

## RESEARCH ARTICLE

# IDENTIFICATION OF FARMERS' SKILLS NEED FOR EFFECTIVE COMMERCIAL PLANTAIN PRODUCTION IN AKWA IBOM STATE, NIGERIA

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## ABSTRACT

The study was conducted to identify farmers' skills need for effective commercial plantain production in Akwa Ibom State. Three research questions and three null hypotheses guided the study. Survey research design was used for the study. The population of the study was 196 registered plantain farmers in all the six agricultural zones of Akwa Ibom state Agricultural Development Programme (AKADEP) and 16 Agricultural Extension agents. Simple random sampling techniques was used to select 148 plantain farmers and 12 Agricultural extension agents from the six zones to constitute the sample size. The researcher developed an 88-item instrument titled "Farmers' skills need for effective commercial plantain production questionnaire (FSNECPPQ)" which was used to gather data for the study. Split half was used to determine the reliability and was established using Cronbach's alpha which yielded a coefficient index of 0.875. Mean was used to answer the research questions while t-test statistic was used to test the null hypotheses at .05 level of significance. The findings of the study revealed that, the skills need of plantain nursery establishment, main plantain plantation development and plantation maintenance, are highly needed by the farmers. The t-test results revealed that extension agents and plantain farmers do not differ significantly in their responses of skills needed by farmers for effective commercial plantain production. Based on the findings of the study, it is recommended among others that government of Akwa Ibom State, through Ministry of Agriculture via AKADEP with the Agricultural extension agents should organize workshops and seminars to train the unskilled farmers to acquire the identified requisite skills needed for effective commercial plantain production.

## KEYWORDS

Farmers' skills need, commercial plantain production, nursery establishment, plantation development, plantain maintenance

## INTRODUCTION

Plantain (*Musa paradisiaca*) is an important staple crop which contributes to national food security and income generation in rural areas of Akwa Ibom State. It is an important source of livelihood for the farmers and their households with economic, nutritional and medicinal potentials (Agom *et al.*, 2018). Engaging in its production activities, provides employment opportunities for unemployed graduates and young school leavers. The fruit is consumed in various ways including fried, baked, boiled, roasted, flour and as soups depending on the geographical location. Omodara *et al.*, (2024) and Agom *et al.*, (2018) noted that the global consumption of plantain and its products have risen greatly in the last few years due to its increasing demand by fast food vendors, hotels, restaurants, flour industries, diabetic patients among others.

In Africa, over seven million people depend on plantain for food in their social and cultural life and as cash crop (IITA, 2009). Although, Nigeria is among the major producers of plantain in Africa and fifth

in the world, about 3,077,159 tons were produced in 2022 (FAO, 2022). Despite this production, it has low export volumes and competitiveness due to lack of relevant technology and insignificant level of production (Miller and Jones, 2010). Currently, the demand for plantain within the country is high with relatively low supply, and is yet to meet the local demand for consumption and food industries (Ekpo et al., 2019).

Skill means, the technique of being able to do something well, ability to perform an act expertly. It requires the acquisition of performance operations (Osinem and Nwoji, 2005). Skill when fully acquired makes an individual competent as well as earning a standard living. Procter (1995) defined need as a condition of lacking or wanting something necessary or very useful while Omon (2010) opined that needs is something required by the farmers to meet a stipulated standard.

Commercial plantain production is the large-scale cultivation and production of different plantain species for the sole purpose of marketing (IITA, 2008 and FAO, 2003). This type of plantain production is a hidden treasure unknown to the unemployed populace. A lot of entrepreneurs have always overlooked this rewarding venture due to initial intensive labour, scarcity of improved suckers, land availability, initial capital and lack of skills needed for the production business. The prerequisite skills needed for effective commercial plantain production are derived from; plantain nursery establishment, main plantain plantation development and plantain plantation maintenance.

Plantain nursery establishment explains the different methods of producing quality planting materials (suckers) for plantain plantation establishment. Sucker is the major primary source of propagation materials in the plantain production. Main plantain plantation development involves the process of producing plantain in the main field. Plantain can be cultivated all year round (with irrigation) and without irrigation from May- June at the onset of rain in the southern ecological zone, Nigeria. (Udoh et al., 2016).

Plantain plantation maintenance explains the act of keeping the plantain so cultivated in a good and desirable condition. The skills involved are mulching, manuring, weed management, pests/diseases management, propping, water (irrigation) management, removal of dry leaves and harvesting. Weed management in plantain plantation cannot be over-emphasized, uncontrol weed infestation results in significant crop yield reductions through their competition with crops for growth, soil moisture and nutrients (Ekpo et al., 2010). Therefore, weed management encompasses all aspects of weed control including prevention and spread at relatively low cost (Ekpo et al., 2019).

The relevant technologies needed by the farmers to catapult plantain production from local consumption to commercial and exporting level is through the acquisition of skills. It is therefore necessary that farmers need certain knowledge, attitude, technology and skills to ensure appropriate management of plantain production to enhance effective commercial production this study seeks to redress.

### **| Statement of the Problem**

Presently, commercial plantain production in Akwa Ibom State is still at its low level due to insufficient skills, knowledge and modern technologies by most farmers and lack of assistance from the government, extension agents, among others. Moreover, the demand for plantain now outweighs its supply in the rural areas and in the international market. This is because farmers still adhere to the traditional practice of producing plantain at their backyard or where it incidentally grow and they do not have access to improved cultivars, financial assistance, loans, subsidies and enough parcels of land for commercial plantain production.

With the aforementioned constraints it is evident that, it will be difficult for plantain farmers to go beyond their present conditions if there are no skills acquisition. A number of studies have been carried out

on plantain production in Nigeria. However, there is limited study in the area of identification of farmers' skills need for effective commercial plantain production. It therefore becomes justified that efforts should be made to provide the needed skills to farmers, thereby enabling them go commercial and an exporting level. This study was therefore designed to fill the gap.

### **| Purpose of the Study**

The main purpose of the study was to identify the extent of farmers' skills need for effective commercial plantain production in Akwa Ibom State. Specifically, the study sought to determine:

- i. the plantain nursery establishment skills need of farmers for effective commercial plantain production.
- ii. the main plantain plantation development skills need of farmers for effective commercial plantain production.
- iii. the plantain plantation maintenance skills need of farmers for effective commercial plantain production.

### **| Research Questions**

The following research questions were raised and answered in the study:

- i. What is the extent of farmers' skills need in plantain nursery establishment for effective commercial plantain production?
- ii. What is the extent of farmers' skills need in plantain plantation development for effective commercial plantain production?
- iii. What is the extent of farmers' skills need in plantain plantation maintenance for effective commercial plantain production?

### **| Research Hypotheses**

The following null hypotheses were tested in this study at .05 level of significance.

- HO<sub>1</sub>:** There is no significant difference in the mean responses of extension agents and plantain farmers on the extent of their plantain nursery establishment skills need for effective commercial plantain production.
- HO<sub>2</sub>:** There is no significant difference in the mean responses of extension agents and plantain farmers on the extent of their main plantain plantation development skills need for effective commercial plantain production.
- HO<sub>3</sub>:** There is no significant difference in the mean responses of extension agents and plantain farmers on the extent of their plantain plantation maintenance skills need for effective commercial plantain production.

### **| Research Methods**

#### **Design of the Study**

The study adopted the survey research design. The design is therefore appropriate for the study as it would enable the researcher obtain information from two groups of respondents (Agricultural Extension Agents and Registered Plantain Farmers) on farmers' skills need for effective commercial plantain production through the use of questionnaire.

### **Area of the Study**

The area of the study was Akwa Ibom State, one of the thirty -six States of the Federal Republic of Nigeria. It is located in the coastal Southern part of the country, lying between latitudes  $4^{\circ} 32'N$  and  $5^{\circ} 33'N$ , and longitude  $7^{\circ} 25'E$  and  $8^{\circ} 25'E$ . The State is located in the South-south geographical zone, and is bounded on the east by Cross River State, on the West by Rivers State and Abia State, and on the South by the Atlantic Ocean. The study area included the 3 Senatorial Districts; Akwa Ibom North-East, Akwa Ibom North-West, and Akwa Ibom South.

### **Population of the Study**

The population for this study consisted of 196 respondents comprising of 16 Agricultural Extension Agents (AEAs) working with Akwa Ibom State Agricultural Development Project (AKADEP) and 180 registered plantain farmers in Akwa Ibom State, this information was obtained from AKADEP Headquarters, Uyo, Akwa Ibom State (AKADEP, 2021).

### **Sample and Sampling Technique**

Simple random sampling, Cap and draw method was used to select 148 plantain farmers and 12 Agricultural Extension Agents from the six AKADEP zones of Abak, Eket, Etinan, Ikot Ekpene, Uyo, and Oron (AKADEP Register, 2021).

### **Instrumentation**

The researcher developed an instrument titled; “Identification of Farmers’ Skills Need for Effective Commercial Plantain Production Questionnaire (FSNECPPQ)” which was used to gather data for the study. The instrument consisted of section A designed to gather data on farmers’ skills need in the area of plantain nursery establishment, plantain plantation development and main plantain plantation maintenance.

### **Validation of Instrument**

The instrument was face and content validated by three experts, two from the Department of Agricultural Education and one from the Department of Educational Foundations, Guidance and Counseling all from the Faculty of Education, University of Uyo.

### **Reliability of the Instrument**

Data for testing the reliability of the instrument was gathered through the split-half method on a sample of 30 respondents who were plantain farmers in Akwa Ibom State who did not take part in the actual study. Cronbach’s Alpha/coefficient was used to establish the reliability of the instrument. The reliability coefficient was 0.875.

### **Method of Data Collection**

The researcher liaised with Zonal Extension Officers (ZEOs) and Subject Matter Specialist (SMS) in order that appropriate meetings were organized which allowed the researcher and the research assistants to meet with registered plantain farmers. At each group meeting, the questionnaire was administered to the respondents and retrieved for data analysis.

## Administration of Instrument

Twelve (12) copies of questionnaire were administered to the Agricultural Extension agents, while 148 copies of questionnaire were administered to the Plantain Farmers.

## Method of Data Analyses

Mean statistic was employed to answer the research questions while independent t-test was utilized in testing the null hypotheses respectively at 0.05 level of significance.

## Decision Rule

In answering the research questions, the instruments employed was a 4-point rating scale, where mean was utilized for the analysis of data in the research questions, remark and judgments were made about the items using the upper and lower limits for needed skills obtained by assigning real limits values to the response options in the four-point scale used where 4 = Highly Needed, 3 = Moderately Needed, 2 = Lowly Needed, 1 = Not Needed.

The upper limit was used in making decisions as follows; items with mean values 3.60-4.00 were highly needed, 2.60-3.50 were moderately needed, 1.60-2.50 were lowly needed and 0-1.50 were not needed. The null hypotheses, were accepted when the calculated t-value were greater than or equal to the table value otherwise, the null hypotheses were rejected.

## Results

The following three research questions were answered and their corresponding hypotheses verified

**Research Question One:** What is the extent of farmers plantain nursery establishment skills need for effective commercial plantain production?

**Table 1: Mean responses of respondents on the extent of farmers plantain nursery establishment skills need for effective commercial plantain production. N = 160**

| S/N                 | Plantain nursery establishment skills need of farmers for effective commercial plantain production. | $\bar{x}$   | SD          | Remarks |
|---------------------|---|-------------|-------------|---------|
| 1.                  | Site selection  | 3.62        | 0.73        | HN      |
| 2.                  | Determining soil fertility  | 3.65        | 0.63        | HN      |
| 3.                  | Selection of good topography  | 3.6         | 0.67        | HN      |
| 4                   | Drainage management   | 3.37        | 0.62        | HN      |
| 5                   | Field design  | 3.21        | 0.85        | HN      |
| 6                   | Pre-nursery establishment   | 2.97        | 1.03        | HN      |
| 7                   | Nursery establishment   | 3.21        | 0.79        | HN      |
| 8                   | Selecting good suckers  | 2.46        | 0.91        | MN      |
| 9                   | Corm paring   | 3.68        | 0.76        | HN      |
| 10                  | Use of whole corm   | 2.84        | 0.77        | HN      |
| 11                  | Use of split corm   | 2.61        | 0.73        | HN      |
| 12                  | Use of excised bud  | 2.67        | 0.81        | HN      |
| <b>Cluster Mean</b> |   | <b>3.39</b> | <b>0.78</b> | HN      |

Key: HN = Highly Needed, MN = Moderately needed, LN= Lowly Needed, NO= Not Needed. (Fieldwork, 2021).

Table 1 shows the analysis of the items and the mean of the respondents (farmers and extension agents) on plantain nursery establishment skills need of farmers for effective commercial plantain production. The result reveals that 11 items had mean responses between 3.6-3.65 indicating they were highly needed while one item had mean response of 2.46 indicating it was moderately needed by farmers for effective commercial plantain production in Akwa Ibom State.

### Hypothesis One

There is no significant difference in the mean responses of extension agents and plantain farmers on the extent of farmers plantain nursery establishment skills need for effective commercial plantain production

**Table 2: t-test analysis of the difference in the mean responses of extension agents and plantain farmers on the extent of plantain nursery establishment skills need for effective commercial plantain production. N=160**

| Respondents      | N   | $\bar{x}$ | t-cal | t-crit | Decision |
|------------------|-----|-----------|-------|--------|----------|
| Extension agents | 12  | 39.25     | 1.39  | 1.976* | Upheld   |
| Plantain farmers | 148 | 37.77     |       |        |          |

Not significant at  $p < .05$  alpha level,  $n=160$ ,  $df=158$  (Fieldwork, 2021)

Table 2 shows the analysis of t-test for the mean responses of extension agents and plantain farmers on the plantain nursery establishment skills need for effective commercial plantain production. The results reveal that the calculated t-value of 1.39 was obtained which is less than the critical t-value of 1.976 with the degree of freedom of 158 at .05 level of significance. Given this result, the null hypothesis was upheld, thus, there is no significance difference in the mean responses between extension agents and plantain farmers on the plantain nursery establishment skills need for effective commercial plantain production. The extension agents and plantain farmers did not differ significantly in their mean responses, implying that, plantain nursery establishment skills were highly needed by farmers for effective commercial plantain production in Akwa Ibom State.

### Research Question Two

What is the extent of farmers' plantain plantation development skills need for effective commercial plantain production?

**Table 3: Mean responses of respondents on the extent of farmers main plantain plantation development skills need for effective commercial plantain production. N = 160**

| S/N                 | Main plantain plantation development skills need of farmers for effective commercial plantain production. | $\bar{x}$   | SD          | Remarks |
|---------------------|---|-------------|-------------|---------|
| 1                   | Appropriate spacing   | 3.85        | 0.53        | HN      |
| 2                   | Seedling selection  | 3.79        | 0.56        | HN      |
| 3                   | Healthy sucker selection  | 3.73        | 0.71        | HN      |
| 4                   | Seedlings transplanting   | 3.67        | 0.53        | HN      |
| 5                   | Sucker cleaning   | 3.1         | 0.79        | HN      |
| 6                   | Sucker treatment  | 3.27        | 0.85        | HN      |
| 7                   | Planting  | 3.92        | 0.25        | HN      |
| <b>Cluster mean</b> |   | <b>3.62</b> | <b>0.60</b> | HN      |

Key: HN = Highly Needed, MN = Moderately needed, LN= Lowly Needed, NO= Not Needed (Fieldwork, 2021)

Table 3 shows the analysis of the items and the mean of the respondents (farmers and extension agents) on main plantain plantation development skills need of farmers for effective commercial plantain production. The results indicate that all the seven items with mean responses between 3.67 -3.92 indicating they were highly needed responses, implying that, all the skills were highly needed by farmers for effective commercial plantain production in Akwa Ibom State.

### Hypothesis Two

There is no significant difference in the mean responses between extension agents and plantain farmers on the extent of main plantain plantation development skills need of farmers for effective commercial plantain production

**Table 4: t-test analysis of the difference in the mean responses between extension agents and plantain farmers on the extent of main plantain plantation development skills need of famers for effective commercial plantain production. N=160**

| Respondents      | N   | $\bar{x}$ | t-cal | t-crit | Decision |
|------------------|-----|-----------|-------|--------|----------|
| Extension agents | 12  | 25.75     | 0.79  | 1.976  | Upheld   |
| Plantain farmers | 148 | 25.15     |       |        |          |

Not significant at  $p < .05$  alpha level,  $n=160$ ,  $df=158$ (Fieldwork, 2021)

Table 4 indicates the analysis of t-test for the mean responses of extension agents and plantain farmers on the main plantain plantation development skills need for effective commercial plantain production. The results indicate that the calculated t-value of 0.79 was obtained which is less than the critical t-value of 1.976 with the degree of freedom of 158 at .05 level of significance. Given this result, the null hypothesis was upheld, thus, there is no significance difference in the mean responses between extension agents and plantain farmers on the main plantain plantation development skills need for effective commercial plantain production. The extension agents and plantain farmers did not differ significantly in their mean responses, implying that, main plantain plantation development skills were highly needed by farmers for effective commercial plantain production in Akwa Ibom State.

### Research Question Three

What is the extent of farmers' plantain plantation maintenance skills need for effective commercial plantain production?

**Table 5: Mean responses of respondents on the extent of farmers' plantain plantation maintenance skills need for effective commercial plantain production. N=160**

| S/N                 | Plantain plantation maintenance skills need of farmers for effective commercial plantain production | $\bar{x}$   | SD          | REMARKS   |
|---------------------|---|-------------|-------------|-----------|
| 1                   | Mulching  | 3.6         | 0.67        | HN        |
| 2                   | Weeding   | 3.65        | 0.64        | HN        |
| 3                   | Intercropping   | 3.21        | 0.7         | HN        |
| 4                   | Soil Fertilization  | 3.5         | 0.71        | HN        |
| 5                   | The use of appropriate fertilizers  | 3.8         | 0.46        | HN        |
| 6                   | Timing of fertilizer application  | 3.81        | 0.47        | HN        |
| 7                   | Fertilizer application  | 3.6         | 0.62        | HN        |
| 8                   | Interval application of fertilizer  | 3.65        | 0.63        | HN        |
| 9                   | Compost manure application  | 3.28        | 0.75        | HN        |
| 10                  | Poultry manure application  | 3.39        | 0.73        | HN        |
| 11                  | Pests/Diseases Management   | 3.47        | 0.63        | HN        |
| 12                  | Pests/diseases control  | 3.46        | 0.7         | HN        |
| 13                  | Timely weeding  | 3.42        | 0.74        | HN        |
| 14                  | The use of appropriate chemicals  | 3.6         | 0.78        | HN        |
| 15                  | Farm sanitation   | 3.72        | 0.59        | HN        |
| 16                  | Propping  | 3.0         | 0.78        | HN        |
| 17                  | Propping material selection   | 3.03        | 0.89        | HN        |
| 18                  | Appropriate propping  | 3.1         | 0.91        | HN        |
| 19                  | Propping direction  | 3.01        | 0.94        | HN        |
| 20                  | Pinning of the "Y" stick  | 3.02        | 0.95        | HN        |
| 21                  | Water Management  | 3.1         | 0.9         | HN        |
| 22                  | Irrigation system during dry season   | 3.52        | 0.82        | HN        |
| 23                  | Drainage during rainy season  | 3.41        | 0.9         | HN        |
| 24                  | Humidity management during irrigation   | 3.18        | 0.93        | HN        |
| 25                  | Water conservation through mulching   | 3.45        | 0.69        | HN        |
| 26                  | Adoption of irrigation method   | 3.17        | 0.81        | HN        |
| <b>Cluster Mean</b> |   | <b>3.69</b> | <b>0.74</b> | <b>HN</b> |

Key: HN = Highly Needed, MN = Moderately needed, LN= Lowly Needed, NO= Not Needed (Fieldwork, 2021)

Table 5 shows the analysis of the items and the mean of the respondents (farmers and extension agents) on plantain plantation maintenance skills need of farmers for effective commercial plantain production. The results reveal that all the 26 items had mean responses between 3.5-3.81 indicating highly needed responses, implying that all the skills were highly needed by farmers for effective commercial plantain production in Akwa Ibom State.

### Hypothesis Three

There is no significant difference in the mean responses between extension agents and plantain farmers on the extent of plantain plantation maintenance skills need of farmers for effective commercial plantain production



**Table 6: t-test analysis of the difference in the mean responses of extension agents and plantain farmers on the extent of plantain plantation maintenance skills need of farmers for effective commercial plantain production. N=160**

| Respondents      | N   | $\bar{x}$ | t-cal | t-crit | Decision |
|------------------|-----|-----------|-------|--------|----------|
| Extension agents | 12  | 90.33     | 1.07  | 1.976* | Upheld   |
| Plantain farmers | 148 | 87.49     |       |        |          |

Not significant at  $p < .05$  alpha level,  $n=160$ ,  $df=158$  (Fieldwork, 2021)

Table 6 reveals the analysis of t-test for the mean responses of extension agents and plantain farmers on the plantain plantation maintenance skills need for effective commercial plantain production. The result reveals that, the calculated t-value of 1.07 was obtained which is less than the critical t-value of 1.976 with the degree of freedom of 158 at .05 level of significance. Given this result, the null hypothesis was upheld, thus, there is no significance difference in the mean responses between extension agents and plantain farmers on the plantain plantation maintenance skills need for effective commercial plantain production. The extension agents and plantain farmers did not differ significantly in their mean responses, implying that, plantain plantation maintenance skills were highly needed by farmers for effective commercial plantain production in Akwa Ibom State.

## **| Discussion of Results**

### **Plantain nursery establishment skills need of farmers for effective commercial plantain production.**

The result of the findings in table 1 provided answer to research question one. The findings reveal that 11 items were the identified skills for effective commercial plantain production which were highly needed by plantain farmers for effective plantain production in Akwa Ibom State, while one item was moderately needed. The corresponding t-test analysis in table 2 indicates that there was no significant difference in the mean responses of plantain farmers and extension agents on the extent of plantain nursery establishment skills needed for effective commercial plantain production. Inability of the plantain farmers to acquire the needed skills in plantain nursery establishment would significantly affect effective commercial plantain production in Akwa Ibom State. Plantain nursery establishment skills would help farmers to examine the location, site and layout before embarking on the business; this would save the trouble of frustration due to one error or the other. The findings are in line with that of Amusa, Ukonze and Olaitan (2010) who found out that instructors needed improvement in resource management skills in oil palm nursery establishment, to bridge this gap, plantain farmers need training on plantain nursery establishment skills to enhance their effectiveness in commercial plantain production.

### **Main plantain plantation development skills need of farmers for effective commercial plantain production.**

The result of the findings in Table 3 shows that all the identified skills for effective commercial plantain production were highly needed by plantain farmers. The corresponding t-test analysis in table 4 shows that, there was no significant difference in the mean responses of plantain farmers and extension agents on the extent of plantain plantation development skills needed for effective commercial plantain production. Therefore farmers in Akwa Ibom needed all the seven identified skills in plantain plantation development since plantain plantation development skills are indispensable in any effective commercial

plantain production. The findings are in line with that of Oso (2017) who found out that plantain farmers lack skills in sucker cleaning, sucker treatment and healthy sucker selection. To bridge this gap in skills, plantain farmers need re-training in main plantain plantation development skills in sucker cleaning, sucker treatment and healthy sucker selection. With re-training, plantain farmers will be able to develop and manage their plantain plots since weak and unclean suckers will adversely affect the future yields. When plantain farmers are well equipped with adequate skills, effective commercial plantain production would be enhanced.

### **Plantain plantation maintenance skills need of farmers for effective commercial plantain plantation.**

The result of the findings in Table 5 reveals that, all the identified skills for effective commercial plantain production were highly needed. The corresponding t-test analysis in table 6 reveals that there was no significant difference in the mean responses of plantain farmers and extension agents on the extent of plantain plantation maintenance skills needed for effective commercial plantain production. Maintenance of the plantain plots is eminent since weeds, poor soil fertility and pest/diseases infestations are serious threats to effective commercial plantain production. Appropriate weed management strategies, proper soil fertility maintenance through the use of fertilizer, organic manure, management/control of pests/diseases are fundamentals for effective commercial plantain production. It is important that the farmers acquire the needed skills to enable them combat all those problems. Inability to acquire the expected skills for plantain maintenance would significantly affect effective commercial plantain production since these skills are indispensable in any effective commercial plantain business. This findings are in line with the findings of Ekpo et al (2019) who found out that manure application and weed management are important factors that increase growth, yield components and bunch yield of plantain. To bridge this gap in skills, plantain farmers need training on plantain maintenance skills to enhance their capability in effective plantain production. Skills in application of manure and fertilizer, timely weeding, timely control of pest and diseases and the use of appropriate herbicide. Through the training, plantain farmers will be equipped with skills to manage and maintain their plantain plots effectively, thereby enhancing commercial production

### **| Conclusion**

On the basis of the findings of the study, it was concluded that the basic skills for farmers to attain effective commercial plantain production were highly needed by the farmers. Farmers need to be trained and equipped with these skills in terms of plantain nursery establishment, main plantain plantation development and plantain plantation maintenance, to enable effective commercial plantain production in the state.

### **| Recommendations**

Based on the findings of the study, the following recommendations are made;

1. Extension agents who are mediators between farmers and research centers should help train farmers on the basic skills needed in plantain nursery establishments.
2. The Ministry of Agriculture in the state via AKADEP should support the extension agents to reach the farmers so as to train them on plantain plantation development for effective commercial plantain production.
3. The Ministry of Agriculture at the state and federal level via AKADEP should support the farmers with different herbicides, insecticides, fungicides and fertilizer needed for plantain plantation maintenance for effective commercial plantain production.

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