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Livelihood Diversification And Operational Techniques Of The Artisanal Fisherfolks In The Coastal Region Of Ondo State, Nigeria

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Abstract:
This study was carried out to assess the livelihood diversification and operational techniques of the artisanal fisherfolks in the coastal region of Ondo state, Nigeria. Both secondary and primary data were used. A multistage sampling techniques was used to select 400 respondents from Ilaje and Ese-Odo LGAs, these LGAs were purposively selected because they fall within the core coast of the state which is about 180km. Descriptive statistics was used to analyse the socioeconomic characteristics and operational techniques of the respondents, Cronbach alpha (α) was also employed to test the sufficiency of the survey instruments.
Analysis showed that 82% of the respondents were married, majority of the respondents (67%) were males while others (33%) were females. The operational techniques for fishing occupation reveals that 85% of the respondents make use of dugout canoe to carry out their fishing, 10% of the respondents make use of motorized canoe to carry out their fishing activities. The fish capturing techniques employed in the study area include active and passive methods. The married class is the most predominant group in the fishing business and this result is significant ($p<0.01$), fishing remains the most engaged main occupation with male predominant in the business than female. However, chi square χ^2 is 246.5 and highly significant ($p<0.01$) it implies that the level of livelihood diversification is significant in terms of gender. Returned Cronbach of 0.74 for items with means of 4617.3 and zero variance, implies a great deal of sufficiency. It is therefore recommended that the artisanal fisher folks should be encouraged to imbibe aquaculture practices in their community to augument their natural catch hence, increase diversification in livelihood.

1.Introduction

Over 38 million people worldwide are employed in fisheries and aquaculture, 95% of them in developing countries. Most of them are involved in small-scale fisheries. Food insecurity remains one of the most visible dimensions of poverty and is generally the first sign of extreme destitutions. While fish is an important source of food security for fish households, incomes derived from fisheries sector or from fish trade is often more important as an indirect contribution to food security. Inland and coastal fisheries and related fish processing and trading provide full-or part time employment for between 6 and 9 million people in Africa, Nigeria inclusive (CBN, 2004). Fish contributes to national food self-sufficiency through direct consumption and through trade and export in Nigeria. About 6 million coastal and riverine rural fisher folks in Nigeria are engaged in artisanal fish production and its subsidiary activities as major sources of livelihood for the fisher folks (FAO, 2005). The contribution of artisanal fish catch to domestic fish production is between 85-90% of domestic production and in 2000 it was more than 89.5% to Nigeria's domestic production (Federal Department of Fisheries, 2003). In Ondo state, fisher folks in the state are mostly artisanal that still depend on traditional method of fishing but in recent times, some of them have started using motorized canoe and out-board engine for their fishing exercise. The fisher folks are dispersed along coastlines, and because they depend mainly on marine ecosystems situated close to their homes they are particularly vulnerable to resource depletions. Small-scale fishing communities are also vulnerable to climatic and other natural events, such as yearly and seasonal fluctuations in stock; poor catches; bad weather and natural disasters such as floods and storms at sea; high cost of fishing inputs, market price fluctuations and variable access to markets. Presently, most of the fish catch consist of young and immature specimens, which is a pointer to the problem of over fishing. Fishermen also confirm the fact that there has been a decline in fish catch over the years and fishing is now at a subsistence level (Fregene, 2002). This study however, examines the livelihood diversification and operational techniques of the artisanal fisher folks in the coastal region of Ondo state, Nigeria.

2.Materials And Methods

2.1.The Study Area

The study was carried out in the coastal region of Ondo –State, Nigeria, it has an approximate land area of 14, 793, 723 square kilometers with co- ordinates 7^0 10`N $5^0$05`E and a population of 3,441,024 million (2006 census). It lies on the tropics and the climatic condition is of two distinct seasons; the rainy season (April - November) and dry season (December – March). The temperature throughout the year ranges from 21^{o}C to 29^{o}C while the humidity is relatively high.

Ondo State is an agrarian state, besides farming and fishing, the inhabitants also engaged in various occupations such as trading, manufacturing, commerce and white civil service. The state is also one of the oil producing states in Nigeria other mineral found in commercial quantity in the state include bitumen, limestone, kaolin, glass sand and granite.

The field work of this study was carried out in Ilaje and Ese-Odo Local Government Areas (LGAs). Ilaje Local Government consists of over four hundred towns and villages, covering an area of 3, 000 square kilometers. The Local Government is one of the most populated in Ondo State, with a population figure of two hundred and seventy seven thousand and thirty four (277,034) (2006, census). It has a shoreline covering about 180km thereby making Ondo State, a state with the longest coastline in Nigeria.

Local Ese-Odo Government is made up of two major ethnic groups: the ljaw Apoi and Arogbo ljaw, who have similar historical antecedents. The local government has a population of 154,978 (NPC, 2006 census). It consists of more than one hundred and twenty towns and villages covering an area of over 1,600 square kilometres.

2.2.Population And Sample

The study was carried out in Ilaje and Ese –Odo Local Government Areas of Ondo state. A multistage random technique was used. The two LGAs were purposely selected because they fall within the coastal region of the state. From each of the LGAs, ten towns/villages were randomly selected and from each of the town/village, twenty respondents were also selected randomly and these add up to a total of four hundred respondents. The respondents were interviewed through a well structured questionnaire, interview schedule and focus group discussion. Extension agents and community development officers (CDOs) were also contacted.

2.3.Analytical Techniques

2.3.1. Descriptive statistics

The descriptive statistics was used to determine the socio-economic characteristics as well as the operational techniques of the respondents. The description include, mean, median, mode, standard deviation, frequency distribution, percentages, pie and bar charts.

2.3.2.Cronbach Alpha

Cronbach alpha was used to analysed the sufficiency of the survey instrument. Alpha was developed by Lee Cronbach in 1951 to provide a measure of the internal consistency of a test or scale; it is expressed as a number between 0 and 1. High quality tests are important to evaluate the reliability of data supplied in an examination or a research study. Alpha is a commonly employed index of test reliability. Alpha is affected by the test length and dimensionality. Reliability analysis was computed for 12 randomly selected items of the questionnaire using Cronbach`s alpha (α). Cronbach's alpha does not provide reliability estimates for single items.

$$Cronbach's\alpha = \frac{N - \overline{C}}{\overline{V} + (N-1).\overline{C}}$$

Where:

N = No of items (12),

$\overline{C}$ = average inter – item covariance among the items and

$\overline{V}$ = average variance.

2.3.4.Cronbach's alpha Internal consistency

$\alpha \geq 0.9$	Excellent
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Acceptable
$0.6 \leq \alpha < 0.7$	Questionable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

3.Results And Discussions

3.1. Socioeconomic Characteristics And Operational Techniques Of The Respondents

Analysis of the socioeconomic characteristics and occupational techniques of the respondents as depicted in Table 1 that 82% of the respondents were married while 5% were divorced, 5% were separated and the singles were just 3%. Also, the socioeconomic characteristics analysis of the respondents' show that majority of the respondents (67%) were males while others (33%) were females. Most of the respondents were Christians (82%) while other groups were the traditional believers (14%) and the Muslims (3%).

Variables	Options	Frequency	Percentage
Marital Status	No answers	8.0	2.0
	Divorced	20.0	5.0
	Married	328	82.0
	Single	11	3.0
	Separated	21	5.0
	Others	12	3.0
Total		400.0	100.0
Gender	Females	131.0	33.0
	Males	269.0	67.0
Total		400.0	100.0
Religion	No answers	4.0	1.0
	Muslims	13	3.0
	Traditional	54	14.0
	Christians	329	82.0
Total		400.0	100.0

Table 1:Socioeconomic characteristics of the respondents
Source: Computed field data, 2012

Analysis of the occupational techniques revealed that 85% of the fisherfolks made use of dugout canoe to carry out their fishing activities, 10% of the fisherfolks made use of motorized canoe while the remaining 5% neither used dugout canoe nor motorized canoe to carry out their fishing activities. The fish capturing techniques employed in the study

area include active and passive methods, which are in form of hand gathering, spearfishing, netting, angling and trapping. (Table 2).

The result of the analysis shows that 60% of the fisherfolks made use of the active methods of fishing which included the use of seine nets, cast nets and out board engines, while 35% of the fisherfolks were involved in the use of passive means such as set nets, hooks, long lines and other types traps, the remaining 5% made use of both methods to capture their fish (Table 2). This implies that the volume of fish catch per effort will still be at subsistence level because of the type of fishing gears the fisherfolks employed in their fishing activities.

Variables	Options	Frequency	Percentage
Types of canoe used	No answers	19.0	5.0
	Motorized canoe	42.0	10.0
	Paddle canoe(dugout)	339.0	85.0
Total		400.0	100.0
Fish captured techniques	No answers	13.0	3.0
	Active	241.0	60.0
	Passive	140.0	35.0
	Both	6.0	2.0
Total		400.0	100.0

Table 2:Operational Techniques of the respondents
Source: Computed field data, 2012

3.2.The Level Of Diversification Of Livelihood Among The Fishing Households

The cross table analysis of the marital status against the main occupation showed that the main occupation of the different groups is fishing except for the singles which amounted to (40%). The married class is the most predominant group in the fishing business and this result is significant ($p<0.01$). The implication of this is that marital status plays a significant role in the types of main occupation engaged in by the respondents as shown in Table 3.

Variables	Options	Civil servants	Farming	Fishing	Tapping (wine)	Teaching	Trading	Others	X^2 statistics
Marital status	No response	0.0	0.0	0.0	8.0	0.0	0.0	0.0	
	Divorced	0.0	0.0	20.0	0.0	0.0	0.0	0.0	
	Married	33.0	2.0	246.0	0.0	27.0	18.0	2.0	**461.079*****
	Single	0.0	0.0	4.0	0.0	7.0	0.0	0.0	
	Separated	0.0	0.0	21.0	0.0	0.0	0.0	0.0	
	Others	0.0	0.0	12.0	0.0	0.0	0.0	0.0	
Total		33.0	2.0	303.0	8.0	34.0	18.0	2.0	400.0

Table 3:Effect of marital status on level of diversification among fishing households
*** Significant at 0.01 level significant (≤0.01)
Source: Computed field data, 2012

For gender, fishing remains the most engaged main occupation with male predominant in the business than female. This is closely followed by teaching with the same trend male dominating than female. However, the trend is reversed for trading where female is predominantly higher than male and this is significant (χ^2 = 28.5) at 0.01 level of significant (Table 4).

Variables	Options	Civil servants	Farming	Fishing	Tapping (wine)	Teaching	Trading	Others	X^2 statistics
Gender	Male	24.0	2.0	204.0	8.0	26.0	3.0	2.0	
	Female	9.0	0.0	99.0	0.0	8.0	15.0	0.0	**28.518*****
Total		33.0	2.0	303.0	8.0	34.0	18.0	2.0	**400.0**

Table 4. Effect of Gender on level of diversification among fishing households
**** Significant at 0.01 level significant (≤0.01)*
Source: Computed field data, 2012

The other occupation engaged in by the respondents as part of their livelihood diversification include; artisan, farming, fishing, timber business and trading. For the married fishing still remain the dominant secondary occupation followed by trading and farming, timber contractors were the least. Only few of the single took fishing as their other or secondary occupation. The reason for this might be to the fact that most of the

youth who are single engaged in other profitable business in the cities or were in the tertiary institutions. However, χ^2 is 246.5 and highly significant ($p<0.01$). (Table 5).

Variables	Options	Artisan	Farming	Fishing	None	Timber business	Trading	Others	X^2 statistics
Marital status	No response	0.0	0.0	6.0	0.0	0.0	0.0	0.0	
	Divorced	0.0	0.0	00.0	20.0	0.0	0.0	0.0	
	Married	0.0	22.0	87.0	133.0	5.0	81.0	0.0	**246.455*****
	Single	4.0	0.0	7.0	0.0	0.0	0.0	0.0	
	Separated	0.0	0.0	21.0	0.0	0.0	0.0	0.0	
	Others	0.0	0.0	2.0	0.0	0.0	0.0	0.0	
Total		4.0	22.0	102.0	186.0	5.0	81.0	0.0	400.0

Table 5 Effect of Marital status on other occupation for livelihood diversification among fishing households

**** Significant at 0.01 level significant (≤0.01)*

Source: Computed field data, 2012

Despite the fact that the number of male respondents that took fishing as their other occupation is higher than that of the female, the level of livelihood diversification is significant in terms of gender, a great number of the female took trading as their other occupation, chi square value χ^2 is 21.8 and significant at 0.01 level. (Table 6)

Variables	Options	Artisan	Farming	Fishing	None	Timber business	Trading	Others	X^2 statistics
Gender	Male	4.0	22.0	67.0	111.0	5.0	21.0	0.0	
	Female	0.0	0.0	35.0	75.0	0.0	60.0	0.0	**21.765*****
Total		4.0	22.0	102.0	186.0	5.0	81.0	0.0	**400.0**

Table 6 Effect of Gender on other occupation for livelihood diversification among fishing households

**** Significant at 0.01 level significant (≤0.01)*

Source: Computed field data, 2012

3.3. Survey Instruments Sufficiency Study (SISS) Results

Reliability analysis was computed for 12 randomly selected items of the questionnaire using Cronbach's alpha (α). These items are mean age of respondents, years of fishing experience, quantity of fish catch per day, selling cost, length of membership in Association, cost of purchase and cost of maintenance of fishing gears (2 listed items), cost of labour for any fishing operations, major occupation and gender.

The analysis of the survey instrument returned Cronbach α index of 0.74 which is acceptable, with means of 4617.3 and variance of 0.0. This implies a great deal of sufficiency because it is higher than recommended alpha of 0.5. The implication of this is that the items of the survey instrument are sufficient in addressing the hypothesis of the research. It is therefore safe to rely on the responses elicited from the instrument.

Number of items	Frequency	Percentage	Cronbach
Included	97	24.3	
Excluded	303	75.8	**0.74*** **
Total	400	100	

Table 7: Summary of Survey Instruments Sufficiency Study
*** *Significant at 0.01 level significant (≤0.01)*
Source: Computed field data, 2012

4.Conclusion And Recommendations

The study was carried out in Ilaje and Ese –Odo Local Government Areas of Ondo state, analysis showed that the survey instrument used was reliable with Cronbach alpha (α) 0.74 with means of 4617.3 and variance of zero.

Result showed that 82% of the respondents were married, most of the respondents (67%) were males while others (33%) were females. Analysis of the occupational techniques reveals that 85% of the respondents make used of dugout canoe to carry out their fishing while, 60% of the respondents make used of the active methods of fishing which include the use of hooks and lines, seine and cast nets e.t.c.

The married class is the most predominant group in the fishing business and this result is significant ($p<0.01$). Fishing remains the most engaged main occupation with male

predominant in the business than female. However, the trend is reversed for trading where female is predominantly higher than male, using chi square to compare the means of the percentage of male to female and this is significant ($\chi^2 = 28.5$). Other occupation engaged in by the respondents as part of their livelihood diversification include; artisan, farming, fishing, timber business and trading.

- It is therefore recommended that aquaculture practices and capture based aquaculture should be introduced in the coastal region as a means of boosting the living standard of the artisanal fisherfolks and modern fishing gears should be provided by the government to increase their production.
- They should be encouraged to form cooperative societies that will assist them in procuring modern day fishing gears that would boost their fish production.
- Assistance should be rendered to them by the government or Non Governmental Organisations (NGOs), in terms of soft loans, grants and subsidies, to increase fish production.

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