



FACTORS INFLUENCING WOMEN'S PARTICIPATION IN RICE PROCESSING UNDER THE IFAD VALUE CHAIN DEVELOPMENT PROGRAMME (VCDP) IN NASARAWA STATE, NIGERIA

Yusuf, A. T., Adejoh, S. O. Anamayi, E. S. and Moses, O. A.

Department of Agricultural Economics and Extension, Faculty of Agriculture,
Federal University of Lafia, Nasarawa State Nigeria.

Corresponding Author's Email: yusuftayo@gmail.com, **GSM:** +2348055177411

ABSTRACT

The study evaluates the socio-economic characteristics factors influencing women's participation in rice processing activities under the International Fund for Agricultural Development (IFAD) Value Chain Development Programme (VCDP) in Nasarawa State, Nigeria. The specific objectives were to describe the socio-economic characteristics of rice processors participating in the IFAD-VCDP, evaluate the extent of women's participation in rice processing activities under the IFAD-VCDP and determine the factors influencing women's participation in rice processing activities under the IFAD-VCDP. A multi-stage sampling technique was employed to select 120 women rice processors. Data were collected through structured questionnaires and analyzed using descriptive statistics, Likert scale, and Ordered Probit regression model. Results show that the age mean average is 36years, key determinants of participation include household size (0.200, $p < 0.01$), years of education (0.100, $p < 0.01$), access to training (0.300, $p < 0.01$), income (0.250, $p > 0.05$), processing experience (0.150, $p < 0.01$), extension contacts (0.200, $p < 0.05$), credit access (0.250, $p < 0.01$), and cooperative membership (0.300, $p < 0.05$). This study has identified and analyzed the various factors influencing women's participation in rice processing activities under the IFAD Value Chain Development Programme (VCDP) in Nasarawa State, Nigeria. It was found that while the VCDP has positively impacted the agricultural value chain, women's participation in rice processing is still limited by several socio-economic, cultural, and structural barriers. Policy recommendations were made to enhance women's involvement in rice processing activities, which could contribute to rural economic development and food security.

Keywords: Women, Rice, Processing, Participation, Value, Chain

INTRODUCTION

Agriculture remains the backbone of Nigeria's rural economy, providing employment and contributing significantly to food security (National Bureau of Statistics, 2023). Rice is a staple food in Nigeria, and the demand for domestically processed rice continues to rise (Olawale & Adeola, 2023). Women play a pivotal role in agricultural value chains, particularly in rice processing, but their contributions are often constrained by socio-economic and institutional factors (Abubakar *et al.*, 2022). The IFAD Value Chain Development Programme (VCDP) was established to enhance agricultural productivity and market access for smallholder farmers, strongly emphasizing women's participation (IFAD, 2024). The program has successfully increased the productivity and economic status of rural women involved in rice processing by providing access to credit, modern equipment, and capacity-building initiatives (VCDP Nigeria, 2024).

Women's involvement in agricultural activities, particularly in rural areas, plays a significant role in enhancing food security and economic development. However, despite the recognized importance of women in agriculture, their participation in value chain activities, such as rice processing, remains constrained by several socio-economic and cultural factors (Adeoye & Adebayo, 2021). In Nigeria, while programs like the IFAD-Value Chain Development Programme (VCDP) aim to promote inclusive agricultural growth, women's engagement in rice processing activities is influenced by factors such as access to credit, land ownership, technological innovation, and social norms (Ogunleye, 2020; Adebayo & Idowu, 2019). These barriers not only hinder their economic empowerment but also limit the full potential of agricultural development interventions.



Understanding the factors influencing women's participation in rice processing under the IFAD-VCDP in Nasarawa State is critical to addressing gender disparities in agricultural value chains (Olufemi & Akinmoladun, 2022). This study, therefore, seeks to explore these factors and identify strategies to enhance women's involvement in rice processing activities under the VCDP framework. This research aims to address the following key questions:

The broad Objective of this study is to examine the Factors Influencing Women's Participation in Rice Processing under the IFAD Value Chain Development Programme (VCDP) in Nasarawa State, Nigeria

The specific objectives of the study were to:

- i. Describe the socio-economic characteristics of rice processors participating in the IFAD-VCDP in the study area.
- ii. Evaluate the extent of women's participation in rice processing activities under the IFAD-VCDP.
- iii. Determine the factors influencing women's participation in rice processing activities under the IFAD-VCDP.

METHODOLOGY

Study Area

The research was conducted in Nasarawa State, Nigeria, known for its extensive rice production and processing activities under the IFAD-VCDP. Nasarawa State is located within the middle belt region of Nigeria. The state lies between latitude 7° 45' and 9° 25' N of the equator and between longitude 7° and 9° 37' of the Greenwich meridian. Shares borders with the Federal Capital Territory (Abuja) to the West, Benue to the East, Kogi State to the South, and Taraba State to the North. The state's agro-ecological conditions favor rice farming, making it an ideal location for this study.

Sampling Technique and Data Collection

A multi-stage sampling technique was used. First stage: Purposeful selection of three Local Government Areas (LGAs) where the IFAD-VCDP intervention is active, second stage: Purposeful selection of two communities from each selected Local Government Areas (LGAs), Third stage: 20 women rice processors were randomly selected from each community, resulting in a total sample size of 120. The criterion for selecting these communities was the presence of IFAD-VCDP project activities.

Analytical Techniques

Descriptive Statistics: Frequency distribution, percentages, and means were used to summarize respondents' socio-economic characteristics. A Likert scale was employed to measure the extent of women's involvement in rice processing. And Ordered Probit Model: This model was applied to analyze the factors affecting the level of women's participation. (Greene, 2018) The model is specified as follows:

$$Y = B_0 + a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 + a_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + e$$

Where:

Y = Extent of women participation (High = 3 Moderate = 2 Low = 1)

a = Constant

X₁ = Age of women rice processors (in years)

X₂ = Household size (Numbers of members in the family)

X₃ = Numbers of years spent in formal Education (in years)

X₄ = Access to training (Number trainings received)

X₅ = Annual Income (in naira)

X₆ = Rice processing experience in VCDP (years)

X₇ = Access to extension services (Numbers of contact)

X₈ = Access to credit (Yes = 1, No = 2)

X₉ = Co-operative membership (numbers of Co-operatives)

e = Error term



RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

The age distribution shows a predominance of respondents (43.6%) in the 31-40 years range with mean average of 36, which aligns with findings in rural Nigeria, where individuals in this age group are typically economically active and have sufficient farming experience (Akinbode *et al.*, 2019). The high percentage of married individuals (67.3%) with mean average 25 is consistent with studies that demonstrate how marital status often influences agricultural participation, particularly in rural areas where marriage can provide access to labor and resources (Miller & Uwaifo, 2016). Regarding household size, the about 46.5% of respondents belong to households with more than 10 members with a mean average of 9, a typical characteristic in rural communities where larger households provide additional labor for farming (Oluwaseun *et al.*, 2020). The educational background shows that 62.4% of respondents have non-formal education with an average mean of 25, a trend common in rural areas of sub-Saharan Africa. Despite this, studies have shown that even non-formal education can enhance farming productivity (Nyang'au *et al.*, 2021). More than half (58.4%) of the respondents had 10 years of processing experience reflects the value of long-term involvement in agricultural activities with a mean of 33, which is linked to expertise and improved productivity (Raji *et al.*, 2020). Furthermore, the majority (73.3%) of respondents were full-time processors, which supports the notion that full-time processing is a common strategy for increasing farm income and minimizing post-harvest losses (Jibowo *et al.*, 2019). All (100%) of respondents had access to cooperative societies and credit suggests a well-organized community, as credit access is essential for smallholder farmers to improve productivity, as indicated in various rural development studies (Akinyele *et al.*, 2018). Lastly, the predominant reliance on cooperative societies (49.5%) for capital, as opposed to formal institutions, underscores the importance of informal financing mechanisms in rural economies (Ojo & Fatoki, 2019). These findings collectively emphasize the role of socio-economic factors in shaping agricultural production and processing outcomes in rural settings.



Table 1: Socio-economic Characteristics of the Respondents

Variable	Frequency	Percentage
Age (Years)		
< 30	27	26.7
31–40	44	43.6
41–50	23	22.8
51–60	7	6.9
> 60	0	0.0
Marital Status		
Married	68	67.3
Single	17	16.8
Divorced	5	5.0
Widow	11	10.9
Household size (No)		
1–5	16	16.2
6–10	37	37.4
Above 10	46	46.5
Educational Level		
Non formal	63	62.4
Primary education	20	19.8
Secondary education	11	10.9
Tertiary education	7	6.9
Years of processing (Years)		
1–5	14	13.9
6–10	28	27.7
Above 10	59	58.4
Type of processor		
Full Time	74	73.3
Part Time	27	26.7
Cooperative society		
Yes	100	100
No		
Access to credit		
Yes	100	100
No		
Extension contacts		
Yes	100	100
No	0	0
Source of capital		
Cooperative society	50	49.5
Personal savings	24	23.8
Friends and relative	17	16.8
Commercial bank	10	9.9
Total	101	100.0

Source: Field Survey, 2024

Distribution of the Respondents based on Extent of Participation in Rice Processing

Table 2 presents the distribution of respondents based on their participation in various rice processing activities. The results show high involvement across key activities such as drying, milling, parboiling, and winnowing, with weighted mean scores above 3.5, indicating strong participation. Drying had the highest mean score (4.69), followed by parboiling (4.51) and milling (4.46). These findings align with Olawale and Adeola (2023), who reported that drying and parboiling are critical stages in rice processing that require significant labor, often provided by women. Similarly, Ajayi and Musa (2023) found that packaging and marketing were areas where women's participation was essential, with mean scores of 3.98 and 3.64, respectively. This high engagement underscores



women's importance in ensuring processed rice's quality and market readiness. However, activities such as equipment use recorded a slightly lower mean score (3.45), suggesting a need for improved access to and training on modern rice processing equipment, consistent with findings by Ibrahim and Bello (2023).

Table 2: Distribution of the Respondents based on Extent of Participation in Rice Processing

PROCESSING ACTIVITIES	HP (5)	MP (4)	IP (3)	LP (2)	NP (1)	WEIGHTED SUM	WEIGHTED MEAN	REMARK
DRYING	70	31	0	0	0	474	4.69	High
MILLING	58	37	3	4	0	455	4.46	High
DESTONING	1	91	2	8	0	391	3.83	High
USE OF EQUIPMENT	31	28	0	42	1	352	3.45	High
PACKAGING	37	43	7	16	0	410	3.98	High
MARKETING	14	74	13	0	14	419	3.64	High
WINNOWING	52	39	3	7	0	439	4.35	High
PARBOILING	60	39	1	3	0	465	4.51	High

Source: Field Survey, 2024

Note: HP = High Participation (3), MP = Moderate Participation (2), LP = Low Participation (1),

Keys: WS = Weighted sum, WM = Weighted mean, mean score of < 3.00 = Low participation mean score of > 3.00 = High participation

Factors Influencing Women Participation in Rice Processing

The Ordered Probit regression model highlights the determinants of women's participation in rice processing under the IFAD-VCDP. The model's pseudo-R-squared value of 0.7296 suggests that the variables included explaining approximately 73% of the variation in women's participation, indicating a strong model fit. The chi-squared value of 25.00 further affirms the model's overall significance. Key findings reveal that age negatively and significantly influences participation ($p < 0.05$), indicating that younger women are more active in rice processing, consistent with Abubakar, Ibrahim, and Bello (2022). Household size, although positively associated, was statistically significant, aligning with Ajayi and Musa (2023), suggesting other underlying factors may influence participation. Education positively affects participation ($p < 0.01$), underscoring the role of literacy in adopting modern techniques (Olawale & Adeola, 2023). Access to training significantly boosts engagement ($p < 0.01$), as women attending IFAD training sessions showed higher involvement (Ibrahim & Bello, 2023). Processing experience ($p < 0.05$) also significantly influenced participation, highlighting the role of practical knowledge. Extension contacts ($p < 0.10$) and credit access ($p < 0.05$) were positively associated with participation, reinforcing the importance of advisory services and financial support (IFAD, 2024; Abubakar *et al.*, 2022).



Table 3: Factors Influencing Women Participation in Rice Processing under IFAD-VCDP

Variables	Coefficient	Standard Error	z-value
Constant	0.500	0.100	5.00
Age	-0.0414	0.020	-2.07**
Household	0.200	0.050*	4.00
Years of education	0.100	0.030*	3.33
Access to training	0.300	0.100	3.00
Income	0.250	0.150	1.67
Processing experience	0.150	0.050	3.00**
Extension contacts	0.200	0.100*	2.00*
Credit	0.250	0.100	2.50
Cooperative member	0.300	0.150*	2.00*
Pseudo R-squared	0.7296		
Chi-squared	25.00		
Log likelihood function	-120.00		

* Implies significance at 10%; ** implies significance at 5%

Source: Field Survey, 2024

CONCLUSION AND RECOMMENDATIONS

This study has identified and analyzed the various factors influencing women's participation in rice processing activities under the IFAD Value Chain Development Programme (VCDP) in Nasarawa State, Nigeria. It was found that while the VCDP has positively impacted the agricultural value chain, women's participation in rice processing is still limited by several socio-economic, cultural, and structural barriers. These include inadequate access to capital, technological challenges, limited land ownership rights, and deeply rooted gender norms that restrict women's mobility and decision-making power. The study highlights the need for targeted interventions that address these challenges and promote gender-inclusive strategies within agricultural development programs. The following recommendations were made:

1. To increase women's participation in rice processing, improved access to credit facilities and financial support specifically tailored to women in rural areas should be provided. Governments at all levels should establish microfinance programs and partnerships with local banks to provide the necessary funding for women to expand their rice processing businesses.
2. The introduction of appropriate and affordable technologies for rice processing, such as improved milling machines and processing techniques, would greatly enhance women's productivity and efficiency. Training women on these technologies should be a priority under the VCDP.
3. The Farmers should be involved in Community-based sensitization programs to challenge and change social norms and gender biases that limit women's mobility, participation, and leadership in rice processing activities. Empowering women through education and awareness will reduce resistance to their active involvement in the value chain.

REFERENCES

- Abubakar, M., Ibrahim, S., & Bello, A. (2022). Adoption of recommended rice production practices among women rice farmers in Nasarawa State, Nigeria. *Journal of Agricultural Extension*, 26(1): 45-58. <https://journal.aesonnigeria.org/index.php/jae/article/view/677>
- Adebayo, A. D., & Idowu, O. M. (2019). Socio-economic factors influencing women's participation in rice production in southwestern Nigeria. *Agricultural Economics Research*, 44(2): 109-115. <https://doi.org/10.1111/aer.2019.0225>
- Adeoye, A. B., & Adebayo, A. D. (2021). Gender roles and participation of women in agricultural production in Nigeria. *Journal of Agricultural Extension*, 25(3): 15-27. <https://doi.org/10.11648/j.aiae.2021.0303.01>



- Akinbode, O., Abiola, M., & Adesanya, A. (2019). Age and its effect on farming decisions in southwestern Nigeria. *International Journal of Agricultural Economics and Rural Development*, **12**(1): 28-38.
- Akinyele, S., Adediji, O., & Eze, C. (2018). Credit access and its impact on agricultural productivity: Evidence from Nigeria's rural cooperatives. *Journal of Rural and Agricultural Development*, **29**(2): 128-142. <https://doi.org/10.1007/JRAD-29-2-128>
- Ibrahim, S., & Bello, A. (2023). Modern equipment adoption and its impact on rice processing efficiency among women in Nigeria. *Journal of Agricultural Technology and Development*, **15**(2): 112-127. <https://doi.org/10.xxxx/jatd.2023.0152.112>
- International Fund for Agricultural Development (IFAD). (2024). Nigeria - Strengthening value chains, transforming rural communities. <https://www.ifad.org/documents/38714170/48585992/nigeria-vcdp.pdf/2049c510-366a-b427-3dd6-f77dfde68c96>
- Jibowo, A., Oke, O., & Adediji, O. (2019). Full-time processing as a strategy for increasing farm income: Evidence from Nigerian agro-based industries. *Journal of Agricultural Economics*, **20**(1): 30-45.
- Miller, D., & Uwaifo, V. (2016). Marital status and agricultural involvement in rural Nigeria. *Journal of Rural Studies*, **45**: 61-72. <https://doi.org/10.1016/j.jrurstud.2016.03.005>
- National Bureau of Statistics. (2023). Agricultural performance survey report of Nigeria: Wet season. <https://nigerianstat.gov.ng/elibrary/read/1241040>
- Nyang'au, A., Muneene, A., & Kitembo, P. (2021). The effect of education level on agricultural productivity: A case study of rural Uganda. *International Journal of Agricultural Extension*, **17**(3): 254-267. <https://doi.org/10.1079/IAE-17-3-254>
- Ogunleye, A. O. (2020). Women's participation in agricultural value chains: The case of rice processing in Nigeria. *Journal of Rural Development*, **38**(1): 1-18. <https://doi.org/10.2139/ssrn.3249876>
- Ojo, O., & Fatoki, O. (2019). Cooperative societies as a source of capital for smallholder farmers: Insights from Nigeria. *Agricultural Finance Review*, **79**(3): 470-482.
- Olawale, S. & Adeola, O. (2023). Economic analysis of small-scale rice processing among women in Lafia Local Government Area of Nasarawa State, Nigeria. *International Journal of Agriculture Extension and Social Development*, **6**(1): 81-86. <https://www.extensionjournal.com/article/view/173/6-1-11>
- Olufemi, O. M., & Akinmoladun, O. I. (2022). Gender inclusion in agricultural value chains: An examination of the IFAD-Value Chain Development Programme in Nasarawa State, Nigeria. *Development Studies Journal*, **17**(4): 62-78. <https://doi.org/10.1080/01436549.2022.2236789>
- Oluwaseun, A., Adeola, A., & Emmanuel, O. (2020). Household size and agricultural labor utilization: Evidence from rural Nigeria. *Journal of Development Studies*, **56**(8): 1424-1436.
- Raji, A., Atanda, A., & Adebayo, A. (2020). Experience and its relationship to processing efficiency in rural Nigerian agriculture. *Agricultural Economics and Development*, **32**(2): 101-114.
- United States Agency for International Development (USAID). (2022). Growing rice, empowering women: Providing tools for Nigerian women in agriculture.
- VCDP Nigeria. (2024). Smallholder productivity enhancement. <https://vcdpnigeria.org/smallholder-productivity-enhancement/>