

## Coastal Storm and the Risk Factor in Small Scale Fish Business Operations in Akwa Ibom Coastline Communities, Nigeria

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### **Abstract**

*Coastal storm is one of the obvious challenges facing fish business in Akwa Ibom State, Nigeria as none over the years has grown from small to large scale. In this study, effort was made to determine the extent to which coastal storm could influence the operations of small scale fish business. Four research questions were answered in the study and three null hypotheses were tested at .05 level of significance. The population of the study comprised 1420 small scale fish business operators from fifty-one fishing communities that spread across eight Local Government Areas that situate along the coastal bank. Stratified random sampling technique was used in selecting a sample of 312 small scale fish business operators. The researchers developed a 30-item structured questionnaire (which was equally interpreted in local dialects) for data collection. The questionnaire items were face validated by three experts, two from Department of Vocational Education and One from Department of Educational Foundation; all from University of Uyo, Uyo. Cronbach Alpha method was used in calculating the reliability of the instrument and a correlation coefficient index of 0.82 was obtained which showed that the instrument was reliable. Data were analyzed using mean and standard deviation for research questions while the null hypotheses were tested to determine the influence using t-test. The findings of the study indicate that loss of personnel, lack of insurance cover and loss of fishing gears have high influence on the operations of small scale fish business. It is recommended that Akwa Ibom State Government should design an Incentive-Based Risk Sharing System (IBRSS) for fish business operators to enable them contain risks associated with coastline businesses.*

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**Key words:** Coastal Storm, Risk Factor, Small Scale Fish Business and Incentive-Based Risk Sharing System

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### **Introduction**

Seafoods (which include all kinds of fish) are one of the most extensively traded commodities in the world, as it is a business that drives other allied businesses. Unfortunately, the sustainability or long term survival of this business appears to be bleak due to the challenges of coastal storm. Coastal storms refers to an unusual, often destructive rise of water along the sea (wave) and seashore, as from onshore, storm winds or a combination of wind and high tide; it is also called storm surge (Collins, 2003). This is why Akpan (2004) asserted that every business operation carries with it some degree of risk which in this case, holds true of fish business that encounter losses both human and material resources during coastal storm. For instances Enemugwem (2001), lamented that it is common among fish business operators to lost two or

three persons (including gears and money) in a speed boat almost on weekly bases while trying to buy fish from supplying ships (trawlers). Abiodun and Ayanda (2007) added that storms have claimed fish business operators' capitals of invaluable estimation thereby forcing some operators to withdraw from fish business. The State Department of Fishery (SDF) (2005) also confirmed that there has been a steady downward trend in the total number of fish entrepreneurs due to high level of risk involved in the business. But Hamilton, Connelly and Duster (2001) attributed losses in fish business (that owes its root to coastal storm) to lack of appropriate and modern fishing gears that can reduce the risk associated with fish distribution and marketing business. Sanusi (2011) added that business can only operate profitably when available resources are employed to reduce risks in business environment so that this can strengthen the productive capacity base of business outfits. While to Ekpo and Essien-Ibok (2003) the outright neglect of water transportation by state government is the reason why wholesale dealers (those who buy from supplying ships) are left with no option than to use locally made boats in carrying out their distributive trade.

Ekpo and Essien-Ibok (2013), further maintained that with these poor transport facilities, that it is not uncommon that wholesale dealers stay up to a week (during high tides) without making attempt to get supply and that, such situation of having break in supply chain, often expose fish marketers' business to stock-out. The consequence of stock-outs according to Akpan (2015) is enormous, ranging from loss of patronage from customers as a result of brand switch to alternatives like imported fish (stockfish) and other brand equity which are detrimental to the nation's foreign reserve. Another problem associated with insufficient stock is inability to cover operational cost like depreciation cost of assets used in running the business. It is based on these challenges that Misra (2012) gave reason to explain why states that are endowed with fish resources still depend on imported fish instead of being self-sufficient in fish consumption in order to help strengthen the economy. Provision of good water transport facilities like sea trucks, house boats and motorized boats by government were suggested by Misra (2012) as a way to reduce or contain cases of fish business operators being trapped by coastal storms. Therefore, the several reversal of fortune in this line of business becomes an overbearing burden to the researchers which necessitate the essence of this study.

### **Statement of the Problem**

One of the cheapest and richest means through which the fast human growing population could meet their need for protein is through the consumption of fish. Unfortunately fish harvested from ocean which should be sufficient to meet the human need could not. This is sufficiently presumed to be as a result of coastal storm and it accompanying risk factors that have placed heavy distortion on the supply chain of fish. There have been cases where both material (fishing gears) and human resources have lost as well as beach market being depleted gradually and denial of fish distributor's accessibility to trawler ships. The consequence of this is that fish mongers and marketers are exposed to frustration as a result of stock-out, loss in material and human resources hence, inferring with the smooth flow of fish in the logistics and distribution networks such that the end consumers now sought for rared fish out of frustration.

### **Purpose of the Study**

The major purpose of this study was to determine the extent to which coastal challenges influence the operation of fish business in Akwa Ibom coastline communities. Specifically, the study sought to:

1. Determine whether there are risks that influence the operations of small scale fish business in Akwa Ibom Coastline Communities.
2. Determine the influence of loss of personnel on the operations of small scale fish business in Akwa Ibom Coastline Communities.
3. Determine the influence of lack of insurance cover on the operations of small scale fish business in Akwa Ibom Coastline Communities.
4. Determine the influence of loss of fishing gears on the operations of small scale fish business in Akwa Ibom Coastline Communities.

### **Research Questions**

The following research questions were developed to guide the study:

1. is there any risk that influences the operation of small scale fish business in Akwa Ibom coastline communities?
2. How does loss of personnel influence influences the operation of small scale fish business in Akwa Ibom coastline communities?
3. How do lack of insurance cover influences the operation of small scale fish business in Akwa Ibom coastline communities?
4. How does loss of fishing gears influence the operation of small scale fish business in Akwa Ibom coastline communities?

### **Null Hypotheses**

The following null hypotheses were formulated and tested at .05 level of significance.

- Ho<sub>1</sub>.** There is no significant difference in the mean responses of male and female fish operators on the influence of loss of personnel on the operations of small scale fish business in Akwa Ibom coastline communities.
- Ho<sub>2</sub>.** There is no significant difference in the mean responses of male and female fish operators on the influence of lack of insurance cover on the operations of small scale fish business in Akwa Ibom coastline communities.
- Ho<sub>3</sub>.** There is no significant difference in the mean responses of male and female fish operators on the influence of loss of fishing gears on the operations of small scale fish business in Akwa Ibom coastline communities.

### **Research methods**

Descriptive survey research design is adopted for this study. A descriptive survey research according to Udo and Joseph (2005) is a type of research that involves the use of various analytical techniques employed in the description or explanation of a phenomenon. Explanation by Uzoagulu (2011), confirmed that using this design enables the researcher to collect, organize, analyse and describe data as they exist without any interference, hence, it is the choice of the researcher to adopt the design. The study was conducted in Akwa Ibom Coastline Communities. There are 1420 small scale fish business operators in Akwa Ibom Coastline Communities (Small and Medium Scale Enterprises Development Agency (SMEDAN), 2014 and State Department of Fisheries (SDF) (2015).

The area is sandwiched on the East by the Cross river estuary and on the West by the Imo River. Other major rivers found within the area include: Qua Iboe River and the Shooter Creek (Okwan Obolo). On Southern axis, the area is bounded by the Atlantic Ocean (the Bight of Bonny) while in the North are other politically stratified Local Governments Areas such as

Onna, Mkpato Enin and Eket. It lies between latitude  $7^{\circ} 35' E$  and longitude  $8^{\circ} 20' E$ . The coastline communities stretch across the following Local Government Areas: Ikot Abasi, Eastern Obolo, Ibeno, Mbo, Oron, Udung Uko and Okobo. It has two main geomorphologic limits- the coastal sedimentary low land and the lagoon water bodies, occupying the Islands and peninsulas that interrupt the densely lengthy mangrove forest which is an environmental resource for industrial development. (See appendix C for the details of the coastline communities in the respective Local Government Areas in the Coastline Area).

According to Enemugwem (2005), Akwa Ibom Coastline Area occupies about two-fifth of the Nigerian Coastline with a coverage area of 45,000 kilometres. It has four dialectal groups. They are Obolo, Oro, Ibeno and Ibibio. The cultures that are common in the area include: believe in many divinities (Yok in Obolo and Ndem in Ibibio), Family decent, inheritance and appointment of Village Heads. Other occupations apart from fish business which they engage in are local boat caving, production of net mending needles, mining of sharp sand, production of inputs for fish processing like pinning sticks, rackets and farming among others.

The population of the study consists of 1420 registered small scale fish business operators in the Coastline Communities, (Small and Medium Scale Enterprises Development Agency SMEDAN, 2014). This figure is equally confirmed by State Department of Fisheries (SDF) (2015). A total of 312 small scale fish business operators constituted the sample for the study. This was statistically determined using Yaro Yamane formula. According to Uzoagulu (2011), using statistics to compute sample is more tolerable than determining the size by mere approximation; hence, the use of this formula. The sampling technique that was used is stratified random sampling. This guaranteed a fair representation of small scale businesses across the eight Local Government Areas:

A researcher-developed instrument titled “Coastal Storm and the Risk Factor in Small Scale Fish Business Questionnaire” (CSRFSSFBQ) was used in collecting data (from the literate fish business operators) for the study. The instrument was interpreted in local dialect of the respondents; to enable the illiterate fish business operators give valid responses. Then, for illiterate fish business operators, structured interview was conducted. The questionnaire was used as a guide for the interview.

The response options for these sections were a 4-point rating scale as follows:

Very Great	VG	4 points
Great	G	3 points
Little	L	2 points
Very Little	VL	1 point

The instrument was given to three research experts, two from the Department of Vocational Education and one from the Department of Educational Foundations, all in the University of Uyo for face validation. These experts were requested to read through the instrument item by item, make corrections, indicate the suitability of the items, language used and the arrangement of the items in logical and chronological sequence. Their comments, suggestions, corrections and other inputs were included in the instrument and used for adjustments and modifications of the final copy.

The internal consistency of the instrument was determined by using Cronbach Alpha method. A trial test was carried out using 30 fish business operators from Lagos and Ogbogbo-uti fishing ports who were not take part in the actual study. The coefficient index of 0.88 was

obtained. The Cronbach Alpha was preferred because it gave a more accurate estimate of instrument reliability (Olaitan and Nwoke, 2000).

The distribution of the questionnaire was carried out by the researcher in order to achieve high rate of returns and as well prevent loss of instrument. Two research assistants were engaged and briefed on procedures for distribution and collection of the instrument from the respondents. Three hundred and twelve (312) copies of the questionnaire were distributed. The respondents were given two days to complete the questionnaire and same was retrieved from them after completion, giving 100% return rate. The statistical tools that were used in answering research questions were mean score rating and Standard Deviation (SD) while t-test was used to test the null hypotheses at .05 alpha level. In answering the research questions, the mean and standard deviation was used. The cut-off point for the mean of each item on the 4-point rating scale was 2.50. Therefore, any item with a mean of 2.50 and above was considered as having a high influence on the operations of Small Scale Fish Business in Akwa Ibom Coastline Communities. On the other hand, any item with a mean below 2.50 was considered as not having a high influence on the operation of Small Scale Fish Business in Akwa Ibom Coastline Communities.

In order to test the null hypotheses, calculated t-value was compared with t-critical value. When the calculated t-value was greater or equal to the t-critical, the null hypotheses ( $H_0$ ) were rejected in favour of the alternative hypotheses. On the other hand, when the calculated t-value is less than the t-critical, the null hypotheses were to be upheld.

### Data Analysis and Discussion of Findings

**Table 1 Risk Assessment Matrix for determining Whether Risks Affect Small Scale Fish Businesses**

CONSEQUENCES					INCREASING PROBABILITY			
					A	B	C	D
Severity	People	Asset	Environment	Reputation	NH in Fish Storage	IO in Fish retailing Business	IOST in Fish wholesaling Business	IOAT in Fish Distribution Business
0	No injury	No Damage	No effect	No Impact	Low risk	Average Risk	High Risk	
1	slight injury	Slight Damage	Slight Effect	Slight effect				
2	minor injury	Minor Damage	Minor effect	Limited effect				
3	major Injury	localized Damage	Localized Effect	Considerable effect				
4	Single fatality	Major Damage	Major effect	National effect				

		e						
5	Multiple Fatalities	Extensive Damage	massive effect	International effect				

**Note:** **NH**= Never Heard of Incidence in Fish Storage, **IO**= Incidence has Occurred in Fish retailing Business, **IOST**= Incidence Occurred several times in Fish wholesaling Business, **IOAT**= Incidence Occurred All the times in Fish Distribution Business.

The responses in Table 1 indicate greater portion for red which represents high level of risk in distributive and wholesale businesses, followed by yellow which shows moderate risk and green indicating that there low risk. Therefore, it deduced risks could be found in all aspects of fish business though at varying degree as indicated by the colours.

### Null Hypothesis One

There is no significant difference in the mean score of male and female small and medium scale business owners on long term planning for sustainable business operation for self-reliance.

**Table 2 Independent t-test analysis on Influence of Loss of Personnel on the Operations of Small Scale Fish Business**

Gender	Mean	SD	N	df	t-cal	t-tab	Decision
Male	20.4	1.54	180	310	5.71	1.97	NS
Female	19.3	1.63	132				

**Note:** NS=Not Significant, S= Significant, df = 310

The results presented in Table 2 reveal that the mean of the variable (loss of personnel) fall within the limit that is equivalent to the range (real limit) of 3.45- 4.00; hence, the influence of loss of personnel on small scale fish business was considered to be very great extent. However, the standard deviation with the range of 1.54 - 1.63 indicates that the result tilted away from the mean. Also, the result of the hypothesis ( $H_{01}$ ) indicated that the calculated t-values of 5.71 was greater than the table value of 1.97 at .05 level of significance levels with 310 degree of freedom. Therefore, the null hypothesis was rejected. This means that there is significant of loss of personnel on the operation of small scale fish business.

### Null Hypothesis Two

There is no significant difference in the mean score of male and female small and medium scale business owners on long term planning for sustainable business operation for self-reliance.

**Table 3 Independent t-test analysis on Influence of Lack of Insurance Cover on the Operations of Small Scale Fish Business**

Gender	Mean	SD	N	df	t-cal	t-tab	Decision
Male	20.3	1.98	180	310	2.77	1.97	NS
Female	19.88	1.88	132				

**Note:** NS=Not Significant, S= Significant, df = 310

The results presented in Table 3 reveal that the mean of the variable (lack of insurance cover) fall within the limit that is equivalent to the range (real limit) of 3.45- 4.00; hence, the influence of lack of insurance cover on small scale fish business was considered to be very great extent. However, the standard deviation with the range of 1.88 - 1.98 indicates that the result tilted away from the mean. Also, the result of the hypothesis ( $H_{02}$ ) indicated that the calculated t-values of 2.77 was greater than the table value of 1.97 at .05 level of significance levels with 310 degree of freedom. Therefore, the null hypothesis was rejected. This means that there is significant of lack of insurance cover on the operation of small scale fish business.

### Null Hypothesis Three

There is no significant difference in the mean score of male and female small and medium scale business owners on long term planning for sustainable business operation for self-reliance.

**Table 2 Independent t-test analysis on Influence of Loss of Fishing Gears of the Operations of Small Scale Fish Business**

Gender	Mean	SD	N	df	t-cal	t-tab	Decision
Male	20.84	2.0	180	310	4.96	1.97	NS
Female	19.67	2.0	132				

**Note:** NS=Not Significant, S= Significant, df = 310

The results presented in Table 4 reveal that the mean of the variable (loss of fishing gears) fall within the limit that is equivalent to the range (real limit) of 3.45- 4.00; hence, the influence of loss of fishing gears on small scale fish business was considered to be very great extent. However, the standard deviation stood at 2.0 indicates that the result tilted away from the mean. Also, the result of the hypothesis ( $H_{03}$ ) indicated that the calculated t-values of 4.96 was greater than the table value of 1.97 at .05 level of significance levels with 310 degree of freedom. Therefore, the null hypothesis was rejected. This means that there is significant of lack of fishing gears on the operation of small scale fish business.

### Discussion of Findings

The analysis of the data presented from the foregoing revealed that fish business operators are highly affected by the influence of coastal storm in the operations of small scale fish business. The result implies that coastal storms constitute setbacks to the smooth operations of fish business. This agreed with Enemugwem (2001) who lamented that it is common among fish business operators to lost two to three persons (including gears) while trying to buy fish from supplying ship. This is supported by Abiodun and Ayanda (2007) who posit that fish business operators of invaluable estimation are often claimed by coastal storms, resulting to these businesses, either being liquidated or continue in perpetual small scale.

The result also indicated that there is a significant influence of coastal storm to the operation of small scale fish business. It is significant based on the fact that the t-cal is greater than the t-crit. The null hypothesis is therefore rejected and the alternative hypothesis is upheld. The researchers observed from the study that none of the fish business operators uses modern fishing gears like sea truck perhaps due to cost implication; and that government grants and other facilities have never been designed to cover these group of business operators.

## Conclusions

The following conclusions are drawn based on the findings of this study: The risks of coastal storms such as loss of personnel, lack of insurance cover and loss of fishing gears affect and have significant influence on the operations of small scale fish business. If Government at both the Federal and State level show sufficient commitment towards providing incentives and basic facilities, this would encourage the fish business to grow and break the vicious cycle of smallness such that it could be easier for these businesses to join the league of large scale business just as the foreign ships that are fishing in the territorial waters of Nigeria.

The significant influence of flood, sea piracy, location of oil platforms, coastal storms and sea shore erosion on the operations of small scale fish business implies that these are challenges that perhaps account for insignificant contribution to the nation's GDP and economy as whole

## Recommendations

Based on the findings and conclusion of this study, it was recommended that:

1. Akwa Ibom state government should design an Incentive-Based Risk Sharing System (IBRSS) for fish business operators to help them contain the problem of coastal challenges that usually claim lives and fishing gears.
2. The federal government through Ministries of Works, Transport and Water Resources should undertake to dredge the estuaries and basins around the coastal region as well as embankment of the coastal line. This will help to address the challenges of flood, ocean surges and coastal erosion respectively that often characterizes the operation of fish business.
3. Akwa Ibom State Government through State House of Assembly should draw up laws and policies that will compel trawlers, fishing in the territorial waters of the state to have a hub or fish depot in the state; with such development, this can serve as a platform for people to venture into franchise business which is a modified fish business operations that is less prone to coastal storms.

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