ASSESSMENT OF URBAN WOMEN PARTICIPATION IN FISH FARMING ENTERPRISE IN OYO STATE, NIGERIA

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ABSTRACT

Women are key players in agribusiness, especially in urban centers, yet they are the most vulnerable gender. Therefore, this study assessed urban women's participation in fish farming enterprise in Oyo State, Nigeria. A multi-stage sampling procedure was used to select 234 female women fish farmers from the four agricultural zones of Oyo State using questionnaire. Data were analyzed using descriptive statistics, likert scale and multiple regression model. Majority of the respondents were educated, married and in their prime age with mean fish farming experience and household size of 14 years and 9 persons respectively. The result also indicated that lime application (2.52) was the main fish framing activity participated in followed by feeding of fish (2.51), record keeping (2.39) and harvesting (2.33). Multiple regression estimates revealed that age, farming experience, educational qualification, household size and source of income were the significant (P>0.01) socio-economic parameters affecting the level of women's participation in fish farming enterprise in the study area. The study recommend that urban women should be provided with capital in form of credit/loan with flexible means of repayment and affordable interest rates so as to motivate other women to embrace fish framing.

Keywords: Fish farming activities, income, poverty, urban center, women
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INTRODUCTION

Women play a significant role in farming activities, yet they are the most vulnerable gender [1]. Karki [1] further opined that women are one of the main food producers, especially in developing countries. Their economic empowerment to produce more and to participate in policy formulation is critical in addressing poverty and food insecurity. Women play critical role in fish farming activities ranging from feeding, sorting, pond preparation, harvesting, processing and marketing to the extent that processing and marketing are mainly devoted for female folks.

In southern Nigeria, processing of fish harvested from the wild has been seen as women's responsibility even up to marketing stage. Anosike and Fasona [2] noted that women from Southern Nigeria shoulder the responsibility in providing food and welfare for their households despite their limited access to productive resources. Also, Amali [3] reported that women's labour input plays a significant role in food production, processing and marketing of farm products. Ashley-Dejo and Adelaja [4] revealed that urban women participate in fish farming activities to maintain and contribute to household income. They are important in translating the products of a vibrant agriculture sector into food and nutritional security for their households.

A study conducted in Zimbabwe reported that women produced about 60.0% of urban food production, which is majorly consumed by household members [5]. Urban women's participation in farming has attracted global recognition due to the enormous tasks they perform in fish production to value addition [6]. It is imperative to realize that urban women are now championing the clarion call by the government to partake in agricultural production.

Fish farming activities are any activity directly related to fish production, commercial sale or as a principal means of personal subsistence [7]. It includes any activity directly related to the processing and marketing of farmed fish. Though lacks universally accepted definitions, urban center, which could literally be referred to as a city or metropolitan area. Fish farming is considered the fastest growing agribusiness, especially in developing countries. The enterprise is gaining prominence globally because it has been discovered to be a viable poverty intervention strategy [4]. The presence and potential of fish farming in Nigeria, especially in urban centers, is not new. Fish farming is being practiced in almost all metropolitan areas in developing and developed countries [8], which has increased considerably in the last two decades [9, 10].

The urban center population keeps increasing as a result of natural growth and rural-urban migration thus, necessitating the need to feed more populace. Therefore, there is the need to increase fish production since fish is a nutritionally balanced animal protein source with unsaturated fatty acid and acceptable by all age. To checkmate food insecurity challenges, especially in urban centers, women became the backbone of urban fish farming.

Women participation and contribution towards agricultural production and development cannot be overemphasized [11]. However, policy makers, development planners, and agricultural service providers generally perceive farmers as 'males'. Researchers have shown that women contribute significantly to agrarian enterprise in both developed and developing nations. In Asia, over 90.0% of the labour force in rice production are women [12]. Also, in Egypt, women contribute about 53.0% of the agricultural labour while in Nigeria, they contribute between 60.0% and 80.0% of labour particularly in subsistence food production as well as in all sub-sectors of agriculture fish farming inclusive [11]. Enete and Amusa [13] pointed out that men have reportedly continued to dominate farm decision-making even in areas where women are the largest providers of farm labour. Therefore, the main objective of this study was to assess the participation of urban women in fish farming enterprise in Oyo state, Nigeria. Specifically, the study described the level of women participation in fish farming enterprise and ascertained the motivational factors behind women participation in the enterprise.

MATERIALS AND METHODS

Study area description

The study location was Oyo State, Nigeria. Oyo State is located within longitude of $2^{0}38.66^{1}$N and $4^{0}38.25^{1}$N and latitude $9^{0}8.74^{1}$E and $7^{0}1.68^{1}$E. The state shares boundaries with Ogun State, Kwara State, Osun State and Republic of Benin in the south, north, east and west respectively. The state has four agricultural zones: Ibadan/Ibarapa, Ogbomoso, Oyo and Saki (Figure 1).

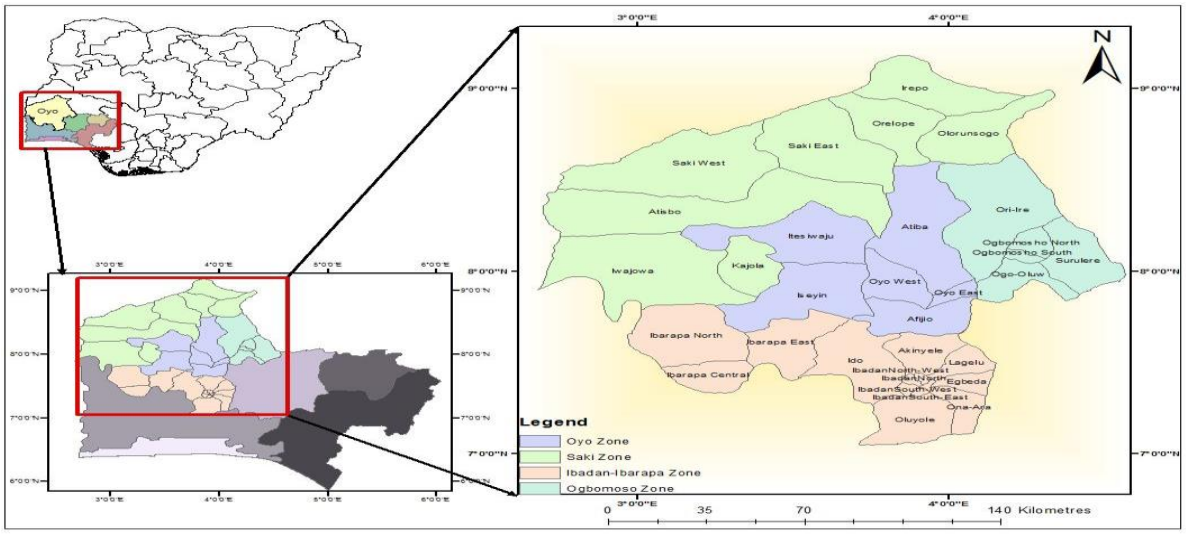

Figure 1: Map of Oyo State showing each agricultural zone [8].

Sampling procedure and data analysis

A multi-stage sampling procedure was adopted in selecting blocks, circles/cells and the female fish farmers. First, there are twenty-five (25) agricultural extension blocks in the state, out of which twelve (12) extension blocks were randomly selected (three extension blocks from each zone). From the selected blocks, 30.0% of the cells were selected randomly to give a total of thirty-nine (39) cells. Six (6) female fish farmers were finally selected to give a total number of two hundred and thirty-four (234) female fish farmers. A structured questionnaire was used to solicit information from the selected fish farmers.

The data were analyzed using descriptive statistics such as frequency, mean and percentage while the Cobb-Douglas function equation was used to analyze the influence of some selected socio-economic characteristics of the respondent's level of participation in fish farming.

A 3-points Likert-type scale was used to rate respondent's level of participation in various fish farming activities. This aids in finding the contribution that a particular variable makes to the prediction of a criterion variable both by itself and in combination with other variables.

Likert Scale = $A = \Sigma \frac{W}{N}$

LS = Sum of weights (W_1+W_2+W_3+……W_n)/N
Where;

W = Weights assigned to each factor by the respondents and it ranges from 3 to 1 where '3' is extremely important and '1' is less important.

N = Total number of respondents (i.e. 234).

$$\text{Weighted score} = \frac{\text{No of F x 3} + \text{No of P x 2} + \text{No of N x 1}}{N}$$

Where: F = Fully, P = Partially and N = Not at all

Cobb-Douglas function form is specified as:

$$\ln Y = \ln\beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \beta_7 \ln X_7 + e$$

Where:

Y = level of participation

X_1 = age of the farmers (years)

X_2 = marital status (married = 1 and otherwise = 0)

X_3 = farming experience (years)

X_4 = educational qualification (year spent in school)

X_5 = household size (number)

X_6 = membership of fish farmers association (yes = 1, no = 0)

X_7 = source of finance (borrowed = 1 and otherwise = 0)

B_0 = intercept, B_1- B_7 = regression parameters to be estimated and e = error terms. Statistics such as the explanatory power of the model (R^2), the significance of the estimated coefficient, the magnitude of the estimated coefficient were used to describe the result of the regression model.

RESULTS AND DISCUSSION

Socio-economic characteristics of urban women participating in fish farming enterprise

The socio-economic characteristics of women fish farmers in the study area are presented in Table 1. Women fish farmers within the ages of 31 – 40 years constitute the highest proportion (44.4%), followed by those within the ages of 20 – 30 years (33.3%), while ages of 41 – 50 years and above 50 years are 9.8% and 6.4% respectively. The mean age of women fish farmers was approximately 36 years. This age range (31 - 40) can be regarded as youthful and productive age when farmers can make a vital impact in agricultural production and development. It was further revealed that majority (80.8%) of the women fish farmers were married. This result agreed with the findings of Salau and Attah [14], who also reported that majority of the urban women participating in agricultural activities are married individuals. The participation of higher percentage of married women could be due to the encouragement of early marriage in Nigerian Society. Women fish farmers educational qualifications revealed that two-thirds (66.7%) had tertiary education while 28.6% and 4.7% had secondary and primary education respectively. This implies that the women fish farmers are educated and literacy has been found to positively influence participation in food production and resulted to high efficiency in the usage of improved production technology [15].

Years of farming experience revealed that half (50.0%) of the respondents had 11 - 15 years of fishing experience, 22.6% had 16 - 20 years of experience. The mean years of fish farming experience was 13.7 years, suggesting that respondents in the study area had considerable good years of fish farming experience. Farming experience is an important factor in determining the profit level and farm output. The more farmers are able to understand the business, conditions, trends and prices the better their output will be which in turn will invariably positively influence farmers' income. Relatively high farming experience recorded in this study implies that respondents are expected to have acquired relevant skills for effective fish farming activities.

Results in Table 1 reveal that the highest proportion (45.3%) of the women fish farmers earned between ₦100,001 and ₦150,000, 19.2% earned ₦50,000 - ₦100,000 while 20.9% and 14.5% earned above ₦150,000 and less than ₦50,000 respectively. The mean estimated monthly income was ₦101,681.63k. The majority (80.3%) of the women fish farmers engage in other income-generating enterprise aside from fish farming, while 19.7% are solely in fish farming enterprise. This finding agreed with the study of Foeken and Mwangi [16], who noted that most farming activities in the urban center are mostly on a part time basis. It was observed that 44.4% had within 5 - 10 persons per household. This was closely followed by 37.2% whose household size was less than 5 persons, with an average household size of 9 persons. The implication is that the relatively large household size may likely enhance labour supply on the farm. Majority (71.8%) of the women fish farmers are members of fish associations or groups. This implies that recent innovations will be at their disposal and will be able to access credit facilities with ease. It was further observed that majority (59.4%) of the respondents had access to credit facilities. The relatively higher percentage could be attributed to participation in fish farmers association.

Table 1: Socio-economic characteristics of respondents

Variables	Frequency	Percentage	Mean ± std
Age (years)			
Less than 21	14	6.0	
21 – 30	78	33.3	
31 – 40	104	44.4	36.11±5.64
41 – 50	23	9.8	
Above 50	15	6.4	
Marital Status			
Single	24	10.3	
Married	189	80.8	
Widow	21	9.0	
Educational qualification			
Primary education	11	4.7	
Secondary education	67	28.6	
Tertiary education	156	66.7	
Fishing experience (Years)			
Less than 11	23	9.8	
11 – 15	117	50.0	13.72±6.71
16 – 20	53	22.6	
Above 20	41	17.5	
Monthly income from fishing (₦)			
Less than 50,000	34	14.5	
50,000-100,000	45	19.2	101,681.63±6,301.81
100,001-150,000	106	45.3	
Above 150,000	49	20.9	
Other sources of income aside fishing			
Yes	188	80.3	
No	46	19.7	
Household size			
Less than 5	87	37.2	
5-10	104	44.4	8.71±45.64
11-15	29	12.4	
Above 15	14	6.0	
Member of fish association group			
Yes	168	71.8	
No	66	28.2	
Access to credit facilities			
Yes	139	59.4	
No	95	40.6	

Source: Field Survey, 2021

Level of participation in various fish farming activities

The level of participation of women fish farmers in thirteen (13) fish farming activities was presented in Table 2. Lime application (2.52) was ranked first followed by feeding of fish (2.51) (2^{nd}), while record keeping (2.39) was third and next to record keeping was harvesting (2.33) (4^{th}). Water quality monitoring (2.26), pond impoundment (2.24), stocking (2.22) and pond fertilization (2.17) were ranked fifth, sixth, seventh and eighth, respectively. Washing of pond (2.13) (9^{th}) was followed by vaccination (2.11) (10^{th}) whereas sorting (2.07) and land preparation/clearing (1.88) were ranked eleventh and twelfth, respectively. Pond construction (1.78) was (13^{th}) was least in the ranking.

Table 2: Mean ratings of 'respondent's level of participation in various fish farming activities

Fish farming activities	Fully	Partially	Not at all	Grand total	Mean	Ranking
Lime application	141	73	20	589	2.52	1st
Feeding of fish	141	71	22	587	2.51	2nd
Record keeping	121	83	30	559	2.39	3rd
Harvesting	97	118	19	546	2.33	4th
Water quality monitoring	103	89	42	529	2.26	5th
Pond impoundment	102	87	45	525	2.24	6th
Stocking	84	118	32	520	2.22	7th
Pond fertilization	96	81	57	507	2.17	8th
Washing of pond	75	115	44	499	2.13	9th
Vaccination	72	116	46	494	2.11	10th
Sorting	86	79	69	485	2.07	11th
Land preparation/clearing	63	81	90	441	1.88	12th
Pond construction	53	77	104	417	1.78	13th

Source: Field Survey, 2021

Motivational factors

The result of respondent's motivational factors was presented in Table 3. It shows that most (31.2%) of the women involved in fish farming were motivated by their passion for fish farming enterprise. This finding agreed with the study of Kaslong [11], who reported that the majority of urban woman engaging in agribusiness had passion for the enterprise. This was closely followed by increasing household income (23.5%) while 18.8% were engaged in fish farming due to unemployment. This implies that urban fish farming provides a household with food, additional income and full-time employment. Thus, the development of urban fish farming will checkmate unemployment among urban women, play an important role in national food security and household income generation.

Table 3: Distribution of respondents based on motivational factor

Variables	Frequency	Percentage
Household income	55	23.5
Passion	75	32.1
Unemployment	44	18.8
Availability of resources	31	13.2
Household consumption	12	5.1
Circumstances	17	7.3

Source: Field Survey, 2021

Contribution of fish farming enterprise to household income

Results in Table 4 showed that fish farming enterprise contributed significantly to household income (44.9%) followed by 33.3% who claimed it moderately contributed to household income. In comparison, less than one-fourth (21.8%) revealed that the enterprise contributed low to household income. This result agreed to the findings of Kaslong [11] who reported that agribusiness contributes significantly to household income in urban centers in Nigeria. Also, Hovorka [17] reported that urban agribusiness has positive effects on poverty alleviation, local economic development, food security, nutrition and health of the urban poor.

Table 4: Distribution of respondents based on the contribution of fish farming enterprise to household income

Contribution to household income	Frequency	Percentage
High	105	44.9
Moderate	78	33.3
Low	51	21.8

Source: Field Survey, 2021

Estimates of regression analysis on the level of participation of women in fish farming in the study area

Table 5 presents the ordinary least square (OLS) regression model. It indicated that the R square was 0.691, which suggested that the explanatory variables in the model specification were important. They explained 69.1% of the variation in the dependent variable. This showed that the model is of good fit and has a good predictive ability. The higher the value of R square, the better the goodness of fit of the specific model. F-ratio was 27.51 and significant at 1.0% level, which implies that the independent variables included in the model; adequately explained the variation in the dependent variable.

The results revealed that age, farming experience, educational qualification, household size and source of finance are important and all significant at 1.0% level of probability. It also revealed that farming

experience, educational qualification, household size and source of finance had a positive relationship with women's participation in fish farming. In contrast, age had a negative relationship according to *a priori* expectations. This implies that an increase in farming experience, educational qualification and household size and source of finance would increase women's participation level in urban center in the study area. The negative relationship between age and women participation level implies that as respondents age, they become less productive per *a priori* expectations. Therefore, as fish farmers are aging, young women should be encouraged to take up fish farming enterprises in urban centers.

Farming experience had a positive and significant ($p<0.01$) effect on women's participation level in fish farming in urban center in the study area. This could be due to improvement in resource-use efficiency as years of experience increases. This conforms to the finding of Nwaobiala [18] who stated that an increase in farming experience would lead to an increased adoption of improved fish farming technologies which will result in increased farmers' income. The coefficient for educational qualification (13.311) was positively signed and significant ($p<0.01$). This implies that an increase in educational qualification will result to corresponding increase in women participation level in fish farming in urban center. This finding agreed with the finding of Tunde *et al* [19], who noted that educational qualification increases productivity and enhances the farms ability to understand, evaluate and effectively utilize farming techniques which will equally boost their gross margin. It was further observed that an increase in household size could result in an increase in women's participation level in fish farming in urban centers provided the members of the household are willing to assist with farm work, but if otherwise, the farmer would have no choice than to obtain pay hired labour form money generated from the enterprise. Otherwise, an increase in household sizes that are willing and ready to assist will affect output positively. An increase in the sources of finance would result in easy access for expansion and provision of adequate and quality feed for the stocked fish invariably positively influence women participation in fish farming in urban centers.

Table 5: Estimates of regression analysis on level of participation of women in fish farming in the study area

Variables	Parameters	Coefficient	Standard error	t-ratio
Constant	β_0	117.471	127.271	0.923
Age (X_1)	β_1	-9.183	2.332	-3.937***
Marital status (X_2)	β_3	-7.613	24.016	-0.317
Farming experience (X_3)	β_4	11.739	1.645	7.137***
Educational qualification (X_4)	β_5	13.311	1.704	7.813***
Household size (X5)	β_6	13.412	3.251	4.125***
Membership of fish farmers association (X6)	β_7	2.958	7.565	0.391
Sources of finance (X_7)	β_8	7.232	1.336	5.412***
R - square (R^2)		0.6910		
Adjusted R^2		0.653		
F – value		27.514***		

***P<0.01

Source: Field Survey, 2021

CONCLUSION AND RECOMMENDATION

It could be concluded that the majority of urban women participating in fish farming are young, active and well experienced. Urban women majorly involve in lime application, feeding, record keeping and harvesting of fish. Also, most urban women had a passion for fish farming and the enterprise contributed significantly to household income. Age, farming experience, educational qualification, household size and source of income are the major factors influencing the level of women participation in fish farming in the study area. Experience farmers Should be encouraged by government agencies, financial institutions and key stakeholders in fish farming industry to stay in the enterprise. Likewise, educated and energetic women should be motivated by giving out credit facilities with flexible means of repayment and affordable interest rates to embrace fish farming. This will go a long way in solving challenges of food insecurity; especially animal protein in the country and the high unemployment rate among women.

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