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ASSESSMENT OF GENDER ROLES IN FISH FARMING ACTIVITIES AMONG RURAL FARMERS IN AFIJIO LOCAL GOVERNMENT AREA OF OYO STATE, NIGERIA

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Abstract
The study was conducted to assess rural farmers' involvement in fish farming activities in Afijio Local Government Area (LGA) of Oyo State, Nigeria. A systematic random sampling technique was used to select 103 respondents for the study. The data collected were analyzed with the use of descriptive and inferential statistics to draw inferences between variables. The results showed that majority (70.9%) of the respondents were males whom are within the age range of of 30-49 years. Males mainly engaged in technical aspects of post-harvest practices such as filleting, gutting, and sticking, whereas, majority of the women engaged in frying, smoking, and marketing of fish. The study revealed that age (χ^2=9.25, P≤0.05) and household size (χ^2=9.256, P≤0.05) were related to involvement in fish farming. The result also revealed that there was significant relationship between farmers' involvement in household activities (r= -0.317, p≤0.01), post-harvest activities (r= 0.614, p≤0.01) and fish farming. The result also showed that farmers' post-harvest activities significantly correlated with their level of involvement in fish farming. The major constraints militating against fish farming were lack of collateral security, high cost of fish feed, and inadequate extension services. The study therefore, call for policies aimed at more enlightenment campaigns to improve socio-economic well-being of farmers. Gender equality should also be mainstreamed into fish production through effective training programs for rural farmers in Afijio LGA, Oyo State, Nigeria.

Keywords: Rural Farmers, Involvement, and Fish Farming

Introduction

Fish farming, a branch of aquaculture is defined as the raising of fish in tanks or enclosures under controlled or semi-controlled conditions usually as food for personal use or profit (FAO, 2002). Fish farming activity in Nigeria started about 50 years ago (Olagunju *et al.,* 2007). Nigeria produced over 400,000 metric tonnes of culture fish in 2004 (Tobor, 2007), which far exceeds the potentials. Fish farming is a practice carried out by both men and women, although fishing business is mainly dominated by the men, whereas, the women are mostly involved in processing and other post-harvest activities. Studies have shown that women were found to be actively involved in fish farming and they have significantly contributed to the growth of the fishery sector in India (Sunderarajan, 2001). It has been established that fish farming is a good source of income being undertaken by both men and women (Mohammed *et al.,* 2011). ICLARM, (2002), described fish farming as the rearing of fish in a controlled volume of water or enclosure. Fish and fish products constitute more than 60% of the total protein intake in adults especially in rural areas (Adekoya and Miller, 2004). It contains essential amino acids mostly lacking in plant sources, vitamins (such as A and D), minerals (such as phosphorous, calcium and sulphur), and also contain low levels of cholesterol (LSMAC, 2003). Fish can convert food into body tissues more efficiently than most farm animals, transforming about 70% of their feed into flesh (Dougherty *et al.,* 2000). When compared with livestock, fish require less space, time, and money and has a high feed conversion rate (Mohammed *et al*., 2011).

FAO (2007), noted that Nigeria has become one of the largest importers of fish in the developing world, importing about 304,413 metric tons annually. Olawunmi *et al.* (2010), indicated that fish farming could easily be established in rural areas such as Ile-Ife, due to relative low cost of establishment. Fapohunda and Godstates (2007), carried out a study on biometry and composition of fish species in Owena reservoir in Ondo State, and indicated that there were fourteen fish species belonging to nine families. George (2005), noted that fish is an important component in the human diet especially for the poor. Yusuf *et al*. (2002),

indicated that medium scale farmers derived the highest return of N1.55 for every N1.00 spent on fish farming, followed by large scale farmers with a gross margin of N1.34.

However, many studies have been conducted on fish farming in Oyo State and Nigeria, but there seems to be dearth of research in relation to gender. Despite the significance of fish as a guarantor of livelihood and a means for reduction of hunger and poverty among the people of Oyo State, yet not much has been done on gender mainstreaming in fish production (Nwabeze *et al*., 2013). Women play a major role in aquaculture production around the world, both as labourers and as managers of food processing, and preservation (Shalesha and Stanley, 2000). In parts of West Africa, hierarchy of traders and processors exist, with younger and poorer women working for wealthier ones and depending on them for livelihoods. Many of the agricultural programs and policies lack strategies for women. This is because, the involvement of women in aquaculture development is influenced by cultural and social issues. Therefore, the study examined assessment of rural farmers' involvement in fish farming activities, with special emphasis on women, in Afijio LGA of Oyo State, Nigeria.

Methodology

Study Area

This study was carried out in Afijio LGA, Oyo State, Nigeria. It is located in the South-West zone of Oyo State, with total land mass of 1.365sq.km, 30 towns and villages, and a population of 134,173 persons (NPC, 2006). Major towns in the LGA include: Akinmorin, Ilu-Aje, Imini, Iware, Jobele, Aawe, Ilora, Ijaye and Fiditi, mainly dominated by the Yorubas. The indigenes are mostly farmers who took the advantage of vast agricultural land that favour the cultivation of food crops and fish farming (Alabi and Ibiyemi, 2002).

Sampling procedure and data collection

Multi-stage sampling technique was used for data collection in the study area. In the first stage, six (6) wards (Ilora I, Ilora III, Aawe I, Aawe II, Fiditi and Akinmorin/Jobele), were randomly selected from the 10 wards, which make up the study area. A systematic random sampling technique was used to select 18 respondents (from Ilora I, Ilora III, Aawe I, Aawe II, Fiditi II) and 20 respondents (from Akinmorin/Jobele), giving a total of 110 respondents. Although, a total of 103 questionnaires were retrieved, and 7 discarded.

Analytical techniques

The data collected were analyzed with descriptive (frequency distribution, percentages, mean) and inferential (Chi-square and Correlation) statistics. The models for inferential analytical tools are as follows:

Chi-square

$$\chi^2 = \frac{\sum(O-E)}{E} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where,

χ^2 = Chi-Square

$\sum$ = Summation

O = Observed values of frequencies of nominal variables like sex, religion, marital status; that is the socio-economic variables for the study.

E = Expected values are frequencies determined from response categories.

Pearson product moment correlation

$$r = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{((n\sum X)^2 - (\sum X^2)(n\sum Y^2) - (n\sum Y)^2}} \quad \ldots\ldots\ldots(2)$$

Where,

r = correlation coefficient

n = sample size

Σ = summation sign

X = independent variables for the study; household activities, and the post-harvest activities

Y = dependent variable for the study; level of involvement in fish farming activities

The level of involvement by gender in fish farming activities was operationalized by using a 2 point scale of male = 1 and female = 0. The benchmark will be obtained thus = 1+0 = 1 divided by 2 to give 0.5. The mean scores of 0.5 and above implies high level of involvement of males and below 0.5 implies low level of involvement among female respondents. Hence , the mean score categorization was based on the benchmark using the decision rule of < 0.5 (low) and ≥ 0.5 (high). Hence, the mean score categorization was based on the benchmark using the decision rule: mean score from 0.1 to 0.49 (low level of involvement) and mean score from 0.5 and above (high level of involvement).

Results and Discussion

The results in Table 1 showed that majority (70.9%) of the respondents that engaged in fish farming were males. This was an indication of male dominance in fishing farming, because such production process requires much time and energy. This is in agreement with Akinbile *et al.* (2008), who noted that males tend to have more physical energy than their female counterparts. Majority (70.9%) of the respondents were within the age range of 30-49 years. This implied that majority of the respondents who were more involved in fish farming were mainly the middle aged, following the findings of Okwuokenye and Onemolease (2006), who indicated that fish farming is mostly carried out by middle-aged married people with family responsibilities. About 68.0% of the respondents were married, indicating that married people were more involved in fish farming. This result agreed with the report of Odebode and Arimi (2011), that the proceeds from fishing activity are used for taking care of families' economic and welfare needs. About 57.3% of the respondents attained tertiary level of education, implying that many of the respondents were highly educated, indicating ability to access and process information on fishing innovations. This also corroborated the findings of Ewuola and Ajibefun (2000), that most fish farmers are educated with ability to manage agricultural activities. Many (50.5%) of the

respondents had 3-4 years of fishing experience. The result indicates that the farmers had ample years in fish farming and were skilful with various production techniques in fish production. This finding is supported by results of Oyekale *et al.* (2003), who noted that the more years acquired by experts in agricultural production over the years have contributed to optimum yield and increased level of income. Furthermore, about 52.4% of the respondents had 4-6 household members. This result indicates that the respondents had large household sizes which could be source of labour to assist in fish farming, thereby, leading to reduction in the cost of production. Ojo and Ajibefun (2000), noted that the use of family labour will go a long way in lowering cost of farming activities, and thereby, increasing their income.

Table 1: Socio-economic characteristics of the respondents (n= 103)

Variables	Frequency	Percentage
Sex		
Male	73	70.9
Female	30	29.1
Age (Years)		
1-20	0	0.0
21-29	18	17.5
30-39	35	34.0
40-49	38	36.9
50years and above	12	11.7
Marital status		
Single	24	23.3
Married	70	68.0
Divorced	7	6.8
Widow/Widower	2	1.9
Religion		
Islamic	44	42.7
Christianity	55	53.4
Traditional	4	3.9
Education		
No formal education	19	18.4
Primary six certificate	10	9.7
Secondary school	11	10.7
Tertiary institution	59	57.3
Adult education	4	3.9
Year of experience		
<3	37	35.9
3-4	52	50.5
5-9	9	8.7
Household size		
1-3	37	35.9
4-6	54	52.4
7-10	12	11.7

Source: Survey Data, 2017

The results in Table 2 showed respondents involvement in other household activities. The result revealed that care for family members, food preparation and vending, and dry cleaning of clothes, were the major household activities of the respondents, which ranked 1st, 2nd and 3rd respectively. This indicated that the respondents were very active with family responsibilities, implying positive implications for their involvement in fish farming. This result agrees with Odebode and Arimi (2011), who indicated that respondents in Afijio LGA are highly involved in taking care of family members, relatives and also engaged in some other household chores.

Table 2: Respondents' Level of Involvement in other Household Activities (n = 103)

Activities	Always	Sometimes	Never	Rank
Care for family members	67.0	9.7	23.3	1st
Food preparation and vending	41.7	22.3	35.9	2nd
Dry cleaning	36.9	27.2	35.9	3rd
Cleaning of surroundings	30.1	27.2	42.7	7th
Dish washing	34.0	22.3	43.7	4th
Fetching of water	32.0	26.2	41.7	5th
Watering of gardens	28.2	39.8	32.0	8th
Weeding of gardens and grasses around the house	32.0	41.7	26.2	5th
Cleaning of kitchen utensils/refrigerator/cupboard	24.3	32.0	43.7	9th
Taking children to school	22.3	38.8	38.8	10th

Source: Survey Data, 2017

The results in Table 3 show the involvement of respondents at different stages in fish farming. The result showed that majority (69.9%) of the respondents involved at different stages of fish production were males with mean score of 0.68 involved in pond construction, 90.3% with mean score of 0.88 in changing of pond water, and 75.7% with mean score of 0.73 in hatchery. This result corroborated with Deji and Koledoye (2013) who noted that males were more involved at different stages of production than females who mainly engage in harvesting and post-harvest practices.

Table 3: Involvement of Respondents at different activities in fish farming (n =103) both percentage and mean scores

Activities	**Female**	**Sig.**	**Mean scores**
Feed formulation	13.6	0.96	0.84
Changing of water	9.7	0.02*	0.88
Cleaning	9.7	0.95	0.88
Pond construction	30.1	0.00*	0.68
Hatchery	24.3	0.00*	0.73
Medication	11.7	0.09	0.86
Sampling	9.7	0.95	0.88
Cropping	14.6	0.7	0.83
Record keeping	3.9	0.89	0.93
Weighing	9.7	0.95	0.88
Feeding	8.7	0.77	0.89
Checking of the water quality	17.5	0.48	0.8
Stocking	5.8	0.82	0.91

Source: Survey Data, 2017

The result in Table 4 shows the involvement of respondents in post-harvest practices. The result showed that both male and female respondents were involved in post-harvest practices of fish farming. The male respondents were involved in certain postharvest practices that needed skills like, marketing, filleting, gutting, sticking, splitting etc., except frying, smoking and marketing of fish, where majority were women. The result implies that there is gender differentials in fish farming, whereby, women are engaged in certain aspects of fish production in the study area. These findings follows the study of Oseni (1995), that women were highly involved in fish marketing in Lagos State.

Table 4: Involvement of Respondents in Post-harvest Practices (n = 103)

	Male			Female			Sig.
Post-harvest activity	**Often**	**Occasionally**	**Not at all**	**Often**	**Occasionally**	**Not at all**	
Marketing	10.0	8.5	3.5	52.5	15.2	5.8	0.03*
Frying	15.0	1.2	3.0	57.1	17.2	6.5	0.00*
Drying	51.5	12.0	4.0	28.5	4.0	0.0	0.00*
Smoking	5.2	5.9	9.1	53.3	17.0	9.5	0.02*
Freezing	65.6	10.4	4.0	15.0	5.4	0.0	0.57
Splitting	53.3	20.0	0.0	15.5	8.5	2.7	0.04*
Gutting	60.6	21.2	5.0	13.8	0.0	0.0	0.26
Filleting	64.7	15.2	0.0	13.1	7.0	0.0	0.40
Sticking	63.6	26.4	5.6	4.4	0.0	0.0	0.54

Source: Survey Data, 2017
Sig. = significance @ p≤0.05 level

The result in Table 5 shows the category-wise rankings of constraints encountered by respondents in fish farming. Majority (61.2%) of the respondents stated that lack of collateral security which ranked 1st was a very severe challenge encountered. This result was supported by Misra (1987) and Bhaumick *et al.* (1990), that the main problem in fish farming is lack of collateral security to obtain loan. Also majority (60.2%) of the respondents indicated high cost of feeding which ranked 2nd as a very severe constraint to fish production. About 59.2% of respondents also stated that inadequate extension services were also a major challenge experienced. The result is in agreement with Eze and Akpa, (2010) who noted that there was inadequate transfer of information to farmers by extension agents.

Table 5: Constraints militating against Fish farming in the study area

	Constraints	**Very severe**	**Severe**	**Not severe**	**Rank**
i.	Lack of collateral security	61.2	32	6.8	1st
ii.	High cost of fish feed	60.2	34	5.8	2nd
iii.	Inadequate extension services	59.2	31.1	9.7	3rd
iv.	Delay in supply of fingerlings	37.9	35.9	26.2	6th
v.	Insufficient labour	27.2	36.9	35.9	9th
vi.	Market price fluctuation	32	46.6	21.4	8th
vi.	Lack of modern fish farming facilities	43.7	39.8	16.5	4th
vii.	Water shortage during dry season	27.2	45.6	27.2	9th
viii.	Diseases, pest control and predators	18.4	41.7	39.8	15th
ix.	Storage/processing facilities	27.2	41.7	31.1	9th
x.	Tadpole mixed with fingerlings/juveniles	24.3	42.7	33	13th
xi.	Inadequate finance/credit facilities	42.7	37.9	19.4	5th
xii.	Lack of information on productive activities	34	55.3	10.7	7th
xiii.	Climate change	16.5	60.2	23.3	17th
xiv.	Low patronage	23.3	55.3	21.4	14th
xv.	Problem of flooding	25.2	57.3	17.5	12th
xvi.	Theft problem	18.4	67	14.6	15th

Source: Survey Data, 2017

The result in Table 6 showed that there was a significant relationship between age (χ^2 = 9.252, p = 0.026*), household size (χ^2 = 9.256, p = 0.010*) and their level of involvement in fish farming. The results showed that age and household size were major contributing factors to respondents' level of involvement in fish farming, indicating high dependency between level of involvement and age and household. This implied that age and household size influenced respondents' level of involvement in fish farming in the study area. This result agrees with Deji and Koledoye (2013), who noted a significant relationship between social characteristic of respondents and their level of farming technology practice.

Table 6: Chi-square analysis of Socio-economic characteristics of the Respondents and level of involvement in fish farming

Variables	χ^2-value	*p*-value	Decision
Sex	3.224	0.073	NS
Age	9.252	0.026*	S
Marital Status	7.575	0.056	NS
Religion	0.661	0.719	NS
Education	0.606	0.962	NS
Experience	0.850	0.837	NS
Household	9.256	0.010*	S

NS=Not Significant at 5% level of probability, S=*Significant at 5% level of probability

The results in Table 7 show a negative and significant relationship between involvement in household activities of the respondents and level of involvement in fish farming (r= -0.317, p< 0.01). This result implies that increase in household activities will lead to decrease in level of involvement in fish farming diminished in the study area. Results also showed a significant relationship between post-harvest activities of the respondents and level of involvement in fish farming (r= 0.614**, p<0.01). This result implies that post-harvest activities have positive effect on the respondents' level of involvement in fish farming in the study area. This result corroborates with Sobo *et al*. (2002) that post-harvest practices among women was germane to significant involvement in the fisheries sector in Lake Victory of Tanzania.

Table 7: Correlation analysis of respondent's involvement in their household activities

Variables	p-value	Correlation	Decision
Household activities vs. Level of involvement in fish farming	0.001	-0.317*	Significant
Post-harvest activities vs. Level of involvement in fish farming	0.000	0.614**	Significant

** Significant at 0.01 level (2-tailed), vs. = versus

Conclusion

The study was conducted to assess rural farmers' involvement in fish farming activities. Results showed that men were more involved at the various stages of fish farming except for marketing, frying, smoking and drying of fish where majority were found to be women. The result further showed that male farmers have higher level of involvement in fish farming than their female counterparts. The results further revealed that as household activities increases among the female respondents, their level of involvement in fish farming decreased. Post-harvest activities among both male and female respondents have positive effects on the respondents' level of involvement in fish farming in the study area. The results therefore call for policies aimed at training and re-training of farmers on innovations that will enhance fish farming for improvement on livelihoods and income. There is need to increase the number of extension visits with gender equity to enhance the involvement of rural farmers in fish farming, especially among female farmers. Gender mainstreaming in technological development through effective programmes among fish farmers should be organized consistently in the study area.

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