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Gender Perspective of Youth Engagement in Aquaculture in Delta State, Nigeria

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Abstract

The study analyzed the determinants of male and female youths engagement in aquaculture in Delta State, described the socio-economic characteristics of youth engaged in aquaculture, ascertained the level of engagement in aquaculture between male and female youths and examined the socio-economic factors influencing aquaculture engagement by male and female youths. A multistage sampling technique was used to collect information from 360 youths comprising 180 males and 180 females each. Primary data were collected through the use of questionnaire. Descriptive statistics, logit model and Z-test were used for the analyses. The result showed that the mean age of male and female youths was 30.69 years and 30.97 years, respectively. The male and female youths had mean household size of 2.32 and 2.36 persons, education of 7.22 years and 5.95 years, farming experience of 2.69 years and 2.62 years as well as mean income N 65,463.61 and N 64,025.83 for male and female youths, respectively. The logit analysis showed that the determinants among the male youths were; age, cost of fingerling, cost of water supply and membership of association, farming experience, labour cost were positively signed and significant at 5% and 1% level of probability, respectively, while distance and education were negatively signed and significant at 5% probability level and for female youths were; farming experience, labour cost, cost of land, cost of water supply, membership of association and cost of fingerlings were positive and significant at 1%, 5% and 10% level of probability while amount of credit accessed was negative and significant at 10% probability level. The result of Z-test revealed that the level of engagement in aquaculture between male and female youths were the same. The results call for policies aimed at encouraging the youths to increase their engagement in aquaculture.

Keywords: *Gender, Youth, Engagement, Aquaculture*

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Background to the Study

Aquaculture is one of the fastest growing sub-sectors of agriculture with huge potential. Aquaculture is defined as the rearing of fish in artificial or natural bodies of water by manipulation of the environment with the aim of increasing production beyond natural limit. The recent popularity of aquaculture in the country is as a result of a decline in the natural stock. As the human population increases and consequent protein demand, the over-exploitation of the natural fish resources has made aquaculture a major option to combat protein malnutrition in the country (Daramola, Osofero, Kester, & Gbadamosi, 2007). Fish remains a major source of protein in human diet. According to FDF (2008), there is still a short in supply of about 1.9 million MT in which aquaculture has the capability to meet if more participants are injected into the sector. This shows the big opportunity waiting to be explored by youth participation in the aquaculture sector. Different units and channels make up the aquaculture sector thereby giving the opportunity to function in different areas within the sector which will in turns contribute to the development of the sector and also reduce unemployment among youths.

The crucial role played by aquaculture in driving the economy of any nation is widely understood and receiving global attention, but most people have not looked at it from the youth angle. Considering the fact that Nigeria has a large suitable land for fish culture, the potential of the aquaculture sector to meet the fish demand of the increasing population cannot be questioned and over-emphasized. For aquaculture to reach its full potential there should be a considerable and active participation of a high percentage of the youths in the sector. Within the framework of potential efforts and strategies to boost employment and job creation for young people, aquaculture is increasingly accepted as an important means and a valuable additional strategy to create jobs and improve livelihoods and economic independence of young people. It is an innovative approach to integrating youth into today's changing labour markets.

Promoting aquaculture would create businesses for youth which would address the rising youth unemployment rate in Nigeria. Aquaculture facilitates the creation of more job opportunities which would address the rising needs of youths. It also gives youths the needed self- confidence to deal with social pressure from peers as well as needed income to support their families. Promoting aquaculture is important because existing opportunities are few to reach everyone who needs a job (Brooks, Zorya & Gautam, 2012; Kararach, Kobena & Frannie, 2011). Some of the areas in the aquaculture sector that can be explored by the youths according to Adelodun (2015) include fish feed suppliers, fish processing, fish farmers and fish marketers. Some of the key factors affecting youths aquaculture engagement include: high cost of inputs and low levels of economic infrastructure, lack of aquaculture education, lack of access to finance, lack of access to markets and start-up capital, rigorous administrative frameworks as well as inadequate business development and support services and social and cultural attitudes towards young people.

Youth as a concept, however, varies from culture to culture and from society to society (Ajibola Salau & Aladejare, 2014**)**. This means that different cultures, societies or countries may have different definitions for youth, although they may all belong to a certain age bracket or age group. The African Youth Charter (2006) defines youth as persons within the age bracket of 15 and 35 years. According to Nigeria's National Youth Development Policy by FGN (2001), the youth comprises all young persons of ages 18 to 35, who are citizens of the Federal Republic of

Nigeria. The working definition of youth in this work comprised of anybody less than 50 years who is still depending on others to survive.

Youths are very important resources for every nation especially for sustaining agricultural productivity, an important sector for development. Unfortunately, this category of people is virtually left out in policies and programmes considerations (FAO, 2009). For instance, the unemployment rate of this group globally ranked 12.6% compared with 4.8% as the rate of the adults in 2010 according to United Nation (UN) report by FAO (2011) and this has the potential of tempting most youths to embark on migration especially to urban centres and beyond since this act creates room for accessing job opportunities. Attracting youth to and retaining them in the agriculture sector remains a global challenge. The youths are not willing to take aquaculture as their main occupation because they have a negative perception about farming. They view farming as an occupation with low income and economic returns and farmers as the uneducated and unskilled labourers.

The Delta State Government introduced the YETA and YAGEP in 2008 and 2015 to motivate the youths to accept agriculture through aquaculture as their main occupation by providing certain farm inputs and services to them, facilitate access to land, ensure food security and also to change the negative perception the youths have about farming.

It is however unfortunate that despite the enormous contributions of youths to agriculture, empirical data are lacking on engagement in aquaculture. Thus, their level of engagement in aquaculture have not been scientifically ascertained with respect to gender perspective. The attendant knowledge gap has not permitted the formulation of articulate policies for improvement. Several youths programmes on agriculture have operated and failed due to lack of data and information on what determines youths engagement in agriculture for design of appropriate intervention strategies.

Objectives of the Study

The Objectives of the study includes

(i) Describe the socio-economic characteristics of youths engaged in aquaculture
(ii) Ascertain the level of engagement in aquaculture between male and female youths
(iii) Examine the socio-economic factors influencing aquaculture engagement by male and female youths in the study area.

Methodology

Study Area

The study was conducted in Delta State, Nigeria. It is located at latitudes $5^0$00' and $6^0$30' North of the Equator and longitudes $5^0$00 and $6^0$45 East of the Greenwich Meridian. Delta State shares boundary with Edo State to the North, to the East, Anambra State, to the South East, Bayelsa State and to the South West, the Bight of Benin which covers approximately 160 km of the States coastline. The State is made up of 25 Local Government Areas which are divided into three agricultural zones; Delta North, Delta South and Delta Central. The population of the State is 4,098,398 persons (NPC, 2006). It has a land mass of 17,163 km^2. Farming is the predominant indigenous economic activity of the people with arable crop farming and fishing. The crops grown are cassava, yam, sweet potato, plantain, maize, okra, pepper and vegetables.

Sampling Technique

A multistage sampling technique involving purposive and random were employed in the selection of respondents for the study. In the first stage, 3 local government areas were purposively selected from each of the 3 agricultural zones in the State; Delta North, Delta South and Delta Central adding up to a total of 9 local government areas. Secondly, 6 communities were selected from each of the 9 LGAs to give a total of 54 communities. Finally, 8 youths comprising 4 males and 4 females involved in aquaculture were selected using snowball sampling technique from each of the 54communities to give a total sample size of 432 youths. However, only 360 retrieved questionnaires were used for the analysis. The study used primary data obtained from cross section of youths involved in aquaculture using structured questionnaire. Trained enumerators also helped in administering the questionnaires.

Analytical Technique

Data were analyzed using descriptive statistics such as mean, frequency tables, percentages and inferential statistics such as logit regression model. Objective 1 was realized with the use of mean, frequency tables and percentages. Objective 2 was achieved with Z-test and Objective 3 was achieved using logitregression model.

Model Specification

Logistic Regression Model

In dummy regression models, it is assumed implicitly that the dependent variable Y is qualitative while the explanatory variables are either qualitative or quantitative (Gujarati, 2004). In this regression model, the dependent or response variable is dichotomous in nature, taking a 1 or 0 value. For example, an unemployed youth in the study area is either engagement in aquaculture is high or low. Hence, the dependent variable (engagement in aquaculture), can take only one of two values: I if the youth engagement in aquaculture is high and 0, otherwise.

Logistic regression model is a qualitative choice model used to explain relationship between a dependent discrete variable and explanatory variables usually when the dependent variable follows a Bernoulli probability distribution (Gujarati, 2004; Gujarati & Porter, 2009). The logit of a number p is between 0 and 1. Logit model, which is used to estimate dichotomous choices, is based on the 'probability' of an 'event' occurring and is appropriate for determining factors that influence youth farmers' engagement in the aquaculture. The robustness of this model is that it does not follow the assumptions of the Ordinary Least Square (OLS) regression.

Following Gujarati (2004), the logit model is specified as:

$$P_i = P(Y=1/X_1) = \beta_1 + \beta_2 X_1, \; i = 1,2,\ldots\ldots\ldots\ldots n \qquad (1)$$

Where: $P_i = P(Y = 1 / X)$ is the probability of the ith youth farmer engaging in aquaculture and $Y = 1$ means high engagement; $Y = 0$ means low, X_i = explanatory variables, β_0 = the intercept, β_i = the corresponding coefficients and n is the sample size.

Engagement can also be represented as:

$$P_i = P(Y = 1 / X_i) = \frac{1}{1 + \exp[-(\beta_1 + \beta_2 X_i)]} = \frac{1}{1 + \exp(-z_i)} \qquad (2)$$

Where Z_i, $\beta_1 + \beta_2 X_i$. This equation is known as the (cumulative) logistic distribution function. Here Z_i ranges from to +; P_i ranges between 0 and 1 and P_i is non-linearly related to Z_i (i.e. X_i), and thus, satisfying the two conditions required for a probability. P_i is non-linear in both X and β parameters.

The log of odds of high engagement is given by:

$$P_i = \frac{1}{1 + \exp(-Z_i)}$$

Then (1- P_i), the probability of low engagement is:

$$(1 - P_i) = \frac{1}{1 + \exp(-Z_i)}$$

Therefore, one can write:

$$\frac{P_i}{(1 - P_i)} = \frac{1 + \exp(Z_i)}{1 + \exp(-Z_i)}$$

P_i / (1- P_i) is the odds ratio in favour of high engagement in aquaculture i.e; the ratio of the probability that a youth farmer in study area have high engagement in aquaculture to the probability that the youth farmer in the study area have low engagement in aquaculture. Taking natural log of odds ratio in favour of engagement, we obtain:

$L_i = \text{In}\,[P_i/(1\text{-}P_i)] = Z_i = \beta_0 + \beta_1 + \beta_2 X_i + U$

Where: Y= Youth farmers' engagement in aquaculture (high engagement = 1; otherwise 0), In $(\frac{P_i}{1-P_i})$ = log odds in favour of youth engagement in aquaculture; P_i = probability of the ith farmer; β_0 = the intercept parameter; β_i (β_1, β_2 ……. B_n)= parameters to be estimated; X_i = explanatory variables; U = error term (Gujarati & Porter, 2009;Pindyck&Robinfield, 1998). The explanatory variables are: $X_{1=}$ age (years), $X_{2=}$ gender (male=1, otherwise=0), $X_{3=}$ educational level (years), $X_{4=}$ farming experience (years), $X_{5=}$ household size (number of persons), $X_{6=}$ labour cost (N), $X_{7=}$ amount of credit obtained (N), $X_{8=}$ cost of land (N), $X_{9=}$ water supply (N), $X_{10=}$ cost of fingerlings (N), $X_{11=}$ membership of association (yes=1, otherwise=0) and $X_{12=}$ distance of pond to residence (km).

Results and Discussion

Socio-economic Characteristics of the Respondents

The result in Table 1 showed the frequency distribution of respondents according to their socio-economic characteristics. The result showed that majority (60.00%) and 58.53% of the males and females fall between age bracket of 25-34 years. This was followed by those below 25 years, 18.33% and 17.78 for males and females. The result also indicated that only 21.66% and 23.89% of the males and females were above 34 years old, respectively. The average age of males and females was 30.69 years and 30.97 years.

Majority (60.56%) of the males and 58.89% of females had household size of less than 3 persons respectively while 37.78% of the males and 40.00% of the females had household size of 3 – 5 persons. However, only about 1.67% and 1.11% of the males and females had

household size of greater than 5 persons. The mean household size for the males and females was 2.32 and 2.36 persons respectively. The result revealed that both the males and females youths had the same household size of less than 3.

The result on educational level showed that 1.11% of the males and 4.44 % of females had no form of formal education while majority (46.67%) of males and 50.00% of females were in school for between 7 – 12 years. About 46.11% and 41.11% of the males and females were in school for between 1 – 6 years while only 6.11% of males and 4.44% of females spent more than 12 years in schooling. The mean years spent was 7.22 years and 5.95 years for males and females. This educational disparity showed by the study may be a reflection of a long history of bias against girl child education especially in the study area. Hence, Heidi and Udey (2001) emphasized on girl child education for economic development, poverty alleviation and food security. Education is an asset for engagement decision. Thus increased education was associated with increased engagement in agriculture by different researchers (Onu, 2005; Nnadi and Akwiwu, 2008).

The result indicated that 42.22% of the males and 43.33% of the females has less than 3 years of aquaculture experience while 57.78% and 56.67% of the males and females had between 3 -5 years of aquaculture experience respectively. This showed that the study area is dominated by youth farmers who had little experience in aquaculture. The average years spent on aquaculture for males and females was 2.69 years and 2.62 years.

The result on the amount of credit accessed showed that majority (47.78%) of males and 50.00% of females access credit of N 40,000 and below. This was followed by 30.56% and 28.89% of males and females that received credit of N 61,000 and above. About 12.78% of males and 13.33% of females accessed credit between N 41,000 – N 50,000 while 8.89% and 7.78% of males and females received between N 51,000 – N 60,000, respectively. The mean amount accessed by males and females was N 65,463.61 and N 64025.83, respectively.

Table 1: Distribution of Respondents according to Socio-economic Characteristics

Variable Description	Male Frequency	Percentage	Female Frequency	Percentage
Age (years)				
<25	33	18.33	32	17.78
25-34	108	60.00	105	58.33
35-44	16	8.88	19	10.56
>44	23	12.78	24	13.33
Mean	30.69		30.97	100.0
Household size (No. of persons)				
<3	109	60.56	106	58.89
3-5	68	37.78	72	40.00
>5	3	1.67	2	1.11
Mean	2.32		2.36	100.0
Educational status (years)				
	2	1.11	8	4.44
None	83	46.11	74	41.11
1-6	84	46.67	90	50.00
7-12	11	6.11	8	4.44
>12	7.22		5.95	100.0
Mean				
Farming experience (years)				
<3	76	42.22	78	43.33
3-5	104	57.78	102	56.67
>5	-		-	
Mean	2.69		2.62	100.0
Credit received (₦)				
₦40,000 and below	86	47.78	90	50.00
₦41,000-₦50,000	23	12.78	24	13.33
₦51,000-₦60,000	16	8.89	14	7.78
₦61,000 and above	55	30.56	52	28.89
Mean	₦65,463.61		₦64,025.83	

Source: field survey, 2017.

Determinants of Youths Engagement in Aquaculture

Logit regression analysis was carried out to identify the variables influencing the engagement in aquaculture by male and female youths in Delta State. Three different logit regression analyses were carried out.

Determinants of Engagement in Aquaculture by Male Youths

The result in table 2 showed the logit regression estimates of the determinants of engagement in aquaculture by the male youths. The result showed that the chi square value of 50.50 was highly significant at 1% level of probability indicating that the model is a good fit. The diagnostic statistics of the estimated model revealed that, the log likelihood ratio of 82.956 is significant at 1% probability level. This indicates that the specified Logit model has a strong explanatory power. The pseudo R2 of 0.2334 shows that about 23.34% of variability in the dependent variables or the decision to engage in aquaculture is associated with the specified

independent variables. This means that, more variables that could have affected the youth decision on engagement in aquaculture in the study area were not included in the model. The sign of the constant is negative. This implies that in the absence of these socio-economic factors, the engagement in aquaculture would be declining.

The empirical result showed that the age of the male youth had a log odd coefficient of (1.06768) and Z- value of 2.28. age is positive and statistically significant at 5% probability level with respect to the decision or probability of male youth to engage in aquaculture in the study area. The result implies that a unit increases in age increases the probability of engaging by 1.067. The higher the age of the male youth, the higher the probability of engaging in aquaculture. This could be attributed to increasing consciousness and self-realization of the importance of aquaculture with age based on experience. The study is in consonance with the findings of Nnadi and Akwiwu (2005).

Results indicate distance reduce the odds of engagement in aquaculture by male youths, holding other things constant. As expected, results indicate that distance in which the pond to residence is located significantly affects engagement in aquaculture. This is not surprising because in such areas, access to extension services, field visits by agricultural staff and interactions with youths is usually limited due to poor road infrastructure. It is negative and statistically significant at 5% probability level. This implies that a unit increase in distance of youth residence from pond reduces the odd of increase engagement by the male youths in aquaculture by 0.597.

Similarly, increased educational opportunities decreased the predicted probability of engaging in aquaculture by the male youths. From table 2 coefficient of education had an odds ratio 0.949 and t-value of 1.96 which is negative and significant at 5% probability level. A unit increase in the formal education of male youths reduces the odd of increase engagement of male youths in aquaculture by 0.949. Alternatively, a year increase in formal education of male youths reduces the probability of decision to engage in aquaculture by 0.949. The result suggests that, as youth acquired more years of formal education, they move out from the rural areas to search for greener pastures in the urban area. The finding indicates that, the absent of educational facilities in the rural areas is a serious push factor that militates against male youths in aquaculture activities.

The log odd coefficient of farming experience (1.732) was positively signed and significant at 1% level of probability. This implies that any increase in years of farming experience will increase the odd of increase engagement by the male youths in aquaculture. The coefficient of cost of labour availability (1.000) at a farm household is positive and statistically significant at affecting engagement of aquaculture. Availability of male youths farm labour in a household is associated with an increase in the odds of engaging in aquaculture, ceteris paribus. Results indicate that households that have more male youths labour available for agricultural use would more likely engage in aquaculture in the study area.

In addition, increase cost of fingerlings increases the probability of youth engagement in aquaculture in the area of study. A very strong relationship exists between fingerlings and engagement in aquaculture. Amount spent on fingerlings is positively related to the engagement in aquaculture. A unit increases in the number of fingerlings increases the engagement in aquaculture by a factor of 1.000. The more fingerlings acquired by male youths, the faster that youth is likely to engage in aquaculture. The result revealed that the log odd

coefficient of amount spent on water supply was positive and significant at 5% level of probability. It implies that for every unit increase of male youth spending on water, the odd in favour of male youth decision to engage in aquaculture increases by 1.000, this was contrarily to a priori expectation.

The empirical result indicated that the log odd coefficient of membership of association was positive and statistically significant at 5% probability level with respect to the decision to engage in aquaculture. The odd interpretation implies that a unit increase of male youths in an association, the odd in favour of male youth decision to engage in aquaculture increases by 3.187.

The log odd coefficient of household size was positive but not significant as well as cost of land and amount of credit received which were negatively signed. The log odd coefficient of male youths decision to engage in aquaculture with respect to distance and education were negatively signed and statistically significant at 1% and 10%, respectively. This means that as the number of male youths, years of formal education and distance of pond to residence increase, the probability of male youths engaging in aquaculture reduces**.**

Table 2: Determinants of Engagement in Aquaculture by Male Youths (N=180)

Variable	Odds Ratio	Std. Err.	Z	P>/Z/
Age	1.06768	0.0413216	2.28	0.023
Distance	0.5974797	0.1213707	-2.54	0.011
Household size	1.058152	0.2516791	0.24	0.812
Education	0.9491395	0.0536905	-1.96	0.056
Farming experience	1.732473	0.2773023	3.43	0.001
Labour cost	1.000081	0.0000243	3.34	0.001
Land cost	0.9999924	0.0001167	-0.07	0.948
Cost of fingerling	1.000023	0.0000106	2.19	0.029
Cost of water supply	1.000212	0.0000921	2.31	0.021
Amount of credit accessed	0.9999864	0.0000106	-1.28	0.199
Membership of association	3.186534	1.416293	2.61	0.009
Constant	0.0252266	0.0406118	-2.29	0.022
Log likelihood	=-82.956366			
LR chi 2 (11)	= 50.50			
Prob>chi 2	=0.0000			
Pseudo R2	=0.2334			

Source: field survey, 2017.

Determinants of Engagement in Aquaculture by Female Youths

The obtained log likelihood ratio is 89.13 and the chi-square statistic for the goodness of fit of the model is 43.31, significant at the 1% level. The pseudo R2 value of the model is 0.1955. Thus, the overall model is significant and the explanatory variables used in the model are collectively able to explain the female youths decisions regarding engagement in aquaculture.

The log odd coefficient of farming experience was positive and significant at 1% level of probability. This implies any increase in years of farming experience will lead to about 1.774 increases in the log odd in favour of female youth decision to engage in aquaculture. The coefficient of labour cost for female youths was positive and significant at 5% level of

probability. The result implies that a unit increases in labour increases the probability of engaging in aquaculture by 1. 000.

The empirical result revealed that the log odd coefficient of cost of land is positive and statistically significant with respect to the decision. The odd interpretation implies that for every unit increase of female youths to acquire more land, the log odd in favour of female youth decision to engage in aquaculture will occur for a unit increase in farm land owned by female youths compared to those who do not owned farm lands. This implies that any increase in farm land will increase their chances to make positive decision to engage in aquaculture. A very strong relationship exists between ownership of farm land and engagement in aquaculture. Land is positively related to engagement in aquaculture. A unit increases in farm land acquired increases the engagement in aquaculture by a factor of 1.000. The more lands acquired, the faster female youths are likely to engage in aquaculture. The positive determinant of probability of female youths to engage in aquaculture satisfied a priori expectation.

Similarly, increase in the amount of fingerlings purchase will result in about 1.000 increases in the log odd in favour of female youths decision to engage in aquaculture compared to other female youths who do not have access to these inputs. Also, increase in female youths access to water supply will lead to about 1.000 increase in the log odd in favour of female youths decision to engage in aquaculture compared to those who do not have access to these water supply.

Amount of credit obtained by female youths was negatively signed and significant at 10% level of probability. This implies that engagement in aquaculture decrease by log odd of 1.000 with a unit increase in amount of credit borrowed. This disagrees with Ohajianja and Onu (2005), that high farm income influences increased participation of technologies. In a similar manner, 3.115 increases in the log odd in favour of youth decision to engage in aquaculture will occur for a unit increase in belonging to an association by female youths compared to those who do not belong. The result implies that increase in female youth membership of association will increase their chances to make positive decision to engage in aquaculture. This conforms to *apriori* expectation.

The log odd coefficient of age and household size were positive but not significant as well as distance and education were negatively signed.The log odd coefficient of female youths decision to engage in aquaculture with respect to amount of credit obtained was negatively signed and statistically significant at 10%. This means that as the amount of credit received by female youths increase, the probability of youth engaging in aquaculture reduces.

Table 3: Determinants of Engagement in Aquaculture by Female Youths (N=180)

Variable	Odds Ratio	Std. Err.	Z	P>/Z/
Age	1.033367	0.0392632	0.86	0.388
Distance	0.7512339	0.2126139	-1.01	0.312
Household size	1.360558	0.3204164	1.31	0.191
Education	0.9876768	0.0795319	-0.15	0.878
Farming experience	1.77472	0.2847548	3.58	0.000
Labour cost	1.000059	0.0000213	2.77	0.006
Land cost	1.000091	0.0000289	2.65	0.004
Cost of fingerling	1.000018	0.0000106	1.71	0.087
Cost of water supply	1.000022	0.0000273	2.99	0.046
Amount of credit accessed	0.9999821	0.0000109	-1.98	0.091
Membership of association	3.114792	1.295176	2.73	0.006
Constant	0.02041	0.0270922	-2.93	0.003
Log likelihood	=-89.133582			
LR chi 2 (11)	= 43.31			
Prob>chi 2	=0.0000			
Pseudo R2	=0.1955			

Source: field survey, 2017.

Determinants of Engagement in Aquaculture by Male and Female Youths (Pooled Result)
Table 4 showed that the coefficient of age was positive significant. The result implies that a unit increases in age increases the probability of youth engagement in aquaculture by 1.049. The higher the age of the youth, the higher the predicted probability of engaging in aquaculture. This could be attributed to increasing consciousness and self-realization of the importance of aquaculture with age based on experience. Gender of youths had coefficient and t-values of 3.762 and 2.53, respectively. The coefficient of gender was positive and significant at 5% level of probability. This means that with a unit increase in gender of youths, the probability of youth engaging in aquaculture increases.

The coefficient of distance was negative and significant at 5% probability level. This implies that a unit increase in distance of youths residence from pond reduces the odd of increase engagement by the youths in aquaculture by 0.672.This conformsto*apriori* expectation. The result showed that the coefficient of educational status of the youths was negative and significant at 5% level of probability. This implies that increase in education of the youths will result in a decrease in aquaculture engagement. This is against *apriori* expectation.

The log odd coefficient of farming experience was positive and statistically significant at 1% probability level. This implies that any increase in years of farming experience will increase the odd of increase engagement by the youths in aquaculture. The logodd coefficient of labour cost for the youths was positive and highly significant at 1% level of probability. The result implies that a unit increases in labour increases the probability of engaging in aquaculture by 1. 000.

The result revealed that cost of fingerlings was positive and significant. This means that increase cost of fingerlings increases the probability of youth engagement in aquaculture in the area of study. Amount spent on fingerlings is positively related to the engagement in aquaculture. The coefficient of amount of credit accessed was negative and significant at 5% level of probability. This implies that a unit increase in the amount of credit accessed will

decrease the odd of engagement in aquaculture by the youths. This is against a priori expectation probably because the amount borrowed was used for unintended purpose. The result disagrees with the finding that high farm income predisposes increased participation of technologies (Ohajianja & Onu, 2005).

The coefficient of membership of association was positive and highly significant at 1% level of probability. This implies that increase in the log odd in favour of youth decision to engage in aquaculture will occur for a unit increase in belonging to an association by the youths compared to those who do not belong. This conforms to *apriori* expectation probably because increase youths membership of association will increase their chances to make positive decision to engage in aquaculture.

Table 4: Determinants of Engagement in Aquaculture by Male and Female Youths (N=360)

Variable	Odds ratio	Std. err.	Z	P>/Z/
Age	1.049491	0.0282107	1.80	0.072
Gender	3.761793	1.97383	2.53	0.012
Distance	0.6719079	0.1047519	-2.55	0.011
Household size	1.233009	0.2022098	1.28	0.202
Education	0.9571965	0.0427239	-2.99	0.027
Farming experience	1.735784	0.1935656	4.95	0.000
Labour cost	1.000068	0.0000157	4.35	0.000
Land cost	1.000076	0.0000695	1.10	0.272
Cost of fingerling	1.00002	7.41e-06	2.66	0.008
Cost of water supply	1.000081	0.0000525	1.55	0.122
Amount of credit accessed	0.9999823	7.62e-06	-2.33	0.020
Membership of association	3.106669	0.9279	3.80	0.000
Constant	0.0134475	0.0129885	-4.46	0.000
Log likelihood	= -174.80445			
LR chi 2 (11)	= 88.51			
Prob>chi 2	=0.0000			
Pseudo R2	=0.2020			

Source: field survey, 2017.

Level of Engagement on Aquaculture between Male and Female Youths

To compare the level of engagement in aquaculture between male and female youths in the study area, Z-test analysis was computed. The result in Table 5 showed that the mean level of engagement in aquaculture for male youths was 0.7111, while it was 0.6944 for the females. The Z-test was 0.3503 and was not significant indicating that the two means were the same. Thus, the level of engagement in aquaculture between male and female youths in the study area was the same.

Table 5.0: Z-Test Analysis on Level of Engagement in Aquaculture Between Male and Female Youths

Variable	Mean	Std. Error	Std. Dev.	t.cal	Pr>t
Male	0.7111111	0.0338772	0.4545105	0.3503	0.7266
Female	0.6944444	0.03443	0.4619273		

Source: field survey, 2017.

Conclusion

Determinants of engagement in aquaculture by male and female youths in the study area were analyzed. The determinants among the male youths were; age, distance, education, farming experience, labour cost, cost of fingerling, cost of water supply and membership of association and for female youths were; farming experience, labour cost, cost of land, cost of fingerlings, cost of water supply, amount of credit accessed and membership of association. The results call for policies aimed at encouraging the youths to engage in aquaculture as a profitable venture.

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