



Determinants of Participation in Life Insurance Scheme by Artisanal Fishermen: A Case of Ghana

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Authors' contributions

This work was carried out in collaboration between all authors. Authors HA, DY and SQ designed the study, reviewed literature and wrote the first draft of the manuscript. Authors HA, RW, RY and FI collected and analyzed data as well as discussion of results. Author HA did the final write-up of the manuscript. All the authors read and approved the final manuscript.

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ABSTRACT

Aims: This study investigates the determinants of participation in life insurance scheme by artisanal fishermen in Ghana.

Study Design: Cross-sectional study design was employed in this study. Field surveys, interviews, questionnaires (semi-structured mostly closed) were employed in the gathering of data 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.

Location and Place of Study: The study was undertaken in some selected communities from four (4) Coastal regions (Great Accra, Volta, Central and Western) and the Inland areas bordering the Volta Lake (Yeji, Abotoase and Kpando). These areas are the major fishing areas in Ghana.

Methodology: The authors employed descriptive statistics and logit model to analyze the data. Three hundred and eighty-six (386) canoe owners and 164 crew from four (4) coastal regions and the Inland Lake Region were sampled.

Results and Discussion: The study observed that most canoe owners and crew members are willing to participate (WTP) in group life, personal life, family insurance, fishing gears and pension

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schemes. This is an indication that there is a potential for such scheme for the sector. The factors that most strongly affect WTP for group insurance of crew are family size, number of dependants, experience of fishing, listening to weather forecast before going fishing and ownership of a house.

Conclusion and Recommendation: It is evident from the study that majority of respondents are willing to participate in the various insurance schemes including group and life. Delay in payment of claims is a major reason why some canoe owners and fishermen will not enroll in the scheme. The logit model shows that family size, number of dependants, experience, weather and ownership of a house significantly influence willingness to participate in fishermen group life insurance scheme. The study recommends the intensification of awareness creation among the fishermen on the insurance scheme through meetings, workshops, conferences and seminars between the industries in the design of suitable insurance needs of the fishermen. Telecommunication service providers should be brought on board to develop insurance packages for the sector since a high number of the fishermen own mobile phones and pay for recharge.

Keywords: Artisanal fishers; insurance scheme; willingness-to-participate (WTP); Logit model.

1. 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 some nations in West Africa with coastline. 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 10% of the population in Ghana are dependent on the fisheries sector for their livelihood [1]. The sector's contribution to the country's GDP was reported to have reduced from 1.5 percent in 2012 to 1.4 percent in 2013 [2].

The fisheries sector has two major components: marine (sea and lagoons) and inland (lakes, rivers and reservoirs) [3]. Inland fisheries are primarily small scale, while the marine fisheries are a combination of mostly small scale and large scale industrial fisheries. According to [4], 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 suggests a total of 12,728 marine canoes of which about 73 percent are motorized [5]. 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 [5]. 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 [5]. 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.

2. LIFE INSURANCE SCHEME

2.1 History of Insurance in Ghana

Insurance as an economic activity came to Ghana before independence in 1957 with a penetration rate of 2-3%. The National Insurance Commission (NIC) was established in 1989 to oversee the sector. The health insurance which is separate from the rest of the sector was finally initiated in 2003 after government had had difficulties in paying due to economic problems. This sector is regulated by the National Health Insurance Authority (NHIA). The NHIA is funded through a 2.5% tax on some goods and services, a portion of the social security contributions of formal sector workers, premiums and other sources (such as from donors). The programme covers most diseases, with some notable exclusions, and a number of classes of people are exempt from premiums, including the aged, the indigent and pregnant women [6]. Only approximately 35% of the population is covered and many of these are the easy-to-convince, premium-exempt participants [6].

By the end of September 2014 the country had 26 non-life firms, 19 life companies, 3 reinsurers and 63 brokers. The number of foreign insurers increased from two in 2006 to 16 in 2012. In 2012, five (5) life insurance firms controlled 80% of the sector: SIC, 28%; Enterprise Life Assurance Company, 25%; Starlife, 11%; Glico, 10%; and Metropolitan, 6%. The non-life sector was much the same, with the top five controlling 61%: SIC 22%; Star, 12%; Metropolitan, 9%;

Enterprise Insurance, 9%; and Vanguard, 9%. Non-life insurance market is driven mainly by motor policies. The life segment has seen increased expansion in recent years and life premiums are expected to exceed the non-life within five years [7]. The NIC has been determined to deepen the insurance penetration in Ghana through the development of Agriculture and Micro insurance. This agenda is being pursued with technical assistance from some development partners [8].

There has been some penetration of insurance in the marine sector. The policies cover marine cargo, hull fire and property insurance. In the fisheries sector, it is a policy requirement in the Fisheries Regulation L.I.1968 for the industrial vessels and semi-industrial to submit valid certificate of insurance of vessel and crew when applying for registration and licensing of vessels. This regulation has been enforced for the industrial vessels except that of the semi-industrial vessels. There has not been any policy for the artisanal sector since the inception of insurance in the country. It is the hope of the authors' that it will see the light of the day.

2.2 Theories

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. Food and Agriculture Organization of the United Nations (FAO/UN) 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 [9]. About 98 percent of these vessels are under 24m in length, and are not covered by any international rules and regulations. The number of global fatalities was estimated by the International Labour Organization [10] 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 cases at sea were reported to the Arbitration Committees in 2013 as against 10 in 2012 [5] 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 [11] 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 [12]. A study conducted by FAO suggests that insurance is considered as a tool in risk management of capture fisheries activities [13]. 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 [13,14]. 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 governments for further development of risk management measures to mitigate the immediate impact of these disasters. The review of the current state of the world and aquaculture insurance by [12] 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.

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 fisher folk. Insurance (particularly micro-insurance) can reduce the risks involved in fisheries, enabling poor fisher folk to innovate and access micro-credit services and investment funds [13].

To the best of authors' knowledge, no study has been undertaken in this area of subject, hence, this has motivated them 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 determinants of participation in life insurance scheme by artisanal fishermen in some selected communities of the four coastal and the lake regions in Ghana and make policy recommendation to the stakeholders

in the fishing industry as well as insurance companies.

3. METHODOLOGY

3.1 Study Area

The study areas are located 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. Fig. 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.

The study employed cross-sectional study design. In this type of study, either the entire population or a subset thereof is selected, from these individuals, data are collected to help answer research questions of interest [15]. Data

from the target groups were collected using two sets of semi-structured questionnaires deduced from the study of [12] 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 numbers 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.

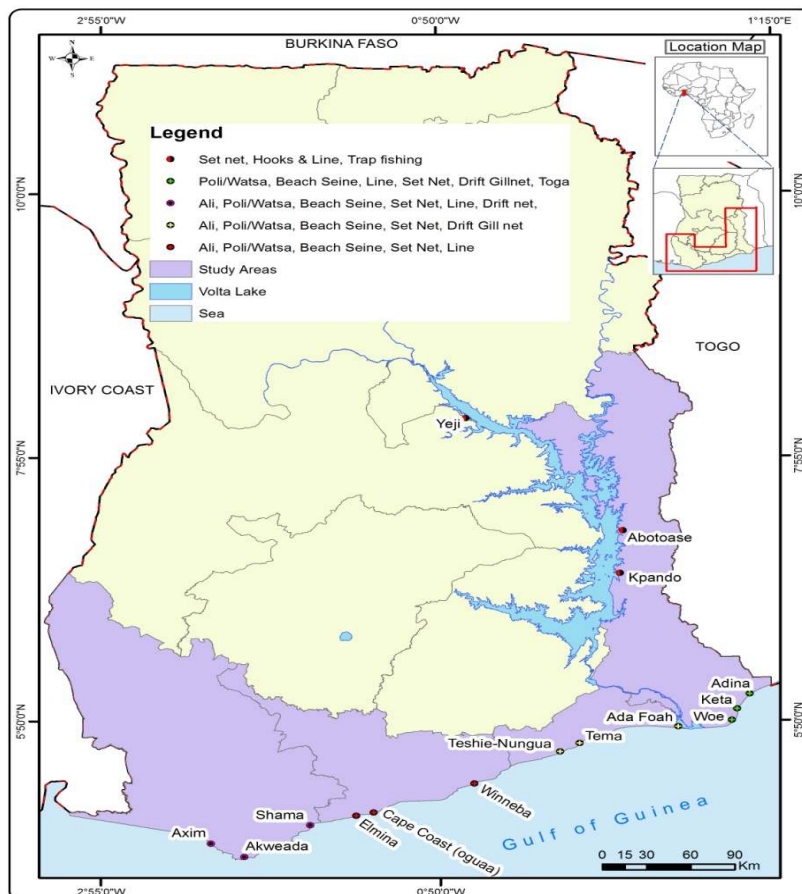


Fig. 1. Map of Ghana showing study areas

3.2 Sampling Method and Data Collection

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-Participate (WTP) for group Life Insurance Scheme. Descriptive statistics such as means, frequency distribution and percentages were also used in the analysis.

3.3 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 Participate (WTP) in a group life insurance scheme by fishermen in Ghana [16].

The model is mathematically represented as:

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

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) [16]. The value of the parameters, β measures the marginal effect of a unit change in the explanatory on the probability of WTP for life insurance.

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

[17], 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. [18] also identified gender, education, household size, membership of association, nature of employment, income, medical expenses and credit as determinant of rural household's willingness to participate in community base health insurance scheme. [19], identified age, educational level, household size, access to credit among others as variables which impact on agricultural insurance in the Federal Capital Territory, in Abuja, Nigeria.

3.4 Justification of Variables

Willingness of fishermen to participate for life insurance depends on various factors. The older

the fishermen, the more the likelihood that they might have encountered lots of risk in their fishing expedition hence their willingness to enroll. Increase in the family size and dependants of fishermen may prevent them from taking part in the policy since most of the earned income will be used to cater for the family and dependants. The more educated the fishermen, the more informed they will be about the importance of insurance policies. It is expected that experience (number of years) in fishing will positively influence Willingness-To-Participate (WTP). An experienced fisherman who is exposed to dangers at sea will pay for an insurance scheme to safeguard his/herself, families and loved ones.

Also, fishermen residing in the community will be more willing than a migrant to take part in insurance policy for the crew. A migrant will like to minimize cost invested on the crew. Fishermen who had benefited from an insurance package(s) (e.g. Health) will be more WTP. The

higher the income of a fisherman, the more he/she will be willing to enroll in the scheme. The older the canoe and the engine, the more likely the canoe owner will like to insure. The longer a fisherman stays at sea, the higher the chances that he might face dangers, hence the likelihood that he might enroll in insurance schemes.

Average number of crew may influence WTP for an insurance scheme or not. The higher the number of crew, the more the canoe owner will have to pay for their wages and premium. There is also the probability that more crew could work harder for good catch hence more output leading to increase in income to invest. In terms of safety at sea, informing families before going to sea and

going to fishing in groups suggest that fishermen are concerned about their safety hence they will be willing to enroll in the scheme. Listening to weather forecast and the wearing of lifejackets is a sign of concern for one's life at sea hence the need to enroll in the insurance scheme. Access to a car suggest that if a fisherman owns such an asset, he/she would have been accustomed to the payment of insurance, hence the willingness to participate. Fishermen with houses are used to payment of property rate, therefore there is the prospect that they will be willing to participate in the scheme.

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	Age of engine (Yrs)	+/-
	Period	Period at sea (Hrs)	+/-
	Avecrew	Average number of crew (Number)	+/-
Attitude	Informfamily	Informing family before going fishing: 1=yes, 0 = No	+
	Goinggrp	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, (2013)

3.4.1 Logit model

$$WTPay = f(\text{socio - economic characteristics, canoe characteristics, attitudes, assets}) \tag{3}$$

3.4.2 Empirical model

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

4. RESULTS AND DISCUSSION

4.1 Gender

Majority of the canoe owners sampled (94%) were males. This confirms the fact that it is a male dominated profession. The females either inherited or bought the canoes for their husbands, head of crew and/or operate them themselves. Some women gave it out to the men to operate while they take charge of operational cost of the canoes. Additionally, all the crew (164) who were interviewed were males.

4.2 Access to Mobile Phones

The canoe owners and the crew were asked if they possessed mobile phones. Access to mobile phone among them provides information sharing. They use the mobile phones in communicating with their colleagues, crew, fish mongers, and processors among others. Marketing of fish produce among them helps in economic development. The result shows that a good number of the canoe owners (76%) and crew (88%) had mobiles. The insurance companies can disseminate information in the form of text messages of their insurance packages through the phones to the fishermen and other stakeholders. In addition to that, agreed deduction (between the implementers and beneficiaries) from paid units as a premium can be undertaken to service premiums as agreed. This confirms the assertion by [20] and [21] that the cellular phones has become the most widely-used telecommunication tool in the World and the highest growth rates worldwide are on the continent of Africa with Ghana being one of the countries. The 2010 Population and Housing census suggests that about 48% percent of the population, 12 years and older own mobile phones. The data further show that males are more likely to own mobiles phones than females

irrespective of the locality and region of residence [22].

4.3 Willingness to Participate in an Insurance Scheme

The respondents were interviewed about their willingness to participate in various insurance schemes (Table 2). 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 (69.4%) and Crew (89.8%) answered affirmatively. Furthermore, majority of the respondents were willing to participate in other insurance schemes as stated in Table 2. This implies the scheme has a high probability of it being successful.

4.4 Reasons for Non-participation in Listed Insurance Schemes

4.4.1 Group insurance

The canoe owners who were not willing to participate in group insurance (30.6%) said so because crew did not stay with one net or canoe for long. The crew were always on the move from canoe to canoe, net to net, and from one community to another. They hardly informed their employers when they were quitting or leaving their jobs. Another reason is that the insurance firms delayed in processing claims for the claimants. Canoe owners believed that the crew were paid hence there was insufficient fund to insure them.

The few of the crew who were not interested in group insurance (10.2%) agreed with the canoe owners that insurance companies did not easily or readily pay claims [7] and also they the crew did not stay with a canoe or a net for long.

Table 2. 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 (2013)

4.4.2 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. 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 on the delayed payment of claims by the insurance companies. There are those who lack funds and interest.

4.4.3 Family insurance (wife and children)

The results suggest that about 23 percent of the canoe owners and about 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 any time;
- ix. Spouses can insure themselves;
- x. Once they are registered, it takes care of the family;
- xi. Members of the family are grown-ups;
- xii. The family members are not with them;
- xiii. The children are very young;
- xiv. The family members do not go fishing with them;
- xv. Children will take their life insurance money when they die;
- xvi. Respondent not interested.

4.4.3.1 D. 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. Respondents not interested.

4.4.3.2 E. 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 them;
- iii. Children would take care of the aged;
- iv. The canoes will still be working for the owners;
- v. They are not interested.

4.5 Risk/ Emergency Coping Mechanism

Coping mechanisms 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 approach banks (21.8%) or go for their savings (21.8%) to remedy the situation (Table 3).

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.

Table 3. 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	6	1.3	9
Union/Organization			

* Women who pre-finance fishing expeditions or buy canoes for the men to operate

Crew also rely on family (23.2%), boat mummies (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.

4.6 Logit Regression Results

The regression result of the logit model is specified in Table 4. It indicates that the goodness of fit of the logistic model tested by means of the Log-Likelihood Ratio shows a 1% level of significance. 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 observed variation in the probability of canoe owners Willingness-To-Participate (WTP) in group life insurance scheme for crew (Table 4). Average monthly income was excluded from the analysis to come out with the best fit results. The study shows that 259 canoe owners representing about 67.1 percent were willing to participate in group life insurance scheme for crew.

The results indicate that five (5) out of 17 variables were statistically significant at the 1% level. Three of the socio-economic variables such as family size, number of dependents and

experience of canoe owners were statistically significant at the 1% level. Regards to attitudes at sea, weather was the only variable that was statistically significant and at 1% level. Furthermore, asset representing ownership of a house was significant statistically at the 1% level. None of the canoe characteristics was significant for this study.

The result shows that if family size and number of dependants increase by one (1) percent, the probability of participating in group life insurance scheme will decrease by 3.7 percent and 1.3 percent respectively. When the members in the family or dependants increase, there is the likelihood that the respondents will spend more money in taking care of them and have less funds to invest hence will not be willing to enroll. Also, if years of experience increase by one (1) year, the probability of participating in a group life insurance scheme for crew will decrease by 0.9 percent.

Fishermen believe that the more experienced they become, the more likely they can overcome risks and emergencies hence the decrease in the likelihood to participate in life insurance scheme. None of the variables for canoe characteristics influenced WTP significantly even at the 5% level.

Table 4. Logit estimation result for group life insurance (Dep. var.: willingness-to-participate (WTP) in group life insurance scheme)

	WTP	Coef.	Std. err.	Z	P>z	ME
Socio-economic characteristics	Age	0.016	0.023	0.69	0.491	0.0022
	Education	0.302	0.214	1.41	0.158	-0.0428
	Family size	0.263	0.079	3.31	0.001***	-0.0374
	Number of dependent	0.088	0.042	2.08	0.038***	-0.0125
	Experience	-0.060	0.025	-2.42	0.016***	-0.0085
	Residential status	-0.020	0.439	0.05	0.964	0.0028
	Involved in insurance	-1.038	0.558	-1.86	0.063	-0.1790
Canoe characteristics	Engine age	0.023	0.046	1.51	0.611	0.0033
	Horse power	0.003	0.021	0.12	0.905	0.0004
	Duration	-0.011	0.010	-1.05	0.292	-0.0016
	Number of crew	0.054	0.038	1.41	0.158	0.0076
Attitude	Canoe group	-0.722	0.432	-1.67	0.094	-0.1152
	Inform family	-1.778	1.375	-1.29	0.196	-0.1422
	Weather	1.830	0.618	-2.96	0.003***	0.1807
	Life jacket	1.244	0.894	1.39	0.164	0.1274
Assets	Car	1.027	0.818	1.26	0.209	0.1104
	House	-1.134	0.462	-2.46	0.014***	-0.1450
	Constant	2.360	1.612	1.46	0.143	-

Log likelihood = -91.127428, number of obs. = 215, LR chi2 (18) = 72.34, Prob. > chi2 = 0.000, Pseudo R2 = 0.2841, ME (dy/dx) denotes marginal effect; *** denotes 1%

Results from the analysis show that listening to weather forecast significantly influence WTP at 1 percent level. It indicates that canoe owners/fishermen who listen to weather forecast are 18.1 percent likely to participate in group life insurance scheme compared to those who do not listen. This finding agrees with that of [17] which suggested that listening to weather forecast, positively influence WTP.

The authors agreed that canoe owners were conscious and concerned about weather changes because safety at sea is a function of weather condition. In this study, having prior knowledge would help in safeguarding the canoe and its crew against accidents hence their desire to enroll in an insurance scheme. Informing family before going fishing and use of life jacket were not statistically significant even at the 5% level. The result does not corroborate the findings of [17] 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 participate in group life insurance scheme. Assets which represent wealth significantly influence willingness to participate in group life insurance in this regression model. Even though ownership of a car was not statistically significant at 1%, it confirms the findings of [17] which suggest that those who own cars are familiar with insurance regulations and benefits, hence are WTP in life insurance scheme. Ownership of house was statistically significant at the 1% level and met its a-priori expectation. It is believed that even though some canoe owners 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 willing to participate in such a scheme.

5. CONCLUSION AND RECOMMENDATIONS

No technological advances can fully eliminate the forces of the sea and Lake and other natural dangers which the 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 [14]. The above issues call for attention of governments to facilitate the implementation of insurance schemes for the artisanal fishermen.

Due to the nature of risk at sea and on the Lake, a good number of the 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 dependants and experience among the socioeconomic characteristics had significant impact on willingness to participate in group life insurance scheme. Also, in terms of canoe characteristics, none of the variables affected willingness to participate even at the 5% level of significant. Furthermore, weather forecast and ownership of a house also influenced willingness to participate. To encourage the participation in insurance schemes, 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 be sensitized on insurance policies and premium payment on fisheries to beneficiaries. The telecommunication service providers can also develop insurance packages for the sector through the use of mobile phone services.

DISCLAIMER

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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