

The Roles of Women in Aquaculture in Selected Riverine Communities of Anambra State

Ikechukwu CC¹, Madu CT¹, Ikeogu CF¹, Akinrotimi OA^{2*}, Nwankwo CG¹ and Merit P¹

¹Department of Fisheries and Aquaculture Management, NnamdiAzikiwe University, P.M.B 5025, Awka, Anambra State Nigeria

²African Regional Aquaculture Center of Nigerian Institute for Oceanography and Marine Research, P.MB.5122, Port Harcourt, Rivers State, Nigeria

ABSTRACT

This study analysed the roles of women in aquaculture in three selected riverine communities in Anambra State. Data were analyzed using simple percentages, tables, and frequency and showed that women participate extensively and actively in all aquaculture productions in Atani, Otuocha and Ebenebe riverine communities in Anambra State. From the results, it was discovered that most women (21.05%) engaged in marketing, 15.79% were involved in processing, broodstock management and feeding of fish, 10.53% were involved in pond management, harvesting and hatchery management, leaving only 5.26% in farm management and feed production. This implied that women are predominantly involved in actual production than managerial roles. Results from this study also revealed some challenges encountered by the respondents in the three riverine fishing communities which were identified as limited access to credit and loan, high cost of feed, lack of quality ingredient for feed formulation, inadequate extension services, fish mortality, lack of proper storage devices, diseases, amongst others. It could be concluded that the women's participation and roles in aquaculture activities are marked by enormous challenges. Therefore, proper measures must be taken into account to address the obstacles inhibiting women from fully developing their potentials in their different roles in aquaculture management.

*Corresponding author

Akinrotimi OA, African Regional Aquaculture Center of Nigerian Institute for Oceanography and Marine Research, P.MB.5122, Port Harcourt, Rivers State, Nigeria.

Received: May 09, 2023; Accepted: May 22, 2023; Published: May 31, 2023

Keywords: Aquaculture, Management, Gender equity, Training, Food security

Introduction

Aquaculture is a significant source of fish food and livelihood. Fish, be it from marine or freshwater origin, has a key role to play in the fight against hunger as it reduces poverty by generating income and malnutrition and provides valuable animal protein and essential micronutrients to vulnerable populations like the women [1]. Human diets require good quality source of protein and this is found in fish products. It has the highest level of easily digestible protein, fats, vitamins, calcium, iron and essential amino acids when compared to other sources of animal protein such as poultry and beef [2]. Fisheries and Aquaculture are important to the ever-increasing world population. The aquaculture sector is often considered a male domain, because of the high levels of investments and nature of work. Women's role and participation has often been ignored partly due to socio-cultural taboo against them [3-4]. Where women are employed in aquaculture, they are predominantly involved in actual production than managerial roles. Women that are literate and financially capable, often manage the farm records and finances According to Brugere and Williams, women participate extensively and actively in all aquaculture productions in fish farms [5]. Also women participation in aquaculture production varies according to the

type and scale of Aquaculture. On small scale farms, women and men frequently work together, carrying out different activities. Less physical and technical tasks are always performed by the women viz: feed preparation and feeding of fish, grading and harvesting of small amount of fish for household use. They also carry out fish production such as grow out production, brood stock production, fish breeding and fingerling production. In medium and industrial scale aquaculture, women are at the lower end of the pay scale or are unpaid auxiliary workers. Women's participation in aquacultural practices reduces as production and economic returns increases through infrastructure and technology investments and they rarely become farm managers, eg Shrimp Aquaculture in North East Vietnam and Catfish Aquaculture of Nigeria [6].

Women make up 80% of the labour force in aquaculture [7]. Through their involvement, women have been able to provide an opportunity for self-employment, improved their socio-economic condition, increased fish availability and contribute to the family income and nutrition. However, the important role played by women in aquaculture have been to some extent derailed by the land tenure systems which gives ownership rights to males, inaccessibility to credit and savings services and facilities, low level of literacy and inadequate technical knowledge on pond management [8]. Although women are very important to value

chain fish production worldwide, data on gender participation in aquaculture activities and the challenges which hinder women participation in aquacultural development are not fully documented. Also, the role of women is repeatedly being ignored and relegated, consequent of primordial systems of social setting, that is prevalent in the rural areas of many developing countries like Nigeria [9]. There is therefore the need to promote and to encourage women folk in this sector, so as to boost supply of food fish and improve the economic welfare of their families [10]. Therefore, the aim of this study is to evaluate the role of women in aquaculture, with a view of proffering recommendations/ solutions that will improve women's participation in aquaculture activities in Anambra state.

Materials and Methods

The Study Areas

This study was carried out among women in the three selected riverine communities of Atani in Ogbaru local government area, Otuocha in Anambra east local government area and Ebenebe in Awka North local government area in Anambra state, Nigeria. Atani lies between latitude $6^{\circ} 7' 0''$ N and longitude $6^{\circ} 46' 0''$ E, Otuocha lies between latitude $6^{\circ} 21' 0''$ N and longitude $6^{\circ} 51' 0''$ E, while Ebenebe geographical coordinates are $6^{\circ} 20' 0''$ N and $7^{\circ} 8' 0''$ E. Atani is a town populated by early fishermen and migrant settlers. Atani is still the rice, fish, yam and cassava basin of Anambra state, producing most of the food sold in many markets in Delta and Anambra States. Atani has an estimated population of 230,000 according to the 2006 Nigerian census. The few private industries in the town involve fish processing and rice packaging. Otuocha is a town which comprises of a large population from different ethnic groups. These include not only the original Igbo natives of Ivite Aguleri but others from other parts of Igbo land as well as Hausa, Ijaw, Yoruba, Umuleri etc. Otuocha is important because it serves as the food basket for the South-Eastern states. Otuocha has a viable Market which is located within the heart of Otuocha at the bank of the great Omabala River. Eke market is a special daily market where traders and buyers from all works of life comes for majorly yam and fish business. Ebenebe is a town which has an estimated population of 45,897 according to the 2006 Nigerian Census. Ebenebe is rated as one of the highest producers of agricultural commodities in the State with good climate and arable land for agricultural activities, it is 25km from Awka, the capital city of Anambra State. The presence of rivers also makes fishing one of their major occupations.

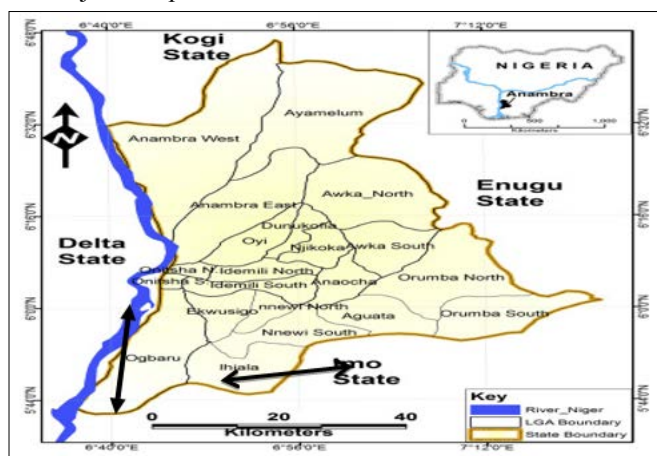


Figure 1: Map of Anambra state showing the Local Government Areas of the three study areas.

Data Collection

The data were obtained from two different sources, the primary and secondary sources. The primary source was obtained with the use of structured questionnaires while the secondary data was obtained from various kinds of sources basically the internet, text books, journals and previous works.

Sampling Techniques and Sample Size

The sampling techniques used to select respondent are both simple random sampling and purposive sampling technique. Sixty structured questionnaires were designed and administered out of which 55 were retrieved from women in the selected communities in study areas, which include Atani in Ogbaru local government area of Anambra state, Otuocha in Anambra East local government area and Ebenebe in Awka North local government area. Twenty were administered to respondents in Atani, while 15 (75%) were retrieved and analyzed. Twenty (20) questionnaires were administered to respondents in Otuocha and 20 (100%) were retrieved and Analyzed. Twenty (20) questionnaires were administered to respondents in Ebenebe and 20(100%) were retrieved and analyzed.

Statistical Tools and Analysis

Data was analyzed using descriptive statistics and inferential statistical method. Descriptive statistical method such as frequency and percentage, bar chart and pie chart and 5point likert scale and mean was used in analyzing this work.

Results

The result of the socioeconomic characteristics of the respondents is shown in Table 1. It was observed that 3.64% of the respondents were below 20 years, 9.09% were within 21-30 years, 23.64% were within 31-40 years, 45.45 were within 41-50 years and 18.18% were from 50 years and above. From the distribution of different age range of women, 31-40years was the highest with 45.45%. In this study, it was discovered that majority of the fisherfolks were married (52.73%) followed by widows (25.45%) while few were single (16.36%) and divorced (5.46%). The result obtained from the educational level of the respondents showed that 29.09% had secondary education, 47.27% had primary education, 12.73% attended tertiary institution, 9.09% are without formal education and 1.82% had adult education. It was observed from this work that 43.64% of the respondent had 20 years and above experience, 21.82% had 16-20 years of experience, 14.55% had 11-15 years of experience, 9.09% had 6-10 years of experience and 7.27% had 1-5 years of experience in Aquacultural activities. From the results in table 4, it was discovered that most women (21.05%) engaged in marketing, 15.79% were involved in processing, broodstock management and feeding of fish respectively, 10.53% were involved in pond management, harvesting and hatchery management respectively, while only a few about 5.26% were involved in farm management, leaving no response for disease treatment and quality control.

Table 1: Socioeconomic Characteristics of Women in Aquaculture

Socioeconomic characteristics	Frequency	Percentage %
Age		
Below 20 years	2	3.64
21-30 years	3	9.09
31-40	13	23.64
41-50	25	45.45
50 and above	10	18.18
Marital Status		
Single	9	16.36
Married	29	52.73
Divorced	3	5.46
Widowed	14	25.45
Educational level		
No Formal Education	5	9.09
Primary education	16	47.27
Secondary education	26	29.09
Tertiary education	7	12.73
Adult education	1	1.82
Religion		
Christian	46	83.64
Islam	4	7.27
Traditional	5	9.09
Other	0	0
Years of experience		
Less than a year	2	3.64
1-5 years	4	7.22
6-10 years	5	9.09
11-15 years	8	14.55
20 and above	24	43.64
Sources of Credit		
Microfinance	5	9.09
Contributions	16	29.09
Inheritance	0	0
Cooperatives	9	16.36
Family and Friends	25	45.45
Sources of Information		
Internet	3	5.45
Extension Agent	4	7.27
Friends	23	41.82
Fish Farmers Association	9	16.36
Radio	14	25.45
Television	2	3.64

Source: Field Survey.

Table 2: Aquacultural Activities carried out by the Respondents

Types of fish feed	Frequency	Percentages %
Foreign feed	4	21.05
Local feed	2	10.53
Foreign and local feed	11	57.89
Feed produced in your farm	2	10.53
Total	29	100
Name of fish	Frequency	Percentage%
Tilapia	0	0
Catfish (Clariasspp)	10	52.63
Catfish (Heterobran-chusspp)	4	21.05
Hybrid catfish	5	26.32
Others	0	0
Total	19	100
Type of production	Frequency	Percentage%
Cages and Pens	0	0
Earthen pond	8	42.10
Concrete ponds	4	21.05
Flow through system	0	0
Tanks and raceways	0	0
Re-circulatory Aqua-culture system	0	0
Hatchery manage-ment /fish breeding	2	10.53
Integrated aquacul-ture	5	26.32
Total	19	100
Source of water	Frequency	Percentage%
Borehole	3	15.79
Surface water	0	0
Well	1	5.26
Municipal supply/ water supply	0	0
River	9	47.37
Stream	6	31.58
Lake	0	0
Rainwater	0	0
Total	29	100

Source: Field Survey.

Table 3: Challenges faced by Aquaculture respondents.

Challenges	Mean score
Disease	4.4
Poor water quality	2.3
Theft /poaching	4.0
Poor access to road	2.3
Unavailability of extension agents	4.24
Lack of storage and processing facilities	4.7
Hardship in securing land due to land tenure system	4.4
Difficulty in securing rights as workers.	3.3
Unhygienic working conditions	2.1
Lack of security	2.4
Under payment of wages.	4.0
Fish mortality	4.8
High cost of feed.	5
Lack of good quality ingredient for feed formulation.	5
Low output	4.4
Market price fluctuations	5
Poor record keeping	2.3
Inadequate extension services	5
High cost of labour	3.3
Limited access to credit and loan.	5

Source: Field Survey.

Table 4: Roles and Participation of respondents in the three riverine communities

Roles of Respondents in Aquacultural activities	Frequency	Percentage %
Fish marketing	4	21.05
Fish Processing	3	15.79
Fish Feed production	1	5.26
Pond management	2	10.53
Feeding of fish	3	15.26
Farm management	1	5.26
Harvesting of fish	3	15.79
Hatchery management	2	10.53
Brood stock manager	3	15.79
Disease Treatment	0	0
Quality Control	0	0

Source: Field Survey.

Discussion

The results of the socioeconomic characteristics of the respondents in Anam, Otuocha and Ebenebe communities are shown in Table 1. It was observed that 3.64% of the respondents were below 20 years, 9.09% were within 21-30 years, 23.64% were within 31-40years, 45.45 were within 41-50 years and 18.18% were from 50 years and above. From the distribution of different age range of women, 31-40years was the highest with 45.45%. Therefore, the predominant women involved in aquaculture activities were in the middle age bracket, making them more favorably disposed

to be innovative. This is in agreement with the findings of who observed that fishery activities are energy demanding jobs, therefore women need to be physically strong to accomplish most of the tasks[11-13]. The result recorded in the study showed that majority of the respondents about 84.64 were Christians, 7.27% were Muslims and 9.09% were traditional worshippers. The high number of Christians can be connected to the fact that Anambra state is situated in the eastern part of Nigeria and the eastern Nigeria is predominated by Christians which in agreement to the work of followed by traditional worshipper which were the major religion practiced by Igbo people before the coming of the missionaries [14]. In this study, it was discovered that majority of the fisherfolks were married (52.73%) followed by widows (25.45%) while few were single (16.36%) and divorced (5.46%). Most respondents were married since the age range of the majority of the women mainly falls within the middle age bracket of 31-50 years. This finding agrees with the work of [15]. The result obtained from the educational level of the respondents showed that 29.09% had secondary education, 47.27% had primary education, 12.73% attended tertiary institution, 9.09% are without formal education and 1.82% had adult education. This implies that majority of the respondents in the three riverine communities who have educational background are greater than those with no formal education. This result is contrary to that obtained by Williams that women from fisher communities are not well-read, with little or no education. The high educational status of the respondents in the studied area may influence their acceptance of improved Aquacultural practices [16]. It was also observed from this work that 43.64% of the respondent had 20 years and above experience, 21.82% had 16-20 years of experience, 14.55% had 11-15 years of experience, 9.09% had 6-10 years of experience and 7.27% had 1-5 years of experience in aquacultural activities. The implication of this observation is that most respondents have a considerable number of years of experience since these women were born there and have been living in these riverine communities all their lives and fish business have been their major occupation, especially older women above 30 years. Similar result was obtained from the study of [17]. In this study, 45.45% of the respondents obtain credit from their family and friends, 29.09% obtain credit from contributions, 16.36% obtain from cooperatives and 9.09% from micro finance banks and 0% from inheritance because women are not seen as heir to properties or wealth of their parents in the Igbo tradition. Funding for aquaculture production depends on the scale of the business and production system employed and it reflects in the accessibility of the different types of financial services. This work is similar to the study carried out by who stated that with no control over land, women lack collateral for loans and also in agreement with the work of Ijioma and Osondu, who reported that high interest rate, lack of collateral, long distance from source of credit and delay in loan disbursement are constraints to acquiring credits from financial institution [18-19]. Therefore, the most suitable and accessible source of credit for the respondents in these riverine communities are from family and friends. Most respondents interviewed about 41.82% obtain information from friends, 25.45% from radio, 25.25 % from fish farmers, 7.27% from extension agents, 5.45% from internet and 3.64% from the television. This results also showed that the major source of information by the respondent were friends since a high percentage of the respondents were middle aged, married and acquired primary education as their highest level of education. Therefore, the internet and television are not really a trend amongst them. The result presented in table 2 on aquacultural activities carried out by the respondents showed that majority of the respondents (57.89) used both foreign and local feed, 21.05 % used foreign feed,

10.53% used local feed and 10.53% used in-farm feed. Also, the results of fish cultured by respondents revealed that 52.63% of the respondents cultured catfish (*Clarias spp*), 26.32% cultured hybrid catfish and 21.05% cultured catfish (*Heterobranchus spp*), which aligns with observation of that catfish is the most farmed fish species in Nigeria, constituting over half aquaculture production by volume [20]. It was also observed from this study that 42.10% of the respondents used earthen pond for aquaculture production, 21.05% used concrete pond, 26.32% of the respondents are into integrated aquaculture while 10.53% engaged in hatchery/fish breeding. The result presented in Table 2 also showed that the major source of water for fish production are rivers with 47.37% followed by streams with 31.58%, then borehole with 15.79% and lastly well water with 5.26%. This study was carried out in riverine communities hence the major source of water are rivers and streams.

The table 3 showed the results on the challenges experienced by the respondents. Limited access to credit and loan, high cost of feed, lack of good quality ingredient for feed formulation and inadequate extension services are strongly agreed with the mean of 5.0. Fish mortality with the mean (4.8), lack of storage device with the mean of (4.7), diseases and hardship in securing land due to land tenure system with the mean (4.4) respectively, unavailability of extension agents with the mean (4.2) were agreed by the respondent. High cost of labour with the mean (3.3), and difficulty in securing rights as workers with the mean (3.3) were neutral whereas lack of security with the mean (2.4), poor water quality, poor access to road both with the mean (2.3) respectively and unhygienic working conditions with the mean (2.1), were disagreed. This finding agrees with the work of that women have limited or no access to credit and capital, social security, hardship in securing land due to land tenure systems which are usually traditionally communal with males having ownership rights making it difficult for them to become aquaculture entrepreneurs themselves because of socio-cultural and religious beliefs but contrary to unfair, unhygienic, unsafe working conditions [21].

From the results in table 4, it was discovered that most women (21.05%) engaged in marketing, 15.79% were involved in processing, bloodstock management and feeding of fish respectively, 10.53% were involved in pond management, harvesting and hatchery management respectively, while only a few about 5.26% were involved in farm management, leaving no response for disease treatment and quality control. This supports the works of that women participate extensively and actively in all aquaculture productions in the farm [22]. The number of respondents managing farms as farm managers has the least distribution hence emphasizing on the fact that women also rarely become managers and rarely hold senior management positions in the aquaculture sector. Managerial roles are usually available for the masculine sex. As production intensifies and economic returns increases, through infrastructure and technology investments, women's engagement drops [23].

Conclusion

This study revealed that women participate actively in all aquaculture production sections in Atani, Otuocha and Ebenebe riverine communities in Anambra State. However, with notable exceptions, women's participation and roles in aquaculture activities are marked by enormous challenges. The existence of these barriers ultimately reflects that despite having obligations, women in aquaculture do not enjoy full rights. We have focused this study on the roles of women in aquaculture, aimed at

contesting gender differences, address power imbalances and bridge the gender gap. Given poor representation of women in high end and viable ventures within the value chain, this study suggests that the government should formulate gender sensitive policies to support equal and effective participation of women in the Aquaculture value chain as a livelihood and economic opportunity. The study further recommended that in order to promote the role of women in aquaculture, the government needs to provide necessary infrastructures with adequate access and utilization by women such as road network, electricity, security, improvement of market systems and facilitate access to finance and credit expansion for women in aquaculture value chain.

Acknowledgements

The authors sincerely appreciate the women involved in aquacultural activities in Atani, Otuocha and Ebenebe fishing communities in Anambra State Nigeria, who participated in the research.

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