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Constraints to Women Involvement in Fish Production in Anambra State, Nigeria

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Abstract

The study analysed constraints to women involvement in fish farming and processing in Anambra State Nigeria. Multi-stage sampling procedure was employed in selecting 90 women fish farmers. Data were analysed using percentage and mean as well as ordinary least square regression. The study revealed that the women mostly used concrete pond (65.6%), the majority (70.0%) have between 1 and 3 ponds. Catfish was mainly cultured by the women (86.7%). The foremost constraints faced by the women in fish farming were inadequate capital ($\bar{x} = 3.31$), inadequate land for expansion ($\bar{x} = 3.27$), and high cost of fish pond establishment ($\bar{x} = 3.23$). The coefficient of inadequate capital (-1.503) was significant at 1%, while the coefficients of inadequate land for expansion (-1.286), pre-occupation with other household chores (1.245), dominance by spouses (1.601) and high cost of fish pond establishment (-1.768) were significant at 5% significant level. Providing low interest loans to active and registered women fish farmers, revisiting and amending the 1999 land reform, encouraging women to form formidable cooperative societies, among others were recommended by the study.

Key words: Concrete pond, women, fish farming

Introduction

Women in Nigeria have always played a key role in the country's society and its economy. Rural women in most developing countries are the food farmers and carry the burdens of life. According to Grassi, Landberg, and Huyer, (2015), women support their households by producing more than half of all food worldwide, despite increasing

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competition over the natural resource base, which is being depleted by climate change and unsustainable practices. Barau and Oladeji (2017) posited that women perform five multiple roles which include; child-bearing, production of agricultural crops, home management, community organization, social, cultural and political activity.

In Nigeria, the involvement of women in agriculture has attracted greater attention in recent years. This is in recognition that women play significant roles in Nigeria's agricultural production, processing and utilization. On average, women contribute 43% of the agricultural labour force in developing countries, ranging from about 20% in Latin America to almost 50% in East and South-east Asia and Sub-Saharan Africa. In many African countries, up to 80% of farm labour is provided by women. This necessitates their integration into planning, policies and programs for effective and sustainable development of a nation. Hence, the role of women in agricultural production in developing nations cannot be overlooked (Barau and Oladeji, 2017).

Women play prominent roles in fish farming. They participate extensively and actively in all phases of work performed on fish farms. According to Ibrahim and Yahaya (2011), the participation of women in aquaculture extends to every aspect of fish farming like construction of pond, preparing fish feed, feeding the fish, cleaning of nets/cages and general maintenance and upkeep of ponds or cages. Other activities the women are engaged include fish harvesting, sorting of fingerlings and pond stocking (Luomba, 2013).

According to Okezie and Joshua, (2016), many women in Nigeria including Anambra State have taken up agribusiness vocations such as fish farming and others as a means of generating income and sidestepping the harsh reality and discriminating practices inherent in the corporate sphere. This is because these agro-enterprises provide women with unique solutions in overcoming poverty and balancing work and family commitments. According to Ayogu, and Agu (2015), the development and involvement of women in fish farming can be seen as one of the necessary conditions for economic growth. Women entrepreneurship contributes more than 50% to Gross Domestic Product (GDP) of most nations both developed and less developed. Its contributions to economic development have been predominantly in the area of job creation, poverty alleviation, environmental vitality, wealth creation and human capital. Hence, the significance of women in agricultural and economic development cannot be over-emphasized. With all the significant roles played and effort made by women in agricultural and economic development, their output still falls below the desired outcome (Nuhu, Donye, and Bawa, 2014).

Women contribute significantly to the national economies through their participation in agricultural production, processing and marketing. Despite their contribution, more than 60 percent of the world-poor are women and they have fewer options than men to escape poverty. The situation in Nigeria is not different. The benefits derivable from empowering the women folk are far reaching, starting with family advancement and

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ultimately touching on the national and global economic advancement (Babalola, Bajimi, and Isitor, 2015).

However, women in Nigeria are facing a lot of problems which to a large extent limit their potentials in agricultural development. Some of these problems include lack of access to credit, lack of access to information technology, lack of access to land, family dependence, restriction to family business with limited leadership role, lack of access to market, poor linkages to supportive services, finance, undue competition from larger and established agribusiness units, cultural inhibitions, discrimination of all sort, transportation facilities, competing family responsibilities among others (Ayogu and Agu, 2015; Nuhu *et al.*, 2014). These problems have reduced remarkably the volume and variety of production and employment possible for women. Women across the developing world are disadvantaged relative to men.

Since women constitute majority of the populace, if given equal opportunity as their male counterparts to participate effectively in agro-entrepreneurship, the agricultural output in Anambra State will be greatly enhanced. This means that meaningful agricultural development in the study area could be achieved by identifying those barriers militating against the participation of women in agro-entrepreneurship development, and formulating appropriate policy (Nuhu, Donye, and Bawa, 2014).

Furthermore, rural women spend long hours engaging in complex and multiple livelihood strategies, many of which are at the subsistence level: they grow crops, keep livestock, prepare food, collect fuel and water, care for their families and children, maintain their home, perform other household responsibilities, and sell and trade in the market place. They also provide cheap labour in agriculture and other rural enterprises, often in part-time, seasonal, low-paying jobs or as unpaid or underpaid workers in the informal sector that is not reflected in national accounts. Moreover, rural women's access to and control of land is severely limited. In developing countries, women constitute, on average, between 10 – 20% of all landholders. Without land, agro-based enterprise is impossible. When rural women do access land, tenure is insecure and their land plots are smaller and often have poor soil. Even when women do own land, management decisions are usually taken over by male relatives (Lamia, 2013). All these divergent factors tend to impede women participation in fish farming and other agroentrepreneurship areas.

According to Cliffe and Akinrotimi (2015), fish production is mostly considered as masculine venture, though women role in fish related activities is imperative and indispensable. However, women role is repeatedly being ignored and relegated, as a result of the primordial systems of social setting that is prevalent in the rural areas of many developing countries like Nigeria (Ibrahim *et al*, 2011). The non-recognition of women contribution in production process is worsened by uneven allocation of resources. Therefore, lack of access and control over productive process is one of the major factors limiting women participation in economic activities such as fish farming (Cliffe and Akinrotimi, 2015). Women in rural areas participate actively in the traditional fisheries sub-sector of the economy. They are either fully involved or play a

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complementary role for men in provision for their families. There is therefore the need to promote and encourage women folk in this sector, so as to boost supply of fish and improve the economic welfare of their families (Ekpo, 2013).

While different developmental efforts have been made to ensure greater productivity through extension services and other programmes e.g. the family support programme (FSP), Better Life Programme (BLP), women in agriculture (WIA), which were established to ensure quality life for women and which aimed to secure inputs and incentives to women farmers, the needed improvement in the general wellbeing of women farmers have not yet been acquired to the desired level. Moreover, it is still a debatable issue whether these programmes have made meaningful contribution in addressing the problems of women in agro-enterprise development particularly fish farming in Anambra.

Moreover, while there are scanty literatures on the problems of women in fish farming in Nigeria, it is possible that there are other issues and problems specifically faced by women in Anambra. Hence, it is pertinent to study the constraints encountered by women engaged in fish farming in Anambra State.

Purpose of study

The study examined constraints encountered by women in fish farming and processing in Anambra State, Nigeria. Specifically, the study identified the fish farming practices employed by the women in rearing fish and assessed the constraints associated with fish farming by the women in the study area.

Ho₁: There is no significant relationship between constraints associated with fish farming and the involvement of women in fish farming.

Methodology

The study was conducted in Anambra State Nigeria. Anambra state is one the states in the South Eastern Nigeria. The state is located in latitude 6°20' north and longitude 7°00' east. The state is made up of 21 Local Government Areas (LGAs) and four agricultural zones namely: Aguata, Anambra, Awka, and Onitsha. The state has a total land mass of 1,870 square metre and population density of 860/km² (2,200/sq mi). The 2019 population of Anambra state is estimated at 10,800,000. The population of the study consists of all the women fish farmers in Anambra State. Multistage sampling procedure was employed in selecting the sample for the study. The first stage involved a random selection of two out of the four agricultural zones in the state. In the second stage, three blocks were randomly selected from each of the selected zones. In the third stage, two cells were purposively selected from each of the selected blocks based on the intensity of fish farming, making a total of twelve cells. From each of the selected cells, at least seven (7) women fish farmers were purposively selected. This is due to the fact that there is limited number of women fish farmers. Thus, a sample size of ninety (90) women fish farmers was used for the study.

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Primary data was used for this study. The primary data were generated through the use of structured questionnaire administered to the women fish farmers. Percentage and mean were used to realize the objectives. The constraints associated with women involvement in fish farming were measured on a 4-point Likert-type scale, categorized as 4 = strongly agree (SA), 3 = agree (A), 2 = disagree (D), 1 = strongly disagree (SD). The mean of 2.5 was used as cut-off in making decision. Ordinary least square regression analysis was used in testing the hypothesis.

The functions were explicitly specified thus:

Linear function:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + e_i \dots\dots\dots 3.2$$

Semi log function:

$$Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + e_i \dots\dots\dots 3.3$$

Double log function:

$$\log Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + e_i \dots\dots\dots 3.4$$

Exponential function:

$$\log Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + e_i \dots\dots\dots 3.5$$

Where:

Y = dependent variable (women involvement in fish farming) (mean count)

e_i = stochastic error term

b_0 = Intercept

$b_1 - b_8$ = Parameters to be estimated

$X_1 - X_8$ = Independent variables (Constraints)

Where:

X_1 = Inadequate capital

X_2 = High cost of feeds

X_3 = Inadequate land for expansion

X_4 = Low patronage/ low selling price of fish

X_5 = Pre-occupation with other households chores

X_6 = Inaccessibility to credit

X_7 = Inadequate technical know-how

X_8 = Dominance by spouse

X_9 = Inadequate extension visits

X_{10} = High cost of fish pond establishment

Results and Discussion

Fish Farming Practices Used by the Women in Rearing Fish

Table 1 shows the results of the fish farming practices of the women fish farmers. These include the pond type, number of ponds, stock size and fish species. The result revealed that most of the women (65.6%) used concrete pond for their fish farming, 15.6% used tarpaulin while 14.4% used plastic pond. This shows that concrete pond is the dominant fish pond by the women in the study area. This could be due to its durable nature.

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The result in Table 1 also reveal that the majority of the women (65.6%) have between 1 and 3 ponds, 27.8% have between 4 and 6 ponds, while 2.2% have 7 ponds and above. The mean number of ponds of the women is approximately 3 ponds. However, 34.4% of the women have stock size of above 500 fingerlings, 32.2% have stock size of between 201 and 300 fingerlings while 30.0% have less than 200 fingerlings. The mean stock size of the women fish farmers was approximately 735 fingerlings. The stock size of a farmer is an important determinant factor of the income base of the farmer. Furthermore, the results in Table 1 reveal that the majority of the women (86.7%) culture mainly catfish (*Heterobranchus* and *Clarias Spp*), 8.9% culture tilapia (*Oreochromis niloticus*) while 4.4% culture both Tilapia and catfish. Olaoye *et al* (2013) in similar result attributed the preference of fish farmers in culturing catfish over other fish species to high market price, greater demand preference, hardiness of the stock, fast growth, high feed conversion ratio, high survival rate under captivity, and generally acceptance of catfish by the people.

Table 1: Fish farming practices used by the women in rearing fish

| Variables | Percentage (n = 90) | Standard deviation |
|--|---------------------|--------------------|
| Pond types | | |
| Earthen pond | 2.2 | 0.207 |
| Concrete pond | 65.6 | 0.478 |
| Plastic pond | 14.4 | 0.354 |
| Tarpaulin | 15.6 | 0.366 |
| Number of ponds | | |
| 1 – 3 ponds | 70.0 | 0.563 |
| 4 – 6 ponds | 27.8 | |
| 7 pond and above | 2.2 | |
| Mean number of ponds | 2.9 | |
| Stocking rate | | 0.375 |
| ≤ 200 | 30.0 | |
| 201 – 300 | 32.2 | |
| 301 – 400 | 1.1 | |
| 401 – 500 | 2.2 | |
| > 500 | 34.4 | |
| Mean stocking rate | 734.6 | |
| Fish species | | 0.488 |
| Catfish (<i>Heterobranchus</i> and <i>Clarias Spp</i>) | 86.7 | |
| Tilapia (<i>Oreochromis niloticus</i>) | 8.9 | |
| Mixed (Both catfish and tilapia) | 4.4 | |

Source: Field survey, 2019

Constraints Associated with Women Involvement in Fish Farming

Table 2 shows the results of the constraints associated with women involvement in fish farming. The results in Table 2 reveal that the foremost constraints faced by women in fish farming were inadequate capital ($\bar{x} = 3.31$), inadequate land for expansion ($\bar{x} = 3.27$) and high cost of fish pond establishment ($\bar{x} = 3.23$) being ranked 1st, 2nd, and 3rd respectively. Other constraints faced by the women in fish farming include inaccessibility to credit ($\bar{x} = 3.19$) and high cost of feeds ($\bar{x} = 3.12$). Fish farming is mostly capital intensive. And most women are greatly confronted with the problems of inadequate capital and lack or inadequate land. These constraints most times hinder involvement of women who might be interested in fish farming and also deter women fish farmers from expanding their fish farming enterprise. This finding corroborates with

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that of Ibrahim and Yahaya (2011) where inadequate capital was also found as the foremost constraint to women involvement in fish farming. Similarly, in Aliyu and Ahmad (2018), inaccessibility to credit was found as the foremost constraint to women involvement in fish farming.

Table 2: Constraints associated with fish farming by the Women

| Constraints | \bar{x} | Std. Deviation |
|--|-----------|----------------|
| Inadequate capital | 3.31* | 0.895 |
| Inadequate land for expansion | 3.27* | 1.026 |
| High cost of fish pond establishment | 3.23* | 0.849 |
| Inaccessibility to credit | 3.19* | 0.898 |
| High cost of feeds | 3.12* | 0.922 |
| Dominance by spouse | 2.44 | 0.823 |
| Inadequate technical know-how | 2.39 | 0.920 |
| Low patronage/ low selling price of fish | 2.37 | 0.977 |
| Pre-occupation with other household chores | 2.16 | 0.833 |
| Inadequate extension visits | 2.08 | 0.997 |

Source: Field survey, 2019

* = constraints

Relationship between Constraints Associated with Fish Farming and Women Involvement

Table 3 shows the ordinary least square regression result of relationship between constraints associated with fish farming and the involvement of women in fish farming. From the result, the semi-log function was chosen as the lead based on the magnitude of the coefficient of determinations and F-ratio, number of significant independent variables, and conformity of the signs of the significant regression coefficient to *a priori* expectation. The F-ratio of 3.231 which is significant at 1% significant level indicates the goodness-of-fit of the model. The co-efficient of determination (R^2) of 0.679 indicates that about 67.9% of the variations in women involvement in fish farming were explained by the constraints associated with fish farming and processing. From Table 3, the coefficient of inadequate capital (-1.503) was negative and significant at 1%. This shows that women involvement in fish farming is reduced as they are besieged with the problem of inadequate capital. According to Okpeke and Akarue (2015), majority of small scale farmers in Nigeria depended solely on their personal savings to finance their production for lack of credit facilities, hence inhibiting them from venturing into their desired agripreneurship ventures. The coefficients of inadequate land for expansion (-1.286) was negative and significant at 5%. This entails that women involvement in fish farming is reduced as they are constrained with inadequate land for expansion. The co-efficient of the problem of pre-occupation with other household chores (1.245), dominance by spouses (1.601) and high cost of fish pond establishment (-1.768) were all negative and significant at 5% significant level. This entails that the women

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involvement in fish farming is reduced as they are being inundated by these constraints. According to Usman, Girei and Tari (2016), the more the constraints fish farmers faced, the lower their adoption of the technologies. Similarly, Oyediran, Omoare, Oladoyinbo, Ajagbe and Dick, (2016) found a significant relationship between constraints and utilization of low-cost fish processing technologies among women fish processors.

Table 3: Relationship between constraints associated with fish farming and women involvement in fish farming

| Parameters | Linear | Exponential | +Semi-log | Cob Douglas |
|---|----------------------|----------------------|----------------------|----------------------|
| Constant | 29.617 (19.915)** | 3.398 (77.656)** | 30.177 (25.049)** | 3.414 (96.182)** |
| Inadequate capital | -0.493 (-2.354)** | -0.014 (-2.342)** | -1.503 (-2.804)** | -0.044 (-2.594)** |
| High cost of feeds | -0.120 (- 0.316) | -0.004 (- 0.345) | -0.218 (- 0.214) | -0.007 (-0.232) |
| Inadequate land for expansion | -0.572 (-1.861)* | -0.017 (- 1.917)* | -1.286 (-2.365)** | -0.039 (-2.217)** |
| Low patronage/ low selling price of fish | -0.408 (-1.381) | -0.012 (-1.434) | -0.757 (-1.222) | -0.023 (-1.249) |
| Pre-occupation with other households chores | -0.663 (-2.028)** | -0.020 (-2.053)* | -1.245 (-2.370)** | -0.037 (-2.263)** |
| Inaccessibility to credit | 0.294 (0.708) | 0.009 (0.713) | 0.321 (0.298) | 0.010 (0.305) |
| Inadequate technical know-how | 0.195 (0.631) | 0.005 (0.543) | 0.499 (0.753) | 0.013 (0.664) |
| Dominance by spouses | -0.593 (-1.778)* | -0.018 (-1.784)* | -1.601 (-2.317)** | -0.047 (-2.310)** |
| Inadequate extension visits | 0.159 (0.606) | 0.005 (0.681) | 0.234 (0.449) | 0.008 (0.512) |
| High cost of fish pond establishment | -0.633 (-2.317)** | -0.019 (-2.224)** | -1.768 (-2.073)** | -0.052 (-2.072)** |
| R-square | 0.618 | 0.631 | 0.679 | 0.647 |
| R-Adjusted | 0.466 | 0.482 | 0.532 | 0.513 |
| F – ratio | 3.142*** | 3.358*** | 3.231*** | 3.208*** |

Source: Computed from field survey, 2019

Key: *, ** and *** is significant at 10%, 5% and 1% level of probability respectively
+ = Lead Equation and the values in bracket are the t-values.

Conclusion and Recommendations

Women involvement in fish farming is besieged by several bottlenecks. The foremost being inadequate capital, inadequate land for expansion, and high cost of fish pond

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establishment. Encouraging active women participation in fish farming requires that these constraints be adequately addressed. Hence, the government and financial institutions should give loans to active and registered women fish farmers at considerable interest rates but with proper monitoring to ensure its effective use for the purpose so as to increase their production levels and profitability. Since the women are faced with the problem of inadequate land, there is need to revisit and amend the 1999 land reform such as to ensure that a large expanse of land is mapped out for agripreneurial areas such fish farming, snailery, livestock and bee farming for women and youths who might want to venture into such areas. Local nutritive fish feeds should be made readily available in the markets as this will help in the long run to reduce the demand and cost of foreign feeds. Government and NGOs should organize training on fish feed formulation, raising of fingerlings and disease control for women involved in fish production in order to help them hone skills that will enhance their fish farming enterprise.

References

- Aliyu, A.A. and Ahmad, H. (2018). Analysis of fishing technology and fish production by women in small scale fish farming in Katsina Metropolis Katsina State, Nigeria. *Scholarly Journal of Agricultural Science*, 8(1): 11-15.
- Ayogu, D.U. and Agu, E.O. (2015). Assessment of the contribution of women entrepreneur towards entrepreneurship development in Nigeria. *International Journal of Current Research and Academic Review*, 3(10): 190 – 207.
- Babalola DA, Bajimi, O and Isitor, S.U (2015). Economic potentials of fish marketing and women empowerment in Nigeria: Evidence from Ogun State. *African Journal of Food, Agriculture, Nutrition and Development*, 15(2): 9922 - 9934.
- Barau, A. A. and Oladeji, D. O. (2017). Participation of urban women in agricultural production activities in the Sokoto Metropolis, Nigeria. *Journal of Natural Resources and Development*; 7: 84- 90.
- Cliffe, P.T. and Akinrotimi, O.A. (2015). Role of women in fishery activities in some coastal communities of Rivers State, Nigeria. *International Journal of Agricultural Research*, 10(1): 24-32.
- Grassi, F., Landberg, J., and Huyer, S. (2015). Running out of time: The reduction of women's work burden in agricultural production. *Food and Agriculture Organization of the United Nations, Rome*.
- Okezie, C.R and Joshua, A. (2016). Analysis of women entrepreneurship development in agribusiness sector in Benue State, Nigeria. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 16(3): 177 – 184.

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Okpeke, M.Y. and Akarue, B.O. (2015). Analysis of the profitability of fish farming in warri south local government area of Delta State, Nigeria. *IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)*, 6(12): 45-51.

Oyediran, W.O., Omoare, A.M., Oladoyinbo, O.B., Ajagbe, B.O. and Dick, T.T. (2016). Constraints Limiting the Effective Utilization of Low-Cost Fish Processing Technologies among Women in Selected Fishing Communities of Lagos State, Nigeria. *Fisheries and Aquaculture Journal*, 7(4): 1-5.

Usman, I. S., Girei, A. A. and Tari, B. I. (2016). Analysis of the constraints to the adoption of improved fish farming technologies by farmers in Yola North and South Local Government Areas of Adamawa State, Nigeria. *Asian Journal of Agricultural Extension, Economics & Sociology*, 10(2): 1-6.