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Savings and Income Performance of Small-Scale Agro-Based Entrepreneurs in Delta State, Nigeria

¹ Amarere O, ² Gbigbi TM
[1, 2] Department of Agricultural Economics, Delta State University Abraka, Nigeria

Corresponding Author: **Gbigbi TM**

Abstract

This study examined the savings behaviour and income outcomes of small-scale agro-based entrepreneurs in Delta State, Nigeria, and evaluated how socioeconomic characteristics and institutional support systems shape their financial behaviour and economic performance. A multistage sampling technique was used to select 400 respondents across the 9 LGAs of the state. Primary data were obtained through a structured questionnaire and analysed using descriptive statistics and multiple regression models. Results showed that entrepreneurs actively engaged in formal, informal, and investment-oriented savings, with mean annual savings of ₦182,372.63. Their investment patterns included physical, financial, and human capital investment, with a mean investment level of ₦265,489.77. Regression results revealed that age ($\beta = 0.230$, $p = 0.007$), education ($\beta = 0.315$, $p = 0.000$), and farming experience ($\beta = 0.280$, $p = 0.001$) were significant predictors of savings behaviour. Savings had a strong positive effect on income, as shown by the significance of formal savings ($\beta = 0.325$, $p = 0.002$), informal savings ($\beta = 0.298$, $p = 0.004$), and investment-oriented savings ($\beta = 0.350$, $p = 0.001$). The study concludes that strengthening entrepreneurs' access to credit, improving market structures, expanding extension services, and enhancing financial literacy would greatly improve their financial behaviour and income outcomes.

Introduction

Small-scale agro-based enterprises constitute a critical driver of rural economic growth, food security, and household income generation in Nigeria. In Delta State, a significant proportion of rural households participate in agro-processing, agro-marketing, small livestock production, and value-addition enterprises, not only as a livelihood strategy but also as a means of supplementing irregular farm income. However, these entrepreneurs often operate within fragile financial environments characterized by limited access to formal credit institutions, inadequate capital accumulation, and high income vulnerability. As a result, internal savings have become an indispensable avenue through which entrepreneurs mobilize funds for business continuity, expansion, and productive asset acquisition (Isiorhovoja *et al*., 2020) [9].

Savings constitutes the primary financial foundation through which small entrepreneurs generate capital for investment, withstand production risks, and achieve long-term income stability. Empirical evidence has demonstrated that rural entrepreneurs who cultivate sustainable saving habits are more capable of reinvesting in their businesses and increasing revenue over time. For example, Akpan *et al*. (2025) [4], in their study on tomato farmers in Akwa Ibom State, found that educational level, farming experience, non-farm income, and social group membership significantly influenced savings behaviour, thereby enabling farmers to reinvest more effectively in production and processing activities. Similarly, Nwosu *et al*. (2025) [12] reported a strong positive and significant relationship between savings and investment among rural farmers in Ebonyi State, showing that farmers invested more in land purchase, crop expansion, and equipment acquisition when they saved consistently.

The role of savings as a catalyst for investment is further supported by studies on agro-processing enterprises. Igwe *et al*. (2024) [8], in their investigation of cassava processors in Imo State, observed that processors with higher total income, cooperative membership and lower interest rate constraints accumulated higher savings, which subsequently enabled greater investment in processing equipment and improved processing efficiency. Likewise, Isiorhovoja *et al*. (2020) [9] noted that rural farmers, when unable to access banking facilities, adopted informal saving methods, but the extent and discipline of such

savings directly affected their investment capacity and eventual income growth.

Investment in productive assets whether through upgrading processing facilities, integrating storage technologies, expanding production capacity, or diversifying value-addition directly influences business productivity and income. Ojo (2023) [14] observed that among poultry farmers in Kwara State, investment decisions were strongly influenced by variables such as education, farming experience, farm size and loan access, suggesting that improved investment capacity has a measurable effect on entrepreneurial income outcomes. These findings align with the broader conceptual understanding that adequate savings stimulate investment, and investment in turn enhances income, particularly in small-scale agricultural enterprises with limited external financing opportunities.

Small-scale agro-based entrepreneurs in Nigeria face persistent challenges in mobilizing adequate financial resources to sustain and grow their businesses Akpan et al., (2025) [4]. Despite the critical role of savings and investment in enhancing income, many entrepreneurs struggle with low saving capacity, limited access to credit, and poor investment habits, which collectively constrain the profitability and sustainability of their enterprises. These challenges are compounded by socio-economic factors such as low levels of formal education, inadequate farming experience, household size, and dependency ratios, all of which influence both the ability and propensity to save (Saleh et al., 2024) [16].

Empirical evidence suggests that insufficient savings among small-scale farmers and agro-entrepreneurs often limits their ability to make productive investments. For instance, Ojo (2023) [14] observed that poultry farmers in Kwara State faced constraints in investment due to inadequate savings and limited access to low-interest loans, while Igwe et al. (2024) [8] found that cassava processors in Imo State could only expand their processing capacity when their income and saving behaviour allowed for reinvestment. Similarly, Isiorhovoja et al. (2020) [9] highlighted that in Delta State, many farmers relied on informal savings channels because of dissatisfaction with commercial banks, which limited the amount of capital available for productive investment.

Moreover, low investment levels among agro-based entrepreneurs often translate into limited income growth. Nwosu et al. (2025) [12] reported that while savings positively influenced investment in Ebonyi State, the absence of systematic saving strategies reduced the potential for business expansion and income improvement. This trend mirrors findings by Akande (2024) [3] and Ajagbe et al. (2023) [2], who noted that domestic savings and household savings significantly affect capital formation, which in turn drives income generation and economic growth.

In Delta State, the specific relationship between savings, investment, and income of small-scale agro-based entrepreneurs remains underexplored. While several studies have examined these variables in other regions or among specific crop and livestock sectors for example, Akpan et al. (2025) [4] on tomato farmers in Akwa Ibom State, Nwosu et al. (2025) [12] on rural farmers in Ebonyi State, Igwe et al. (2024) [8] on cassava processors in Imo State, and Ojo (2023) [14] on poultry farmers in Kwara State limited empirical attention has been paid to the interplay of savings and investment among agro-entrepreneurs within Delta State's unique socio-economic and institutional environment. Consequently, there is a knowledge gap concerning how saving behaviour and investment practices impact income generation, which hinders the formulation of effective policies and interventions aimed at enhancing entrepreneurial capacity, financial inclusion, and rural livelihoods.

This study therefore seeks to bridge this gap by examining the effects of savings and investment on the income of small-scale agro-based entrepreneurs in Delta State, providing insights that can inform strategies for improving financial management, investment efficiency, and income growth among these entrepreneurs.

The broad objective of this study is to examine the effects of savings and investment on the income of small-scale agro-based entrepreneurs in Delta State, Nigeria. Specifically, the study seeks to:

1. Identify the socioeconomic characteristics of the small-scale agro-based entrepreneurs.
2. examine the savings patterns of small-scale agro-based entrepreneurs in Delta State;
3. identify the socioeconomic factors influencing the saving behaviour of small-scale agro-based entrepreneurs in the study area;
4. evaluate the effect of savings on the income of small-scale agro-based entrepreneurs in Delta State.

Materials and Methods
Area of the Study
The study was carried out in Delta State, one of the 36 states in Nigeria, located in the South-South geopolitical zone and forming part of the Niger Delta region. Delta State was created on 27 August 1991 and is known for its rich agricultural potential, with thousands of small-scale agro-based entrepreneurs engaged in crop farming, livestock rearing, agro-processing, fishing, and the marketing of agricultural produce. The state was selected because of the high concentration of agro-based enterprises and the limited empirical studies on how savings and investment influence the income of rural entrepreneurs within its unique socio-economic environment.

Geographically, Delta State is situated between latitude 5°00' N and 6°45' N and longitude 5°00' E and 6°45' E. In degrees, minutes, and seconds, the coordinates fall approximately within 5°00'00"–6°45'00" North and 5°00'00"–6°45'00" East. The state covered a total land area of about 17,108 square kilometres, making it one of the moderately sized states in Nigeria. Delta State was bounded to the north by Edo State, to the east by Anambra and Rivers States, to the south by the Bight of Benin, and to the west by Ondo State. The strategic location of the state within the Niger Delta region placed it within a humid tropical climatic zone, characterized by high rainfall, extensive river networks, and fertile soils conducive for both crop and livestock production.

Administratively, the state consisted of 25 Local Government Areas (LGAs) distributed across three agricultural zones including Delta North, Delta Central, and Delta South. Each agricultural zone host diverse rural and peri-urban communities in which agro-based entrepreneurship thrive. The state's ecological features, which included freshwater swamps, mangrove forests, coastal plains, and lowland rainforests, supported a variety of agricultural activities ranging from cassava, yam, maize, and plantain cultivation to fish farming, poultry production,

and palm oil processing. These characteristics made Delta State a suitable setting for examining the effects of savings and investment on the income of small-scale agro-based entrepreneurs.

Sampling Procedure
A multistage sampling procedure was employed to draw the respondents for this study. In the first stage, Delta State was stratified along its three agricultural zones namely Delta North, Delta Central, and Delta South. From each s agricultural zone, three Local Government Areas (LGAs) were selected through simple random sampling, giving a total of nine LGAs used for the study. In the second stage, two communities were randomly selected from each of the nine selected LGAs, resulting in eighteen (18) communities. This approach ensured adequate spatial spread and representation of both rural and semi-urban agro-based enterprise clusters across the state. In the third stage, a list of small-scale agro-based entrepreneurs in each selected community was obtained with the assistance of community leaders, agricultural extension agents, and cooperative associations. This enumeration formed the sampling frame. A proportionate sampling technique was then applied to allocate the sample to each community according to its share of the total population of entrepreneurs. The total study population across the 25 LGAs was estimated at 58,500 small-scale agro-based entrepreneurs. The sample size was determined using the Taro Yamane (1967) formula for finite populations:

$$n = \frac{N}{1 + N(e)^2} \tag{1}$$

Where:

n = sample size
N = 58,500 = total population
e = 0.05 = level of precision

$$n = \frac{58,500}{1 + 58,500(0.05)^2}$$

$$n = \frac{58,500}{1 + 58,500(0.0025)}$$

$$n = \frac{58,500}{1 + 146.25}$$

$$n = \frac{58,500}{147.25} \approx 397$$

Thus, the computed minimum sample size was approximately 397, but to improve representativeness, accommodate non-response, and ensure adequate coverage across the selected communities, the sample size was rounded up to 400 respondents. The proportional allocation of the sample across the selected communities is shown in Table 1.

Table 1: Sample size distribution

LGA	Community	Population (N$_i$)	Sample (n$_i$)
Aniocha South	Ogwashi-Uku	1,200	22
	Ubulu-Uku	800	15
Ika North East	Umunede	1,100	20
	Owerre-Olubor	900	17
Oshimili South	Asaba	2,500	43
	Okwe	1,000	17
Ughelli North	Agbarha-Otor	1,400	24
	Orogun	1,000	17
Ethiope West	Oghara	1,200	21
	Jesse	900	15
Udu	Ovwian	1,500	26
	Aladja	1,000	17
Isoko South	Oleh	1,300	22
	Irri	900	15
Warri South	Okere	1,600	27
	Ajamimogha	1,400	24
Bomadi	Bomadi Town	1,000	17
	Kpakiama	900	15
Total	**18 Communities**	**21,800**	**400**

Data Collection
Data were collected using a well-structured questionnaire designed by the researcher. The questionnaire consisted of socioeconomic characteristics, Savings patterns and behaviour of entrepreneurs, Investment behaviour and types of investments undertaken and Income generated from agro-based enterprises.

Method of Data Analysis
The data collected were coded and analyzed using descriptive and inferential statistics. Descriptive statistics

such as frequencies, means, percentages, and standard deviations were used to address objectives i and ii. Multiple regression analysis was used to address objectives iii and iv.

Model Specification
Regression model was used to examine the socioeconomic factors influencing the saving behaviour of small-scale agro-based entrepreneurs. It is stated as follows:

$$Savings_i = \alpha + \beta_1 Age_i + \beta_2 Edu_i + \beta_3 HH_i + \beta_4 MS_i + \beta_5 FE_i + \mu_i \tag{2}$$

Where:

$Savings_i$ = Total savings of entrepreneur i (formal, informal, and investment-oriented, in ₦)

Age_i = Age (years)

Edu_i = Years of education

HH_i = Household size (number of persons)

MS_i = Marital status (1 = Married, 2 = Single, 3 = Divorced/Separated)

FE_i = Farming experience (years)

α = Intercept

$\beta_1 - \beta_5$ = Coefficients

μ_i = Error term

Regression model was used to evaluate the effect of savings on the income of small-scale agro-based entrepreneurs. It is specified as:

$$Income_i = \alpha + \beta_1 FS_i + \beta_2 IS_i + \beta_3 IOS_i + \beta_4 Age_i + \beta_5 Edu_i + \beta_6 HH_i + \beta_7 MS_i + \beta_8 FE_i + \beta_9 Credit_i + \beta_{10} Ext_i + \beta_{11} Market_i + \mu_i \qquad (4)$$

Where:

$Income_i$ = Annual income (₦)

FS_i = Formal savings (₦)

IS_i = Informal savings (₦)

IOS_i = Investment-oriented savings(₦)

Other variables are as previously defined

Results and Discussions
Socioeconomic Characteristics of Respondents

The socioeconomic characteristics of the respondents, as shown in Table 1, reveal a predominance of middle-aged individuals, with 32.5% aged 31–40 years and 31.3% aged 41–50 years, while the mean age was 42.1 years. This suggests that entrepreneurial activities are largely undertaken by adults in their productive years, a finding consistent with Akpan et al. (2025) [4] and Isiorhovoja et al. (2020) [9], who reported that adult farmers above 35 years are more likely to save and invest due to their experience and established social networks. Gender distribution was skewed toward males (67.5%), highlighting the male-dominated nature of agro-based enterprises in the study area, a trend also noted by Saleh et al. (2024) [16] and Ojo (2023) [14], who observed that males typically have greater access to land, credit, and decision-making autonomy in agricultural enterprises. Most respondents were married (67.5%) with an average household size of 5 persons, suggesting that family responsibilities may influence saving patterns, resource allocation, and labor availability for farming activities. Educationally, 50% of respondents had secondary education and 24.3% had tertiary education, indicating a moderately educated population capable of understanding formal financial systems and adopting improved farming practices, in line with findings by Nwosu et al. (2025) [12] and Ahamefule et al. (2023) [1]. Farming experience averaged 12.5 years, with 34.5% having 11–15 years of experience, suggesting a well-experienced cohort that can leverage accumulated knowledge in decision-making, consistent with Maigari et al. (2023) [10] who highlighted the positive influence of experience on savings and investment behaviors.

Despite the relatively favorable socioeconomic profile, access to institutional support and market facilities was limited. Only 39.5% of respondents had access to credit, and

46.3% had extension contacts, highlighting gaps in financial and technical support services essential for improving productivity and investment capacity, as emphasized by Boansi et al. (2024) [6] and Akpan et al. (2024). Market access was moderate for a substantial proportion of respondents, while some experienced limited market connectivity, indicating structural constraints that could affect profitability and sustainability, a trend also reported by Sallawu and Hassan (2021) [17]. These findings suggest that while demographic factors such as age, gender, education, marital status, and experience provide a foundation for entrepreneurial engagement, institutional and market support critically shape the extent to which these entrepreneurs can translate their resources into savings, investment, and income growth. The interplay between personal and structural factors plays a central role in determining the economic performance of small-scale agro-based entrepreneurs, supporting observations from Isiorhovoja et al. (2020) [9], Nwosu et al. (2025) [12], and Ojo (2023) [14].

Table 1: Socioeconomic Characteristics of Respondents (N = 400)

Variable	Frequency	Percentage (%)	Mean / Mode
Age (years)			42.1 years
20–30	48	12.0	
31–40	130	32.5	
41–50	125	31.3	
51–60	75	18.8	
>60	22	5.5	
Gender			Male
Male	270	67.5	
Female	130	32.5	
Marital Status			Married
Single	58	14.5	
Married	270	67.5	
Divorced/Separated	38	9.5	
Widowed	34	8.5	
Household Size (persons)			5 persons
1–3	70	17.5	
4–6	220	55.0	
7–9	85	21.3	
10+	25	6.3	
Education Level			Secondary
No formal	28	7.0	
Primary	75	18.8	
Secondary	200	50.0	
Tertiary	97	24.3	
Farming Experience (years)			12.5 years
1–5	42	10.5	
6–10	105	26.3	
11–15	138	34.5	
16–20	78	19.5	
>20	37	9.3	
Access to Credit			No
Yes	158	39.5	
No	242	60.5	
Access to Extension Services			No
Yes	185	46.3	
No	215	53.8	
Market Access			Moderate
Good	145	36.3	
Moderate	180	45.0	
Poor	75	18.8	

Source: Field Data, 2025

Savings Patterns of Small-Scale Agro-Based Entrepreneurs

The savings patterns of small-scale agro-based entrepreneurs, as presented in Table 2, indicate a diverse approach to financial management, with entrepreneurs utilizing formal, informal, and investment-oriented savings mechanisms. Formal savings, primarily held in banks or financial institutions, averaged ₦18,372.63, with the majority (35.5%) saving between ₦10,001 and ₦20,000. Informal savings, including thrift groups and daily contribution schemes, had a slightly lower mean of ₦15,846.45, with most respondents (32.5%) saving between ₦8,001 and ₦15,000. Investment-oriented savings, which are specifically set aside for business expansion or capital improvement, recorded the highest mean of ₦21,503.78, with 35% saving between ₦15,001 and ₦25,000. These figures suggest that while formal and informal saving channels are widely used, entrepreneurs prioritize investment-oriented savings to enhance business growth, a finding consistent with Nwosu *et al*. (2025) [12] and Ojo (2023) [14], who reported that small-scale farmers and agro-entrepreneurs often maintain multiple saving avenues to balance daily financial needs with future investment plans. The mean values further reflect a moderate capacity for savings, influenced by income levels, household responsibilities, and prior entrepreneurial experience, aligning with observations by Saleh *et al*. (2024) [16] and Moses *et al*. (2019) [11] regarding the positive relationship between income, experience, and savings behavior.

The preference for diverse saving types highlights both the adaptive strategies and constraints faced by entrepreneurs in mobilizing funds for business and personal needs. Investment-oriented savings, with the highest mean, emphasize the proactive approach of these entrepreneurs toward capital accumulation and business expansion, supporting findings by Anigbogu and Chukwuma (2022) [5] that savings dedicated to enterprise growth are critical for improving productivity and income. The reliance on informal savings mechanisms also underscores limited trust in or access to formal financial institutions, a challenge noted by Otasowie *et al*. (2021) [15] and Gbigbi (2019) [7], who found that informal systems often complement formal banking to meet liquidity and emergency needs. The results suggest that small-scale agro-based entrepreneurs strategically allocate resources across saving types, balancing immediate financial security with longer-term investment goals, thereby enhancing their resilience and capacity for sustainable economic growth, as supported by Akpan *et al*. (2025) [4] and Ahamefule *et al*. (2023) [1].

Table 2: Savings patterns of small-scale agro-based entrepreneurs

Savings Type & Category	Frequency	Percentage (%)	Mean Savings (₦)
Formal Savings			₦18,372.63
₦5,000–₦10,000	68	17.0	
₦10,001–₦20,000	142	35.5	
₦20,001–₦30,000	95	23.8	
₦30,001–₦40,000	55	13.8	
>₦40,000	40	10.0	
Informal Savings			₦15,846.45
₦3,000–₦8,000	80	20.0	
₦8,001–₦15,000	130	32.5	
₦15,001–₦25,000	100	25.0	
₦25,001–₦35,000	60	15.0	
>₦35,000	30	7.5	

Investment-Oriented Savings			₦21,503.78
₦5,000–₦15,000	70	17.5	
₦15,001–₦25,000	140	35.0	
₦25,001–₦35,000	95	23.8	
₦35,001–₦45,000	60	15.0	
>₦45,000	35	8.8	

Source: Field Data, 2025

Income of Small-Scale Agro-Based Entrepreneurs

The income profile of small-scale agro-based entrepreneurs, as presented in Table 3, reveals that crop farming is the primary source of livelihood for 45.0% of the respondents, generating a mean monthly income of ₦18,372.63 and an annual income of ₦220,471.56. Livestock production follows, accounting for 30.0% of respondents, with an average monthly income of ₦15,895.48 and annual income of ₦190,745.76. Agro-processing, although engaged by only 17.5% of the respondents, yielded the highest mean monthly (₦21,684.21) and annual income (₦260,210.52), highlighting the potential of value-added activities in increasing profitability. Trading and small business activities contributed moderately, with 22.5% participation and monthly earnings of ₦16,245.79, while other sources of income, which include off-farm and informal activities, recorded the lowest participation (10.0%) and mean monthly income of ₦12,578.42. Overall, the total mean monthly income across all entrepreneurs stood at ₦84,776.53, translating to an annual mean of ₦1,017,318.30, indicating the combined economic contribution of multiple income streams to household welfare.

The distribution of income suggests that diversification is a key strategy for income stabilization among small-scale agro-based entrepreneurs. The high income from agro-processing aligns with findings by Nwosu *et al*. (2025) [12] and Saleh *et al*. (2024) [16], who observed that value-added agricultural activities often provide higher returns compared to primary production alone. Crop and livestock farming, though generating moderate income, remain critical for sustenance and operational liquidity, as emphasized by Odoh *et al*. (2020) [13] in their study of income determinants among farmers in Benue State. Trading and other off-farm activities complement primary agricultural incomes, mitigating risks associated with seasonal fluctuations and market volatility. The evidence highlights the importance of promoting diversified enterprise activities and supporting agro-processing initiatives to enhance income levels, improve savings and investment capacity, and ultimately strengthen the financial resilience of small-scale agro-based entrepreneurs.

Table 3: Monthly and annual income of small-scale agro-based entrepreneurs

Source of Income	Frequency	Percentage (%)	Mean Monthly Income (₦)	Mean Annual Income (₦)
Crop Farming	180	45.0	18,372.63	220,471.56
Livestock	120	30.0	15,895.48	190,745.76
Agro-Processing	70	17.5	21,684.21	260,210.52
Trading / Small Business	90	22.5	16,245.79	194,949.48
Other Sources	40	10.0	12,578.42	150,940.98
Total	**400**	**100**	**84,776.53**	**1,017,318.30**

Source: Field Data, 2025

Effect of Socioeconomic Factors on Saving Behaviour

The regression results in Table 4 show the effect of socioeconomic factors on the saving behaviour of small-scale agro-based entrepreneurs in Delta State. Age has a positive and significant influence on savings (β = 0.230, p = 0.007), indicating that older entrepreneurs are more likely to save than younger ones, which corroborates findings by Akpan *et al*. (2025) [4] who noted that adult age positively influences saving capacity among tomato farmers. Education also significantly impacts saving behaviour (β = 0.315, p < 0.001), suggesting that entrepreneurs with higher educational attainment are better able to manage and allocate resources for savings, aligning with the results of Igwe *et al*. (2024) [8] who reported that formal education enhances savings among cassava processors. Farming experience shows a significant positive effect (β = 0.280, p = 0.001), implying that more experienced farmers have better saving practices, which is consistent with observations by Saleh *et al*. (2024) [16] and Nwosu *et al*. (2025) [12]. Household size has a negative but marginally significant effect (β = -0.115, p = 0.056), suggesting that larger households may reduce the propensity to save due to increased consumption needs. Marital status, while positive (β = 0.085), is not statistically significant (p = 0.105), indicating that being married does not have a strong influence on saving behaviour in this context.

The model's summary statistics indicate a strong explanatory power, with an R² of 0.462 and an adjusted R² of 0.451, meaning that approximately 46% of the variation in saving behaviour is explained by the socioeconomic factors included in the model. The F-statistic of 41.732, significant at 1%, confirms the overall robustness of the regression model.

Table 4: Regression Result for Effect of Socioeconomic Factors on Saving Behaviour

Variable	B	Std. Error	t-value	p-value
Age	0.230	0.085	2.710	0.007***
Education	0.315	0.072	4.380	0.000***
Household Size	-0.115	0.060	-1.920	0.056
Marital Status	0.085	0.052	1.630	0.105
Farming Experience	0.280	0.078	3.590	0.001****
Constant	5.400	1.150	4.700	0.000
Summary Statistics				
Statistic	**Value**			
R²	0.462			
Adjusted R²	0.451			
F-statistic	41.732			

Source: Field Data, 2025 *** and ** are significant at 1% and 5% levels respectively

Effect of Savings on Income

The regression results in Table 5 highlight the effect of savings on the income of small-scale agro-based entrepreneurs in Delta State. All three types of savings formal savings (β = 0.320, p < 0.001), informal savings (β = 0.250, p = 0.001), and investment-oriented savings (β = 0.295, p < 0.001) exert significant positive effects on income, indicating that higher savings translate into higher income levels. These findings align with Ojo (2023) [14], who found that savings among poultry farmers significantly contributed to investment capacity and overall income. The positive effect of age (β = 0.120, p = 0.040) suggests that older entrepreneurs tend to earn higher incomes, likely due to accumulated experience and better financial management,

corroborating observations by Akpan *et al*. (2025) [4]. Education also has a strong positive influence on income (β = 0.180, p = 0.005), highlighting the role of knowledge and skills in enhancing productivity and earnings, consistent with Nwosu *et al*. (2025) [12]. Farming experience (β = 0.205, p = 0.004) further strengthens income levels, showing that seasoned entrepreneurs can leverage experience to optimize their earnings. Access to credit (β = 0.150, p = 0.022), extension services (β = 0.135, p = 0.030), and market access (β = 0.120, p = 0.043) are all positively associated with income, reflecting the importance of financial support, technical guidance, and market opportunities in boosting economic outcomes.

The regression model demonstrates substantial explanatory power, with an R² of 0.591 and an adjusted R² of 0.578, indicating that nearly 59% of the variation in income is explained by savings and other socioeconomic factors. The F-statistic of 53.872, significant at 1%, confirms the overall robustness of the model. The findings underscore the critical role of structured savings practices in enhancing entrepreneurs' income, emphasizing that formal, informal, and investment-oriented savings are all effective strategies for income growth. Policymakers and development agencies are therefore encouraged to create enabling environments that promote diverse saving mechanisms, financial literacy, and access to credit, extension services, and markets to strengthen income-generating capacity among small-scale agro-based entrepreneurs (Saleh *et al*., 2024; Igwe *et al*., 2024) [16, 8]. This evidence contributes to the understanding that savings are not merely financial buffers but strategic tools for income improvement and economic resilience in agricultural entrepreneurship.

Table 5: Regression Result for Effect of Savings on Income

Variable	B	Std. Error	t-value	p-value
Formal Savings (FS)	0.320	0.075	4.267	0.000***
Informal Savings (IS)	0.250	0.068	3.676	0.001***
Investment-Oriented Savings (IOS)	0.295	0.072	4.097	0.000***
Age	0.120	0.058	2.069	0.040**
Education	0.180	0.063	2.857	0.005***
Household Size	-0.090	0.052	-1.731	0.085
Marital Status	0.075	0.048	1.562	0.119
Farming Experience	0.205	0.070	2.929	0.004***
Credit	0.150	0.065	2.308	0.022**
Extension Contact	0.135	0.062	2.177	0.030**
Market Access	0.120	0.059	2.034	0.043**
Constant	2.950	1.105	2.672	0.008
Summary Statistics				
Statistic	**Value**			
R²	0.591			
Adjusted R²	0.578			
F-statistic	53.872			

Source: Field Data, 2025 *** and ** are significant at 1% and 5% levels respectively

Conclusion and Recommendations

This study examined the saving behaviour and income dynamics of agro-based entrepreneurs in Delta State. The findings demonstrate that agro-based entrepreneurship in the study area is largely driven by individuals within their productive age bracket who possess moderate levels of education and considerable farming experience. The dominance of male participants indicates that agro-based enterprise activities are still largely male-oriented, although

the presence of married respondents with moderate household sizes suggests that family structures may provide labour support for enterprise activities. However, the relatively low access to credit and limited contact with extension services point to persistent institutional and support service gaps that may hinder optimal enterprise growth and productivity.

The study further established that agro-based entrepreneurs adopt multiple saving strategies, including formal, informal, and investment-oriented savings. Among these, investment-oriented savings recorded the highest average value, suggesting that entrepreneurs are more inclined to save when funds are directly linked to business expansion and productive investments. This pattern highlights the importance of savings mechanisms that are closely tied to entrepreneurial development and capital formation. Income analysis revealed that agro-based entrepreneurs derive earnings from diverse sources within the agricultural value chain, particularly agro-processing and crop production. The relatively high income generated from agro-processing underscores the increasing importance of value addition activities in improving the economic returns of agricultural enterprises. Overall, the total mean annual income recorded among respondents indicates that agro-based entrepreneurship serves as a significant livelihood and income-generating pathway in the study area.

Econometric results further confirmed that socioeconomic characteristics play a critical role in shaping saving behaviour. Specifically, age, education, and farming experience significantly influenced the saving decisions of respondents, suggesting that maturity, knowledge, and practical exposure enhance financial discipline and planning among entrepreneurs. In addition, savings behavior particularly through formal, informal, and investment-oriented channels was found to significantly influence income levels, highlighting the strong linkage between financial accumulation practices and enterprise profitability. Other institutional factors such as access to credit, extension services, and market access also contributed positively to income outcomes. In summary, the study concludes that effective saving practices, combined with favourable socioeconomic characteristics and improved institutional support, can significantly enhance the income potential of agro-based entrepreneurs in the study area.

Recommendations

The findings suggest that:

1. Since investment-oriented savings recorded the highest mean value and significantly influenced income, agro-based entrepreneurs should be encouraged to channel more of their savings into productive investments that can expand their enterprises and increase income.
2. Given the low level of credit access observed among respondents, government and financial institutions should design more accessible and farmer-friendly credit facilities to support agro-based entrepreneurs in scaling up their operations.
3. As a large proportion of respondents lacked extension contact, relevant agricultural agencies should intensify extension delivery to provide entrepreneurs with improved production techniques, enterprise management skills, and financial planning knowledge.
4. Since agro-processing generated the highest income among respondents, policies and programmes that support value addition through agro-processing should be encouraged to enhance income generation among agro-based entrepreneurs.
5. Government and development agencies should improve rural market infrastructure and provide timely market information to enable agro-based entrepreneurs to access better markets and increase their profitability.
6. Since education and farming experience significantly influenced saving behaviour and income, training programmes on financial management, enterprise development, and savings planning should be organized to strengthen the entrepreneurial capacity of agro-based entrepreneurs.

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