

Responses of Plantain Farmers to Agricultural Extension Services Delivered in Bayelsa State, Nigeria

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Abstract

The study investigated the response of plantain farmers to Agricultural Extension Services Delivered in Bayelsa State, Nigeria. Multi-stage and proportionate sampling techniques were used to sample 208 plantain farmers. Interview schedule was used to collect data on respondents' socio-economic characteristics, response to agricultural extension services delivered and constraints faced by plantain farmers on responding to extension services delivered. Data were collected with the aid of structured questionnaire and were analyzed using linear regression at $p=0.05$. The result shows that majority of the plantain farmers were young adult female (58.67%) and were married (61.06%). Agricultural extension services delivered by the extension agents on services like cooperative farming in plantain production ($GM = 2.20$), sucker multiplication in plantain production ($GM = 1.87$), use of improved plantain varieties ($GM = 1.47$) and accessing agro-credits from credit institutions had not been embraced by the farmers. Plantain farmers were constrained by lodging of plantains at the beginning and ending of every rainy season ($GM = 3.94$), intruders or poachers at the point of harvest ($GM = 3.87$), poor/no monitoring of extension projects in the State ($GM = 3.78$) and inadequate access to credit facilities ($GM = 3.12$). Respondents' annual income, level of education, age, marital status, and contact with extension agents, with t -ratios of 2.778, 2.293*, 1.519*, 1.362* and 1.129* respectively had positive relationships with extension services delivered in the area. Agricultural credits should be made accessible to plantain famers' in the State and extension agents should be encouraged and strengthened to provide services to plantain farmers.*

Keywords: Plantain Farmers, Extension Services, Extension Agents

Introduction

Agriculture is important to the Nigerian economy as it engages about 70% of the labor force and contributes 32% of Gross Domestic Product (Nwachukwu, 2013). Since the 2014 decline in global oil prices, Nigeria's economic growth has slowed down. Critically at this time of declining oil revenues for the government, agriculture contributes 75 percent of all other export earnings (Federal Ministry of Agriculture and Rural Development, 2016). However, the sector is faced with a lot of problems which makes it difficult to optimize its potentials. Some of the problems include poor marketing, inadequate access to credit, and weak extension services. In an attempt to ameliorate these constraints, the Government established Agricultural Development Projects (ADPs) to perform extension functions under the Ministry of Agriculture.

Effective extension service involves adequate and timely access by farmers to relevant information, with appropriate incentives, to adopt a new technology if it suits their socio-economic and agro-ecological circumstances. Public extension is one of the sources of information, but not necessarily the most efficient (Odinwa, Nlerum and Odinwa, 2020). It is widely accepted that extension services are important elements in farming but poor and marginalized farmers in remote villages do not receive appropriate extension services. Yet, extension service in agriculture is indispensable and it offers more than just expert assistance in improvement of production and processing, but also enables flow of information and transfer of knowledge and scientific findings into practice. These activities are performed according to rules which regulate the establishment of organization, functioning, goals and fields of operation, their obligations and rights. The response of farmers to extension service delivery has not received adequate attention; the focus has been more on research and extension. The public sector programmes are constrained by many factors including lack of transportation, communication and poor skills of service providers. This situation could lead to poor extension service delivery to the farmers that in turn affect their perception on the services they receive. It is an established fact that agricultural production, as currently practiced under traditional methods, has not been able to sustain Nigeria. The effort of government in information dissemination to farmers is appreciable, but farmers' adoption of innovations remains low and their perception and feedbacks to the extension services have not received adequate attention (Wauton, Odinwa and Ekeogu, 2022). Farmers' acceptance, rejection, compatibility, relevance of the services that are provided by the extension organization (ADP) require a thorough assessment to find out the level of their reactions with regards to farmers' satisfaction with the extension services that are being delivered to them in the study area ((Wauton, Odinwa and Ekeogu, 2022)).

Plantain (*Musa spp.*) is one of the major sources of carbohydrates and iron in Africa. Plantain contains 35% carbohydrate, 0.2 to 0.5% fats, 1.2% protein, and 0.8% ash (Asbaye et al., 2017). 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 unripe pulp) and plantain flour (Ajayi, 2018). Plantain fruit can be consumed boiled, pounded, roasted, baked, or sliced and fried into chips (*pekere*); over-ripped 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 (Shaibu et al, 2012). Economically, plantain production, including processing, is a veritable 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 (Asbaye et al. 2017). The same source 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. Iyabo et al (2013) 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 constrains 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 (Ajayi, 2018). According to Aina et al (2012), 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 ((Shaibu et al, 2012). It could be processed into food/foodstuffs such as breakfast cereals, baby food, (soymusa), flour, chips, and snacks food (FAO, 2013).

Most plantains are produced by small scale farmers who often do not have the financial resources for sustainable production due to high labor cost and limited land space. Oil exploration and extraction activity has led to adverse environmental hazard on the soil, forestry, aquatic life and waters of the Niger Delta communities. This has ultimately affected peasant agriculture leading to low output and environmental toxicology. Landless farmers migrated to other communities in search of fertile land for farming, thereby putting pressure on scarce fertile lands in other communities, and creating reduction on fallow land, while displaced farmers out-migrated to the urban areas in search of other means of livelihood and urban jobs (FAO, 2013). There is need to incorporate appropriate extension innovations in the production of plantain especially in Bayelsa State, which made this study a timely response.

Statement of the Problem

Agriculture is the bedrock of all economies of the world and it is not an exception in Bayelsa State. With over 70 per cent of the population in the rural area, and most of them dependent on agriculture, it follows that the strategy for economic transformation must address the barriers on production and funding (Young, 2012). There are a number of natural barriers towards the realization of the food security goals, one of which is land availability. Bayelsa State has a riverine setting, a lot of her communities are almost (and in some cases) completely surrounded by water

(Angela, 2011). About three-quarters of its total area lie under water which makes available land for plantain production inadequate as it competes with other food crops produced in the State such as: rice, oil palm, vegetables, cocoyam, etc. (Bayelsa Development and Investment Corporation (BDIC), 2012).

Agricultural lands have been reduced owing to increased oil and gas exploration and exploitation activities in the study area (BDIC, 2012). Studies in plantain and banana production have also shown that land under plantain production in Nigeria over ten years' period (1996–2005) increased by 24.6%, while a yield reduction of 21.8% was recorded during the same period (FAO, 2012). Yield of plantain has reduced drastically as the chances of increased land are very remote because of increased population growth and higher rates of urbanization (Faturotiet et al, 2007).

Plantain is one of the staple foods in Bayelsa State. It is enjoyed by many at meal time, but its production favours small holder farmers who still engage in traditional methods of farming in plantain production, leading to its low yield (FAOSTAT, 2017). Although the yield from the subsistence farmers is low, while the demand for plantain products are increasing daily. Efforts to increase plantain and other food productions as to alleviate food shortages and high cost of food items in the State cannot be achieved with the traditional crop rotation system of agriculture. Hence, farmers' adoption of agricultural extension innovations and services would immensely boost plantain production in the area.

The low yield in this area may be an indication that farmers are not fully benefiting from the production innovations that are passed through the ADP, or there may be no innovation passed to the farmers at all or they were not motivated to adopt extension innovations in the area. These and many more factors prompted the researchers to go into this study. Broadly speaking, yield can be improved if farmers' response to agricultural extension service delivery is adequately assessed and incorporated into the adoption and diffusion process of ADPs and the identified constraints ameliorated. It is on this backdrop that the researchers deemed it fit to assess the response of plantain farmers to the extension service delivery in the study area, with special interest to the following specific objectives:

- i. describing the socio-economic characteristics of plantain farmers in the study area,
- ii. assessing the level of response of plantain farmers to agricultural extension services delivered in the area, and
- iii. identifying the constraints faced by plantain farmers in responding to extension services delivered to them in the area.

Three hypotheses were framed to further direct the study, such as:

H₀₁: There is no significant relationship between the socio-economic characteristics of plantain farmers and their response to extension services delivered in the study area.

H₀₂: Response of plantain farmers to agricultural extension services delivered to plantain farmers in the study area do not differ significantly among the LGAs.

H₀₃: Constraints faced by plantain farmers in responding to extension services delivered in Bayelsa State do not differ significantly among the LGAs.

Methodology

The Study was conducted in Bayelsa State, one of the Niger Delta States in Southern Nigeria. Bayelsa State lies between latitude $04^{\circ} 15'N$ and $05^{\circ} 23'S$ of the equator, along longitude $06^{\circ} 45'E$ and $05^{\circ}22'W$ of the equator. The State has a total land area of $9,415.8\text{km}^2$, with about three-quarters lied under water (Bayelsa Development and Investment Corporation, 2012). The State has a population of 1,704,515 (NPC, 2006). The primary occupation of the people is farming, fishing, petty trading as well as forestry activities such as hunting and timbering (lumbering) gathering of wild snails and raffia palm tapping.

The design of this study was a descriptive survey, which Nworgu (2006) defined as a survey which aims at collecting data and describing in a systematic manner the characteristics or facts about a given population. A multi stage random sampling technique was adopted for the study in series. At stage one; a purposive sampling was used to select three (3) LGAs from the three Senatorial Districts in Bayelsa State, (Ogbia, Yenagoa and Sagbama). The reason for this selection was based on the high level of concentration of plantain farmers in these areas (Palys and Atchison 2008). At stage two; a total of nine (9) major plantain producing communities were randomly selected across the three (3) Local government areas to represent the population for the study. At the final stage, a proportionate sampling technique was used to select 20% of contact farmers from each of the communities through the farmers' data base available at Bayelsa ADP office, making a total of two hundred and eight (208) as sample size for the study.

Data for this study were obtained from both primary and secondary sources. Primary data were collected using structured questionnaire designed in Likert type rating scale, with closed ended questions, while the secondary data were collected through review of literatures, journals, annual reports and publications.

Data analysis was achieved using both quantitative and qualitative analytical techniques. The quantitative tools used were percentages, arithmetic mean and weighted mean while the qualitative analytical tools used were Regression Analysis and the Analysis of variance (ANOVA) to test the hypotheses at 0.05% alpha level of significance.

H_{o1} was done using ordinary least square regression model which was explicitly represented as:

$$Y = f(x_1 x_2 x_3 x_4 x_5 x_6 x_7 x_8 x_9 x_{10} x_{11} x_{12} +e)$$

Where Y = response to extension services delivered; x_1 = sex; x_2 = age (years); x_3 = marital status; x_4 = education; x_5 = nature of farming; x_6 = farm size (ha); x_7 = household size (no); x_8 = types of plantain; x_9 = annual income (₦); x_{10} = contact with ext. agent; x_{11} = experience (years); b_0 = constant; e = error term.

Simple linear regression model was built-in as:

$$Y = f(x_1 x_2 x_3 x_4 x_5 x_6 x_7 x_8 x_9 x_{10} x_{11} x_{12} +e) \quad (1)$$

Linear function:

$$Y = b_0 + b_1x_1 + b_2x_2+ b_3x_3 + b_4x_4 + b_5x_5 \dots\dots\dots + b_{112}x_{121}+ e \quad (2)$$

Test of H_0 and H_1 were done using ANOVA. All hypotheses were tested at 0.05% alpha level of significance.

Results and Discussion

Socio-Economic Characteristics of Plantain Farmers in Bayelsa State

The result in Table 1, shows the socio-economic characteristics of the respondents in the three respective LGAs; Ogbia, Sagbama and Yenagoa. It showed that majority of the plantain farmers were female (58.67%). This finding did not however agree with a similar study carried out in Kaduna Metropolis by Ariyo, *et al* (2013) where 64% of the plantain producers/traders were male. The reason was attributed to the fact that some women in the study area were restricted to household activities by their religious stand. As regards the age and marital status of the respondents, the result revealed 45 years old as the mean age of the respondents and that majority of them were married (61.06%). This implies that plantain farmers are in their economic productive age, an indication of a bright future for plantain production if the farmers can be guided and motivated in the area. On the marital status the finding is in agreement with Obinna and Agu-Aguiyi (2014) who revealed that most of the participating farmers were married and noted that marriage is indisputably a respected institution in most farming communities for providing supporting hands in farming activities and active participation in agricultural programmes.

As for the educational level of the respondents, the result shows that higher proportion of the respondents (77.51%) had formal education from primary to tertiary. This finding supports the study of Ariyo *et al.* (2013) whose findings revealed that over (87%) of the plantain traders and farmers in Kaduna had formal education. The implication of the result is that plantain farmers/traders are enlightened as such have high tendency to adopt new innovations.

On respondents' membership in Cooperative societies, the result revealed that majority of plantain farmers in Ogbia and Yenagoa belong to farmers' cooperatives (76.47%) and (74.58%), respectively; only plantain farmers in Sagbama 100% do not belong to any farmers' cooperative society. This finding agreed with Amugo and Odinwa (2022) who stressed that membership of farmers group influences participation in agricultural projects due to the fact that there is increasing interest in farmers' organization as an effective approach to farmer participation research (FPR).

The result also indicated a mean household size of 7 persons per plantain farmers' family and a mean farm size of 1.3 hectares per household. This is supported by the findings of Oladeji, Ogunleye and Aderinto (2012) who reported that a fairly large house hold size dominates the rural people in Nigeria as an economic advantage that provides the members of a household to serve as source of labour and also in meeting the socio-economic demand and food security of the entire household.

The findings further show a mean annual income of ₦378,300.00 for plantain farmers in the study area, which is an indication that plantain farmers in Bayelsa State are poor considering the economic situation in the country as a whole. This result agrees with the findings of Eronmwon,

et al (2014) in their studies on structure, conduct and performance of plantain marketing in Edo State, Nigeria.

Regarding regularity of contact with extension agents, the result showed that plantain farmers were mostly contacted once in every four months (77.70%) and followed by once in every two months (22.03%), hence, daily, weekly, fortnightly and monthly contact with farmers never exist in the study area. The irregular visit by extension agents indicates the imbalance ratio of extension agent to a farmer in Nigeria. This finding was not in line with Wauton, Odinwa and Ekeogu (2022) who reported that frequent and regular extension contacts with the farmers have positive effect on the adoption of technologies by farmers.

Table 1 Socio-Economic Characteristics of Plantain Farmers in Bayelsa State

Variables	Ogbia n = 68		Sagbama n = 81		Yenagoa n = 59		Mean
	(f)	(%)	(f)	(%)	(f)	(%)	
Sex	(f)	(%)	(f)	(%)	(f)	(%)	
Male	29	42.65	34	41.98	25	42.37	42.33%
Female	39	57.35	47	58.02	34	57.63	58.67%
Age	(f)	(%)	(f)	(%)	(f)	(%)	
21 - 30	10	14.71	4	04.94	8	13.56	
31 - 40	14	20.59	17	20.99	16	27.12	
41 - 50	23	33.82	45	55.56	20	33.80	45 years
51 - 60	11	16.18	7	08.64	10	16.95	
61 and above	10	14.71	8	09.88	5	08.47	
Marital Status	(f)	(%)	(f)	(%)	(f)	(%)	
Single	12	17.65	11	13.58	12	20.34	17.19%
Married	37	54.41	59	72.84	33	55.93	61.06%
Others	19	27.94	11	13.58	14	23.73	21.75%
Level of Education	(f)	(%)	(f)	(%)	(f)	(%)	
No Formal education	14	20.59	16	19.75	16	27.12	22.49%
Primary education.	24	35.29	6	07.41	15	25.42	22.71%
Secondary education	19	27.94	42	51.85	18	30.51	36.77%
Tertiary education	11	16.18	17	20.99	10	16.95	18.04%
Cooperative Membership	(f)	(%)	(f)	(%)	(f)	(%)	
Yes	52	76.47	-	-	44	74.58	50.35%
No	16	23.53	81	100	15	25.42	49.65%
Household Size	(f)	(%)	(f)	(%)	(f)	(%)	
2- 3 Persons	5	07.35	9	11.11	4	06.78	
4-5 Persons	33	48.53	18	22.22	17	28.81	7 persons
6-7 Persons	22	32.35	36	44.44	24	40.68	
8 and above	8	11.76	18	22.22	14	23.73	
Farm Size in Hectare	(f)	(%)	(f)	(%)	(f)	(%)	
Below 0.5ha	12	17.65	-	-	11	18.64	
0.5 - 1.4ha	43	63.24	38	46.91	36	61.02	1.30ha

Variables	Ogbia n = 68		Sagbama n = 81		Yenagoa n = 59		Mean
1.5 - 2.4ha	10	14.71	25	30.86	07	11.86	
2.5ha and above	3	04.41	18	22.22	05	08.47	
Years of Experience	(f)	(%)	(f)	(%)	(f)	(%)	
1 - 5 Years	11	16.18	27	33.33	09	15.25	
6 - 10 Years	45	66.18	45	55.55	39	66.10	8 Years
11-15 Years	12	17.65	-	-	11	18.64	
16 Years and above	-	-	9	11.11	-	-	
Annual Income	(f)	(%)	(f)	(%)	(f)	(%)	
Below N200, 000	3	04.41	16	19.75	2	03.39	
N200,000-N299,000	9	13.24	19	23.46	5	06.17	
N300,000-N399,000	27	42.65	15	18.52	30	50.85	₦378,300
N400,000-N499,000	20	29.41	21	25.93	12	20.34	
N500,000 and above	9	13.24	10	12.35	10	16.95	
Variety cultivated	(f)	(%)	(f)	(%)	(f)	(%)	
Improved varieties	1	01.47	-	-	1	01.69	1.05%
Local varieties	67	98.53	81	100	58	98.31	98.95%
Regularity of contact with Ext. Agent	(f)	(%)	(f)	(%)	(f)	(%)	
Bimonthly	13	19.12	14	17.28	18	30.51	22.30%
Quarterly	55	80.88	67	82.72	41	69.49	77.70%

Source: Field Survey, 2021

The result of the relationship between the socio-economic characteristics of plantain farmers and their response to extension service delivered in Bayelsa State (Table 2) showed that annual income, level of education, age, marital status, and contact with extension agents, with t-ratios of 2.778*, 2.293*, 1.519*, 1.362* and 1.129* respectively had positive relationships with extension services delivered at least 5% significant level for variables such as annual income and level of education. This implied that increase in annual income, level of education, age, marital status, and contact with extension agents will increase the response to extension services delivery in the area. This finding supported Odinwa, Isife and Nlerum (2019) who submitted that age and education had positive and significant relationship with adoption and that the intensity of the adoption improved maize production.

Also, the findings indicated that membership of cooperative, farm size, and variety of plantain cultivated in the area with t-values of -4.712** and -3.781** respectively, were negative and significant at 1% level of probability. The implications are that, as membership of cooperative, farm size, and variety of plantain cultivated in the area increase, the level of plantain farmers' response to extension services delivered will decrease in Bayelsa State.

Table 4.2 Relationship between the Socio-economic Characteristics of Plantain Farmers and their Response to extension Service Delivery in Bayelsa State

Variables	Coefficient	Std error	t-Values	Probability
(Constant)	3.148	1.921	1.638	.103
Sex	-0.039	.151	-0.258	.797
Age	0.103	.068	1.519	.131
Marital Status	0.158	.116	1.362	.175
Level of Education	0.160	.070	2.293*	.023
Membership of Cooperative	-0.746	.158	-4.712**	.000
Household Size	-0.026	.083	-0.314	.754
Farm Size	-0.418	.111	-3.781**	.000
Years of Experience	0.114	.124	0.914	.362
Annual Income	0.226	.081	2.778**	.006
Type of plantain cultivated	-1.130	.701	-1.612	.109
Contact with Ext Agents	0.190	.168	1.129	.260

Source: Field Survey, 2021 ** = significant at 1% * = significant at 5%.

Level of Response to Agricultural Extension Services Delivered in the Area by Plantain Farmers in Bayelsa State

Findings on response of farmers to agricultural extension services provided (Table 3) showed that apart from: Planting suckers at the right season (GM =2.81), Pest and diseases control measures (GM = 2.64), Pruning and weed control measures and Organic farming in plantain production with equal grand mean (GM = 2.50) that have been responded to by plantain farmers in the area; high proportion of agricultural extension services delivered have not been responded to by plantain farmers in Bayelsa State. Such services as essential as: The use of inputs like fertilizer, pesticides etc. (GM = 2.22), Cooperative farming in plantain production (GM = 2.20), Sucker multiplication in plantain production (GM = 1.87), Attending Training Meetings (GM = 1.56), Use of improved plantain varieties (GM = 1.47) and accessing agro - credits from credit institutions among other extension services. This low or no response to extension services by farmers must have resulted from irregular extension agents' contact with farmers as observed by Speranza et al (2009).

Table 3: Mean Level of Response to Agricultural Extension Services Delivered in the Area by Plantain Farmers in Bayelsa State

Ext. Services Delivered	Ogbia Weighted Scores n = 68		Sagbama Weighted Scores n = 81		Yenagoa Weighted Scores n = 59		Grand Total scores N= 208	Grand Mean	Remark
	Mean	Mean	Mean	Mean					
Organizing Training Meetings	127	1.87	89	1.00	109	1.85	325	1.56	Low Response
Use of improved plantain varieties	115	1.60	89	1.00	102	1.73	306	1.47	Low Response
Sucker multiplication in plantain production.	169	2.49	89	1.00	130	2.20	388	1.87	Low Response
Planting Suckers at the right season	263	3.87	93	1.15	229	3.88	585	2.81	High Response
Plantain inter- crop with other crops	213	3.13	89	1.00	185	3.14	487	2.34	Low Response
Plantain mixed farming with snail or poultry	89	1.31	93	1.15	74	1.25	256	1.23	Low Response
Proper Seedbed preparation for plantain seedlings (suckers)	69	1.01	85	1.05	60	1.02	214	1.03	Low Response
Pest and diseases control measures	241	3.54	93	1.15	214	3.63	548	2.64	High Response
Pruning and weed controlling measures	227	3.34	97	1.10	194	3.29	518	2.50	High Response
Organic farming in plantain production	229	3.37	93	1.15	198	2.36	520	2.50	High Response
Accessing agro - credits from credit institutions	162	2.39	93	1.15	149	2.53	404	1.94	Low Response

Ext. Services Delivered	Ogbia Weighted Scores n = 68	Mean	Sagbama Weighted Scores n = 81	Mean	Yenagoa Weighted Scores n = 59	Mean	Grand Total scores N= 208	Grand Mean	Remark
Use of inputs(like fertilizer, pesticides, etc.	197	2.80	89	1.00	175	2.97	461	2.22	Low Response
Processing of plantain produce to plantain floor or chips	89	1.31	93	1.15	76	1.29	258	1.24	Low Response
Accessing market information/export tips for your outputs	89	1.31	93	1.15	72	1.22	254	1.22	Low Response
Linking with off-takers and processors to promote your farm	115	1.69	89	1.00	97	1.64	301	1.45	Low Response
Cooperative farming in plantain	210	3.09	89	1.00	179	3.03	478	2.20	Low Response
Source: Field Survey, 2021					Decision Mean = 2.50				

ANOVA result on the level of plantain farmers' response to agricultural extension services delivered in Bayelsa State presented an ($f - \text{calculated} = 14.80$) and ($f - \text{critical} = 3.20$), at probability level less than 0.05% significant level. This led to the rejection of the null hypothesis which states that 'Response to agricultural extension services delivered to plantain farmers in the area do not differ significantly among the LGAs. The implication is that the response of plantain farmers to agricultural extension services delivered in Bayelsa State varies from one LGA to another, meaning that some LGAs respond more or less than others. The difference in response of farmers to extension services among the LGAs may be due to their different exposure to extension services by different extension agencies handling extension services in their local government areas; agrarian interest of the farmers; the farmers' social economic status and lack of effective motivation in plantain production.

Table 4: Summary of ANOVA result on the Level of Plantain Farmers' Response to Agricultural Extension Services Delivered in Bayelsa State

Source of Variance	SS	Df	MS	f-cal	f-Critical	Remarks
B/W Group variance	17.33	2	8.67			
W/Group variance	26.35	205	0.59			
Total	43.68	207		14.80	3.20	S

Source: Field Survey, 2021

Significant at $P < 0.05$

Constraints faced by Plantain Farmers on Responding to Agro Extension Services Delivered in Bayelsa State

Findings showed in the degree of seriousness that: Lodging of plantains at the beginning and ending of every rainy season (GM = 3.94), problems of intruders or poachers at the point of harvest (GM = 3.87), poor/no monitoring of extension projects in the State (GM = 3.78), lack of required inputs at the right time (GM = 3.70), insufficient number of extension agents for plantain farmers' (GM = 3.68), illiteracy of plantain farmers and fear of risk and uncertainty with equal grand mean (GM = 3.52), inadequate access to technical facilities (GM = 3.42) and governments' leap services to farmers' needs (GM = 3.38), inadequate access to credit facilities (GM = 3.12) among other factors posed serious constraints in responding to agricultural extension services delivered to plantain farmers in Bayelsa State. These constraints are critical to the growth and sustainability of plantain production in the area. These findings were supported by Odinwa, Nlerum and Odinwa (2020) who reported that inadequate access to credit and technical facilities, lack of required inputs at the right time, limited access to land, governments' leap services to farmers' needs, poor/no monitoring of extension projects, poor/no incentive, and reward to farmers by service providers and problems of pest and diseases constitute serious challenges in satisfying the extension needs of yam farmers in Rivers and Imo States.

Table 5: Mean Constraints faced by Plantain Farmers on Responding to Agro Extension Services Delivered in Bayelsa State

Constraints	Ogbia Weighted Scores n = 68		Sagbama Weighted Scores n = 81		Yenagoa Weighted Scores n = 59		Grand Total scores N = 208		Grand Mean	Remark
	Mean		Mean		Mean		Mean			
Limited access to land.	245	3.60	225	2.78	220	3.73	690	3.32	Serious	
Inadequate access to credit facilities.	215	3.61	245	3.02	189	3.20	649	3.12	Serious	
Inadequate access to technical facilities.	214	2.15	308	3.80	190	3.22	712	3.42	Serious	
Lack of required inputs at the right time.	250	3.68	308	3.80	212	3.59	770	3.70	Serious	
Instability of prices of plantain products.	235	3.56	251	3.00	210	3.56	696	3.35	Serious	
Farmers' mind-set towards plantain farming as a poverty venture.	189	2.78	133	1.64	163	2.76	485	2.33	Not Serious	
Language problem between extension agents and the farmers.	186	2.74	141	1.74	158	2.68	485	2.33	Not Serious	
Lack of technical know-how on the part of the extension agents.	203	2.99	137	1.69	171	2.80	511	2.46	Not Serious	
Incessant failed promises by the extension agents.	235	3.46	142	1.75	201	3.41	578	2.78	Serious	
Illiteracy of plantain farmers.	255	3.75	251	3.00	227	3.85	733	3.52	Serious	
Poor attitude of some extension agents.	238	3.50	137	1.69	198	3.36	573	2.75	Serious	
Farmers' resistance to change.	243	3.57	245	3.02	203	3.44	691	3.32	Serious	
Unavailability of extension agents at the time of need.	214	3.00	304	3.75	194	3.31	712	3.42	Serious	

Table 5: continues

	Ogbia Weighted Scores n = 68		Sagbama Weighted Scores n = 81		Yenagoa Weighted Scores n = 59		Grand Total scores N = 208		Grand Mean	Remark
		Mean		Mean		Mean		Mean		
Governments' leap services to farmers' needs.	204	3.00	304	3.75	195	3.21	703	3.38	Serious	
Lack of/poor marketing arrangement for plantain products.	180	2.65	251	3.00	171	2.80	602	2.89	Serious	
Inconsistent extension programmes on plantain production.	205	3.01	161	1.99	177	3.00	543	2.61	Serious	
Top-down and supply-driven decisions for plantain farmers.	214	3.15	161	1.99	185	3.14	560	2.69	Serious	
Insufficient number of extension agents for plantain farmers.	263	3.87	275	3.30	228	3.86	766	3.68	Serious	
Lack of feedback from extension agents on salient issues.	269	3.96	179	2.21	233	3.95	681	3.27	Serious	
Poor/no monitoring of extension projects in Bayelsa State.	268	3.94	291	2.59	228	2.86	787	3.78	Serious	
Poor service delivery by the extension agents.	248	3.65	137	1.69	224	3.70	609	2.93	Serious	
Poor or no incentive and reward to farmers by service providers.	244	3.59	245	3.02	212	3.59	701	3.37	Serious	
Incompetent leadership among farmers.	259	3.81	145	1.79	226	3.83	630	3.03	Serious	
Rigors involve in plantain production and marketing.	259	3.81	177	2.19	226	3.83	662	3.18	Serious	
Lodging of plantains at the beginning and ending of rainy season.	272	4.00	312	3.85	236	4.00	820	3.94	Serious	

Lack of functional cooperative system.	226	3.32	304	3.75	189	3.20	719	3.46	Serious
Improper assessment of existing problem by extension agents.	198	2.91	251	3.00	171	2.80	620	2.98	Serious
Fear of risk and uncertainty.	230	3.38	300	3.70	203	3.44	733	3.52	Serious
Problems of pest and diseases.	257	3.78	149	1.84	221	3.75	627	3.01	Serious
Problems of intruders or poachers at the point harvest.	268	3.94	303	3.74	233	3.95	804	3.87	Serious

Source: Field Survey, 2021

Decision Mean = 2.50

Test of significance on the constraints faced by plantain farmers in responding to agro extension services delivered in Bayelsa State showed the ($f_{cal} = 12.62$) as against ($f_{critical} = 3.10$) at probability level less than 0.05%. Since $f_{calculated}$ was greater than $f_{critical}$, the null hypothesis which states that the ‘Constraints faced by plantain farmers in responding to extension services delivered in Bayelsa State do not differ significantly among the studied LGAs’ was rejected, implying that the constraints facing the three LGAs are not the same. The difference in the constraints faced by plantain farmers in responding to agro extension services delivered to them in these LGAs may be due to their different exposure to extension services by different extension agencies handling extension services in their local government areas; agrarian interest of the local government areas; the farmers’ social economic status and lack of effective motivation in plantain production. This finding supported the observation of Nwachukwu (2013) who testified that different types of extension approaches were being practiced in various parts of the world and that each approach reflects a particular set of objectives, aims, clients and socio-cultural setting.

Table 6: Summary of ANOVA result on the Constraints faced by Plantain Farmers on Responding to Agro Extension Services Delivered in Bayelsa State

Source of Variance	SS	Df	MS	f-cal	f-Critical	Remarks
B/W Group variance	8.81	2	4.40			
W/Group variance	30.38	205	0.03			
Total	39.19	207		12.62	3.10	S

Source: Field Survey, 2021

Significant at $P < 0.01$

Conclusion

From the findings of this study, it was obvious that much has not been done as regards extension services delivery to plantain farmers in Bayelsa State. It showed that the major operators in plantain production in the study area were poor married women in their energetic age (45 years) and that extension services delivered by the extension agents vis-a-vis their low responses by the plantain farmers in Bayelsa State differed significantly, owing to the fact that Agricultural Development Programme of different LGAs pursue different objectives and with different levels of extension workers delivering agricultural extension services of their choices in their areas of operation.

Recommendations

Based on the findings the study recommended the following:

- i. Pliable agricultural credits should be made accessible to plantain farmers in Bayelsa State by the State government and the non - governmental organizations operating in the State to enable them acquire more land and expand their farms.
- ii. Extension Agents through their Agencies should be motivated to beef up their service delivery in order to satisfy the plantain farmers in the State.

- iii. Extension agents should encourage and strengthen plantain farmers' cooperatives for easy accessibility of credits and cross fertilization of ideas and resources, especially in Ogbia local government area of Bayelsa State.
- iv. Plantain farmers should be encouraged both in cash (financial grant) and other input supports, including adequate follow up to enable the adoption of the available extension services delivered to them.
- v. Wind resistant variety of plantain should be developed and plantain processing facilities be provided across the State by the State government.

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