



## **Enterprise Factors Influencing Gender Involvement in Rice Enterprises in Southwestern Nigeria**

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### **Author's contribution**

*The sole author designed, analyzed and interpreted and prepared the manuscript.*

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### **ABSTRACT**

This study assessed enterprise characteristics and gender involvement in rice enterprises in south-western Nigeria. Multi-stage sampling procedures were employed for the study. The respondents were stratified by age and gender into adult male, adult female, young male and young female. Both qualitative and quantitative methods were used to gather data for the study. The results of the study show that larger farm sizes and production activities mostly associated with male respondents; greater sales especially by adult respondents; high dependence on personal savings for credit and use of both self and hired labour and rented land across gender categories, characterised the rice enterprises surveyed in south-western Nigeria. The Chi-square analysis of enterprise characteristics and involvement in the rice enterprises confirmed the statistical significance of type of enterprise (production), type of enterprise (marketing) and land acquisition, while correlation analysis affirms the significance of years of farming experience. The regression analysis shows that types of enterprise - production, processing and marketing are significant enterprise factors influencing involvement in the rice enterprises.

*Keywords: Rice enterprises; gender; involvement; rice enterprise preference.*

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## 1. INTRODUCTION

Men and women play important roles in the process of rice production. According to [1], the proportion of labour supplied by women in rice cultivation range from 3 per cent for floating rice cultivation (using animal traction) in Mali, to 80-100 per cent in mangrove swamp rice cultivation in the Gambia and Liberia. In the latter case, women participation in most of the activities is usually undertaken in post-harvest processing of the crop [2]. In almost all rice growing areas in Nigeria, men traditionally undertake such activities as land preparation, ploughing, irrigation and field-levelling. Women, on the other hand are responsible for sowing, transplanting, weeding and crop processing [3].

Women in Sub-Sahara African countries play an important role in rice marketing, and rely on income from rice to meet a variety of household and personal needs [4]. In many areas of West Africa, rice is produced primarily by female farmers and generates an important share of family income [5]. In Nigeria, women farmers play prominent roles in rice production activities among rice farming communities. The level of their involvement spans various activities such as field levelling, weeding, sowing and threshing, preparatory tillage, harvesting and transplanting [5].

Rural women are active participants in retail trade and marketing, particularly where trade is traditional and not highly commercialized [6]. In Central African Republic, [7] found that women were more active than men in rice activities, except in clearing and bird-scaring activities, where men were more active. [8] however found that males were more involved in Sawah rice production activities than females. This, they ascribed to labour demand for each of the activities connected with the use of Sawah rice production technology. They noted that there is a household spread of rice production activities— like all other farm activities — among the members of the family: household head, his spouse(s), children and other active members as well as hired labour. Once this is accounted for, women represented about 70% of this available labour in rice cultivation. This is corroborated by [9] who confirmed that 20 million small-scale farmers comprising mostly of women operating on family farms are involved in rice cultivation in west and central Africa.

According to [10], from a study conducted in Obafemi–Owode Local Government Area of Ogun State, most male farmers tend to take on more difficult activities, especially rice cultivation. Specifically, they reported that women are hardly involved in activities such as weeding and land clearing while they have majority involvement in winnowing and parboiling. The proportional participation was quite close for control of birds and other pests and storage.

Enterprise characteristics are expected to influence the level of involvement in rice enterprises. It is expected that the larger the farm size and years of farming experience; the greater would be the level of involvement. The higher the quantity of yield and the type of rice cultivated are expected to influence the level of involvement. Furthermore, the source of labour and the type of land acquired may also impact on the level of involvement. For instance, [11] showed that land, level of variable inputs (fertilizers, seeds, herbicides and labour), and farmers' experience had significant influence on rice production by male farmers in their study area. Thus, they concluded that policies that would enhance farmers' access to relevant inputs including land, fertilizers, improved seeds, herbicides and labour would encourage greater production of rice in the area.

The objective of the study is to assess enterprise factors influencing gender involvement in rice enterprises in south-western Nigeria. Furthermore, the study used chi-square, correlation and regression analyses to test the relationships between enterprise characteristics and respondents' involvement in rice enterprises.

## 2. MATERIALS AND METHODS

### 2.1 Study Area

This study was carried out in Southwestern Nigeria. The South-west zone lies between latitudes 5°N and 9°N, with an area of 114,271 square kilometres, which represents 12% of the country's total land mass. There are six states within this zone which are mainly Yoruba speaking with various dialects namely Oyo, Osun, Ogun, Ondo, Ekiti and Lagos. Each state has both rural and urban areas depending on their location. Southwestern Nigeria had a provisional population of 27,581,993 people according to 2006 Census figures [12]. The zone is predominantly agrarian with rainforest and derived savannah vegetation. The climate of the

zone is a double rainfall maxima characterized by bimodal high rainfall peaks, with short and long dry seasons falling between and after each peak. Average zonal annual rainfall is 1250mm. The mean annual temperature is 27°C. Agriculture is the main occupation of the people in the study area. The study population comprises of all the people in rice enterprises in the study area.

## 2.2 Sampling Procedure and Sample Size

A multi-stage (four-stage) sampling procedure was employed for this study. The first stage involved purposive selection of Ogun, Ekiti and Osun states among the six states in the agricultural zones of South-western Nigeria, because of prominent and high intensity rice production in the three states [13,14]

Ogun, Osun and Ekiti States have 4, 3 and 2 Agricultural Development Programme (ADP) zones, respectively. In the second stage, using purposive sampling, zones with high predominant rice production were selected. In Ogun State, the ADP zones are Abeokuta, Ijebu-Ode, Ilaro and Ikenne, Ikenne zone was purposively selected. In Ekiti state, the ADP zones are Aramoko and Ikare, Aramoko zone was purposively selected. In Osun state, the ADP zones are Iwo, Osogbo, Ife/Ijesha, Ife/Ijesha zone was purposively selected.

Ikenne and Aramoko zone has 4 blocks, while Ijesha/Ife zone has 10 blocks. In the third stage, simple random sampling technique was used to select 20% of the blocks. The selected blocks are Obafemi in Ikenne zone, Aramoko in Aramoko zone and Oriade and Obokun in Ife/ Ijesha zone.

The cells in the sampled extension blocks are 7 and 8 for Obafemi and Aramoko in Ogun and Ekiti states respectively, while the cells in Oriade and Obokun are 6 each in Osun state. In the fourth stage, 50% of sampled extension cells were selected. The number of rice entrepreneurs in the sampled extension cells was 280 in Obafemi, Ogun state, 320 in Aramoko, Ekiti State, 275 and 146 in Oriade and Obokun respectively in Osun state, making a total of 1021 respondents.

The respondents were stratified by age and gender into adult male, adult female, young male and young female, 25% of rice entrepreneurs were stratified across age and gender using simple random sampling making a total of 254

respondents. The young are defined as those within 15-35 years and adult as those from 36 years and above [15]. Sex is male or female. Both qualitative and quantitative methods were used in collecting data for the study. Quantitative data was collected by means of administration of well-structured interview schedule. Qualitative data was gathered through Focus Group Discussions (FGDs).

## 2.3 Independent Variables

Enterprise characteristics

- i. Farm size: Respondents were asked to indicate the exact size of their farm in acres/plots/hectares
- ii. Years of farming experience: Respondents were asked to indicate their exact years of farming experience
- iii. Sources of credit: Respondents were asked to indicate their sources of credit from the options: (a) self (b) family (c) friends (d) cooperative society (e) bank. Nominal values of 1, 2,3,4,5 were assigned respectively to each of these options.
- iv. Quantity of yield: Respondents were asked the exact yield from their enterprise per month in bags/hectare of 50 kg size
- v. Source of labour: Respondents were asked to indicate their sources of labour from the options; (a) self (b) family (c) hired labour (d) communal labour Nominal values of 1,2,3,4 were assigned respectively
- vi. Source of land acquisition: Respondents were asked to indicate their sources of land acquisition from the options, (a) purchased (b) rented (c) leased (d) inherited (e) community owned and (f) government land. Nominal values of 1,2,3,4,5,6 were assigned respectively.
- vii. Type of rice cultivated: Respondents were asked to indicate the type of rice cultivated from the options (a) upland (b) lowland. Nominal values of 1 and 2 were assigned

## 2.4 Dependent Variable: Level of Involvement in Rice Enterprise

Involvement in rice enterprise was determined by asking respondents to indicate their involvement in specific activities along the rice enterprise. This was measured on a three-point scale of often involved, assigned 2, rarely involved, assigned 1 and not involved, assigned 0

## 2.5 Regression Model

Multiple regression models were used to determine the contribution of the independent variable to involvement in the enterprise.

The model is shown below:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \mu$$

where:

Y=Involvement

$\alpha$  = Constant (intercept)

$\mu$  = Random error term

$\beta_1, \dots, \beta_8$  = partial regression coefficient attached to the predictor

$X_1$  = Farm size (exact size of their farm in acres/plots/hectares)

$X_2$  = Years of experience. (exact years of farming experience)

$X_3$  = Type of enterprise (Production) (exact yield from their enterprise per month in bags/hectare of 50kg size)

$X_4$  = Type of enterprise (Processing) (bags processed per month)

$X_5$  = Type of enterprise (Marketing) (bags sold per month)

$X_6$  = Self-labour (indicate sources of labour)

$X_7$  = Hired labour (respondents' indicate sources of labour)

$X_8$  = Rented land (respondents' indicate sources of land acquisition)

$X_9$  = Inherited land (respondents' indicate sources of land acquisition)

## 3. RESULTS AND DISCUSSION

### 3.1 Enterprise Characteristics of Respondents by Gender

The enterprise characteristics of respondents by gender are presented in Table 1. The discussion covered farm size, years of farming experience, type of enterprise, bags of rice processed monthly, bags of rice sold monthly, sources of credit, type of rice, source of labour and type of land acquisition

#### 3.1.1 Farm size of respondents

The mean farm size for all respondents was 4.11±3.57 acres. The distribution of respondents by farm size shows that all (100%) of young and adult female respondents managed farm sizes of 1-5 acres. By comparison, 72.1% and 84.6% of adult and young male respondents respectively

operated farm sizes of 1-5 acres. It is significant that 22.1% of adult male and 11.5% of young male managed rice enterprises of farm size 6-10 acres. Moreover, 2.5% of adult male handled enterprises with farm size 11-15 acres while the farm size of 3.3% of them was above 15 acres.

This larger farm size of male respondents suggests that the male gender has the capacity or resources to run larger rice enterprises in terms of acreage compared to the female gender. The implication of this finding is that small size of farms particularly for female respondents limits their involvement in rice enterprises [16]. submitted that the small size of farms used by female farmers limit their ability to practice commercial scale farming [17]. concurred with the constraining effect of small farm plots on women farmers' practice of large-scale agriculture.

#### 3.1.2 Farming experience of respondents

The mean years of farming experience for all respondents was 16.34±6.70 and for adult male and female respondents are 17.98±2.15 and 12.10±3.25 respectively, while the corresponding mean years of farming experience for young male and female respondents are 3.68± 1.53 and 3.51 ± 1.28, respectively. A vast majority of the young respondents had shorter years of farming experience while expectedly; most of the adult respondents had been in the rice business for longer periods. Specifically, 74.1% and 93.8% respectively of young male and female respondents had 1 to 5 years of farming experience. By contrast, 47.2% and 37.7% respectively of adult male and female respondents had 16 to 20 years of farming experience. Indeed, 11.3% of adult male respondents had been in the rice enterprise for more than 20 years. This fairly long farming experience indicates that farming is a life-long occupation for the respondents and mirrors the finding of [18], of an average of 21 years rice farming experience in Kaduna and Niger States.

#### 3.1.3 Type of enterprise of respondents

The distribution of respondents by type of enterprise revealed that 80.3% of adult male respondents and 88.9% of young male respondents were engaged in production. By contrast, only 40.8% of adult female respondents and 68.8% of young female respondents were involved in production. Interestingly, 81.3% of young female respondents compared to 44.4 %

of young male respondents were engaged in processing, while 71% of adult female respondents compared to 23.7% of adult male respondents were involved in marketing. The level of involvement by the male gender in rice production was high, while the level of involvement by the female gender in rice marketing was also high. These results suggest a preference for less laborious activities in the rice enterprise by the female gender, an inference that is corroborated by [8], that energy-sapping rice activities are exclusively reserved for men who are considered more energetic than women.

### **3.1.4 Bags of rice processed monthly by respondents**

The mean bags of rice processed monthly by all the respondents were (49.29±64.16) distributed as follows: adult male (53.78±53.55), adult female (39.76±97.78), youth male (33.31±34.92) and youth female (67.33±35.24). In terms of number of bags processed monthly, majority (53.2%) of adult male respondents processed above 20 bags while most (45.8%) of adult female respondents, processed 6-10 bags. For young female respondents, an overwhelming majority (90.0%) processed 11-15 bags monthly. The greater number of bags processed by young female respondents confirms their predilection for processing activities. The fact that the female gender, particularly the young female respondents are inclined towards the processing function raises their level of involvement in this activity.

### **3.1.5 Bags of rice sold monthly by respondents**

The mean bags of rice sold monthly by all the respondents were (34.69±53.26) distributed as follows: adult male (34.68±53.26), adult female (38.98±81.91), young male (19.62±19.42) and young female (64.29±36.45). Most (39.3%) of the adult male respondents sold above 20 bags monthly; while most (36.8%) of the adult female respondents sold 16-20 bags monthly. In the case of young male respondents, most (30.8%) sold 1-5 bags monthly while a huge majority (83.3%) of the young female respondents sold 11-15 bags monthly. Evidently, most of the adult respondents sold higher numbers of rice bags than most of the young respondents probably reflecting the marketing experience of the adult respondents and patronage of captive or loyal customers cultivated over the years. The

capacity to sell more bags of rice and the marketing hedge of adult respondents fosters their level of involvement in the rice enterprise.

### **3.1.6 Respondents' sources of credit**

The distribution of respondents by sources of credit revealed that personal savings was the dominant source of credit as indicated by 47.0% of adult male, 56.5% of adult female, 66.7% of young male and 75% of young female respondents. The fact that a greater proportion of female respondents access credit from personal savings relative to male respondents highlight difficulties the female gender face obtaining credit from other sources which might limit their involvement in the rice enterprise relative to the male gender. Another relatively important source of credit for adults was cooperatives as indicated by 45.2% of adult male and 34.8% of adult female. The high dependence on self- and group - financing is consistent with [19] who opined that personal saving is the most important source of financial support for women farmers. This is substantiated by [20] who found that the cooperatives source provide farmers access to sizable amount of credit at reasonable interest rates and realistic maturity period. [21] submitted that dependence on co-operative societies for agricultural credit was the greatest source of farmers' credit in their study area.

### **3.1.7 Respondents' rice cultivation systems**

The distribution of respondents by type of rice production system reveals that 54.9% of adult male respondents and 55.6% of young male were engaged in lowland rice cultivation compared to 42.0% of adult female and 50.0% of young female. This indicated that a greater proportion of male respondents were engaged in cultivation of lowland rice. Regarding upland rice, 38% adult male respondents and 40.7 young male respondents were engaged in this production system while 42% adult female and 25% young female were engaged in this type of cultivation system, on average, suggesting more male involvement [22]. In general, there is no strong gender bias for involvement in either rice cultivation system. Indeed, involvements in both methods are influenced by a range of factors including the topography, adequate rainfall and flooding or drought, yield levels, financial capacity for irrigation and fertiliser procurement and for management of excessive flooding, weeds and pests control.

### **3.1.8 Respondents' source of labour**

The distribution of respondents by source of labour shows a heavy use of self-labour across all gender categories. Specifically, 65.5% of adult male and 63% of young male utilized self-labour while 78.3% of adult female and 50.0% of young female also depended on self-labour. Similarly, there was considerable dependence on hired labour across gender. Precisely, 90.1% of adult male and 59.3% of young male employed hired labour while 65.2% of adult female and 56.3% young female also hired labour. The heavy use of both family and hired labour highlights the demanding nature of the rice enterprise. These results correspond with that of [5] who found that 46% of respondents in their study used family labour and 50% engaged both family and hired labour. The very high proportion (90.1%) of adult male gender that hired labour compared to significantly lower proportions for women and young gender is presumably a result of affordability by adult male respondents. It is conceivable that the likely inability of both female and young gender to afford outside labour limits their involvement in the rice enterprise, particularly regarding expanding area cultivated and by extension, quantity of rice processed and marketed.

### **3.1.9 Type of land acquisition by respondents**

The distribution of respondents by type of land acquisition showed predominance of rented land by the young gender as indicated by 51.9% of young male and 68.8% of young female respondents. Interestingly, a considerable number of the adult gender also used rented land as indicated by 38.7% of adult male respondents and 36.2% of adult female respondents. This agrees with the findings of [8] that 24% of farmers covered in their study used rented land. Inherited land was also used for the rice enterprises by a sizable number of respondents as revealed by 21.1% of adult male, 39.1% of adult female, 29.6% of young male and 25.0% of young female respondents. The female gender had almost similar access to inherited land as the male gender, contradicting the notion that women were discriminated against in terms of land inheritance [23]. Overall, the low proportions of respondents that used purchased land suggests that majority of the respondents lack financial capacity to purchase land for use for their rice business. Indeed, [24] concluded that whilst unmarried and married women may have access to the produce from the land for consumption, they rarely own this very valuable

asset. Land ownership may however be restrictive for the enterprise as not all land can be used for rice cultivation [25].

## **3.2 Hypotheses Testing**

### **3.2.1 Chi-square analysis of enterprise characteristics and respondents' involvement in rice enterprises**

Table 2 presents the Chi-square analysis of enterprise characteristics and respondents' involvement in the rice enterprises. It shows that overall type of enterprise (production) ( $\chi^2=89.380$ ,  $p<0.05$ ); type of enterprise (marketing) ( $\chi^2=11.365$ ,  $p<0.05$ ) and land acquisition ( $\chi^2=28.898$ ,  $p<0.05$ ) significantly influence involvement in the rice enterprises. The latter is plausibly because rice requires a large expanse of land with silt clay loamy soil for cultivation. [26] also confirms the significance of land area to involvement in rice production in the Northern Guinea Savannah of Nigeria. However, [27] found an insignificant relationship between land holding of household head and involvement in rice marketing. Other variables - type of enterprise (processing), source of credit and type of rice cultivated did not significantly affect involvement in the rice enterprises. The gender dynamics show that for adult male, the significant enterprise characteristics affecting involvement were type of enterprise (production) ( $\chi^2=32.44$ ,  $p<0.05$ ); type of enterprise (processing) ( $\chi^2=4.13$ ,  $p<0.05$ ), type of rice cultivated ( $\chi^2=7.62$ ,  $p<0.05$ ), and land acquisition ( $\chi^2=12.64$ ,  $p<0.05$ ).

### **3.2.2 Correlation analysis between enterprise characteristics and involvement in the rice enterprises**

Table 3 shows that years of farming experience has a positive and significant relationship with involvement in the rice enterprise ( $r=0.645$ ,  $p<0.05$ ). This implies that the greater the farming experience, the higher the involvement; which confirms the findings of [28], that as the number of years in farm business increases, so does profitability and involvement in the enterprise. Interestingly, farming experience has positive and significant influence on involvement for adult female gender ( $r=0.38$ ,  $p<0.05$ ), but negative and significant relationship for young male ( $r=-0.44$ ,  $p<0.05$ ), probably because the latter have not accumulated sufficient farming experience to induce a positive effect on involvement. Overall, farm size is positively correlated with involvement but not significant.

**Table 1. Respondents' enterprise characteristics**

<b>Variables</b>	<b>Categories</b>	<b>Adult male (%)</b>	<b>Adult female (%)</b>	<b>Young male (%)</b>	<b>Young female (%)</b>	<b>Total (%)</b>
<b>Farm size (Acres)</b>	1-5 acres	72.1	100.0	84.6	100.0	80.1
	6-10 acres	22.1	-	11.5	-	15.7
	11-15 acres	2.5	-	3.8	-	2.1
	above 15 acres	3.3	-	-	-	2.1
	Mean	4.77±4.01	2.97±1.40	3.25±3.08	2.18±0.99	4.11±3.57
<b>Years of experience</b>	1-5 years	0.7	7.2	74.1	93.8	14.1
	6-10 years	21.1	15.9	25.9	6.3	18.1
	11-15 years	19.7	39.1			21.7
	16-20 years	47.2	37.7			39.8
	Above 20 years	11.3	0			6.3
	Mean exp.	17.98±2.15	12.10±3.25	3.68± 1.53	3.51 ± 1.28	16.34±6.70
<b>Type of enterprise</b>	Production	80.3	40.6	88.9	68.8	69.7
	Processing	35.2	34.8	44.4	81.3	39.0
	Marketing	43.7	71.0	44.4	56.3	52.0
<b>Bags processed monthly</b>	1-5 bags	-	-	16.7	-	2.2
	6-10 bags	12.8	45.8	25.0	10.0	22.6
	11-15 bags	4.3	8.3	-	90.0	4.3
	16-20 bags	29.8	33.3	25.0		26.9
	Above 20 bags	53.2	12.5	33.3		44.1
	Mean	53.78±53.55	39.76±97.78	33.31±34.92	67.33±35.24	49.29±64.16
<b>Bags sold monthly</b>	1-5 bags	1.8	2.6	30.8	-	5.3
	6-10 bags	21.4	34.2	23.1	16.7	25.7
	11-15 bags	7.1	5.3	-	83.3	5.3
	16-20 bags	30.4	36.8	23.1	-	30.1
	Above 20 bags	39.3	21.1	23.1		33.6
	Mean	34.68±53.26	38.98±81.91	19.62±19.42	64.29±36.45	34.69±53.26
<b>Source of credit</b>	Bank	0.7	-	-	-	0.4
	Cooperative	45.1	34.8	11.1	6.3	36.2
	Friends and relatives	4.9	8.7	22.2	18.8	8.7
	Personal savings	47.9	56.5	66.7	75.0	53.9
	Fadama	1.4	-	-	-	0.8

Variables	Categories	Adult male (%)	Adult female (%)	Young male (%)	Young female (%)	Total (%)
Type of rice	Lowland	54.9	42.0	55.6	50.0	51.1
	Upland	38.0	42.0	40.7	25.0	38.6
	Both	7.0	15.9	3.7	25.0	10.2
Source of labour	Self	65.5	78.3	63.0	50.0	67.7
	Family	38.7	42.0	7.4	-	33.9
	Hired	90.1	65.2	59.3	56.3	78.0
Land acquisition	communal	3.5	-	3.7	6.3	2.8
	Purchased	12.7	4.3	-	6.3	8.7
	Rented	38.7	36.2	51.9	68.8	41.3
	Lease	9.2	14.5	14.8	-	10.6
	Inherited	21.1	39.1	29.6	25.0	27.2
	Communal ownership	0.7	-	-	-	0.4
	Government land	17.6	5.8	3.7	-	11.8

• Field survey, 2017

**Table 2. Chi-square analysis of enterprise characteristics and respondents' involvement in rice enterprises**

Variable	Young male			Young female			Adult male			Adult female			Overall		
	$\chi^2$	df	p	$\chi^2$	df	P	$\chi^2$	Df	P	$\chi^2$	df	P	$\chi^2$	df	p
Type of enterprise (production)	14.85*	1	0.00	2.78	1	0.09	32.44*	1	0.00	30.77*	1	0.00	89.38*	1	0.00
Type of enterprise (processing)	0.60	1	0.43	2.15	1	0.14	4.13*	1	0.04	0.00	1	1.00	0.93	1	0.33
Type of enterprise (marketing)	4.90*	1	0.02	0.042	1	0.83	2.99	1	0.08	12.70*	1	0.00	11.36*	1	0.00
Source of credit	1.59	2	0.45	5.13	2	0.07	6.26	4	0.18	3.75	2	0.15	8.11	4	0.08
Type of rice cultivate	1.05	2	0.59	12.51*	2	0.00	7.62*	2	0.02	1.43	2	0.49	4.51	2	0.10
Land acquisition	0.72	3	0.86	8.27*	2	0.01	12.64*	5	0.03	16.13*	4	0.00	28.89*	5	0.00

\*Significant@  $p \leq 0.05$



**Table 3. Correlation analysis between enterprise characteristics and involvement in the rice enterprises**

Variable	Young male			Young female			Adult male			Adult female			Overall		
	N	r	p	N	r	p	N	r	P	N	r	p	N	r	p
Farming experience	27	-0.4*	0.04	16	-0.4	0.11	142	0.06	0.51	69	0.38*	0.04	254	0.645*	0.023
Farm size	27	0.34	0.08	16	0.12	0.67	142	0.38	0.97	69	0.05	0.69	254	0.017	0.814

\*Significant@  $p \leq 0.05$ **Table 4. Regression analysis of enterprise factors influencing gender involvement in rice enterprises**

Variables	Young male			Young female			Adult male			Adult female			Overall		
	$\beta$ -value	t-value	p-value	$\beta$ -value	t-value	p-value	$\beta$ -value	t-value	p-value	$\beta$ -value	t-value	p-value	$\beta$ -value	t-value	p-value
Farm size	-0.07	-0.32	0.76	0.00	-0.01	0.99	0.26*	2.45	0.02	0.56	1.58	0.14	0.15	1.69	0.09
Years of exp.	0.12	0.58	0.58	0.15	0.68	0.51	-0.18*	-2.39	0.02	0.11	0.45	0.66	0.00	0.03	0.98
Production	-0.48*	-2.54	0.04	-0.03	-0.10	0.92	-0.20*	-2.53	0.01	-0.09	-0.17	0.87	-0.18*	-2.66	0.01
Processing	-0.37	-2.05	0.08	-0.55	-2.05	0.06	-0.34	-4.23	0.00	-0.23	-0.70	0.50	-0.29*	-4.03	0.00
Marketing	0.47	2.58	0.04	-0.02	-0.08	0.94	0.29	3.30	0.00	-0.22	-0.38	0.71	0.20*	2.77	0.01
Self-labour	-1.73*	-3.96	0.01	-0.64	-1.58	0.14	-0.07	-0.77	0.44	-0.30	-0.94	0.37	-0.10	-1.20	0.23
Hired labour	-2.32*	-3.86	0.01	-0.64	-1.61	0.13	-0.01	-0.13	0.90	-0.19	-0.47	0.65	-0.01	-0.12	0.91
Rented land	-0.27	-0.71	0.50	-1.01	-2.05	0.06	0.02	0.20	0.84	-0.48	-1.21	0.26	-0.02	-0.24	0.81
Inherited land	0.37	1.12	0.30	-0.89	-2.01	0.07	-0.01	-0.14	0.89	-0.69	-2.12	0.06	-0.12	-1.61	0.11
	R-value =0.97 R <sup>2</sup> =0.94 Adjusted R=0.78 Standard Error of the estimate=3.27			R-value =0.86 R <sup>2</sup> =0.74 Adjusted R=0.35 Standard Error of the estimate=6.94			R-value =0.75 R <sup>2</sup> =0.56 Adjusted R=0.48 Standard Error of the estimate=5.81			R-value =0.86 R <sup>2</sup> =0.74 Adjusted R=0.26 Standard Error of the estimate=6.48			R-value =0.64 R <sup>2</sup> =0.41 Adjusted R=0.34 Standard Error of the estimate=6.42		

\*Significant@  $p \leq 0.05$

### **3.2.3 Regression results**

Table 4 reports the results of the regression analysis. The types of enterprise - production ( $\beta = 0.18, p < 0.05$ ), processing ( $\beta = 0.29, p < 0.05$ ) and marketing ( $\beta = 0.20, p < 0.05$ ), are significant enterprise factors motivating involvement in rice enterprises, indicating that as the more the enterprise produces, processes and markets rice, the greater the involvement. Finally, constraints ( $\beta = -0.33, p < 0.05$ ) are negatively and significantly correlated with involvement in rice enterprises meaning that the constraints faced by the enterprise inhibits involvement in the rice business. The positive sign and significance of farm size ( $\beta = 0.26, p < 0.05$ ) for adult male gender is consistent with findings of the descriptive analysis that this gender had larger farm sizes relative to the female gender, and reinforces the positive effect this has on involvement. The positive relationship and significance of overall years of experience ( $\beta = 0.18, p < 0.05$ ) confirms that experience strengthens involvement in rice enterprises.

### **4. CONCLUSION**

This study assessed enterprise characteristics and gender involvement in rice enterprises in south-western Nigeria. The following conclusions can be drawn from the findings of the study: The rice enterprises studied in south-western Nigeria were characterised by larger farm sizes and production activities mostly associated with male respondents, greater sales especially by adult respondents, high dependence on personal savings for credit and use of both self and hired labour and rented land across gender categories. The Chi-square analysis of enterprise characteristics and involvement in the rice enterprises confirmed the statistical significance of type of enterprise (production), type of enterprise (marketing) and land acquisition, while correlation analysis affirms the significance of years of farming experience. The regression analysis shows that types of enterprise - production, processing and marketing are significant enterprise factors influencing involvement in the rice enterprises.

### **5. CONTRIBUTION TO KNOWLEDGE AND LIMITATION OF THE STUDY**

The main contribution of this study is that it assessed involvement in rice enterprises in terms

of four different gender categories (or generations), unlike most studies that limit themselves to male and female categorisation. The major limitation of the study is that in many instances, it was difficult to neatly separate out actors involvement in each of the three types of enterprises as many of them were involved in multiple activities and in two or more enterprises.

### **COMPETING INTERESTS**

Author has declared that no competing interests exist.

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