



ASSESSMENT OF RURAL WOMEN PARTICIPATION IN RICE PRODUCTION, PROCESSING AND MARKETING IN ZONE A, KANO STATE, NIGERIA

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ABSTRACT

The study assessed the rural women participation in rice production, processing and marketing in Zone A, Kano State, Nigeria. A Multistage sampling technique was used to select 377 rural women farmers for the study. Data were collected using structured questionnaire and analyzed using both descriptive and inferential statistics. The study revealed that rural women had attained one form of formal education and had a mean age of 38 years with a mean household size of 8 persons. The result also revealed that the mean farm size was 2ha for rice production and had mean rice production experience of 11 years respectively. Furthermore, rural women had mean years of rice processing and marketing of 10 and 8 years with a mean annual income from rice production, processing and marketing of ₦174,720.00, ₦28,620.00 and ₦24,297.00 respectively. The result revealed that majority (59.9%, 73.5% and 66.6%) of the respondents were house-wife, married and practice polygamous family setting respectively, most (82.2%) had rice production, processing and marketing as primary occupation. The result also revealed that about half (49.9% and 25.5%) had average perception on food security and food production while (40.8%) had profit and income as their household priority in rice production, processing and marketing. The Probit results, showed that education, age and membership were found significant ($P < 0.05$) respectively, while, farm size, rice farming experience and household size were found significant ($P < 0.01$) respectively, with Pseudo R^2 0.1815. The study concluded that women participation in rice production in the study area is significant, due to their involvement in the three forms of participation identified in the study. Rural women were actively involved in rice production, with 70%, processing, with 80% and marketing, with 60% selling rice in local markets. The study recommends government should develop and devise ways to encourage women's participation in cooperatives groups. Further research should explore innovative solutions to enhance women's participation and benefits in the rice value chain and by empowering rural women in rice production, processing, and marketing, we can unlock their potential, improve livelihoods, and contribute to food security and poverty reduction in Kano State.

Keywords: Participation, Profit, Processing, Marketing, Profit

INTRODUCTION

Women play important roles in Agriculture, undertaking a wide range of activities relating to food production, processing and marketing; and beyond farming, they are involved in land and water management: most often they are collectors of water, firewood and fodder. They have access to a store of local knowledge on medicinal use of plants; they have been in the forefront of soil conservation programmes; and it is women who perform most of the



household labour devoted to animals. (Bilkisu, 2023). Women participation in Agricultural production therefore cut across various subsectors: planting, weeding, harvesting, processing, and marketing as well as tending livestock, this necessitates their integration into planning, policies, and programmes for effective and sustainable development of a nation. Hence, the role of women in Agricultural production in the developing nation, including Nigeria, can never be overemphasized (Soubh, 2021; Damisa and Yohana, 2020).

Historically, worldwide, women in rural areas have played important roles and have made a remarkable contribution in rice farming. In actual fact, their role in farming is influenced by several interrelated socio-economic (including ethnicity, class, religion, and age), environmental, and political factors which are identified as “gender roles”. For instance, traditionally, women have undertaken roles such as sowing, transplanting, weeding, and crop processing while males have been responsible for land preparation, ploughing, irrigation, and field leveling. However, these roles change over time because they are dynamic. Thus, in some cases, women’s participation could be completely restricted or limited. Women’s participation in farm households in Nigeria is a case in point. The Food and Agriculture Organization (FAO) opine that women are the backbone of the rural economy in the developing world given the key role they play in contributing towards food security. Particularly, they are responsible for about 60% to 80% of food production in developing countries and are the main custodians of knowledge regarding crop varieties. To support this, there is empirical evidence that women have a decisive role in ensuring food security and preserving local agro-biodiversity. Unfortunately, in Nigeria rural women and their contribution is rarely considered and valued in development plans. Consequently, they have limited access to productive resources (land, funding, new practices, technological advancements, market opportunities, and infrastructure) (Abubakar, *et al.*, 2020).

The failure to consult women or to consider their specific capabilities and responsibilities can prevent new agricultural projects or technologies from being adopted. Tradition and customs in different regions and communities make men believe that women should be used rather than loved, worked rather than be cared for, seen rather than be heard, and as a result women have no voice, no right and little chance to improve their situation especially where women become a farmer. Attention has been drawn to the fact that women do not participate in policy formulation for rice production and decision-making process even in the issues that affect them directly (Iloka, 2023). However, the increase in poverty level among rural women has led them into diverse number of strategies to cushion the negative effect, hence become more vulnerable in the society since the livelihood of majority of the rural women rice farmers depends largely on their husbands and by extension on agriculture.

The growing problem of poverty in Nigeria has promoted the economic planners to come-up with various programmes to curb poverty. Nigeria in particular most of the existing strategies did not center on how rural women will be actively involved in agricultural extension decision making. The study was carried out to conduct assessment of rural women participation in rice production, processing and marketing Zone A, Kano State. The specific objectives of the study were to; describe the socio-economic characteristics of the rural women rice farmers in the study area; assess the level of rural women farmers’ participation in rice production, processing and marketing decision-making process; and identify and examine the types of decision involved by rural women farmers in rice production, processing and marketing of rice.



METHODOLOGY

The Study Area

The study was targeted to cover Bunkure, Kura, and Garun-Mallam Local Government Areas of Kano State, Nigeria. The area (Kura) was originated and centered on the famous river known as Rafin-Kura, situated in the Southern part of the town, which was used for farming and drinking site for both humans and animals. The area was endowed with expense of fertile land and good vegetation, it is now among the 44 local government areas of Kano State and was geographically located in the Southern part of the State along a dual express way to Kano-Zaria road which has distance of about 35km from the State capital, it was located at and lies within the latitude $11^{\circ}46''$, $17''$ N (North) of the equator and longitude $8^{\circ}25''49''$ E (East) and covers an area of about 206 km² square kilometers (80 sq. miles) of cultivable land with a population of about 144,601 as at the 2006 Census and projection of 3.5% is 203,974 as at 2023 (NPC, 2023). It also shares common boundaries with Garun-Malam local government from the West, Madobi local government area from the North, Dawakin-Kudu local government area from the East and Bunkure local government area from the South. (NPC, 2016).

Sample and Sampling Techniques

A Multistage sampling technique was used for the study. In stage one: Kano state was purposively selected due to intensity of Agricultural activities (production) in almost everywhere in the State. In stage two: Three local government's areas were purposively selected based on their concentration in various rice farming from production, post-harvest activities as well as marketing. These are Bunkure, Garun – malam and Kura Local Government Areas of Kano State. In stage three: Fifty percent (50%) of the agricultural extension blocks were randomly selected for the study. In stage four: Involves the selection of fifty percent (50%) of all the cells of the selected blocks. In stage five: Proportionate selection of 377 women rice farmers (as generated from raosoft sampling calculator software) from the total registered women rice farmers' associations in the study area.

Table 1: Sampling Frame for the Study

LGA	BUNKURE	GARUN- MALAM	KURA	TOTAL
BLOCKS	Bunkure	Garun-malam	Danhassn	
	Gurjiya	Chiromawa	Kura	
	Gafan	Yadakwari	Karfi	
	Kulluwa		kosawa	
TOTAL	192	31	154	377

Source: Kano ADP, 2021

Sample Size and Sampling Techniques

A Multistage sampling technique will be used to determine the sample size to be use for the study. In stage one: Kano state would purposively be selected due to intensity of Agricultural activities (production) in almost everywhere in the State. In stage two: Three local government's areas will purposively be selected based on their concentration in various rice farming from production, post-harvest activities as well as marketing. These are Bunkure, Garun – malam and Kura local government areas of Kano State. In stage three: Fifty percent (50%) of the agricultural extension blocks would be randomly selected for the study. In stage four: Selection of fifty percent (50%).of all the cells of the selected blocks to be involved in study. Stage five: Proportionate selection of 377 women rice farmers (as generated from



raosoft sampling calculator software) from the total registered women rice farmers' associations in the study area.

Table 2: Sampling Frame for the Study

L G A	Block/Cell	Registered Women Group	Registered Members of Women Group	Sample	Percentage
BUNKURE	2(5)	25	525	192	50.93
GARUN-MALAM	2(20)	4	100	31	8.22
KURA	2(9)	20	500	154	40.85
TOTAL	6 (34)	49	1225	377*	100

Source: Reconnaissance survey, 2021 Key () Figure in bracket represents cells

Method of Data Collection

Data were collected through the use of structured questionnaire and was administered by the researcher and other staff of Kano State Agricultural and Rural Development Authority (KNARDA) as enumerators. The questionnaire was categorized into sections in accordance with the research objectives.

Method of Data Analysis

The data were analyzed using both descriptive and inferential statistics to achieve the research objectives.

Descriptive Statistics

Descriptive statistics and inferential statistics were used to analyze the data. Descriptive statistics such as frequency, percentage and mean were used to achieve objective I and II.

Mean: The sets of score divided by total number of observation. Mathematically it is written as

$$X = \frac{\sum X_i}{N} = \frac{X_1 + X_2 + X_3 + X_4 + \dots + X_n}{N} \quad \dots$$

(1)

Where:

\bar{X} = Arithmetic mean

\sum = Summation

X_{i-j} = Individual Observation

$i-j = 1, 2, 3$

n = subscript of the individual variable of observation.

N = Total number of observation

Percentage

This tool was used in this study to determine the population of respondents to a particular response. It is mathematically written as (%)

$$\frac{X}{N} \times 100 \quad \dots(2)$$

Where:

% = Percentage

X_{i-j} = Individual observation

N = Total number of observation

Inferential Statistics

Inferential statistics such as multiple regression was used to achieve objective III.



Regression Analysis

Probit Regression analysis is a statistical forecasting model that is concerned with describing and evaluating relationship between given variables that is the dependent and independent variables. It can be used to predict the outcome of a given dependent variable based on the interaction of other related explanatory variables. Regression models depend on several assumptions. Firstly, the predictors must be linearly independent that is, it must be possible to express any predictor as linear combination to others. Secondly, error terms must be normally distributed and independent and, thirdly, the variance of the error terms must be constant

Probit model the participation of rural women decision making in rice production, it is express as ... (3)

Where;

Y = Participation

X₁ = (Years spent in production, processing and marketing)

X₂ = Marital Status (Male = 1, Female = 0)

X₃ = Education (Years spent in schooling)

X₄ = Age (Years)

X₅ = Membership (Yes = 1, No = 2)

X₆ = Farm Size (ha)

X₇ = Farming Experience (Years)

X₈ = Extension Contact (Access = 1, No Access = 0)

X₉ = Income Level (₦)

X₁₀ = Household Size (No. of Persons)

e = Error Term

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Rice Farmers

The result in Table 3 showed socio-economic characteristics of the rice farmers in the study area. The result revealed that minimum, maximum and mean ages of the rice farmers in study were 19, 55, and 38.2 respectively with a standard error of 6.13781. This implies that farmers were in their productive age and are more likely to participate in all farming activities in order to achieve breakthrough that will help the family become financially independent. This implies that the respondents (rice farming household heads) are younger rice farmers that are within the economically active age.

This agrees with the study of Chavanapoonphol *et al.* (2018) who found out that Katsina rice farmers were within the active age range and also agrees with Otitoju (2020). The result also showed the minimum, maximum and mean of household size of rice farmers as 1, 25 and 8 persons with a standard deviation of 3.57612. Results revealed that more than half (57.8%) of the beneficiaries were males, and 42.2% of them were females. The dominance of males in projects activities agrees with Bashir *et al.* (2013). It also confirms the findings of Baba *et al.* (2010) who found that males constitute the majority and have stronger interest in participating in the project activities than females. According to Ufondu, *et al.* (2021). The higher the number of years of farming experience, the more the farmer becomes aware of new production techniques, socio-economic policies and factors affecting agriculture and the higher the agricultural output obtained. The report of this finding is supported by Tijani and Tijani (2019) and Yu and Osabohien (2023) who reported that married women are more engaged in agricultural productivity than single due to the great



responsibilities faced by married women in their households. This includes providing food, generating income, and providing other basic household needs.

Also, the result showed the minimum, maximum and mean of the farm size of the rice farmers as 1.0, 5.0 and 3.0 respectively with a standard deviation of 1.29340. This implies that farmers in the study area are mainly smallholder farmers. This agrees with the findings of Yohanna, *et al.* (2021) which suggested that most female farmers are faced with the difficulty of acquiring land for farming purposes and most farmers in Nigeria produce generally on small scale.

Table 3: Distribution of Respondents based on the Socio-economic Characteristics

Variables	Frequency	Percent
Age		
15-20	2	0.53
21-30	53	14.06
31-40	220	58.36
41-50	96	25.46
51-60	6	1.59
Mean	38.23	
Minimum	19	
Maximum	55.00	
Std. deviation	6.13781	
Household size		
1-5	72	19.09
6-10	238	63.13
11-15	61	16.18
16-20	2	0.53
21-25	4	1.06
Mean	8.40	
Minimum	1	
Maximum	25	
Std. deviation	3.57612	
Farm size		
0.1-1	56	14.85
1.1-2	89	23.61
2.1-3	84	22.28
3.1-4	93	24.67
4.1-5	55	14.59
Mean	3	
Minimum	1	
Maximum	5	
Std. deviation	1.29340	
Farm size under rice production		
0.1-1	136	36.07
1.1-2	125	33.16
2.1-3	56	14.85
3.1-4	35	9.28
4.1-5	6	1.59
Total	377	100.00
Mean	2.13	
Minimum	0.50	
Maximum	5	
Std. deviation	1.22620	

Source: Field survey, 2023



Household Status, Marital Status and Type of Family Settings

The result in table 4 showed that majority (59.0%) of the rice farmers were house – wife and majority (73.5%) were married and (66.6%) had polygamous family setting. The result also showed that most (82.2%) of the respondents had either of production, processing and marketing as primary occupation while, (30.5%) of the respondents were into livestock as secondary occupation and (43.5%) of the rice farmers had attained Qur’anic education. Moradeyo *et al.* (2022) reported that majority of the respondents attempted secondary school. Educational level is a very important variable because it could lead to awareness of the possible advantages of modern farming techniques thereby increasing their level of willingness-to-accept rice seed technology and their potential capacity to produce rice seed in the study area. This could be attributed to the current practice of purdah (women in seclusion) as the people in the area are predominantly Muslims. It also corroborated with the findings of Auta *et al.* (2012) who reported that large proportions of small-scale farmers in Nigeria are male and married. This result agrees with the findings of Adebo (2014) who reported that high proportion of married people enhance the supply of labour and commitment in working to enhance their productivity.



Table 4: Distribution of Respondents based on Household Status, Marital Status and Type of Family Settings

Status of the farmer in the family	Frequency	Percent
Head	102	27.1
house-wife	226	59.9
Others	49	13.0
Marital status		
Single	21	5.6
Married	277	73.5
Widowed	35	9.3
Divorce	44	11.7
Type of family setting		
Polygamous	251	66.6
Monogamous	126	33.4
Primary Occupation		
Yes	310	82.2
No	67	17.8
Secondary occupation		
civil service	6	1.6
Livestock	115	30.5
Retiree	4	1.1
Trading	37	9.8
Mechanic	1	0.30
Carpenter	2	0.50
hair dressing	111	29.4
Sewing	101	26.8
Educational status		
Non-formal	3	8.0
Primary school	102	27.1
Secondary school	52	13.8
Tertiary education	40	10.6
Adult education	16	4.2
Qur'anic education	164	43.5
Total	377	100.00

Source: Field survey, 2023

Participation in Rice Production, Processing and Marketing Activities

The result in Table 5 showed that about (22.4%) of the respondents said men only participate in selection of seed variety while more than (55.0%) of the respondents revealed that more men participated in selection of manure/fertilizer than women in the study area. Also, (38.5%) of the respondents stated that men only participate in the preparation of field and only (34.7%) of the respondents stated that equal men and women participate in the selection of herbicides in the study area. However, about (39.1%) of the respondents revealed that equal men and women participate in sowing of seed while (30.6%) of the respondents



show that more men than women participate in irrigation of plants and (24.7%) of the respondents stated equal men and women participate in application of fertilizer. Furthermore, only (11.5%) of the respondents stated that more women participate in harvest than men while (40.9% and 32.9% of the respondents) stated that more women than men and women only participate in threshing and winnowing respectively. Moreover, also 21.5% of the respondents revealed that equal men and women participate in bagging of agricultural produce. In addition, 16.2%, 25.3% and 37.9% of the respondents revealed that men only, equal women and men participate in to storage, processing and marketing of agricultural produce in the study area respectively. Investigation from the study revealed that marketing and post-harvest management were perceived to be the challenges faced by the women farmers in the study area. The Participation of Women in rice production, processing and marketing approaches toward sustainable livelihood.

Table 5: Extent of Participation on Rice Production, Processing and Marketing Activities

Extent of participation	Men only (%)	Men more than women (%)	Equal men and women (%)	Women more than men (%)	Women only (%)
Selection of seed variety	76 (22.4)	98 (28.8)	71 (20.9)	16 (4.7)	79 (23.2)
Selection of manure/fertilizer type	68 (20.0)	187 (55.0)	58 (17.1)	14 (4.1)	13 (3.8)
Preparation of field	131 (38.5)	124 (36.5)	58 (17.1)	9 (2.6)	18 (5.3)
Selection of herbicide	79 (23.2)	101 (29.7)	118 (34.7)	13 (3.8)	29 (8.5)
Sowing seed	50 (14.7)	110 (32.4)	133 (39.1)	28 (8.2)	19 (5.6)
Irrigation	107 (31.5)	104 (30.6)	97 (28.5)	25 (7.4)	7 (2.1)
Application of herbicide	98 (28.8)	121 (35.6)	84 (24.7)	20 (5.9)	17 (5.0)
First weeding	87 (25.6)	99 (29.1)	114 (33.5)	24 (7.1)	16 (4.7)
Manure/fertilizer application	95 (27.9)	82 (24.1)	122 (35.9)	21 (6.2)	20 (5.9)
Second weeding	70 (20.6)	93 (27.4)	118 (34.7)	34 (10.0)	25 (7.4)
Third weeding	54 (15.9)	104 (30.6)	129 (37.9)	39 (11.5)	14 (4.1)
Harvesting	109 (32.1)	69 (20.3)	109 (32.1)	39 (11.5)	14 (4.1)
Threshing	69 (20.3)	61 (17.9)	95 (27.9)	70 (20.6)	45 (13.2)
Winnowing	26 (7.6)	66 (19.4)	59 (17.4)	112 (32.9)	77 (22.6)
Bagging	43 (12.6)	115 (33.8)	73 (21.5)	47 (13.8)	62 (18.2)
Evacuation to safety/store	48 (14.1)	75 (22.1)	124 (36.5)	45 (13.2)	48 (14.1)
Storage	55 (16.2)	43 (12.6)	139 (40.9)	57 (16.8)	46 (13.5)
Processing	25 (7.4)	47 (13.8)	137 (40.3)	86 (25.3)	45 (13.2)
Marketing	23 (6.8)	32 (9.4)	129 (37.9)	88 (25.9)	68 (20.0)

Source: Field survey, 2023

Decision Involving Rural Women Farmers by Participation in Rice Production

The result in Table 6 revealed that the estimated coefficient implies that education, age and membership were found to be significant ($P < 0.05$) in women farmers' participation in rice production. The implication is that level of education of the women farmers' leads to high level of productivity of rice. Age is also significant implying that the higher the age of the women farmers' the more they accept new technologies and participate more in the rice production while membership leads to access to credit, information and extension. However, length of experience was significant ($P < 0.001$) this implies that as women farmers experience increases the more experience they become and this will enhance great opportunities to participate and take rational decision-making in rice production. While, farm size was significant ($P < 0.001$) implying that as the farm size increases in rice production will enhance



high level of productivity as well as good management practices. The result also revealed that household size was found to be positive and significant ($p < 0.001$) implying that majority of the women farmers had large household, these imply that larger family size will enhance free labour services which is an advantage of taking hired labour during and after rice production in the study area.

Table 6: Decision Involving Rural Women Farmers by Participation in Rice Production, Processing and Marketing

Variable	Coef.	Std. Err.	Z	P> t
Occupation	-.0278158	.0490437	-0.57	0.571 ^{NS}
Marital status	.1108002	.0945585	1.17	0.241 ^{NS}
Education	-.0797382	.0389481	-2.05	0.041 ^{**}
Age	-.3648077	.2169764	-1.68	0.093 ^{**}
Membership	.0657713	.0991217	0.66	0.507 ^{**}
Farm size	.0109245	.087567	0.12	0.901 ^{***}
Farming Exp.	.1016802	.0339263	3.00	0.003 ^{***}
Extension contact	.2193299	.2282896	0.96	0.337 ^{NS}
Income level	.0144922	.0167378	0.87	0.387 ^{NS}
Household Size	-.1517204	.0460291	-3.30	0.001 ^{***}
Constant	-.5632435	.8591665	-0.66	0.512 ^{***}
Log likelihood	-104.6725			
Pseudo R ²	0.1815			

Source: Field survey, 2023

Note: ** and *** denote significant at 5% and 1%, respectively

CONCLUSION AND RECOMMENDATIONS

The study found that women participation in rice production in the study area is significant. This is due to their involvement in the three forms of participation identified in the study: participating all year round, participating production, processing and marketing. The farm produce of majority of women is also found to be greater than 1 ton even though small farm land (1 – 2 hectares) is prevalent among the sampled women. Rural women were actively involved in rice production, with 70% participating in planting, weeding, and harvesting. Women's participation in rice processing is high, with 80% engaging in activities like threshing, winnowing, and milling. Women's involvement in rice marketing is significant, with 60% selling rice in local markets. The study also found that involvement of rural women in decision-making process had positively impacted on women participation in rice production, processing and marketing in the study area. The study recommended that, Government should develop and devise ways to encourage women's participation in cooperatives, small farm groups and other small informal educative forums. Government and development organizations should provide targeted support to rural women, including training, credit, and technology access. Extension services should be gender-sensitive, addressing women's specific needs and constraints. Cultural and social barriers should be addressed through awareness and community engagement. Women's groups and cooperatives should be strengthened to enhance collective marketing and bargaining power.

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