

## SOIL SURVEY EDUCATION ON CASSAVA PRODUCTION IN AN ERA OF ECONOMIC UNCERTAINTIES IN AKWA IBOM STATE

BY

ESSIEN, VICTOR JACKSON,  
FIDELA ENOIDEM UDOH PhD,  
JACKSON, UDUAKOBONG IME

And

EKPAIDOT MAGDALENE BASIL  
THE DEPARTMENT OF AGRICULTURAL EDUCATION  
FACULTY OF VOCATIONAL EDUCATION, INFORMATION AND  
LIBRARY SCIENCE,  
UNIVERSITY OF UYO  
UYO

### ABSTRACT

*The study was carried out to determine the influence of soil survey education on cassava production in Akwa Ibom State. Two research objectives, and questions were raised to guide the study. Two null hypotheses were formulated and tested at 0.5 level of significance. The survey design was used for the study. The population for the study was 2,464 respondents consisting of 1441 male and 1023 female registered cassava farmers in Akwa Ibom State. Using a multistage sampling procedure, a sample size of 370 cassava farmers consisting of 216 male and 154 female cassava farmers were used for the study. Data for the study were collected using the researcher's structured questionnaire titled: Soil survey education on cassava production questionnaire (SSECPQ). The research instrument was validated by three experts. The reliability of the instrument was established using Pearson product moment correlation statistics which yielded a reliability coefficient of .85. Mean and standard deviation was used for answering the research questions, while t-test statistics was used for testing the null hypotheses at .05 level of significance. The findings show that soil survey education influence cassava production in terms of its accessibility and utilization by farmers. On the basis of the finding of the study, it was concluded that utilization of soil survey education by farmers could positively influence cassava production in the era of economic uncertainty in Akwa Ibom State. Based on the conclusion drawn, it was recommended among other things that training programmes aimed at educating farmers on the importance of soil surveys and how to apply the information in cassava production should be organized by the government of Akwa Ibom State.*

**Keywords:** Cassava production, Soil survey education, Accessibility, utilization, Economic uncertainties

### INTRODUCTION

Cassava (*manihot esculenta* Crantz) is a food crop grown for its roots which serve as a major source of carbohydrate, starch, vitamins and iron. Cassava production in Akwa Ibom State contributes significantly to food security and also as a source of income for many

households. According to Ekunwe and Ajayi (2010) cited in UDOH, Inibehe & NKANTA (2024) farming is undoubtedly one of the most profitable agricultural business ventures that can be described as a true investment. According to Apata (2019) cassava serves as raw material for more than 80 industrial products worldwide and is use for human consumption and animal feed. It is also said to be more productive per unit of land and labour than even the high yielding cereals. The increase demand for cassava and its products necessitates increase production and yields.

However, the productivity of cassava is closely linked to soil conditions, as different types of soil have varying capacities to support plant growth. Historically, farmers in Akwa Ibom have relied on traditional knowledge and practices to select suitable lands for cassava cultivation. While these methods have sustained production over time, they often do not account for the detailed soil characteristics that modern soil surveys can provide. According to IITA (2013), it is necessary to device improved soil management techniques capable of increasing the growth, yield and income generating capability of cassava production. Increased in cassava production could be attained by farmers on soil survey education in the era of economic uncertainty in Akwa Ibom State.

Soil survey is the process of examining, describing, classifying, and mapping of soils in a specific area and geo-encoding such information. It involves assessing the physical, chemical, and biological properties of the soil, including texture, structure, drainage, fertility, and pH levels. It is the study of the natural environment with specific reference to the soil resources, providing information on the spatial distribution of major soil types, their properties, potentials and response to management (Esu, 2014).

Abdulrasak, Lawal, Raji, Yakubu, and Panti (2018) defined soil survey as location and mapping features on the surface of the soil. Soil survey education is essential for the agricultural as it provides information on effective crop distribution, improving crop productivity and efficiency. Vink (2016) observed that analyzing soil through soil surveying allows the farmer to determine the crops suitable for a particular soil type. This practice also educate famers on specific areas of land that needs extra care to make the soil healthier in order to improve efficiency. Soil survey offers workable information on soil texture, structure, fertility, and drainage, which are crucial for determining the most appropriate land for cassava farming.

Conducting soil test before planting improves the quality of the farm and ensures increase productivity as information gathered will guide the farmer in the planting processes. Farmers who understand the soil conditions are better equipped to manage the crops efficiently. Soil surveys provide detailed information on soil properties, enabling farmers to choose appropriate crops and management practices that align with the characteristics of the land (Udoh, 2019). Farmers' information on the availability and use of soil information can significantly enhance agricultural productivity by guiding farmers in selecting the right area and practices (Obot, 2021).

Cassava production is heavily influenced by soil conditions which vary across different region. Farmers' education on accurate and timely soil survey information is vital for optimizing cassava production. This allows farmers to make decisions on crop management practices to be employed, which can lead to improved cassava yields. Farmers who are equipped with soil survey information can better understand the characteristics of the soil, such as texture, fertility, and drainage, which are all important factors in determining cassava yield. As observed by Akpan (2022), farmers who access and utilize soil

survey information achieve better cassava yields compared to those who do not. For instance, soil survey data can inform farmers about nutrient deficiencies in the soils, enabling the application of the necessary fertilizers to improve crop growth. Similarly, understanding soil texture and drainage helps farmers optimize planting times and irrigation practices, which are crucial for cassava growth and development (Effiong, 2023)

Adewumi (2021) observed that there is a positive correlation between the use of soil survey data and increased cassava yields. Farmers who used soil survey information to guide the land selection, preparation and crop management practices achieved higher yields compared to those who did not. Which justify the importance of integrating soil survey data into farming practices to improve agricultural output.

Obasi, (2020) stated that the utilizing soil survey information allows farmers to apply appropriate agronomic practices that can lead to better crop yields and sustainable farming practices. In cassava farming, soil survey information is crucial for determining the suitability of land for cassava cultivation. Cassava thrives in well-drained, fertile soils with good organic matter content. When farmers are aware of the soil characteristics, it guides in the farming techniques accordingly to increase the quantity and quality of cassava yield (Eze, 2021). Udo (2019) pointed out that the application of soil survey information in cassava farming led to a 20% increase in yield compared to traditional farming methods.

Furthermore, the use of soil survey data helps farmers manage soil fertility more effectively. The understanding of specific nutrient needs of soil guide farmers to apply the right amount and type of fertilizer, reducing waste and environmental impact. This targeted approach to soil management not only improves cassava yields but also enhances the sustainability of farming practices (Asuquo, 2022). Nse (2020) observed that farmers who utilized soil survey information reported better cassava yield performance. This emphasized the need for increased educational access and utilization of soil survey data as a means to boost agricultural productivity. Education according to Joseph (2024) is an intentional purposeful and organized learning which individual, groups and societies can reach the fullest potential. The fullest of cassava farmers' potential in soil survey information, accessibility and utilization can be achieved through education. Pauley and Buseri (2019) see education also as socializing agent that equips all its beneficiaries with the necessary knowledge and skill to enable them conform to the demand of the society. In an era of economic uncertainties, including uncertainty in cassava production, farmers need soil survey education to understand the physical, chemical and biological properties of soil as a guide in soil selection, utilization and management of cassava to boost increase in yield. Toward attaining certainty in production thereby meeting the demand of the society.

The education and utilization of soil survey information among farmers serve as a measure of increasing agricultural production. This calls for soil survey education to equip both current and future farmers with the knowledge and skills necessary for making decisions to improve crop management. This educational strategy is believe not only to enhances cassava productivity but also fosters a culture of continuous learning and adaptation among farmers

Furthermore, educating farmers on the interpretation and application of soil survey data ensures that farmers can independently determine soil conditions and make precise decisions regarding soil fertility management, crop cultivation, crop rotation, and the use of sustainable farming practices. This approach bridges the gap between traditional farming methods and modern agricultural science, by doing so, it helps create a farming community that is stronger, more adaptable, and advancing in its methods and productivity.

Farmers' education to accurate and timely soil survey information is vital for optimizing cassava production. As mentioned by Azari and Udoh (2023) farming is a profitable venture for many farmers in rural areas. Farmers who are equipped with this information can better understand the characteristics of their soil, such as texture, fertility, and drainage, which are all important factors in determining cassava yield. By utilizing soil survey data, farmers can select the most suitable varieties of cassava for their specific soil conditions and apply appropriate farming practices that enhance crop performance. However, not all farmers in Akwa Ibom State have equal access to soil survey education. Those who may not fully utilize it for cassava production. This disparity can lead to variations in cassava growth and yield performance across different regions and among different groups of farmers. Understanding the extent to which farmers acquire and use soil survey information is crucial for identifying gaps and developing strategies to improve cassava production in the state. This study aims to explore the influence of soil survey education on cassava production in Akwa Ibom State. It focuses on the acquisition, accessibility and utilization of soil survey education by cassava farmers to improve upon the growth and yield of cassava in the era of economic uncertainty

### **Statement of the Problem**

The growth and yield of cassava in Akwa Ibom State is inadequately below demand. Most farmers, especially, the peasant farmers experience poor harvest. The poor yield could be attributable to farmers' inaccessibility to soil survey education and poor management of the information to enhance cassava production. As such, the output level remains low and the cassava products are grossly inadequate because supply is lower than demand. As the result of cultivation of cassava through traditional method without having access to soil survey education on the soil properties and the managements. The study therefore intends to determine the influence of soil survey education in terms of accessibility and utilization by farmers on cassava production in an era of economic uncertainty in Akwa Ibom State.

### **Purpose of the Study**

The main purpose of the study was to determine the influence of soil survey education on cassava production in an era of economic uncertainties in Akwa Ibom State. Specifically, the study sought to:

1. Determine the extent to which farmers' accessibility to soil survey education influence cassava production in an era of economic uncertainties Akwa Ibom State.
2. Determine the extent to which farmers' utilization of soil survey education influence cassava production in an era of economic uncertainties Akwa Ibom State.

### **Research Questions**

The following research questions were answered in the study:

1. To what extent does cassava farmers' accessibility to soil survey education influence cassava production in an era of economic uncertainties Akwa Ibom State?
2. To what extent does farmers' utilization of soil survey education influence cassava production in an era of economic uncertainties Akwa Ibom State?

### **Null Hypotheses**

The following null hypotheses were formulated and tested at 0.05 level of significance.

1. There is no significant difference in the mean responses of male and female cassava farmers on the influence of farmers' accessibility to soil survey education on cassava

production in an era of economic uncertainties Akwa Ibom State.

2. There is no significant difference in the mean responses of male and female cassava farmers on the influence farmers' utilization of soil survey education on cassava production in an era of economic uncertainties Akwa Ibom State.

## Methodology

The descriptive survey design was used for this study. The area of this study was Akwa Ibom State. Two research question were answered and two null hypotheses were tested at 0.05 level of significance. The population for this study consisted of all registered cassava farmers in Akwa Ibom State, totaling 2464 (1443 males and 1021 females). The multistage sampling technique was used to select 370 registered cassava farmers to form the sample size for the study.

Data collection was done using the research's structured questionnaire "titled soil survey education and cassava production questionnaire (SSECPQ)". The responses were of a four-point rating as follows: very high influence (VHI) 3.50-4.00 high influence (HI). (2.50-3.49), low influence (LI) (1.50-2.49), and very low influence (VLI) (1.00-1.49). The instrument was developed in line with the specific purposes of the study and was validated by experts in the field of agricultural education in the faculty of vocational education library and information science, University of Uyo, Uyo.

The reliability of the instrument was established using person product moment correlation coefficient which yielded a reliability coefficient of .82. The administration of the instrument was personally done by the researcher and four trained assistants to represent the agricultural zones in the State. A 98% return rate was achieved. The data was analyzed using mean and standard deviation for answering the research questions and t-test for testing the null hypotheses at .05 level of significance. The null hypotheses were rejected where the P- value was less than 0.05 alpha level and retained where the P-value was greater than 0.05 alpha level. On the basis of the results, relevant conclusions were then drawn based on the outcome of the hypotheses tested.

## Data Analysis and Results

Research questions were answered using means and standard deviation. In testing the null hypotheses, when the calculated t-value is greater than or equal to the table value, the null hypothesis was rejected. On the other hand, when the t-value was less than or equal to the table value, the null hypothesis was upheld.

### Research Question 1

To what extent does farmers' accessibility to soil survey education influence cassava production in an era of economic uncertainties in Akwa Ibom State?

**Table 1: Mean Rating of Responses by male and female cassava farmers on the influence of farmers' accessibility to soil survey education on cassava production (N = 370)**

S/N	Influence of accessibility to soil survey education on cassava growth	Mean		SD	Remarks
		Male	Female		
1.	Education received from soil surveys helps to select suitable land for cassava farming	3.2	3.04	.93	HI
2.	The availability of soil survey educational reports from agricultural agencies affects decision-making for cassava cultivation	2.7	2.74	.88	HI
3.	Access to soil pH and texture data education on soil surveys influence the choice of cassava planting materials	2.8	2.93	.76	HI
4.	Accessibility of soil survey maps and data education influence the way land is prepared for cassava cultivation	3.1	2.84	.95	HI
5.	Access to soil survey education on water retention and drainage influence irrigation planning for cassava farming	2.7	2.67	.92	HI
6.	Access to soil survey education on soil topography influence seed bed preparation for cassava farming	2.8	2.93	.90	HI
7.	Access to soil nutrient and fertility through soil survey education influence cassava farming practices	2.6	2.61	.82	HI
	<b>Average Mean Score</b>	<b>2.84</b>	<b>2.82</b>		HI

Cutoff point of 2.50

Source: Field work (2024).

The result presented in Table 1 reveals that the mean range for cassava farmers are between 2.6 and 3.2, and mean range are all above the cutoff point of 2.50. It is observed that the standard deviation of the farmers ranges from .82 to .95, these scores are not far away

from the mean as the scores cluster around the average mean of 2.84 and 2.82. This means that the two groups of farmers agreed accessibility to soil survey education by cassava farmers influence cassava production in Akwa Ibom State to a high extent.

### **Research Question 2**

To what extent does farmers' utilization of soil survey education influence cassava production in an era of economic uncertainties in Akwa Ibom State?

**Table 2: Mean Rating of Responses by male and female cassava farmers on the influence of farmers' utilization of soil survey education on cassava production (N = 370)**

S/N	Influence of Utilization of soil survey education on cassava yield	Mean		SD	Remarks
		Male	Female		
1.	Cassava farmer conduct nutrients status of the soil before planting.	3.6	3.4	.92	VHI
2.	Guideline for interpretation of soil survey information is strictly followed.	3.4	3.5	.84	VHI
3.	Tillage practices followed in Land preparation is carried out by cassava farmers.	2.9	2.8	.83	HI
4.	Fertilizers are regularly applied in adequate amount based on soil test results.	3.1	2.9	.84	HI
5.	Use of soil fertility education on soil surveys influence the yield of cassava crops	3.2	2.6	.87	HI
6.	Use of soil pH information influence the productivity of cassava farming	2.6	2.7	.73	HI
7.	Use of soil survey education on nutrient deficiencies influences cassava yield performance	3.6	3.5	.80	VHI
<b>Average Mean Score</b>		<b>3.2</b>	<b>3.06</b>		HI

*Cutoff point of 2.50*

Source: Field work (2024).

The result presented in Table 2 reveals that the mean range of cassava farmers are between 2.68 and 3.16 and mean range are above the cutoff point of 2.50. It is observed that the standard deviation of the farmers ranges from .71 to .92 and are not far away from the mean as the scores cluster around the grand mean of 3.2 and 3.06. This implies that the utilization of soil survey education by farmers has a very high influence on cassava production.

### Testing of null hypotheses

**H0<sub>1</sub>:** There is no significant difference in the mean responses of male and female cassava farmers on the influence of farmers' accessibility to soil survey education on cassava production in an era of economic uncertainties in Akwa Ibom State.

**Table 3: t-test analysis of the influence of accessibility of soil survey education by male and female cassava formers on cassava production.**

Variable	N	X	SD	Df	t-value	Sig.P-value	Remark
Male	210	18.35	1.60	368	8.70	.089	NS
Female	160	15.39	4.76				

\*df=368; P>0.05; Ns

Source: Field work (2024)

Table 3 shows a summary of the t-test analysis of the mean responses of male and female cassava farmers in Akwa Ibom State on the influence of accessibility of soil survey education on cassava production. The result shows that the P-value is not significant (t =8.70; P=.089; df = 368). Since the P-value is higher than the 0.05 alpha level, the hypothesis which stated that there is no significant difference in the mean responses of male and female cassava farmers on the influence of farmers' accessibility to soil survey education on cassava production in the era of economic uncertainty in Akwa Ibom State is accepted. It is deduced that having access to soil survey education by farmers influences cassava production in Akwa Ibom State.

**H0<sub>2</sub>:** There is no significant difference in the mean responses of male and female cassava farmers on the influence of farmers' utilization of soil survey education on cassava production in an era of economic uncertainties in Akwa Ibom State.

**Table 4: t-test analysis of the influence of utilization of soil survey education by male and female cassava farmers on cassava production**

Variable	N	X	SD	Df	t-value	Sig.P-value	Remark
Male	210	2.98	.72	368	1.66	.098	NS
Female	160	3.10	.84				

\*df=368; P>0.05; Ns

Source: Field work (2024).

Table 4 shows a summary of t-test analysis of the mean responses of male and female cassava farmers in Akwa Ibom State on the influence of management of soil survey education on cassava production. The result shows the P-value is not significant (t=1.66; P=.098; df = 368). Since the P-value is higher than 0.05 alpha level, the hypothesis which started that there is no significant difference in the mean responses of male and female cassava farmers on influence of utilization of soil survey education on cassava production is accepted. Deduction from the hypothesis tested is that utilization of soil survey education by farmers influence cassava production in Akwa Ibom State irrespective of gender.



## Discussion of the Findings

The findings of this study are discussed based on the research questions and corresponding hypotheses.

### Accessibility to soil survey education by farmers and cassava production

The result presented in Table 1 reveals that there is a high influence of accessibility of soil survey education by farmers on cassava production. While Table 3 reveals that there is no significant difference in the mean responses of male and female cassava farmers on the influence of accessibility to soil survey education by farmers on cassava growth in Akwa Ibom State. This implies that both male and female cassava farmers agreed that accessibility to soil survey education can increase the growth performance of cassava to a high extent. It means that not all farmers have equal access to soil survey data especially those in the rural areas. The findings of the study agree with the work of Vink (2016) who noted that the knowledge of soil is required for land use planning activities and the decision of what use a particular soil type could be assigned. Access to accurate and timely soil survey information allow farmers to make decisions on crop management practices to apply, which can lead to improved cassava growth and yield performance. The present study is inconsonance with the work of Lobry de Bruyn and Andrew (2016) who stressed that increase in demand and lack of information on soils contributed to the problems of soil degradation and world food crisis, due to wrong use and poor management of soil resource. This also affect cassava production in Akwa Ibom State. When farmers are aware of the soil characteristics, they can adjust their farming techniques accordingly in order to improve cassava growth and productivity.

### Utilization of soil survey education by farmers and cassava production

The result presented in Table 2 reveals that there is a very high influence of utilization of soil survey education by farmers on cassava production in Akwa Ibom State. Table 4 shows that there is no significant difference in the mean responses of male and female cassava farmers on the influence of farmers' utilization of soil survey information on cassava production in Akwa Ibom State. This implies that both male and female cassava farmers agreed that utilizing soil survey education on cassava production is necessary but is lacking within the farming enterprises. The finding of this study is in line with the finding of Achukwu et al. (2013) who noted that the only way agricultural production can be sustained is when farmers can assess adequate and accurate data through soil survey and effectively utilize such information in the production processes. This means that a farmer who selects appropriate sites for planting, adjust soil fertility, and adopt suitable crop management strategies based on data gotten from soil test will enhance the quantity and quality of cassava yield. Therefore, by utilizing soil survey information farmers apply appropriate agronomic practices that can lead to better crop yields and sustainable farming practices.

## Conclusion

On the basis of the findings of the study it was concluded that soil survey education can increase cassava production in the era of economic uncertainty although this depends on the availability of this education to farmers and the extent to which the information is effectively utilized in cassava production. It is observed that, in Akwa Ibom State, farmers who have access to and effectively utilize soil survey data significantly improve their cassava

growth, yield and overall productivity. Despite the proven benefits, challenges such as limited access, insufficient education, and high costs hinder the widespread use of soil survey information.

### **Recommendations**

Based on the finding of this study, the following recommendations were made:

1. Soil survey education should be made available for farmers through government initiatives and partnerships with non-governmental organizations. .
2. Training programmes aimed at educating farmers on the importance of soil surveys and how to apply the information in their farming practices should be organized to enhance the utilization of such valuable data.
3. Extension services need to be strengthened to provide ongoing support to farmers, helping them to interpret and implement soil survey findings effectively.
4. The cost of conducting soil surveys should be subsidized by the state government.

## REFERENCES

- Abdulrasak, Y.1; Lawal, B.A; Raji, B. A., Yakubu, M and Panti, A. D. (2018). An assessment of farmers' use of soil survey information in crop production and Local classification of soils in Niger State, Nigeria. Sustainable strategies for enhancing food security & livelihood in Nigeria. 52<sup>nd</sup> Annual Conference of Agricultural Society of Nigeria, 22-26 October 2018, ARCN, Abuja
- Achukwu, E. M., Raji, B. A. & Lya, U. S. (2018). Compilation and prospect. *Nigeria Journal of soil science*, 23 (2): 189 -195
- Adewumi, T. (2021). The impact of soil survey data on cassava yields in Nigeria. *Journal of Agricultural Science*, 18(3), 45-59.
- Agbor, I. (2018). Economic barriers to the adoption of soil survey data in smallholder farming. *African Journal of Agricultural Economics*, 12(2), 123-135.
- Ajayi, R. (2019). Educational influence on the utilization of soil survey data in Nigerian agriculture. *International Journal of Agricultural Extension*, 7(4), 88-99.
- Akinola, F. (2020). Barriers to accessing soil survey information in rural Nigeria. *Journal of Rural Development Studies*, 9(4), 67-78.
- Akpan, I. (2022). The impact of soil survey information on cassava production in Southern Nigeria. *Journal of Agricultural Research*, 18(3), 45-58.
- Apata, T. G. (2019). Analysis of Cassava Value chain in Nigeria. Pro-poor approach and gender perspective. *International Journal Value Chain Management*, 10 (3): 2/9 -237.
- Asuquo, E. (2022). Enhancing the availability of soil survey information for improved agricultural practices. *International Journal of Agronomy*, 20(1), 89-102.
- Azari, A. A., & Udoh, F. E. (2023). Economic viability of fish farming compared to crop cultivatio. *International Contemporary Journal of Science Education and Technology*, 2(2).
- Effiong, T. (2023). Soil texture and cassava yield: A case study of Akwa Ibom State. *Nigerian Agricultural Journal*, 25(1), 30-40.
- Ekanem, M. (2020). Barriers to accessing agricultural information among rural farmers in Nigeria. *African Journal of Rural Development*, 12(2), 67-79.
- Ekong, M. (2019). Awareness and utilization of soil survey information among farmers in Akwa Ibom State. *Nigerian Agricultural Journal*, 17(2), 78-89.
- Esu, I. E (2014). Soil characterization & mapping for food security & sustainable environment in Nigeria. In Proceeding of 29<sup>th</sup> Annual Conference of the soil Science Society of Nigeria PP 10 -1

- Etuk, U. (2020). Enhancing agricultural productivity through improved access to soil data. *International Journal of Agronomy*, 22(1), 89-97.
- Eze, P. (2021). Role of soil characteristics in cassava production: A study in Southeastern Nigeria. *Tropical Agriculture*, 26(1), 32-47.
- IITA, (Internal Institute for Tropical Agriculture) (2013) Annual Report
- Inyang, J. (2021). The role of soil survey data in improving cassava yields in Akwa Ibom State. *Journal of Tropical Agriculture*, 11(2), 55-68.
- Lobry De Bruyn, L. A and Andrew, S. (2016). Review of Australian and United States Farmers Using Soil Information for soil health management. *Sustainability*. 8(4): 304 -309
- Nethononda, L. O & Odhiambo, J. J. O (2011). Indigenous soil knowledge relevant to crop production of small holder farmers at. Rambuda irrigation Scheme, Vhembe district south Africa. *African Journal of Agricultural Research*, 6 (11) 25 76 -2581.
- Nse, A. (2020). The impact of soil survey utilization on cassava yields in Akwa Ibom State. *Journal of Agricultural Research*, 23(3), 56-70.
- Obasi, C. (2020). The significance of soil survey information in improving agricultural productivity. *Journal of Agricultural Studies*, 16(4), 34-51.
- Obot, M. (2021). Soil information dissemination and its effect on crop yields in Nigeria. West *African Journal of Soil Science*, 9(4), 76-85.
- Okon, J. (2020). Awareness and use of soil survey information among smallholder farmers in Nigeria. *Journal of Rural Studies*, 12(2), 99-110.
- Okon, R. (2022). Training farmers in the use of soil survey data: Lessons from Akwa Ibom State. *Journal of Agricultural Extension*, 16(2), 50-63.
- Udo, J. (2019). Access to agricultural information and its effects on farming outcomes in Nigeria. *Journal of Rural Studies*, 10(2), 99-121.
- UDOH, F. E., Inibehe, J. O. B., & NKANTA, A. E. (2024). MID-RAIN PLANTAIN FARMING SKILL NEEDS REQUIRED BY GRADUATES OF AGRICULTURE EDUCATION FOR SUSTAINABLE PRODUCTION IN AKWA IBOM STATE, NIGERIA. *International Journal of Contemporary Africa Research Network*, 1(1).
- Udoh, E. (2019). Soil fertility and crop production: The case of cassava in Nigeria. *Journal of Agricultural Science*, 15(2), 25-38.
- Vink, A. P. A (2016). Soil survey as Related to agricultural productivity. *European Journal of Soil Science*, 14 (1) 88-101.