

Determinants of Women Participation in Off-Farm Agribusiness Enterprises

Irhivben, Bright Odafe^{1*}, Inoni, Oghenyerhovwo Rita², Aberji, Okompu Davina³ and Inoni, Odjuvwuederhie Emmanuel⁴

^{1,3,4}Department of Agricultural Economics and Agribusiness
Dennis Osadebay University, Asaba, Delta State, Nigeria

²Department of Marketing, Dennis Osadebay University
Asaba, Delta State, Nigeria

**For correspondence, email: irhivben.bright@dou.edu.ng*

Abstract

Efforts to boost off-farm income among farming households in rural areas have been hampered by socio-economic and institutional variables. This study thus seeks to critically examine factors determining women's participation in off-farm agribusiness enterprises in Oshimili North Local Government Area of Delta State, Nigeria. Off-farm activities include palm oil production and sale of products like yam, garri, red oil, and plantain. Data for the study were obtained from a cross section of rural dwellers with the aid of structured questionnaire, using multi-stage sampling procedure. The research instrument was administered to 280 female agribusiness entrepreneurs, but statistical analysis was based on 225, given a response rate of 80.4%. Descriptive and inferential statistics as well as net margin were used to analyse data collected. The results indicate that about 67% of them are married, living in households with an average of 6 persons, and with a mean age of 46 years. This implies that 83.1% of off-farm agribusiness operators are within the economically active age of 23-55 years. Based on the estimated model, gender, annual income, start-up capital, household size and farm size exerted significant ($p \leq 0.05$) effects on participation in off-farm agribusiness operation. Net margin is ₦ 196,395.78, while net margin-to-total-cost ratio is 40.3%; indicating that participation in off-farm agribusiness operations is highly profitable.

Keyword: Agribusiness enterprises, Agricultural products, Binary Probit analysis, Net margin, Women participation

INTRODUCTION

Agricultural production in Nigeria is dominated by smallholder farmers who are aged and resource-poor. (Bolarinwa et al, 2022) It has remained rudimentary and mostly in the hands of the rural poor in society. Farming returns are marginal, while a farmer's social perception is derogatory (Avane, Amfo, Aidoo & Mensah, 2022). Off-farm agribusiness has the potential to enhance farmers' income and Livelihood. Regarding less developed countries that predominantly lived on Agriculture, off-farm jobs can be a veritable source of income (Anang & Apedo, 2023).

According to Msangi, et al., (2024), off-farm agribusiness involves individuals earning income away from their "home plot." Thus, participation plays a crucial role in sustainable rural development and poverty reduction, especially in local communities. In developing countries and economies in transition, about a 33 to 50% of households' earnings are obtained from non-farm operations. Such type of income accounts for between 20% and 70% of the total household income (Hazell et al., 2024). According to Uchelue, et al., (2023) about 65 percent of rural farmers in Nigeria take part in off-farm businesses. Kehinde and Ogundeji (2023) posited that rural non-farm sector provides an opportunity for compensating for the risk and uncertainties related to the variation in farm income. Thus, off-farm activities have been regarded as additional sources of income for farming households. Further studies have shown that participating in non-farm agribusiness ventures is a strategy to hedge against production risks by the farm family (Takele et al, 2025; Chmielinskie et al, 2023). Recently, there has been increased attention on the non-farm economy as a result of perceived potential to reduce rural poverty and inequality, accommodate an improving labour force, poor rural-urban migration, and contribute to national economic development. A case in point is the Fadama project in Nigeria. (Chidawa, 2022)

Women engagement in off-farm agribusiness activities is a major source of household income, food and nutrition security in amongst rural dwellers. Income generating off-farm operations falls into three broad categories of handling, processing and marketing of agricultural products and raw materials. Although there is growing evidence that participation in off-farm businesses tends to increase the total household income of participants, factors besides instability in farm income are implicated in rural women taking part in non-farm agribusiness ventures. Thus, the main purpose of study is to examine factors that influence women participation in off-farm agribusiness venture in Oshimili North LGA. This answers the question of those factors behind the need for women participation in off – farm agribusiness enterprises. Women's participation in off-farm agribusiness in Oshimili North LGA, Delta State, is driven by crucial factors such as the need for diverse income sources and their skills in processing and marketing. These ventures not only empower women economically but also help overcome the barriers they face in accessing resources within traditional agriculture, particularly in post-harvest activities. The specific objectives are to: describe the socio-economic features of participants, examine the effects of socio-economic factors such as (access to land, credit, and technology; education level; marital status; and cultural norms) that influence participation in agribusiness ventures, identify the various off-farm agribusiness enterprises in the study area, determine the net

margin in agribusiness activities as well as identify constraints to off-farm agribusiness enterprise in the study area.

Research Hypothesis

H₀: Socio-economic factors do not significantly affect women's participation in off-farm agribusiness enterprises.

LITERATURE REVIEW

Empirical Review

Nagler and Naudé (2017) shed light on the critical role of off-farm enterprises across 6 sub-Saharan African countries. The research delves into the performance of these businesses, focusing on key metrics like labour productivity, survival rates, and exit strategies, drawing upon statistics from the World Bank's Living Standards Measurement Study - Integrated Surveys on Agriculture (LSMS-ISA). The findings reveal that rural households are actively engaging in entrepreneurship, motivated by a mix of push and pull factors, which often choose to participate in less complex activities like sales and trade. This entrepreneurial spirit is vital for rural economic development and deserves greater attention and support.

Entrepreneurs often wisely avoid businesses with high startup costs, like transportation services, or those requiring substantial educational qualifications, such as professional services. Research clearly shows that labour productivity significantly varies across different businesses. Rural enterprises, female-led businesses, and those situated far from population centres generally experience lower labour productivity different to their urban counterparts, male-owned ventures, and businesses which maintain steady operations year-round. Moreover, rural enterprises face greater risks of exiting the market due to challenges like inadequate profitability and difficulty accessing financing, compounded by vulnerability to sudden economic shocks. Addressing these disparities is essential for promoting equitable growth and sustainability in all sectors.

Taramuel-Taramuel et al., (2023) conducted a compelling study titled in which their findings reveal that strong decision-making skills among farmers are directly linked to improved farm outcomes, a relationship that spans various types of farms and geographical areas. Historically, research in farm management has looked decision-making and performance as distinct topics. However, this paper introduces significant new result that underscores critical connection between effective farmers' decision-making and enhanced farm performance, highlighting importance of integrating these aspects for better outcomes in agriculture. Their study compellingly examines the vital association between decision-making and farm management practices over the past decade. By focusing on essential research topics, performance metrics, and methodological frameworks, it offers valuable insights. This study equally identifies significant gaps in the current literature and presents thoughtful recommendations for future investigations. Ultimately, these results demonstrate the essential role that decision-making skills play in enhancing farmers' managerial capacity and significantly influencing farm performance.

Theoretical Review

Islam et al., (2022) conducted an insightful study titled "Rural Women's Participation in Farm and Off-Farm Activities and Household Income in Bangladesh." This research delves into the vital role that farm, and non-farm activities play in shaping family income, particularly focusing on taking part of rural women in Thakurgaon district of Bangladesh. The study purposefully aims to distinguish rural women's involvement based on their socioeconomic traits, evaluate their substantial contributions to household income, and uncover the critical factors that influence these dynamics. To effectively compare socioeconomic differences, the researchers employed an Independent Sample T-test, Pearson's correlation test was used to determine whether significant association existed between women's personal income and farm family income, while Propensity Score Matching (PSM) was adopted to assess impact of non-farm activities on the overall wellbeing of rural households. The t-test results compellingly show that women participating in off-farm activities significantly outperformed their farm counterparts regarding socioeconomic indicators. Notably, a strong positive correlation exists between income from non-farm endeavours and the overall household income of these women. Outcome of the PMS affirm that off-farm business activities exert a profound and positive effect on the income of rural farming households. The results of the binary Probit model reveal that key factors such as educational attainment, household size, work experience, savings, and training, play a crucial role in influencing rural women's engagement in non-farm agribusiness venture. Implementing targeted measures for area-based development, including enhancements in the work environment, improved access to credit facilities, and upgraded communication and infrastructure, will create a more supportive framework that can lead to sustainable economic growth for women in rural communities.

Salam and Bauer (2022) highlight a significant shift occurring among rural families in Bangladesh, where many are moving from only agricultural ventures to a model that embraces part-time farming alongside various non-farm activities. This study is critical as it not only identifies the key factors influencing this diversification but also examines how it affects poverty levels in these communities. Researchers selected 153 households across three districts in Bangladesh using a purposive sampling technique to gain insights into this transformation. To analyse propensity of women adopting one of five potential activity portfolios, the study employed multinomial logistic regression while utilizing the multidimensional poverty index to assess poverty levels. Findings revealed that the age and farming experience of household head, along with the full land cultivated, negatively impact the likelihood of diversifying into off-farm activities. Again, higher education stands out as a significant factor that increases women propensity of participating in income-generating off-farm strategies. Thus, the paper advocates for policies that will enhance strategy-based rural off-farm activities, as this approach is essential for fostering balanced growth in the rural economies throughout the country.

Zhang et al., (2024) explore the critical link between gender of family heads and susceptibility to poverty in light of China's ambitious goal to eradicate absolute poverty. Using a robust sample of 5,061 rural families from 2018 China Family Panel Studies (CFPS) database, the study employs the Vulnerability Evaluation and Policy (VEP) model alongside the innovative three-stage Feasible Generalized Least Squares (3FGLS) method to quantitatively assess

poverty vulnerability. Additionally, a Probit model is utilized to delve deeper into relationship between household head gender and poverty vulnerability among rural families. The findings indicate that, on the surface, there is no serious change in poverty vulnerability between female-headed and male-headed families. However, a closer examination reveals striking variations among female-headed households: those classified as de jure (legally recognized) experience heightened vulnerability, while de facto (socially recognized) female-headed households are notably more resilient. Health risks emerge as a prominent concern, with de jure female-headed households facing significantly higher health challenges than their male counterparts. Moreover, research underscores the positive impact of higher education levels, household income, and asset accumulation, all of which contribute to a decreased likelihood of poverty vulnerability and support households in breaking free from poverty. These compelling findings provide essential insights for the design of effective poverty reduction methods and robust mechanisms to prevent relapses, thereby contributing significantly to fight against relative poverty.

Conceptual Review

This study clearly establishes the critical importance of women's participation in off-farm agribusiness as a powerful tool for enhancing household income. By actively engaging in both farm and off-farm activities (as shown in the diagram below), women significantly boost their financial contributions and drive improvements in their families' overall well-being through effective livelihood diversification. Transformations in social structures decisively impact the livelihood strategies of women, whose backgrounds play a pivotal role in their ability to diversify successfully. As they balance agricultural and non-agricultural roles, their contributions not only elevate household income but also fortify family dynamics. This enhancement leads to marked improvements in essential areas such as education, health, food security, and housing. Thus, it is imperative that further research is conducted to fully understand and amplify the positive effects of women's contributions on family and community development.

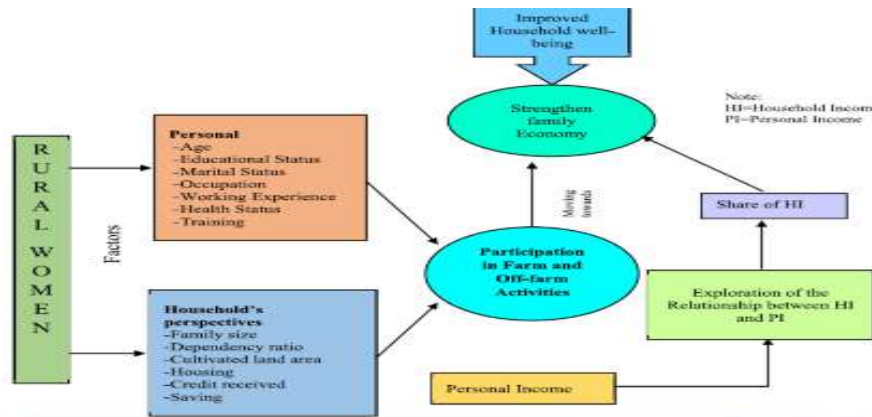


Figure 1: Conceptual framework adapted from the work of Islam et al, 2022

METHODOLOGY

Area of Study and Sampling Procedure

The research was conducted in Oshimili North Local Government Area of Delta State with a population of one hundred and eighteen thousand, five hundred and forty (118,540) persons (Federal Republic of Nigeria, 2019) A multi-stage sampling procedure was used to select farmers for this study. First stage involved randomly selecting seven (7) communities from the total number of twelve (12) communities. Second stage involved the selection of forty (40) respondents from each of the seven (7) communities to give a total of 280 agribusiness entrepreneurs. This is to enable us get reasonable number of entrepreneurs that will provide enough information for us to achieve our desired goals of the study. Data from this study was collected from primary sources and secondary sources. Relevant information needed for the study was also gathered through personal interviews. The data obtained from these sources provided information that was analysed to achieve the objectives of the study. Descriptive statistics, including percentages and frequency distribution tables, were utilized to outline the socio-economic characteristics of participants engaged in off-farm agribusiness. Additionally, Net Margin Analysis was employed to evaluate the costs and returns of off-farm agribusiness enterprises over the past one year. The survey was carried out between 1st December 2023 to 31st March 2024 through well-structured questionnaire.

The Net Margin Analysis is specified as:

$$NM = \{TR - (TFC + TVC)\} \quad (1)$$

NM = Net Margin

TR = Total Revenue

TFC = Total Fixed Cost

TVC = Total Variable Cost

The Probit Regression Model used to test the null hypothesis which states that socio-economic factors do not have a significant effect on participation in off-farm agribusiness is specified below:

$$Y_i^* = F(X_{ij}) \quad (2)$$

Where Y^* = Dependent variable

X_j = Independent variables

$$Y_i^* = \beta_0 + \beta_{ij} X_{ij} + U_{ij} \quad (3)$$

Where Y^* is dependent variable which is the probability of the participation of farmers in off-farm agribusiness.

X_{ij} = independent variable

β = parameters of the estimate,

U_{ij} = stochastic error term

‘X’ is a k-vector of regressors; $X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8$.

Where X_1 =Sex; X_2 = Age; X_3 = Marital status; X_4 = Years of formal education; X_5 = Household

size; X_6 = Business Experience; X_7 = Start-up capital. X_8 = Credit Access

RESULTS AND DISCUSSION

Socio-economic Features of Agripreneurs

The results presented in Table 1 show the socio-economic characteristics of respondents. The age of farmers was between 28 to 67 years with the majority between 30 and 49 years. From this result, it is evident that majority of the respondents are adults predominately in their active age. Smith (Chakrabarti, 2023) noted that it is generally the younger ones in the household who migrate in search of income-earning opportunities and points out that age is a factor synonymous with moving into the non-farm sector more broadly. Of the total number of respondents, 41% were male and 59% female. This infers that more female farmers participated in off-farm agribusiness in the study. Zhang et al.

Table 1: Socio-economic Characteristics of Agripreneurs (n=225)

Variable	Frequency	Percentage (%)	Mean (Mode)
Age (in years)			
23 – 33	22	9.8	46.04 years
34 – 44	75	33.3	
45 – 55	90	40.0	
56 – 66	38	16.9	
Gender			
Female	133	59	
Male	92	41	
Marital Status			
Single	34	15.1	(Married)
Married	150	66.7	
Divorced	14	6.2	
Widowed	27	12.0	
Educational Level			
No formal education	37	16.4	(Primary Education)
Primary Education	75	33.3	
Secondary Education	53	23.6	
NCE/OND	40	17.8	
HND/First Degree	20	8.9	
Household Size			
1 – 3	27	12.0	

Irhivben, Inoni, Aberji, Inoni. Determinants of women participation in off-farm agriculture ..

Variable	Frequency	Percentage (%)	Mean (Mode)
4 – 6	87	38.7	6 persons
7 – 9	102	45.3	
10 –12	9	4.0	
Farming experience (years)			
1 – 5	20	8.9	
6 – 10	32	14.2	
11 – 15	54	24.0	15.38 years
16 – 20	59	26.2	
21 – 25	60	26.7	
Farm size (hectare)			
0.5 – 1.1	80	35.6	
1.2- 1.8	70	31.1	1.55 ha
1.9 – 2.5	60	26.7	
2.6– 3.2	10	4.4	
3.3– 3.9	5	2.2	
Participation in Off-farm			
Yes (1)	144	64.0	(Yes)
No (0)	81	36.0	
Source of Start-up Capital			
Personal savings	151	67.1	(Personal savings)
Loans and Credit	63	28.0	
Other sources	11	4.9	
Amount of Start-up Capital (₦)			
20,000 – 60,000	63	28.0	(₦ 20,000– 60,000)
61,000 – 101,000	55	24.4	
102,000 – 142,000	53	23.6	
143,000 – 183,000	33	14.7	
184,000 – 224,000	21	9.3	
Type of Agribusiness Enterprises			
Assemblage & wholesaling	58	25.8	
Processing of agric. produce	55	24.4	
Retailing of agric. produce	92	40.9	(Produce retailing)
Food retailing	20	8.9	

Source: Field Survey, 2024

(2024) highlight that female-headed households are particularly vulnerable to poverty. As a result, these households often have a greater need for income, which can be obtained through participation in the off-farm sector.

The results further showed that about 52% had no formal education, while 26% had O' level and primary education qualifications. The significance of education is paramount; Khan et al. (2022) maintains that primary education boosts workforce productivity, while secondary education encourages entrepreneurial initiatives. Majority of respondents (66%) were married with 74% having a household size of 3-9 persons. The households with a larger number of adults in most cases had greater supply of (unskilled) labour.

According to Salam and Bauer (2022) family size and structure affect the ability of a household to supply labour to the non-farm sector. Farm size was predominantly small and fragmented and ranged from 0.5 to 3.9, with an average of 1.55 hectares. Although small farm size may imply smaller farm income explained by the fact that land size could measure household net worth, Z. Shen, D. S. Brown, X. Zheng and H. Yang (2022) however opined that participation in off-farm employment is not primarily a response to household land constraints. Table 1 further shows that Food retailing (8.9%), Retailing of agricultural produce (40.9%), Produce processing (24.4%) and Produce assemblage & wholesaling (25.8%) are the major agribusiness activities where women are engaged in the study area. Anang and Apedo (2023) suggested that farmers who diversify into off-farm activities may demonstrate less commitment to farming, potentially resulting in reduced time spent managing their farm enterprises and consequently lower farm productivity. Nevertheless, since off-farm activities are meant to complement farm production, the additional stream of income realised from non-farm enterprises helps to stabilise household income and enhance food security.

Personal savings is the major source of start-up capital from which 64% of the respondents sourced fund for their operations while loans and credit (28%) while other sources is 4.9%. although personal savings is a very reliable source of start-fund, but over-dependence on this may limit the entrepreneur's ability to take advantage of business expansion opportunities.

The amount of start-up capital mobilised by non-farm micro-entrepreneurs ranged from ₦ 20,000 to ₦ 224,000. Twenty-eight (28%) of the respondents invested capital between ₦ 20,000 to ₦ 60,000, while 24% of them invested initial capital ranging from ₦ 143,000 to ₦ 224,000. Although, short term profitability of the venture does not depend essentially on the amount of start-up capital invested, the volume of capital invested is likely to affect revenue generated in the long-run which will ultimately affect profitability. Therefore, diversification of employment would broaden the income streams of farming households by spreading risk across several activities (Getahun *et al*, 2023).

The results presented in Table 3 shows a Net Margin of ₦ 196,395.78, while a net margin-to-total cost ratio of 40.3% was obtained from engaging in off-farm agribusiness activities. The finding implies that every ₦ 1.00 invested, yielded a return of 40.3 kobo, which is quite profitable. Off-farm agribusinesses serve as a dependable source of household income, significantly contributing to the overall financial well- being of rural households. El-Benni and Schmid (2022) posited that cash income generated from off-farm activities can enhance farm production and help cover the costs of agricultural inputs. As a result, households with better access to off-farm income are more likely to increase their agricultural earnings; thus,

Irhivben, Inoni, Aberji, Inoni. Determinants of women participation in off-farm agriculture ..

confirming the fact that participating in off-farm agribusiness enterprises is a veritable source of generating extra income towards improving the wellbeing of farm families.

Table 3: Net Margin Analysis

Parameter	Value (₦)
Average Revenue (A)	684,266.67
Average Variable Cost (B)	343,673.11
Average Fixed Cost (C)	144,197.78
Total Cost (TC)	487,870.89
Gross Margin (GM): (A – B)	470,068.89
Net Margin (NM) : {A – (B + C) }	196,395.78
Net margin-to-total-cost ratio	40.3%

Source: Field Survey, 2024.

Probit Regression Analysis

Table 2: Binary Probit Regression

Variable	Co-efficient	Std. Error	Z-Statistics	p-value
Constant	-9.03819	1.21205	-7.4569	0.00001**
Sex	0.304594	0.253524	1.2014	0.22958
Age	0.0440608	0.0127027	3.4686	0.00052**
Martstatus	1.10566	0.255745	4.3233	0.00002**
Yrseducation	0.0628164	0.0296448	2.1190	0.03409*
Household size	0.582792	0.153975	3.7850	0.00015**
Busexperience	0.066052	0.0524688	1.2589	0.20807
Start-up capital	4.50288e-05	8.88123e-06	5.0701	0.00001**
Credtaccess	0.596164	0.249337	2.3910	0.01680*
Mean dependent var	0.511111		S.D. dependent var	0.500991
McFadden R-squared	0.540675		Adjusted R-squared	0.482947
Log-likelihood	-71.60991		Akaike criterion	161.2198
Schwarz criterion	191.9647		Hannan-Quinn	173.6286
Number of cases 'correctly predicted' = 196 (87.1%)				
Likelihood ratio test: Chi-square (8) = 168.585 [0.0000]				
Null hypothesis: error is normally distributed				
Test statistic: Chi-square ² = 0.62935 with p-value = 0.1897984				

**p < 0.001, *p < 0.05;

Source: Field Survey, 2024

The results of the Binary Probit regression model are shown in Table 2. Age, marital status, years of formal education, household size, start-up capital and access to credit exerted significant influence on participation in off-farm agribusiness micro-enterprises. The positive and significant impact of years of basic education indicate that the more exposed farmers are to basic education, the more likely they are to participate in off-farm activities. Individuals with

some basic educations are more likely to engage in self-employment, according to Tamvada et al. (2022). Also, the significant positive coefficient of start-up capital implies that farmers who have the capacity to raise start-up capital, to access the different sources of credit have a higher propensity to be actively engaged in non-farm agro-based ventures.

The findings also reveal that household size positively and significantly affect off-farm participation decisions. The implication of the finding is that as the size of a household increases, the likelihood of respondents participating also rises. This trend may be attributed to a higher level of dependency within the household, leading to a greater need to supplement the family's income. According to Islam et al. (2022), having more adults in a household enhances an individual's likelihood of allocating labour to off-farm activities. Age of the operators is another variable that significantly affected the decision to participate in non-farm agribusiness ventures. All the respondents are adults, with age comes the mental capacity to take risks financial and operational risks associated with the business. And the older they are, the more experienced they are in managing their enterprises.

The test for the overall significance showed that socioeconomic factors significantly influence participation in off-farm agribusiness with a highly significant loglikelihood ratio ($p < 0.0001$), a McFadden R^2 of 0.541, and 196 (87.1%) cases 'correctly predicted'. Therefore, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_A) which states that socioeconomic factors have a significant effect on participation in off-farm agribusiness accepted. This result is in agreement with the work of Chmielinski *et al.*, (2023) that socioeconomic factors have a significant effect on participation in off-farm agribusiness enterprises.

The results of constraints to participation in off-farm agro-ventures is shown in Table 4. High cost of transportation, high produce cost and inadequate access to credit ranked first, second and third respectively, while long distance to market had the least rank.

Table 4: Constraint to off-farm Agribusiness Enterprises

Constraints	Frequency	Percentage (%)	Rank
High cost of transportation	210	93.3	1 st
High cost of produce	203	90.2	2 nd
Inadequate access to credit	165	73.3	3 rd
High cost of labour	115	51.1	4 th
Low sales revenue	111	49.3	5 th
High cost of energy	97	43.1	6 th
Long distance to market	77	34.2	7 th

Source: Field Survey, 2024. *Based on Multiple responses

CONCLUSION AND RECOMMENDATIONS

The study assessed determinants of participation in off-farm agribusiness in Oshimili North local government area of Delta state. The results showed majority of the respondents were adults predominately in their active age. The probit model results showed that all the variables except sex and entrepreneurial experience have statistically significant ($p < 0.05$) on the dependent variable. Net margin is estimated at ₦ 196,395.78 while net margin to-total cost ratio 40.3%, implying that every ₦ 1 invested yielded a net return of 40 kobo. Thus, participating in off-farm agribusiness enterprises in the study area is a profitable, and should be encouraged among farmers. These measures include increased access to farm credit, and the provision of subsidised inputs to rural farmers to boost productivity. Training programmes should also focus on equipping farmers with skills for off-farm agro-based ventures. Government agencies have a role to play by ensuring that credit facilities and loans are easily accessible to farmers at low and guaranteed interest rates. Such support would enable farmers to engage in both on-farm and off-farm activities, in order to increase household income generation for enhanced food security.

REFERENCES

- Anang, B. T., & Apedo, C. K. (2023). The influence of off-farm work on farm income among smallholder farm households in northern Ghana. *Cogent Economics & Finance*, 11(1), 2196861.
- Avane, A., Amfo, B., Aidoo, R., & Mensah, J. O. (2022). Adoption of organic fertilizer for cocoa production in Ghana: perceptions and determinants. *African Journal of Science, Technology, Innovation and Development*, 14(3), 718-729
- Bolarinwa, K. A., Ogunkanmi, L. A., Ogundipe, O. T., Agboola, O. O., & Amusa, O. D. (2022). An investigation of cowpea production constraints and preferences among small holder farmers in Nigeria. *GeoJournal*, 1-13.
- Chakrabarti, S. (2023). *Factors Influencing Rural Non-Farm Employment And Quality of Employment* (Doctoral dissertation, ICFAI UNIVERSITY JHARKHAND).
- Chidawa, Y. (2022). *Impact of the Third National Fadama Development Policy on Poverty Reduction among Selected Farmers in Niger State, Nigeria* (Doctoral dissertation, Kwara State University (Nigeria)).
- Chmielinski, P., Pawłowska, A., & Bocian, M. (2023). On-farm or off-farm? Diversification processes in the livelihood strategies of farming families in Poland. *Social Sciences & Humanities Open*, 8(1), 100575
- El Benni, N., & Schmid, D. (2022). Off-farm income and direct payments—an indispensable diversification strategy of Swiss farmers. *Q Open*, 2(1), qoab019.
- Federal Republic of Nigeria, (2009). 2006 Census Final Results. FRN Official Gazette, 96 (2). Federal Government Printer, Abuja, Nigeria.
- Getahun, W., Haji, J., Mehare, A., & Zemedu, L. (2023). Drivers of income diversification among rural households in the Ethiopian central highlands. *Food and Energy Security*, 12(3), e443

- Hazell, P., Haggblade, S., & Reardon, T. (2024). The rural nonfarm economy is transformed during rapid urbanisation and structural transformation in developing regions. *Annual Review of Resource Economics*, 16.
- Islam, M. S., Islam, S., Fatema, K., & Khanum, R. (2022). Rural women participation in farm and off-farm activities and household income in Bangladesh. *Heliyon*, 8(9) Pg. 3
- Khan, N., Sarwar, A., Chen, T. B., & Khan, S. (2022). Connecting digital literacy in higher education to the 21st-century workforce. *Knowledge Management & E-Learning*, 14(1), 46-61
- Msangi, H. A., Waized, B., Ndyetabula, D. W., & Manyong, V. M. (2024). Promoting youth engagement in agriculture through land titling programs: Evidence from Tanzania. *Heliyon*, 10(7)
- Nagler, P., & Naudé, W. (2017). Non-farm entrepreneurship in rural sub-Saharan Africa: New empirical evidence. *Food policy*, 67, 175-191.
- Salam, S., & Bauer, S. (2022). Rural non-farm economy and livelihood diversification strategies: evidence from Bangladesh. *Geo Journal*, 87(2), 477-489
- Shen, Z., Brown, D. S., Zheng, X., & Yang, H. (2022). Women's off-farm work participation and son preference in Rural China. *Population Research and Policy Review*, 41(3), 899-928.
- Takele, A., Abelieneh, A., Wondimagegnhu, B. A., & Ashagrie, M. (2025). Determinants of farmers' decision to engage in non-farm adaptation strategies to climate change in Lake Tana and Upper Beles River Watersheds, Northwest Ethiopia. *Mitigation and Adaptation Strategies for Global Change*, 30(4), 1-30.
- Tamvada, J. P., Shrivastava, M., & Mishra, T. K. (2022). Education, social identity and self-employment over time: evidence from a developing country. *Small Business Economics*, 59(4), 1449-1468.
- Taramuel-Taramuel, J. P., Montoya-Restrepo, I. A., & Barrios, D. (2023). Drivers linking farmers' decision-making with farm performance: A systematic review and future research agenda. *Heliyon*
- Uchelue, C. S., Isibor, C. A., Nkamigbo, D. C., & Okonkwo-Emegha, K. (2023) Socioeconomic Determinants of Off-Farm Income Generating Activities Among Smallholder Rice Farmers in Anambra State.
- Zhang, M., You, S., Yi, S., Zhang, S., & Xiao, Y. (2024). Vulnerability of Poverty Between Male and Female-Headed Households in China. *Journal of Family and Economic Issues*, 1-19.