

Plantain value addition: Opportunities, challenges and prospects in Enugu State, Nigeria

Vincent Chidindu Asogwa^{1*} • Edward Chukwuka Isiwu² • Glory Mmachukwu Nwakpadolu² •
Valentine Sonny Ogonnia Ibe² • Georgiana Ngozi Ubah²

¹Department of Agricultural Education and Extension, University of Eswatini, Eswatini.

²Department of Agricultural and Home Science Education, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria.

*Corresponding author. E-mail: asovinchidi@gmail.com.

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Abstract. Plantain is one of the staple foods in Enugu State whose opportunities, challenges, and prospects in value addition are not yet known to the citizenry. Therefore, this study identified opportunities, challenges, and prospects of plantain value addition in Enugu State, Nigeria. Mixed method was used for this study. The population of the study was 113 participants. Census sample and snowball sampling techniques were used for the study. Two instruments were validated by 5 experts. A Cronbach Alpha coefficient of .89 was obtained for Plantain Value Addition Questionnaire (PVAQ). Arithmetic mean and narrative approach were used to analyze the quantitative and qualitative data to answer the research questions. The findings showed that the major opportunities of plantain value addition consist of making plantain flour, chips, roasted and pottage available for economic gain (Mean = 3.69), easy to acquire the needed skills (M = 3.66), availability of high-yielding plantain varieties (M=3.65), available markets (M = 3.64), and efficient market information system (M = 3.64). Inadequate capital for establishment and sustenance of enterprise (M = 3.76), unstable input and output prices (M = 3.71), and lack of support from the government or poor government policies (M = 3.68) were the major challenges to plantain value addition. The main prospects of plantain value addition were un-seasonality of consumption (M = 3.89), available market locally and internationally (M = 3.77), and available cultivable fertile land (M = 3.68), and available labour (M = 3.68). The recommendation among others was that the Ministry of Agriculture should organize a seminar to expose youths to the opportunities, challenges, and prospects of plantain value addition in the state.

Keywords: Employment opportunities, mixed method, plantain chips, plantain processors, snowballing.

INTRODUCTION

Plantain (*Musa paradisiaca*) is the common name for herbaceous plants in genus *Musa*. It is classified formally as *Musa balbisiana* or hybrids *Musa acuminata* × *balbisiana* (AAB Group), depending on their genetic constitution (Ekpete *et al.*, 2016). In Nigeria, about 116 cultivars were classified into three groups namely: Unereike (French plantain), Bini plantain (Okirika in parts

of Rivers State) and Horn plantain (Ogbutun) (Udofia and Nlebem, 2013). On gross value production, Asbaye *et al.* (2017) asserted that plantain is one of the most important fruit in developing world including Nigeria (Asbaye *et al.*, 2017). Food and Agriculture Organization Corporate Statistical Database (FAOSTAT, 2018) reported that plantain had the highest percentage increase in output

over years from 1999 to 2003. In West Africa, Nigeria is the highest plantain producer with an annual production of about 2.4 million metric tons mostly obtained from the Southern States. In South-East region, plantain is produced mainly in Enugu, Ebonyi and Anambra State (Ajayi, 2018).

Plantain is one of the major sources of carbohydrates and iron in Africa. Plantain contains 35% carbohydrate, 0.2 to 0.5% fat, 1.2% protein, and 0.8% ash (Campuzano *et al.*, 2018). Unlike desert banana, plantain fruit is cooked in different forms and served as food in many households. As one of the major staple foods in Nigeria, plantain products in the chef of many Nigerian families include dodo (fried ripe pulp), chip (fried unripped pulp) and plantain flour (Ajayi, 2018). Plantain fruit can be consumed boiled, pounded, roasted, baked, or sliced and fried into chips (pekere); overripped plantain is processed into beer or sliced with chile pepper, fried with palm oil, and served as snacks (dodo). Unripe plantain is traditionally processed into flour which is mixed with boiling water to prepare amala (elubo-ogede) (Asbaye *et al.*, 2017). Plantain is more advantageous over other starchy foods because it contains protein, mineral and vitamins. Plantain can be used in the treatment of sore throat, tongilolitis diarrhea vomiting. Unripe plantain is used to treat diabetic patients (Asbaye *et al.*, 2017). Plantain is a major diet in the production of soy-musa used in kwashiorkor treatment because of its richness in health-promoting bioactive phytochemicals (Sidhu and Zafar, 2018).

Economically, plantain production, including processing, is a variable source of income to the farmers and processors. Many people in Enugu State engage in plantain farming, marketing, or processing as an occupation for income generation. Before now, plantain was grown on homestead and as an intercrop with other crops like yam, maize and cassava, but recently, it is grown in small plantation for the commercial market. The growing of plantain has been left in the hands of aged and subsistence farmers who accounted for about 80% of Nigeria's agricultural output (Adelodun *et al.*, 2016). Asbaye *et al.* (2017) stated that such aged farmers concentrate on small scale due to lack of financial capacity to manage cost of labour, inputs and climate variability commercially. Osalusi (2019) recommended that plantain production, including processing, is a viable and profitable venture and should be engaged by the unemployed youths in Nigeria. However, one of the major constraints of plantain production is post-harvest losses (Ajayi, 2018). This is because plantain fruit contains high water content, which makes it easy to deteriorate rapidly with any little change above room temperature. To circumvent such losses, there is a need for plantain value addition with a view to enhancing the shelf-life and diversifying the products base. The perishable nature of

plantain therefore makes plantain value addition a vital link in the marketing structure and process (Loos *et al.*, 2018).

According to Yadav *et al.* (2017), plantain value addition implies changing or transforming plantain fruits from its original state to a more valuable state preferred in the market. Plantain value added product serves as food and important raw materials for livestock feed, confectionary, bakery, and pharmaceutical industry (Mogaj and Mogaji, 2020). It could be processed into food/foodstuffs such as breakfast cereals, baby food, (soymusa), flour, chips, and snacks food (Evans *et al.*, 2020). This study centres on plantain chips and flour since they are the most common plantain value-added products in study area. Besides, the target market of plantain value addition includes the children, teenagers, young and older people alike. The national demand for plantain chips is estimated at 5,250 tons/year while the annual national supply is estimated at 4,575 tons/year, leaving a demand-supply gap of about 675 tons/year (Zubair, 2017). Therefore, plantain value addition could provide employment opportunities for the rural dwellers, especially the youths and thus help to stem the tide of rural urban migration and contribute to food security in Enugu State.

Currently, the opportunities, challenges, and prospects of plantain value addition in Enugu state is lacking in literature. Most available literature to the researchers were on economic analysis of plantain marketing (Adetunji and Adesiyani, 2008); profitability analysis of plantain marketing (Ariyo, 2013); economics of plantain production (Asbaye *et al.*, 2017; Osalusi, 2019); effect of utilization of improved plantain production technologies (Olojede and Ukoha, 2018); production and marketing of banana and plantain in West Africa (Olumba and Onunka, 2020), and plantain value chain mapping (Adeoye *et al.*, 2013). The existing gap in available literature prompted the researchers to undertake this study. Hence, the study determined the opportunities, challenges, and prospects of plantain value addition in Enugu State, Nigeria. Specifically, the study sought to determine the:

- i. Socio-economic characteristics of the respondents;
- ii. Opportunities for plantain value addition;
- iii. Challenges of plantain value addition; and
- iv. Prospects of plantain value addition in Enugu State.

Research questions

- i. What are the socio-economic characteristics of the respondents?
- ii. What are the opportunities for plantain value addition in Enugu State?

- iii. What are the challenges of plantain value addition in Enugu State?
- iv. What are the prospects of plantain value addition in Enugu State?

Research hypotheses

1. There is no significant difference in the mean responses of male and female plantain processors on the opportunities for plantain value addition in Enugu State.
2. There is no significant difference in the mean responses of male and female plantain processors on the challenges of plantain value addition in Enugu State.
3. There is no significant difference in the mean responses of male and female plantain processors on the prospects of plantain value addition in Enugu State.

MATERIALS AND METHODS

Research design

Primary data was collected through mixed method (quantitative and qualitative approaches). The descriptive survey research design was used for this study. Data from the respondents (plantain processors) were obtained through face-to-face approach and the findings were generalized upon the population of the respondents in the study area.

Area of the study

The study was carried out in Enugu State, Nigeria which is agriculturally divided into 6 zones: Agbani, Awgu, Enugu, Enugu-Ezike, Nsukka, and Udi (Enugu State Agricultural Development Programme, 2020). Climatically, it has loamy soil and good average annual rainfall system of about 2,000 mm and a mean daily temperature of 26.7°C (Ume *et al.*, 2019), which makes it possible for sustainable supply of plantain fruits for value addition and supply to other parts of the country like the North. The hot nature of Enugu State (Europa Publications, 2004) demands value addition against the perishability of plantain fruits.

Population of the study

The accessible population for the study was 113 plantain processors. The plantain processors have been processing plantain fingers into roasted plantain, dodo (fried ripe pulp), chip (fried unripe pulp) and/or plantain flour. Hence, they were assumed to have acquired

experience of the opportunities, challenges, and prospects of the plantain enterprise to respond to the instruments for data collection.

Sample and sampling technique

The entire accessible population was involved in the study, hence there was no sampling. This was based on Nworgu (2009) that census sampling that is using the entire population can be adopted where the population is small and can be effectively handled during data collection. Meanwhile, snowball sampling techniques was used to sample the accessible population of the plantain processors since there was no comprehensive list of the processors and many of them were based in rural areas without a clear address. Snowball sampling is one in which the researchers collect data on the few members of the target population they can locate, then asks those individuals to provide information needed to locate other members of the population whom they know. Snowball sampling uses recommendation from members of a group to find others with the specific range of skills that has been determined as being useful for the desired study. The respondents know others who share the same skills in plantain value addition that make them eligible for inclusion in the study (Crossman, 2016). For qualitative data collection through interview, stratified simple random sampling technique was used to select one plantain processor who served as Key Informant (KI) from each of the six-agriculture zone in the study area. This was possible since their contacts and addresses were already known from the snowball sampling technique.

Instrumentation

Two instruments titled: Plantain Value Addition Questionnaire (PVAQ) and Plantain Value Addition Interview Guide (PVAIG) were developed by the researchers from literature reviewed. The PVAQ had a 4-point response scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with a corresponding value of 4, 3, 2, and 1 while the PVAIG was semi-structured without any specific answer. The instruments were face validated by 5 experts; two from the Department of Agricultural and Home Science Education, two from the Department of Agricultural Extension and Communication and the other from the Department of Science Education (measurement and Evaluation Unit), all from Michael Okpara University of Agricultural, Umudike, Abia State. The corrections and suggestions by the validates were used to improve the initial draft of the PVAQ which brought the items from 44 to 39 whereas there was no correction on the PVAIG with

3 item questions. Furthermore, 15 copies of the questionnaire were once trial tested on 15 plantain processors in Ebonyi State to determine the reliability of the PVAQ. The respondents were not part of the area of the study but have close boundary for proximity; they have similar training, practices, and experience with the target audience for the study. Cronbach Alpha reliability method was used to determine the internal consistency of the questionnaire items which gave 0.89 as the reliability coefficient of the questionnaire items. Since the instrument was not dichotomously scored and the reliability coefficient was above the acceptable level according to Kline (1999), the instrument was deemed exceptionally reliable and used for the study.

Data collection

Six research assistants who were familiar with the study area were employed and given orientation on how to administer and retrieve the questionnaire from the respondents. Fifty-five copies of the questionnaire were administered to the respondents by the research assistants through face-to-face contact but only 41 copies were returned, giving 94.55% retrieval rate. The administration and retrieval of the PVAQ lasted for 2 months between 27th February and 19th April 2020.

For qualitative data collection, the researchers personally interviewed 6 participants (one from each zone: 2 males and 4 females). One key informant was selected from each Agriculture Zones based on years of experience (up to 15 years) in plantain value addition. Responses were electronically recorded, and individual prolonged discussion with the participants aimed at obtaining trustworthiness of the data collected (Clark and Vealé, 2018).

Data analysis

The data collected was analyzed using descriptive analysis precisely frequency count and arithmetic mean to answer the research questions quantitatively and t-test for testing the null hypotheses at 0.05 level significance. A mean of 2.50 was used for decision-making. Any item with a mean value of 2.50 or above was regarded as agreed while any item with a mean less than 2.50 was regarded as disagreed. In testing the hypothesis, a null hypothesis of no significant difference was accepted where alpha p-value was greater than the 0.05 level of probability but rejected where alpha p-value was less than the 0.05 level of probability. The qualitative data collected was analyzed using narrative and thematic approaches; that is, the stories or points made by the participants were reformulated, coded, categorized, and

interpreted considering the context of each question and different experience of each participants (Butina, 2015; Mihas, 2021).

Ethical considerations

The researchers sought approval from the State Ministry of Agriculture to conduct the study. The cover page of the instruments was consent letters to introduce the study and obtain approval from the respondents before participation since it was voluntary. The respondents were permanently protected because there was no part of the Plantain Value Addition Questionnaire (PVAQ) and Plantain Value Addition Interview Guide (PVAIG) containing information that could be used to trace back a particular individual after data collection. The identity of respondents was kept anonymous and only their gender was recorded. The respondents had the right to withdraw from the study at any point in time. The data collected was confidentially treated, honestly analyzed, and discussed for this academic purpose. This paper has remarkably high uniqueness against plagiarism.

RESULTS AND DISCUSSION

The study results obtained from the research questions answered and the hypothesis tested were presented in Tables 1 to 4.

The socio-economic characteristics as shown in Table 1 indicated that the respondents were dominated by female (73.45%). This may be due to cultural belief that processing of agricultural produce is mainly the responsibilities of women. Plantain value addition is practiced by all status of married life but primarily the married (70%), probably to engage family labour in the operation. The average experience of the respondents in plantain value addition is 13.7 years which means that the enterprise is sustainable. Most of the plantain value added products is chips (59.30%), indicating its market demand above all other plantain products in the study area. The estimated average annual income of the respondents is 138,461.54; hence, proves that plantain value addition is a viable enterprise in Enugu State.

Table 2 revealed that the mean of the 9 items ranged from 3.55 to 3.69 which were greater than the cutoff point 2.50 of a 4-point rating scale. The respondents agreed that the opportunities for plantain value addition were that plantain value addition makes its flour, chips, roasted and pottage available for economic gain ($M = 3.69$), easy to acquire the needed skills for plantain value addition ($M = 3.66$), availability of high-yielding plantain varieties for steady supply ($M = 3.65$), readily available market ($M = 3.64$), opportunities to export value added plantain

Table 1. Socio-economic characteristics of respondents.

Socio-economic characteristics	Number	Percentage	Mean
Gender			
Male	30	26.55	
Female	83	73.45	
Marital status			
Single	23	20.30	
Married	79	70	
Divorcee	11	9.70	
Experience			
0-9	26	23.00	
10-19	71	62.83	13.73
20-29	11	9.73	
30 or above	5	4.42	
Plantain value added product			
Chips	67	59.30	
Flour	35	30.97	
Other snacks	11	9.73	
Income status per annum (#)			
>100,000	50	44.25	
101-200,000	37	32.75	138,461.54
201,000-300,000	15	13.27	
<300,000	11	9.73	

products (M = 3.63), a substitute for more expensive food materials (M = 3.56), diversification of plantain utilization based on products to suit different purposes (M = 3.60), easy linking of stakeholders in the plantain value chain (M = 3.55), efficient market information system on plantain value addition (M = 3.64). The p-value of all the 9 items ranged from 0.38 to 0.90 which were greater than the alpha-value of 0.05. The null hypothesis was upheld for all the 9 items since there was no significant difference in the mean responses of male and female plantain processors on the opportunities of plantain value addition in Enugu State.

Furthermore, the qualitative data obtained through interview guide showed that 67% of the 6 respondents expressed that it is easy to acquire skills for value addition to plantain, there is readily available input, and high market demand for different product that they have not been able to saturate. A female participant residing in Enugu said that:

“... I just learnt how to produce chips from my mother who was roasting plantain. ...currently, I cannot supply to all my customers. Some of them call me from other states like Anambra

and Ebonyi. Sometimes, I do not pick their calls because I do not have products to supply to them due to limited hands. All I can say is that there is good market for value added plantain in Enugu...”

A male participant residing in Nsukka stated thus:

“...yes, I have learnt that many of the consumers take plantain chips as snacks in place of other foods like biscuits because it is cheaper and processed locally. Even if I experience poor market which I have never since more than 10 years now, I can start processing plantain flour. Many customers have been asking me if I can supply them flour”

This finding is in line with the observation of Faleti (2017) that there are three major opportunities in agribusiness: the production and distribution of farm inputs, the actual crop/animal production (farming) and the processing and distribution of farm produce. Omeh (2017) noted that opportunities in agriculture results from Nigeria having

Table 2. Opportunities for plantain value addition.

S/N	Item on opportunities	Mean	S	p-value	Remarks
1.	Plantain value addition makes its flour, chips, roasted and pottage available for economic gain	3.69	0.52	0.89	Agreed*
2.	Easy to acquire the needed skills for plantain value addition	3.66	0.62	0.82	Agreed*
3.	Availability of high-yielding plantain varieties for steady supply	3.65	0.64	0.91	Agreed*
4.	Readily available market	3.64	0.60	0.88	Agreed*
5.	Opportunities to export plantain value added products	3.63	0.64	0.41	Agreed*
6.	A substitute for more expensive food materials	3.56	0.68	0.18	Agreed*
7.	Diversification of plantain utilization based on products to suit different purposes	3.60	0.63	0.44	Agreed*
8.	Easy linking of stakeholders in the value chain	3.55	0.54	0.38	Agreed*
9.	Efficient market information system on plantain value addition	3.64	0.62	0.90	Agreed*

N=113, S = standard deviation, significant at P < 0.05, *=not significant

Table 3. Challenges of plantain value addition.

S/N	Items on challenges	Mean	S	P-value	Remarks
1	Inadequate capital for establishment and sustenance of plantain value addition enterprise	3.76	0.74	0.76	Agreed*
2	High competition from the other agro-producing countries in the world	3.39	0.68	0.81	Agreed*
3	Lack of social amenities necessary for plantain value addition	3.54	0.65	0.96	Agreed*
4	High cost of labour for the activities in plantain value addition	3.49	0.70	0.51	Agreed*
5	Inadequate storage facilities for plantain value added products	3.58	0.59	0.97	Agreed*
6	Scarcity of input resources	3.59	0.62	0.49	Agreed*
7	Unstable input and output prices for plantain value added products	3.71	0.46	0.86	Agreed*
8	Only manual equipment available for plantain value addition	3.62	0.71	0.43	Agreed*
9	Low level of awareness of the areas of scarcity for effective marketing	3.66	0.70	0.79	Agreed*
10	Low technical know-how of the personnel involved	3.53	0.67	0.58	Agreed*
11	Lack of support from government or poor government policies on agricultural products	3.68	0.71	0.54	Agreed*
12	Lack of adequate research to increase the prices of plantain value added products	3.47	0.80	0.93	Agreed*
13	Communication gaps between the processors, marketers and consumers	3.62	0.66	0.71	Agreed*
14	Unaccountability of the enterprise by the managers	3.47	0.51	0.42	Agreed*
15	Unfavorable market climate for sustainable value addition to plantain industry.	3.59	0.61	0.74	Agreed*
16	Inadequate funding of agriculture by the government and stakeholders	3.38	0.83	0.24	Agreed*
17	Competition for relative prices of other food crops and products	3.40	0.80	1.03	Agreed*
18	Irregular/poor government policies on agriculture policies	3.53	0.76	0.71	Agreed*
19	Gender disparity in plantain value addition enterprise	3.34	0.86	0.39	Agreed*

N=113, S = standard deviation, significant at P<0.05, *=not significant

large expanse of fertile farmlands, attention to promoting farming to help boost food productions and minimize food importation. Olumba and Onunka (2020) found that plantain production enterprises in West Africa have great prospects in the area of employment generation, contributions to national income and gross domestic product, poverty alleviation, economic and industrial growth and rural development.

Table 3 revealed that the mean of the 19 items ranged

from 3.34 to 3.71 which were greater than the cutoff point 2.50 of a 4-point rating scale. The respondents agreed that challenges of plantain value addition were inadequate capital for establishment and sustenance of plantain value addition enterprise (M = 3.76), competition from the other agro-producing countries in the world (M = 3.49), lack of social amenities necessary for plantain value addition (M = 3.54), high cost of labour for the activities in plantain value addition (M = 3.49), inadequate

Table 4. Prospects of plantain value addition.

S/N	Items on prospects	Mean	S	P-value	Remark
1	Un-seasonality of consumption of value-added plantain	3.89	0.51	0.81	Agreed*
2	Available cultivable fertile land for input steady supply	3.68	0.64	0.62	Agreed*
3	Available market locally and internationally	3.77	0.65	0.60	Agreed*
4	Adaptability of plantain to different soil conditions for regular supply	3.56	0.61	0.97	Agreed*
5	Available water bodies for continues production of plantain	3.63	0.65	1.00	Agreed*
6	Conducive weather conditions for increased production	3.55	0.78	0.76	Agreed*
7	Easy acquisition of skills in plantain value addition by interested individuals	3.61	0.63	0.38	Agreed*
8	Available improved cultivars of plantain	3.54	0.53	0.15	Agreed*
9.	Functional value addition to plantain association to promote market	3.60	0.62	0.20	Agreed*
10.	Available local resources for appropriate technology	3.40	0.75	0.63	Agreed*
11	Available labour for processing, especially from women	3.68	0.70	0.92	Agreed*

N = 113, S = standard deviation, significant at $P < 0.05$, * = not significant.

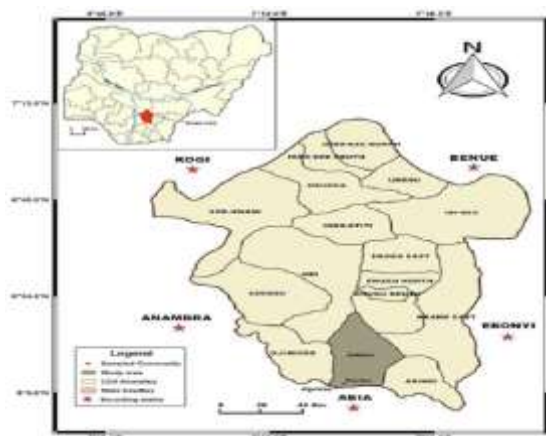


Figure 1. Map of Enugu State, Nigeria showing the study area (Onyishi *et al.*, 2018).

storage facilities for plantain value added products ($M = 3.58$), scarcity of input resources ($M = 3.59$), unstable input and output prices for plantain value added products ($M = 3.71$), only manual equipment available for plantain value addition ($M = 3.62$), low level of awareness of the areas of scarcity for effective marketing ($M = 3.66$), low technical know-how of the personnel involved ($M = 3.53$), lack of support from government or poor government policies on agricultural products ($M = 3.68$), lack of adequate research to increase the prices of plantain value added products ($M = 3.47$), communication gaps between the processors, marketers and consumers ($M = 3.62$), unaccountability of the enterprise by the managers ($M = 3.47$), unfavorable market climate for sustainable value addition to plantain industry ($M = 3.59$), inadequate funding of agriculture by the government and stakeholders ($M = 3.38$), competition for relative prices of other food crops and products ($M = 3.40$), irregular/poor government policies on agriculture policies ($M = 3.53$),

and gender disparity in value addition to plantain enterprise ($M = 3.34$).

The p-value of all the 19 items ranged from 0.24 to 1.03 which were greater than the alpha p-value of 0.05. The null hypothesis was upheld for the 19 items sincere there was no significant difference in the mean responses of male and plantain processors on the challenges of plantain value addition in Enugu State. Also, the qualitative result revealed that 100% of the respondents said that poor capital, lack of adequate or in-service training, lack of communication and cooperation, lack of market regulation and unfavourable government policies are prominent challenges to value addition to plantain. A female participant living in Agbani said:

“...Money is my major problem. I need more money to buy plantain in large quantity instead of going to market every week. I can even go to Imo, Cross River, Akwa-Ibom, or Delta state to buy them because I go to our local markets and boundary communities in Kogi, and sometimes, I will not buy enough plantain.”

A male respondent residing in Enugu was captured saying:

“There is no helper to teach me the market more. I want to export my products to other major cities like Onitsha, Lagos, Abuja, to make more profit. There is virtually no communication or cooperation among us the plantain processor. They cannot give you any market contact, they hardly pick up my call and always avoid my questions; maybe because I am a man in this kind of business. Nobody gives me information on new ways of adding value to my product. It is really

challenging especially to men.”

A female respondent residing in Udi expressed that:

“...yes, government does not have good policies for us. There is no price regulation by anybody; I sell my product based on my cost of production and those local government revenue people are always looking for us to pay for license, even ESEPA. The government did not train me or support me financially. In fact, the police and the task force on produce exploit me any time I am transporting plantain from Imo State.”

The finding agrees with Adesope *et al.* as cited in Akinyemi *et al.* (2010) that plantain processing, distribution and marketing have not been very efficient resulting from lack of established quality and quantity standards for plantain transportation and marketing. Olukunle (2013) found that the challenges of agriculture in Nigeria include lack of adequate storage and processing facilities, getting the agricultural products from the farmers to the consumers, technical constraint, unstable input and output prices, inadequacies in past policies and programmes, low level of development of infrastructure like roads and railway system, educational and health facilities, social services such as potable water and electricity and communication system. Okonjo-Iweala and Madan (2016) asserted that most farmers rely on local facilities making it difficult to transform subsistence farming into a profitable business. Faleti (2017) added that the challenges of Agriculture in Nigeria are inadequate access to land (availability, high clearing cost etc), mechanization and appropriate technology, improved varieties, extension services, inputs (agro-chemicals, fertilizers, etc), finance, market, information, and poor infrastructure (roads, storage facilities, etc). Osalusi (2019) found that inadequate credit facilities (20.7%), pest and disease (19.3%) and insufficient farmland (16.7%) were three major challenges to plantain production.

Table 4 revealed that the mean of the 11 items ranged from 3.35 to 3.79 which were greater than the cutoff point 2.50 of a 4-point rating scale. The respondents agreed that the prospects of plantain value addition were unseasonality of consumption of value-added plantain (M = 3.89), available cultivable fertile land for input steady supply (M = 3.68), available market locally and internationally (M = 3.77), adaptability of plantain to different soil conditions for regular supply (M = 3.56), available water bodies for continues production of plantain (M = 3.63), conducive weather conditions for increased production (M = 3.55), easy acquisition of skills in plantain value addition by interested individuals (M =

3.61), available improved cultivars of plantain (M = 3.54), functional value addition to plantain association to promote market (M = 3.60), available local resources for appropriate technology (M = 3.40), and available labour for processing, especially from women (M = 3.68). The p-value of all the 11 items ranged from 0.15 to 1.00 which was greater than the alpha-value of 0.05. The null hypothesis was upheld for all the 11 items sincere there was no significant difference in the mean responses of male and female plantain processors on the prospects of plantain value addition.

Moreover, 83% of the respondents interviewed posited that the prospects of value addition to plantain in Enugu State include availability of farmlands, readily available local resource and labour inputs and clement weather condition for growing and processing plantain to ensure a continuous supply.

A female respondent residing in Enugu-Ezike said:

“...In Uzu-uwani, there are large hectares of land, even in Ibagwa-egu, that you can use for plantain production. I normally go there to buy but sometimes I travel to neighboring communities in Kogi and Anambra to buy plantain. I think Enugu weather especially during dry season favours my business. Rainy season slows my business, but I know, it is good for the farmers who supply us plantain.

Another female respondent residing in Awgu posited that:

“All my resources and workers are from my community, Agwu. I had seven workers but just five workers now outside my family members; all of them are women. Two of them, Ujunwa, and Mama Ejima have started their own business after 3 months working with me. I can easily teach you skills needed in the business.”

This is in consonance with the findings of Akinola (1987) that Nigeria has fertile land that could sustain a variety of crops for marketing both within and outside the country, encouragement of private investment in large-scale agriculture with new incentives, tax relief on new agricultural business, generous credit facilities, and provision of essential infrastructural facilities. The rapid population growth and the desire for self-food sufficiency indicate good prospects of agriculture in Nigeria (Oni, 2007). Nwaiwu *et al.* (2012) found that each one naira (₦1) invested in plantain banana production yielded a profit of one naira twelve kobo (₦1.12k), hence vindicated that plantain banana production is a potentially viable farm business enterprise that has great prospects. Olukunle (2013) found that the prospects of Agriculture in

Nigeria include processing of farm produce for domestic and export markets, production of farm machinery and equipment, improvement in downstream commodity activities, environmental management, increased funding, and efficiency in agricultural spending. The economic returns derivable from investing in plantain production outweigh the costs of investing in the innovation (Ojo and Ayanwale, 2019). They recommended that policy actions establish a value chain financing agency under a public-private partnership be taken by the government.

CONCLUSION AND RECOMMENDATIONS

Plantain is a food crop with high acceptance among households in Enugu State. This made its consumption high but without a corresponding increase in production, thereby creating a gap between the quantity supplied by farmers and quantity demanded by consumers. Its quick ripening and decay usually widen this gap during transportation due to high moisture content. This situation could be ameliorated through value addition to the plantain fruit. Plantain value addition could be taken up by some of the unemployed citizen, especially the youths in the State if they are informed of its opportunities, expected challenges and prospects of plantain value addition enterprise in the State. It was in this view that the researchers conducted this study where it was found that there are 9 opportunities of value addition to plantain, 19 challenges of value addition to plantain and 11 prospects of plantain value addition to food security. Also, the hypotheses of no significant difference in the mean responses of male and female plantain processors on the 9 opportunities of plantain value addition, 19 challenges of plantain value addition and 11 prospects of plantain value addition to food security were not rejected. Therefore, it was recommended that:

1. Teachers of Agriculture and Home Science should encourage students to embark on any plantain value addition enterprise after graduation for their economic empowerment.
2. Ministry of agriculture should organize a seminar for youths in Enugu State to expose them to the opportunities, challenges, and prospects of plantain value addition in the State.
3. Unemployed youths should seek to acquire the required competencies in plantain value addition to enable them to tap the available opportunities in plantain value addition.
4. Agricultural extension agents should encourage unemployed youths to engage in plantain value addition enterprise for their self-reliance and contribution to food security.
5. The State Government should review some of the policies that discourage youths from embarking on

plantain value addition enterprise for their self-reliance and food security.

6. Through the Ministry of Agriculture, the State Government should provide support fund and retrain plantain producers and processor to sustainable food security in the State.

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