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Gender Analysis of Culture Fish Enterprises in Epe Local Area of Lagos State, Nigeria

Afodu osagie john[a*], Makinde Yetunde Olawunmi[b], Bello Ayodeji Taofeek[c], Ndubuisi-ogbonna Lois Chidima[d], Akinboye Olufunso Emmanuel[e]

[a,c]*Department of Agricultural Economics & Extension*

[b]*Department of Nutrition and Dietetics*

[d]*Department of Animal Science*

[e]*Department of Agronomy and Landscape Design, School of Agriculture and Industrial Technology Babcock University, Ilishan-Remo, Ogun State, Nigeria*

[a]*Email: oafodu@gmail.com*

Abstract

Understanding the role that gender plays in fish culture enterprises is critical for designing agricultural policies to increase productivity and enhance economic growth and to reduce poverty. The research investigated gender analysis of culture fish enterprises in Epe Local Area of Lagos State, Nigeria. This was achieved through random selection of 149 respondents. The method of analysis used was descriptive analysis to determine the socio economic characteristics of the fish farmers; production function was applied to examine technical efficiency. The results showed that 54.4% were male and 45.6% were female. Majority of the respondents (67.9% male and 55.9% female) were married and (32.1% male and 44.1% female) were in the single category. It also revealed that 23.5% male and 17.6% female went through tertiary education. 43.2% male and 36.8% had about above 6 years experiences in the business, 43.2% male and 42.6% female started their business with their own personal savings and 66.7% male and 70.6% female farmers purchased their land.

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* Corresponding author.

The maximum likelihood estimation of the stochastic production frontier shows that the mean technical efficiency is 0.75 for both male and female farmers. The results also reveal that coefficients of pond size and labour are positive and significant for male farmers, while for the female counterpart years of farming experience, pond size and labour are positive and significant. It was recommended that young people should be encouraged to practice fish farming, and also involve in carrying research on fish farming as this may help in solving the problem of food security and food sufficiency.

Keywords: Gender; Culture fishing; Technical Efficiency; Socio-economic Stochastic frontier.

1. Introduction

Fish farming is an age long livelihood practice in the world. Although fish culture has long existed in Africa, it first started in Nigeria in 1942 [1]. Nigeria with a long coastline of 853/Kilometers has wide potential for fishery enterprise [2]. There is also a vast network of inland waters like rivers, flood plains, natural and man-made lakes and reservoirs that allow for fish farming [3]. The country has a strong fish culture supported by natural catch, it accounted for less than 20% of fish supply in Nigeria in 2007 [4]. The fish industry remains the most untapped investment potential in Nigeria [5].

The 1970-1974 prolonged drought that decimated the population of livestock in the Northern part of Nigeria contributed to the problem. All these have made other sources of animal protein to become a scarce with increased prices. This situation has shifted the demand for animal protein to fish.

The world's natural fish supply, though renewable, has finite production limit. This cannot be exceeded even under the best management regimes. For most of our lakes, rivers and oceans, the maximum sustainable fishing limit has been exceeded [6]. Therefore, fish supply will come from aquaculture to bridge the demand - supply gap so as to ensure food security [7]. Aquaculture is the farming of aquatic organisms such as fish, crustaceans, mollusks and aquatic plants [8]. It involves the cultivating of fresh and salt water population under controlled conditions.

Commercial fish farming is yet to become widespread [9]. At present, most fish farmers operate small scale ranging from homestead concrete pond (25mX40m) to small earthen pond of between 0.02 hectare and 0.2 hectares.

The domestic fish production is however inadequate to meet the increased fish demand.

Production and productivity is consistently low due to under performance of fish farmers in fish use of inputs. FAO opined that any increase in productivity will definitely increase the living standard of the fish [10] farmers. However, the inefficient use of fish inputs by the farmers constitute a production problem that calls for empirical quantification

The fish industry produced over 30,000 tons of fish in 2000, 24398 tons in 2001, 30664 tons of fish in 2002, 3067 tons in 2003, 43930 tons in 2003 and 43930 tons in 2004 [11,12]. The industry has contributed about 4

percent to the agricultural Gross Domestic Product (GDP) of the country.

Fish occupies a unique position in Nigeria. It is the cheapest source of animal protein consumed by the average Nigerian, accounting for up to 50% of the total animal protein intake [13]. With diminishing returns from over fishing in capture fisheries, aquaculture has been growing at some 20% per year since 2003 in Nigeria and continues to attract many investors and new farmers.

Gender Issues in Culture Fish Enterprise

Understanding the role that gender plays in agricultural production is critical for designing agricultural policies to increase productivity and enhance economic growth and to reduce poverty. Although there is increasing awareness of the importance of including women in agricultural policies, either through explicit programs for women or through mainstreaming approaches, key data gaps still exist that inhibit the development of appropriate policies and monitoring their progress.

However, women's roles and the extent of their participation in aquaculture value chains, for fish, shrimp, seaweed and crab, are extensive — much higher than in capture fisheries.

The promotion of aquaculture as a development strategy for women has been partially based on the perception that it is an extension of women's domestic tasks [14], allowing integration with home gardening, household chores and child care. In many countries in South Asia and Africa, there is ample scope for increasing women's participation in and income from aquaculture through improved extension services, innovations, policies and institutional practices that are directed towards women [15]. It is generally accepted that women participate actively and efficiently in the rural economy due to their social and economic roles. They are the mainstay of small scale agriculture and backbone of agricultural labour force.

Most importantly is that they are either been ignored or underestimated in efficient input combination [16]. In the fishery sub sector in particular, men have always been the target of the extension agents despite the fact that without the indispensable labour provided by their womenfolk, men operating fish farms would be saddled with more work than they can handle. Even though there is no consensus on quantifying the efficient role of women in livestock production, there is clear indication that their contribution is quite significant.

Gender disparities in aquaculture can result in lower labor productivity within the sector and inefficient allocation of labor at household and national levels. In many developing countries, customary beliefs, norms and laws, and/or unfavorable regulatory structures of the state reduce women's access to land and water resources, assets, technology and decision-making [17,18,19]

This confines them to the lower end of supply chains within the so-called "informal" sector [20] Even though they use aquatic resources, they are rarely consulted in attempts to manage these resources. The differential impacts of and contribution to ecological degradation and depletion of aquatic resources by women and by men are often overlooked. These disparities are likely to be exacerbated by climate change [21]. While women bear the brunt of the costs of gender inequities, these costs are distributed widely and are a cause of persistent

poverty for all members of the society. Addressing gender inequities by improving women's incomes and educational levels, along with their access to information, technology and decision making processes, not only enhances human capabilities of the household but also augments it at the societal level is essential..

The passion for fish farming has increased over the years rapidly as a result of the awareness of the importance of this practice to individuals and the economy at large, as well as the advantage attached to it. The government of Nigeria has shown its interest through setting up of various national programme and project such as the aquaculture and inland fishery project (AIFP), National Accelerated Fish Production Project (NAFPP), Fishing Terminal Projects (FTP), Fisheries Infrastructures Provision/Improvement (FIP), Presidential Initiative Aquaculture (PIA) [22].

Despite all the efforts of National Accelerated fish Production Project (NAFP) in Nigeria toward improving the efficiency of fish farmers as well as to increase per capita income of indigenous fish farmers, the project did not yield expected outcomes due to poor implementation, poor monitoring and evaluation of the project. This study therefore examine the analysis of gender impact on efficiency of fish production in Epe Local Government Area of Lagos State. The purpose of assessing the attained and the attainable levels of production of the fish farmers. The result could point to the need for resource savings and or area of improvement in fish production.

2. Materials and Methods

2.1 Area of Study

The study was carried out in Epe Local Government Area of Lagos State Nigeria. Epe is situated at longitude 6.58° North latitude 3.98° East. Epe lies about 86Kms North-east of the city of Lagos. Epe consist of so many divisions which includes the Eko Aworis. Olomowewe, Ibeju, Lekki, Akodo, Orulu, Magbon-Alade, Oriba, Iwerekin, Iberekedo, Idaso, Orimedu, Olorunkoya, Ojita, Ibonwon, Ode-Ifa, Ofin, Igbesibi and Igbolomi, Awoyaya, among others.

A peculiar feature of Epe is the presence of a long range of hills, which demarcates the coastal town into equal parts.

Fishing and farming form the major occupations of the inhabitants of this area.

Modern Epe is a collecting point for the export of fish, cassava (manioc), corn (maize), green vegetables, coconuts, cocoa, palm produce, rubber, and firewood to Lagos.

Epe is best known for its construction of the motorized, shallow-draft barges that navigate the costal lagoons. According to the 2006 Census the population of Epe was 181,409.

2.2 Sources of Data

Data for this study were mainly primary data. The primary data were collected with questionnaires that were

administered to fish farmers in the study area during the field work.

2.3 Sampling Techniques

A two stage sampling techniques was employed in this study. First, purposive sampling procedure was adopted in the selection of Epe Local Government Area for the study. This is because of the predominant fish farming activities. A stratification of fish farmers was made from the list of registered fish farmers in the area. This was followed by the selection of 70% of the fish farmers in the list using a stratified random sampling. This account for a true representation of the population since they do not have equal numbers of farmers in the area.

2.4 Study Population and Sample Selection

The study population comprises of people with aquaculture or culture fishery in Epe Local Government Area of Lagos State. Samples were drawn from blocks as classified by Agricultural Development Programme of the area. Data were drawn from a total of 149 respondents selected from both gender.

2.5 Analytical tool

Various analytical tools were used to achieve the objectives of the study. These include: descriptive statistics and stochastic frontier production function.

2.6 Stochastic Frontier Production Function

The model of the stochastic frontier production for the estimation of technical efficiency is

Specified as:

$\ln Yi = \beta_0 + \beta_1 \ln Z_1 + \beta_2 \ln Z_2 + \beta_3 \ln Z_3 + \beta_4 \ln Z_4 + \beta_5 \ln Z_5 + \beta_6 \ln Z_6 + Vi - Ui$ ……Equation 1

Y = Output of the farmers in kg.

Z_1 = Hire Labour input use in production in man-day

Z_2 = Pond Size in (ha).

Z_3 = Family Labour in (Man-day)

Z_4= Farming Experience in (years)

Z_5 = Feed in (kg)

Z_6 = Fingerlings in (kg)

β's = Parameters to be estimated.

In's = Natural Logarithms

Vi = The symmetric component that captures random error associated with random factor under the control of fisheries farmers.

Ui =The asymmetric error component represents the deviation from the frontier production (the technical inefficiency).

3. Results and Discussion

Table 1: Distribution of Respondents by Gender

Sex	Frequency	Percent	Mean Efficiency
Male	81	54.4	0.92
Female	68	45.6	0.94
TOTAL	149	100	

Sources: Field Survey, 2013.

Out of the respondents, 54.4% were male while 45.6% were female. This shows that men are more involved in fishery production, while women are into post-cropping operations like marketing and processing into consumable product, this is in line with [23], who investigated children's involvement in fish production in waterside local Government Area, Ogun State, Nigeria. Multi-stage technique was used. The findings of the research showed that male children dominated fish catching and net making and mending while the female children were mainly involved in processing. All other activities in which the children were involved were water fetching, fish marketing, fish processing and fish storage among others gave no significant difference on gender basis.

Table 2: Distribution of Respondents by Age

Age	Male		Female	
	Frequency	Percent	Frequency	Percent
<30 years	13	16	15	22
31-40 years	20	24.7	13	19.1
41-50 years	29	35.8	22	32.4
>51years	19	23.5	18	26.5
Total	81	100	68	100

Sources: Field Survey, 2013

Age is an important factor in traditional Agriculture. It determines farmer's productive ability and consequently his output. This is because farming is still labour intensive in this part of the world and traditional agriculture

production system relying on rudiments implements powered by human muscle. Therefore, beyond certain age, farmer's productivity begins to decline. The table below shows the analysis of age, the modal age for both male and female was 41-50 years, which means that majority of the fishery farmers interviewed were in their middle age and some old. This has effect on productivity.

[24] Farming population is ageing thus reducing the effective labour force from agricultural productivity. Result shows that younger people are rarely engaged in farm work as they have migrated to urban areas for non-farming occupation.

Table 3: Marital Status of Respondents

Marital Status	Male		Female	
	Frequency	Percent	Frequency	Percent
Married	55	67.9	38	55.9
Single	17	20.9	21	30.9
Widowed	5	6.2	5	7.3
Widower	4	4.9	4	5.9
Total	81	100	68	100

Sources: Field Survey, 2013

This shows the number of dependents, which fishery farmers have to cater for as part of his responsibility. From the table, majority of the sampled farmers both male and female were married. The married male were 67.9% while their married female counterpart were 55.9%, male singles were 20.9%, while that of the female were 30.9.

Table 4: Distribution of Respondents by Household Size

Household Size	Male		Female	
	Frequency	Percent	Frequency	percent
2-4	30	37.1	16	23.5
5-7	45	55.6	41	60.3
>8	6	7.4	11	16.2
Total	81	100	68	100

Sources: Field Survey, 2013

The household size is an important socio-economic characteristic because it often times determines how that household size distribution of sampled farmers.

Table 5: Level of Education of Respondents

Educational Level	Male		Female	
	Frequency	Percent	Frequency	Percent
No Formal Education	12	14.8	7	10.3
Primary	20	24.7	22	32.4
Secondary	30	37.0	27	39.7
Tertiary	19	23.5	12	17.6
Total	81	100	68	100

Sources: Field Survey, 2013

Table 5 shows that 14.8 % of the 81 male respondents had no formal education, while that were 10.3%, 24.7% of the male earned primary education, that of the female is 32.4%. That of the secondary education for both male and female were 37.0% and 39.7% respectively. For Tertiary education, the male were 23.5% while the female were 17.6%. This implies that education plays a significant role in skill acquisition and knowledge transfer. It enhances technology adoption as well as the ability to plan and take risks. The distributions of the educational attainment of the respondents show that most of the fish farmers had secondary education as the highest educational attainment.

This result is in conformity with [25] who asserted that educated fisher folks have greater likelihood to understand the working mechanism of the motorized engines and therefore should be able to use it more than the illiterate class of fisher folks.

Table 6: Distribution of Respondents by Years of Farming Experience

Farming Experience	Male		Female	
	Frequency	Percent	Frequency	Percent
<5	24	29.6	25	36.8
6-10	35	43.2	25	36.8
11-15	16	19.8	13	19.1
>16	6	7.4	5	7.4
Total	81	100	68	100

Sources: Field Survey, 2013

The number of years of farming of fish farmers will determine how he will organized his resources in order to achieve level of production. More experienced and educated farmers realize a high productive efficiency and output.

The years of farming experience of farmers affect the level of productivity and efficiency.

Majority of the sampled framers have been in farming operation for a long time.

Table 6 show that 29.6% male and 36.8% female respondents have between less than 5 years of farming experience. About 43.2% of the male and 36.8 of the female had been in the business for between 6 and 10 years; while 20% of both gender them have much long experience (that is between 11 and 15 years) while few of them have a much longer experience.

Table 7: Distribution of Respondent by Farm Size

Farm Size (ha)	Male		Female	
	Frequency	Percent	Frequency	Percent
0-0.5	16	19.8	12	17.6
0..6-1.0	30	37.1	34	50.0
1.1-1.5	20	24.7	10	14.7
1.6-2.0	5	6.2	11	16.2
>2.1	10	12.3	1	1.5
Total	81	100	68	100

Sources: Field Survey, 2013

Farm size is a factor that affects the level of output. Nigeria agriculture is characterized by small farm holdings [26]. Therefore small size invariably leads to small output. The table shows that majority of the farmers are involved in the cultivation of small and medium size farmland.

3.1 Estimated Production Function for Fish Farmers

The results in Table 8 show the Maximum Likelihood Estimates (MLE) of the stochastic frontier for male and female fish farmers in the study area. As indicated in the Table, the estimated variance (6^2) was significant at 1 percent level of probability for both male and female farmers indicating goodness of fit and correctness of the specified distribution assumption of the composite error terms.

The estimated values of the gamma (y) were not significant at any level for male farmers and female fish farmers and the coefficients for gamma were 0.62 and 0.93 for male and female farmers respectively implying that 62% and 93% variability in fish output for the male and female farmers respectively was due to technical inefficiency.

The coefficients for pond size have the desired positive signs and were highly significant at 5% and 1% level of probability for both male and female farmers respectively. The coefficients for quantity of feed were also positive but not significant at any level of probability for the male and female farmers respectively.

The coefficient for labour was positively and significantly related to fish output at 10% and 5% level of probability for both female farmers respectively.

Table 8: Results of maximum likelihood estimate of the stochastic frontier production functions for technical efficiency (male and female fish farmers).

Variables	Male			Female		
	coefficient	Std. error	t-value	coefficient	Std. error	t-value
Constant	0.106	0.440	0.241	0.104	0.576	0.181
ln Exp	0.287	0.854	0.336	-0.876	0.111	-7.892***
ln pond	0.310	0.123	2.520**	0.802	0.144	5.569***
ln fingerlings	-0.540	0.825	-0.655	0.409	0.435	0.940
ln feed	-0.845	0.999	0.846	0.100	0.999	0.100
ln labour	0.182	0.118	1.542*	0.289	0.115	2.513**
Sigma- square ($ss^2= du^2+ dv^2$)	0.182	0.896	0.203	0.251	0.238	1.055
Gamma ($g=du^2 / dv^2$)	0.619	0.899	0.689	0.926	0.695	1.332
Log (likelihood)(qo)	0.899		-0.847			
Mean Technical efficiency			0.75			0.75

Source: Field Survey, 2013

*Significant at (P<0.01), ** Significant at (P<0.05), *** Significant at (P<0.10).

4. Summary, Recommendation and Conclusion

4.1 Summary of major Findings

This study focused on the gender analysis of culture fish enterprises in Epe Local Government Area of Lagos State, Nigeria. Based on the findings of the research, the male fish farmers dominated the area more than the female fish farmer which implies that more awareness should be made so as to enable more female fish farmers to be involved in the enterprise.

The findings showed that both gender are technically efficient though not at 100% level.

4.2 Conclusion

This study examined gender analysis of fish culture enterprises in Epe Local Government Area of Lagos State, Nigeria.

From the study, fish culture enterprises have a lot of benefit to both genders. The increasing preference for fish and its products by people makes the enterprises profitable venture mostly for the female farmers.

Thus, as production becomes more efficient an equally efficient marketing system to absorb farm output which affords farmers a fair share of the market price should be encouraged as this stimulates employment of idle resources and increase the standard of living of the farmer.

4.3 Recommendations

Based on the outcome of this study, the following recommendations were needed: -

a. Extension agent should play active role in disseminates useful information's practices that will increase farmer's efficiency of fish production.

b. Adequate farm inputs like feed, fingerings should be made available and affordable to farmers in the study area on time.

c. Young people should be encouraged to practice fish farming, and also involve in carrying out research on fish farming as this may help in solving the problem of food security and food sufficiency.

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