



## GENDER DIFFERENTIALS IN FRESH FISH PRODUCTION: IMPLICATIONS FOR FARMERS ACCESS TO CREDIT FACILITIES IN DELTA STATE, NIGERIA

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### Abstract

The study analysed gender differentials in fresh fish production and the implications for farmers' access to credit facilities in Delta State, Nigeria. Two agricultural zones of the state were purposively selected for the study and 45 respondents selected based on intensity of production. Descriptive and inferential statistics were used to analyze data generated. The socio-economic characteristics of the respondents showed that male (75.56%) dominated the fish business with many (68%) married and educated to tertiary level (62.22%). The mean household size and age of the respondents were about 7 persons and 53.67 years respectively. The result also showed that male farmers had more access to credit facilities than their female counterparts and had credit facilities with provision of collateral security. In addition, respondents average farm income was N658,823.53 and N472,727.27 for the male and female farmers respectively. The difference of N186,096.26 was significant at the 5% level. The results show that coefficients for age, gender and farm income were directly related to probability of access to credit and significant at 10% level, as well as education, marital status and farming experience at 5% level and household size at 1% level. The results therefore call for policies aimed at provision of free and affordable education to enable the fish farmers access and process information on credit in the study area. There is also need to encourage women and experienced fish farmers to increase production by adequate credit incentives to enhance income.

**Keywords:** Gender, fish production, income, education and farming experience

### Introduction

A good number of households in Nigeria depend on fish as their main source of animal protein and source of livelihood (Odebode and Arimi, 2011). This is because of its importance to man as well as some of its allied products. Some of these include; the provision of food for man and his animals, provision of recreation, its use in scientific studies, provision of medicine for man and the control of malaria in the tropics through preying on mosquitoes larvae (FAO, 2007). Odebode and Arimi (2011) noted that fish and fishery activities provide employment for those who engaged in various aspects of the sub-sector. It is also a source of foreign exchange to the country through exportation of fish and fish products, provides opportunity for recreation and it is a raw material for manufacturers and livestock industries. Despite the aforementioned, there still exists a continuous widening gap between supply and demand (Odebode and Arimi, *ibid*). Esobhawan and Ogunde (2011) noted that most successive governments in Nigeria have had several programmes [such as National Accelerated Fish Production Programme (NAFPP), Integrated Inshore Fish Programme (IIFP), Integrated

Aquaculture Fish Production Programme (IAFPP), Fish Seed Multiplication Programme (FSMP), Directorate for Food, Roads and Rural Infrastructure (DFRRI) and Monitoring, Control and Surveillance (MCS) for the country's territorial waters to prevent poachers from neighbouring countries from entering the country's territorial waters] to help bridge this gap. Even with all these programmes, the gap still seems to be widening (Esobhawan and Ogunde, 2011). The decline in fishery resources has an interface with poor enforcement of sustainable fisheries management practices (FAO, 2007). The report stressed that increased knowledge and dynamic development of fisheries, living aquatic resources, although renewable, are needed to be properly managed if their contribution to the nutritional, economic and social wellbeing of the teeming human population is to be sustained. Arnason (2001) argued that under fairly general conditions, the best fisheries management system is one that induces the fishing industry to produce maximum sustainable net profits.

Going by the aforementioned programmes advanced by the Federal Government to foster fish production, it is

convincing to assert that the government at the federal level is committed to increase the interest of the populace towards fish production. This interest cuts across gender differences. According to FAO (2007), gender is the relations between men and women both perceptual and material. The report also stressed that gender goes beyond its biological determination but encompasses its social construct. FAO (*ibid*) acknowledged that gender is a central organizing principle of societies and often governs the processes of production and reproduction, consumption and distribution. Gender difference as stated by Okwuokenye and Okoedo-Okojie (2018) affect the distribution of resources and responsibilities between men and women. The authors also stated that gender difference is shaped by economic, cultural, religious and ideological considerations.

More so, the place of women in food production from the farm, household security, family wellbeing, planning, production and many other aspects of life cannot be overemphasized (Okwuokenye and Okoedo-Okojie, 2018). Ekong (2003), indicated that about 95% of the farmers responsible for feeding the nation are women, and that the same women decision making ability has been relegated to the background by their male counterparts (Okoh *et al.*, 2010). Fish production cuts across gender differences but what is not clear is which group has more access to credit facilities and earns more from the production process. Though many studies like that of Ikpoza and Elijah (2018) examined profitability analysis of fish farming in Ese-Odo Local Government Area of Ondo State, Okwuokenye and Onemolease (2011) analysed the determinants of fresh fish marketing in urban areas of Delta State. Tafida *et al.*, (2014) examined the livelihood improvement following resilience intervention in fishing community on Niger River Basin, but none seemed to have focused on gender differentials in line with fresh fish production.

### Methodology

The study was carried out in Delta State, Nigeria. The State is one of the major oil producing states in the Niger Delta region of Nigeria. The State is bounded on the North by Edo State, on the East by Anambra and Rivers States, on the South by Bayelsa State and on the West by Ondo State and the Bight of Benin of the Atlantic Ocean. It lies within Latitudes 5° 00' and 6° 30' N, and Longitudes 5° 00' and 6° 45' E. It covers an area of approximately 17,698km<sup>2</sup> (DTSG, 2006) with a projected population of 5,663,400 as at 2016 (NPC, 2018). The indigenes of Delta State engage mostly in agriculture and fishing for their subsistence. The study was carried out in two agricultural zones of Delta State: Delta South and Delta Central. These agricultural zones were purposively selected and used for this study because of intensity of fish production and the inhabitants are known for fish rearing. From each zone, 2 Local Government Areas (LGAs) were selected: Isoko North and South selected from Delta South, while Ughelli North and South were selected from Delta Central. The LGAs were purposively chosen because of

intensity of fresh fish production in the area. Two towns were randomly selected from each LGA given total of 8 towns: Oleh and Irri (Isoko South), Ozoro and Oweh-Ologbo (Isoko North). Other towns were Ughelli and Ughweru (Ughelli North), and Out-Jeremi and Agbaro (Ughelli South). From each town, 6 fresh fish farmers were randomly selected, giving a total of 48 farmers for detailed study. Data were obtained from the farmers with the use of structured questionnaires (for literate farmers) and interview schedule (for non-educated farmers), which were administered to the farmers with the support of some community stakeholders. Out of 48 question instruments administered, forth-five (45) of them were suitable for analysis.

Both descriptive and inferential statistics were used to analyze the study. Descriptive statistics were used to analyze the farmers' socio-economic characteristics and access to credit facilities. The constraints militating against fresh fish production were measured on a 4-point Likert scale from very serious (4), serious (3), not too serious (2) and not a problem at all (1). The average weighted mean score was used to determine which constraints were serious and which were not. The average weighted mean score (2.50) was obtained as follows  $(4+3+2+1) / 4 = 2.50$ . Constraints with values of 2.50 and above are considered serious, while those with values less than 2.50 are regarded as not serious. A similar approach was adopted by Okwuokenye and Onemolease (2011) in determining constraints facing Agricultural Loan and Input Supply (ALIS) programme. Binary logistic regression was used to analyse the relationship between socio-economic characteristics of fresh fish farmers and access to credit facilities. The implicit form of the equation is expressed thus;

$$(1 + X)^n = \ln \frac{p}{1-p} = \beta_0 + \beta_i X_i + e \dots \dots (1)$$

Where,

- P = probability of occurrence
- 1 - P = probability of non-occurrence (Access to credit facilities)
- $\beta_0$  = coefficient of the constant term
- $\beta_i$  = coefficient of the independent variables
- $X_i$  = independent variables
- $X_1$  = gender (Male = 1; female = 0)
- $X_2$  = age (years)
- $X_3$  = educational status (years)
- $X_4$  = marital status
- $X_5$  = farming experience (years)
- $X_6$  = household size (number of people living and feeding together)
- $X_7$  = farm income (N)

T-test was used to analyze for significant difference in farm income of the male and female fresh fish farmers. The model is expressed thus;

$$\sqrt{\frac{\bar{X}_1 + \bar{X}_2}{\frac{\delta_1^2}{n_1} + \frac{\delta_2^2}{n_2}}} \dots\dots\dots (2)$$

Where,

- $\bar{X}_1$  = mean farm income (male)
- $\bar{X}_2$  = mean farm income (female)
- $\delta_1^2$  = standard error of farm income (male)
- $\delta_2^2$  = standard error of farm income (female)
- $n_1$  = number of respondents for male (34)
- $n_2$  = number of respondents for female (11)

**Results and Discussion**

The socio-economic characteristics of the respondents are shown in Table 1. From the Table, majority (75.56%) of the respondents were males while 24.44% were females. The dominance of male respondents in the fish business in the study area is an indication of the engagement of fish farming among males and this could be attributed to the tedious nature of the business. A larger proportion of the male farmers (76.47%), compared to their female counterparts (45.45%) were married. More married people in fish business is an indication that they have a sense of responsibility. Ikpoza and Elijah (2018) indicated gender difference in the fish business in favour of their male counterparts and dominance of married farmers in fish farm business. These results were in consonance with the findings of this study. Also, the results showed that many of the males (47.06%) and females (48.89%) were within the

age range of 51 – 60years. The result showed the mean age of the respondents (both male and female) was 53.67 years. This implies that most of the respondents were in their fairly advanced age group and so is likely to be judged to have the capacity for the farming activity, following the study of Okwuokenye and Onemolease (2011). The educational distribution of the respondents indicated that a larger proportion (70.59%) of the males attained tertiary education, while 45.45% of the females attained secondary education. The results imply that the respondents are literate and could be asserted to be favourably disposed to improved farm technologies. The reports of Okwuokenye and Okoh (2018) agreed with this finding that most of the present day farmers in Delta State are literates. About 50% of the male respondents have household size of between 7–9persons, while 45.46% of the females have 4 – 6 persons. The mean household size of both groups was 7persons, indicating large household sizes among the respondents. Some dependants may in turn serve as source of farm labour to the farmers. Similar household size was reported by Okwuokenye and Onemolease (2011). Many (41.18%) males had between 10 – 14 years of farming experience, while 45.45% of the females had 5 – 9years of experience, with the mean farming experience of 12.11 years. This indicates that the male respondents had more farming experience than their female counterparts. The large number of years of farming experience would go a long way in improving the farming skills in fish farming business.

**Table 1: Socio-economic Characteristics of the Respondents**

Characteristics	Categories	Male {n = 34 (75.56%)}		Female {n = 11 (24.44%)}		Pooled {n = 45 (100%)}		Mean
		Freq.	%	Freq.	%	Freq.	%	
Age	≤ 30	2	5.88	-	-	2	4.44	53.67
	31 – 40	2	5.88	1	9.09	3	6.67	
	41 – 50	4	11.77	2	18.18	6	13.33	
	51 – 60	16	47.06	6	54.55	22	48.89	
	>60	10	29.41	2	18.18	12	26.67	
Marital Status	Single	3	8.82	1	9.09	4	8.89	6.7
	Married	26	76.47	5	45.45	31	68	
	Divorced	2	5.88	1	9.09	3	6.67	
	Widow(er)	3	8.82	4	36.36	7	15.56	
Educ. level	Primary educ.	-	-	2	18.18	2	4.44	6.7
	Secondary educ.	10	29.41	5	45.45	15	33.33	
	Tertiary educ.	24	70.51	4	36.36	28	62.22	
Household size	< 4	4	11.77	2	18.18	6	13.13	6.7
	4 – 6	9	26.47	5	45.46	14	31.11	
	7 – 9	17	50.00	3	27.27	20	44.44	
	≥ 10	4	11.77	1	9.09	5	11.11	
Farming exp.	< 5	2	2.88	-	-	2	4.44	12.11
	5 – 9	8	23.53	5	45.45	13	28.89	
	10 – 14	14	41.18	3	27.27	17	37.78	
	15 – 19	5	14.71	3	27.27	8	17.78	
	≥ 20	5	14.71	-	-	5	11.11	

Source: Field survey, 2019

**Access to credit facilities among respondents by gender**

Results in Table 2 show the analysis of respondent's access to credit facilities by gender. The result revealed that only 32.35% males and none of the females patronized the commercial banks as source of their

credit (loans). Half of the number of males (50%) and few (36.36%) females sourced for their credit from micro finance banks. Cooperative societies were also identified as another source which most of the males (82.35%) and females (81.82%) got their funds from. This finding is an indication that cooperative societies in

the study area are meeting up with the primary reason for which they were formed. The results agreed with of the study of Kaine and Chukwuma (2017), who reported that males' accessed credit facilities more than females, and that the respondents have their main credit source as cooperative societies. In assessing the various sources, it could be asserted that male farmers had more access to credit facilities than their female counterparts. This assertion concurred with reports of FAO (2011), which stated that in relation to male counterparts, women experience gender gaps with less access to finance.

In line with source of start-up capital, half (50%) of the males indicated that they got their start-up capital from cooperatives, while most (81.82%) of the females identified cooperative societies and thrift as the sources of their business start-up capital. The results also showed that most of the sources of funds are not without conditions attached, as many (58.82%) of the males indicated that they were able to secure their credit after tendering the required collateral security. In contrast,

majority (72.72%) of the females secured their funds without tendering any collateral security. Suffice to say that, the imposition on females to tender collateral may be linked to the low level of trust the sources have for men. Through personal communication, the respondents ascribed more response of cooperative societies to female members due to their high level of commitment.

Thrift savings was also identified by the females as a major means of generating saving for their business. This finding corroborates with that of Okwuokenye and Okoedo-Okojie (2018). The authors reported high level of patronage of thrift savings. Other sources of credit facility to the respondents as indicated by males (38.24%) and females (81.82%) were family source and Osusu respectively. Results of Okwuokenye and Okoedo-Okojie (2018) also agreed that family source is another main source from where male farmers source credit, thus in line with findings of this study.

**Table 2: Access to credit facilities by Gender among the Respondents**

Source of finance	Category	Male (n = 34)		Female (n = 11)	
Credit facilities	- Collected loan from commercial bank	11	32.35	-	-
	- Collected loan from micro-finance bank	17	50	4	36.36
	- Collected loan from cooperative societies	28	82.35	9	81.82
Source of start-up capital	- From savings	16	47.06	5	45.45
	- From banks	9	26.47	3	27.27
	- From cooperatives	17	50	9	81.82
	- Thrift	11	32.35	9	81.82
	- Others	5	14.71	4	36.36
	- No collateral security	14	41.18	8	72.72
Conditions for loan provision	- Provision of collateral security	20	58.82	3	27.27
	- Friends	4	11.76	4	36.36
Other sources of funds	- Family	13	38.24	7	63.64
	- Osusu	-	-	9	81.82
	- LAPO loans	-	-	7	63.64
	- Other business(es)	-	-	2	18.18

*Source: Field survey, 2019*

#### Determinants of access to credit facilities

Binary Logistics regression was used to analyze influence of some socio-economic factors on access to credit facilities in the study area (Table 3). Gender, age, educational level, marital status, farming experience, household size and farm income jointly accounted for

about 62.85% of the variation in the farmers' access to credit facilities. All the variables had significant and direct relationship with probability of access to credit facilities in the study area. The variables were presented in the order of their beta-coefficient.

**Table 3: Logit Regression Estimates of Access to Credit Facilities among the Respondents in the Study Area**

Variable	Beta coefficient	Standard Error	t-value	Sig. level	Odd ratio
Constant	67093.76	12129.64	4.403	0.000	
Age	5834.346*	271.93	1.87	0.127	2.342
Educational level	3323.48**	319.72	4.73	0.000	3.196
Gender	2077.96*	117.24	2.61	0.056	0.027
Marital status	1464.21**	139.25	3.92	4.215	1.725
Farming exp.	439.28**	252.26	2.87	2.003	1.647
Household size	132.67***	34.66	5.73	5.871	2.411
Farm income	118.37*	27.50	2.38	0.001	2.031

*Source: Field Survey, 2019*

\* Significant at 10% level; \*\* Significant at the 5% level; \*\*\* Significant at the 1% level;  $R^2 = 62.85\%$

The coefficient of age was positively signed and significant at the 10% level of probability. The implication is that the older fish farmers are likely to have more access to credit facilities. This finding is in line with results of Okwuokenye and Okoedo-Okojie (2018), who acknowledged that older farmers are more likely to have more access to credit facilities and this was linked to the farmers' higher level of responsibilities which needed to be met. The odd-ratio was 2.342, implying that older respondents will have up to 2 times access to credit facilities than their younger counterparts. Educational level of the respondents was positively signed and significant at the 5% level. The result implies that the more educated respondents are likely to have more access to credit facilities. The result of Adisa and Akinkunmi (2012) confirmed this result. They stressed that education helps to broaden the scope of farmer's access to credit facilities. Educational level had an odd-ratio of 3.196, thus implying that educated farmers would have up to 3 times access to credit facilities than their non-educated counterparts.

Gender was positively signed and significant at the 10% level. It therefore implies that males have more access to credit facilities than their female counterparts. This may not be unconnected to the challenges or risks which males can take over compared to their female counterparts. This finding is in line with reports of FAO (2011), which stressed that male farmers have greater access to credit facilities than female farmers. The odd-ratio (2.027) showed that male farmers have 2 times access to credit facilities than their female counterparts. Respondents' farm income was positively signed and significant at the 10% level. The result implies that farmers with higher farm income are likely to have more access to credit facilities. The result is in line with that of Ogbonna and Nwaobiala (2015), which stated that farmers with higher farm income are much more likely to encounter more derived benefits including credit. The odd-ratio (2.031) indicates that farmers with higher income are likely to have 2 times access to credit facilities than farmers with lower farm income.

The coefficient of household size was also positive and significantly related at 1% level to farmers' probability

of access to credit facilities. This assertion is in agreement with the findings of Nagujja (2003). The author stated that larger household size enhances farmers' productivity and consequently his/her farm income which provides him/her the necessary collateral for access to credit facilities. The odd-ratio for household size was 2.411 which thus imply that farmers with larger household size will have 2 times access to credit facilities than those with smaller household size. The coefficient of farm experience was positive and significant at 5% level, indicating that the more farming experience farmers have, the more likely they are able to access credit facilities. Okwuokenye and Okoedo-Okojie (2018), indicated that more farming experience will better position the farmers to know their needs and how to go about solving them. The odd ratio was 1.647, which simply indicates that farmers with more farming experience will have about 2 times access to credit facilities than their counterparts with little farming experience. The coefficient of marital status was positively signed and significant at the 5% level. Since married farmers constitute the majority (68%), the result therefore implies that married farmers would be more likely to have access to credit facilities than other counterparts who belong to other categories. The odd ratio was however 1.725 indicating that married farmers would have about 2 times access to credit facilities than their other counterparts.

#### Effect of gender on income level of respondents

The results revealed that the average fish farm income of the male farmers was N658,832.53, while that of the female farmers was N472,727.27 (Table 4). The difference in income level between groups was N186,096.26, indicating that male fish farmers earn higher fish farming income than their female counterparts. The difference (N186,096.26) in the revenue was significant at the 5% level. Olakojo (2017) noted that gender gaps in farm output was marginally higher in males managed plots than female managed plots, and so in conformity with this finding. In further corroboration with this finding, the report of FAO (2011) stated that productivity and income of male farmers is usually higher than that of their female counterparts.

**Table 4: Effect of gender on income level of respondents**

Gender of farmers'	n	Mean Income (₦)	Difference (₦)	t
Male	34	658,832.53		
Female	11	472,727.27	186,096.26	24.348*

*Source: Field survey, 2019. \*Significant at the 5% level*

#### Constraints militating against Fresh Fish Production

The study found that there were many constraints faced by the respondents in the production of fresh fish in the study area (Table 5). Through personal communication, the respondents revealed that the challenges to a large extent lower their farm income. The challenges include; lack of storage facilities (mean = 3.05), insufficient capital / financial constraints (mean = 3.11) and theft of

fresh fish (mean = 3.43). Other constraints were high cost of fishing inputs (mean = 2.91), high cost of transporting materials to the farm (mean = 2.95) and abuse of power by fresh fish farmers association executive (mean = 2.62). These findings are in line with that of Esobhawan and Ogundele (2011) and Odebode and Arimi (2011). The authors acknowledged the factors mentioned were serious challenges plaguing fresh fish production among farmers. In addition to the challenges

mentioned, constraints associated with pests and diseases (mean = 2.51) as well as those from water management arising from flood (mean = 2.71) were

specifically identified by the respondents and followed the findings of Adebode and Arimi (2011) as factors militating against fresh fish production.

**Table 5: Constraints militating against fresh fish production among male and female fish farmers**

Constraints	Mean	Standard Dev.	Rank
- Theft of fresh fish	3.43*	0.68	1
- Insufficient capital / financial constraints	3.11*	0.88	2
- Lack of storage facilities	3.05*	0.79	3
- High transportation cost	2.95*	0.72	4
- High cost of fishing inputs	2.91*	0.71	5
- Problem of water management arising from flood	2.71*	0.81	6
- Abuse of power by fresh fish farmers executives	2.62*	0.62	7
- Pests and diseases	2.51*	0.69	8
- Payment of high association dues	2.21	0.57	9

**Source: Field survey, 2019. Serious constraint (mean  $\geq$  2.50)**

### Conclusion

The study assessed access to credit facilities in the study area among male and female fresh fish farmers and. The results show that the male farmers had more access to formal sources of credit facilities and this was possible with the provision of collateral security. Findings in this regard generally revealed that males are more favourably disposed to credit facilities than their female counterparts. The annual average farm income of male and female fresh fish farmers were N658,823.53 and N472,727.27 respectively, indicating that the males farmers were more successful in financial benefits derived from their fishing business. Several problems like theft, insufficient capital, lack of storage facilities, high cost of transportation, high cost of fishing inputs, flood and pest and diseases were among the important constraints militating against fresh fish farming in the study area and this could have affected the fish farmer's potentials in production. Factors like age, educational level, gender, household size and farm income were found to have significant relationship with probability of access to credit facilities. The study therefore calls for interventions aimed at provision of affordable and free education to enable farmers access and process information on credit facilities in the study area for increased production and income. There is also need for policies aimed at mitigating against gender disparities in credit access and provision of inputs and facilities to increase production.

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