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Determinants of agriculture graduates' involvement in farming activities in Bayelsa State

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Abstract

Agriculture is vital to the socio-economic development of Bayelsa State, Nigeria, yet fewer agricultural graduates are engaging in farming. This study examines the determinants of agriculture graduate involvement in farming activities in Bayelsa State. It identifies the socioeconomic characteristics of agriculture graduates, the types of agricultural enterprises they engage in, determinants of involvement, and the constraints faced by graduate farmers. A survey research design was used to collect data from 100 Agriculture graduates of Niger Delta University, Bayelsa State from an online alumni platform using well-structured questionnaire. Findings reveal that 37% of the sampled graduates studied Agricultural Economics and Extension, majority (70%) were male graduates, more than half (53%) of agriculture graduates were aged 20–30 years, majority (60%) of the graduates are single while 39% are married. Majority (55%) of the graduates engaged in agriculture, mainly poultry farming, cassava production, and vegetable farming. Their participation is driven by access to land, government support, and business aspirations, with poultry farming being the most preferred. Binary logistic regression results show that access to land, start-up capital, and income from other ventures significantly enhance participation, highlighting the role of financial resources and land ownership. Gender had a negative effect, suggesting women face more challenges. Age had a significant positive influence on participation. The study recommends low-interest loans, agribusiness training, and improved infrastructure to encourage young agriculture graduates to venture into farming, ensuring food security and economic growth in Bayelsa State.

Keywords: *Agriculture graduates, determinants, farming activities, Niger Delta University, participation, logistic regression*

Introduction

Agriculture historically provided employment for approximately 86% of Nigeria's population (World Bank, 2007). As of 1999, the agricultural sector employed more than 60% of the total labor force. An analysis of Nigeria's Gross Domestic Product (GDP) in 2006 showed that agriculture contributed around 42% to the GDP (Central Bank of Nigeria (CBN) 2006). However, the situation has changed in recent years. According to the World Bank (2022), employment in agriculture in Nigeria was reported at 37.99%. In 2023, agriculture contributed 21.05% to Nigeria's GDP, with crop production making the largest contribution. This percentage was lower compared to 23.69% in 2022, 24.17% in 2021, and 24.23% in 2020 (National Bureau of Statistics (NBS), 2023).

Agriculture graduates, equipped with specialized knowledge and skills acquired from academic institutions are crucial to advancing farming practices, improving

productivity, and promoting sustainable development in the sector. However, empirical evidence shows that many graduates are opting for non-agricultural career paths, contributing to a significant gap in the agricultural workforce (Egbule, 2016). Despite the perception that young people are leaving agriculture, their role in improving farming methods and achieving food security is undeniable. They represent a significant portion of future farmers, especially in rural areas, and have the potential to be progressive contributors to the agricultural sector (Sumberg & Okali, 2013).

Consequently, this has raised significant concerns regarding the involvement of agricultural graduates in agriculture. Many young people are hesitant to pursue careers in agriculture because they perceive it as a less dynamic profession with limited long-term prospects. Consequently, a significant proportion of small-scale farmers are elderly. As a result, there is a persistent challenge in finding educated and motivated young individuals willing to enter farming and replace aging farmers. Therefore, this study aims to examine the determinants of agricultural graduates' involvement in farming activities in Bayelsa State, Nigeria. The specific objectives of this study were to: describe the socioeconomic characteristics of agriculture graduates, determine the factors affecting their involvement in farming; and identify the constraints associated with their involvement in farming. The null hypothesis: there is no significant influence of socio-economic characteristics on agricultural graduates involvement in farming activities, was formulated to guide the study.

Methodology

Study Area

This research focused on graduates of agriculture, Niger Delta University, Bayelsa State. Niger Delta University (NDU) is located in Amassoma, a town in the Southern Ijaw Local Government Area of Bayelsa State, Nigeria. Established in 2000 by the Bayelsa State government, NDU serves as a centre for academic excellence and a hub for research and development in the Niger Delta region (NDU, 2020).

Amassoma, a town situated in Bayelsa State, Nigeria, is located at approximately 4.97309° N latitude and 6.108971° E longitude (Longitude-Latitude-Maps.com, 2024). Its intricate network of rivers, creeks, and swamps, typical of the Niger Delta region, geographically characterizes it. The area is largely made up of mangrove forests and freshwater swamps, contributing to its rich biodiversity and complex ecosystem.

The Faculty of Agriculture at Niger Delta University (NDU) is a pivotal part of the institution, dedicated to advancing agricultural education, research, and practice. Established to address the agricultural needs of the Niger Delta region and beyond, the faculty plays a crucial role in developing sustainable agricultural practices, enhancing food security, and promoting rural development.

The Faculty of Agriculture comprises several departments, each offering a variety of undergraduate and postgraduate programs (NDU, 2020). These include: Department of Agricultural Economics, Extension and Rural Development, Department of Crop and Soil Science, Department of Animal Science, Department of Fisheries and Aquatic Studies**:**

The study employed an online platform sampling technique, where participants were recruited from a pre-existing online platform. This method is characterized by self-selection, meaning participants voluntarily chose to take part in the study. Recruitment was conducted through a single online whassApp channel, ensuring that participants had easy access to the survey.

Method of Data Collection

Bayelsa State is made up of two institutions that award degrees in Agriculture, these institutions include, Niger Delta University, and University of Africa. Niger Delta University was purposively chosen over University of Africa because it's a relatively old university with so many Agriculture graduates and there is an existing alumni platform where respondents can be gotten from. Data collection was done with the aid of distributed survey questionnaires through online channels to dedicated agriculture alumni whatsApp platforms that has quite a number of agricultural graduates, specifically from Niger Delta University. These participants were invited to complete the surveys at their convenience, often via clickable links that direct them to the survey form. Hundred (100) graduates took part in the survey, and the study was based on these 100 respondents.

Objective (I) was analysed using simple percentages, frequency counts, mean, and frequency. Objective (II) was analysed with binary logistic regression model, and objective (III) was achieved using a 4-point Likert-type scale.

Logistic Regression model

The study used a logistic regression model with a dependent variable of a dichotomous nature. The agriculture graduates are classified as either participants or non-participants in agriculture based on whether they are engaged in any aspect of agriculture or not. The explanatory variables are a set of socio-economic variables. The logistic regression model can be explained implicitly by the equation:

$$Y_i = f(X_1, X_2 ..... X_n) \quad (1)$$

Y_i is the dependent variable representing the participation or non-participation of agriculture graduates in agriculture, and Xs are the various socio-economic factors that determine the participation of the agriculture graduates in agriculture. The logistic regression model employed in the study is specified explicitly as follows:

$$\text{Ln } Y = \text{Ln } (P/1\text{-}P) \quad (2)$$

$$\text{Ln } (P/1\text{-}P) = b_0 + b_1 X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + e \quad (3)$$

Where Y = participation in agriculture (Participation, 1; 0 otherwise)

P = probability of youth participation in farming

Ln = Natural logarithm function

b_0 = Constant

$b_1 – b_6$ = Logistic regression coefficients

$X_1 – X_5$ = independent variable

X_1 = Course studied (Fisheries =1; Crop science = 2; Animal science = 3; Agricultural economics = 4)

X_2 = Gender (male, 1; female 0)

X_3 = Age (years)

X_4 = Marital status (married=1; 0 otherwise)

X5 = Years after graduation (number)

X6 = Start- up capital (Yes =1, No =0)

X7 = Engagement in other ventures (Yes = 1, No = 0)

X8 = Income from other ventures (₦)

X9 = Access to land (Yes = 1, No = 0)

Results and Discussion

Socio-Economic Characteristics of the Respondents

The respondents in this study had diverse academic backgrounds, with participants from various fields of study. Gender distribution varied, representing both male and female respondents. The age range of participants was broad, ensuring representation across different age groups. Marital status included both married and unmarried individuals, reflecting different social dynamics. Household sizes also varied, indicating differences in family structure, responsibilities, and living arrangements.

Course Studied by Agriculture Graduates

The Table 3.1 shows that among the participants, Agricultural Economics/ Extension graduates had the highest representation, accounting for 37% of the total respondents. Followed by graduates of Animal Science with 25%, while Fisheries and Crop Science had an equal share of 19% each. This observation suggests that the graduates of Agricultural Economics and Extension are more active in the digital platform than graduates of agriculture sub-disciplines.

Table 3.1 Socioeconomic characteristics of Agriculture graduates

Variables	Frequency	Percentage (%)
Age		
20 – 30	53	**53.00**
31 – 40	42	**42.00**
41 – 50	5	**5.00**
Gender		
Male	57	**57.00**
Female	43	**43.00**
Marital Status		
Single	60	**60.00**
Married	39	**39.00**
Divorced	1	**1.00**
Widow/Widower	0	**0.00**
Course		
Fisheries	19	**19.00**
Crop science	19	**19.00**
Animal science	25	**25.00**
Agricultural Economics and Extension	37	**37.00**
Household size		
0 – 5	76	**76.00**
6 – 10	20	**20.00**
11 – 15	4	**4.00**
Years after graduation		
3 years or less	26	**26**
4- 6 years	43	**43**
7-9 years	23	**23**
10 years and above	8	**8**

Source: Field Survey, 2024

The gender distribution of respondents, as shown in Table 3.1 indicates that males constituted a larger proportion, accounting for 57% of the total sample, while females made up 43%. The observed higher proportion of male graduates involved in farming is consistent with Otuisi *et al.* (2023), who reported that agricultural work remains male-dominated due to the physically demanding nature of farming.

The study further reveals that about half (53%) of Agriculture graduates are 20-30 years old, this indicates that they are very young. This aligns with the study by Agumagu *et al.,* (2019) and Ehien *et al., (*2020) highlighting that recent graduates in Nigeria are typically within the 20–30 age range. These findings suggest that the educational system in Nigeria generally produces graduates in their early to mid-20s,

as most students enter higher education directly after secondary school.

Table 3.1 also shows the marital status of Agriculture graduates, showing that more than half (60%) are single, while 39% are married. Only 1% of the respondents are divorced, and none are widowed. This distribution aligns with findings from a study on undergraduate students' farm practice programmes in Nigeria, which reported that all respondents were single (Rasak *et al.*, 2019). The higher proportion of single respondents among recent agriculture graduates may indicate that many young Nigerians are prioritizing their education and career development over marriage.

In addition, majority (76%) live in households with 0–5 members, while 20% belong to households with 6–10 members. Only 4% of respondents have a household size between 11 and 15. This result was expected because a good number of the Agriculture graduates are likely to keep smaller families because of the economy.

Agriculture Graduates Involvement in Agricultural Activities

Table 3.2 shows that 55% of respondents are involved in agriculture, while 45% are not. This indicates a moderate level of agricultural participation among the graduates. This result is in consonance with Akpan, (2022) and Boye *et al.*, (2024) that a significant proportion of agriculture graduates in Nigeria are likely to engage in agricultural activities due to their educational background, leveraging their academic knowledge to enhance productivity and innovation in the sector and the increasing emphasis on agripreneurship as a viable career path.

Table 3.2 Distribution of Agriculture graduates according to involvement in agriculture

Involvement	Frequency	Percentage (%)
YES	55	**55.00**
NO	45	**45.00**

Source: Field Survey (2024)

Types of Agricultural Enterprise Engaged in by Agriculture Graduates

Table 3.3 presents the distribution of respondents based on their engagement in agricultural enterprises. Poultry production ranked highest, with 67% of respondents involved, followed by cassava production (64%) and vegetable production (58%). Fish rearing (56%) and maize production (38%) were also notable areas of involvement. Agricultural processing, marketing/ distribution of produce, and oil palm production had moderate participation, while enterprises such as piggery, supply of animal feed, and sheep/goat rearing had lower levels of engagement. Poultry farming, cassava production, and vegetable farming were among the most common choices. This aligns with Owigho *et al*. (2023), who reported that fishery had the highest youth participation (70.97%), followed by livestock (58.06%) and crop production (25.81%). Similarly, Igbolekwu *et al*. (2020) found that fish farming attracted the highest interest (34%), followed by poultry (29.5%) and crop farming (25.5%). These variations suggest that enterprise selection depends on regional and economic factors, with youth participation shifting based on available resources and market demands.

Table 3.3 Distribution of the respondents according to engaged agricultural enterprise

Agricultural enterprise	Frequency	Percentage (%)	Ranking
Cassava production	35	64.00	2nd
Maize production	21	38.00	5th
Agricultural processing	18	33.00	7th
Fish rearing	31	56.00	4th
Poultry production	37	67.00	1st
Piggery	11	20.00	11th
Sheep/goat rearing	6	11.00	12th
Oil palm production	15	27.00	8th
Vegetable production	32	58.00	3rd
Rabbitery/Grass cutter production	14	25.00	9th
Marketing/distribution of agricultural produce	19	34.00	6th
Supply of animal feed	12	21.00	10th
Total	55*	100*	

Source: Field Survey (2024)
*Indicates multiple responses

Agriculture Graduate Perception for non-involvement in Agricultural Activities

Table 3.4 presents the distribution of respondents based on their reasons for not engaging in farming activities. The major barriers identified include lack of capital (3.33), ineffective government policies (3.24), and poor infrastructure (3.15), which were widely acknowledged. Difficulty in acquiring land (3.04) and family influence (2.62) were also noted as significant concerns. Additionally, the state of the economy (2.61) and the rise of tech-related jobs (2.81) were seen as discouraging factors. However, respondents disagreed with the notion that farming is a low-status job (2.01) or that there are no market opportunities for farm produce in Bayelsa (2.21).

Barriers to agricultural participation identified in this study reflect challenges widely acknowledged in existing literature. The lack of capital, ineffective government policies, and poor infrastructure were the most significant deterrents, which are consistent with findings by Igbolekwu *et al*., (2020). Additionally, Thomas and Fadipe (2018), identified financial constraints as a primary barrier, followed by climate change, poor transportation networks, and inadequate storage facilities. Social perceptions also influenced youth participation, as Igbolekwu *et al*. (2020) found that 50.5% of respondents viewed farming as dirty work, while stressfulness (14.5%) and unprofitability (12%) were also cited as factors discouraging involvement.

Challenges encountered in engaging in farming

Table 3.5 presents the challenges respondents face in engaging in farming activities. The most significant concerns include failed government support programs (3.51), lack of capital for expansion (3.42), and limited funds for future challenges (3.41). Other major obstacles identified were substandard processing facilities (3.26), difficulty in employing skilled manpower (3.26), and restricted access to extension services (3.16). Additionally, respondents acknowledged that not seeing immediate profit (3.09) and the strenuous nature of farming (2.93) posed challenges. However, the marketing system (2.7) was not widely considered a major issue.

Challenges faced by those already engaged in farming highlight systemic issues affecting agricultural sustainability. Failed government support programs, limited

access to credit, and difficulty in hiring skilled labor were major concerns, aligning with previous research (Thomas & Fadipe, 2018). Additionally, the physically demanding nature of farming and the lack of immediate financial returns remains a pressing issue, reinforcing the need for interventions to improve youth retention in agriculture. Overall, the study supports existing literature in emphasizing that financial constraints, lack of resources, and social perceptions continue to hinder agricultural participation.

Table 3.4 Agriculture Graduates Perception for not Engaging in Farming Activities

S/N	Questionnaire items	SA	A	D	SD	$\bar{x}$	St-dv	Decision
1	Farming is a boring low status business.	1 1	9	50	30	2.01	1.69	Disagree
2	Acquiring land to start farming operation is difficult	33	42	21	4	3.04	2.63	Agree
3	There's no capital to get the required materials to start.	47	42	8	3	3.33	2.88	Agree
4	There is no market opportunity for farm produce in Bayelsa	8	28	41	23	2.21	1.86	Disagree
5	Government policies or support programs for farmers are not effective.	45	39	11	5	3.24	2.82	Agree
6	The economy of the state does not encourage farming activities.	20	33	35	12	2.61	2.25	Agree
7	Poor infrastructure can hinder pursuit for farming activities.	36	48	11	5	3.15	2.72	Agree
8	Family can influence your choice to farm for a living.	23	30	33	14	2.62	2.28	Agree
9	The advent of tech-related job makes farming unappealing.	24	41	27	8	2.81	2.42	Agree

Strongly Agree (SA, 4), Agree (A, 3), Disagree (D, 2), Strongly Disagree (SD, 1) cut-off mean =2.5

Table 3.5 Agriculture Graduates Perception of Challenges Encountered in Engaging in Farming

S/N	Questionnaire items	VSC	SC	LC	VLC	$\bar{x}$	St-dv	Decision
1	There's limited funds for future challenges.	57	31	8	4	3.41	2.98	**SC**
2	There's not much room for improvement.	36	28	28	8	2.92	2.56	**SC**
3	The processing facilities are not up to standard.	46	38	12	4	3.26	2.84	**SC**
4	The marketing system is a challenge.	18	45	26	11	2.7	2.32	**LC**
5	Starting and not seeing profit immediately.	29	54	14	3	3.09	2.65	**SC**
6	Limited access to extension service.	35	50	11	4	3.16	2.72	**SC**
7	Failed promises of the government for support programmes.	62	30	5	3	3.51	3.06	**SC**
8	Farming is a strenuous activity.	29	43	20	8	2.93	2.54	**SC**
9	Employing willing and capable manpower.	40	48	10	2	3.26	2.81	**SC**
10	No capital to expand	56	34	6	4	3.42	2.98	**SC**

Very Strong Constraint (VSC, 4), Strong Constraint (SC, 3), Less Constraint (LC, 2) Very Less Constraint (VLS, 1) Cut-off mean = 2.5

Determinants of Agriculture Graduates' Involvement in Agriculture

The regression results in Table 3.6 provide valuable insights into the factors influencing agriculture graduates' involvement in farming. The R^2 was 0.69 indicating that 69% of the changes in the dependent variables can be explained by changes in the independent variables. Gender had a Z value of 2.466, which is statistically significant at the 5% level. Odds for gender indicates that agriculture graduate males are likely to get involved in farming activities rather than their female counterparts who have a lower odd of 0.678 as compared to (1/0.678) for males. Age also was statistically significant at 5 %, the odds ratio 0.088 shows that younger graduates are more likely to participate in farming after graduation than older graduates. This implies that the older the graduate the less their interest in farming activities. Probably, older graduates may already be involved in one venture or the other before coming to school and may want to continue with that rather than starting a new venture which is agriculture related because of the risk involved and the difficulties in starting afresh. This may not be the case for younger graduates who are willing to try something new. However, this results contradicts Jimmy et al., (2024) submission that older youths have a greater odd of involvement in cassava farming than younger youth in Khana local government area of River State, Nigeria.

In addition, access to land greatly increases the likelihood of farming, with a Z value of 2.530, which is statistically significant at 5%. This implies that having access to land plays a significant role in graduate farmers' choice to be involved in farming activities in the study area, this result agrees with that of Jimmy et al., (2024) that youth access to land plays a crucial role in their involvement in cassava farming. Startup capital also plays a crucial role, as graduates with access to startup funds are significantly more likely to engage in farming, with a Z value of 2.890, which is statistically significant at the 1% level. Graduates engaged in other business ventures are less likely to farm, as indicated by a Z value of 2.002, which is significant at the 5% level. However, those who earn higher income from these other ventures tend to invest more in farming, with a Z value of 2.766, which is significant at the 1% level.

Furthermore, the result shows that number of years after graduation was positive and significant at 5%, with an odd ratio of 2.333. This implies that graduates who have left school for a relatively longer time have more likelihood of being involved in agriculture than fresh graduates. This may be because of the shortage of job opportunities in the State, Graduates who may have waited for a long time for white collar opportunities without one may decide to go into their profession by training in a way of survival.

The findings show that younger graduates, males, those with access to land, and those with startup capital are more likely to engage in farming, while involvement in other businesses reduces farming participation unless the income from those businesses is high. They also align with existing research highlighting the impact of gender-based constraints on access to agricultural resources. For instance, Salau and Rahman (2007), observed that women had less access to farm resources (37.5%) and lower involvement in farm decisions (43.8%) in Nasarawa State, Nigeria. Similarly, Njoku *et al.,* (2025) identified constraints such as lack of collateral, land tenure systems, inadequate finance, and discriminatory social norms hindering women's access to agricultural resources in Ebonyi State, Nigeria.

Table 3.6 Determinants of Agriculture graduates' involvement in Agriculture

Variables	Odd ratios	Robust standard error	Z
Gender	0.678	0.250	2.466 *
Age	0.881	0.044	1.994*
Marital status	0.023	0.026	0.892
Course of study	0.033	0.019	1.766
Access to Land	2.038	0.805	2.530*
Startup capitals	1.162	0.402	2.890**
Engagement in other ventures	0.562	0.281	2.002*
Income from other ventures	2.186	0.790	2.766**
Years after schooling	2.333	0.0415	2.083*
Wald Chi 2 (8)	28.3		
Pseudo R^2	0.687		
Prob> Ch2	0.013*		
Constant	2.019*		

*Significant at 5% and ** significant at 1% probability level

Conclusion

The study shows that while many agriculture graduates engage in farming, financial constraints and limited support hinder their participation. Poultry and cassava farming are the most preferred due to their profitability, while livestock farming attracts less interest. To boost graduate involvement, better financial support and targeted programs are needed. Encouraging agribusiness through credit schemes and training will help graduates contribute more to food security and economic growth in Bayelsa State.

Recommendations

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

- The government and financial institutions should provide low-interest loans and grants to agriculture graduates to encourage their active participation in farming.
- Government and private organizations should establish support programs specifically designed to attract and retain young graduates in agriculture.
- Policies should be implemented to improve access to markets, ensuring that graduates can sell their produce at competitive prices.
- Investments in rural infrastructure, such as roads and irrigation systems, will enhance productivity and make agriculture a more attractive career option.

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