDS), is another metric that has gathered much momentum in recent times regarding food security measures. Household access to varieties of food in qualitative terms can also be measured using the dietary diversity score. Household Dietary Diversity score reflects both food access and availability in the sense that the ability of a household to consume varieties of food groups depend on the household purchasing power. The Household Food Insecurity Access Scale (HFIAS) is also another metric that has been used in recent years as a proxy to measure food security; this was developed as part of the Food and Nutrition Technical Assistance (FANTA II) Project to assess how households experienced problems with food access in the past. Studies have proven that increase in dietary diversity can be related to household food security and socioeconomic status hence the application of the metrics. The importance of these metrics has been emphasized by Kennedy (2021) as an essential measure of food security in various individual households. This study therefore aims at assessing the farmers' income on the attainment of SDGs2 in Cross River State, Nigeria.

Statement of the problem

The world is faced with many challenges. Among these problems include hunger and starvation and this is associated with food insecurity; sanitation and hygiene, disease and sickness, water scarcity to mention but a few. Though the entire world is at risk of these problems, the third world nations and most especially Nigeria is badly affected and the question that we should be bordered about at the moment; Is Nigeria ready for sustainable development goal two-zero hunger target by 2030 or are we really serious about ending hunger?. In Cross River State for instance, there are several problems that has plagued the people. One of the major problems that have challenged the government and the people is the issue of hunger/starvation. It is very common to see children,

women and men begging for food or money to buy food at public places such as eateries, parks, filling stations, resorts, churches, mosques, markets, school gates and government offices. The issue of hunger in Cross River State is an indication that the state needs to put in place urgent measures in an attempt to achieve sustainable development goal two by 2030 as stipulated by the UN-SDGs in 2015 and avoid the devastating consequences of hunger and starvation on the people and the society at large. The issue of insecurity, burglary, theft, armed robbery, violence and other social vices that are witnessed in the society today cannot be separated from hunger and food insecurity and, it seems the situation is getting worse by the day.

In view of this, the government, individuals, scholars and non-governmental organizations may have relentlessly worked in synergy to promote the production and distribution of food, subsidization of farm inputs, information and guidance on modern agricultural practices all in a bid to boost food production. But, it is glaring that despite all these efforts so far, it seems that nothing tangible has been achieved. However, one should not be surprised because all these efforts seem more of paper work than in practice. Otherwise, why will a government that hopes to eradicate hunger and ensure food security allow agriculture as basic as it is to food security to be an option rather than a compulsory subject in senior secondary school curriculum. If this continues unabated, Students/Youths would tend to believe that farming is a dirty profession exclusively for the aging and poor people. Looking at this from any angle, no state no matter how wealthy can attain SDG2 even beyond 2030 if agriculture that is the main driver of food security is built on such a weak/faulty foundation. Farming feeds the world. No person survives on earth without food but, it is only few persons that are feeding the many people that live on earth. It is against this background that this study was conceived to examine; to what extent do farmers' income and access to farmers' income influence the attainment of sustainable development goal 2 in Cross River State, Nigeria?

Purpose of the study

This study focused on farmers' income and attainment of sustainable development goal two in Cross River State, Nigeria. Specifically, this study sought to;

1. determine the influence of farmers' income on attainment of sustainable development goal two in Cross River State, Nigeria

Research questions

The following research question was posed to guide this study;

1. To what extent does farmers' income level influence the attainment of sustainable development goal two in Cross River State, Nigeria?

Statement of hypotheses

The following hypothesis was formulated to direct this study;

1. There is no significant influence of farmers' income level on the attainment of sustainable development goal two in Cross River State, Nigeria.

LITERATURE REVIEW

Farmers' income and attainment of sustainable development goal two

Many low-income farmers across Sub-Saharan Africa to Southeast Asia have suffered major natural disasters and political upheavals through the 1990s. These events remind observers about what is hidden in official poverty statistics: that the condition of poverty is linked closely to vulnerability. Many agrarian households are exposed regularly to risks from poor weather, illness, political instability, and economic mismanagement. Concern with vulnerability may be both intrinsic and tied to implications for income generation, as well as longer-term consequences on the nutrition, health, and schooling of children (Rose, 2015; Hoddinott and Kinsey (2018); and Jacoby and Skoufias (2017), low income/poverty can lead agrarian households to forego potentially valuable new technologies and profitable production choices. Rosenzweig and Binswanger (2023), for example, use data from rural South India to show that an increase in low income leads to reductions in farm profits by 35% for the poorest quarter of households, while the wealthiest (and least vulnerable) farmers are virtually unaffected. Vulnerable households may also spiral downward into ongoing poverty following adverse economic or climatic shocks, as productive assets are depleted to protect consumption levels. Addressing risk of low income can thus be an important complement to redistributive efforts and anti-poverty strategies focused on increasing economic growth and employment.

Alderman, Harold and Christina Paxson (2024) are of the opinion that most households in developing countries including Nigeria deal with economic hardships through informal insurance arrangements arising between individuals and communities on a personalized basis, rather than through markets or states. Examples include drawing down savings, engaging in reciprocal gift exchange and diversifying income-generating activities. They hope that these mechanisms can be highly effective in the right circumstances, but most recent studies show that informal insurance arrangement is often weak. In particular, poorer households in this area appear to have substantial difficulties coping even with localized idiosyncratic risks.

According to Estacio and Mordeno (2021), agriculture is very much vulnerable to the unpredictability of nature. With agricultural production representing the major source of income of many, resource constrained of farmers, the impact of nature and other agricultural risk cannot be

taken lightly. Other agribusinesses and commercial farms that operate with higher capital and better technology on better lands are also not spared from the same risks. The need to safeguard the interests and investments of local farmers and industry players in this region is therefore of paramount importance. Maintaining an increasing flow of income to rural farmers is a challenge to the success of poverty alleviation programs in developing economies, due to risks and uncertainties that characterize agricultural activities. Farmers and entrepreneurs in rural agrarian economies therefore should have high demand for social support system like credit and insurance services even though the option to purchase such services as credit and insurance facilities often does not exist (Rosenzweig, 2018).

In other hand, farmers in Africa and other parts of the world can utilize the potentials of mobile phones/internet to enhance productivity, generate income, and have better access to agricultural information/innovation. However, the use of mobile phones for the acquisition of agricultural information which would aid agricultural activities is often being influenced by income level of the famers. A study by Jain and Hundal (2017) in India revealed that about 62% of farmers make use of button phones that does not have internet facilities. This they explain that it is not unconnected to low income level of the farm workforce. In a study on Grameen Telecom's Village Phone Program in Bangladesh, Richardson, Ramirez, and Haq (2020) explained that the quality of phone usage in modern times by the farm workforce is a function of income continuum. They believe that the quality of phone use determine the amount of information farmers can acquire over time. Kalba (2018) argues that the adoption of certain technology attributes or alternatives (e.g. fixed vs mobile connection and postpaid vs pre-paid services) depends on the level of farmers' income over time. Also, in relations to income, farmers' earnings would determine the type of mobile phones to buy and how it will be utilized in terms of the amount of call card to buy which could result in the rate and quality of agricultural information acquire that could influence sustainable agriculture and ensure food security.

Mbuha, *et al.*, (2022) carried out a study on poverty and food security of Rural dwellers in Ogoja Education Zone, Cross River State, Nigeria. The study adopted a multistage sampling procedure to select a sample size of three hundred and thirty (330) participants out of a study population of five thousand and twenty one (5,021) secondary school teachers in the study area. The researchers used a 30 self-structured questionnaire to obtain data from the respondents. Findings from the analysis of data collected using a multidimensional poverty indices (MPIs), indicated that individuals with low income level were noted to have a more negative impact on sustainable agriculture than those with high income level. They also observed that the poor and individuals with low income level and education live in rural areas that are environmentally fragile,

and they depend largely on natural resources over which they have little or no sustainable control. The result also shows that families with low income background are often poor and lack the resources to avoid degrading their environment. The study also revealed that low income farmers are struggling at the edge of subsistence and preoccupied with day-to-day survival struggle which make them to do anything possible to ensure survival even when it is environmentally or agriculturally unhealthy. This made Mbuha, *et al.*, to submit that illiterates are both victims and agents of food insecurity. Their findings significantly relates with the present study in terms of the income variable and the geographical area used in both studies. However, the present work differs in study area coverage, sample size, population under study, statistical tool adopted and the other variables as used in the study. This suggests that the findings of the present study significantly differs with Mbuha,*etal.*, Lawrence and Paul's findings in respect to the attainment of the sustainable development goal two as stipulated in the SDGs 2015.

Ayandokun, Alamu, George-Onaho and Ete (2022) conducted a study on achieving sustainable development goals in Nigeria with benefits from insects. In a bid to address various global challenges, seventeen sustainable development goals (SDGs) were set to replace the defunct millennium development goals (MDGs) in 2000. There is however urgent need to explore different avenues as provided by nature especially with year 2030 set to be the deadline for full achievement of the goals fast approaching. This research work uncovers various different potentials associated with insects that can be explored in achieving SDGs. Honey, beeswax, royal jelly, pollen, propolis and bee venom are products from apiculture which can be used as food, source of income, employment and also provide healing of diverse ailments. Creation of gainful employment to ever-increasing labour force; treatment of headache, abdominal pain, blood pressure, reduction of blood glucose, treatment of mouth ulcers, fever, anemia, dizziness, insomnia, hepatitis and constipation are potentials in sericulture that are relevant in achieving some of the SDGs. Edible insect such as bees, wasps, beetles, moths, caterpillars, crickets and grasshoppers are rich in fats, proteins, fiber, vitamins and minerals. They are therefore consumed as food and income generation in various part of the world. They are also useful in enhancing immune function, improve gastrointestinal health, prevent incidence of cancer, cardiovascular disease and diabetes in human being. These potentials when properly harnessed can go a long way as a means of achieving the SDGs.

A study by Oyedepo, Oluwakemi, Bello, Olaoye, Adebukunola, Oluwalana, Oyedepo and Akinwumi (2024) examined the Livelihood Support Programmes for Sustainable Development Goals in Rural Nigeria. The Federal University of Agriculture, Abeokuta (FUNAAB), Nigeria, extended a livelihood support programme to neighbouring villages it adopted for its Agricultural Productivity Programme (APP). The APP included training, advisory services, and dissemination

of some agricultural technologies. The targets of APP were to effectively tackle development challenges by increasing agricultural productivity and to reduce poverty and hunger (malnutrition) as entrenched in the first two Sustainable Development Goals. Four technologies were disseminated and demonstrated to the rural dwellers. The project beneficiaries were guided into personal investment using practical knowledge acquired from the demonstration. At the end of 2 years, an early impact assessment was conducted. Results revealed that the income of farmers improved from \$1.81 to \$3.76 a day from just two enterprises. Nutritious food such as vitamin A-fortified cassava, quality protein maize, fish, eggs, and chicken were made available to people in the rural areas. The University-led APP intervention was an empirical way of actualizing the SDG at the village level.

Lawrence, Ihebuzor and Lawrence (2020) carried out a study on some challenges militating against developing countries achieving SDG 2 on targets: Nigeria as case study. The sustainable development goal (SDG) 2, which is “ending hunger, ensure food security, improve nutrition and promote sustainable agriculture”, is a critical goal that is needed to be achieved for improved quality of life and the developmental advancement of any nation. The United Nations Sustainable Development reports identified some major challenges that can hinder Nigeria from achieving this goal: they include poor funding of agriculture in the budgets, out-of-school-children, prolonged neglect of learning environments and facilities, among many others. The source evaluated those identified critical factors of poor funding, poor school enrolment/out-of-school-children and poor school infrastructure using fishbone and problem tree analysis and also applied qualitative descriptive assessment of the 7 SDG 2 targets and the 3 enabling targets. Funding was identified as the key issue and it is also an underlying factor militating against the achievement of many other challenges. The other key challenge of poor school enrolment cannot be resolved with persisting insecurity and Almajiri problems in the northern parts of Nigeria. Without concerted effort to increase the budget for education, agriculture, social welfare for farmers and ensuring that the allocated funds are not misappropriated, it will not be possible to achieve the SDG 2. The study posited that “This position was reinforced by the fact that Nigeria is currently ranked 159 out of 162 nations in our performance towards achieving the SDGs and also our not too good performance during the Millennium Development Goals (MDGs) era”.

RESEARCH METHODOLOGY

The research design adopted for this study was the descriptive survey design. It is a design that uses both quantitative and qualitative data to provide the researcher with relevant and accurate information without manipulating the variables to gain deeper knowledge of the research problem. Hence, this design is relevant to this study as it helps in collecting accurate data for describing the

present trend of the farmers' income, access to farm inputs and the attainment of sustainable development goal two (SDG 2) in Cross River State, Nigeria.

The study was carried out in Cross River State. It is one of the 36 states that is located in the South-South Geopolitical Zone of Nigeria. Cross River State is a coastal state in South Eastern Nigeria, its capital is Calabar, and it is named after the Cross River which passes through the state. The state was created on 27th May, 1967 from the eastern part of the Eastern Region by General Yakubu Gowon military administration. Cross River State lies between latitudes 4°28'N and 6°55'N of the equator, and longitudes 7°50'E and 9°28'E of the Greenwich Meridian and has a land mass of 23,074km². The population of the study comprised all registered farmers in Cross River State. As at the time of study, the population stood at 5,681 male and female registered farmers. (Cross River Ministry of Agriculture, 2025). A breakdown of the distribution of the population is shown in Table 1.

A multi-stage sampling approach involving stratified sampling, simple random sampling, and systematic random sampling techniques were used in the study. In the first stage, Cross River State was stratified into three (3) strata that made up the three (3) Education Zones. They are: Ogoja Education Zone with 5 Local Government Areas (L.G.As), Ikom Education Zone with 6 LGAs and Calabar Education Zone with 7 LGAs; giving a total of eighteen (18) LGAs.

In the second stage, a simple random sampling technique was adopted to select Local Government Areas from the three Education Zones. In each of the Education Zones, 30% of the Local Government Areas was used for the study. The researcher wrote the names of all the Local Government Areas with registered farmers on pieces of paper, folded them into a ball-like shape and dropped them into a bowl. The researcher then blindly picked 30 percent from each bowl with replacement. With this method, 2 L.G.As from Ogoja Education Zone, 2 L.G.As from Ikom Education Zone and 3 L.G.As from Calabar Education Zones making a total of 7 L.G.As were proportionately picked for the study. In the third stage, a systematic sampling technique was adopted to select a sample from each of the Local Government Area selected for the study

With the sampling techniques adopted above, thirty three (33%) of registered farmers in each of the selected Local Government Area was taken as a sample. The researcher obtained the list of registered farmers in each L.G.As selected. Therefore, a sample of 924 respondents drawn from a population of 2,799 registered farmers in the seven (7) LGAs selected was used for the study.

The instrument designed for data collection in this study was a questionnaire titled: Farmers' income and Attainment of Sustainable Development Goal 2 Questionnaire (FIASDGQ). The instrument was divided into three (3) sections – 'A' 'B' and 'C'. Section A elicited information on respondents' farmers' incomes such as farmers' educational qualification consisted of ten (10) items

which was designed to measure the sub-independent variable. Section C contained ten (10) items that focused on the attainment of sustainable development goal two. Responses were rated using four point Likert-type scale starting from Very true (VT), True (T), NT (Not true) and VU (Very untrue).

TABLE 1

Sample distribution of registered farmers from the selected Local Government Areas in the Education Zones of Cross River State

S/N	Education zones	No of LGAs selected	Population of farmers	Sample (33%)
1.	Ogoja	Ogoja	293	97
		Obudu	407	134
2.	Ikom	Yakurr	316	104
		Ikom	510	169
3.	Calabar	Biase	231	75
		Calabar Municipality	627	206
		Odukpani	415	136
	TOTAL	7	2799	924

Source: Field work, 2026

The researcher visited the Ministries of Agriculture in each Local Government Area selected for the study and obtained a list of Registered Farmers' Association. This way, the researcher contacted Chairmen of the Associations, introduced himself and sought their consent to be used for the study. The farmers consented and agreed to meet with the researcher on their meeting days. Thereafter, the researcher in company of 2 trained research assistants personally visited the farmers in their meeting venues in each of the seven (7) Local Government Areas on agreed dates and administered the questionnaire to 924 respondents according to the sample sizes in each local government area. Enough time was allowed to enable the respondents to supply all the needed information. All 924 administered questionnaires were retrieved from the respondents after they had responded accordingly to the items in the instrument. The exercise lasted for about 7 weeks.

During sorting, it was discovered that out of the 924 questionnaires administered, 24 were invalid while only 900 were valid. Preparation of valid data for statistical analysis was achieved by assigning numerical values to the responses of the items in the questionnaire. A coding schedule was prepared by developing a key for which all information obtained from the questionnaire was coded for analysis. The scoring was done using the scoring key and each response was given a degree score ranging from 4 - 1 for positively worded items as shown below: Very True (VT) - 4 points, True (T) - 3 points, Untrue (UT) - 2 points and Very Untrue (VU) - 1 point. The reverse was used in the negatively worded items.

RESULTS AND DISCUSSION

Presentation of results

Hypothesis

The null hypothesis states that there is no significant influence of farmers' income level on the attainment of sustainable development goal two in Cross River State, Nigeria. To test this hypothesis, the attainment of sustainable development goal two with salary less than 100,000, 101,000-500,000, 501,000-600,000 and 601,000 and above were compared using the one-way analysis of variance (ANOVA) as reported in Table 2.

The result in Table 2 revealed that there is a significant influence of farmers' income level on attainment of sustainable development goal two in Cross River State ($F=16.069$; $p=0.000$). Thus the null hypothesis that farmers' income level does not significantly influence their attainment of sustainable development goal two in Cross River State is rejected at the 0.05 level of significance. To find out the direction of influence, a Post Hoc test using Fisher's Least Significant Difference (LSD) test was performed as reported in Table 3.

TABLE 2

Summary data and one-way ANOVA of the influence of farmer's income level on the attainment of sustainable development goal two

Income level	N	$\bar{x}$	SD		
Less 100,000	28	48.56	6.85		
101,000-500,000	202	60.10	5.16		
501,000-600,000	370	63.33	5.59		
601,000/Above	300	62.08	6.99		
Total	900	59.82	6.47		
Source of variance	SS	Df	MS	F	P-value
Between groups	1250.807	3	625.404	16.069*	.000
Within groups	15334.135	893	38.919		
Total	16584.942	896			

Significance at the 0.05 level of significance

The information in Table 3 shows that the farmers' attainment of sustainable development goal two with income level of less than 100,000 is significantly more negative than those with income level of between 101,000-500,000; 501,000-600,000 and that are significantly more positive than the farmers' attainment of sustainable development goal two with income level of level 601,000 and above. Again, farmers with salary level between level 101,000-500,000, 501,000-600,000 and

601,000 and above have significantly more positive farmers' attainment of sustainable development goal two than farmers whose income level is less than 100,000. In the same way, farmers' attainment of sustainable development goal two with income level 501,000-600,000 is significantly negative to farmers' attainment of sustainable development goal two with income level of less than 100,000 than farmers with income level of 101,000-500,000, 501,000 and 600,000 and 601,000 and above are significantly positive to farmers attainment of sustainable development goal two in Cross River State. Finally, farmers' attainment of sustainable development goal two with income level of 601,000 and above revealed that farmers' attainment of sustainable development goal two with income level with less than 100,000 is significantly negative than farmers' attainment of sustainable development goal two with income level 100,000-500,000 and 501,000-600,000. It is thus clear that the higher the income level of farmers in Cross River State, the more positive their attainment of sustainable development goal two and vice versa.

TABLE 3
Fisher's LSD test of the influence of income level on farmers' attainment of sustainable development goal two

Income level		Mean difference	Standard	p-value
(I)	(J)	(I-J)	error	
Less than 100,000	100,000-500,000	-1.5365*	.7477	.041
	501,000-600,000	-4.7708*	.8452	.000
	601,000 and Above	-3.6313*	.5732	.038
100,000-500,000	Less than 100,000	.2343*	.9622	.001
	501,000-600,000	-3.7124	.9213	.006
	601,000/Above	-4.5561	.8764	.000
501,000-600,000	Less than 100,000	-1.3241	.7783	.024
	100,000-500,000	-4.3325	.9114	.043
	601,000/Above	-3.6674	1.4372	.083
601,000 and Above	Less than 100,000	-1.2233	.5324	.033
	100,000-500,000	-3.8753	1.8764	.000
	501,000-600,000	-4.4116	1.5542	.000

* Significant at 0.05 level of significance

The hypothesis which states that farmers' income does not significantly influence attainment of sustainable development goal 2 in Cross River State, Nigeria was rejected while the alternate was upheld. This is because income is crucial for providing financial security and this determines farmers' standard of living and enabling access to the essential needs in daily life. This implies that farmers' income significantly influence the attainment of sustainable development goal 2.

This finding is in tandem with the findings of Umoh and Umana, (2002) as cited in Bassey and Patrick, (2021) who carried out a study to find out the Dimensions of Poverty that the individuals in Akwa Ibom State are faced with and how it affects the practices of farming households. The study adopted a descriptive survey design and a multistage sampling procedure and randomly selected a sample of 380 respondents from a study population of 2,074 registered farmers. They researchers constructed a 35 item questionnaire and administered it to the respondents in the study area for data collection. Multidimensional poverty indices were used to analyse the data that was collected. The analysis of data obtained reveals that the poor deplete the environment more than those who are well-to-do. From the study, they discovered that the rich can afford fertilizers, thus do not so much need virgin forests for better yield of their crops. Whereas, the poor or those with low income on the other hand, depend more on virgin forests for better yield and a better sale of crops for higher income. The study also quoted that factors such as state of health, aging, accommodation, feeding habit, water quality, type of school children attend, farming method to adopt among other things, are determined by an individual's position in the income continuum.

It was supported by the study of Gil, Reidsma, Giller, Todman, Whitmore and Van Ittersum (2018) who also conducted a study on farmers' income level and sustainable development goal 2: Improved targets and indicators for agriculture and food security. The pursuit of global food security and agricultural sustainability, the dual aim of the second sustainable development goal (SDG-2), requires urgent and concerted action from developing and developed countries. This, in turn,

depends on clear and universally applicable targets and indicators which are partially lacking. The novel and complex nature of the SDGs poses further challenges to their implementation on the ground, especially in the face of inter linkages across SDG objectives and scales.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on the results of the findings in this study, the researcher concluded that while there is a significant influence of farmers' educational level, farmers' income, farmers' family size, farmers' age, access to farm implements, planting materials and access to pest/disease control chemical significantly influence the attainment of sustainable development Goal 2 in Cross River State, Nigeria. On the other hand, it is pertinent that, farmers' socioeconomic variables and access to farmers' income should be strengthened order to promote the attainment of sustainable development Goal 2 in Cross River State, Nigeria.

Implications of Findings

The implications of the findings include the following:

Higher farmers' income directly strengthens food security by enhancing purchasing power, allowing households to purchase diverse nutritious food and invest in better agricultural inputs. Although, smallholders' farmers produce up to 80% of the world's food but, many remain vulnerable to hunger due to low income, market volatility and climate shocks.

While large family sizes, particularly in the rural areas often correlate to reduce household food security due to high consumption needs and low income, smaller family sizes are positively related to better food security and an improved nutrition.

With an aging farming population (51-60 years above,) there is a tendency of a decrease in productivity, lower technology adoption, and reduced outputs due to lower physical capacity to manage labor intensive farms. In other hand, middle aged farmers (30-50years) are generally considered more productive and innovative in adopting modern farming techniques. Finally, the attainment of sustainable development goal two in Cross River State, Nigeria, hinges on factor as discussed above.

Recommendations

The following recommendations are made in this study based on the results of the findings;

1. Farmers are advised to diversify their income sources by engaging in off farm income activities that can relive capital constraints and provides a safety net against agricultural loses.

2. Farmers are also encouraged to maintain a small family sizes to boost household efficiency. This can be achieved through family planning and education
3. The government, Non-Governmental Organization (NGOs) and well spirited individuals should invest in rural infrastructure and strengthening the agricultural value chain to encourage youth's engagement in agriculture.
4. Government should modernized farming especially at the rural areas by providing farmers with improve equipment such as tractors, power tiller and specialize implements to less burdensome in farming.
5. Farmers are encouraged to pull resources together enable them buy and distribute planting materials such as improve seeds and seedlings that are adaptable to local conditions and climate smart.
6. Government at all level should subsidize the prices of pests and disease control chemicals to enable low-income farmers have access to them.

REFERENCES

- Adams, W. M. (1995), in Davis, N. A. (2024). *Green Environment: Environment and sustainability in the third world*. London: Routledge Press.
- Alderman, H. & Christina P. (2024), "Do the Poor Insure? A Synthesis of the Literature on Risk Sharing Institutions in Developing Countries," in *Economics in a Changing World: Proceedings of the Tenth World Congress of the International Economics Association*, Moscow, London: MacMillan Press.
- Ayandokun, A.E., Alamu, O. T., George-Onaho, J. A., & Ete, J.A (2022). Achieving sustainable development goals in Nigeria with benefits from insects.Proceedings of the 8th Biennial conference of the Forests & Forest Products Society, Held at the Forestry Research Institute of Nigeria, Ibadan, Nigeria. 14th - 20th August, 2022.
- Ekposin, A. L. (2025), *Economic reforms and the national question in Nigeria*. Poverty alleviation in Nigeria: Nigerian Economic society.
- FAO (2020). Migration, Agriculture and Climate Change. Reducing vulnerabilities and enhancing resilience. *Food and Agricultural Organization of the United Nations, Rome, Italy*.
- Ipeh, G. A. & Agbebia, U. L. (2019), Resource management strategies in Nigeria coastal region. An unpublished M.Sc thesis, University of Nsukka.
- Lawrence, A.Ihebuzor, N. & Lawrence, D. (2020) Some Challenges Militating against Developing Countries Achieving SDG 4 on Targets: Nigeria as Case Study. *Modern Economy*, 11 (23), 1307-1328.
- Mbuha, M. M., Lawrence, U.A. & Pual, A.T. (2023), Poverty and Environmental health of rural dwellers in the Oban Corridor of Nigeria and Cameroun. An unpublished M. Ed Thesis, University of Calabar.
- Obu, I. E. & Lawrence, A.U. (2025). Environmental Management for sustainable development. An unpublished Ph.D seminar presentation: University of Makurdi.
- Oyedepo, J.A Oluwakemi, T. I, Bello, K.O., Olalekan Jacob Olaoye, OJ., Adebukunola, O. L, Oluwalana, E.O., Oyedepo, E.O & Akinwumi, M. O (2024). Livelihood Support Programmes for Sustainable Development Goals in Rural Nigeria. *Sustainable Development Goals and Institutions of Higher Education*, 19 (8), 1-17.