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**PERCEIVED IMPACT OF AQUACULTURE ON RURAL LIVELIHOODS  
IN AKWA IBOM STATE, NIGERIA**

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**Abstract**

The study ascertained the perceived impact of aquaculture on rural livelihoods in Akwa Ibom State, Nigeria. A sample size of 270 fish farmers was selected in the rural areas of Akwa Ibom State using a multi-stage sampling method. Data were collected using the questionnaire; and analyzed using descriptive statistics such as frequency counts, percentages, standard deviations, means and ranks. Results indicated that majority of the respondents were males with the mean age of 44 years; 47.8% were married and 81.1% were functionally literate with a mean monthly income of ₦134,333.33. Fish farming, fish rearing and fish processing were the major livelihood activities the respondents were involved in. Findings also showed that the respondents perceived that aquaculture had a high impact on fish farming, fish processing and fish marketing; and a low impact on livestock rearing, handicrafts and salaried jobs. It was therefore, recommended among others, that Governmental and Non-Governmental agencies in the State should organize appropriate training programmes on integrated fish farming for fish farmers in the rural areas of the State to enable them practice integrated fish farming more efficiently and maximize the impact of aquaculture on both fish farming and crop farming in the study area.

**Keywords:** Aquaculture, Impact, Perceived, Rural livelihoods

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### Résumé

Cette étude a évalué l'impact perçu de l'aquaculture sur les moyens de subsistance ruraux dans l'État d'Akwa Ibom, au Nigéria. Un échantillon de 270 pisciculteurs a été sélectionné dans les zones rurales de cet État selon une méthode d'échantillonnage à plusieurs degrés. Les données ont été recueillies à l'aide d'un questionnaire et analysées au moyen de statistiques descriptives telles que les fréquences, les pourcentages, les écarts-types, les moyennes et les rangs. Les résultats indiquent que la majorité des répondants étaient des hommes, d'un âge moyen de 44 ans ; 47,8 % étaient mariés et 81,1 % étaient alphabétisés fonctionnellement, avec un revenu mensuel moyen de 134 333,33 nairas. L'élevage, la transformation et la production de poissons constituaient les principales activités génératrices de revenus des répondants. L'étude a également montré que les répondants percevaient un impact important de l'aquaculture sur l'élevage, la transformation et la commercialisation du poisson, et un faible impact sur l'élevage, l'artisanat et les emplois salariés. Il a donc été recommandé, entre autres, que les organismes gouvernementaux et non gouvernementaux de l'État organisent des programmes de formation adaptés à l'aquaculture intégrée à destination des pisciculteurs des zones rurales, afin de leur permettre de pratiquer une aquaculture intégrée plus efficace et de maximiser l'impact de l'aquaculture sur la pisciculture et les cultures dans la zone d'étude.

**Mots-clés:** Aquaculture, Impact, Perçu, Moyens de subsistance ruraux

### Introduction

A livelihood comprises the capabilities, assets and activities required for a means of living (Krantz, 2001). It constitutes adequate stocks and flows of food and cash to meet basic needs of life and it comprises people, their capabilities and means of living including income and assets (Udoh, Akpan and Uko 2017). The assets could be tangible or intangible assets. Tangible assets are physical resources while intangible assets are claims and access. Livelihood activities encompass a broad range of economic engagements, both on-farm and off-farm, that individuals or households undertake to sustain their well-being and secure income (Tabares *et al*, 2002). People in rural areas of Akwa Ibom State, including fish farmers, are often involved in various livelihood activities such as crop farming, livestock rearing, fishing, trading/ business, transportation, etc (Asa and Solomon, 2010; Archibong, Akpabio, Etuk and Umoh, 2025). Rural livelihoods has great significance for a country like Nigeria where the majority of the population lives in rural areas (Oladimeji and Abdulsalam, 2015).

Aquaculture production contributes to livelihood systems through the channels of employment, nutrition, farm productivity and income growth (Odozi, 2025). A uniform increase in aquaculture was found to reduce income inequality and thus is an equalizing enterprise income source in livelihood systems. Rural aquaculture creates "own enterprise" employment where the entire family devotes to the business (Edwards, 2000). Aquaculture contributes to the livelihood of the poor through improved employment and income; it creates job opportunities for rural communities, especially for illiterate women to earn side income for households. However, there is a dearth of information in literature on how fish farmers in rural area of Akwa Ibom State perceive the impacts on aquaculture on their livelihoods, hence this study. Conducting a study aimed at understanding how society perceives different aquaculture practices is crucial to

supporting the continued evolution of aquaculture towards greater sustainability while boosting public acceptance (Budhathoki *et al*, 2024). The specific objectives of this study were:

- i. To examine the demographic characteristics of rural fish farmers in Akwa Ibom State,
- ii. To determine the respondents' level of involvement in livelihood activities in the study area, and
- iii. To ascertain the respondents' perceptions of the impact of aquaculture and livelihood activities in the study area.

## **Methodology**

### **Study Area**

The study area was conducted in Akwa Ibom State of Nigeria. The State lies between latitudes 4°33" and 5°33" North, and longitudes 7°33" and 8°25" East; occupies a total land area of 7,245,935km<sup>2</sup> and has an estimated population of 3,920,208 (National Population Commission, 2006). Akwa Ibom State is wedged between Cross River State, Abia State and Rivers State on the sandy deltaic plain of the Guinea Coast. Akwa Ibom State has three Senatorial Districts (Uyo Senatorial District, Eket Senatorial District and Ikot Ekpene Senatorial District) and the capital of the State is Uyo Local Government Area. The major ethnic groupings in the State are Ibibio, Annang and Oron. Ibibio language is the main language, but there are variations in dialects within the State: Annang, Eket, Ibeno, Itu Mbon Uso, Mbo, Okobo and Oron, while Andoni language is spoken by a minute population of the State. The above population lives within the tropical rainforest zone with two major seasons: a rainy season (May to October) and a dry season (November to April). Annual rainfall ranges between 2400mm along the coast and 2000mm. The physical features directly influence the choice of crop cultivation and fishing as a means of sustainable livelihood. In 1997, the State was divided into six agricultural zones: Abak, Etinan, Eket, Uyo, Oron and Ikot Ekpene. The map of Akwa Ibom State is shown in Figure 1.

### **Sampling Procedures and Sample Size:**

A multi-stage sampling procedure was used to select the sample for this study. The first stage of the sampling procedure involved the random selection of three Local Government Areas out of each of the three Senatorial Districts in the State. The selected Local Government Areas were Etinan, Itu and Uruan in Uyo Senatorial District; Ibeno, Oron and Urue Offong/Oruko in Eket Senatorial District; and Essien Udim, Ini and Obot Akara in Ikot Ekpene Senatorial District. The second stage involved the purposive selection of a rural community in each of the nine selected Local Government Areas. The use of purposive selection at this stage ensured that only communities considered rural were selected for the study since the study was focused on fish farmers in rural areas of Akwa Ibom State. The third stage of the sampling procedure involved the convenience selection of thirty (30) fish farmers in each rural community of the selected nine (9) Local Government Areas thereby resulting in a total sample size of 270 rural fish farmers. Convenience sampling was employed at this last stage of the multi-stage sampling procedure for ease of access to fish farmers in the rural communities.

### **Data collection**

The Research Team that carried out this study used trained enumerators for the collection of data from the respondents. Data collection was conducted at the homes of the respondents. The enumerators provided detailed explanations about the study and questionnaire completion,

remaining present throughout the process to address any questions or clarifying ambiguities. All the questionnaires were collected immediately after completion by enumerators. Respondents were assured of complete confidentiality. The average completion time for the questionnaire was approximately 20 minutes. The questionnaire was divided into three sections that include demographic variables, respondents' level of involvement in rural livelihood activities in the study area and respondents' perceptions of the impact of aquaculture on rural livelihoods activities in the study area. The Livelihood Activities Involvement Scale (LAIS) used to ascertain the respondents' level of involvement in rural livelihood activities in the study area was adapted and modified from a Scale from literature (Asa and Solomon 2010). The Scale had 13 items and the response categories to items in the scale were: Not Involved, Lowly Involved and Highly Involved scored nominally as 0, 1 and 2 respectively. The mean from the nominal score of the response categories (0, 1 and 2) is 1.00 which served as the cut-off point between low (<1.00) and high ( $\geq 1.0$ ) levels of respondents' involvement in each rural livelihood activity. The perceived impact of aquaculture on the respondents' livelihood activities was measured using the Perceived Impact of Aquaculture on Livelihood Activities Scale (PIALAS) developed by the authors. The PIALAS was subjected to content validity and construct validity evaluations by experts in socio-economic analysis. Responses to the items in PIALAS were scored on a 3-point rating scale ranging from "No Impact", "Little Impact", to "Great Impact", nominally scored on a scale of 0,1 and 2 respectively.



Figure 1 Map of Akwa Ibom State

Source: Produced at GIS Laboratory, Uniuyo, 2025

The mean of the rating scores (0, 1 and 2) is 1.00 which served as a benchmark between low (<1.00) and high ( $\geq 1.00$ ) levels of respondents’ perceived impact of aquaculture on each rural livelihood activity.

**Data Analysis**

The data were analyze using the Statistical Package for the Social Sciences Software Version 25. Descriptive statistics, including mean, standard deviation, frequency distribution, tables (absolute and relative) were used to analyze the three specific objectives of the study.

**Results and Discussion**

**Demographic characteristics of rural fish farmers in Akwa Ibom State:** Table 1 (about here) provides a summary of the demographic characteristics of fish farmers in rural areas of Akwa Ibom State, Nigeria. A total of 270 fish farmers we use as sample in the study. Majority of the respondents (70.0%) were males; the mean age of the respondents was 44 ±15.44 years (range: 18-71 years); one hundred and twenty-nine (129) of them were married; two hundred and nineteen

Table 1: Demographic characteristics of rural fish farmers in the study area

S/N	Variables	Frequencies (%)	Mean (SD)
1	<b>Sex</b>		
	Male	189 (70.0)	
	Female	81 (30.0)	
2	<b>Age</b>		44 years (15.44)
3	<b>Marital Status</b>		
	Single	87 (32.2)	
	Married	129 (47.8)	
	Divorced/Separated	18 (6.7)	
	Widowed	36 (13.3)	
4	<b>Educational Level</b>		
	No formal education	51 (18.9)	
	Formal education	219 (81.1)	
5	<b>Formal Employment Status</b>		
	Unemployed	147 (54.4)	
	Employed	123 (45.6)	
6	<b>Type of Aquaculture Practice</b>		
	Homestead/subsistence farming	81 (30.0)	
	Commercial farming	108 (40.0)	
	Both homestead/subsistence and commercial farming	81 (30.0)	
7	<b>Monthly Income</b>		₦134,333.33 (₦158,617.17)
8	<b>Years of fish farming</b>		10 years (6.58)

**Note:** % = Percentage; SD = Standard Deviation

**Source:** Field survey, 2025

(219) of them had some forms of formal education. Asa and Solomon (2015) reported that majority of catfish farmers in Akwa Ibom State were males and were also functionally literate which agrees

with the finding of this study. One hundred and forty-seven (147) were unemployed in the formal employment sectors in the State indicating a high level of unemployment among them. This is of concern, although it is not different from literature on the unemployment status of people in the rural areas of Akwa Ibom State. The 2023 National Bureau of Statistics (NBS) data show that unemployment rate in rural areas of Akwa Ibom State remain a critical issue - the rate is 4.3% as the first quarter of 2024 ([www.statista.com](http://www.statista.com), 2026). One hundred and eight (108) of the respondents practice commercial type of fish farming; their mean monthly income is ₦134,333.33 ± 158,617.17 (range: ₦20,000 - ₦1,000,000.00) and their average year of fish farming experience is 10±6.58 years (range: 2-35 years).

**Respondents’ level of involvement in livelihood activities in the study area:** Table 2 (about here) reveals the respondents’ level of involvement in livelihood activities in the study area. The shows that fish farmers were highly involved in the following livelihood activities: fish marketing (mean = 1.78), fish rearing (mean = 1.76), fish processing (mean = 1.37), crop farming (mean = 1.42), transportation (mean = 1.13), hired labour (mean = 1.10) and fish pond construction/maintenance and repairs (mean = 1.01). The result agrees with Asa and Solomon (2010) who reported that fish farming, fish processing and crop farming are some of the livelihood activities that rural dwellers in Akwa Ibom State highly participate in. In contrast, the respondents were lowly involved in the following livelihood activities: salaried jobs (mean = 0.96), livestock rearing (mean = 0.87), hunting (mean = 0.41), fishing gears sales and repairs (mean = 0.36) and handicrafts (mean = 0.31).

Table 2: Mean Analysis and Ranking of respondents’ involvement in rural livelihood activities in Akwa Ibom State

Livelihood Activities	Mean	Level of Involvement	Rank*
1. Fish rearing	1.76	High	2
2. Fish processing	1.36	High	3
3. Fish marketing	1.78	High	1
4. Fish pond construction/maintenance and repairs	1.01	High	8
5. Fish gears sales and repairs	0.36	Low	12
6. Crop farming	1.42	High	5
7. Trading/Business	1.57	High	4
8. Salaried job (Government or Private)	0.96	Low	9
9. Livestock rearing (poultry, goats, chicken, etc)	0.87	Low	10
10. Transportation (cars, motorcycle, tricycle)	1.13	High	6
11. Hunting	0.41	Low	11
12. Hired labour	1.11	High	7
13. Handicrafts	0.31	Low	13

**Note:** Items with mean < 1.00 signifies low level involvement, while items with mean ≥ 1.00 signifies high level involvement; \* = rank 1 is the activity with the highest level of involvement while rank 13 is the activity with the lowest level of involvement

The findings, however, contradicts Obinaju and Asa (2016) who reported livestock rearing as a livelihood activity people in rural areas of Akwa Ibom State are highly involved. This could be due to the fact that this study specifically focused on persons in the rural areas whose major

means of livelihood/income is fish farming. The ranking of the respondents’ involvement in rural livelihoods in Table 2 reveals that the respondents were most highly involved in fish marketing and were most lowly involved in handicrafts.

**Respondents’ Perception of the Impact of Aquaculture on Livelihood Activities in the study area**

Depicted in Table 3 (about here) are the perceptions of the impact of aquaculture on rural livelihoods in Akwa Ibom State, Nigeria. The Table reveals that the respondents perceived that aquaculture has a high impact on seven livelihood activities in the study area: fish farming (mean = 1.84), fish processing (mean = 1.82), fish marketing (mean = 1.09), transportation (mean = 1.08), hired labour (mean = 1.03), trading/business (mean = 1.01), and fish pond construction/maintenance and repairs (mean = 1.00). Contrastingly, aquaculture is perceived to have a low impact on the six livelihood activities in the study area: hunting (mean = 0.98), fish gears sales and repairs (mean = 0.84), crop farming (mean = 0.63), salaried jobs (mean = 0.10), handicrafts (mean = 0.10); and livestock rearing (mean = 0.04). The findings in Table 3 show a close link between respondent’s perceived impacts of aquaculture on the rural livelihood of fish farmers and their levels of involvement in the livelihood activities.

Table 3: Mean Analysis of Ranking of respondents’ perceptions of impact of aquaculture on rural livelihoods in the study area

Livelihood Activities	Mean	Level of Involvement	Rank*
1. Fish rearing	1.84	High	1
2. Fish processing	1.82	High	2
3. Fish marketing	1.09	High	3
4. Fish pond construction/maintenance and repairs	1.00	High	7
5. Fish gears sales and repairs	0.84	Low	9
6. Crop farming	0.63	Low	10
7. Trading/Business	1.01	High	6
8. Salaried job (Government or Private)	0.10	Low	11.5
9. Livestock rearing (poultry, goats, chicken, etc)	0.04	Low	13
10. Transportation (cars, motorcycle, tricycle)	1.08	High	4
11. Hunting	0.98	Low	8
12. Hired labour	1.03	High	5
13. Handicrafts	0.10	Low	11.5

**Note:** Item with mean < 1.00 signifies low impact while items with mean ≥ 1.00 signifies high impact; \* = rank 1 is the livelihood activity the respondents’ perceived aquaculture has the highest impact on while rank 13 is the activity aquaculture has the lowest impact on.

The ranking of the perceived impact of aquaculture in Table 3 reveals that aquaculture has the highest impact on fish farming and the lowest impact on livestock rearing. This is due to the fact that the respondents of this study are mainly farmers whose major/primary agricultural activity is fish farming.

### Conclusion and Recommendations

The study used a quantitative questionnaire to elicit the perceptions of fish farmers on the impact of aquaculture on rural livelihoods in Akwa Ibom State, Nigeria. It can be concluded that aquaculture is perceived by rural fish farmers in Akwa Ibom State as having a high impact on majority of the identified rural livelihood activities in the study area. Based on the findings of the study, it is recommended that:

- (i) Government and Non-Government Agencies in Akwa Ibom State should organize appropriate training programmes on integrated farming for fish farmers to enable them practice integrated farming more efficiently and therefore maximum the impact of aquaculture on both fish farming and crop farming simultaneously since the result of the study shows that aquaculture, is perceived to, have a high impact on fish farming but a low impact on crop farming.
- (ii) Programmes on aquaculture for fish farmers organized by Governmental and Non-Governmental Agencies in the State should aimed at encouraging more females to be involved in fish farming. This is necessary because the findings of the study revealed that majority of fish farmers in the study area are males.
- (iii) The high level of formal unemployment status of the respondents calls for concern and reveals the need for Government, at the State and Local Government levels, to create more employment opportunities for people residing in the rural areas of the State including rural fish farmers.

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### Conflicts of Interest

The authors declare no potential conflicts of interest.

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