WILLINGNESS TO PARTICIPATE IN LIFE INSURANCE SCHEME BY ARTISANAL FISHERS IN GHANA

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ABSTRACT

This study examines the willingness of canoe owners and crew members to participate in an insurance scheme in Ghana. A total of 386 canoe owners and 164 crew from four (4) coastal regions and the inland lake Region were sampled. Data was collected through semi-structured questionnaires on socio-economic characteristics, canoe characteristics, attitude at sea, assets, income, type of insurance, willingness to participate in insurance schemes, emergency coping mechanism and disasters encountered. A logit model was used to identify factors most likely to affect willingness to pay on group life insurance for crew. The study reveals that most canoe owners and crew members who go to sea adopt some safety measures such as informing their families, listening to weather forecast and carrying mobile phones. Very few go to fishing in groups, use life jacket and compasses for navigation. Very few respondents have enrolled in insurance policies including National Health Insurance Scheme (NHIS). Results suggest that most of the respondents are willing to participate (WTP) as well as pay (WTPay) for group life, personal life, family insurance, fishing gears and pension schemes. The factors that most strongly affect WTPay for group insurance of crew are family size, number of dependents, experience of fishing, whether canoe owners have ever been involved in insurance, listening to weather forecast before going fishing and ownership of a car. In conclusion, the study shows that majority of respondents are willing to participate and pay for the various insurance schemes including group and life.

Key words- Artisanal fishers, insurance scheme, willingness-To-Pay (WTPay), Logit model.

INTRODUCTION

Ghana is endowed with significant and valuable stocks of fish in its water resources, leading to a tradition and culture of fishing just like any other nation in West Africa. The country produces on average 430,000 tons (2009 to 2013) of fish each year worth about US$1 billion annually. It is estimated that as many as 2.5 million people (10% of 2013 population estimate) in Ghana are dependent on the fisheries sector for their livelihoods [17]. The sector's contribution to the country's GDP was reported to have reduced from 1.5 percent in 2012 to 1.4[i] percent in 2013 [11].

The fisheries sector has two major components: marine (sea and lagoons) and inland (lakes, rivers and reservoirs) [15]. Inland fisheries are primarily small scale, while the marine fisheries are a combination of mostly small scale and large scale industrial fisheries. According to [1], marine fishery resources are exploited by among other vessel types a fleet of 11,213 dugout canoes, 57 percent of which are motorized. The 2010 marine canoe frame survey suggest a total of 12,728 marine canoes of which about 73 percent are motorized [8]. The canoe fleet has increased significantly since the 1990s and now operates from 314 landing beaches and 190 fishing villages and also lands about 70 percent of the total marine fish production [8]. A significant proportion of Ghanaian small scale marine fishermen also operate in neighbouring countries such as Liberia, Senegal, Cote d'Ivoire, Togo, and Benin among others along the coast.

In the inland capture fishery, fishermen operating in Lake Volta use an estimated number of 24,000 fishing planked canoes of which about 4% are motorized with outboard engines [8]. The canoes in the inland are yet to be countered to know their current number. Fishing is carried out from not less than 1,232 fishing villages.

LIFE INSURANCE SCHEME

Work at sea has never been without danger, and the fishing industry has a long and growing roll of honour of crew who have lost their lives and gears in the performance of their work. FAO estimates that roughly 30 million fishermen are working aboard 4 million fishing vessels operating in capture fisheries, 1.3 million decked vessels and 2.7 million undecked vessels [6]. About 98 percent of these vessels are under 24 m in length, and are not covered by any

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international rules and regulations. The number of global fatalities was estimated by the International Labour Organization [12] in 1999 to be 24, 000 deaths worldwide per year. It is believed that the number of global fatalities may be considerably higher, since fatality rate in countries in which information is not available might be higher than in those that supply statistical information. Ghana has had its fair share of accidents of fishing vessels at sea and on the Lake and it is believed that figures reported are lower than expected at the fishing sector. In Ghana, A total of 12 accident case at sea were reported to the Arbitration Committees in 2013 as against 10 in 2012 [8] and by the end of June 2014, 35 fishermen had lost their lives on the Lake and Sea due to windstorm.

A number of countries including Republic of Korea, India, Malaysia and Indonesia [4] have taken steps to provide a measure of protection against part of the risks inherent in fisheries by setting up insurance schemes of various kinds. However, insurance schemes are still in an early stage of development in the fisheries sector in many developing countries of the region and countries face a number of institutional, financial, and technical constraints in their establishment [20]. A study conducted by FAO suggests that insurance is considered as a tool in risk management of capture fisheries activities [5]. It can contribute to the improvement of safety on fishing vessels by highlighting the factors that cause accidents. Insurance of marine capture fisheries vessels is available in many countries including Ghana. It is believed that majority of the small-scale vessels fishing in marine waters and inland fisheries are not insured [5,13]. Recent disasters that hit the fisheries sector (e.g. tsunami in 2004 and 2006, annual hurricanes in the Caribbean, typhoons in Viet Nam and China in 2006), has been a wakeup call for government for further development of risk management measures to mitigate the immediate impact of these disasters and ensure rapid rehabilitation of coastal communities, as well as the rapid restoration of productive capacity for food security, income and employment. The review of the current state of the world and aquaculture insurance by [20] and a presentation at the 10th Aquaculture Insurance and Risk Management Conference held in Vigo, Spain, in April 2006 showed that capture fisheries insurance services generally do not reach those involved in small scale activities in the sector worldwide. The coverage of insurance is very low particularly in Africa, South America, America and Asia. A regional conference on Insurance and Credit for Sustainable Fisheries Development in Asia (Tokyo, November 1996) show that particularly the small-scale marine capture and inland fisheries rarely received attention in the past from the insurance sector, although a clear need for the service was expressed by fisherfolks in the region [5].

Many people who depend on the fisheries sector for their livelihoods are among the poorest in the world. When a fishing boat is damaged or lost at sea, the consequences and burden are borne by the fishing households and sometimes governments. Risk prevention and reduction tools, such as fisheries insurance services among others can contribute to improving the livelihood of impoverished fisherfolk. Insurance (particularly micro-insurance) can reduce the risks involved in fisheries, enabling poor fisherfolk to innovate and access micro-credit services and investment funds [5].

As much as the authors are concerned, no study so far has been undertaken in this area of subject hence, this has motivated the authors to undertake this study to inform the sector, stakeholders and policy makers about the said topic. The main objective of the study is to analyze the willingness of artisanal fishers in some selected communities of the four coastal regions and the lake areas in Ghana to participate in life insurance schemes, particularly group life insurance and make policy recommendation to the stakeholders in the fishing industry as well as insurance companies.

METHODOLOGY

- **Study Area**

The study areas are locate at the 4 coastal regions and the Volta Lake area of Ghana. The coastal area comprised Volta, Greater Accra, Central and Western Regions. The Lake Areas (region) considered in this study covered Yeji, Kpando and Abotoase. Figure 1 gives a description of the landing sites/beaches and the gears sampled in each of the regions. Fishing is one of the major activities in these areas because of the water bodies. Fishing communities as well as landing sites are spread along these areas.

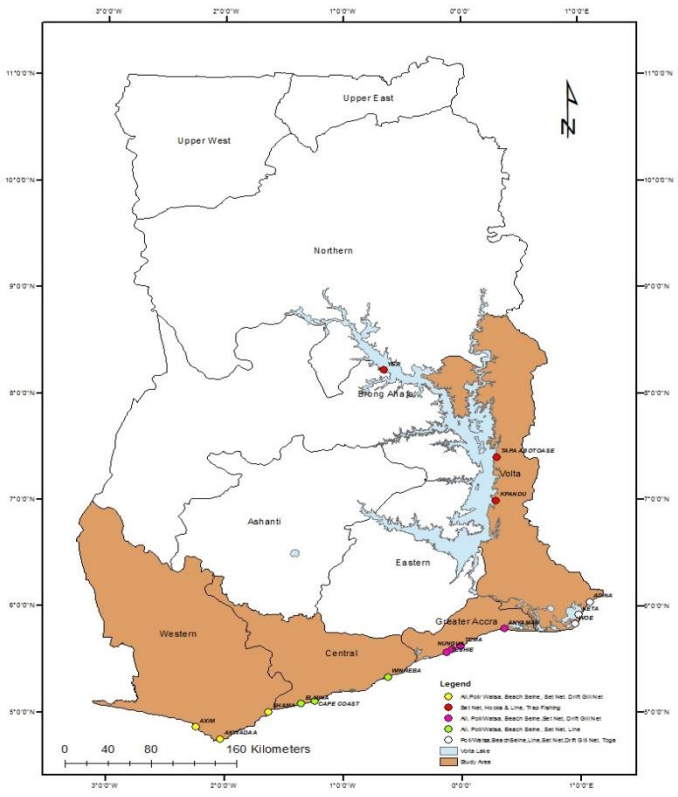

Fig 1: Map of Ghana showing study areas

Data from the target groups were collected using two sets of semi-structured questionnaires deduced from the study of [21] and other studies, one for canoe owners and the other for the crew. The canoe owners included the chief fishermen who are opinion leaders in the fishing communities in the selected landing sites. The Regional Directors of Fisheries Commission and some zonal officers in these study areas assisted in identifying areas for the study. Eighty percent of the data collection targeted major landing areas. The designed questionnaires were pre-tested for clarity, consistency, ambiguity and to avoid duplication before finalized for the data collection. Zonal Fisheries Officers and technical staff were trained to administer the questionnaires.

The study was conducted from May to July, 2013. Equal number of questionnaires were allocated to each of the study area. These were made up of thirty (30) canoe owners' and 10 crew for each of the zones selected. In all, a total of 450 canoe owners and 180 crew were sampled for the study. All the chief fishermen in the landing sites/beaches were targeted (purposively) while the canoe owners and crew who were willing to participate in the survey were interviewed. The owners and crew were interviewed at the landing sites/beaches, meeting places and at their homes. They were randomly selected. The number of questionnaires retrieved were 386 (86%) for canoe owners and 164 (91%) for the crew. The logistic model was employed to examine the factors affecting Willingness-To-Pay (WTPay) for group Life Insurance Scheme. Descriptive statistics such as means, frequency distribution and percentages were also used in the analysis.

Conceptual Framework

Logit regression models the relationship between a binary response variable and one or more explanatory variables, which may be either discrete or continuous. This model with dichotomous (or binary) dependent variables can be used

as a conceptual framework to examine variables associated with the Willingness to pay (WTPay) for a life insurance scheme by fishermen in Ghana [18].

The model is mathematically represented as:

$$P_i = F(\alpha + \beta X_i) = \frac{1}{1+e^{-(\alpha+\beta X_i)}} \quad \text{(Eq. 1)}$$

Where 'e' denotes the natural logarithms, P_i is the probability that an individual will like to make payment for life insurance policy, β_i are the coefficients of the explanatory variables (X_i) [18]. The value of the parameters, β measures the marginal effect of a unit change in the explanatory on the probability of WTPay for life insurance.

$$Marginal\ effect = {}^{\delta P_i}/_{\delta X_i} = f(X'\beta).\beta_i = \frac{e^{-X'\beta}}{(1+e^{-X'\beta})^2}.\beta_i \quad \text{(Eq. 2)}$$

Zekri et al., (2010) in the study of Fishermen Willingness to Participated in an Insurance Program in Oman, identified some indicators which influence Willingness-To-Pay. These are socio-economic and demographic factors such as number of employees, income, family size, fisherman's age, safety measures and experience. In addition were canoe characteristics, attitude at sea and asset.

Table 1 shows description, definition and a priori expectations of variables in the logit model

Table 1: Description, Definition and A' Priori Expectations of Variables in the Logit Model

	Variable	Definition/measurement	A Priori expectation
Socio-economic	Age	Age of canoe owners (Yrs)	+
	Fsize	Family size (Number)	-
	Educ	Educational level: 1=Educated, 0=None	+
	Ndep	Number of dependents (Number)	-
	Exp	Experience in fishing (Yrs)	+
	Resdnt	Residential status: 1 = Indigene, 0 = Migrant	+
	Insur	Ever insure before: 1=yes, 0 = No	+
	Income/Revenue	Revenue = (GH₵)	+
Canoe characteristics	Canang	Age of outboard motor (Yrs)	-
	Engage	Engine (Yrs)	+/-
	Period	Period at sea (Hrs)	+/-
	Avecrew	Average number of crew (Number)	+/-
Attitude	Informfamily	Informing family before going fishing: 1=yes, 0 = No	+
	Goingrp	Moving in groups during fishing: 1=yes, 0 = No	+
	Weather	Listening to weather forecast: 1=yes, 0 = No	+
	Lifejacket	Using lifejacket: 1=Yes, 0 = No	+
Assets	Car	Have car: 1=Yes, 0 = No	+
	House	Have house: 1=Yes, 0 = No	+
ε_i	Error term		

Survey, (2014)

- **Logit Model**

$$WTPay = f(socio-economic\ chracteristics, \text{canoe chracterisrics}, attitudes, assets) \quad \text{(Eq. 3)}$$

- **Empirical model**

$$WTPay = \alpha_0 + \alpha_1 Age + \alpha_2 Fsize + \alpha_3 Educ + \alpha_4 Ndep + \alpha_5 Exp + \alpha_6 Resdnt + \alpha_7 Insur + \alpha_8 Income + \alpha_9 Canage + \alpha_{10} Engage + \alpha_{11} Period + \alpha_{12} Avecrew + \alpha_{13} Informfamily + \alpha_{14} Goingrp + \alpha_{15} Weather + \alpha_{16} lifejacket + \alpha_{17} Car + \alpha_{18} House + \varepsilon_i \quad \text{(Eq. 4)}$$

RESULTS AND DISCUSSIONS

- **Attitude/ Safety at sea**

The attitude of the sampled respondents towards safety at sea was examined. In order to improve safety and to encourage fishermen to adopt safety methods, invest in safety equipment among others, it is necessary that they gain control of their resources [7]. In this study, the boat owners and the crew were therefore interviewed about their attitude towards safety at sea. Results from the study indicate that majority of the canoe owners (80%) do not allow their canoes (where they have more than one canoe) to go to fishing together or allow theirs to go with other canoes together. This was confirmed by 82% of the crew. Those who go together indicated that they do not go together with the intention of helping each other in case of accidents. Fishermen decide to go to a common fishing ground to fish. In the event of an accident, they extend a helping hand to their colleagues.

The respondents were again asked if they inform their family before going fishing. Almost all of the owners (98%) and the crew (96%) answered affirmatively. It implies that the family could notify authorities' when their husbands, friends and love ones do not return from fishing expeditions. Those who did not, assumed that their families are aware they go to finishing some days in a week, hence there is no need to do so every day. Additionally, most (80%) of the owners and the crew (69%) listen to weather forecast before going fishing. Weather forecast is a vital information before a fishing voyage. With reliable weather information before departure to the fishing ground, many accidents could be avoided [6].

The results further revealed that majority of canoes do not carry lifejacket/life belt for fishing. This was confirmed by 93% of canoe owners and 98 percent of the crew. The respondents were of the view that they do not feel comfortable wearing it and the equipment were expensive to be bought. It is seen from the study that sea safety measure such as the use of life jacket was not widespread among the artisanal fishermen. According to a good number of canoe owners (96.3%), crew carry communication equipment such as mobile phones for communication purposes. They use it to communicate with those on the water and on land. This accession was confirmed by 95 percent of crew interviewed. The limitation in using the mobile phones according to them was that it cannot operate at a certain distance on the sea.

The results further indicate that a few of the canoes (7%) are equipped with compass. Use of compass according to the fishermen depend on the type of fishing undertaken. The low percentage of use could be due to the fact that some of the fishermen undertake their fishing activities within the territorial sea (coastal fishing) as well as the Lake therefore they believe that they do not necessary need compasses for fishing. The canoe owners were of the view that the fishermen employ long experience, the stars and the horizon among others (astronavigation) to navigate their way during fishing and thus take decisions regarding their safety. This notion was confirmed by 98 percent of the crew who agreed. The Drift Gill Net go far to sea to fish hence use compasses to navigate around.

- **Assets**

The canoe owners were interviewed about ownership of assets (e.g. car and vehicle). Results indicate that 8.5 percent and 65.5 percent own a car and houses respectively while 7 percent own both assets. It implies that such owners have an idea about the payment of car insurance and or property rates and therefore may likely participate in insurance policies as well as pay for premium.

- **Types of insurance**

There are many definition for insurance but one of the most helpful is to define insurance as a mechanism or a service for the transfer to someone (insurer) of certain risks of financial loss in exchange of the payment of an agreed fixed amount [17].

Table 2 summarizes the various insurance policies pursued by some canoe owners. The results of the empirical survey indicate that 70 out of 384 canoe owners sampled representing about 19 percent have been involved in different insurance policies as compared to 9 (5.5%) of the crew. Fishermen are not very much involved in insurance schemes as Table 4 suggests. The result shows that 8.3 percent and 4.9 percent of canoe owners and crew are involved in health insurance. Also, 7.6 percent of canoe owners and 0.6 percent crew have insured their motor vehicles. The results from the survey suggest that a large number of fishermen have neither insured their life nor their gears and other equipment/instruments. It is primarily attributed to ignorance and lack of understanding of the significance of insurance [9].

Table 2: Types of Insurance by Respondents

Type of insurance	Canoe Owners*	Crew*
Health Insurance	32 (8.3%)	8 (4.9%)
Motor vehicle	29 (7.6%)	1 (0.6%)
Life insurance	8 (2.1%)	-
Kids school fees	2 (0.5%)	-
Property	1 (0.3%)	-
Child policy	1 (0.3%)	-
Canoe	1 (0.3%)	-
Net	-	-
Outboard motor	-	-

** Multiple responses* *Survey (2014)*

- **Willingness to participate in an insurance scheme**

The respondents were interviewed about their willingness to participate in various insurance schemes (Table 3). The canoe owners were asked if they were willing to insure their crew (group insurance) while the crew were asked if they were interested to be insured by canoe owners. Results show that in all, most canoe owners (69%) and Crew (89%) answered affirmatively. Furthermore, majority of the respondents were willing to participate in other insurance schemes as stated in Table 3.

Reasons for non-participation in listed insurance schemes

- ✓ **Group insurance**

The canoe owners who were not willing to participate in group insurance (30.6%) said so because crew members do not stay with one net or canoe for long. Crew are always on the move from canoe to canoe, net to net, and from one community to another. They hardly inform their employers when they are quitting or leaving the job. Another reason is that the insurance firms delay in processing claims for the claimants. Canoe owners believe that the crew are paid hence there is no need to insure them. They also indicated that there is not enough funds to pay for the insurance of the crew.

The few of the crew who were not interested in group insurance (10.2%) agreed with the canoes owners that insurance companies do not easily or readily pay claims and also they the crew do not stay with a canoe or a net for long.

Table 3: Willingness to Participate in the various Insurance Schemes

	Canoe owners		Crew	
	Yes	No	Yes	No
Group life/accident insurance	259 (69.4%)	114 (30.6%)	140 (89.8%)	17 (10.2%)
Personal life/accident insurance	358 (94.5%)	19 (5.5%)	143 (95.0%)	8 (5.0%)
Life insurance for family	276 (76.7%)	84 (23.3%)	103 (77.6%)	32 (22.4%)
Outboard motor	283 (79.1%)	75 (20.9%)	N/A	N/A
Fishing net	302 (82.3%)	65 (17.7%)	N/A	N/A
Canoe	325 (88.8%)	41 (11.2%)	N/A	N/A
Pension	314 (84.0%)	60 (16.0%)	148 (93.7%)	10 (6.3%)

Survey (2014)

- ✓ **Personal life insurance**

There were a few canoe owners (5.5%) who were not interested insuring themselves. Their reasons were that they would not benefit if nothing happen to them and also, they are old and could die very soon hence there is no need for the insurance. They were of the view that it is difficult to get claims from insurance companies when accidents occur. A few (5.0%) of the crew also agreed with the canoe owners of delay payment of claims by the insurance companies. There are those who lack funds and interest.

- ✓ **Family insurance (Wife and children)**

The results suggest that about 23 percent of the canoe owners and 22 percent of crew were not willing to insure their families. The following were the stated reasons:

i. Delay or no payment of claims;
ii. No wife and/or children;
iii. More than one wife and many children;
iv. The family can take care of itself;
v. Lack of financial resources to insure the family/my income level is low;
vi. There is the need to decide with the family first;
vii. One can try first before enrolling the family in;
viii. There is the need to insure children and not wife because they can ask for divorce at anytime;
ix. Spouses can insure themselves;
x. Once am registered, it takes care of the family;
xi. Members of the family are grown-ups;
xii. The family members are not with me;
xiii. The children are very young;
xiv. The family members do not go fishing with me;
xv. Children will take my life insurance money when I die;
xvi. Respondent not interested.

- ✓ **Gears**

The following were the reasons why some owners of canoes will not insure their gears (Outboard motor, net, canoe):

i. Delay in claims;
ii. Accident rarely occur;
iii. There is not enough money;
iv. Outboard motors can be protected always;
v. There will not be any major problem;
vi. It is an additional cost;
vii. The nets do not last long to be insured;

viii. The net would be mended;
ix. It can be managed when it occurs;
x. Respondent not interested.

✓ **Pension**

Sixteen (16) percent of the canoe owners and 6 percent of crew did not show interest in pension scheme because of the following:

i. Delay in processing of claims;
ii. Fishermen do not go on pension/ Their jobs will take care of me;
iii. Children would take care of the aged;
iv. The canoes will still be working for the owners;
v. Am not interested.

Willingness-To-Pay (WTPay)

Furthermore, the results indicate that a good number of the canoe owners are willing to pay for group insurance (64.7%), personal life insurance (86.5%), outboard motors (68.9%), fishing net (72.5%), canoe (77.5%) and pension (798%). Results from the survey shows that more than half of the target group responded positively to the prospect of an insurance scheme. The average amount that the canoe owners were willing to pay for a crew is US$1/month. Also, the canoe owners were willing to spend more on their personal insurance. They were willing to pay an average premium of US3.3/month while the crew were willing to pay an average amount of US$1.7. The average amount to be paid by owners for an outboard motor, canoe, fishing net, and pension are US7, US$13.5, US$15 and US$10 per month respectively. In addition, the crew were prepared to pay an average of US$1.7/month for personal life and pension respectively[ii]. Even though the owners were prepared to pay a high premium for fishing net, they advised the insurance companies to be carefully about insuring nets since the risk is too high in terms of losses and damage.

- **Risk/emergency coping mechanism**

Coping mechanism in this context are ways by which canoe owners and crew cope with risks or emergencies in relation to fishing and fishing activities. The respondents were asked, how they cope with risk or emergencies in fishing. Results show that out of a total of 386 boat owners, 24.7% approach boat mummies for financial support. Also, equal percentage (21.8%) approach banks or go for their savings to remedy the situation (Table 4).

Table 4: Emergency Coping Mechanism by Canoe Owners

	Freq.	%	Rank
Boat Mummy	93	24.7	1
Bank	82	21.8	2
Savings	82	21.8	3
Family	60	15.9	4
Money lender	46	12.2	5
Friends	39	10.3	6
Fish mongers/processor	22	5.8	7
Microfinance	21	5.6	8
Credit Union/Organization	6	1.3	9

Survey (2014)

In terms of percentage ranking, boat mummy was ranked as the most preferred choice of sourcing for funds during risk coping mechanism among the sampled boat owners. Crew also rely on family (23.2%), boat mommies (15.9%)

canoe owners (13.3), processors and customers (11.6%), banks (11%), savings (7.9%), friends (7.9%), microfinance groups/susu (6.7%) and money lenders (3.0%) for emergencies.

- **Disasters encountered by canoe owners in the last five years**

Canoe owners were interviewed about the various disasters they encountered for the past half a decade. The most natural occurring disasters are storms (35%) followed by excess rain on the waters (15%). The storms led to boat capsizing and loss of gears as well as injury with a few cases of loss of lives (Table 5). The human made disasters are characterized by damage of fishing gears (66.3%). Sometimes bigger vessels and canoes tend to drag fishing nets of other canoes away or destroy the nets.

Cargo vessels on the sea can smash into canoes, break them up and throw the fishermen into the sea. A good number of the canoes fishing on the Lake encountered loss of fishing gears. The nets get entangle around the stumps while the canoe also get split up at the base. There are unreported cases of loss of lives or injury as fishermen dive to recover the nets and outboard motors in the Lake.

Table 5: Disasters Encountered for the Last 5 years

	Freq.	**%***
Damaged gears (net, canoe)	256	66.3
Storm	135	35.0
Excess rain	58	15.0
Collision	37	9.6
Fire outbreak	10	2.6
Others	25	6.5

** Multiple responses* *Survey (2014)*

The study also revealed collision of fishing canoes with industrial and semi-industrial vessels. Some of the collision occurs in the night when visibility is very poor especially with the industrial and semi-industrial vessels. There are sometimes outbreak of fire or explosion onboard fishing canoes leading to loss of fishing gears and/or injury.

- **Logit regression results**

The regression result of the logit model is specified in Table 6. It indicates that the goodness of fit of the logistic model tested by means of the Log-Likelihood Ratio shows a 1% level of significant. It implies that the null hypothesis which states that all slope coefficients are equal to zero is rejected in favour of the alternative. The variables jointly explain the observe variation in the probability of fishermen Willingness-To-Pay (WTPay) for group life insurance (Table 6). Some variables such as average monthly income were excluded from the analysis to come out with the best fit results. The study shows that 242 canoe owners representing about 62.7 percent were willing to pay for group life insurance scheme for crew.

The results indicate that six (6) out of 17 variables were statistically significant. Four of the socio-economic variables such as family size, number of dependents, experience and whether fishermen have ever involved themselves in insurance were statistically significant at the 1% level. Regards to attitude at sea, weather was the only variable that was statistically significant and at 1% level. Furthermore, asset representing ownership of car is significant statistically at the 5% level. None of the canoe characteristics was significant for this study. Contrary to the study undertaken by [21], it was the number of crew on the boat among the canoe characteristics that was statistically significant.

The result shows that if family size and number of dependents increase by one (1) percent, the probability of paying for life insurance scheme will decrease by 3.2 percent and 2.3 percent respectively. When the members in the family or dependents increase, there is the likelihood that the respondents will spend more money in taking care of them and have less funds to invest. Also, if years of experience increase by one (1) year, the probability of paying for insurance scheme will decrease by 1.2 percent. Fishermen believe that the more experienced they become, the more likely they can overcome risks and emergencies hence the decrease in likelihood to invest in life insurance scheme. The results

further point out that ever participating in an insurance scheme decreases the likelihood of paying for life insurance by 40.0 percent. This could be due to the fact that fishermen find it difficult accessing claims from insurance companies. None of the variables for canoe characteristics influenced WTPay significantly even at the 10 percent level.

Table 6: **Logit Estimation Result for Life Insurance (Dep. Var.: WTPay for Group life Insurance Policy)**

	WTP	Coef.	Std. Err.	Z	P>z	ME
Socio-economic characteristics	Age	0.008	0.022	0.35	0.728	0.001
	Education	-0.336	0.420	-0.80	0.423	-0.065
	Family size	**-0.165**	**0.063**	**-2.60**	**0.009*** **	**-0.032**
	Number of dependent	**-0.116**	**0.041**	**-2.85**	**0.004*** **	**-0.023**
	Experience	**-0.060**	**0.022**	**-2.70**	**0.007*** **	**-0.012**
	Residential status	0.252	0.422	0.60	0.550	0.051
	Involved in insurance	**-1.783**	**0.575**	**-3.10**	**0.002*** **	**-0.400**
Canoe characteristics	Engine age	0.037	0.041	0.90	0.367	0.007
	Horse power	0.006	0.019	0.33	0.741	0.001
	Duration	-0.007	0.010	-0.75	0.453	-0.001
	Number of crew	0.038	0.033	1.17	0.453	0.008
Attitude	Canoe group	-0.642	0.409	-1.57	0.116	-0.135
	Inform family	0.026	1.273	0.02	0.984	0.005
	Weather	**-1.503**	**0.549**	**-2.74**	**0.006*** **	**-0.230**
	Life jacket	1.151	0.880	1.31	0.191	0.178
Assets	**Car**	**1.514**	**0.781**	**1.94**	**0.053** **	**0.215**
	House	-0.629	0.412	-1.53	0.127	-0.118
	Constant	0.869	1.507	0.58	0.564	-

Log likelihood = -101.56794 Number of obs. = 222
LR chi2(18) = 82.17 Prob. > chi2 = 0.000 Pseudo R2 = 0.2880

ME (*dy/dx) denotes marginal effect; ***, ** denote 1% and 5% respectively*

Results from the analysis show that listening to weather forecast significantly influence WTPay at 1 percent level. It indicates that fishermen who listen to weather forecast are 23.0 percent more likely not to pay for life insurance scheme compared to those who do not listen. This findings disprove the findings of [21] which suggested that listening to weather, positively influence WTP.

The authors agreed that fishermen are conscious and concerned about weather changes because their safety at sea is a function of weather condition. In this study, having a prior knowledge would help in safeguarding the canoe and its crew against accidents hence decline in enrolling in an insurance scheme. Informing family before going fishing and use of life jacket positively influence WTPay even though they were not statistically significant even at the 10 percent level. The result does not corroborate the findings of [21] on the idea that the general feeling by some fishermen that availability of equipment such as life jacket is sufficient to secure their life. This could be due to the fact that very few crew use lifejacket and also, informing family is not sufficient enough to overcome disasters on the water body hence the need to pay for life insurance scheme. Assets which represent wealth significantly influence WTPay for life insurance in this regression model. Ownership of a car and house affect WTPay positively and negatively respectively. Having a car increases WTPay by 21.5 percent. This confirms the findings of [21] which suggest that those who own cars are familiar with insurance regulations and benefits, hence are WTPay for life insurance scheme. Ownership of house was not statistically significant even at the 10 percent level though it met it's a-priori expectation. It is believed that even though some fishermen own house(s) in fishing communities, most do not pay house or property rent as

compared to occupants of houses in well developed areas. Since they may not be familiar with housing regulations, they might not be WTPay.

CONCLUSION AND RECOMMENDATION

No technological advances can fully eliminate the forces of the sea and Lake and other natural dangers which crew have to face, nor is it possible to eliminate the human errors or to make the tools of the fishing activity such as the fishing vessels and gears completely accident proof [13]. The above issues call for attention of governments on the implementation of insurance schemes for the artisanal fishermen. Due to the nature of risk at sea and on the Volta Lake, a good number of the canoe owners' exhibit safety measures or attitudes such as informing their families before going fishing, listening to weather forecast and carrying communication gadget such as mobile phones. Very few of the canoes go in groups with the intension of helping each other as well as wear life jackets as a safety measure. Most of the canoes do not go with radio communication systems except mobile phones. The study indicates that in terms of coping with emergencies and risks, most respondents preferred approaching boat mummies followed by talking to the banks or depending on their savings. It was also revealed from the analysis that a few of the respondents were involved in health insurance schemes followed by motor vehicles. Ultimate, fishermen (canoe owners and crew) are willing to participate in the following insurance schemes: group life, personal life, life insurance for the family, gears and pension schemes.

Following the estimation of the logit equation, family size, number of dependent and experience among the socioeconomic characteristics had significant impact on willingness to pay for life/group insurance scheme. Also, in terms of canoe characteristics, none of the variables affected WTPay at the 5% level of significant. Furthermore, weather forecast was the only factor in terms of attitude that influenced WTPay and last but not the least, ownership of a car also influenced WTP. To encourage the participation and payment of insurance scheme, stakeholders in the industry, including the insurance companies are to intensify awareness creation through education. There should be collaboration among stakeholders through education and sensitization in the form of meetings, workshops, conferences and seminars between the industries in the designing of suitable policies to address the insurance needs of the fishermen. It is also suggested that insurance companies need to be sensitized on insurance policies and premium payment on fisheries to beneficiaries. The telecommunication service provides can also develop packages for the sector through the use of mobile phone services.

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[i] 2013 revised in April 2014

[ii] Exchange rate of Cedi to Dollar is GH₵3.00 = US$1.00